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Smithsonian Astrophysical Observatory
Cambridge, MA 02138, U.S.A.

TWX 710-320-6842 ASTROGRAM CAM ** Brian G. Marsden, Director
Telephone 617-864-5758 ** Conrad M. Bardwell, Assistant Director

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OBSERVATION MADE AT THE HOHER LIST OBSERVATORY BY M. HOFFMANN.

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | Obs. |
|--------|---------|---------|--------------|-------------|------|------|
| /1979i | 1979 09 | 25.8083 | 13 23 17.20 | +66 26 06.8 | 12 T | 017 |

OBSERVATIONS MADE AT THE MAIN ASTRONOMICAL OBSERVATORY OF THE UKRAINIAN ACADEMY OF SCIENCES. FROM KIEV KOMET. TSIRK. NO. 241 AND BYULL. INST. TEOR. ASTRON. 14, 499, 1979.

| Object | Date | UT | R. A. (1950) | Decl. | Obs. |
|--------|---------|----------|--------------|-------------|------|
| /19771 | 1977 08 | 27.03239 | 00 19 28.37 | -03 38 07.7 | 083 |
| /19771 | 1977 08 | 27.04249 | 00 19 28.45 | -03 38 07.9 | 083 |
| /19771 | 1977 09 | 17.96833 | 00 11 36.84 | -05 28 25.5 | 083 |
| /19771 | 1977 09 | 17.96833 | 00 11 36.79 | -05 28 24.1 | 083 |
| /19771 | 1977 10 | 07.92500 | 00 01 29.74 | -07 07 20.3 | 083 |
| /19771 | 1977 10 | 07.92512 | 00 01 29.68 | -07 07 21.7 | 083 |
| /19771 | 1977 10 | 11.87961 | 23 59 40.28 | -07 22 32.2 | 083 |
| /19771 | 1977 10 | 11.87973 | 23 59 40.48 | -07 22 38.0 | 083 |
| /19771 | 1977 10 | 12.84916 | 23 59 14.89 | -07 25 57.8 | 083 |
| /19771 | 1977 10 | 12.84916 | 23 59 14.90 | -07 25 58.4 | 083 |
| /19771 | 1977 11 | 05.79963 | 23 53 38.92 | -08 01 07.0 | 083 |
| /19771 | 1977 11 | 05.79963 | 23 53 38.63 | -08 01 04.6 | 083 |
| /19771 | 1977 11 | 13.81037 | 23 54 22.84 | -07 49 59.0 | 083 |
| /19771 | 1977 11 | 13.81043 | 23 54 23.02 | -07 49 57.2 | 083 |
| 1 | 1959 06 | 01.89370 | 15 06 07.04 | -10 13 46.8 | 083 |
| 1 | 1965 08 | 21.03285 | 00 28 05.55 | -13 28 50.6 | 083 |
| 1 | 1970 12 | 07.81917 | 01 40 24.16 | +00 21 15.4 | 083 |
| 1 | 1971 01 | 14.69619 | 01 47 28.05 | +04 15 15.1 | 083 |
| 1 | 1971 01 | 14.71832 | 01 47 28.82 | +04 15 25.6 | 083 |
| 1 | 1972 01 | 26.96418 | 09 40 53.83 | +28 19 17.5 | 083 |
| 1 | 1972 01 | 26.98841 | 09 40 52.64 | +28 19 29.2 | 083 |
| 1 | 1972 02 | 01.96266 | 09 35 46.94 | +29 06 42.6 | 083 |
| 1 | 1972 02 | 01.99236 | 09 35 45.29 | +29 06 55.9 | 083 |
| 1 | 1972 02 | 02.96331 | 09 34 52.95 | +29 14 12.3 | 083 |
| 1 | 1972 02 | 02.98963 | 09 34 51.48 | +29 14 24.0 | 083 |
| 1 | 1972 02 | 04.91834 | 09 33 05.91 | +29 28 26.4 | 083 |
| 1 | 1972 02 | 04.94950 | 09 33 04.14 | +29 28 39.7 | 083 |
| 1 | 1972 02 | 07.94190 | 09 30 17.02 | +29 49 16.1 | 083 |
| 1 | 1972 02 | 07.96400 | 09 30 15.73 | +29 49 24.8 | 083 |
| 1 | 1972 02 | 16.90706 | 09 21 53.38 | +30 40 39.4 | 083 |
| 1 | 1972 02 | 16.92773 | 09 21 52.22 | +30 40 45.0 | 083 |
| 1 | 1973 05 | 21.92887 | 16 47 10.34 | -18 51 14.1 | 083 |
| 1 | 1973 05 | 21.95057 | 16 47 09.08 | -18 51 16.2 | 083 |
| 1 | 1973 06 | 21.83341 | 16 18 52.20 | -19 45 25.8 | 083 |
| 1 | 1973 06 | 21.85765 | 16 18 51.06 | -19 45 28.5 | 083 |
| 2 | 1955 07 | 09.86289 | 17 03 45.81 | +23 55 23.8 | 083 |
| 2 | 1955 07 | 16.82320 | 17 00 12.25 | +22 59 33.7 | 083 |
| 2 | 1955 08 | 17.78780 | 16 56 35.30 | +17 21 38.1 | 083 |

| | | | | | | | | | | |
|----|------|----|----------|----|----|-------|-----|----|------|-----|
| 2 | 1960 | 06 | 23.97845 | 19 | 13 | 27.88 | +22 | 10 | 21.3 | 083 |
| 2 | 1960 | 08 | 12.87744 | 18 | 38 | 01.03 | +17 | 04 | 32.1 | 083 |
| 2 | 1969 | 05 | 27.00898 | 18 | 31 | 32.34 | +23 | 06 | 03.1 | 083 |
| 2 | 1969 | 05 | 27.01741 | 18 | 31 | 32.01 | +23 | 06 | 06.4 | 083 |
| 2 | 1969 | 06 | 14.93535 | 18 | 17 | 45.69 | +24 | 19 | 19.7 | 083 |
| 2 | 1973 | 05 | 21.86750 | 14 | 47 | 48.08 | +26 | 06 | 05.3 | 083 |
| 2 | 1973 | 05 | 21.89171 | 14 | 47 | 47.02 | +26 | 06 | 08.1 | 083 |
| 3 | 1952 | 08 | 14.91298 | 20 | 59 | 51.64 | -05 | 08 | 22.4 | 083 |
| 3 | 1970 | 12 | 07.85108 | 03 | 21 | 14.28 | -04 | 54 | 44.7 | 083 |
| 3 | 1970 | 12 | 07.86909 | 03 | 21 | 13.73 | -04 | 54 | 42.1 | 083 |
| 3 | 1971 | 01 | 14.77817 | 03 | 24 | 51.15 | -00 | 43 | 15.3 | 083 |
| 3 | 1971 | 01 | 14.79929 | 03 | 24 | 51.96 | -00 | 43 | 01.9 | 083 |
| 3 | 1973 | 05 | 22.00013 | 17 | 12 | 00.87 | -04 | 43 | 58.9 | 083 |
| 3 | 1973 | 05 | 22.02433 | 17 | 11 | 59.61 | -04 | 43 | 53.1 | 083 |
| 4 | 1956 | 05 | 10.88086 | 14 | 11 | 55.21 | -00 | 58 | 29.3 | 083 |
| 4 | 1960 | 06 | 04.99576 | 19 | 08 | 33.48 | -19 | 53 | 22.5 | 083 |
| 4 | 1969 | 12 | 31.07638 | 09 | 58 | 53.39 | +17 | 06 | 01.2 | 083 |
| 4 | 1970 | 02 | 12.95375 | 09 | 28 | 57.31 | +22 | 22 | 38.7 | 083 |
| 4 | 1970 | 02 | 12.97592 | 09 | 28 | 55.89 | +22 | 22 | 48.1 | 083 |
| 4 | 1970 | 04 | 10.78624 | 09 | 04 | 44.41 | +24 | 18 | 23.5 | 083 |
| 4 | 1971 | 08 | 17.86579 | 19 | 46 | 48.88 | -26 | 10 | 48.4 | 083 |
| 4 | 1971 | 08 | 17.88276 | 19 | 46 | 48.27 | -26 | 10 | 52.0 | 083 |
| 6 | 1953 | 07 | 04.92551 | 19 | 40 | 48.56 | -08 | 27 | 47.7 | 083 |
| 6 | 1953 | 08 | 11.82933 | 19 | 07 | 57.62 | -14 | 28 | 26.0 | 083 |
| 6 | 1955 | 01 | 15.93999 | 08 | 27 | 57.86 | +11 | 36 | 33.3 | 083 |
| 6 | 1955 | 01 | 26.89577 | 08 | 16 | 59.85 | +13 | 22 | 30.0 | 083 |
| 6 | 1955 | 01 | 29.94164 | 08 | 13 | 58.95 | +13 | 52 | 43.7 | 083 |
| 6 | 1955 | 03 | 01.81965 | 07 | 53 | 06.25 | +18 | 22 | 03.8 | 083 |
| 6 | 1956 | 05 | 26.84690 | 13 | 56 | 53.64 | +09 | 45 | 53.6 | 083 |
| 6 | 1957 | 08 | 01.97110 | 22 | 33 | 37.64 | -11 | 22 | 55.8 | 083 |
| 6 | 1957 | 08 | 03.98060 | 22 | 32 | 59.02 | -11 | 49 | 43.2 | 083 |
| 6 | 1957 | 08 | 06.96282 | 22 | 31 | 50.49 | -12 | 31 | 12.6 | 083 |
| 6 | 1959 | 02 | 06.93680 | 10 | 10 | 23.62 | +14 | 02 | 59.5 | 083 |
| 6 | 1959 | 02 | 07.96087 | 10 | 09 | 29.73 | +14 | 13 | 44.0 | 083 |
| 6 | 1960 | 08 | 02.79736 | 15 | 12 | 48.64 | -02 | 37 | 24.8 | 083 |
| 6 | 1968 | 05 | 22.01100 | 18 | 57 | 14.64 | -05 | 33 | 52.1 | 083 |
| 6 | 1968 | 07 | 06.89802 | 18 | 23 | 14.09 | -07 | 08 | 16.5 | 083 |
| 6 | 1968 | 07 | 06.91117 | 18 | 23 | 13.29 | -07 | 08 | 21.7 | 083 |
| 6 | 1972 | 08 | 13.86787 | 20 | 41 | 47.65 | -16 | 06 | 25.2 | 083 |
| 6 | 1972 | 08 | 13.89072 | 20 | 41 | 46.47 | -16 | 06 | 43.4 | 083 |
| 7 | 1954 | 10 | 15.70430 | 20 | 56 | 02.08 | -09 | 20 | 40.9 | 083 |
| 7 | 1954 | 11 | 12.70420 | 21 | 25 | 04.65 | -08 | 24 | 30.7 | 083 |
| 7 | 1958 | 09 | 13.99322 | 01 | 58 | 31.04 | +21 | 56 | 28.5 | 083 |
| 7 | 1962 | 11 | 05.13461 | 07 | 42 | 53.37 | +20 | 38 | 55.5 | 083 |
| 7 | 1965 | 08 | 18.88207 | 20 | 29 | 40.29 | -10 | 40 | 35.4 | 083 |
| 7 | 1969 | 11 | 12.81451 | 00 | 22 | 08.42 | +11 | 00 | 57.1 | 083 |
| 11 | 1969 | 05 | 08.89960 | 14 | 51 | 20.22 | -08 | 20 | 10.9 | 083 |
| 18 | 1959 | 02 | 28.97763 | 13 | 18 | 46.25 | +00 | 41 | 07.0 | 083 |
| 18 | 1959 | 03 | 14.99120 | 13 | 10 | 55.96 | +02 | 35 | 34.0 | 083 |
| 18 | 1965 | 01 | 24.80993 | 04 | 47 | 58.82 | +09 | 08 | 10.1 | 083 |
| 18 | 1970 | 05 | 07.99567 | 16 | 26 | 43.81 | -05 | 28 | 41.2 | 083 |
| 18 | 1973 | 04 | 19.90499 | 13 | 14 | 44.54 | +05 | 05 | 31.5 | 083 |
| 18 | 1973 | 04 | 19.93593 | 13 | 14 | 42.88 | +05 | 05 | 42.9 | 083 |
| 39 | 1953 | 03 | 21.95773 | 12 | 25 | 27.12 | +04 | 33 | 44.9 | 083 |
| 39 | 1953 | 05 | 01.84974 | 12 | 00 | 06.15 | +08 | 19 | 02.5 | 083 |
| 39 | 1954 | 05 | 31.98307 | 18 | 07 | 05.40 | -08 | 17 | 12.6 | 083 |
| 39 | 1954 | 06 | 04.98946 | 18 | 04 | 12.55 | -08 | 11 | 54.4 | 083 |
| 39 | 1954 | 07 | 22.84582 | 17 | 27 | 47.53 | -09 | 43 | 06.5 | 083 |
| 39 | 1955 | 09 | 16.99554 | 02 | 34 | 20.55 | +03 | 48 | 01.6 | 083 |

| | | | | | | | | | | |
|----|------|----|----------|----|----|-------|-----|----|------|-----|
| 39 | 1955 | 10 | 10.97233 | 02 | 25 | 18.38 | +00 | 36 | 14.1 | 083 |
| 39 | 1955 | 10 | 15.90355 | 02 | 21 | 56.65 | -00 | 04 | 12.4 | 083 |
| 39 | 1957 | 03 | 24.83354 | 08 | 45 | 00.25 | +15 | 07 | 12.3 | 083 |
| 39 | 1957 | 04 | 02.77736 | 08 | 45 | 30.33 | +15 | 35 | 13.6 | 083 |
| 39 | 1957 | 04 | 03.77842 | 08 | 45 | 40.65 | +15 | 37 | 46.0 | 083 |
| 39 | 1959 | 08 | 27.81806 | 20 | 29 | 18.30 | -13 | 06 | 46.9 | 083 |
| 39 | 1959 | 08 | 27.83467 | 20 | 29 | 17.73 | -13 | 06 | 54.4 | 083 |
| 40 | 1955 | 04 | 20.87692 | 12 | 52 | 50.49 | +01 | 52 | 34.7 | 083 |
| 40 | 1958 | 03 | 25.81213 | 09 | 08 | 47.34 | +21 | 59 | 52.9 | 083 |
| 40 | 1969 | 05 | 08.95662 | 16 | 17 | 50.72 | -16 | 58 | 48.9 | 083 |
| 40 | 1972 | 03 | 14.96597 | 12 | 44 | 56.32 | +03 | 00 | 33.3 | 083 |
| 40 | 1972 | 03 | 14.99299 | 12 | 44 | 54.86 | +03 | 00 | 44.7 | 083 |

OBSERVATIONS MADE AT SARATOV BY YU. V. MIKHAILOV. FROM BYULL. INST. TEOR.
ASTRON. 14, 507, 1979.

| Object | Date | UT | R. A. (1950) | | Decl. | | O - C | | Obs. |
|--------|------|----|--------------|-------|-------|--------|-------|---------|------|
| 2 | 1975 | 09 | 04.87419 | 00 07 | 23.11 | -01 21 | 18.0 | 0.0 0 | 128 |
| 4 | 1975 | 09 | 02.87953 | 00 11 | 46.09 | -10 52 | 24.2 | 0.2- 0 | 128 |
| 4 | 1975 | 09 | 13.89321 | 00 02 | 41.95 | -12 18 | 02.2 | 0.1+ 0 | 128 |
| 6 | 1975 | 05 | 16.88300 | 14 47 | 19.71 | +07 11 | 53.1 | 0.1- 0 | 128 |
| 6 | 1975 | 05 | 17.83855 | 14 46 | 30.16 | +07 13 | 53.4 | 0.1- 0 | 128 |
| 6 | 1975 | 05 | 29.85699 | 14 37 | 02.66 | +07 19 | 57.8 | 0.4- 0 | 128 |
| 6 | 1975 | 05 | 30.87675 | 14 36 | 20.02 | +07 18 | 56.2 | 0.2- 0 | 128 |
| 6 | 1975 | 06 | 02.88025 | 14 34 | 22.71 | +07 14 | 41.6 | 0.2- 1- | 128 |
| 6 | 1975 | 06 | 03.86013 | 14 33 | 46.48 | +07 12 | 47.5 | 0.2- 1- | 128 |
| 6 | 1975 | 06 | 05.85539 | 14 32 | 36.68 | +07 08 | 29.8 | 0.2- 2- | 128 |
| 6 | 1975 | 06 | 06.86239 | 14 32 | 03.01 | +07 05 | 59.2 | 0.1- 0 | 128 |
| 6 | 1975 | 06 | 07.83635 | 14 31 | 31.81 | +07 03 | 16.9 | | 128 |
| 6 | 1975 | 06 | 09.82535 | 14 30 | 31.96 | +06 57 | 20.5 | | 128 |
| 6 | 1975 | 06 | 10.85402 | 14 30 | 03.30 | +06 53 | 55.1 | | 128 |
| 6 | 1975 | 06 | 12.84907 | 14 29 | 10.96 | +06 46 | 50.7 | | 128 |
| 6 | 1975 | 06 | 13.86025 | 14 28 | 45.73 | +06 49 | 53.0 | | 128 |
| 9 | 1969 | 02 | 19.78332 | 09 44 | 28.85 | +23 42 | 19.5 | 0.1- 2+ | 128 |
| 9 | 1969 | 03 | 09.96146 | 09 29 | 17.12 | +24 27 | 14.5 | 0.1+ 0 | 128 |
| 9 | 1969 | 03 | 19.86787 | 09 24 | 20.11 | +24 20 | 02.8 | | 128 |
| 9 | 1969 | 03 | 24.99581 | 09 23 | 30.37 | +24 11 | 13.9 | | 128 |
| 9 | 1969 | 04 | 09.86715 | 09 25 | 16.49 | +23 13 | 11.9 | | 128 |
| 9 | 1969 | 04 | 11.89737 | 09 26 | 01.95 | +23 03 | 23.4 | | 128 |
| 9 | 1969 | 04 | 14.80082 | 09 27 | 18.69 | +22 48 | 23.8 | | 128 |
| 9 | 1969 | 04 | 14.82660 | 09 27 | 19.31 | +22 48 | 15.0 | | 128 |
| 9 | 1969 | 04 | 15.81945 | 09 27 | 48.56 | +22 42 | 55.6 | | 128 |
| 12 | 1975 | 09 | 11.94653 | 02 19 | 53.06 | +22 34 | 48.5 | | 128 |
| 12 | 1975 | 10 | 02.84028 | 02 11 | 14.54 | +21 16 | 27.6 | 0.2+ 2+ | 128 |
| 12 | 1975 | 10 | 06.80640 | 02 08 | 08.59 | +20 49 | 03.8 | 0.1+ 2+ | 128 |
| 18 | 1969 | 02 | 19.80034 | 10 18 | 25.02 | +11 01 | 16.2 | 0.1- 3+ | 128 |
| 433 | 1974 | 12 | 15.92639 | 07 59 | 54.76 | +54 53 | 39.3 | 0.6- 0 | 128 |
| 433 | 1975 | 03 | 03.77188 | 07 53 | 49.27 | +08 28 | 24.7 | 0.2- 0 | 128 |
| 433 | 1975 | 03 | 03.80899 | 07 53 | 51.28 | +08 28 | 54.4 | 0.2- 0 | 128 |
| 433 | 1975 | 03 | 16.75154 | 08 13 | 38.03 | +11 52 | 57.6 | 0.2- 0 | 128 |

OBSERVATIONS MADE AT GEISEI BY T. SEKI.

| Object | Date | UT | R. A. (1950) | | Decl. | | N | Obs. |
|--------|------|----|--------------|-------|-------|--------|------|-------|
| /1979i | 1979 | 09 | 25.43299 | 13 23 | 55.1 | +66 34 | 26 | 1 372 |
| /1979i | 1979 | 10 | 19.82604 | 12 53 | 49.11 | +59 08 | 01.4 | 372 |
| /1979i | 1979 | 10 | 19.83576 | 12 53 | 48.45 | +59 07 | 50.6 | 2 372 |
| /1979i | 1979 | 10 | 23.81910 | 12 49 | 38.57 | +58 13 | 05.9 | 372 |
| /1979i | 1979 | 10 | 23.82917 | 12 49 | 38.19 | +58 12 | 59.3 | 372 |

Note 1: comet very diffuse and uncondensed. 2: very good image with
condensation and a tail > 30" long.

OBSERVATIONS MADE AT THE UPPSALA SOUTHERN STATION BY C.-I. LAGERKVIST (WITH ASSISTANCE FROM M. CARLSSON AND G. HAHN).

| Object | Date | UT | R. A. (1950) | | | Decl. | Obs. |
|--------|---------|----------|--------------|-------|--------|-------|------|
| 253 | 1978 02 | 01.72551 | 11 42 | 33.95 | -00 36 | 59.5 | 414 |
| 253 | 1978 02 | 01.74006 | 11 42 | 33.64 | -00 36 | 57.3 | 414 |
| 253 | 1978 02 | 09.55477 | 11 39 | 13.66 | -00 09 | 12.1 | 414 |
| 253 | 1978 02 | 09.56932 | 11 39 | 13.14 | -00 09 | 07.1 | 414 |
| 253 | 1978 02 | 12.66154 | 11 37 | 35.19 | +00 04 | 11.8 | 414 |
| 253 | 1978 02 | 12.67609 | 11 37 | 34.83 | +00 04 | 16.3 | 414 |
| 289 | 1978 02 | 01.72551 | 11 35 | 16.77 | -00 24 | 50.0 | 414 |
| 289 | 1978 02 | 01.74006 | 11 35 | 16.40 | -00 24 | 46.3 | 414 |
| 289 | 1978 02 | 09.55477 | 11 31 | 48.61 | +00 03 | 17.2 | 414 |
| 289 | 1978 02 | 09.56932 | 11 31 | 48.17 | +00 03 | 21.2 | 414 |
| 289 | 1978 02 | 12.66154 | 11 30 | 08.61 | +00 16 | 40.5 | 414 |
| 289 | 1978 02 | 12.67609 | 11 30 | 08.15 | +00 16 | 44.3 | 414 |
| 289 | 1978 02 | 28.64210 | 11 19 | 38.23 | +01 41 | 31.6 | 414 |
| 289 | 1978 02 | 28.65318 | 11 19 | 37.75 | +01 41 | 34.8 | 414 |
| 289 | 1978 03 | 05.66653 | 11 15 | 54.36 | +02 12 | 00.8 | 414 |
| 289 | 1978 03 | 05.67761 | 11 15 | 53.90 | +02 12 | 04.8 | 414 |
| 289 | 1978 03 | 15.40861 | 11 08 | 35.92 | +03 12 | 49.7 | 414 |
| 289 | 1978 03 | 15.41969 | 11 08 | 35.50 | +03 12 | 53.9 | 414 |
| 314 | 1978 02 | 01.70612 | 11 29 | 26.45 | +00 57 | 32.9 | 414 |
| 314 | 1978 02 | 01.72067 | 11 29 | 26.08 | +00 57 | 36.5 | 414 |
| 314 | 1978 02 | 07.58378 | 11 27 | 04.06 | +01 23 | 49.4 | 414 |
| 314 | 1978 02 | 07.59832 | 11 27 | 03.62 | +01 23 | 53.5 | 414 |
| 314 | 1978 02 | 12.64492 | 11 24 | 36.61 | +01 49 | 41.8 | 414 |
| 314 | 1978 02 | 12.65600 | 11 24 | 36.24 | +01 49 | 45.5 | 414 |
| 314 | 1978 02 | 28.64210 | 11 14 | 59.02 | +03 26 | 31.1 | 414 |
| 314 | 1978 02 | 28.65318 | 11 14 | 58.56 | +03 26 | 34.8 | 414 |
| 314 | 1978 03 | 05.66653 | 11 11 | 36.46 | +03 59 | 49.7 | 414 |
| 314 | 1978 03 | 05.67761 | 11 11 | 36.07 | +03 59 | 54.1 | 414 |
| 353 | 1975 04 | 06.55012 | 13 01 | 31.40 | +02 31 | 14.2 | 414 |
| 353 | 1975 04 | 06.57090 | 13 01 | 30.79 | +02 31 | 19.6 | 414 |
| 353 | 1975 04 | 07.45597 | 13 00 | 45.40 | +02 35 | 46.7 | 414 |
| 353 | 1975 04 | 07.46359 | 13 00 | 44.87 | +02 35 | 49.1 | 414 |
| 353 | 1975 04 | 07.61941 | 13 00 | 36.86 | +02 36 | 34.5 | 414 |
| 353 | 1975 04 | 07.62703 | 13 00 | 36.31 | +02 36 | 37.3 | 414 |
| 378 | 1978 01 | 09.72529 | 09 56 | 16.82 | +02 12 | 12.9 | 414 |
| 378 | 1978 01 | 09.73984 | 09 56 | 16.43 | +02 12 | 13.1 | 414 |
| 378 | 1978 01 | 13.67212 | 09 54 | 21.04 | +02 11 | 37.0 | 414 |
| 378 | 1978 01 | 13.68667 | 09 54 | 20.53 | +02 11 | 37.6 | 414 |
| 378 | 1978 02 | 01.56276 | 09 41 | 09.63 | +02 44 | 27.1 | 414 |
| 378 | 1978 02 | 01.57385 | 09 41 | 09.09 | +02 44 | 30.2 | 414 |
| 378 | 1978 02 | 07.47851 | 09 36 | 09.62 | +03 05 | 36.9 | 414 |
| 378 | 1978 02 | 07.48959 | 09 36 | 09.05 | +03 05 | 39.8 | 414 |
| 378 | 1978 02 | 12.53827 | 09 31 | 47.47 | +03 26 | 51.2 | 414 |
| 378 | 1978 02 | 12.55074 | 09 31 | 46.82 | +03 26 | 55.6 | 414 |
| 378 | 1978 02 | 27.40798 | 09 19 | 43.75 | +04 39 | 39.5 | 414 |
| 378 | 1978 02 | 27.41906 | 09 19 | 43.27 | +04 39 | 43.7 | 414 |
| 378 | 1978 03 | 05.54880 | 09 15 | 32.91 | +05 11 | 15.1 | 414 |
| 378 | 1978 03 | 05.55988 | 09 15 | 32.47 | +05 11 | 18.2 | 414 |
| 439 | 1978 01 | 11.68036 | 10 07 | 21.04 | -11 40 | 56.4 | 414 |
| 439 | 1978 01 | 11.69490 | 10 07 | 20.77 | -11 40 | 58.0 | 414 |
| 439 | 1978 02 | 07.49583 | 09 52 | 56.13 | -10 56 | 53.0 | 414 |
| 439 | 1978 02 | 07.50691 | 09 52 | 55.68 | -10 56 | 48.9 | 414 |
| 439 | 1978 02 | 12.55766 | 09 49 | 19.37 | -10 29 | 23.5 | 414 |
| 439 | 1978 02 | 12.56874 | 09 49 | 18.93 | -10 29 | 19.4 | 414 |
| 439 | 1978 02 | 26.43287 | 09 39 | 30.59 | -08 48 | 00.2 | 414 |
| 439 | 1978 02 | 26.44395 | 09 39 | 30.04 | -08 47 | 53.4 | 414 |

| | | | | | | | | | | |
|-----|------|----|----------|----|----|-------|-----|----|------|-----|
| 439 | 1978 | 03 | 05.56611 | 09 | 35 | 00.67 | -07 | 44 | 55.5 | 414 |
| 439 | 1978 | 03 | 05.57720 | 09 | 35 | 00.22 | -07 | 44 | 48.1 | 414 |
| 439 | 1978 | 03 | 14.46328 | 09 | 30 | 25.32 | -06 | 20 | 46.2 | 414 |
| 439 | 1978 | 03 | 14.47436 | 09 | 30 | 24.99 | -06 | 20 | 39.1 | 414 |
| 510 | 1978 | 01 | 13.67212 | 09 | 55 | 58.78 | +00 | 04 | 16.8 | 414 |
| 510 | 1978 | 01 | 13.68667 | 09 | 55 | 58.42 | +00 | 04 | 18.8 | 414 |
| 510 | 1978 | 02 | 01.56276 | 09 | 43 | 15.94 | +00 | 49 | 46.7 | 414 |
| 510 | 1978 | 02 | 01.57385 | 09 | 43 | 15.44 | +00 | 49 | 50.1 | 414 |
| 510 | 1978 | 02 | 07.47851 | 09 | 38 | 19.49 | +01 | 16 | 08.4 | 414 |
| 510 | 1978 | 02 | 07.48959 | 09 | 38 | 18.88 | +01 | 16 | 11.6 | 414 |
| 510 | 1978 | 02 | 12.53827 | 09 | 33 | 56.57 | +01 | 42 | 30.0 | 414 |
| 510 | 1978 | 02 | 12.55074 | 09 | 33 | 55.95 | +01 | 42 | 34.7 | 414 |
| 510 | 1978 | 02 | 27.40798 | 09 | 21 | 26.51 | +03 | 13 | 56.4 | 414 |
| 510 | 1978 | 02 | 27.41906 | 09 | 21 | 25.98 | +03 | 14 | 01.1 | 414 |
| 510 | 1978 | 03 | 05.55988 | 09 | 16 | 54.20 | +03 | 54 | 45.4 | 414 |
| 541 | 1978 | 02 | 01.63548 | 10 | 47 | 44.91 | -00 | 52 | 35.3 | 414 |
| 541 | 1978 | 02 | 01.64656 | 10 | 47 | 44.45 | -00 | 52 | 34.1 | 414 |
| 541 | 1978 | 02 | 07.51314 | 10 | 44 | 01.93 | -00 | 45 | 01.2 | 414 |
| 541 | 1978 | 02 | 07.52422 | 10 | 44 | 01.49 | -00 | 44 | 59.9 | 414 |
| 541 | 1978 | 02 | 12.57428 | 10 | 40 | 22.66 | -00 | 34 | 11.9 | 414 |
| 541 | 1978 | 02 | 12.58536 | 10 | 40 | 22.11 | -00 | 34 | 10.1 | 414 |
| 541 | 1978 | 02 | 28.44680 | 10 | 27 | 22.44 | +00 | 21 | 15.3 | 414 |
| 541 | 1978 | 02 | 28.45788 | 10 | 27 | 21.87 | +00 | 21 | 18.5 | 414 |
| 541 | 1978 | 03 | 05.58274 | 10 | 23 | 04.62 | +00 | 44 | 09.6 | 414 |
| 541 | 1978 | 03 | 05.59382 | 10 | 23 | 03.99 | +00 | 44 | 12.1 | 414 |
| 541 | 1978 | 03 | 15.45778 | 10 | 15 | 24.81 | +01 | 30 | 54.4 | 414 |
| 541 | 1978 | 03 | 15.46886 | 10 | 15 | 24.35 | +01 | 30 | 57.6 | 414 |
| 541 | 1978 | 03 | 15.67386 | 10 | 15 | 14.81 | +01 | 32 | 00.0 | 414 |
| 585 | 1978 | 02 | 28.49666 | 10 | 58 | 31.64 | +01 | 53 | 57.0 | 414 |
| 585 | 1978 | 02 | 28.50774 | 10 | 58 | 31.07 | +01 | 54 | 03.8 | 414 |
| 585 | 1978 | 03 | 05.63260 | 10 | 54 | 26.27 | +02 | 45 | 27.0 | 414 |
| 585 | 1978 | 03 | 05.64368 | 10 | 54 | 25.73 | +02 | 45 | 33.7 | 414 |
| 585 | 1978 | 03 | 15.69117 | 10 | 46 | 44.99 | +04 | 28 | 05.3 | 414 |
| 585 | 1978 | 03 | 15.70225 | 10 | 46 | 44.56 | +04 | 28 | 11.8 | 414 |
| 588 | 1978 | 02 | 01.68604 | 11 | 22 | 52.57 | -02 | 34 | 11.3 | 414 |
| 588 | 1978 | 02 | 01.70058 | 11 | 22 | 52.35 | -02 | 34 | 10.6 | 414 |
| 588 | 1978 | 02 | 07.62395 | 11 | 20 | 41.12 | -02 | 32 | 17.4 | 414 |
| 588 | 1978 | 02 | 07.63849 | 11 | 20 | 40.82 | -02 | 32 | 18.8 | 414 |
| 588 | 1978 | 02 | 12.62415 | 11 | 18 | 34.32 | -02 | 28 | 32.2 | 414 |
| 588 | 1978 | 02 | 12.63869 | 11 | 18 | 33.93 | -02 | 28 | 31.0 | 414 |
| 588 | 1978 | 02 | 28.51328 | 11 | 10 | 42.26 | -02 | 05 | 01.8 | 414 |
| 588 | 1978 | 02 | 28.52436 | 11 | 10 | 41.84 | -02 | 05 | 00.3 | 414 |
| 588 | 1978 | 03 | 05.64991 | 11 | 07 | 56.73 | -01 | 54 | 26.7 | 414 |
| 588 | 1978 | 03 | 05.66099 | 11 | 07 | 56.41 | -01 | 54 | 25.4 | 414 |
| 589 | 1978 | 02 | 28.49666 | 11 | 05 | 06.15 | +01 | 55 | 50.2 | 414 |
| 589 | 1978 | 02 | 28.50774 | 11 | 05 | 05.65 | +01 | 55 | 55.1 | 414 |
| 589 | 1978 | 03 | 05.63260 | 11 | 01 | 32.25 | +02 | 32 | 10.8 | 414 |
| 589 | 1978 | 03 | 05.64368 | 11 | 01 | 31.75 | +02 | 32 | 15.4 | 414 |
| 589 | 1978 | 03 | 15.69117 | 10 | 54 | 38.37 | +03 | 44 | 46.9 | 414 |
| 589 | 1978 | 03 | 15.70225 | 10 | 54 | 37.86 | +03 | 44 | 51.8 | 414 |
| 624 | 1978 | 02 | 01.70612 | 11 | 30 | 05.36 | +01 | 57 | 06.2 | 414 |
| 624 | 1978 | 02 | 01.72067 | 11 | 30 | 05.03 | +01 | 57 | 06.0 | 414 |
| 624 | 1978 | 02 | 07.58378 | 11 | 27 | 50.38 | +01 | 57 | 42.3 | 414 |
| 624 | 1978 | 02 | 07.59832 | 11 | 27 | 50.06 | +01 | 57 | 42.5 | 414 |
| 624 | 1978 | 02 | 12.64492 | 11 | 25 | 37.12 | +01 | 59 | 53.5 | 414 |
| 624 | 1978 | 02 | 12.65600 | 11 | 25 | 36.79 | +01 | 59 | 53.8 | 414 |
| 624 | 1978 | 02 | 28.64210 | 11 | 17 | 19.26 | +02 | 14 | 52.7 | 414 |
| 624 | 1978 | 02 | 28.65318 | 11 | 17 | 18.89 | +02 | 14 | 53.5 | 414 |
| 624 | 1978 | 03 | 05.66653 | 11 | 14 | 28.11 | +02 | 21 | 21.0 | 414 |

| | | | | | | | | | | |
|------|------|----|----------|----|----|-------|-----|----|------|-----|
| 624 | 1978 | 03 | 05.67761 | 11 | 14 | 27.75 | +02 | 21 | 21.6 | 414 |
| 624 | 1978 | 03 | 15.40861 | 11 | 08 | 53.30 | +02 | 34 | 55.8 | 414 |
| 624 | 1978 | 03 | 15.41969 | 11 | 08 | 52.91 | +02 | 34 | 56.9 | 414 |
| 787 | 1978 | 01 | 06.64207 | 09 | 47 | 27.73 | -02 | 56 | 17.2 | 414 |
| 787 | 1978 | 01 | 06.65592 | 09 | 47 | 27.43 | -02 | 56 | 16.9 | 414 |
| 787 | 1978 | 01 | 13.64996 | 09 | 44 | 10.75 | -02 | 48 | 36.7 | 414 |
| 787 | 1978 | 01 | 13.66451 | 09 | 44 | 10.22 | -02 | 48 | 34.4 | 414 |
| 787 | 1978 | 02 | 01.58216 | 09 | 30 | 48.48 | -01 | 34 | 31.4 | 414 |
| 787 | 1978 | 02 | 01.61332 | 09 | 30 | 46.90 | -01 | 34 | 21.1 | 414 |
| 801 | 1978 | 02 | 01.65210 | 10 | 54 | 28.78 | -05 | 57 | 58.0 | 414 |
| 801 | 1978 | 02 | 01.66318 | 10 | 54 | 28.41 | -05 | 57 | 54.7 | 414 |
| 801 | 1978 | 02 | 07.52976 | 10 | 51 | 41.31 | -05 | 26 | 44.5 | 414 |
| 801 | 1978 | 02 | 07.54084 | 10 | 51 | 41.02 | -05 | 26 | 40.1 | 414 |
| 801 | 1978 | 02 | 12.59090 | 10 | 48 | 43.05 | -04 | 52 | 05.3 | 414 |
| 801 | 1978 | 02 | 28.46342 | 10 | 37 | 16.94 | -02 | 23 | 40.6 | 414 |
| 801 | 1978 | 02 | 28.48004 | 10 | 37 | 16.41 | -02 | 23 | 33.2 | 414 |
| 801 | 1978 | 03 | 05.59936 | 10 | 33 | 21.95 | -01 | 26 | 20.3 | 414 |
| 801 | 1978 | 03 | 05.61044 | 10 | 33 | 21.43 | -01 | 26 | 12.7 | 414 |
| 911 | 1978 | 02 | 12.68163 | 11 | 44 | 10.06 | -06 | 05 | 01.2 | 414 |
| 911 | 1978 | 02 | 12.69617 | 11 | 44 | 09.66 | -06 | 05 | 02.1 | 414 |
| 911 | 1978 | 02 | 13.59371 | 11 | 43 | 46.87 | -06 | 05 | 24.3 | 414 |
| 911 | 1978 | 02 | 13.60826 | 11 | 43 | 46.48 | -06 | 05 | 24.9 | 414 |
| 911 | 1978 | 02 | 28.68019 | 11 | 36 | 25.86 | -06 | 03 | 21.0 | 414 |
| 911 | 1978 | 02 | 28.69127 | 11 | 36 | 25.42 | -06 | 03 | 19.8 | 414 |
| 911 | 1978 | 03 | 05.70185 | 11 | 33 | 41.63 | -05 | 59 | 25.9 | 414 |
| 911 | 1978 | 03 | 05.71293 | 11 | 33 | 41.24 | -05 | 59 | 25.8 | 414 |
| 911 | 1978 | 03 | 15.65516 | 11 | 28 | 05.99 | -05 | 47 | 57.7 | 414 |
| 911 | 1978 | 03 | 15.66624 | 11 | 28 | 05.64 | -05 | 47 | 57.4 | 414 |
| 1051 | 1975 | 04 | 07.45597 | 12 | 54 | 05.42 | +02 | 05 | 56.7 | 414 |
| 1051 | 1975 | 04 | 07.46359 | 12 | 54 | 05.20 | +02 | 06 | 02.3 | 414 |
| 1051 | 1975 | 04 | 07.61941 | 12 | 53 | 58.96 | +02 | 07 | 29.1 | 414 |
| 1051 | 1975 | 04 | 07.62703 | 12 | 53 | 58.61 | +02 | 07 | 33.4 | 414 |
| 1143 | 1978 | 02 | 09.55477 | 11 | 36 | 58.24 | -00 | 44 | 39.3 | 414 |
| 1143 | 1978 | 02 | 09.56932 | 11 | 36 | 57.88 | -00 | 44 | 35.3 | 414 |
| 1143 | 1978 | 02 | 12.66154 | 11 | 35 | 53.60 | -00 | 38 | 11.8 | 414 |
| 1143 | 1978 | 02 | 12.67609 | 11 | 35 | 53.19 | -00 | 38 | 11.0 | 414 |
| 1186 | 1975 | 04 | 06.55012 | 13 | 02 | 07.63 | +01 | 33 | 34.4 | 414 |
| 1186 | 1975 | 04 | 06.57090 | 13 | 02 | 06.68 | +01 | 33 | 38.4 | 414 |
| 1186 | 1975 | 04 | 07.45597 | 13 | 01 | 22.91 | +01 | 36 | 00.8 | 414 |
| 1186 | 1975 | 04 | 07.46359 | 13 | 01 | 22.58 | +01 | 36 | 01.5 | 414 |
| 1186 | 1975 | 04 | 07.61941 | 13 | 01 | 14.61 | +01 | 36 | 26.9 | 414 |
| 1186 | 1975 | 04 | 07.62703 | 13 | 01 | 14.29 | +01 | 36 | 27.9 | 414 |
| 1286 | 1978 | 01 | 06.66492 | 09 | 53 | 56.82 | +00 | 46 | 58.2 | 414 |
| 1286 | 1978 | 01 | 06.67946 | 09 | 53 | 56.52 | +00 | 47 | 01.6 | 414 |
| 1286 | 1978 | 01 | 09.72529 | 09 | 52 | 47.60 | +00 | 47 | 36.1 | 414 |
| 1286 | 1978 | 01 | 09.73984 | 09 | 52 | 47.19 | +00 | 47 | 35.8 | 414 |
| 1286 | 1978 | 01 | 13.67212 | 09 | 51 | 02.86 | +00 | 50 | 34.0 | 414 |
| 1286 | 1978 | 01 | 13.68667 | 09 | 51 | 02.44 | +00 | 50 | 35.0 | 414 |
| 1286 | 1978 | 02 | 01.56276 | 09 | 39 | 24.05 | +01 | 37 | 27.9 | 414 |
| 1286 | 1978 | 02 | 01.57385 | 09 | 39 | 23.56 | +01 | 37 | 31.1 | 414 |
| 1286 | 1978 | 02 | 07.47851 | 09 | 35 | 00.03 | +02 | 02 | 17.9 | 414 |
| 1286 | 1978 | 02 | 07.48959 | 09 | 34 | 59.34 | +02 | 02 | 20.7 | 414 |
| 1286 | 1978 | 02 | 12.53827 | 09 | 31 | 08.22 | +02 | 26 | 37.3 | 414 |
| 1286 | 1978 | 02 | 12.55074 | 09 | 31 | 07.67 | +02 | 26 | 40.1 | 414 |
| 1286 | 1978 | 02 | 27.40789 | 09 | 20 | 16.35 | +03 | 48 | 48.8 | 414 |
| 1286 | 1978 | 02 | 27.41906 | 09 | 20 | 15.71 | +03 | 48 | 54.7 | 414 |
| 1286 | 1978 | 03 | 05.54880 | 09 | 16 | 22.98 | +04 | 24 | 47.3 | 414 |
| 1286 | 1978 | 03 | 05.55988 | 09 | 16 | 22.54 | +04 | 24 | 52.9 | 414 |
| 1291 | 1978 | 02 | 07.52976 | 10 | 55 | 40.53 | -04 | 31 | 12.5 | 414 |

