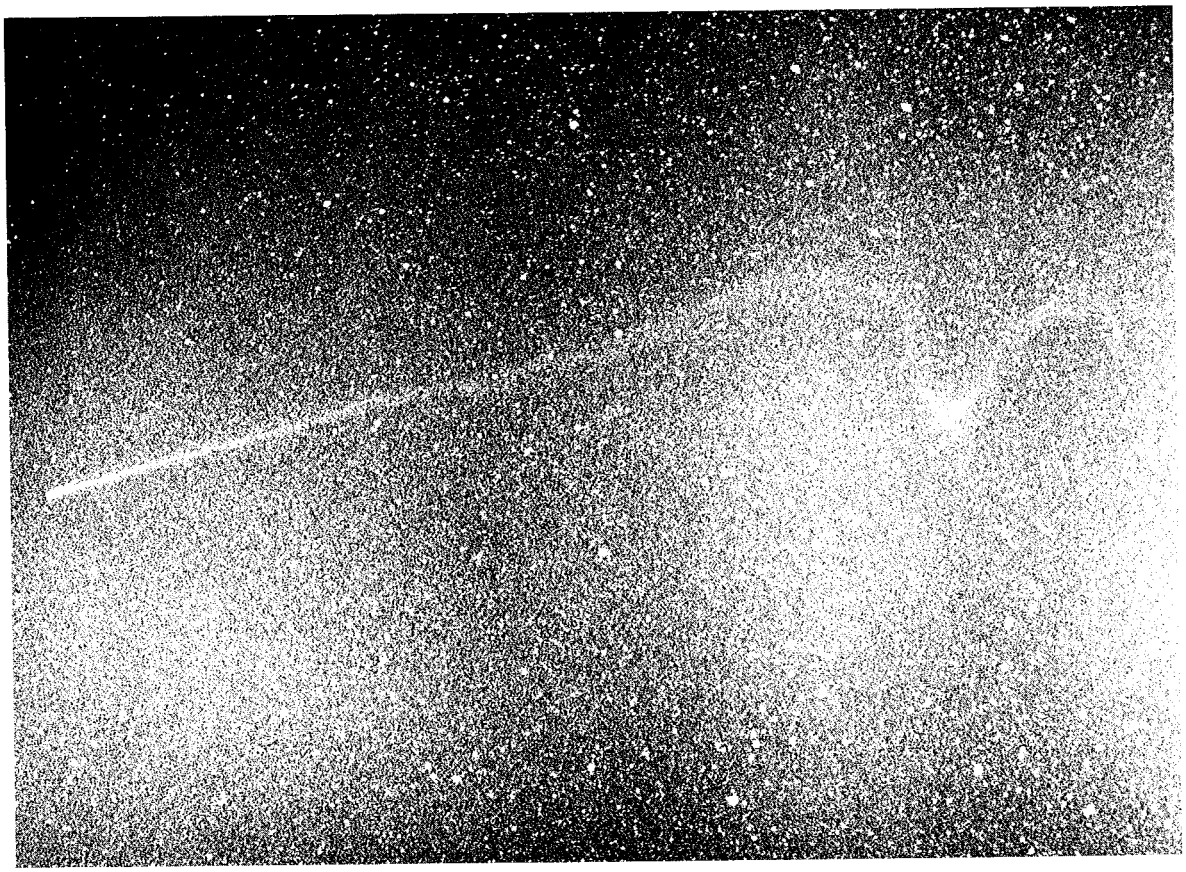
THE INTERNATIONAL COMET QUARTERLY

Whole Number 66 APRIL 1988 Vol. 10, No. 2



A very prominent "v"-shaped kink is noticeable in this photograph of comet Tomita-Gerber-Honda 1964 *VI* obtained 1964 July 4 by Alan McClure from Mt. Pinos, California. The 18-min exposure beginning at 4^h52^m UT was made on a blue plate with a 4-inch $f/2.8$ wide-field camera.

INSIDE THIS ISSUE

The International Comet Quarterly (*ICQ*) is a non-profit journal devoted to news and observation of comets. Regular issues are published 4 times per year (January, April, July, and October), with an annual *Comet Handbook* of ephemerides published as a special fifth issue in December. The *ICQ* is published in part by the Department of Physics and Astronomy at Appalachian State University in Boone, North Carolina. An index to each volume is published in the January issue of the following volume; the *ICQ* is also indexed in *Astronomy and Astrophysics Abstracts* and in *Science Abstracts Section A*.

The regular (invoiced) subscription rate is US$24.00 per year (price includes the annual *Comet Handbook*; the price without the *Handbook* is US$16.00 per year). Subscribers who do not wish to be billed may subscribe at the special rate of US$18.00 per year, or US$20.00/year outside North America (rates are $10.00 and $12.00, respectively, without *Handbook*). [The last set of digits (after the hyphen) on the top line of the mailing address label gives the Whole Number that signifies the last *ICQ* issue which will be sent under the current subscription status.] Make checks or money orders payable in U.S. funds to *International Comet Quarterly* and send to Daniel Green; Smithsonian Astrophysical Observatory; 60 Garden St.; Cambridge, MA 02138, U.S.A. [Group subscription rates available upon request.] Back issues are $4.00 each — *except* for the *Comet Handbook*, which is available for $10.00 ($8.00 to subscribers if ordered with their *ICQ* subscription; see above).

Manuscripts will be reviewed for possible publication (send 2 copies of typed, double-spaced copy to the Editor at the Cambridge address above); authors should first obtain a copy of "Information and Guidelines for Authors" from the Editor. Cometary observations also should be sent to the Editor in Cambridge; all data intended for publication in the *ICQ* should be sent on standard *ICQ* observation report forms, which can be obtained upon request from the Editor. Those who can send manuscripts and observational data in machine-readable form are encouraged to do so [especially via floppy disks, or through mail via the computer networks *BITNET* (GREEN@CFA) or *SPAN* (CFAPS2::GREEN)], and should contact the Editor for further information.

++++++++++++

This issue is No. 66 of the publication originally called *The Comet*, founded in March 1973, and is Vol. 10, No. 2, of the *ICQ*.

 [ISSN 0736-6922]

****

CORRIGENDA

- In the *ICQ 1988 Comet Handbook*, pp. H4 and H35, the absolute magnitude (H_1) for P/Borrelly should read 5.5 instead of 4.5. Add 1.0 magnitude to each of the m_1 values in the ephemeris.
- In the April 1987 issue, p. 64, top line of first paragraph, for P/Harrington (1987*m*) read P/Harrington (1987*n*)
- In the July 1987 *ICQ*, p. 136, end of first paragraph of "Book Review" concerning *Long-Term Evolution of Short-Period Comets*: for (see book review in this issue read (see book review on page 173 of the October 1987 issue [That book review was originally intended for the July issue, but space constraints forced it to be published in the October issue.]
- October 1987 issue, p. 138, last line, for Novemer read November
- Oct. 1987 issue, p. 175, "*ICQ* Comet Report Form", line 8, for helpful is observers read helpful if observers
- In the January 1988 issue, p. 23, third heading, for Periodic comet Wild 3 (1987e) read Periodic comet Tempel 1 (1987e_1)

★ ★ ★ ★

TABULATION OF COMET OBSERVATIONS

MAGNITUDE-REFERENCE KEY

With the July 1982 issue, we incorporated a new Magnitude-Reference Key, using a 2-letter code rather than the limited 1-letter code previously in use. For the convenience of observers, we list the full Key below, and ask that all who contribute observations use these 1- and 2-letter abbreviations. (The full set of *ICQ* Keys is available from the Editor for $4.00 postpaid.)

A = Charts or Atlas of the A.A.V.S.O. **(please use AA or AC instead)**
AA = A.A.V.S.O. Variable Star Atlas
AC = Charts of the American Assn. of Variable Star Observers (AAVSO)
AE = Planetary magnitudes from the *American Ephemeris and Nautical Alamanc* (for use with bright comets)
AG = *Astronomisches Gesellschaft Katalog*
AH = G. D. Roth's *Astronomy: A Handbook*, p. 534 (chart of the Pleiades)
AN = Comparison-star sequences as published by M. Beyer in articles in *Astron. Nachrichten*
AT = Arizona-Tonantzintla Catalog (publ. in *Sky & Tel.*)
BD = *Bonner Durchmusterung* (Argelander *et al.*)
C = Photovisual magnitudes from "Cape Photographic Catalogue for 1950.0", in *Annals of the Cape Observatory*, Vols. **17–22**.

(Cont. on page 35)

CA = M44 standard sequence as published in Henden and Kaitchuck's *Astronomical Photometry* (1982, New York: Van Nostrand Reinhold), pp. 301–302.
CC = Carte du Ciel, Paris
CM = Photovisual and photoelectric-*V* magnitudes from *Cape Mimeograms* (Royal Observatory, Cape of Good Hope).
CS = "Catalogue of Stellar Identifications" (1979, Strasbourg). Large compilation of many catalogues. For information, see F. Ochsenbein *et al.* (1981), *A.Ap. Suppl.* **43**, 259, and Ochsenbein (1974), *A.Ap. Suppl.* **15**, 215. The visual magnitudes with colons (:) should be avoided if possible.
D = Dutch Comet Halley Handbook (E. P. Bus)
E = One of Everhart's 3 Selected Area charts (1984, *Sky Telesc.* **67**, 28)
EA = Selected Area 51: From Everhart (1984, *Sky Telesc.* **67**, pp. 28–30).
EB = Selected Area 57: From Everhart (1984, see EA, above)
EC = Selected Area 68: From Everhart (1984, see EA, above)
FA = *V* photometry by Harold Ables, U.S. Naval Observatory, Flagstaff, "Region No. 6", unpublished (stellar *V* magnitude range 11.1–15.8 photoelectric and 13.7–21.6 electronographic); cf. *ICQ* **9**, 99.
GR = Groombridge
HD = Henry Draper Catalog (*Harvard Coll. Obs. Annals*)
HP = Harvard Photometry (*Harvard College Obs. Annals*)
HR = Harvard Revised Photometry (*H.C.O. Annals*)
L = Landolt *V* Photoelectric Sequences (*A.J.* **78**, 959)
LN = Lampkin's Naked-Eye Stars
ME = V photometry by Tedesco, Tholen, and Zellner (1982, *A.J.* **87**, 1585); mag range 6–13
MP = McCormick Photovisual Sequence (Univ. of Virginia) **(for old data only; new data must use a more specific reference, as listed immediately below)**
MS = From "McCormick Photovisual Sequences", by C. A. Wirtanen and A. N. Vyssotsky (1945, *Ap. J.* **101**, 141–178).
MV = From *Publ. Leander McCormick Obs.*, Vol. **VI**, Part II, pp. 201–306 ("Magnitudes and Coordinates of Comparison Stars in Regions of Long-Period Variables", by S. A. Mitchell, 1935) or Vol. **IX**, Part V, pp. 59–88 ("Sequences for Fifty Variable Stars", by Mitchell and C. A. Wirtanen, 1939).
NN = NGC 2129 cluster photometry, in *Publ. U.S. Naval Observatory*, Vol. **XVII**, part VII (1961), p. 406.
NO = *Photoelectric Catalogue* (1970), *Publ. U.S. Naval Obs.*, 2^{nd} series, Vol. **XXI**.
NP = North Polar Sequence (publ. by the A.A.V.S.O.)
NS = "Magnitudes and Colors of Stars North of +80°", by Seares, Ross, and Joyner (1941, *Carnegie Inst. Publication* 532)
OH = From listing of bright stars in *Observers' Handbook*, R.A.S.C.
PA = M45 sequence, Johnson and Mitchell (1958, *Ap. J.* **128**, 31)
PB = Pleiades chart in *Sky and Telescope* **70**, 465 (1985).
PC = Pleiades sequence, Henden and Kaitchuck (1982, *Astronomical Photometry*, New York: Van Nostrand Reinhold), pp. 298–300.
PD = "Photometrische Durchmusterung: Generalkatalog", by G. Mueller and P. Kempf (1907), in *Publ. Astrophysikalischen Observatoriums zu Postdam* No. 52 (Vol. **17**); B.D. stars to mag 7.5
PI = IC 4665 sequence as found in Henden and Kaitchuck (1982, *Astronomical Photometry*, New York: Van Nostrand Reinhold), pp. 302–304.
PL = star(s) and sources quoted for photoelectric data, but difference (comet – comparison-star) > 4.5 mag
RA = Annual Ephemeris of the Royal Astronomical Society of Canada (not recommended, even for bright comets)
RB = "Photoelectric Magnitudes and Colours of Southern Stars", A. W. J. Cousins and R. H. Stoy (1963), in *Royal Observatory Bulletin* No. 64 (Royal Greenwich Obs.), Series E3, pp. E101–E248.
RC = "Standard Magnitudes in the E Regions", A. W. J. Cousins and R. H. Stoy (1962), in *Royal Observatory Bulletin* No. 49 (Royal Greenwich Obs.), Series E2, pp. E1–E59.
S = *Smithsonian Astrophysical Observatory Star Catalog*
SA = M67 sequence by R. E. Schild (1983, *PASP* **95**, 1021), Kron-Cousins magnitudes
SC = *Sky Catalogue 2000.0* (Sky Publishing)
SP = *Skalnate-Pleso Atlas Catalog (Atlas Coeli Catalog)*
V = Variable star charts from recognized sources
VB = Variable star charts of the British Astr. Assn.
VF = Variable star charts of the A.F.O.E.V. (France)
VN = Variable star charts of the R.A.S. of New Zealand
W = International Halley Watch (IHW) version of an unspecified AAVSO chart
WA = Special IHW version of AAVSO chart for SU Tauri
WB = Special IHW version of AAVSO chart for CZ Orionis

WC = Special IHW version of AAVSO chart for Y Tauri
WD = Special IHW version of AAVSO chart for V Tauri
WE = IHW version of AAVSO chart for X Sextantis
WF = IHW version of AAVSO chart for S Sextantis
WG = IHW version of AAVSO chart for SX Leonis
WH = Unspecified IHW charts
WW = B.A.A. Charts as published in the *IHW Observers' Manual*
Y = *Yale Bright Star Catalogue*

If a valid reference is used that is not given in the above list, provide full details (full title, publication, authors, years, magnitude ranges, *etc.*). Many valid references are not listed above, but first check the list of "unacceptable references", below.

UNACCEPTABLE REFERENCES. Visual magnitude estimates of comets made using the following sources are highly unreliable and are not accepted for publication in the *ICQ* (except where there are no better data available):

(1) any photographic (or non-visual or non-*V*) comparison stars
(2) any galaxies, nebulae, star clusters, *etc.*
(3) "experience"
(4) atlases which do not have accurate visual/*V* magnitudes given to 0.1 mag or better (those, such as *Atlas Eclipticalis*, which only have a scheme of star diameters for brightness must be avoided)
(5) specific stars quoted, but no catalogue specified

◇ ◇ ◇

DESCRIPTIVE DATA (to complement the tabulated data, some from the last two issues):

◇ *Periodic comet Tuttle (1980 XIII)* [all observations by JON with 31.7-cm *f*/5 L, 86×]: 1980 Dec. 2.65: DC = 2. Dec. 3.65: coma dia. 2′, DC = 2. Dec. 9.64: coma dia. 3.5′. Dec. 10.64: coma dia. 4′, DC = 4. Dec. 19.65, and 1981 Jan. 15.41, 23.41, and 26.42: DC = 4. Dec. 20.64: DC = 3. Dec. 22.42: coma dia. 2′. Dec. 26.47: coma dia. 3′, DC = 4. 1981 Jan. 6.42: coma dia. 3′, DC = 5. Jan. 9.45 and 25.43: DC = 5. Jan. 10.50: DC = 6. Jan. 16.65: coma dia. 3′. Feb. 1.46: coma dia. = 2′, DC = 3. Feb. 3.44: coma dia. 2.5′, DC = 3. Feb. 8.43: coma dia. 4′, DC = 2.

◇ *Comet Hartley-Good 1985 XVII* [all observations are by ZAN]: 1985 Oct. 28.73: in 20×80 B, comet seen during total lunar eclipse, coma dia. 10′, DC = 5. Nov. 2.73: in 30.5-cm *f*/5 L, small disklike difficult central cond.; possible tail in p.a. 245°. Nov. 3.76: in 30.5-cm *f*/5 L, starlike nuclear region, possible tail in p.a. 245°. Nov. 11.76: in 30.5-cm *f*/5 L, central cond. of dia. 1.6′, also starlike nuclear region.

◇ *Comet Thiele 1985 XIX:* 1985 Nov. 3.79: "comet appeared circular, with low surface brightness; in 30.5-cm *f*/5 L (60×), starlike nuclear region in a central cond., extremely diffuse outer coma with indefinite edges" [ZAN]. Nov. 11.91: as on Nov. 3.79 in 30.5-cm L, starlike nuclear region [ZAN].

◇ *Periodic comet Schwassmann-Wachmann 2 (1986h):* 1987 Nov. 18.45: intense cond. offset towards NE in coma [JAC01].

◇ *Periodic comet Kohoutek (1986k):* 1988 Jan. 13.67: "fairly diffuse with outer coma quite ill-defined" [PEA]. Jan. 18.66: "large and diffuse, best seen at low power" [PEA]. Jan. 20.75: "very diffuse and of low surface brightness" [PEA].

◇ *Comet Wilson 1986l:* 1987 Nov. 27.53: circular coma had a stellar condensation at the edge toward p.a. 65° [MOR].

◇ *Comet Sorrells 1986n:* 1986 Nov. 6.88: also 0.02° tail in p.a. 225° [JAH]. Nov. 23.76: at 49×, coma dia. 1.9′, DC = 6 [JAH].

◇ *Periodic comet Borrelly (1987p):* 1987 Oct. 17.45: "small bright cond., small nucleus" [JON]. Oct. 18.78: in 31.7-cm L, "small nucleus" [JON]. Oct. 19.44 and 21.45: in 31.7-cm *f*/5 L (86×), coma dia. 1.5′, DC = 3 [JON]. Oct. 20.46: in 31.7-cm *f*/5 L (86×), coma dia. 1.5′, DC = 2–3 [JON]. Nov. 1.67: in 31.7-cm *f*/5 L (86×), coma dia. ~ 1.5′, DC = 3–4 [JON]. Nov. 17.42: in 31.7-cm *f*/5 L (86×), coma dia. 3′, DC = 6–7 [JON]. Nov. 18.92: also 7.5′ jet in p.a. 55° [BOA]. Nov. 24.49: in 31.7-cm *f*/5 L (86×), coma dia. 3′, DC = 6 [JON]. Nov. 24.75: prominent central cond., starlike nucleus [PEA]. Nov. 30.61: in 31.7-cm *f*/5 L (86×), coma dia. 2′, DC = 6 [JON]. Dec. 7.80: in 5.0-cm *f*/10 R (13×), coma dia. ~ 4′, DC = 2 [JAH]. Dec. 11.39: in 7.8-cm *f*/8 R (30×), coma dia. 3′; in 31.7-cm L, "short faint tail?, small bright nucleus" [JON]. Dec. 12.83: in 20.4-cm *f*/6 L (72×), coma dia. 2.2′, DC = 5 [JAH]. Dec. 13.41: in 31.7-cm *f*/5 L (86×), coma dia. 2′, DC = 8 [JON]. Dec. 15.54: outer coma very ill-defined and faint [PEA]. Dec. 16.57: central cond. offset towards west [PEA]. Dec. 22.78: at 76×, coma dia. ~ 8′, DC = 2 [JAH]. Dec. 23.40: in 31.7-cm *f*/5 L (86×), coma dia. 1.5′, DC = 5 [JON]. Dec. 26.44: in 31.7-cm *f*/5 L (86×), coma dia. 1′, DC = 5 [JON]. Dec. 27.64: central cond. offset towards SSW-SW [PEA].

