
INTERNATIONAL COMET QUARTERLY

Whole Number 87

JULY 1993

Vol. 15, No. 3



SMITHSONIAN ASTROPHYSICAL OBSERVATORY
60 Garden Street • Cambridge, MA 02138 • U.S.A.

The *International Comet Quarterly (ICQ)* is a journal devoted to news and observation of comets, published by the Smithsonian Astrophysical Observatory in Cambridge, Massachusetts. Regular issues are published 4 times per year (January, April, July, and October), with an annual *Comet Handbook* of ephemerides published normally in the first half of the year as a special fifth issue. An index to each volume normally is published in every other January issue (even-numbered years); the *ICQ* is also indexed in *Astronomy and Astrophysics Abstracts* and in *Science Abstracts Section A*.

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This issue is No. 87 of the publication originally called *The Comet* (founded March 1973) and is Vol. 15, No. 3, of the *ICQ*. [ISSN 0736-6922]

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LETTER TO THE EDITOR: Drawings of P/Swift-Tuttle

[Ed. note: Mr. Bortle comments on his drawings that appeared in the last issue of the *ICQ*, pages 57, 64, 65, and 67.]

I feel that my stipple drawings of P/Swift-Tuttle were reproduced at a slightly larger scale than would have been most desirable to properly convey the visual impressions that I had of this comet's internal structure. The technique of stipple drawing is very effective in reproducing diffuse features and subtle differences in contrast. The maximum effectiveness is reached when the image is viewed from a distance such that the individual stipple dots just begin to merge into an overall shape. At the scale of reproduction of my drawings in the April *ICQ*, this amounts to a viewing distance of ~ 8 feet (2.4 meters), considerably more than the usual arm's length that a reader might be expected to employ. When the drawings are viewed at the proper distance, the reader will be better able to appreciate the wealth of subtle detail that I could perceive in this striking comet.

I would also like to call attention to the amazing similarity between features rendered in my images and those depicted in some of J. F. J. Schmidt's drawings of this same comet during its 1862 apparition. In particular, that of the inner coma on 1862 Aug. 26 is strikingly like my own of 1992 Nov. 10. Likewise, I find his depiction on 1862 Sept. 1 very nearly a match to my drawing of 1992 Dec. 13. Readers interested in making a direct comparison between the drawings will find Schmidt's illustrations reproduced in the NASA publication SP-198, *Atlas of Cometary Forms, Structures Near the Nucleus*, pages 22-27.

— John E. Bortle (39 Gold Road; Stormville, NY 12582; U.S.A.)

Tabulated BAA Observations

The British Astronomical Association (BAA) comet section has observations of comets in its files going back to the early 1950s. Observations for the years 1948-1954 have been analyzed by Hendrie and Morris (1982) and published in the *ICQ* [e.g., see the January 1982, April 1982, and July 1982 issues]. BAA observations between 1979 and 1990 have sometimes been published in the *ICQ*, though there are gaps [e.g., see the April 1980 and July 1980 issues].

Since 1990, when I became Director of the BAA comet section, BAA observations have been sent directly to the *ICQ* by e-mail, and observations sent to the British amateur monthly journal *The Astronomer* are also being forwarded electronically to the *ICQ*. BAA observations of comet Kohler 1977 XIV were analysed by Hendrie and Keitch (1981), and reports on comets Austin 1989c₁, Levy 1990c, P/Swift-Tuttle 1992t, and P/Schaumasse 1992x are in preparation. There are, however, still several thousand observations remaining in the files for the years 1955-1978. My work with the British Antarctic Survey involves regular trips to the Antarctic, and I have been using the time spent travelling there and back by ship to enter some of these observations into *ICQ* format. The sequence of entry is somewhat random, and at this stage no formal analysis of the observations has been carried out, though the intention is to publish magnitude parameters and brief descriptions in the *Journal of the BAA*.

All of the BAA archive observations are recorded on a standard form, with one observation per form. This form had entries for the name of the comet, date, place of observation, position of the comet, observing conditions, magnitude estimate (and comparison stars), description (coma diameter; degree of condensation; nucleus; tail length and p.a.) and remarks, instrument and magnification, and observer. There was also an opportunity to draw a field sketch on the reverse of the form. The BAA comet observing practices of the time are given in the book *Observational Astronomy for Amateurs* by J. B. Sidgwick (1955, 1961, 1971) and also in the BAA pamphlet "Nature, Aims and Methods" (1948, 1969). The BAA observers of the 1950s and early 1960s were generally more interested in obtaining an accurate or semi-accurate position than in making an accurate magnitude estimate or quantified description of the comet. For this reason, many of the magnitude estimates can only be regarded as educated guesses. In general, observers used the Sidgwick technique, as recommended by Steavenson (1942), though this is rarely stated explicitly. The source of stellar magnitudes is not often given, but the *Henry Draper Catalogue* was recommended prior to the introduction of the *Atlas Coeli* and *SAO Catalog*. In the 1960s, observers were asked to be more systematic and include field sketches showing comparison stars; sometimes it has proved possible to identify these comparisons and re-reduce the observation. Assignment of a numeric value for the DC doesn't appear until the mid-1970s, but I have attempted to assign a value based on a verbal description when possible. The focal length of the telescope is rarely quoted.

Several hundred BAA observations from 1955 to 1975 are published in the "Tabulation of Comet Observations" in this issue (see below). Some departures from standard *ICQ* policy include the use of "1 cm" as the aperture for naked-eye observations [*ICQ* policy is to give "0.0 cm" as the naked-eye aperture when not stated by the observer], and also the lack of colons for m_1 estimates given to whole magnitudes with no decimal points. I hope to submit further BAA observations over the next few years; however, my next Antarctic trip is not due until late in 1994.

- J. D. Shanklin, Director, BAA comet section (1993 June 20)

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 Sidgwick, J. B. (1955). *Observational Astronomy for Amateurs* (London: Faber and Faber); also 1961 and 1971 editions.
 Hendrie, M. J.; and G. S. Keitch (1981). *J.B.A.A.* 91, 251.
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TABULATION OF COMET OBSERVATIONS

Descriptive Information (to complement the Tabulated Data):

◊ Comet Tanaka-Machholz 1992d $\Rightarrow$ 1992 Apr. 20.09 and 21.07 (tabulated data in *ICQ* 84): in 25×100 B, cond. east of center [LEH].

◊ Comet Mueller 1993a $\Rightarrow$ 1993 May 22.85: photometry obtained with 20-cm f/2 Baker-Schmidt camera + V filter + ST-6 CCD [MIK].

◊ P/Giacobini-Zinner (1985 XIII) [all notes by GRA04 to complement tabulated data in *ICQ* 15, 77] $\Rightarrow$ 1985 Aug. 30.01: coma appeared elongated E-W. Sept. 12.09: coma appeared somewhat elongated. Sept. 12.09: broad tail.

◊ P/Halley (1986 III) [all notes by GRA04, to complement tabulated data in *ICQ* 15, 84-85] $\Rightarrow$ 1985 Nov. 8.02: coma appeared somewhat extended toward p.a. 290°. Nov. 13.04: in 20.3-cm f/10 T (80×), coma dia. 3'0, DC = 7. Nov. 21.07: in 20.3-cm f/10 T (80×), coma dia. 5', DC = 7. 1986 Apr. 8.18: in 7×35 B, 3'7 tail in p.a. 329°. Apr. 11.10: in 7×35 B, coma dia. 33', DC = 7, tails 2'9 and 3'2 long in p.a. 337° and 357°. Apr. 12.11: in 7×35 B, coma dia. 38', DC = 7, 2'7 tail in p.a. 6°. Apr. 17.00: in 7×35 B, coma dia. 25', DC = 7, tails 1'7 and 1'2 long in p.a. 32° and 105°; tail was fan-shaped, spanning p.a. 27°-115°, being brightest near its boundaries (mean length and p.a. were 1'4 and 69°, respectively).

◊ *Periodic Comet Schaumasse (1992z)* $\Rightarrow$ 1992 Dec. 15.13: at 248 $\times$, DC = 4, stellar or almost-stellar central cond. of mag 15.0 $\pm$ 0.2 [MOD]. Dec. 21.11: in 40-cm L, stellar cond. (mag $\sim$ 14.5) offset toward p.a. 42° $\pm$ 8°; coma elongated toward p.a. $\sim$ 222° [MOD]. 1993 Jan. 26.19: at 164 $\times$, almost-stellar central cond. of mag $\sim$ 14.5 [MOD]. Mar. 13.82: comet involved w/ 10th-mag star (also on Mar. 15.95); comet appeared brighter w/ Lumicon Swan Band Filter [MEY]. Mar. 15.08: estimates of coma dia./ m_1 may be too small/faint, due to star of mag $\sim$ 9 only $\sim$ 4' from the comet [MOD]. Mar. 19.16: in 10 $\times$ 50 B, comet suspected at $m_1 = 9.5$ (MM: S; ref: AA, AC), coma dia. 3'5, DC = 0 [MOD]. May 21.20: some light pollution present; comet suspected at $m_1 = 12.8$ (MM: S; ref: GA), coma dia. 1'0, DC = 1-2 [MOD]. June 19.87: "diffuse with conspicuous central cond." [MIK].

◊ *P/Schwassmann-Wachmann 1 [for tabulated data in Oct. 1988 ICQ]* $\Rightarrow$ 1988 July 12.38: comet's position close to star of $m_v \sim 10$ -11 [HAL]. Aug. 13.36: comet's position within a small group of fairly bright stars [HAL].

◊ *Periodic Comet Shoemaker-Levy 9 (1993e)* $\Rightarrow$ 1993 Apr. 17.58: tail 3'0 long in p.a. 70° [NAK01]. Apr. 23.25, 24.16, and 27.27: coma elongated roughly E-W; minor axis is 0'20 $\pm$ 0'05 [MOD]. Apr. 25.52: tail 2'3 long in p.a. 74° [NAK01]. May 15.61: tail 2'5 long in p.a. 75° [NAK01]. May 17.84: photometry obtained with 20-cm f/2 Baker-Schmidt camera + V filter + ST-6 CCD; coma 1'5 $\times$ 0'5; 'V'-shaped tail 10' long in p.a. $\sim$ 260° [MIK]. May 22.89: comet trailed; size as on May 17.84; conspicuous knot on W side; no tail detected [MIK]. May 25.60: tail 2'8 long in p.a. 253° [NAK01]. June 18.87: trailed coma 0'8 $\times$ 0'5 [MIK].

◊ *Periodic Comet Swift-Tuttle (1992t) [information by PLE01 complements tabulated data published in April issue]* $\Rightarrow$ 1992 Oct. 3.41: in 35.9-cm L, asymmetrical coma w/ $\sim$ 90° fan toward the SW [MOD]. Oct. 5.43: in 35.9-cm f/7 L (164 $\times$), stellar cond. of mag $\sim$ 14.5; $\sim$ 90° fan toward S-SW [MOD]. Oct. 8.42: comet involved w/ star of mag $\sim$ 9.8 (m_1 is thus probably 8.5 $\pm$ 0.1); in 35.9-cm f/7 L (85 $\times$), 3' coma, DC = 2, $\sim$ 60° fan in p.a. 220° $\pm$ 5° [MOD]. Oct. 18.01: two stars of mag $\sim$ 10.0 involved w/ coma (m_1 could thus be 8.4 or 8.3) [MOD]. Oct. 23.01: in 35.9-cm f/7 L (85 $\times$), 3'8 coma, DC = 3-4, $\sim$ 140° fan in p.a. 293° $\pm$ 5°; at 164 $\times$, stellar cond. of mag 12.5 $\pm$ 0.2 [MOD]. Oct. 23.99: w/ 4-inch f/5 refractor (+ ST-6 unfiltered CCD), "200-sec exp. shows the nuclear region as having a pronounced offset to the E side of the coma; the coma's fan shape extends over half the comet with the p.a. ever so slightly N of E; there may be several rays within the coma, but all have much lower contrast than the ion tail, which runs more than 25' in p.a. 329° and off the edge of the frame; at the same brightness level as the ion tail, the coma is $>$ 8' across; some tri-color imaging suggests that the comet's primary color is blue-green" [D. DiCicco, Sudbury, MA, U.S.A.]. Oct. 26.05: moderate light pollution; w/ 20-cm L, fan-shaped coma, opens to p.a. 290° $\pm$ 10°; at 68 $\times$, stellar cond. of mag 12.0 $\pm$ 0.3 (offset from center of coma) [MOD]. Oct. 28.01: w/ 20-cm L, fan-shaped coma opens to p.a. 255° $\pm$ 5° [MOD].

Nov. 4.05: moderate light pollution; 9-day-old moon $\sim$ 85° away from comet; in 20.0-cm f/5 L (35 $\times$), 2'7 coma, DC = 3-4, fan-shaped coma opening toward p.a. 273° $\pm$ 5°; on Nov. 4.07 at 169 $\times$, stellar cond. of mag 11.7 $\pm$ 0.1, offset from center of coma [MOD]. Nov. 4.79: also 0'2 tail in p.a. 38° [PLE01]. Nov. 7.92: also 0'5 tail in p.a. 44° [PLE01]. Nov. 8.94: also 0'4 tail in p.a. 38° [PLE01]. Nov. 8.97: moderate light pollution, some twilight present; 14-day-old moon $\sim$ 110° away from comet; in 20.0-cm f/5 L (35 $\times$), 2'7 coma, DC = 3-4; at 68 $\times$, coma elongated 3'4 $\pm$ 0'3 in p.a. 353° $\pm$ 5°, and fan tail $\sim$ 1'5 long spanning p.a. $\sim$ 270°-353°; on Nov. 8.99 at 169 $\times$, stellar cond. of mag 11.0 $\pm$ 0.1, offset from center of coma [MOD]. Nov. 11.78: also 0'4 tail in p.a. 28° [PLE01]. Nov. 12.91: also 0'3 tail in p.a. 36° [PLE01]. Nov. 14.00: moderate light pollution; in 20.0-cm f/5 L (35 $\times$), 2'5 coma, DC = 4; at 68 $\times$, 0'07 tail in p.a. 28°; faint ion tail, half as wide as coma (this remark also applies to observations by MOD on Nov. 19.02, 20.00, 20.01, 21.00, 26.01, and 30.02); dust tail $\sim$ 1'5 long spanning p.a. 260°-28° [MOD]. Nov. 14.90: in 10 $\times$ 50 B, 0'3 tail in p.a. 32° [PLE01]. Nov. 15.01: in 20.0-cm f/5 L (68 $\times$), 0'07 tail in p.a. 25° [MOD]. Nov. 19.02: in 20-cm L, dust tail $\sim$ 0'05 $\pm$ 0'01 in p.a. 293° $\pm$ 5°, brighter than ion tail; on Nov. 19.03 at 169 $\times$, stellar cond. of mag 9.6 $\pm$ 0.2; the cond. is stellar ($\sim$ 1") even at 343 $\times$; "at both 169 $\times$ and 343 $\times$, the brightest feature of the inner coma (after the stellar cond.) is a 'fountain' or jet of bright material that converges to a point just before reaching the stellar cond. — this feature appears to be the source of the dust tail" [MOD]. Nov. 19.83: 1'2 tail in p.a. 48° [PLE01]. Nov. 21.01: in 20-cm L (169 $\times$), stellar cond. of mag 9.5 $\pm$ 0.2, 2' dust tail in p.a. 295° $\pm$ 10° [MOD]. Nov. 24.79: 1'25 tail in p.a. 67° [PLE01]. Nov. 30.01: $\sim$ 20° alt.; comparison stars w/in 1° of comet's alt. [MOD]. Dec. 9.97: m_1 est. incl. some light from star of mag 6.52 located 4' from comet (m_1 could be $\sim$ 5.4); on Dec. 9.98 in 20.0-cm f/5 L (169 $\times$), stellar cond. of mag 9.0 $\pm$ 0.2 [MOD]. Dec. 13.99: tail as wide as coma; $\sim$ 15° alt. — comparison stars w/in 1° of comet's alt.; in 35.9-cm L, fan seen inside coma, subtending $\sim$ 180° — axis of fan is at p.a. $\sim$ 237° (opposite tail); a bright streamer lies along S edge of tail; on Dec. 13.96 at 164 $\times$, stellar cond. of mag 9.6 $\pm$ 0.1 [MOD]. Dec. 14.97: in 35.9-cm f/7 L (85 $\times$), 1'8 coma, DC = 6, 0'28 tail in p.a. 55°, tail as wide as coma; very light blue coma; fan inside coma subtends $\sim$ 90° — axis of fan is in p.a. $\sim$ 282°; bright streamer seen along S edge of tail [MOD]. Dec. 15.77: in 25 $\times$ 100 B, tails 0'3, 0'6, and 0'4 long in p.a. 35°, 63°, and 69° [PLE01]. Dec. 16.97: strong light pollution; in 20-cm L (68 $\times$), tail as wide as coma; 0'07 tail in p.a. 60°; fan inside coma subtends $\sim$ 180° — axis of fan is in p.a. $\sim$ 240°; bright streamer lies along S edge of tail; at 169 $\times$, stellar cond. of mag 9.6 $\pm$ 0.1 [MOD]. Dec. 22.97: light cirrus; 10° alt.; comparison stars have exactly the same alt. as the comet [MOD]. Dec. 23.97: light haze; 9° alt.; comparison stars have exactly the same alt. as the comet [MOD]. Dec. 27.98: 5° alt. [MOD].

◊ *Periodic Comet Väisälä (1992u)* $\Rightarrow$ 1993 Mar. 27.22: comet's position $\sim$ 3' from star of mag 5.3 [MOD]. Apr. 11.25: 19-day-old moon $\sim$ 10° up, $\sim$ 100° away from comet [MOD]. Apr. 24.22: comet suspected at $m_1 = 14.2 \pm 0.2$ (MM: S; ref: GA), coma dia. 0'5, DC = 2; observation made through very light cirrus [MOD]. May 17.85: fan-like tail 3'5 long in p.a. $\sim$ 145° [MIK]. June 19.88: star-like appearance [MIK].

◊ *Periodic comet Tempel 2 [for tabulated data in Oct. 1988 ICQ]* $\Rightarrow$ 1988 Aug. 10.18: 11th-mag star involved in coma, which made m_1 estimate somewhat difficult [HAL]. Sept. 1.19 and 30.13: sky conditions rather poor [HAL].

Explanation of the tabulated columns appeared in the January and April issues. A complete list of the Keys to abbreviations used in the *ICQ* is available from the Editor for \$4.00 postpaid. Please note that data in archival form, and thus the data to be sent in machine-readable form, use a format that is different from that of the Tabulated data in the printed pages of the *ICQ*; see pages 59-61 of the July 1992 issue for further information.