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|------|----|------|------|----------|----------|----|-------|-------|-----|------|------|-----|
| 1291 | | 1978 | 02 | 07.54084 | 10 | 55 | 40.20 | -04 | 31 | 12.0 | 414 | |
| 1291 | | 1978 | 02 | 12.59090 | 10 | 52 | 35.70 | -04 | 15 | 13.2 | 414 | |
| 1291 | | 1978 | 02 | 28.46342 | 10 | 41 | 25.65 | -03 | 01 | 52.7 | 414 | |
| 1291 | | 1978 | 02 | 28.47450 | 10 | 41 | 25.09 | -03 | 01 | 50.0 | 414 | |
| 1291 | | 1978 | 03 | 05.59936 | 10 | 37 | 37.99 | -02 | 32 | 19.4 | 414 | |
| 1291 | | 1978 | 03 | 05.61044 | 10 | 37 | 37.53 | -02 | 32 | 15.8 | 414 | |
| 1291 | | 1978 | 03 | 15.44116 | 10 | 30 | 41.38 | -01 | 31 | 20.6 | 414 | |
| 1437 | | 1978 | 02 | 07.52976 | 10 | 56 | 14.04 | -05 | 51 | 19.1 | 414 | |
| 1437 | | 1978 | 02 | 07.54084 | 10 | 56 | 13.64 | -05 | 51 | 20.3 | 414 | |
| 1437 | | 1978 | 02 | 12.59090 | 10 | 53 | 40.92 | -05 | 53 | 01.7 | 414 | |
| 1437 | | 1978 | 02 | 12.60198 | 10 | 53 | 40.58 | -05 | 53 | 01.4 | 414 | |
| 1437 | | 1978 | 02 | 28.48004 | 10 | 44 | 48.73 | -05 | 44 | 55.4 | 414 | |
| 1437 | | 1978 | 02 | 28.49112 | 10 | 44 | 48.22 | -05 | 44 | 53.5 | 414 | |
| 1437 | | 1978 | 03 | 05.61598 | 10 | 41 | 50.22 | -05 | 38 | 34.2 | 414 | |
| 1437 | | 1978 | 03 | 05.62706 | 10 | 41 | 49.98 | -05 | 38 | 32.7 | 414 | |
| 1437 | | 1978 | 03 | 15.42523 | 10 | 36 | 19.23 | -05 | 22 | 41.8 | 414 | |
| 1437 | | 1978 | 03 | 15.43631 | 10 | 36 | 19.05 | -05 | 22 | 39.0 | 414 | |
| 1491 | | 1978 | 02 | 01.66942 | 11 | 20 | 52.82 | +01 | 53 | 46.6 | 414 | |
| 1491 | | 1978 | 02 | 01.68050 | 11 | 20 | 52.60 | +01 | 53 | 47.4 | 414 | |
| 1491 | | 1978 | 02 | 07.54638 | 11 | 18 | 07.44 | +02 | 00 | 49.4 | 414 | |
| 1491 | | 1978 | 02 | 07.55746 | 11 | 18 | 07.07 | +02 | 00 | 50.7 | 414 | |
| 1491 | | 1978 | 02 | 12.60753 | 11 | 15 | 12.10 | +02 | 10 | 33.0 | 414 | |
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| 1491 | | 1978 | 02 | 28.50774 | 11 | 03 | 44.11 | +02 | 58 | 14.3 | 414 | |
| 1491 | | 1978 | 03 | 05.63260 | 10 | 59 | 40.04 | +03 | 17 | 08.2 | 414 | |
| 1491 | | 1978 | 03 | 05.64368 | 10 | 59 | 39.50 | +03 | 17 | 10.5 | 414 | |
| 1491 | | 1978 | 03 | 15.69117 | 10 | 51 | 53.28 | +03 | 55 | 05.4 | 414 | |
| 1491 | | 1978 | 03 | 15.70225 | 10 | 51 | 52.74 | +03 | 55 | 07.5 | 414 | |
| 1604 | | 1978 | 03 | 15.44116 | 10 | 33 | 18.82 | +00 | 54 | 23.3 | 414 | |
| 1604 | | 1978 | 03 | 15.45224 | 10 | 33 | 18.34 | +00 | 54 | 24.6 | 414 | |
| 1628 | | 1978 | 02 | 01.66318 | 10 | 57 | 23.88 | -06 | 14 | 28.8 | 414 | |
| 1628 | | 1978 | 02 | 07.52976 | 10 | 54 | 40.05 | -05 | 39 | 59.4 | 414 | |
| 1628 | | 1978 | 02 | 07.54084 | 10 | 54 | 39.77 | -05 | 39 | 55.1 | 414 | |
| 1628 | | 1978 | 02 | 12.59090 | 10 | 51 | 51.68 | -05 | 04 | 03.0 | 414 | |
| 1628 | | 1978 | 02 | 12.60198 | 10 | 51 | 51.25 | -05 | 03 | 58.3 | 414 | |
| 1628 | | 1978 | 02 | 28.46342 | 10 | 41 | 23.34 | -02 | 40 | 16.3 | 414 | |
| 1628 | | 1978 | 02 | 28.47450 | 10 | 41 | 22.84 | -02 | 40 | 08.9 | 414 | |
| 1628 | | 1978 | 03 | 05.59936 | 10 | 37 | 49.16 | -01 | 46 | 31.3 | 414 | |
| 1628 | | 1978 | 03 | 05.61044 | 10 | 37 | 48.73 | -01 | 46 | 24.9 | 414 | |
| 1628 | | 1978 | 03 | 15.44116 | 10 | 31 | 23.44 | +00 | 00 | 16.6 | 414 | |
| 1628 | | 1978 | 03 | 15.45224 | 10 | 31 | 23.04 | +00 | 00 | 24.2 | 414 | |
| 1804 | | 1978 | 02 | 01.70612 | 11 | 31 | 22.53 | +01 | 50 | 46.6 | 414 | |
| 1804 | | 1978 | 02 | 01.72067 | 11 | 31 | 22.19 | +01 | 50 | 47.1 | 414 | |
| 1804 | | 1978 | 02 | 07.58378 | 11 | 28 | 39.04 | +01 | 56 | 21.3 | 414 | |
| 1804 | | 1978 | 02 | 07.59832 | 11 | 28 | 38.55 | +01 | 56 | 22.7 | 414 | |
| 1804 | | 1978 | 02 | 12.64492 | 11 | 25 | 33.51 | +02 | 05 | 41.8 | 414 | |
| 1804 | | 1978 | 02 | 12.65600 | 11 | 25 | 33.03 | +02 | 05 | 43.8 | 414 | |
| 1804 | | 1978 | 02 | 28.64210 | 11 | 12 | 16.75 | +02 | 57 | 55.5 | 414 | |
| 1804 | | 1978 | 02 | 28.65311 | 11 | 12 | 16.11 | +02 | 57 | 58.8 | 414 | |
| 1804 | | 1978 | 03 | 05.66653 | 11 | 07 | 25.95 | +03 | 19 | 11.6 | 414 | |
| 1804 | | 1978 | 03 | 05.67761 | 11 | 07 | 25.29 | +03 | 19 | 13.3 | 414 | |
| 1978 | CG | * | 1978 | 02 | 09.55477 | 11 | 37 | 51.80 | +00 | 27 | 33.7 | 414 |
| 1978 | CG | | 1978 | 02 | 09.56932 | 11 | 37 | 51.52 | +00 | 27 | 37.2 | 414 |
| 1978 | CG | | 1978 | 02 | 12.66154 | 11 | 36 | 24.89 | +00 | 38 | 38.9 | 414 |
| 1978 | CG | | 1978 | 02 | 12.67609 | 11 | 36 | 24.35 | +00 | 38 | 43.7 | 414 |
| 1978 | DB | * | 1978 | 02 | 28.64210 | 11 | 17 | 28.04 | +02 | 49 | 46.5 | 414 |
| 1978 | DB | | 1978 | 02 | 28.65318 | 11 | 17 | 27.45 | +02 | 49 | 47.7 | 414 |
| 1978 | DB | | 1978 | 03 | 05.66653 | 11 | 13 | 07.27 | +02 | 59 | 28.9 | 414 |

| | | | | |
|-----------|------------------|-------------|-------------|-----|
| 1978 DB | 1978 03 05.67761 | 11 13 06.66 | +02 59 29.4 | 414 |
| 1978 DB | 1978 03 15.40861 | 11 04 35.23 | +03 19 53.2 | 414 |
| 1978 DB | 1978 03 15.41969 | 11 04 34.47 | +03 19 54.8 | 414 |
| 1978 EJ * | 1978 03 05.63260 | 11 05 26.7 | +04 02 15 | 414 |
| 1978 EJ | 1978 03 05.64368 | 11 05 26.2 | +04 02 16 | 414 |
| 1978 EJ | 1978 03 05.66653 | 11 05 25.2 | +04 02 18 | 414 |
| 1978 EJ | 1978 03 05.67761 | 11 05 24.7 | +04 02 18 | 414 |
| 1978 EJ | 1978 03 15.69117 | 10 57 09.6 | +04 27 19 | 414 |
| 1978 EJ | 1978 03 15.70225 | 10 57 09.0 | +04 27 21 | 414 |
| 1978 EK * | 1978 03 15.44116 | 10 31 32.26 | +00 39 44.0 | 414 |
| 1978 EK | 1978 03 15.45224 | 10 31 31.75 | +00 39 46.7 | 414 |
| 1978 EL * | 1978 03 05.70185 | 11 34 56.38 | -05 05 53.5 | 414 |
| 1978 EL | 1978 03 05.71293 | 11 34 55.85 | -05 05 47.3 | 414 |
| 1978 EM * | 1978 03 05.70185 | 11 36 13.72 | -04 44 48.6 | 414 |
| 1978 EM | 1978 03 05.71293 | 11 36 13.25 | -04 44 44.4 | 414 |
| 1978 EN * | 1978 03 05.70185 | 11 30 33.26 | -06 25 47.0 | 414 |
| 1978 EN | 1978 03 05.71293 | 11 30 32.73 | -06 25 44.9 | 414 |

OBSERVATIONS MADE AT KAMBAH BY D. HERALD.

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | Obs. |
|--------|------------------|----|--------------|-------------|------|------|
| /1979g | 1979 09 09.39840 | | 14 18 08.01 | -18 37 38.6 | 11 T | 415 |
| /1979g | 1979 09 14.40389 | | 14 41 25.33 | -21 41 28.6 | 11 T | 415 |
| /1979g | 1979 09 18.41007 | | 15 01 16.54 | -24 03 17.9 | | 415 |

OBSERVATIONS MADE AT SIEGEN UNIVERSITY OBSERVATORY BY W. LANDGRAF.

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | Obs. |
|--------|------------------|----|--------------|-------------|------|------|
| 2 | 1979 07 25.90683 | | 21 23 57.03 | +14 13 24.3 | | 510 |
| 2 | 1979 07 25.91309 | | 21 23 56.78 | +14 13 20.1 | | 510 |
| 6 | 1979 05 14.98208 | | 16 21 52.97 | +01 25 45.3 | | 510 |
| 6 | 1979 05 14.98763 | | 16 21 52.70 | +01 25 46.2 | | 510 |
| 6 | 1979 05 16.94281 | | 16 20 08.75 | +01 32 59.3 | | 510 |
| 6 | 1979 05 16.94689 | | 16 20 08.56 | +01 32 57.9 | | 510 |
| 115 | 1979 03 05.82492 | | 04 56 10.65 | +28 14 01.3 | | 510 |
| 115 | 1979 03 05.88200 | | 04 56 16.27 | +28 13 50.3 | | 510 |
| 246 | 1979 08 29.83732 | | 20 22 50.94 | -08 34 10.7 | | 510 |
| 246 | 1979 08 29.84734 | | 20 22 50.75 | -08 34 12.3 | | 510 |
| 246 | 1979 08 29.88017 | | 20 22 49.75 | -08 34 35.2 | | 510 |
| 246 | 1979 08 29.88995 | | 20 22 49.68 | -08 34 39.6 | | 510 |
| 386 | 1979 05 29.00568 | | 16 19 06.36 | +07 13 38.3 | | 510 |

OBSERVATIONS MADE AT OSSERVATORIO S. VITTORE. MEASURED BY V. GORETTI AND E. COLOMBINI.

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | Obs. |
|---------|------------------|----|--------------|-------------|------|------|
| 1979 QF | 1979 10 18.93681 | | 23 02 47.15 | +03 42 47.4 | 16.0 | 552 |
| 1979 QF | 1979 10 18.95208 | | 23 02 47.02 | +03 42 35.7 | | 552 |
| 1979 SA | 1979 10 18.87639 | | 23 00 29.64 | +06 06 42.6 | | 552 |
| 1979 SA | 1979 10 18.89306 | | 23 00 29.27 | +06 06 34.0 | | 552 |
| 1979 SA | 1979 10 18.90972 | | 23 00 29.04 | +06 06 25.2 | 16.5 | 552 |
| 1979 SA | 1979 10 18.92500 | | 23 00 28.65 | +06 06 18.5 | | 552 |
| 1979 SA | 1979 10 21.88542 | | 22 59 36.09 | +05 42 39.5 | | 552 |

OBSERVATIONS MADE AT PALOMAR BY C. KOWAL.

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | Obs. |
|-----------|------------------|----|--------------|-------------|------|------|
| 1979 QB | 1979 10 21.15833 | | 22 46 03.10 | -01 42 13.5 | 18 | 675 |
| 1979 QB | 1979 10 22.17083 | | 22 47 59.41 | -01 25 59.3 | | 675 |
| 1979 SY * | 1979 09 18.36944 | | 00 55 15.11 | +12 30 22.3 | 19 | 675 |
| 1979 SY | 1979 09 18.42153 | | 00 55 13.94 | +12 30 23.6 | | 675 |
| 1979 SY | 1979 09 19.42361 | | 00 54 49.62 | +12 30 29.2 | | 675 |
| 1979 SY | 1979 09 19.47569 | | 00 54 48.38 | +12 30 29.7 | | 675 |

OBSERVATIONS MADE AT MOUNT WILSON OBSERVATORY BY L. E. CUNNINGHAM.
 MEASURED BY L. R. COTTER, B. J. FRANKLIN, J. GIBSON, A. Q. HOWARD
 AND A. G. MOWBRAY.

| Object | Date | UT | R. A. (1950) | | | Decl. | Mag. | Obs. |
|---------|---------|----------|--------------|-------|--------|-------|----------|------|
| 317 | 1951 09 | 30.48354 | 09 03 | 08.72 | +15 54 | 20.2 | 672 | |
| 317 | 1951 09 | 30.48806 | 09 03 | 09.11 | +15 54 | 18.0 | 672 | |
| 317 | 1951 10 | 01.50872 | 09 04 | 46.05 | +15 47 | 28.3 | 15 672 | |
| 317 | 1951 10 | 01.51150 | 09 04 | 46.30 | +15 47 | 27.0 | 672 | |
| 317 | 1951 10 | 28.53867 | 09 43 | 51.82 | +12 46 | 17.6 | 15.5 672 | |
| 317 | 1951 10 | 28.54284 | 09 43 | 52.15 | +12 46 | 16.0 | 672 | |
| 317 | 1951 11 | 26.46756 | 10 15 | 51.71 | +09 58 | 51.5 | 16 672 | |
| 317 | 1951 11 | 26.47363 | 10 15 | 52.02 | +09 58 | 49.5 | 672 | |
| 875 | 1951 09 | 30.33476 | 05 04 | 35.36 | +11 15 | 12.8 | 672 | |
| 875 | 1951 09 | 30.34604 | 05 04 | 35.63 | +11 15 | 08.3 | 672 | |
| 875 | 1951 10 | 01.44709 | 05 04 | 59.79 | +11 07 | 27.3 | 672 | |
| 875 | 1951 10 | 01.45803 | 05 05 | 00.02 | +11 07 | 22.7 | 672 | |
| 875 | 1951 10 | 28.46645 | 05 04 | 23.84 | +07 35 | 46.2 | 17 672 | |
| 875 | 1951 10 | 28.47340 | 05 04 | 23.67 | +07 35 | 43.1 | 672 | |
| 875 | 1951 11 | 26.36443 | 04 43 | 28.01 | +04 02 | 56.8 | 16.5 672 | |
| 875 | 1951 11 | 26.36929 | 04 43 | 27.76 | +04 02 | 55.5 | 672 | |
| 875 | 1951 12 | 21.41630 | 04 21 | 06.21 | +02 39 | 47.5 | 17.5 672 | |
| 875 | 1951 12 | 21.42186 | 04 21 | 05.96 | +02 39 | 46.6 | 672 | |
| 875 | 1953 04 | 14.18022 | 09 47 | 32.71 | +02 40 | 58.3 | 672 | |
| 875 | 1953 04 | 14.18734 | 09 47 | 32.69 | +02 41 | 00.9 | 672 | |
| 875 | 1953 04 | 14.24532 | 09 47 | 32.72 | +02 41 | 23.8 | 672 | |
| 875 | 1953 04 | 14.24810 | 09 47 | 32.72 | +02 41 | 24.7 | 16.5 672 | |
| 875 | 1953 05 | 07.18231 | 09 54 | 03.17 | +04 31 | 34.9 | 672 | |
| 875 | 1953 05 | 07.19133 | 09 54 | 03.47 | +04 31 | 36.7 | 672 | |
| 1807 | 1951 05 | 01.47511 | 21 19 | 16.08 | -12 31 | 49.2 | 672 | |
| 1807 | 1951 05 | 01.48066 | 21 19 | 16.59 | -12 31 | 47.1 | 672 | |
| 1807 | 1951 05 | 02.47370 | 21 20 | 47.54 | -12 22 | 52.2 | 672 | |
| 1807 | 1951 05 | 02.48429 | 21 20 | 48.52 | -12 22 | 46.7 | 672 | |
| 1807 | 1951 05 | 03.48464 | 21 22 | 19.48 | -12 13 | 47.1 | 672 | |
| 1807 | 1951 05 | 03.49019 | 21 22 | 19.97 | -12 13 | 43.4 | 672 | |
| 1807 | 1951 05 | 04.48951 | 21 23 | 50.14 | -12 04 | 43.8 | 672 | |
| 1807 | 1951 05 | 05.49591 | 21 25 | 20.33 | -11 55 | 39.4 | 672 | |
| 1807 | 1951 08 | 05.34850 | 22 23 | 34.21 | -02 36 | 24.6 | 672 | |
| 1807 | 1951 08 | 06.35885 | 22 22 | 57.96 | -02 37 | 37.9 | 672 | |
| 1807 | 1951 08 | 06.36053 | 22 22 | 57.91 | -02 37 | 38.0 | 672 | |
| 1807 | 1951 09 | 01.33141 | 22 01 | 40.65 | -04 18 | 09.0 | 672 | |
| 1807 | 1951 09 | 01.33662 | 22 01 | 40.35 | -04 18 | 10.8 | 672 | |
| 1807 | 1951 09 | 01.34113 | 22 01 | 40.19 | -04 18 | 11.7 | 672 | |
| 1807 | 1951 09 | 29.21133 | 21 46 | 16.83 | -06 48 | 31.8 | 15.5 672 | |
| 1807 | 1951 09 | 30.20663 | 21 46 | 11.58 | -06 52 | 27.6 | 672 | |
| 1807 | 1951 12 | 21.19911 | 23 18 | 21.75 | -02 09 | 47.5 | 672 | |
| 1807 | 1951 12 | 21.20311 | 23 18 | 22.21 | -02 09 | 45.3 | 672 | |
| 1807 | 1952 10 | 19.52585 | 10 04 | 52.06 | +08 46 | 34.6 | 672 | |
| 1807 | 1952 10 | 19.53054 | 10 04 | 52.44 | +08 46 | 32.4 | 672 | |
| 1807 | 1953 04 | 12.30349 | 10 18 | 24.67 | +05 39 | 56.0 | 672 | |
| 1807 | 1953 04 | 12.31599 | 10 18 | 24.48 | +05 39 | 58.4 | 672 | |
| 1807 | 1953 04 | 13.19323 | 10 18 | 14.42 | +05 42 | 49.8 | 672 | |
| 1807 | 1953 04 | 13.20521 | 10 18 | 14.27 | +05 42 | 51.8 | 672 | |
| 1807 | 1953 04 | 14.19866 | 10 18 | 04.14 | +05 45 | 58.4 | 672 | |
| 1807 | 1953 04 | 14.21182 | 10 18 | 04.07 | +05 45 | 59.4 | 17.5 672 | |
| 1807 | 1953 05 | 07.21251 | 10 21 | 23.41 | +06 14 | 42.1 | 672 | |
| 1807 | 1953 05 | 07.22137 | 10 21 | 23.62 | +06 14 | 42.0 | 672 | |
| 1950 DB | 1950 05 | 20.28073 | 10 53 | 51.43 | +25 51 | 54.4 | 672 | |
| 1950 DB | 1950 05 | 20.28802 | 10 53 | 51.85 | +25 51 | 50.9 | 672 | |
| 1950 DB | 1951 05 | 01.45809 | 18 18 | 54.22 | -02 14 | 19.8 | 18 672 | |

| | | | | | | | | |
|------------|---------|----------|-------|-------|--------|------|----|-----|
| 1950 DB | 1951 05 | 02.43238 | 18 18 | 43.63 | -02 11 | 07.1 | 18 | 672 |
| 1951 WO2 * | 1951 11 | 26.29481 | 03 02 | 22.21 | -08 33 | 05.5 | | 672 |
| 1951 WO2 | 1951 11 | 26.31756 | 03 02 | 21.27 | -08 33 | 05.2 | | 672 |
| 1951 WO2 | 1951 12 | 22.32359 | 02 50 | 24.46 | -07 15 | 29.1 | | 672 |
| 1951 WO2 | 1951 12 | 22.33071 | 02 50 | 24.38 | -07 15 | 26.3 | | 672 |
| 1951 WO2 | 1951 12 | 23.32689 | 02 50 | 12.79 | -07 09 | 58.2 | | 672 |
| 1951 WO2 | 1951 12 | 23.33401 | 02 50 | 12.68 | -07 09 | 55.9 | | 672 |
| 1951 WO2 | 1951 12 | 23.34165 | 02 50 | 12.60 | -07 09 | 53.6 | | 672 |
| 1951 WO2 | 1952 02 | 19.18993 | 03 12 | 47.01 | +00 29 | 12.8 | 18 | 672 |
| 1951 WO2 | 1952 02 | 19.19479 | 03 12 | 47.33 | +00 29 | 16.5 | | 672 |
| 1951 WO2 | 1952 02 | 20.21721 | 03 13 | 40.71 | +00 38 | 10.1 | 18 | 672 |

OBSERVATIONS MADE AT THE LOWELL OBSERVATORY, ANDERSON MESA STATION, BY
E. BOWELL.

| Object | Date | UT | R. A. (1950) | | Decl. | | Mag. | N | Obs. |
|--------|---------|----------|--------------|-------|--------|------|------|---|------|
| 10 | 1979 10 | 17.26319 | 23 13 | 59.05 | +00 34 | 55.3 | | 1 | 688 |
| 111 | 1979 10 | 17.26319 | 23 16 | 22.85 | +02 02 | 16.0 | | | 688 |
| 211 | 1979 08 | 27.29201 | 22 29 | 54.84 | -03 32 | 12.0 | | | 688 |
| 248 | 1979 10 | 17.26319 | 22 59 | 18.33 | -00 18 | 10.3 | | | 688 |
| 295 | 1979 10 | 17.26319 | 23 17 | 03.92 | -00 04 | 26.4 | | | 688 |
| 308 | 1979 08 | 27.29201 | 22 25 | 56.78 | -06 24 | 42.3 | | | 688 |
| 382 | 1979 10 | 17.26319 | 23 07 | 03.04 | +01 56 | 19.0 | | | 688 |
| 433 | 1979 08 | 27.24896 | 21 13 | 13.58 | -05 28 | 27.7 | | 2 | 688 |
| 444 | 1979 10 | 29.31597 | 01 03 | 05.68 | +03 56 | 46.2 | | | 688 |
| 474 | 1979 08 | 27.17604 | 19 18 | 09.76 | -13 55 | 48.9 | | | 688 |
| 486 | 1979 10 | 17.31250 | 03 16 | 22.48 | +03 48 | 25.1 | | | 688 |
| 499 | 1979 08 | 27.29201 | 22 39 | 30.41 | -05 29 | 49.9 | | | 688 |
| 504 | 1979 10 | 17.35000 | 04 03 | 42.58 | +02 10 | 04.2 | | | 688 |
| 504 | 1979 10 | 28.45417 | 03 56 | 55.35 | +01 42 | 52.0 | | | 688 |
| 511 | 1979 10 | 17.35000 | 04 13 | 33.36 | +00 53 | 28.7 | | | 688 |
| 511 | 1979 10 | 28.45417 | 04 08 | 39.51 | +00 21 | 00.2 | | | 688 |
| 564 | 1979 10 | 17.31250 | 03 24 | 05.37 | +04 37 | 28.9 | | | 688 |
| 572 | 1979 08 | 27.17604 | 19 20 | 43.27 | -06 36 | 20.8 | | 1 | 688 |
| 585 | 1979 08 | 27.19132 | 19 32 | 49.35 | -12 48 | 23.3 | | | 688 |
| 608 | 1979 08 | 27.19132 | 19 40 | 35.16 | -18 19 | 04.7 | | | 688 |
| 612 | 1979 10 | 28.45417 | 04 02 | 05.82 | +05 52 | 17.6 | | | 688 |
| 627 | 1979 10 | 17.31250 | 03 36 | 10.98 | +09 47 | 26.9 | | | 688 |
| 627 | 1979 10 | 28.41806 | 03 29 | 01.82 | +09 00 | 38.4 | | | 688 |
| 666 | 1979 08 | 27.24896 | 21 17 | 05.67 | -02 13 | 30.8 | | | 688 |
| 732 | 1979 10 | 17.31250 | 03 31 | 47.43 | +05 55 | 31.3 | | | 688 |
| 835 | 1979 10 | 17.26319 | 23 21 | 26.93 | +00 26 | 45.7 | | | 688 |
| 875 | 1979 10 | 17.26319 | 23 16 | 09.56 | +00 52 | 19.8 | | | 688 |
| 966 | 1979 10 | 17.31250 | 03 23 | 12.10 | +07 29 | 50.2 | | | 688 |
| 966 | 1979 10 | 28.41806 | 03 14 | 07.96 | +07 15 | 18.1 | | | 688 |
| 1002 | 1979 10 | 17.26319 | 22 58 | 29.55 | -01 22 | 05.6 | | | 688 |
| 1131 | 1979 10 | 17.31250 | 03 23 | 20.18 | +11 51 | 48.4 | | | 688 |
| 1131 | 1979 10 | 28.41806 | 03 14 | 03.14 | +11 24 | 21.6 | | | 688 |
| 1299 | 1979 08 | 27.29201 | 22 36 | 32.06 | -06 34 | 27.1 | | 1 | 688 |
| 1315 | 1979 10 | 17.26319 | 23 15 | 14.85 | +03 59 | 36.1 | | | 688 |
| 1427 | 1979 10 | 17.31250 | 03 22 | 06.93 | +09 01 | 27.3 | | | 688 |
| 1427 | 1979 10 | 28.41806 | 03 12 | 45.31 | +08 44 | 50.4 | | | 688 |
| 1588 | 1979 10 | 28.45417 | 03 54 | 51.34 | +07 50 | 44.2 | | 2 | 688 |
| 1605 | 1979 08 | 27.17604 | 19 05 | 14.71 | -11 12 | 02.5 | | 2 | 688 |
| 1614 | 1979 08 | 27.17604 | 19 09 | 35.99 | -09 51 | 08.3 | | | 688 |
| 1734 | 1979 10 | 17.31250 | 03 26 | 16.46 | +09 45 | 42.8 | | | 688 |
| 1734 | 1979 10 | 28.41806 | 03 19 | 34.06 | +08 17 | 13.0 | | | 688 |
| 1800 | 1979 08 | 27.30903 | 00 19 | 33.05 | -06 04 | 35.5 | | | 688 |
| 1831 | 1979 10 | 17.29097 | 01 11 | 44.56 | -00 47 | 20.0 | | | 688 |

| | | | | | | | | | | |
|---------|---|------|----|----------|-------|-------|--------|------|------|-------|
| 1831 | | 1979 | 10 | 29.31597 | 01 00 | 14.87 | -01 22 | 18.1 | | 688 |
| 1905 | | 1979 | 08 | 27.29201 | 22 37 | 39.29 | -04 48 | 26.8 | | 688 |
| 1914 | | 1979 | 10 | 28.41806 | 03 26 | 46.09 | +09 44 | 07.8 | | 688 |
| 1941 | | 1979 | 10 | 17.29097 | 01 06 | 08.96 | +02 42 | 47.5 | | 688 |
| 1979 MB | | 1979 | 08 | 27.17604 | 19 25 | 10.71 | -10 44 | 32.9 | | 688 |
| 1979 MC | | 1979 | 08 | 27.19132 | 19 41 | 01.38 | -15 48 | 33.2 | | 688 |
| 1979 OB | | 1979 | 10 | 17.24792 | 22 30 | 53.22 | -09 30 | 05.7 | 1 | 688 |
| 1979 OC | | 1979 | 08 | 27.24896 | 21 10 | 55.95 | -02 18 | 09.2 | | 688 |
| 1979 UC | * | 1979 | 10 | 17.31250 | 03 19 | 14.27 | +10 58 | 18.9 | | 688 |
| 1979 UC | | 1979 | 10 | 28.41806 | 03 08 | 52.45 | +10 48 | 05.2 | 16.5 | 2 688 |
| 1979 UD | * | 1979 | 10 | 17.31250 | 03 31 | 16.46 | +10 51 | 15.0 | | 688 |
| 1979 UD | | 1979 | 10 | 28.41806 | 03 23 | 51.23 | +10 36 | 27.2 | 16.5 | 688 |
| 1979 UE | * | 1979 | 10 | 17.31250 | 03 16 | 49.21 | +08 14 | 44.9 | | 688 |
| 1979 UE | | 1979 | 10 | 28.41806 | 03 06 | 56.58 | +08 22 | 35.0 | 16.5 | 688 |
| 1979 UF | * | 1979 | 10 | 17.29097 | 01 05 | 04.52 | -00 50 | 27.9 | 16.0 | 688 |
| 1979 UF | | 1979 | 10 | 29.31597 | 00 52 | 52.06 | +00 02 | 49.2 | 16.0 | 1 688 |
| 1979 UG | * | 1979 | 10 | 17.29097 | 01 11 | 10.78 | +00 36 | 34.4 | 15.5 | 688 |
| 1979 UG | | 1979 | 10 | 29.31597 | 01 02 | 14.11 | -00 19 | 52.8 | 15.5 | 688 |
| 1979 UH | * | 1979 | 10 | 17.35000 | 04 11 | 37.08 | +03 28 | 25.5 | | 688 |
| 1979 UH | | 1979 | 10 | 28.45417 | 04 09 | 57.09 | +02 21 | 28.3 | 17.0 | 688 |
| 1979 UJ | * | 1979 | 10 | 17.35000 | 03 55 | 15.78 | +06 33 | 06.4 | | 1 688 |
| 1979 UJ | | 1979 | 10 | 28.45417 | 03 49 | 41.74 | +05 18 | 47.9 | 16.5 | 688 |

Note 1: declination uncertain. 2: right ascension uncertain.

OBSERVATIONS MADE AT THE LOWELL OBSERVATORY (CODE 690) AND BY H. L. GICLAS
AT THE ANDERSON MESA STATION (CODE 688). MEASURED BY M. L. KANTZ.

| Object | Date | UT | R. A. (1950) | Decl. | N | Obs. |
|----------|------|----|--------------|-------------------------|---|------|
| /1979i | 1979 | 10 | 15.09028 | 12 58 42.22 +60 19 39.3 | | 688 |
| 1929 TD1 | 1929 | 10 | 11.33333 | 00 49 44.03 +01 30 17.4 | | 690 |
| 1929 TD1 | 1929 | 10 | 12.36806 | 00 48 47.4 +01 27 13 | 1 | 690 |
| 1930 WG | 1930 | 12 | 13.19236 | 03 02 29.73 +28 58 18.8 | | 690 |
| 1930 WG | 1930 | 12 | 14.20069 | 03 01 52.25 +28 56 00.8 | | 690 |
| 1930 WG | 1930 | 12 | 16.19444 | 03 00 43.08 +28 51 27.3 | | 690 |
| 1931 TC3 | 1931 | 10 | 10.27778 | 00 44 19.20 -05 04 48.7 | | 690 |
| 1931 TC3 | 1931 | 10 | 12.27083 | 00 42 28.58 -05 14 19.2 | | 690 |
| 1931 TC3 | 1931 | 10 | 14.23958 | 00 40 40.03 -05 22 55.9 | | 690 |

Note 1: image very faint, position approximate.

