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ENVIRONMENTAL DATA SERVICE
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Solar - Geophysical Data

NO. 405 MAY 1978

Part II (Comprehensive Reports)

DATA FOR
NOVEMBER 1977
OCTOBER 1977
& MISCELLANEA

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
BOULDER, COLORADO

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SOLAR-GEOPHYSICAL DATA

No. 405

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Director
Solar-Terrestrial Data Services Division

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----- = no data available.
blank = data not yet received.

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ACTIVE REGIONS

CARRINGTON ROTATION 1661

(October 27 - November 24, 1977)

Region No.	Coordinates Lat.	Coordinates Long.	Age at CMP	Imp.	Spot-less Region	Region No. in Rotation 1660	Activity at West Limb
1	19°N	352°	>6	1	x		dispersed
2	17 N	351	>6	1	x		disappeared
3	18 S	346	-1	1	x		stable
4	17 S	341	+2	1	x		decreasing
5	21 N	330	>6	1	x		decreasing
6	32 N	328	>6	1	x	(2)	decreasing
7	32 N	328	+3	2			decreasing
8	22 N	300	>6	1	x	(5)	dispersed
9	21 N	297	>6	1	x	(6)	dispersed
10	23 S	269	>6	3			decreasing
11	20 N	252	>6	3			decreasing
12	20 N	241	0	1	x		disappeared
13	9 N	212	>6	1	x		decreasing
14	20 N	206	>6	1	x	(11 + 12)	dispersed
15	8 N	202	>6	1	x	(13)	decreasing
16	26 S	189	-4	1	x		increasing
17	26 N	167	>6	1	x	(18)	dispersed
18	21 N	150	>6	1	x	(20)	decreasing
19	23 S	147	+5	2			decreasing
20	30 N	137	>6	1	x		dispersed
21	24 N	136	>6	2		(21)	decreasing
22	25 S	135	-1	1	x		dispersed
23	13 N	103	-3	1	x		decreasing
24	27 N	103	>6	1	x		dispersed
25	6 N	99	-2	1	x		disappeared
26	13 N	90	-4	1	x		stable
27	25 S	80	>6	1	x	(29)	dispersed
28	38 N	76	>6	2			decreasing
29	27 S	66	0	1	x		dispersed
30	24 N	63	+4	4			decreasing
31	31 N	63	+5	1	x		disappeared
32	22 N	53	>6	1	x		dispersed
33	18 S	46	>6	2			dispersed
34	22 N	41	>6	1	x		dispersed
35	25 S	38	+4	1	x		disappeared
36	15 N	35	-3	1	x		decreasing
37	15 N	29	>6	2			decreasing
38	25 N	27	-1	2			decreasing
39	31 N	18	>6	1	x		decreasing

ACTIVE REGIONS

CARRINGTON ROTATION 1662

(November 24 - December 21, 1977)

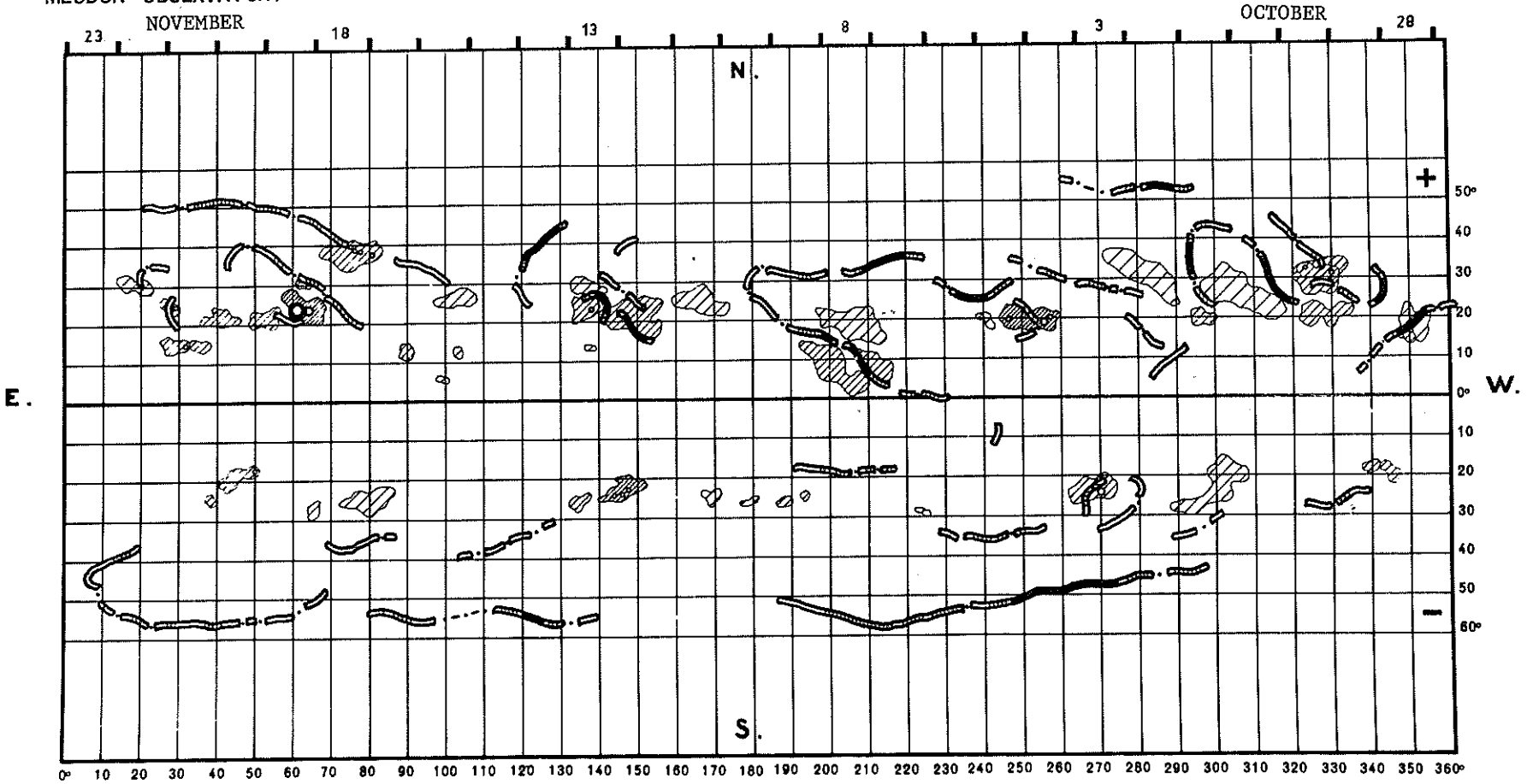
Region No.	Coordinates Lat.	Coordinates Long.	Age at CMP	Imp.	Spot-less Region	Region No. in Rotation 1661	Activity at West Limb
1	35°N	318°	>6	1	x		dispersed
2	34 N	312	>6	1	x		dispersed
3	15 N	285	0	2			increasing
4	3 N	252	+4	1	x		disappeared
5	20 N	252	>6	1	x	(11)	decreasing
6	13 N	251	-2	2			stable
7	17 S	227	-3	1	x		stable
8	17 N	226	0	2			decreasing
9	8 N	221	>6	1	x	(13)	decreasing
10	19 N	213	>6	1	x	(14)	dispersed
11	10 N	206	>6	1	x	(15)	decreasing
12	19 S	202	>6	4			decreasing
13	24 S	189	>6	2			decreasing
14	18 N	187	+6	1	x		dispersed
15	28 N	168	>6	1	x		dispersed
16	2 N	160	-1	1	x		dispersed
17	25 N	155	>6	1	x	(17)	dispersed
18	25 S	143	>6	1	x	(19)	disappeared
19	25 S	134	>6	5			decreasing
20	23 N	109	-5	1	x		(?)
21	24 N	89	+6	3			decreasing
22	23 S	84	+2	1	x		disappeared
23	22 S	69	>6	1	x		dispersed
24	28 S	61	>6	1	x		decreasing
25	24 S	60	+1	2			decreasing
26	25 N	56	>6	1	x	(30)	dispersed
27	37 N	53	>6	1	x		dispersed
28	16 N	45	>6	2			decreasing
29	16 N	34	>6	1	x	(36+37)	decreasing
30	13 S	23	+3	1	x		dispersed
31	20 N	17	0	1	x		disappeared

SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1661

OCTOBER 27 TO NOVEMBER 24, 1977

MEUDON OBSERVATORY

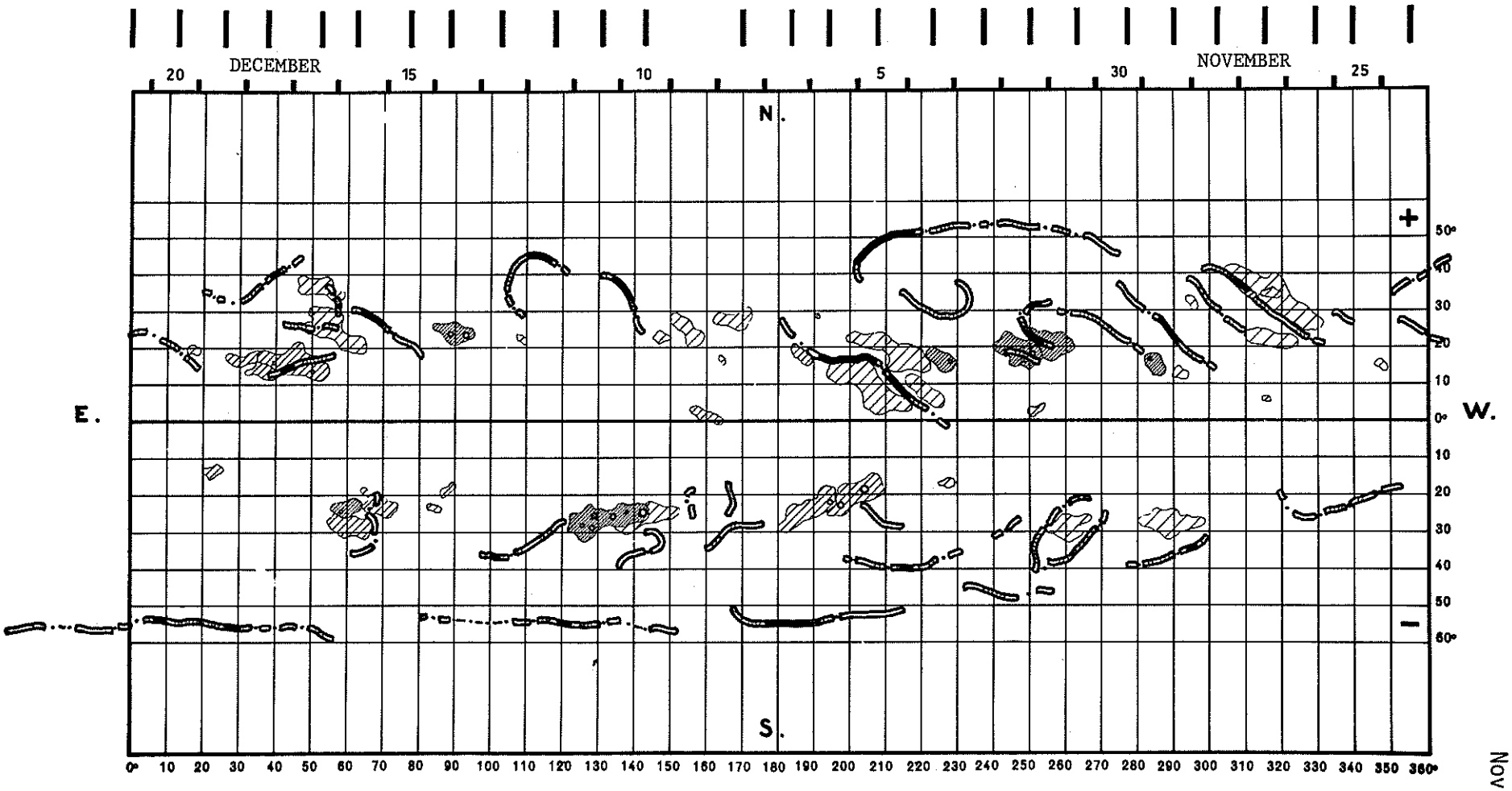


SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1662

NOVEMBER 24 TO DECEMBER 21, 1977

MEUDON OBSERVATORY



NOV 77

Hα SOLAR FLARES

NOVEMBER 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE NOV	START	MAX PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		COND	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	01	1515	1619	NO FLARE PATROL														
	01	1651	1659	NO FLARE PATROL														
	01	1714	1800	NO FLARE PATROL														
	01	1803	1823	NO FLARE PATROL														
	01	1824	1839	NO FLARE PATROL														
	01	1847	1944	NO FLARE PATROL														
	01	1947	2023	NO FLARE PATROL														
	01	2109	2114	NO FLARE PATROL														
975 CULG	01	2207	2212	2228	S24	E20	.566	15016	3.4	21	-F		C	2212	20	.2		Y5
GRP64976	02	0031+1	0032+1	0050	S24	E19	.557	15016	3.4	19	-N				30	.4	DJ	
CULG	02	0031	0033	0100	S24	E20	.564	15016	3.5	29	-F		C	0033	30	.3		
VORO	02	0032	0032	0039	S24	E18	.549	15016	3.4	7	-B		C	0032	27	.3	DJ	
977 VORO	02	0204	0209	0222	S24	E18	.549	15016	3.4	18	-N		C	0209	54	.6	DH	Y5
978 CULG	02	0336	0340	0356	S25	E18	.561	15016	3.5	20	-F		C	0340	15	.2		Y5
979 MONT	02	0828	0832	0838	S25	E14	.534	15016	3.4	10	-F		C	0832	40		E	Y5
980 MONT	02	0849	0851	0855	N31	W40	.721	15008	30.4	6	-F		C	0851	40		D	Y5
	02	1145	1155	NO FLARE PATROL														
	02	1257	1300	NO FLARE PATROL														
	02	1320	1322	NO FLARE PATROL														
	02	1408	1452	NO FLARE PATROL														
	02	1458	1508	NO FLARE PATROL														
	02	1510	1525	NO FLARE PATROL														
	02	1540	1548	NO FLARE PATROL														
	02	2134	2147	NO FLARE PATROL														
	02	2213	2223	NO FLARE PATROL														
	02	2230	2233	NO FLARE PATROL														
	03	0536	0552	NO FLARE PATROL														
GRP64981	03	1219+1	1227+2	1240	N20	E20	.424	15017	5.0	21	-F						E	
MONT	03	1219	1229	1240	N20	E20	.424	15017	5.0	21	-F		C	1229	60		E	
KANZ	03	1220	1227	1239	N20	E20	.424	15017	5.0	19	-F						E	
	03	1525	2019	NO FLARE PATROL														
	03	2020	2034	NO FLARE PATROL														
982 CULG	03	2255	2302	2310	N30	W63	.903	15008	30.2	15	-F		C	2302	50			Y5
	04	0141	0142	NO FLARE PATROL														
	04	0243	0248	NO FLARE PATROL														
	04	0329	0340	NO FLARE PATROL														
983 KANZ	04	0949	0956	1003	N22	E05	.318	15017	4.8	14	-F						D	Y5
984 KANZ	04	1014	1022	1028	N22	E05	.318	15017	4.8	14	-F							Y5
	04	1304	1310	NO FLARE PATROL														
	04	1350	1405	NO FLARE PATROL														
	04	1410	1412	NO FLARE PATROL														
	04	1418	1420	NO FLARE PATROL														
	04	1440	1455	NO FLARE PATROL														
	04	1510	1718	NO FLARE PATROL														
	04	1837	2030	NO FLARE PATROL														
	05	0114	0122	NO FLARE PATROL														
	05	0552	0605	NO FLARE PATROL														
985 HTPR	05	0736	0741	0750	S24	W18	.545	15016	4.0	14	-F		C	0741	10	.1		Y5
986 HTPR	05	1229	1235	1241	S24	W21	.569	15016	3.9	12	-F		C	1235	10	.1		Y5
987 HTPR	05	1425	1428	1434	N20	W07	.299	15017	5.1	9	-F		C	1428	20	.2		Y5
	05	1529	1540	NO FLARE PATROL														
	05	1541	1829	NO FLARE PATROL														
	05	1854	2003	NO FLARE PATROL														
	05	2130	2144	NO FLARE PATROL														
	05	2159	2226	NO FLARE PATROL														
	06	1508	1732	NO FLARE PATROL														
	06	1740	1824	NO FLARE PATROL														
988 PALE	06	1921	1922	1946	N22	E64	.902	15024	11.6	25	-N	3	V		35		U F	Y5

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	07	0301	0309	NO FLARE PATROL														
	07	0322	0327	NO FLARE PATROL														
GRP64989	07	0531	0607	0830D	S23	W45	.782	15016	3.9	179	1N						U	
CULG	07	0531	0607	0718D	S24	W45	.786	15016	3.9	107D	1N		C	0607	200	3.2	U	
CATA	07	0705E	0705	0830D	S23	W45	.782	15016	3.9	85D	1N	2		0705	252	4.1		
	07	1515	1709	NO FLARE PATROL														
	07	2058	2059	NO FLARE PATROL														
	07	2105	2111	NO FLARE PATROL														
990 CULG	07	2355	2401	0008	N25	W36	.651	15017	5.3	13	-F		C	2401	60	.8	L	Y5
	08	0139	0144	NO FLARE PATROL														
	08	0157	0245	NO FLARE PATROL														
	08	0300	0309	NO FLARE PATROL														
991 CULG	08	0451	0456	0523	S23	E64	.926	15026	13.0	32	-N		C	0456	70			Y5
	08	0649	0701	NO FLARE PATROL														
	08	0725	0732	NO FLARE PATROL														
GRP64992	08	1057+4	1105+1	1118	N22	W50	.786	15017	4.7	21	1N				180	3.0	H	
LVOV	08	1057	1105	1121	N21	W49	.773	15017	4.8	24	1F		C	1105	150	2.6		
MONT	08	1058	1106	1118	N23	W51	.793	15017	4.6	20	1N		C	1106	220		H	
KANZ	08	1101	1105	1112	N21	W51	.793	15017	4.6	11	1N							
	08	1544	1957	NO FLARE PATROL														
993 CULG	08	2039	2042	2045	N22	W57	.849	15017	4.6	6	-F		C	2042	40	.8		Y5
994 CULG	08	2050	2053	2100	N21	W55	.830	15017	4.7	10	-F		C	2053	30	.6		Y5
995 CULG	08	2256	2300	2310	N21	W59	.864	15017	4.5	14	-N		C	2300	30	.6		Y5
996 CULG	08	2335	2340	2343	N22	W59	.866	15017	4.6	8	-N		C	2340	60	1.2		Y5
997 CULG	09	0046	0110	0140	N22	W53	.815	15017	5.1	54	-N		C	0110	60	1.0	L	Y5
998 CULG	09	0301	0305	0312	N22	W59	.866	15017	4.7	11	-F		C	0305	20	.4		Y5
999 CULG	09	0339	0402	0440	N24	E60	.877	15017	13.7	61	-N		C	0402	40	1.2	F	Y5
0 CULG	09	0347	0424U	0445	N18	W63	.893	15017	4.4	58	-F		C	0424	15	.3		Y5
	09	0700	0705	NO FLARE PATROL														
	09	0725	0747	NO FLARE PATROL														
1 MONT	09	0847	0852	0903	S23	E48	.807	15026	13.0	16	-F		C	0852	40		E	Y5
	09	0941	0950	NO FLARE PATROL														
2 MONT	09	1124	1129	1149	S25	E48	.815	15026	13.1	25	-F		C	1129	20		D	Y5
	09	1420	1845	NO FLARE PATROL														
	09	2109	2220	NO FLARE PATROL														
	10	0215	0227	NO FLARE PATROL														
	10	0316	0350	NO FLARE PATROL														
GRP65003	10	0834	0847+3	0918	N25	E18	.464	15024	11.7	44	-F				45	.5	E	
HTPR	10	0834	0847	0918	N25	E17	.455	15024	11.6	44	-F		C	0847	30	.3	E	
CATA	10	0845E	0850	0900D	N25	E19	.474	15024	11.8	15D	-N	2		0850	56	.6		
	10	1557	1954	NO FLARE PATROL														
4 PALE	10	1754	1754	1759	S22	E30	.627	15026	13.0	5	-F	3	C		26		DE	Y5
GRP65005	10	2057	2124+1	2135	S22	E26	.587	15026	12.8	38	-F				40	.5		
PALE	10	2057	2124	2125	S22	E27	.597	15026	12.9	28	-N	3	C		45			
CULG	10	2123E	2125	2145	S22	E26	.587	15026	12.8	22D	-F		P	2125	30	.4		
	10	2116	2123	NO FLARE PATROL														
6 KANZ	11	1004	1020	1024	N37	E86	.996	15028	17.9	20	-F							Y5
7 KANZ	11	1159	1206	1210	N37	E86	.996	15028	17.9	11	-F							Y5

