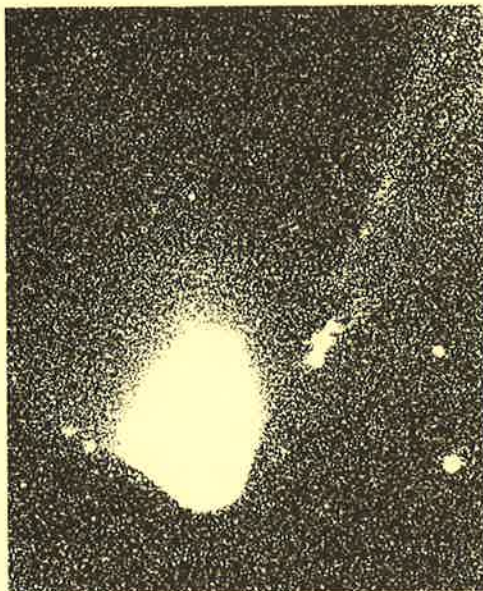


The Archive of The Amateur Observation Network of The International Halley Watch

Volume 2: Comet Halley

Stephen J. Edberg
Editor



February 9, 1996



National Aeronautics and
Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California



DATE: 14 DEC 1985

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NOTE M PA = E.
 NOTE N Central condensation about 20".
 NOTE O Mist.
 NOTE P Haze.
 NOTE Q Very clear sky.
 NOTE R Central condensation magnitude 5.6. Thin central brighter spine.
 NOTE S Clear, no wind. (Translated by IHW staff. Ed.)
 NOTE T Tail length approximate. Halley visible with naked eye.
 NOTE U (Observer gave limit as 9.0. Ed.)
 NOTE V Coma diameter determined as an average of five transit time observations.
 NOTE W Slight haze.
 NOTE X Tail fanned to 78 deg. (?). Seeing Antoniadis III.
 NOTE Y Coma diameter approximate.
 NOTE Z Coma diameter and tail length approximate.

SUB-NETWORK: DRAWING

Date(UT)	AON#	Scale	Ap	Ins	f/	Pwr(s)	DurM	Lim	Site	Observer(s)	Notes
14.010	830485	0.6	0.203	R	13	85	10	4.5	1	Fox,J.H	A
14.053	830486		0.203	SC	10	81			2	Lohvinenko,T.W	B
14.061	830487		0.203	SC	10	81			1	Lohvinenko,T.W	C
14.139	830488		0.108	N	4	24	20	5.5	2	Franch,J	D
14.166	830489		0.254	N	4.8	32	24	6.0	1	Troiani,D.M	E
14.189	830490	3.2	0.050	B		7		5 6.0	5	Cook,A.J	
14.44	830491	1.40	0.15	N	5.7	23	14	5	3	Tanikawa,M	F
14.527	830492	0.2	0.318	N	8	150			3	Tregaskis,T.B	G
14.7	830493	0.29	0.254	N	4.5	125, 45	72	6	1	Pesci,S	H
14.705	830494	1.6	0.090	M	11	56	10	5.0	2	Westlund,M	
14.711	830495		0.06	R	6.9	20	12	4.2	1	Guerrini,F	
14.877	830496	0.08	0.125	N	5.8	28, 40, 60	33	4.0	1	Riccabone,G	I

NOTE A Star embedded in W coma looks almost like 2nd nucleus. Its surrounding condensation is probably an artifact.
 NOTE B Comet Halley is seen here with a nuclear magnitude of 7.9 (check star: AGK 3+0 deg. 0181) and an integrated magnitude of 5.8 (check stars: HR 69, 61 Cyg A, B). The comet on this date was seen through 16x50 binoculars and through the Celestron 6x30 finder scope and then I saw it with the naked eye. (Duration not indicated. Time of observation is assumed to be start time. Ed.)
 NOTE C The comet is seen here with a size of 233.47" and is seen with some forms of a tail with spikes forming at PA 240 and PA 16. (Duration not indicated. Time of observation is assumed to be start time. Ed.)
 NOTE D Gas tail at PA 69. The comet, now of 5.4 magnitude, possessed a somewhat parabolic coma which was some 17' in total extent. The nucleus was reported as being ill-defined and inconspicuous, being hard to extract from the strong central condensation of the coma. The gas tail was well seen, extending to the northeast for almost 1.5 deg. Scale = 10.0"/mm.
 NOTE E Sky darkness (1-5): 5. Ray at PA 90 deg. Envelope in coma at PA 20 deg. Streamer at PA 180 deg. DC = 4.5.
 NOTE F Feature at PA 85, length 20'. Dia. and m2 (observer's symbol believed to mean "approximately equal to", Ed.) 13' and 10.5, respectively. DC 7/10. ml = 6.9.
 NOTE G No stellar-like nucleus. DC 5.
 NOTE H No special feature visible in coma DC 6/7; central condensation appears not exactly in coma's center. "Water-drop" feature towards north: very faint.
 NOTE I Areas of greater luminosity at PA 65 and at PA 103. Diameter of the nucleus is 44 arc sec. Magnifications of 80 and 144 also used. Two drawings included. Intense city lights interfered with the observation. (Translated by IHW staff. Ed.)

