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

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

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

EDITORIAL NOTICE.

A fifth edition of the machine-readable files of astrometric observations is now available. Intended to be complete through the 1986 May 23 MPCs, it contains a total of 402 348 observations: 275 636 of numbered minor planets, 101 179 of unnumbered minor planets and 25 533 of comets. The files are available, either on a labeled VAX/VMS magnetic tape, or on an unlabeled 9-track magnetic tape (coded in ASCII at 1600 bpi, 80-byte record size and 4000-byte block size). The cost is $300.00 ($100.00 to customers who purchased one or more of the earlier editions). Enquiries should be made to the Minor Planet Center at the address given above.

* * * * *

CRITICAL LIST OF MINOR PLANETS.

The following list updates and is in the same form as that on MPC 9811:

1. Objects observed at only one opposition:
473 719 724 878 1026 1179

2. Objects observed at only two oppositions:
1981 2202 2608 3102 3103 3199 3270 3271 3288 3352 3360 3362

3. Objects accurately observed at only three oppositions:
1009 1316 1538 2059 2061 2062 2076 2101 2135 2148 2198 2210
2212 2229 2257 2260 2272 2285 2327 2340 2368 2373 2444 2462
2551 2552 2596 2629 2645 2671 2695 2703 2706 2758 2765 2800
2868 2876 2895 2904 2914 2915 2935 2937 2948 2964 2966 2968
2974 2977 2986 2994 2999 3004 3013 3014 3017 3018 3022 3025
3037 3040 3041 3043 3044 3046 3057 3073 3075 3079 3080 3086
3087 3101 3119 3122 3144 3160 3161 3169 3178 3192 3198 3200
3204 3206 3211 3212 3217 3218 3225 3245 3252 3254 3255 3273
3274 3284 3287 3289 3304 3307 3309 3336 3343 3344 3353 3361
3371 3374 3375 3383 3392 3398 3401 3402 3410 3416 3426

4. Objects observed at four or more oppositions, last during 1973-1975:
353 1134 1138 1230 1373 1710 1750 1871 1876 1883

5. Objects observed at four or more oppositions, last during 1976:
879 880 881 1205 1372 1580 1709 1917 1919

* * * * *

CORRECTED OBSERVATIONS.

The following observations correct those previously published.

| Object | Date | UT | R. A. (1950) | Decl. | Reference | Mag. | Obs. |
|---|---|---|---|---|---|---|---|
| 1984 HC1 * | 1984 04 | 19.87935 | 12 57 58.36 | +03 00 52.2 | MPC 8836 | | 046 |
| 1984 SG2 | 1984 09 | 28.14861 | 22 50 01.13 | -03 01 47.1 | MPC 9196 | 17.0 | 688 |
| 1986 JQ * | 1986 05 | 13.99164 | 16 12 58.59 | -06 56 05.3 | MPC10684 | 16.5 | 054 |
| 1986 JQ | 1986 05 | 14.00553 | 16 12 57.82 | -06 55 49.7 | MPC10684 | | 054 |
| 1985 XB | 1986 04 | 30.26319 | 09 00 46.49 | +53 18 19.9 | MPC10690 | | 675 |

* * * * *

IDENTIFICATION CHANGES.

Continuation to MPC 10669.

| Object | Date | UT | R. A. (1950) | Decl. | Old desig. | Mag. | Obs. |
|---|---|---|---|---|---|---|---|
| 1933 DM * | 1933 02 | 26.90167 | 07 12 51.20 | +20 53 46.6 | 1933 BK | | 024 |
| 1973 WO * | 1973 11 | 24.04236 | 05 16 07.90 | +22 25 59.9 | 1973 YA2 | 16.3 | 026 |
| 1973 WO | 1973 11 | 24.14653 | 05 16 01.73 | +22 25 13.6 | 1973 YA2 | 16.0 | 026 |
| 1976 GY8 * | 1976 04 | 04.95809 | 13 56 55.62 | -03 56 53.7 | 1976 GP3 | 18.0 | 095 |
| 1976 HD1 * | 1976 04 | 23.93312 | 13 41 12.52 | -01 26 42.8 | 1976 GL7 | 17.0 | 095 |
| 1976 JE11* | 1976 05 | 01.19653 | 15 02 10.65 | -06 34 09.8 | 1976 HQ | | 808 |
| 1976 YW7 * | 1976 12 | 28.25411 | 06 10 39.67 | +21 08 14.0 | 1976 YV3 | 18 | 801 |
| 1977 TK8 * | 1977 10 | 07.82126 | 23 29 22.64 | -03 06 08.1 | 1977 RW2 | 16.5 | 095 |
| 1980 XJ3 * | 1980 12 | 10.85974 | 04 30 38.62 | +16 45 07.0 | 1980 WU1 | 17.5 | 095 |
| 1981 RO5 * | 1981 09 | 07.35972 | 01 15 27.62 | +06 09 34.7 | 1981 SH1 | | 688 |
| 1983 DV * | 1983 02 | 19.28194 | 09 46 12.69 | +17 00 52.5 | 1983 CH1 | 16.8 | 688 |
| 1983 DV | 1983 02 | 19.32778 | 09 46 10.24 | +17 01 06.5 | 1983 CH1 | | 688 |
| 1983 DW * | 1983 02 | 19.32778 | 09 47 28.56 | +17 01 06.7 | 1983 CE1 | 17.0 | 688 |

* * * * *

OBSERVATIONS OF COMETS.

Observations are published here for the following observatory codes:

006 Fabra Observatory, Barcelona. Observers J. M. Codina, J. Nunez, M. Moreno and M. Hernandez. Measured by N. Torras. Reduced by J. Nunez.
010 Caussols. Observers O. Lefevre, C. Pollas and J. Lecacheux. Reduced by R. Chemin.
026 Zimmerwald. Observers T. Schildknecht and P. Wild.
046 Klet. Observer A. Mrkos.
051 Cape. Observer J. Churms.
061 Uzhgorod. Observers S. I. Vorinka, I. I. Goroshchak, N. L. Polishchuk, S. I. Ignatovich and T. Y. Galas.
071 Bulgarian National Observatory. Observers V. Ivanova and V. Shkodrov.
083 Golosseevo-Kiev. Observers E. M. Izhakevich, I. V. Ledovskaya, S. P. Major, Y. N. Ivashchenko and A. Yatsenko.
094 Crimea-Simeis. Observers L. S. Merezhina, I. V. Nikolenko and S. V. Fokanov.
190 Gissar. Observer S. I. Gerasimenko.
293 Burlington remote site. Observer T. Handley.
323 Perth. Observers M. P. Candy, A. John, P. Jekabsons, A. McGrath and L. Stevens.
334 Tsingtao. Observers S. S. Sun and Y. J. Shao.
372 Geisei. Observer T. Seki. Communicated by S. Nakano.
391 Sendai Observatory, Ayashi Station. 0.20-m reflector. Observer M. Koishikawa. Measured by T. Tsumagari. Communicated by S. Nakano.
415 Kambah, near Canberra. Observer D. Herald.
503 Cambridge. Observer J. Shanklin.
552 Osservatorio S. Vittore. Observers C. Vacchi and G. Sassi. Measured

by V. Goretti, C. Vacchi and E. Colombini.
553 Chorzow. Observer I. Wlodarczyk.
581 Sedgefield. 0.36-m Schmidt-Cassegrain. Observer J. Hers.
657 Victoria. Observers J. B. Tatum and D. D. Balam.
675 Palomar. 0.46-m Schmidt. Observers C. S. and E. M. Shoemaker.
688 Lowell Observatory, Anderson Mesa Station. Observer B. A. Skiff. Measured by S. J. Bus.
691 University of Arizona, Kitt Peak. 0.91-m reflector, CCD in scanning mode. Observers T. Gehrels and J. V. Scotti. Reduced by J. V. Scotti and C. Lykins.
707 Chamberlin Observatory field station. Observer J. Briggs. Measured by J. Briggs and E. Everhart.
801 Oak Ridge Observatory. Observers R. E. McCrosky, G. Schwartz and C.-Y. Shao.
805 Cerro el Roble. Observers C. Torres and H. Wroblewski. Measured by M. Wischnjewsky.
809 European Southern Observatory. GPO astrograph. Observer W. Ferreri. Reduced by G. De Sanctis using the IHW special catalogue.

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | N Obs. |
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| /1982i | 1986 | 03 01.83785 | 20 25 05.88 | -16 36 47.8 | | 323 |
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| /1982i | 1986 | 03 01.84062 | 20 25 05.52 | -16 36 51.9 | | 323 |
| /1982i | 1986 | 03 01.88438 | 20 25 00.96 | -16 37 49.5 | | 323 |
| /1982i | 1986 | 03 01.88576 | 20 25 00.75 | -16 37 51.6 | | 323 |
| /1982i | 1986 | 03 01.88715 | 20 25 00.63 | -16 37 52.3 | | 323 |
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| /1982i | 1986 | 03 04.82257 | 20 19 46.29 | -17 44 25.4 | | 323 |
| /1982i | 1986 | 03 04.86649 | 20 19 41.57 | -17 45 30.3 | | 323 |
| /1982i | 1986 | 03 04.86771 | 20 19 41.39 | -17 45 30.8 | | 323 |
| /1982i | 1986 | 03 05.84375 | 20 17 53.33 | -18 08 57.2 | | 323 |
| /1982i | 1986 | 03 05.84479 | 20 17 53.14 | -18 08 59.1 | | 323 |
| /1982i | 1986 | 03 05.85214 | 20 17 52.41 | -18 09 11.6 | | 323 |
| /1982i | 1986 | 03 06.80799 | 20 16 04.04 | -18 32 55.0 | | 323 |
| /1982i | 1986 | 03 06.80938 | 20 16 03.94 | -18 32 55.6 | | 323 |
| /1982i | 1986 | 03 06.81076 | 20 16 03.84 | -18 32 59.0 | | 323 |
| /1982i | 1986 | 03 06.87257 | 20 15 56.73 | -18 34 32.8 | | 323 |
| /1982i | 1986 | 03 06.87361 | 20 15 56.57 | -18 34 34.8 | | 323 |
| /1982i | 1986 | 03 06.87465 | 20 15 56.45 | -18 34 37.0 | | 323 |
| /1982i | 1986 | 03 06.87812 | 20 15 56.11 | -18 34 41.6 | | 323 |
| /1982i | 1986 | 03 06.87917 | 20 15 55.97 | -18 34 43.5 | | 323 |
| /1982i | 1986 | 03 06.88021 | 20 15 55.81 | -18 34 44.8 | | 323 |
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| /1982i | 1986 | 03 06.88507 | 20 15 55.24 | -18 34 52.6 | | 323 |
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| /1982i | 1986 | 03 09.84549 | 20 10 00.60 | -19 53 46.7 | | 323 |
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| /1982i | 1986 | 03 09.85208 | 20 09 59.78 | -19 53 57.9 | | 323 |
| /1982i | 1986 | 03 09.85382 | 20 09 59.59 | -19 54 00.8 | | 323 |
| /1982i | 1986 | 03 09.85868 | 20 09 58.95 | -19 54 08.7 | | 323 |
| /1982i | 1986 | 03 09.86007 | 20 09 58.76 | -19 54 11.0 | | 323 |

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| /1982i | 1986 | 03 | 09.86562 | 20 | 09 | 58.04 | -19 | 54 | 20.3 | 323 |
| /1982i | 1986 | 03 | 09.86667 | 20 | 09 | 57.93 | -19 | 54 | 22.6 | 323 |
| /1982i | 1986 | 03 | 09.86771 | 20 | 09 | 57.83 | -19 | 54 | 24.5 | 323 |
| /1982i | 1986 | 03 | 11.32234 | 20 | 06 | 49.43 | -20 | 36 | 34.4 | 809 |
| /1982i | 1986 | 03 | 11.32303 | 20 | 06 | 49.37 | -20 | 36 | 35.5 | 809 |
| /1982i | 1986 | 03 | 11.79062 | 20 | 05 | 46.44 | -20 | 50 | 39.8 | 323 |
| /1982i | 1986 | 03 | 11.79201 | 20 | 05 | 46.25 | -20 | 50 | 43.0 | 323 |
| /1982i | 1986 | 03 | 11.79340 | 20 | 05 | 45.99 | -20 | 50 | 45.9 | 323 |
| /1982i | 1986 | 03 | 11.79896 | 20 | 05 | 45.31 | -20 | 50 | 55.9 | 323 |
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| /1982i | 1986 | 03 | 11.80174 | 20 | 05 | 44.92 | -20 | 51 | 00.8 | 323 |
| /1982i | 1986 | 03 | 11.80729 | 20 | 05 | 44.25 | -20 | 51 | 11.0 | 323 |
| /1982i | 1986 | 03 | 11.80868 | 20 | 05 | 43.93 | -20 | 51 | 13.8 | 323 |
| /1982i | 1986 | 03 | 11.81076 | 20 | 05 | 43.83 | -20 | 51 | 15.7 | 323 |
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| /1982i | 1986 | 03 | 11.81562 | 20 | 05 | 43.06 | -20 | 51 | 26.4 | 323 |
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| /1982i | 1986 | 03 | 12.32442 | 20 | 04 | 32.97 | -21 | 07 | 09.8 | 809 |
| /1982i | 1986 | 03 | 12.32512 | 20 | 04 | 32.95 | -21 | 07 | 10.8 | 809 |
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| /1982i | 1986 | 03 | 13.81632 | 20 | 00 | 57.96 | -21 | 55 | 10.6 | 323 |
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| /1982i | 1986 | 03 | 15.11875 | 19 | 57 | 36.00 | -22 | 39 | 59.7 | 094 |

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| /1982i | 1986 | 03 | 15.31605 | 19 | 57 | 04.67 | -22 | 46 | 50.1 | 809 |
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| /1982i | 1986 | 03 | 17.31675 | 19 | 51 | 19.88 | -24 | 01 | 59.5 | 809 |
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| /1982i | 1986 | 03 | 18.31964 | 19 | 48 | 09.72 | -24 | 42 | 36.3 | 809 |
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| /1982i | 1986 | 03 | 19.78368 | 19 | 43 | 07.43 | -25 | 45 | 54.2 | 323 |
| /1982i | 1986 | 03 | 19.78507 | 19 | 43 | 07.11 | -25 | 45 | 57.8 | 323 |
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| /1982i | 1986 | 03 | 19.87535 | 19 | 42 | 47.31 | -25 | 50 | 04.2 | 323 |
| /1982i | 1986 | 03 | 19.87674 | 19 | 42 | 46.98 | -25 | 50 | 07.2 | 323 |
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| /1982i | 1986 | 03 | 21.76285 | 19 | 35 | 22.70 | -27 | 19 | 57.3 | 323 |
| /1982i | 1986 | 03 | 21.76424 | 19 | 35 | 22.38 | -27 | 20 | 01.3 | 323 |
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| /1982i | 1986 | 03 | 21.76910 | 19 | 35 | 20.90 | -27 | 20 | 13.9 | 323 |
| /1982i | 1986 | 03 | 21.77049 | 19 | 35 | 20.57 | -27 | 20 | 17.9 | 323 |
| /1982i | 1986 | 03 | 21.77188 | 19 | 35 | 20.18 | -27 | 20 | 21.4 | 323 |
| /1982i | 1986 | 03 | 21.86354 | 19 | 34 | 56.70 | -27 | 25 | 02.0 | 323 |
| /1982i | 1986 | 03 | 21.86493 | 19 | 34 | 56.37 | -27 | 25 | 07.0 | 323 |
| /1982i | 1986 | 03 | 21.86632 | 19 | 34 | 56.07 | -27 | 25 | 10.9 | 323 |
| /1982i | 1986 | 03 | 21.87326 | 19 | 34 | 54.29 | -27 | 25 | 32.2 | 323 |
| /1982i | 1986 | 03 | 21.87465 | 19 | 34 | 53.92 | -27 | 25 | 36.7 | 323 |
| /1982i | 1986 | 03 | 21.87604 | 19 | 34 | 53.54 | -27 | 25 | 41.4 | 323 |
| /1982i | 1986 | 03 | 21.99375 | 19 | 34 | 23.21 | -27 | 31 | 50.2 | 190 |
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| /1982i | 1986 | 03 | 22.78160 | 19 | 30 | 52.48 | -28 | 12 | 32.8 | 323 |
| /1982i | 1986 | 03 | 22.78299 | 19 | 30 | 52.08 | -28 | 12 | 37.5 | 323 |
| /1982i | 1986 | 03 | 22.78438 | 19 | 30 | 51.68 | -28 | 12 | 43.2 | 323 |
| /1982i | 1986 | 03 | 22.78854 | 19 | 30 | 50.49 | -28 | 12 | 54.5 | 323 |
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| /1982i | 1986 | 03 | 22.87188 | 19 | 30 | 27.14 | -28 | 17 | 23.2 | 323 |
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| /1982i | 1986 | 03 | 24.80521 | 19 | 20 | 38.85 | -30 | 06 | 39.6 | 323 |
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| /1982i | 1986 | 03 | 26.70590 | 19 | 09 | 05.36 | -32 | 06 | 23.7 | 323 |
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| /1982i | 1986 | 05 | 13.51741 | 10 | 30 | 50.25 | -10 | 53 | 30.4 | | 6 | T | 334 |
| /1982i | 1986 | 05 | 13.53686 | 10 | 30 | 48.89 | -10 | 53 | 03.3 | | 6 | T | 334 |
| /1982i | 1986 | 05 | 13.58234 | 10 | 30 | 46.21 | -10 | 51 | 59.5 | | 6 | T | 334 |
| /1982i | 1986 | 05 | 13.58686 | 10 | 30 | 45.95 | -10 | 51 | 52.3 | | 6 | T | 334 |
| /1982i | 1986 | 05 | 13.79761 | 10 | 30 | 34.10 | -10 | 47 | 08.4 | | | | 071 |
| /1982i | 1986 | 05 | 13.87847 | 10 | 30 | 29.33 | -10 | 45 | 11.9 | | | | 552 |
| /1982i | 1986 | 05 | 14.53821 | 10 | 29 | 53.13 | -10 | 30 | 35.9 | | 6 | T | 334 |
| /1982i | 1986 | 05 | 14.54238 | 10 | 29 | 52.77 | -10 | 30 | 31.4 | | 6 | T | 334 |
| /1982i | 1986 | 05 | 14.57224 | 10 | 29 | 51.20 | -10 | 29 | 52.8 | | 6 | T | 334 |
| /1982i | 1986 | 05 | 14.59724 | 10 | 29 | 49.79 | -10 | 29 | 19.8 | | 6 | T | 334 |
| /1982i | 1986 | 05 | 15.51873 | 10 | 29 | 03.40 | -10 | 09 | 56.4 | | 6 | T | 334 |
| /1982i | 1986 | 05 | 15.52533 | 10 | 29 | 03.22 | -10 | 09 | 49.4 | | 6 | T | 334 |
| /1982i | 1986 | 05 | 15.54929 | 10 | 29 | 01.96 | -10 | 09 | 19.1 | | 6 | T | 334 |
| /1982i | 1986 | 05 | 15.55693 | 10 | 29 | 01.54 | -10 | 09 | 10.2 | | 6 | T | 334 |
| /1982i | 1986 | 05 | 15.81804 | 10 | 28 | 49.39 | -10 | 03 | 53.6 | | | | 071 |
| /1982i | 1986 | 05 | 15.86330 | 10 | 28 | 47.28 | -10 | 02 | 59.0 | | | | 071 |
| /1982i | 1986 | 05 | 25.73287 | 10 | 24 | 21.76 | -07 | 32 | 50.9 | | | | 051 |
| /1982i | 1986 | 05 | 25.74456 | 10 | 24 | 21.59 | -07 | 32 | 42.2 | | | | 051 |
| /1982i | 1986 | 05 | 27.83151 | 10 | 24 | 02.79 | -07 | 10 | 39.2 | | | | 061 |
| /1982i | 1986 | 05 | 27.83403 | 10 | 24 | 02.61 | -07 | 10 | 38.8 | | | | 061 |
| /1982i | 1986 | 06 | 02.24618 | 10 | 23 | 56.35 | -06 | 24 | 18.4 | | | | 657 |
| /1982i | 1986 | 06 | 03.25111 | 10 | 24 | 01.05 | -06 | 17 | 11.6 | | | | 657 |
| /1982i | 1986 | 06 | 04.51909 | 10 | 24 | 09.25 | -06 | 08 | 54.1 | | 7 | T | 334 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| /1982i | 1986 | 06 | 05.51773 | 10 | 24 | 17.13 | -06 | 02 | 46.5 | 7 | T 334 |
| /1982i | 1986 | 06 | 05.52328 | 10 | 24 | 17.17 | -06 | 02 | 44.0 | 7 | T 334 |
| /1982i | 1986 | 06 | 05.52953 | 10 | 24 | 17.34 | -06 | 02 | 42.3 | 7 | T 334 |
| /1982i | 1986 | 06 | 05.53925 | 10 | 24 | 17.18 | -06 | 02 | 38.1 | 7 | T 334 |
| /1982i | 1986 | 06 | 05.54620 | 10 | 24 | 17.42 | -06 | 02 | 35.5 | 7 | T 334 |
| /1982i | 1986 | 06 | 05.55453 | 10 | 24 | 17.33 | -06 | 02 | 34.7 | 7 | T 334 |
| /1982i | 1986 | 06 | 05.72477 | 10 | 24 | 19.13 | -06 | 01 | 28.1 | | 051 |
| /1982i | 1986 | 06 | 05.73241 | 10 | 24 | 19.12 | -06 | 01 | 24.6 | | 051 |
| /1982i | 1986 | 06 | 06.51704 | 10 | 24 | 26.52 | -05 | 57 | 01.7 | 7 | T 334 |
| /1982i | 1986 | 06 | 06.53301 | 10 | 24 | 26.65 | -05 | 56 | 55.3 | 7 | T 334 |
| /1982i | 1986 | 06 | 06.54829 | 10 | 24 | 27.11 | -05 | 56 | 47.9 | 7 | T 334 |
| /1982i | 1986 | 06 | 06.55454 | 10 | 24 | 26.88 | -05 | 56 | 47.2 | 7 | T 334 |
| /1982i | 1986 | 06 | 06.56148 | 10 | 24 | 27.17 | -05 | 56 | 46.4 | 7 | T 334 |
| /1982i | 1986 | 06 | 07.21944 | 10 | 24 | 33.77 | -05 | 53 | 11.6 | | 707 |

Comet Hartley (1984v)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| /1984v | 1986 | 04 | 04.52014 | 03 | 56 | 31.47 | -76 | 48 | 18.7 | | 323 |

Comet Thiele (1985m)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| /1985m | 1986 | 05 | 10.30950 | 19 | 15 | 31.82 | +13 | 44 | 20.9 | | 801 |
| /1985m | 1986 | 05 | 13.43601 | 19 | 06 | 23.69 | +13 | 47 | 38.5 | 1 | 691 |
| /1985m | 1986 | 05 | 13.44541 | 19 | 06 | 21.96 | +13 | 47 | 39.1 | 1 | 691 |

Periodic Comet Shoemaker 3

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| /1986a | 1986 | 05 | 13.14047 | 10 | 22 | 38.21 | +18 | 12 | 10.3 | | 691 |
| /1986a | 1986 | 05 | 13.15584 | 10 | 22 | 39.52 | +18 | 12 | 01.2 | | 691 |
| /1986a | 1986 | 05 | 13.19744 | 10 | 22 | 42.37 | +18 | 11 | 38.4 | | 691 |
| /1986a | 1986 | 05 | 14.18193 | 10 | 23 | 55.15 | +18 | 02 | 28.7 | | 691 |
| /1986a | 1986 | 05 | 14.19420 | 10 | 23 | 56.15 | +18 | 02 | 22.2 | | 691 |
| /1986a | 1986 | 05 | 14.19995 | 10 | 23 | 56.58 | +18 | 02 | 16.7 | | 691 |

Comet Shoemaker (1986b)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| /1986b | 1986 | 05 | 04.27152 | 09 | 57 | 47.00 | +28 | 58 | 07.7 | | 675 |
| /1986b | 1986 | 05 | 05.17256 | 09 | 56 | 40.20 | +28 | 55 | 14.8 | | 675 |
| /1986b | 1986 | 05 | 10.16388 | 09 | 51 | 01.12 | +28 | 37 | 42.1 | | 675 |
| /1986b | 1986 | 05 | 11.17912 | 09 | 49 | 58.75 | +28 | 33 | 50.4 | | 691 |
| /1986b | 1986 | 05 | 11.18260 | 09 | 49 | 58.54 | +28 | 33 | 49.7 | | 691 |
| /1986b | 1986 | 05 | 13.20397 | 09 | 48 | 00.08 | +28 | 25 | 54.5 | | 691 |
| /1986b | 1986 | 05 | 13.20729 | 09 | 47 | 59.92 | +28 | 25 | 53.6 | | 691 |
| /1986b | 1986 | 05 | 13.22604 | 09 | 47 | 58.82 | +28 | 25 | 49.9 | | 691 |

Periodic Comet Hartley 2

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| /1986c | 1986 | 05 | 10.15791 | 10 | 55 | 37.90 | -01 | 43 | 08.2 | | 691 |
| /1986c | 1986 | 05 | 10.17935 | 10 | 55 | 37.94 | -01 | 43 | 03.9 | | 691 |
| /1986c | 1986 | 05 | 10.19726 | 10 | 55 | 37.99 | -01 | 43 | 00.5 | | 691 |
| /1986c | 1986 | 05 | 12.08925 | 10 | 55 | 44.75 | -01 | 37 | 30.1 | | 801 |

Periodic Comet Singer Brewster

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| /1986d | 1986 | 05 | 10.23472 | 14 | 47 | 02.14 | -05 | 27 | 17.2 | | 293 |
| /1986d | 1986 | 05 | 10.25069 | 14 | 47 | 01.68 | -05 | 27 | 09.4 | | 293 |

Periodic Comet Machholz

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| /1986e | 1986 | 05 | 17.43958 | 00 | 03 | 37.13 | +41 | 34 | 49.3 | | 688 |
| /1986e | 1986 | 05 | 17.45434 | 00 | 03 | 29.92 | +41 | 35 | 20.0 | | 688 |
| /1986e | 1986 | 05 | 18.08194 | 23 | 58 | 12.17 | +41 | 56 | 28.2 | | 026 |
| /1986e | 1986 | 05 | 26.36111 | 22 | 29 | 47.88 | +45 | 24 | 45.5 | | 657 |
| /1986e | 1986 | 05 | 26.76007 | 22 | 24 | 32.66 | +45 | 29 | 21.4 | 13 | T 372 |
| /1986e | 1986 | 05 | 26.76424 | 22 | 24 | 29.71 | +45 | 29 | 27.7 | | 372 |
| /1986e | 1986 | 05 | 29.73021 | 21 | 42 | 43.62 | +45 | 30 | 06.2 | 15 | T 372 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| /1986e | 1986 | 05 | 29.73472 | 21 | 42 | 40.09 | +45 | 29 | 59.7 | | 372 |
| /1986e | 1986 | 05 | 29.75347 | 21 | 42 | 23.28 | +45 | 29 | 54.1 | | 372 |
| /1986e | 1986 | 05 | 31.66458 | 21 | 13 | 29.71 | +44 | 56 | 11.7 | 15 T | 372 |
| /1986e | 1986 | 05 | 31.77292 | 21 | 11 | 48.67 | +44 | 53 | 26.2 | | 372 |
| /1986e | 1986 | 06 | 02.40840 | 20 | 46 | 28.06 | +43 | 58 | 19.4 | | 657 |
| /1986e | 1986 | 06 | 03.27555 | 20 | 33 | 01.06 | +43 | 19 | 29.1 | 3 | 801 |
| /1986e | 1986 | 06 | 04.30915 | 20 | 17 | 07.92 | +42 | 24 | 29.3 | 7 | 801 |
| /1986e | 1986 | 06 | 05.21174 | 20 | 03 | 30.23 | +41 | 28 | 47.8 | 3 | 801 |
| /1986e | 1986 | 06 | 05.32081 | 20 | 01 | 52.51 | +41 | 21 | 40.5 | 6 | 691 |
| /1986e | 1986 | 06 | 05.32897 | 20 | 01 | 45.31 | +41 | 21 | 07.7 | 6 | 691 |
| /1986e | 1986 | 06 | 05.33672 | 20 | 01 | 38.11 | +41 | 20 | 38.1 | 6 | 691 |
| /1986e | 1986 | 06 | 05.33896 | 20 | 01 | 36.22 | +41 | 20 | 28.0 | 6 | 691 |
| /1986e | 1986 | 06 | 06.39182 | 19 | 46 | 08.44 | +40 | 06 | 15.5 | 6 | 691 |
| /1986e | 1986 | 06 | 06.39396 | 19 | 46 | 06.60 | +40 | 06 | 07.1 | 6 | 691 |
| /1986e | 1986 | 06 | 11.36841 | 18 | 41 | 46.26 | +32 | 45 | 39.7 | 6 | 691 |
| /1986e | 1986 | 06 | 11.38149 | 18 | 41 | 37.27 | +32 | 44 | 24.1 | 6 | 691 |
| /1986e | 1986 | 06 | 11.39014 | 18 | 41 | 31.86 | +32 | 43 | 37.1 | 6 | 691 |
| /1986e | 1986 | 06 | 12.37431 | 18 | 30 | 46.40 | +31 | 06 | 06.6 | | 707 |

Note 1: crowded star field. 2: poor quality plate. 3: image trailed. 4: involved with star. 5: streaked image due to motion. 6 = 1 + 5. 7 = 3 + 4.

* * * * *

OBSERVATIONS MADE AT CAUSSOLS.

Plates taken by T. Baribaud, A. Barthelemy, J. Ciffreo, C. Pollas, A. Robin and J. Lecacheux with the 0.9-m Schmidt in association with the International Near-Earth Asteroid Survey (INAS). Reductions by R. Chemin and J.-L. Heudier. Contact: J.-L. Heudier, CERGA, Avenue Copernic, F-06130 Grasse, France.

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | Obs. |
|---|---|---|---|---|---|---|
| 310 | 1985 | 12 17.93958 | 04 50 22.37 | +20 11 17.9 | | 010 |
| 310 | 1985 | 12 17.97429 | 04 50 20.75 | +20 11 15.5 | | 010 |
| 701 | 1985 | 12 17.93958 | 04 29 14.51 | +19 57 01.2 | | 010 |
| 701 | 1985 | 12 17.97429 | 04 29 13.04 | +19 56 54.3 | | 010 |
| 701 | 1985 | 12 19.99081 | 04 27 38.23 | +19 50 02.8 | | 010 |
| 811 | 1985 | 12 13.97850 | 04 47 42.63 | +18 34 45.2 | | 010 |
| 811 | 1985 | 12 17.93958 | 04 44 13.55 | +18 31 47.2 | | 010 |
| 811 | 1985 | 12 17.97429 | 04 44 12.09 | +18 31 47.8 | | 010 |
| 811 | 1985 | 12 19.99081 | 04 42 29.65 | +18 30 27.6 | | 010 |
| 1680 | 1985 | 12 17.93958 | 04 38 52.91 | +21 19 19.6 | | 010 |
| 1680 | 1985 | 12 17.97429 | 04 38 51.23 | +21 19 20.1 | | 010 |
| 1680 | 1985 | 12 19.99081 | 04 37 02.00 | +21 17 56.0 | | 010 |
| 1684 | 1985 | 12 17.93958 | 04 33 17.19 | +19 18 03.2 | | 010 |
| 1684 | 1985 | 12 17.97429 | 04 33 15.67 | +19 18 01.6 | | 010 |
| 1684 | 1985 | 12 19.99081 | 04 31 41.34 | +19 16 34.3 | | 010 |
| 1691 | 1985 | 12 17.93958 | 04 49 36.79 | +20 49 09.6 | | 010 |
| 1691 | 1985 | 12 17.97429 | 04 49 35.16 | +20 49 07.9 | | 010 |
| 1728 | 1985 | 12 17.93958 | 04 32 06.08 | +19 02 26.9 | | 010 |
| 1728 | 1985 | 12 17.97429 | 04 32 04.43 | +19 02 18.8 | | 010 |
| 1728 | 1985 | 12 19.99081 | 04 30 17.85 | +18 54 29.7 | | 010 |
| 1773 | 1985 | 12 17.93958 | 04 37 26.49 | +22 21 23.9 | | 010 |
| 1773 | 1985 | 12 19.99081 | 04 35 21.92 | +22 20 56.1 | | 010 |
| 2046 | 1985 | 12 17.93958 | 04 41 16.17 | +22 21 14.2 | | 010 |
| 2046 | 1985 | 12 17.97429 | 04 41 14.52 | +22 21 12.9 | | 010 |
| 2046 | 1985 | 12 19.99081 | 04 39 34.93 | +22 19 44.6 | | 010 |
| 2628 | 1985 | 12 17.93958 | 04 30 30.42 | +20 20 05.0 | | 010 |
| 2628 | 1985 | 12 17.97429 | 04 30 28.98 | +20 20 00.1 | | 010 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2628 | | | 1985 | 12 | 19.99081 | 04 | 28 | 50.95 | +20 | 16 | 22.1 | 010 |
| 3382 | | | 1985 | 10 | 14.91666 | 23 | 39 | 51.33 | +00 | 29 | 28.9 | 010 |
| 3382 | | | 1985 | 10 | 15.82638 | 23 | 39 | 19.74 | +00 | 30 | 29.0 | 010 |
| 3390 | | | 1985 | 10 | 14.91666 | 23 | 59 | 31.65 | +02 | 43 | 10.0 | 010 |
| 3390 | | | 1985 | 10 | 15.82638 | 23 | 58 | 48.07 | +02 | 39 | 14.7 | 010 |
| 3421 | | | 1985 | 12 | 17.93958 | 04 | 49 | 55.02 | +21 | 08 | 39.3 | 010 |
| 3421 | | | 1985 | 12 | 17.97429 | 04 | 49 | 52.96 | +21 | 08 | 35.7 | 010 |
| 1980 | EE2 | | 1985 | 10 | 14.91666 | 23 | 44 | 00.58 | +02 | 15 | 20.9 | 010 |
| 1980 | EE2 | | 1985 | 10 | 15.82638 | 23 | 43 | 22.56 | +02 | 09 | 39.1 | 010 |
| 1985 | SP | | 1985 | 10 | 14.91666 | 23 | 39 | 18.80 | +01 | 59 | 09.0 | 010 |
| 1985 | SP | | 1985 | 10 | 15.82638 | 23 | 38 | 53.83 | +01 | 52 | 05.9 | 010 |
| 1985 | TB2 | | 1985 | 10 | 14.91666 | 23 | 42 | 32.62 | +01 | 32 | 55.7 | 010 |
| 1985 | TB2 | | 1985 | 10 | 15.82638 | 23 | 41 | 44.58 | +01 | 35 | 10.5 | 010 |
| 1985 | TC2 | | 1985 | 10 | 14.91666 | 23 | 45 | 09.73 | +01 | 14 | 06.5 | 010 |
| 1985 | TC2 | | 1985 | 10 | 15.82638 | 23 | 44 | 37.46 | +01 | 07 | 31.1 | 010 |
| 1985 | TO2 | * | 1985 | 10 | 12.89236 | 23 | 48 | 47.69 | +02 | 58 | 29.3 | 19 010 |
| 1985 | TO2 | | 1985 | 10 | 12.91319 | 23 | 48 | 45.07 | +02 | 58 | 44.9 | 19 010 |
| 1985 | TP2 | * | 1985 | 10 | 14.91666 | 23 | 40 | 52.16 | +02 | 50 | 44.2 | 010 |
| 1985 | TP2 | | 1985 | 10 | 15.82638 | 23 | 40 | 18.11 | +02 | 49 | 41.5 | 010 |
| 1985 | TQ2 | * | 1985 | 10 | 14.91666 | 23 | 40 | 57.90 | +02 | 41 | 52.2 | 010 |
| 1985 | TQ2 | | 1985 | 10 | 15.82638 | 23 | 40 | 15.60 | +02 | 38 | 58.7 | 010 |
| 1985 | TR2 | * | 1985 | 10 | 14.91666 | 23 | 48 | 10.29 | +04 | 18 | 39.5 | 010 |
| 1985 | TR2 | | 1985 | 10 | 15.82638 | 23 | 47 | 28.23 | +04 | 13 | 36.7 | 010 |
| 1985 | TS2 | * | 1985 | 10 | 14.91666 | 23 | 53 | 30.57 | +01 | 11 | 38.3 | 010 |
| 1985 | TS2 | | 1985 | 10 | 15.82638 | 23 | 52 | 58.19 | +01 | 06 | 57.3 | 010 |
| 1985 | TT2 | * | 1985 | 10 | 14.91666 | 23 | 53 | 52.14 | +00 | 16 | 40.1 | 010 |
| 1985 | TT2 | | 1985 | 10 | 15.82638 | 23 | 53 | 18.31 | +00 | 12 | 34.0 | 010 |
| 1985 | TU2 | * | 1985 | 10 | 14.93750 | 23 | 40 | 48.81 | +04 | 01 | 23.5 | 010 |
| 1985 | TU2 | | 1985 | 10 | 15.82638 | 23 | 40 | 15.37 | +03 | 58 | 59.7 | 010 |
| 1985 | XQ | * | 1985 | 12 | 13.97850 | 04 | 37 | 47.01 | +18 | 23 | 36.1 | 010 |
| 1985 | XQ | | 1985 | 12 | 17.93958 | 04 | 34 | 06.10 | +18 | 03 | 45.9 | 010 |
| 1985 | XQ | | 1985 | 12 | 17.97429 | 04 | 34 | 04.73 | +18 | 03 | 38.5 | 010 |
| 1985 | XR | * | 1985 | 12 | 13.97850 | 04 | 48 | 24.30 | +18 | 01 | 07.2 | 010 |
| 1985 | XR | | 1985 | 12 | 17.93958 | 04 | 44 | 38.83 | +18 | 01 | 01.5 | 010 |
| 1985 | XR | | 1985 | 12 | 17.97429 | 04 | 44 | 37.23 | +18 | 01 | 02.9 | 010 |
| 1985 | XR | | 1985 | 12 | 19.99081 | 04 | 42 | 47.89 | +18 | 01 | 18.3 | 010 |
| 1985 | XS | * | 1985 | 12 | 13.97850 | 04 | 49 | 35.67 | +18 | 43 | 48.8 | 010 |
| 1985 | XS | | 1985 | 12 | 17.93958 | 04 | 46 | 04.05 | +18 | 38 | 57.1 | 010 |
| 1985 | XS | | 1985 | 12 | 17.97429 | 04 | 46 | 02.50 | +18 | 38 | 57.3 | 010 |
| 1985 | XS | | 1985 | 12 | 19.99081 | 04 | 44 | 18.57 | +18 | 36 | 37.2 | 010 |
| 1985 | YW | * | 1985 | 12 | 17.93958 | 04 | 30 | 25.30 | +18 | 29 | 53.8 | 010 |
| 1985 | YW | | 1985 | 12 | 17.97429 | 04 | 30 | 24.07 | +18 | 29 | 50.2 | 010 |
| 1985 | YW | | 1985 | 12 | 19.99081 | 04 | 28 | 46.90 | +18 | 27 | 04.2 | 010 |
| 1985 | YX | * | 1985 | 12 | 17.93958 | 04 | 30 | 55.84 | +19 | 49 | 46.8 | 010 |
| 1985 | YX | | 1985 | 12 | 17.97429 | 04 | 30 | 53.85 | +19 | 49 | 47.6 | 010 |
| 1985 | YY | * | 1985 | 12 | 17.93958 | 04 | 31 | 12.84 | +18 | 45 | 49.2 | 010 |
| 1985 | YY | | 1985 | 12 | 17.97429 | 04 | 31 | 10.84 | +18 | 45 | 41.6 | 010 |
| 1985 | YY | | 1985 | 12 | 19.99081 | 04 | 29 | 08.66 | +18 | 39 | 06.9 | 010 |
| 1985 | YZ | * | 1985 | 12 | 17.93958 | 04 | 31 | 19.46 | +21 | 43 | 30.7 | 010 |
| 1985 | YZ | | 1985 | 12 | 17.97429 | 04 | 31 | 17.45 | +21 | 43 | 26.3 | 010 |
| 1985 | YA1 | * | 1985 | 12 | 17.93958 | 04 | 31 | 34.15 | +20 | 01 | 02.1 | 010 |
| 1985 | YA1 | | 1985 | 12 | 17.97429 | 04 | 31 | 32.31 | +20 | 00 | 53.2 | 010 |
| 1985 | YB1 | * | 1985 | 12 | 17.93958 | 04 | 31 | 51.76 | +18 | 29 | 46.1 | 010 |
| 1985 | YB1 | | 1985 | 12 | 17.97429 | 04 | 31 | 50.34 | +18 | 29 | 44.4 | 010 |
| 1985 | YB1 | | 1985 | 12 | 19.99081 | 04 | 30 | 15.98 | +18 | 28 | 28.5 | 010 |
| 1985 | YC1 | * | 1985 | 12 | 17.93958 | 04 | 32 | 59.26 | +18 | 46 | 04.5 | 010 |
| 1985 | YC1 | | 1985 | 12 | 17.97429 | 04 | 32 | 57.60 | +18 | 46 | 08.7 | 010 |
| 1985 | YD1 | * | 1985 | 12 | 17.93958 | 04 | 33 | 18.21 | +19 | 12 | 51.9 | 010 |
| 1985 | YD1 | | 1985 | 12 | 17.97429 | 04 | 33 | 16.74 | +19 | 12 | 47.1 | 010 |

```
1985 YD1    1985 12 19.99081  04 31 37.94  +19 07 48.7                    010
1985 YE1  * 1985 12 17.93958  04 33 47.44  +19 48 24.2                    010
1985 YE1    1985 12 17.97429  04 33 45.50  +19 48 17.3                    010
1985 YE1    1985 12 19.99081  04 31 58.50  +19 42 51.1                    010
1985 YF1  * 1985 12 17.93958  04 34 14.53  +20 34 39.6                    010
1985 YF1    1985 12 17.97429  04 34 12.67  +20 34 49.1                    010
1985 YG1  * 1985 12 17.93958  04 35 22.87  +19 13 11.4                    010
1985 YG1    1985 12 17.97429  04 35 21.08  +19 13 15.1                    010
1985 YH1  * 1985 12 17.93958  04 35 43.58  +21 35 59.4                    010
1985 YH1    1985 12 17.97429  04 35 41.95  +21 35 56.6                    010
1985 YH1    1985 12 19.99081  04 34 05.31  +21 32 48.7                    010
1985 YJ1  * 1985 12 17.93958  04 35 59.71  +22 20 23.3                    010
1985 YJ1    1985 12 17.97429  04 35 57.59  +22 20 23.7                    010
1985 YJ1    1985 12 19.99081  04 33 50.96  +22 21 32.5                    010
1985 YK1  * 1985 12 17.93958  04 37 02.85  +22 52 01.1                    010
1985 YK1    1985 12 17.97429  04 37 01.01  +22 52 00.8                    010
1985 YK1    1985 12 19.99081  04 35 23.82  +22 50 10.1                    010
1985 YL1  * 1985 12 17.93958  04 37 08.79  +20 40 07.3                    010
1985 YL1    1985 12 17.97429  04 37 07.39  +20 40 04.5                    010
1985 YM1  * 1985 12 17.93958  04 38 30.87  +20 35 42.2                    010
1985 YM1    1985 12 17.97429  04 38 28.97  +20 35 47.3                    010
1985 YN1  * 1985 12 17.93958  04 38 35.48  +20 04 05.8                    010
1985 YN1    1985 12 17.97429  04 38 33.91  +20 04 10.9                    010
1985 YN1    1985 12 19.99081  04 36 48.72  +20 08 09.1                    010
1985 YO1  * 1985 12 17.93958  04 38 43.46  +21 55 55.4                    010
1985 YO1    1985 12 19.99081  04 36 07.62  +22 09 09.3                    010
1985 YP1  * 1985 12 17.93958  04 40 07.71  +18 25 40.5                    010
1985 YP1    1985 12 17.97429  04 40 06.11  +18 25 34.6                    010
1985 YP1    1985 12 19.99081  04 38 29.07  +18 18 15.3                    010
1985 YQ1  * 1985 12 17.93958  04 40 55.62  +22 59 13.9                    010
1985 YQ1    1985 12 17.97429  04 40 53.68  +22 59 13.8                    010
1985 YQ1    1985 12 19.99081  04 39 00.38  +22 58 02.6                    010
1985 YR1  * 1985 12 17.93958  04 40 59.26  +22 27 08.9                    010
1985 YR1    1985 12 17.97429  04 40 57.67  +22 27 04.3                    010
1985 YS1  * 1985 12 17.93958  04 41 19.85  +22 52 20.6                    010
1985 YS1    1985 12 17.97429  04 41 17.82  +22 52 19.8                    010
1985 YT1  * 1985 12 17.93958  04 42 01.22  +22 17 50.6                    010
1985 YT1    1985 12 17.97429  04 41 59.34  +22 17 58.4                    010
1985 YT1    1985 12 19.99081  04 40 10.01  +22 26 08.2                    010
1985 YU1  * 1985 12 17.93958  04 42 05.89  +21 15 43.4                    010
1985 YU1    1985 12 17.97429  04 42 04.07  +21 15 46.6                    010
1985 YV1  * 1985 12 17.93958  04 42 20.63  +20 58 30.5                    010
1985 YV1    1985 12 17.97429  04 42 18.72  +20 58 25.2                    010
1985 YV1    1985 12 19.99081  04 40 24.51  +20 52 20.1                    010
1985 YW1  * 1985 12 17.93958  04 43 19.85  +21 29 36.2                    010
1985 YW1    1985 12 17.97429  04 43 17.70  +21 29 06.2                    010
1985 YW1    1985 12 19.99081  04 41 14.88  +20 59 30.5                    010
1985 YX1  * 1985 12 17.93958  04 43 47.17  +22 22 40.6                    010
1985 YX1    1985 12 17.97429  04 43 45.53  +22 22 39.3                    010
1985 YX1    1985 12 19.99081  04 42 05.94  +22 20 26.9                    010
1985 YY1  * 1985 12 17.93958  04 44 17.48  +21 32 00.3                    010
1985 YY1    1985 12 17.97429  04 44 15.94  +21 32 01.0                    010
1985 YZ1  * 1985 12 17.93958  04 44 42.15  +18 46 48.2                    010
1985 YZ1    1985 12 17.97429  04 44 40.41  +18 46 48.3                    010
1985 YA2  * 1985 12 17.93958  04 45 52.01  +21 19 17.6                    010
1985 YA2    1985 12 17.97429  04 45 50.19  +21 19 19.1                    010
1985 YA2    1985 12 19.99081  04 43 58.13  +21 20 22.4                    010
1985 YB2  * 1985 12 17.93958  04 45 56.32  +22 20 13.9                    010
1985 YB2    1985 12 17.97429  04 45 54.30  +22 20 26.5                    010
```

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1985 YC2 | * | 1985 | 12 | 17.93958 | 04 | 46 | 01.84 | +21 | 51 | 45.4 | 010 |
| 1985 YC2 | | 1985 | 12 | 17.97429 | 04 | 46 | 00.29 | +21 | 51 | 45.5 | 010 |
| 1985 YC2 | | 1985 | 12 | 19.99081 | 04 | 44 | 19.69 | +21 | 50 | 46.2 | 010 |
| 1985 YD2 | * | 1985 | 12 | 17.93958 | 04 | 46 | 16.56 | +22 | 39 | 42.9 | 010 |
| 1985 YD2 | | 1985 | 12 | 17.97429 | 04 | 46 | 14.81 | +22 | 39 | 40.5 | 010 |
| 1985 YD2 | | 1985 | 12 | 19.99081 | 04 | 44 | 22.56 | +22 | 35 | 35.9 | 010 |
| 1985 YE2 | * | 1985 | 12 | 17.93958 | 04 | 46 | 50.25 | +22 | 08 | 51.6 | 010 |
| 1985 YE2 | | 1985 | 12 | 17.97429 | 04 | 46 | 48.65 | +22 | 08 | 52.4 | 010 |
| 1985 YE2 | | 1985 | 12 | 19.99081 | 04 | 45 | 05.34 | +22 | 07 | 48.9 | 010 |
| 1985 YF2 | * | 1985 | 12 | 17.93958 | 04 | 48 | 08.31 | +22 | 13 | 23.5 | 010 |
| 1985 YF2 | | 1985 | 12 | 17.97429 | 04 | 48 | 06.72 | +22 | 13 | 29.6 | 010 |
| 1985 YG2 | * | 1985 | 12 | 17.93958 | 04 | 48 | 21.75 | +20 | 46 | 22.5 | 010 |
| 1985 YG2 | | 1985 | 12 | 17.97429 | 04 | 48 | 20.21 | +20 | 46 | 22.1 | 010 |
| 1985 YH2 | * | 1985 | 12 | 17.93958 | 04 | 48 | 59.08 | +22 | 55 | 10.5 | 010 |
| 1985 YH2 | | 1985 | 12 | 17.97429 | 04 | 48 | 56.86 | +22 | 55 | 06.2 | 010 |
| 1985 YJ2 | * | 1985 | 12 | 17.93958 | 04 | 50 | 13.07 | +21 | 21 | 04.0 | 010 |
| 1985 YJ2 | | 1985 | 12 | 17.97429 | 04 | 50 | 11.21 | +21 | 21 | 01.7 | 010 |
| 1985 YK2 | * | 1985 | 12 | 17.93958 | 04 | 50 | 40.96 | +22 | 31 | 16.8 | 010 |
| 1985 YK2 | | 1985 | 12 | 17.97429 | 04 | 50 | 39.17 | +22 | 31 | 15.8 | 010 |
| 1985 YL2 | * | 1985 | 12 | 17.93958 | 04 | 51 | 01.33 | +22 | 42 | 57.0 | 010 |
| 1985 YL2 | | 1985 | 12 | 17.97429 | 04 | 50 | 59.64 | +22 | 43 | 00.6 | 010 |
| 1986 JL | | 1986 | 05 | 12.85070 | 14 | 33 | 51.08 | +08 | 58 | 16.7 | 010 |
| 1986 JL | | 1986 | 05 | 12.88190 | 14 | 33 | 48.53 | +08 | 57 | 53.2 | 010 |
| 1986 JL | | 1986 | 05 | 12.92500 | 14 | 33 | 44.38 | +08 | 57 | 17.2 | 010 |
| 1986 JL | | 1986 | 05 | 12.95972 | 14 | 33 | 41.54 | +08 | 56 | 51.3 | 010 |

OBSERVATIONS MADE AT TAUTENBURG BY R. ZIENER.

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

| Object | | Date | | UT | R. A. (1950) | | | Decl. | | | Mag. | Obs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 781 | | 1979 | 02 | 21.96458 | 12 | 59 | 49.99 | +11 | 55 | 37.7 | 15.3 | 033 |
| 781 | | 1979 | 02 | 21.98819 | 12 | 59 | 49.64 | +11 | 55 | 50.4 | | 033 |
| 781 | | 1979 | 02 | 25.98021 | 12 | 58 | 46.68 | +12 | 31 | 38.5 | | 033 |
| 781 | | 1979 | 02 | 25.99375 | 12 | 58 | 46.41 | +12 | 31 | 46.3 | | 033 |
| 1979 DD1 | * | 1979 | 02 | 21.96458 | 13 | 06 | 30.68 | +11 | 40 | 18.6 | 18.5 | 033 |
| 1979 DD1 | | 1979 | 02 | 21.98819 | 13 | 06 | 30.15 | +11 | 40 | 24.4 | | 033 |
| 1979 DD1 | | 1979 | 02 | 25.98021 | 13 | 04 | 51.27 | +11 | 56 | 36.2 | | 033 |
| 1979 DD1 | | 1979 | 02 | 25.99375 | 13 | 04 | 50.88 | +11 | 56 | 39.9 | | 033 |

OBSERVATIONS MADE AT ASIAGO BY W. FERRERI.

Plates taken with the 0.65-m Schmidt, reduced by G. De Sanctis using the AGK3. Contact: W. Ferreri, Osservatorio Astronomico di Torino, I-10025 Pino Torinese, Italy.

| Object | Date | | UT | R. A. (1950) | | | Decl. | | | Obs. |
|---|---|---|---|---|---|---|---|---|---|---|
| 153 | 1985 | 09 | 11.99792 | 01 | 02 | 29.41 | +13 | 05 | 05.0 | 043 |
| 153 | 1985 | 09 | 12.01806 | 01 | 02 | 28.84 | +13 | 05 | 00.7 | 043 |
| 153 | 1985 | 09 | 13.01493 | 01 | 02 | 01.11 | +13 | 01 | 56.8 | 043 |
| 153 | 1985 | 09 | 13.03715 | 01 | 02 | 00.46 | +13 | 01 | 51.9 | 043 |
| 153 | 1985 | 09 | 15.03403 | 01 | 01 | 02.99 | +12 | 55 | 24.6 | 043 |
| 153 | 1985 | 09 | 15.05556 | 01 | 01 | 02.28 | +12 | 55 | 20.5 | 043 |
| 153 | 1985 | 09 | 18.04479 | 00 | 59 | 31.71 | +12 | 44 | 55.2 | 043 |
| 153 | 1985 | 09 | 18.07049 | 00 | 59 | 30.89 | +12 | 44 | 49.6 | 043 |
| 420 | 1985 | 09 | 15.03403 | 01 | 09 | 43.19 | +15 | 05 | 22.6 | 043 |
| 420 | 1985 | 09 | 15.05556 | 01 | 09 | 42.58 | +15 | 05 | 18.9 | 043 |
| 420 | 1985 | 09 | 18.04479 | 01 | 08 | 08.61 | +14 | 56 | 29.8 | 043 |
| 420 | 1985 | 09 | 18.07049 | 01 | 08 | 07.75 | +14 | 56 | 24.7 | 043 |
| 467 | 1985 | 09 | 11.99792 | 01 | 06 | 01.67 | +14 | 43 | 23.6 | 043 |
| 467 | 1985 | 09 | 12.01806 | 01 | 06 | 00.96 | +14 | 43 | 24.4 | 043 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 467 | 1985 | 09 | 13.01493 | 01 | 05 | 27.38 | +14 | 43 | 28.4 | 043 |
| 467 | 1985 | 09 | 13.03715 | 01 | 05 | 26.52 | +14 | 43 | 28.0 | 043 |
| 467 | 1985 | 09 | 15.03403 | 01 | 04 | 15.44 | +14 | 43 | 08.1 | 043 |
| 467 | 1985 | 09 | 15.05556 | 01 | 04 | 14.63 | +14 | 43 | 07.7 | 043 |
| 467 | 1985 | 09 | 18.04479 | 01 | 02 | 19.51 | +14 | 41 | 22.2 | 043 |
| 467 | 1985 | 09 | 18.07049 | 01 | 02 | 18.37 | +14 | 41 | 20.5 | 043 |
| 1315 | 1985 | 09 | 11.99792 | 01 | 06 | 15.39 | +14 | 31 | 02.7 | 043 |
| 1315 | 1985 | 09 | 12.01806 | 01 | 06 | 14.71 | +14 | 30 | 59.2 | 043 |
| 1315 | 1985 | 09 | 13.01493 | 01 | 05 | 43.89 | +14 | 27 | 53.2 | 043 |
| 1315 | 1985 | 09 | 13.03715 | 01 | 05 | 43.09 | +14 | 27 | 49.1 | 043 |
| 1315 | 1985 | 09 | 15.03403 | 01 | 04 | 38.46 | +14 | 21 | 11.9 | 043 |
| 1315 | 1985 | 09 | 15.05556 | 01 | 04 | 37.75 | +14 | 21 | 08.0 | 043 |
| 1315 | 1985 | 09 | 18.04479 | 01 | 02 | 54.68 | +14 | 10 | 07.9 | 043 |
| 1315 | 1985 | 09 | 18.07049 | 01 | 02 | 53.71 | +14 | 10 | 02.5 | 043 |
| 1717 | 1985 | 09 | 11.99792 | 01 | 12 | 18.66 | +12 | 54 | 55.8 | 043 |
| 1717 | 1985 | 09 | 12.01806 | 01 | 12 | 17.76 | +12 | 54 | 57.1 | 043 |
| 1717 | 1985 | 09 | 13.01493 | 01 | 11 | 40.14 | +12 | 56 | 15.1 | 043 |
| 1717 | 1985 | 09 | 13.03715 | 01 | 11 | 39.16 | +12 | 56 | 17.2 | 043 |
| 1717 | 1985 | 09 | 15.03403 | 01 | 10 | 18.16 | +12 | 58 | 19.2 | 043 |
| 1717 | 1985 | 09 | 15.05556 | 01 | 10 | 17.32 | +12 | 58 | 20.2 | 043 |
| 1717 | 1985 | 09 | 18.04479 | 01 | 08 | 02.52 | +12 | 59 | 57.4 | 043 |
| 1717 | 1985 | 09 | 18.07049 | 01 | 08 | 01.24 | +12 | 59 | 57.4 | 043 |
| 2282 | 1985 | 09 | 10.99653 | 23 | 19 | 46.72 | +01 | 44 | 18.4 | 043 |
| 2282 | 1985 | 09 | 11.02222 | 23 | 19 | 45.41 | +01 | 44 | 06.5 | 043 |
| 2282 | 1985 | 09 | 12.88854 | 23 | 18 | 02.43 | +01 | 28 | 51.4 | 043 |
| 2282 | 1985 | 09 | 12.91076 | 23 | 18 | 01.13 | +01 | 28 | 41.2 | 043 |
| 2282 | 1985 | 09 | 17.02222 | 23 | 14 | 14.12 | +00 | 54 | 04.9 | 043 |
| 2282 | 1985 | 09 | 17.04097 | 23 | 14 | 13.04 | +00 | 53 | 55.7 | 043 |
| 2282 | 1985 | 09 | 18.92604 | 23 | 12 | 30.71 | +00 | 37 | 45.2 | 043 |
| 2282 | 1985 | 09 | 18.94757 | 23 | 12 | 29.50 | +00 | 37 | 33.6 | 043 |
| 2374 | 1985 | 09 | 11.99792 | 01 | 03 | 38.81 | +16 | 11 | 08.1 | 043 |
| 2374 | 1985 | 09 | 12.01806 | 01 | 03 | 37.98 | +16 | 11 | 14.6 | 043 |
| 2374 | 1985 | 09 | 13.01493 | 01 | 02 | 56.05 | +16 | 16 | 25.1 | 043 |
| 2374 | 1985 | 09 | 13.03715 | 01 | 02 | 55.10 | +16 | 16 | 32.0 | 043 |
| 2374 | 1985 | 09 | 15.03403 | 01 | 01 | 26.67 | +16 | 26 | 23.4 | 043 |
| 2374 | 1985 | 09 | 15.05556 | 01 | 01 | 25.67 | +16 | 26 | 29.3 | 043 |
| 2374 | 1985 | 09 | 18.04479 | 00 | 59 | 03.59 | +16 | 39 | 55.0 | 043 |
| 2374 | 1985 | 09 | 18.07049 | 00 | 59 | 02.28 | +16 | 40 | 01.6 | 043 |
| 2917 | 1985 | 09 | 11.99792 | 01 | 01 | 48.34 | +13 | 53 | 50.4 | 043 |
| 2917 | 1985 | 09 | 12.01806 | 01 | 01 | 47.40 | +13 | 53 | 53.2 | 043 |
| 2917 | 1985 | 09 | 13.01493 | 01 | 01 | 05.09 | +13 | 56 | 56.1 | 043 |
| 2917 | 1985 | 09 | 13.03715 | 01 | 01 | 04.03 | +13 | 56 | 58.9 | 043 |
| 2917 | 1985 | 09 | 15.03403 | 00 | 59 | 34.92 | +14 | 02 | 36.5 | 043 |
| 2917 | 1985 | 09 | 15.05556 | 00 | 59 | 33.89 | +14 | 02 | 40.3 | 043 |
| 2917 | 1985 | 09 | 18.04479 | 00 | 57 | 10.93 | +14 | 09 | 53.3 | 043 |
| 2917 | 1985 | 09 | 18.07049 | 00 | 57 | 09.57 | +14 | 09 | 56.2 | 043 |
| 3012 | 1985 | 09 | 11.99792 | 01 | 07 | 44.22 | +15 | 14 | 43.3 | 043 |
| 3012 | 1985 | 09 | 12.01806 | 01 | 07 | 43.31 | +15 | 14 | 47.5 | 043 |
| 3012 | 1985 | 09 | 13.01493 | 01 | 07 | 03.22 | +15 | 17 | 17.8 | 043 |
| 3012 | 1985 | 09 | 13.03715 | 01 | 07 | 02.22 | +15 | 17 | 20.3 | 043 |
| 3012 | 1985 | 09 | 15.03403 | 01 | 05 | 38.45 | +15 | 22 | 00.6 | 043 |
| 3012 | 1985 | 09 | 15.05556 | 01 | 05 | 37.61 | +15 | 22 | 04.0 | 043 |
| 3012 | 1985 | 09 | 18.04479 | 01 | 03 | 24.14 | +15 | 28 | 07.8 | 043 |
| 3012 | 1985 | 09 | 18.07049 | 01 | 03 | 23.02 | +15 | 28 | 09.8 | 043 |
| 3378 | 1985 | 09 | 10.99653 | 23 | 22 | 48.52 | -00 | 05 | 47.4 | 043 |
| 3378 | 1985 | 09 | 11.02222 | 23 | 22 | 46.78 | -00 | 05 | 51.6 | 043 |
| 3378 | 1985 | 09 | 12.88854 | 23 | 20 | 47.89 | -00 | 09 | 29.1 | 043 |
| 3378 | 1985 | 09 | 12.91076 | 23 | 20 | 46.43 | -00 | 09 | 31.9 | 043 |
| 3378 | 1985 | 09 | 17.02222 | 23 | 16 | 23.45 | -00 | 18 | 08.5 | 043 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3378 | | 1985 | 09 | 17.04097 | 23 | 16 | 22.36 | -00 | 18 | 11.4 | 043 |
| 1985 | RX4 * | 1985 | 09 | 10.99653 | 23 | 18 | 12.82 | +01 | 37 | 40.6 | 043 |
| 1985 | RX4 | 1985 | 09 | 11.02222 | 23 | 18 | 11.42 | +01 | 37 | 35.8 | 043 |
| 1985 | RX4 | 1985 | 09 | 12.88854 | 23 | 16 | 27.81 | +01 | 31 | 40.1 | 043 |
| 1985 | RX4 | 1985 | 09 | 12.91076 | 23 | 16 | 26.51 | +01 | 31 | 35.0 | 043 |

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. | N | Obs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 122 | 1986 | 05 02.93073 | 14 | 54 | 01.31 | -14 | 49 | 15.5 | | | 046 |
| 122 | 1986 | 05 02.94497 | 14 | 54 | 00.57 | -14 | 49 | 12.8 | | | 046 |
| 214 | 1986 | 05 04.97231 | 14 | 41 | 41.78 | -20 | 52 | 26.0 | | | 046 |
| 214 | 1986 | 05 04.98644 | 14 | 41 | 41.05 | -20 | 52 | 23.5 | | | 046 |
| 214 | 1986 | 05 08.96204 | 14 | 37 | 55.57 | -20 | 37 | 48.6 | | | 046 |
| 214 | 1986 | 05 08.97616 | 14 | 37 | 54.79 | -20 | 37 | 46.2 | | | 046 |
| 214 | 1986 | 05 12.92228 | 14 | 34 | 16.56 | -20 | 22 | 31.8 | | | 046 |
| 214 | 1986 | 05 12.93362 | 14 | 34 | 15.98 | -20 | 22 | 29.2 | | | 046 |
| 215 | 1986 | 05 01.94340 | 14 | 40 | 17.10 | -16 | 25 | 24.2 | | | 046 |
| 215 | 1986 | 05 01.95764 | 14 | 40 | 16.32 | -16 | 25 | 21.6 | | | 046 |
| 272 | 1986 | 05 01.90365 | 14 | 30 | 19.31 | -15 | 13 | 18.2 | | | 046 |
| 272 | 1986 | 05 01.92135 | 14 | 30 | 18.27 | -15 | 13 | 16.2 | | | 046 |
| 272 | 1986 | 05 02.89167 | 14 | 29 | 26.16 | -15 | 10 | 40.2 | | | 046 |
| 272 | 1986 | 05 02.90625 | 14 | 29 | 25.41 | -15 | 10 | 38.0 | | | 046 |
| 300 | 1986 | 05 01.94340 | 14 | 48 | 59.27 | -16 | 16 | 15.7 | | | 046 |
| 300 | 1986 | 05 01.95764 | 14 | 48 | 58.61 | -16 | 16 | 13.5 | | | 046 |
| 851 | 1986 | 05 01.97604 | 15 | 17 | 43.30 | -13 | 39 | 52.7 | | | 046 |
| 851 | 1986 | 05 01.99028 | 15 | 17 | 42.50 | -13 | 39 | 49.7 | | | 046 |
| 851 | 1986 | 05 02.96481 | 15 | 16 | 44.59 | -13 | 35 | 33.8 | | | 046 |
| 851 | 1986 | 05 02.97899 | 15 | 16 | 43.69 | -13 | 35 | 30.0 | | | 046 |
| 1300 | 1986 | 05 08.99705 | 15 | 41 | 23.18 | -12 | 00 | 53.9 | | | 046 |
| 1300 | 1986 | 05 09.01128 | 15 | 41 | 22.39 | -12 | 00 | 53.2 | | | 046 |
| 1300 | 1986 | 05 12.99450 | 15 | 37 | 47.66 | -11 | 58 | 20.5 | | | 046 |
| 1300 | 1986 | 05 13.00868 | 15 | 37 | 46.84 | -11 | 58 | 19.9 | | | 046 |
| 2193 | 1986 | 05 04.97231 | 14 | 44 | 09.11 | -18 | 18 | 49.6 | | | 046 |
| 2193 | 1986 | 05 04.98644 | 14 | 44 | 08.30 | -18 | 18 | 49.8 | | | 046 |
| 2193 | 1986 | 05 08.96204 | 14 | 40 | 31.90 | -18 | 17 | 52.8 | | | 046 |
| 2193 | 1986 | 05 08.97616 | 14 | 40 | 31.09 | -18 | 17 | 54.4 | | | 046 |
| 2193 | 1986 | 05 12.92228 | 14 | 36 | 59.27 | -18 | 16 | 30.8 | | | 046 |
| 2193 | 1986 | 05 12.93362 | 14 | 36 | 58.72 | -18 | 16 | 30.6 | | | 046 |
| 2315 | 1986 | 05 04.97231 | 14 | 44 | 17.59 | -19 | 56 | 56.6 | | | 046 |
| 2315 | 1986 | 05 04.98644 | 14 | 44 | 16.71 | -19 | 56 | 56.2 | | | 046 |
| 2315 | 1986 | 05 08.96204 | 14 | 40 | 47.11 | -19 | 51 | 05.4 | | | 046 |
| 2315 | 1986 | 05 08.97616 | 14 | 40 | 46.37 | -19 | 51 | 04.9 | | | 046 |
| 2315 | 1986 | 05 12.92228 | 14 | 37 | 21.28 | -19 | 44 | 42.0 | | | 046 |
| 2315 | 1986 | 05 12.93362 | 14 | 37 | 20.78 | -19 | 44 | 39.6 | | | 046 |
| 1977 QA5 | 1986 | 05 01.90365 | 14 | 30 | 50.51 | -14 | 22 | 27.2 | | | 046 |
| 1977 QA5 | 1986 | 05 01.92135 | 14 | 30 | 49.52 | -14 | 22 | 25.1 | | | 046 |
| 1980 XW | 1986 | 05 04.97231 | 14 | 34 | 37.60 | -17 | 22 | 09.1 | | 1 | 046 |
| 1980 XW | 1986 | 05 04.98644 | 14 | 34 | 36.97 | -17 | 22 | 04.5 | | 1 | 046 |
| 1981 NU | 1986 | 05 01.97604 | 15 | 20 | 39.97 | -14 | 33 | 50.0 | | | 046 |
| 1981 NU | 1986 | 05 01.99028 | 15 | 20 | 39.33 | -14 | 33 | 48.6 | | | 046 |
| 1981 NU | 1986 | 05 02.96481 | 15 | 19 | 55.92 | -14 | 30 | 54.3 | | | 046 |
| 1981 NU | 1986 | 05 02.97899 | 15 | 19 | 55.27 | -14 | 30 | 52.3 | | | 046 |
| 1982 DN | 1986 | 05 01.90365 | 14 | 30 | 22.63 | -13 | 06 | 11.6 | | | 046 |
| 1982 DN | 1986 | 05 01.92135 | 14 | 30 | 21.67 | -13 | 06 | 05.4 | | | 046 |
| 1982 DN | 1986 | 05 02.89167 | 14 | 29 | 31.45 | -13 | 00 | 42.8 | | | 046 |
| 1982 DN | 1986 | 05 02.90625 | 14 | 29 | 30.50 | -13 | 00 | 36.9 | | | 046 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1984 | HA1 | | 1986 | 05 | 02.00903 | 18 | 06 | 13.50 | +05 | 03 | 45.6 | 15.7 | 046 |
| 1984 | HA1 | | 1986 | 05 | 02.01765 | 18 | 06 | 13.45 | +05 | 03 | 49.1 | | 046 |
| 1984 | HA1 | | 1986 | 05 | 02.99855 | 18 | 06 | 04.45 | +05 | 08 | 42.3 | | 046 |
| 1984 | HA1 | | 1986 | 05 | 03.00717 | 18 | 06 | 04.47 | +05 | 08 | 45.1 | | 046 |
| 1984 | HA1 | | 1986 | 05 | 09.02899 | 18 | 04 | 53.22 | +05 | 37 | 46.5 | | 046 |
| 1984 | HA1 | | 1986 | 05 | 09.03617 | 18 | 04 | 53.15 | +05 | 37 | 48.5 | | 046 |
| 1984 | HA1 | | 1986 | 05 | 13.02575 | 18 | 03 | 51.20 | +05 | 55 | 46.8 | | 046 |
| 1984 | HA1 | | 1986 | 05 | 13.03304 | 18 | 03 | 51.08 | +05 | 55 | 48.3 | | 046 |
| 1986 | DA | | 1986 | 05 | 01.87992 | 12 | 44 | 10.69 | +07 | 29 | 27.5 | | 046 |
| 1986 | DA | | 1986 | 05 | 01.88432 | 12 | 44 | 11.54 | +07 | 29 | 14.9 | | 046 |
| 1986 | DA | | 1986 | 05 | 02.86863 | 12 | 47 | 20.93 | +06 | 41 | 42.0 | | 046 |
| 1986 | DA | | 1986 | 05 | 02.87303 | 12 | 47 | 21.68 | +06 | 41 | 30.8 | | 046 |
| 1986 | DA | | 1986 | 05 | 03.88609 | 12 | 50 | 34.14 | +05 | 52 | 59.6 | | 046 |
| 1986 | DA | | 1986 | 05 | 03.89054 | 12 | 50 | 34.92 | +05 | 52 | 47.4 | | 046 |
| 1986 | DA | | 1986 | 05 | 04.87150 | 12 | 53 | 39.59 | +05 | 06 | 18.4 | | 046 |
| 1986 | DA | | 1986 | 05 | 04.87590 | 12 | 53 | 40.34 | +05 | 06 | 05.1 | | 046 |
| 1986 | DA | | 1986 | 05 | 04.88372 | 12 | 53 | 41.70 | +05 | 05 | 44.4 | | 046 |
| 1986 | DA | | 1986 | 05 | 04.88881 | 12 | 53 | 42.60 | +05 | 05 | 29.5 | | 046 |
| 1986 | DA | | 1986 | 05 | 12.90145 | 13 | 17 | 33.31 | -00 | 51 | 24.1 | | 046 |
| 1986 | DA | | 1986 | 05 | 12.90631 | 13 | 17 | 34.26 | -00 | 51 | 35.5 | | 046 |
| 1986 | JT | | 1986 | 05 | 02.89167 | 14 | 26 | 57.30 | -11 | 48 | 26.4 | | 046 |
| 1986 | JT | | 1986 | 05 | 02.90625 | 14 | 26 | 56.52 | -11 | 48 | 21.4 | | 046 |
| 1986 | JB1 | * | 1986 | 05 | 04.97231 | 14 | 31 | 10.50 | -20 | 09 | 02.9 | | 046 |
| 1986 | JB1 | | 1986 | 05 | 04.98644 | 14 | 31 | 09.92 | -20 | 08 | 59.5 | | 046 |
| 1986 | JC1 | * | 1986 | 05 | 08.96204 | 14 | 31 | 11.52 | -18 | 42 | 05.3 | 16.9 | 046 |
| 1986 | JC1 | | 1986 | 05 | 08.97616 | 14 | 31 | 10.80 | -18 | 42 | 03.0 | | 046 |
| 1986 | JD1 | * | 1986 | 05 | 08.96204 | 14 | 31 | 14.41 | -20 | 56 | 22.5 | 17.2 | 046 |
| 1986 | JD1 | | 1986 | 05 | 08.97616 | 14 | 31 | 13.76 | -20 | 56 | 22.0 | | 046 |
| 1986 | JE1 | * | 1986 | 05 | 08.96204 | 14 | 33 | 21.07 | -19 | 46 | 36.3 | 16.7 | 046 |
| 1986 | JE1 | | 1986 | 05 | 08.97616 | 14 | 33 | 20.29 | -19 | 46 | 37.8 | | 046 |
| 1986 | JF1 | * | 1986 | 05 | 08.96204 | 14 | 34 | 15.86 | -20 | 38 | 47.9 | 16.8 | 046 |
| 1986 | JF1 | | 1986 | 05 | 08.97616 | 14 | 34 | 15.10 | -20 | 38 | 43.6 | | 046 |
| 1986 | JG1 | * | 1986 | 05 | 08.96204 | 14 | 36 | 52.11 | -18 | 11 | 34.4 | 16.9 | 046 |
| 1986 | JG1 | | 1986 | 05 | 08.97616 | 14 | 36 | 51.28 | -18 | 11 | 32.8 | | 046 |
| 1986 | JH1 | * | 1986 | 05 | 08.99705 | 15 | 38 | 05.30 | -12 | 45 | 20.4 | 16.9 | 046 |
| 1986 | JH1 | | 1986 | 05 | 09.01128 | 15 | 38 | 04.70 | -12 | 45 | 19.7 | | 046 |
| 1986 | JJ1 | * | 1986 | 05 | 08.99705 | 15 | 43 | 30.28 | -13 | 08 | 22.6 | 17.0 | 046 |
| 1986 | JJ1 | | 1986 | 05 | 09.01128 | 15 | 43 | 29.33 | -13 | 08 | 12.4 | | 046 |
| 1986 | JJ1 | | 1986 | 05 | 12.99450 | 15 | 39 | 55.47 | -12 | 56 | 17.7 | | 046 |
| 1986 | JJ1 | | 1986 | 05 | 13.00868 | 15 | 39 | 54.94 | -12 | 56 | 06.3 | | 046 |
| 1986 | JK1 | * | 1986 | 05 | 12.92228 | 14 | 27 | 53.59 | -19 | 18 | 07.5 | 17.1 | 046 |
| 1986 | JK1 | | 1986 | 05 | 12.93362 | 14 | 27 | 52.75 | -19 | 18 | 06.9 | | 046 |
| 1986 | JL1 | * | 1986 | 05 | 12.99450 | 15 | 32 | 21.19 | -12 | 53 | 47.6 | 17.0 | 046 |
| 1986 | JL1 | | 1986 | 05 | 13.00868 | 15 | 32 | 20.81 | -12 | 53 | 45.2 | | 046 |
| 1986 | JM1 | * | 1986 | 05 | 12.99450 | 15 | 42 | 57.21 | -12 | 29 | 35.3 | 16.9 | 046 |
| 1986 | JM1 | | 1986 | 05 | 13.00868 | 15 | 42 | 56.67 | -12 | 29 | 30.8 | | 046 |

Note 1: at edge of plate.