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GRP65008	11	1235+0	1239+2	1309	N25	E02	.371	15024	11.7	34	1N						GU	
ZURI	11	1235	1239	1311	N25	E02	.371	15024	11.7	36	-F		C	1239	60	.7		
KANZ	11	1235	1241	1307	N26	E02	.387	15024	11.7	32	1N						G	
CATA	11	1255E	1255	1305D	N24	E02	.354	15024	11.7	10D	1N	2		1255	196	2.1	U	
9 KANZ	11	1417	1431	1434D	N23	E28	.552	15025	13.7	17D	-N							Y5
GRP65010	11	1442E		1508	N23	E30	.574	15025	13.9	26	-N						E	
HTPR	11	1442E		1505	N23	E30	.574	15025	13.9	23D	-F		C	1443	20	.2		
CATA	11	1445E	1445	1510	N22	E27	.532	15025	13.6	25D	1N	2		1445	168	2.0		
11 HTPR	11	1510	1511	1519	N20	E17	.399	15025	12.9	9	-F		C	1511	10	.1		Y5
	11	1542	1843	NO FLARE PATROL														
	11	1906	1949	NO FLARE PATROL														
GRP65012	12	0800+0	0805	0845	N25	W10	.404	15024	11.6	45	-F						E	
BUCA	12	0800		0850	N26	W10	.418	15024	11.6	50	-F		C	0815	43	.5	E	
CATA	12	0800E	0805	0840	N25	W10	.404	15024	11.6	40D	-N	1		0805	56	.6		
13 BUCA	12	0819	0824	0840	S24	E08	.474	15026	12.9	21	-N		C	0824	107	1.2		Y5
14 CATA	12	1335	1335	1345	N39	E68	.945	15028	17.7	10	-N	1		1335	28			Y5
	12	1625	1706	NO FLARE PATROL														
	12	1710	1724	NO FLARE PATROL														
	12	1740	1843	NO FLARE PATROL														
	12	1906	1916	NO FLARE PATROL														
	12	1919	1952	NO FLARE PATROL														
	13	0256	0301	NO FLARE PATROL														
15 CULG	13	0302E	0313U	0343D	N25	E08	.394	15025	13.7	41D	-F		P	0313	50	.6	F	Y5
	13	0325	0330	NO FLARE PATROL														
	13	0335	0341	NO FLARE PATROL														
	13	0347	0501	NO FLARE PATROL														
	13	0523	0545	NO FLARE PATROL														
	13	0548	0557	NO FLARE PATROL														
16 CATA	13	1030	1035	1055	N23	E05	.350	15025	13.8	25	-N	2		1035	168	1.8		Y5
17 MCMA	13	1456	1458	1501	N36	E68	.942	15028	18.7	5	-F		C	1458	15	.5	D	Y5
	13	1600	1620	NO FLARE PATROL														
18 MCMA	13	1620E		1637	N36	E67	.938	15028	18.7	17D	-N		P	1622	50	1.3	E	Y5
	13	1724	1734	NO FLARE PATROL														
	13	1954	2000	NO FLARE PATROL														
19 CULG	13	2106	2112	2117D	N23	W03	.344	15025	13.7	11D	-F		P	2112	70	.8		Y5
	14	0308	0615	NO FLARE PATROL														
	14	0631	0639	NO FLARE PATROL														
	14	0755	0757	NO FLARE PATROL														
GRP65020	14	0806+7	0814+1	0817	S20	E88	1.000	15035	20.9	11	-F						D	
KANZ	14	0806	0815	0818	S20	E87	1.000	15035	20.9	12	-F							
MONT	14	0813	0814	0816	S20	E90	1.000	15035	21.1	3	-F		C	0814	20		D	
21 MONT	14	1012	1016	1024	S20	E88	1.000	15035	21.0	12	-F		C	1016	20		D	Y5
22 MONT	14	1204	1207	1211	S20	E87	1.000	15035	21.0	7	-F		C	1207	20		D	Y5
	14	1440	1705	NO FLARE PATROL														
GRP65023	14	2005+0	2006+0	2011	S25	W68	.948	15032	9.7	6	-F				20			
PALE	14	2005	2006	2011	S25	W68	.948	15032	9.7	6	-F	3	V		23		FDE	
PALE	14	2005	2006	2011	S25	W68	.948	15032	9.7	6	-F	3	C		23		FDE	
GRP65024	14	2116+0	2117+0	2120	S25	W69	.953	15032	9.7	4	-F				20			
PALE	14	2116	2117	2120	S25	W69	.953	15032	9.7	4	-F	3	V		22		FDE	
PALE	14	2116	2117	2120	S25	W69	.953	15032	9.7	4	-F	3	C		22		FDE	
25 CULG	14	2220	2230U	2350	S25	W73	.970	15032	9.5	90	-F		C	2230	40		FJ	Y5
26 CULG	14	2318	2321	2330	S22	E74	.972	15035	20.5	12	-N		C	2321	15			Y5

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27 CULG	15	0419	0425	0440	S24	W80	.990	15032	9.2	21	1F		C	0425	60		Y5
28 CULG	15	0645	0718U	0747	S25	W85	.998	15032	8.9	62	-F		C	0718	15		Y5
GRP65029	15	0801	0804	0818	S20	E68	.942	15035	20.4	17	-N						
			0809														
HTPR	15	0801	0804	0818	S20	E68	.942	15035	20.4	17	-N		C	0804	10	.1	
HTPR	15	0801	0809	0818	S20	E68	.942	15035	20.4	17	-N		C	0804			
30 HTPR	15	0842	0847	0857	S20	E68	.942	15035	20.5	15	-F		C	0847	10	.1	Y5
GRP65031	15	0920E	0920	0930	N15	E90	1.000	15034	22.1	10	-F				50		
ZURI	15	0920E	0920	0930	N14	E90	1.000	15034	22.1	100	-F		P	0920	40		
CATA	15	0925E	0925	0930	N16	E90	1.000	15034	22.1	50	1F	1		0925	56		
	15	1056	1100	NO FLARE PATROL													
32 KANZ	15	1247	1250	1254	N37	E40	.767	15028	18.5	7	-F						D Y5
33 CATA	15	1255	1255	1300D	N24	E49	.785	15031	19.2	50	-N	2		1255	56	.9	Y5
	15	1533	1744	NO FLARE PATROL													
	15	1754	1800	NO FLARE PATROL													
	15	1935	2008	NO FLARE PATROL													
34 CULG	15	2013	2026	2037	N40	E30	.719	15028	18.1	24	-N		C	2026	120	1.8	Y5
35 CULG	15	2056	2102	2112	N40	E30	.719	15028	18.1	16	-F		C	2102	30	.4	Y5
	15	2112	2116	NO FLARE PATROL													
36 VORO	15	2312	2317	2344	S22	W42	.743	15026	12.8	32	-B		C	2317	54	.8	OJ Y5
37 CULG	16	0013	0029U	0109	N30	E33	.662	15028	18.5	56	-F		C	0029	50	.7	Y5
38 CULG	16	0705	0706	0714	N19	W48	.762	15025	12.7	9	-N		C	0706	30	.5	Y5
GRP65039	16	0739	0753	0802	S24	W45	.780	15025	12.9	23	-N				50	.8	FK
CULG	16	0739	0753U	0803D	S23	W45	.775	15025	12.9	24D	-N		P	0753	70	1.0	FK
HTPR	16	0748E		0800	S25	W46	.793	15025	12.9	12D	-N		C	0758	30	.3	
40 CATA	16	1115E	1120	1120D	S24	W90	1.000	15032	9.7	5D	1N	2		1120	56		Y5
	16	1232	1245	NO FLARE PATROL													
	16	1250	1402	NO FLARE PATROL													
	16	1439	1455	NO FLARE PATROL													
	16	1502	1741	NO FLARE PATROL													
	16	1749	1830	NO FLARE PATROL													
GRP65041	16	1856	1858	1920D	S23	W49	.811	15026	13.1	24	-F						
PALE	16	1856	1858	1920	S24	W51	.832	15026	13.0	24	-F	3	C		28		FOE
MCMA	16	1907E		1951D	S23	W48	.803	15026	13.2	44D	-N		P	1908	60	1.1	E
	16	2035	2138	NO FLARE PATROL													
	16	2140	0107	NO FLARE PATROL													
	17	0200	0235	NO FLARE PATROL													
	17	0930	0940	NO FLARE PATROL													
GRP65042	17	1100+3	1106	1145D	N22	E24	.505	15031	19.3	45	-N						
			1115														
CATA	17	1100	1115	1145D	N22	E24	.505	15031	19.3	45D	-B	1		1115	112	1.3	T
KANZ	17	1103	1106	1110	N22	E25	.516	15031	19.3	7	-F						
GRP65043	17	1215+0	1215+0	1230	N22	E23	.493	15031	19.2	15	-N				100	1.1	
CATA	17	1215	1215	1235	N22	E23	.493	15031	19.2	20	-B	2		1215	112	1.3	T
RAMY	17	1215E	1215U	1225	N23	E23	.503	15031	19.2	10D	-N	3	C		95		
	17	1545	1609	NO FLARE PATROL													
44 MCMA	17	1640	1644	1658	S23	W62	.910	15026	13.0	18	-F		C	1644	30	.8	D Y5
	17	1714	1730	NO FLARE PATROL													
	17	1733	1753	NO FLARE PATROL													
	17	1758	1826	NO FLARE PATROL													
	17	1856	1916	NO FLARE PATROL													
	17	1922	1937	NO FLARE PATROL													
	17	1952	2026	NO FLARE PATROL													

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	17	2200	2205	NO FLARE PATROL														
	17	2317	2341	NO FLARE PATROL														
	17	2351	2358	NO FLARE PATROL														
	18	0002	0006	NO FLARE PATROL														
	18	0012	0053	NO FLARE PATROL														
	18	0057	0105	NO FLARE PATROL														
	18	0118	0126	NO FLARE PATROL														
	18	0145	0152	NO FLARE PATROL														
	18	0303	0313	NO FLARE PATROL														
45 CULG	18	0433	0442U	0510	N21	E13	.381	15031	19.2	37	-F		C	0442	40	.4		Y5
46 KANZ	18	0826	0829	0845	N24	E12	.413	15031	19.3	19	-F							Y5
GRP65047	18	1154+3	1200+1	1207	N37	W01	.566	15028	18.4	13	-F						E	
KANZ	18	1154	1201	1206	N37	W01	.566	15028	18.4	12	-F							
MONT	18	1157	1200	1208	N38	W02	.581	15028	18.3	11	-F		C	1200	40		E	
	18	1427	1432	NO FLARE PATROL														
	18	1540	1726	NO FLARE PATROL														
48 HUAN	18	1726F		1732D	N20	E07	.322	15031	19.3	6D	-F	1	P	1728	20	.2	D	Y5
	18	1750	1827	NO FLARE PATROL														
	18	1841	1956	NO FLARE PATROL														
	18	2227	2241	NO FLARE PATROL														
	19	0130	0142	NO FLARE PATROL														
49 CULG	19	0146E	0155U	0223	N38	W10	.598	15028	18.3	37D	-F		C	0155	100	1.3	L	Y5
	19	0154	0200	NO FLARE PATROL														
50 KANZ	19	0857		1044	N22	W02	.337	15031	19.2	107	-F							Y5
51 KANZ	19	1036	1036	1055	N26	W01	.401	15031	19.4	19	-F							Y5
GRP65052	19	1245+3	1250+2	1257	S25	W19	.545	15030	18.1	12	-F						EG	
HTPR	19	1245	1250	1258	S26	W18	.549	15030	18.2	13	-F		C	1250	10	.1	G	
KANZ	19	1248	1252	1256	S25	W21	.561	15030	18.0	8	-F						GE	
53 KANZ	19	1424		1424D	N26	W02	.402	15031	19.5		-F						D	Y5
	19	1627	1634	NO FLARE PATROL														
	19	1952	2033	NO FLARE PATROL														
	19	2117	2225	NO FLARE PATROL														
	20	0100	0101	NO FLARE PATROL														
	20	0107	0119	NO FLARE PATROL														
54 KANZ	20	0852	0858	0906	N22	W12	.389	15031	19.5	14	-F						D	Y5
55 KANZ	20	1104	1107	1118	N24	W90	1.000	15025	13.7	14	-F						G	Y5
GRP65056	20	1132+3	1135+4	1143	N26	W14	.458	15031	19.4	11	-F						E	
HTPR	20	1132	1135	1142	N21	W13	.384	15031	19.5	10	-N		C	1135	60	.6	E	
KANZ	20	1135	1139	1143	N26	W14	.458	15031	19.4	8	-F							
KHAR	20	1135E	1135	1140D	N27	W14	.471	15031	19.4	5D	-F		P					
GRP65057	20	1213+2	1213	1229	N40	W23	.683	15028	18.8	16	-F							
KANZ	20	1213	1213	1228	N40	W24	.689	15028	18.7	15	-F							
WEND	20	1215		1229	N40	W23	.683	15028	18.8	14	-N							
GRP65058	20	1235+4		1248	N22	W15	.415	15031	19.4	13	-F							
WEND	20	1235		1249	N22	W16	.424	15031	19.3	14	-N							
KANZ	20	1239		1247	N22	W15	.415	15031	19.4	8	-F							
GRP65059	20	1308>9	1318	1334	N24	W12	.417	15031	19.6	26	-F							
KANZ	20	1308	1318	1332	N25	W15	.453	15031	19.4	24	-F							
WEND	20	1328		1335	N23	W10	.389	15031	19.8	7	-N							
60 KANZ	20	1416	1419	1426D	N26	W16	.474	15031	19.4	10D	-N							Y5
	20	1449	1703	NO FLARE PATROL														
	20	2120	2129	NO FLARE PATROL														
	20	2143	2151	NO FLARE PATROL														
	20	2152	2158	NO FLARE PATROL														
	20	2210	2215	NO FLARE PATROL														
	20	2220	2225	NO FLARE PATROL														

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OBSERVATORY	OBSERVED UT: DATE (NOV)	START	MAX. PHASE	END	LOCATION: APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	DURATION MIN.	IMPORTANCE	OBS: COND	OBS: TYPE	MEASUREMENTS: TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	REMARKS
61 CULG	21	0014	0020	0036	N25	W21	.508	15031	19.4	22	-F		C	0020	30	.3	Y5
GRP65062	21	0141	0210	0254	N22	W23	.498	15031	19.3	73	-F						
			0218														
CULG	21	0141	0210U	0300	N21	W23	.489	15031	19.3	79	-F		C	0210	60	.7	
PALE	21	0217E	0218	0247	N24	W23	.518	15031	19.4	30D	-F	3	C		48		DE
63 KANZ	21	1048		1057	N28	W28	.604	15031	19.4	9	-F						Y5
	21	1222	1459	NO FLARE PATROL													
	21	1642	1655	NO FLARE PATROL													
	21	1701	1720	NO FLARE PATROL													
	21	2101	2106	NO FLARE PATROL													
64 CULG	21	2312	2326	2337	N21	W38	.663	15031	19.1	25	-F		C	2326	15	.2	Y5
65 CULG	22	0040	0044	0115	N26	W25	.558	15033	20.2	35	-N		C	0044	30	.3	Y5
GRP65066	22	0217	0227	0304	N25	W36	.664	15031	19.4	47	-N						JL
CULG	22	0217	0227U	0302	N27	W36	.676	15031	19.4	45	-N		C	0227	30	.3	FL
VORO	22	0232E		0306	N24	W36	.658	15031	19.4	34D	1N		C	0232	179	2.4	EJL
GRP65067	22	0330+1	0334+2	0400	N25	W37	.674	15031	19.4	30	1F				190	2.6	JL
CULG	22	0330	0336	0406	N25	W36	.664	15031	19.4	36	1F		C	0336	160	2.1	
VORO	22	0331	0334	0353	N26	W39	.701	15031	19.2	22	1N		C	0334	215	2.9	JL
68 CULG	22	0424	0428	0505	N25	W36	.664	15031	19.5	41	-N		C	0428	60	.8	F Y5
GRP65069	22	0945+0	1005+5	1108	N24	W40	.700	15031	19.4	83	2B				450	6.3	EI
HTPR	22	0945	1007	1105	N23	W40	.695	15031	19.4	80	2B		C	1007	400	5.6	EI
KANZ	22	0945	1010	1110	N24	W40	.700	15031	19.4	85	2B						
CATA	22	0950E	1005	1036D	N23	W41	.706	15031	19.3	46D	2B	2		1005	505	7.3	
LOCA	22	1015E	1015	1100D	N25	W40	.705	15031	19.4	45D	2N		P	1015	652	9.5	
70 HTPR	22	1222	1223	1232	S25	W22	.565	15035	20.9	10	-F		C	1223	20	.2	Y5
	22	1530	1950	NO FLARE PATROL													
	22	2102	2108	NO FLARE PATROL													
	23	1535	2005	NO FLARE PATROL													
71 CULG	23	2007	2013	2025	N14	W21	.407	15034	22.3	18	-F		C	2013	25	.3	Y5
	23	2111	2116	NO FLARE PATROL													
	24	0318	0329	NO FLARE PATROL													
	24	0537	0542	NO FLARE PATROL													
	24	0544	0604	NO FLARE PATROL													
	24	0619	0626	NO FLARE PATROL													
GRP65072	24	0907+2	0909	0920D	N24	W64	.911	15031	19.6	13	-F						D
MONT	24	0907	0909	0920	N24	W53	.904	15031	19.7	13	-F		C	0909	20		D
KANZ	24	0909		0951	N24	W65	.917	15031	19.5	42	-F						
	24	1406	1414	NO FLARE PATROL													
	24	1419	1433	NO FLARE PATROL													
	24	1524	1727	NO FLARE PATROL													
	24	1801	2233	NO FLARE PATROL													
	25	0313	0325	NO FLARE PATROL													
	25	1914	1935	NO FLARE PATROL													
	25	1957	2005	NO FLARE PATROL													
	25	2254	2257	NO FLARE PATROL													
	26	1938	2010	NO FLARE PATROL													
73 HTPR	27	1333	1338	1346	N15	W88	.999	15034	21.0	13	-F		C	1338	20	.4	Y5
74 HTPR	27	1442	1447	1450	N26	W74	.966	15042	22.1	8	-F		C	1447	30	.7	Y5
	27	1535	1835	NO FLARE PATROL													
	27	1915	1945	NO FLARE PATROL													
	27	2204	2212	NO FLARE PATROL													
GRP65075	28	0305+0	0310+1	0331	N19	E60	.877	15044	1.6	26	-N				70	1.5	D
VORO	28	0305	0310	0321	N19	E60	.877	15044	2.6	16	-B		C	0310	90	1.9	D
CULG	28	0305	0311	0340	N19	E60	.877	15044	2.6	35	-F		C	0311	50	1.0	
76 CULG	28	0428	0431	0441	N26	W81	.989	15042	22.1	13	-F		C	0431	35		Y5
77 MONT	28	0925E	0930	0930D	N15	W90	1.000	15034	21.6	5D	-F		C	0930	20		D Y5

Hα SOLAR FLARES

NOVEMBER 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE NOV	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		COND	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
	28	0930	0940	NO FLARE PATROL													
	28	2155	2208	NO FLARE PATROL													
	28	2307	0005	NO FLARE PATROL													
	29	0230	0310	NO FLARE PATROL													
	29	0758	0813	NO FLARE PATROL													
	29	1450	1532	NO FLARE PATROL													
	29	1540	1651	NO FLARE PATROL													
	29	2021	2220	NO FLARE PATROL													
	29	2225	2240	NO FLARE PATROL													
78 MITK	30	0009	0010	0026	N19	E36	.637	15044	2.7	17	-N		C	0010	60	.8	E Y5
79 CULG	30	0337	0407	0409D	S25	E90	1.000	15049	6.9	32D	?N		P	0407	45		Y5
	IMP 1 NO		MITK1														
80 KHAR	30	0905E		0908D	S28	E85	.998	15049	6.8	3D	?N		V				Y5
	IMP 1 NO		HTPR2														
	30	1530	1555	NO FLARE PATROL													
	30	2136	2141	NO FLARE PATROL													
81 CULG	30	2310	2312	0011	S21	E65	.922	15049	5.8	61	-N		C	2312	30		Y5

"Remarks":

A = Eruptive prominence whose base is less than 90° from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

NOVEMBER 1977

DAILY FLARE INDICES
Includes all Flares

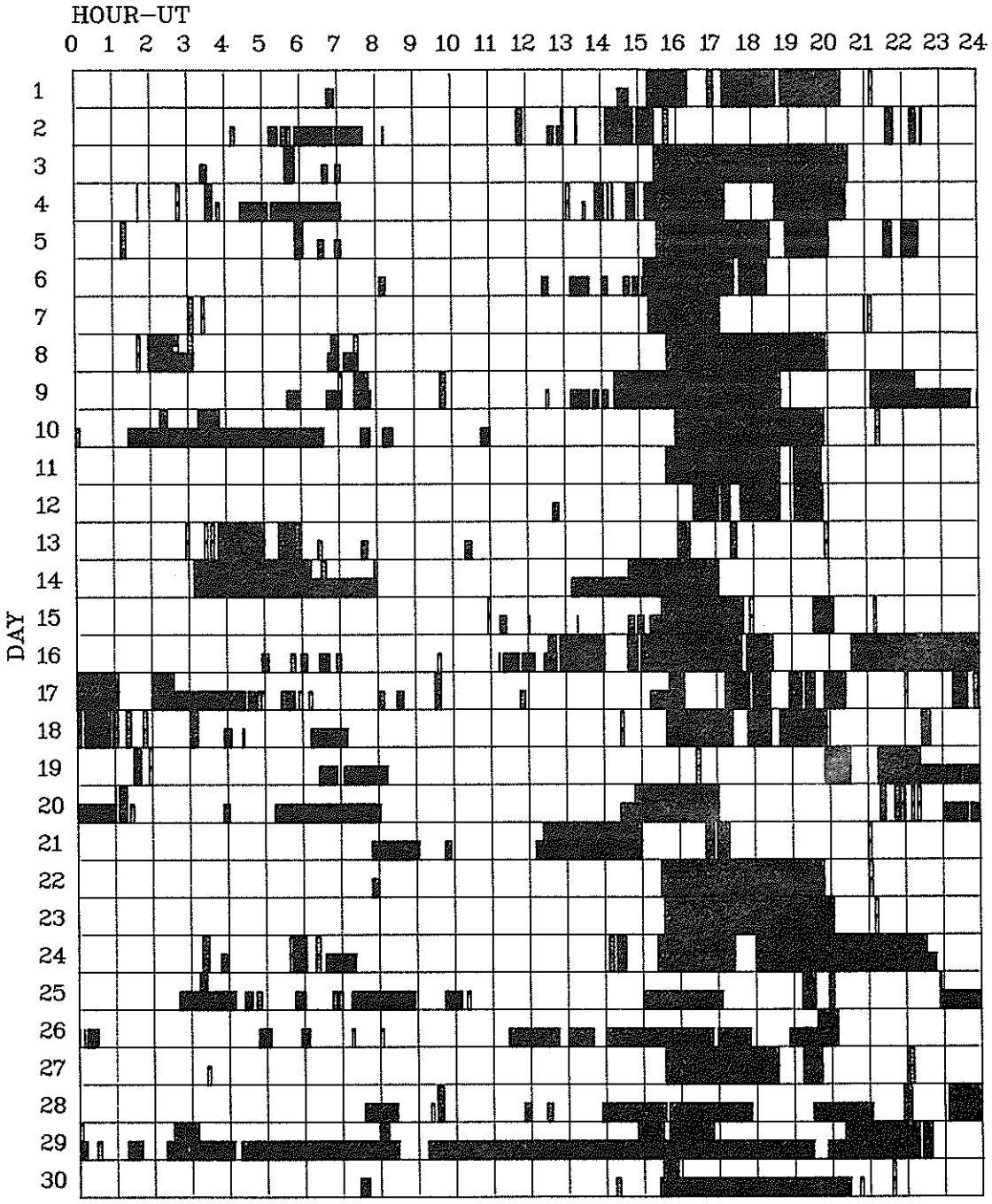
Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.
771101	3.68	19.8	771111	44.04	20.3	771121	13.28	20.8
771102	12.74	22.0	771112	9.62	21.3	771122	155.61	19.6
771103	7.55	18.6	771113	17.93	21.4	771123	6.40	19.4
771104	12.41	19.0	771114	5.92	18.3	771124	1.14	16.3
771105	14.54	18.8	771115	18.28	21.0	771125	0.00	23.3
771106	.93	20.9	771116	16.56	14.5	771126	0.00	23.5
771107	12.24	21.8	771117	10.07	20.0	771127	1.94	20.4
771108	28.57	18.4	771118	20.82	18.8	771128	4.37	22.7
771109	9.78	17.8	771119	22.59	21.8	771129	0.00	19.0
771110	6.51	19.2	771120	27.64	21.0	771130	4.25	23.5

When no Flare Index is given, it is 0 for that day.