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Key to observers with observations published in this issue, with 2-digit numbers between Observer Code and Observer's Name indicating source [07 = Comet Section, British Astronomical Association; 16 = Japanese observers (c/o Akimasa Nakamura, Kuma, Japan); 32 = Hungarian observers (c/o Krisztián Sárneczky); etc.]. Those with asterisks (*) preceding the 5-character code are new additions to the Observer Key:

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KYS 23	Attila Kosa-Kiss, Romania	*WAT04 07	Nobuo Watanabe, Japan
LEM 07	J. Kysely, Czech Republic	*WIL09 07	R. D. Watkins, Wales
LEW 07	A. G. le Moeur, England	YOS03 16	Hugh Percy Wilkins, England
LIV 07	J. Lewis, United Kingdom	YUS 16	Hitoshi Yoshida, Japan
*LOW01 07	R. J. Livesey, Glasgow, U.K.	ZNO 23	Toru Yusa, Japan
	C. M. Lowe, England		Vladimir Znojil, Czech Republic

Comet Mrkos 1955 IIII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1955 06 15.0		4.4		4.5	B		12	7		1	330	ALC
1955 06 16.0		4.7		4.5	B		12	5		1.5	330	ALC
1955 06 16.05	!	5.5		5	R		16	4		0.5	340	MER02
1955 06 17.97		5.0		5	R		7					STE06
1955 06 18.0		4.5		5	R		6				330	TAY02
1955 06 18.0		4.7:										WAT
1955 06 18.0		4.9		4.5	B		12	4		1.25	5	ALC
1955 06 18.00		5.0:		15	R		40	3				GRA
1955 06 18.08		5.0	BD	5	R		6	5		0.75	335	STO01
1955 06 18.98		5 :		15	R		40	3				GRA
1955 06 19.0		5.1		4.5	B		12	5			325	ALC

Comet Mrkos 1955 III [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1955 06 21.0		5.7			B							WIL09
1955 06 22.1		5.0	V	7.5	R		30	4				HEN
1955 06 23.1		5.0	V	7.5	R		30	4			330	HEN
1955 06 25.0		5.4		7	R		30	5		0.5	0	STO01
1955 06 26.0		5.9	HD	5	B							WAT
1955 06 26.04		5.4		7	R		30					STO01
1955 06 27.94		6.6		6	R		40	2				HAM
1955 06 28.00		6.3	BD	7	R		30	5		0.5	360	STO01
1955 06 28.01		5.7		7.5	R		30	5		0.2		HEN
1955 06 28.02		7.5		20	L		36	4		0.15	0	PAN
1955 07 01.92		6.7	BD	6	R		25	5				MER01
1955 07 01.94		6.2:		15	R		40	3				GRA
1955 07 01.95		6.6	BD	6	R		40	2				HAM
1955 07 02.0		6.5		4.5	B		12	6		1.25	20	ALC
1955 07 03.0		6.3		5	B							WAT
1955 07 03.94		6.6	BD	6	R		40	5				MER01
1955 07 03.95		7 :		15	R		40	3				GRA
1955 07 03.96		6.7:		6	R		40	2				HAM
1955 07 04.0		6.3		5	B							WAT
1955 07 04.95		7.3:		6	R		25	3				MER01
1955 07 07.93		7 :		6	R		40	3				HAM
1955 07 08.92		7 :		6	R		25	3				HAM
1955 07 09.94		7.3		6	R		40	3				HAM
1955 07 10.0		7 :		9	R		27	2.5				SOP
1955 07 10.93		7.5		6	R		25	3				MER01
1955 07 10.94		7.0		7	R		30	5				STO01
1955 07 11.0		7.3:		9	R		27	3				SOP
1955 07 11.95		8.0	V	15	L		38	5				HEN
1955 07 12.0		6.5		4.5	B		12	3		0.67	55	ALC
1955 07 14.0		7.4	V	7	R		30	4				STO01
1955 07 17.0		6.8		4.5	B		12	5		0.3	85	ALC
1955 07 19.9		7.0		4.5	B		12	6				ALC
1955 07 19.92		8.5:		6	R		25	1.5				MER01
1955 07 19.94		7.8	V	15	L		38	5				HEN
1955 07 20.0		7.7		9	R		53	3				SOP
1955 07 20.9		7.0		4.5	B		12	4				ALC
1955 07 23.0		7.2		4.5	B		12	5		0.25	90	ALC
1955 07 23.0		8 :		9	R		27	4				SOP
1955 07 23.94		8.4		7	R		30	6				STO01
1955 07 24.94		8.4		7	R		30	6				STO01
1955 07 26.0		8.5		9	R		27	4				SOP
1955 07 27.0		8.0		10	R		30	5				ALC
1955 07 27.95		8.3:		6	R		25	3				MER01
1955 07 31.9		8.4		10	R		30	3				ALC
1955 08 16.9		10.0:		10	R		30	3				ALC
1955 09 04.25		11.5					45					MEI01

Comet Bakharev-Macfarlane-Krienke 1955 IV

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1955 07 17.0		7 :		5	B			5				WAT
1955 07 17.0		7.5	HD	4.5	R		12	15		0.5	135	ALC
1955 07 20.9		7.2		4.5	B		12	15		0.17	225	ALC
1955 07 20.99		7.5		15	L		40	5				GRA
1955 07 21.98		8 :		20	L		36	10				PAN
1955 07 22		8 :		4	R		8	15		0.42	225	HOL02
1955 07 22.95		7.2	V	15	L		38	8				HEN
1955 07 22.95		7.5		6	R		25	5				MER01
1955 07 23.0		7.0		4.5	B		12	17		0.67	225	ALC

Comet Bakharev-Macfarlane-Krienke 1955 IV [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1955 07 23.0		7.3:		15	L		40	7				GRA
1955 07 23.00		7.2		7	R		30	10				STO01
1955 07 23.97		7 :		15	L		38	8				HEN
1955 07 23.97		7.0:		7	R		30	10				STO01
1955 07 23.97		8.0:		6	R		40	5				HAM
1955 07 24.0	S	7.5	BD	5	R			12				WAT
1955 07 24.93		8 :		6	R		25	7				MER01
1955 07 24.96		7.5	V	7	R		30	10				STO01
1955 07 26.0	S	8.0	BD	5	R							WAT
1955 07 26.9		7.8		4.5	B		12	17				ALC
1955 07 26.95		8.0		15	L		38	10				HEN
1955 07 27.93		7.5		6	R		25	7				MER01
1955 07 28.0		7.9	V	7	R		30	8				STO01
1955 07 28.0	S	8.0	BD	5	R							WAT
1955 07 30.95		7.7		6	R		25	8				MER01
1955 07 31.9		7.8		4.5	B		12	8				ALC
1955 07 31.92		8 :		6	R		25	7				MER01
1955 08 05.9		8.2		10	R		30	5				ALC
1955 08 06.9		8.0		10	R		30	8				ALC
1955 08 07.9		8.1		4.5	B		12	8				ALC
1955 08 07.91		7.5		20	L		36	6				PAN
1955 08 07.91		7.7		6	R		25	5			0	MER01
1955 08 08.9		8.0:		4.5	B		12	10				ALC
1955 08 08.92		7.5		20	L		36	5				PAN
1955 08 10.9		8.4		4.5	B		12	11				ALC
1955 08 10.92		7.5		20	L		36	5				PAN
1955 08 10.94		9.5:		6	R		40	4				HAM
1955 08 11.9		8.5		4.5	B		12	8				ALC
1955 08 12.94		8.7:		6	R		40	3				HAM
1955 08 15.87		9.3:		6	R		40	3				HAM
1955 08 15.93		8.0		6	R		25	8				MER01
1955 08 15.96		7.5		20	L		36	6				PAN
1955 08 16.90		8.3:		6	R		25	9				MER01
1955 08 24.95		10 :		20	L		36	4				PAN
1955 08 25.92		9.0:		6	R		25	5				MER01

Comet Honda 1955 V

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1955 08 09.1		7.1		10	R		30	7				ALC
1955 08 12.1		6.0		4.5	B		12	14				ALC
1955 08 13.06		6.1	BD	7	R		30	8				STO01
1955 08 14.05		6.0	BD	7	R		30	8				STO01
1955 08 14.99		5.5:		4	R			8				MIL01
1955 08 15.0		6.0			B			10				WAT
1955 08 15.9		7.3		9	R		27	5				SOP
1955 08 15.95		6.7:		24	L		40	5				HAM
1955 08 15.97		6.1	BD	6	R		25	8				MER01
1955 08 15.99		6.2:		20	L		36	10		0.42	300	PAN
1955 08 16.0		5.0		15	L		38	8		0.1	270	HEN
1955 08 16.0		5.7			B			10				WAT
1955 08 16.0		6.0	BD	7	R		30	10			270	STO01
1955 08 16.89		6.0	BD	6	R		25	9				MER01
1955 08 16.9		5.7		5	R		6	20				TAY02
1955 08 16.9		6 :		3.5	B		9	20			240	COL01
1955 08 16.91		6.4	V	20	L		36	10			240	PAN
1955 08 17.10		4.9		2.5	R		4	8				HEN
1955 08 18.9		5.2		5	R		6					TAY01
1955 08 20.95		6.1	BD	7	R		30	10			300	STO01

Comet Honda 1955 V [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1955 08 21.93		6.2	BD	7	R		30	10			315	STO01
1955 08 22.9		7.3		7.5	R		30	5				HEN
1955 08 22.94		8 :		20	L		36	11				PAN
1955 08 23.88		6.3	BD	7	R		30	10			35	STO01
1955 08 23.90		6.8		6	R		25	8		0.13	330	MER01
1955 08 23.93		7.9	V	7.5	R		30	8				HEN
1955 08 24.91		7.3	V	15	L		38	5				HEN
1955 08 24.92		8 :		20	L		36	10		0.28	65	PAN
1955 08 24.96		6.9		6	R		25	9		0.12	320	MER01
1955 08 25.9		7 :		9	R		27	5			45	SOP
1955 08 25.91		7.1	BD	6	R		25	7		0.2	290	MER01
1955 08 25.91		7.7	V	15	L		38	7			45	HEN
1955 08 25.91		8 :		20	L		36	10		0.6	350	PAN
1955 08 25.92		6.2	BD	7	R		30	9		0.25	90	STO01
1955 08 26.95		6.5	BD	7	R		30	12		0.3	90	STO01
1955 09 06.85		6.7	HR	6	R		25	6				MER01
1955 09 09.85		7.0	HR	6	R		25	4				MER01
1955 09 09.95	S	6.7		6	R		40	7				HAM
1955 09 10.0	S	6.3:		5	R							WAT
1955 09 10.9		7.3	HD	5	R		6					TAY02
1955 09 12.83		8 :		6	R		15	4				HAM
1955 09 12.9		8.0	BD	5	R		6					TAY02
1955 09 12.91		8.5		20	L		36	5		0.33	90	PAN
1955 09 12.92		8 :		6	R		25	3				MER01
1955 09 13.0	S	7.8	BD	5	B							WAT
1955 09 13.83		8 :		6	R		40	4				HAM
1955 09 15.83		7.7:		15	L		38					HEN
1955 09 15.84		8.5:		6	R		15	4				HAM
1955 09 18.88		8.5		6	R		15	4				HAM
1955 09 18.9		8.7		15	L		38	4				HEN
1955 09 18.9	S	7.9	BD	5	R			3		0.12	90	WAT
1955 09 18.91		9.2		20	L		36	4				PAN
1955 09 19.81		8.3:		6	R		15	9				HAM
1955 09 19.83		8.4	V	15	L		38	7				HEN
1955 09 19.85		7.9	V	7	R		30	8				STO01
1955 09 19.86		9.3		12	L		22	5				PAN
1955 09 20.0	S	8.1	BD	5	R							WAT
1955 09 20.82		8 :		6	R		15	4				HAM
1955 09 20.83		8.1	V	15	L		38	8				HEN
1955 09 23.82		8.1	V	15	L		38	7				HEN
1955 09 23.89		8 :		6	R		15	4				HAM
1955 09 23.9	S	7.8	BD	5	B							WAT
1955 09 23.92		7.6		7	R		30	5				STO01
1955 09 25.89		8 :		6	R		15	4				HAM
1955 09 26.84		8.7	V	12	L		22	6				PAN
1955 09 26.87		8 :		6	R		15	4				HAM
1955 10 08.9		10 :		5	R							WAT

Comet Mrkos 1956 III

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1956 03 30.86		8.3		20	L		36	6				PAN
1956 04 02.9		8.8		30	R		240	6				MER02
1956 04 05.88		9.3		76	L		140	4				STE06
1956 04 06.9		9.2		10	R		30	8				ALC
1956 04 09.9		9.7		10	R		30	5				ALC
1956 04 22.3		10.1		20	L		80					MEI01

Comet Mrkos 1957 V

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1957 08 03.12		1.2		6	R		36	0.2		2		HAR05
1957 08 04.1		1										CLA02
1957 08 04.15		1.5		5	R		12	6		4		HEN
1957 08 09.89		2.4		7.6	R		25			1	0	DIN
1957 08 10.87		1.5		1	E					3		HEN
1957 08 10.89		1.5						6		3		GRA
1957 08 10.89		2		1	E					3		MER02
1957 08 10.9		1.5		4.9	R		7			3		STE06
1957 08 10.93		2.7		6	R		36	6		4		HAR05
1957 08 10.93		3.0		4	B		8	4		3.5	0	PAN
1957 08 11.89		3.3		4	B		8	4		3	10	PAN
1957 08 11.9		2.5		1	E							BAR07
1957 08 13.9		1		1	E					2	30	TAY02
1957 08 14.89		2.5:		1	E					3		MER02
1957 08 14.9		3.5		8.9	R		27			1.5	40	SOP
1957 08 14.94		3.2		4	R		15			2	30	CAN
1957 08 16.89		2.4		1	E					1		DIN
1957 08 18.92		3.0		2.3	R		10	9	8	2		MAR14
1957 08 21.9		2.5		1	E					2	50	TAY02
1957 08 21.9		3		1	E				5	0.7		THO04
1957 08 21.9		3.2		4	R		15		7	3	45	CAN
1957 08 21.91		3.7		6	R		36	5	6	4		HAR05
1957 08 21.92		3.7		4	B		8	5	5	3.7	60	PAN
1957 08 22.9		2.5		1	E					2		TAY02
1957 08 22.92		3.5		2.3	R		10	6	7	2		MAR14
1957 08 22.93		3.6	SC	1	E				7			GLY
1957 08 23.93		4.5:		6	R		72	4	8	3		HAR05
1957 08 24.9		3.9		1	E					3		PAN
1957 08 24.9		4.1		2	R		6			3		MAR03
1957 08 25.88		4.7		6	R		72	4	8	2.5		HAR05
1957 08 30.9		3.9	Y	1	E					2.5		TAY02
1957 08 30.9		4.0		1	E							CAN
1957 09 12.83		5.5		5	R							TAY02
1957 09 13.8		5.7	V	4	R		10			1	70	CAN
1957 09 13.83		5.0	V	3	R		3					TAY02

Comet Candy 1961 II

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1960 12 26.83		7.3		13	R		20					CAN
1960 12 26.86		8.0		20	L		27					TAY02
1961 01 02.74		8.0		10	B		25	6				ALC
1961 01 06.84		8.4	S	29	L		96	3				HAR05
1961 01 08.85		8.3	S	29	L		96	3.3				DET
1961 01 08.92		7.7		6	B		10	10				MIL01
1961 01 10.9		9.2	S	16	R		50	3				VIN
1961 01 10.91		8.2	S	9	R		15					WAT04
1961 01 11.75		8.5	S	13	R		16					CAN
1961 01 13.8		7.4		9	R		15					WAT04
1961 01 14.8		9.1	S	9	R		15					WAT04
1961 01 15.75		8.1	S	16	R		50	4				VIN
1961 01 15.79		8.6	S	13	R		16					CAN

Comet Wilson-Hubbard 1961 V

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1961 07 29.08		5.0		4	B		8	16		4	290	PAN
1961 08 03.1		3		10	B			15		4	320	STO01
1961 08 06.0		8.5:		16	R		50	2				VIN

Comet Wilson-Hubbard 1961 V [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1961 08 06.1		8		10	B		11	2		10		ALC
1961 08 07.07		7		6	B		10	0		6		MIL01
1961 08 07.1		8		10	B		11	2		10		ALC
1961 08 09.1		6.5		10	B			4		4		STO01
1961 08 10.1		7		10	B					3		STO01

Comet Seki-Lines 1962 III

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1962 02 16.79		6.0										VEN
1962 02 17.78		6.0										VEN
1962 02 18.78		6.0										VEN
1962 02 19.75		6.0										VEN
1962 02 20.4		7.0		5	B		7					ORR
1962 02 21.30		6.5		5	B		7	3				ORR
1962 02 21.75		5.5										VEN
1962 02 22.75		5.0										VEN
1962 02 23.50		6.0		5	B		7	4			10	ORR
1962 02 24.3		6.0		5	B		7	4			10	ORR
1962 02 25.3		5.7		5	B		7	5			355	ORR
1962 02 25.76		5.0										VEN
1962 02 26.79		5.0										VEN
1962 02 27.4		6.0		5	B		7					ORR
1962 02 27.77		5.0										VEN
1962 03 02.75		4.7										VEN
1962 03 03.3		4.9		5	B		7					ORR
1962 03 03.75		4.7										VEN
1962 03 04.75		4.7										VEN
1962 03 05.75		4.6										VEN
1962 03 06.79		4.6										VEN
1962 03 07.75		4.6										VEN
1962 03 09		4.0		1	E					2	90	HAR06
1962 03 09.3		3.9		10	R			10		0.5	70	ORR
1962 03 10.3		3.9		5	B		7					ORR
1962 03 10.75		4.3										VEN
1962 03 11.20		4.2		5	B		7	3				ORR
1962 03 11.81		4.3										VEN
1962 03 14.79		4.3										VEN
1962 03 15.75		4.3										VEN
1962 03 16.3		4.8		10	R		40	5		0.67	70	ORR
1962 03 16.39		4.4	HR	2.5	B		8		3			ORC01
1962 03 19.73		3.9										VEN
1962 03 21.75		3.9										VEN
1962 03 22.75		3.5										VEN
1962 03 23.75		3.6										VEN
1962 03 24.39		3.2	HR	2.5	B		8		5			ORC01
1962 03 26.31		1.0		1	E							THR01
1962 03 27.31		-1.0		1	E							THR01
1962 04 03.80		-1.5		8	B		12			1.5		HIN
1962 04 04.82		-1.5		5	B		7			2.5		FOR
1962 04 05.81		1.0		6	B		10			5		MIL01
1962 04 05.82		1.0		5	R					3		RID
1962 04 06.81		2.3		5	B		10			6		NEL
1962 04 06.84		2.9		5	B		7			3		LOW01
1962 04 08.83		2.3		1	E							ORD
1962 04 08.85		1.0		1	E					10		CHU02
1962 04 08.85		2.5		1	E					10		RID
1962 04 08.86		2.0		8	B		12	6		15		HIN
1962 04 08.86		2.2		5	B		7			15		STE06

