INTERNATIONAL COMET QUARTERLY

Whole Number 85 | JANUARY 1993 | Vol. 15, No. 1

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*.

The regular (invoiced) subscription rate is US$24.00 per year (price includes the annual *Comet Handbook*; the price without the *Handbook* is US$16.00 per year). Subscribers who do not wish to be billed may subscribe at the special rate of US$20.00 per year (rate is $12.00 without *Handbook*). [The last set of digits (after the hyphen) on the top line of the mailing address label gives the Whole Number that signifies the last *ICQ* issue which will be sent under the current subscription status.] Make checks or money orders payable in U.S. funds (and drawn on a U.S. bank) to *International Comet Quarterly* and send to Daniel Green; Smithsonian Astrophysical Observatory; 60 Garden St.; Cambridge, MA 02138, U.S.A. [Group subscription rates available upon request.] Back issues are $4.00 each — *except* for "current" *Comet Handbooks*, which are available for $10.00 ($8.00 to subscribers if ordered with their *ICQ* subscription; see above). Up-to-date information concerning comet discoveries, orbital elements, and ephemerides can be obtained by subscribing to the *IAU Circulars* and/or the *Minor Planet Circulars* (via postal mail and also available via computer access); for further information, contact the *ICQ* Editor at the above address.

Manuscripts will be reviewed for possible publication (if possible, send via computer networks; or, send typed, double-spaced copy to the Editor at the Cambridge address above); authors should first obtain a copy of "Information and Guidelines for Authors" from the Editor. Cometary observations also should be sent to the Editor in Cambridge; all data intended for publication in the *ICQ* that is not sent via computer electronic mail should be sent on standard *ICQ* observation report forms, which can be obtained upon request from the Editor. Those who can send manuscripts and observational data in machine-readable form are encouraged to do so [especially through e-mail via the computer networks *SPAN* (CFAPS2::GREEN), *BITNET* (GREEN@CFA), or Internet (GREEN@CFA.HARVARD.EDU), or via floppy disks that can be read on an IBM PC], and should contact the Editor for further information.

Among the Observation Coordinators (OCs) listed below, those with postal addresses have e-mail contacts with the *ICQ* Editor (or regularly send data to the Editor on IBM PC-compatible floppy disks); observers in the general area of such OCs who lack access to e-mail networks may send data to the OC for relay to the *ICQ* in electronic form.

ICQ EDITORIAL STAFF::

Daniel W. E. Green.....Editor
Syuichi Nakano.....*Comet Handbook* Editor
Charles S. Morris.....Associate Editor
Veronica L. Passalacqua.....Assistant Editor

OBSERVATION COORDINATORS::

AUSTRALIA.....Andrew Pearce (46A Newborough St.; Scarborough, W.A. 6019); David A. J. Seargent
BRAZIL.....José Guilherme de S. Aguiar (R. Candido Portinari, 241; 13089-070 - Campinas - S.P.)
CZECH REPUBLIC.....Petr Pravec (Astronomical Institute; CS-25165 Ondrejov)
GERMANY.....Jost Jahn (Neustaedter Str. 11; D-3123 Bodenteich)
HUNGARY.....Krisztian Sarneczky
JAPAN.....Akimasa Nakamura (P.O. Box 9, Kuma Post Office; Kuma-cho, Ehime 791-12)
Syuichi Nakano (P.O. Box 32; Sumoto Post Office; Hyogo-Ken, 656-91)
THE NETHERLANDS.....A. H. Scholten
NEW ZEALAND.....Alan C. Gilmore and Pamela Kilmartin (P.O. Box 57; Lake Tekapo 8770)
NORWAY.....Bjoern H. Granslo (Postboks 1029; Blindern; N-0315 Oslo 3)
POLAND.....Jerzy Rafalski and Krzysztof Jaroszewski (Institute of Astronomy; Nicolaus Copernicus University; ul. Chopina 12/18; 87-100 Torun)
PORTUGAL.....Alfredo Pereira (R. Antero de Quental 8, 2 dto; Carnaxide; 2795 Linda-a-Velha)
SLOVENIA.....Herman Mikuz (Kersnikova 11; 61000 Ljubljana)
SWEDEN.....Joergen Danielsson (Hasselstigen 2D; 386 00 Farjestaden)
UKRAINE.....Klim I. Churyumov
UNITED KINGDOM.....Guy M. Hurst (16 Westminster Close; Kempshott Rise; Basingstoke, Hants RG22 4PP, England)
Jonathan Shanklin (11 City Road; Cambridge CB1 1DP, England)

EDITORIAL ADVISORY BOARD::

Michael F. A'Hearn, *University of Maryland*
Ľubor Kresák, *Astronomical Institute, Slovak Academy of Sciences, Bratislava*
Brian G. Marsden, *Harvard-Smithsonian Center for Astrophysics*
David D. Meisel, *State University College of New York, Geneseo*
Zdenek Sekanina, *Jet Propulsion Laboratory*

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

This issue is No. 85 of the publication originally called *The Comet* (founded March 1973) and is Vol. 15, No. 1, of the *ICQ*. *[ISSN 0736-6922]*

****

— NOTES FROM THE EDITOR: 20th Anniversary —

With this issue, twenty years of this publication have been completed, beginning with the March 1973 issue of *The Comet*, which briefly became *The Comet Quarterly* in the late 1970s before reaching the inaugural issue of the *International Comet Quarterly* in January 1979. The *ICQ* now enters its fifteenth year, and in celebration of all of the hard work and the resulting accomplishments, we are holding the first 'International Workshop on Cometary Astronomy' (IWCA I) early next year, as reported in the October 1992 issue. There have been some more developments, and we include a pre-registration form on the back cover of this issue for interested individuals to complete and mail to the host organizers in Italy. Due to a large response based on the announcement in the last issue, we have expanded the meeting to two days, 1994 February 18-19 (Friday and Saturday), and the meeting will be held in Selvino, which is a few kilometers northeast of Bergamo in the Valle Seriana. More on all this on page 55.

We have made many strides during the last 20 years, especially with regard to the *ICQ* archive of cometary photometric data, which now numbers around 55,000 lines of observation (4.4 Mbytes). Many said that a project of this type and scope would not last more than a couple of years, and there have always been fears over the quality of the data. The importance of this ongoing project lies in collecting high-quality data over a long period of time, and I believe that we are accomplishing that goal quite well.

(cont. on page 3)

Some newer readers have expressed surprise at our publishing observations of P/Halley and other comets that go back 7 years and even much longer than that. The point here is not only to develop a useful archive of data, but also to have these data available in published form. The majority of data herein probably would not be published at all if they were not published in the *ICQ*, and we strive for completeness as far as good-quality data are concerned. But I'd like to take this opportunity to express my dismay at the many observers (including many good, experienced observers!) who send their observations to the *ICQ* many months — and often a year or two — after the comets have been observed. Not only is this aggravating to an editor, but such observers only hurt the usefulness of their data in two significant ways: (1) Much of the scientific use for the visual photometry of a particular comet comes immediately after the comet has been lost to visual observers (if not long before that point!). For example, I have had requests for visual m_1 data on P/Swift-Tuttle in recent weeks by people working now on papers utilizing that data, and I supply such researchers with what is available at the time of request. In addressing one such request, I noted that unfortunately two or three of our best experienced observers had not yet sent in their observations (which therefore will not be used). (2) Years later, when some researchers look at the published pages of the *ICQ* for data on particular comets, they will concentrate on the one or two main issues containing data for a particular comet (where most of the data will be located, thereby precluding the need for looking at many years' worth of issues after the fact for those odd additional observations that were sent in late). In fact, during the next few years, we may arrive at a point — due to the cost of publishing and the large number of observations — where we will decline to publish any further observations that are older than a year or so (unless special circumstances so warrant their publication). As a last aside on this topic, it certainly does not look good for observers to send in their data regularly many months after other observers' data have been published; while we hope that *no* observers adjust their data based on other observers' published observations, this is a worry of an editor in my position. We *do* hope that observers make the effort to compare their observations with those of other experienced observers, to refine their observing techniques for *future* observing.

Before I close, I want to express 15 years' worth of pent-up disgust with 'professional' astronomers' attitudes concerning decent magnitudes for comets. It is absolutely amazing how apathetic 'professional' astronomers are when it comes to obtaining magnitudes for the comets that they observe — this goes for virtually all astrometric observers and virtually all physical observers. Oh, they want decent magnitude predictions, alright, and most observers rely very heavily on the annual *ICQ Comet Handbook*, the *IAU Circulars*, and/or the *Minor Planet Circulars* for magnitude predictions in planning their schedules. But the excuses for not providing decent total magnitudes when the comets are fainter than mag 13 (and thus out of the range of most amateurs) have just gotten really old and ridiculous. And there are many excuses, believe me. Like the CCD astrometric observer who says that, while it would be rather easy to program an automatic photometry measuring software procedure into the astrometry reduction (a software technician working with the program said he could have such a program running from scratch in less than a day), the resulting magnitudes would be ambiguous because there is no filter (or no 'appropriate comet filter'); this observer does not listen to arguments that even unfiltered *carefully-measured* CCD magnitudes for 16th- and 17th- and 18th-magnitude comets can have *immense* value because the current meager amount of data for most comets fainter than mag 13 or 14 have errors on the order of $\pm$ 4-5 magnitudes! Unfiltered CCD magnitudes are probably only different from visual (or V) total magnitudes by a few tenths of a magnitude (H. Mikuz has shown in recent months that the difference between V and unfiltered m_1 values is more like 0.1 mag, using an ST-6 CCD) — and even 0.5-1.0 mag would be *much* better than we have now for most comets! Then there are the 'professional' comet observers imaging faint comets on a regular basis, who have 'no time' to reduce and provide decent photometric data. And there are the photographic wide-field searchers who can't break away from their searching to provide magnitudes that are even good to $\pm$ 0.5 or even 1.0 mag. This list goes on and on, although I must cite one exception to all of this: Jim Scotti of the Spacewatch telescope group at the University of Arizona, who has been working hard to provide CCD magnitudes of comets (both total and 'nuclear') for some years now.

Once again it looks as if the amateur astronomer will have to come to the rescue. Herman Mikuz of Slovenia is now routinely going after comets between mag 14 and 16 with CCDs and is providing V total magnitudes that look very good so far. John E. Rogers of Camarillo, CA, has become the first American amateur in many decades to actively provide decent astrometry of comets on a regular basis, and he is using a CCD. It appears that CCDs and amateurs are going to raise the level of cometary science, and it is here that I make an appeal to amateurs with access to the new, improved CCDs to get involved in helping us obtain reliable photometry and astrometry of comets fainter than mag 13. We can't rely on the 'professional' astronomers — they have too many important 'other' things to do; they're too busy helping themselves to care about other observers — as long as they can get their good predictions elsewhere, why should they do their share of work in assisting the prediction assembly stages? After fifteen years at gaining experience for comet predictions, I've learned not to count on 'professional' astronomers for much help. So we *must* count on the amateurs, and it is this unselfish group that must and will come through.

So I close with a salute to the many hard-working, careful amateur observers who have contributed so many thousands of hours to producing the observations published in the *ICQ*. The goal for the next 20 years is to continue building up a valuable archive that is similar to that produced by the AAVSO for variable stars during their 80-year history, and in the process to encourage observers — both new and old — to use proper procedures for obtaining the highest quality observations.

— Daniel W. E. Green (1993 Jan. 29)

Φ Φ Φ

— CORRIGENDA —

- In the October 1992 issue, page 102, 'Comet Shoemaker-Levy 1991a$_1$', June 26.30 and June 27.30 (observations by MOD), *for* $m_1 = 9.3$, *read* $m_1 = 9.0$,
- Also in the October 1992 issue, page 103, 'Comet Tanaka-Machholz 1992d', May 6.36 (observation by MOD), *for* $m_1 = 8.4$ *read* $m_1 = 9.1$

ROMAN NUMERAL DESIGNATIONS OF COMETS IN 1990

The following tabulation is from *Minor Planet Circular* 21303.

Comet	T	Name	Year/letter	Ref.
1991 I	Jan. 5.6	P/Metcalf-Brewington	1991a	MPC 18597
1991 II	Feb. 22.7	P/Swift-Gehrels	1991c	MPC 17596
1991 III	Feb. 27.7	McNaught-Hughes	1990g	MPC 18255
1991 IV	Mar. 19.0	P/Mrkos	1991k	MPC 18256
1991 V	Apr. 4.8	P/Wolf-Harrington	1990e	IAUC 5033
1991 VI	Apr. 24.7	P/Van Biesbroeck	1989h1	IAUC 4936
1991 VII	May 17.7	P/Hartley 1	1991j	MPC 18081
1991 VIII	May 26.0	P/Arend	1991u	IAUC 5342
1991 IX	June 16.1	P/McNaught-Hughes	1991y	MPC 20774
1991 X	July 6.9	P/Harrington-Abell	1990m	IAUC 5129
1991 XI	July 8.2	P/Levy	1991q	MPC 20308
1991 XII	July 22.0	P/Machholz		MPC 18598
1991 XIII	Aug. 17.9	P/Takamizawa	1991h	MPC 20774
1991 XIV	Aug. 30.6	P/Tsuchinshan 1	1991c1	IAUC 5383
1991 XV	Sept.11.7	P/Hartley 2	1991t	MPC 18598
1991 XVI	Sept.20.6	P/Wirtanen	1991s	IAUC 5303
1991 XVII	Oct. 2.7	P/Arend-Rigaux		MPC 13040
1991 XVIII	Oct. 13.9	P/Shoemaker-Levy 6	1991b1	MPC 20774
1991 XIX	Oct. 27.5	P/Shoemaker-Levy 7	1991d1	MPC 20774
1991 XX	Nov. 4.4	P/Kowal 2	1991f1	MPC 19467
1991 XXI	Nov. 16.2	P/Faye	1991n	IAUC 5246
1991 XXII	Dec. 13.2	P/Shoemaker-Levy 5	1991z	MPC 20774
1991 XXIII	Dec. 18.2	P/Shoemaker 1	1991p	MPC 18598
1991 XXIV	Dec. 31.2	Shoemaker-Levy	1991d	MPC 20602

Φ Φ Φ

TABULATION OF COMET OBSERVATIONS

In order to make the tables more readable and less confusing, we have changed the notes for atmospheric extinction corrections (using the procedure outlined by Green 1992, *ICQ* **14**, 55-59) from upper-case to lower-case letters; thus, 'A', 'W', and 'S' become 'a', 'w', and 's', respectively.

Further to the 'Magnitude-Reference Key' published in the October 1992 issue, we add the code 'HS' to denote the use of V magnitudes from the Hubble Space Telescope astrometric catalogue of stars on compact disk.

Descriptive Information (to complement the Tabulated Data):

◇ *Comet Austin 1984 XIII* ⟹ 1984 Sept. 13.09: an antitail in p.a. 120° was also glimpsed [GRA04].

◇ *Comet Levy-Rudenko 1984 XXIII* ⟹ 1984 Dec. 25.68: possible nucleus of mag 12 [GRA04]. Dec. 26.69: stellar point of mag 11-12 in the middle of coma [GRA04].

◇ *Comet Shoemaker-Levy 1991d* ⟹ 1992 Jan. 12.55: condensed, but no stellar cond. [MOR]. May 31.36: at 275×, comet had a nearly stellar cond. [MOR]. June 28.31: in 35.9-cm L (164×), stellar central cond. of mag 14.5 ± 0.1 [MOD]. June 29.24: in 35.9-cm L (164×), stellar central cond. of mag 14.6 ± 0.1 [MOD]. July 4.26 and Aug. 1.23: "nearly stellar cond. was present" [MOR]. July 7.34: at 164×, stellar central cond. of mag 15.0 ± 0.2 [MOD]. Aug. 31.17: comet ~ 1′ from star of mag 14.0, making mag est. difficult [MOD]. Sept. 25.17: comet's position 1′-2′ from star of mag ~ 10 [MOD]. Oct. 2.15: at 248×, almost stellar central cond. of mag 15.2 ± 0.3 [MOD].

◇ *Comet Shoemaker-Levy 1991a*$_1$ ⟹ 1992 June 8.08: tail wide and diffuse [REN]. June 27.28 and 28.30: the reported rapid change in tail p.a. is documented on field drawings; on latter date at 45×, 0°.20 tail in p.a. 330° [MOR]. July 1.01: star of mag 9.5-10 on N edge of coma, possibly affecting m_1 est. [REN]. July 6.22: tail half as wide as coma; w/ 20.0-cm L (169×), stellar cond. of mag 11.4 ± 0.1; w/ 35.9-cm L, second fainter tail, 0°.02 long, strongly suspected in p.a. 311° ± 10° [MOD]. July 7.26: in 20.0-cm L, also tail 0°.03 long in p.a. 312°, tapering to a point [MOD]. July 10.13: suggested correction for light pollution: $m_1 \simeq 8.4$ (same also true for July 11.11 and 13.18); at 68×, stellar central cond. of mag 11.0 ± 0.2 [MOD]. July 16.21 and Aug. 5.09: suggested correction for light pollution: $m_1 \simeq 8.5$ [MOD].

(Continued on next page...)

[cont. from previous page] July 18.14 and 24.12: suggested correction for light pollution: $m_1 \simeq 8.3$ [MOD]. July 18.92: comet very diffuse w/ small bright cond. [DES01]. July 25.22: tail broad and diffuse; in 26-cm L (45×-156×), well condensed coma, but no stellar cond. [MOR]. July 28.10: suggested correction for light pollution: $m_1 \simeq 8.2$ [MOD]. Aug. 1.97: in 20.0-cm C, fan-shaped tail very faint [DES01].

◇ *Comet Mueller 1991h*$_1$ $\Longrightarrow$ 1992 Jan. 25.21: "comet had totally diffuse (DC = 0) coma and a stellar cond.; comet filter did not enhance comet; clouds interfered with obs." [MOR]. Feb. 6.17: "more visible in Swan band filter" [SPR]. Feb. 23.16: "very bright in Swan band filter" [SPR].

◇ *Comet Tanaka-Machholz 1992d* $\Longrightarrow$ 1992 Apr. 5.50: tail was narrow and straight [MOR]. Dec. 27.13 and 27.19: no candidate found on 10- and 15-min *V* frames w/ 19-cm *f*/4 flat field camera + ST-6 CCD [MIK].

◇ *Comet Shoemaker 1992y* $\Longrightarrow$ 1992 Dec. 19.76 and 20.72: w/ 20-cm *f*/2 Baker-Schmidt camera + *V* filter + ST-6 CCD, an area 2° × 2° around the predicted position (*IAUC* 5667) was searched [MIK].

◇ *Comet Ohshita 1992a*$_1$ $\Longrightarrow$ 1992 Dec. 7.19: w/ 20-cm *f*/2 Baker-Schmidt camera + *V* filter + ST-6 CCD, there is a 1′.9 central cond. w/ weak halo of coma surrounding [MIK]. Dec. 27.07: not seen in 20-cm L at 40× under good conditions; quite conspicious on CCD frame [MIK]. 1993 Jan. 19.20: faint, diffuse object [MIK].

◇ *Comet Mueller 1993a* $\Longrightarrow$ 1993 Jan. 6.21: photometry obtained in moonless conditions with 20-cm *f*/2 Baker-Schmidt camera + *V* filter + ST-6 CCD; coma almost starlike; delicate 3′ fan-shaped tail [MIK]. Jan. 19.01: almost starlike coma; delicate fan-shaped tail 5′ long in p.a. 160° [MIK].

◇ *P/Arend-Rigaux* $\Longrightarrow$ 1991 Nov. 15.47: w/ 41-cm *f*/6 L (193×), $m_1 \sim 13.5$, coma dia. 0′.5 [ARM].

◇ *Periodic Comet Brewington (1992p)* $\Longrightarrow$ 1992 Sept. 4.38: at 164×, stellar central cond. of mag ~ 13.5 [MOD]. Sept. 5.39: w/ 35.9-cm L (164×), almost stellar central cond. of mag 13.9 ± 0.1 [MOD]. Sept. 24.41: "coma elongated 0′.7-0′.8 toward p.a. ~ 300°?" [MOD]. Sept. 25.39, 28.39, and Oct. 5.41: comet involved on each night with single stars of mag ~ 13.6-14.5 (m_1 est. may be slightly affected in each case) [MOD]. Sept. 26.13: 574×384 Wright CCD + standard *V* filter w/ 19-cm *f*/4 flat field camera; reduction w/ PCVISTA software; 2-min unfiltered frame obtained on Sept. 26.13 shows only a 1′.2 coma, DC = 8; fan-shaped tail ~ 6′ long in p.a. 300° [MIK]. Oct. 9.14: T Lyn AAVSO Atlas sequence [MIK]. Oct. 23.39: 3 stars (of mag 11-13) located at comet's predicted position [MOD]. Oct. 28.36: comet easier to see at 100× than 190× [MOD].

◇ *P/Ciffréo (1992s)* $\Longrightarrow$ 1992 Dec. 27.75-27.77: ST-6 CCD; two 10-min frames, w/ searches based on elements from *IAUC* 5618 [MIK].

◇ *Periodic Comet Faye (1991n)* $\Longrightarrow$ 1992 Mar. 28.08: comet 0′.2-0′.5 from star of mag ~ 14.5-15.0 (possibly making m_1 estimate a little too bright); possible stellar cond. of mag ~ 14.5 [MOD].

◇ *P/Grigg-Skjellerup* $\Longrightarrow$ 1992 July 25.19: "magnitude estimate is a guess" [MOR]. July 26.19: comet's elevation was ~ 9° [MOR]. Aug. 1.19: "m_1 estimate obtained by waiting for comparison field to set to comet's elevation" [MOR].

◇ *Periodic Comet Schaumasse (1992x)* $\Longrightarrow$ 1992 Dec. 16.88: unfiltered CCD photometry obtained in bad conditions (through haze), lim. mag on frames ~ 16; several frames were taken to confirm the identity of object; weak object, much fainter than predicted on *IAUC* 5666; two AA stars on the same frame used for reduction [MIK]. Dec. 20.79: comet diffuse with cond. [MIK]. Dec. 26.85: 7-min exp. on T-Max 400 film w/ 15-cm *f*/3.5 flat-field camera shows a very diffuse 10′ coma with stellar nucleus [BOS01]. Dec. 27.00: in 20-cm *f*/2 Baker-Schmidt camera + *V* filter + ST-6 CCD, circular coma w/ 25″ starlike central cond.; not seen in 20-cm L at 40× (as on previous night) in spite of good conditions [MIK]. Dec. 29.91: star of mag ~ 14.5 star inside the coma [MIK]. 1993 Jan. 18.07: in 33.3-cm *f*/4 L, coma dia. 4′.0 [KRO02].

◇ *P/Schwassmann-Wachmann 1* $\Longrightarrow$ 1992 Aug. 4.08-Oct. 9.11: photometry obtained with 19-cm *f*/4 flat field camera + unfiltered CCD (574×384 pixels); on Aug. 25.12, there was a 25″ starlike central cond., w/ no trace of coma [MIK]. Aug. 31.35: comet's position ~ 1′ from star of mag 8-9 [MOD]. Sept. 28.33: "crowded star field at comet's position" [MOD]. Oct. 22.96: 10-min exp. [MIK]. Dec. 5.031: w/ 1-m Schmidt telescope of National Observatory of Venezuela, "CCD images show the object in outburst, w/ central cond. of mag 15.3 embedded in a fan-shaped coma (spanning p.a. 40°-140° of dia. 40″, w/ $m_1 \simeq 14.1$; images taken the next night show the coma decreasing in brightness" [I. Ferrin]. Dec. 13.78: 5-min exp. made with 20-cm *f*/2 Baker-Schmidt camera + ST-6 CCD + *V* filter [MIK]. Dec. 14.76: 10-min exp.; comparison field U Aur; comet diffuse w/ cond. [MIK]. Dec. 29.96: starlike central cond. of dia. ~ 0′.5, imbedded in 'delicate coma' [MIK]. Dec. 31.00: starlike central cond. of dia. ~ 0′.4 [MIK].

◇ *Periodic Comet Swift-Tuttle (1992t)* $\Longrightarrow$ 1992 Sept. 27.48: "no cond. was visible; comet filter enhanced comet" [MOR]. Sept. 29.19: "remarkable in Swan band [filter]; visually asymmetrical" [SPR]. Sept. 29.38: "in 31.7-cm *f*/6 L (68×), dense, circular 2′.4 coma, DC = 3; general brightness plateau at the center; Lumicon comet filter noticeably enhances comet but also dramatically darkens the sky" [BOR]. Oct. 1.49: more condensed w/ Swan band filter [SPR]. Oct. 1.50: poor conditions [MOR]. Oct. 1.87 and 5.93: flat coma profile — very diffuse and oval towards E [BRE02]. Oct. 2.01: in 50-cm L (78×), circular w/ diffuse boundaries — no nucleus or separate central cond. at 157×; the lower power shows the coma to condense steadily to the center, w/ a very faint outer halo surrounding the coma; Lumicon comet filter again strongly enhances the comet [BOR]. Oct. 2.79: coma appeared assymetric [MID01]. Oct. 3.80: elliptical coma [MOE]. Oct. 4.51 and 5.22: bright in Swan band filter [SPR]. Oct. 4.77: coma elongated [MOE]. Oct. 6.69: w/ 31.7-cm *f*/6 L (68×), vague outer halo to the coma; at 110×, glimpses of a stellar nucleus of mag perhaps 13.5 [BOR]. Oct. 7.39: in 20×80 B, comet distinctly brighter than last night; "in regard to extinction correction, particular pains were taken for this object in the selection of comparison stars so that differences in the altitudes of the comet and stars were always minor — in no case did any applied extinction correction amount to more than 0.1 mag throughout the apparition" [BOR]. Oct. 8.15 and Nov. 14.72: coma fan-shaped [HAV]. *[continued on next page...]*

◇ *Periodic Comet Swift-Tuttle (1992t)* ⟹

[cont. from previous page] Oct. 10.14: "relatively weak central cond." [LOO01]. Oct. 10.21: at 72×, $m_2 \sim 13$; used chart T UMa [JAH]. Oct. 10.79: there was only the slightest suggestion of a central cond., but by Oct. 12.79, there was a "weak central cond.", and by Nov. 3.73, there was "strong central cond.", visible as a "point" during Nov. 9.72-21.73 ($m_2 = 8.5$ on the last date); by Nov. 27.70, the central cond. was noted as "very strong" [LEH]. Oct. 12.79: oval coma [LOO01]. Oct. 12.8: used S Boo chart [JAH]. Oct. 12.98: in 31.7-cm *f*/6 L (68×), 3'.2 coma, DC = 5; no nucleus evident at 110× [BOR]. Oct. 14.74: 1-min unfiltered frame w/ 19-cm *f*/4 flat field camera (+ 574×384 CCD) shows ~ 9′ circular coma and slightly curved jet 0°.2 long in p.a. 15°; 1-min exp. w/ *V* filter shows coma of dia. ~ 11′; inner coma on both frames is fan-shaped westwards [MIK]. Oct. 15.76: elongated coma [LOO01]. Oct. 16.77: central cond. [LOO01]. Oct. 17.09: nucleus is off center with respect to the rest of the coma, hint of a fan in the solar direction, increased contrast when viewed through Orion Skyglow filter [HER02]. Oct. 17.99: in 31.7-cm *f*/6 L (110×), a vague, dense knot of bright material occupies the coma's center — but when viewed with 167×, one sees a 13th-mag stellar nucleus at the apex of a fanlike mass or diffuse jet sector (the sector is centered at p.a. 220° and is roughly 35°-45° wide in p.a. and extends 1'.1 from the nucleus in a sunward direction); at 55×, 3'.9 coma, DC = 5-6 [BOR]. Oct. 18.08: unfiltered Tech Pan exp. w/ 10-cm Schmidt camera shows narrow, straight tail 15′ long in p.a. 20° and ~ 5′ coma; well-defined nucleus visible through the 26-cm guide telescope [P. Roques, Williams, AZ]. Oct. 18.78: comet occulted star of mag 8.5 at 18^h45^m UT (m_1 of comet + star = 7.6 ± 0.2, corrected to 7.9 for the comet alone) [REN]. Oct. 19.09: exp. taken as on Oct. 18.08 shows narrow, straight tail 36′ long in p.a. 20° w/ coma dia. ~ 6′; the inner coma that was relatively well-defined on previous night was bright but considerably more diffuse as viewed through the 26-cm guide telescope [Roques]. Oct. 20.74: dust tail 0°.2 long in p.a. 60° (and spanning p.a. 25°-60°); other tail was gas tail [MOE]. Oct. 21.097: w/ 91-cm Spacewatch reflector at Kitt Peak (+ CCD), "nuclear region is saturating tonight in only 120-sec stares, while it took a 240-sec stare to show saturation on Oct. 18; the fan-shaped jet to the west has dissipated slightly and the tail is a single strand and is a bit fainter than on previous nights; the inner coma is definitely still asymmetrical toward the west primarily; the measured coma dia. is 10'.5; the fan-shaped jet structure runs from p.a. 242° to 313°; the tail extends toward p.a. 24° and there are two faint streamers bracketting the tail at p.a. 9° and 50°, each extending ~ 5′ and perhaps further, though they fade a bit too much to follow further" [J. V. Scotti]. Oct. 21.80: very faint starlike cond. [BRE02]. Oct. 21.89: dust tail 0°.2 long in p.a. 70° [MOE]. Oct. 22.75: variable DC from 3 to 6 [BAR]. Oct. 22.77-22.80: 10-min CCD exp. w/ 19-cm *f*/4 flat field camera (+ narrow-band interference filters, FWHM = 10 nm) obtained — a C_2 filter frame (514 nm) shows a uniform circular coma ~ 16′ across; the subtraction of outer coma on the same frame revealed the inner coma to be asymmetric (fan-shaped, extending at p.a. ~ 200°-330°, with the main axis toward p.a. ~ 270°); an exp. with an H_2O^+ filter (620 nm) shows a 0°.4 straight ion tail at p.a. 30°; a red continuum filter (647 nm) show the absence of a dust component [MIK]. Oct. 22.92: w/ 25-cm *f*/20 'tri-schiefspiegler' (105×), $m_1 = 8.0$ (MM: B; ref: AC), 9′ coma, DC = 4, 2′ tail in p.a. 15° [NOW]. Oct. 22.98: "w/ 32-cm L, examination of coma at 68×, 110×, and 167× indicates a minute, almost stellar nucleus that grows steadily fainter w/ increasing magnification and that is the source of a striking outflow of bright material — this jet sector is centered at p.a. 230° and its outlines are more circular than on the 17th" [BOR]. Oct. 23.01: 10-min exp. on hypered 2415 Tech Pan film w/ 20-cm *f*/1.5 USNO Schmidt camera shows thin, diffuse ion tail extending 1°.3 in p.a. 24° and a short faint jet at p.a. 6°; there is a broad, diffuse, fan-shaped brightening of the coma between p.a. 140° and 280° [CHE]. Oct. 23.77: stellar central cond. [LOO01]. Oct. 24.74: fan tail spans p.a. ~ 25°-75° [BAR]. Oct. 25.085: w/ 60-cm L, six 10-sec CCD frames were aligned and added (10′ field-of-view) shows ~ 4′ plasma tail in p.a. 35°, extending from the comet's center of light; asymmetric coma in sunward direction [J. Newton, Victoria, BC]. Oct. 25.73: coma diffuse toward W, but sharper toward NE [BRE02]. Oct. 26.01: "the near-stellar cond. observed a few days ago was gone, although the remaining cond. was still off center; a faint tail was definitely seen last night in the binoculars, which seemed fan-shaped; the reflector did not show the tail, but the coma did extend in the same general direction; I had very good observing conditions and was surprised at how much larger the coma appeared in the reflector than on previous nights" [KRO02]. Oct. 26.75-26.77: narrow-band exp. taken as on Oct. 22.8 — H_2O^+ filter shows ~ 0°.5 prominent ion tail with several knots; there is a weak trace of a dust component ~ 0°.3 long in p.a. 0° on a red continuum frame [MIK]. Oct. 26.83: "coma compact with a large and brighter cond." [BRE02]. Oct. 27.06: in 10.2-cm *f*/4 L (20×), suggestion of a tail 15′-20′ long in p.a. ~ 25° [COL]. Oct. 27.07: w/ 31.8-cm *f*/4 L (63×), 0°.25 tail in p.a. 45° [KEE]. Oct. 27.11: fan seen perpendicular to solar vector [HER02]. Oct. 27.99: "w/ 20×120 B, minute nucleus very noticeable offset toward the NE, outline of coma is gibbous-shaped; in 50-cm *f*/5 L (78×), 5'.4 coma, DC = 5-6; the intense, starlike nucleus is strongly offset E of coma's physical center, and coma itself is a bizzarre comma-shaped object, which suggests sweeping emission of material in a counterclockwise direction — very much like that seen in comet Bennett of 1970; no individual jets are evident, save for one fairly ill-defined and narrow fountaining feature directed just a bit N of due W; there are also occasional suggestions of a vague dark lane stretching out behind the nucleus in the anti-solar direction (the dark lane may be the interior edges of a forked tail)" [BOR]. Oct. 28.73 and 29.79: "intensity distribution of coma was strongly shifted towards the E and fan-shaped toward the W; a point source was glimpsed" [BRE02]. Oct. 28.75: "clear nucleus" [LOO01]. Oct. 29.09, Nov. 6.09 and 9.09: heavy haze and light pollution [HER02]. Oct. 29.76: 4-min exp. on hypered TP2415 film w/ 14.0-cm *f*/1.65 A shows 4'.6 coma and 1°.15 tail in p.a. 35° [HAS02]. Oct. 29.81: at 76×, starlike cond. of mag 11 [MOE]. Oct. 30: "comet appears remarkably similar to nearby M13 now, but a half-mag fainter and a bit smaller (in 11×80 B); a 13-inch L shows a thin tail ~ 30′ long pointing to the NE, but only obvious w/ the Swan Band filter at 60×, w/ the overall size of the head ~ 9′, still showing the bright cond. at p.a. 60° very near the center" [Tom Polakis, Phoenix, AZ]. Oct. 30.74: in 48.5-cm L, also 0°.1 tail in p.a. 70°, central cond. of mag 11 [MOE]. Oct. 30.74: in 20.4-cm *f*/6 L (72×), central cond. of mag ~ 11; at 35×, DC = 6, coma dia. ~ 7′ [JAH]. *(continued on next page...)*

[cont. from previous page] Nov. 1.00: fan-shaped tail in p.a. 225°-300° [SHA04]. Nov. 1.99: "in 31.7-cm *f*/6 L (68×), well-condensed 4'.1 coma (DC = 6-7) of complex appearance; distinct, broad, fan-shaped emission (jet) sector points toward p.a. 250°; although there may be a central jet in this fan, it is not distinctly enough seen to be certain; at 167×, a tiny, highly-eccentrically placed knot of bright material is noted, which is the source of a distinct emission sector — knot becomes steadily sharper and more starlike w/ increasing magnification; at lower powers, w/ Lumicon comet (Swan band) filter, the outer coma is noticeably enhanced" [BOR]. Nov. 2.06: in 10.2-cm *f*/4 L (20×), some tail in p.a. ~ 30° [COL]. Nov. 3.75: in 20×80 B, round coma, distinct bright 2' central cond. with a more diffuse outer edge; in 25.4-cm L, distinct 3' central cond., and a thin, taillike feature 15'-30' long at p.a. 170° was seen, as well as a diffuse, curved, broad extension in p.a. 225° [DAN01]. Nov. 3.753: 3-min exp. on hypered TP2415 film w/ 14.0-cm *f*/1.65 A shows 4'.6 coma and tails 0°.13 and 0°.08 long in p.a. 50° and 320° [HAS02]. Nov. 4.74: in 12×40 B, tail was very faint and seemed straight [DAH]. Nov. 4.76: in 31.6-cm *f*/5 L (62×), coma dia. 5', DC = 7, asymmetric coma with major axis along p.a. 90°-270°, elongated 'nucleus' of size 2" × 4" w/ major axis along p.a. 120°-300° [MID01]. Nov. 4.78: large, bright cond. [BRE02]. Nov. 4.93: in 20.3-cm T, nucleus of mag ~ 10 visible; coma seemed asymmetric; the sunward side of the coma was considerably brighter and more extended than the other side [DAH]. Nov. 5.06: broad tail spans p.a. 35°-80° [COL]. Nov. 7.71: in 20.3-cm T, asymmetric brightness distribution of the coma; star-like nucleus at mag ~ 12 [GRA04]. Nov. 7.73: "large cond. w/ diffuse rays towards p.a. 150° and 330°; comet resembled M13 in brightness and shape, though more condensed" [BRE02]. Nov. 8.76: nucleus of mag ~ 10 visible [DAH]. Nov. 8.97: bright moonlight hinders observations; w/ 31.7-cm *f*/6 L (68×), DC = 6-7, coma dia. 3'.0+, "broad fan-shaped sector perhaps as much as 180° wide and centered at p.a. ~ 250°, perhaps 1'.5 tall; at 167×, a small, bright mass stands at the base of the jet sector, but no clearly starlike nucleus is visible" [BOR]. Nov. 9.72: in 15.2-cm L, also 0°.4 tail in p.a. 80° [MOE].