SUB-NETWORK: PHOTOGRAPHY

Date(UT)	AON#	FL	f/	Ap	FOV	ExpM	Emulsion	ISO	Hyp	Gdng	Id/Typ	Site	Observer(s)	Notes
14.049	850464	1.583	8	0.203	1.3 x 0.9	20.00	Kodak 2415		Y	C	2/P	1	Minton,R.B	A
14.151	850465	0.135	2.8		15.2 x 10.2	7.00	Ektachrome	400/	N		5/S		Pryal,J	
14.210	850466	0.300	1.5	0.200	6.9 x 4.6	4.00	Kodak 2415		Y	S	5/P	1	Yen,B	B
14.552	850467	0.268	2.6	2	7.7 x 5.1	12.00	Ilford HP5		N	X	5/P	1	Richardson,C	C
14.720	850468	0.500	5.6		4.1 x 2.7	30.00	Kodak 103a-o		N	O	1/C	3	Cimatti,A	
14.787	850469	0.200	3.5		10.3 x 6.9	14.00	Kodak 103a-o		N	O	3/C	3	Cimatti,A	
14.795	850470	0.500	5.6		4.1 x 2.7	30.00	Kodak 103a-o		N	O	2/C	3	Cimatti,A	
14.798	850471	0.200	3.5		10.3 x 6.9	13.00	Kodak 103a-o		N	O	4/C	3	Cimatti,A	
14.810	850472	0.300	1.5	0.200	6.9 x 4.6	5.00	Kodak 2415		Y		102/P		Jager,M	D
14.842	850473	0.803	2.1	0.350	2.6 x 1.7	1.00	Kodak 103a-F		N	M	28/P	1	Guarro,J	
14.848	850474	0.803	2.1	0.350	2.6 x 1.7	8.00	Kodak 103a-F		N	M	27/P	1	Guarro,J	
14.994	850475	0.225	1.7	0.140	9.1 x 6.1	3.50	Kodak 2415		Y	S	4/P	1	Dilsizian,R	E

NOTE A Measured coma diameter = 5.7 arc min. Measured tail length = 18 arc min. (Print submitted by observer is a composite of two contiguous 10 min. Ed.)
 NOTE B Start time approximate. (Observer's image identifier is 32. Ed.) Instrument is Schmidt camera.
 NOTE C Instrument is Meade Schmidt camera.
 NOTE D Coma 30 arc min.; magnitude 4.5; tails 3 deg. at PA 66, 4 deg. at PA 69, 90 arc min. at PA 73. Instrument is Schmidt camera.
 NOTE E Exposures limited below 5 minutes to allow for stellar guiding with a minimum of "proper motion" distortion in resolution.

DATE: 29 DEC 1985

DATE: 29 DEC 1985

NETWORK: AMATEUR OBSERVATION

SUB-NETWORK: VISUAL APPEARANCE

Date(UT)	AON#	ml	MM	Chart	Coma size	DC	Tail	PA	Ap	Ins	f/	Pwr	Lim	DA	Site	Observer(s)	Notes
29.000	814709	5.8	B	100					0.08	B		11	4.0	N	1	Gorski,L	A
29.007	814710	4.7	M	100	22	7	0.6	290	0.05	B		10	6.5	Y	4	Fabre,R	B
29.007	814711	6.0	B	100	15	6			0.06	R	8.3	30	4.0	N	1	Fox,J.H	C
29.01	814712	5.4	B	100	13	6			0.080	B		20	4.0	Y		Kronk,G	
29.011	814713	3.5	B	100		6		66	0.05	B		20	3.5	Y	8	da Silva,L.A.L	D
29.012	814714	4.0	B	100	3.5	3			0.06	R	12	56	5.5	Y	1	Onofre D.,D	
29.021	814715	5.6	B	100	8	1	0.53	55	0.05	B		7	6.0			Lairret,R	
29.03	814716	6.0	B	100	7.8	6	0.46	80	0.335	N	4.5	56	4.0	Y		Kronk,G	E
29.042	814717	5.3	S	SAO 86					0.050	B		7		Y	1	Minton,R.B	F
29.094	814718	5.8	S	100	8	6			0.080	B		11	3.9C	Y	1	Bailey,G	
29.38	814719	4.5	S	4A					0.08	B		11	4.5	Y	3	Momose,M	
29.40	814720	5.4	M	100	5.9	7	0.42	65	0.08	B		11	4.5M	Y		Mitsuma,S	
29.413	814721	5.2	B	100					0.05	B		7	4.5C	Y	1	Hayashi,H	
29.413	814722				15	5	0.33		0.12	N	6	40				Hayashi,H	
29.42	814723	4.5	S	100	10	7	1.0		0.08	B		15	5.3TC	Y	1	Lovejoy,T	
29.43	814724	5.3	S	AAVSO	4	5			0.13	N	6.3	24	3.0M	Y	1	Hayashi,A	
29.44	814725	4.3	S	100					0.025	B		3	5	Y	1	Seargent,D	
29.44	814726					7	0.6	70	0.08	B		15				Seargent,D	
29.445	814727	5.2	S	100					0.05	B		10	5.0	Y	1	Williams,P.F	
29.448	814728	5.0	M	100	6				0.13	N	6	47	4.0	Y	1	Ichikawa,K	
29.450	814729				5	9	0.1	90	0.15	N	8	50	5.0	Y	1	Williams,P.F	
29.47	814730	4.7	S	100	5				0.07	B		10	3.5M	Y	1	Yasuki,M	
29.50	814731	5.8	B	M					0.05	B		7				Konstantinov,S	
29.56	814732	5.7	B	M					0.05	B		7				Ponomaryov,E	
29.67	814733	4.8	B	E	12	5			0.05	B		7				Mormil,V	
29.70	814734	5.3	B	M	13	2			0.07	N	8	33				Shitikov,A	
29.72	814735	5.0	M	100	15	6	0.67	80	0.06	R	4	10	5.0	Y	3	Granslo,B.H	G
29.72	814736	5.7	S	DCS 7		6			0.080	B		11		Y	3	Both,S.J.J	
29.720	814737	5.1	M	100	18	8			0.030	B		8	5.0	Y	5	Villa,M	
29.725	814738	4.6	S	100	6.7	7			0.05	B		10	4.0T	N	1	Rurst,G.M	
29.73	814739	5.5	S	100					0.08	B		20	5.3	Y	1	Shanklin,J.D	
29.73	814740	4.3	S	DCS 7	15	5	2	70	0.040	B		7	5.5	Y	7	Bus,E.P	H
29.73	814741	4.9	B	DCS 7					0.040	B		7	5.5	Y	7	Bus,E.P	
29.73	814742	5.2	B	M					0.03	B		8				Tsygankov,D	
29.732	814743				6.7	7	0.50	70	0.08	B		15	4.6	Y	1	Hurst,G.M	
29.738	814744	5.0	B	4A	20	7			0.05	B		10	5	Y	1	Ward,A	
29.740	814745	4.6	S	100	7.5	6		75	0.08	B		11	5	Y	1	Gainsford,M.J	
29.740	814746	4.7	M	100					0.089	R	13.7	32	C	Y	1	Linger,S	I
29.742	814747	5.1	B	4A	20	7			0.06	R		15	5	Y	1	Ward,A	
29.750	814748	5.7	B	100	3.8	6	0.08	95	0.330	N	4.5	59	4.7	Y	1	Castino,R	J
29.7500	814749	5.7	B	100					0.05	B		10	5.7C	Y	2	Franciosi,C	
29.750	814750	5.7	M	100	5.5	5	0.1	40	0.04	B		8	5.3C	Y	1	Taylor,M.D	K
29.753	814751	4.7	S	100	4	7	0.23	70	0.25	N	6	60	5	Y	1	Gainsford,M.J	
29.753	814752	5.5	S	100	6	3	0.53	60	0.050	B		10	5.6	Y	3	Rogers,J.H	L
29.753	814753	5.8	M	100	4.1	5	0.1	40	0.07	B		16	5.3C	Y	1	Taylor,M.D	M
29.760	814754	4.8	S	100	4.0	8	0.20	83	0.05	B		10	4.8M	Y	3	Abbott,J	N
29.778	814755	4.5	B	100	20	5			0.102	R	14.7	60		Y		Medway,K	O
29.79	814756	5.5			8				0.034	B		9				Pereira,A	P
29.799	814757	5.2	B	4A					0.050	B		7	5.5	Y	1	van der Mey,L	Q
29.82	814758	4.3	B	100	25	4			0.050	B		7	5.5	Y	2	Merlin,J.-C	
29.834	814759	4.6	S	100	6.7	7			0.05	B		10	3.0	Y	1	Hurst,G.M	R
29.84	814760	5.0	S	DCS 8					0.050	B		10	3.5MC	N	1	van Loo,F.R	
29.95	814761	4.3	M	AA	13	7	1		0.050	B		7				Green,D.W.E	S
29.95	814762	4.5	S	AA	13	7	1		0.050	B		7				Green,D.W.E	S
29.955	814763	5.3	M	100	5.5	8	0.5	90	0.203	N	8	128	5.0	Y	1	Hannon,J	
29.96	814764	4.3	M	AA	15	5			0.035	B		7				Green,D.W.E	H
29.96	814765	4.2	S	AA	15	5			0.035	B		7				Green,D.W.E	H
29.96	814766	4.4	S	AA	10	7	1		0.080	B		20				Green,D.W.E	S
29.972	814767	5.7	S	100	4.3	7	0.17	70	0.203	N	6	101	5.0	Y	1	Hudak,D.M	T
29.975	814768	5.6	B	100		4	0.28	79	0.05	B		7	5.0	N	3	Benavides,A	
29.98	814769	4.5	M	AA	6.5	8			0.203	N	6	38				Green,D.W.E	H
29.98	814770	4.8	S	AA	6.5	8			0.203	N	6	38				Green,D.W.E	H
29.986	814771	5.3	B	100					0.050	B		10	5 C	Y	1	Robinson,R.L	
29.986	814772	6.0	B	100					0.080	B		20	6.0	Y		Smith,D	
29.99	814773	4.8	S	AAVSO	9	6	0.8	55	0.050	B		10				Bortle,J.E	H
29.99	814774	4.9	S	AA	10	8			0.229	R	12	86				Green,D.W.E	U
29.993	814775					5		63	0.05	B		20	4.0	Y	8	da Silva,L.A.L	
29.993	814776	4.0	B	100		3			0.06	R	12	56	5.5	Y	1	Onofre D.,D	
29.997	814777	5.7	M	100			1.25		0.050	B		7		Y	4	Torres,E	V

