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:

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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 fourth edition of the machine-readable files of astrometric observations is now available. The standard form costs $300.00 ($100.00 to customers who purchased one or more of the earlier editions) and consists of a single unlabeled 9-track magnetic tape, coded in ASCII at 1600 bpi, with 80-byte record size and 8000-byte block size. A labeled VAX/VMS tape could instead be supplied at the same price, but an additional charge must be made for other variations. The new edition, which is intended to be complete through the 1985 July 2 MPCs, contains a total of 373 847 observations: 261 191 of numbered minor planets, 93 764 of unnumbered minor planets and 18 892 of comets. For the first time the unnumbered minor planets include the complete set of Palomar-Leiden objects: one of the 70 files on the tape contains the 15 283 previously unpublished observations of the 2231 P-L objects so far known to have been observed only at the single survey opposition (in 1960). Enquiries concerning the availability of the tape 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 8691:

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

2. Objects observed at only two oppositions:
1981 2059 2202 2608 3102 3103 3199 3200 3270 3271

3. Objects accurately observed at only three oppositions:
1009 1316 1538 1921 2061 2062 2063 2076 2101 2135 2146 2148
2198 2210 2212 2223 2229 2257 2260 2272 2285 2327 2340 2368
2373 2420 2444 2449 2462 2482 2503 2539 2551 2552 2596 2619
2629 2645 2663 2669 2671 2695 2703 2706 2710 2765 2791 2799
2800 2860 2868 2876 2895 2899 2904 2914 2915 2917 2920 2926
2935 2937 2940 2948 2964 2966 2968 2974 2977 2986 2994 2999
3004 3008 3012 3013 3014 3017 3018 3022 3025 3037 3040 3041
3043 3044 3046 3057 3073 3075 3079 3080 3086 3087 3101 3119
3122 3124 3144 3148 3160 3161 3162 3169 3178 3192 3198 3204
3206 3211 3212 3217 3218 3225 3245 3252 3254 3255 3273 3274

4. Objects observed at four or more oppositions, last during 1973-1974:
914 926 998 1134 1226 1373 1612 1657 1750 1818 1871 1876
1883

5. Objects observed at four or more oppositions, last during 1975:
353 816 1138 1230 1367 1573 1710 1931

* * * * *

CORRECTED OBSERVATIONS.

The following observations correct those previously published.

| Object | Date | UT | R. A. (1950) | Decl. | Reference | N | Obs. |
|---|---|---|---|---|---|---|---|
| 1957 WK | 1957 11 | 23.26734 | 02 40 34.44 | +26 02 05.0 | MPC 9739 | 1 | 760 |
| 1957 WK | 1957 11 | 23.31317 | 02 40 31.61 | +26 01 53.5 | MPC 9739 | 1 | 760 |

Note 1: date erroneously given as 1957 10 23.

* * * * *

IDENTIFICATION CHANGES.

Continuation to MPC 9717.

| Object | Date | UT | R. A. (1950) | Decl. | Old desig. | Obs. |
|---|---|---|---|---|---|---|
| 1965 UG2 * | 1965 10 | 20.57073 | 01 10 15.35 | +12 18 40.6 | 1965 UD1 | 330 |
| 1965 UG2 | 1965 10 | 24.64556 | 01 06 13.69 | +12 00 39.5 | 1965 UD1 | 330 |

* * * * *

OBSERVATIONS OF COMETS.

Observations are published here for the following observatory codes:

046 Klet. Observer A. Mrkos.
055 Cracow. Observer M. Winiarski.
056 Skalnate Pleso. Observers G. Cervak, L. Kornos and J. Svoren.
114 Engelhardt Observatory, Zelenchukskaya Station. 0.4-m f/5 astrograph. Observers Nasarchuk et al.
186 Kitab. Observers Mirmakhmudov and Rakhmatov.
193 Sanglok. 1-m reflector. Observers Kiselyev and others.
293 Burlington remote site, New Jersey. Observer T. Handley.
323 Perth Observatory, Bickley. Observers M. P. Candy, P. Jekabsons, J. Johnston, G. Kinnear and R. Martin.
372 Geisei. Observer T. Seki. 0.60-m reflector. From Orient. Astron. Assoc. Comet Bull. No. 273.
392 JCPM Sapporo Station. Observer H. Kaneda. 0.25-m reflector. Measured by K. Watanabe.
397 Sapporo Science Center. Observer K. Watanabe. 0.6-m reflector.
413 U.K. Schmidt Telescope Unit, Siding Spring. Observer M. Hartley.
474 Mt. John University Observatory. Observer A. C. Gilmore. Measured by P. M. Kilmartin (assisted by R. McIntosh and W. M. Kissling).
491 Yebes. Observers M. de Pascual, J. Garcia, C. Cabanas and F. Sanchez.
494 Stakenbridge. Observer B. Manning.
657 Victoria. Observers D. D. Balam, T. B. Lowe and J. B. Tatum.
675 Palomar. 0.46-m Schmidt. Observer D. W. E. Green (in collaboration with E. Helin). Measured by Green.
691 University of Arizona, Kitt Peak. 0.91-m reflector, CCD in scanning mode. Observer T. Gehrels. Reductions by J. V. Scotti.
695 Kitt Peak. #1 0.91-m reflector. Observer R. C. Kennicutt. Reduction by M. J. S. Belton.
707 Chamberlin Observatory field station. 0.40-m f/5.5 reflector. Observer J. Briggs. Measured by E. Everhart.

711 McDonald Observatory. 0.76-m and 2.1-m reflectors. Observers A. Whipple and J. D. Mulholland.
801 Oak Ridge Observatory. Observers R. E. McCrosky, G. Schwartz and C.-Y. Shao (assisted by C. M. Bardwell, D. W. E. Green and B. G. Marsden).
893 Sendai Observatory. Observers K. Kurosu and K. Aisawa. 0/4-m reflector. Measured by T. Tsumagari and S. Kasahara.

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | N | Obs. |
|---|---|---|---|---|---|---|---|
| | | Periodic Comet Schwassmann-Wachmann 1 | | | | | |
| /1974 II | 1985 | 05 24.76111 | 16 34 10.80 | -31 57 56.6 | | | 323 |
| /1974 II | 1985 | 06 19.61806 | 16 21 10.41 | -31 18 11.7 | | | 323 |
| | | Periodic Comet Smirnova-Chernykh | | | | | |
| /1975 VII | 1985 | 05 12.26250 | 15 36 22.32 | -15 46 37.6 | | | 707 |
| | | Periodic Comet Halley | | | | | |
| /1982i | 1984 | 12 24.79956 | 05 53 31.37 | +11 57 59.7 | | | 193 |
| /1982i | 1984 | 12 26.81310 | 05 51 15.96 | +11 59 01.8 | | | 193 |
| /1982i | 1985 | 02 14.65919 | 05 03 26.89 | +13 04 28.6 | | | 193 |
| /1982i | 1985 | 02 15.14554 | 05 03 08.48 | +13 05 27.5 | | | 711 |
| /1982i | 1985 | 03 12.66469 | 04 52 32.28 | +14 02 59.0 | | | 193 |
| /1982i | 1985 | 03 12.72793 | 04 52 31.46 | +14 03 06.7 | | | 193 |
| /1982i | 1985 | 03 13.73754 | 04 52 19.40 | +14 05 37.3 | | | 193 |
| /1982i | 1985 | 03 14.13500 | 04 52 15.00 | +14 06 35.2 | | | 695 |
| /1982i | 1985 | 03 23.75524 | 04 51 09.80 | +14 30 45.6 | | | 114 |
| /1982i | 1985 | 04 15.65686 | 04 53 32.18 | +15 29 54.1 | | | 193 |
| | | Comet Cernis (1983 XII) | | | | | |
| /1983 XII | 1984 | 11 19.60521 | 20 46 33.27 | -61 50 29.6 | | | 323 |
| /1983 XII | 1985 | 05 15.87188 | 21 47 00.12 | -65 28 58.4 | | | 323 |
| | | Comet Shoemaker (1983 XV) | | | | | |
| /1983 XV | 1984 | 09 25.61458 | 19 20 36.47 | -58 01 57.6 | | | 323 |
| /1983 XV | 1984 | 10 18.50278 | 19 02 41.48 | -56 25 58.6 | | | 323 |
| | | Periodic Comet Wild 2 | | | | | |
| /1983s | 1985 | 06 12.43823 | 20 18 56.63 | -17 33 28.6 | | | 691 |
| /1983s | 1985 | 06 15.39912 | 20 17 09.63 | -17 40 16.9 | | | 691 |
| /1983s | 1985 | 06 15.40936 | 20 17 09.24 | -17 40 18.5 | | | 691 |
| /1983s | 1985 | 06 15.41853 | 20 17 08.85 | -17 40 20.0 | | 1 | 691 |
| /1983s | 1985 | 06 17.76910 | 20 15 36.20 | -17 46 06.5 | | | 323 |
| /1983s | 1985 | 06 19.79028 | 20 14 11.16 | -17 51 27.3 | | | 323 |
| /1983s | 1985 | 06 22.31240 | 20 12 18.84 | -17 58 35.1 | | | 801 |
| | | Periodic Comet Neujmin 1 | | | | | |
| /1984c | 1984 | 09 24.59028 | 19 14 13.74 | -31 02 32.0 | | | 323 |
| /1984c | 1984 | 10 23.49306 | 20 27 13.32 | -20 08 16.1 | | | 323 |
| | | Periodic Comet Giacobini-Zinner | | | | | |
| /1984e | 1985 | 05 16.73927 | 20 20 56.52 | +25 34 45.4 | | | 893 |
| /1984e | 1985 | 05 16.75566 | 20 20 58.29 | +25 35 11.9 | | | 893 |
| /1984e | 1985 | 05 16.87548 | 20 21 11.00 | +25 38 27.3 | | | 186 |
| /1984e | 1985 | 05 17.88028 | 20 23 01.02 | +26 07 03.1 | | | 186 |
| /1984e | 1985 | 05 18.85925 | 20 24 48.54 | +26 34 57.7 | | | 186 |
| /1984e | 1985 | 05 20.84584 | 20 28 28.53 | +27 32 17.3 | | | 186 |
| /1984e | 1985 | 05 20.88601 | 20 28 32.77 | +27 33 23.8 | | | 186 |
| /1984e | 1985 | 05 21.04780 | 20 28 50.96 | +27 38 05.4 | | 2 | 491 |
| /1984e | 1985 | 05 22.12681 | 20 30 51.89 | +28 09 41.8 | | | 491 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| /1984e | 1985 | 05 | 22.85530 | 20 | 32 | 14.01 | +28 | 31 | 04.5 | | | | 186 |
| /1984e | 1985 | 05 | 22.87607 | 20 | 32 | 16.39 | +28 | 31 | 40.8 | | | | 186 |
| /1984e | 1985 | 05 | 24.87340 | 20 | 36 | 03.35 | +29 | 30 | 52.4 | | | | 186 |
| /1984e | 1985 | 05 | 25.38576 | 20 | 37 | 02.37 | +29 | 46 | 15.2 | | | 3 | 711 |
| /1984e | 1985 | 05 | 25.44262 | 20 | 37 | 08.77 | +29 | 47 | 58.7 | | | 4 | 711 |
| /1984e | 1985 | 05 | 25.93853 | 20 | 38 | 05.91 | +30 | 02 | 47.9 | | | | 186 |
| /1984e | 1985 | 05 | 25.94546 | 20 | 38 | 06.65 | +30 | 02 | 58.8 | | | | 186 |
| /1984e | 1985 | 05 | 26.42639 | 20 | 39 | 02.64 | +30 | 17 | 30.3 | | | 3 | 711 |
| /1984e | 1985 | 05 | 26.91885 | 20 | 39 | 59.78 | +30 | 32 | 16.3 | | | | 186 |
| /1984e | 1985 | 05 | 26.92577 | 20 | 40 | 00.67 | +30 | 32 | 31.1 | | | | 186 |
| /1984e | 1985 | 05 | 27.32532 | 20 | 40 | 47.62 | +30 | 44 | 38.9 | | | | 711 |
| /1984e | 1985 | 05 | 27.34619 | 20 | 40 | 50.00 | +30 | 45 | 17.5 | | | 3 | 711 |
| /1984e | 1985 | 05 | 27.38935 | 20 | 40 | 54.91 | +30 | 46 | 35.7 | | | | 711 |
| /1984e | 1985 | 05 | 27.41818 | 20 | 40 | 58.17 | +30 | 47 | 27.2 | | | | 711 |
| /1984e | 1985 | 05 | 27.93585 | 20 | 41 | 58.93 | +31 | 03 | 07.4 | | | | 186 |
| /1984e | 1985 | 05 | 28.33763 | 20 | 42 | 46.47 | +31 | 15 | 23.2 | | | | 711 |
| /1984e | 1985 | 05 | 28.38789 | 20 | 42 | 52.30 | +31 | 16 | 56.5 | | | | 711 |
| /1984e | 1985 | 05 | 28.41635 | 20 | 42 | 55.51 | +31 | 17 | 46.7 | | | 3 | 711 |
| /1984e | 1985 | 05 | 29.41462 | 20 | 44 | 54.22 | +31 | 48 | 17.5 | | | 3 | 711 |
| /1984e | 1985 | 05 | 29.42697 | 20 | 44 | 55.64 | +31 | 48 | 39.7 | | | | 711 |
| /1984e | 1985 | 05 | 30.93562 | 20 | 47 | 56.87 | +32 | 35 | 00.1 | | | | 186 |
| /1984e | 1985 | 06 | 11.98229 | 21 | 14 | 07.63 | +38 | 56 | 16.2 | | | | 056 |
| /1984e | 1985 | 06 | 12.11019 | 21 | 14 | 25.49 | +39 | 00 | 23.5 | | | | 491 |
| /1984e | 1985 | 06 | 12.83758 | 21 | 16 | 09.15 | +39 | 23 | 49.5 | | | | 186 |
| /1984e | 1985 | 06 | 12.84450 | 21 | 16 | 10.05 | +39 | 24 | 03.4 | | | | 186 |
| /1984e | 1985 | 06 | 12.86216 | 21 | 16 | 13.05 | +39 | 24 | 42.3 | | | | 186 |
| /1984e | 1985 | 06 | 12.86910 | 21 | 16 | 13.64 | +39 | 24 | 53.1 | | | | 186 |
| /1984e | 1985 | 06 | 13.79090 | 21 | 18 | 27.43 | +39 | 54 | 41.1 | | | | 186 |
| /1984e | 1985 | 06 | 13.79784 | 21 | 18 | 28.25 | +39 | 54 | 54.2 | | | | 186 |
| /1984e | 1985 | 06 | 15.04119 | 21 | 21 | 31.42 | +40 | 35 | 09.6 | | | | 491 |
| /1984e | 1985 | 06 | 15.11737 | 21 | 21 | 42.51 | +40 | 37 | 37.8 | | | | 491 |
| /1984e | 1985 | 06 | 15.35624 | 21 | 22 | 18.43 | +40 | 45 | 22.1 | | | | 691 |
| /1984e | 1985 | 06 | 15.37212 | 21 | 22 | 20.77 | +40 | 45 | 54.0 | | | | 691 |
| /1984e | 1985 | 06 | 15.38310 | 21 | 22 | 22.43 | +40 | 46 | 15.5 | | | | 691 |
| /1984e | 1985 | 06 | 15.40903 | 21 | 22 | 26.16 | +40 | 47 | 05.2 | | | | 675 |
| /1984e | 1985 | 06 | 15.43229 | 21 | 22 | 29.17 | +40 | 47 | 50.0 | | | | 675 |
| /1984e | 1985 | 06 | 15.70579 | 21 | 23 | 10.77 | +40 | 56 | 40.0 | | 11 T | | 392 |
| /1984e | 1985 | 06 | 15.99942 | 21 | 23 | 55.20 | +41 | 06 | 10.6 | | 11 T | | 046 |
| /1984e | 1985 | 06 | 16.00660 | 21 | 23 | 56.38 | +41 | 06 | 26.4 | | | | 046 |
| /1984e | 1985 | 06 | 16.35663 | 21 | 24 | 49.34 | +41 | 17 | 47.1 | | | | 675 |
| /1984e | 1985 | 06 | 16.45226 | 21 | 25 | 03.60 | +41 | 20 | 51.0 | | | 5 | 675 |
| /1984e | 1985 | 06 | 16.62639 | 21 | 25 | 30.54 | +41 | 26 | 32.3 | | 12.0T | | 392 |
| /1984e | 1985 | 06 | 16.69236 | 21 | 25 | 40.64 | +41 | 28 | 38.3 | | | | 392 |
| /1984e | 1985 | 06 | 16.98125 | 21 | 26 | 25.21 | +41 | 37 | 59.8 | | | 6 | 494 |
| /1984e | 1985 | 06 | 17.00000 | 21 | 26 | 28.14 | +41 | 38 | 36.6 | | | 6 | 494 |
| /1984e | 1985 | 06 | 18.32028 | 21 | 29 | 54.19 | +42 | 21 | 24.2 | | | | 657 |
| /1984e | 1985 | 06 | 18.99810 | 21 | 31 | 42.11 | +42 | 43 | 24.5 | | | | 046 |
| /1984e | 1985 | 06 | 19.18617 | 21 | 32 | 12.49 | +42 | 49 | 30.5 | | | | 801 |
| /1984e | 1985 | 06 | 19.32434 | 21 | 32 | 34.63 | +42 | 53 | 57.9 | | | | 657 |
| /1984e | 1985 | 06 | 19.44387 | 21 | 32 | 53.48 | +42 | 57 | 54.1 | | | | 675 |
| /1984e | 1985 | 06 | 19.92639 | 21 | 34 | 12.41 | +43 | 13 | 28.8 | | | | 056 |
| /1984e | 1985 | 06 | 19.97292 | 21 | 34 | 19.83 | +43 | 14 | 58.9 | | | | 056 |
| /1984e | 1985 | 06 | 20.21394 | 21 | 34 | 59.48 | +43 | 22 | 48.9 | | | | 801 |
| /1984e | 1985 | 06 | 20.31923 | 21 | 35 | 16.59 | +43 | 26 | 09.7 | | | | 657 |
| /1984e | 1985 | 06 | 20.45405 | 21 | 35 | 38.43 | +43 | 30 | 36.0 | | | | 675 |
| /1984e | 1985 | 06 | 20.55278 | 21 | 35 | 55.15 | +43 | 33 | 43.5 | | 12.0T | | 397 |
| /1984e | 1985 | 06 | 20.56875 | 21 | 35 | 58.04 | +43 | 34 | 14.5 | | | | 397 |
| /1984e | 1985 | 06 | 20.59873 | 21 | 36 | 02.95 | +43 | 35 | 12.2 | | 11 T | | 392 |
| /1984e | 1985 | 06 | 21.22679 | 21 | 37 | 47.43 | +43 | 55 | 34.2 | | | | 801 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| /1984e | 1985 | 06 | 21.30451 | 21 | 38 | 00.47 | +43 | 58 | 03.0 | | 657 |
| /1984e | 1985 | 06 | 22.21324 | 21 | 40 | 34.83 | +44 | 27 | 27.7 | | 801 |
| /1984e | 1985 | 06 | 22.32014 | 21 | 40 | 53.03 | +44 | 30 | 55.3 | | 707 |
| /1984e | 1985 | 06 | 23.92517 | 21 | 45 | 33.57 | +45 | 22 | 33.5 | 10.8T | 046 |
| /1984e | 1985 | 06 | 23.92819 | 21 | 45 | 34.11 | +45 | 22 | 38.9 | | 046 |
| /1984e | 1985 | 06 | 24.53507 | 21 | 47 | 22.76 | +45 | 42 | 04.2 | 12.0T | 397 |
| /1984e | 1985 | 06 | 24.56451 | 21 | 47 | 27.97 | +45 | 43 | 05.6 | | 397 |
| /1984e | 1985 | 06 | 25.25660 | 21 | 49 | 34.28 | +46 | 05 | 15.6 | | 657 |
| /1984e | 1985 | 06 | 25.36428 | 21 | 49 | 54.19 | +46 | 08 | 47.1 | 7 | 691 |
| /1984e | 1985 | 07 | 01.28252 | 22 | 09 | 29.08 | +49 | 15 | 21.3 | | 657 |
| /1984e | 1985 | 07 | 03.37147 | 22 | 17 | 10.20 | +50 | 19 | 33.5 | | 657 |
| /1984e | 1985 | 07 | 04.28397 | 22 | 20 | 40.29 | +50 | 47 | 08.8 | | 657 |
| /1984e | 1985 | 07 | 05.32494 | 22 | 24 | 47.24 | +51 | 18 | 24.9 | | 657 |
| /1984e | 1985 | 07 | 05.99298 | 22 | 27 | 29.51 | +51 | 38 | 15.2 | | 494 |
| /1984e | 1985 | 07 | 06.02273 | 22 | 27 | 36.69 | +51 | 39 | 08.7 | | 494 |
| /1984e | 1985 | 07 | 06.02863 | 22 | 27 | 38.17 | +51 | 39 | 19.6 | | 494 |
| /1984e | 1985 | 07 | 06.26331 | 22 | 28 | 36.21 | +51 | 46 | 11.4 | | 657 |
| /1984e | 1985 | 07 | 07.29286 | 22 | 32 | 55.02 | +52 | 16 | 21.4 | | 657 |
| /1984e | 1985 | 07 | 07.59549 | 22 | 34 | 13.08 | +52 | 25 | 11.3 | | 893 |
| /1984e | 1985 | 07 | 07.59861 | 22 | 34 | 13.51 | +52 | 25 | 17.1 | | 893 |
| /1984e | 1985 | 07 | 08.26655 | 22 | 37 | 07.33 | +52 | 44 | 28.5 | | 657 |
| /1984e | 1985 | 07 | 08.66493 | 22 | 38 | 52.55 | +52 | 55 | 57.7 | | 893 |
| /1984e | 1985 | 07 | 09.29295 | 22 | 41 | 41.30 | +53 | 13 | 38.5 | | 657 |
| /1984e | 1985 | 07 | 11.00095 | 22 | 49 | 37.17 | +54 | 01 | 05.3 | | 055 |
| /1984e | 1985 | 07 | 11.01345 | 22 | 49 | 40.45 | +54 | 01 | 25.9 | | 055 |
| /1984e | 1985 | 07 | 11.27005 | 22 | 50 | 54.92 | +54 | 08 | 21.5 | | 657 |
| /1984e | 1985 | 07 | 11.94535 | 22 | 54 | 12.08 | +54 | 26 | 33.9 | | 055 |
| /1984e | 1985 | 07 | 11.96699 | 22 | 54 | 18.25 | +54 | 27 | 10.5 | | 055 |
| /1984e | 1985 | 07 | 12.41032 | 22 | 56 | 29.83 | +54 | 38 | 57.3 | | 657 |
| /1984e | 1985 | 07 | 14.63455 | 23 | 08 | 00.51 | +55 | 36 | 05.9 | | 893 |
| /1984e | 1985 | 07 | 14.63750 | 23 | 08 | 01.41 | +55 | 36 | 10.9 | | 893 |
| /1984e | 1985 | 07 | 14.91170 | 23 | 09 | 29.86 | +55 | 42 | 54.1 | | 055 |
| /1984e | 1985 | 07 | 15.00752 | 23 | 10 | 00.65 | +55 | 45 | 19.1 | | 055 |
| /1984e | 1985 | 07 | 16.89486 | 23 | 20 | 34.19 | +56 | 30 | 11.3 | | 055 |
| /1984e | 1985 | 07 | 16.93745 | 23 | 20 | 48.68 | +56 | 31 | 10.9 | | 055 |