◇ *Periodic comet Borrelly (1987p)* [cont.]: 1988 Jan. 9.72: in 5.0-cm *f*/10 R (13×), coma dia. 5.3′, DC = 2 [JAH]. Jan. 12.01: in 31.7-cm *f*/6 L (55×), coma dia. 4.0′, DC = 3; "starlike nucleus of 12^{th} mag" [BOR]. Jan. 13.55: faint outer coma [PEA]. Jan. 17.05: in 31.7-cm L, "tiny cond. 0.1′–0.2′ in dia.; bright broad fan of material extends eastward from nuclear cond." [BOR]. Feb. 19.02: "dense cond. 0.5′ in dia with nucleus" [BOR]. Feb. 22.04: "nucleus glimpsed" [BOR]. Mar. 6.04: "tiny central knot with stellar nucleus" [BOR]. Mar. 20.05: "minute stellar nucleus glimpsed" [BOR].

◇ *Comet Bradfield 1987s:* 1987 Sept. 27.78: in 25.4-cm L, "straight, quite narrow main tail, fan spanning p.a. 90°–135°, also 7′ tail in p.a. 135°; parabolic coma, strong disklike central cond." [ZAN]. Oct. 12.41: fan tail [SEA]. Oct. 17.41: "tail still quite broad" [SEA]. Oct. 19.09: in 20×120 B, 0.8° tail in p.a. 90° [KEE]. Nov. 13.71: also 0.09° tail in p.a. 45° [JAH]. Nov. 22.09: in 31.8-cm *f*/4 L (33×), coma dia. 6′, DC = 8, 2.0° tail in p.a. 55° [KEE]. Nov. 22.16: "anti-tail was very faint and broad, and was also seen in 10×50 B and 20×80 B" [MOR]. Nov. 23.08: to naked eye, 4° tail in p.a. 65° [KEE]. Dec. 4.66: in 11.0-cm *f*/7 L (54×), coma dia. 2.7′ [FIL02]. Dec. 5.64: in 11.0-cm *f*/7 L (54×), coma dia. 3.1′ [FIL02]. Dec. 7.70: also 0.15° tail in p.a. 355° [JAH]. Dec. 7.73: in 10×80 B, tails 1.35° and 1.31° long in p.a. 93° and 50° [SHA02]. Dec. 8.71: also 0.17° tail in p.a. 28° [JAH]. Dec. 11.71: at 76×, coma dia. 3.6′, DC = 5, 0.20° and 0.12° tails in p.a. 66° and 115° [JAH]. Dec. 12.72: in 5.0-cm *f*/10 R (76×), coma dia. 5.5′, DC = 7, 0.48° and 0.35° tails in p.a. 56° and 95° [JAH]. Dec. 22.77: in 25.4-cm *f*/6 J (59×), 0.5° anti-tail, very faint and diffuse, in p.a. ∼ 245° [BOU]. Dec. 24.66: in 11.0-cm *f*/7 L (54×), coma dia. 5.7′ [FIL02]. Dec. 24.71: also 0.35° tail in p.a. 110° [JAH]. Dec. 26.10: "very broad tail, diffuse and faint" [PRY].

1988 Jan. 1.66: in 11.0-cm *f*/7 L (54×), coma dia. 4.7′ [FIL02]. Jan. 7.54: "prominent central cond. of 9^{th} mag, diffuse outer coma" [PEA]. Jan. 12.00: in 31.7-cm *f*/6 L (55×), coma dia. 4.0′, DC = 5 [BOR]. Jan. 16.03: coma elongated NE to SW [BOR]. Jan. 17.04: in 31.7-cm L, almost stellar nucleus of 12^{th} mag, dia < 0.1′ [BOR]. Jan. 19.16: photographically, tail is 15′ long [PRY]. Jan. 20.54: "central cond. offset towards p.a. 250°" [PEA]. Jan. 22.55: "tail quite broad and diffuse" [PEA]. Feb. 7.00: in 31.7-cm L, tiny stellar nucleus of 13^{th} mag [BOR]. Feb. 17.03: "tiny central knot of material" [BOR]. Feb. 19.01: "tiny starlike nucleus" [BOR]. Feb. 22.03: nuclear cond. of 13^{th} mag [BOR]. Mar. 6.03: very faint stellar nucleus of mag 13.5 [BOR]. Mar. 12.02: 13^{th}-mag stellar nucleus glimpsed [BOR].

◇ *Comet Rudenko 1987u:* 1987 Sept. 20.13: "hint of a tail toward the east" [MOR]. Oct. 31.66 and Nov. 4.65: in 31.7-cm *f*/5 R (86×), coma dia. ∼ 1.5′, DC = 2 [JON]. Nov. 5.66: in 31.7-cm *f*/5 R (86×), coma dia. 1.7′, DC = 3 [JON]. Nov. 10.66: in 31.7-cm *f*/5 R (86×), coma dia. 2′, DC = 3 [JON]. Nov. 17.65: in 31.7-cm *f*/5 R (86×), DC = 5 [JON]. Nov. 24.61: in 31.7-cm *f*/5 R (86×), coma dia. 3′, DC = 5 [JON]. Nov. 30.62: in 31.7-cm *f*/5 R (86×), coma dia. 2.5′, DC = 1 [JON].

◇ *Levy 1987y:* 1987 Oct. 11.1: discovery observation [LEV]. Oct. 12.08: asymmetric, slightly elongated, diffuse with some cond. [LEV].

◇ *Comet McNaught 1987b$_1$:* 1988 Jan. 20.55: tail teardrop-shaped [LEV]. Jan. 22.55: tail fanned [LEV]. Jan. 24.49: "coma possibly elongated?" [PRY].

◇ *Comet Ichimura 1987d$_1$:* 1987 Nov. 23.53: "very large faint outer coma; central cond. absent" [PEA]. Nov. 24.46: in 31.7-cm *f*/5 L (86×), coma dia. 3′, DC = 1 [JON]. Nov. 25.44: in 15-cm *f*/8 L (100×), coma dia. 4′ [WIL02]. Nov. 30.60: in 31.7-cm *f*/5 L (86×), coma dia. 3′, DC = 1–2 [JON]. Nov. 30.69: in 15-cm *f*/8 L (100×), coma dia. 10′ [WIL02]. Dec. 11.43: in 31.7-cm *f*/5 L (86×), coma dia. 2′, DC = 1 [JON]. Dec. 13.43: in 31.7-cm *f*/5 L (86×), DC = 1 [JON]. Dec. 16.55: "faint broad tail of low surface brightness" [PEA].

◇ *Comet Furuyama 1987f$_1$:* 1988 Jan. 19.58: small starlike central cond., fainter outer coma [PEA].

◇ *Comet Liller 1988a:* 1988 Mar. 18.01: in 31.7-cm *f*/6 L (55×), coma dia. 1.9′, DC = 6–7 [BOR].

◇ *P/Schwassmann-Wachmann 1:* 1987 Oct. 16.22: "appearance suggests outburst is ∼ 1 week old" [HAL].

◇ ◇ ◇

OBSERVATIONS OF COMETS

The headings for the tabulated data are as follows: "DATE (UT)" = Date and time to hundredths of a day in Universal Time; "MM" = the method employed for estimating the total visual magnitude (B = Bobrovnikoff, M = Morris, S = Sidgwick/In-out, etc.; also, P stands for photographic magnitude, and photoelectrically-determined values fall under L, U, and V for the standard *U*, *B*, and *V*, respectively). "MAG." = total visual magnitude estimate; a colon indicates that the observation is only approximate, due to bad weather conditions, *etc.* (A left bracket, [, indicates limiting magnitude, comet not seen.) "RF" = reference for magnitude estimates (see Key above). "AP." = aperture in centimeters of the instrument used for the observations, usually given to tenths. "T" = type of instrument used for the observation (R = refractor, L = Newtonian reflector, B = binoculars, C = Cassegrain reflector, A = camera, T = Schmidt-Cassegrain reflector, S = Schmidt-Newtonian reflector, E = naked eye, *etc.*). "F/" and "PWR" are the focal ratio and power or magnification, respectively, of the instrument used for the observation. "COMA" = estimated coma diameter of the comet in minutes of arc. An ampersand (&) indicates an approximate estimate. An exclamation mark (!) precedes a coma diameter when the comet was not seen (*i.e.*, was too faint) and where a limiting magnitude estimate is provided based on an "assumed" coma diameter (a default size of 1′ or 30″ is recommended; cf. *ICQ* **9**, 100).

"COMA" = estimated coma diameter of the comet in minutes of arc. An ampersand (&) indicates an approximate estimate. An exclamation mark (!) precedes a coma diameter when the comet was not seen (*i.e.*, was too faint) and where a limiting magnitude estimate is provided based on an "assumed" coma diameter (a default size of 1′ or 30″ is recommended; cf. *ICQ* **9**, 100). "DC" = degree of condensation on a scale where 9 = stellar and 0 = diffuse; a slash (/) indicates a value midway between the given number and the next-higher integer. "TAIL" = estimated tail length in degrees; again, an ampersand indicates a rough estimate. "PA" = estimated measured position angle of the tail in degrees (north = 0°, east = 90°). "OBS" = the observer who made the observation (given as a 3-letter, 2-digit code). An asterisk between the DATE and MM columns indicates that the observation is an updated version of one already published in a previous issue of the *ICQ*, *The Comet Quarterly*, or *The Comet*. (An exclamation mark in this same location indicates that the observer has corrected his estimate in some manner for atmospheric extinction.)

Key to observers with observations published in this issue [those with asterisks (*) preceding the 5-character code are new additions to the Observer Key (cf. ICQ 9, 66)]:

AMO	Mauro Amoretti, Italy
BAR	Sandro Baroni, Italy
BOA	Andrea Boattini, Italy
BOR	John E. Bortle, NY, U.S.A.
BOU	Reinder J. Bouma, The Netherlands
CHE	G. R. Chester, VA, U.S.A.
DEA	V. F. de Assis Neto, Brazil
*FIL02 17	V. S. Filonenko, Ukraine, U.S.S.R.
GRE	Daniel W. E. Green, U.S.A.
HAL	Alan Hale, U.S.A.
HAS02	Werner Hasubick, West Germany
HAS03	Hisaya Hasegawa, Japan
JAC01	Eric A. Jacobson, MN, U.S.A.
JAH	Jost Jahn, West Germany
JON	Albert F. Jones, New Zealand
KEE	Richard A. Keen, CO, U.S.A.
KOB01	Juro Kobayashi, Japan
KOC01	Volkmar Koch, West Germany
KOR	Stefan Korth, West Germany
MIK	Herman Mikuz, Yugoslavia
MIT 06	Shigeo Mitsuma, Japan
MOE	Michael Moeller, West Germany
*MOM 06	Masahiko Momose, Japan
OME	Stephen O'Meara, MA, U.S.A.
*PAM	Carlo Pampaloni, Italy
PEA 14	Andrew R. Pearce, Australia
*PER01	Alfredo Pereira, Portugal
*PRY	Jim Pryal, WA, U.S.A.
REI01	Johann Reifberger, Austria
SEA 14	David A. J. Seargent, Australia
SHA02	Jonathan D. Shanklin, England
SPR	C. E. Spratt, BC, Canada
SUG01	Yukihiro Sugiyama, Japan
WES02	Margareta Westlund, Sweden
WIL02	Peter F. Williams, Australia
ZAN	Mauro Vittorio Zanotta, Italy

Comet Humason 1962 VIII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1963 06 16.45				31.7	L	5	86		5	0.1	122	JON

Comet Toba 1971 V

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1971 05 18.73	S	9.0	S	7.8	R	8	30				260	JON

Comet Bradfield 1975 XI

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1976 01 24.78	S	8.7	S	5.0	B		10	5				MOE

Comet Bradfield 1979 X

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1980 02 01.78	S	6.2	S	48.5	L	4	115	8				MOE

Comet Panther 1981 II

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1981 02 04.79	S	9.2	S	48.5	L	4	115	4				MOE
1981 02 11.94	S	8.7	S	48.5	L	4	115	5				MOE
1981 02 12.10	S	8.7	S	48.5	L	4	115	5				MOE
1981 04 06.92	P	10.8	NP	48.5	L	4		3				MOE

Comet Austin 1982 VI

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 08 19.85	S	4.0	SP	10.0	B		14	12		>2		MOE
1982 08 20.85	S	4.2	SP	10.0	B		14	10		2		MOE
1982 08 23.86	S	4.3	SP	10.0	B		14	11		1.5		MOE
1982 08 27.94	S	5.4	SP	10.0	B		14	8		1.0		MOE
1982 08 29.83	S	5.4	SP	10.0	B		14	7		0.8		MOE
1982 08 30.82	S	5.5	SP	10.0	B		14	6		0.5		MOE

Comet Sugano-Saigusa-Fujikawa 1983 V

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 06 05.99	B	8.0	S	10.0	B		14	20	0			MOE
1983 06 06.98	S	7.5	S	6.0	R	12	35	15	0			MOE
1983 06 07.96	S	7.2	S	10.0	B		14	15	0			MOE
1983 06 09.93	B	6.6	S	10.0	B		14	20	0			MOE
1983 06 10.94	S	6.5	S	6.0	R	12	35	25	0			MOE

Comet IRAS-Araki-Alcock 1983 VII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 05 05.35	M	6.2	AA	5.0	B		10	20				OME
1983 05 06.31	S	5.6	AA	0.0	E		1	20				OME
1983 05 07.10	S	4.8	AA	0.0	E		1	45				OME
1983 05 07.15	S	4.6	AA	0.0	E		1					OME
1983 05 07.31	S	4.5	AA	0.0	E		1					OME
1983 05 08.2	S	4.4	AA	0.0	E		1	75				OME
1983 05 10.02	I	3.5	S	0.0	E		1	>30	2			MOE
1983 05 10.10	S	2.6	AA	0.0	E		1	150				OME
1983 05 11.12	S	2.5	AA	0.0	E		1	210				OME
1983 05 11.93	B	3.0	S	6.0	R	8	12	>50	1			MOE
1983 05 12.08	S	1.5	AA	0.0	E		1	240				OME
1983 05 12.18	B	2.0:	AA	0.7	E		1	200				JAC01

Comet Hartley-Good 1985 XVII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 10 06.83	S	8.2	A	19	T	4	38	12	4			MIK
1985 10 11.89	S	8.2	A	8.0	B		10	12	3			MIK
1985 10 11.92	S	7.9	A	19	T	4	38	10	5			MIK
1985 10 13.85	S	7.8	A	19	T	4	38	11	4			MIK
1985 10 15.86	S	7.2	A	8.0	B		10	16	5			MIK
1985 10 17.85	S	7.1	A	8.0	B		10	15	5			MIK
1985 10 17.87	S	6.7	A	5.0	B		7	18	4			MIK
1985 10 28.75	S	7.7	A	5.0	B		7	10	4			MIK
1985 11 02.73	S	7.2	AA	8.0	B		20	7.9	6			ZAN
1985 11 03.76	S	7.1	AA	5.0	B		7	11.8	5			ZAN
1985 11 03.76	S	7.2	AA	8.0	B		20	7.9	6			ZAN
1985 11 11.75	S	7.2	AA	5.0	B		7	6.4	6/			ZAN
1985 11 11.76	S	7.1	AA	8.0	B		20	6.4	5/			ZAN
1985 12 22.20	S	8.2	A	8.0	B		10	4	8			MIK
1985 12 22.21	M	8.0	A	19	T	4	38	3.5	7			MIK

Comet Thiele 1985 XIX

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 11 03.79	S	7.8	AA	8.0	B		20	12	3			ZAN
1985 11 11.91	S	8.0	AA	8.0	B		20	10.2	2/			ZAN
1986 03 05.54	I[	12.0		20	L	6	122					HAL
1986 03 07.54	I[	12.0		20	L	6	122					HAL

Comet Wilson 19861

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 11 22.45	M	10.8	AC	31.8	L	4	63	2.5	3			KEE
1987 11 23.75	S	11.5	VN	20	L	4	45	2	5			PEA
1987 11 24.83	S	11.5	VN	20	L	4	45	2	5			PEA
1987 11 25.62	S	11.3	V	25.4	L	4	44					SEA
1987 12 16.68	S	11.7	VN	20	L	4	45	1.5	5			PEA
1987 12 17.77	S	11.7	VN	20	L	4	45	1.5	5			PEA
1987 12 26.70	S	11.8	VN	20	L	4	45	1.2	4			PEA

Comet Wilson 1986l [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 12 27.68	S	11.8	VN	20	L	4	45	1	4/			PEA
1987 12 28.74	S	11.6	VN	20	L	4	45	1.5	5/			PEA
1988 01 11.94	S	11.9	AC	25.4	J	6	90	1.2	3			BOU
1988 01 13.66	S	12.0	VN	20	L	4	45	1.2	5			PEA
1988 01 14.66	S	11.9	VN	20	L	4	45	1.5	5			PEA
1988 01 18.65	S	12.0	VN	20	L	4	45	1.2	6			PEA
1988 01 19.65	S	12.0	VN	20	L	4	45	1	5			PEA
1988 01 20.69	S	12.2	VN	20	L	4	45	1.2	5			PEA
1988 01 21.96	S	12.1	AC	25.4	J	6	90	1.1	3/			BOU
1988 01 22.68	S	12.2	VN	20	L	4	45	1.2	5			PEA
1988 01 23.42	M	11.8	CA	41	L	4	83					HAL
1988 01 23.66	S	12.5:	VN	20	L	4	45		5			PEA
1988 01 26.70	S	12.3	VN	20	L	4	87	1	5			PEA
1988 02 08.25	S	12.3	AC	41	L	4	183					HAL
1988 02 09.27	M	12.4	AC	41	L	4	83					HAL
1988 02 13.61	S	13.6	VN	20	L	4	130	0.6	3			PEA
1988 02 14.85	S	13.2	AC	36.0	T	11	325	0.3	7			KOR
1988 02 14.91	S[	13.3	VB	20.0	R	14	112					SHA02
1988 02 16.24	M	12.5	AC	41	L	4	83					HAL
1988 03 07.21	S	13.2:	AC	41	L	4	183					HAL
1988 03 10.18	S	13.5	AC	41	L	4	183					HAL
1988 03 20.25	I[	13.5		41	L	4	244					HAL

Comet Sorrells 1986n

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 11 06.88	S	11.3	AH	20.4	L	6	136	0.8	4	0.02	165	JAH
1986 11 23.76	S	10.3	AH	20.4	L	6	136	1.2	4			JAH

Comet McNaught 1987b$_1$

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 10 21.35	S	9.3	S	31.7	L	5	86	2	3			JON
1987 10 31.39	S	8.9	S	31.7	L	5	86	1	2/			JON
1987 11 03.37	S	9.0	S	31.7	L	5	86		3			JON
1987 12 30.85	S	7.0	AA	31.0	L	6	63	3.5	7	0.20		HAS03
1987 12 31.52	S	7.0:	AA	25	L	4	46		3/			JAC01
1988 01 05.52	S	7.4:	AA	25	L	4	46		3/			JAC01
1988 01 06.85	S	6.7	AA	31.0	L	6	63	4.0	6	0.20		HAS03
1988 01 17.51	S	6.8	AA	5.0	B		10	9	4			JAC01
1988 01 17.51	S	7.0	AA	25	L	4	46	7.3	4	0.22	352	JAC01
1988 01 18.51	M	6.9	AA	5.0	B		10	8	4			JAC01
1988 01 18.51	M	7.0	AA	25	L	4	46			0.25	347	JAC01
1988 01 21.51	M	7.0	AA	5.0	B		10					JAC01
1988 01 21.54				41	L	4	83			>0.25	320	HAL
1988 01 21.54	M	7.2	PI	5.0	B		10					HAL
1988 01 23.19	M	6.6	AA	8.0	B		20	4	6	1.3	325	BOU
1988 01 23.20	S	6.6	AA	5.0	B		10		4			BOU
1988 01 23.54	M	7.0	PI	5.0	B		10			0.42	320	HAL
1988 01 23.82	S	7.3	AA	31.0	L	6	63	5.2	6	0.37		HAS03
1988 01 24.49	S	7.5	AA	20	C	10	50	6	5			PRY
1988 01 24.83	S	6.8	AA	31.0	L	6	63	5.2	6	1		HAS03
1988 01 25.18	B	6.9	AA	10.0	B		14	4.7	5	0.3	315	HAS02
1988 01 25.18	S	6.8	AA	10.0	B		14					HAS02
1988 01 25.50	M	6.9	AA	5.0	B		10					JAC01
1988 01 25.84	S	7.0	AA	31.0	L	6	63	5.2	5	1		HAS03
1988 01 26.51	M	6.9	AA	5.0	B		10					JAC01
1988 01 26.53	M	6.6	SC	5.0	B		10			0.58	320	HAL
1988 01 28.44	E	6.4	NO	5.0	B		10					BOR

Comet McNaught 1987b, [cont.]