- NOTE A Intermittent clouds.
- NOTE B (PA value appears to be measured incorrectly. Ed.)
- NOTE C SAO 146074 comparison star.
- NOTE D Clouds and moonlight.
- NOTE E Some moonlight.
- NOTE F Used 7x50 binoculars out-of-focus. Estimated comet Halley to be halfway between Pi Aqu (SAO 127520) and 60 Aqu (SAO 146160). The first = 4.6 and the second = 5.9.
- NOTE G Coma diameter uncertain.
- NOTE H Coma diameter approximate.
- NOTE I Clear. (Observer gave limit as 9.5. Ed.)
- NOTE J Moon.
- NOTE K Antiohiadi II. Tail fanned.
- NOTE L Coma slightly pear-shaped; tail very faint, broad.
- NOTE M Tail fanned.
- NOTE N Comparison stars 5.3, 4.7, 5.0, 4.0. Tail length and PA approximate. Moonlight.
- NOTE O Slight mist. (Observer gave limit as 11.5. Ed.)
- NOTE P (Observer gave limit as 8.6. Ed.)
- NOTE Q First time seen with naked eye.
- NOTE R Field very low.
- NOTE S Coma diameter approximate. Tail length is lower limit.
- NOTE T Tail length and PA approximate.
- NOTE U Clouds (cumulus).
- NOTE V (Observer gave limit as 7.5. Ed.)

SUB-NETWORK: DRAWING

Date(UT)	AON#	Scale	Ap	Ins	f/	Pwr(s)	DurM	Lim	Site	Observer(s)	Notes
29.003	830595	0.6	0.203	R	13	85,225	10	4.0	1	Fox,J.H	A
29.729	830596	0.25	0.356	SC	11	200			1	Verdenet,M	B
29.733	830597	3.64	0.050	B		12	50	6.5	2	Pesci,S	C

DATE: 29 DEC 1985

DATE: 29 DEC 1985

Date(UT)	AON#	Scale	Ap	Ins	f/	Pwr(s)	DurM	Lim	Site	Observer(s)	Notes
29.740	830598	0.4	0.254	N	6.4	41	20	4.8	3	Abbott,J	D
29.742	830599	0.22	0.298	N	5	40, 65,269	27	6.0	1	Stott,D	E
29.747	830600	0.11	0.125	N	5.8	28, 40, 60	52	4.0	1	Riccabone,G	F
29.766	830601	0.37	0.406	N	5	68	5		2	Farroni,G	G
29.782	830602	2.0	0.08	B	15	179	4.6		1	Hurst,G.M	H
29.997	830603	0.46	0.200	N	8	81,130	20	5	1	Robinson,R.L	I
29.998	830604	0.050	0.050	B	7	15	7.5		3	Cifuentes,E	J

NOTE A Tail extension visible in both 0.203 m and 0.060 m finder at about PA 100. Coma brighter along W edge. Nucleus more condensed than recent nights. Central spike seen only at 225x.

