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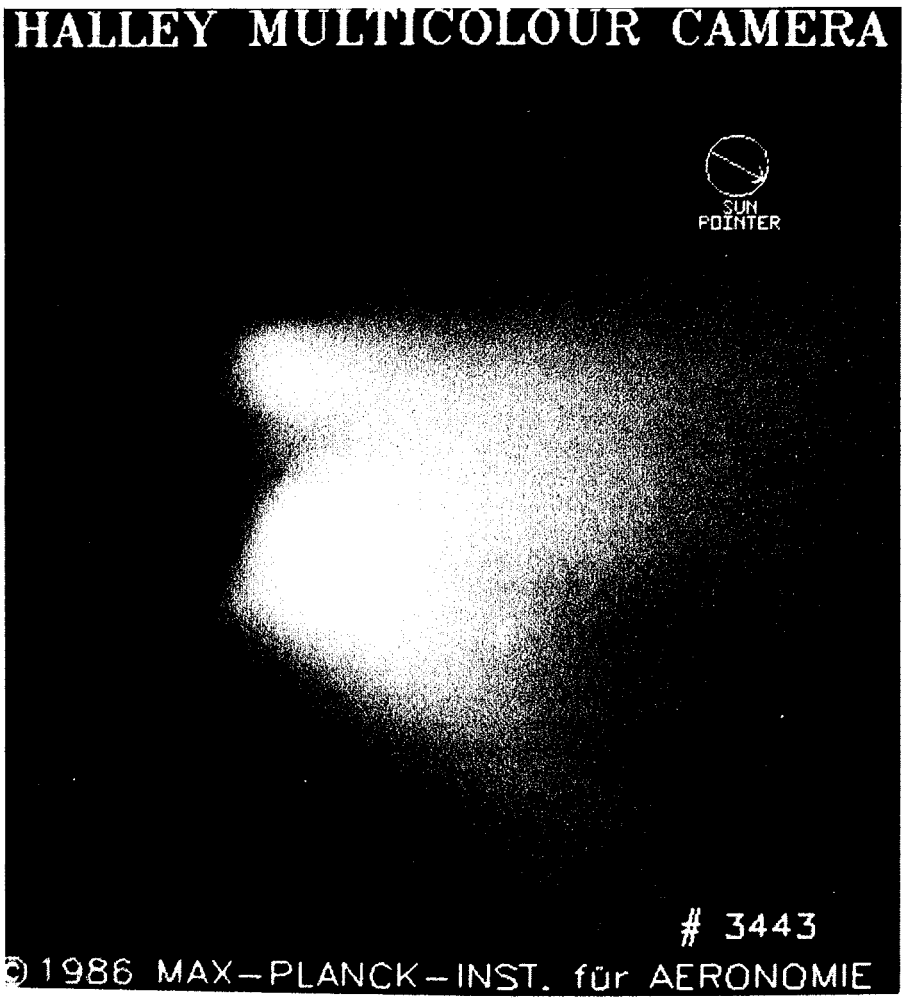

P/Halley as seen from the *Giotto* spacecraft from a distance of 18,270 km. The nucleus is at upper left, with two bright jets pointing in the direction of the sun and dominating much of the picture. Image obtained near 0*h* UT on 1986 March 14.

INSIDE THIS ISSUE

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Manuscripts will be reviewed for possible publication; send typed, double-spaced copy to the Editor (Cambridge address above). Cometary observations also should be sent to the Editor in Cambridge; all data intended for publication in the *ICQ* should be sent on standard *ICQ* observation report forms.

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RECENT NEWS AND RESEARCH CONCERNING COMETS

Daniel W. E. Green
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The biggest news in cometary astronomy right now is that concerning the successful March flybys of Halley's comet by several spacecraft. The first-ever direct images of a comet's nucleus were obtained, showing several most interesting features, as *Giotto* flew only about 600 km past P/Halley's core. With space and time limitations, we can only give a brief sketch here of some of the findings. Interested readers will find useful the 38 articles on P/Halley in the May 15 issue of *Nature*.

The *Giotto* images revealed "a single nucleus of elongate, non-spherical shape (like a potato)" with diameter $\sim 15 \times 8$ km, the nuclear surface being irregular and showing "spherical structures, not unlike impact craters, and valleys and hills. The nucleus has a very low albedo (2–4%), comparable to the darkest bodies in the Solar System: presumably it is covered with a layer of dust. ... Most of the cometary activity appears to originate from only a few discrete sources on the nucleus" in the form of bright dust jets (R. Reinhard 1986, *Nature* **321**, 317). The dust damaged the *Giotto* and both *Vega* spacecraft, but the *Giotto* imaging camera may still be usable for a proposed flyby of P/Grigg-Skjellerup in 1992.

P/Halley has held center-stage since my last column was written a few months back, as it passed through perihelion and was well observed as an object of magnitude 2–3 during February, March, and much of April. It is now fading as this is being written, still barely visible to the naked eye on May 30.2 UT by Richard Keen (observing from Mt. Thorodin, CO) as it approached total visual magnitude 7.

Fully 85% of the tabulated observations in this issue are of P/Halley, and the current return has certainly seen a large volume of photometric data accumulated. The *ICQ* has published visual total magnitude estimates of P/Halley for every UT date from 1985 Sept. 10–1986 Jan. 28, with the exception of 7 days in October around full moon. And, including observations which will appear in the July issue, we have a complete daily run of visual magnitude data for P/Halley from 1986 Feb. 15–May 17 (with the exception of May 9). While there are problems on some dates due to moonlight or altitude, this is a most impressive continuous string of magnitude data for a single comet.

P/Halley's magnitude was about 2.5–3.0 when it was picked up in the morning sky in mid-February by visual observers. The comet's tail gradually grew from $\sim 3^o - 5^o$ in late February to as much as $15^o - 19^o$ by mid-March, as seen visually. However, as the comet neared opposition in April, its tail length went down to $< 10^o$ visually, and was disappointing to many observers who had travelled far to the Southern Hemisphere to view the comet "at its best". However, near opposition P/Halley exhibited a bright fan which was spread out $> 90^o$ at one point (with most of the fan exhibiting a reasonably high surface brightness out to a few degrees in length), with a sharply-defined gas tail on one edge of the fan and a surprisingly-well-defined dust tail constituting the other edge of the fan.

The second half of April saw the tail grow to its longest lengths at this apparition. During the total lunar eclipse on the night of April 24–25, many observers reported long tail lengths, up to $\sim 43^o$ long by Terry Lovejoy in Australia! I could easily trace 26^o of tail visually, with my suspicions of longer lengths drowned out by totally-eclipsed moonlight from my site near Lake Tekapo in New Zealand (the tail actually was oriented such that the outermost lengths were directed somewhat in the direction of the moon). The tail had such low surface brightness, however, that it was much more difficult for Northern Hemisphere observers to detect long lengths as soon as the moon was out of the sky, due to the comet's tail being directed almost parallel to the horizon and very low in altitude.

Next in line to comet Halley is the bizarre news of Don Machholz's new comet 1986*e*. Machholz found his third comet on May 12 using 29x130 *f*/7 binoculars (173 hunting hours after discovering comet 1985*e*) just a degree or two south of M31 in Andromeda as an object of $m_1 = 11$ (reports the following night by Charles Morris and Alan Hale put its total visual magnitude as slightly brighter than 10). The object was $\sim 2' - 3'$ across and diffuse with some condensation. It soon became obvious that the orbit of comet Machholz 1986*e* is highly inclined to the ecliptic ($i \sim 60^o$) and its perihelion distance is quite small ($q = 0.127$ AU), and it was assumed to be a long-period comet.

But as more astrometry came in, a parabolic fit soon gave large residuals for the comet's position, and S. Nakano noted that an ellipse of very short orbital period (~ 5.3 years) would fit the observations quite well. This very strange comet, known as P/Machholz, apparently has had no really close approach to any of the major planets in many decades, according to computations by Brian Marsden. This comet goes closer to the sun than any other known planet, or any comet with a period < 500 years, (the previous record-holder was 3200 Phaethon = 1983 TB, which has $q = 0.14$). While P/Machholz is not intrinsically bright, it seems strange that it has not been discovered at previous returns.

The comet's brightness dropped off about as expected, assuming an r^{-4} or r^{-6} law and an absolute magnitude of ~ 10.5. In early June, P/Machholz appeared to me as a diffuse object of $m_1 \sim 12.5$ with a strong ($m_2 \sim 15$) visual condensation. My visual observations with the 16-inch *f*/18 Cassegrain reflector at Oak Ridge Observatory showed a very tenuous coma at least 1′ in diameter, with the inner 0.3′ of significantly higher surface brightness. Meanwhile, Richard Keen could see a coma $4' - 5'$ across at the same time with a 12-inch *f*/4 Newtonian reflector, and he was finding $m_1 \sim 10 - 11$. One or two observers mentioned the possibility of variability in the nuclear condensation. On May 13, a 7-min exposure by Gary Emerson at Mt. Thorodin, CO, (0.3-m *f*/1.8 Schmidt telescope + 2415 film) showed a broad main tail (4′ long in p.a. 312^o, covering $\sim 40^o$ of p.a.) and a 2′-long anti-tail (p.a. 159^o); his photo showed a coma size of 2′.

(continued on page 72)

TABULATION OF COMET OBSERVATIONS

With the Editor (and Managing Editor, who is also a major factor in compiling and checking the tabulated data before publication) on trips to the Southern Hemisphere in February and April to view Halley's comet, and with the large number of P/Halley observations we've received for publication, this issue has gotten somewhat delayed. The July issue should be out in August, however. While a few months late, we have managed to publish most of the current observations of comets reported to the ICQ -- that is, those made within the past 6 months. However, we did not have space or time to publish another couple hundred or so of the current data, and these will appear in the next issue. Also, due to time contraints, we will not publish the description information (to complement the tabulated data published in this issue) until the July issue.

NEW ADDITIONS TO THE REFERENCE KEY:
WH = Unspecified IHW charts
WW = B.A.A. Charts as published in the IHW Observers' Manual

Key to observers with observations published in this issue [those with asterisks (*) preceding the 5-character code are new additions to the Observer Key (cf. ICQ 8, 11)]:

AER	07	L. Aerts, Belgium
AND01		Karl-Gustav Andersson, Sweden
BAR		Sandro Baroni, Italy
*BAT01		Hilma Batza, Australia
BEM		C. S. Bembrick, Australia
BOE	05	Leo Boethin, The Philippines
BOR		John E. Bortle, NY, U.S.A.
*BOT		S. J. J. Both, The Netherlands
BOU	11	Reinder J. Bouma, The Netherlands
BUS01	11	E. P. Bus, The Netherlands
CLA	07	Maurice L. Clark, Australia
COM	05	Georg Comello, The Netherlands
DEA		V. F. de Assis Neto, Brazil
*DOU		H. Douma, The Netherlands
DUC		Richard Ducoty, CA, U.S.A.
FEI	11	H. Feijth, The Netherlands
FER		Ignacio Ferrin, Venezuela
*GAR01		Gordon Garradd, N.S.W., Australia
GEE	11	J. Geenen, The Netherlands
GRE		Daniel W. E. Green, U.S.A.
GUB		Herbert Gubo, West Germany
HAS02		Werner Hasubick, West Germany
HUR	01	Guy M. Hurst, England
*JAH		Jost Jahn, West Germany
KAM01		Andreas Kammerer, West Germany
KEE	05	Richard A. Keen, CO, U.S.A.
KEI	01	Graham Keitch, England
*KEI01		P. C. Keijmel, The Netherlands
KES01		Sa'ndor Keszthelyi, Hungary
KOC		Bernd Koch, West Germany
KOC01		Volkmar Koch, West Germany
KRO01	11	B. Kroon, The Netherlands
KUI	11	G. Kuipers, The Netherlands
LAA		T. A. van der Laan, The Netherlands
LIN02		Juergen Linder, West Germany
LOO01		F. R. van Loo, Belgium
LOV		Terry Lovejoy, Australia
*LUD		Stephen T. Ludden, NE, U.S.A.
*MAA		W. J. Maat, The Netherlands
MAC		Donald E. Machholz, CA, U.S.A.
MAT01		Vic L. Matchett, Australia
MER		Jean-Claude Merlin, France
MIL02		Giannantonio Milani, Italy
MOE		Michael Moeller, West Germany
MOR03		Warren C. Morrison, Canada
NOL		Michael Nolle, West Germany
PEA		Andrew R. Pearce, Australia
*PUR		Robert Purvinskis, Australia
REI01		Johann Reifberger, Austria
*ROO		M. C. Roos, The Netherlands
SCH04		A. H. Schoiten, The Netherlands
SEA		David A. J. Seargent, Australia
SHA02	07	Jonathan D. Shanklin, England
SIM	05	Karl Simmons, FL, U.S.A.
SIM01	05	Wanda Simmons, FL, U.S.A.
SPR		C. E. Spratt, BC, Canada
*SWA		E. T. Swart, The Netherlands
VAN02	11	H. Van Asperen, The Netherlands
*VAN04		T. VanMunster, Belgium
*VER03		P. G. Verhoeven, The Netherlands
*WAG		Geroid Wagner, West Germany
WEG	11	R. L. W. van der Weg, The Netherlands
*WES02		Margareta Westlund, Sweden
WIL02		Peter F. Williams, Australia
*WIL03		P. Wils, Belgium
WOO		Jeff Wood, Australia
ZAN		Mauro Zanotta, Italy
ZAN01		W. T. Zanstra, The Netherlands

* * *

Comet Shoemaker (1984f)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 04 02.45	S	12.5	AC	31.7	L	7	77	1.0	6			BOU
1986 04 03.41	S	12.5	AC	31.7	L	7	127	& 1	7			BOU
1986 04 04.44	S	12.4	AC	31.7	L	7	103	0.8	7			BOU
1986 04 06.42	S	12.4	AC	31.7	L	7	77	0.8	7			BOU
1986 04 07.44	S	12.5	AC	31.7	L	7	77		6			BOU
1986 04 08.43	S	12.4	AC	31.7	L	7	103	0.8	7			BOU
1986 04 09.41	S	12.6	AC	31.7	L	7	103	0.7	7/			BOU
1986 04 13.42	S	12.6	AC	31.7	L	7	77	0.8	7			BOU
1986 04 13.42	S	12.7	AC	31.7	L	7	103	0.7	7/			BOU

Comet Hartley-Good (19851)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 10 01.50	S	9.1	AA	31.7	L	5	49	5.5	2			PEA
1985 10 06.05	S	8.3	A	31.7	L	6	68	3.8	3/			BOR
1985 10 06.05	S	8.0	A	8.0	B		20	8.5	1			BOR

Comet Hartley-Good (19851) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 10 07.07	S	7.9	A	8.0	B		20	11				BOR
1985 10 07.07	S	7.4	A	5.0	B		10	14	0			BOR
1985 10 07.07	S	8.3	A	31.7	L	6	68	5.5	4			BOR
1985 10 08.09	S	8.0	A	31.7	L	6	68	& 5	4	?	90	BOR
1985 10 08.09	S	7.7	A	8.0	B		20	12	2			BOR
1985 10 08.09	S	7.5	A	5.0	B		10	13	2			BOR
1985 10 10.08	S	7.4	A	5.0	B		10	13	1			BOR
1985 10 12.02	S	7.1	NO	5.0	B		10	13	1			BOR
1985 10 12.49	S	7.9	AA	6.5	B		20	8.5	3			PEA
1985 10 12.90	S	7.4	AA	8.0	B		20	8.4	3			KEI
1985 10 13.61	S	7.7	AA	6.5	B		20	10	3			PEA
1985 10 13.80	S	7.4	AA	8.0	B		20	11.0	1/			KEI
1985 10 13.80	S	7.4	AA	5.0	B		10	11				KEI
1985 10 14.49	S	7.7	AA	6.5	B		20	10	3			PEA
1985 10 15.52	S	7.4	AA	6.5	B		20	15	4			PEA
1985 10 18.02				31.7	L	6	55	8	5	0.2	100	BOR
1985 10 18.02	S	6.9	A	5.0	B		10	13	3			BOR
1985 10 19.80	S	6.7	AA	5.0	B		10	15				KEI
1985 10 19.80	S	7.3	AA	8.0	B		20	6.3	3			KEI
1985 10 30.50	S	7.4	AA	6.5	B		20	10	3			PEA
1985 10 31.97	S	7.3	NO	8.0	B		20	6	4			BOR
1985 11 01.77	S	7.1	AA	5.0	B		10	6.3	4/			KEI
1985 11 01.77	S	7.2	AA	8.0	B		20	5.4	5	0.50	28	KEI
1985 11 02.76	S	7.2	AA	5.0	B		10	4.8	6			KEI
1985 11 05.79	S	7.3	AA	5.0	B		10	7.2		0.50	88	KEI
1985 11 08.76	S	7.4	AA	8.0	B		20	5.4	5	0.17	82	KEI
1985 11 08.76	S	7.3	AA	5.0	B		10	6.3				KEI
1985 11 09.00	S	7.4	A	8.0	B		20	8	5			BOR
1985 11 09.00	S	8.3	A	31.7	L	6	55	4.3	5	0.2	80	BOR
1985 11 09.00	S	7.3	A	5.0	B		10	8.5	5			BOR
1985 11 09.77	S	7.3	AA	5.0	B		10					KEI
1985 11 10.76	S	7.5	AA	5.0	B		10	4.5	4/	0.23	90	KEI
1985 11 12.77	S	7.4	AA	5.0	B		10	3.9		0.34	136	KEI
1985 11 15.78	S	7.5	AA	5.0	B		10	3				KEI
1985 11 18.98	S	7.2	NO	8.0	B		20	5.5	5			BOR
1985 11 18.98	S	7.0	NO	5.0	B		10	7	4			BOR
1985 11 25.71	S	7.9	AA	5.0	R	10	13	4.9	3			JAH
1985 12 03.97	S	7.5	S	8.0	B		20	3.5	5			BOR
1985 12 03.97	S	6.9	S	5.0	B		10	5				BOR
1985 12 19.44	S	7.8	A	8.0	B		20	3	6			BOR
1985 12 19.47	S	7.8	AC	6	R	15	36	4	3			MOR03
1985 12 20.45	S	7.9	A	8.0	B		20	4	5/			BOR
1985 12 21.47	S	7.9	AC	6	R	15	36	4.5	3			MOR03
1985 12 25.46	S	8.0	AC	6	R	15	36	4	3			MOR03
1985 12 28.46	S	8.3	AC	6	R	15	36	3				MOR03
1986 01 04.43	S	8.3	AC	6	R	15	36	4	2			MOR03
1986 01 06.20	S	8.3	AA	8.0	B		20	2.8	3		23	KEI
1986 01 06.20	S	8.0	AA	5.0	B		10	3.3				KEI
1986 01 06.42	S	8.3	AC	6	R	15	36	4.5	2			MOR03
1986 01 07.46	S	8.6	AC	6	R	15	36	4	2			MOR03
1986 01 08.46	S	8.4	AC	6	R	15	36	5	2			MOR03
1986 01 09.47	S	8.6	AC	6	R	15	36	4.5	2			MOR03
1986 01 12.39	S	8.6	AC	6	R	15	36	4.5	2			MOR03
1986 01 12.44	S	8.6	A	8.0	B		20	4	3			BOR
1986 01 15.26	S	8.4	AA	5.0	B		10	5.0	2/			KEI

