

4. Coronal Transient List

Following is a preliminary list of coronal transients which occurred during the Skylab mission. For each event listed the following information is given: Day of Year (DOY) and the date, the time (GMT) at which we first observed the event, time of our last previous observations, its position in degrees from solar north (the E-limb at the equator is 90^0) and a description of what the event looked like on the first frame.

In addition to the above information, we have reviewed several sources in an attempt to relate these transients with other indicators of solar activity. The time and type of solar activity are listed. In describing particular events or in the listing of an observatory, NOAA abbreviations are used and can be found in the Solar-Geophysical Data, Descriptive Text, February 1974. The sources used are as follows:

1. NOAA "Blue Books" which are a compilation of all solar related events that were received in the ATM Science Room at Johnson Space Center during the Skylab mission by the NOAA network.
2. Solar-Geophysical Data (Prompt Reports) - for one month earlier events:
 - a. Solar flares of numerical importance 1 or greater.
 - b. Selected fixed-frequency radio occurrences.For two months earlier events:
 - a. Radio spectral observations.
3. Preliminary report and forecast of solar geophysical data.

a. X-ray flare information.

Additional information under Radio Spectral Coverage gives the time (GMT) at which observatories with radio sweep frequency equipment were on and the name of the observatory.

Under ATM-WLC Coverage the time (GMT) and the operating mode are given for which the Apollo Telescope Mount - white light coronagraph was on near the time of each particular event.

S	standard mode
F	fast scan mode
C	continuous mode
Ext. S	extended standard
S(2)	two standard modes were run in succession

Finally, note that the numbers following WLC operating refer to our (S-052) frame numbers.

DOY: 154DATE: 03 June 1973Time first observed: 1430Time of last previous observation: 1149Position: 315⁰Description: Split ray event.TIMETYPE OF ACTIVITY

No Reported Activity

1245-1315

Possible EPL IMP 1- 330⁰ NW 60 SPO

Small prominence seems to form in place, then fade with little or no apparent motion

RADIO SPECTRAL COVERAGE

0912-2411	SGMR
1231-2400	HARV
1130-2400	BOUL

ATM-WLC COVERAGE

154/1133-1149	F	#2148-2219
154/1430-1436	S	2220-2231
154/1446-1452	S	2232-2243
154/1457-1508	C	2244-2266
154/1734-1740	S	2267-2278
154/1744-1750	S	2279-2290

DOY: 160DATE: 9 June 1973Time first observed: 0719Time of last previous observation: 0614Position: 250°Description: Very faint loop at 4.5 R₀

TIME	TYPE OF ACTIVITY
0550-2104	260 MHz Burst Max at 1134, 30 F.U., HIRA

RADIO SPECTRAL COVERAGE

0-0731	CULG
0337-1710	WEIS

ATM-WLC COVERAGE

160/0608-0614	S	#3745-3756
160/0719-0735	F	3757-3828
160/0747-0753	S	3829-3840

Can see as early as 0536, not at 0134

CME!

DOY: 161

DATE: 10 June 1973

Time first observed: 0150

Time of last previous observation: 160/1404

Position: 80°

Description: Bright turbulent transient confined to streamer out to 4 R.

TIME

TYPE OF ACTIVITY

000-0622	Radio, Type I N,W CULG
004-0649	Radio, Type III N,W CULG
0014-0033	APR (N12E90)
0020.5-0027	Radio, Type II W CULG
0051.5-0057	606 MHz Burst, 17.4 F.U., MANI
0052-0102	EPL (N13E90)
0052.5-0058	1415 MHz Burst, 5.1 F.U., MANI
0054-0056	100 HHZ Burst, 90 F.U., HIRA
0055-0140	Spray, IMP I (N15E90) BOUL
0059-0108	Radio, Type II, IMP I, CULG
0105- 0114	EPL (N14E90)
0109-0117	← C1 X-Ray Flare, Max 0112 (S17E48)
0150- 0701	ASR (N11E90)
0150-150.5	Radio, Type III G, IMP 2, CULG
0150.7-0151.0	Radio Type III, IMP 1, BOUL

RADIO SPECTRAL COVERAGE

000-0731	CULG
000-0230	BOUL

ATM-WLC COVERAGE

160/1254-1404	C	#3865-3886
161/0150-0212	S(2),C	3887-3937
161/0219-0235	F	3938-4009
161/0630-0646	F	4010-4081

CME!

DOY: 161

DATE: 10 June 1973

Time first observed: 0929

Time of last previous observation: 0828

Position: 80°

Description: Large intense nested loops at 3 R

TIME

TYPE OF ACTIVITY

0428-0744	Eruptive Prominence, (N06-20, E90)
0741	Spray Type Surge (E-Limb) CYI
0815-0900	Eruptive Prominence, Large (<u>N20E90</u>) out to .45 R
0839.5-0928	29 MHz Burst UPIC
0845.5-0854.5	Radio, Type II, IMP 2, WEIS
0848-0851	23 MHz Burst, 40,000 F.U., POTS
0853.8-0854.3	221MHz Burst, 26 F.U., ABST
0857-1005	C2 X-Ray Flare, Max 0859 (N10E90)
0930	Bright Surge (N10E90) out to 0.2 R
0948.5-0949.5	29 MHz UPIC
0948.6-0949.6	23 MHz 2000 F.U. POTS
0949-0950	221 MHz, ABST

RADIO SPECTRAL COVERAGE

0337-1908	WEIS
0911-2415	SGMR
1331-2400	HARV
1130-2400	BOUL

ATM-WLC COVERAGE

161/0812-0828	F	#4106-4177
161/0929-0945	F	4178-4249
161/0945-1001	F	4250-4321
161/1600-1606	S	4322-4333

CME!

DOY: 170

DATE: 19 June 1973

Time first observed: 2357

Time of last previous observation: 2226

Position: 270°

Description: Loops out to 3.0 R

TIME

TYPE OF ACTIVITY

Active filament 147 (S08E55) NOTE: E-limb activity
no W-limb activity

171/0023

Radio, Type III, IMP 1, BOUL

171/0043-0143

Radio, Type I, IMP 1, HARV

170/2240-2330

CRN, BSL to $.1R_{\odot}$ (N15W90) SPO $\bar{v}=300$

RADIO SPECTRAL COVERAGE

170/2032-171/0728 CULG

170/1130-171/0230 BOUL

170/1219-171/0145 HARV

ATM-WLC COVERAGE

170/2210-2226 F #4377-4448

170/2357-171/0003 S 4449-4460

171/0546-0551 S 4461-4472

DOY: 175

DATE: 24 June 1973

Time first observed: 1422

Time of last previous observation: 0338

Position: 70°

Description: Fork in streamer at 3.5 R.

TIME

TYPE OF ACTIVITY

RADIO SPECTRAL COVERAGE

ATM-WLC COVERAGE

175/0338-0343	S	#4605-4616
175/1422-1427	S	4617-4628
175/1736-1741	S	4629-4640
175/1749-1754	S	4641-4652
175/1916-1921	S	4653-4664
175/2015-2020	S	4665-4676

CME!

DOY: 175

DATE: 24 June 1973

Time first observed: 1916

Time of last previous observation: 1754

Position: 260°

Description: Loop structure out to 2.5 R

TIME

TYPE OF ACTIVITY

1500-1735

Active Prominence, Reported by Mauna Loa (S05W90)

1722

Prominence disappeared SW 28

RADIO SPECTRAL COVERAGE

1216-2400	HARV
1130-2400	BOUL
0911-2420	SGMR

ATM-WLC COVERAGE

175/1749-1754	S	#4641-4652
175/1916-1921	S	4653-4664
175/2015-2021	S	4665-4676
175/2327-2332	S	4677-4688
176/0431-0436	S	4689-4700

CME!

DOY: 176

DATE: 25 June 1973

Time first observed: 1337

Time of last previous observation: 0431

Position: 270

Description: Entire west limb disrupted; post event phase

TIME

TYPE OF ACTIVITY

0630-1007

APR, IMP 3, (S08W90)

0650-0800

APR, IMP 2, (S15W90)

0700-1005

EPL (S03W90 - N06W90) to .34 R_⊙ (cause)

0730-1025

EPL, IMP 3 +, (N10W90)

1120-1200

EPL, IMP 2, (S27W90)

0842 = .23 R_⊙

Measured Height of EPL

RADIO SPECTRAL COVERAGE

ATM-WLC COVERAGE

176/0431-0436 S #4689-4700

176/1337-1342 S 4701-4712

176/2115-2120 S 4713-4724

CME!

DOY: 177

DATE: 26 June 1973

Time first observed: 0348

Time of last previous observation: 0212

Position: 225°

Description: Faint material in Southwest, leading edge beyond FOV.

Does not look like limb event.

TIME	TYPE OF ACTIVITY
0010	Radio, Type III, IMP 1, BOUL
0019-0506	Radio, Type I, IMP 1, CULG
0127-0245	C9 X-Ray Flare, Max 0139 (S06W25) (Wrong Limb)
0135-0415	Radio, Type IV, IMP 2, CULG
0136-0145	Radio, Type IV, IMP 3, HARV
0137-0142	Radio, Type III G, V, IMP 2, CULG
0139-0143	Radio, Type II (Dekameter), IMP 2, BOUL
0155	Prominence, lifting off. Reported by Mauna Loa Obs. (N15W90)
0210	2000 MHz Burst, 6 F.U., TYKW
0210	9400 MHz Burst, 11 F.U., TYKW
0216-0259	-N Flare, Max 0139 (S06W28) (Wrong Limb) TEHR
0228	1000 MHz Burst, 1 F.U., TYKW
01	DSF 3 (S06W25) v̄ radial = 1140

RADIO SPECTRAL COVERAGE

000-0734	CULG
000-0230	BOUL
000-0146	HARV

ATM-WLC COVERAGE

177/0212-0218	S	4725-4736
177/0348-0354	S	4737-4748

CME! II-65

DOY: 179

DATE: 28 June 1973

Time first observed: 1955

Time of last previous observation: 1310

Position: 90°

Description: Diffuse loop at 3 R

TIME	TYPE OF ACTIVITY
1844-1915	2B Flare, Max 1848 (N12E90), BOUL
1844-1915	C6 X-Ray Flare, Max 1848 (N12E90)
1905-1910	M7 X-Ray Flare, Max 1906
1915	Surge on limb reported by Mauna Loa Obs.
1945	7000 MHz Burst 177 F.U. SAOP
1952-1954	Radio, Type III G, IMP 1, BOUL

SPRAY IMP 3

Explosion in spray with ejecta

RADIO SPECTRAL COVERAGE

1217-2400	HARV
1130-2400	BOUL
0913-2420	SGMR

ATM-WLC COVERAGE

179/1304-1310	S	#4821-4832
179/1955-2000	S	4833-4844
179/2002-2004	S	4845-4849
179/2125-2130	S	4850-4861

CME!

DOY: 180

DATE: 29 June 1973

Time first observed: 0315

Time of last previous observation: 179/2131

Position: 290°

Description: Material out to ~3.5-no loops can be distinguished.

TIME

TYPE OF ACTIVITY

179/2315	Eruptive Prominence, In Progress (N05-30; E90) material extended to 0.08 R
179/2321 - 180/0003	B Flare (S14W44)
0140 - 0142	Radio, Type III G, IMP1, HARV
0144.5-0151	Radio, Type III GG, IMP2, CULG
0145-0210	N Flare (S13W48)
0146.1 - 0147.5	Radio, Type III G, IMP2, BOUL
0153 - 0158	Radio, Type IV, IMP1, CULG
0217-0218	N Flare (S12W45)
0319	Small Loop Prominence (N11E85) Rising to 0.05 R visible to 0352 GMT

RADIO SPECTRAL COVERAGE

000-0735	CULG
000-0146	HARV
000-0230	BOUL

WLC COVERAGE

179/2125-2131	S	#4850-4861
180/0315-0321	S	4862-4873
180/0454-0500	S	4874-4885
180/1358-1404	S	4886-4897

DOY: 180

DATE: 29 June 1973

Time first observed: 0454

Time of last previous observation: 0321

Position: 75⁰

Description: Diffuse and narrow loop, some restructuring on the W-Limb also.

TIME

TYPE OF ACTIVITY

0324-0336

C6, X-Ray Flare, Max 0326 (N10E90)

0343

Active Prominence (N12E90)

RADIO SPECTRAL COVERAGE

000-0735 CULG

0343-1919 WEIS

ATM-WLC COVERAGE

180/0315-0321 S #4862-4873

180/0454-0459 S 4874-4885

180/1358-1403 S 4886-4897

DOY: 180DATE: 29 June 1973Time first observed: 2044Time of last previous observation: 1553Position: 100°

Description: Very subtle changes at 3.5 R. Thought to be the aftermath of a transient. May have started earlier at 1537, can see motion in this fast scan - correspondes to ~10 min before type II.