OBSERVATIONS MADE AT THE GOETHE LINK OBSERVATORY, MEASURED AT INDIANA
UNIVERSITY, REDUCED AT THE SMITHSONIAN ASTROPHYSICAL OBSERVATORY.

| Object | Date | UT | R. A. (1950) | Decl. | Obs. |
|---------|------|----|--------------|-------------------------|------|
| 1950 LN | 1950 | 06 | 07.16190 | 15 56 20.36 +01 09 29.5 | 760 |
| 1950 LN | 1950 | 06 | 07.22163 | 15 56 17.08 +01 09 51.4 | 760 |
| 1955 DA | 1955 | 02 | 23.22852 | 08 49 14.50 +21 42 22.5 | 760 |
| 1955 DA | 1955 | 02 | 23.26879 | 08 49 12.82 +21 42 28.5 | 760 |
| 1955 UT | 1955 | 10 | 20.17363 | 01 05 15.10 +05 05 02.3 | 760 |
| 1955 UT | 1955 | 10 | 20.21461 | 01 05 13.17 +05 04 52.6 | 760 |
| 1962 VB | 1962 | 11 | 01.14786 | 01 00 42.80 +05 53 08.8 | 760 |
| 1963 DE | 1963 | 02 | 23.10339 | 08 38 54.96 +18 06 40.9 | 760 |
| 1963 DE | 1963 | 02 | 23.14681 | 08 38 53.01 +18 06 49.4 | 760 |
| 1965 WJ | 1965 | 11 | 20.26735 | 04 47 14.36 +17 47 06.2 | 760 |
| 1965 WJ | 1965 | 11 | 20.31179 | 04 47 12.00 +17 47 13.1 | 760 |
| 1966 DD | 1966 | 02 | 18.18830 | 08 48 53.76 +15 46 15.6 | 760 |
| 1966 DD | 1966 | 02 | 18.23344 | 08 48 51.65 +15 46 24.2 | 760 |
| 1966 DH | 1966 | 02 | 18.29872 | 09 52 47.96 +16 31 46.7 | 760 |
| 1966 DH | 1966 | 02 | 18.35253 | 09 52 45.00 +16 31 54.3 | 760 |
| 1966 FC | 1966 | 03 | 18.22720 | 12 20 34.13 -09 53 26.1 | 760 |
| 1966 FC | 1966 | 03 | 18.27372 | 12 20 32.27 -09 53 10.2 | 760 |

OBSERVATIONS MADE AT MT. CUBA OBSERVATORY BY J. W. MC CARTER, H. K. HERGLOTZ, H. MONCURE, G. PRUCKMAYR AND L. E. WADE.

| Object | Date | UT | R. A. (1950) | | | Decl. | Obs. |
|--------|---------|----------|--------------|-------|--------|-------|------|
| 2 | 1977 03 | 26.10243 | 08 40 | 42.83 | -01 00 | 41.1 | 788 |
| 2 | 1977 03 | 26.14410 | 08 40 | 44.09 | -00 59 | 33.5 | 788 |
| 2 | 1977 04 | 30.07535 | 09 11 | 25.29 | +08 52 | 13.0 | 788 |
| 2 | 1977 04 | 30.11632 | 09 11 | 28.27 | +08 52 | 39.5 | 788 |
| 2 | 1978 06 | 24.13854 | 16 56 | 01.61 | +25 32 | 20.9 | 788 |
| 2 | 1978 06 | 24.15694 | 16 56 | 00.73 | +25 32 | 17.2 | 788 |
| 2 | 1978 07 | 08.08750 | 16 46 | 58.73 | +24 12 | 23.6 | 788 |
| 2 | 1978 07 | 08.10903 | 16 46 | 57.98 | +24 12 | 14.7 | 788 |
| 4 | 1977 04 | 09.10382 | 07 11 | 00.47 | +25 53 | 14.5 | 788 |
| 4 | 1977 04 | 09.12743 | 07 11 | 01.87 | +25 53 | 14.2 | 788 |
| 7 | 1978 05 | 10.07326 | 09 40 | 21.25 | +07 19 | 22.1 | 788 |
| 7 | 1978 05 | 10.10729 | 09 40 | 23.26 | +07 19 | 02.6 | 788 |
| 7 | 1978 06 | 10.08819 | 10 11 | 22.25 | +05 31 | 02.4 | 788 |
| 7 | 1978 06 | 10.10764 | 10 11 | 22.86 | +05 30 | 38.6 | 788 |
| 25 | 1978 02 | 11.14097 | 05 30 | 55.44 | -01 54 | 25.2 | 788 |
| 25 | 1978 02 | 11.17292 | 05 30 | 55.63 | -01 54 | 10.4 | 788 |
| 39 | 1977 08 | 06.11806 | 17 08 | 06.60 | -10 34 | 41.0 | 788 |
| 39 | 1977 08 | 06.18958 | 17 08 | 07.02 | -10 35 | 01.5 | 788 |
| 39 | 1978 11 | 01.14201 | 01 43 | 38.53 | -03 38 | 58.5 | 788 |
| 39 | 1978 11 | 01.16632 | 01 43 | 37.41 | -03 39 | 06.5 | 788 |
| 40 | 1977 12 | 17.10243 | 04 25 | 18.89 | +19 13 | 28.2 | 788 |
| 40 | 1977 12 | 17.14062 | 04 25 | 16.48 | +19 13 | 29.2 | 788 |
| 40 | 1978 02 | 11.08125 | 04 18 | 58.59 | +21 11 | 36.8 | 788 |
| 40 | 1978 02 | 11.11181 | 04 18 | 59.97 | +21 11 | 43.0 | 788 |
| 40 | 1978 03 | 18.08299 | 04 59 | 31.07 | +23 18 | 02.1 | 788 |
| 40 | 1978 03 | 18.11632 | 04 59 | 33.94 | +23 18 | 07.9 | 788 |
| 73 | 1977 11 | 12.08368 | 00 24 | 38.20 | +03 44 | 19.0 | 788 |
| 73 | 1977 11 | 12.10521 | 00 24 | 38.11 | +03 44 | 18.8 | 788 |
| 389 | 1976 11 | 20.20833 | 00 05 | 45.51 | +12 26 | 12.3 | 788 |
| 389 | 1976 11 | 20.22431 | 00 05 | 45.53 | +12 26 | 05.2 | 788 |
| 532 | 1978 05 | 20.11076 | 15 09 | 56.26 | +06 37 | 44.9 | 788 |
| 532 | 1978 05 | 20.13715 | 15 09 | 54.77 | +06 37 | 39.3 | 788 |
| 532 | 1978 05 | 27.19965 | 15 04 | 11.37 | +06 04 | 02.6 | 788 |
| 532 | 1978 05 | 27.23160 | 15 04 | 09.79 | +06 03 | 50.0 | 788 |
| 532 | 1978 06 | 10.17049 | 14 55 | 33.81 | +04 23 | 27.5 | 788 |
| 532 | 1978 06 | 10.19479 | 14 55 | 33.13 | +04 23 | 16.0 | 788 |

OBSERVATIONS MADE AT THE HARVARD COLLEGE OBSERVATORY AGASSIZ STATION BY R. E. MC CROSKY, C.-Y. SHAO, G. SCHWARTZ AND J. H. BULGER (WITH ASSISTANCE FROM C. M. BARDWELL AND B. G. MARSDEN).

| Object | Date | UT | R. A. (1950) | | | Decl. | Mag. | Obs. |
|----------|---------|----------|--------------|-------|--------|-------|-------|------|
| /1977 X | 1978 09 | 06.25961 | 22 42 | 34.81 | -02 06 | 07.9 | | 801 |
| /1977 XI | 1979 09 | 17.19872 | 23 00 | 29.32 | -02 19 | 22.1 | | 801 |
| /1977 XI | 1979 09 | 24.25418 | 22 53 | 31.50 | -02 58 | 11.3 | | 801 |
| /1977s | 1979 09 | 17.25406 | 00 11 | 23.31 | -03 58 | 56.7 | | 801 |
| /1978f | 1979 09 | 16.13794 | 22 49 | 09.31 | -18 38 | 23.2 | | 801 |
| /1978f | 1979 10 | 26.11749 | 22 24 | 41.93 | -17 01 | 49.0 | | 801 |
| /1979f | 1979 09 | 17.33907 | 05 15 | 20.31 | +44 16 | 33.3 | | 801 |
| /1979j | 1979 10 | 22.14944 | 01 44 | 34.79 | -01 39 | 40.0 | 20.5N | 801 |
| /1979j | 1979 10 | 23.18312 | 01 43 | 48.01 | -01 44 | 32.0 | | 801 |
| 612 | 1979 10 | 22.23713 | 04 05 | 44.40 | +06 53 | 17.4 | | 801 |
| 612 | 1979 10 | 23.26120 | 04 05 | 11.32 | +06 43 | 12.9 | | 801 |
| 1130 | 1979 09 | 16.27712 | 01 29 | 08.11 | +11 31 | 16.8 | | 801 |
| 1130 | 1979 09 | 17.27971 | 01 28 | 40.06 | +11 27 | 21.1 | | 801 |
| 1922 | 1979 09 | 21.30051 | 22 38 | 30.99 | +38 04 | 48.3 | | 801 |
| 2174 | 1979 09 | 16.27712 | 01 27 | 43.06 | +11 38 | 36.1 | | 801 |

| | | | | | | | | | | |
|-----------|------|----|----------|----|----|-------|-----|----|------|----------|
| 2174 | 1979 | 09 | 17.27971 | 01 | 27 | 13.58 | +11 | 44 | 42.8 | 801 |
| 2174 | 1979 | 10 | 28.08470 | 00 | 52 | 01.53 | +13 | 44 | 12.3 | 801 |
| 1942 YA | 1979 | 09 | 17.30418 | 02 | 52 | 59.27 | +20 | 32 | 33.9 | 801 |
| 1942 YA | 1979 | 10 | 23.28330 | 02 | 29 | 30.71 | +22 | 28 | 57.6 | 801 |
| 1943 EQ | 1979 | 09 | 16.22241 | 23 | 57 | 54.80 | -10 | 18 | 57.0 | 801 |
| 1965 WO | 1978 | 11 | 27.06407 | 01 | 34 | 56.07 | +03 | 58 | 48.0 | 801 |
| 1972 RA | 1979 | 09 | 16.31553 | 04 | 51 | 43.38 | +12 | 42 | 01.1 | 801 |
| 1972 RA | 1979 | 10 | 23.39351 | 07 | 06 | 20.38 | +01 | 44 | 59.1 | 801 |
| 1975 VF | 1979 | 10 | 23.11174 | 23 | 24 | 07.00 | -00 | 02 | 02.9 | 801 |
| 1976 UH | 1979 | 09 | 18.16745 | 23 | 01 | 06.40 | -18 | 45 | 48.0 | 801 |
| 1977 QH1 | 1979 | 10 | 19.28218 | 04 | 52 | 16.09 | +14 | 34 | 28.6 | 801 |
| 1977 TJ3 | 1979 | 10 | 22.29550 | 05 | 46 | 59.93 | -03 | 35 | 55.2 | 801 |
| 1977 TJ3 | 1979 | 10 | 23.35140 | 05 | 46 | 53.05 | -03 | 42 | 42.0 | 801 |
| 1977 TJ3 | 1979 | 10 | 26.24744 | 05 | 46 | 29.32 | -04 | 01 | 10.7 | 801 |
| 1977 TL3 | 1979 | 10 | 26.26829 | 06 | 12 | 06.07 | +11 | 03 | 51.4 | 801 |
| 1977 TL3 | 1979 | 10 | 27.37848 | 06 | 12 | 00.77 | +11 | 00 | 27.3 | 801 |
| 1978 GC | 1979 | 09 | 18.34770 | 05 | 30 | 01.20 | -00 | 22 | 49.6 | 801 |
| 1978 GC | 1979 | 09 | 24.32713 | 05 | 36 | 01.68 | -01 | 45 | 58.5 | 801 |
| 1978 LA | 1979 | 09 | 18.31119 | 05 | 07 | 20.82 | +13 | 20 | 15.6 | 801 |
| 1978 RD * | 1978 | 09 | 06.25961 | 22 | 43 | 02.19 | -02 | 09 | 42.9 | 19 801 |
| 1978 SB | 1979 | 10 | 31.34297 | 03 | 19 | 22.08 | +24 | 24 | 22.5 | 801 |
| 1979 KA | 1979 | 09 | 19.05125 | 17 | 46 | 43.83 | -18 | 15 | 20.8 | 801 |
| 1979 MB | 1979 | 09 | 24.06324 | 19 | 25 | 16.73 | -13 | 40 | 45.2 | 801 |
| 1979 OB | 1979 | 09 | 18.22062 | 22 | 21 | 13.07 | -06 | 34 | 56.9 | 801 |
| 1979 OC | 1979 | 09 | 21.14771 | 20 | 58 | 52.41 | -04 | 13 | 42.4 | 801 |
| 1979 OC | 1979 | 09 | 24.22380 | 20 | 58 | 45.01 | -04 | 26 | 28.2 | 801 |
| 1979 SC | 1979 | 09 | 17.25406 | 00 | 10 | 09.40 | -04 | 09 | 33.8 | 801 |
| 1979 SD | 1979 | 09 | 17.25406 | 00 | 11 | 30.29 | -04 | 06 | 00.1 | 801 |
| 1979 SE | 1979 | 10 | 23.08101 | 22 | 05 | 12.40 | -16 | 05 | 21.8 | 801 |
| 1979 SE | 1979 | 10 | 26.08418 | 22 | 05 | 38.33 | -15 | 59 | 24.5 | 801 |
| 1979 SU * | 1979 | 09 | 17.19872 | 23 | 00 | 09.15 | -02 | 04 | 47.7 | 19 801 |
| 1979 SV * | 1979 | 09 | 17.19872 | 23 | 00 | 22.77 | -02 | 34 | 57.0 | 18 801 |
| 1979 SW * | 1979 | 09 | 16.22241 | 23 | 57 | 48.09 | -10 | 27 | 37.4 | 17 801 |
| 1979 SX * | 1979 | 09 | 24.25418 | 22 | 53 | 32.39 | -02 | 55 | 50.2 | 19 801 |
| 1979 UA * | 1979 | 10 | 22.14944 | 01 | 45 | 22.27 | -01 | 22 | 10.1 | 18.5 801 |
| 1979 UA | 1979 | 10 | 23.18312 | 01 | 44 | 33.06 | -01 | 28 | 45.9 | 801 |
| 1979 UB * | 1979 | 10 | 23.18312 | 01 | 44 | 07.19 | -01 | 42 | 05.1 | 20 801 |
| 1979 UK * | 1979 | 10 | 31.34297 | 03 | 19 | 12.76 | +24 | 23 | 56.8 | 20 801 |
| 1979 UL * | 1979 | 10 | 31.34297 | 03 | 18 | 40.56 | +24 | 20 | 30.0 | 19 801 |
| 1979 UM * | 1979 | 10 | 31.34297 | 03 | 18 | 48.08 | +24 | 08 | 43.8 | 18 801 |
| 1979 UN * | 1979 | 10 | 28.08470 | 00 | 51 | 47.37 | +13 | 42 | 08.5 | 17 801 |
| 2528 P-L | 1979 | 09 | 17.11476 | 20 | 35 | 33.19 | -22 | 30 | 29.1 | 801 |
| 6090 P-L | 1979 | 10 | 23.14319 | 01 | 47 | 21.40 | +16 | 31 | 27.3 | 801 |

OBSERVATIONS MADE AT THE UNIVERSITY OF CHILE, CERRO EL ROBLE STATION, BY
C. TORRES AND J. MAZA. MEASURED BY M. WISCHNJEWSKY AND TORRES.

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | N | Obs. |
|--------|------|----|--------------|-------------|-------------|----|-------|
| /1978f | 1979 | 06 | 28.41387 | 23 54 31.29 | -17 27 31.5 | | 1 805 |
| /1978f | 1979 | 06 | 28.43332 | 23 54 30.94 | -17 27 28.9 | | 2 805 |
| /1978f | 1979 | 06 | 29.34130 | 23 54 19.51 | -17 27 07.2 | | 805 |
| /1978f | 1979 | 06 | 29.38887 | 23 54 18.47 | -17 27 03.4 | | 805 |
| /1978j | 1978 | 10 | 29.29768 | 02 20 38.48 | -29 05 49.3 | | 805 |
| /1978l | 1978 | 09 | 30.35312 | 06 18 14.71 | -34 51 46.5 | | 805 |
| /1979e | 1979 | 08 | 17.11875 | 18 52 28.72 | -05 10 36.8 | | 3 805 |
| /1979e | 1979 | 08 | 18.10764 | 18 51 38.58 | -05 04 57.9 | | 805 |
| /1979e | 1979 | 08 | 19.10208 | 18 50 49.26 | -04 59 25.5 | | 805 |
| /1979e | 1979 | 08 | 20.09167 | 18 50 01.07 | -04 53 56.3 | | 805 |
| 114 | 1979 | 07 | 15.02703 | 11 46 24.77 | +04 09 07.7 | | 805 |
| 114 | 1979 | 07 | 16.01661 | 11 47 53.63 | +04 00 02.4 | 16 | 805 |

| | | | | | | | | | | | |
|------------|------|----|----------|----|----|-------|-----|----|------|------|-------|
| 1166 | 1979 | 06 | 28.41387 | 23 | 49 | 57.16 | -17 | 15 | 25.5 | 14 | 805 |
| 1166 | 1979 | 06 | 28.43332 | 23 | 49 | 58.62 | -17 | 15 | 32.1 | | 805 |
| 1166 | 1979 | 06 | 29.34130 | 23 | 51 | 08.17 | -17 | 21 | 16.3 | | 805 |
| 1166 | 1979 | 06 | 29.35762 | 23 | 51 | 09.37 | -17 | 21 | 23.3 | | 805 |
| 1166 | 1979 | 06 | 29.42012 | 23 | 51 | 13.80 | -17 | 21 | 46.5 | | 805 |
| 1942 | 1979 | 06 | 28.41387 | 23 | 55 | 32.60 | -16 | 11 | 12.4 | 18.5 | 805 |
| 1942 | 1979 | 06 | 28.43332 | 23 | 55 | 33.64 | -16 | 10 | 58.6 | | 805 |
| 1942 | 1979 | 06 | 29.34130 | 23 | 56 | 19.69 | -16 | 00 | 28.0 | | 805 |
| 1942 | 1979 | 06 | 29.35762 | 23 | 56 | 20.58 | -16 | 00 | 15.2 | | 805 |
| 1942 | 1979 | 06 | 29.42012 | 23 | 56 | 23.39 | -15 | 59 | 33.5 | | 805 |
| 2102 | 1979 | 07 | 02.29512 | 20 | 19 | 48.6 | -66 | 42 | 50 | | 4 805 |
| 2102 | 1979 | 07 | 16.10898 | 17 | 43 | 23.3 | -76 | 44 | 16 | | 4 805 |
| 1979 MD9 * | 1979 | 06 | 28.41387 | 23 | 48 | 00.69 | -18 | 17 | 42.0 | 18.5 | 805 |
| 1979 MD9 | 1979 | 06 | 29.34130 | 23 | 48 | 39.10 | -18 | 17 | 22.9 | | 805 |
| 1979 MD9 | 1979 | 06 | 29.35762 | 23 | 48 | 39.74 | -18 | 17 | 23.5 | | 805 |
| 1979 MD9 | 1979 | 06 | 29.42012 | 23 | 48 | 41.83 | -18 | 17 | 22.4 | | 805 |
| 1979 ME9 * | 1979 | 06 | 28.41387 | 23 | 54 | 54.29 | -18 | 33 | 42.0 | 17.5 | 805 |
| 1979 ME9 | 1979 | 06 | 28.43332 | 23 | 54 | 55.27 | -18 | 33 | 38.4 | | 805 |
| 1979 ME9 | 1979 | 06 | 29.34130 | 23 | 55 | 43.60 | -18 | 31 | 05.9 | | 805 |
| 1979 ME9 | 1979 | 06 | 29.35762 | 23 | 55 | 44.76 | -18 | 31 | 02.9 | | 805 |
| 1979 ME9 | 1979 | 06 | 29.42012 | 23 | 55 | 47.58 | -18 | 30 | 53.7 | | 805 |
| 1979 NE * | 1979 | 07 | 15.02703 | 11 | 39 | 56.78 | +03 | 54 | 57.6 | 19 | 805 |
| 1979 NE | 1979 | 07 | 16.01661 | 11 | 41 | 07.32 | +03 | 46 | 38.8 | | 805 |

Note 1: 7" condensation in 15" x 20" asymmetric coma at p.a. 135 ; 30' tail in p.a. 200. 2: 4" x 6" condensation, elongated in p.a. 135 , and 7' x 10' coma. 3: very nebulous image. 4: stars trailed, integrated exposures.

OBSERVATIONS MADE AT THE EUROPEAN SOUTHERN OBSERVATORY. MEASURED BY R. M. WEST.

| Object | Date | UT | R. A. (1950) | Decl. | Obs. |
|---------|------|----|--------------|-------------------------|------|
| 546 | 1979 | 10 | 17.15069 | 22 41 35.67 -20 02 44.5 | 809 |
| 1582 | 1979 | 10 | 17.15069 | 22 56 32.61 -22 35 07.5 | 809 |
| 1976 UH | 1979 | 10 | 17.15069 | 22 49 22.71 -21 14 53.8 | 809 |

OBSERVATIONS MADE AT TOKAI (CODE 879) BY T. FURUTA AND AT JCPM YAKIIMO STATION (CODE 885) BY T. URATA. FROM NIHONDAIRA OBS. CIRC. NO. 1075.

| Object | Date | UT | R. A. (1950) | Decl. | Mag. | Obs. |
|---------|------|----|--------------|-------------------------|------|------|
| 1972 HN | 1979 | 10 | 14.54043 | 01 17 20.72 +06 25 00.4 | 15.5 | 885 |
| 1972 HN | 1979 | 10 | 14.54936 | 01 17 20.30 +06 24 56.5 | | 885 |
| 1972 HN | 1979 | 10 | 14.55990 | 01 17 19.83 +06 24 54.9 | | 885 |
| 1972 HN | 1979 | 10 | 20.61887 | 01 12 46.63 +05 55 03.2 | 15.5 | 879 |
| 1972 HN | 1979 | 10 | 20.63102 | 01 12 46.13 +05 54 59.3 | | 879 |

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

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

Comet Tsuchinshan (1977 X)

Epoch 1977 Aug. 5.0 ET = JDE 2443360.5

T 1977 July 24.80807 ET

| q | (1950.0) | P | Q |
|--------------|-----------------|-------------|-------------|
| z +0.0001611 | Peri. 318.16170 | +0.69043769 | +0.72321790 |
| +/-0.0000409 | Node 4.58096 | +0.70515602 | -0.67776373 |
| e 0.9994194 | Incl. 168.54320 | +0.16140253 | -0.13263555 |

From 56 observations 1977 Nov. 3-1978 Sept. 6, mean residual 1".1.

Comet Meier (1978f)

Epoch 1978 Nov. 28.0 ET = JDE 2443840.5

T 1978 Nov. 11.40931 ET

| | | | | | |
|---|--------------|----------|-----------|-------------|-------------|
| q | 1.1365273 | (1950.0) | P | Q | |
| z | -0.0007429 | Peri. | 231.40304 | -0.72276930 | +0.67754431 |
| | +/-0.0000035 | Node | 348.64562 | -0.18003927 | -0.37481432 |
| e | 1.0008443 | Incl. | 43.75497 | -0.66722589 | -0.63280956 |

From 153 observations 1978 Apr. 28-1979 Oct. 26, mean residual 1".0.

Comet Bradfield (1979c)

Epoch 1979 July 26.0 ET = JDE 2444080.5

T 1979 July 23.26258 ET

| | | | | | |
|---|--------------|----------|-----------|-------------|-------------|
| q | 0.4132170 | (1950.0) | P | Q | |
| z | -0.0001416 | Peri. | 47.64950 | -0.49453868 | +0.84670733 |
| | +/-0.0000226 | Node | 163.51651 | +0.44150727 | +0.05022070 |
| e | 1.0000585 | Incl. | 136.23567 | +0.74866736 | +0.52968346 |

From 18 observations 1979 June 25-Sept. 24, mean residual 1".6.

Periodic Comet Schwassmann-Wachmann 3 (1979g)

T 1979 Sept. 2.78379 ET

| | | | | | |
|---|------------|----------|-----------|-------------|-------------|
| q | 0.9408671 | (1950.0) | P | Q | |
| n | 0.18310842 | Peri. | 198.74285 | -0.04053463 | +0.98190461 |
| a | 3.0713584 | Node | 69.27445 | -0.88954019 | +0.04885495 |
| e | 0.6936642 | Incl. | 11.40756 | -0.45505515 | -0.18296592 |
| P | 5.38 | | | | |

From 12 observations 1979 Aug. 13-Sept. 18; not linked to 1930.

Comet Meier (1979i)

T 1979 Oct. 17.56084 ET

| | | | | | |
|---|-----------|----------|-----------|-------------|-------------|
| q | 1.4442072 | (1950.0) | P | Q | |
| | | Peri. | 112.75998 | +0.13840658 | -0.55289169 |
| | | Node | 297.14825 | +0.12518918 | +0.83277490 |
| e | 1.0 | Incl. | 67.42996 | +0.98243131 | -0.02822646 |

From 16 observations 1979 Sept. 20-Oct. 23.

(612) Veronika = 1950 LN = 1962 VB = 1973 RE = 1973 TQ = 1973 UH3 = 1974 XS

The identifications 1974 XS = 1973 RE = 1973 TQ = 1973 UH3 were found independently by T. Urata (NOC 1068).

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5

| | | | | | |
|---|------------|----------|-----------|-------------|-------------|
| M | 63.69006 | (1950.0) | P | Q | |
| n | 0.17735204 | Peri. | 118.85866 | +0.76966161 | +0.62249111 |
| a | 3.1374628 | Node | 203.55693 | -0.63530254 | +0.76876232 |
| e | 0.2740644 | Incl. | 20.79133 | +0.06333782 | +0.14666051 |
| P | 5.56 | B(1,0) | 12.4 | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|--------|-----|------|------|--------|-----|--------|--------|--------|-----|-------|-------|
| 061008 | 024 | 2.8- | 0.3- | 621101 | 760 | 0.6+ | 1.2+ | 741220 | 808 | 1.2+ | 0.6- |
| 061012 | 045 | 2.6+ | 1.3- | 730907 | 095 | (4.2+ | 9.0-) | 741220 | 808 | 0.0 | 0.1+ |
| 061012 | 045 | 2.2- | 1.8+ | 731001 | 095 | 1.4- | 4.1+ | 750111 | 808 | 0.1- | 0.2- |
| 061017 | 045 | 0.4+ | 3.5- | 731029 | 095 | 1.0+ | 1.3+ | 750111 | 808 | 0.3- | 0.3- |
| 061023 | 045 | 1.3- | 0.9- | 741213 | 808 | 0.1- | 0.4- | 750115 | 808 | 1.8- | 0.3- |
| 061108 | 024 | 2.5+ | 5.0- | 741214 | 808 | 0.1+ | 0.1+ | 750115 | 808 | 1.3- | 0.5- |
| 061111 | 045 | 2.2+ | 0.1+ | 741215 | 808 | 0.6+ | 0.1+ | 791022 | 801 | 1.0+ | 0.7+ |
| 500607 | 760 | 4.4+ | 1.2- | 741215 | 808 | 0.4+ | 0.3- | 791023 | 801 | 1.0- | 1.1+ |
| 500607 | 760 | 4.3- | 0.1+ | 741217 | 808 | (29.7+ | 37.9-) | 791028 | 688 | (1.0+ | 1.8-) |

(2179)* 1965 MA = 1930 WG = 1940 TK = 1951 WU1 = 1976 QU1

Discovered 1965 June 28 by A. R. Klemola at the Yale-Columbia Southern Station, El Leoncito.

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5

| | | | | | | | |
|---|------------|--------|----------|--|-------------|--|-------------|
| M | 124.48576 | | (1950.0) | | P | | Q |
| n | 0.18889012 | Peri. | 55.38115 | | +0.33946250 | | -0.93943944 |
| a | 3.0083606 | Node | 14.99138 | | +0.79231187 | | +0.25859082 |
| e | 0.1011203 | Incl. | 10.49193 | | +0.50695868 | | +0.22490962 |
| P | 5.22 | B(1,0) | 13.0 | | | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|--------|-----|--------|---------|--------|-----|--------|--------|--------|-----|------|------|
| 301213 | 690 | 0.3+ | 2.5- | 650610 | 808 | (14.4- | 1.3+)Y | 760821 | 809 | 0.3- | 0.1- |
| 301214 | 690 | 0.7+ | 2.1- | 650628 | 808 | (1.6+ | 7.3-)Y | 760821 | 809 | 0.1+ | 0.2- |
| 301216 | 690 | 1.8+ | 1.5- | 650630 | 808 | 0.5+ | 2.3- Y | 760823 | 808 | 0.1- | 0.2+ |
| 401002 | 119 | (43.3+ | 5.2-)X | 650702 | 808 | (12.5+ | 1.0-)Y | 760828 | 808 | 0.5- | 0.7+ |
| 401006 | 119 | (50.2+ | 48.8+)X | 650705 | 808 | 0.0 | 3.0- Y | 760828 | 808 | 0.8- | 0.8+ |
| 511129 | 711 | 1.6+ | 0.4- Y | 760820 | 808 | 0.8- | 0.5- | 760830 | 808 | 0.7+ | 1.0+ |
| 511129 | 711 | 2.1- | 3.4+ Y | 760820 | 808 | 0.9- | 0.2+ | 760830 | 808 | 0.6+ | 1.1+ |

1938 TB = 1972 TB2

The identification is by J. Lehtinen.

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5 (J-P)

| | | | | | | | |
|---|------------|--------|-----------|--|-------------|--|-------------|
| M | 100.61844 | | (1950.0) | | P | | Q |
| n | 0.17466347 | Peri. | 267.77544 | | +0.89821594 | | -0.43800464 |
| a | 3.1695834 | Node | 118.19929 | | +0.41807174 | | +0.82539571 |
| e | 0.1993979 | Incl. | 2.39828 | | +0.13573554 | | +0.35619356 |
| P | 5.64 | B(1,0) | 12.5 | | | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|--------|-----|------|------|--------|-----|------|------|--------|-----|------|------|
| 380922 | 062 | 1.3+ | 0.9- | 381021 | 062 | 2.8- | 0.9+ | 721008 | 095 | 2.3- | 1.1- |
| 381015 | 062 | 2.2- | 1.1- | 381021 | 062 | 1.2- | 0.9+ | 721202 | 095 | 7.3- | 1.4- |
| 381015 | 062 | 1.8- | 0.3+ | 381115 | 062 | 2.1- | 0.4+ | 721206 | 095 | 6.0- | 0.6- |

1941 SZ = 1941 SH1 = 1966 UP = 1970 PQ

The identification 1941 SZ = 1970 PQ is by J. Lehtinen. The identification 1941 SZ = 1961 TD1 (MPC 2195) is invalid.

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5 (J-P)

| | | | | | | | |
|---|------------|--------|-----------|--|-------------|--|-------------|
| M | 78.89057 | | (1950.0) | | P | | Q |
| n | 0.23723196 | Peri. | 165.69499 | | +0.93777131 | | +0.34711975 |
| a | 2.5843705 | Node | 173.96755 | | -0.32691831 | | +0.89187166 |
| e | 0.2983961 | Incl. | 5.26073 | | -0.11708707 | | +0.28995311 |
| P | 4.15 | B(1,0) | 14.5 | | | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|--------|-----|------|------|--------|-----|------|------|--------|-----|------|------|
| 410920 | 062 | 1.8- | 3.3+ | 661020 | 095 | 0.1+ | 1.4- | 700831 | 095 | 0.0 | 3.1- |
| 410925 | 062 | 0.3- | 0.9- | 700809 | 095 | 1.8- | 5.0+ | 700909 | 095 | 4.4+ | 3.1+ |
| 410927 | 062 | 1.0+ | 0.5+ | 700829 | 095 | 0.4- | 6.1- | 700929 | 095 | 1.8- | 0.7+ |

1971 SC

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5 (J-P)

| | | | | | | | |
|---|------------|--------|-----------|--|-------------|--|-------------|
| M | 188.69513 | | (1950.0) | | P | | Q |
| n | 0.30226310 | Peri. | 173.53671 | | +0.95829306 | | +0.28339029 |
| a | 2.1989406 | Node | 169.76995 | | -0.27062563 | | +0.94138039 |
| e | 0.3893655 | Incl. | 12.00392 | | -0.09184869 | | +0.18301064 |
| P | 3.26 | B(1,0) | 16.5 | | | | |

From 16 observations 1971 Aug. 1-Oct. 13, mean residual 1".0.

1973 FF1 = 1978 DB

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5 (J-P)

| | | | | | | | |
|---|------------|--------|-----------|--|-------------|--|-------------|
| M | 62.65823 | | (1950.0) | | P | | Q |
| n | 0.18876726 | Peri. | 247.44330 | | -0.67292450 | | +0.73717762 |
| a | 3.0096718 | Node | 339.87030 | | -0.59640757 | | -0.58961876 |
| e | 0.0473916 | Incl. | 10.23839 | | -0.43757356 | | -0.33002858 |
| P | 5.22 | B(1,0) | 12.5 | | | | |

Residuals in seconds of arc

| | | | | | | | | |
|------------|------|------|------------|------|------|------------|------|------|
| 730327 095 | 2.7- | 3.0- | 780228 414 | 0.9+ | 2.1+ | 780305 414 | 0.3- | 0.1+ |
| 730402 095 | 1.4+ | 1.3- | 780228 414 | 0.7+ | 2.0+ | 780315 414 | 1.2+ | 2.5- |
| 730405 095 | 2.5+ | 2.5+ | 780305 414 | 0.1- | 1.0+ | 780315 414 | 1.5- | 2.3- |

1975 BU

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5 (J-P)

| | | | | | | |
|--------------|--------|-----------|--|-------------|--|-------------|
| M 318.59442 | | (1950.0) | | P | | Q |
| n 0.21114152 | Peri. | 69.75632 | | -0.90105408 | | +0.36771977 |
| a 2.7931086 | Node | 131.05494 | | -0.41287000 | | -0.88963260 |
| e 0.1128818 | Incl. | 17.75578 | | +0.13281533 | | -0.27080622 |
| P 4.67 | B(1,0) | 12.3 | | | | |

From 10 observations 1975 Jan. 12-Apr. 7, mean residual 1".3.

1975 VD

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5 (J-P)

| | | | | | | |
|--------------|--------|-----------|--|-------------|--|-------------|
| M 82.49141 | | (1950.0) | | P | | Q |
| n 0.27875896 | Peri. | 346.10605 | | +0.98231688 | | +0.18715497 |
| a 2.3208711 | Node | 3.12100 | | -0.16145243 | | +0.86070912 |
| e 0.2369398 | Incl. | 5.43223 | | -0.09479799 | | +0.47344780 |
| P 3.54 | B(1,0) | 16.0 | | | | |

From 7 observations 1975 Nov. 3-1976 Feb. 5, mean residual 1".1.

1976 DC

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5 (J-P)

| | | | | | | |
|--------------|--------|-----------|--|-------------|--|-------------|
| M 15.97901 | | (1950.0) | | P | | Q |
| n 0.27959638 | Peri. | 223.33004 | | -0.96435186 | | +0.04673858 |
| a 2.3162346 | Node | 317.18519 | | +0.13164491 | | -0.76910300 |
| e 0.3435376 | Incl. | 22.53464 | | -0.22955416 | | -0.63741358 |
| P 3.53 | B(1,0) | 17.5 | | | | |

From 19 observations 1976 Feb. 27-May 25, mean residual 0".9.

1976 DD

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5 (J-P)

| | | | | | | |
|--------------|--------|-----------|--|-------------|--|-------------|
| M 322.79776 | | (1950.0) | | P | | Q |
| n 0.23668366 | Peri. | 211.10471 | | -0.95011785 | | -0.04382081 |
| a 2.5883603 | Node | 322.26748 | | +0.26082517 | | -0.65451423 |
| e 0.2652172 | Incl. | 30.30418 | | -0.17101550 | | -0.75477867 |
| P 4.16 | B(1,0) | 15.9 | | | | |

From 19 observations 1976 Feb. 27-May 24, mean residual 1".2.

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

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

(2180)* 1940 RJ = 1950 NQ1 = 1970 JR = 1971 OL1 = 1976 NM = 1977 TT3
 Discovered 1940 Sept. 8 by Y. Vaisala at Turku. The key identifi-
 cations 1940 RJ = 1950 NQ1 = 1970 JR are by O. Kippes.

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5

| | | | | | | |
|--------------|--------|-----------|-------------|---|--|-------------|
| M 204.37140 | | (1950.0) | | P | | Q |
| n 0.18819175 | Peri. | 89.34799 | +0.78441564 | | | +0.60679595 |
| a 3.0157985 | Node | 233.28533 | -0.61345690 | | | +0.72850453 |
| e 0.0788269 | Incl. | 9.21825 | -0.09144796 | | | +0.31793051 |
| P 5.24 | B(1,0) | 12.0 | | | | |

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

| | | | | | | | |
|------------|------|------|------------|----------------|------------|------|------|
| 400908 062 | 1.6+ | 1.1+ | 500715 094 | (60.7+ 83.0+)X | 760701 095 | 0.5+ | 2.8+ |
| 400910 062 | 2.0- | 0.2+ | 500719 094 | (0.06- 0.04-)X | 771012 330 | 1.4+ | 4.0- |
| 400930 062 | 0.5+ | 1.6+ | 700508 805 | 0.3- 0.2- | 771101 330 | 0.6+ | 2.2+ |
| 401022 062 | 1.4- | 0.3+ | 710729 095 | 0.2+ 4.6- | 771108 330 | 1.7- | 0.7+ |

(2181)* 1942 YA = 1952 HC2 = 1975 VF9

Discovered 1942 Dec. 28 by K. Reinmuth at Heidelberg.

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5

| | | | | | | |
|--------------|--------|-----------|-------------|---|--|-------------|
| M 284.04772 | | (1950.0) | | P | | Q |
| n 0.23652118 | Peri. | 117.71893 | -0.69631858 | | | -0.71471015 |
| a 2.5895404 | Node | 16.94758 | +0.55292897 | | | -0.59262597 |
| e 0.1205646 | Incl. | 13.04622 | +0.45761336 | | | -0.37146179 |
| P 4.17 | B(1,0) | 13.4 | | | | |

Residuals in seconds of arc

| | | | | | | | | |
|------------|------|------|------------|-----------|---|------------|------|------|
| 421228 024 | 0.1- | 1.7+ | 520423 711 | 3.1- 4.5- | Y | 790917 801 | 0.9+ | 1.0- |
| 430109 024 | 1.0- | 1.5+ | 751108 095 | 2.6+ 4.2- | | 791023 801 | 1.2- | 0.3- |
| 430125 024 | 0.7+ | 0.4+ | 751127 095 | 0.4+ 0.9- | | | | |
| 430208 024 | 1.5+ | 2.5+ | 790818 801 | 0.0 1.2+ | | | | |

(2182)* 1953 FH1 = 1953 GY = 1955 UT = 1975 EU1 = 1975 EU3 = 1978 VB8

Discovered 1953 Mar. 21 at the Goethe Link Observatory, Indiana University. The key identification 1953 FH1 = 1975 EU1 is by E. Bowell. The identification 1953 FH1 = 1978 VB8 was independently suggested by S. J. Bus. The double designations 1953 FH1 = 1953 GY and 1975 EU1 = 1975 EU3 were found by O. Kipptes (MPC 1331) and Bowell (MPC 4576), respectively.