Comet Seki-Lines 1962 III [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T F/	PWR	COMA	DC	TAIL	PA	OBS.
1962 04 11.86		3.5		8	B	12			1		HIN
1962 04 11.90		2.5		1	E				18	310	SAM
1962 04 12.83		4.8	SC	5	B	10			1.5	91	NEL
1962 04 12.89		3.5		8	B	12			11		HIN
1962 04 13.83		3.4	SC	5	B	10			2	90	NEL
1962 04 13.85		2.8		1	E				0.5	50	LOW01
1962 04 13.85		3.4			B						LIV
1962 04 13.86		3.7		1	E				0.5		BEN05
1962 04 13.88		3.2		1	E				7		HIN
1962 04 13.9		3.5		1	E		2				VIN
1962 04 13.90		3.5		1	E				11	310	SAM
1962 04 14.82		2.9		1	E				1.5		NEL
1962 04 14.84		2.5		15	L	35	5		1		MIL01
1962 04 14.85		3.0		5	B	7			3		STE06
1962 04 14.85		3.8		1	E				0.67		WAL01
1962 04 14.86		3.5		1	E				0.3		CHU02
1962 04 14.87		3.4		1	E				0.7		CAR03
1962 04 14.87		4.0		1	E		5		2.5		HIN
1962 04 14.90		3.8		1	E						SAM
1962 04 15.89		4.0		1	E				1.5		HIN
1962 04 17.8		4.5		5	B	10			1	330	NEL
1962 04 20.8		5.5		5	B	10			1		NEL
1962 04 20.86		5.2	SC	5	B	7					BRI02
1962 04 21.48		5.5		1	E				2		BRI
1962 04 22.48		5.8		1	E				1.5		BRI
1962 04 22.87		4.8		5	B	7			2		STE06
1962 04 22.90		5.5		8	B	12	7		1.0		HIN
1962 04 25.89		6.2		8	B	12	4				HIN
1962 04 26.92		6.5		8	B	12	4		0.7		HIN
1962 04 27.92		6.5		8	B	12	4		0.3		HIN
1962 04 28.8		6.2	SC	5	B	10			0.5		NEL
1962 04 28.9		6.5		16	R	50	2		0.05	60	VIN
1962 04 28.9		7.0		16	R	50	2		0.05	60	VIN
1962 04 29.88		6.0		15	L	35					MIL01
1962 04 30.8		6.5		5	B	10					NEL
1962 04 30.92		6.8		15	L	40	5		0.17		HIN
1962 05 03.93		7.8		15	L	40	4		0.13		HIN
1962 05 04.8		7.5		5	B	10					NEL
1962 05 04.93		8.0		15	L	40	4		0.13		HIN
1962 05 10.93		8.5		15	L	40	3				HIN

Comet Ikeya 1963 I

DATE (UT)	MM	MAG.	RF	AP.	T F/	PWR	COMA	DC	TAIL	PA	OBS.
1963 02 12.79		4.5		5	B	7					VAN10
1963 02 13.75		4.2		5	B	7					VAN10
1963 02 14.79		4.1		5	B	7			3		VAN10
1963 02 16.83		4.0		5	B	7			3		VAN10
1963 02 18.90		4.0		5	B	7			3.5		VAN10
1963 02 19.85		3.9		5	B	7			4		VAN10
1963 02 20.79		3.8		5	B	7			4		VAN10
1963 02 21.77		3.8		5	B	7			5		VAN10
1963 02 22.78		3.8		5	B	7			6		VAN10
1963 02 24.77		3.9		5	B	7			5		VAN10
1963 02 25.75		4.0		5	B	7			5		VAN10
1963 02 26.75		4.0		5	B	7			4		VAN10
1963 02 27.79		4.1		5	B	7			4		VAN10
1963 02 28.78		4.2		5	B	7			3		VAN10
1963 07 10.97		10.4		12	R	21	1		6		HIN

Comet Alcock 1963 III

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1963 03 22.85		8.0:		12	R		21	4	5			HIN
1963 03 23.06		8.3		12	R		21	6	7			HIN
1963 03 24.14		8.3		15	L		40	8	7	0.2	280	HIN
1963 03 24.84		8.2		8	R		28	5	3			HUT
1963 03 27.98		8.5		15	L			5	3			MIL01
1963 03 28.13		8.9		15	L		40	6	6			HIN
1963 03 28.86		8.3		10	L		46	6	5			HUT
1963 03 28.86		8.5		10	L		46		3			JON03
1963 03 31.03		9.3		15	L		40	5	4			HIN
1963 04 02.13		8.5	VB	15	L		40	6	6			HIN
1963 04 04.11		8.3	VB	15	L		40	5	6		290	HIN
1963 04 07.85		7.7		8	R		28	3	5			HUT
1963 04 12.11		8.0	VB	15	L		40	6	6			HIN
1963 04 12.96		8.0:		5	B		10	1	6			STO04
1963 04 13.96		7.5		15	L		24	4				LEM
1963 04 14.0		8 :		15	L							SAV02
1963 04 18.91		7.5		5	B		10					NEL
1963 04 19.85		7.1		3	R		15	5	3			HUT
1963 04 19.92		7.7		5	B		10					NEL
1963 04 19.95		7 :		15	L		24	5				LEM
1963 04 22.9		7.2		10	L		31	3	3			JON03
1963 04 22.91		6.7		10	L		31	3	3			HUT
1963 04 23.29		8.5:		15	L		06					SCA
1963 04 23.86		6.9		10	L		23	4	3			HUT
1963 04 23.87		7 :		10	L		24	5				LEM
1963 04 23.9		7.0:		10	L		31	4	3			JON03
1963 04 29.92		6.7	BD	5	R		8	6	4			HEG
1963 05 05.9		6.8		10	L		23	4	3			JON03
1963 05 07.88		6.5:		3	R		15	7				HUT
1963 05 09.91		6.7		1	B		10	7				HUT
1963 05 11.89		6.9		15	L		31	7	3			HUT
1963 05 11.9		6.3		15	L		23	3	3			JON03
1963 05 11.90		6.9		3	R		15	5	3			HUT
1963 05 11.90		7.0		5	B		10					NEL
1963 05 15.89		7 :		5	B		10					NEL
1963 05 16.77		6.7		5	B		7					VEN
1963 05 17.0		6.2		9	R		27	5	4	0.25	170	MAL04
1963 05 17.91		6.7		5	B		10					NEL
1963 05 18.90		6.5		5	B		10					NEL
1963 05 19.04		5.8		1	E			22		0.75		ALC
1963 05 22.81		6.0		5	B		7					VEN
1963 05 24.78		6.0		5	B		7					VEN
1963 05 24.92		7.5		5	B		10					NEL
1963 05 30.92		6.5		5	B		10	0.5				NEL
1963 06 01.75		4.7		5	B		7					VEN
1963 06 02.00		6.2		12	R		21	11	6			HIN
1963 06 02.76		4.7		5	B		7					VEN
1963 06 02.94		6.3		12	R		21	9	6			HIN
1963 06 03.77		4.7		5	B		7					VEN
1963 06 03.97		6.2		12	R		21	11	6			HIN
1963 06 04.77		5.1		5	B		7					VEN
1963 06 08.77		5.2		5	B		7					VEN
1963 06 09.75		5.2		5	B		7					VEN
1963 06 10.75		5.5		5	B		7					VEN
1963 06 11.41		6.0:		15	L					0.1		EMM
1963 06 11.47		6.0	SP	15	L		58	7	4			WAR02
1963 06 12.40		6.0		15	L			1.3		0.1		EMM
1963 06 12.46		6 :		15	L		58	7	4			WAR02
1963 06 13.39		6 :		15	L		58	7	4	0.3		WAR02

Comet Alcock 1963 III [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1963 06 13.40		6.2		1	E							EMM
1963 06 13.40		7.0		15	L			1.3		0.1		EMM
1963 06 13.79		5.5		5	B		7					VEN
1963 06 14.37		5.7	SP	15	L		58	6	5			WAR02
1963 06 15.4		7.2		15	L			1		1.5		EMM
1963 06 15.43		6 :		15	L		58					WAR02
1963 06 15.77		6.0		5	B		7					VEN
1963 06 16.42		5.7		15	L		58					WAR02
1963 06 17.75		6.2		5	B		7					VEN
1963 06 19.45		6.5		15	L		58					WAR02
1963 06 20.45		6.5		15	L		58					WAR02
1963 06 20.75		7.0		5	B		7					VEN
1963 06 21.75		7.0		5	B		7					VEN
1963 06 24.79		7.0		5	B		7					VEN
1963 06 26.49		7.5	S	15	L		58					WAR02
1963 07 09.39		8 :		15	L		58	3.5				WAR02
1963 07 11.81		8.8		5	B		7					VEN
1963 07 13.77		8.8		5	B		7					VEN
1963 07 14.47		8 :		15	L		58	3		0.07		WAR02
1963 07 15.39		8 :		15	L		58	3		0.07		WAR02
1963 07 16.36		8 :		15	L		58	3	4	0.07		WAR02
1963 07 17.46		8 :		15	L		58	3	3	0.07		WAR02
1963 07 19.77		8.9		7	R		20					VEN
1963 07 22.77		8.8		7	R		20					VEN
1963 07 24.77		9.2		7	R		20					VEN

Comet Tomita-Gerber-Honda 1964 VI

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1964 06 12.15		5.1		5	B		7	5				VEN
1964 06 13.13		5.2		1	E							VEN
1964 06 14.13		5.1		1	E			5		0.7		VEN
1964 06 14.45		5.5		5	B		7	9	6	1.3	250	MCC02
1964 06 15.14		5.2		1	E							VEN
1964 06 16.15		5.4		5	B		7	5				VEN
1964 06 17.15		4.9		5	B		7	4				VEN
1964 06 19.15		5.0		5	B		7					VEN
1964 07 04.71		4.5		5	B		7					VEN
1964 07 05.34		5.2		5	B		7					MAT01
1964 07 06.36		5 :		10	R		38	4		0.5		JON01
1964 07 06.71		5.2		7	R		40			0.5		VEN
1964 07 07.35		5 :		10	R		38	4		0.5	90	JON01
1964 07 07.69		6.0		7	R		40					VEN
1964 07 08.71		5.9		5	B		7	5		0.5		VEN
1964 07 09.71		5.9		5	B		7					VEN
1964 07 10.69		5.8		5	B		7					VEN
1964 07 11.70		5.8		5	B		7	5				VEN
1964 07 13.70		6.1		5	B		7					VEN
1964 07 14.70		6.1		5	B		7					VEN

Comet Everhart 1964 IX

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1964 08 25.86		7.0		10	B		11	8	6			ALC

Comet Ikeya-Seki 1965 VIII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1965 09 23.13		7.0		5	B		7					VEN

Comet Ikeya-Seki 1965 VIII [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1965 09 24.13		7.0		5	B		7					VEN
1965 09 27.11		6.0		5	B		7	2		0.1	110	VEN
1965 09 29.13		5.7		1	E			4		0.3		VEN
1965 09 30.13		5.6		1	E							VEN
1965 10 01.13		5.4		1	E							VEN
1965 10 05.10		5.2		1	E					1.5		VEN
1965 10 06.74		5.5		5	B		10			1.5		HOD
1965 10 07.11		4.3		1	E			1.5		2		VEN
1965 10 07.75	! S	3.0		5.0	B		7			0.7		MAT01
1965 10 07.77		4.5		5	B		10			2.3		HOD
1965 10 09.10		4.2		1	E			1.5				VEN
1965 10 10.11		3.8		1	E					2		VEN
1965 10 11.13		3.5		1	E							VEN
1965 10 11.75		3.7		5	B		10			1.5		HOD
1965 10 12.11		3.2		1	E							VEN
1965 10 12.75		2.5		5	B		7			2		MAT01
1965 10 12.76		3.0		5	B		10			2		HOD
1965 10 13.11		2.6		1	E							VEN
1965 10 13.76		2.2		5	B		10			2.5		HOD
1965 10 14.11		2.2		1	E			2.5		3	255	VEN
1965 10 15.11		2.1		1	E							VEN
1965 10 16.11		1.9		1	E							VEN
1965 10 17.11		1.0		1	E					5		VEN
1965 10 17.74		3.5		5	B		7			1		MAT01
1965 10 24.11		0		1	E					>5		VEN
1965 10 25.1		2		1	E					9		VEN
1965 10 26.10		2.7		1	E					13	280	VEN
1965 10 28.74		3		5	B		7			19	270	MAT01
1965 10 29.09		4.0		1	E							VEN
1965 10 29.74		3.3		5	B		7			18.8	270	MAT01
1965 10 31.09		4.3		1	E					16		VEN
1965 11 05.10		5.8		1	E					20		VEN
1965 11 06.23		4.7		8	B		10			1		BRO02
1965 11 07.10		6.0		5	B		7					VEN
1965 11 08.09		5.8		5	B		7			22		VEN
1965 11 19.09		6.5		5	B		7			22		VEN
1965 11 22.24		6	:	5	R		6					TAY02
1965 11 24.06		6.7		5	B		7	2				VEN
1965 11 25.04		6.8		5	B		7					VEN

Comet Barbon 1966 II

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1966 08 22.9		11.7:		25	R		80					MOS02
1966 08 25.07		10.5:		25	R		80		2			MOS02
1966 08 25.07		11.0:		25	R		80		2			MOO01
1966 08 26.08		10.5:		25	R		80		2			MOS02

Comet Kilston 1966 V

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1966 08 12.9		9.5		20	L		90		3			TAY02
1966 08 14.05		9.5	VB	7	B		10					BRO02
1966 08 14.05		10.0	VB	11	B		25					BRO02
1966 08 14.05		10.5	VB	21	L		24	2				BRO02
1966 08 14.90		9.0		5	R		25					BRO02
1966 08 14.90		10.0		11	B		25					BRO02
1966 08 14.90		10.0		21	L		24	1.5	5			BRO02
1966 08 15.90		9.0		5	R		25					BRO02

Comet Kilston 1966 V [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T F/	PWR	COMA	DC	TAIL	PA	OBS.
1966 08 15.90		10.0		21	L	28	2	7			BRO02
1966 08 23.92		9.5		25	R	80		5			MOO01
1966 08 23.95		10.3:		22	L	50					NEL
1966 08 23.96		10.3:		15	L	100		3			LIV
1966 08 24.89		10.0:		25	R	80					MOO01
1966 08 24.93		10.5		22	L	50		4			NEL
1966 08 25.92		9.0		25	R	80					MOS02
1966 08 25.92		10.0		22	L	50		3			NEL
1966 08 25.92		10.5		15	R	60	1	5			HEG
1966 09 04.89		10.5		22	L	50		4			NEL
1966 09 05.85		10.2	UM	22	L	70	0.5	6			GAI
1966 09 06.92		10.5	UM	22	L	70	0.5	6			GAI
1966 09 07.92		9.0		25	R	80	1.0				COR
1966 09 07.92		9.2		25	R	80	1.5				MOS02
1966 09 08.86		10.2	V	22	L	70	0.5				GAI
1966 09 09.87		10.1	V	22	L	70	0.5				GAI
1966 10 18.88		10.0:		16	L	75	2	5			LEM

Comet Wild 1967 III

DATE (UT)	MM	MAG.	RF	AP.	T F/	PWR	COMA	DC	TAIL	PA	OBS.
1967 02 26.84		10.5		30	L	54	2.0	5			BRO02
1967 02 28.82		10.6		30	L	54	1.5	5			BRO02
1967 03 01.83		10.4		30	L	54	2.0	4			BRO02
1967 03 02.81		10.5		30	L	54	2.0				BRO02
1967 03 05.81		10.8		30	L	54	1.5				BRO02
1967 03 10.85		10.8		30	L	54	1.5				BRO02
1967 03 11.85		11 :		32	R	80					HEG
1967 03 11.89		10.9		30	L	54	1.5				BRO02
1967 03 14.88		10.9		30	L	54	1.5				BRO02
1967 03 15.81		11.1	VB	30	L	54	1.5				BRO02

Comet Seki 1967 IV

DATE (UT)	MM	MAG.	RF	AP.	T F/	PWR	COMA	DC	TAIL	PA	OBS.
1967 02 13.17		10.3		21	L	28	1.5				BRO02
1967 02 13.17		10.5		30	L	54	1.5				BRO02

Comet Daido-Fujikawa 1970 I

DATE (UT)	MM	MAG.	RF	AP.	T F/	PWR	COMA	DC	TAIL	PA	OBS.
1970 02 05.26		6.3		8	B	11	2				BRI02
1970 02 06.26		6.1		8	B	11	3		0.17	300	BRI02

Comet Kobayashi-Berger-Milon 1975 IX

DATE (UT)	MM	MAG.	RF	AP.	T F/	PWR	COMA	DC	TAIL	PA	OBS.
1975 07 11.93		6.3	S	8	B	11	8				MIL01
1975 07 11.94		7.0	S	5	B	10	20				GAR
1975 07 11.97		6.9	S	5	B	10	20				HUR
1975 07 11.97		7.1	S	8	B	11	18				PAN
1975 07 13.93		6.4	S	11	R	70	7				RID
1975 07 13.94		5.8	S	6	B	13	8				HEN
1975 07 13.95		7.0	S	5	B	10	14				GAR
1975 07 13.96		6.3	S	8	B	11	19				PAN
1975 07 14.9		5.5	S	6	B	13	10				HEN
1975 07 14.91		7.3		5	B	10	21				GAR
1975 07 14.97		6.0		5	B	10	10				DOH
1975 07 15.93		5.3		6	B	13	10				HEN