Comet Hartley-Good (19851) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 01 15.42	S	9.0	AC	6	R	15	36	4	2			MOR03
1986 01 17.10	S	9.0	S	15.2	L	5	44	4	3			MOE
1986 01 19.72	S	8.8	AA	15.2	L	5	29	3	0			SEA
1986 01 20.24	S	8.9	AA	8.0	B		20	6.2	3			KEI
1986 01 21.15	B	9.2	S	10.0	B		14	4.3	4			HAS02
1986 01 21.47	S	9.6	AC	6	R	15	36	3.5	2			MOR03
1986 02 06.10	S	10.1	AC	15.2	L	5	44	3	2			MOE

Comet Thiele (1985m)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 10 23.35	S	9.0	A	8.0	B		20	5	1			BOR
1985 10 23.35	S	9.6	A	31.7	L	6	68	3.4	3			BOR
1985 10 25.39	S	8.9	AC	15	R	5	31	5.0	3			MOR03
1985 10 26.39	S	9.1	A	31.7	L	6	68	4.7	5			BOR
1985 10 26.39	S	8.8	A	8.0	B		20	9	2			BOR
1985 10 26.39	S	8.8	AC	15	R	5	31	5.7	3			MOR03
1985 11 09.01	S	7.7	A	5.0	B		10	11.5	2/			BOR
1985 11 09.02	S	9.1	AC	15	R	5	31	5	3			MOR03
1985 11 12.00	S	9.0	AC	15	R	5	31	5.5	2			MOR03
1986 01 02.77	S	10.2	AC	20.3	T	10	92	1.7	2			HAS02
1986 01 08.71	S	10.4	AC	15.2	L	5	44	3	1			MOE
1986 01 11.00	S	10.5	AC	15	R	5	62	1.7	1			MOR03
1986 01 11.02	S	10.7	AC	44.5	L	4	80	2.0	2			MOR03

Periodic Comet Machholz (1986e)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 05 13.43	M	9.8	AA	32	L	4	33	2.5	2			KEE
1986 06 03.24	S	12.3	EB	40.6	L	18	229	& 1.5	3			GRE

Periodic Comet Giacobini-Zinner (1984e)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 08 07.92	S	8.8	AC	8.0	B	5	20	3.5	4			MIL02
1985 08 08.91	S	8.7	AC	8.0	B	5	20		5			MIL02
1985 08 09.91	S	8.9	AC	20	L	4	50	2.5	5			MIL02
1985 08 09.92	S	8.8	AC	8.0	B	5	20	3.0				MIL02
1985 08 10.94	S	8.6	AC	8.0	B	5	20					MIL02
1985 08 12.90	S	8.5	AA	8.0	B	5	20		5			MIL02
1985 08 12.91	S	8.6	AC	8.0	B	5	20		5			MIL02
1985 08 13.93	S	8.5	AA	8.0	B	5	20	2.0	5			MIL02
1985 08 14.94	S	8.5	AA	8.0	B	5	20	1.7	6	0.08	265	MIL02
1985 08 15.90	S	8.5	AA	8.0	B	5	20					MIL02
1985 08 17.91	S	8.4	AA	8.0	B	5	20	2.0	6			MIL02
1985 09 11.06	S	8.9	AA	20	L	4	50	1.5	7	0.03		MIL02
1985 09 12.33	S	7.5	A	8.0	B		20	5.3	3			BOR
1985 09 12.33				31.7	L	6	68	2.4	7	0.5	293	BOR
1985 09 14.34	S	8.5	NO	8.0	B		20	5	2			BOR
1985 09 14.34	S	9.0	NO	31.7	L	6	68	2.9	5	0.6	305	BOR
1985 09 15.34	S	8.5	A	8.0	B		20	7	4			BOR
1985 09 15.34	S	9.1	A	31.7	L	6	68	& 1.4	6	0.2	280	BOR
1985 09 16.37	S	8.4	A	8.0	B		20	8	3			BOR
1985 09 16.37	S	9.2	A	31.7	L	6	68	4.0	3	0.2	290	BOR
1985 09 17.35	S	9.0	A	31.7	L	6	68	2.6	5	0.2	280	BOR

Periodic Comet Giacobini-Zinner (1984e) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 09 17.35	S	8.6	A	8.0	B		20	4	3			BOR
1985 10 08.36	S	10.0	A	31.7	L	6	68	2.1	2/			BOR
1985 10 10.83	S	10.3	AC	31.7	L	5	63	0.8	5			PEA
1985 10 11.80	S	10.3	AC	31.7	L	5	63	0.9	6			PEA
1985 10 12.39	S	10.0	A	31.7	L	6	68	1.4	6	0.1	270	BOR
1985 10 14.82	S	10.4	AC	31.7	L	5	63	1.2	6	0.18	279	PEA
1985 10 23.38	S	10.0	A	31.7	L	6	68	2.0	4/	?	270	BOR

Periodic Comet Wirtanen (1985q)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 03 04.12	M	9.2	S	32	L	4	40	2.5	2			KEE
1986 03 28.12	M	10.0	S	32	L	4	40	3	1			KEE
1986 03 31.05	S	10.2	AC	15	R	5	31	2				MOR03
1986 03 31.05	S	10.5	AC	15	R	5	62	1.6	5			MOR03
1986 04 03.05	S	10.0	AC	15	R	5	31	3	2			MOR03
1986 04 03.05	S	10.2	AC	15	R	5	62	2.2	2			MOR03
1986 04 05.06	S	10.6	AC	15	R	5	62	2.0	2			MOR03
1986 04 29.08	S	10.8	AC	15	R	5	62	2.2	1			MOR03
1986 05 11.10	S	12.6	AC	44.5	L	4	167	0.6	0			MOR03

Periodic Comet Ashbrook-Jackson (1985a)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 10 12.03	S	13.1	AC	44.5	L	4	167	0.6	2			MOR03

Periodic Comet Giclas (1985g)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 11 14.08	S	13.5	WA	20	R	14	170	0.4	3			SHA02
1985 12 31.74	P	13.5:	UP	20.0	A	6	24	0.9	3			JAH

Periodic Comet Ciffréo (1985p)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 11 15.88	S	12.4	WC	26	L	6	145	0.5	2			HUR
1985 11 16.02	S	11.9	WA	20	R	14	40	1.2	1			SHA02
1985 11 19.15	S	10.7	A	20.0	C	10	50	5	2			COM
1985 12 07.87	S	12.0	A	25.4	J	6	90	1.7	0/			BOU
1985 12 10.96	S	12.5	A	25.4	J	6	90	1	2			BOU
1985 12 18.97	S	12.0	A	25.4	J	6	90		1			BOU
1986 01 01.82	S	11.6	AC	15.2	L	5	44	1.5	1			MOE
1986 01 11.79	S	13.0	A	25.4	J	6	90	1				BOU

Periodic Comet Halley (1982i)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 09 12.36	S	13.3	WA	50.0	L	5	241	0.5	6			BOR
1985 09 12.36	S	13.2	WA	31.7	L	6	170	0.4				BOR
1985 09 13.34	S	13.1	WA	31.7	L	6	170	0.8				BOR
1985 09 13.34	S	12.8	WA	50.0	L	5	157	0.9	6			BOR
1985 09 14.36	S	13.0	WA	31.7	L	6	170	0.6	5			BOR
1985 09 14.36	S	12.9	WA	50.0	L	5	157	0.9	6			BOR
1985 09 15.36	S	12.8	WA	31.7	L	6	170	0.6	6			BOR
1985 09 15.36	S	12.7	WA	50.0	L	5	157	0.8	6			BOR

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 09 16.35	S	12.6	WA	50.0	L	5	157	0.9	6			BOR
1985 09 16.35	S	12.7	WA	31.7	L	6	170	0.6	2/			BOR
1985 09 17.37	S	12.5	WA	50.0	L	5	157	0.8	5/			BOR
1985 09 17.37	S	12.6	WA	31.7	L	6	170	0.6	3			BOR
1985 09 25.37	S	11.7	WA	31.7	L	6	88	1.5	5			BOR
1985 10 07.39	S	11.0	WA	31.7	L	6	88	1.1				BOR
1985 10 08.35	S	11.0	WA	31.7	L	6	88	1.2	5			BOR
1985 10 10.38	S	10.7	WA	31.7	L	6	68	1.8	5			BOR
1985 10 10.73	S	10.7	WC	20	L	6	50	1.0	7			LOV
1985 10 10.81	S	11.5	AC	31.7	L	5	63	1.5	3			PEA
1985 10 11.78	S	11.7	AC	31.7	L	5	63	1.2	2			PEA
1985 10 12.37	S	10.3	WA	31.7	L	6	68	3.2	6			BOR
1985 10 13.03	S	10.5	WA	29.8	L	5	62	1.8	4			KEI
1985 10 13.08	B	11.6	AA	20.3	T	10	63		3			WAG
1985 10 14.12	S	10.4	WA	29.8	L	5	62	2.4	4/			KEI
1985 10 14.12	S	10.7	WA	29.8	L	5	89					KEI
1985 10 14.12	S	9.7	WA	8.0	B		20	2.4				KEI
1985 10 14.79	S	11.0	AC	31.7	L	5	63	1.5	4			PEA
1985 10 19.74	S	9.5	WC	20	L	6	50	3.9	6			LOV
1985 10 20.16	S	10.8	WA	25.4	J	6	76	2	4/			WIL03
1985 10 20.18	S	9.3	WA	10	L	9	23	5	3			WEG
1985 10 21.10	S	9.8	WA	29.8	L	5	62	2.1	5			KEI
1985 10 21.10	S	9.0	AA	5.0	B		10					KEI
1985 10 21.10	S	9.1	AA	8.0	B		20	4.2				KEI
1985 10 21.16	S	9.2	WA	10	L	9	23	5	3			WEG
1985 10 22.03	S	9.6	WA	10.2	R		60	3	2			VAN02
1985 10 22.13	B	10.8	WA	11.5	L	8	45	& 3.5	4/			VAN04
1985 10 22.14	S	10.6	WA	25.4	J	6	76	2	5			WIL03
1985 10 22.17	S	9.2	AA	12.7	L	8	40	3.0	4/	0.08	160	KEI
1985 10 22.17	S	9.0	AA	8.0	B		20	4.2				KEI
1985 10 22.32	S	9.0	WA	31.7	L	6	68	3.4	6/			BOR
1985 10 22.32	S	8.4:	WA	5.0	B		10	7				BOR
1985 10 22.32	S	8.6	WA	8.0	B		20	8	2			BOR
1985 10 23.16	S	8.9	WA	10	L	9	23	6	3			WEG
1985 10 23.16	B	9.4	WA	10	L	9	23					WEG
1985 10 23.36	S	8.6	WA	8.0	B		20	8	2			BOR
1985 10 23.36	S	9.0	WA	31.7	L	6	68	4.0	7			BOR
1985 10 24.18	B	9.3	WA	10	L	9	23					WEG
1985 10 24.18	S	8.8	WA	10	L	9	23	5	3			WEG
1985 10 25.13	S	8.8	AA	8.0	B		20	3.8	4			KEI
1985 10 25.13	S	9.0:	WC	10.0	B		14	4	5			LOO01
1985 10 25.15	S	8.6	WC	10	L	9	23	5	3			WEG
1985 10 25.19	S	10.1	WA	15	R	8	34	& 5.5	5			AER
1985 10 26.18	S	8.4	WC	10	L	9	23	6	3			WEG
1985 10 26.18	B	8.8	WC	10	L	9	23					WEG
1985 10 26.41	S	8.9	WA	31.7	L	6	68	3.2	6/			BOR
1985 10 28.75	S	8.6	WC	20	L	6	50	> 5	7			LOV
1985 11 03.72	B	8.7	W	25	T	10	100	&10	3			BEM
1985 11 03.81	S	7.7	D	6.0	B		12	&15	4/			WEG
1985 11 03.90	S	8.2	D	10.0	B		14		4			LOO01
1985 11 05.83	S	8.0	D	10.0	B		14	7	4			LOO01
1985 11 05.85	B	8.2	D	11.5	L	8	45	8	7			VAN04
1985 11 05.85	S	8.0	D	8.0	B		15		3			SCH04
1985 11 05.86	B	7.7	D	6.0	B		12					WEG
1985 11 05.86	S	7.4	D	6.0	B		12	18	4	0.35	280	WEG

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 11 05.90	S	6.9	AA	5.0	B		10	13.5		0.25	302	KEI
1985 11 06.85	B	8.5	AA	14.0	S	4	25	5.4	6			LIN02
1985 11 06.87	B	8.0	AA	5.0	B		7	12.5	5/			LIN02
1985 11 07.04	S	6.8	AA	5.0	B		10	15.8		0.33	347	KEI
1985 11 07.18				8.0	B		20	10	5	0.4	125	BOR
1985 11 07.18	S	7.1	NO	5.0	B		10	12	5			BOR
1985 11 07.88	B	7.0	D	5.0	B		10					BOU
1985 11 07.88	S	8.2	D	14.5	L	8	30		5			LAA
1985 11 07.89	B	7.1	D	4.0	B		7					BUS01
1985 11 07.89	S	6.7	D	4.0	B		7	&20	4			BUS01
1985 11 07.89	S	6.5:	D	1.8	B		3					BUS01
1985 11 07.89	S	6.5	D	5.0	B		10	&17.5	4			BOU
1985 11 07.90	S	7.1	D	10	L	9	23	&15	6/	0.30	100	WEG
1985 11 07.92	S	7.9	D	10	B		14		6			LOO01
1985 11 07.94	B	6.9	AA	5.0	B		10					KEI
1985 11 07.94	S	6.8	AA	5.0	B		10	12.8	5/	0.50	270	KEI
1985 11 07.97	S	7.9	D	15.5	L	5	33	8	3			ZAN01
1985 11 07.98	S	7.9	D	6.0	B		12	12	2			ZAN01
1985 11 07.99	B	7.2	D	6.0	B		12					WEG
1985 11 07.99	S	6.9	D	6.0	B		12	&20	5		90	WEG
1985 11 07.99	S	8.0	D	8.0	B		15		3			SCH04
1985 11 08.01	B	7.7	D	5.0	B		7	&20	4			KUI
1985 11 08.05	S	7.2	D	5.0	B		10	&11.5	4			COM
1985 11 08.56	S	6.8	W	8.0	B		15	10	7			LOV
1985 11 08.89	S	7.8	D	10.0	B		14	& 6.5	6			LOO01
1985 11 09.15	S	6.6	AA	5.0	B		10	11.5	5	0.33	348	KEI
1985 11 09.15	S	6.8	AA	8.0	B		20	11.5	5	0.33	348	KEI
1985 11 09.18	S	6.8	NO	5.0	B		10	15	5			BOR
1985 11 09.53	S	8.0	W	5.0	B		12	5	1			BAT01
1985 11 09.68	B	8.0	W	25	T	10	100	&15	4			BEM
1985 11 09.79	S	7.0	D	20	T	10	50	8.1	6			WOO
1985 11 09.83	B	7.8	D	11.5	L	8	45	& 5.5	7/			VAN04
1985 11 09.91	S	6.4	AA	5.0	B		10	11.5		0.33	39	KEI
1985 11 10.78	B	7.7	AA	20.3	T	10	63		5			WAG
1985 11 10.83	S	7.9	D	8.0	B		15		3			SCH04
1985 11 10.83	S	6.7	D	10.0	B		14	8	6			LOO01
1985 11 10.84	B	6.8	AA	5.0	B		7	&15	6			LIN02
1985 11 10.85	S	6.2	D	4.0	B		7	&22	4/			BUS01
1985 11 10.91	B	6.7	D	4.6	R		8					WEG
1985 11 10.91	S	6.2	D	4.6	R		8	23	4			WEG
1985 11 10.92	S	6.4	D	6.0	B		12	21	6	0.42	250	WEG
1985 11 10.92	S	6.2	D	5.0	B		10	17	4/			BOU
1985 11 10.92	B	6.8	D	6.0	B		12					WEG
1985 11 10.93	S	6.8	D	10.0	B		14	8	5			AER
1985 11 10.95	B	7.9	D	11.5	L	8	45	7	8			VAN04
1985 11 10.95	S	6.5	D	5.0	B		10	&15	4			COM
1985 11 10.99	S	6.4	AA	5.0	B		10	18	5			KEI
1985 11 11.05	S	6.8	D	5.0	B		10	12	5			LOO01
1985 11 11.59	S	8.0	W	5.0	B		10	4	3			WIL02
1985 11 11.82	S	6.2	D	8.0	B		20	12	5/			BOU
1985 11 11.86	B	8.1	D	11.5	L	8	45	5	8			VAN04
1985 11 11.88	S	7.3	D	15	R	8	34	10	5			AER
1985 11 12.07	S	6.4	D	5.0	B		10	&15	5			COM
1985 11 12.53	S	7.5	W	5.0	B		12	6	1			BAT01
1985 11 12.54	S	6.3	W	8.0	B		15	10				LOV