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

NOVEMBER 1977



Observatories included in total patrol:

Athenes	Herstmonceux	Kodaikanal	Mitaka	Tehran
Bucharest	Huancayo	Locarno	Monte Mario	Upice
Catania	Istanboul	Lvov	Palehua	Voroshilov
Culgoora	Kanzelhohe	Manila	Ramey	Wendelstein
Haute Provence	Kiev	McMath-Hulbert	Tashkent	Zürich

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

NOVEMBER 1977

NOV 1977	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY $10^{-22} Wm^{-2} Hz^{-1}$ PEAK	MEAN	INT	POLARIZATION OR REMARKS
1	260	ONDR	44	NS	0720 E		390 D	67			
	245	SGMR	44	NS	1121 E	1848.6	611 D	86.7			
	237	TRST	41	F	0736.1	0736.3	.3	245			L
	202	IZMI	3	S	0736	0736.4	.5	150	100		
	3100	CRIM	8	S	0750.5	0751	1	3	1		
	208	VORO	44	NS	2300		240		8		
2	3750	TYKW	5	S	0031.5	0032.3	3	1	.3		
	2000	TYKW	5	S	0032	0032.3	1	.7	.2		OL
	1000	TYKW	45	C	0032	0032.2	1	21	2		10L
	260	ONDR	44	NS	0754 E		391 D	24			
	202	IZMI	44	NS	0812		108	25			
	245	SGMR	44	NS	1123 E	1437.6	608 D	43.5			
3	208	VORO	43	NS	0122	0217	86	10	7		
	260	ONDR	44	NS	0750 E		400 D	28			
	240	DWIN	44	NS	0953	1000	180 D	30	4		
	160	DWIN	44	NS	0953	1000	60 D	20	5		
	9100	ARCE	24		1117.6		8.1				
4	202	IZMI	44	NS	0600		180	26			
	260	ONDR	44	NS	0746 E		404. D	13			
	930	BORD	40	F	0832.3	0832.8	.7	18	2		
	930	BORD	40	F	1032.4	1032.5	.3	46	2		
	240	DWIN	8	S	1414.6		.1	50	5		
	237	TRST	41	F	1414.6	1414.7	.2	110			L
	930	BORD	40	F	1537.5	1537.5	.7	53	2		
5	200	HIRA	45	C	0417.3	0418	1.2	500	30		O
	3100	CRIM	20	GRF	0732	0744	1	3	1		
	260	ONDR	44	NS	0802 E		352 D	11			
	8800	ATHN	40	F	0818.6	0818.6	10.7	82.5	41.2		
	245	SGMR	6	S	2046.9	2048	2.1	44.8	13.5		
	410	SGMR	6	S	2047.4	2048.2	2.2	42.8	12.7		
	606	SGMR	3	S	2047.4	2047.7	.8	55.6	16.7		
	1415	SGMR	1	S	2047.5	2047.7	.6	7.2	2.2		
6	250	GORK	1	S	1050.4	1052.2	2.1	4.5	2		
	2800	OTTA	20	GRF	1920	1932	65	3.2	1.6		
	245	SGMR	6	S	1921	1922.8	2.4	14.3	7.1		
7	200	GORK	41	F	0533	0548	44	98			
	200	GORK			0533	0558		54			
	200	GORK			0533	0609.8		27			
	200	HIRA	24	R	0535	0547.5	110 D	80	15		WR
	500	HIRA	27	RF	0535	0548	73	30	3		WR
	650	GORK	22	GRF	0538.6	0547.5	75	15	5		
	100	HIRA	24	R	0540	0558	100 D	350	50		O
	606	MANI	22		0544.8	0547.2	12.4	9.9	7.3		NT
	1415	MANI	2		0545.5	0549.4	5.5	3.7	3.1		
	2000	TYKW	45	C	0546	0547.7	7	13	3		OL
	1000	TYKW	45	C	0546	0550.1	7	6	2		15L
	100	GORK	2	S/F	0557.1	0557.8	1.6	480			
	113	POTS	45	C	0620	0656	305	70	23		
	234	POTS	45	C	0620	0701	320	16	10		
	100	GORK	43	NS	0542		318		10		
	200	GORK	43	NS	0615		165		5		
	127	TORN	44	NS	0650 E	0800 U	260 U	50 U			V=O
	228	HARS	47	GB	0750 E	0758 U	20 D	70 U	17 U		
8	8800	ATHN	3	S	0840.9	0840.9	.3	44.6	13.4		
	408	TRST	42	SER	1059.2	1100.1	3.8	19			
	237	TRST	41	F	1100	1100.1	.3	1500			L
	260	ONDR	8	S	1100	1100	.3	185			
	536	ONDR	4	S/F	1215.7	1216.3	1.5	26	3.7		
	260	ONDR	8	S	1215.8	1215.8	.5	54			
	237	TRST	41	F	1215.9	1216.1	.3	215			L
	930	BORD	40	F	1322.4	1322.6	.2	42	2		
	4995	BOUL	8	S	1839	1839.5	2.5	13	4		
9	3100	CRIM	24	R	0938	1200 U		3			
	260	ONDR	8	S	1021	1021	.2	22			
	260	ONDR	8	S	1028.3	1028.3	.2	25			
	536	ONDR	3	S	1038.8	1038.8	.2	13			
	536	ONDR	3	S	1056.2	1056.2	.2	17			
	260	ONDR	3	S	1131.8	1131.8	.2	16			
	18	HCMA	41	F	1659	1702	8			1	
11	260	ONDR	2	S/F	0911	0911.8	1.2	8	2.8		
	536	ONDR	3	S	0912	0912	.3	11			
	808	ONDR	3	S	0912	0912	.3	28			
	536	ONDR	3	S	1222.3	1222.3	.2	20			
	113	POTS		F	1233.7	1236.7	8.5	150	10		
	9500	BERL	2		1311	1311.1	1	30			

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

NOVEMBER 1977

NOV 1977	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	MEAN	INT	POLARIZATION OR REMARKS
	2800	OTTA	20	GRF	1420	1450	90	2.8	1.5		
12	1420	BOUL	8	S	1707.5	1708.5	1	4	1		
	4995	BOUL	3	S	1827	1828	1.5	12	4		
	2695	BOUL	1	S	1828	1829	1.5	3	1		
13	260	ONDR	44	NS	0800		350 D	22			
	4995	BOUL	1	S	1606.5	1608	3	7	2		
	2695	SGMR	3	S	1607.5	1608.5	2.5	12.2	3.7		
	2800	OTTA	1	S	1607.5	1608.5	6	9.6	2.2		
	4995	SGMR	1	S	1607.6	1608.5	2.4	5.5	1.7		
	1415	SGMR	3	S	1607.6	1608.7	1.7	12.4	3.7		
	245	SGMR	6	S	1607.7	1608.2	1.3	15.8	4.7		
	410	SGMR	6	S	1607.8	1608.6	1.6	2	.6		
	2695	BOUL	3	S	1608.5	1610	4	9	3		
14	260	ONDR	44	NS	0753 E		358 D	12			
	930	BORC	8	S	0807.8	0807.8	.2	35	2		
	1420	ARCE	1		1044.9	1045	.4				
	1420	ARCE	29		1045.3		26.6				
	930	BORD	40	F	1047.8	1047.9	.2	21	2		
	245	SGMR	43	NS	1923.4	2034.3	113.60	19.3			
	208	VORC	44	NS	2300		240		7		
	500	HIRA	45	C	2319.1	2319.4	1	18	7		HR
15	260	ONDR	44	NS	0753 E		359 D	17			
	245	SGMR	44	NS	1139 E	1259.5	577 D	19.2			
	930	BORD	40	F	1246.3	1246.8	.6	24	2		
	2800	OTTA	1	S	1424	1427	10	1	.5		
	2800	OTTA	1	S	1755	1800	10	1	.5		
	2800	OTTA	20	GRF	1815		15	.8	.5		
	1420	BOUL	8	S	2021	2021.5	1	4	1		
	1420	BOUL	8	S	2024	2024.5	1.5	5	2		
	208	VORO	44	NS	2300		240		8		
16	260	ONDR	44	NS	0814 E		326 D	10			
	240	DWIN	44	NS	0900 E		274 D		2		
	160	DWIN	44	NS	0900 E		274 D		2		
	930	BORD	41	F	1040.3	1040.4	.6	31	2		
	202	IZMI	3	S	1128.7	1128.7	.3	220	120		
	245	SGMR	43	NS	1615	1822	300 D	19			3
	2800	OTTA	20	GRF	1848	1910	80	1.6	.8		
17	208	VORO	43	NS	0234		26		7		
	200	GORK	44	NS	0539		459		10		
	100	GORK	43	NS	0605		355		5		
	127	TORN	44	NS	0650 E	0835.6	440 D	65			V=2
	260	ONDR	44	NS	0847 E		256 D	22			
	240	DWIN	44	NS	0900 E		168 D		5		
	160	DWIN	44	NS	0900 E		168 D		10		
	245	SGMR	44	NS	1142 E	2022	572 D	197			
	410	SGMR	43	NS	1600	1839.6	314 D	68.4			
	127	TORN			0650 E	1049		80			
	200	GORK	8	S	0957	0957.5	2	27	13		
	650	GORK	3	S	0957.2	0957.5	.6	42	20		
	930	BORD	8	S	1310.4	1310.5	.1	24	2		
	200	HIRA	44	NS	2120 E	2300	610 D	40	10		SL
	208	VORO	44	NS	2300	0202	240	21	14		
18	202	IZMI	41	F	0600		25	35			
	3100	CRIM	24	R	0805	0928		5			
	260	ONDR	44	NS	0820 E		326 D	108	11		
	240	DWIN	44	NS	0846 E		181 D		3		
	160	DWIN	44	NS	0846 E		181 D		3		
	202	IZMI	43	NS	1010		110	50			
	245	SGMR	44	NS	1143 E	1538.2	571 D	16.7			
	410	SGMR	44	NS	1143 E	1207.8	571 D	19.2			
	127	TORN	40	F	1132.9	1237	40 U	6			
	1420	ARCE	40		1149.7	1151.1	2				
	536	ONDR	4	S/F	1156.3	1157.8	5	8.4	4		
	808	ONDR	45	C	1158.2	1158.7	2.6	22	7.7		
	930	BORC	40	F	1158.7	1158.9	1.7	28	4		
	1470	BERL	6		1158	1159.4	2	8.2			
	2800	OTTA	21	GRF	1635	1700	150	6.8	3.4		
	1415	SGMR	4	S/F	1644	1649.2	11.3	37.5	11.3		
	2695	SGMR	4	S/F	1646	1650.4	10.6	29.7	8.9		
	410	SGMR	6	S	1646.2	1652	8.2	71.6	21.5		
	245	SGMR	6	S	1646.2	1647.7	8.2	19.1	5.7		
	606	SGMR	4	S/F	1646.3	1651.8	9.2	115	34.4		
	4995	SGMR	3	S	1646.5	1652	10.4	17.3	5.2		
	2800	OTTA	4	S/F	1646	1650	11	26	13		
	8800	SGMR	1	S	1647.9	1652.2	7.7	9.3	2.8		
	1420	BOUL	1	S	1703	1704	2	2	1		
	208	VORO	44	NS	2300		240		7		
19	3750	TYKW	5	S	0014	0014.3	2	3	1		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

NOVEMBER 1977

NOV 1977	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	MEAN	INT	POLARIZATION OR REMARKS
	2000	TYKW	5	S	0014	0014.3	2	1.8	.6		0L
	9400	TYKW	5	S	0523.3	0523.7	1	8	3		25L
	202	IZMI	1	S	0914.3	0914.5	.7	40	10		
	237	TRST	41	F	0914.6	0914.6	.5	104	-		R
	260	ONDR	2	S/F	0914	0914.5	1	12	2		
	260	ONDR	3	S	0955.7	0955.7	.2	7			
	9500	BERL	1		1151	1151.4	3	7			
	2800	OTTA	1	S	1756.2	1800	10	1.6	.8		
	2800	OTTA	20	GRF	1940	1945	15	1.6	.8		
20	3750	TYKW	5	S	0229	0230.3	5	7	2.5		15R,250001F
	3750	TYKW	30	PBI	0234		90	1.8	.9		
	2000	TYKW	5	S	0230	0230.1	1	9	2		10L
	3750	TYKW	20	GRF	0310	0324	40	3	1		0R,250001F
	500	HIRA	45	C	0617.3	0617.3	2.5	25	5		SL
	100	HIRA	45	C	0617.3	0617.5	1	300	70		ML
	200	HIRA	45	C	0617.3	0617.3	2	400	15		0
	200	GORK	6	S	0617.6	0618.2	2.2	36			
	237	TRST	41	F	1326.9	1327	.3	58			
	260	ONDR	8	S	1327.2	1327.2	.2	17			
	245	SGMR	43	NS	1513.6	1922.3	358.4D	20			
	410	SGMR	43	NS	1522.8	1923	349.2D	23.8			
	2800	OTTA	20	GRF	1555	1710	310	4	2		
	245	SGMR	6	S	1602.9	1643.6	68.1	28	14		
21	500	HIRA	27	RF	0058	0123.7	85	7	3		0
	200	HIRA	27	RF	0100	0220	240	20	5		0
	3750	TYKW	20	GRF	0140	0215	120	2	1		250021F
	208	VORO	27	RF	0230	0230	124	21	13		
	260	ONDR	45	C	1035	1035.2	2	27	11.8		
	237	TRST	41	F	1051.5	1051.7	.5	34			
	260	ONDR	8	S	1051.7	1051.7	.3	44			
	1420	ARCE	1		1236.6	1236.7	.5				
22	3750	TYKW	5	S	0039	0041.3	5	22	7		251038F
	3750	TYKW	29	PBI	0044		20	3	1		
	4995	MANI	3		0040.2	0041.5	3	26.7	8		
	2000	TYKW	5	S	0040.5	0041.3	2.5	3	1		15L
	2695	MANI	3		0040.4	0041.5	4.1	10.4	2.3		
	3750	TYKW	21	GRF	0210	0226	110	6	2		251038F
	3750	TYKW	5	S	0215	0216.4	7	3.5	1.2		251038F
	3750	TYKW	5	S	0252	0255	15	1.2	.5		
	3750	TYKW	45	C	0331	0333.2	20	2	1		251038F
	3750	TYKW	21	GRF	0410	0440	70	3	1.5		
	3750	TYKW	45	C	0424	0425.8	16	17	4		251038F
	2695	MANI	1		0424.6	0426.3	4.4	9.2	.9		
	4995	MANI	3		0424.9	0426.3	4.1	25.6	2.6		
	5730	IRKU		S	0424	0426	10	16	4		L
	3750	TYKW	5	S	0440	0444	20	4.5	1.7		
	2000	TYKW	5	S	0425	0426.2	4	3.5	1.5		15L
	2000	TYKW	29	PBI	0429		11	1.2	.6		
	3750	TYKW	5	S	0530	0534	20	1.5	.5		
	260	ONDR	44	NS	0820 E		327 D	9			
	100	GORK	43	NS	1033		90		20		
	950	GORK	28	PRE	0933		19.5				
	950	GORK	49	GB	0958.5	1033.3	64.5	780			
	950	GORK			0958.5	1035.5	42	2183			
	950	GORK			0958.5	1055.3		774			
	950	GORK	30	PBI	0958.5	1103	42	50			
	650	GORK	1	S	0933.6	0939	22.2	4	2		
	1420	ARCE	28		0944.3		13.8				DUBIOUS TIME
	1470	BERL	46		0946.5	1032.8	137	1380			
	3000	BERL	46		0946.5	1006	134	1200			
	4995	ATHN	47	GB	0948.4	1005	74.3	3468	1040		
	2695	ATHN	47	GB	0948.8	1007	74.1	1598	479		
	9100	GORK	23	GRF	0949.4		123				
	2950	GORK	48	C	0949.9	1007	160	1400			
	1415	ATHN	47	GB	0955.4	1002.8	67.5	441	114.3		
	1415	ATHN	47	GB	0955.4	1008.6		481.3			
	1415	ATHN	47	GB	0955.4	1032.7		3471			
	1415	ATHN	47	GB	0955.4	1034.2		4171			
	930	BORC	28	PRE	0957	1004	24	550			
	8800	ATHN	47	GB	0957.9	1004.2	60.8	4735	1421		
	775	BERL	45	C	0957		179				
	9100	GORK	48	C	0958	1002.1	17	3100			
	650	GORK	48	C	0958	1035.4	122	6900			
	1420	ARCE	47		0958.1	1033.6	49.5				
	1420	ARCE			0958.1	1002.2	5.3				
	9500	BERL	46		0958	1003.5	92	3300			
	408	TRST	49	GB	0959.5	1009.4	16.9	570			
	536	ONDR	49	GB	0959.6		71	436	357		
	536	ONDR			0959.6	1005.5		338			
	536	ONDR			0959.6	1055		403			
	536	ONDR			0959.6	1058.6		280			
	234	POTS	45	C	0959	1034.5	201	400			

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

NOVEMBER 1977

NOV 1977	FREQUENCY STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	MEAN	INT	POLARIZATION OR REMARKS
	808 ONDR	49 GB	0959		65	626	500		
	808 ONDR		0959	1005.8		505			
	808 ONDR		0959	1059		535			
	237 TRST	47 GB	1000.9	1034.8	155.5	1600			R
	260 ONDR	49 GB	1000		117	226	113		
	260 ONDR		1000	1054.5		141			
	260 ONDR		1000	1142		44			
	200 GORK	45 C	1000	1009	36	540			
	228 HARS	47 GB	1001	1007	90	750	136		
	127 TORN	28 PRE	1001.2		.7	.4	.3		
	127 TORN	49 GB	1001.9	1002 D	218 D	1000 D	50 U		SATURATED
	127 TORN		1001.9	1009.4		5000 U			
	127 TORN		1001.9	1013.2		4000 U			
	202 IZMI	45 S	1001.3	1004.8	16	850	660		
	100 GORK	46 C	1001.6	1003.7	30	25500			
	100 GORK		1001.6	1009.2		26000			
	113 POTS	45 C	1001	1004	105	35000			
	228 HARS	S	1002.5E	1002.5	1.5	170			
	1420 ARCE		1003.4	1008.2	17.8				
	408 TRST	49 GB	1016.4	1026.2	32	670			
	202 IZMI	48 C	1017.3	1026.3	31.2	380	220		
	228 HARS	S	1019.5E	1019.5	1.5	195			
	930 BORD	47 GB	1021	1036	29	4100			
	930 BORD		1021	1027.8		800			
	930 BORD		1021	1038.5		1350			
	930 BORD		1021	1040		1050			
	930 BORD		1021	1041		1210			
	930 BORD		1021	1042.6		1250			
	930 BORD		1021	1045		600			
	1420 ARCE		1021.2	1033.6	16.2				
	228 HARS	S	1021.5E	1021.5	2	147			
	228 HARS	C	1023 E	1023	2.5	168			
	228 HARS	C	1031.5E	1031.5	9.5	700	225		
	1420 ARCE		1037.4	1038.3	10.2				
	228 HARS	S	1037.5E	1037.5	2	55			
	228 HARS	S	1040 E	1040	4	87			
	127 TORN	45 C	1042	1044.2	6	25	15		
	1420 ARCE	30	1047.6		85				
	1420 ARCE	4	1048.4	1054.7	13.6				
	408 TRST	49 GB	1048.4	1055.7	19.2	650			
	202 IZMI	29 PBI	1048.5	1100.4	62	60	30		
	930 BORD	47 GB	1050	1056	15	845			
	930 BORD		1050	1057		790			
	930 BORD		1050	1100		695			
	930 BORD	29 PBI	1105	1118	55	13			
	228 HARS	F	1052 E	1052	9	70			
	408 TRST	49 GB	1107.6	1122.6	23.4	66			
	536 ONDR	46 C	1109.5	1133.8	51	143	24		
	536 ONDR		1109.5	1122.5		98			
	808 ONDR	46 C	1111	1134.6	48	80	18		
	808 ONDR		1111	1138		50			
	228 HARS	F	1117.5E	1117.5	7	40			
	160 DWIN	45 C	1121.5		1.2	10	3		
	408 TRST	49 GB	1131	1139.1	20	120			
	408 TRST	29 PBI	1151	1154.3	9	12			
	930 BORD	3 S	1133	1134.6	4.3	52			
	1420 ARCE		1133.2	1135	4.5				
	1420 ARCE	45	1133.2	1135	16				
	950 GORK	3 S	1133.6	1134.6	2.2	34			
	930 BORD	3 S	1137.3	1138.8	6.7	37			
	1420 ARCE		1137.7	1138.9	11.5				
	950 GORK	3 S	1137.9	1138.8	4	18			
	1420 ARCE	3	1153.8	1155.1	6				
23	260 ONDR	44 NS	0810 E		350 D	13			
	1420 ARCE	1	0922.3	0922.5	.5				
	1420 ARCE	2	0940.1	0940.2	.7				
24	930 BORD	40 F	1106	1106.4	.4	15	2		
	2695 PENT	1 S	2116	2117	4.5	1.4	.7		
25	260 ONDR	42 SER	1024	1032.2	9	138			
	9100 ARCE	1	1258.7	1259	1				
26	8800 ATHN	3 S	0642	0642.5	1.1	32.6	9.8		
	18 MCMA	6 S	1351	1353	2			1	
	930 BORD	8 S	1545.4	1545.6	.3	25	2		
27	18 MCMA	6 S	2056	2057	2			1	
28	930 BORD	40 F	1116.7	1116.8	.4	12	2		
	9100 ARCE	3	1227.6	1227.7	1.2				
	930 BORD	40 F	1456.6	1456.7	.1	53	2		
29	9100 ARCE	20	1127.3	1138.5	66				DUBIOUS TIME

