



**U.S. DEPARTMENT OF COMMERCE**  
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## **Solar - Geophysical Data**

**NO. 400 DECEMBER 1977**

**Part II (Comprehensive Reports)**

**DATA FOR**  
**JUNE 1977**  
**MAY 1977**  
**& MISCELLANEA**

**NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER**  
**BOULDER, COLORADO**

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# SOLAR - GEOPHYSICAL DATA

No. 400

Issued in two parts

Helen E. Coffey, Editor

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

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#### Daily Solar Activity Centers

2 cm Spectroheliograms September 1977

8.6 mm Spectroheliograms September 1977

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Spectral Observations Culgoora August 1977

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U.S.S.R. Aurora April 1977



## JUNE 1977 DATA

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ACTIVE REGION

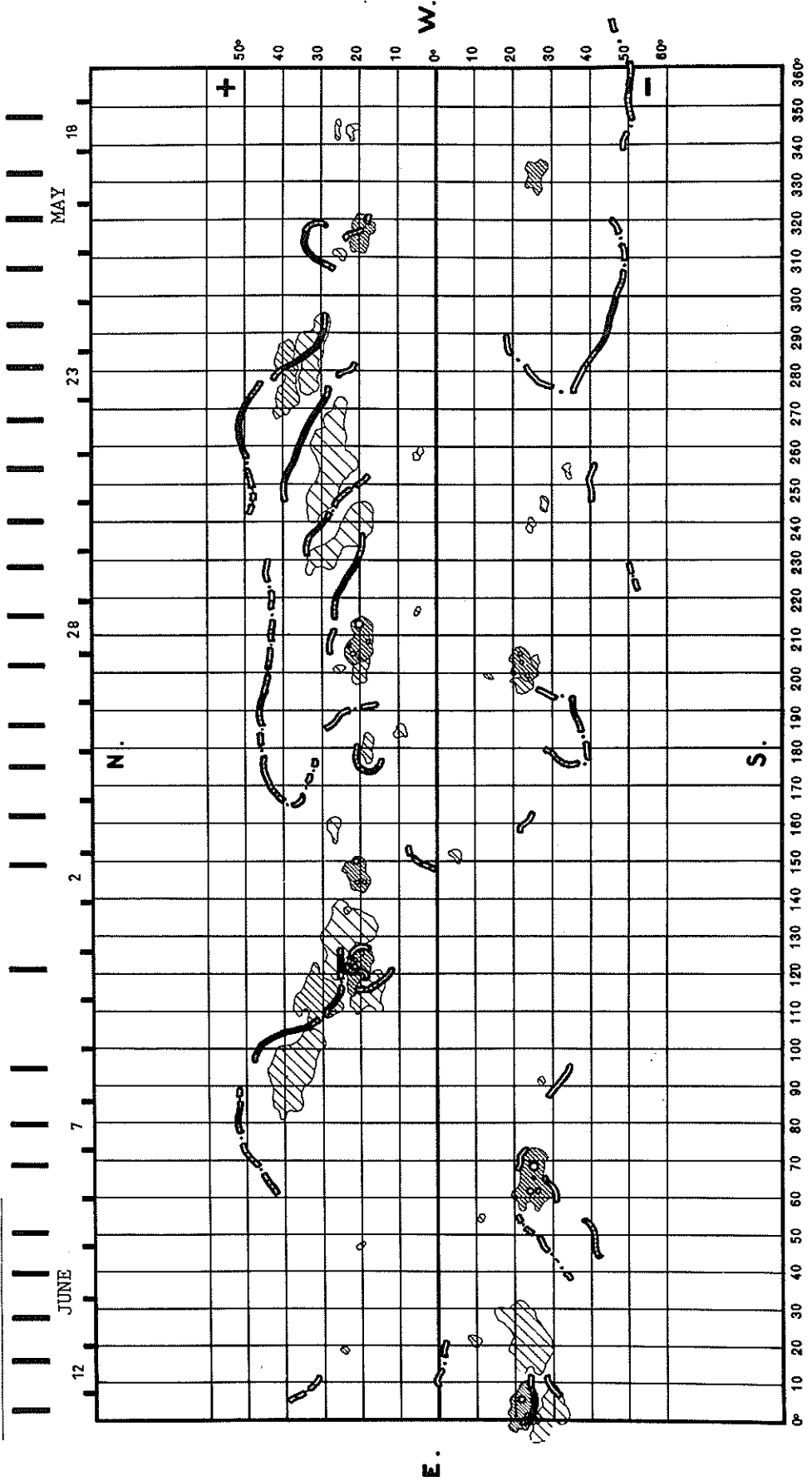
CARRINGTON ROTATION 1656

(June 13 - July 10, 1977)

Region No.	Coordinates		Age at CMP	IMP.	Spot-less Region	Region No. in Rotation 1655	Activity at West Limb
	Lat.	Long.					
1	32° N	348°	+1	1	x		decreasing
2	26 N	342	>6	1	x		dispersed
3	31 N	253	>6	1	x		dispersed
4	9 S	228	>6	1	x		decreasing
5	32 N	229	-4	1	x		decreasing
6	27 N	223	>6	1	x		decreasing
7	3 N	214	0	1	x		disappeared
8	22 N	209	>6	2		(6)	decreasing
9	22 S	205	>6	4			decreasing
10	24 S	196	>6	1	x		decreasing
11	25 S	157	-3	1	x		decreasing
12	28 N	154	>6	1	x		dispersed
13	18 S	150	+2	1	x		disappeared
14	22 N	146	>6	1	x	(15)	dispersed
15	30 N	144	+6	1	x		disappeared
16	16 N	142	>6	5			decreasing
17	30 N	140	>6	1	x		decreasing
18	40 N	133	-1	4			stable
19	20 N	123	>6	1	x	(16+17)	dispersed
20	21 N	94	+4	1	x		dispersed
21	22 N	93	-2	3			increasing
22	23 N	65	-4	1	x		stable
23	26 S	58	>6	1	x	(20)	dispersed
24	28 S	58	-2	1	x		decreasing
25	21 N	31	-2	1	x		increasing
26	18 N	27	>6	2		(23)	decreasing
27	21 S	0	>6	2			decreasing

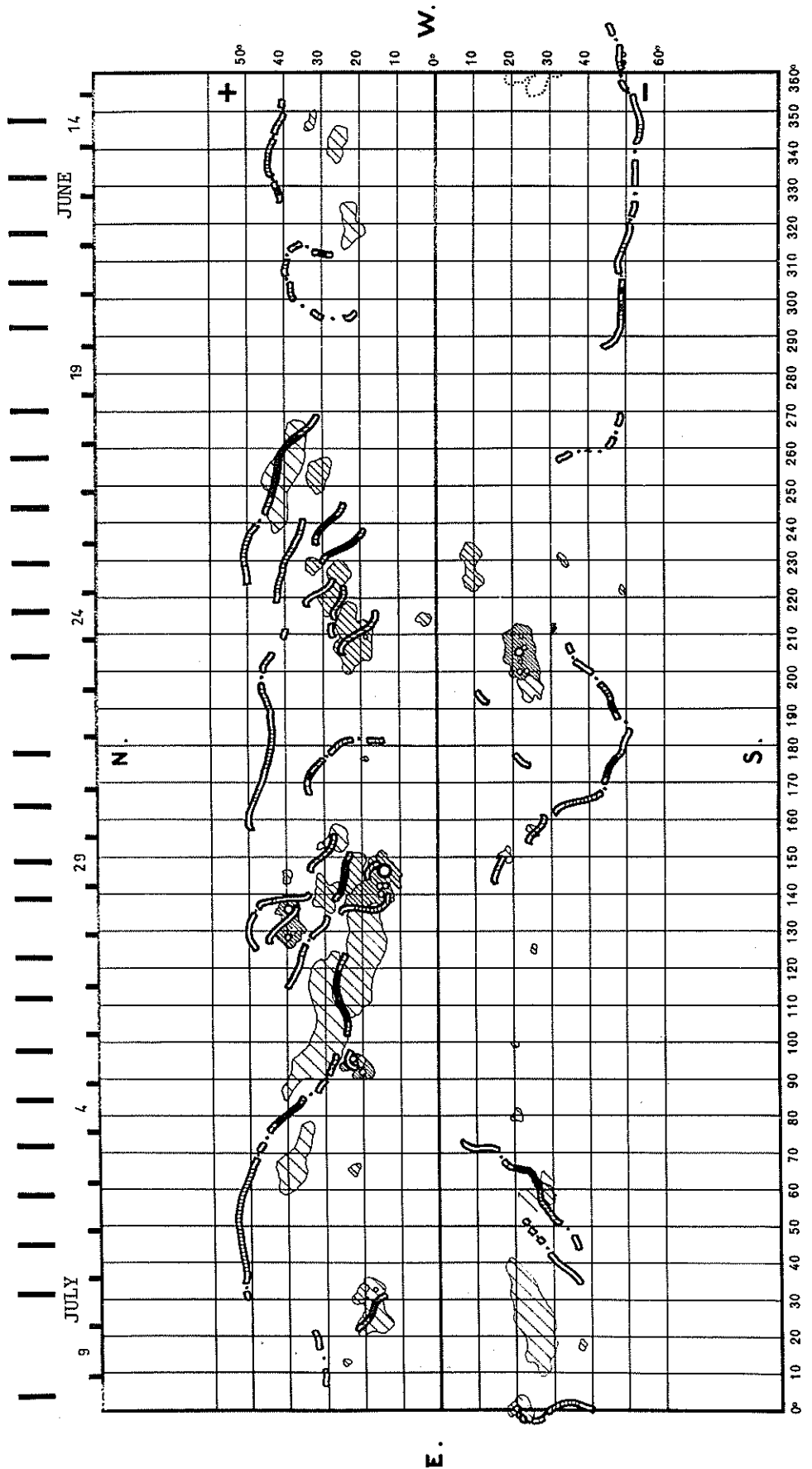
SYNOPTIC SOLAR MAP  
CARRINGTON ROTATION 1655  
MAY 17 TO JUNE 13, 1977