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 11 12.75	S	7.1	D	20	T	10	50	9.9	5			WOO
1985 11 12.83	S	6.9	D	8.0	B		15	8	3			ZAN01
1985 11 12.84	S	5.9	D	5.0	B		10	17	4/			BOU
1985 11 12.86	S	7.7	D	11	L	8	45	10	4			DOU
1985 11 12.86	S	5.9	D	4.0	B		7	&22	4/			BUS01
1985 11 12.86	B	6.5	D	4.0	B		7					BUS01
1985 11 12.86	S	5.9	AA	5.0	B		10	18				KEI
1985 11 12.86	S	5.7	AA	2.5	B		2	20				KEI
1985 11 12.87	S	5.8	D	1.8	B		3	&25	4			BUS01
1985 11 12.88	S	6.4	D	4.5	B		9	&15	5			COM
1985 11 12.90	S	7.1	D	10.0	B		14	7	6			LOO01
1985 11 13.10	B	7.8	D	8.0	B		15					KEI01
1985 11 13.24	S	5.9	AA	5.0	B		10	10.3		0.33	150	KEI
1985 11 13.53	S	7.3	W	5.0	B		12	8	1			BAT01
1985 11 13.54	S	6.2	W	8.0	B		15	10			225	LOV
1985 11 13.95	B	6.4	D	6.0	B		12					WEG
1985 11 13.95	S	6.0	D	6.0	B		12	&17	6	0.25	107	WEG
1985 11 13.95	B	6.1	D	4.6	R		8					WEG
1985 11 13.95	S	5.7	D	4.6	R		8	&22	5			WEG
1985 11 14.06	S	6.7	D	10.0	B		14	12	6			LOO01
1985 11 14.07	S	6.3	NO	5.0	B		10	14	5			BOR
1985 11 14.07	B	6.5	NO	5.0	B		10					BOR
1985 11 14.15	S	5.8	D	5.0	B		10	18	4			BOU
1985 11 14.75	S	6.8	D	20	T	10	50	10.2	5			WOO
1985 11 14.85	S	6.8	AA	8.0	B		20	12	5			BAR
1985 11 14.9	B	7.0:	AA	20.3	T	10	63		5			WAG
1985 11 14.92	S	7.2:	AA	8.0	B	5	20	8	6			MIL02
1985 11 14.93	B	7.3:	AA	8.0	B	5	20					MIL02
1985 11 14.95	S	6.5	AA	14.0	S	4	16	7.4	6			LIN02
1985 11 15.08	S	6.6	D	5.0	B		10	28	6			LOO01
1985 11 15.13	S	5.5	D	4.6	R		8	24	5			WEG
1985 11 15.13	B	6.0	D	4.6	R		8					WEG
1985 11 15.17	S	6.1	S	5.0	B		10	15	5/			BOR
1985 11 15.36	S	6.9	A	8.0	B		11	12	5			DUC
1985 11 15.55	S	5.7	W	3	R	7	8	15	7			LOV
1985 11 15.88	S	5.9	AA	5.0	B		10	20				KEI
1985 11 15.88	S	5.9	AA	2.5	B		2	30				KEI
1985 11 15.94	S	7.4:	AA	20	L	4	50		7			MIL02
1985 11 16.05	S	6.0	AA	14.0	S	4	16	&20	6			LIN02
1985 11 16.06	B	6.3	AA	14.0	S		16	16	6			WAG
1985 11 16.43	B	7.5	W	10	R	16	65		5			BEM
1985 11 16.49	S	5.6	W	8.0	B		15	16	7			LOV
1985 11 16.75	S	6.8	D	20	T	10	50	10.4	5			WOO
1985 11 16.91	B	6.3	AA	5.0	B		7	14	5/			LIN02
1985 11 16.93	S	5.2	D	4.6	R		8	23	4/			WEG
1985 11 16.93	B	5.6	D	4.6	R		8					WEG
1985 11 16.94	B	6.2	AA	5.0	B		10		8			WAG
1985 11 17.01	B	7.3	AA	5.0	B		7		3			SIM
1985 11 17.02	B	7.3	AA	5.0	B		7		5			SIM01
1985 11 17.55	S	6.8	W	5.0	B		10		6			WIL02
1985 11 17.75	M	5.6	AA	8.0	B		20		5			LUD
1985 11 17.83	B	7.8	D	8.0	B		15					KEI01
1985 11 17.91	B	7.4	D	11.5	L	8	45	& 4.5	9			VAN04
1985 11 17.92	S	6.4	D	4	R		10	12	6			LOO01
1985 11 17.92	S	7.3	D	10.2	R		37	&10	4			VAN02

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 11 17.93	B	6.8	D	6.3	B		9		6			SWA
1985 11 17.94	M	5.6	AA	8.0	B		20		5			LUD
1985 11 17.97	S	7.0	D	15	R	15	31	12	3			GEE
1985 11 18.07	S	5.2	AA	5.0	B		10	18	8			KEI
1985 11 18.20	S	5.8	S	5.0	B		10	20	5/			BOR
1985 11 18.20	S	6.0	S	0.0	E		1					BOR
1985 11 18.24	S	6.4	A	8.0	B		11	12	5			DUC
1985 11 18.67	S	6.5	D	6	R	10	18	12.9	5			WOO
1985 11 18.99	S	5.8	NO	5.0	B		10	14	5			BOR
1985 11 19.04	S	5.5	AA	5.0	B		10	19.5	7			KEI
1985 11 19.05	S	6.3	D	5.0	B		10	&15	5			COM
1985 11 19.23	S	5.7	NO	5.0	B		10	17	5/			BOR
1985 11 19.45	S	6.3	A	8.0	B		11	15	5			DUC
1985 11 19.50	S	6.5	W	5.0	B		12	9	2			BAT01
1985 11 19.50	S	7.1	W	5.0	B		10		8			WIL02
1985 11 19.67	S	6.6	D	6	R	10	18	10.0	6			WOO
1985 11 20.50	S	5.3	W	0.0	E		1					LOV
1985 11 21.57	S	6.5	W	5.0	B		12	9	2			BAT01
1985 11 22.14	M	5.2	AA	8.0	B		20		5			LUD
1985 11 23.50	S	6.5	W	5.0	B		12	10	2			BAT01
1985 11 24.00	S	5.8	W	8.0	B		20	7.5	5			BOR
1985 11 24.00	S	5.7	W	5.0	B		10	10	5			BOR
1985 11 25.80	S	7.4	D	25.4	J	6	73	2	7		190	BUS01
1985 11 27.43	S	5.1	W	8.0	B		15					LOV
1985 11 27.81	S	7.2	D	25.4	J	6	73	2.5	7			BUS01
1985 11 27.84	S	5.0	D	4.0	B		7	16	4			BUS01
1985 11 27.93	S	4.9	D	5.0	B		10	&15	1/			BOU
1985 11 28.51	S	6.6	W	5.0	B		10		6			WIL02
1985 11 28.75	S	4.9	AA	5.0	B		10					KEI
1985 11 28.77	S	5.2	D	5.0	B		10	15	5			LOO01
1985 11 28.93	S	4.9	D	4.0	B		7	18	4			BUS01
1985 11 28.98	S	4.5	D	4.6	R		8	15	4	0.33	70	WEG
1985 11 29.42	S	4.7	W	0.0	E		1	30	7			LOV
1985 11 29.74	S	4.8	D	5.0	B		10	&15	3			BOU
1985 11 30.71	S	4.6	D	5.0	B		10	&20	3			BOU
1985 11 30.71	S	4.3	D	1.8	B		3	&23	3/			BUS01
1985 12 01.45	S	6.3	W	5.0	B		7		2			MAT01
1985 12 01.46	S	4.7	W	3	R		8	30	7			LOV
1985 12 01.73	S	4.1	D	1.8	B		3	28	4/			BUS01
1985 12 01.73	S	5.3	D	5.0	B		10	&25	5/			COM
1985 12 01.73	S	5.2	D	5.0	B		10	15	5			AER
1985 12 01.74	S	5.4	D	5.0	B		10	& 8	6	0.25	83	LOO01
1985 12 01.74	S	4.3	D	4.6	R		8	25	4/	0.50	60	WEG
1985 12 01.74	S	4.8	AA	8.0	B		20	22	6			BAR
1985 12 01.75	K	5.4	AA	6.3	B		9	20	6	&1	80	KAM01
1985 12 01.78	B	5.3	AA	5.0	B		7	21	5/			LIN02
1985 12 01.79	B	5.5	D	6.3	B		8	25	2/			GEE
1985 12 01.82	B	6.5	D	11.5	L	8	45	&11	8			VAN04
1985 12 01.83	S	4.9	AA	5.0	B		10	30	7	0.5	72	KEI
1985 12 02.44	S	4.4	W	0.0	E		1	30	7			LOV
1985 12 02.54	S	4.9	W	6.5	B		20	10	4			PEA
1985 12 02.58	S	6.4	D	20	T	10	50	14.4	5	0.4	90	WOO
1985 12 02.76	M	5.3	AA	6.3	B		9	20	5			KAM01
1985 12 02.77	S	5.4	D	5.0	B		10					LOO01
1985 12 02.78	B	5.2	AA	5.0	B		7	&11	6			LIN02

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 12 02.79	B	5.6	AA	5.0	B		10		6			WAG
1985 12 02.80	S	6.1	D	5.0	B		16	50	5			VAN02
1985 12 02.80	S	5.1	D	5.0	B		10	&20	6			COM
1985 12 02.84	B	6.2	D	11.5	L	8	45	&13.5	8			VAN04
1985 12 02.85	S	5.0	D	4.0	B		7	16	5			BUS01
1985 12 02.88	M	4.9	AA	8.0	B		20		6			LUD
1985 12 02.98	S	4.8	W	5.0	B		10	15	5			BOR
1985 12 03.10	K	5.3	AC	4.0	B		8	20	5	0.40	70	KEE
1985 12 03.11	B	4.6	AC	0.9	E		1					KEE
1985 12 03.12	M	5.8	AC	32	L	4	40	20	6	0.67	70	KEE
1985 12 03.42	S	6.3	W	5.0	B		7		2			MAT01
1985 12 03.43	S	4.4	W	0.0	E		1	30	7			LOV
1985 12 03.53	S	5.1	W	6.5	B		20	12	5			PEA
1985 12 03.58	S	6.2	D	20	T	10	50	14.6	5	0.4	90	WOO
1985 12 03.73	S	4.1	D	1.8	B		3	&25	4/			BUS01
1985 12 03.74	S	4.5	D	4.0	B		7	20	5	2.0	90	BUS01
1985 12 03.77	M	4.6	AA	8.0	B		20		6			LUD
1985 12 03.83	S	4.8	AA	2.5	B		2	18				KEI
1985 12 03.83	S	4.9	AA	5.0	B		10	22	7			KEI
1985 12 03.99	S	4.8	W	0.0	E		1	&25				BOR
1985 12 03.99	S	4.8	W	5.0	B		10	23	5/			BOR
1985 12 03.99				31.7	L	6	55	10	7/	0.3	90	BOR
1985 12 04.03	B	5.8	AA	5.0	B		7					SIM
1985 12 04.04	B	5.8	AA	5.0	B		7					SIM01
1985 12 04.10	S	5.6	A	8.0	B		20	16	5			DUC
1985 12 04.86	B	5.0:	AA	5.0	B		10	20	6			WAG
1985 12 04.95	M	4.6	AA	8.0	B		20		6/			LUD
1985 12 05.05	S	4.7	W	0.0	E		1	&30	3			BOR
1985 12 05.05	S	4.8	W	5.0	B		10	17	6	2.0	70	BOR
1985 12 05.15				32	L	4	40	15	7	0.75	70	KEE
1985 12 05.16	B	4.7	AC	0.9	E		1	30	3			KEE
1985 12 05.17	K	5.3	AC	4.0	B		8	15	5	1.0	70	KEE
1985 12 05.18				8.0	B		11	15	6	1.7	70	KEE
1985 12 05.42	S	6.0	W	5.0	B		7		2			MAT01
1985 12 05.50	S	5.8	W	5.0	B		12	15	3			BAT01
1985 12 05.58	S	6.4	D	20	T	10	50	15.7	4	0.5	85	WOO
1985 12 05.66	M	6.1	W	6	R	15	45	7	7			PUR
1985 12 05.74	B	5.0:	AA	5.0	B		10	20	7/			WAG
1985 12 05.75	B	6.4	D	5.0	B		10	12	8			VAN04
1985 12 05.83	S	4.7	AA	2.5	B		2	22				KEI
1985 12 05.83	S	4.8	AA	5.0	B		10	16	7	0.3	60	KEI
1985 12 05.96	M	4.6	AA	8.0	B		20		6/			LUD
1985 12 06.56	M	5.9	W	6	R	15	45					PUR
1985 12 06.74	S	5.0	D	5.0	B		10	&20	6			COM
1985 12 06.76	S	4.3:	D	5.0	B		10		6	1.0	75	BOU
1985 12 06.77	S	4.5:	D	4.0	B		7	&20	5/	1.5	90	BUS01
1985 12 06.81	M	4.6	AA	8.0	B		20		7			LUD
1985 12 06.97	S	4.7	W	0.0	E		1					BOR
1985 12 06.97	S	4.8	W	5.0	B		10	14.5	5	?	70	BOR
1985 12 07.02	B	6.0	AA	5.0	B		7		3			SIM
1985 12 07.02	B	5.7	AA	5.0	B		7		4			SIM01
1985 12 07.25	K	5.2	AC	4.0	B		8	20	5	1.2	70	KEE
1985 12 07.25	B	4.8	AC	0.9	E		1					KEE
1985 12 07.58	S	6.1	D	6	R	10	18	14.9	4	0.55	90	WOO
1985 12 07.75	S	5.5	D	8.0	B		15	20	6			ZAN01

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 12 07.76	S	5.2	D	8.0	B		15		6			FEI
1985 12 07.76	S	6.0	D	5.0	B		7	15	5			KUI
1985 12 07.76		4.3:	D	0.8	E		1	25	4			BUS01
1985 12 07.76	S	4.3	D	5.0	B		10	12	6	1.5	65	BOU
1985 12 07.78	S	4.3	D	1.8	B		3	20	5			BUS01
1985 12 07.80	S	4.5:	D	4.0	B		7	&17	6			BUS01
1985 12 07.87	S	4.3	D	4.6	R		8	23	5			WEG
1985 12 07.87	B	5.5	D	6.0	B		12					WEG
1985 12 07.87	B	5.3	D	4.6	R		8					WEG
1985 12 07.87	S	4.4	D	6.0	B		12	21	7	1.5	60	WEG
1985 12 07.92	S	4.6	AA	5.0	B		10	21	7	0.3	67	KEI
1985 12 07.96	S	4.8	D	5.0	B		10	&20	6	0.83	90	COM
1985 12 08.12	S	5.1	A	8.0	B		20	20	5			DUC
1985 12 08.12		5.2	A	0.0	E		1	20				DUC
1985 12 08.47	S	6.0	W	5.0	B		10		6			WIL02
1985 12 08.75	S	5.4	D	5.0	B		10	12		0.33		LOO01
1985 12 08.97	S	4.8	W	5.0	B		10	16	5			BOR
1985 12 09.45	S	5.9	W	5.0	B		10		8			WIL02
1985 12 09.75	S	5.4	D	5.0	B		10	15	5			LOO01
1985 12 09.76	S	4.4	AA	2.5	B		2					KEI
1985 12 09.76	S	4.5	AA	5.0	B		10	13.5	7	0.3	47	KEI
1985 12 09.93	B	4.4	D	4.0	B		8		6			SCH04
1985 12 10.04		5.8	AA	0.0	E		1					FER
1985 12 10.04	B	5.9	AA	10	R	15						FER
1985 12 10.15	B	4.6	AC	0.9	E		1	30	3			KEE
1985 12 10.16	K	5.2	AC	4.0	B		8	16	5	1.3	70	KEE
1985 12 10.17				8.0	B		11	20	6	1.7	70	KEE
1985 12 10.41	S	4.5	W	3	R	7	8		7			LOV
1985 12 10.49	S	5.5	W	5.0	B		7		2			MAT01
1985 12 10.54		5.4	W	0.0	E		1					CLA
1985 12 10.55	S	5.0	W	3.0	R		6	14	4			CLA
1985 12 10.56	S	5.4	W	41	L	4	86	10	6	0.47	114	CLA
1985 12 10.58	M	5.8	W	6	R	15	45		6			PUR
1985 12 10.73	M	4.8	AA	6.3	B		9	15	5			KAM01
1985 12 10.75	B	5.8	D	6.3	B		8	12	5			GEE
1985 12 10.75	S	5.1	D	11.5	L		45		5			MAA
1985 12 10.77	B	5.1	D	6.0	B		12					WEG
1985 12 10.77	S	4.3	D	4.6	R		8	23	4/	&2.0	78	WEG
1985 12 10.77	B	4.9	D	4.6	R		8					WEG
1985 12 10.77	B	5.9	D	5.0	B		10		6			ROO
1985 12 10.77	S	4.5	D	6.0	B		12	18	7	1.75	78	WEG
1985 12 10.78	S	5.4	D	8.0	B		15	12	5			ZAN01
1985 12 10.79	B	4.4	D	4.0	B		8		6/			SCH04
1985 12 10.79	S	4.7	D	5.0	B		10	15				AER
1985 12 10.80	B	5.1	AA	3.0	B		6	20	6	?	80	LIN02
1985 12 10.88	S	4.7	D	4.5	B		9		6			COM
1985 12 10.88	B	6.1	D	11.5	L	8	45	&11	7			VAN04
1985 12 11.05	B	6.0	AA	12.0	B		20	7				FER
1985 12 11.12	S	4.4	A	8.0	B		11	25	6	0.5	68	SPR
1985 12 11.42	S	4.7	W	3	R	7	8		7			LOV
1985 12 11.42	S	5.9	W	5.0	B		7		2			MAT01
1985 12 11.54	S	6.0	D	6	R	10	18	13.0	5	0.8	85	WOO
1985 12 11.56	M	5.6	W	6	R	15	45	9.7	6			PUR
1985 12 11.57	S	5.1	W	6.5	B		20	12	5			PEA
1985 12 11.87	S	5.7	D	5.0	B		16	&60	6			VAN02