Nov. 10.10: "w/ Swan band filter, bright arcs and central cond." [SPR]. Nov. 10.68: also 0°.5 tail in p.a. 45° [KOS]. Nov. 10.72: in 15.2-cm L, also 0°.6 tail in p.a. 80° [MOE]. Nov. 10.96: w/ 31.7-cm *f*/6 L (68×), DC = 6; "there is a perfectly stellar nucleus at the heart of the 3'.0 coma; at this power, it is like a star of mag 10-11 and very obvious, and it is the source of an obvious outflow of bright material in a generally sunward direction; w/ increasing magnification, the nucleus remains perfectly stellar but grows steadily fainter; at 167×, one gets the impression of complex structure in the inner coma — the most obvious feature is the sunward fountain, which extends 1'.0 in p.a. 245°; there is also rather definitely a fainter, broad fan of material to the S of the fountain's position; less definite but glimpsed a number of times is a broad, curving ray that extends N from the nuclear region; occasionally one gets the impression of a general counterclockwise-rotation arrangement among these features and the supsected even-finer jets or rays" [BOR]. Nov. 11.119: frames taken as on Oct. 25 shows main plasma tail at p.a. 40° w/ a well-defined thin streamer at p.a. 32°, both tails extending past the edge of the frame; also fainter side rays at p.a. 1° and 64°; coma now nearly symmetrical [Newton]. Nov. 12.78: w/ 11.4-cm *f*/7.9 L (150×), 12' tail in p.a. 30° [FOG]. Nov. 13.68: also 0°.5 tail in p.a. 19° [CSU]. Nov. 13.96: in 50-cm L, "w/ the possible exception of comet Bennett in 1970, the present comet has the most extraordinary appearance of any object I have ever seen; the coma's structure is, at the least, quite bizarre and — while not commanding instant attention — still is readily apparent; at various powers (78×-241×), one sees that (as previously) most of the bright coma material lies sunward of the nucleus; the nucleus is stellar or near-stellar, bright, w/ a dense surrounding envelope; from the nucleus comes an ill-defined fountain of bright material centered at p.a. 280° and spanning perhaps 45° in p.a.; the N edge of the fountain is more sharply defined than the S; a strange 'lobe' of material hangs from the S side of the bright sunward envelope, curving around until it is directed almost E (p.a. ~ 110°); this latter feature is of a considerably lower surface brightness than the inner envelope, but clearly apparent; the tail is occasionally suggested to be composed of multiple rays or streamers; the tail does not lay opposite the fountain, but obliquely to the N; the following (S) edge of the tail seems to be formed by a slightly brighter ray that can be traced right up to the nucleus itself; the trailing (N) edge of the tail comes off the coma parallel to the opposite tail edge and is not aligned w/ the nucleus in any way; in spite of the large aperture employed, all these features are very dim and best seen w/ averted vision" [BOR]. Nov. 14.0 and 16.0: in 33.3-cm L (216×), the condensation was very diffuse and indistinct, while a near-stellar cond. of mag ~ 10.5 existed at 56×; also, the coma was noticeably brighter on the NW half; on the 16th, a small cone-shaped feature was also seen on the NW side of the cond., with the point at the cond. [KRO02]. Nov. 14.00: small central cond. prominent [DES01]. Nov. 14.07: w/ 31.8-cm *f*/4 L (33×), 1°.0 tail in p.a. 40° [KEE]. Nov. 14.70: in 20.3-cm T, nucleus seemed offset from center of coma towards the ENE [DAH]. Nov. 14.73-14.78: "10-min CCD frames taken w/ 250-mm *f*/4 lens (3° × 2° field) and narrow-band filters (all have FWHM = 10 nm) — H_2O^+ filter (620 nm) shows a 2°.3 straight ion tail in p.a. 42°, probably extending beyond the frame; there are four distinct knots of material along the tail, present at 0°.25, 0°.6, 1°.2, and 2°.1 from the comet nucleus, indicating a high rate of ejections; a red continuum filter (647 nm) revealed only a 12' fan of dust at p.a. 20°; 18' circular coma on a C_2 frame (514 nm)" [MIK]. Nov. 14.79: w/ 11.0-cm *f*/4 telescope, tail 2°.5 long in p.a. 315° ± 2° [TRI]. Nov. 14.80 and 20.78, and Dec. 15.70: 250-mm *f*/4 lens + *V* filter + CCD; comparison stars in same frame as comet on first two dates; comparison was HR 7432 (*V* = 6.34) for last date [MIK]. Nov. 14.735: beginning time of 9-min exp. on Scotch color slide film (ASA 1600) w/ 300-mm *f*/4.5 lens shows 12' coma and 2°.63 tail in p.a. 43°, "the tail beginning tangent to the coma (probably beginning of disconnection)" [HAV]. Nov. 14.81: w/ 20-cm T (123×), apparently stellar cond. of mag ~ 11.5 (ref: W Lyr AAVSO chart) [GRA04]. Nov. 14.96: w/ 50-cm *f*/5 L (78×-241×), "nucleus sharp and near stellar — seems less eccentrically placed w/in coma tonite; bright spray of material directed generally sunward (more or less due W) obvious; coma's outline (dia. 3'.2 and DC = 6 at 78×) circular w/ sunward half much brighter; no particular internal structure, save for the fan of bright material from the nucleus" [BOR].

Nov. 15.07: exp. taken as on Oct. 18 and 19 shows 3°.8 tail in p.a. 45° and well-condensed center w/in a 13' coma [Roques]. Nov. 15.09: under similar conditions, tail was significantly less obvious than on previous night [MOR]. Nov. 15.70: in 31.6-cm L (200×), nuclear cond. of mag ~ 11 was 1" × 2" in size, w/ major axis along p.a. 300° [MID01]. Nov. 15.98: in 37-cm L (60×), very pronounced stellar nucleus of mag ~ 7.0 (compared w/ nearby star SAO 85712)

(Continued on next page...)

◇ *Periodic Comet Swift-Tuttle (1992t)* ⟹

[cont. from previous page] surrounded by a bright inner coma that faded exponentially into the background at a radius of ~ 10′; the nucleus was symmetrically placed within the coma [CHE]. Nov. 15.99: in 32-cm L, "coma appears rather symmetrically arranged about the nucleus, although distinctly brighter on the sunward side; at 55×, the nucleus is 10th mag and essentially stellar — it grows fainter w/ increasing magnification; high powers (110×-167×) fail to indicate the complex structure of the inner coma seen last week; only distinct feature is the bright sunward outflow of material w/out defineable borders, centered more or less at p.a. 260° (impression seems to vary); occasional suggestion of a stubby jet projecting from the nucleus, but its p.a. also seems variable; tail appears to be type-I ion tail, as it is clearly narrower than the coma's dia." [BOR]. Nov. 16.02: in 33.3-cm *f*/4 L (56×), w/ Orion SkyGlow filter (which strongly favors the blue spectrum), m_1 = 5.0 (MM: B; ref: SC, using same primary star — 98 Her — as was used for the estimate w/o the filter in the tabulated data), coma dia. 6′.1, DC = 7, possible tail at p.a. 41° [KRO02]. Nov. 16.70: "cond. with a point source at m_2 ~ 10, strongly condensed towards E; structures in coma towards p.a. 148° and 23°, and a thin, faint jet at p.a. 320°; tail was faint" [BRE02]. Nov. 16.97: w/ 50-cm L, observed at 78×-241×; at 78×, sharp stellar nucleus of mag ~ 11; "majority of bright material sunward of nucleus, particularly w/ regard to the brightest regions; nucleus remains hard and sharp at all powers and is the source of a bright fan of material directed sunward, centered at p.a. ~ 285°; again the strange 'lobe' of brighter material is noted extending from the SE side of the inner coma; occasionally an impression of some sort of thin appendages coming off the nucleus; entire coma appears very similar, if not identical, to view on Nov. 13/14; tail only about half as wide as coma's dia.; edges parallel; ~ 1/3 of way from S to N in tail is a slightly brighter, very narrow, straight ray or spine that can be traced almost up to the nucleus itself; all these features are, however, very faint" [BOR]. Nov. 17.74: short jet noted towards p.a. 23° [BRE02]. Nov. 18.733: exp. taken as on Nov. 14.735 shows 8′.5 coma and 2°.53 type-I tail in p.a. 46° [HAV]. Nov. 19.742: exp. taken as on Oct. 29.76 shows 7′.6 coma and 3°.3 tail in p.a. 46° [HAS02]. Nov. 19.78 and 20.75: "several CCD frames obtained as on Nov. 14.73 — H_2O^+ filter shows straight ion tail ~ 4°.5 long in p.a. 41°; several clouds and knots of material are present along the tail stream" [MIK].

Nov. 20.03: in 32-cm L, "comet's appearance distinctly different tonite; distribution of brightness strangely asymmetric; emission jet sector now directed at right angles to tail axis, splitting coma more or less NE-SW, w/ brighter portion to the N; outer coma, however, is more circular in outline; additionally, more bright material lies tailward than at any time previously; bright but very non-stellar nucleus embedded in dense, bright central mass; bright jet sector rises ~ 1′ above nucleus and is centered at p.a. 320°" [BOR]. Nov. 20.75: in 20×80 B, 10′ coma, DC = 6-7, 2°.3 tail in p.a. 50° [ZAN]. Nov. 21.71: in 20.3-cm *f*/10 T (80×), DC = 7, tail length > 0°.4 [GRA04]. Nov. 21.72: 1°.9 tail was type-I; also type-II tail 0°.3 long in p.a. 21° [HAV]. Nov. 21.73: w/ 10-cm *f*/10 L (80×), 15′ tail in p.a. 35°; m_2 = 7.8 [FOG]. Nov. 21.75: possible jet in inner coma, 4″ long at p.a. ~ 315° (ref: AH Her AAVSO chart) [DAH]. Nov. 21.75: in 20×80 B, 10′ coma, DC = 6-7, 2°.4 tail in p.a. 50°; also curved tail 0°.8 long in p.a. 25° [ZAN]. Nov. 21.762: beg. of 8-min exp. taken as on Nov. 14.735 shows 7′.0 coma, w/ 3°.20 very irregular type-I tail in p.a. 43° and 0°.40 type-II tail in p.a. 24° [HAV]. Nov. 22.00: faint fan-shaped tail in p.a. 330°-15° [SHA04]. Nov. 22.4: a photograph shows the tail extending > 6° in length, past the edge of the field [OHK]. Nov. 23.00: dust tail in p.a. 315°-350° [SHA04]. Nov. 23.716: exp. taken as on Oct. 29.76 shows 6′.1 coma and 3°.6 tail in p.a. 46° [HAS02]. Nov. 23.72: 1°.8 tail was type-I; also type-II tail 0°.3 long in p.a. 25° [HAV]. Nov. 23.730: beg. of 7.5-min exp. taken as on Nov. 14.735 shows 6′.0 coma w/ a 2°.8 type-I tail in p.a. 44° (bent at 1°.4 in p.a. 52°) and a 0°.4 type-II tail in p.a. 30° [HAV]. Nov. 23.73-23.77: several CCD frames — taken as on Nov. 14, 19, and 20 — H_2O^+ filter show a straight ion tail ~ 6°.7 long in p.a. 44°, w/ clouds and knots of material are present along the tail stream; a red continuum filter shows ~ 2° fan of dust extending in p.a. 10°-40° [MIK]. Nov. 23.97: in 50-cm /5 L (78×), 3′.6 coma, DC = 7; "bright, intense, essentially starlike nucleus of mag ~ 10 contained w/in bright mass; this central 'star' is particularly striking; general coma outline of brighter material circular but outermost envelope rather teardrop-shaped; no distinct internal detail except for general vague outflow of bright material due W; seeing rather poor; tail fairly obvious, much more sharply defined on S edge; tail ~ 2/3 as wide as coma's dia.; possible narrow, straight jet S of tail's centerline; edges of tail diverge significantly" [BOR]. Nov. 23.99: in 20-cm L (48×), coma was extremely condensed around a central bright stellar nucleus of mag 7.2 (comparison stars SAO 103889, 103975, 103986, 103989) [CHE]. Nov. 24.68: structures in coma were detected towards p.a. 55° and 150°; tail was faint [BRE02]. Nov. 24.713: 3-min exp. on hypered TP2415 film w/ 14.0-cm *f*/1.65 A shows 6′.1 coma and tails 2°.8 and 1°.5 long in p.a. 46° and 43° [HAS02]. Nov. 27.08: exp. taken as on Oct. 18 and 19 shows 3°.3 tail in p.a. 58° and a faint, fan-like tail spread through 20° of p.a. and centered at p.a. 48°; coma dia. ~ 13′ [Roques]. Nov. 28.07: various short exp. on Tech pan film w/ 41-cm L show the inner tail structure to be centered at p.a. ~ 60°, w/ the inner coma somewhat asymmetrical in p.a. 0° [Roques]. Nov. 28.11: in 28-cm *f*/10 T (93×), inner coma appeared starlike [DIL]. Nov. 28.72: in 20.3-cm T, bright inner coma, difficult to distinguish any nucleus [GRA04]. Nov. 28.73: tail length and p.a. refer to bright, narrow plasma tail; there is also a fan-shaped dust tail [BEN03]. Nov. 28.73: tail was straight and narrow [DAH]. Nov. 28.96: in 32-cm L, "rather oddly-shaped coma; clearly more bright material lies NW of nuclear region; SE side of coma noticeably flattened, corresponding to S tail boundary; nucleus fairly bright and obvious but grows rapidly fainter and more diffuse w/ increasing magnification — at 167×, faint and ill-defined, being heavily involved in surrounding material; occasional suggestions of many very faint rays emanating from nuclear region and sweeping back into tail in differing directions; much more apparent is bright but diffuse fan or jet sector centered at p.a. 225°; Lumicon comet (Swan band) filter does not seem to significantly enhance comet; S edge of tail strikingly well defined; N edge very ill defined; edges straight and significantly divergent" [BOR]. Nov. 29.99: 9th-mag star w/in coma; tail fanned across 50° of p.a. (the tabulated p.a. on Nov. 28.99 and 29.99 represent the brightest portion, which was almost centered w/in the tail) [KRO02]. Nov. 30.00: dust tail spans p.a. 15°-60°, w/ plasma tail spike at p.a. 60° [SHA04]. Nov. 30.68: also 0°.5 tail in p.a. 35° [UJV]. Nov. 30.73: also 0°.7 tail in p.a. 26° [HAS02].

(continued on next page...)

[cont. from previous page] Dec. 1.00: fan-shaped dust tail spans p.a. 40°-60° [SHA04]. Dec. 1.69: in 15.2-cm L, also 0°.3 tail in p.a. 70° [MOE]. Dec. 1.71: tail in p.a. 50° was type-I; also type-II tail 0°.2 long in p.a. 30° [HAV]. Dec. 1.95: in 32-cm L, "minute stellar nucleus; brightest portion of coma just sunward of this feature; considerably more material tailward than previously, giving intermediate region of coma a teardrop-shaped outline — outermost coma, however, may be parabolic; flattened profile of S coma/tail boundary has vanished; at 167×, nucleus is faint and difficult but quite stellar ($m_2 \sim 12$); dense, bright mass of material lying sunward of nucleus too ill-defined to be described as a fan; tail may be as wide as coma's dia., certainly straight, w/ the S edge more sharply defined" [BOR]. Dec. 5.95: in 20×120 B, "intensely condensed, circular coma that condenses sharply near the center to an essentially stellar 9th-mag point" [BOR]. Dec. 6.94: small, bright, disklike central cond.; extending from the NE edge of the coma, there appeared to be a fan-shaped tail made up mostly of streamers — the longest of which was ~ 25′ long and extended from p.a. ~ 65°-80° [DID]. Dec. 7.93: somewhat of a bright streamer seemed to extend out to ~ 6′ from the coma into p.a. 56° [DID]. Dec. 8.95: in 32-cm L, "one immediately notices the very strong, stellar nucleus of mag ~ 8; this intense feature dominates the coma's appearance; nucleus perfectly stellar at 55× and 110×, fading very little w/ increasing power — only at 167× does the nucleus seem to have some measureable diameter; low power shows vague but definite broad fan of material directed sunward (opposite tail), so wide that it comprises full half of the coma; at high powers, however, one gets the impression that the inner coma is once again comma-shaped, as on Nov. 16/17, w/ a diffuse extension trailing off to the S of the nucleus" [BOR]. Dec. 12.71: tail was faint and appeared fan-shaped, spanning p.a. ~ 20°-45°; central cond. ~ 20″ in dia., $m_2 = 6.7$ (ref: SC) [GRA04]. Dec. 13.71 and 16.72: 5-min CCD frames with 20-cm *f*/2 Baker-Schmidt camera (+ H_2O^+ filter) show almost featureless flow of material ~ 1°.5 long [MIK]. Dec. 13.725: beg. of 6-min exp. taken as on Nov. 14.735 shows 4′.5 coma and 2°.8 type-II tail in p.a. 43° [HAV]. Dec. 13.95: in 32-cm L, "strongly asymmetric coma outline; coma distinctly comma-shaped, jsut as on Nov. 16/17 and Dec. 8/9; bright material clearly flows roughly sunward toward p.a. 280°, then progressively curves back to form the leading (S) edge of the tail; intense, almost starlike nucleus (mag ~ 8-9) at heart of emission and distinctly offset from dimensional center of coma, toward the NE; at 110×, more diffuse, but one gets the distinct impression that the bright material is spiraling out from the nucleus in a counterclockwise direction and curving back into the tail, from S through E to the NE; the Lumicon comet filter enhances the comet slightly but somewhat suppresses the nucleus; tail's leading (S) edge both brighter and sharper than its counterpart" [BOR]. Dec. 14.08: poor conditions; brightness probably underestimated [MOR]. Dec. 14.70 and 15.72: tail curved from p.a. 50° at the beginning to 30° at the end [HAS02]. Dec. 14.95: in 32-cm L, "comet not viewed until fairly low in the sky; coma strongly condensed w/ vaguely defined outer envelope of perhaps parabolic outline; nucleus very pronounced and, together w/ area of greatest cond., is offset slightly to the NW of the coma's center; starlike nucleus of $m_2 = 8.5$ (ref: S) — at same time, 20×120 B gives $m_2 = 7.9$; at 110×, bright stellar or near-stellar nucleus remains unchanged; distribution of bright material in coma similar to last night, but nucleus not quite so eccentrically placed; tail appears unusual in outline, w/ S edge possibly bulged outward or slightly curved just behind the coma" [BOR]. Dec. 15.68: coma appeared asymmetric; central cond. ~ 30″ in dia., $m_2 = 6.9$ (ref: SC) [GRA04]. Dec. 15.69: tail at p.a. 56° was straight and narrow; another tail 0°.23 long in p.a. 27° was broad, diffuse, and fan-shaped, spanning p.a. 20°-35°; a 'nucleus' of mag ~ 10.0 was also seen [DAH]. Dec. 15.70-15.73: several CCD frames obtained as on Nov. 23.73 — H_2O^+ filter shows outburst of fresh material in form of prominent ion tail 1°.1 long in p.a. 50° and a 0°.5 ray in p.a. 65°; the ion tail has a total length of 2°.8, ending with a ~ 0°.6 × 0°.3 cloud; a red continuum frame on Dec. 15.72 shows ~ 0°.8 fan of dust extending in p.a. 15°-50° [MIK]. Dec. 15.95: in 32-cm L, "area of greatest cond. distinctly offset toward p.a. 335° w/in coma; coma remains strongly condensed but *totally lacks* the stellar nucleus of last night!; no trace of nucleus even at 110×; brighter portions of coma obviously comma-shaped, very much like R. T. A. Innes' drawing of P/Halley on 1910 May 16, J. F. Schmidt's illustration of P/Swift-Tuttle on 1862 Aug. 21, and a view I had of P/Halley in 1985; the tailward-flowing material extends much further downstream tonite than at any time before, making the S side of both the coma and tail much more pronounced than the N; sides of tail diverge slightly and width equals coma's dia.; late twilight" [BOR]. Dec. 17.69: central cond. ~ 30″ in dia. of $m_2 \simeq 6.7$ (ref: SC) [GRA04]. Dec. 18.93: central cond. appeared as a disk of dia. 30″ [DID]. Dec. 19.08: faint tail, slightly fan-shaped, subtending p.a. 40°-60° [MOR]. Dec. 19.69: second tail 0°.10 long in p.a. ~ 0°; central cond. 1′.0 in dia., $m_2 = !6.9$ (ref: SC); conditions considerably better than on Dec. 17.69 [GRA04]. Dec. 21.00: fan-shaped dust tail spans p.a. 30°-60° [SHA04].

◇ *Periodic Comet Väisälä (1992u)* ⟹ 1992 Dec. 29.99 and 31.03: search w/ 20-cm *f*/2 Baker-Schmidt camera + *V* filter + ST-6 CCD, based on elements published in *ICQ 1993 Comet Handbook* [MIK].

◇ ◇ ◇

OBSERVATIONS OF COMETS

The headings for the tabulated data are as follows: "DATE (UT)" = Date and time to hundredths of a day in Universal Time; "MM" = the method employed for estimating the total visual magnitude [B = Bobrovnikoff, M = Morris, S = Sidgwick/In-out — see October 1980 issue of *ICQ*, pages 69-73 — etc.; also, P stands for photographic magnitude, and photoelectrically-determined values fall under U, L, and V for the standard *U*, *B*, and *V*, respectively]. "MAG." = total visual magnitude estimate; a colon indicates that the observation is only approximate, due to bad weather conditions, *etc.*; a left bracket ([) indicates that the comet was not seen, with an estimated limiting magnitude given (if the comet IS seen, and it is simply estimated to be fainter than a certain magnitude, a "greater-than" sign (>) must be used, not a bracket). "RF" = reference for magnitude estimates (see pages 98-100 of this issue for the 1- and 2-letter codes). "AP." = aperture in centimeters of the instrument used for the observations, usually given to tenths. "T" = type of instrument used for the observation (R = refractor, L = Newtonian reflector, B = binoculars, C = Cassegrain reflector, A = camera, T = Schmidt-Cassegrain reflector, S = Schmidt-Newtonian reflector, E = naked eye, *etc.*). "F/" and "PWR" are the focal ratio and power or magnification, respectively, of the instrument used for the observation — given to nearest whole integer (round even).

"COMA" = estimated coma diameter of the comet in minutes of arc. An ampersand (&) indicates an approximate estimate. An exclamation mark (!) precedes a coma diameter when the comet was not seen (*i.e.*, was too faint) and where a limiting magnitude estimate is provided based on an "assumed" coma diameter (a default size of 1′ or 30″ is recommended; cf. *ICQ* **9**, 100); a plus mark (+) precedes a coma diameter when a diaphragm was used electronically, thereby specifying the diaphragm size (i.e., the coma is almost always larger than such a specified diaphragm size). "DC" = degree of condensation on a scale where 9 = stellar and 0 = diffuse; a slash (/) indicates a value midway between the given number and the next-higher integer. "TAIL" = estimated tail length in degrees, to 0.01 degree if appropriate; again, an ampersand indicates a rough estimate. "PA" = estimated measured position angle of the tail to nearest whole integer in degrees (north = 0°, east = 90°). "OBS" = the observer who made the observation (given as a 3-letter, 2-digit code).

An asterisk between the published DATE and MM columns indicates that the observation is an updated version of one already published in a previous issue of the *ICQ*, *The Comet Quarterly*, or *The Comet*. An exclamation mark (!) in this same location indicates that the observer has corrected his estimate in some manner for atmospheric extinction; prior to September 1992, this was the standard symbol for noting extinction correction, but following publication of the extinction paper (July 1992 *ICQ*), this symbol is only to be used to denote corrections made using procedures different from that outlined by Green (1992, *ICQ* **14**, 55-59), and then only for situations where the observed comet is at altitude > 10°. Here again are the new special symbols: '&' = comet observed at altitude 20° or less with no atmospheric extinction correction applied; '$' = comet observed at altitude 10° or lower, observations corrected by the observer using procedure of Green (*ibid.*); for a correction applied by the observer using Tables Ia, Ib, or Ic of Green (*ibid.*), the letters 'a', 'w', or 's', respectively, should be used.

A complete list of the Keys to abbrevations 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.

◇ ◇ ◇

Key to observers with observations published in this issue, *with 2-digit numbers between Observer Code and Observer's Name indicating source [11 = Dutch Comet Section; 16 = Japanese observers (c/o Akimasa Nakamura, Aichi, Japan); 32 = Hungarian observers (c/o Krisztian Sarneczky), etc.]. Those with asterisks (*) preceding the 5-character code are new additions to the Observer Key:*

CODE	S	OBSERVER, LOCATION
AND01	21	Karl-Gustav Andersson, Sweden
ARM		Jerry Armstrong, GA, U.S.A.
BAN	18	Jaroslaw Bandurowski, Poland
BAR		Sandro Baroni, Italy
*BEL04		Luis Bellot, Tenerife, Spain
BEN03	21	Hans Bengtsson, Sweden
BOA		Andrea Boattini, Italy
BOR		John E. Bortle, NY, U.S.A.
*BOS		Mike Boschat, Canada
*BOS01		J. G. Bosch, Switzerland
BRE02	24	Per-Jonny Bremseth, Norway
BUS01	11	E. P. Bus, The Netherlands
CAV		Marco Cavagna, Italy
CHE		G. R. Chester, VA, U.S.A.
CHE03	33	Kazimir T. Cernis, Lithuania
CHO01	18	Franciszek Chodorowski, Poland
COL		Peter L. Collins, MA, U.S.A.
COM	11	Georg Comello, The Netherlands
*CSU	32	Matyas Csukas, Romania
DAH	24	Haakon Dahle, Norway
DAN01	21	Jorgen Danielsson, Sweden
DEA		Vicente Ferreira de Assis Neto, Brazil
DES01		Jose Guilherme de Souza Aguiar, Brazil
DID		Richard Robert Didick, MA, U.S.A.
DIL		William G. Dillon, VA, U.S.A.
DUS	21	Grzegorz Duszanowicz, Sweden
EKL	21	Anders Ekloef, Sweden
FIL04	18	Marcin Filipek, Poland
*FOG		Sergio Foglia, Italy
GAL		Jesus Gallego Maestro, Spain
GAM	18	Mariusz Gamracki, Poland
*GAS01	33	Darius Gasiunas, Lithuania
*GEO	34	Radostin Georgiev, Bulgaria
GRA04	24	Bjoern Haakon Granslo, Norway
GRE		Daniel W. E. Green, U.S.A.
GRO03	18	Radoslaw Grochowski, Poland
*HAD01	32	Csaba Hadhazi, Hungary
HAS02		Werner Hasubick, Germany
HAV		Roberto Haver, Italy
HAY01	16	Hironori Hayashi, Japan
HEE	24	Lars Trygve Heen, Norway
HER02		Carl Hergenrother, NJ, U.S.A.
ISH02	16	Akiyoshi Ishikawa, Japan
IWA02	18	Mariusz Iwanski, Poland
JAH		Jost Jahn, Germany
*JOR	34	Tatiana Jordanova, Bulgaria
*KAK01	16	Nataru Kakei, Japan
KEE		Richard A. Keen, CO, U.S.A.
KER	32	Akos Kereszturi, Hungary
KES01	32	Sa'ndor Keszthelyi, Hungary
KID		Mark Kidger, Canary Islands
*KLA01	23	P. Klasek, Czech Republic
KOB01	16	Juro Kobayashi, Japan
KOL03	18	Szymon Kolodziej, Poland
KOM	18	Artur Komorowski, Poland
KOS	32	Attila Kosa-Kiss, Romania
KRO02		Gary W. Kronk, IL, U.S.A.
*KYS	23	J. Kysely, Czech Republic
LEH		Martin Lehky, Czechoslovakia
LOO01		Frans R. van Loo, Belgium
MAR03		Brian G. Marsden, MA, U.S.A.
MID01	24	Oernulf Midtskogen, Norway
MIK		Herman Mikuz, Slovenia
*MIS01		Sabina Mistero, Italy
MIT	16	Shigeo Mitsuma, Japan
*MIY	16	Shuuichi Miyata, Japan
MOD		Robert J. Modic, OH, U.S.A.
MOE		Michael Moeller, Germany
MOR		Charles S. Morris, U.S.A.
MOR03		Warren C. Morrison, Canada
NAG04	16	Kazuro Nagashima, Japan
NAK01	16	Akimasa Nakamura, Japan
NAK05	16	Tetsuya Nakamura, Japan
NIE	28	H. Nieschulz, Germany
NOW		Gary T. Nowak, VT, U.S.A.
OBU	16	Yasushi Obuchi, Japan
OFE		Eran Ofek, Israel
OHK	16	Masami Ohkuma, Japan
OLE	18	Arkadiusz Olech, Poland
ONO	16	Osamu Onodera, Japan
*OSS	18	Piotr Ossowski, Poland
PAR03	18	Mieczyslaw L. Paradowski, Poland
*PAZ01	23	P. Pazour, Czech Republic
PED01		Santos Pedraz, Spain
PER05	18	Piotr Perek, Poland
PLE01	18	Janusz Pleszka, Poland
*POD	23	M. Podzorny, Czech Republic
*POR02	34	Diliana Porojanova, Bulgaria
PRY		Jim Pryal, WA, U.S.A.
RAD01	34	Veselka Radeva, Bulgaria
RAF	18	Jerzy Rafalski, Poland
REN		Alexandre Renou, France
RZE01	18	Marcin Rzepka, Poland
SAR02	32	Krisztian Sarneczky, Hungary
SCH04	11	A. H. Scholten, The Netherlands
SCH05		Patrick Schmeer, Germany
SCH07	21	Paul Schlyter, Sweden
SCI	18	Tomasz Sciezor, Poland
SCO01		James V. Scotti, AZ, U.S.A.
SEA01	14	John Seach, Australia
SHA04		Gregory T. Shanos, U.S.A.
*SKI	24	Oddleiv Skilbrei, Norway
SKJ	24	Olaf Skjaeraasen, Norway
*SLI	18	Robert Sliwa, Poland
SOC	18	Krzysztof Socha, Poland
SPE01	18	Jerzy Speil, Poland
SPR		C. E. Spratt, BC, Canada
*SWI01	18	Stanislaw Swierczynski, Poland
*SZE02	32	Laszlo Szentasko, Hungary
*THO03	24	Steinar Thorvaldsen, Norway
TOM	16	Akira Tominaga, Japan
TOM01		Maura Tombelli, Italy
*TRI		Josep Ma Trigo i Rodriguez, Spain
TSU	16	Kazuyoshi Tsuji, Japan
TSU02	16	Mitsunori Tsumura, Japan
UJV	32	Antal Ujva'rosy, Hungary
VEL02	34	Valentin Velkov, Bulgaria
VIE		Jean-Francois Viens, Quebec, Canada
WAR01	21	Johan Warell, Sweden
WAS	16	Shinsyo (Shinsho) Washi, Japan
WES04	18	Tomasz Weselak, Poland
YAS	16	Masanori Yasuki, Japan
*YOS03	16	Hitoshi Yoshida, Japan
YUS	16	Toru Yusa, Japan
ZAN		Mauro Vittorio Zanotta, Italy
*ZNO	23	Vladimir Znojil, Czech Republic

Comet Kohoutek 1973 XII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1973 11 30.47	B	5.0:	S	6.4	R		45			0.25		KRO02

Comet Kobayashi-Berger-Milon 1975 IX

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1975 08 06.20	B	5 :	S	5.0	B		7	10		?		KRO02
1975 08 07.18	B	4.8	S	15.2	L	8	68	12		?		KRO02
1975 08 08.17	B	5 :	S	15.2	L	8	68	12				KRO02
1975 08 11.12	B	5 :	S	15.2	L	8	68	10				KRO02
1975 08 12.13	B	5.1	S	15.2	L	8	68	11				KRO02