Comet Kobayashi-Berger-Milon 1975 IX [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1975 07 15.97		5.8		8	B		11	18				PAN
1975 07 15.98		5.7		5	B		10	11				DOH
1975 07 16.97		6.2		4	B		8	22				BRE
1975 07 17.98		5.3		5	B		7	26				GAI
1975 07 18.92		7.2		5	B		10	17				GAR
1975 07 18.94		5.3		5	B		7	15	2/			HOW
1975 07 18.96		5.8	S	8	B		11	10				MIL01
1975 07 18.97		5.3		5	B		10	11				DOH
1975 07 18.98		4.5		1	E			10				LEW
1975 07 18.98		5.4		8	B		11	15				PAN
1975 07 19.00		6.0		11	R		70	8				RID
1975 07 19.07		5.4		10	B		25	25				ALC
1975 07 19.08		5.0		5	B		16	15				POT
1975 07 19.91		5.5		16	L		50	8				LEM
1975 07 20.9		5.5		5	B		7		3/			HOW
1975 07 20.93		5.0		5	B		10	15				DOH
1975 07 20.95		5.4		4	B		8	25				BRE
1975 07 20.98		4.5		7	R		30	12				POT
1975 07 20.99		5.2		8	B		11	19				PAN
1975 07 21.06		5.1		3	B		6	15				MAD
1975 07 21.08		4.7		10	B		20	21				ALC
1975 07 21.09		5.7	S	5	B		10					HUR
1975 07 21.9		5.4	S	5	B		7		4			HOW
1975 07 21.90		5.1		16	L		50	8				LEM
1975 07 21.90		5.5		10	B		20	17				ALC
1975 07 21.91		5.2	S	5	B		10					HUR
1975 07 21.91		5.6	S	8	B		11	10				MIL01
1975 07 22.91		5.5		16	L		50	8				LEM
1975 07 22.93		5.0		10	B		20	20				ALC
1975 07 22.94		5.2	S	5	B		10					HUR
1975 07 23.86		5.3		5	B		12	15				PAN
1975 07 23.88		5.2		16	L		50	6				LEM
1975 07 23.88		5.7	S	5	R		75					MCI
1975 07 23.89		6.5		5	B		7	10				PIC
1975 07 23.92		6.0	S	11	R		70	15				RID
1975 07 23.93		4.8		5	B		10	15				DOH
1975 07 23.95		5.2		10	B		20	15				ALC
1975 07 23.95		5.8		4	B		8	8				TAY
1975 07 23.96		5.3	S	5	B		10	10				HUR
1975 07 24.01		4.8		5	B		7	17	5			HOW
1975 07 24.91		5.2		16	L		50	10				LEM
1975 07 24.93		5.1		5	B		7	18				GAI
1975 07 24.93		5.1	S	5	B		10	20				HUR
1975 07 24.94		5.3		3	B		8	13				OWE
1975 07 24.96		5.4		4	B		8	10				TAY
1975 07 25.87		5.0		16	L		50	8				LEM
1975 07 25.89		6.0		5	B		7	10		0.5		PIC
1975 07 25.91		4.9		8	B		11	10				MIL01
1975 07 25.92		5.1	S	5	B		10					HUR
1975 07 25.92		5.2	S	11	R		70	10				RID
1975 07 25.95		4.7		10	B		20	10		0.25		ALC
1975 07 26.02		4.8	S	5	B		7	12	6			HOW
1975 07 26.87		5.6		21	L		57	10				DRI
1975 07 26.88		5.0		16	L		50	9				LEM
1975 07 26.90		5.2		11	R		70	8				RID
1975 07 26.97		5.0	SP	5	B		7	7				STU
1975 07 26.98		4.7	S	5	B		7	12	6			HOW
1975 07 26.99		4.5		5	B		16	10				POT
1975 07 26.99		4.9		15	L		30	8				LEW

Comet Kobayashi-Berger-Milon 1975 IX [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1975 07 27.01		5.3		3	B		8	13				OWE
1975 07 27.87		5.1	S	21	L		57	8				DRI
1975 07 27.89		5.3		16	L		50	7				LEM
1975 07 27.90		5.2		5	B		10	12				HAT
1975 07 27.95		4.5		5	B		10	12				BUL
1975 07 27.95		5.0		5	B		10	20				ENT
1975 07 27.95		5.0	S	5	B		7		6			HOW
1975 07 27.95		5.1		7.5	R		39	30				HOS
1975 07 27.95		5.2		7.5	R		24	7				GAI
1975 07 27.95		5.3		5	B		7	7				STU
1975 07 27.97		4.5		15	L		30	7				LEW
1975 07 27.98		4.7		7	R		62	10				POT
1975 07 27.98		6.1		3	B		8	15				OWE
1975 07 28.87		5.0		21	L		57	6				DRI
1975 07 28.89		5.0		16	L		50	6				LEM
1975 07 28.9		4.8		4	B		12	12				HEN01
1975 07 28.91		4.8		8	B		11	10				MIL01
1975 07 28.91		5.1		4	B		8	20				BRE
1975 07 28.91		5.5		5	B		10	10				HAT
1975 07 28.94		5.1		8	B		11	15				PAN
1975 07 28.95		4.7		5	B		10	17				BUL
1975 07 28.95		4.8		10	B		20	15		0.83		ALC
1975 07 28.95		5.1		7.5	R		24	8				GAI
1975 07 28.95		5.5		3.5	B		7	7				LEW
1975 07 28.96		5.0		5	B		7			0.5	60	KEE01
1975 07 28.96		5.0		5	B		10	11				ENT
1975 07 28.97		4.8		5	B		16	8				POT
1975 07 29.87		5.6		21	L		57	7				DRI
1975 07 29.89		5.1		16	L		50	7				LEM
1975 07 29.91		5.7		11.5	R		70	11				RID
1975 07 29.94		5.0		4	B		8	20				BRE
1975 07 29.94		5.0		15	L		30	5				LEW
1975 07 29.97		4.5		1	E			25				BRE
1975 07 29.98		5.0		5	B		10	10				HAT
1975 07 29.99		5.0		5	B		10	15		0.75		DOH
1975 07 29.99		5.1		5	B		7	15	4			HOW
1975 07 30.91		4.9	S	11.5	R		70	12				RID
1975 07 30.93		4.7		5	B		10	11				BUL
1975 07 30.93		5.3	Y	5	B		7	20				ROT
1975 07 30.95		4.8		5	B		10	12		0.75		DOH
1975 07 30.96		4.9		7.5	R		30	10				POT
1975 07 31.89		5.3		16	L		50	7				LEM
1975 08 01.86		4.5		21	L		57	6				DRI
1975 08 01.89		4.5	S	5	B		10	30		1	85	HUR
1975 08 01.89		5.4		16	L		50	7				LEM
1975 08 01.9		5.0		4	B		12	11				HEN01
1975 08 01.90		5.0	S	11.5	R		70	12		0.33	72	RID
1975 08 01.90		5.1		15	R	9	75	5				MCI
1975 08 01.91		4.6		10	L		18	15				HAT
1975 08 01.91		4.9		8	B		11	8		0.5		MIL01
1975 08 01.91		5.1		5	B		10	9				GAR
1975 08 01.92		5.3		5	B		10	10		0.67		DOH
1975 08 01.94		5.1	LN	5	B		7	6		1	65	CLA01
1975 08 01.95		4.5		15	L		30	8				LEW
1975 08 01.96		4.6		5	B		10	9				BUL
1975 08 01.96		5.4		5	R		10	20				HOS
1975 08 01.97		4.5		5	B		7	7		0.25		KEE01
1975 08 01.97		5.0		5	B		7	13				GAI
1975 08 01.98		5.0		6	B		13	8				HEN

Comet Kobayashi-Berger-Milon 1975 IX [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1975 08 02.00		5.0		5	B		7	12				HOW
1975 08 02.00		5.3		5	B		7	7				STU
1975 08 02.03		4.9		4	B		8	12		0.42	65	BRE
1975 08 02.03		5.0		8	B		11	12				PAN
1975 08 02.86		5.1		21	L		57	5				DRI
1975 08 02.89		5.5		16	L		50	6				LEM
1975 08 02.89	S	5.1		15	R	9	75	5				MCI
1975 08 02.9		5.0		4	B		12	11		1	70	HEN01
1975 08 02.90		4.6		10	L		18	12				HAT
1975 08 02.90		4.9		8	B		11	8		1	70	MIL01
1975 08 02.90		5.1		5	B		10	10				GAR
1975 08 02.91		4.7	S	5	B		10	25		1	75	HUR
1975 08 02.91		5.0	S	11.5	R		70	14		0.33	75	RID
1975 08 02.91		5.2	LN	5	B		7			0.5	75	CLA01
1975 08 02.92		4.9		5	B		7	7				GAI
1975 08 02.92		5.4		5	B		7	7		0.25	90	STU
1975 08 02.92		5.7		5	B		7	30		0.67		PIC
1975 08 02.94		4.8		8	B		11	12				PAN
1975 08 02.95		4.9		1	E			10		0.67		DOH
1975 08 02.95		5.0		15	L		30	8				LEW
1975 08 02.95		5.1		1	E			10		1.5	85	HEN
1975 08 02.95		5.1		5	B		10	15				BUL
1975 08 02.97		5.2		5	B		7	10				HOW
1975 08 02.98		4.9		4	B		8	8		0.2	65	BRE
1975 08 03.09		4.6		10	L		18	12				HAT
1975 08 03.87		5.2		5	B		10	9				GAR
1975 08 03.88		5.7		5	B		7	30		0.67		PIC
1975 08 03.89		5.1		16	L		50	6				LEM
1975 08 03.9		4.9		5	B		7	12		0.25	90	HOW
1975 08 03.9		5.0		4	B		12	15		2.5	85	HEN01
1975 08 03.90		4.8		10	L		18	12				HAT
1975 08 03.91		4.9		8	B		11	8		1	70	MIL01
1975 08 03.92		4.7		11.5	R		70	12		0.67	85	RID
1975 08 03.92		5.1		5	B		7	7		0.13	90	STU
1975 08 03.93		4.6		6	B		13	8		1.5	80	HEN
1975 08 03.94		4.9		5	B		7	8				GAI
1975 08 03.95		4.7	S	5	B		10	30		2	80	HUR
1975 08 03.95		5.0		15	L		30	8		0.2	70	LEW
1975 08 03.96		4.6		5	B		10	15				BUL
1975 08 03.99		4.8		5	B		10	9				DOH
1975 08 04.00		4.8		4	B		8	8		0.28	87	BRE
1975 08 04.88		5.7		5	B		7	30		0.67		PIC
1975 08 04.9		5.3		5	B		10	10		1.2		GAR
1975 08 04.91		4.7	S	5	B		10	20		1.13	80	HUR
1975 08 04.91		4.9	S	11.5	R		70	14		0.5	77	RID
1975 08 04.93		4.6		8	B		11	10				PAN
1975 08 04.93		5.2		4	B		8	10		0.42	85	BRE
1975 08 04.94		5.0		5	B		10	14				BUL
1975 08 04.95		4.6		6	B		13	10		1.5	80	HEN
1975 08 04.95		4.9		5	B		10	8				DOH
1975 08 04.96		5.0		3.5	B		7	8				LEW
1975 08 04.99		4.8		10	L		18	10				HAT
1975 08 05.88		5.4		5	B		10	8.8				GAR
1975 08 05.89		4.7		11.5	R		70	12		0.67	78	RID
1975 08 05.90		5.2		4	B		8	8		0.25	76	BRE
1975 08 05.91		4.5		8	B		11	10				PAN
1975 08 05.91		4.9		8	B		11	10		1	70	MIL01
1975 08 05.92		4.8		5	B		10	10				HAT
1975 08 05.93		4.8		5	B		10	7		1		DOH

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DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1975 08 05.94		5.3		15	L	8	30	7				LEW
1975 08 05.95		4.6		6	B		13	8		0.75		HEN
1975 08 05.95		4.8		5	B		10	15				BUL
1975 08 06.87		5.5		21	L		57	7				DRI
1975 08 06.89		4.5	S	5	B		10	25		1	55	HUR
1975 08 06.89		5.0		16	L		50	6		0.13		LEM
1975 08 06.9		5.2		5	B		7	12		0.42	65	HOW
1975 08 06.90		5.0		5	B		10	10				HAT
1975 08 06.90		5.1		4	B		8	10		0.33	75	BRE
1975 08 06.90		5.2		5	B		10	16		0.33	45	HOS
1975 08 06.91		5.0		8	B		11	10		1	70	MIL01
1975 08 06.91		5.1		5	B		7	7				GAI
1975 08 06.92		4.8		5	B		10	6		0.83		DOH
1975 08 06.93		4.3		8	B		11	9				PAN
1975 08 06.96		5.1		5	B		7	17				BUL
1975 08 06.96		5.3		5	B		16	10				POT
1975 08 06.97		4.7	S	11.5	R		70	12		0.67	70	RID
1975 08 07.01		5.5		15	L	8	30	8		0.08	70	LEW
1975 08 07.89		5.1		16	L		50	6		0.13		LEM
1975 08 07.9		4.8		4	B		12	10		1	65	HEN01
1975 08 07.90		4.8		21	L		57	7				DRI
1975 08 07.90		5.3		4	B		8	5		0.17	84	BRE
1975 08 07.92		5.0		15	R	9	75	6				MCI
1975 08 07.93		4.6	S	5	B		10	30		1.5	65	HUR
1975 08 07.98		5.5		15	L	8	30	4		0.17	70	LEW
1975 08 08.90		4.9		5	B		10	6				STU
1975 08 08.91		5.1		4	B		8	6		0.2	80	BRE
1975 08 08.96		5.3		6	R		15	7				BRE
1975 08 08.97		5.1		5	B		10	10				BUL
1975 08 09.86		4.5		21	L		57	10				DRI
1975 08 09.89		5.0		16	L		50	15		0.25		LEM
1975 08 09.90		5.0		5	B		7	30		1.5		PIC
1975 08 09.90		5.2		5	B		7	8				GAI
1975 08 09.91		4.9		10	R	8	20	10		0.92	67	TAY
1975 08 09.91		5.0		5	B		10	12				BUL
1975 08 09.92		5.0		5	B		10	7.8				GAR
1975 08 09.92		5.7		5	B		7	4				STU
1975 08 09.94		4.3		8	B		11	9				PAN
1975 08 09.94		4.5		11.5	R		70	14		1	71	RID
1975 08 09.94		4.9		5	B		10	6		1.5		DOH
1975 08 09.94		5.1		4	B		8	6		0.25	75	BRE
1975 08 09.94		5.2		5	B		7	13		1.6	40	HOW
1975 08 09.95		4.6		1	E			8		1.5		HEN
1975 08 09.99		5.0		10	L		18	8				HAT
1975 08 10.0		4.8		4	B		12	10		1.3	65	HEN01
1975 08 10.89		4.8		10	R	8	20	10		0.92	63	TAY
1975 08 10.9		5.4		5	B		7	15		0.82	25	HOW
1975 08 10.90		4.2	S	5	B		10	15		1	55	HUR
1975 08 10.90		5.3		4	B		8	5		0.15	88	BRE
1975 08 10.90		5.3		5	B		7	7		0.25	60	STU
1975 08 10.93		5.0		15	L	8	30	5		0.33	70	LEW
1975 08 10.95		4.5		11.5	R		70	11		1	65	RID
1975 08 11.91		4.5		11.5	R		70	7		0.33	70	RID
1975 08 11.91		5.3		4	B		8	10				BRE
1975 08 11.92		4.3	S	5	B		10	15		1	55	HUR
1975 08 11.94		5.0		15	L	8	30	4		0.17	70	LEW
1975 08 12.89		5.0		22	L		50	5		1.5		LEM
1975 08 12.90		5.0		15	R	9	75	5				DRI
1975 08 12.90		5.3		4	B		8	5		0.25	83	BRE

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DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1975 08 12.95		4.5		6	B		13	5				HEN
1975 08 13.91		4.7		8	B		11	7		1	60	MIL01
1975 08 13.91		5.1		22	L		52	10		0.25		LEM
1975 08 13.95		4.3		6	B		13	5		1.5		HEN
1975 08 15.85		4.6		5	B		10	4		0.75		DOH
1975 08 16.89		4.0		5	B		10	10		0.5	50	HUR
1975 08 16.89		5.1		4	B		8	4		0.38	48	BRE
1975 08 16.89		5.2		5	B		7	5		0.42	50	STU
1975 08 16.90		4.5		5	B		10	4		1.17		DOH
1975 08 16.91		4.6		8	B		11	8		0.53	50	PAN
1975 08 17.89		4.8		5	B		10	19		0.95	70	BUL
1975 08 17.92		5.0		3.5	B		7	2.5		0.12		LEW
1975 08 18.88		5.2		5	B		7	10		0.33	30	HOW
1975 08 19.85		3.9	S	5	B		10	7		2	55	HUR
1975 08 20.89		5.4		4	B		8	2		0.08	80	BRE
1975 08 21.87		5.0		16	L		50	10		0.13		LEM
1975 08 21.89		4.5		5	B		10	2		0.5		DOH
1975 08 21.89		4.9		4	B		8	3		0.08	70	BRE
1975 08 21.9		4.9		4	B		12	4.5			60	HEN01
1975 08 21.90		4.4		8	B		11	6		0.15	65	PAN
1975 08 21.92		5.0		15	L	8	30	2		0.13		LEW
1975 08 22.85		4.6	S	5	B		10	5		2	20	HUR
1975 08 22.88		4.5		5	B		10	2.5		1		DOH
1975 08 22.89		5.0		3	B		8	6				OWE
1975 08 22.90		4.2		8	B		11	6		0.27	52	PAN
1975 08 24.87		4.9		5	B		7	5		0.9	45	HOW
1975 08 24.89		4.2		8	B		11	6		0.2	45	PAN
1975 08 24.89		4.9		5	B		7	4			45	STU
1975 08 24.90		4.9		15	L	8	30	3		0.38		LEW
1975 08 25.86		4.3	S	5	B		10	3		0.25		HUR
1975 08 25.87		5.0		22	L		52	10		0.5		LEM
1975 08 25.89		5.0		3	B		8	6				OWE
1975 08 26.85		4.5	S	5	B		10	4		1	40	HUR
1975 08 26.86		4.6		5	B		7	3		0.25	45	STU
1975 08 26.87		4.5		5	B		10	2		1		DOH
1975 08 26.87		4.6		22	L		52	10		1		LEM
1975 08 26.88		4.2		8	B		11	6		0.27	30	PAN
1975 08 26.89		5.1		4	B		8	3		0.27	32	BRE
1975 08 27.84		5.1		5	B		10	3		0.13	30	STU
1975 08 27.85		4.3	S	5	B		10	4		2		HUR
1975 08 27.87		4.8		6	R		20	5				LEM
1975 08 27.88		4.2	S	11.5	R		70	3		3		RID
1975 08 27.89		4.3		5	B		10	2		2		DOH
1975 08 28.87		4.5		5	B		7	2				STU
1975 08 28.88		4.2	S	11.5	R		70	2		2	26	RID
1975 08 28.88		4.3		25.4	L		48	1.5		2		DOH
1975 09 01.85		5.7		5	B		7	4				JUD
1975 09 03.85		5.1		5	B		7	3				JUD
1975 10 24.84		8.9		5	B		10					CLA
1975 10 26.84		9.1		5	B		10					CLA