OBSERVATIONS MADE AT BRORFELDE BY K. AUGUSTESEN, P. JENSEN AND H. J. FOGH OLSEN.

Observations made in part in association with the International Near-Earth Asteroid Survey (INAS). Contact: P. Jensen, Copenhagen University Observatory, Brorfelde, DK-4340 Tollose, Denmark.

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | Obs. |
|---|---|---|---|---|---|---|
| 161 | 1986 04 | 10.92891 | 12 41 53.88 | -03 29 35.8 | | 054 |
| 1671 | 1986 04 | 10.92891 | 12 47 24.07 | -03 06 07.2 | | 054 |
| 1811 | 1986 04 | 10.92891 | 12 42 19.12 | +00 58 59.2 | | 054 |
| 3177 | 1986 04 | 10.90183 | 12 27 38.08 | +08 59 05.6 | | 054 |
| 1986 EN2 | * 1986 03 | 03.91166 | 09 14 42.56 | +24 04 23.8 | 17.5 | 054 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1986 EO2 * | 1986 03 03.91166 | 09 15 08.09 | +24 26 27.4 | | 17.2 | 054 |
| 1986 GO1 * | 1986 04 10.90183 | 12 32 00.80 | +07 35 45.8 | | 17.0 | 054 |

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. |
|---|---|---|---|---|
| 2591 | 1985 10 12.28194 | 02 22 23.82 | +15 34 15.7 | 293 |
| 2591 | 1985 10 12.29931 | 02 22 23.02 | +15 34 13.5 | 293 |
| 3372 | 1985 10 12.28194 | 02 23 16.29 | +15 23 03.4 | 293 |
| 3372 | 1985 10 12.29931 | 02 23 15.44 | +15 23 01.8 | 293 |

OBSERVATIONS MADE AT GEISEI BY T. SEKI.
Copied in part from Nihondaira Obs. Circ. No. 1557. Contact: T. Seki, Kamimachi 2-9-35, Kochi, Japan.

| Object | Date UT | R. A. (1950) | Decl. | Mag. | Obs. |
|---|---|---|---|---|---|
| 947 | 1986 05 14.62674 | 14 00 07.20 | -10 28 02.7 | 17 | 372 |
| 947 | 1986 05 15.66424 | 13 59 21.01 | -10 25 33.6 | | 372 |
| 2158 | 1986 05 14.62674 | 13 59 27.39 | -10 50 37.7 | 18 | 372 |
| 2158 | 1986 05 15.66424 | 13 58 46.51 | -10 46 35.3 | | 372 |
| 1985 BB | 1986 05 14.61944 | 13 57 44.65 | -10 34 39.5 | 19.5 | 372 |
| 1985 BB | 1986 05 14.63403 | 13 57 43.80 | -10 34 33.2 | | 372 |
| 1986 JK | 1986 05 14.67882 | 15 35 46.71 | -16 17 13.6 | 14 | 372 |
| 1986 JK | 1986 05 14.69028 | 15 35 48.94 | -16 17 29.4 | | 372 |

OBSERVATIONS MADE AT KOBUCHIZAWA BY M. INOUE AND O. MURAMATSU.
Films with the 0.31-m f/5.6 reflector. In part from Nihondaira Obs. Circ. No. 1556. Contact: T. Urata, Nishitaka-cho 8-23, Shimizu, Shizuoka 424, Japan.

| Object | Date UT | R. A. (1950) | Decl. | Mag. | N | Obs. |
|---|---|---|---|---|---|---|
| 3432 | 1986 04 05.64236 | 11 30 11.10 | +08 28 50.4 | | | 386 |
| 1986 ED | 1986 04 05.64236 | 11 31 53.94 | +08 23 33.0 | | | 386 |
| 1986 FA | 1986 04 11.68403 | 12 37 04.89 | +01 41 47.7 | | | 386 |
| 1986 FA | 1986 04 11.71875 | 12 37 03.02 | +01 41 53.3 | | 1 | 386 |
| 1986 GA | 1986 04 12.60972 | 13 57 29.12 | -09 33 22.9 | 16.5 | 2 | 386 |
| 1986 GA | 1986 04 12.65104 | 13 57 27.06 | -09 33 07.8 | | 2 | 386 |

Note 1: faint image. 2: measured by T. Urata.

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. | Obs. |
|---|---|---|---|---|---|
| 1986 JK | 1986 05 23.49964 | 16 47 55.24 | -22 24 49.2 | 13 | 474 |
| 1986 JK | 1986 05 23.50106 | 16 47 56.77 | -22 24 56.2 | | 474 |
| 1986 JK | 1986 05 27.54875 | 19 20 04.90 | -27 47 22.4 | 13 V | 474 |
| 1986 JK | 1986 05 27.55031 | 19 20 10.83 | -27 47 23.1 | | 474 |

OBSERVATIONS MADE AT YEBES BY M. DE PASCUAL, J. GARCIA, C. CABANAS AND F. SANCHEZ.
Plates taken with the 0.4-m f/5 double astrograph at the Centro Astronomico of the National Astronomical Observatory of the National Geographical Institute. Measurements using an ASCORECORD II Coordinometer, reductions using about eight SAO Catalog reference stars. Contact: M. de Pascual M., Observatorio Astronomico de Madrid, Alfonso XII 3, Madrid, Spain.

| Object | Date UT | R. A. (1950) | Decl. | N | Obs. |
|---|---|---|---|---|---|
| 1 | 1984 09 25.08211 | 03 39 18.04 | +09 46 10.5 | | 491 |
| 1 | 1984 09 25.08626 | 03 39 18.04 | +09 46 10.0 | | 491 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1984 | 09 | 25.09042 | 03 | 39 | 18.00 | +09 | 46 | 09.6 | 491 |
| 1 | 1984 | 09 | 26.09536 | 03 | 39 | 12.55 | +09 | 45 | 09.9 | 491 |
| 1 | 1984 | 09 | 26.10229 | 03 | 39 | 12.49 | +09 | 45 | 09.7 | 491 |
| 1 | 1984 | 09 | 26.10921 | 03 | 39 | 12.44 | +09 | 45 | 09.5 | 491 |
| 1 | 1984 | 10 | 24.04522 | 03 | 26 | 36.60 | +09 | 04 | 07.0 | 491 |
| 1 | 1984 | 10 | 24.05145 | 03 | 26 | 36.29 | +09 | 04 | 06.4 | 491 |
| 1 | 1984 | 10 | 24.05769 | 03 | 26 | 36.03 | +09 | 04 | 06.1 | 491 |
| 1 | 1984 | 10 | 25.08056 | 03 | 25 | 48.37 | +09 | 02 | 26.3 | 491 |
| 1 | 1984 | 10 | 25.08749 | 03 | 25 | 48.06 | +09 | 02 | 25.1 | 491 |
| 1 | 1984 | 10 | 25.09441 | 03 | 25 | 47.68 | +09 | 02 | 25.6 | 491 |
| 2 | 1984 | 09 | 25.00079 | 22 | 31 | 48.61 | -02 | 04 | 40.1 | 491 |
| 2 | 1984 | 09 | 25.00772 | 22 | 31 | 48.29 | -02 | 04 | 45.1 | 491 |
| 2 | 1984 | 09 | 25.01464 | 22 | 31 | 48.08 | -02 | 04 | 51.7 | 491 |
| 2 | 1984 | 09 | 26.01364 | 22 | 31 | 11.61 | -02 | 17 | 49.0 | 491 |
| 2 | 1984 | 09 | 26.02057 | 22 | 31 | 11.29 | -02 | 17 | 54.3 | 491 |
| 2 | 1984 | 09 | 26.02749 | 22 | 31 | 11.05 | -02 | 17 | 59.4 | 491 |
| 2 | 1984 | 10 | 23.90533 | 22 | 21 | 30.76 | -07 | 28 | 27.3 | 491 |
| 2 | 1984 | 10 | 23.91226 | 22 | 21 | 30.72 | -07 | 28 | 31.4 | 491 |
| 2 | 1984 | 10 | 23.92057 | 22 | 21 | 30.72 | -07 | 28 | 36.3 | 491 |
| 2 | 1984 | 10 | 24.94172 | 22 | 21 | 27.65 | -07 | 37 | 29.7 | 491 |
| 2 | 1984 | 10 | 24.94864 | 22 | 21 | 27.66 | -07 | 37 | 32.7 | 491 |
| 2 | 1984 | 10 | 24.95557 | 22 | 21 | 27.58 | -07 | 37 | 37.4 | 491 |
| 2 | 1984 | 11 | 26.76334 | 22 | 31 | 21.72 | -10 | 39 | 54.3 | 491 |
| 2 | 1984 | 11 | 26.77026 | 22 | 31 | 21.95 | -10 | 39 | 55.1 | 491 |
| 2 | 1984 | 11 | 26.77719 | 22 | 31 | 22.15 | -10 | 39 | 56.8 | 491 |
| 2 | 1984 | 11 | 27.82193 | 22 | 32 | 01.09 | -10 | 42 | 38.5 | 491 |
| 2 | 1984 | 11 | 27.82885 | 22 | 32 | 01.37 | -10 | 42 | 38.9 | 491 |
| 2 | 1984 | 11 | 27.83578 | 22 | 32 | 01.61 | -10 | 42 | 41.3 | 491 |
| 6 | 1984 | 10 | 24.11483 | 06 | 44 | 09.65 | +04 | 55 | 51.0 | 491 |
| 6 | 1984 | 10 | 24.12175 | 06 | 44 | 09.85 | +04 | 55 | 49.1 | 491 |
| 6 | 1984 | 10 | 24.12868 | 06 | 44 | 10.12 | +04 | 55 | 47.1 | 491 |
| 6 | 1984 | 10 | 25.18029 | 06 | 44 | 46.61 | +04 | 50 | 51.7 | 491 |
| 6 | 1984 | 10 | 25.18445 | 06 | 44 | 46.75 | +04 | 50 | 50.5 | 491 |
| 6 | 1984 | 10 | 25.18860 | 06 | 44 | 46.87 | +04 | 50 | 49.6 | 491 |
| 6 | 1984 | 12 | 18.97604 | 06 | 27 | 04.17 | +04 | 16 | 14.7 | 491 |
| 6 | 1984 | 12 | 18.98297 | 06 | 27 | 03.72 | +04 | 16 | 17.2 | 491 |
| 6 | 1984 | 12 | 18.98989 | 06 | 27 | 03.27 | +04 | 16 | 19.6 | 491 |
| 6 | 1984 | 12 | 20.09139 | 06 | 25 | 54.45 | +04 | 22 | 26.7 | 491 |
| 6 | 1984 | 12 | 20.09786 | 06 | 25 | 54.04 | +04 | 22 | 28.8 | 491 |
| 6 | 1984 | 12 | 20.10432 | 06 | 25 | 53.58 | +04 | 22 | 31.1 | 491 |
| 7 | 1984 | 09 | 25.09769 | 05 | 17 | 23.40 | +26 | 58 | 05.8 | 491 |
| 7 | 1984 | 09 | 25.10184 | 05 | 17 | 23.77 | +26 | 58 | 05.7 | 491 |
| 7 | 1984 | 09 | 25.10600 | 05 | 17 | 24.17 | +26 | 58 | 05.1 | 491 |
| 7 | 1984 | 09 | 26.11199 | 05 | 18 | 55.78 | +26 | 58 | 12.4 | 491 |
| 7 | 1984 | 09 | 26.11752 | 05 | 18 | 56.27 | +26 | 58 | 12.7 | 491 |
| 7 | 1984 | 09 | 26.12306 | 05 | 18 | 56.79 | +26 | 58 | 12.1 | 491 |
| 7 | 1984 | 10 | 24.17017 | 05 | 48 | 59.20 | +26 | 21 | 24.1 | 491 |
| 7 | 1984 | 10 | 24.17432 | 05 | 48 | 59.30 | +26 | 21 | 23.6 | 491 |
| 7 | 1984 | 10 | 24.17848 | 05 | 48 | 59.45 | +26 | 21 | 22.7 | 491 |
| 7 | 1984 | 10 | 25.19062 | 05 | 49 | 32.06 | +26 | 18 | 47.0 | 491 |
| 7 | 1984 | 10 | 25.19408 | 05 | 49 | 32.17 | +26 | 18 | 46.3 | 491 |
| 7 | 1984 | 10 | 25.19755 | 05 | 49 | 32.25 | +26 | 18 | 45.8 | 491 |
| 7 | 1984 | 12 | 18.95908 | 05 | 21 | 15.29 | +22 | 14 | 45.9 | 491 |
| 7 | 1984 | 12 | 18.96600 | 05 | 21 | 14.86 | +22 | 14 | 43.3 | 491 |
| 7 | 1984 | 12 | 18.97293 | 05 | 21 | 14.40 | +22 | 14 | 40.9 | 491 |
| 7 | 1984 | 12 | 20.00558 | 05 | 20 | 12.18 | +22 | 08 | 58.6 | 491 |
| 7 | 1984 | 12 | 20.01112 | 05 | 20 | 11.88 | +22 | 08 | 57.0 | 491 |
| 7 | 1984 | 12 | 20.01666 | 05 | 20 | 11.52 | +22 | 08 | 54.8 | 491 |
| 40 | 1984 | 12 | 19.10716 | 06 | 41 | 25.97 | +23 | 08 | 15.0 | 491 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 40 | 1984 | 12 | 19.11270 | 06 | 41 | 25.61 | +23 | 08 | 16.0 | 491 |
| 40 | 1984 | 12 | 19.11824 | 06 | 41 | 25.23 | +23 | 08 | 17.6 | 491 |
| 40 | 1984 | 12 | 20.14772 | 06 | 40 | 16.73 | +23 | 11 | 43.4 | 491 |
| 40 | 1984 | 12 | 20.15465 | 06 | 40 | 16.17 | +23 | 11 | 44.9 | 491 |
| 40 | 1984 | 12 | 20.16157 | 06 | 40 | 15.69 | +23 | 11 | 46.3 | 491 |
| 337 | 1984 | 09 | 25.06329 | 01 | 01 | 47.64 | +10 | 43 | 45.1 | 1 491 |
| 389 | 1984 | 09 | 24.93586 | 21 | 38 | 48.53 | -03 | 33 | 46.1 | 491 |
| 389 | 1984 | 09 | 24.94348 | 21 | 38 | 48.32 | -03 | 33 | 47.7 | 491 |
| 389 | 1984 | 09 | 24.95110 | 21 | 38 | 48.13 | -03 | 33 | 49.1 | 491 |
| 389 | 1984 | 09 | 25.94249 | 21 | 38 | 23.69 | -03 | 37 | 10.1 | 491 |
| 389 | 1984 | 09 | 25.95218 | 21 | 38 | 23.44 | -03 | 37 | 12.2 | 491 |
| 389 | 1984 | 09 | 25.96187 | 21 | 38 | 23.20 | -03 | 37 | 14.1 | 491 |
| 480 | 1984 | 09 | 25.02244 | 02 | 15 | 31.25 | +30 | 46 | 48.6 | 491 |
| 480 | 1984 | 09 | 25.03006 | 02 | 15 | 31.04 | +30 | 46 | 47.1 | 491 |
| 480 | 1984 | 09 | 25.03768 | 02 | 15 | 30.88 | +30 | 46 | 45.2 | 491 |
| 480 | 1984 | 09 | 26.03632 | 02 | 15 | 04.35 | +30 | 42 | 26.1 | 491 |
| 480 | 1984 | 09 | 26.04394 | 02 | 15 | 04.10 | +30 | 42 | 23.6 | 491 |
| 480 | 1984 | 09 | 26.05156 | 02 | 15 | 03.88 | +30 | 42 | 22.2 | 491 |
| 480 | 1984 | 11 | 26.84416 | 01 | 33 | 06.29 | +19 | 14 | 18.6 | 491 |
| 480 | 1984 | 11 | 26.85247 | 01 | 33 | 06.13 | +19 | 14 | 12.0 | 491 |
| 480 | 1984 | 11 | 26.86078 | 01 | 33 | 06.03 | +19 | 14 | 05.6 | 491 |
| 480 | 1984 | 11 | 27.86637 | 01 | 32 | 50.01 | +19 | 01 | 35.7 | 491 |
| 480 | 1984 | 11 | 27.87329 | 01 | 32 | 49.94 | +19 | 01 | 30.4 | 491 |
| 480 | 1984 | 11 | 27.88022 | 01 | 32 | 49.77 | +19 | 01 | 26.4 | 2 491 |
| 480 | 1984 | 12 | 17.81349 | 01 | 33 | 16.49 | +15 | 35 | 54.0 | 491 |
| 480 | 1984 | 12 | 17.82042 | 01 | 33 | 16.65 | +15 | 35 | 50.5 | 491 |
| 480 | 1984 | 12 | 17.82734 | 01 | 33 | 16.70 | +15 | 35 | 46.6 | 491 |
| 480 | 1984 | 12 | 18.85923 | 01 | 33 | 35.32 | +15 | 27 | 33.0 | 491 |
| 480 | 1984 | 12 | 18.86616 | 01 | 33 | 35.47 | +15 | 27 | 29.7 | 491 |
| 480 | 1984 | 12 | 18.87308 | 01 | 33 | 35.59 | +15 | 27 | 26.9 | 491 |
| 480 | 1984 | 12 | 19.98463 | 01 | 33 | 57.36 | +15 | 18 | 51.3 | 491 |
| 480 | 1984 | 12 | 19.99156 | 01 | 33 | 57.44 | +15 | 18 | 48.7 | 491 |
| 480 | 1984 | 12 | 19.99848 | 01 | 33 | 57.59 | +15 | 18 | 45.4 | 491 |
| 532 | 1984 | 10 | 23.92905 | 23 | 37 | 40.39 | -24 | 29 | 41.8 | 491 |
| 532 | 1984 | 10 | 23.93459 | 23 | 37 | 40.24 | -24 | 29 | 41.6 | 491 |
| 532 | 1984 | 10 | 23.94013 | 23 | 37 | 40.08 | -24 | 29 | 41.2 | 491 |
| 532 | 1984 | 10 | 25.00144 | 23 | 37 | 12.33 | -24 | 27 | 59.9 | 491 |
| 532 | 1984 | 10 | 25.00698 | 23 | 37 | 12.21 | -24 | 27 | 59.3 | 491 |
| 532 | 1984 | 10 | 25.01252 | 23 | 37 | 12.03 | -24 | 27 | 59.5 | 491 |
| 532 | 1984 | 11 | 26.78227 | 23 | 34 | 30.31 | -22 | 05 | 03.4 | 491 |
| 532 | 1984 | 11 | 26.78919 | 23 | 34 | 30.37 | -22 | 05 | 00.3 | 491 |
| 532 | 1984 | 11 | 26.79612 | 23 | 34 | 30.49 | -22 | 04 | 57.7 | 491 |
| 532 | 1984 | 11 | 27.84040 | 23 | 34 | 46.79 | -21 | 58 | 07.0 | 491 |
| 532 | 1984 | 11 | 27.85079 | 23 | 34 | 46.99 | -21 | 58 | 02.9 | 491 |
| 532 | 1984 | 11 | 27.85771 | 23 | 34 | 47.08 | -21 | 57 | 59.6 | 491 |
| 554 | 1984 | 11 | 26.88572 | 00 | 36 | 20.09 | +08 | 55 | 27.4 | 491 |
| 554 | 1984 | 11 | 27.92662 | 00 | 36 | 35.53 | +08 | 54 | 39.9 | 1 491 |
| 583 | 1984 | 09 | 24.97395 | 23 | 40 | 40.08 | +10 | 02 | 15.9 | 491 |
| 911 | 1984 | 09 | 24.97395 | 23 | 42 | 24.14 | +10 | 17 | 14.3 | 491 |
| 911 | 1984 | 09 | 25.99027 | 23 | 41 | 48.80 | +10 | 15 | 49.0 | 491 |
| 939 | 1984 | 09 | 25.06329 | 00 | 55 | 04.77 | +09 | 46 | 58.7 | 491 |
| 939 | 1984 | 09 | 26.07545 | 00 | 54 | 09.49 | +09 | 43 | 30.3 | 491 |
| 1206 | 1984 | 09 | 24.97395 | 23 | 39 | 03.52 | +10 | 29 | 32.8 | 491 |
| 1206 | 1984 | 09 | 25.99027 | 23 | 38 | 09.67 | +10 | 26 | 47.4 | 2 491 |
| 1404 | 1984 | 09 | 24.97395 | 23 | 40 | 25.91 | +09 | 45 | 08.8 | 491 |
| 1404 | 1984 | 09 | 25.99027 | 23 | 39 | 50.93 | +09 | 43 | 28.6 | 491 |
| 1431 | 1984 | 10 | 23.99622 | 00 | 45 | 31.06 | -20 | 28 | 50.7 | 491 |
| 1431 | 1984 | 10 | 24.92249 | 00 | 44 | 57.95 | -20 | 27 | 39.8 | 491 |
| 1431 | 1984 | 10 | 29.86451 | 00 | 42 | 19.78 | -20 | 16 | 13.3 | 491 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1543 | | 1984 11 26.99445 | 02 | 23 | 16.76 | +29 | 58 | 52.0 | | 491 |
| 1543 | | 1984 11 28.00592 | 02 | 22 | 36.28 | +29 | 49 | 13.3 | | 491 |
| 1727 | | 1984 11 26.94112 | 02 | 50 | 22.34 | -31 | 10 | 29.3 | 2 | 491 |
| 1727 | | 1984 11 27.96021 | 02 | 49 | 32.22 | -30 | 57 | 49.4 | | 491 |
| 2449 | | 1984 10 24.07794 | 02 | 31 | 22.45 | -13 | 11 | 03.3 | 2 | 491 |
| 2449 | | 1984 10 25.04161 | 02 | 30 | 22.23 | -13 | 28 | 43.9 | 2 | 491 |
| 2621 | | 1984 11 27.02284 | 03 | 46 | 36.08 | +07 | 22 | 11.9 | | 491 |
| 2621 | | 1984 11 28.03327 | 03 | 45 | 42.13 | +07 | 24 | 18.5 | | 491 |
| 2621 | | 1984 12 17.94993 | 03 | 30 | 48.07 | +08 | 30 | 27.3 | | 491 |
| 2621 | | 1984 12 19.01297 | 03 | 30 | 12.65 | +08 | 35 | 14.5 | | 491 |
| 2645 | | 1984 12 19.04898 | 06 | 54 | 43.01 | +46 | 48 | 37.2 | | 491 |
| 2645 | | 1984 12 19.95831 | 06 | 53 | 30.03 | +46 | 50 | 24.9 | | 491 |
| 2698 | | 1984 09 25.06329 | 00 | 57 | 58.82 | +09 | 19 | 40.7 | 2 | 491 |
| 2698 | | 1984 09 26.07545 | 00 | 57 | 14.24 | +09 | 12 | 39.5 | | 491 |
| 2808 | | 1984 12 17.90873 | 03 | 25 | 51.10 | +31 | 25 | 36.8 | | 491 |
| 2808 | | 1984 12 18.93576 | 03 | 25 | 16.62 | +31 | 19 | 37.9 | | 491 |
| 3199 | | 1984 09 24.88600 | 20 | 18 | 26.99 | +18 | 30 | 22.8 | 3 | 491 |
| 3199 | | 1984 09 25.88466 | 20 | 15 | 14.27 | +19 | 36 | 42.4 | | 491 |
| 3200 | | 1984 12 17.87445 | 02 | 05 | 40.79 | +28 | 59 | 48.2 | 3 | 491 |
| 3248 | | 1984 10 23.96403 | 00 | 49 | 47.19 | +07 | 47 | 30.0 | | 491 |
| 3248 | | 1984 10 24.98101 | 00 | 49 | 00.27 | +07 | 46 | 14.8 | | 491 |
| 3248 | | 1984 10 29.97809 | 00 | 45 | 24.62 | +07 | 40 | 52.0 | | 491 |
| 3248 | | 1984 11 26.88572 | 00 | 34 | 55.39 | +07 | 47 | 58.2 | | 491 |
| 3248 | | 1984 11 27.92662 | 00 | 34 | 53.00 | +07 | 49 | 45.4 | | 491 |

Note 1: close to edge of plate. 2: diffuse image, difficult to meaure.
3: very long image, difficult to measure.

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. | Obs. |
|---|---|---|---|---|---|---|
| 882 | 1986 02 | 13.88472 | 09 06 39.82 | +08 39 44.0 | 16.5 | 552 |
| 882 | 1986 02 | 13.90486 | 09 06 38.84 | +08 39 47.6 | | 552 |
| 1986 CK1 * | 1986 02 | 13.88472 | 09 07 24.87 | +08 38 27.6 | 16.5 | 552 |
| 1986 CK1 | 1986 02 | 13.90486 | 09 07 23.63 | +08 38 30.7 | | 552 |

OBSERVATION MADE AT MAUNA KEA.

Observation made using the encoders at the Infrared Telescope Facility. Contact: D. J. Tholen, Institute for Astronomy, 2680 Woodlawn Drive, Honolulu, HI 96822, U.S.A.

| Object | Date | UT | R. A. (1950) | Decl. | Obs. |
|---|---|---|---|---|---|
| 1986 JK | 1986 05 | 20.38924 | 16 07 12.21 | -19 13 49.4 | 568 |

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

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

| Object | Date | UT | R. A. (1950) | Decl. | N | Obs. |
|---|---|---|---|---|---|---|
| 851 | 1986 05 | 08.36111 | 15 11 16.49 | -13 12 02.6 | 1 | 657 |
| 1981 NU | 1986 05 | 08.36111 | 15 15 47.18 | -14 14 55.9 | | 657 |
| 1981 NU | 1986 05 | 08.41111 | 15 15 44.92 | -14 14 48.6 | | 657 |
| 1986 JK | 1986 05 | 16.36431 | 15 42 11.58 | -16 55 09.3 | | 657 |
| 1986 JK | 1986 05 | 16.37750 | 15 42 14.67 | -16 55 32.0 | | 657 |

Note 1: image near edge of plate.

OBSERVATIONS MADE AT PALOMAR.

Palomar-Leiden Survey plates taken with the 1.2-m Schmidt by T. Gehrels, scanned and measured by C. J. van Houten and I. van Houten-Groeneveld at Leiden. Computational support from the late P. Herget.

| Object | | Date | UT | R. A. (1950) | Decl. | Mag. | Obs. |
|---|---|---|---|---|---|---|---|
| 6541 P-L | * | 1960 09 | 24.35002 | 00 03 26.59 | -04 34 59.4 | 18.9 | 675 |
| 6541 P-L | | 1960 09 | 26.28543 | 00 02 31.87 | -04 42 34.1 | | 675 |
| 6541 P-L | | 1960 09 | 27.34237 | 00 02 02.07 | -04 46 41.2 | | 675 |
| 6541 P-L | | 1960 09 | 28.33822 | 00 01 34.08 | -04 50 29.8 | | 675 |
| 6541 P-L | | 1960 10 | 17.28198 | 23 53 22.56 | -05 54 14.6 | | 675 |
| 6541 P-L | | 1960 10 | 22.23406 | 23 51 36.72 | -06 07 05.0 | | 675 |
| 6541 P-L | | 1960 10 | 25.25350 | 23 50 38.57 | -06 13 56.9 | | 675 |
| 6541 P-L | | 1960 10 | 26.31531 | 23 50 19.47 | -06 16 11.0 | | 675 |
| 9602 P-L | * | 1960 10 | 17.22501 | 23 27 33.94 | -08 05 18.0 | 20.0 | 675 |
| 9602 P-L | | 1960 10 | 22.16324 | 23 26 05.39 | -08 15 19.1 | | 675 |
| 9602 P-L | | 1960 10 | 26.27157 | 23 25 03.52 | -08 22 05.9 | | 675 |

OBSERVATIONS MADE WITH THE 1.2-m SCHMIDT AT PALOMAR BY C. T. KOWAL.

Plates scanned and measured by S. J. Bus, with assistance from E. Bowell. Contact: S. J. Bus, Lowell Observatory, 1400 W. Mars Hill Road, Flagstaff, AZ 86001, U.S.A.

| Object | | Date | UT | R. A. (1950) | Decl. | Mag. | Obs. |
|---|---|---|---|---|---|---|---|
| 1302 | | 1977 05 | 18.29827 | 15 25 39.43 | -16 32 33.8 | | 675 |
| 1302 | | 1977 05 | 19.27813 | 15 24 53.39 | -16 30 13.0 | | 675 |
| 1316 | | 1977 05 | 18.29827 | 15 29 00.55 | -20 30 25.0 | | 675 |
| 1316 | | 1977 05 | 19.27813 | 15 28 01.26 | -20 20 56.6 | | 675 |
| 1911 | | 1977 05 | 18.29827 | 15 28 09.48 | -20 35 37.3 | | 675 |
| 1911 | | 1977 05 | 19.27813 | 15 27 30.92 | -20 33 09.2 | | 675 |
| 2210 | | 1977 02 | 13.39549 | 09 37 59.56 | +15 41 16.2 | | 675 |
| 2210 | | 1977 02 | 14.39514 | 09 37 01.23 | +15 46 49.7 | | 675 |
| 3148 | | 1977 05 | 18.29827 | 15 10 12.07 | -18 34 50.8 | | 675 |
| 3148 | | 1977 05 | 19.27813 | 15 09 26.89 | -18 31 54.8 | | 675 |
| 1967 JP | | 1977 02 | 13.39549 | 09 37 06.09 | +14 41 16.9 | | 675 |
| 1967 JP | | 1977 02 | 14.32110 | 09 36 19.48 | +14 44 01.5 | | 675 |
| 1975 QO | | 1977 02 | 12.31979 | 09 27 29.70 | +17 25 22.3 | | 675 |
| 1975 QO | | 1977 02 | 14.24705 | 09 25 26.82 | +17 28 07.5 | | 675 |
| 1977 CH | * | 1977 02 | 11.29976 | 09 11 51.83 | +17 41 12.6 | 19.8 | 675 |
| 1977 CH | | 1977 02 | 12.31979 | 09 11 17.38 | +17 43 34.4 | | 675 |
| 1977 CJ | * | 1977 02 | 11.29976 | 09 11 51.87 | +17 46 31.5 | 20.5 | 675 |
| 1977 CJ | | 1977 02 | 12.31979 | 09 11 17.19 | +17 47 57.1 | | 675 |
| 1977 CK | * | 1977 02 | 11.29976 | 09 13 56.63 | +14 08 14.6 | 16.5 | 675 |
| 1977 CK | | 1977 02 | 12.31979 | 09 12 59.04 | +14 16 15.3 | | 675 |
| 1977 CK | | 1977 02 | 14.24705 | 09 11 13.42 | +14 31 02.7 | | 675 |
| 1977 CL | * | 1977 02 | 11.29976 | 09 14 39.19 | +17 08 57.1 | 16.2 | 675 |
| 1977 CL | | 1977 02 | 12.31979 | 09 13 57.94 | +17 22 01.9 | | 675 |
| 1977 CL | | 1977 02 | 14.24705 | 09 12 42.94 | +17 46 05.9 | | 675 |
| 1977 CM | * | 1977 02 | 11.29976 | 09 14 46.41 | +14 34 48.3 | 19.8 | 675 |
| 1977 CM | | 1977 02 | 12.31979 | 09 14 14.97 | +14 37 59.6 | | 675 |
| 1977 CM | | 1977 02 | 14.24705 | 09 13 16.94 | +14 43 53.5 | | 675 |
| 1977 CN | * | 1977 02 | 11.29976 | 09 17 32.14 | +18 04 24.9 | 16.5 | 675 |
| 1977 CN | | 1977 02 | 12.31979 | 09 16 36.04 | +18 15 27.3 | | 675 |
| 1977 CO | * | 1977 02 | 11.29976 | 09 18 42.60 | +15 32 26.5 | 17.8 | 675 |
| 1977 CO | | 1977 02 | 12.31979 | 09 17 59.45 | +15 34 18.5 | | 675 |
| 1977 CO | | 1977 02 | 14.24705 | 09 16 39.45 | +15 37 45.5 | | 675 |
| 1977 CP | * | 1977 02 | 11.29976 | 09 20 05.97 | +17 38 56.5 | 16.8 | 675 |
| 1977 CP | | 1977 02 | 12.31979 | 09 19 03.51 | +17 43 14.7 | | 675 |
| 1977 CP | | 1977 02 | 14.24705 | 09 17 08.63 | +17 51 00.0 | | 675 |
| 1977 CQ | * | 1977 02 | 11.29976 | 09 23 05.46 | +17 02 15.8 | 16.8 | 675 |
| 1977 CQ | | 1977 02 | 12.31979 | 09 22 11.73 | +17 07 27.6 | | 675 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 1977 | CQ | | 1977 | 02 | 14.24705 | 09 | 20 | 32.49 | +17 | 16 | 58.4 | | 675 |
| 1977 | CR | * | 1977 | 02 | 11.29976 | 09 | 25 | 15.21 | +12 | 06 | 51.1 | 19.0 | 675 |
| 1977 | CR | | 1977 | 02 | 12.31979 | 09 | 24 | 43.65 | +12 | 12 | 10.5 | | 675 |
| 1977 | CR | | 1977 | 02 | 14.24705 | 09 | 23 | 44.77 | +12 | 22 | 07.0 | | 675 |
| 1977 | CS | * | 1977 | 02 | 11.29976 | 09 | 27 | 29.77 | +13 | 50 | 51.8 | 20.0 | 675 |
| 1977 | CS | | 1977 | 02 | 12.31979 | 09 | 26 | 52.54 | +13 | 51 | 42.9 | | 675 |
| 1977 | CS | | 1977 | 02 | 14.24705 | 09 | 25 | 43.84 | +13 | 53 | 16.0 | | 675 |
| 1977 | CT | * | 1977 | 02 | 11.29976 | 09 | 29 | 38.30 | +15 | 50 | 30.9 | 17.0 | 675 |
| 1977 | CT | | 1977 | 02 | 12.31979 | 09 | 28 | 06.27 | +15 | 46 | 11.7 | | 675 |
| 1977 | CT | | 1977 | 02 | 14.24705 | 09 | 25 | 14.88 | +15 | 37 | 53.7 | | 675 |
| 1977 | CU | * | 1977 | 02 | 11.29976 | 09 | 30 | 57.79 | +16 | 56 | 17.3 | 16.2 | 675 |
| 1977 | CU | | 1977 | 02 | 12.31979 | 09 | 29 | 55.91 | +16 | 58 | 15.2 | | 675 |
| 1977 | CU | | 1977 | 02 | 14.24705 | 09 | 28 | 01.35 | +17 | 01 | 45.0 | | 675 |
| 1977 | CV | * | 1977 | 02 | 11.29976 | 09 | 34 | 26.41 | +13 | 22 | 35.8 | 20.5 | 675 |
| 1977 | CV | | 1977 | 02 | 12.31979 | 09 | 33 | 54.51 | +13 | 26 | 20.6 | | 675 |
| 1977 | CV | | 1977 | 02 | 14.24705 | 09 | 32 | 55.28 | +13 | 33 | 23.6 | | 675 |
| 1977 | CW | * | 1977 | 02 | 11.29976 | 09 | 37 | 13.45 | +16 | 53 | 24.9 | 17.2 | 675 |
| 1977 | CW | | 1977 | 02 | 12.31979 | 09 | 36 | 25.67 | +17 | 07 | 42.3 | | 675 |
| 1977 | CW | | 1977 | 02 | 14.24705 | 09 | 34 | 56.87 | +17 | 34 | 11.0 | | 675 |
| 1977 | CX | * | 1977 | 02 | 13.39548 | 09 | 36 | 14.06 | +14 | 18 | 54.8 | 16.5 | 675 |
| 1977 | CX | | 1977 | 02 | 14.39514 | 09 | 35 | 07.93 | +14 | 20 | 17.1 | | 675 |
| 1977 | CY | * | 1977 | 02 | 13.39548 | 09 | 44 | 12.31 | +15 | 22 | 13.7 | 17.8 | 675 |
| 1977 | CY | | 1977 | 02 | 14.39514 | 09 | 43 | 16.48 | +15 | 28 | 06.5 | | 675 |
| 1977 | CZ | * | 1977 | 02 | 13.39548 | 09 | 50 | 06.39 | +10 | 41 | 56.2 | 16.8 | 675 |
| 1977 | CZ | | 1977 | 02 | 14.39514 | 09 | 49 | 19.08 | +10 | 46 | 23.1 | | 675 |
| 1977 | CA1 | * | 1977 | 02 | 13.39548 | 09 | 52 | 12.11 | +10 | 51 | 50.4 | 16.0 | 675 |
| 1977 | CA1 | | 1977 | 02 | 14.39514 | 09 | 51 | 02.04 | +10 | 51 | 26.6 | | 675 |
| 1977 | CB1 | * | 1977 | 02 | 13.39548 | 09 | 52 | 34.75 | +11 | 29 | 06.4 | 16.2 | 675 |
| 1977 | CB1 | | 1977 | 02 | 14.39514 | 09 | 51 | 38.85 | +11 | 38 | 08.9 | | 675 |
| 1977 | CC1 | * | 1977 | 02 | 13.39548 | 09 | 53 | 01.35 | +11 | 31 | 32.3 | 19.2 | 675 |
| 1977 | CC1 | | 1977 | 02 | 14.39514 | 09 | 52 | 31.56 | +11 | 35 | 03.7 | | 675 |
| 1977 | CD1 | * | 1977 | 02 | 13.39548 | 09 | 55 | 16.96 | +10 | 38 | 19.9 | 20.8 | 675 |
| 1977 | CD1 | | 1977 | 02 | 14.39514 | 09 | 54 | 46.70 | +10 | 41 | 04.7 | | 675 |
| 1977 | CE1 | * | 1977 | 02 | 13.39548 | 09 | 59 | 01.89 | +11 | 14 | 16.4 | 18.8 | 675 |
| 1977 | CE1 | | 1977 | 02 | 14.39514 | 09 | 58 | 31.75 | +11 | 17 | 00.6 | | 675 |
| 1977 | DO | | 1977 | 02 | 13.39548 | 09 | 55 | 42.40 | +12 | 21 | 25.7 | 16.5 | 675 |
| 1977 | DO | | 1977 | 02 | 14.39514 | 09 | 54 | 51.38 | +12 | 33 | 06.1 | | 675 |
| 1977 | DS | | 1977 | 02 | 13.39548 | 09 | 57 | 44.11 | +13 | 19 | 11.9 | 16.8 | 675 |
| 1977 | DS | | 1977 | 02 | 14.39514 | 09 | 56 | 45.45 | +13 | 19 | 22.0 | | 675 |
| 1977 | DU | | 1977 | 02 | 13.39548 | 09 | 58 | 54.22 | +15 | 28 | 28.6 | 16.5 | 675 |
| 1977 | DU | | 1977 | 02 | 14.39514 | 09 | 57 | 51.25 | +15 | 30 | 35.8 | | 675 |
| 1977 | DX | | 1977 | 02 | 13.39548 | 09 | 59 | 22.58 | +14 | 21 | 59.9 | 16.8 | 675 |
| 1977 | DX | | 1977 | 02 | 14.39514 | 09 | 58 | 24.35 | +14 | 28 | 55.4 | | 675 |
| 1977 | DB1 | | 1977 | 02 | 13.39548 | 09 | 59 | 30.03 | +12 | 59 | 41.1 | 17.0 | 675 |
| 1977 | DB1 | | 1977 | 02 | 14.39514 | 09 | 58 | 35.57 | +13 | 06 | 48.3 | | 675 |
| 1977 | DD1 | | 1977 | 02 | 13.39548 | 10 | 00 | 34.88 | +12 | 59 | 34.4 | 16.8 | 675 |
| 1977 | DD1 | | 1977 | 02 | 14.39514 | 09 | 59 | 34.01 | +13 | 08 | 17.7 | | 675 |
| 1977 | KV | | 1977 | 05 | 18.29827 | 15 | 17 | 18.93 | -18 | 17 | 48.8 | 17.0 | 675 |
| 1977 | KV | | 1977 | 05 | 19.27813 | 15 | 16 | 21.71 | -18 | 15 | 22.2 | | 675 |
| 1977 | KE1 | * | 1977 | 05 | 18.29827 | 15 | 13 | 11.19 | -18 | 19 | 09.2 | | 675 |
| 1977 | KE1 | | 1977 | 05 | 19.27813 | 15 | 12 | 23.37 | -18 | 16 | 36.8 | | 675 |
| 1977 | KF1 | * | 1977 | 05 | 18.29827 | 15 | 13 | 53.89 | -20 | 29 | 30.2 | 17.2 | 675 |
| 1977 | KF1 | | 1977 | 05 | 19.27813 | 15 | 13 | 06.54 | -20 | 23 | 57.9 | | 675 |
| 1977 | KG1 | * | 1977 | 05 | 18.29827 | 15 | 19 | 25.46 | -18 | 45 | 07.5 | | 675 |
| 1977 | KG1 | | 1977 | 05 | 19.27813 | 15 | 18 | 19.47 | -18 | 42 | 17.0 | | 675 |
| 1977 | KH1 | * | 1977 | 05 | 18.29827 | 15 | 24 | 04.86 | -18 | 12 | 41.9 | | 675 |
| 1977 | KH1 | | 1977 | 05 | 19.27813 | 15 | 23 | 20.18 | -18 | 10 | 22.6 | | 675 |
| 1977 | KJ1 | * | 1977 | 05 | 18.29827 | 15 | 27 | 18.68 | -21 | 16 | 40.0 | 16.8 | 675 |
| 1977 | KJ1 | | 1977 | 05 | 19.25208 | 15 | 26 | 26.29 | -21 | 13 | 08.6 | | 675 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1978 | LW | * | 1978 | 06 | 10.39132 | 17 | 25 | 13.04 | -19 | 33 | 30.6 | 675 |
| 1978 | LW | | 1978 | 06 | 11.36354 | 17 | 24 | 12.61 | -19 | 32 | 53.0 | 675 |
| 1978 | LX | * | 1978 | 06 | 10.44896 | 17 | 58 | 52.72 | -21 | 53 | 22.7 | 675 |
| 1978 | LX | | 1978 | 06 | 12.39618 | 17 | 57 | 16.83 | -21 | 53 | 18.0 | 675 |
| 1978 | LX | | 1978 | 06 | 13.36840 | 17 | 56 | 28.28 | -21 | 53 | 14.8 | 675 |
| 1978 | QJ2 | | 1977 | 05 | 18.29827 | 15 | 30 | 35.22 | -19 | 54 | 52.4 | 675 |
| 1978 | QJ2 | | 1977 | 05 | 19.27813 | 15 | 29 | 46.35 | -19 | 52 | 22.7 | 675 |
| 1981 | DZ | | 1977 | 05 | 18.29827 | 15 | 28 | 30.03 | -20 | 23 | 30.7 | 675 |
| 1981 | DZ | | 1977 | 05 | 19.25208 | 15 | 27 | 40.26 | -20 | 16 | 29.5 | 675 |
| 1981 | EE1 | | 1977 | 02 | 13.39549 | 09 | 45 | 07.48 | +13 | 27 | 31.8 | 675 |
| 1981 | EE1 | | 1977 | 02 | 14.39514 | 09 | 44 | 12.51 | +13 | 34 | 12.5 | 675 |
| 1981 | EX3 | | 1977 | 05 | 18.29827 | 15 | 25 | 41.51 | -18 | 27 | 40.8 | 675 |
| 1981 | EX3 | | 1977 | 05 | 19.27813 | 15 | 24 | 51.04 | -18 | 22 | 04.8 | 675 |
| 1981 | EA9 | | 1977 | 02 | 13.39549 | 09 | 49 | 33.10 | +14 | 44 | 39.4 | 675 |
| 1981 | EA9 | | 1977 | 02 | 14.39514 | 09 | 48 | 28.52 | +14 | 48 | 00.7 | 675 |
| 1981 | EP10 | | 1977 | 02 | 11.28646 | 09 | 33 | 09.21 | +12 | 32 | 26.7 | 675 |
| 1981 | EP10 | | 1977 | 02 | 12.31979 | 09 | 32 | 02.94 | +12 | 35 | 02.8 | 675 |
| 1981 | EP10 | | 1977 | 02 | 14.24705 | 09 | 29 | 59.65 | +12 | 39 | 52.9 | 675 |
| 1981 | EQ12 | | 1978 | 06 | 10.39132 | 17 | 17 | 47.15 | -18 | 56 | 22.5 | 675 |
| 1981 | EQ12 | | 1978 | 06 | 11.36354 | 17 | 16 | 46.97 | -18 | 50 | 45.7 | 675 |
| 1981 | ER14 | | 1977 | 02 | 13.39549 | 09 | 45 | 03.49 | +13 | 45 | 22.6 | 675 |
| 1981 | ER14 | | 1977 | 02 | 14.39514 | 09 | 43 | 58.07 | +13 | 48 | 03.3 | 675 |
| 1981 | EO15 | | 1977 | 05 | 18.29827 | 15 | 07 | 27.91 | -15 | 30 | 06.2 | 675 |
| 1981 | EO15 | | 1977 | 05 | 19.27813 | 15 | 06 | 39.31 | -15 | 24 | 50.1 | 675 |
| 1981 | EN16 | | 1977 | 02 | 11.28646 | 09 | 19 | 41.28 | +17 | 03 | 07.4 | 675 |
| 1981 | EN16 | | 1977 | 02 | 12.31979 | 09 | 18 | 31.38 | +17 | 03 | 16.5 | 675 |
| 1981 | EN16 | | 1977 | 02 | 14.24705 | 09 | 16 | 22.63 | +17 | 03 | 20.0 | 675 |
| 1981 | EV17 | | 1977 | 02 | 11.26042 | 09 | 13 | 32.44 | +12 | 59 | 55.1 | 675 |
| 1981 | EV17 | | 1977 | 02 | 12.31979 | 09 | 12 | 27.73 | +13 | 04 | 49.9 | 675 |
| 1981 | EQ19 | | 1977 | 02 | 13.39549 | 09 | 39 | 41.55 | +10 | 23 | 20.9 | 675 |
| 1981 | EQ19 | | 1977 | 02 | 14.39514 | 09 | 38 | 42.17 | +10 | 29 | 12.0 | 675 |
| 1981 | ET19 | | 1977 | 02 | 11.28646 | 09 | 25 | 43.36 | +15 | 25 | 13.3 | 675 |
| 1981 | ET19 | | 1977 | 02 | 12.31979 | 09 | 24 | 40.84 | +15 | 30 | 59.6 | 675 |
| 1981 | ET19 | | 1977 | 02 | 14.24705 | 09 | 22 | 44.99 | +15 | 41 | 41.6 | 675 |
| 1981 | EP20 | | 1977 | 02 | 12.31979 | 09 | 34 | 42.46 | +18 | 03 | 26.0 | 675 |
| 1981 | EP20 | | 1977 | 02 | 14.24705 | 09 | 32 | 38.57 | +18 | 11 | 51.2 | 675 |
| 1981 | EO21 | | 1977 | 02 | 13.39549 | 09 | 59 | 59.61 | +11 | 44 | 11.0 | 675 |
| 1981 | EO21 | | 1977 | 02 | 14.39514 | 09 | 58 | 57.10 | +11 | 49 | 02.6 | 675 |
| 1981 | EO22 | | 1977 | 02 | 11.28646 | 09 | 23 | 06.96 | +14 | 18 | 28.0 | 675 |
| 1981 | EO22 | | 1977 | 02 | 12.31979 | 09 | 22 | 03.63 | +14 | 23 | 04.3 | 675 |
| 1981 | EO22 | | 1977 | 02 | 14.24705 | 09 | 20 | 05.74 | +14 | 31 | 37.7 | 675 |
| 1981 | EH23 | | 1977 | 02 | 13.39549 | 09 | 45 | 34.18 | +11 | 57 | 50.0 | 675 |
| 1981 | EH23 | | 1977 | 02 | 14.39514 | 09 | 44 | 34.55 | +12 | 02 | 35.2 | 675 |
| 1981 | EK23 | | 1978 | 06 | 10.39132 | 17 | 26 | 15.64 | -17 | 21 | 49.7 | 675 |
| 1981 | EK23 | | 1978 | 06 | 11.36354 | 17 | 25 | 19.28 | -17 | 20 | 00.5 | 675 |
| 1981 | EF25 | | 1977 | 02 | 11.28646 | 09 | 18 | 45.02 | +16 | 16 | 02.9 | 675 |
| 1981 | EF25 | | 1977 | 02 | 12.31979 | 09 | 17 | 44.92 | +16 | 20 | 41.3 | 675 |
| 1981 | EF25 | | 1977 | 02 | 14.24705 | 09 | 15 | 54.93 | +16 | 29 | 07.7 | 675 |
| 1981 | EC26 | | 1977 | 02 | 11.28646 | 09 | 30 | 59.98 | +16 | 34 | 21.7 | 675 |
| 1981 | EC26 | | 1977 | 02 | 12.31979 | 09 | 29 | 56.79 | +16 | 38 | 54.3 | 675 |
| 1981 | EC26 | | 1977 | 02 | 14.24705 | 09 | 27 | 59.66 | +16 | 47 | 13.7 | 675 |
| 1981 | EX30 | | 1977 | 02 | 13.39549 | 09 | 53 | 21.76 | +12 | 25 | 55.4 | 675 |
| 1981 | EX30 | | 1977 | 02 | 14.39514 | 09 | 52 | 21.75 | +12 | 32 | 18.5 | 675 |
| 1981 | ER31 | | 1977 | 02 | 13.39549 | 09 | 57 | 50.67 | +10 | 24 | 42.7 | 675 |
| 1981 | ER31 | | 1977 | 02 | 14.39514 | 09 | 56 | 58.13 | +10 | 32 | 28.9 | 675 |
| 1981 | EY31 | | 1977 | 02 | 11.28646 | 09 | 17 | 02.83 | +13 | 41 | 34.2 | 675 |
| 1981 | EY31 | | 1977 | 02 | 12.31979 | 09 | 15 | 58.37 | +13 | 46 | 05.6 | 675 |
| 1981 | EY31 | | 1977 | 02 | 14.24705 | 09 | 13 | 59.09 | +13 | 54 | 28.1 | 675 |
| 1981 | ED35 | | 1977 | 02 | 13.39549 | 09 | 45 | 13.23 | +15 | 27 | 30.3 | 675 |

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|---|---|---|---|---|---|---|---|---|---|---|
| 1981 ED35 | 1977 02 14.39514 | 09 44 12.81 | +15 31 33.0 | | | | | | | 675 |
| 1981 EY42 | 1977 02 12.31979 | 09 36 48.53 | +13 09 06.0 | | | | | | | 675 |
| 1981 EY42 | 1977 02 13.39549 | 09 35 43.89 | +13 14 34.5 | | | | | | | 675 |
| 1981 EY42 | 1977 02 14.27309 | 09 34 51.17 | +13 19 02.4 | | | | | | | 675 |
| 1981 EA43 | 1977 02 11.28646 | 09 26 56.23 | +15 28 55.7 | | | | | | | 675 |
| 1981 EA43 | 1977 02 12.31979 | 09 25 50.42 | +15 33 15.4 | | | | | | | 675 |
| 1981 EA43 | 1977 02 14.24705 | 09 23 48.93 | +15 41 12.2 | | | | | | | 675 |
| 1981 EQ43 | 1977 02 13.39549 | 09 41 34.13 | +12 12 40.4 | | | | | | | 675 |
| 1981 EQ43 | 1977 02 14.39514 | 09 40 35.06 | +12 18 06.7 | | | | | | | 675 |
| 1981 FP | 1977 02 13.39549 | 09 47 34.57 | +10 37 45.4 | | | | | | | 675 |
| 1981 FP | 1977 02 14.39514 | 09 46 38.02 | +10 43 43.3 | | | | | | | 675 |
| 1981 JQ | 1977 05 18.29827 | 15 05 48.45 | -20 55 49.1 | | | | | | | 675 |
| 1981 TH4 | 1977 02 11.28646 | 09 33 21.61 | +16 13 01.3 | | | | | | | 675 |
| 1981 TH4 | 1977 02 12.31979 | 09 32 26.15 | +16 15 02.5 | | | | | | | 675 |
| 1981 TH4 | 1977 02 14.24705 | 09 30 43.48 | +16 18 42.0 | | | | | | | 675 |

OBSERVATIONS MADE WITH THE 1.2-M SCHMIDT AT PALOMAR.

Plates taken by J. Schombert, R. Windhorst and E. Helin. Measured by M. Rudnyk. Reduced by P. Saunders and M. Rudnyk. 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. |
|---|---|---|---|---|---|---|---|---|
| 446 | | 1986 04 29.30833 | | 13 45 12.77 | -07 34 11.8 | 14.0 | | 675 |
| 446 | | 1986 04 29.34305 | | 13 45 10.57 | -07 34 08.4 | | | 675 |
| 2982 | | 1986 04 29.30833 | | 13 52 06.48 | -08 27 58.8 | 17.0 | | 675 |
| 2982 | | 1986 04 29.34305 | | 13 52 04.55 | -08 27 55.2 | | | 675 |
| 1985 QD2 | | 1985 08 16.30486 | | 21 38 52.07 | +00 23 01.0 | | | 675 |
| 1985 QD2 | | 1985 08 16.35694 | | 21 38 49.43 | +00 22 57.1 | | | 675 |
| 1985 QF2 | | 1985 08 16.30486 | | 21 40 26.06 | +00 15 09.1 | | | 675 |
| 1985 QF2 | | 1985 08 16.35694 | | 21 40 23.87 | +00 14 54.9 | | | 675 |
| 1985 QG2 | | 1985 08 16.30486 | | 21 40 46.59 | -00 02 02.5 | | | 675 |
| 1985 QG2 | | 1985 08 16.35694 | | 21 40 43.57 | -00 02 00.9 | | | 675 |
| 1985 QH2 | | 1985 08 16.30486 | | 21 41 16.05 | +00 36 36.6 | | | 675 |
| 1985 QH2 | | 1985 08 16.35694 | | 21 41 13.87 | +00 36 18.1 | | | 675 |
| 1985 QJ2 | | 1985 08 16.30486 | | 21 41 40.95 | +00 33 14.5 | | | 675 |
| 1985 QJ2 | | 1985 08 16.35694 | | 21 41 38.40 | +00 32 53.7 | | | 675 |
| 1985 QJ4 | * | 1985 08 23.30277 | | 21 36 10.68 | +01 22 03.9 | 19 | 1 | 675 |
| 1985 QJ4 | | 1985 08 23.35486 | | 21 36 06.45 | +01 22 08.1 | | | 675 |
| 1986 GA | | 1986 04 29.30833 | | 13 43 15.23 | -07 41 40.9 | 17.2 | | 675 |
| 1986 GA | | 1986 04 29.34305 | | 13 43 13.34 | -07 41 26.6 | | | 675 |
| 1986 HP | * | 1986 04 29.30833 | | 13 42 48.26 | -07 30 37.3 | 20.2 | 1 | 675 |
| 1986 HP | | 1986 04 29.34305 | | 13 42 45.65 | -07 30 20.0 | | | 675 |
| 1986 HQ | * | 1986 04 29.30833 | | 13 45 10.20 | -07 11 13.1 | 17.5 | 1 | 675 |
| 1986 HQ | | 1986 04 29.34305 | | 13 45 08.57 | -07 11 05.3 | | | 675 |
| 1986 HR | * | 1986 04 29.30833 | | 13 45 43.27 | -06 55 22.7 | 20.0 | 1 | 675 |
| 1986 HR | | 1986 04 29.34305 | | 13 45 41.36 | -06 55 08.6 | | | 675 |
| 1986 HS | * | 1986 04 29.30833 | | 13 46 11.68 | -06 41 09.7 | 17.8 | 1 | 675 |
| 1986 HS | | 1986 04 29.34305 | | 13 46 09.85 | -06 40 59.2 | | | 675 |
| 1986 HT | * | 1986 04 29.30833 | | 13 48 34.03 | -06 33 54.9 | 18.5 | 1 | 675 |
| 1986 HT | | 1986 04 29.34305 | | 13 48 31.40 | -06 33 40.0 | | | 675 |
| 1986 HU | * | 1986 04 29.30833 | | 13 49 07.29 | -06 43 09.3 | 18.5 | 1 | 675 |
| 1986 HU | | 1986 04 29.34305 | | 13 49 05.86 | -06 42 52.1 | | | 675 |
| 1986 HV | * | 1986 04 29.30833 | | 13 49 09.40 | -08 05 08.3 | 17.8 | 1 | 675 |
| 1986 HV | | 1986 04 29.34305 | | 13 49 07.68 | -08 04 59.7 | | | 675 |
| 1986 HW | * | 1986 04 29.30833 | | 13 49 13.31 | -07 46 27.8 | 18.0 | 1 | 675 |
| 1986 HW | | 1986 04 29.34305 | | 13 49 11.43 | -07 46 15.7 | | | 675 |
| 1986 HX | * | 1986 04 29.30833 | | 13 49 45.44 | -07 46 34.4 | 19.8 | 1 | 675 |
| 1986 HX | | 1986 04 29.34305 | | 13 49 43.02 | -07 46 15.3 | | | 675 |
| 1986 HY | * | 1986 04 29.30833 | | 13 50 38.56 | -07 38 37.4 | 21.0 | 1 | 675 |
| 1986 HY | | 1986 04 29.34305 | | 13 50 34.89 | -07 38 24.6 | | | 675 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 HZ | * | 1986 04 29.30833 | 13 50 39.41 | -08 27 52.7 | | | 18.2 | 1 | 675 |
| 1986 HZ | | 1986 04 29.34305 | 13 50 37.80 | -08 27 44.4 | | | | | 675 |
| 1986 HA1 | * | 1986 04 29.30833 | 13 52 29.89 | -07 04 25.7 | | | 19.0 | 1 | 675 |
| 1986 HA1 | | 1986 04 29.34305 | 13 52 28.18 | -07 04 18.2 | | | | | 675 |
| 1986 HB1 | * | 1986 04 29.30833 | 13 52 31.49 | -06 22 06.5 | | | 17.5 | 1 | 675 |
| 1986 HB1 | | 1986 04 29.34305 | 13 52 29.60 | -06 21 48.3 | | | | | 675 |
| 1986 HC1 | * | 1986 04 29.30833 | 13 53 37.87 | -06 45 33.7 | | | 18.8 | 1 | 675 |
| 1986 HC1 | | 1986 04 29.34305 | 13 53 35.66 | -06 45 23.8 | | | | | 675 |
| 1986 HD1 | * | 1986 04 29.30833 | 13 54 15.40 | -07 08 58.1 | | | 18.8 | 1 | 675 |
| 1986 HD1 | | 1986 04 29.34305 | 13 54 13.57 | -07 08 46.5 | | | | | 675 |
| 1986 HE1 | * | 1986 04 29.30833 | 13 55 08.64 | -08 30 10.4 | | | 19.5 | 1 | 675 |
| 1986 HE1 | | 1986 04 29.34305 | 13 55 06.50 | -08 30 03.9 | | | | | 675 |
| 1986 HF1 | * | 1986 04 29.30833 | 13 55 10.17 | -06 34 37.2 | | | 18.0 | 1 | 675 |
| 1986 HF1 | | 1986 04 29.34305 | 13 55 08.09 | -06 34 16.8 | | | | | 675 |
| 1986 JQ | | 1986 06 03.27778 | 15 52 47.57 | -00 05 15.8 | | | 16.2 | | 675 |
| 1986 JQ | | 1986 06 03.31552 | 15 52 45.34 | -00 04 35.8 | | | | | 675 |
| 1986 JQ | | 1986 06 04.34166 | 15 51 48.74 | +00 12 10.6 | | | | | 675 |
| 1986 JQ | | 1986 06 04.36250 | 15 51 47.44 | +00 12 32.6 | | | | | 675 |
| 1986 LA | * | 1986 06 04.29930 | 14 48 20.59 | -01 13 52.1 | | | 18 | 2 | 675 |
| 1986 LA | | 1986 06 04.32014 | 14 48 19.25 | -01 12 56.8 | | | | | 675 |
| 1986 LA | | 1986 06 06.31806 | 14 46 50.61 | +00 13 46.3 | | | | | 675 |
| 1986 LA | | 1986 06 06.33541 | 14 46 49.48 | +00 14 32.2 | | | | | 675 |
| 1986 LA | | 1986 06 07.23750 | 14 46 14.18 | +00 53 16.3 | | | | | 675 |
| 1986 LA | | 1986 06 07.25833 | 14 46 13.14 | +00 54 08.9 | | | | | 675 |
| 1986 LB | * | 1986 06 03.27778 | 15 51 31.05 | -00 09 53.0 | | | 16.2 | 1 | 675 |
| 1986 LB | | 1986 06 03.31552 | 15 51 29.26 | -00 09 46.2 | | | | | 675 |
| 1986 LB | | 1986 06 04.34166 | 15 50 42.89 | -00 07 39.5 | | | | | 675 |
| 1986 LB | | 1986 06 04.36250 | 15 50 41.81 | -00 07 34.4 | | | | | 675 |
| 1986 LC | * | 1986 06 03.27778 | 16 00 40.53 | +00 04 31.1 | | | 16.5 | 2 | 675 |
| 1986 LC | | 1986 06 03.31552 | 16 00 38.38 | +00 04 23.7 | | | | | 675 |
| 1986 LC | | 1986 06 04.34166 | 15 59 45.82 | +00 00 21.5 | | | | | 675 |
| 1986 LC | | 1986 06 04.36250 | 15 59 44.53 | +00 00 17.1 | | | | | 675 |

Note 1: discoverer M. Rudnyk. 2: discoverer E. Helin.