DATE (UT)		MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 01 28.44		S	6.4	NO	5.0	B		10	5.5	6/			BOR
1988 01 28.83		S	6.8	AA	31.0	L	6	63	5.5	6	1		HAS03
1988 01 29.44					31.7	L	6	55	2.6	6	0.45	320	BOR
1988 01 29.44		E	6.5	NO	5.0	B		10	5.5	5			BOR
1988 01 31.27		S	6.8	AA	15	L	4	26	7				PER01
1988 01 31.54		M	7.1	SC	5.0	B		10					HAL
1988 02 01.56		S	8.0	SC	8.0	B	3	11	3	3			PRY
1988 02 02.26		S	8.0	AA	15	L	4	26	3				PER01
1988 02 02.84		S	8.0	AA	31.0	L	6	63	4.5	4			HAS03
1988 02 03.22		S	7.9	VB	8.0	B		20	2.0	6			SHA02
1988 02 03.26		S	8.0	AA	15	L	4	26	3				PER01
1988 02 04.77	!	S	7.8	VB	8.0	B		20	3.7	5			SHA02
1988 02 06.76		S	7.2	AC	8.0	B		20	4	4			BOU
1988 02 06.82	!	S	8.0	VB	8.0	B		20	1.3	6			SHA02
1988 02 07.76		S	7.4	AC	8.0	B		20	4	4/			BOU
1988 02 08.54		S	7.7	NP	5.0	B		10					HAL
1988 02 10.19		S	8.3	S	10.0	B		14	1.8	5			HAS02
1988 02 10.79		S	8.6:	AC	15.2	L	5	44	5	6			MOE
1988 02 11.47		B	7.3	AA	8.0	B		20					JAC01
1988 02 11.48					25	L	4	46	6.4	4/	0.42	325	JAC01
1988 02 11.78		S	8.3	AC	15.2	L	5	38	4.5	5			MOE
1988 02 11.78		S	8.3	AC	15.2	L	5	44	4.5	5			MOE
1988 02 11.78		S	8.5	AC	15.2	L	5	100	4	5			MOE
1988 02 13.07	!	S	8.0	VB	8.0	B		20	1.8	5			SHA02
1988 02 13.14		S	7.2	AA	8.0	B		15	3.5	5			KOR
1988 02 13.75		S	8.6:	S	10.0	B		14	2.1	4			HAS02
1988 02 14.13		B	8.8	AC	35	T	6	96	1.9	5	0.07	45	AMO
1988 02 14.53					41	L	4	83			0.25	310	HAL
1988 02 14.53		S	8.2	NP	5.0	B		10					HAL
1988 02 14.76		S	8.9	S	10.0	B		14		4			HAS02
1988 02 14.77		S	8.6	AA	8.0	B		15	4	2			MIK
1988 02 14.81	!	S	8.7	VB	20.0	R	14	40	3.3	5			SHA02
1988 02 15.16		S	8.5	AA	36.0	T	11	123	4	2/	&0.13	315	KOR
1988 02 15.17		S	8.5	AA	8.0	B		15	4	7			MIK
1988 02 15.78		S	8.0:	AA	8.0	B		20	5.6	4			KOC01
1988 02 15.78		S	8.5	AA	8.0	B		20	5.6	5			HAS02
1988 02 16.77		S	7.8	AC	8.0	B		20	4	3			BOU
1988 02 16.78		M	7.9	AC	25.4	J	6	59	3	5			BOU
1988 02 16.78		S	8.5	AA	8.0	B		15	5	7			MIK
1988 02 17.48		M	7.2	AA	5.0	B		10					JAC01
1988 02 18.50		M	7.2	AA	5.0	B		10					JAC01
1988 02 19.00		S	8.3	NO	31.7	L	6	55	5.6	3	0.2	315	BOR
1988 02 20.76		S	8.9	AC	15.2	L	5	44	4.5	4			MOE
1988 02 20.76		S	9.1	AC	15.2	L	5	100	3.5	3			MOE
1988 02 21.19		M	8.4	AA	8.0	B		15	5	6			MIK
1988 02 21.43		S	8.0	NO	5.0	B		10	6.5	3/			BOR
1988 02 21.82		S	8.8	AA	31.0	L	6	63	5.2	4	0.25		HAS03
1988 02 22.14		M	8.4	AA	8.0	B		15	6	7			MIK
1988 02 22.51					41	L	4	83			0.25	310	HAL
1988 02 22.51		S	8.4	NP	5.0	B		10					HAL
1988 02 28.91		S	9.1	AA	20.0	R	14	40	1.2	4			SHA02
1988 03 05.77		S	9.8	AC	15.2	L	5	38	3	3			MOE
1988 03 05.77		S	9.8	AC	15.2	L	5	44	3	2			MOE
1988 03 05.77		S	10.0	AC	15.2	L	5	100	2.5	2			MOE
1988 03 06.02		S	9.0	AA	31.7	L	6	68	3.4	3			BOR
1988 03 07.13	!	M	9.0:	PC	41	L	4	83			0.17	310	HAL
1988 03 08.03		S	9.1	AA	31.7	L	6	68	2.5	3			BOR
1988 03 08.81		M	8.8	AC	25.4	J	6	48	3.5	4			BOU
1988 03 10.79		S	9.5	AA	8.0	B		15	4	5			MIK

Comet McNaught 1987b$_1$ [cont.]

DATE (UT)		MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 03 10.92		M	9.0	AC	25.4	J	6	48	3.5	4			BOU
1988 03 12.02		S	9.7	AA	31.7	L	6	68	2.0	3			BOR
1988 03 12.82		S	9.4	AC	25.4	J	6	48	3.5	3			BOU
1988 03 12.84		S	10.3	AC	15.2	L	5	44	3	4			MOE
1988 03 12.84		S	10.4	AC	15.2	L	5	100	2.5	3			MOE
1988 03 12.85		S	10.2	AC	15.2	L	5	38	3	4			MOE
1988 03 13.13	!	M	9.7	PC	41	L	4	83			0.25	295	HAL
1988 03 13.79		S	10.7	AC	15.2	L	5	38	3	2			MOE
1988 03 13.79		S	10.7	AC	15.2	L	5	44	3	2			MOE
1988 03 13.79		S	10.8	AC	15.2	L	5	100	2.5	2			MOE
1988 03 14.03		S	9.7	AA	31.7	L	6	68	2.2	2			BOR
1988 03 14.84		S	10.7	AC	15.2	L	5	38	3	2			MOE
1988 03 14.84		S	10.7	AC	15.2	L	5	44	3	2			MOE
1988 03 14.84		S	10.8	AC	15.2	L	5	100	2	2			MOE
1988 03 17.81		S	11.2	AC	15.2	L	5	38	& 2	2			MOE
1988 03 17.81		S	11.2	AC	15.2	L	5	44	& 2.5	2			MOE
1988 03 17.81		S	11.3	AC	15.2	L	5	100	& 2	1			MOE
1988 03 17.85		S	9.7	AC	25.4	J	6	48	3.3	2/			BOU
1988 03 20.03		S	10.2	AA	31.7	L	6	68	2.7	1			BOR
1988 03 20.16	!	S	9.7	PC	41	L	4	83					HAL
1988 03 26.50		S	9.6	AC	41	L	4	83					HAL
1988 04 09.87		M	9.8	AC	25.4	J	6	59	3.0	2/			BOU

Comet Bradfield 1987s

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 09 28.42	S	6.7	AA	8.0	B		15					SEA
1987 10 09.42	S	6.5	AA	8.0	B		15		7	0.9	80	SEA
1987 10 10.40	S	6.4	AA	8.0	B		15		7			SEA
1987 10 12.41	S	6.1	AA	8.0	B		15	3	7	0.8	92	SEA
1987 10 14.41	S	6.4	AA	8.0	B		15		7	>0.8	100	SEA
1987 10 16.41	S	6.2	AA	8.0	B		15		7		105	SEA
1987 10 17.08	M	7.0	AA	31.8	L	4	33	4	8	0.8	90	KEE
1987 10 17.09	B	6.6	AA	4.0	B		8	3	5	0.27	90	KEE
1987 10 17.41	S	6.0	AA	8.0	B		15	3	7	1.0	95	SEA
1987 10 18.08	B	6.5	AA	4.0	B		8					KEE
1987 10 19.08	B	6.4	AA	4.0	B		8	4	6	0.5	90	KEE
1987 10 19.08	I	6.2	AA	0.9	E		1					KEE
1987 10 21.07	B	6.3	AA	4.0	B		8			0.6	90	KEE
1987 10 21.07	I	6.1	AA	0.9	E		1					KEE
1987 10 22.82	S	6.7	AA	3.4	B		9	10		0.5	90	PER01
1987 10 23.08				31.8	L	4	63	5	8	0.6	90	KEE
1987 10 23.08	B	6.0	AA	4.0	B		8	5	6	0.6	90	KEE
1987 10 27.79	S	6.5	AA	3.4	B		9	5		0.2	100	PER01
1987 10 28.08	B	5.9	AA	4.0	B		8	6	7	0.6	90	KEE
1987 10 28.79	S	6.4	AA	3.4	B		9			0.07	100	PER01
1987 10 30.41	S	5.7	AA	8.0	B		15		7			SEA
1987 11 03.10	B	5.7	AA	4.0	B		8	6	7	0.4	80	KEE
1987 11 05.09	B	5.7	AA	4.0	B		8					KEE
1987 11 07.74	S	5.0	A	8.0	B		20	5	6	0.47	45	BAR
1987 11 07.80	S	5.9	AA	3.4	B		9					PER01
1987 11 08.72	M	5.3	VF	8.0	B		12		6			WES02
1987 11 08.79	S	6.1	AA	3.4	B		9	4		0.4	60	PER01
1987 11 09.07				31.8	L	4	33	4	8	1.2	70	KEE
1987 11 09.07	B	5.6	AA	4.0	B		8			1.0	70	KEE
1987 11 09.07	I	5.6	AA	0.9	E		1					KEE
1987 11 10.08				31.8	L	4	33	5	8	1.3	70	KEE
1987 11 10.08	B	5.6	AA	4.0	B		8			1.0	70	KEE
1987 11 10.08	I	5.5	AA	0.9	E		1					KEE

Comet Bradfield 1987s [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 11 10.80	S	5.9	AA	3.4	B		9	3.5		1.0	70	PER01
1987 11 11.74	M	6.2	VF	8.0	B		12		5	0.4	66	WES02
1987 11 12.43	M	4.8	AA	8.0	B		15		7	>1	70	SEA
1987 11 12.74	M	5.4	AA	8.0	B		20		7	1.5	63	BOU
1987 11 12.74	M	5.5	AA	5.0	B		10		8			BOU
1987 11 13.71	B	6.5:	AA	5.0	R	10	13	4.0	4	0.26	76	JAH
1987 11 14.71	B	6.1:	AA	5.0	R	10	13	7	6	0.37	41	JAH
1987 11 14.78	S	5.5	AA	3.4	B		9	4.5		0.4	70	PER01
1987 11 15.80	S	5.6	AA	3.4	B		9	6		0.8	75	PER01
1987 11 17.79	S	5.5	AA	3.4	B		9	8				PER01
1987 11 18.06	B	5.4	AA	4.0	B		8			1.8	65	KEE
1987 11 18.83	S	5.3	AA	3.4	B		9	7.5		1.5	65	PER01
1987 11 19.07	B	5.4	AA	4.0	B		8	10	8	2.0	70	KEE
1987 11 19.08	I	5.3	AA	0.9	E		1					KEE
1987 11 19.52	S	6.0	AA	20	L	4	45		7			PEA
1987 11 19.83	S	5.4	AA	3.4	B		9	5.5		1.6	65	PER01
1987 11 20.10	B	5.3	AA	4.0	B		8			2.0	60	KEE
1987 11 20.10	I	5.2	AA	0.9	E		1			2	60	KEE
1987 11 20.81	S	5.5	AA	3.4	B		9	7		3	65	PER01
1987 11 21.06	B	5.3	AA	4.0	B		8			2	60	KEE
1987 11 21.06	I	5.2	AA	0.9	E		1			4	60	KEE
1987 11 21.79	S	5.4	AA	3.4	B		9	5		1.4	60	PER01
1987 11 22.07	B	5.3	AA	4.0	B		8	7	8	2.5	55	KEE
1987 11 22.07	I	5.1	AA	0.9	E		1			3	55	KEE
1987 11 22.85	S	5.5	AA	3.4	B		9					PER01
1987 11 23.08	B	5.2	AA	4.0	B		8	8	7	3	65	KEE
1987 11 23.80	S	5.4	AA	3.4	B		9	3.5		2	70	PER01
1987 11 24.11	B	5.3	AA	4.0	B		8			3	65	KEE
1987 11 24.11	I	5.2	AA	0.9	E		1					KEE
1987 11 25.06	K	5.4	AA	4.0	B		8	9	7	3	65	KEE
1987 11 26.80	S	5.6	AA	3.4	B		9					PER01
1987 11 27.72	S	5.1	A	8.0	B		20	6	6	0.58	45	BAR
1987 11 27.78	S	5.3	AA	3.4	B		9	6.5		1.5	70	PER01
1987 11 28.05	B	5.5	AA	4.0	B		8	11	5	3.5	65	KEE
1987 11 28.64	B	6.4	S	11.0	L	7	32					FIL02
1987 11 28.64	E	6.6	S	11.0	L	7	32					FIL02
1987 11 28.78	S	5.3	AA	3.4	B		9	8.5		1.1	55	PER01
1987 11 29.08	S	5.6	AA	3.0	B		4			2	65	KEE
1987 11 29.62	E	6.1	S	11.0	L	7	32	3	7	0.1	55	FIL02
1987 11 29.74	B	5.9	S	6.0	B		20	2				FIL02
1987 11 29.74	M	5.5:	S	6.0	B		20					FIL02
1987 11 30.79	M	6.4	VF	8.0	B		12		5	0.2	70	WES02
1987 12 01.08	B	5.4	S	4.0	B		8	9	5	2	65	KEE
1987 12 01.78	M	5.7	SC	8.0	B		12		5	0.2	57	WES02
1987 12 02.73	M	5.8	SC	8.0	B		12		5	0.2	42	WES02
1987 12 03.68	B	5.7	AA	5.0	B		10		4			REI01
1987 12 03.78	S	5.6	AA	3.4	B		9					PER01
1987 12 03.79	M	5.8	SC	8.0	B		12		5			WES02
1987 12 04.65	B	6.4	S	11.0	L	7	32					FIL02
1987 12 04.65	E	6.3	S	11.0	L	7	32		8	&0.1	105	FIL02
1987 12 04.70	B	5.7	AA	5.0	B		10		4			REI01
1987 12 05.63	B	6.5	S	11.0	L	7	32		6	0.1	85	FIL02
1987 12 05.63	E	6.3	S	11.0	L	7	32					FIL02
1987 12 07.70	B	5.9	AA	5.0	R	10	13	6.5	4	0.57	50	JAH
1987 12 08.63	E	6.7	S	11.0	L	7	32		5			FIL02
1987 12 08.64	E	6.8	S	11.0	L	7	54	3.8				FIL02
1987 12 08.66	B	6.8	S	11.0	L	7	32			1.0	55	FIL02
1987 12 08.71	B	6.4	AA	5.0	R	10	13	8	4	0.53	72	JAH
1987 12 09.06	B	5.7	AA	4.0	B		8	9	5	3	60	KEE