NOTE B (Duration not indicated. Time of observation is assumed to be start time. Additional drawing submitted made using 11x80 binoculars (2"/mm). Ed.)

NOTE C About 1.9 deg. of tail easily visible through binocular. Total coma magnitude 4.5; DC 7/8. Comet easily visible naked eye at 15 deg. above horizon. Jet at PA 66. No other feature recorded.

NOTE D Moonrise as twilight ended. Moonlight and twilight interfered with the observation. Central condensation near stellar. Southernmost forward projection at PA 259 deg., approximately 1.0 arc min. Northernmost forward projection at PA 299 deg., approximately 1.6 arc min. Southernmost tail section at PA 75 deg., approximately 4.0 arc min. Central tail section at PA 69 deg., approximately 7.6 arc min. Northernmost tail section at PA 56 deg., approximately 12.8 arc min. Root tail width approximately 3.6 arc min. Semi latus rectum (northward) 2.4 arc min. Semi latus rectum (southward) 2.0 arc min. Vertex distance 2.4 arc min. Near stellar central condensation dominating the appearance of the coma. Asymmetrical coma about two axes and nonregular coma about edge - two forward projections appeared at PA 259 deg. and PA 299 deg. Tail surface brightness comparable with outer coma brightness. Evidence of tail structure - a faint southernmost component in PA 75, a central section in PA 69 and a dominant 12.8' tail in PA 56.

NOTE E Tail at PA 72. Jet at PA 320. Coma is irregular in shape with a spur at PA 104 deg. Tail seems offset from central condensation.

NOTE F Strongly pronounced luminous "mustaches" at PA 130 and at PA 47. Magnifications of 80 and 144 also used. Two drawings included. Intense city lights interfered with the observation. (Translated by IHW staff. Ed.)

NOTE G Apparent dimensions of the comet 5.4'x7.2'.

NOTE H Well condensed coma with nuclear condensation offset, PA 255 from coma center. Tail clearly seen in 15x80 binoculars, but only suspected with 10x50 binoculars, as a broad straight extension to the coma in PA 70 deg., length 30'. Coma diameter 6.7', DC 7.

NOTE I The central condensation was almost nonexistent. The coma simply gradually brightened toward the central region. A dark lane in the tail just behind the head appeared briefly and then was not seen again.

NOTE J Gas tail straight, easily visible (especially in the first third). Not able to see dust tail. Estimated length 1 deg. 15'. Positioned at low altitude above horizon. (Translated by IHW staff. Ed.)

SUB-NETWORK: PHOTOGRAPHY

Date(UT)	AON#	FL	f/	Ap	FOV	ExpM	Emulsion	ISO	Hyp	Gdng	Id/Typ	Site	Observer(s)	Notes
29.012	850542	1.970	5.5	0.355	1.0 x 0.7	4.50	Kodak 2415		Y	O	14/P	1	Crist,M	A
29.020	850543	1.970	5.5	0.355	1.0 x 0.7	10.00	Kodak 2415		Y	O	15/P	1	Crist,M	B
29.032	850544	1.970	5.5	0.355	1.0 x 0.7	12.00	Kodak 2415		Y	O	16/P	1	Crist,M	C
29.050	850545	1.583	8	0.203	1.3 x 0.9	15.00	Kodak 2415		Y	S	8/P	1	Minton,R,B	D
29.442	850546	0.180	2.8		11.4 x 7.6	10.50	Kodak 2415		Y	O	1/S	6	Garradd,G	
29.738	850547	0.600	1.7	0.350	3.4 x 2.3	15.00	Ilford FP4	125/	N	O	1/T	1	Valisa,P	E
29.741	850548	0.500	5.6		4.1 x 2.7	8.17	Kodak Tri-X	400/	N	X	3/P	1	Ward,A	F
29.742	850549	1.780	5	0.356	1.2 x 0.8	24.00	3M 1000	1000/	N	M	1/P	1	Mobberley,M	
29.743	850550	0.058	2		34.5 x 23.4	5.00	Fujichrome	400/27	N	O	4/S	2	Townsend,R	
29.748	850551	0.394	2.4	0.165	5.2 x 3.5	15.00	Kodak Tri-X		N		703/P		Soc. Astro. de France G	
29.975	850552	0.225	1.7	0.140	9.1 x 6.1	2.00	Kodak 2415		Y	S	8/P	1	Dilsizian,R	H
29.976	850553	0.050	4.0		39.6 x 27.0	5.00	Kodak Tri-X		N		172/P		Gianforte,J.S	I

NOTE A Moon 3 deg. above horizon. City lights interfered with the observation. (Observer's image identifier is followed by suffix A. Ed.) Auxiliary lens used. Original instrument characteristics are FL = 3.720, f/10.5.

NOTE B Moon 4 deg. above horizon. City lights interfered with the observation. (Observer's image identifier is followed by suffix A. Ed.) Auxiliary lens used. Original instrument characteristics are FL = 3.720, f/10.5.

NOTE C Moon 9 deg. above horizon. Moonlight interfered with the observation. (Observer's image identifier is followed by suffix A. Ed.) Auxiliary lens used. Original instrument characteristics are FL = 3.720, f/10.5.

NOTE D (Print submitted by observer is a composite of three 5 min. exposures; the first and second were separated by 10 min. and the second and third were separated by 1 min. Ed.)

NOTE E Instrument is Schmidt camera. Large format film used.

NOTE F UV filter used.

NOTE G Photograph made by B. Fouquet.

NOTE H Exposures limited below 5 minutes to allow for stellar guiding with a minimum of "proper motion" distortion in resolution.

NOTE I (Observer's image identifier is 107-2. Observer listed emulsion speed as ASA 800. Ed.)