OBSERVATIONS MADE WITH THE 0.46-m SCHMIDT AT PALOMAR.

Films taken by E. Helin, S. Singer-Brewster, D. Schneeberger and E. Burr in the course of the International Near-Earth Asteroid Survey (INAS). Measured and reduced by S. Singer-Brewster, M. Rudnyk and P. Saunders. Contact: E. Helin, MS 183-501, Jet Propulsion Laboratory, Pasadena, CA 91109, U.S.A.

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | Obs. |
|---|---|---|---|---|---|---|
| 277 | 1986 05 03.26979 | | 13 28 03.70 | -09 54 01.8 | 14.5 | 675 |
| 277 | 1986 05 03.31424 | | 13 28 01.82 | -09 53 49.2 | | 675 |
| 3192 | 1986 04 30.29306 | | 14 24 16.93 | -12 35 11.7 | | 675 |
| 3192 | 1986 05 02.35313 | | 14 22 12.95 | -12 28 43.0 | | 675 |
| 1986 GN | 1986 04 29.31389 | | 13 07 19.22 | +16 23 56.5 | 16.8 | 675 |
| 1986 GN | 1986 05 03.25174 | | 13 04 39.84 | +16 28 19.5 | | 675 |
| 1986 GN | 1986 05 03.29618 | | 13 04 37.89 | +16 28 23.5 | | 675 |
| 1986 HN * | 1986 04 29.31389 | | 12 57 10.21 | +18 40 38.7 | 16.5 | 675 |
| 1986 HN | 1986 05 03.25174 | | 12 54 50.08 | +18 26 03.5 | | 675 |
| 1986 HN | 1986 05 03.29618 | | 12 54 48.54 | +18 25 52.2 | | 675 |
| 1986 HO * | 1986 04 29.31389 | | 12 59 41.53 | +14 48 03.9 | 16.5 | 675 |
| 1986 HO | 1986 05 03.25174 | | 12 57 21.38 | +14 44 55.9 | | 675 |
| 1986 HO | 1986 05 03.29618 | | 12 57 19.87 | +14 44 52.9 | | 675 |
| 1986 JQ | 1986 06 08.30417 | | 15 48 22.53 | +01 12 28.5 | 16 | 675 |
| 1986 JQ | 1986 06 09.37014 | | 15 47 30.75 | +01 27 23.5 | | 675 |
| 1986 JS * | 1986 05 02.38021 | | 14 51 33.70 | -02 50 26.8 | 16.5 | 675 |
| 1986 JS | 1986 05 02.39792 | | 14 51 32.77 | -02 50 22.4 | | 675 |
| 1986 JS | 1986 05 03.33681 | | 14 50 40.19 | -02 45 50.0 | | 675 |

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. |
|---|---|---|---|---|---|---|---|
| 329 | | 1986 05 | 08.41493 | 17 13 17.46 | +00 30 07.8 | 14.5 | 675 |
| 329 | | 1986 05 | 08.45266 | 17 13 16.26 | +00 30 28.0 | | 675 |
| 1982 DK | | 1986 05 | 05.23142 | 10 45 40.88 | +26 47 18.7 | | 675 |
| 1982 DK | | 1986 05 | 08.20434 | 10 48 33.95 | +26 10 10.3 | | 675 |
| 1982 DK | | 1986 05 | 09.17239 | 10 49 32.98 | +25 57 47.4 | | 675 |
| 1982 DK | | 1986 05 | 10.17188 | 10 50 35.15 | +25 44 52.5 | | 675 |
| 1986 EB | | 1986 05 | 05.20659 | 09 13 49.04 | -05 44 07.0 | | 675 |
| 1986 EB | | 1986 05 | 06.19531 | 09 14 09.28 | -06 03 10.2 | | 675 |
| 1986 GU | | 1986 05 | 05.33489 | 15 17 45.70 | +18 43 45.3 | | 675 |
| 1986 GU | | 1986 05 | 08.33854 | 15 13 48.47 | +18 18 36.1 | | 675 |
| 1986 GU | | 1986 05 | 09.35486 | 15 12 28.46 | +18 09 20.7 | | 675 |
| 1986 JZ | * | 1986 05 | 04.44063 | 17 50 55.66 | -10 03 54.5 | 16.5 | 675 |
| 1986 JZ | | 1986 05 | 08.43090 | 17 50 17.94 | -11 00 52.1 | | 675 |
| 1986 JZ | | 1986 05 | 09.44947 | 17 50 01.75 | -11 16 19.4 | | 675 |
| 1986 JZ | | 1986 05 | 10.45972 | 17 49 43.04 | -11 32 01.8 | | 675 |
| 1986 JA1 | * | 1986 05 | 04.44063 | 17 57 27.77 | -10 13 04.2 | 17 | 675 |
| 1986 JA1 | | 1986 05 | 08.43090 | 17 57 59.93 | -08 30 51.5 | | 675 |
| 1986 JA1 | | 1986 05 | 09.44947 | 17 58 01.99 | -08 03 49.9 | | 675 |
| 1986 JA1 | | 1986 05 | 10.45972 | 17 58 01.52 | -07 36 48.6 | | 675 |
| 1986 JN1 | * | 1986 05 | 05.39201 | 16 11 04.22 | +00 56 22.7 | 17.5 | 675 |
| 1986 JN1 | | 1986 05 | 08.36076 | 16 06 58.31 | +00 26 01.1 | | 675 |

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

Observations made by B. A. Skiff and S. J. Bus, measured by B. A. Skiff, E. Bowell and S. J. Bus using a PDS scanning microdensitometer. 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. |
|---|---|---|---|---|---|---|
| 74 | 1986 05 | 04.27477 | 14 58 16.44 | -14 01 39.1 | | 688 |
| 74 | 1986 05 | 04.31957 | 14 58 14.25 | -14 01 26.5 | | 688 |
| 74 | 1986 05 | 13.28194 | 14 50 43.91 | -13 20 50.4 | | 688 |
| 74 | 1986 05 | 13.32361 | 14 50 41.86 | -13 20 38.1 | | 688 |
| 97 | 1986 05 | 04.21858 | 12 51 38.73 | +06 18 37.0 | | 688 |
| 97 | 1986 05 | 04.23669 | 12 51 38.14 | +06 18 40.4 | | 688 |
| 122 | 1986 05 | 04.27477 | 14 52 59.99 | -14 44 13.8 | | 688 |
| 122 | 1986 05 | 04.31957 | 14 52 57.90 | -14 44 04.3 | | 688 |
| 140 | 1986 05 | 14.29144 | 15 37 17.40 | -14 56 44.6 | | 688 |
| 140 | 1986 05 | 14.32014 | 15 37 15.78 | -14 56 40.5 | | 688 |
| 151 | 1986 05 | 04.27477 | 14 58 11.61 | -18 18 45.0 | | 688 |
| 151 | 1986 05 | 04.31957 | 14 58 08.88 | -18 18 42.3 | | 688 |
| 177 | 1986 05 | 04.20284 | 14 11 55.45 | -14 54 08.8 | | 688 |
| 177 | 1986 05 | 04.25249 | 14 11 52.93 | -14 53 56.8 | | 688 |
| 214 | 1986 05 | 04.27477 | 14 42 21.52 | -20 54 48.9 | | 688 |
| 214 | 1986 05 | 04.31957 | 14 42 19.05 | -20 54 39.2 | | 688 |
| 215 | 1986 05 | 04.27477 | 14 38 14.16 | -16 17 15.0 | | 688 |
| 215 | 1986 05 | 04.31957 | 14 38 11.73 | -16 17 05.5 | | 688 |
| 223 | 1986 05 | 04.29705 | 15 16 15.63 | -18 11 30.2 | | 688 |
| 223 | 1986 05 | 04.34205 | 15 16 13.29 | -18 11 22.4 | | 688 |
| 272 | 1986 05 | 04.20284 | 14 28 16.01 | -15 07 03.0 | | 688 |
| 272 | 1986 05 | 04.25249 | 14 28 13.24 | -15 06 54.1 | | 688 |
| 282 | 1986 05 | 04.21858 | 12 53 58.59 | +07 30 11.3 | | 688 |
| 282 | 1986 05 | 04.23669 | 12 53 58.01 | +07 30 14.0 | | 688 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 300 | 1986 | 05 | 04.27477 | 14 | 47 | 11.65 | -16 | 08 | 41.7 | | 688 |
| 300 | 1986 | 05 | 04.31957 | 14 | 47 | 09.50 | -16 | 08 | 33.6 | | 688 |
| 340 | 1986 | 05 | 04.27477 | 14 | 55 | 25.07 | -19 | 05 | 29.4 | | 688 |
| 340 | 1986 | 05 | 04.31957 | 14 | 55 | 22.56 | -19 | 05 | 23.0 | | 688 |
| 528 | 1986 | 05 | 04.27477 | 15 | 00 | 35.13 | -15 | 46 | 00.6 | | 688 |
| 528 | 1986 | 05 | 04.31957 | 15 | 00 | 32.95 | -15 | 45 | 59.8 | | 688 |
| 528 | 1986 | 05 | 13.28194 | 14 | 53 | 14.53 | -15 | 42 | 11.4 | | 688 |
| 528 | 1986 | 05 | 13.32361 | 14 | 53 | 12.49 | -15 | 42 | 09.9 | | 688 |
| 570 | 1986 | 05 | 04.20284 | 14 | 35 | 06.62 | -15 | 21 | 36.4 | | 688 |
| 570 | 1986 | 05 | 04.25249 | 14 | 35 | 04.50 | -15 | 21 | 25.0 | | 688 |
| 851 | 1986 | 05 | 04.29705 | 15 | 15 | 24.86 | -13 | 29 | 39.7 | | 688 |
| 851 | 1986 | 05 | 04.34205 | 15 | 15 | 22.01 | -13 | 29 | 27.8 | | 688 |
| 851 | 1986 | 05 | 13.28194 | 15 | 06 | 14.19 | -12 | 51 | 34.8 | | 688 |
| 851 | 1986 | 05 | 13.32361 | 15 | 06 | 11.57 | -12 | 51 | 25.0 | | 688 |
| 903 | 1986 | 05 | 04.21858 | 12 | 50 | 45.43 | +05 | 42 | 31.9 | | 688 |
| 903 | 1986 | 05 | 04.23669 | 12 | 50 | 44.88 | +05 | 42 | 35.1 | | 688 |
| 995 | 1986 | 05 | 04.20284 | 14 | 19 | 03.79 | -14 | 41 | 35.9 | | 688 |
| 995 | 1986 | 05 | 04.25249 | 14 | 19 | 01.27 | -14 | 41 | 09.7 | | 688 |
| 1072 | 1986 | 05 | 04.27477 | 14 | 39 | 08.55 | -16 | 44 | 08.3 | | 688 |
| 1072 | 1986 | 05 | 04.31957 | 14 | 39 | 06.54 | -16 | 44 | 02.9 | | 688 |
| 1091 | 1986 | 05 | 04.27477 | 15 | 03 | 07.66 | -16 | 19 | 41.7 | | 688 |
| 1091 | 1986 | 05 | 04.31957 | 15 | 03 | 05.60 | -16 | 19 | 34.0 | | 688 |
| 1091 | 1986 | 05 | 13.28194 | 14 | 56 | 31.59 | -15 | 53 | 43.5 | | 688 |
| 1091 | 1986 | 05 | 13.32361 | 14 | 56 | 29.77 | -15 | 53 | 35.8 | | 688 |
| 1185 | 1986 | 05 | 04.34205 | 15 | 28 | 21.87 | -15 | 07 | 14.9 | | 688 |
| 1186 | 1986 | 05 | 04.29705 | 15 | 12 | 48.24 | -19 | 33 | 50.2 | | 688 |
| 1186 | 1986 | 05 | 04.34205 | 15 | 12 | 45.79 | -19 | 33 | 49.5 | | 688 |
| 1309 | 1986 | 05 | 04.29705 | 15 | 14 | 46.68 | -12 | 23 | 14.8 | | 688 |
| 1309 | 1986 | 05 | 04.34205 | 15 | 14 | 44.68 | -12 | 23 | 01.2 | | 688 |
| 1309 | 1986 | 05 | 13.28194 | 15 | 08 | 14.38 | -11 | 37 | 44.0 | | 688 |
| 1309 | 1986 | 05 | 13.32361 | 15 | 08 | 12.54 | -11 | 37 | 31.5 | | 688 |
| 1448 | 1986 | 05 | 04.20284 | 14 | 34 | 04.51 | -14 | 34 | 14.8 | | 688 |
| 1590 | 1986 | 05 | 04.20284 | 14 | 14 | 39.05 | -14 | 34 | 27.9 | | 688 |
| 1590 | 1986 | 05 | 04.25249 | 14 | 14 | 36.26 | -14 | 34 | 03.4 | | 688 |
| 1610 | 1986 | 05 | 04.25249 | 14 | 13 | 51.20 | -15 | 53 | 53.2 | | 688 |
| 1736 | 1986 | 05 | 04.34205 | 15 | 28 | 38.59 | -11 | 46 | 32.2 | 1 | 688 |
| 1739 | 1986 | 05 | 04.20284 | 14 | 36 | 11.44 | -13 | 03 | 43.9 | | 688 |
| 1739 | 1986 | 05 | 04.25249 | 14 | 36 | 08.53 | -13 | 03 | 23.5 | | 688 |
| 1761 | 1986 | 05 | 14.29144 | 15 | 27 | 45.43 | -17 | 23 | 32.7 | | 688 |
| 1761 | 1986 | 05 | 14.32014 | 15 | 27 | 43.84 | -17 | 23 | 27.6 | | 688 |
| 1988 | 1986 | 05 | 04.29705 | 15 | 24 | 34.97 | -11 | 52 | 16.7 | 1 | 688 |
| 1988 | 1986 | 05 | 04.34205 | 15 | 24 | 31.75 | -11 | 52 | 05.6 | 1 | 688 |
| 1988 | 1986 | 05 | 13.28194 | 15 | 15 | 00.42 | -11 | 22 | 39.8 | | 688 |
| 1988 | 1986 | 05 | 13.32361 | 15 | 14 | 57.53 | -11 | 22 | 29.8 | | 688 |
| 2163 | 1986 | 05 | 04.34205 | 15 | 06 | 17.81 | -14 | 11 | 24.2 | 1 | 688 |
| 2163 | 1986 | 05 | 13.28194 | 14 | 59 | 29.85 | -13 | 44 | 17.5 | | 688 |
| 2163 | 1986 | 05 | 13.32361 | 14 | 59 | 27.97 | -13 | 44 | 09.8 | | 688 |
| 2193 | 1986 | 05 | 04.27477 | 14 | 44 | 47.39 | -18 | 18 | 55.7 | | 688 |
| 2193 | 1986 | 05 | 04.31957 | 14 | 44 | 44.86 | -18 | 18 | 56.0 | | 688 |
| 2255 | 1986 | 05 | 04.27477 | 14 | 41 | 51.97 | -16 | 34 | 29.2 | | 688 |
| 2255 | 1986 | 05 | 04.31957 | 14 | 41 | 49.66 | -16 | 34 | 27.5 | | 688 |
| 2256 | 1986 | 05 | 04.20284 | 14 | 11 | 13.56 | -12 | 30 | 12.6 | 1 | 688 |
| 2256 | 1986 | 05 | 04.25249 | 14 | 11 | 11.46 | -12 | 30 | 00.5 | | 688 |
| 2315 | 1986 | 05 | 04.27477 | 14 | 44 | 54.26 | -19 | 57 | 52.7 | | 688 |
| 2315 | 1986 | 05 | 04.31957 | 14 | 44 | 51.98 | -19 | 57 | 48.1 | | 688 |
| 2334 | 1986 | 05 | 13.28194 | 15 | 02 | 29.11 | -09 | 27 | 34.5 | | 688 |
| 2334 | 1986 | 05 | 13.32361 | 15 | 02 | 26.66 | -09 | 27 | 27.8 | | 688 |
| 2379 | 1986 | 05 | 04.29705 | 15 | 29 | 04.55 | -18 | 13 | 39.0 | | 688 |
| 2379 | 1986 | 05 | 04.34205 | 15 | 29 | 02.39 | -18 | 13 | 32.1 | | 688 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2439 | | 1986 | 05 | 04.29705 | 15 | 12 | 48.41 | -17 | 32 | 57.1 | | | 688 |
| 2439 | | 1986 | 05 | 04.34205 | 15 | 12 | 46.33 | -17 | 32 | 48.1 | | | 688 |
| 2468 | | 1986 | 05 | 14.29144 | 15 | 28 | 37.44 | -15 | 41 | 24.5 | | | 688 |
| 2468 | | 1986 | 05 | 14.32014 | 15 | 28 | 35.71 | -15 | 41 | 13.5 | | | 688 |
| 2475 | | 1986 | 05 | 14.29144 | 15 | 32 | 14.03 | -13 | 40 | 01.3 | | | 688 |
| 2475 | | 1986 | 05 | 14.32014 | 15 | 32 | 12.90 | -13 | 39 | 53.2 | | | 688 |
| 2564 | | 1986 | 05 | 04.27477 | 14 | 57 | 14.64 | -13 | 30 | 36.1 | | | 688 |
| 2564 | | 1986 | 05 | 04.31957 | 14 | 57 | 11.96 | -13 | 30 | 23.4 | | | 688 |
| 2611 | | 1986 | 05 | 04.20284 | 14 | 26 | 01.06 | -11 | 34 | 34.5 | 17.0 | | 688 |
| 2611 | | 1986 | 05 | 04.25249 | 14 | 25 | 58.44 | -11 | 34 | 26.2 | | | 688 |
| 2693 | | 1986 | 05 | 04.29705 | 15 | 11 | 01.65 | -15 | 10 | 10.8 | | | 688 |
| 2693 | | 1986 | 05 | 04.34205 | 15 | 10 | 58.46 | -15 | 10 | 05.6 | | 1 | 688 |
| 2693 | | 1986 | 05 | 13.28194 | 15 | 01 | 11.09 | -14 | 52 | 36.9 | | 1 | 688 |
| 2693 | | 1986 | 05 | 13.32361 | 15 | 01 | 08.58 | -14 | 52 | 31.0 | | 3 | 688 |
| 2725 | | 1986 | 05 | 14.29144 | 15 | 29 | 25.45 | -15 | 40 | 33.5 | | | 688 |
| 2725 | | 1986 | 05 | 14.32014 | 15 | 29 | 23.96 | -15 | 40 | 33.3 | | | 688 |
| 2742 | | 1986 | 05 | 04.29705 | 15 | 16 | 25.31 | -13 | 29 | 41.2 | | | 688 |
| 2742 | | 1986 | 05 | 04.34205 | 15 | 16 | 23.10 | -13 | 29 | 32.4 | | | 688 |
| 2742 | | 1986 | 05 | 13.28194 | 15 | 09 | 02.05 | -13 | 01 | 15.7 | | | 688 |
| 2742 | | 1986 | 05 | 13.32361 | 15 | 09 | 00.24 | -13 | 01 | 09.0 | | | 688 |
| 2974 | | 1986 | 05 | 04.25249 | 14 | 22 | 16.55 | -13 | 06 | 54.7 | | | 688 |
| 3192 | | 1986 | 05 | 04.20284 | 14 | 20 | 23.57 | -12 | 23 | 01.0 | | | 688 |
| 3192 | | 1986 | 05 | 04.25249 | 14 | 20 | 20.46 | -12 | 22 | 52.2 | | | 688 |
| 3241 | | 1986 | 05 | 04.27477 | 14 | 42 | 38.68 | -13 | 20 | 27.5 | | | 688 |
| A924 | EG | 1986 | 05 | 04.27477 | 15 | 02 | 08.85 | -15 | 14 | 50.4 | 16.8 | | 688 |
| A924 | EG | 1986 | 05 | 04.31957 | 15 | 02 | 06.15 | -15 | 14 | 40.7 | | | 688 |
| A924 | EG | 1986 | 05 | 13.28194 | 14 | 53 | 39.60 | -14 | 39 | 50.0 | 16.5 | | 688 |
| A924 | EG | 1986 | 05 | 13.32361 | 14 | 53 | 37.32 | -14 | 39 | 40.0 | | | 688 |
| 1977 | QA5 | 1986 | 05 | 04.20284 | 14 | 28 | 21.20 | -14 | 13 | 56.4 | 16.8 | | 688 |
| 1977 | QA5 | 1986 | 05 | 04.25249 | 14 | 28 | 17.96 | -14 | 13 | 46.0 | | | 688 |
| 1980 | FB | 1986 | 04 | 09.30806 | 13 | 16 | 58.13 | -07 | 41 | 09.1 | 16.8 | | 688 |
| 1980 | FB | 1986 | 04 | 09.37571 | 13 | 16 | 54.73 | -07 | 40 | 53.1 | | | 688 |
| 1980 | XW | 1986 | 05 | 04.20284 | 14 | 35 | 21.56 | -17 | 27 | 59.4 | 16.5 | | 688 |
| 1980 | XW | 1986 | 05 | 04.25249 | 14 | 35 | 18.67 | -17 | 27 | 37.3 | | | 688 |
| 1981 | NU | 1986 | 05 | 04.29705 | 15 | 18 | 55.66 | -14 | 26 | 57.7 | 15.8 | | 688 |
| 1981 | NU | 1986 | 05 | 04.34205 | 15 | 18 | 53.51 | -14 | 26 | 49.1 | | | 688 |
| 1981 | NU | 1986 | 05 | 13.28194 | 15 | 11 | 55.68 | -14 | 00 | 44.6 | 16.0 | | 688 |
| 1981 | NU | 1986 | 05 | 13.32361 | 15 | 11 | 53.72 | -14 | 00 | 37.6 | | | 688 |
| 1982 | BS1 | 1986 | 03 | 05.26703 | 11 | 09 | 59.99 | +08 | 33 | 59.7 | 16.8 | | 688 |
| 1982 | BS1 | 1986 | 03 | 05.34086 | 11 | 09 | 55.91 | +08 | 34 | 39.3 | | | 688 |
| 1982 | DN | 1986 | 05 | 04.20284 | 14 | 28 | 23.67 | -12 | 53 | 26.1 | 15.8 | | 688 |
| 1982 | DN | 1986 | 05 | 04.25249 | 14 | 28 | 21.00 | -12 | 53 | 09.7 | | | 688 |
| 1982 | DN | 1986 | 05 | 13.30278 | 14 | 20 | 59.66 | -12 | 06 | 26.7 | 16.5 | | 688 |
| 1982 | DN | 1986 | 05 | 13.34514 | 14 | 20 | 57.46 | -12 | 06 | 15.1 | | | 688 |
| 1982 | DS6 | 1986 | 05 | 13.28194 | 15 | 14 | 20.00 | -11 | 30 | 36.1 | 17.2 | | 688 |
| 1982 | KC1 | 1986 | 05 | 04.29705 | 15 | 23 | 17.85 | -16 | 05 | 57.3 | 16.2 | | 688 |
| 1982 | KC1 | 1986 | 05 | 04.34205 | 15 | 23 | 15.54 | -16 | 05 | 38.7 | | | 688 |
| 1982 | KC1 | 1986 | 05 | 13.28194 | 15 | 15 | 42.91 | -15 | 05 | 10.9 | 15.8 | | 688 |
| 1982 | KC1 | 1986 | 05 | 13.32361 | 15 | 15 | 40.77 | -15 | 04 | 54.2 | | | 688 |
| 1986 | DA | 1986 | 05 | 04.21858 | 12 | 51 | 37.03 | +05 | 37 | 19.3 | | | 688 |
| 1986 | DA | 1986 | 05 | 04.23669 | 12 | 51 | 40.20 | +05 | 36 | 27.0 | | | 688 |
| 1986 | JK | 1986 | 05 | 04.29705 | 15 | 15 | 25.59 | -14 | 18 | 04.6 | 17.2 | | 688 |
| 1986 | JK | 1986 | 05 | 04.34205 | 15 | 15 | 27.88 | -14 | 18 | 21.4 | | 1 | 688 |
| 1986 | JT * | 1986 | 05 | 04.20284 | 14 | 25 | 57.00 | -11 | 37 | 56.6 | 16.2 | 4 | 688 |
| 1986 | JT | 1986 | 05 | 04.25249 | 14 | 25 | 54.58 | -11 | 37 | 32.7 | | | 688 |
| 1986 | JT | 1986 | 05 | 13.30278 | 14 | 19 | 13.45 | -10 | 27 | 28.3 | 17.0 | | 688 |
| 1986 | JT | 1986 | 05 | 13.34514 | 14 | 19 | 11.46 | -10 | 27 | 10.9 | | | 688 |
| 1986 | JU * | 1986 | 05 | 04.27477 | 14 | 44 | 02.97 | -14 | 28 | 43.8 | 17.2 | 4 | 688 |
| 1986 | JU | 1986 | 05 | 04.31957 | 14 | 44 | 00.01 | -14 | 28 | 40.4 | | | 688 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1986 JV | * | 1986 05 04.29705 | 15 04 55.44 | -12 46 48.7 | | 16.5 | 4 | 688 |
| 1986 JV | | 1986 05 04.34205 | 15 04 52.98 | -12 46 47.2 | | | | 688 |
| 1986 JV | | 1986 05 13.28194 | 14 56 58.36 | -12 41 52.6 | | 16.2 | | 688 |
| 1986 JV | | 1986 05 13.32361 | 14 56 56.09 | -12 41 51.6 | | | | 688 |
| 1986 JW | * | 1986 05 13.28194 | 15 00 54.83 | -10 13 12.6 | | 16.8 | 4 | 688 |
| 1986 JW | | 1986 05 13.32361 | 15 00 52.47 | -10 13 10.5 | | | | 688 |
| 1986 JX | * | 1986 05 13.28194 | 15 03 22.83 | -08 47 16.6 | | 17.0 | 4 | 688 |
| 1986 JX | | 1986 05 13.32361 | 15 03 24.38 | -08 46 54.8 | | | | 688 |
| 1986 JY | * | 1986 05 13.28194 | 15 14 14.10 | -11 09 22.6 | | 17.0 | 4 | 688 |
| 1986 JY | | 1986 05 13.32361 | 15 14 11.93 | -11 09 09.1 | | | | 688 |

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

OBSERVATIONS MADE AT THE FLAGSTAFF STATION OF THE U.S. NAVAL OBSERVATORY.

Positions obtained and reduced by C. C. Dahn with the WF/PICIDT CCD camera attached to the 1.55-m astrometric reflector. Positions reduced to the AGK3 system using also plates taken with the twin 0.2-m astrograph of the U.S. Naval Observatory in Washington. Plates measured by R. S. Harrington. Contact: R. S. Harrington, U.S. Naval Observatory, Washington, DC 20390.

| Object | Date | UT | R. A. (1950) | Decl. | Obs. |
|---|---|---|---|---|---|
| 1219 | 1984 01 31.07830 | | 02 00 15.14 | +14 05 09.0 | 689 |
| 1219 | 1984 01 31.08073 | | 02 00 15.37 | +14 05 10.4 | 689 |
| 1219 | 1984 01 31.08287 | | 02 00 15.57 | +14 05 11.6 | 689 |
| 1586 | 1984 01 29.10611 | | 03 51 59.99 | +16 29 43.3 | 689 |
| 1586 | 1984 01 29.11051 | | 03 52 00.11 | +16 29 44.5 | 689 |
| 1586 | 1984 01 29.11653 | | 03 52 00.24 | +16 29 45.8 | 689 |
| 1586 | 1984 01 29.12253 | | 03 52 00.39 | +16 29 47.2 | 689 |
| 1972 | 1984 02 03.25854 | | 07 11 54.57 | +29 32 21.6 | 689 |
| 1972 | 1984 02 03.26209 | | 07 11 54.42 | +29 32 21.6 | 689 |
| 1972 | 1984 02 03.26531 | | 07 11 54.28 | +29 32 21.5 | 689 |
| 1972 | 1984 02 03.26920 | | 07 11 54.11 | +29 32 21.5 | 689 |
| 1972 | 1984 02 03.27235 | | 07 11 53.97 | +29 32 21.4 | 689 |

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

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

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | Obs. |
|---|---|---|---|---|---|---|
| 3103 | 1986 05 13.45234 | | 20 08 59.47 | +06 40 07.4 | | 691 |
| 3103 | 1986 05 13.47076 | | 20 09 01.37 | +06 40 18.8 | | 691 |
| 3103 | 1986 05 13.47389 | | 20 09 01.66 | +06 40 20.5 | | 691 |
| 1985 TB | 1986 05 13.16782 | | 10 39 16.33 | +20 47 31.1 | | 691 |
| 1985 TB | 1986 05 13.17304 | | 10 39 16.67 | +20 47 23.5 | | 691 |
| 1985 TB | 1986 05 13.19294 | | 10 39 18.02 | +20 46 50.9 | | 691 |
| 1985 TB | 1986 05 14.20385 | | 10 40 29.98 | +20 18 43.1 | 19.1V | 691 |
| 1985 TB | 1986 05 14.23444 | | 10 40 32.09 | +20 17 52.4 | | 691 |
| 1985 TB | 1986 05 14.24604 | | 10 40 32.95 | +20 17 32.4 | | 691 |
| 1985 YP | 1986 05 12.15116 | | 08 09 10.43 | +05 41 59.9 | | 691 |
| 1985 YP | 1986 05 12.15765 | | 08 09 11.00 | +05 42 00.1 | | 691 |
| 1985 YP | 1986 05 14.14987 | | 08 12 52.92 | +05 31 55.2 | 18.5V | 691 |
| 1985 YP | 1986 05 14.16071 | | 08 12 54.13 | +05 31 51.6 | | 691 |
| 1985 YP | 1986 05 14.17226 | | 08 12 55.37 | +05 31 48.1 | | 691 |
| 1986 EB | 1986 05 14.13888 | | 09 18 12.73 | -08 29 16.9 | 17.5V | 691 |
| 1986 EB | 1986 05 14.14608 | | 09 18 12.99 | -08 29 24.5 | | 691 |
| 1986 EB | 1986 05 14.16836 | | 09 18 13.75 | -08 29 47.9 | | 691 |
| 1986 GW | 1986 05 14.25530 | | 13 02 50.29 | -05 15 22.3 | 18.8V | 691 |
| 1986 GW | 1986 05 14.28396 | | 13 02 49.62 | -05 15 18.1 | | 691 |
| 1986 GW | 1986 05 14.29760 | | 13 02 49.32 | -05 15 16.5 | | 691 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 | GZ | 1986 | 05 | 14.25988 | 12 | 54 | 11.59 | +00 | 10 | 00.3 | 19.1V 691 |
| 1986 | GZ | 1986 | 05 | 14.26206 | 12 | 54 | 11.59 | +00 | 10 | 02.1 | 691 |
| 1986 | GZ | 1986 | 05 | 14.30205 | 12 | 54 | 10.47 | +00 | 10 | 25.7 | 691 |
| 1986 | JE | 1986 | 05 | 15.27456 | 14 | 43 | 21.83 | -18 | 58 | 13.6 | 691 |
| 1986 | JE | 1986 | 05 | 15.29130 | 14 | 43 | 19.89 | -18 | 58 | 26.5 | 691 |
| 1986 | JE | 1986 | 05 | 15.29566 | 14 | 43 | 19.39 | -18 | 58 | 29.1 | 691 |
| 1986 | JE | 1986 | 05 | 17.31888 | 14 | 39 | 41.04 | -19 | 24 | 16.5 | 691 |
| 1986 | JE | 1986 | 05 | 17.33749 | 14 | 39 | 38.93 | -19 | 24 | 29.6 | 691 |
| 1986 | JE | 1986 | 05 | 17.34457 | 14 | 39 | 38.16 | -19 | 24 | 35.4 | 691 |
| 1986 | JE | 1986 | 05 | 17.34985 | 14 | 39 | 37.58 | -19 | 24 | 38.0 | 691 |
| 1986 | JJ | 1986 | 05 | 17.27428 | 14 | 58 | 40.78 | -15 | 27 | 59.9 | 691 |
| 1986 | JJ | 1986 | 05 | 17.28183 | 14 | 58 | 40.31 | -15 | 27 | 51.7 | 691 |
| 1986 | JJ | 1986 | 05 | 18.20912 | 14 | 57 | 48.63 | -15 | 06 | 44.4 | 691 |
| 1986 | JJ | 1986 | 05 | 18.21657 | 14 | 57 | 48.13 | -15 | 06 | 34.1 | 691 |
| 1986 | JJ | 1986 | 05 | 18.23448 | 14 | 57 | 47.11 | -15 | 06 | 10.4 | 691 |
| 1986 | JK | 1986 | 05 | 16.35556 | 15 | 42 | 08.83 | -16 | 54 | 44.1 | 691 |
| 1986 | JK | 1986 | 05 | 16.36854 | 15 | 42 | 11.83 | -16 | 55 | 03.1 | 691 |
| 1986 | JK | 1986 | 05 | 16.37609 | 15 | 42 | 13.56 | -16 | 55 | 14.1 | 691 |
| 1986 | JK | 1986 | 05 | 17.23010 | 15 | 46 | 14.17 | -17 | 18 | 01.5 | 15.4V 691 |
| 1986 | JK | 1986 | 05 | 17.24650 | 15 | 46 | 18.58 | -17 | 18 | 30.6 | 691 |
| 1986 | JK | 1986 | 05 | 17.26057 | 15 | 46 | 22.37 | -17 | 18 | 55.2 | 691 |
| 1986 | JK | 1986 | 05 | 18.26212 | 15 | 51 | 47.26 | -17 | 49 | 49.0 | 15.2V 691 |
| 1986 | JK | 1986 | 05 | 18.27086 | 15 | 51 | 50.06 | -17 | 50 | 06.7 | 691 |
| 1986 | JK | 1986 | 05 | 18.28652 | 15 | 51 | 55.08 | -17 | 50 | 38.6 | 691 |

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. | N | Obs. |
|---|---|---|---|---|---|---|
| 585 | 1986 06 | 05.19154 | 15 19 39.46 | -07 05 38.9 | | 801 |
| 3103 | 1986 06 | 05.30031 | 20 49 55.50 | +10 12 48.1 | | 801 |
| 3103 | 1986 06 | 10.28808 | 20 59 32.28 | +10 48 56.7 | | 801 |
| 3361 | 1986 05 | 10.28437 | 16 17 15.88 | -06 57 46.8 | | 801 |
| 3416 | 1986 02 | 13.40102 | 12 22 28.00 | +22 33 10.7 | | 801 |
| 3416 | 1986 04 | 04.18798 | 11 12 43.03 | +22 41 54.2 | | 801 |
| A924 EG | 1986 04 | 12.33256 | 15 19 13.13 | -16 29 38.8 | 1 | 801 |
| A924 EG | 1986 05 | 10.24631 | 14 56 29.07 | -14 51 22.6 | | 801 |
| 1942 EB | 1986 05 | 11.13260 | 12 25 20.32 | -00 20 30.5 | | 801 |
| 1955 BG | 1986 04 | 14.36676 | 16 11 47.95 | -09 34 04.6 | | 801 |
| 1955 BG | 1986 05 | 11.26221 | 15 50 39.21 | -09 07 46.9 | | 801 |
| 1956 SC | 1986 05 | 11.11523 | 11 11 37.02 | -06 07 06.7 | | 801 |
| 1975 ES | 1986 05 | 12.12034 | 12 11 26.59 | -03 43 19.6 | 2 | 801 |
| 1977 QA5 | 1986 04 | 05.33942 | 14 55 59.10 | -15 41 36.4 | | 801 |
| 1977 QA5 | 1986 05 | 11.20137 | 14 20 56.94 | -13 48 15.3 | | 801 |
| 1978 VR9 | 1986 04 | 13.30227 | 13 56 16.29 | -09 27 31.1 | | 801 |
| 1978 VR9 | 1986 05 | 12.21158 | 13 35 41.46 | -07 42 42.9 | 3 | 801 |
| 1980 FB | 1986 05 | 10.18111 | 12 56 36.01 | -05 54 27.0 | | 801 |
| 1980 OA | 1986 05 | 11.15679 | 12 41 49.01 | -02 22 58.3 | | 801 |
| 1980 XW | 1986 04 | 12.30813 | 14 53 57.11 | -19 48 41.2 | | 801 |
| 1980 XW | 1986 05 | 10.20675 | 14 29 41.88 | -16 41 33.9 | | 801 |
| 1981 EL19 | 1986 04 | 13.25810 | 13 32 12.25 | -05 39 19.6 | | 801 |
| 1981 EL19 | 1986 05 | 11.17857 | 13 12 20.54 | -02 55 16.8 | | 801 |
| 1981 EN26 | 1986 05 | 12.27238 | 15 38 36.34 | -09 06 25.1 | 3 | 801 |
| 1981 EN26 | 1986 06 | 05.19154 | 15 20 33.89 | -07 24 57.0 | 4 | 801 |
| 1981 NU | 1986 04 | 13.32648 | 15 32 02.02 | -15 23 43.5 | | 801 |
| 1981 NU | 1986 05 | 10.26197 | 15 14 17.86 | -14 09 23.4 | | 801 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1982 BJ | 1986 05 12.32321 | 16 48 49.67 | +13 43 21.0 | | | 801 |
| 1982 BJ | 1986 06 03.20696 | 16 25 05.56 | +12 01 57.0 | | | 801 |
| 1982 BS1 | 1986 05 10.12696 | 10 51 10.61 | +12 27 44.2 | | | 801 |
| 1983 NU | 1986 04 14.25016 | 11 35 54.34 | +00 12 33.3 | | | 801 |
| 1983 QJ | 1986 04 05.29092 | 13 05 33.57 | +01 59 34.1 | | | 801 |
| 1983 QJ | 1986 05 12.16567 | 12 39 59.05 | +03 11 41.8 | | | 801 |
| 1983 SC | 1986 05 12.13854 | 12 37 51.45 | -13 10 41.5 | | | 801 |
| 1986 DA | 1986 05 10.16588 | 13 09 40.09 | +01 05 18.5 | | | 801 |
| 1986 EC2 | 1986 05 10.14807 | 11 15 15.61 | +02 57 54.8 | | | 801 |

Note 1: poor reference stars. 2: three-star solution. 3: weak image. 4: very weak image.

OBSERVATIONS MADE AT KARASUYAMA BY S. INODA.

Films with 0.31-m reflector, measured by T. Urata. Copied from Nihon-daira Obs. Circ. No. 1559. Contact: T. Urata, Nishitaka-cho 8-23, Shimizu, Shizuoka 424, Japan.

| Object | Date UT | R. A. (1950) | Decl. | Mag. | N | Obs. |
|---|---|---|---|---|---|---|
| 1852 | 1986 03 12.62134 | 11 57 12.84 | +18 03 09.9 | | | 889 |
| 1852 | 1986 03 12.64252 | 11 57 11.55 | +18 03 19.1 | | | 889 |
| 1975 AM | 1986 03 12.64252 | 11 56 24.8 | +17 43 08 | 17 | 1 | 889 |

Note 1: faint image.

* * * * *

ORBITAL ELEMENTS OF ONE-OPPOSITION MINOR PLANETS.

The orbit computers and authors of double designations are b = F. N. Bowman, G = D. W. E. Green, I = H. Oishi, M = B. G. Marsden, N = S. Nakano.

| Planet | H | Epoch | M | Peri. | Node | Incl. | e | a | Arc | O | N | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1949 QH1 | 15.0 | 490901 | 327.02 | 183.35 | 200.22 | 2.16 | 0.2000 | 2.2947 | 37 | 5 | 1 | N |
| 1952 QW | 16.0 | 520925 | 348.85 | 263.67 | 112.25 | 6.26 | 0.3047 | 2.3414 | 29 | 6 | 1 | N |
| 1975 PG | 16.5 | 750816 | 21.57 | 76.44 | 207.95 | 3.00 | 0.2064 | 2.2071 | 2 | 3 | | I |
| 1975 VN5 | 14.0 | 751104 | 23.58 | 251.92 | 124.77 | 7.13 | 0.2465 | 2.5383 | 31 | 3 | 1 | I |
| 1975 XH | 14.3 | 751214 | 308.04 | 41.54 | 93.50 | 11.10 | 0.2089 | 2.4294 | 4 | 3 | | I |
| 1976 GP3 | 13.5 | 760502 | 315.73 | 96.14 | 167.81 | 7.02 | 0.0976 | 2.3178 | 32 | 4 | 1 | I |
| 1976 QU | 14.0 | 760830 | 28.81 | 305.38 | 340.95 | 8.15 | 0.2576 | 2.7125 | 3 | 3 | | I |
| 1976 WD | 12.9 | 761208 | 103.58 | 76.26 | 260.78 | 8.60 | 0.0664 | 2.2605 | 61 | 4 | 1 | I |
| 1977 CK | 14.5 | 770206 | 36.66 | 281.12 | 154.64 | 3.14 | 0.2737 | 2.1674 | 3 | 3 | 2 | M |
| 1977 CL | 15.0 | 770206 | 20.72 | 323.09 | 136.03 | 7.00 | 0.2863 | 2.1631 | 3 | 3 | 2 | M |
| 1977 CO | 17.5 | 770206 | 342.45 | 218.36 | 316.67 | 0.66 | 0.3538 | 2.1824 | 3 | 3 | 2 | M |
| 1977 CP | 15.0 | 770206 | 34.88 | 34.05 | 45.42 | 0.89 | 0.2652 | 2.1772 | 3 | 3 | 2 | M |
| 1977 CQ | 14.5 | 770206 | 23.76 | 344.92 | 109.50 | 1.53 | 0.2921 | 2.4932 | 3 | 3 | | M |
| 1977 CR | 18.5 | 770206 | 349.96 | 342.41 | 176.30 | 1.69 | 0.3267 | 2.1735 | 3 | 3 | 2 | M |
| 1977 CS | 19.5 | 770206 | 356.01 | 204.48 | 302.00 | 1.16 | 0.3319 | 2.2735 | 3 | 3 | 2 | M |
| 1977 CT | 14.0 | 770206 | 78.83 | 71.67 | 322.22 | 20.05 | 0.2299 | 2.1764 | 3 | 3 | 2 | M |
| 1977 CU | 14.5 | 770206 | 24.47 | 112.56 | 343.96 | 2.32 | 0.2640 | 2.2070 | 3 | 3 | 2 | M |
| 1977 CV | 20.0 | 770206 | 356.86 | 331.69 | 173.43 | 0.65 | 0.3247 | 2.2104 | 3 | 3 | 2 | M |
| 1977 CW | 16.0 | 770206 | 24.10 | 323.02 | 134.29 | 8.18 | 0.2688 | 2.1687 | 3 | 3 | 2 | M |
| 1977 DG | 13.3 | 770226 | 275.54 | 238.31 | 14.91 | 4.36 | 0.1062 | 2.2076 | 57 | 3 | 1 | I |
| 1977 DO | 11.5 | 770206 | 94.26 | 230.73 | 146.28 | 29.49 | 0.3199 | 2.8094 | 6 | 6 | | M |
| 1977 DS | 13.0 | 770206 | 344.20 | 197.51 | 328.67 | 9.92 | 0.1697 | 2.9379 | 6 | 6 | | M |
| 1977 DU | 13.0 | 770206 | 23.44 | 138.46 | 339.51 | 7.18 | 0.0424 | 2.5088 | 6 | 6 | | M |
| 1977 DX | 12.0 | 770206 | 253.00 | 149.92 | 132.75 | 5.57 | 0.3321 | 2.4480 | 6 | 6 | | M |
| 1977 DB1 | 13.5 | 770206 | 43.47 | 305.16 | 140.44 | 3.90 | 0.1619 | 2.5304 | 6 | 6 | 2 | M |
| 1977 DD1 | 13.0 | 770206 | 124.39 | 221.50 | 142.96 | 7.83 | 0.1924 | 2.2132 | 6 | 6 | | M |
| 1977 QA1 | 13.0 | 770825 | 59.76 | 271.16 | 356.75 | 1.21 | 0.1838 | 2.2272 | 50 | 6 | 1 | I |
| 1977 QK1 | 14.1 | 770914 | 349.79 | 24.56 | 344.92 | 1.90 | 0.2342 | 2.3676 | 50 | 5 | 1 | I |
| 1985 QD2 | 14.0 | 850803 | 345.51 | 92.03 | 251.17 | 6.74 | 0.2326 | 2.4657 | 7 | 6 | | M |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 QF2 | 12.5 | 850803 | 203.65 | 287.73 | 197.51 | 11.86 | 0.1382 | 2.9257 | 7 | 6 | | M |
| 1985 RM1 | 13.5 | 850912 | 309.46 | 118.82 | 305.01 | 11.82 | 0.1953 | 2.4336 | 9 | 6 | 1 | N |
| 1985 SP | 11.5 | 851002 | 71.54 | 79.08 | 195.60 | 13.19 | 0.1333 | 3.0647 | 27 | 6 | | G |
| 1985 UL | 13.0 | 851022 | 201.68 | 298.60 | 249.22 | 3.80 | 0.0350 | 2.2101 | 17 | 6 | 1 | N |
| 1985 XR | | 851201 | 48.63 | 246.20 | 123.48 | 3.58 | 0.1498 | 2.6485 | 6 | 4 | | G |
| 1985 XS | | 851201 | 104.17 | 137.14 | 164.51 | 2.60 | 0.2850 | 2.8695 | 6 | 4 | 2 | M |
| 1986 CH | 12.0 | 860130 | 320.52 | 273.57 | 268.98 | 8.93 | 0.0553 | 2.9940 | 59 | 0 | 1 | M |
| 1986 GN | 13.0 | 860331 | 79.86 | 300.67 | 141.94 | 15.80 | 0.2811 | 2.2920 | 31 | 7 | | M |
| 1986 GU | 13.0 | 860420 | 45.91 | 58.57 | 81.17 | 31.32 | 0.2696 | 2.6392 | 35 | 5 | | M |
| 1986 JE | 18.0 | 860510 | 346.33 | 195.86 | 46.15 | 22.69 | 0.0279 | 1.8920 | 8 | 0 | | M |
| 1986 JJ | 18.0 | 860510 | 43.01 | 311.74 | 229.81 | 19.58 | 0.0513 | 1.8875 | 8 | 0 | | M |
| 1986 JL | 15.0 | 860420 | 86.70 | 45.09 | 67.54 | 26.29 | 0.1099 | 1.9832 | 11 | 0 | | M |
| 1986 JQ | 14.0 | 860510 | 311.86 | 71.65 | 219.53 | 20.67 | 0.0719 | 1.9400 | 26 | 8 | | M |
| 1986 JT | 13.5 | 860420 | 290.62 | 83.67 | 211.43 | 11.66 | 0.0795 | 2.8629 | 10 | 6 | | M |
| 1986 JZ | 13.5 | 860420 | 350.83 | 171.46 | 80.74 | 24.79 | 0.2316 | 2.3930 | 6 | 4 | | M |
| 1986 JA1 | 14.0 | 860420 | 298.40 | 99.58 | 228.59 | 23.16 | 0.2304 | 1.9523 | 6 | 4 | | M |

Note 1: double designations 1949 QH1 = 1949 SN (N); 1952 QW = 1952 SL (N); 1975 VN5 = 1975 XB4 (I, JAM 2004); 1976 GP3 = 1976 HD1 = 1976 JO (I, JAM 2005); 1976 WD = 1976 YV3 = 1977 AT (I, JAM 1999); 1977 DG = 1977 GB (I, JAM 2000); 1977 QA1 = 1977 TK8 (I, JAM 2000); 1977 QK1 = 1977 RW2 = 1977 TQ2 (I, JAM 2000); 1985 RM1 = 1985 SL (N); 1985 UL = 1985 VG1 (N); 1986 CH = 1986 AV2 (b). 2: e assumed.

* * * * *

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

The identifications are by D. W. E. Green unless otherwise stated. The 1977-1978 observations of the 1981 UCAS objects were found by S. J. Bus.

Periodic Comet Ciffreo (1985p)
Epoch 1985 Oct. 22.0 ET = JDE 2446360.5
T 1985 Oct. 30.11032 ET

| | | | | | |
|---|---|---|---|---|---|
| q | 1.70209753 | | (1950.0) | P | Q |
| n | 0.13663360 | Peri. | 357.90265 | +0.62852522 | -0.75637188 |
| a | 3.7333415 | Node | 53.09981 | +0.71683267 | +0.47287396 |
| e | 0.5440820 | Incl. | 13.10130 | +0.30183931 | +0.45198650 |
| P | 7.21 | | | | |

From 54 observations 1985 Nov. 8-1986 Mar. 15, mean residual 0".9.

Periodic Comet Shoemaker 3 (1986a)
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5
T 1985 Dec. 18.57752 ET

| | | | | | |
|---|---|---|---|---|---|
| q | 1.79402238 | | (1950.0) | P | Q |
| n | 0.05828185 | Peri. | 14.82070 | -0.36418213 | -0.92470547 |
| a | 6.5884084 | Node | 96.63426 | +0.84267341 | -0.37786165 |
| e | 0.7277002 | Incl. | 6.40830 | +0.39657648 | -0.04626407 |
| P | 16.91 | | | | |

From 61 observations 1986 Jan. 10-May 14, mean residual 0".8.

(203) Pompeja
Epoch 1986 June 19.0 ET = JDE 2446600.5
M 171.49379

| | | | | | |
|---|---|---|---|---|---|
| | | | (1950.0) | P | Q |
| n | 0.21768338 | Peri. | 58.87271 | +0.68657193 | -0.72696653 |
| a | 2.7368597 | Node | 347.74588 | +0.64671354 | +0.61801867 |
| e | 0.0601024 | Incl. | 3.18028 | +0.33223573 | +0.29928680 |
| P | 4.53 | H | 9.1 | G 0.25 | |

From 41 observations at 15 oppositions 1951-1983, mean residual 1".5.

(280) Philia
Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | |
|---|---|---|---|---|
| M | 67.23606 | (1950.0) | P | Q |
| n | 0.19521197 | Peri. 88.03031 | -0.13712897 | -0.99030058 |
| a | 2.9430553 | Node 9.93563 | +0.84940756 | -0.12917756 |
| e | 0.1098232 | Incl. 7.44928 | +0.50961009 | -0.05116559 |
| P | 5.05 | H 10.9 | G 0.25 | |

From 77 observations at 15 oppositions 1918-1986, mean residual 1".1.

(288) Glauke
Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | |
|---|---|---|---|---|
| M | 330.39186 | (1950.0) | P | Q |
| n | 0.21530986 | Peri. 83.52512 | -0.91372947 | +0.40104002 |
| a | 2.7569365 | Node 120.10068 | -0.39621343 | -0.84377859 |
| e | 0.2096104 | Incl. 4.32937 | -0.09007429 | -0.35665753 |
| P | 4.58 | H 10.1 | G 0.25 | |

From 82 observations at 27 oppositions 1908-1986, mean residual 1".4.

(385) Ilmatar
Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | |
|---|---|---|---|---|
| M | 72.71551 | (1950.0) | P | Q |
| n | 0.20517053 | Peri. 187.49686 | -0.99049176 | -0.12344585 |
| a | 2.8470345 | Node 344.99846 | +0.13522847 | -0.79251989 |
| e | 0.1257634 | Incl. 13.56742 | +0.02528518 | -0.59722136 |
| P | 4.80 | H 7.8 | G 0.25 | |

From 83 observations at 28 oppositions 1906-1985, mean residual 1".3.

(437) Rhodia
Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | |
|---|---|---|---|---|
| M | 294.09327 | (1950.0) | P | Q |
| n | 0.26762895 | Peri. 60.74723 | +0.80073893 | +0.58532947 |
| a | 2.3847745 | Node 263.14299 | -0.58439932 | +0.71669906 |
| e | 0.2495014 | Incl. 7.36687 | -0.13150893 | +0.37911987 |
| P | 3.68 | H 10.6 | G 0.25 | |

From 31 observations at 19 oppositions 1906-1980, mean residual 1".9.

(781) Kartvelia
Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | |
|---|---|---|---|---|
| M | 347.75897 | (1950.0) | P | Q |
| n | 0.16984048 | Peri. 157.89802 | +0.45615269 | +0.86271278 |
| a | 3.2293014 | Node 138.35132 | -0.85769104 | +0.49160904 |
| e | 0.0962407 | Incl. 19.17626 | -0.23725684 | -0.11852097 |
| P | 5.80 | H 9.6 | G 0.25 | |

From 40 observations at 19 oppositions 1926-1985, mean residual 1".2.

(1220) Crocus
Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | |
|---|---|---|---|---|
| M | 212.56992 | (1950.0) | P | Q |
| n | 0.18942342 | Peri. 328.45747 | +0.13321593 | -0.97442623 |
| a | 3.0027114 | Node 113.34205 | +0.94534975 | +0.07010450 |
| e | 0.0745449 | Incl. 11.36698 | +0.29760269 | +0.21349212 |
| P | 5.20 | H 11.2 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 320211 | 024 | 1.6- | 0.3+ | | 550810 | 839 | 0.2+ | 0.2- | | 750518 | 801 | 1.7- | 0.0 |
| 320301 | 024 | 0.8+ | 1.9+ | | 740214 | 801 | 1.6- | 0.7+ | | 750610 | 801 | 1.3- | 0.1+ |
| 320310 | 024 | 0.1+ | 0.5- | | 740215 | 801 | 0.9+ | 2.1+ | | 760821 | 809 | 0.7- | 0.4+ |
| 320325 | 024 | 3.3- | 0.8+ | | 740216 | 801 | 1.9- | 1.1+ | | 760821 | 809 | 0.5- | 0.1+ |
| 370108 | 020 | 1.7+ | 2.2- | | 740313 | 801 | (11.6- | 6.6+) | | 800517 | 095 | 3.3+ | 5.4- |
| 370111 | 012 | 2.8+ | 3.3- | | 740515 | 801 | 1.5+ | 0.9+ | | 821021 | 688 | 0.4- | 0.2+ |
| 380505 | 024 | (92.4+ | 53.4-)X | | 750509 | 801 | 0.8+ | 0.4+ | | 821021 | 688 | 0.7+ | 0.4- |

(1481) Tubingia

Epoch 1986 June 19.0 ET = JDE 2446600.5

| M | 291.69977 | | (1950.0) | | P | | Q |
|---|---|---|---|---|---|---|---|
| n | 0.18811964 | Peri. | 319.78165 | | +0.69056973 | | +0.72323615 |
| a | 3.0165692 | Node | 353.88327 | | -0.64675434 | | +0.61343694 |
| e | 0.0412609 | Incl. | 3.52501 | | -0.32376268 | | +0.31721380 |
| P | 5.24 | H | 10.8 | G | 0.25 | | |

From 74 observations at 18 oppositions 1933-1985, mean residual 1".2.

(1593) Fagnes

Epoch 1986 June 19.0 ET = JDE 2446600.5

| M | 169.30780 | | (1950.0) | | P | | Q |
|---|---|---|---|---|---|---|---|
| n | 0.29690288 | Peri. | 184.77535 | | +0.56420422 | | +0.81179128 |
| a | 2.2253233 | Node | 119.64766 | | -0.75161445 | | +0.58047718 |
| e | 0.2805995 | Incl. | 9.97629 | | -0.34168599 | | +0.06357016 |
| P | 3.32 | H | 13.6 | G | 0.25 | | |

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

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 510601 | 012 | 0.6- | 2.6+ | | 521222 | 711 | 1.6- | 1.2+ | | 710628 | 323 | 0.5+ | 0.6+ |
| 510602 | 711 | 1.4+ | 0.1- | Y | 530110 | 662 | 0.0 | 0.8- | | 710628 | 323 | 0.6- | 3.7+ |
| 510603 | 012 | 3.4- | 4.5- | | 530110 | 662 | 0.6+ | 1.0- | | 710629 | 095 | 2.1- | 0.7- |
| 510605 | 012 | 1.3- | 1.1+ | | 581009 | 760 | (0.20+ | 0.13+) | | 710718 | 095 | 2.0- | 2.0- |
| 510607 | 012 | 1.2- | 1.0- | | 581013 | 760 | 0.2+ | 0.0 | | 710728 | 095 | 0.7+ | 2.5- |
| 510610 | 012 | 0.2+ | 0.9- | | 581013 | 760 | 0.6+ | 0.4- | | 710729 | 073 | (0.14+ | 0.09-) |
| 510707 | 760 | 1.5+ | 2.4- | | 581113 | 760 | (5.9- | 9.1+) | | 710729 | 073 | (0.14+ | 0.09-) |
| 510707 | 760 | 2.9+ | 0.7- | | 581113 | 760 | 1.3- | 0.1- | | 710822 | 323 | 1.2- | 0.6- |
| 510824 | 662 | 0.8+ | 0.6+ | | 610616 | 760 | (5.9+ | 6.9+) | | 710822 | 323 | 0.1- | 1.4- |
| 510824 | 662 | 0.2- | 0.7+ | | 610616 | 760 | 2.6+ | 3.1+ | | 810726 | 688 | 0.6+ | 1.2+ |
| 521222 | 711 | 1.6+ | 0.9- | | 610617 | 012 | (5.6+ | 6.3+) | | 810726 | 688 | 1.3+ | 1.0+ |

1981 DZ

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

| M | 59.24810 | | (1950.0) | | P | | Q |
|---|---|---|---|---|---|---|---|
| n | 0.22500481 | Peri. | 315.74024 | | -0.95003954 | | +0.28096341 |
| a | 2.6771685 | Node | 241.03244 | | -0.22536470 | | -0.91882261 |
| e | 0.0888077 | Incl. | 8.93992 | | -0.21595282 | | -0.27717245 |
| P | 4.38 | H | 14.0 | G | 0.25 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 770518 | 675 | 1.5+ | 1.1- | | 810306 | 413 | 1.0+ | 1.7- | | 810408 | 413 | 0.7- | 0.9+ |
| 770519 | 675 | 1.6- | 0.9+ | | 810308 | 413 | 0.0 | 0.1+ | | 810408 | 413 | 1.3+ | 0.6- |
| 810209 | 413 | 0.6- | 0.5+ | | 810308 | 413 | 1.2+ | 0.9- | | 810409 | 413 | 0.7- | 0.8+ |
| 810209 | 413 | 0.7+ | 0.5+ | | 810312 | 413 | 0.3- | 0.3- | | 810409 | 413 | 1.0+ | 0.4- |
| 810228 | 413 | 1.1- | 0.4+ | | 810312 | 413 | 0.8+ | 0.7- | | 810501 | 413 | 0.7- | 0.1- |
| 810228 | 413 | 0.6+ | 0.4- | | 810407 | 413 | 0.1+ | 0.9+ | | 810503 | 413 | 0.7- | 0.0 |
| 810306 | 413 | 0.7- | 0.5+ | | 810407 | 413 | 1.0- | 0.2- | | | | | |

1981 EE1 = 1977 DC
The identification was suggested by W. Landgraf.
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 143.65308 | | (1950.0) | P | Q |
| n | 0.25681245 | Peri. | 16.58756 | -0.94764403 | -0.31796560 |
| a | 2.4512797 | Node | 144.82880 | +0.28684533 | -0.88817098 |
| e | 0.1308721 | Incl. | 2.93294 | +0.14032303 | -0.33173813 |
| P | 3.84 | H | 14.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 770213 | 675 | 0.4+ | 0.5- | 810306 | 809 | 1.3+ | 0.6+ | 810309 | 809 | 0.8+ | 0.5- |
| 770214 | 675 | 0.2- | 1.2- | 810306 | 809 | 1.5+ | 0.6+ | 810310 | 809 | 0.1+ | 0.4- |
| 770216 | 801 | 0.4- | 1.2+ | 810307 | 809 | 1.8- | 0.1- | 810310 | 809 | 0.6+ | 0.7- |
| 810202 | 413 | 0.2- | 1.1- | 810307 | 809 | 0.7- | 1.0- | 810310 | 809 | 0.9+ | 1.1- |
| 810213 | 413 | 0.0 | 0.3- | 810307 | 809 | 0.0 | 1.8- | 810311 | 413 | 0.7- | 1.3+ |
| 810302 | 413 | 1.8- | 1.7+ | 810307 | 413 | 0.7- | 1.2+ | 810311 | 413 | 0.4+ | 0.8+ |
| 810302 | 413 | 0.0 | 0.2+ | 810307 | 413 | 0.4+ | 0.6+ | 810316 | 809 | 0.2+ | 0.2+ |
| 810303 | 413 | 1.2- | 0.9+ | 810308 | 809 | 0.5- | 0.3- | 810316 | 809 | 0.4+ | 0.1+ |
| 810303 | 413 | 0.0 | 0.6+ | 810308 | 809 | 0.0 | 0.4- | 810316 | 809 | 0.7+ | 0.2+ |
| 810305 | 809 | 0.2- | 0.1+ | 810308 | 809 | 0.4+ | 0.5- | 810317 | 809 | 0.5- | 1.1+ |
| 810305 | 809 | 0.0 | 0.6+ | 810309 | 809 | 0.1+ | 0.6- | 810317 | 809 | 0.2- | 0.1+ |
| 810305 | 809 | 0.1- | 0.6+ | 810309 | 809 | 0.3+ | 0.6- | 810426 | 413 | 0.2- | 1.0- |
| 810306 | 809 | 0.9+ | 0.5+ | 810309 | 809 | 0.4+ | 0.7- | 810502 | 413 | 0.5- | 0.8- |

1981 EX3
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 113.72484 | | (1950.0) | P | Q |
| n | 0.21657878 | Peri. | 236.54229 | -0.33641970 | -0.93516711 |
| a | 2.7461630 | Node | 233.50676 | +0.90325757 | -0.28714992 |
| e | 0.0970039 | Incl. | 7.92439 | +0.26635981 | -0.20738227 |
| P | 4.55 | H | 14.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 770518 | 675 | 0.2+ | 0.4- | 810307 | 413 | 0.9- | 2.0+ | 810408 | 413 | 0.8- | 0.3- |
| 770519 | 675 | 0.2- | 0.0 | 810307 | 413 | 0.8+ | 0.3- | 810408 | 413 | 1.4+ | 1.7- |
| 810202 | 413 | 1.0- | 0.9- | 810310 | 413 | 1.4- | 2.3+ | 810409 | 413 | 0.2- | 0.7- |
| 810214 | 413 | 0.0 | 2.3- | 810310 | 413 | 1.8+ | 0.2- | 810409 | 413 | 0.0 | 0.8- |
| 810302 | 413 | (5.0- | 1.7+) | 810312 | 413 | 0.6- | 1.6+ | 810429 | 413 | 0.1+ | 1.5+ |
| 810302 | 413 | 1.1+ | 0.1- | 810312 | 413 | 0.4- | 0.3- | 810503 | 413 | 0.1+ | 0.4- |

1981 EA9
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 349.03433 | | (1950.0) | P | Q |
| n | 0.27380873 | Peri. | 21.37330 | +0.99288040 | +0.10546615 |
| a | 2.3487604 | Node | 332.39454 | -0.11904277 | +0.86232097 |
| e | 0.2422649 | Incl. | 6.86227 | -0.00416390 | +0.49525695 |
| P | 3.60 | H | 15.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 770213 | 675 | 0.2+ | 0.3- | 810301 | 413 | 1.7+ | 0.3- | 810412 | 413 | 0.2- | 0.6- |
| 770214 | 675 | 0.5- | 0.2- | 810307 | 413 | 1.1+ | 0.7+ | 810412 | 413 | 2.5+ | 1.4- |
| 810209 | 413 | 3.3+ | 0.1+ | 810311 | 413 | 2.0- | 1.1+ | 810430 | 413 | 0.7- | 0.0 |
| 810213 | 413 | 2.5- | 0.4+ | 810315 | 413 | 1.2- | 0.2- | 810502 | 413 | 1.3- | 0.1+ |
| 810301 | 413 | 1.7- | 1.1+ | 810315 | 413 | 1.2+ | 0.6- | | | | |

1981 EP10
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 88.45853 | | (1950.0) | P | Q |
| n | 0.26452090 | Peri. | 297.50317 | -0.36821485 | +0.92648230 |
| a | 2.4034232 | Node | 310.67258 | -0.81269934 | -0.36136349 |
| e | 0.0990895 | Incl. | 5.88547 | -0.45159451 | -0.10510463 |
| P | 3.73 | H | 16.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 770211 | 675 | 2.2- 0.6+ | 810307 | 413 | 0.8- 0.7+ | 810407 | 413 | (3.4+ 1.5-) |
| 770212 | 675 | 0.3- 0.4+ | 810311 | 413 | 0.9- 0.5+ | 810409 | 413 | 0.2- 0.1+ |
| 770214 | 675 | 2.4+ 0.9- | 810311 | 413 | 1.8+ 0.3- | 810409 | 413 | 2.0+ 0.0 |
| 810212 | 413 | 0.4+ 0.7- | 810315 | 413 | 0.4+ 0.7- | 810412 | 413 | 0.3- 0.5- |
| 810214 | 413 | 0.0 0.6- | 810315 | 413 | 0.5+ 0.2+ | 810412 | 413 | 0.6+ 0.7- |
| 810301 | 413 | 1.7- 1.6+ | 810405 | 413 | 1.4- 0.1+ | 810429 | 413 | 0.1- 1.3+ |
| 810301 | 413 | 0.6+ 0.5+ | 810406 | 413 | 1.4- 0.6- | | | |
| 810307 | 413 | (6.1+ 1.0-) | 810406 | 413 | 0.6+ 1.0- | | | |

1981 EQ12
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 14.19870 | (1950.0) | P | Q | |
| n | 0.26667436 | Peri. 94.50431 | +0.89770518 | +0.42966878 | |
| a | 2.3904669 | Node 240.07657 | -0.43553126 | +0.83190951 | |
| e | 0.2680187 | Incl. 6.46058 | -0.06661776 | +0.35115711 | |
| P | 3.70 | H 15.0 | G 0.25 | | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 780610 | 675 | 0.2+ 0.2+ | 810301 | 413 | (4.1+ 0.8-) | 810312 | 413 | 0.8+ 0.3- |
| 780611 | 675 | 0.2- 0.1+ | 810306 | 413 | 0.7- 1.4+ | 810409 | 413 | 2.3- 1.3+ |
| 810209 | 413 | 1.4- 0.3+ | 810306 | 413 | (4.7+ 1.5-) | 810409 | 413 | 0.7+ 0.7- |
| 810212 | 413 | 1.8+ 0.1- | 810308 | 413 | 1.3- 0.8+ | 810503 | 413 | 0.3+ 2.1- |
| 810214 | 413 | 0.2+ 0.9- | 810308 | 413 | 0.9+ 0.2- | 810503 | 413 | 0.4+ 0.8+ |
| 810301 | 413 | 0.7+ 0.4- | 810312 | 413 | (3.0- 2.5+) | | | |

1981 ER14
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 70.02482 | (1950.0) | P | Q | |
| n | 0.27545578 | Peri. 339.23433 | +0.56148516 | +0.82245964 | |
| a | 2.3393883 | Node 324.74692 | -0.73517105 | +0.44529657 | |
| e | 0.2224542 | Incl. 9.07862 | -0.37981305 | +0.35393659 | |
| P | 3.58 | H 14.0 | G 0.25 | | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 770213 | 675 | 0.5+ 0.0 | 810308 | 413 | 0.7+ 0.2+ | 810407 | 413 | 2.2+ 0.4- |
| 770214 | 675 | 0.5- 0.1- | 810308 | 413 | 1.2- 0.0 | 810408 | 413 | 0.9- 0.9+ |
| 810209 | 413 | 0.7- 0.4- | 810308 | 413 | 1.2+ 0.1+ | 810408 | 413 | 1.0+ 0.1+ |
| 810212 | 413 | 1.2+ 0.1+ | 810312 | 413 | 1.3- 0.4+ | 810409 | 413 | 1.7- 0.6+ |
| 810301 | 413 | 0.3+ 0.1+ | 810312 | 413 | 0.9+ 0.3- | 810409 | 413 | 0.1+ 0.2+ |
| 810306 | 413 | 0.4- 0.3- | 810312 | 413 | 1.3- 0.2+ | 810502 | 413 | 0.3+ 1.0- |
| 810306 | 413 | 2.4+ 1.3- | 810312 | 413 | 1.3+ 0.1+ | 810503 | 413 | 0.3+ 0.5- |
| 810308 | 413 | 2.0- 0.7+ | 810407 | 413 | 2.2- 0.6+ | | | |

1981 EO15 = 1974 SM4 = 1979 YG5

The identification 1981 EO15 = 1974 SM4 was suggested by L. D. Schmadel.