Comet Shoemaker (1984f)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| /1984f | 1985 | 03 | 21.64730 | 15 | 45 | 52.90 | -29 | 46 | 09.1 | | 474 |
| /1984f | 1985 | 03 | 21.65928 | 15 | 45 | 51.78 | -29 | 46 | 19.3 | | 474 |
| /1984f | 1985 | 06 | 18.18767 | 11 | 38 | 36.79 | -33 | 48 | 04.3 | | 675 |
| /1984f | 1985 | 06 | 19.19931 | 11 | 37 | 08.08 | -33 | 40 | 38.6 | | 675 |

Periodic Comet Wolf-Harrington

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| /1984g | 1984 | 11 | 30.79583 | 09 | 57 | 57.54 | -05 | 30 | 29.6 | | 323 |
| /1984g | 1985 | 01 | 14.79826 | 10 | 12 | 13.83 | -18 | 59 | 18.5 | | 323 |
| /1984g | 1985 | 02 | 11.70556 | 09 | 49 | 46.24 | -21 | 16 | 09.0 | | 323 |
| /1984g | 1985 | 03 | 01.70313 | 09 | 34 | 11.84 | -19 | 39 | 13.5 | | 323 |
| /1984g | 1985 | 03 | 15.61458 | 09 | 27 | 06.65 | -17 | 26 | 32.8 | | 323 |
| /1984g | 1985 | 03 | 19.63333 | 09 | 26 | 06.94 | -16 | 44 | 41.0 | | 323 |
| /1984g | 1985 | 03 | 26.69236 | 09 | 25 | 32.31 | -15 | 31 | 08.9 | | 323 |

Periodic Comet Faye

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| /1984h | 1984 | 09 | 25.86545 | 07 | 53 | 57.49 | +13 | 03 | 24.9 | | 323 |
| /1984h | 1984 | 11 | 29.79375 | 09 | 19 | 28.64 | +03 | 13 | 20.9 | | 323 |
| /1984h | 1985 | 01 | 14.74236 | 09 | 06 | 29.06 | +02 | 03 | 24.8 | | 323 |
| /1984h | 1985 | 01 | 29.66806 | 08 | 52 | 48.85 | +03 | 19 | 27.2 | | 323 |
| /1984h | 1985 | 02 | 11.62986 | 08 | 41 | 35.81 | +04 | 47 | 33.3 | | 323 |
| /1984h | 1985 | 02 | 25.62465 | 08 | 32 | 43.07 | +06 | 26 | 49.5 | | 323 |
| /1984h | 1985 | 03 | 22.61111 | 08 | 28 | 47.03 | +08 | 50 | 23.0 | | 323 |

Comet Austin (1984i)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| /1984i | 1984 | 07 | 18.29236 | 09 | 09 | 57.46 | -13 | 37 | 25.5 | 474 |
| /1984i | 1984 | 07 | 18.29549 | 09 | 09 | 59.57 | -13 | 37 | 01.1 | 474 |

Periodic Comet Arend-Rigaux

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| /1984k | 1984 | 11 | 14.73403 | 07 | 49 | 43.04 | -02 | 16 | 45.2 | 323 |
| /1984k | 1984 | 11 | 27.79167 | 08 | 15 | 31.08 | -01 | 12 | 19.6 | 323 |
| /1984k | 1984 | 12 | 17.81250 | 08 | 45 | 56.03 | +03 | 21 | 53.5 | 323 |
| /1984k | 1985 | 01 | 14.70139 | 09 | 03 | 33.59 | +16 | 23 | 03.6 | 323 |

Periodic Comet Schaumasse

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| /1984m | 1985 | 01 | 29.76875 | 15 | 25 | 49.56 | -04 | 49 | 45.6 | 323 |
| /1984m | 1985 | 02 | 26.81285 | 16 | 12 | 22.10 | -07 | 14 | 22.3 | 323 |
| /1984m | 1985 | 02 | 27.83958 | 16 | 13 | 29.52 | -07 | 17 | 33.4 | 323 |

Comet Meier (1984o)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| /1984o | 1984 | 09 | 24.47292 | 14 | 57 | 53.20 | +07 | 09 | 34.1 | 323 |
| /1984o | 1984 | 09 | 25.47760 | 14 | 56 | 20.80 | +06 | 35 | 28.5 | 323 |

Periodic Comet Tsuchinshan 1

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| /1984p | 1985 | 02 | 18.40764 | 10 | 36 | 00.02 | +32 | 15 | 34.6 | 293 |

Periodic Comet Shoemaker 1

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| /1984q | 1984 | 10 | 05.58646 | 23 | 05 | 16.75 | +18 | 27 | 01.4 | 323 |
| /1984q | 1984 | 10 | 15.59306 | 22 | 56 | 18.60 | +19 | 46 | 31.9 | 323 |

Comet Shoemaker (1984s)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| /1984s | 1984 | 11 | 03.67882 | 01 | 58 | 01.93 | +15 | 32 | 09.3 | 323 |
| /1984s | 1984 | 11 | 13.62153 | 02 | 01 | 00.81 | +10 | 39 | 48.2 | 323 |
| /1984s | 1984 | 11 | 14.68646 | 02 | 01 | 30.96 | +10 | 04 | 36.3 | 323 |
| /1984s | 1984 | 11 | 19.67917 | 02 | 04 | 35.40 | +07 | 11 | 26.8 | 323 |
| /1984s | 1984 | 11 | 21.60694 | 02 | 06 | 07.05 | +06 | 01 | 32.2 | 323 |
| /1984s | 1984 | 11 | 29.65625 | 02 | 14 | 52.74 | +00 | 58 | 58.7 | 323 |
| /1984s | 1984 | 11 | 30.60000 | 02 | 16 | 11.86 | +00 | 23 | 01.9 | 323 |
| /1984s | 1984 | 12 | 07.62674 | 02 | 28 | 00.44 | -04 | 01 | 27.3 | 323 |
| /1984s | 1984 | 12 | 12.65486 | 02 | 38 | 45.86 | -07 | 01 | 50.6 | 323 |
| /1984s | 1984 | 12 | 17.56597 | 02 | 51 | 09.54 | -09 | 45 | 04.1 | 323 |
| /1984s | 1984 | 12 | 18.64514 | 02 | 54 | 07.00 | -10 | 18 | 47.7 | 323 |
| /1984s | 1984 | 12 | 20.56806 | 02 | 59 | 37.86 | -11 | 16 | 43.0 | 323 |
| /1984s | 1985 | 01 | 02.57708 | 03 | 43 | 23.97 | -16 | 19 | 33.5 | 323 |
| /1984s | 1985 | 01 | 03.52847 | 03 | 46 | 59.55 | -16 | 34 | 56.0 | 323 |
| /1984s | 1985 | 01 | 04.53194 | 03 | 50 | 48.49 | -16 | 50 | 05.6 | 323 |
| /1984s | 1985 | 01 | 07.53819 | 04 | 02 | 29.10 | -17 | 28 | 59.1 | 323 |
| /1984s | 1985 | 01 | 08.53125 | 04 | 06 | 24.52 | -17 | 39 | 36.4 | 323 |
| /1984s | 1985 | 02 | 04.52917 | 05 | 54 | 43.74 | -16 | 15 | 45.1 | 323 |
| /1984s | 1985 | 02 | 05.53125 | 05 | 58 | 29.72 | -16 | 01 | 59.6 | 323 |
| /1984s | 1985 | 02 | 06.53472 | 06 | 02 | 13.75 | -15 | 47 | 47.2 | 323 |
| /1984s | 1985 | 02 | 07.53056 | 06 | 05 | 54.59 | -15 | 33 | 15.8 | 323 |
| /1984s | 1985 | 02 | 12.63889 | 06 | 24 | 11.09 | -14 | 13 | 18.9 | 323 |
| /1984s | 1985 | 02 | 21.39258 | 06 | 53 | 18.29 | -11 | 44 | 01.1 | 8 474 |
| /1984s | 1985 | 02 | 21.41550 | 06 | 53 | 22.34 | -11 | 43 | 36.4 | 9 474 |
| /1984s | 1985 | 03 | 13.61701 | 07 | 50 | 49.47 | -06 | 16 | 56.6 | 323 |
| /1984s | 1985 | 03 | 21.36600 | 08 | 09 | 53.01 | -04 | 35 | 49.1 | 474 |
| /1984s | 1985 | 03 | 21.39898 | 08 | 09 | 57.65 | -04 | 35 | 25.7 | 474 |

Comet Levy-Rudenko (1984t)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| /1984t | 1985 | 02 | 18.36285 | 09 | 56 | 56.75 | +68 | 08 | 00.7 | 293 |
| /1984t | 1985 | 03 | 16.26111 | 08 | 16 | 48.48 | +34 | 22 | 11.4 | 293 |

Comet Hartley (1984v)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| /1984v | 1984 | 12 | 20.62014 | 04 | 35 | 51.23 | -16 | 27 | 44.5 | 323 |
| /1984v | 1985 | 01 | 21.61806 | 04 | 11 | 20.50 | -19 | 13 | 59.9 | 323 |
| /1984v | 1985 | 03 | 20.38046 | 04 | 08 | 03.36 | -19 | 36 | 38.8 | 474 |
| /1984v | 1985 | 03 | 20.40616 | 04 | 08 | 03.96 | -19 | 36 | 39.8 | 474 |
| /1984v | 1985 | 03 | 20.52222 | 04 | 08 | 06.40 | -19 | 36 | 39.0 | 323 |

Periodic Comet Ashbrook-Jackson

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| /1985a | 1985 | 04 | 24.70536 | 19 | 57 | 45.44 | -35 | 05 | 02.9 | 474 |
| /1985a | 1985 | 04 | 24.74367 | 19 | 57 | 47.62 | -35 | 05 | 07.3 | 474 |
| /1985a | 1985 | 05 | 23.71786 | 20 | 17 | 30.79 | -36 | 25 | 14.4 | 474 |
| /1985a | 1985 | 05 | 23.74309 | 20 | 17 | 31.27 | -36 | 25 | 19.7 | 474 |
| /1985a | 1985 | 06 | 17.69306 | 20 | 17 | 52.90 | -38 | 11 | 38.2 | 323 |
| /1985a | 1985 | 06 | 19.70521 | 20 | 17 | 07.71 | -38 | 20 | 32.9 | 323 |
| /1985a | 1985 | 06 | 27.65833 | 20 | 13 | 03.70 | -38 | 54 | 01.0 | 323 |

Periodic Comet Russell 1

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| /1985b | 1985 | 06 | 13.16067 | 11 | 49 | 19.40 | -06 | 27 | 00.8 | 691 |
| /1985b | 1985 | 06 | 13.17471 | 11 | 49 | 21.31 | -06 | 26 | 53.2 | 691 |
| /1985b | 1985 | 06 | 13.18156 | 11 | 49 | 22.22 | -06 | 26 | 49.4 | 691 |
| /1985b | 1985 | 06 | 17.16296 | 11 | 58 | 27.93 | -05 | 53 | 52.7 | 691 |
| /1985b | 1985 | 06 | 17.17616 | 11 | 58 | 29.79 | -05 | 53 | 46.3 | 691 |
| /1985b | 1985 | 06 | 17.18214 | 11 | 58 | 30.61 | -05 | 53 | 44.2 | 691 |

Comet Machholz (1985e)

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| /1985e | 1985 | 05 | 29.77882 | 01 | 03 | 07.2 | +16 | 14 | 13 | 11 | T | 372 |
| /1985e | 1985 | 05 | 29.91632 | 01 | 03 | 57.01 | +16 | 18 | 01.9 | | | 323 |
| /1985e | 1985 | 05 | 31.88958 | 01 | 16 | 27.73 | +17 | 12 | 41.2 | | | 323 |
| /1985e | 1985 | 06 | 05.77292 | 01 | 51 | 49.4 | +19 | 28 | 18 | 9 | T | 372 |

Periodic Comet Hartley

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| /1985f | 1985 | 06 | 13.38141 | 11 | 45 | 24.29 | +04 | 37 | 47.2 | 16 | T | 413 |
| /1985f | 1985 | 06 | 13.46175 | 11 | 45 | 31.64 | +04 | 34 | 49.8 | | | 413 |
| /1985f | 1985 | 06 | 13.47911 | 11 | 45 | 32.87 | +04 | 34 | 18.2 | | | 413 |
| /1985f | 1985 | 06 | 21.35870 | 11 | 57 | 37.52 | +00 | 05 | 01.2 | | | 413 |
| /1985f | 1985 | 06 | 21.37606 | 11 | 57 | 38.94 | +00 | 04 | 31.5 | | | 413 |
| /1985f | 1985 | 07 | 10.44414 | 12 | 31 | 06.33 | -10 | 00 | 01.9 | | | 413 |

Periodic Comet Giclas

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| /1985g | 1985 | 06 | 22.38646 | 00 | 53 | 11.05 | -00 | 36 | 55.6 | 20 | T | 707 |
| /1985g | 1985 | 07 | 18.30242 | 01 | 43 | 07.71 | +02 | 36 | 51.6 | 18 | T A | 801 |
| /1985g | 1985 | 07 | 21.30067 | 01 | 48 | 45.37 | +02 | 55 | 06.1 | 18 | T B | 801 |

Note 1: nuclear condensation merged with fainter star. 2: extremely diffuse image; extremely difficult to measure. 3: corrections to MPC 9720. 4: bad tracking. 5: image involved with star. 6: corrections to MPC 9721. 7: poor platescale determination in declination. 8: 0.25-m astrograph stopped down to 0.20-m f/8.5. 9: astrograph; image trailed. A: very dark plate; inkdot measured. B: dark plate but image strong enough to measure.

* * * * *

OBSERVATIONS MADE AT VIENNA (CODE 045) AND ST. POLTEN (CODE 082)

Observations by P. Jackson with the normal astrograph at the Vienna Observatory and by F. Klauser with a 0.20-m f/6 reflector at St. Polten Measured by A. Hanslmeier using AGK3 reference stars, the results shown generally being the mean from two sets of stars. Contact: A. Hanslmeier, Institut fur Astronomie, Universitatsplatz 5, A-8010 Graz, Austria.

| Object | Date | UT | R. A. (1950) | Decl. | N | Obs. |
|---|---|---|---|---|---|---|
| 111 | 1977 02 | 09.90454 | 10 21 04.30 | +06 46 24.3 | | 045 |
| 111 | 1977 02 | 11.94429 | 10 19 13.35 | +06 51 22.5 | | 045 |
| 111 | 1977 02 | 13.90336 | 10 17 24.41 | +06 56 29.0 | | 045 |
| 111 | 1977 02 | 13.92172 | 10 17 23.31 | +06 56 31.6 | | 045 |
| 111 | 1977 02 | 15.93308 | 10 15 29.43 | +07 02 05.7 | | 045 |
| 111 | 1977 02 | 15.94209 | 10 15 28.88 | +07 02 07.9 | | 045 |
| 111 | 1977 02 | 17.94270 | 10 13 34.39 | +07 07 53.9 | | 045 |
| 111 | 1977 02 | 17.95205 | 10 13 33.87 | +07 07 56.2 | | 045 |
| 111 | 1977 02 | 23.87300 | 10 07 53.55 | +07 26 04.8 | | 045 |
| 111 | 1977 02 | 23.88305 | 10 07 52.97 | +07 26 06.6 | | 045 |
| 111 | 1977 03 | 16.86087 | 09 50 54.50 | +08 26 40.5 | | 045 |
| 111 | 1977 03 | 16.86914 | 09 50 54.21 | +08 26 41.6 | | 045 |
| 111 | 1977 03 | 17.87472 | 09 50 18.95 | +08 28 55.8 | | 045 |
| 111 | 1977 03 | 17.88303 | 09 50 18.63 | +08 28 56.9 | | 045 |
| 111 | 1977 03 | 18.86921 | 09 49 45.69 | +08 31 02.3 | | 045 |
| 111 | 1977 03 | 18.87752 | 09 49 45.45 | +08 31 03.6 | | 045 |
| 896 | 1984 09 | 27.97541 | 00 22 01.87 | +16 16 45.7 | 1 | 082 |
| 896 | 1984 09 | 27.99692 | 00 22 00.53 | +16 16 32.6 | 1 | 082 |
| 896 | 1984 10 | 17.92564 | 00 04 31.88 | +13 22 59.2 | 1 | 082 |
| 896 | 1984 10 | 17.94763 | 00 04 30.94 | +13 22 48.8 | 1 | 082 |
| 896 | 1984 10 | 17.96715 | 00 04 30.06 | +13 22 38.3 | 1 | 082 |
| 2621 | 1984 11 | 27.95012 | 03 45 46.25 | +07 24 06.4 | 1 | 082 |
| 2621 | 1984 11 | 27.96571 | 03 45 45.59 | +07 24 10.6 | 1 | 082 |
| 2621 | 1984 11 | 27.98791 | 03 45 44.24 | +07 24 11.0 | 1 | 082 |
| 2621 | 1984 11 | 28.01848 | 03 45 42.76 | +07 24 15.4 | 1 | 082 |
| 2621 | 1984 11 | 28.92101 | 03 44 54.91 | +07 26 14.0 | 1 | 082 |

Note 1: observatory code 082, Long. and Parallax 15.63, -285, -316 (see MPC 7759).

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

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

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | Obs. |
|---|---|---|---|---|---|---|
| 19 | 1985 06 | 18.96405 | 17 10 33.38 | -20 59 36.0 | | 046 |
| 19 | 1985 06 | 18.97829 | 17 10 32.48 | -20 59 35.3 | | 046 |
| 113 | 1985 06 | 13.95816 | 16 44 00.50 | -15 36 42.7 | | 046 |
| 113 | 1985 06 | 13.97257 | 16 43 59.66 | -15 36 43.6 | | 046 |
| 268 | 1985 06 | 13.92280 | 16 20 19.42 | -18 38 21.1 | | 046 |
| 268 | 1985 06 | 13.93715 | 16 20 18.82 | -18 38 20.7 | | 046 |
| 268 | 1985 06 | 15.91933 | 16 18 51.50 | -18 36 35.5 | | 046 |
| 268 | 1985 06 | 15.93351 | 16 18 50.84 | -18 36 34.9 | | 046 |
| 866 | 1985 06 | 18.96405 | 17 11 30.24 | -20 48 13.4 | | 046 |
| 866 | 1985 06 | 18.97829 | 17 11 29.30 | -20 48 14.2 | | 046 |
| 1060 | 1985 06 | 13.95816 | 16 40 14.16 | -14 40 29.6 | | 046 |
| 1060 | 1985 06 | 13.97257 | 16 40 13.35 | -14 40 26.0 | | 046 |
| 1127 | 1985 06 | 13.99225 | 17 21 38.90 | -06 53 15.3 | | 046 |
| 1127 | 1985 06 | 14.00642 | 17 21 38.08 | -06 53 15.7 | | 046 |
| 1154 | 1985 06 | 13.92280 | 16 16 56.25 | -19 55 11.3 | | 046 |
| 1154 | 1985 06 | 13.93715 | 16 16 55.52 | -19 55 11.2 | | 046 |
| 1154 | 1985 06 | 15.91933 | 16 15 31.68 | -19 54 22.5 | | 046 |
| 1154 | 1985 06 | 15.93351 | 16 15 31.10 | -19 54 23.9 | | 046 |
| 1782 | 1985 06 | 13.92280 | 16 24 04.35 | -19 09 04.6 | | 046 |
| 1782 | 1985 06 | 13.93715 | 16 24 03.51 | -19 09 04.0 | | 046 |
| 1782 | 1985 06 | 15.91933 | 16 22 35.77 | -19 06 22.0 | | 046 |
| 1782 | 1985 06 | 15.93351 | 16 22 35.12 | -19 06 18.6 | | 046 |
| 1878 | 1985 06 | 18.96405 | 17 06 33.05 | -20 18 10.2 | | 046 |
| 1878 | 1985 06 | 18.97829 | 17 06 32.53 | -20 18 00.1 | | 046 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2223 | | 1985 | 06 | 15.95584 | 17 | 00 | 01.00 | -10 | 37 | 49.1 | 046 |
| 2223 | | 1985 | 06 | 15.97431 | 17 | 00 | 00.23 | -10 | 37 | 47.0 | 046 |
| 2357 | | 1985 | 06 | 18.93083 | 16 | 36 | 35.37 | -18 | 49 | 02.9 | 046 |
| 2357 | | 1985 | 06 | 18.94530 | 16 | 36 | 34.72 | -18 | 48 | 52.5 | 046 |
| 2674 | | 1985 | 06 | 13.92280 | 16 | 25 | 55.41 | -19 | 26 | 44.9 | 046 |
| 2674 | | 1985 | 06 | 13.93715 | 16 | 25 | 55.09 | -19 | 26 | 44.1 | 046 |
| 2674 | | 1985 | 06 | 15.91933 | 16 | 24 | 53.87 | -19 | 24 | 34.0 | 046 |
| 2674 | | 1985 | 06 | 15.93351 | 16 | 24 | 53.25 | -19 | 24 | 33.2 | 046 |
| 3105 | | 1985 | 06 | 15.95584 | 16 | 56 | 08.74 | -11 | 43 | 32.7 | 046 |
| 3105 | | 1985 | 06 | 15.97431 | 16 | 56 | 07.82 | -11 | 43 | 34.5 | 046 |
| 1984 | HA1 | 1985 | 06 | 11.90787 | 15 | 06 | 19.42 | +06 | 53 | 03.9 | 046 |
| 1984 | HA1 | 1985 | 06 | 13.88634 | 15 | 05 | 39.49 | +06 | 53 | 13.6 | 046 |
| 1984 | HA1 | 1985 | 06 | 13.90046 | 15 | 05 | 39.23 | +06 | 53 | 13.4 | 046 |
| 1984 | HA1 | 1985 | 06 | 15.88426 | 15 | 05 | 01.45 | +06 | 52 | 55.8 | 046 |
| 1984 | HA1 | 1985 | 06 | 15.89838 | 15 | 05 | 01.26 | +06 | 52 | 55.6 | 046 |
| 1984 | HA1 | 1985 | 06 | 21.90815 | 15 | 03 | 21.67 | +06 | 49 | 23.6 | 046 |
| 1984 | HA1 | 1985 | 06 | 21.94439 | 15 | 03 | 21.08 | +06 | 49 | 21.5 | 046 |
| 1985 | LA * | 1985 | 06 | 13.88634 | 15 | 04 | 45.93 | +06 | 59 | 04.8 | 17.0 046 |
| 1985 | LA | 1985 | 06 | 13.90046 | 15 | 04 | 45.43 | +06 | 59 | 10.0 | 046 |
| 1985 | LB * | 1985 | 06 | 13.92280 | 16 | 25 | 52.08 | -21 | 14 | 59.4 | 16.7 046 |
| 1985 | LB | 1985 | 06 | 13.93715 | 16 | 25 | 51.63 | -21 | 14 | 58.9 | 046 |
| 1985 | MA * | 1985 | 06 | 18.93083 | 16 | 37 | 34.28 | -18 | 16 | 14.7 | 17.1 046 |
| 1985 | MA | 1985 | 06 | 18.94530 | 16 | 37 | 33.66 | -18 | 16 | 06.9 | 046 |
| 1985 | MB * | 1985 | 06 | 18.93083 | 16 | 37 | 53.88 | -18 | 45 | 56.6 | 16.8 046 |
| 1985 | MB | 1985 | 06 | 18.94530 | 16 | 37 | 53.20 | -18 | 45 | 46.0 | 046 |
| 1985 | MC * | 1985 | 06 | 18.96405 | 17 | 08 | 24.21 | -20 | 25 | 31.7 | 16.8 046 |
| 1985 | MC | 1985 | 06 | 18.97829 | 17 | 08 | 23.49 | -20 | 25 | 36.1 | 046 |

OBSERVATIONS MADE AT BRORFELDE BY K. AUGUSTESEN AND P. JENSEN.
Contact: P. Jensen, Copenhagen University Observatory, Brorfelde, DK-4340 Tollose, Denmark.