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

NOVEMBER 1977

NOV 1977	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	1420	ARCE	41		1141.7	1141.8	20.5				DUBIOUS TIME
	1420	ARCE	8		1141.7	1141.8	.5				
	1420	ARCE	2		1147.6	1147.9	3				
	1420	ARCE	1		1152.2	1152.3	.5				
	1420	ARCE	2		1200.2	1200.3	2				
30	3750	TYKW	20	GRF	0330	0340	80	2	1		
	260	ONDR	3	S	0914.1	0914.1	.2	6			
	260	ONDR	1	S	0916.6	0916.6	.2	3.5			
	260	ONDR	45	C	0950	0950.7	3	10	1.8		
	260	ONDR	4	S/F	1100	1100	1.5	8	5		
	1420	ARCE	4		1130.2	1130.5	.9				
	200	HIRA	41	F	2309	2311	3	10000			WR
	100	HIRA	41	F	2309.2	2310.5	6	1200			WLWR

Reports received from the following observatories:

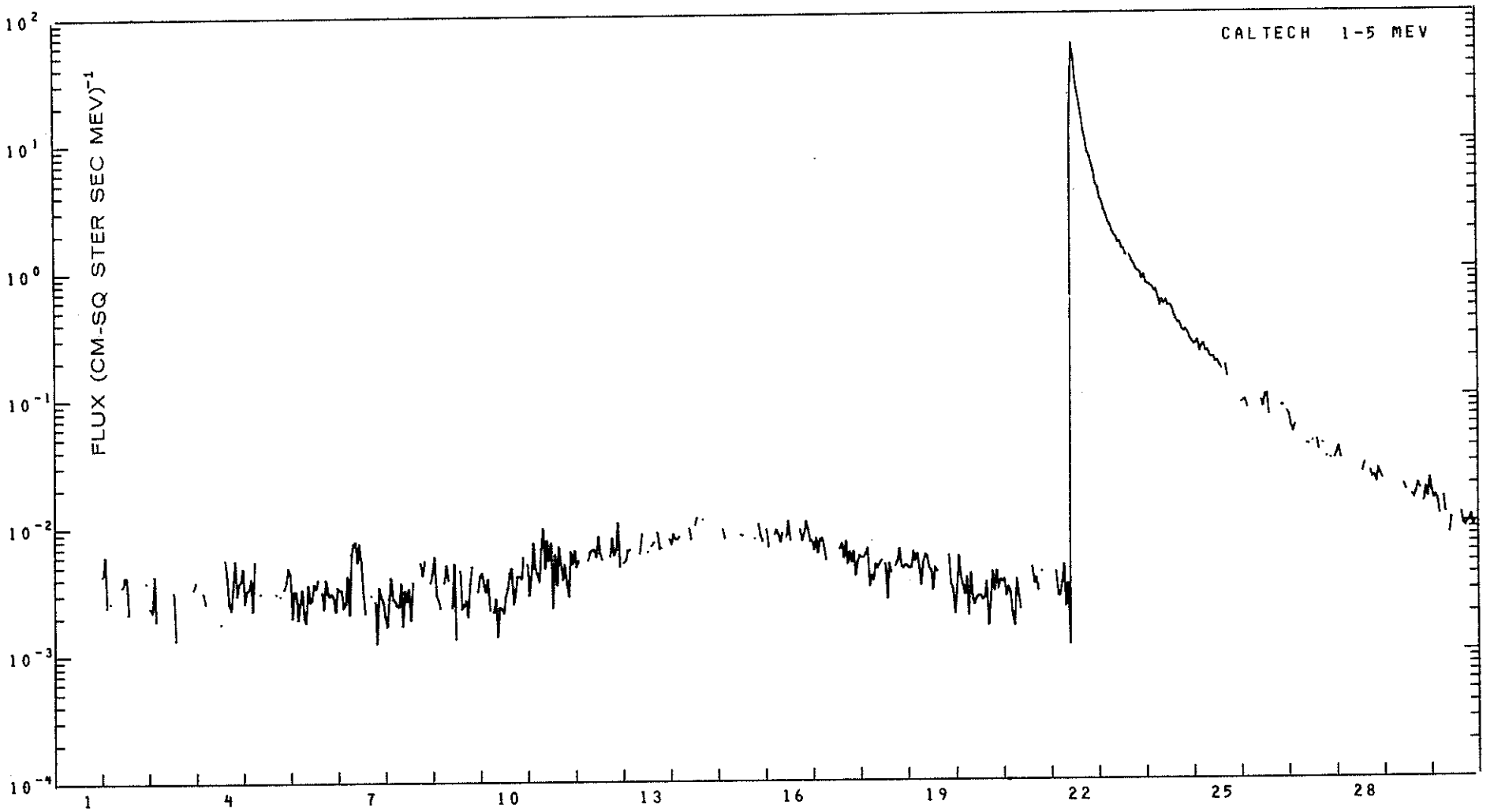
ARCE = Arcetri
BERL = Berlin-Adlershof
BORD = Bordeaux
BOUL = Boulder
CRIM = Simferopol
DWIN = Dwingeloo
GORK = Gorky
HARS = Harestua
HIRA = Hiraiso
HUAN = Huancayo
IRKU = Irkutsk
KIEV = Kiev
MANI = Manila
MCMA = McMath-Hulbert
NAGO = Nagoya
ONDR = Ondrejov
OTTA = Ottawa
PENT = Penticton
POTS = Potsdam
SAOP = Sao Paulo
SGMR = Sagamore Hill
SYDN = Sydney
TORN = Torun
TYKW = Toyokawa
TRST = Trieste
VORO = Voroshilov (Ussurisk)

Explanation of Type Code:

1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
32 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise Storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

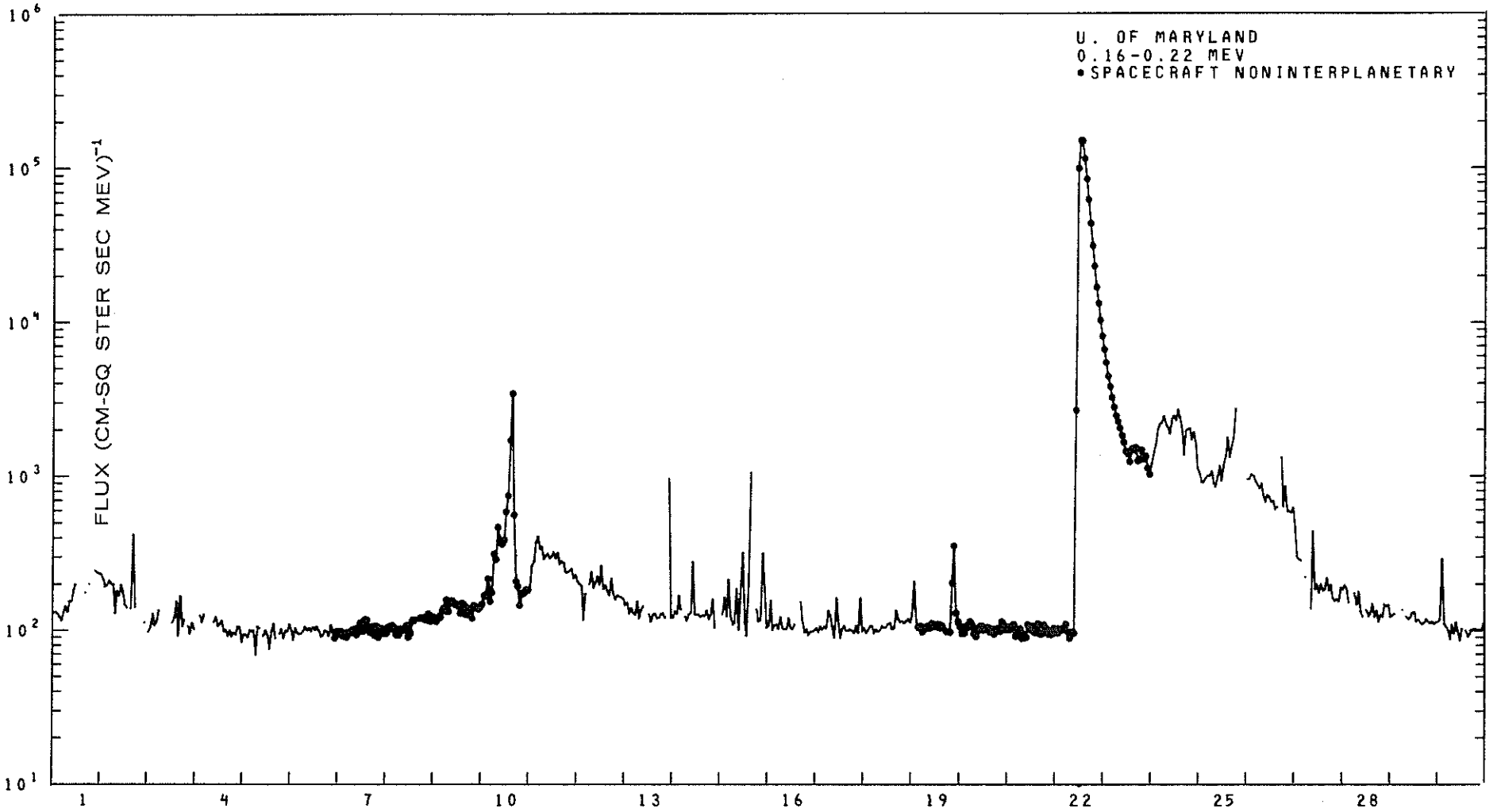
IMP 7 AND 8 ELECTRONS

NOVEMBER 1977



IMP 7 AND 8 LOW ENERGY PROTONS

NOVEMBER 1977



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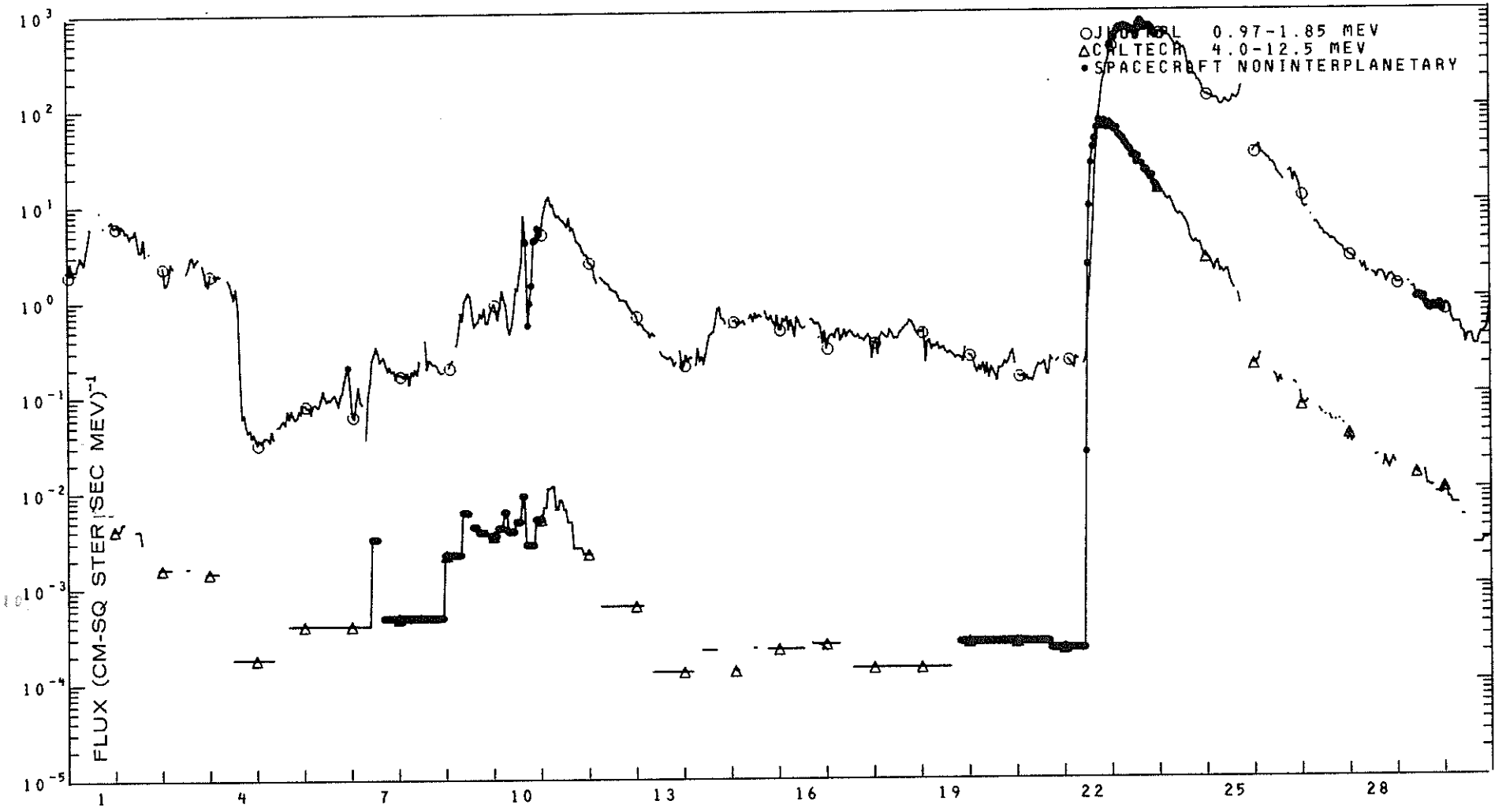
Nov 77

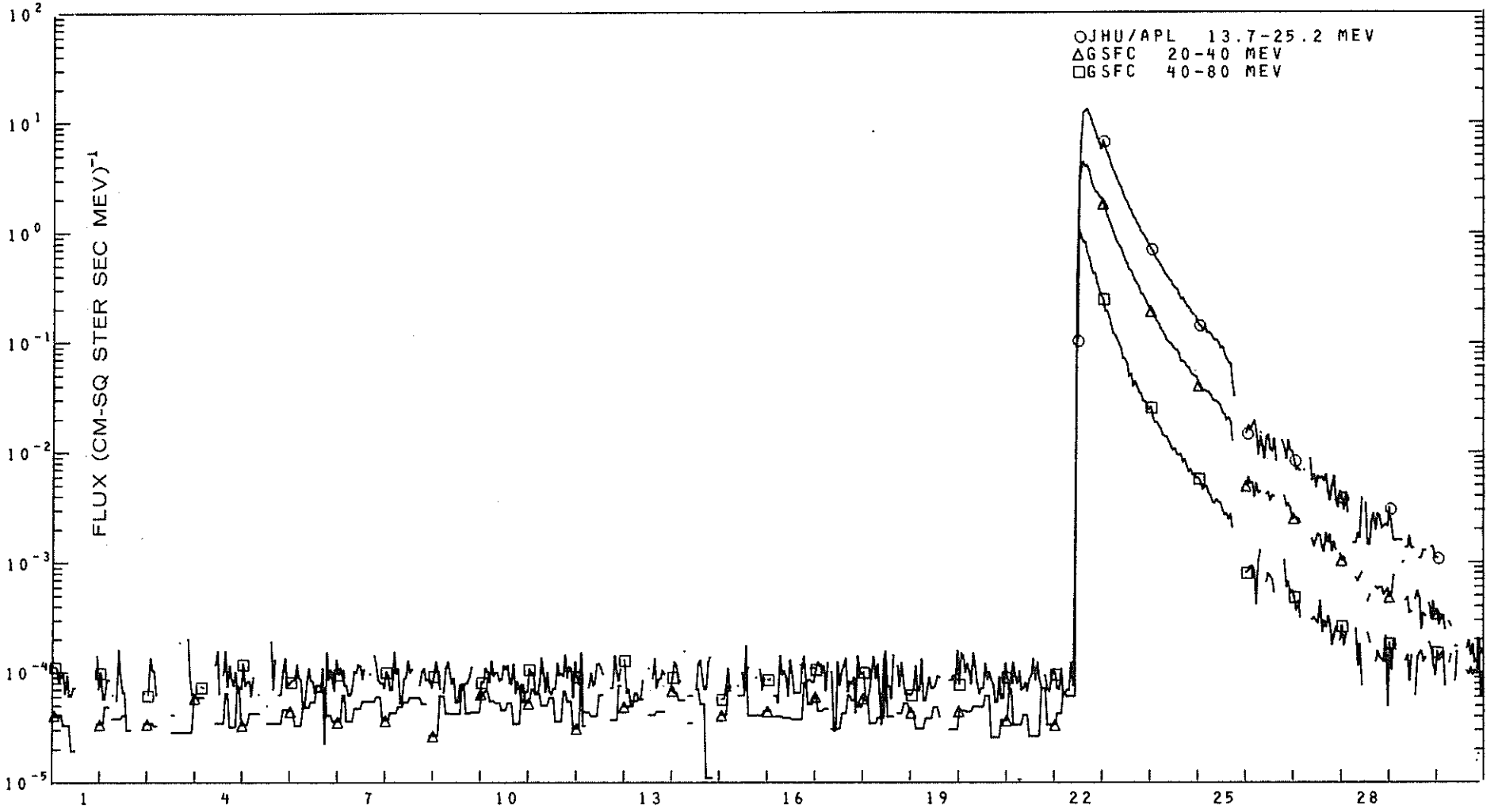
IMP 7 AND 8 INTERMEDIATE ENERGY PROTONS

NOVEMBER 1977



IMP 7 AND 8 HIGH ENERGY PROTONS

NOVEMBER 1977



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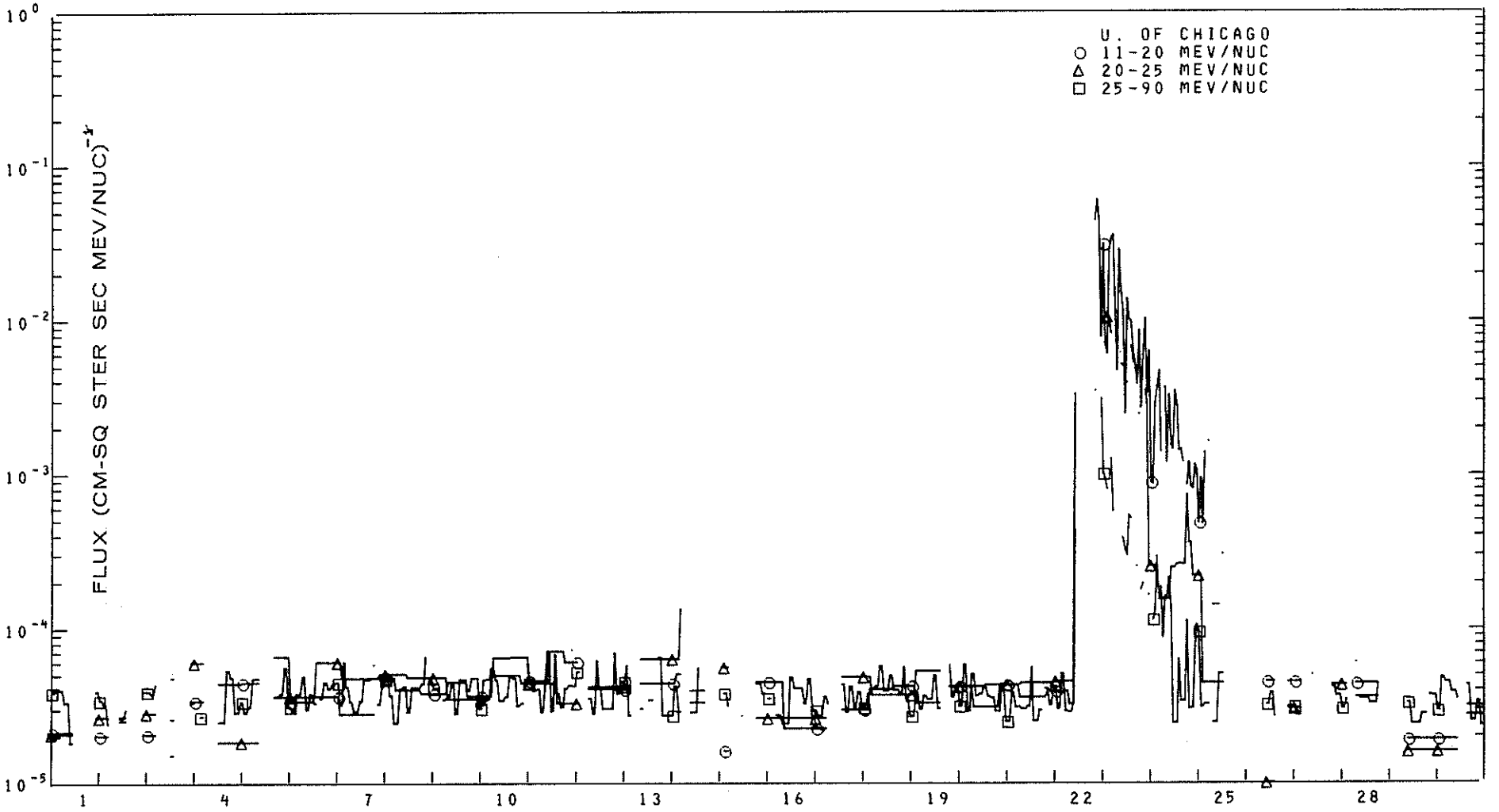
Nov 77