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

| | | | | | |
|---|---|---|---|---|---|
| M | 180.79313 | (1950.0) | P | Q | |
| n | 0.21820235 | Peri. 193.76163 | +0.58623378 | -0.80649711 | |
| a | 2.7325238 | Node 220.42484 | +0.75400932 | +0.57781573 | |
| e | 0.0707153 | Incl. 6.79845 | +0.29631048 | +0.12526528 | |
| P | 4.52 | H 14.0 | G 0.25 | | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 740925 | 095 | 0.8+ 1.9- | 810306 | 413 | 0.8- 1.0+ | 810408 | 413 | 0.7- 0.4+ |
| 770518 | 675 | 0.9+ 1.0- | 810306 | 413 | 1.8+ 0.6- | 810408 | 413 | 0.9+ 0.6- |
| 770519 | 675 | 1.6- 0.3+ | 810308 | 413 | 0.3- 0.2+ | 810409 | 413 | 0.2- 0.3+ |
| 791218 | 095 | 0.4- 0.2- | 810308 | 413 | 0.3+ 0.5+ | 810409 | 413 | 2.4+ 0.5- |
| 810209 | 413 | 1.3- 0.8- | 810312 | 413 | 0.0 0.2- | 810501 | 413 | 0.3- 2.4- |
| 810212 | 413 | 1.6- 0.1- | 810406 | 413 | 1.1- 0.9+ | | | |
| 810301 | 413 | 0.2+ 0.5- | 810406 | 413 | 0.3+ 0.3+ | | | |

1981 EN16
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | |
|---|---|---|---|---|
| M 135.47668 | | (1950.0) | P | Q |
| n 0.26096878 | Peri. | 222.82774 | -0.98743291 | +0.13873803 |
| a 2.4251831 | Node | 324.93469 | -0.08383391 | -0.86578908 |
| e 0.1493354 | Incl. | 7.56992 | -0.13397061 | -0.48079209 |
| P 3.78 | H | 16.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 770211 675 | 0.2+ | 0.6- | 810306 413 | 1.1- | 0.8+ | 810408 413 | 1.3- | 0.2+ |
| 770212 675 | 1.2- | 0.1+ | 810306 413 | 1.5+ | 0.5- | 810408 413 | 0.1- | 1.1- |
| 770214 675 | 0.8+ | 0.2- | 810308 413 | 1.5- | 0.4+ | 810409 413 | 0.0 | 0.9+ |
| 810212 413 | 1.2+ | 0.6+ | 810312 413 | 1.4- | 0.4+ | 810409 413 | 1.6+ | 0.1+ |
| 810214 413 | (3.8+ | 3.0+) | 810312 413 | 1.3+ | 0.6- | 810503 413 | 0.2- | 0.6- |

1981 EV17
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | |
|---|---|---|---|---|
| M 83.02637 | | (1950.0) | P | Q |
| n 0.26468180 | Peri. | 22.36436 | -0.24281702 | +0.96974484 |
| a 2.4024491 | Node | 233.59164 | -0.89465251 | -0.23390423 |
| e 0.1495487 | Incl. | 1.79404 | -0.37501571 | -0.06988385 |
| P 3.72 | H | 16.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 770211 675 | 0.6- | 0.2+ | 810303 413 | 0.4+ | 0.5- | 810411 413 | 0.6- | 0.2- |
| 770212 675 | 0.7+ | 0.4+ | 810307 413 | 0.6- | 0.1+ | 810411 413 | 1.4+ | 0.6- |
| 810302 413 | 2.5- | 1.7+ | 810307 413 | 2.1+ | 1.1- | 810430 413 | 0.3- | 1.8+ |
| 810302 413 | 0.8- | 0.3+ | 810311 413 | 0.8+ | 1.6- | | | |

1981 EQ19 = 1979 WZ5
The identification was suggested by K. Hurukawa (JAM 1901) and by L. D. Schmadel.
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | |
|---|---|---|---|---|
| M 302.52650 | | (1950.0) | P | Q |
| n 0.26818530 | Peri. | 184.25069 | +0.95140000 | -0.30774695 |
| a 2.3814800 | Node | 193.68930 | +0.28393292 | +0.89090497 |
| e 0.1841351 | Incl. | 2.75984 | +0.11924818 | +0.33403615 |
| P 3.68 | H | 14.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 770213 675 | 0.7- | 0.9+ | 810303 413 | 1.8- | 0.8+ | 810408 413 | 1.7- | 0.3+ |
| 770214 675 | 1.4+ | 1.1+ | 810307 413 | 1.1- | 0.6+ | 810408 413 | 2.2+ | 1.9- |
| 791117 095 | 0.5+ | 1.4- | 810307 413 | 1.4+ | 0.6- | 810411 413 | 3.1- | 1.0+ |
| 810209 413 | 1.7- | 0.4- | 810311 413 | 1.7- | 0.4+ | 810411 413 | 2.0+ | 1.8- |
| 810213 413 | 0.3+ | 0.0 | 810311 413 | 0.3+ | 0.7- | 810430 413 | 0.5- | 0.5- |
| 810302 413 | 1.0- | 1.4+ | 810316 413 | 2.8+ | 0.5+ | 810502 413 | 0.8+ | 1.1- |
| 810302 413 | 2.6+ | 1.2- | 810329 413 | 1.9- | 0.4- | 810503 413 | 1.0+ | 0.3+ |

1981 ET19
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | |
|---|---|---|---|---|
| M 84.71821 | | (1950.0) | P | Q |
| n 0.26334909 | Peri. | 115.62824 | -0.32832596 | +0.94427153 |
| a 2.4105476 | Node | 135.18309 | -0.87811093 | -0.29595649 |
| e 0.1416112 | Incl. | 1.91253 | -0.34802768 | -0.14408689 |
| P 3.74 | H | 16.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 770211 675 | 0.9- | 1.6+ | 810303 413 | 0.3- | 0.8- | 810329 413 | (5.6+ | 1.1-) |
| 770212 675 | 1.2+ | 0.5- | 810307 413 | 0.3- | 0.6+ | 810502 413 | 0.1- | 0.1+ |
| 770214 675 | (7.9+ | 2.5-) | 810311 413 | 1.1- | 0.4- | 810503 413 | 0.1- | 0.6+ |
| 810213 413 | 0.1+ | 2.2- | 810316 413 | (6.1+ | 2.6-) | | | |
| 810302 413 | (4.7+ | 3.7-) | 810329 413 | 1.4+ | 1.3+ | | | |

1981 EO21 = 1977 DB6 = 1979 SF8
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 265.36745 | (1950.0) | | P | Q |
| n | 0.26492764 | Peri. | 84.26789 | +0.75998460 | -0.64964709 |
| a | 2.4009626 | Node | 316.24503 | +0.58453214 | +0.69634054 |
| e | 0.2118814 | Incl. | 1.61961 | +0.28415767 | +0.30507132 |
| P | 3.72 | H | 16.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 770213 | 675 | 2.1+ 0.8- | 810213 | 413 | 0.6- 0.2- | 810311 | 413 | 0.0 1.1- |
| 770214 | 675 | 0.4- 0.5+ | 810302 | 413 | 1.9- 0.4- | 810311 | 413 | 3.0+ 0.8- |
| 770219 | 381 | 0.7- 0.5+ | 810302 | 413 | 1.1- 1.5+ | 810329 | 413 | 1.4- 0.7+ |
| 770219 | 381 | 1.0- 0.3- | 810303 | 413 | 0.5+ 0.6+ | 810430 | 413 | 1.6+ 0.8- |
| 790924 | 095 | 0.1- 0.2+ | 810307 | 413 | 0.7+ 0.1- | 810502 | 413 | 0.7- 1.0+ |

1981 EO22
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 108.77497 | (1950.0) | | P | Q |
| n | 0.26197297 | Peri. | 303.49971 | -0.74793829 | +0.66360782 |
| a | 2.4189817 | Node | 278.08045 | -0.60397050 | -0.68951325 |
| e | 0.1352646 | Incl. | 0.84458 | -0.27533243 | -0.29016572 |
| P | 3.76 | H | 17.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 770211 | 675 | 0.6- 0.9+ | 810302 | 413 | 0.3- 0.1+ | 810329 | 413 | 0.3- 1.5+ |
| 770212 | 675 | 1.9+ 0.1- | 810303 | 413 | 1.6- 0.6+ | 810329 | 413 | 1.1+ 1.7+ |
| 770214 | 675 | 1.2- 0.3- | 810307 | 413 | 3.0+ 0.1- | 810426 | 413 | 0.8+ 1.2- |
| 810209 | 413 | 1.7- 1.5- | 810311 | 413 | 2.5+ 0.4- | 810502 | 413 | 1.3- 0.4- |
| 810213 | 413 | 0.3+ 1.1- | 810316 | 413 | 2.9- 0.1- | | | |

1981 EF25
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 204.74315 | (1950.0) | | P | Q |
| n | 0.26210796 | Peri. | 21.01281 | -0.15030007 | -0.98862356 |
| a | 2.4181511 | Node | 77.63187 | +0.90616980 | -0.14009528 |
| e | 0.1619403 | Incl. | 0.33870 | +0.39530518 | -0.05474273 |
| P | 3.76 | H | 15.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 770211 | 675 | 0.5+ 0.0 | 810302 | 413 | 0.1+ 0.8- | 810410 | 413 | 0.6- 0.7+ |
| 770212 | 675 | 0.4- 0.2+ | 810306 | 413 | 0.2- 0.4- | 810410 | 413 | 1.8+ 2.3- |
| 770214 | 675 | 0.1- 0.2+ | 810311 | 413 | 0.7- 0.3- | 810426 | 413 | 1.8+ 0.3- |
| 810209 | 413 | 1.4+ 0.2- | 810315 | 413 | 1.1- 0.6+ | 810501 | 413 | 1.0+ 1.3+ |
| 810212 | 413 | 0.2+ 0.6+ | 810315 | 413 | 2.0+ 1.3- | 810502 | 413 | 1.3- 1.2+ |
| 810213 | 413 | 0.4- 0.6+ | 810406 | 413 | 1.5- 1.3+ | | | |
| 810302 | 413 | 2.3- 0.2+ | 810406 | 413 | 0.1- 0.9- | | | |

1981 EC26
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 127.06594 | (1950.0) | | P | Q |
| n | 0.26059281 | Peri. | 184.45021 | -0.95880228 | +0.28403757 |
| a | 2.4275152 | Node | 12.05409 | -0.25994070 | -0.87075193 |
| e | 0.1353243 | Incl. | 1.25258 | -0.11458191 | -0.40138975 |
| P | 3.78 | H | 16.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 770211 | 675 | 0.5- 0.1+ | 810306 | 413 | 1.9- 0.3- | 810406 | 413 | 0.9+ 0.2- |
| 770212 | 675 | 0.9- 0.0 | 810311 | 413 | 1.5- 0.9+ | 810410 | 413 | 4.5+ 0.3+ |
| 770214 | 675 | 1.5+ 0.1+ | 810311 | 413 | 0.8+ 0.3- | 810410 | 413 | 0.5+ 0.7+ |
| 810209 | 413 | 0.0 0.5- | 810315 | 413 | 1.6- 0.0 | 810426 | 413 | 0.3+ 0.6- |
| 810213 | 413 | 0.3- 1.7+ | 810315 | 413 | 0.7+ 0.0 | 810501 | 413 | 1.3- 0.2- |
| 810302 | 413 | 0.9+ 0.2- | 810405 | 413 | 0.2- 0.9- | | | |
| 810306 | 413 | 2.0+ 2.7- | 810406 | 413 | 3.7- 2.2+ | | | |

1981 EX30
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 318.35091 | (1950.0) | | P | Q |
| n | 0.27180771 | Peri. | 224.01556 | +0.97017381 | -0.24104477 |
| a | 2.3602739 | Node | 149.90469 | +0.23415074 | +0.90440525 |
| e | 0.2171500 | Incl. | 2.93717 | +0.06273918 | +0.35206328 |
| P | 3.63 | H | 16.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 770213 | 675 | 0.8- | 0.0 | 810302 | 413 | (5.1- | 0.6+) | 810315 413 2.0+ 1.4- |
| 770214 | 675 | 0.7+ | 0.2- | 810311 | 413 | 2.0- | 0.3- | 810426 413 2.6+ 1.3- |
| 810302 | 413 | 0.7- | 2.2+ | 810315 | 413 | (3.8+ | 3.7-) | 810502 413 1.7- 1.0+ |

1981 ER31
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 158.10273 | (1950.0) | | P | Q |
| n | 0.25856171 | Peri. | 353.70319 | -0.88646768 | -0.46183475 |
| a | 2.4402113 | Node | 158.71294 | +0.42807452 | -0.84268582 |
| e | 0.1225107 | Incl. | 4.69688 | +0.17586146 | -0.27674768 |
| P | 3.81 | H | 16.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 770213 | 675 | 0.0 | 0.2+ | 810213 | 413 | 0.2- | 0.3+ | 810311 413 0.5+ 1.4- |
| 770214 | 675 | 0.1+ | 0.2+ | 810302 | 413 | 1.0- | 0.3+ | 810315 413 1.2- 0.3+ |
| 810209 | 413 | 0.5+ | 0.3+ | 810306 | 413 | 0.9- | 0.7- | 810315 413 0.5+ 0.0 |
| 810212 | 413 | 1.4+ | 0.2+ | 810306 | 413 | 0.0 | 0.6- | 810501 413 0.9+ 1.1+ |

1981 ED35
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 200.18084 | (1950.0) | | P | Q |
| n | 0.25858285 | Peri. | 86.09639 | +0.05761686 | -0.99833873 |
| a | 2.4400784 | Node | 0.60081 | +0.90453447 | +0.05207970 |
| e | 0.2151559 | Incl. | 1.59160 | +0.42248987 | +0.02464737 |
| P | 3.81 | H | 16.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 770213 | 675 | 0.6+ | 0.6+ | 810307 | 413 | 0.7- | 0.0 | 810407 413 0.4+ 0.1- |
| 770214 | 675 | 0.4- | 0.1+ | 810307 | 413 | 2.2+ | 1.6- | 810407 413 0.4+ 0.8+ |
| 810202 | 413 | 0.1- | 1.0- | 810311 | 413 | 0.7- | 1.0+ | 810408 413 2.0- 0.8+ |
| 810213 | 413 | 0.2- | 1.0- | 810311 | 413 | 1.0+ | 0.1+ | 810408 413 1.9+ 0.8- |
| 810302 | 413 | 1.1- | 0.8+ | 810316 | 413 | 1.2- | 0.7+ | 810430 413 0.0 0.1+ |
| 810302 | 413 | 0.6- | 0.2- | 810316 | 413 | 2.3+ | 1.6- | 810502 413 0.7+ 0.7- |
| 810303 | 413 | 1.9- | 0.9+ | 810329 | 413 | 1.4- | 0.1+ | 810502 413 0.6- 0.2+ |
| 810303 | 413 | 0.9+ | 0.6+ | 810329 | 413 | 0.1+ | 0.3- | 810503 413 0.4+ 0.7+ |

1981 EY42
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 111.93709 | (1950.0) | | P | Q |
| n | 0.26272891 | Peri. | 11.44178 | -0.73179076 | +0.68150501 |
| a | 2.4143395 | Node | 211.52201 | -0.62612682 | -0.67561714 |
| e | 0.1346133 | Incl. | 0.63142 | -0.26916071 | -0.28123370 |
| P | 3.75 | H | 17.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 770212 | 675 | (5.9- | 0.1+) | 810302 | 413 | 0.7+ | 0.0 | 810405 413 0.5- 0.2- |
| 770213 | 675 | 0.2+ | 0.1- | 810306 | 413 | 2.5- | 0.5+ | 810405 413 1.8- 0.2+ |
| 770214 | 675 | 0.4- | 0.5- | 810306 | 413 | 1.0+ | 1.4+ | 810410 413 1.2+ 2.1- |
| 810212 | 413 | 0.2+ | 0.2+ | 810311 | 413 | 2.9+ | 1.8- | 810501 413 0.2+ 0.2+ |
| 810212 | 413 | 0.4+ | 0.3- | 810315 | 413 | 0.0 | 0.1+ | |
| 810302 | 413 | 0.9- | 1.1+ | 810315 | 413 | 0.3- | 1.1+ | |

1981 EA43
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | |
|---|---|---|---|---|
| M | 277.01271 | (1950.0) | P | Q |
| n | 0.27133541 | Peri. 77.63002 | +0.67972682 | -0.73334641 |
| a | 2.3630120 | Node 329.53455 | +0.66237738 | +0.62148252 |
| e | 0.1981402 | Incl. 1.49295 | +0.31500421 | +0.27561299 |
| P | 3.63 | H 16.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 770211 | 675 | 0.8- | 0.8- | 810302 | 413 | 0.2+ | 2.1+ | 810501 | 413 | 2.3+ | 1.2- |
| 770212 | 675 | 1.6+ | 2.0- | 810311 | 413 | (6.2+ | 2.1-) | 810503 | 413 | 1.7- | 0.7- |
| 770214 | 675 | 0.8+ | 1.3- | 810315 | 413 | 0.7- | 0.2+ | | | | |

1981 EQ43
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | |
|---|---|---|---|---|
| M | 103.56213 | (1950.0) | P | Q |
| n | 0.26055592 | Peri. 35.66129 | -0.71011213 | +0.70408016 |
| a | 2.4277444 | Node 189.09646 | -0.65090973 | -0.65833717 |
| e | 0.1320159 | Incl. 1.24948 | -0.26843487 | -0.26620160 |
| P | 3.78 | H 17.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 770213 | 675 | 1.3- | 1.0+ | 810307 | 413 | 0.7- | 0.4+ | 810329 | 413 | 1.4+ | 0.4+ |
| 770214 | 675 | 1.1+ | 0.9+ | 810311 | 413 | 3.0- | 0.4+ | 810426 | 413 | 0.1+ | 0.1- |
| 810303 | 413 | (10.9+ | 7.8-) | 810311 | 413 | 1.5- | 0.5- | 810502 | 413 | 2.5- | 1.7+ |
| 810306 | 413 | 3.1+ | 2.0- | 810315 | 413 | 1.4+ | 0.3+ | | | | |

1981 FP
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | |
|---|---|---|---|---|
| M | 117.26534 | (1950.0) | P | Q |
| n | 0.25754828 | Peri. 18.31462 | -0.94404459 | +0.32981713 |
| a | 2.4466085 | Node 180.94389 | -0.30758522 | -0.88116118 |
| e | 0.1361186 | Incl. 2.40173 | -0.11904263 | -0.33878553 |
| P | 3.83 | H 15.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 770213 | 675 | 0.0 | 0.9+ | 810307 | 413 | 1.1+ | 0.4- | 810408 | 413 | 0.1- | 0.6- |
| 770214 | 675 | 0.1+ | 0.7- | 810311 | 413 | 1.0- | 0.3+ | 810408 | 413 | 0.9+ | 0.4+ |
| 810209 | 413 | 0.5- | 0.9- | 810311 | 413 | 1.5- | 0.1+ | 810411 | 413 | 1.2+ | 0.1- |
| 810213 | 413 | 0.4+ | 0.4- | 810316 | 413 | 1.5- | 0.4+ | 810411 | 413 | 2.9+ | 1.5- |
| 810302 | 413 | 0.1- | 0.7+ | 810328 | 801 | 0.3+ | 0.3+ | 810426 | 413 | 0.5- | 2.5- |
| 810303 | 413 | 1.0- | 0.3+ | 810329 | 413 | 0.2- | 0.8+ | 810502 | 413 | 3.1- | 1.9+ |
| 810307 | 413 | 0.1+ | 0.1- | 810329 | 413 | 0.9+ | 0.4+ | 810502 | 413 | 1.8+ | 0.1+ |

* * * * *

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

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

(3446)* 1942 EB = 1975 GL

Discovered 1942 Mar. 12 by K. Reinmuth at Heidelberg. The identification is by E. Bowell and L. D. Schmadel, who found it independently (MPC 7239).

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | |
|---|---|---|---|---|
| M | 68.70036 | (1950.0) | P | Q |
| n | 0.26913052 | Peri. 94.32352 | -0.62131623 | -0.77990733 |
| a | 2.3758959 | Node 34.45936 | +0.65541917 | -0.57013881 |
| e | 0.1597178 | Incl. 7.67516 | +0.42940873 | -0.25823688 |
| P | 3.66 | H 13.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 420312 024 | 2.2- | 0.6+ | 750418 805 | 0.7- | 0.3- | 860409 688 | 3.3- | 0.4- |
| 420323 024 | 2.0+ | 0.1- | 860209 801 | 0.1+ | 1.6+ | 860409 688 | 1.1+ | 1.5- |
| 420406 024 | 1.2+ | 0.4+ | 860305 688 | 1.2+ | 2.0- | 860410 054 | 0.8+ | 0.5- |
| 420411 024 | 0.3+ | 0.3+ | 860305 688 | 1.0- | 1.6- | 860511 801 | 0.1- | 0.6+ |
| 420413 024 | 1.7- | 2.1+ | 860403 054 | 0.1- | 1.1+ | | | |
| 750415 805 | 0.4- | 0.2+ | 860405 054 | 0.2+ | 0.9+ | | | |

(3447)* 1956 SC = 1942 RO = 1970 SQ1 = 1984 SD = 1986 EH

Discovered 1956 Sept. 29 at the Goethe Link Observatory, Indiana University.

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 47.41707 | | (1950.0) | P | Q |
| n | 0.35088865 | Peri. | 163.00377 | -0.95723504 | -0.28930896 |
| a | 1.9907796 | Node | 0.19205 | +0.20675815 | -0.68695454 |
| e | 0.0289560 | Incl. | 20.71454 | +0.20236637 | -0.66662867 |
| P | 2.81 | H | 13.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 420908 062 | 0.6+ | 1.2+ | 561010 024 | 0.1+ | 1.1+ | 860305 675 | 0.1+ | 0.7- |
| 420911 062 | 0.8+ | 1.0+ | 700930 095 | 4.4+ | 3.8- | 860306 675 | 2.5- | 0.9+ |
| 420911 062 | 0.2- | 0.0 | 840924 889 | 0.1+ | 0.0 | 860306 675 | 1.1- | 0.6- |
| 560929 760 | 2.4+ | 1.3- | 840924 889 | 0.9- | 0.1+ | 860405 801 | 1.8+ | 0.1- |
| 560929 760 | 4.5- | 2.0+ | 840924 889 | 1.7+ | 0.4+ | 860511 801 | 1.0+ | 0.3- |
| 561001 024 | 3.3- | 1.8- | 860305 675 | 0.1- | 0.4- | | | |

(3448)* 1977 QA5 = 1953 EH1 = 1976 GW5

Discovered 1977 Aug. 22 by N. S. Chernykh at the Crimean Astrophysical Observatory. The identification 1977 QA5 = 1976 GW5 is by B. G. Marsden (MPC 9355).

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 202.56659 | | (1950.0) | P | Q |
| n | 0.30374086 | Peri. | 349.07739 | +0.82931480 | -0.55722399 |
| a | 2.1917982 | Node | 44.87023 | +0.51699953 | +0.73685444 |
| e | 0.1183626 | Incl. | 3.38806 | +0.21201050 | +0.38281452 |
| P | 3.24 | H | 13.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 530308 012 | 0.9+ | 0.5+ | 841120 688 | 0.6+ | 0.4+ | 860501 046 | 1.9+ | 0.6- |
| 760402 095 | 0.6- | 3.5+ | 841217 095 | 0.5- | 2.2+ | 860504 688 | 0.3- | 1.1- |
| 770822 095 | 2.0- | 1.5+ | 841223 095 | 0.8- | 1.1- | 860504 688 | 0.8+ | 1.6- |
| 770907 095 | 1.1+ | 1.0+ | 841227 095 | 0.1- | 0.6- | 860511 801 | 0.2- | 0.1- |
| 770912 095 | 0.2- | 0.1+ | 860405 801 | 0.1- | 0.8+ | | | |
| 841120 688 | 0.9+ | 0.0 | 860501 046 | 0.9- | 1.2+ | | | |

(3449)* 1978 VR9 = 1983 TQ1

Discovered 1978 Nov. 7 by E. Helin and S. J. Bus at Palomar. The identification is by E. Bowell (MPC 8400).

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 153.16462 | | (1950.0) | P | Q |
| n | 0.18259899 | Peri. | 336.06172 | +0.54226732 | -0.83946319 |
| a | 3.0770683 | Node | 81.08269 | +0.77649349 | +0.48464552 |
| e | 0.1609213 | Incl. | 2.04906 | +0.32094239 | +0.24580536 |
| P | 5.40 | H | 12.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 781105 675 | 0.1+ | 0.1- | 830910 688 | 1.1- | 0.3- | 850218 801 | 0.5- | 0.9- |
| 781106 675 | 0.1- | 0.7+ | 830910 688 | 0.8- | 0.4- | 850322 801 | 0.1+ | 0.9- |
| 781107 675 | 0.5- | 1.7+ | 831012 688 | 1.7+ | 1.9+ | 860413 801 | 0.5- | 0.5- |
| 781108 675 | 0.1+ | 1.3+ | 831012 688 | 0.8- | 0.1- | 860512 801 | 2.2+ | 4.5+ |
| 781129 675 | 0.1+ | 0.1+ | 831104 688 | 1.4+ | 1.1- | | | |
| 781130 675 | 0.2- | 0.2- | 831104 688 | 0.6- | 0.3+ | | | |

(3450)* 1983 QJ = 1961 VW = 1977 FL1 = 1979 WJ7 = 1984 YH4

Discovered 1983 Aug. 31 by H. Debehogne at the European Southern Observatory.

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 158.08339 | (1950.0) | | P | Q |
| n | 0.21671739 | Peri. | 336.79571 | +0.66534089 | -0.73886491 |
| a | 2.7449865 | Node | 71.31301 | +0.70136016 | +0.56965006 |
| e | 0.0646053 | Incl. | 6.47176 | +0.25576440 | +0.35996869 |
| P | 4.55 | H | 12.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 611111 | 760 | 2.2- | 1.3+ | 830906 | 809 | 0.7- | 0.3- | 830912 | 809 | 1.2+ | 1.2- |
| 611111 | 760 | 0.3+ | 2.4+ | 830907 | 809 | 0.5- | 0.5+ | 841227 | 095 | 0.7+ | 0.3+ |
| 770326 | 095 | 1.9+ | 0.9+ | 830907 | 809 | 0.3- | 0.6+ | 841229 | 095 | 0.6- | 0.6+ |
| 791117 | 095 | 2.9+ | 0.3+ | 830907 | 809 | 0.3- | 1.7+ | 841230 | 095 | 1.2- | 0.5- |
| 830831 | 809 | 1.0- | 1.0+ | 830908 | 809 | 0.1- | 0.1+ | 841231 | 095 | 0.0 | 0.2- |
| 830831 | 809 | 0.8- | 1.1+ | 830908 | 809 | 0.1+ | 0.3- | 860405 | 801 | 1.0+ | 1.4+ |
| 830831 | 809 | 0.5- | 1.3+ | 830908 | 809 | 0.0 | 0.1- | 860512 | 801 | 0.0 | 2.3+ |
| 830906 | 809 | 1.1- | 0.0 | 830912 | 809 | 1.2+ | 0.7- | | | | |
| 830906 | 809 | 0.9- | 0.1- | 830912 | 809 | 1.1+ | 0.9- | | | | |

(3451)* 1984 HA1 = 1950 HG1

Discovered 1984 Apr. 19 by A. Mrkos at Klet.

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 323.04564 | (1950.0) | | P | Q |
| n | 0.08563504 | Peri. | 129.86274 | +0.63008554 | +0.77649881 |
| a | 5.0976310 | Node | 179.11355 | -0.77641799 | +0.62983759 |
| e | 0.0708124 | Incl. | 24.70343 | +0.01293486 | -0.01882037 |
| P | 11.51 | H | 8.5 | G 0.25 | |

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

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 500421 | 094 | (0.04- | 0.01-)X | 850420 | 046 | 0.2+ | 0.7+ | 850525 | 046 | 1.0- | 0.5- |
| 830314 | 095 | 0.7+ | 1.6+ | 850420 | 046 | 0.6+ | 1.2+ | 850525 | 046 | 2.0- | 0.4- |
| 840419 | 046 | 0.0 | 1.1- | 850420 | 046 | 0.5+ | 0.3+ | 850527 | 046 | 4.4- | 0.9- |
| 840419 | 046 | 0.5- | 1.1- | 850421 | 046 | 0.2- | 0.4+ | 850527 | 046 | 0.8- | 0.8- |
| 840424 | 046 | 0.3- | 0.9- | 850422 | 046 | 0.6+ | 0.6+ | 850611 | 046 | 0.2- | 0.4+ |
| 840424 | 046 | 0.8- | 0.9- | 850422 | 046 | 0.0 | 0.2+ | 850613 | 046 | 0.6- | 1.2+ |
| 840425 | 046 | 0.0 | 1.8- | 850422 | 046 | 0.8- | 0.1- | 850613 | 046 | 0.3- | 1.0+ |
| 840425 | 046 | 0.8- | 2.1- | 850422 | 046 | 1.6+ | 0.9+ | 850615 | 046 | 0.8- | 1.1+ |
| 840427 | 046 | 0.3- | 2.1- | 850509 | 657 | 0.0 | 0.7- | 850615 | 046 | 0.3+ | 1.2+ |
| 840427 | 046 | 0.8- | 2.1- | 850510 | 657 | 0.1- | 1.1- | 850621 | 046 | 0.7+ | 1.1+ |
| 840628 | 801 | 0.4+ | 2.8+ | 850510 | 046 | 0.6+ | 0.4- | 850621 | 046 | 0.0 | 1.0+ |
| 840630 | 801 | 1.2+ | 2.2+ | 850510 | 046 | 0.7+ | 0.2+ | 860414 | 801 | 0.5+ | 0.5+ |
| 840730 | 801 | 1.4+ | 0.2- | 850513 | 046 | 0.5+ | 1.4+ | 860415 | 046 | 0.4- | 0.1- |
| 850321 | 691 | 0.7+ | 1.5- | 850513 | 046 | 0.1+ | 2.0+ | 860415 | 046 | 0.6- | 1.3- |
| 850321 | 691 | 0.2+ | 1.9- | 850515 | 657 | 1.0- | 0.8+ | 860416 | 046 | 0.5- | 0.4- |
| 850321 | 691 | 0.3+ | 2.5- | 850515 | 657 | 0.7- | 0.4+ | 860416 | 046 | 0.3- | 1.4- |
| 850321 | 801 | 0.7+ | 0.1+ | 850515 | 552 | 1.4+ | 1.9+ | 860502 | 046 | 0.6- | 0.4- |
| 850413 | 691 | 1.3+ | 0.5- | 850515 | 552 | 0.2+ | 0.1- | 860502 | 046 | 0.2- | 0.5+ |
| 850413 | 691 | 1.2+ | 0.5- | 850515 | 552 | 0.2- | 0.6- | 860502 | 046 | 1.1- | 1.0- |
| 850413 | 691 | 1.3+ | 0.6- | 850524 | 046 | 0.4- | 0.3+ | 860503 | 046 | 0.5+ | 0.8- |
| 850417 | 567 | 0.4+ | 0.2- | 850524 | 563 | 0.3- | 1.0+ | 860509 | 046 | 0.1- | 0.8- |
| 850417 | 567 | 0.5+ | 0.0 | 850524 | 046 | 0.7- | 0.1+ | 860509 | 046 | 0.4+ | 0.8- |
| 850417 | 054 | 1.3- | 1.0+ | 850524 | 563 | 0.2+ | 1.6+ | 860513 | 046 | 0.7+ | 0.7- |
| 850417 | 801 | 1.0+ | 0.6- | 850524 | 563 | 0.6+ | 0.6+ | 860513 | 046 | 0.8+ | 1.1- |
| 850419 | 046 | 0.1- | 0.4+ | 850524 | 563 | 0.6- | 0.7+ | | | | |
| 850419 | 046 | 0.1- | 1.0+ | 850524 | 563 | 1.3+ | 1.2+ | | | | |

1982 BJ
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | |
|---|---|---|---|---|
| M 71.94166 | | (1950.0) | P | Q |
| n 0.27961539 | Peri. | 37.56473 | -0.85422356 | -0.37186876 |
| a 2.3161297 | Node | 116.76939 | +0.32045103 | -0.92691697 |
| e 0.1959865 | Incl. | 24.01366 | +0.40940598 | -0.05038411 |
| P 3.52 | H | 14.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 820124 | 675 | (9.7+ 3.7-) | 820203 | 675 | 0.7- 0.5+ | 820401 | 675 | 0.1+ 0.1- |
| 820124 | 675 | (10.9+ 0.6-) | 820213 | 675 | 0.3+ 1.9+ | 820413 | 675 | 0.6+ 0.1- |
| 820126 | 381 | 0.2+ 0.3- | 820213 | 675 | 0.7- 1.4+ | 860512 | 801 | 1.2+ 0.4+ |
| 820126 | 381 | 0.6+ 0.5+ | 820218 | 675 | 0.5+ 2.4- | 860603 | 801 | 1.0- 0.1- |
| 820128 | 381 | 0.3+ 0.8- | 820228 | 675 | 0.4+ 0.7- | | | |
| 820202 | 675 | 1.0- 0.3+ | 820304 | 675 | 0.2- 0.5- | | | |

1982 DK
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | |
|---|---|---|---|---|
| M 11.88862 | | (1950.0) | P | Q |
| n 0.23627297 | Peri. | 83.46803 | -0.97745625 | +0.02188626 |
| a 2.5913588 | Node | 97.63936 | -0.09873591 | -0.92654077 |
| e 0.2635106 | Incl. | 12.23262 | +0.18662933 | -0.37555718 |
| P 4.17 | H | 13.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 820220 | 688 | 1.2- 0.4- | 820401 | 688 | 0.3+ 0.3- | 860505 | 675 | 1.0- 1.5+ |
| 820220 | 688 | 1.0- 1.0- | 820401 | 688 | 0.4- 0.1+ | 860508 | 675 | 0.5+ 0.8+ |
| 820304 | 688 | 0.9+ 0.1- | 820418 | 688 | 0.1- 0.1- | 860509 | 675 | 0.7+ 0.5+ |
| 820304 | 688 | 0.2- 0.6- | 820418 | 688 | 0.0 0.5- | 860510 | 675 | 0.7+ 1.1+ |

1982 KN1 = 1973 FR1 = 1986 HN

The identification 1982 KN1 = 1973 FR1 is by W. Landgraf.

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

| | | | | |
|---|---|---|---|---|
| M 9.61673 | | (1950.0) | P | Q |
| n 0.23111123 | Peri. | 100.70323 | -0.89889488 | +0.36675863 |
| a 2.6298010 | Node | 101.15321 | -0.43179298 | -0.83443345 |
| e 0.1173389 | Incl. | 14.14383 | +0.07445010 | -0.41135014 |
| P 4.26 | H | 12.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 730328 | 095 | (9.3- 4.5-) | 820515 | 095 | 0.8- 3.2+ | 820524 | 381 | 0.1+ 0.2- |
| 730401 | 095 | 1.1- 0.7+ | 820522 | 381 | 1.1+ 0.7- | 820526 | 095 | 3.1- 0.7- |
| 730403 | 095 | (15.4- 9.0-) | 820522 | 381 | 0.1- 0.4- | 860429 | 675 | 1.3+ 0.4- |
| 730404 | 095 | 1.6+ 2.2+ | 820523 | 381 | 0.0 0.0 | 860503 | 675 | 1.8- 2.2- |
| 820513 | 095 | 4.4+ 4.2+ | 820523 | 095 | 0.9- 3.0- | 860503 | 675 | 1.6- 1.9- |

* * * * *

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

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

Periodic Comet Hartley 2 (1986c)
T 1985 June 4.94907 ET

| | | | | |
|---|---|---|---|---|
| q 0.9517416 | | (1950.0) | P | Q |
| n 0.15749299 | Peri. | 174.83913 | +0.75413573 | -0.64640327 |
| a 3.3959548 | Node | 226.13727 | +0.59659649 | +0.74812836 |
| e 0.7197425 | Incl. | 9.25358 | +0.27450305 | +0.14988920 |
| P 6.26 | | | | |

From 13 observations 1986 Mar. 15-May 12.

Periodic Comet Machholz (1986e)
T 1986 Apr. 23.51578 ET

| | | | | |
|---|---|---|---|---|
| q | 0.1267681 | (1950.0) | P | Q |
| n | 0.18801910 | Peri. 14.52147 | -0.18954428 | -0.46668385 |
| a | 3.0176445 | Node 93.81134 | +0.79213602 | -0.59255003 |
| e | 0.9579910 | Incl. 59.97296 | +0.58016678 | +0.65657494 |
| P | 5.24 | | | |

From 28 observations 1986 May 13-June 12.

(3452)* 1980 OA

Discovered 1980 July 17 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | |
|---|---|---|---|---|
| M | 234.67801 | (1950.0) | P | Q |
| n | 0.28833889 | Peri. 289.89417 | +0.97854776 | +0.20312069 |
| a | 2.2691711 | Node 58.40020 | -0.17063380 | +0.89274807 |
| e | 0.0803807 | Incl. 2.31757 | -0.11544866 | +0.40217269 |
| P | 3.42 | H 14.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 800717 | 688 | 0.6+ 2.1+ | 820118 | 688 | 0.1+ 0.3+ | 860409 | 688 | 0.5+ 1.7- |
| 800717 | 688 | 0.4- 0.9+ | 841223 | 552 | 2.0- 1.3- | 860412 | 801 | 0.0 0.4- |
| 800719 | 688 | 0.6+ 2.9- | 841223 | 552 | 2.4+ 0.5- | 860511 | 801 | (4.7+ 4.9+) |
| 800806 | 688 | 0.7+ 0.6- | 850320 | 801 | (6.2- 0.8-) | | | |
| 800904 | 688 | 0.9- 0.7- | 860409 | 688 | 1.3- 0.3+ | | | |

1931 UE = 1977 CA1

The identification is by E. Bowell.

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

| | | | | |
|---|---|---|---|---|
| M | 234.10827 | (1950.0) | P | Q |
| n | 0.26611140 | Peri. 122.20929 | +0.13996262 | -0.98393042 |
| a | 2.3938371 | Node 319.28014 | +0.84156395 | +0.17720620 |
| e | 0.1881855 | Incl. 9.78471 | +0.52170929 | -0.02188358 |
| P | 3.70 | H 13.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 311018 | 024 | 0.4+ 0.9+ | 311108 | 024 | 2.5+ 1.6- | 770214 | 675 | 0.0 0.2- |
| 311020 | 024 | 2.9- 3.2- | 311113 | 024 | 1.8- 1.3+ | | | |
| 311022 | 024 | 1.4+ 1.9+ | 770213 | 675 | 0.1+ 0.1+ | | | |

1973 QG2 = 1973 SF5 = 1977 KE1

The double designation 1973 QG2 = 1973 SF5 is by C. M. Bardwell (MPC 8665). The identification 1973 QG2 = 1977 KE1 is by E. Bowell.

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

| | | | | |
|---|---|---|---|---|
| M | 127.60034 | (1950.0) | P | Q |
| n | 0.18473387 | Peri. 327.12222 | +0.96796015 | -0.24847279 |
| a | 3.0533216 | Node 47.30938 | +0.23971211 | +0.87137010 |
| e | 0.1955309 | Incl. 2.82725 | +0.07477469 | +0.42305487 |
| P | 5.34 | H 12.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 730831 | 095 | 0.6- 0.1- | 730927 | 095 | 0.2- 0.2- | 770519 | 675 | 0.5+ 0.1+ |
| 730905 | 095 | 0.8+ 0.4+ | 770518 | 675 | 0.5- 0.1- | | | |

1975 VZ = 1978 LW

The identification is by E. Bowell.

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

| | | | | |
|---|---|---|---|---|
| M | 285.78905 | (1950.0) | P | Q |
| n | 0.25643009 | Peri. 247.84315 | +0.87242364 | -0.48791848 |
| a | 2.4537158 | Node 141.34460 | +0.46353458 | +0.80751308 |
| e | 0.2353854 | Incl. 2.61562 | +0.15496031 | +0.33144860 |
| P | 3.84 | H 14.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 751101 095 | 0.6+ | 0.7+ | 751202 095 | 0.4+ | 1.2- | 780611 675 | 1.0- | 0.1- |
| 751107 095 | 1.1- | 0.6- | 780610 675 | 0.9+ | 0.1- | | | |

1976 GD2 = 1986 EC2

The identification is by E. Bowell.

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

| | | | | | |
|---|---|---|---|---|---|
| M | 349.40484 | (1950.0) | | P | Q |
| n | 0.29237737 | Peri. | 21.84044 | -0.71839204 | +0.69343395 |
| a | 2.2482318 | Node | 202.36151 | -0.65780075 | -0.70304209 |
| e | 0.1375473 | Incl. | 8.36351 | -0.22629858 | -0.15773768 |
| P | 3.37 | H | 14.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 760401 095 | 2.2+ | 2.4+ | 760429 808 | 1.4+ | 0.9+ | 760503 808 | 2.0- | 1.0+ |
| 760404 095 | 0.2+ | 6.8- | 760502 808 | 0.8- | 0.4+ | 860306 688 | 0.1+ | 0.2- |
| 760424 808 | 0.4+ | 0.0 | 760502 808 | 2.8- | 2.2- | 860306 688 | 0.3- | 0.6+ |
| 760425 808 | 1.1+ | 0.5+ | 760502 095 | 1.0- | 0.9+ | 860510 801 | 1.0+ | 2.4+ |
| 760429 808 | 2.0+ | 1.1+ | 760503 808 | 0.1+ | 0.3+ | | | |

1979 SP9 = 1977 KH1

The identification is by E. Bowell.

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

| | | | | | |
|---|---|---|---|---|---|
| M | 28.52463 | (1950.0) | | P | Q |
| n | 0.16841892 | Peri. | 345.80994 | +0.67850953 | -0.73373849 |
| a | 3.2474538 | Node | 61.44914 | +0.67781056 | +0.60676240 |
| e | 0.1477883 | Incl. | 2.30922 | +0.28319194 | +0.30572409 |
| P | 5.85 | H | 12.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 770518 675 | 0.3- | 0.0 | 790928 095 | 0.8+ | 1.4- | 791116 095 | 1.2- | 0.9+ |
| 770519 675 | 0.3+ | 0.0 | 791016 095 | 1.4- | 0.3+ | | | |
| 790922 095 | 0.1+ | 1.1+ | 791111 095 | 1.7+ | 0.8- | | | |

1979 SO11 = 1968 UF = 1978 LX

The key identification 1979 SO11 = 1978 LX is by E. Bowell. The identification 1979 SO11 = 1968 UF was suggested by L. D. Schmadel.

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

| | | | | | |
|---|---|---|---|---|---|
| M | 91.10265 | (1950.0) | | P | Q |
| n | 0.17641409 | Peri. | 203.63255 | +0.99783687 | +0.06510699 |
| a | 3.1485801 | Node | 152.62973 | -0.05671683 | +0.92254793 |
| e | 0.2027977 | Incl. | 1.13312 | -0.03323818 | +0.38035035 |
| P | 5.59 | H | 13.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 681022 095 | 0.2- | 0.4+ | 780613 675 | 0.3+ | 0.1- | 791116 095 | 1.1- | 0.8+ |
| 780610 675 | 0.0 | 0.8+ | 790924 095 | 0.0 | 0.2- | 791122 095 | 0.8+ | 0.3+ |
| 780612 675 | 0.4- | 0.1- | 791014 095 | 0.4+ | 1.2- | | | |

1980 FB

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

| | | | | | |
|---|---|---|---|---|---|
| M | 340.38689 | (1950.0) | | P | Q |
| n | 0.17194485 | Peri. | 209.48014 | -0.51249834 | +0.85857385 |
| a | 3.2029056 | Node | 29.69598 | -0.78214974 | -0.46001964 |
| e | 0.1093343 | Incl. | 1.62102 | -0.35438291 | -0.22634679 |
| P | 5.73 | H | 12.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 800221 095 | 0.2+ | 0.0 | 800317 809 | 0.0 | 0.9+ | 800414 046 | 2.1- | 1.1+ |
| 800316 809 | 0.1+ | 0.6+ | 800317 809 | 0.7+ | 0.7+ | 800414 046 | 2.3+ | 0.2+ |
| 800316 809 | 0.6+ | 0.6+ | 800317 809 | 0.1+ | 0.9+ | 800416 046 | 0.5- | 0.6+ |
| 800316 809 | 0.1+ | 1.1+ | 800317 809 | 0.6+ | 0.2+ | 800416 046 | 2.7- | 1.3- |
| 800316 809 | 0.2+ | 1.0+ | 800317 046 | 0.1+ | 2.9- | 860409 688 | 1.5+ | 0.3+ |
| 800316 046 | 1.4- | 0.2- | 800317 046 | 1.2+ | 2.0- | 860409 688 | 1.7- | 0.1- |
| 800316 095 | 0.8- | 0.2- | 800413 046 | 0.5+ | 1.3- | 860510 801 | 0.1+ | 0.0 |
| 800316 046 | 2.0- | 1.2+ | 800413 046 | 0.7+ | 0.1- | | | |

1981 GC = 1972 BA = 1977 KJ1

The key identification 1981 GC = 1977 KJ1 is by E. Bowell.

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

| | | | | |
|---|---|---|---|---|
| M 65.59271 | | (1950.0) | P | Q |
| n 0.23172061 | Peri. | 269.69591 | -0.84705076 | +0.53111775 |
| a 2.6251884 | Node | 302.38501 | -0.47747784 | -0.77729132 |
| e 0.1750063 | Incl. | 1.38886 | -0.23349502 | -0.33724194 |
| P 4.25 | H | 13.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 720117 095 | 0.2- | 0.9- | 810405 688 | 1.3+ | 0.0 | 810409 688 | 0.3+ | 1.1- |
| 770518 675 | 9.4+ | 2.6- | 810405 688 | 0.9+ | 0.1- | 810502 688 | 0.6- | 1.5- |
| 770519 675 | 9.5- | 1.3+ | 810407 688 | 0.0 | 0.5- | 810502 688 | 0.3- | 1.8- |
| 810401 688 | 0.0 | 4.0+ | 810407 688 | 0.8+ | 0.7- | | | |
| 810401 688 | 2.6- | 3.5+ | 810409 688 | 0.6- | 1.6- | | | |

1981 JJ2 = 1958 UD = 1963 TB1 = 1968 UA3 = 1973 UE2 = 1986 JY

The key identification 1981 JJ2 = 1986 JY is by E. Bowell.

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

| | | | | |
|---|---|---|---|---|
| M 239.15700 | | (1950.0) | P | Q |
| n 0.20172357 | Peri. | 163.51747 | +0.99391306 | -0.09180567 |
| a 2.8793811 | Node | 202.02472 | +0.07347586 | +0.96428046 |
| e 0.0822836 | Incl. | 9.34572 | +0.08208604 | +0.24846512 |
| P 4.89 | H | 13.0 | G 0.25 | |

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

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 581016 760 | 0.5+ | 0.1- | 810411 675 | 1.0- | 1.4+ | 810510 675 | 2.2+ | 0.4- |
| 631015 760(0.03- | | 0.00-)X | 810411 675 | 0.4- | 0.6+ | 860513 688 | 0.9+ | 0.5+ |
| 681023 095 | 1.5- | 0.8+ | 810505 675 | 1.4- | 2.6- | 860513 688 | 0.8- | 0.0 |
| 731026 095 | 1.2+ | 1.6- | 810510 675 | 0.3+ | 0.4- | | | |

1981 VC1 = 1981 UO10 = 1971 QF = 1977 KG1

The key identification 1981 VC1 = 1977 KG1 is by E. Bowell. The double designation 1981 VC1 = 1981 UO10 is by K. Hurukawa and L. D. Schmadel, who found it independently (MPC 10022).

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

| | | | | |
|---|---|---|---|---|
| M 166.35649 | | (1950.0) | P | Q |
| n 0.30218041 | Peri. | 316.04948 | +0.99418457 | -0.10031131 |
| a 2.1993417 | Node | 49.74932 | +0.10741017 | +0.89747665 |
| e 0.1607753 | Incl. | 2.94220 | +0.00775275 | +0.42950355 |
| P 3.26 | H | 14.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 710816 095 | 0.1- | 0.4+ | 811006 095 | 0.8- | 2.3+ | 811027 095 | 0.8- | 1.8- |
| 770518 675 | 1.0- | 2.3- | 811006 095 | 1.1- | 1.6- | 811029 330 | 2.8+ | 2.8+ |
| 770519 675 | 0.0 | 0.9- | 811021 095 | 1.3+ | 1.7- | 811102 688 | 0.2- | 3.4- |
| 810928 095 | 1.6- | 1.9+ | 811026 095 | 0.1+ | 3.0+ | 811102 688 | 1.5+ | 3.9- |

1982 BS1
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 89.57551 | (1950.0) | | P | Q |
| n | 0.25688097 | Peri. | 294.86535 | +0.07189730 | -0.99560607 |
| a | 2.4508437 | Node | 150.81855 | +0.95373187 | +0.05101867 |
| e | 0.1515462 | Incl. | 7.06794 | +0.29193543 | +0.07852169 |
| P | 3.84 | H | 13.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 820124 | 688 | 1.6+ 3.0+ | 820221 | 688 | 1.6- 0.5- | 860305 | 688 | 0.0 1.2+ |
| 820130 | 688 | 2.0- 0.4- | 820228 | 688 | 0.3- 1.0- | 860510 | 801 | 0.7- 2.4- |
| 820130 | 688 | 1.3- 1.6- | 820228 | 688 | 1.7+ 0.3+ | | | |
| 820221 | 688 | 1.5+ 1.1- | 860305 | 688 | 1.1+ 2.5+ | | | |

1982 DN = 1957 HL = 1964 FG
The identification 1982 DN = 1964 FG was suggested by C. M. Bardwell.
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 21.50505 | (1950.0) | | P | Q |
| n | 0.27195282 | Peri. | 14.82117 | -0.88127922 | +0.47254120 |
| a | 2.3594342 | Node | 193.38524 | -0.43667851 | -0.82002824 |
| e | 0.1654493 | Incl. | 1.78079 | -0.18071749 | -0.32289086 |
| P | 3.62 | H | 13.5 | G 0.25 | |

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

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 570424 | 076(0.27+ 0.03-)X | | 820221 | 688 | 1.5+ 0.1+ | 860502 | 046 | 1.8+ 0.2- |
| 640316 | 760 | 1.5- 4.0- | 820228 | 688 | 1.4+ 1.4+ | 860502 | 046 | 0.5- 0.9+ |
| 820124 | 688 | 2.7- 1.0+ | 820228 | 688 | 0.9- 0.2- | 860504 | 688 | 0.4+ 1.4+ |
| 820124 | 688 | 0.0 1.2+ | 820328 | 688 | 0.0 1.1+ | 860504 | 688 | 0.8+ 1.6+ |
| 820130 | 688 | 0.1+ 0.1+ | 820328 | 688 | 0.1+ 1.7+ | 860513 | 688 | 0.4+ 1.1- |
| 820130 | 688 | 0.4- 0.1- | 860501 | 046 | 0.2- 0.1- | 860513 | 688 | 2.3- 1.6- |
| 820221 | 688 | 1.9+ 2.1- | 860501 | 046 | 0.1- 0.3+ | | | |

1986 LA
Epoch 1986 May 30.0 ET = JDE 2446580.5

| | | | | | |
|---|---|---|---|---|---|
| M | 318.78324 | (1950.0) | | P | Q |
| n | 0.50658947 | Peri. | 86.64986 | +0.70700796 | +0.69133855 |
| a | 1.5584706 | Node | 229.54571 | -0.70130995 | +0.65824165 |
| e | 0.3206191 | Incl. | 11.28968 | -0.09112682 | +0.29794119 |
| P | 1.95 | H | 18.5 | G 0.25 | |

From 6 observations 1986 June 4-7.

6541 P-L = 1977 CC1
The identification is by E. Bowell.
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 1.36139 | (1950.0) | | P | Q |
| n | 0.08115881 | Peri. | 261.92019 | +0.56858911 | -0.82011640 |
| a | 5.2833957 | Node | 153.11195 | +0.79950317 | +0.53256846 |
| e | 0.0677704 | Incl. | 8.15502 | +0.19365202 | +0.20923655 |
| P | 12.14 | H | 11.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 600924 | 675 | 0.7- 0.2- | 601017 | 675 | 1.2- 0.4- | 770213 | 675 | 0.0 0.3+ |
| 600926 | 675 | 1.0- 0.3+ | 601022 | 675 | 0.3- 0.5- | 770214 | 675 | 0.1+ 0.4+ |
| 600927 | 675 | 0.0 0.9- | 601025 | 675 | 1.1- 0.1- | | | |
| 600928 | 675 | 0.4+ 0.1+ | 601026 | 675 | 0.3+ 0.0 | | | |

9602 P-L = 1977 CM

The identification is by E. Bowell.

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

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| M | 24.88708 | | (1950.0) | | P | | Q | | | | |
| n | 0.08187862 | Peri. | 241.64618 | | +0.87868817 | | -0.47251179 | | | | |
| a | 5.2523853 | Node | 146.42137 | | +0.46966757 | | +0.83004860 | | | | |
| e | 0.0497658 | Incl. | 7.07430 | | +0.08555398 | | +0.29622951 | | | | |
| P | 12.04 | H | 12.5 | G | 0.25 | | | | | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 601017 | 675 | 1.8- | 0.3+ | 601026 | 675 | 2.4+ | 0.4- | 770212 | 675 | 2.7- | 1.2+ |
| 601022 | 675 | 0.8- | 0.1- | 770211 | 675 | 3.2+ | 1.3- | 770214 | 675 | 0.5- | 0.3+ |

* * * * *

ORBITAL ELEMENTS BY D. K. YEOMANS, JET PROPULSION LABORATORY.

1986 JK

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| M | 357.22158 | | (1950.0) | | P | | Q |
| n | 0.21501783 | Peri. | 232.40301 | | +0.41639121 | | +0.90859148 |
| a | 2.7594322 | Node | 62.23443 | | -0.82197589 | | +0.39165134 |
| e | 0.6746235 | Incl. | 2.12831 | | -0.38855374 | | +0.14515765 |
| P | 4.58 | H | 19.0 | G | 0.25 | | |

From 29 observations 1986 May 4-27, mean residual 1".01.

* * * * *

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

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

(3453)* 1981 SS5 = 1936 NA = 1940 QE = 1974 YL = 1977 RT7 = 1977 SC2

Discovered 1981 Sept. 27 by L. G. Karachkina at the Crimean Astrophysical Observatory. The identifications 1981 SS5 = 1936 NA = 1940 QE are by H. Oishi, who also independently found the other identifications (JAM 1927).

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| M | 224.38411 | | (1950.0) | | P | | Q | | | | |
| n | 0.26723456 | Peri. | 317.37915 | | -0.20803114 | | +0.97577882 | | | | |
| a | 2.3871202 | Node | 300.50826 | | -0.87487762 | | -0.21656242 | | | | |
| e | 0.0855398 | Incl. | 4.50464 | | -0.43739249 | | -0.03092592 | | | | |
| P | 3.69 | H | 12.5 | G | 0.25 | | | | | | |

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

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 360712 | 078(0.03+ | 0.00+)X | 741219 | 330 | 0.3+ | 6.8- | 811124 | 095 | 0.5+ | -0.1- | |
| 360715 | 078(0.04+ | 0.00-)X | 770912 | 095 | 0.8+ | 1.7- | 811124 | 095 | 0.3- | 1.1+ | |
| 360807 | 078(0.03+ | 0.01-)X | 770919 | 095 | 0.1- | 0.1- | 851116 | 801 | 0.5+ | 0.8+ | |
| 400829 | 020(0.02+ | 0.01+) | 810927 | 095 | 1.5- | 0.1- | 851213 | 801 | 1.4- | 4.0+ | |
| 400829 | 020(0.02+ | 0.01+) | 810929 | 095 | 1.2- | 0.1- | 860113 | 801 | 0.3+ | 0.7+ | |
| 400902 | 020(0.35+ | 0.11+) | 811003 | 095 | 0.0 | 0.2+ | | | | | |
| 400902 | 020(0.33+ | 0.15+) | 811119 | 095 | 2.1+ | 1.4+ | | | | | |

(3454)* 1981 WB1 = 1981 WA4 = 1933 UJ1 = 1938 EL = 1964 VX1 = 1967 RQ

Discovered 1981 Nov. 24 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory. The identification 1981 WB1 = 1933 UJ1 is by K. Hurukawa, who also independently found the other identifications (MPC 10024).

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 106.33245 | (1950.0) | | P | Q |
| n | 0.28860069 | Peri. | 244.75836 | +0.20887701 | -0.97770767 |
| a | 2.2677986 | Node | 193.23821 | +0.92747832 | +0.20499082 |
| e | 0.1572717 | Incl. | 5.36295 | +0.31008766 | +0.04545846 |
| P | 3.42 | H | 14.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 331019 | 024 | (1.4- | 8.6-) | 811124 | 688 | 0.3+ | 2.1- | 811230 | 688 | 0.2+ | 0.7+ |
| 331020 | 024 | (2.3+ | 9.8-) | 811124 | 688 | 0.5+ | 2.2- | 860213 | 801 | 1.2+ | 1.3+ |
| 380304 | 024 | 0.4+ | 5.3- | 811129 | 511 | 0.7- | 0.4- | 860306 | 688 | 0.1+ | 0.7- |
| 641110 | 330 | 3.4- | 0.2+ | 811129 | 511 | 0.2+ | 0.2+ | 860306 | 688 | 0.5- | 0.6- |
| 670911 | 095 | 0.5- | 0.4+ | 811129 | 511 | 0.8+ | 0.2+ | 860309 | 071 | 0.5+ | 0.4- |
| 811024 | 095 | 4.2+ | 1.9- | 811201 | 330 | 0.8- | 0.6+ | 860309 | 071 | 1.7+ | 0.2- |
| 811117 | 046 | 0.9- | 0.7+ | 811202 | 688 | 0.7- | 0.5- | 860309 | 071 | 1.9+ | 1.7- |
| 811117 | 046 | 3.4+ | 0.8+ | 811202 | 688 | 0.8- | 0.6+ | 860309 | 071 | 2.6+ | 2.0- |
| 811118 | 046 | 1.9- | 5.4+ | 811220 | 046 | 0.6+ | 1.9+ | 860314 | 071 | 3.8- | 4.5+ |
| 811123 | 046 | 2.1- | 2.2- | 811220 | 046 | 0.3+ | 1.6+ | 860314 | 071 | 4.1- | 3.8+ |
| 811123 | 046 | 0.7- | 0.8- | 811230 | 688 | 1.1+ | 0.5- | 860405 | 801 | 1.2+ | 1.2+ |

(3455)* 1985 QC = 1967 EC = 1978 NF4 = 1979 XH1 = 1982 SJ4 = 1982 UH5

Discovered 1985 Aug. 20 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory. The identifications were found independently by S. Nakano.

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 251.78386 | (1950.0) | | P | Q |
| n | 0.29345439 | Peri. | 0.20812 | -0.98024347 | -0.19739962 |
| a | 2.2427230 | Node | 168.38426 | +0.18137436 | -0.92227246 |
| e | 0.0649771 | Incl. | 3.55797 | +0.07890554 | -0.33233553 |
| P | 3.36 | H | 13.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 670305 | 095 | 0.4- | 0.9- | 850911 | 809 | 0.6+ | 0.3+ | 850918 | 809 | 0.2- | 0.9- |
| 780710 | 095 | 0.3+ | 0.1- | 850911 | 809 | 0.4+ | 0.1+ | 850918 | 809 | 0.0 | 0.9- |
| 791214 | 095 | 0.3+ | 0.3- | 850912 | 809 | 0.8+ | 0.2+ | 850918 | 809 | 0.1+ | 0.7- |
| 820920 | 095 | 1.0+ | 0.7- | 850912 | 809 | 0.6+ | 0.1+ | 850918 | 809 | 0.1- | 1.1- |
| 820922 | 095 | 1.4- | 1.5+ | 850912 | 809 | 0.7+ | 0.1+ | 850918 | 809 | 0.2+ | 1.1- |
| 821020 | 033 | 0.1- | 0.0 | 850914 | 809 | 0.9- | 2.7+ | 850918 | 809 | 0.2+ | 1.0- |
| 850820 | 688 | 4.3- | 3.3- | 850914 | 809 | 0.8- | 2.6+ | 850920 | 809 | 0.2- | 0.4- |
| 850820 | 688 | 0.4+ | 0.5+ | 850914 | 809 | 1.0- | 2.4+ | 850920 | 809 | 0.0 | 0.4- |
| 850904 | 809 | 0.9- | 0.0 | 850916 | 809 | 0.1- | 0.1- | 850920 | 809 | 0.1- | 0.5- |
| 850904 | 809 | 0.6- | 0.0 | 850916 | 809 | 0.1- | 0.0 | 850920 | 809 | 0.0 | 0.5- |
| 850904 | 809 | 0.3- | 0.1+ | 850916 | 809 | 0.0 | 0.3+ | 850920 | 809 | 0.0 | 0.7- |
| 850910 | 809 | 0.5- | 0.2+ | 850917 | 809 | 1.0+ | 0.2+ | 850920 | 809 | 0.1+ | 0.7- |
| 850910 | 809 | 0.4- | 0.0 | 850917 | 809 | 1.1+ | 0.2+ | 850920 | 809 | 1.8+ | 0.0 |
| 850910 | 809 | 0.4- | 0.2+ | 850917 | 809 | 1.1+ | 0.2+ | 850920 | 809 | 2.0+ | 0.1- |
| 850911 | 809 | 0.0 | 0.3+ | | | | | | | | |

(3456)* 1985 RS2 = 1931 TP4 = 1978 JL1 = 1979 UM4 = 1979 VR = 1981 EZ1 = 1981 FB1 = 1982 RY1

Discovered 1985 Sept. 5 by H. Debehogne at the European Southern Observatory.

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 174.88266 | (1950.0) | | P | Q |
| n | 0.30968593 | Peri. | 164.87295 | -0.45666131 | +0.88912150 |
| a | 2.1636569 | Node | 77.94723 | -0.81938160 | -0.40704686 |
| e | 0.0157196 | Incl. | 1.78062 | -0.34651730 | -0.20922671 |
| P | 3.18 | H | 13.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 311004 024 | 0.4- | 0.8+ | 850906 809 | 0.2+ | 0.4+ | 850916 809 | 0.4- | 1.1+ |
| 780506 095 | 0.2+ | 0.7- | 850906 809 | 0.4+ | 0.4+ | 850916 809 | 0.0 | 0.1- |
| 791016 095 | 0.6- | 0.1+ | 850906 809 | 0.8+ | 0.5+ | 850916 809 | 0.2+ | 0.3- |
| 791111 095 | 3.0- | 0.1- | 850910 809 | 0.8- | 1.5- | 850917 809 | 0.2- | 1.0+ |
| 810308 809 | 0.6- | 1.3- | 850910 809 | 1.1- | 1.7- | 850917 809 | 0.1- | 0.6+ |
| 810308 809 | 0.9- | 2.0- | 850910 809 | 1.1- | 1.7- | 850917 809 | 0.0 | 0.3+ |
| 810308 809 | 1.2- | 2.6- | 850911 809 | 1.1- | 0.7+ | 850918 809 | 0.7+ | 1.0+ |
| 810328 801 | (2.9- | 13.5-) | 850911 809 | 0.9- | 0.4+ | 850918 809 | 0.1+ | 0.5+ |
| 820915 046 | 2.0- | 2.0- | 850911 809 | 0.8- | 0.2+ | 850918 809 | 0.4- | 0.0 |
| 820915 046 | 4.2+ | 3.5- | 850912 809 | 0.3- | 0.4+ | 850919 809 | 0.1- | 1.4+ |
| 820915 046 | (7.1+ | 1.4-) | 850912 809 | 0.3- | 0.0 | 850919 809 | 0.2- | 0.8+ |
| 820916 046 | 3.5+ | 1.0- | 850912 809 | 0.2- | 0.0 | 850919 809 | 0.3- | 0.3+ |
| 820916 046 | 5.0+ | 1.9- | 850914 809 | 0.6+ | 0.7+ | 850920 809 | 0.2- | 1.3+ |
| 820917 046 | 0.2- | 0.0 | 850914 809 | 0.7+ | 0.4+ | 850920 809 | 0.6- | 0.6+ |
| 820917 046 | 0.4+ | 1.4- | 850914 809 | 0.8+ | 0.1+ | 850920 809 | 0.9- | 0.0 |
| 850905 809 | 0.7- | 0.1- | 850915 809 | 0.9- | 0.2+ | 850921 809 | 1.6+ | 0.3- |
| 850905 809 | 0.1- | 0.5- | 850915 809 | 0.5- | 0.0 | 850921 809 | 1.0+ | 0.8- |
| 850905 809 | 0.6+ | 0.7- | 850915 809 | 0.1- | 0.0 | 850921 809 | 0.1+ | 1.5- |

(3457)* 1985 RA3 = 1969 EU = 1973 AX1 = 1975 NT = 1979 HH4 = 1980 PT2
= 1980 RD4 = 1981 WD2 = 1983 CE1 = 1983 DV

Discovered 1985 Sept. 5 by H. Debehogne at the European Southern Observatory.