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5

| | | | | | | |
|--------------|--------|-----------|-------------|---|--|-------------|
| M 255.06119 | | (1950.0) | | P | | Q |
| n 0.17799870 | Peri. | 190.82677 | -0.46590916 | | | +0.88427746 |
| a 3.1298594 | Node | 51.41180 | -0.80875233 | | | -0.41121444 |
| e 0.1332771 | Incl. | 2.29768 | -0.35895449 | | | -0.22126016 |
| P 5.54 | B(1,0) | 12.5 | | | | |

Residuals in seconds of arc

| | | | | | | | | |
|------------|------|------|------------|-----------|--|------------|------|------|
| 530321 760 | 0.2- | 0.5- | 551020 760 | 0.6+ 0.1+ | | 750317 095 | 3.0- | 4.2+ |
| 530321 760 | 0.4- | 0.9+ | 551020 760 | 0.6- 0.0 | | 781105 675 | 0.1+ | 0.1+ |
| 530405 760 | 0.4- | 1.1- | 750306 095 | 0.7- 2.2+ | | 781106 675 | 0.2- | 0.2- |
| 530405 760 | 0.0 | 0.8- | 750308 095 | 0.3+ 0.4- | | 781108 675 | 0.2+ | 0.2- |
| 530411 760 | 0.1+ | 0.3- | 750314 095 | 0.4- 0.3+ | | | | |
| 530411 760 | 0.4+ | 0.9+ | 750316 095 | 4.3+ 5.3- | | | | |

(2183)* 1959 OB

Discovered 1959 July 26 by C. Hoffmeister at Bloemfontein. Elements based on two oppositions have previously been computed by M. A. Dirikis and V. A. Magone (MPC 4169).

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5

| | | | | | | |
|--------------|--------|-----------|-------------|---|--|-------------|
| M 316.83326 | | (1950.0) | | P | | Q |
| n 0.19067656 | Peri. | 238.18116 | +0.78749785 | | | +0.53080692 |
| a 2.9895409 | Node | 87.94606 | -0.40397124 | | | +0.82834367 |
| e 0.3768145 | Incl. | 18.26403 | -0.46546146 | | | +0.17913897 |
| P 5.17 | B(1,0) | 12.6 | | | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|--------|-----|-------|-------|--------|-----|------|------|--------|-----|------|------|
| 590726 | 074 | 1.1- | 1.5- | 590808 | 074 | 2.5- | 2.6- | 590810 | 074 | 0.6+ | 0.8- |
| 590728 | 074 | 0.1- | 1.1+ | 590808 | 074 | 0.1+ | 0.5- | 590810 | 074 | 0.8+ | 1.3+ |
| 590729 | 074 | 0.1+ | 0.6- | 590808 | 074 | 0.2+ | 0.5- | 590810 | 074 | 0.4- | 0.5- |
| 590730 | 074 | (5.3- | 0.9-) | 590808 | 074 | 1.1+ | 0.3+ | 590811 | 074 | 0.2- | 0.2+ |
| 590731 | 074 | 1.3+ | 0.7+ | 590809 | 074 | 1.7- | 0.7- | 751105 | 095 | 0.5+ | 2.7+ |
| 590802 | 074 | 0.1- | 1.3+ | 590809 | 074 | 1.1+ | 0.9+ | 751106 | 095 | 1.9+ | 2.8- |
| 590804 | 074 | 2.2+ | 4.1+ | 590809 | 074 | 0.3- | 0.2- | 751111 | 095 | 2.4- | 0.2+ |
| 590808 | 074 | (4.6- | 0.6+) | 590809 | 074 | 1.0- | 0.0 | 770113 | 095 | 0.1- | 0.4+ |
| 590808 | 074 | 0.3- | 0.3+ | 590809 | 074 | 2.2+ | 1.1+ | | | | |
| 590808 | 074 | 1.6- | 1.4- | 590810 | 074 | 0.2+ | 1.9- | | | | |

(2184)* 1964 TV2 = 1953 VH = 1976 YK3

Discovered 1964 Oct. 9 at the Purple Mountain Observatory. The recovery in 1966 was made on the basis of calculations at the Purple Mountain Observatory.

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5

| | | | | | | | |
|---|------------|--------|-----------|-------------|---|--|-------------|
| M | 243.26990 | | (1950.0) | | P | | Q |
| n | 0.17482739 | Peri. | 125.44880 | +0.92294671 | | | -0.37462050 |
| a | 3.1675956 | Node | 256.69659 | +0.31707781 | | | +0.87023170 |
| e | 0.1148056 | Incl. | 5.21657 | +0.21824532 | | | +0.31993165 |
| P | 5.64 | B(1,0) | 12.0 | | | | |

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

| | | | | | | | | | | | | |
|--------|-----|--------|--------|---|--------|-----|------|------|--------|-----|------|------|
| 531110 | 094 | (0.03- | 0.01+) | X | 641130 | 330 | 0.1+ | 0.5- | 660119 | 330 | 1.5- | 1.4- |
| 641009 | 330 | 0.5- | 0.6- | | 641203 | 330 | 0.8+ | 1.1- | 761216 | 095 | 0.7- | 0.8+ |
| 641020 | 330 | 1.1- | 0.0 | | 660601 | 330 | 0.3+ | 1.5- | 770113 | 095 | 0.5+ | 0.7+ |
| 641109 | 330 | 1.5+ | 0.6+ | | 660116 | 330 | 0.2+ | 1.6- | 770120 | 095 | 0.5+ | 3.4+ |

(2185)* 1965 WO = 1950 HZ = 1968 HX = 1974 YM

Discovered 1965 Nov. 20 at the Purple Mountain Observatory. The key identification 1965 WO = 1968 HX was found at the Purple Mountain Observatory (Acta Astron. Sinica Vol. 18, No. 2).

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5

| | | | | | | | |
|---|------------|--------|-----------|-------------|---|--|-------------|
| M | 138.96166 | | (1950.0) | | P | | Q |
| n | 0.22102913 | Peri. | 260.55358 | +0.76747668 | | | +0.62438881 |
| a | 2.7091708 | Node | 60.66208 | -0.50304181 | | | +0.72706880 |
| e | 0.1612925 | Incl. | 9.59607 | -0.39740216 | | | +0.28549880 |
| P | 4.46 | B(1,0) | 13.0 | | | | |

Residuals in seconds of arc

| | | | | | | | | | | | | |
|--------|-----|------|------|--|--------|-----|------|------|--------|-----|------|------|
| 500420 | 760 | 3.1+ | 1.8- | | 651125 | 330 | 1.3- | 1.8- | 680521 | 095 | 1.5+ | 2.0- |
| 500420 | 760 | 2.0+ | 0.9- | | 651128 | 330 | 1.9- | 1.4- | 680522 | 095 | 3.0- | 1.9+ |
| 651120 | 330 | 0.3- | 0.9- | | 651213 | 330 | 0.4- | 4.4- | 741219 | 330 | 4.5+ | 6.5+ |
| 651121 | 330 | 1.3- | 1.0+ | | 680425 | 095 | 0.1- | 1.0- | 781127 | 801 | 2.4+ | 3.4+ |
| 651125 | 330 | 2.3- | 0.7- | | 680427 | 095 | 3.1- | 4.0+ | | | | |

(2186)* 1973 SQ4 = 1966 DD = 1975 EJ2

Discovered 1973 Sept. 27 by L. Chernykh at the Crimean Astrophysical Observatory. The 1977 recovery observation was obtained on the basis of calculations at the Institute for Theoretical Astronomy.

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5

| | | | | | | | |
|---|------------|--------|-----------|-------------|---|--|-------------|
| M | 116.23875 | | (1950.0) | | P | | Q |
| n | 0.22457384 | Peri. | 132.26707 | +0.53380581 | | | -0.84466911 |
| a | 2.6805872 | Node | 285.42871 | +0.76312191 | | | +0.50148586 |
| e | 0.1030655 | Incl. | 2.36736 | +0.36427503 | | | +0.18720586 |
| P | 4.39 | B(1,0) | 13.5 | | | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|--------|-----|------|------|--------|-----|------|------|--------|-----|------|------|
| 660130 | 330 | 0.3+ | 0.3- | 660224 | 330 | 1.4+ | 0.3- | 731029 | 095 | 0.1+ | 2.6+ |
| 660216 | 330 | 1.6- | 0.7+ | 730927 | 095 | 1.1- | 1.1- | 750308 | 095 | 0.7- | 1.7- |
| 660218 | 760 | 1.2- | 0.2- | 730928 | 095 | 0.2- | 0.7+ | 770918 | 095 | 0.3+ | 0.8- |
| 660218 | 760 | 1.3+ | 0.9+ | 731027 | 095 | 1.2+ | 2.4- | | | | |

(2187)* 1976 UH

Discovered 1976 Oct. 24 by R. M. West at the European Southern Observatory.

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5

| | | | | | | | |
|---|------------|--------|-----------|-------------|---|-------------|---|
| M | 12.58108 | | (1950.0) | | P | | Q |
| n | 0.24395394 | Peri. | 213.82087 | +0.97764491 | | +0.14114891 | |
| a | 2.5366711 | Node | 137.19295 | -0.10249565 | | +0.96708129 | |
| e | 0.1183050 | Incl. | 13.25826 | -0.18358941 | | +0.21173273 | |
| P | 4.04 | B(1,0) | 14.0 | | | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|--------|-----|------|------|--------|-----|------|------|--------|-----|------|------|
| 761024 | 809 | 1.2- | 0.7- | 761102 | 809 | 0.2- | 0.3- | 780414 | 801 | 0.7+ | 0.3- |
| 761024 | 809 | 0.2+ | 0.6- | 761102 | 809 | 0.2+ | 0.5+ | 780416 | 801 | 2.7- | 0.7+ |
| 761025 | 809 | 0.2+ | 0.1- | 761129 | 809 | 0.6+ | 0.3+ | 780502 | 801 | 3.2+ | 0.4+ |
| 761031 | 809 | 0.9+ | 0.6- | 761129 | 809 | 0.5+ | 0.4+ | 790726 | 801 | 0.9- | 0.9+ |
| 761031 | 809 | 0.8+ | 0.1- | 761130 | 809 | 0.4+ | 0.9+ | 790918 | 801 | 0.1- | 0.1+ |
| 761101 | 809 | 0.0 | 0.1- | 770121 | 801 | 1.1- | 1.4+ | 791017 | 809 | 0.7+ | 0.3+ |
| 761101 | 809 | 1.1- | 0.2- | 780310 | 801 | 1.2- | 0.4- | | | | |

(2188)* 1976 UL4 = 1950 ND = 1963 DE = 1969 HB = 1979 HU

Discovered 1976 Oct. 28 by L. Zhuravleva at the Crimean Astrophysical Observatory. The key identifications 1976 UL4 = 1969 HB and 1976 UL4 = 1979 HU were made by T. Urata and E. Bowell respectively. The identification 1976 UL4 = 1970 PY (NOC 1067) is not valid.

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5

| | | | | | | | |
|---|------------|--------|-----------|-------------|---|-------------|---|
| M | 295.00598 | | (1950.0) | | P | | Q |
| n | 0.19948304 | Peri. | 195.54830 | +0.91108545 | | +0.41114658 | |
| a | 2.9008954 | Node | 140.13314 | -0.37307125 | | +0.85306191 | |
| e | 0.0900344 | Incl. | 2.65521 | -0.17533153 | | +0.32131582 | |
| P | 4.94 | B(1,0) | 13.0 | | | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|--------|-----------|--------|--------|--------|------|------|--------|--------|------|------|------|
| 500706 | 078(15.7- | 2.7-)Y | 761028 | 095 | 1.9- | 2.6- | 790419 | 807 | 0.9- | 0.5- | |
| 630223 | 760 | 1.1+ | 0.2+ | 761218 | 095 | 1.1- | 1.4+ | 790426 | 807 | 0.4- | 0.4- |
| 630223 | 760 | 1.2- | 0.1+ | 761220 | 095 | 3.2+ | 0.0 | 790426 | 807 | 0.7+ | 0.8- |
| 690422 | 095 | 0.2+ | 0.3+ | | | | | | | | |

1975 RB

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5 (J-P)

| | | | | | | | |
|---|------------|--------|-----------|-------------|---|-------------|---|
| M | 69.86586 | | (1950.0) | | P | | Q |
| n | 0.28207807 | Peri. | 42.76197 | +0.99621875 | | +0.02650976 | |
| a | 2.3026293 | Node | 315.51269 | -0.06262634 | | +0.87916995 | |
| e | 0.3312859 | Incl. | 6.78068 | +0.06021746 | | +0.47577034 | |
| P | 3.49 | B(1,0) | 16.5 | | | | |

From 15 observations 1975 Sept. 4-1976 Jan. 26, mean residual 0".5.

1977 TZ

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5 (J-P)

| | | | | | | | |
|---|------------|--------|----------|-------------|---|-------------|---|
| M | 165.16085 | | (1950.0) | | P | | Q |
| n | 0.23910938 | Peri. | 29.34579 | +0.68673170 | | -0.72263822 | |
| a | 2.5708250 | Node | 17.68165 | +0.60611544 | | +0.50948141 | |
| e | 0.1029548 | Incl. | 15.01732 | +0.40127750 | | +0.46714312 | |
| P | 4.12 | B(1,0) | 14.0 | | | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|--------|-----|------|------|--------|-----|------|------|--------|-----|-------|--------|
| 771012 | 026 | 1.0+ | 0.9- | 771105 | 026 | 0.5+ | 0.3+ | 790228 | 801 | (6.1- | 11.4+) |
| 771013 | 026 | 1.0+ | 0.7- | 771108 | 330 | 0.8- | 1.6- | 790324 | 801 | 0.7- | 0.0 |
| 771019 | 026 | 0.7- | 0.8+ | 771110 | 026 | 0.6+ | 0.9+ | 790424 | 801 | 0.2- | 0.7+ |
| 771020 | 026 | 0.1- | 1.4+ | 771111 | 026 | 0.1- | 1.3+ | | | | |
| 771101 | 330 | 2.3- | 1.0- | 780210 | 801 | 0.7- | 0.0 | | | | |

1977 TJ3

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5 (J-P)

| | | | | | | | |
|---|------------|--------|-----------|-------------|---|-------------|---|
| M | 180.29741 | | (1950.0) | | P | | Q |
| n | 0.08492343 | Peri. | 52.08789 | -0.18000831 | | +0.94399084 | |
| a | 5.1260781 | Node | 211.19914 | -0.98312047 | | -0.16329841 | |
| e | 0.0346247 | Incl. | 32.26664 | +0.03272815 | | +0.28673145 | |
| P | 11.61 | B(1,0) | 9.7 | | | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|--------|-----|------|------|--------|-----|------|------|--------|-----|------|------|
| 771004 | 330 | 0.9- | 1.2- | 771101 | 330 | 1.4+ | 0.5- | 791023 | 801 | 1.3+ | 0.4+ |
| 771010 | 330 | 0.3+ | 1.4+ | 771108 | 330 | 1.0- | 0.5- | 791026 | 801 | 0.5- | 1.1- |
| 771016 | 330 | 0.4+ | 0.9- | 791022 | 801 | 1.4- | 1.1+ | | | | |

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ORBITAL ELEMENTS BY S. NAKANO, SUMOTO, AND T. URATA, SHIMIZU, JAPAN.

The following orbital elements are from NOC 1059, 1058, 1062 and 1075, respectively. The identifications are by T. Urata.

1968 SB = 1972 HE = 1974 WA1 = 1977 FH1

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5

| | | | | | | | |
|---|------------|--------|-----------|-------------|---|-------------|---|
| M | 356.26026 | | (1950.0) | | P | | Q |
| n | 0.17492500 | Peri. | 292.11584 | +0.99634289 | | -0.07337616 | |
| a | 3.1664172 | Node | 72.11388 | +0.08490002 | | +0.90793463 | |
| e | 0.1929048 | Incl. | 2.63680 | -0.00963518 | | +0.41263863 | |
| P | 5.63 | B(1,0) | 13.0 | | | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|--------|-----|------|------|--------|-----|------|------|--------|-----|------|------|
| 680928 | 026 | 1.0- | 0.6- | 681019 | 026 | 0.3- | 0.5+ | 741118 | 095 | 0.2+ | 0.3- |
| 681012 | 026 | 0.1+ | 0.2- | 681126 | 026 | 0.2+ | 4.2+ | 770325 | 095 | 0.4+ | 2.2+ |
| 681017 | 026 | 0.4- | 0.3- | 720418 | 095 | 0.9+ | 1.1+ | | | | |

1968 UQ = 1963 WF

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5

| | | | | | | | |
|---|------------|--------|-----------|-------------|---|-------------|---|
| M | 337.76815 | | (1950.0) | | P | | Q |
| n | 0.17089176 | Peri. | 203.34845 | +0.80152373 | | -0.59796148 | |
| a | 3.2160439 | Node | 193.37584 | +0.54949640 | | +0.73743382 | |
| e | 0.1452429 | Incl. | 0.32958 | +0.23582497 | | +0.31405957 | |
| P | 5.77 | B(1,0) | 12.5 | | | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|--------|-----|------|------|--------|-----|------|------|--------|-----|------|------|
| 631122 | 675 | 0.1- | 0.4+ | 631125 | 675 | 0.3- | 0.6- | 681026 | 095 | 1.5- | 0.3+ |
| 631123 | 675 | 0.2- | 0.8+ | 681022 | 095 | 1.5+ | 0.1- | 681213 | 095 | 0.1+ | 0.2- |
| 631124 | 675 | 0.7+ | 0.5- | | | | | | | | |

1970 LD = 1971 SK2 = 1976 OB1

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5

| | | | | | | | |
|---|------------|--------|-----------|-------------|---|-------------|---|
| M | 218.81730 | | (1950.0) | | P | | Q |
| n | 0.17425606 | Peri. | 164.28795 | +0.37680280 | | +0.92579010 | |
| a | 3.1745155 | Node | 127.83794 | -0.85392747 | | +0.35994965 | |
| e | 0.1497482 | Incl. | 2.21580 | -0.35892550 | | +0.11553763 | |
| P | 5.66 | B(1,0) | 12.2 | | | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|--------|-----|-------|-------|--------|-----|------|------|--------|-----|------|------|
| 700610 | 095 | 0.7- | 0.1- | 711013 | 095 | 0.1+ | 0.3- | 711015 | 095 | 0.6- | 0.2+ |
| 700706 | 095 | 0.6+ | 0.8- | 711014 | 095 | 0.7+ | 0.5- | 760729 | 095 | 0.2- | 0.9+ |
| 710926 | 095 | (4.8- | 3.7+) | | | | | | | | |

1972 HN = 1968 UK

Epoch 1979 Nov. 23.0 ET = JDE 2444200.5

| | | | | | | | |
|---|------------|--------|-----------|--|-------------|--|-------------|
| M | 39.82444 | | (1950.0) | | P | | Q |
| n | 0.17491495 | Peri. | 173.61852 | | +0.87757049 | | +0.47934364 |
| a | 3.1665384 | Node | 157.73040 | | -0.44102002 | | +0.81522804 |
| e | 0.2047351 | Incl. | 1.50986 | | -0.18807280 | | +0.32501217 |
| P | 5.63 | B(1,0) | 12.5 | | | | |

Residuals in seconds of arc

| | | | | | | | | | | | |
|--------|-----|------|------|--------|-----|------|------|--------|-----|------|------|
| 681022 | 095 | 0.0 | 0.3- | 720512 | 095 | 1.2- | 0.1+ | 791014 | 885 | 0.4+ | 2.2+ |
| 681026 | 095 | 0.1+ | 0.2+ | 791014 | 885 | 0.1- | 1.8+ | 791020 | 879 | 2.2- | 1.1- |
| 720418 | 095 | 0.3- | 0.3- | 791014 | 885 | 0.0 | 0.6+ | 791020 | 879 | 1.4- | 1.5- |
| 720509 | 095 | 1.4+ | 0.1- | | | | | | | | |

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NEW NAMES OF MINOR PLANETS.

(1918) Aiguillon = 1968 UA

Discovered 1968 Oct. 19 by G. Soulie at Bordeaux.

Named for the discoverer's birthplace, a small town on the Garonne river.

(1964) Luyten = 2007 P-L

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

Named in honor of Willem Jacob Luyten, emeritus professor of astronomy at the University of Minnesota, well known for his investigations on stars with large proper motion.

(1965) van de Kamp = 2521 P-L

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

Named in honor of Peter van de Kamp, director of Sproul Observatory from 1937 until 1972, well known for his investigations on astrometric binary stars.

(2059) Baboquivari = 1963 UA

Discovered 1963 Oct. 16 at the Goethe Link Observatory, Indiana University.

This Amor-type object, recovered with the Steward Observatory's 2.3-m reflector on Kitt Peak in 1976, is named in honor of the Papago Indian Tribe, which made available the land on which the AURA observatories are based. Baboquivari, located a few kilometers south of Kitt Peak, is the highest and most sacred peak in Papago country. It figures prominently in Papago mythology as the home of the culture hero I'itoi. Name proposed by F. K. Edmondson.

(2133) Franceswright = 1976 WB

Discovered 1976 Nov. 20 at the Harvard College Observatory, Agassiz Station.

Named in honor of Frances Woodworth Wright, long time staff member of the Harvard College Observatory, known for her research on photographic meteors, extraterrestrial dust and variable stars, and revered for teaching generations of navigators to fare forth and return safely to port.

(2174) Asmodeus = 1975 TA

Discovered 1975 Oct. 8 by S. J. Bus and J. P. Huchra at Palomar.

Named for the Babylonian god of lust.

(2187) La Silla = 1976 UH

Discovered 1976 Oct. 24 by R. M. West at the European Southern Observatory.

Named for the mountain in the Chilean Atacama desert on the top of which the European Southern Observatory is situated.

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EPHEMERIDES.

Periodic Comet Schwassmann-Wachmann 3 (1979g)

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | MPC | 5031 |
|------------|----|--------------|----------|-------|-------|--------|-------|-----|------|
| | | | | | | | | | ml |
| 1979 11 23 | | 21 04.28 | -28 32.3 | 1.447 | 1.461 | 70.9 | 39.7 | | 14.9 |
| 1979 12 03 | | 21 40.75 | -25 11.5 | | | | | | |
| 1979 12 13 | | 22 12.11 | -21 48.3 | 1.751 | 1.649 | 67.6 | 33.5 | | 15.9 |
| 1979 12 23 | | 22 39.59 | -18 30.6 | | | | | | |
| 1980 01 02 | | 23 04.14 | -15 21.9 | 2.095 | 1.837 | 61.2 | 28.0 | | 16.7 |
| 1980 01 12 | | 23 26.47 | -12 23.5 | | | | | | |
| 1980 01 22 | | 23 47.12 | -09 35.7 | 2.455 | 2.020 | 52.9 | 22.9 | | 17.5 |
| 1980 02 01 | | 00 06.46 | -06 58.1 | | | | | | |
| 1980 02 11 | | 00 24.77 | -04 30.4 | 2.808 | 2.197 | 43.3 | 17.9 | | 18.2 |
| 1980 02 21 | | 00 42.27 | -02 11.9 | | | | | | |
| 1980 03 02 | | 00 59.08 | -00 02.4 | 3.137 | 2.367 | 32.9 | 13.1 | | 18.7 |
| 1980 03 12 | | 01 15.33 | +01 58.7 | | | | | | |
| 1980 03 22 | | 01 31.09 | +03 51.5 | 3.426 | 2.530 | 22.0 | 8.5 | | 19.2 |
| 1980 04 01 | | 01 46.40 | +05 36.4 | | | | | | |
| 1980 04 11 | | 02 01.30 | +07 13.5 | 3.663 | 2.687 | 11.0 | 4.1 | | 19.6 |
| 1980 04 21 | | 02 15.81 | +08 43.1 | | | | | | |
| 1980 05 01 | | 02 29.91 | +10 05.4 | 3.839 | 2.836 | 4.9 | 1.7 | | 19.9 |
| 1980 05 11 | | 02 43.60 | +11 20.4 | | | | | | |
| 1980 05 21 | | 02 56.84 | +12 28.5 | 3.947 | 2.980 | 14.8 | 5.0 | | 20.2 |
| 1980 05 31 | | 03 09.59 | +13 29.6 | | | | | | |
| 1980 06 10 | | 03 21.80 | +14 24.1 | 3.984 | 3.117 | 27.3 | 8.6 | | 20.4 |

Comet Meier (1979i)

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | MPC | 5031 |
|------------|----|--------------|----------|-------|-------|--------|-------|-----|------|
| | | | | | | | | | ml |
| 1979 11 23 | | 12 03.55 | +53 47.1 | 1.203 | 1.535 | 88.4 | 40.0 | | 11.8 |
| 1979 12 03 | | 11 35.30 | +52 57.9 | | | | | | |
| 1979 12 13 | | 10 55.71 | +51 52.7 | 1.017 | 1.650 | 111.0 | 33.8 | | 11.7 |
| 1979 12 23 | | 10 04.05 | +49 39.2 | | | | | | |
| 1980 01 02 | | 09 06.00 | +45 16.9 | 0.909 | 1.798 | 143.8 | 18.8 | | 11.8 |
| 1980 01 12 | | 08 12.58 | +38 40.7 | | | | | | |
| 1980 01 22 | | 07 31.56 | +31 08.8 | 1.000 | 1.969 | 165.7 | 7.1 | | 12.4 |

| | | | | | | | | |
|------------|----------|----------|-------|-------|-------|------|------|--|
| 1980 02 01 | 07 03.91 | +24 14.1 | | | | | | |
| 1980 02 11 | 06 46.96 | +18 40.3 | 1.303 | 2.154 | 140.0 | 17.1 | 13.4 | |
| 1980 02 21 | 06 37.74 | +14 27.3 | | | | | | |
| 1980 03 02 | 06 34.00 | +11 18.3 | 1.729 | 2.348 | 116.7 | 22.1 | 14.4 | |
| 1980 03 12 | 06 34.11 | +08 55.5 | | | | | | |
| 1980 03 22 | 06 36.98 | +07 04.3 | 2.208 | 2.547 | 98.1 | 22.8 | 15.3 | |
| 1980 04 01 | 06 41.86 | +05 34.1 | | | | | | |
| 1980 04 11 | 06 48.21 | +04 17.4 | 2.697 | 2.749 | 82.3 | 21.2 | 16.0 | |
| 1980 04 21 | 06 55.64 | +03 08.8 | | | | | | |
| 1980 05 01 | 07 03.86 | +02 04.6 | 3.172 | 2.951 | 68.2 | 18.5 | 16.7 | |
| 1980 05 11 | 07 12.65 | +01 01.9 | | | | | | |
| 1980 05 21 | 07 21.83 | -00 01.0 | 3.613 | 3.153 | 55.6 | 15.4 | 17.3 | |
| 1980 05 31 | 07 31.25 | -01 05.6 | | | | | | |
| 1980 06 10 | 07 40.81 | -02 13.0 | 4.006 | 3.354 | 44.2 | 12.2 | 17.8 | |

1976 WA

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elements MPC 4660 | | Mag. |
|------------|----|--------------|----------|-----------|-------|-------------------|-------|------|
| | | | | Variation | | | | |
| 1980 01 02 | | 14 41.36 | -05 45.7 | 2.276 | 1.994 | -1.24 | +1.7 | 20.2 |
| 1980 01 12 | | 15 03.93 | -06 00.2 | | | | | |
| 1980 01 22 | | 15 28.22 | -05 57.6 | 1.903 | 1.819 | -1.64 | +2.1 | 19.7 |
| 1980 02 01 | | 15 54.59 | -05 34.0 | | | | | |
| 1980 02 11 | | 16 23.55 | -04 44.7 | 1.550 | 1.635 | -2.23 | +2.5 | 19.1 |
| 1980 02 21 | | 16 55.66 | -03 24.3 | | | | | |
| 1980 03 02 | | 17 31.59 | -01 28.1 | 1.245 | 1.445 | -3.04 | +3.3 | 18.6 |
| 1980 03 12 | | 18 12.06 | +01 06.5 | | | | | |
| 1980 03 22 | | 18 57.62 | +04 16.4 | 1.021 | 1.251 | -4.01 | +6.4 | 18.0 |
| 1980 04 01 | | 19 48.32 | +07 48.3 | | | | | |
| 1980 04 11 | | 20 43.46 | +11 18.0 | 0.914 | 1.065 | -4.64 | +15.0 | 17.6 |
| 1980 04 21 | | 21 41.29 | +14 15.6 | | | | | |
| 1980 05 01 | | 22 39.56 | +16 18.3 | 0.934 | 0.910 | -4.23 | +24.8 | 17.5 |
| 1980 05 11 | | 23 36.31 | +17 20.0 | | | | | |
| 1980 05 21 | | 00 30.22 | +17 29.0 | 1.051 | 0.826 | -3.18 | +25.8 | 17.5 |
| 1980 05 31 | | 01 20.66 | +16 59.8 | | | | | |
| 1980 06 10 | | 02 07.33 | +16 06.4 | 1.212 | 0.850 | -2.31 | +20.2 | 17.6 |
| 1980 06 20 | | 02 50.04 | +14 57.7 | | | | | |
| 1980 06 30 | | 03 28.74 | +13 38.3 | 1.371 | 0.969 | -1.67 | +13.5 | 18.0 |
| 1980 07 10 | | 04 03.56 | +12 10.2 | | | | | |
| 1980 07 20 | | 04 34.68 | +10 34.4 | 1.503 | 1.141 | -1.19 | +9.8 | 18.4 |
| 1980 07 30 | | 05 02.33 | +08 51.2 | | | | | |
| 1980 08 09 | | 05 26.76 | +07 01.0 | 1.594 | 1.332 | -0.87 | +5.1 | 18.8 |
| 1980 08 19 | | 05 48.14 | +05 04.3 | | | | | |
| 1980 08 29 | | 06 06.58 | +03 01.5 | 1.639 | 1.526 | -0.69 | +1.4 | 19.1 |
| 1980 09 08 | | 06 22.13 | +00 53.2 | | | | | |
| 1980 09 18 | | 06 34.74 | -01 19.7 | 1.640 | 1.714 | -0.62 | -1.6 | 19.3 |
| 1980 09 28 | | 06 44.31 | -03 35.8 | | | | | |
| 1980 10 08 | | 06 50.66 | -05 53.1 | 1.608 | 1.894 | -0.65 | -4.2 | 19.5 |
| 1980 10 18 | | 06 53.56 | -08 08.4 | | | | | |
| 1980 10 28 | | 06 52.81 | -10 17.1 | 1.562 | 2.065 | -0.78 | -6.2 | 19.5 |
| 1980 11 07 | | 06 48.32 | -12 12.9 | | | | | |
| 1980 11 17 | | 06 40.19 | -13 47.5 | 1.533 | 2.226 | -0.99 | -7.2 | 19.5 |
| 1980 11 27 | | 06 28.97 | -14 52.4 | | | | | |
| 1980 12 07 | | 06 15.59 | -15 20.4 | 1.560 | 2.378 | -1.18 | -6.5 | 19.5 |
| 1980 12 17 | | 06 01.41 | -15 07.7 | | | | | |
| 1980 12 27 | | 05 47.91 | -14 16.6 | 1.677 | 2.522 | -1.22 | -4.6 | 19.8 |
| 1981 01 06 | | 05 36.28 | -12 54.1 | | | | | |
| 1981 01 16 | | 05 27.36 | -11 09.8 | 1.891 | 2.656 | -1.11 | -2.8 | 20.2 |
| 1981 01 26 | | 05 21.47 | -09 13.7 | | | | | |
| 1981 02 05 | | 05 18.56 | -07 13.8 | 2.186 | 2.783 | -0.94 | -1.7 | 20.6 |

| Periodic Comet Forbes | | | | | Elements MPC 4773 | | | |
|-----------------------|----|--------------|----------|-------|-------------------|-----------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | m2 |
| 1980 02 11 | | 13 34.28 | -07 47.7 | 1.998 | 2.591 | -1.19 | +8.6 | 20.6 |
| 1980 02 21 | | 13 37.42 | -08 13.2 | | | | | |
| 1980 03 02 | | 13 38.17 | -08 27.5 | 1.660 | 2.465 | -1.47 | +10.5 | 20.0 |
| 1980 03 12 | | 13 36.23 | -08 29.8 | | | | | |
| 1980 03 22 | | 13 31.43 | -08 19.5 | 1.388 | 2.337 | -1.74 | +12.7 | 19.4 |
| 1980 04 01 | | 13 23.97 | -07 57.7 | | | | | |
| 1980 04 11 | | 13 14.42 | -07 27.4 | 1.208 | 2.210 | -1.90 | +14.5 | 18.9 |
| 1980 04 21 | | 13 03.88 | -06 53.6 | | | | | |
| 1980 05 01 | | 12 53.77 | -06 23.5 | 1.128 | 2.083 | -1.84 | +14.9 | 18.4 |
| 1980 05 11 | | 12 45.49 | -06 04.3 | | | | | |
| 1980 05 21 | | 12 40.15 | -06 01.9 | 1.133 | 1.960 | -1.63 | +14.3 | 18.2 |
| 1980 05 31 | | 12 38.40 | -06 19.8 | | | | | |
| 1980 06 10 | | 12 40.43 | -06 58.9 | 1.189 | 1.842 | -1.44 | +13.4 | 18.0 |
| 1980 06 20 | | 12 46.20 | -07 58.9 | | | | | |
| 1980 06 30 | | 12 55.50 | -09 17.9 | 1.263 | 1.733 | -1.36 | +12.8 | 17.9 |
| 1980 07 10 | | 13 08.06 | -10 53.6 | | | | | |
| 1980 07 20 | | 13 23.70 | -12 43.3 | 1.338 | 1.638 | -1.39 | +12.5 | 17.8 |
| 1980 07 30 | | 13 42.22 | -14 43.7 | | | | | |
| 1980 08 09 | | 14 03.51 | -16 50.8 | 1.407 | 1.561 | -1.53 | +12.0 | 17.7 |
| 1980 08 19 | | 14 27.51 | -19 00.2 | | | | | |
| 1980 08 29 | | 14 54.12 | -21 06.6 | 1.474 | 1.507 | -1.74 | +11.0 | 17.6 |
| 1980 09 08 | | 15 23.22 | -23 04.2 | | | | | |
| 1980 09 18 | | 15 54.66 | -24 46.6 | 1.549 | 1.481 | -1.99 | +8.7 | 17.7 |
| 1980 09 28 | | 16 28.08 | -26 07.7 | | | | | |
| 1980 10 08 | | 17 03.03 | -27 02.0 | 1.643 | 1.485 | -2.19 | +5.1 | 17.8 |
| 1980 10 18 | | 17 38.94 | -27 25.7 | | | | | |
| 1980 10 28 | | 18 15.09 | -27 16.9 | 1.766 | 1.519 | -2.23 | +0.6 | 18.1 |
| 1980 11 07 | | 18 50.84 | -26 36.1 | | | | | |
| 1980 11 17 | | 19 25.61 | -25 25.9 | 1.924 | 1.579 | -2.09 | -3.6 | 18.4 |
| 1980 11 27 | | 19 58.96 | -23 50.3 | | | | | |
| 1980 12 07 | | 20 30.65 | -21 54.2 | 2.113 | 1.662 | -1.83 | -6.5 | 18.8 |
| 1980 12 17 | | 21 00.60 | -19 42.4 | | | | | |
| 1980 12 27 | | 21 28.81 | -17 19.8 | 2.329 | 1.761 | -1.54 | -7.9 | 19.3 |
| 1981 01 06 | | 21 55.38 | -14 50.2 | | | | | |
| 1981 01 16 | | 22 20.48 | -12 17.0 | 2.560 | 1.873 | -1.29 | -8.2 | 19.8 |

| Comet Torres (1979e) | | | | | Elements MPC 4933 | | | |
|----------------------|----|--------------|----------|-------|-------------------|--------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | m2 |
| 1980 02 11 | | 19 30.89 | +11 04.4 | 5.691 | 4.972 | 39.7 | 7.3 | 18.7 |
| 1980 02 21 | | 19 35.97 | +12 52.6 | | | | | |
| 1980 03 02 | | 19 40.44 | +14 49.4 | 5.575 | 5.027 | 52.1 | 8.9 | 18.7 |
| 1980 03 12 | | 19 44.17 | +16 54.4 | | | | | |
| 1980 03 22 | | 19 46.99 | +19 07.1 | 5.415 | 5.085 | 65.6 | 10.3 | 18.7 |
| 1980 04 01 | | 19 48.76 | +21 26.6 | | | | | |
| 1980 04 11 | | 19 49.32 | +23 51.4 | 5.237 | 5.147 | 79.4 | 11.0 | 18.7 |
| 1980 04 21 | | 19 48.49 | +26 19.8 | | | | | |
| 1980 05 01 | | 19 46.14 | +28 49.1 | 5.072 | 5.213 | 92.5 | 11.1 | 18.7 |
| 1980 05 11 | | 19 42.13 | +31 16.2 | | | | | |
| 1980 05 21 | | 19 36.40 | +33 37.5 | 4.948 | 5.283 | 103.9 | 10.7 | 18.7 |
| 1980 05 31 | | 19 28.95 | +35 48.6 | | | | | |
| 1980 06 10 | | 19 19.90 | +37 45.3 | 4.889 | 5.356 | 112.2 | 10.1 | 18.7 |
| 1980 06 20 | | 19 09.53 | +39 23.8 | | | | | |
| 1980 06 30 | | 18 58.23 | +40 41.0 | 4.910 | 5.431 | 115.9 | 9.7 | 18.8 |
| 1980 07 10 | | 18 46.54 | +41 35.4 | | | | | |

| | | | | | | | |
|------------|----------|----------|-------|-------|-------|------|------|
| 1980 07 20 | 18 35.03 | +42 06.9 | 5.012 | 5.510 | 114.4 | 9.7 | 18.9 |
| 1980 07 30 | 18 24.28 | +42 17.3 | | | | | |
| 1980 08 09 | 18 14.75 | +42 09.5 | 5.184 | 5.592 | 108.6 | 9.9 | 19.0 |
| 1980 08 19 | 18 06.79 | +41 47.1 | | | | | |
| 1980 08 29 | 18 00.57 | +41 14.5 | 5.407 | 5.676 | 100.4 | 10.1 | 19.2 |
| 1980 09 08 | 17 56.15 | +40 35.6 | | | | | |
| 1980 09 18 | 17 53.49 | +39 54.1 | 5.655 | 5.762 | 91.1 | 10.0 | 19.4 |
| 1980 09 28 | 17 52.49 | +39 13.3 | | | | | |
| 1980 10 08 | 17 52.98 | +38 35.7 | 5.906 | 5.851 | 81.9 | 9.7 | 19.5 |
| 1980 10 18 | 17 54.82 | +38 03.6 | | | | | |
| 1980 10 28 | 17 57.82 | +37 38.8 | 6.141 | 5.942 | 73.8 | 9.2 | 19.7 |
| 1980 11 07 | 18 01.82 | +37 22.6 | | | | | |
| 1980 11 17 | 18 06.65 | +37 16.1 | 6.344 | 6.034 | 67.4 | 8.7 | 19.8 |
| 1980 11 27 | 18 12.15 | +37 20.2 | | | | | |
| 1980 12 07 | 18 18.18 | +37 35.5 | 6.507 | 6.129 | 63.4 | 8.3 | 19.9 |
| 1980 12 17 | 18 24.58 | +38 02.5 | | | | | |
| 1980 12 27 | 18 31.21 | +38 41.2 | 6.624 | 6.225 | 62.1 | 8.0 | 20.0 |

| 1977 RA | Elements MPC 4660 | | | | | | 4660 | |
|------------|-------------------|--------------|----------|-------|-------|-----------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | Mag. | |
| 1980 03 02 | | 16 25.27 | -27 26.0 | 1.731 | 2.026 | -1.80 | +2.5 | 20.2 |
| 1980 03 12 | | 16 42.26 | -28 16.0 | | | | | |
| 1980 03 22 | | 16 58.62 | -28 59.5 | 1.414 | 1.923 | -2.36 | +1.4 | 19.7 |
| 1980 04 01 | | 17 14.07 | -29 36.5 | | | | | |
| 1980 04 11 | | 17 28.31 | -30 07.3 | 1.122 | 1.817 | -3.18 | -0.2 | 19.0 |
| 1980 04 21 | | 17 40.87 | -30 31.8 | | | | | |
| 1980 05 01 | | 17 51.27 | -30 49.8 | 0.864 | 1.709 | -4.38 | -1.8 | 18.2 |
| 1980 05 11 | | 17 58.95 | -31 00.3 | | | | | |
| 1980 05 21 | | 18 03.25 | -31 00.8 | 0.651 | 1.603 | -6.04 | -2.0 | 17.3 |
| 1980 05 31 | | 18 03.72 | -30 46.5 | | | | | |
| 1980 06 10 | | 18 00.24 | -30 10.9 | 0.494 | 1.501 | -7.73 | +1.1 | 16.4 |
| 1980 06 20 | | 17 53.45 | -29 06.1 | | | | | |
| 1980 06 30 | | 17 45.25 | -27 27.6 | 0.396 | 1.407 | -8.41 | +4.4 | 15.7 |
| 1980 07 10 | | 17 38.18 | -25 18.4 | | | | | |
| 1980 07 20 | | 17 35.02 | -22 50.0 | 0.354 | 1.328 | -7.77 | -0.4 | 15.7 |
| 1980 07 30 | | 17 37.81 | -20 17.3 | | | | | |
| 1980 08 09 | | 17 47.26 | -17 51.3 | 0.350 | 1.269 | -6.81 | -22.4 | 15.9 |
| 1980 08 19 | | 18 03.36 | -15 36.6 | | | | | |
| 1980 08 29 | | 18 25.38 | -13 32.3 | 0.370 | 1.239 | -6.16 | -37.6 | 16.1 |
| 1980 09 08 | | 18 52.17 | -11 34.8 | | | | | |
| 1980 09 18 | | 19 22.60 | -09 40.7 | 0.412 | 1.239 | -5.71 | -45.6 | 16.4 |
| 1980 09 28 | | 19 55.32 | -07 46.8 | | | | | |
| 1980 10 08 | | 20 29.02 | -05 52.3 | 0.486 | 1.270 | -5.20 | -46.2 | 16.8 |
| 1980 10 18 | | 21 02.73 | -03 56.9 | | | | | |
| 1980 10 28 | | 21 35.63 | -02 00.7 | 0.598 | 1.329 | -4.52 | -40.2 | 17.3 |
| 1980 11 07 | | 22 07.24 | -00 04.6 | | | | | |
| 1980 11 17 | | 22 37.41 | +01 51.0 | 0.755 | 1.409 | -3.76 | -31.7 | 17.9 |
| 1980 11 27 | | 23 06.08 | +03 45.8 | | | | | |
| 1980 12 07 | | 23 33.37 | +05 39.2 | 0.956 | 1.503 | -3.06 | -23.7 | 18.5 |
| 1980 12 17 | | 23 59.46 | +07 30.7 | | | | | |
| 1980 12 27 | | 00 24.53 | +09 19.9 | 1.196 | 1.605 | -2.49 | -17.2 | 19.1 |
| 1981 01 06 | | 00 48.74 | +11 05.7 | | | | | |
| 1981 01 16 | | 01 12.30 | +12 47.8 | 1.468 | 1.712 | -2.05 | -12.1 | 19.6 |
| 1981 01 26 | | 01 35.31 | +14 25.2 | | | | | |
| 1981 02 05 | | 01 57.89 | +15 57.1 | 1.760 | 1.819 | -1.72 | -8.7 | 20.1 |
| 1981 02 15 | | 02 20.16 | +17 22.8 | | | | | |
| 1981 02 25 | | 02 42.16 | +18 41.6 | 2.062 | 1.925 | -1.46 | -5.9 | 20.4 |