TIMETYPE OF ACTIVITY

1508.6 - 1508.7	Radio, Type III, IMP 1, BOUL
1513 - 1518	Radio, Type III GG, V, IMP 3, HARV
1513 - 1526	-B Flare, Max 1517 (S08E74) followed by bright surge on the disk, spray type activity. Material out to 0.25 R
1517	Small Flares, were observed which ejected material southward over the limb. Most material returned to the chromosphere along the trajectory.
1518	Active Prominence, along with bright surge (S07E72)
1521 - 1524.6	Radio, Type II, IMP 2, BOUL
1526.1- 1526.7	Radio, Type III, IMP 1, BOUL
1910.8- 1915	Radio, Type II, IMP 3, HARV

RADIO SPECTRAL COVERAGE

0343-1919	WEIS
0913-1556	SGMR
1216-2400	HARV
1130-2400	BOUL

WLC COVERAGE

180/1537-1553	F	#4898-4969
180/2044-2050	S	4970-4981

CME!

II-69

DOY: 183

DATE: 2 July 1973

Time first observed: 1341

Time of last previous observation: 1331

Position: 250°

Description: Bright knots at 2.0 R, can see prominence material at edge of
occulting disk, leading edge 2.5 R.

TIME	TYPE OF ACTIVITY
1245	Prominence lifted off (F97), Began as a surge, Top of loop broke and material ejected at
1349	Active Prominence (S16W90)
1357-1403	Radio, Type III G, IMP 1, BOUL
1100	Start of EPL to .32 R _⊙ at 1245 SW27 $\bar{v} = 244$ to $2.5 R_{\odot}$

RADIO SPECTRAL COVERAGE

0735-1846	WEIS
1130-2400	BOUL
0915-2420	SGMR

ATM-WLC COVERAGE

183/1326-1331	S	#5174-5185
183/1341-1346	S	5186-5197
183/2141-2147	S	5198-5209

CME!

DOY: 184 DATE: 3 July

Time first observed: 0507 Time of last previous observation: 183/2141

Position: 240

Description: Same class as 4 July and 21 January events--slow moving, filled in loops.

TIME	TYPE OF ACTIVITY
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RADIO SPECTRAL COVERAGE

ATM-WLC COVERAGE

183/2141-2146	S	#5198-5209
184/0507-0512	S	5210-5221
184/1109-1114	S	5222-5233
184/2057-2103	S	5234-5245
184/0425-0431	S	5246-5257

"POSSIBLE CORONAL TRANSIENT"

II-70

DOY: 185

DATE: 04 July 1973

Time first observed: 0425

Time of last previous observation: 185/2103

Position: 250°

Description: Appearance of sharp ray possibly caused by transient

TIME

TYPE OF ACTIVITY

0142-0144	Radio, Type III GG, IMP 2, HARV
0143-0200	Bright Surge, on the Disk (N13E17)
0201.5-0227.5	Fixed Frequency Radio Burst, 100-9400 MHz
0202-0238	-B Flare, Max 0215 (S08E13)
0205.6-0211.9	Radio, Type II, IMP 3, BOUL
0236-0710	Radio, Type CONT and Type I Noise Storm, CULG

ALL ACTIVITY ON OPPOSITE LIMB

RADIO SPECTRAL COVERAGE

000-0230	BOUL
0236-0735	CULG

WLC COVERAGE

184/2057-2103	S	#5234-5245
185/0425-0431	S	5246-5257
185/1337-1343	S	5258-5269

CME!

DOY: 185

DATE: 4 July 1973

Time first observed: 2324

Time of last previous observation: 2202

Position: 90°

Description: Bright loop at 2.5 R

TIME

TYPE OF ACTIVITY

2117-2354
2249

Radio, Type III S, IMP 1, CULG
Subflare N (S07E03) In Progress

RADIO SPECTRAL COVERAGE

1130-2400	BOUL
1216-186/0147	HARV
2036-186/0736	CULG

ATM-WLC COVERAGE

185/2157-2202	S	#5316-5327
185/2324-2330	S	5328-5339
186/0032-0037	S	5340-5351
186/0518-0524	S	5352-5363
186/1307-1312	S	5364-5374

0205	Type II	} disk center
0235	Type IV	

"POSSIBLE CORONAL TRANSIENT"

II-72

DOY: 189

DATE: 8 July 1973

Time first observed: 2033

Time of last previous observation: 1406

Position: 260°

Description: Change in streamer structure possibly associated with transient

TIME

TYPE OF ACTIVITY

1600	Wispy Prominence, on SW limb remains slightly active
1819-1835	Sub-faint flare, Max 1825 (S06W53)
1822.8-1834.2	Radio, Type II, IMP 1, BOUL .18 R.
1827.8-1836.1	Radio, Type II, IMP 1, BOUL
1840	Active Dark Filament (N16E20)
1235	{ EPL SW35 (APR) - to .2 R. ? SPO

RADIO SPECTRAL COVERAGE

0918-2418	SGMR
1130-2400	BOUL
1600-1915	WEIS

WLC COVERAGE

189/1400-1406	S	#5472-5483
189/2033-2039	S	5484-5495

CME!

DOY: 193

DATE: 12 July 1973

Time first observed: 1305

Time of last previous observation: 0236

Position: 100°

Description: Small surge behind bright streamer

TIME

TYPE OF ACTIVITY

1104	Active Dark Filament (N17E20)
1236	Bright Surge on <u>West</u> limb (N11W90)
?	Filament at N44E12 is gone, BOUL
1304	Active Prominence W-Limb .15 R to .2 R

Several tall prominences disappeared overnight on E limb prior to 1235.

RADIO SPECTRAL COVERAGE

0355-1909	WEIS
0921-2416	SGMR
1231-2400	HARV
1130-2400	BOUL

ATM-WLC COVERAGE

193/0231-0236	S	#5616-5627
193/1305-1311	S	5628-5639
193/2220-2226	S	5640-5651

DOY: 194DATE: 13 JulyTime first observed: 1355Time of last previous observation: 0252Position: 100-140

Description: Material out to at least 3.5 R_o in the form of a distorted
loop-like structure.

TIMETYPE OF ACTIVITYRADIO SPECTRAL COVERAGEATM-WLC COVERAGE

194/0252-0257	S	#5652-5663
194/1355-1400	S	5664-5675
194/2136-2141	S	5676-5687

DOY: 196DATE: 15 JulyTime first observed: 0200Time of last previous observation: 195/2115Position: 45°Description: Diffuse fan forms, disappears by end of day.TIMETYPE OF ACTIVITYRADIO SPECTRAL COVERAGEATM-WLC COVERAGE

195/2115-2120	S	#5712-5723
196/0200-0205	S	5724-5735
196/0335-0340	S	5736-5747

CME!

DOY: 210

DATE: 29 July 1973

Time first observed: 1632

Time of last previous observation: 0619

Position: 90°

Description: Diffuse narrow loop, very hard to see

TIME

TYPE OF ACTIVITY

1000	Active Surge Region (N14E90) NOTE: 6 hours earlier than event.
1321-1348	Radio, Type II, IMP 2, HARV NOTE: 3 hours earlier
1321.1-1400.0	Radio, Type IV, IMP 3, BOUL
1321.1-1330	Radio, Type II, IMP 3, BOUL
1400-1900	Radio, Type IV, IMP 1, BOUL
1445-1935	Radio, Type I S, IMP 1, BOUL
1530-1630	2N Flare (N13E46) Followed disappearance of filament, LOCA

RADIO SPECTRAL COVERAGE

1200-2400	BOUL
0936-2402	SGMR
1231-2400	HARV

ATM-WLC COVERAGE

210/0613-0619	S	#5895-5906
210/1632-1638	S	5907-5918
210/1820-1826	S	5919-5930

DOY: 211DATE: 30 July 1973Time first observed: 1806Time of last previous observation: 1422Position: 100°Description: Very small diffuse condensation at 4 RDoes not look highly polarized.TIMETYPE OF ACTIVITY

1615

Arch Filament System (S05E12)

RADIO SPECTRAL COVERAGE

0833-1837 WEIS

0931-2401 SGMR

1200-2400 BOUL

1246-2156 HARV

ATM-WLC COVERAGE

211/1417-1422 S #6243-6254

211/1806-1821 S 6255-6266

211/1916-1928 S(2) 6267-6290

211/1941-1946 S 6291-6303

211/2033-2039 S 6304-6314

CME!

DOY: 215

DATE: 3 August 1973

Time first observed: 0236

Time of last previous observation: 214/1844

Position: 80°

Description: Loop at 3 R

TIME

TYPE OF ACTIVITY

0216,0245

Active Dark Filament (S09E63)

RADIO SPECTRAL COVERAGE

000-0738 CULG

000-0230 BOUL

ATM-WLC COVERAGE

214/1842-1844 S #7227-7229

215/0236-0242 S 7230-7241

215/0655-0700 S 7242-7253

DOY: 218DATE: 6 August 1973Time first observed: 0702Time of last previous observation: 0224Position: 80°Description: Very diffuse brightening - not highly polarized.

<u>TIME</u>	<u>TYPE OF ACTIVITY</u>
0625-0711	1N Flare, Max 0631 (N07W05)
0627-0644	M1 X-Ray Flare, Max 0629 (N06W06)
0642-0736	1B Flare, Max 0642 (N07W05)

RADIO SPECTRAL COVERAGE

000-0737	CULG
0440-1509	WEIS

ATM-WLC COVERAGE

218/0207-0224	F	#7363-7434
218/0702-0713	S(2)	7435-7446

CME!

II-78

DOY: 221

DATE: 9 August 1973

Time first observed: 1530

Time of last previous observation: 1242

Position: 280°

Description: Diffuse loop at 2.5 R

TIME	TYPE OF ACTIVITY
1400	Disappearing Filament (N13E90) Wrong Limb
1413	4995 MHz Noise Storm
1415-1427	Sub-Faint Flare, Max 1418 (N06W48)
1542-1605	M1 X-Ray Flare, Max 1547 (N07W51)
1545.3-1545.8	2800 MHz Burst
1550	2695 and 8800 MHz Burst
1551-1600	Sub-Normal Flare, Max 1553 (N08W49)
1400	NW04-35 EPL to .25 R

RADIO SPECTRAL COVERAGE

1246-2400	HARV
1200-2400	BOUL
0948-2349	SGMR

ATM-WLC COVERAGE

221/1225-1242	F	#8561-8632
221/1530-1536	S	8633-8644
221/1541-1550	S,C	8645-8665

CME!

DOY: 222

DATE: 10 August 1973

Time first observed: 0821

Time of last previous observation: 0108

Position: 280°

Description: Looks like tail end of loop - entire west limb covered with faint material, but existing structures not affected much.

TIME	TYPE OF ACTIVITY
0330-0624	Radio, Type IS, IMP 1, CULG
0500	Continuous Surges from AR 84 (N02W90)
0654	Radio, Type III B,W, CULG
0659	Radio, Type III B, CULG
0720	Radio, Type III B,W CULG
0200	Filament disappeared (S09W27)
0018	Flare (N08W57) with high speed dark surges

RADIO SPECTRAL COVERAGE

0437-1825	WEIS
000-0738	CULG
0949-2348	SGMR

ATM-WLC COVERAGE

222/0052-0108	F	#8726-8797
222/0821-0843	S,F	8798-8881
222/1126-1132	S	8882-8893

CME¹ II-80

DOY: 222

DATE: 10 August 1974

Time first observed: 1331

Time of last previous observation: 1145

Position: 280⁰

Description: Bright loop at 2 R (The Garriott Event)

TIME	TYPE OF ACTIVITY
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1240-1319

Bright Surge and Eruptive Prominence (NO2W90)

RADIO SPECTRAL COVERAGE

0437-1825	WEIS
1246-2400	HARV
1200-2400	BOUL
0949-2348	SGMR

ATM-WLC COVERAGE

222/1139-1145	S	#8894-8905
222/1331-1344	F	8906-8960
222/1424-1430	S	8961-8972
222/1432-1447	S(3)	8973-9007
222/1450-1503	S(2)	9008-9031
222/1512-1518	S	9032-9043
222/1633-1649	F	9044-9115
222/1809-1825	S	9116-9127
222/1917-1926	S	9128-9139
222/2212-2218	S	9140-9151
222/2220-2226	S	9152-9163
223/0117-0123	S	9164-9175
223/0126-0144	S,C	9176-9213
223/0458-0504	S	9214-9225
223/0506-0512	S	9226-9237

DOY: 224

DATE: 12 August 1973

Time first observed: 0037

Time of last previous observation: 223/2320

Position: 300°

Description: Growing crescent stands rearily radial; high latitude ray appears post-transient.