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 87.42668 | (1950.0) | P | Q | |
| n | 0.20459881 | Peri. | 206.96281 | +0.61463658 | +0.78684465 |
| a | 2.8523357 | Node | 101.01473 | -0.71307076 | +0.58440290 |
| e | 0.0559717 | Incl. | 3.25032 | -0.33727135 | +0.19836517 |
| P | 4.82 | H | 13.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 690312 095 | 0.2- | 2.0- | 850905 809 | 2.3- | 0.1+ | 850917 809 | 0.1+ | 0.1+ |
| 730101 095 | 1.7- | 0.4+ | 850907 809 | 0.6- | 1.8- | 850917 809 | 0.3+ | 0.2+ |
| 750711 095 | 2.0- | 1.8+ | 850907 809 | 0.3- | 1.7- | 850917 809 | 0.5+ | 0.2+ |
| 750713 095 | 2.7+ | 0.8- | 850907 809 | 0.2- | 1.5- | 850919 809 | 0.1+ | 0.1+ |
| 790424 095 | 1.5- | 0.7- | 850910 809 | 0.5+ | 1.2+ | 850919 809 | 0.3+ | 0.1+ |
| 800815 323 | 0.7- | 0.5+ | 850910 809 | 0.5+ | 1.1+ | 850919 809 | 0.6+ | 0.2+ |
| 800815 323 | 0.8- | 0.7+ | 850910 809 | 0.5+ | 1.1+ | 850919 809 | 0.2- | 0.9- |
| 800907 095 | 2.2+ | 2.2- | 850912 809 | 0.3+ | 0.6- | 850919 809 | 0.1+ | 0.9- |
| 811123 046 | 0.0 | 0.8- | 850912 809 | 0.3+ | 0.6- | 850919 809 | 0.2+ | 0.8- |
| 811123 046 | 0.6+ | 1.2+ | 850912 809 | 0.2+ | 0.7- | 850920 809 | 1.1+ | 0.2- |
| 830211 688 | 0.7- | 1.3- | 850914 809 | 1.3- | 0.7+ | 850920 809 | 1.1+ | 0.3- |
| 830211 688 | 1.2+ | 0.6- | 850914 809 | 1.3- | 0.6+ | 850920 809 | 1.2+ | 0.2- |
| 830219 688 | 0.3+ | 1.7- | 850914 809 | 1.2- | 0.6+ | 850921 809 | 1.7+ | 0.5- |
| 830219 688 | 0.5- | 1.0- | 850915 809 | 0.1- | 0.3- | 850921 809 | 1.8+ | 0.5- |
| 850905 809 | 2.5- | 0.0 | 850915 809 | 0.1- | 0.2- | 850921 809 | 1.9+ | 0.6- |
| 850905 809 | 2.4- | 0.1+ | 850915 809 | 0.1+ | 0.3- | | | |

(3458)* 1985 RT3 = 1933 BK = 1951 YP = 1964 FB = 1968 HG = 1974 VO1
= 1976 KA2 = 1980 LT = 1981 SU1 = 1983 CY1

Discovered 1985 Sept. 7 by H. Debehogne at the European Southern Observatory.

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 313.73563 | (1950.0) | P | Q | |
| n | 0.25696872 | Peri. | 336.39782 | -0.67076249 | -0.74151468 |
| a | 2.4502809 | Node | 155.71933 | +0.68622252 | -0.62830182 |
| e | 0.1522145 | Incl. | 2.13042 | +0.28138291 | -0.23535676 |
| P | 3.84 | H | 13.0 | G 0.25 | |

330125 024 3.3+ 0.5- 850907 809 1.0- 1.0+ 850919 809 0.9- 0.3-
330126 024 4.9- 2.6+ 850908 809 0.7+ 0.2+ 850919 809 0.7- 0.3-
330216 024 0.4+ 1.1- 850908 809 0.6+ 0.2+ 850919 809 0.5- 0.3-
511223 711 (0.5- 6.2+)Y 850908 809 0.9+ 0.2+ 850919 809 1.0- 0.4-
640316 760(0.06+ 0.01-)X 850911 809 0.5- 0.2+ 850919 809 0.5- 0.2-
680422 095 (6.7- 10.6-) 850911 809 0.2- 0.3+ 850920 809 0.3+ 0.6-
680426 095 0.6- 2.8- 850911 809 0.0 0.4+ 850920 809 0.2+ 0.7-
741112 095 2.9+ 2.4- 850914 809 0.1+ 0.8+ 850920 809 0.1+ 0.5-
741117 095 (2.8+ 7.0-) 850914 809 0.5+ 0.8+ 850920 809 0.1+ 0.5-
760529 808 2.6- 0.2- 850914 809 0.4+ 0.7+ 850920 809 0.3+ 0.6-
760529 808 1.4- 4.7- 850916 809 0.1+ 1.1+ 850920 809 0.2+ 0.7-
800610 675 4.6+ 3.4+ 850916 809 0.3+ 1.1+ 850921 809 0.0 0.4+
810926 688 1.3- 3.5- 850916 809 0.3- 0.9+ 850921 809 0.3+ 0.7+
810926 688 0.9- 0.7- 850918 809 0.5+ 0.5- 850921 809 0.3+ 0.6+
811004 688 2.1- 3.6- 850918 809 0.3+ 0.1- 850921 809 0.1- 0.4+
811004 688 3.0+ 2.3- 850918 809 0.5+ 0.3- 850921 809 0.0 0.4+
830215 046 0.7- 1.8- 850918 809 0.8+ 0.4- 850921 809 0.1+ 0.7+
830215 046 1.3- 0.0 850918 809 0.1+ 0.0 850922 809 0.3+ 0.8-
850907 809 0.8- 1.0+ 850918 809 0.6+ 0.4- 850922 809 0.1+ 0.7-
850907 809 0.9- 1.1+ 850919 809 0.8- 0.4-

1981 SC7 = 1981 WG7 = 1969 TL6 = 1969 UJ2 = 1977 SL3

The double designations 1981 SC7 = 1981 WG7 and 1969 TL6 = 1969 UJ2 were both given by H. Oishi on JAM 1997. The double designation 1969 TL6 = 1969 UJ2 was also found by S. Nakano (MPC 10610).

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| M | 55.62258 | | (1950.0) | | P | | Q | | | | |
| n | 0.24478837 | | Peri. | 344.54047 | | +0.90759149 | | -0.40856948 | | | |
| a | 2.5309032 | | Node | 40.01763 | | +0.39937821 | | +0.76908346 | | | |
| e | 0.2418779 | | Incl. | 8.64811 | | +0.12951734 | | +0.49150952 | | | |
| P | 4.03 | | H | 13.5 | | G | 0.25 | | | | |

691015 095 0.2+ 5.7+ 770923 095 0.4+ 0.2+ 811026 095 0.2+ 4.1+
691018 095 3.7- 5.2- 810928 095 0.3- 2.4- 811027 095 1.5+ 0.5-
691105 095 2.6+ 1.7- 811006 095 0.5- 0.6- 811125 095 1.9- 0.3-

1985 RB3 = 1948 TF = 1981 SH1

The identification 1985 RB3 = 1981 SH1 was independently suggested by F. N. Bowman.

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| M | 41.80424 | | (1950.0) | | P | | Q | | | | |
| n | 0.23870550 | | Peri. | 21.68606 | | +0.85438281 | | -0.51940944 | | | |
| a | 2.5737188 | | Node | 9.65201 | | +0.46200070 | | +0.74550812 | | | |
| e | 0.3196929 | | Incl. | 5.34403 | | +0.23787679 | | +0.41764994 | | | |
| P | 4.13 | | H | 15.0 | | G | 0.25 | | | | |

481008 062 0.2- 1.6- 850907 809 0.4+ 0.2- 850917 809 0.4+ 0.3+
481008 062 0.7+ 0.7+ 850907 809 0.7+ 0.1- 850917 809 0.2+ 0.1+
810926 688 0.5- 1.6- 850910 809 0.6- 0.4- 850919 809 1.0+ 0.8+
810926 688 1.8- 1.6- 850910 809 0.8- 0.3- 850919 809 0.9+ 0.7+
811004 688 1.4+ 0.1- 850910 809 1.0- 0.2- 850919 809 0.1+ 0.5+
811004 688 1.7+ 0.6+ 850912 809 0.7- 0.3- 850919 809 0.5+ 0.4+
811006 095 (3.0+ 0.3+) 850912 809 0.4- 0.3- 850919 809 1.1+ 0.8+
811007 095 (2.0- 3.8+) 850912 809 0.3- 0.5- 850919 809 0.2+ 0.5+
811027 095 (2.2- 1.2+) 850914 809 0.3+ 0.0 850920 809 0.9- 0.5+
811102 688 0.1- 0.8- 850914 809 0.1+ 0.1+ 850920 809 0.6- 0.3+
811102 688 0.7- 2.8+ 850914 809 0.0 0.1+ 850920 809 0.8- 0.3+
850905 809 0.3- 0.7- 850915 809 0.8+ 0.1- 850921 809 0.8- 0.5+
850905 809 0.5- 0.7- 850915 809 0.2+ 0.0 850921 809 0.5- 0.5+
850905 809 0.8- 1.0- 850915 809 0.4+ 0.0 850921 809 0.4- 0.5+
850907 809 0.6+ 0.1- 850917 809 0.8+ 0.2+

1985 RG4 = 1984 HE
Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | |
|---|---|---|---|---|
| M | 166.41460 | (1950.0) | P | Q |
| n | 0.22821045 | Peri. 57.30366 | -0.74691491 | +0.66171032 |
| a | 2.6520336 | Node 163.80799 | -0.66100606 | -0.72830354 |
| e | 0.1379690 | Incl. 13.53215 | -0.07203540 | -0.17808258 |
| P | 4.32 | H 12.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 840419 | 046 | 2.4+ | 0.1+ | 850912 | 809 | 1.1- 0.0 | 850917 | 809 0.6- 0.7+ |
| 840419 | 046 | 2.4+ | 0.5- | 850912 | 809 | 1.1- 0.1- | 850917 | 809 0.3- 0.7+ |
| 840424 | 046 | 2.7- | 0.9- | 850912 | 809 | 0.7- 0.4- | 850917 | 809 0.3- 0.7+ |
| 840424 | 046 | 2.3- | 0.1- | 850915 | 809 | 0.2+ 0.7+ | 850918 | 809 1.4- 0.5- |
| 840425 | 046 | 0.8+ | 0.4+ | 850915 | 809 | 0.5+ 0.7+ | 850918 | 809 1.4- 0.5- |
| 840425 | 046 | 0.7- | 1.1+ | 850915 | 809 | 0.5+ 0.6+ | 850918 | 809 1.1- 0.5- |
| 850911 | 809 | 0.1- | 1.0- | 850916 | 809 | 1.8+ 0.1+ | 850920 | 809 0.1+ 0.4+ |
| 850911 | 809 | 0.2+ | 1.0- | 850916 | 809 | 2.0+ 0.0 | 850920 | 809 0.2+ 0.3+ |
| 850911 | 809 | 0.1+ | 0.8- | 850916 | 809 | 2.3+ 0.2- | 850920 | 809 0.2+ 0.3+ |

* * * * *

ORBITAL ELEMENTS BY L. K. KRISTENSEN, INSTITUTE OF PHYSICS, AARHUS.

(3459)* 1986 GB = 1953 PA1 = 1965 AH = 1966 HM = 1976 HD = 1982 BL = 1983 LQ

Discovered 1986 Apr. 2 by P. Jensen at Brorfelde. The identifications were found independently by B. Knudsen and S. Nakano.

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | |
|---|---|---|---|---|
| M | 290.13139 | (1950.0) | P | Q |
| n | 0.29292484 | Peri. 200.45320 | +0.47855690 | +0.87342245 |
| a | 2.2454251 | Node 98.23173 | -0.79237631 | +0.47378776 |
| e | 0.1693301 | Incl. 5.22284 | -0.37831611 | +0.11250948 |
| P | 3.36 | H 13.9 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 530803 | 078 | 0.5- | 1.8- | 820118 | 688 | 4.5- 4.3- | 830613 | 675 0.4+ 1.1- |
| 650101 | 330 | 0.1+ | 0.9+ | 820118 | 046 | 0.8+ 1.1- | 830614 | 675(18.1+) 1.8+ |
| 660418 | 330 | 1.9+ | 2.2- | 820118 | 046 | 2.1+ 1.0- | 860402 | 054 0.5- 0.8+ |
| 760423 | 095 | 0.4- | 3.8- | 820119 | 046 | 0.5+ 1.6- | 860404 | 054 0.4+ 0.3+ |
| 760503 | 095 | 1.6+ | 4.3- | 820119 | 046 | 0.7+ 1.2- | 860404 | 054 1.4- 0.0 |
| 820116 | 046 | 2.7+ | 0.9+ | 830611 | 675 | 0.9+ 0.5- | 860405 | 054 0.8+ 0.2- |
| 820116 | 046 | 2.2- | 3.0+ | 830611 | 675 | 0.3+ 0.4- | 860408 | 054 1.0+ 0.4+ |
| 820118 | 688 | 0.3+ | 3.5- | 830613 | 675 | 1.2+ 0.6- | 860410 | 054 0.3+ 0.4+ |

* * * * *

ORBITAL ELEMENTS BY K. HURUKAWA, TOKYO ASTRONOMICAL OBSERVATORY.

The following orbital elements are from JAM 2008-2011. The identifications are by K. Hurukawa unless otherwise stated.

(3460)* 1973 QB2 = 1951 WJ2 = 1975 BU1 = 1979 WP7

Discovered 1973 Aug. 31 by T. M. Smirnova at the Crimean Astrophysical Observatory. The identification 1973 QB2 = 1975 BU1 was originally suggested at the Crimean Astrophysical Observatory (MPC 9476).

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | |
|---|---|---|---|---|
| M | 78.47920 | (1950.0) | P | Q |
| n | 0.17348156 | Peri. 289.39465 | +0.97471572 | -0.21965150 |
| a | 3.1839568 | Node 83.31044 | +0.21736032 | +0.88948653 |
| e | 0.2187859 | Incl. 2.36695 | +0.05180502 | +0.40070803 |
| P | 5.68 | H 12.1 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 511129 | 711 | 2.8- | 5.6- | Y | 750117 | 095 | 0.6+ | 0.8- | 851215 | 801 | 1.0+ | 1.1- |
| 730831 | 095 | 1.3+ | 0.4+ | | 780705 | 675 | 0.7- | 1.9- | 860110 | 801 | 0.4+ | 0.3- |
| 730905 | 095 | 0.3+ | 1.3+ | | 780706 | 675 | 0.4- | 2.3- | 860113 | 801 | 0.7+ | 0.4- |
| 730927 | 095 | 0.3+ | 0.8+ | | 791117 | 095 | 3.0- | 2.1- | | | | |

(3461)* 1977 SA1 = 1968 DQ = 1981 YU1

Discovered 1977 Sept. 18 by N. S. Chernykh at the Crimean Astrophysical Observatory. The identification 1977 SA1 = 1981 YU1 was found independently by A. Lowe (MPC 10025).

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 113.18569 | | (1950.0) | P | Q |
| n | 0.26867234 | Peri. | 343.43668 | +0.75510311 | -0.65386654 |
| a | 2.3785963 | Node | 57.49526 | +0.60771409 | +0.67077308 |
| e | 0.1346787 | Incl. | 3.24422 | +0.24597333 | +0.35003146 |
| P | 3.67 | H | 13.3 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 680227 | 095 | 0.1+ | 0.2+ | | 811219 | 330 | 0.9- | 0.2- | 860112 | 688 | 2.4+ | 0.3- |
| 770918 | 095 | 1.0- | 0.6- | | 811222 | 330 | 0.6- | 0.9- | 860113 | 801 | 1.2- | 0.3- |
| 770919 | 095 | 1.0+ | 0.9+ | | 811225 | 330 | 1.6+ | 0.1+ | 860204 | 801 | 2.0- | 0.7+ |
| 771009 | 095 | 0.3- | 0.4+ | | 851220 | 801 | 0.7+ | 1.7+ | | | | |
| 811124 | 095 | (6.1+ | 6.7-) | | 860112 | 688 | 0.6+ | 0.8- | | | | |

(3462)* 1981 UA10 = 1950 TL2 = 1977 SQ2 = 1977 TL6

Discovered 1981 Oct. 25 at the Purple Mountain Observatory. The identifications were found independently by L. D. Schmadel (MPC 10028).

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 100.93393 | | (1950.0) | P | Q |
| n | 0.25641011 | Peri. | 254.80556 | +0.98685051 | -0.13220087 |
| a | 2.4538384 | Node | 112.72002 | +0.15712670 | +0.91957551 |
| e | 0.2138835 | Incl. | 5.78660 | -0.03791128 | +0.37000515 |
| P | 3.84 | H | 13.4 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 501005 | 760 | 1.0- | 0.6+ | | 811023 | 095 | 2.3+ | 2.4+ | 851215 | 801 | 0.3+ | 0.3+ |
| 501005 | 760 | 0.5+ | 0.9+ | | 811025 | 330 | 2.1- | 0.3+ | 860112 | 801 | 0.6- | 0.5+ |
| 770919 | 095 | 0.6+ | 1.2- | | 811118 | 330 | 0.1+ | 2.2- | 860204 | 801 | 0.1+ | 0.6+ |
| 771008 | 095 | 0.1- | 0.3- | | 811201 | 330 | 0.0+ | 1.1- | | | | |

(3463)* 1981 XJ2 = A923 RM = 1954 WS = 1979 HP3

Discovered 1981 Dec. 3 at the Purple Mountain Observatory. The identification 1981 XJ2 = 1979 HP3 was found independently by L. D. Schmadel (MPC 10028).

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 48.97827 | | (1950.0) | P | Q |
| n | 0.25741659 | Peri. | 49.23515 | -0.16667299 | -0.98516984 |
| a | 2.4474379 | Node | 50.40675 | +0.88792171 | -0.16793366 |
| e | 0.1327571 | Incl. | 3.03125 | +0.42873669 | -0.03519471 |
| P | 3.83 | H | 13.2 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 230913 | 024 | 0.1- | 0.3+ | | 811203 | 330 | 0.6- | 2.0+ | 860110 | 801 | 1.2- | 0.7- |
| 230914 | 024 | (2.1+ | 20.5-) | | 811219 | 330 | 0.3+ | 0.7- | 860112 | 688 | 0.7+ | 1.6- |
| 541116 | 210 | (24.6+ | 0.6+)X | | 811222 | 330 | 0.8+ | 0.0+ | 860209 | 801 | 0.9- | 0.4+ |
| 790425 | 095 | 0.5+ | 1.3+ | | 811225 | 330 | 0.8- | 0.0+ | | | | |
| 811124 | 095 | 4.1+ | 2.3- | | 851220 | 801 | 1.4+ | 1.2+ | | | | |

(3464)* 1983 BA = 1931 TD2 = 1970 EL2 = 1975 VO6 = 1975 XL3

Discovered 1983 Jan. 16 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | |
|---|---|---|---|---|
| M 272.71765 | (1950.0) | P | Q | |
| n 0.29401708 | Peri. 250.01070 | -0.82205291 | +0.56524060 | |
| a 2.2398607 | Node 324.31172 | -0.46832009 | -0.73987524 | |
| e 0.0445236 | Incl. 6.77193 | -0.32389088 | -0.36481188 | |
| P 3.35 | H 13.6 | G 0.25 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 311010 | 024 | 1.4+ | 2.6- | 751106 | 095 | 1.5- | 0.9+ | 830121 | 688 | 1.5- | 1.3- |
| 311016 | 024 | (9.9+ | 2.7+) | 751202 | 095 | 1.0+ | 3.0+ | 830121 | 688 | 4.3+ | 0.2- |
| 311019 | 024 | (9.0- | 3.9-) | 830109 | 688 | 0.4- | 0.2+ | 851215 | 801 | 0.3+ | 0.6+ |
| 700304 | 805 | 0.2- | 0.1+ | 830109 | 688 | 2.3+ | 0.1- | 860205 | 801 | 0.5- | 0.1- |
| 700304 | 805 | 0.4- | 0.3+ | 830116 | 688 | 1.5- | 0.7- | | | | |
| 700304 | 805 | 0.2+ | 0.0- | 830116 | 688 | 4.1- | 1.3- | | | | |

(3465)* 1984 SQ5 = 1966 PO = 1966 PY = 1976 GV8 = 1976 JB2

Discovered 1984 Sept. 20 by H. Debehogne at the European Southern Observatory. The double designation 1966 PO = 1966 PY was found by H. Oishi (JAM 853).

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | |
|---|---|---|---|---|
| M 292.00040 | (1950.0) | P | Q | |
| n 0.27989148 | Peri. 137.19586 | -0.34909504 | +0.93195077 | |
| a 2.3146017 | Node 112.15608 | -0.88578731 | -0.29405434 | |
| e 0.0514790 | Incl. 6.07289 | -0.30579976 | -0.21213161 | |
| P 3.52 | H 13.5 | G 0.25 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 660807 | 074 | 0.5+ | 2.4+ | 840922 | 809 | 0.4+ | 0.1- | 840928 | 809 | 0.0- | 0.4+ |
| 660807 | 074 | 0.0+ | 2.2+ | 840922 | 809 | 0.7+ | 0.1+ | 840928 | 809 | 0.1- | 0.0+ |
| 660809 | 074 | 3.2+ | 0.5+ | 840922 | 809 | 0.7+ | 0.2- | 840929 | 809 | 1.5- | 0.3+ |
| 660810 | 074 | 0.7+ | 0.8+ | 840923 | 809 | 0.2+ | 0.2+ | 840929 | 809 | 1.3- | 0.4+ |
| 660812 | 074 | 2.3+ | 0.5+ | 840923 | 809 | 0.5+ | 0.2+ | 840929 | 809 | 1.0- | 0.5+ |
| 660812 | 074 | 1.0+ | 0.2+ | 840923 | 809 | 1.1+ | 0.2+ | 840930 | 809 | 1.0- | 0.3- |
| 660816 | 074 | 8.6- | 2.9- | 840924 | 809 | 0.4- | 0.0- | 840930 | 809 | 1.2- | 0.0+ |
| 760406 | 808 | 0.8+ | 0.1+ | 840924 | 809 | 0.5+ | 0.0+ | 840930 | 809 | 1.7- | 0.1+ |
| 760406 | 808 | 1.0+ | 0.6- | 840924 | 809 | 0.7+ | 0.0- | 841001 | 809 | 1.1- | 0.0+ |
| 760502 | 095 | 1.8- | 0.1- | 840926 | 809 | 1.1- | 0.1- | 841001 | 809 | 1.1- | 0.4- |
| 840920 | 809 | 0.6+ | 0.2- | 840926 | 809 | 0.6- | 0.4- | 841001 | 809 | 0.3- | 0.7- |
| 840920 | 809 | 0.7+ | 0.1+ | 840926 | 809 | 0.3+ | 0.6- | 860113 | 801 | 0.3+ | 0.2+ |
| 840920 | 809 | 0.9+ | 0.3+ | 840927 | 809 | 1.2+ | 0.4- | 860204 | 801 | 0.4+ | 3.3+ |
| 840921 | 809 | 0.0+ | 0.0- | 840927 | 809 | 1.8+ | 0.2- | 860227 | 054 | 0.2+ | 0.0- |
| 840921 | 809 | 0.2+ | 0.2- | 840927 | 809 | 2.4+ | 0.5- | | | | |
| 840921 | 809 | 0.5+ | 0.1- | 840928 | 809 | 0.6- | 0.8+ | | | | |

* * * * *

ORBITAL ELEMENTS BY S. NAKANO, TOKYO.

The identifications are by S. Nakano unless otherwise stated.

1939 SF = 1973 WO = 1985 LE

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

| | | | | |
|---|---|---|---|---|
| M 46.77932 | (1950.0) | P | Q | |
| n 0.23448672 | Peri. 106.78849 | +0.97768362 | +0.05862305 | |
| a 2.6045023 | Node 250.21339 | -0.12273909 | +0.93873446 | |
| e 0.2300883 | Incl. 12.38007 | +0.17049884 | +0.33961883 | |
| P 4.20 | H 12.5 | G 0.25 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 390919 | 062 | 1.3+ | 0.5+ | 391017 | 062 | 0.9- | 0.6- | 731124 | 026 | 1.0+ | 1.6- |
| 390920 | 062 | 0.4- | 1.0- | 391020 | 062 | 0.2+ | 2.4+ | 850615 | 675 | 1.8+ | 1.5- |
| 391007 | 062 | 0.9- | 0.7+ | 731124 | 026 | 1.6- | 1.7- | 850615 | 675 | 0.7- | 1.4- |

1967 GF1 = 1950 JA = 1955 RH = 1981 QK2
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | |
|---|---|---|---|---|
| M | 93.14039 | (1950.0) | P | Q |
| n | 0.22738335 | Peri. 127.77418 | -0.00611896 | +0.98890563 |
| a | 2.6584662 | Node 141.06994 | -0.97557190 | +0.02668984 |
| e | 0.1555221 | Incl. 13.66216 | -0.21959516 | -0.14612769 |
| P | 4.33 | H 13.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 500513 012 | 2.8+ | 1.4- | 670411 033 | 1.3+ | 0.2- | 670415 033 | 1.4+ | 1.2- |
| 500514 024 | 2.9- | 2.1+ | 670411 033 | 0.2- | 0.1- | 810830 688 | 0.8+ | 0.7- |
| 550913 760 | 0.5+ | 4.8+ | 670411 033 | 1.9- | 0.8+ | 810830 688 | 0.4+ | 6.5- |
| 550913 760 | 0.8+ | 1.3+ | 670411 033 | 0.8+ | 0.0 | | | |
| 550921 760 | 2.5- | 1.6+ | 670415 033 | 1.1- | 0.7+ | | | |

1983 VP7 = 1983 WN1 = 1953 RD1 = 1966 TO = 1970 QL1
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | |
|---|---|---|---|---|
| M | 283.50158 | (1950.0) | P | Q |
| n | 0.23158991 | Peri. 312.04807 | +0.72589835 | +0.68754562 |
| a | 2.6261760 | Node 4.63264 | -0.54212059 | +0.58873638 |
| e | 0.1891317 | Incl. 13.44385 | -0.42329287 | +0.42505351 |
| P | 4.26 | H 11.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 530907 024 | 2.8- | 4.2- | 700831 095 | 3.8+ | 2.3+ | 831123 330 | 1.8+ | 3.9- |
| 661013 095 | 0.5- | 3.9+ | 831101 330 | 3.5- | 1.4+ | 831128 330 | 2.5+ | 4.3- |
| 661017 095 | 2.7+ | 6.0+ | 831105 330 | 3.2- | 0.3+ | 831201 330 | 1.5+ | 2.0- |

1986 EM1 = 1951 KV = 1970 GT = 1974 TT = 1974 UP = 1983 JT
The double designation 1974 TT = 1974 UP is by B. G. Marsden (MPC 9041).
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | |
|---|---|---|---|---|
| M | 258.45840 | (1950.0) | P | Q |
| n | 0.30695284 | Peri. 303.47534 | +0.84499693 | +0.53382789 |
| a | 2.1764857 | Node 24.30602 | -0.46145620 | +0.75786812 |
| e | 0.1173617 | Incl. 4.42377 | -0.27025612 | +0.37505159 |
| P | 3.21 | H 13.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 510527 711 | 1.5+ | 5.4+ Y | 741019 808 | 0.5+ | 1.3- | 860401 046 | 5.6- | 0.4- |
| 700410 805 | 0.4+ | 0.6+ | 830507 688 | 1.3- | 0.8+ | 860402 046 | 1.6+ | 1.1- |
| 700410 805 | 0.8+ | 1.5+ | 830507 688 | 0.5+ | 2.1- | 860402 046 | 0.9- | 2.1- |
| 700410 805 | 0.5+ | 1.0+ | 830515 688 | 1.7- | 3.3- | 860402 046 | 0.3- | 1.8- |
| 741010 808 | 0.3+ | 0.8- | 830515 688 | 0.4- | 2.6- | 860409 046 | 0.3- | 0.1+ |
| 741010 808 | 0.5+ | 0.8- | 860305 688 | 0.3- | 0.9+ | 860409 046 | 1.0+ | 0.2- |
| 741019 808 | 0.7+ | 1.2- | 860305 688 | 2.2+ | 0.2- | | | |

1986 GC = 1982 BB6
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | |
|---|---|---|---|---|
| M | 351.33700 | (1950.0) | P | Q |
| n | 0.27153143 | Peri. 167.22448 | -0.73935043 | +0.66551463 |
| a | 2.3618746 | Node 54.97873 | -0.62819344 | -0.62715116 |
| e | 0.0809056 | Incl. 7.17115 | -0.24235087 | -0.40468717 |
| P | 3.63 | H 14.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 820126 381 | 1.5- | 0.3+ | 860402 054 | 0.8- | 0.8+ | 860408 054 | 4.4+ | 0.6+ |
| 820126 381 | 1.2+ | 0.3- | 860404 054 | 1.0- | 0.3+ | 860410 054 | 3.2- | 0.1+ |
| 820128 381 | 0.3+ | 0.0 | 860405 054 | 0.6+ | 1.8- | | | |

ORBITAL ELEMENTS BY T. KOBAYASHI, TOKYO.

The identifications are by T. Kobayashi unless otherwise stated.

1931 TC1 = 1972 VW = 1981 WP

The identification 1981 WP = 1972 VW was independently suggested by L. D. Schmadel.

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 51.89513 | (1950.0) | | P | Q |
| n | 0.21823968 | Peri. | 308.64384 | +0.90122632 | +0.42719189 |
| a | 2.7322068 | Node | 26.30462 | -0.32870426 | +0.78334325 |
| e | 0.2380504 | Incl. | 9.45399 | -0.28239092 | +0.45153122 |
| P | 4.52 | H | 13.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 311006 024 | 6.7+ | 3.3+ | 811004 095 | 3.8- | 6.6+ | 811124 095 | 0.8- | 0.2- |
| 311013 024 | 5.7- | 2.2- | 811023 095 | 1.8+ | 2.5+ | 811202 688 | 0.1+ | 2.6- |
| 311017 024 | 0.4+ | 4.3- | 811124 688 | 1.2- | 0.9- | 811202 688 | 0.2- | 1.6- |
| 721108 095 | 2.3+ | 0.6- | 811124 688 | 0.7+ | 0.5- | | | |

1967 UV = 1953 UW = 1958 DM = 1960 VE = 1975 AV = 1979 HQ = 1984 YO1

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 149.81042 | (1950.0) | | P | Q |
| n | 0.28932063 | Peri. | 35.66242 | -0.03060301 | -0.99725613 |
| a | 2.2640349 | Node | 56.18281 | +0.89715957 | -0.05713642 |
| e | 0.1149299 | Incl. | 4.65370 | +0.44064516 | +0.04707063 |
| P | 3.41 | H | 13.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 531031 760 | 1.2- | 1.2- | 671030 029 | 0.6- | 0.5- | 790426 807 | 0.8+ | 0.1+ |
| 531031 760 | 0.4+ | 1.6+ | 671031 029 | 0.2+ | 0.4+ | 790426 807 | 0.7+ | 0.5+ |
| 580223 760(55.9+ 43.4+)X | | | 671031 029 | 0.7+ | 0.6+ | 841217 095 | 1.0+ | 0.2- |
| 601112 760(64.8+ 61.5+)X | | | 671031 029 | 0.6+ | 0.4+ | 841223 095 | 0.6- | 0.3+ |
| 671013 029 | 1.2- | 0.1+ | 750110 026 | 0.7- | 0.3+ | 841227 095 | 0.6- | 0.5- |
| 671014 029 | 1.4+ | 0.4+ | 750111 026 | 0.1- | 0.4- | | | |
| 671014 029 | 0.5+ | 0.3+ | 790419 807 | 0.6- | 0.9+ | | | |

1983 NT = 1935 EH = 1952 HT1 = 1984 YM1

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 72.21085 | (1950.0) | | P | Q |
| n | 0.29316882 | Peri. | 213.91226 | -0.99861277 | -0.01068641 |
| a | 2.2441792 | Node | 325.36400 | +0.03346243 | -0.88482673 |
| e | 0.0974517 | Incl. | 5.20477 | -0.04065469 | -0.46579765 |
| P | 3.36 | H | 13.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 350307 024 | 0.2+ | 0.4+ | 830713 688 | 3.4- | 0.6- | 841217 095 | 0.9+ | 1.8+ |
| 520421 094(43.0+ 69.1+)X | | | 830713 688 | 0.2- | 0.5- | 841223 095 | 1.8- | 1.7- |
| 830711 688 | 0.7+ | 1.1+ | 830813 688 | 1.6+ | 1.2+ | 841227 095 | 0.9+ | 0.1+ |
| 830711 688 | 0.8+ | 0.7- | 830813 688 | 0.3+ | 0.1- | | | |

1984 UX1 = 1976 QB2

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 133.61507 | (1950.0) | | P | Q |
| n | 0.26308269 | Peri. | 22.91317 | +0.42534727 | -0.90135638 |
| a | 2.4121698 | Node | 42.03671 | +0.81032404 | +0.33920400 |
| e | 0.1180520 | Incl. | 6.98788 | +0.40305664 | +0.26925327 |
| P | 3.75 | H | 13.5 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 760820 808 | 0.5- | 0.8- | 841020 095 | 0.3- | 0.1- | 841031 688 | 1.8- | 0.1- |
| 760823 808 | 0.5- | 0.1+ | 841029 688 | 0.8+ | 0.3- | 841031 688 | 0.5- | 0.3+ |
| 760823 808 | 1.0+ | 0.8+ | 841029 688 | 1.8+ | 0.2+ | | | |

1984 YY = 1938 DA2 = 1971 TS = 1974 QO = 1981 YC2
Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | |
|---|---|---|---|---|
| M | 240.33381 | (1950.0) | P | Q |
| n | 0.30920710 | Peri. 286.25848 | +0.98250169 | +0.18510451 |
| a | 2.1658901 | Node 63.07820 | -0.16080334 | +0.89898202 |
| e | 0.1837867 | Incl. 1.32761 | -0.09398258 | +0.39694792 |
| P | 3.19 | H 13.0 | G 0.25 | |

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

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 380228 | 053(0.07- | 0.26-)X | 740823 095 | 0.2- | 2.3- | 841222 552 | 1.1- | 0.1+ |
| 380306 | 053(21.6- | 18.3-)X | 811222 330 | 0.0 | 0.2+ | 841223 801 | 2.4+ | 0.8+ |
| 711010 | 095 | 0.0 0.0 | 841217 095 | 0.0 | 0.8- | 841223 095 | 0.0 | 1.1- |
| 740818 | 095 | 0.1+ 2.4+ | 841222 552 | 0.1+ | 2.0+ | 841227 095 | 1.4- | 1.3- |

* * * * *

ORBITAL ELEMENTS BY H. OISHI, NIIZA, JAPAN.

The following orbital elements are from JAM 2005-2008. The identifications are by H. Oishi unless otherwise stated.

(3466)* 1975 EA6 = 1943 DC = 1947 LN = 1968 DM = 1982 BT2 = 1983 NS

Discovered 1975 Mar. 6 by N. S. Chernykh at the Crimean Astrophysical Observatory.

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | |
|---|---|---|---|---|
| M | 352.85370 | (1950.0) | P | Q |
| n | 0.27563396 | Peri. 127.14857 | -0.61966259 | +0.78430164 |
| a | 2.3383754 | Node 104.53319 | -0.72948435 | -0.56150157 |
| e | 0.1577595 | Incl. 1.76530 | -0.28960466 | -0.26379334 |
| P | 3.58 | H 13.4 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 430227 | 024 | 0.9- 2.3+ | 820121 046 | 0.3- | 1.0- | 860403 054 | (0.5- | 6.0+) |
| 470615 | 690 | 0.5- 0.0 | 820121 046 | 2.3- | 1.5- | 860404 054 | 0.2+ | 0.6+ |
| 470616 | 690 | 1.5+ 0.0 | 830711 688 | 0.8+ | 1.2- | 860405 054 | 0.0 | 0.7+ |
| 680225 | 095 | 0.9- 1.3- | 830711 688 | 2.0+ | 1.3- | 860405 801 | 1.3+ | 0.5+ |
| 680325 | 095 | (6.3- 5.1+) | 830713 688 | 1.7+ | 2.2- | 860409 688 | 0.3- | 0.1- |
| 680327 | 095 | 0.0 2.2- | 830713 688 | 3.2- | 1.7- | 860409 046 | 4.5- | 1.4- |
| 750306 | 095 | 1.2+ 0.3- | 860305 688 | 0.8+ | 0.0 | 860409 046 | 2.4- | 2.2- |
| 750308 | 095 | 1.0- 0.7- | 860305 688 | 0.6+ | 1.0- | 860410 398 | 3.3+ | 2.1+ |
| 750312 | 095 | 0.1- 3.1- | 860401 046 | 0.4- | 1.7- | 860410 398 | 1.8+ | 2.7+ |
| 750315 | 095 | 1.1+ 0.9- | 860402 046 | 0.4+ | 2.2- | 860410 054 | 0.3- | 1.7+ |
| 820120 | 046 | 0.3- 0.3+ | 860402 054 | 1.0+ | 1.7+ | | | |
| 820120 | 046 | 1.3+ 0.0 | 860402 054 | 0.6- | 1.4+ | | | |

(3467)* 1981 SF2 = 1981 SJ6 = 1981 UB19 = 1929 WG1 = 1968 DP = 1970 WR = 1977 QJ

Discovered 1981 Sept. 26 by N. G. Thomas at the Anderson Mesa Station of the Lowell Observatory. The triple designation 1981 SF2 = 1981 SJ6 = 1981 UB19 is by K. Hurukawa (JAM 1959).

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | |
|---|---|---|---|---|
| M | 18.93298 | (1950.0) | P | Q |
| n | 0.26336319 | Peri. 349.04211 | -0.07048585 | -0.99511024 |
| a | 2.4104567 | Node 104.97269 | +0.92048681 | -0.09161365 |
| e | 0.1468568 | Incl. 4.10718 | +0.38436413 | +0.03691282 |
| P | 3.74 | H 13.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 291127 | 690 | 2.7+ | 1.3+ | 810926 | 688 | 1.7+ | 1.2- | 811005 688 0.7+ 0.1- |
| 291203 | 690 | 2.2- | 1.6- | 810926 | 688 | 0.8- | 1.2- | 811026 095 (1.9+ 6.2+) |
| 680227 | 095 | 0.4- | 0.0 | 810926 | 688 | 2.3+ | 1.4+ | 851116 801 0.7+ 2.5+ |
| 701126 | 095 | 0.0 | 4.5- | 810926 | 688 | 1.6- | 0.9- | 860111 801 0.2- 2.5+ |
| 770818 | 095 | 1.7+ | 0.2- | 810928 | 095 | 1.2- | 2.9+ | |
| 810908 | 095 | 1.0- | 1.4+ | 811005 | 688 | 2.4- | 2.1- | |

1974 FV1 = 1974 HN3 = 1930 XF = 1953 SG = 1965 TA = 1975 NQ
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 298.11672 | (1950.0) | | P | Q |
| n | 0.08274991 | Peri. | 54.97403 | +0.94721531 | +0.23641488 |
| a | 5.2154514 | Node | 290.49060 | -0.31269973 | +0.83028910 |
| e | 0.1588709 | Incl. | 13.36596 | +0.07072512 | +0.50470587 |
| P | 11.91 | H | 10.1 | G 0.25 | |

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

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 301213 | 690(0.04+ 0.02-)X | 651002 | 095 | 0.0 | 0.3+ | 740424 | 805 | 0.3- 0.9+ |
| 301214 | 690(23.5+ 67.3-)X | 740321 | 805 | 1.3+ | 0.0 | 740425 | 805 | 0.6- 2.6- |
| 530917 | 760 0.6- 0.6+ | 740322 | 805 | 0.3- | 0.2+ | 750711 | 095 | 0.7- 1.2+ |
| 530917 | 760 1.2+ 2.1- | 740421 | 805 | 0.4+ | 1.0- | | | |
| 651001 | 095 0.1- 0.2+ | 740422 | 805 | 0.0 | 0.8+ | | | |

1976 HQ = 1976 JD2 = 1976 KY1 = 1978 VK12 = 1986 AK1
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| | | | | | |
|---|---|---|---|---|---|
| M | 311.11784 | (1950.0) | | P | Q |
| n | 0.17729099 | Peri. | 89.26330 | -0.88022464 | +0.46171305 |
| a | 3.1381893 | Node | 118.22871 | -0.46965576 | -0.81442890 |
| e | 0.0640163 | Incl. | 7.14983 | -0.06802975 | -0.35146354 |
| P | 5.56 | H | 11.7 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 760426 | 808 | 1.3+ | 0.9+ | 760525 | 095 | 2.2- | 2.5+ | 860111 688 0.3- 1.5+ |
| 760426 | 808 | 1.9+ | 3.0- | 781102 | 095 | 0.0 | 0.1+ | 860117 688 0.5+ 1.1- |
| 760502 | 095 | 1.0- | 0.1- | 860111 | 688 | 0.1- | 0.7+ | 860117 688 0.2- 0.9- |

* * * * *

ORBITAL ELEMENTS BY T. URATA, SHIMIZU, JAPAN.

The following orbital elements are from NOC 1557-1559. The identifications are by T. Urata unless otherwise stated.

(3468)* 1975 AM = 1984 YD

Discovered 1975 Jan. 7 by P. Wild at Zimmerwald. The identification was found independently by H. Oishi.

Epoch 1986 June 19.0 ET = JDE 2446600.5

| | | | | | |
|---|---|---|---|---|---|
| M | 155.23049 | (1950.0) | | P | Q |
| n | 0.18771438 | Peri. | 308.12746 | +0.86037784 | -0.47350766 |
| a | 3.0209093 | Node | 80.86689 | +0.50657359 | +0.75389175 |
| e | 0.0816760 | Incl. | 11.00779 | +0.05597466 | +0.45545333 |
| P | 5.25 | H | 12.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 750107 | 026 | 1.4+ | 1.0- | 750305 | 026 | 0.8- | 1.2- | 841231 095 (0.3- 10.1-) |
| 750110 | 026 | 0.2+ | 0.5- | 841223 | 881 | (6.4- | 4.5+)Y | 860209 801 1.6+ 0.3+ |
| 750118 | 801 | 3.0- | 1.3+ | 841223 | 881 | 0.8- | 2.1+ Y | 860213 801 0.0 0.5+ |
| 750205 | 026 | 1.1+ | 0.1- | 841227 | 095 | 0.2- | 0.1+ | 860312 889 3.2- 1.6- Y |
| 750207 | 026 | 0.3- | 0.5+ | 841229 | 095 | 1.8+ | 0.1- | 860405 801 2.1+ 1.7+ |
| 750218 | 026 | 1.3+ | 0.4- | 841230 | 095 | 0.9- | 1.4- | |

1982 FH3 = 1980 XJ3 = 1986 GA
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| M 345.25877 | (1950.0) | P | Q |
|---|---|---|---|
| n 0.25630870 | Peri. 59.95367 | -0.42203935 | +0.90656143 |
| a 2.4544905 | Node 185.09191 | -0.85127594 | -0.39833606 |
| e 0.0920895 | Incl. 3.48777 | -0.31178848 | -0.13955196 |
| P 3.85 | H 13.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801210 095 | 0.0 | 0.1+ | 820330 809 | 0.3+ | 0.0 | 820401 809 | 0.4- | 0.1+ |
| 820321 809 | 1.4+ | 0.4- | 820330 809 | 0.2+ | 0.0 | 820401 809 | 0.2+ | 0.0 |
| 820321 809 | 1.3+ | 0.1- | 820330 809 | 0.3+ | 0.3+ | 820401 809 | 0.4+ | 0.4- |
| 820321 809 | 1.3+ | 0.4+ | 820331 809 | 0.5- | 0.1- | 820401 809 | 0.2+ | 0.4- |
| 820326 809 | 3.3- | 1.8+ | 820331 809 | 0.1- | 0.2- | 820401 809 | 0.4+ | 0.5- |
| 820326 809 | 3.6- | 1.8+ | 820331 809 | 0.0 | 0.4- | 860407 889 | 1.5- | 0.6- |
| 820326 809 | 3.8- | 1.7+ | 820331 809 | 0.3+ | 1.4- | 860407 889 | 1.4+ | 1.2- |
| 820329 809 | 1.4+ | 0.1- | 820331 809 | 0.7+ | 1.4- | 860412 386 | 0.8- | 3.1+ |
| 820329 809 | 1.2+ | 0.0 | 820331 809 | 0.9+ | 1.5- | 860412 386 | 0.4+ | 1.6+ |
| 820329 809 | 1.0+ | 0.5+ | 820401 809 | 0.2- | 0.0 | 860413 801 | 0.6+ | 2.4- |

1985 BB
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

| M 297.59430 | (1950.0) | P | Q |
|---|---|---|---|
| n 0.19324554 | Peri. 229.51856 | +0.36535662 | +0.93018985 |
| a 2.9629928 | Node 61.94445 | -0.84137095 | +0.34631300 |
| e 0.0344216 | Incl. 2.30649 | -0.39825803 | +0.12171336 |
| P 5.10 | H 14.0 | G 0.25 | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 850126 372 | 0.5+ | 0.6- | 850210 372 | 2.9- | 0.4+ | 860514 372 | 1.7+ | 1.9- |
| 850126 372 | 0.6- | 1.9+ | 850210 372 | 2.3+ | 0.3- | 860514 372 | 1.8- | 1.9+ |
| 850131 372 | 1.3+ | 1.1- | 850224 372 | 0.5+ | 0.6+ | | | |
| 850131 372 | 0.9- | 1.0- | 850224 372 | 0.2- | 0.1- | | | |

* * * * *

NEW NAMES OF MINOR PLANETS.

(2543) Machado = 1980 LJ

Discovered 1980 June 1 by H. Debehogne at the European Southern Observatory.

Named in honor of Luiz Eduardo da Silva Machado, director of the Valongo Observatory and professor at the Universidade Federal do Rio de Janeiro, codeveloper with the discoverer of the program of astrometry of minor planets and comets at the European Southern Observatory. He has also promoted the installation of a Zeiss astrograph at Campinas.

(2624) Samitchell = 1962 RE

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

Named in memory of Samuel Alfred Mitchell (1874-1960), a faculty member of Columbia University from 1899 to 1913 and then director of the Leander McCormick Observatory until 1945, known for his work on solar eclipses and stellar parallaxes. His measurements of the flash spectrum at the eclipses in 1900, 1901 and 1905 referred to nearly 3000 lines. His book "Eclipses of the Sun" went through five editions. His photographic parallax work with the McCormick refractor resulted in the publication of 2001 parallaxes by 1950. Subsequent work by van de Kamp and Vyssotsky, encouraged and supported by Mitchell, yielded absolute proper motions of 29 000 stars between magnitudes 8 and 12. Name proposed by F. K. Edmondson.

(2814) Vieira = 1982 FA3
Discovered 1982 Mar. 18 by H. Debehogne at the European Southern Observatory.
Named in honor of Gilson Vieira, astronomer at the Valongo Observatory and professor at the Universidade Federal do Rio de Janeiro, collaborator in the program that produced the discovery of this object, in particular by adapting computer programs for orbit computations and astrometric reductions.

(2839) Annette = 1929 TP
Discovered 1929 Oct. 5 by C. W. Tombaugh at the Lowell Observatory.
Named by the discoverer in honor of his daughter.

(2926) Caldeira = 1980 KG
Discovered 1980 May 22 by H. Debehogne at the European Southern Observatory.
Named in honor of Felipe Caldeira, astronomer at the Valongo Observatory and professor at the Universidade Federal do Rio de Janeiro, participant in the minor-planet program at the European Southern Observatory.

(2941) Alden = 1930 YV
Discovered 1930 Dec. 24 by C. W. Tombaugh at the Lowell Observatory.
Named by the discoverer in honor of his son.

(3015) Candy = 1980 VN
Discovered 1980 Nov. 9 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.
Named in honor of Michael P. Candy, acting director of Perth Observatory and an active astrometrist and orbit computer for more than thirty years. While on the staff of the Royal Greenwich Observatory he discovered comet 1961 II, and he now fulfills a major role in southern-hemisphere astronomy by obtaining positions, particularly of comets and minor planets, that would be difficult for northern observers. A former director of the comet section of the British Astronomical Association and editor of the B.A.A. Circulars, he served as president of IAU Commission 6 during 1982-1985. Citation prepared by P. V. Birch and B. G. Marsden.

(3031) Houston = 1984 CX
Discovered 1984 Feb. 8 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.
Named in honor of Walter Scott Houston, American amateur astronomer well known for his column "Deep Sky Wonders" in the magazine "Sky and Telescope". Houston has specialized in the visual study of deep-sky objects and has guided countless amateurs to view and marvel at the varied objects within the grasp of small telescopes. Name proposed by the discoverer following a suggestion by P. L. Dombrowski.

(3032) Evans = 1984 CA1
Discovered 1984 Feb. 8 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.
Named in honor of the Reverend Robert O. Evans, Australian amateur astronomer and discoverer of several extragalactic supernovae. Evans has successfully used a systematic visual search program to examine selected galaxies for supernova activity. Name proposed by the discoverer following a suggestion by P. L. Dombrowski.

(3061) Cook = 1982 UB1
Discovered 1982 Oct. 21 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.
Named for James Cook (1728-1779), British circumnavigator and one of the first scientific navigators. He observed the solar eclipse of 1766 Aug. 5 from Newfoundland and in 1769 measured the transit of Venus from Tahiti. In 1761 he assisted the Astronomer Royal, Nevil Maskelyne, in tests of John Harrison's fourth marine chronometer as a means of determining longitude at sea. Name proposed by the discoverer following a suggestion by B. Hetherington.

(3062) Wren = 1982 XC
Discovered 1982 Dec. 14 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.
Named for Christopher Wren (1632-1723), British architect and astronomer who was professor of astronomy at Gresham College, London, and later professor of astronomy at Oxford. Wren prepared a scheme for rebuilding London after the Great Fire of 1666, his most noted building being St. Paul's Cathedral. He also designed and built the Royal Observatory at Greenwich in 1675. Name proposed by the discoverer following a suggestion by B. Hetherington.

(3077) Henderson = 1982 SK
Discovered 1982 Sept. 22 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.
Named for Thomas Henderson (1798-1844), Scottish astronomer and noted computer. He was appointed Royal Astronomer at the Cape of Good Hope and later Astronomer Royal for Scotland. Henderson computed an improved value for the solar parallax and was the first to measure the distance to a star, Alpha Centauri, in 1839. Name proposed by the discoverer following a suggestion by B. Hetherington.

(3078) Horrocks = 1984 FG
Discovered 1984 Mar. 31 by E. Bowell at the Anderson Mesa Station of the Lowell of Observatory.
Named for Jeremiah Horrocks (1619-1641), the English astronomer who predicted the transit of Venus across the face of the sun in 1639 Nov. and became the first to see such an event. From his observations he improved the orbital elements and the diameter of Venus. He believed the moon to have an elliptical orbit with the earth at one focus--a fact that Newton was later to acknowledge. Name proposed by the discoverer following a suggestion by B. Hetherington.

(3104) Durer = 1982 BB1
Discovered 1982 Jan. 24 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.
Named for Albrecht Durer of Nuremberg (1471-1528), master painter, woodcutter, engraver, scholar of the Renaissance. Durer is noted for his meticulous applications of perspective geometry to art, not only for his rendering of the unusual themes of his times, but also for his beautiful and accurate depictions of scientific instruments and of constellations. Name proposed by the discoverer following a suggestion by G. Reaves.

(3106) Morabito = 1981 EE
Discovered 1981 Mar. 9 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.
Named in honor of Linda A. Morabito, member of the Optical Navigation Team for the Voyager 1 spacecraft, who because of her alertness, knowledge of astronomy and skill in image processing discovered an active volcano on

the Galilean satellite Io. Name proposed by the discoverer following a suggestion by G. Reaves.

(3115) Baily = 1981 PL

Discovered 1981 Aug. 3 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Named for Francis Baily (1774-1844), English astronomer and one of the founders of the Royal Astronomical Society. During his observation of the total solar eclipse of 1836 he noticed intrusions of sunlight around the moon's limb, which have become known as Baily's beads. Name proposed by the discoverer following a suggestion by B. Hetherington.

(3116) Goodricke = 1983 CF

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

Named for John Goodricke (1764-1786), the deaf and dumb Dutch-English astronomer who studied the light variations of the star Algol and correctly suggested that it is what we now call an eclipsing variable. He also discovered and studied the variable star Delta Cephei. Name proposed by the discoverer following a suggestion by B. Hetherington.

(3123) Dunham = 1981 QF2

Discovered 1981 Aug. 30 by E. Bowell at the Anderson Mesa Station of the Lowell Obsservatory.

Named in honor of David W. Dunham, American astronomer and organizer of the International Occultation Timing Association. Dunham has played a cardinal role in collecting and analyzing occultation observations, particularly those involving asteroids and grazing occultations by the moon. In addition, he has stimulated many observers to make accurate and useful timings of occultation phenomena. Name proposed by the discoverer following suggestions by E. Goffin and P. L. Dombrowski.

(3125) Hay = 1982 BJ1

Discovered 1982 Jan. 24 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Named for William Thompson Hay (1888-1949), British music-hall comedian and film star of the 1930s and early 1940s. Will Hay was an accomplished planetary observer who in 1933 discovered a famous white spot on Saturn. Name proposed by the discoverer following a suggestion by B. Hetherington.

(3131) Mason-Dixon = 1982 BM1

Discovered 1982 Jan. 24 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Named for Charles Mason (1730-1787) and Jeremiah Dixon (1773-1779), British astronomers who observed the 1761 transit of Venus from the Cape of Good Hope. Between 1763 and 1767 they surveyed the boundary between Pennsylvania and Maryland--the Mason-Dixon Line. Name proposed by the discoverer following a suggestion by B. Hetherington.

(3150) Tosa = 1983 CB

Discovered 1983 Feb. 11 by T. Seki at Geisei.

This planet is being given the old name of Kochi prefecture, where the discoverer resides.

(3159) Prokof'ev = 1976 US2

Discovered 1976 Oct. 26 by T. M. Smirnova at the Crimean Astrophysical Observatory.

Named in honor of Vladimir Konstantinovich Prokof'ev, well-known expert on atomic spectroscopy and emission spectral analysis, a professor at the

Leningrad and Gorkij universities and since 1961 on the staff of the Crimean Astrophysical Observatory. He contributed much to solar ultraviolet spectroscopic research and discovered the presence of oxygen in the atmosphere of Venus. He served as president of IAU Commission 44 during 1970-1973.

(3160) Angerhofer = 1980 LE

Discovered 1980 June 14 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Named in memory of Philip E. Angerhofer (1950-1986), astronomer at the U.S. Naval Observatory, Washington. He was involved in using the National Radio Astronomy Observatory connected-element interferometer at Green Bank for the determination of earth-orientation parameters. His other research interests included supernova remnants such as CTB 80 and Cas A. Angerhofer's caring attitude toward his colleagues and family are greatly missed. Name proposed by the discoverer, following a suggestion by P. K. Seidelmann, who also prepared the citation.

(3175) Netto = 1979 YP

Discovered 1979 Dec. 16 by H. Debehogne and E. R. Netto at the European Southern Observatory.

Named by the first discoverer in honor of the second, Edgar Rangel Netto, astronomer at the Valongo Observatory (Universidade Federal do Rio de Janeiro), measurer of many of the plates obtained in the program that produced this discovery.

(3182) Shimanto = 1984 WC

Discovered 1984 Nov. 27 by T. Seki at Geisei.

Named for the longest river in the discoverer's home prefecture of Kochi.

(3192) A'Hearn = 1982 BY1

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

Named in honor of Michael F. A'Hearn, professor of astronomy at the University of Maryland. A prominent student of cometary physics, A'Hearn has pursued coordinated spectrocopic and spectrophotometric observations of comets spanning the spectral interval from the vacuum ultraviolet to the radio region. He participated in the 1983 discovery with the IUE spacecraft of diatomic sulphur in the spectrum of Comet IRAS-Araki-Alcock (1983d) and has made many other important contributions to our current understanding of comets. Citation prepared by R. L. Millis.

(3193) Elliot = 1982 DJ

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

Named in honor of James L. Elliot, professor of physics and astronomy at the Massachusetts Institute of Technology and codiscoverer of the Uranian rings. A pioneer in the study of solar-system bodies through photometric observations of stellar occultations, he has made major contributions to understanding the structure of planetary atmospheres and ring systems. Elliot is currently involved in planning solar-system studies using the Hubble Space Telescope and other earth-orbiting platforms. Citation prepared by R. L. Millis.

(3198) Wallonia = 1981 YH1

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

Named in honor of Wallonia, the French speaking part of Belgium, where the discoverer was born and where the Institut d'Astrophysique is located.

(3262) Miune = 1983 WB
Discovered 1983 Nov. 28 by T. Seki at Geisei.
Named for a mountain in the eastern part of Kochi prefecture.

(3268) De Sanctis = 1981 DD
Discovered 1981 Feb. 26 by H. Debehogne and G. De Sanctis at the European Southern Observatory.
Named by the first discoverer in honor of the second, Giovanni De Sanctis, astronomer at the Osservatorio Astronomico di Torino who has also participated in minor-planet programs at the European Southern Observatory, Catania and elsewhere.

(3310) Patsy = 1931 TS2
Discovered 1931 Oct. 9 by C. W. Tombaugh at the Lowell Observatory.
Named by the discoverer in honor of his wife.

(3312) Pedersen = 1984 SN
Discovered 1984 Sept. 24 by K. Augustesen, P. Jensen and H. G. Fogh Olsen at Brorfelde.
Named in honor of Bodil and Helge Pedersen, who have made a great contribution to the popularization of astronomy in Denmark by donating a planetarium (to be erected in Copenhagen) to the Danish people.

(3343) Nedzel = 1982 HS
Discovered 1982 Apr. 28 by L. G. Taff at the Lincoln Laboratory ETS, New Mexico.
Named in memory of V. Alexander Nedzel, scholar, gentleman, patron of the sciences and friend. The foremost supporter of the Lincoln Laboratory Earth-Approaching Asteroid Search, he was head of the Laboratory's Aerospace Division, and the Search was carried out under his auspices until his untimely death on 1984 Sept. 6.

(3431) Nakano = 1984 QC
Discovered 1984 Aug. 24 by T. Seki at Geisei.
Named in honor of Syuichi Nakano, energetic computer of orbits and identifier of minor planets, prolific author of computer software and related astronomical books, catalogues and circulars.

(3432) Kobuchizawa = 1986 EE
Discovered 1986 Mar. 7 by M. Inoue, O. Muramatsu and T. Urata at Kobuchizawa.
Named for the observing station, 150 km west of Tokyo, at which this minor planet was the first discovery.

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EPHEMERIDES.