Periodic Comet Reinmuth 2

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elements MPC | | 4773 |
|------------|----|--------------|----------|-------|-------|--------------|------|------|
| | | | | | | Variation | | m2 |
| 1980 03 02 | | 17 07.55 | -28 46.5 | 3.084 | 3.118 | -0.86 | +0.1 | 20.5 |
| 1980 03 12 | | 17 17.58 | -29 06.9 | | | | | |
| 1980 03 22 | | 17 26.26 | -29 24.6 | 2.715 | 3.026 | -1.01 | -0.4 | 20.1 |
| 1980 04 01 | | 17 33.29 | -29 40.1 | | | | | |
| 1980 04 11 | | 17 38.39 | -29 53.5 | 2.361 | 2.934 | -1.20 | -0.7 | 19.7 |
| 1980 04 21 | | 17 41.22 | -30 04.9 | | | | | |
| 1980 05 01 | | 17 41.53 | -30 13.4 | 2.047 | 2.841 | -1.41 | -0.9 | 19.3 |
| 1980 05 11 | | 17 39.15 | -30 17.9 | | | | | |
| 1980 05 21 | | 17 34.08 | -30 16.2 | 1.800 | 2.748 | -1.60 | -0.5 | 18.7 |
| 1980 05 31 | | 17 26.68 | -30 06.0 | | | | | |
| 1980 06 10 | | 17 17.64 | -29 45.5 | 1.645 | 2.655 | -1.71 | +0.2 | 18.3 |
| 1980 06 20 | | 17 07.98 | -29 14.2 | | | | | |
| 1980 06 30 | | 16 58.92 | -28 34.1 | 1.593 | 2.564 | -1.66 | +0.9 | 18.3 |
| 1980 07 10 | | 16 51.58 | -27 49.0 | | | | | |
| 1980 07 20 | | 16 46.81 | -27 03.2 | 1.636 | 2.474 | -1.50 | +1.0 | 18.5 |
| 1980 07 30 | | 16 45.12 | -26 20.8 | | | | | |
| 1980 08 09 | | 16 46.64 | -25 44.2 | 1.746 | 2.388 | -1.35 | +0.5 | 18.8 |
| 1980 08 19 | | 16 51.31 | -25 14.1 | | | | | |
| 1980 08 29 | | 16 58.94 | -24 50.1 | 1.892 | 2.305 | -1.24 | -0.2 | 19.0 |
| 1980 09 08 | | 17 09.22 | -24 30.4 | | | | | |
| 1980 09 18 | | 17 21.92 | -24 12.8 | 2.050 | 2.227 | -1.18 | -1.1 | 19.1 |
| 1980 09 28 | | 17 36.74 | -23 54.9 | | | | | |
| 1980 10 08 | | 17 53.41 | -23 34.1 | 2.205 | 2.156 | -1.16 | -2.1 | 19.2 |
| 1980 10 18 | | 18 11.70 | -23 08.0 | | | | | |
| 1980 10 28 | | 18 31.37 | -22 34.4 | 2.349 | 2.093 | -1.15 | -3.2 | 19.2 |
| 1980 11 07 | | 18 52.19 | -21 51.5 | | | | | |
| 1980 11 17 | | 19 13.94 | -20 57.5 | 2.478 | 2.039 | -1.14 | -4.3 | 19.2 |
| 1980 11 27 | | 19 36.41 | -19 51.6 | | | | | |
| 1980 12 07 | | 19 59.40 | -18 32.9 | 2.591 | 1.996 | -1.13 | -5.5 | 19.2 |
| 1980 12 17 | | 20 22.75 | -17 01.4 | | | | | |
| 1980 12 27 | | 20 46.28 | -15 17.3 | 2.690 | 1.966 | -1.11 | -6.5 | 19.1 |

Periodic Comet Gehrels 3 (1977 VII)

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elements IAUC | | 3097 |
|------------|----|--------------|----------|-------|-------|---------------|-------|------|
| | | | | | | Elong. | Phase | m2 |
| 1980 03 22 | | 17 52.08 | -23 10.9 | 4.306 | 4.469 | 92.9 | 12.9 | 20.7 |
| 1980 04 01 | | 17 55.21 | -23 09.6 | | | | | |
| 1980 04 11 | | 17 56.78 | -23 07.9 | 4.018 | 4.485 | 111.6 | 12.0 | 20.5 |
| 1980 04 21 | | 17 56.73 | -23 06.0 | | | | | |
| 1980 05 01 | | 17 55.05 | -23 03.9 | 3.769 | 4.500 | 131.5 | 9.7 | 20.4 |
| 1980 05 11 | | 17 51.81 | -23 01.4 | | | | | |
| 1980 05 21 | | 17 47.18 | -22 58.4 | 3.592 | 4.515 | 152.6 | 5.9 | 20.3 |
| 1980 05 31 | | 17 41.48 | -22 54.5 | | | | | |
| 1980 06 10 | | 17 35.08 | -22 49.6 | 3.517 | 4.529 | 174.6 | 1.2 | 20.3 |
| 1980 06 20 | | 17 28.47 | -22 43.8 | | | | | |
| 1980 06 30 | | 17 22.15 | -22 37.5 | 3.559 | 4.542 | 163.3 | 3.7 | 20.3 |
| 1980 07 10 | | 17 16.56 | -22 31.3 | | | | | |
| 1980 07 20 | | 17 12.07 | -22 25.9 | 3.711 | 4.554 | 141.9 | 7.9 | 20.4 |
| 1980 07 30 | | 17 08.95 | -22 21.9 | | | | | |
| 1980 08 09 | | 17 07.34 | -22 19.8 | 3.951 | 4.566 | 121.7 | 10.9 | 20.6 |
| 1980 08 19 | | 17 07.29 | -22 19.8 | | | | | |
| 1980 08 29 | | 17 08.79 | -22 21.8 | 4.246 | 4.577 | 102.8 | 12.4 | 20.7 |

Periodic Comet Brooks 2

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elements MPC | | 4773 |
|------------|----|--------------|----------|-------|-------|--------------|------|------|
| | | | | | | Variation | | m2 |
| 1980 03 22 | | 20 19.52 | -14 54.1 | 3.131 | 2.729 | -0.85 | -2.1 | 20.3 |
| 1980 04 01 | | 20 34.75 | -13 54.0 | | | | | |

| | | | | | | | | | |
|------------|----|-------|-----|------|-------|-------|-------|-------|------|
| 1980 04 11 | 20 | 49.56 | -12 | 49.7 | 2.803 | 2.628 | -0.97 | -2.9 | 19.9 |
| 1980 04 21 | 21 | 03.86 | -11 | 42.1 | | | | | |
| 1980 05 01 | 21 | 17.55 | -10 | 32.4 | 2.465 | 2.528 | -1.13 | -3.8 | 19.5 |
| 1980 05 11 | 21 | 30.54 | -09 | 22.0 | | | | | |
| 1980 05 21 | 21 | 42.67 | -08 | 12.3 | 2.130 | 2.429 | -1.33 | -5.0 | 19.0 |
| 1980 05 31 | 21 | 53.81 | -07 | 05.4 | | | | | |
| 1980 06 10 | 22 | 03.76 | -06 | 03.2 | 1.811 | 2.333 | -1.60 | -6.4 | 18.5 |
| 1980 06 20 | 22 | 12.29 | -05 | 08.6 | | | | | |
| 1980 06 30 | 22 | 19.14 | -04 | 24.5 | 1.521 | 2.241 | -1.95 | -8.1 | 17.9 |
| 1980 07 10 | 22 | 24.05 | -03 | 54.2 | | | | | |
| 1980 07 20 | 22 | 26.74 | -03 | 41.4 | 1.277 | 2.154 | -2.38 | -10.2 | 17.4 |
| 1980 07 30 | 22 | 27.09 | -03 | 49.0 | | | | | |
| 1980 08 09 | 22 | 25.13 | -04 | 18.9 | 1.096 | 2.075 | -2.81 | -12.2 | 16.9 |
| 1980 08 19 | 22 | 21.23 | -05 | 10.2 | | | | | |
| 1980 08 29 | 22 | 16.22 | -06 | 18.4 | 0.996 | 2.004 | -3.05 | -12.9 | 16.5 |
| 1980 09 08 | 22 | 11.21 | -07 | 35.4 | | | | | |
| 1980 09 18 | 22 | 07.48 | -08 | 50.8 | 0.984 | 1.945 | -2.98 | -11.8 | 16.4 |
| 1980 09 28 | 22 | 06.17 | -09 | 54.8 | | | | | |
| 1980 10 08 | 22 | 07.93 | -10 | 40.2 | 1.050 | 1.898 | -2.70 | -10.0 | 16.4 |
| 1980 10 18 | 22 | 13.05 | -11 | 03.0 | | | | | |
| 1980 10 28 | 22 | 21.43 | -11 | 01.6 | 1.172 | 1.867 | -2.39 | -8.6 | 16.6 |
| 1980 11 07 | 22 | 32.69 | -10 | 36.8 | | | | | |
| 1980 11 17 | 22 | 46.42 | -09 | 49.9 | 1.331 | 1.851 | -2.12 | -8.0 | 16.8 |
| 1980 11 27 | 23 | 02.14 | -08 | 43.4 | | | | | |
| 1980 12 07 | 23 | 19.42 | -07 | 19.9 | 1.515 | 1.853 | -1.90 | -7.8 | 17.1 |
| 1980 12 17 | 23 | 37.92 | -05 | 42.2 | | | | | |
| 1980 12 27 | 23 | 57.33 | -03 | 53.4 | 1.718 | 1.871 | -1.72 | -7.5 | 17.4 |
| 1981 01 06 | 00 | 17.43 | -01 | 56.4 | | | | | |
| 1981 01 16 | 00 | 38.04 | +00 | 06.0 | 1.935 | 1.905 | -1.57 | -7.1 | 17.7 |
| 1981 01 26 | 00 | 59.02 | +02 | 10.8 | | | | | |
| 1981 02 05 | 01 | 20.29 | +04 | 15.6 | 2.163 | 1.953 | -1.44 | -6.4 | 18.1 |
| 1981 02 15 | 01 | 41.78 | +06 | 18.1 | | | | | |
| 1981 02 25 | 02 | 03.42 | +08 | 16.0 | 2.397 | 2.015 | -1.33 | -5.5 | 18.4 |
| 1981 03 07 | 02 | 25.18 | +10 | 07.7 | | | | | |
| 1981 03 17 | 02 | 47.01 | +11 | 51.6 | 2.631 | 2.087 | -1.23 | -4.4 | 18.8 |
| 1981 03 27 | 03 | 08.87 | +13 | 26.4 | | | | | |
| 1981 04 06 | 03 | 30.70 | +14 | 51.2 | 2.859 | 2.167 | -1.13 | -3.3 | 19.1 |

Comet Meier (1978f)

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | MPC | 5031 | |
|------------|----|--------------|-------|-------|------|--------|-------|-------|------|------|
| | | | | | | | | | m2 | |
| 1980 05 01 | | 23 | 43.82 | -00 | 56.1 | 7.008 | 6.328 | 44.4 | 6.4 | 19.7 |
| 1980 05 11 | | 23 | 47.43 | -00 | 16.5 | | | | | |
| 1980 05 21 | | 23 | 50.38 | +00 | 19.2 | 6.920 | 6.502 | 61.8 | 7.9 | 19.8 |
| 1980 05 31 | | 23 | 52.60 | +00 | 50.6 | | | | | |
| 1980 06 10 | | 23 | 54.03 | +01 | 17.3 | 6.781 | 6.675 | 79.7 | 8.6 | 19.9 |
| 1980 06 20 | | 23 | 54.60 | +01 | 38.9 | | | | | |
| 1980 06 30 | | 23 | 54.29 | +01 | 55.2 | 6.622 | 6.846 | 98.5 | 8.4 | 20.0 |
| 1980 07 10 | | 23 | 53.07 | +02 | 05.9 | | | | | |
| 1980 07 20 | | 23 | 50.94 | +02 | 10.9 | 6.478 | 7.015 | 118.2 | 7.3 | 20.0 |
| 1980 07 30 | | 23 | 47.96 | +02 | 10.4 | | | | | |
| 1980 08 09 | | 23 | 44.22 | +02 | 04.5 | 6.389 | 7.183 | 138.8 | 5.3 | 20.1 |
| 1980 08 19 | | 23 | 39.85 | +01 | 53.8 | | | | | |
| 1980 08 29 | | 23 | 35.02 | +01 | 39.2 | 6.392 | 7.349 | 160.1 | 2.7 | 20.2 |
| 1980 09 08 | | 23 | 29.95 | +01 | 21.7 | | | | | |
| 1980 09 18 | | 23 | 24.87 | +01 | 02.6 | 6.512 | 7.513 | 174.9 | 0.7 | 20.3 |
| 1980 09 28 | | 23 | 20.00 | +00 | 43.2 | | | | | |
| 1980 10 08 | | 23 | 15.55 | +00 | 24.7 | 6.759 | 7.677 | 155.1 | 3.1 | 20.5 |
| 1980 10 18 | | 23 | 11.71 | +00 | 08.4 | | | | | |
| 1980 10 28 | | 23 | 08.59 | -00 | 04.7 | 7.120 | 7.838 | 133.6 | 5.3 | 20.7 |

| 1977 TJ3 | | | | | | Elements MPC | | 5037 |
|------------|----|--------------|----------|-------|-------|--------------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
| 1979 11 23 | | 05 37.75 | -06 39.3 | 4.487 | 5.304 | 142.3 | 6.5 | 16.7 |
| 1979 12 03 | | 05 32.88 | -07 21.7 | | | | | |
| 1979 12 13 | | 05 27.57 | -07 53.1 | 4.436 | 5.303 | 148.9 | 5.5 | 16.6 |
| 1979 12 23 | | 05 22.17 | -08 12.2 | | | | | |
| 1980 01 02 | | 05 17.07 | -08 18.6 | 4.494 | 5.303 | 142.0 | 6.6 | 16.7 |
| 1980 01 12 | | 05 12.63 | -08 13.1 | | | | | |
| 1980 01 22 | | 05 09.12 | -07 56.8 | 4.650 | 5.303 | 127.1 | 8.5 | 16.9 |
| 1980 02 01 | | 05 06.76 | -07 31.7 | | | | | |
| 1980 02 11 | | 05 05.65 | -07 00.0 | 4.880 | 5.302 | 110.2 | 10.1 | 17.0 |
| 1980 02 21 | | 05 05.83 | -06 23.8 | | | | | |
| 1980 03 02 | | 05 07.28 | -05 45.1 | 5.149 | 5.302 | 93.4 | 10.8 | 17.1 |
| 1980 03 12 | | 05 09.94 | -05 05.9 | | | | | |
| 1980 03 22 | | 05 13.70 | -04 27.5 | 5.427 | 5.301 | 77.5 | 10.6 | 17.2 |
| 1980 04 01 | | 05 18.48 | -03 51.4 | | | | | |
| 1980 04 11 | | 05 24.13 | -03 18.5 | 5.685 | 5.300 | 62.7 | 9.7 | 17.3 |
| 1980 04 21 | | 05 30.55 | -02 49.8 | | | | | |
| 1980 05 01 | | 05 37.63 | -02 25.9 | 5.903 | 5.299 | 49.2 | 8.3 | 17.4 |

| 1941 SZ | | | | | | Elements MPC | | 5032 |
|------------|----|--------------|----------|-------|-------|--------------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
| 1979 11 23 | | 07 18.12 | +14 55.7 | 1.916 | 2.664 | 130.3 | 16.4 | 18.4 |
| 1979 12 03 | | 07 13.01 | +14 48.0 | | | | | |
| 1979 12 13 | | 07 05.35 | +14 48.9 | 1.810 | 2.724 | 153.0 | 9.5 | 18.2 |
| 1979 12 23 | | 06 55.81 | +14 58.1 | | | | | |
| 1980 01 02 | | 06 45.39 | +15 14.2 | 1.805 | 2.783 | 172.2 | 2.8 | 18.0 |
| 1980 01 12 | | 06 35.23 | +15 35.4 | | | | | |
| 1980 01 22 | | 06 26.41 | +16 00.1 | 1.918 | 2.839 | 154.7 | 8.5 | 18.4 |
| 1980 02 01 | | 06 19.74 | +16 26.5 | | | | | |
| 1980 02 11 | | 06 15.65 | +16 53.3 | 2.133 | 2.892 | 132.4 | 14.6 | 18.8 |
| 1980 02 21 | | 06 14.26 | +17 19.5 | | | | | |
| 1980 03 02 | | 06 15.48 | +17 44.0 | 2.419 | 2.943 | 112.4 | 18.1 | 19.2 |
| 1980 03 12 | | 06 19.05 | +18 06.0 | | | | | |
| 1980 03 22 | | 06 24.69 | +18 24.6 | 2.739 | 2.992 | 94.7 | 19.4 | 19.5 |
| 1980 04 01 | | 06 32.08 | +18 39.0 | | | | | |
| 1980 04 11 | | 06 40.94 | +18 48.8 | 3.066 | 3.037 | 78.9 | 18.9 | 19.8 |
| 1980 04 21 | | 06 51.02 | +18 53.3 | | | | | |
| 1980 05 01 | | 07 02.07 | +18 52.2 | 3.378 | 3.080 | 64.4 | 17.2 | 20.0 |

| 1975 RB | | | | | | Elements MPC | | 5036 |
|------------|----|--------------|----------|-------|-------|--------------|------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | Mag. |
| 1979 11 23 | | 08 58.24 | +21 35.5 | 1.770 | 2.287 | -1.08 | +7.3 | 20.1 |
| 1979 12 03 | | 08 59.65 | +21 23.3 | | | | | |
| 1979 12 13 | | 08 57.58 | +21 22.6 | 1.614 | 2.362 | -1.25 | +8.2 | 19.8 |
| 1979 12 23 | | 08 51.92 | +21 32.4 | | | | | |
| 1980 01 02 | | 08 43.01 | +21 49.4 | 1.517 | 2.433 | -1.45 | +8.4 | 19.6 |
| 1980 01 12 | | 08 31.63 | +22 08.8 | | | | | |
| 1980 01 22 | | 08 19.02 | +22 25.6 | 1.518 | 2.502 | -1.55 | +7.5 | 19.2 |
| 1980 02 01 | | 08 06.72 | +22 35.5 | | | | | |
| 1980 02 11 | | 07 56.12 | +22 36.9 | 1.635 | 2.567 | -1.47 | +6.1 | 19.8 |
| 1980 02 21 | | 07 48.19 | +22 30.1 | | | | | |
| 1980 03 02 | | 07 43.44 | +22 16.6 | 1.853 | 2.628 | -1.28 | +4.9 | 20.3 |
| 1980 03 12 | | 07 41.85 | +21 57.8 | | | | | |
| 1980 03 22 | | 07 43.19 | +21 34.5 | 2.138 | 2.686 | -1.07 | +4.2 | 20.8 |
| 1980 04 01 | | 07 47.10 | +21 07.4 | | | | | |
| 1980 04 11 | | 07 53.15 | +20 36.4 | 2.455 | 2.739 | -0.89 | +3.8 | 21.1 |
| 1980 04 21 | | 08 00.96 | +20 01.4 | | | | | |
| 1980 05 01 | | 08 10.19 | +19 22.0 | 2.779 | 2.789 | -0.76 | +3.6 | 21.4 |

| (2185) 1965 WO | | | | Elements MPC | | | | 5035 |
|----------------|----|--------------|----------|--------------|-------|--------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
| 1979 11 23 | | 08 50.93 | +26 48.3 | 2.560 | 3.064 | 111.6 | 17.4 | 17.9 |
| 1979 12 03 | | 08 52.20 | +27 26.1 | | | | | |
| 1979 12 13 | | 08 50.87 | +28 13.9 | 2.336 | 3.081 | 131.7 | 13.8 | 17.6 |
| 1979 12 23 | | 08 46.85 | +29 09.6 | | | | | |
| 1980 01 02 | | 08 40.29 | +30 08.8 | 2.185 | 3.095 | 153.3 | 8.2 | 17.3 |
| 1980 01 12 | | 08 31.66 | +31 06.0 | | | | | |
| 1980 01 22 | | 08 21.73 | +31 55.2 | 2.139 | 3.108 | 167.9 | 3.8 | 17.1 |
| 1980 02 01 | | 08 11.56 | +32 31.4 | | | | | |
| 1980 02 11 | | 08 02.24 | +32 52.3 | 2.212 | 3.119 | 152.3 | 8.5 | 17.4 |
| 1980 02 21 | | 07 54.71 | +32 57.7 | | | | | |
| 1980 03 02 | | 07 49.60 | +32 49.9 | 2.387 | 3.128 | 131.1 | 13.8 | 17.7 |
| 1980 03 12 | | 07 47.16 | +32 31.5 | | | | | |
| 1980 03 22 | | 07 47.40 | +32 05.1 | 2.632 | 3.136 | 111.4 | 17.2 | 18.0 |
| 1980 04 01 | | 07 50.14 | +31 32.5 | | | | | |
| 1980 04 11 | | 07 55.08 | +30 55.2 | 2.910 | 3.141 | 93.9 | 18.6 | 18.2 |
| 1980 04 21 | | 08 01.91 | +30 13.8 | | | | | |
| 1980 05 01 | | 08 10.33 | +29 28.5 | 3.193 | 3.145 | 78.2 | 18.3 | 18.4 |

| (2182) 1953 FH1 | | | | Elements MPC | | | | 5034 |
|-----------------|----|--------------|----------|--------------|-------|--------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
| 1979 11 23 | | 09 34.99 | +16 55.6 | 2.982 | 3.286 | 99.1 | 17.3 | 17.9 |
| 1979 12 03 | | 09 38.95 | +16 45.3 | | | | | |
| 1979 12 13 | | 09 40.98 | +16 44.7 | 2.684 | 3.263 | 118.0 | 15.5 | 17.6 |
| 1979 12 23 | | 09 40.89 | +16 54.9 | | | | | |
| 1980 01 02 | | 09 38.58 | +17 15.5 | 2.432 | 3.239 | 139.0 | 11.5 | 17.2 |
| 1980 01 12 | | 09 34.12 | +17 45.4 | | | | | |
| 1980 01 22 | | 09 27.77 | +18 22.1 | 2.264 | 3.215 | 162.0 | 5.4 | 16.8 |
| 1980 02 01 | | 09 20.06 | +19 01.8 | | | | | |
| 1980 02 11 | | 09 11.73 | +19 39.9 | 2.208 | 3.190 | 172.7 | 2.3 | 16.6 |
| 1980 02 21 | | 09 03.63 | +20 12.7 | | | | | |
| 1980 03 02 | | 08 56.64 | +20 36.9 | 2.270 | 3.164 | 149.5 | 9.2 | 17.0 |
| 1980 03 12 | | 08 51.40 | +20 51.2 | | | | | |
| 1980 03 22 | | 08 48.33 | +20 55.3 | 2.429 | 3.139 | 127.6 | 14.6 | 17.2 |
| 1980 04 01 | | 08 47.60 | +20 49.4 | | | | | |
| 1980 04 11 | | 08 49.16 | +20 34.5 | 2.650 | 3.113 | 108.2 | 17.8 | 17.5 |
| 1980 04 21 | | 08 52.86 | +20 11.2 | | | | | |
| 1980 05 01 | | 08 58.48 | +19 40.2 | 2.898 | 3.087 | 91.1 | 19.1 | 17.7 |

| 1976 DD | | | | Elements MPC | | | | 5033 |
|------------|----|--------------|----------|--------------|-------|-----------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | Mag. |
| 1979 11 23 | | 10 11.73 | +29 55.1 | 1.802 | 2.134 | -1.04 | +20.0 | 19.5 |
| 1979 12 03 | | 10 20.83 | +28 21.2 | | | | | |
| 1979 12 13 | | 10 27.05 | +26 47.1 | 1.524 | 2.085 | -1.22 | +24.3 | 19.0 |
| 1979 12 23 | | 10 29.79 | +25 11.9 | | | | | |
| 1980 01 02 | | 10 28.46 | +23 32.9 | 1.272 | 2.039 | -1.53 | +29.2 | 18.5 |
| 1980 01 12 | | 10 22.56 | +21 46.3 | | | | | |
| 1980 01 22 | | 10 11.85 | +19 47.0 | 1.076 | 1.999 | -1.94 | +33.8 | 17.9 |
| 1980 02 01 | | 09 56.86 | +17 30.3 | | | | | |
| 1980 02 11 | | 09 39.10 | +14 55.5 | 0.977 | 1.964 | -2.18 | +36.0 | 17.0 |
| 1980 02 21 | | 09 20.88 | +12 08.3 | | | | | |
| 1980 03 02 | | 09 04.77 | +09 19.2 | 0.997 | 1.937 | -2.01 | +35.1 | 17.6 |
| 1980 03 12 | | 08 52.55 | +06 38.7 | | | | | |
| 1980 03 22 | | 08 45.07 | +04 12.5 | 1.117 | 1.917 | -1.61 | +32.1 | 18.1 |
| 1980 04 01 | | 08 42.33 | +02 00.7 | | | | | |
| 1980 04 11 | | 08 43.80 | +00 00.8 | 1.294 | 1.905 | -1.26 | +28.5 | 18.5 |
| 1980 04 21 | | 08 48.88 | -01 51.3 | | | | | |
| 1980 05 01 | | 08 56.93 | -03 39.5 | 1.495 | 1.902 | -1.02 | +25.0 | 18.9 |

| 1955 RX | | Elements MPC 5010 | | | | | | | |
|---------|-------|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1979 | 11 23 | 10 01.05 | +06 52.5 | 1.672 | 1.938 | 89.8 | 30.6 | 18.3 | |
| 1979 | 12 03 | 10 13.18 | +05 36.9 | | | | | | |
| 1979 | 12 13 | 10 23.02 | +04 33.2 | 1.485 | 1.970 | 104.0 | 29.0 | 18.0 | |
| 1979 | 12 23 | 10 30.18 | +03 45.2 | | | | | | |
| 1980 | 01 02 | 10 34.30 | +03 17.1 | 1.311 | 2.005 | 121.2 | 24.8 | 17.7 | |
| 1980 | 01 12 | 10 35.08 | +03 12.3 | | | | | | |
| 1980 | 01 22 | 10 32.39 | +03 33.6 | 1.175 | 2.042 | 142.0 | 17.3 | 17.3 | |
| 1980 | 02 01 | 10 26.47 | +04 20.9 | | | | | | |
| 1980 | 02 11 | 10 18.07 | +05 30.3 | 1.110 | 2.081 | 165.8 | 6.7 | 17.0 | |
| 1980 | 02 21 | 10 08.44 | +06 53.6 | | | | | | |
| 1980 | 03 02 | 09 59.14 | +08 19.6 | 1.143 | 2.121 | 167.3 | 5.9 | 17.1 | |
| 1980 | 03 12 | 09 51.58 | +09 38.0 | | | | | | |
| 1980 | 03 22 | 09 46.73 | +10 41.3 | 1.274 | 2.162 | 144.1 | 15.7 | 17.6 | |
| 1980 | 04 01 | 09 45.07 | +11 25.7 | | | | | | |
| 1980 | 04 11 | 09 46.54 | +11 50.4 | 1.479 | 2.202 | 124.0 | 22.2 | 18.1 | |
| 1980 | 04 21 | 09 50.86 | +11 56.5 | | | | | | |
| 1980 | 05 01 | 09 57.64 | +11 45.6 | 1.729 | 2.243 | 107.1 | 25.4 | 18.5 | |

| 1977 QV | | Elements MPC 4927 | | | | | | | |
|---------|-------|-------------------|----------|-------|-------|-----------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | Mag. | | |
| 1979 | 11 23 | 10 32.26 | +27 56.6 | 2.922 | 3.092 | -0.62 | +7.8 | 17.2 | |
| 1979 | 12 03 | 10 38.94 | +27 41.5 | | | | | | |
| 1979 | 12 13 | 10 43.64 | +27 36.9 | 2.645 | 3.084 | -0.67 | +8.9 | 17.0 | |
| 1979 | 12 23 | 10 46.07 | +27 43.0 | | | | | | |
| 1980 | 01 02 | 10 45.98 | +27 58.7 | 2.395 | 3.077 | -0.76 | +9.9 | 16.7 | |
| 1980 | 01 12 | 10 43.21 | +28 21.7 | | | | | | |
| 1980 | 01 22 | 10 37.73 | +28 47.9 | 2.206 | 3.070 | -0.87 | +10.7 | 16.4 | |
| 1980 | 02 01 | 10 29.81 | +29 11.5 | | | | | | |
| 1980 | 02 11 | 10 20.07 | +29 26.2 | 2.110 | 3.063 | -0.95 | +10.6 | 16.2 | |
| 1980 | 02 21 | 10 09.38 | +29 26.4 | | | | | | |
| 1980 | 03 02 | 09 58.88 | +29 08.6 | 2.129 | 3.056 | -0.96 | +9.7 | 16.2 | |
| 1980 | 03 12 | 09 49.59 | +28 32.3 | | | | | | |
| 1980 | 03 22 | 09 42.30 | +27 39.5 | 2.255 | 3.050 | -0.89 | +8.7 | 16.5 | |
| 1980 | 04 01 | 09 37.49 | +26 33.4 | | | | | | |
| 1980 | 04 11 | 09 35.26 | +25 17.4 | 2.461 | 3.045 | -0.78 | +7.9 | 16.8 | |
| 1980 | 04 21 | 09 35.52 | +23 54.3 | | | | | | |
| 1980 | 05 01 | 09 38.03 | +22 26.3 | 2.714 | 3.039 | -0.68 | +7.3 | 17.0 | |

| 1970 LD | | Elements MPC 5037 | | | | | | | |
|---------|-------|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1979 | 12 13 | 10 47.83 | +08 23.7 | 3.251 | 3.554 | 99.8 | 15.8 | 17.9 | |
| 1979 | 12 23 | 10 50.65 | +08 12.4 | | | | | | |
| 1980 | 01 02 | 10 51.71 | +08 12.2 | 2.952 | 3.537 | 119.2 | 14.0 | 17.6 | |
| 1980 | 01 12 | 10 50.89 | +08 23.9 | | | | | | |
| 1980 | 01 22 | 10 48.16 | +08 47.3 | 2.704 | 3.520 | 140.6 | 10.2 | 17.3 | |
| 1980 | 02 01 | 10 43.62 | +09 21.3 | | | | | | |
| 1980 | 02 11 | 10 37.59 | +10 03.6 | 2.543 | 3.502 | 163.7 | 4.5 | 17.0 | |
| 1980 | 02 21 | 10 30.52 | +10 50.6 | | | | | | |
| 1980 | 03 02 | 10 23.08 | +11 38.0 | 2.498 | 3.482 | 172.0 | 2.3 | 16.7 | |
| 1980 | 03 12 | 10 15.97 | +12 21.6 | | | | | | |
| 1980 | 03 22 | 10 09.84 | +12 57.7 | 2.571 | 3.461 | 148.7 | 8.6 | 17.1 | |
| 1980 | 04 01 | 10 05.22 | +13 23.9 | | | | | | |
| 1980 | 04 11 | 10 02.41 | +13 39.2 | 2.742 | 3.440 | 127.0 | 13.5 | 17.4 | |
| 1980 | 04 21 | 10 01.57 | +13 43.2 | | | | | | |
| 1980 | 05 01 | 10 02.68 | +13 36.3 | 2.975 | 3.417 | 107.6 | 16.3 | 17.6 | |
| 1980 | 05 11 | 10 05.60 | +13 19.4 | | | | | | |
| 1980 | 05 21 | 10 10.18 | +12 53.1 | 3.235 | 3.394 | 90.2 | 17.4 | 17.8 | |

| 1938 TB | | | | | | Elements MPC | | 5032 |
|---------|-------|--------------|----------|-------|-------|--------------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
| 1979 | 12 13 | 11 14.91 | +06 19.4 | 3.240 | 3.432 | 92.8 | 16.7 | 18.1 |
| 1979 | 12 23 | 11 18.83 | +06 02.4 | | | | | |
| 1980 | 01 02 | 11 21.02 | +05 56.9 | 2.979 | 3.464 | 111.6 | 15.3 | 17.9 |
| 1980 | 01 12 | 11 21.34 | +06 03.6 | | | | | |
| 1980 | 01 22 | 11 19.70 | +06 22.7 | 2.754 | 3.494 | 132.4 | 12.0 | 17.7 |
| 1980 | 02 01 | 11 16.18 | +06 53.5 | | | | | |
| 1980 | 02 11 | 11 10.98 | +07 33.9 | 2.604 | 3.523 | 155.1 | 6.8 | 17.5 |
| 1980 | 02 21 | 11 04.48 | +08 20.9 | | | | | |
| 1980 | 03 02 | 10 57.26 | +09 10.3 | 2.561 | 3.552 | 177.5 | 0.7 | 17.0 |
| 1980 | 03 12 | 10 49.97 | +09 57.5 | | | | | |
| 1980 | 03 22 | 10 43.29 | +10 38.7 | 2.639 | 3.578 | 157.1 | 6.2 | 17.5 |
| 1980 | 04 01 | 10 37.79 | +11 10.7 | | | | | |
| 1980 | 04 11 | 10 33.84 | +11 31.9 | 2.825 | 3.604 | 134.9 | 11.4 | 17.8 |
| 1980 | 04 21 | 10 31.66 | +11 41.6 | | | | | |
| 1980 | 05 01 | 10 31.32 | +11 40.1 | 3.088 | 3.628 | 114.8 | 14.6 | 18.1 |
| 1980 | 05 11 | 10 32.72 | +11 28.3 | | | | | |
| 1980 | 05 21 | 10 35.74 | +11 06.9 | 3.391 | 3.650 | 96.7 | 16.0 | 18.3 |