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 12 11.96	S	4.8	AA	3.0	B	4	6					MIL02
1985 12 12.07	B	4.5	AC	0.9	E		1	35	3			KEE
1985 12 12.08	M	5.5	AC	32	L	4	33	15	7	1.2	70	KEE
1985 12 12.09	K	5.1	AC	4.0	B		8	18	6	0.7	70	KEE
1985 12 12.10	K	5.2	AC	8.0	B		11	18	6	1.0	70	KEE
1985 12 12.11	S	5.4	A	8.0	B		20	20	5/			DUC
1985 12 12.11	S	4.5	A	8.0	B		11	25	6	0.75	65	SPR
1985 12 12.43	S	4.5	W	3	R	7	8					LOV
1985 12 12.44	S	5.0	W	5.0	B		7		3			MAT01
1985 12 12.45	S	4.7	W	0.0	E		1		7			SEA
1985 12 12.47	S	5.6	W	5.0	B		10		7			WIL02
1985 12 12.54	S	5.8	D	6	R	10	18	13.1	5	0.8	80	WOO
1985 12 12.58	M	5.6	W	6	R	15	45	7.8				PUR
1985 12 12.71	S	4.7	AA	8.0	B		20	12	6			BAR
1985 12 12.73	B	5.5	D	6.3	B		8	12	4			GEE
1985 12 12.75	B	5.3	D	11.5	L	8	45	12	8			VAN04
1985 12 12.75	S	4.3	D	5.0	B		10	15	7			AER
1985 12 12.76	B	4.9	AA	6.3	B		9	11.5	7	0.7	70	KAM01
1985 12 12.76	B	4.7	AA	3.0	B		8	10.7	6	0.77	68	LIN02
1985 12 12.78	S	4.6	AA	3.0	B	4	6	15				MIL02
1985 12 12.78	B	4.8	AA	3.0	B	4	6					MIL02
1985 12 12.78	S	4.7:	AA	0.0	E		1					MIL02
1985 12 12.78	S	4.9	D	5.0	B		10	6	7			LOO01
1985 12 12.78	B	5.5	D	6.3	B		9		5			SWA
1985 12 12.83	S	4.4	D	6.0	B		12	17	7	2.0	70	WEG
1985 12 12.83	S	4.2	D	4.6	R		8	21	4/	1.5		WEG
1985 12 12.83	B	5.0	D	6.0	B		12					WEG
1985 12 12.83	B	5.0	D	4.6	R		8					WEG
1985 12 12.84	M	4.5	AA	8.0	B		20		6/			LUD
1985 12 12.90	B	4.7	AA	10.0	B		14	8	6	&0.27	68	LIN02
1985 12 12.97	S	4.7	W	5.0	B		10					BOR
1985 12 13.02	B	5.3	AA	5.0	B		7					SIM
1985 12 13.03	B	5.4	AA	5.0	B		7					SIM01
1985 12 13.10	S	5.1	A	8.0	B		20	20	6			DUC
1985 12 13.11	S	4.3	A	8.0	B		11	25	6	1	65	SPR
1985 12 13.11	S	4.4	A	14.0	S	4	28	20	7	1	65	SPR
1985 12 13.42	S	4.5	W	5.0	B		10					SEA
1985 12 13.44	S	4.4	W	0.0	E		1	20	7			LOV
1985 12 13.54	S	5.9	D	6	R	10	18	13.8	5	0.85	80	WOO
1985 12 13.57	M	5.7	W	5.0	B		7					PUR
1985 12 13.72	S	4.4	AA	8.0	B		20	16	6			BAR
1985 12 13.83	S	4.9	AA	8.0	B	5	20					MIL02
1985 12 14.45	S	4.5	W	0.0	E		1	20	7			LOV
1985 12 14.53	S	4.8	W	3	R		6	11	4			CLA
1985 12 14.54	S	5.2	W	41	L	4	86	9	6	0.35	110	CLA
1985 12 14.54	S	5.8	D	6	R	10	18	14.0	5	1.0	80	WOO
1985 12 14.78	S	4.6	AA	3.0	B	4	6	12				MIL02
1985 12 14.79	S	4.3	AA	8.0	B		20	20	6	0.5	65	BAR
1985 12 15.03	S	4.8	W	5.0	B		10	11.5	5			BOR
1985 12 15.21	K	5.1	AC	4.0	B		8	20	5	1.0	70	KEE
1985 12 15.45	S	5.5	W	5.0	B		12	15	3			BAT01
1985 12 15.45		6.0	W	5.0	B		7		2			MAT01
1985 12 15.54	S	5.9	D	6	R	10	18	13.3	5	0.9	80	WOO
1985 12 15.56	M	6.2	W	6	R	15	45	3.2	5			PUR
1985 12 15.56	S	5.0	W	6.5	B		20	10	5			PEA

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 12 15.78	B	6.4	D	8.0	B		15		3			KEI01
1985 12 15.84	S	4.0	AA	0.0	E		1					MIL02
1985 12 15.84				8.0	B	5	20	15	4	0.33	70	MIL02
1985 12 16.04	B	6.0	AA	10.0	B		14					SIM01
1985 12 16.04	B	6.0	AA	10.0	B		14					SIM
1985 12 16.12	S	4.8	A	8.0	B		11	20	6	0.5	65	SPR
1985 12 16.89	M	4.5	AA	8.0	B		20		7			LUD
1985 12 17.05	B	5.7	AA	5.0	B		7					SIM
1985 12 17.11	S	5.1	A	8.0	B		20	20	6	0.33	80	DUC
1985 12 17.44	S	4.4	W	5.0	B		10					SEA
1985 12 17.46	S	5.4	W	5.0	B		10		7			WIL02
1985 12 17.48	B	5.6	W	5.0	B	7	7		6			BEM
1985 12 18.00	S	4.7	W	5.0	B		10	10.5	5/			BOR
1985 12 18.12	S	4.5	A	8.0	B		11	20	5	0.25	65	SPR
1985 12 18.54	S	5.7	D	6	R	10	18	9.2	6	0.8	75	WOO
1985 12 18.76	S	4.8	AA	5.0	B		10	7.8		1.00	61	KEI
1985 12 18.81	S	4.7	D	5.0	B		10	10	6			LOO01
1985 12 18.83	S	4.7	AA	8.0	B	5	20	9	3			MIL02
1985 12 18.88	S	4.5	D	4.0	B		7	12	5/			BUS01
1985 12 18.98	S	4.7	W	5.0	B		10	11.5	6			BOR
1985 12 18.98				31.7	L	6	68	3.5	7	0.8	67	BOR
1985 12 19.76	S	5.0	D	5.0	B		10		6/			LAA
1985 12 19.76	B	4.3	A	5.0	B		7	30	4			MER
1985 12 19.84	S	4.5	D	4.0	B		7	15	5			BUS01
1985 12 19.85	S	4.5	D	10.0	B		14		7			LOO01
1985 12 20.01	S	4.9	W	5.0	B		10	7	6			BOR
1985 12 20.01				31.7	L	6	68		7/	0.2	70	BOR
1985 12 20.45	S	4.7	W	5.0	B		10					SEA
1985 12 20.54	M	6.1	W	6	R	15	45	3.1	5			PUR
1985 12 21.54	S	5.5	D	6	R	10	18	10.7	5	0.6	80	WOO
1985 12 21.75	B	4.3	A	5.0	B		7	30	4	0.67	66	MER
1985 12 21.80	B	4.8	AA	5.0	B		7	&12	7			LIN02
1985 12 21.81	B	5.0	AA	10.0	B		14	10	7	0.33	70	LIN02
1985 12 21.83	B	4.9	AA	3.0	B		8	8	7			LIN02
1985 12 22.02	S	4.8	W	5.0	B		10	9	5			BOR
1985 12 22.54	S	5.6	D	6	R	10	18	10.0	5	0.6	75	WOO
1985 12 22.72	S	5.5	D	5.0	B		10		6/			LAA
1985 12 22.73	S	4.3	D	4.6	R		8	17	6			WEG
1985 12 22.74	S	4.5	D	6.0	B		12	14	8	1.0	50	WEG
1985 12 22.74	B	5.9	D	6.3	B		8	10	4			GEE
1985 12 22.74	B	4.3	A	5.0	B		7	30	4	1.0	64	MER
1985 12 23.54	S	5.2	D	6	R	10	18	9.8	5	0.45	80	WOO
1985 12 23.75	B	5.4	D	11.5	L	8	45	9	8	0.08	55	VAN04
1985 12 23.76	S	5.2	D	5.0	B		10	4	7/			LOO01
1985 12 23.77	B	4.3	A	6.0	B		9	30	3	1.0	51	MER
1985 12 23.78	S	4.4	D	6.0	B		12	12	7	&1.5	50	WEG
1985 12 23.78	S	4.1	D	4.6	R		8	15	4/			WEG
1985 12 24.43	S	4.8	D	2.5	B		2					SEA
1985 12 24.54	S	5.5	D	6	R	10	18	8.4	6	0.3	80	WOO
1985 12 25.79	M	4.5	AA	8.0	B		20		7			LUD
1985 12 25.81	S	4.6	W	12.5	R	5	32	9.5	4	0.30	68	CLA
1985 12 25.85	S	5.5	D	5.0	B		10	5	8			LOO01
1985 12 25.96	S	5.1	AA	3.5	B		7	14	4			MOR03
1985 12 26.00	S	4.7	W	5.0	B		10	8	5/			BOR
1985 12 26.11	S	4.1	A	8.0	B		11	20	5	0.75	65	SPR

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 12 26.11	S	4.2	A	14.0	S	4	28	20	6	1	65	SPR
1985 12 26.54	S	5.2	D	6	R	10	18	8.0	6	0.3	75	WOO
1985 12 26.73	B	5.6	D	8.0	B		11		6	&1.0	75	BOT
1985 12 26.79	M	4.4	AA	8.0	B		20		7			LUD
1985 12 27.71	S	4.3	AA	8.0	B		20	10	8	0.5	50	BAR
1985 12 27.71	B	5.8	D	6.3	B		8	13	4/			GEE
1985 12 27.73	S	4.5	D	4.0	B		7	12	6			BUS01
1985 12 27.73	S	4.5	D	1.8	B		3		6			BUS01
1985 12 27.74	B	5.4	D	5.0	B		10					BOU
1985 12 27.74	S	5.0	D	5.0	B		10	5	7	&1.0	70	BOU
1985 12 27.75	S	4.7	D	5.0	B		10					AER
1985 12 27.75	S	5.5	D	5.0	B		10		8			LOO01
1985 12 27.77	S	4.0	D	6.0	B		12	12	7/	&2.5	51	WEG
1985 12 27.77	S	4.0	D	4.6	R		8	14	5			WEG
1985 12 27.80	M	4.4	AA	8.0	B		20		8			LUD
1985 12 27.98	S	5.3	AA	3.5	B		7	9.5	4			MOR03
1985 12 27.99	S	4.7	W	5.0	B		10	7	6			BOR
1985 12 28.42	B	5.2	W	5.0	B	7	7		7			BEM
1985 12 28.49	S	5.0	W	5.0	B		12	10	3			BAT01
1985 12 28.54	S	5.3	D	6	R	10	18	10.0	5	0.5	75	WOO
1985 12 28.76	S	4.9	AA	5.0	B		10	5.7	7/	0.30	75	KEI
1985 12 28.79	M	4.4	AA	8.0	B		20		8			LUD
1985 12 28.97	S	5.0	AA	3.5	B		7	12	4	0.25	70	MOR03
1985 12 28.99	S	4.7	W	5.0	B		10	7	6	?	60	BOR
1985 12 29.42	S	4.5	W	8.0	B		15	10	7	1.0		LOV
1985 12 29.44	S	5.2	W	5.0	B		10		7			WIL02
1985 12 29.44	S	4.3	W	2.5	B		2					SEA
1985 12 29.54	S	5.0	D	6	R	10	18	10.7	5	0.85	70	WOO
1985 12 29.72	B	5.8	D	8.0	B		11		6	&0.67	80	BOT
1985 12 29.72	S	5.7	D	8.0	B		11					BOT
1985 12 29.73	B	4.9	D	4.0	B		7					BUS01
1985 12 29.73	S	4.3	D	4.0	B		7	&15	5/	2.0	70	BUS01
1985 12 29.74	S	5.0	AA	5.0	B		10	7.1	7	0.8	71	KEI
1985 12 29.79	M	4.4	AA	8.0	B		20		8			LUD
1985 12 29.82	B	4.3	A	5.0	B		7	25	4			MER
1985 12 29.84	S	5.0	D	5.0	B		10	4	7			LOO01
1985 12 29.99	S	4.8	W	5.0	B		10	9	6	0.8	55	BOR
1985 12 30.08	K	5.2	AC	4.0	B		8	5	6	0.7	70	KEE
1985 12 30.09				32	L	4	33	7	7	1.0	70	KEE
1985 12 30.42	S	4.4	W	8.0	B		15		7			LOV
1985 12 30.54	S	4.9	D	6	R	10	18	10.5	5	1.0	75	WOO
1985 12 30.75	B	4.2	A	5.0	B		7	20	5	1.15	51	MER
1985 12 30.77	B	5.3	D	11.5	L	8	45	7	8	0.08	55	VAN04
1985 12 30.78	B	4.2	D	5.0	B		7	11	3			VER03
1985 12 30.99	S	4.7	W	5.0	B		10	7	7	1.0	64	BOR
1985 12 30.99	S	4.8	W	0.0	E		1					BOR
1985 12 31.05	B	5.7	AA	5.0	B		7					SIM01
1985 12 31.05	B	5.7	AA	5.0	B		7					SIM
1985 12 31.08	K	4.8	AC	4.0	B		8	10	7	1.0	70	KEE
1985 12 31.09	I	4.7	AC	0.9	E		1					KEE
1985 12 31.11	S	4.0	A	20.0	S	10	64	18	7	0.75	60	SPR
1985 12 31.58	S	4.8	W	41	L	4	86	7	6	0.58	73	CLA
1985 12 31.78	S	4.9	AA	5.0	B		10	7.1	7/	1.1	73	KEI
1985 12 31.78	S	4.8	AA	2.5	B		2					KEI
1985 12 31.80	M	4.4	AA	8.0	B		20		8			LUD

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 01 01.06	K	4.8	AC	4.0	B		8	9	7	0.8	70	KEE
1986 01 01.06	I	4.7	AC	0.9	E		1					KEE
1986 01 01.07				32	L	4	33	12	7	2.2	70	KEE
1986 01 01.44	S	4.3	W	5.0	B		10					SEA
1986 01 01.44	S	5.2	W	5.0	B		10		7			WIL02
1986 01 01.70	B	5.0	D	10.0	B		14		6			HAS02
1986 01 01.76	O	5.0	A	8.0	B	4	12	8	6	0.3	80	AND01
1986 01 01.80	M	4.4	AA	8.0	B		20		8			LUD
1986 01 01.83	S	4.8	AA	5.0	B		10	4.3	7	0.5	75	KEI
1986 01 01.97	S	4.9	AA	3.5	B		7	8	4	0.63	55	MOR03
1986 01 01.99	S	4.7	W	5.0	B		10	7	7	1.0	62	BOR
1986 01 01.99	B	4.9	W	5.0	B		10					BOR
1986 01 01.99	S	4.8	W	0.0	E		1	18				BOR
1986 01 02.0	B	5.3	AA	0.0	E		1					FER
1986 01 02.11	S	4.4:	A	8.0	B		20	10	5			DUC
1986 01 02.45				8.0	B		15	& 8	7	1.5	65	SEA
1986 01 02.45	S	4.2	W	0.0	E		1					SEA
1986 01 02.54	S	4.6	D	6	R	10	18	12.6	4	1.6	65	WOO
1986 01 02.71	I	4.9	D	0.0	E		1		6			HAS02
1986 01 02.72	B	4.8	D	10.0	B		14		6	1.8	60	HAS02
1986 01 02.72	B	4.9	D	3.0	B		8		6	1.15	60	HAS02
1986 01 02.72	M	4.8	D	8.0	B		11	&13.5	7	1.63	61	GUB
1986 01 02.73	B	4.8	AA	6.3	B		9	8	7/	1.1	62	KAM01
1986 01 02.73	B	4.5	D	5.6	B		8	12	5	0.79		KOC01
1986 01 02.74	B	4.7	D	8.0	B		20	12	5	0.6		KOC
1986 01 03.10	K	5.0	AC	4.0	B		8	10	6	2.0	60	KEE
1986 01 03.10	I	4.9	AC	0.9	E		1					KEE
1986 01 03.54	S	4.6	W	5.0	B		7	7	5	0.88	77	CLA
1986 01 03.54	S	4.7	D	6	R	10	18	11.8	4	1.9	70	WOO
1986 01 03.70		4.4	D	0.8	E		1		6/	2.0		KRO01
1986 01 03.72	B	4.9	D	10.0	B		14	& 4.7	6	2.17	60	HAS02
1986 01 03.72	M	4.9	D	8.0	B		11	&13	7	1.5	60	GUB
1986 01 03.72	S	4.9	D	3.0	B		8		6			HAS02
1986 01 03.73	S	4.1	D	4.0	B		7	12	5/	2.0	70	BUS01
1986 01 03.73	I	4.9	D	0.0	E		1		6			HAS02
1986 01 03.73	B	5.4	D	8.0	B		15		5	&1.0		KEI01
1986 01 03.73	B	4.4	D	4.0	B		7					BUS01
1986 01 03.76	S	4.9	AA	5.0	B		10	5.5	8	0.3	67	KEI
1986 01 03.77	B	5.3	AA	5.0	B		10					REI01
1986 01 03.81	S	5.1	D	10.0	B		14	& 5.5	7			LOO01
1986 01 04.0	B	5.0	AA	0.0	E		1					FER
1986 01 04.0	B	5.0	AA	3.0	B		6					FER
1986 01 04.00	S	5.2	AA	3.5	B		7	6.5	5	0.18	60	MOR03
1986 01 04.43	B	4.9	W	5.0	B	7	7		7	0.2	60	BEM
1986 01 04.44	S	5.0	W	5.0	B		10		7			WIL02
1986 01 04.70		4.0	D	0.8	E		1		6/	2.4		KRO01
1986 01 04.72	S	4.7	D	4.0	B		12					FEI
1986 01 04.73	S	4.4	AA	8.0	B		20	8	7	0.4	50	BAR
1986 01 04.75	B	5.0	D	6.3	B		8	12	5			GEE
1986 01 04.76	B	4.4	A	5.0	B		7	18	6	1.75	62	MER
1986 01 04.78	B	5.2	AA	5.0	B		10		6			REI01
1986 01 04.78	M	4.5	AA	8.0	B		20		8			LUD
1986 01 04.98	B	4.8	W	5.0	B		10	8	7	2.0	65	BOR
1986 01 04.98	S	4.8	W	0.0	E		1					BOR
1986 01 05.07	I	4.8	AC	0.9	E		1					KEE