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | Obs. |
|---|---|---|---|---|---|---|
| 143 | 1985 | 02 11.86276 | 09 03 38.49 | +22 23 01.2 | | 054 |
| 143 | 1985 | 02 13.94785 | 09 01 30.80 | +22 22 29.5 | | 054 |
| 143 | 1985 | 02 18.96988 | 08 56 35.76 | +22 19 15.1 | | 054 |
| 1543 | 1984 | 11 30.92804 | 02 20 50.12 | +29 21 32.6 | 16.6 | 054 |
| 2705 | 1985 | 02 11.86276 | 09 02 30.19 | +22 59 32.6 | 17.5 | 054 |
| 2733 | 1985 | 04 23.98192 | 13 55 22.90 | +07 26 42.3 | | 054 |
| 2873 | 1985 | 02 18.96988 | 09 00 39.88 | +23 13 07.0 | 17.0 | 054 |
| 3210 | 1985 | 03 27.95602 | 11 03 30.61 | +20 00 19.8 | | 054 |
| 3210 | 1985 | 04 10.90019 | 10 57 11.75 | +20 40 23.9 | | 054 |
| 3262 | 1985 | 03 27.95602 | 11 06 12.45 | +20 49 55.8 | | 054 |
| 3262 | 1985 | 04 10.90019 | 10 58 42.99 | +20 43 08.9 | | 054 |
| 1983 WP | 1985 | 04 24.00912 | 14 17 23.16 | +05 08 53.3 | 16.7 | 054 |
| 1984 HA1 | 1985 | 04 17.03204 | 15 31 18.24 | +03 53 43.4 | 15.8 | 054 |
| 1984 WE | 1984 | 11 30.92804 | 02 24 34.23 | +27 08 00.0 | 16.8 | 054 |
| 1985 HB | 1985 | 04 25.96272 | 14 00 15.98 | +06 05 07.3 | | 054 |

OBSERVATIONS MADE AT BUCHAREST.
Plates (ORWO, 0.24-m x 0.24-m, field 2 by 2 ) taken with the 0.38-m f/16 astrograph. Measured with a Zeiss ASCORECORD engine. Five reference stars from the SAO Catalog, solutions by both plate constants and dependences. Contact: G. Bocsa, Observatoire Astronomique, 5 Rue Cutitul Argint, R-75212 Bucharest, Roumania.

| Object | Date | UT | R. A. (1950) | Decl. | Obs. |
|---|---|---|---|---|---|
| 2 | 1983 | 07 15.85494 | 18 39 30.91 | +21 39 33.5 | 073 |
| 2 | 1983 | 07 15.86463 | 18 39 30.44 | +21 39 30.2 | 073 |
| 5 | 1984 | 07 23.87154 | 18 38 17.60 | -18 36 09.4 | 073 |
| 5 | 1984 | 07 23.88123 | 18 38 17.20 | -18 36 10.5 | 073 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 6 | 1983 | 07 | 15.83208 | 17 | 15 | 17.74 | -05 | 56 | 24.8 | 073 |
| 6 | 1983 | 07 | 15.84386 | 17 | 15 | 17.34 | -05 | 56 | 31.5 | 073 |
| 11 | 1983 | 03 | 17.72136 | 05 | 19 | 46.15 | +21 | 17 | 07.2 | 073 |
| 11 | 1983 | 03 | 17.73313 | 05 | 19 | 46.66 | +21 | 17 | 06.6 | 073 |
| 13 | 1984 | 03 | 28.78343 | 08 | 09 | 07.71 | +41 | 26 | 07.0 | 073 |
| 13 | 1984 | 03 | 28.79590 | 08 | 09 | 08.12 | +41 | 26 | 00.1 | 073 |
| 14 | 1984 | 05 | 31.79118 | 13 | 21 | 07.71 | +02 | 31 | 27.2 | 073 |
| 14 | 1984 | 05 | 31.80226 | 13 | 21 | 07.71 | +02 | 31 | 22.7 | 073 |
| 18 | 1984 | 05 | 31.85939 | 16 | 49 | 04.16 | -05 | 45 | 50.4 | 073 |
| 18 | 1984 | 05 | 31.86701 | 16 | 49 | 03.69 | -05 | 45 | 49.3 | 073 |
| 18 | 1984 | 06 | 28.86709 | 16 | 22 | 24.67 | -05 | 56 | 17.0 | 073 |
| 18 | 1984 | 06 | 28.87610 | 16 | 22 | 25.06 | -05 | 56 | 15.1 | 073 |
| 18 | 1984 | 06 | 29.82419 | 16 | 21 | 42.94 | -05 | 59 | 01.5 | 073 |
| 18 | 1984 | 06 | 29.83181 | 16 | 21 | 42.62 | -05 | 59 | 02.3 | 073 |
| 18 | 1984 | 07 | 02.82812 | 16 | 19 | 39.25 | -06 | 08 | 40.4 | 073 |
| 18 | 1984 | 07 | 02.83713 | 16 | 19 | 38.96 | -06 | 08 | 41.3 | 073 |
| 21 | 1984 | 06 | 08.82474 | 14 | 20 | 18.59 | -11 | 38 | 54.6 | 073 |
| 21 | 1984 | 06 | 08.83859 | 14 | 20 | 18.34 | -11 | 38 | 54.6 | 073 |
| 21 | 1984 | 06 | 29.80064 | 14 | 17 | 47.81 | -12 | 01 | 57.9 | 073 |
| 21 | 1984 | 06 | 29.81415 | 14 | 17 | 47.92 | -12 | 01 | 57.5 | 073 |
| 22 | 1984 | 05 | 22.82322 | 16 | 18 | 30.80 | -20 | 59 | 13.7 | 073 |
| 22 | 1984 | 05 | 22.83222 | 16 | 18 | 30.35 | -20 | 59 | 13.6 | 073 |
| 22 | 1984 | 06 | 08.87530 | 16 | 02 | 52.27 | -21 | 17 | 58.5 | 073 |
| 22 | 1984 | 06 | 08.88430 | 16 | 02 | 51.67 | -21 | 18 | 00.4 | 073 |
| 22 | 1984 | 06 | 28.84597 | 15 | 48 | 19.52 | -21 | 37 | 37.6 | 073 |
| 22 | 1984 | 06 | 28.85428 | 15 | 48 | 19.80 | -21 | 37 | 39.2 | 073 |
| 27 | 1984 | 03 | 28.83919 | 11 | 00 | 08.44 | +09 | 18 | 38.3 | 073 |
| 27 | 1984 | 03 | 28.85027 | 11 | 00 | 08.91 | +09 | 18 | 35.5 | 073 |
| 27 | 1984 | 03 | 29.76651 | 10 | 59 | 31.06 | +09 | 21 | 24.2 | 073 |
| 27 | 1984 | 03 | 29.77413 | 10 | 59 | 30.75 | +09 | 21 | 26.0 | 073 |
| 27 | 1984 | 04 | 08.78587 | 10 | 55 | 15.07 | +09 | 42 | 21.8 | 073 |
| 27 | 1984 | 04 | 08.79556 | 10 | 55 | 14.83 | +09 | 42 | 22.8 | 073 |
| 28 | 1984 | 05 | 31.81369 | 14 | 16 | 40.76 | +00 | 32 | 50.8 | 073 |
| 28 | 1984 | 05 | 31.82511 | 14 | 16 | 40.50 | +00 | 32 | 50.4 | 073 |
| 28 | 1984 | 06 | 08.79773 | 14 | 13 | 28.97 | +00 | 22 | 37.9 | 073 |
| 28 | 1984 | 06 | 08.81158 | 14 | 13 | 29.48 | +00 | 22 | 30.3 | 073 |
| 29 | 1984 | 03 | 28.75401 | 08 | 00 | 53.81 | +25 | 14 | 20.9 | 073 |
| 29 | 1984 | 03 | 28.76648 | 08 | 00 | 54.15 | +25 | 14 | 10.8 | 073 |
| 29 | 1984 | 03 | 31.73230 | 08 | 02 | 29.94 | +24 | 59 | 57.5 | 073 |
| 29 | 1984 | 03 | 31.74269 | 08 | 02 | 30.29 | +24 | 59 | 54.8 | 073 |
| 29 | 1984 | 04 | 06.76301 | 08 | 06 | 22.58 | +24 | 29 | 39.7 | 073 |
| 29 | 1984 | 04 | 06.77409 | 08 | 06 | 23.01 | +24 | 29 | 36.8 | 073 |
| 52 | 1984 | 05 | 22.73700 | 13 | 53 | 07.49 | -00 | 36 | 56.5 | 073 |
| 52 | 1984 | 05 | 22.74946 | 13 | 53 | 07.12 | -00 | 36 | 56.5 | 073 |
| 148 | 1983 | 03 | 17.75044 | 07 | 05 | 55.44 | +12 | 23 | 17.1 | 073 |
| 148 | 1983 | 03 | 17.76360 | 07 | 05 | 55.68 | +12 | 23 | 21.8 | 073 |
| 196 | 1984 | 05 | 31.83862 | 15 | 00 | 15.40 | -13 | 36 | 59.7 | 073 |
| 196 | 1984 | 05 | 31.84901 | 15 | 00 | 15.02 | -13 | 36 | 59.4 | 073 |
| 196 | 1984 | 06 | 08.84933 | 14 | 55 | 19.66 | -13 | 36 | 09.6 | 073 |
| 196 | 1984 | 06 | 08.86110 | 14 | 55 | 19.18 | -13 | 36 | 08.7 | 073 |
| 201 | 1984 | 07 | 23.92105 | 19 | 23 | 15.11 | -15 | 08 | 43.5 | 073 |
| 201 | 1984 | 07 | 23.93006 | 19 | 23 | 14.66 | -15 | 08 | 46.2 | 073 |
| 216 | 1984 | 06 | 29.84254 | 18 | 10 | 28.10 | -06 | 23 | 19.1 | 073 |
| 216 | 1984 | 06 | 29.85293 | 18 | 10 | 27.59 | -06 | 23 | 18.4 | 073 |
| 216 | 1984 | 07 | 23.81371 | 17 | 51 | 45.88 | -06 | 26 | 46.3 | 073 |
| 216 | 1984 | 07 | 23.82548 | 17 | 51 | 45.50 | -06 | 26 | 47.4 | 073 |
| 258 | 1984 | 07 | 23.89543 | 19 | 14 | 46.95 | +02 | 35 | 32.0 | 073 |
| 258 | 1984 | 07 | 23.90512 | 19 | 14 | 46.46 | +02 | 35 | 29.9 | 073 |
| 349 | 1984 | 03 | 26.78612 | 10 | 37 | 55.87 | +17 | 57 | 15.8 | 073 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 349 | 1984 03 26.79651 | 10 37 55.40 | +17 57 16.3 | | | 073 |
| 349 | 1984 03 28.81253 | 10 36 40.88 | +17 57 44.6 | | | 073 |
| 349 | 1984 03 28.82569 | 10 36 40.41 | +17 57 44.3 | | | 073 |
| 349 | 1984 03 29.74054 | 10 36 08.17 | +17 57 45.6 | | | 073 |
| 349 | 1984 03 29.75093 | 10 36 07.79 | +17 57 45.3 | | | 073 |
| 349 | 1984 04 06.76301 | 10 32 07.29 | +17 52 36.8 | | | 073 |
| 349 | 1984 04 06.77409 | 10 32 07.04 | +17 52 37.5 | | | 073 |
| 704 | 1984 06 29.86540 | 18 44 51.95 | -23 30 09.9 | | | 073 |
| 704 | 1984 06 29.87578 | 18 44 51.32 | -23 30 07.6 | | | 073 |

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

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

| Object | Date | UT | R. A. (1950) | Decl. | | N | Obs. |
|---|---|---|---|---|---|---|---|
| 99 | 1985 02 18.40764 | | 10 37 36.74 | +31 52 29.6 | | | 293 |
| 1984 YL | 1984 12 26.35486 | | 05 43 04.83 | +23 20 11.0 | | 1 | 293 |
| 1984 YM | 1984 12 26.35486 | | 05 44 37.57 | +23 13 20.1 | | | 293 |

Note 1: time given slightly in error on MPC 9728.

OBSERVATIONS MADE AT MOUNT JOHN UNIVERSITY OBSERVATORY.

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

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | N | Obs. |
|---|---|---|---|---|---|---|---|
| 1224 | 1985 02 20.59939 | | 11 54 37.47 | -12 17 26.9 | | 1 | 474 |
| 1224 | 1985 02 20.64696 | | 11 54 35.31 | -12 17 21.8 | | 1 | 474 |
| 1943 | 1985 03 23.66414 | | 16 46 36.51 | -51 01 12.3 | | | 474 |
| 1943 | 1985 03 23.67074 | | 16 46 39.49 | -51 01 11.7 | | | 474 |
| 1980 | 1985 03 24.37028 | | 08 54 30.47 | -26 25 16.6 | | | 474 |
| 1980 | 1985 03 24.41345 | | 08 54 29.46 | -26 24 35.7 | | | 474 |
| 1938 DZ | 1985 03 24.52161 | | 12 14 05.69 | -04 53 27.8 | | 1 | 474 |
| 1938 DZ | 1985 03 24.56709 | | 12 14 02.88 | -04 53 20.3 | | 1 | 474 |
| 1981 WO1 | 1985 03 23.71137 | | 17 18 29.90 | -26 15 24.3 | | | 474 |
| 1981 WO1 | 1985 03 24.63521 | | 17 19 37.17 | -26 07 55.7 | | | 474 |
| 1981 WO1 | 1985 03 24.67780 | | 17 19 40.01 | -26 07 34.8 | | | 474 |
| 1983 VW1 | 1985 03 20.58775 | | 12 48 21.19 | -30 57 44.9 | | | 474 |
| 1983 VW1 | 1985 03 20.62201 | | 12 48 19.34 | -30 57 33.5 | | | 474 |
| 1983 VW1 | 1985 04 24.50744 | | 12 19 14.01 | -25 44 48.1 | | | 474 |
| 1983 VW1 | 1985 04 24.52955 | | 12 19 13.17 | -25 44 33.1 | | | 474 |
| 1984 AP | 1985 02 19.63236 | | 14 38 05.54 | -31 26 58.6 | | | 474 |
| 1984 AP | 1985 02 19.65661 | | 14 38 06.21 | -31 27 05.3 | | | 474 |
| 1984 AP | 1985 03 21.48694 | | 14 39 13.79 | -34 02 50.4 | | | 474 |
| 1984 AP | 1985 03 21.52398 | | 14 39 12.95 | -34 02 57.7 | | | 474 |
| 1985 KA | 1985 05 25.62823 | | 15 07 26.19 | -27 02 48.1 | 17 | | 474 |
| 1985 KA | 1985 05 25.64206 | | 15 07 25.34 | -27 02 33.6 | | | 474 |

Note 1: observation with 0.25-m astrograph stopped down to 0.20-m f/8.5.

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 Coordinatometer, reductions using about eight SAO Catalog reference stars. Contact: M. de Pascual M., Observatorio Astronomico de Madrid, Alfonso XII 3, Spain.

| Object | Date | UT | R. A. (1950) | Decl. | | N | Obs. |
|---|---|---|---|---|---|---|---|
| 40 | 1983 08 03.94139 | | 19 24 31.66 | -25 15 53.4 | | | 491 |
| 40 | 1983 08 05.88780 | | 19 22 53.91 | -25 21 58.5 | | | 491 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 295 | 1983 | 08 | 03.94139 | 19 | 07 | 48.89 | -21 | 19 | 12.6 | 491 |
| 295 | 1983 | 08 | 05.88780 | 19 | 06 | 24.11 | -21 | 20 | 31.9 | 491 |
| 296 | 1983 | 08 | 03.94139 | 19 | 29 | 30.32 | -21 | 48 | 20.4 | 491 |
| 336 | 1983 | 08 | 04.02242 | 22 | 16 | 00.10 | +00 | 14 | 22.2 | 491 |
| 336 | 1983 | 08 | 05.96606 | 22 | 14 | 31.88 | +00 | 10 | 15.3 | 491 |
| 371 | 1983 | 08 | 03.94139 | 19 | 13 | 09.45 | -19 | 42 | 43.6 | 491 |
| 371 | 1983 | 08 | 05.88780 | 19 | 11 | 47.57 | -19 | 40 | 27.5 | 491 |
| 656 | 1983 | 08 | 03.94139 | 19 | 24 | 17.30 | -21 | 21 | 47.5 | 491 |
| 656 | 1983 | 08 | 05.88780 | 19 | 22 | 58.97 | -21 | 24 | 39.8 | 1 491 |
| 945 | 1983 | 08 | 04.02242 | 22 | 25 | 10.32 | +01 | 31 | 28.5 | 491 |
| 945 | 1983 | 08 | 05.96606 | 22 | 23 | 13.23 | +01 | 41 | 27.2 | 491 |
| 1027 | 1983 | 08 | 03.94139 | 19 | 31 | 52.31 | -23 | 33 | 00.9 | 491 |
| 1427 | 1983 | 08 | 03.99160 | 21 | 36 | 28.54 | -29 | 25 | 45.1 | 491 |
| 1456 | 1983 | 08 | 04.02242 | 22 | 19 | 11.74 | +01 | 55 | 48.7 | 1 491 |
| 1456 | 1983 | 08 | 05.96606 | 22 | 17 | 58.24 | +02 | 00 | 33.1 | 491 |
| 1547 | 1983 | 08 | 04.02242 | 22 | 25 | 59.21 | +01 | 52 | 59.1 | 491 |
| 1547 | 1983 | 08 | 05.96606 | 22 | 24 | 33.84 | +01 | 55 | 38.4 | 491 |
| 1909 | 1983 | 08 | 03.94139 | 19 | 22 | 28.36 | -18 | 56 | 32.2 | 491 |
| 2204 | 1983 | 08 | 04.02242 | 22 | 26 | 47.64 | -01 | 44 | 32.5 | 491 |
| 2204 | 1983 | 08 | 05.96606 | 22 | 25 | 37.38 | -02 | 01 | 32.8 | 491 |
| 2585 | 1983 | 09 | 08.04027 | 00 | 49 | 25.07 | -03 | 15 | 41.7 | 491 |
| 2585 | 1983 | 09 | 08.98924 | 00 | 49 | 09.69 | -03 | 23 | 45.9 | 491 |

Note 1: faint image; difficult to measure.

OBSERVATIONS MADE WITH THE 0.46-M SCHMIDT AT PALOMAR BY D. W. E. GREEN, R. S. DUNBAR AND D. SCHNEEBERGER.