MEUDON OBSERVATORY



SYNOPTIC SOLAR MAP  
CARRINGTON ROTATION 1656  
JUNE 13 - JULY 10, 1977

MEUDON OBSERVATORY











# H $\alpha$ SOLAR FLARES

JUNE 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX		CENTRAL DISTANCE	McMATH PLAGE REGION	CNR DAY			MIL	COND	TYPE	TIME UT	MEAS. AREA Mil. of Disk		CORR AREA Sq. Deg
					LAT.	NER. DIST.												
GRP64034 MCHA HTPR	14	1305+2	1309	1317	S22	W19	.492	14801	13.1	12	-F					E		
	14	1305E		13170	S23	W19	.503	14801	13.1	120	-F	P	1306	25	.3	E		
	14	1307	1309	1317	S22	W20	.501	14801	13.0	10	-F	C	1309	30	.3			
	14	1903	1918		NO FLARE PATROL													
	14	1940	1952		NO FLARE PATROL													
	14	1958	2020		NO FLARE PATROL													
	14	2055	2146		NO FLARE PATROL													
14	2258	2303		NO FLARE PATROL														
35	HTPR	15	0822	0824	0847	S23	W31	.623	14801	13.0	25	-F	C	0824	10	.1	Y5	
36	HTPR	15	1507	1510	1520	S23	W27	.582	14801	13.6	13	-F	C	1510	10	.1	Y5	
37	MCHA	15	1520E		16300	S23	W34	.654	14801	13.1	700	-N	C	1535	40	.5	ELT Y5	
		16	2154	2235	NO FLARE PATROL													
		17	0057	0108	NO FLARE PATROL													
GRP64038 HTPR MONT	17	0638		07070	S09	E87	.999	14814	23.8	29	-F					D		
	17	0638	0722	0750	S09	E85	.997	14814	23.7	72	-F	C	0722	20		D		
	17	0657E	0657	0707	S10	E90	1.000	14814	24.0	100	-F	C	0657	20		D		
GRP64039 MONT KANZ ZURI HTPR ATHN RAMY KHAR GATA	17	1042+3	1049+9	1116	S22	W53	.835	14801	13.5	34	1N			140	2.5	E		
	17	1042	1052	11260	S22	W53	.835	14801	13.5	440	-N	C	1052	180		E		
	17	1042	1052	1103	S23	W53	.838	14801	13.5	21	-N	P				E		
	17	1044	1050	1112	S22	W53	.835	14801	13.5	28	-B	C	1050	60	1.2	E		
	17	1045	1049	1110	S23	W54	.846	14801	13.4	25	1N	C	1049	150	2.5	E		
	17	1055E	1055	1114	S18	W56	.851	14801	13.3	190	-N	1		98				
	17	1055E	1058U	1120	S21	W55	.849	14801	13.3	250	-F	1	C	159				
	17	1100E	1100	1113	S23	W52	.830	14801	13.6	130	1F	1	P					
	17	1105E	1105	1130	S23	W52	.830	14801	13.6	250	-F	2		1105	84	1.5	E	
	40	KANZ	17	1414	1424	1429	N25	E90	1.000	14813	24.3	15	-N	C				Y5
41	KANZ	17	1516	1528	1531	N25	E90	1.000	14813	24.4	15	-N	C				Y5	
		17	2120	2132	NO FLARE PATROL													
		17	2146	2155	NO FLARE PATROL													
		17	2158	2219	NO FLARE PATROL													
		17	2258	0030	NO FLARE PATROL													
		18	0050	0054	NO FLARE PATROL													
		18	0106	0230	NO FLARE PATROL													
		18	0545	0551	NO FLARE PATROL													
GRP64042 MONT KANZ	18	0835	0837	0845	S21	W64	.916	14801	13.6	10	-F					D		
	18	0835	0837	0845	S22	W64	.918	14801	13.6	10	-F	C	0837	20		D		
	18	0844E	0844	08440	S21	W65	.923	14801	13.5		-N	C				D		
GRP64043 MONT HTPR WEND	18	0947+6	0957	1013	S21	W65	.923	14801	13.5	26	-F					D		
	18	0947	0957	1013	S22	W65	.924	14801	13.5	26	-F	C	0957	20		D		
	18	0952	1005	1009	S21	W72	.960	14801	13.0	17	-F	C	1005	20	.4			
	18	0953		1014	S21	W65	.923	14801	13.5	21	-N							
GRP64044 MONT KANZ	18	0957+9	1030	1110	S20	E90	1.000	14815	25.2	73	-F					OK		
	18	0957	1030	11150	S21	E90	1.000	14815	25.2	780	-F	C	1030	20		OK		
	18	1027	1046	1105	S20	E90	1.000	14815	25.2	38	-N	C						
45	HTPR	18	1453E		14580	S21	W73	.964	14801	13.1	50	-F	C	1454	10	.2	Y5	
46	KANZ	18	1518	1518	1533	S21	W74	.969	14801	13.1	15	-F	C				E Y5	
		18	2115	2144	NO FLARE PATROL													
		18	2212	2227	NO FLARE PATROL													
47	HUAN	19	1942		1953	S30	E78	.986	14815	25.7	11	-F	1	C			Y5	
48	HUAN	19	2146	2150	2157	N24	E72	.956	14813	25.3	11	-F	1	C	2150	25		D Y5
49	MONT	20	0808	0811	0822	N25	E57	.863	14813	24.6	14	-F	C	0811	20		D Y5	
		20	2158	2205	NO FLARE PATROL													
		21	0021	0025	NO FLARE PATROL													
		21	0032	0050	NO FLARE PATROL													
		21	0149	0204	NO FLARE PATROL													

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Jun 77

# H $\alpha$ SOLAR FLARES

JUNE 1977

OBSERVATORY	OBSERVED UT				LOCATION				DURATION MIN	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX		CENTRAL DISTANCE	MCMATH PLAGE REGION			CMP. DAY	COND	TYPE	TIME UT	MEAS. AREA Mill. of Disk		CORR AREA Sq. Deg.
					LAT.	MER. DIST.											
50 CATA	21	0206	0229	NO FLARE	RE PATROL												
	21	0234	0316	NO FLARE	RE PATROL												
51 KANZ	21	0730	0730	0730D	S23 E54	.849	14815	25.4		-N	2	0730	28	.5	Y5		
	21	0732	0732	0732D	S23 E57	.872	14815	25.6		-F		P			D Y5		
52 HUAN	21	2143	2201	NO FLARE	RE PATROL												
	21	2230	2235	NO FLARE	RE PATROL												
	21	2236	2255	NO FLARE	RE PATROL												
	22	0002	0050	NO FLARE	RE PATROL												
	22	0158	0219	NO FLARE	RE PATROL												
53 HUAN	22	1518	1522	1523	N16 E90	1.000	14822	29.4	5	-F	1	C 1522	20		D Y5		
54 HUAN	22	1857	1858	1900	N11 E90	1.000	14822	29.5	3	-F	1	C 1859	40		Y5		
55 HUAN	22	1923		1933	N12 E90	1.000	14822	29.6	10	-F	1	C 1930	40		E Y5		
56 HUAN	22	1951	1957	1957	N16 E88	.999	14822	29.4	6	-F	1	C 1957	30		Y5		
	22	2018	2020	2025	N14 E90	1.000	14822	29.6	7	-F	1	C 2020	20		D Y5		
57 CATA	22	2046	2050	NO FLARE	RE PATROL												
	22	2211	2236	NO FLARE	RE PATROL												
	23	0115	0140	NO FLARE	RE PATROL												
58 HTPR	23	0650	0650	0705D	S21 E31	.616	14815	25.6	150	-N	2	0650	28	.3	Y5		
GRP64059	23	0755		0759D	N14 E86	.997	14822	29.8	40	-F		C 0756	20		Y5		
	23	1032	1051	1149	N21 E21	.469	14813	25.0	77	-F			70	.8	E		
	23	1032	1102	1102	N21 E21	.469	14813	25.0	480	-F		C 1102	40		E		
	23	1035E	1051	1149	N21 E21	.469	14813	25.0	740	-F		P 1051	80	1.0	E		
	23	1041E		1112D	N22 E22	.490	14813	25.1	310	-F		C 1053	60	.6	E		
60 HUAN	23	1411	1412	1417	S27 E24	.602	14815	25.4	6	-F	1	C 1412	35	.4	Y5		
61 HUAN	23	1426	1428	1435	N20 E20	.448	14813	25.1	9	-F	2	C 1428	35	.4	E Y5		
62 HUAN	23	1540	1543	1551	N26 E12	.449	14813	24.6	11	-F	2	C 1543	50	.6	E Y5		
63 HUAN	23	1611		1616	N24 E07	.392	14813	24.2	5	-F	1	C			Y5		
64 HUAN	23	1613		1631	N13 E85	.996	14822	30.1	18	-N	1	C 1617	20		DT Y5		
65 HUAN	23	1634		1649	N13 E85	.996	14822	30.1	15	-F	1	C			Y5		
GRP64066	23	1710+8	1723	1731	S24 E27	.600	14815	25.7	21	-N			35	.4	EH		
	23	1710		1724D	S24 E28	.610	14815	25.8	140	-N		C 1723	30	.4	EH		
	23	1718	1723	1731	S24 E27	.600	14815	25.7	13	-N	2	C 1723	40	.5			
67 HUAN	23	1727		1734	N13 E85	.996	14822	30.1	7	-F	1	C			Y5		
68 HUAN	23	1747	1750	1752	N13 E85	.996	14822	30.1	5	-F	1	C 1750	20		D Y5		
GRP64069	23	1824+1	1833+2	1903	N13 E86	.997	14822	30.2	39	-N					EL		
	23	1824	1835	1903	N13 E85	.996	14822	30.1	39	-B	1	C 1835	50		E		
	23	1825	1833	1838D	N14 E88	.999	14822	30.4	130	-N		C 1833			EL		
70 HUAN	23	1921		2005	N13 E85	.996	14822	30.2	44	-F	1	C			Y5		
71 HUAN	23	1943	1954	2005	S26 E26	.610	14815	25.8	22	-F	2	C 1954	20	.2	D Y5		
72 HUAN	23	2029	2050	2106	N13 E83	.992	14822	30.1	37	-N	1	C 2050	35		Y5		
73 HUAN	23	2111	2112	2122	S24 E26	.591	14815	25.8	11	-N	2	C 2112	35	.4	E Y5		
74 HUAN	23	2200	2208	2213	N13 E82	.990	14822	30.1	13	-N	1	C 2208	40		Y5		
75 HANI	23	2208	2211	NO FLARE	RE PATROL												
	23	2217	2232	NO FLARE	RE PATROL												
	23	2240	2316	NO FLARE	RE PATROL												
	23	2323	2330	NO FLARE	RE PATROL												
	23	2359E	2402	0020	N16 E77	.974	14822	29.8	210	-N		P 2402	70	1.8	Y5		