Comet West 1976 VI

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1976 03 05.48	B	1.0:	S	15.2	L	8	68				290	KRO02
1976 03 06.47	B	1.5	S	15.2	L	8	68	6			290	KRO02
1976 03 06.47	P			3.8	R					10	313	KRO02
1976 03 06.47	P	0.5:	S	3.8	R			& 5		7	299	KRO02
1976 03 06.48	B	1.0:	S	0.0	E		1			10	290	KRO02
1976 03 06.48	P	0.6	S	3.8	R			& 6		14	337	KRO02
1976 03 07.47	B	1.8	S	0.0	E		1			15	290	KRO02
1976 03 07.48	N	3.7	S	15.2	L	8	68					KRO02
1976 03 10.42	B	2.6	S	5.0	B		7			7	315	KRO02
1976 03 10.42	N	4.5	S	5.0	B		7					KRO02
1976 03 14.47	B	2.0:	S	5.0	B		7			5		KRO02
1976 03 14.47	N	3.9	S	5.0	B		7					KRO02
1976 03 14.47	P	1.5:	S	3.8	R					10	299	KRO02
1976 03 14.48	P	1.5:	S	3.8	R					8	301	KRO02
1976 03 25.38	B	4.4	S	15.2	L	8	68			1.5		KRO02
1976 03 25.38	B	5.4	S	15.2	L	8	68					KRO02
1976 03 25.38	P	4.4	S	3.8	R					3	278	KRO02
1976 04 02.34	B	4.8	S	15.2	L	8	68			1		KRO02
1976 04 02.34	P	4.8	S	4.1	R					2	292	KRO02
1976 04 04.34	B	5.4	S	15.2	L	8	68			0.5		KRO02
1976 04 10.31	B	6 :	S	5.0	B		7					KRO02
1976 04 12.30	B	6.8	S	15.2	L	8	68			0.17		KRO02
1976 04 18.31	B	7.5	S	15.2	L	8	68			0.33		KRO02
1976 04 26.29	B	7.3	S	15.2	L	8	68			0.5		KRO02
1976 04 26.29	N	9.5:	S	15.2	L	8	100					KRO02
1976 04 30.27	B	7 :	S	5.0	B		7			0.5		KRO02
1976 05 09.24	B	8 :	S	8.0	B		20					KRO02
1976 05 10.22	B	8.3	S	8.0	B		20					KRO02
1976 05 12.22	B	8.5	S	8.0	B		20					KRO02
1976 05 18.25	B	9.3	S	8.0	B		20					KRO02
1976 05 19.18	B	9.3	S	15.2	L	8	100	2		0.05	260	KRO02
1976 05 20.22	B	8.7	S	8.0	B		20	4				KRO02
1976 05 21.23	B	9.0:	S	8.0	B		20	2.5				KRO02
1976 05 23.20	B	8.7	S	8.0	B		20	3				KRO02
1976 05 25.19	B	8.8	S	15.2	L	8	100	2		0.12	260	KRO02
1976 06 03.24	B	9.1	S	8.0	B		20	3.5		0.17		KRO02
1976 06 06.23	B	9.3	S	8.0	B		20	2				KRO02
1976 06 17.21	B	9.6:	S	8.0	B		20	2			250	KRO02
1976 06 21.21	B	9.5:	S	15.2	L	8	100					KRO02
1976 06 22.17	B	9.5:	S	8.0	B		20					KRO02

Comet Kohler 1977 XIV

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1977 09 25.10	* B	9.4	S	15.2	L	8	68					KRO02
1977 09 27.10	* B	9.1	S	15.2	L	8	68	2				KRO02
1977 10 03.05	* B	8 :	S	15.2	L	8	68	3.5				KRO02
1977 10 04.06	* B	7.9	S	15.2	L	8	68					KRO02
1977 10 10.06	* B	7.5	S	15.2	L	8	68	3				KRO02
1977 10 13.06	* B	7.9	S	15.2	L	8	68					KRO02
1977 10 16.06	B	7.4	S	8.0	B		20	3				KRO02
1977 10 17.06	* B	7.3	S	8.0	B		20			0.2		KRO02
1977 10 18.05	* B	7.4	S	8.0	B		20	4				KRO02
1977 10 18.05	B	7.5:	S	15.2	L	8	68					KRO02
1977 10 27.03	* B	6.7	S	8.0	B		20	5				KRO02
1977 10 30.04	* B	6.6	S	8.0	B		20					KRO02
1977 11 13.04	* B	6.8	S	8.0	B		20	5.5				KRO02
1977 11 14.02	* B	6.9	S	8.0	B		20	5.5				KRO02
1977 11 22.03	* B	6.9	S	15.2	L	8	68	3.5				KRO02
1977 12 11.01	B	7.8	S	8.0	B		20	4.5				KRO02

Comet Bradfield 1979 X

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1980 02 01.04	B	7.0:	S	15.2	L	8	68	& 7				KRO02
1980 02 04.10	* B	7.7	S	15.2	L	8	68	& 7			135	KRO02
1980 02 12.05	B	9.5:	S	15.2	L	8	100	& 7				KRO02
1980 02 12.05	P	8.4	S	5.1	R			& 6				KRO02
1980 02 13.06	* B	8.8	S	15.2	L	8	68	&10			120	KRO02
1980 02 13.08	P	9.1	S	5.1	R			4				KRO02
1980 02 14.06	* B	8.8	S	15.2	L	8	68	6.5				KRO02
1980 02 18.07	* B	9.2	S	15.2	L	8	68	& 9				KRO02

Comet Bradfield 1980 XV

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1981 01 08.02	B	5 :	S	8.0	B		20			1		KRO02
1981 01 12.01	B	6.5	S	15.2	L	8	31			1	75	KRO02
1981 01 16.03	* B	5.8	S	8.0	B		20			0.33		KRO02
1981 01 16.74	O	5.1	SC	5.0	B		7			&1.5	50	GRA04
1981 01 17.02	B	6.1	S	8.0	B		20					KRO02
1981 01 17.73	O	6 :	SC	5.0	B		7			&1	50	GRA04
1981 01 18.02	B	6.5	S	15.2	L	8	31	1.5		0.5	25	KRO02
1981 01 23.02	B	7.0	S	8.0	B		20					KRO02
1981 01 23.02	* B	7.2	S	15.2	L	8	31					KRO02
1981 01 25.02	* B	8 :	S	15.2	L	8	68					KRO02
1981 01 31.02	* B	8.8	S	15.2	L	8	68					KRO02

Comet Panther 1981 II

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1981 01 25.04	* B	9.8:	S	15.2	L	8	100					KRO02
1981 02 05.04	* B	9.3	S	15.2	L	8	100					KRO02
1981 02 24.09	* B	8.9	S	15.2	L	8	68					KRO02
1981 02 25.06	* B	8.9	S	15.2	L	8	68	&10				KRO02
1981 02 26.06	* B	9.1	S	15.2	L	8	68	& 3				KRO02
1981 03 03.17	* B	9 :	S	15.2	L	8	100					KRO02
1981 03 07.17	* B	8.9	S	15.2	L	8	100					KRO02
1981 03 11.09	* B	8.9	S	15.2	L	8	100					KRO02
1981 03 11.11	P	8.9	S	5.1	R			& 3				KRO02
1981 03 12.07	* B	8.8	S	15.2	L	8	68	3				KRO02
1981 03 12.07	P	9.1	S	5.1	R			& 3				KRO02
1981 03 12.09	P	8.9	S	5.1	R			& 3				KRO02

Comet Panther 1981 II [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1981 03 12.14	P	8.8	S	5.1	R			& 3				KRO02
1981 03 13.08	* B	8.8	S	15.2	L	8	68	3				KRO02
1981 03 14.08	* B	9 :	S	15.2	L	8	68	3.4				KRO02
1981 03 15.11	* B	9 :	S	15.2	L	8	68	2.5				KRO02
1981 03 17.08	* B	9.2	S	15.2	L	8	68					KRO02
1981 03 23.09	* B	9.4	S	15.2	L	8	100	2.1				KRO02
1981 03 24.13	* B	9.2	S	15.2	L	8	100	3.1				KRO02
1981 03 25.08	* B	9 :	S	15.2	L	8	100	3.4				KRO02
1981 03 28.19	* B	9.4	S	15.2	L	8	100	3.2				KRO02
1981 03 31.19	* B	9.5:	S	8.0	B		20	4				KRO02
1981 04 01.10	* B	9.2	S	8.0	B		20	4				KRO02
1981 04 02.10	B	9.2	S	15.2	L	8	68	3.6				KRO02
1981 04 08.10	* B	9.3	S	15.2	L	8	100	3.2				KRO02
1981 04 10.11	* B	9.3	S	15.2	L	8	100					KRO02
1981 04 24.10	* B	9.5:	S	15.2	L	8	68					KRO02
1981 04 25.19	* B	10.0:	S	15.2	L	8	174					KRO02
1981 04 26.13	* B	10.0:	S	15.2	L	8	174	2				KRO02
1981 04 27.09	* B	9.8:	S	15.2	L	8	174	2.7				KRO02
1981 04 28.10	* B	10.1:	S	15.2	L	8	174	& 3				KRO02
1981 05 01.10	* B	9.5:	S	15.2	L	8	68	2.7				KRO02
1981 05 07.11	B	10.6:	S	15.2	L	8	100	1.5				KRO02
1981 05 08.13	B	10.7:	S	15.2	L	8	174	1.5				KRO02
1981 05 21.15	B	11.0	A	15.2	L	8	174	& 1				KRO02
1981 05 22.14	B	11.2	A	15.2	L	8	174	0.7				KRO02
1981 05 25.13	B	11.5:	S	15.2	L	8	174	& 1				KRO02

Comet Austin 1982 VI

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1982 09 05.08	B	6.3	S	15.2	L	8	31	4.7		?		KRO02
1982 09 13.06	B	7 :	S	8.0	B		20	6				KRO02
1982 09 16.08	B	7.1	S	8.0	B		20	4				KRO02
1982 09 16.08	B	7.4	S	15.2	L	8	68	4.3				KRO02
1982 09 17.08	B	7.5	S	8.0	B		20					KRO02
1982 09 19.08	B	7.8	S	8.0	B		20					KRO02
1982 09 19.08	B	8.2	S	15.2	L	8	68	& 5				KRO02

Comet Sugano-Saigusa-Fujikawa 1983 V

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 05 16.39	P	7.8	S	3.8	R							KRO02
1983 05 16.40	B	8.5	S	15.2	L	8	68	& 2				KRO02
1983 05 20.39	P	7.3	S	3.8	R							KRO02
1983 05 20.40	B	7.9	S	15.2	L	8	68	& 2				KRO02
1983 05 24.44	B	9 :	S	15.2	L	8	68	1.5				KRO02
1983 06 09.38	B	9 :	S	15.2	L	8	68					KRO02

Comet IRAS-Araki-Alcock 1983 VII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 05 10.18	P	3.3	S	3.8	R			51				KRO02
1983 05 10.21	B	3.5	S	0.0	E		1					KRO02
1983 05 10.21	B	3.5	S	8.0	B		20	30			315	KRO02
1983 05 11.23	P	2.9	S	3.8	R			48				KRO02
1983 05 11.24	B	2.9	S	8.0	B		20	45				KRO02
1983 05 11.24	B	3.0:	S	15.2	L	8	31	30				KRO02
1983 05 11.24	N	8.5	S	15.2	L	8	100					KRO02

Comet Austin 1984 XIII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 09 01.42	B	7.0	S	8.0	B		20	4				KRO02
1984 09 01.42	B	7.3	S	15.2	L	8	68	& 4				KRO02
1984 09 02.11	O	7.5	V	20.3	T	10	80	1.5				GRA04
1984 09 02.43	B	7.1	S	15.2	L	8	68	4.5		?	275	KRO02
1984 09 04.06	O	7.5	SC	20.3	T	10	80	1.5		?	320	GRA04
1984 09 04.42	B	7.1	S	8.0	B		20	5				KRO02
1984 09 04.42	B	7.3	S	15.2	L	8	68	5.3		?	279	KRO02
1984 09 06.01	O	7.6	S	20.3	T	10	80					GRA04
1984 09 07.42	B	7.6	S	15.2	L	8	68	5.0				KRO02
1984 09 08.42	B	7.7	S	15.2	L	8	68	& 5				KRO02
1984 09 13.09	O	8.0	SC	20.3	T	10	50	2			300	GRA04
1984 09 13.43	B	8.5:	S	15.2	L	8	68	& 5		?	275	KRO02
1984 09 19.41	B	7.9	S	8.0	B		20					KRO02
1984 09 19.41	B	8.1	S	15.2	L	8	68	3.3		0.12	295	KRO02
1984 09 20.40	B	8.4	S	8.0	B		20	5	3			KRO02
1984 09 20.40	B	8.6	S	15.2	L	8	68	& 4				KRO02
1984 09 21.40	B	8.2	S	8.0	B		20	6				KRO02
1984 09 21.40	B	8.2	S	15.2	L	8	31					KRO02
1984 09 25.39	B	8.6	S	15.2	L	8	68	6.2	4			KRO02
1984 09 28.40	B	8.4	S	8.0	B		20					KRO02
1984 09 28.41	B	8.6	S	15.2	L	8	68	6.6	3			KRO02
1984 10 04.42	B	8.8	S	15.2	L	8	68	6.6	3			KRO02

Comet Levy-Rudenko 1984 XXIII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1984 12 18.51	B	9.1	S	15.2	L	8	68					KRO02
1984 12 22.70	O	8.5:	SC	20.3	L	6	30	& 4	5			GRA04
1984 12 23.55	B	9.1	S	15.2	L	8	68					KRO02
1984 12 24.51	B	8.8	S	15.2	L	8	68	3.7	1			KRO02
1984 12 25.68	O	8.2	SC	20.3	L	6	30	3	5			GRA04
1984 12 26.51	B	8.7	S	15.2	L	8	68	3.9	3			KRO02
1984 12 26.69	O	8.3	V	20.3	L	6	30	3	4			GRA04
1984 12 29.20	O	8.3	V	20.3	L	6	30	3	4			GRA04
1985 01 03.52	B	9.2:	S	15.2	L	8	68					KRO02
1985 01 08.51	B	9.2:	S	15.2	L	8	68					KRO02

Comet Hartley-Good 1985 XVII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 10 06.16	B	9.7:	S	33.3	L	4	56	3.0	4			KRO02
1985 10 07.13	B	9.0	S	33.3	L	4	56	5.3				KRO02
1985 10 16.09	B	8.5	S	8.0	B		20	6	3			KRO02
1985 11 08.10	B	8.7	S	33.3	L	4	56	3.7	3			KRO02

Comet Thiele 1985 XIX

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 10 25.44	B	9.5:	S	33.3	L	4	56	& 5	3			KRO02
1985 11 04.10	B	8.8	S	33.3	L	4	56	4.4	3			KRO02
1985 11 05.13	B	8.9	S	33.3	L	4	56	5.6	2			KRO02
1985 11 05.13	N	12.5:	S	33.3	L	4	216					KRO02
1985 11 06.16	B	8.8	S	15.2	L	8	68	5.6	2			KRO02
1985 11 08.15	B	8.9	S	33.3	L	4	56	4.0	4			KRO02
1985 12 07.02	B	9.3	S	33.3	L	4	56	3.5	2			KRO02
1985 12 09.01	B	9.0	S	33.3	L	4	56	3.5	1			KRO02

Comet Terasako 1986 XVIII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 02 08.05	B	9.0:	S	33.3	L	4	56	3	2			KRO02
1987 02 09.06	B	9.0:	S	33.3	L	4	56	4	2			KRO02

Comet Sorrells 1987 II

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 12 04.09	B	10.5:	A	33.3	L	4	56	2.1	8			KRO02
1986 12 04.09	N	12.3	A	33.3	L	4	216					KRO02
1986 12 05.20	B	10.5	A	33.3	L	4	56		8			KRO02
1986 12 05.20	N	12.0	A	33.3	L	4	216					KRO02
1986 12 29.06	B	10.2:	S	33.3	L	4	56	& 2				KRO02
1986 12 29.06	N	11.5:	S	33.3	L	4	216					KRO02
1987 06 27.32	B	9.7:	S	33.3	L	4	56	2.6	4			KRO02
1987 08 19.15	B	12 :	S	33.3	L	4	216	0.3	1			KRO02
1987 08 23.15	B	12 :	S	33.3	L	4	216	0.4	1			KRO02

Comet Nishikawa-Takamizawa-Tago 1987 III

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 02 09.03	B	8.6	S	8.0	B		20		4			KRO02
1987 02 09.03	B	8.8	S	33.3	L	4	56	2.9	5			KRO02
1987 06 15.17	B	10 :	S	33.3	L	4	56	& 1				KRO02
1987 06 26.14	B	9.5:	S	33.3	L	4	56	& 1.5				KRO02

Comet Rudenko 1987 XXIII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 09 10.07	B	8.9	S	33.3	L	4	56	2.4	2			KRO02
1987 09 14.08	B	8.5	S	33.3	L	4	56	1.9	1			KRO02

Comet Bradfield 1987 XXIX

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 08 23.09	B	9.0:	S	33.3	L	4	56	& 2	1			KRO02
1987 08 29.08	B	9.0:	S	33.3	L	4	56	& 1	2			KRO02
1987 08 30.08	B	8.5:	S	33.3	L	4	56	& 2				KRO02
1987 09 14.06	B	8.2	S	33.3	L	4	56	2.6	5			KRO02
1987 09 20.07	B	8 :	S	33.3	L	4	56	3.6	5			KRO02
1987 09 21.06	B	8 :	S	33.3	L	4	56	4.1	7	?	113	KRO02
1987 09 24.05	B	7.9	S	33.3	L	4	56	4.0	7	0.13	127	KRO02
1987 09 25.05	B	7.8	S	33.3	L	4	56	4.2	7	0.15	126	KRO02
1987 09 25.05	N	12 :	S	33.3	L	4	216					KRO02
1987 09 26.04	B	7.8	S	33.3	L	4	56	4.3	7	0.15	132	KRO02
1987 10 04.04	B	7.4	S	33.3	L	4	56	4.5		?	120	KRO02
1987 10 05.03	B	7.5	S	33.3	L	4	56	& 5		0.13	115	KRO02
1987 10 12.02	B	6.7	S	8.0	B		20	5	8		100	KRO02
1987 10 13.04	B	6.6	S	8.0	B		20	5	8		90	KRO02
1987 10 14.03	B	6.6	S	8.0	B		20	5			95	KRO02
1987 10 18.00	B	6.7	S	8.0	B		20					KRO02
1987 10 19.02	B	6.6:	S	33.3	L	4	56	4.5		0.13	81	KRO02
1987 10 22.04	B	6.4	S	8.0	B		20	6		0.3	80	KRO02
1987 10 31.03	B	5.9	S	8.0	B		20				69	KRO02
1987 11 06.01	B	5.6	S	8.0	B		20					KRO02
1987 11 06.01	P	6.1	S	5.1	R			2.5		0.35	56	KRO02
1987 11 06.02				33.3	L	4	56	3.4		0.42	66	KRO02
1987 11 12.10	B	5.9	S	15.2	L	8	31			0.83	80	KRO02
1987 11 19.08	B	5.7	S	8.0	B		20	4				KRO02
1987 11 20.09	B	5.8	S	8.0	B		20	4		0.67		KRO02
1987 11 20.09	P	6.5:	S	5.1	R							KRO02

Comet Bradfield 1987 XXIX [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 11 21.00	B	5.9	S	15.2	L	8	31	5.0		0.78		KRO02
1987 11 21.01	P	5.6	S	5.1	R					0.58		KRO02
1987 11 22.02	B	6 :	S	33.3	L	4	56	4.7		0.78		KRO02
1987 11 22.03	P	5.7	S	5.1	R					0.38		KRO02
1987 12 05.00	B	5.7	S	8.0	B		20					KRO02
1987 12 12.02	B	6.1	S	33.3	L	4	56	5.1		1.1	53	KRO02
1987 12 12.02	N	10.0:	S	33.3	L	4	122					KRO02
1987 12 12.03	P	6.5	S	5.1	R			4.1		0.67	57	KRO02
1987 12 23.03	B	6.6	S	8.0	B		20	11		1.3	66	KRO02
1988 01 02.01	B	6.8	S	8.0	B		20	7			70	KRO02
1988 01 06.38	S	6.8	AC	7.0	B		10	4	3			MIY
1988 01 09.02				8.0	B		20				81	KRO02
1988 01 09.02	B	7.5	S	33.3	L	4	56			0.75	83	KRO02
1988 01 10.08	B	7.6	S	8.0	B		20					KRO02
1988 01 11.03	B	7.5	S	8.0	B		20	10	5			KRO02
1988 01 13.04	B	7.7	S	33.3	L	4	56	6.8		0.67	61	KRO02
1988 01 16.47	S	7.8	S	15	L	7	31	8	5			KAK01
1988 01 23.42	S	8.1	AA	15	L	6	28	4	4			YOS03
1988 01 27.05	B	8.7	S	33.3	L	4	56	6.1	6			KRO02
1988 02 06.44	S	8.8	S	15	L	6	72	3	3			YOS03
1988 02 07.44	M	8.7	S	15	L	7	31	8	4			KAK01
1988 02 08.48	M	8.6	S	15	L	7	31	8	4			KAK01
1988 02 12.49	M	8.9	S	15	L	7	31	8	2/			KAK01
1988 02 19.49	M	9.2	S	15	L	7	31	4	5			KAK01
1988 02 27.06	B	9.6:	S	33.3	L	4	56	2.4				KRO02

Comet McNaught 1987 XXXII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 01 18.86	S	6.8	S	7.0	B		10	3	4			MIY
1988 02 20.83	S	8.5	AA	15	L	6	28	3	2			YOS03
1988 02 27.08	B	9.1	S	33.3	L	4	56	1.5	3			KRO02
1988 04 09.16	B	11.3:	S	33.3	L	4	122	0.5	2			KRO02
1988 04 10.14	B	11.7:	S	33.3	L	4	122	0.5	2			KRO02

Comet Furuyama 1988 IV

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 12 12.11	B	10 :	S	33.3	L	4	56	1.5	3			KRO02

Comet Liller 1988 V

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 01 27.03	B	9.2	S	33.3	L	4	56	1.8	1			KRO02
1988 04 10.13	B	6.2	S	33.3	L	4	56	4.3	8	0.15	22	KRO02
1988 04 15.18				8.0	B		20				45	KRO02
1988 04 16.14	P	6.7	S	5.1	R			3				KRO02
1988 04 16.16	B	6.8	S	8.0	B		20					KRO02
1988 05 01.09	B	6 :	S	33.3	L	4	56	6.6		0.5	25	KRO02
1988 05 03.09	B	6.1	S	8.0	B		20	10	5	1.5	25	KRO02
1988 05 06.09	B	6.3	S	8.0	B		20	7		1	25	KRO02
1988 05 13.10	B	6.6	S	8.0	B		20					KRO02
1988 05 17.11	B	6.8	S	8.0	B		20	6	2			KRO02
1988 05 20.15	B	7 :	S	8.0	B		20	8	4	0.5	300	KRO02
1988 05 20.18	P	7.3:	S	5.1	R							KRO02
1988 05 21.15	B	7.0:	S	8.0	B		20	6	3			KRO02
1988 05 25.17	B	7.0:	S	8.0	B		20		2	?		KRO02
1988 05 28.15	B	7.4	S	8.0	B		20	6	2			KRO02
1988 05 29.13	B	7.6	S	8.0	B		20		3			KRO02

Comet Liller 1988 V [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 06 04.14	P	8 :	S	5.1	R			3				KRO02
1988 06 04.15	B	7.8	S	8.0	B		20	4				KRO02
1988 06 04.15	B	8.1	S	33.3	L	4	56	4.1	4			KRO02
1988 06 04.17	P	8.2	S	5.1	R			3				KRO02
1988 06 05.13	P	8.1	S	5.1	R			4				KRO02
1988 06 05.14	B	7.8	S	8.0	B		20					KRO02
1988 06 05.15	B	8.2	S	33.3	L	4	56	3.9	5			KRO02
1988 06 07.14	B	8.0:	S	8.0	B		20	6	3			KRO02
1988 06 07.15	P	8.3	S	5.1	R			2				KRO02
1988 06 10.15	B	7.6	S	8.0	B		20	9				KRO02
1988 06 10.16	B	8.0	S	33.3	L	4	56	4.9	5			KRO02
1988 06 11.16	B	7.6	S	8.0	B		20	6	4			KRO02
1988 06 12.12	B	7.8	S	33.3	L	4	56		3	?	23	KRO02
1988 06 13.19	B	8.2	S	8.0	B		20		2			KRO02
1988 06 13.19	P	8.5	S	5.1	R			3				KRO02

Comet Machholz 1988 XV

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 08 24.42	B	7.6	S	33.3	L	4	56	2.7	5			KRO02
1988 10 05.05	B	11.5:	S	33.3	L	4	122	& 3	0			KRO02
1988 10 06.04	B	11.5:	S	33.3	L	4	122	& 2	1			KRO02

Comet Yanaka 1988 XX

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 01 04.50	B	11.1:	S	33.3	L	4	122	1.9				KRO02
1989 01 10.50	B	11.2:	S	33.3	L	4	122	1.8				KRO02
1989 01 13.50	B	11.2:	S	33.3	L	4	122	2.1				KRO02
1989 01 16.44	B	11.4:	S	33.3	L	4	122	& 2				KRO02
1989 01 18.50	B	11.3:	S	33.3	L	4	122	& 2				KRO02
1989 01 19.49	B	11.3:	S	33.3	L	4	122	2.1				KRO02
1989 02 25.16	B	11.5:	S	33.3	L	4	216	& 2				KRO02
1989 02 28.22	B	11.8:	S	33.3	L	4	216	1.6				KRO02

Comet Yanaka 1988 XXIV

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 12 31.51	B	9.1	S	33.3	L	4	56	2.3		?	270	KRO02
1989 01 04.49	B	9.3	S	33.3	L	4	56	2.1	8	0.12	300	KRO02
1989 01 10.49	B	9.5:	S	33.3	L	4	56	2.1	8			KRO02
1989 01 13.49	B	9.8:	S	33.3	L	4	56	2.8				KRO02
1989 01 16.48	B	10 :	S	33.3	L	4	56	2.7		0.07	281	KRO02
1989 01 18.46	B	9.8:	S	33.3	L	4	56	2.4				KRO02
1989 01 19.47	B	10.3:	S	33.3	L	4	56	1.9				KRO02

Comet Okazaki-Levy-Rudenko 1989 XIX

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 08 27.10	B	11.2:	S	33.3	L	4	122	3.1	2			KRO02
1989 08 29.10	B	10.2:	S	33.3	L	4	56	4.2				KRO02
1989 08 31.09	B	9.7:	S	33.3	L	4	56	5.7				KRO02
1989 09 01.09	B	9.7:	S	33.3	L	4	56	5.3				KRO02
1989 09 03.08	B	9.5:	S	33.3	L	4	56	4.8				KRO02
1989 09 04.08	B	9.4	S	33.3	L	4	56	4.3				KRO02
1989 09 24.06	B	8.4	S	33.3	L	4	56	4.9	5			KRO02
1989 09 25.05	B	8.5	S	33.3	L	4	56	5.2				KRO02
1989 09 26.10	B	8.4	S	8.0	B		20					KRO02
1989 09 27.07	B	8.4	S	8.0	B		20	5	5			KRO02

Comet Okazaki-Levy-Rudenko 1989 XIX [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 09 28.06	B	8.3	S	8.0	B		20	5	5			KRO02
1989 09 29.09	B	8.2	S	8.0	B		20	6				KRO02
1989 10 01.06	B	8.1	S	8.0	B		20	5				KRO02
1989 10 02.07	B	8.1	S	8.0	B		20	5				KRO02
1989 10 02.07	B	8.3	S	33.3	L	4	56	4.3				KRO02
1989 10 03.04	B	7.8	S	8.0	B		20	5				KRO02
1989 10 03.04	B	7.9	S	33.3	L	4	56	4.4				KRO02
1989 10 03.04	P	8.1	S	5.1	R			& 3				KRO02
1989 10 07.09	B	7.7	S	8.0	B		20	5				KRO02
1989 10 09.03	B	7.8	S	8.0	B		20	4				KRO02
1989 10 10.05	B	8 :	S	8.0	B		20	3				KRO02
1989 10 11.03	B	8.2	S	33.3	L	4	56	2.2				KRO02
1989 10 12.02	B	8.2	S	8.0	B		20	4				KRO02
1989 10 14.02	B	7.7	S	33.3	L	4	56	3.4				KRO02
1989 10 24.01	B	7 :	S	33.3	L	4	56	3.2	5			KRO02
1989 10 26.02	B	6.8	S	33.3	L	4	56	4.3				KRO02
1989 11 06.46	B	6.1	S	33.3	L	4	56	8	6			KRO02
1989 11 11.48	B	5.9	S	33.3	L	4	56	5.9	7	0.5	341	KRO02
1989 11 11.48	B	6 :	S	8.0	B		20			1		KRO02
1989 11 12.46	B	5.6	S	8.0	B		20	8	8	0.33	334	KRO02
1989 11 20.47	P	5.8	S	5.1	R			4				KRO02
1989 11 20.48	B	5.8	S	8.0	B		20	8	8	1.4	304	KRO02
1989 11 20.48	P	5.7	S	5.1	R			5				KRO02
1989 11 29.48	B	6 :	S	8.0	B		20	9	8	0.67	313	KRO02
1989 12 02.49	B	6.4	S	8.0	B		20	6	7			KRO02

Comet Helin-Roman-Alu 1989 XXI

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 10 24.11	B	10.4:	S	33.3	L	4	56	1.5	3			KRO02
1989 10 26.09	B	10.0:	S	33.3	L	4	56	& 2	1			KRO02
1989 10 27.10	B	9.9:	S	33.3	L	4	56	2.7				KRO02
1989 11 01.20	B	10.4:	S	33.3	L	4	56	2.2				KRO02
1989 11 03.05	B	10.4:	S	33.3	L	4	56	2.3	3			KRO02
1989 11 06.03	B	10.2:	S	33.3	L	4	56	2.5	3			KRO02
1989 11 09.06	B	10.5:	S	33.3	L	4	56	& 2	4			KRO02
1989 11 12.06	B	11.0:	S	33.3	L	4	56	& 1	1			KRO02
1989 11 17.06	B	10.1:	S	33.3	L	4	56	3.5	4			KRO02
1989 11 20.08	B	10 :	S	33.3	L	4	56	2.9	3			KRO02
1989 11 21.05	B	10.3:	S	33.3	L	4	56	2.9	4			KRO02
1989 11 22.02	B	10.4:	S	33.3	L	4	56	2.7	4			KRO02
1989 11 24.03	B	10.0:	S	33.3	L	4	56	& 3	3			KRO02
1989 11 29.20	B	10.2:	S	33.3	L	4	56	2	3			KRO02
1989 11 30.04	B	10.2:	S	33.3	L	4	56	2.2	3			KRO02
1989 12 01.01	B	10.4:	S	33.3	L	4	56	1.9	4			KRO02
1989 12 03.01	B	10.2:	S	33.3	L	4	56	1.9	4			KRO02
1989 12 04.02	B	10.3:	S	33.3	L	4	56	2.4	4			KRO02
1989 12 17.02	B	10.5:	S	33.3	L	4	56	1.8	4			KRO02
1989 12 20.05	B	10.8:	S	33.3	L	4	56	& 1	3			KRO02
1989 12 21.01	B	10.7:	S	33.3	L	4	56	1.1	3			KRO02

Comet Aarseth-Brewington 1989 XXII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 11 19.01	B	8.4	S	8.0	B		20	& 2	2			KRO02
1989 11 19.02	B	8.6	S	33.3	L	4	56	2.9	3			KRO02
1989 11 21.01	B	8.4	S	33.3	L	4	56	4.1	4			KRO02
1989 11 22.03	B	8.6	S	33.3	L	4	56	2.2	6			KRO02
1989 11 24.01	B	8.6	S	33.3	L	4	56	3.1	5			KRO02

Comet Aarseth-Brewington 1989 XXII [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 11 30.01	B	7.5	S	8.0	B		20	5	5			KRO02
1989 11 30.01	B	7.6	S	33.3	L	4	56	4.4	5			KRO02
1989 12 01.00	B	7.4	S	33.3	L	4	56	3.8	5			KRO02
1989 12 03.00	B	7.5	S	33.3	L	4	56	& 3	6		18	KRO02
1989 12 04.00	B	7.5:	S	33.3	L	4	56	& 3	4			KRO02
1989 12 09.49	B	6.4	S	8.0	B		20	5	8			KRO02
1989 12 09.49	B	6.6	S	33.3	L	4	56	3.5	8	1.0	346	KRO02
1989 12 16.50	B	3.6	S	8.0	B		20		9			KRO02
1989 12 17.50	B	3.8	S	8.0	B		20	2	7			KRO02
1989 12 18.49	B	3.7	S	8.0	B		20	2		0.5		KRO02
1989 12 18.49	B	4.0	S	33.3	L	4	56	1.1		0.25	328	KRO02
1989 12 18.49	P	3.8	S	5.1	R					1.03	304	KRO02
1989 12 18.49	P	3.9	S	5.1	R					0.75	269	KRO02
1989 12 22.50	B	3.4	S	8.0	B		20					KRO02
1989 12 22.50	B	3.6	S	33.3	L	4	56					KRO02
1989 12 23.51	B	3.2	S	8.0	B		20	2	8	0.5	297	KRO02

Comet Černis-Kiuchi-Nakamura 1990 III

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 03 21.08	B	8.1	S	33.3	L	4	56	4.3	4			KRO02
1990 03 21.44	S	9.1	AA	15	L	5	38	2	4			ONO
1990 03 25.42	S	8.8	AA	15	L	5	38	2	4			ONO
1990 03 26.46	S	9.0	AA	16	L	6	40	2	3			TOM

Comet Skorichenko-George 1990 VI

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 12 23.04	B	10.6:	S	33.3	L	4	56	1.9	3			KRO02
1989 12 24.01	B	10.2:	S	33.3	L	4	56	1.8	4			KRO02
1990 01 08.02	B	10.1:	S	33.3	L	4	56	1.8	2			KRO02
1990 01 13.03	B	9.8:	S	33.3	L	4	56	1.8	4			KRO02
1990 01 15.04	B	9.5:	S	33.3	L	4	56	1.8	3			KRO02
1990 01 24.04	B	9.6:	S	33.3	L	4	56	2.1	4			KRO02
1990 01 27.05	B	9.4	S	33.3	L	4	56	1.8	4			KRO02
1990 01 31.04	B	9.5:	S	33.3	L	4	56	2.3	4			KRO02
1990 03 21.07	B	8.9	S	33.3	L	4	56	2.7	2			KRO02

Comet Tsuchiya-Kiuchi 1990 XVII

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 01 18.50	E	9.3	AA	15	L	5	38	5	4			ONO

Comet Arai 1990 XXVI

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 01 08.58	B	10.5	AA	15	L	6	42	2.0	2			YUS
1991 01 10.56	B	9.8	AA	15	L	6	30	6	2			YUS
1991 01 10.58	S	10.3	AC	13	L	6	62	3	2			ISH02
1991 01 15.56	S	10.7	AC	13	L	6	44	2	3			ISH02
1991 01 17.81	S	10.8	AC	13	L	6	62	3	2			ISH02
1991 01 18.65	E	10.9	AA	15	L	5	38	2	4			ONO
1991 01 19.44	S	10.5	S	15.0	B		25	3.3	0/			NAG04
1991 01 19.66	B	10.5	AA	15	L	6	19	6.5	3			YUS
1991 02 08.73	S	11.4	AC	13	L	6	44	3	1			ISH02