Observations made in collaboration with E. Helin. Exposures taken on hypersensitized IIaD films, via 5-min exposures. Measurements by Green. Contact: D. W. E. Green, Harvard-Smithsonian Center for Astrophysics, 60 Garden St., Cambridge, MA 02138, U.S.A.

| Object | Date | UT | R. A. (1950) | Decl. | Obs. |
|---|---|---|---|---|---|
| 1866 | 1985 06 | 17.28507 | 14 19 48.39 | -20 08 01.3 | 675 |
| 1866 | 1985 06 | 17.32031 | 14 19 42.05 | -20 08 46.0 | 675 |

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

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

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | Obs. |
|---|---|---|---|---|---|---|
| 1870 | 1985 06 | 15.22316 | 16 57 38.38 | -14 32 53.8 | | 691 |
| 1870 | 1985 06 | 15.23877 | 16 57 37.85 | -14 32 52.7 | | 691 |
| 1870 | 1985 06 | 15.25995 | 16 57 37.53 | -14 32 52.4 | | 691 |
| 1953 NB | 1985 06 | 15.27953 | 16 16 10.54 | -21 27 17.1 | | 691 |
| 1953 NB | 1985 06 | 15.29162 | 16 16 09.73 | -21 27 18.2 | | 691 |
| 1953 NB | 1985 06 | 19.22106 | 16 12 10.75 | -21 33 34.3 | | 691 |
| 1953 NB | 1985 06 | 19.24002 | 16 12 09.55 | -21 33 36.5 | | 691 |
| 1953 NB | 1985 06 | 19.24884 | 16 12 09.03 | -21 33 37.4 | | 691 |
| 1982 DV | 1985 06 | 13.41528 | 21 37 01.78 | -02 22 40.3 | | 691 |
| 1982 DV | 1985 06 | 13.43127 | 21 37 01.73 | -02 22 34.0 | | 691 |
| 1982 DV | 1985 06 | 13.44206 | 21 37 01.64 | -02 22 29.7 | | 691 |
| 1982 DV | 1985 06 | 19.43258 | 21 36 05.46 | -01 47 53.2 | | 691 |
| 1982 DV | 1985 06 | 19.44035 | 21 36 05.29 | -01 47 50.9 | | 691 |
| 1982 DV | 1985 06 | 19.46161 | 21 36 04.80 | -01 47 45.0 | | 691 |
| 1985 FC | 1985 06 | 14.16465 | 11 35 11.30 | -07 34 45.1 | | 691 |
| 1985 FC | 1985 06 | 14.17500 | 11 35 11.91 | -07 34 54.8 | | 691 |
| 1985 FC | 1985 06 | 14.17865 | 11 35 12.10 | -07 34 58.1 | | 691 |
| 1985 JA | 1985 06 | 19.29551 | 15 00 41.82 | +14 08 56.5 | | 691 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1985 JA | 1985 06 19.31168 | 15 00 42.16 | +14 09 11.5 | | | 691 |
| 1985 JA | 1985 06 19.32263 | 15 00 42.33 | +14 09 21.0 | | | 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. | Mag. | Obs. |
|---|---|---|---|---|---|---|---|
| 1627 | | 1985 06 | 19.20103 | 21 11 23.41 | +10 24 29.8 | | 801 |
| 1627 | | 1985 06 | 19.26957 | 21 11 42.80 | +10 24 44.8 | | 801 |
| 1627 | | 1985 06 | 20.22337 | 21 16 22.88 | +10 27 27.3 | | 801 |
| 1627 | | 1985 06 | 21.23602 | 21 21 22.44 | +10 29 28.3 | | 801 |
| 1627 | | 1985 06 | 22.23462 | 21 26 20.60 | +10 30 30.9 | | 801 |
| 1866 | | 1985 06 | 19.08458 | 14 14 29.73 | -20 47 32.4 | | 801 |
| 1943 | | 1985 06 | 19.21655 | 21 31 21.83 | +07 20 12.0 | | 801 |
| 1943 | | 1985 06 | 19.29052 | 21 31 19.86 | +07 22 22.5 | | 801 |
| 1943 | | 1985 06 | 20.23711 | 21 31 01.83 | +07 49 44.2 | | 801 |
| 1943 | | 1985 06 | 20.32872 | 21 30 59.07 | +07 52 22.9 | | 801 |
| 1943 | | 1985 06 | 21.25066 | 21 30 38.36 | +08 18 17.2 | | 801 |
| 1943 | | 1985 06 | 22.22436 | 21 30 12.51 | +08 44 54.1 | | 801 |
| 1941 | HJ | 1985 06 | 20.07953 | 13 33 45.59 | +04 46 13.1 | | 801 |
| 1953 | NB | 1985 06 | 21.16727 | 16 10 18.60 | -21 36 50.9 | | 801 |
| 1977 | QC4 | 1985 04 | 22.26033 | 14 00 56.88 | +07 57 27.6 | | 801 |
| 1980 | BV | 1985 05 | 21.24534 | 16 09 50.52 | -04 09 28.1 | | 801 |
| 1980 | BV | 1985 06 | 19.14509 | 15 45 30.77 | -05 56 41.5 | | 801 |
| 1980 | TG5 | 1985 05 | 24.32852 | 20 27 11.76 | -05 45 10.0 | | 801 |
| 1980 | TG5 | 1985 06 | 19.23243 | 20 30 01.22 | -02 09 57.8 | | 801 |
| 1981 | DK1 | 1985 06 | 18.09656 | 15 06 15.20 | -04 24 48.3 | | 801 |
| 1981 | WO1 | 1985 05 | 21.29368 | 17 23 02.85 | -12 36 21.4 | | 801 |
| 1981 | WO1 | 1985 06 | 21.18798 | 16 45 17.49 | -04 30 11.0 | | 801 |
| 1982 | DV | 1985 06 | 20.30508 | 21 35 48.16 | -01 43 53.6 | | 801 |
| 1983 | WP | 1985 05 | 23.16068 | 13 53 04.74 | +03 57 37.1 | | 801 |
| 1984 | CN1 | 1985 05 | 24.28823 | 18 12 43.17 | -12 46 29.8 | | 801 |
| 1984 | CN1 | 1985 06 | 21.20610 | 17 52 42.73 | -11 50 33.9 | | 801 |
| 1984 | EB | 1985 05 | 21.26882 | 16 42 47.87 | -01 22 27.0 | | 801 |
| 1984 | EB | 1985 06 | 19.16327 | 16 21 18.91 | -01 23 32.6 | | 801 |
| 1984 | KF | 1985 06 | 22.15498 | 16 44 05.34 | +09 14 59.5 | | 801 |
| 1985 | HC | 1985 06 | 18.08170 | 14 41 12.46 | +02 14 44.9 | | 801 |
| 1985 | HS1 | 1985 06 | 22.09935 | 12 35 13.57 | +14 44 36.9 | | 801 |
| 1985 | JA | 1985 06 | 19.10120 | 15 00 37.55 | +14 06 04.0 | | 801 |
| 1985 | JA | 1985 06 | 21.14538 | 15 01 25.86 | +14 34 33.0 | | 801 |
| 1985 | KY * | 1985 05 | 25.21067 | 15 17 43.67 | -16 44 46.4 | 17 | 801 |
| 4650 | P-L | 1985 05 | 25.16575 | 13 34 46.42 | -12 10 48.0 | | 801 |

* * * * *

ORBITAL ELEMENTS OF ONE-OPPOSITION MINOR PLANETS.

The orbit computers and authors of double designations are a = A. Lowe, B = C. M. Bardwell, h = K. Hurukawa, I = H. Oishi, M = B. G. Marsden. For further information see MPC 7828.

| Planet | B(1,0) | Epoch | M | Peri. | Node | Incl. | e | a | Arc | O | N | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1980 RB4 | 13.3 | 800829 | 13.78 | 328.32 | 338.35 | 14.23 | 0.0887 | 2.4549 | 4 | 4 | 1 | a |
| 1981 GN1 | 15.4 | 810317 | 241.19 | 129.57 | 177.49 | 9.85 | 0.1285 | 2.3268 | 61 | 0 | 1 | I |
| 1985 FC | 16.0 | 850425 | 32.65 | 142.52 | 14.58 | 23.97 | 0.0407 | 1.8622 | 86 | 0 | | B |
| 1985 HB | 11.5 | 850425 | 283.25 | 206.78 | 100.86 | 12.39 | 0.1967 | 3.1639 | 2 | 4 | | B |

1985 HC 13.0 850515 312.66 107.32 217.32 28.77 0.4105 2.7702 56 8 B
1985 HS1 15.0 850515 353.51 31.34 180.84 23.22 0.1965 2.3251 72 5 B
1985 KA 14.5 850515 297.58 79.90 249.72 22.22 0.2945 2.3628 12 0 M
Note 1: double designations 1980 RB4 = 1980 RG5 (a); 1981 GN1 = 1981 GP1 (h, JAM 1902).

* * * * *

ORBITAL ELEMENTS BY S. NAKANO, TOKYO.

The identifications are by S. Nakano unless otherwise stated.

(3280)* 1933 SJ = 1954 UL2 = 1954 WB = 1958 TN1 = 1975 XF3
Discovered 1933 Sept. 17 by F. Rigaux at Uccle. The identification 1933 SJ = 1958 TN1 was independently suggested by E. Bowell (MPC 9305).
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

| | | (1950.0) | P | Q |
|---|---|---|---|---|
| M 240.54462 | | | | |
| n 0.23739244 | Peri. | 359.80831 | +0.73142696 | +0.68141255 |
| a 2.5832005 | Node | 317.19771 | -0.62556688 | +0.65513355 |
| e 0.1737454 | Incl. | 2.21801 | -0.27144184 | +0.32630807 |
| P 4.15 | B(1,0) | 13.5 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 330917 | 012 | 6.7+ | 0.8- | 541028 | 760 | 1.4- | 1.5+ | 751129 | 330 | 0.5+ | 0.2- |
| 330925 | 012 | 4.7+ | 0.5+ | 541028 | 760 | 2.4+ | 1.5+ | 751202 | 095 | (2.3+ | 10.3-) |
| 330927 | 012 | (11.1- | 1.9+) | 541116 | 760 | 2.4- | 0.8+ | 850113 | 372 | 0.3- | 0.5+ |
| 331012 | 012 | 5.0- | 2.7+ | 541116 | 760 | 1.8- | 1.9+ | 850113 | 372 | 2.7- | 0.3+ |
| 331014 | 012 | (9.9+ | 6.4+) | 581010 | 690 | 1.7- | 2.2- | 850119 | 688 | 0.4- | 0.7- |
| 331017 | 012 | 3.1- | 3.7- | 581011 | 690 | 0.2+ | 1.4- | 850119 | 688 | 0.7+ | 4.6- |
| 331019 | 012 | 0.2- | 2.1- | 581014 | 690 | 2.3+ | 0.3+ | 850217 | 801 | 0.3+ | 1.5+ |
| 331020 | 012 | 2.0- | 1.0+ | 751126 | 330 | 1.2+ | 0.4- | 850326 | 801 | 0.9+ | 0.3- |

(3281)* 1938 DZ = 1961 TP = 1970 AP = 1979 TV
Discovered 1938 Feb. 24 by Y. Vaisala at Turku.
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

| | | (1950.0) | P | Q |
|---|---|---|---|---|
| M 32.18494 | | | | |
| n 0.27364515 | Peri. | 240.22524 | -0.66303564 | +0.74828194 |
| a 2.3496917 | Node | 348.16853 | -0.64569234 | -0.58612909 |
| e 0.0972114 | Incl. | 5.99056 | -0.37876794 | -0.31068767 |
| P 3.60 | B(1,0) | 13.5 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 380218 | 062 | 1.3- | 1.1- | 700104 | 095 | 0.6- | 1.0- | 850324 | 688 | 1.7+ | 1.1+ |
| 380224 | 062 | 0.4- | 0.9+ | 791014 | 095 | 3.0+ | 0.7+ | 850324 | 474 | 3.2- | 2.0+ |
| 380303 | 062 | 1.1+ | 0.3- | 791110 | 095 | 2.6- | 1.8+ | 850324 | 474 | 1.6- | 2.2+ |
| 380307 | 062 | 0.4+ | 0.9- | 791111 | 095 | 3.1- | 5.3+ | 850414 | 688 | 0.7+ | 0.5+ |
| 611007 | 760 | 1.6+ | 0.9+ | 850321 | 688 | 0.2+ | 0.3+ | 850414 | 688 | 2.9+ | 0.4+ |
| 611007 | 760 | 0.7+ | 0.1- | 850321 | 688 | 0.6- | 0.6- | 850425 | 801 | 1.3+ | 0.0 |
| 611017 | 760 | 3.7- | 1.5- | 850324 | 688 | 2.3+ | 0.8+ | | | | |

(3282)* 1949 DA = 1933 FL1 = 1933 HN = 1973 SL6 = 1975 EU2
Discovered 1949 Feb. 19 at the Goethe Link Observatory, Indiana University.
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

| | | (1950.0) | P | Q |
|---|---|---|---|---|
| M 95.92434 | | | | |
| n 0.30420786 | Peri. | 18.52858 | -0.99982060 | +0.00801426 |
| a 2.1895545 | Node | 161.90483 | -0.01350275 | -0.93699280 |
| e 0.0419076 | Incl. | 3.16748 | +0.01328295 | -0.34925674 |
| P 3.24 | B(1,0) | 14.0 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 330325 | 024 | 1.0- | 0.3+ | | 490305 | 754 | 4.1+ | 3.7+ | | 850321 | 801 | 0.3- | 1.4+ |
| 330420 | 024 | 0.6+ | 2.5- | | 490305 | 754 | 3.8+ | 3.7+ | | 850414 | 688 | 0.9- | 0.6+ |
| 490219 | 760 | 0.9- | 1.7- | | 490307 | 760 | 0.0 | 1.3- | | 850414 | 688 | 0.3+ | 0.7+ |
| 490219 | 760 | 2.0- | 0.5- | | 490307 | 760 | 2.4- | 0.8- | | 850416 | 567 | 1.2- | 0.5- |
| 490219 | 760 | 2.6- | 2.5- | | 730928 | 095 | 0.9+ | 2.1- | | 850417 | 567 | 1.6- | 1.3- |
| 490227 | 760 | 1.2- | 1.8- | | 750308 | 095 | 0.5+ | 0.8+ | | 850423 | 688 | 0.7+ | 1.0- |
| 490302 | 760 | 0.6+ | 0.3+ | | 850218 | 801 | 1.9+ | 0.4+ | | 850423 | 688 | 1.5+ | 0.3- |

(3283)* 1979 QA10 = 1953 TW1 = 1957 WK = 1959 ED = 1973 AM2 = 1977 AJ1

Discovered 1979 Aug. 27 by N. S. Chernykh at the Crimean Astrophysical Observatory. The key identifications 1979 QA10 = 1973 AM2 = 1977 AJ1 are by T. Furuta (JAM 1819). The identifications 1979 QA10 = 1953 TW1 = 1957 WK = 1959 ED were found independently by H. Oishi and S. Nakano (MPC 9473).

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

| | | | | | |
|---|---|---|---|---|---|
| M | 252.53342 | | (1950.0) | P | Q |
| n | 0.26575532 | Peri. | 352.13569 | +0.97962678 | +0.20067438 |
| a | 2.3959701 | Node | 356.26064 | -0.17710123 | +0.84487673 |
| e | 0.1006700 | Incl. | 6.88754 | -0.09469176 | +0.49589625 |
| P | 3.71 | B(1,0) | 14.0 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 531009 | 760 | 0.2- | 0.9+ | | 770113 | 095 | 2.8- | 0.7+ | | 831208 | 330 | 0.8+ | 1.2- |
| 531009 | 760 | 0.6- | 1.8+ | | 770120 | 095 | 1.0- | 1.2+ | | 850321 | 688 | 0.1- | 0.5- |
| 571123 | 760 | 1.1+ | 1.7+ | | 790827 | 095 | 0.8- | 2.1- | | 850321 | 688 | 1.3+ | 1.0- |
| 571123 | 760 | 0.4- | 1.1+ | | 790902 | 095 | 0.9- | 0.2- | | 850324 | 801 | 0.3- | 0.4+ |
| 590309 | 024 | 0.1- | 0.7+ | | 790924 | 095 | 1.1- | 0.1- | | 850325 | 801 | 2.0+ | 0.1+ |
| 730102 | 095 | 1.2- | 0.8+ | | 831129 | 330 | 5.5+ | 0.1+ | | 850418 | 801 | 0.1+ | 0.8+ |
| 730103 | 095 | 0.9- | 2.4- | | 831202 | 330 | 0.2- | 0.1+ | | | | | |

* * * * *

ORBITAL ELEMENTS BY H. OISHI, NIIZA, JAPAN.

The following orbital elements are from JAM 1902-1905 and 1910. The identifications are by T. Furuta.

1983 VG7 = 1973 YM2 = 1982 KA2

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

| | | | | | |
|---|---|---|---|---|---|
| M | 212.26580 | | (1950.0) | P | Q |
| n | 0.28753491 | Peri. | 359.27748 | +0.70717940 | -0.70402288 |
| a | 2.2734035 | Node | 45.71359 | +0.64911527 | +0.60993826 |
| e | 0.1605504 | Incl. | 5.22450 | +0.28026178 | +0.36376791 |
| P | 3.43 | B(1,0) | 14.4 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 731220 | 095 | 0.0 | 0.3- | | 820528 | 474 | 0.0 | 0.2- | | 831104 | 688 | 0.2- | 0.6- |
| 820527 | 474 | 0.4- | 0.8- | | 831028 | 330 | 1.1- | 0.2+ | | 831105 | 330 | 2.0+ | 1.8+ |
| 820527 | 474 | 0.2- | 1.9- | | 831101 | 330 | 0.8- | 0.7- | | 831107 | 688 | 0.4- | 0.1- |
| 820528 | 474 | 0.4+ | 2.2+ | | 831104 | 688 | 0.1- | 1.0- | | 831107 | 688 | 0.8+ | 0.1+ |

1984 DC1 = 1957 TO = 1968 UQ1 = 1979 YH8

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

| | | | | | |
|---|---|---|---|---|---|
| M | 256.56600 | | (1950.0) | P | Q |
| n | 0.27402624 | Peri. | 251.64689 | +0.57837590 | -0.81569596 |
| a | 2.3475174 | Node | 163.00286 | +0.76193283 | +0.53533043 |
| e | 0.2094413 | Incl. | 2.16025 | +0.29144412 | +0.21922918 |
| P | 3.60 | B(1,0) | 15.1 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 571002 | 024 | 0.2+ | 0.6- | 840304 | 809 | 0.5- | 1.2+ | 840310 | 809 | 0.5- | 0.8- |
| 681023 | 095 | 0.1- | 0.7+ | 840304 | 809 | 0.0 | 1.2+ | 840310 | 809 | 0.4- | 1.1- |
| 681026 | 095 | 0.1+ | 0.8- | 840305 | 809 | 0.9+ | 0.6+ | 840310 | 809 | 0.3- | 0.8- |
| 791223 | 095 | (30.8+ | 0.9-) | 840305 | 809 | 0.8+ | 0.6+ | 840311 | 809 | 1.0+ | 1.8- |
| 840227 | 809 | 0.3+ | 0.4- | 840305 | 809 | 1.1+ | 0.6+ | 840311 | 809 | 0.7+ | 1.6- |
| 840227 | 809 | 0.5+ | 0.4- | 840306 | 809 | 0.1+ | 0.8+ | 840311 | 809 | 1.0+ | 1.8- |
| 840227 | 809 | 0.5+ | 0.3- | 840306 | 809 | 0.4+ | 0.9+ | 840313 | 809 | 1.0- | 0.4- |
| 840228 | 809 | 0.5- | 0.3+ | 840306 | 809 | 0.6+ | 0.7+ | 840313 | 809 | 1.0- | 0.5- |
| 840228 | 809 | 0.2- | 0.4+ | 840308 | 809 | 0.1- | 0.2+ | 840313 | 809 | 0.9- | 0.1- |
| 840228 | 809 | 0.1- | 0.4+ | 840308 | 809 | 0.2+ | 0.0 | 840314 | 809 | 0.4+ | 0.8- |
| 840303 | 809 | 1.0- | 1.1+ | 840308 | 809 | 0.4+ | 0.0 | 840314 | 809 | 0.7+ | 0.5- |
| 840303 | 809 | 0.8- | 0.7+ | 840309 | 809 | 0.9- | 0.0 | 840314 | 809 | 0.9+ | 0.6- |
| 840303 | 809 | 0.7- | 0.5+ | 840309 | 809 | 0.6- | 0.2- | | | | |
| 840304 | 809 | 1.0- | 1.5+ | 840309 | 809 | 0.4- | 0.4- | | | | |

1984 SH = 1978 XB1 = 1980 DV4

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

| | | | | | |
|---|---|---|---|---|---|
| M | 187.62649 | | (1950.0) | P | Q |
| n | 0.31136964 | Peri. | 177.16446 | +0.35867192 | +0.93236993 |
| a | 2.1558543 | Node | 113.85081 | -0.85736334 | +0.34818441 |
| e | 0.1631770 | Incl. | 2.83116 | -0.36916467 | +0.09723133 |
| P | 3.17 | B(1,0) | 15.0 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 781203 | 675 | 1.2+ | 2.1+ | 840924 | 071 | 0.6- | 1.6- | 840928 | 809 | 0.1+ | 0.8+ |
| 781203 | 675 | 1.2+ | 2.3+ | 840924 | 071 | 1.2+ | 2.4- | 840928 | 809 | 0.3+ | 1.0+ |
| 781205 | 675 | 0.3+ | 1.1- | 840925 | 071 | 3.2+ | 0.3+ | 840929 | 809 | 1.9- | 0.3+ |
| 781206 | 675 | 1.7- | 1.7- | 840925 | 071 | (6.0+ | 0.5-) | 840929 | 809 | 1.3- | 0.3+ |
| 781206 | 675 | 1.1- | 1.6- | 840928 | 809 | 1.3- | 1.2+ | 840929 | 809 | 0.7- | 0.3+ |
| 800221 | 095 | 0.6- | 1.4- | 840928 | 809 | 1.2- | 1.1+ | 840930 | 809 | 1.7- | 0.1+ |
| 840923 | 071 | (4.9- | 1.1-) | 840928 | 809 | 0.9- | 1.5+ | 840930 | 809 | 1.5- | 0.0 |
| 840923 | 071 | 3.6+ | 0.5+ | 840928 | 809 | 0.3- | 0.7- | 840930 | 809 | 1.4- | 0.1- |
| 840923 | 071 | 1.6+ | 0.9- | 840928 | 809 | 0.0 | 2.2- | | | | |
| 840923 | 071 | 3.2+ | 1.4- | 840928 | 809 | 0.0 | 0.6+ | | | | |

1984 SB6 = 1969 VE1 = 1980 PS2

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

| | | | | | |
|---|---|---|---|---|---|
| M | 111.92274 | | (1950.0) | P | Q |
| n | 0.25913547 | Peri. | 262.61062 | +0.99787935 | -0.04109619 |
| a | 2.4366080 | Node | 99.73514 | +0.05755666 | +0.91926273 |
| e | 0.1831926 | Incl. | 2.93565 | -0.03039808 | +0.39149347 |
| P | 3.80 | B(1,0) | 14.9 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 691111 | 095 | 2.3+ | 0.6+ | 840924 | 809 | 0.7- | 0.8+ | 840929 | 809 | 0.1+ | 0.2- |
| 691113 | 095 | 2.6- | 0.4+ | 840924 | 809 | 0.6- | 0.9+ | 840929 | 809 | 0.3+ | 0.3- |
| 800815 | 323 | 1.6- | 0.5- | 840926 | 809 | 0.5+ | 0.0 | 840929 | 809 | 0.3+ | 0.3- |
| 800815 | 323 | 1.4+ | 0.9+ | 840926 | 809 | 0.4+ | 0.1- | 840930 | 809 | 0.6+ | 0.2- |
| 840921 | 809 | 0.8- | 1.2+ | 840926 | 809 | 0.5+ | 0.1+ | 840930 | 809 | 0.3+ | 0.2- |
| 840921 | 809 | 0.6- | 1.2+ | 840927 | 809 | 0.1- | 0.6- | 840930 | 809 | 0.1+ | 0.6- |
| 840921 | 809 | 0.5- | 1.0+ | 840927 | 809 | 0.2- | 0.6- | 840930 | 809 | 0.6- | 0.1- |
| 840922 | 809 | 0.4+ | 0.8+ | 840927 | 809 | 0.2- | 0.5- | 840930 | 809 | 0.2- | 0.1- |
| 840922 | 809 | 0.5+ | 0.8+ | 840928 | 809 | 0.4+ | 0.3- | 840930 | 809 | 0.0 | 0.1- |
| 840922 | 809 | 0.6+ | 0.7+ | 840928 | 809 | 0.8+ | 0.4- | 841001 | 809 | 1.4- | 0.7- |
| 840923 | 809 | 0.6- | 0.1+ | 840928 | 809 | 0.7+ | 0.4- | 841001 | 809 | 1.1- | 0.3- |
| 840923 | 809 | 0.2- | 0.1- | 840929 | 809 | 0.2- | 0.8- | 841001 | 809 | 0.3+ | 0.5- |
| 840923 | 809 | 0.0 | 0.0 | 840929 | 809 | 0.3+ | 0.4- | 841001 | 809 | 0.4+ | 0.4- |
| 840924 | 809 | 0.5- | 0.9+ | 840929 | 809 | 0.7+ | 0.4- | 841001 | 809 | 0.6+ | 0.7- |

1985 FC1 = 1952 BW = 1965 UG2 = 1974 EQ = 1976 UO3 = 1980 YE
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5 (J-P)

| | | | | |
|---|---|---|---|---|
| M 143.72665 | | (1950.0) | P | Q |
| n 0.27294594 | Peri. | 111.49707 | -0.11516212 | -0.99317976 |
| a 2.3537075 | Node | 345.08129 | +0.88314307 | -0.09397576 |
| e 0.1193404 | Incl. | 4.05636 | +0.45474829 | -0.06901102 |
| P 3.61 | B(1,0) | 14.3 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 520123 | 711 | 0.0 | 4.3- | Y | 761026 | 095 | 6.6+ | 4.1+ | 850321 | 688 | 1.0- 0.2+ |
| 520123 | 711 | 1.5+ | 0.7+ | Y | 801230 | 688 | 1.3- | 0.9+ | 850324 | 688 | 2.6+ 0.4+ |
| 651020 | 330 | 2.0- | 1.8- | | 801230 | 688 | 1.8- | 1.4+ | 850324 | 688 | 0.4+ 0.1+ |
| 651024 | 330 | 1.7- | 3.9- | | 810109 | 688 | 1.3- | 2.4+ | 850414 | 688 | 0.8- 2.3- |
| 740315 | 095 | (20.7- | 13.2+) | | 850321 | 688 | 0.2- | 1.1+ | 850414 | 688 | 0.1- 2.4- |

* * * * *

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

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

(3284)* 1953 NB = 1981 WC1

Discovered 1953 July 13 by J. A. Bruwer at Johannesburg. The identification is by F. Bowman (MPC 7015).