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DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1980 01 31.44	S	5.8	S	10	L	5	20	8	5			NAG02
1980 02 01.51	S	6.0	S	10	L	5	20	10	5			NAG02
1980 02 02.49	S	6.0	S	10	L	5	20	8	4			NAG02
1980 02 06.44	S	7.0	S	10	L	5	20	6	5			NAG02
1980 02 07.56	S	6.8	S	10	L	5	20	6	5			NAG02

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DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1980 02 08.56	S	7.2	S	10	L	5	20	7	4			NAG02
1980 02 09.57	S	7.5	S	10	L	5	20	10	4			NAG02
1980 02 10.43	S	8.0	S	10	L	5	20	6	4			NAG02
1980 02 11.52	S	8.5	S	10	L	5	20	7	4			NAG02
1980 02 13.49	S	8.8	S	8.0	B		20	10	4			NAG02
1980 02 14.44	S	9.0	S	8.0	B		20	8	3			NAG02
1980 02 16.43	S	9.2	S	10	L	5	20	5	4			NAG02
1980 02 17.48	S	9.2	S	10	L	5	20	6	3			NAG02

Comet Okazaki-Levy-Rudenko 1989 XIX

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 09 23.45	S	8.5	S	15	R	5	23	4	6			NAG02

Comet Cernis-Kiuchi-Nakamura 1990 III

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 03 19.46	S	9.0	S	12.5	B		25	4	3			KAN04

Comet Austin 1990 V

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 03 13.41	S	6.5	AA	16	L	6	55		4			MOM
1990 03 19.41	S	6.5	S	12.5	B		25	& 5	4			KAN04
1990 04 02.43	S	4.5	AA	8.0	B		11		4			MOM
1990 04 05.42	S	3.7	AA	7.0	B		14	4	7	0.5		KAN04
1990 04 06.42	S	3.7	AA	12.5	B		25	4	6	0.5		KAN04
1990 04 24.79	B	4.5	S	12.0	B		20	& 5	7			HIS
1990 04 24.79	S	4.6	S	15	R	5	23	3	8	>1.0		NAG02
1990 04 24.80	S	5.5	AA	7.0	B		10	5	6			MIY
1990 04 26.81	S	4.9	S	15	R	5	23	4	8			NAG02
1990 04 29.76	B	5.2	S	12.0	B		20	4	7			HIS
1990 04 29.78	S	5.8	AA	7.0	B		10	5	6			MIY
1990 04 30.78	S	5.2	S	15	R	5	23	4	7	1.0		NAG02
1990 04 30.78	S	5.7	AA	7.0	B		10	5	6			MIY
1990 05 05.78	S	5.7	S	15	R	5	23	6	7	0.16		NAG02
1990 05 06.74	B	6.1	S	12.0	B		20	5	3			HIS
1990 05 08.77	B	6.3	AC	12.0	B		20	4	5			HIS
1990 05 08.78	S	5.6	AA	7.0	B		10	5	5			MIY
1990 05 15.77	S	5.6	AA	7.0	B		10	10	3			MIY
1990 05 19.63	S	5.4	AA	8.0	B		11	15	3			MOM
1990 05 20.63	S	5.5	AA	8.0	B		11	12	2/			MOM
1990 05 21.76	M	5.7	AA	7.0	B		10	&10	4			KAK01
1990 05 24.60	S	5.7	AA	8.0	B		11	16	2/			MOM
1990 05 25.66	S	5.9	AA	8.0	B		11	12	2			MOM
1990 05 25.73	M	5.5	AA	10	R	6	19	>10	6			KAK01
1990 05 26.60	M	5.7	AA	10	R	6	19	15	6			KAK01
1990 05 26.78	S	5.5	S	15	R	5	23	10	5			NAG02
1990 05 28.78	S	6.0	S	15	R	5	23	8	5			NAG02
1990 06 02.78	S	7.1	S	15	R	5	23	7	4			NAG02

Comet Tsuchiya-Kiuchi 1990 XVII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 10 16.82	S	8.0	S	15	R	5	23	4	6			NAG02
1990 10 21.81	S	8.0	S	12.0	B		20	3	2			HIS
1990 10 26.81	S	7.6	S	12.0	B		20	& 4	5			HIS
1990 10 28.79	S	8.0	S	15	R	5	23	4	5			NAG02
1990 10 31.82	S	7.5	S	12.0	B		20	3	5			HIS

Comet Tsuchiya-Kiuchi 1990 XVII [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 11 04.83	S	7.2	AA	8.0	B		20	4	4			YOS03
1990 11 10.81	S	7.3	AA	8.0	B		20	4	3			YOS03
1990 11 10.84	S	8.3	S	7.0	B		10	3	2			MIY
1990 11 11.81	S	7.7	AA	8.0	B		20	4	2			YOS03
1990 11 13.81	S	8.3	S	12.0	B		20	& 5	4			HIS
1990 11 15.78	S	8.1	AA	8.0	B		20	6	2			YOS03
1990 11 15.81	S	8.4	S	12.0	B		20	& 5	4			HIS
1990 11 16.78	S	8.0	AA	12.5	B		25	4	4			KAN04
1990 11 17.30	B	7.0	AA	6.0	R	4	25	10	2	0.2		BUS02
1990 11 18.28	B	7.0	AA	6.0	R	4	25	10	2	0.2	110	BUS03
1990 11 18.30	B	7.0	AA	6.0	R	4	25	10	2	0.2		PIZ
1990 11 18.31	B	7.0	AA	6.0	R	4	25	10	4	0.2		BUS02
1990 11 19.30	B	7.1	AA	6.0	R	4	25	10	2	0.07		PIZ
1990 11 21.29	B	7.1	AA	6.0	R	4	60	6	2	0.08		PIZ
1990 11 21.80	S	8.0	AA	8.0	B		20	6	3			YOS03
1990 11 22.29	B	7.4	AA	6.0	R	4	60	7	2	0.08		PIZ
1990 11 22.30	B	7.6	AA	6.0	R	4	30	8	3	0.2		BUS02
1990 11 27.24	B	7.7	AA	6.0	R	4	30	8	2	0.15	220	BUS03
1990 11 27.24	B	7.8	AA	9.0	R	6	20	4	2			BUS02
1990 11 27.27	B	7.5	AA	6.0	R	4	60	5	2	0.06		PIZ
1990 11 29.28	B	8.0	AA	6.0	R	4	30	4	1	0.15		PIZ

Comet Levy 1990 XX

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 07 17.57	M	8.0	AA	10	R	6	18	6	5			KAK01
1990 07 17.62	S	8.0	AA	16	L	6	40	3	3			MOM
1990 07 19.68	M	7.4	AA	7.0	B		10					KAK01
1990 07 20.73	S	7.2	AA	16	L	6	31	4	5	0.08		MOM
1990 07 28.58	S	6.5	S	7.0	B		14	5	5			KAN04
1990 07 28.58	S	6.6	AA	16	L	6	40	8	4			MOM
1990 07 29.60	S	6.5	S	7.0	B		14	10	5			KAN04
1990 07 30.60	S	6.5	S	7.0	B		14	10	5			KAN04
1990 08 02.65	S	6.2	S	7.0	B		14	8	5			KAN04
1990 08 03.55	S	5.5	AA	8.0	B		11	9	4			MOM
1990 08 03.67	S	6.0	S	7.0	B		14	8	5	0.5		KAN04
1990 08 04.79	S	6.2	AA	7.0	B		10	6	4			MIY
1990 08 12.52	B	4.5	AA	5.0	B		10	15	6	2.5		ASA
1990 08 13.74	B	4.4	AA	7.0	B		10	15	7			KAK01
1990 08 13.77	B	5.7	S	7.0	B		10	10	5			HIS
1990 08 14.56	S	4.1	AA	8.0	B		11	25	5			MOM
1990 08 14.62	S	4.5	AA	7.0	B		10	10	5			MIY
1990 08 15.53	B	4.0	AA	0.0	E		1	20	8	>1		KAK01
1990 08 15.54	B	5.5	S	7.0	B		10	10	5			HIS
1990 08 15.66	S	4.4	AA	7.0	B		10	13	5			MIY
1990 08 18.50	B	3.8	AA	5.0	B		10	25	7	2		ASA
1990 08 18.63	S	4.3	AA	4.0	B		7	40	6			MOM
1990 08 18.76	S	3.5	S	8.0	B		20	15				NAG02
1990 08 19.62	S	4.2	AA	7.0	B		10		5			MIY
1990 08 19.69	B	4.0	AA	0.0	E		1					KAK01
1990 08 20.52	B	3.5	AA	6.0	B		15	30	7	2.5		ASA
1990 08 20.74	B	4.6	S	7.0	B		10	10	5			HIS
1990 08 22.48	B	3.3	AA	12.0	B		20	30	7	2.5		ASA
1990 08 24.47	B	3.5	AA	0.0	E		1					KAK01
1990 08 24.50	B	3.3	AA	12.0	B		20	30	7	2.5		ASA
1990 08 24.50	B	3.4	S	7.0	B		10	25	5	0.37	105	HIS
1990 08 25.53	B	3.0	AA	6.0	B		15	33	7	2		ASA
1990 08 26.50	B	3.0	AA	6.0	B		15	30	7	1		ASA
1990 09 03.47	S	4.5	AA	7.0	B		10	10	4			MIY

Comet Levy 1990 XX [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 01 12.87	S	8.7	S	15	R	5	23	5	5			NAG02

Comet Shoemaker-Levy 1991a1

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 06 21.93	S	8.4	S	20.3	T	10	78	& 1.3	2			KAM01
1992 06 27.94	S	8.6	S	20.3	T	10	80	2.0	4/			KAM01
1992 07 11.93	S	7.4	S	6.3	B		9					KAM01
1992 07 26.89	S	7.5:	S	7.5	L	9	35	3.0	3			KAM01

Comet Ohshita 1992a1

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 12 08.85	S	11.2	AC	13	L	6	62	3	2			ISH02
1992 12 21.46	S	12.2	GA	35.9	L	7	85	2.0	1			MOD
1992 12 25.82	S	11.6	AC	20	L	6	74	3.5	2			NAK01
1992 12 28.39	S	12.4	GA	35.9	L	7	85	2.0	1			MOD
1993 01 20.44	S[13.0		GA	35.9	L	7	85	! 2.0				MOD

Comet Spacewatch 1992h

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1993 02 19.70	C	15.4	EB	60.0	Y	6		0.4			205	NAK01
1993 02 19.74	S	14.7:	AC	60.0	Y	8	200	0.7				NAK01
1993 03 22.61	C	15.4	EA	60.0	Y	6		0.3			195	NAK01
1993 04 01.75	* S	14.9	HS	60.0	Y	8	240	0.6	6			NAK01
1993 04 14.56	C	15.5	HS	60.0	Y	6		0.5				NAK01
1993 04 19.58	C	15.4	HS	60.0	Y	6		0.25			155	NAK01
1993 05 20.58	C	15.9	HS	60.0	Y	6		0.3				NAK01

Comet Shoemaker 1992y

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 11 02.66	S	14.6	GA	60.0	Y	8	320	0.4	3			NAK01
1992 11 02.67	C	14.9:	EC	60.0	Y	6		0.5		0.07	199	NAK01
1992 11 24.72	S	14.3	AC	60.0	Y	8	253	0.6	5			NAK01
1992 11 24.74	C	14.7	EA	60.0	Y	6		0.5		0.08	184	NAK01
1992 11 30.62	S	14.3	AC	60.0	Y	8	253	0.5	4			NAK01
1992 12 14.16	S[13.6		GA	35.9	L	7	164	! 0.5				MOD
1992 12 15.02	S[14.5		GA	35.9	L	7	164	! 0.5				MOD
1992 12 17.61	C	15.2	EA	60.0	Y	6		0.3			138	NAK01
1992 12 21.22	S[14.0		GA	35.9	L	7	164	! 0.5				MOD
1992 12 25.53	C	15.2	EA	60.0	Y	6		0.4			125	NAK01
1992 12 25.56	S	14.5	AC	60.0	Y	8	253	0.5				NAK01
1992 12 28.02	S[14.2		GA	35.9	L	7	164	! 0.5				MOD
1993 01 21.52	C	15.9	GA	60.0	Y	6		0.4			105	NAK01
1993 01 26.21	S[14.0		GA	35.9	L	7	164	! 0.5				MOD
1993 02 14.46	C	15.9	EA	60.0	Y	6		0.3				NAK01
1993 02 27.14	S[12.7		GA	31.8	L	6	127	! 0.5				MOD
1993 03 20.43	C	15.7	HS	60.0	Y	6		0.2				NAK01
1993 03 21.45	C	15.5	HS	60.0	Y	6		0.2				NAK01

Comet Mueller 1993a

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1993 01 20.41	M	14.2	GA	35.9	L	7	164	0.5	2			MOD
1993 01 26.26	S[14.3		GA	35.9	L	7	164	! 0.5				MOD
1993 01 30.30	S[14.0		GA	35.9	L	7	164	! 0.5				MOD
1993 02 27.35	S[14.2		GA	40	L	7	190	! 0.5				MOD

Comet Mueller 1993a [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1993 03 15.21	S	[14.2	GA	35.9	L	7	164	! 0.5				MOD
1993 03 19.31	S	[14.5	GA	40	L	7	190	! 0.5				MOD
1993 03 27.29	S	[14.4	GA	40	L	7	190	! 0.5				MOD
1993 04 11.22	S	[13.5	GA	35.9	L	7	164	! 0.5				MOD
1993 04 18.13	S	14.3	GA	40	L	7	190	0.5	1			MOD
1993 04 23.13	M	14.2	GA	35.9	L	7	164					MOD
1993 04 23.13	S	14.0	GA	35.9	L	7	164	0.55	3			MOD
1993 04 24.08	M	14.2	GA	35.9	L	7	164	0.50	3			MOD
1993 04 30.82	M	12.6	HS	15	R	13	80	1.5	4			ZNO
1993 05 10.14	M	13.9	GA	35.9	L	7	164	0.70	3			MOD
1993 05 12.85	I	12.0	HS	11	L	8	32	& 1				KYS
1993 05 13.84	M	12.0	HS	15	R	13	80	2.0	3			ZNO
1993 05 16.11	M	13.9	GA	35.9	L	7	164	0.5	3			MOD
1993 05 17.88	I	12.5	HS	11	L	8	32	0.7				KYS
1993 05 22.85	! V	13.2	YF	20.0	T	2		1.3	7/	0.03	90	MIK
1993 05 25.86	M	11.8	S	10	B		25	1.5	4			ZNO

Periodic Comet Encke (1961 I = 1990 XXI)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1961 01 04.75		9.2		10	B		11	2				ALC
1961 01 06		9	:	13	R		30					BLA
1961 01 15.74		7.3		16	R		50	3				VIN
1990 10 08.81	S	8.0	S	15	R	5	23	3				NAG02
1990 10 16.84	S	8.1	S	15	R	5	23	1	9			NAG02

Periodic Comet Tuttle-Giacobini-Kresák (1962 V)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1962 03 26.9		11		16	R		50	3				VIN
1962 03 26.93		11.5		15	L		35	5				MIL01
1962 03 27.9		11.5		15	L		35	5				MIL01
1962 03 30.87		11		10	B		25	15				ALC
1962 04 26.96		10.7		15	L		40	2				HIN

Periodic Comet Tempel 2 (1967 X)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1967 06 30.95		11.0:		30	L		54					BRO02
1967 07 02.02		11.0		30	L		54	1.5				BRO02
1967 07 03.03		10.5		8	B		10					BRO02
1967 07 03.03		10.7		10	B		25	3.0				BRO02
1967 07 03.03		10.9		30	L		54	2.0				BRO02
1967 07 08.94		10	:	21	L		90	4.0				LEM
1967 07 08.97		10.8		15								WAT
1967 07 09.08		10.1		8	B		10	5.0				BRO02
1967 07 09.08		10.3		30	L		54	2.5				BRO02
1967 07 10.63		10.2		8	B		10					BRO02
1967 07 10.63		10.4		30	L		54	2.0				BRO02
1967 07 10.94		10.5		21	L		90	4.0				LEM
1967 07 11.97		10.5		21	L		90	4.0				LEM
1967 08 03.99		9.5:		30	L		54	3.0				BRO02

Periodic Comet Honda-Mrkos-Pajdušáková (1990 XIV)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 08 20.80	S	9.2	S	15	R	5	23	5				NAG02
1990 08 25.79	S	9.0	S	15	R	5	23	4				NAG02
1990 08 27.79	S	8.7	S	15	R	5	23	3				NAG02

Periodic Comet Honda-Mrkos-Pajdušáková (1990 XIV) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 08 30.80	S	9.1	S	15	R	5	23	3	6			NAG02
1990 09 04.81	S	8.1	S	15	R	5	23	2	8			NAG02
1990 09 20.81	S	8.2	S	15	R	5	23	1				NAG02

Periodic Comet Daniel (1992o)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 10 25.82	C	16.0:	EC	60.0	Y	6		0.2				NAK01
1992 11 30.79	C	16.4	EA	60.0	Y	6		0.25				NAK01
1993 01 21.79	C	16.9	EB	60.0	Y	6		0.3				NAK01
1993 02 19.69	C	16.8	EB	60.0	Y	6		0.45				NAK01
1993 03 22.58	C	17.7	EA	60.0	Y	6		0.3				NAK01

Periodic Comet Wild 2 (1990 XXVIII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 01 18.83	S	11.6	AC	25	L	5	170	1.5	4			NAK05

Periodic Comet Hartley 2 (1991 XV)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 08 11.09	S	8.4	S	20.3	T	10	77	2.8	4/			KAM01

Periodic Comet Schuster (1992n)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 08 06.37	S	[14.0	GA	40	L	7	190	! 0.5				MOD
1992 08 31.39	S	[14.7	GA	40	L	7	190	! 0.5				MOD
1992 09 05.38	S	[14.5	GA	35.9	L	7	164	! 0.5				MOD
1992 09 24.39	S	[14.5	GA	35.9	L	7	164	! 0.5				MOD
1992 09 28.37	S	[14.5	GA	40	L	7	190	! 0.5				MOD