1986 LA a,e,i = 1.56, 0.32, 11 Elements MPC 10832

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 06 19 | 14 42.44 | +08 40.7 | 0.280 | 1.198 | 124.7 | 44.2 | 17.6 |
| 1986 | 06 24 | 14 43.34 | +11 33.1 | | | | | |
| 1986 | 06 29 | 14 45.75 | +14 08.7 | 0.282 | 1.160 | 114.0 | 53.2 | 17.8 |
| 1986 | 07 04 | 14 49.67 | +16 28.2 | | | | | |
| 1986 | 07 09 | 14 55.08 | +18 32.9 | 0.284 | 1.127 | 105.5 | 60.4 | 18.0 |
| 1986 | 07 14 | 15 01.95 | +20 24.5 | | | | | |
| 1986 | 07 19 | 15 10.22 | +22 04.9 | 0.285 | 1.099 | 99.3 | 65.9 | 18.1 |
| 1986 | 07 24 | 15 19.84 | +23 35.8 | | | | | |
| 1986 | 07 29 | 15 30.78 | +24 58.0 | 0.283 | 1.078 | 95.1 | 69.8 | 18.2 |

Periodic Comet Machholz (1986e) Elements MPC 10829

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | m1 |
|---|---|---|---|---|---|---|---|---|
| 1986 | 06 19 | 17 34.48 | +20 22.6 | 0.492 | 1.412 | 136.1 | 29.9 | 13.0 |
| 1986 | 06 24 | 17 06.63 | +13 30.6 | | | | | |
| 1986 | 06 29 | 16 47.23 | +07 58.7 | 0.653 | 1.575 | 140.2 | 24.4 | 14.0 |
| 1986 | 07 04 | 16 33.66 | +03 35.2 | | | | | |
| 1986 | 07 09 | 16 24.19 | +00 04.9 | 0.860 | 1.728 | 133.9 | 25.1 | 15.0 |
| 1986 | 07 14 | 16 17.71 | -02 45.3 | | | | | |
| 1986 | 07 19 | 16 13.45 | -05 05.6 | 1.092 | 1.872 | 125.2 | 26.3 | 15.9 |
| 1986 | 07 24 | 16 10.87 | -07 03.2 | | | | | |
| 1986 | 07 29 | 16 09.61 | -08 43.4 | 1.341 | 2.009 | 116.3 | 26.9 | 16.7 |
| 1986 | 08 03 | 16 09.40 | -10 10.0 | | | | | |
| 1986 | 08 08 | 16 10.06 | -11 26.0 | 1.599 | 2.139 | 107.8 | 26.8 | 17.3 |
| 1986 | 08 13 | 16 11.44 | -12 33.3 | | | | | |
| 1986 | 08 18 | 16 13.40 | -13 33.6 | 1.864 | 2.264 | 99.6 | 26.2 | 17.9 |
| 1986 | 08 23 | 16 15.87 | -14 28.0 | | | | | |
| 1986 | 08 28 | 16 18.77 | -15 17.5 | 2.131 | 2.384 | 91.6 | 25.1 | 18.4 |

1967 UV a,e,i = 2.26, 0.11, 5 Elements MPC 10841

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 06 19 | 15 29.46 | -20 27.2 | 1.574 | 2.495 | 148.1 | 12.4 | 17.1 |
| 1986 | 06 29 | 15 24.22 | -20 21.6 | | | | | |
| 1986 | 07 09 | 15 21.96 | -20 24.1 | 1.755 | 2.505 | 127.3 | 18.8 | 17.6 |
| 1986 | 07 19 | 15 22.67 | -20 35.2 | | | | | |
| 1986 | 07 29 | 15 26.13 | -20 54.4 | 1.987 | 2.513 | 109.3 | 22.4 | 17.9 |
| 1986 | 08 08 | 15 32.04 | -21 20.5 | | | | | |
| 1986 | 08 18 | 15 40.14 | -21 51.9 | 2.244 | 2.519 | 93.6 | 23.6 | 18.2 |

1982 BJ a,e,i = 2.32, 0.20, 24 Elements MPC 10828

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 06 19 | 16 09.71 | +09 02.9 | 1.388 | 2.261 | 139.8 | 16.9 | 17.3 |
| 1986 | 06 29 | 16 02.93 | +06 38.7 | | | | | |
| 1986 | 07 09 | 15 59.01 | +04 01.8 | 1.552 | 2.306 | 126.5 | 20.8 | 17.7 |
| 1986 | 07 19 | 15 58.06 | +01 20.5 | | | | | |
| 1986 | 07 29 | 15 59.90 | -01 19.1 | 1.777 | 2.350 | 111.7 | 23.7 | 18.1 |
| 1986 | 08 08 | 16 04.27 | -03 53.0 | | | | | |
| 1986 | 08 18 | 16 10.89 | -06 18.8 | 2.042 | 2.393 | 97.4 | 24.8 | 18.5 |

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

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 06 19 | 17 07.87 | -31 29.9 | 1.193 | 2.197 | 168.2 | 5.4 | 15.5 |
| 1986 | 06 29 | 16 57.71 | -30 49.0 | | | | | |
| 1986 | 07 09 | 16 50.30 | -30 02.6 | 1.291 | 2.220 | 148.0 | 14.0 | 16.0 |
| 1986 | 07 19 | 16 46.38 | -29 16.8 | | | | | |
| 1986 | 07 29 | 16 46.07 | -28 36.0 | 1.466 | 2.242 | 128.4 | 20.8 | 16.5 |
| 1986 | 08 08 | 16 49.14 | -28 02.1 | | | | | |
| 1986 | 08 18 | 16 55.26 | -27 35.2 | 1.691 | 2.265 | 111.3 | 24.6 | 16.9 |
| 1986 | 08 28 | 17 03.98 | -27 14.1 | | | | | |
| 1986 | 09 07 | 17 14.91 | -26 56.7 | 1.944 | 2.286 | 96.3 | 26.0 | 17.3 |

1981 DZ a,e,i = 2.68, 0.09, 9 Elements MPC 10819

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 06 19 | 17 33.81 | -17 16.5 | 1.561 | 2.572 | 173.2 | 2.7 | 17.3 |
| 1986 | 06 29 | 17 24.95 | -16 41.7 | | | | | |
| 1986 | 07 09 | 17 17.55 | -16 14.5 | 1.643 | 2.590 | 152.9 | 10.3 | 17.7 |
| 1986 | 07 19 | 17 12.36 | -15 56.2 | | | | | |
| 1986 | 07 29 | 17 09.75 | -15 46.8 | 1.814 | 2.608 | 132.3 | 16.7 | 18.2 |
| 1986 | 08 08 | 17 09.84 | -15 45.5 | | | | | |
| 1986 | 08 18 | 17 12.53 | -15 50.6 | 2.046 | 2.627 | 114.0 | 20.6 | 18.5 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1986 08 28 | 17 17.60 | -16 00.3 | | | | | | |
| 1986 09 07 | 17 24.79 | -16 12.5 | 2.312 | 2.645 | 97.8 | 22.2 | 18.9 |

1974 FV1 a,e,i = 5.22, 0.16, 13 Elements MPC 10843

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|
| 1986 06 19 | 17 44.74 | -30 17.0 | 3.928 | 4.938 | 173.1 | 1.4 | 16.7 |
| 1986 06 29 | 17 38.60 | -29 58.6 | | | | | |
| 1986 07 09 | 17 32.93 | -29 36.7 | 3.961 | 4.915 | 157.2 | 4.6 | 16.9 |
| 1986 07 19 | 17 28.12 | -29 12.5 | | | | | |
| 1986 07 29 | 17 24.50 | -28 47.3 | 4.101 | 4.891 | 136.8 | 8.2 | 17.1 |
| 1986 08 08 | 17 22.26 | -28 22.3 | | | | | |
| 1986 08 18 | 17 21.52 | -27 58.4 | 4.322 | 4.868 | 117.1 | 10.7 | 17.3 |
| 1986 08 28 | 17 22.30 | -27 36.4 | | | | | |
| 1986 09 07 | 17 24.57 | -27 16.3 | 4.592 | 4.845 | 98.5 | 11.9 | 17.5 |

1975 VZ a,e,i = 2.45, 0.24, 3 Elements MPC 10829

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|
| 1986 06 19 | 20 13.36 | -17 33.7 | 1.526 | 2.430 | 145.2 | 13.8 | 17.5 |
| 1986 06 29 | 20 07.72 | -17 54.7 | | | | | |
| 1986 07 09 | 19 59.62 | -18 25.0 | 1.375 | 2.378 | 167.6 | 5.3 | 17.0 |
| 1986 07 19 | 19 49.88 | -19 01.4 | | | | | |
| 1986 07 29 | 19 39.69 | -19 39.5 | 1.322 | 2.325 | 168.2 | 5.1 | 16.8 |
| 1986 08 08 | 19 30.36 | -20 15.4 | | | | | |
| 1986 08 18 | 19 23.16 | -20 46.3 | 1.366 | 2.272 | 145.1 | 14.8 | 17.2 |
| 1986 08 28 | 19 18.95 | -21 10.7 | | | | | |
| 1986 09 07 | 19 18.13 | -21 27.8 | 1.486 | 2.219 | 124.5 | 22.0 | 17.5 |
| 1986 09 17 | 19 20.80 | -21 37.3 | | | | | |
| 1986 09 27 | 19 26.72 | -21 38.7 | 1.651 | 2.167 | 107.0 | 26.2 | 17.8 |
| 1986 10 07 | 19 35.59 | -21 31.6 | | | | | |
| 1986 10 17 | 19 47.02 | -21 15.0 | 1.834 | 2.118 | 92.0 | 28.1 | 18.0 |

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

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|
| 1986 06 19 | 21 09.42 | -16 33.8 | 1.711 | 2.509 | 132.1 | 17.5 | 17.5 |
| 1986 06 29 | 21 06.03 | -16 43.3 | | | | | |
| 1986 07 09 | 21 00.04 | -17 03.2 | 1.596 | 2.546 | 153.5 | 10.3 | 17.1 |
| 1986 07 19 | 20 51.97 | -17 30.5 | | | | | |
| 1986 07 29 | 20 42.72 | -18 01.0 | 1.570 | 2.584 | 176.8 | 1.3 | 16.7 |
| 1986 08 08 | 20 33.33 | -18 30.3 | | | | | |
| 1986 08 18 | 20 24.93 | -18 54.9 | 1.648 | 2.621 | 159.7 | 7.7 | 17.2 |
| 1986 08 28 | 20 18.42 | -19 12.5 | | | | | |
| 1986 09 07 | 20 14.37 | -19 22.0 | 1.823 | 2.658 | 137.9 | 14.7 | 17.7 |
| 1986 09 17 | 20 13.03 | -19 23.5 | | | | | |
| 1986 09 27 | 20 14.36 | -19 17.0 | 2.069 | 2.694 | 118.4 | 19.1 | 18.1 |
| 1986 10 07 | 20 18.14 | -19 03.1 | | | | | |
| 1986 10 17 | 20 24.10 | -18 41.7 | 2.358 | 2.730 | 101.0 | 21.0 | 18.4 |

1931 UE a,e,i = 2.39, 0.19, 10 Elements MPC 10829

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|
| 1986 06 19 | 21 25.85 | -19 43.9 | 1.946 | 2.705 | 129.2 | 16.9 | 17.9 |
| 1986 06 29 | 21 22.77 | -19 42.1 | | | | | |
| 1986 07 09 | 21 16.95 | -19 47.5 | 1.747 | 2.677 | 150.2 | 10.9 | 17.4 |
| 1986 07 19 | 21 08.65 | -19 57.6 | | | | | |
| 1986 07 29 | 20 58.52 | -20 08.6 | 1.636 | 2.647 | 173.1 | 2.6 | 16.9 |
| 1986 08 08 | 20 47.50 | -20 16.6 | | | | | |
| 1986 08 18 | 20 36.82 | -20 18.4 | 1.633 | 2.614 | 162.0 | 6.9 | 17.1 |
| 1986 08 28 | 20 27.61 | -20 12.2 | | | | | |
| 1986 09 07 | 20 20.77 | -19 57.8 | 1.732 | 2.580 | 139.2 | 14.8 | 17.5 |
| 1986 09 17 | 20 16.82 | -19 35.9 | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1986 09 27 | 20 15.91 | -19 07.2 | 1.905 | 2.544 | 118.8 | 20.2 | 17.8 |
| 1986 10 07 | 20 17.93 | -18 32.3 | | | | | |
| 1986 10 17 | 20 22.63 | -17 51.4 | 2.119 | 2.506 | 100.9 | 23.0 | 18.1 |

1981 EQ19 a,e,i = 2.38, 0.18, 3 Elements MPC 10822

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 06 19 | | 21 36.34 | -10 06.2 | 1.479 | 2.212 | 123.8 | 22.4 | 17.5 |
| 1986 06 29 | | 21 38.13 | -09 44.5 | | | | | |
| 1986 07 09 | | 21 37.02 | -09 39.0 | 1.275 | 2.171 | 142.4 | 16.6 | 17.0 |
| 1986 07 19 | | 21 32.99 | -09 51.4 | | | | | |
| 1986 07 29 | | 21 26.36 | -10 20.9 | 1.139 | 2.133 | 163.8 | 7.6 | 16.4 |
| 1986 08 08 | | 21 17.86 | -11 04.8 | | | | | |
| 1986 08 18 | | 21 08.73 | -11 57.2 | 1.091 | 2.096 | 170.7 | 4.5 | 16.1 |
| 1986 08 28 | | 21 00.41 | -12 50.7 | | | | | |
| 1986 09 07 | | 20 54.19 | -13 38.9 | 1.135 | 2.062 | 148.4 | 14.9 | 16.6 |
| 1986 09 17 | | 20 51.05 | -14 16.5 | | | | | |
| 1986 09 27 | | 20 51.38 | -14 40.4 | 1.254 | 2.031 | 128.1 | 22.9 | 17.0 |
| 1986 10 07 | | 20 55.19 | -14 49.5 | | | | | |
| 1986 10 17 | | 21 02.23 | -14 43.1 | 1.420 | 2.004 | 110.9 | 27.7 | 17.4 |
| 1986 10 27 | | 21 12.07 | -14 21.3 | | | | | |
| 1986 11 06 | | 21 24.29 | -13 44.6 | 1.610 | 1.982 | 96.3 | 29.8 | 17.7 |

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

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 06 19 | | 22 18.01 | -09 45.2 | 2.144 | 2.722 | 114.1 | 19.9 | 19.2 |
| 1986 06 29 | | 22 19.13 | -09 44.9 | | | | | |
| 1986 07 09 | | 22 17.85 | -09 59.3 | 1.936 | 2.735 | 133.3 | 15.7 | 18.9 |
| 1986 07 19 | | 22 14.13 | -10 28.5 | | | | | |
| 1986 07 29 | | 22 08.16 | -11 10.9 | 1.792 | 2.746 | 155.0 | 9.0 | 18.5 |
| 1986 08 08 | | 22 00.38 | -12 03.3 | | | | | |
| 1986 08 18 | | 21 51.53 | -13 00.6 | 1.743 | 2.755 | 178.7 | 0.5 | 18.0 |
| 1986 08 28 | | 21 42.57 | -13 56.9 | | | | | |
| 1986 09 07 | | 21 34.47 | -14 47.0 | 1.804 | 2.763 | 157.5 | 8.0 | 18.5 |
| 1986 09 17 | | 21 28.08 | -15 26.7 | | | | | |
| 1986 09 27 | | 21 23.95 | -15 53.8 | 1.964 | 2.768 | 135.3 | 14.8 | 18.9 |
| 1986 10 07 | | 21 22.35 | -16 07.8 | | | | | |
| 1986 10 17 | | 21 23.31 | -16 08.9 | 2.194 | 2.771 | 115.3 | 19.0 | 19.3 |
| 1986 10 27 | | 21 26.64 | -15 57.8 | | | | | |
| 1986 11 06 | | 21 32.12 | -15 35.6 | 2.462 | 2.772 | 97.6 | 20.8 | 19.6 |

1981 EX30 a,e,i = 2.36, 0.22, 3 Elements MPC 10824

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 06 19 | | 22 46.49 | -06 28.2 | 1.506 | 2.040 | 106.3 | 28.5 | 20.0 |
| 1986 06 29 | | 22 56.38 | -05 38.4 | | | | | |
| 1986 07 09 | | 23 04.21 | -05 03.1 | 1.276 | 1.998 | 120.8 | 25.9 | 19.6 |
| 1986 07 19 | | 23 09.61 | -04 45.8 | | | | | |
| 1986 07 29 | | 23 12.24 | -04 49.3 | 1.084 | 1.959 | 138.0 | 20.3 | 19.0 |
| 1986 08 08 | | 23 11.83 | -05 15.6 | | | | | |
| 1986 08 18 | | 23 08.42 | -06 04.1 | 0.947 | 1.925 | 158.5 | 11.1 | 18.4 |
| 1986 08 28 | | 23 02.49 | -07 10.2 | | | | | |
| 1986 09 07 | | 22 55.04 | -08 25.5 | 0.889 | 1.897 | 177.7 | 1.2 | 17.8 |
| 1986 09 17 | | 22 47.57 | -09 38.0 | | | | | |
| 1986 09 27 | | 22 41.59 | -10 36.9 | 0.918 | 1.874 | 154.7 | 13.2 | 18.4 |
| 1986 10 07 | | 22 38.29 | -11 14.4 | | | | | |
| 1986 10 17 | | 22 38.39 | -11 26.7 | 1.022 | 1.858 | 134.0 | 22.7 | 18.8 |
| 1986 10 27 | | 22 41.98 | -11 14.0 | | | | | |
| 1986 11 06 | | 22 48.83 | -10 38.0 | 1.178 | 1.849 | 116.7 | 28.6 | 19.3 |
| 1986 11 16 | | 22 58.54 | -09 41.4 | | | | | |
| 1986 11 26 | | 23 10.60 | -08 27.0 | 1.365 | 1.848 | 102.4 | 31.4 | 19.7 |

1975 TJ6 a,e,i = 2.37, 0.18, 12 Elements MPC 8674

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 09 | 00 36.96 | -05 25.9 | 1.999 | 2.388 | 99.6 | 24.8 | 17.9 |
| 1986 | 07 19 | 00 46.15 | -05 39.6 | | | | | |
| 1986 | 07 29 | 00 53.62 | -06 12.2 | 1.735 | 2.348 | 114.7 | 23.1 | 17.5 |
| 1986 | 08 08 | 00 59.02 | -07 05.3 | | | | | |
| 1986 | 08 18 | 01 01.98 | -08 19.3 | 1.505 | 2.307 | 131.8 | 19.1 | 17.1 |
| 1986 | 08 28 | 01 02.21 | -09 52.7 | | | | | |
| 1986 | 09 07 | 00 59.55 | -11 40.9 | 1.336 | 2.265 | 149.9 | 12.9 | 16.6 |
| 1986 | 09 17 | 00 54.16 | -13 35.2 | | | | | |
| 1986 | 09 27 | 00 46.63 | -15 23.6 | 1.252 | 2.224 | 161.2 | 8.3 | 16.2 |
| 1986 | 10 07 | 00 37.95 | -16 53.4 | | | | | |
| 1986 | 10 17 | 00 29.46 | -17 53.6 | 1.263 | 2.184 | 150.0 | 13.2 | 16.4 |
| 1986 | 10 27 | 00 22.45 | -18 18.8 | | | | | |
| 1986 | 11 06 | 00 17.88 | -18 08.6 | 1.359 | 2.145 | 131.1 | 20.4 | 16.7 |
| 1986 | 11 16 | 00 16.33 | -17 26.5 | | | | | |
| 1986 | 11 26 | 00 17.87 | -16 17.9 | 1.511 | 2.107 | 113.4 | 25.5 | 17.0 |
| 1986 | 12 06 | 00 22.37 | -14 48.0 | | | | | |
| 1986 | 12 16 | 00 29.54 | -13 01.5 | 1.692 | 2.072 | 98.0 | 28.1 | 17.3 |

1981 EA28 a,e,i = 2.36, 0.14, 8 Elements MPC 10290

| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 01 09.26 | +03 56.5 | 1.498 | 2.048 | -1.47 | -14.0 | 17.5 |
| 1986 | 08 08 | 01 16.05 | +05 06.5 | | | | | |
| 1986 | 08 18 | 01 20.10 | +06 05.4 | 1.302 | 2.043 | -1.74 | -16.0 | 17.1 |
| 1986 | 08 28 | 01 21.02 | +06 52.0 | | | | | |
| 1986 | 09 07 | 01 18.54 | +07 25.2 | 1.147 | 2.042 | -2.08 | -18.4 | 16.7 |
| 1986 | 09 17 | 01 12.69 | +07 44.6 | | | | | |
| 1986 | 09 27 | 01 04.06 | +07 51.2 | 1.059 | 2.045 | -2.35 | -20.6 | 16.1 |
| 1986 | 10 07 | 00 53.74 | +07 47.5 | | | | | |
| 1986 | 10 17 | 00 43.32 | +07 39.1 | 1.063 | 2.051 | -2.35 | -21.0 | 16.1 |
| 1986 | 10 27 | 00 34.38 | +07 32.3 | | | | | |
| 1986 | 11 06 | 00 28.12 | +07 32.8 | 1.161 | 2.062 | -2.08 | -19.3 | 16.6 |
| 1986 | 11 16 | 00 25.20 | +07 45.3 | | | | | |
| 1986 | 11 26 | 00 25.73 | +08 11.4 | 1.335 | 2.075 | -1.73 | -16.6 | 17.2 |
| 1986 | 12 06 | 00 29.49 | +08 51.4 | | | | | |
| 1986 | 12 16 | 00 36.13 | +09 44.4 | 1.556 | 2.092 | -1.44 | -13.9 | 17.6 |
| 1986 | 12 26 | 00 45.20 | +10 48.5 | | | | | |
| 1987 | 01 05 | 00 56.34 | +12 01.9 | 1.802 | 2.112 | -1.23 | -11.6 | 18.0 |

1979 XK a,e,i = 2.41, 0.22, 1 Elements MPC 8675

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 01 15.54 | +07 00.2 | 2.317 | 2.760 | 105.0 | 20.8 | 18.9 |
| 1986 | 08 08 | 01 19.20 | +07 18.2 | | | | | |
| 1986 | 08 18 | 01 20.73 | +07 23.2 | 2.040 | 2.725 | 122.8 | 18.2 | 18.6 |
| 1986 | 08 28 | 01 19.89 | +07 14.0 | | | | | |
| 1986 | 09 07 | 01 16.54 | +06 49.8 | 1.812 | 2.688 | 143.3 | 12.9 | 18.1 |
| 1986 | 09 17 | 01 10.76 | +06 11.3 | | | | | |
| 1986 | 09 27 | 01 02.96 | +05 20.9 | 1.664 | 2.649 | 166.5 | 5.1 | 17.6 |
| 1986 | 10 07 | 00 53.83 | +04 22.8 | | | | | |
| 1986 | 10 17 | 00 44.39 | +03 23.6 | 1.622 | 2.607 | 168.6 | 4.3 | 17.5 |
| 1986 | 10 27 | 00 35.72 | +02 30.3 | | | | | |
| 1986 | 11 06 | 00 28.79 | +01 49.0 | 1.690 | 2.563 | 144.5 | 13.0 | 17.9 |
| 1986 | 11 16 | 00 24.26 | +01 23.9 | | | | | |
| 1986 | 11 26 | 00 22.45 | +01 16.7 | 1.843 | 2.517 | 122.7 | 19.3 | 18.2 |
| 1986 | 12 06 | 00 23.39 | +01 27.4 | | | | | |
| 1986 | 12 16 | 00 26.94 | +01 55.0 | 2.044 | 2.470 | 103.7 | 22.8 | 18.5 |
| 1986 | 12 26 | 00 32.85 | +02 37.3 | | | | | |
| 1987 | 01 05 | 00 40.85 | +03 32.5 | 2.261 | 2.421 | 87.2 | 23.9 | 18.7 |

1981 TP1 a,e,i = 3.06, 0.04, 13 Elements MPC 10041

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|
| 1986 07 29 | 01 18.11 | +22 10.1 | 2.873 | 3.184 | 98.4 | 18.4 | 17.1 |
| 1986 08 08 | 01 21.46 | +22 56.7 | | | | | |
| 1986 08 18 | 01 22.91 | +23 32.1 | 2.613 | 3.182 | 115.4 | 16.7 | 16.9 |
| 1986 08 28 | 01 22.30 | +23 54.1 | | | | | |
| 1986 09 07 | 01 19.60 | +24 00.1 | 2.393 | 3.179 | 134.2 | 13.1 | 16.6 |
| 1986 09 17 | 01 14.93 | +23 48.0 | | | | | |
| 1986 09 27 | 01 08.67 | +23 16.8 | 2.244 | 3.175 | 153.9 | 8.0 | 16.3 |
| 1986 10 07 | 01 01.39 | +22 26.9 | | | | | |
| 1986 10 17 | 00 53.87 | +21 21.3 | 2.197 | 3.172 | 165.5 | 4.5 | 16.1 |
| 1986 10 27 | 00 46.91 | +20 05.3 | | | | | |
| 1986 11 06 | 00 41.24 | +18 45.5 | 2.262 | 3.167 | 151.2 | 8.7 | 16.3 |
| 1986 11 16 | 00 37.39 | +17 28.9 | | | | | |
| 1986 11 26 | 00 35.64 | +16 21.0 | 2.428 | 3.162 | 130.7 | 13.7 | 16.6 |
| 1986 12 06 | 00 36.07 | +15 25.6 | | | | | |
| 1986 12 16 | 00 38.62 | +14 44.8 | 2.666 | 3.157 | 111.2 | 16.9 | 16.9 |
| 1986 12 26 | 00 43.11 | +14 18.9 | | | | | |
| 1987 01 05 | 00 49.33 | +14 07.3 | 2.939 | 3.152 | 93.2 | 18.2 | 17.2 |

1952 SG a,e,i = 2.26, 0.18, 5 Elements MPC 8906

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|
| 1986 07 29 | 01 05.44 | +02 00.1 | 1.249 | 1.850 | 109.2 | 31.2 | 17.5 |
| 1986 08 08 | 01 15.12 | +02 13.2 | | | | | |
| 1986 08 18 | 01 21.92 | +02 05.1 | 1.092 | 1.862 | 124.3 | 26.7 | 17.1 |
| 1986 08 28 | 01 25.43 | +01 35.6 | | | | | |
| 1986 09 07 | 01 25.31 | +00 45.6 | 0.974 | 1.879 | 142.9 | 18.9 | 16.7 |
| 1986 09 17 | 01 21.64 | -00 20.2 | | | | | |
| 1986 09 27 | 01 14.99 | -01 33.7 | 0.918 | 1.902 | 163.8 | 8.4 | 16.2 |
| 1986 10 07 | 01 06.49 | -02 44.1 | | | | | |
| 1986 10 17 | 00 57.74 | -03 39.4 | 0.947 | 1.929 | 165.8 | 7.3 | 16.3 |
| 1986 10 27 | 00 50.32 | -04 11.2 | | | | | |
| 1986 11 06 | 00 45.38 | -04 15.7 | 1.064 | 1.961 | 145.1 | 16.8 | 16.9 |
| 1986 11 16 | 00 43.56 | -03 53.5 | | | | | |
| 1986 11 26 | 00 44.93 | -03 08.2 | 1.250 | 1.996 | 125.8 | 23.6 | 17.5 |
| 1986 12 06 | 00 49.28 | -02 03.9 | | | | | |
| 1986 12 16 | 00 56.25 | -00 44.8 | 1.483 | 2.034 | 109.3 | 27.2 | 18.0 |
| 1986 12 26 | 01 05.41 | +00 45.0 | | | | | |
| 1987 01 05 | 01 16.42 | +02 22.6 | 1.743 | 2.073 | 94.9 | 28.2 | 18.4 |

(3253) 1982 HQ1 a,e,i = 2.25, 0.20, 7 Elements MPC 9686

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|
| 1986 07 29 | 01 25.74 | -01 30.0 | 1.401 | 1.939 | 105.6 | 30.3 | 17.3 |
| 1986 08 08 | 01 33.31 | -01 11.2 | | | | | |
| 1986 08 18 | 01 37.81 | -01 08.7 | 1.253 | 1.979 | 121.4 | 25.9 | 17.0 |
| 1986 08 28 | 01 38.88 | -01 21.9 | | | | | |
| 1986 09 07 | 01 36.27 | -01 48.6 | 1.139 | 2.022 | 140.6 | 18.4 | 16.6 |
| 1986 09 17 | 01 30.13 | -02 24.2 | | | | | |
| 1986 09 27 | 01 21.13 | -03 02.0 | 1.089 | 2.066 | 162.0 | 8.6 | 16.3 |
| 1986 10 07 | 01 10.42 | -03 34.0 | | | | | |
| 1986 10 17 | 00 59.58 | -03 52.1 | 1.131 | 2.112 | 165.8 | 6.6 | 16.3 |
| 1986 10 27 | 00 50.12 | -03 51.6 | | | | | |
| 1986 11 06 | 00 43.15 | -03 30.7 | 1.269 | 2.158 | 145.0 | 15.3 | 16.9 |
| 1986 11 16 | 00 39.28 | -02 50.4 | | | | | |
| 1986 11 26 | 00 38.58 | -01 53.7 | 1.485 | 2.204 | 125.0 | 21.5 | 17.5 |
| 1986 12 06 | 00 40.84 | -00 43.7 | | | | | |
| 1986 12 16 | 00 45.72 | +00 37.0 | 1.749 | 2.250 | 107.5 | 24.7 | 18.0 |
| 1986 12 26 | 00 52.81 | +02 05.4 | | | | | |
| 1987 01 05 | 01 01.77 | +03 39.7 | 2.039 | 2.295 | 92.0 | 25.4 | 18.4 |

4601 P-L a,e,i = 3.01, 0.23, 3 Elements MPC 9300

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 01 20.25 | +04 48.8 | 2.345 | 2.782 | 104.7 | 20.7 | 18.5 |
| 1986 | 08 08 | 01 25.18 | +05 08.6 | | | | | |
| 1986 | 08 18 | 01 28.16 | +05 16.5 | 2.064 | 2.737 | 121.8 | 18.3 | 18.1 |
| 1986 | 08 28 | 01 28.94 | +05 11.8 | | | | | |
| 1986 | 09 07 | 01 27.37 | +04 54.3 | 1.830 | 2.692 | 141.4 | 13.5 | 17.6 |
| 1986 | 09 17 | 01 23.43 | +04 25.0 | | | | | |
| 1986 | 09 27 | 01 17.43 | +03 46.3 | 1.673 | 2.649 | 163.3 | 6.2 | 17.2 |
| 1986 | 10 07 | 01 09.90 | +03 02.3 | | | | | |
| 1986 | 10 17 | 01 01.75 | +02 18.8 | 1.617 | 2.607 | 171.3 | 3.3 | 16.9 |
| 1986 | 10 27 | 00 53.99 | +01 41.8 | | | | | |
| 1986 | 11 06 | 00 47.57 | +01 16.7 | 1.668 | 2.566 | 148.5 | 11.7 | 17.3 |
| 1986 | 11 16 | 00 43.25 | +01 07.2 | | | | | |
| 1986 | 11 26 | 00 41.44 | +01 14.8 | 1.807 | 2.527 | 127.0 | 18.2 | 17.6 |
| 1986 | 12 06 | 00 42.26 | +01 39.2 | | | | | |
| 1986 | 12 16 | 00 45.67 | +02 19.3 | 2.002 | 2.491 | 108.2 | 22.0 | 17.9 |
| 1986 | 12 26 | 00 51.43 | +03 13.1 | | | | | |
| 1987 | 01 05 | 00 59.31 | +04 18.6 | 2.223 | 2.458 | 91.7 | 23.6 | 18.2 |

1984 AC1 a,e,i = 2.25, 0.25, 7 Elements MPC 9959

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 00 58.30 | -03 08.5 | 1.306 | 1.939 | 112.6 | 28.9 | 16.6 |
| 1986 | 08 08 | 01 08.67 | -03 19.6 | | | | | |
| 1986 | 08 18 | 01 16.79 | -03 52.3 | 1.092 | 1.885 | 127.2 | 25.3 | 16.1 |
| 1986 | 08 28 | 01 22.21 | -04 46.9 | | | | | |
| 1986 | 09 07 | 01 24.42 | -06 02.1 | 0.922 | 1.836 | 144.0 | 18.8 | 15.5 |
| 1986 | 09 17 | 01 23.18 | -07 32.2 | | | | | |
| 1986 | 09 27 | 01 18.67 | -09 06.7 | 0.816 | 1.791 | 160.3 | 10.9 | 14.9 |
| 1986 | 10 07 | 01 11.62 | -10 31.1 | | | | | |
| 1986 | 10 17 | 01 03.52 | -11 29.3 | 0.787 | 1.754 | 159.0 | 11.8 | 14.8 |
| 1986 | 10 27 | 00 56.14 | -11 49.9 | | | | | |
| 1986 | 11 06 | 00 51.05 | -11 28.6 | 0.834 | 1.724 | 141.5 | 21.0 | 15.2 |
| 1986 | 11 16 | 00 49.32 | -10 27.6 | | | | | |
| 1986 | 11 26 | 00 51.31 | -08 53.7 | 0.939 | 1.703 | 124.3 | 28.6 | 15.6 |
| 1986 | 12 06 | 00 56.92 | -06 54.2 | | | | | |
| 1986 | 12 16 | 01 05.80 | -04 36.0 | 1.082 | 1.691 | 109.8 | 33.2 | 16.0 |
| 1986 | 12 26 | 01 17.48 | -02 05.4 | | | | | |
| 1987 | 01 05 | 01 31.54 | +00 32.9 | 1.249 | 1.690 | 97.7 | 35.2 | 16.4 |

1984 AQ a,e,i = 2.54, 0.18, 11 Elements MPC 9030

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 01 32.84 | -02 30.3 | 2.541 | 2.960 | 104.3 | 19.4 | 17.7 |
| 1986 | 08 08 | 01 36.36 | -02 57.6 | | | | | |
| 1986 | 08 18 | 01 37.82 | -03 38.5 | 2.306 | 2.970 | 122.1 | 16.8 | 17.5 |
| 1986 | 08 28 | 01 37.05 | -04 31.8 | | | | | |
| 1986 | 09 07 | 01 33.98 | -05 35.4 | 2.122 | 2.978 | 141.6 | 12.1 | 17.1 |
| 1986 | 09 17 | 01 28.74 | -06 45.0 | | | | | |
| 1986 | 09 27 | 01 21.70 | -07 55.1 | 2.021 | 2.984 | 160.2 | 6.5 | 16.8 |
| 1986 | 10 07 | 01 13.45 | -08 59.0 | | | | | |
| 1986 | 10 17 | 01 04.82 | -09 50.1 | 2.028 | 2.987 | 160.7 | 6.3 | 16.8 |
| 1986 | 10 27 | 00 56.70 | -10 23.8 | | | | | |
| 1986 | 11 06 | 00 49.86 | -10 37.5 | 2.145 | 2.988 | 141.9 | 11.8 | 17.2 |
| 1986 | 11 16 | 00 44.88 | -10 31.0 | | | | | |
| 1986 | 11 26 | 00 42.06 | -10 05.9 | 2.348 | 2.987 | 121.7 | 16.3 | 17.5 |
| 1986 | 12 06 | 00 41.49 | -09 24.7 | | | | | |
| 1986 | 12 16 | 00 43.11 | -08 30.1 | 2.604 | 2.983 | 103.0 | 18.8 | 17.8 |
| 1986 | 12 26 | 00 46.71 | -07 25.0 | | | | | |
| 1987 | 01 05 | 00 52.09 | -06 11.5 | 2.879 | 2.977 | 86.0 | 19.2 | 18.0 |

1938 DN1 a,e,i = 2.59, 0.12, 14 Elements MPC 9684

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|
| 1986 07 29 | 01 22.19 | +03 08.5 | 2.258 | 2.703 | 104.9 | 21.3 | 17.8 |
| 1986 08 08 | 01 27.55 | +02 40.4 | | | | | |
| 1986 08 18 | 01 30.88 | +01 54.4 | 1.998 | 2.679 | 122.3 | 18.6 | 17.5 |
| 1986 08 28 | 01 31.97 | +00 50.2 | | | | | |
| 1986 09 07 | 01 30.64 | -00 31.4 | 1.787 | 2.654 | 141.8 | 13.6 | 17.1 |
| 1986 09 17 | 01 26.94 | -02 07.0 | | | | | |
| 1986 09 27 | 01 21.15 | -03 50.9 | 1.657 | 2.628 | 161.8 | 6.8 | 16.6 |
| 1986 10 07 | 01 13.87 | -05 34.8 | | | | | |
| 1986 10 17 | 01 05.99 | -07 09.0 | 1.631 | 2.601 | 163.3 | 6.3 | 16.6 |
| 1986 10 27 | 00 58.51 | -08 25.1 | | | | | |
| 1986 11 06 | 00 52.36 | -09 17.4 | 1.711 | 2.575 | 143.3 | 13.3 | 16.9 |
| 1986 11 16 | 00 48.26 | -09 43.6 | | | | | |
| 1986 11 26 | 00 46.59 | -09 44.6 | 1.874 | 2.548 | 122.8 | 19.0 | 17.2 |
| 1986 12 06 | 00 47.45 | -09 23.0 | | | | | |
| 1986 12 16 | 00 50.77 | -08 42.3 | 2.086 | 2.521 | 104.6 | 22.2 | 17.5 |
| 1986 12 26 | 00 56.32 | -07 46.0 | | | | | |
| 1987 01 05 | 01 03.88 | -06 37.1 | 2.318 | 2.495 | 88.6 | 23.2 | 17.8 |

1981 EC20 a,e,i = 2.40, 0.22, 1 Elements MPC 10289

| Date ET | R. A. (1950) | Decl. | Delta | r | Variation | | V |
|---|---|---|---|---|---|---|---|
| 1986 07 29 | 01 10.99 | +09 18.7 | 1.326 | 1.869 | -1.85 | -10.9 | 17.2 |
| 1986 08 08 | 01 21.02 | +10 26.9 | | | | | |
| 1986 08 18 | 01 28.36 | +11 18.0 | 1.164 | 1.882 | -2.16 | -12.2 | 16.8 |
| 1986 08 28 | 01 32.58 | +11 50.1 | | | | | |
| 1986 09 07 | 01 33.30 | +12 00.8 | 1.034 | 1.903 | -2.54 | -14.2 | 16.4 |
| 1986 09 17 | 01 30.47 | +11 49.2 | | | | | |
| 1986 09 27 | 01 24.53 | +11 16.4 | 0.960 | 1.930 | -2.87 | -16.5 | 15.9 |
| 1986 10 07 | 01 16.43 | +10 26.6 | | | | | |
| 1986 10 17 | 01 07.68 | +09 28.1 | 0.967 | 1.963 | -2.91 | -17.5 | 15.6 |
| 1986 10 27 | 00 59.89 | +08 31.3 | | | | | |
| 1986 11 06 | 00 54.33 | +07 45.4 | 1.067 | 2.000 | -2.59 | -16.1 | 16.3 |
| 1986 11 16 | 00 51.79 | +07 17.1 | | | | | |
| 1986 11 26 | 00 52.46 | +07 09.0 | 1.246 | 2.042 | -2.14 | -13.3 | 16.9 |
| 1986 12 06 | 00 56.18 | +07 20.5 | | | | | |
| 1986 12 16 | 01 02.64 | +07 49.9 | 1.481 | 2.087 | -1.75 | -10.7 | 17.5 |
| 1986 12 26 | 01 11.41 | +08 34.0 | | | | | |
| 1987 01 05 | 01 22.11 | +09 29.9 | 1.748 | 2.135 | -1.45 | -8.5 | 17.9 |

1981 DQ2 a,e,i = 2.27, 0.13, 6 Elements MPC 8538

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|
| 1986 07 29 | 01 27.42 | +15 27.4 | 1.962 | 2.348 | 99.1 | 25.3 | 18.8 |
| 1986 08 08 | 01 34.79 | +16 23.3 | | | | | |
| 1986 08 18 | 01 40.07 | +17 06.5 | 1.706 | 2.319 | 114.7 | 23.4 | 18.5 |
| 1986 08 28 | 01 42.89 | +17 34.9 | | | | | |
| 1986 09 07 | 01 42.91 | +17 45.4 | 1.481 | 2.290 | 133.0 | 18.8 | 18.0 |
| 1986 09 17 | 01 39.93 | +17 35.2 | | | | | |
| 1986 09 27 | 01 34.09 | +17 02.2 | 1.315 | 2.260 | 154.2 | 11.1 | 17.5 |
| 1986 10 07 | 01 25.91 | +16 06.4 | | | | | |
| 1986 10 17 | 01 16.46 | +14 51.7 | 1.236 | 2.229 | 173.7 | 2.8 | 17.0 |
| 1986 10 27 | 01 07.09 | +13 26.1 | | | | | |
| 1986 11 06 | 00 59.19 | +12 00.1 | 1.260 | 2.199 | 155.0 | 11.0 | 17.3 |
| 1986 11 16 | 00 53.83 | +10 44.4 | | | | | |
| 1986 11 26 | 00 51.59 | +09 46.5 | 1.375 | 2.169 | 132.6 | 19.6 | 17.7 |
| 1986 12 06 | 00 52.61 | +09 10.2 | | | | | |
| 1986 12 16 | 00 56.78 | +08 56.1 | 1.550 | 2.139 | 113.3 | 25.0 | 18.1 |
| 1986 12 26 | 01 03.75 | +09 02.6 | | | | | |
| 1987 01 05 | 01 13.19 | +09 27.2 | 1.754 | 2.111 | 96.9 | 27.5 | 18.4 |

(3305) 1985 KB a,e,i = 2.61, 0.15, 13 Elements MPC 10023

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 01 55.66 | +04 21.1 | 2.237 | 2.561 | 96.6 | 23.2 | 17.3 |
| 1986 | 08 08 | 02 00.95 | +05 03.0 | | | | | |
| 1986 | 08 18 | 02 03.98 | +05 35.2 | 2.021 | 2.593 | 113.3 | 21.0 | 17.0 |
| 1986 | 08 28 | 02 04.51 | +05 57.7 | | | | | |
| 1986 | 09 07 | 02 02.32 | +06 10.5 | 1.836 | 2.625 | 132.7 | 16.4 | 16.7 |
| 1986 | 09 17 | 01 57.38 | +06 14.4 | | | | | |
| 1986 | 09 27 | 01 49.94 | +06 10.9 | 1.715 | 2.657 | 154.9 | 9.2 | 16.3 |
| 1986 | 10 07 | 01 40.59 | +06 02.3 | | | | | |
| 1986 | 10 17 | 01 30.26 | +05 52.2 | 1.692 | 2.688 | 176.7 | 1.2 | 15.9 |
| 1986 | 10 27 | 01 20.04 | +05 44.6 | | | | | |
| 1986 | 11 06 | 01 10.99 | +05 43.2 | 1.784 | 2.718 | 155.7 | 8.6 | 16.4 |
| 1986 | 11 16 | 01 03.96 | +05 51.1 | | | | | |
| 1986 | 11 26 | 00 59.41 | +06 09.7 | 1.976 | 2.747 | 133.1 | 15.2 | 16.9 |
| 1986 | 12 06 | 00 57.48 | +06 39.5 | | | | | |
| 1986 | 12 16 | 00 58.11 | +07 20.1 | 2.238 | 2.775 | 113.0 | 19.1 | 17.3 |
| 1986 | 12 26 | 01 01.07 | +08 10.4 | | | | | |
| 1987 | 01 05 | 01 06.10 | +09 09.1 | 2.537 | 2.802 | 95.1 | 20.5 | 17.6 |

1983 CX2 a,e,i = 3.10, 0.09, 3 Elements MPC 7836

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 01 44.55 | +13 47.2 | 2.816 | 3.090 | 95.9 | 19.1 | 17.5 |
| 1986 | 08 08 | 01 49.54 | +14 23.8 | | | | | |
| 1986 | 08 18 | 01 52.78 | +14 50.9 | 2.534 | 3.072 | 112.8 | 17.7 | 17.3 |
| 1986 | 08 28 | 01 54.05 | +15 07.3 | | | | | |
| 1986 | 09 07 | 01 53.18 | +15 11.8 | 2.288 | 3.054 | 131.8 | 14.2 | 16.9 |
| 1986 | 09 17 | 01 50.16 | +15 03.5 | | | | | |
| 1986 | 09 27 | 01 45.13 | +14 42.3 | 2.107 | 3.036 | 153.2 | 8.6 | 16.5 |
| 1986 | 10 07 | 01 38.48 | +14 09.0 | | | | | |
| 1986 | 10 17 | 01 30.88 | +13 26.3 | 2.024 | 3.018 | 175.2 | 1.6 | 16.1 |
| 1986 | 10 27 | 01 23.14 | +12 38.2 | | | | | |
| 1986 | 11 06 | 01 16.09 | +11 50.1 | 2.054 | 3.000 | 159.0 | 6.8 | 16.4 |
| 1986 | 11 16 | 01 10.49 | +11 07.2 | | | | | |
| 1986 | 11 26 | 01 06.86 | +10 33.9 | 2.189 | 2.983 | 136.4 | 13.2 | 16.7 |
| 1986 | 12 06 | 01 05.45 | +10 12.9 | | | | | |
| 1986 | 12 16 | 01 06.33 | +10 05.6 | 2.401 | 2.966 | 115.9 | 17.4 | 17.1 |
| 1986 | 12 26 | 01 09.39 | +10 11.8 | | | | | |
| 1987 | 01 05 | 01 14.47 | +10 30.7 | 2.655 | 2.950 | 97.6 | 19.3 | 17.3 |

1983 AS2 a,e,i = 2.92, 0.06, 10 Elements MPC 9965

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 01 47.88 | +01 03.2 | 2.420 | 2.775 | 99.5 | 21.1 | 17.5 |
| 1986 | 08 08 | 01 53.39 | +01 20.6 | | | | | |
| 1986 | 08 18 | 01 56.90 | +01 27.4 | 2.170 | 2.769 | 116.2 | 19.2 | 17.2 |
| 1986 | 08 28 | 01 58.19 | +01 23.9 | | | | | |
| 1986 | 09 07 | 01 57.05 | +01 10.8 | 1.957 | 2.764 | 135.0 | 14.9 | 16.9 |
| 1986 | 09 17 | 01 53.45 | +00 50.0 | | | | | |
| 1986 | 09 27 | 01 47.58 | +00 24.5 | 1.814 | 2.759 | 155.9 | 8.5 | 16.5 |
| 1986 | 10 07 | 01 39.91 | -00 01.7 | | | | | |
| 1986 | 10 17 | 01 31.23 | -00 23.6 | 1.767 | 2.755 | 170.6 | 3.4 | 16.2 |
| 1986 | 10 27 | 01 22.48 | -00 36.6 | | | | | |
| 1986 | 11 06 | 01 14.64 | -00 37.1 | 1.832 | 2.753 | 153.1 | 9.4 | 16.6 |
| 1986 | 11 16 | 01 08.51 | -00 23.0 | | | | | |
| 1986 | 11 26 | 01 04.60 | +00 05.9 | 1.994 | 2.751 | 131.7 | 15.5 | 16.9 |
| 1986 | 12 06 | 01 03.12 | +00 48.8 | | | | | |
| 1986 | 12 16 | 01 04.10 | +01 44.0 | 2.223 | 2.750 | 112.1 | 19.4 | 17.3 |
| 1986 | 12 26 | 01 07.36 | +02 49.6 | | | | | |
| 1987 | 01 05 | 01 12.68 | +04 03.6 | 2.488 | 2.749 | 94.7 | 20.9 | 17.6 |

(3325) 1984 JZ a,e,i = 3.19, 0.01, 22 Elements MPC 10162

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 02 00.62 | -04 48.4 | 2.851 | 3.164 | 98.4 | 18.5 | 17.1 |
| 1986 | 08 08 | 02 04.43 | -04 38.0 | | | | | |
| 1986 | 08 18 | 02 06.35 | -04 36.1 | 2.593 | 3.162 | 115.3 | 16.8 | 16.9 |
| 1986 | 08 28 | 02 06.19 | -04 41.6 | | | | | |
| 1986 | 09 07 | 02 03.79 | -04 52.9 | 2.374 | 3.160 | 134.1 | 13.2 | 16.6 |
| 1986 | 09 17 | 01 59.18 | -05 07.3 | | | | | |
| 1986 | 09 27 | 01 52.55 | -05 21.3 | 2.227 | 3.158 | 153.9 | 8.0 | 16.2 |
| 1986 | 10 07 | 01 44.32 | -05 30.9 | | | | | |
| 1986 | 10 17 | 01 35.19 | -05 32.0 | 2.181 | 3.156 | 165.3 | 4.6 | 16.0 |
| 1986 | 10 27 | 01 25.98 | -05 21.4 | | | | | |
| 1986 | 11 06 | 01 17.51 | -04 57.2 | 2.251 | 3.154 | 150.8 | 8.8 | 16.3 |
| 1986 | 11 16 | 01 10.51 | -04 19.1 | | | | | |
| 1986 | 11 26 | 01 05.44 | -03 27.9 | 2.424 | 3.152 | 130.1 | 13.9 | 16.6 |
| 1986 | 12 06 | 01 02.54 | -02 25.3 | | | | | |
| 1986 | 12 16 | 01 01.85 | -01 13.2 | 2.670 | 3.150 | 110.4 | 17.0 | 16.9 |
| 1986 | 12 26 | 01 03.27 | +00 06.6 | | | | | |
| 1987 | 01 05 | 01 06.62 | +01 32.5 | 2.952 | 3.149 | 92.3 | 18.2 | 17.2 |

1981 DF2 a,e,i = 2.32, 0.20, 7 Elements MPC 10289

| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 01 15.77 | +18 26.4 | 1.423 | 1.893 | -1.92 | -8.0 | 17.8 |
| 1986 | 08 08 | 01 27.89 | +20 13.3 | | | | | |
| 1986 | 08 18 | 01 38.01 | +21 46.7 | 1.227 | 1.873 | -2.32 | -8.2 | 17.4 |
| 1986 | 08 28 | 01 45.64 | +23 03.6 | | | | | |
| 1986 | 09 07 | 01 50.24 | +23 59.6 | 1.057 | 1.859 | -2.83 | -9.2 | 17.0 |
| 1986 | 09 17 | 01 51.40 | +24 29.8 | | | | | |
| 1986 | 09 27 | 01 49.04 | +24 29.2 | 0.930 | 1.853 | -3.35 | -11.8 | 16.5 |
| 1986 | 10 07 | 01 43.52 | +23 53.7 | | | | | |
| 1986 | 10 17 | 01 36.01 | +22 44.3 | 0.870 | 1.853 | -3.61 | -15.2 | 16.0 |
| 1986 | 10 27 | 01 28.14 | +21 08.4 | | | | | |
| 1986 | 11 06 | 01 21.64 | +19 19.6 | 0.895 | 1.860 | -3.40 | -16.3 | 16.2 |
| 1986 | 11 16 | 01 17.90 | +17 34.1 | | | | | |
| 1986 | 11 26 | 01 17.59 | +16 04.9 | 1.004 | 1.873 | -2.89 | -14.1 | 16.7 |
| 1986 | 12 06 | 01 20.82 | +14 59.3 | | | | | |
| 1986 | 12 16 | 01 27.37 | +14 19.7 | 1.176 | 1.893 | -2.37 | -10.7 | 17.3 |
| 1986 | 12 26 | 01 36.75 | +14 04.2 | | | | | |
| 1987 | 01 05 | 01 48.52 | +14 09.5 | 1.391 | 1.919 | -1.97 | -7.7 | 17.8 |

1982 WE a,e,i = 2.62, 0.17, 14 Elements MPC 8778

| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 01 50.73 | -02 53.1 | 2.146 | 2.531 | -0.96 | -9.7 | 18.1 |
| 1986 | 08 08 | 01 57.59 | -02 36.9 | | | | | |
| 1986 | 08 18 | 02 02.42 | -02 31.5 | 1.881 | 2.495 | -1.12 | -11.3 | 17.8 |
| 1986 | 08 28 | 02 04.88 | -02 36.4 | | | | | |
| 1986 | 09 07 | 02 04.63 | -02 50.5 | 1.652 | 2.459 | -1.32 | -13.0 | 17.3 |
| 1986 | 09 17 | 02 01.50 | -03 10.9 | | | | | |
| 1986 | 09 27 | 01 55.52 | -03 33.7 | 1.485 | 2.424 | -1.52 | -14.5 | 16.9 |
| 1986 | 10 07 | 01 47.08 | -03 53.2 | | | | | |
| 1986 | 10 17 | 01 37.06 | -04 03.0 | 1.410 | 2.390 | -1.60 | -14.9 | 16.5 |
| 1986 | 10 27 | 01 26.62 | -03 57.5 | | | | | |
| 1986 | 11 06 | 01 17.05 | -03 33.1 | 1.438 | 2.358 | -1.52 | -14.3 | 16.8 |
| 1986 | 11 16 | 01 09.49 | -02 48.7 | | | | | |
| 1986 | 11 26 | 01 04.65 | -01 45.9 | 1.559 | 2.327 | -1.32 | -13.1 | 17.1 |
| 1986 | 12 06 | 01 02.83 | -00 27.1 | | | | | |
| 1986 | 12 16 | 01 04.04 | +01 04.8 | 1.743 | 2.299 | -1.12 | -11.9 | 17.5 |
| 1986 | 12 26 | 01 08.05 | +02 46.7 | | | | | |
| 1987 | 01 05 | 01 14.56 | +04 36.3 | 1.959 | 2.273 | -0.97 | -10.9 | 17.8 |

1982 TP a,e,i = 2.55, 0.13, 6 Elements MPC 10034

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 01 49.37 | +18 09.3 | 2.116 | 2.398 | 93.2 | 25.0 | 17.0 |
| 1986 | 08 08 | 01 57.04 | +19 15.7 | | | | | |
| 1986 | 08 18 | 02 02.56 | +20 10.9 | 1.905 | 2.425 | 108.6 | 23.3 | 16.8 |
| 1986 | 08 28 | 02 05.59 | +20 53.4 | | | | | |
| 1986 | 09 07 | 02 05.85 | +21 20.9 | 1.716 | 2.453 | 126.5 | 19.3 | 16.5 |
| 1986 | 09 17 | 02 03.20 | +21 31.1 | | | | | |
| 1986 | 09 27 | 01 57.78 | +21 22.0 | 1.579 | 2.481 | 147.2 | 12.7 | 16.1 |
| 1986 | 10 07 | 01 50.07 | +20 52.4 | | | | | |
| 1986 | 10 17 | 01 40.98 | +20 04.1 | 1.526 | 2.509 | 168.1 | 4.7 | 15.8 |
| 1986 | 10 27 | 01 31.67 | +19 02.1 | | | | | |
| 1986 | 11 06 | 01 23.35 | +17 53.6 | 1.579 | 2.538 | 161.2 | 7.2 | 16.0 |
| 1986 | 11 16 | 01 16.99 | +16 47.4 | | | | | |
| 1986 | 11 26 | 01 13.18 | +15 50.5 | 1.734 | 2.566 | 139.4 | 14.5 | 16.5 |
| 1986 | 12 06 | 01 12.13 | +15 07.7 | | | | | |
| 1986 | 12 16 | 01 13.79 | +14 41.3 | 1.967 | 2.593 | 119.2 | 19.4 | 16.9 |
| 1986 | 12 26 | 01 17.92 | +14 31.1 | | | | | |
| 1987 | 01 05 | 01 24.23 | +14 36.0 | 2.244 | 2.620 | 101.3 | 21.6 | 17.3 |

1975 TV2 a,e,i = 2.37, 0.14, 10 Elements MPC 9024

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 02 01.69 | +03 40.4 | 2.350 | 2.647 | 95.4 | 22.5 | 17.4 |
| 1986 | 08 08 | 02 07.46 | +04 00.4 | | | | | |
| 1986 | 08 18 | 02 11.15 | +04 09.4 | 2.110 | 2.660 | 112.0 | 20.7 | 17.1 |
| 1986 | 08 28 | 02 12.50 | +04 07.2 | | | | | |
| 1986 | 09 07 | 02 11.24 | +03 54.2 | 1.899 | 2.671 | 131.0 | 16.5 | 16.8 |
| 1986 | 09 17 | 02 07.29 | +03 31.6 | | | | | |
| 1986 | 09 27 | 02 00.79 | +03 01.9 | 1.750 | 2.680 | 152.6 | 9.9 | 16.4 |
| 1986 | 10 07 | 01 52.16 | +02 28.7 | | | | | |
| 1986 | 10 17 | 01 42.23 | +01 56.9 | 1.697 | 2.687 | 171.8 | 3.0 | 16.1 |
| 1986 | 10 27 | 01 32.04 | +01 31.8 | | | | | |
| 1986 | 11 06 | 01 22.65 | +01 17.8 | 1.756 | 2.692 | 155.9 | 8.7 | 16.4 |
| 1986 | 11 16 | 01 15.03 | +01 18.1 | | | | | |
| 1986 | 11 26 | 01 09.75 | +01 33.6 | 1.918 | 2.694 | 133.5 | 15.4 | 16.8 |
| 1986 | 12 06 | 01 07.08 | +02 03.9 | | | | | |
| 1986 | 12 16 | 01 07.04 | +02 47.7 | 2.150 | 2.694 | 113.2 | 19.6 | 17.2 |
| 1986 | 12 26 | 01 09.44 | +03 43.0 | | | | | |
| 1987 | 01 05 | 01 14.05 | +04 47.9 | 2.417 | 2.692 | 95.3 | 21.3 | 17.5 |

1984 FA a,e,i = 2.69, 0.10, 7 Elements MPC 8891

| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 01 48.65 | +04 12.6 | 2.204 | 2.556 | -1.02 | -5.6 | 16.7 |
| 1986 | 08 08 | 01 56.30 | +04 20.0 | | | | | |
| 1986 | 08 18 | 02 02.04 | +04 13.6 | 1.948 | 2.536 | -1.16 | -6.5 | 16.4 |
| 1986 | 08 28 | 02 05.59 | +03 53.1 | | | | | |
| 1986 | 09 07 | 02 06.66 | +03 18.3 | 1.726 | 2.517 | -1.35 | -7.5 | 16.0 |
| 1986 | 09 17 | 02 05.09 | +02 30.8 | | | | | |
| 1986 | 09 27 | 02 00.95 | +01 33.6 | 1.566 | 2.499 | -1.53 | -8.5 | 15.6 |
| 1986 | 10 07 | 01 54.57 | +00 31.6 | | | | | |
| 1986 | 10 17 | 01 46.68 | -00 28.2 | 1.496 | 2.482 | -1.63 | -8.8 | 15.2 |
| 1986 | 10 27 | 01 38.30 | -01 18.2 | | | | | |
| 1986 | 11 06 | 01 30.52 | -01 52.3 | 1.531 | 2.467 | -1.58 | -8.3 | 15.4 |
| 1986 | 11 16 | 01 24.36 | -02 06.0 | | | | | |
| 1986 | 11 26 | 01 20.48 | -01 58.4 | 1.661 | 2.453 | -1.41 | -7.3 | 15.8 |
| 1986 | 12 06 | 01 19.23 | -01 30.5 | | | | | |
| 1986 | 12 16 | 01 20.68 | -00 44.7 | 1.858 | 2.441 | -1.22 | -6.4 | 16.2 |
| 1986 | 12 26 | 01 24.64 | +00 15.9 | | | | | |
| 1987 | 01 05 | 01 30.91 | +01 28.2 | 2.091 | 2.430 | -1.07 | -5.8 | 16.5 |

1978 VW6 a,e,i = 2.57, 0.15, 13 Elements MPC 8384

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 01 36.92 | +23 54.7 | 2.012 | 2.312 | 93.8 | 26.0 | 19.2 |
| 1986 | 08 08 | 01 46.79 | +25 10.0 | | | | | |
| 1986 | 08 18 | 01 54.83 | +26 13.3 | 1.764 | 2.286 | 107.8 | 24.9 | 18.8 |
| 1986 | 08 28 | 02 00.66 | +27 01.9 | | | | | |
| 1986 | 09 07 | 02 03.87 | +27 32.3 | 1.539 | 2.262 | 124.0 | 21.7 | 18.4 |
| 1986 | 09 17 | 02 04.15 | +27 40.5 | | | | | |
| 1986 | 09 27 | 02 01.43 | +27 22.2 | 1.359 | 2.241 | 142.9 | 15.7 | 18.0 |
| 1986 | 10 07 | 01 55.97 | +26 33.5 | | | | | |
| 1986 | 10 17 | 01 48.56 | +25 13.9 | 1.251 | 2.223 | 162.7 | 7.7 | 17.5 |
| 1986 | 10 27 | 01 40.41 | +23 27.9 | | | | | |
| 1986 | 11 06 | 01 32.91 | +21 25.0 | 1.241 | 2.207 | 162.8 | 7.6 | 17.5 |
| 1986 | 11 16 | 01 27.35 | +19 19.0 | | | | | |
| 1986 | 11 26 | 01 24.53 | +17 22.7 | 1.329 | 2.195 | 142.4 | 15.9 | 17.9 |
| 1986 | 12 06 | 01 24.80 | +15 45.4 | | | | | |
| 1986 | 12 16 | 01 28.18 | +14 31.9 | 1.495 | 2.186 | 122.4 | 22.3 | 18.3 |
| 1986 | 12 26 | 01 34.37 | +13 43.0 | | | | | |
| 1987 | 01 05 | 01 43.07 | +13 16.7 | 1.708 | 2.182 | 105.1 | 25.8 | 18.7 |

1936 XA a,e,i = 2.76, 0.19, 8 Elements MPC 7661

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 01 45.56 | +18 48.4 | 2.282 | 2.559 | 93.8 | 23.3 | 17.3 |
| 1986 | 08 08 | 01 53.91 | +19 47.7 | | | | | |
| 1986 | 08 18 | 02 00.54 | +20 37.0 | 2.003 | 2.519 | 108.9 | 22.3 | 17.0 |
| 1986 | 08 28 | 02 05.13 | +21 14.2 | | | | | |
| 1986 | 09 07 | 02 07.32 | +21 37.2 | 1.750 | 2.481 | 126.1 | 19.2 | 16.5 |
| 1986 | 09 17 | 02 06.86 | +21 43.1 | | | | | |
| 1986 | 09 27 | 02 03.70 | +21 29.6 | 1.548 | 2.444 | 145.9 | 13.3 | 16.1 |
| 1986 | 10 07 | 01 58.05 | +20 54.6 | | | | | |
| 1986 | 10 17 | 01 50.56 | +19 58.7 | 1.426 | 2.408 | 167.2 | 5.3 | 15.6 |
| 1986 | 10 27 | 01 42.27 | +18 45.9 | | | | | |
| 1986 | 11 06 | 01 34.38 | +17 23.1 | 1.407 | 2.375 | 163.9 | 6.7 | 15.6 |
| 1986 | 11 16 | 01 28.08 | +16 00.3 | | | | | |
| 1986 | 11 26 | 01 24.21 | +14 46.3 | 1.488 | 2.344 | 141.7 | 15.1 | 15.9 |
| 1986 | 12 06 | 01 23.22 | +13 47.9 | | | | | |
| 1986 | 12 16 | 01 25.22 | +13 08.7 | 1.647 | 2.316 | 121.3 | 21.3 | 16.3 |
| 1986 | 12 26 | 01 30.04 | +12 49.1 | | | | | |
| 1987 | 01 05 | 01 37.43 | +12 48.0 | 1.851 | 2.291 | 103.6 | 24.7 | 16.6 |

1984 AZ a,e,i = 2.34, 0.15, 6 Elements MPC 8901

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 02 03.33 | +05 44.0 | 2.335 | 2.616 | 94.3 | 22.8 | 18.4 |
| 1986 | 08 08 | 02 10.50 | +06 00.8 | | | | | |
| 1986 | 08 18 | 02 15.81 | +06 05.5 | 2.064 | 2.595 | 110.3 | 21.5 | 18.1 |
| 1986 | 08 28 | 02 18.96 | +05 57.9 | | | | | |
| 1986 | 09 07 | 02 19.61 | +05 37.4 | 1.820 | 2.572 | 128.6 | 17.8 | 17.7 |
| 1986 | 09 17 | 02 17.55 | +05 04.8 | | | | | |
| 1986 | 09 27 | 02 12.77 | +04 21.9 | 1.632 | 2.547 | 149.5 | 11.5 | 17.2 |
| 1986 | 10 07 | 02 05.49 | +03 31.9 | | | | | |
| 1986 | 10 17 | 01 56.39 | +02 40.5 | 1.533 | 2.520 | 169.9 | 4.0 | 16.8 |
| 1986 | 10 27 | 01 46.45 | +01 54.1 | | | | | |
| 1986 | 11 06 | 01 36.85 | +01 19.0 | 1.542 | 2.491 | 158.6 | 8.4 | 16.9 |
| 1986 | 11 16 | 01 28.73 | +01 00.5 | | | | | |
| 1986 | 11 26 | 01 22.91 | +01 00.9 | 1.652 | 2.461 | 136.1 | 16.1 | 17.3 |
| 1986 | 12 06 | 01 19.84 | +01 20.4 | | | | | |
| 1986 | 12 16 | 01 19.67 | +01 57.6 | 1.834 | 2.429 | 115.8 | 21.4 | 17.7 |
| 1986 | 12 26 | 01 22.24 | +02 49.9 | | | | | |
| 1987 | 01 05 | 01 27.35 | +03 54.9 | 2.052 | 2.396 | 98.0 | 24.0 | 17.9 |

1981 EU35 a,e,i = 2.39, 0.24, 4 Elements MPC 9752

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|
| 1986 07 29 | 01 35.83 | +08 50.5 | 1.358 | 1.827 | 99.7 | 33.2 | 16.8 |
| 1986 08 08 | 01 49.20 | +09 33.9 | | | | | |
| 1986 08 18 | 02 00.24 | +09 58.6 | 1.195 | 1.841 | 112.8 | 30.5 | 16.5 |
| 1986 08 28 | 02 08.49 | +10 03.2 | | | | | |
| 1986 09 07 | 02 13.45 | +09 46.7 | 1.055 | 1.862 | 129.0 | 24.9 | 16.1 |
| 1986 09 17 | 02 14.76 | +09 09.4 | | | | | |
| 1986 09 27 | 02 12.40 | +08 13.5 | 0.959 | 1.891 | 149.1 | 15.8 | 15.6 |
| 1986 10 07 | 02 06.76 | +07 04.1 | | | | | |
| 1986 10 17 | 01 58.92 | +05 50.2 | 0.935 | 1.926 | 170.9 | 4.7 | 15.2 |
| 1986 10 27 | 01 50.37 | +04 42.3 | | | | | |
| 1986 11 06 | 01 42.69 | +03 50.4 | 1.001 | 1.966 | 161.4 | 9.3 | 15.6 |
| 1986 11 16 | 01 37.21 | +03 21.4 | | | | | |
| 1986 11 26 | 01 34.65 | +03 17.0 | 1.153 | 2.011 | 139.8 | 18.5 | 16.3 |
| 1986 12 06 | 01 35.23 | +03 36.1 | | | | | |
| 1986 12 16 | 01 38.83 | +04 15.2 | 1.371 | 2.059 | 121.1 | 24.2 | 16.8 |
| 1986 12 26 | 01 45.09 | +05 10.0 | | | | | |
| 1987 01 05 | 01 53.65 | +06 16.9 | 1.630 | 2.110 | 105.0 | 26.8 | 17.3 |

1981 EA9 a,e,i = 2.35, 0.24, 7 Elements MPC 10820

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|
| 1986 07 29 | 01 39.67 | +13 53.5 | 1.344 | 1.780 | 96.9 | 34.5 | 18.7 |
| 1986 08 08 | 01 53.24 | +16 09.1 | | | | | |
| 1986 08 18 | 02 04.70 | +18 16.2 | 1.178 | 1.784 | 108.9 | 32.5 | 18.3 |
| 1986 08 28 | 02 13.53 | +20 13.5 | | | | | |
| 1986 09 07 | 02 19.11 | +21 58.6 | 1.033 | 1.798 | 123.5 | 27.9 | 17.9 |
| 1986 09 17 | 02 20.90 | +23 28.0 | | | | | |
| 1986 09 27 | 02 18.62 | +24 37.2 | 0.925 | 1.819 | 141.4 | 20.1 | 17.5 |
| 1986 10 07 | 02 12.40 | +25 20.5 | | | | | |
| 1986 10 17 | 02 03.23 | +25 33.8 | 0.878 | 1.849 | 160.9 | 10.1 | 17.1 |
| 1986 10 27 | 01 52.79 | +25 17.6 | | | | | |
| 1986 11 06 | 01 43.09 | +24 38.1 | 0.913 | 1.885 | 163.7 | 8.5 | 17.2 |
| 1986 11 16 | 01 35.93 | +23 47.2 | | | | | |
| 1986 11 26 | 01 32.32 | +22 57.0 | 1.034 | 1.927 | 145.0 | 17.1 | 17.8 |
| 1986 12 06 | 01 32.57 | +22 16.7 | | | | | |
| 1986 12 16 | 01 36.49 | +21 51.5 | 1.224 | 1.974 | 126.4 | 23.7 | 18.4 |
| 1986 12 26 | 01 43.60 | +21 42.5 | | | | | |
| 1987 01 05 | 01 53.41 | +21 48.6 | 1.462 | 2.024 | 110.2 | 27.1 | 18.9 |

1982 VT a,e,i = 2.59, 0.16, 15 Elements MPC 10388

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|
| 1986 07 29 | 02 12.10 | +01 12.7 | 1.948 | 2.256 | 93.8 | 26.7 | 17.8 |
| 1986 08 08 | 02 20.56 | +02 02.5 | | | | | |
| 1986 08 18 | 02 26.80 | +02 43.1 | 1.745 | 2.280 | 108.6 | 24.9 | 17.5 |
| 1986 08 28 | 02 30.44 | +03 14.8 | | | | | |
| 1986 09 07 | 02 31.13 | +03 38.5 | 1.563 | 2.306 | 126.2 | 20.6 | 17.2 |
| 1986 09 17 | 02 28.63 | +03 55.5 | | | | | |
| 1986 09 27 | 02 22.96 | +04 07.9 | 1.429 | 2.335 | 147.0 | 13.5 | 16.8 |
| 1986 10 07 | 02 14.45 | +04 18.1 | | | | | |
| 1986 10 17 | 02 03.95 | +04 29.7 | 1.378 | 2.365 | 169.3 | 4.5 | 16.4 |
| 1986 10 27 | 01 52.69 | +04 46.0 | | | | | |
| 1986 11 06 | 01 42.02 | +05 09.7 | 1.434 | 2.397 | 162.1 | 7.3 | 16.6 |
| 1986 11 16 | 01 33.19 | +05 43.1 | | | | | |
| 1986 11 26 | 01 26.97 | +06 26.9 | 1.593 | 2.429 | 139.5 | 15.3 | 17.2 |
| 1986 12 06 | 01 23.73 | +07 20.7 | | | | | |
| 1986 12 16 | 01 23.48 | +08 23.7 | 1.828 | 2.463 | 119.2 | 20.4 | 17.7 |
| 1986 12 26 | 01 25.98 | +09 34.6 | | | | | |
| 1987 01 05 | 01 30.93 | +10 52.1 | 2.108 | 2.497 | 101.5 | 22.7 | 18.1 |

1936 UB a,e,i = 3.13, 0.25, 19 Elements MPC 10401

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 02 13.39 | -06 40.1 | 2.054 | 2.385 | 96.0 | 25.0 | 16.5 |
| 1986 | 08 08 | 02 21.59 | -06 18.8 | | | | | |
| 1986 | 08 18 | 02 27.54 | -06 07.5 | 1.857 | 2.406 | 110.5 | 23.2 | 16.2 |
| 1986 | 08 28 | 02 30.94 | -06 04.9 | | | | | |
| 1986 | 09 07 | 02 31.50 | -06 08.9 | 1.685 | 2.432 | 127.3 | 19.2 | 15.9 |
| 1986 | 09 17 | 02 29.05 | -06 16.0 | | | | | |
| 1986 | 09 27 | 02 23.68 | -06 21.5 | 1.565 | 2.461 | 146.1 | 13.1 | 15.6 |
| 1986 | 10 07 | 02 15.76 | -06 20.0 | | | | | |
| 1986 | 10 17 | 02 06.10 | -06 06.0 | 1.528 | 2.495 | 161.8 | 7.2 | 15.4 |
| 1986 | 10 27 | 01 55.81 | -05 35.7 | | | | | |
| 1986 | 11 06 | 01 46.08 | -04 47.4 | 1.596 | 2.531 | 155.4 | 9.4 | 15.6 |
| 1986 | 11 16 | 01 37.98 | -03 41.8 | | | | | |
| 1986 | 11 26 | 01 32.21 | -02 21.9 | 1.765 | 2.571 | 136.4 | 15.4 | 16.0 |
| 1986 | 12 06 | 01 29.08 | -00 50.8 | | | | | |
| 1986 | 12 16 | 01 28.65 | +00 48.4 | 2.012 | 2.614 | 117.3 | 19.5 | 16.5 |
| 1986 | 12 26 | 01 30.72 | +02 32.7 | | | | | |
| 1987 | 01 05 | 01 35.04 | +04 20.3 | 2.305 | 2.658 | 100.0 | 21.4 | 16.9 |