H $\alpha$  SOLAR FLARES

JUNE 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION MIR	IMPOR- TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX		CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY			COND	TYPE	TIME UT	MEAS. AREA	CORR AREA	
					LAT.	MER. DIST.											
	24	0130	0140	NO FLARE	RE PATROL												
	24	0150	0152	NO FLARE	RE PATROL												
76 TACH	24	0340	0347	0353	N14	E78	.978	14822	30.0	13	1N	C	0345	176			Y5
GRP64077	24	0613+2	0613+2	0624	N14	E73	.956	14822	29.7	11	-N			80			
ATHN	24	0613E	0613	0622	N14	E72	.951	14822	29.7	90	-N	1		98			
CATA	24	0615	0615	0625	N15	E74	.961	14822	29.8	10	-B	2	0615	56			
78 HTPR	24	0637	0637	0644	S23	E24	.563	14815	26.1	7	-F	C	0637	40	.4		E Y5
GRP64079	24	0652+2	0701	0706	N14	E73	.956	14822	29.8	14	-F			25			D
HTPR	24	0652		0706D	N14	E70	.940	14822	29.5	14.0	-F	C	0701	30			D
MONT	24	0654	0701	0705	N14	E76	.970	14822	30.0	11	-F	C	0701	20			
GRP64080	24	0734+6	0742+3	0750	N14	E73	.956	14822	29.8	16	1N			90			
MONT	24	0734	0742	0751	N14	E76	.970	14822	30.0	17	-N	C	0742	60			
HTPR	24	0735	0742	0746	N14	E70	.940	14822	29.6	11	-B	C	0742	100			
CATA	24	0740	0745	0750	N15	E73	.957	14822	29.8	10	1N	2	0745	112			
GRP64081	24	0800+1	0817	0926	N15	E75	.966	14822	30.0	86	-F						EK
HTPR	24	0800	0817	0925	N15	E75	.966	14822	30.0	85	-N	C	0817	50	1.0		E
MONT	24	0801	0826	0926	N15	E76	.970	14822	30.0	85	-F	C	0826	60			EK
GRP64082	24	0830+4	0833+0	0840	S22	E12	.450	14815	25.3	10	-F			35	.4		
MONT	24	0830	0833	0839	S22	E12	.450	14815	25.3	9	-F	C	0833	40			
HTPR	24	0831	0833	0840	S22	E12	.450	14815	25.3	9	-F	C	0833	30	.3		
KANZ	24	0834	0838	0842	S23	E11	.458	14815	25.2	8	-N	P					B
GRP64083	24	0909	0924	0933	S22	E11	.444	14815	25.2	24	-F						
MONT	24	0909	0924	0931	S22	E12	.450	14815	25.3	22	-F	C	0924	40			
CATA	24	0915E	0915	09350	S23	E11	.458	14815	25.2	200	-N	2	0915	84	.9		
GRP64084	24	0930+8	0934	0945	N14	E72	.951	14822	29.8	15	-N			50			E
LOCA	24	0930	0934	0945	N16	E73	.957	14822	29.9	15	-N	V	0934	51	1.9		
MONT	24	0937	0942	0945	N15	E75	.966	14822	30.0	8	-N	C	0942	60			E
HTPR	24	0938		0943D	N13	E70	.940	14822	29.7	50	-B	C	0939	40	.8		
CATA	24	0940E	0945	0950	N13	E71	.946	14822	29.7	100	-N	2	0945	56			
GRP64085	24	0956+4	0957+3	1004	S22	E10	.438	14815	25.2	8	-N			50	.6		D
MONT	24	0956	0959	1002	S22	E11	.444	14815	25.2	6	-F	C	0959	40			D
ZURI	24	0957	0957	09590	S22	E10	.438	14815	25.2	20	-N	P	0957	60	.7		
CATA	24	1000	1000	1005	S23	E10	.452	14815	25.2	5	-N	2	1000	56	.6		
86 MONT	24	1006	1007	1010	N15	E75	.966	14822	30.0	4	-F	C	1007	20			D Y5
87 ZURI	24	1026	1027	1028	S22	E10	.438	14815	25.2	2	-F	C	1027	60	.7		Y5
GRP64088	24	1123+2	1126+7	1138	N15	E73	.957	14822	29.9	15	-N			60			D
MONT	24	1123	1126	11300	N15	E75	.966	14822	30.1	70	-F	C	1126	20			D
ZURI	24	1125	1133	1135	N15	E72	.952	14822	29.9	10	-N	C	1133	60			D
CATA	24	1130E	1130	11400	N14	E72	.951	14822	29.9	100	-N	2	1130	56			
GRP64089	24	1142>9	1208	12140	N13	E71	.946	14822	29.8	32	-F						D
LVOV	24	1142	1208	1302	N14	E71	.946	14822	29.8	80	1F	C	1208	100	2.7		D
HUAN	24	1209		1214	N13	E71	.946	14822	29.8	5	-F	C					
GRP64090	24	1230+0	1241	1338	S23	E11	.458	14815	25.3	68	1F						EJKW
LVOV	24	1230	1256	1518	S22	E09	.432	14815	25.2	168	2F	C	1256	500	5.8		KJ
MCMA	24	1230	1241	12500	S23	E08	.442	14815	25.1	200	-F	C	1241	50	.5		E
HUAN	24	1249	1253	1332	S24	E13	.484	14815	25.5	43	1F	2	1253	110	1.3		TW
HUAN	24	1249	1322	1332	S24	E13	.484	14815	25.5	43	1F	C	1322	22	2.6		
MCMA	24	1250	1253	13440	S23	E12	.464	14815	25.4	540	-N	C	1253	60	.6		EW
ZURI	24	1251	1255	1311	S22	E10	.438	14815	25.3	20	-N	C	1255	150	1.8		
UPIC	24	1257E		12580	S24	E11	.472	14815	25.4	10	-F	P	1258	82			
GRP64091	24	1309+0	1309+1	1312	N11	E69	.934	14822	29.7	3	-N			20			D
HUAN	24	1309	1310	1312	N11	E69	.934	14822	29.7	3	-F	1	1310	15			D
MCMA	24	1309	1309	1311	N12	E69	.934	14822	29.7	2	-B	P	1309	15	.5		D
92 HUAN	24	1352	1352	1359	S23	E08	.442	14822	25.2	7	-N	1	1352	40	.5		E Y5