Periodic Comet Giclas (1992l)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 09 05.36	S	[14.0	GA	40	L	7	190	! 0.5				MOD
1992 10 02.29	S	[14.7	GA	40	L	7	190	! 0.5				MOD
1993 03 20.44	C	17.6	HS	60.0	Y	6		0.2				NAK01

Periodic Comet Ciffréo (1992s)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 10 23.18	S	[13.7	GA	40	L	7	190	! 0.5				MOD
1992 10 28.17	S	[14.1	GA	40	L	7	190	! 0.5				MOD

Periodic Comet Schaumasse (1992x)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 11 30.14	S	[14.0	GA	35.9	L	7	164	! 0.5				MOD
1992 12 14.09	S	[14.0	GA	35.9	L	7	164	! 0.5				MOD
1992 12 15.13	M	14.4	GA	40	L	7	190	0.50	3			MOD
1992 12 20.80	S	[12.3	A	33.4	L	4	61					SZE02
1992 12 21.07	M	13.4	GA	40	L	7	100					MOD
1992 12 21.07	S	13.2	GA	40	L	7	100	1.5	3			MOD
1992 12 21.11	M	13.6	GA	40	L	7	190	0.8	4			MOD
1992 12 21.82	S	[12.3	A	33.4	L	4	61					SZE02
1992 12 22.84	B	10.8	AA	15.6	L	10	54	2	3			KOS
1992 12 23.88	B	10.6	AA	15.6	L	10	54	2	3			KOS
1992 12 24.79	B	10.5	AA	15.6	L	10	54	2	4			KOS

Periodic Comet Schaumasse (1992x) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 12 28.06	M	13.2	GA	35.9	L	7	85	1.4	2			MOD
1992 12 28.79	S	12.2	A	33.4	L	4	61	2	1			SZE02
1992 12 28.82	B	11.0	AA	15.6	L	10	54	1	4			KOS
1992 12 29.80	S	[12.3	A	33.4	L	4	61					SZE02
1993 01 12.00	S	11.8	AC	44.5	L	4	80	1.5	1			MOR03
1993 01 14.85	S	11.2	A	33.4	L	4	61	3	3	0.05	90	SZE02
1993 01 16.23	S	10.4:	S	20	T	10	100	2.0	1			PRY
1993 01 16.84	S	11.1	A	33.4	L	4	61	4	2	0.05	90	SZE02
1993 01 18.11	S	11.6	AC	15	R	5	62	1.8				MOR03
1993 01 19.00	S	11.8	AC	44.5	L	4	80	1.8	1			MOR03
1993 01 20.13	M	10.7	GA	20.0	L	5	35					MOD
1993 01 20.13	S	10.6	GA	20.0	L	5	35	3.5	1/			MOD
1993 01 20.78	S	11.2	AA	35	L	4	50	2.5	0			PAN
1993 01 21.79	S	10.6	A	33.4	L	4	61	5	4			SZE02
1993 01 22.76	S	11.2	AA	35	L	4	50	4	1			PAN
1993 01 23.90	S	10.5:	A	33.4	L	4	61	7	4			SZE02
1993 01 25.78	S	11.4	AA	35	L	4	50	5	1			PAN
1993 01 25.90	S	9.6	A	33.4	L	4	61	7	4			SZE02
1993 01 26.03	S	10.9	AC	44.5	L	4	80	2.5	2			MOR03
1993 01 26.15	M	10.8	GA	20.0	L	5	35	3.5	1/			MOD
1993 01 26.19	M	11.4	GA	35.9	L	7	85	2.5	1/			MOD
1993 01 27.84	S	9.4	A	33.4	L	4	61	6	5	0.1	100	SZE02
1993 01 28.09	S	10.3	AC	15	R	5	62	3	1			MOR03
1993 01 30.19	M	10.6	GA	20.0	L	5	35	3.5	1/			MOD
1993 01 30.24	M	11.0	GA	35.9	L	7	85	2.5	1/			MOD
1993 02 08.02	M	10.0	GA	20.0	L	5	35	2.1	1			MOD
1993 02 09.79	S	9.1	A	33.4	L	4	61	5	7			SZE02
1993 02 18.80	S	9.4	A	33.4	L	4	61	5	6			SZE02
1993 02 19.10	S	9.2	AC	15	R	5	42	4	2			MOR03
1993 02 20.12	S	10.1	GA	20.0	L	5	35	2.0	1			MOD
1993 02 20.80	S	8.7	A	6.0	B		20	9	2			KER
1993 02 21.02	S	10.0	GA	20.0	L	5	35	2.3	1			MOD
1993 02 25.11	S	9.1	AC	15	R	5	42	3.5	2			MOR03
1993 02 25.21	S	8.9	S	20	T	10	63	2.2	3			PRY
1993 02 26.25	S	9.0	S	20	T	10	100	2.2	3			PRY
1993 02 26.87	S	8.5	AA	25	L	4	50	4	2			PAN
1993 02 27.07	M	9.6	GA	20.0	L	5	35	4.2	1/			MOD
1993 02 27.12	S	9.4	AC	15	R	5	42	4	2			MOR03
1993 02 27.90	S	8.5	AA	25	L	4	36	6	2			PAN
1993 03 05.94	S	8.8	AA	20.0	C	10	133	5	3			DES01
1993 03 08.88	S	9.4	AA	25	L	4	50	8	2			PAN
1993 03 09.79	S	8.9	AC	13.0	L	6	36	6.3	3			MEY
1993 03 09.99	S	9.0	AA	20.0	C	10	133	4	4			DES01
1993 03 11.81	S	8.8	AC	13.0	L	6	36	6.6	2			MEY
1993 03 11.90	S	9.4	AA	25	L	4	36	6	2			PAN
1993 03 12.91	S	8.9	S	20.3	T	10	78	3.2	2			KAM01
1993 03 13.82	S	8.9	AC	13.0	L	6	36	5.2	2			MEY
1993 03 14.85	S	9.4	AA	25	L	4	36	6	2			PAN
1993 03 14.88	S	8.9	AA	20.3	T	10	78	2.7	2			KAM01
1993 03 14.96	S	8.9	AC	13.0	L	6	36	6.3	2			MEY
1993 03 15.08	M	9.9	AC	20.0	L	5	35	2.5	1			MOD
1993 03 15.08	S	9.5	AC	15	R	5	42	4	2			MOR03
1993 03 15.95	S	8.9	AC	13.0	L	6	36	5.5	3			MEY
1993 03 17.91	S	9.4	AA	25	L	4	36	4	2			PAN
1993 03 18.12	S	9.5	AC	15	R	5	42	3.5	2			MOR03
1993 03 19.07	M	9.8	AC	20.0	L	5	35	3.5	1			MOD
1993 03 19.79	S	8.8	A	6.0	B		20	7	2			KER
1993 03 19.80	S	8.9	A	6.0	B		20	8	2			SAR02
1993 03 19.81	S	8.9	AC	13.0	L	6	36	6.6	4			MEY

Periodic Comet Schaumasse (1992x) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1993 03 19.86	S	9.6	A	33.4	L	4	61	8	5	0.12	115	SZE02
1993 03 20.78	S	8.7	A	6.0	B		20	6	3			SAR02
1993 03 20.80	S	9.0	S	20.3	T	10	78	3.0	3			KAM01
1993 03 20.81	S	8.9	AC	13.0	L	6	36	6.7	4			MEY
1993 03 20.82	S	9.0	A	6.0	B		20	6	2			KER
1993 03 20.85	S	9.6	A	33.4	L	4	61	8	4	0.15	115	SZE02
1993 03 22.81	S	9.0	AC	13.0	L	6	36	6.7	3			MEY
1993 03 22.89	S	9.6	AA	25	L	4	36	5	2			PAN
1993 03 23.12	S	9.6	AC	15	R	5	42	3.5	2			MOR03
1993 03 23.83	S	9.1	AA	13.0	L	6	36	6.1	3			MEY
1993 03 25.21	S	9.1	S	20	T	10	100	2.1	3			PRY
1993 03 26.11	S	9.4	AC	15	R	5	42	5	2			MOR03
1993 03 26.26	S	9.2	S	20	T	10	100	2.0	3			PRY
1993 03 26.88	S	9.1:	AA	13.0	L	6	36	5.1	2			MEY
1993 03 26.92	S	9.8	AA	25	L	4	36	5	2			PAN
1993 03 27.12	M	9.9	GA	20.0	L	5	35					MOD
1993 03 27.12	S	9.8	GA	20.0	L	5	35	3.8	1			MOD
1993 03 27.13	S	9.5	AC	15	R	5	42	4.5	2			MOR03
1993 03 27.87	S	9.1	AA	13.0	L	6	36	6.3	3			MEY
1993 04 08.79	S	9.8	A	33.4	L	4	61	7	3			SZE02
1993 04 08.93	S	9.8	AC	33	L	4	56	3	3/			BOA
1993 04 09.82	S	9.7	A	33.4	L	4	61	7	2			SZE02
1993 04 09.88	S	9.8	AC	13.0	L	6	36	6.4	1			MEY
1993 04 10.84	S	9.7	A	33.4	L	4	61	7	2			SZE02
1993 04 10.85	S	9.7	AC	13.0	L	6	36	5.5	2			MEY
1993 04 11.09	M	10.4	GA	20.0	L	5	35	3.5	1			MOD
1993 04 11.84	S	9.7	AC	13.0	L	6	36	4.6	3			MEY
1993 04 12.10	S	10.0	AC	15	R	5	42	5	2			MOR03
1993 04 15.86	S	10.0	AC	13.0	L	6	36	5.2	2			MEY
1993 04 16.85	S	10.1	AC	13.0	L	6	36	4.0	1			MEY
1993 04 17.88	S	10.6	A	33.4	L	4	61	6	1			SZE02
1993 04 19.10	S	9.1	AC	31.7	L	6	68	3.6	3/			BOR
1993 04 20.82	I	11.4	HS	11	L	8	32	3				KYS
1993 04 20.88	S	10.8	A	33.4	L	4	61	5	1			SZE02
1993 04 21.86	I	11.6	HS	11	L	8	32	2				KYS
1993 04 21.88	S	10.5:	AC	20.3	T	10	78	3	1			KAM01
1993 04 21.88	S	10.7	AC	40	L	5	40	4	1			BOA
1993 04 23.87	S	10.5	AA	44	L	4	222					TOM01
1993 04 23.89	S	10.6	AC	13.0	L	6	36	4.9	2			MEY
1993 04 24.05	S	9.5	AC	31.7	L	6	68	3.8	3			BOR
1993 04 24.12	M	11.7	GA	35.9	L	7	85	2.2	1/			MOD
1993 04 24.13	S	10.6	GA	20.0	L	5	35	3.6	1			MOD
1993 04 24.17	S	11.0	AC	15	R	5	42	3.5	1			MOR03
1993 04 26.82	M	11.3	S	10	B		25	1.8	3			ZNO
1993 04 27.25	S	10.7	GA	20.0	L	5	35	3.0	0/			MOD
1993 05 08.08	S	10.1	AC	31.7	L	6	68	& 4	0/			BOR
1993 05 09.13	S	12.9	AC	44.5	L	4	80	2.1	1			MOR03
1993 05 10.18	S	12.0	GA	35.9	L	7	85	1.9	1			MOD
1993 05 11.21	S	12.1	GA	35.9	L	7	85	1.9	1			MOD
1993 05 12.10	S	12.9	AC	44.5	L	4	80	1.7	1			MOR03
1993 05 12.86	I	12.2	HS	11	L	8	32	& 1				KYS
1993 05 13.14	S	12.6	AC	44.5	L	4	80	2.6	1			MOR03
1993 05 14.20	S	12.4	GA	35.9	L	7	85	1.9	1			MOD
1993 05 16.17	S	12.5	GA	35.9	L	7	85	1.9	1			MOD
1993 05 18.87	S	12.6	A	33.4	L	4	61	4	1			SZE02
1993 05 21.20	S	12.5	GA	35.9	L	7	85	! 2.0				MOD
1993 06 19.87	! V	14.7	YF	20.0	T	2		1.5	5			MIK

Periodic Comet Smirnova-Chernykh

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 05 19.09	S	[14.4	GA	40	L	7	190	! 0.5				MOD
1992 05 22.10	S	[14.4	GA	40	L	7	190	! 0.5				MOD
1993 04 27.30	S	[14.4	GA	40	L	7	190	! 0.5				MOD
1993 05 14.25	S	[14.2	GA	40	L	7	190	! 0.5				MOD

Periodic Comet Halley (1986 III)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 11 04.66	S	9.1	S	16	L	6	25	3	5			NAG02
1985 11 12.80	S	8.1	S	16	L	6	25	4	6			NAG02
1985 11 15.79	S	7.6	S	16	L	6	25	5	6			NAG02
1985 11 17.77	S	6.9	S	16	L	6	25	8	6			NAG02
1986 04 05.74	S	3.7	S	8.0	B		20	10	5			NAG02

Periodic Comet Olbers (1956 IV)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1956 03 30.9		10.2		16	R		50	0.25				VIN
1956 04 01.3		10.9		20	L		80					MEI01
1956 04 02.8		9.7		16	R		50	0.5				VIN
1956 04 06.9		9.5		16	R		50	0.5				VIN
1956 04 06.9		9.8		10	R		30	3		0.08	30	ALC
1956 04 09.9		9.3		10	R		30	3.5		0.12	35	ALC
1956 04 28.88		8		76	L		140	2				STE06
1956 05 08.2		10.4		20	L		80					MEI01
1956 05 26.96		7		76	L		140	2				STE06
1956 06 24.9		7.2		16	R		50					VIN
1956 06 29.9		7.7		16	R		50	1				VIN
1956 07 01.9		6.7		16	R		50	1				VIN
1956 07 01.92		6.5		5	R							WAT
1956 07 02.99		6.5		76	L		140	3		0.13	65	STE06
1956 07 25.9		6.5		16	R		50	1				VIN
1956 07 26.9		6 :		16	R		180	1.5				VIN
1956 07 29.95		7.3		5	R					0.1	75	WAT
1956 08 07.9		7 :		16	R		50	2				VIN
1956 08 13.9		7.3		16	R		50	2				VIN
1956 08 13.90		7.6	V	7	R		30	5		0.2	25	STO01
1956 08 13.93		7.6		5	R			3		0.17	90	STE06
1956 08 14.88		7.5	V	7	R		30					STO01
1956 08 14.9		7.5		16	R		50					VIN
1956 08 26.87		8.2	V	7	R		30	6				STO01
1956 08 27.8		9 :		16	R		50	2				VIN
1956 08 28.8		9 :		16	R		50	2				VIN
1956 08 28.86		8.5	V	7	R		30	6				STO01
1956 09 02.85		9.0	V	7	R		30	6				STO01

Periodic Comet Tuttle (1967 V)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1967 03 05.80		10.5:		16	R		50	1.0				VIN
1967 03 11.87		10 :		32	R		80					HEG

Periodic Comet Swift-Tuttle (1992t)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 09 29.80	S	9.0	AA	25	L	4	50	11	1			PAN
1992 09 30.84	S	9.0	AA	25	L	4	50	6	1			PAN
1992 10 01.82	S	9.0	AA	25	L	4	50	8	2			PAN
1992 10 02.79	S	8.9	AC	25	L	6	57	4.2	1			WAT01

Periodic Comet Swift-Tuttle (1992t) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 10 03.40	M	8.8	GA	5.0	B		10	5	1			MOD
1992 10 03.41	M	9.5	GA	35.9	L	7	85	3.3	2			MOD
1992 10 05.43	M	8.8	NO	5.0	B		10	5.0	2			MOD
1992 10 05.43	M	9.3	NO	20.0	L	5	35	3.9	2			MOD
1992 10 05.78	S	8.6	S	15	R	5	25	6	4			NAG02
1992 10 06.38	S	8.9	AC	15	R	5	42	6	2			MOR03
1992 10 06.41	S	8.6	AA	13	L	6	44	3	3			ISH02
1992 10 06.77	S	9.0	AC	8.0	B		20	4.5	2			YUS
1992 10 06.78	S	9.0	AC	25	L	6	57	4.2	2			WAT01
1992 10 06.79	S	8.3	AA	13	L	6	44	6	3			ISH02
1992 10 07.40	S	8.8	AC	15	R	5	42	5				MOR03
1992 10 08.40	M	9.1	NO	20.0	L	5	35	3.2	2			MOD
1992 10 08.41	a S	8.8	AC	15	R	5	42	4.5	2			MOR03
1992 10 08.42	M	8.3	NO	5.0	B		10	4.0	2			MOD
1992 10 09.80	S	8.1	AA	13	L	6	24	8	3			ISH02
1992 10 09.80	S	8.9	AA	25	L	4	50	6	1			PAN
1992 10 09.81	S	8.0	S	15	R	5	25	6	4			NAG02
1992 10 10.39	S	8.0	AA	13	L	6	24	6	3			ISH02
1992 10 10.80	S	7.7	AA	8.0	B		20	7	3			YUS
1992 10 13.79	S	8.5	AA	25	L	4	50	6	2			PAN
1992 10 15.82	S	7.6	S	15	R	5	25	4	5			NAG02
1992 10 17.02	S	7.6	AC	3.5	B		7	6				MOR03
1992 10 17.06	M	8.6	GA	20.0	L	5	35	3.0	2			MOD
1992 10 17.42	S	7.8	S	25	L	6	57	4.5	3			WAT01
1992 10 17.42	S	8.0	AA	8.0	B		20	10	3			YUS
1992 10 17.81	S	7.7	S	25	L	6	57	4.5	3			WAT01
1992 10 18.01	M	8.5	GA	20.0	L	5	35	3.0	2/			MOD
1992 10 18.42	S	7.5	S	25	L	6	57	4.5	4			WAT01
1992 10 20.01	S	7.4	AC	3.5	B		7	9				MOR03
1992 10 21.20	S	7.4	AA	8.0	B		15	10	3			PAN
1992 10 21.47	S	7.4	AA	13	L	6	24	6	4			ISH02
1992 10 21.49	S	7.5	S	25	L	6	57	5.2	5			WAT01
1992 10 21.81	S	7.6	AA	13	L	6	24	5	3			ISH02
1992 10 22.41	S	7.1	AA	8.0	B		20	6	4			YUS
1992 10 22.45	S	6.7	S	25	L	6	57	5.3	5			WAT01
1992 10 23.01	S	7.6	AC	3.5	B		7	7.5				MOR03
1992 10 23.05	M	7.8	NO	5.0	B		10	6.2	2/			MOD
1992 10 23.07	M	8.1	GA	20.0	L	5	35	3.5	3			MOD
1992 10 24.23	S	6.9	AA	8.0	B		15	10	3			PAN
1992 10 24.79	S	6.7	AA	8.0	B		15	10	4			PAN
1992 10 24.99	S	7.0	AC	3.5	B		7	10				MOR03
1992 10 25.40	S	6.8	S	15	R	5	25	5	6			NAG02
1992 10 25.44	S	7.1	AA	13	L	6	24	6	4			ISH02
1992 10 25.45	M	7.0	AA	10	R	8	24	6.5	4			ISH02
1992 10 25.99	S	7.0	AC	3.5	B		7	10.5				MOR03
1992 10 26.05	M	8.0	SC	20.0	L	5	35	3.2	2/			MOD
1992 10 26.06	M	7.7	SC	5.0	B		10	5.7	2			MOD
1992 10 26.40	S	7.0	AA	13	L	6	24	6.5	4			ISH02
1992 10 26.41	M	6.9	AA	10	R	8	20	6.7	4			ISH02
1992 10 27.13	S	6.9	AC	3.5	B		7	9				MOR03
1992 10 27.44	S	6.9	AA	10.0	B		20	6	4			ISH02
1992 10 27.48	S	6.9	AA	13	L	6	24	6	4			ISH02
1992 10 27.79	S	6.6	AA	8.0	B		15	14	4			PAN
1992 10 28.01	M	7.5	SC	20.0	L	5	35	4.2	3			MOD
1992 10 28.05	M	7.0	SC	5.0	B		10	6.2	2			MOD
1992 10 28.39	S	6.8	AA	10.0	B		20	7	4			ISH02
1992 10 30.41	S	6.1	S	15	R	5	25	4	7			NAG02
1992 10 30.78	S	6.1	AA	8.0	B		15	14	5			PAN
1992 10 31.04	M	7.0	SC	5.0	B		10	6.5	2/			MOD