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

| | | | | |
|---|---|---|---|---|
| M 358.13393 | | (1950.0) | P | Q |
| n 0.21462354 | Peri. | 258.90915 | +0.87943227 | +0.46283471 |
| a 2.7628108 | Node | 73.44006 | -0.37870154 | +0.82188456 |
| e 0.3887356 | Incl. | 6.66672 | -0.28841642 | +0.33209907 |
| P 4.59 | B(1,0) | 14.0 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 530713 | 078 | 2.9+ | 0.3- | | 811202 | 688 | (4.3+ | 7.3-) | 850518 | 691 | 0.9- 1.8- |
| 530716 | 078 | 0.9+ | 1.6- | | 811220 | 688 | 0.2- | 3.5- | 850518 | 691 | 0.9- 1.9- |
| 530731 | 078 | 0.2+ | 0.4+ | | 811220 | 688 | 2.8+ | 2.2- | 850519 | 801 | 0.2+ 2.1+ |
| 530805 | 078 | 0.3+ | 0.9- | | 811230 | 688 | 1.9+ | 2.2- | 850615 | 691 | 0.2+ 0.9- |
| 530810 | 078 | 0.7- | 0.1- | | 811230 | 688 | 1.0+ | 1.9- | 850615 | 691 | 0.1- 0.9- |
| 530828 | 078 | 2.1- | 2.7+ | | 850515 | 691 | 1.0- | 0.4- | 850619 | 691 | 0.4+ 1.1- |
| 811124 | 688 | 0.0 | 1.6- | | 850515 | 691 | 1.1- | 0.3- | 850619 | 691 | 0.1- 1.4- |
| 811124 | 688 | 0.3+ | 2.3- | | 850515 | 691 | 1.1- | 0.4- | 850619 | 691 | 0.3+ 1.5- |
| 811202 | 688 | 0.4+ | 0.1- | | 850518 | 691 | 0.6- | 1.9- | 850621 | 801 | 0.3+ 2.7- |

(3285)* 1983 VW1 = 1952 BR = 1979 VP1 = 1979 YR1

Discovered 1983 Nov. 5 by C. Shoemaker at Palomar. The double designation 1979 VP1 = 1979 YR1 is by N. S. Chernykh (MPC 8534, 8579)

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

| | | | | |
|---|---|---|---|---|
| M 183.30364 | | (1950.0) | P | Q |
| n 0.24524489 | Peri. | 168.75089 | +0.56949636 | -0.75737441 |
| a 2.5277614 | Node | 245.74424 | +0.72431890 | +0.64612452 |
| e 0.2140250 | Incl. | 20.51165 | +0.38863354 | -0.09437744 |
| P 4.02 | B(1,0) | 13.5 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 520121 | 711 | (45.0- | 5.5+) | Y | 831108 | 675 | 1.2+ | 1.5+ | 831209 | 688 | 0.9+ 0.7- |
| 520122 | 711 | 0.2+ | 1.1- | Y | 831108 | 046 | 2.1+ | 1.9- | 840124 | 675 | 0.1+ 2.3+ |
| 791114 | 095 | 1.3+ | 1.7- | | 831109 | 046 | 1.4+ | 0.1- | 840201 | 801 | 0.2+ 2.0+ |
| 791114 | 095 | 2.2- | 1.9+ | | 831109 | 675 | 1.6+ | 1.1+ | 850320 | 474 | 0.6- 0.0 |
| 791223 | 095 | 1.4- | 0.9+ | | 831109 | 046 | 1.4- | 3.0- | 850320 | 474 | 1.1- 1.3+ |
| 791223 | 095 | 1.6- | 2.9- | | 831109 | 046 | 0.8- | 1.8- | 850424 | 474 | 0.8+ 0.2- |
| 831105 | 675 | 0.6+ | 1.6+ | | 831110 | 046 | 2.5- | 0.0 | 850424 | 474 | 0.9+ 0.6- |
| 831106 | 675 | 0.1- | 0.3+ | | 831110 | 046 | 1.2- | 3.3+ | | | |
| 831107 | 675 | 0.7- | 0.9+ | | 831209 | 688 | 2.6+ | 0.6- | | | |

1981 WO1
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5 (J-P)

| | | | | |
|---|---|---|---|---|
| M 197.99047 | | (1950.0) | P | Q |
| n 0.40988125 | Peri. | 248.92371 | -0.51313036 | -0.81502823 |
| a 1.7948640 | Node | 234.83188 | +0.85751039 | -0.47326324 |
| e 0.0842275 | Incl. | 19.22108 | +0.03705621 | -0.33429163 |
| P 2.40 | B(1,0) | 15.5 | | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 811121 493 | 0.3- | 0.0 | 811205 493 | 0.3- | 0.6+ | 850324 474 | 0.3+ | 0.3- |
| 811123 493 | 0.9- | 0.6+ | 811231 801 | 0.1+ | 0.3+ | 850324 474 | 1.4- | 0.1- |
| 811203 493 | 0.5+ | 0.8+ | 820225 801 | 0.8+ | 0.3- | 850521 801 | 0.3- | 0.8+ |
| 811204 493 | 0.5- | 0.5+ | 820227 801 | 2.0+ | 1.1- | 850621 801 | 0.4- | 2.7+ |
| 811205 493 | 0.7- | 0.4+ | 850323 474 | 0.0 | 1.0+ | | | |

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

The identifications are by B. G. Marsden.

Comet Hartley (1984v)
T 1985 Sept. 28.42489 ET

| | | | | |
|---|---|---|---|---|
| q 3.9994925 | | (1950.0) | P | Q |
| | Peri. | 255.29136 | +0.07826961 | -0.34129201 |
| | Node | 249.51387 | +0.60665542 | -0.72928227 |
| e 1.0 | Incl. | 89.33020 | -0.79110244 | -0.59301528 |

From 16 observations 1984 Nov. 17-1985 Mar. 20.

Periodic Comet Hartley (1985f)
T 1985 June 11.62136 ET

| | | | | |
|---|---|---|---|---|
| q 1.5406732 | | (1950.0) | P | Q |
| n 0.17419301 | Peri. | 174.11363 | -0.81834341 | +0.50575237 |
| a 3.1752815 | Node | 40.34496 | -0.54299046 | -0.52469220 |
| e 0.5147916 | Incl. | 24.94155 | -0.18834921 | -0.68477195 |
| P 5.66 | | | | |

From 6 observations 1985 June 13-July 10.

(3286)* 1980 BV = 1978 TK7 = 1978 VP14 = 1984 AN
Discovered 1980 Jan. 23 by L. G. Karachkina at the Crimean Astrophysical Observatory.
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

| | | | | |
|---|---|---|---|---|
| M 91.51725 | | (1950.0) | P | Q |
| n 0.23021752 | Peri. | 76.08346 | -0.97293386 | +0.06564545 |
| a 2.6365973 | Node | 107.32054 | -0.13686753 | -0.93623392 |
| e 0.1036243 | Incl. | 13.42002 | +0.18619074 | -0.34519085 |
| P 4.28 | B(1,0) | 14.0 | | |

Residuals in seconds of arc

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 781002 095 | 1.6- | 1.8- | 831230 033 | 0.4- | 1.6+ | 840108 688(12.3+ | | 2.8-) |
| 781101 095 | 2.1+ | 0.5+ | 840105 688 | 1.0+ | 0.0 | 840108 688 | 0.5- | 0.7- |
| 800123 095 | 1.6- | 1.6+ | 840105 688 | 0.6- | 1.1+ | 850521 801 | 1.0- | 0.9- |
| 800123 095 | 2.4+ | 3.0- | 840105 688 | 1.4+ | 1.1- | 850619 801 | 0.5+ | 0.6- |
| 800220 095 | 1.0- | 1.1+ | 840105 688 | 0.4- | 2.0- | | | |
| 831229 033 | 0.7- | 1.1+ | 840108 688 | 0.3+ | 0.5- | | | |

(3287)* 1981 DK1

Discovered 1981 Feb. 28 by S. J. Bus in the course at the U.K. Schmidt-Caltech Asteroid Survey at Siding Spring.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

| | | | | | |
|---|---|---|---|---|---|
| M | 10.58069 | | (1950.0) | P | Q |
| n | 0.27080222 | Peri. | 94.75146 | +0.60291152 | +0.78952947 |
| a | 2.3661080 | Node | 213.20071 | -0.78947872 | +0.56971755 |
| e | 0.2995051 | Incl. | 12.08419 | -0.11498280 | +0.22817784 |
| P | 3.64 | B(1,0) | 15.0 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 810209 | 413 | 0.6- | 0.0 | 810308 | 413 | 0.3- | 0.3+ | 820929 | 675 | 0.3+ | 0.4+ |
| 810212 | 413 | 0.9+ | 0.2- | 810308 | 413 | 1.5+ | 1.0- | 850418 | 801 | 0.3- | 1.3+ |
| 810228 | 413 | 1.4- | 0.8+ | 810312 | 413 | 1.0+ | 0.7- | 850521 | 801 | 0.2- | 0.5- |
| 810228 | 413 | 0.9+ | 0.5- | 810408 | 413 | 1.9- | 1.8+ | 850618 | 801 | 0.5+ | 0.5- |
| 810306 | 413 | 1.5- | 1.3+ | 810408 | 413 | 1.2+ | 0.9- | | | | |
| 810306 | 413 | 0.1+ | 1.2- | 820928 | 675 | 0.2- | 0.2- | | | | |

(3288)* 1982 DV

Discovered 1982 Feb. 28 by H.-E. Schuster at the European Southern Observatory.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

| | | | | | |
|---|---|---|---|---|---|
| M | 91.45613 | | (1950.0) | P | Q |
| n | 0.33994917 | Peri. | 349.23101 | -0.88706237 | +0.45721336 |
| a | 2.0332622 | Node | 218.18584 | -0.41548639 | -0.85096986 |
| e | 0.4568575 | Incl. | 5.92777 | -0.20122478 | -0.25846901 |
| P | 2.90 | B(1,0) | 16.5 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 820228 | 809 | 0.5+ | 1.0+ | 820323 | 809 | 1.2+ | 1.0- | 820522 | 801 | 1.1- | 0.3+ |
| 820304 | 809 | 0.3+ | 0.5+ | 820323 | 809 | 1.2+ | 1.0- | 820527 | 046 | 0.9- | 2.3- |
| 820305 | 809 | 0.2- | 0.4+ | 820324 | 675 | 0.7+ | 1.1+ | 820527 | 046 | 0.2- | 1.8- |
| 820306 | 809 | 0.4- | 0.6+ | 820324 | 675 | 0.5- | 0.5- | 820618 | 491 | 0.8+ | 0.6- |
| 820307 | 809 | 1.2- | 1.2+ | 820324 | 809 | 0.0 | 0.3- | 820618 | 491 | 0.6+ | 0.9- |
| 820309 | 809 | 1.0- | 0.8+ | 820324 | 809 | 0.4- | 0.1- | 820618 | 491 | 0.2- | 0.2- |
| 820310 | 809 | 0.0 | 1.1+ | 820324 | 809 | 0.5- | 0.4- | 820618 | 491 | 0.0 | 0.6- |
| 820311 | 809 | 0.7+ | 0.9+ | 820325 | 809 | 0.6- | 0.8+ | 820814 | 675 | 0.3- | 1.2+ |
| 820312 | 809 | 0.9+ | 0.1- | 820325 | 809 | 0.6- | 1.0+ | 820815 | 675 | 0.4- | 0.3- |
| 820313 | 809 | 0.0 | 0.1- | 820325 | 809 | 0.7- | 0.7+ | 820819 | 801 | 0.5- | 0.6- |
| 820314 | 809 | 0.2- | 0.1- | 820327 | 474 | 0.5- | 0.4+ | 820912 | 675 | 0.0 | 0.2+ |
| 820317 | 809 | 0.6- | 0.4+ | 820327 | 474 | 0.1+ | 0.5+ | 820914 | 675 | 1.1- | 0.7- |
| 820318 | 809 | 0.5- | 0.3+ | 820328 | 805 | 1.2- | 0.7+ | 841202 | 675 | 0.3- | 0.9- |
| 820318 | 809 | 0.3+ | 0.8- | 820328 | 805 | 0.3+ | 1.4+ | 841223 | 801 | 2.0+ | 1.7- |
| 820318 | 809 | 0.0 | 0.7- | 820328 | 372 | 2.3- | 1.5+ | 850101 | 675 | 0.7- | 0.4- |
| 820318 | 809 | 0.1- | 0.7- | 820331 | 809 | 0.2- | 1.8- | 850515 | 691 | 1.8- | 1.3- |
| 820319 | 809 | 1.7- | 1.9+ | 820331 | 809 | 0.1+ | 1.9- | 850515 | 691 | 1.5- | 1.6- |
| 820319 | 809 | 0.0 | 0.5- | 820331 | 809 | 0.2+ | 1.7- | 850519 | 691 | 0.8- | 0.2- |
| 820319 | 809 | 0.4+ | 0.8- | 820423 | 474 | 1.3- | 0.4- | 850519 | 691 | 0.9- | 0.0 |
| 820319 | 809 | 0.8+ | 0.3- | 820423 | 474 | 1.0- | 0.1- | 850519 | 691 | 0.8- | 1.0+ |
| 820319 | 809 | 0.5+ | 0.5- | 820424 | 688 | 2.3+ | 1.0+ | 850521 | 801 | 1.2- | 1.8+ |
| 820319 | 809 | 1.0+ | 0.8- | 820424 | 688 | 0.8- | 0.6- | 850613 | 691 | 0.9+ | 0.3+ |
| 820319 | 809 | 0.8+ | 0.6- | 820424 | 474 | 0.4- | 2.3+ | 850613 | 691 | 1.2+ | 0.1+ |
| 820321 | 809 | 0.7+ | 0.4- | 820424 | 474 | 0.5- | 2.2+ | 850613 | 691 | 0.6+ | 0.1+ |
| 820321 | 809 | 0.5+ | 0.2- | 820430 | 675 | 0.8- | 0.1+ | 850619 | 691 | 0.7+ | 1.1+ |
| 820321 | 809 | 0.7+ | 0.7- | 820521 | 491 | 2.3+ | 0.9+ | 850619 | 691 | 0.8+ | 1.1+ |
| 820321 | 809 | 0.0 | 0.5- | 820521 | 491 | 1.5+ | 0.6+ | 850619 | 691 | 0.6+ | 1.0+ |
| 820323 | 809 | 1.2+ | 1.2- | 820522 | 491 | 1.3+ | 0.4- | 850620 | 801 | 2.3- | 1.3+ |

1984 AP
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

| | | | | | |
|---|---|---|---|---|---|
| M | 158.19691 | | (1950.0) | P | Q |
| n | 0.21993155 | Peri. | 164.59611 | -0.13333859 | -0.96889768 |
| a | 2.7181767 | Node | 292.70018 | +0.88369381 | -0.02100638 |
| e | 0.1186366 | Incl. | 13.05995 | +0.44867145 | -0.24656848 |
| P | 4.48 | B(1,0) | 13.0 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 840105 | 688 | 0.1+ | 0.1- | 840126 | 688 | 1.6+ | 2.1- | 850219 | 474 | 1.1+ | 1.0+ |
| 840105 | 688 | 1.3+ | 0.3+ | 840204 | 688 | 0.5+ | 3.1- | 850321 | 474 | 1.3- | 1.7+ |
| 840108 | 688 | 0.0 | 0.4+ | 840204 | 688 | 0.4- | 3.1- | 850321 | 474 | 0.8- | 1.5+ |
| 840108 | 688 | 0.9- | 0.9+ | 840403 | 801 | 0.9- | 2.7+ | | | | |
| 840126 | 688 | 0.0 | 0.6- | 850219 | 474 | 0.2+ | 2.5- | | | | |

1985 JA
Epoch 1985 May 15.0 ET = JDE 2446200.5

| | | | | | |
|---|---|---|---|---|---|
| M | 40.11620 | | (1950.0) | P | Q |
| n | 0.46781117 | Peri. | 288.78361 | -0.79616171 | -0.37933931 |
| a | 1.6434468 | Node | 232.01202 | +0.42091750 | -0.90690220 |
| e | 0.3201343 | Incl. | 36.73616 | -0.43468954 | -0.18338507 |
| P | 2.11 | B(1,0) | 18.0 | | |

From 26 observations 1985 May 11-June 21.

* * * * *

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

Periodic Comet Tsuchinshan 1 (1984p)
Epoch 1985 Jan. 15.0 ET = JDE 2446080.5
T 1985 Jan. 2.39220 ET

| | | | | | |
|---|---|---|---|---|---|
| q | 1.5078309 | | (1950.0) | P | Q |
| n | 0.14772577 | Peri. | 22.77010 | -0.47759831 | -0.85973442 |
| a | 3.5440394 | Node | 96.17872 | +0.77541027 | -0.50933119 |
| e | 0.5745445 | Incl. | 10.48891 | +0.41308445 | -0.03792703 |
| P | 6.67 | | | | |

From 64 observations 1965-1985, mean residual 0".9. Nongravitational parameters A1 = +0.46, A2 = -0.0068.

Periodic Comet Tsuchinshan 2 (1985d)
Epoch 1985 Aug. 3.0 ET = JDE 2446280.5
T 1985 July 21.18929 ET

| | | | | | |
|---|---|---|---|---|---|
| q | 1.7941149 | | (1950.0) | P | Q |
| n | 0.14396073 | Peri. | 203.16270 | -0.65043225 | -0.75137298 |
| a | 3.6055653 | Node | 287.60508 | +0.71384486 | -0.55464197 |
| e | 0.5024040 | Incl. | 6.70264 | +0.25954459 | -0.35750654 |
| P | 6.85 | | | | |

From 32 observations 1965-1985, mean residual 0".9. Nongravitational parameters A1 = -1.02, A2 = -0.0110.

* * * * *

EPHEMERIDES.

Periodic Comet Hartley (1985f) Elements MPC 9828

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | m1 |
|---|---|---|---|---|---|---|---|---|
| 1985 07 | 14 | 12 37.95 | -11 44.7 | 1.344 | 1.574 | 82.4 | 39.8 | 16.5 |
| 1985 07 | 24 | 12 58.18 | -16 24.7 | | | | | |
| 1985 08 | 03 | 13 19.82 | -20 43.0 | 1.530 | 1.625 | 76.4 | 37.4 | 16.9 |
| 1985 08 | 13 | 13 42.86 | -24 38.8 | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1985 08 23 | 14 07.30 | -28 11.7 | 1.736 | 1.695 | 70.7 | 34.3 | 17.3 |
| 1985 09 02 | 14 33.12 | -31 21.0 | | | | | |
| 1985 09 12 | 15 00.23 | -34 05.6 | 1.958 | 1.782 | 64.9 | 30.8 | 17.7 |
| 1985 09 22 | 15 28.55 | -36 25.3 | | | | | |
| 1985 10 02 | 15 57.87 | -38 19.2 | 2.193 | 1.879 | 58.7 | 27.1 | 18.1 |
| 1985 10 12 | 16 27.94 | -39 47.2 | | | | | |
| 1985 10 22 | 16 58.46 | -40 49.6 | 2.434 | 1.985 | 52.1 | 23.3 | 18.4 |
| 1985 11 01 | 17 29.08 | -41 27.1 | | | | | |
| 1985 11 11 | 17 59.43 | -41 41.2 | 2.677 | 2.096 | 45.0 | 19.5 | 18.8 |
| 1985 11 21 | 18 29.21 | -41 33.7 | | | | | |
| 1985 12 01 | 18 58.13 | -41 06.8 | 2.911 | 2.211 | 37.4 | 15.7 | 19.1 |

(3200) Phaethon a,e,i = 1.27, 0.89, 22 Elements MPC 9428

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|
| 1985 07 14 | 03 43.63 | +33 14.5 | 2.641 | 2.153 | 51.1 | 21.5 | 20.3 |
| 1985 07 24 | 03 55.32 | +34 14.9 | | | | | |
| 1985 08 03 | 04 05.60 | +35 13.7 | 2.479 | 2.242 | 64.7 | 24.2 | 20.3 |
| 1985 08 13 | 04 14.19 | +36 11.6 | | | | | |
| 1985 08 23 | 04 20.67 | +37 09.4 | 2.261 | 2.311 | 80.0 | 25.5 | 20.2 |
| 1985 09 02 | 04 24.54 | +38 07.4 | | | | | |
| 1985 09 12 | 04 25.16 | +39 05.2 | 2.009 | 2.361 | 97.4 | 25.0 | 20.0 |
| 1985 09 22 | 04 21.71 | +40 00.6 | | | | | |
| 1985 10 02 | 04 13.38 | +40 48.6 | 1.757 | 2.391 | 117.5 | 21.8 | 19.6 |
| 1985 10 12 | 03 59.49 | +41 20.8 | | | | | |
| 1985 10 22 | 03 39.91 | +41 23.9 | 1.552 | 2.403 | 140.2 | 15.4 | 19.2 |
| 1985 11 01 | 03 15.75 | +40 43.5 | | | | | |
| 1985 11 11 | 02 49.44 | +39 10.4 | 1.450 | 2.396 | 157.9 | 9.0 | 18.9 |
| 1985 11 21 | 02 24.26 | +36 48.7 | | | | | |
| 1985 12 01 | 02 03.00 | +33 57.1 | 1.487 | 2.372 | 146.3 | 13.3 | 19.0 |
| 1985 12 11 | 01 47.10 | +30 59.4 | | | | | |
| 1985 12 21 | 01 36.75 | +28 16.0 | 1.645 | 2.328 | 122.6 | 20.8 | 19.4 |
| 1985 12 31 | 01 31.38 | +25 58.4 | | | | | |
| 1986 01 10 | 01 30.20 | +24 10.3 | 1.868 | 2.265 | 100.6 | 25.3 | 19.7 |
| 1986 01 20 | 01 32.44 | +22 50.9 | | | | | |
| 1986 01 30 | 01 37.44 | +21 56.8 | 2.099 | 2.182 | 81.5 | 26.5 | 19.9 |
| 1986 02 09 | 01 44.69 | +21 24.0 | | | | | |
| 1986 02 19 | 01 53.83 | +21 08.8 | 2.297 | 2.077 | 64.7 | 25.5 | 20.0 |
| 1986 03 01 | 02 04.58 | +21 07.4 | | | | | |
| 1986 03 11 | 02 16.75 | +21 16.6 | 2.435 | 1.948 | 49.8 | 22.9 | 19.9 |