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OBSERVATORY	OBSERVED UT				LOCATION				DURATION MIN	IMPOR- TANCE	OBS.		MEASUREMENTS			REMARKS		
	DATE 1977 JUN	START	MAX PHASE	END	APPROX		CENTRAL DISTANCE	MCNATH PLAGE REGION			CMP DAY	COND	TYPE	TIME UT	MEAS. AREA Mill. of Disk		CORR AREA Sq. Deg.	
					LAT.	MER. DIST.												
GRP64093	24	1405+4	1412+3	1423	S22	E08	.427	14815	25.2	18	-N						E	
HUAN	24	1405	1412	1423	S22	E07	.423	14815	25.1	18	-N	* C	1412	65	.7		E	
ZURI	24	1409	1415	1415D	S22	E10	.438	14815	25.3	60	-N	* P	1415	170	2.0			
94 HUAN	24	1438	1440	1447	N14	E75	.966	14822	30.2	9	-F	1 C	1440	40			E Y5	
GRP64095	24	1454+1	1456+2	1554	S21	E07	.408	14815	25.1	60	-N			35	.4		E	
HUAN	24	1454	1456	1503	S23	E07	.438	14815	25.1	9	-N	* C	1456	40	.5		E	
RAMY	24	1455	1458	1555	S21	E08	.412	14815	25.2	60	-N	* C	1455	32				
HUAN	24	1548	1550	1553	S22	E06	.419	14815	25.1	5	-F	* C	1550	30	.3			
96 HUAN	24	1639	1640	1652	S23	E07	.438	14815	25.2	13	-F	1 C	1640	25	.3		Y5	
97 HUAN	24	1710	1711	1712	S22	E05	.416	14815	25.1	2	-N	2 C	1711	40	.4		E Y5	
GRP64098	24	1719	1721	1929	S24	E05	.446	14815	25.1	130	-N						EL	
HUAN	24	1719	1721	1929	S23	E06	.434	14815	25.2	130	-F	2 C	1721	75	.8		E	
MCMA	24	1824E		18280	S24	E05	.446	14815	25.1	40	-N	C	1827	125	1.4		EL	
MCMA	24	1903E		19050	S24	E05	.446	14815	25.2	20	-N	P	1903	40	.4		E	
99 MCMA	24	1824E		18280	N28	W05	.444	14813	24.4	40	-N	C	1827	25	.3		E Y5	
GRP64100	24	2023+1	2026	2034	N15	E67	.922	14822	29.9	11	-F							
RAMY	24	2023	2026	2033	N16	E67	.923	14822	29.9	10	-F	3 C		32				
HUAN	24	2024		2035	N14	E68	.928	14822	30.0	11	-F	1 C						
101 HUAN	24	2104		2125	N25	E55	.845	14819	29.0	21	-F	1 C					E Y5	
GRP64102	24	2202	2210+5	2219D	N15	E66	.916	14822	29.9	17	-F				50			
HUAN	24	2202	2210	22140	N14	E67	.922	14822	29.9	120	-F	1 P	2210	40				
RAMY	24	2212E	2215	2219D	N16	E65	.909	14822	29.8	70	-N	2 C		64				
103 RAMY	24	2217	2219	22210	S21	E05	.400	14815	25.3	40	-N	2 C		128			OE Y5	
104 CULG	24	2222	2253	0000	S23	E03	.426	14815	25.2	98	-N	C	2253	85	.9		Y5	
105 CULG	25	0030	0031	0041	S23	E02	.426	14815	25.2	11	-F	C	0031	30	.3		Y5	
	25	0217	0218	NO FLARE PATROL														
106 CULG	25	0246	0302	0314	S23	W01	.426	14815	25.0	28	-F	C	0302	30	.3		Y5	
107 HTPR	25	0617E		06210	N14	E60	.869	14822	29.8	40	-F	C	0618	10	.2		Y5	
108 HTPR	25	0653	0655	0700	N14	E60	.869	14822	29.8	7	-F	C	0655	20	.4		E Y5	
GRP64109	25	0851+1	0851+1	08550	N13	E59	.860	14822	29.8	4	-F						E	
HTPR	25	0851	0851	0855	N13	E59	.860	14822	29.8	4	-F	C	0851	20	.4		E	
KANZ	25	0852	0852	1152	N13	E60	.869	14822	29.9	180	-F	C					T	
GRP64110	25	1040+0	1042+3	1053	S22	W04	.414	14815	25.1	13	-N							
RAMY	25	1040E	1042	1049	S21	W05	.402	14815	25.1	90	-N	3 C		159			FDE	
KANZ	25	1040	1043	1055	S22	W05	.417	14815	25.1	15	-N	C						
UPIC	25	1040E		1053	S23	W02	.426	14815	25.3	130	-F	P	1040	61				
UPIC	25	1040E	1045U	1053	S21	W04	.399	14815	25.1	130	-F	P	1045	61				
GRP64111	25	1052+6	1052	1113	N15	E58	.853	14822	29.8	21	-N				90	1.8		KS
ATHN	25	1052E	1052	1120	N22	E65	.914	14822	30.3	280	-N	* C		114				
HTPR	25	1053E		11020	N14	E58	.852	14822	29.8	90	-N	* C	1054	30	.5		E	
UPIC	25	1053	1109	1115	N16	E58	.854	14822	29.8	22	-F	* P	1109	41			K	
RAMY	25	1056	1059	11100	N17	E58	.856	14822	29.8	140	-B	* C		80			FDE	
TEHR	25	1058	1102	1108	N13	E57	.842	14822	29.7	10	-F	* C		127			DE S	
112 HUAN	25	1239		1241	S20	W05	.386	14815	25.2	2	-F	1 C					Y5	
GRP64113	25	1425+2	1429+5	1443	N15	E57	.845	14822	29.9	18	1N				130	2.4		Y
RAMY	25	1425E	1429	14410	N17	E56	.838	14822	29.8	160	-N	4 C		144			OE	
LVOV	25	1427	1434	1439	N14	E60	.869	14822	30.1	12	1F	C	1434	150	3.2		O	
MCMA	25	1434E		14470	N15	E57	.845	14822	29.9	130	1B	P	1434	125	2.4		EY	
UPIC	25	1435E	1435U	14350	N14	E57	.843	14822	29.9		-F	P	1435	82				
CATA	25	1438E	1438	14450	N14	E57	.843	14822	29.9	70	-B	2	1438	56	1.0			
GRP64114	25	1458+3	1503+2	1509	N14	E58	.852	14822	30.0	11	-F				35	.7		
HUAN	25	1458	1503	1507	N14	E58	.852	14822	30.0	9	-N	1 C	1503	30	.6			
UPIC	25	1501	1505	1510U	N14	E59	.861	14822	30.1	90	-F	P	1505	41				

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION MIN	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX		CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY			COND	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
					LAT.	MER. DIST.											
115 MCMA	25	1543E		1608D	N16	E57	.846	14822	29.9	250	-F	P	1543	30	.6	D Y5	
	25	1905	1907	NO FLARE	PATROL												
GRP64116 MCMA HUAN	25	1952	1953	2002	N15	E55	.828	14822	30.0	10	-B						E
	25	1952	1953	2002	N16	E55	.828	14822	30.0	10	-B	C	1953	50	.9	E	
	25	1958E		2001	N15	E55	.828	14822	30.0	30	-F	1 P					
GRP64117 MCMA RAMY	25	2015	2032+3	2050	S22	W11	.445	14815	25.0	35	-F						E
	25	2015	2032	2050	S22	W11	.445	14815	25.0	35	-F	C	2032	30	.3	E	
	25	2031E	2035U	2038D	S22	W12	.452	14815	25.0	70	-F	3 C		80		DE	
GRP64118 MCMA VORO	25	2038	2040	2059	N16	E55	.828	14822	30.0	21	-B			80	1.4		E
	25	2038	2040	2100	N16	E55	.828	14822	30.0	22	-B	C	2040	80	1.4	E	
	25	2044E		2058	N16	E56	.837	14822	30.1	140	-B	C	2045	81	1.4	D	
GRP64119 VORO MCMA	25	2102+1	2103+2	2111	N16	E55	.828	14822	30.0	9	-N			30	.5	D	
	25	2102	2103	2110	N16	E56	.837	14822	30.1	8	-B	C	2103	27	.4	D	
	25	2103	2105	2112	N16	E55	.828	14822	30.0	9	-N	C	2105	25	.4	D	
GRP64120 MCMA VORO	25	2119+1	2124+1	2133	N16	E55	.828	14822	30.0	14	-N			60	1.1	DJ	
	25	2119	2124	2125D	N16	E55	.828	14822	30.0	60	-B	P	2124	40	.7	D	
	25	2120	2125	2133	N16	E56	.837	14822	30.1	13	-F	C	2125	90	1.6	DJ	
121 VORO	25	2151	2159	2211	N16	E56	.837	14822	30.1	20	-F	C	2159	10	1.9	J Y5	
122 CULG	25	2329E	2329E	2340	N15	E51	.787	14822	29.8	110	-N	P	2329	80	.9	Y5	
	26	0029	0102	NO FLARE	PATROL												
	26	0103	0110	NO FLARE	PATROL												
	26	0120	0125	NO FLARE	PATROL												
123 UPIC	26	0610E		0615D	S21	W15	.462	14815	25.1	50	-F	P	0615	61		Y5	
124 UPIC	26	0710	0720	0805D	N18	E48	.761	14822	29.9	550	1F	P	0720	224		K Y5	
125 KHAR	26	0913	0913	0925	N16	E48	.757	14822	30.0	12	-F	P				E Y5	
GRP64126 TEHR ATHN RAMY	26	1018+1	1021+0	1043	N15	E44	.710	14822	29.7	25	1N			160	2.3	UZ	
	26	1018	1021	1043	N14	E44	.707	14822	29.7	25	1N	4 C		286		U Z	
	26	1019	1021	1030D	N20	E40	.680	14822	29.4	110	-N	1 C		131			
	26	1024E	1026U	1038D	N15	E44	.710	14822	29.7	140	-N	2 C		159		ZOE	
127 MCMA	26	1110	1114	1230D	N15	E45	.721	14822	29.8	800	-N	C	1114	60	.9	E Y5	
128 MCMA	26	1243	1246	1248	N15	E43	.698	14822	29.8	5	-N	C	1246	40	.6	E Y5	
129 MCMA	26	1304	1309	1335	N15	E45	.721	14822	29.9	31	-B	C	1309	50	.7	EF Y5	
GRP64130 MCMA RAMY HUAN TEHR LVOV	26	1334	1340+2	1405	S22	W16	.483	14815	25.4	31	2N			480	5.4	IJ	
	26	1334	1340	1405	S23	W18	.512	14815	25.2	31	1B	C	1340	300	3.3	FI	
	26	1336E	1341	1349D	S21	W16	.470	14815	25.4	130	2N	4 C		891		FOE	
	26	1337E		1404	S23	W16	.496	14815	25.4	270	2N	1 P	1338	450	5.4	E	
	26	1338E	1341	1357	S22	W13	.460	14815	25.6	190	1N	3 C		477		DE	
	26	1341E	1342	1414	S23	W17	.503	14815	25.3	330	1N	C	1342	500	5.9	CJ	
GRP64131 MCMA HUAN	26	1407+1	1410+0	1412	N13	E44	.705	14822	29.9	5	-N			35	.5	D	
	26	1407	1410	1412	N15	E45	.721	14822	30.0	5	-B	C	1410	25	.4	D	
	26	1408	1410	1412	N12	E43	.691	14822	29.8	4	-N	1 C	1410	40	.6		
GRP64132 MCMA LOCA RAMY HUAN	26	1422+7	1430+1	1545	S22	W18	.500	14815	25.2	83	1N			340	3.9	HI	
	26	1422	1438	1605	S23	W18	.512	14815	25.2	103	1B	C	1438	300	3.3	EFIH	
	26	1424	1430	1545	S21	W18	.488	14815	25.3	81	2N	V	1430	611	7.3		
	26	1425E	1439	1443D	S21	W17	.479	14815	25.3	180	1N	4 C		350		FOE	
	26	1429	1439	1538	S23	W20	.529	14815	25.1	69	1N	1 C	1439	360	4.0	E	
133 MCMA	26	1455	1456	1500	N15	E45	.721	14822	30.0	5	-N	C	1456	25	.4	D Y5	
GRP64134 MCMA HUAN	26	1507+2	1509+2	1530	N16	E44	.712	14822	29.9	23	-N			70	1.0	E	
	26	1507	1511	1540	N17	E44	.715	14822	29.9	33	-B	C	1511	65	1.0	E	
	26	1509	1509	1519	N15	E45	.721	14822	30.0	10	-N	1 C	1509	65	1.0	E	