Comet Bradfield 1987s [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 12 09.06	I	5.6	AA	0.9	E		1			1	60	KEE
1987 12 09.70	B	6.1	AA	5.0	B		10		4			REI01
1987 12 09.77	M	5.6	AA	8.0	B		20	6	6	3.0	72	BOU
1987 12 11.69	B	5.8	AA	5.0	R	10	13	8	6	0.62	70	JAH
1987 12 11.78	M	5.9	SC	8.0	B		12		6			WES02
1987 12 12.07	B	5.8	AA	4.0	B		8	10	5	4.5	55	KEE
1987 12 12.07	I	5.7	AA	0.9	E		1			2.5	55	KEE
1987 12 12.71		5.8:	AA	0.0	E		1	14	2			JAH
1987 12 12.71	B	5.5	AA	5.0	R	10	13	12	6	0.85	69	JAH
1987 12 13.80	S	5.5	AA	3.4	B		9	12		0.2	80	PER01
1987 12 13.81	M	5.9	SC	8.0	B		12		6			WES02
1987 12 14.70	B	6.2	AA	5.0	B		10		6			REI01
1987 12 14.71	M	6.3	VF	8.0	B		12		6	0.6	65	WES02
1987 12 15.09	S	5.7	A	8.0	B		11	6	4	2	50	SPR
1987 12 17.09	S	5.6	A	8.0	B		11	6	4	2	55	SPR
1987 12 17.82	M	6.4	VF	8.0	B		12		5	0.2	51	WES02
1987 12 18.66	E	6.7	S	11.0	L	7	32		4	1.6	60	FIL02
1987 12 18.68	E	6.9	S	11.0	L	7	54	6.2				FIL02
1987 12 19.80	S	5.9	AA	3.4	B		9	10		1	50	PER01
1987 12 20.09	S	5.7	A	8.0	B		11	6	4	1.5	55	SPR
1987 12 21.08	K	5.9	AA	4.0	B		8	10	3	3	60	KEE
1987 12 21.21	S	5.8	A	8.0	B		11	5	4	1	50	SPR
1987 12 21.91	S	6.0	AA	3.4	B		9					PER01
1987 12 22.70	B	6.0	AA	5.0	R	10	13	9.2	3	1.27	69	JAH
1987 12 22.76	M	5.9	AA	5.0	B		10		5			BOU
1987 12 22.76	M	6.0	AA	8.0	B		20	6.5	6	2.3	65	BOU
1987 12 23.65	E	7.1	S	11.0	L	7	32		6	1.0	70	FIL02
1987 12 23.66	B	7.1:	S	11.0	L	7	32					FIL02
1987 12 23.66	E	7.2	S	11.0	L	7	54	7.5				FIL02
1987 12 23.91	S	6.9	AA	15	L	4	26	9		0.2		PER01
1987 12 24.20	S	5.9	A	8.0	B		11	5.5	4	1	45	SPR
1987 12 24.65	B	7.4	S	11.0	L	7	32		6	1.8	70	FIL02
1987 12 24.68	E	6.9	S	11.0	L	7	32					FIL02
1987 12 25.09	S	5.9	A	8.0	B		11	5	4	0.5	45	SPR
1987 12 25.64	E	7.1	S	11.0	L	7	32		6	1.5	65	FIL02
1987 12 25.65	E	7.0	S	11.0	L	7	54	5.9				FIL02
1987 12 25.66	B	7.2	S	11.0	L	7	32					FIL02
1987 12 25.88	S	6.2	AA	3.4	B		9					PER01
1987 12 26.09	S	6.0	A	8.0	B		11	5	4	0.25	40	SPR
1987 12 26.10	S	5.9	SC	8.0	B	3	11	8	4	0.25	70	PRY
1987 12 27.09	S	6.1	A	8.0	B		11	4.5	3			SPR
1987 12 28.86	M	7.0	SC	8.0	B		12		5			WES02
1988 01 01.10	S	6.3	A	8.0	B		11	4.5	2			SPR
1988 01 01.66	E	7.3	S	11.0	L	7	32		7	0.8	75	FIL02
1988 01 01.68	E	7.1	AA	11.0	L	7	32					FIL02
1988 01 02.03	K	6.6	AA	4.0	B		8	9	3	1	55	KEE
1988 01 02.11	S	6.4	A	8.0	B		11	4	2			SPR
1988 01 03.10	S	6.4	A	8.0	B		11	4.5	1			SPR
1988 01 03.82	B	6.5:	AA	5.0	B		10		8			REI01
1988 01 03.89	S	7.1	AA	15	L	4	26	10				PER01
1988 01 04.99	S	6.2	HP	5.0	B		10	8	4			BOR
1988 01 05.97	E	6.4	HP	5.0	B		10					BOR
1988 01 05.97	S	6.3	HP	5.0	B		10	10	5	1.2	62	BOR
1988 01 06.40	S	6.7	AA	31.0	L	6	63	7.5	4	1.5		HAS03
1988 01 06.73	B	7.1	S	5.0	R	10	13	7	4	0.58	68	JAH
1988 01 06.99	E	6.4	HP	5.0	B		10	8	5	1.2	60	BOR
1988 01 07.54	S	7.5	AA	20	L	4	45	3	6			PEA
1988 01 07.85	S	6.6	A	8.0	B		20	5	3			BAR
1988 01 08.09	M	6.8	AA	5.0	B		10					JAC01

Comet Bradfield 1987s [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 01 08.75	B	7.7	S	5.0	R	10	13	5.8	5	0.32	61	JAH
1988 01 09.23	M	6.7	AA	5.0	B		10					JAC01
1988 01 09.54	S	7.5	AA	20	L	4	45					PEA
1988 01 09.71	B	7.3	AA	5.0	R	10	13	7	6	0.23	59	JAH
1988 01 09.94	S	7.3	AA	3.4	B		9	10		1		PER01
1988 01 11.41	S	7.3	AA	31.0	L	6	63	5.2	4			HAS03
1988 01 11.73	B	7.2	AA	5.0	R	10	13	8.2	5	0.40	72	JAH
1988 01 11.73	B	7.2	S	5.0	R	10	13					JAH
1988 01 11.79	M	6.8	AA	5.0	B		10		4			BOU
1988 01 11.79	M	6.8	AA	8.0	B		20	6	4/	1.2	69	BOU
1988 01 12.00	S	6.5	HP	5.0	B		10	11	4	1.0	58	BOR
1988 01 12.77	S	7.0	AA	8.0	B		20	6	3/	1.3	62	BOU
1988 01 12.81	S	6.1	S	5.0	R	10	13	6.7	5	0.23	49	JAH
1988 01 12.84	M	6.7	VF	8.0	B		12		3			WES02
1988 01 13.05	M	6.8	AA	5.0	B		10			1	65	JAC01
1988 01 13.79	S	7.3:	S	5.0	R	10	76	2.2	2			JAH
1988 01 13.79	S	7.4	S	5.0	R	10	13	5.6	2	0.23		JAH
1988 01 14.16	S	6.8	A	8.0	B		11	5	1			SPR
1988 01 14.77	M	7.0	AA	8.0	B		20	6	4	1.4	60	BOU
1988 01 14.77	S	6.9	AA	5.0	B		10		3			BOU
1988 01 15.21	M	6.8	AA	5.0	B		10	8	2			JAC01
1988 01 15.22	S	7.1	AA	6.0	R	13	32	5	4	0.10	78	JAC01
1988 01 16.03	S	6.7	HP	5.0	B		10	9	4	0.75	62	BOR
1988 01 17.03	M	6.9	AA	5.0	B		10					JAC01
1988 01 17.04				31.7	L	6	55	4.1	5	0.75	60	BOR
1988 01 17.04	S	6.8	HP	5.0	B		10	9	4	?		BOR
1988 01 18.03	M	6.9	AA	5.0	B		10					JAC01
1988 01 18.55	S	8.1	AA	20	L	4	45	4	6	0.5	78	PEA
1988 01 19.16	S	7.0	SC	20	C	10	100	5	5		45	PRY
1988 01 19.55	S	8.3	AA	20	L	4	45	4	6	0.4	69	PEA
1988 01 19.75	S	7.2	AA	8.0	B		20	6	3	0.9	61	BOU
1988 01 19.76	S	7.2	AA	5.0	B		10		1/			BOU
1988 01 20.54	S	8.3	AA	20	L	4	45	4.5	6	0.3	74	PEA
1988 01 21.11	M	7.3	AA	5.0	B		10		0			JAC01
1988 01 21.14	S	7.0	A	8.0	B		11	6	1			SPR
1988 01 21.19	M	7.5	AC	5.0	B		10			1	65	HAL
1988 01 21.73	B	8.2	AA	5.0	R	10	13	7.6	3			JAH
1988 01 21.73	B	8.4	S	5.0	R	10	13					JAH
1988 01 21.73	S	7.8	AA	5.0	R	10	13					JAH
1988 01 21.73	S	7.9	S	5.0	R	10	13					JAH
1988 01 21.85	S	7.3	AA	5.0	B		10		2			BOU
1988 01 21.85	S	7.3	AA	8.0	B		20	6	3	1.2	64	BOU
1988 01 22.02	B	7.9	S	7.0	B		10	7.5		0.33	60	DEA
1988 01 22.13	S	7.2	A	8.0	B		11	6	1			SPR
1988 01 22.55	S	8.5	AA	20	L	4	45	4	6	0.3	84	PEA
1988 01 23.13	S	7.4	A	8.0	B		11	5	1			SPR
1988 01 24.13	S	7.5	A	8.0	B		11	4.5	1			SPR
1988 01 24.40	S	7.9	S	16	L	6	31	5	5			SUG01
1988 01 25.43	S	8.2	AA	31.0	L	6	63	4.8	3			HAS03
1988 01 28.04	S	7.4	AA	25	L	4	46			0.25	72	JAC01
1988 01 31.16	M	7.7	AC	41	L	4	83					HAL
1988 01 31.17	S	7.8	AC	5.0	B		10					HAL
1988 01 31.79	S	8.7	AA	8.0	B		15	3	3			MIK
1988 02 01.04	S	7.9	AA	25	L	4	46			0.32	71	JAC01
1988 02 02.87	S	8.8	AA	20.0	R	14	40	2.0	5			SHA02
1988 02 04.45	S	9.0	AA	31.0	L	6	63	2.9	3			HAS03
1988 02 04.76	S	8.5	AA	8.0	B		15	3.5	3			KOR
1988 02 04.78	S	8.6	AA	20.0	R	14	40	3.7	6			SHA02
1988 02 05.78	S	8.5	AA	10.0	B		14	9.0	4			HAS02

Comet Bradfield 1987s [cont.]

DATE (UT)		MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 02 06.77		M	8.0	AC	15.6	L	5	29	5	3/			BOU
1988 02 06.78		S	8.0	AC	8.0	B		20		2/			BOU
1988 02 06.81		S	9.1	AA	8.0	B		20	4.0	5			SHA02
1988 02 06.82		S	9.0	AC	15.2	L	5	38	7	3	0.6	70	MOE
1988 02 06.82		S	9.0	AC	15.2	L	5	44	6.5	3	0.6	70	MOE
1988 02 06.82		S	9.3	AC	15.2	L	5	100	5.5	2			MOE
1988 02 07.00		S	7.9	AA	5.0	B		10	9	3			BOR
1988 02 07.00		S	8.8	AA	31.7	L	6	68	2.9	5	?		BOR
1988 02 07.56		S	9.2	AA	20	L	4	45	2.5	4			PEA
1988 02 07.74		S	8.9	AC	15.2	L	5	44	6.5	2	0.7	70	MOE
1988 02 07.75		S	8.8	AC	15.2	L	5	38	7	2	0.7	70	MOE
1988 02 07.75		S	9.1	AC	15.2	L	5	100	5	2			MOE
1988 02 07.77		S	8.1	AC	8.0	B		20	5.5	2	0.5		BOU
1988 02 07.78		S	9.0	AA	8.0	B		15	5	3			KOR
1988 02 07.84		B	8.9	AC	35	T	6	96	1.1	5	0.15	290	AMO
1988 02 08.18		S	8.0	PC	5.0	B		10					HAL
1988 02 09.56		S	9.5	AA	20	L	4	45	3	5			PEA
1988 02 09.88		S	9.2	AA	20.0	R	14	40	3.0	4			SHA02
1988 02 10.54		S	9.6	AA	31.0	L	6	63	4.5	2			HAS03
1988 02 10.78		S	9.3	AC	15.2	L	5	44	5	2	0.4	70	MOE
1988 02 10.78		S	9.5	AC	15.2	L	5	100	4	2			MOE
1988 02 11.01		S	8.3	AA	5.0	B		10	4.5				BOR
1988 02 11.01		S	8.9	AA	31.7	L	6	55	3.2	4	0.2	50	BOR
1988 02 11.09		M	7.9	AA	5.0	B		10	6	1/			JAC01
1988 02 11.56		S	9.5	AA	20	L	4	45	3	4/			PEA
1988 02 11.75		S	9.5	AC	15.2	L	5	44	5	2	0.3	70	MOE
1988 02 11.75		S	9.8	AC	15.2	L	5	100	4.5	1			MOE
1988 02 11.76		S	9.5	AC	15.2	L	5	38	6	2	0.3	70	MOE
1988 02 11.79		S	9.1	AA	8.0	B		15	5.5	6			MIK
1988 02 12.07		M	8.0	AA	5.0	B		10					JAC01
1988 02 12.93		S	9.2	AA	8.0	B		20	4.0	4			SHA02
1988 02 13.78		B	9.7	AC	35	T	6	96	1.5	7	0.06	310	AMO
1988 02 13.89		S	8.5	S	10.0	B		14	5.2	3			HAS02
1988 02 14.16		M	7.9	PC	5.0	B		10					HAL
1988 02 14.83		S	9.2	AA	8.0	B		15	4.5	4			MIK
1988 02 14.83		S	9.5	AA	36.0	T	11	123	3	3	&0.12	100	KOR
1988 02 14.85	!	S	9.2	VB	20.0	R	14	40	3.7	4			SHA02
1988 02 14.86		S	8.8	S	10.0	B		14	3.5	3			HAS02
1988 02 15.56		S	9.3	AA	31.0	L	6	166	3.0	3			HAS03
1988 02 15.56		S	9.8	AA	20	L	4	45	2				PEA
1988 02 15.80		S	8.8	S	10.0	B		14	3.6	4			HAS02
1988 02 16.13		M	8.2	AA	5.0	B		10					JAC01
1988 02 16.79		S	8.5	AC	8.0	B		20	5	1			BOU
1988 02 16.80		S	9.1	AA	8.0	B		15	5.5	5			MIK
1988 02 16.92	!	S	9.3	VB	20.0	R	14	40	2.9	3			SHA02
1988 02 17.03		S	9.3	AA	31.7	L	6	68	3.5	3/			BOR
1988 02 17.57		S	10.2:	AA	20	L	4	45					PEA
1988 02 19.01		S	9.4	AA	31.7	L	6	68	3.6	4			BOR
1988 02 20.76		S	10.3	AC	15.2	L	5	44	3	2			MOE
1988 02 20.77		S	10.3	AC	15.2	L	5	38	3.5	2			MOE
1988 02 20.77		S	10.4	AC	15.2	L	5	100	2.5	2			MOE
1988 02 21.19		M	8.3	PC	41	L	4	83					HAL
1988 02 22.03		S	9.4	AA	31.7	L	6	68	3.2	3/			BOR
1988 03 05.78		S	10.8	AC	15.2	L	5	44	3	2			MOE
1988 03 05.79		S	10.9	AC	15.2	L	5	38	3.5	2			MOE
1988 03 05.79		S	11.0	AC	15.2	L	5	100	2	1			MOE
1988 03 06.03		S	10.4	AA	31.7	L	6	68	4.2	2			BOR
1988 03 06.13		M	9.4	PC	41	L	4	83					HAL
1988 03 07.82		S	9.8	AC	25.4	J	6	48	3.5	1			BOU

Comet Bradfield 1987s [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 03 08.03	S	10.2	AA	31.7	L	6	68	2.4	2			BOR
1988 03 08.82	S	10.1	AC	25.4	J	6	48	3.2	0/			BOU
1988 03 12.02	S	10.5	AA	31.7	L	6	68	2.3	1			BOR
1988 03 12.81	S	10.5	AC	25.4	J	6	48	& 3	0/			BOU
1988 03 12.83	S	11.4	AC	15.2	L	5	38	2	2			MOE
1988 03 12.83	S	11.4	AC	15.2	L	5	44	2	2			MOE
1988 03 12.83	S	11.5	AC	15.2	L	5	100	1.5	2			MOE
1988 03 13.16	M	10.1	PC	41	L	4	83					HAL
1988 03 13.79	S	11.4	AC	15.2	L	5	44	1.8	2			MOE
1988 03 13.80	S	11.4	AC	15.2	L	5	38	2.0	2			MOE
1988 03 13.80	S	11.5	AC	15.2	L	5	100	1.6	2			MOE
1988 03 14.04	S	11.3	AA	31.7	L	6	68	2.2	0			BOR
1988 03 14.85	S	11.7	AC	15.2	L	5	38	1.5	1			MOE
1988 03 14.85	S	11.7	AC	15.2	L	5	44	1.5	1			MOE
1988 03 14.85	S	11.9	AC	15.2	L	5	100	1.5	1			MOE
1988 03 17.81	S	11.8	AC	15.2	L	5	44	1.5	1			MOE
1988 03 17.81	S	11.9	AC	15.2	L	5	100	1.2	1			MOE
1988 03 17.82	S	11.8	AC	15.2	L	5	38	1.5	1			MOE
1988 03 17.84	S	10.8	AC	25.4	J	6	48	3.0	0/			BOU
1988 03 20.04	S	11.2	AA	31.7	L	6	68	2.0	1			BOR
1988 03 20.18	M	9.9	PC	41	L	4	83					HAL

Comet Rudenko 1987u

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 10 27.74	S	6.6	AA	8.0	B		15	& 1	7			SEA
1987 10 30.73	S	6.4	AA	8.0	B		15		7			SEA
1987 10 31.66	S	7.6	SC	7.8	R	8	30					JON
1987 10 31.72	S	6.4	AA	8.0	B		15		6			SEA
1987 10 31.73	S	6.4	AA	15.2	L	5	29		7			SEA
1987 11 04.65	S	8.0	SC	7.8	R	8	30					JON
1987 11 05.66	S	8.5	S	7.8	R	8	30					JON
1987 11 10.66	S	8.4	S	7.8	R	8	30					JON
1987 11 15.64				31.7	L	5	86	2.5	4			JON
1987 11 15.64	S	8.0	SC	4.5	R	6	13					JON
1987 11 17.65	S	9.1	AA	7.8	R	8	30					JON
1987 11 18.61	S	8.1	AA	8.0	B		15	5	4			SEA
1987 11 22.60	S	8.4	AA	8.0	B		15					SEA
1987 11 23.75	S	8.5	AA	20	L	4	45	3.5	4/			PEA
1987 11 24.59	S	8.4	AA	8.0	B		15					SEA
1987 11 24.61	S	8.9	AA	4.5	R	6	13					JON
1987 11 24.80	S	8.7	AA	20	L	4	45	4	4			PEA
1987 11 25.60	S	8.3	AA	8.0	B		15					SEA
1987 12 11.49	S	10.1	VN	7.8	R	8	30					JON
1987 12 11.49	S	10.5	VN	31.7	L	5	86	2	1/			JON
1987 12 13.50	S	10.0	V	8.0	B		15					SEA
1987 12 14.55	S	10.0	AA	20	L	4	45	3.5	2			PEA
1987 12 15.56	S	10.1	AA	20	L	4	45	3	2			PEA
1987 12 16.58	S	10.1	AA	20	L	4	45	4	3			PEA
1987 12 17.75	S	10.2	AA	20	L	4	45	3.5	2/			PEA

Comet Levy 1987y

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 10 17.07	S	9.4	AA	31.8	L	4	33	4	1			KEE
1987 10 21.09	S	9.4	AA	15.2	L	3	16	7	1			KEE
1987 11 09.06	S	11.0	AC	31.8	L	4	63	4	1			KEE

Comet Shoemaker 1988b

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 03 10.24	I[	14.0		41	L	4	244					HAL

Comet Maury-Phinney 1988c

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 03 12.23	I[	13.5		41	L	4	244					HAL

Comet Levy 1988e

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 03 22.51	S	11.8	AC	41	L	4	83		4			HAL
1988 03 26.50	S	11.8	AC	41	L	4	83					HAL