| (2169) 1964 VP1 | | | | | | Elements MPC | | 4928 |
|-----------------|-------|--------------|----------|-------|-------|--------------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
| 1980 | 01 02 | 12 06.19 | +01 13.8 | 2.448 | 2.783 | 99.4 | 20.4 | 17.9 |
| 1980 | 01 12 | 12 11.05 | +00 48.7 | | | | | |
| 1980 | 01 22 | 12 13.81 | +00 37.6 | 2.197 | 2.794 | 117.8 | 18.2 | 17.7 |
| 1980 | 02 01 | 12 14.25 | +00 41.5 | | | | | |
| 1980 | 02 11 | 12 12.29 | +01 00.4 | 1.988 | 2.805 | 138.5 | 13.5 | 17.3 |
| 1980 | 02 21 | 12 07.98 | +01 33.5 | | | | | |
| 1980 | 03 02 | 12 01.69 | +02 17.9 | 1.858 | 2.815 | 161.5 | 6.4 | 17.0 |
| 1980 | 03 12 | 11 54.03 | +03 08.9 | | | | | |
| 1980 | 03 22 | 11 45.83 | +04 00.8 | 1.833 | 2.826 | 173.6 | 2.2 | 16.7 |
| 1980 | 04 01 | 11 38.04 | +04 47.4 | | | | | |
| 1980 | 04 11 | 11 31.50 | +05 23.7 | 1.921 | 2.836 | 150.4 | 10.0 | 17.2 |
| 1980 | 04 21 | 11 26.82 | +05 46.6 | | | | | |
| 1980 | 05 01 | 11 24.33 | +05 54.5 | 2.101 | 2.846 | 129.1 | 15.9 | 17.5 |
| 1980 | 05 11 | 11 24.12 | +05 47.8 | | | | | |
| 1980 | 05 21 | 11 26.09 | +05 27.2 | 2.341 | 2.855 | 110.4 | 19.4 | 17.9 |
| 1980 | 05 31 | 11 30.05 | +04 54.2 | | | | | |
| 1980 | 06 10 | 11 35.76 | +04 10.4 | 2.610 | 2.865 | 93.9 | 20.7 | 18.1 |

| 1977 QA3 | | | | | | Elements MPC | | 4927 |
|----------|-------|--------------|----------|-------|-------|--------------|------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | Mag. |
| 1980 | 01 02 | 12 13.55 | +01 32.9 | 2.677 | 2.975 | -0.74 | +4.5 | 18.4 |
| 1980 | 01 12 | 12 18.43 | +01 16.1 | | | | | |
| 1980 | 01 22 | 12 21.39 | +01 12.8 | 2.399 | 2.968 | -0.83 | +5.2 | 18.2 |
| 1980 | 02 01 | 12 22.22 | +01 23.9 | | | | | |
| 1980 | 02 11 | 12 20.80 | +01 49.5 | 2.164 | 2.961 | -0.94 | +5.8 | 17.8 |
| 1980 | 02 21 | 12 17.16 | +02 28.6 | | | | | |
| 1980 | 03 02 | 12 11.53 | +03 18.5 | 2.005 | 2.953 | -1.04 | +6.4 | 17.5 |
| 1980 | 03 12 | 12 04.43 | +04 14.8 | | | | | |
| 1980 | 03 22 | 11 56.56 | +05 11.7 | 1.952 | 2.945 | -1.07 | +6.4 | 17.1 |
| 1980 | 04 01 | 11 48.80 | +06 03.2 | | | | | |
| 1980 | 04 11 | 11 41.98 | +06 44.2 | 2.013 | 2.936 | -1.02 | +6.0 | 17.6 |
| 1980 | 04 21 | 11 36.76 | +07 11.3 | | | | | |
| 1980 | 05 01 | 11 33.57 | +07 22.7 | 2.170 | 2.926 | -0.93 | +5.3 | 17.9 |
| 1980 | 05 11 | 11 32.55 | +07 18.7 | | | | | |
| 1980 | 05 21 | 11 33.71 | +07 00.2 | 2.390 | 2.916 | -0.82 | +4.7 | 18.1 |
| 1980 | 05 31 | 11 36.91 | +06 28.6 | | | | | |
| 1980 | 06 10 | 11 41.92 | +05 45.6 | 2.641 | 2.906 | -0.73 | +4.3 | 18.4 |

| (2180) 1940 RJ | | Elements MPC 5033 | | | | | | | |
|----------------|----|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1980 01 02 | | 12 16.79 | -11 19.8 | 3.036 | 3.222 | 91.9 | 17.8 | 17.4 | |
| 1980 01 12 | | 12 21.33 | -12 08.7 | | | | | | |
| 1980 01 22 | | 12 24.11 | -12 46.9 | 2.745 | 3.215 | 109.8 | 16.7 | 17.1 | |
| 1980 02 01 | | 12 24.97 | -13 12.4 | | | | | | |
| 1980 02 11 | | 12 23.80 | -13 23.2 | 2.487 | 3.206 | 129.5 | 13.7 | 16.8 | |
| 1980 02 21 | | 12 20.59 | -13 17.7 | | | | | | |
| 1980 03 02 | | 12 15.58 | -12 54.7 | 2.296 | 3.197 | 150.7 | 8.7 | 16.5 | |
| 1980 03 12 | | 12 09.16 | -12 15.0 | | | | | | |
| 1980 03 22 | | 12 01.94 | -11 20.8 | 2.203 | 3.187 | 169.1 | 3.4 | 16.2 | |
| 1980 04 01 | | 11 54.70 | -10 16.6 | | | | | | |
| 1980 04 11 | | 11 48.16 | -09 08.0 | 2.225 | 3.177 | 158.0 | 6.8 | 16.4 | |
| 1980 04 21 | | 11 42.96 | -08 01.1 | | | | | | |
| 1980 05 01 | | 11 39.55 | -07 01.3 | 2.352 | 3.165 | 137.1 | 12.5 | 16.6 | |
| 1980 05 11 | | 11 38.13 | -06 12.2 | | | | | | |
| 1980 05 21 | | 11 38.74 | -05 36.1 | 2.557 | 3.154 | 117.4 | 16.6 | 16.9 | |
| 1980 05 31 | | 11 41.31 | -05 13.8 | | | | | | |
| 1980 06 10 | | 11 45.65 | -05 05.2 | 2.804 | 3.141 | 99.8 | 18.6 | 17.2 | |

| 1978 TA | | Elements MPC 4717 | | | | | | | |
|------------|----|-------------------|----------|-------|-------|-----------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | Mag. | | |
| 1980 01 02 | | 12 47.42 | -14 10.5 | 2.501 | 2.588 | -0.58 | +8.4 | 17.1 | |
| 1980 01 12 | | 12 52.98 | -16 12.9 | | | | | | |
| 1980 01 22 | | 12 56.43 | -18 10.4 | 2.262 | 2.625 | -0.68 | +8.8 | 16.9 | |
| 1980 02 01 | | 12 57.41 | -20 01.2 | | | | | | |
| 1980 02 11 | | 12 55.62 | -21 42.5 | 2.040 | 2.658 | -0.80 | +9.6 | 16.6 | |
| 1980 02 21 | | 12 50.85 | -23 10.6 | | | | | | |
| 1980 03 02 | | 12 43.13 | -24 20.7 | 1.869 | 2.689 | -0.93 | +10.4 | 16.3 | |
| 1980 03 12 | | 12 32.85 | -25 08.1 | | | | | | |
| 1980 03 22 | | 12 20.83 | -25 29.2 | 1.783 | 2.717 | -0.99 | +11.5 | 16.1 | |
| 1980 04 01 | | 12 08.26 | -25 23.8 | | | | | | |
| 1980 04 11 | | 11 56.44 | -24 55.7 | 1.804 | 2.742 | -0.95 | +12.2 | 16.2 | |
| 1980 04 21 | | 11 46.49 | -24 12.1 | | | | | | |
| 1980 05 01 | | 11 39.17 | -23 21.9 | 1.928 | 2.765 | -0.83 | +12.0 | 16.5 | |
| 1980 05 11 | | 11 34.78 | -22 32.9 | | | | | | |
| 1980 05 21 | | 11 33.30 | -21 51.2 | 2.130 | 2.784 | -0.71 | +10.8 | 16.8 | |
| 1980 05 31 | | 11 34.52 | -21 20.8 | | | | | | |
| 1980 06 10 | | 11 38.12 | -21 03.4 | 2.377 | 2.800 | -0.62 | +9.5 | 17.1 | |

| 1975 BU | | Elements MPC 5033 | | | | | | | |
|------------|----|-------------------|----------|-------|-------|-----------|------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | Mag. | | |
| 1980 01 02 | | 12 21.09 | +08 23.4 | 2.199 | 2.541 | -1.12 | +3.2 | 16.6 | |
| 1980 01 12 | | 12 29.97 | +09 00.0 | | | | | | |
| 1980 01 22 | | 12 36.98 | +09 57.6 | 1.941 | 2.526 | -1.28 | +4.2 | 16.2 | |
| 1980 02 01 | | 12 41.79 | +11 17.0 | | | | | | |
| 1980 02 11 | | 12 44.15 | +12 56.9 | 1.728 | 2.513 | -1.48 | +5.2 | 15.9 | |
| 1980 02 21 | | 12 43.87 | +14 53.7 | | | | | | |
| 1980 03 02 | | 12 40.98 | +16 59.9 | 1.587 | 2.502 | -1.68 | +5.8 | 15.5 | |
| 1980 03 12 | | 12 35.83 | +19 05.1 | | | | | | |
| 1980 03 22 | | 12 29.08 | +20 57.5 | 1.542 | 2.493 | -1.78 | +5.4 | 15.4 | |
| 1980 04 01 | | 12 21.74 | +22 25.8 | | | | | | |
| 1980 04 11 | | 12 14.87 | +23 23.4 | 1.598 | 2.486 | -1.73 | +4.1 | 15.6 | |
| 1980 04 21 | | 12 09.44 | +23 47.6 | | | | | | |
| 1980 05 01 | | 12 06.15 | +23 40.2 | 1.736 | 2.481 | -1.56 | +3.1 | 15.9 | |
| 1980 05 11 | | 12 05.28 | +23 05.5 | | | | | | |
| 1980 05 21 | | 12 06.89 | +22 08.1 | 1.927 | 2.479 | -1.35 | +2.6 | 16.2 | |
| 1980 05 31 | | 12 10.84 | +20 53.0 | | | | | | |
| 1980 06 10 | | 12 16.85 | +19 24.2 | 2.147 | 2.478 | -1.17 | +2.7 | 16.5 | |

| 1977 TA1 | | | | | | Elements MPC | | 4501 |
|------------|----|--------------|----------|-------|-------|--------------|------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | Mag. |
| 1980 01 02 | | 12 33.82 | -11 02.4 | 2.963 | 3.093 | -0.71 | +2.6 | 18.7 |
| 1980 01 12 | | 12 39.86 | -11 47.3 | | | | | |
| 1980 01 22 | | 12 44.22 | -12 21.2 | 2.678 | 3.092 | -0.79 | +2.7 | 18.5 |
| 1980 02 01 | | 12 46.69 | -12 42.3 | | | | | |
| 1980 02 11 | | 12 47.12 | -12 48.9 | 2.418 | 3.090 | -0.89 | +3.1 | 18.2 |
| 1980 02 21 | | 12 45.42 | -12 39.1 | | | | | |
| 1980 03 02 | | 12 41.70 | -12 12.2 | 2.216 | 3.088 | -0.98 | +3.6 | 17.9 |
| 1980 03 12 | | 12 36.26 | -11 28.5 | | | | | |
| 1980 03 22 | | 12 29.61 | -10 30.2 | 2.105 | 3.086 | -1.04 | +4.1 | 17.6 |
| 1980 04 01 | | 12 22.48 | -09 21.6 | | | | | |
| 1980 04 11 | | 12 15.64 | -08 08.5 | 2.106 | 3.084 | -1.02 | +4.2 | 17.6 |
| 1980 04 21 | | 12 09.82 | -06 57.1 | | | | | |
| 1980 05 01 | | 12 05.59 | -05 53.4 | 2.217 | 3.082 | -0.94 | +3.9 | 17.9 |
| 1980 05 11 | | 12 03.27 | -05 01.2 | | | | | |
| 1980 05 21 | | 12 02.98 | -04 23.1 | 2.412 | 3.079 | -0.85 | +3.4 | 18.2 |
| 1980 05 31 | | 12 04.71 | -03 59.9 | | | | | |
| 1980 06 10 | | 12 08.30 | -03 51.0 | 2.660 | 3.076 | -0.76 | +3.0 | 18.5 |

| (2119) 1930 QG | | | | | | Elements MPC | | 4661 |
|----------------|----|--------------|----------|-------|-------|--------------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
| 1980 01 22 | | 12 46.69 | -10 10.2 | 1.889 | 2.358 | 105.9 | 23.7 | 18.7 |
| 1980 02 01 | | 12 51.62 | -11 04.2 | | | | | |
| 1980 02 11 | | 12 54.07 | -11 43.8 | 1.626 | 2.325 | 123.8 | 20.6 | 18.3 |
| 1980 02 21 | | 12 53.68 | -12 06.1 | | | | | |
| 1980 03 02 | | 12 50.30 | -12 08.2 | 1.411 | 2.290 | 144.4 | 14.6 | 17.8 |
| 1980 03 12 | | 12 44.07 | -11 48.6 | | | | | |
| 1980 03 22 | | 12 35.52 | -11 07.2 | 1.273 | 2.255 | 166.8 | 5.8 | 17.3 |
| 1980 04 01 | | 12 25.74 | -10 08.1 | | | | | |
| 1980 04 11 | | 12 16.04 | -08 58.6 | 1.236 | 2.219 | 164.9 | 6.8 | 17.2 |
| 1980 04 21 | | 12 07.78 | -07 48.2 | | | | | |
| 1980 05 01 | | 12 02.02 | -06 46.5 | 1.296 | 2.183 | 142.4 | 16.4 | 17.5 |
| 1980 05 11 | | 11 59.31 | -06 00.2 | | | | | |
| 1980 05 21 | | 11 59.82 | -05 32.8 | 1.428 | 2.147 | 122.3 | 23.5 | 17.9 |
| 1980 05 31 | | 12 03.39 | -05 25.5 | | | | | |
| 1980 06 10 | | 12 09.72 | -05 37.3 | 1.599 | 2.112 | 105.6 | 27.6 | 18.2 |
| 1980 06 20 | | 12 18.47 | -06 06.3 | | | | | |
| 1980 06 30 | | 12 29.32 | -06 50.5 | 1.785 | 2.077 | 91.5 | 29.3 | 18.4 |

| 1977 NG | | | | | | Elements MPC | | 4926 |
|------------|----|--------------|----------|-------|-------|--------------|------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | Mag. |
| 1980 01 22 | | 13 00.58 | -07 18.0 | 2.442 | 2.844 | -0.78 | +5.5 | 18.7 |
| 1980 02 01 | | 13 03.64 | -07 47.1 | | | | | |
| 1980 02 11 | | 13 04.49 | -08 03.5 | 2.161 | 2.823 | -0.90 | +6.3 | 18.3 |
| 1980 02 21 | | 13 02.89 | -08 05.7 | | | | | |
| 1980 03 02 | | 12 58.81 | -07 53.1 | 1.933 | 2.800 | -1.03 | +7.2 | 17.9 |
| 1980 03 12 | | 12 52.43 | -07 26.0 | | | | | |
| 1980 03 22 | | 12 44.23 | -06 46.4 | 1.792 | 2.775 | -1.11 | +7.9 | 17.5 |
| 1980 04 01 | | 12 35.01 | -05 58.2 | | | | | |
| 1980 04 11 | | 12 25.74 | -05 07.1 | 1.761 | 2.747 | -1.10 | +8.1 | 17.4 |
| 1980 04 21 | | 12 17.41 | -04 19.1 | | | | | |
| 1980 05 01 | | 12 10.86 | -03 40.0 | 1.840 | 2.717 | -1.01 | +7.6 | 17.8 |
| 1980 05 11 | | 12 06.57 | -03 13.5 | | | | | |
| 1980 05 21 | | 12 04.78 | -03 01.6 | 2.001 | 2.685 | -0.89 | +6.7 | 18.1 |
| 1980 05 31 | | 12 05.49 | -03 05.0 | | | | | |
| 1980 06 10 | | 12 08.52 | -03 22.8 | 2.209 | 2.651 | -0.79 | +6.0 | 18.3 |
| 1980 06 20 | | 12 13.66 | -03 53.9 | | | | | |
| 1980 06 30 | | 12 20.65 | -04 36.9 | 2.434 | 2.615 | -0.72 | +5.4 | 18.5 |

(2130) 1974 QH1

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Elements MPC | Mag. |
|------------|----|--------------|----------|-------|-------|--------|-------|--------------|------|
| 1980 01 22 | | 13 02.74 | -07 22.4 | 2.131 | 2.546 | 103.4 | 22.1 | 4741 | 19.2 |
| 1980 02 01 | | 13 06.93 | -08 09.1 | | | | | | |
| 1980 02 11 | | 13 08.73 | -08 43.6 | 1.853 | 2.517 | 121.8 | 19.5 | | 18.8 |
| 1980 02 21 | | 13 07.81 | -09 04.3 | | | | | | |
| 1980 03 02 | | 13 04.00 | -09 09.8 | 1.623 | 2.486 | 142.8 | 13.9 | | 18.3 |
| 1980 03 12 | | 12 57.40 | -08 59.5 | | | | | | |
| 1980 03 22 | | 12 48.45 | -08 34.0 | 1.473 | 2.452 | 166.3 | 5.5 | | 17.8 |
| 1980 04 01 | | 12 38.05 | -07 56.6 | | | | | | |
| 1980 04 11 | | 12 27.40 | -07 12.9 | 1.427 | 2.416 | 167.7 | 5.1 | | 17.7 |
| 1980 04 21 | | 12 17.76 | -06 29.8 | | | | | | |
| 1980 05 01 | | 12 10.23 | -05 54.3 | 1.487 | 2.378 | 144.1 | 14.4 | | 18.1 |
| 1980 05 11 | | 12 05.43 | -05 31.2 | | | | | | |
| 1980 05 21 | | 12 03.64 | -05 23.6 | 1.625 | 2.338 | 123.2 | 21.2 | | 18.4 |
| 1980 05 31 | | 12 04.83 | -05 32.3 | | | | | | |
| 1980 06 10 | | 12 08.73 | -05 56.8 | 1.807 | 2.297 | 105.5 | 25.2 | | 18.7 |
| 1980 06 20 | | 12 15.08 | -06 35.8 | | | | | | |
| 1980 06 30 | | 12 23.57 | -07 27.8 | 2.004 | 2.254 | 90.4 | 26.8 | | 18.9 |

1977 QX2

| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | Elements MPC | Mag. | |
|------------|----|--------------|----------|-------|-------|-----------|--------------|------|------|
| 1980 01 22 | | 13 20.70 | -08 11.4 | 2.742 | 3.055 | -0.69 | +4.2 | 4927 | 18.0 |
| 1980 02 01 | | 13 24.60 | -08 33.4 | | | | | | |
| 1980 02 11 | | 13 26.47 | -08 43.2 | 2.501 | 3.087 | -0.77 | +4.6 | | 17.8 |
| 1980 02 21 | | 13 26.18 | -08 40.3 | | | | | | |
| 1980 03 02 | | 13 23.72 | -08 24.5 | 2.306 | 3.119 | -0.85 | +5.1 | | 17.6 |
| 1980 03 12 | | 13 19.23 | -07 56.7 | | | | | | |
| 1980 03 22 | | 13 13.09 | -07 18.9 | 2.190 | 3.151 | -0.92 | +5.6 | | 17.3 |
| 1980 04 01 | | 13 05.88 | -06 34.4 | | | | | | |
| 1980 04 11 | | 12 58.33 | -05 47.7 | 2.183 | 3.182 | -0.92 | +5.8 | | 17.0 |
| 1980 04 21 | | 12 51.21 | -05 03.4 | | | | | | |
| 1980 05 01 | | 12 45.20 | -04 26.0 | 2.290 | 3.213 | -0.87 | +5.6 | | 17.5 |
| 1980 05 11 | | 12 40.77 | -03 58.7 | | | | | | |
| 1980 05 21 | | 12 38.19 | -03 43.3 | 2.493 | 3.243 | -0.79 | +5.0 | | 17.9 |
| 1980 05 31 | | 12 37.56 | -03 40.4 | | | | | | |
| 1980 06 10 | | 12 38.82 | -03 49.5 | 2.760 | 3.273 | -0.70 | +4.5 | | 18.2 |
| 1980 06 20 | | 12 41.83 | -04 09.8 | | | | | | |
| 1980 06 30 | | 12 46.42 | -04 39.9 | 3.061 | 3.301 | -0.63 | +4.0 | | 18.4 |

(2157) A924 EF

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Elements MPC | Mag. |
|------------|----|--------------|----------|-------|-------|--------|-------|--------------|------|
| 1980 01 22 | | 13 23.56 | -11 06.0 | 2.353 | 2.662 | 97.2 | 21.5 | 4826 | 17.2 |
| 1980 02 01 | | 13 29.38 | -12 14.6 | | | | | | |
| 1980 02 11 | | 13 33.13 | -13 14.6 | 2.074 | 2.641 | 114.5 | 19.9 | | 16.8 |
| 1980 02 21 | | 13 34.50 | -14 04.5 | | | | | | |
| 1980 03 02 | | 13 33.25 | -14 42.8 | 1.833 | 2.620 | 134.0 | 15.8 | | 16.5 |
| 1980 03 12 | | 13 29.35 | -15 08.0 | | | | | | |
| 1980 03 22 | | 13 22.97 | -15 18.6 | 1.660 | 2.600 | 155.5 | 9.1 | | 16.1 |
| 1980 04 01 | | 13 14.69 | -15 14.7 | | | | | | |
| 1980 04 11 | | 13 05.40 | -14 58.1 | 1.584 | 2.581 | 172.6 | 2.9 | | 15.7 |
| 1980 04 21 | | 12 56.21 | -14 32.7 | | | | | | |
| 1980 05 01 | | 12 48.23 | -14 04.2 | 1.615 | 2.563 | 154.9 | 9.6 | | 16.0 |
| 1980 05 11 | | 12 42.28 | -13 38.4 | | | | | | |
| 1980 05 21 | | 12 38.88 | -13 20.4 | 1.738 | 2.547 | 133.9 | 16.6 | | 16.3 |
| 1980 05 31 | | 12 38.21 | -13 13.5 | | | | | | |
| 1980 06 10 | | 12 40.18 | -13 19.2 | 1.925 | 2.532 | 115.3 | 21.2 | | 16.6 |
| 1980 06 20 | | 12 44.61 | -13 37.7 | | | | | | |
| 1980 06 30 | | 12 51.24 | -14 08.4 | 2.146 | 2.518 | 99.3 | 23.5 | | 16.9 |

| (2096) 1939 UC | | Elements MPC 4537 | | | | | | | |
|----------------|----|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1980 01 22 | | 13 41.00 | -11 30.4 | 2.704 | 2.928 | 93.1 | 19.6 | 19.2 | |
| 1980 02 01 | | 13 46.45 | -12 05.5 | | | | | | |
| 1980 02 11 | | 13 50.01 | -12 30.0 | 2.401 | 2.904 | 111.0 | 18.5 | 18.9 | |
| 1980 02 21 | | 13 51.39 | -12 42.7 | | | | | | |
| 1980 03 02 | | 13 50.39 | -12 42.4 | 2.129 | 2.878 | 131.0 | 15.1 | 18.6 | |
| 1980 03 12 | | 13 46.92 | -12 28.3 | | | | | | |
| 1980 03 22 | | 13 41.09 | -12 00.1 | 1.923 | 2.849 | 153.3 | 9.0 | 18.2 | |
| 1980 04 01 | | 13 33.32 | -11 19.3 | | | | | | |
| 1980 04 11 | | 13 24.31 | -10 29.0 | 1.816 | 2.817 | 177.0 | 1.1 | 17.7 | |
| 1980 04 21 | | 13 14.97 | -09 34.0 | | | | | | |
| 1980 05 01 | | 13 06.31 | -08 40.4 | 1.822 | 2.783 | 158.2 | 7.7 | 18.0 | |
| 1980 05 11 | | 12 59.17 | -07 54.0 | | | | | | |
| 1980 05 21 | | 12 54.15 | -07 19.3 | 1.930 | 2.746 | 135.6 | 14.9 | 18.3 | |
| 1980 05 31 | | 12 51.56 | -06 58.9 | | | | | | |
| 1980 06 10 | | 12 51.44 | -06 53.7 | 2.108 | 2.707 | 115.7 | 19.8 | 18.5 | |
| 1980 06 20 | | 12 53.70 | -07 03.3 | | | | | | |
| 1980 06 30 | | 12 58.14 | -07 26.6 | 2.321 | 2.665 | 98.3 | 22.2 | 18.8 | |

| 1978 WC | | Elements MPC 4600 | | | | | | | |
|------------|----|-------------------|----------|-------|-------|-----------|------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | Mag. | | |
| 1980 01 22 | | 13 46.35 | -00 45.1 | 2.444 | 2.724 | -0.71 | +5.2 | 19.6 | |
| 1980 02 01 | | 13 51.85 | -00 43.7 | | | | | | |
| 1980 02 11 | | 13 55.19 | -00 28.4 | 2.207 | 2.755 | -0.79 | +6.0 | 19.4 | |
| 1980 02 21 | | 13 56.09 | +00 00.5 | | | | | | |
| 1980 03 02 | | 13 54.41 | +00 41.9 | 2.006 | 2.784 | -0.90 | +6.8 | 19.1 | |
| 1980 03 12 | | 13 50.16 | +01 33.0 | | | | | | |
| 1980 03 22 | | 13 43.57 | +02 29.7 | 1.875 | 2.810 | -0.99 | +7.4 | 18.8 | |
| 1980 04 01 | | 13 35.19 | +03 26.2 | | | | | | |
| 1980 04 11 | | 13 25.83 | +04 16.3 | 1.846 | 2.833 | -1.03 | +7.5 | 18.6 | |
| 1980 04 21 | | 13 16.46 | +04 54.2 | | | | | | |
| 1980 05 01 | | 13 08.02 | +05 15.9 | 1.929 | 2.853 | -0.99 | +6.9 | 18.9 | |
| 1980 05 11 | | 13 01.23 | +05 19.6 | | | | | | |
| 1980 05 21 | | 12 56.55 | +05 05.8 | 2.108 | 2.870 | -0.88 | +6.1 | 19.3 | |
| 1980 05 31 | | 12 54.17 | +04 36.0 | | | | | | |
| 1980 06 10 | | 12 54.04 | +03 52.7 | 2.349 | 2.885 | -0.77 | +5.3 | 19.6 | |
| 1980 06 20 | | 12 56.04 | +02 58.1 | | | | | | |
| 1980 06 30 | | 12 59.94 | +01 54.5 | 2.623 | 2.896 | -0.67 | +4.8 | 19.9 | |

| 1978 WB | | Elements MPC 4637 | | | | | | | |
|------------|----|-------------------|----------|-------|-------|-----------|------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | Mag. | | |
| 1980 01 22 | | 13 50.79 | -09 30.4 | 2.506 | 2.718 | -0.74 | +4.7 | 20.7 | |
| 1980 02 01 | | 13 57.07 | -10 02.3 | | | | | | |
| 1980 02 11 | | 14 01.31 | -10 22.7 | 2.250 | 2.738 | -0.84 | +5.2 | 20.4 | |
| 1980 02 21 | | 14 03.22 | -10 30.6 | | | | | | |
| 1980 03 02 | | 14 02.61 | -10 25.5 | 2.022 | 2.755 | -0.96 | +5.9 | 20.1 | |
| 1980 03 12 | | 13 59.38 | -10 07.2 | | | | | | |
| 1980 03 22 | | 13 53.68 | -09 36.4 | 1.855 | 2.771 | -1.07 | +6.7 | 19.8 | |
| 1980 04 01 | | 13 45.93 | -08 55.5 | | | | | | |
| 1980 04 11 | | 13 36.88 | -08 08.3 | 1.784 | 2.783 | -1.12 | +7.2 | 19.3 | |
| 1980 04 21 | | 13 27.46 | -07 19.8 | | | | | | |
| 1980 05 01 | | 13 18.70 | -06 35.8 | 1.825 | 2.794 | -1.08 | +7.2 | 19.7 | |
| 1980 05 11 | | 13 11.42 | -06 01.2 | | | | | | |
| 1980 05 21 | | 13 06.21 | -05 39.2 | 1.969 | 2.802 | -0.97 | +6.6 | 20.0 | |
| 1980 05 31 | | 13 03.36 | -05 31.6 | | | | | | |
| 1980 06 10 | | 13 02.88 | -05 38.1 | 2.186 | 2.807 | -0.85 | +5.8 | 20.4 | |
| 1980 06 20 | | 13 04.66 | -05 58.1 | | | | | | |
| 1980 06 30 | | 13 08.52 | -06 29.9 | 2.444 | 2.810 | -0.75 | +5.1 | 20.7 | |

| (2163) 1971 SP1 | | | | | Elements MPC 4827 | | | |
|-----------------|----|--------------|----------|-------|-------------------|-----------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
| 1980 01 22 | | 13 55.41 | -09 03.7 | 3.581 | 3.725 | 90.7 | 15.3 | 18.8 |
| 1980 02 01 | | 13 59.45 | -09 18.0 | | | | | |
| 1980 02 11 | | 14 01.91 | -09 23.1 | 3.284 | 3.729 | 109.3 | 14.5 | 18.6 |
| 1980 02 21 | | 14 02.63 | -09 18.6 | | | | | |
| 1980 03 02 | | 14 01.52 | -09 04.4 | 3.019 | 3.731 | 129.6 | 11.8 | 18.3 |
| 1980 03 12 | | 13 58.61 | -08 40.9 | | | | | |
| 1980 03 22 | | 13 54.03 | -08 09.2 | 2.825 | 3.731 | 151.5 | 7.3 | 18.1 |
| 1980 04 01 | | 13 48.09 | -07 31.4 | | | | | |
| 1980 04 11 | | 13 41.27 | -06 50.0 | 2.732 | 3.730 | 173.8 | 1.7 | 17.7 |
| 1980 04 21 | | 13 34.11 | -06 08.6 | | | | | |
| 1980 05 01 | | 13 27.26 | -05 30.8 | 2.757 | 3.727 | 161.6 | 4.9 | 17.9 |
| 1980 05 11 | | 13 21.23 | -04 59.6 | | | | | |
| 1980 05 21 | | 13 16.49 | -04 37.4 | 2.893 | 3.723 | 139.6 | 10.1 | 18.2 |
| 1980 05 31 | | 13 13.30 | -04 25.7 | | | | | |
| 1980 06 10 | | 13 11.79 | -04 24.8 | 3.112 | 3.717 | 119.3 | 13.8 | 18.4 |
| 1980 06 20 | | 13 11.98 | -04 34.6 | | | | | |
| 1980 06 30 | | 13 13.81 | -04 54.1 | 3.380 | 3.709 | 100.9 | 15.6 | 18.6 |
| 1978 PC | | | | | Elements MPC 4576 | | | |
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | Mag. |
| 1980 01 22 | | 14 05.94 | +19 28.1 | 1.543 | 1.940 | -1.10 | +18.3 | 17.6 |
| 1980 02 01 | | 14 16.44 | +19 54.5 | | | | | |
| 1980 02 11 | | 14 23.70 | +20 36.5 | 1.409 | 1.990 | -1.20 | +21.3 | 17.4 |
| 1980 02 21 | | 14 27.21 | +21 30.7 | | | | | |
| 1980 03 02 | | 14 26.61 | +22 30.8 | 1.297 | 2.043 | -1.43 | +23.8 | 17.1 |
| 1980 03 12 | | 14 21.72 | +23 27.4 | | | | | |
| 1980 03 22 | | 14 12.76 | +24 08.6 | 1.232 | 2.097 | -1.72 | +24.5 | 17.0 |
| 1980 04 01 | | 14 00.62 | +24 21.7 | | | | | |
| 1980 04 11 | | 13 46.76 | +23 57.2 | 1.241 | 2.153 | -1.86 | +22.4 | 17.0 |
| 1980 04 21 | | 13 32.95 | +22 51.7 | | | | | |
| 1980 05 01 | | 13 20.87 | +21 08.8 | 1.339 | 2.208 | -1.72 | +18.8 | 17.2 |
| 1980 05 11 | | 13 11.58 | +18 57.4 | | | | | |
| 1980 05 21 | | 13 05.56 | +16 27.3 | 1.519 | 2.263 | -1.44 | +15.6 | 17.7 |
| 1980 05 31 | | 13 02.81 | +13 47.1 | | | | | |
| 1980 06 10 | | 13 03.02 | +11 03.2 | 1.759 | 2.317 | -1.16 | +13.3 | 18.1 |
| 1980 06 20 | | 13 05.81 | +08 19.6 | | | | | |
| 1980 06 30 | | 13 10.79 | +05 38.8 | 2.035 | 2.369 | -0.95 | +12.4 | 18.5 |
| 1934 CD | | | | | Elements MPC 4933 | | | |
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | Mag. |
| 1980 02 11 | | 14 01.69 | -30 47.7 | 2.581 | 2.939 | 101.3 | 19.2 | 18.3 |
| 1980 02 21 | | 14 04.11 | -31 56.8 | | | | | |
| 1980 03 02 | | 14 04.03 | -32 53.8 | 2.350 | 2.959 | 118.9 | 17.1 | 18.1 |
| 1980 03 12 | | 14 01.32 | -33 35.6 | | | | | |
| 1980 03 22 | | 13 56.06 | -33 58.3 | 2.167 | 2.978 | 137.4 | 13.1 | 17.8 |
| 1980 04 01 | | 13 48.64 | -33 58.6 | | | | | |
| 1980 04 11 | | 13 39.78 | -33 34.5 | 2.062 | 2.996 | 154.0 | 8.4 | 17.6 |
| 1980 04 21 | | 13 30.42 | -32 46.9 | | | | | |
| 1980 05 01 | | 13 21.62 | -31 40.0 | 2.059 | 3.012 | 156.8 | 7.6 | 17.6 |
| 1980 05 11 | | 13 14.28 | -30 20.8 | | | | | |
| 1980 05 21 | | 13 09.03 | -28 57.0 | 2.160 | 3.027 | 142.5 | 11.7 | 17.8 |
| 1980 05 31 | | 13 06.20 | -27 36.4 | | | | | |
| 1980 06 10 | | 13 05.82 | -26 24.4 | 2.346 | 3.040 | 124.6 | 16.0 | 18.1 |
| 1980 06 20 | | 13 07.78 | -25 24.6 | | | | | |
| 1980 06 30 | | 13 11.87 | -24 38.7 | 2.589 | 3.052 | 107.4 | 18.5 | 18.4 |
| 1980 07 10 | | 13 17.82 | -24 06.9 | | | | | |
| 1980 07 20 | | 13 25.41 | -23 48.3 | 2.860 | 3.062 | 91.6 | 19.4 | 18.7 |

(2105) Gudy

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Elements MPC | Mag. |
|------------|----|--------------|----------|-------|-------|--------|-------|--------------|------|
| 1980 02 11 | | 14 05.19 | -46 36.6 | 2.325 | 2.587 | 93.9 | 22.4 | 4824 | 18.0 |
| 1980 02 21 | | 14 09.94 | -48 25.4 | | | | | | |
| 1980 03 02 | | 14 11.46 | -50 00.6 | 2.130 | 2.612 | 108.0 | 21.2 | 17.8 | |
| 1980 03 12 | | 14 09.33 | -51 17.1 | | | | | | |
| 1980 03 22 | | 14 03.41 | -52 08.3 | 1.961 | 2.635 | 122.6 | 18.6 | 17.6 | |
| 1980 04 01 | | 13 54.10 | -52 26.8 | | | | | | |
| 1980 04 11 | | 13 42.43 | -52 06.2 | 1.845 | 2.657 | 135.7 | 15.3 | 17.4 | |
| 1980 04 21 | | 13 29.98 | -51 03.5 | | | | | | |
| 1980 05 01 | | 13 18.55 | -49 21.6 | 1.805 | 2.676 | 142.5 | 13.3 | 17.3 | |
| 1980 05 11 | | 13 09.56 | -47 09.2 | | | | | | |
| 1980 05 21 | | 13 03.82 | -44 38.3 | 1.855 | 2.693 | 137.9 | 14.6 | 17.4 | |
| 1980 05 31 | | 13 01.57 | -42 02.1 | | | | | | |
| 1980 06 10 | | 13 02.61 | -39 31.4 | 1.990 | 2.708 | 125.4 | 17.8 | 17.7 | |
| 1980 06 20 | | 13 06.55 | -37 14.0 | | | | | | |
| 1980 06 30 | | 13 12.96 | -35 14.4 | 2.191 | 2.721 | 110.6 | 20.5 | 17.9 | |
| 1980 07 10 | | 13 21.41 | -33 34.0 | | | | | | |
| 1980 07 20 | | 13 31.55 | -32 12.7 | 2.432 | 2.731 | 96.0 | 21.7 | 18.2 | |

(2186) 1973 SQ4

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Elements MPC | Mag. |
|------------|----|--------------|----------|-------|-------|--------|-------|--------------|------|
| 1980 02 11 | | 14 23.68 | -17 07.9 | 2.519 | 2.886 | 101.8 | 19.6 | 5035 | 18.3 |
| 1980 02 21 | | 14 27.42 | -17 35.2 | | | | | | |
| 1980 03 02 | | 14 28.88 | -17 51.5 | 2.268 | 2.899 | 120.5 | 17.1 | 18.0 | |
| 1980 03 12 | | 14 27.91 | -17 55.9 | | | | | | |
| 1980 03 22 | | 14 24.46 | -17 47.4 | 2.065 | 2.911 | 141.4 | 12.3 | 17.7 | |
| 1980 04 01 | | 14 18.77 | -17 25.8 | | | | | | |
| 1980 04 11 | | 14 11.30 | -16 52.0 | 1.944 | 2.921 | 164.1 | 5.4 | 17.3 | |
| 1980 04 21 | | 14 02.80 | -16 08.6 | | | | | | |
| 1980 05 01 | | 13 54.18 | -15 19.7 | 1.931 | 2.930 | 170.9 | 3.1 | 17.2 | |
| 1980 05 11 | | 13 46.34 | -14 30.6 | | | | | | |
| 1980 05 21 | | 13 40.03 | -13 46.5 | 2.028 | 2.938 | 148.4 | 10.4 | 17.6 | |
| 1980 05 31 | | 13 35.75 | -13 11.5 | | | | | | |
| 1980 06 10 | | 13 33.71 | -12 48.2 | 2.214 | 2.945 | 127.5 | 15.9 | 17.9 | |
| 1980 06 20 | | 13 33.94 | -12 37.7 | | | | | | |
| 1980 06 30 | | 13 36.33 | -12 39.8 | 2.458 | 2.950 | 109.0 | 19.0 | 18.2 | |
| 1980 07 10 | | 13 40.67 | -12 53.6 | | | | | | |
| 1980 07 20 | | 13 46.77 | -13 17.5 | 2.729 | 2.954 | 92.5 | 20.1 | 18.5 | |