TIME

TYPE OF ACTIVITY

RADIO SPECTRAL COVERAGE

ATM-WLC COVERAGE

223/2320-2326	S	#9425-9436
224/0037-0042	S	9437-9448
224/0044-0058	C	9449-9480
224/0100-0107	C	9481-9494
224/0654-0700	S	9495-9506

CME!

DOY: 224DATE: 12 August 1973Time first observed: 1152Time of last previous observation: 1003Position: 290°Description: Bright knots at 2.5 R, diffuse loops at 5 RVery fast moving transient.TIMETYPE OF ACTIVITY

1158.9-1209.1	Radio, Type III G, IMP 1, SAGM
1250	Active Surge
1610	Eruptive Prominence 4 ⁺ hours after event (N35W90)

RADIO SPECTRAL COVERAGE

0443-1331	WEIS
0951-2400	HARV
1200-2400	BOUL

ATM-WLC COVERAGE

224/0957-1003	S	#9603-9614
224/1152-1208	F	9615-9686
224/1303-1309	S	9687-9698
224/1757-1815	F,Ext. S	9699-9738
224/1959-2005	S	9739-9750
224/2304-2310	S	9751-9762
224/2355-225/0001	S	9763-9774

DOY: 224

DATE: 12 August 1973

Time first observed: 1757

Time of last previous observation: 1303

Position: .310°

Description: This transient occurs over end of previous transient at 1152.

Material is distributed differently than "pre-event" frame 5 hours earlier.

TIME

TYPE OF ACTIVITY

1610-1635

EPL, N35W90 to .25 R
 May not be associated with EPL since $\Rightarrow V > 500$

RADIO SPECTRAL COVERAGE

ATM-WLC COVERAGE

224/1303-1309	S	#9687-9698
224/1757-1815	F,Ext.S	9699-9738

CME!

DOY: 225

DATE: 13 August 1973

Time first observed: 0655

Time of last previous observation: 0614

Position: 315°

Description: Bright loop at 3 R

TIME

TYPE OF ACTIVITY

0613.5-0616.5	Radio, Type III G, V, IMP 1, CULG
0616-0631	Radio, Type II HB, IMP 1, CULG
0618-0628	Radio, Type III GG, V, IMP 2, CULG
0650	Eruptive Prominence out to .18 R (N42W90)

RADIO SPECTRAL COVERAGE

000-0737 CULG

ATM-WLC COVERAGE

225/0609-0614	S	#9848-9859
225/0655-0701	S	9860-9871
225/0746-0818	S,F	9872-9955
225/0914-0920	S	9956-9967
225/0923-0929	S	9968-9979

DOY: 225DATE: 13 August 1973Time first observed: 1414Time of last previous observation: 1051Position: 315°Description: Narrow diffuse loop at 5 RTIMETYPE OF ACTIVITY

No Activity Reported

RADIO SPECTRAL COVERAGE

0715-1825	WEIS
0952-2343	SGMR
1200-2400	BOUL
1245-2400	HARV

ATM-WLC COVERAGE

225/1051	S	9980-9991
225/1414-1420	S	# 9992-10003
225/1424-1437	S,C	10004-10043
225/1446-1447	C	10044-10047

DOY: 225

DATE: 13 August 1973

Time first observed: 2137

Time of last previous observation: 1749

Position: 260°

Description: Diffuse loop at 3.5 R

TIME	TYPE OF ACTIVITY
------	------------------

1708-1745	Eruptive Prominence (S25W90)
1830	Active Prominence (S20W90)
2131-2155	C1 X-Ray Flare, Max 2146 (S09W90)

RADIO SPECTRAL COVERAGE

0952-2343	SGMR
1200-2400	BOUL
1245-2400	HARV
2037-2400	CULG

ATM-WLC COVERAGE

225/1743-1749	S	#10048-10059
225/2137-2143	S	10060-10071
225/2233-2235	S	10072-10075
225/2315-2321	S	10076-10087
226/0006-0012	C	10088-10091
226/0050-0056	S	10092-10103
226/0059-0105	S	10104-10115

CME!

DOY: 233

DATE: 21 August 1973

Time first observed: 1441

Time of last previous observation: 1334

Position: 50°

Description: Large bright loop at 2.5 R

TIME	TYPE OF ACTIVITY
1319	Eruptive Prominence (N13E90)
1325-1600	2800 MHz Burst, 2.2 F.U., OTTA
1344-1433	1F Flare, Max 1407 (N12E90)
1440-1650	Radio, CONT Dekameter, IMP 2, HARV
1441.5-1734.0	Radio, Type IV, IMP 3, BOUL
1825.0-1919	Radio, Type IV, IMP 1, BOUL

RADIO SPECTRAL COVERAGE

1200-2400	BOUL
1300-2400	HARV
1600-2332	SGMR

ATM-WLC COVERAGE

233/1326-1334	C	#11930-11948
233/1441-1447	S	11949-11960
233/1450-1452	S	11961-11964
233/1511-1512	S	11965-11966
233/1615-1621	S	11967-11978
233/1653-1659	S	11979-11990
233/1835-1841	S	11991-12002

2 CMEs 1
0 II-86

DOY: 238

DATE: 26 August 1973

Time first observed: 2302

Time of last previous observation: 2006

Position: 70° + 280°

Description: Large, slow moving loop at 2 R on E-limb and restructuring of streamer on W-limb, the Lousma Event.

TIME TYPE OF ACTIVITY

1757 Hedgerow Prominence, Large, slowly evolving hedgerow prominence reported throughout the evening by Mauno Loa at .14 R (N20E90)

2254 Radio, Type III B,W, CULG

RADIO SPECTRAL COVERAGE

1006-2324	SGMR
1230-2400	BOUL
1633-2400	HARV
2034-2400	CULG

ATM-WLC COVERAGE

238/2004-2006	C	#12899-12902
238/2302-2308	S	12903-12914
238/2349-2355	S	12915-12926
239/0003-0009	S	12927-12938
239/0011-0022	C	12939-12962
239/0206-0212	S	12963-12974
239/0512-0518	S	12975-12986
239/0622-0644	F,S	12987-13070
239/1227-1233	S	13071-13082
239/1235-1241	S	13083-13094
239/1243-1256	C	13095-13122

CME!

DOY: 249

DATE: 6 Sept. 1973

Time first observed: 0957

Time of last previous observation: 0405

Position: 120°

Description: Big, faint loop at 2.5 R

TIME	TYPE OF ACTIVITY
0911.5-0913.5	2695 MHz Burst, 6 F.U., CRON
0912.5-0915	2695 MHz Butst, 6 F.U., CANR
0912.5-0915	4995 MHz Burst, 12 F.U., CANR
0912-0930	1B Flare, Max 0915 (N05W90) NOTE: W-limb
0915-1010	X1 X-Ray Flare, Max 0922 (West Limb)
0950	Surge (N05W90)

RADIO SPECTRAL COVERAGE

0521-1045 WEIS

ATM-WLC COVERAGE

249/0359-0405	S	#15792-15803
249/0957-1003	F	15804-15828
249/1006-1023	F	15829-15900
249/1155-1201	S	15901-15912
249/1208-1224	Ext. S, S	15913-15946
249/1304-1310	S	15947-15958
249/1312-1318	S	15959-15970
249/1320-1342	C	15971-15991
249/1350-1357	Ext. S	15992-16006
249/1511-1517	S	16007-16018
249/1835-1837	C	16019-16022
249/1919-1925	S	16023-16034
249/1930-1936	S	16635-16046

DOY: 249

DATE: 6 September 1973

Time first observed: 1155

Time of last previous observation: 1023

Position: 270

Description: Growth of jet like feature, continues to grow through 1800 GMT, becomes diffuse by end of day but continues to evolve through midday 7 September.

TIME

TYPE OF ACTIVITY

0912-0930	1B Flare (N05W90), X1 X-ray flare
0913-1030	BSL (N04W90) to .15 to .20 R _⊙
0949-1002	EPL (N04W90) to .1 R _⊙
1053-1105	SPY (N20W90), small
1100-1135	EPL (N06W90), to .1 R _⊙

RADIO SPECTRAL COVERAGE

ATM-WLC COVERAGE

249/1006-1023	F	#15829-15900
249/1155-1201	S	15901-15912
249/1208-1224	Ext.S	15913-15946
249/1304-1310	S	15947-15958

CME!

DOY: 250

DATE: 7 Sept. 1973

Time first observed: 1306

Time of last previous observation: 1118

Position: 210⁰-310⁰

Description: Complete chaos on W-limb - possibly back end of loop structure.

TIME	TYPE OF ACTIVITY
1008-1537	Radio, Type I N, IMP 1, WEIS
1130-1142	2B Flare, Max. 1142 (S18W46) Confirmed by 10 observatories; Rated 3B - SN
1139-1300	X1 X-Ray Flare, Max 1142 (S18W46)
1207-1215	Radio, Type IV, IMP 2, SGMR
1215.1-1351	Radio, CONT, IMP 2, SGMR
1220-1222	Radio, Type II, IMP 2, WEIS
1222-1532	2800 MHz, 11 F.U., OTTA
1235.0-1400	Radio, Type IV, IMP 2, BOUL

RADIO SPECTRAL COVERAGE

0522-1720	WEIS
1018-2302	SGMR
1230-2400	BOUL

ATM-WLC COVERAGE

250/1102-1118	F	#16230-16301
250/1306-1314	F	16302-16330
250/1354-1355	F	16331-16334
250/1434-1447	S(4)	16335-16360
250/1530-1539	S,C	16361-16375
250/1658-1704	S	16376-16387
250/1746-1752	S	16388-16399
250/1835-1841	S	16400-16411
250/1851-1857	S	16412-16423
250/1926-1928	C	16424-16426
250/2141-2147	S	16427-16438

CME!

DOY: 250

DATE: 7 Sept. 1973

Time first observed: 2312

Time of last previous observation: 2234

Position: 270°

Description: Loop at 3 R

TIME	TYPE OF ACTIVITY
2035-2400	Radio, Type I N, IMP 1, CULG
2201-2225	Radio, Type I N, Decimeter, IMP 1, HARV
2226-2233	<C1 X-Ray Flare, Max 2227 (S10W80)
2230-2243	Eruptive Prominence, out to 0.2 R at (N18W90)
2249.5-2257	2695 MHz Burst, 6 F.U., BOUL
2250-2300	2695 MHz Burst, 3 F.U., PENT
2250-2256	C2 X-Ray Flare, Max 2254 (S18W50)
2250-2256	C2 X-Ray Flare, Max 2254 (N24W58)
2319.8-2319.9	Radio, Type III, Dekametric, IMP 1, BOUL
2339.8-2340.3	Radio, Type III, Dekametric, IMP 1, BOUL

RADIO SPECTRAL COVERAGE

1230-2400	BOUL
2035-2400	CULG
1300-2400	HARV

ATM-WLC COVERAGE

250/2228-2234	Ext. S	#16439-16451
250/2312-2318	S	16452-16463
250/2328-2345	Ext. S	16464-16499
250/2347-2354	Ext. S	16500-16515
250/2357-251/0008	Ext.S,	16516-16538
251/0049-0055	S	16539-16550
251/0057-0103	S	16551-16562
251/0106-0117	C	16563-16585
251/1315-1321	S	16586-16597
251/1324-1330	S	16598-16609
251/1333-1345	C	16610-16635

CME!

DOY: 251

DATE: 8 Sept. 1973

Time first observed: 1758

Time of last previous observation: 1626

Position: 300°

Description: Very fast, narrow loop at 2.75 R

TIME	TYPE OF ACTIVITY
1720.5-1725	Radio, Type II, IMP 2, HARV
1740-1746	<C1 X-Ray Flare, Max 1742 (N20W72)
1758.5-1758.8	Radio, Type III, IMP 1; BOUL
1818-1831	<C1 X-Ray Flare, Max 1818 (N25W73)
1829-1900	K-Coronameter transient, reported by Mauna Loa Obs. Weak and narrow coronal transient between 6 ^r & 12 ^r above limb at N40W90
1830-1840	<C1 X-Ray Flare, Max 1831 (N17W37)
1626-1710	DSD N23W75 Boulder
1549-1722	DSD IMP 1+ possible EPL

RADIO SPECTRAL COVERAGE

1020-2301	SGMR
1300-2400	HARV
1230-2400	BOUL

ATM-WLC COVERAGE

251/1620-1626	S	#16652-16663
251/1758-1831	F, Ext. S, F, S. Ext. S	16664-16743
251/1833-1839	Ext. S	16744-16757
251/1841-1847	S	16758-16765
251/1926-2017	Ext. S (3)	16766-16873
251/2100-2106	S	16874-16885
251/2115-2122	S	16886-16897
251/2151-2152	C	16898-16900
251/2236-2242	S	16901-16912
252/0139-0145	S	16913-16924
252/0148-0154	S	16925-16936

CME!