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OBSERVATORY	OBSERVED UT				LOCATION					DURATION MIN.	IMPOR- TANCE	OBS.		MEASUREMENTS			REMARKS		
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX		CENTRAL DISTANCE	McMATH PLACE REGION	CMP DAY			COND	TYPE	TIME UT	MEAS. AREA	CORR AREA			
					LAT.	MER. DIST.												Mill. of Disk	Sq. Deg.
GRP64135	26	1546+2	1548+1	1552	N15	E44	.710	14822	30.0	6	-N								
MCMA	26	1546	1548	1552	N14	E45	.719	14822	30.0	6	-B	C	1548	70	1.0			E	
HUAN	26	1548	1549	1552	N13	E46	.728	14822	30.1	4	-N	1 C	1549	55	.8			E	
RAMY	26	1550E	1552U	1557	N17	E41	.680	14822	29.7	70	-F	3 C		95	.8			FDE	
136 HUAN	26	1611	1613	1614	S22	H23	.546	14815	24.9	3	-F	1 C	1613	20	.2			D	Y5
GRP64137	26	1623+0	1626+1	1632	N14	E44	.707	14822	30.0	9	-F			50	.7			E	
HUAN	26	1623	1627	1632	N14	E45	.719	14822	30.1	9	-F	1 C	1627	55	.8			E	
MCMA	26	1623	1626	1631	N14	E43	.695	14822	29.9	8	-N	C	1626	40	.6			E	
GRP64138	26	1644+1	1648+1	1658	N13	E45	.717	14822	30.1	14	-N			50	.7			E	
MCMA	26	1644	1648	1658D	N14	E45	.719	14822	30.1	14D	-B	C	1648	50	.7			E	
H LAN	26	1645	1649	1658	N13	E46	.728	14822	30.1	13	-N	2 C	1649	50	.8			E	
GRP64139	26	1709	1718+3	1727	N14	E44	.707	14822	30.0	18	-F			35	.5			E	
MCMA	26	1709	1718	1725	N15	E43	.698	14822	29.9	16	-N	C	1718	40	.6			E	
HUAN	26	1717E	1721	1729	N14	E45	.719	14822	30.1	120	-F	1 P	1721	30	.4				
140 HUAN	26	1801		1805	N13	E42	.681	14822	29.9	4	-F	1 C							Y5
141 HUAN	26	1832	1832	1840	N14	E45	.719	14822	30.1	8	-F	1 C	1832	50	.7				Y5
142 HUAN	26	1849		1852	N15	E41	.674	14822	29.9	3	-F	1 C							Y5
143 HUAN	26	1947		1951	S22	H25	.566	14815	24.9	4	-F	1 C							Y5
144 HUAN	26	1956	1958	1959	N15	E43	.698	14822	30.1	3	-F	1 C	1958	30	.4				Y5
145 HUAN	26	2016	2018	2022	N13	E45	.717	14822	30.2	6	-F	1 C	2018	25	.4			D	Y5
146 HUAN	26	2034		2037	S22	H22	.536	14815	25.2	3	-F	1 C							Y5
147 HUAN	26	2049		2102D	N15	E43	.698	14822	30.1	13D	-F	1 P							Y5
GRP64148	26	2153	2154	2223	S23	H25	.575	14815	25.0	30	-N								E
CULG	26	2153	2154	2223	S24	H25	.585	14815	25.0	30	-N	C	2154	95	1.2				E
HUAN	26	2207E		2212D	S22	H26	.576	14815	25.0	50	-F	1 P							E
149 CULG	26	2215	2218	2239	N13	E40	.656	14822	29.9	24	-N	C	2218	65	.9				Y5
GRP64150	27	0127	0146	0205D	N14	E37	.620	14822	29.8	38	-N								E
CULG	27	0127	0146	0205	N13	E37	.617	14822	29.8	38	-N	C	0146	110	1.4				E
VORO	27	0159E		0241	N16	E38	.640	14822	29.9	42D	1N	P	0201	170	2.2				E
151 MANI	27	0333E	0338U	0347	S22	H25	.567	14815	25.3	14D	-F	P	0338	50	.6				Y5
GRP64152	27	0418+2	0419+2	0436	S22	H24	.557	14815	25.4	18	-F								JRU
CULG	27	0352	0420	0504	S23	H25	.576	14815	25.3	72	-N	C	0420	135	1.8				J
PALE	27	0418	0419	0423	S22	H25	.567	14815	25.3	5	-F	2 C		57					U R
TACH	27	0420	0421	0436	S21	H23	.537	14815	25.5	16	1F	C	0423	309	3.9				
153 CULG	27	0420	0424	0450	N14	E36	.607	14822	29.9	30	-F	C	0424	75	1.0				Y5
GRP64154	27	0505	0529+0	0600	N14	E36	.607	14822	29.9	55	1N			260	3.3				Z
CULG	27	0505	0542	0600	N13	E35	.591	14822	29.8	55	1N	C	0529	215	2.7				
KODA	27	0529E	0529	0544	N15	E37	.624	14822	30.0	15D	1B	P	0529	314	3.2				CE
TEHR	27	0531	0542	0601	N15	E35	.598	14822	29.9	30	1N	3 C		382					Z F
155 CULG	27	0525	0530	0545	S22	H25	.567	14815	25.4	20	-F	C	0530	30	.4				Y5
GRP64156	27	0600+9	0623	0648	S22	H26	.577	14815	25.3	48	-F								E
CULG	27	0600	0630	0640D	S23	H25	.576	14815	25.4	40D	-F	C	0630	60	.8				
HTPR	27	0620	0623	0624	S20	H26	.558	14815	25.3	4	-N	C	0623	50	.6				E
HTPR	27	0626	0628	0648	S22	H28	.597	14815	25.2	22	-F	C	0628	30	.3				E
157 MONT	27	0920	0932	0942	S22	H31	.628	14815	25.1	22	-F	C	0932	40					Y5
GRP64158	27	1000+1	1007	1017	N17	E34	.594	14822	30.0	17	-F			35	.4				E
HTPR	27	1000		1009D	N18	E34	.599	14822	30.0	9D	-F	C	1006	30	.3				E
MONT	27	1001	1007	1016	N19	E34	.604	14822	30.0	15	-F	C	1007	40					E
KHAR	27	1013E		1013D	N16	E34	.590	14822	30.0		-F	C							D
MONT	27	1014	1014	1017	N15	E35	.598	14822	30.1	3	-F	C	1014	20					D