SUB-NETWORK: SPECTROSCOPY

Date(UT)	AON#	Config	Ins	FL	f/	Ap	ExpM	Emulsion	ISO	Hyp	Gdng	Id/Typ	Site	Observer(s)	Notes
29.981	870106	42P-O	CL	0.400	6.3		6.25	Ektachrome	400/27	N	C	16/P	1	Grieser,D	A
29.998	870107	42P-O	CL	0.400	6.3		4.00	Ektachrome	400/27	N	C	20/P	1	Grieser,D	A

NOTE A Gamma Aquarii in same field. Prism glass type uncertain. Film emulsion at ambient temperature of 0 C.

DATE: 1 JAN 1986

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NETWORK: AMATEUR OBSERVATION

SUB-NETWORK: VISUAL APPEARANCE

Date(UT)	AON#	ml	MM	Chart	Coma size	DC	Tail	PA	Ap	Ins	f/	Pwr	Lim	DA	Site	Observer(s)	Notes	
1.000	814941	4.7	S	100	16	8	1.5	68	0.108	N	4	24	5.0	Y	1	Franch,J	A	
1.007	814942	5.8	B	100	20	6	2	90	0.152	R	5	24	4.7	N	1	Fox,J.H	B	
1.01	814943	5.1	B	100	11	6	0.71	65	0.080	B		20	5.0	Y		Kronk,G		
1.010	814944	5.3	B	100	8	2	0.80	59	0.05	B		7	6.0			Lairret,R		
1.02	814945	5.9	B	100	6.6	5.0	7		0.335	N	4.5	56	5.0	Y		Kronk,G		
1.045	814946	5.6	B	100		7			0.08	B		11	5.0	Y	1	Gorski,L		
1.06	814947	4.7	V	4A						EY			6.5	Y	1	Keen,R		
1.06	814948			4A			1.0	70	0.120	B		20	6.5	Y	1	Keen,R		
1.06	814949	4.8		4A	9	7	0.8	70	0.040	B		8	6.5	Y	1	Keen,R	C	
1.07	814950			4A	12	7	2.2	70	0.32	N	4	33	6.5	Y	1	Keen,R	D	
1.073	814951	5.5	S	100	7.4	5			0.080	B		11	4.5C	Y	1	Bailey,G	E	
1.103	814952	5.1	B	100	7.5	8	2.0	68	0.15	N	8	30	6.1	Y	1	McBride,P	F	
1.40	814953	5.5	B	M	8	4	0.3		0.12	N		40				Knyazyuk,N		
1.440	814954	5.2	S	100		7			0.05	B		10	4.5	Y	1	Williams,P.F		
1.44	814955	4.3	S	100					0.05	B		10		Y	1	Seargent,D		
1.445	814956				5	9	0.1	85	0.15	N	8	100	4.5	Y	1	Williams,P.F		
1.479	814957	5.5	B	100	2.5	5	0.38	55	0.08	R	12.5	40	4.5C	Y	1	Feisheng,J		
1.58	814958	5.2	B	M	4				0.05	B		7				Nesterov,Yu	G	
1.639	814959	6.0	M	4A	15	6			0.150	N	5.3	45	4.9	Y	1	Wikholm,L		
1.64	814960	5.6	B	M	3				0.05	B		7				Mamedov,V		
1.667	814961	5.6	B	100					0.05	B		7	5.0C	Y	1	Kukkonen,I.T		
1.677	814962	5.5	S		6	8	2	90	0.05	B		10	6.0	Y	1	Brenseth,P.-J		
1.681	814963	5.6				6	0.42	60	0.080	B		15	4	Y	2	Nagele,A	H	
1.694	814964				1.8	5	0.1	55	0.076	R	16	139	5.0C	Y	1	Kukkonen,I.T	I	
1.701	814965	5.5	M	100	6.5	6	0.3	77	0.09	M	11	56	4.5	Y	3	Westlund,M	J	
1.705	814966	5.0	B	4A		6			0.10	B		14	4.0	Y	1	Hasubick,W		
1.708	814967	4.7	B	100		7			0.050	B		7	5.0	N	1	Lunde,R	K	
1.71	814968	4.8	M	100	15	6	0.8	68	0.06	R	4	10	5.0	Y	3	Granslo,B.H		
1.722	814969	4.7	M	100	9.5	7	0.6	61	0.05	B		12	5.5	Y	1	Tanti,T	L	
1.723	814970	4.0	S	100	10	8	1.44	57	0.050	B		7	6.2	Y	1	Meozzi,D		
1.729	814971	4.2	S	100	12	6		63	0.08	B		20	6.0	Y	2	Parisio,R		
1.73	814972	4.7	S	SAO 86	8				0.05	B		10	5.0	Y	1	Germann,R		
1.740	814973	5.1	M	100	6	7	0.6	68	0.05	B		10	5.5Z	Y	4	Vanin,G		
1.750	814974	5.5	B	4A	3.0	6	0.05	70	0.050	B		7	4.0	Y	1	Koschny,D	M	
1.753	814975	5.3	B	100					0.050	B		10	4.0	N	1	Lehmann,T		
1.760	814976	5.5							0.050	B		10		TC	1	Kauschke,A		
1.760	814977	4.8	S	100	7	5	1.0	80	0.050	B		7	5.0C	Y	3	Piccinini,M		
1.771	814978	6.0	M	100	60	3			0.070	R	14	20	6.0	N	1	Luga,M		
1.771	814979	5.0	B	100	2.2	5			0.20	N	4.7	104	3.5	Y	1	Cappellari,M		
1.792	814980	5.8	B	100	6	6			0.113	N	8	22	4.5	Y	1	Schambeck,C.M		
1.934	814981	6.2	B	100	9	3	0.42	40	0.203	SC	10	80	6.0	Y	1	Farrington,W.R		
1.95	814982	4.7	M	AA						EY						Green,D.W.E		
1.958	814983	5.0	M	100	6.5	8	1	90	0.203	N	8	128	5.0	Y	1	Hannon,J		
1.97	814984	4.5	S	AA	12	7	1		0.035	B		7				Green,D.W.E	N	
1.972	814985	4.9	S	100	8	4	0.63	55	0.035	B		7	6.0	Y	3	Morrison,W		
1.976	814986				6		0.67	55	0.15	R	5	31	6.0	Y	3	Robinson,R.L	O	
1.976	814987	5.0	B	100					0.050	B		10	5	C	Y	1	Robinson,R.L	
1.978	814988			100			1.17		0.050	B		7		Y	5	Torres,E	P	
1.979	814989	4.7	M	100	6	7	0.4	55	0.05	B		7	4.5	Y	1	DeYoung,J.A		
1.98	814990	4.3	S	100	20	6	1	90	0.05	B		7	4.5	Y	1	Harrington,P		
1.983	814991	4.9	M	100	10.0	7	2.0	64	0.05	B		12	6.3	Y	1	Knight,S	Q	
1.99	814992	4.9	B	AAVSO					0.050	B		10				Bortle,J.E		
1.99	814993	4.3	M	AA	13	7			0.050	B		7				Green,D.W.E	R	
1.99	814994	4.5	M	AA	13	7			0.080	B		20				Green,D.W.E	R	
1.99	814995	4.4	S	AA	13	7	2		0.050	B		7				Green,D.W.E	S	
1.99	814996	4.6	S	AA	13	7	2		0.080	B		20				Green,D.W.E	N	
1.99	814997	4.7	S	AAVSO	7	7	1.0	62	0.050	B		10				Bortle,J.E		
1.99	814998	4.8	S	AAVSO	18					EY						Bortle,J.E		
1.99	814999				5.6	7	1.4	62	0.120	B		20				Bortle,J.E	T	
1.99	815000				5.0	7	1	62	0.317	N	6	55				Bortle,J.E	U	