Comet Shoemaker-Levy 1991 XXIV = 1991d

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR		COMA	DC	TAIL	PA	OBS.
1991 11 17.43	S	11.0	AC	44.5	L	4	80		1.8	4			MOR03
1991 11 18.43	S	11.9	AC	15	R	5	62		1.3	3			MOR03
1991 12 12.44	S	11.3	AC	15	R	5	62		2.3	2			MOR03
1991 12 19.46	S	11.2	AC	15	R	5	62		2.0	2			MOR03
1991 12 30.46	S	10.9	AC	15	R	5	62		1.8	4			MOR03
1992 01 07.47	S	10.8	AC	41	L	6	193		4				ARM
1992 01 08.47	S	11.0	AC	15	R	5	62		2.1	4			MOR03
1992 01 12.55	M	9.8	NP	25.6	L	4	67		4.0	3/			MOR
1992 02 05.46	S	10.8	AC	15	R	5	62		1.8	2			MOR03
1992 02 10.39	S	11.1	AC	44.5	L	4	80		1.8	2			MOR03
1992 02 12.46	S	10.8	AC	15	R	5	62		1.8	2			MOR03
1992 02 29.43	S	11.0	AC	15	R	5	62		1.7	2			MOR03
1992 03 02.43	S	11.3	AC	44.5	L	4	80		1.6	3			MOR03
1992 03 31.12	M	11.2:	S	11	L	8	54						KYS
1992 03 31.40	S	11.1	AC	44.5	L	4	80		2.4	3			MOR03
1992 04 04.49	S	11.5	NP	25.6	L	4	67		1.9	3			MOR
1992 04 05.49	S	11.6	NP	25.6	L	4	67		1.9	3			MOR
1992 04 11.45	M	11.7	NP	25.6	L	4	111		1.4	3			MOR
1992 05 04.34	S	12.4	AC	44.5	L	4	167		1.1	2			MOR03
1992 05 31.06	B	12.5:	VF	25	L	4	50		0.8	5			REN
1992 05 31.36	M	12.0	NP	50.8	L	4	120		0.8	4			MOR
1992 06 02.24	S	13.3	AC	44.5	L	4	167		0.8	1			MOR03
1992 06 20.26	S	12.1	NP	25.6	L	4	111		1.4	3			MOR
1992 06 25.17	S	13.3	AC	44.5	L	4	167		0.9				MOR03
1992 06 27.29	S	12.2	NP	25.6	L	4	111		1.9	2/			MOR
1992 06 28.25	S	12.2	NP	25.6	L	4	111		1.6	2/			MOR
1992 06 28.31	M	12.9	GA	35.9	L	7	85		0.85	3/			MOD
1992 06 28.34	M	12.7	GA	20.0	L	5	68		0.9	2			MOD
1992 06 29.24	M	12.9	GA	35.9	L	7	85		0.75	3/			MOD
1992 06 29.28	M	12.7	GA	20.0	L	5	68		0.8	2			MOD
1992 07 02.06	B	12.6	VF	25	L	6	60		0.5	4			REN
1992 07 03.26	S	11.9	NP	25.6	L	4	111		1.8	3			MOR
1992 07 04.26	S	11.5	NP	25.6	L	4	111		1.7	4			MOR
1992 07 06.43	S	11.6	NP	25.6	L	4	111		1.8	3			MOR
1992 07 07.34	M	12.9	GA	35.9	L	7	85		0.90	3			MOD
1992 07 22.18	M	13.2	GA	35.9	L	7	164		0.55	3/			MOD
1992 07 25.25	S	11.9	NP	25.6	L	4	111		2.0	3			MOR
1992 07 26.22	S	12.2	NP	25.6	L	4	111		2.0	2			MOR
1992 07 28.35	M	12.9	GA	35.9	L	7	85		0.85	2/			MOD
1992 08 01.23	S	11.8	NP	25.6	L	4	111		2.0	3			MOR
1992 08 02.22	S	12.0	NP	25.6	L	4	111		2.0	2			MOR
1992 08 02.30	M	13.0	GA	35.9	L	7	85		0.75	3			MOD
1992 08 06.34	M	13.1	GA	35.9	L	7	85		0.70	2/			MOD
1992 08 20.09	M	13.2	GA	35.9	L	7	85		0.70	3			MOD
1992 08 21.09	M	13.1	GA	35.9	L	7	85		0.60	3			MOD
1992 08 22.16	S	13.7	AC	44.5	L	4	167		0.6	2			MOR03
1992 08 31.17	M	13.7	GA	35.9	L	7	85		0.40	2/			MOD
1992 09 24.25	S[	13.2	GA	35.9	L	7	164	!	0.5				MOD
1992 09 25.17	S[	14.2	GA	40	L	7	190	!	0.5				MOD
1992 09 26.06	S[	14.5	GA	35.9	L	7	164	!	0.5				MOD
1992 10 02.15	M	14.5	GA	40	L	7	190		0.25	2			MOD
1992 10 03.17	S[	13.9	GA	40	L	7	190	!	0.5				MOD
1992 10 03.17	S[	14.3	GA	40	L	7	190	!	0.25				MOD
1992 10 23.13	S[	14.2	GA	40	L	7	190	!	0.5				MOD

Comet Helin-Lawrence 1991l

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 05 04.11	S	13.6	AC	44.5	L	4	167	0.6	3			MOR03

Comet Helin-Lawrence 1991l [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 07 06.12	S	[13.5	GA	35.9	L	7	164	! 0.5				MOD
1992 06 28.35	S	[11.5	GA	35.9	L	7	164	! 0.5				MOD
1992 07 07.36	S	[13.0	GA	35.9	L	7	164	! 0.5				MOD
1992 07 28.31	S	[14.6	GA	40	L	7	190	! 0.5				MOD
1992 08 02.32	S	[14.5	GA	35.9	L	7	164	! 0.5				MOD
1992 08 05.75	I	[14.0:		60.0	Y	8	200					NAK01
1992 08 06.36	S	[14.5	GA	40	L	7	190	! 0.5				MOD
1992 08 31.33	S	[14.7	GA	40	L	7	190	! 0.5				MOD

Comet Helin-Alu 1991r

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 04 29.31	S	[14.5	GA	40	L	7	190	! 0.5				MOD
1992 05 29.31	S	[14.6	GA	40	L	7	190	! 0.5				MOD
1992 06 29.34	S	[14.5	GA	40	L	7	190	! 0.5				MOD
1992 07 28.28	S	[14.5	GA	40	L	7	190	! 0.5				MOD
1992 08 06.26	S	[14.5	GA	40	L	7	190	! 0.5				MOD
1992 08 21.16	S	[14.5	GA	40	L	7	190	! 0.5				MOD

Comet Shoemaker-Levy 1991a1

DATE (UT)		MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 05 24.98		M	10.5:	S	10.0	B	5	25					KYS
1992 05 30.02		M	10.5:	S	8	R	4	17					KYS
1992 05 31.47	!	M	9.6	NP	50.8	L	4	78	2.0	3			MOR
1992 06 06.33		S	9.3	A	20.0	T	10	64	1.5	2			SPR
1992 06 08.08		B	11 :	VF	25	L	6	75	3	3/	&0.05	270	REN
1992 06 10.31		S	10.6	AC	44.5	L	4	80	1.8	4			MOR03
1992 06 15.19		S	10.2	AC	15	R	5	62	2.0	2			MOR03
1992 06 17.90		S	10.3:		25.0	L	7	80		1			KOM
1992 06 17.91		B	10.4:		25.0	L	7	80	1	2			PER05
1992 06 18.96		M	9.0:	S	5.0	B		7					KYS
1992 06 20.22	!	S	8.2	AA	8.0	B		20		2			MOR
1992 06 22.92		B	7.8	S	11.0	L	7	32		1			CHO01
1992 06 22.93		S	9.3:	S	10.0	M	10	25		1			PAR03
1992 06 22.93		S	9.5	S	8.0	B		20	6.5	2			WES04
1992 06 22.95		S	9.3:	S	10.0	M	10	50		2			PAR03
1992 06 23.32		S	9.3	AC	15	R	5	42	3.5	3			MOR03
1992 06 24.96		B	8.1	S	7.5	R	3	15		4			IWA02
1992 06 25.00		B	9.8:	S	25.0	L	7	80	1	2			PER05
1992 06 25.00		S	9.8	S	25.0	L	7	80					KOM
1992 06 25.18		S	9.4	AC	6	R	15	50	3				MOR03
1992 06 25.90		B	8.1	S	6.0	B		20		3			BAN
1992 06 25.92		B	8.7	S	10.0	B	4	25		4			FIL04
1992 06 25.94		B	8.2	S	11.0	L	7	32		1			CHO01
1992 06 25.94		S	8.1	S	10.0	M	10	25		3			PAR03
1992 06 25.94		S	8.6:	S	11.0	L	7	54					SWI01
1992 06 25.94		S	9.1	S	8.0	B		20	3.3	4			WES04
1992 06 25.97		B	8.0	S	7.5	R	3	15		4			IWA02
1992 06 25.97		B	8.3	S	8.0	B		20	& 3	3			SPE01
1992 06 25.97		B	8.7	S	10.0	B	4	25	6	4/			PLE01
1992 06 25.99		S	8.5	S	5.0	R	7	20		3			OSS
1992 06 26.90		B	8.3	S	6.0	B		20		3			BAN
1992 06 26.93		B	9.1	S	8.0	B		20	3.6	4	0.2	318	WES04
1992 06 26.93		S	8.0	S	10.0	M	10	25		3			PAR03
1992 06 26.94		S	8.6	S	10.0	M	10	70					OLE
1992 06 26.96		B	8.5	S	6.6	B	6	20	4	4/			PLE01
1992 06 26.96		B	9.4	S	15.0	L	8	95	1	2			PER05
1992 06 26.96		M	8.8:	S	5.0	B		7					KYS

Comet Shoemaker-Levy 1991a1 [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 06 26.96	S	8.0	S	7.0	L	8	40		2/			GRO03
1992 06 26.96	S	8.5	S	5.0	R	7	20	2.2	3/			OSS
1992 06 26.96	S	9.6	S	15.0	L	8	95		3			KOM
1992 06 26.97	M	9.0	S	5.0	B		7					POD
1992 06 26.99	B	8.0	S	7.5	R	3	15		4			IWA02
1992 06 26.99	B	8.3	S	6.0	B	5	20	& 6.5	4			FIL04
1992 06 27.28	M	8.5	AA	25.6	L	4	45	2.5	5/	0.12	138	MOR
1992 06 27.28	M	8.9	AA	8.0	B		20		5/			MOR
1992 06 27.92	S	8.4	S	11.0	L	7	54					SWI01
1992 06 27.93	S	9.0	S	8.0	B		20	3.4	5/			WES04
1992 06 27.94	S	8.0	S	10.0	M	10	25		3			PAR03
1992 06 27.94	S	8.9:	S	10.0	M	10	70					OLE
1992 06 27.96	B	8.2	A	12	L	6	40	4	4/			REN
1992 06 27.96	M	8.7:	S	5.0	B		7					KYS
1992 06 27.96	S	8.0	S	10.0	M	10	50	1.4	3			PAR03
1992 06 27.98	B	8.8	S	11.0	L	7	32		1			CHO01
1992 06 27.98	S	8.2	S	7.0	L	8	40		2			GRO03
1992 06 27.99	B	8.5	S	10.0	B	4	25	6.5	5			PLE01
1992 06 28.24	M	8.4	AA	8.0	B		20	5.0	5			MOR
1992 06 28.28	S	9.3	AC	15	R	5	42	3.5	4			MOR03
1992 06 28.87	B	8.3	S	7.0	L	8	40					RZE01
1992 06 28.88	B	8.5	S	10.0	M	10	50		2			GAM
1992 06 28.91	S	8.5	AA	10.0	B		25	2.5	4			HAS02
1992 06 28.92	B	8.3	S	10.0	M	10	55	& 4.0	5			FIL04
1992 06 28.93	B	8.9	S	8.0	B		20	3.2	5	0.1	359	WES04
1992 06 28.93	S	7.9	S	10.0	M	10	25		3			PAR03
1992 06 28.94	B	8.4	S	11.0	L	7	54	2.7	3			SWI01
1992 06 28.95	B	8.3	S	7.0	L	8	40		2/			GRO03
1992 06 28.95	B	8.4	S	6.6	B	6	20	4.5	5			PLE01
1992 06 28.95	S	8.5	S	5.0	R	7	20	2.2	3			OSS
1992 06 28.96	M	8.7:	S	5.0	B		7					KYS
1992 06 28.97	B	8.4	S	8.0	B		20	& 8	3			SPE01
1992 06 29.91	S	8.1	AA	10.0	B		25	2.5	4			HAS02
1992 06 29.93	B	8.7	S	10.0	B	4	25	& 3.5	5			FIL04
1992 06 29.95	S	8.4	S	5.0	R	7	20	2.6	3/			OSS
1992 06 29.96	B	8.3	S	7.0	L	8	40		3			GRO03
1992 06 29.96	M	8.5:	S	5.0	B		7					KYS
1992 06 29.97	B	8.4:	S	8.0	B		20	& 4	2			SPE01
1992 06 29.97	S	8.4	S	14.2	L	6	30	2.4	4			OSS
1992 06 29.99	B	8.4	S	10.0	B	4	25	7	5			PLE01
1992 06 30.91	B	8.5	S	10.0	B	4	25	& 3.0	5			FIL04
1992 06 30.92	B	8.6	S	11.0	L	7	54		4			SWI01
1992 06 30.92	S	8.3	S	6.0	B		20	& 6	4			SCI
1992 06 30.93	B	8.5	S	11.0	L	7	32		1			CHO01
1992 06 30.94	M	8.3	S	7.0	L	8	40		2/			GRO03
1992 06 30.94	S	8.5:	S	12.0	R	5	22		3			CHE03
1992 06 30.95	S	7.8	S	10.0	M	10	25		3			PAR03
1992 06 30.96	B	8.4:	S	8.0	B		20	& 4	3			SPE01
1992 06 30.96	B	9.2	S	15.0	L	8	95	2	3			PER05
1992 06 30.96	M	8.5:	S	5.0	B		7					KYS
1992 06 30.96	S	8.4	S	5.0	R	7	20		3			OSS
1992 06 30.96	S	9.1	S	15.0	L	8	95					KOM
1992 06 30.97	B	8.2	S	10.0	B	4	25	6	4/			PLE01
1992 06 30.97	S	7.8	S	10.0	M	10	50	2.3	3			PAR03
1992 06 30.98	S	7.8	S	6.0	B	5	20		3			PAR03
1992 07 01.01	B	8.5	A	12	L	6	40	4	5			REN
1992 07 01.02	S	8.4	S	14.2	L	6	30	& 2	3/			OSS
1992 07 01.92	B	8.6	S	10.0	M	10	50		3			GAM
1992 07 01.92	S	8.2:	S	6.0	B		20	& 6	4			SCI

Comet Shoemaker-Levy 1991a1 [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 07 01.93	S	8.8	S	11.0	L	8	54		4			CHE03
1992 07 01.94	B	8.2	S	6.6	B	6	20	5	4			PLE01
1992 07 01.94	S	9.0	S	15.0	L	8	95					KOM
1992 07 01.96	S	7.8	S	6.0	B	5	20		3			PAR03
1992 07 01.97	B	8.4:	S	8.0	B		20	& 5	3/			SPE01
1992 07 01.97	B	8.5	A	12	L	6	40	4.5	5	?		REN
1992 07 02.14	B	7.4	AC	8.0	B	4	11	7	5			NOW
1992 07 02.95	B	7.8	S	7.5	R	3	15		5/			IWA02
1992 07 03.26	M	7.5	AA	8.0	B		20		6			MOR
1992 07 03.89	B	7.9	S	6.0	B		20		4			BAN
1992 07 03.90	B	8.1	S	6.0	B		20	& 7	4			SCI
1992 07 03.93	S	7.8	S	6.0	B	5	20		3			PAR03
1992 07 03.94	B	8.3	S	11.0	B	4	20		4			CHE03
1992 07 03.95	B	8.3	S	11.0	L	7	32		3			CHO01
1992 07 03.95	S	7.8	S	10.0	M	10	25		3			PAR03
1992 07 03.95	S	8.3	S	5.0	R	7	20	2.5	4/			OSS
1992 07 03.96	B	8.4:	S	11.0	L	7	54		4			SWI01
1992 07 03.96	B	8.5	S	8.0	B		40		5			SOC
1992 07 03.96	B	8.6	S	25.0	L	7	80	4	3			PER05
1992 07 03.96	M	8.6	S	15.0	L	8	95		5			KOM
1992 07 03.97	B	8.1	S	6.6	B	6	20	6	4/			PLE01
1992 07 03.99	B	8.6	S	10.0	M	10	55	& 4.0	5			FIL04
1992 07 04.01	S	8.3	S	14.2	L	6	30	2.5	5			OSS
1992 07 04.24	M	8.0	AA	8.0	B		20	2.3	6/	0.17		MOR
1992 07 04.32	S	7.8	A	20.0	T	10	64	4.5	4			SPR
1992 07 04.97	B	8.0	S	6.6	B	6	20	6	4/			PLE01
1992 07 05.29	S	8.4	AC	15	R	5	42	3.5	4			MOR03
1992 07 05.93	B	8.4	S	12.0	R	5	25		3			CHE03
1992 07 05.94	B	8.5	S	11.0	L	7	32		3			CHO01
1992 07 05.95	S	7.9	S	6.0	B	5	20		3			PAR03
1992 07 05.95	S	8.0	S	6.0	B		20					OLE
1992 07 06.20	M	8.2	NO	5.0	B		10	6.5	3			MOD
1992 07 06.22	M	8.7	GA	20.0	L	5	35	2.0	5	0.05	31	MOD
1992 07 06.24				35.9	L	7	85	1.2	6	0.05	31	MOD
1992 07 06.89	B	7.9	S	6.0	B		20		4			BAN
1992 07 06.90	B	8.1	S	6.7	B		20	& 5	4/			SCI
1992 07 06.90	B	8.3	S	11.0	L	7	54	4.0	5			SWI01
1992 07 06.92	M	7.9	S	5.0	B		7					POD
1992 07 06.93	B	8.9:	S	10.0	M	10	55		5			FIL04
1992 07 06.96	B	7.6	S	7.5	R	3	15		5/			IWA02
1992 07 06.98	B	7.9	S	6.6	B	6	20	7	4			PLE01
1992 07 07.06	B	8.3	A	12	L	6	40	4	5	0.17	45	REN
1992 07 07.24	M	8.1	NO	5.0	B		10	7.0	3	?		MOD
1992 07 07.26	M	8.6	GA	20.0	L	5	35	2.0	5	0.05	37	MOD
1992 07 07.92	S	8.2	S	6.0	B	5	20		3			PAR03
1992 07 07.93	B	8.4	S	25.0	L	7	80	4	3			PER05
1992 07 07.94	S	7.9	S	6.0	B		20					OLE
1992 07 07.94	S	8.2	S	5.0	R	7	20	3.1	4/			OSS
1992 07 07.95	M	8.5	S	15.0	L	8	95		6			KOM
1992 07 07.96	S	8.2	S	10.0	M	10	50	& 3.8	3			PAR03
1992 07 07.97	B	7.5	S	7.5	R	3	15		5/			IWA02
1992 07 07.97	S	8.2	S	14.2	L	6	30	2.8	5			OSS
1992 07 07.98	B	8.4	S	11.0	L	7	32		3			CHO01
1992 07 08.86	B	8.1	S	7.0	L	8	40					RZE01
1992 07 08.87	S	7.0	AC	20.0	T	10	77					TOM01
1992 07 08.88	M	8.2	S	11.0	L	7	32		5			SWI01
1992 07 08.89	B	8.1	S	6.7	B		20	& 8	4/	&0.12	0	SCI
1992 07 08.90	B	8.3	S	10.0	M	10	50		3			GAM
1992 07 08.90	M	8.1	S	6.0	B		20		4			SWI01

Comet Shoemaker-Levy 1991a1 [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 07 08.92	B	7.7	S	19.0	L	8	50	4.92	3			SLI
1992 07 08.92	B	8.0	S	6.0	B		20		5			BAN
1992 07 08.92	M	8.2	S	11.0	L	7	54	4.7	5			SWI01
1992 07 08.92	S	7.8	S	6.0	B		20					OLE
1992 07 08.93	M	8.0	S	7.0	L	8	40		4			GRO03
1992 07 08.93	M	8.2	S	5.0	B		7					POD
1992 07 08.94	B	7.8	S	10.0	B	4	25	7	4/	0.2	325	PLE01
1992 07 08.94	B	7.8	S	10.0	B	4	25	7	4/	0.5	40	PLE01
1992 07 08.94	M	8.3	S	15.0	L	8	95					KOM
1992 07 08.94	S	7.7	S	10.0	M	10	25		4			PAR03
1992 07 08.95	S	7.7	S	10.0	M	10	50	& 5.1	4			PAR03
1992 07 08.96	B	7.3	S	7.5	R	3	15		6			IWA02
1992 07 08.96	B	8.0	S	8.0	B		20	& 5	4			SPE01
1992 07 08.97	B	8.0	S	10.0	B	4	25	& 4.0	5	&0.06	330	FIL04
1992 07 08.97	B	8.0	S	10.0	B	4	25	& 4.0	5	&0.1	35	FIL04
1992 07 08.98	B	7.9:	S	6.6	R	12	50	& 4	3/			KOL03
1992 07 08.98	B	8.2	S	25.0	L	7	80	4	4			PER05
1992 07 08.98	B	8.4	S	11.0	L	8	54	1.7	3			GAS01
1992 07 09.02	B	8.2	S	5.0	B		7					KYS
1992 07 09.86	B	8.1	S	7.0	L	8	40					RZE01
1992 07 09.88	M	7.9	S	6.0	B		20		5			SWI01
1992 07 09.90	B	7.8:	S	6.0	B		20					RAF
1992 07 09.91	M	7.9	S	11.0	L	7	32	4.7	5			SWI01
1992 07 09.93	B	7.8	S	11.0	B	4	20		3			CHE03
1992 07 09.93	B	7.8	S	25.0	L	7	80	5	4			PER05
1992 07 09.93	S	8.0:	S	6.0	B		20					OLE
1992 07 09.94	S	7.6	S	10.0	M	10	50		4			PAR03
1992 07 09.95	B	7.7	S	6.6	B	6	20	6	5	0.25	56	PLE01
1992 07 09.95	B	7.7	S	6.6	B	6	20	6	5	0.25	330	PLE01
1992 07 09.95	M	8.0	S	15.0	L	8	95		6			KOM
1992 07 09.96	M	7.8	S	7.0	L	8	40	5.0	4/			GRO03
1992 07 09.97	B	7.2	S	7.5	R	3	15		6/			IWA02
1992 07 09.97	B	8.0	S	8.0	B		20	& 5	4			SPE01
1992 07 09.97	B	8.3	S	11.0	L	8	54	1.7	3			GAS01
1992 07 09.98	B	7.7:	S	6.6	R	12	50	& 5	3/			KOL03
1992 07 09.98	S	7.7	S	6.0	B	7	20	2.7				OSS
1992 07 09.99	B	7.8:	S	4.0	B		11		5			WES04
1992 07 10.00	B	8.4	S	10.0	M	10	55	& 4.5	5	&0.04	115	FIL04
1992 07 10.00	B	8.4	S	10.0	M	10	55	& 4.5	5	&0.1	25	FIL04
1992 07 10.13	M	8.7	NO	20.0	L	5	35	2.5	4			MOD
1992 07 10.18	S	8.5	AC	15	R	5	42	3	4	0.10	50	MOR03
1992 07 10.93	B	8.1	S	11.0	B	4	20		3			CHE03
1992 07 10.93	S	7.5	S	10.0	M	10	50		4			PAR03
1992 07 10.93	S	7.8	S	6.0	B		20					OLE
1992 07 10.94	B	7.6	S	6.6	B	6	20	6	5	0.2	25	PLE01
1992 07 10.94	S	7.5	S	10.0	M	10	25		4			PAR03
1992 07 10.96	B	8.4	S	11.0	L	8	54	1.5	4			GAS01
1992 07 11.11	M	8.7	NO	20.0	L	5	35	2.7	4			MOD
1992 07 11.90	S	7.5	S	6.0	B	5	20		4			PAR03
1992 07 11.94	B	7.5	S	6.6	B	6	20	5.5	5			PLE01
1992 07 12.32	S	7.8	A	8.0	R	4	19	4.5	4			SPR
1992 07 12.91	S	7.2	AC	20.0	T	10	77					TOM01
1992 07 13.18	M	8.7	NO	20.0	L	5	35	2.0	3			MOD
1992 07 13.32	S	7.7	A	8.0	R	4	19	4.5	4			SPR
1992 07 13.88	S	7.4	SC	33	L	4	56	4	4			BOA
1992 07 13.90	B	7.7	S	8.0	B		20		5			WES04
1992 07 14.02	B	7.5	S	6.6	B	6	20	6.5	5			PLE01
1992 07 15.92	S	7.7:	S	6.0	B		20					OLE
1992 07 15.96	B	8.3:	S	11.0	L	8	54	1.9	3			GAS01

Comet Shoemaker-Levy 1991a1 [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 07 16.21	& M	8.8	GA	20.0	L	5	68	1.5	3			MOD
1992 07 16.86	B	8.3	S	6.7	B		20	& 6	3/			SCI
1992 07 16.87	M	7.7	S	11.0	L	7	32					SWI01
1992 07 16.90	S	7.9:	S	11.0	B	4	20		3			CHE03
1992 07 16.93	B	7.4	S	6.6	B	6	20	6	5			PLE01
1992 07 17.86	S	8.4:	S	6.7	B		20	& 7	3			SCI
1992 07 17.87	M	7.9	S	11.0	L	7	32					SWI01
1992 07 17.91	S	7.8	S	11.0	B	4	20		3			CHE03
1992 07 18.10	S	8.3	AC	15	R	5	42	3.5	4			MOR03
1992 07 18.14	M	8.6	GA	20.0	L	5	35	2.0	4			MOD
1992 07 18.32	S	7.8	A	8.0	R	4	19	4.5	5			SPR
1992 07 18.92	S	7.6	AA	5.0	B		20	8	3			DES01
1992 07 19.15	M	8.3	NO	20.0	L	5	35	1.7	4/			MOD
1992 07 19.32	S	7.6	A	8.0	R	4	19	4.5	4			SPR
1992 07 19.84	S	8.8:	S	6.7	B		20	& 6	3			SCI
1992 07 19.85	M	7.8	S	11.0	L	7	32					SWI01
1992 07 19.88	B	7.6	S	10.0	B	4	25	4	4	0.49	50	PLE01
1992 07 19.88	B	8.1	S	10.0	B	4	25	& 6.0	4	&0.1		FIL04
1992 07 19.89	S	7.6	AA	10.0	B		25	3.7	4			HAS02
1992 07 19.90	B	7.4	S	6.0	B	5	20		4			PAR03
1992 07 19.90	M	7.9	S	11.0	L	7	54	5.2	6			SWI01
1992 07 19.94	S	8.0:	S	11.0	B	4	20		3			CHE03
1992 07 20.13	M	7.9	SC	5.0	B		10	4	3			MOD
1992 07 20.13	M	8.2	SC	20.0	L	5	35	1.7	4/	0.06	39	MOD
1992 07 20.85	M	7.8	S	11.0	L	7	32					SWI01
1992 07 20.87	B	7.5	S	10.0	B	4	25	4.5	5	0.2	60	PLE01
1992 07 20.87	B	7.8	S	10.0	B	4	25	& 4.5	5	&0.1		FIL04
1992 07 20.87	M	7.8	S	11.0	L	7	54	5.0	6			SWI01
1992 07 20.87	S	7.2	AA	40	L	5	40	4.5	4/			BOA
1992 07 20.88	M	7.7	S	10.0	M	10	50		3			GAM
1992 07 20.89	S	7.2	S	15.0	L	8	95					KOM
1992 07 20.92	B	7.1	S	25.0	L	7	80	5	4			PER05
1992 07 21.86	B	7.5:	S	10.0	B	4	25	& 9.0	4			FIL04
1992 07 21.87	B	8.3	S	8	R	4	17					KYS
1992 07 21.87	M	7.8	S	11.0	L	7	54	4.6	6			SWI01
1992 07 21.88	S	7.3	AC	44.0	L	10	50					TOM01
1992 07 21.89	B	7.5	S	6.0	B		20		5			BAN
1992 07 21.90	B	8.0:	S	8.0	B		20		3			SPE01
1992 07 21.90	B	8.2:	S	4.0	B		12		3			KOL03
1992 07 21.92	B	7.8	S	25.0	L	7	80	5	3			PER05
1992 07 21.92	S	7.8	S	25.0	L	7	80					KOM
1992 07 21.92	S	8.0	S	11.0	B	4	20		3			CHE03
1992 07 22.13	& M	7.8	SC	5.0	B		10	4.0	3/			MOD
1992 07 22.15	& M	8.1	SC	20.0	L	5	35	2.0	4/	0.05	65	MOD
1992 07 22.36	S	7.5	AA	8.0	B		15		2			SEA01
1992 07 22.87	B	7.5	S	10.0	B	4	25	4	4	0.15	45	PLE01
1992 07 22.90	B	7.6	S	7.5	R	3	15		5			IWA02
1992 07 22.92	S	7.8:	S	11.0	B	4	20		3			CHE03
1992 07 23.36	S	7.7	SC	5.0	B		10		2			SEA01
1992 07 23.36	S	7.7	SC	8.0	B		15		2			SEA01
1992 07 23.87	B	8.5	S	8	R	4	17					KYS
1992 07 23.90	B	7.7	S	7.5	R	3	15		5			IWA02
1992 07 23.92	B	7.8	S	25.0	L	7	80	4	3			PER05
1992 07 24.12	& M	8.6	NO	20.0	L	5	68	1.2	3			MOD
1992 07 24.34	S	8.0	SC	8.0	B		15		2			SEA01
1992 07 24.83	B	7.6	S	10.0	B	4	25	5	5			PLE01
1992 07 24.85	B	7.6:	S	10.0	B	4	25		5	&0.1	50	FIL04
1992 07 24.87	B	8.2	S	8	R	4	17					KYS
1992 07 24.87	M	8.0	S	11.0	L	7	54					SWI01

Comet Shoemaker-Levy 1991a1 [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 07 24.88	B	7.6	S	5.0	B		7		5			BAN
1992 07 24.89	B	8.1	S	8.0	B		20	& 5	4			SPE01
1992 07 24.89	M	8.0	S	15.0	L	8	95					KOM
1992 07 24.90	S	7.9:	S	11.0	B	4	20		3			CHE03
1992 07 24.92	B	8.0	S	25.0	L	7	80	3	2			PER05
1992 07 25.22	M	7.8	AA	8.0	B		20		8	0.92	83	MOR
1992 07 25.83	B	7.5	S	10.0	B	4	25	4	5			PLE01
1992 07 25.91	S	7.8:	S	11.0	B	4	20		3			CHE03
1992 07 26.20	M	7.9	AA	8.0	B		20		8	0.58	73	MOR
1992 07 26.82	B	7.6	S	10.0	B	4	25	4	4/			PLE01
1992 07 26.92	S	7.5	AA	5.0	B		20	5	3/			DES01
1992 07 27.36	S	8.1	AA	8.0	B		15		3			SEA01
1992 07 28.10	& M	8.5	NO	20.0	L	5	35	2.0	4			MOD
1992 07 28.34	S	8.5	AA	5.0	B		10		4			SEA01
1992 07 28.34	S	8.5	AA	8.0	B		15		4			SEA01
1992 07 29.34	S	8.4	AA	8.0	B		15		4			SEA01
1992 07 31.95	S	7.6	AA	5.0	B		20	5	3/	?		DES01
1992 08 01.20	M	8.0	AA	8.0	B		20		7			MOR
1992 08 01.35	S	8.6	AA	5.0	B		10		5			SEA01
1992 08 01.35	S	8.7	AA	8.0	B		15		5			SEA01
1992 08 01.96	S	7.6	AA	5.0	B		20	6	4			DES01
1992 08 01.97	S	7.7	AA	20.0	C	10	66	5	3/	0.15		DES01
1992 08 02.11	& M	8.3	AA	20.0	L	5	35	2.0	4			MOD
1992 08 02.20	M	8.2	AA	8.0	B		20		7/	1.0	70	MOR
1992 08 05.09	& M	8.8	AA	20.0	L	5	68	1.5	3			MOD
1992 08 06.08	! S	9.1	AC	44.5	L	4	80	1.5	2			MOR03
1992 08 06.10	S[	8.8	AA	20.0	L	5	68	! 1.5				MOD
1992 08 07.09	S[	7.9	SC	20.0	L	5	68	! 1.5				MOD

Comet Zanotta-Brewington 1991g1

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 01 08.01	S	8.6	AC	41	L	6	193	5	4	0.25	25	ARM
1992 01 13.74	B	8.6	S	15.0	C	15	74	2.3	3			CHE03
1992 01 23.12	M	8.3	AA	8.0	B		20	5	6			MOR

Comet Mueller 1991h1

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 01 25.21	S	11.3:	NP	25.6	L	4	156	4	2			MOR
1992 02 01.47	S	11.1	AC	20	L	6	58	3	1			NAK01
1992 02 02.45	S	10.9	AC	20	L	6	58	3.5	1/			NAK01
1992 02 04.17	S	11.7	A	20.0	T	10	125	1	1			SPR
1992 02 05.16	S	11.6:	A	20.0	T	10	125	1	1			SPR
1992 02 06.17	S	11.5	A	20.0	T	10	125	2	2			SPR
1992 02 08.17	S	11.5:	A	20.0	T	10	125	1	1			SPR
1992 02 08.47	S	10.2	AC	20	L	6	58	3.5	2			NAK01
1992 02 21.43	S	8.5	AC	20	L	6	46	4.5	3			NAK01
1992 02 23.16	S	9.5	A	20.0	T	10	64	3	3			SPR
1992 02 24.76	M	7.8	S	30	L	5	60					PAZ01
1992 02 26.16	S	9.2	A	20.0	T	10	64	4	3			SPR
1992 02 26.74	B	8.7	S	15.0	C	15	74	2.5	3			CHE03
1992 02 27.16	S	9.1	A	20.0	T	10	64	4	4			SPR
1992 02 28.16	S	8.9	A	20.0	T	10	64	5	4			SPR
1992 03 01.77	M	8.1	S	30	L	5	60					PAZ01
1992 03 04.77	M	8.2	S	30	L	5	60					PAZ01
1992 03 06.42	S	7.6	AC	20	L	6	58	2	6			NAK01