IMP 7 AND 8 ALPHA PARTICLES

NOVEMBER 1977



OCTOBER 1977 DATA

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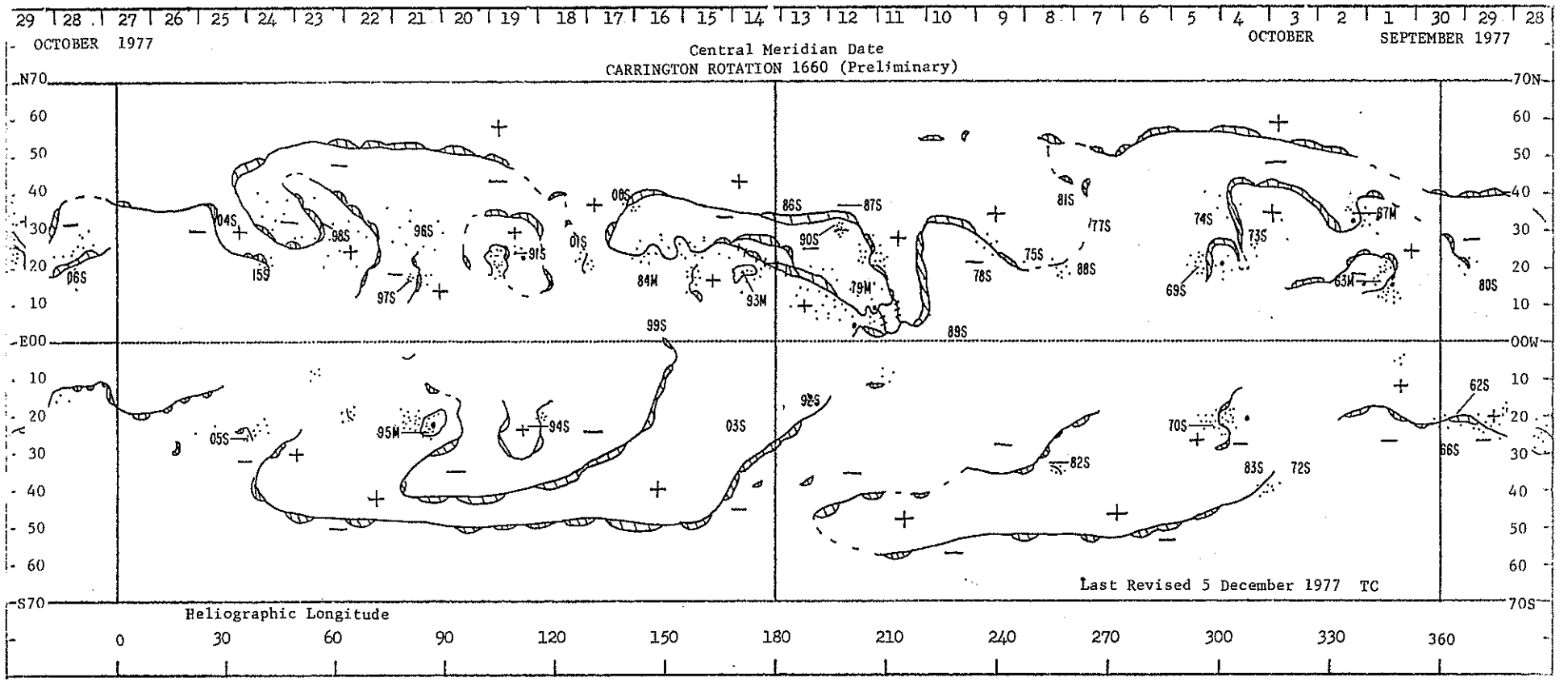
Regional Flare Index	38

ABBREVIATED CALENDAR RECORD

Hα SYNOPTIC CHART

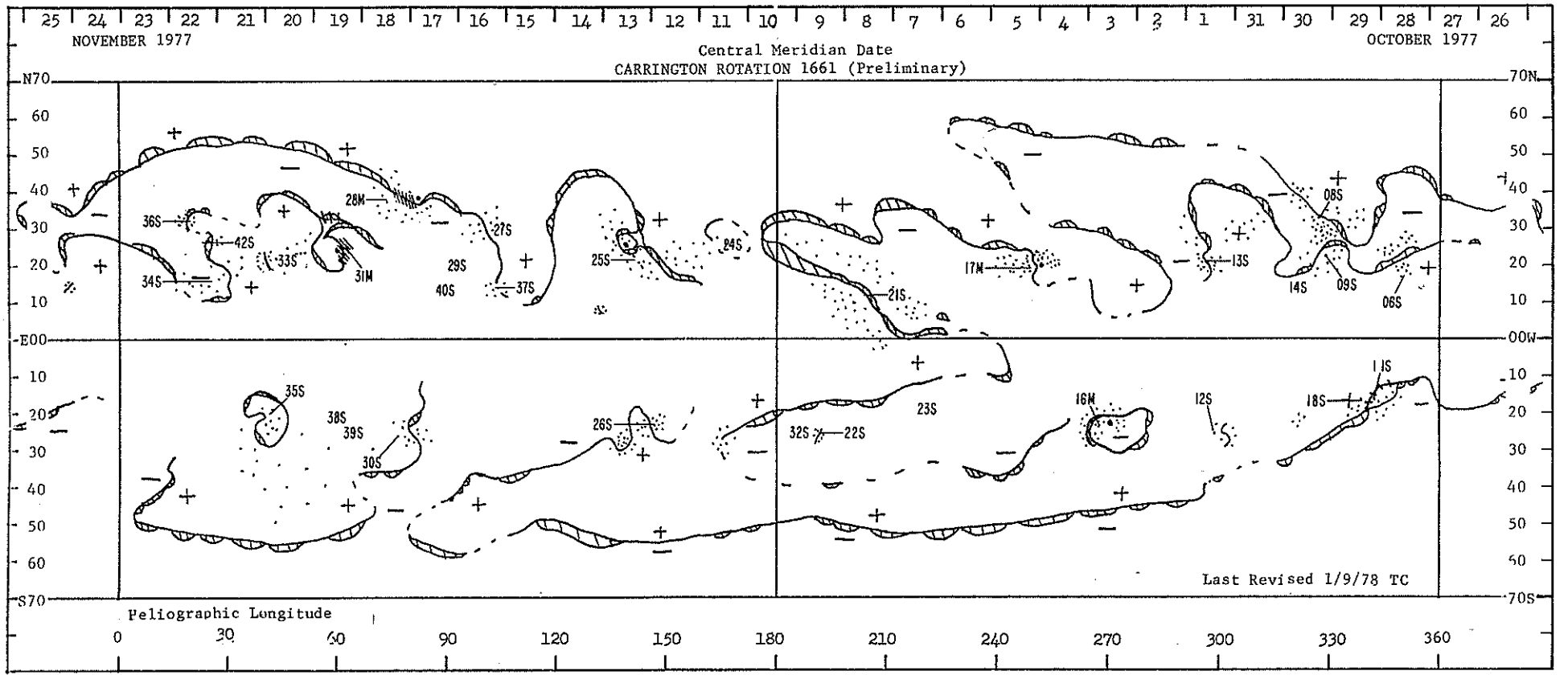
SEPTEMBER - OCTOBER 1977



ABBREVIATED CALENDAR RECORD

Hα SYNOPTIC CHART

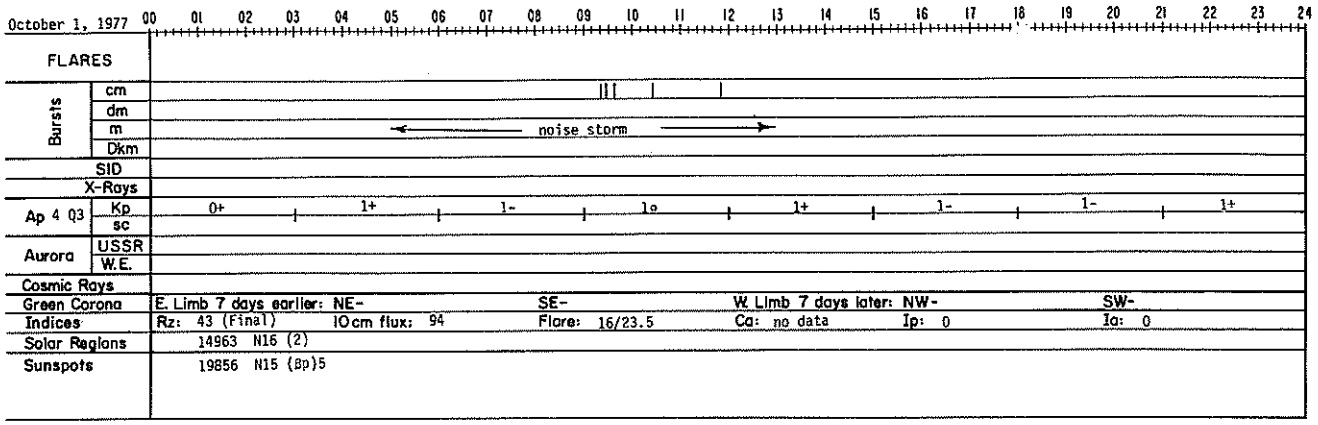
CARRINGTON ROTATION 1661 (PRELIMINARY)