NOTE A Gas tail.

NOTE B SAO 145989 comparison star.

NOTE C Modified Sidgwick method used.

NOTE D Brighter knot in tail 2.0 deg. from nucleus.

NOTE E Hint of a tail?

NOTE F Nucleus undefined.

NOTE G Granulation in central condensation.

NOTE H (Observer indicated "A" method [Argelander?]. Ed.) Comparison star is SAO 145989.

NOTE I Coma diameter determined as an average of five transit time observations.

NOTE J Cirrus.

NOTE K Faint haze.

NOTE L Seeing good, transparency excellent. Clouds. Type I tail 0.6 deg. at PA 61, type II tail 0.4 deg. at PA 77.

NOTE M Drawing.

NOTE N Coma diameter approximate. Tail length is lower limit.

NOTE O Tail 0.11 deg. wide at end, diffuse central spine of tail 0.13 deg. long.

NOTE P Dust tail 1 deg. 20 arc min. (Observer gave limit as 9.0. Ed.)

NOTE Q Dust tail.

NOTE R Coma diameter approximate.

NOTE S Coma diameter and tail length approximate.

NOTE T Tail 3.5-4' wide at beginning.

NOTE U Nuc. 10.0 mag., tail 2.5' wide, length is lower limit.

SUB-NETWORK: DRAWING

Date(UT)	AON#	Scale	Ap	Ins	f/	Pwr(s)	DurM	Lim	Site	Observer(s)	Notes	
1.007	830628	0.6	0.203	R	13	85,150	10	4.7	1	Fox,J.H	A	
1.024	830629		0.203	SC	10	70		6.0		Williams,D.J	B	
1.031	830630		0.203	SC	10	81			1	Lohvinenko,T.W	C	
1.037	830631		0.203	SC	10	169			1	Lohvinenko,T.W	D	
1.057	830632	0.38	0.254	N	5.6	60,120,180	16	6.7	2	Knisely,D	E	
1.075	830633		0.152	N	4.5	18		21	6.5	1	Troiani,D.M	F
1.084	830634		0.203	N	6	32		25	6.5	1	Troiani,D.M	G
1.68	830635	0.26	0.114	N	8	100		101	7	2	Pesci,S	H
1.691	830636	0.39	0.076	R	16	139		30	5.0	1	Kukkonen,I.T	I
1.698	830637	1.6	0.090	M	11	56		10	4.5	3	Westlund,M	J
1.753	830638	0.6	0.060	R	15	45		10	4.0	1	Koschny,D	K
1.764	830639	0.2	0.103	M	10.5	35		20	5.0	3	Piccinini,M	L
1.942	830640	1	0.203	SC	10	80		4	6.0	1	Farrington,W.R	M
1.981	830641		0.050	B		7		25		5	Cifuentes,E	N

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Date(UT)	AON#	Scale	Ap	Ins	f/	Pwr(s)	DurM	Lim	Site	Observer(s)	Notes
1.984	830642		0.200	N	8	81,130,203	16	5	1	Robinson,R.L	O

NOTE A Very mottled appearance near nucleus. Extensions from nucleus more apparent at 150x.

NOTE B Halley seems to be stuck at its present brightness. Just detectable with the eye. (Duration not indicated. Time of observation is start time. Ed.)

NOTE C The nuclear magnitude is 7.2 (check stars: HR 72, AGK 3+0 deg. 0181) and has an integrated magnitude of 5.5 (check star: 14 Piscium). Comet Halley is seen with a blue spike which I believe is the ion tail at PA 23. (Duration not indicated. Time of observation is assumed to be start time. Ed.)

NOTE D The nuclear diameter of the comet is 30.45" and the coma has a diameter of 243.62". The tail of the comet is blue in colour and is difficult to see. (Duration not indicated. Time of observation is assumed to be start time. Ed.)

NOTE E Comparable to T Aquari in brightness. Nucleus not quite centered in coma. Central disk noted 20" arc in diameter and diffuse. Faint broad central spine noted in tail approximately 10' arc long. PA 45. Possible hints of faint streamer noted near northeast side of coma. Tail slightly irregular in brightness and 2/3 width of coma at its widest.

NOTE F Seeing (1-3): 2. Sky darkness (1-5): 4. Ray at PA 75 deg. Tail was 3/4 deg. long.

NOTE G Seeing (1-3): 2. Sky darkness (1-5): 4-3. Streamer at PA 80 deg. Fan at PA 80 deg. DC = 7. Tail = 2 deg. long.