DOY: 253

DATE: 10 Sept. 1973

Time first observed: 0408

Time of last previous observation: 0236

Position: 250°

Description: Streamer blow-out

TIME	TYPE OF ACTIVITY
0022.5 - 0538.5	Radio, Type I N, IMP 1, CULG
0101	Active Prominence (S23W90)
0158	EPL, .OR _⊙
0242	Eruptive Prominence
0255-0315	SB Flare, Max 0259 (S10W42), PALE
0256-0323	IN Flare, Max 0301 (S10W42), MANI
0300-0310	SB Flare, Max 0300 (S18W43), TEHR
0300-0310	SB Flare, Max 0300 (S09W39), TEHR

RADIO SPECTRAL COVERAGE

000-0730 CULG

ATM-WLC COVERAGE

253/0232-0236	Ext. S	#17192-17199
253/0408-0414	S	17200-17211
253/0416-0422	S	17212-17223
253/0428-0439	C	17224-17245
253/0843-0849	S	17246-17257

CME!

DOY: 254

DATE: 11 Sept. 1973

Time first observed: 0936

Time of last previous observation: 0214

Position: 290°

Description: Streamer blow-out and continuing transients--started earlier with strange form--blown out at 0936

TIME	TYPE OF ACTIVITY
0654-0729	Subnormal Flare, Max 0659 (S12W56), ATHN M1
0701.5-0721	Radio, Type II H, IMP 2, CULG
0702.8-0705.7	Radio, Type II, IMP 1, WEIS
0724-0738	Sub-Faint Flare, Max 0729 (S12W40)
0430	EPL west limb (ASR .1) SW20
0533	DSD (S10W51)

RADIO SPECTRAL COVERAGE

000-0743	CULG
0531-1318	WEIS

ATM-WLC COVERAGE

254/0205-0214	C	#17682-17699
254/0936-0949	S(2)	17700-17723
254/1115-1121	S	17724-17735
254/1124-1130	S	17736-17747
254/1138-1143	C	17748-17758
254/1455-1456	F	17759-17762
254/1621 (1 fr)	S	17763
254/1623-1629	S	17764-17775
254/1721-1722	S	17776-17778

CME!

DOY: 256

DATE: 13 Sept. 1973

Time first observed: 0811

Time of last previous observation: 0243

Position: 300°

Description: Looks like rear end of loop structure

TIME

TYPE OF ACTIVITY

0646-0800

<C1 X-Ray Flare, Max 0647 (S12W66)

RADIO SPECTRAL COVERAGE

0534-1018 WEIS

ATM-WLC COVERAGE

256/0217-0143 C #18359-18394

256/0811-0817 S 18395-18406

256-1131-1137 S 18407-18418

CME!

DOY: 256

DATE: 13 Sept. 1973

Time first observed: 1131

Time of last previous observation: 0817

Position: 300°

Description: Very fast, narrow loop at 4 R 870 km sec⁻¹

TIME

TYPE OF ACTIVITY

No Activity Reported

(1041-1052)

-N, S13, W68, max 1044. no association

RADIO SPECTRAL COVERAGE

1021-1708	WEIS
1025-2253	SGMR

ATM-WLC COVERAGE

256/0811-0817	S	#18395-18406
256/1131-1137	S	18407-18418
256/1142-1148	S	18419-18430
256/1152-1207	C	18431-18463
256/1305-1321	S	18464-18475

DOY: 257

DATE: 14 September 1973

Time first observed: 1432

Time of last previous observation: 1350

Position: 285°

Description: "Wine glass" pinch transient

TIME

TYPE OF ACTIVITY

1325-1540

APR, (S10W90) IMP 3

1325

? EPL, (S16W90)

RADIO SPECTRAL COVERAGE

ATM-WLC COVERAGE

257/1350-1355	S	#18689-18700
257/1432-1433	F	18701-18704
257/1515-1520	S	18705-18716
257/1823-1828	S	18717-18728

CME!

DOY: 258

DATE: 15 Sept. 1973

Time first observed: 0032

Time of last previous observation: 257/2306

Position: 280°

Description: Very fast loop out to 4 R

TIME	TYPE OF ACTIVITY
257/2338-258/0049	Radio, Type IV, IMP 2, BOUL
258/000 -0441	Radio, Type I, IMP 1, CULG

RADIO SPECTRAL COVERAGE

- 257/1230-258/0130 BOUL
- 257/2028-258/0727 CULG
- 257/1301-258/0033 HARV

ATM-WLC COVERAGE

- | | | |
|---------------|-----------|--------------|
| 257/2301-2306 | S | #18765-18776 |
| 258/0032-0038 | S | 18777-18788 |
| 258/0041-0047 | S | 18789-18800 |
| 258/0050-0123 | Ext. S(2) | 18801-18872 |
| 258/0205-0211 | S | 18873-18884 |
| 258/0830-0836 | S | 18885-18896 |

DOY: 258

DATE: 15 Sept. 1973

CME!

II-97

Time first observed: 2220

Time of last previous observation: 2047

Position: 270°

Description: Diffuse, bright loop at 2.3 R_⊙

TIME

TYPE OF ACTIVITY

0817-0900
0026.5-0028

EPL, (N05W90)
2695 MHz Burst, 4 F.U., BOUL

RADIO SPECTRAL COVERAGE

000-0130 BOUL
000-0727 CULG

ATM-WLC COVERAGE

258/2047-2052	S	#18983-18994
258/2220-2221	F	18995-18998
258/2250-2251	F	18999-19002
258/2309-2310	F	19003-19006
258/2352-2353	F	#19007-19010
259/0139-0158	S, S, C	19011-19045
259/0213-0214	F	19046-19049
259/0743-0749	S	19050-19061
259/1109-1115	S	19062-19073
259/1139-1141	C	19074-19077
259/1224-1237	S(2)	19078-19101
259/1239-1244	C	19102-19112
259/1354-1400	S	19113-19124
259/1412-1413	F	19125-19128
259/1832-1838	S	19129-19140
259/1842-1848	S	19141-19152
259/2138-2139	F	19153-19157
259/2228-2229	F	19158-19161
259/2317-2323	S	19162-19173
259/2327-2333	S	19174-19185
259/2337 (1 Fr)	S	19186
259/2337-2342	C	19187-19197

CME!

DOY: 260

DATE: 17 Sept. 1973

Time first observed: 1619

Time of last previous observation: 1402

Position: 240-290°

Description: The "Bean" transient with spectacular curved rays

TIME

TYPE OF ACTIVITY

1516.5-1519.7

Radio, Type II, IMP 1, BOUL

1517-1521

Radio, Type II, IMP 2, HARV

RADIO SPECTRAL COVERAGE

0537-1610	WEIS
1028-2247	SGMR
1230-2400	BOUL
1318-2400	HARV

ATM-WLC COVERAGE

260/1402-1403	F	#19289-19292
260/1619-1645	Ext. S	19293-19328
260/1703-1704	F	19329-19332
260/1750-1756	S	19333-19344
260/1926-1932	S	19345-19356
260/2112-2125	S(2)	19357-19380
260/2127-2132	C	19381-19391
261/0619-0625	S	19392-19403

CME!

DOY: 260

DATE: 17 September 1973

Time first observed: 1927

Time of last previous observation: 1751

Position: 70°

Description: Slow loop (75-100 km S⁻¹); looks like streamer blow-out

TIME

TYPE OF ACTIVITY

RADIO SPECTRAL COVERAGE

ATM-WLC COVERAGE

260/1751-1756	S	#19333-19344
260/1927-1932	S	19345-19356
260/2112-2117	S	19357-19368
260/2119-2124	S	19369-19380
260/2128-2132	C	19381-19391
261/0619-0624	S	19392-19403

DOY: 265

DATE: 22 Sept. 1973

Time first observed: 1951

Time of last previous observation: 1152

Position: 90

Description: Small twisting of streamer

TIME

TYPE OF ACTIVITY

No Activity Reported

RADIO SPECTRAL COVERAGE

1034-2238	SGMR
1230-2400	BOUL
1317-2400	HARV

ATM-WLC COVERAGE

265/1149-1152	F	#20101-20112
265/1942-1958	F	20113-20184
266/0153-0159	S	20185-20196

CMB!

DOY: 267

DATE: 24 Sept. 1973

Time first observed: 0108

Time of last previous observation: 266/1223

Position: 90

Description: Complete change in streamer structure

Could be growth of streamer

TIME	TYPE OF ACTIVITY
266/1430-1600	DSF (N12E71) IMP 1
266/1515-2115	APR (N25E90) IMP 2
266/1757-1803	Type II
266/1808-1819	Type II
266/2355-2355.5	Radio, Type III G,W CULG

RADIO SPECTRAL COVERAGE

2025-0724	CULG
000-0100	BOUL

ATM-WLC COVERAGE

266/1217-1223	S	#20209-20220
267/0108-0116	S	20221-20232

CME!

DOY: 268

DATE: 25 Sept. 1973

Time first observed: 0201

Time of last previous observation: 267/1313

Position: 90

Description: End of transient, front loop at edge of FOV

TIME	TYPE OF ACTIVITY
0030	Radio, Type III B,W CULG
0034-0132 640 km/s	C1 x-ray flare, max 0053 (N25E72)
0034-0132	1N flare, max 0053 (N29E73) PALE infall-impact
0046.5-0047	Radio, Type III G, IMP 1, CULG
0049.5	Radio, Type III G, CULG
0054-0055.5	Radio, Type III G,U, IMP 2, CULG
0058.5-0221	Radio, Type III, N,W CULG
0101.5-0326.5	Radio, Type I, IMP 1, CULG
0158.5-202	2695 MHz burst, 5.0 F.U., CRON

RADIO SPECTRAL COVERAGE

0000-0723	CULG
0000-0100	BOUL

ATM-WLC COVERAGE

267/1307-1313	S	#20233-20244
268/0201-0207	S	20245-20256
268/0744-0750	S	20257-20268

eme!

DOY: 272

DATE: 29 Sept. 1973

Time first observed: 1432

Time of last previous observation: 0054

Position: 90

Description: Looks like an enlarged helmet streamer, blown out by
#20366 (273/0307). (3.5 R_o at 1432)

TIME	TYPE OF ACTIVITY
9099-1100	APR (N18E90) IMP 2, Prominence disappeared
1405-1520	2800 MHz burst, max 1420, 2.4 F.U. OTTA

RADIO SPECTRAL COVERAGE

0557-1518	WEIS
1042-2224	SGMR
1300-2400	BOUL
1317-2400	HARV

ATM-WLC COVERAGE

272/0048-0054	S	#20341-20352
272/1432-1438	S	20353-20364
273/0307-0313	S	20365-20376

DOY: 275DATE: 2 October 1973Time first observed: 1405Time of last previous observation: 0014Position: 98Description: Transient goes out diffuse streamer, leaving it very intense.

TIME

TYPE OF ACTIVITY

1225-1242

C3 x-ray flare, max 1228 (S13E05)

1225-1242

SB flare, max 1228 (S13E05)

1225-1258

2800 MHz burst, max 1225, 4.0 F.U.

1256-1400

Active surge region (N10W85)

MAY BE ROTATION!! TAKES 2 DAYS!!

I CAN'T CALL THIS A TRANSIENT.

RADIO SPECTRAL COVERAGE

0603-1628 WEIS

1045-2219 SGMR

1300-2400 BOUL

1316-2400 HARV

ATM-WLC COVERAGE

275/0008-0014 S #20408-20419

275/1405-1411 S 20420-20431

276/0233-0239 S 20432-20443

276/1312-1318 S 20444-20455

CME!