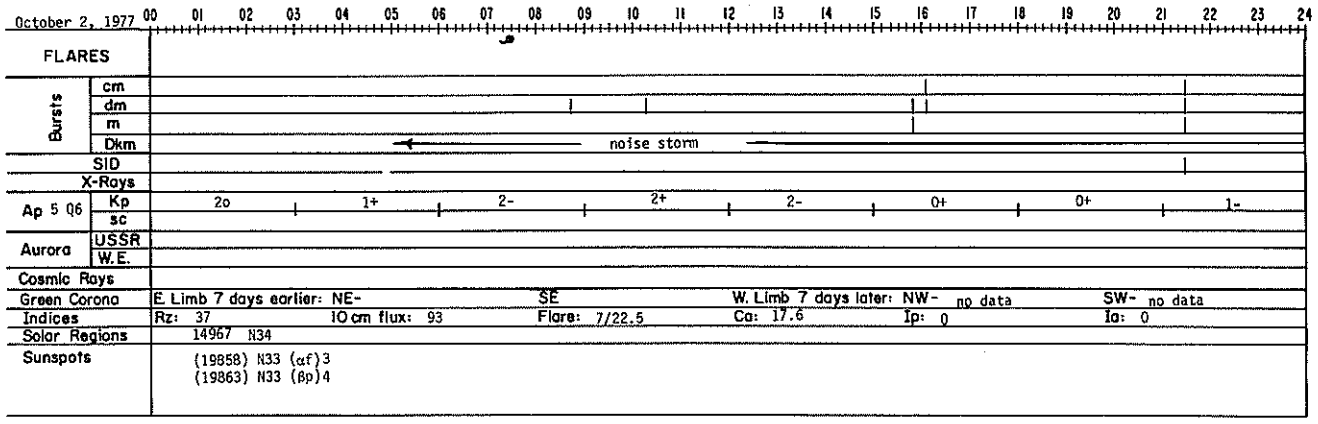


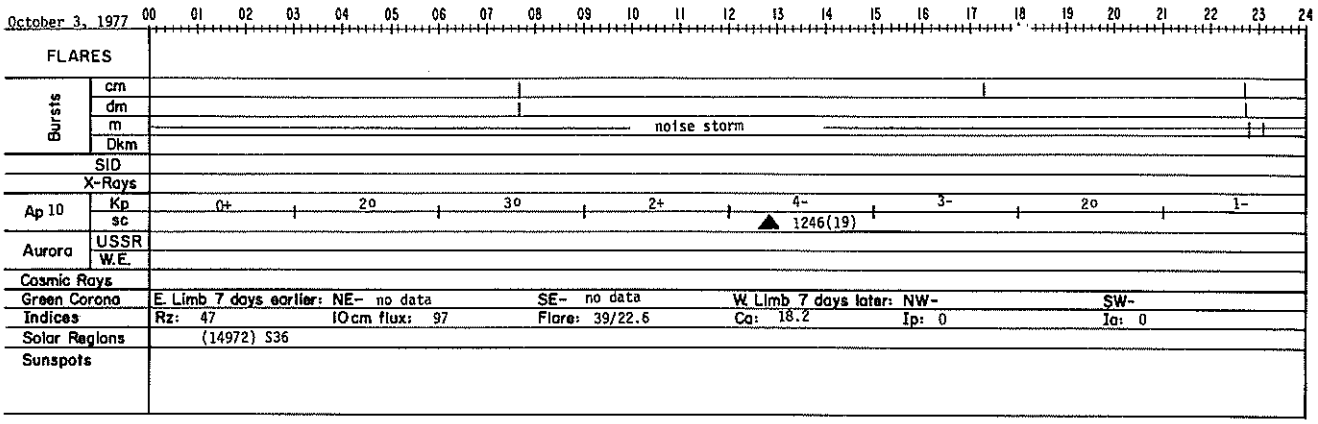
29
Oct 77

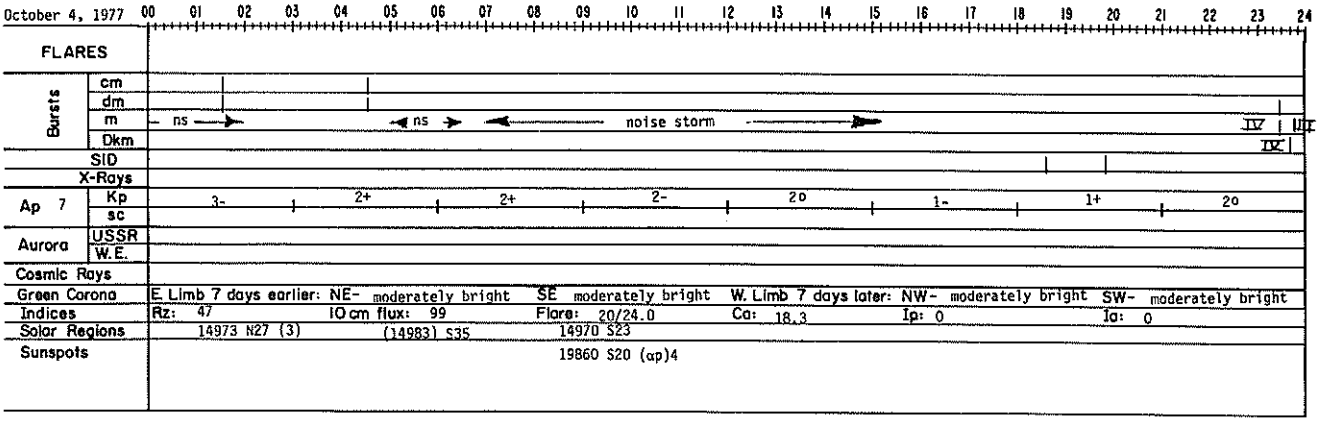
ABBREVIATED CALENDAR RECORD

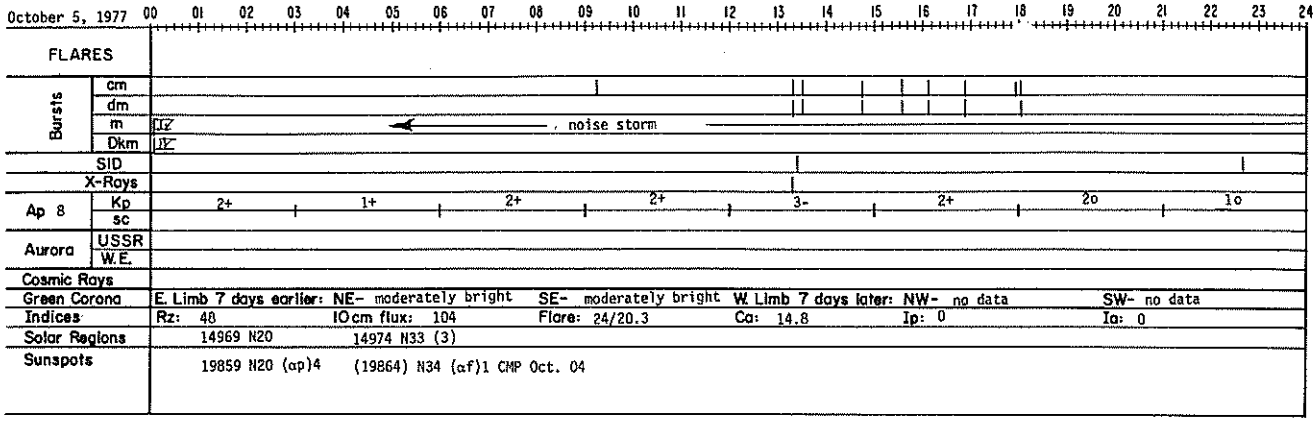
OCTOBER 1977

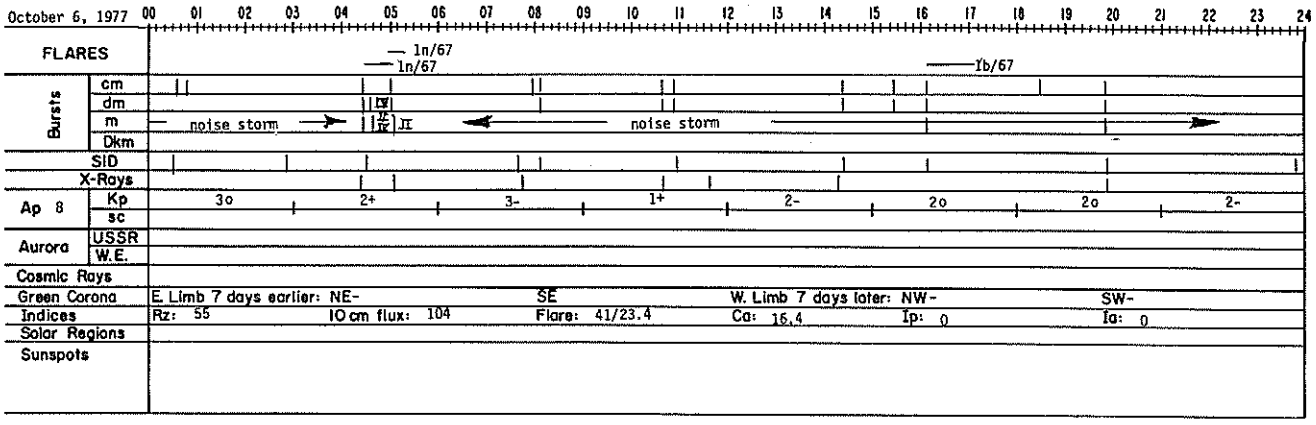


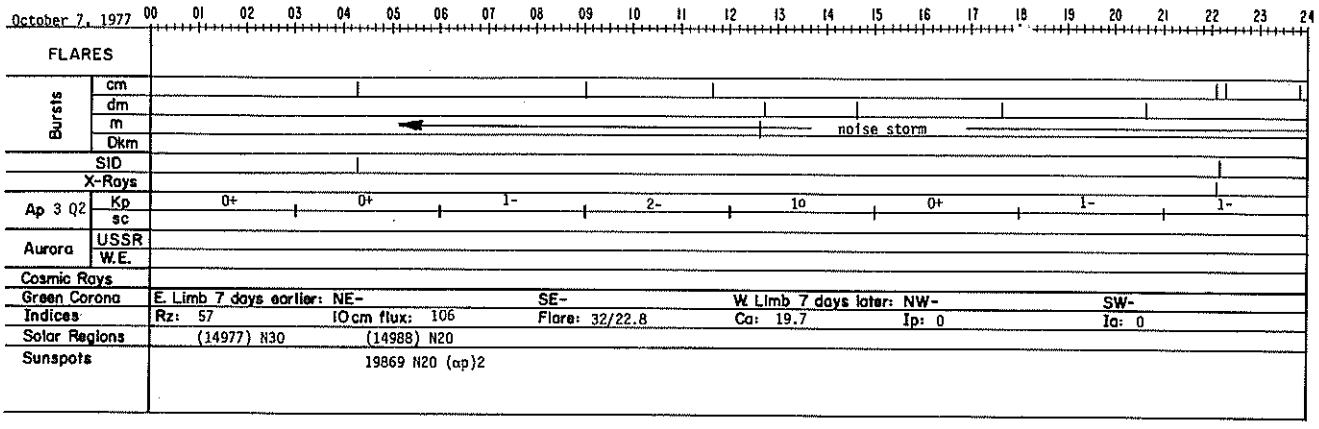


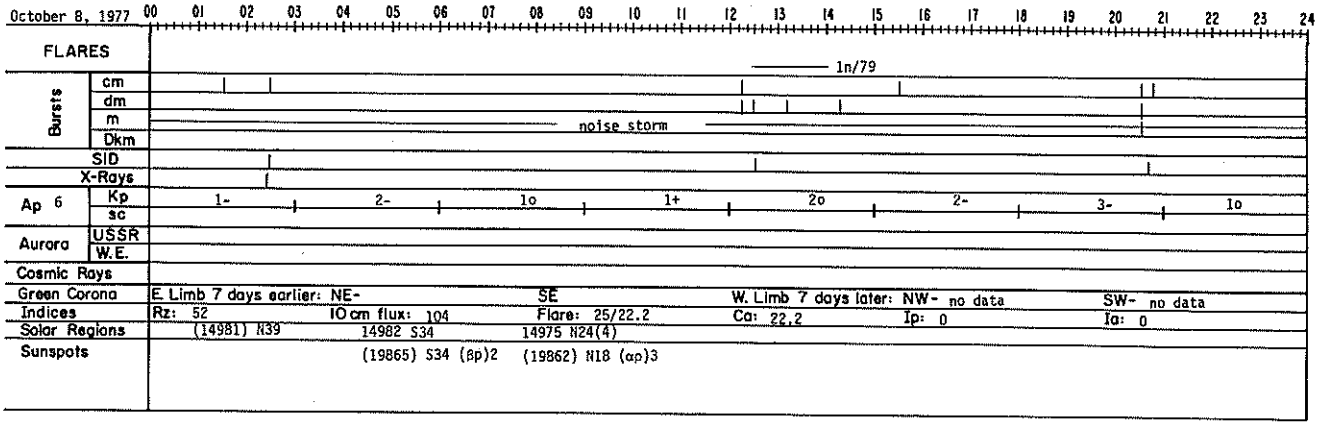


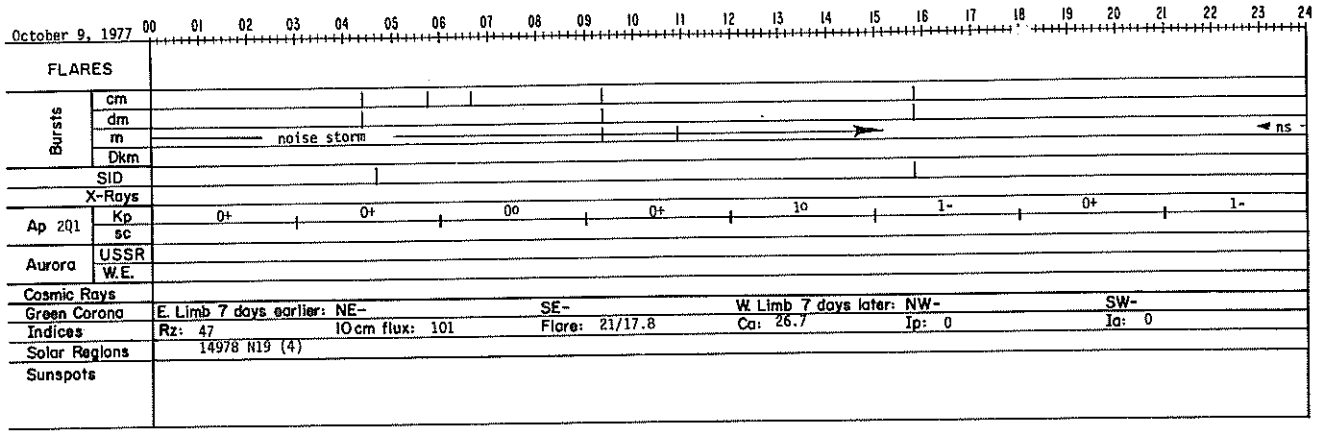


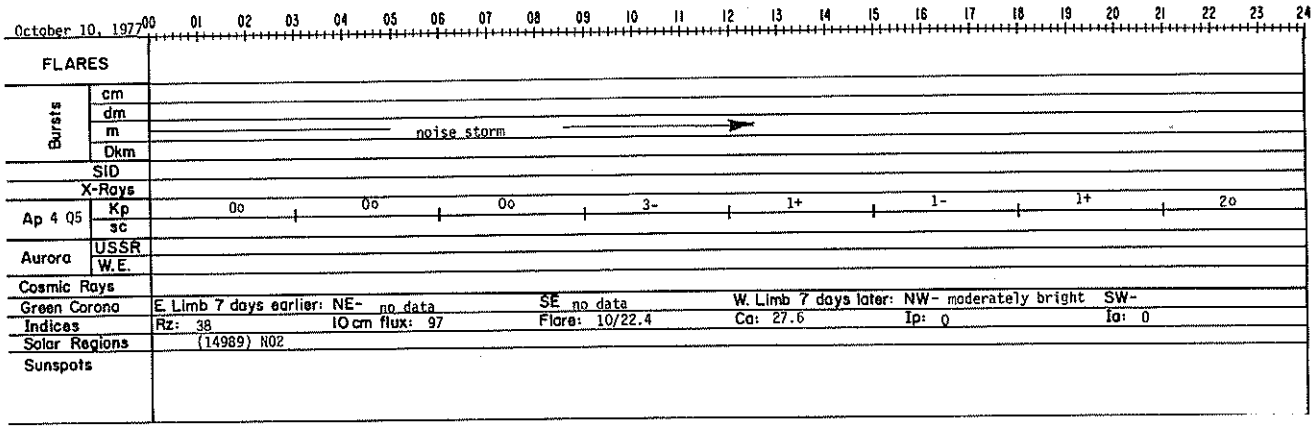

October 5, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 8
Kp
sc
2+ 1+ 2+ 2+ 3- 2+ 2o 1o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE- moderately bright W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 48 10cm flux: 104 Flare: 24/20.3 Ca: 14.8 Ip: 0 Ia: 0
Solar Regions
14969 N20 14974 N33 (3)
Sunspots
19859 N20 (αp)4 (19864) N34 (αf)1 CMP Oct. 04

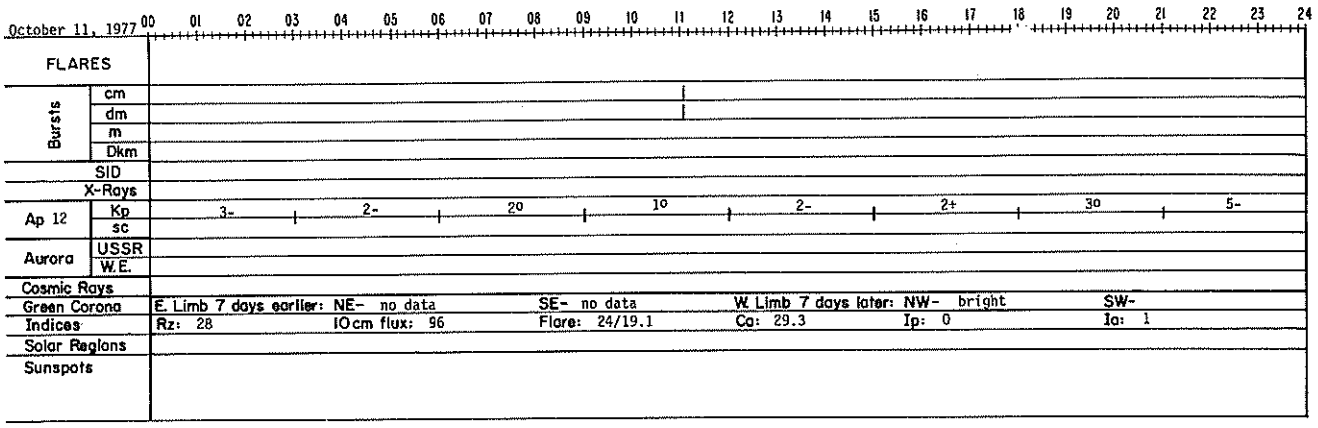

October 6, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/67
1n/67
1b/67
Bursts
cm
dm
m
Dkm
noise storm
noise storm
SID
X-Rays
Ap 8
Kp
sc
3o 2+ 3- 1+ 2- 2o 2o 2-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- SW-
Indices
Rz: 55 10cm flux: 104 Flare: 41/23.4 Ca: 16.4 Ip: 0 Ia: 0
Solar Regions
Sunspots

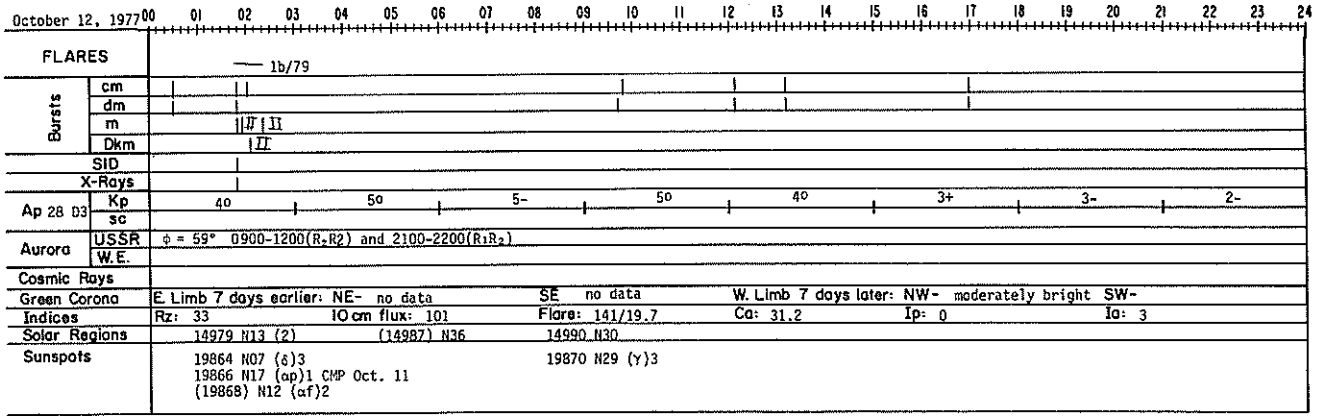

October 7, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 3 Q2
Kp
sc
0+ 0+ 1- 2- 1o 0+ 1- 1-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- SW-
Indices
Rz: 57 10cm flux: 106 Flare: 32/22.8 Ca: 19.7 Ip: 0 Ia: 0
Solar Regions
(14977) N30 (14988) N20
Sunspots
19869 N20 (αp)2


October 8, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/79
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 6
Kp
sc
1- 2- 1o 1+ 2o 2- 3- 1o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 52 10cm flux: 104 Flare: 25/22.2 Ca: 22.2 Ip: 0 Ia: 0
Solar Regions
(14981) N39 14982 S34 14975 N24(4)
Sunspots
(19865) S34 (βp)2 (19862) N18 (αp)3









Remarks Proton Event: The 20-40 MeV detector on board IMPs 7 and 8 recorded a sharp rise in the proton flux early in the day on Oct. 12.

October 13, 1977

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 14	Kp	2- 4o 3+ 3- 4o 1+ 2+ 3-
	sc	
Aurora	USSR	ϕ = 58° 1700-1900(R_1R1) and ϕ = 60° 2100-2200(HA1)
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- moderately bright SW-
Indices		Rz: 53 10cm flux: 99 Flare: 43/23.6 Ca: 33.6 Ip: 0 Ia: 1
Solar Regions		14992 S17 (14986) N37
Sunspots		

October 14, 1977

FLARES		
Bursts	cm	
	dm	
	m	noise storm
	Dkm	
SID		
X-Rays		
Ap 13	Kp	2- 00 0+ 4o 3- 2+ 3- 5-
	sc	1151(27)
Aurora	USSR	ϕ = 59° 2000-2400(HA1) and ϕ = 58° 2300(R_2B4)
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- moderately bright SW-
Indices		Rz: 48 10cm flux: 99 Flare: 37/20.1 Ca: 28.3 Ip: 0 Ia: 1
Solar Regions		14993 N19 (15003) S24
Sunspots		19871 N18 (βp)4

October 15, 1977

FLARES		
Bursts	cm	
	dm	
	m	noise storm
	Dkm	
SID		
X-Rays		
Ap 19	Kp	4+ 2+ 5- 4+ 2- 2- 3o 3-
	sc	
Aurora	USSR	ϕ = 59° 0000-0200(HA1)
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 54 10cm flux: 99 Flare: 6/20.1 Ca: no data Ip: 0 Ia: 1
Solar Regions		
Sunspots		

Remarks Proton Event: The satellite-level proton flux enhancement, which IMPs 7 and 8 detected on Oct. 12, decayed to background level by the end of the day.

October 16, 1977

FLARES		
Bursts	cm	
	dm	
	m	ns noise storm
	Dkm	
SID		
X-Rays		
Ap 8	Kp	2+ 3o 1o 1o 2o 2- 2- 2+
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 53 10cm flux: 98 Flare: 14/22.5 Ca: 21.9 Ip: 0 Ia: 3
Solar Regions		14984 N22 (2) (14999) N03
Sunspots		19867 N18 (βp)4 CMP Oct. 15 19873 N23 (αp)3 CMP Oct. 15 19874 N23 (β)4 (19877) N23 (αp)2 CMP Oct. 15

October 17, 1977

FLARES		
Bursts	cm	
	dm	
	m	ns → ← noise storm
	Dkm	
SID		
X-Rays		
Ap 12	Kp	2+ 3o 2+ 2o 2+ 3+ 3- 3+
	sc	
Aurora	USSR	ϕ = 60° 1700(R,A2)
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- SW-
Indices		Rz: 51 10cm flux: 96 Flare: 0/23.3 Ca: 17.1 Ip: 0 Ia: 1
Solar Regions		15000 N40
Sunspots		

October 18, 1977

FLARES		
Bursts	cm	
	dm	
	m	ns → ← noise storm →
	Dkm	
SID		
X-Rays		
Ap 22	Kp	3+ 3+ 4- 3- 2+ 3o 4+ 5o
	sc	
Aurora	USSR	ϕ = 59° 1300-1400(HA1) and ϕ = 60° 1900-2000(SA2)
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- SW- moderately bright
Indices		Rz: 50 10cm flux: 96 Flare: 17/21.7 Ca: 21.2 Ip: 0 Ia: 3
Solar Regions		(15001) N24
Sunspots		(19875) N22 (αp)1

October 19, 1977

FLARES		
Bursts	cm	
	dm	
	m	← noise storm → ← ns
	Dkm	
SID		
X-Rays		
Ap 28D4	Kp	6o 5o 4+ 3+ 3+ 3+ 2+ 0+
	sc	
Aurora	USSR	ϕ = 59° 1200-1300(HB1) and ϕ = 60° 1700-2200(HA1)
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- SW- moderately bright
Indices		Rz: 54 10cm flux: 106 Flare: 24/21.3 Ca: 23.1 Ip: 0 Ia: 0
Solar Regions		14994 S23 (2) 14991 N24
Sunspots		19872 N24 (αp)2

October 20, 1977

FLARES		1b/95
Bursts	cm	
	dm	
	m	ns → ← noise storm
	Dkm	
SID		
X-Rays		
Ap 7	Kp	0o 1+ 1+ 2o 2+ 3o 1+ 2+
	sc	
Aurora	USSR	ϕ = 59° 1300-1400(HA1)
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- moderately bright SE W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 54 10cm flux: 100 Flare: 29/22.8 Ca: 24.0 Ip: 0 Ia: 3
Solar Regions		
Sunspots		

October 21, 1977

FLARES		
Bursts	cm	
	dm	
	m	ns → ← noise storm
	Dkm	
SID		
X-Rays		
Ap 5 Q7	Kp	3- 0+ 1o 1o 1- 1+ 1+ 2o
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona	E. Limb 7 days earlier: NE- moderately bright SE-	W. Limb 7 days later: NW- SW- moderately bright
Indices	Rz: 42 10cm flux: 100 Flare: 25/23.5	Ca: 16.5 Ip: 0 Ia: 2
Solar Regions	14995 S25 (3) 14996 N30 (2) 14997 N17	
Sunspots	19876 S25 (β)4	

October 22, 1977

FLARES		1n/84
Bursts	cm	
	dm	
	m	noise storm → ← ns
	Dkm	
SID		
X-Rays		
Ap 22 D5	Kp	4- 4o 5o 3o 3o 3+ 3- 4-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona	E. Limb 7 days earlier: NE- no data SE no data	W. Limb 7 days later: NW- no data SW- no data
Indices	Rz: 35 10cm flux: 95 Flare: 23/18.7	Ca: 10.9 Ip: 0 Ia: 4
Solar Regions		
Sunspots		

October 23, 1977

FLARES		
Bursts	cm	
	dm	
	m	ns → ← noise storm →
	Dkm	
SID		
X-Rays		
Ap 6	Kp	3- 3- 2- 1- 0o 0+ 2o 2-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona	E. Limb 7 days earlier: NE- moderately bright SE-	W. Limb 7 days later: NW- no data SW- no data
Indices	Rz: 30 10cm flux: 88 Flare: 15/16.9	Ca: no data Ip: 0 Ia: 1
Solar Regions	14998 N31 (2)	
Sunspots		

October 24, 1977

FLARES		
Bursts	cm	
	dm	
	m	← noise storm →
	Dkm	
SID		
X-Rays		
Ap 6 Q10	Kp	2+ 2o 1+ 1+ 1+ 1o 1+ 2-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona	E. Limb 7 days earlier: NE- SE	W. Limb 7 days later: NW- no data SW- no data
Indices	Rz: 29 10cm flux: 89 Flare: 6/22.9	Ca: 10.5 Ip: 0 Ia: 0
Solar Regions	(15015) N19 15C 7 S26	
Sunspots	(19883) N20 (ap)3 19878 S26 (β)3	

October 25, 1977

FLARES		
Bursts	cm	
	dm	
	m	← noise storm →
	Dkm	
SID		
X-Rays		
Ap 4 Q4	Kp	2- 0+ 1- 0+ 0o 1+ 2o 2o
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- SW-
Indices		Rz: 28 10cm flux: 89 Flare: 2/23.0 Ca: 8.0 Ip: 0 Ia: 1
Solar Regions		(15004) N33
Sunspots		

October 26, 1977

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 6 Q9K	Kp	1- 2+ 2- 1o 0+ 1- 1o 3o
	sc	2330(25) ▲
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- SW-
Indices		Rz: 30 10cm flux: 90 Flare: 3/19.6 Ca: 10.3 Ip: 0 Ia: 0
Solar Regions		
Sunspots		

October 27, 1977

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 62 01	Kp	4o 3+ 3+ 6+ 6- 5o 7- 7-
	sc	
Aurora	USSR	$\phi = 58°$ 1500(R_1R2); $\phi = 57°$ 1600-2000 and 2200-2300($R_{1-2}R1-3$)
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- SW-
Indices		Rz: 38 10cm flux: 90 Flare: 6/24.0 Ca: 11.8 Ip: 0 Ia: 3
Solar Regions		
Sunspots		

October 28, 1977

FLARES		— 1n/16 — 1n/16 — 1f/16 —
Bursts	cm	
	dm	
	m	← noise storm →
	Dkm	
SID		
X-Rays		
Ap 47 02	Kp	6o 7+ 5+ 3- 3+ 3+ 4+ 2o
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- moderately bright SW-
Indices		Rz: 37 10cm flux: 92 Flare: 28/22.2 Ca: 12.5 Ip: 0 Ia: 1
Solar Regions		15006 N19 (3)
Sunspots		(19879) N17

October 29, 1977

FLARES		—1n/16
Bursts	cm	
	dm	
	m	← noise storm → ← ns —
	Dkm	
SID		
X-Rays		
Ap 9	Kp	2+ 2o 1o 3- 4- 2+ 1o 2-
	sc	
Aurora	USSR	Φ = 60° 1600-1700(R1B2)
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- moderately bright SW-
Indices		Rz: 42 IOcm flux: 92 Flare: 64/17.0 Ca: 10.6 Ip: 0 Ia: 0
Solar Regions		(15011) S17 (15018) S17
Sunspots		(19881) S17 (β)3 (19886) S18 (β)4

October 30, 1977

FLARES		
Bursts	cm	
	dm	
	m	— ns → ← noise storm →
	Dkm	
SID		
X-Rays		
Ap 9	Kp	1+ 1o 2- 2o 2+ 4o 2o 2-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 45 IOcm flux: 96 Flare: 9/20.7 Ca: 13.7 Ip: 0 Ia: 2
Solar Regions		15009 N23 15008 N32 (2) (15014) N14
Sunspots		19880 N21 (β)3 19882 N31 (β)4

October 31, 1977

FLARES		
Bursts	cm	
	dm	
	m	‖ ← noise storm →
	Dkm	
SID		
X-Rays		
Ap 6 Q8	Kp	2o 2- 2- 2- 1o 1o 2o 1+
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 52 IOcm flux: 97 Flare: 5/22.0 Ca: 15.4 Ip: 0 Ia: 2
Solar Regions		
Sunspots		

REGIONAL FLARE INDEX

INCLUDES ALL FLARES

MC MATH PLAGE NO.	LAT	CMP DATE	DATE FIRST FLARE	DATE LAST FLARE	FLARE-INDEX SUM	FLARE-INDEX MEAN	TOTAL NO. OF FLARES
14967	N33	77/10/02.1	77/10/03	77/10/07	88.14	17.63	35
14970	S23	77/10/04.9	77/09/30	77/09/30	.50	.50	1
14969	N21	77/10/05.2	77/10/06	77/10/07	11.10	5.55	3
14988	N20	77/10/07.8	77/10/12	77/10/12	1.00	1.00	1
14982	S34	77/10/08.4	77/10/07	77/10/07	1.95	1.95	1
14975	N23	77/10/08.7	77/10/09	77/10/11	11.54	3.85	3
14979	N13	77/10/12.2	77/10/05	77/10/14	280.58	28.06	67
14990	N30	77/10/12.7	77/10/13	77/10/13	6.39	6.39	1
14993	N18	77/10/14.7	77/10/14	77/10/19	21.72	3.62	6
14984	N22	77/10/16.2	77/10/10	77/10/22	38.96	3.00	27
14991	N25	77/10/19.7	77/10/12	77/10/23	33.47	2.79	13
14995	S25	77/10/21.4	77/10/18	77/10/24	81.42	11.63	24
14996	N30	77/10/21.4	77/10/21	77/10/21	.85	.85	1
15015	N19	77/10/24.7	77/10/27	77/10/31	8.03	1.61	7
15005	S26	77/10/24.8	77/10/23	77/10/31	4.13	.46	2
15006	N19	77/10/28.4	77/10/22	77/10/24	3.05	1.02	3
15011	S17	77/10/29.2	77/10/25	77/10/29	8.79	1.76	2
15018	S18	77/10/29.3	77/10/30	77/10/30	3.48	3.48	1
15009	N23	77/10/30.1	77/10/26	77/10/30	57.54	11.51	13
15008	N32	77/10/30.2	77/10/23	77/11/03	11.02	.92	4

Miscellaneous Data

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SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