1980 OF a,e,i = 3.11, 0.16, 10 Elements MPC 6645

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 02 06.88 | +23 04.6 | 2.569 | 2.724 | 87.7 | 21.9 | 17.7 |
| 1986 | 08 08 | 02 14.51 | +24 27.0 | | | | | |
| 1986 | 08 18 | 02 20.28 | +25 42.2 | 2.341 | 2.747 | 102.7 | 21.1 | 17.4 |
| 1986 | 08 28 | 02 23.91 | +26 49.0 | | | | | |
| 1986 | 09 07 | 02 25.11 | +27 45.4 | 2.131 | 2.772 | 119.7 | 18.4 | 17.2 |
| 1986 | 09 17 | 02 23.70 | +28 28.8 | | | | | |
| 1986 | 09 27 | 02 19.68 | +28 56.6 | 1.966 | 2.799 | 138.7 | 13.7 | 16.9 |
| 1986 | 10 07 | 02 13.31 | +29 05.6 | | | | | |
| 1986 | 10 17 | 02 05.22 | +28 54.3 | 1.879 | 2.827 | 157.8 | 7.7 | 16.6 |
| 1986 | 10 27 | 01 56.33 | +28 23.3 | | | | | |
| 1986 | 11 06 | 01 47.71 | +27 36.1 | 1.894 | 2.856 | 162.8 | 5.9 | 16.6 |
| 1986 | 11 16 | 01 40.38 | +26 39.1 | | | | | |
| 1986 | 11 26 | 01 35.10 | +25 39.6 | 2.016 | 2.886 | 145.7 | 11.1 | 16.9 |
| 1986 | 12 06 | 01 32.27 | +24 44.1 | | | | | |
| 1986 | 12 16 | 01 32.04 | +23 58.0 | 2.229 | 2.916 | 125.8 | 15.9 | 17.3 |
| 1986 | 12 26 | 01 34.28 | +23 24.0 | | | | | |
| 1987 | 01 05 | 01 38.79 | +23 03.0 | 2.501 | 2.947 | 107.3 | 18.6 | 17.7 |

1981 WK2 a,e,i = 2.87, 0.06, 3 Elements MPC 10154

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 02 08.51 | +10 23.2 | 2.544 | 2.765 | 91.6 | 21.5 | 17.4 |
| 1986 | 08 08 | 02 15.54 | +10 57.0 | | | | | |
| 1986 | 08 18 | 02 20.75 | +11 20.9 | 2.296 | 2.775 | 107.6 | 20.4 | 17.1 |
| 1986 | 08 28 | 02 23.89 | +11 34.4 | | | | | |
| 1986 | 09 07 | 02 24.71 | +11 36.9 | 2.072 | 2.785 | 125.9 | 17.1 | 16.8 |
| 1986 | 09 17 | 02 23.07 | +11 28.3 | | | | | |
| 1986 | 09 27 | 02 19.02 | +11 09.2 | 1.903 | 2.796 | 146.8 | 11.3 | 16.4 |
| 1986 | 10 07 | 02 12.82 | +10 40.8 | | | | | |
| 1986 | 10 17 | 02 05.06 | +10 06.1 | 1.821 | 2.807 | 169.9 | 3.6 | 16.0 |
| 1986 | 10 27 | 01 56.58 | +09 29.1 | | | | | |
| 1986 | 11 06 | 01 48.33 | +08 54.6 | 1.848 | 2.819 | 165.4 | 5.1 | 16.2 |
| 1986 | 11 16 | 01 41.24 | +08 27.4 | | | | | |
| 1986 | 11 26 | 01 36.01 | +08 11.1 | 1.985 | 2.830 | 142.3 | 12.3 | 16.6 |
| 1986 | 12 06 | 01 33.05 | +08 07.7 | | | | | |
| 1986 | 12 16 | 01 32.50 | +08 17.8 | 2.205 | 2.842 | 121.2 | 17.2 | 17.0 |
| 1986 | 12 26 | 01 34.29 | +08 40.7 | | | | | |
| 1987 | 01 05 | 01 38.27 | +09 15.0 | 2.474 | 2.854 | 102.5 | 19.7 | 17.3 |

(3315) 1984 CZ a,e,i = 2.64, 0.09, 10 Elements MPC 10035

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 07 29 | 02 11.56 | +04 59.8 | 2.631 | 2.864 | 92.7 | 20.7 | 17.8 |
| 1986 | 08 08 | 02 18.33 | +04 52.0 | | | | | |
| 1986 | 08 18 | 02 23.33 | +04 31.3 | 2.373 | 2.867 | 109.0 | 19.5 | 17.5 |
| 1986 | 08 28 | 02 26.33 | +03 57.4 | | | | | |
| 1986 | 09 07 | 02 27.10 | +03 10.5 | 2.143 | 2.868 | 127.3 | 16.2 | 17.2 |
| 1986 | 09 17 | 02 25.50 | +02 12.1 | | | | | |
| 1986 | 09 27 | 02 21.58 | +01 05.1 | 1.973 | 2.869 | 147.4 | 10.8 | 16.9 |
| 1986 | 10 07 | 02 15.59 | -00 06.2 | | | | | |
| 1986 | 10 17 | 02 08.07 | -01 15.8 | 1.893 | 2.868 | 165.1 | 5.1 | 16.5 |
| 1986 | 10 27 | 01 59.80 | -02 17.1 | | | | | |
| 1986 | 11 06 | 01 51.69 | -03 04.4 | 1.925 | 2.866 | 157.6 | 7.6 | 16.7 |
| 1986 | 11 16 | 01 44.62 | -03 33.3 | | | | | |
| 1986 | 11 26 | 01 39.27 | -03 42.3 | 2.061 | 2.863 | 137.0 | 13.6 | 17.0 |
| 1986 | 12 06 | 01 36.05 | -03 31.9 | | | | | |
| 1986 | 12 16 | 01 35.16 | -03 04.0 | 2.274 | 2.859 | 117.0 | 17.9 | 17.4 |
| 1986 | 12 26 | 01 36.55 | -02 21.4 | | | | | |
| 1987 | 01 05 | 01 40.08 | -01 26.7 | 2.531 | 2.853 | 98.9 | 19.9 | 17.7 |

(3266) 1978 PA a,e,i = 1.91, 0.11, 26 Elements MPC 9758

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 13.15 | -30 49.9 | 0.990 | 1.705 | 116.7 | 32.0 | 16.3 |
| 1986 | 08 28 | 02 25.31 | -34 16.2 | | | | | |
| 1986 | 09 07 | 02 33.24 | -37 41.9 | 0.930 | 1.699 | 122.5 | 30.0 | 16.1 |
| 1986 | 09 17 | 02 36.20 | -40 51.5 | | | | | |
| 1986 | 09 27 | 02 33.83 | -43 27.7 | 0.910 | 1.698 | 125.1 | 28.9 | 16.1 |
| 1986 | 10 07 | 02 26.43 | -45 12.8 | | | | | |
| 1986 | 10 17 | 02 15.42 | -45 51.2 | 0.929 | 1.701 | 124.1 | 29.0 | 16.1 |
| 1986 | 10 27 | 02 03.07 | -45 15.4 | | | | | |
| 1986 | 11 06 | 01 51.84 | -43 26.4 | 0.984 | 1.709 | 119.8 | 30.2 | 16.3 |
| 1986 | 11 16 | 01 43.66 | -40 33.6 | | | | | |
| 1986 | 11 26 | 01 39.42 | -36 51.8 | 1.075 | 1.721 | 113.1 | 31.8 | 16.5 |
| 1986 | 12 06 | 01 39.19 | -32 35.7 | | | | | |
| 1986 | 12 16 | 01 42.64 | -27 59.2 | 1.200 | 1.737 | 104.9 | 33.2 | 16.8 |
| 1986 | 12 26 | 01 49.18 | -23 13.8 | | | | | |
| 1987 | 01 05 | 01 58.31 | -18 27.6 | 1.359 | 1.756 | 95.8 | 33.9 | 17.1 |
| 1987 | 01 15 | 02 09.59 | -13 47.3 | | | | | |
| 1987 | 01 25 | 02 22.62 | -09 17.2 | 1.544 | 1.778 | 86.4 | 33.5 | 17.4 |

1983 AR a,e,i = 2.77, 0.13, 11 Elements MPC 7766

| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 25.67 | +06 11.6 | 1.914 | 2.425 | -1.08 | -10.5 | 16.8 |
| 1986 | 08 28 | 02 30.42 | +06 43.2 | | | | | |
| 1986 | 09 07 | 02 32.63 | +07 06.4 | 1.689 | 2.414 | -1.25 | -11.9 | 16.4 |
| 1986 | 09 17 | 02 32.00 | +07 21.8 | | | | | |
| 1986 | 09 27 | 02 28.44 | +07 30.5 | 1.513 | 2.406 | -1.45 | -13.4 | 16.0 |
| 1986 | 10 07 | 02 22.08 | +07 34.2 | | | | | |
| 1986 | 10 17 | 02 13.50 | +07 35.5 | 1.416 | 2.400 | -1.59 | -14.5 | 15.5 |
| 1986 | 10 27 | 02 03.68 | +07 37.9 | | | | | |
| 1986 | 11 06 | 01 53.87 | +07 44.9 | 1.423 | 2.397 | -1.57 | -14.7 | 15.6 |
| 1986 | 11 16 | 01 45.33 | +08 00.3 | | | | | |
| 1986 | 11 26 | 01 39.03 | +08 26.2 | 1.533 | 2.396 | -1.41 | -13.7 | 16.0 |
| 1986 | 12 06 | 01 35.53 | +09 03.7 | | | | | |
| 1986 | 12 16 | 01 35.04 | +09 52.7 | 1.723 | 2.398 | -1.21 | -12.2 | 16.5 |
| 1986 | 12 26 | 01 37.42 | +10 52.2 | | | | | |
| 1987 | 01 05 | 01 42.44 | +12 00.6 | 1.961 | 2.404 | -1.03 | -10.6 | 16.8 |
| 1987 | 01 15 | 01 49.81 | +13 16.4 | | | | | |
| 1987 | 01 25 | 01 59.19 | +14 37.5 | 2.221 | 2.411 | -0.90 | -9.2 | 17.1 |

1985 FC a,e,i = 1.86, 0.04, 24 Elements MPC 9823

| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 49.12 | +15 26.8 | 1.472 | 1.922 | -1.01 | -17.9 | 18.4 |
| 1986 | 08 28 | 02 55.73 | +18 02.6 | | | | | |
| 1986 | 09 07 | 02 59.30 | +20 45.5 | 1.256 | 1.916 | -1.24 | -20.0 | 18.0 |
| 1986 | 09 17 | 02 59.04 | +23 35.9 | | | | | |
| 1986 | 09 27 | 02 54.13 | +26 31.4 | 1.075 | 1.908 | -1.58 | -22.9 | 17.5 |
| 1986 | 10 07 | 02 43.88 | +29 24.3 | | | | | |
| 1986 | 10 17 | 02 28.31 | +32 01.2 | 0.959 | 1.900 | -1.91 | -27.4 | 17.0 |
| 1986 | 10 27 | 02 08.66 | +34 05.8 | | | | | |
| 1986 | 11 06 | 01 47.53 | +35 25.6 | 0.939 | 1.891 | -1.91 | -32.2 | 16.9 |
| 1986 | 11 16 | 01 28.29 | +36 01.0 | | | | | |
| 1986 | 11 26 | 01 13.60 | +36 04.6 | 1.015 | 1.881 | -1.57 | -32.8 | 17.3 |
| 1986 | 12 06 | 01 04.77 | +35 53.5 | | | | | |
| 1986 | 12 16 | 01 01.92 | +35 42.9 | 1.160 | 1.871 | -1.17 | -29.3 | 17.7 |
| 1986 | 12 26 | 01 04.42 | +35 41.5 | | | | | |
| 1987 | 01 05 | 01 11.53 | +35 53.1 | 1.339 | 1.861 | -0.89 | -24.6 | 18.1 |
| 1987 | 01 15 | 01 22.53 | +36 18.6 | | | | | |
| 1987 | 01 25 | 01 36.80 | +36 55.9 | 1.528 | 1.851 | -0.75 | -20.2 | 18.5 |

(3301) 1978 CT a,e,i = 2.23, 0.15, 5 Elements MPC 9960

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 34.29 | +09 27.6 | 1.895 | 2.367 | 105.0 | 24.4 | 17.8 |
| 1986 | 08 28 | 02 38.97 | +09 18.8 | | | | | |
| 1986 | 09 07 | 02 40.95 | +08 55.6 | 1.697 | 2.397 | 122.7 | 20.7 | 17.4 |
| 1986 | 09 17 | 02 39.98 | +08 18.4 | | | | | |
| 1986 | 09 27 | 02 36.01 | +07 28.8 | 1.545 | 2.425 | 143.4 | 14.3 | 17.1 |
| 1986 | 10 07 | 02 29.26 | +06 29.6 | | | | | |
| 1986 | 10 17 | 02 20.37 | +05 26.3 | 1.473 | 2.451 | 165.7 | 5.8 | 16.7 |
| 1986 | 10 27 | 02 10.35 | +04 25.6 | | | | | |
| 1986 | 11 06 | 02 00.42 | +03 34.5 | 1.506 | 2.474 | 164.3 | 6.2 | 16.8 |
| 1986 | 11 16 | 01 51.78 | +02 59.0 | | | | | |
| 1986 | 11 26 | 01 45.30 | +02 42.3 | 1.644 | 2.496 | 141.8 | 14.1 | 17.3 |
| 1986 | 12 06 | 01 41.48 | +02 45.1 | | | | | |
| 1986 | 12 16 | 01 40.46 | +03 05.9 | 1.863 | 2.515 | 121.0 | 19.6 | 17.7 |
| 1986 | 12 26 | 01 42.12 | +03 42.3 | | | | | |
| 1987 | 01 05 | 01 46.22 | +04 31.5 | 2.128 | 2.531 | 102.6 | 22.3 | 18.1 |
| 1987 | 01 15 | 01 52.47 | +05 30.7 | | | | | |
| 1987 | 01 25 | 02 00.56 | +06 37.4 | 2.409 | 2.545 | 86.4 | 22.7 | 18.4 |

1979 MB6 a,e,i = 2.23, 0.19, 4 Elements MPC 6639

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 11.12 | +10 08.9 | 1.176 | 1.797 | 110.2 | 31.9 | 18.8 |
| 1986 | 08 28 | 02 21.39 | +10 24.5 | | | | | |
| 1986 | 09 07 | 02 28.59 | +10 20.4 | 1.021 | 1.802 | 125.3 | 27.2 | 18.4 |
| 1986 | 09 17 | 02 32.22 | +09 56.4 | | | | | |
| 1986 | 09 27 | 02 32.02 | +09 13.8 | 0.904 | 1.814 | 144.1 | 18.9 | 17.9 |
| 1986 | 10 07 | 02 28.02 | +08 15.9 | | | | | |
| 1986 | 10 17 | 02 20.96 | +07 10.0 | 0.850 | 1.833 | 165.9 | 7.6 | 17.4 |
| 1986 | 10 27 | 02 12.21 | +06 05.9 | | | | | |
| 1986 | 11 06 | 02 03.49 | +05 14.2 | 0.880 | 1.858 | 166.0 | 7.4 | 17.5 |
| 1986 | 11 16 | 01 56.51 | +04 43.7 | | | | | |
| 1986 | 11 26 | 01 52.39 | +04 38.0 | 0.996 | 1.888 | 144.3 | 17.7 | 18.2 |
| 1986 | 12 06 | 01 51.63 | +04 57.0 | | | | | |
| 1986 | 12 16 | 01 54.28 | +05 37.6 | 1.180 | 1.923 | 125.1 | 24.7 | 18.8 |
| 1986 | 12 26 | 02 00.00 | +06 35.4 | | | | | |
| 1987 | 01 05 | 02 08.41 | +07 46.1 | 1.407 | 1.961 | 108.9 | 28.3 | 19.3 |
| 1987 | 01 15 | 02 19.10 | +09 05.6 | | | | | |
| 1987 | 01 25 | 02 31.68 | +10 30.2 | 1.660 | 2.002 | 95.0 | 29.3 | 19.7 |

1978 SQ2 a,e,i = 2.44, 0.07, 13 Elements MPC 10627

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 40.42 | +25 35.5 | 2.078 | 2.442 | 98.5 | 24.2 | 17.0 |
| 1986 | 08 28 | 02 45.75 | +27 12.0 | | | | | |
| 1986 | 09 07 | 02 48.49 | +28 42.2 | 1.860 | 2.457 | 114.7 | 21.9 | 16.7 |
| 1986 | 09 17 | 02 48.22 | +30 03.9 | | | | | |
| 1986 | 09 27 | 02 44.69 | +31 13.5 | 1.677 | 2.472 | 133.0 | 17.3 | 16.4 |
| 1986 | 10 07 | 02 37.86 | +32 06.1 | | | | | |
| 1986 | 10 17 | 02 28.21 | +32 36.5 | 1.562 | 2.486 | 152.1 | 10.8 | 16.0 |
| 1986 | 10 27 | 02 16.71 | +32 41.2 | | | | | |
| 1986 | 11 06 | 02 04.78 | +32 20.2 | 1.541 | 2.500 | 161.4 | 7.3 | 15.9 |
| 1986 | 11 16 | 01 53.97 | +31 38.7 | | | | | |
| 1986 | 11 26 | 01 45.54 | +30 45.1 | 1.624 | 2.514 | 147.5 | 12.2 | 16.2 |
| 1986 | 12 06 | 01 40.24 | +29 49.1 | | | | | |
| 1986 | 12 16 | 01 38.34 | +28 59.0 | 1.798 | 2.526 | 128.1 | 17.9 | 16.6 |
| 1986 | 12 26 | 01 39.72 | +28 19.9 | | | | | |
| 1987 | 01 05 | 01 44.06 | +27 54.2 | 2.030 | 2.538 | 109.9 | 21.4 | 17.0 |
| 1987 | 01 15 | 01 51.01 | +27 42.5 | | | | | |
| 1987 | 01 25 | 02 00.16 | +27 43.6 | 2.291 | 2.550 | 93.6 | 22.7 | 17.3 |

1979 SN11 a,e,i = 2.30, 0.18, 2 Elements MPC 9028

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 18.72 | +16 01.7 | 1.478 | 2.015 | 106.5 | 28.8 | 17.5 |
| 1986 | 08 28 | 02 28.20 | +16 54.9 | | | | | |
| 1986 | 09 07 | 02 35.26 | +17 34.8 | 1.258 | 1.981 | 121.6 | 25.7 | 17.0 |
| 1986 | 09 17 | 02 39.39 | +17 59.9 | | | | | |
| 1986 | 09 27 | 02 40.19 | +18 08.2 | 1.075 | 1.951 | 139.8 | 19.4 | 16.5 |
| 1986 | 10 07 | 02 37.41 | +17 57.8 | | | | | |
| 1986 | 10 17 | 02 31.34 | +17 28.4 | 0.953 | 1.925 | 161.6 | 9.4 | 15.9 |
| 1986 | 10 27 | 02 22.90 | +16 42.5 | | | | | |
| 1986 | 11 06 | 02 13.59 | +15 45.9 | 0.916 | 1.904 | 173.3 | 3.5 | 15.5 |
| 1986 | 11 16 | 02 05.23 | +14 48.7 | | | | | |
| 1986 | 11 26 | 01 59.36 | +14 01.0 | 0.970 | 1.889 | 149.7 | 15.3 | 16.1 |
| 1986 | 12 06 | 01 56.91 | +13 30.2 | | | | | |
| 1986 | 12 16 | 01 58.26 | +13 20.3 | 1.097 | 1.879 | 128.9 | 24.0 | 16.6 |
| 1986 | 12 26 | 02 03.25 | +13 31.0 | | | | | |
| 1987 | 01 05 | 02 11.52 | +13 59.8 | 1.272 | 1.875 | 111.8 | 29.1 | 17.0 |
| 1987 | 01 15 | 02 22.65 | +14 43.3 | | | | | |
| 1987 | 01 25 | 02 36.19 | +15 37.4 | 1.474 | 1.878 | 97.6 | 31.3 | 17.4 |

1985 NE a,e,i = 2.54, 0.19, 7 Elements MPC 10530

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 51.76 | +20 11.0 | 2.582 | 2.897 | 97.8 | 20.3 | 18.3 |
| 1986 | 08 28 | 02 55.43 | +20 52.7 | | | | | |
| 1986 | 09 07 | 02 56.84 | +21 26.4 | 2.343 | 2.922 | 115.5 | 18.1 | 18.0 |
| 1986 | 09 17 | 02 55.77 | +21 51.1 | | | | | |
| 1986 | 09 27 | 02 52.12 | +22 05.2 | 2.142 | 2.944 | 135.7 | 13.8 | 17.7 |
| 1986 | 10 07 | 02 45.99 | +22 07.4 | | | | | |
| 1986 | 10 17 | 02 37.76 | +21 56.6 | 2.016 | 2.964 | 158.1 | 7.2 | 17.3 |
| 1986 | 10 27 | 02 28.16 | +21 33.5 | | | | | |
| 1986 | 11 06 | 02 18.13 | +21 00.1 | 1.996 | 2.982 | 172.3 | 2.5 | 17.1 |
| 1986 | 11 16 | 02 08.72 | +20 20.9 | | | | | |
| 1986 | 11 26 | 02 00.83 | +19 41.2 | 2.094 | 2.997 | 151.3 | 9.1 | 17.5 |
| 1986 | 12 06 | 01 55.08 | +19 06.1 | | | | | |
| 1986 | 12 16 | 01 51.82 | +18 39.8 | 2.291 | 3.010 | 129.0 | 14.7 | 17.9 |
| 1986 | 12 26 | 01 51.08 | +18 24.4 | | | | | |
| 1987 | 01 05 | 01 52.76 | +18 20.8 | 2.554 | 3.020 | 109.0 | 17.9 | 18.3 |
| 1987 | 01 15 | 01 56.63 | +18 28.7 | | | | | |
| 1987 | 01 25 | 02 02.43 | +18 47.0 | 2.846 | 3.028 | 91.0 | 19.0 | 18.5 |

(3436) 1976 SS3 a,e,i = 2.86, 0.06, 2 Elements MPC 10755

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 46.59 | +15 32.4 | 2.409 | 2.775 | 100.3 | 21.0 | 17.0 |
| 1986 | 08 28 | 02 51.71 | +15 48.6 | | | | | |
| 1986 | 09 07 | 02 54.66 | +15 54.4 | 2.171 | 2.786 | 117.7 | 18.7 | 16.7 |
| 1986 | 09 17 | 02 55.20 | +15 49.1 | | | | | |
| 1986 | 09 27 | 02 53.24 | +15 32.7 | 1.973 | 2.797 | 137.6 | 14.0 | 16.4 |
| 1986 | 10 07 | 02 48.84 | +15 05.4 | | | | | |
| 1986 | 10 17 | 02 42.36 | +14 28.5 | 1.850 | 2.808 | 160.1 | 6.9 | 16.0 |
| 1986 | 10 27 | 02 34.45 | +13 44.9 | | | | | |
| 1986 | 11 06 | 02 25.99 | +12 58.5 | 1.830 | 2.819 | 175.4 | 1.6 | 15.7 |
| 1986 | 11 16 | 02 18.00 | +12 14.8 | | | | | |
| 1986 | 11 26 | 02 11.34 | +11 38.4 | 1.924 | 2.831 | 151.6 | 9.5 | 16.2 |
| 1986 | 12 06 | 02 06.67 | +11 13.1 | | | | | |
| 1986 | 12 16 | 02 04.34 | +11 01.2 | 2.113 | 2.843 | 129.5 | 15.5 | 16.6 |
| 1986 | 12 26 | 02 04.45 | +11 03.0 | | | | | |
| 1987 | 01 05 | 02 06.89 | +11 17.6 | 2.367 | 2.855 | 109.9 | 18.9 | 17.0 |
| 1987 | 01 15 | 02 11.49 | +11 43.6 | | | | | |
| 1987 | 01 25 | 02 17.99 | +12 19.0 | 2.652 | 2.867 | 92.4 | 20.1 | 17.3 |

1985 KC a,e,i = 2.20, 0.03, 6 Elements MPC 10042

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 48.08 | +20 26.1 | 1.814 | 2.204 | 98.5 | 27.0 | 18.6 |
| 1986 | 08 28 | 02 55.84 | +21 36.1 | | | | | |
| 1986 | 09 07 | 03 01.06 | +22 37.7 | 1.598 | 2.211 | 114.2 | 24.6 | 18.2 |
| 1986 | 09 17 | 03 03.28 | +23 29.6 | | | | | |
| 1986 | 09 27 | 03 02.13 | +24 09.8 | 1.412 | 2.218 | 132.8 | 19.4 | 17.8 |
| 1986 | 10 07 | 02 57.42 | +24 35.2 | | | | | |
| 1986 | 10 17 | 02 49.40 | +24 42.7 | 1.284 | 2.225 | 154.3 | 11.2 | 17.4 |
| 1986 | 10 27 | 02 38.89 | +24 30.4 | | | | | |
| 1986 | 11 06 | 02 27.26 | +23 59.2 | 1.246 | 2.231 | 171.1 | 4.0 | 17.0 |
| 1986 | 11 16 | 02 16.21 | +23 14.6 | | | | | |
| 1986 | 11 26 | 02 07.23 | +22 25.1 | 1.313 | 2.237 | 153.0 | 11.6 | 17.5 |
| 1986 | 12 06 | 02 01.32 | +21 39.4 | | | | | |
| 1986 | 12 16 | 01 58.94 | +21 04.6 | 1.468 | 2.243 | 131.3 | 19.3 | 17.9 |
| 1986 | 12 26 | 02 00.04 | +20 44.2 | | | | | |
| 1987 | 01 05 | 02 04.34 | +20 39.1 | 1.683 | 2.248 | 112.3 | 23.9 | 18.4 |
| 1987 | 01 15 | 02 11.47 | +20 48.5 | | | | | |
| 1987 | 01 25 | 02 20.99 | +21 10.0 | 1.928 | 2.253 | 95.9 | 25.8 | 18.7 |

(3353) Jarvis a,e,i = 1.86, 0.08, 22 Elements MPC 10306

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 38.84 | +38 15.2 | 1.482 | 1.859 | 94.5 | 32.9 | 16.9 |
| 1986 | 08 28 | 02 50.76 | +39 18.6 | | | | | |
| 1986 | 09 07 | 02 59.56 | +40 02.4 | 1.307 | 1.880 | 107.9 | 30.7 | 16.6 |
| 1986 | 09 17 | 03 04.54 | +40 22.2 | | | | | |
| 1986 | 09 27 | 03 05.12 | +40 12.4 | 1.143 | 1.901 | 124.6 | 25.7 | 16.2 |
| 1986 | 10 07 | 03 00.99 | +39 24.7 | | | | | |
| 1986 | 10 17 | 02 52.57 | +37 50.2 | 1.018 | 1.920 | 144.9 | 17.4 | 15.8 |
| 1986 | 10 27 | 02 41.13 | +35 24.3 | | | | | |
| 1986 | 11 06 | 02 28.71 | +32 11.3 | 0.969 | 1.939 | 163.2 | 8.5 | 15.4 |
| 1986 | 11 16 | 02 17.59 | +28 28.7 | | | | | |
| 1986 | 11 26 | 02 09.47 | +24 41.6 | 1.023 | 1.956 | 153.5 | 13.0 | 15.7 |
| 1986 | 12 06 | 02 05.21 | +21 13.7 | | | | | |
| 1986 | 12 16 | 02 04.94 | +18 20.2 | 1.173 | 1.972 | 132.0 | 21.8 | 16.2 |
| 1986 | 12 26 | 02 08.29 | +16 05.8 | | | | | |
| 1987 | 01 05 | 02 14.76 | +14 29.0 | 1.386 | 1.985 | 112.7 | 27.2 | 16.8 |
| 1987 | 01 15 | 02 23.83 | +13 24.5 | | | | | |
| 1987 | 01 25 | 02 35.03 | +12 46.0 | 1.630 | 1.997 | 96.5 | 29.3 | 17.2 |

1981 EJ22 a,e,i = 2.44, 0.23, 6 Elements MPC 10619

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 51.21 | +14 58.6 | 1.893 | 2.288 | 99.4 | 25.9 | 19.2 |
| 1986 | 08 28 | 02 57.90 | +14 59.7 | | | | | |
| 1986 | 09 07 | 03 01.92 | +14 46.3 | 1.711 | 2.339 | 116.3 | 22.7 | 19.0 |
| 1986 | 09 17 | 03 02.98 | +14 18.3 | | | | | |
| 1986 | 09 27 | 03 00.95 | +13 35.9 | 1.563 | 2.390 | 136.3 | 16.9 | 18.6 |
| 1986 | 10 07 | 02 55.91 | +12 40.5 | | | | | |
| 1986 | 10 17 | 02 48.36 | +11 35.3 | 1.484 | 2.441 | 159.2 | 8.3 | 18.3 |
| 1986 | 10 27 | 02 39.17 | +10 25.6 | | | | | |
| 1986 | 11 06 | 02 29.47 | +09 18.0 | 1.504 | 2.491 | 173.0 | 2.8 | 18.1 |
| 1986 | 11 16 | 02 20.53 | +08 19.9 | | | | | |
| 1986 | 11 26 | 02 13.34 | +07 36.6 | 1.634 | 2.539 | 150.3 | 11.1 | 18.7 |
| 1986 | 12 06 | 02 08.54 | +07 11.1 | | | | | |
| 1986 | 12 16 | 02 06.43 | +07 03.9 | 1.856 | 2.585 | 128.5 | 17.3 | 19.2 |
| 1986 | 12 26 | 02 06.97 | +07 13.5 | | | | | |
| 1987 | 01 05 | 02 09.97 | +07 37.6 | 2.137 | 2.630 | 109.3 | 20.7 | 19.6 |
| 1987 | 01 15 | 02 15.16 | +08 13.4 | | | | | |
| 1987 | 01 25 | 02 22.24 | +08 58.2 | 2.446 | 2.673 | 92.3 | 21.6 | 20.0 |

(3383) 1951 AB a,e,i = 2.57, 0.05, 15 Elements MPC 10398

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 53.27 | +00 43.0 | 2.160 | 2.579 | 102.7 | 22.5 | 17.2 |
| 1986 | 08 28 | 02 59.38 | -00 07.1 | | | | | |
| 1986 | 09 07 | 03 03.21 | -01 11.3 | 1.945 | 2.588 | 119.0 | 19.9 | 16.9 |
| 1986 | 09 17 | 03 04.50 | -02 27.4 | | | | | |
| 1986 | 09 27 | 03 03.13 | -03 51.7 | 1.775 | 2.598 | 136.8 | 15.3 | 16.6 |
| 1986 | 10 07 | 02 59.10 | -05 19.0 | | | | | |
| 1986 | 10 17 | 02 52.74 | -06 41.4 | 1.679 | 2.607 | 153.0 | 10.0 | 16.3 |
| 1986 | 10 27 | 02 44.74 | -07 50.9 | | | | | |
| 1986 | 11 06 | 02 35.98 | -08 39.9 | 1.681 | 2.616 | 155.6 | 9.0 | 16.2 |
| 1986 | 11 16 | 02 27.57 | -09 03.1 | | | | | |
| 1986 | 11 26 | 02 20.45 | -08 59.3 | 1.783 | 2.624 | 141.0 | 13.7 | 16.5 |
| 1986 | 12 06 | 02 15.35 | -08 29.9 | | | | | |
| 1986 | 12 16 | 02 12.67 | -07 38.8 | 1.967 | 2.632 | 122.6 | 18.3 | 16.9 |
| 1986 | 12 26 | 02 12.50 | -06 30.5 | | | | | |
| 1987 | 01 05 | 02 14.77 | -05 09.4 | 2.205 | 2.640 | 105.3 | 21.1 | 17.2 |
| 1987 | 01 15 | 02 19.27 | -03 39.4 | | | | | |
| 1987 | 01 25 | 02 25.75 | -02 03.9 | 2.466 | 2.647 | 89.5 | 21.8 | 17.5 |

1977 RC a,e,i = 2.72, 0.46, 30 Elements MPC 7838

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 01 35.16 | -27 00.9 | 0.999 | 1.784 | 125.1 | 27.7 | 16.8 |
| 1986 | 08 28 | 01 51.86 | -31 50.0 | | | | | |
| 1986 | 09 07 | 02 07.12 | -36 56.0 | 0.877 | 1.692 | 127.6 | 28.2 | 16.5 |
| 1986 | 09 17 | 02 20.21 | -41 56.0 | | | | | |
| 1986 | 09 27 | 02 30.39 | -46 26.1 | 0.825 | 1.611 | 123.4 | 31.3 | 16.3 |
| 1986 | 10 07 | 02 36.96 | -50 05.1 | | | | | |
| 1986 | 10 17 | 02 39.86 | -52 36.7 | 0.818 | 1.545 | 116.4 | 35.3 | 16.3 |
| 1986 | 10 27 | 02 39.73 | -53 51.5 | | | | | |
| 1986 | 11 06 | 02 37.95 | -53 44.6 | 0.828 | 1.498 | 110.6 | 38.3 | 16.3 |
| 1986 | 11 16 | 02 36.43 | -52 15.1 | | | | | |
| 1986 | 11 26 | 02 36.72 | -49 26.7 | 0.841 | 1.474 | 107.2 | 39.8 | 16.4 |
| 1986 | 12 06 | 02 39.76 | -45 24.6 | | | | | |
| 1986 | 12 16 | 02 45.91 | -40 17.2 | 0.862 | 1.475 | 105.8 | 39.9 | 16.4 |
| 1986 | 12 26 | 02 55.01 | -34 16.4 | | | | | |
| 1987 | 01 05 | 03 06.74 | -27 37.0 | 0.911 | 1.500 | 104.6 | 39.4 | 16.6 |
| 1987 | 01 15 | 03 20.75 | -20 37.9 | | | | | |
| 1987 | 01 25 | 03 36.67 | -13 39.3 | 1.010 | 1.548 | 101.8 | 38.5 | 16.8 |

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

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 56.55 | +21 18.5 | 2.059 | 2.393 | 96.4 | 24.9 | 18.5 |
| 1986 | 08 28 | 03 04.93 | +22 04.5 | | | | | |
| 1986 | 09 07 | 03 11.11 | +22 40.9 | 1.817 | 2.385 | 112.0 | 23.1 | 18.1 |
| 1986 | 09 17 | 03 14.71 | +23 06.4 | | | | | |
| 1986 | 09 27 | 03 15.38 | +23 19.6 | 1.603 | 2.377 | 130.2 | 18.8 | 17.7 |
| 1986 | 10 07 | 03 12.91 | +23 18.6 | | | | | |
| 1986 | 10 17 | 03 07.40 | +23 01.8 | 1.446 | 2.370 | 151.6 | 11.5 | 17.3 |
| 1986 | 10 27 | 02 59.39 | +22 28.5 | | | | | |
| 1986 | 11 06 | 02 49.84 | +21 40.4 | 1.376 | 2.364 | 173.7 | 2.7 | 16.8 |
| 1986 | 11 16 | 02 40.12 | +20 42.4 | | | | | |
| 1986 | 11 26 | 02 31.61 | +19 41.9 | 1.413 | 2.359 | 158.4 | 8.8 | 17.1 |
| 1986 | 12 06 | 02 25.38 | +18 46.7 | | | | | |
| 1986 | 12 16 | 02 22.11 | +18 03.3 | 1.547 | 2.355 | 135.8 | 16.9 | 17.6 |
| 1986 | 12 26 | 02 21.97 | +17 35.0 | | | | | |
| 1987 | 01 05 | 02 24.87 | +17 22.8 | 1.749 | 2.352 | 115.9 | 22.1 | 18.0 |
| 1987 | 01 15 | 02 30.56 | +17 25.7 | | | | | |
| 1987 | 01 25 | 02 38.69 | +17 41.5 | 1.988 | 2.350 | 98.8 | 24.5 | 18.3 |

1978 VQ3 a,e,i = 2.55, 0.13, 9 Elements MPC 8383

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 55.01 | +22 58.7 | 2.192 | 2.512 | 96.2 | 23.6 | 19.1 |
| 1986 | 08 28 | 03 03.18 | +23 29.7 | | | | | |
| 1986 | 09 07 | 03 09.29 | +23 49.4 | 1.924 | 2.485 | 112.0 | 22.1 | 18.7 |
| 1986 | 09 17 | 03 12.95 | +23 56.3 | | | | | |
| 1986 | 09 27 | 03 13.86 | +23 48.5 | 1.686 | 2.458 | 130.4 | 18.1 | 18.3 |
| 1986 | 10 07 | 03 11.80 | +23 24.0 | | | | | |
| 1986 | 10 17 | 03 06.85 | +22 41.3 | 1.507 | 2.431 | 151.8 | 11.2 | 17.8 |
| 1986 | 10 27 | 02 59.49 | +21 40.4 | | | | | |
| 1986 | 11 06 | 02 50.61 | +20 23.9 | 1.417 | 2.405 | 174.8 | 2.1 | 17.3 |
| 1986 | 11 16 | 02 41.49 | +18 58.1 | | | | | |
| 1986 | 11 26 | 02 33.41 | +17 31.7 | 1.435 | 2.381 | 158.5 | 8.7 | 17.6 |
| 1986 | 12 06 | 02 27.44 | +16 13.5 | | | | | |
| 1986 | 12 16 | 02 24.29 | +15 10.4 | 1.552 | 2.357 | 135.5 | 17.0 | 18.0 |
| 1986 | 12 26 | 02 24.16 | +14 26.0 | | | | | |
| 1987 | 01 05 | 02 27.03 | +14 01.0 | 1.737 | 2.335 | 115.4 | 22.4 | 18.4 |
| 1987 | 01 15 | 02 32.67 | +13 53.8 | | | | | |
| 1987 | 01 25 | 02 40.76 | +14 01.8 | 1.958 | 2.314 | 98.2 | 24.9 | 18.7 |

1983 HO a,e,i = 3.96, 0.13, 10 Elements MPC 8213

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 03 10.66 | +07 04.9 | 3.665 | 3.919 | 96.9 | 14.9 | 17.5 |
| 1986 | 08 28 | 03 13.86 | +06 53.7 | | | | | |
| 1986 | 09 07 | 03 15.48 | +06 35.6 | 3.411 | 3.941 | 114.8 | 13.4 | 17.3 |
| 1986 | 09 17 | 03 15.43 | +06 11.3 | | | | | |
| 1986 | 09 27 | 03 13.69 | +05 42.2 | 3.199 | 3.964 | 134.3 | 10.4 | 17.1 |
| 1986 | 10 07 | 03 10.33 | +05 09.7 | | | | | |
| 1986 | 10 17 | 03 05.56 | +04 36.3 | 3.064 | 3.987 | 154.5 | 6.2 | 16.9 |
| 1986 | 10 27 | 02 59.73 | +04 04.5 | | | | | |
| 1986 | 11 06 | 02 53.31 | +03 37.2 | 3.035 | 4.009 | 167.6 | 3.0 | 16.7 |
| 1986 | 11 16 | 02 46.85 | +03 16.9 | | | | | |
| 1986 | 11 26 | 02 40.90 | +03 05.6 | 3.126 | 4.031 | 153.3 | 6.3 | 16.9 |
| 1986 | 12 06 | 02 35.91 | +03 04.5 | | | | | |
| 1986 | 12 16 | 02 32.27 | +03 13.9 | 3.323 | 4.053 | 132.5 | 10.3 | 17.2 |
| 1986 | 12 26 | 02 30.15 | +03 33.3 | | | | | |
| 1987 | 01 05 | 02 29.66 | +04 01.7 | 3.597 | 4.075 | 112.4 | 12.9 | 17.5 |
| 1987 | 01 15 | 02 30.79 | +04 37.8 | | | | | |
| 1987 | 01 25 | 02 33.43 | +05 20.1 | 3.913 | 4.097 | 93.7 | 13.9 | 17.7 |

1984 EN a,e,i = 2.40, 0.08, 4 Elements MPC 9019

| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 03 03.94 | +21 06.5 | 2.078 | 2.386 | -1.08 | -5.0 | 17.5 |
| 1986 | 08 28 | 03 12.71 | +22 02.4 | | | | | |
| 1986 | 09 07 | 03 19.41 | +22 50.7 | 1.824 | 2.368 | -1.27 | -5.2 | 17.2 |
| 1986 | 09 17 | 03 23.60 | +23 30.6 | | | | | |
| 1986 | 09 27 | 03 24.90 | +24 01.0 | 1.596 | 2.350 | -1.51 | -5.8 | 16.7 |
| 1986 | 10 07 | 03 22.98 | +24 19.9 | | | | | |
| 1986 | 10 17 | 03 17.80 | +24 25.0 | 1.421 | 2.332 | -1.75 | -7.1 | 16.3 |
| 1986 | 10 27 | 03 09.76 | +24 14.4 | | | | | |
| 1986 | 11 06 | 02 59.71 | +23 47.6 | 1.330 | 2.315 | -1.87 | -8.7 | 15.8 |
| 1986 | 11 16 | 02 49.06 | +23 07.3 | | | | | |
| 1986 | 11 26 | 02 39.33 | +22 19.6 | 1.344 | 2.298 | -1.79 | -9.6 | 16.0 |
| 1986 | 12 06 | 02 31.80 | +21 32.0 | | | | | |
| 1986 | 12 16 | 02 27.36 | +20 52.1 | 1.456 | 2.282 | -1.57 | -9.1 | 16.4 |
| 1986 | 12 26 | 02 26.30 | +20 24.7 | | | | | |
| 1987 | 01 05 | 02 28.58 | +20 11.9 | 1.637 | 2.267 | -1.35 | -7.7 | 16.8 |
| 1987 | 01 15 | 02 33.95 | +20 13.6 | | | | | |
| 1987 | 01 25 | 02 42.04 | +20 28.1 | 1.856 | 2.253 | -1.18 | -6.2 | 17.1 |

(3348) 1978 EA3 a,e,i = 3.17, 0.16, 10 Elements MPC 10304

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 03 17.58 | +12 43.5 | 3.330 | 3.545 | 93.9 | 16.6 | 18.1 |
| 1986 | 08 28 | 03 21.71 | +12 29.9 | | | | | |
| 1986 | 09 07 | 03 24.12 | +12 07.6 | 3.067 | 3.564 | 111.7 | 15.2 | 17.9 |
| 1986 | 09 17 | 03 24.68 | +11 37.0 | | | | | |
| 1986 | 09 27 | 03 23.32 | +10 58.5 | 2.839 | 3.581 | 131.4 | 12.1 | 17.7 |
| 1986 | 10 07 | 03 20.05 | +10 13.4 | | | | | |
| 1986 | 10 17 | 03 15.07 | +09 23.6 | 2.682 | 3.597 | 152.7 | 7.3 | 17.4 |
| 1986 | 10 27 | 03 08.74 | +08 31.8 | | | | | |
| 1986 | 11 06 | 03 01.59 | +07 41.3 | 2.630 | 3.611 | 170.6 | 2.6 | 17.1 |
| 1986 | 11 16 | 02 54.28 | +06 55.8 | | | | | |
| 1986 | 11 26 | 02 47.45 | +06 18.7 | 2.698 | 3.625 | 156.6 | 6.2 | 17.4 |
| 1986 | 12 06 | 02 41.70 | +05 52.3 | | | | | |
| 1986 | 12 16 | 02 37.46 | +05 38.0 | 2.875 | 3.637 | 134.8 | 11.1 | 17.7 |
| 1986 | 12 26 | 02 34.97 | +05 35.9 | | | | | |
| 1987 | 01 05 | 02 34.34 | +05 45.3 | 3.133 | 3.647 | 114.2 | 14.2 | 18.0 |
| 1987 | 01 15 | 02 35.54 | +06 04.7 | | | | | |
| 1987 | 01 25 | 02 38.46 | +06 32.6 | 3.432 | 3.657 | 95.3 | 15.5 | 18.2 |

(3150) Tosa a,e,i = 3.20, 0.12, 22 Elements MPC 9289

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 03 25.29 | +37 09.0 | 3.364 | 3.445 | 86.0 | 17.0 | 17.1 |
| 1986 | 08 28 | 03 30.57 | +38 36.9 | | | | | |
| 1986 | 09 07 | 03 33.91 | +40 02.7 | 3.110 | 3.460 | 101.8 | 16.6 | 16.9 |
| 1986 | 09 17 | 03 34.99 | +41 24.9 | | | | | |
| 1986 | 09 27 | 03 33.55 | +42 41.1 | 2.880 | 3.475 | 118.8 | 14.6 | 16.7 |
| 1986 | 10 07 | 03 29.40 | +43 48.1 | | | | | |
| 1986 | 10 17 | 03 22.61 | +44 41.4 | 2.703 | 3.489 | 136.0 | 11.4 | 16.5 |
| 1986 | 10 27 | 03 13.55 | +45 16.8 | | | | | |
| 1986 | 11 06 | 03 02.92 | +45 30.5 | 2.610 | 3.502 | 149.8 | 8.2 | 16.3 |
| 1986 | 11 16 | 02 51.78 | +45 21.4 | | | | | |
| 1986 | 11 26 | 02 41.27 | +44 51.3 | 2.621 | 3.514 | 150.5 | 7.9 | 16.3 |
| 1986 | 12 06 | 02 32.39 | +44 04.8 | | | | | |
| 1986 | 12 16 | 02 25.89 | +43 08.6 | 2.738 | 3.525 | 137.3 | 10.9 | 16.5 |
| 1986 | 12 26 | 02 22.11 | +42 09.5 | | | | | |
| 1987 | 01 05 | 02 21.10 | +41 13.1 | 2.941 | 3.535 | 119.9 | 14.0 | 16.8 |
| 1987 | 01 15 | 02 22.73 | +40 23.6 | | | | | |
| 1987 | 01 25 | 02 26.74 | +39 43.3 | 3.199 | 3.544 | 102.5 | 15.7 | 17.0 |

(3322) 1975 XY1 a,e,i = 2.39, 0.21, 24 Elements MPC 10157

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 54.31 | +37 09.4 | 2.029 | 2.298 | 91.9 | 26.1 | 16.9 |
| 1986 | 08 28 | 03 05.88 | +38 07.6 | | | | | |
| 1986 | 09 07 | 03 15.42 | +38 53.4 | 1.758 | 2.249 | 105.6 | 25.6 | 16.5 |
| 1986 | 09 17 | 03 22.40 | +39 23.9 | | | | | |
| 1986 | 09 27 | 03 26.28 | +39 35.2 | 1.505 | 2.201 | 121.5 | 22.9 | 16.1 |
| 1986 | 10 07 | 03 26.54 | +39 21.6 | | | | | |
| 1986 | 10 17 | 03 22.98 | +38 35.9 | 1.292 | 2.154 | 140.1 | 17.3 | 15.5 |
| 1986 | 10 27 | 03 15.92 | +37 10.7 | | | | | |
| 1986 | 11 06 | 03 06.30 | +35 01.4 | 1.149 | 2.108 | 159.9 | 9.3 | 15.0 |
| 1986 | 11 16 | 02 55.80 | +32 10.5 | | | | | |
| 1986 | 11 26 | 02 46.30 | +28 50.6 | 1.107 | 2.064 | 160.7 | 9.1 | 14.8 |
| 1986 | 12 06 | 02 39.34 | +25 21.1 | | | | | |
| 1986 | 12 16 | 02 35.93 | +22 02.8 | 1.169 | 2.024 | 139.9 | 18.3 | 15.2 |
| 1986 | 12 26 | 02 36.29 | +19 10.3 | | | | | |
| 1987 | 01 05 | 02 40.28 | +16 50.5 | 1.311 | 1.987 | 119.3 | 25.6 | 15.6 |
| 1987 | 01 15 | 02 47.52 | +15 03.7 | | | | | |
| 1987 | 01 25 | 02 57.52 | +13 46.3 | 1.496 | 1.955 | 102.0 | 29.5 | 16.0 |

6548 P-L a,e,i = 2.65, 0.27, 4 Elements MPC 7663

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 02 47.34 | +13 43.4 | 1.716 | 2.147 | 100.7 | 27.6 | 17.4 |
| 1986 | 08 28 | 02 58.79 | +14 05.6 | | | | | |
| 1986 | 09 07 | 03 08.38 | +14 14.1 | 1.466 | 2.100 | 114.9 | 25.8 | 17.0 |
| 1986 | 09 17 | 03 15.66 | +14 08.3 | | | | | |
| 1986 | 09 27 | 03 20.20 | +13 47.7 | 1.250 | 2.058 | 131.7 | 21.3 | 16.5 |
| 1986 | 10 07 | 03 21.58 | +13 12.5 | | | | | |
| 1986 | 10 17 | 03 19.68 | +12 24.6 | 1.088 | 2.020 | 151.5 | 13.6 | 15.9 |
| 1986 | 10 27 | 03 14.77 | +11 27.6 | | | | | |
| 1986 | 11 06 | 03 07.60 | +10 27.6 | 1.003 | 1.990 | 171.7 | 4.1 | 15.3 |
| 1986 | 11 16 | 02 59.54 | +09 33.1 | | | | | |
| 1986 | 11 26 | 02 52.14 | +08 52.3 | 1.012 | 1.966 | 159.1 | 10.3 | 15.6 |
| 1986 | 12 06 | 02 46.80 | +08 31.5 | | | | | |
| 1986 | 12 16 | 02 44.49 | +08 33.7 | 1.106 | 1.949 | 137.7 | 19.9 | 16.0 |
| 1986 | 12 26 | 02 45.61 | +08 57.9 | | | | | |
| 1987 | 01 05 | 02 50.14 | +09 41.1 | 1.261 | 1.941 | 119.3 | 26.2 | 16.5 |
| 1987 | 01 15 | 02 57.85 | +10 39.1 | | | | | |
| 1987 | 01 25 | 03 08.35 | +11 47.4 | 1.453 | 1.941 | 103.9 | 29.5 | 16.9 |

1983 CS2 a,e,i = 2.86, 0.23, 3 Elements MPC 8062

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 03 21.68 | +21 13.3 | 3.011 | 3.189 | 90.7 | 18.5 | 18.2 |
| 1986 | 08 28 | 03 27.48 | +21 46.7 | | | | | |
| 1986 | 09 07 | 03 31.54 | +22 14.4 | 2.697 | 3.151 | 107.6 | 17.8 | 18.0 |
| 1986 | 09 17 | 03 33.59 | +22 35.8 | | | | | |
| 1986 | 09 27 | 03 33.39 | +22 50.3 | 2.410 | 3.111 | 126.5 | 15.0 | 17.6 |
| 1986 | 10 07 | 03 30.78 | +22 56.6 | | | | | |
| 1986 | 10 17 | 03 25.77 | +22 53.6 | 2.181 | 3.070 | 147.7 | 10.0 | 17.2 |
| 1986 | 10 27 | 03 18.64 | +22 40.6 | | | | | |
| 1986 | 11 06 | 03 09.94 | +22 17.6 | 2.045 | 3.027 | 170.5 | 3.1 | 16.7 |
| 1986 | 11 16 | 03 00.54 | +21 46.2 | | | | | |
| 1986 | 11 26 | 02 51.43 | +21 09.8 | 2.025 | 2.983 | 163.2 | 5.5 | 16.8 |
| 1986 | 12 06 | 02 43.56 | +20 32.8 | | | | | |
| 1986 | 12 16 | 02 37.69 | +20 00.2 | 2.116 | 2.938 | 139.9 | 12.5 | 17.1 |
| 1986 | 12 26 | 02 34.26 | +19 35.7 | | | | | |
| 1987 | 01 05 | 02 33.44 | +19 21.7 | 2.290 | 2.891 | 118.5 | 17.4 | 17.4 |
| 1987 | 01 15 | 02 35.21 | +19 19.0 | | | | | |
| 1987 | 01 25 | 02 39.39 | +19 27.2 | 2.510 | 2.844 | 99.5 | 20.0 | 17.6 |

6092 P-L a,e,i = 2.61, 0.19, 11 Elements MPC 9301

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 03 24.75 | +14 59.9 | 2.893 | 3.091 | 91.6 | 19.1 | 18.8 |
| 1986 | 08 28 | 03 30.34 | +14 48.8 | | | | | |
| 1986 | 09 07 | 03 34.07 | +14 28.0 | 2.622 | 3.097 | 108.8 | 17.9 | 18.6 |
| 1986 | 09 17 | 03 35.70 | +13 57.0 | | | | | |
| 1986 | 09 27 | 03 35.09 | +13 16.3 | 2.380 | 3.101 | 128.2 | 14.7 | 18.3 |
| 1986 | 10 07 | 03 32.15 | +12 26.2 | | | | | |
| 1986 | 10 17 | 03 27.01 | +11 28.6 | 2.201 | 3.103 | 149.7 | 9.3 | 17.9 |
| 1986 | 10 27 | 03 20.02 | +10 26.0 | | | | | |
| 1986 | 11 06 | 03 11.77 | +09 22.5 | 2.120 | 3.102 | 170.3 | 3.1 | 17.6 |
| 1986 | 11 16 | 03 03.09 | +08 22.8 | | | | | |
| 1986 | 11 26 | 02 54.85 | +07 31.6 | 2.158 | 3.099 | 158.8 | 6.6 | 17.8 |
| 1986 | 12 06 | 02 47.82 | +06 52.8 | | | | | |
| 1986 | 12 16 | 02 42.61 | +06 28.6 | 2.306 | 3.093 | 136.3 | 12.7 | 18.1 |
| 1986 | 12 26 | 02 39.55 | +06 19.3 | | | | | |
| 1987 | 01 05 | 02 38.75 | +06 24.3 | 2.533 | 3.086 | 115.4 | 16.7 | 18.4 |
| 1987 | 01 15 | 02 40.18 | +06 41.9 | | | | | |
| 1987 | 01 25 | 02 43.66 | +07 09.8 | 2.801 | 3.076 | 96.7 | 18.5 | 18.7 |

1985 TC1 a,e,i = 5.26, 0.04, 15 Elements MPC 10545

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 03 27.32 | +24 55.3 | 5.387 | 5.456 | 88.6 | 10.7 | 16.9 |
| 1986 | 08 28 | 03 29.60 | +25 26.1 | | | | | |
| 1986 | 09 07 | 03 30.65 | +25 53.8 | 5.078 | 5.455 | 106.8 | 10.2 | 16.8 |
| 1986 | 09 17 | 03 30.40 | +26 17.8 | | | | | |
| 1986 | 09 27 | 03 28.82 | +26 37.5 | 4.801 | 5.454 | 126.3 | 8.5 | 16.6 |
| 1986 | 10 07 | 03 25.92 | +26 52.3 | | | | | |
| 1986 | 10 17 | 03 21.84 | +27 01.5 | 4.591 | 5.453 | 146.8 | 5.7 | 16.4 |
| 1986 | 10 27 | 03 16.79 | +27 04.9 | | | | | |
| 1986 | 11 06 | 03 11.08 | +27 02.2 | 4.482 | 5.451 | 166.7 | 2.4 | 16.2 |
| 1986 | 11 16 | 03 05.11 | +26 54.2 | | | | | |
| 1986 | 11 26 | 02 59.28 | +26 42.0 | 4.493 | 5.450 | 164.2 | 2.8 | 16.2 |
| 1986 | 12 06 | 02 54.01 | +26 27.1 | | | | | |
| 1986 | 12 16 | 02 49.64 | +26 11.6 | 4.625 | 5.448 | 143.5 | 6.2 | 16.4 |
| 1986 | 12 26 | 02 46.43 | +25 57.3 | | | | | |
| 1987 | 01 05 | 02 44.53 | +25 45.9 | 4.854 | 5.446 | 122.5 | 8.8 | 16.6 |
| 1987 | 01 15 | 02 44.01 | +25 38.6 | | | | | |
| 1987 | 01 25 | 02 44.87 | +25 36.1 | 5.146 | 5.444 | 102.5 | 10.2 | 16.8 |

1983 CY2 a,e,i = 2.99, 0.06, 9 Elements MPC 7829

| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 03 18.93 | +27 37.1 | 2.671 | 2.851 | -0.82 | -3.4 | 17.3 |
| 1986 | 08 28 | 03 26.58 | +28 41.2 | | | | | |
| 1986 | 09 07 | 03 32.34 | +29 40.5 | 2.405 | 2.843 | -0.95 | -3.3 | 17.1 |
| 1986 | 09 17 | 03 35.87 | +30 33.9 | | | | | |
| 1986 | 09 27 | 03 36.88 | +31 20.2 | 2.163 | 2.835 | -1.09 | -3.5 | 16.7 |
| 1986 | 10 07 | 03 35.12 | +31 56.9 | | | | | |
| 1986 | 10 17 | 03 30.59 | +32 21.3 | 1.972 | 2.829 | -1.22 | -4.2 | 16.4 |
| 1986 | 10 27 | 03 23.58 | +32 30.2 | | | | | |
| 1986 | 11 06 | 03 14.75 | +32 21.2 | 1.864 | 2.823 | -1.29 | -5.2 | 16.0 |
| 1986 | 11 16 | 03 05.13 | +31 54.5 | | | | | |
| 1986 | 11 26 | 02 55.91 | +31 12.8 | 1.864 | 2.818 | -1.24 | -6.1 | 16.0 |
| 1986 | 12 06 | 02 48.18 | +30 21.8 | | | | | |
| 1986 | 12 16 | 02 42.80 | +29 28.4 | 1.971 | 2.813 | -1.12 | -6.2 | 16.4 |
| 1986 | 12 26 | 02 40.16 | +28 38.9 | | | | | |
| 1987 | 01 05 | 02 40.38 | +27 57.7 | 2.162 | 2.810 | -0.99 | -5.6 | 16.7 |
| 1987 | 01 15 | 02 43.34 | +27 27.4 | | | | | |
| 1987 | 01 25 | 02 48.78 | +27 08.3 | 2.406 | 2.807 | -0.88 | -4.7 | 17.0 |

1984 EZ a,e,i = 2.67, 0.12, 13 Elements MPC 10034

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 03 25.76 | +06 36.8 | 2.738 | 2.975 | 93.4 | 19.9 | 17.9 |
| 1986 | 08 28 | 03 31.81 | +06 06.9 | | | | | |
| 1986 | 09 07 | 03 36.00 | +05 26.0 | 2.484 | 2.983 | 110.0 | 18.5 | 17.7 |
| 1986 | 09 17 | 03 38.07 | +04 34.9 | | | | | |
| 1986 | 09 27 | 03 37.87 | +03 35.2 | 2.261 | 2.988 | 128.4 | 15.2 | 17.4 |
| 1986 | 10 07 | 03 35.30 | +02 29.3 | | | | | |
| 1986 | 10 17 | 03 30.48 | +01 21.1 | 2.102 | 2.993 | 147.7 | 10.2 | 17.1 |
| 1986 | 10 27 | 03 23.76 | +00 15.5 | | | | | |
| 1986 | 11 06 | 03 15.72 | -00 42.1 | 2.039 | 2.995 | 161.6 | 6.0 | 16.8 |
| 1986 | 11 16 | 03 07.18 | -01 26.0 | | | | | |
| 1986 | 11 26 | 02 59.03 | -01 52.5 | 2.087 | 2.997 | 152.4 | 8.8 | 17.0 |
| 1986 | 12 06 | 02 52.06 | -01 59.8 | | | | | |
| 1986 | 12 16 | 02 46.91 | -01 48.0 | 2.237 | 2.996 | 133.0 | 13.9 | 17.3 |
| 1986 | 12 26 | 02 43.90 | -01 19.3 | | | | | |
| 1987 | 01 05 | 02 43.16 | -00 36.3 | 2.461 | 2.994 | 113.6 | 17.5 | 17.6 |
| 1987 | 01 15 | 02 44.67 | +00 18.0 | | | | | |
| 1987 | 01 25 | 02 48.24 | +01 20.3 | 2.724 | 2.990 | 95.9 | 19.1 | 17.9 |

1981 EH13 a,e,i = 2.40, 0.22, 3 Elements MPC 10770

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 03 17.34 | +21 05.3 | 1.785 | 2.079 | 91.8 | 29.1 | 19.5 |
| 1986 | 08 28 | 03 28.35 | +21 47.9 | | | | | |
| 1986 | 09 07 | 03 36.89 | +22 19.1 | 1.607 | 2.124 | 106.3 | 27.1 | 19.2 |
| 1986 | 09 17 | 03 42.51 | +22 38.7 | | | | | |
| 1986 | 09 27 | 03 44.83 | +22 46.0 | 1.446 | 2.171 | 123.9 | 22.5 | 18.9 |
| 1986 | 10 07 | 03 43.55 | +22 40.0 | | | | | |
| 1986 | 10 17 | 03 38.71 | +22 19.8 | 1.327 | 2.219 | 145.1 | 14.9 | 18.6 |
| 1986 | 10 27 | 03 30.79 | +21 45.1 | | | | | |
| 1986 | 11 06 | 03 20.76 | +20 57.5 | 1.286 | 2.268 | 169.2 | 4.7 | 18.2 |
| 1986 | 11 16 | 03 10.08 | +20 01.6 | | | | | |
| 1986 | 11 26 | 03 00.27 | +19 04.3 | 1.349 | 2.317 | 165.1 | 6.3 | 18.4 |
| 1986 | 12 06 | 02 52.55 | +18 12.9 | | | | | |
| 1986 | 12 16 | 02 47.72 | +17 33.3 | 1.514 | 2.366 | 141.6 | 15.0 | 19.0 |
| 1986 | 12 26 | 02 46.02 | +17 08.4 | | | | | |
| 1987 | 01 05 | 02 47.36 | +16 58.8 | 1.756 | 2.414 | 121.0 | 20.4 | 19.5 |
| 1987 | 01 15 | 02 51.47 | +17 03.2 | | | | | |
| 1987 | 01 25 | 02 57.98 | +17 19.2 | 2.043 | 2.461 | 103.1 | 22.9 | 20.0 |

1967 GF1 a,e,i = 2.66, 0.16, 14 Elements MPC 10840

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 03 34.70 | +04 53.8 | 2.616 | 2.832 | 91.7 | 20.9 | 18.3 |
| 1986 | 08 28 | 03 41.44 | +04 22.4 | | | | | |
| 1986 | 09 07 | 03 46.25 | +03 40.3 | 2.387 | 2.860 | 107.7 | 19.6 | 18.0 |
| 1986 | 09 17 | 03 48.86 | +02 48.6 | | | | | |
| 1986 | 09 27 | 03 49.10 | +01 49.2 | 2.185 | 2.886 | 125.6 | 16.4 | 17.8 |
| 1986 | 10 07 | 03 46.85 | +00 44.7 | | | | | |
| 1986 | 10 17 | 03 42.22 | -00 20.4 | 2.041 | 2.910 | 144.5 | 11.5 | 17.5 |
| 1986 | 10 27 | 03 35.53 | -01 21.0 | | | | | |
| 1986 | 11 06 | 03 27.36 | -02 11.5 | 1.987 | 2.933 | 158.8 | 7.0 | 17.3 |
| 1986 | 11 16 | 03 18.56 | -02 46.6 | | | | | |
| 1986 | 11 26 | 03 10.02 | -03 02.8 | 2.042 | 2.955 | 152.8 | 8.8 | 17.4 |
| 1986 | 12 06 | 03 02.61 | -02 58.9 | | | | | |
| 1986 | 12 16 | 02 56.98 | -02 35.7 | 2.200 | 2.974 | 134.6 | 13.6 | 17.8 |
| 1986 | 12 26 | 02 53.50 | -01 55.8 | | | | | |
| 1987 | 01 05 | 02 52.31 | -01 02.4 | 2.435 | 2.992 | 115.5 | 17.3 | 18.1 |
| 1987 | 01 15 | 02 53.38 | +00 01.1 | | | | | |
| 1987 | 01 25 | 02 56.54 | +01 11.6 | 2.712 | 3.009 | 97.8 | 18.9 | 18.4 |

1981 RU3 a,e,i = 2.78, 0.10, 5 Elements MPC 9949

| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 03 29.13 | +16 22.5 | 2.516 | 2.716 | -0.83 | -2.2 | 17.3 |
| 1986 | 08 28 | 03 36.92 | +16 29.6 | | | | | |
| 1986 | 09 07 | 03 42.74 | +16 27.2 | 2.277 | 2.737 | -0.93 | -2.3 | 17.1 |
| 1986 | 09 17 | 03 46.31 | +16 15.3 | | | | | |
| 1986 | 09 27 | 03 47.40 | +15 54.0 | 2.061 | 2.759 | -1.04 | -2.6 | 16.8 |
| 1986 | 10 07 | 03 45.86 | +15 23.8 | | | | | |
| 1986 | 10 17 | 03 41.73 | +14 45.5 | 1.898 | 2.780 | -1.15 | -3.2 | 16.4 |
| 1986 | 10 27 | 03 35.36 | +14 01.2 | | | | | |
| 1986 | 11 06 | 03 27.32 | +13 13.7 | 1.823 | 2.802 | -1.23 | -3.7 | 16.1 |
| 1986 | 11 16 | 03 18.55 | +12 27.3 | | | | | |
| 1986 | 11 26 | 03 10.05 | +11 46.3 | 1.860 | 2.823 | -1.21 | -3.9 | 16.2 |
| 1986 | 12 06 | 03 02.75 | +11 14.9 | | | | | |
| 1986 | 12 16 | 02 57.38 | +10 55.8 | 2.006 | 2.843 | -1.10 | -3.7 | 16.6 |
| 1986 | 12 26 | 02 54.34 | +10 50.1 | | | | | |
| 1987 | 01 05 | 02 53.76 | +10 57.6 | 2.236 | 2.863 | -0.97 | -3.3 | 17.0 |
| 1987 | 01 15 | 02 55.59 | +11 16.8 | | | | | |
| 1987 | 01 25 | 02 59.62 | +11 45.7 | 2.514 | 2.883 | -0.85 | -2.8 | 17.4 |

1981 EZ15 a,e,i = 2.24, 0.11, 5 Elements MPC 9961

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 08 18 | 03 06.96 | +23 41.5 | 1.735 | 2.060 | 93.4 | 29.4 | 19.9 |
| 1986 | 08 28 | 03 19.68 | +24 58.0 | | | | | |
| 1986 | 09 07 | 03 30.50 | +26 06.5 | 1.508 | 2.041 | 106.8 | 28.2 | 19.5 |
| 1986 | 09 17 | 03 38.91 | +27 06.2 | | | | | |
| 1986 | 09 27 | 03 44.38 | +27 56.2 | 1.301 | 2.025 | 122.6 | 24.6 | 19.1 |
| 1986 | 10 07 | 03 46.31 | +28 34.3 | | | | | |
| 1986 | 10 17 | 03 44.36 | +28 57.3 | 1.134 | 2.012 | 141.5 | 17.9 | 18.6 |
| 1986 | 10 27 | 03 38.55 | +29 01.5 | | | | | |
| 1986 | 11 06 | 03 29.53 | +28 42.9 | 1.033 | 2.002 | 162.9 | 8.4 | 18.1 |
| 1986 | 11 16 | 03 18.74 | +28 01.3 | | | | | |
| 1986 | 11 26 | 03 08.10 | +27 01.5 | 1.023 | 1.995 | 165.9 | 6.9 | 18.0 |
| 1986 | 12 06 | 02 59.46 | +25 52.9 | | | | | |
| 1986 | 12 16 | 02 54.19 | +24 46.8 | 1.107 | 1.991 | 144.4 | 16.7 | 18.5 |
| 1986 | 12 26 | 02 52.83 | +23 51.9 | | | | | |
| 1987 | 01 05 | 02 55.40 | +23 13.0 | 1.263 | 1.991 | 124.4 | 24.1 | 19.0 |
| 1987 | 01 15 | 03 01.58 | +22 50.9 | | | | | |
| 1987 | 01 25 | 03 10.88 | +22 43.8 | 1.463 | 1.994 | 107.5 | 28.1 | 19.4 |