# H $\alpha$ SOLAR FLARES

JUNE 1977

OBSERVATORY	OBSERVED UT				LOCATION				DURATION MIN.	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS			
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX.		CENTRAL DISTANCE	MCNATH PLAGE REGION			CMP. DAY	COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk		CORR. AREA Sq. Deg.		
					LAT.	MER. DIST.													
GRP64159	27	1024	1026	1032	N12	E33	.560	14822	29.9	8	-F								
MONT	27	1024	1026	1032	N13	E33	.564	14822	29.9	8	-F	C	1026	20					D
KHAR	27	1027E		1027D	N12	E33	.560	14822	29.9		-F	C							D
160 HTPR	27	1130	1132	1135	N16	E35	.602	14822	30.1	5	-F	C	1132	10	.1				Y5
GRP64161	27	1144+6	1148+3	1200	N16	E34	.590	14822	30.0	16	-N			70	.9				
MCMA	27	1144	1150	1203	N15	E34	.585	14822	30.0	19	-B	C	1150	60	.7				E
HTPR	27	1144		1155D	N16	E35	.602	14822	30.1	110	-F	C	1149	48	.5				D
KHAR	27	1145	1148	1155	N15	E33	.572	14822	30.0	10	-F	C	1148	110	1.4				D
RAMY	27	1148	1151	1156	N17	E33	.581	14822	30.0	8	-N	4 C		80					FDE
CATA	27	1150	1150	1205	N15	E33	.572	14822	30.0	15	-N	2	1150	56	.7				
GRP64162	27	1458+7	1510	1520	N14	E32	.554	14822	30.0	22	-N								
HUAN	27	1458		1518	N14	E31	.541	14822	29.9	20	-F	1 C							E
MCMA	27	1505E		1538D	N15	E32	.559	14822	30.0	330	-N	P	1518	60	.7				E
CATA	27	1505	1510	1520D	N14	E32	.554	14822	30.0	150	-N	2	1510	112	1.3				E
GRP64163	27	1539+1	1544	1605	N15	E30	.532	14822	29.9	26	-N								
			1555+1																
HUAN	27	1539		1549	N14	E30	.527	14822	29.9	10	-F	1 C							E
RAMY	27	1540	1555	1615	N16	E29	.524	14822	29.8	35	-N	4 C		140					E
MCMA	27	1541E	1544	1558D	N15	E30	.532	14822	29.9	170	-N	C	1544	70	.8				F
KANZ	27	1550	1556	1611	N14	E32	.554	14822	30.1	21	-N	C							E
GRP64164	27	1656+1	1659	1720	S21	H34	.652	14815	25.2	24	-F			45	.6				E
			1705+2																
MCMA	27	1656E	1705	1725	S22	H33	.648	14815	25.2	290	-N	C	1705	60	.7				E
HUAN	27	1657	1705	1720	S21	H36	.673	14815	25.0	23	-F	1 C							E
HTPR	27	1657	1659	1705	S21	H33	.641	14815	25.2	8	-F	C	1659	20	.2				E
HTPR	27	1700	1707	1719	S21	H35	.662	14815	25.1	19	-F	C	1707	30	.3				E
HTPR	27	1700	1703	1713	S23	H28	.606	14815	25.6	13	-F	C	1703	10	.1				E
165 HTPR	27	1739	1739	1744	N16	E31	.551	14822	30.1	5	-F	C	1739	20	.2				E
GRP64166	27	1851+0	1854	1900	N14	E29	.514	14822	30.0	9	-F								
HUAN	27	1851	1854	1900	N14	E28	.500	14822	29.9	9	-F	1 C							E
MCMA	27	1851		1852D	N15	E30	.532	14822	30.0	10	-N	P	1852	40	.5				E
	27	2102	2146	NO FLARE PATROL															
GRP64167	27	2146E		2330	N21	H37	.650	14813	25.1	104	1F								
HUAN	27	2146E		2222D	N22	H37	.655	14813	25.1	360	1F	1 P	2149	200	2.7				E
CULG	27	2147E	2147E	2330	N21	H38	.661	14813	25.1	1030	1N	P	2147	240	3.4				E
168 CULG	27	2323	2324	2340	N13	E25	.453	14822	29.8	17	-F	C	2324	25	.3				Y5
169 CULG	27	2330E	2331	2343	S22	H40	.720	14815	25.0	130	-F	P	2331	50	.7				Y5
GRP64170	27	2347	0012+1	0028	N14	E25	.458	14822	29.9	41	-N			70	.8				
MANI	28	0003E	0013	0023D	N15	E26	.477	14822	30.0	200	-N	P	0013	80	.9				
CULG	27	2347	2412	0028	N14	E25	.458	14822	29.9	41	-N	C	2412	60	.7				
171 CULG	27	2356	2413	0245	N30	H45	.774	14813	24.6	169	-F	C	2413	60	1.0				Y5
172 CULG	28	0238E	0242	0440	N15	E24	.450	14822	29.9	1220	-F	P	0242	60	.7				KF
173 CULG	28	0339	0407	0510	S22	H37	.690	14815	25.4	91	-N	C	0407	110	1.5				F
174 HTPR	28	0619	0620	0621	N16	E23	.444	14822	30.0	2	-F	C	0620	10	.1				Y5
GRP64175	28	0713+1	0721+3	0742	S21	H40	.715	14815	25.3	29	-F								
HTPR	28	0713	0721	0740	S20	H40	.710	14815	25.3	27	-F	C	0721	40	.5				E
MONT	28	0714	0724	0743	S22	H40	.721	14815	25.3	29	-N	C	0724	110					E
GRP64176	28	0819+1	0825	0853	N15	E21	.410	14822	29.9	34	-F								
			0832																
MONT	28	0819	0825	0852	N15	E21	.410	14822	29.9	33	-F	C	0825	40					E
HTPR	28	0820	0832	0853	N15	E22	.423	14822	30.0	33	-F	C	0832	30	.3				E
177 RAMY	28	1250E	1258	1303	N16	E19	.392	14822	30.0	130	-N	3 C		160					DE
GRP64178	28	1518+1	1520+5	1534	S21	H47	.784	14815	25.1	16	-F			40	.6				E
HTPR	28	1518	1520	1534	S20	H46	.771	14815	25.2	16	-F	C	1534	30	.4				E
HUAN	28	1519	1520	1548	S20	H48	.790	14815	25.0	29	-F	2 C	1520	35	.6				E
MCMA	28	1519	1525	1534	S22	H48	.797	14815	25.0	15	-F	C	1525	40	.6				E

# H $\alpha$ SOLAR FLARES

JUNE 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS. COND.	OBS. TYPE	MEASUREMENTS			REMARKS	
	DATE 1977	START	MAX. PHASE	END	APPROX.		CENTRAL DISTANCE	MAGNITUDE	CPR DAY					TIME UT	MEAS. AREA	CORR. AREA		
					LAT.	MR. DIST.												MIN. OF OBS.
179 MCHA	28	1810	1813	1826	N14	E16	.334	14822	30.0	16	-N	C	1813	25	.3	D	Y5	
180 HUAN	28	2016		2037	S20	W50	.809	14815	25.1	21	-F	1 C					Y5	
	28	2225	2335		NO FLARE PATROL													
	28	2346	2351		NO FLARE PATROL													
	29	0052	0145		NO FLARE PATROL													
	29	0152	0157		NO FLARE PATROL													
	29	0200	0207		NO FLARE PATROL													
	29	0210	0229		NO FLARE PATROL													
	29	0245	0320		NO FLARE PATROL													
GRP64181	29	0906	0908	0913	N14	E13	.295	14822	30.4	7	-F	C					DH	
HONT	29	0906	0908	0913	N14	E13	.295	14822	30.4	7	-F	C	0908	40			DH	
KANZ	29	0909E	0909	0909D	N14	E13	.295	14822	30.4		-N	C					C	
182 CATA	29	0935E	0940	0955	N24	W50	.865	14813	25.0	200	-F	2	0940	56	1.1		Y5	
183 HONT	29	0959	1001	1008	S21	W57	.871	14815	25.1	9	-F	C	1001	60			E	
GRP64184	29	1342		1354	N17	E03	.253	14822	29.8	12	-F	C						
HUA	29	1342		1354	N19	E04	.290	14822	29.9	12	-F	2 C	1344	20	.2		D	
HUAN	29	1342		1353	N15	E03	.220	14822	29.8	11	-F	2 C						
185 HUAN	29	1811	1813	1815	N15	E03	.220	14822	30.0	4	-F	1 C	1813	15	.2		D	
	29	2011	2015		NO FLARE PATROL													
186 HUAN	29	2015E		2030	N15	E02	.217	14822	30.0	230	-F	1 P	2024	15	.2		D	
	29	2100	2105		NO FLARE PATROL													
187 HUAN	29	2105E		2135	N14	E02	.200	14822	30.0	300	-N	2 P	2118	20	.2		D	
	29	2151	2203		NO FLARE PATROL													
188 MANI	30	0305E	0306	0310	N16	W02	.232	14822	30.0	50	-F	P	0306	50	.5		F	
189 HTPR	30	0812	0814	0827	S21	W68	.943	14815	25.2	15	-F	C	0814	10	.2		Y5	
190 HTPR	30	0922	0926	0929	S20	W69	.947	14815	25.2	7	-F	C	0926	30	.6		Y5	
GRP64191	30	1042+0	1044+6	1108	S21	W70	.953	14815	25.2	26	1N	C		110			E	
KHAR	30	1028	1045	1108	S22	W72	.963	14815	25.0	40	1F	C					E	
HTPR	30	1042	1044	1056	S20	W69	.947	14815	25.3	14	-N	C	1044	120	2.4		E	
MCHA	30	1042	1050	1112	S21	W68	.943	14815	25.3	30	1N	C	1050	100	3.0		E	
192 HTPR	30	1127	1132	1140	N20	E42	.700	14829	3.6	13	-F	C	1132	50	.7		Y5	
	30	2224	2231		NO FLARE PATROL													

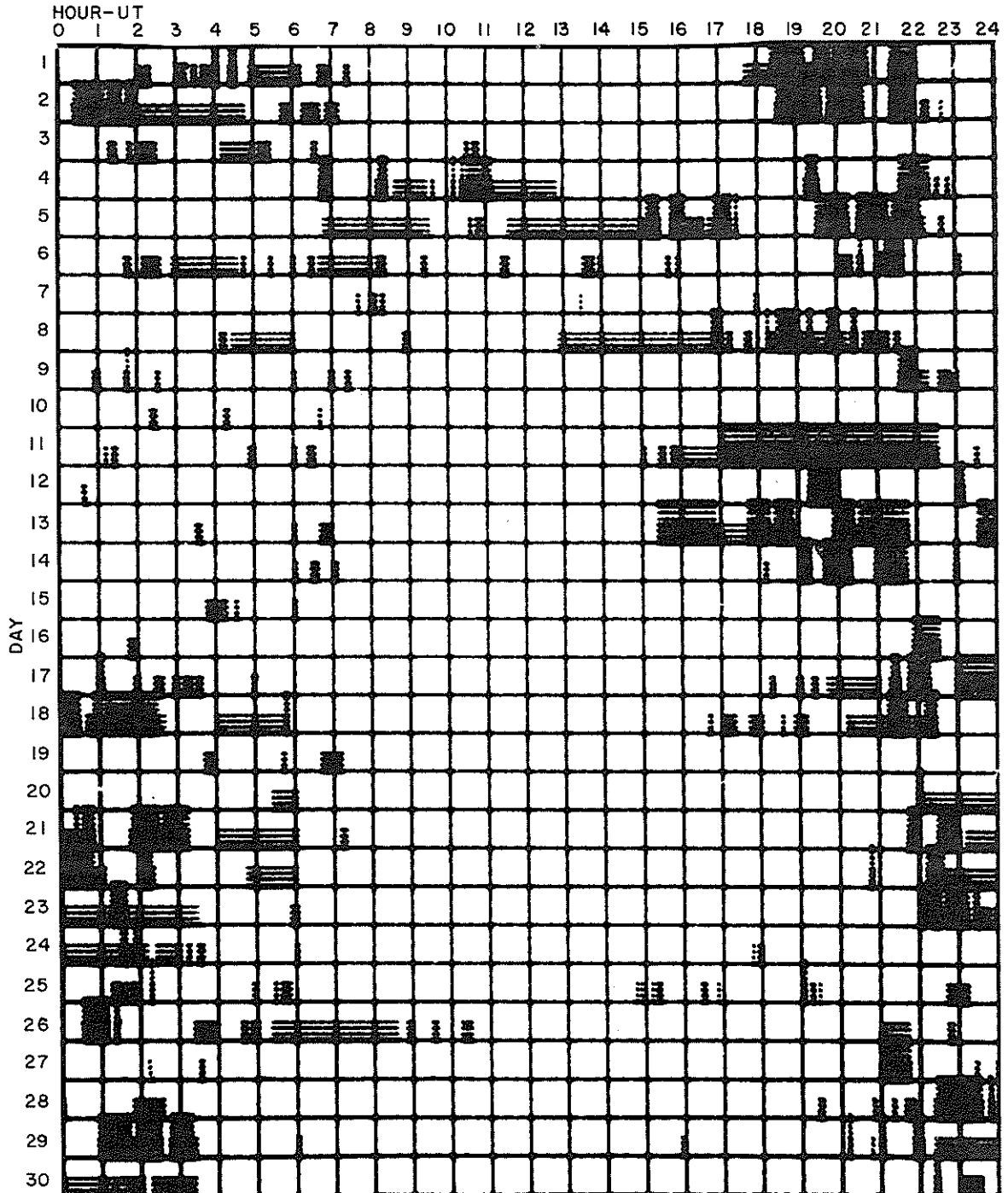
"Remarks":