Comet Ichimura 1987d$_1$

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 11 23.53	S	8.5	AA	20	L	4	45	12	3			PEA
1987 11 24.46	S	8.4	AA	8.0	B		15	12	2			SEA
1987 11 24.46	S	9.0	S	4.5	R	6	13					JON
1987 11 24.46	S	9.0	S	7.8	R	8	30					JON
1987 11 24.75	S	8.5	AA	20	L	4	45	10	3			PEA
1987 11 25.23	M	8.3	AA	31.8	L	4	33	15	1			KEE
1987 11 25.24	K	7.9	AA	4.0	B		8	13	1			KEE
1987 11 25.43	S	7.3	AA	5.0	B		10	16	1			SEA
1987 11 25.44	S	8.0	AA	5.0	B		10		2			WIL02
1987 11 29.32	K	7.9	S	12.0	B		20	11	1			KEE
1987 11 30.40	S	8.3	S	7.8	R	8	30	3				JON
1987 11 30.60	S	8.2	VN	4.5	R	6	13					JON
1987 11 30.69	S	7.6	AA	5.0	B		10		2			WIL02
1987 12 05.41	S	9.1	VN	7.8	R	8	30	2	1			JON
1987 12 06.42	S	5.9	AA	5.0	B		10					SEA
1987 12 06.44	S	7.5	AA	5.0	B		10		2			WIL02
1987 12 08.56	S	7.0	AA	20	L	4	45	7	3/			PEA
1987 12 11.43	S	8.2	VN	4.5	R	6	13					JON
1987 12 11.43	S	8.8	VN	7.8	R	8	30	2				JON
1987 12 12.38	S	7.5	AA	5.0	B		10	7	2			WIL02
1987 12 13.43	S	8.7	VN	7.8	R	8	30	3				JON
1987 12 13.43	S	9.1	S	7.8	R	8	30					JON
1987 12 13.45	S	7.5	AA	5.0	B		10	12	2			SEA
1987 12 14.49	S	7.5	AA	5.0	B		10					SEA
1987 12 14.51	S	8.0	AA	20	L	4	45	6	2			PEA
1987 12 15.44	S	7.3	AA	8.0	B		15	10	1			SEA
1987 12 15.52	S	8.2	AA	20	L	4	45	5.5	2			PEA
1987 12 16.55	S	8.0	AA	20	L	4	45	6	2	0.8	101	PEA
1987 12 27.53	S[	8.0	AA	20	L	4	45					PEA
1988 02 11.51	I[	8.0	AA	25	L	4	46					JAC01
1988 02 17.51	I[	8.5	AA	25	L	4	46					JAC01
1988 03 14.46	I[	10.5	L	25	L	4	179					JAC01
1988 03 14.47	S[	8.0	AA	25	L	4	46					JAC01

Comet Furuyama 1987f$_1$

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 11 25.28	M	10.1	AC	31.8	L	4	63	4	2			KEE
1987 11 26.63	S	11.3	V	25.4	L	4	44	2	5			SEA
1987 12 01.28	S	10.0	AC	15.2	L	3	24	4	1			KEE
1987 12 08.55	S	10.6	VN	20	L	4	45	1.2				PEA
1987 12 09.79	S	9.8	AC	25.4	J	6	59	2.5	2/			BOU
1987 12 10.19	S	10.1:	L	25	L	4	82					JAC01

Comet Furuyama 1987f$_1$ [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 12 11.23	S	9.9	L	13	L	8	40					JAC01
1987 12 11.23	S	10.0	L	25	L	4	82	4	3			JAC01
1987 12 13.51	S	9.8	AA	8.0	B		15					SEA
1987 12 15.10	S	9.9	A	20.0	C	10	64	2	1			SPR
1987 12 16.21	M	10.3	AA	31.8	L	4	63	4	4			KEE
1987 12 16.62	S	10.4	VN	20	L	4	45	3	4/			PEA
1987 12 17.08	S	9.4	AA	13	L	8	40					JAC01
1987 12 17.11	S	10.0	A	20.0	C	10	64	2	1			SPR
1987 12 17.73	S	10.4	VN	20	L	4	45	2.5	4			PEA
1987 12 19.08	B	9.2	AA	13	L	8	40	4.5	2/			JAC01
1987 12 20.13	S	9.8	A	20.0	C	10	64	2	2			SPR
1987 12 22.80	S	10.4	AC	25.4	J	6	59	2.2	1/			BOU
1987 12 26.64	S	10.4	VN	20	L	4	45	3	4			PEA
1987 12 27.66	S	10.4	VN	20	L	4	45	2.5	3/			PEA
1987 12 28.71	S	10.3	VN	20	L	4	45	3	4/			PEA
1988 01 05.04	S	9.6:	AA	13	L	8	40					JAC01
1988 01 07.48	S	10.1	AA	15.2	L	5	29		5			SEA
1988 01 08.09	S	9.7	AA	25	L	4	82	3.5	3			JAC01
1988 01 11.46	S	9.6	AA	8.0	B		15					SEA
1988 01 11.78	S	10.6	AC	25.4	J	6	73	& 2.0	1			BOU
1988 01 13.57	S	10.2	VN	20	L	4	45	3				PEA
1988 01 14.46	S	9.7	AA	8.0	B		15					SEA
1988 01 14.59	S	10.2	VN	20	L	4	45	3	4			PEA
1988 01 18.03	S	9.8	AA	25	L	4	82					JAC01
1988 01 18.60	S	10.1	VN	20	L	4	45	3	4/			PEA
1988 01 19.14	S	10.5	AA	20	C	10	50	2.5	1			PRY
1988 01 19.58	S	10.2	VN	20	L	4	45	3.5	5			PEA
1988 01 20.57	S	10.2	VN	20	L	4	45	4	4/			PEA
1988 01 21.14	M	9.8	PC	41	L	4	83					HAL
1988 01 22.57	S	10.5:	VN	20	L	4	45		4			PEA
1988 01 23.57	S	10.3	VN	20	L	4	45	3	4			PEA
1988 02 08.12	M	9.7	AC	41	L	4	83					HAL
1988 02 09.57	S	10.6	VN	20	L	4	45	2	4			PEA
1988 02 10.58	S	10.5	VN	20	L	4	45					PEA
1988 02 11.06	S	9.7	AA	25	L	4	46	4.1	2			JAC01
1988 02 11.57	S	10.5	VN	20	L	4	45	2	4			PEA
1988 02 13.57	S	10.5	VN	20	L	4	45	3	4			PEA
1988 02 14.12	! M	9.7	AC	41	L	4	83					HAL
1988 02 15.56	S	10.7	VN	20	L	4	45	2				PEA
1988 02 19.58	S	11.0	VN	41	L	4	91	2	4			PEA
1988 02 21.10	! M	9.9	AC	41	L	4	83					HAL
1988 03 14.06	S	10.2:	AA	25	L	4	46					JAC01

Comet Liller 1988a

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 01 13.41	S	9.7	AA	15.2	L	5	29	4	5			SEA
1988 01 13.56	S	10.5	AA	32	L	4	60	2	4			PEA
1988 01 14.56	S	10.2	AA	32	L	4	60	3	4			PEA
1988 01 17.02	S	9.9	AA	25	L	4	82	4.5	3	?0.03	49	JAC01
1988 01 18.02	S	9.9	AA	25	L	4	46	5	3			JAC01
1988 01 18.57	S	10.0	AA	32	L	4	60	3	5			PEA
1988 01 19.58	S	9.9	AA	32	L	4	60	3	5			PEA
1988 01 20.56	S	9.8	AA	20	L	4	45	3	5			PEA
1988 01 21.03	B	9.6	AA	25	L	4	46					JAC01
1988 01 21.09	M	9.1	AC	41	L	4	83					HAL
1988 01 22.57	S	10.0	AA	20	L	4	45	3	4/			PEA
1988 01 23.41	S	9.5	S	31.7	L	5	86	1	1			JON
1988 01 23.56	S	10.2	AA	20	L	4	45	2.5	4/			PEA

Comet Liller 1988a [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 01 28.03	B	9.7	AA	25	L	4	46					JAC01
1988 02 01.04	S	9.0	AA	25	L	4	46					JAC01
1988 02 04.77	S	9.4	AA	20.0	R	14	40	2.5	4			SHA02
1988 02 06.76	S	9.1	AC	15.6	L	5	36	3	3/			BOU
1988 02 06.78	S	8.9	AA	20.0	R	14	40	3.0	4			SHA02
1988 02 06.99	S	9.0	AA	31.7	L	6	55	2.4	5			BOR
1988 02 07.76	S	8.8:	AA	8.0	B		15	& 4	3			KOR
1988 02 07.76	S	8.9	AC	25.4	J	6	59	3.0	2/			BOU
1988 02 08.03	M	8.4	AA	8.0	B		20	6.5	2			JAC01
1988 02 08.03	M	8.4	AA	25	L	4	46			0.07	65	JAC01
1988 02 08.04	M	8.7	AA	6.0	R	13	32					JAC01
1988 02 08.10	M	8.8	AC	41	L	4	83					HAL
1988 02 09.55	S	9.3	AA	20	L	4	45	2.5	4			PEA
1988 02 10.99	S	9.2	AA	31.7	L	6	55	2.0	4			BOR
1988 02 11.06	M	8.0	AA	5.0	B		10					JAC01
1988 02 11.07	M	8.2	AA	25	L	4	46	10	3	0.08	65	JAC01
1988 02 11.55	S	9.0:	AA	20	L	4	45					PEA
1988 02 12.05	M	8.2	AA	13	L	8	40					JAC01
1988 02 12.79	S	8.9	S	20.0	R	14	40	3.0	5			SHA02
1988 02 14.10	! S	8.5	AC	5.0	B		10					HAL
1988 02 14.76	S	8.6:	S	10.0	B		14	3.4	4			HAS02
1988 02 14.76	S	8.7:	AA	8.0	B		15	& 3	3			KOR
1988 02 14.79	S	9.2	S	20.0	R	14	40	3.0	4			SHA02
1988 02 15.77	S	8.1	S	8.0	B		20	3.2	4			HAS02
1988 02 15.77	S	8.2	S	8.0	B		20	1.8	5			KOC01
1988 02 21.12	! M	8.3	AC	41	L	4	83					HAL
1988 02 22.01	O	8.3	S	14	S		19		6			CHE
1988 02 22.09	M	8.1	AA	13	L	8	40					JAC01
1988 03 06.01	B	8.2	AA	31.7	L	6	55					BOR
1988 03 06.01	S	8.1	AA	31.7	L	6	55	2.5	7			BOR
1988 03 06.11	! S	7.4	NP	5.0	B		10					HAL
1988 03 07.41	M	7.7	AA	31.0	L	6	63	2.5	6			HAS03
1988 03 07.79	S	7.2:	AC	8.0	B		20					BOU
1988 03 12.01	B	7.5	MP	31.7	L	6	55					BOR
1988 03 12.01	S	7.1	MP	5.0	B		10	4				BOR
1988 03 12.01	S	7.4	MP	31.7	L	6	55	2.0	6/			BOR
1988 03 12.11	! S	7.4:	NP	5.0	B		10					HAL
1988 03 18.01	S	7.3	HP	8.0	B		20	2	6	?		BOR
1988 03 18.11	! S	7.2:	PC	41	L	4	83					HAL
1988 03 20.11	! M	7.1:	PC	41	L	4	83					HAL
1988 03 31.11	! S	6.8:	PC	41	L	4	83					HAL
1988 04 04.11	! M	6.0	PC	20	L	6	61					HAL
1988 04 04.11	! S	6.1	PC	5.0	B		10					HAL
1988 04 09.84	B	5.8	AA	8.0	B		20	3.5	8	0.9	355	BOU
1988 04 09.84	M	5.8	AA	5.0	B		10		8			BOU
1988 04 10.11	M	5.7	AA	5.0	B		10		8			BOU
1988 04 11.02	S	5.5	AA	5.0	B		7		5/			GRE
1988 04 11.02	S	5.6	HR	5.0	B		7		5/			GRE
1988 04 11.03	S	5.4	AA	8.0	B		20	& 5	6/			GRE
1988 04 11.03	S	5.5	HR	8.0	B		20	& 5	6/			GRE
1988 04 13.02	B	5.8	AA	5.0	B		7	& 7	5/			GRE
1988 04 13.03	M	5.7:	AA	8.0	B		20					GRE
1988 04 13.03	S	5.5	AA	5.0	B		7	& 7	5/			GRE
1988 04 13.03	S	5.5	AA	8.0	B		20	& 5.8	6/			GRE

Periodic comet Encke (1980 XI)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1980 11 10.16	S	7.0	S	48.5	L	4	115	15				MOE

Periodic comet Grigg-Skjellerup (1986m)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 05 17.16	I	[12.5		20	L	6	163					HAL
1987 05 29.18	S	[13.0	CA	41	L	4	244	! 1.0				HAL
1987 05 30.19	I	[13.0		41	L	4	244					HAL

Periodic comet Kohoutek (1986k)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 12 17.16	S	13.2	L	25	L	4	179	1.9	2			JAC01
1987 12 19.33	S	13.2	L	25	L	4	179					JAC01
1988 01 10.13	S	13.1	L	25	L	4	179	1.4	2			JAC01
1988 01 13.67	S	13.0	VN	32	L	4	60	1.4	1			PEA
1988 01 13.67	S	13.2	VN	32	L	4	114	1	1			PEA
1988 01 14.65	S	13.2	VN	32	L	4	114	1.2	1			PEA
1988 01 15.27	S	13.1	L	25	L	4	179					JAC01
1988 01 18.66	S	12.9	VN	32	L	4	60	2	1			PEA
1988 01 19.67	S	13.2	VN	32	L	4	114	1	0/			PEA
1988 01 20.75	S	13.0	VN	32	L	4	60	1.5	0			PEA
1988 01 20.75	S	13.2	VN	32	L	4	114		0			PEA
1988 01 22.76	S	12.9	VN	32	L	4	60	1.6	0			PEA
1988 01 23.46	S	12.8	CA	41	L	4	183					HAL
1988 01 26.78	S	[13.0	VN	32	L	4	60					PEA
1988 02 08.08	S	12.9	L	25	L	4	179					JAC01
1988 02 09.24	S	13.2	CA	41	L	4	83					HAL
1988 02 17.24	S	13.2	CA	41	L	4	83					HAL
1988 03 10.20	S	[13.8	AC	41	L	4	183	0.5				HAL
1988 03 20.27	I	[13.5	AC	41	L	4	244					HAL

Periodic comet Borrelly (1987p)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 07 03.45	I	[12.0		41	L	4	244					HAL
1987 07 26.44	I	[12.5		41	L	4	244					HAL
1987 10 10.44	S	11.8	VN	31.7	L	5	86	& 1	3			JON
1987 10 11.48	S	12.0	VN	31.7	L	5	86	& 1	3			JON
1987 10 16.48	S	10.4	VN	7.8	R	8	30					JON
1987 10 16.48	S	10.9	VN	31.7	L	5	86	1.5	4			JON
1987 10 17.45	S	11.2	VN	31.7	L	5	86	1.5	7			JON
1987 10 18.78				31.7	L	5	86	1.5	3			JON
1987 10 18.78	S	10.6	VN	7.8	R	8	30					JON
1987 10 19.44	S	10.5	VN	7.8	R	8	30					JON
1987 10 20.46	S	10.5	VN	7.8	R	8	30					JON
1987 10 21.45	S	10.5	VN	7.8	R	8	30					JON
1987 10 31.64				31.7	L	5	86	2	5/			JON
1987 10 31.64	S	9.7	VN	7.8	R	8	30					JON
1987 11 01.67	S	9.8	VN	7.8	R	8	30					JON
1987 11 15.96	S	8.0	SC	40	L	5	66	3		0.13		BOA
1987 11 16.47				31.7	L	5	86	3	6/			JON
1987 11 16.47	S	8.5	VN	4.5	R	6	13					JON
1987 11 17.03	S	8.8	AA	15	L	4	26	4				PER01
1987 11 17.42	S	8.6	VN	4.5	R	6	13					JON
1987 11 18.92	S	7.9	SC	33	L	4	50	4.5		0.12	167	BOA
1987 11 19.99	S	9.0	AA	15	L	4	26	2				PER01
1987 11 20.21	K	8.3	S	12.0	B		20	6	2			KEE
1987 11 20.24	B	8.1	S	31.8	L	4	33	7	5			KEE
1987 11 20.25	B	8.2	S	12.0	B		20	7	3			KEE
1987 11 21.00	S	8.9	AA	15	L	4	26	3.5				PER01
1987 11 21.90	S	7.3	SC	33	L	4	50		4			BOA
1987 11 22.04	S	8.6	AA	15	L	4	26	4				PER01
1987 11 22.33	B	7.7	S	4.0	B		8	13	3			KEE

Periodic comet Borrelly (1987p) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 11 23.00	S	8.4	AA	15	L	4	26	4				PER01
1987 11 23.29	M	7.7	S	4.0	B		8					KEE
1987 11 23.77	S	7.5	AA	20	L	4	45	4	7			PEA
1987 11 24.04	S	8.4	AA	15	L	4	26	3				PER01
1987 11 24.49	S	7.7	S	4.5	R	6	13					JON
1987 11 24.75	S	7.8	AA	20	L	4	45	4	8			PEA
1987 11 25.22	K	7.8	S	4.0	B		8	7	3			KEE
1987 11 25.22	M	8.0	S	31.8	L	4	63	8	6			KEE
1987 11 26.03	S	8.2	AA	15	L	4	26	3				PER01
1987 11 29.01	S	7.3	AA	3.4	B		9	8				PER01
1987 11 30.61	S	7.8	SC	4.5	R	6	13					JON
1987 12 08.58	S	7.5	AA	20	L	4	45	4	7/			PEA
1987 12 09.80	S	7.5	AC	8.0	B		20	9	2/			BOU
1987 12 11.39				31.7	L	5	86		8	?	55	JON
1987 12 11.39	S	8.2	AA	4.5	R	6	13					JON
1987 12 11.81	B	7.7	AA	5.0	R	10	13	6.4	3			JAH
1987 12 11.97	S	7.5	AA	15	L	4	26	5				PER01
1987 12 12.81	S	7.6	AA	5.0	R	10	13	2.9	3			JAH
1987 12 13.41	S	7.9	AA	4.5	R	6	13					JON
1987 12 13.47	M	7.0	AA	5.0	B		10	16	6			SEA
1987 12 14.53	S	7.8	AA	20	L	4	45	4	7			PEA
1987 12 15.10	S	7.4	A	8.0	B		11	5	4	0.17	60	SPR
1987 12 15.47	M	7.2	AA	8.0	B		15	10	6			SEA
1987 12 15.54	S	7.9	AA	20	L	4	45	4	6/			PEA
1987 12 16.20	K	7.4	AA	4.0	B		8	15	4			KEE
1987 12 16.57	S	7.5	AA	20	L	4	45	4	7			PEA
1987 12 17.11	S	7.4	A	8.0	B		11	6	5	0.17	60	SPR
1987 12 17.73	S	7.5	AA	20	L	4	45	4	7			PEA
1987 12 18.70	E	8.7	S	11.0	L	7	32		6	0.1	95	FIL02
1987 12 18.71	E	8.8	S	11.0	L	7	54	2.2				FIL02
1987 12 20.10	S	7.2	A	8.0	B		11	5	4			SPR
1987 12 20.75	S	7.5	A	8.0	B		20	8	7			BAR
1987 12 21.21	S	7.3	A	8.0	B		11	4	3			SPR
1987 12 22.77	S	7.5	AA	8.0	B		20	8	4			BOU
1987 12 22.78	M	7.7	AA	25.4	J	6	48		6			BOU
1987 12 22.78	S	7.3	AA	5.0	R	10	13	5.2	4			JAH
1987 12 22.78	S	7.5	AA	5.0	B		10		2			BOU
1987 12 23.40	S	8.6	S	7.8	R	8	30					JON
1987 12 24.20	S	7.1	A	8.0	B		11	5	3	0.17	60	SPR
1987 12 25.10	S	7.3	A	8.0	B		11	4	3			SPR
1987 12 26.02	S	7.7	AA	3.4	B		9					PER01
1987 12 26.10	S	7.4	A	8.0	R	4	19	3.5	3			SPR
1987 12 26.10	S	7.5	AA	8.0	B	3	11	10	1			PRY
1987 12 26.44	S	8.5	MS	7.8	R	8	30					JON
1987 12 26.62	S	8.0	AA	20	L	4	45	3.5	7			PEA
1987 12 27.45	S	8.6	MS	7.8	R	8	30					JON
1987 12 27.45	S	9.6	MS	31.7	L	5	86	1	5			JON
1987 12 27.64	S	8.1	AA	20	L	4	45	3.2	7			PEA
1988 01 03.10	S	7.4	A	8.0	R	4	19	3	2			SPR
1988 01 05.45	S	8.1	AA	8.0	B		15					SEA
1988 01 05.97	S	7.6	NO	5.0	B		10	9	3			BOR
1988 01 06.47	S	8.1	AA	8.0	B		15					SEA
1988 01 06.75	S	7.5	AA	5.0	R	10	13	5.9	2			JAH
1988 01 06.99	S	7.6	NO	5.0	B		10	9	4			BOR
1988 01 07.55	S	8.5	AA	20	L	4	45	3	5/			PEA
1988 01 07.97	S	9.2	AA	15	L	4	26					PER01
1988 01 09.54	S	8.5	AA	20	L	4	45					PEA
1988 01 09.97	S	9.0	AA	15	L	4	26	4				PER01
1988 01 11.80	M	8.2	AC	25.4	J	6	48		7			BOU