1966 BO a,e,i = 2.55, 0.19, 8 Elements MPC 9471

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|
| 1985 09 12 | 05 13.39 | +14 11.3 | 2.668 | 2.854 | 90.1 | 20.7 | 19.4 |
| 1985 09 22 | 05 20.67 | +13 53.0 | | | | | |
| 1985 10 02 | 05 26.08 | +13 29.9 | 2.374 | 2.824 | 106.4 | 19.9 | 19.1 |
| 1985 10 12 | 05 29.32 | +13 03.1 | | | | | |
| 1985 10 22 | 05 30.09 | +12 34.1 | 2.103 | 2.793 | 124.8 | 17.0 | 18.7 |
| 1985 11 01 | 05 28.22 | +12 04.6 | | | | | |
| 1985 11 11 | 05 23.65 | +11 36.8 | 1.887 | 2.759 | 145.4 | 11.8 | 18.4 |
| 1985 11 21 | 05 16.60 | +11 13.0 | | | | | |
| 1985 12 01 | 05 07.64 | +10 55.9 | 1.759 | 2.725 | 165.3 | 5.3 | 18.0 |
| 1985 12 11 | 04 57.66 | +10 47.7 | | | | | |
| 1985 12 21 | 04 47.77 | +10 50.4 | 1.743 | 2.688 | 159.9 | 7.2 | 18.0 |
| 1985 12 31 | 04 39.09 | +11 04.6 | | | | | |
| 1986 01 10 | 04 32.51 | +11 29.9 | 1.835 | 2.650 | 138.2 | 14.3 | 18.3 |
| 1986 01 20 | 04 28.59 | +12 05.2 | | | | | |
| 1986 01 30 | 04 27.57 | +12 48.6 | 2.005 | 2.611 | 117.6 | 19.5 | 18.5 |
| 1986 02 09 | 04 29.40 | +13 37.7 | | | | | |
| 1986 02 19 | 04 33.91 | +14 30.5 | 2.218 | 2.571 | 99.4 | 22.3 | 18.8 |

1981 GX a,e,i = 1.94, 0.10, 20 Elements MPC 7460

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 09 12 | 04 55.03 | +34 41.3 | 1.648 | 1.964 | 92.2 | 30.8 | 18.8 |
| 1985 | 09 22 | 05 09.67 | +34 27.6 | | | | | |
| 1985 | 10 02 | 05 21.78 | +33 58.1 | 1.408 | 1.940 | 106.0 | 29.7 | 18.4 |
| 1985 | 10 12 | 05 30.74 | +33 11.7 | | | | | |
| 1985 | 10 22 | 05 35.87 | +32 05.9 | 1.184 | 1.915 | 122.8 | 25.9 | 17.9 |
| 1985 | 11 01 | 05 36.60 | +30 37.3 | | | | | |
| 1985 | 11 11 | 05 32.57 | +28 41.9 | 0.999 | 1.891 | 143.7 | 18.0 | 17.3 |
| 1985 | 11 21 | 05 23.92 | +26 16.3 | | | | | |
| 1985 | 12 01 | 05 11.75 | +23 22.2 | 0.889 | 1.867 | 169.3 | 5.6 | 16.7 |
| 1985 | 12 11 | 04 57.96 | +20 09.4 | | | | | |
| 1985 | 12 21 | 04 44.93 | +16 56.0 | 0.881 | 1.843 | 162.6 | 9.2 | 16.8 |
| 1985 | 12 31 | 04 34.77 | +14 01.9 | | | | | |
| 1986 | 01 10 | 04 28.68 | +11 40.3 | 0.972 | 1.822 | 137.4 | 21.4 | 17.2 |
| 1986 | 01 20 | 04 27.07 | +09 55.6 | | | | | |
| 1986 | 01 30 | 04 29.72 | +08 44.5 | 1.126 | 1.802 | 117.0 | 29.1 | 17.7 |
| 1986 | 02 09 | 04 36.12 | +08 00.6 | | | | | |
| 1986 | 02 19 | 04 45.76 | +07 36.7 | 1.308 | 1.784 | 101.1 | 32.9 | 18.1 |

(3112) 1977 QC5 a,e,i = 2.38, 0.20, 4 Elements MPC 9074

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 09 12 | 05 18.66 | +22 05.8 | 2.181 | 2.374 | 88.3 | 25.1 | 18.6 |
| 1985 | 09 22 | 05 27.99 | +22 22.6 | | | | | |
| 1985 | 10 02 | 05 34.96 | +22 37.1 | 1.971 | 2.417 | 104.0 | 23.7 | 18.4 |
| 1985 | 10 12 | 05 39.20 | +22 50.4 | | | | | |
| 1985 | 10 22 | 05 40.34 | +23 03.2 | 1.777 | 2.460 | 122.6 | 19.9 | 18.2 |
| 1985 | 11 01 | 05 38.17 | +23 15.9 | | | | | |
| 1985 | 11 11 | 05 32.65 | +23 27.7 | 1.629 | 2.501 | 144.3 | 13.4 | 17.9 |
| 1985 | 11 21 | 05 24.12 | +23 37.2 | | | | | |
| 1985 | 12 01 | 05 13.42 | +23 42.9 | 1.565 | 2.540 | 168.9 | 4.3 | 17.5 |
| 1985 | 12 11 | 05 01.77 | +23 43.8 | | | | | |
| 1985 | 12 21 | 04 50.60 | +23 40.8 | 1.613 | 2.577 | 165.5 | 5.5 | 17.7 |
| 1985 | 12 31 | 04 41.23 | +23 36.1 | | | | | |
| 1986 | 01 10 | 04 34.51 | +23 32.5 | 1.770 | 2.613 | 141.5 | 13.5 | 18.1 |
| 1986 | 01 20 | 04 30.90 | +23 32.3 | | | | | |
| 1986 | 01 30 | 04 30.43 | +23 36.7 | 2.009 | 2.646 | 120.2 | 18.8 | 18.6 |
| 1986 | 02 09 | 04 32.89 | +23 45.9 | | | | | |
| 1986 | 02 19 | 04 37.97 | +23 59.0 | 2.294 | 2.677 | 101.8 | 21.2 | 18.9 |

1979 SZ9 a,e,i = 3.10, 0.18, 0 Elements MPC 9072

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 02 | 05 41.63 | +23 33.1 | 2.513 | 2.899 | 102.5 | 19.7 | 18.3 |
| 1985 | 10 12 | 05 45.53 | +23 35.4 | | | | | |
| 1985 | 10 22 | 05 46.92 | +23 36.6 | 2.294 | 2.934 | 121.0 | 16.9 | 18.0 |
| 1985 | 11 01 | 05 45.65 | +23 37.0 | | | | | |
| 1985 | 11 11 | 05 41.73 | +23 36.1 | 2.123 | 2.969 | 142.2 | 11.8 | 17.8 |
| 1985 | 11 21 | 05 35.40 | +23 33.4 | | | | | |
| 1985 | 12 01 | 05 27.25 | +23 28.3 | 2.038 | 3.004 | 165.7 | 4.6 | 17.5 |
| 1985 | 12 11 | 05 18.10 | +23 20.3 | | | | | |
| 1985 | 12 21 | 05 08.97 | +23 10.2 | 2.066 | 3.039 | 169.7 | 3.3 | 17.5 |
| 1985 | 12 31 | 05 00.86 | +22 59.3 | | | | | |
| 1986 | 01 10 | 04 54.54 | +22 49.4 | 2.209 | 3.073 | 146.0 | 10.3 | 17.9 |
| 1986 | 01 20 | 04 50.53 | +22 42.4 | | | | | |
| 1986 | 01 30 | 04 49.02 | +22 39.3 | 2.444 | 3.108 | 124.4 | 15.2 | 18.3 |
| 1986 | 02 09 | 04 49.98 | +22 40.2 | | | | | |
| 1986 | 02 19 | 04 53.25 | +22 45.0 | 2.736 | 3.142 | 105.1 | 17.7 | 18.6 |
| 1986 | 03 01 | 04 58.59 | +22 52.5 | | | | | |
| 1986 | 03 11 | 05 05.73 | +23 01.8 | 3.053 | 3.176 | 87.9 | 18.2 | 18.9 |

1973 QB2 a,e,i = 3.18, 0.22, 2 Elements MPC 9476

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|
| 1985 10 02 | 05 38.72 | +22 24.7 | 2.251 | 2.664 | 103.2 | 21.5 | 17.5 |
| 1985 10 12 | 05 43.69 | +22 30.8 | | | | | |
| 1985 10 22 | 05 45.99 | +22 36.2 | 2.044 | 2.699 | 121.3 | 18.4 | 17.2 |
| 1985 11 01 | 05 45.45 | +22 41.3 | | | | | |
| 1985 11 11 | 05 42.05 | +22 46.2 | 1.885 | 2.735 | 142.2 | 12.8 | 17.0 |
| 1985 11 21 | 05 36.02 | +22 50.3 | | | | | |
| 1985 12 01 | 05 27.98 | +22 52.7 | 1.808 | 2.774 | 165.6 | 5.1 | 16.7 |
| 1985 12 11 | 05 18.83 | +22 53.1 | | | | | |
| 1985 12 21 | 05 09.69 | +22 51.5 | 1.840 | 2.813 | 169.9 | 3.5 | 16.7 |
| 1985 12 31 | 05 01.66 | +22 49.2 | | | | | |
| 1986 01 10 | 04 55.59 | +22 47.8 | 1.984 | 2.854 | 146.2 | 11.0 | 17.1 |
| 1986 01 20 | 04 52.01 | +22 48.8 | | | | | |
| 1986 01 30 | 04 51.10 | +22 53.1 | 2.218 | 2.896 | 124.9 | 16.2 | 17.5 |
| 1986 02 09 | 04 52.80 | +23 00.8 | | | | | |
| 1986 02 19 | 04 56.92 | +23 11.5 | 2.509 | 2.939 | 106.0 | 18.9 | 17.9 |
| 1986 03 01 | 05 03.18 | +23 24.0 | | | | | |
| 1986 03 11 | 05 11.28 | +23 37.4 | 2.825 | 2.982 | 89.2 | 19.5 | 18.2 |

(3161) 1980 TB5 a,e,i = 2.57, 0.18, 15 Elements MPC 9295

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|
| 1985 10 02 | 05 54.85 | +39 48.6 | 2.698 | 3.019 | 98.9 | 19.1 | 18.0 |
| 1985 10 12 | 05 59.62 | +40 46.5 | | | | | |
| 1985 10 22 | 06 01.61 | +41 46.2 | 2.442 | 3.016 | 116.2 | 17.2 | 17.7 |
| 1985 11 01 | 06 00.48 | +42 45.7 | | | | | |
| 1985 11 11 | 05 55.96 | +43 41.7 | 2.229 | 3.011 | 134.9 | 13.5 | 17.4 |
| 1985 11 21 | 05 48.06 | +44 28.5 | | | | | |
| 1985 12 01 | 05 37.29 | +44 59.8 | 2.094 | 3.004 | 152.5 | 8.7 | 17.2 |
| 1985 12 11 | 05 24.61 | +45 10.2 | | | | | |
| 1985 12 21 | 05 11.48 | +44 56.7 | 2.064 | 2.994 | 156.8 | 7.4 | 17.1 |
| 1985 12 31 | 04 59.47 | +44 21.0 | | | | | |
| 1986 01 10 | 04 49.84 | +43 28.6 | 2.145 | 2.982 | 142.0 | 11.7 | 17.3 |
| 1986 01 20 | 04 43.41 | +42 26.7 | | | | | |
| 1986 01 30 | 04 40.46 | +41 22.2 | 2.315 | 2.968 | 122.9 | 16.2 | 17.6 |
| 1986 02 09 | 04 40.87 | +40 20.2 | | | | | |
| 1986 02 19 | 04 44.37 | +39 23.5 | 2.543 | 2.951 | 104.6 | 18.9 | 17.8 |
| 1986 03 01 | 04 50.55 | +38 33.2 | | | | | |
| 1986 03 11 | 04 59.02 | +37 49.0 | 2.794 | 2.933 | 88.0 | 19.8 | 18.0 |

(3225) 1982 QQ a,e,i = 1.88, 0.05, 25 Elements MPC 9475

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|
| 1985 10 02 | 05 38.11 | -01 01.1 | 1.372 | 1.871 | 103.0 | 31.4 | 17.4 |
| 1985 10 12 | 05 46.90 | -04 22.1 | | | | | |
| 1985 10 22 | 05 52.38 | -07 55.8 | 1.228 | 1.884 | 115.5 | 28.5 | 17.1 |
| 1985 11 01 | 05 54.15 | -11 33.4 | | | | | |
| 1985 11 11 | 05 51.96 | -15 02.6 | 1.127 | 1.897 | 127.2 | 24.6 | 16.8 |
| 1985 11 21 | 05 45.88 | -18 07.4 | | | | | |
| 1985 12 01 | 05 36.59 | -20 30.8 | 1.085 | 1.910 | 134.4 | 21.6 | 16.7 |
| 1985 12 11 | 05 25.30 | -21 58.9 | | | | | |
| 1985 12 21 | 05 13.74 | -22 24.5 | 1.110 | 1.922 | 133.1 | 21.9 | 16.7 |
| 1985 12 31 | 05 03.70 | -21 49.9 | | | | | |
| 1986 01 10 | 04 56.49 | -20 24.7 | 1.197 | 1.933 | 124.6 | 24.8 | 17.0 |
| 1986 01 20 | 04 52.87 | -18 22.0 | | | | | |
| 1986 01 30 | 04 53.01 | -15 55.6 | 1.332 | 1.944 | 113.2 | 27.8 | 17.3 |
| 1986 02 09 | 04 56.70 | -13 17.1 | | | | | |
| 1986 02 19 | 05 03.58 | -10 35.3 | 1.498 | 1.953 | 101.5 | 29.7 | 17.6 |
| 1986 03 01 | 05 13.23 | -07 57.0 | | | | | |
| 1986 03 11 | 05 25.22 | -05 26.8 | 1.683 | 1.961 | 90.4 | 30.4 | 17.9 |

1981 PG a,e,i = 2.25, 0.19, 2 Elements MPC 6945

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|
| 1985 10 02 | 05 51.36 | +24 47.2 | 1.828 | 2.234 | 100.2 | 26.2 | 18.2 |
| 1985 10 12 | 05 58.03 | +24 44.8 | | | | | |
| 1985 10 22 | 06 01.49 | +24 40.8 | 1.637 | 2.277 | 117.7 | 22.8 | 17.9 |
| 1985 11 01 | 06 01.43 | +24 35.6 | | | | | |
| 1985 11 11 | 05 57.66 | +24 29.1 | 1.482 | 2.319 | 138.6 | 16.4 | 17.6 |
| 1985 11 21 | 05 50.33 | +24 20.1 | | | | | |
| 1985 12 01 | 05 40.13 | +24 07.0 | 1.400 | 2.360 | 162.8 | 7.1 | 17.2 |
| 1985 12 11 | 05 28.22 | +23 49.1 | | | | | |
| 1985 12 21 | 05 16.18 | +23 26.9 | 1.421 | 2.399 | 171.4 | 3.5 | 17.2 |
| 1985 12 31 | 05 05.57 | +23 03.3 | | | | | |
| 1986 01 10 | 04 57.55 | +22 41.6 | 1.553 | 2.435 | 146.7 | 12.8 | 17.7 |
| 1986 01 20 | 04 52.77 | +22 24.9 | | | | | |
| 1986 01 30 | 04 51.38 | +22 14.5 | 1.771 | 2.470 | 124.9 | 19.1 | 18.1 |
| 1986 02 09 | 04 53.18 | +22 10.4 | | | | | |
| 1986 02 19 | 04 57.85 | +22 11.7 | 2.041 | 2.502 | 106.1 | 22.3 | 18.6 |
| 1986 03 01 | 05 04.98 | +22 16.7 | | | | | |
| 1986 03 11 | 05 14.18 | +22 23.6 | 2.333 | 2.532 | 89.8 | 23.1 | 18.9 |

1973 QZ1 a,e,i = 3.16, 0.18, 2 Elements MPC 9157

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|
| 1985 10 02 | 05 48.57 | +22 46.7 | 2.476 | 2.840 | 100.9 | 20.2 | 17.7 |
| 1985 10 12 | 05 53.26 | +22 50.5 | | | | | |
| 1985 10 22 | 05 55.45 | +22 54.1 | 2.255 | 2.874 | 119.1 | 17.6 | 17.5 |
| 1985 11 01 | 05 54.97 | +22 57.8 | | | | | |
| 1985 11 11 | 05 51.79 | +23 01.6 | 2.080 | 2.908 | 139.9 | 12.7 | 17.2 |
| 1985 11 21 | 05 46.09 | +23 05.0 | | | | | |
| 1985 12 01 | 05 38.36 | +23 07.2 | 1.985 | 2.943 | 163.2 | 5.6 | 16.9 |
| 1985 12 11 | 05 29.41 | +23 07.3 | | | | | |
| 1985 12 21 | 05 20.23 | +23 05.4 | 2.001 | 2.979 | 172.3 | 2.5 | 16.8 |
| 1985 12 31 | 05 11.88 | +23 02.3 | | | | | |
| 1986 01 10 | 05 05.20 | +22 59.4 | 2.133 | 3.015 | 148.5 | 9.8 | 17.3 |
| 1986 01 20 | 05 00.78 | +22 58.1 | | | | | |
| 1986 01 30 | 04 58.89 | +22 59.5 | 2.359 | 3.051 | 126.7 | 15.0 | 17.6 |
| 1986 02 09 | 04 59.52 | +23 04.0 | | | | | |
| 1986 02 19 | 05 02.55 | +23 11.4 | 2.646 | 3.087 | 107.3 | 17.8 | 18.0 |
| 1986 03 01 | 05 07.73 | +23 20.8 | | | | | |
| 1986 03 11 | 05 14.79 | +23 31.3 | 2.961 | 3.123 | 90.0 | 18.5 | 18.3 |

1934 CY a,e,i = 2.67, 0.13, 10 Elements MPC 6944

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|
| 1985 10 02 | 05 44.66 | +33 35.4 | 2.150 | 2.543 | 101.3 | 22.7 | 18.2 |
| 1985 10 12 | 05 52.08 | +33 57.1 | | | | | |
| 1985 10 22 | 05 56.74 | +34 16.7 | 1.890 | 2.517 | 118.2 | 20.4 | 17.9 |
| 1985 11 01 | 05 58.23 | +34 33.4 | | | | | |
| 1985 11 11 | 05 56.27 | +34 45.1 | 1.671 | 2.492 | 137.6 | 15.5 | 17.5 |
| 1985 11 21 | 05 50.78 | +34 48.4 | | | | | |
| 1985 12 01 | 05 42.21 | +34 38.9 | 1.523 | 2.469 | 158.8 | 8.3 | 17.1 |
| 1985 12 11 | 05 31.52 | +34 13.0 | | | | | |
| 1985 12 21 | 05 20.16 | +33 29.6 | 1.476 | 2.446 | 167.5 | 5.0 | 16.9 |
| 1985 12 31 | 05 09.79 | +32 31.9 | | | | | |
| 1986 01 10 | 05 01.76 | +31 25.9 | 1.537 | 2.425 | 147.5 | 12.6 | 17.1 |
| 1986 01 20 | 04 56.97 | +30 18.6 | | | | | |
| 1986 01 30 | 04 55.74 | +29 15.6 | 1.687 | 2.405 | 126.4 | 19.3 | 17.5 |
| 1986 02 09 | 04 57.98 | +28 20.1 | | | | | |
| 1986 02 19 | 05 03.38 | +27 32.8 | 1.892 | 2.387 | 107.8 | 23.2 | 17.8 |
| 1986 03 01 | 05 11.54 | +26 52.7 | | | | | |
| 1986 03 11 | 05 22.04 | +26 17.9 | 2.122 | 2.372 | 91.9 | 24.7 | 18.1 |

1979 SL11 a,e,i = 2.98, 0.29, 17 Elements MPC 9417

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|
| 1985 10 02 | 06 05.72 | +36 32.1 | 3.283 | 3.545 | 96.9 | 16.3 | 19.2 |
| 1985 10 12 | 06 08.75 | +37 24.7 | | | | | |
| 1985 10 22 | 06 09.42 | +38 19.6 | 3.043 | 3.581 | 115.2 | 14.6 | 19.0 |
| 1985 11 01 | 06 07.52 | +39 15.3 | | | | | |
| 1985 11 11 | 06 02.95 | +40 09.0 | 2.848 | 3.615 | 134.9 | 11.2 | 18.8 |
| 1985 11 21 | 05 55.80 | +40 57.0 | | | | | |
| 1985 12 01 | 05 46.51 | +41 34.9 | 2.736 | 3.647 | 153.9 | 6.8 | 18.6 |
| 1985 12 11 | 05 35.77 | +41 59.0 | | | | | |
| 1985 12 21 | 05 24.59 | +42 07.1 | 2.735 | 3.676 | 160.4 | 5.2 | 18.6 |
| 1985 12 31 | 05 14.04 | +41 59.5 | | | | | |
| 1986 01 10 | 05 05.04 | +41 39.0 | 2.852 | 3.703 | 145.3 | 8.7 | 18.8 |
| 1986 01 20 | 04 58.30 | +41 09.8 | | | | | |
| 1986 01 30 | 04 54.14 | +40 36.2 | 3.069 | 3.728 | 125.5 | 12.4 | 19.1 |
| 1986 02 09 | 04 52.62 | +40 02.0 | | | | | |
| 1986 02 19 | 04 53.63 | +39 29.8 | 3.350 | 3.751 | 106.4 | 14.6 | 19.3 |
| 1986 03 01 | 04 56.93 | +39 01.1 | | | | | |
| 1986 03 11 | 05 02.25 | +38 36.1 | 3.660 | 3.771 | 88.7 | 15.3 | 19.6 |