DOY: 277

DATE: 4 October 1974

Time first observed: 1406

Time of last previous observation: 0154

Position: 90

Description: Transient along streamer, very diffuse but restructuring of E-Limb obvious. End of transient--material left East limb

TIME	TYPE OF ACTIVITY
1033-1234	C1 x-ray flare, max 1033 (S11W44)
1129.8-1139.0	Radio, Type II, IMP 1 WEIS
1134.3-1142.1	Radio, Type V (Dekameter) IMP 1 SGMR
1324-1335	SN Flare, max 1326 (S16W19) ATHN
1325-1346	Dark surge on the disk (S16W19) ATHN
1403-1441	Dark surge on the disk (S16W20) ATHN
1452-1525	C1 x-ray flare, max 1509 (S14W16)

Matter suspended over East limb 0200

RADIO SPECTRAL COVERAGE

0604-1629	WEIS
1048-2215	SGMR
1300-2400	BOUL
1317-2400	HARV

ATM-WLC COVERAGE

277/0148-0154	S	#20504-20515
277/1406-1412	S	20516-20527
278/0105-0111	S	20528-20539

DOY: 278DATE: 5 October 1973Time first observed: 0105Time of last previous observation: 277/1412Position: 290Description: Broadening of northern-most streamer, complete fan by #20541 (1323).TIMETYPE OF ACTIVITY

277/2347-2353.5	2695 MHz Burst, Max 2350, 4.0 F.U., CRON
0018-0715	C1 x-ray flare, Max 0341 (S14W58)
0245-0351	SN Flare, Max 0341 (S14W58)
0300-0445	C1 x-ray Flare, Max 0300 (S13W53)

RADIO SPECTRAL COVERAGE

0059-0130	CULG
1317-0011	HARV

ATM-WLC COVERAGE

277/1406-1412	S	#20516-20527
278/0105-0111	S	20528-20539
278/1323-1329	S	20540-20551

CME!

DOY: 279

DATE: 6 October 1973

Time first observed: 1414

Time of last previous observation: 0159

Position: 260°

Description: End of transient: diffuse legs of loops can be seen.

TIME

TYPE OF ACTIVITY

1010-1041	BSD/BSL (S15W69) to .1 R _o
1049-1127	-N flare, C1, (S16W68)
1051-1058	Type II

RADIO SPECTRAL COVERAGE

ATM-WLC COVERAGE

279/0159-0204	S	#20552-20563
279/1414-1419	S	20564-20575

DOY: 282

DATE: 9 October 1973

Time first observed: 0123

Time of last previous observation: 281/2044

Position: 90

Description: Small loop (fairly faint) out to 3 R₀.

TIME	TYPE OF ACTIVITY
0039	Radio, Type III B,W CULG
0054	Radio, Type III B,W CULG
0057-0109	Active Surge Region (N14W82) PALE; Wrong Limb
0101-0104	Radio, Type III G,V, IMP 1, CULG

RADIO SPECTRAL COVERAGE

1300-0030	BOUL
1317-0009	HARV
2020-0720	CULG

ATM-WLC COVERAGE

281/2038-2044	S	#20649-20660
282/0123-0129	S	20661-20672
282/1341-1347	S	20673-20684

CME!

DOY: 283

DATE: 10 October 1973

Time first observed: 1259

Time of last previous observation: 0233

Position: 260°

Description: Aftermath of transient, which has already left the FOV, is visible.

TIME	TYPE OF ACTIVITY
1217-1330	Active Prominence (N21W90) RAMEY

RADIO SPECTRAL COVERAGE

0619-1453 WEIS

1054-2205 SGMR

ATM-WLC COVERAGE

283/0227-0233 S #20697-20708

283/1259-1305 S 20709-20720

283/2355-284/0001 S 20721-20732

CME!

DOY: 284

DATE: 11 October 1973

Time first observed: 1343

Time of last previous observation: 0001

Position: 270

Description: Some condensation at 3.5 R_o, very diffuse.

End of transient.

TIME	TYPE OF ACTIVITY
1230-1600	Active Prominence (S15W90) RAMEY
1331.0-1331.2	Radio, Type III (Dekameter) IMP 1, SGMR

RADIO SPECTRAL COVERAGE

0620-1433	WEIS
1300-2400	BOUL
1331-2400	HARV
1056-2204	SGMR

ATM-WLC COVERAGE

283/2355-284/0001	S	#20721-20732
284/1343-1349	S	20733-20744
285/0229-0235	S	20745-20756

DOY: 288

DATE: 15 October 1973

Time first observed: 0025

Time of last previous observation: 287/1316

Position: 280

Description: Narrow ray appears, very diffuse by #20830 (1231)

TIME

TYPE OF ACTIVITY

287/2319-2322

SF Flare, max 2319 (S10W36) PALE

RADIO SPECTRAL COVERAGE

000-0718 CULG

ATM-WLC COVERAGE

287/1310-1316 S #20805-20816

288/0025-0031 S 20817-20828

288/1231-1237 S 20829-20840

CME!

II-110

DOY: 291

DATE: 18 October 1973

Time first observed: 1637

Time of last previous observation: 0124

Position: 80

Description: Condensation at 3 R₀, dissipated by #20914 (292/0035)

TIME

TYPE OF ACTIVITY

No Activity Reported

RADIO SPECTRAL COVERAGE

0705-1605	WEIS
1104-2152	SGMR
1300-2400	BOUL
1331-2352	HARV

ATM-WLC COVERAGE

291/0118-0124	S	#20889-20900
291/1637-1643	S	20901-20912
292/0035-0041	S	20913-20924

CME!

DOY: 292

DATE: 19 October 1973

Time first observed: 2221

Time of last previous observation: 1304

Position: 60-80°

Description: End of transient

TIME

TYPE OF ACTIVITY

None reported

RADIO SPECTRAL COVERAGE

ATM-WLC COVERAGE

292/1304-1309	S	#20925-20936
292/2221-2226	S	20937-20948
293/1359-1404	S	20949-20960

CME!

II-111

DOY: 294

DATE: 21 October 1973

Time first observed: 0054

Time of last previous observation: 293/1405

Position: 90

Description: Diffuse loops out to 5 R₀

TIME	TYPE OF ACTIVITY
293/1740-1900 (1630)	EPL/APR (S07-11, E90) to .07 R ₀
293/2306-2306.5	Radio, Type III G,W CULG
294/0004-0034	Active Surge Region (S12E90) PALE

RADIO SPECTRAL COVERAGE

1300-0030	BOUL
2018-0717	CULG

ATM-WLC COVERAGE

293/1359-1405	S	#20949-20960
294/0054-0100	S	20961-20972
294/1313-1319	S	20973-20984

DOY: 295

DATE: 22 October 1973

Time first observed: 0001

Time of last previous observation: 294/1319

Position: 90

Description: Faint loops out to 3.0 R_o, more obvious at #20998 (1230).

Moving very slowly. Looks like rotation--takes a day and 1/2.

TIME	TYPE OF ACTIVITY
294/2213.5	Radio, Type III B,W CULG
294/2335-2345	SF Flare, max 2334 (S14E84) PALE

RADIO SPECTRAL COVERAGE

2020-0101 CULG
1300-2400 BOUL

ATM-WLC COVERAGE

294/1313-1319	S	#20973-20984
295/0001-0007	S	20985-20996
295/1230-1236	S	20997-21008
295/2315-2321	S	21009-21020
296/1324-1330	S	21021-21032

DOY: 295

DATE: 22 October 1973

Time first observed: 2315

Time of last previous observation: 1236

Position: 250

Description: Void between two streamers completely filled in with a fan structure. New bright streamer out of diffuse material just before

TIME	TYPE OF ACTIVITY
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2118-
2225-0529

Radio, Type III, B,U, IMP 1 CULG
Active Filament System (S13E67) MANILA;
Wrong limb

RADIO SPECTRAL COVERAGE

1330-2347	HARV
1500-2400	BOUL
2255-2400	BULG

ATM-WLC COVERAGE

295/1230-1236	S	#20997-21008
295/2315-2321	S	21008-21021
296/1324-1330	S	21022-21033

CME!

DOY: 300

DATE: 27 October 1973

Time first observed: 1659

Time of last previous observation: 1349

Position: 80

Description: Bright loop to 5 R_o, still obvious at #21142 (1725).

TIME	TYPE OF ACTIVITY
1517.1-1517.3	Radio, Type III, IMP 1, HARV
1540.5-1738	2695 MHz Burst, max 1602, 69 F.U., CANR
1543-1851	M3 x-ray Flare, max 1635 (N20E55)
1547-1730	2B Flare, max 1606 (N18E54) RAMEY
1548-1600	Bright surge on the disk, out to 0.1 R _o (N22E59) RAMEY
1550-1600	Radio, Type I (Decimeter), IMP 1, HARV
1554-1559	Radio, Type III GG,RS (Decimeter) IMP 3, BOUL
1554-1608	Radio, Type IV (Decimeter) IMP 3, HARV
1600.0-1602.4	Radio, Type III G, IMP 1, HARV
1601-1623	Radio, Type II, IMP 3, BOUL
1605.0-1605.8	Radio, Type III (Dekameter), IMP 1, SGMR
1605-1713	Radio, Type I, S, IMP 1, SGMR
1608-1630	Radio, Type IV P (Decimeter) IMP 3, HARV
1642-1714	Radio, Type IV N (Decimeter) IMP 3, HARV

RADIO SPECTRAL COVERAGE

1330-2400	BOUL
1330-2342	HARV
1115-2139	SGMR

ATM-WLC COVERAGE

300/1343-1349	S	#21117-21128
300/1659-1705	S	21129-21140
300/1725-1729	S	21141-21149
301/0109-0115	S	21150-21161

DOY: 306

DATE: 2 Nov 1973

Time first observed: 0324

Time of last previous observation: 305/1501

Position: 270

Description: Very subtle restructuring of rays.

TIME	TYPE OF ACTIVITY
305/1822	Type IV
305/1825-1848	EPL (possible; very small) (S07W90) Mauna Loa
305/1915-2007	-N flare, C 7 (S18W66)
0000-0332	Radio, Type IS, IMP 1, CULG
0241-0505	Active Filament System (S10W22)

RADIO SPECTRAL COVERAGE

0000-0716 CULG

ATM-WLC COVERAGE

305/1455-1501	S	#21270-21281
306/0324-0330	S	21282-21293
306/1410-1416	S	21294-21305

CME!

DOY: 307

DATE: 3 November 1973

Time first observed: 0107

Time of last previous observation: 306/1416

Position: 270

Description: Complete blow out of W-limb.

TIME	TYPE OF ACTIVITY
0011.5 - 0035.3	2695 MHz Burst, 250 F.U., MANI
0012-0018	Radio, Type III G, V, IMP 2, CULG
0012-0101	2N Flare, Max 0034, (S18W85)
0013-0015	Radio, UNCLF, IMP 2, CULG
0014-0100	X1 X-Ray Flare (S13W82)
0014-0255	Loop Prominence System (S14W90)
0015-0045	Radio, Type II, H, IMP 2, CULG
0020-0050	Radio, Type IV, IMP 1, CULG

RADIO SPECTRAL COVERAGE

0000-0715 CULG

ATM/WLC COVERAGE

306/1410-1416 S #21294-21305
 307/0107-0113 S 21306-21317
 307/0253-0259 S 21318-21329

2 CMES!

DOY: 309

DATE: 5 Nov. 1973

Time first observed: 0248

Time of last previous observation: 308/1428

Position: 90 & 220

Description: Small transient on E-limb near pylon, also a transient causing a split ray on W-limb. slow moving jet

TIME	TYPE OF ACTIVITY
0044.5	Radio, Type III G,W, CULG
0048-0101	Dark surge on disk (S04W17) MANILA
1717-1755	EPL ?
1935	Type II
1950	Type IV

Added comment - times refer to previous day.

RADIO SPECTRAL COVERAGE

0000-0716 CULG

ATM-WLC COVERAGE

308/1422-1428	S	#21366-21377
309/0248-0254	S	21378-21389
309/1335-1341	S	21390-21401
310/0205-0211	S	21402-21413

CME!

DOY: 310DATE: 6 Nov. 1973Time first observed: 1450Time of last previous observation: 0211Position: 280Description: Large helmet streamer blows out and appears as a fan. End of eventTIMETYPE OF ACTIVITY

<u>TIME</u>	<u>TYPE OF ACTIVITY</u>
0455-0530	1 F flare, C 3 (N18W69)
0639-1215	APR, IMP 1 (N23W90)
0900-1300	Eruptive Prominence (S17E90); Wrong Limb

RADIO SPECTRAL COVERAGE

0651-1525	WEIS
1128-2126	SGMR
1330-2400	BOUL
1345-2335	HARV

ATM-WLC COVERAGE

310/0205-0211	S	#21402-21413
310/1450-1456	S	21414-21425
311/0120-0126	S	21426-21437

DOY: 317DATE: 13 Nov. 1973Time first observed: 0012Time of last previous observation: 316/1515Position: 270

Description: A considerable amount of restructuring . Possibly only rotational effects with evolution

TIME

TYPE OF ACTIVITY

No Activity Reported

RADIO SPECTRAL COVERAGE

316/1330-2400	BOUL
316/1436-2333	HARV
316/2016-317/0716	CULG

ATM-WLC COVERAGE

316/1509-1515	S	#21558-21569
317/0012-0018	S	21570-21581
317/1431-1437	S	21582-21593

CME!