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 01 05.08	K	4.9	AC	4.0	B		8	8	7	2.4	60	KEE
1986 01 05.16	! S	4.8	D	5.0	R		8	5	4			MAC
1986 01 05.42	S	4.2	W	8.0	B		15	5	7	1.0		LOV
1986 01 05.54	S	4.5	D	6	R	10	18	12.1	5	1.8	70	WOO
1986 01 05.70	M	5.5	AA	10.6	R	6	24	3	7	0.6	80	KES01
1986 01 05.70		4.1	D	0.8	E		1		6/	3.0		KRO01
1986 01 05.75	B	5.2	AA	5.0	B		10		7		294	REI01
1986 01 05.76	S	4.8	AA	5.0	B		10	7.4	8	2.5	69	KEI
1986 01 05.76	S	4.7	AA	2.5	B		2					KEI
1986 01 05.81	M	4.5	AA	8.0	B		20		8			LUD
1986 01 06.00	B	4.8	W	5.0	B		10	8	6/	2.0	65	BOR
1986 01 06.07	I	4.8	AC	0.9	E		1					KEE
1986 01 06.07	K	4.9	AC	4.0	B		8	8	7	2.2	60	KEE
1986 01 06.54	S	4.4	D	6	R	10	18	12.5	5	1.8	65	WOO
1986 01 06.71		3.7	D	0.8	E		1		6/	1.8		KRO01
1986 01 06.73	S	4.6	AA	5.0	B		7	7	8			ZAN
1986 01 06.74	S	4.9	AA	5.0	B		10	4.6	8	0.7	50	KEI
1986 01 06.74	S	4.9	AA	2.5	B		2					KEI
1986 01 06.75	S	4.2	AA	8.0	B		20	4	6	0.2	60	BAR
1986 01 06.75	B	4.4	A	5.0	B		7	15	6			MER
1986 01 06.81	M	4.4	AA	8.0	B		20		8			LUD
1986 01 06.98	B	4.8	W	5.0	B		10	6	7			BOR
1986 01 07.10	S	4.6	A	8.0	B		20	7	5/	1.0	60	DUC
1986 01 07.10	! S	4.9	D	5.0	R	12	13	4.5	7	0.48	75	MAC
1986 01 07.10	! S	4.8	D	8.0	B		20	6	6	0.68	75	MAC
1986 01 07.10	!	4.6	D	0.0	E		1	10	2			MAC
1986 01 07.44	S	4.9	W	5.0	B		10		8			WIL02
1986 01 07.54	S	4.2	D	6	R	10	18	13.6	5	1.8	70	WOO
1986 01 07.71		3.8	D	0.8	E		1		6/	2.0		KRO01
1986 01 07.71	O	4.7	A	8.0	B	4	20	7	6	0.3	80	AND01
1986 01 07.72	M	5.0	D	8.0	B		11	&12.5	8	1.5	72	GUB
1986 01 07.72	B	4.7	AA	8.0	B	5	20	4	8	0.67	65	MIL02
1986 01 07.73	B	4.5	D	8.0	B		20		6			KOC
1986 01 07.73	B	4.5	D	10.0	B		14		7	1.8	60	HAS02
1986 01 07.74	B	4.6	AA	3.0	B	4	6					MIL02
1986 01 07.74	S	4.4	AA	0.0	E		1					MIL02
1986 01 07.79	M	4.3	AA	8.0	B		20		8			LUD
1986 01 07.98	B	4.4	W	5.0	B		10	5.5	7			BOR
1986 01 07.99	S	4.8	AA	3.5	B		7	6.5	5	0.60	60	MOR03
1986 01 08.07	K	4.7	AC	4.0	B		8	6	8	3.0	60	KEE
1986 01 08.07	I	4.6	AC	0.9	E		1					KEE
1986 01 08.10	S	4.2	A	8.0	B		11	18	7	2	60	SPR
1986 01 08.43	B	4.7	W	5.0	B	7	7		7			BEM
1986 01 08.44	S	3.9	W	8.0	B		15		7	>1		SEA
1986 01 08.44	S	4.9	W	5.0	B		10		8			WIL02
1986 01 08.69	S	4.0	W	15.2	L	5	44	19	8	1.5	60	MOE
1986 01 08.82	M	4.3	AA	8.0	B		20		8/			LUD
1986 01 08.98	B	4.4	W	5.0	B		10	5.5	7			BOR
1986 01 09.08	K	4.7	AC	4.0	B		8	6	8	3.0	60	KEE
1986 01 09.08	I	4.6	AC	0.9	E		1			1.5	60	KEE
1986 01 09.10	S	4.6	A	8.0	B		20	7	5	1.5	60	DUC
1986 01 09.12	! S	4.7	D	8.0	B		20	5	6	0.23	77	MAC
1986 01 09.12	! B	5.0	D	8.0	B		20					MAC
1986 01 09.44	S	4.9	W	5.0	B		10		8			WIL02
1986 01 09.54	S	4.4	D	6	R	10	18	11.4	5	1.6	70	WOO

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 01 09.69	S	4.0	W	15.2	L	5	44	15	8	1.2	65	MOE
1986 01 09.72		3.5:	D	0.8	E		1		6/	1.4		KRO01
1986 01 09.72	S	4.9	D	5.0	B		10	10	6/	0.5	63	LAA
1986 01 09.73	S	4.2	WW	8.0	B		20	7	5	0.3	65	BAR
1986 01 09.74	S	4.4	D	4.5	B		9		7	2.5		COM
1986 01 09.75	S	4.4	D	5.0	B		10		7	>1.0		BOU
1986 01 09.76	B	4.7	D	5.0	B		10					BOU
1986 01 09.80	M	4.3	AA	8.0	B		20		8/			LUD
1986 01 09.98	B	4.5	W	5.0	B		10	5	7	2.3	61	BOR
1986 01 09.98	I	4.4	W	0.0	E		1					BOR
1986 01 10.10	S	4.6	A	8.0	B		20	8	6	1.5	58	DUC
1986 01 10.10 !	S	4.8	D	15.2	L	8	76	5	8	0.18	75	MAC
1986 01 10.54	S	4.1	D	6	R	10	18	11.5	5	1.3	65	WOO
1986 01 10.71	M	5.3	AA	8.0	R	8	26	6	7	0.5	105	KES01
1986 01 10.76	S	4.9	AA	5.0	B		10	4.1	8	0.5	68	KEI
1986 01 10.80	M	4.3	AA	8.0	B		20		8/			LUD
1986 01 10.99	S	4.8	AA	3.5	B		7	6	7	0.37	60	MOR03
1986 01 11.06	I	4.6	WH	0.9	E		1			2.0	60	KEE
1986 01 11.08	K	4.7	WH	4.0	B		8			3.0	60	KEE
1986 01 11.41	S	4.3	W	8.0	B		15					LOV
1986 01 11.70		3.6	D	0.8	E		1		6/	1.8		KRO01
1986 01 11.72	S	3.9	D	6.0	B		12	10	7/	>2.0	68	WEG
1986 01 11.74	S	4.2	D	5.0	B		10		7	3.5	59	BOU
1986 01 11.75	B	4.3	A	5.0	B		7	10	7	1.0	60	MER
1986 01 11.76	B	4.6	A	15.0	L	5	25	8	5		60	MER
1986 01 11.76	S	4.9	AA	2.5	B		2	3.3	8/	1.0	63	KEI
1986 01 11.80	M	4.3	AA	8.0	B		20		8/			LUD
1986 01 11.97	I	4.5	W	0.0	E		1	&18				BOR
1986 01 11.97	B	4.6	W	5.0	B		10	5	8	1.5	67	BOR
1986 01 12.10	S	4.3	A	8.0	B		11	10	7	2	60	SPR
1986 01 12.42	S	4.5	W	8.0	B		15					LOV
1986 01 12.69		3.3	D	0.8	E		1		6/	1.4		KRO01
1986 01 12.73	S	4.3	AA	5.0	B		7	4	8	1.12	60	ZAN
1986 01 12.73	B	4.4	AA	6.3	B		9	5.5	8	?	65	KAM01
1986 01 12.73	S	3.9	WW	8.0	B		20	5	7	0.8	60	BAR
1986 01 12.75	B	5.2	D	8.0	B		15		6	&1		KEI01
1986 01 12.75	B	4.8	AA	5.0	B		10					REI01
1986 01 12.77	S	4.8	AA	5.0	B		10	3.2	9	>1.0	67	KEI
1986 01 12.80	M	4.2	AA	8.0	B		20		9			LUD
1986 01 12.97	B	4.2	W	5.0	B		10	5	7	1.6	59	BOR
1986 01 12.97	I	4.3	W	0.0	E		1	&18				BOR
1986 01 13.07	I	4.4	WH	0.9	E		1			1.5	60	KEE
1986 01 13.08	K	4.5	WH	4.0	B		8	5	8	2.5	60	KEE
1986 01 13.41	S	4.3	W	8.0	B		15					LOV
1986 01 13.69		3.5	D	0.8	E		1		6/	2.5		KRO01
1986 01 13.76	S	4.1	WW	8.0	B		20	5	5	0.5	60	BAR
1986 01 13.98	S	4.8	AA	3.5	B		7	6	7	0.80	50	MOR03
1986 01 14.06	I	4.5	WH	0.9	E		1					KEE
1986 01 14.06	K	4.5	WH	4.0	B		8	8	8	2.8	60	KEE
1986 01 14.10	S	4.0	A	8.0	B		11	8	7	2	60	SPR
1986 01 14.69	S	3.7	D	8.0	B		15		6/	1.9		KRO01
1986 01 14.73	S	4.8	D	5.0	B		10	15	8	>1.0		AER
1986 01 14.73	B	4.7	D	11.5	L		45	5	8	&1	55	VAN04
1986 01 14.73	S	4.5	D	5.0	B		10	& 4.5	9	0.33	55	LOO01
1986 01 14.73	B	4.4	A	5.0	B		7	10	7			MER

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 01 14.75	S	4.8	AA	5.0	B		10	3	8	4.0	67	KEI
1986 01 14.79	M	4.2	AA	8.0	B		20		9			LUD
1986 01 14.97	B	4.2	W	5.0	B		10	5	6/	1.5	60	BOR
1986 01 15.00	S	4.7	AA	3.5	B		7	6	7	0.42	55	MOR03
1986 01 15.72	S	4.8	D	5.0	B		10					AER
1986 01 15.72	S	4.0	WW	8.0	B		20	5	7	0.8	60	BAR
1986 01 15.73	B	3.8	D	5.0	B		10	4	7	0.12		ROO
1986 01 15.75	B	4.7	D	6.3	B		8		4/			GEE
1986 01 15.96	B	4.1	W	5.0	B		10	4.5	7/	1.0	62	BOR
1986 01 16.67	O	4.0	A	6.3	B	5	9	6	7	0.5	75	AND01
1986 01 16.69	S	3.5	W	15.2	L	5	44	12	8	1.2	60	MOE
1986 01 16.70	S	3.8	D	8.0	B		15		6/	2.0		KRO01
1986 01 16.72	S	4.9	D	4.0	B		12		8			FEI
1986 01 16.73	B	4.4	D	5.0	B		10					BOU
1986 01 16.73	S	4.2	D	5.0	B		10	4	7	2.5	58	BOU
1986 01 16.74	S	4.3	D	5.0	B		10	10	8	1.5	66	LAA
1986 01 16.74	B	4.0	D	4.0	B		7					BUS01
1986 01 16.74	S	3.8	D	4.0	B		7	6	6/	2.5	65	BUS01
1986 01 16.74	B	4.7	D	4.0	B		8	6	6/	0.5	55	SCH04
1986 01 16.75	S	4.5	D	5.0	B		10	4	8			LOO01
1986 01 16.76	B	4.3	A	5.0	B		7	6	7/	0.65	65	MER
1986 01 16.81	M	4.2	AA	8.0	B		20		9			LUD
1986 01 16.96				50.0	L	5	96	2.5	7	>0.5		BOR
1986 01 16.96	B	4.2	W	5.0	B		10	5				BOR
1986 01 17.71	S	3.6	W	8.0	R	12	16	15	8			MOE
1986 01 17.72	S	3.8	WW	8.0	B		20	4	8	1.0	60	BAR
1986 01 17.98	S	4.7	AA	3.5	B		7	5.5		0.32	60	MOR03
1986 01 18.06	I	4.6	WH	0.9	E		1					KEE
1986 01 18.06	K	4.7	WH	4.0	B		8	5	8	2.5	60	KEE
1986 01 18.69	S	4.1	D	8.0	B		15		6/	2.3		KRO01
1986 01 19.06	K	4.6	WH	4.0	B		8	4	8	2.0	60	KEE
1986 01 19.06	I	4.5	WH	0.9	E		1					KEE
1986 01 19.75	S	3.7	AA	5.0	B		10	1.5	9	1.5	65	KEI
1986 01 19.75	S	3.6	AA	2.5	B		2					KEI
1986 01 20.00	B	4.2	AA	5.0	B		7			1	90	SIM
1986 01 20.01	B	3.8	AA	5.0	B		7			0.75	90	SIM01
1986 01 20.06	K	4.6	WH	4.0	B		8	5	8	1.8	60	KEE
1986 01 20.06	I	4.6	WH	0.9	E		1					KEE
1986 01 20.10	! S	4.3	D	15.2	L	8	76	7	9	0.45	67	MAC
1986 01 20.10	! S	6.7	S	15.2	L	8	76	1	9			MAC
1986 01 20.10	! S	4.1	D	8.0	B		20	6	9	0.35	67	MAC
1986 01 20.70	M	4.8	AA	8.0	R	8	26	5	8	0.6	100	KES01
1986 01 20.71	S	4.5	D	10.0	B		14	2	9			LOO01
1986 01 20.72	B	4.5	D	8.0	B		20	5.4	6	0.4		KOC01
1986 01 20.72	I	4.2	D	0.0	E		1					HAS02
1986 01 20.72	B	4.0	D	10.0	B		14	5.4	7	2.07	58	HAS02
1986 01 20.73	B	4.3	D	8.0	B		20	4	6	0.33		KOC
1986 01 20.73	S	3.7	AA	0.0	E		1					ZAN
1986 01 20.73	S	3.7	AA	5.0	B		7	4	8/			ZAN
1986 01 20.74	B	3.6	AA	5.0	B		7		9	0.92	58	LIN02
1986 01 20.74	S	3.7	D	8.0	B		15		7	0.17	55	SCH04
1986 01 20.74	B	4.0	AA	6.3	B		9	& 2	9	&1.3	60	KAM01
1986 01 20.74	S	3.4	WW	8.0	B		20	3	8	1.4	60	BAR
1986 01 20.74	M	3.8:	D	8.0	B		11	&11.5	9	1.83	72	GUB
1986 01 20.75	B	3.8	AA	3.0	B		8		8	1		WAG