Comet Tanaka-Machholz 1992d

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR		COMA	DC	TAIL	PA	OBS.
1992 04 02.80	S	8.5	S	20	L	6	46		3	5			NAK01
1992 04 04.51	M	8.0	AA	25.6	L	4	45		4.2	5			MOR
1992 04 05.50	M	8.0	AA	8.0	B		20		4.2	7	0.75	280	MOR
1992 04 05.81	S	8.3	AA	20	L	6	46		5	4			NAK01
1992 04 10.39	S	8.7	AC	15	R	5	42		4	3			MOR03
1992 04 11.50	M	8.4	AA	25.6	L	4	45			6			MOR
1992 04 11.81	S	8.6:	S	20	L	6	46			5			NAK01
1992 04 13.39	S	8.6	AC	15	R	5	42		4	3			MOR03
1992 04 13.80	S	8.5	AA	20	L	6	46		4.5	4			NAK01
1992 04 26.12	S	8.6	AC	33	L	4	50		3	3/			BOA
1992 04 26.49	M	8.7	AA	8.0	B		20			6			MOR
1992 04 27.36	S	8.4	AC	15	R	5	31		3	3			MOR03
1992 04 28.39	S	8.5	AC	6	R	15	50		3.5	3			MOR03
1992 04 28.79	S	8.2	AC	20	L	6	46		3.5	4/			NAK01
1992 05 02.77	S	8.3	AC	20	L	6	46		4	4			NAK01
1992 05 04.03	S	8.6:	AA	6.0	B		20						OLE
1992 05 04.86	B	8.3	S	12.0	R	5	22		5.0	4			CHE03
1992 05 05.91	B	8.2	S	12.0	R	5	22			4			CHE03
1992 05 09.91	B	7.6	S	11.0	B	4	20			3			CHE03
1992 05 10.76	S	7.6	AC	20	L	6	46		5	5		310	NAK01
1992 05 11.75	B	8.0	AA	6	R	7	25	>	5	3/			OBU
1992 05 11.76	S	7.3	AC	20	L	6	46		5.5	5		300	NAK01
1992 05 12.35	S	7.9	AC	15	R	5	42		4	3			MOR03
1992 05 18.10	B	8.8	AC	10.0	B	4	20		4	2			NOW
1992 05 18.90	B	8.3	AA	8.0	B		20		4.0	5			WES04
1992 05 19.10	S	8.2	AC	15	R	5	42		3.5	3			MOR03
1992 05 19.88	B	8.4	AA	8.0	B		20		4.2	6	0.3	328	WES04
1992 05 22.09	S	8.4	AC	6	R	15	50		4	3			MOR03
1992 05 22.89	B	7.8	S	12.0	R	5	22			3			CHE03
1992 05 23.93	B	7.8	S	12.0	R	5	22			3			CHE03
1992 05 24.77	S	8.0	AA	20	L	6	46		4.5	4			NAK01
1992 05 24.98	B	7.8	S	12.0	R	5	22			3			CHE03
1992 05 24.98	B	9.5:	S	10.0	B	5	25						KYS
1992 05 26.00	B	8.5	A	12	L	6	40		5	5			REN
1992 05 26.88	B	9.8:	S	8	R	4	20						KYS
1992 05 29.88	B	9.8:	S	8	R	4	20						KYS
1992 05 30.31	S	8.2	A	20.0	T	10	64		3.5	2			SPR
1992 05 31.45	S	8.5	AA	8.0	B		20		4	3			MOR
1992 05 31.76	S	8.5	AA	20	L	6	46		4	2			NAK01
1992 06 02.17	S	8.8	AC	15	R	5	42		3	3			MOR03
1992 06 03.76	S	8.4	AC	20	L	6	46		4.5	3			NAK01
1992 06 04.96	B	8.8	A	12	L	6	45		4	5		300	REN
1992 06 05.76	S	8.8	AC	20	L	6	46		3.5	3			NAK01
1992 06 06.31	S	8.5	A	20.0	T	10	64		3.5	3			SPR
1992 06 08.07	B	8.6	A	8.0	B		11			5			REN
1992 06 10.32	S	9.8	AC	44.5	L	4	80		2.0	3			MOR03
1992 06 27.24	S	10.0:	AA	25.6	L	4	67		4.5	1			MOR
1992 06 28.21	S	9.9	AA	25.6	L	4	67		4.5	1			MOR
1992 07 01.95	B[	9.5	A	12	L	6	40	!	2.5				REN
1992 07 02.13	B	8.8	AC	8.0	B	4	11		4	2			NOW
1992 07 03.21	S	10.0:	AA	25.6	L	4	67		3.5	1/			MOR
1992 07 19.88	[	9.0	AA	8.0	B		20						WES04
1992 09 28.42	S[	14.2	GA	35.9	L	7	164	!	0.5				MOD
1992 10 08.44	S[	12.0	GA	35.9	L	7	85	!	1.0				MOD
1992 10 23.40	S[	14.7	GA	40	L	7	190	!	0.5				MOD
1992 12 27.13	! V[	17.0	HR	19.0	T	4							MIK

Comet Machholz 1992k

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 07 06.45		M 8.2	S	25.6	L	4	67	1.8	5/			MOR
1992 07 19.37		S[8.5	GA	35.9	L	7	85	! 2.0				MOD
1992 07 19.37		S[9.5	GA	35.9	L	7	164	! 1.0				MOD

Comet Helin-Lawrence 1992q

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 09 05.34		S[14.0	GA	35.9	L	7	164	! 0.5				MOD
1992 10 03.34		S 13.8	NP	50.8	L	4	120	1.0	1			MOR

Comet Shoemaker 1992y

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 12 19.76	!	V[15.5	AA	20.0	T	2						MIK
1992 12 20.72	!	V[15.5	AA	20.0	T	2						MIK

Comet Ohshita 1992a1

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 12 07.19	!	V 11.9	AA	20.0	T	2		2.8	8			MIK
1992 12 24.52		S 11.3	NP	25.6	L	4	67	2.7	1			MOR
1992 12 27.07		V 11.9	AC	20.0	T	2		3.5	6			MIK
1992 12 29.10		S[11.7	AC	20.3	T	10	80	! 1.0				GRA04
1992 12 30.05	!	V 12.6	AC	20.0	T	2		& 3	7			MIK
1993 01 03.55		S 11.9	NP	25.6	L	4	111	2.5	0/			MOR
1993 01 19.20	!	V 14.4	HR	20.0	T	2		& 1	3			MIK

Comet Mueller 1993a

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1993 01 06.21	!	V 14.0	HR	20.0	T	2		0.6	8	0.05	180	MIK
1993 01 19.01	!	V 13.6	HR	20.0	T	2		1.3	8	0.08	160	MIK

Periodic Comet Encke (1980 XI = 1990 XXI)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1980 10 13.21	B	11 :	S	15.2	L	8	174	> 5	1			KRO02
1980 10 19.23	B	9.5:	S	8.0	B		20	12	1			KRO02
1980 10 19.23	B	10 :	S	15.2	L	8	100	10	1			KRO02
1990 09 22.38	B	9.2	S	33.3	L	4	56	2.8	4			KRO02
1990 09 26.41	B	9 :	S	33.3	L	4	56	4.2	5			KRO02
1990 10 15.45	B	7.4	S	8.0	B		20	3	7			KRO02

Periodic Comet Grigg-Skjellerup (1987 X)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 06 27.13	B	12.3:	S	33.3	L	4	216	& 1.5	2			KRO02
1992 07 25.19		11.5:		25.6	L	4	111	3	3			MOR
1992 07 26.19	! S	11.5:	NP	25.6	L	4	111	3	2/			MOR
1992 08 01.19		S 11.5	AC	25.6	L	4	111	2.0	2			MOR

Periodic Comet Tempel 2 (1983 X = 1988 XIV)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 10 05.44	B	10.3:	S	15.2	L	8	100	2				KRO02
1988 07 31.13	B	11 :	S	33.3	L	4	56	& 1	1			KRO02
1988 08 12.14	B	10 :	S	33.3	L	4	56	& 2	1			KRO02
1988 08 31.08	B	9.6:	S	33.3	L	4	56	2.2	1			KRO02
1988 09 01.07	B	9.6:	S	33.3	L	4	56	2.4	1			KRO02

Periodic Comet Tempel 2 (1983 X = 1988 XIV) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 09 05.08	B	10 :	S	33.3	L	4	56	& 2	1			KRO02
1988 09 06.08	B	9.5:	S	33.3	L	4	56	3.8	2			KRO02
1988 10 02.10	B	9 :	S	33.3	L	4	56		2			KRO02
1988 10 03.06	B	9.1	S	33.3	L	4	56	3.7	1			KRO02
1988 10 04.08	B	8.8	S	33.3	L	4	56	4.3	1			KRO02
1988 10 05.06	B	8.5	S	33.3	L	4	56	3.8				KRO02
1988 10 06.06	B	8.4	S	33.3	L	4	56	3.9	2			KRO02

Periodic Comet Schwassmann-Wachmann 3 (1990 VIII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 04 26.41	B	9.8:	S	33.3	L	4	56	& 1	5			KRO02
1990 05 07.39	B	9.9:	S	33.3	L	4	56	1.4	5	0.1	245	KRO02

Periodic Comet Honda-Mrkos-Pajdušáková (1990 XIV)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 08 19.42	B	9.1	S	33.3	L	4	56	2.0	2			KRO02
1990 08 28.42	B	8.9	S	33.3	L	4	56	2.3	4			KRO02
1990 08 30.41	B	8.8	S	33.3	L	4	56	2.5	4			KRO02
1990 09 01.41	B	8.3	S	33.3	L	4	56	2.8	5			KRO02
1990 09 22.42	B	8.4	S	33.3	L	4	56	2.5	6			KRO02
1990 09 26.43	B	8.9	S	33.3	L	4	56	2.1	7			KRO02

Periodic Comet d'Arrest (1976 XI)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1976 07 23.19	B	10.8:	S	15.2	L	8	174	1				KRO02
1976 07 25.25	B	10.8:	S	15.2	L	8	174					KRO02
1976 08 01.19	B	9.2	S	8.0	B		20	6				KRO02
1976 08 03.24	B	8.5	S	15.2	L	8	68	6				KRO02
1976 08 03.25	B	8.2	S	8.0	B		20	10				KRO02
1976 08 04.17	B	8 :	S	8.0	B		20	10.5				KRO02
1976 08 08.28	B	7.6	S	8.0	B		20	> 7			315	KRO02
1976 08 17.26	B	7 :	S	8.0	B		20	17			270	KRO02
1976 08 18.25	B	6.8	S	8.0	B		20	13.5				KRO02
1976 08 18.25	P	7.4	S	4.1	R		–	6		0.23	262	KRO02
1976 08 19.27	B	6.7	S	8.0	B		20	&15				KRO02
1976 08 19.27	B	6.8	S	15.2	L	8	68	14.4				KRO02
1976 08 20.26	B	6.8	S	8.0	B		20	& 9				KRO02
1976 08 30.29	B	5.6	S	8.0	B		20					KRO02
1976 08 31.27	B	6.2	S	8.0	B		20	15				KRO02
1976 09 13.23	B	7.3	S	15.2	L	8	68	&10				KRO02
1976 09 14.28	B	7.3	S	8.0	B		20					KRO02
1976 09 22.25	B	7.2	S	8.0	B		20	&10				KRO02
1976 10 18.18	B	9.6:	S	15.2	L	8	68	5				KRO02

Periodic Comet Borrelly (1987 XXXIII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1987 11 21.25	B	8 :	S	15.2	L	8	68	10.8	1			KRO02
1987 11 22.08				8.0	B		20	7.5	2			KRO02
1987 11 22.08	B	8 :	S	33.3	L	4	56					KRO02
1987 12 12.08				33.3	L	4	56	& 5	6			KRO02
1987 12 12.08	B	7.8	S	8.0	B		20	10				KRO02
1987 12 12.09	P	7.9	S	5.1	R			6.4				KRO02
1988 01 06.42	S	8.8	AA	31	L	6	62	6	4	0.17	85	KOB01
1988 01 10.45	S	8.9	S	12	L	6	40	& 6	3			HAY01
1988 01 11.17	B	8.4	S	8.0	B		20	5				KRO02

Periodic Comet Borrelly (1987 XXXIII) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1988 01 11.46	S	8.5	AA	31	L	6	62	5	5	0.15	50	KOB01
1988 01 13.03	B	8.9	S	33.3	L	4	56	4				KRO02
1988 01 13.52	S	8.8	AA	31	L	6	62	5	4	0.13	100	KOB01
1988 01 14.56	B	9.2	S	25	L	5	57	3.3	5	0.08	70	NAK05
1988 01 16.52	B	9.3	S	25	L	5	46	2.5	4			NAK05
1988 01 16.56	M	8.6	S	15	L	7	31	3	3			KAK01
1988 01 17.47	S	9.0	S	12	L	6	40	4	4			HAY01
1988 01 18.50	S	9.3	AA	15	L	5	38	3	4			ONO
1988 01 20.45	S	8.6	AA	31	L	6	62	5	4	0.08	65	KOB01
1988 01 23.55	B	9.4	S	25	L	5	46	2.3	5			NAK05
1988 01 24.50	S	9.4	S	12	L	6	40	& 4				HAY01
1988 02 21.28	B	10.7:	S	33.3	L	4	122	0.9	3			KRO02
1988 02 27.11	B	10.9	A	33.3	L	4	122		1			KRO02
1988 03 22.15	B	12.0	A	33.3	L	4	216	& 1	1			KRO02
1988 03 23.20	B	12.1	A	33.3	L	4	216	1.1	1			KRO02
1988 04 10.16	B	12.5:	A	33.3	L	4	216		1			KRO02

Periodic Comet Kopff (1983 XIII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1983 06 10.14	P	9.1	S	5.1	R							KRO02
1983 06 10.15	B	9.6:	S	15.2	L	8	100					KRO02
1983 06 10.16	P	8.9	S	5.1	R			& 3				KRO02
1983 06 11.15	B	9.5:	S	15.2	L	8	68	& 2				KRO02
1983 06 14.19	B	9.5:	S	15.2	L	8	68					KRO02
1983 06 16.13	B	9.5:	S	15.2	L	8	100					KRO02
1983 07 01.16	B	9.4	S	15.2	L	8	68					KRO02
1983 07 04.17	B	9.1	S	15.2	L	8	68					KRO02
1983 07 06.21	B	9 :	S	15.2	L	8	68					KRO02
1983 07 07.17	B	9.2	S	15.2	L	8	68	& 3				KRO02
1983 07 08.17	B	8.9	S	15.2	L	8	68	4.3				KRO02
1983 07 09.17	B	9 :	S	15.2	L	8	68					KRO02

Periodic Comet Giacobini-Zinner (1985 XIII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 07 16.19	B	10.5:	S	33.3	L	4	56	3.1	5			KRO02
1985 07 17.22	B	10 :	S	33.3	L	4	56	2.6				KRO02
1985 07 18.15	B	10.4:	S	33.3	L	4	56	3.7		?	235	KRO02
1985 07 27.14	B	10 :	S	33.3	L	4	56	1.5	8			KRO02
1985 07 29.41	B	9.4	S	33.3	L	4	56	& 3	7	?	278	KRO02
1985 08 03.17	B	9.5:	S	33.3	L	4	56					KRO02
1985 08 08.29	B	9 :	S	33.3	L	4	56	& 3	6	?	250	KRO02
1985 08 08.32	B	8.4	S	8.0	B		20	9				KRO02
1985 08 11.22	B	8.4	S	8.0	B		20	& 4	7			KRO02
1985 08 25.42	B	8.7	S	33.3	L	4	56	6.1	7	0.08	286	KRO02
1985 09 06.38	B	8.7	S	33.3	L	4	56	4.4		?	270	KRO02
1985 09 09.42	B	9.2	S	33.3	L	4	56	2.0				KRO02
1985 09 12.38				33.3	L	4	56			0.33	273	KRO02
1985 09 12.38	B	9.2	S	33.3	L	4	56	3.2		0.13	276	KRO02
1985 09 16.41				33.3	L	4	56			0.25	286	KRO02
1985 09 16.41	B	8.8	S	33.3	L	4	56	3.1		0.07	290	KRO02
1985 09 18.41	B	9.2	S	33.3	L	4	56	3.2	5	0.28	279	KRO02

Periodic Comet Wirtanen (1991 XVI)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 10 15.79	S	10.8	AC	12.0	B		20	2	2			MIT
1991 10 20.82	M	9.5	S	16	W	4	19					TSU02

Periodic Comet Arend-Rigaux (1991 XVII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 10 09.43		[15.5:		41	L	6	193	! 0.5				ARM
1991 10 19.43		[15.5:		41	L	6	193	! 0.5				ARM

Periodic Comet Hartley 2 (1991 XV)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 07 22.75	M	9.5	S	16	W	4	49	4	2			TSU02
1991 08 08.64	B	9.1:	S	15.0	B		25	2.3	4			NAG04
1991 08 16.74	M	8.2	S	16	W	4	19					TSU02
1991 08 16.74	S	7.8	AC	25	L	5	40	5	4			NAK05
1991 08 16.75	S	8.4	AA	15	L	5	38	8	5			ONO
1991 08 17.76	B	9.0	S	12.0	B		20	2.5	4			WAS
1991 08 17.78	B	8.5	S	15.0	B		25	3.5	5			NAG04
1991 09 06.72	B	8.2	AA	15.0	B		25	2.5	6	0.10	285	NAG04
1991 09 06.74	M	7.6	S	16	W	4	49	3.5	4			TSU02
1991 09 06.75	S	7.8	AA	15	L	5	38	6	5			ONO
1991 09 07.68	M	8.0	AC	12.0	B		20	4	5			MIT
1991 09 09.74	M	7.8	AC	12.0	B		20	4	6			MIT
1991 09 10.78	B	8.3	S	15.0	B		25	3.0	5	0.10	283	NAG04
1991 09 10.80	M	8.0	S	16	W	4	49	4	4	0.18	283	TSU
1991 10 02.77	M	8.5	AC	12.0	B		20	4.5	4			MIT
1991 10 15.78	M	8.1	AA	12.0	B		20	4	5			MIT
1991 10 15.81	B	8.8	S	15.0	B		25	2.3	4/			NAG04
1991 10 15.81	M	8.6	S	16	W	4	19					TSU02
1991 10 19.83	S	8.6	AA	12	L	7	44	5	5			YAS
1991 11 09.81	M	9.0	S	16	W	4	19					TSU02
1991 11 15.81	S	10.0	AC	20	L	6	48	2.5	3			YAS
1992 01 12.47	S	12.0	NP	25.6	L	4	111	1.5	1/			MOR

Periodic Comet Wild 4 (1990 X)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 01 27.07	B	12.7:	S	33.3	L	4	216	1.1	2			KRO02
1990 01 27.19	B	13.0:	S	33.3	L	4	216					KRO02
1990 01 31.16	B	12.6:	S	33.3	L	4	216	& 1	2			KRO02
1990 02 20.19	B	12.2:	S	33.3	L	4	216	& 1	3			KRO02
1990 02 25.06	B	12.1:	S	33.3	L	4	122	& 1	3			KRO02
1990 03 21.15	B	12 :	S	33.3	L	4	122	1.8	4			KRO02
1990 04 27.13	B	11.7:	S	33.3	L	4	56	& 1	2			KRO02

Periodic Comet Faye (1991 XXI)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 10 02.57	M	9.5	S	31	L	4	103	1.5	4			TSU02
1991 10 03.63	B	10.0	AC	16	L	6	40	4	4	0.17	270	TOM
1991 10 04.87	S	10.3:	AA	20.0	C	14	71		3			PAR03
1991 10 06.95	S	10.0:	AA	10.0	M	10	25		3			PAR03
1991 10 09.03	S	9.4:	AA	8.0	B		20	& 5	2			WES04
1991 10 09.89	M	10.5:	AA	15.0	L	5	75	1.4	3			SPE01
1991 10 11.02	S	9.4:	AA	8.0	B		20	4.3	3			WES04
1991 10 11.89	M	10.5:	AA	15.0	L	5	75	1.4	3			SPE01
1991 10 13.07	S	9.3:	AA	8.0	B		20	6.5	3/			WES04
1991 10 13.15	S	10.2	AC	41	L	6	193	5	6			ARM
1991 10 13.49	S	10.2	AC	12.0	B		20	2.5	4			MIT
1991 10 13.60	S	10.2	S	15	L	5	38	3	6			ONO
1991 10 13.77	B	10.1	AC	16	L	6	40	4	4	0.08		TOM
1991 10 14.89	M	10.2:	AA	15.0	L	5	75	1.4	2/			SPE01
1991 10 15.75	M	8.6	S	16	W	4	19					TSU02
1991 10 15.75	M	9.9	AA	12.0	B		20	3	6			MIT

Periodic Comet Faye (1991 XXI) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 10 19.74	S	9.4	AA	20	L	6	48	2	6	>0.17	255	YAS
1991 10 28.06	S	10.0	AC	41	L	6	193	2	7	0.17	290	ARM
1991 10 29.90	S	9.7:	AA	8.0	B		20	4.6	4/	&0.1	321	WES04
1991 10 30.85	S	9.9:	AA	8.0	B		20	3.8	4	&0.1	318	WES04
1991 11 01.18	S	10.4	AC	41	L	6	193	2	7			ARM
1991 11 01.89	S	9.5:	AA	10.0	M	10	25		4			PAR03
1991 11 02.24	S	10.5	AC	41	L	6	193	2	7	0.17	300	ARM
1991 11 02.62	S	9.6	S	15	L	5	38	3	4			ONO
1991 11 03.54	S	9.6	S	15	L	5	38	3	4			ONO
1991 11 03.57	B	9.2	S	15.0	B		25	1.5	6			NAG04
1991 11 03.88	S	9.3:	AA	10.0	M	10	25		5			PAR03
1991 11 04.28	S	9.7:	S	41	L	6	79	6	7	0.2	315	ARM
1991 11 05.55	M	8.9	S	31	L	4	40					TSU02
1991 11 05.61	S	9.9	S	15	L	5	38	4	5			ONO
1991 11 07.58	S	10.1	S	15	L	5	38	2	4			ONO
1991 11 08.65	S	10.1	S	15	L	5	38	4	5			ONO
1991 11 09.65	B	9.1	S	15.0	B		25	2.0	6			NAG04
1991 11 10.95	S	9.5:	AA	10.0	M	10	25		2			PAR03
1991 11 11.54	M	9.2	S	31	L	4	40					TSU02
1991 11 12.16	S	9.2	AC	41	L	6	79	4	6	0.08	320	ARM
1991 11 12.54	S	9.5:	S	15	L	5	38	3	4			ONO
1991 11 13.56	S	10.2	S	15	L	5	38	3	4			ONO
1991 11 25.00	S	9.2	AC	41	L	6	79	2.2	5			ARM
1991 11 25.45	M	9.3	S	31	L	4	40					TSU02
1991 11 25.52	S	9.8	S	15	L	5	38	4	4			ONO
1991 11 26.09	S	9.4	AC	41	L	6	79	2.5	5			ARM
1991 11 27.04	S	9.6	AC	41	L	6	79	2.5	5			ARM
1991 11 28.15	S	9.6	AC	41	L	6	79	3	6	0.08	5	ARM
1991 11 30.17	S	9.6	AC	41	L	6	79	& 2.5	6	0.08	5	ARM
1991 12 07.17	S	10.3	AC	41	L	6	79	& 2.5	6	0.07	355	ARM
1991 12 07.45	S	10.1	AC	12.0	B		20	3.5	3			MIT
1991 12 08.05	S	10.4	AC	44	L	4	85	& 2.5	5	0.05	350	ARM
1991 12 08.85	S	10.5:	AA	10.0	M	10	25		1			PAR03
1991 12 09.54	S	10.4	AA	15	L	5	38	3	4			ONO
1991 12 11.12	S	10.7	AC	20	L	8	57	& 2.8	5	0.07	355	ARM
1991 12 11.52	S	10.5	AA	15	L	5	38	3	4			ONO
1991 12 12.14	S	10.5	AC	41	L	6	79	& 2.8	5	0.08	0	ARM
1991 12 25.01	S	10.4	AC	41	L	6	79	& 1.8	8	0.05	30	ARM
1991 12 28.52	S	11.0	AC	16	L	6	50	2	3			MIT
1991 12 31.99	S	11.5	AC	20	L	8	57	2	5			ARM
1992 01 07.06	S	11.6	AC	41	L	6	193	& 1.2	3			ARM
1992 01 08.02	S	10.7	AC	41	L	6	63	& 2.2	6	0.05	40	ARM
1992 01 25.17	S	11.4	NP	25.6	L	4	67	2.0	2/			MOR
1992 03 05.12	S[	13.9	GA	40	L	7	190	! 0.5				MOD
1992 03 25.09	S[	13.5	GA	40	L	7	190	! 0.5				MOD
1992 03 28.08	M	13.6	GA	40	L	7	190	0.40	2			MOD
1992 03 29.09	M	13.6	GA	40	L	7	190	0.40	3			MOD
1992 04 06.08	S[	14.0	GA	40	L	7	190	! 0.5				MOD

Periodic Comet Giclas (19921)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 12 29.93	! V	14.3	AA	20.0	T	2		1.5	7			MIK
1993 01 18.95	! V	16.0	HR	20.0	T	2		0.5	2			MIK

Periodic Comet Shoemaker 1 (1991 XXIII)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 09 28.04		14.0:		41	L	6	193	1.0				ARM

Periodic Comet Shoemaker 1 (1991 XXIII) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 10 09.04		14.0:		41	L	6	193	0.5				ARM
1991 10 28.05		13.5:		41	L	6	193	0.5				ARM
1991 11 03.01		[14.5:		41	L	6	193	! 0.5				ARM
1991 11 03.46	I	[14.0:		73	C	11	275					NAK01
1991 11 04.01		[14.5:		41	L	6	193	! 0.5				ARM

Periodic Comet Ciffréo (1992s)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 12 27.76	! V	[16.2	HR	19.0	T	4						MIK

Periodic Comet Shoemaker-Levy 8 (1992f)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 04 22.59	I	[14.0:		60.0	Y	8	240					NAK01

Periodic Comet Schaumasse (1992x)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 12 16.86	S	11.9	AC	15.2	L	5	76	1.5	1			MOE
1992 12 16.88	C	14.3	AA	20.0	T	2		& 1	7			MIK
1992 12 20.77		[12.3	AC	20.3	T	10	77	! 1.0				GRA04
1992 12 20.79	! V	14.2	AA	20.0	T	2		& 1.5	5			MIK
1992 12 20.85	S	11.8	AC	15.2	L	5	44	1.5	1			MOE
1992 12 20.94	S	11.7	AC	15.2	L	5	76	2.0	1			MOE
1992 12 21.87	S	11.7	AC	15.2	L	5	76	2.0	1			MOE
1992 12 23.80	S	11.5	AC	15.2	L	5	76	2.0	1			MOE
1992 12 25.88	S	12.3	AC	20.0	L	4	40	& 2	5			MIK
1992 12 25.95	S	11.4	AC	15.2	L	5	76	2.0	1			MOE
1992 12 26.82	B	10.9	AA	20.0	T	6	40	2	1/			BOS01
1992 12 27.00	V	13.0	AC	20.0	T	2		& 5	5			MIK
1992 12 27.06	B	12 :	S	33.3	L	4		2.5	2			KRO02
1992 12 27.80	S	11.5	AC	15.2	L	5	76	2.5	1			MOE
1992 12 28.70	S	11.3	AC	15.2	L	5	76	3.0	0			MOE
1992 12 29.91	! V	12.0	AC	20.0	T	2		& 6	5			MIK
1992 12 31.01	! V	12.1	HR	20.0	T	2		& 5	5			MIK
1993 01 20.05	B	10.2	S	33.3	L	4	56	4.6	2			KRO02
1993 01 23.04	B	10 :	S	25.4	L			4.3	2			KRO02
1993 01 25.05	B	9.9	S	33.3	L	4	56	4.4	3			KRO02

Periodic Comet Smirnova-Chernykh

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 04 22.45	I	[14.0:		60.0	Y	8	240					NAK01
1992 05 20.49	I	[14.0:		60.0	Y	8	253					NAK01

Periodic Comet Brewington (1992p)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 08 30.50	S	11.5:	NP	25.6	L	4	67	2.2	2/			MOR
1992 08 31.08	S	12.6:	A	28.0	T	10	180	& 2	0			COM
1992 09 02.11	S	11.7	AC	44	L	4	50					TOM01
1992 09 04.38	M	11.4	GA	35.9	L	7	85	1.2	2			MOD
1992 09 05.39	M	11.2	GA	35.9	L	7	85	2.0	2			MOD
1992 09 05.40	S	11.1	GA	20.0	L	5	35	2.0	1			MOD
1992 09 09.38	S	11.9	AC	44.5	L	4	167	1.3	1			MOR03
1992 09 10.10	B	11.2:	S	11	L	8	32					KYS
1992 09 24.41	M	12.8	GA	35.9	L	7	85	1.3	1/			MOD
1992 09 25.39	M	12.8	GA	35.9	L	7	85	1.1	1/			MOD

Periodic Comet Brewington (1992p) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 09 26.14	! V	13.2	AA	19.0	T	4		3.5	6	0.08	300	MIK
1992 09 28.39	M	12.8	GA	35.9	L	7	85	1.2	1			MOD
1992 09 28.39	S	12.4	AC	44.5	L	4	80	1.1	1			MOR03
1992 10 02.40	S	13.1	GA	35.9	L	7	85	1.0	1			MOD
1992 10 05.41	M	13.0	GA	35.9	L	7	85	0.9	1			MOD
1992 10 06.39	M	13.6	GA	35.9	L	7	85					MOD
1992 10 06.39	S	13.5	GA	35.9	L	7	85	0.85	1			MOD
1992 10 07.38	S	13.9	GA	35.9	L	7	85	0.8	1			MOD
1992 10 08.39	S	14.0	GA	35.9	L	7	85	0.90	1			MOD
1992 10 08.39	S	14.3	GA	35.9	L	7	164	0.80	1			MOD
1992 10 09.14	! V	14.4	AA	19.0	T	4		& 2.5	5/	0.08	295	MIK
1992 10 23.39	S[	14.2	GA	40	L	7	190	! 0.5				MOD
1992 10 28.36	S	14.1	GA	40	L	7	100	1.0	0			MOD

Periodic Comet Halley (1986 III)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 09 13.76	S	13.1	AC	20	L	6	123	0.6	3/			NAK01
1985 09 20.75	S	12.8	AC	20	L	6	89	1.1	2			NAK01
1985 10 08.75	S	12.3	AC	20	L	6	89	1.3	5			NAK01
1985 10 15.76	S	10.8	AC	20	L	6	89	2.5	4			NAK01
1985 10 15.79	S	11.5	AC	13	L	6	88	1	3			ISH02
1985 10 20.75	S	10.1	AC	20	L	6	89	3	4/			NAK01
1985 10 22.76	S	9.6	AC	20	L	6	44	4.5	4			NAK01
1985 10 22.78	S	11.2	AC	13	L	6	64	1.5	4			ISH02
1985 10 23.76	S	9.9	AC	20	L	6	44	4	4			NAK01
1985 10 23.79	S	11.2	AC	13	L	6	64	1.3	4			ISH02
1985 10 24.79	S	10.8	AC	13	L	6	64	2.8	5			ISH02
1985 10 28.78	S	10.6	AC	13	L	6	44	3	4			ISH02
1985 11 03.81	S	10.0	AC	13	L	6	44	2.5	4			ISH02
1985 11 07.66	B	8.7	AC	20	L	6	44	7	6			NAK01
1985 11 08.60	S	8.2	AA	13	L	6	24	3	5			ISH02
1985 11 08.64	B	8.4	AC	20	L	6	44	6.5	5			NAK01
1985 11 10.25	S	6.9	WH	8.0	B		11	7	3			PRY
1985 11 11.25	S	6.6	WH	8.0	B		11	15	5	0.08	280	PRY
1985 11 11.77	S	7.7	AA	13	L	6	24	6	5			ISH02
1985 11 12.25	S	6.7	WH	8.0	B		11	13	3			PRY
1985 11 12.61	B	8.0	S	20	L	6	44	7.5	6			NAK01
1985 11 12.61	M	7.5	S	6.0	R	12	22	9.5				NAK01
1985 11 12.76	S	7.6	AA	13	L	6	24	6	5	0.2		ISH02
1985 11 13.28	S	6.6	WH	8.0	B		11	13	3			PRY
1985 11 13.73	B	7.8	S	20	L	6	44	8	6			NAK01
1985 11 13.75	S	7.4	AA	13	L	6	24	7	5	0.2		ISH02
1985 11 14.21	S	6.6	WH	8.0	B		11	14	6			PRY
1985 11 15.64	B	7.9	S	20	L	6	44	8	6			NAK01
1985 11 15.64	M	7.6	S	6.0	R	12	22	10	6			NAK01
1985 11 15.72	S	7.5	AA	13	L	6	24	5	5			ISH02
1985 11 17.26	S	6.2	WH	8.0	B		11	15	6			PRY
1985 11 17.72	S	7.2	AA	13	L	6	24	7	5	0.2		ISH02
1985 11 18.25	S	6.4	WH	8.0	B		11	17	3			PRY
1985 11 18.61	B	7.3	S	20	L	6	44	10	6			NAK01
1985 11 18.61	M	6.9	S	6.0	R	12	22	14	6			NAK01
1985 11 18.76	S	7.1	AA	13	L	6	24	6.5	5	0.1		ISH02
1985 11 20.73	S	6.9	AA	13	L	6	24	6	5	0.2		ISH02
1985 11 21.24	S	6.2	WH	8.0	B		11	10	5			PRY
1985 11 21.53	S	6.8	AA	13	L	6	24	5	5			ISH02
1985 11 24.31	S	6.4	WH	8.0	B		11	7	3			PRY
1985 11 25.57	S	6.8	AA	13	L	6	24	4	4			ISH02
1985 11 30.49	S	6.2	AA	13	L	6	24	8	5			ISH02