- |  |  |
|--|--|
| <p>A = Eruptive prominence whose base is less than 90° from central meridian.<br/>         B = Probably the end of a more important flare.<br/>         C = Invisible 10 minutes before.<br/>         D = Brilliant point.<br/>         E = Two or more brilliant points.<br/>         F = Several eruptive centers.<br/>         G = No visible spots in the neighborhood.<br/>         H = Flare accompanied by a high speed dark filament.<br/>         I = Active region very extended.<br/>         J = Distinct variations of phase intensity before or after the flare.<br/>         K = Several intensity maxima.<br/>         L = Existing filaments show signs of sudden activity.<br/>         M = White-light flare.</p> | <p>N = Continuous spectrum shows effects of polarization.<br/>         O = Observations have been made in the calcium II lines H and K.<br/>         P = Flare shows helium D<sub>3</sub> in emission.<br/>         Q = Flare shows the Balmer continuum in emission.<br/>         R = Marked asymmetry in H<math>\alpha</math> line suggests ejection of high velocity material.<br/>         S = Brightness follows disappearance of filament (same position).<br/>         T = Region active all day.<br/>         U = Two bright branches, parallel (  ) or converging (Y).<br/>         V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.<br/>         W = Great increase in area after time of maximum intensity.<br/>         X = Unusually wide H<math>\alpha</math> line.<br/>         Y = System of loop-type prominences.<br/>         Z = Major sunspot umbra covered by flare.</p> |
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JUNE 1977			DAILY FLARE INDICES			Includes all Flares		
Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.
770601	0.00	20.9	770611	5.47	18.5	770621	3.05	21.6
770602	9.76	20.0	770612	8.66	23.2	770622	4.47	22.4
770603	24.54	24.0	770613	15.69	19.3	770623	42.47	22.6
770604	5.07	21.6	770614	.34	22.3	770624	98.10	23.8
770605	0.00	20.6	770615	8.66	24.0	770625	56.12	24.0
770606	12.90	23.5	770616	0.00	23.3	770626	255.61	23.3
770607	9.29	24.0	770617	13.42	21.6	770627	114.77	23.3
770608	11.83	22.7	770618	4.53	21.7	770628	32.64	22.8
770609	5.78	23.5	770619	1.69	24.0	770629	29.97	21.7
770610	11.88	24.0	770620	.84	23.9	770630	15.25	23.9

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

INTERVALS OF NO FLARE PATROL OBSERVATION  
FOR PRECEDING SOLAR FLARE TABLE  
JUNE 1977



Observatories included in total patrol:

- |                |              |            |                |             |
|----------------|--------------|------------|----------------|-------------|
| Athens         | Herstmonceux | Kiev       | McMath-Hulbert | Tashkent    |
| Bucharest      | Huancayo     | Kodaikanal | Meudon         | Tehran      |
| Catania        | Istanbul     | Locarno    | Mitaka         | Upice       |
| Cuigoora       | Kanzelhohe   | Lvov       | Monte Mario    | Voroshilov  |
| Haute Provence | Kharkov      | Manila     | Palehua        | Wendelstein |
|                |              |            | Ramey          | 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).

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Jun 77

## SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY $10^{-27} \text{ Wm}^{-2} \text{ Hz}^{-1}$		INT	POLARIZATION OR REMARKS
			UT	UT	MINUTES	PEAK	MEAN		
1	260 ONDR	44 NS	0643 E		505 D		14		
	3100 CRIM	26 FAL	0800	0834			4		
	2800 OTTA	20 GRF	1100		60		1.2	0.6	
	536 ONDR	8 S	1245.6	1245.6	.3		64		
	2800 OTTA	240 R	1605		25		1.4	0.7	
	245 SGMR	43 NS	1700	1725.3	430 D		43.7		
	207 VORO	44 NS	2100		240			8	
	2800 OTTA	27A RF	1900		210		1.4	1.2	
	2800 OTTA	24 R	1900	1934	34		1.4	0.7	
	2800 OTTA	24P R	1934		136		1.4		
	2800 OTTA	1 S	1935	1940	10		0.8	0.4	
	2800 OTTA	21 GRF	2040		50		1	0.5	
	2800 OTTA	1 S	2042	2044	4		1.6	0.8	
	2800 OTTA	26 FAL	2150	2230	40		-1.4	-0.7	
	18 HCHA	41 F	2236	2239	8				1
2	1420 BCUL	3 S	0121.5	0122.5	2.5		4	1	
	2000 TYKH	45 C	0121.7	0122.6	2.3		13	4	45R
	2695 PENT	45 C	0121.8	0122.8	3		9.8	2.6	
	2695 BCUL	3 S	0122.5	0123.5	2.5		8	3	
	500 HIRA	45 C	0420	0420	.7		6	4	O
	500 HIRA	45 C	0424.6	0425	.6		8	4	O
	1000 TYKH	45 C	0426.5	0427.3	4		36	5	
	1000 TYKH		0426.5	0428.9			11		
	2000 TYKH	45 C	0426.5	0427.8	5.5		39	11	20R
	2000 TYKH		0426.5	0429.3			39		05L
	4995 ATHN	2 GRF	0426.5	0427.6	5.5		4.8	2.9	
	1400 SYDN	40 F	0426.6	0427.1	4				
	700 SYDN	40 F	0426.7	0427.2	3.8				
	500 HIRA	45 C	0426.8	0427.1	1.6		19	8	HR
	1415 ATHN	13 C	0426.8	0427.3	4.2		31.6	9.5	
	8800 ATHN	2 GRF	0427.1	0430	5.4		7.7	4.6	
	500 HIRA	45 C	0428.6	0429	2		7	3	MR
	3750 TYKH	45 C	0428	0428.9	3		4	2	DL, 105102F
	5730 IRKU	1 S	0428	0428.9	2.5		3	2	
	1415 ATHN	13 C	0429.4E	0429.4			20.5		
	100 HIRA	45 C	0430.7	0431.3	2.3		30	5	O
	228 HARS	45 C	0445	0449	6		26	4	
	9400 TYKH	45 C	0516	0516.7	3		36	10	0L
	200 GORK	44 NS	0530 E		310			5	
	260 ONDR	44 NS	0640 E		508 D		50		
	245 SGMR	43 NS	1431	1710.8	579 D		89.7		
	202 IZMI	42 SER	0710		95		35		
	3000 BERL	46	0803.5	0810.2	13		29	7.2	
	808 ONDR	45 C	0804.3	0805.5	6		38		
	2695 MANI	1	0804.3	0810.4	6.9		36.2	6.7	
	536 ONDR	45 C	0804.5	0810	6.5		18	4.4	
	1470 BERL	46	0804.5	0810.4	8		32	9	
	9500 BERL	20	0804	0810.2	36		4.7		
	3100 CRIM	41 SER	0805	0810.2	6.5		7	2	
	1415 MANI	1	0805	0810.5	6.6		32	6.7	
	606 MANI	1	0805	0810.5	6.8		20.5	2.9	
	1415 ATHN	1 F	0805	0810.6	8.7		28.4	14.2	
	8800 ATHN	2 GRF	0805.1	0824.4	26.8		7.7	4.6	
	930 BORD	41 F	0805	0806.1			7	48	C
	4995 MANI	1	0806.1	0810.4	7.9		3.7	1.2	
	950 GORK	4 SF	0806.4E	0810.6	4.7		12.5		
	650 GORK		0806.4E	0811.4			19.8		
	650 GORK	4 SF	0806.4E	0806.6	5.4E		16.5		
	33 UPIC	2 S/F	0807.1	0807.3	.5				
	29 UPIC	2 S/F	0807.2	0807.3	.3				
	4995 ATHN	2 GRF	0809.8	0810.7	2.6		4.8	2.9	
	100 GORK	6 S	0810.1	0810.3	.9		200	60	
	33 UPIC	8 S	0810.3	0810.4	.7				
	29 UPIC	8 S	0810.4	0810.6	.7				
	5730 IRKU	1 S	0810	0810.3	1		3	1.5	
	3100 CRIM	24 R	1123	1247			3		
	2800 OTTA	21 GRF	1450	1635	155		1.8	0.9	
	2800 OTTA	40 F	1505	1520.5	24		3.2		
	1420 BCUL	1 S	1519.5	1520	2		1		
	2695 BOUL	3 S	1520.5	1521	2.5		5	2	
1420 ARCE	1	1520	1520.5	2.3					
2800 OTTA	8 S	1710.5	1710.5	0.5		6.2			
2800 OTTA	240 R	1905	1935	30		1.4	0.7		
2695 PENT	45 C	2003	2006.2	5		4.8	1.2		
1420 BOUL	8 S	2005.5	2006	1.5		3	1		
2695 BOUL	8 S	2006.5	2007	1.5		5	2		
2800 OTTA	240AR	2047	2340	173		3	1.5		
2800 TYKH	5 S	2139	2139.1	.3		1	.3	80L	
1000 TYKH	5 S	2139	2139.1	.3		1.8	.6U		
2800 OTTA	40 F	2139	2139.1	2		3.2			
1000 TYKH	5 S	2140.3	2140.6	.6		4	.8		
2000 TYKH	5 S	2140	2140.6	1		4	1	90L	
2695 PENT	3 S	2336.2	2336.9	1		11.4	2.9		