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 01 20.75	B	4.3	A	5.0	B		7	6	7	1.0	55	MER
1986 01 20.79	S	3.5	D	5.0	B		16	5	7	0.5		NOL
1986 01 21.10	S	4.3	A	8.0	B		11	5	7	2	55	SPR
1986 01 21.77	S	3.8	AA	5.0	B		10	2	9	1.3	60	KEI
1986 01 21.94 !	B	4.3	AA	8.0	B		20					GRE
1986 01 21.94 !	S	4.0	AA	8.0	B		20	& 4.5	7/			GRE
1986 01 21.94 !	M	3.8:	AA	8.0	B		20					GRE
1986 01 21.96 !	B	4.2	AA	3.5	B		7					GRE
1986 01 21.96 !	S	4.0	AA	3.5	B		7	& 5	7/			GRE
1986 01 21.96 !	B	4.4	AA	5.0	B		7					GRE
1986 01 21.96 !	S	4.1	AA	5.0	B		7	& 5	8			GRE
1986 01 22.05	K	4.5	WH	4.0	B		8			1.2	60	KEE
1986 01 22.68	S	3.3:	W	6.0	R	8	12	10	8			MOE
1986 01 22.72	M	3.7:	D	8.0	B		11	12	9	1.33	62	GUB
1986 01 23.06	K	4.4	WH	4.0	B		8			0.3	60	KEE
1986 01 23.72	S	3.7	D	8.0	B		15		7			SCH04
1986 01 23.75	S	3.6	AA	5.0	B		10	1.5	8/	1.5	60	KEI
1986 01 23.96 !	S	3.3	AA	8.0	B		20					GRE
1986 01 23.96 !	B	3.5	AA	8.0	B		20	& 5	7/			GRE
1986 01 23.98	S	4.1	AA	3.5	B		7	4	7	0.37	50	MOR03
1986 01 24.09	S	4.6	A	8.0	B		11	5	6	1	50	SPR
1986 01 24.10 !	S	4.4	D	8.0	B		20	4	8	0.38	62	MAC
1986 01 24.10 !	B	4.6	D	8.0	B		20					MAC
1986 01 24.74	S	3.6	AA	5.0	B		10	1.0	8/	1.8	53	KEI
1986 01 24.77	M	4.0	AA	8.0	B		20		9			LUD
1986 01 24.96 !	S	3.6	AA	8.0	B		20	& 5	7			GRE
1986 01 24.96 !	B	4.2	AA	8.0	B		20					GRE
1986 01 24.96 !	B	3.9	AA	5.0	B		7	& 3				GRE
1986 01 25.73	S	3.6	D	6.0	B		12	10	7/	>1	50	WEG
1986 01 25.73	B	4.1	A	5.0	B		7	5	6/			MER
1986 01 26.06 !	B	4.1	WH	4.0	B		8	2	8	1.0	60	KEE
1986 01 26.09	S	4.7	A	8.0	B		11	4.5	6	1	50	SPR
1986 01 26.10 !	S	4.6	D	8.0	B		20	4	8	0.43	62	MAC
1986 01 26.72	S	3.4	D	6.0	B		12	10	7/			WEG
1986 01 26.72	S	4.2	D	5.0	B		10	6	9	0.10	45	LOO01
1986 01 26.73	S	3.5	AA	5.0	B		7		8/	?	60	ZAN
1986 01 27.06 !	B	3.8	WH	4.0	B		8	2	8	0.7	60	KEE
1986 01 27.71	B	4.0	D	8.0	B		20					KOC
1986 01 27.72	B	4.0	D	8.0	B		20		6			KOC01
1986 01 27.72	B	3.5:	D	10.0	B		14		7			HAS02
1986 01 27.72	S	3.5	AA	5.0	B		7	2	8/	?	60	ZAN
1986 01 27.72	M	3.5	D	8.0	B		11	12	8	1.67	72	GUB
1986 01 27.75	S	3.3	AA	5.0	B		10	1.4	8/			KEI
1986 01 28.05 !	B	3.5	WH	4.0	B		8	2	8	0.5	60	KEE
1986 01 28.09	S	4.7:	A	8.0	B		11	& 4.0	6	&0.5	50	SPR
1986 02 15.78	S	3 :	W	8.0	B		15	& 2	8	0.08		LOV
1986 02 16.78	S	3.2	D	8.0	B		15		8			SEA
1986 02 16.78	S	3.0	W	8.0	B		15	3.0	8			LOV
1986 02 17.77	S	2.4	W	3.0	R	6	8	3.0		0.3		LOV
1986 02 18.78	I	3.3	D	8.0	B		15		9			SEA
1986 02 18.78	S	2.5	W	0.0	E		1			1.0		LOV
1986 02 19.76	S	2.5	W	8.0	B		15			2.0		LOV
1986 02 19.77	I	2.7	D	0.0	E		1					SEA
1986 02 19.77				8.0	B		15		9	&0.25		SEA
1986 02 20.58	S	4.2:	A	8.0	B		20	2	6	0.25	300	DUC

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 02 20.77				8.0	B		15			0.5		SEA
1986 02 20.77	I	2.7	D	0.0	E		1					SEA
1986 02 20.77	S	2.3	W	0.0	E		1			1.0		LOV
1986 02 21.57	S	4.0	A	8.0	B		20	5	6	1.0	300	DUC
1986 02 21.77	I	2.9	D	0.0	E		1					SEA
1986 02 21.77	S	2.6	W	3.0	R	6	8	5				LOV
1986 02 22.46	S	4 :	AA	3.5	B		7					MOR03
1986 02 22.53	! B	3.0	WH	4.0	B		8	4	6	1.2	280	KEE
1986 02 23.31		2.5	WH	0.0	E		1			1.7	285	DEA
1986 02 23.39	B	2.6	WW	0.0	E		1					GRE
1986 02 23.40	B	2.7	WW	3.5	B		7	& 6	8/	>3		GRE
1986 02 23.57	! S	3.0	D	8.0	B		20	3	7	0.67	260	MAC
1986 02 23.58	! S	2.9	D	13.0	R	7	27	4	8	0.42	260	MAC
1986 02 23.58	! S	2.7	D	0.0	E		1	10	5			MAC
1986 02 23.86		3.5	W	0.0	E		1					CLA
1986 02 23.87	S	3.6	W	12.5	R	5	32	2	8	2	287	CLA
1986 02 24.38	B	2.5:	WW	3.5	B		7					GRE
1986 02 24.56	S	4.0	A	8.0	B		20	5	6	1.5	285	DUC
1986 02 24.58	! S	3.2	D	8.0	B		20	3	7	0.37	263	MAC
1986 02 24.79	S	2.8	W	0.0	E		1			2.5		LOV
1986 02 24.85		3.4	W	0.0	E		1					CLA
1986 02 24.86	S	3.6	W	12.5	R	5	32	2.5	8	1.75	287	CLA
1986 02 25.39	B	2.9	WW	3.5	B		7	& 6	8			GRE
1986 02 25.39	B	3.0	WW	8.0	B		20	& 6	8	>2		GRE
1986 02 25.40	B	2.8	WW	0.0	E		1					GRE
1986 02 25.46	! S	3.2	AA	3.5	B		7					MOR03
1986 02 25.52	! B	3.0	WH	4.0	B		8			1.3	270	KEE
1986 02 25.53	! I	3.0	WH	0.9	E		1					KEE
1986 02 25.57	S	3.8	A	8.0	B		20	4	6	0.5	280	DUC
1986 02 25.76	S	2.9	W	0.0	E		1					LOV
1986 02 26.39	B	2.5:	WW	0.0	E		1			&2		GRE
1986 02 26.40	B	2.8	WW	5.0	B		7	& 6	8/	>3		GRE
1986 02 26.40	B	3.0	WW	8.0	B		20		8/	>2		GRE
1986 02 26.45	! S	3.2	AA	3.5	B		7					MOR03
1986 02 26.53	! B	3.2	WH	4.0	B		8					KEE
1986 02 26.53	! I	2.9	WH	0.9	E		1					KEE
1986 02 26.56	S	3.4	A	8.0	B		20	7	6	1.5	275	DUC
1986 02 26.58	! S	3.1	D	8.0	B		20	3	7	0.33	256	MAC
1986 02 26.76	S	2.7	W	0.0	E		1			3.0		LOV
1986 02 26.76	I	3.3	D	0.0	E		1					SEA
1986 02 26.76				8.0	B		15		8	1	280	SEA
1986 02 27.45	! S	3.3	AA	3.5	B		7	3		0.30	270	MOR03
1986 02 27.56	M	3.7	A	8.0	B		20	7	6	1.5	270	DUC
1986 02 27.57	! S	3.4	D	8.0	B		20	3	8	0.33	267	MAC
1986 02 27.76	S	2.9	W	0.0	E		1	4.5		3.0		LOV
1986 02 27.85	S	2.8	D	0.0	E		1			4.5	270	WOO
1986 02 27.85				5.0	B		7	19	4			WOO
1986 02 27.86		3.2	W	0.0	E		1					CLA
1986 02 28.52	! I	2.8	WH	0.9	E		1					KEE
1986 02 28.52	! B	2.8	WH	4.0	B		8	5	8	1.8	270	KEE
1986 02 28.56	M	3.7	A	8.0	B		20	7	6	2.0	270	DUC
1986 02 28.76	I	2.7	D	0.0	E		1					SEA
1986 02 28.77	S	3.0	W	0.0	E		1	5.0		5.0		LOV
1986 02 28.85	S	3.1	D	0.0	E		1			5.5	270	WOO
1986 03 01.43	! B	3.1:	WW	8.0	B		20	& 4	8			GRE

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 03 01.43	! B	2.9	WW	3.5	B		7	& 4	8			GRE
1986 03 01.76	I	2.9	D	0.0	E		1					SEA
1986 03 01.77	S	2.8	W	0.0	E		1			5.3		LOV
1986 03 02.43	! B	2.7	WW	3.5	B		7		8			GRE
1986 03 02.51	! I	2.8	WH	0.9	E		1			1.3	270	KEE
1986 03 02.51	! B	2.8	WH	4.0	B		8	5	8	1.8	270	KEE
1986 03 02.56	M	3.4	A	8.0	B		20	8	6	2.5	265	DUC
1986 03 02.57		3.5	A	0.0	E		1	4		0.5	265	DUC
1986 03 02.57	! S	3.4	D	8.0	B		20	3	8	0.82	262	MAC
1986 03 02.57	! B	3.8	D	8.0	B		20	3	8	0.82	262	MAC
1986 03 02.76	S	2.7	W	0.0	E		1	5.0		5.5		LOV
1986 03 02.85	S	3.1	D	0.0	E		1			6.5	265	WOO
1986 03 03.42	! B	2.8	WW	3.5	B		7		8			GRE
1986 03 03.56	M	3.8	A	8.0	B		20	8	6	2.0	260	DUC
1986 03 03.57	! S	3.3	D	8.0	B		20	4	8	0.85	263	MAC
1986 03 03.75	S	2.7	W	0.0	E		1			6.5		LOV
1986 03 03.75	I	2.8	D	0.0	E		1					SEA
1986 03 04.52	! B	2.9	WH	4.0	B		8	5	8	1.5	270	KEE
1986 03 04.55	! S	3.1	D	13.0	R	7	27	5	8	1.08	278	MAC
1986 03 04.56	! S	3.1	D	8.0	B		20	5	8	1.37	278	MAC
1986 03 04.56	! S	2.8	D	0.0	E		1	10	5	1.47	278	MAC
1986 03 04.76	S	3.0	D	0.0	E		1					SEA
1986 03 04.76	S	2.8	W	0.0	E		1	5.0		4.0		LOV
1986 03 04.83		3.2	W	0.0	E		1					CLA
1986 03 05.55	! S	3.0	D	13.0	R	7	27	6	8	1.05	266	MAC
1986 03 05.56	! S	2.8	D	0.0	E		1	10	3	2.18	266	MAC
1986 03 05.56	! S	3.0	D	8.0	B		20	7	7	2.15	266	MAC
1986 03 05.75	S	2.7	W	0.0	E		1			?8		LOV
1986 03 05.76		2.9	D	0.0	E		1					SEA
1986 03 06.43	! B	3.6	WW	3.5	B		7		8			GRE
1986 03 06.73	S	3.0	W	3.0	R	6	8	6.0		3		LOV
1986 03 06.74		2.9	D	0.0	E		1			4.0		SEA
1986 03 06.83	S	3.0	D	0.0	E		1			12.0	265	WOO
1986 03 07.69	S	2.7	W	0.0	E		1			5.0		LOV
1986 03 07.74	B	2.8	D	0.0	E		1					SEA
1986 03 07.74				8.0	B		15	& 6	8	3.5		SEA
1986 03 08.43	! B	3.6:	WW	5.0	B		7		8/			GRE
1986 03 08.69	S	2.7	W	0.0	E		1			11		LOV
1986 03 08.76		3.1	W	5.0	B		7		6			MAT01
1986 03 09.51	! I	3.2	WH	0.9	E		1					KEE
1986 03 09.51	! B	3.2	WH	4.0	B		8	5	8	3.3	265	KEE
1986 03 09.55	M	3.5	A	8.0	B		20	10	6	3.0	245	DUC
1986 03 09.56	! S	3.5	D	8.0	B		20	10	8	1.50	251	MAC
1986 03 09.73	B	3.1	W	5.0	B		10					BOU
1986 03 09.75	S	2.9	W	5.0	B		10		8	6.5	270	BOU
1986 03 10.73	B	3.0	W	5.0	B		10					BOU
1986 03 10.73	S	2.8	W	5.0	B		10		7/	6.0	260	BOU
1986 03 10.74		2.8	W	0.8	G		1					BOU
1986 03 10.74	B	2.7	D	0.0	E		1			5	274	SEA
1986 03 10.77	S	2.5	W	0.0	E		1			13		LOV
1986 03 11.74	S	2.9	W	5.0	B		10		7/	5.0	270	BOU
1986 03 11.74	B	3.1	W	5.0	B		10					BOU
1986 03 11.75	B	2.7	D	0.0	E		1			12		SEA
1986 03 11.75		2.9	W	0.8	G		1			11	262	BOU
1986 03 12.30		3.6	WH	0.0	E		1			6.0	262	DEA

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 03 12.40	! B	3.4	WW	0.0	E		1		7/	&3		GRE
1986 03 12.42	! B	3.5	WW	3.5	B		7	& 6	8	>5		GRE
1986 03 12.56	! S	3.3	D	8.0	B		20	8	7	1.13	254	MAC
1986 03 12.76	S	2.6	W	0.0	E		1	7.5		13		LOV
1986 03 12.77	B	2.8	D	0.0	E		1			8.5	267	SEA
1986 03 12.77	S	2.9	W	5.0	B		10					BOU
1986 03 12.77		2.8	W	0.8	G		1			12	262	BOU
1986 03 12.77	B	3.1	W	5.0	B		10	6.5	7/	4.5	275	BOU
1986 03 12.77				8.0	B		15	7	8			SEA
1986 03 13.29		3.6	WH	0.0	E		1			6.0	262	DEA
1986 03 13.50	! B	3.0	WH	4.0	B		8	6	8	4	270	KEE
1986 03 13.50	! I	3.0	WH	0.9	E		1			5	270	KEE
1986 03 13.74	B	2.7	D	0.0	E		1					SEA
1986 03 13.75		2.8	W	0.8	G		1			10	261	BOU
1986 03 13.75	B	3.1	W	5.0	B		10	8	7	4	270	BOU
1986 03 13.83	S	3.4	D	0.0	E		1			16	270	WOO
1986 03 14.50	! B	3.1	WH	4.0	B		8	5	8	5	270	KEE
1986 03 14.50	! I	3.0	WH	0.9	E		1			6	270	KEE
1986 03 14.53	M	3.9	A	8.0	B		20	15	6	4.0	255	DUC
1986 03 14.53		4.0	A	0.0	E		1	10	6	2.0	255	DUC
1986 03 14.54	!	3.1	D	0.0	E		1	10	4	3.37	263	MAC
1986 03 14.55	! S	3.2	D	8.0	B		20	12	6	2.88	263	MAC
1986 03 14.55	! S	3.3	D	25.4	L	4	32	10	8	0.78	263	MAC
1986 03 14.73	B	2.9	D	0.0	E		1					SEA
1986 03 14.73				8.0	B		15	8	8			SEA
1986 03 14.73		2.9	W	0.8	G		1			11	259	BOU
1986 03 14.76	B	3.2	W	5.0	B		10	8	7	4	272	BOU
1986 03 14.83	S	3.3	D	0.0	E		1			12	270	WOO
1986 03 15.73	S	2.6	W	0.0	E		1	10		18.5		LOV
1986 03 15.78	B	3.1	W	5.0	B		10	10	7	5.0	260	BOU
1986 03 15.78		2.8	W	0.8	G		1					BOU
1986 03 15.83	S	3.4	D	0.0	E		1			11	270	WOO
1986 03 17.42	! S	3.6	AA	3.5	B		7			1.8	265	MOR03
1986 03 17.53	M	3.6	A	8.0	B		20	18	5	5.0	260	DUC
1986 03 17.75		2.9	W	0.8	G		1					BOU
1986 03 17.75	B	3.0	D	0.0	E		1			3.5	262	SEA
1986 03 17.75	B	3.3	W	5.0	B		10	10	7	4.5	255	BOU
1986 03 17.77	S	2.7	W	0.0	E		1			4.0		LOV
1986 03 18.53	M	3.2	A	8.0	B		20	18	5	5	260	DUC
1986 03 18.54	! S	3.0	D	8.0	B		20	11	5	3.40	271	MAC
1986 03 18.54	! S	3.3	D	25.4	L	4	32	9	7	2.18	271	MAC
1986 03 18.54	!	2.9	D	0.0	E		1	15	3	4.08	271	MAC
1986 03 18.71	S	2.9	D	0.0	E		1			5	270	SEA
1986 03 18.73		2.8	W	0.8	G		1			9	260	BOU
1986 03 18.73	B	3.2	W	5.0	B		10	12	6	5.0	260	BOU
1986 03 18.77	S	2.7	W	0.0	E		1			7.5		LOV
1986 03 19.53	M	3.6	A	8.0	B		20	20	4/	5	260	DUC
1986 03 19.53	!	3.2	D	0.0	E		1	10	5	1.58	266	MAC
1986 03 19.54	! S	3.4	D	8.0	B		20	10	6	1.30	266	MAC
1986 03 19.72	B	3.3	W	5.0	B		10					BOU
1986 03 19.72	S	3.0	W	5.0	B		10	12	6			BOU
1986 03 19.73	S	2.9	D	0.0	E		1			5	270	SEA
1986 03 19.73		2.9	W	0.8	G		1			9	260	BOU
1986 03 19.77	S	2.7	W	0.0	E		1	15		8.0		LOV
1986 03 20.53	! S	3.2	D	8.0	B		20	9	6	1.63	274	MAC