Periodic comet Borrelly (1987p) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 01 11.80	S	8.1	AA	8.0	B		20		4			BOU
1988 01 11.83	S	8.4	S	5.0	R	10	13	3.8	2	0.20	54	JAH
1988 01 11.95	S	8.1	AA	5.0	B		10	8	2			BOU
1988 01 12.01	S	7.7	NO	5.0	B		10	10	3			BOR
1988 01 12.78	S	8.1	AA	5.0	B		10		2			BOU
1988 01 12.78	S	8.1	AA	8.0	B		20	7	3/			BOU
1988 01 12.83	B	7.9	S	5.0	R	10	13	6.8	2			JAH
1988 01 13.55	S	8.5	AA	20	L	4	45	3	5			PEA
1988 01 13.80	S	7.4	S	5.0	R	10	13	5.0	3			JAH
1988 01 14.16	S	7.7	A	8.0	B		11	4	2			SPR
1988 01 14.54	S	8.7	AA	20	L	4	45	4	5/			PEA
1988 01 14.78	S	8.3	AC	8.0	B		20	8	2			BOU
1988 01 15.22	M	7.7	AA	5.0	B		10					JAC01
1988 01 16.98	S	9.0	AA	15	L	4	26	3				PER01
1988 01 17.03	M	8.0	AA	5.0	B		10					JAC01
1988 01 17.05	S	8.2	NO	5.0	B		10	11	2			BOR
1988 01 17.05	S	8.8	NO	31.7	L	6	68	4.6	4			BOR
1988 01 17.99	S	8.4	AC	15.6	L	5	29	7	1/			BOU
1988 01 18.00	S	8.3	AC	8.0	B		20	8	1			BOU
1988 01 18.00	S	8.6	AC	15.6	L	5	45	5.5	2/			BOU
1988 01 18.57	S	9.0	AA	20	L	4	45	2.5	5			PEA
1988 01 19.19	S	8.3	AA	20	C	10	50	3	3			PRY
1988 01 19.56	S	9.2	AA	20	L	4	45	2	5/			PEA
1988 01 19.76	S	8.3	AC	8.0	B		20	7.5	1/			BOU
1988 01 20.55	S	9.2	AA	20	L	4	45	2.5	6			PEA
1988 01 21.11	M	8.2	AA	5.0	B		10					JAC01
1988 01 21.15	S	8.0	A	20.0	C	10	64	4	2			SPR
1988 01 21.23	S	7.7	PC	5.0	B		10					HAL
1988 01 21.86	S	8.4	AC	8.0	B		20	7	2/			BOU
1988 01 22.13	S	8.2	A	8.0	B		11	3	1			SPR
1988 01 22.55	S	9.2	AA	20	L	4	45	3	5/			PEA
1988 01 23.13	S	8.3	A	20.0	C	10	64	3.5	3			SPR
1988 01 23.57	S	9.3	AA	20	L	4	45	2.8	5			PEA
1988 01 23.91	S	9.5	AC	33	L	4	50	5	1			PAM
1988 01 24.13	S	8.4	A	20.0	C	10	64	3	2			SPR
1988 01 24.42	S	8.9	S	16	L	6	31	4	3			SUG01
1988 01 25.61	S	9.1	AA	31.0	L	6	63	3.7	2			HAS03
1988 01 31.20	M	8.3	PC	41	L	4	83					HAL
1988 02 04.80	S	9.8	AC	20.0	R	14	40	3.0	5			SHA02
1988 02 05.78	S	9.0	AC	10.0	B		14	3.2	3			HAS02
1988 02 06.78	S	9.4	AC	15.6	L	5	29	3.5	1/			BOU
1988 02 06.79	S	9.4	AC	15.6	L	5	36		2			BOU
1988 02 06.83	S	9.8	AC	15.2	L	5	38	2.2	2			MOE
1988 02 06.83	S	9.9	AC	15.2	L	5	44	2	2			MOE
1988 02 06.83	S	10.1	AC	15.2	L	5	100	2	2			MOE
1988 02 06.86	S	9.9	AC	20.0	R	14	40	3.0	4			SHA02
1988 02 07.02	S	9.1	AA	8.0	B		20	5	1			BOR
1988 02 07.02	S	9.5	AA	31.7	L	6	68	3.3	4			BOR
1988 02 07.75	S	10.0	AC	15.2	L	5	44	2.5	1			MOE
1988 02 07.75	S	10.1	AC	15.2	L	5	38	3.0	1			MOE
1988 02 07.75	S	10.3	AC	15.2	L	5	100	2.5	1			MOE
1988 02 07.77	M	9.3	AC	25.4	J	6	59	3	2/			BOU
1988 02 08.06	M	9.4	AA	25	L	4	46	4.3	2/			JAC01
1988 02 08.21	M	9.2	PC	41	L	4	83					HAL
1988 02 10.56	S	10.1	AA	31.0	L	6	63	3.7	3			HAS03
1988 02 10.76	S	10.3	AC	15.2	L	5	44	3	3			MOE
1988 02 10.77	S	10.2	AC	15.2	L	5	44	3	3			MOE
1988 02 10.78	S	10.4	AC	15.2	L	5	100	2.5	2			MOE
1988 02 11.02	S	9.6	AA	31.7	L	6	68	2.7	3			BOR

Periodic comet Borrelly (1987p) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 02 11.10	S	9.5	AA	25	L	4	46					JAC01
1988 02 11.76	S	10.3	AC	15.2	L	5	44	3	3			MOE
1988 02 11.77	S	10.3	AC	15.2	L	5	38	3	2			MOE
1988 02 11.77	S	10.5	AC	15.2	L	5	100	2	1			MOE
1988 02 12.07	S	9.5	AA	13	L	8	40					JAC01
1988 02 12.95	S	9.2	VB	20.0	R	14	40	2.2	5			SHA02
1988 02 13.89	B	9.1	AC	35	T	6	96	1.5	6	0.05	265	AMO
1988 02 13.90	S	10.0	AC	10.0	B		14	1.4	3			HAS02
1988 02 14.20	M	9.6	PC	41	L	4	83					HAL
1988 02 14.81	S	10.1	AA	36.0	T	11	123	2	2/			KOR
1988 02 14.87	S	9.5	VB	20.0	R	14	40	2.2	5			SHA02
1988 02 15.60	S	10.3	AA	31.0	L	6	63	3.4	2			HAS03
1988 02 15.93	B	9.3	AC	35	T	6	96	1.4	7	0.03	270	AMO
1988 02 16.17	S	9.3	AA	25	L	4	46	3.9	1/			JAC01
1988 02 16.18				25	L	4	179	3	2	0.03	69	JAC01
1988 02 16.93	S	10.0	VB	20.0	R	14	40	2.3	3			SHA02
1988 02 17.03	S	9.7	AA	31.7	L	6	68	3.0	3			BOR
1988 02 19.02	S	9.7	AA	31.7	L	6	68	3.6	3			BOR
1988 02 20.77	S	10.5	AC	15.2	L	5	38	2	2			MOE
1988 02 20.77	S	10.6	AC	15.2	L	5	44	2	3			MOE
1988 02 20.77	S	10.7	AC	15.2	L	5	100	1.5	2			MOE
1988 02 21.23	M	9.8	PC	41	L	4	83					HAL
1988 02 22.04	S	9.6	AA	31.7	L	6	68	2.9	3			BOR
1988 03 05.78	S	11.2	AC	15.2	L	5	38	3	1			MOE
1988 03 05.78	S	11.2	AC	15.2	L	5	44	2.5	1			MOE
1988 03 05.78	S	11.3	AC	15.2	L	5	100	2	1			MOE
1988 03 06.04	S	10.8	AA	31.7	L	6	68	3.2	1/			BOR
1988 03 07.16	M	10.5	PC	41	L	4	83					HAL
1988 03 07.85	S	10.5	AC	25.4	J	6	59	2.5	1			BOU
1988 03 08.04	S	10.9	AA	31.7	L	6	68	2.0	3			BOR
1988 03 08.83	S	10.7	AC	25.4	J	6	48	2.5	1			BOU
1988 03 09.93	B	10.2	AC	35	T	6	96	1.4	5			AMO
1988 03 12.04	S	11.0	AA	31.7	L	6	68	3.0	2			BOR
1988 03 12.84	S	11.6	AC	15.2	L	5	38	1.6	2			MOE
1988 03 12.84	S	11.6	AC	15.2	L	5	44	1.5	2			MOE
1988 03 12.84	S	11.7	AC	15.2	L	5	100	1.3	2			MOE
1988 03 13.19	S	11.2	AC	41	L	4	83					HAL
1988 03 13.80	S	11.6	AC	15.2	L	5	38	1.5	1			MOE
1988 03 13.80	S	11.6	AC	15.2	L	5	44	1.5	1			MOE
1988 03 13.80	S	11.7	AC	15.2	L	5	100	1.5	1			MOE
1988 03 14.85	S	11.8	AC	15.2	L	5	44	1.3	2			MOE
1988 03 14.85	S	11.9	AC	15.2	L	5	100	& 1	2			MOE
1988 03 14.86	S	11.8	AC	15.2	L	5	38	1.3	2			MOE
1988 03 14.89	B	10.5	AC	35	T	6	96	1.2	3			AMO
1988 03 17.82	S	11.7	AC	15.2	L	5	38	1.6	1			MOE
1988 03 17.82	S	11.7	AC	15.2	L	5	44	1.5	1			MOE
1988 03 17.82	S	11.8	AC	15.2	L	5	100	1.3	1			MOE
1988 03 17.88	B	10.8	AC	35	T	6	96	0.9	6			AMO
1988 03 18.86	B	10.9	AC	35	T	6	96	0.9	6			AMO
1988 03 20.05	S	11.0	AA	31.7	L	6	68	2.0	2			BOR
1988 03 20.23	M	11.3	AC	41	L	4	83					HAL

Periodic comet Kopff (1983 XIII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 06 02.94	S	9.7	S	6.0	R	12	35	5				MOE
1983 06 06.92	S	9.6	S	6.0	R	12	35	5				MOE
1983 06 07.92	S	9.6	S	6.0	R	12	35	6.5				MOE
1983 06 10.92	S	9.6	S	6.0	R	12	35	5				MOE

Periodic comet Kopff (1983 XIII) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 06 14.91	S	9.4	S	6.0	R	12	35	6				MOE
1983 06 16.93	S	9.3	S	6.0	R	12	35	4				MOE
1983 06 17.96	S	9.3	S	6.0	R	12	35	4				MOE
1983 06 18.94	S	9.3	S	6.0	R	12	35	5				MOE

Periodic comet Giacobini-Zinner (1985 XIII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 08 05.87	S	8.5:	S	20.4	L	6	49	& 5	0			JAH
1985 08 05.88	S	9.2	A	19	T	4	38	3	5			MIK
1985 08 07.88	S	8.6	AA	20.4	L	6	31	2.3	6	0.09	260	JAH
1985 08 08.88	B	8.5	AA	20.4	L	6	31	3.6	7	0.05	250	JAH
1985 08 09.89	S	8.6	AA	20.4	L	6	31	2.4	7	0.08	270	JAH
1985 08 10.87	B	9.2	S	20.4	L	6	31	4.4	6	0.07	260	JAH
1985 08 11.96	S	8.6	A	19	T	4	38	4	6			MIK
1985 08 12.88	B	9.2	S	20.4	L	6	31	4.4	6	0.07	260	JAH
1985 08 12.93	S	8.6	A	19	T	4	38	4.5	5/	0.13	255	MIK
1985 08 14.95	S	8.5	A	19	T	4	38	5	5	0.17	255	MIK
1985 08 16.91	S	8.4	A	19	T	4	38	5	7			MIK
1985 08 17.94	S	7.9	S	20.4	L	6	31	2.4	5	0.05	230	JAH
1985 08 21.95	B	8.6	S	20.4	L	6	31	3.3	0	0.08	290	JAH
1985 08 27.00	S	8.9	S	20.4	L	6	49	1.8	5	0.11	290	JAH
1985 09 12.06	S	8.5	WB	8.0	B		10	6	2			MIK
1985 09 18.13	S	9.3	WB	8.0	B		10	4	3			MIK
1985 09 19.13	S	8.9	WB	8.0	B		10	5	3	0.20	282	MIK
1985 09 20.12	S	8.8	WB	8.0	B		10	5	4			MIK
1985 09 22.13	S	8.8	WB	8.0	B		10	6	1			MIK

Periodic comet Schwassmann-Wachmann 2 (1986h)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 01 19.07	S[	13.4	AC	20	L	6	163	! 1.0				HAL
1987 01 21.21	I[	13.0		20	L	6	163					HAL
1987 01 22.16	I[	13.0		20	L	6	163					HAL
1987 10 21.46	S	12.2:	L	25	L	4	82	& 1	5			JAC01
1987 11 18.45	S	12.5	L	25	L	4	82	& 1	6			JAC01
1987 11 20.45	S[	12.8	L	25	L	4	179					JAC01
1987 12 17.26	I[	14.0	L	25	L	4	358					JAC01
1987 12 19.36	S[	13.0	L	25	L	4	179					JAC01
1987 12 26.44	S	13.6:	L	25	L	4	179					JAC01
1988 01 18.49	S	13.4	L	25	L	4	358					JAC01
1988 01 21.52	I[	13.5		41	L	4	244					HAL
1988 01 24.47	S	13.7	AC	41	L	4	183					HAL
1988 01 25.47	S	13.7	AC	41	L	4	183					HAL
1988 02 11.39	S	13.0	L	25	L	4	179	0.7	0/			JAC01
1988 02 15.48	S	13.8	AC	41	L	4	183					HAL
1988 02 17.45	S	13.1	L	25	L	4	179					JAC01
1988 02 28.52	S	13.8	AC	41	L	4	183					HAL
1988 03 12.33	S	13.9	AC	41	L	4	183					HAL
1988 03 14.96	B	12.8	AC	35	T	6	96	0.01	8			AMO
1988 03 19.02	B	12.7	AC	35	T	6	96	0.01	8			AMO
1988 03 20.32	S	13.8	AC	41	L	4	183					HAL
1988 03 26.47	S	13.7	AC	41	L	4	83					HAL

Periodic comet Reinmuth 2 (1987l)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 06 29.40	I[	14.0		41	L	4	244					HAL

Periodic comet Harrington (1987n)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 06 29.35		I[13.5		41	L	4	244					HAL
1987 07 25.37		I[13.5		41	L	4	244					HAL

Periodic comet Churyumov-Gerasimenko (1982 VIII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 11 21.62	S	10.6	V	31.7	L	5	86					JON
1982 11 22.63	S	10.9	V	31.7	L	5	86	0.5	4			JON
1982 11 24.64	S	10.7	V	31.7	L	5	86		4			JON

Periodic comet Howell (1987h)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 03 28.50		I[10.5		20	L	6	163					HAL
1987 04 08.58		I[12.5		20	L	6	163					HAL
1987 04 09.48		I[12.5		20	L	6	163					HAL
1987 04 10.48		I[12.5		20	L	6	163					HAL
1987 04 25.46		I[12.0		20	L	6	163					HAL
1987 04 27.47		I[12.0		20	L	6	163					HAL
1987 05 01.47		I[12.0		20	L	6	163					HAL
1987 05 04.47		I[12.5		20	L	6	163					HAL
1987 06 05.45		I[12.0		41	L	4	244					HAL
1987 06 10.54		I[12.5		41	L	4	244					HAL

Periodic comet Brooks 2 (1987m)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 07 05.44	S[	14.1	AC	41	L	4	244	! 0.5				HAL
1987 07 09.45		I[14.0		41	L	4	244					HAL
1987 07 26.45		I[13.5		41	L	4	244					HAL
1987 10 17.14	S	12.8	AC	31.8	L	4	150	1.2	1			KEE
1987 10 23.13	S	13.0:	AC	31.8	L	4	150	1.0	0			KEE

Periodic comet Reinmuth 1 (1987r)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 02 09.22		I[13.5		41	L	4	244					HAL
1988 02 10.23		I[13.5		41	L	4	244					HAL
1988 03 10.15		I[14.0		41	L	4	244					HAL
1988 03 20.20		I[13.5		41	L	4	183					HAL

Periodic comet Comas Solá (1986j)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 01 21.50		I[13.5		41	L	4	244					HAL
1988 01 24.43		I[13.5		41	L	4	244					HAL
1988 02 21.46		I[13.5		41	L	4	244					HAL

Periodic comet Halley (1986 III)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 10 12.07	S	10.5	WA	19	T	4	38	3	3			MIK
1985 10 13.96	S	10.1	WA	19	T	4	38	3	3/			MIK
1985 10 17.99	M	9.7	WA	19	T	4	38	8	4			MIK
1985 10 26.17	M	8.5	WC	19	T	4	38	7.5	5			MIK
1985 11 02.54	M	9.8	AA	16	L	6	31	2.3	4			MIT
1985 11 02.55	M	10.0	AA	16	L	6	80	2.1	5			MIT
1985 11 03.71	M	9.3	AA	16	L	6	31	3.2	3			MIT
1985 11 03.72	M	9.8	AA	16	L	6	80	2.0	4			MIT