DOY: 323

DATE: 19 November 1973

Time first observed: 2253

Time of last previous observation: 1445

Position: 250°

Description: Blow out of streamer

TIME

TYPE OF ACTIVITY

No activity reported

RADIO SPECTRAL COVERAGE

ATM-WLC COVERAGE

323/1445-1450	S	#21654-21665
323/2253-2258	S	21666-21677
324/1401-1407	S	21678-21689

DOY: 324

DATE: 20 November 1973

Time first observed: 2208

Time of last previous observation: 1401

Position: 135°

Description: "November ray" Narrow transient through existing ray-like structure - out to 3 R

TIME	TYPE OF ACTIVITY
~ 2130	DSF (S15E70) $\bar{v} = 600$ which is too fast

RADIO SPECTRAL COVERAGE

ATM-WLC COVERAGE

324/1401-1406	S	#21678-21689
324/2208-2213	S	21690-21701
325/0659-0704	S	21702-21713
325/1318-1323	S	21714-21725
325/2125-2130	S	21726-21737

2 CMEs!

DOY: 330

DATE: 26 Nov. 1973

Time first observed: 0052

Time of last previous observation: 329/1835

Position: 70 & 270

Description: Transient going out Northeast streamer very slowly. Also,
transient moving out helmet streamer at 3 R₀. Blown out by 1257 U.T.

TIME	TYPE OF ACTIVITY
329/2236-2237	Radio, Type III GG,U, IMP 1, CULG
330/0000-0728	Radio, Type III N, IMP 1, CULG
0000-0728	Radio, Type IS, IMP 1, CULG
0001-0015	Dark surge on disk (S05E19)
0001-0555	Active filament system (N06W06)
0007-0400	Active dark filament (S11W28) IMP 1
0024-0033	Bright surge on disk (S10E18)
0025.5-0030	Radio, Type III G,U, IMP 2, CULG
0032-0046	Dark surge on disk (S09E18)

RADIO SPECTRAL COVERAGE

329/2019-330/0728	CULG
329/1401-2332	HARV
329/1400-2400	BOUL

ATM-WLC COVERAGE

329/1829-1835	S	#21870-21881
330/0052-0058	S	21882-21893
330/0725-0731	S	21894-21905
330/1257-1303	S	21906-21917
330/1746-1752	S	21918-21929
330/2000-2006	S	21930-21941
331/0124-0126	S	21942-21944

DOY: 332

DATE: 28 Nov, 1973

Time first observed: 1931

Time of last previous observation: 1623

Position: 270

-Description: First appearance of a very diffuse loop near 4 R.

TIME

TYPE OF ACTIVITY

NO ACTIVITY REPORTED

RADIO SPECTRAL COVERAGE

0000-0720 CULG

ATM-WLC COVERAGE

332/1618-1623	S	#22228-22239
332/1931-1936	S	22240-22251
332/2059-2100	S	22252-22254
333/0017-0023	S	#22255-22266
333/0136-0141	S	22267-22278
333/0145-0151	S	22279-22290
333/0153-0200	C	22291-22305
333/0324-0330	S	22306-22317
333/0504-0510	S	22318-22329
333/0643-0649	S	22330-22341

DOY: 334DATE: 30 November 1973Time first observed: 1017Time of last previous observation: 0741Position: 90Description: Loops at 2.5 R₀, doesn't really blow, just sneaks out the streamer.

TIME	TYPE OF ACTIVITY
0906-0953	SN Flare, Max 0924 (S13W33) Wrong limb, MONT
0907-0919	C3 x-ray flare (S14W31)
0913-0918	2695 MHz burst max at 0917, 10 F.U., CRON
1006-1115	Active surge region (S15W90)

RADIO SPECTRAL COVERAGE

No coverage.

ATM-WLC COVERAGE

334/0735-0741	S	#22484-22495
334/1017-1023	S	22496-22507
334/1454-1500	S	22508-22519
334/1502-1508	S	22520-22531
334/1513-1520	S	22532-22543

DOY: 336DATE: 2 December 1973Time first observed: 1511Time of last previous observation: 0747Position: 270

Description: Either the growth of a helmet streamer or a small transinet -
too fast for rotational effects.

TIME	TYPE OF ACTIVITY
1505-1537	1N, M 1, (S13,W64)
2010-2020	BSC (.1R) (S14W67)

RADIO SPECTRAL COVERAGE

0000-0721 CULG

ATM-WLC COVERAGE

336/0747-0753	S	22700-22711
336/1502-1508	S	22712-22723
336/1511-15	S (7)	22724-22730
336/1524-15	C (15)	22731-22745
336/1534-1540	S	22746-22757
336/1542-1549	C (18)	22758-22775
336/1550-1555	S	22776-22787
336/1847-1848	C (3)	22788-22790
336/2018-2019	C (14)	22791-22794
336/2121-2127	S	22795-22806
337/0159-0205	S	22807-22818
337/0207-0213	S	22819-22803

CME!

DOY: 339

DATE: 5 December 1974

Time first observed: 1040

Time of last previous observation: 0824

Position: 90

Description: Small surge moving up northern most streamer.

TIME

TYPE OF ACTIVITY

0936.5-0939

2695 MHz burst, 7 F.U., CRON

RADIO SPECTRAL COVERAGE

0735-1009 WEIS

1049-1520 WEIS

ATM-WLC COVERAGE

339/0818-0824 S #23263-23274

339/1040-1045 S 23275-23284

339/1125-1131 S 23285-23296

339/1259-1305 S 23297-23308

339/1307-1313 S 23309-23320

339/1315-1322 C 23321-23335

339/1429-1430 C 23336-23338

339/1638-1644 S 23339-23350

339/1736-1737 C 23351-23353

339/2118-2123 S 23354-23362

DOY: 341DATE: 7 December 1973Time first observed: 1612Time of last previous observation: 1225Position: 270Description: Very, very diffuse loop at 4 R₀

TIME

TYPE OF ACTIVITY

No Activity Reported

RADIO SPECTRAL COVERAGE

1212-2105 SGMR

1400-2330 BOUL

1402-2335 HARV

ATM-WLC COVERAGE

341/1223-1225 C #23789-23791

341/1612-1613 C 23792-23794

341/1755-1756 C 23795-23797

DOY: 341DATE: 7 December 1973Time first observed: 2103Time of last previous observation: 2100Position: 270Description: Diffuse transient, may be associated with earlier transient (1612)
in same region

TIME

TYPE OF ACTIVITY

NO ACTIVITY REPORTED

RADIO SPECTRAL COVERAGE

1212-2105	SGMR
1400-1330	BOUL
1402-2335	HARV
2024-2400	CULG

ATM-WLC COVERAGE

341/2054-2100	S	#23816-23827
341/2103-2110	ExtS	23828-23841
342/0049-0054	S	23842-23851

DOY: 342

DATE: 8 December 1973

Time first observed: 1705

Time of last previous observation: 1403

Position: 95-100

Description: Brightening, doesn't appear to blow out.

TIME

TYPE OF ACTIVITY

NO ACTIVITY REPORTED

RADIO SPECTRAL COVERAGE

1205-2105	SGMR
1400-2330	BOUL
1402-2335	HARV

ATM-WLC COVERAGE

342/1358-1403	C	23942-23945
342/1705-1710	C	23945-23947
342/1901-1907	S	#23948-23959
342/1910-1926	Ext.S	23960-23995
342/2151-2157	S	23996-24007
342/2319-2325	S	24008-24019

DOY: 343

DATE: 9 December 1973

Time first observed: 0749

Time of last previous observation: 0100

Position: 90°

Description: Considerable restructuring on E-limb; bright thin rays present.

TIME

TYPE OF ACTIVITY

0553-0645

Active Dark filament (N04E58), IMP 1, ATHENS

RADIO SPECTRAL COVERAGE

0000-0721 CULG

ATM-WLC COVERAGE

343/0058-0100	C	#24047-24051
343/0749-0755	S	24052-24063
343/1321-1327	S	24064-24075

DOY: 344

DATE: 10 December 1973

Time first observed: 0758

Time of last previous observation: 0219

Position: 270

Description: Appearance of several sharp rays.

TIME

TYPE OF ACTIVITY

0643-0644

Radio, Type III G,W, CULG

0707-0708

Radio, Type III G,W, CULG

RADIO SPECTRAL COVERAGE

0000-0725 CULG

0748-0953 WEIS

ATM-WLC COVERAGE

344/0212-0219 C #24155-24169

344/0757-0763 S 24170-24181

344/1104-1110 S 24182-24193

CME¹

DOY: 346

DATE: 12 December 1973

Time first observed: 0020

Time of last previous observation: 345/2339

Position: 105

Description: Large transient passing through existing helmet streamer - very spectacular.

TIME

TYPE OF ACTIVITY

NO ACTIVITY REPORTED

RADIO SPECTRAL COVERAGE

345/1400-2330	BOUL
345/1401-2336	HARV
345/2025-346/0725	CULG

ATM-WLC COVERAGE

345/2338-2339	C	#24374-24376
346/0020-0021	C	24377-24379
346/0110-0111	C	24380-24382
346/0212-0218	S	24383-24394
346/0245-0246	C	24395-24397
346/0329-0335	S	24398-24409
346/0337-0343	S	24410-24421
346/0351-0358	C	24422-24436
346/0417-0418	C	24437-24439
346/0459-0500	C	24440-24442
346/0520-0521	C	24443-24445
346/0713-0719	S	24446-24457

CME!

DOY: 346

DATE: 12 December 1973

Time first observed: 1114

Time of last previous observation: 0958

Position: 75-90

Description: Beautiful loop on E-limb (MacDonald's arches) at 3 R_o.

TIME

TYPE OF ACTIVITY

NO ACTIVITY REPORTED

RADIO SPECTRAL COVERAGE

No coverage

ATM-WLC COVERAGE

346/0952-0958	S	#24470-24481
346/1114-1120	S	24482-24493
346/1247-1252	S	24494-24505
346/1419-1425	S	24506-24517

DOY: 347DATE: 13 December 1973Time first observed: 0251Time of last previous observation: 0140Position: 70°Description: Slow growth of ray; takes all day to develop.TIMETYPE OF ACTIVITY

No Activity Reported

RADIO SPECTRAL COVERAGEATM-WLC COVERAGE

347/0140-0145	S	#24632-24643
347/0251-0256	S	24644-24655
347/0259-0304	S	24656-24667

CME!

DOY: 348

DATE: 14 December 1974

Time first observed: 1002

Time of last previous observation: 0859

Position: 100

Description: Slowly moving transient along streamer.

TIME	TYPE OF ACTIVITY
0211-0937	APR (S13E90)
0924-1005	EPL (S13E90) to .12 R _o
	V ~ 600 → transient may have started first

RADIO SPECTRAL COVERAGE

No coverage

ATM-WLC COVERAGE

348/0724-0730	S	#24994-25005
348/0859-0905	S	25006-25017
348/1002-1008	S	25018-25029
348/1008-1014	S	25030-25041
348/1032-1038	S	25042-25053
348/1212-1218	S	25054-25065
348/1303-1304	C	25066-25067
348/1413-1419	S	25068-25079

DOY: 349

DATE: 15 December 1973

Time first observed: 1355

Time of last previous observation: 1137

Position: 130

Description: Sharp ray appears.

TIME	TYPE OF ACTIVITY
1130-1210	<C1 x-ray flare, Max 1134 (S12E80)
1140-1300	Active prominence region (S13E90), IMP 20

RADIO SPECTRAL COVERAGE

1133-1322	WEIS
1211-2106	SGMR

ATM-WLC COVERAGE

349/1132-1137	S	#25176-25186
349/1355-1401	S	25187-25198
349/1403-1409	S	25199-25210
349/1415-1422	C	25211-25225

DOY: 350

DATE: 16 December 1973

CME¹ II-134

Time first observed: 1148

Time of last previous observation: 1050

Position: 110

Description: Large loop structure transient starting at 2 R₀.