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 03 20.54	!	3.1	D	0.0	E		1	10	4	1.83	274	MAC
1986 03 20.72	B	3.3	W	5.0	B		10					BOU
1986 03 20.72	S	3.0	W	5.0	B		10	10	6/			BOU
1986 03 20.73				8.0	B		15	8	8	?0.25	5	SEA
1986 03 20.73	S	2.8	D	0.0	E		1			7	262	SEA
1986 03 20.76	S	2.6	W	0.0	E		1	17		10		LOV
1986 03 20.76		2.8	W	0.8	G		1			11	262	BOU
1986 03 21.40	! B	2.9	WW	0.0	E		1		7	&3		GRE
1986 03 21.42	! S	3.6	AA	3.5	B		7	12	6	1.7	270	MOR03
1986 03 21.48	! B	2.5	WH	0.9	E		1			7	270	KEE
1986 03 21.49	! B	3.1	WH	4.0	B		8	10	6	7	270	KEE
1986 03 21.54	! S	3.3	D	8.0	B		20	10	6	1.07	274	MAC
1986 03 21.72	S	2.7	D	0.0	E		1			6.5	270	SEA
1986 03 21.72				5.0	B		10	15	7	0.25	7	SEA
1986 03 21.74	B	3.2	W	5.0	B		10	14	7	0.25	7	BOU
1986 03 21.74		2.7	W	0.8	G		1			8	262	BOU
1986 03 21.77	S	2.6	W	0.0	E		1			10		LOV
1986 03 21.83	S	3.6	D	0.0	E		1			9.5	270	WOO
1986 03 22.39	! B	3.4	WW	5.0	B		7					GRE
1986 03 22.39	! B	3.3	WW	3.5	B		7					GRE
1986 03 22.39	! S	3.1	WW	5.0	B		7	& 6	8			GRE
1986 03 22.41	! S	3.4	AA	3.5	B		7	12	5	1.2	270	MOR03
1986 03 22.48	! B	2.4	WH	0.9	E		1	20	6	7	270	KEE
1986 03 22.52	! S	3.3	D	25.4	L	4	32	13	9	1.53	264	MAC
1986 03 22.53	!	3.1	D	8.0	B		20	16	7	2.33	264	MAC
1986 03 22.53	! S	3.0	D	0.0	E		1	15	5	3.90	264	MAC
1986 03 22.75	S	2.8	W	5.0	B		10	14	7	6	258	BOU
1986 03 22.75	S	2.6	D	0.0	E		1			5	273	SEA
1986 03 22.75		2.6	W	0.8	G		1					BOU
1986 03 22.76	B	3.1	W	5.0	B		10					BOU
1986 03 22.77	S	2.4	W	0.0	E		1			9.0		LOV
1986 03 22.77				15.2	L	5	29	10		0.25	0	BOU
1986 03 22.83	S	3.6	D	0.0	E		1			9.5	270	WOO
1986 03 23.40	! S	3.0	WW	5.0	B		7	& 6	8			GRE
1986 03 23.74	B	3.2	W	5.0	B		10	16	6/	0.33	5	BOU
1986 03 23.74	S	2.6	W	0.0	E		1	20		12		LOV
1986 03 23.74	S	2.7	D	0.0	E		1					SEA
1986 03 23.74		2.7	W	0.8	G		1			12	258	BOU
1986 03 23.83	S	3.5	D	0.0	E		1			9	270	WOO
1986 03 24.41	! S	4.2	AA	3.5	B		7	11	5			MOR03
1986 03 24.78	S	2.4	W	0.0	E		1	21		11		LOV
1986 03 24.78	S	2.7	D	0.0	E		1					SEA
1986 03 24.81	B	3.2	W	5.0	B		10	&15	6/	6.0	259	BOU
1986 03 24.81		2.7	W	0.8	G		1					BOU
1986 03 25.38	! S	3.1	WW	5.0	B		7	& 7	6/			GRE
1986 03 25.38	! B	3.3	WW	5.0	B		7					GRE
1986 03 25.39	! S	2.7	WW	3.5	B		7	& 7.5	6			GRE
1986 03 25.39	! B	3.1	WW	3.5	B		7					GRE
1986 03 25.40	! S	2.7	WW	8.0	B		20	& 8.1	5/			GRE
1986 03 26.39	! B	3.1	WW	3.5	B		7					GRE
1986 03 26.39	! S	2.8	WW	3.5	B		7	& 6.0	6/			GRE
1986 03 26.39	! S	2.7	WW	8.0	B		20	& 9.0	5/			GRE
1986 03 26.53	! S	3.2	D	8.0	B		20	8	6			MAC
1986 03 27.48	! K	3.0	WH	4.0	B		8					KEE
1986 03 27.67		3.1	W	0.0	E		1					GAR01

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 03 27.70	S	3.2:	D	0.0	E		1					SEA
1986 03 27.80		3.1	W	0.8	G		1					BOU
1986 03 27.80	B	3.5	W	5.0	B		10		6	2.5	270	BOU
1986 03 28.49	! K	3.1	WH	4.0	B		8	12	6			KEE
1986 03 28.79		3.2	W	0.0	E		1					GAR01
1986 03 28.81	B	3.4	W	5.0	B		10	&15	6	2.0		BOU
1986 03 28.81		3.0	W	0.8	G		1					BOU
1986 03 29.75		2.9	W	0.0	E		1					GAR01
1986 03 30.49	! K	2.8	WH	4.0	B		8					KEE
1986 03 30.74		2.9	W	0.0	E		1					GAR01
1986 03 30.80	B	3.0	W	5.0	B		10	&20	5	2.0	267	BOU
1986 03 30.80		2.7	W	0.8	G		1					BOU
1986 03 31.40	S	4.0	AA	3.5	B		7	15				MOR03
1986 03 31.65		3.0	W	0.0	E		1					GAR01
1986 03 31.72	B	3.2	W	5.0	B		10	&20	5/	2.0		BOU
1986 03 31.72		2.8	W	0.8	G		1					BOU
1986 04 01.53	S	2.6	D	0.0	E		1	20		5		SEA
1986 04 01.53	B	2.9	W	5.0	B		10	18	5			BOU
1986 04 01.53		2.5	W	0.8	G		1			7.0	278	BOU
1986 04 01.64		3.0	W	0.0	E		1					GAR01
1986 04 01.80		2.9	W	0.0	E		1					GAR01
1986 04 02.15	M	3.6	WW	4.0	B		7					WES02
1986 04 02.40	! S	3.4	AA	3.5	B		7	19				MOR03
1986 04 02.46	M	2.9	A	8.0	B		20	25	4			DUC
1986 04 02.51	B	2.4	WW	0.0	E		1					GRE
1986 04 02.51	B	2.5	WW	3.5	B		7					GRE
1986 04 02.51	S	2.4	WW	3.5	B		7	&26	5/	>5		GRE
1986 04 02.54	S	2.4	D	0.0	E		1					SEA
1986 04 02.56		2.4	W	0.8	G		1					BOU
1986 04 02.56	B	2.8	W	5.0	B		10	18	4/	4.0	285	BOU
1986 04 02.71	S	2.6	D	0.0	E		1			6.5	280	WOO
1986 04 03.40	! S	3.5	AA	3.5	B		7	24				MOR03
1986 04 03.50	M	3.4	A	8.0	B		20	25	4	1.0	330	DUC
1986 04 03.52				8.0	B		15		6	0.3	30	SEA
1986 04 03.52	S	2.5	D	0.0	E		1	36		8	285	SEA
1986 04 03.53		2.4	W	0.8	G		1			6.0	285	BOU
1986 04 03.54	M	2.6	W	5.0	B		10	23	4/			BOU
1986 04 03.55	B	2.9	W	6.3	B		9					BOU
1986 04 03.56	B	3.0	WW	0.0	E		1					GRE
1986 04 03.56				3.5	B		7	&23	5	>5		GRE
1986 04 03.70	B	3.0	WW	0.0	E		1					GRE
1986 04 04.45	! B	2.6	WH	0.9	E		1	20	5			KEE
1986 04 04.45	! K	2.9	WH	4.0	B		8	15	5	3	310	KEE
1986 04 04.51	B	3.3	WW	0.0	E		1					GRE
1986 04 04.54		2.4	W	0.8	G		1	&30				BOU
1986 04 04.54	S	2.5	D	0.0	E		1	36		6	285	SEA
1986 04 04.55	M	2.6	W	5.0	B		10	24	4/			BOU
1986 04 04.71	S	2.6	D	0.0	E		1			5.5	285	WOO
1986 04 05.44	! K	2.9	WH	4.0	B		8	15	4	2	310	KEE
1986 04 05.45	! B	2.6	WH	0.9	E		1	25	3	1	310	KEE
1986 04 05.56		2.3	W	0.8	G		1	&30	2/			BOU
1986 04 05.58	S	2.4	D	0.0	E		1					SEA
1986 04 05.66	B	3.2	WW	0.0	E		1		3/	&4.5		GRE
1986 04 05.66				3.5	B		7	&23	7	&4		GRE
1986 04 06.23	M	3.6	WW	4.0	B		7			3.8	282	WES02

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 04 06.45	! K	2.4	WH	4.0	B		8	12	6	3	310	KEE
1986 04 06.46	! B	2.1	WH	0.9	E		1	15	5	1	310	KEE
1986 04 06.56		2.4	W	0.8	G		1		3			BOU
1986 04 06.71	S	2.8	D	0.0	E		1			4.0	300	WOO
1986 04 07.15	M	3.3	WW	4.0	B		7			2.0	294	WES02
1986 04 07.41	S	3.1	D	8.0	B		20	32	8	2.15	328	MAC
1986 04 07.41		3.0	D	0.0	E		1	22	7	2.58	328	MAC
1986 04 07.42	S	3.0	D	5.0	B		7	36	7	2.16	328	MAC
1986 04 07.44	B	2.3	OH	0.9	E		1					KEE
1986 04 07.58	S	2.2	D	0.0	E		1	40	6			SEA
1986 04 07.59	M	2.0	W	5.0	B		10	&30	5	3.5	275	BOU
1986 04 07.59		1.9	W	0.8	G		1		4			BOU
1986 04 07.60	B	2.6	WW	0.0	E		1	&35	5	&5		GRE
1986 04 07.71	S	2.5	D	0.0	E		1			4.0	315	WOO
1986 04 07.77		1.9	W	0.8	G		1					BOU
1986 04 08.15	M	3.8	WW	4.0	B		7			3.0	275	WES02
1986 04 08.36		2.8	D	0.0	E		1	48	6	1.87	318	MAC
1986 04 08.37	S	3.0	D	8.0	B		20	40	7	1.72	318	MAC
1986 04 08.52	S	2.0	D	0.0	E		1					SEA
1986 04 08.52	B	2.8	WW	0.0	E		1	&35	5	&1		GRE
1986 04 08.67		2.0	W	0.8	G		1		4/			BOU
1986 04 08.67	S	2.3	D	0.0	E		1					SEA
1986 04 08.67	M	2.1	W	5.0	B		10	30	5/			BOU
1986 04 08.71	S	2.3	D	0.0	E		1			4.5	320	WOO
1986 04 09.15		2.0	WH	0.0	E		1					DEA
1986 04 09.41		2.8	D	0.0	E		1	18	5	2.33	358	MAC
1986 04 09.41	S	2.8	D	8.0	B		20	19	6	1.70	26	MAC
1986 04 09.51	B	2.7	WW	0.0	E		1	&35	5	&5		GRE
1986 04 09.53				8.0	B		15	&30	7	&3	330	SEA
1986 04 09.53	S	2.0	D	0.0	E		1					SEA
1986 04 09.55		1.9	W	0.8	G		1	&32	4			BOU
1986 04 09.55	M	2.1	W	5.0	B		10	&26	5/	4.0	313	BOU
1986 04 09.71	S	2.1	D	0.0	E		1			4.5	335	WOO
1986 04 10.42	B	2.8	WW	0.0	E		1					GRE
1986 04 10.47	S	2.8	D	8.0	B		20	48	5	2.42	16	MAC
1986 04 10.47		3.0	D	0.0	E		1	40	4	1.42	2	MAC
1986 04 10.51	M	2.3	WH	0.9	E		1	45	5			KEE
1986 04 10.56	S	2.0	D	0.0	E		1					SEA
1986 04 10.57	S	2.3	W	1.8	B		2		4			BOU
1986 04 10.57		2.2	W	0.8	G		1	32	3			BOU
1986 04 10.71	S	2.2	D	0.0	E		1			5.5	345	WOO
1986 04 10.78	S	2.3	W	1.8	B		2					BOU
1986 04 11.14		2.1	WH	0.0	E		1					DEA
1986 04 11.14				7.0	B		10	36		1.8	335	DEA
1986 04 11.42	S	2.1	D	0.0	E		1					SEA
1986 04 11.47	S	2.4	W	1.8	B		2		4			BOU
1986 04 11.49		2.3	W	0.8	G		1	35	3/			BOU
1986 04 11.53	M	2.5	W	5.0	B		10	30	4/	5.5	334	BOU
1986 04 11.71	S	2.4	D	0.0	E		1			4.5	350	WOO
1986 04 12.19		2.4	WH	0.0	E		1					DEA
1986 04 12.52	B	4.0	WW	3.5	B		7		7/			GRE
1986 04 12.54	S	3.2	WW	3.5	B		7					GRE
1986 04 12.54	M	3.3	WW	3.5	B		7					GRE
1986 04 12.57	B	3.1	WW	0.0	E		1					GRE
1986 04 12.77	S	2.5	W	1.8	B		2		4			BOU

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DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 04 12.78	M	2.7	W	5.0	B		10	28	5	3.0	345	BOU
1986 04 12.86	M	2.8	WW	3.5	B		7					GRE
1986 04 12.86	S	3.0	WW	3.5	B		7	&28	6/			GRE
1986 04 13.24		2.4	WH	0.0	E		1					DEA
1986 04 13.44	M	2.6	W	5.0	B		10	22	4/	3.5	10	BOU
1986 04 13.46	M	2.5	WH	0.9	E		1	40	5	2.0	330	KEE
1986 04 13.54	S	2.6	W	1.8	B		2		4			BOU
1986 04 13.54		2.5	W	0.8	G		1					BOU
1986 04 13.57	B	3.1	WW	0.0	E		1	&14	5	&4		GRE
1986 04 13.76	M	2.7	W	1.8	B		2					BOU
1986 04 13.76	B	3.0	W	1.8	B		2					BOU
1986 04 14.06		2.4	WH	0.0	E		1					DEA
1986 04 14.23	S	3.2	AA	3.5	B		7	18	2			MOR03
1986 04 14.41	S	2.3	D	0.0	E		1			>4	75	SEA
1986 04 14.46	M	2.6	W	1.8	B		2		5			BOU
1986 04 14.46		2.4	W	0.8	G		1					BOU
1986 04 14.46	M	2.5	W	6.3	B		9	20	5/	4.0	90	BOU
1986 04 14.48	B	2.9	W	5.0	B		10		6			BOU
1986 04 14.52	B	2.9	WW	0.0	E		1	&32	5	&5		GRE
1986 04 14.62	S	2.1	D	0.0	E		1			20	80	SEA
1986 04 14.70	M	2.6	WH	0.9	E		1					KEE
1986 04 14.71	B	2.9	WW	0.0	E		1	&35	5	&5		GRE
1986 04 14.73	S	3.2	D	8.0	B		20	26	6			MAC
1986 04 14.77	B	2.8	W	1.8	B		2					BOU
1986 04 14.77		2.3	W	0.8	G		1					BOU
1986 04 14.78	M	2.5	W	6.3	B		9			4.0	90	BOU
1986 04 14.96	M	3.4	WW	4.0	B		7			1.2	21	WES02
1986 04 15.34		2.8	D	0.0	E		1	50	6	4.40	48	MAC
1986 04 15.42	M	2.6	WH	0.9	E		1					KEE
1986 04 15.43	S	2.2	D	0.0	E		1			10		SEA
1986 04 15.49		2.4	W	0.8	G		1					BOU
1986 04 15.49	M	2.6	W	6.3	B		9	18	6	4.5	18	BOU
1986 04 15.49	B	2.9	W	1.8	B		2					BOU
1986 04 15.50	B	3.0	WW	0.0	E		1	&41	4/	&5		GRE
1986 04 15.64	S	3.0	D	8.0	B		20	23	8	2.63	35	MAC
1986 04 15.67				0.9	E		1	40	5	12	50	KEE
1986 04 15.79		2.3	W	0.8	G		1					BOU
1986 04 16.42	M	2.8	WH	0.9	E		1			11	60	KEE
1986 04 16.44		2.8	D	0.0	E		1	55	5	2.70	59	MAC
1986 04 16.52	S	2.5	D	0.0	E		1			15.5	60	SEA
1986 04 16.56		2.5	W	0.8	G		1		4	10	62	BOU
1986 04 16.57	M	2.7	W	5.0	B		10	15	6	5.5	62	BOU
1986 04 16.59	B	3.0	WW	0.0	E		1	&46	4/			GRE
1986 04 17.06		2.5	WH	0.0	E		1					DEA
1986 04 17.45	S	2.8:	D	0.0	E		1					SEA
1986 04 17.61	B	3.1	WW	0.0	E		1					GRE
1986 04 18.18	! S	3.8	AA	3.5	B		7	23	4	0.27	40	MOR03
1986 04 18.38	M	2.7	WH	0.9	E		1					KEE
1986 04 18.58	B	2.9	WW	0.0	E		1	&46	3/	10		GRE
1986 04 18.62	S	2.8	D	0.0	E		1			23	65	SEA
1986 04 18.67		2.4	W	0.8	G		1		3/	20	82	BOU
1986 04 18.67	M	2.6	W	5.0	B		10	17	5	3.5	45	BOU
1986 04 18.74	B	3.0	WH	0.9	E		1	30	5	16	85	KEE
1986 04 19.18		2.7	WH	0.0	E		1					DEA
1986 04 19.42	M	3.2	WH	0.9	E		1					KEE