Periodic comet Halley (1986 III) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 11 07.78	M	8.8	AA	16	L	6	31	4.0	6			MIT
1985 11 07.82	M	8.5	AA	8.0	B		11					MIT
1985 11 07.99	M	7.0	A	8.0	B		10	12	6			MIK
1985 11 08.60	M	8.2	AA	8.0	B		11	6.5	5			MIT
1985 11 08.61	M	8.5	AA	16	L	6	31	5.9	6/			MIT
1985 11 10.56	M	8.1	AA	16	L	6	31	8	6			MIT
1985 11 10.58	M	7.9	AA	8.0	B		11	11	5			MIT
1985 11 11.54	M	7.8	AA	8.0	B		11	10	5			MIT
1985 11 11.56	M	8.0	AA	16	L	6	31	10	7			MIT
1985 11 11.88	S	7.6	AA	8.0	B		20	7.6	5/			ZAN
1985 11 12.06	S	8.7	AA	3.4	B		9	3				PER01
1985 11 12.50	M	7.4	AA	8.0	B		11	11	5/			MIT
1985 11 12.52	M	7.5	AA	16	L	6	31	11	7			MIT
1985 11 13.06	S	8.2	AA	3.4	B		9	4				PER01
1985 11 13.53	M	7.4	AA	8.0	B		11	9.5	6			MIT
1985 11 14.06	S	8.0	AA	3.4	B		9	4				PER01
1985 11 14.96	S	7.6	AA	3.4	B		9	3				PER01
1985 11 15.52	M	7.1	AA	8.0	B		11	12	7			MIT
1985 11 15.94	S	7.7	AA	3.4	B		9	3				PER01
1985 11 15.96	M	6.3	AA	8.0	B		10	10	6			MIK
1985 11 16.58	M	6.9	AA	8.0	B		11	11	6			MIT
1985 11 16.96	S	7.1	AA	3.4	B		9	6				PER01
1985 11 17.58	M	6.8	AA	8.0	B		11	13	7			MIT
1985 11 17.96	S	6.7	AA	3.4	B		9	8				PER01
1985 11 18.55	M	6.8	AA	8.0	B		11	14	7			MIT
1985 11 18.98	S	6.2	W	5.0	R	10	33	5.5	6			JAH
1985 11 19.04	S	6.9	AA	3.4	B		9	5				PER01
1985 11 20.65	M	6.6	AA	8.0	B		11	13	7	0.25	100	MIT
1985 11 22.15	S	6.2	AA	3.4	B		9	9				PER01
1985 11 23.01	S	6.4	AA	3.4	B		9	8				PER01
1985 11 26.61	S	6.0	AA	7.0	B		10	8	5	0.17	80	KOB01
1985 11 29.70	S	5.4	AA	5.0	B		7	12	6			MIK
1985 11 30.40	M	5.7	AA	8.0	B		11	13	6/			MIT
1985 12 01.57	M	6.0	AA	8.0	B		11	12	6	0.25	70	MIT
1985 12 02.42	M	6.0	AA	8.0	B		11	13	7	0.25	70	MIT
1985 12 02.80	M	5.4	AA	5.0	B		7	13	7			MIK
1985 12 03.43	S	5.9	AA	7.0	B		10	22	5	0.33	90	KOB01
1985 12 04.52	M	5.9	AA	8.0	B		11	12	7	0.33	75	MIT
1985 12 04.96	S	5.7	AA	3.4	B		9	11				PER01
1985 12 05.58	M	5.8	AA	8.0	B		11	13	6/			MIT
1985 12 05.60	S	5.9	AA	7.0	B		10	22	5	0.5	90	KOB01
1985 12 05.86	S	5.7	AA	3.4	B		9	13				PER01
1985 12 06.54	S	5.4	AA	7.0	B		10	20	5	0.33	80	KOB01
1985 12 06.86	S	5.8	AA	3.4	B		9					PER01
1985 12 07.58	S	5.5	AA	7.0	B		10	17	5	0.5	90	KOB01
1985 12 07.72	B	6.6	W	20.4	L	6	31	42	8			JAH
1985 12 07.88	S	6.2	AA	3.4	B		9	12				PER01
1985 12 08.48	M	5.9	AA	8.0	B		11	11	7	0.33	60	MIT
1985 12 08.57	S	5.4	AA	7.0	B		10	20	5	0.5	75	KOB01
1985 12 08.96	S	6.2	AA	3.4	B		9	9		0.5	40	PER01
1985 12 10.40	M	5.7	AA	8.0	B		11	11	7	0.33	65	MIT
1985 12 10.48	S	5.6	AA	8.0	B		11		6			MOM
1985 12 11.44	M	5.8	AA	8.0	B		11	12	7			MIT
1985 12 11.55	S	5.7	AA	7.0	B		10	15	5	0.5	80	KOB01
1985 12 11.94	S	6.2	AA	3.4	B		9	7				PER01
1985 12 12.45	M	5.8	AA	8.0	B		11	10	7	0.42	68	MIT
1985 12 13.40	M	5.6	AA	8.0	B		11	14	7	0.67	65	MIT
1985 12 14.38	M	5.7	AA	8.0	B		11					MIT
1985 12 14.59	S	4.6	AA	7.0	B		10	18	5	0.58	60	KOB01

Periodic comet Halley (1986 III) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 12 14.86	S	5.2	AA	3.4	B		9	9				PER01
1985 12 15.44	S	4.6	AA	7.0	B		10	20	5	0.58	80	KOB01
1985 12 15.46	M	5.7	AA	8.0	B		11	11	7/	0.5	60	MIT
1985 12 15.48	M	5.8	AA	5.0	B		7		7/			MIT
1985 12 15.79	S	5.6	AA	3.4	B		9	9		0.2	80	PER01
1985 12 15.83	M	5.2	AA	8.0	B		10	& 7.5	8	0.5	64	MIK
1985 12 15.84	M	5.3	AA	5.0	B		7	10	7	0.2	64	MIK
1985 12 16.79	S	5.5	AA	3.4	B		9	9				PER01
1985 12 16.91	M	5.2	AA	8.0	B		10	10	8	0.25	64	MIK
1985 12 17.42	M	5.5	AA	8.0	B		11	9	7/	0.5	60	MIT
1985 12 17.42	S	5.4	AA	7.0	B		10	19	5	0.33	90	KOB01
1985 12 17.44	M	5.6	AA	5.0	B		7		8			MIT
1985 12 17.51	S	4.9	AA	8.0	B		11	8	7			MOM
1985 12 18.43	M	5.5	AA	5.0	B		7	10	8			MIT
1985 12 18.44	M	5.4	AA	8.0	B		11	9.5	8	0.42	65	MIT
1985 12 19.44	M	5.6	AA	5.0	B		7	8.5	8			MIT
1985 12 19.44	M	5.6	AA	8.0	B		11	6.9	8	0.42	65	MIT
1985 12 19.74	S	5.6	AA	5.0	B		7	7	5			MIK
1985 12 19.79	S	5.5	AA	3.4	B		9					PER01
1985 12 20.39	S	5.2	AA	8.0	B		11					MOM
1985 12 20.39	S	5.4	AA	7.0	B		10	15	5	0.33	90	KOB01
1985 12 20.44	M	5.5	AA	8.0	B		11	6.5	8	0.42	65	MIT
1985 12 20.81	S	5.4	AA	3.4	B		9					PER01
1985 12 22.69	S	6.5	W	20.4	L	6	31	3.6	7	0.08	67	JAH
1985 12 22.74	M	5.5	AA	8.0	B		10	7	6	0.13		MIK
1985 12 23.46	S	4.8	AA	8.0	B		11	9	8	0.07	90	MOM
1985 12 24.42	M	5.4	AA	8.0	B		11	6.5	8	0.42	65	MIT
1985 12 24.47	S	4.6	WW	8.0	B		11	8	6			MOM
1985 12 25.37	S	5.0	AA	7.0	B		10	10	5	0.42	90	KOB01
1985 12 25.39	S	4.7	WW	8.0	B		11	12	7	0.10		MOM
1985 12 25.88	S	5.4	AA	3.4	B		9					PER01
1985 12 26.26	S	4.9	AA	7.0	B		10	12	5	0.58	70	KOB01
1985 12 26.39	S	4.7	WW	8.0	B		11	12	5	0.25		MOM
1985 12 27.39	S	4.7	WW	8.0	B		11	8	6	0.13		MOM
1985 12 28.38	S	4.6	WW	8.0	B		11	9	7			MOM
1985 12 28.39	M	5.2	AA	8.0	B		11	3.5	7/			MIT
1985 12 28.40	S	5.0	AA	7.0	B		10	7	5		80	KOB01
1985 12 29.38	S	4.5	WW	8.0	B		11					MOM
1985 12 29.40	M	5.4	AA	8.0	B		11	5.9	7	0.42	65	MIT
1985 12 29.79	S	5.5	AA	3.4	B		9	8				PER01
1985 12 30.41	S	5.1	AA	7.0	B		10	15	5	0.58	80	KOB01
1985 12 30.80	S	5.3	AA	3.4	B		9	4				PER01
1985 12 31.40	S	4.2	AA	7.0	B		10	9	5	1.5	80	KOB01
1985 12 31.43	S	4.2	WW	8.0	B		11	15	7	&1		MOM
1985 12 31.70	B	5.2	W	5.0	B		7	&13	6			JAH
1986 01 02.4	S	4.4	WW	8.0	B		11				60	MOM
1986 01 02.43	S	4.6	AA	7.0	B		10	10	5	2	80	KOB01
1986 01 02.44	M	5.2	AA	8.0	B		11	5.2	8	1.1	65	MIT
1986 01 03.40	M	5.1	AA	8.0	B		11	4.5	7/	0.75	60	MIT
1986 01 04.38	S	4.3	WW	8.0	B		11	10	6	1.33	60	MOM
1986 01 04.79	S	5.0	AA	3.4	B		9	4		0.07		PER01
1986 01 05.38	M	5.0	AA	8.0	B		11	4.5	8	1.5		MIT
1986 01 05.78	M	5.1	AA	5.0	B		7	8	7	2.2	63	MIK
1986 01 06.38	S	4.4	WW	8.0	B		11	10	6	1.17		MOM
1986 01 06.39	M	5.0	AA	8.0	B		11	4.5	8	1.5	60	MIT
1986 01 06.45	S	4.6	AA	7.0	B		10	8	6	1	80	KOB01
1986 01 07.41	M	5.0	AA	8.0	B		11	3.5	8/			MIT
1986 01 08.38	M	4.7	AA	8.0	B		11	4.4	8	1	60	MIT
1986 01 08.70	S	4.8	W	5.0	R	10	13	5.3	8	0.13	60	JAH

Periodic comet Halley (1986 III) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 01 09.39	M	4.7	WW	8.0	B		11	4.1	8	1.5	60	MIT
1986 01 09.40	S	4.3	WW	8.0	B		11					MOM
1986 01 09.41	S	4.1	AA	7.0	B		10	7	6	1.5	85	KOB01
1986 01 09.70	S	5.1	W	5.0	R	10	13	4.7	7	0.46	60	JAH
1986 01 09.79	S	4.8	AA	3.4	B		9	6		1.0	60	PER01
1986 01 10.38	M	4.8	WW	8.0	B		11	4.0	8	1.5	60	MIT
1986 01 10.43	S	3.9	AA	7.0	B		10	7	6	1	80	KOB01
1986 01 11.39	M	4.8	WW	8.0	B		11	4.1	8	2	60	MIT
1986 01 11.41	S	3.9	AA	7.0	B		10	7	6	4	80	KOB01
1986 01 11.79	S	4.8	AA	3.4	B		9	4		0.6	65	PER01
1986 01 12.37	S	4.0	WW	8.0	B		11		8			MOM
1986 01 12.38	M	4.6	WW	8.0	B		11	3.2	8/	2	60	MIT
1986 01 12.41	S	3.9	AA	7.0	B		10	7	6	2.5	75	KOB01
1986 01 12.79	S	4.5	AA	3.4	B		9					PER01
1986 01 13.38	M	4.5	WW	8.0	B		11	3.4	8/	1.5	60	MIT
1986 01 13.41	S	3.9	AA	7.0	B		10	6.5	6	4	75	KOB01
1986 01 13.79	S	4.8	AA	3.4	B		9			0.6	55	PER01
1986 01 14.39	M	4.7	WW	8.0	B		11	3.0	8	2	60	MIT
1986 01 14.41	S	3.9	AA	7.0	B		10	6	6	1.5	75	KOB01
1986 01 14.79	S	4.8	AA	3.4	B		9			0.8	55	PER01
1986 01 16.41	S	3.8	AA	7.0	B		10	6	6	0.5	75	KOB01
1986 01 16.70	S	4.4	W	5.0	R	10	13	17	7	0.13	60	JAH
1986 01 16.78	S	4.5	AA	3.4	B		9					PER01
1986 01 17.38	M	4.4	WW	8.0	B		11	3.3	8/	1.5	60	MIT
1986 01 17.71	S	4.5	W	5.0	R	10	13	3	7	0.13	55	JAH
1986 01 17.78	S	4.8	AA	3.4	B		9					PER01
1986 01 18.38	M	4.5	WW	8.0	B		11					MIT
1986 01 19.37	S	3.6	WW	8.0	B		11		8			MOM
1986 01 19.38	M	4.3	WW	8.0	B		11		8/			MIT
1986 01 20.41	S	3.8	WW	7.0	B		10	5	7	0.5	70	KOB01
1986 01 22.38	M	4.1	WW	8.0	B		11	2.7	8/	&1.25	60	MIT
1986 01 22.38	S	3.8	WW	8.0	B		11					MOM
1986 01 22.41	S	4.4	WW	7.0	B		10	4	6	0.75	85	KOB01
1986 01 22.70	S	4.4	W	5.0	R	10	13	& 4	6			JAH
1986 01 23.38	S	3.8	WW	8.0	B		11		7			MOM
1986 01 24.40	S	4.5	WW	7.0	B		10	4	7	0.25	60	KOB01
1986 01 25.38	M	4.0	WW	8.0	B		11	& 2.5	8	1	55	MIT
1986 01 25.71	S	4.3	W	5.0	R	10	13	& 3	0	&0.08	40	JAH
1986 01 27.72	S	4.9	A	8.0	B		10					MIK
1986 02 15.88	S	4 :	WW	10.0	R	8	25	5	8			KOB01
1986 02 18.88	S	4.5	WW	8.0	B		11	5	8			KOB01
1986 02 19.88	S	3.9	WW	10.0	R	8	25	7	7	0.25	260	KOB01
1986 02 21.86	M	3.5	WW	8.0	B		11	2	8	1	285	MIT
1986 02 21.88	S	3.3	WW	8.0	B		11	10	6	2	270	KOB01
1986 02 23.86	M	3.3	WW	8.0	B		11	3	8	1	285	MIT
1986 02 23.88	S	4.0	WW	7.0	B		10	5	6	0.33	260	KOB01
1986 02 24.84	M	3.5	WW	8.0	B		11	2.7	8	1	275	MIT
1986 02 24.87	S	3.6	WW	7.0	B		10	6	6	1.5	250	KOB01
1986 02 25.84	M	3.5	WW	8.0	B		11	3	8	1.5	275	MIT
1986 02 28.88	S	3.8	WW	7.0	B		10	12	6	0.5	250	KOB01
1986 03 02.83	S	3.4	WW	8.0	B		11		7	1		MOM
1986 03 02.84	M	3.4	WW	8.0	B		11	3.0	8	3	275	MIT
1986 03 03.80	S	3.3	WW	3.5	B		8	10	6	3.5	260	KOB01
1986 03 03.84	M	3.4	WW	8.0	B		11	3.0	8	3.5	280	MIT
1986 03 04.82	S	3.7	WW	8.0	B		11		5	2		MOM
1986 03 05.24	S	4.0	AA	3.4	B		9			0.6	270	PER01
1986 03 05.84	M	3.3	WW	8.0	B		11	3.5	8	3.5	270	MIT
1986 03 06.20	S	3.8	AA	5.0	B		7		7			MIK
1986 03 06.83	S	3.4	WW	8.0	B		11			3		MOM

Periodic comet Halley (1986 III) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 03 07.83	M	3.3	WW	8.0	B		11	3.9	8			MIT
1986 03 08.24	S	3.8	AA	3.4	B		9			1.0	270	PER01
1986 03 08.81	S	3.0	WW	3.5	B		8	13	5	4	270	KOB01
1986 03 08.83	S	3.5	WW	8.0	B		11		5	5		MOM
1986 03 08.84	M	3.6	WW	8.0	B		11	4	7			MIT
1986 03 09.24	S	3.9	AA	3.4	B		9			1.5	270	PER01
1986 03 10.23	S	3.9	AA	3.4	B		9					PER01
1986 03 11.82	M	3.6	WW	8.0	B		11	4.5	7/			MIT
1986 03 12.82	M	3.8	WW	8.0	B		11	4.5	7			MIT
1986 03 15.81	S	3.2	WW	8.0	B		11		6	7		MOM
1986 03 16.81	S	3.3	WW	8.0	B		11		6	5		MOM
1986 03 16.82	M	3.8	WW	8.0	B		11	4.0	7/			MIT
1986 03 16.87	S	3.4	WW	7.0	B		10	20	5	10	270	KOB01
1986 03 17.17	S	4.0	WW	5.0	B		7	10	6			MIK
1986 03 17.80	S	3.0	WW	8.0	B		11		7	3		MOM
1986 03 17.81	M	3.6	WW	8.0	B		11	4.5	7/			MIT
1986 03 18.17	S	4.5	WW	5.0	B		7	10	6			MIK
1986 03 19.83	S	3.5	WW	7.0	B		10	12	5	4	270	KOB01
1986 03 20.80	S	3.2	WW	8.0	B		11					MOM
1986 03 20.82	M	3.7	WW	8.0	B		11	7.5	7			MIT
1986 03 23.84	S	3.5	WW	7.0	B		10	20	5	6	270	KOB01
1986 03 24.80	M	3.5	WW	8.0	B		11	5.5	8			MIT
1986 03 24.83	S	3.2	WW	7.0	B		10	10	5	1.5	260	KOB01
1986 03 25.80	M	3.4	WW	8.0	B		11	7.2	7/			MIT
1986 03 27.20	S	3.8	AA	3.4	B		9					PER01
1986 03 31.20	S	3.5	AA	3.4	B		9	14				PER01
1986 03 31.78	M	3.6	WW	8.0	B		11	7.7	6			MIT
1986 03 31.79	S	3.1	WW	7.0	B		10	10	4	1	270	KOB01
1986 04 01.78	S	3.0	WW	7.0	B		10	30	5	1	280	KOB01
1986 04 04.77	M	3.9	WW	8.0	B		11	12	5	&1	295	MIT
1986 04 04.77	S	3.7	WW	7.0	B		10	30	5	2	270	KOB01
1986 04 05.75	M	3.5	WW	8.0	B		11	16	5	3	295	MIT
1986 04 05.75	S	4.0	WW	8.0	B		11		3			MOM
1986 04 05.81	S	3.0	WW	7.0	B		10	30	4	2.5	295	KOB01
1986 04 06.80	S	3.3	WW	7.0	B		10	20	4	2.3	300	KOB01
1986 04 07.75	M	3.6	WW	8.0	B		11	19	4	&1.5	315	MIT
1986 04 07.76	M	3.4	WW	5.0	B		7	20	4			MIT
1986 04 11.58	S	2.8	WW	7.0	B		10	45	4	4	45	KOB01
1986 04 11.71	M	4.0	WW	8.0	B		11	15	3			MIT
1986 04 12.58	S	2.7	WW	7.0	B		10	45	4	5	45	KOB01
1986 04 13.55	S	2.7	WW	7.0	B		10	50	5	6	45	KOB01
1986 04 15.66	S	3.0	WW	7.0	B		10	40	5	4	90	KOB01
1986 04 20.83	S	4.9	WW	8.0	B		10	8	5/			MIK
1986 04 21.97	S	4.4	AA	3.4	B		9					PER01
1986 04 23.53	M	4.8	WW	8.0	B		11	13	4			MIT
1986 04 23.53	S	4.0	WW	7.0	B		10	12	5	0.58	90	KOB01
1986 04 24.54	S	4.3	WW	7.0	B		10	25	4	5	90	KOB01
1986 04 25.87	S	5.1	WW	5.0	B		7	15	5			MIK
1986 04 25.93	S	4.7	AA	3.4	B		9	15				PER01
1986 04 26.96	S	5.3	AA	3.4	B		9	11				PER01
1986 04 27.91	S	5.1	AA	3.4	B		9	8				PER01
1986 04 28.50	S	4.5	WW	7.0	B		10	15	4	1	90	KOB01
1986 04 28.98	S	5.2	AA	3.4	B		9	10				PER01
1986 04 29.47	S	4.5	WW	7.0	B		10	15	4	2	90	KOB01
1986 04 29.52	M	4.6	AA	8.0	B		11	17	4/	2	100	MIT
1986 04 30.48	S	5.4	AA	6.5	R	8	16		3			MOM
1986 04 30.49	M	4.9	AA	8.0	B		11	13	4	0.5	98	MIT
1986 04 30.93	M	4.8	WW	5.0	B		7	12	5/			MIK
1986 05 01.90	S	5.5	AA	3.4	B		9	14				PER01