Periodic Comet Halley (1986 III) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 12 01.10	S	6.7	WH	8.0	B		11	10	6			PRY
1985 12 01.47	S	6.2	AA	13	L	6	24	8	5			ISH02
1985 12 02.49	S	5.8	AA	13	L	6	24	10	5	0.2		ISH02
1985 12 02.51	S	5.7	AA	7.0	B		10	12	4			ISH02
1985 12 03.52	M	5.8	S	6.0	R	12	22	15	5		60	NAK01
1985 12 09.26	S	6.6	WH	8.0	B		11	10	5	0.03	80	PRY
1985 12 09.45	M	5.9	S	6.0	R	12	22	13	6	0.33	65	NAK01
1985 12 10.30	S	6.5	WH	8.0	B		11	10	5			PRY
1985 12 11.08	S	6.3	WH	8.0	B		11	11	5	0.02	80	PRY
1985 12 12.15	S	6.3	WH	8.0	B		11	11	6			PRY
1985 12 12.46	S	5.4	AA	13	L	6	24	10	5			ISH02
1985 12 13.17	S	6.2	WH	8.0	B		11	10	3			PRY
1985 12 13.46	S	5.4	AA	13	L	6	24	9	5	0.2		ISH02
1985 12 13.49	M	5.5	S	6.0	R	12	22	14	5/	0.33	70	NAK01
1985 12 14.12	S	6.2	WH	8.0	B		11	12	6	0.05	80	PRY
1985 12 14.46	S	5.4	AA	13	L	6	24	9	5	0.3		ISH02
1985 12 15.47	M	5.6	S	6.0	R	12	22	11	4/	0.42	70	NAK01
1985 12 15.47	S	5.5	AA	13	L	6	24	10	5	0.5		ISH02
1985 12 15.49	S	5.6	AA	7.0	B		10	10	5	0.3		ISH02
1985 12 16.12	S	6.3	WH	8.0	B		11	9	5			PRY
1985 12 17.21	S	6.1	WH	8.0	B		11	10	5	0.02	80	PRY
1985 12 17.48	S	5.5	AA	13	L	6	24	8	5			ISH02
1985 12 17.49	S	5.6	AA	7.0	B		10	8	4			ISH02
1985 12 18.12	S	6.3	WH	8.0	B		11	7	3			PRY
1985 12 18.49	S	5.6	AA	7.0	B		10	8	4			ISH02
1985 12 18.51	S	5.4	AA	13	L	6	24	8	5			ISH02
1985 12 23.08	S	6.0	WH	8.0	B		11	6	5			PRY
1985 12 24.49	S	5.8	AA	7.0	B		10	5	4			ISH02
1985 12 26.12	S	6.2	WH	8.0	B		11	5	3			PRY
1985 12 28.39	S	5.1	AA	13	L	6	24	6	5	0.3		ISH02
1985 12 29.45	S	5.3	AA	13	L	6	24	4	5			ISH02
1985 12 31.48	S	4.9	AA	13	L	6	24	6	6	0.7		ISH02
1986 01 02.41	S	4.8	AA	13	L	6	24	6.5	6	1		ISH02
1986 01 02.42	S	5.0	AA	7.0	B		10	5	6	0.8		ISH02
1986 01 03.41	S	5.0	AA	13	L	6	24	4	5			ISH02
1986 01 04.10	S	5.5	WH	8.0	B		11	10	6	0.5	80	PRY
1986 01 04.41	M	5.0	S	6.0	R	12	22	7	5	0.67	65	NAK01
1986 01 04.43	S	5.0	AA	13	L	6	24	4	5	0.5		ISH02
1986 01 05.41	S	4.7	AA	13	L	6	24	6	6	1.2		ISH02
1986 01 05.42	M	5.0	S	6.0	R	12	22	9	6/	1.6	65	NAK01
1986 01 06.40	S	4.8	AA	13	L	6	24	6.5	6	1.5		ISH02
1986 01 06.42	B	5.0	AA	7.0	B		10	5	6	1		ISH02
1986 01 07.39	S	4.9	AA	13	L	6	24	5	6	1.2		ISH02
1986 01 08.40	S	4.9	AA	13	L	6	24	4	7	1		ISH02
1986 01 09.41	M	4.8	S	6.0	R	12	22	9	6	1.2	65	NAK01
1986 01 10.41	M	4.7	S	6.0	R	12	22	8	5	0.83	65	NAK01
1986 01 11.39	S	4.9	AA	7.0	B		10	3	7	1		ISH02
1986 01 11.40	M	4.9	S	6.0	R	12	22	8	7	0.67	65	NAK01
1986 01 12.10	S	5.0	WH	8.0	B		11	15	7	1	75	PRY
1986 01 12.41	M	4.7	S	6.0	R	12	22	8	7	1.2	65	NAK01
1986 01 13.10	S	5.0	WH	20	T		50	7	7	0.5	55	PRY
1986 01 13.39	S	4.8	AA	13	L	6	24	4	7	0.7		ISH02
1986 01 14.12	S	5.5	WH	8.0	B		11	6	7	0.5	55	PRY
1986 01 14.39	S	4.9	AA	13	L	6	24	3.5	7	2		ISH02
1986 01 17.39	S	4.8	AA	13	L	6	24	3	7	1		ISH02
1986 01 18.39	S	5.0	AA	13	L	6	24	2.5	7	1		ISH02
1986 01 19.39	S	5.1	AA	13	L	6	24	2	8	0.5		ISH02
1986 01 19.40	M	4.4	S	6.0	R	12	22	6	7	0.67	65	NAK01
1986 02 19.86	M	4.0	S	6.0	R	12	22	4	7/			NAK01

Periodic Comet Halley (1986 III) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 02 19.86	S	4.1	AA	8.0	B		15	2	7	0.2		ISH02
1986 02 20.86	S	4.0	AA	8.0	B		15	2	8	0.3		ISH02
1986 02 21.86	S	3.8	AA	8.0	B		15	3	8			ISH02
1986 02 22.86	M	3.8	S	6.5	R	8	16		8/			NAK01
1986 02 23.86	M	3.6	S	6.5	R	8	16	4	8	0.4	270	NAK01
1986 02 25.85	M	3.6	S	6.5	R	8	16		8			NAK01
1986 02 25.85	S	3.5	AA	8.0	B		15	3	7	0.5		ISH02
1986 02 28.85	M	3.6	S	6.5	R	8	16	4	7			NAK01
1986 03 01.84	M	3.6	S	6.5	R	8	16	5.5	8	1.0	275	NAK01
1986 03 02.84	S	3.6	AA	8.0	B		15	3	7	1.5		ISH02
1986 03 03.83	M	3.7	S	6.5	R	8	16	5	8	0.7	270	NAK01
1986 03 03.83	S	3.6	AA	8.0	B		15	3	7	2		ISH02
1986 03 03.84	S	3.5	AA	13	L	6	24	3.5	6	1.5		ISH02
1986 03 05.84	M	3.6	S	6.5	R	8	16	5	8/			NAK01
1986 03 05.84	S	3.4	AA	13	L	6	24	3	7	0.7		ISH02
1986 03 07.82	M	3.4	S	6.5	R	8	16	9	8	2.0	265	NAK01
1986 03 07.82	S	3.6	AA	8.0	B		15	5	6	3		ISH02
1986 03 07.83	S	3.5	AA	13	L	6	24	5	6	2		ISH02
1986 03 08.83	M	3.6	S	6.5	R	8	16	9	8	1.5	265	NAK01
1986 03 11.82	M	3.9	S	6.5	R	8	16	9	7	2.1	270	NAK01
1986 03 12.82	M	3.9	S	6.5	R	8	16	9	7	2.0	265	NAK01
1986 03 12.82	S	3.9	AA	7.0	B		10	4	6	2		ISH02
1986 03 12.83	S	3.7	AA	13	L	6	24	5	6	1		ISH02
1986 03 16.53	S	4.0	WH	8.0	B		11	7	6	1	270	PRY
1986 03 16.80	M	3.8	S	6.5	R	8	16	11	7	1.9	265	NAK01
1986 03 16.81	S	3.8	AA	7.0	B		10		6	2		ISH02
1986 03 16.83	S	3.7	AA	13	L	6	24	6	5	1		ISH02
1986 03 17.81	S	3.6	AA	7.0	B		10	& 6	6	2		ISH02
1986 03 17.82	S	3.6	AA	13	L	6	24	6	6	1.5		ISH02
1986 03 19.81	M	3.9	S	6.5	R	8	16	13	7	2.2	265	NAK01
1986 03 20.79	S	4.0	AA	7.0	B		10	4	5	3		ISH02
1986 03 20.82	S	3.8	AA	13	L	6	24	6	5	2		ISH02
1986 03 24.79	S	3.8	AA	7.0	B		10	6	6	1		ISH02
1986 03 24.81	S	3.5	AA	13	L	6	24	8	5	0.5		ISH02
1986 03 25.79	S	3.8	AA	7.0	B		10	5	6	1		ISH02
1986 03 25.81	S	3.4	AA	13	L	6	24	7	6	0.5		ISH02
1986 03 31.79	S	4.1	AA	7.0	B		10	8	5			ISH02
1986 03 31.80	S	3.9	AA	13	L	6	24	9	5			ISH02
1986 04 01.62	S	3.5	WH	8.0	B		11	20	7	4	280	PRY
1986 04 02.60	S	3.8	WH	8.0	B		11	20	6	3.5	280	PRY
1986 04 02.76	M	3.6	S	6.5	R	8	16	18			290	NAK01
1986 04 03.56	S	3.5	WH	8.0	B		11	22	7	4.5	285	PRY
1986 04 03.80	S	4.0	AA	13	L	6	24	9	4			ISH02
1986 04 05.54	S	3.7	WH	8.0	B		11	18	6	5	290	PRY
1986 04 05.76	M	3.5	S	6.5	R	8	16	18	6	1.1	300	NAK01
1986 04 06.58	S	4.0	WH	8.0	B		11	15	5	3	295	PRY
1986 04 06.77	M	3.5	S	6.5	R	8	16	21	5/		320	NAK01
1986 04 07.52	S	4.1	WH	8.0	B		11	15	5	4	300	PRY
1986 04 07.76	M	3.6	S	6.5	R	8	16	22	6	0.8	325	NAK01
1986 04 07.78	S	4.2	AA	7.0	B		10	8	4			ISH02
1986 04 07.79	S	4.0	AA	13	L	6	24	10	4			ISH02
1986 04 10.80	M	3.8	S	6.5	R	8	16	28	5		325	NAK01
1986 04 11.62	M	3.3	S	6.5	R	8	16	28	5	3.7	335	NAK01
1986 04 11.65	S	4.3	AA	13	L	6	24	12	4			ISH02
1986 04 11.67	S	4.5	AA	7.0	B		10	10	4			ISH02
1986 04 12.59	S	4.4	WH	8.0	B		11	10	5	1	10	PRY
1986 04 12.63	S	4.3	AA	7.0	B		10	10	4			ISH02
1986 04 12.69	M	3.4	S	6.5	R	8	16	30	5	3.2	350	NAK01
1986 04 23.51	S	4.7	AA	7.0	B		10	8	4			ISH02

Periodic Comet Halley (1986 III) [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 04 23.53	S	4.4	AA	13	L	6	24	10	4			ISH02
1986 04 24.55	M	4.1	AC	6.5	R	8	16	16	5/	0.7	70	NAK01
1986 04 29.51	S	4.7	AA	7.0	B		10	10	4			ISH02
1986 04 30.49	S	4.8	AA	7.0	B		10	12	4			ISH02
1986 04 30.50	S	4.7	AA	13	L	6	24	15	3			ISH02
1986 05 04.21	S	5.8	WH	8.0	B		11	6	3	0.5	75	PRY
1986 05 05.51	M	5.0	AC	6.5	R	8	16	15	5		80	NAK01
1986 05 07.48	S	5.6	AA	7.0	B		10	10	4			ISH02
1986 05 07.49	S	5.5	AA	13	L	6	24	10	5	0.3		ISH02
1986 05 07.52	M	5.4	AC	6.5	R	8	16	15	4			NAK01
1986 05 09.50	M	5.6	AC	6.5	R	8	16	12	4			NAK01
1986 05 16.52	S	6.5	AA	7.0	B		10	5	3			ISH02
1986 05 16.54	S	6.2	AA	13	L	6	24	6	4			ISH02
1986 05 17.48	B	6.9	AC	20	L	6	35	8	6			NAK01
1986 05 17.48	M	6.3	AC	6.5	R	8	16	11	5/			NAK01
1986 05 25.52	S	6.9	AA	13	L	6	24	6	4			ISH02
1986 05 26.52	S	7.0	AA	13	L	6	24	4	3			ISH02
1986 06 01.24	S	8.2	WH	20	T		50	3	1			PRY
1986 06 08.47	M	8.2	AC	6.5	R	8	16	8	5/			NAK01
1986 06 08.47	S	8.1	AC	20	L	6	35	6.5	6			NAK01
1986 06 08.50	S	7.8	AA	13	L	6	44	4	2			ISH02
1986 06 09.47	M	8.2	AC	6.5	R	8	16	7	4			NAK01
1986 06 09.47	S	8.2	AC	20	L	6	35	6	4			NAK01
1986 06 11.48	S	7.6	AA	13	L	6	44	5	3			ISH02
1986 06 26.48	S	8.0	AA	13	L	6	44	4	3			ISH02
1986 06 26.48	S	9.7	AC	20	L	6	65	2				NAK01
1986 11 09.83	S	13.3	AC	20	L	6	106	0.7				NAK01
1986 11 29.78	S	12.8	AC	20	L	6	106	1.2	2			NAK01
1986 12 05.78	S	13.0	AC	20	L	6	106	1.0	1/			NAK01
1986 12 07.80	S	12.9	AC	20	L	6	106	1.1	2/			NAK01
1986 12 28.79	S	12.9	AC	20	L	6	106	1.5	2			NAK01
1987 01 03.84	S	12.8	AC	20	L	6	69	2	2			ISH02

Periodic Comet Peters-Hartley (1990 IX)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1990 06 19.12	B	13.0:	S	33.3	L	4	216	0.3	2			KRO02
1990 06 21.13	B	12.7:	S	33.3	L	4	216	0.2	1			KRO02

Periodic Comet Swift-Tuttle (1992t)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 09 27.48	S	9.1	AA	25.6	L	4	45	5.2	1			MOR
1992 09 28.20	S	9.5	A	20.0	T	10	125	4	1			SPR
1992 09 28.79	S	8.8	A	10.8	L	4	22	> 6	0/			BUS01
1992 09 28.82	S	9.2	A	20.0	T	10	77	& 3	2			COM
1992 09 29.00	S	9.1	A	12	L	6	40	6	3			REN
1992 09 29.19	S	9.2	A	20.0	T	10	64	5	2			SPR
1992 09 29.38	S	9.1	AC	8.0	B		20	3.9	2			BOR
1992 09 29.76	S	8.8	AC	44	L	4	50	4	2			TOM01
1992 09 29.82	S	9.2	A	20.0	T	10	77	& 4	2			COM
1992 09 29.86	S	9.0	AA	8.0	B		20	4	1			ZAN
1992 09 30.01	S	9.1	AC	8.0	B		20	4.0	2			BOR
1992 09 30.48	S	9.0	AA	8.0	B		20	6.8	1/			MOR
1992 09 30.48	S	9.0	AA	25.6	L	4	45	4.5	1/			MOR
1992 09 30.77	S	9.0	AA	8.0	B		20	3	3			BAR
1992 09 30.82	S	9.1	A	20.0	T	10	77	& 4	2			COM
1992 09 30.82	S	11.7	GA	31.6	L	5	62	1.8	2			MID01
1992 09 30.98	S	9.5:	S	8.0	B		11	5	3			WAR01

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

DATE (UT)		MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 10 01.05		S	8.9	AC	44	L	4	50	4	2			TOM01
1992 10 01.11		M	9.1	S	15.2	L	3	16	3.5	2			KEE
1992 10 01.38		S	9.2	AC	8.0	B		20	3.0	3			BOR
1992 10 01.49		S	8.9	A	20.0	T	10	64	6	3			SPR
1992 10 01.50		S	8.8:	AA	8.0	B		20					MOR
1992 10 01.78		S	9.8	AA	15.2	L	5	63	4	1			BEN03
1992 10 01.87		S	10.0	AA	20.3	T	10	50	5	2			BRE02
1992 10 01.91		S	9.4	AC	15.2	L	5	44	4.0	2			MOE
1992 10 02.01		S	9.1	AC	8.0	B		20	3.2	2			BOR
1992 10 02.05		B	9.0	S	33.3	L	4	56	3.6	2			KRO02
1992 10 02.39		S	8.9	AC	8.0	B		20	5.3	3			BOR
1992 10 02.75		S	9.6	AA	25.4	L	6	56	5	2			AND01
1992 10 02.79		S	10.5	GA	31.6	L	5	62	2.2	2			MID01
1992 10 03.04		B	8.9	S	8.0	B		20	5	3			KRO02
1992 10 03.04		B	9.1	S	33.3	L	4	56	3.6	2			KRO02
1992 10 03.07		S	9.5	AC	15.2	L	5	44	4.5	1			MOE
1992 10 03.33		B	8.5	AC	15	L	5	25	6	3			NOW
1992 10 03.50		S	8.6	AA	8.0	B		20	11	1			MOR
1992 10 03.77		S	9.3	AC	15.2	L	5	44	4.0	1			MOE
1992 10 03.80		B	9.7	AC	20.4	L	6	72	& 3	0			JAH
1992 10 03.80		S	9.4	AC	15.2	L	5	76	3.5	2			MOE
1992 10 03.83		S	8.7	A	10.8	L	4	22	> 6	0/			BUS01
1992 10 04.06		B	9.1	S	33.3	L	4	56	3.1	2			KRO02
1992 10 04.12		S	8.5	AA	10.0	B		14	3	3			LOO01
1992 10 04.15		S	8.8	A	11.0	L	7	32	3	1/			SCH04
1992 10 04.21		S	8.8	A	20.0	T	10	64	5	3			SPR
1992 10 04.39		S	9.1	AC	11.4	L	8	40	4	3			VIE
1992 10 04.51		S	8.8	A	20.0	T	10	64	5.5	3			SPR
1992 10 04.77		S	9.3	AC	15.2	L	5	44	3.5	2			MOE
1992 10 04.80		S	8.6	A	10.8	L	4	22	> 6	0/			BUS01
1992 10 04.81		S	9.8	GA	31.6	L	5	62	1.1	4			MID01
1992 10 05.22		S	8.7	A	20.0	T	10	64	5	4			SPR
1992 10 05.39		S	8.7	AC	8.0	B		20	4.8	2/			BOR
1992 10 05.93		S	9.5	AA	20.3	T	10	50	4	2			BRE02
1992 10 06.39		S	8.6	AC	8.0	B		20	5.3	3			BOR
1992 10 06.76		B	9 :	S	11	L	8	32					KYS
1992 10 06.85		S	9.3	GA	31.6	L	5	62	1.2	3			MID01
1992 10 07.12		S	9.2	S	15.0	L	8	67	4.5	3			WAR01
1992 10 07.39	a	S	8.2	AC	8.0	B		20	6	5			BOR
1992 10 07.39	a	S	8.3	AC	5.0	B		10	6.5	5			BOR
1992 10 07.50		S	8.3	AA	8.0	B		20	7	2			MOR
1992 10 07.51		M	8.3	AA	25.6	L	4	45		3/			MOR
1992 10 07.79		S	8.8:	AC	15.2	L	5	44	& 3.5	1			MOE
1992 10 07.83		S	8.4	AA	6.3	B		9	4	2			NIE
1992 10 08.15		S	8.0	AA	8.0	B		15	9.5	3	?	0	HAV
1992 10 08.39	a	S	8.2	AC	5.0	B		10	6	5			BOR
1992 10 08.39	a	S	8.2	AC	8.0	B		20	6	4			BOR
1992 10 08.39	a	S	8.2	NO	5.0	B		10					BOR
1992 10 08.39	a	S	8.2	NO	8.0	B		20					BOR
1992 10 09.51		S	8.1	AA	8.0	B		20	9	2			MOR
1992 10 09.79		S	8.5	AA	12.0	B		20	4	4			LOO01
1992 10 09.79		S	9.6	GA	31.6	L	5	62	1.6	4			MID01
1992 10 09.99		S	8.5	AC	20.3	T	10	80	3.8	4			DAH
1992 10 10.14		S	8.4	AA	12.0	B		20	4	4			LOO01
1992 10 10.17		B	8.6	AC	20.4	L	6	35					JAH
1992 10 10.17		S	8.5	AC	20.4	L	6	35	4.0	4	&0.20	270	JAH
1992 10 10.21					20.4	L	6	72	3.0	3	&0.10	320	JAH
1992 10 10.77		S	7.7	A	10.8	L	4	22	> 7.5	1/			BUS01
1992 10 10.79		M	9.3	S	20.0	R	17	87	3	1			LEH

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

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 10 10.79	S	9.7	GA	31.6	L	5	62	1.8	3			MID01
1992 10 10.80	S	8.5	AC	20.3	T	10	80	3.1	4			DAH
1992 10 10.88	S	8.0	AA	6.3	B		9	4	2			NIE
1992 10 10.88	S	8.4	S	20.3	T	10	80	3.2	2/			GRA04
1992 10 11.80	S	7.6	S	10.8	L	4	22	> 7.5	1/			BUS01
1992 10 12.75	B	8.0	AC	5.0	R	4	10	5	3			MOE
1992 10 12.76	S	7.9	AC	15.2	L	5	44	5.0	3			MOE
1992 10 12.77	S	8.8	GA	31.6	L	5	62	1.5	3			MID01
1992 10 12.78	S	7.4	S	10.8	L	4	22	8	2			BUS01
1992 10 12.78	S	7.7	S	25.4	J	6	48	6	2/	0.1	360	BUS01
1992 10 12.79	M	9.1	S	20.0	R	17	87	2	2			LEH
1992 10 12.79	S	7.7	AA	12.0	B		20	3.5	5			LOO01
1992 10 12.83	S	7.5	AC	5.0	R	10	13	3.9	1			JAH
1992 10 12.85				20.4	L	6	72	4.8	5	&0.20	340	JAH
1992 10 12.85	S	7.6	AC	20.4	L	6	35	6.4	3			JAH
1992 10 12.85	S	7.9	AA	6.3	B		9	4	3			NIE
1992 10 12.98	a S	7.8	AC	8.0	B		20	3.7	5			BOR
1992 10 13.74	B	8.0	S	11	L	8	32					KYS
1992 10 13.76	S	7.5	A	11.0	L	7	32	8	3			SCH04
1992 10 13.77	S	7.3	A	10.8	L	4	22	9	2/			BUS01
1992 10 13.78	M	8.7	S	10.0	B	4	25	7	2			LEH
1992 10 13.79	S	7.2	A	6.7	R	4	14	10	2			BUS01
1992 10 13.98	S	7.7	AC	8.0	B		20	5.3	4			BOR
1992 10 13.99	S	8.5	AC	11.4	L	8	40	4	3			VIE
1992 10 14.07	B	8.5:	S	8.0	B		20	5	3			KRO02
1992 10 14.74	S	7.8	AA	5.0	B		7	& 8	5			MIK
1992 10 14.75	M	8.3	S	10.0	B	4	25	6	3			LEH
1992 10 14.86	S	7.6	AC	20	T	10	77	6	3			TOM01
1992 10 15.09	K	7.7	AA	4.0	B		8	8	2			KEE
1992 10 15.09	S	7.7	AA	15.2	L	3	16	10	3			KEE
1992 10 15.09	S	7.7	AA	20.3	R	15	152	& 8	2/			HER02
1992 10 15.75	S	7.7	A	5.0	B		10	& 5	5			COM
1992 10 15.76	S	7.2	AA	10.0	B		14	6.5	6			LOO01
1992 10 15.78	B	8.0	A	12	L	6	40	6	3		270	REN
1992 10 15.79	S	8.5	AA	20.3	T	10	50		2			BRE02
1992 10 15.85	S	7.1	A	6.7	R	4	14	&10	2/			BUS01
1992 10 16.03	S	8.0	AC	11.4	L	8	40	4.5	3			VIE
1992 10 16.08	S	7.5	AA	20.3	R	15	152		3/			HER02
1992 10 16.08	S	7.9:	AA	5.0	B		10					COL
1992 10 16.76	S	7.5:	A	3.0	B		8	& 7	2			BUS01
1992 10 16.77	S	6.9	A	6.7	R	4	14	&11	2/			BUS01
1992 10 16.77	S	7.2	AA	5.0	B		10	5	5			LOO01
1992 10 16.78	S	7.2	A	10.8	L	4	22	9	3			BUS01
1992 10 16.78	S	7.7	A	5.0	B		10	& 6	5/			COM
1992 10 16.81	S	8.5	AA	20.3	T	10	111		2			BRE02
1992 10 17.09	S	7.4	AA	20.3	R	15	152	18	3/			HER02
1992 10 17.11	M	7.3	AA	8.0	B		20	8	3/			MOR
1992 10 17.74	S	7.4	AC	15.2	L	5	44	6.5	3	0.3	20	MOE
1992 10 17.74	S	7.5:	S	15.0	L	8	30	& 5	2			THO03
1992 10 17.77	S	6.9	A	6.7	R	4	14	>11	3			BUS01
1992 10 17.77	S	7.6	A	5.0	B		10	& 5	5/			COM
1992 10 17.78	S	7.2	A	10.8	L	4	22	10	3/			BUS01
1992 10 17.79	B	7.4	AC	5.0	R	4	10	6	3			MOE
1992 10 17.79	S	7.5	AC	15.2	L	5	76	5.5	3	0.1	20	MOE
1992 10 17.98	B	7.9	NP	5.0	B		12					GRE
1992 10 17.98	S	7.1	NP	5.0	B		12	&12	5			GRE
1992 10 17.99	B	7.7	NP	8.0	B		20	& 8	4			GRE
1992 10 17.99	S	6.9	AC	5.0	B		10	12.5	5			BOR
1992 10 17.99	S	7.1	AC	8.0	B		20	10.5	6			BOR

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

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 10 18.02	S	7.9	AC	11.4	L	8	40	4	3			VIE
1992 10 18.10	K	7.0:	AA	4.0	B		8	16	2			KEE
1992 10 18.10	S	7.5	AA	20.3	R	15	152	9	3/			HER02
1992 10 18.74	S	7.1	AA	8.0	B		15	8.5	4	0.2	15	HAV
1992 10 18.74	S	7.5	AC	15.2	L	5	44	6.0	4	0.1	20	MOE
1992 10 18.74	S	7.7	S	10.0	B		25	7.0	4			HAS02
1992 10 18.75	S	6.5	SC	5.0	B		10	10				CAV
1992 10 18.75	S	6.6	S	5.0	B		10	10				CAV
1992 10 18.75	S	7.4	AA	8.0	B		20	10	5			BAR
1992 10 18.77	S	7.4	AC	20	T	10	77	7	4			TOM01
1992 10 18.77	S	7.7	AC	15.2	L	5	76	5.0	4			MOE
1992 10 18.78	B	7.9	A	12	L	6	40	> 4			270	REN
1992 10 18.80	S	7.3	AA	5.0	B		10	6	5			ZAN
1992 10 18.82	B	6.8	S	11	L	8	32					KYS
1992 10 18.94	S	7.6	A	20.0	T		77	& 5	5/			COM
1992 10 19.03	B	7.3	S	8.0	B		20	7	4			KRO02
1992 10 19.77	S	7.0	AA	5.0	B		10	6.5	6			LOO01
1992 10 19.77	S	7.6	S	10.0	B		25	5.1	4			HAS02
1992 10 19.78	B	7.8	A	12	L	6	40	7.5	4		250	REN
1992 10 19.78	M	7.8	A	12	L	6	40					REN
1992 10 19.82	S	6.9	AA	6.3	B		9	5	3			NIE
1992 10 19.92	S	7.3	AC	15.2	L	5	44	6.5	3	0.2	25	MOE
1992 10 20.00	S	7.5	AA	20.0	T	10	50	3.1	4/			SHA04
1992 10 20.08	S	7.2	AA	5.0	B		10					COL
1992 10 20.09	S	7.1	AA	20.3	R	15	152		3/			HER02
1992 10 20.12	K	7.0	S	4.0	B		8	15	2			KEE
1992 10 20.20	B	7.3	AA	20.4	L	6	35	& 8	2			JAH
1992 10 20.74	B	7.0	AA	5.0	R	4	10	7	4			MOE
1992 10 20.74	S	6.9	AC	15.2	L	5	44	7.5	3	0.3	25	MOE
1992 10 20.78	S	7.0	AC	15.2	L	5	76	6.5	4	0.2	25	MOE
1992 10 20.83	S	7.3	SC	20.3	T	10	80	4.5	3			DAH
1992 10 21.02	S	7.4	AA	20.0	T	10	50	3.3	5/			SHA04
1992 10 21.04	B	7.2	S	8.0	B		20	5	4			KRO02
1992 10 21.04	B	7.5	S	33.3	L	4	56	4.0	5			KRO02
1992 10 21.06	S	7.2	AA	5.0	B		10					COL
1992 10 21.10	S	7.2	NP	5.0	B		10					SCO01
1992 10 21.80	S	6.7	A	6.7	R	4	14	12	5	0.2		BUS01
1992 10 21.80	S	7.5	AA	20.3	T	10	50	7	3			BRE02
1992 10 21.89				20.0	T	10	77			0.2	360	COM
1992 10 21.89	S	6.8	AC	15.2	L	5	44	7.0	4	0.3	30	MOE
1992 10 21.89	S	6.9	A	6.7	R	4	14	10	6			BUS01
1992 10 21.89	S	7.1	A	5.0	B		10	& 3	6			COM
1992 10 21.92	S	6.8	A	8.0	B		15	8	6			SCH04
1992 10 22.03	B	7.2	S	8.0	B		20	6	3			KRO02
1992 10 22.03	B	7.5	S	33.3	L	4	56	3.8	4	?		KRO02
1992 10 22.71	S	7.0	AA	6.0	B		20	7	5			KES01
1992 10 22.72	B	7.2	S	10.0	B		25	10				ZNO
1992 10 22.73	B	6.8	AA	5.0	R	4	10	7	4			MOE
1992 10 22.73	S	7.2	SC	33	L	4	56	7.5	2/	0.3	30	BOA
1992 10 22.74	S	6.6	AC	15.2	L	5	44	8.5	4	0.8	30	MOE
1992 10 22.75	S	7.3	AA	8.0	B		20	8		&0.2	30	BAR
1992 10 22.77	S	7.1	AC	20	T	10	77	7	4			TOM01
1992 10 22.78	S	7.3	AA	5.0	B		7	&10	5/			MIK
1992 10 22.79	M	7.6	A	12	L	6	40	7	5/			REN
1992 10 22.89	B	6.4	AA	5.0	R	10	13	&10	4			JAH
1992 10 22.89	S	6.5	AA	5.0	R	10	13					JAH
1992 10 22.98				31.7	L	6	55	4.5	5/	?		BOR
1992 10 22.98	S	6.5	HR	5.0	B		10	7.5	5			BOR
1992 10 22.99	B	6.7	SC	6.3	B		9					CHE

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

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 10 23.03	S	7.1	AA	20.0	T	10	50	3.6	6/			SHA04
1992 10 23.11	M	6.5	AA	8.0	B		20	10	4			MOR
1992 10 23.11	S	6.8	NP	5.0	B		10		4			SCO01
1992 10 23.71	S	6.8	A	5.0	B		10	6	2			SAR02
1992 10 23.74	M	8.0	AA	20.0	T	10	77	> 3	2			OFE
1992 10 23.75	S	7.7	S	8.0	B	4	20	3	5			SCH07
1992 10 23.77	S	6.6	AA	5.0	B		10	8	6			LOO01
1992 10 23.78	S	6.5	A	6.7	R	4	14	11	5/			BUS01
1992 10 23.78	S	6.8	A	3.0	B		8	>11	4			BUS01
1992 10 23.80	S	7.2:	S	15.0	L	8	30	& 7	3			THO03
1992 10 23.98	B	6.7	HR	5.0	B		10					BOR
1992 10 23.98	B	6.9	S	5.0	B		12					GRE
1992 10 23.98	S	6.5	HR	5.0	B		10	9	6			BOR
1992 10 23.99	S	6.3	S	5.0	B		12	&11	5/			GRE
1992 10 23.99	S	6.5	MC	5.0	B		12					GRE
1992 10 24.00	S	6.8	SC	8.0	B	4	20	7	4			AND01
1992 10 24.06	S	6.8	AA	5.0	B		10					COL
1992 10 24.68	M	8.0	AA	20.0	T	10	77	> 4	3			OFE
1992 10 24.68	S	6.8	A	6.0	B		20	8	5			KER
1992 10 24.73	S	7.0	SC	33	L	4	56	9	2/	0.4	32	BOA
1992 10 24.74	S	6.7	AA	8.0	B		20	10	5	&0.3	50	BAR
1992 10 24.75	S	6.8	SC	8.0	B	4	20	8	4			AND01
1992 10 24.77	S	6.3	A	6.7	R	4	14	12	5/			BUS01
1992 10 24.78	B	6.2	S	5.0	B		7					KYS
1992 10 24.78	S	7.0	AC	8.0	B		11	8	5			TOM01
1992 10 24.84	M	6.5	AA	8.0	B		11	15	6			GAL
1992 10 24.84	M	6.6	A	5.0	B		7					PED01
1992 10 24.84	S	6.6	AA	6.3	B		9	5	3			NIE
1992 10 24.88	S	6.6	AA	5.0	B		10	15	5			KID
1992 10 24.90	S	6.6	A	8.0	B		11		7			BEL04
1992 10 24.94	S	6.7	A	5.0	B		10	& 7	6			COM
1992 10 25.00	S	7.0	AA	20.0	T	10	50	3.6	7			SHA04
1992 10 25.09	M	6.5	AA	4.0	B		8	12	4			KEE
1992 10 25.11	M	6.3	AA	5.0	B		10		4/			MOR
1992 10 25.14	S	6.7	A	8.0	B		11	10	4			SPR
1992 10 25.18				20.0	T	10	77			&0.1		COM
1992 10 25.18	S	6.7	A	5.0	B		10	& 7	6			COM
1992 10 25.73	S	7.5	AA	20.3	T	10	50	10	2			BRE02
1992 10 25.75	S	6.7	AA	5.0	B		10	& 8	4			ZAN
1992 10 25.78	M	7.3	A	12	L	6	40	& 7	5		270	REN
1992 10 25.81	S	7.2:	S	15.0	L	8	30	& 7	3			THO03
1992 10 25.85	M	6.8	AA	8.0	B		11	8	5			GAL
1992 10 25.85	S	6.9	AA	5.0	B		10	8	4			KID
1992 10 25.88	M	6.8	A	5.0	B		7		6			PED01
1992 10 25.95	S	6.6:	V	5.0	B		7	& 3				HEE
1992 10 26.01	B	6.8	S	8.0	B		20	6	5	0.5	22	KRO02
1992 10 26.01	B	7.0	S	33.3	L	4	56	4.8	4			KRO02
1992 10 26.02	S	6.9	AA	20.0	T	10	50	3.4	7			SHA04
1992 10 26.11 a	S	6.2	HR	5.0	B		10	9.5	5			BOR
1992 10 26.14	S	6.6	A	8.0	B		11	9	4			SPR
1992 10 26.16	S	6.7	A	20.0	T	10	64	6	5			SPR
1992 10 26.73	S	6.3	S	5.0	B		10					CAV
1992 10 26.74	S	6.5	AA	8.0	B		20	10	6			BAR
1992 10 26.74	S	6.6	AA	8.0	B		15	5.0	5			HAV
1992 10 26.74	S	6.6	AC	8.0	B		11	8	6			TOM01
1992 10 26.74	S	6.6	V	5.0	B		7	2.5				HEE
1992 10 26.76				20.0	T	10	77			0.2	260	COM
1992 10 26.76	S	6.1	S	6.7	R	4	14	13	5/			BUS01
1992 10 26.76	S	6.5	A	5.0	B		10	& 7	6			COM