6591 P-L a,e,i = 5.29, 0.01, 7 Elements MPC 4831

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 03 42.38 | +23 47.9 | 4.929 | 5.276 | 104.8 | 10.6 | 19.2 |
| 1986 | 09 17 | 03 42.86 | +24 03.2 | | | | | |
| 1986 | 09 27 | 03 41.99 | +24 14.3 | 4.646 | 5.275 | 124.2 | 9.0 | 19.0 |
| 1986 | 10 07 | 03 39.78 | +24 21.0 | | | | | |
| 1986 | 10 17 | 03 36.31 | +24 22.8 | 4.426 | 5.274 | 145.0 | 6.2 | 18.8 |
| 1986 | 10 27 | 03 31.80 | +24 19.5 | | | | | |
| 1986 | 11 06 | 03 26.52 | +24 11.4 | 4.304 | 5.272 | 166.4 | 2.5 | 18.5 |
| 1986 | 11 16 | 03 20.84 | +23 59.1 | | | | | |
| 1986 | 11 26 | 03 15.18 | +23 43.6 | 4.300 | 5.271 | 168.4 | 2.2 | 18.5 |
| 1986 | 12 06 | 03 09.96 | +23 26.6 | | | | | |
| 1986 | 12 16 | 03 05.56 | +23 09.9 | 4.418 | 5.270 | 146.8 | 5.9 | 18.7 |
| 1986 | 12 26 | 03 02.23 | +22 55.1 | | | | | |
| 1987 | 01 05 | 03 00.19 | +22 43.7 | 4.638 | 5.268 | 125.3 | 8.8 | 19.0 |
| 1987 | 01 15 | 02 59.52 | +22 36.7 | | | | | |
| 1987 | 01 25 | 03 00.23 | +22 34.7 | 4.925 | 5.267 | 105.1 | 10.4 | 19.2 |
| 1987 | 02 04 | 03 02.27 | +22 37.9 | | | | | |
| 1987 | 02 14 | 03 05.57 | +22 46.0 | 5.240 | 5.266 | 86.1 | 10.8 | 19.3 |

(3333) Schaber a,e,i = 3.12, 0.23, 12 Elements MPC 10293

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 03 48.79 | +22 19.1 | 2.717 | 3.113 | 103.7 | 18.3 | 17.2 |
| 1986 | 09 17 | 03 51.36 | +22 07.5 | | | | | |
| 1986 | 09 27 | 03 51.66 | +21 46.8 | 2.502 | 3.158 | 122.6 | 15.5 | 16.9 |
| 1986 | 10 07 | 03 49.60 | +21 16.6 | | | | | |
| 1986 | 10 17 | 03 45.28 | +20 36.9 | 2.341 | 3.202 | 144.1 | 10.5 | 16.7 |
| 1986 | 10 27 | 03 39.04 | +19 48.5 | | | | | |
| 1986 | 11 06 | 03 31.42 | +18 53.1 | 2.270 | 3.245 | 167.6 | 3.8 | 16.3 |
| 1986 | 11 16 | 03 23.21 | +17 54.0 | | | | | |
| 1986 | 11 26 | 03 15.22 | +16 55.2 | 2.315 | 3.287 | 168.0 | 3.6 | 16.4 |
| 1986 | 12 06 | 03 08.24 | +16 01.1 | | | | | |
| 1986 | 12 16 | 03 02.87 | +15 15.5 | 2.478 | 3.328 | 144.4 | 9.9 | 16.8 |
| 1986 | 12 26 | 02 59.46 | +14 40.7 | | | | | |
| 1987 | 01 05 | 02 58.16 | +14 17.6 | 2.734 | 3.367 | 122.6 | 14.2 | 17.2 |
| 1987 | 01 15 | 02 58.96 | +14 06.2 | | | | | |
| 1987 | 01 25 | 03 01.69 | +14 05.1 | 3.046 | 3.406 | 103.1 | 16.4 | 17.6 |
| 1987 | 02 04 | 03 06.19 | +14 13.1 | | | | | |
| 1987 | 02 14 | 03 12.25 | +14 28.1 | 3.379 | 3.443 | 85.4 | 16.6 | 17.8 |

1983 AE1 a,e,i = 2.98, 0.13, 17 Elements MPC 10758

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 03 51.93 | +36 49.1 | 3.049 | 3.364 | 99.4 | 17.2 | 16.9 |
| 1986 | 09 17 | 03 54.76 | +37 28.6 | | | | | |
| 1986 | 09 27 | 03 55.24 | +38 01.3 | 2.793 | 3.369 | 117.0 | 15.4 | 16.6 |
| 1986 | 10 07 | 03 53.16 | +38 24.7 | | | | | |
| 1986 | 10 17 | 03 48.55 | +38 35.9 | 2.582 | 3.372 | 136.1 | 11.8 | 16.3 |
| 1986 | 10 27 | 03 41.64 | +38 31.9 | | | | | |
| 1986 | 11 06 | 03 32.97 | +38 09.9 | 2.451 | 3.374 | 154.8 | 7.2 | 16.0 |
| 1986 | 11 16 | 03 23.40 | +37 29.2 | | | | | |
| 1986 | 11 26 | 03 13.92 | +36 31.7 | 2.427 | 3.375 | 160.9 | 5.5 | 16.0 |
| 1986 | 12 06 | 03 05.49 | +35 21.8 | | | | | |
| 1986 | 12 16 | 02 58.90 | +34 05.6 | 2.518 | 3.374 | 145.3 | 9.6 | 16.2 |
| 1986 | 12 26 | 02 54.62 | +32 49.7 | | | | | |
| 1987 | 01 05 | 02 52.82 | +31 39.3 | 2.707 | 3.372 | 125.2 | 13.8 | 16.5 |
| 1987 | 01 15 | 02 53.49 | +30 38.1 | | | | | |
| 1987 | 01 25 | 02 56.43 | +29 47.8 | 2.961 | 3.368 | 106.0 | 16.3 | 16.8 |
| 1987 | 02 04 | 03 01.42 | +29 08.7 | | | | | |
| 1987 | 02 14 | 03 08.22 | +28 40.3 | 3.244 | 3.363 | 88.3 | 17.1 | 17.0 |

1984 AB1 a,e,i = 2.25, 0.16, 4 Elements MPC 9020

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 03 31.55 | +12 20.1 | 1.286 | 1.884 | 109.8 | 30.2 | 16.6 |
| 1986 | 09 17 | 03 40.90 | +12 25.4 | | | | | |
| 1986 | 09 27 | 03 47.17 | +12 19.3 | 1.110 | 1.878 | 125.4 | 25.8 | 16.1 |
| 1986 | 10 07 | 03 49.82 | +12 03.2 | | | | | |
| 1986 | 10 17 | 03 48.54 | +11 39.6 | 0.974 | 1.877 | 144.5 | 18.0 | 15.6 |
| 1986 | 10 27 | 03 43.46 | +11 12.3 | | | | | |
| 1986 | 11 06 | 03 35.24 | +10 46.0 | 0.905 | 1.882 | 166.0 | 7.3 | 15.1 |
| 1986 | 11 16 | 03 25.31 | +10 26.8 | | | | | |
| 1986 | 11 26 | 03 15.50 | +10 20.3 | 0.922 | 1.892 | 164.5 | 8.0 | 15.2 |
| 1986 | 12 06 | 03 07.53 | +10 30.3 | | | | | |
| 1986 | 12 16 | 03 02.69 | +10 58.2 | 1.028 | 1.907 | 142.8 | 18.2 | 15.8 |
| 1986 | 12 26 | 03 01.51 | +11 42.5 | | | | | |
| 1987 | 01 05 | 03 04.02 | +12 40.5 | 1.201 | 1.927 | 123.5 | 25.2 | 16.3 |
| 1987 | 01 15 | 03 09.96 | +13 48.4 | | | | | |
| 1987 | 01 25 | 03 18.87 | +15 02.5 | 1.417 | 1.951 | 107.3 | 28.8 | 16.8 |
| 1987 | 02 04 | 03 30.34 | +16 19.5 | | | | | |
| 1987 | 02 14 | 03 43.97 | +17 36.3 | 1.656 | 1.979 | 93.5 | 29.9 | 17.2 |

1978 SE3 a,e,i = 2.43, 0.11, 3 Elements MPC 10516

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 03 48.24 | +19 38.1 | 1.934 | 2.393 | 104.4 | 24.1 | 18.0 |
| 1986 | 09 17 | 03 53.46 | +19 41.5 | | | | | |
| 1986 | 09 27 | 03 55.87 | +19 34.8 | 1.731 | 2.418 | 122.1 | 20.5 | 17.7 |
| 1986 | 10 07 | 03 55.19 | +19 17.8 | | | | | |
| 1986 | 10 17 | 03 51.37 | +18 50.5 | 1.572 | 2.443 | 143.1 | 14.2 | 17.3 |
| 1986 | 10 27 | 03 44.67 | +18 13.4 | | | | | |
| 1986 | 11 06 | 03 35.76 | +17 28.6 | 1.492 | 2.468 | 166.8 | 5.3 | 16.9 |
| 1986 | 11 16 | 03 25.75 | +16 39.7 | | | | | |
| 1986 | 11 26 | 03 15.92 | +15 52.0 | 1.519 | 2.492 | 167.7 | 4.8 | 17.0 |
| 1986 | 12 06 | 03 07.49 | +15 10.9 | | | | | |
| 1986 | 12 16 | 03 01.38 | +14 41.2 | 1.653 | 2.516 | 143.8 | 13.3 | 17.5 |
| 1986 | 12 26 | 02 58.07 | +14 25.1 | | | | | |
| 1987 | 01 05 | 02 57.66 | +14 23.2 | 1.870 | 2.538 | 122.6 | 19.1 | 17.9 |
| 1987 | 01 15 | 03 00.04 | +14 34.5 | | | | | |
| 1987 | 01 25 | 03 04.93 | +14 56.8 | 2.136 | 2.560 | 104.1 | 21.9 | 18.3 |
| 1987 | 02 04 | 03 12.02 | +15 27.8 | | | | | |
| 1987 | 02 14 | 03 21.03 | +16 05.0 | 2.422 | 2.581 | 87.8 | 22.5 | 18.6 |

1984 HZ1 a,e,i = 3.05, 0.12, 5 Elements MPC 10754

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 03 48.67 | +20 19.3 | 2.482 | 2.898 | 104.1 | 19.7 | 16.5 |
| 1986 | 09 17 | 03 52.38 | +20 18.3 | | | | | |
| 1986 | 09 27 | 03 53.74 | +20 08.8 | 2.258 | 2.922 | 122.5 | 16.8 | 16.2 |
| 1986 | 10 07 | 03 52.60 | +19 50.5 | | | | | |
| 1986 | 10 17 | 03 48.98 | +19 23.5 | 2.085 | 2.946 | 143.5 | 11.6 | 15.9 |
| 1986 | 10 27 | 03 43.18 | +18 48.4 | | | | | |
| 1986 | 11 06 | 03 35.71 | +18 06.9 | 1.997 | 2.970 | 166.8 | 4.4 | 15.5 |
| 1986 | 11 16 | 03 27.39 | +17 21.8 | | | | | |
| 1986 | 11 26 | 03 19.15 | +16 36.9 | 2.021 | 2.995 | 168.7 | 3.7 | 15.5 |
| 1986 | 12 06 | 03 11.90 | +15 56.4 | | | | | |
| 1986 | 12 16 | 03 06.36 | +15 24.1 | 2.158 | 3.019 | 145.2 | 10.7 | 16.0 |
| 1986 | 12 26 | 03 02.96 | +15 02.3 | | | | | |
| 1987 | 01 05 | 03 01.89 | +14 52.0 | 2.386 | 3.044 | 123.7 | 15.6 | 16.4 |
| 1987 | 01 15 | 03 03.13 | +14 52.9 | | | | | |
| 1987 | 01 25 | 03 06.53 | +15 03.8 | 2.670 | 3.068 | 104.5 | 18.1 | 16.7 |
| 1987 | 02 04 | 03 11.88 | +15 23.1 | | | | | |
| 1987 | 02 14 | 03 18.95 | +15 48.9 | 2.977 | 3.092 | 87.3 | 18.6 | 17.0 |

(3339) 1978 LB a,e,i = 3.18, 0.13, 18 Elements MPC 10300

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 03 55.60 | +06 18.5 | 3.175 | 3.572 | 105.0 | 15.8 | 17.5 |
| 1986 | 09 17 | 03 56.99 | +06 07.9 | | | | | |
| 1986 | 09 27 | 03 56.46 | +05 53.3 | 2.924 | 3.578 | 123.7 | 13.5 | 17.3 |
| 1986 | 10 07 | 03 53.94 | +05 36.2 | | | | | |
| 1986 | 10 17 | 03 49.47 | +05 18.7 | 2.731 | 3.584 | 143.9 | 9.4 | 17.0 |
| 1986 | 10 27 | 03 43.30 | +05 03.0 | | | | | |
| 1986 | 11 06 | 03 35.82 | +04 51.5 | 2.629 | 3.588 | 162.8 | 4.7 | 16.7 |
| 1986 | 11 16 | 03 27.63 | +04 47.0 | | | | | |
| 1986 | 11 26 | 03 19.43 | +04 51.1 | 2.644 | 3.591 | 160.8 | 5.2 | 16.8 |
| 1986 | 12 06 | 03 11.90 | +05 05.2 | | | | | |
| 1986 | 12 16 | 03 05.64 | +05 29.7 | 2.776 | 3.593 | 140.9 | 10.0 | 17.1 |
| 1986 | 12 26 | 03 01.06 | +06 03.8 | | | | | |
| 1987 | 01 05 | 02 58.39 | +06 46.6 | 2.999 | 3.594 | 120.1 | 13.7 | 17.4 |
| 1987 | 01 15 | 02 57.70 | +07 36.8 | | | | | |
| 1987 | 01 25 | 02 58.92 | +08 32.7 | 3.278 | 3.594 | 100.7 | 15.6 | 17.6 |
| 1987 | 02 04 | 03 01.93 | +09 33.0 | | | | | |
| 1987 | 02 14 | 03 06.57 | +10 36.2 | 3.576 | 3.592 | 83.0 | 15.8 | 17.8 |

1932 WB a,e,i = 2.25, 0.08, 4 Elements MPC 9206

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 03 42.64 | +24 29.2 | 1.755 | 2.232 | 104.5 | 25.9 | 17.0 |
| 1986 | 09 17 | 03 49.88 | +25 04.7 | | | | | |
| 1986 | 09 27 | 03 54.35 | +25 30.9 | 1.523 | 2.214 | 121.1 | 22.8 | 16.6 |
| 1986 | 10 07 | 03 55.57 | +25 46.4 | | | | | |
| 1986 | 10 17 | 03 53.24 | +25 49.1 | 1.331 | 2.196 | 140.9 | 16.6 | 16.1 |
| 1986 | 10 27 | 03 47.39 | +25 36.7 | | | | | |
| 1986 | 11 06 | 03 38.51 | +25 07.3 | 1.209 | 2.178 | 163.6 | 7.4 | 15.6 |
| 1986 | 11 16 | 03 27.80 | +24 21.7 | | | | | |
| 1986 | 11 26 | 03 16.87 | +23 24.1 | 1.185 | 2.162 | 168.9 | 5.0 | 15.4 |
| 1986 | 12 06 | 03 07.40 | +22 22.2 | | | | | |
| 1986 | 12 16 | 03 00.72 | +21 25.1 | 1.262 | 2.146 | 145.4 | 15.1 | 15.9 |
| 1986 | 12 26 | 02 57.54 | +20 39.8 | | | | | |
| 1987 | 01 05 | 02 58.02 | +20 10.0 | 1.417 | 2.131 | 124.3 | 22.4 | 16.3 |
| 1987 | 01 15 | 03 02.01 | +19 56.5 | | | | | |
| 1987 | 01 25 | 03 09.11 | +19 57.7 | 1.618 | 2.118 | 106.4 | 26.5 | 16.7 |
| 1987 | 02 04 | 03 18.94 | +20 10.8 | | | | | |
| 1987 | 02 14 | 03 31.10 | +20 32.6 | 1.838 | 2.106 | 91.2 | 28.0 | 17.0 |

1981 WV1 a,e,i = 2.88, 0.07, 1 Elements MPC 10166

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 03 51.68 | +21 37.5 | 2.421 | 2.827 | 103.2 | 20.3 | 17.6 |
| 1986 | 09 17 | 03 55.75 | +21 55.5 | | | | | |
| 1986 | 09 27 | 03 57.42 | +22 06.5 | 2.188 | 2.840 | 121.3 | 17.6 | 17.3 |
| 1986 | 10 07 | 03 56.48 | +22 09.8 | | | | | |
| 1986 | 10 17 | 03 52.89 | +22 04.9 | 2.002 | 2.854 | 142.0 | 12.4 | 16.9 |
| 1986 | 10 27 | 03 46.89 | +21 51.3 | | | | | |
| 1986 | 11 06 | 03 38.98 | +21 29.2 | 1.899 | 2.868 | 165.2 | 5.1 | 16.6 |
| 1986 | 11 16 | 03 30.01 | +21 00.3 | | | | | |
| 1986 | 11 26 | 03 21.00 | +20 27.3 | 1.905 | 2.882 | 170.1 | 3.4 | 16.5 |
| 1986 | 12 06 | 03 12.97 | +19 54.5 | | | | | |
| 1986 | 12 16 | 03 06.76 | +19 26.0 | 2.024 | 2.896 | 146.4 | 10.8 | 16.9 |
| 1986 | 12 26 | 03 02.88 | +19 05.1 | | | | | |
| 1987 | 01 05 | 03 01.53 | +18 54.0 | 2.235 | 2.910 | 124.7 | 16.1 | 17.3 |
| 1987 | 01 15 | 03 02.72 | +18 53.1 | | | | | |
| 1987 | 01 25 | 03 06.27 | +19 01.8 | 2.502 | 2.923 | 105.5 | 18.9 | 17.7 |
| 1987 | 02 04 | 03 11.94 | +19 18.9 | | | | | |
| 1987 | 02 14 | 03 19.48 | +19 42.9 | 2.793 | 2.936 | 88.4 | 19.6 | 17.9 |

(3307) 1981 DE1 a,e,i = 2.26, 0.10, 6 Elements MPC 10024

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 03 39.84 | +26 25.9 | 1.551 | 2.052 | 104.7 | 28.4 | 17.3 |
| 1986 | 09 17 | 03 48.90 | +27 01.5 | | | | | |
| 1986 | 09 27 | 03 55.02 | +27 24.8 | 1.347 | 2.046 | 120.5 | 25.0 | 16.9 |
| 1986 | 10 07 | 03 57.67 | +27 34.0 | | | | | |
| 1986 | 10 17 | 03 56.50 | +27 26.6 | 1.180 | 2.044 | 139.6 | 18.4 | 16.4 |
| 1986 | 10 27 | 03 51.53 | +27 00.1 | | | | | |
| 1986 | 11 06 | 03 43.31 | +26 12.7 | 1.077 | 2.044 | 162.1 | 8.6 | 15.9 |
| 1986 | 11 16 | 03 33.16 | +25 06.1 | | | | | |
| 1986 | 11 26 | 03 22.81 | +23 46.2 | 1.067 | 2.046 | 170.1 | 4.7 | 15.8 |
| 1986 | 12 06 | 03 14.03 | +22 23.0 | | | | | |
| 1986 | 12 16 | 03 08.17 | +21 07.2 | 1.154 | 2.051 | 147.1 | 15.1 | 16.3 |
| 1986 | 12 26 | 03 05.89 | +20 06.6 | | | | | |
| 1987 | 01 05 | 03 07.27 | +19 24.6 | 1.320 | 2.059 | 126.2 | 22.7 | 16.8 |
| 1987 | 01 15 | 03 12.09 | +19 01.5 | | | | | |
| 1987 | 01 25 | 03 19.92 | +18 54.6 | 1.533 | 2.069 | 108.6 | 26.8 | 17.3 |
| 1987 | 02 04 | 03 30.33 | +19 00.7 | | | | | |
| 1987 | 02 14 | 03 42.91 | +19 15.9 | 1.771 | 2.082 | 93.6 | 28.2 | 17.6 |

1981 EK23 a,e,i = 2.36, 0.19, 3 Elements MPC 10515

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 03 59.37 | +18 35.4 | 1.776 | 2.217 | 102.0 | 26.4 | 18.9 |
| 1986 | 09 17 | 04 05.93 | +18 35.1 | | | | | |
| 1986 | 09 27 | 04 09.52 | +18 24.8 | 1.594 | 2.259 | 119.2 | 22.8 | 18.6 |
| 1986 | 10 07 | 04 09.81 | +18 04.6 | | | | | |
| 1986 | 10 17 | 04 06.67 | +17 35.3 | 1.450 | 2.302 | 139.7 | 16.3 | 18.3 |
| 1986 | 10 27 | 04 00.32 | +16 57.7 | | | | | |
| 1986 | 11 06 | 03 51.37 | +16 14.1 | 1.377 | 2.344 | 163.1 | 7.0 | 17.9 |
| 1986 | 11 16 | 03 40.95 | +15 28.3 | | | | | |
| 1986 | 11 26 | 03 30.46 | +14 45.3 | 1.407 | 2.385 | 170.1 | 4.1 | 17.9 |
| 1986 | 12 06 | 03 21.22 | +14 10.3 | | | | | |
| 1986 | 12 16 | 03 14.31 | +13 47.4 | 1.543 | 2.425 | 146.5 | 13.0 | 18.4 |
| 1986 | 12 26 | 03 10.27 | +13 38.6 | | | | | |
| 1987 | 01 05 | 03 09.26 | +13 43.9 | 1.765 | 2.465 | 125.0 | 19.1 | 18.9 |
| 1987 | 01 15 | 03 11.16 | +14 01.8 | | | | | |
| 1987 | 01 25 | 03 15.67 | +14 30.1 | 2.039 | 2.502 | 106.4 | 22.2 | 19.4 |
| 1987 | 02 04 | 03 22.46 | +15 06.1 | | | | | |
| 1987 | 02 14 | 03 31.21 | +15 47.5 | 2.336 | 2.538 | 90.1 | 22.9 | 19.7 |

3040 P-L a,e,i = 2.64, 0.22, 8 Elements MPC 9299

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 03 54.43 | +30 02.4 | 1.774 | 2.196 | 100.6 | 26.8 | 18.2 |
| 1986 | 09 17 | 04 02.44 | +30 49.3 | | | | | |
| 1986 | 09 27 | 04 07.39 | +31 26.2 | 1.597 | 2.236 | 116.8 | 23.6 | 17.9 |
| 1986 | 10 07 | 04 08.86 | +31 51.6 | | | | | |
| 1986 | 10 17 | 04 06.64 | +32 02.7 | 1.454 | 2.277 | 135.9 | 17.7 | 17.6 |
| 1986 | 10 27 | 04 00.89 | +31 56.4 | | | | | |
| 1986 | 11 06 | 03 52.24 | +31 29.8 | 1.375 | 2.322 | 157.4 | 9.5 | 17.3 |
| 1986 | 11 16 | 03 41.91 | +30 42.6 | | | | | |
| 1986 | 11 26 | 03 31.47 | +29 38.5 | 1.392 | 2.368 | 168.5 | 4.8 | 17.1 |
| 1986 | 12 06 | 03 22.42 | +28 24.7 | | | | | |
| 1986 | 12 16 | 03 15.90 | +27 10.6 | 1.515 | 2.415 | 149.4 | 12.0 | 17.7 |
| 1986 | 12 26 | 03 12.47 | +26 03.7 | | | | | |
| 1987 | 01 05 | 03 12.25 | +25 09.1 | 1.727 | 2.463 | 128.5 | 18.2 | 18.2 |
| 1987 | 01 15 | 03 15.06 | +24 28.9 | | | | | |
| 1987 | 01 25 | 03 20.53 | +24 02.4 | 1.999 | 2.511 | 109.9 | 21.6 | 18.6 |
| 1987 | 02 04 | 03 28.31 | +23 48.1 | | | | | |
| 1987 | 02 14 | 03 38.01 | +23 43.4 | 2.301 | 2.560 | 93.5 | 22.6 | 19.0 |

1973 UF5 a,e,i = 5.20, 0.12, 23 Elements MPC 10380

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 04.35 | +33 08.4 | 4.831 | 5.068 | 97.9 | 11.4 | 17.1 |
| 1986 | 09 17 | 04 05.56 | +33 55.4 | | | | | |
| 1986 | 09 27 | 04 05.25 | +34 40.1 | 4.526 | 5.050 | 116.2 | 10.3 | 16.9 |
| 1986 | 10 07 | 04 03.31 | +35 21.1 | | | | | |
| 1986 | 10 17 | 03 59.76 | +35 57.2 | 4.272 | 5.032 | 135.5 | 8.0 | 16.7 |
| 1986 | 10 27 | 03 54.74 | +36 26.6 | | | | | |
| 1986 | 11 06 | 03 48.50 | +36 47.7 | 4.104 | 5.014 | 154.1 | 4.9 | 16.4 |
| 1986 | 11 16 | 03 41.45 | +36 59.6 | | | | | |
| 1986 | 11 26 | 03 34.11 | +37 02.0 | 4.047 | 4.997 | 162.5 | 3.4 | 16.3 |
| 1986 | 12 06 | 03 27.03 | +36 55.7 | | | | | |
| 1986 | 12 16 | 03 20.75 | +36 42.6 | 4.110 | 4.979 | 149.1 | 5.8 | 16.5 |
| 1986 | 12 26 | 03 15.70 | +36 25.2 | | | | | |
| 1987 | 01 05 | 03 12.19 | +36 06.3 | 4.278 | 4.962 | 129.6 | 8.8 | 16.7 |
| 1987 | 01 15 | 03 10.37 | +35 48.4 | | | | | |
| 1987 | 01 25 | 03 10.29 | +35 33.6 | 4.521 | 4.945 | 110.0 | 10.8 | 16.8 |
| 1987 | 02 04 | 03 11.90 | +35 23.1 | | | | | |
| 1987 | 02 14 | 03 15.11 | +35 17.8 | 4.801 | 4.928 | 91.6 | 11.6 | 17.0 |

1981 EC16 a,e,i = 2.36, 0.21, 4 Elements MPC 7768

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 10.78 | +24 12.0 | 2.364 | 2.701 | 98.3 | 21.7 | 18.9 |
| 1986 | 09 17 | 04 15.42 | +24 27.8 | | | | | |
| 1986 | 09 27 | 04 17.51 | +24 36.9 | 2.133 | 2.729 | 116.2 | 19.2 | 18.6 |
| 1986 | 10 07 | 04 16.76 | +24 38.4 | | | | | |
| 1986 | 10 17 | 04 13.07 | +24 31.2 | 1.941 | 2.754 | 136.9 | 14.3 | 18.2 |
| 1986 | 10 27 | 04 06.57 | +24 14.2 | | | | | |
| 1986 | 11 06 | 03 57.70 | +23 46.7 | 1.823 | 2.777 | 160.3 | 6.9 | 17.9 |
| 1986 | 11 16 | 03 47.33 | +23 09.3 | | | | | |
| 1986 | 11 26 | 03 36.60 | +22 24.8 | 1.814 | 2.796 | 173.5 | 2.3 | 17.7 |
| 1986 | 12 06 | 03 26.69 | +21 37.6 | | | | | |
| 1986 | 12 16 | 03 18.61 | +20 53.1 | 1.921 | 2.813 | 149.4 | 10.2 | 18.1 |
| 1986 | 12 26 | 03 13.00 | +20 15.7 | | | | | |
| 1987 | 01 05 | 03 10.16 | +19 48.7 | 2.125 | 2.827 | 126.9 | 16.1 | 18.6 |
| 1987 | 01 15 | 03 10.09 | +19 33.1 | | | | | |
| 1987 | 01 25 | 03 12.58 | +19 28.7 | 2.389 | 2.838 | 107.0 | 19.4 | 18.9 |
| 1987 | 02 04 | 03 17.39 | +19 34.2 | | | | | |
| 1987 | 02 14 | 03 24.23 | +19 48.0 | 2.678 | 2.846 | 89.5 | 20.3 | 19.2 |

(3311) 1976 QM1 a,e,i = 2.79, 0.04, 1 Elements MPC 10031

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 03.16 | +19 44.7 | 2.485 | 2.853 | 100.9 | 20.3 | 17.6 |
| 1986 | 09 17 | 04 08.00 | +19 53.7 | | | | | |
| 1986 | 09 27 | 04 10.59 | +19 56.1 | 2.226 | 2.846 | 118.7 | 18.0 | 17.3 |
| 1986 | 10 07 | 04 10.67 | +19 51.8 | | | | | |
| 1986 | 10 17 | 04 08.11 | +19 40.7 | 2.011 | 2.839 | 139.0 | 13.3 | 17.0 |
| 1986 | 10 27 | 04 03.01 | +19 22.8 | | | | | |
| 1986 | 11 06 | 03 55.73 | +18 58.7 | 1.873 | 2.832 | 161.9 | 6.2 | 16.5 |
| 1986 | 11 16 | 03 47.00 | +18 30.0 | | | | | |
| 1986 | 11 26 | 03 37.78 | +17 59.3 | 1.842 | 2.825 | 173.3 | 2.3 | 16.3 |
| 1986 | 12 06 | 03 29.12 | +17 30.1 | | | | | |
| 1986 | 12 16 | 03 22.00 | +17 06.3 | 1.925 | 2.817 | 149.3 | 10.3 | 16.7 |
| 1986 | 12 26 | 03 17.08 | +16 50.8 | | | | | |
| 1987 | 01 05 | 03 14.72 | +16 45.5 | 2.103 | 2.809 | 127.2 | 16.2 | 17.1 |
| 1987 | 01 15 | 03 15.01 | +16 50.7 | | | | | |
| 1987 | 01 25 | 03 17.82 | +17 05.7 | 2.341 | 2.801 | 107.6 | 19.6 | 17.4 |
| 1987 | 02 04 | 03 22.95 | +17 29.0 | | | | | |
| 1987 | 02 14 | 03 30.16 | +17 58.9 | 2.605 | 2.793 | 90.4 | 20.7 | 17.7 |

1974 ST a,e,i = 3.17, 0.23, 2 Elements MPC 7838

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 09.11 | +18 43.2 | 2.914 | 3.240 | 99.7 | 17.9 | 18.2 |
| 1986 | 09 17 | 04 12.19 | +18 47.2 | | | | | |
| 1986 | 09 27 | 04 13.16 | +18 45.8 | 2.687 | 3.283 | 118.3 | 15.6 | 18.0 |
| 1986 | 10 07 | 04 11.89 | +18 38.9 | | | | | |
| 1986 | 10 17 | 04 08.37 | +18 26.9 | 2.507 | 3.325 | 139.1 | 11.3 | 17.7 |
| 1986 | 10 27 | 04 02.82 | +18 10.1 | | | | | |
| 1986 | 11 06 | 03 55.63 | +17 49.3 | 2.409 | 3.366 | 162.1 | 5.2 | 17.4 |
| 1986 | 11 16 | 03 47.44 | +17 26.1 | | | | | |
| 1986 | 11 26 | 03 39.03 | +17 02.6 | 2.424 | 3.406 | 173.1 | 2.0 | 17.3 |
| 1986 | 12 06 | 03 31.19 | +16 41.3 | | | | | |
| 1986 | 12 16 | 03 24.62 | +16 24.7 | 2.558 | 3.444 | 149.7 | 8.3 | 17.7 |
| 1986 | 12 26 | 03 19.80 | +16 14.8 | | | | | |
| 1987 | 01 05 | 03 17.01 | +16 12.7 | 2.793 | 3.481 | 127.5 | 12.9 | 18.1 |
| 1987 | 01 15 | 03 16.33 | +16 18.5 | | | | | |
| 1987 | 01 25 | 03 17.67 | +16 31.9 | 3.094 | 3.517 | 107.4 | 15.5 | 18.4 |
| 1987 | 02 04 | 03 20.90 | +16 51.9 | | | | | |
| 1987 | 02 14 | 03 25.82 | +17 17.3 | 3.424 | 3.551 | 89.2 | 16.1 | 18.7 |

1979 SR9 a,e,i = 2.24, 0.15, 2 Elements MPC 10037

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|
| 1986 09 07 | 04 11.78 | +19 35.2 | 1.971 | 2.349 | 99.0 | 25.1 | 17.8 |
| 1986 09 17 | 04 18.13 | +19 51.2 | | | | | |
| 1986 09 27 | 04 21.75 | +20 00.2 | 1.761 | 2.379 | 116.1 | 22.2 | 17.6 |
| 1986 10 07 | 04 22.26 | +20 02.5 | | | | | |
| 1986 10 17 | 04 19.45 | +19 57.9 | 1.585 | 2.407 | 136.3 | 16.6 | 17.2 |
| 1986 10 27 | 04 13.36 | +19 46.2 | | | | | |
| 1986 11 06 | 04 04.42 | +19 27.6 | 1.478 | 2.433 | 159.8 | 8.1 | 16.8 |
| 1986 11 16 | 03 53.58 | +19 03.2 | | | | | |
| 1986 11 26 | 03 42.15 | +18 35.7 | 1.473 | 2.457 | 174.5 | 2.2 | 16.5 |
| 1986 12 06 | 03 31.54 | +18 09.2 | | | | | |
| 1986 12 16 | 03 23.00 | +17 48.4 | 1.579 | 2.479 | 149.7 | 11.5 | 17.1 |
| 1986 12 26 | 03 17.27 | +17 36.6 | | | | | |
| 1987 01 05 | 03 14.66 | +17 35.8 | 1.776 | 2.498 | 127.4 | 18.2 | 17.6 |
| 1987 01 15 | 03 15.16 | +17 46.1 | | | | | |
| 1987 01 25 | 03 18.50 | +18 06.3 | 2.030 | 2.516 | 108.0 | 21.8 | 18.0 |
| 1987 02 04 | 03 24.38 | +18 34.8 | | | | | |
| 1987 02 14 | 03 32.45 | +19 09.4 | 2.309 | 2.531 | 91.2 | 23.0 | 18.3 |

1977 QE1 a,e,i = 4.01, 0.18, 6 Elements MPC 10165

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|
| 1986 09 07 | 04 08.30 | +16 25.2 | 3.667 | 3.973 | 100.3 | 14.5 | 17.5 |
| 1986 09 17 | 04 10.62 | +16 14.1 | | | | | |
| 1986 09 27 | 04 11.23 | +15 57.9 | 3.418 | 4.003 | 119.1 | 12.6 | 17.3 |
| 1986 10 07 | 04 10.08 | +15 37.0 | | | | | |
| 1986 10 17 | 04 07.21 | +15 12.2 | 3.221 | 4.033 | 139.8 | 9.2 | 17.1 |
| 1986 10 27 | 04 02.80 | +14 44.4 | | | | | |
| 1986 11 06 | 03 57.15 | +14 15.0 | 3.110 | 4.063 | 161.6 | 4.4 | 16.8 |
| 1986 11 16 | 03 50.72 | +13 45.7 | | | | | |
| 1986 11 26 | 03 44.06 | +13 18.5 | 3.114 | 4.092 | 171.2 | 2.1 | 16.7 |
| 1986 12 06 | 03 37.72 | +12 55.5 | | | | | |
| 1986 12 16 | 03 32.25 | +12 38.5 | 3.240 | 4.122 | 150.0 | 6.9 | 17.1 |
| 1986 12 26 | 03 28.04 | +12 28.5 | | | | | |
| 1987 01 05 | 03 25.35 | +12 26.2 | 3.468 | 4.150 | 128.3 | 10.7 | 17.4 |
| 1987 01 15 | 03 24.31 | +12 31.5 | | | | | |
| 1987 01 25 | 03 24.93 | +12 43.6 | 3.767 | 4.178 | 108.1 | 12.9 | 17.7 |
| 1987 02 04 | 03 27.14 | +13 01.9 | | | | | |
| 1987 02 14 | 03 30.83 | +13 25.0 | 4.098 | 4.206 | 89.5 | 13.6 | 17.9 |

(3300) 1928 NA a,e,i = 3.15, 0.21, 19 Elements MPC 9957

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|
| 1986 09 07 | 04 21.65 | +30 14.5 | 3.129 | 3.367 | 94.8 | 17.4 | 16.4 |
| 1986 09 17 | 04 24.93 | +31 16.2 | | | | | |
| 1986 09 27 | 04 26.03 | +32 16.3 | 2.888 | 3.403 | 112.7 | 15.8 | 16.2 |
| 1986 10 07 | 04 24.72 | +33 13.5 | | | | | |
| 1986 10 17 | 04 20.87 | +34 05.7 | 2.686 | 3.437 | 132.4 | 12.4 | 16.0 |
| 1986 10 27 | 04 14.58 | +34 50.2 | | | | | |
| 1986 11 06 | 04 06.15 | +35 23.7 | 2.560 | 3.471 | 152.6 | 7.5 | 15.7 |
| 1986 11 16 | 03 56.24 | +35 43.7 | | | | | |
| 1986 11 26 | 03 45.75 | +35 49.0 | 2.542 | 3.503 | 164.4 | 4.3 | 15.6 |
| 1986 12 06 | 03 35.65 | +35 40.7 | | | | | |
| 1986 12 16 | 03 26.90 | +35 22.1 | 2.642 | 3.533 | 150.6 | 7.8 | 15.8 |
| 1986 12 26 | 03 20.15 | +34 57.7 | | | | | |
| 1987 01 05 | 03 15.80 | +34 32.2 | 2.847 | 3.562 | 130.2 | 12.2 | 16.2 |
| 1987 01 15 | 03 13.97 | +34 09.3 | | | | | |
| 1987 01 25 | 03 14.57 | +33 51.6 | 3.124 | 3.590 | 110.6 | 14.9 | 16.5 |
| 1987 02 04 | 03 17.43 | +33 40.4 | | | | | |
| 1987 02 14 | 03 22.30 | +33 36.1 | 3.435 | 3.616 | 92.5 | 15.8 | 16.7 |

1985 TQ a,e,i = 5.25, 0.12, 3 Elements MPC 10513

| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 08.96 | +22 28.3 | 4.416 | 4.682 | -0.41 | -1.4 | 17.2 |
| 1986 | 09 17 | 04 11.11 | +22 39.9 | | | | | |
| 1986 | 09 27 | 04 11.79 | +22 48.0 | 4.120 | 4.674 | -0.44 | -1.5 | 17.0 |
| 1986 | 10 07 | 04 10.95 | +22 52.2 | | | | | |
| 1986 | 10 17 | 04 08.60 | +22 52.5 | 3.875 | 4.666 | -0.47 | -1.7 | 16.8 |
| 1986 | 10 27 | 04 04.88 | +22 48.6 | | | | | |
| 1986 | 11 06 | 04 00.01 | +22 40.5 | 3.715 | 4.659 | -0.49 | -1.8 | 16.5 |
| 1986 | 11 16 | 03 54.36 | +22 28.8 | | | | | |
| 1986 | 11 26 | 03 48.39 | +22 14.3 | 3.668 | 4.653 | -0.49 | -2.0 | 16.3 |
| 1986 | 12 06 | 03 42.59 | +21 58.4 | | | | | |
| 1986 | 12 16 | 03 37.43 | +21 42.7 | 3.743 | 4.647 | -0.48 | -2.1 | 16.6 |
| 1986 | 12 26 | 03 33.31 | +21 28.8 | | | | | |
| 1987 | 01 05 | 03 30.52 | +21 18.4 | 3.927 | 4.642 | -0.45 | -2.1 | 16.8 |
| 1987 | 01 15 | 03 29.23 | +21 12.4 | | | | | |
| 1987 | 01 25 | 03 29.49 | +21 11.4 | 4.188 | 4.638 | -0.42 | -1.9 | 17.1 |
| 1987 | 02 04 | 03 31.29 | +21 15.6 | | | | | |
| 1987 | 02 14 | 03 34.55 | +21 24.6 | 4.489 | 4.634 | -0.39 | -1.8 | 17.2 |

1981 EN17 a,e,i = 2.29, 0.17, 5 Elements MPC 10771

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 03 56.00 | +20 26.3 | 1.428 | 1.917 | 102.4 | 30.9 | 16.9 |
| 1986 | 09 17 | 04 07.01 | +20 29.6 | | | | | |
| 1986 | 09 27 | 04 15.02 | +20 19.3 | 1.254 | 1.935 | 117.6 | 27.3 | 16.5 |
| 1986 | 10 07 | 04 19.52 | +19 55.5 | | | | | |
| 1986 | 10 17 | 04 20.12 | +19 18.9 | 1.112 | 1.957 | 136.3 | 20.6 | 16.1 |
| 1986 | 10 27 | 04 16.78 | +18 30.6 | | | | | |
| 1986 | 11 06 | 04 09.87 | +17 33.0 | 1.027 | 1.984 | 158.7 | 10.5 | 15.6 |
| 1986 | 11 16 | 04 00.52 | +16 30.7 | | | | | |
| 1986 | 11 26 | 03 50.32 | +15 30.3 | 1.030 | 2.014 | 173.9 | 3.0 | 15.4 |
| 1986 | 12 06 | 03 41.00 | +14 39.0 | | | | | |
| 1986 | 12 16 | 03 34.06 | +14 03.1 | 1.130 | 2.047 | 151.0 | 13.5 | 16.0 |
| 1986 | 12 26 | 03 30.31 | +13 45.5 | | | | | |
| 1987 | 01 05 | 03 30.03 | +13 46.0 | 1.312 | 2.083 | 129.8 | 21.3 | 16.6 |
| 1987 | 01 15 | 03 33.11 | +14 02.3 | | | | | |
| 1987 | 01 25 | 03 39.18 | +14 30.8 | 1.547 | 2.121 | 111.9 | 25.5 | 17.1 |
| 1987 | 02 04 | 03 47.83 | +15 08.0 | | | | | |
| 1987 | 02 14 | 03 58.68 | +15 50.2 | 1.811 | 2.160 | 96.6 | 27.0 | 17.5 |

(3256) Daguerre a,e,i = 2.78, 0.10, 8 Elements MPC 9688

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 05.12 | +14 05.8 | 2.169 | 2.567 | 101.5 | 22.6 | 17.2 |
| 1986 | 09 17 | 04 11.90 | +13 42.7 | | | | | |
| 1986 | 09 27 | 04 16.40 | +13 09.8 | 1.923 | 2.555 | 118.2 | 20.2 | 16.8 |
| 1986 | 10 07 | 04 18.30 | +12 27.9 | | | | | |
| 1986 | 10 17 | 04 17.41 | +11 38.6 | 1.719 | 2.544 | 137.4 | 15.4 | 16.4 |
| 1986 | 10 27 | 04 13.76 | +10 44.4 | | | | | |
| 1986 | 11 06 | 04 07.64 | +09 48.9 | 1.587 | 2.534 | 158.2 | 8.4 | 16.0 |
| 1986 | 11 16 | 03 59.74 | +08 57.0 | | | | | |
| 1986 | 11 26 | 03 51.05 | +08 13.8 | 1.554 | 2.526 | 167.1 | 5.0 | 15.8 |
| 1986 | 12 06 | 03 42.70 | +07 43.9 | | | | | |
| 1986 | 12 16 | 03 35.80 | +07 30.5 | 1.629 | 2.520 | 148.3 | 11.8 | 16.2 |
| 1986 | 12 26 | 03 31.10 | +07 34.3 | | | | | |
| 1987 | 01 05 | 03 29.05 | +07 54.3 | 1.792 | 2.515 | 127.5 | 18.1 | 16.6 |
| 1987 | 01 15 | 03 29.79 | +08 28.1 | | | | | |
| 1987 | 01 25 | 03 33.18 | +09 12.7 | 2.013 | 2.513 | 109.0 | 21.7 | 16.9 |
| 1987 | 02 04 | 03 39.03 | +10 05.1 | | | | | |
| 1987 | 02 14 | 03 47.06 | +11 02.4 | 2.262 | 2.512 | 92.8 | 23.1 | 17.2 |

1981 EY35 a,e,i = 2.28, 0.14, 4 Elements MPC 10542

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 18.57 | +24 26.7 | 2.286 | 2.601 | 96.6 | 22.6 | 19.3 |
| 1986 | 09 17 | 04 24.64 | +24 59.4 | | | | | |
| 1986 | 09 27 | 04 28.25 | +25 27.5 | 2.035 | 2.605 | 113.7 | 20.6 | 19.0 |
| 1986 | 10 07 | 04 29.03 | +25 50.7 | | | | | |
| 1986 | 10 17 | 04 26.70 | +26 07.7 | 1.818 | 2.607 | 133.5 | 16.1 | 18.6 |
| 1986 | 10 27 | 04 21.19 | +26 16.8 | | | | | |
| 1986 | 11 06 | 04 12.76 | +26 16.0 | 1.668 | 2.606 | 156.2 | 8.8 | 18.2 |
| 1986 | 11 16 | 04 02.16 | +26 03.7 | | | | | |
| 1986 | 11 26 | 03 50.55 | +25 40.2 | 1.619 | 2.603 | 174.3 | 2.2 | 17.8 |
| 1986 | 12 06 | 03 39.31 | +25 08.3 | | | | | |
| 1986 | 12 16 | 03 29.77 | +24 33.1 | 1.684 | 2.597 | 152.4 | 10.1 | 18.3 |
| 1986 | 12 26 | 03 22.84 | +24 00.4 | | | | | |
| 1987 | 01 05 | 03 19.02 | +23 34.6 | 1.847 | 2.589 | 129.7 | 17.0 | 18.7 |
| 1987 | 01 15 | 03 18.39 | +23 18.5 | | | | | |
| 1987 | 01 25 | 03 20.77 | +23 12.9 | 2.073 | 2.578 | 109.8 | 21.1 | 19.0 |
| 1987 | 02 04 | 03 25.89 | +23 17.2 | | | | | |
| 1987 | 02 14 | 03 33.41 | +23 29.9 | 2.326 | 2.565 | 92.5 | 22.6 | 19.3 |

1973 SO a,e,i = 5.12, 0.09, 8 Elements MPC 10379

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 13.43 | +22 45.5 | 4.420 | 4.668 | 98.0 | 12.3 | 17.2 |
| 1986 | 09 17 | 04 15.58 | +23 03.5 | | | | | |
| 1986 | 09 27 | 04 16.26 | +23 18.5 | 4.127 | 4.665 | 116.8 | 11.1 | 17.0 |
| 1986 | 10 07 | 04 15.39 | +23 30.3 | | | | | |
| 1986 | 10 17 | 04 12.98 | +23 38.4 | 3.882 | 4.662 | 137.1 | 8.4 | 16.8 |
| 1986 | 10 27 | 04 09.15 | +23 42.7 | | | | | |
| 1986 | 11 06 | 04 04.13 | +23 43.0 | 3.721 | 4.659 | 158.9 | 4.4 | 16.5 |
| 1986 | 11 16 | 03 58.28 | +23 39.3 | | | | | |
| 1986 | 11 26 | 03 52.05 | +23 32.4 | 3.672 | 4.657 | 176.2 | 0.8 | 16.3 |
| 1986 | 12 06 | 03 45.94 | +23 23.1 | | | | | |
| 1986 | 12 16 | 03 40.47 | +23 13.2 | 3.746 | 4.656 | 154.8 | 5.2 | 16.6 |
| 1986 | 12 26 | 03 36.02 | +23 04.1 | | | | | |
| 1987 | 01 05 | 03 32.91 | +22 57.5 | 3.931 | 4.655 | 132.8 | 8.9 | 16.8 |
| 1987 | 01 15 | 03 31.33 | +22 54.5 | | | | | |
| 1987 | 01 25 | 03 31.32 | +22 55.8 | 4.193 | 4.654 | 112.1 | 11.3 | 17.1 |
| 1987 | 02 04 | 03 32.88 | +23 01.8 | | | | | |
| 1987 | 02 14 | 03 35.93 | +23 12.3 | 4.497 | 4.654 | 93.0 | 12.2 | 17.2 |

1981 EQ12 a,e,i = 2.39, 0.27, 6 Elements MPC 10821

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 07.90 | +24 40.5 | 1.522 | 1.951 | 98.9 | 30.7 | 18.5 |
| 1986 | 09 17 | 04 17.93 | +24 48.1 | | | | | |
| 1986 | 09 27 | 04 24.70 | +24 43.2 | 1.370 | 2.006 | 114.6 | 27.0 | 18.3 |
| 1986 | 10 07 | 04 27.73 | +24 25.6 | | | | | |
| 1986 | 10 17 | 04 26.76 | +23 54.8 | 1.244 | 2.065 | 134.0 | 20.3 | 17.9 |
| 1986 | 10 27 | 04 21.88 | +23 10.7 | | | | | |
| 1986 | 11 06 | 04 13.61 | +22 13.7 | 1.176 | 2.125 | 157.2 | 10.4 | 17.6 |
| 1986 | 11 16 | 04 03.17 | +21 06.8 | | | | | |
| 1986 | 11 26 | 03 52.16 | +19 55.5 | 1.200 | 2.186 | 177.2 | 1.3 | 17.3 |
| 1986 | 12 06 | 03 42.21 | +18 47.5 | | | | | |
| 1986 | 12 16 | 03 34.64 | +17 50.0 | 1.329 | 2.248 | 152.4 | 11.7 | 18.0 |
| 1986 | 12 26 | 03 30.15 | +17 07.6 | | | | | |
| 1987 | 01 05 | 03 28.93 | +16 42.0 | 1.547 | 2.310 | 130.4 | 18.9 | 18.6 |
| 1987 | 01 15 | 03 30.84 | +16 32.3 | | | | | |
| 1987 | 01 25 | 03 35.52 | +16 35.9 | 1.824 | 2.370 | 111.6 | 22.7 | 19.1 |
| 1987 | 02 04 | 03 42.59 | +16 50.0 | | | | | |
| 1987 | 02 14 | 03 51.68 | +17 11.3 | 2.132 | 2.430 | 95.2 | 23.9 | 19.6 |

1985 RG4 a,e,i = 2.65, 0.14, 14 Elements MPC 10837

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 16.54 | +07 48.1 | 2.679 | 3.017 | 99.7 | 19.2 | 17.9 |
| 1986 | 09 17 | 04 20.90 | +07 03.0 | | | | | |
| 1986 | 09 27 | 04 23.18 | +06 09.6 | 2.424 | 3.014 | 117.0 | 17.2 | 17.6 |
| 1986 | 10 07 | 04 23.17 | +05 09.5 | | | | | |
| 1986 | 10 17 | 04 20.78 | +04 05.3 | 2.212 | 3.010 | 136.0 | 13.3 | 17.3 |
| 1986 | 10 27 | 04 16.09 | +03 00.5 | | | | | |
| 1986 | 11 06 | 04 09.39 | +01 59.5 | 2.079 | 3.003 | 154.3 | 8.2 | 17.0 |
| 1986 | 11 16 | 04 01.26 | +01 07.6 | | | | | |
| 1986 | 11 26 | 03 52.49 | +00 29.5 | 2.051 | 2.995 | 159.6 | 6.6 | 16.9 |
| 1986 | 12 06 | 03 43.98 | +00 08.5 | | | | | |
| 1986 | 12 16 | 03 36.60 | +00 06.2 | 2.133 | 2.986 | 143.9 | 11.2 | 17.1 |
| 1986 | 12 26 | 03 30.99 | +00 22.0 | | | | | |
| 1987 | 01 05 | 03 27.55 | +00 53.8 | 2.308 | 2.974 | 124.2 | 15.9 | 17.4 |
| 1987 | 01 15 | 03 26.47 | +01 38.7 | | | | | |
| 1987 | 01 25 | 03 27.70 | +02 33.5 | 2.540 | 2.961 | 105.6 | 18.7 | 17.7 |
| 1987 | 02 04 | 03 31.11 | +03 35.2 | | | | | |
| 1987 | 02 14 | 03 36.51 | +04 41.1 | 2.798 | 2.946 | 88.7 | 19.6 | 17.9 |

1984 DC1 a,e,i = 2.35, 0.21, 2 Elements MPC 10297

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 03 45.72 | +17 42.6 | 1.357 | 1.892 | 105.4 | 30.9 | 17.3 |
| 1986 | 09 17 | 03 57.81 | +18 00.4 | | | | | |
| 1986 | 09 27 | 04 07.30 | +18 06.2 | 1.162 | 1.874 | 119.7 | 27.7 | 16.9 |
| 1986 | 10 07 | 04 13.60 | +18 00.4 | | | | | |
| 1986 | 10 17 | 04 16.19 | +17 44.0 | 1.001 | 1.861 | 137.4 | 21.3 | 16.4 |
| 1986 | 10 27 | 04 14.85 | +17 18.5 | | | | | |
| 1986 | 11 06 | 04 09.74 | +16 46.0 | 0.897 | 1.856 | 158.7 | 11.2 | 15.8 |
| 1986 | 11 16 | 04 01.76 | +16 10.4 | | | | | |
| 1986 | 11 26 | 03 52.47 | +15 37.0 | 0.873 | 1.858 | 174.2 | 3.1 | 15.4 |
| 1986 | 12 06 | 03 43.73 | +15 11.8 | | | | | |
| 1986 | 12 16 | 03 37.30 | +15 00.2 | 0.940 | 1.867 | 152.1 | 14.3 | 16.0 |
| 1986 | 12 26 | 03 34.22 | +15 04.8 | | | | | |
| 1987 | 01 05 | 03 34.93 | +15 25.3 | 1.082 | 1.883 | 131.5 | 23.0 | 16.6 |
| 1987 | 01 15 | 03 39.36 | +15 59.5 | | | | | |
| 1987 | 01 25 | 03 47.14 | +16 43.7 | 1.275 | 1.905 | 114.3 | 28.1 | 17.1 |
| 1987 | 02 04 | 03 57.81 | +17 34.0 | | | | | |
| 1987 | 02 14 | 04 10.94 | +18 26.8 | 1.500 | 1.933 | 100.0 | 30.2 | 17.6 |

(3306) 1979 SM11 a,e,i = 2.25, 0.15, 5 Elements MPC 10024

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 18.66 | +20 35.0 | 2.055 | 2.400 | 97.2 | 24.6 | 17.3 |
| 1986 | 09 17 | 04 25.50 | +20 33.2 | | | | | |
| 1986 | 09 27 | 04 29.72 | +20 22.9 | 1.837 | 2.426 | 114.2 | 22.1 | 17.0 |
| 1986 | 10 07 | 04 30.96 | +20 04.1 | | | | | |
| 1986 | 10 17 | 04 28.98 | +19 36.9 | 1.650 | 2.451 | 134.2 | 17.0 | 16.6 |
| 1986 | 10 27 | 04 23.81 | +19 01.6 | | | | | |
| 1986 | 11 06 | 04 15.76 | +18 19.1 | 1.530 | 2.474 | 157.3 | 8.9 | 16.2 |
| 1986 | 11 16 | 04 05.67 | +17 31.5 | | | | | |
| 1986 | 11 26 | 03 54.72 | +16 42.5 | 1.510 | 2.495 | 175.5 | 1.8 | 15.9 |
| 1986 | 12 06 | 03 44.27 | +15 57.2 | | | | | |
| 1986 | 12 16 | 03 35.56 | +15 20.3 | 1.602 | 2.513 | 151.8 | 10.7 | 16.4 |
| 1986 | 12 26 | 03 29.40 | +14 55.5 | | | | | |
| 1987 | 01 05 | 03 26.20 | +14 44.3 | 1.790 | 2.529 | 129.2 | 17.5 | 16.9 |
| 1987 | 01 15 | 03 26.02 | +14 46.5 | | | | | |
| 1987 | 01 25 | 03 28.66 | +15 00.3 | 2.038 | 2.543 | 109.6 | 21.4 | 17.3 |
| 1987 | 02 04 | 03 33.83 | +15 23.6 | | | | | |
| 1987 | 02 14 | 03 41.22 | +15 53.9 | 2.313 | 2.554 | 92.5 | 22.7 | 17.6 |

1981 TG2 a,e,i = 2.85, 0.09, 3 Elements MPC 10027

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 15.44 | +17 49.7 | 2.348 | 2.688 | 98.4 | 21.8 | 17.1 |
| 1986 | 09 17 | 04 21.54 | +17 55.7 | | | | | |
| 1986 | 09 27 | 04 25.34 | +17 55.5 | 2.114 | 2.702 | 115.5 | 19.6 | 16.8 |
| 1986 | 10 07 | 04 26.56 | +17 49.5 | | | | | |
| 1986 | 10 17 | 04 25.03 | +17 38.2 | 1.917 | 2.717 | 135.3 | 15.0 | 16.5 |
| 1986 | 10 27 | 04 20.81 | +17 22.4 | | | | | |
| 1986 | 11 06 | 04 14.17 | +17 02.9 | 1.790 | 2.733 | 157.7 | 7.9 | 16.1 |
| 1986 | 11 16 | 04 05.79 | +16 41.5 | | | | | |
| 1986 | 11 26 | 03 56.63 | +16 20.4 | 1.765 | 2.750 | 175.3 | 1.7 | 15.8 |
| 1986 | 12 06 | 03 47.75 | +16 02.5 | | | | | |
| 1986 | 12 16 | 03 40.20 | +15 50.7 | 1.853 | 2.767 | 153.0 | 9.3 | 16.3 |
| 1986 | 12 26 | 03 34.73 | +15 47.2 | | | | | |
| 1987 | 01 05 | 03 31.77 | +15 53.0 | 2.040 | 2.784 | 130.9 | 15.5 | 16.7 |
| 1987 | 01 15 | 03 31.45 | +16 08.3 | | | | | |
| 1987 | 01 25 | 03 33.68 | +16 31.9 | 2.292 | 2.802 | 111.1 | 19.1 | 17.1 |
| 1987 | 02 04 | 03 38.25 | +17 02.4 | | | | | |
| 1987 | 02 14 | 03 44.93 | +17 38.0 | 2.577 | 2.819 | 93.7 | 20.5 | 17.4 |

1981 SZ7 a,e,i = 2.85, 0.23, 14 Elements MPC 10021

| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 23.55 | +25 11.6 | 2.210 | 2.513 | -0.78 | -5.8 | 17.2 |
| 1986 | 09 17 | 04 30.07 | +26 20.6 | | | | | |
| 1986 | 09 27 | 04 34.03 | +27 28.1 | 2.008 | 2.559 | -0.90 | -5.8 | 17.0 |
| 1986 | 10 07 | 04 35.03 | +28 33.5 | | | | | |
| 1986 | 10 17 | 04 32.82 | +29 35.4 | 1.838 | 2.606 | -1.04 | -6.1 | 16.7 |
| 1986 | 10 27 | 04 27.35 | +30 31.0 | | | | | |
| 1986 | 11 06 | 04 18.92 | +31 16.5 | 1.733 | 2.654 | -1.15 | -6.9 | 16.4 |
| 1986 | 11 16 | 04 08.30 | +31 48.0 | | | | | |
| 1986 | 11 26 | 03 56.70 | +32 03.5 | 1.727 | 2.702 | -1.16 | -7.9 | 16.2 |
| 1986 | 12 06 | 03 45.51 | +32 03.7 | | | | | |
| 1986 | 12 16 | 03 36.05 | +31 52.7 | 1.835 | 2.750 | -1.07 | -8.4 | 16.6 |
| 1986 | 12 26 | 03 29.20 | +31 36.1 | | | | | |
| 1987 | 01 05 | 03 25.39 | +31 19.1 | 2.041 | 2.797 | -0.92 | -8.0 | 17.0 |
| 1987 | 01 15 | 03 24.72 | +31 06.0 | | | | | |
| 1987 | 01 25 | 03 26.94 | +30 58.8 | 2.316 | 2.845 | -0.79 | -6.9 | 17.4 |
| 1987 | 02 04 | 03 31.78 | +30 58.4 | | | | | |
| 1987 | 02 14 | 03 38.88 | +31 04.2 | 2.626 | 2.891 | -0.69 | -5.7 | 17.8 |

1981 ET13 a,e,i = 2.28, 0.22, 4 Elements MPC 10538

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 25.33 | +25 53.7 | 2.510 | 2.782 | 94.8 | 21.2 | 19.6 |
| 1986 | 09 17 | 04 30.99 | +26 15.8 | | | | | |
| 1986 | 09 27 | 04 34.32 | +26 33.0 | 2.242 | 2.779 | 112.1 | 19.5 | 19.3 |
| 1986 | 10 07 | 04 34.97 | +26 44.6 | | | | | |
| 1986 | 10 17 | 04 32.69 | +26 49.5 | 2.005 | 2.773 | 132.1 | 15.5 | 19.0 |
| 1986 | 10 27 | 04 27.41 | +26 46.0 | | | | | |
| 1986 | 11 06 | 04 19.35 | +26 32.2 | 1.835 | 2.764 | 154.7 | 8.8 | 18.5 |
| 1986 | 11 16 | 04 09.15 | +26 07.0 | | | | | |
| 1986 | 11 26 | 03 57.85 | +25 30.9 | 1.767 | 2.752 | 175.1 | 1.8 | 18.1 |
| 1986 | 12 06 | 03 46.70 | +24 46.6 | | | | | |
| 1986 | 12 16 | 03 36.96 | +23 59.4 | 1.817 | 2.736 | 154.0 | 9.1 | 18.5 |
| 1986 | 12 26 | 03 29.54 | +23 14.7 | | | | | |
| 1987 | 01 05 | 03 24.99 | +22 37.3 | 1.969 | 2.717 | 130.9 | 15.9 | 18.9 |
| 1987 | 01 15 | 03 23.47 | +22 10.2 | | | | | |
| 1987 | 01 25 | 03 24.86 | +21 54.3 | 2.189 | 2.695 | 110.4 | 20.0 | 19.2 |
| 1987 | 02 04 | 03 28.93 | +21 49.1 | | | | | |
| 1987 | 02 14 | 03 35.38 | +21 53.1 | 2.437 | 2.669 | 92.5 | 21.7 | 19.5 |

(3347) 1975 VN1 a,e,i = 3.13, 0.10, 5 Elements MPC 10304

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 17.12 | +18 28.7 | 2.489 | 2.811 | 97.9 | 20.8 | 17.1 |
| 1986 | 09 17 | 04 23.49 | +18 23.7 | | | | | |
| 1986 | 09 27 | 04 27.73 | +18 11.4 | 2.238 | 2.811 | 114.9 | 18.9 | 16.8 |
| 1986 | 10 07 | 04 29.55 | +17 52.3 | | | | | |
| 1986 | 10 17 | 04 28.80 | +17 26.8 | 2.024 | 2.814 | 134.4 | 14.7 | 16.5 |
| 1986 | 10 27 | 04 25.51 | +16 56.0 | | | | | |
| 1986 | 11 06 | 04 19.90 | +16 21.1 | 1.881 | 2.817 | 156.3 | 8.1 | 16.1 |
| 1986 | 11 16 | 04 12.56 | +15 44.4 | | | | | |
| 1986 | 11 26 | 04 04.31 | +15 08.6 | 1.839 | 2.822 | 174.4 | 2.0 | 15.8 |
| 1986 | 12 06 | 03 56.15 | +14 37.2 | | | | | |
| 1986 | 12 16 | 03 49.06 | +14 13.5 | 1.909 | 2.829 | 154.4 | 8.6 | 16.2 |
| 1986 | 12 26 | 03 43.79 | +13 59.7 | | | | | |
| 1987 | 01 05 | 03 40.82 | +13 56.9 | 2.080 | 2.837 | 132.4 | 14.8 | 16.6 |
| 1987 | 01 15 | 03 40.36 | +14 04.9 | | | | | |
| 1987 | 01 25 | 03 42.35 | +14 22.5 | 2.319 | 2.846 | 112.6 | 18.6 | 16.9 |
| 1987 | 02 04 | 03 46.65 | +14 47.9 | | | | | |
| 1987 | 02 14 | 03 53.04 | +15 19.3 | 2.594 | 2.857 | 95.1 | 20.1 | 17.2 |

(3327) 1985 PW a,e,i = 3.17, 0.11, 2 Elements MPC 10163

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 28.38 | +21 12.9 | 2.913 | 3.162 | 94.9 | 18.5 | 17.7 |
| 1986 | 09 17 | 04 33.34 | +21 24.9 | | | | | |
| 1986 | 09 27 | 04 36.26 | +21 32.6 | 2.662 | 3.183 | 112.5 | 16.9 | 17.4 |
| 1986 | 10 07 | 04 36.94 | +21 35.9 | | | | | |
| 1986 | 10 17 | 04 35.25 | +21 34.8 | 2.445 | 3.203 | 132.5 | 13.3 | 17.1 |
| 1986 | 10 27 | 04 31.25 | +21 29.3 | | | | | |
| 1986 | 11 06 | 04 25.15 | +21 19.1 | 2.299 | 3.224 | 154.8 | 7.5 | 16.8 |
| 1986 | 11 16 | 04 17.48 | +21 04.6 | | | | | |
| 1986 | 11 26 | 04 08.97 | +20 46.8 | 2.257 | 3.244 | 178.7 | 0.4 | 16.4 |
| 1986 | 12 06 | 04 00.48 | +20 27.5 | | | | | |
| 1986 | 12 16 | 03 52.88 | +20 09.2 | 2.334 | 3.263 | 157.2 | 6.7 | 16.9 |
| 1986 | 12 26 | 03 46.86 | +19 54.5 | | | | | |
| 1987 | 01 05 | 03 42.88 | +19 45.3 | 2.518 | 3.282 | 134.4 | 12.4 | 17.2 |
| 1987 | 01 15 | 03 41.16 | +19 43.0 | | | | | |
| 1987 | 01 25 | 03 41.69 | +19 47.7 | 2.779 | 3.301 | 113.8 | 15.8 | 17.6 |
| 1987 | 02 04 | 03 44.39 | +19 59.0 | | | | | |
| 1987 | 02 14 | 03 49.04 | +20 16.0 | 3.079 | 3.319 | 95.3 | 17.2 | 17.8 |

1977 YA a,e,i = 2.73, 0.36, 31 Elements MPC 8060

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | V |
|---|---|---|---|---|---|---|---|---|
| 1986 | 09 07 | 04 15.03 | +39 25.2 | 1.906 | 2.223 | 94.4 | 26.9 | 18.7 |
| 1986 | 09 17 | 04 27.49 | +42 49.4 | | | | | |
| 1986 | 09 27 | 04 38.70 | +46 30.0 | 1.632 | 2.146 | 106.6 | 26.6 | 18.3 |
| 1986 | 10 07 | 04 47.99 | +50 27.5 | | | | | |
| 1986 | 10 17 | 04 54.39 | +54 39.9 | 1.404 | 2.072 | 118.3 | 25.1 | 17.8 |
| 1986 | 10 27 | 04 56.51 | +59 01.8 | | | | | |
| 1986 | 11 06 | 04 52.26 | +63 21.7 | 1.240 | 2.002 | 127.2 | 23.2 | 17.4 |
| 1986 | 11 16 | 04 39.06 | +67 21.2 | | | | | |
| 1986 | 11 26 | 04 14.9 | +70 35.9 | 1.149 | 1.938 | 130.1 | 22.9 | 17.2 |
| 1986 | 12 06 | 03 41.0 | +72 41.3 | | | | | |
| 1986 | 12 16 | 03 05.6 | +73 27.3 | 1.124 | 1.881 | 126.1 | 25.0 | 17.1 |
| 1986 | 12 26 | 02 39.4 | +73 08.0 | | | | | |
| 1987 | 01 05 | 02 28.0 | +72 10.3 | 1.148 | 1.833 | 118.4 | 28.2 | 17.2 |
| 1987 | 01 15 | 02 31.5 | +70 57.3 | | | | | |
| 1987 | 01 25 | 02 47.22 | +69 40.0 | 1.202 | 1.795 | 109.9 | 31.0 | 17.3 |
| 1987 | 02 04 | 03 12.40 | +68 19.0 | | | | | |
| 1987 | 02 14 | 03 44.50 | +66 49.7 | 1.275 | 1.770 | 102.2 | 33.1 | 17.5 |