FEBRUARY 1978

FEB 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
01	0000	0727	CULG				0000	0705					IIIN,W
			CULG				0050	0200					IS,W
			CULG				0443.5	0445	1	0444	0445	1	IIIG
			CULG	0700	0705	1	0659	0705	1				IIIGG
	2045	2400	CULG				2045	2400	1				IIIN
			CULG				2208	2210	2				IIIG
			CULG	2357	2402	1							IIIGG
02	0000	0745	CULG				0000	0745	1				IIIN
			CULG				0202	0203	1				IIIG
			CULG	0205.5	0207	2	0205.5	0207	2				IIIG,V
			CULG				0555	0745					IN,W
			CULG	0700	0701.5	1	0700	0701.5	2				IIIG,V,U
			CULG				0725		2				IIIB
	2046	2400	CULG	2046	2400	1	2046	2400	1				IS,C,DC
			CULG	2135	2400	1	2135	2400	1				IIIS
			CULG	2232.5	2233	1	2232.5	2233	3	2232.5	2233	1	IIIB
			CULG				2349		2	2349		1	IIIB
03	0000	0745	CULG	0000	0745	1	0000	0530	1				IS,C,DC
			CULG	0000	0745	1							IIIN
			CULG				0000	0555	1				IIIS
			CULG	0440	0526	2							CONT
			CULG	0449.5		2	0449.5		2				IIIB
			CULG				0530	0745	2				IS,C,DC
			CULG				0535	0536	3	0535	0536	2	IIIG
			CULG				0555	0745	2				IIIS
	2046	2400	CULG	2046	2400		2046	2400					IS,W
			CULG	2046	2400	2	2046	2400	2	2046	2400	2	IIIGN
			CULG	2103	2104.5	2	2103.5	2105.5	3	2103.5	2105.5	2	IIIGG,V
			CULG	2114	2116	2	2114	2116	3	2115	2116	2	IIIGG
			CULG	2147	2148	2	2144	2148	3	2146	2148	3	IIIGG,V
			CULG	2214	2217	2	2214	2217	3	2214	2216	2	IIIGG
			CULG	2237.5	2239.5	3	2237.5	2239.5	3	2238	2239.5	3	IIIG,V
			CULG	2302.5	2306	2	2302.5	2306	3	2303	2306	2	IIIGG
04	0000	0746	CULG	0000	0315		0000	0315					IN,W
			CULG	0000	0746	2	0000	0746	2	0000	0746	2	IIIN
			CULG				0251	0251.5	2				IIIG
			CULG				0255.5	0256	2				IIIG
			CULG	0315	0540	1	0315	0540	1				IS,C,DC
			CULG	0435.5	0437.5	2	0435.5	0437.5	3	0435	0437.5	3	IIIGG
			CULG	0540	0746		0540	0746					IS,W
			CULG				0611	0611.5	2				IIIG
	2046	2400	CULG	2046	2400		2046	2400					IS,W
			CULG	2046	2400	1	2046	2400	1				IIIN
05	0000	0746	CULG	0000	0746		0000	0746					IS,W
			CULG	0000	0746		0000	0720					IIIN,W
			CULG				0700	0746	1				IS,C,DC
			CULG				0735	0746	1				IIIS
	2046	2400	CULG	2046	2400	1	2046	2400	1				IS
			CULG				2046	2400					IIIS,W
06	0000	0728	CULG	0000	0728	1	0000	0728	1				IS,DC
			CULG				0000	0728					IIIS,W
	2046	2400	CULG	2046	2400	1	2046	2400	1				IS,C,DC
			CULG	2046	2400	1							IIIN
			CULG				2046	2400					IIIS,W
07			CULG	0000	0746	1	0000	0313	1				IIIN
			CULG				0000	0746					IIIS,W
	0000	0746	CULG	0000	0746	1	0000	0746	1				IS,C,DC
			CULG				0118.5	0119	1	0118.5	0119	1	IIIG
			CULG	0425	0426	2	0425	0426	2				IIIG,U
			CULG	0649	0650	2	0649	0650	2				IIIG,U
			CULG				2046	2400	1				IIIS
	2046	2400	CULG	2046	2400	1	2046	2400	2				IS,C,DC
			CULG	2046	2400	1							IIIN
08	0000	0746	CULG	0000	0746	1	0000	0746	1				IS,C,DC

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

FEBRUARY 1978

FEB 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
08			CULG	0000	0746	1	0000	0746	2				IIIN
			CULG				0000	0746	1				IIIS
			CULG				0128		2				IIIB,U
			CULG				0324		2				IIIB
			CULG				2046	2400	1				IIIS
	2046	2400	CULG	2046	2400	2	2046	2400	2				IS,C,DC
			CULG	2046	2400	1	2046	2400	2				IIIN
			CULG				2225	2226	2				IIIG
			CULG				2342	2343	2	2342	2343	1	IIIG
09	0000	0746	CULG	0000	0746	1	0000	0746	1				IS,C,DC
			CULG	0000	0746	1	0000	0746	2				IIIN
			CULG				0000	0746	1				IIIS
			CULG				0057.5	0102	2				IIIGG
	2046	2400	CULG	2046	2400	1	2046	2400	2				IS,C,DC
			CULG	2046	2400	1	2046	2400	2				IIIN
			CULG				2046	2400	1				IIIS
10			CULG				0000	0746	1				IIIS
	0000	0746	CULG	0000	0746	1	0000	0746	1				IS,C,DC
			CULG	0043	0045	2	0043.5	0046.5	3	0043.5	0046	1	IIIGG,V
			CULG	0043	0746	1	0247	0746	2	0000	0746	1	IIIN
			CULG	0333	0335	1	0332.5	0335	2	0333	0335	2	IIIGG
			CULG	0542.5	0543.5	1	0541.5	0544	2	0542.5	0543	1	IIIGG
			CULG				0546	0549	2	0546	0547	2	IIIGG
	2046	2400	CULG	2046	2400	1	2046	2400	2				IS,C,DC
			CULG	2046	2400	1	2046	2400	2	2046	2400	2	IIIN
			CULG				2046	2400	1				IIIS
			CULG	2113	2137	2	2123	2230	2				IV
			CULG							2113	2140	1	SWF
			CULG				2115	2128	2				II
			CULG	2125	2126	2	2125	2126	2				IIIG
			CULG	2128	2131	1	2129	2132	2				IIIGGV
			CULG	2134	2136	1	2136	2138	2				IIIG,V
			CULG				2256		2	2256		2	IIIB
			CULG				2258	2258.5	2				IIIG
11			CULG	0000	0723	1	0000	0723	2	0000	0723	1	IIIG,N
			CULG				0000	0723	1				IIIS
	0000	0723	CULG	0000	0723	1	0000	0723	2				IS,C,DC
			CULG	0015.5	0016.5	1	0015.5	0017	3	0015.5	0017	2	IIIG,V
			CULG	0319	0323	2	0319.5	0323	3	0319	0323	3	IIIGG,V
			CULG	0510	0515	1	0510	0515	1	0510	0515	1	IIIGG
			CULG				2046	2400	2				IIIS
	2046	2400	CULG	2046	2400	1	2046	2400	2				IS,C,DC
			CULG	2046	2400	2	2046	2400	2	2046	2400	2	IIIGN
			CULG	2120	2122	1	2120	2123	3	2120	2122	1	IIIGG,V
			CULG	2135	2148	2	2135	2149	3	2146	2148	2	IIIGG
			CULG	2155.5	2157.5	2	2155	2157.5	3	2155	2156	2	IIIGG
12			CULG	0000	0746	1	0000	0746	2	0000	0746	2	IIIGN
			CULG				0000	0746	2				IIIS
	0000	0746	CULG	0000	0746	1	0000	0746	2				IS,C,DC
			CULG	0132	0132.5	2	0132	0132.5	3	0132	0133	2	IIIG
			CULG	0136	0140	2	0135.5	0140	3	0136	0140	1	IIIGG,V
			CULG	0523	0524	1	0523.5	0525	3	0522.5	0524	3	IIIGG
			CULG				2046	2400	2				IIIS
	2046	2400	CULG	2046	2400	1	2046	2400	2				IS,C,DC
			CULG				2046	2400	1				N,RS,DP
			CULG	2046	2400	1				2046	2400	1	IIIN
			CULG				2046	2400	1				N,RS,DP
			CULG				2046	2400	2				IIIS
			CULG	2247	2400	1	2247	2400	2	2247	2400	2	IIIN
			CULG				2248	2249.5	1	2248	2249.5	1	IIIG
			CULG				2345	2345.5	1	2345	2345.5	2	IIIGV
			CULG				2349.5	2351	1	2349.5	2351	1	IIIG
13	0000	0746	CULG	0000	0746	1	0000	0746	2				IS,C,DC
			CULG				0000	0746	1				N,RS,DP
			CULG				0000	0600	1				IIIS

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FEB 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
13			CULG							0130	0455	1	SWF
			CULG				0134	0400	2				IV
			CULG				0138	0200	2	0154	0209	2	II
			CULG				0226	0233	1				III,RS
			CULG	0244	0340	2							N,FASTDRIF
			CULG	0407.5	0413	2							FAST DRIFT
			CULG	0408	0413	2	0409.5	0415	3	0409.5	0413	3	IIIGG
			CULG	0409	0746	2	0345	0746	2	0345	0746	2	IIIN
			CULG				0418	0530	2				DP
			CULG				0428		2				RS,DP
			CULG				0434	0435.5	3	0434	0435.5	3	IIIG
			CULG	0442	0449	3	0442	0452	3	0442	0449	3	IIIGG
			CULG				0541	0543	3	0541	0543	3	IIIG
			CULG				0545.5	0546.5	3	0545.5	0546.5	3	IIIG
			CULG				0600	0746	2				IIIS
	2046	2400	CULG	2046	2400	1	2046	2400	2				IS,C,DC
			CULG				2046	2400	2				S,RS,DP
			CULG	2046	2400	2				2046	2400	1	IIIN
			CULG				2046	2400	2				IIIS
14	0000	0746	CULG	0000	0746	1	0000	0746	2				IS,C,DC
			CULG	0000	0746	1				0000	0746	1	IIIN
			CULG				0000	0746	2				S,RS,DP
			CULG				0000	0746	2				IIIS
			CULG				0454	0456	3	0454	0455	1	IIIG,V
	2046	2400	CULG	2046	2400	1	2046	2400	1				IS,C,DC
15			CULG	0000	0746	1	0000	0746	2	0000	0746	2	IIIN
			CULG				0000	0746	1				N,RS,DP
			CULG				0000	0610	1				IIIS
	0000	0746	CULG	0000	0746	1	0000	0746	2				IS,DC,C
			CULG	0353	0353.5	2	0352.5	0354	3	0353	0353.5	2	IIIG
			CULG	0400.5	0402	2							UNCLF
			CULG	0402	0402.5	2	0402	0403	3	0402	0402.5	3	IIIG
			CULG	0458.5	0502	2	0458.5	0502	3	0459	0501.5	2	IIIGG
			CULG	0543.5	0547.5	2	0544	0547.5	3	0544	0547.5	2	IIIGG
			CULG				0610	0746	2				IIIS
			CULG	0656.5	0701	2	0656	0700	3	0656.5	0659	1	IIIGG
			CULG	0710	0713	2	0710	0714	3	0710	0712	1	IIIGG
			CULG	2046	2400	1	2046	2400	2	2046	2400	2	IIIN
			CULG				2046	2400	1				IIIS
	2046	2400	CULG	2046	2400	1	2046	2400	2				IS,C,DC
			CULG				2139.5	2141	3	2139.5	2140	3	IIIG
			CULG				2143	2144	3	2143.5	2144	3	IIIG
			CULG	2225.5	2238	3	2225.5	2239.5	3	2225.5	2239.5	3	IIIGG
			CULG				2240	2300	2	2252	2258	2	II, HB
			CULG				2254	2255	1	2254	2255	1	RD
			CULG				2258	2400	2				IV
16	0000	0746	CULG				0000	0345	2				IV
			CULG				0000	0746	2				IIIS
			CULG	0000	0746	1	0000	0746	2				IS,C,DC
			CULG	0000	0746	2	0000	0746	2	0000	0746	2	IIIN
			CULG	0015.5	0018.5	2	0015.5	0019	3	0016	0020	3	IIIGG,V
			CULG	0607.5	0622	2	0607.5	0622	3	0607.5	0621	3	IIIGG
			CULG	0608	0617	2							CONT
			CULG	0631	0637.5	2	0631	0637.5	3	0631	0637.5	2	IIIGG
	2046	2400	CULG	2046	2400	1	2046	2400	2				IS,C,DC
			CULG				2046	2400	2				N,RS,DP
			CULG				2046	2400	2				IIIS
			CULG	2046	2400	2							N,FASTDRIF
			CULG	2046	2400	2	2046	2400	2	2046	2400	2	IIIN
			CULG	2127.5	2136.5	3	2127.5	2136.5	2				IIIGG
			CULG	2248	2248.5	2	2248	2249	3	2248	2249	3	IIIG
17			CULG	0000	0746	2							FAST DRIFT
			CULG	0000	0746	2	0000	0746	2	0000	0746	2	IIIN
			CULG				0000	0746	1				IIIS
	0000	0746	CULG	0000	0746		0000	0746	1				IS,C,DC
			CULG				0000	0746	1				N,RS,DP

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FEB 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
17			CULG	0254	0316	3	0254	0317	3	0254	0316	3	IIIGG
			CULG				0314	0338	2				II
			CULG							0315	0330	1	SWF
			CULG	0513	0515	1	0513	0516	3	0513.5	0516	3	IIIGG,V
			CULG	0646.5	0647.5	1	0646.5	0647.5	3	0646.5	0647	2	IIIGG
			CULG	0652.5	0653	3	0652.5	0654	3	0653	0654	2	IIIGG
	2046	2400	CULG	2046	2400	1	2046	2400	1				IS,DC,C
			CULG	2046	2400	2	2046	2400	2	2046	2400	2	IIIN
			CULG				2046	2400	1				N,RS,DP
			CULG				2046	2400	1				IIIS
			CULG	2049	2051	1	2046	2052	3	2046	2051	3	IIIGG
18			CULG				0000	0746	1				N,RSDP
			CULG	0000	0746	2	0000	0746	2	0000	0746	2	IIIN
			CULG				0000	0746					IIIS,W
	0000	0746	CULG	0000	0746	1	0000	0746	1				IS,C,DC,W
			CULG	0207	0208	2	0207	0210	3	0208	0210	3	IIIG,V,U
	2046	2400	CULG	2046	2400		2046	2400					IS,DC,W
			CULG				2046	2400	1				N,RSDP
			CULG				2046	2400	1				IIIS
			CULG	2046	2400	2	2046	2400	2	2046	2400	2	IIIN
			CULG				2148.5	2151	2				IIIGG,V,U
19			CULG				0000	0746	1				IIIS
	0000	0746	CULG	0000	0746	1	0000	0746	1				IS
			CULG	0000	0411	2	0000	0746	2	0000	0422	2	IIIN
			CULG				0007.5	0011.5	2				IIIGG,U
			CULG				2046	2400	1				IIIS
	2046	2400	CULG	2046	2400	1	2046	2400	1				IS
			CULG	2046	2319	1	2046	2400	2	2046	2310	1	IIIN
20	0000	0746	CULG	0000	0746		0000	0746					IS,DC,W
			CULG				0000	0746					IIIS,W
			CULG				0522	0522.5	2				IIIG
			CULG	0620	0746	1	0000	0746	2	0145	0746	1	IIIN
	2046	2400	CULG	2046	2400		2046	2400					IS,W
			CULG				2046	2400	2	2243	2345	1	IIIN
			CULG				2046	2400					IIIS,W
21			CULG				0000	0634	2	0000	0634	1	IIIN
			CULG				0000	0746					IIIS,W
	0000	0746	CULG	0000	0746		0000	0746					IS,W
	2046	2157	CULG	2046	2157		2046	2157					IN,W
			CULG				2046	2157	1				IIIS
			CULG				2120	2157	2				IIIN
22			CULG	0425	0746	2	0425	0746	1				IIIN
	0425	0746	CULG	0425	0746		0425	0746					IN,W
			CULG				2046	2400					IIIS,W
	2046	2400	CULG	2046	2400		2046	2400					IS,DC,W
			CULG				2153	2306	2	2153	2306	1	IIIN
23	0000	0746	CULG	0000	0746		0000	0746					IS,W
			CULG				0000	0746					IIIS,W
			CULG				0510	0511	2	0510	0511	1	IIIG
			CULG				2046	2400					IIIS,W
	2046	2400	CULG				2046	2400	1				IS,DC
24			CULG				0000	0120					IIIS,W
	0000	0745	CULG				0000	0745	1				IS,DC
			CULG	0042	0049		0042	0049					IIIGG,W
			CULG				0051	0106	2				II
			CULG	0337.5	0338.5	1	0337.5	0338.5	1				IIIG,U
			CULG				0426	0745	2	0426	0636	2	IIIGN
			CULG	0735	0737.5	2	0735	0737.5	2				IIIGG,U
	2045	2400	CULG				2045	2400					IS,DC,W
			CULG	2350.5		2	2350.5		2				IIIB
25			CULG	0306.5	0312	1	0307.5	0311	1				IIIG,U
			CULG							0310	0322	1	SWF

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

FEBRUARY 1978

FEB 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
25			CULG				0310	0326	2				II
			CULG	0313.5	0315.5	1	0313.5	0315.5	1				IIIG,U
			CULG	0315.5	0316.5								FASTDRIFTW
	0000	0745	CULG	0445	0745		0000	0745					IS,W
	2045	2400	CULG	2331	2334								IIIG,W
26	0000	0745	CULG	0103	0231	1							IIIN
			CULG	0611	0614	1							IIIG
			CULG				0652.5	0718	2				II
	2045	2400	CULG				2045	2400					IIIN,W
			CULG	2326.5	2328	1							IIIG,RS
27	0000	0745	CULG	0103	0745	1	0103	0745	1				IIIN
			CULG				0308	0545	1				IS
			CULG				0308	0545	1				IIIS
			CULG	0559.5	0602.5	2	0559.5	0602.5	2				IIIG,V
	2045	2400	CULG				2158.5	2200	2				IIIG,U
28	0000	0740	CULG	0116	0116.5	1	0116	0116.5	2				IIIG,U
	2045	2400	CULG				2252	2253					IIIG,U,W

The symbols used in connection with the spectral type in describing the important bursts are as follows:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of bursts
C = Underlying continuum (particularly with type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III

RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity

SELECTED SOLAR EVENTS

JANUARY 1978

Culgoora

UT Date 1978. JANUARY	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
31/1	2300	0500	160	.2	270	R	2	I	Type I emission from this region until 2nd.
1/2	2300	0500	43.25) 80) 160)	.1	180	R	2	I	This region produced type I & III activity until 8th.
	2244	2400	43.25) 80) 160)	.1	180	R	2	IV	Type II, IV began before start of observing period at 22^h44^m.
3	0307	0309	43.25 80) 160)	.3) .2) 0	325 0	-	3	IIIG	*
4	0408	0412	43.25) 80) 160)	.3	250 230	-	3	IIIGG	*
6	0153	0154	43.25) 80) 160)	.9	240 235	-	3	IIIG	
	0405	0407	43.25) 80) 160)	1.1 .9	90 100	-	2 2 1	IIIG	*
7	0110	0111	43.25) 80) 160	1.0 .9	250 240	-	3	IIIG	*
	0119	0407	43.25) 80) 160)	1.0 .9	250 240	R	3	CONTINUUM.	

Days without Heliograph observations: 20th, 21st.

* Other type III's observed at same position during the day.

SELECTED SOLAR EVENTS

JANUARY 1978

Culgoora

UT Date 1978. JANUARY	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
8	0208	0402	43.25) 80) 160)	1.3 1.2 1.0	270 260	Unpol	3-2)))	Type II, IV event complex source structure.	
9/10	2300	0500	160	1.1	260	Unpol	2	I	
10/11	2319	0050	A) 43.25) 80) 160) B) 80) 160)	.8 3.0 2.0	270 260	Unpol	)3)3)2)3)2	II & IV	Complex source structure. Type IV moved from position A to B at times indicated Becoming RH Polz. at $00^h\ 20^m$ 80, 160 MHz.
	0133	0135	43.25) 80) 160)	1.2 1.1 1.0	55	-	2	IIIB	
	0319	0332	43.25) 80) 160)	. 3	280	-	3 3 1	II	
12/13	2300	0500	160	.1	120	Variable	1	I	Type I persisted from this region until 16th.
	0314	0318	43.25) 80) 160)	.1	120	-	- 3 2	IIIG	*
14/15	2300	0500	43.25) 80) 160)	1.3 1.0 .8	330	-	3 2 2	IIIS	

Days without Heliograph observations: ....20th....21st.....

* Other type III's observed at same position during the day.

SELECTED SOLAR EVENTS

JANUARY 1978

Culgoora

UT Date 197.8 JANUARY	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
26	0240	0252	43.25) 80) 160)	1.1	70	-	- 2 1	$\overline{\underline{111}}$GG,U	*
	0252	0322	80	1.1	0	L	2	$\overline{\underline{1}}$	Type $\overline{\underline{1}}$ activity persisted from this region until 30th.
27	2335	2400	160	1.1	110	variable	1	$\overline{\underline{1}}$	Type $\overline{\underline{1}}$ activity intermittently present until 31st.
	2349	2350	80) 160)	1.0	90	-	2 2	$\overline{\underline{111}}$G	*
29	0345	0348	43.25) 80) 160)	1.3 1.2 1.1	55	-	3	$\overline{\underline{111}}$G,$\overline{\underline{V}}$,U	

Days without Heliograph observations: .....20th, 21st.....

* Other type $\overline{\underline{111}}$'s observed at same position during the day.

SELECTED SOLAR EVENTS

FEBRUARY 1978

Culgoora

UT Date 1978. FEBRUARY	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
2	2354	2355	160	.8	230	L	1	I	Type $\overline{\underline{1}}$ activity persisted from this region from 1 - 4.
	2354	2356	80) 160)	.4) .3)	270	-	2	$\overline{\underline{111}}$G	
	0032	0034	80) 160)	1.8) 1.3)	275	-	2	$\overline{\underline{111}}$G	
	0205	0207	43.25) 80) 160)	1.5 1.3	65	-	3	$\overline{\underline{111}}$G,$\overline{\underline{V}}$	*
2/3	2310	0523	80) 160)	.7	220) 210)	R	1) 2)	$\overline{\underline{1}}$	Type $\overline{\underline{1}}$ activity persisted intermittently from this region 3-9.
	2329	2330	43.25) 80) 160)	1.0) .6)	330	-	3	$\overline{\underline{111}}$G	*
	2347	2348	43.25) 80) 160)	.7	220) 210)	-	3	$\overline{\underline{111}}$G	
	0058	0059	160	.6	330	L	2	$\overline{\underline{1}}$	Type 1 activity persisted from this region 3-7.
	0442	0523	80) 160)	1.6 1.5	40	-	1) 2)	Slow drift continuum.	
3/4	2300	0500	80) 160)	1.1 .9	40	L))	1-2 2-3	$\overline{\underline{1}}$	Type 1 activity from this region also on 5th.

Days without Heliograph observations: Nil

* Other type $\overline{\underline{111}}$'s observed from same position during the day.