Periodic Comet Swift-Tuttle (1992t) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 10 31.04	M	7.3	SC	20.0	L	5	35	4.9	3			MOD
1992 10 31.39	S	6.8	AA	10.0	B		20	7	4			ISH02
1992 10 31.40	S	6.9	AA	13	L	6	44	7	4			ISH02
1992 11 01.39	S	6.6	AA	10.0	B		20	7	5			ISH02
1992 11 01.40	S	6.6	AA	13	L	6	24	7	5			ISH02
1992 11 02.39	S	6.4	AA	10.0	B		20	5.5	4			ISH02
1992 11 02.40	S	6.4	AA	13	L	6	24	5.3	4			ISH02
1992 11 02.50	M	6.2	S	25	L	6	57	5.3	5			WAT01
1992 11 02.78	S	6.2	AA	6.3	B		9	12	5			KAM01
1992 11 03.05	M	6.5	SC	5.0	B		10	7.5	2/			MOD
1992 11 04.05	M	6.3	SC	5.0	B		10	4.6	3			MOD
1992 11 04.41	S	6.1	AA	10.0	B		20	7	5			ISH02
1992 11 04.43	S	6.1	AA	13	L	6	24	7	5			ISH02
1992 11 06.98	S	5.9	AC	3.5	B		7	8.5				MOR03
1992 11 07.98	S	5.8	AC	3.5	B		7	8				MOR03
1992 11 08.97	M	6.1	SC	5.0	B		10	5.1	3			MOD
1992 11 09.02	S	6.0	AC	3.5	B		7	8				MOR03
1992 11 10.48	S	5.7	AA	10.0	B		20	7	5			ISH02
1992 11 10.48	S	5.8	AA	13	L	6	24	6.5	5			ISH02
1992 11 11.43	S	5.7	AA	10.0	B		20	7	5			ISH02
1992 11 11.44	S	5.7	AA	13	L	6	24	7	5			ISH02
1992 11 11.77	S	5.1	AA	8.0	B		15	8	6			PAN
1992 11 12.43	S	5.7	AA	10.0	B		20	6	5			ISH02
1992 11 12.44	S	5.7	AA	13	L	6	24	6	5			ISH02
1992 11 12.80	S	5.1	AA	8.0	B		15	8	6	1	56	PAN
1992 11 13.98	S	5.8	AC	3.5	B		7	8.5	4			MOR03
1992 11 14.00	M	5.8	SC	5.0	B		10	5.1	3			MOD
1992 11 14.39	B	5.5	S	8.0	B		11	6.5	6			WAT01
1992 11 14.40	M	5.5	S	25	L	6	57	5.0	6	1.0	85	WAT01
1992 11 14.75	S	5.0	AA	0.0	E		1	12	6/			BOA
1992 11 14.75	S	5.2	AA	6.0	B		20	11	6	1.3	50	BOA
1992 11 14.98	S	5.8	AC	3.5	B		7	8				MOR03
1992 11 15.01	B	6.2	SC	20.0	L	5	35	2.5	4			MOD
1992 11 15.01	M	5.8	SC	5.0	B		10	5.0	3			MOD
1992 11 15.39	B	5.6	S	8.0	B		11	7.3	6			WAT01
1992 11 15.44	M	5.5	S	25	L	6	57	& 4	6			WAT01
1992 11 15.44	S	5.8	AA	8.0	B		20		5			YUS
1992 11 15.98	B	6.2	SC	20.0	L	5	35	2.5	4/			MOD
1992 11 15.98	M	5.8	SC	5.0	B		10	5.0	3			MOD
1992 11 15.99	S	5.7	AC	3.5	B		7	7	5			MOR03
1992 11 16.79	S	5.3	S	25	L	4	40	8	5			MIL01
1992 11 17.43	B	5.5	S	8.0	B		11	8.7	6			WAT01
1992 11 17.74	S	5.1	AA	8.0	B		15	9	6	1.5	40	PAN
1992 11 18.37	S	5.4	AA	5.0	B		7	8	5			ISH02
1992 11 18.42	B	5.4	S	8.0	B		11	11.0	6			WAT01
1992 11 18.42	M	5.4	S	25	L	6	57	6.0	6			WAT01
1992 11 18.70	S	4.9	AA	6.0	B		20	9	6/			BOA
1992 11 18.99	M	5.4	SC	5.0	B		10	7.2	3/			MOD
1992 11 19.02	B	5.8	SC	20.0	L	5	35	3.5	5	0.25	39	MOD
1992 11 19.44	B	5.3	S	7.0	B		10	8.7				WAT01
1992 11 19.98	S	5.4	AA	3.5	B		7	7	5			MOR03
1992 11 20.00	B	5.5	SC	5.0	B		10					MOD
1992 11 20.00	M	5.5	SC	5.0	B		10	5.8	3/	0.8	40	MOD
1992 11 20.01	B	5.8	SC	20.0	L	5	35	3.4	5	0.40	40	MOD
1992 11 20.01	S	4.9	SC	0.7	E		1	&11	1			MOD
1992 11 20.78	S	5.1	AA	8.0	B		15	8	6	1.25	40	PAN
1992 11 20.99	B	5.5	SC	5.0	B		10	5.0	3/			MOD
1992 11 21.00	B	5.9	SC	20.0	L	5	35	2.8	5	0.11	38	MOD
1992 11 21.42	S	5.2	AA	8.0	B		20		6	0.5		YUS

Periodic Comet Swift-Tuttle (1992t) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 11 21.44	S	5.6	S	15	R	5	25	4	8	0.16		NAG02
1992 11 22.37	B	5.6	S	8.0	B		11	5.1	6	2.0		WAT01
1992 11 22.37	S	5.3	AA	10.0	B		20	6	6			ISH02
1992 11 22.38	M	5.4	S	25	L	6	57	5.0	6			WAT01
1992 11 22.38	S	5.3	AA	13	L	6	24	6	7			ISH02
1992 11 22.40	S	5.5	S	15	R	5	25	4	8	0.25		NAG02
1992 11 22.42	S	5.0	AA	8.0	B		20		6	0.9	27	YUS
1992 11 22.72	S	5.5	AA	6.3	B		9					KAM01
1992 11 23.41	S	5.4	AA	10.0	B		20	6	6			ISH02
1992 11 23.43	S	5.3	AA	13	L	6	24	6	6			ISH02
1992 11 23.71	S	5.4	AA	6.3	B		9	9	8	0.5	45	KAM01
1992 11 26.00	B	5.6	SC	5.0	B		10	4.8	3/			MOD
1992 11 26.01				20.0	L	5	35	2.4	5	0.09	46	MOD
1992 11 26.41	S	4.9	AA	8.0	B		20		6	1.0	60	YUS
1992 11 26.42	S	5.2	AA	10	R	8	24	6.5	6	0.25		ISH02
1992 11 26.74	S	5.0	AA	8.0	B		15	8	7	1.5	40	PAN
1992 11 27.40	S	5.1	AA	10.0	B		20	6.5	7	0.67		ISH02
1992 11 27.41	S	5.1	AA	13	L	6	24	6.9	7	0.5		ISH02
1992 11 29.38	S	5.3	S	15	R	5	25	3	9	1.0		NAG02
1992 11 29.39	S	5.2	AA	10.0	B		20	5.7	6	0.67		ISH02
1992 11 29.40	S	5.2	AA	13	L	6	24	5.5	6	0.67		ISH02
1992 11 29.97	B	5.5	SC	5.0	B		10	5.0	3/			MOD
1992 11 30.01	& B	5.4	SC	5.0	B		10	5.8	3/			MOD
1992 11 30.02				20.0	L	5	35	3.0	5	0.13	57	MOD
1992 11 30.38	S	5.1	AA	10.0	B		20	5	7	0.5		ISH02
1992 11 30.40	S	5.1	AA	13	L	6	24	5	7	0.33		ISH02
1992 11 30.40	S	5.3	AA	8.0	B		20	7	7	1.0	60	YUS
1992 11 30.44	B	5.2	AC	8.0	B		11	16	4			WAT01
1992 11 30.74	B	5.3	AA	6.3	B		9	7	8	1.0	40	KAM01
1992 11 30.80	S	5.0	AA	8.0	B		15	10	6	1.5	40	PAN
1992 12 02.42	S	5.1	AA	10.0	B		20	4.8	6	0.83		ISH02
1992 12 02.43	S	5.1	AA	13	L	6	24	4.7	6	0.5		ISH02
1992 12 03.74	S	5.0	AA	8.0	B		15	6	6	0.5	40	PAN
1992 12 04.39	S	5.1	AA	10.0	B		20	4.5	6	1.2		ISH02
1992 12 04.40	S	5.2	AA	13	L	6	24	4.5	6	1.0		ISH02
1992 12 04.75	S	5.0	AA	8.0	B		15	6	7	1	50	PAN
1992 12 05.36	S	5.0	AA	10.0	B		20	4	7	0.67		ISH02
1992 12 05.37	S	5.1	AA	13	L	6	24	4	7	0.5		ISH02
1992 12 05.38	B	5.2	AC	8.0	B		11	4.3	7			WAT01
1992 12 05.40	M	5.3	AC	25	L	6	57	2.3	7			WAT01
1992 12 05.73	S	5.0	AA	8.0	B		15	7	7	1	40	PAN
1992 12 05.96	S	5.3	AA	3.5	B		7	4		0.17	65	MOR03
1992 12 06.37	B	5.2	AC	8.0	B		11	3.1	7	1.3		WAT01
1992 12 06.39	M	5.1	AC	25	L	6	57	2.4	7			WAT01
1992 12 07.98	S	5.3	AA	3.5	B		7	7				MOR03
1992 12 08.39	S	5.2	AA	10.0	B		20	4	6	0.42		ISH02
1992 12 08.41	S	5.3	AA	13	L	6	24	3.5	6	0.33		ISH02
1992 12 09.97	s B	5.2	SC	5.0	B		10	& 7	3			MOD
1992 12 12.96	S	5.4	AA	3.5	B		7	8		0.75	60	MOR03
1992 12 13.37	S	5.3	AA	10.0	B		20	4	6	0.5		ISH02
1992 12 13.38	S	5.3	AA	13	L	6	24	4	6	0.33		ISH02
1992 12 13.97	S	5.4	AA	3.5	B		7	5		0.6	55	MOR03
1992 12 13.98	a B	5.6	SC	5.0	B		10	3.7	4	0.50	57	MOD
1992 12 13.99	B	6.1	SC	35.9	L	7	85	1.8	6	0.28	57	MOD
1992 12 14.37	S	5.3	AA	10.0	B		20	4	7	1.0		ISH02
1992 12 14.39	S	5.3	AA	13	L	6	24	4	6	0.5		ISH02
1992 12 14.98	a B	5.6	SC	5.0	B		10	3.7	4	0.50	51	MOD
1992 12 16.39	S	5.3	AA	10.0	B		20	3	6	0.25		ISH02
1992 12 16.97	s B	6.0	SC	20.0	L	5	35	2.0	5/			MOD

Periodic Comet Swift-Tuttle (1992t) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 12 16.98	s B	5.7	SC	5.0	B		10					MOD
1992 12 18.39	S	5.4	AA	10.0	B		20	3	6	0.17		ISH02
1992 12 19.38	S	5.5	AA	10.0	B		20	3	5	0.5		ISH02
1992 12 20.73	S	5.5	AA	8.0	B		15	9	6	0.5	40	PAN
1992 12 20.98	s B	5.4:	SC	5.0	B		10	5.5	4			MOD
1992 12 20.98	s B	6.0	SC	35.9	L	7	85	2.1	6	0.18	60	MOD
1992 12 21.74	S	5.0	AA	8.0	B		15	7	5			PAN
1992 12 22.73	S	5.0	AA	8.0	B		15	7	5			PAN
1992 12 22.97	& B	6.3	SC	20.0	L	5	35	2.2	4			MOD
1992 12 23.37	B	5.5	S	8.0	B		11	4.4	7			WAT01
1992 12 23.38	S	5.8	AA	10.0	B		20	3	5	0.33		ISH02
1992 12 23.97	& B	6.3	SC	20.0	L	5	35	2.6	4			MOD
1992 12 24.37	S	5.7	AA	10.0	B		20	4	5	0.5		ISH02
1992 12 24.97	a B	6.4	SC	20.0	L	5	35	2.3	4			MOD
1992 12 25.36	S	5.6	AA	10.0	B		20	4	6	0.33		ISH02
1992 12 26.37	S	5.8	AA	10.0	B		20	3	4			ISH02
1992 12 27.98	a B	6.7:	SC	35.9	L	7	85	2.0	5			MOD
1992 12 29.37	S	6.0	AA	10.0	B		20	3	4			ISH02
1992 12 31.37	S	6.1	AA	10.0	B		20	3	4			ISH02

Periodic Comet Brorsen-Metcalf (1989 X)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 08 07.75	S	7.1	S	15	R	5	23	5				NAG02
1989 08 10.73	S	6.1	S	15	R	5	23	5				NAG02
1989 08 11.76	S	6.0	S	15	R	5	23	5	7			NAG02
1989 08 12.76	S	5.9	S	15	R	5	23	4				NAG02
1989 08 20.76	S	5.4	S	15	R	5	23	4	8	0.13		NAG02
1989 08 21.76	S	5.4	S	15	R	5	23	3		0.16		NAG02
1989 08 27.81	S	5.7	S	15	R	5	23	3		1.5		NAG02
1989 09 06.84	S	5.0	S	8.0	B		20	2	8	2.0		NAG02

Periodic Comet Schwassmann-Wachmann 1

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 01 02.57	P	15	:	31	L	4		0.3	3			TSU02
1992 01 24.52	P	15	:	31	L	4		0.3	2			TSU02
1992 02 02.45	P	12.5:		31	L	5		0.2	8			TSU02
1992 02 26.48	P	13	:	31	L	4		< 0.2	9			TSU02
1992 02 27.46	P	13.5:		20	L	5		0.3	6			TSU02
1992 03 07.44	P	13.5:		20	L	5		0.6	3			TSU02
1992 03 22.44	P	13.5:		31	L	4		0.7	1			TSU02
1992 07 28.77	P[16	:		20	L	5						TSU02
1992 07 31.79	P[15	:		10.7	R	3						TSU02
1992 08 26.77	P	15	:	20	L	5		0.7	3			TSU02
1992 08 28.79	S	13.7	AC	60.0	Y	8	253	0.6	3			NAK01
1992 09 03.81	P[15	:		16	W	4						TSU02
1992 09 06.75	P[16	:		20	L	5						TSU02
1992 09 27.71	P[16	:		16	W	4						TSU02
1992 10 06.72	P[16	:		20	L	5						TSU02
1992 10 23.28	S[14.7	GA		40	L	7	190	! 0.5				MOD
1992 10 25.70	I[14.0:			60.0	Y	8	200					NAK01
1992 10 27.57	I[14.0:			60.0	Y	8	240					NAK01
1992 10 27.74	P[16	:		20	L	5						TSU02
1992 10 28.25	S[14.7	GA		40	L	7	190	! 0.5				MOD
1992 10 31.67	P	16.5:		20	L	5		0.3				TSU02
1992 11 02.59	I[14.0:			60.0	Y	8	253					NAK01
1992 11 17.58	I[14.0:			60.0	Y	8	192					NAK01
1992 11 23.57	P[16.5:			20	L	5						TSU02