TIME	TYPE OF ACTIVITY
0938-1006	1N Flare, Max 0948 (S18E85)
1035-1126	<C1 X-ray Flare, Max 1039 (S17E82)
1108.5-1122	2695 MHz Burst, 10 F.U., CANR
1110-1145	Bright Surge on Disk (S15E82) RAMEY
1110-1152	C5 X-ray Flare, Max 1110 (S17E82)
1114-1120	Spray (S16E82) CANR
1116-1127	Bright Surge on Disk (S18E80) RAMEY

RADIO SPECTRAL COVERAGE

1020-1500 WEIS

ATM-WLC COVERAGE

350/1044-1050	S	#25364-25375
350/1148-1153	S	25376-25387
350/1153-1210	F	25388-25459
350/1310-1316	S	25460-25471
350/1321-1327	S	25472-25483
350/1332-1339	C	25484-25498
350/1343-1349	S	25499-25510
350/1354-1356	C	25511-25515

DOY: 350

DATE: 16 December 1973

Time first observed: 2303

Time of last previous observation: 2302

Position: 130

Description: Interesting split ray, persists for 2-3 hours.

TIME

TYPE OF ACTIVITY

2144-2207

M1 X-ray Flare, Max 2146 (S18E76)

RADIO SPECTRAL COVERAGE

1416-2337	HARV
1400-2400	BOUL
2115-2400	CULG

ATM-WLC COVERAGE

350/2248-2318	C	#25655-25722
351/0001-0031	C	25723-25790
351/0134-0135	C	25791-25793
351/0159-0205	S	25794-25805

CME!

DOY: 351

DATE: 17 December 1973

Time first observed: 0829

Time of last previous observation: 0214

Position: 265

Description: Bright transient moving along west streamer.

TIME

TYPE OF ACTIVITY

0742-0753

C3 X-ray Flare, (S19E71) Wrong Limb

RADIO SPECTRAL COVERAGE

0754-0930 WEIS

ATM-WLC COVERAGE

351/0217-0214	C	#25818-25832
351/0829-0834	S	25833-25844
351/1536-1541	S	25845-25856
351/1545-1551	S	25857-25868
351/1552-1559	C	25869-25883
351/1842-1843	C	25884-25886

CME!

DOY: 351

DATE: 17 December 1973

Time first observed: 1536

Time of last previous observation: 0834

Position: 90

Description: Very diffuse loops at 3 R₀, very slow moving.

TIME	TYPE OF ACTIVITY
1450-1635	2800 MHz Burst, 1.4 F.U., OTTA
1521-1546	Bright Surge on Disk (S17E67) RAMEY
1040	BSL ? (S16E90) associated with small flare
1030-1043	- N flare, (S14E67)

RADIO SPECTRAL COVERAGE

1426-1500	WEIS
1211-2106	SGMR
1400-2400	BOUL
1416-2337	HARV

ATM-WLC COVERAGE

351/0829-0834	S	#25833-25844
351/1536-1541	S	25845-25856
351/1545-1551	S	25857-25868
351/1552-1559	C	25869-25883
351/1842-1843	C	25884-25886
351/1924-1928	C	25887-25896
351/1928-1934	S	25897-25908
351/2016-2017	C	25909-25912
351/2020-2026	S	25913-25924

DOY: 353

DATE: 19 December 1973

Time first observed: 0700

Time of last previous observation: 0630

Position: 80

Description: Spectacular transient with loop structure at 2.5 R_o going out
existing streamer.

TIME TYPE OF ACTIVITY

0516-0517	Radio, Type III G, IMP 1, CULG
0533.5-0535	Radio, Type III G,U, IMP 2, CULG
0654-0656	Radio, Type III GG, V, IMP 2, CULG
0656-0657.5	Radio, Type III G, IMP 1, CULG
0400-0701	EPL (N30E90) to .6 R _o at 0648 ~ 100 km/sec

*Missing
 Entry for Dec 18
 picture of East (80°)
 possible CME on Munro poster*

RADIO SPECTRAL COVERAGE

0000-0728 CULG

ATM-WLC COVERAGE

353/0624-0630	S	#26167-26178
353/0700-0706	S	26179-26190
353/0805-0811	S	26191-26202
353/0833-0839	S	26203-26214
353/1014-1020	S	26215-26226
353/1103-1109	S	26227-26238
353/1241-1242	C	26239-26241
353/1332-1333	C	26242-26244
353/1417-1423	S	26245-26256

CME!

DOY: 357

DATE: 23 December 1973

Time first observed: 1628

Time of last previous observation: 1412

Position: 255

Description: Small brightening moving along streamer.

TIME	TYPE OF ACTIVITY
1416-1423	<C1 x-ray flare, Max 1423 (S16W40)
1418-1543	Radio, Type IN, IMP 1, HARV
1450-1452	Radio, Type III GG, IMP 1, HARV
1451-1511	2800 MHz Burst, 2.0 F.U., OTTA
1515-1525	2800 MHz Burst, 1.0 F.U., OTTA
1515-1545	Dark surge on disk (N03W14)
1526-1528	Radio, Type III G, IMP 3, HARV
1600-1613	2800 MHz Burst, 1.0 F.U., OTTA
1608-1610	Radio, Type III GG, IMP 2, HARV

RADIO SPECTRAL COVERAGE

1216-2109	SGMR
1400-2400	BOUL
1416-2340	HARV

ATM-WLC COVERAGE

357/1335-1412	C	#27033-27071
357/1628-1634	S	27072-27083
357/1911-2131	Comet observations (not sun CTR)	
358/0143-0149	S	27159-27170
358/0153-0159	S	27171-27182

CME! II-140

DOY: 359

DATE: 25 December 1973

Time first observed: 0746

Time of last previous observation: 0559

Position: 250

Description: Growing streamer 4.5 R_o to 5.5 R_o.

TIME

TYPE OF ACTIVITY

0535	Radio, Type III B, IMP 1, CULG
0713-0714	Radio, Type III G, IMP 1, CULG
0732.5-0737	2695 MHz Burst, 4 F.U., CRON
0708-0716	1F flare, (S17W64)

RADIO SPECTRAL COVERAGE

0220-0731 CULG

ATM-WLC COVERAGE

359/0553-0559	S	#27789-27800
359/0746-0752	S	27801-27812
359/1148-1154	S	27813-27824

DOY: 361

DATE: 27 December 1973

Time first observed: 0119

Time of last previous observation: 0059

Position: 270

Description: Bright tongue appears in streamer out to 3 R_o. Moving very slowly,
if at all.

TIME	TYPE OF ACTIVITY
360/2331-2341	< C1 X-ray Flare, Max 2333 (S17W62)
0000-0735	Radio, Type III N, IMP 1, CULG
0035-0054	Bright Surge on Disk (S22W71)
0042-0042.5	Radio, Type III G, IMP 1, CULG

RADIO SPECTRAL COVERAGE

0000-0638 CULG

ATM-WLC COVERAGE

361/0058-0059	C	#28077-28079
361/0119-0125	S	28080-28091
361/0149-0151	C	28092-28094
361/0237-0243	S	28095-28106

DOY: 001

DATE: 1 January 1974

Time first observed: 0213

Time of last previous observation: 365/2039

Position: 230

Description: Ray narrow at base diverges upward.

TIME

TYPE OF ACTIVITY

NO ACTIVITY REPORTED

RADIO SPECTRAL COVERAGE

0000-0735 CULG

ATM-WLC COVERAGE

365/2033-2039	S	#30010-30021
001/0213-0219	S	30022-30033
001/0220-0226	S	30034-30045

DOY: 002

DATE: 2 January 1974

Time first observed: 0131

Time of last previous observation: 001/2002

Position: 230

Description: Ray narrow at base diverges upward.

TIME

TYPE OF ACTIVITY

0112.5-0114.5

Radio, Type III/G,V, IMP 1, 'CULG

RADIO SPECTRAL COVERAGE

0000-0735 CULG

ATM-WLC COVERAGE

001/1956-2002 S #30232-30243

Comet Observations (not sun-centered)

002/0131-0137 S 30274-30285

002/0140-0146 S 30286-30297

002/0148-0200 C 30298-30318

002/0743-0749 S 30319-30330

DOY: 002DATE: 2 January 1974Time first observed: 0743 Time of last previous observation: 0200Position: 90

Description: Large streamer increases in intensity, changes shape as transient moves through it; "Event" takes 18 hours.

TIME

TYPE OF ACTIVITY

0705-0900

Active Dark Filament, IMP 1, (S18E06)

RADIO SPECTRAL COVERAGE

0000-0735 CULG

ATM-WLC COVERAGE

002/0148-0200	C	#30298-30318
002/0743/0749	S	30319-30330
002/0916-0922	S	30331-30342
002/1056-1102	S	30343-30354
002/1528-1534	S	30355-30366

CME!

DOY: 003

DATE: 3 January 1974

Time first observed: 0048

Time of last previous observation: 002/2148

Position: 225

Description: Clouds of diffuse material in SW, looks far from limb

TIME

TYPE OF ACTIVITY

0045-0125

Active Prominence Region, IMP 1, (N26E90)
(Wrong limb)

RADIO SPECTRAL COVERAGE

002/1416-2348	HARV
002/1430-2400	BOUL
002/2036-003/0736	CULG

ATM-WLC COVERAGE

002/2142-2148	S	#30418-30429
003/0048-0054	S	30430-30441
003/0057-0103	S	30442-30453
003/0103-0110	C	30454-30468
003/0137-0138	C	30469-30471
003-0834-0840	S	30472-30483

DOY: 003DATE: 3 January 1974Time first observed: 1314Time of last previous observation: 1211Position: 75Description: Appearance of sharp ray, very diffuse within an hour.

TIME

TYPE OF ACTIVITY

1130-1215

Eruptive Prominence (N08W90)' (wrong limb)

RADIO SPECTRAL COVERAGE

0810-1447 WEIS

1218-2117 SGMR

ATM-WLC COVERAGE

003/1210-1211 C #30496-30498

003/1314-1320 S 30499-30510

003/1324-1330 S 30511-30522

DOY: 004 DATE: 4 January 1974Time first observed: 2055 Time of last previous observation: 1711Position: 100Description: Very subtle changes, diffuse loops visible.

TIME

TYPE OF ACTIVITY

0543.5-0551

Radio, UNCLF,

RADIO SPECTRAL COVERAGE

0000-0737 CULG

ATM-WLC COVERAGE

004/1711-1716	C	#30778-30780
004/2055-2100	S	30781-30792
004/2200-2205	S	30793-30804
005/0709-0715	S	#30857-30868
005/0715-0721	S	30869-30880
005/1021-1027	S	30881-30891

DOY: 010

DATE: 10 January 1974

Time first observed: 1138

Time of last previous observation: 1006

Position: 90

Description: Narrow transient at 3.5 R₀, moving fast.

TIME	TYPE OF ACTIVITY
0930-0934	SN Flare, Max 0934 (S17E88)
0935-0955	Spray (S20E90)
0935-1015	Loop Prominence System (S16E90)
0938-1005	Bright Surge on Disk (S18E85)
1108-1110	2695 MHz Burst, 3.0 F.U., CANR

RADIO SPECTRAL COVERAGE

0734-1520 WEIS

ATM-WLC COVERAGE

010/1000-1006	S	#31597-31608
010/1138-1144	S	31609-31620
010/1330-1336	S	31621-31632

CME!

DOY: 012

DATE: 12 January 1974

Time first observed: 1144

Time of last previous observation: 1019

Position: 120

Description: Large transient moving out streams at 4.0 R_o.

TIME	TYPE OF ACTIVITY
1015.3-1016.3	Radio, Type III G, WEIS
1028-1032	2695 MHz Burst, 65.0 F.U., CANR
1028-1045	1N Flare, Max 1033 (S19E80)
1029.7-1032.2	Radio, Type III GG, WEIS
1032.2-1032.6	Radio, Type III G, WEIS
1108.6-1108.8	Radio, Type III G, WEIS

RADIO SPECTRAL COVERAGE

0755-1520 WEIS

ATM-WLC COVERAGE

012/1013-1019	S	#31909-31920
1144-1150	S	31921-31932
1151-1157	C	31933-31945
1157-1208	C	31946-31974
1201-1247	C	31975-32062

DOY: 012DATE: 12 January 1974Time first observed: 1927Time of last previous observation: 1540Position: 95Description: Some restructuring in streamer, new ray forms at 2100 UT(out to 4 R_o).