(3106) 1981 EE a,e,i = 3.16, 0.22, 15 Elements MPC 9070

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|
| 1985 10 02 | 05 47.81 | +08 07.8 | 2.072 | 2.466 | 101.0 | 23.5 | 16.1 |
| 1985 10 12 | 05 54.47 | +07 44.5 | | | | | |
| 1985 10 22 | 05 58.61 | +07 22.4 | 1.859 | 2.477 | 117.2 | 20.9 | 15.8 |
| 1985 11 01 | 06 00.01 | +07 04.8 | | | | | |
| 1985 11 11 | 05 58.53 | +06 55.3 | 1.685 | 2.492 | 135.8 | 16.1 | 15.5 |
| 1985 11 21 | 05 54.24 | +06 57.5 | | | | | |
| 1985 12 01 | 05 47.57 | +07 14.3 | 1.580 | 2.511 | 155.6 | 9.3 | 15.2 |
| 1985 12 11 | 05 39.26 | +07 47.4 | | | | | |
| 1985 12 21 | 05 30.38 | +08 36.4 | 1.574 | 2.534 | 164.2 | 6.1 | 15.1 |
| 1985 12 31 | 05 22.11 | +09 39.0 | | | | | |
| 1986 01 10 | 05 15.49 | +10 51.4 | 1.674 | 2.560 | 147.7 | 11.8 | 15.4 |
| 1986 01 20 | 05 11.24 | +12 09.8 | | | | | |
| 1986 01 30 | 05 09.74 | +13 30.4 | 1.867 | 2.590 | 127.7 | 17.5 | 15.8 |
| 1986 02 09 | 05 11.03 | +14 50.1 | | | | | |
| 1986 02 19 | 05 14.99 | +16 06.8 | 2.122 | 2.622 | 109.4 | 20.8 | 16.2 |
| 1986 03 01 | 05 21.36 | +17 18.6 | | | | | |
| 1986 03 11 | 05 29.81 | +18 24.3 | 2.409 | 2.656 | 93.2 | 21.9 | 16.5 |

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

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|
| 1985 10 02 | 05 58.53 | +28 31.0 | 1.976 | 2.344 | 98.5 | 25.0 | 18.4 |
| 1985 10 12 | 06 06.09 | +28 51.8 | | | | | |
| 1985 10 22 | 06 10.71 | +29 13.1 | 1.754 | 2.361 | 115.6 | 22.4 | 18.1 |
| 1985 11 01 | 06 12.01 | +29 35.2 | | | | | |
| 1985 11 11 | 06 09.65 | +29 57.1 | 1.566 | 2.377 | 135.6 | 17.0 | 17.7 |
| 1985 11 21 | 06 03.55 | +30 16.2 | | | | | |
| 1985 12 01 | 05 54.15 | +30 28.6 | 1.447 | 2.391 | 158.4 | 8.7 | 17.4 |
| 1985 12 11 | 05 42.38 | +30 30.3 | | | | | |
| 1985 12 21 | 05 29.78 | +30 19.0 | 1.427 | 2.404 | 171.3 | 3.6 | 17.2 |
| 1985 12 31 | 05 18.07 | +29 56.0 | | | | | |
| 1986 01 10 | 05 08.69 | +29 25.4 | 1.518 | 2.415 | 149.2 | 12.0 | 17.6 |
| 1986 01 20 | 05 02.60 | +28 52.7 | | | | | |
| 1986 01 30 | 05 00.15 | +28 22.2 | 1.698 | 2.425 | 127.3 | 18.8 | 18.0 |
| 1986 02 09 | 05 01.21 | +27 56.4 | | | | | |
| 1986 02 19 | 05 05.50 | +27 36.0 | 1.935 | 2.434 | 108.3 | 22.7 | 18.4 |
| 1986 03 01 | 05 12.58 | +27 20.1 | | | | | |
| 1986 03 11 | 05 22.02 | +27 07.3 | 2.196 | 2.440 | 91.9 | 24.0 | 18.7 |

(3053) Dresden a,e,i = 2.38, 0.21, 5 Elements MPC 8788

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 02 | 06 08.09 | +28 05.9 | 2.080 | 2.407 | 96.4 | 24.4 | 18.6 |
| 1985 | 10 12 | 06 15.14 | +28 28.6 | | | | | |
| 1985 | 10 22 | 06 19.27 | +28 52.9 | 1.876 | 2.452 | 113.7 | 21.8 | 18.3 |
| 1985 | 11 01 | 06 20.15 | +29 19.2 | | | | | |
| 1985 | 11 11 | 06 17.51 | +29 46.4 | 1.705 | 2.495 | 133.9 | 16.6 | 18.0 |
| 1985 | 11 21 | 06 11.32 | +30 12.0 | | | | | |
| 1985 | 12 01 | 06 02.02 | +30 32.2 | 1.601 | 2.537 | 156.7 | 8.8 | 17.7 |
| 1985 | 12 11 | 05 50.51 | +30 42.9 | | | | | |
| 1985 | 12 21 | 05 38.18 | +30 41.7 | 1.599 | 2.576 | 172.0 | 3.1 | 17.5 |
| 1985 | 12 31 | 05 26.60 | +30 28.9 | | | | | |
| 1986 | 01 10 | 05 17.09 | +30 07.8 | 1.710 | 2.614 | 150.9 | 10.5 | 18.0 |
| 1986 | 01 20 | 05 10.54 | +29 42.8 | | | | | |
| 1986 | 01 30 | 05 07.32 | +29 18.0 | 1.918 | 2.649 | 128.9 | 16.8 | 18.4 |
| 1986 | 02 09 | 05 07.36 | +28 56.1 | | | | | |
| 1986 | 02 19 | 05 10.42 | +28 38.1 | 2.186 | 2.683 | 109.4 | 20.3 | 18.8 |
| 1986 | 03 01 | 05 16.10 | +28 23.7 | | | | | |
| 1986 | 03 11 | 05 24.01 | +28 12.1 | 2.483 | 2.713 | 92.4 | 21.5 | 19.1 |

(3098) 4579 P-L a,e,i = 2.30, 0.21, 1 Elements MPC 9023

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 02 | 06 08.90 | +22 14.9 | 2.100 | 2.422 | 96.2 | 24.3 | 20.1 |
| 1985 | 10 12 | 06 15.36 | +22 11.4 | | | | | |
| 1985 | 10 22 | 06 19.02 | +22 08.4 | 1.891 | 2.465 | 113.6 | 21.7 | 19.8 |
| 1985 | 11 01 | 06 19.58 | +22 07.0 | | | | | |
| 1985 | 11 11 | 06 16.82 | +22 07.6 | 1.714 | 2.506 | 134.1 | 16.5 | 19.5 |
| 1985 | 11 21 | 06 10.77 | +22 09.9 | | | | | |
| 1985 | 12 01 | 06 01.83 | +22 12.7 | 1.605 | 2.545 | 157.8 | 8.4 | 19.2 |
| 1985 | 12 11 | 05 50.86 | +22 14.6 | | | | | |
| 1985 | 12 21 | 05 39.10 | +22 14.6 | 1.599 | 2.581 | 176.4 | 1.4 | 18.9 |
| 1985 | 12 31 | 05 27.99 | +22 13.0 | | | | | |
| 1986 | 01 10 | 05 18.74 | +22 11.1 | 1.708 | 2.615 | 151.5 | 10.3 | 19.5 |
| 1986 | 01 20 | 05 12.22 | +22 10.6 | | | | | |
| 1986 | 01 30 | 05 08.80 | +22 12.9 | 1.914 | 2.646 | 128.9 | 16.9 | 19.9 |
| 1986 | 02 09 | 05 08.48 | +22 18.5 | | | | | |
| 1986 | 02 19 | 05 11.06 | +22 27.1 | 2.181 | 2.674 | 109.2 | 20.4 | 20.3 |
| 1986 | 03 01 | 05 16.22 | +22 37.8 | | | | | |
| 1986 | 03 11 | 05 23.58 | +22 49.3 | 2.475 | 2.699 | 92.0 | 21.6 | 20.6 |

1938 AD a,e,i = 2.28, 0.13, 3 Elements MPC 9306

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 02 | 05 52.80 | +26 33.4 | 1.585 | 2.014 | 99.8 | 29.3 | 17.7 |
| 1985 | 10 12 | 06 03.53 | +26 42.2 | | | | | |
| 1985 | 10 22 | 06 11.15 | +26 49.0 | 1.395 | 2.033 | 115.5 | 26.2 | 17.4 |
| 1985 | 11 01 | 06 15.18 | +26 55.1 | | | | | |
| 1985 | 11 11 | 06 15.19 | +27 00.7 | 1.235 | 2.055 | 134.5 | 20.1 | 17.0 |
| 1985 | 11 21 | 06 11.02 | +27 04.8 | | | | | |
| 1985 | 12 01 | 06 03.03 | +27 04.7 | 1.134 | 2.079 | 157.3 | 10.6 | 16.6 |
| 1985 | 12 11 | 05 52.24 | +26 57.4 | | | | | |
| 1985 | 12 21 | 05 40.30 | +26 41.4 | 1.123 | 2.105 | 175.5 | 2.1 | 16.3 |
| 1985 | 12 31 | 05 29.19 | +26 17.9 | | | | | |
| 1986 | 01 10 | 05 20.54 | +25 50.9 | 1.214 | 2.133 | 152.1 | 12.5 | 16.9 |
| 1986 | 01 20 | 05 15.40 | +25 24.8 | | | | | |
| 1986 | 01 30 | 05 14.13 | +25 02.9 | 1.390 | 2.162 | 130.3 | 20.3 | 17.4 |
| 1986 | 02 09 | 05 16.54 | +24 46.3 | | | | | |
| 1986 | 02 19 | 05 22.28 | +24 34.5 | 1.623 | 2.192 | 111.9 | 24.7 | 17.8 |
| 1986 | 03 01 | 05 30.85 | +24 25.9 | | | | | |
| 1986 | 03 11 | 05 41.74 | +24 18.4 | 1.884 | 2.223 | 96.2 | 26.4 | 18.2 |

1978 QJ2 a,e,i = 3.15, 0.16, 1 Elements MPC 9291

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|
| 1985 10 02 | 06 13.08 | +24 20.9 | 3.341 | 3.575 | 95.3 | 16.2 | 18.3 |
| 1985 10 12 | 06 16.71 | +24 23.3 | | | | | |
| 1985 10 22 | 06 18.36 | +24 26.6 | 3.068 | 3.588 | 113.9 | 14.7 | 18.0 |
| 1985 11 01 | 06 17.88 | +24 30.8 | | | | | |
| 1985 11 11 | 06 15.20 | +24 35.8 | 2.835 | 3.600 | 134.6 | 11.3 | 17.8 |
| 1985 11 21 | 06 10.38 | +24 40.9 | | | | | |
| 1985 12 01 | 06 03.71 | +24 45.1 | 2.681 | 3.611 | 157.4 | 6.0 | 17.5 |
| 1985 12 11 | 05 55.69 | +24 47.4 | | | | | |
| 1985 12 21 | 05 47.00 | +24 47.1 | 2.637 | 3.620 | 178.0 | 0.6 | 17.1 |
| 1985 12 31 | 05 38.46 | +24 44.0 | | | | | |
| 1986 01 10 | 05 30.83 | +24 38.8 | 2.716 | 3.628 | 154.4 | 6.7 | 17.6 |
| 1986 01 20 | 05 24.75 | +24 32.7 | | | | | |
| 1986 01 30 | 05 20.64 | +24 27.1 | 2.904 | 3.635 | 131.7 | 11.7 | 17.9 |
| 1986 02 09 | 05 18.68 | +24 22.8 | | | | | |
| 1986 02 19 | 05 18.91 | +24 20.4 | 3.166 | 3.640 | 111.1 | 14.7 | 18.1 |
| 1986 03 01 | 05 21.22 | +24 20.0 | | | | | |
| 1986 03 11 | 05 25.41 | +24 21.1 | 3.463 | 3.644 | 92.5 | 15.8 | 18.4 |

1980 SD a,e,i = 2.59, 0.18, 13 Elements MPC 7779

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|
| 1985 10 02 | 06 23.76 | +34 42.4 | 2.647 | 2.882 | 93.2 | 20.3 | 19.9 |
| 1985 10 12 | 06 30.31 | +35 31.0 | | | | | |
| 1985 10 22 | 06 34.37 | +36 23.8 | 2.407 | 2.907 | 110.4 | 18.7 | 19.7 |
| 1985 11 01 | 06 35.58 | +37 20.5 | | | | | |
| 1985 11 11 | 06 33.64 | +38 19.3 | 2.199 | 2.930 | 129.5 | 15.1 | 19.4 |
| 1985 11 21 | 06 28.38 | +39 16.6 | | | | | |
| 1985 12 01 | 06 20.00 | +40 07.2 | 2.059 | 2.952 | 149.6 | 9.7 | 19.1 |
| 1985 12 11 | 06 09.10 | +40 44.9 | | | | | |
| 1985 12 21 | 05 56.76 | +41 04.7 | 2.019 | 2.971 | 162.3 | 5.8 | 19.0 |
| 1985 12 31 | 05 44.44 | +41 04.4 | | | | | |
| 1986 01 10 | 05 33.50 | +40 45.8 | 2.093 | 2.988 | 150.5 | 9.3 | 19.2 |
| 1986 01 20 | 05 25.07 | +40 13.4 | | | | | |
| 1986 01 30 | 05 19.75 | +39 33.2 | 2.269 | 3.004 | 130.5 | 14.4 | 19.5 |
| 1986 02 09 | 05 17.71 | +38 50.3 | | | | | |
| 1986 02 19 | 05 18.81 | +38 08.4 | 2.513 | 3.016 | 111.3 | 17.8 | 19.8 |
| 1986 03 01 | 05 22.74 | +37 29.3 | | | | | |
| 1986 03 11 | 05 29.12 | +36 53.6 | 2.793 | 3.027 | 93.9 | 19.1 | 20.1 |

(3172) 1981 WW a,e,i = 2.43, 0.22, 4 Elements MPC 9353

| Date ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|
| 1985 10 02 | 06 15.30 | +22 08.5 | 1.831 | 2.157 | 94.7 | 27.5 | 18.1 |
| 1985 10 12 | 06 24.71 | +22 13.8 | | | | | |
| 1985 10 22 | 06 31.23 | +22 20.6 | 1.647 | 2.206 | 110.8 | 24.9 | 17.9 |
| 1985 11 01 | 06 34.50 | +22 30.9 | | | | | |
| 1985 11 11 | 06 34.19 | +22 45.7 | 1.487 | 2.256 | 130.2 | 19.6 | 17.6 |
| 1985 11 21 | 06 30.16 | +23 05.1 | | | | | |
| 1985 12 01 | 06 22.69 | +23 27.5 | 1.384 | 2.306 | 153.0 | 11.2 | 17.3 |
| 1985 12 11 | 06 12.51 | +23 50.1 | | | | | |
| 1985 12 21 | 06 00.90 | +24 09.9 | 1.373 | 2.357 | 178.2 | 0.7 | 16.8 |
| 1985 12 31 | 05 49.48 | +24 24.9 | | | | | |
| 1986 01 10 | 05 39.72 | +24 35.4 | 1.473 | 2.407 | 156.4 | 9.4 | 17.5 |
| 1986 01 20 | 05 32.73 | +24 42.9 | | | | | |
| 1986 01 30 | 05 29.05 | +24 49.1 | 1.670 | 2.456 | 133.7 | 16.9 | 18.0 |
| 1986 02 09 | 05 28.73 | +24 55.5 | | | | | |
| 1986 02 19 | 05 31.56 | +25 02.4 | 1.933 | 2.504 | 114.0 | 21.1 | 18.4 |
| 1986 03 01 | 05 37.16 | +25 09.4 | | | | | |
| 1986 03 11 | 05 45.11 | +25 15.6 | 2.230 | 2.550 | 97.0 | 22.7 | 18.8 |

(3259) 1984 SZ4 a,e,i = 3.16, 0.13, 16 Elements MPC 9689

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 02 | 06 21.41 | +18 52.6 | 3.126 | 3.335 | 93.2 | 17.4 | 17.0 |
| 1985 | 10 12 | 06 26.25 | +18 09.7 | | | | | |
| 1985 | 10 22 | 06 29.16 | +17 24.0 | 2.823 | 3.312 | 110.9 | 16.3 | 16.7 |
| 1985 | 11 01 | 06 29.95 | +16 36.5 | | | | | |
| 1985 | 11 11 | 06 28.50 | +15 48.1 | 2.556 | 3.289 | 130.7 | 13.2 | 16.4 |
| 1985 | 11 21 | 06 24.80 | +14 59.9 | | | | | |
| 1985 | 12 01 | 06 19.03 | +14 13.4 | 2.360 | 3.265 | 152.1 | 8.1 | 16.1 |
| 1985 | 12 11 | 06 11.59 | +13 30.1 | | | | | |
| 1985 | 12 21 | 06 03.14 | +12 51.8 | 2.269 | 3.240 | 169.2 | 3.3 | 15.8 |
| 1985 | 12 31 | 05 54.51 | +12 20.2 | | | | | |
| 1986 | 01 10 | 05 46.52 | +11 56.4 | 2.297 | 3.215 | 155.1 | 7.4 | 16.0 |
| 1986 | 01 20 | 05 39.96 | +11 41.3 | | | | | |
| 1986 | 01 30 | 05 35.35 | +11 34.4 | 2.432 | 3.190 | 133.4 | 13.0 | 16.2 |
| 1986 | 02 09 | 05 32.98 | +11 34.7 | | | | | |
| 1986 | 02 19 | 05 32.96 | +11 40.9 | 2.642 | 3.164 | 113.2 | 16.7 | 16.5 |
| 1986 | 03 01 | 05 35.19 | +11 51.0 | | | | | |
| 1986 | 03 11 | 05 39.52 | +12 03.3 | 2.889 | 3.138 | 95.2 | 18.4 | 16.7 |

(3132) 1940 WL a,e,i = 3.15, 0.11, 4 Elements MPC 9203

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 02 | 06 21.94 | +20 22.7 | 2.735 | 2.963 | 93.1 | 19.7 | 17.5 |
| 1985 | 10 12 | 06 28.16 | +20 18.1 | | | | | |
| 1985 | 10 22 | 06 32.25 | +20 14.7 | 2.487 | 2.984 | 110.4 | 18.2 | 17.3 |
| 1985 | 11 01 | 06 33.98 | +20 13.6 | | | | | |
| 1985 | 11 11 | 06 33.21 | +20 15.7 | 2.269 | 3.005 | 130.2 | 14.6 | 17.0 |
| 1985 | 11 21 | 06 29.88 | +20 21.5 | | | | | |
| 1985 | 12 01 | 06 24.22 | +20 30.6 | 2.117 | 3.026 | 152.4 | 8.7 | 16.7 |
| 1985 | 12 11 | 06 16.66 | +20 42.2 | | | | | |
| 1985 | 12 21 | 06 07.96 | +20 55.2 | 2.066 | 3.048 | 175.9 | 1.3 | 16.3 |
| 1985 | 12 31 | 05 59.08 | +21 08.7 | | | | | |
| 1986 | 01 10 | 05 50.97 | +21 22.0 | 2.132 | 3.070 | 158.9 | 6.6 | 16.7 |
| 1986 | 01 20 | 05 44.48 | +21 35.3 | | | | | |
| 1986 | 01 30 | 05 40.16 | +21 48.8 | 2.306 | 3.092 | 136.1 | 12.8 | 17.1 |
| 1986 | 02 09 | 05 38.29 | +22 02.5 | | | | | |
| 1986 | 02 19 | 05 38.91 | +22 16.7 | 2.558 | 3.115 | 115.6 | 16.6 | 17.4 |
| 1986 | 03 01 | 05 41.89 | +22 30.8 | | | | | |
| 1986 | 03 11 | 05 47.00 | +22 44.3 | 2.851 | 3.137 | 97.4 | 18.3 | 17.7 |

(3246) 1976 GQ3 a,e,i = 3.19, 0.03, 22 Elements MPC 9594

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 02 | 06 26.20 | +02 57.9 | 3.043 | 3.223 | 91.2 | 18.1 | 18.4 |
| 1985 | 10 12 | 06 31.49 | +01 36.3 | | | | | |
| 1985 | 10 22 | 06 34.95 | +00 11.1 | 2.782 | 3.217 | 107.0 | 17.2 | 18.2 |
| 1985 | 11 01 | 06 36.39 | -01 15.0 | | | | | |
| 1985 | 11 11 | 06 35.70 | -02 39.0 | 2.553 | 3.211 | 123.8 | 14.9 | 17.9 |
| 1985 | 11 21 | 06 32.86 | -03 56.6 | | | | | |
| 1985 | 12 01 | 06 28.02 | -05 03.3 | 2.386 | 3.204 | 139.9 | 11.4 | 17.7 |
| 1985 | 12 11 | 06 21.53 | -05 54.3 | | | | | |
| 1985 | 12 21 | 06 13.96 | -06 25.7 | 2.309 | 3.197 | 149.7 | 8.9 | 17.5 |
| 1985 | 12 31 | 06 06.07 | -06 35.1 | | | | | |
| 1986 | 01 10 | 05 58.63 | -06 22.3 | 2.335 | 3.191 | 145.0 | 10.2 | 17.6 |
| 1986 | 01 20 | 05 52.39 | -05 49.6 | | | | | |
| 1986 | 01 30 | 05 47.90 | -05 00.7 | 2.457 | 3.184 | 130.3 | 13.7 | 17.8 |
| 1986 | 02 09 | 05 45.48 | -04 00.2 | | | | | |
| 1986 | 02 19 | 05 45.28 | -02 52.9 | 2.652 | 3.177 | 113.5 | 16.6 | 18.0 |
| 1986 | 03 01 | 05 47.25 | -01 42.8 | | | | | |
| 1986 | 03 11 | 05 51.26 | -00 33.3 | 2.888 | 3.171 | 97.3 | 18.1 | 18.2 |

(3148) 1979 SA12 a,e,i = 3.11, 0.18, 1 Elements MPC 9288

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 02 | 06 23.38 | +24 07.3 | 2.361 | 2.611 | 92.9 | 22.5 | 17.5 |
| 1985 | 10 12 | 06 32.01 | +24 04.9 | | | | | |
| 1985 | 10 22 | 06 38.32 | +24 03.2 | 2.127 | 2.630 | 109.3 | 20.9 | 17.2 |
| 1985 | 11 01 | 06 42.03 | +24 03.3 | | | | | |
| 1985 | 11 11 | 06 42.90 | +24 06.1 | 1.921 | 2.651 | 128.3 | 17.1 | 16.9 |
| 1985 | 11 21 | 06 40.78 | +24 11.6 | | | | | |
| 1985 | 12 01 | 06 35.82 | +24 19.0 | 1.774 | 2.674 | 150.1 | 10.6 | 16.6 |
| 1985 | 12 11 | 06 28.46 | +24 26.6 | | | | | |
| 1985 | 12 21 | 06 19.52 | +24 32.6 | 1.719 | 2.699 | 174.0 | 2.2 | 16.2 |
| 1985 | 12 31 | 06 10.15 | +24 35.5 | | | | | |
| 1986 | 01 10 | 06 01.54 | +24 35.1 | 1.777 | 2.727 | 161.4 | 6.6 | 16.6 |
| 1986 | 01 20 | 05 54.72 | +24 32.3 | | | | | |
| 1986 | 01 30 | 05 50.39 | +24 28.3 | 1.940 | 2.756 | 138.5 | 13.7 | 17.0 |
| 1986 | 02 09 | 05 48.85 | +24 24.3 | | | | | |
| 1986 | 02 19 | 05 50.12 | +24 20.9 | 2.179 | 2.786 | 118.2 | 18.2 | 17.3 |
| 1986 | 03 01 | 05 54.00 | +24 18.0 | | | | | |
| 1986 | 03 11 | 06 00.19 | +24 15.1 | 2.464 | 2.818 | 100.4 | 20.3 | 17.7 |