SELECTED SOLAR EVENTS

FEBRUARY 1978

Culgoora

UT Date 1978. FEBRUARY	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
	2300	0500	160	.9	140	L	2	$\overline{\underline{I}}$	
	0250	0252	43.25) 80) 160)	.9	245		3	$\overline{\underline{III}}$G	*
5/6	2300	0500	80) 160)	1.2	55	R	1) 2)	$\overline{\underline{I}}$	Type $\overline{\underline{I}}$ activity persisted from this region 8-22.
7	0425	0426	80) 160)	1.3 1.2	50	-	3	$\overline{\underline{III}}$G,U	
8/9	2300	0500	43.25) 80) 160)	1.0	40	Unpol R	2) 1) 2)	$\overline{\underline{I}}$	
	0057	0102	43.25 80) 160)	1.0	40	-	2) 2) 3)	$\overline{\underline{III}}$GG	*
	0112	0114	43.25) 80) 160)	1.3	260	-	3	$\overline{\underline{III}}$G	*
9/10	2300	0500	160	.4	0	L	2	$\overline{\underline{I}}$	Type $\overline{\underline{I}}$ activity visible also on 12.
	2300	0500	80) 160)	1.0	320	L	2	$\overline{\underline{I}}$	
	0043	0051	43.25) 80) 160)	1.0 .9 .8	65	-	3	$\overline{\underline{III}}$GG,$\overline{\underline{V}}$	*
10/11	2300	0047	43.25) 80)	1.4	320	Unpol	3) 2)	$\overline{\underline{IV}}$	Type $\overline{\underline{II}}$ occurred at 21^h15^m before start of heliograph observations

Days without Heliograph observations: Nil

* Other type $\overline{\underline{III}}$'s observed from same position during the day.

SELECTED SOLAR EVENTS

FEBRUARY 1978

Culgoora

UT Date 197.8 FEBRUARY	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
	0317	0324	43.25) 80) 160)	.8	45	-	3	$\overline{\underline{111}}$GG,$\overline{\underline{V}}$	*
11/12	2300	0500	80) 160)	.5	105	R	2) 3)	$\overline{\underline{I}}$	
	0135	0140	43.25) 80) 160)	1.6 1.4 1.2	45	-	3	$\overline{\underline{111}}$GG,$\overline{\underline{V}}$	*
12/13	2300	0500	160	.7	230	Varying	2	$\overline{\underline{I}}$	Type $\overline{\underline{I}}$ activity from this region persisted until 15th.
	0141	0205	43.25) 80) 160)	1.2	315	-	3	$\overline{\underline{II}}$	Complex source structure.
	0409	0415	43.25) 80) 160)	1.2	315	-	3	$\overline{\underline{111}}$GG	*
	0434	0435	43.25) 80) 160)	.7	230	-	3) 3) 2)	$\overline{\underline{111}}$G	*
15	0458	0502	43.25) 80) 160)	1.0	280	-	3) 3) 2)	$\overline{\underline{111}}$GG	*
15/16	2300	0500	80) 160)	1.0	50	L	2	$\overline{\underline{I}}$	Type $\overline{\underline{I}}$ activity persisted from this region until 19th.

Days without Heliograph observations: ..Nil.....

* Other type $\overline{\underline{111}}$'s observed from same position during the day.

SELECTED SOLAR EVENTS

FEBRUARY 1978

Culgoora

UT Date 197.8 FEBRUARY	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polar-ization	Inten-sity (1-3)		
16	2259	0500	43.25) 80) 160)	.8	290	-	3	$\overline{\underline{IV}}$	Type $\overline{\underline{II}}$ occurred before start of heliograph observations at 22^h59^m, Type $\overline{\underline{IV}}$ was in progress at start.
17	0253	0338	43.25) 80) 160)	.8	260		3	$\overline{\underline{II}}$	
18	0206	0211	43.25) 80 160	1.5) 1.3) 1.2)	260	-	3) 3) 2)	$\overline{\underline{III}}$G,$\overline{\underline{V}}$,U	*
19	0007	0012	43.25) 80) 160)	1.5) 1.3) 1.2)	270	-	3) 3) 2)	$\overline{\underline{III}}$GG,U	*
19/20	2300	0500	80) 160)	1.1	40	R	1) 2)	$\overline{\underline{I}}$	Type $\overline{\underline{I}}$ activity persisted until 28th.
	0117	0118	43.25) 80)	1.0	340		3	$\overline{\underline{III}}$G	*
21	0046	0047	43.25) 80) 160)	1.2 1.0	280		3) 3) 2)	$\overline{\underline{III}}$G	*
22	0205	0208	43.25) 80) 160)	1.0	280	-	2	$\overline{\underline{III}}$G	*

Days without Heliograph observations: ....Nil.....

* Other type $\overline{\underline{III}}$'s observed from same position during the day.

SELECTED SOLAR EVENTS

FEBRUARY 1978

Culgoora

UT Date 197.8 FEBRUARY	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
23	0509	0512	43.25) 80)	1.5 1.1	310		3) 2)	$\overline{\underline{111}}$G	*
24	0052	0108	43.25) 80)	1.5 1.2	55		3	$\overline{\underline{11}}$	
	0427	0428	43.25) 80) 160)	1.5 1.2	55		3	$\overline{\underline{111}}$G	*
25	0306	0325	43.25) 80) 160)	1.3 1.1 1.0	330		2) 3) 2)	$\overline{\underline{111}}$G,U $\overline{\underline{11}}$	
27	0104	0105	80) 160)	1.0	320		2) 3)	$\overline{\underline{111}}$G	*
	0300	0306	43.25) 80) 160)	1.3	40		3) 2) 3)	$\overline{\underline{111}}$G	*
	0308	0517	80) 160)	1.3	40	L	2	$\overline{\underline{1}}$	
28	0115	0118	80) 160)	1.0	35		3	$\overline{\underline{111}}$G,U	Complex source structure.

Days without Heliograph observations: Nil

* Other type $\overline{\underline{111}}$'s observed from same position during the day.

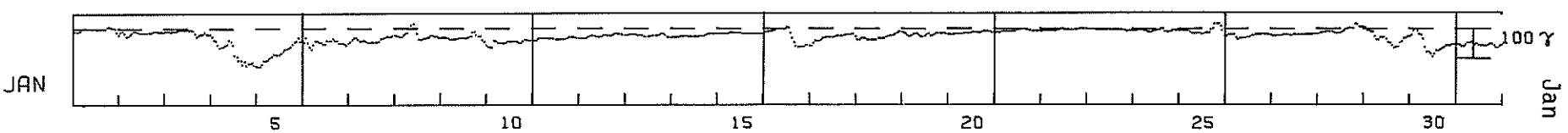
HOURLY EQUATORIAL DST VALUES (PROVISIONAL)

JANUARY 1978

NASA/GODDARD SPACE FLIGHT CENTER

(Time-UT) (Units-Gammas)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-10	-12	-12	-8	-3	0	-3	-3	-4	-5	-4	-5	-5	-5	-3	-3	-2	4	6	1	-2	-4	-16	-23
2	-14	-10	-19	-29	-26	-21	-16	-11	-11	-15	-18	-16	-15	-15	-15	-14	-14	-12	-10	-13	-14	-15	-14	-12
3	-10	-12	-14	-12	-11	-10	-8	-5	-7	-8	-8	-9	-8	-7	-11	-21	-30	-24	-20	-20	-14	-22	-24	-21
4	-31	-42	-44	-57	-65	-62	-60	-56	-53	-39	-46	-57	-91	-96	-108	-108	-121	-111	-125	-115	-115	-112	-123	-126
5	-129	-127	-118	-109	-106	-104	-98	-93	-87	-87	-89	-88	-82	-76	-70	-67	-64	-61	-53	-45	-42	-33	-45	-47
6	-49	-31	-51	-64	-71	-54	-42	-45	-50	-50	-56	-53	-42	-45	-41	-36	-43	-44	-51	-53	-53	-55	-59	-50
7	-44	-38	-33	-32	-39	-45	-42	-40	-46	-50	-49	-48	-47	-46	-47	-44	-36	-35	-32	-28	-32	-32	-26	-24
8	-28	-30	-32	-32	-22	-17	-15	-4	10	13	-8	-21	-39	-41	-35	-35	-32	-31	-25	-25	-30	-30	-35	-35
9	-34	-33	-31	-36	-40	-39	-38	-39	-36	-33	-34	-35	-37	-35	-30	-27	-13	-12	-25	-31	-27	-40	-48	-60
10	-64	-66	-64	-42	-45	-51	-52	-52	-53	-49	-45	-44	-44	-43	-44	-48	-52	-48	-43	-38	-40	-43	-40	-41
11	-41	-40	-35	-33	-35	-36	-34	-35	-36	-34	-36	-39	-39	-39	-37	-37	-36	-33	-30	-29	-32	-34	-36	-35
12	-35	-34	-35	-33	-28	-26	-24	-26	-30	-32	-30	-27	-23	-24	-26	-27	-26	-21	-18	-19	-21	-22	-25	-26
13	-24	-21	-20	-21	-21	-25	-27	-25	-27	-30	-32	-32	-27	-25	-24	-26	-26	-22	-18	-18	-24	-31	-34	-32
14	-30	-30	-31	-31	-27	-27	-26	-29	-31	-31	-31	-31	-31	-28	-25	-27	-26	-22	-19	-18	-18	-19	-17	-17
15	-19	-21	-21	-21	-18	-16	-13	-14	-15	-15	-16	-18	-21	-21	-21	-19	-19	-19	-19	-19	-18	-20	-20	-15
16	-12	-12	-11	-9	-8	-7	-3	-2	-3	-6	-4	4	-1	-19	-36	-50	-62	-64	-64	-62	-62	-57	-56	-61
17	-58	-49	-42	-45	-43	-38	-33	-31	-29	-30	-29	-30	-28	-25	-25	-26	-26	-24	-21	-21	-21	-18	-22	-30
18	-39	-41	-33	-34	-37	-41	-38	-38	-41	-40	-38	-34	-33	-34	-34	-29	-26	-24	-24	-22	-18	-14	-11	-15
19	-17	-20	-27	-30	-25	-21	-18	-20	-27	-31	-32	-27	-21	-18	-27	-26	-20	-16	-17	-18	-19	-19	-21	-23
20	-21	-21	-20	-18	-17	-20	-19	-16	-15	-18	-17	-15	-12	-15	-16	-16	-13	-10	-9	-10	-11	-13	-16	-15
21	-14	-13	-13	-11	-10	-10	-10	-11	-10	-10	-10	-5	-3	-3	-2	-2	-5	-8	-10	-12	-12	-12	-11	-11
22	-9	-7	-7	-7	-8	-9	-12	-9	-5	-4	-3	-4	-4	-6	-6	-5	-5	-3	-4	-2	0	0	-1	-3
23	-3	-3	-3	-4	-7	-7	-7	-4	-4	-5	-4	-3	-3	-3	-4	-5	-5	-7	-8	-9	-12	-9	-7	-8
24	-8	-7	-5	-7	-9	-10	-11	-14	-12	-12	-9	-7	-5	-5	0	-2	-11	-14	-14	-10	-6	-9	-9	-9
25	-8	-8	-10	-9	-10	-14	-19	-20	-17	-16	-19	-22	-20	-15	-17	-14	-4	-1	14	15	14	5	-11	-29
26	-27	-21	-23	-20	-22	-34	-39	-33	-32	-32	-31	-29	-28	-23	-23	-20	-20	-20	-19	-18	-20	-22	-23	-25
27	-28	-26	-25	-23	-25	-22	-20	-22	-24	-26	-25	-20	-21	-21	-21	-20	-21	-20	-19	-19	-19	-18	-18	-19
28	-17	-14	-13	-12	-11	-11	-11	-12	-16	-19	-17	-15	-12	-8	-3	-1	1	-2	0	14	11	3	2	4
29	-1	-9	-9	-14	-15	-30	-39	-41	-31	-31	-29	-38	-47	-51	-59	-66	-62	-61	-48	-43	-34	-33	-27	-29
30	-22	-8	-3	-11	-20	-25	-38	-65	-80	-78	-86	-96	-86	-75	-73	-70	-65	-62	-57	-56	-56	-52	-53	-52
31	-52	-57	-62	-61	-54	-47	-50	-45	-48	-57	-50	-58	-60	-59	-61	-60	-55	-51	-50	-60	-66	-66	-59	-55



53
Misc
Jan 78

HOURLY EQUATORIAL Dst VALUES (PROVISIONAL)

FEBRUARY 1978

NASA/GODDARD SPACE FLIGHT CENTER

(Time-UT) (Units-Gammas)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-57	-56	-54	-55	-48	-43	-41	-42	-40	-40	-40	-40	-37	-38	-44	-40	-38	-38	-30	-28	-29	-29	-35	-42
2	-47	-46	-43	-47	-48	-47	-40	-37	-35	-33	-34	-30	-28	-24	-26	-24	-24	-22	-20	-21	-25	-28	-26	-30
3	-33	-36	-39	-39	-38	-41	-43	-37	-37	-40	-38	-38	-38	-41	-39	-38	-41	-42	-42	-36	-34	-32	-26	-32
4	-37	-39	-36	-38	-39	-43	-43	-38	-30	-30	-26	-23	-24	-28	-30	-30	-29	-27	-21	-19	-20	-19	-21	-25
5	-25	-26	-28	-32	-39	-51	-58	-52	-46	-40	-36	-39	-43	-45	-53	-53	-54	-56	-56	-50	-47	-42	-38	-38
6	-35	-35	-32	-32	-32	-36	-40	-36	-25	-21	-23	-22	-18	-19	-24	-35	-37	-36	-43	-55	-57	-50	-46	-46
7	-44	-35	-32	-27	-28	-31	-33	-32	-30	-32	-28	-23	-22	-20	-20	-18	-24	-25	-25	-23	-21	-27	-29	-26
8	-26	-25	-25	-25	-26	-27	-30	-57	-34	-33	-28	-24	-29	-29	-30	-32	-35	-39	-37	-34	-37	-35	-34	-36
9	-30	-27	-22	-21	-23	-25	-28	-35	-43	-57	-56	-65	-62	-56	-52	-50	-46	-45	-48	-50	-54	-47	-41	-43
10	-38	-36	-31	-22	-20	-22	-18	-19	-19	-19	-19	-23	-22	-21	-17	-14	-13	-18	-18	-18	-19	-19	-21	-21
11	-19	-19	-19	-19	-16	-12	-12	-13	-17	-15	-16	-15	-13	-14	-17	-19	-17	-16	-12	-12	-14	-12	-14	-15
12	-17	-18	-14	-12	-9	-6	-8	-9	-2	-1	-1	-3	-4	-4	-4	-4	-6	-13	-17	-19	-25	-25	-21	-23
13	-19	-21	-22	-22	-19	-13	-6	-7	-4	-11	-14	-16	-17	-18	-19	-19	-18	-22	-22	-21	-24	-24	-22	-23
14	-26	-29	-27	-30	-28	-24	-20	-15	-11	-12	-10	-19	-23	-21	-20	-22	-28	-24	-19	-17	-19	-14	15	9
15	12	20	11	9	-8	-11	-15	-12	-45	-83	-89	-118	-107	-105	-106	-104	-102	-94	-87	-84	-84	-81	-76	-77
16	-73	-69	-69	-69	-68	-70	-70	-68	-67	-74	-83	-87	-84	-75	-76	-77	-77	-79	-78	-78	-78	-79	-75	-76
17	-76	-73	-64	-68	-63	-59	-54	-53	-50	-50	-48	-50	-48	-45	-47	-48	-47	-46	-42	-40	-45	-44	-44	-48
18	-44	-45	-47	-52	-53	-54	-51	-48	-43	-41	-41	-42	-42	-41	-43	-42	-41	-43	-42	-42	-44	-40	-37	-38
19	-35	-37	-42	-46	-48	-50	-47	-46	-38	-37	-38	-40	-42	-42	-38	-36	-40	-42	-39	-41	-48	-50	-47	-47
20	-42	-40	-40	-43	-47	-51	-52	-51	-47	-48	-52	-54	-50	-47	-41	-34	-35	-41	-44	-44	-45	-38	-33	-34
21	-33	-32	-31	-34	-38	-35	-33	-27	-22	-23	-28	-31	-26	-22	-24	-30	-34	-42	-48	-55	-62	-65	-68	-70
22	-72	-71	-73	-73	-72	-73	-71	-54	-45	-40	-38	-37	-32	-31	-32	-38	-53	-42	-34	-39	-38	-39	-37	-35
23	-32	-29	-28	-31	-32	-32	-30	-27	-25	-28	-28	-26	-26	-26	-26	-23	-20	-22	-25	-25	-24	-23	-21	-24
24	-29	-28	-30	-33	-31	-29	-28	-24	-22	-20	-18	-21	-22	-21	-21	-21	-23	-25	-20	-18	-16	-14	-12	-13
25	-10	-11	-10	-12	-15	-21	-19	-19	-19	-21	-22	-25	-20	-16	-13	-10	-9	-8	-2	12	26	8	-3	4
26	-15	-55	-50	-44	-45	-41	-32	-31	-34	-36	-38	-32	-27	-38	-44	-53	-50	-56	-58	-58	-57	-54	-51	-54
27	-53	-53	-48	-45	-48	-52	-46	-41	-34	-34	-38	-34	-35	-42	-42	-44	-60	-74	-73	-62	-73	-80	-68	-65
28	-58	-54	-61	-65	-64	-66	-71	-75	-64	-65	-61	-64	-66	-53	-52	-48	-43	-54	-59	-57	-64	-65	-59	-53

SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS

FEBRUARY 1978

PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS (by Dr. A. Romaná)

The meaning of the station symbols is given in the IAGA-News No. 16.
Times of ssc are mean values.

Sudden commencements followed by a magnetic storm or a period of storminess (ssc).

14	2147	A: SOD DOB ESK WNG WIT DOU VIC FUR OTT AQU EBR COI TOL FRD KSA KNY LMN CZT PAF DRV; B: NGK HAD MMB KAK
25	1928	A: SOD DOB ESK WNG WIT DOU FUR OTT AQU EBR COI TOL FRD LMM CZT PAF; B: NGK HAD VIC MMB KAK KSA KNY DRV

Solar-flare effects (sfe).
Effects confirmed by ionospheric or solar observations are underlined.

06	1013 - 1032	SOD
09	1318 - 1337	EBR (si: A: FUR; B: TOL)
17	0312 - 0325	MMB
19	1055 - 1109	WNG
25	0304 - 0325	MMB KAK

Very unusual events.
None

UAG Series of Reports

Prepared by World Data Center A for Solar-Terrestrial Physics, NOAA, Boulder, Colorado, U.S.A.

These reports are for sale through the National Climatic Center, Federal Building, Asheville, NC 28801, Attn: Publications. Subscription price: $25.20 a year; $12.00 additional for foreign mailing; single copy price varies. These reports are issued on an irregular basis with 6 to 12 reports being issued each year. Therefore, in some years the single copy rate will be less than the subscription price, and in some years the single copy rate will be more than the subscription price. Make check or money order payable to: Department of Commerce, NOAA.

Some issues are now out of print and are available only on microfiche as indicated. Requests for microfiche should be sent to World Data Center A for Solar-Terrestrial Physics, NOAA, Boulder, CO 80302, with check or money order made payable to Department of Commerce, NOAA.

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UAG-3 "Observations of Jupiter's Sporadic Radio Emission in the Range 7.6-41 MHz, 6 July 1966 through 8 September 1968", microfiche only, price 45 cents.
UAG-4 "Abbreviated Calendar Record 1966-1967", price $1.25.
UAG-5 "Data on Solar Event of May 23, 1967 and its Geophysical Effects", price 65 cents.

UAG-6 "International Geophysical Calendars 1957-1969", price 30 cents.
UAG-7 "Observations of the Solar Electron Corona: February 1964-January 1968", price 15 cents.
UAG-8 "Data on Solar-Geophysical Activity October 24-November 6, 1968", price (includes Parts 1 & 2) $1.75.
UAG-9 "Data on Cosmic Ray Event of November 18, 1968 and Associated Phenomena", price 55 cents.
UAG-10 "Atlas of Ionograms", price $1.50.

UAG-11 "Catalogue of Data on Solar-Terrestrial Physics" (now obsolete).
UAG-12 "Solar-Geophysical Activity Associated with the Major Geomagnetic Storm of March 8, 1970", price (includes Parts 1-3) $3.00.
UAG-13 "Data on the Solar Proton Event of November 2, 1969 through the Geomagnetic Storm of November 8-10, 1969, price 50 cents.
UAG-14 "An Experimental, Comprehensive Flare Index and Its Derivation for 'Major' Flares, 1955-1969", price 30 cents.
UAG-15 "Catalogue of Data on Solar-Terrestrial Physics" (now obsolete).

UAG-16 "Temporal Development of the Geographical Distribution of Auroral Absorption for 30 Substorm Events in each of IQSY (1964-65) and IASY (1969)", price 70 cents.
UAG-17 "Ionospheric Drift Velocity Measurements at Jicamarca, Peru (July 1967-March 1970)", microfiche only, price 45 cents.
UAG-18 "A Study of Polar Cap and Auroral Zone Magnetic Variations", price 20 cents.
UAG-19 "Reevaluation of Solar Flares 1967", price 15 cents.
UAG-20 "Catalogue of Data on Solar-Terrestrial Physics" (now obsolete).

UAG-21 "Preliminary Compilation of Data for Retrospective World Interval July 26 - August 14, 1972", price 70 cents.
UAG-22 "Auroral Electrojet Magnetic Activity Indices (AE) for 1970", price 75 cents.
UAG-23 "U.R.S.I. Handbook of Ionogram Interpretation and Reduction", price $1.75.
UAG-24 "Data on Solar-Geophysical Activity Associated with the Major Ground Level Cosmic Ray Events of 24 January and 1 September 1971", price (includes Parts 1 and 2) $2.00.
UAG-25 "Observations of Jupiter's Sporadic Radio Emission in the Range 7.6-41 MHz, 9 September 1968 through 9 December 1971", price 35 cents.

UAG-26 "Data Compilation for the Magnetospherically Quiet Periods February 19-23 and November 29 - December 3, 1970", price 70 cents.
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UAG-28 "Collected Data Reports on August 1972 Solar-Terrestrial Events", price (includes Parts 1-3) $4.50.
UAG-29 "Auroral Electrojet Magnetic Activity Indices AE (11) for 1968", price 75 cents.
UAG-30 "Catalogue of Data on Solar-Terrestrial Physics", price $1.75.

UAG-31 "Auroral Electrojet Magnetic Activity Indices AE (11) for 1969", price 75 cents.
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The ICSU Panel on WDCs has recommended that it would be appropriate courtesy to acknowledge in publications that data were obtained from the originating station or investigator through the intermediary of the WDCs. The following statement is suggested:

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