Periodic comet Halley (1986 III) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 05 02.84	M	5.3	AA	5.0	B		7	15	7			MIK
1986 05 03.01	S	5.7	AA	3.4	B		9	14				PER01
1986 05 03.88	S	5.6	AA	5.0	B		7	14	7			MIK
1986 05 04.49	M	5.7	AA	8.0	B		11	12	5	0.67	105	MIT
1986 05 04.52	S	5.1	AA	4.0	B		7		3			MOM
1986 05 04.85	M	5.4	AA	5.0	B		7	15	6			MIK
1986 05 05.51	S	5.4	AA	7.0	B		10	20	5	3	90	KOB01
1986 05 06.52	S	5.8	AA	7.0	B		10	18	4	2.2	90	KOB01
1986 05 06.93	S	6.0	AA	3.4	B		9	10				PER01
1986 05 07.48	M	6.2	AA	8.0	B		11	12	5			MIT
1986 05 07.48	S	5.7	AA	7.0	B		10	15	4	2.5	90	KOB01
1986 05 07.51	S	6.0	AA	8.0	B		11		2			MOM
1986 05 07.90	S	5.7	A	5.0	B		7	14	5/			MIK
1986 05 08.50	M	6.4	AA	8.0	B		11	9.5	4			MIT
1986 05 09.90	M	5.9	A	5.0	B		7	16	6	0.5	100	MIK
1986 05 10.54	S	6.1	AA	7.0	B		10	10	4	1	90	KOB01
1986 05 10.88	S	7.0	AA	3.4	B		9					PER01
1986 05 11.50	S	6.5	AA	7.0	B		10	8	4			KOB01
1986 05 12.51	S	5.9	AA	7.0	B		10	20	4	1.5	90	KOB01
1986 05 13.83	S	6.2	A	5.0	B		7	13	5			MIK
1986 05 14.51	S	6.3	AA	7.0	B		10	15	4	1.5	90	KOB01
1986 05 16.50	M	7.1	AA	8.0	B		11	8.2	4			MIT
1986 05 16.51	M	7.1	AA	16	L	6	31		5			MIT
1986 05 25.50	M	7.9	AA	8.0	B		11					MIT
1986 05 25.50	M	8.0	AA	16	L	6	31	6.0	5			MIT
1986 05 26.53	M	8.1	AA	16	L	6	31	5.5	4			MIT
1986 05 26.86	S	7.6	A	8.0	B		10	8	7			MIK
1986 05 27.48	M	8.1	AA	16	L	6	31	6.4	5			MIT
1986 05 27.48	M	8.2	AA	16	L	6	80	4.8	5			MIT
1986 06 08.51	M	8.2	AA	16	L	6	31	6.5	5			MIT
1986 06 11.50	M	8.5	AA	16	L	6	31					MIT
1986 06 26.48	M	10.1	AA	16	L	6	31	3	1/			MIT
1986 06 26.48	M	10.3	AA	16	L	6	80	3	2/			MIT
1987 04 27.21	I	[12.5		20	L	6	163					HAL
1987 05 24.19	I	[13.0		20	L	6	163					HAL
1987 05 27.17	I	[13.5		41	L	4	244					HAL
1987 06 15.17	I	[13.5		41	L	4	244					HAL

Periodic comet Tuttle (1980 XIII)

DATE (UT)		MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1980 10 11.09		S	10.2:	S	48.5	L	4	115					MOE
1980 11 08.06		S	8.9	S	48.5	L	4	115	12				MOE
1980 11 10.12		S	8.6	S	48.5	L	4	115	12		?		MOE
1980 12 02.65	*	S	7.9	V	4.5	R	6	13					JON
1980 12 03.65	*	S	7.8	V	4.5	R	6	13					JON
1980 12 07.65					31.7	L	5	86	3	2			JON
1980 12 07.65	*	S	7.2	V	4.5	R	6	13					JON
1980 12 09.64		S	7.1	V	4.5	R	6	13					JON
1980 12 10.64		S	7.2	V	4.5	R	6	13					JON
1980 12 19.65		S	8.2	V	4.5	R	6	13					JON
1980 12 20.64		S	8.1	S	4.5	R	6	13					JON
1980 12 22.42		S	8.3	S	7.8	R	8	30					JON
1980 12 26.47		S	8.0	S	4.5	R	6	13					JON
1980 12 30.42					31.7	L	5	86	3.5	5			JON
1980 12 30.42		S	7.5	S	4.5	R	6	13					JON
1981 01 06.42		S	7.4	S	4.5	R	6	13					JON
1981 01 09.45		S	7.9	S	4.5	R	6	13					JON
1981 01 10.50		S	8.2	S	4.5	R	6	13					JON

Periodic comet Tuttle (1980 XIII) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1981 01 15.41	S	8.8	S	7.8	R	8	30					JON
1981 01 15.66	S	8.5	S	4.5	R	6	13					JON
1981 01 16.65	S	8.6	S	4.5	R	6	13					JON
1981 01 18.66	S	9.0	S	7.8	R	8	30					JON
1981 01 23.41	S	8.8	S	4.5	R	6	13					JON
1981 01 24.43	S	8.5	S	4.5	R	6	13					JON
1981 01 25.43	S	8.7	HD	4.5	R	6	13					JON
1981 01 26.42	S	9.8:	HD	4.5	R	6	13					JON
1981 02 01.46	S	8.5	HD	4.5	R	6	13					JON
1981 02 03.44	S	8.5	HD	4.5	R	6	13					JON
1981 02 04.42				31.7	L	5	86	3	3			JON
1981 02 04.42	S	8.5	HD	4.5	R	6	13					JON
1981 02 08.43	S	9.2	S	7.8	R	8	30					JON
1981 02 11.43	S	9.8	S	7.8	R	8	30		2			JON
1981 02 15.67	S	10.0	V	7.8	R	8	30					JON
1981 02 15.67	S	11.0	V	31.7	L	5	86	3	3			JON
1981 02 21.38	S	11.0	V	31.7	L	5	86		2			JON
1981 02 26.40	S	11.0	V	31.7	L	5	86	2	1			JON
1981 02 27.37	S	11.2	V	31.7	L	5	86	2	1			JON
1981 02 28.40	S	10.9	V	31.7	L	5	86	3	3			JON
1981 03 10.89	S	11.2	V	31.7	L	5	86	2	2			JON
1981 03 13.69	S	11.3	V	7.8	R	8	30					JON
1981 03 13.69	S	11.7	V	31.7	L	5	86	1.5	2			JON

Periodic comet Schwassmann-Wachmann 1

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 10 23.11	S	13.0	AC	31.8	L	4	150	1.5	0			KEE

Periodic comet Stephan-Oterma (1980 X)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1980 10 11.13	S	10.6:	S	48.5	L	4	115	3				MOE
1980 11 08.03	S	9.8	S	48.5	L	4	115	6				MOE
1980 11 10.14	S	9.7	S	48.5	L	4	115	6				MOE
1980 12 03.97	S	8.8	S	6.0	R	12	35	2				MOE
1980 12 04.85	S	9.0	S	48.5	L	4	115	2				MOE
1980 12 05.01	S	8.9	S	6.0	R	12	35	2.5				MOE
1980 12 07.92	S	9.1	S	6.0	R	12	35	2.5				MOE

Periodic comet Hartley-IRAS (1984 III)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 03 03.10	S	9.2	S	6.0	R	12	35	4				MOE

Periodic comet Shoemaker-Holt (1987z)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 11 12.14	S[	12.6	L	25	L	4	179					JAC01
1987 11 18.19	I[	14.5:	L	25	L	4	358					JAC01
1987 11 18.19	S[	13.1	L	25	L	4	179					JAC01

BOOK REVIEWS

20th ESLAB Symposium on the Exploration of Halley's Comet: Proceedings of the International Symposium, Heidelberg, Germany, October 27–31, 1986.

B. Battrick, E. J. Rolfe, R. Reinhard, Editors. European Space Agency SP-250, December 1986, soft cover, 1608 pages (three volumes), about US$100. [ISSN 0379-6566]

Never in the history of comet research have so many investigators from all corners of the world gathered to dicuss their findings on this narrow field. The catalyst for this meeting was the current apparition of periodic comet Halley and the armada of spacecraft sent to meet it. By any standard the meeting and resulting *Proceedings* are impressive. More than 450 investigators attended the five-day meeting and presented 370 papers and posters primarily focused on comet Halley (with some dicussion of periodic comet Giacobini-Zinner and other comets). The *Proceedings* are massive — three large volumes of more than 1600 pages in total which contain nearly 300 papers.

The conference and the *Proceedings* provided an "open" forum for the discussion of early findings from comet Halley's apparition. The papers in the *Proceedings* represent the efforts of not only professional, but also amateur astronomers (although the vast majority are by professional astronomers). These papers were not refereed. Thus, the quality of the papers varies greatly on all levels and the reader must use caution when interpreting the results presented. [A subset of these papers have been published in a special issue of *Astronomy and Astrophysics* (Vol. **187**) — which has been refereed.]

Volume I of the *Proceedings* contains papers that focus on the plasma and gas properties of the comet. The contributions in Volume II deal with the dust properties and the nucleus. The final Volume includes the poster and late papers. These volumes discuss detailed spacecraft observations and ground-based studies in a wide range of spectral wavelengths. Visual studies, primarily of the light curve, are also covered in a number of papers.

The conference proved that for all we have learned about comet Halley, in particular (and comets, in general), during this apparition of comet Halley, we still have a long way to go for a complete understanding of the subject. For instance, despite having five spacecraft in the vicinity of comet Halley and the thousands of ground-based observation hours, we still do not know (for sure) one of the most basic properties of this comet — the rotation period of the nucleus.

For those interested in the physics of comets on a professional level, these *Proceedings* are a must. They provide a snapshot view of the status of our understanding of these complex objects. The price, while high, is not unreasonable for this nicely produced, massive, three-volume set. — *Charles S. Morris*

* * *

BOOKS RECEIVED. The following recently-published books have been received:

Astronomie: Le Guide de l'Observateur, ed. by Patrick Martinez (1987), 2 volumes, 1096 *pp.*, paperback. Address: Société d'Astronomie Populaire; 10, rue Alphonse Daudet; 31200 Toulouse; France. Detailed observing guide, written in French; contains 19 chapters on the planets, sun, moon, meteors, variable stars, astrometry, spectroscopy, photometry; the chapter on comets by J.-C. Merlin is nearly 160 pages long.

Atlas of Comet Halley 1910 II, by Bertram Donn, Jürgen Rahe, and John C. Brandt (1986), 600 *pp.*, hardbound, NASA SP-488. Address: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, U.S.A. Atlas of photographs (including spectra) and drawings of P/Halley in 1835 (26 *pp.*) and 1910 (remainder of book).

Catalogue of Short-Period Comets, by N. A. Belyaev, L. Kresák, E. M. Pittich, and A. N. Pushkarev (1986), 398 *pp.*, paperback. Address: Astronomical Institute, Slovak Academy of Sciences, C-059 60 Tatranska Lomnica, Czechoslovakia. A useful, interesting book concerning the orbital evolution of comets; contains data for all periodic comets discovered prior to 1984; appendix includes many useful tables such as "Closest Approaches to the Sun" (and others to various planets), "Greatest Tail Lengths", "Strongest Brightness Bursts", "A Short Guide to Comet Names".

The Evolution of the Small Bodies of the Solar System, ed. by M. Fulchignoni and L. Kresák (1987), 307 *pp.*, hardbound. *Proceedings of the International School of Physics "Enrico Fermi"*, Course XCVIII. Address: North-Holland Physics Publishing, Elsevier Science Publishers B.V., P.O. Box 103, 1000 AC Amsterdam, The Netherlands. Contains review chapters written by specialists on asteroids, comets, meteors, planetary satellites, and planetary rings.

How to Survive the Return of Halley's Comet without Having to Sacrifice a Virgin: The Complete Comet Watcher's Guide, by Alan Marcus and Gary Crandall (1985), 88 *pp.*, paperback. Address: Outer Ring Publishing; 500 Promontory Dr., West; Newport Beach, CA 92660, U.S.A. A humorous book for rainy nights.

Looking Back: Amateur Adventures with Halley's Comet 1985–1986, by David Deskins (1987), 112 *pp.*, paperback. Address: Intrinsic Publishing Corp., Box 124, Holly Drive, Pikeville, KY 41501, U.S.A. This heavily illustrated book (including color photos) is very well produced and contains contributions (both textual and illustrative) from scores of observers. The articles are well written; contains an interesting observing log; vast majority of book deals with the period Nov. 1985–Apr. 1986.

Observe: Comets, by Stephen J. Edberg and David H. Levy (1985), 56 *pp.*, paperback (magazine style). Address: Astronomical League; Science Service Bldg.; 1719 N. St., NW; Washington, DC 20036, U.S.A. The Association of Lunar and Planetary Observers' Guide to Cometary Studies; similar to Edberg's *IHW Observer's Manual*, but with more text on comets in general.

Minor planets recently named (1984-1988) for people involved with comet observing or the study of comets:

No.	M.P. Name	Date	MPC	Remarks (astronomer, location, notes*)
2384	Schulhof	2/17/84	8541	Leopold Schulhof, France; R
2391	Tomita	4/14/87	11748	Koichiro Tomita, Japan; A, D(1), d
2507	Bobone	9/18/86	11156	Jorge Bobone, Argentina; R, A
2596	Vainu Bappu	9/29/85	10043	M. K. Vainu Bappu, India; D(1)
2626	Belnika	2/17/84	8542	Nikolaj A. Belyaev, U.S.S.R.; R
2627	Churyumov	2/17/84	8542	Klim I.Churyumov, U.S.S.R.; D, R
2879	Shimizu	5/15/84	8801	Shin-ichi Shimizu, Japan; d, A
2954	Delsemme	9/18/86	11158	Armand H. Delsemme, U.S.A.; R
2955	Newburn	9/18/86	11158	Ray L. Newburn, Jr., U.S.A.; R, O
2956	Yeomans	9/18/86	11158	Donald K. Yeomans, U.S.A.; R
3013	Dobrovoleva	9/18/86	11159	Oleg V. Dobrovol'skij, U.S.S.R.; R
3015	Candy	6/22/86	10845	Michael P. Candy, Australia; D(1), A, R
3040	Kozai	7/2/85	9770	Yoshihide Kozai, Japan; R
3066	McFadden	4/14/87	11748	Lucy-Ann A. McFadden, U.S.A.; R, O
3132	Landgraf	11/5/87	12457	Werner Landgraf, West Germany; A, R
3169	Ostro	4/14/87	11749	Steven J. Ostro, U.S.A.; R, O
3173	McNaught	11/5/87	12457	Rob H. McNaught, Australia; A, V, D(1)
3174	Alcock	11/5/87	12458	George E. D. Alcock, England; D(5), V
3192	A'Hearn	6/22/86	10848	Michael F. A'Hearn, U.S.A.; R, O
3197	Weissman	9/18/86	11160	Paul R. Weissman, U.S.A.; R
3222	Liller	7/11/87	12015	William Liller, Chile; R, O
3227	Hasegawa	12/16/86	11441	Ichiro Hasegawa, Japan; R
3253	Gradie	4/14/87	11749	Jonathan C. Gradie, HI, U.S.A.; R
3254	Bus	7/2/85	9771	Schelte J. Bus, AZ, U.S.A.; D(2)
3255	Tholen	4/14/87	11749	David J. Tholen, HI, U.S.A.; R, O
3267	Glo	2/13/87	11641	Eleanor F. Helin, CA, U.S.A.; A, D(2)
3294	Carlvesely	9/18/86	11161	Carl Vesely, U.S.A.; A
3327	Campins	11/5/87	12458	Humberto Campins, Tucson, AZ; R, O
3338	Richter	3/26/86	10549	Nikolaus B. Richter, Germany; R
3370	Kohsai	4/14/87	11750	Hiroki Kosai, Japan; A, D(1), d
3426	Seki	12/16/86	11443	Tsutomu Seki, Japan; A, D(6), d, V
3430	Bradfield	4/14/87	11750	William A. Bradfield, Australia; D(13)
3449	Abell	9/18/86	11162	George O. Abell, U.S.A.; D(3)
3467	Bernheim	7/11/87	12017	Robert Burnham, Jr., U.S.A.; D(6), d
3500	Kobayashi	4/2/88	12972	Takao Kobayashi, Japan; R
3531	Cruikshank	2/2/88	12806	Dale P. Cruikshank, U.S.A.; O
3537	Jurgen	4/2/88	12973	Jurgen Rahe, W. Germany/U.S.A.; O
3581	Alvarez	2/2/88	12807	Luis W. Alvarez; R
3594	Scotti	9/7/87	12211	James V. Scotti, Tucson, AZ; A, O, V, d
3658	Feldman	4/2/88	12974	Paul D. Feldman, U.S.A.; O, R
3672	Stevedberg	4/2/88	12974	Stephen J. Edberg, U.S.A.; V
3673	Levy	4/2/88	12974	David H. Levy, U.S.A.; D(4), V, O
3690	Larson	4/2/88	12975	Stephen M. Larson, U.S.A.; O
3692	Rickman	4/2/88	12975	Hans Rickman, Sweden; R
3696	Herald	2/2/88	12809	David Herald, Australia; A
3697	Guyhurst	2/2/88	12809	Guy M. Hurst, England; V
3698	Manning	2/2/88	12809	Brian Manning, England; A
3699	Milbourn	2/2/88	12809	Stanley W. Milbourn, England; R
3736	Rokoske	4/2/88	12976	Thomas L. Rokoske, U.S.A.; Associate Editor (1975-1989) and Editor (1976-1977) of The Comet, The Comet Quarterly, and the ICQ

---

*Abbreviations under "Remarks":
A = has performed astrometry of comets
V = has performed visual photometry of comets
D = has discovered (one or more) comet(s)
d = has recovered one or more short-period comet(s)
O = has made non-astrometric comet observations (spectroscopy, photometry, etc.)
R = has performed valuable research concerning comets (may include orbit work)