(3130) 1981 YO a,e,i = 2.47, 0.20, 4 Elements MPC 9159

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 02 | 06 31.04 | +20 18.9 | 2.019 | 2.269 | 91.0 | 26.2 | 17.9 |
| 1985 | 10 12 | 06 40.66 | +20 11.8 | | | | | |
| 1985 | 10 22 | 06 47.70 | +20 06.2 | 1.819 | 2.312 | 106.8 | 24.3 | 17.7 |
| 1985 | 11 01 | 06 51.85 | +20 04.4 | | | | | |
| 1985 | 11 11 | 06 52.77 | +20 08.0 | 1.639 | 2.357 | 125.6 | 20.0 | 17.4 |
| 1985 | 11 21 | 06 50.26 | +20 18.2 | | | | | |
| 1985 | 12 01 | 06 44.43 | +20 34.7 | 1.509 | 2.401 | 147.8 | 12.7 | 17.1 |
| 1985 | 12 11 | 06 35.72 | +20 56.1 | | | | | |
| 1985 | 12 21 | 06 25.10 | +21 19.9 | 1.467 | 2.445 | 172.5 | 3.0 | 16.7 |
| 1985 | 12 31 | 06 13.94 | +21 43.5 | | | | | |
| 1986 | 01 10 | 06 03.65 | +22 05.2 | 1.536 | 2.489 | 161.9 | 7.1 | 17.1 |
| 1986 | 01 20 | 05 55.47 | +22 24.6 | | | | | |
| 1986 | 01 30 | 05 50.20 | +22 42.2 | 1.709 | 2.532 | 138.4 | 15.0 | 17.5 |
| 1986 | 02 09 | 05 48.10 | +22 58.5 | | | | | |
| 1986 | 02 19 | 05 49.14 | +23 13.7 | 1.957 | 2.573 | 118.0 | 19.8 | 18.0 |
| 1986 | 03 01 | 05 53.05 | +23 27.6 | | | | | |
| 1986 | 03 11 | 05 59.45 | +23 39.5 | 2.247 | 2.613 | 100.3 | 22.0 | 18.3 |

1977 QG4 a,e,i = 2.37, 0.23, 3 Elements MPC 9465

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 02 | 06 37.24 | +20 27.1 | 2.104 | 2.322 | 89.5 | 25.5 | 18.5 |
| 1985 | 10 12 | 06 46.23 | +20 12.9 | | | | | |
| 1985 | 10 22 | 06 52.65 | +20 00.1 | 1.903 | 2.373 | 105.7 | 23.8 | 18.3 |
| 1985 | 11 01 | 06 56.19 | +19 50.6 | | | | | |
| 1985 | 11 11 | 06 56.56 | +19 46.0 | 1.719 | 2.424 | 124.7 | 19.6 | 18.1 |
| 1985 | 11 21 | 06 53.56 | +19 47.3 | | | | | |
| 1985 | 12 01 | 06 47.31 | +19 54.5 | 1.587 | 2.472 | 147.0 | 12.6 | 17.8 |
| 1985 | 12 11 | 06 38.26 | +20 06.4 | | | | | |
| 1985 | 12 21 | 06 27.34 | +20 21.1 | 1.542 | 2.519 | 171.6 | 3.3 | 17.4 |
| 1985 | 12 31 | 06 15.88 | +20 36.8 | | | | | |
| 1986 | 01 10 | 06 05.24 | +20 51.9 | 1.611 | 2.564 | 162.1 | 6.8 | 17.7 |
| 1986 | 01 20 | 05 56.64 | +21 06.4 | | | | | |
| 1986 | 01 30 | 05 50.85 | +21 20.4 | 1.786 | 2.607 | 138.5 | 14.5 | 18.2 |
| 1986 | 02 09 | 05 48.15 | +21 34.4 | | | | | |
| 1986 | 02 19 | 05 48.53 | +21 48.3 | 2.038 | 2.648 | 117.8 | 19.3 | 18.6 |
| 1986 | 03 01 | 05 51.73 | +22 01.8 | | | | | |
| 1986 | 03 11 | 05 57.40 | +22 13.9 | 2.332 | 2.685 | 99.8 | 21.4 | 19.0 |

(3248) 1982 FK a,e,i = 3.19, 0.17, 11 Elements MPC 9679

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 02 | 06 42.59 | +33 44.9 | 3.247 | 3.385 | 89.3 | 17.2 | 17.6 |
| 1985 | 10 12 | 06 48.68 | +34 14.8 | | | | | |
| 1985 | 10 22 | 06 52.70 | +34 48.2 | 2.993 | 3.414 | 106.6 | 16.2 | 17.4 |
| 1985 | 11 01 | 06 54.40 | +35 25.2 | | | | | |
| 1985 | 11 11 | 06 53.58 | +36 04.7 | 2.766 | 3.441 | 125.8 | 13.5 | 17.2 |
| 1985 | 11 21 | 06 50.13 | +36 44.7 | | | | | |
| 1985 | 12 01 | 06 44.17 | +37 21.9 | 2.603 | 3.467 | 146.4 | 9.1 | 17.0 |
| 1985 | 12 11 | 06 36.07 | +37 52.4 | | | | | |
| 1985 | 12 21 | 06 26.49 | +38 12.4 | 2.537 | 3.492 | 163.7 | 4.5 | 16.8 |
| 1985 | 12 31 | 06 16.39 | +38 19.3 | | | | | |
| 1986 | 01 10 | 06 06.77 | +38 12.8 | 2.589 | 3.516 | 157.2 | 6.2 | 16.9 |
| 1986 | 01 20 | 05 58.58 | +37 54.5 | | | | | |
| 1986 | 01 30 | 05 52.50 | +37 27.7 | 2.752 | 3.539 | 137.2 | 10.9 | 17.2 |
| 1986 | 02 09 | 05 48.88 | +36 55.8 | | | | | |
| 1986 | 02 19 | 05 47.83 | +36 22.0 | 2.999 | 3.561 | 117.2 | 14.3 | 17.5 |
| 1986 | 03 01 | 05 49.24 | +35 48.3 | | | | | |
| 1986 | 03 11 | 05 52.88 | +35 15.9 | 3.294 | 3.582 | 98.7 | 15.9 | 17.7 |

1981 SO a,e,i = 2.30, 0.12, 6 Elements MPC 6514

| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 02 | 06 35.64 | +29 53.3 | 1.996 | 2.240 | -1.40 | +1.7 | 18.4 |
| 1985 | 10 12 | 06 46.93 | +30 11.2 | | | | | |
| 1985 | 10 22 | 06 55.64 | +30 31.4 | 1.784 | 2.268 | -1.65 | +3.0 | 18.1 |
| 1985 | 11 01 | 07 01.33 | +30 55.6 | | | | | |
| 1985 | 11 11 | 07 03.57 | +31 24.3 | 1.590 | 2.295 | -1.97 | +3.9 | 17.8 |
| 1985 | 11 21 | 07 01.96 | +31 56.5 | | | | | |
| 1985 | 12 01 | 06 56.43 | +32 29.2 | 1.444 | 2.322 | -2.27 | +4.1 | 17.5 |
| 1985 | 12 11 | 06 47.29 | +32 56.9 | | | | | |
| 1985 | 12 21 | 06 35.50 | +33 13.5 | 1.380 | 2.348 | -2.38 | +2.9 | 17.2 |
| 1985 | 12 31 | 06 22.67 | +33 14.4 | | | | | |
| 1986 | 01 10 | 06 10.58 | +32 58.7 | 1.423 | 2.374 | -2.18 | +1.1 | 17.3 |
| 1986 | 01 20 | 06 00.85 | +32 29.8 | | | | | |
| 1986 | 01 30 | 05 54.50 | +31 53.1 | 1.569 | 2.399 | -1.84 | +0.0 | 17.7 |
| 1986 | 02 09 | 05 51.87 | +31 13.7 | | | | | |
| 1986 | 02 19 | 05 52.88 | +30 35.0 | 1.788 | 2.423 | -1.54 | -0.1 | 18.2 |
| 1986 | 03 01 | 05 57.17 | +29 58.6 | | | | | |
| 1986 | 03 11 | 06 04.24 | +29 24.2 | 2.049 | 2.445 | -1.33 | +0.4 | 18.5 |

1949 PQ a,e,i = 2.17, 0.14, 1 Elements MPC 9583

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 02 | 06 43.49 | +23 11.0 | 2.274 | 2.457 | 88.3 | 24.0 | 19.8 |
| 1985 | 10 12 | 06 52.69 | +23 03.4 | | | | | |
| 1985 | 10 22 | 06 59.62 | +22 57.5 | 2.024 | 2.467 | 104.3 | 23.0 | 19.5 |
| 1985 | 11 01 | 07 03.94 | +22 54.9 | | | | | |
| 1985 | 11 11 | 07 05.27 | +22 57.0 | 1.791 | 2.474 | 123.1 | 19.6 | 19.2 |
| 1985 | 11 21 | 07 03.30 | +23 04.5 | | | | | |
| 1985 | 12 01 | 06 57.94 | +23 16.8 | 1.606 | 2.479 | 145.0 | 13.2 | 18.8 |
| 1985 | 12 11 | 06 49.40 | +23 32.3 | | | | | |
| 1985 | 12 21 | 06 38.42 | +23 48.0 | 1.506 | 2.481 | 169.8 | 4.0 | 18.4 |
| 1985 | 12 31 | 06 26.22 | +24 00.9 | | | | | |
| 1986 | 01 10 | 06 14.30 | +24 09.2 | 1.519 | 2.480 | 164.3 | 6.2 | 18.5 |
| 1986 | 01 20 | 06 04.13 | +24 13.1 | | | | | |
| 1986 | 01 30 | 05 56.78 | +24 13.8 | 1.639 | 2.476 | 140.0 | 14.8 | 18.9 |
| 1986 | 02 09 | 05 52.77 | +24 13.3 | | | | | |
| 1986 | 02 19 | 05 52.23 | +24 12.8 | 1.838 | 2.470 | 118.7 | 20.6 | 19.3 |
| 1986 | 03 01 | 05 54.93 | +24 12.5 | | | | | |
| 1986 | 03 11 | 06 00.53 | +24 11.9 | 2.077 | 2.460 | 100.5 | 23.4 | 19.6 |

(3157) 1973 SX3 a,e,i = 3.15, 0.14, 8 Elements MPC 9293

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 02 | 06 47.37 | +28 00.6 | 2.936 | 3.065 | 87.8 | 19.0 | 17.7 |
| 1985 | 10 12 | 06 54.77 | +28 19.1 | | | | | |
| 1985 | 10 22 | 07 00.13 | +28 41.3 | 2.686 | 3.092 | 104.7 | 18.1 | 17.5 |
| 1985 | 11 01 | 07 03.22 | +29 07.8 | | | | | |
| 1985 | 11 11 | 07 03.79 | +29 38.8 | 2.458 | 3.119 | 123.8 | 15.3 | 17.3 |
| 1985 | 11 21 | 07 01.69 | +30 13.4 | | | | | |
| 1985 | 12 01 | 06 56.97 | +30 49.5 | 2.287 | 3.146 | 145.1 | 10.3 | 17.0 |
| 1985 | 12 11 | 06 49.90 | +31 23.9 | | | | | |
| 1985 | 12 21 | 06 41.08 | +31 53.1 | 2.208 | 3.173 | 166.6 | 4.1 | 16.8 |
| 1985 | 12 31 | 06 31.42 | +32 13.7 | | | | | |
| 1986 | 01 10 | 06 21.95 | +32 24.1 | 2.246 | 3.200 | 163.2 | 5.1 | 16.9 |
| 1986 | 01 20 | 06 13.70 | +32 24.7 | | | | | |
| 1986 | 01 30 | 06 07.46 | +32 17.3 | 2.397 | 3.226 | 141.4 | 11.0 | 17.2 |
| 1986 | 02 09 | 06 03.66 | +32 04.5 | | | | | |
| 1986 | 02 19 | 06 02.49 | +31 48.6 | 2.635 | 3.252 | 120.6 | 15.2 | 17.5 |
| 1986 | 03 01 | 06 03.88 | +31 31.3 | | | | | |
| 1986 | 03 11 | 06 07.62 | +31 13.6 | 2.924 | 3.277 | 101.9 | 17.3 | 17.8 |

(3146) 1972 KG a,e,i = 2.43, 0.20, 8 Elements MPC 9288

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 22 | 07 08.47 | +12 55.2 | 2.555 | 2.913 | 101.0 | 19.6 | 19.3 |
| 1985 | 11 01 | 07 11.59 | +12 15.8 | | | | | |
| 1985 | 11 11 | 07 12.35 | +11 39.3 | 2.293 | 2.911 | 119.5 | 17.2 | 19.0 |
| 1985 | 11 21 | 07 10.55 | +11 08.0 | | | | | |
| 1985 | 12 01 | 07 06.17 | +10 43.8 | 2.079 | 2.905 | 140.1 | 12.6 | 18.7 |
| 1985 | 12 11 | 06 59.37 | +10 28.6 | | | | | |
| 1985 | 12 21 | 06 50.64 | +10 23.8 | 1.948 | 2.897 | 161.2 | 6.3 | 18.4 |
| 1985 | 12 31 | 06 40.77 | +10 29.8 | | | | | |
| 1986 | 01 10 | 06 30.75 | +10 46.2 | 1.930 | 2.886 | 163.3 | 5.6 | 18.3 |
| 1986 | 01 20 | 06 21.64 | +11 11.4 | | | | | |
| 1986 | 01 30 | 06 14.32 | +11 43.4 | 2.027 | 2.873 | 142.7 | 12.0 | 18.6 |
| 1986 | 02 09 | 06 09.36 | +12 19.8 | | | | | |
| 1986 | 02 19 | 06 07.09 | +12 58.4 | 2.211 | 2.856 | 121.6 | 17.1 | 18.9 |
| 1986 | 03 01 | 06 07.49 | +13 37.0 | | | | | |
| 1986 | 03 11 | 06 10.43 | +14 14.0 | 2.448 | 2.838 | 102.8 | 20.0 | 19.2 |
| 1986 | 03 21 | 06 15.68 | +14 47.8 | | | | | |
| 1986 | 03 31 | 06 22.95 | +15 17.2 | 2.701 | 2.816 | 86.1 | 20.7 | 19.4 |

(3116) 1983 CF a,e,i = 2.23, 0.20, 5 Elements MPC 9076

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 22 | 07 08.78 | +22 20.5 | 1.682 | 2.127 | 102.2 | 27.2 | 16.9 |
| 1985 | 11 01 | 07 15.46 | +22 32.9 | | | | | |
| 1985 | 11 11 | 07 18.82 | +22 53.4 | 1.504 | 2.174 | 119.9 | 23.2 | 16.6 |
| 1985 | 11 21 | 07 18.48 | +23 23.4 | | | | | |
| 1985 | 12 01 | 07 14.27 | +24 02.3 | 1.364 | 2.221 | 141.3 | 16.1 | 16.3 |
| 1985 | 12 11 | 07 06.38 | +24 47.5 | | | | | |
| 1985 | 12 21 | 06 55.53 | +25 33.9 | 1.300 | 2.267 | 165.8 | 6.1 | 16.0 |
| 1985 | 12 31 | 06 43.12 | +26 15.6 | | | | | |
| 1986 | 01 10 | 06 30.83 | +26 48.2 | 1.341 | 2.311 | 167.4 | 5.3 | 16.0 |
| 1986 | 01 20 | 06 20.36 | +27 10.4 | | | | | |
| 1986 | 01 30 | 06 12.91 | +27 23.4 | 1.489 | 2.354 | 143.4 | 14.5 | 16.6 |
| 1986 | 02 09 | 06 09.03 | +27 29.7 | | | | | |
| 1986 | 02 19 | 06 08.78 | +27 31.8 | 1.716 | 2.395 | 122.3 | 20.4 | 17.0 |
| 1986 | 03 01 | 06 11.88 | +27 30.7 | | | | | |
| 1986 | 03 11 | 06 17.88 | +27 26.9 | 1.989 | 2.433 | 104.3 | 23.3 | 17.5 |
| 1986 | 03 21 | 06 26.35 | +27 20.1 | | | | | |
| 1986 | 03 31 | 06 36.82 | +27 09.6 | 2.281 | 2.470 | 88.7 | 23.9 | 17.8 |

1972 KM a,e,i = 2.54, 0.25, 9 Elements MPC 7613

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 22 | 07 17.06 | +19 23.3 | 2.815 | 3.143 | 99.9 | 18.2 | 19.7 |
| 1985 | 11 01 | 07 19.83 | +19 25.5 | | | | | |
| 1985 | 11 11 | 07 20.32 | +19 33.4 | 2.554 | 3.157 | 119.1 | 15.9 | 19.4 |
| 1985 | 11 21 | 07 18.33 | +19 47.8 | | | | | |
| 1985 | 12 01 | 07 13.85 | +20 08.9 | 2.341 | 3.168 | 140.9 | 11.3 | 19.1 |
| 1985 | 12 11 | 07 07.01 | +20 35.7 | | | | | |
| 1985 | 12 21 | 06 58.26 | +21 06.5 | 2.215 | 3.175 | 164.9 | 4.6 | 18.8 |
| 1985 | 12 31 | 06 48.32 | +21 38.8 | | | | | |
| 1986 | 01 10 | 06 38.14 | +22 10.1 | 2.208 | 3.180 | 169.8 | 3.1 | 18.7 |
| 1986 | 01 20 | 06 28.71 | +22 38.8 | | | | | |
| 1986 | 01 30 | 06 20.91 | +23 03.9 | 2.321 | 3.182 | 145.5 | 10.1 | 19.1 |
| 1986 | 02 09 | 06 15.31 | +23 25.7 | | | | | |
| 1986 | 02 19 | 06 12.25 | +23 44.3 | 2.530 | 3.181 | 123.3 | 15.1 | 19.4 |
| 1986 | 03 01 | 06 11.77 | +24 00.4 | | | | | |
| 1986 | 03 11 | 06 13.73 | +24 14.1 | 2.795 | 3.177 | 103.5 | 17.7 | 19.6 |
| 1986 | 03 21 | 06 17.94 | +24 25.3 | | | | | |
| 1986 | 03 31 | 06 24.11 | +24 33.8 | 3.079 | 3.170 | 86.0 | 18.3 | 19.9 |

1981 CK a,e,i = 3.05, 0.11, 0 Elements MPC 8895

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 22 | 07 07.34 | +23 00.6 | 2.508 | 2.892 | 102.6 | 19.6 | 18.3 |
| 1985 | 11 01 | 07 12.20 | +22 53.8 | | | | | |
| 1985 | 11 11 | 07 14.70 | +22 50.6 | 2.236 | 2.872 | 120.9 | 17.2 | 17.9 |
| 1985 | 11 21 | 07 14.59 | +22 51.9 | | | | | |
| 1985 | 12 01 | 07 11.79 | +22 57.7 | 2.012 | 2.853 | 141.8 | 12.4 | 17.6 |
| 1985 | 12 11 | 07 06.41 | +23 07.2 | | | | | |
| 1985 | 12 21 | 06 58.85 | +23 18.6 | 1.872 | 2.834 | 165.1 | 5.1 | 17.2 |
| 1985 | 12 31 | 06 49.90 | +23 29.8 | | | | | |
| 1986 | 01 10 | 06 40.58 | +23 38.9 | 1.842 | 2.817 | 170.3 | 3.4 | 17.1 |
| 1986 | 01 20 | 06 32.04 | +23 44.8 | | | | | |
| 1986 | 01 30 | 06 25.27 | +23 47.6 | 1.925 | 2.800 | 146.5 | 11.2 | 17.4 |
| 1986 | 02 09 | 06 20.94 | +23 47.9 | | | | | |
| 1986 | 02 19 | 06 19.41 | +23 46.4 | 2.098 | 2.784 | 124.9 | 16.9 | 17.7 |
| 1986 | 03 01 | 06 20.69 | +23 43.7 | | | | | |
| 1986 | 03 11 | 06 24.64 | +23 39.4 | 2.326 | 2.770 | 106.0 | 20.2 | 18.0 |
| 1986 | 03 21 | 06 30.99 | +23 33.3 | | | | | |
| 1986 | 03 31 | 06 39.43 | +23 24.4 | 2.577 | 2.757 | 89.6 | 21.2 | 18.2 |

(3159) 1976 US2 a,e,i = 2.57, 0.11, 15 Elements MPC 9294

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 1985 | 10 22 | 07 14.88 | +10 17.0 | 2.515 | 2.846 | 99.0 | 20.2 | 18.7 |
| 1985 | 11 01 | 07 18.63 | +09 04.7 | | | | | |
| 1985 | 11 11 | 07 20.04 | +07 53.0 | 2.263 | 2.849 | 116.7 | 18.1 | 18.5 |
| 1985 | 11 21 | 07 18.92 | +06 44.4 | | | | | |
| 1985 | 12 01 | 07 15.23 | +05 41.9 | 2.057 | 2.851 | 136.1 | 13.9 | 18.2 |
| 1985 | 12 11 | 07 09.13 | +04 49.0 | | | | | |
| 1985 | 12 21 | 07 01.03 | +04 09.0 | 1.930 | 2.851 | 154.8 | 8.5 | 17.9 |
| 1985 | 12 31 | 06 51.70 | +03 44.6 | | | | | |
| 1986 | 01 10 | 06 42.07 | +03 37.1 | 1.909 | 2.849 | 159.1 | 7.1 | 17.8 |
| 1986 | 01 20 | 06 33.17 | +03 45.8 | | | | | |
| 1986 | 01 30 | 06 25.91 | +04 08.5 | 1.998 | 2.846 | 142.9 | 12.1 | 18.1 |
| 1986 | 02 09 | 06 20.88 | +04 41.6 | | | | | |
| 1986 | 02 19 | 06 18.41 | +05 21.2 | 2.176 | 2.842 | 123.3 | 16.9 | 18.3 |
| 1986 | 03 01 | 06 18.57 | +06 03.8 | | | | | |
| 1986 | 03 11 | 06 21.20 | +06 46.2 | 2.408 | 2.835 | 105.2 | 19.8 | 18.6 |
| 1986 | 03 21 | 06 26.12 | +07 26.0 | | | | | |
| 1986 | 03 31 | 06 33.02 | +08 01.2 | 2.663 | 2.828 | 89.0 | 20.7 | 18.9 |