1978 PA

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Elements MPC | Mag. |
|------------|----|--------------|----------|-------|-------|--------|-------|--------------|------|
| 1980 02 11 | | 14 41.93 | +20 15.6 | 1.610 | 2.118 | -1.36 | +10.8 | 4576 | 18.3 |
| 1980 02 21 | | 14 50.54 | +22 26.8 | | | | | | |
| 1980 03 02 | | 14 56.09 | +24 53.8 | 1.452 | 2.118 | -1.60 | +13.3 | 18.0 | |
| 1980 03 12 | | 14 58.08 | +27 29.3 | | | | | | |
| 1980 03 22 | | 14 56.12 | +30 02.2 | 1.340 | 2.114 | -1.91 | +14.7 | 17.8 | |
| 1980 04 01 | | 14 50.18 | +32 18.0 | | | | | | |
| 1980 04 11 | | 14 40.71 | +34 01.2 | 1.290 | 2.108 | -2.18 | +13.5 | 17.6 | |
| 1980 04 21 | | 14 28.77 | +34 57.8 | | | | | | |
| 1980 05 01 | | 14 16.02 | +34 59.6 | 1.305 | 2.099 | -2.20 | +9.9 | 17.7 | |
| 1980 05 11 | | 14 04.20 | +34 06.1 | | | | | | |
| 1980 05 21 | | 13 54.71 | +32 23.1 | 1.380 | 2.088 | -1.94 | +7.3 | 17.9 | |
| 1980 05 31 | | 13 48.42 | +30 00.8 | | | | | | |
| 1980 06 10 | | 13 45.55 | +27 10.3 | 1.502 | 2.073 | -1.60 | +6.4 | 18.1 | |
| 1980 06 20 | | 13 45.96 | +24 00.9 | | | | | | |
| 1980 06 30 | | 13 49.34 | +20 40.6 | 1.654 | 2.057 | -1.31 | +6.7 | 18.3 | |
| 1980 07 10 | | 13 55.28 | +17 15.1 | | | | | | |
| 1980 07 20 | | 14 03.43 | +13 48.3 | 1.824 | 2.038 | -1.11 | +7.3 | 18.5 | |

| 1977 VN | | | | | | Elements MPC | | | | 5007 |
|------------|----|--------------|----------|-------|-------|--------------|------|------|--|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | Mag. | | |
| 1980 02 11 | | 14 44.02 | -16 07.3 | 3.368 | 3.630 | -0.51 | +2.4 | 17.8 | | |
| 1980 02 21 | | 14 46.84 | -16 21.7 | | | | | | | |
| 1980 03 02 | | 14 47.84 | -16 27.9 | 3.100 | 3.654 | -0.56 | +2.6 | 17.6 | | |
| 1980 03 12 | | 14 46.91 | -16 25.6 | | | | | | | |
| 1980 03 22 | | 14 44.05 | -16 14.6 | 2.878 | 3.676 | -0.62 | +2.9 | 17.4 | | |
| 1980 04 01 | | 14 39.41 | -15 55.2 | | | | | | | |
| 1980 04 11 | | 14 33.31 | -15 28.3 | 2.738 | 3.696 | -0.66 | +3.3 | 17.0 | | |
| 1980 04 21 | | 14 26.23 | -14 55.6 | | | | | | | |
| 1980 05 01 | | 14 18.76 | -14 19.8 | 2.708 | 3.715 | -0.66 | +3.5 | 16.7 | | |
| 1980 05 11 | | 14 11.54 | -13 43.9 | | | | | | | |
| 1980 05 21 | | 14 05.16 | -13 11.1 | 2.796 | 3.732 | -0.63 | +3.5 | 17.2 | | |
| 1980 05 31 | | 14 00.08 | -12 44.2 | | | | | | | |
| 1980 06 10 | | 13 56.58 | -12 25.3 | 2.985 | 3.747 | -0.58 | +3.3 | 17.5 | | |
| 1980 06 20 | | 13 54.81 | -12 15.5 | | | | | | | |
| 1980 06 30 | | 13 54.79 | -12 15.0 | 3.245 | 3.761 | -0.53 | +3.0 | 17.8 | | |
| 1980 07 10 | | 13 56.44 | -12 23.6 | | | | | | | |
| 1980 07 20 | | 13 59.65 | -12 40.5 | 3.542 | 3.774 | -0.48 | +2.7 | 18.0 | | |

| 1976 EA | | | | | | Elements MPC | | | | 4661 |
|------------|----|--------------|----------|-------|-------|--------------|-------|------|--|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | | |
| 1980 02 11 | | 14 21.29 | -15 06.8 | 1.372 | 1.861 | 103.0 | 31.1 | 17.3 | | |
| 1980 02 21 | | 14 32.68 | -16 21.3 | | | | | | | |
| 1980 03 02 | | 14 41.32 | -17 22.6 | 1.195 | 1.876 | 117.8 | 27.9 | 16.9 | | |
| 1980 03 12 | | 14 46.69 | -18 09.7 | | | | | | | |
| 1980 03 22 | | 14 48.34 | -18 41.2 | 1.051 | 1.897 | 135.8 | 21.5 | 16.5 | | |
| 1980 04 01 | | 14 46.16 | -18 55.9 | | | | | | | |
| 1980 04 11 | | 14 40.47 | -18 53.3 | 0.962 | 1.925 | 157.1 | 11.7 | 16.1 | | |
| 1980 04 21 | | 14 32.19 | -18 34.1 | | | | | | | |
| 1980 05 01 | | 14 22.85 | -18 02.8 | 0.953 | 1.960 | 176.2 | 1.9 | 15.7 | | |
| 1980 05 11 | | 14 14.13 | -17 26.4 | | | | | | | |
| 1980 05 21 | | 14 07.47 | -16 52.7 | 1.033 | 1.999 | 155.5 | 12.1 | 16.4 | | |
| 1980 05 31 | | 14 03.80 | -16 28.9 | | | | | | | |
| 1980 06 10 | | 14 03.40 | -16 18.6 | 1.191 | 2.042 | 135.4 | 20.4 | 16.9 | | |
| 1980 06 20 | | 14 06.18 | -16 22.9 | | | | | | | |
| 1980 06 30 | | 14 11.85 | -16 41.1 | 1.404 | 2.089 | 118.4 | 25.3 | 17.4 | | |
| 1980 07 10 | | 14 19.98 | -17 10.9 | | | | | | | |
| 1980 07 20 | | 14 30.23 | -17 49.9 | 1.653 | 2.138 | 103.9 | 27.5 | 17.9 | | |

| 1977 QR2 | | | | | | Elements MPC | | | | 4927 |
|------------|----|--------------|----------|-------|-------|--------------|------|------|--|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | Mag. | | |
| 1980 02 11 | | 14 44.41 | -16 36.7 | 2.625 | 2.918 | -0.78 | +3.2 | 19.4 | | |
| 1980 02 21 | | 14 49.44 | -16 58.3 | | | | | | | |
| 1980 03 02 | | 14 52.36 | -17 10.0 | 2.352 | 2.917 | -0.89 | +3.6 | 19.1 | | |
| 1980 03 12 | | 14 52.95 | -17 11.1 | | | | | | | |
| 1980 03 22 | | 14 51.06 | -17 00.9 | 2.118 | 2.915 | -1.01 | +4.1 | 18.8 | | |
| 1980 04 01 | | 14 46.74 | -16 39.3 | | | | | | | |
| 1980 04 11 | | 14 40.29 | -16 06.9 | 1.957 | 2.911 | -1.10 | +4.7 | 18.4 | | |
| 1980 04 21 | | 14 32.26 | -15 25.4 | | | | | | | |
| 1980 05 01 | | 14 23.48 | -14 38.4 | 1.898 | 2.905 | -1.12 | +5.2 | 17.9 | | |
| 1980 05 11 | | 14 14.87 | -13 50.4 | | | | | | | |
| 1980 05 21 | | 14 07.31 | -13 06.3 | 1.952 | 2.898 | -1.06 | +5.2 | 18.5 | | |
| 1980 05 31 | | 14 01.49 | -12 30.6 | | | | | | | |
| 1980 06 10 | | 13 57.83 | -12 06.3 | 2.102 | 2.889 | -0.95 | +4.8 | 18.8 | | |
| 1980 06 20 | | 13 56.49 | -11 54.8 | | | | | | | |
| 1980 06 30 | | 13 57.46 | -11 56.2 | 2.318 | 2.879 | -0.84 | +4.2 | 19.1 | | |
| 1980 07 10 | | 14 00.58 | -12 09.5 | | | | | | | |
| 1980 07 20 | | 14 05.68 | -12 33.6 | 2.567 | 2.867 | -0.75 | +3.7 | 19.3 | | |

| 1950 DB | | Elements MPC 4782 | | | | | | | |
|------------|----|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1980 02 11 | | 14 41.57 | +06 27.7 | 1.975 | 2.414 | 104.1 | 23.4 | 17.9 | |
| 1980 02 21 | | 14 48.30 | +07 51.7 | | | | | | |
| 1980 03 02 | | 14 52.38 | +09 30.7 | 1.808 | 2.461 | 120.2 | 20.4 | 17.7 | |
| 1980 03 12 | | 14 53.60 | +11 20.4 | | | | | | |
| 1980 03 22 | | 14 51.88 | +13 14.2 | 1.691 | 2.507 | 136.2 | 16.0 | 17.5 | |
| 1980 04 01 | | 14 47.38 | +15 03.2 | | | | | | |
| 1980 04 11 | | 14 40.59 | +16 37.4 | 1.649 | 2.554 | 147.7 | 12.1 | 17.4 | |
| 1980 04 21 | | 14 32.29 | +17 47.6 | | | | | | |
| 1980 05 01 | | 14 23.52 | +18 27.1 | 1.699 | 2.600 | 146.6 | 12.3 | 17.5 | |
| 1980 05 11 | | 14 15.32 | +18 33.8 | | | | | | |
| 1980 05 21 | | 14 08.55 | +18 09.1 | 1.836 | 2.645 | 134.4 | 15.9 | 17.8 | |
| 1980 05 31 | | 14 03.81 | +17 17.3 | | | | | | |
| 1980 06 10 | | 14 01.34 | +16 04.3 | 2.043 | 2.690 | 119.3 | 19.2 | 18.1 | |
| 1980 06 20 | | 14 01.18 | +14 35.5 | | | | | | |
| 1980 06 30 | | 14 03.20 | +12 55.9 | 2.296 | 2.733 | 104.5 | 21.1 | 18.5 | |
| 1980 07 10 | | 14 07.19 | +11 09.4 | | | | | | |
| 1980 07 20 | | 14 12.91 | +09 19.0 | 2.572 | 2.775 | 90.6 | 21.5 | 18.8 | |

| 1975 WM1 | | Elements MPC 5011 | | | | | | | |
|------------|----|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1980 02 11 | | 14 51.28 | +00 01.4 | 5.139 | 5.403 | 100.2 | 10.4 | 17.0 | |
| 1980 02 21 | | 14 52.76 | +00 15.8 | | | | | | |
| 1980 03 02 | | 14 53.02 | +00 35.0 | 4.852 | 5.405 | 119.2 | 9.2 | 16.8 | |
| 1980 03 12 | | 14 52.05 | +00 58.0 | | | | | | |
| 1980 03 22 | | 14 49.87 | +01 23.3 | 4.620 | 5.407 | 138.5 | 7.0 | 16.6 | |
| 1980 04 01 | | 14 46.62 | +01 49.0 | | | | | | |
| 1980 04 11 | | 14 42.48 | +02 13.3 | 4.475 | 5.408 | 156.3 | 4.3 | 16.4 | |
| 1980 04 21 | | 14 37.70 | +02 34.0 | | | | | | |
| 1980 05 01 | | 14 32.61 | +02 49.2 | 4.441 | 5.410 | 162.3 | 3.3 | 16.4 | |
| 1980 05 11 | | 14 27.54 | +02 57.5 | | | | | | |
| 1980 05 21 | | 14 22.81 | +02 57.9 | 4.522 | 5.411 | 148.6 | 5.6 | 16.6 | |
| 1980 05 31 | | 14 18.72 | +02 49.9 | | | | | | |
| 1980 06 10 | | 14 15.49 | +02 33.7 | 4.702 | 5.412 | 130.1 | 8.2 | 16.7 | |
| 1980 06 20 | | 14 13.27 | +02 09.6 | | | | | | |
| 1980 06 30 | | 14 12.16 | +01 38.5 | 4.956 | 5.413 | 111.6 | 10.1 | 16.9 | |
| 1980 07 10 | | 14 12.17 | +01 01.4 | | | | | | |
| 1980 07 20 | | 14 13.30 | +00 19.2 | 5.250 | 5.414 | 93.9 | 10.8 | 17.0 | |

| 6591 P-L | | Elements MPC 4831 | | | | | | | |
|------------|----|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1980 02 11 | | 14 52.31 | -18 54.8 | 5.101 | 5.275 | 94.7 | 10.7 | 19.9 | |
| 1980 02 21 | | 14 54.22 | -19 14.3 | | | | | | |
| 1980 03 02 | | 14 54.85 | -19 28.9 | 4.794 | 5.277 | 114.1 | 9.9 | 19.7 | |
| 1980 03 12 | | 14 54.17 | -19 38.2 | | | | | | |
| 1980 03 22 | | 14 52.20 | -19 41.9 | 4.531 | 5.279 | 134.6 | 7.7 | 19.6 | |
| 1980 04 01 | | 14 49.05 | -19 40.2 | | | | | | |
| 1980 04 11 | | 14 44.90 | -19 33.1 | 4.350 | 5.280 | 155.8 | 4.5 | 19.3 | |
| 1980 04 21 | | 14 40.01 | -19 21.4 | | | | | | |
| 1980 05 01 | | 14 34.73 | -19 05.9 | 4.276 | 5.282 | 175.8 | 0.8 | 19.0 | |
| 1980 05 11 | | 14 29.44 | -18 48.2 | | | | | | |
| 1980 05 21 | | 14 24.48 | -18 29.8 | 4.322 | 5.283 | 159.8 | 3.8 | 19.3 | |
| 1980 05 31 | | 14 20.21 | -18 12.5 | | | | | | |
| 1980 06 10 | | 14 16.85 | -17 57.9 | 4.477 | 5.285 | 138.9 | 7.3 | 19.5 | |
| 1980 06 20 | | 14 14.60 | -17 47.3 | | | | | | |
| 1980 06 30 | | 14 13.55 | -17 41.7 | 4.717 | 5.286 | 119.1 | 9.7 | 19.7 | |
| 1980 07 10 | | 14 13.73 | -17 41.5 | | | | | | |
| 1980 07 20 | | 14 15.12 | -17 47.0 | 5.008 | 5.288 | 100.5 | 10.9 | 19.9 | |

(2148) Epeios

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Elements MPC | Mag. |
|------------|----|--------------|----------|-------|-------|--------|-------|--------------|------|
| 1980 02 11 | | 14 50.52 | -10 18.7 | 5.249 | 5.468 | 97.6 | 10.3 | 4777 | 19.5 |
| 1980 02 21 | | 14 52.32 | -10 09.3 | | | | | | |
| 1980 03 02 | | 14 52.92 | -09 54.0 | 4.946 | 5.470 | 117.2 | 9.3 | | 19.4 |
| 1980 03 12 | | 14 52.32 | -09 33.4 | | | | | | |
| 1980 03 22 | | 14 50.53 | -09 08.0 | 4.694 | 5.472 | 137.7 | 7.0 | | 19.2 |
| 1980 04 01 | | 14 47.68 | -08 39.0 | | | | | | |
| 1980 04 11 | | 14 43.95 | -08 07.7 | 4.529 | 5.474 | 158.5 | 3.9 | | 19.0 |
| 1980 04 21 | | 14 39.58 | -07 35.6 | | | | | | |
| 1980 05 01 | | 14 34.88 | -07 04.6 | 4.475 | 5.475 | 172.1 | 1.4 | | 18.8 |
| 1980 05 11 | | 14 30.17 | -06 36.5 | | | | | | |
| 1980 05 21 | | 14 25.78 | -06 12.9 | 4.540 | 5.476 | 155.3 | 4.4 | | 19.0 |
| 1980 05 31 | | 14 22.00 | -05 55.1 | | | | | | |
| 1980 06 10 | | 14 19.05 | -05 43.8 | 4.712 | 5.477 | 135.1 | 7.5 | | 19.2 |
| 1980 06 20 | | 14 17.08 | -05 39.5 | | | | | | |
| 1980 06 30 | | 14 16.19 | -05 42.2 | 4.962 | 5.478 | 115.6 | 9.6 | | 19.4 |
| 1980 07 10 | | 14 16.40 | -05 51.4 | | | | | | |
| 1980 07 20 | | 14 17.72 | -06 06.7 | 5.258 | 5.479 | 97.2 | 10.6 | | 19.5 |

1977 TG

| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | Elements MPC | Mag. | |
|------------|----|--------------|----------|-------|-------|-----------|--------------|------|------|
| 1980 02 11 | | 14 49.90 | -12 25.4 | 2.099 | 2.428 | -1.13 | +5.0 | 4927 | 18.1 |
| 1980 02 21 | | 14 58.63 | -12 41.4 | | | | | | |
| 1980 03 02 | | 15 05.44 | -12 45.4 | 1.792 | 2.369 | -1.36 | +5.7 | | 17.7 |
| 1980 03 12 | | 15 09.94 | -12 36.7 | | | | | | |
| 1980 03 22 | | 15 11.72 | -12 14.8 | 1.519 | 2.308 | -1.66 | +6.9 | | 17.2 |
| 1980 04 01 | | 15 10.47 | -11 39.8 | | | | | | |
| 1980 04 11 | | 15 06.11 | -10 52.9 | 1.306 | 2.245 | -1.95 | +8.2 | | 16.6 |
| 1980 04 21 | | 14 58.83 | -09 56.8 | | | | | | |
| 1980 05 01 | | 14 49.40 | -08 56.8 | 1.177 | 2.181 | -2.12 | +9.1 | | 16.0 |
| 1980 05 11 | | 14 38.98 | -07 59.7 | | | | | | |
| 1980 05 21 | | 14 29.00 | -07 13.4 | 1.148 | 2.115 | -2.04 | +8.9 | | 16.2 |
| 1980 05 31 | | 14 20.86 | -06 44.5 | | | | | | |
| 1980 06 10 | | 14 15.51 | -06 36.7 | 1.205 | 2.050 | -1.80 | +7.9 | | 16.4 |
| 1980 06 20 | | 14 13.50 | -06 50.8 | | | | | | |
| 1980 06 30 | | 14 14.95 | -07 25.3 | 1.317 | 1.985 | -1.56 | +6.9 | | 16.7 |
| 1980 07 10 | | 14 19.69 | -08 17.3 | | | | | | |
| 1980 07 20 | | 14 27.49 | -09 23.6 | 1.456 | 1.922 | -1.39 | +6.2 | | 17.0 |

(2126) 1970 QZ

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Elements MPC | Mag. |
|------------|----|--------------|----------|-------|-------|--------|-------|--------------|------|
| 1980 02 11 | | 15 03.70 | -25 40.5 | 2.483 | 2.676 | 90.3 | 21.6 | 4740 | 18.2 |
| 1980 02 21 | | 15 11.05 | -26 48.2 | | | | | | |
| 1980 03 02 | | 15 16.27 | -27 50.1 | 2.217 | 2.678 | 106.9 | 20.7 | | 17.9 |
| 1980 03 12 | | 15 19.00 | -28 45.0 | | | | | | |
| 1980 03 22 | | 15 18.91 | -29 31.3 | 1.976 | 2.679 | 125.3 | 17.7 | | 17.6 |
| 1980 04 01 | | 15 15.81 | -30 06.3 | | | | | | |
| 1980 04 11 | | 15 09.77 | -30 26.9 | 1.791 | 2.677 | 145.5 | 12.2 | | 17.3 |
| 1980 04 21 | | 15 01.16 | -30 29.8 | | | | | | |
| 1980 05 01 | | 14 50.85 | -30 13.4 | 1.690 | 2.674 | 164.1 | 5.9 | | 17.0 |
| 1980 05 11 | | 14 39.99 | -29 38.5 | | | | | | |
| 1980 05 21 | | 14 29.82 | -28 49.2 | 1.695 | 2.668 | 159.8 | 7.5 | | 17.1 |
| 1980 05 31 | | 14 21.47 | -27 52.6 | | | | | | |
| 1980 06 10 | | 14 15.66 | -26 56.0 | 1.801 | 2.661 | 140.1 | 14.2 | | 17.3 |
| 1980 06 20 | | 14 12.73 | -26 05.6 | | | | | | |
| 1980 06 30 | | 14 12.71 | -25 25.7 | 1.981 | 2.651 | 120.9 | 19.2 | | 17.6 |
| 1980 07 10 | | 14 15.40 | -24 58.0 | | | | | | |
| 1980 07 20 | | 14 20.57 | -24 43.0 | 2.207 | 2.640 | 103.8 | 21.9 | | 17.9 |

(2153) Akiyama

| | | | | | Elements MPC 4779 | | | |
|------------|----|--------------|----------|-------|-------------------|--------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
| 1980 02 11 | | 15 13.57 | -17 39.8 | 3.267 | 3.416 | 90.2 | 16.8 | 18.6 |
| 1980 02 21 | | 15 18.49 | -18 00.0 | | | | | |
| 1980 03 02 | | 15 21.61 | -18 13.0 | 2.996 | 3.440 | 108.4 | 15.9 | 18.4 |
| 1980 03 12 | | 15 22.76 | -18 18.8 | | | | | |
| 1980 03 22 | | 15 21.82 | -18 16.9 | 2.755 | 3.462 | 128.3 | 13.1 | 18.2 |
| 1980 04 01 | | 15 18.80 | -18 07.5 | | | | | |
| 1980 04 11 | | 15 13.89 | -17 50.7 | 2.579 | 3.483 | 150.0 | 8.3 | 18.0 |
| 1980 04 21 | | 15 07.40 | -17 27.2 | | | | | |
| 1980 05 01 | | 14 59.92 | -16 58.8 | 2.501 | 3.503 | 172.9 | 2.0 | 17.6 |
| 1980 05 11 | | 14 52.08 | -16 27.7 | | | | | |
| 1980 05 21 | | 14 44.59 | -15 56.9 | 2.538 | 3.522 | 163.9 | 4.6 | 17.8 |
| 1980 05 31 | | 14 38.10 | -15 29.5 | | | | | |
| 1980 06 10 | | 14 33.06 | -15 08.1 | 2.684 | 3.539 | 141.9 | 10.2 | 18.1 |
| 1980 06 20 | | 14 29.78 | -14 54.4 | | | | | |
| 1980 06 30 | | 14 28.38 | -14 49.5 | 2.915 | 3.555 | 121.6 | 14.1 | 18.4 |
| 1980 07 10 | | 14 28.85 | -14 53.4 | | | | | |
| 1980 07 20 | | 14 31.10 | -15 05.6 | 3.196 | 3.569 | 103.2 | 16.1 | 18.7 |

(2179) 1965 MA

| | | | | | Elements MPC 5031 | | | |
|------------|----|--------------|----------|-------|-------------------|--------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
| 1980 03 02 | | 15 32.96 | -24 19.5 | 2.873 | 3.262 | 104.3 | 17.1 | 18.3 |
| 1980 03 12 | | 15 35.07 | -25 01.4 | | | | | |
| 1980 03 22 | | 15 34.91 | -25 37.7 | 2.617 | 3.272 | 123.3 | 14.7 | 18.0 |
| 1980 04 01 | | 15 32.40 | -26 07.2 | | | | | |
| 1980 04 11 | | 15 27.59 | -26 28.4 | 2.416 | 3.281 | 144.0 | 10.3 | 17.7 |
| 1980 04 21 | | 15 20.76 | -26 39.9 | | | | | |
| 1980 05 01 | | 15 12.45 | -26 40.8 | 2.305 | 3.288 | 164.9 | 4.6 | 17.4 |
| 1980 05 11 | | 15 03.40 | -26 31.3 | | | | | |
| 1980 05 21 | | 14 54.47 | -26 13.3 | 2.304 | 3.295 | 165.9 | 4.3 | 17.4 |
| 1980 05 31 | | 14 46.49 | -25 50.0 | | | | | |
| 1980 06 10 | | 14 40.11 | -25 25.4 | 2.413 | 3.301 | 145.5 | 10.0 | 17.7 |
| 1980 06 20 | | 14 35.76 | -25 03.0 | | | | | |
| 1980 06 30 | | 14 33.63 | -24 46.1 | 2.610 | 3.305 | 125.4 | 14.5 | 18.0 |
| 1980 07 10 | | 14 33.71 | -24 36.3 | | | | | |
| 1980 07 20 | | 14 35.93 | -24 34.5 | 2.864 | 3.309 | 107.1 | 17.1 | 18.3 |
| 1980 07 30 | | 14 40.10 | -24 40.7 | | | | | |
| 1980 08 09 | | 14 46.01 | -24 54.3 | 3.143 | 3.311 | 90.5 | 17.8 | 18.5 |

(2156) A917 SH

| | | | | | Elements MPC 4825 | | | |
|------------|----|--------------|----------|-------|-------------------|--------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
| 1980 03 02 | | 15 41.61 | -21 52.7 | 2.265 | 2.668 | 103.0 | 21.2 | 18.4 |
| 1980 03 12 | | 15 45.82 | -22 28.2 | | | | | |
| 1980 03 22 | | 15 47.44 | -22 57.4 | 1.995 | 2.653 | 121.3 | 18.7 | 18.0 |
| 1980 04 01 | | 15 46.18 | -23 19.5 | | | | | |
| 1980 04 11 | | 15 41.93 | -23 33.1 | 1.771 | 2.635 | 142.1 | 13.5 | 17.7 |
| 1980 04 21 | | 15 34.76 | -23 36.8 | | | | | |
| 1980 05 01 | | 15 25.21 | -23 29.1 | 1.628 | 2.614 | 164.8 | 5.8 | 17.3 |
| 1980 05 11 | | 15 14.18 | -23 10.2 | | | | | |
| 1980 05 21 | | 15 02.86 | -22 42.2 | 1.589 | 2.589 | 168.7 | 4.4 | 17.1 |
| 1980 05 31 | | 14 52.55 | -22 09.6 | | | | | |
| 1980 06 10 | | 14 44.27 | -21 37.8 | 1.657 | 2.562 | 146.0 | 12.8 | 17.4 |
| 1980 06 20 | | 14 38.70 | -21 11.9 | | | | | |
| 1980 06 30 | | 14 36.12 | -20 55.6 | 1.807 | 2.532 | 125.1 | 19.2 | 17.7 |
| 1980 07 10 | | 14 36.51 | -20 50.3 | | | | | |
| 1980 07 20 | | 14 39.70 | -20 56.6 | 2.006 | 2.499 | 106.9 | 22.9 | 18.0 |
| 1980 07 30 | | 14 45.43 | -21 13.4 | | | | | |
| 1980 08 09 | | 14 53.41 | -21 39.1 | 2.225 | 2.463 | 91.2 | 24.3 | 18.3 |

| (2162) 1966 BE | | | | Elements MPC 4827 | | | | |
|----------------|----|--------------|----------|-------------------|-------|--------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
| 1980 03 02 | | 15 45.40 | -16 05.3 | 2.063 | 2.487 | 103.4 | 22.8 | 18.1 |
| 1980 03 12 | | 15 50.60 | -16 07.0 | | | | | |
| 1980 03 22 | | 15 53.13 | -15 59.4 | 1.825 | 2.495 | 121.5 | 19.9 | 17.7 |
| 1980 04 01 | | 15 52.74 | -15 42.9 | | | | | |
| 1980 04 11 | | 15 49.34 | -15 18.1 | 1.632 | 2.500 | 142.1 | 14.3 | 17.4 |
| 1980 04 21 | | 15 43.04 | -14 46.1 | | | | | |
| 1980 05 01 | | 15 34.39 | -14 09.2 | 1.517 | 2.503 | 164.8 | 6.0 | 17.0 |
| 1980 05 11 | | 15 24.30 | -13 30.7 | | | | | |
| 1980 05 21 | | 15 13.91 | -12 54.8 | 1.504 | 2.504 | 168.8 | 4.5 | 16.9 |
| 1980 05 31 | | 15 04.46 | -12 26.2 | | | | | |
| 1980 06 10 | | 14 56.90 | -12 08.4 | 1.594 | 2.503 | 146.2 | 13.0 | 17.3 |
| 1980 06 20 | | 14 51.87 | -12 03.6 | | | | | |
| 1980 06 30 | | 14 49.65 | -12 12.4 | 1.766 | 2.499 | 125.6 | 19.3 | 17.7 |
| 1980 07 10 | | 14 50.20 | -12 33.7 | | | | | |
| 1980 07 20 | | 14 53.38 | -13 05.9 | 1.987 | 2.493 | 107.8 | 22.8 | 18.0 |
| 1980 07 30 | | 14 58.92 | -13 47.0 | | | | | |
| 1980 08 09 | | 15 06.55 | -14 34.8 | 2.230 | 2.485 | 92.2 | 24.1 | 18.3 |

| (2109) 1950 TH2 | | | | Elements MPC 4607 | | | | |
|-----------------|----|--------------|----------|-------------------|-------|--------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
| 1980 03 02 | | 15 51.69 | -12 10.8 | 2.680 | 3.054 | 102.6 | 18.5 | 17.9 |
| 1980 03 12 | | 15 55.94 | -11 48.7 | | | | | |
| 1980 03 22 | | 15 58.10 | -11 17.8 | 2.376 | 3.012 | 120.9 | 16.5 | 17.6 |
| 1980 04 01 | | 15 57.98 | -10 38.7 | | | | | |
| 1980 04 11 | | 15 55.50 | -09 52.9 | 2.121 | 2.967 | 140.8 | 12.3 | 17.2 |
| 1980 04 21 | | 15 50.70 | -09 02.4 | | | | | |
| 1980 05 01 | | 15 43.92 | -08 10.3 | 1.949 | 2.920 | 161.1 | 6.4 | 16.8 |
| 1980 05 11 | | 15 35.72 | -07 20.5 | | | | | |
| 1980 05 21 | | 15 26.88 | -06 37.5 | 1.881 | 2.872 | 165.4 | 5.1 | 16.6 |
| 1980 05 31 | | 15 18.33 | -06 05.4 | | | | | |
| 1980 06 10 | | 15 10.91 | -05 47.1 | 1.920 | 2.821 | 146.3 | 11.5 | 16.8 |
| 1980 06 20 | | 15 05.29 | -05 43.9 | | | | | |
| 1980 06 30 | | 15 01.90 | -05 55.8 | 2.046 | 2.769 | 126.1 | 17.3 | 17.1 |
| 1980 07 10 | | 15 00.91 | -06 21.4 | | | | | |
| 1980 07 20 | | 15 02.33 | -06 58.9 | 2.225 | 2.715 | 107.9 | 20.9 | 17.3 |
| 1980 07 30 | | 15 06.06 | -07 45.9 | | | | | |
| 1980 08 09 | | 15 11.91 | -08 40.3 | 2.428 | 2.661 | 91.8 | 22.4 | 17.5 |

| 1977 TD1 | | | | Elements MPC 4501 | | | | |
|------------|----|--------------|----------|-------------------|-------|-----------|------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | Mag. | |
| 1980 03 02 | | 16 15.55 | -16 52.4 | 2.801 | 3.069 | -0.73 | -0.2 | 18.6 |
| 1980 03 12 | | 16 20.77 | -16 26.8 | | | | | |
| 1980 03 22 | | 16 23.92 | -15 52.5 | 2.520 | 3.066 | -0.82 | -0.2 | 18.3 |
| 1980 04 01 | | 16 24.81 | -15 09.8 | | | | | |
| 1980 04 11 | | 16 23.35 | -14 19.4 | 2.278 | 3.060 | -0.92 | -0.1 | 18.0 |
| 1980 04 21 | | 16 19.56 | -13 22.6 | | | | | |
| 1980 05 01 | | 16 13.67 | -12 21.6 | 2.108 | 3.052 | -1.00 | +0.1 | 17.7 |
| 1980 05 11 | | 16 06.16 | -11 19.4 | | | | | |
| 1980 05 21 | | 15 57.72 | -10 19.8 | 2.040 | 3.042 | -1.03 | +0.3 | 17.4 |
| 1980 05 31 | | 15 49.19 | -09 26.9 | | | | | |
| 1980 06 10 | | 15 41.38 | -08 44.4 | 2.085 | 3.031 | -0.99 | +0.3 | 17.7 |
| 1980 06 20 | | 15 34.99 | -08 14.6 | | | | | |
| 1980 06 30 | | 15 30.52 | -07 58.5 | 2.227 | 3.017 | -0.90 | +0.3 | 18.0 |
| 1980 07 10 | | 15 28.20 | -07 55.8 | | | | | |
| 1980 07 20 | | 15 28.10 | -08 05.2 | 2.437 | 3.001 | -0.80 | +0.2 | 18.2 |
| 1980 07 30 | | 15 30.16 | -08 24.8 | | | | | |
| 1980 08 09 | | 15 34.22 | -08 52.5 | 2.683 | 2.984 | -0.72 | +0.1 | 18.5 |

| 1971 SL2 | | Elements MPC 4829 | | | | | | | |
|------------|----|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1980 03 02 | | 16 11.59 | -17 16.7 | 2.104 | 2.432 | 97.0 | 23.9 | 18.9 | |
| 1980 03 12 | | 16 19.57 | -17 26.8 | | | | | | |
| 1980 03 22 | | 16 25.24 | -17 29.9 | 1.835 | 2.414 | 113.6 | 22.2 | 18.5 | |
| 1980 04 01 | | 16 28.23 | -17 26.4 | | | | | | |
| 1980 04 11 | | 16 28.23 | -17 17.0 | 1.599 | 2.394 | 132.6 | 18.0 | 18.1 | |
| 1980 04 21 | | 16 25.03 | -17 02.3 | | | | | | |
| 1980 05 01 | | 16 18.73 | -16 43.1 | 1.423 | 2.371 | 154.2 | 10.6 | 17.7 | |
| 1980 05 11 | | 16 09.79 | -16 20.8 | | | | | | |
| 1980 05 21 | | 15 59.13 | -15 57.5 | 1.336 | 2.346 | 175.3 | 2.0 | 17.1 | |
| 1980 05 31 | | 15 48.06 | -15 36.6 | | | | | | |
| 1980 06 10 | | 15 37.94 | -15 21.5 | 1.352 | 2.320 | 156.7 | 10.0 | 17.5 | |
| 1980 06 20 | | 15 29.93 | -15 15.7 | | | | | | |
| 1980 06 30 | | 15 24.81 | -15 21.1 | 1.459 | 2.291 | 134.7 | 18.4 | 17.8 | |
| 1980 07 10 | | 15 22.86 | -15 38.3 | | | | | | |
| 1980 07 20 | | 15 24.11 | -16 06.6 | 1.626 | 2.261 | 115.8 | 23.9 | 18.2 | |
| 1980 07 30 | | 15 28.38 | -16 44.4 | | | | | | |
| 1980 08 09 | | 15 35.35 | -17 29.3 | 1.825 | 2.230 | 99.6 | 26.6 | 18.5 | |

| (2137) 1936 QZ | | Elements MPC 4774 | | | | | | | |
|----------------|----|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1980 03 02 | | 16 19.26 | -34 04.9 | 3.119 | 3.309 | 92.3 | 17.4 | 18.0 | |
| 1980 03 12 | | 16 24.97 | -34 52.7 | | | | | | |
| 1980 03 22 | | 16 28.55 | -35 37.1 | 2.852 | 3.320 | 109.5 | 16.4 | 17.8 | |
| 1980 04 01 | | 16 29.78 | -36 17.0 | | | | | | |
| 1980 04 11 | | 16 28.52 | -36 50.8 | 2.618 | 3.331 | 128.0 | 13.7 | 17.5 | |
| 1980 04 21 | | 16 24.72 | -37 15.9 | | | | | | |
| 1980 05 01 | | 16 18.62 | -37 29.7 | 2.448 | 3.340 | 147.3 | 9.4 | 17.3 | |
| 1980 05 11 | | 16 10.70 | -37 29.5 | | | | | | |
| 1980 05 21 | | 16 01.69 | -37 14.1 | 2.370 | 3.349 | 162.7 | 5.2 | 17.0 | |
| 1980 05 31 | | 15 52.52 | -36 43.9 | | | | | | |
| 1980 06 10 | | 15 44.10 | -36 01.8 | 2.400 | 3.358 | 157.0 | 6.8 | 17.2 | |
| 1980 06 20 | | 15 37.22 | -35 11.9 | | | | | | |
| 1980 06 30 | | 15 32.40 | -34 19.3 | 2.533 | 3.366 | 138.9 | 11.4 | 17.4 | |
| 1980 07 10 | | 15 29.89 | -33 28.5 | | | | | | |
| 1980 07 20 | | 15 29.75 | -32 42.7 | 2.745 | 3.373 | 120.3 | 15.1 | 17.7 | |
| 1980 07 30 | | 15 31.87 | -32 03.9 | | | | | | |
| 1980 08 09 | | 15 36.06 | -31 33.0 | 3.007 | 3.380 | 102.8 | 17.0 | 17.9 | |