NOTE H Jet at PA 64 deg. "Water drop" at PA 64 deg. Coma, DC 7/8; about 8' diameter. Coma appears perfectly round at western limb. Central condensation resembles a water drop fading toward east. Tail appears very thin, jet-like. No special feature in comet's coma.

NOTE I Coma elongated, long axis in 55-235 deg. direction. The edge of coma "sharper", more distinct, in the 235 deg. direction. Tail length 0.1 deg.; tail very dim.

NOTE J Cirrus.

NOTE K Only 1 tail at PA 70.

NOTE L Tail PAs 80 deg. and 70 deg. Vertex distance = 3.2', semi latus rectums P1 = 3', P2 = 3.6'. City lights interfered with the observation.

NOTE M Mag 6.2, N mag. 10. Degree of condensation 3. Tail length 25'. Very good seeing tonight allowed the observations of new details. Tail now easily seen and very long. Large diffuse coma now seen outside main coma. P1 = 3', PA 270; P2 = 3', PA 90. Vertex 30". P1 and P2 came off coma, not nucleus. (This observer's P1 and P2 may not follow the standard definition of semi latus rectum. The tail's orientation appears northerly in the drawing. Ed.)

NOTE N Comet naked eye visible today. Both tails excellently visible. Better dust tail (wider and longer) than the gas tail (straighter and fainter). Estimated lengths: dust, 1 deg. 20'; gas, 1 deg. 10'. (Observer gave limit as 9.0. Translated by IBW staff. Ed.)

NOTE O Central condensation again more diffuse, nonstellar in nature. Coma appeared to be brighter on north side and slightly wider than on the south side. A distinct darkening occurred in the coma on the south side. A central bright tail projected to the east for over a degree. The tail had an obvious fan shape.

SUB-NETWORK: PHOTOGRAPHY

Date(UT)	AON#	FL	f/	Ap	FOV	ExpM	Emulsion	ISO	Hyp	Gdng	Id/Typ	Site	Observer(s)	Notes
1.071	850573	0.305	2.5	0.122	6.8 x 4.5	8.00	Kodak 2415		Y	S	159/P	1	Minton,R.B	A
1.713	850574	0.200	5.6		10.3 x 6.9	15.00	Kodak 103a-O		N	O	2/C	4	Cimatti,A	B
1.725	850575	0.200	5.6		10.3 x 6.9	10.00	Kodak 103a-O		N	O	3/C	4	Cimatti,A	
1.740	850576	0.200	3.5		10.3 x 6.9	15.00	Kodak 103a-O		N	O	4/C	4	Cimatti,A	
1.758	850577	1.000	8	0.125	2.1 x 1.4	4.00	Agfa-Pan Pro	400/27	N	M	6/C	2	Trixler,F	C
1.769	850578	1.000	8	0.125	2.1 x 1.4	7.00	Agfa-Pan Pro	400/27	N	M	10/C	2	Trixler,F	C
1.794	850579	0.200	5.6		10.3 x 6.9	5.00	Kodak 103a-O		N	O	5/C	4	Cimatti,A	
1.826	850580	0.700	5	0.14	2.9 x 2.0	30.00	Kodak IIA-F		N	M	44/P	1	Ridley,H.B	D
1.964	850581	0.225	1.7	0.140	9.1 x 6.1	5.00	Kodak 2415		Y	S	1/P	1	Dilsizian,R	E
1.977	850582	0.050	4.0		39.6 x 27.0	6.50	Kodak Tri-X		N		176/P		Gianforte,J.S	F

NOTE A Tail is 1.9 deg. long with condensation in tail 1.5 deg. from nucleus. Some wavy structure in first 1 deg. from head. Instrument is Aero-Ektar aerial camera lens. (Print submitted by observer is a composite of two contiguous 4 min. exposures. Ed.)

NOTE B Twilight interfered with the observation.

NOTE C City lights interfered with the observation.

NOTE D (Observer's image identifier is preceded by prefix ZA. Ed.) Instrument uses photographic plates.

NOTE E Stellar guiding was used because of extremely small apparent movement of the comet within the exposure period (movement during a 24 hour period was 2 minutes of arc [sic] in RA and approximately 0.2-0.3 degrees of arc in declination during this period). The 5.5" Schmidt camera gives a strong "hot spot" near the center of the frame.

NOTE F (Observer's image identifier is 107-6. Observer listed emulsion speed as ASA 800. Ed.)

SUB-NETWORK: SPECTROSCOPY

Date(UT)	AON#	Config	Ins	FL	f/	Ap	ExpM	Emulsion	ISO	Hyp	Gdng	Id/Typ	Site	Observer(s)	Notes
1.056	870108	45P-O	N	0.495		0.065	20.00	Kodak 2415		Y	S	9/P	1	Minton,R.B	A

NOTE A Newtonian spectrograph used. The emissions and their strengths appear to be similar to my spectrum of December 4, 1985. (Prints submitted are composites of two contiguous 10 min. exposures. Observer's image identifiers are NS 9 and NS 10. Ed.)

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- NOTE T Seeing good, transparency excellent.
- NOTE U I perceive detail. (Roughly translated by IEW staff. Ed.)
- NOTE V Drawing 1.
- NOTE W Omicron Agr: 4.7 mag., 32 Agr: 5.3 mag.
- NOTE X Tail length very uncertain. (Observer gave limit as 8. Ed.)
- NOTE Y See draw. D.1.
- NOTE Z Coma diameter approximate.
- NOTE a Dust tail.