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

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 10 26.76	S	6.5	S	3.0	B		8	&15	4			BUS01
1992 10 26.76	S	6.8	A	5.0	B		10	6	4			FOG
1992 10 26.77	B	6.1	AA	5.0	B		10	8	5			MOE
1992 10 26.77	S	6.1	AC	15.2	L	5	44	9.5	5	0.9	30	MOE
1992 10 26.77	S	6.3	S	10.8	L	4	22	11	6			BUS01
1992 10 26.79	S	6.8	AA	5.0	B		7	& 8	7			MIK
1992 10 26.83	S	7.0	AA	20.3	T	10	111	5	4			BRE02
1992 10 26.85	S	6.4	AA	5.0	B		10	15	6			KID
1992 10 27.02	S	6.8	AA	20.0	T	10	50	3.1	8	1.0	325	SHA04
1992 10 27.06	S	6.2	AA	5.0	B		10	7				COL
1992 10 27.07	M	6.2	AA	4.0	B		8	13	4			KEE
1992 10 27.08	S	6.7	AC	5.0	B		10	5.5	4			VIE
1992 10 27.11	S	6.2	AA	20.3	R	15	152	8	6			HER02
1992 10 27.24	S	6.5	A	8.0	R	3	19	5	5			SPR
1992 10 27.77	S	6.6	AA	6.0	B		20	10	4			BOA
1992 10 27.79	M	7.3	SC	8.0	B	4	20	5	4			DUS
1992 10 27.85	M	6.5	AA	8.0	B		11	20	6			GAL
1992 10 27.85	S	6.4	S	8.0	B	4	20	5.5	4	0.5	355	DAN01
1992 10 27.88	S	6.7	SC	8.0	B	4	20	8	5			AND01
1992 10 27.89	S	6.2	AA	8.0	R	11	102	&15				BOS
1992 10 27.99	B	6.6	HR	5.0	B		10					BOR
1992 10 27.99	S	6.3	HR	5.0	B		10	8	6			BOR
1992 10 28.00	B	6.4	S	5.0	B		12					GRE
1992 10 28.01	B	6.5	S	3.5	B		7		7			GRE
1992 10 28.01	S	6.1	S	5.0	B		12	&13	5/			GRE
1992 10 28.02	B	6.7	SC	8.0	B		20	7	5	0.43	28	KRO02
1992 10 28.12	S	6.4	A	8.0	R	3	19	6	4			SPR
1992 10 28.18	S	6.3	S	5.0	B		10	& 8	7			COM
1992 10 28.73	S	7.0	AA	20.3	T	10	50	7	3			BRE02
1992 10 28.73	S	7.0:	S	15.0	L	8	30	& 6	4			THO03
1992 10 28.74	B	5.9	AA	10.0	B		14	8	5			MOE
1992 10 28.74	S	6.2	AA	6.3	B		9	5	4			NIE
1992 10 28.75	M	6.4	AA	8.0	B		11	20	6	0.5		GAL
1992 10 28.75	S	6.5	AA	5.0	B		10	6.5	6			LOO01
1992 10 28.76	S	6.0	S	6.7	R	4	14	11	6			BUS01
1992 10 28.76	S	6.4	S	5.0	B		10		6			COM
1992 10 28.79	S	7.0	AA	8.0	B		20	6	4			SCH05
1992 10 28.81	M	7.1	A	12	L	6	40	7.5	5/		270	REN
1992 10 28.82	B	6.9	A	3	R	4	6		4			REN
1992 10 28.99	B	6.8	HR	5.0	B		10					BOR
1992 10 28.99	S	6.4	HR	5.0	B		10	9	6			BOR
1992 10 29.09	B	6.2	AA	20.3	R	15	152	5.5	6/			HER02
1992 10 29.74	S	5.7	S	6.7	R	4	14	13	6			BUS01
1992 10 29.74	S	7.0:	S	6.0	R	7	20	& 6	4			THO03
1992 10 29.75	S	6.5	AA	3.0	B		7	6.5	7			LOO01
1992 10 29.76	B	6.0	S	11	L	8	32					KYS
1992 10 29.76	S	5.9	S	10.8	L	4	22	10	6/	0.2	30	BUS01
1992 10 29.77				11.0	L	7	54			&0.1	310	COM
1992 10 29.77	S	6.0	S	8.0	B		15	10	6			SCH04
1992 10 29.78	B	7.4	S	10.0	B		25	7.0	4			HAS02
1992 10 29.78	S	7.3	S	10.0	B		25					HAS02
1992 10 29.79	B	5.9	AA	5.0	B		10	8	5			MOE
1992 10 29.79	S	6.5	AA	20.3	T	10	50	7	3			BRE02
1992 10 29.80	S	5.9	AC	15.2	L	5	44	9.0	5	0.5	30	MOE
1992 10 29.81	S	6.0	AC	15.2	L	5	76	8.5	5			MOE
1992 10 29.83	S	6.4:	AA	20.3	T	10	80	5.0	3/			DAH
1992 10 29.85	S	6.2	S	5.0	B		10	&10	6			COM
1992 10 30.00	S	6.2	AC	5.0	B		10	6	5			VIE
1992 10 30.00	S	6.5	AA	20.0	T	10	50	2.9	8/	1.0	278	SHA04

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

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 10 30.06	S	6.2	SC	6.0	R	4	10	6	4			GRA04
1992 10 30.08	S	5.8	AA	8.0	B		11		5			HER02
1992 10 30.18	S	6.1	S	5.0	B		10	&10	6			COM
1992 10 30.71	S	6.9:	S	15.0	L	8	30	& 7	5			THO03
1992 10 30.72	B	6.1	AA	5.0	R	10	13	7.3	5			JAH
1992 10 30.73	B	5.9	AA	5.0	B		10	8	5			MOE
1992 10 30.73	S	6.0	AA	6.3	B		9	7	4			NIE
1992 10 30.73	S	7.2	S	8.0	B	4	20	5	5			SCH07
1992 10 30.74	S	6.3	AA	48.5	L	4	117	8	5	0.3	30	MOE
1992 10 30.78	B	6.0	S	5.0	B		7					KYS
1992 10 30.80	S	7.3	SC	8.0	B	4	20	8	3			EKL
1992 10 30.81	S	6.3	SC	15.2	L	5	63	9	5			BEN03
1992 10 30.97	S	6.1	AC	5.0	B		10		5			VIE
1992 10 31.00	S	6.4	AA	20.0	T	10	50	3.2	8/	1.0	270	SHA04
1992 10 31.73	M	5.6	SC	4.0	B		12	14	4			DAH
1992 10 31.73	S	5.8	AA	5.0	B		10	11	4			ZAN
1992 10 31.73	S	5.8	AA	8.0	B		20	10	5/			ZAN
1992 10 31.73	S	5.9	SC	4.0	B		12	9	4			GRA04
1992 10 31.73	S	6.0	AA	6.3	B		9	7	4			NIE
1992 10 31.73	S	6.1	AA	8.0	B		15	7.5	5/	0.4	30	HAV
1992 10 31.74	B	6.1	SC	4.0	B		12					GRA04
1992 10 31.74	S	5.8	S	10.8	L	4	22	10	6/			BUS01
1992 10 31.75	S	5.6	S	6.7	R	4	14	12	6			BUS01
1992 10 31.76	S	7.0:	S	15.0	L	8	30	& 6	5			THO03
1992 10 31.85	S	6.4	AA	5.0	B		10	15	7			KID
1992 10 31.97	S	6.1	AC	5.0	B		10	5	5			VIE
1992 11 01.00	S	6.1	AA	20.0	T	10	50	3.3	9	1	263	SHA04
1992 11 01.11	M	5.9	AA	5.0	B		10	11	5/			MOR
1992 11 01.12	S	6.1	A	8.0	R	3	19	6	5	0.25	55	SPR
1992 11 01.71	S	7.0:	S	15.0	L	8	30	& 8	5			THO03
1992 11 01.72	B	5.9	S	5.0	B		7					KLA01
1992 11 01.72	S	5.9	AA	6.3	B		9	8	4			NIE
1992 11 01.96	B	5.9	Y	3.5	B		7	&15	6/			GRE
1992 11 01.96	B	6.0	S	3.5	B		7					GRE
1992 11 01.96	B	6.5	AC	8.0	B	4	11	13	6	0.05	0	NOW
1992 11 01.97	B	6.0	Y	5.0	B		12					GRE
1992 11 01.97	B	6.1	S	5.0	B		12					GRE
1992 11 01.98	S	5.7	AA	5.0	B		12	&12	5/			GRE
1992 11 01.99	B	6.0	Y	5.0	B		7					MAR03
1992 11 01.99	B	6.1	NO	5.0	B		10					BOR
1992 11 01.99	B	6.3	HR	5.0	B		10					BOR
1992 11 01.99	S	5.8	HR	5.0	B		10	13	6			BOR
1992 11 01.99	S	5.8	NO	5.0	B		10					BOR
1992 11 02.00	S	5.9	AA	5.0	B		10	8	5			VIE
1992 11 02.05	S	5.9	AA	20.0	T	10	50	& 3.5	9	&1	322	SHA04
1992 11 02.06	S	5.8	AA	5.0	B		10					COL
1992 11 02.09	B	6.0	AA	20.3	R	15	152	12	5			HER02
1992 11 02.10	S	5.7	AA	5.6	B		8	12	4			HER02
1992 11 02.69	B	5.9	AA	15.6	L	10	54	10	5	0.4	56	KOS
1992 11 02.70	S	5.9	A	16	L	6	80	7	3			HAD01
1992 11 02.77	S	6.8	AA	10.0	B		25	6.4	3	0.47	25	HAS02
1992 11 02.78	B	6.7	AA	3.0	B		8					HAS02
1992 11 02.78	S	6.8:	S	15.0	L	8	30	& 6	4			THO03
1992 11 02.85	B	6.2	S	5.0	B		7		4			TRI
1992 11 03.10	M	5.9	AA	5.0	B		10	11	6			MOR
1992 11 03.12	S	5.9	A	5.0	B		7	6	5			SPR
1992 11 03.40	B	5.8	S	7.0	B		10	10	5	1.0	40	OHK
1992 11 03.69	S	5.9	SC	8.0	B	4	20	8	5	0.5		AND01
1992 11 03.71	B	5.5	AA	5.0	B		10	10	5	1.5	35	MOE

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

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 11 03.72	S	5.6	AA	15.2	L	5	44	9.5	5	1.1	35	MOE
1992 11 03.73	M	6.4	S	10.0	B	4	25	7	4			LEH
1992 11 03.73	S	5.7	AA	15.2	L	5	76	9.0	5	0.5	35	MOE
1992 11 03.73	S	5.9	AA	8.0	B		15	7	5/	0.5	35	HAV
1992 11 03.74	S	6.6	AA	10.0	B		25		4			HAS02
1992 11 03.75	B	5.7	S	5.0	B		7					KYS
1992 11 03.75	M	6.7	SC	8.0	B		15	6	4			DUS
1992 11 03.75	S	6.3	SC	8.0	B	4	20	6	5	1	20	DAN01
1992 11 03.75	S	6.3	SC	8.0	B	4	20	6	5	1	20	DAN01
1992 11 03.76	S	5.9	AA	6.3	B		9	8	5			NIE
1992 11 03.76	S	6.1	SC	25.4	L	6	90	7	6	0.3	170	DAN01
1992 11 03.76	S	6.1	SC	25.4	L	6	90	7	6	&0.4	170	DAN01
1992 11 03.79	B	6.6	SC	8.0	B		10		4			VEL02
1992 11 03.79	M	6.7	SC	8.0	B	6	15	6	4			DUS
1992 11 03.81	S	5.7	S	8.0	B		15	&10	6/			SCH04
1992 11 03.88	B	6.0	S	5.0	B		7		4	1	300	TRI
1992 11 04.00	S	5.7	AA	20.0	T	10	50	2.7	9	1	258	SHA04
1992 11 04.72	S	5.6	AA	6.0	B		20	11	6			BOA
1992 11 04.73	S	5.7	AA	8.0	B		20	11	7	&0.6	45	BAR
1992 11 04.74	B	5.6	AA	5.0	B		10	9	6	0.8	35	MOE
1992 11 04.74	B	5.8	SC	5.0	B		7	&10				SKI
1992 11 04.74	B	6.1	SC	4.0	B		12	11	5	2.4	39	DAH
1992 11 04.75	S	5.6	AC	20	T	10	77	8	6			TOM01
1992 11 04.76	S	5.8	SP	5.0	R		8	4.5	6			MID01
1992 11 04.78	S	5.8	SC	3.5	B		7	10	5			GRA04
1992 11 04.78	S	6.8	AA	20.3	T	10	50	6	5			BRE02
1992 11 04.80	S	5.9	AA	6.3	B		9	10	5			NIE
1992 11 04.85	S	5.8	SC	8.0	B	4	20	6	6			DAN01
1992 11 04.93	! M	5.7	SC	20.3	T	10	80	4.5	4			DAH
1992 11 05.00	S	5.5	AA	20.0	T	10	50	3.1	9	1	246	SHA04
1992 11 05.06	S	5.4:	AA	5.0	B		10	10		1	58	COL
1992 11 05.07	M	5.6	AA	4.0	B		8	11	4			KEE
1992 11 05.10	B	5.4	SC	5.0	B		7					DIL
1992 11 05.73	S	5.4	AC	20	T	10	77	10	7			TOM01
1992 11 05.77	S	5.6	AA	5.0	B		7	20	3			UJV
1992 11 05.78	S	5.5	AC	8.0	B		11	8	7			TOM01
1992 11 06.09	S	5.8:	AA	5.6	B		8		2			HER02
1992 11 06.68	S	5.6	A	6.0	B		20	8	5			SAR02
1992 11 06.69	S	5.7	A	6.0	B		20	9	7			KER
1992 11 06.70	S	5.4	AA	5.0	B		7	25	4			UJV
1992 11 06.72	S	5.5	AA	8.0	B		15	7	6	0.6	38	HAV
1992 11 06.72	S	5.8	AA	33	L	4	56	9	6/			BOA
1992 11 06.75	B	5.2	S	10.0	B		25	10		0.3		ZNO
1992 11 06.75	B	5.4	S	5.0	B		7					KYS
1992 11 06.75	S	6.4	AA	10.0	B		25		4			HAS02
1992 11 06.90	B	5.5:	SC	5.0	B		7	&10				SKI
1992 11 07.03	S	5.4	AA	5.0	B		12	&10	6/			GRE
1992 11 07.08	S	5.3	AA	5.0	B		10	&10		&0.67	90	COL
1992 11 07.08	S	5.7	AA	5.6	B		8		6			HER02
1992 11 07.21	S	5.9	AA	5.0	B		10					LOO01
1992 11 07.68	B	5.5	AA	15.6	L	10	54	12	7	0.9	50	KOS
1992 11 07.69	S	5.5	A	6.0	B		20	8	7			SAR02
1992 11 07.70	S	5.4	A	6.0	B		20	8	6			KER
1992 11 07.70	S	5.7	A	16	L	6	80	8	3			HAD01
1992 11 07.71	S	6.4	SC	20.3	T	10	80	5.3	6/			GRA04
1992 11 07.72	B	5.3	S	5.0	B		7					KYS
1992 11 07.73	M	5.4	AA	8.0	B		20	10	6	1.2	50	ZAN
1992 11 07.73	S	5.4	AA	4.2	B		7	12	6/			ZAN
1992 11 07.73	S	5.4	AA	8.0	B		20	12	7	1.2	50	BAR

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

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 11 07.73	S	5.6	S	0.0	E		1					CAV
1992 11 07.73	S	6.0	AA	20.3	T	10	50	7	4			BRE02
1992 11 07.74	S	5.5	AA	6.0	B		20	10	6/			BOA
1992 11 07.74	S	5.6	AA	6.0	B		20	9	6			MIS01
1992 11 07.75	B	5.4	AA	5.0	B		10	9	5	1.0	35	MOE
1992 11 07.75	S	5.3	AA	5.0	B		7	15	4			UJV
1992 11 07.76	S	6.2	AA	10.0	B		25	4.6	4			HAS02
1992 11 07.77	B	5.7	SC	3.5	B		7	10	5			GRA04
1992 11 07.77	B	5.9	S	5.0	B		7					KLA01
1992 11 07.77	S	5.6	SC	3.5	B		7					GRA04
1992 11 07.78	B	6.0	SC	8.0	B		10		4			VEL02
1992 11 08.08	S	5.4	AA	5.6	B		8		3			HER02
1992 11 08.39	B	5.5	S	7.0	B		10	8	5			OHK
1992 11 08.69	S	5.5	A	6.0	B		20	8	7			KER
1992 11 08.69	S	5.5	SC	8.0	B	4	20	9	6			AND01
1992 11 08.70	S	5.8	SC	3.5	B		7	9.5	5/			GRA04
1992 11 08.71	M	7.6	AA	20.0	T	10	77	> 5	6			OFE
1992 11 08.71	S	5.5	A	6.0	B		20	8	6			SAR02
1992 11 08.71	S	5.6	AA	6.3	B		9	10	5			NIE
1992 11 08.73	S	6.2	S	8.0	B	4	20	3	5			SCH07
1992 11 08.75	B	6.3	SC	8.0	B		10		4			GEO
1992 11 08.76	B	5.9	SC	20.3	T	10	80	4.5	4/			DAH
1992 11 08.76	B	6.3	SC	8.0	B		10		5			VEL02
1992 11 08.77	S	5.2	AA	5.0	B		7	20	4			UJV
1992 11 08.79	B	5.3	AA	5.0	B		10	8	6	0.5	35	MOE
1992 11 08.87	S	6.3	SC	8.0	B		11	6	6			WAR01
1992 11 08.97	B	6.0	HR	5.0	B		10					BOR
1992 11 08.97	B	6.0	NO	5.0	B		10					BOR
1992 11 08.97	S	5.6	HR	5.0	B		10	7	7			BOR
1992 11 08.97	S	5.6	NO	5.0	B		10					BOR
1992 11 09.00	S	5.7	AA	5.0	B		10	4	5			VIE
1992 11 09.02	B	5.6	SC	8.0	B		20	8	5	0.75	45	KRO02
1992 11 09.05	M	5.4	AA	4.0	B		8	11	4			KEE
1992 11 09.08	S	5.7	A	8.0	B		11	8	5			SPR
1992 11 09.09	S	5.6	AA	5.6	B		8	11	2			HER02
1992 11 09.69	S	5.6	A	6.0	B		20	6	8			SAR02
1992 11 09.71	B	5.3	AA	5.0	B		10	8	6	1.2	40	MOE
1992 11 09.72	M	5.3	S	10.0	B	4	25	5	5			LEH
1992 11 09.72	S	5.3	AA	15.2	L	5	44	8.5	6	1.1	40	MOE
1992 11 09.73	S	5.5	SC	8.0	B	4	20	9	6	0.2		AND01
1992 11 09.74	S	5.2	AA	5.0	B		7	20	4			UJV
1992 11 09.75	B	5.5	S	5.0	B		7					KLA01
1992 11 09.76	B	5.8	SC	8.0	B		10		5			GEO
1992 11 09.76	S	6.1	AA	8.0	B		15	& 5	6/			MIK
1992 11 09.77	S	5.5	A	6.0	B		20	8	6			KER
1992 11 09.77	S	6.0	AA	5.0	B		7	& 4	7			MIK
1992 11 09.81	B	5.8	SC	8.0	B		10		6			VEL02
1992 11 09.96	S	5.6	AA	5.0	B		10		5			VIE
1992 11 10.08	M	5.5	AA	4.0	B		8					KEE
1992 11 10.09	S	5.4	A	5.0	B		7	5	5			SPR
1992 11 10.10	S	5.5	A	20.0	T	10	64	5	6			SPR
1992 11 10.68	B	5.4	AA	15.6	L	10	54	12	7	1.4	17	KOS
1992 11 10.69	S	5.3	A	6.0	B		20	7	6			SAR02
1992 11 10.71	B	5.2	AA	5.0	B		10	9	6	0.8	40	MOE
1992 11 10.72	S	5.2	AA	15.2	L	5	44	9.5	6	1.4	45	MOE
1992 11 10.77	B	5.9	SC	8.0	B		10		6			VEL02
1992 11 10.81	B	5.9	SC	8.0	B		10		6			VEL02
1992 11 10.96	B	5.8	HR	5.0	B		10					BOR
1992 11 10.96	S	5.4	HR	5.0	B		10	6.5	6/			BOR

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

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 11 11.77	B	5.8	S	5.0	B		7	& 7	5	1.5		TRI
1992 11 11.78	B	5.7	SC	8.0	B		10		6			VEL02
1992 11 12.71	S	5.8	AA	10.0	B		25	6.5	4	0.5	40	HAS02
1992 11 12.72	B	5.7	AA	3.0	B		8					HAS02
1992 11 12.72	I	5.8	AA	0.8	E		1					HAS02
1992 11 12.73	S	5.1	AA	8.0	B		20	10	7	0.5	40	BAR
1992 11 12.73	S	5.3	AA	8.0	B		15	7.5	6	0.9	42	HAV
1992 11 12.75	S	6.6	A	5.0	B		10	9	4			FOG
1992 11 12.76	M	5.9	S	10.0	B	4	25	8	7			LEH
1992 11 12.76	S	5.1	AA	4.2	B		7	12	7			ZAN
1992 11 12.77	B	5.5	A	5.0	B		7	& 6	5	1.5		TRI
1992 11 12.77	M	5.9	S	8.0	B		10	10	6			LEH
1992 11 13.00	B	5.4	SC	8.0	B		20	6	6	0.38	43	KRO02
1992 11 13.06	B	5.2	SC	5.0	B		7					DIL
1992 11 13.09	M	5.3	AA	5.0	B		10	11	7/	2.0	58	MOR
1992 11 13.11	I	5.3	AA	0.7	E		1		9			MOR
1992 11 13.68	B	5.5	AA	15.6	L	10	54	12	7	0.9	45	KOS
1992 11 13.68	S	5.3	A	6.0	B		20	9	8			KER
1992 11 13.68	S	5.8	AA	6.0	B		20	13	7	0.7	45	CSU
1992 11 13.70	S	5.2	A	33.3	L	4	56	10	7	1.5	45	SZE02
1992 11 13.70	S	5.3	A	6.0	B		20	8	8			SAR02
1992 11 13.73	S	5.0	AA	5.0	B		7		5			UJV
1992 11 13.74	B	5.0	S	5.0	B		7					KLA01
1992 11 13.74	S	5.4	AA	5.0	R		10	10	7	0.7	35	LOO01
1992 11 13.75	S	5.3	AA	6.3	B		9	10	5			NIE
1992 11 13.79	B	6.0	SC	8.0	B		10		6			VEL02
1992 11 13.85	B	5.1	AA	5.0	B		10	9	6	0.8	50	MOE
1992 11 13.96				12.0	B		20	7.2	7	1.6	42	BOR
1992 11 13.96				31.7	L	6	55	5.7	7	1.1	42	BOR
1992 11 13.96				50.0	L	5	78	3.8	7	&1	42	BOR
1992 11 13.96	B	5.5	HR	5.0	B		10					BOR
1992 11 13.96	S	5.4	HR	5.0	B		10	9	7			BOR
1992 11 13.97	S	5.5	AA	5.0	B		10		6			VIE
1992 11 13.98	S	5.3	AA	5.0	B		12	& 8	6/			GRE
1992 11 14.00	S	5.9	AA	5.0	B		20	10	4			DES01
1992 11 14.01	B	5.3	SC	8.0	B		20	8	6	0.83	42	KRO02
1992 11 14.01	B	5.8	SC	33.3	L	4	56	5.8	5	0.27	42	KRO02
1992 11 14.06	M	5.4	AA	4.0	B		8	9	4	0.67	40	KEE
1992 11 14.09	M	5.4	AA	5.0	B		10	11	7/	4.0	46	MOR
1992 11 14.11	S	5.3	AA	8.0	B		11		7	&3		HER02
1992 11 14.68	S	5.4	SP	5.0	R		8	4	6			MID01
1992 11 14.69	B	5.1	AA	5.0	B		10	9	7	1.5	50	MOE
1992 11 14.70	B	5.5	SC	3.0	R		6	6	7			DAH
1992 11 14.70	M	5.6	SC	20.3	T	10	80	6	6/			DAH
1992 11 14.71	N	11.3	AC	20.3	T	10	200					DAH
1992 11 14.71	S	5.1	AA	15.2	L	5	44	8.5	7	1.8	50	MOE
1992 11 14.71	S	5.3	AA	6.3	B		9	10	5			NIE
1992 11 14.71	S	5.4	SC	3.5	B		7	8.5	5			GRA04
1992 11 14.72	I	5.0:	AA	0.0	E		1					MOE
1992 11 14.72	S	4.7	AA	0.0	E		1	&12				HAV
1992 11 14.72	S	4.8	AA	5.0	B		10	12	6/	1.8	44	HAV
1992 11 14.72	S	6.1	A	5.0	B		10	12	4			FOG
1992 11 14.73	S	5.5	S	0.0	E		1					CAV
1992 11 14.74	S	5.0	AA	8.0	B		20	11	6	1.3	25	BAR
1992 11 14.74	S	5.2	A	6.0	B		20	6	7			SAR02
1992 11 14.74	S	5.2	A	6.0	B		20	8	8			KER
1992 11 14.76	M	5.9	AA	8.0	B		15	& 8	6	&1	25	MIK
1992 11 14.77	B	5.6	AA	3.0	B		8					HAS02
1992 11 14.79	B	5.5	A	5.0	B		7		5			TRI

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

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 11 14.79	S	5.6	AA	10.0	B		25	7.0	4			HAS02
1992 11 14.80	V	5.8	AA	6.3	A	4		+11	8	&1.5	40	MIK
1992 11 14.81	M	6.0:	SC	20.3	T	10	80	4.9	6	0.12	30	GRA04
1992 11 14.82	S	5.1	AA	4.2	B		7	12	7	1.7	20	ZAN
1992 11 14.95	B	5.5	AA	5.0	B		12					GRE
1992 11 14.95	S	5.1	AA	5.0	B		12	&10	6/			GRE
1992 11 14.96	B	5.6	HR	5.0	B		10					BOR
1992 11 14.96	S	5.5	HR	5.0	B		10	9.5	7			BOR
1992 11 15.07	I	5.2	AA	0.9	E		1					KEE
1992 11 15.07	M	5.3	AA	4.0	B		8	9	4	1.0	40	KEE
1992 11 15.09	M	5.3	AA	8.0	B		20	9	7/	3.25	48	MOR
1992 11 15.70	S	5.3	SP	5.0	R		8	5	6			MID01
1992 11 15.76	B	5.5	SC	3.5	B		7	6.0	5			GRA04
1992 11 15.77	B	6.0	SC	8.0	B		10		6			VEL02
1992 11 15.78	M	5.7	SC	20.3	T	10	80	4.5	6/	0.15	40	GRA04
1992 11 15.79	S	4.9	AA	5.0	B		10	6.8	7			LOO01
1992 11 15.93	B	5.8	S	7.0	B		10	10.5	4			DEA
1992 11 15.98	B	5.2	SC	6.3	B		9			1.5	45	CHE
1992 11 15.98	B	5.3	Y	5.0	B		7					MAR03
1992 11 15.99				31.7	L	6	55	4.5	7	0.6	30	BOR
1992 11 15.99	B	5.3	HR	5.0	B		10					BOR
1992 11 15.99	S	5.3	HR	5.0	B		10	8	7			BOR
1992 11 16.00	S	5.3	AA	20.0	T	10	50	4.6	9	1	80	SHA04
1992 11 16.02	B	5.0	SC	8.0	B		20	8	7	0.72	41	KRO02
1992 11 16.02	B	5.3	SC	33.3	L	4	56	6.1	7	0.20	41	KRO02
1992 11 16.70	S	5.3	AA	20.3	T	10	50	7	4	0.2	10	BRE02
1992 11 16.70	S	5.7	SC	5.0	B		7	6.0	5			HEE
1992 11 16.75	I	5.5	AA	0.8	E		1					HAS02
1992 11 16.75	S	5.4	AA	10.0	B		25	7.0	4	0.4	48	HAS02
1992 11 16.80	B	6.1	SC	8.0	B		10		6			VEL02
1992 11 16.82	B	5.0	A	5.0	B		7		5/	2	305	TRI
1992 11 16.82	E	5.0	A	5.0	B		7					TRI
1992 11 16.94	B	5.4	AA	5.0	B		12					GRE
1992 11 16.94	S	4.8	AA	5.0	B		12	&10	6/			GRE
1992 11 16.97				12.0	B		20	8.5	7	1.7	55	BOR
1992 11 16.97				50.0	L	6	78	5.1	7	&1	55	BOR
1992 11 16.97	B	5.2	HR	5.0	B		10					BOR
1992 11 16.97	S	5.2	HR	5.0	B		10	9.5	7	1.7	55	BOR
1992 11 17.74	S	5.5	AA	20.3	T	10	50	5	7			BRE02
1992 11 17.74	S	5.7	SC	5.0	B		7	7	5			HEE
1992 11 17.76	S	4.9	AA	5.0	B		10	5.5	7			LOO01
1992 11 17.80	B	5.6	A	5.0	B		7		6			TRI
1992 11 18.08	B	5.5	SC	5.0	B		7					DIL
1992 11 18.68	S	4.9	A	6.0	B		20	7	8			SAR02
1992 11 18.69	S	5.0	A	6.0	B		20	9	8			KER
1992 11 18.72	B	5.3	AA	10.0	B		25	6.7	5	0.73	44	HAS02
1992 11 18.72	S	4.7	AA	0.0	E		1	&12				HAV
1992 11 18.72	S	4.8	AA	5.0	B		10	10	7	1.8	49	HAV
1992 11 18.72	S	5.4	AA	10.0	B		25					HAS02
1992 11 18.73	B	4.8	S	8.0	B		10	12		1.1		ZNO
1992 11 18.93	B	5.3	AA	7.0	B		10	12.6	5			DEA
1992 11 18.94	S	5.2	AA	5.0	B		10	4	7			VIE
1992 11 19.01	S	5.1	AA	20.0	T	10	50	3.5	9	&0.5	48	SHA04
1992 11 19.08	M	5.2	AA	5.0	B		10		7/			MOR
1992 11 19.71	S	4.9	AA	8.0	B		20	10	7	0.9	30	BAR
1992 11 19.72	B	5.3	AA	10.0	B		25	7.7	5	1.2	46	HAS02
1992 11 19.72	S	5.3	AA	10.0	B		25					HAS02
1992 11 19.76	S	4.9	AA	3.0	B		7	5	7	1.5	52	LOO01
1992 11 19.93	B	5.4	AA	7.0	B		10	8.4	4			DEA

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

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 11 19.94	S	5.0:	AA	5.0	B		12		6/			GRE
1992 11 19.95	S	5.3	AA	5.0	B		10	4	7		35	VIE
1992 11 20.03				31.7	L	6	55	3.9	7	&0.4	50	BOR
1992 11 20.03	B	5.5	HR	5.0	B		10					BOR
1992 11 20.03	S	5.3	HR	5.0	B		10	9.5	7	?		BOR
1992 11 20.12	M	5.2	AA	4.0	B		8	10	5			KEE
1992 11 20.69	S	5.2	A	5	M		10	9	6	0.15	45	HAD01
1992 11 20.70	B	5.0	AA	5.0	B		10	7	6	1.5	60	MOE
1992 11 20.71	S	4.8	AA	8.0	B		20	9	7			BAR
1992 11 20.72	B	4.9	S	8.0	B		10	10		1.8		ZNO
1992 11 20.74	S	5.3	AA	6	M		20	12	6	2	45	SZE02
1992 11 20.75	M	4.9	AA	4.2	B		7	12	7	1.9	50	ZAN
1992 11 20.78	B	4.8	A	5.0	B		7		7			TRI
1992 11 20.78	S	5.4	A	5.0	B		10	10	6			FOG
1992 11 20.78	V	5.6	AA	6.3	A	4		+12	8	2.3	48	MIK
1992 11 20.94	B	5.2	AA	5.0	B		12					GRE
1992 11 20.94	S	5.3	AA	5.0	B		10		7			VIE
1992 11 20.95	S	4.9	AA	5.0	B		12	&11	6/			GRE
1992 11 20.98	B	5.2	AA	8.0	B		20		6			GRE
1992 11 21.09	M	5.2	AA	8.0	B		20		7/			MOR
1992 11 21.69	S	5.5	SC	5.0	B		7	4.5	7			DAH
1992 11 21.72	S	4.6	AA	0.0	E		1					HAV
1992 11 21.72	S	4.7	AA	5.0	B		10	7	7/	1.9	50	HAV
1992 11 21.72	S	5.0	A	5.0	B		10	10	5			FOG
1992 11 21.73	B	4.9	S	5.0	B		7					KLA01
1992 11 21.73	M	5.2	S	10.0	B	4	25	10.5	8/	0.92	44	LEH
1992 11 21.74	M	4.5	S	0.0	E		1					LEH
1992 11 21.74	M	5.3	SC	20.3	T	10	80	7	7			DAH
1992 11 21.74	S	4.9	AA	4.2	B		7	12	7	1.9	50	ZAN
1992 11 21.75	N	9.5	AC	20.3	T	10	200					DAH
1992 11 21.76	S	5.3	SC	3.5	B		7	& 6	5			GRA04
1992 11 21.77	B	5.4	SC	8.0	B		10		6			VEL02
1992 11 22.00	S	5.0	AA	20.0	T	10	50		9	1	350	SHA04
1992 11 22.05	B	5.4	SC	5.0	B		7	7				DIL
1992 11 22.06	M	5.0	AA	0.9	E		1					KEE
1992 11 22.06	M	5.0	AA	4.0	B		8	10	6	3.5	45	KEE
1992 11 22.08	M	5.0	AA	8.0	B		20		7/			MOR
1992 11 22.38	B	4.6	S	7.0	B		10	30	5	3.5	50	OHK
1992 11 22.68	B	4.8:	AA	5.0	B		10	7	7	1.2	60	MOE
1992 11 22.69	S	5.3	S	8.0	B	4	20	4	7			SCH07
1992 11 22.70	S	5.4	SC	5.0	B		7	9	6			HEE
1992 11 22.71	S	4.7	AA	8.0	B		20	10	8	&1.0	25	BAR
1992 11 22.71	S	5.0	A	5.0	B		10	10	6			FOG
1992 11 22.73	S	4.8	AA	4.2	B		7	12	7/	2.3	50	ZAN
1992 11 22.74	I	4.7	AA	0.0	E		1					ZAN
1992 11 22.75	S	5.2	SC	8.0	B	4	20	7	6	1.5	45	DAN01
1992 11 22.76	S	5.3	SC	6.3	B		9	8	6	0.5	45	AND01
1992 11 22.78	S	6.0	SC	8.0	B		11	6	7			WAR01
1992 11 22.79	B	5.1	A	5.0	B		7		7			TRI
1992 11 22.83	B	5.6	SC	8.0	B		10		6			VEL02
1992 11 23.00	S	5.0	AA	20.0	T	10	50	4.3	9	1	74	SHA04
1992 11 23.08	M	5.2	AA	8.0	B		20		7/			MOR
1992 11 23.70	B	5.3	AA	10.0	B		25	5.0	5	1.2	45	HAS02
1992 11 23.70	S	5.3	AA	10.0	B		25					HAS02
1992 11 23.71	I	5.0	AA	0.0	E		1					MIK
1992 11 23.72	S	4.5	AA	0.0	E		1					HAV
1992 11 23.72	S	4.7	AA	5.0	B		10	7	7/	1.8	51	HAV
1992 11 23.76	S	4.9	AA	5.0	B		10	6	8	1.5	67	LOO01
1992 11 23.97	B	5.4	HR	5.0	B		10					BOR