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 04 19.48	B	3.2	WW	0.0	E		1	&46	3			GRE
1986 04 19.66	S	3.0	D	0.0	E		1			13	85	SEA
1986 04 19.68		2.7	W	0.8	G		1		3	23	80	BOU
1986 04 19.69	B	3.0	WH	0.9	E		1			17	85	KEE
1986 04 19.70	M	3.0	W	5.0	B		10	20	4/			BOU
1986 04 19.70	B	3.2	W	0.8	E		1					BOU
1986 04 20.19	! S	4.8	D	8.0	B		20	9	7			MAC
1986 04 20.44	B	3.3	WW	0.0	E		1	&46	4			GRE
1986 04 20.71	B	3.4	W	5.0	B		10					BOU
1986 04 20.71	M	3.1	W	5.0	B		10	&20	4/	2.5	64	BOU
1986 04 20.71		2.9	W	0.8	G		1		3	17	95	BOU
1986 04 20.71	S	3.4:	D	0.0	E		1	23		10	100	SEA
1986 04 21.21	! S	4.3	D	8.0	B		20	10	6			MAC
1986 04 21.35	B	3.4	WW	0.0	E		1	&46	3			GRE
1986 04 21.72	B	3.5	W	5.0	B		10	&20	4/			BOU
1986 04 21.73		3.0	W	0.8	G		1		3	14	90	BOU
1986 04 22.24	! S	3.9	D	8.0	B		20	15	4			MAC
1986 04 22.37	B	3.5	WW	0.0	E		1					GRE
1986 04 22.43	S	3.4	WW	3.5	B		7	&30	3/			GRE
1986 04 24.10	S	4.6	AA	3.5	B		7	16				MOR03
1986 04 24.36	S	3.5	WW	3.5	B		7		5			GRE
1986 04 24.44	B	3.5	WW	0.0	E		1					GRE
1986 04 24.51		3.2	W	0.8	G		1		3/	35	92	BOU
1986 04 24.53	M	3.3	WH	0.9	E		1			15	90	KEE
1986 04 24.53	B	3.6	WW	0.0	E		1	&28	4	26	90	GRE
1986 04 24.56	B	3.8	W	5.0	B		10		5			BOU
1986 04 25.08	S	4.7	AA	3.5	B		7	18				MOR03
1986 04 25.38	B	4.0	W	3.0	B		8					BOU
1986 04 26.21	! S	3.9	D	8.0	B		20	17	5			MAC
1986 04 27.10	S	4.7	AA	3.5	B		7	17	4			MOR03
1986 04 27.20	B	4.3:	WW	0.0	E		1	&60				GRE
1986 04 27.20	S	4.4	WW	3.5	B		7	&24	5			GRE
1986 04 27.22	!	4.1	D	0.0	E		1	14	3			MAC
1986 04 27.22	! S	4.3	D	8.0	B		20	20	6	0.82	105	MAC
1986 04 28.11	S	4.9	AA	3.5	B		7	17		0.37	95	MOR03
1986 04 28.23	! S	4.6	D	8.0	B		20	11	7	1.01	103	MAC
1986 04 28.23	!	4.3	D	0.0	E		1	12	6	0.60	103	MAC
1986 04 28.23	! S	4.6	D	25.4	L	4	32	9	8	0.63	103	MAC
1986 04 28.23	M	3.8	WH	0.9	E		1			5	85	KEE
1986 04 29.05	B	4.6	WW	0.0	E		1					GRE
1986 04 29.06	B	5.2	WW	3.5	B		7	&20	5	&3.5		GRE
1986 04 29.07	S	4.4	WW	3.5	B		7	&20	5	&3.5		GRE
1986 04 29.31	M	4.0	WH	0.9	E		1			10	95	KEE
1986 04 30.05	S	4.1	WW	3.5	B		7	&36	3/			GRE
1986 04 30.05	B	4.4:	WW	0.0	E		1					GRE
1986 04 30.22	! S	4.7	D	8.0	B		20	18	4	0.30	89	MAC
1986 04 30.91	S	4.8	W	15.2	L	5	44	6	4			MOE
1986 05 01.88	M	5.2:	AA	9	M	11	56	8	2			WES02
1986 05 01.92		4.7	WH	0.0	E		1					DEA
1986 05 03.12	S	4.5	WW	3.5	B		7	&15	4/			GRE
1986 05 03.12	M	4.6	WW	3.5	B		7	&15	4/			GRE
1986 05 03.13	B	4.6	WW	0.0	E		1	&20	0/			GRE
1986 05 04.15	S	4.8	WW	3.5	B		7	&15	4/			GRE
1986 05 05.09		4.9	WH	0.0	E		1					DEA
1986 05 05.12	S	4.9	WW	3.5	B		7	&15	4/			GRE

Periodic Comet Halley (1982i) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 05 05.31	M	4.2	WH	0.9	E		1	40	3	6	95	KEE
1986 05 05.90	M	5.8:	AA	9	M	11	56	6	2			WES02
1986 05 06.37	M	4.4	WH	0.9	E		1					KEE
1986 05 07.06	B	4.9	WH	7.0	B		10	18		2.4	110	DEA
1986 05 07.29	M	4.5	WH	0.9	E		1					KEE
1986 05 10.08	S	5.7	AA	3.5	B		7	&20	5			GRE
1986 05 10.08	M	5.6	AA	3.5	B		7					GRE
1986 05 10.09	M	5.7	AA	8.0	B		20	&14	4/	&2		GRE
1986 05 10.09	B	6.3	AA	8.0	B		20					GRE
1986 05 10.20	S	4.8	WH	0.9	E		1			2	110	KEE
1986 05 10.94	S	5.3	W	8.0	B		20	&12				BOU
1986 05 11.05	S	5.9	AA	5.0	B		7	& 6	2			GRE
1986 05 11.06	S	6.1	AA	8.0	B		20	& 8	4			GRE
1986 05 11.22	B	4.9	WH	0.9	E		1					KEE
1986 05 12.09	S	4.9	AA	8.0	B		20	&18	4/			GRE
1986 05 12.10	S	4.7	AA	5.0	B		7	&18	5			GRE
1986 05 12.10	S	4.9	AA	3.5	B		7	&16	3/			GRE
1986 05 12.12	B	6.2	WH	7.0	B		10	15		1.7	108	DEA
1986 05 12.22	S	5.0	WH	0.9	E		1					KEE
1986 05 12.23	K	5.6	WH	4.0	B		8	13	5	1.5	110	KEE
1986 05 13.20	K	5.7	WH	4.0	B		8					KEE
1986 05 13.20	S	5.3	WH	0.9	E		1					KEE
1986 05 14.07	S	6.0	AA	8.0	B		20	&12	3/			GRE
1986 05 14.08	S	5.5	AA	5.0	B		7	&15	4/			GRE
1986 05 14.08	M	5.8:	AA	5.0	B		7					GRE
1986 05 15.07	S	6.1	AA	8.0	B		20	&10	3/			GRE
1986 05 15.07	M	5.7	AA	5.0	B		7					GRE
1986 05 15.07	S	5.6	AA	5.0	B		7	&12	5			GRE
1986 05 15.17	K	5.7	WH	4.0	B		8	13	4	1.4	110	KEE
1986 05 16.06	S	6.2	AA	8.0	B		20	& 7	2/			GRE
1986 05 16.06	B	6.4	WH	7.0	B		10	15.0		1.0	105	DEA
1986 05 17.03	B	6.6	WH	7.0	B		10					DEA
1986 05 27.07	M	7.7	AA	22.9	R	12	86					GRE
1986 05 27.07	S	7.5	AA	22.9	R	12	86	& 4	5/			GRE
1986 05 27.09	S	7.1	AA	8.0	B		20	& 8	3/			GRE
1986 05 29.04	B	7.4	WH	7.0	B		10	12.0		1.0	95	DEA
1986 05 29.06	S	7.7	AA	22.9	R	12	86	& 4	5/			GRE
1986 05 29.06	M	7.8	AA	22.9	R	12	86					GRE
1986 06 03.08	S	7.3	AA	8.0	B		20	&10	3/			GRE
1986 06 03.08	S	7.2	AA	5.0	B		7	&11	1			GRE

Periodic Comet Boethin (1985n)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1985 11 03.53	S	10.7	AA	31.7	L	5	49	3				PEA
1985 12 04.49	S	10.0	AA	20.3	L	8	38	5	3			BOE
1985 12 07.45	S	9.8	AA	20.3	L	8	38	5	3			BOE
1985 12 11.49	S	9.5	AA	20.3	L	8	38	4	3			BOE
1985 12 20.00	S	9.8	AC	44.5	L	4	80	1.5	2			MOR03
1985 12 29.00	S	8.6	AC	15	R	5	31	5	1			MOR03
1986 01 01.97	S	8.7	AC	15	R	5	31	4	3			MOR03
1986 01 02.45	S	7.5:	AA	8.0	B		15					SEA
1986 01 02.73	B	8.6	AA	20.3	T	10	92	2.4	3			HAS02
1986 01 02.73	B	8.5	AA	10.0	B		14	2.4	3			HAS02
1986 01 02.76	S	8.4	AA	20.5	L	4	52	4.0	4			KOC01

Periodic Comet Boethin (1985n) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 01 02.76	B	8.5	AA	20.5	L	4	52	4.0	3			KOC
1986 01 03.48	S	8.3	S	20.3	L	8	38	5	3			BOE
1986 01 05.76	S	8.2	AA	8.0	B		20	4.1	3			KEI
1986 01 05.76	S	8.1	AA	5.0	B		10	5.4				KEI
1986 01 06.75	S	8.1	AA	8.0	B		20	2.7				KEI
1986 01 07.10	S	8.9	S	8.0	B		20	2	2			MAC
1986 01 07.99	S	8.7	AC	15	R	5	31	4.5	3			MOR03
1986 01 08.46	S	7.5	S	20.3	L	8	38	5	4			BOE
1986 01 08.70	S	8.9	S	15.2	L	5	44	4	2			MOE
1986 01 09.70	S	9.1	S	15.2	L	5	44	3.5	2			MOE
1986 01 09.74	S	9.3	A	20.0	C	10		5	3			COM
1986 01 09.76	S	9.0	A	8.0	B	5	20					BOU
1986 01 11.00	S	8.7	AC	15	R	5	31	5	4			MOR03
1986 01 11.75	S	8.7	A	8.0	B	5	20	4	2			BOU
1986 01 11.76	S	8.6	A	5.0	B	5	10		1			BOU
1986 01 11.80	S	8.2	AA	8.0	B		20	3.2	2/			KEI
1986 01 12.00	S	8.2	A	8.0	B		20	5.5	3/			BOR
1986 01 12.78	S	8.0	AA	5.0	B		10	2.7	4			KEI
1986 01 12.78	S	8.2	AA	8.0	B		20	2.7	3/			KEI
1986 01 13.00	S	8.6	A	8.0	B		20	3.5	3			BOR
1986 01 13.00	S	8.7	A	31.7	L	6	68	2.5	4			BOR
1986 01 14.01	S	8.7	AC	15	R	5	31	4.5	3			MOR03
1986 01 14.09	M	8.4	S	32	L	4	33	6	3			KEE
1986 01 15.00	S	8.8	AC	15	R	5	31	4.5	2			MOR03
1986 01 16.48	S	8.3	S	20.3	L	8	38	4	4			BOE
1986 01 16.74	S	9.5	S	15.2	L	5	44	4	2			MOE
1986 01 16.78	B	8.1	A	15.0	L	5	25	3.5	2			MER
1986 01 20.73	B	8.9:	S	20.3	T	10	92	1.9	2			HAS02
1986 01 21.10	S	7.6	A	8.0	R	4	19	6	2			SPR
1986 01 22.06	M	9.3	S	32	L	4	40	2.3	1			KEE
1986 01 23.73	S	7.7	AA	8.0	B		20	6.5	4/			ZAN
1986 01 28.10	S	7.2	A	8.0	B		11	5	2			SPR
1986 01 31.98	S	8.2	S	7.0	B		10					DEA
1986 02 01.00	S	8.8	AC	15	R	5	31	4.1	4			MOR03
1986 02 01.96	S	8.2	S	7.0	B		10	6.8				DEA
1986 02 02.10	S	7.2	A	8.0	B		11	& 4.5	3			SPR
1986 02 03.11	M	8.6	S	32	L	4	33	6	3			KEE
1986 02 04.78	S	9.2	S	15.2	L	5	44	4	2	?		MOE
1986 02 04.79	S	8.5	A	8.0	B	5	20	4.5	3			BOU
1986 02 05.77	S	9.2	S	15.2	L	5	44	4	2			MOE
1986 02 08.78	S	8.7	AA	8.0	B		20	4.0	3			KEI
1986 02 08.78	S	8.5	AA	5.0	B		10					KEI
1986 02 09.81	S	8.6	AA	8.0	B		20	4.0				KEI
1986 02 10.79	S	8.7	AA	8.0	B		20	3.0	3			KEI
1986 02 13.02	S	9.9	AC	15	R	5	31	4.5	2			MOR03
1986 02 23.77	S	9.3	AC	15.2	L	5	44	3.5	2			MOE
1986 02 25.77	S	9.7	AC	15.2	L	5	44	3.5	2			MOE
1986 02 26.76	S	9.5	AC	15.2	L	5	44	3.5	3			MOE
1986 02 28.22	! S	9.4	S	13.0	R	7	27	4	1			MAC
1986 02 28.48	S	9.4	S	20.3	L	8	38	5	4			BOE
1986 02 28.77	S	9.8	AC	15.2	L	5	44	3	2			MOE
1986 03 02.48	S	9.7	S	20.3	L	8	38	6	3			BOE
1986 03 03.49	S	9.8	S	20.3	L	8	38	5	2			BOE
1986 03 07.49	S	9.5	S	20.3	L	8	38	3	2			BOE
1986 03 14.41	S	9.5	AC	15.2	L	5	36					SEA

Periodic Comet Boethin (1985n) Cont.

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 03 18.82	S	10.3	AC	15.2	L	5	44	3	2			MOE
1986 03 19.83	S	10.2:	AC	15.2	L	5	44	& 3.5	2			MOE
1986 03 23.83	S	10.1	AC	15.2	L	5	44	3	3			MOE
1986 03 28.82	S	10.4	AC	15.2	L	5	44	1.5	2			MOE

Periodic Comet Shoemaker 3 (1986a)

DATE (UT)	MM	MAG.	RF	AP.	T	F/	PWR	COMA	DC	TAIL	PA	OBS.
1986 02 08.96	S	13.0	A	29.8	L	5	89	0.6	2			KEI
1986 02 14.04	S	13.0	A	29.8	L	5	89	0.6	1/			KEI

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RECENT NEWS AND RESEARCH CONCERNING COMETS

(continued from page 43)

Carolyn Shoemaker discovered her eighth comet on films exposed with the 18-inch Schmidt telescope at Palomar on March 4, 5, and 8. This places her in a first-place tie with Caroline Herschel as the women with the most comet discoveries. (To the list of persons with 6 comet discoveries mentioned in the last issue, page 40, should be added R. Burnham, who discovered most of his photographically while employed by Lowell Observatory nearly 3 decades ago.) Comet Shoemaker 1986*b* was reported to be diffuse with central condensation ($m_1 \sim 15.5$, $m_2 \sim 17$) on the discovery films, and it was moving northeastward in Coma Berenices. Brian Marsden has computed orbital elements which show that comet 1986*b* passed perihelion on 1986 March 11 at $q = 3.59$ AU. Marsden's elements (*MPC* 10759), based on an arc of < 2 months, indicate that this comet may have an orbital period around 500 or so years.

Comet 1986*c* was Malcolm Hartley's seventh comet discovery, found as a faint object ($m_1 \sim 17-18$) on plates exposed March 15, 17, and 20 with the U.K. Schmidt Telescope at Siding Spring, Australia. At discovery, the comet was moving northwestward from Crater into Leo. Marsden soon found that a short-period ellipse of ~ 6.2 years best fits the observations ($T = 1985$ June 5.05 ET, $q = 0.96$ AU, $i = 9°$), and comet 1986*c* is now known as P/Hartley 2. Comet 1985*f* thus now becomes P/Hartley 1. P/Hartley 2 passed within ~ 0.32 AU of Jupiter in 1982 November, and within 0.08 AU of Jupiter in late 1971 April. The 1971 approach brought the orbit's inclination from $\sim 17°$ down to $\sim 8°$ and the period from ~ 8.0 down to ~ 6.1 years.

Stephen Singer-Brewster discovered comet 1986*d* on films exposed with the 18-inch Schmidt telescope at Palomar Mountain on May 3. He works with Eleanor Helin's project of searching for close-approaching asteroids, one similar to that project run by the Shoemakers with the same telescope. The comet was at total magnitude 15 upon discovery and moving slowly southwestward in Libra. This comet actually has a 6.1-year period ($T = 1986$ May 28, $q = 1.95$ AU), and is thus now known as P/Singer Brewster (spelled without a hyphen to avoid confusing the name with two separate people); it apparently had a close approach to Jupiter in 1976 (*IAUC* 4214).

James Gibson has successfully recovered P/Holmes (designated comet 1986*f*) on CCD exposures taken June 9, 10, and 11 with the 1.5-m reflector at Palomar Mountain. He notes the object as being diffuse with central condensation, with a tail $1'-1.5'$ long and $m_1 \simeq 18$ (*IAUC* 4225).

Comet 1986*a*, reported in the last issue, has turned out to be the Shoemakers' third discovery of a short-period comet. P/Shoemaker 3 has a rather long orbital period of 17 years.

J.-C. Merlin and V. F. de Assis Neto reported an outburst of P/Schwassmann-Wachmann 1 in early April ($m_1 = 12.0$ on Apr. 4 and 5, 31-cm reflector; cf. *IAUC* 4200). Other observers apparently were not able to confirm this report, however.

Observers having access to telescopes of 30-cm aperture or greater are encouraged to try to locate visually any comets — especially the short-period ones — which are predicted to reach "$m_1 = 18$" or brighter, since the photographic magnitudes are often very misleading. The *ICQ* is interested in receiving information regarding attempts to observe such comets, whether negative or positive results are obtained. For total magnitude estimates (or lower limit estimates, in the event the comet is not seen), we ask observers to use the Everhart (E) or Landolt (L) series of comparison-star magnitudes for such observations fainter than magnitude 12 (instead of AAVSO charts, for example). With objects this faint, observers must take painstaking measures to assure proper identification, including a verification of proper motion with an up-to-date ephemeris; use of Palomar Sky Survey charts (or similar sources) are highly recommended. Comets with potential of being seen by visual observers during the next 4-6 months are: P/Machholz, P/Holmes, P/Smirnova-Chernykh, Shoemaker 1984*f*, Hartley 1984*v*, Thiele 1985*m*, P/Ashbrook-Jackson, P/Shajn-Schaldach, P/Forbes, and P/Schwassmann-Wachmann 1.

(1986 June 13)