SUB-NETWORK: DRAWING

Date(UT)	AON#	Scale	Ap	Ins	f/	Pwr(s)	DurM	Lim	Site	Observer(s)	Notes
4.224	830660	6	0.33	N	4.5	50, 70, 100	15	5.5	1	Fabre,R	A
4.44	830661	1.38	0.15	N	6	23	14	4	2	Tanikawa,M	B
4.696	830662		0.063	R	13.3	52				Kosa-Kiss,A	D
4.70	830663	1.04	0.114	N	8	45	86	7.5	2	Pesci,S	C
4.734	830664	2	0.05	R	7	30, 35, 40	45	4.0	5	Kopp,M	E
4.743	830665	2.97	0.035	R	14	12, 15	5.3		1	Sajtz,A	F
4.760	830666	0.25	0.356	SC	11	200	30		1	Verdenet,M	G
4.764	830667		0.25	N	6	75			1	Guthier,O	H
4.778	830668	2.6	0.06	R	5.7	20	20	5.8	2	Cardial,N	I
4.781	830669		0.050	B		20			3	Gallego,J	J
4.785	830670		0.206	N	6	60		5.5	8	Gomez,A	K
4.792	830671		0.050	B		8			6	Cano,M	L
4.795	830672	0.2	0.11	R	11	30, 70	30	5.5	1	Adamoli,G	M
4.797	830673	0.5	0.15	N	5	25, 75	15	5.5	2	Merlin,J.-C	N
4.813	830674		0.256	N	5.6	44			2	Pedraz,S	O

- NOTE A The north (PA 0 deg.) semi latus rectum is still longer than the south portion. The bright spine in the center of the tail is clearly visible. Note the clean straight line of the tail on the northern upper section. Two drawings supplied at scales of 6 arc min./mm and 10 arc min./mm. Magnification of 150x also used.
- NOTE B ml = 4.9. Dia. = 8". DC = 7/10. m2 and feature at PA 85 (observer's symbol believed to mean "approximately equal to", Ed.) 10 and 20' long, respectively.
- NOTE C Schematic drawing. (Duration not indicated. Time of observation is assumed to be end time. Ed.)
- NOTE D Coma DC 7/8; about 7' diameter. Clearly visible main tail jet-like at PA 64, about 1.7 deg. long. (Estimate made with 12x50 binoculars.) Seen a probable second tail [sic], PA 50 deg. about 15' long (1/4 deg.) very faint. No special feature in comet's coma. Field 1.9.
- NOTE E Stability of star images: fair; temperature: 0 deg. C. Coma bright, shows definite intensity peak at center; great latitude of tail, bright(!) too. Vertex distance: V = 14.0'. Semi latus rectum: P1 = 11.5', P2 = 10.5'. Tail PA = 55 deg. Magnifications of 15, 20, 25 also used. City lights interfered with the observation.
- NOTE F Coma 10'; tail at PA 60-65 (plot), length 1.3 deg. (Duration not indicated. Time of observation is assumed to be start time. Ed.)
- NOTE G (Additional drawing submitted made using 11x80 binoculars (2.01'/mm). Ed.)
- NOTE H Condensation conspicuously bright. Jets in PA 126, 45" and PA 63, 36". (Translated by IEW staff. Duration not indicated. Time of observation is assumed to be start time. Ed.)
- NOTE I Tail long: 1 deg. at PA 65.
- NOTE J Field 3 deg. Stellar central condensation. (Duration not indicated. Time of observation is assumed to be end time. Drawing data inferred from magnitude report form. Ed.)
- NOTE K (Duration not indicated. Time of observation is assumed to be start time. Ed.)
- NOTE L Field 9 deg. Limiting magnitude through binoc.: 9.0. (Duration not indicated. Time of observation is assumed to be start time. Drawing data inferred from magnitude report form. Ed.)
- NOTE M Tail at PA 80. Central condensation of coma little and very bright. City lights interfered with the observation.
- NOTE N Tail at PA 62, nearly parallel edges, very condensed over 15', jet at PA 141, diffuse; jet at PA 319, more contrasted. Plume sunward.
- NOTE O (Duration not indicated. Time of observation is assumed to be end time. Drawing data inferred from magnitude report form. Ed.)

SUB-NETWORK: PHOTOGRAPHY

Date(UT)	AON#	FL	f/	Ap	FOV	ExpM	Emulsion	ISO	Hyp	Gdng	Id/Typ	Site	Observer(s)	Notes
4.012	850611	0.058	1.4		34.5 x 23.4	10.00	Kodak Tri-X		N	T	4/C	1	Priester,D.C	A
4.060	850612	0.305	2.5	0.122	6.8 x 4.5	20.00	Kodak 2415		Y	S	166/P	1	Minton,R.B	B
4.715	850613	7.417	7.3	1.016	0.3 x 0.2	40.00			N		1/N	1	Manulis,I	C
4.769	850614	0.600	1.7	0.350	3.4 x 2.3	13.00	Kodak Tri-X	400/	N		1/T	1	Molinari,L	D
4.777	850615	0.803	2.1	0.350	2.6 x 1.7	1.00	Kodak 103a-F		N	M	31/P	1	Guarro,J	E
4.785	850616	0.803	2.1	0.350	2.6 x 1.7	7.50	Kodak 103a-F		N	M	132/P	1	Guarro,J	F
4.803	850617	0.600	1.7	0.350	3.4 x 2.3	35.00	Kodak Tri-X	400/	N		2/T	1	Molinari,L	G
4.981	850618	0.225	1.7	0.140	9.1 x 6.1	4.25	Kodak 2415		Y	S	3/P	1	Dilsizian,R	H

- NOTE A Push processed to 800 ASA.
- NOTE B (Prints submitted by observer are composites of five contiguous 4 min. exposures. Ed.) Instrument is Aero-Ektar aerial camera lens.
- NOTE C Instrument is Ritchey-Chretien design. Observer assisted by E. Drucker.
- NOTE D Instrument is Schmidt camera. (Observer supplied other nonessential notes on original report form. Ed.) 120 size film used.
- NOTE E (Observer's image identifier is followed by suffix A. Ed.)
- NOTE F (Observer's image identifier is 32A. Ed.)
- NOTE G Kodak Wratten 36 filter used. Instrument is Schmidt camera. (Observer supplied other nonessential notes on original report form. Ed.) 120 size film used.
- NOTE H Stellar guiding was used because of extremely small apparent movement of the comet within the exposure period (movement during a 24 hour period was 2 minutes of arc [sic] in RA and approximately 0.2-0.3 degrees of arc in declination during this period). The 5.5" Schmidt camera gives a strong "hot spot" near the center of the frame.