TIME	TYPE OF ACTIVITY
1819-1821	Radio, Type III G,U, V, IMP 3, HARV
1837-1838	Radio, Type III G, IMP 2, HARV
1837-1839.5	2800 MHz Burst, 2.6 F.U., OTTA
2052.5-2054	2800 MHz Burst, 6.4 F.U., OTTA
2052.5-2055.5	Radio, Type III GG; U, V, IMP 3, CULG

RADIO SPECTRAL COVERAGE

1217-2127	SGMR
1416-2353	HARV
1430-2400	BOUL
2040-2400	CULG

ATM-WLC COVERAGE

012/1534-1540	S	#32275-32286
012/1927-1932	S	32287-32298
012/2100-2101	C	32299-32301
013/0006-0012	S	32302-32313

DOY: 13

DATE: 13 January

Time first observed: 0627

Time of last previous observation: 0035

Position: 70°

Description: Start of slow moving, amorphous, helmet-like structure which takes
~ 1 1/2 days to become a fan-like structure. May be associated with
13 January, 0928 event.

TIME

TYPE OF ACTIVITY

RADIO SPECTRAL COVERAGE

ATM-WLC COVERAGE

13/0035-0040	S	#32341
13/0627-0632	S	32353
13/0750-0755	S	32365

DOY: 013

DATE: 13 January 1974

Time first observed: 0928

Time of last previous observation: 0756

Position: 75

Description: Restructuring of existing streamer, large indentation in streamer at 3 R₀.

TIME	TYPE OF ACTIVITY
0727-0734	Radio, Type III G,W
0900-1300	Active Surge Region (S13E87)

RADIO SPECTRAL COVERAGE

0000-0743 CULG
 0745-1520 WEIS

ATM-WLC COVERAGE

013/0750-0756 S #32365-32376
 013/0928-0934 S 32377-32388
 013/1126-1132 S 32389-32400
 013/1258-1304 S 32401-32412
 013/1406-1412 S 32413-32424

DOY: 015DATE: 15 January 1974Time first observed: 0636Time of last previous observation: 0056Position: 100Description: A decrease in intensity, or a void, occurs between two streamers.

<u>TIME</u>	<u>TYPE OF ACTIVITY</u>
0534.5-0537	Radio, Type III GG,U,V, IMP 2, CULG
0541-0543	Radio, Type III G,U, IMP 1, CULG
0552-0741	Radio, Type IS, IMP 1, CULG
0619-0628	Eruptive Prominence (N10W90)(Wrong Limb)
0619-0633	Spray (N08W90)

I question this event, may be due to rotation over 6 hours.

RADIO SPECTRAL COVERAGE

0349-0741 CULG

ATM-WLC COVERAGE

015/0050-0056	S	#32760-32771
015/0636-0642	S	32772-32783
015/0805-0811	S	32784-32795

CME!

DOY: 015

DATE: 15 January 1974

Time first observed: 1132

Time of last previous observation: 1004

Position: 270

Description: Large bright loops at 2.5 and 3.0 R₀ moving very rapidly.

TIME	TYPE OF ACTIVITY
0951.5-0954	2695 MHz Burst, 3.0 F.U., CANR
1028-1241	Active Prominence Region (N10W90)
1047-1307	2695 MHz Burst, 4.1 F.U., CANR
1050-1124	1N Flare, Max 1056 (N07W88)
1052-1130	Eruptive Prominence (N07W90)
	SPY

RADIO SPECTRAL COVERAGE

No Coverage

ATM-WLC COVERAGE

015/0958-1004	S	#32796-32807
015/1132-1138	S	32808-32819
015/1146-1152	S	32820-32831
015/1246-1252	S	32832-32843
015/1257	S	32844
015/1257-1303	S	32845-32856
015/1304-1311	C	32857-32873

CME!

DOY: 016

DATE: 16 January 1974

Time first observed: 0730

Time of last previous observation: 0601

Position: 280

Description: Very rapidly moving transient at edge of FOV.

TIME	TYPE OF ACTIVITY
0000-0732	Radio, Type IS, IMP 1, CULG
0000-0732	Radio, Type III S, IMP 1, CULG
0628-0900	Active Surge Region (N07W90)
0629-0632.5	2695 MHz Burst, 6 F.U., CRON
0636-0655	Radio, Type II H, IMP 1, CULG
0706-0707	Radio, UNCLF, IMP 1, CULG
0730-0745	Active Prominence Region (N06W90)

RADIO SPECTRAL COVERAGE

0000-0732 CULG

ATM-WLC COVERAGE

016/0555-0601	S	#33067-33078
016/0730-0736	S	33079-33090
016/0915-0921	S	33091-33102

DOY: 016

DATE: 16 January 1974

Time first observed: 1054

Time of last previous observation: 0921

Position: 275

Description: Some restructuring of streamers; could be foot-point of previous transient moving southward and filling with material.

TIME	TYPE OF ACTIVITY
------	------------------

0932-1005 < C1 X-ray Flare, Max 0942 (N13W42)

RADIO SPECTRAL COVERAGE

No Coverage

ATM-WLC COVERAGE

016/0915-0921	S	#33091-33102
016/1054-1100	S	33103-33114
016/1207-1213	S	33115-33126
016/1216-1222	S	33127-33138

CME!

DOY: 017DATE: 17 January 1974Time first observed: 1943Time of last previous observation: 1916Position: 280Description: Transient with diffuse loops at 2.5 R₀ and bright tongue at 2.0 R₀.

TIME	TYPE OF ACTIVITY
1515-1805	Radio, CONT, IMP 1, BOUL
1701-1926	Radio, Type III N, IMP 1, HARV
1925-1936	Spray (N03W90)
1925-1945	Eruptive Prominence (N07W90)
1931-1948	Radio, Type II, IMP 1, HARV
1933.4-1935.7	Radio, Type III, IMP 2, BOUL
1936.7-1948.5	Radio, Type II, IMP 2, BOUL

RADIO SPECTRAL COVERAGE

1215-2133	SGMR
1400-2400	BOUL
1416-2355	HARV

ATM-WLC COVERAGE

017/1915-1916	C	#33402-33404
017/1943	S	33405
017/1943-2026	C,S,C	33406-33497
	S,C	
017/2028-2034	C	33498-33523
017/2038-2056	C,S	33524-33560
017/2058-2153	C,S,C	33561-33677
017/2224-2226	C	33678-33682
017/2317-2318	C	33683-33685

DOY: 018

DATE: 18 January 1974

Time first observed: 1227

Time of last previous observation: 0931

Position: 80

Description: Very narrow ray suddenly becomes divergent.

TIME

TYPE OF ACTIVITY

1100-1300

Active Filament System (S14E22)

1115-1300

Active Filament System (S13W46)

RADIO SPECTRAL COVERAGE

0740-1343 WEIS

1214-2134 SGMR

ATM-WLC COVERAGE

018/0925-0931 S #33761-33772

018/1227-1233 S 33773-33784

018/1404-1410 S 33785-33796

DOY: 019DATE: 19 January 1974Time first observed: 1758Time of last previous observation: 1627Position: 275

Description: Narrow streamer becomes more intense and rays on either side
vanish.

TIME	TYPE OF ACTIVITY
1647-1651	< C1 X-ray Flare, Max 1647 (S18W19)
1721-1722	Radio, Type III G,U, IMP 1, HARV
1731-1733	2695 MHz Burst, 5.0 F.U., CANR
1730-1741	< C1 X-ray Flare, Max 1734 (N06W19)

RADIO SPECTRAL COVERAGE

1213-2135	SGMR
1400-2400	BOUL
1416-2357	HARV

ATM-WLC COVERAGE

019/1626-1627	C	#33985-33987
019/1758-1759	C	33988-33990
019/1932-1933	C	33991-33994

CME! II-159

DOY: 021

DATE: 21 January 1974

Time first observed: 0720

Time of last previous observation: 0133

Position: 255

Description: Large transient moves out helmet streamer, very spectacular.

TIME

TYPE OF ACTIVITY

0711.5

Radio, Type III B, IMP 1, CULG
APR SW 18-30 to .09 R active since 0900, DOY 20

RADIO SPECTRAL COVERAGE

0000-0743 CULG

ATM-WLC COVERAGE

021/0126-0133	C	#34127-34141
021/0720-0726	S	34142-34153
021/1027-1033	S	34154-34165
021/1202-1209	S	34166-34177
021/1211-1217	S	34178-34189
021/1222-1229	C	34190-34204
021/1234-1235	C	34205-34207
021/1335-1336	C	34208-34210
021/1507-1508	C	34211-34213

DOY: 022DATE: 22 January 1974Time first observed: 1151 Time of last previous observation: 1032Position: 275Description: Appearance of faint ray, becomes diffuse in several hours.

TIME	TYPE OF ACTIVITY
1100-1116	C1 X-ray Flare, Max 1106 (N07W57)

RADIO SPECTRAL COVERAGE

0738-1531 WEIS

ATM-WLC COVERAGE

022/1026-1032	S	#34272-34283
022/1151-1157	S	34284-34295
022/1204-1211	C	34296-34310
022/1307-1308	C	34311-34313
022/1426-1427	C	34314-34316

DOY: 024

DATE: 24 January 1974

Time first observed: 1202

Time of last previous observation: 1155

Position: 230

Description: Restructuring of streamer causing curved rays. Major event at 1309;
may have started as early as 0544 or 0900.

TIME

TYPE OF ACTIVITY

1032-1300

Active Surge Region (N07W90)

RADIO SPECTRAL COVERAGE

1210-2141 SGMR

ATM-WLC COVERAGE

024/1149-1155 S #34530-34541

024/1202-1209 C 34542-34556

024/1309-1315 S 34557-34568

DOY: 025DATE: 25 January 1974Time first observed: 0647Time of last previous observation: 0027Position: 250Description: SW streamer increase in intensity possible aftermath of transientCould be due to rotation; material added to streamer.TIMETYPE OF ACTIVITY

0412-0423

Active Surge Region (N04W90)

RADIO SPECTRAL COVERAGE

0000-0745 CULG

ATM-WLC COVERAGE

025/0026-0027 C #34653-34655

025/0647-0653 S 34656-34667

025/1222-1228 S 34668-34679

DOY: 025DATE: 25 January 1974Time first observed: 1222Time of last previous observation: 0653Position: 90Description: Slight bulge in streamer at 3 R₀.

TIME

TYPE OF ACTIVITY

1125-1245

Active Prominence Region (S12W90) (Wrong Limb)

1141-1220

Active Surge Region (S17W85) (Wrong Limb)

RADIO SPECTRAL COVERAGE

0808-1325

WEIS

ATM-WLC COVERAGE

025/0647-0653

S

#34656-34667

025/1222-1228

S

34668-34679

025/1230-1236

S

34680-34691

025/1237-1245

C

34692-34708

025/1259-1300

C

34712-34714

025/1841-1846

S

34715-34726

DOY: 025

DATE: 25 January 1974

Time first observed: 1841

Time of last previous observation: 1300

Position: 310

Description: Restructuring in streamer may be caused by transient.

Very slow, could be rotation.

TIME	TYPE OF ACTIVITY
025/1735-026/0304	Active Prominence Region (S22W90)
025/1845-026/0302	Active Prominence Region (S30W90)

RADIO SPECTRAL COVERAGE

1209-2143	SGMR
1400-2400	BOUL
1404-2400	HARV

ATM-WLC COVERAGE

025/1259-1300	C	#34712-34714
025/1841-1846	S	34715-34726
025/2012-2013	C	34727-34729
025/2142-2143	C	34730

DOY: 030DATE: 30 January 1974Time first observed: 1232Time of last previous observation: 1231Position: 120Description: Verily visible transient at 2 R₀.

TIME

TYPE OF ACTIVITY

No Activity Reported

RADIO SPECTRAL COVERAGE

0736-1546 WEIS

1204-2149 SGMR

ATM-WLC COVERAGE

030/1227-1233 C #35294-35308

030/1830-1836 S 35309-35320

030/2006-2012 S 35321-35332

B. Experiment Performance

1. Introduction

Several experiment and spacecraft problems occurred during the Skylab mission, some resulted in degraded data and others had little or no effect on experiment operations. All anomalies concerning the S-052 experiment are discussed below, and any corrections to housekeeping data are presented as required.

One spacecraft problem that has continuing effect on data analysis is the lack of precise spacecraft roll information. An addendum to this report is the BBRC report on measurements of spacecraft roll from stars in the S-052 field of view. For analysis of coronal data, measurement of star positions remains the optimum source of roll information.

2. Experiment Anomalies

a. Operate Light - On DOY 150 and DOY 151, the crew reported that the S-052 operate light went off for short periods. This condition repeated periodically during the first camera load. The cause of these anomalies was not determined, and except for continued discrepancy between ground accounting of frames remaining and the crew's on-board frames remaining count, there was no significant impact determined for instrument operation.

b. Partial Frame Advances - Approximately 100 partial frame advances were observed near the beginning of the developed film for each of the first two film camera loads. This resulted in the overlapping of approximately 0.5 percent of the frames exposed.