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

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 11 23.97	S	5.2	HR	5.0	B		10	5	7/	&1	50	BOR
1992 11 23.99	B	5.2	SC	6.3	B		9			2	60	CHE
1992 11 24.06	S	5.3	AA	5.6	B		8	10	7/			HER02
1992 11 24.08	M	5.1	AA	8.0	B		20		7/			MOR
1992 11 24.68	S	5.0	AA	20.3	T	10	50	10	6	0.5	35	BRE02
1992 11 24.70	B	4.7	AA	5.0	B		10	6.5	7	2.2	65	MOE
1992 11 24.70	B	5.2	AA	10.0	B		25					HAS02
1992 11 24.70	S	4.9	AA	15.2	L	5	44	7.5	7	1.9	65	MOE
1992 11 24.70	S	5.1	AA	10.0	B		25	6.4	5	1.0	44	HAS02
1992 11 24.73	S	5.4	SC	8.0	B		11	9	7	0.6	40	WAR01
1992 11 24.78	S	5.2:	SC	3.5	B		7	& 5				GRA04
1992 11 25.11	M	5.0	AA	5.0	B		10		8			MOR
1992 11 25.11	M	5.0	AA	8.0	B		20		7/			MOR
1992 11 25.69	B	4.7	AA	10.0	B		14	7	7	1.6	65	MOE
1992 11 25.69	M	4.3	S	0.0	E		1					LEH
1992 11 25.71	S	5.1	AA	48.5	L	4	117	7.5	7	0.7	65	MOE
1992 11 25.85	B	5.7	SC	8.0	B		8		6			VEL02
1992 11 26.03	S	5.3	SC	5.0	B		7	7				DIL
1992 11 26.09	M	5.1	AA	8.0	B		20		7/			MOR
1992 11 26.09	M	5.2	AA	4.0	B		8					KEE
1992 11 26.69	S	4.7	AA	15.2	L	5	44	6.5	7	1.9	60	MOE
1992 11 26.71	I	4.8	AA	0.0	E		1					MOE
1992 11 27.11	M	5.1	AA	5.0	B		10		8			MOR
1992 11 27.11	M	5.1	AA	8.0	B		20		7/			MOR
1992 11 27.67	S	5.3	AA	6.0	B		20	13	8	1.5	52	CSU
1992 11 27.69	B	5.1	AA	15.6	L	10	54	14	8	1.6	50	KOS
1992 11 27.69	M	4.8	S	0.0	E		1					LEH
1992 11 27.69	S	5.1	AA	6.0	B		20	6	8	1	55	SAR02
1992 11 27.70	M	5.3	S	10.0	B	4	25	8	7	0.83	50	LEH
1992 11 27.70	S	5.3	A	6.0	B		20	10	8	0.5	51	KER
1992 11 27.71	S	4.7	AA	8.0	B		20	9	8/			BAR
1992 11 27.72	B	4.9	S	8.0	B		10			1.7		ZNO
1992 11 27.72	S	5.5:	AA	20.3	T	10	50	4	6			BRE02
1992 11 27.73	S	5.1	AA	33.3	L	4	56	10	7	1.5	55	SZE02
1992 11 27.80	S	5.1	SC	8.0	B	4	20	7	7	2	45	DAN01
1992 11 27.84	B	5.1	SC	8.0	B		8		6			JOR
1992 11 27.84	B	5.1	SC	8.0	B		8		6			RAD01
1992 11 27.94				12.0	B		20	6.0	7	0.9	45	BOR
1992 11 27.94	B	5.3	HR	5.0	B		10					BOR
1992 11 27.94	S	5.2	HR	5.0	B		10	7	7/	&0.5	45	BOR
1992 11 27.96	S	5.2	AA	5.0	B		10	5	7	0.6	40	VIE
1992 11 28.01	S	5.6	AA	5.0	B		20	10	4	0.1		DES01
1992 11 28.09	M	4.9	AA	5.0	B		10		8/	3.75	30	MOR
1992 11 28.09	M	4.9	AA	8.0	B		20		8	3.75	30	MOR
1992 11 28.11	S	5.4	SC	5.0	B		7	5				DIL
1992 11 28.69	B	5.5	SC	3.5	B		7	4.5	6	0.7	43	GRA04
1992 11 28.70	B	4.8	AA	5.0	B		10	6	7	1.5	60	MOE
1992 11 28.72	M	5.6	SC	20.3	T	10	80	3.4	6/	0.41	43	GRA04
1992 11 28.72	S	4.8	AA	15.2	L	5	44	6.0	7	1.7	60	MOE
1992 11 28.73	S	4.8	SC	8.0	B		12	6	7	0.9	40	BEN03
1992 11 28.73	S	5.1	S	5.0	B		10	10				CAV
1992 11 28.73	S	5.1	SC	4.0	B		12	8	6	0.9	39	DAH
1992 11 28.84	B	5.3	SC	8.0	B		8		6			VEL02
1992 11 28.86	B	5.3	SC	8.0	B		8		6			JOR
1992 11 28.86	B	5.5	SC	8.0	B		8		6			RAD01
1992 11 28.87	B	5.3	SC	8.0	B		8		6			POR02
1992 11 28.96				12.0	B		20	4.9	7	1.35	45	BOR
1992 11 28.96				31.7	L	6	55	3.6	7	0.7	45	BOR
1992 11 28.96	B	5.3	HR	5.0	B		10					BOR

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

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 11 28.96	S	5.2	HR	5.0	B		10	6	7	0.3	45	BOR
1992 11 28.99	B	5.2	SC	8.0	B		20	7	6	0.31	45	KRO02
1992 11 28.99	B	5.5	SC	33.3	L	4	56	5.5	7	0.50	53	KRO02
1992 11 29.07	S	5.5	SC	5.0	B		7	5				DIL
1992 11 29.72	S	5.5	SC	3.5	B		7	& 4				GRA04
1992 11 29.73	M	5.3	SC	20.3	T	10	80	5	7	0.33	30	DAH
1992 11 29.73	S	5.6	SC	20.3	T	10	80	3.6	6/	0.28	40	GRA04
1992 11 29.74	N	8.9:	AC	20.3	T	10	200					DAH
1992 11 29.99	B	5.2	SC	8.0	B		20	8	7	?		KRO02
1992 11 29.99	B	5.5	SC	33.3	L	4	56	6.5	8	0.43	38	KRO02
1992 11 30.00	S	4.9	AA	20.0	T	10	50	4.2	9	&2	60	SHA04
1992 11 30.07	S	5.6	SC	5.0	B		7	5				DIL
1992 11 30.08	M	5.0	AA	8.0	B		20		7/			MOR
1992 11 30.08	M	5.1	AA	4.0	B		8	7	6	0.8	35	KEE
1992 11 30.67	S	5.3	AA	6.0	B		20	18	8			CSU
1992 11 30.68	S	4.9	AA	5.0	B		7	20	5	1.5	55	UJV
1992 11 30.69	B	4.7	AA	5.0	B		10	6	8	1.2	55	MOE
1992 11 30.69	B	5.0	AA	15.6	L	10	54	13	8	3.4	52	KOS
1992 11 30.70	B	5.1	AA	3.0	B		8					HAS02
1992 11 30.70	I	5.0	AA	0.8	E		1					HAS02
1992 11 30.73	S	5.0	AA	10.0	B		25	5.7	5	1.3	53	HAS02
1992 11 30.76	B	4.6	A	5.0	B		7			0.5		TRI
1992 11 30.93	B	5.5	AA	7.0	B		10	6.0	7			DEA
1992 12 01.00	S	4.9	AA	20.0	T	10	50	4.7	9	&4	85	SHA04
1992 12 01.07	M	5.1	AA	4.0	B		8	7	6	1.0	40	KEE
1992 12 01.08	M	5.0	AA	8.0	B		20		8			MOR
1992 12 01.67	S	5.1	SC	5.0	B		7	6	7	1.0	45	DAH
1992 12 01.68	B	4.7	AA	5.0	B		10	6	8	1.5	55	MOE
1992 12 01.69	S	4.6	AA	15.2	L	5	44	6.0	7	1.9	55	MOE
1992 12 01.71	S	4.7	AA	5.0	B		10	4.5	7/	0.7	50	HAV
1992 12 01.71	S	5.5	SC	3.5	B		7	4	6			GRA04
1992 12 01.72	S	4.9	AA	8.0	B		15	4.5	7	0.9	50	HAV
1992 12 01.95				12.0	B		20	3.5	7	1.3	43	BOR
1992 12 01.95				31.7	L	6	55	2.0	7	0.45	43	BOR
1992 12 01.95	a B	5.3	HR	5.0	B		10					BOR
1992 12 01.95	a S	5.2	HR	5.0	B		10	4	7	?		BOR
1992 12 02.09	M	5.0	AA	8.0	B		20		7/			MOR
1992 12 02.68	S	5.0	S	8.0	B		20	5	7	0.2	40	SCH07
1992 12 02.69	M	6.1	AA	5.0	R		8					OFE
1992 12 02.85	B	5.4	SC	8.0	B		8		4			JOR
1992 12 02.85	B	5.4	SC	8.0	B		8		4			POR02
1992 12 02.85	B	5.6	SC	8.0	B		8		6			RAD01
1992 12 02.85	B	5.6	SC	8.0	B		8		6			VEL02
1992 12 03.01	B	5.0	SC	8.0	B		20	6	7	1.24	44	KRO02
1992 12 03.69	B	4.6	AA	5.0	B		10	7	7	1.2	60	MOE
1992 12 03.77	& S	5.3	SC	3.5	B		7	& 4	5/			GRA04
1992 12 03.94	B	5.4	AA	7.0	B		10	6.2	6			DEA
1992 12 03.97	S	4.6:	SC	11.5	L	8	50	4	8	0.5	60	DID
1992 12 03.99	a B	5.2	HR	5.0	B		10	5	7	?		BOR
1992 12 04.67	S	5.3	A	6.0	B		20	6	7	0.1	70	KER
1992 12 04.68	S	5.2	AA	6.0	B		20	5	7	0.15	60	SAR02
1992 12 04.68	S	5.3	SC	5.0	B		7	7	7	0.2	60	HEE
1992 12 04.84	B	5.5	SC	8.0	B		8		6			VEL02
1992 12 04.86	B	5.5	SC	8.0	B		8		6			RAD01
1992 12 04.96	S	5.3	AA	5.0	B		10	3.5	7		50	VIE
1992 12 05.01	B	5.2	SC	8.0	B		20		7	0.5	49	KRO02
1992 12 05.65	S	5.5	AA	20.3	T	10	50	4	7	0.15	45	BRE02
1992 12 05.66	M	5.7	AA	5.0	R		8					OFE
1992 12 05.66	M	5.7	AA	20.0	T	10	77	> 5	8			OFE

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

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 12 05.68	S	5.3	SC	5.0	B		7	7	6	0.2	50	HEE
1992 12 05.85	B	5.5	SC	8.0	B		8		6			VEL02
1992 12 05.86	B	5.5	SC	8.0	B		8		6			RAD01
1992 12 05.94	B	5.5	AA	7.0	B		10	6.4	6			DEA
1992 12 05.94	S	5.3	AA	5.0	B		10	3.5	7		50	VIE
1992 12 05.95				12.0	B		20	3.8	7/	1.3	45	BOR
1992 12 05.95	B	5.4	HR	5.0	B		10					BOR
1992 12 05.95	B	5.4	NO	5.0	B		10					BOR
1992 12 05.95	S	5.3	HR	5.0	B		10	5	7	?		BOR
1992 12 05.95	S	5.3	NO	5.0	B		10					BOR
1992 12 06.69	B	4.9:	AA	5.0	B		10	6	7	0.5	50	MOE
1992 12 06.69	S	5.0	A	5.0	B		10	9	6			FOG
1992 12 06.70	S	4.9	AA	5.0	B		7	& 2.5	8	&1	45	MIK
1992 12 06.71	S	4.8	AA	8.0	B		20	7	8/	0.6	30	BAR
1992 12 06.71	S	5.1	S	5.0	B		10	5	7			CAV
1992 12 06.93	B	5.4	AA	7.0	B		10	4.3	7			DEA
1992 12 06.94	S	4.6:	SC	11.5	L	8	50	4	8	0.42	80	DID
1992 12 07.00	S	4.7	AA	20.0	T	10	50	3.2	9	&1	73	SHA04
1992 12 07.04	M	5.0	AA	4.0	B		8	5	5	1.0	40	KEE
1992 12 07.77	B	4.7	A	5.0	B		7		6			TRI
1992 12 07.93	S	4.6	SC	11.5	L	8	50	4	8	1	55	DID
1992 12 07.94	S	5.1	AA	5.0	B		12	& 6	7/			GRE
1992 12 07.95	a B	5.4	HR	5.0	B		10	5.5	7			BOR
1992 12 07.95	a B	5.4	NO	5.0	B		10					BOR
1992 12 08.00	S	4.7	AA	20.0	T	10	50	2.7	9	&1	90	SHA04
1992 12 08.06	M	5.0	AA	4.0	B		8					KEE
1992 12 08.75	B	4.8	A	5.0	B		7		6/			TRI
1992 12 08.93	S	4.6	SC	11.5	L	8	50	4	9	1	65	DID
1992 12 08.93	S	5.0	AA	5.0	B		12	& 7	7/			GRE
1992 12 08.94	B	5.4	AA	7.0	B		10	4.2	6			DEA
1992 12 08.94	S	5.3	AA	5.0	B		10	3	7			VIE
1992 12 08.95				31.7	L	6	55	2.3	7/	&0.5	45	BOR
1992 12 08.95	a B	5.3	HR	5.0	B		10					BOR
1992 12 08.95	a B	5.3	NO	5.0	B		10					BOR
1992 12 08.95	a S	5.2	HR	5.0	B		10	5	7/			BOR
1992 12 08.95	a S	5.2	NO	5.0	B		10					BOR
1992 12 09.01	B	5.1	SC	8.0	B		20	6	7	0.27	40	KRO02
1992 12 09.01	B	5.5	SC	33.3	L	4	56	3.1	8	0.35	68	KRO02
1992 12 09.66	M	6.1	AA	20.0	T	10	77	> 4	7			OFE
1992 12 09.93	B	5.3	AA	5.0	B		12					GRE
1992 12 09.93	S	5.0	AA	5.0	B		12	& 8	7/			GRE
1992 12 09.93	S	5.3	AA	5.0	B		10		7		50	VIE
1992 12 09.95	a B	5.4	HR	5.0	B		10	4.5	7/	2.2	45	BOR
1992 12 09.95	a B	5.4	NO	5.0	B		10					BOR
1992 12 10.09	S	4.8	AA	5.6	B		8		8			HER02
1992 12 11.00	S	4.8	AA	20.0	T	10	50	3.2	8	&2	115	SHA04
1992 12 11.04	M	5.0	AA	4.0	B		8	5	5	2	45	KEE
1992 12 11.66	M	6.0	AA	20.0	T	10	77	> 3	8	>0.05	90	OFE
1992 12 11.71	S	5.1	SC	6.0	R	4	15	& 4.5	7			GRA04
1992 12 12.00	S	4.9	AA	20.0	T	10	50	4.6	8	&2	84	SHA04
1992 12 12.06	M	5.1	AA	4.0	B		8					KEE
1992 12 12.69	B	5.1	SC	3.5	B		7	& 4	6			GRA04
1992 12 12.71	M	5.3	SC	20.3	T	10	80	3.7	6/	0.18	20	GRA04
1992 12 12.75	S	5.4	AA	5.0	B		10	3.5	7			LOO01
1992 12 13.00	S	4.9	AA	20.0	T	10	50	4.5	8	&2	45	SHA04
1992 12 13.71	S	5.4	AA	5.0	B		10	3.5	8	2.1	51	HAV
1992 12 13.77	B	5.2	A	5.0	B		7		6/	>3		TRI
1992 12 13.95				31.7	L	6	55	2.5	7/	&1	47	BOR
1992 12 13.95	B	5.3	AA	7.0	B		10	6.9	5	0.53	36	DEA

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

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 12 13.95	a B	5.3	HR	5.0	B		10					BOR
1992 12 13.95	a S	5.3	HR	5.0	B		10	4.5	7/	1.8	47	BOR
1992 12 14.00	S	5.0	AA	20.0	T	10	50	4.2	8	&2	60	SHA04
1992 12 14.08	! M	5.4:	AA	5.0	B		10		8			MOR
1992 12 14.70	S	5.3	AA	10.0	B		25	2.4	6	1.3	50	HAS02
1992 12 14.84	B	5.8	SC	8.0	B		8		9			RAD01
1992 12 14.85	B	5.5	SC	8.0	B		8		9			VEL02
1992 12 14.95				12.0	B		20	3.5	7	1.3	54	BOR
1992 12 14.95				31.7	L	6	55	3.0	7	&1	54	BOR
1992 12 14.95	a B	5.3	HR	5.0	B		10					BOR
1992 12 14.95	a S	5.3	HR	5.0	B		10	4	8	1.3	54	BOR
1992 12 15.68	S	5.4	SC	20.3	T	10	80	3.6	6/			GRA04
1992 12 15.69	S	5.1	SC	20.3	T	10	80	2.8	7	0.32	56	DAH
1992 12 15.70	M	5.6	S	10.0	B	4	25	5	7	0.42	70	LEH
1992 12 15.70	! V	5.5	HR	6.3	A	4		8	8	2.2	52	MIK
1992 12 15.72	S	5.2	AA	8.0	B		20	5	5	0.3	50	SCH05
1992 12 15.72	S	5.3	AA	10.0	B		25	2.1	6	1.3	50	HAS02
1992 12 15.83	B	6.0	SC	8.0	B		8		4			RAD01
1992 12 15.84	B	5.9	SC	8.0	B		8		4			VEL02
1992 12 15.95				31.7	L	6	55	2.3	7	1.0	53	BOR
1992 12 15.95	B	5.2	S	7.0	B		10	4.8	5	0.33	49	DEA
1992 12 15.95	a B	5.3	HR	5.0	B		10					BOR
1992 12 15.95	a S	5.3	HR	5.0	B		10	4.5	7/	1.0	53	BOR
1992 12 16.68	B	5.5:	AA	5.0	B		10	5	8	0.3	40	MOE
1992 12 17.04	M	4.9	AA	4.0	B		8	6	6	2.5	45	KEE
1992 12 17.69	S	5.3	SC	20.3	T	10	80	3.5	6			GRA04
1992 12 18.68	S	5.6	AA	48.5	L	4	117	3.5	7			MOE
1992 12 18.72	S	5.4	AA	10.0	B		25	3.3	6	1.35	46	HAS02
1992 12 18.93	S	4.9	SC	11.5	L	8	50	4	8	0.1	30	DID
1992 12 18.95	a B	5.6	Y	5.0	B		12		7/			GRE
1992 12 18.95	a S	5.2	Y	8.0	B		20	& 7	5/			GRE
1992 12 19.00	S	5.1	AA	20.0	T	10	50	4.0	8	&2	58	SHA04
1992 12 19.08	! M	5.3	AA	5.0	B		10		8/	2.25	50	MOR
1992 12 19.69	! N	10.1:	AC	20.3	T	10	123					GRA04
1992 12 19.69	! S	5.3	SC	20.3	T	10	80	4.3	7	0.18	50	GRA04
1992 12 20.08	! M	5.4	AA	5.0	B		10		8	2.0	45	MOR
1992 12 20.68	! S	5.6	SC	20.3	T	10	80	2.4	6			DAH
1992 12 20.69	! S	5.4	SC	20.3	T	10	77	4.6	7	0.28	70	GRA04
1992 12 20.71	! S	5.2:	SC	20.3	T	10	77	3.3	5			SKJ
1992 12 20.71	S	5.6	AA	8.0	B		15	3.0	6/	1.0	55	HAV
1992 12 20.93	a S	5.4	Y	8.0	B		20	& 4	6			GRE
1992 12 20.95				12.0	B		20	5.0	7	1.0	60	BOR
1992 12 20.95	B	5.2	HR	5.0	B		10					BOR
1992 12 20.95	S	5.2	HR	5.0	B		10	4	7	?		BOR
1992 12 20.99	B	5.6	SC	8.0	B		20		6			KRO02
1992 12 21.00	S	5.1	AA	20.0	T	10	50	4.3	8	&1	45	SHA04
1992 12 21.68	! S	5.8	SC	20.3	T	10	80	2.6	5			DAH
1992 12 21.95				12.0	B		20	3.8	7	1.1	57	BOR
1992 12 21.95	B	5.2	HR	5.0	B		10					BOR
1992 12 21.95	I	6.2	HR	5.0	B		10					BOR
1992 12 21.95	S	5.3	HR	5.0	B		10	3.5	6	?		BOR
1992 12 21.99	B	5.6	SC	8.0	B		20	3	6	0.22	54	KRO02
1992 12 22.09	! M	5.5	AA	5.0	B		10		7/	2.0		MOR
1992 12 23.09	! M	5.5	AA	5.0	B		10		7/	2.5	55	MOR
1992 12 23.69	M	5.6	S	10.0	B	4	25	6	7	0.25	83	LEH
1992 12 24.99	B	5.5	SC	8.0	B		20		6			KRO02
1992 12 24.99	B	6.0	SC	33.3	L	4	56	2.8	7	0.17	82	KRO02
1992 12 26.72	S	6.8	AA	12.0	B		20		6			LOO01
1992 12 26.99	B	5.7	SC	8.0	B		20	4	6			KRO02

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

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 12 26.99	B	6.5:	SC	33.3	L	4	56	2.7	7	0.17	89	KRO02
1992 12 27.72	S	6.9	AA	12.0	B		20	5	6			LOO01

Periodic Comet Boethin (1986 I)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 12 29.03	B	9.1	S	33.3	L	4	56	3.7				KRO02
1985 12 30.00	B	8.6	S	8.0	B		20	5				KRO02
1985 12 30.00	B	8.6	S	33.3	L	4	56	4.9	6			KRO02
1986 01 01.06	B	9.2	S	33.3	L	4	56	4.9				KRO02
1986 01 02.03	B	9.1	S	33.3	L	4	56	4.2				KRO02
1986 01 06.01	B	8.9	S	33.3	L	4	56	4.3				KRO02
1986 01 08.03	B	9.1	S	33.3	L	4	56	4.4	3			KRO02
1986 01 09.03	B	9.2	S	15.2	L	8	100	4.2	3			KRO02
1986 01 10.03	B	9.1	S	33.3	L	4	56	3.0	3			KRO02
1986 01 11.03	B	9.3	S	33.3	L	4	56	3.2	2			KRO02
1986 01 12.02	B	8.8	S	33.3	L	4	56	3.7	5			KRO02
1986 01 13.01	B	8.6	S	33.3	L	4	56	4.3	4			KRO02

Periodic Comet Chernykh (1991o)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 10 13.17		13.5:		41	L	6	193	1.0				ARM
1991 10 28.05		[15.5:		41	L	6	193	! 1.0				ARM
1991 11 02.20		[14.5:		41	L	6	193	! 1.0				ARM
1991 11 03.60	I	[14.0:		73	C	11	275					NAK01
1991 11 27.01		[15.0:		41	L	6	193	! 0.5				ARM

Periodic Comet Brorsen-Metcalf (1989 X)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1989 07 17.35	B	8.4	S	33.3	L	4	56	& 7	2			KRO02
1989 08 05.27	B	6.6	S	8.0	B		20	12	4			KRO02
1989 08 05.27	B	6.8	S	33.3	L	4	56	12.3	3			KRO02
1989 08 08.24	B	6.4	S	8.0	B		20	12	3			KRO02
1989 08 09.27	B	6.5	S	8.0	B		20	10	5	0.22	302	KRO02
1989 09 02.42	B	5.4	S	8.0	B		20	10	8			KRO02
1989 09 03.43	B	5.6	S	8.0	B		20	7	8	0.83	307	KRO02
1989 09 04.42	B	5.7	S	8.0	B		20					KRO02
1989 09 24.45	B	7.0:	S	8.0	B		20	5				KRO02
1989 09 25.45	B	7.7	S	33.3	L	4	56	& 3				KRO02

Periodic Comet Schwassmann-Wachmann 1 (1989 XV)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 04 06.06	S	[13.5	GA	40	L	7	190	! 0.5				MOD
1992 08 02.34	S	[13.8	GA	35.9	L	7	164	! 0.5				MOD
1992 08 04.08	C	15.2	HS	19.0	T	4		& 0.5	5			MIK
1992 08 06.38	S	[13.7	GA	40	L	7	190	! 0.5				MOD
1992 08 08.08	C	15.0	HS	19.0	T	4		& 0.5	6			MIK
1992 08 09.09	C	15.2	HS	19.0	T	4		& 0.5	5			MIK
1992 08 25.12	C	15.4	HS	19.0	T	4		0.4	9			MIK
1992 08 31.35	S	[14.0	GA	40	L	7	190	! 0.5				MOD
1992 09 05.38	S	[14.3	GA	35.9	L	7	164	! 0.5				MOD
1992 09 24.37	S	[14.5	GA	35.9	L	7	164	! 0.5				MOD
1992 09 25.27	S	[14.4	GA	35.9	L	7	164	! 0.5				MOD
1992 09 26.06	C	[17.0	HS	19.0	T	4						MIK
1992 09 26.37	S	[14.0	GA	35.9	L	7	164	! 0.5				MOD
1992 09 28.33	S	[14.2	GA	40	L	7	190	! 0.5				MOD

Periodic Comet Schwassmann-Wachmann 1 [cont.]

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 10 02.34		S[14.5	GA	40	L	7	190	! 0.5				MOD
1992 10 03.28		S[14.4	GA	40	L	7	190	! 0.5				MOD
1992 10 05.39		S[14.0	GA	35.9	L	7	164	! 0.5				MOD
1992 10 06.34		S[14.0	GA	35.9	L	7	164	! 0.5				MOD
1992 10 07.34		S[14.2	GA	35.9	L	7	164	! 0.5				MOD
1992 10 08.36		S[14.2	GA	35.9	L	7	164	! 0.5				MOD
1992 10 09.11		C[17.5	HS	19.0	T	4						MOD
1992 10 22.96		V 16.3	HS	19.0	T	4		0.5	5			MIK
1992 12 13.78	!	V 14.1	AA	20.0	T	2		0.4	9	0.04	25	MIK
1992 12 14.76	!	V 14.3	AA	19.0	T	4		1.0	5			MIK
1992 12 29.96	!	V 14.5	HR	20.0	T	2		& 3	3	0.03	15	MIK
1992 12 31.00	!	V 14.6	HR	20.0	T	2		& 2.5	3			MIK

Periodic Comet Väisälä 1 (1992u)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1992 12 29.99		V[16.0	AC	20.0	T	2						MIK
1992 12 31.03		V[16.0	AC	20.0	T	2						MIK

Periodic Comet Stephan-Oterma (1980 X)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1980 11 09.23		B 10 :	S	15.2	L	8	68					KRO02
1980 11 10.19		B 10 :	S	15.2	L	8	100	& 1.5				KRO02
1980 12 12.04		O 9.5	AC	20.3	L	6	49	& 3.5				GRA04
1980 12 14.10		B 9.5:	S	15.2	L	8	68					KRO02
1981 01 12.06	*	B 9.7:	S	15.2	L	8	68			0.03	75	KRO02
1981 01 13.17	*	B 9.9:	S	15.2	L	8	100	2.5				KRO02
1981 01 14.13	*	B 10.1	A	15.2	L	8	100	& 1.5				KRO02
1981 01 23.09	*	B 10.5:	S	15.2	L	8	174					KRO02
1981 01 25.17	*	B 10.1:	S	15.2	L	8	100					KRO02

Periodic Comet Levy (1991 XI)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1991 10 05.39		[15.0:		41	L	6	193	! 1.0				ARM
1991 10 09.43		[15.5:		41	L	6	193	! 1.0				ARM
1991 11 06.42		[14.0:		41	L	6	193	! 0.5				ARM

Φ Φ Φ

JET STRUCTURE IN P/SWIFT-TUTTLE

J. DeYoung and R. Schmidt, U.S. Naval Observatory, Washington, report the following co-added CCD observations of the near nucleus of P/Swift-Tuttle, which show increasing jet activity in October (tail lengths and position angles are provided): 1992 Oct. 1.0 UT, 10″ in p.a. 214° and 12″ in p.a. 277°; Oct. 2.0, 14″ and 17″ in p.a. 207° and 273°; Oct. 3.0, 15″ and 10″ in p.a. 209° and 270°; Oct. 4.0, 11″ and 14″ in p.a. 205° and 268°; Oct. 6.0, 16″ and 11″ in p.a. 214° and 282°; Oct. 20.0, > 105″ and > 133″ (curved and linear extensions) in p.a. 26° and 240°, and 42″ (curved) in p.a. 292°; Oct. 24.0, > 100″, 35″, 120″ (curved and linear extensions), > 146″ (curved), and 34″ in p.a. 33°, 166°, 242°, 303°, and 354°; Oct. 28.0, > 152″, 63″, 39″ (curved and linear extensions), > 78″ (disconnected), and > 135″ (with extension) in p.a. 34°, 69°, 251°, 287°, and 306°; Oct. 29.0, > 89″ (with curved companion), 40″ (curved), 37″, 46″ (curved), and > 66″ (curved extension) in p.a. 31°, 233°, 260°, 291°, and 318°.

Schmidt and DeYoung also write that they observed P/Swift-Tuttle with the USNO 60-cm reflector (+ CCD) on 1992 Nov. 4.0 UT, obtaining a total integration time of 15 min with co-added frames in Kron-Cousins *R*, *I*, and clear filters. They observed jets of length > 90″, > 73″, 114″, 84″, and > 119″ (curved) in p.a. 25°, 60°, 258°, 306°, and 313°, respectively.

International Workshop on Cometary Astronomy

The IWCA was announced on page 86 of the October issue, and as noted on page 2 of this issue, the meeting has bee expanded to cover two days (1994 February 18 and 19). Meeting organizers Adriano Gaspani and Zanotta Mauro Vittori have selected the small holiday village of Selvino in northern Italy, located some 20 km from Bergamo at an altitude o 1 km. The extra day was added into the schedule so that observers from various countries would have the opportunit to speak on the status of observing in their respective home locations. Those interested in giving a presentation (eithe oral or with a poster) should state a suggested topic on the 'pre-registration form' provided on the back cover of thi issue (page 56).

There is usually snow present in Selvino in February, but roads are well maintained. Those attending the meetin should dress warmly and bring boots. 'Very good' lodging and meals in Selvino will cost from US$50 to nearly $80 pe day. The meeting rooms and hotels are only one minute apart. Due to the small size of Selvino, it will be possibl to have evening observing sessions in town, which will be planned to review methodology procedures for making tota visual magnitude estimates. There will be a small registration fee to cover various costs to the hosts, probably aroun US$20 (meeting participants with financial problems, especially those from eastern Europe, can ask the local organizin committee for a special reduced cost).

A bus from Milano Malpensa International Airport to the Milano city rail station costs ~ US$8, and from there one can get a train to Bergamo every hour for ~ US$3. While there is bus service (costing ~ US$4) from Bergamo to Selvino, the hosts hope to have enough cars available to bring some, if not all, foreign visitors from the Bergamo airport or rail station to Selvino. Accompanying spouses who do not wish to attend the meeting could take a bus to Bergamo for daily shopping or touring.

Further information regarding the meeting can be obtained from Adriano Gaspani (Osservatorio Astronomico di Brera; Via Brera 28; 20121 Milano; Italy), who can be reached at electronic mail addresses 32469::GASPANI (Span) and GASPANI@ASTMIB.ASTRO.IT (Internet). The completed 'pre-registration form', which should be photocopied from the next page, should be sent to Elena Rigon (*not* to Adriano Gaspani). The local organizing committee asks all interested individuals to complete this form and mail it to them by April 30, so that they can get a good idea of potential numbers to plan for.

Φ Φ Φ

The Last 15 Comets to Receive Provisional Letter Designations

Listed below, for handy reference, are the last 15 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 Oct. 1992 issue, p. 125.]

Desig.			*Comet*	*P*	*T*	*q*	*IAUC*	P/ code
1992p	=	⋆	P/Brewington	8.6	6/4/92	1.56	5596	815
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
1992a1	=	⋆	Ohshita		11/1/92	0.66	5668	
1993a	=	⋆	Mueller		1/13/94	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

INTERNATIONAL WORKSHOP ON COMETARY ASTRONOMY (I.W.C.A.)

Selvino, Italy
February 18-19, 1994

PRE-REGISTRATION FORM

If you are interested in receiving further information regarding this first IWCA, please make a photocopy of this form, complete it, and return it as soon as possible. [Please type or print clearly.]

Name: _____

Address: _____

_____

_____

Phone: _____ Fax: _____

E-mail address: _____

Please check one:
___ I will definitely attend the Symposium
___ I will probably attend the Symposium
___ I will possibly attend the Symposium

Please check if applicable (and if so, please provide a proposed title and short abstract in the space below)
___ I would like to present a contributed paper
___ I would like to present a poster paper

Title of paper or poster: _____

_____

Abstract: _____

_____

_____

_____

_____

Date: _____ Signature: _____

Please reply before April 30, 1993, to:
Circolo Astrofili Bergamaschi
c/o Elena Rigon
Via Papa Giovanni, 4
24027 Nembro
Bergamo
(ITALY)