| 1971 UQ1 | | Elements MPC 4578 | | | | | | | |
|------------|----|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1980 03 02 | | 16 02.39 | -20 23.3 | 1.812 | 2.191 | 98.6 | 26.6 | 18.3 | |
| 1980 03 12 | | 16 13.04 | -20 44.4 | | | | | | |
| 1980 03 22 | | 16 21.47 | -20 56.7 | 1.550 | 2.157 | 114.0 | 25.0 | 17.9 | |
| 1980 04 01 | | 16 27.24 | -21 00.3 | | | | | | |
| 1980 04 11 | | 16 29.92 | -20 55.4 | 1.319 | 2.123 | 131.8 | 20.6 | 17.4 | |
| 1980 04 21 | | 16 29.14 | -20 41.9 | | | | | | |
| 1980 05 01 | | 16 24.83 | -20 19.8 | 1.143 | 2.089 | 152.6 | 12.8 | 16.9 | |
| 1980 05 11 | | 16 17.33 | -19 49.6 | | | | | | |
| 1980 05 21 | | 16 07.55 | -19 13.1 | 1.045 | 2.056 | 175.8 | 2.1 | 16.2 | |
| 1980 05 31 | | 15 56.95 | -18 33.9 | | | | | | |
| 1980 06 10 | | 15 47.16 | -17 57.6 | 1.041 | 2.024 | 159.6 | 10.0 | 16.6 | |
| 1980 06 20 | | 15 39.65 | -17 29.7 | | | | | | |
| 1980 06 30 | | 15 35.40 | -17 14.5 | 1.121 | 1.994 | 137.7 | 20.1 | 16.9 | |
| 1980 07 10 | | 15 34.80 | -17 13.7 | | | | | | |
| 1980 07 20 | | 15 37.85 | -17 26.8 | 1.258 | 1.966 | 119.3 | 26.8 | 17.3 | |
| 1980 07 30 | | 15 44.30 | -17 51.8 | | | | | | |
| 1980 08 09 | | 15 53.78 | -18 25.5 | 1.427 | 1.941 | 104.1 | 30.4 | 17.6 | |

| (2097) 1953 PV | | | | | Elements MPC 4537 | | | |
|----------------|----|--------------|----------|-------|-------------------|--------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
| 1980 03 02 | | 16 22.31 | -26 16.8 | 3.124 | 3.326 | 93.0 | 17.3 | 18.3 |
| 1980 03 12 | | 16 28.14 | -26 43.2 | | | | | |
| 1980 03 22 | | 16 32.11 | -27 05.9 | 2.794 | 3.279 | 110.6 | 16.5 | 18.0 |
| 1980 04 01 | | 16 33.98 | -27 24.7 | | | | | |
| 1980 04 11 | | 16 33.57 | -27 38.7 | 2.497 | 3.231 | 129.7 | 13.8 | 17.7 |
| 1980 04 21 | | 16 30.76 | -27 47.0 | | | | | |
| 1980 05 01 | | 16 25.67 | -27 48.2 | 2.265 | 3.181 | 150.6 | 8.9 | 17.3 |
| 1980 05 11 | | 16 18.60 | -27 41.0 | | | | | |
| 1980 05 21 | | 16 10.14 | -27 24.7 | 2.127 | 3.131 | 171.3 | 2.8 | 16.9 |
| 1980 05 31 | | 16 01.13 | -26 59.9 | | | | | |
| 1980 06 10 | | 15 52.46 | -26 28.8 | 2.099 | 3.080 | 161.7 | 5.9 | 17.0 |
| 1980 06 20 | | 15 45.01 | -25 54.7 | | | | | |
| 1980 06 30 | | 15 39.47 | -25 21.6 | 2.176 | 3.028 | 140.2 | 12.4 | 17.2 |
| 1980 07 10 | | 15 36.21 | -24 52.7 | | | | | |
| 1980 07 20 | | 15 35.45 | -24 30.4 | 2.331 | 2.975 | 120.3 | 17.2 | 17.4 |
| 1980 07 30 | | 15 37.16 | -24 16.1 | | | | | |
| 1980 08 09 | | 15 41.22 | -24 09.6 | 2.531 | 2.922 | 102.4 | 19.8 | 17.6 |

| (2099) Opik | | | | | Elements MPC 4541 | | | |
|-------------|----|--------------|----------|-------|-------------------|--------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
| 1980 03 02 | | 16 46.17 | -15 21.9 | 2.671 | 2.834 | 89.1 | 20.5 | 21.4 |
| 1980 03 12 | | 16 53.74 | -14 18.8 | | | | | |
| 1980 03 22 | | 16 59.46 | -13 01.8 | 2.337 | 2.780 | 105.8 | 20.2 | 21.0 |
| 1980 04 01 | | 17 03.03 | -11 30.6 | | | | | |
| 1980 04 11 | | 17 04.17 | -09 45.2 | 2.032 | 2.721 | 123.9 | 17.8 | 20.6 |
| 1980 04 21 | | 17 02.64 | -07 46.7 | | | | | |
| 1980 05 01 | | 16 58.35 | -05 37.6 | 1.785 | 2.659 | 142.8 | 13.2 | 20.2 |
| 1980 05 11 | | 16 51.44 | -03 22.7 | | | | | |
| 1980 05 21 | | 16 42.32 | -01 09.3 | 1.630 | 2.592 | 157.1 | 8.7 | 19.8 |
| 1980 05 31 | | 16 31.82 | +00 53.7 | | | | | |
| 1980 06 10 | | 16 20.96 | +02 37.8 | 1.582 | 2.522 | 151.6 | 11.0 | 19.8 |
| 1980 06 20 | | 16 10.87 | +03 56.3 | | | | | |
| 1980 06 30 | | 16 02.58 | +04 46.6 | 1.633 | 2.447 | 133.6 | 17.5 | 19.9 |
| 1980 07 10 | | 15 56.75 | +05 09.5 | | | | | |
| 1980 07 20 | | 15 53.76 | +05 08.3 | 1.751 | 2.369 | 115.2 | 22.8 | 20.1 |
| 1980 07 30 | | 15 53.72 | +04 47.6 | | | | | |
| 1980 08 09 | | 15 56.50 | +04 12.2 | 1.900 | 2.288 | 98.9 | 26.0 | 20.3 |

| (2161) 1963 UD | | | | | Elements MPC 4827 | | | |
|----------------|----|--------------|----------|-------|-------------------|--------|-------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. |
| 1980 03 02 | | 16 44.17 | -14 50.0 | 2.910 | 3.068 | 89.6 | 18.8 | 18.6 |
| 1980 03 12 | | 16 51.07 | -14 43.7 | | | | | |
| 1980 03 22 | | 16 56.17 | -14 32.3 | 2.609 | 3.047 | 106.5 | 18.3 | 18.3 |
| 1980 04 01 | | 16 59.24 | -14 16.6 | | | | | |
| 1980 04 11 | | 17 00.06 | -13 57.7 | 2.334 | 3.023 | 125.1 | 15.7 | 18.0 |
| 1980 04 21 | | 16 58.50 | -13 36.7 | | | | | |
| 1980 05 01 | | 16 54.58 | -13 15.1 | 2.114 | 2.999 | 145.4 | 11.0 | 17.7 |
| 1980 05 11 | | 16 48.50 | -12 54.5 | | | | | |
| 1980 05 21 | | 16 40.71 | -12 36.8 | 1.981 | 2.972 | 165.7 | 4.8 | 17.3 |
| 1980 05 31 | | 16 31.93 | -12 24.0 | | | | | |
| 1980 06 10 | | 16 23.03 | -12 17.9 | 1.955 | 2.945 | 164.3 | 5.4 | 17.2 |
| 1980 06 20 | | 16 14.87 | -12 19.9 | | | | | |
| 1980 06 30 | | 16 08.25 | -12 30.9 | 2.034 | 2.916 | 143.7 | 11.9 | 17.5 |
| 1980 07 10 | | 16 03.66 | -12 50.8 | | | | | |
| 1980 07 20 | | 16 01.42 | -13 19.0 | 2.196 | 2.886 | 123.7 | 17.0 | 17.8 |
| 1980 07 30 | | 16 01.61 | -13 54.3 | | | | | |
| 1980 08 09 | | 16 04.14 | -14 35.3 | 2.409 | 2.855 | 105.7 | 20.0 | 18.0 |

| 1977 TZ | | Elements MPC 5036 | | | | | | | |
|------------|----|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1980 03 22 | | 17 01.67 | -34 09.8 | 2.431 | 2.829 | 103.1 | 20.1 | 18.6 | |
| 1980 04 01 | | 17 05.99 | -35 22.7 | | | | | | |
| 1980 04 11 | | 17 07.58 | -36 36.3 | 2.178 | 2.824 | 120.6 | 17.8 | 18.4 | |
| 1980 04 21 | | 17 06.11 | -37 48.6 | | | | | | |
| 1980 05 01 | | 17 01.41 | -38 56.2 | 1.975 | 2.817 | 139.4 | 13.5 | 18.0 | |
| 1980 05 11 | | 16 53.59 | -39 54.3 | | | | | | |
| 1980 05 21 | | 16 43.16 | -40 37.2 | 1.852 | 2.809 | 156.5 | 8.2 | 17.8 | |
| 1980 05 31 | | 16 31.15 | -41 00.4 | | | | | | |
| 1980 06 10 | | 16 18.89 | -41 02.2 | 1.829 | 2.800 | 158.8 | 7.5 | 17.7 | |
| 1980 06 20 | | 16 07.79 | -40 44.7 | | | | | | |
| 1980 06 30 | | 15 59.04 | -40 13.3 | 1.908 | 2.789 | 143.2 | 12.6 | 17.9 | |
| 1980 07 10 | | 15 53.32 | -39 34.5 | | | | | | |
| 1980 07 20 | | 15 50.91 | -38 54.4 | 2.068 | 2.777 | 124.9 | 17.5 | 18.2 | |
| 1980 07 30 | | 15 51.76 | -38 17.5 | | | | | | |
| 1980 08 09 | | 15 55.60 | -37 46.3 | 2.280 | 2.764 | 107.7 | 20.4 | 18.5 | |
| 1980 08 19 | | 16 02.16 | -37 21.5 | | | | | | |
| 1980 08 29 | | 16 11.08 | -37 02.9 | 2.517 | 2.749 | 92.2 | 21.5 | 18.7 | |

| 1972 FA | | Elements MPC 4661 | | | | | | | |
|------------|----|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1980 03 22 | | 16 53.38 | +03 06.4 | 1.422 | 1.968 | 107.6 | 28.9 | 18.9 | |
| 1980 04 01 | | 17 00.57 | +06 08.3 | | | | | | |
| 1980 04 11 | | 17 04.47 | +09 22.6 | 1.276 | 1.984 | 120.7 | 25.7 | 18.6 | |
| 1980 04 21 | | 17 04.74 | +12 40.0 | | | | | | |
| 1980 05 01 | | 17 01.33 | +15 48.0 | 1.179 | 1.999 | 132.0 | 22.0 | 18.4 | |
| 1980 05 11 | | 16 54.51 | +18 31.8 | | | | | | |
| 1980 05 21 | | 16 45.02 | +20 36.3 | 1.147 | 2.011 | 137.1 | 20.0 | 18.3 | |
| 1980 05 31 | | 16 34.18 | +21 50.2 | | | | | | |
| 1980 06 10 | | 16 23.47 | +22 09.1 | 1.184 | 2.021 | 133.4 | 21.4 | 18.4 | |
| 1980 06 20 | | 16 14.32 | +21 35.5 | | | | | | |
| 1980 06 30 | | 16 07.81 | +20 17.6 | 1.279 | 2.028 | 123.7 | 24.7 | 18.6 | |
| 1980 07 10 | | 16 04.44 | +18 26.4 | | | | | | |
| 1980 07 20 | | 16 04.36 | +16 12.1 | 1.418 | 2.033 | 112.2 | 27.6 | 18.9 | |
| 1980 07 30 | | 16 07.41 | +13 44.2 | | | | | | |
| 1980 08 09 | | 16 13.30 | +11 09.9 | 1.586 | 2.035 | 100.7 | 29.3 | 19.2 | |
| 1980 08 19 | | 16 21.72 | +08 34.8 | | | | | | |
| 1980 08 29 | | 16 32.36 | +06 03.2 | 1.769 | 2.035 | 89.9 | 29.8 | 19.5 | |

| 1977 QJ3 | | Elements MPC 4927 | | | | | | | |
|------------|----|-------------------|----------|-------|-------|-----------|------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | | Mag. | |
| 1980 03 22 | | 16 53.63 | -18 55.2 | 1.955 | 2.437 | -1.26 | +3.7 | 18.9 | |
| 1980 04 01 | | 16 59.46 | -19 00.3 | | | | | | |
| 1980 04 11 | | 17 02.69 | -19 02.0 | 1.679 | 2.392 | -1.52 | +4.1 | 18.5 | |
| 1980 04 21 | | 17 02.94 | -19 01.1 | | | | | | |
| 1980 05 01 | | 17 00.00 | -18 58.4 | 1.451 | 2.345 | -1.80 | +4.9 | 18.0 | |
| 1980 05 11 | | 16 53.88 | -18 54.4 | | | | | | |
| 1980 05 21 | | 16 44.97 | -18 49.3 | 1.299 | 2.296 | -2.01 | +6.0 | 17.5 | |
| 1980 05 31 | | 16 34.20 | -18 44.1 | | | | | | |
| 1980 06 10 | | 16 22.88 | -18 40.1 | 1.244 | 2.246 | -2.01 | +7.0 | 17.3 | |
| 1980 06 20 | | 16 12.48 | -18 39.5 | | | | | | |
| 1980 06 30 | | 16 04.33 | -18 45.0 | 1.285 | 2.195 | -1.82 | +7.2 | 17.6 | |
| 1980 07 10 | | 15 59.26 | -18 58.4 | | | | | | |
| 1980 07 20 | | 15 57.71 | -19 20.6 | 1.400 | 2.144 | -1.57 | +6.7 | 17.9 | |
| 1980 07 30 | | 15 59.71 | -19 51.3 | | | | | | |
| 1980 08 09 | | 16 05.05 | -20 28.9 | 1.557 | 2.093 | -1.39 | +5.9 | 18.2 | |
| 1980 08 19 | | 16 13.47 | -21 11.5 | | | | | | |
| 1980 08 29 | | 16 24.65 | -21 56.7 | 1.731 | 2.043 | -1.27 | +4.9 | 18.4 | |

| (2154) 2015 P-L | | Elements MPC 4779 | | | | | | | |
|-----------------|----|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1980 03 22 | | 17 03.83 | -30 26.3 | 2.353 | 2.756 | 103.2 | 20.6 | 18.3 | |
| 1980 04 01 | | 17 08.23 | -31 09.2 | | | | | | |
| 1980 04 11 | | 17 09.90 | -31 50.2 | 2.125 | 2.780 | 121.2 | 18.0 | 18.1 | |
| 1980 04 21 | | 17 08.59 | -32 27.9 | | | | | | |
| 1980 05 01 | | 17 04.28 | -33 00.1 | 1.946 | 2.802 | 141.1 | 13.1 | 17.8 | |
| 1980 05 11 | | 16 57.18 | -33 23.8 | | | | | | |
| 1980 05 21 | | 16 47.87 | -33 35.5 | 1.846 | 2.824 | 161.3 | 6.6 | 17.5 | |
| 1980 05 31 | | 16 37.33 | -33 33.5 | | | | | | |
| 1980 06 10 | | 16 26.72 | -33 17.7 | 1.849 | 2.844 | 165.7 | 5.0 | 17.4 | |
| 1980 06 20 | | 16 17.21 | -32 50.9 | | | | | | |
| 1980 06 30 | | 16 09.75 | -32 17.8 | 1.957 | 2.863 | 146.9 | 11.2 | 17.8 | |
| 1980 07 10 | | 16 04.88 | -31 43.1 | | | | | | |
| 1980 07 20 | | 16 02.83 | -31 11.0 | 2.151 | 2.880 | 127.1 | 16.3 | 18.1 | |
| 1980 07 30 | | 16 03.57 | -30 44.1 | | | | | | |
| 1980 08 09 | | 16 06.87 | -30 23.4 | 2.401 | 2.896 | 109.1 | 19.3 | 18.5 | |
| 1980 08 19 | | 16 12.51 | -30 09.1 | | | | | | |
| 1980 08 29 | | 16 20.19 | -30 00.4 | 2.679 | 2.911 | 92.9 | 20.3 | 18.7 | |

| 1939 BF | | Elements MPC 4828 | | | | | | | |
|------------|----|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1980 03 22 | | 17 05.10 | -23 37.5 | 3.386 | 3.749 | 103.7 | 15.0 | 17.9 | |
| 1980 04 01 | | 17 06.79 | -23 42.5 | | | | | | |
| 1980 04 11 | | 17 06.50 | -23 45.0 | 3.125 | 3.767 | 123.1 | 12.9 | 17.7 | |
| 1980 04 21 | | 17 04.19 | -23 44.8 | | | | | | |
| 1980 05 01 | | 16 59.94 | -23 41.6 | 2.921 | 3.783 | 144.1 | 9.0 | 17.4 | |
| 1980 05 11 | | 16 54.00 | -23 35.0 | | | | | | |
| 1980 05 21 | | 16 46.78 | -23 24.8 | 2.807 | 3.798 | 166.4 | 3.6 | 17.1 | |
| 1980 05 31 | | 16 38.84 | -23 11.5 | | | | | | |
| 1980 06 10 | | 16 30.85 | -22 55.8 | 2.805 | 3.811 | 170.6 | 2.5 | 17.1 | |
| 1980 06 20 | | 16 23.43 | -22 39.3 | | | | | | |
| 1980 06 30 | | 16 17.18 | -22 23.6 | 2.919 | 3.822 | 148.4 | 8.0 | 17.4 | |
| 1980 07 10 | | 16 12.47 | -22 10.6 | | | | | | |
| 1980 07 20 | | 16 09.56 | -22 01.4 | 3.127 | 3.831 | 127.5 | 12.1 | 17.7 | |
| 1980 07 30 | | 16 08.54 | -21 56.8 | | | | | | |
| 1980 08 09 | | 16 09.37 | -21 57.1 | 3.397 | 3.839 | 108.4 | 14.5 | 17.9 | |
| 1980 08 19 | | 16 11.98 | -22 01.8 | | | | | | |
| 1980 08 29 | | 16 16.22 | -22 10.6 | 3.697 | 3.845 | 90.7 | 15.2 | 18.1 | |

| 1976 UB | | Elements MPC 4539 | | | | | | | |
|------------|----|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1980 03 22 | | 17 04.60 | -22 47.2 | 3.348 | 3.715 | 103.9 | 15.1 | 19.8 | |
| 1980 04 01 | | 17 06.74 | -22 49.8 | | | | | | |
| 1980 04 11 | | 17 06.92 | -22 49.8 | 3.058 | 3.701 | 123.1 | 13.1 | 19.6 | |
| 1980 04 21 | | 17 05.08 | -22 47.3 | | | | | | |
| 1980 05 01 | | 17 01.26 | -22 41.9 | 2.824 | 3.686 | 143.9 | 9.3 | 19.3 | |
| 1980 05 11 | | 16 55.67 | -22 33.5 | | | | | | |
| 1980 05 21 | | 16 48.67 | -22 22.1 | 2.679 | 3.669 | 166.1 | 3.8 | 19.0 | |
| 1980 05 31 | | 16 40.83 | -22 07.9 | | | | | | |
| 1980 06 10 | | 16 32.81 | -21 51.9 | 2.645 | 3.651 | 171.0 | 2.5 | 19.0 | |
| 1980 06 20 | | 16 25.28 | -21 35.6 | | | | | | |
| 1980 06 30 | | 16 18.88 | -21 20.7 | 2.725 | 3.632 | 148.6 | 8.4 | 19.2 | |
| 1980 07 10 | | 16 14.04 | -21 08.8 | | | | | | |
| 1980 07 20 | | 16 11.07 | -21 01.3 | 2.899 | 3.611 | 127.7 | 12.9 | 19.4 | |
| 1980 07 30 | | 16 10.08 | -20 58.8 | | | | | | |
| 1980 08 09 | | 16 11.06 | -21 01.5 | 3.135 | 3.589 | 108.6 | 15.5 | 19.6 | |
| 1980 08 19 | | 16 13.94 | -21 09.0 | | | | | | |
| 1980 08 29 | | 16 18.58 | -21 20.6 | 3.400 | 3.565 | 91.1 | 16.5 | 19.8 | |

| 1977 TQ3 | | | | Elements MPC | | | | 5007 |
|------------|----|--------------|----------|--------------|-------|------------|------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | Mag. | |
| 1980 03 22 | | 17 06.23 | -23 44.1 | 2.031 | 2.461 | -1.26 +3.7 | 19.3 | |
| 1980 04 01 | | 17 13.21 | -24 17.4 | | | | | |
| 1980 04 11 | | 17 17.75 | -24 50.8 | 1.739 | 2.406 | -1.53 +4.0 | 18.9 | |
| 1980 04 21 | | 17 19.40 | -25 25.0 | | | | | |
| 1980 05 01 | | 17 17.81 | -25 59.9 | 1.489 | 2.350 | -1.85 +4.8 | 18.4 | |
| 1980 05 11 | | 17 12.80 | -26 34.4 | | | | | |
| 1980 05 21 | | 17 04.48 | -27 05.6 | 1.308 | 2.291 | -2.13 +6.4 | 17.9 | |
| 1980 05 31 | | 16 53.57 | -27 30.5 | | | | | |
| 1980 06 10 | | 16 41.29 | -27 46.4 | 1.222 | 2.231 | -2.20 +8.3 | 17.5 | |
| 1980 06 20 | | 16 29.25 | -27 52.7 | | | | | |
| 1980 06 30 | | 16 19.12 | -27 52.2 | 1.234 | 2.170 | -2.01 +9.4 | 17.8 | |
| 1980 07 10 | | 16 12.09 | -27 49.1 | | | | | |
| 1980 07 20 | | 16 08.87 | -27 47.8 | 1.325 | 2.109 | -1.74 +9.0 | 18.0 | |
| 1980 07 30 | | 16 09.64 | -27 51.2 | | | | | |
| 1980 08 09 | | 16 14.22 | -28 00.2 | 1.462 | 2.049 | -1.52 +7.8 | 18.3 | |
| 1980 08 19 | | 16 22.35 | -28 14.4 | | | | | |
| 1980 08 29 | | 16 33.65 | -28 32.0 | 1.619 | 1.990 | -1.40 +6.3 | 18.5 | |

| 1977 QK3 | | | | Elements MPC | | | | 4931 |
|------------|----|--------------|----------|--------------|-------|--------------|------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. Phase | Mag. | |
| 1980 03 22 | | 16 59.14 | -17 48.4 | 1.608 | 2.107 | 105.6 27.1 | 16.3 | |
| 1980 04 01 | | 17 08.74 | -17 58.5 | | | | | |
| 1980 04 11 | | 17 15.81 | -18 05.8 | 1.363 | 2.068 | 121.2 24.5 | 15.8 | |
| 1980 04 21 | | 17 19.88 | -18 12.2 | | | | | |
| 1980 05 01 | | 17 20.57 | -18 19.6 | 1.157 | 2.032 | 139.5 18.8 | 15.3 | |
| 1980 05 11 | | 17 17.66 | -18 29.9 | | | | | |
| 1980 05 21 | | 17 11.27 | -18 43.8 | 1.013 | 1.997 | 160.8 9.6 | 14.8 | |
| 1980 05 31 | | 17 02.15 | -19 01.7 | | | | | |
| 1980 06 10 | | 16 51.58 | -19 23.4 | 0.952 | 1.965 | 174.1 3.0 | 14.3 | |
| 1980 06 20 | | 16 41.27 | -19 48.8 | | | | | |
| 1980 06 30 | | 16 32.94 | -20 18.5 | 0.980 | 1.936 | 151.7 14.4 | 14.7 | |
| 1980 07 10 | | 16 27.82 | -20 53.0 | | | | | |
| 1980 07 20 | | 16 26.57 | -21 32.4 | 1.080 | 1.911 | 131.4 23.5 | 15.1 | |
| 1980 07 30 | | 16 29.34 | -22 16.2 | | | | | |
| 1980 08 09 | | 16 35.88 | -23 02.5 | 1.228 | 1.890 | 114.6 29.2 | 15.5 | |
| 1980 08 19 | | 16 45.87 | -23 49.3 | | | | | |
| 1980 08 29 | | 16 58.88 | -24 34.0 | 1.403 | 1.875 | 100.7 32.0 | 15.8 | |

| 1968 DL | | | | Elements MPC | | | | 4742 |
|------------|----|--------------|----------|--------------|-------|--------------|------|------|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. Phase | Mag. | |
| 1980 03 22 | | 17 05.93 | -18 59.7 | 1.622 | 2.097 | 103.9 27.5 | 17.3 | |
| 1980 04 01 | | 17 15.13 | -18 55.2 | | | | | |
| 1980 04 11 | | 17 21.41 | -18 45.8 | 1.429 | 2.115 | 119.9 24.3 | 17.0 | |
| 1980 04 21 | | 17 24.40 | -18 33.2 | | | | | |
| 1980 05 01 | | 17 23.90 | -18 19.3 | 1.274 | 2.137 | 138.7 18.1 | 16.6 | |
| 1980 05 11 | | 17 19.96 | -18 05.4 | | | | | |
| 1980 05 21 | | 17 13.01 | -17 52.8 | 1.182 | 2.162 | 160.2 9.1 | 16.2 | |
| 1980 05 31 | | 17 04.01 | -17 42.7 | | | | | |
| 1980 06 10 | | 16 54.28 | -17 36.6 | 1.178 | 2.189 | 173.3 3.1 | 16.0 | |
| 1980 06 20 | | 16 45.24 | -17 36.0 | | | | | |
| 1980 06 30 | | 16 38.17 | -17 42.2 | 1.268 | 2.219 | 152.2 12.3 | 16.5 | |
| 1980 07 10 | | 16 33.84 | -17 55.8 | | | | | |
| 1980 07 20 | | 16 32.63 | -18 16.6 | 1.439 | 2.251 | 132.2 19.6 | 17.0 | |
| 1980 07 30 | | 16 34.52 | -18 43.3 | | | | | |
| 1980 08 09 | | 16 39.28 | -19 14.4 | 1.665 | 2.284 | 114.8 23.8 | 17.4 | |
| 1980 08 19 | | 16 46.62 | -19 47.7 | | | | | |
| 1980 08 29 | | 16 56.20 | -20 21.5 | 1.924 | 2.318 | 99.7 25.4 | 17.8 | |

| 1977 VC | | Elements MPC 4932 | | | | | | | |
|------------|----|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1980 03 22 | | 17 28.52 | -30 11.8 | 2.128 | 2.470 | 97.9 | 23.6 | 17.6 | |
| 1980 04 01 | | 17 36.86 | -31 54.3 | | | | | | |
| 1980 04 11 | | 17 42.94 | -33 47.2 | 1.837 | 2.424 | 114.0 | 22.2 | 17.3 | |
| 1980 04 21 | | 17 46.21 | -35 51.8 | | | | | | |
| 1980 05 01 | | 17 46.09 | -38 07.6 | 1.587 | 2.377 | 131.4 | 18.5 | 16.8 | |
| 1980 05 11 | | 17 41.99 | -40 31.4 | | | | | | |
| 1980 05 21 | | 17 33.53 | -42 55.6 | 1.405 | 2.328 | 148.5 | 13.1 | 16.4 | |
| 1980 05 31 | | 17 20.86 | -45 08.9 | | | | | | |
| 1980 06 10 | | 17 04.96 | -46 58.4 | 1.314 | 2.279 | 156.0 | 10.5 | 16.1 | |
| 1980 06 20 | | 16 47.76 | -48 14.2 | | | | | | |
| 1980 06 30 | | 16 31.79 | -48 54.1 | 1.321 | 2.230 | 144.7 | 15.3 | 16.2 | |
| 1980 07 10 | | 16 19.26 | -49 04.0 | | | | | | |
| 1980 07 20 | | 16 11.62 | -48 53.9 | 1.407 | 2.181 | 127.6 | 21.7 | 16.4 | |
| 1980 07 30 | | 16 09.36 | -48 34.2 | | | | | | |
| 1980 08 09 | | 16 12.28 | -48 11.9 | 1.541 | 2.132 | 111.5 | 26.3 | 16.7 | |
| 1980 08 19 | | 16 19.95 | -47 50.7 | | | | | | |
| 1980 08 29 | | 16 31.79 | -47 31.7 | 1.697 | 2.085 | 97.5 | 28.7 | 16.9 | |

| (2160) 1956 RL | | Elements MPC 4826 | | | | | | | |
|----------------|----|-------------------|----------|-------|-------|--------|-------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Mag. | |
| 1980 03 22 | | 17 29.31 | -20 13.4 | 2.605 | 2.921 | 98.3 | 19.7 | 18.6 | |
| 1980 04 01 | | 17 35.39 | -20 09.8 | | | | | | |
| 1980 04 11 | | 17 39.35 | -20 04.2 | 2.322 | 2.901 | 115.7 | 18.1 | 18.3 | |
| 1980 04 21 | | 17 40.96 | -19 57.4 | | | | | | |
| 1980 05 01 | | 17 40.08 | -19 50.0 | 2.079 | 2.880 | 134.9 | 14.3 | 17.9 | |
| 1980 05 11 | | 17 36.68 | -19 42.6 | | | | | | |
| 1980 05 21 | | 17 30.96 | -19 35.5 | 1.904 | 2.860 | 156.3 | 8.2 | 17.6 | |
| 1980 05 31 | | 17 23.41 | -19 29.0 | | | | | | |
| 1980 06 10 | | 17 14.77 | -19 23.3 | 1.826 | 2.840 | 176.3 | 1.3 | 17.1 | |
| 1980 06 20 | | 17 05.95 | -19 19.2 | | | | | | |
| 1980 06 30 | | 16 57.97 | -19 17.7 | 1.855 | 2.819 | 157.2 | 8.0 | 17.5 | |
| 1980 07 10 | | 16 51.61 | -19 19.9 | | | | | | |
| 1980 07 20 | | 16 47.46 | -19 26.6 | 1.980 | 2.800 | 135.8 | 14.7 | 17.8 | |
| 1980 07 30 | | 16 45.84 | -19 38.1 | | | | | | |
| 1980 08 09 | | 16 46.79 | -19 54.1 | 2.173 | 2.780 | 116.7 | 19.0 | 18.0 | |
| 1980 08 19 | | 16 50.24 | -20 13.9 | | | | | | |
| 1980 08 29 | | 16 56.01 | -20 36.2 | 2.406 | 2.761 | 99.7 | 21.1 | 18.3 | |

| 1977 NH | | Elements MPC 4926 | | | | | | | |
|------------|----|-------------------|----------|-------|-------|-----------|------|------|--|
| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | Mag. | | |
| 1980 03 22 | | 17 33.04 | -23 14.8 | 1.848 | 2.208 | -1.46 | +1.7 | 18.2 | |
| 1980 04 01 | | 17 43.91 | -23 25.6 | | | | | | |
| 1980 04 11 | | 17 52.48 | -23 34.0 | 1.597 | 2.187 | -1.73 | +1.2 | 17.8 | |
| 1980 04 21 | | 17 58.29 | -23 41.6 | | | | | | |
| 1980 05 01 | | 18 00.95 | -23 49.5 | 1.374 | 2.165 | -2.09 | +1.1 | 17.3 | |
| 1980 05 11 | | 18 00.12 | -23 58.3 | | | | | | |
| 1980 05 21 | | 17 55.67 | -24 07.6 | 1.203 | 2.144 | -2.46 | +1.7 | 16.9 | |
| 1980 05 31 | | 17 47.93 | -24 15.9 | | | | | | |
| 1980 06 10 | | 17 37.73 | -24 21.2 | 1.110 | 2.122 | -2.68 | +3.1 | 16.3 | |
| 1980 06 20 | | 17 26.46 | -24 22.1 | | | | | | |
| 1980 06 30 | | 17 15.84 | -24 19.0 | 1.111 | 2.102 | -2.58 | +4.4 | 16.5 | |
| 1980 07 10 | | 17 07.37 | -24 14.0 | | | | | | |
| 1980 07 20 | | 17 02.13 | -24 09.9 | 1.200 | 2.082 | -2.25 | +4.6 | 16.9 | |
| 1980 07 30 | | 17 00.65 | -24 09.1 | | | | | | |
| 1980 08 09 | | 17 02.90 | -24 12.3 | 1.351 | 2.064 | -1.92 | +3.9 | 17.3 | |
| 1980 08 19 | | 17 08.67 | -24 19.0 | | | | | | |
| 1980 08 29 | | 17 17.58 | -24 27.6 | 1.539 | 2.047 | -1.66 | +2.7 | 17.6 | |

(2151) 1977 VX

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Elements MPC | 4778 Mag. |
|------------|----|--------------|----------|-------|-------|--------|-------|--------------|--------------|
| 1980 03 22 | | 17 57.95 | -34 18.6 | 2.446 | 2.666 | 91.5 | 21.9 | | 16.6 |
| 1980 04 01 | | 18 07.30 | -35 26.2 | | | | | | |
| 1980 04 11 | | 18 14.45 | -36 38.2 | 2.197 | 2.674 | 107.4 | 21.0 | | 16.3 |
| 1980 04 21 | | 18 18.95 | -37 55.2 | | | | | | |
| 1980 05 01 | | 18 20.43 | -39 16.4 | 1.976 | 2.681 | 124.7 | 18.0 | | 16.0 |
| 1980 05 11 | | 18 18.56 | -40 39.4 | | | | | | |
| 1980 05 21 | | 18 13.16 | -41 59.5 | 1.811 | 2.687 | 142.7 | 13.2 | | 15.7 |
| 1980 05 31 | | 18 04.46 | -43 10.1 | | | | | | |
| 1980 06 10 | | 17 53.18 | -44 03.9 | 1.727 | 2.693 | 157.2 | 8.4 | | 15.5 |
| 1980 06 20 | | 17 40.52 | -44 35.1 | | | | | | |
| 1980 06 30 | | 17 28.12 | -44 41.8 | 1.743 | 2.697 | 154.6 | 9.3 | | 15.6 |
| 1980 07 10 | | 17 17.47 | -44 26.3 | | | | | | |
| 1980 07 20 | | 17 09.70 | -43 54.2 | 1.854 | 2.701 | 138.5 | 14.4 | | 15.8 |
| 1980 07 30 | | 17 05.42 | -43 12.5 | | | | | | |
| 1980 08 09 | | 17 04.72 | -42 26.9 | 2.039 | 2.704 | 121.0 | 18.8 | | 16.1 |
| 1980 08 19 | | 17 07.42 | -41 41.4 | | | | | | |
| 1980 08 29 | | 17 13.17 | -40 58.2 | 2.269 | 2.706 | 104.6 | 21.2 | | 16.4 |

1979 DE

| Date | ET | R. A. (1950) | Decl. | Delta | r | Variation | Elements MPC | 5008 Mag. |
|------------|----|--------------|----------|-------|-------|-----------|--------------|--------------|
| 1980 03 22 | | 18 06.87 | -04 36.4 | 2.906 | 3.061 | -0.65 | +3.0 | 17.2 |
| 1980 04 01 | | 18 12.72 | -03 58.9 | | | | | |
| 1980 04 11 | | 18 16.66 | -03 20.4 | 2.670 | 3.091 | -0.70 | +3.4 | 17.0 |
| 1980 04 21 | | 18 18.50 | -02 43.3 | | | | | |
| 1980 05 01 | | 18 18.14 | -02 10.1 | 2.456 | 3.119 | -0.78 | +3.7 | 16.8 |
| 1980 05 11 | | 18 15.56 | -01 44.0 | | | | | |
| 1980 05 21 | | 18 10.87 | -01 27.9 | 2.295 | 3.146 | -0.86 | +3.9 | 16.6 |
| 1980 05 31 | | 18 04.39 | -01 24.7 | | | | | |
| 1980 06 10 | | 17 56.62 | -01 36.4 | 2.217 | 3.172 | -0.90 | +4.0 | 16.4 |
| 1980 06 20 | | 17 48.22 | -02 03.8 | | | | | |
| 1980 06 30 | | 17 39.97 | -02 46.2 | 2.242 | 3.196 | -0.90 | +3.8 | 16.4 |
| 1980 07 10 | | 17 32.58 | -03 41.5 | | | | | |
| 1980 07 20 | | 17 26.66 | -04 46.6 | 2.371 | 3.219 | -0.84 | +3.6 | 16.7 |
| 1980 07 30 | | 17 22.62 | -05 58.2 | | | | | |
| 1980 08 09 | | 17 20.63 | -07 13.2 | 2.584 | 3.241 | -0.76 | +3.3 | 17.0 |
| 1980 08 19 | | 17 20.77 | -08 28.8 | | | | | |
| 1980 08 29 | | 17 22.96 | -09 42.9 | 2.853 | 3.261 | -0.68 | +3.0 | 17.2 |

1979 FK

| Date | ET | R. A. (1950) | Decl. | Delta | r | Elong. | Phase | Elements MPC | 4781 Mag. |
|------------|----|--------------|----------|-------|-------|--------|-------|--------------|--------------|
| 1980 03 22 | | 18 02.04 | -06 45.4 | 2.765 | 2.948 | 90.6 | 19.8 | | 18.5 |
| 1980 04 01 | | 18 08.71 | -05 29.5 | | | | | | |
| 1980 04 11 | | 18 13.43 | -04 08.8 | 2.530 | 2.972 | 106.3 | 18.9 | | 18.3 |
| 1980 04 21 | | 18 16.01 | -02 45.4 | | | | | | |
| 1980 05 01 | | 18 16.34 | -01 22.2 | 2.325 | 2.995 | 123.0 | 16.4 | | 18.1 |
| 1980 05 11 | | 18 14.41 | -00 02.7 | | | | | | |
| 1980 05 21 | | 18 10.33 | +01 08.8 | 2.175 | 3.018 | 139.6 | 12.6 | | 17.9 |
| 1980 05 31 | | 18 04.42 | +02 08.0 | | | | | | |
| 1980 06 10 | | 17 57.20 | +02 50.8 | 2.107 | 3.040 | 151.9 | 9.1 | | 17.7 |
| 1980 06 20 | | 17 49.35 | +03 14.2 | | | | | | |
| 1980 06 30 | | 17 41.66 | +03 17.2 | 2.136 | 3.063 | 150.5 | 9.4 | | 17.8 |
| 1980 07 10 | | 17 34.85 | +03 00.8 | | | | | | |
| 1980 07 20 | | 17 29.51 | +02 27.3 | 2.261 | 3.085 | 137.2 | 12.9 | | 18.0 |
| 1980 07 30 | | 17 26.07 | +01 40.6 | | | | | | |
| 1980 08 09 | | 17 24.69 | +00 44.7 | 2.461 | 3.106 | 120.9 | 16.3 | | 18.3 |
| 1980 08 19 | | 17 25.44 | -00 16.8 | | | | | | |
| 1980 08 29 | | 17 28.22 | -01 20.3 | 2.711 | 3.127 | 104.9 | 18.2 | | 18.6 |