Periodic Comet Schwassmann-Wachmann 1 [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 11 24.69	I	[14.5:		60.0	Y	8	253					NAK01
1992 11 30.70	S	13.3	AC	60.0	Y	8	200	0.5	4			NAK01
1992 11 30.71	C	13.9	EA	60.0	Y	6		0.5	7			NAK01
1992 12 02.70	C	13.8	EA	60.0	Y	6		0.7	5			NAK01
1992 12 02.72	S	13.1	AC	60.0	Y	8	200	0.9	3			NAK01
1992 12 14.18	S	[13.3	GA	35.9	L	7	164	! 0.5				MOD
1992 12 15.04	S	[14.2	GA	35.9	L	7	164	! 0.5				MOD
1992 12 17.60	C	14.1	EA	60.0	Y	6		0.9	1			NAK01
1992 12 19.52	P	15.5:		20	L	5		0.6	2			TSU02
1992 12 21.31	S	[14.3	GA	35.9	L	7	164	! 0.5				MOD
1992 12 25.52	C	14.1	EA	60.0	Y	6		1.3	0			NAK01
1992 12 28.15	S	[14.3	GA	35.9	L	7	164	! 0.5				MOD
1993 01 20.30	S	[14.5	GA	40	L	7	190	! 0.5				MOD
1993 01 26.23	S	[14.4	GA	35.9	L	7	164	! 0.5				MOD
1993 02 08.43	S	12.8	AC	20	L	6	150	0.8				NAK01
1993 02 14.53	S	12.6	AC	20	L	6	100	1.3	4			NAK01
1993 02 14.54	C	12.7	EA	60.0	Y	6		1.3	6			NAK01
1993 02 18.58	S	12.8	AC	60.0	Y	8	200	0.5	4			NAK01
1993 02 25.53	C	12.7	EA	60.0	Y	6		2.1	2			NAK01
1993 02 27.21	S	[14.0	GA	40	L	7	190	! 0.5				MOD
1993 03 15.17	S	[14.0	GA	35.9	L	7	164	! 0.5				MOD
1993 03 19.12	S	[14.5	GA	40	L	7	190	! 0.5				MOD
1993 03 21.47	C	12.9	HS	60.0	Y	6		1.5	0			NAK01
1993 03 22.45	C	13.2	EA	60.0	Y	6		1.6	0			NAK01
1993 03 27.16	S	[13.8	GA	40	L	7	190	! 0.5				MOD
1993 04 11.15	S	[13.2	GA	35.9	L	7	164	! 0.5				MOD
1993 04 18.12	S	[13.4	GA	40	L	7	190	! 0.5				MOD
1993 04 19.47	C	12.8	HS	60.0	Y	6		0.7	2			NAK01
1993 04 19.48	S	12.8	AC	60.0	Y	8	253	0.6	3			NAK01
1993 04 23.09	S	[13.5	GA	35.9	L	7	164	! 0.5				MOD
1993 04 24.07	S	[13.7	GA	35.9	L	7	164	! 0.5				MOD
1993 04 25.45	C	13.3	HS	60.0	Y	6		0.8	4			NAK01
1993 05 10.11	S	[12.3	GA	35.9	L	7	164	! 0.5				MOD
1993 05 11.09	S	[12.8	GA	35.9	L	7	164	! 0.5				MOD
1993 05 14.09	S	[12.5	GA	35.9	L	7	164	! 0.5				MOD

Periodic Comet Väisälä 1 (1992u)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1993 01 21.62	C	15.2	EA	60.0	Y	6		0.3			295	NAK01
1993 01 21.65	S	15.0	EA	60.0	Y	8	320	0.3				NAK01
1993 01 26.30	S	[14.6	GA	40	L	7	190	! 0.5				MOD
1993 02 14.60	M	13.2	AC	60.0	Y	8	200	0.4	6			NAK01
1993 02 19.65	M	13.2	AC	60.0	Y	8	200	0.7	6/			NAK01
1993 02 25.54	C	13.6	EA	60.0	Y	6		1.1				NAK01
1993 02 27.30	M	13.7	GA	40	L	7	100					MOD
1993 02 27.30	S	13.5	GA	40	L	7	100	0.3	2			MOD
1993 03 13.59	S	13.1	AC	60.0	Y	8	200	0.7	5			NAK01
1993 03 15.23	S	14.1	GA	35.9	L	7	164	0.3	2			MOD
1993 03 19.33	S	[14.0	GA	40	L	7	190	! 0.5				MOD
1993 03 21.53	S	13.1	HS	60.0	Y	8	200	0.6	3			NAK01
1993 03 22.53	C	13.8	EA	60.0	Y	6		0.7				NAK01
1993 03 27.22	S	[14.2	GA	40	L	7	190	! 0.5				MOD
1993 04 11.25	S	[13.2	GA	35.9	L	7	164	! 0.5				MOD
1993 04 14.51	C	14.2	HS	60.0	Y	6		0.5			130	NAK01
1993 04 19.54	C	14.2	HS	60.0	Y	6		0.45			135	NAK01
1993 04 19.56	S	13.8	GA	60.0	Y	8	253	0.6	3			NAK01
1993 04 23.23	S	14.2	GA	40	L	7	190	0.4	3			MOD
1993 04 24.22	S	[14.0	GA	40	L	7	190	! 0.5				MOD

Periodic Comet Väisälä 1 (1992u) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1993 04 25.48	C	14.4	HS	60.0	Y	6		0.35			130	NAK01
1993 04 25.49	S	14.0	GA	60.0	Y	8	253	0.6	3			NAK01
1993 04 27.23	S	14.1	GA	40	L	7	190	0.5	3			MOD
1993 05 10.17	S[14.1		GA	35.9	L	7	164	! 0.5				MOD
1993 05 11.16	M	14.2	GA	40	L	7	190					MOD
1993 05 11.16	S	14.1	GA	40	L	7	190	0.5	3			MOD
1993 05 14.22	S[14.0		GA	40	L	7	190	! 0.5				MOD
1993 05 15.59	C	14.8	HS	60.0	Y	6		0.6		0.04	135	NAK01
1993 05 16.20	S[14.1		GA	35.9	L	7	164	! 0.5				MOD
1993 05 17.85	! V	14.2	YF	20.0	T	2		0.5	8	0.06	145	MIK
1993 05 20.59	C	14.5	HS	60.0	Y	6		0.45			135	NAK01
1993 06 19.88	! V	15.0	YF	20.0	T	2		0.5	9			MIK

Periodic Comet Levy (1991 XI)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 06 17.74	S	8.8	AA	25	L	5	40	3	5			NAK05
1991 06 17.75	B	8.5	S	15.0	B		25	2.8	3			NAG04
1991 06 17.77	S	8.6	S	15	R	5	23	6	4			NAG02
1991 06 25.71	S	8.8	S	16	H	3	44	3	3			KON03
1991 07 22.76	P	8.8	S	16	W	4		3	4			TSU02
1991 07 23.75	B	8.7	S	15.0	B		25	2.1	4	0.05	280	NAG04
1991 07 23.76	S	8.6	S	15	R	5	23	3	7			NAG02
1991 08 08.77	S	9.2	S	15.0	B		25	1.6	2			NAG04
1991 08 15.79	B	9.2	S	15.0	B		25	2.3	2			NAG04
1991 08 16.76	M	8.5	S	16	W	4	49					TSU02
1991 08 16.76	S	9.5	AC	25	L	5	40	4	3			NAK05
1991 08 17.78	B	9.2	S	12.0	B		20	3	5			WAS
1991 08 17.80	B	9.3	S	15.0	B		25	2.3	2			NAG04

Periodic Comet Shoemaker-Levy 9 (1993e)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1993 04 17.58	C	14.7	HS	60.0	Y	6		1.0		0.06	257	NAK01
1993 04 18.20	S	14.5	GA	45.7	L	4	135	0.5	2			MOD
1993 04 23.25	S	14.4:	GA	40	L	7	190	0.4	3			MOD
1993 04 23.99	S	13.5	AA	44	L	4	222					TOM01
1993 04 24.16	S	14.3:	GA	40	L	7	190	0.6	4			MOD
1993 04 25.52	C	14.4	HS	60.0	Y	6		0.95		0.08	256	NAK01
1993 04 26.86	M	13.6	HS	15	R	13	80	1.2	3			ZNO
1993 04 27.27	S	14.1	GA	40	L	7	190	0.6	3			MOD
1993 05 10.20	S[13.7		GA	40	L	7	190	! 0.5				MOD
1993 05 11.19	S	14.3	GA	35.9	L	7	164	0.6	2			MOD
1993 05 14.23	S[14.0		GA	40	L	7	190	! 0.5				MOD
1993 05 15.61	C	14.5	GA	60.0	Y	6		0.95		0.05	256	NAK01
1993 05 17.84	! V	14.2	YF	20.0	T	2				0.17	260	MIK
1993 05 20.61	C	15.0	HS	60.0	Y	6		1.0			255	NAK01
1993 05 22.89	! V	14.1	YF	20.0	T	2		1.5				MIK
1993 06 16.14	S[14.1		GA	40	L	7	190	! 0.5				MOD
1993 06 17.12	S[14.1		GA	40	L	7	190	! 0.5				MOD
1993 06 18.87	! V	14.1	YF	20.0	T	2		0.8				MIK

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— CORRIGENDA —

- In the January 1993 issue, p. 41, 'P/Swift-Tuttle', on 1992 Oct. 26.76, the tail p.a. from observer COM *should read* 10°
- In the April 1993 *ICQ*, p. 100, the observation of P/Schwassmann-Wachmann 1 by NAK01 on 1993 Apr. 14.48 UT should have DC = 6 added.

Recent News and Research Concerning Comets

Since I last wrote this column for the April issue, there has been one confirmed new comet discovery: Eleanor Helin of NASA's Jet Propulsion Laboratory reported her discovery of a comet with Ken Lawrence, found on 18-inch Schmidt films taken at Palomar Mountain in the course of their searches for close-approach asteroids. Comet 1993 ℓ , now known as P/Helin-Lawrence, is a short-period comet with an orbital period around 9 years.

T. Seki recovered P/Holmes (1993i) on photographs taken at Geisei, Japan, on May 24 and 25, reporting the comet's total magnitude as 18; this comet is making its eighth recorded approach to perihelion, and was very close to the prediction. Jim Scotti continued his program of recovering comets at Kitt Peak by finding P/Neujmin 3 (1993j) and P/Shajn-Schaldach (1993k) in late May and P/Hartley 3 (1993m) and P/Whipple (1993n) in the second half of June. The first three of these four comets needed corrections of $\Delta T = +0.03$, -0.03 , and $+0.49$ day, respectively, to their predictions in the *Minor Planet Circulars*; P/Hartley 3 is making its first predicted return to perihelion. P/Neujmin 3 and P/Whipple appeared essentially stellar and of mag 21-22. The other two comets appeared to have coma diameters of $\sim 10''$ and $m_1 \sim 19.5$ -20.

Karen J. Meech (Institute for Astronomy, University of Hawaii) and colleagues have produced a paper (submitted to the *Astronomical Journal*) suggesting that periodic comet Schwassmann-Wachmann 1 is smaller than has been assumed for decades. Previous studies had arrived at figures as large as 100 km for the diameter of the comet's nucleus, but Meech finds that the nucleus is more likely to be around 15-20 km in size. She argues that the true, bare nucleus of P/Schwassmann-Wachmann 1 has rarely (if ever) been observed, due to the apparently constant presence of a coma.

In early July, we learned that observations just made with the Hubble Space Telescope showed that the largest nuclei of P/Shoemaker-Levy 9 were close to mag 22 in brightness. It is well-known that the so-called nuclear magnitude (often denoted m_2) is a very ambiguous value, because it is extremely instrument- and wavelength-dependent. Even the HST value probably includes much coma contamination. Taking the so-called absolute magnitude for P/Schwassmann-Wachmann 1 and extrapolating to comet 1993e, it would appear that the brighter nuclei of the latter comet may be no larger than 1 km in size (and perhaps even as small as 500 meters or so). Press reports were appearing during June with sensational, dangerous remarks by some scientists who were suggesting that huge explosions will occur following the impacts of 10-km-sized nuclei with Jupiter's atmosphere in July 1994 — a *Boston Globe* newspaper article even quoting C. Chyba as saying that Jupiter will increase as much as 25 times in brightness (~ 3.5 magnitudes) each time the larger nuclei hit the planet. But astronomy risks getting more of a bad rap in the eyes of the public when such sensational predictions never come true.

There is a lot of "uncharted new territory" concerning large objects colliding with planets (especially Jupiter). Comets are thought by many scientists to be extremely fragile, and while kilometer-sized rocks may withstand rupture inside the Roche limit of Jupiter, a fragile comet may well break apart into not much more than small piles of rubble before entering Jupiter's atmosphere (especially next July after comet 1993e passes within the 'perijove' distance of July 1992). P/Shoemaker-Levy 9 is certain to cause a lot of excitement as its collision date with Jupiter draws closer. All of the predictions to date have relied on center-of-trail measurements which are necessarily uncertain, as either ends of the "trail" (meaning individual 'nuclei') will undoubtedly die out over the months to come, making such center-of-trail astrometry more meaningless. Accurate measurements of larger nuclei regularly made with larger (non-amateur) telescopes in coming months will help with the predictions of collision in the second half of next July. Cometary and planetary scientists alike will be eagerly awaiting the encounter, especially to see what (if anything) might be visible in the clouds of Jupiter after the encounter.

Discovery Records

In the list of recent comet designations on page 138, it is immediately evident that 7 of the last 8 comet discoveries were made at Palomar (two by Jean Mueller at the 48-inch Schmidt, two by Eleanor Helin *et al.*, and three by Carolyn Shoemaker *et al.* — and the eighth new comet was found by an amateur astronomer in Japan. It now appears that the Shoemaker program at Palomar will permanently end sometime in the second half of 1994, as Gene Shoemaker is retiring and is throwing his efforts toward starting a CCD-scanning program from Flagstaff, Arizona, to replace the photographic Palomar search. Helin is also working on plans to change over to CCD searches, and it appears that the 18-inch Schmidt at Palomar (which has been used to discover more comets than any other single instrument in history) may no longer be used for such surveys.

Carolyn Shoemaker continues to add to her record number of comet discoveries. As of this writing, those observers with ten or more comets named after them are (asterisks indicating they are still living): Shoemaker, 30*; Pons, 26; Brooks, 21; Levy, 19*; Bradfield, 16*; Barnard, 16; Swift, 14; Mrkos, 13*; Tempel, 13; Helin, 12*; Giacobini, 12; Honda, 12; Messier, 12; Hartley, 11*; Borrelly, 11; Peltier, 10; Winnecke, 10. Very noteworthy in this list is William Bradfield, who has found 16 comets visually during the past 20 years, and he has yet to share a comet with another discoverer! The only other discoverers to find as many comets visually were Brooks and Pons, who were observing one and two centuries ago — before the competition got so intense from photographic surveys (Barnard found one of his comets photographically). The greatest comet discoverers of the 20th century will surely be Carolyn Shoemaker and William Bradfield, and it will be interesting to see how many they can add to their totals before the end of the decade. Among the 19 named for David Levy, he found only 7 himself; the other 12 were actually discovered by Carolyn Shoemaker. In fact, though numerous Shoemaker comets include names of other observers at Palomar who helped take the survey films, only one comet out of 30 includes the name of a discoverer from another site! Some of these comets Shoemaker and Bradfield would not have been discovered at all had they not found them. Their combined 45 comet discoveries have really contributed to cometary science in the past two decades, accounting for more than a fifth of all new comets discovered in that time (sungrazers excluded). — D. W. E. Green (1993 July 10)

1994 Comet Handbook

The *ICQ*'s latest annual supplement, the *1994 Comet Handbook*, is now available to *ICQ* subscribers for US\$8.00 postpaid (and to non-subscribers for \$10.00 postpaid; special bulk rates are also available), and this edition is being mailed along with the July 1993 *ICQ* to the majority of *ICQ* subscribers who pre-paid via their subscription dues. The 56-page edition for next year includes orbital elements for five long-period comets expected to be brighter than total visual magnitude 18 during 1994 and for 52 short-period comets expected to be brighter than $m_1 = 22$ during the year.

For the first time, the *Handbook* includes the minor planet (2060) Chiron, which has been shown to exhibit coma and tail-like features in recent years as it approaches its 1996 perihelion. The 1-page ephemeris for P/Shoemaker-Levy 9 gives positions into mid-July 1994 based on orbital elements utilizing the 'center-of-bar' measurements available through June 1993; more refined elements for this and other recently-discovered comets should be obtained from the *IAU Circulars* and *Minor Planet Circulars* — the *Comet Handbook's* ephemerides for such objects being meant chiefly for planning purposes and for general reference material, as opposed to being intended for accurately locating such comets.

— The Editor

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The Last 25 Comets to Receive Provisional Letter Designations

Listed below, for handy reference, are the last 25 comets which have been given letter designations (1989a is the first comet to be discovered/recovered in 1989, 1989b is the second comet..., etc.). After the "equal sign" is given the name, preceded by a star (*) if the comet is a new discovery (compared to a recovery from predictions of a previously-known short-period comet); a 'sharp' sign (#) is used to indicate a 're-discovery' of a comet that had been lost for many years (or one significantly off from the prediction). Also given are such values as the orbital period (in years) for periodic comets, date of perihelion, T (month/date/year), and the perihelion distance (q , in AU). Four-digit numbers in the second-to-last column indicate the *IAU Circular* containing the discovery/recovery announcement. The last column lists the 3-digit code for short-period comets as used internally in archival data (first 3 characters), and which should be used by those observers contributing data in computer-readable form. [This list updates that in the Apr. 1993 issue, p. 101.]

Desig.		Comet	P	T	q	IAUC	P/ code
1992q	=	* Helin-Lawrence		3/11/93	2.1	5597	
1992r	=	P/Tuttle	13.5	6/25/94	1.00	5604	908
1992s	=	P/Ciffréo	7.2	1/23/93	1.7	5618	723
1992t	=	# P/Swift-Tuttle	135	12/12/92	0.96	5620	909
1992u	=	P/Väisälä 1	10.8	4/29/93	1.8	5623	923
1992v	=	P/Gehrels 3	8.1	7/25/93	3.4	5624	808
1992w	=	P/Slaughter-Burnham	11.6	6/22/93	2.5	5626	929
1992x	=	P/Schaumasse	8.2	3/3/93	1.20	5627	803
1992y	=	* Shoemaker		3/25/93	2.3	5644	
1992z	=	P/Kojima	7.8	2/17/94	2.4	5667	515
1992a ₁	=	* Ohshita		11/1/92	0.66	5668	
1993a	=	* Mueller		1/12/94	1.94	5687	
1993b	=	P/Bus	6.5	6/28/94	2.2	5696	633
1993c	=	P/Tempel 1	5.5	7/3/94	1.49	5698	507
1993d	=	* Mueller		7/30/92	5.9	5723	
1993e	=	* P/Shoemaker-Levy 9	16.6	4/17/94	5.4	5725	953
1993f	=	P/Forbes	6.1	3/14/93	1.4	5728	617
1993g	=	P/Reinmuth 2	6.6	6/29/94	1.9	5772	618
1993h	=	* Shoemaker-Levy		1/27/94	4.9	5803	
1993i	=	P/Holmes	7.1	4/10/93	2.2	5804	607
1993j	=	P/Neujmin 3	10.6	11/13/93	2.0	5805	922
1993k	=	P/Shajn-Schaldach	7.5	11/15/93	2.3	5807	711
1993l	=	* P/Helin-Lawrence	9.4	6/18/93	3.1	5810	954
1993m	=	P/Hartley 3	6.8	5/20/94	2.5	5826	642
1993n	=	P/Whipple	8.5	12/22/94	3.1	5827	708