SOLAR RADIO EMISSION  
OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$		INT	POLARIZATION OR REMARKS			
			UT	UT	MINUTES	PEAK	MEAN					
3	2695 HANI	3	2336.6	2337.2	.9	11.9	1.3		90L OR			
	2000 TYKW	5 S	2336.7	2336.9	.6	4	1					
	3750 TYKW	5 S	2336.8	2336.9	.2	11	5					
	1000 TYKW	45 C	2336	2337.6	2	5	1					
	200 GORK	44 NS	0342 E		348		7					
	260 ONDR	44 NS	0639 E		509 D	57						
	245 SGMR	43 NS	1409.8	2033	601.20	21.3						
	9100 ARCE	21	0900.7	0924.7	163							
	1470 BERL	22	0904	0923.5	26	2.8						
	3000 BERL	22	0905	0923.2	27	7.8						
	9500 BERL	20	0905	0923.5	29	10						
	3100 CRIM	20 GRF	0908	0923	49	6	2					
	1420 ARCE	20	0908.3	0923.6	49							
	9100 GORK	20 GRF	0908.8	0924	34.7	15	6					
	9100 ARCE	3	0922.9	0923	.6							
	9100 ARCE	2	0938.2	0938.4	1							
	9100 ARCE	1	0944	0944.1	.6							
	2800 OTTA	26 FAL	1105	1140	35	-1.6	-0.8					
	650 GORK	2 SF	1151.7	1152.5	1.9	15.8	7.4					
	8800 ATHN	2 S	1218.8	1221.8	13.9	4.1	2.5					
	4995 ATHN	2 S	1218.8	1222.9	8.7	2.7	1.6					
	3000 BERL	20	1312.5	1323.5	35	3.5						
	2800 OTTA	24P R	1313.2		26.8	0.6						
	2800 OTTA	24 R	1313	1313.2	0.2		0.3					
	2800 OTTA	27 RF	1313		41	0.6	0.5					
	9500 BERL	20	1315	1328	40	4.5						
	1470 BERL	20	1322	1329	18	1						
	2800 OTTA	26 FAL	1340	1354	14	-0.6	-0.3					
2800 OTTA	20 GRF	1620	1720	130	1.2	0.6						
2800 OTTA	20 GRF	1835	1900	65	0.8	0.4						
2800 OTTA	21 GRF	2110	2025	100	2	1						
2800 OTTA	20 GRF	2111	2112.5	20	1.6	0.6						
4	100 HIRA	45 C	0046.3	0046.7	1	630	200		0			
	1000 TYKW	45 C	0046	0046.2	1	7	1					
	2695 PENT	240 R	0055	0105	10	1.6	0.8					
	2000 TYKW	5 S	0153.3	0153.7	1	1.1	.4					
	200 GORK	43 NS	0306 E		129		5					
	260 ONDR	44 NS	0603 E		553 D	19	4					
	127 TORN	44 NS	0630 E	1241	510 D	18						
	200 GORK	43 NS	0836		60		5					
	245 SGMR	44 NS	0912 E	1653.8	900 D	99.6						
	207 VORO	44 NS	2100		240		11					
	2800 OTTA	2 S/F	1131	1132.1	5	1.2	0.6					
	237 TRST	41 F	1413.7	1413.8	.1	84						
	237 TRST	41 F	1550.6	1550.6	.1	117						
	237 TRST	41 F	1655.7	1656	.4	302						
	5	100 HIRA	43 NS	0230	0830	360 D	50			18		ML
		200 GORK	44 NS	0300 E		120 D				8		
260 ONDR		44 NS	0603 E		549 D	14						
127 TORN		44 NS	0630 E	0935.7	510 D	51						
245 SGMR		44 NS	0911 E	2256.9	902 D	34.2						
100 HIRA		44 NS	1925 E	0440	865 D	80	20					
207 VORO		44 NS	2100	2249	240	15	9					
3100 CRIM		1 S	0800	0803	8	3	1					
3100 CRIM		1 S	0906	0909	7	3	1					
3100 CRIM		1 S	1000	1005	10	3	1					
29 UPIC		8 S	1240.4	1240.8	.7							
33 UPIC		8 S	1240	1240.1	.7							
2800 OTTA		20 GRF	1305	1350	95	1	0.5					
2800 OTTA		20 GRF	1625	1636	95	1	0.5					
6	2695 PENT	20 GRF	0005	0020	60	1.2	0.6		V=0			
	260 ONDR	44 NS	0608 E		542 D	42						
	127 TORN	44 NS	0630 E		510 D							
	169 DWIN	44 NS	1225		147		2					
	245 SGMR	43 NS	1317	1330.5	23.2	8.9						
	3100 CRIM	20 GRF	0832	0838	11	2	1					
	3100 CRIM	1 S	0903	0905	3	2	1					
	3100 CRIM	5 S	1003	1010	11	2	1					
	3100 CRIM	1 S	1156	1158	7	2	1					
	3100 CRIM	5 S	1242	1247	14	3	1					
	2800 OTTA	20 GRF	1815	2000	240	2.6	1.3					
	245 SGMR	43 NS	2043.2	2346.8	209.80	21.6						
	7	200 GORK	44 NS	0300 E		600 D				10		V=1 3. CONT SR
		260 ONDR	44 NS	0606 E		542 D	24			3		
160 DWIN		44 NS	0700		395		15					
169 DWIN		44 NS	0700		395		15					
127 TORN		44 NS	0720 E	1213.7	460 D	80						
245 SGMR		44 NS	0911 E	1118	903 D	165						
100 HIRA		44 NS	1925 E	2250	525 D	400	130					
207 VORO		44 NS	2100	2125	240	28	15					

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## SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

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JUN 1977	FREQUENCY STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$		INT	POLARIZATION OR REMARKS
			UT	UT	MINUTES	PEAK	MEAN		
	3100 CRIM	5 S	0513	0517	10	3	1		
	228 HARS	45 C	0628	0628.8	1.5	50	20		
	202 IZMI	42 SER	0715		285	33			
	550 KIEV	40 F	0751.5	0753.5	7	12			
	3100 CRIM	1 S	0851	0855	7	2	1		
	550 KIEV	7 C	1242.7	1243.5	9	3.5			
	2800 OTTA	2 S/F	1322.5	1322.6	1	1.6	0.8		
	536 ONDR	8 S	1445.4	1445.4	.3	18			
	228 HARS	45 C	1553.2	1555	2	63	30		
	228 HARS	45 C	1713.5	1713.7	2	140	30		
	228 HARS	45 C	1750.3	1752	2.5	130	35		
	2800 OTTA	240 R	1830	1840	10	1.4	0.7		
	2800 OTTA	240 R	1910	1940	30	0.8	0.4		
	2800 OTTA	20 GRF	2120	2255	110	1.6	0.8		
8	260 ONDR	44 NS	0606	E	543 0	19			
	127 TORN	44 NS	0720	E	375 0	150 U			V=1
	245 SGMR	44 NS	0911	E	903 0	65.8			CONT
	160 DWIN	44 NS	0915		285		10		
	169 DWIN	44 NS	0915		285		10		
	207 VORO	44 NS	2100		240		12		
	536 ONDR	8 S	1115.8	1115.8	.3	19			
	2800 OTTA	20 GRF	1500	1537	65	1	0.5		
	2800 OTTA	20 GRF	1640	1655	45	1	0.5		
	2800 OTTA	20 GRF	1810	1930	150	1.2	0.6		
	2800 OTTA	240 R	2235	2255	20	1.2	0.6		
	606 SGMR	4 S/F	2344.5	2344.8	.5	169	68		CONT
	245 SGMR	6 S	2344.6	2344.7	.4	20.6	8.2		CONT
	1415 SGMR	1 S	2344.7	2344.8	.2	4.6	1.8		CONT
	410 SGMR	6 S	2344.8	2344.9	.2	18.8	7.5		CONT
	245 SGMR	6 S	2349.6	2350.2	1.3	105	42		CONT
	606 SGMR	4 S/F	2349.7	2350.2	.9	250	100		CONT
	1415 SGMR	4 S/F	2349.7	2349.8	.5	23.3	9.3		CONT
	2695 SGMR	4 S/F	2349.7	2350.1	.5	51	20.4		CONT
	410 SGMR	6 S	2349.8	2349.9	1	84.7	33.9		CONT
	245 SGMR	48 C	2359.4	2401.3	3.1	758	303		CONT
9	606 SGMR	45 C	0001	0001.4	1.2	241 U	96.40		CONT
	410 SGMR	7 C	0001.1	0001.4	1	205	82		CONT
	1415 SGMR	1 S	0001.2	0001.3	.8	5.3J	2.1U		CONT
	2695 SGMR	4 S/F	0001.2	0001.3	.7	38.9U	15.6U		CONT
	606 SGMR	45 C	0001.8E	0001.8		122 J			CONT
	410 SGMR	7 C	0001.9E	0001.9		72			CONT
	260 ONDR	44 NS	0606	E	543 0	54			
	127 TORN	44 NS	0630	E	360 0	53			V=1
	160 DWIN	44 NS	0755		373		5		
	169 DWIN	44 NS	0755		373		5		
	245 SGMR	43 NS	1044.9	1324.8	810.10	32.3			36.5,CONT
	202 IZMI	42 SER	0635		90	26			
	536 ONDR	8 S	1116.2	1116.2	.3	48			
	536 ONDR	1 S	1117.8	1117.8	.3	11			
	1470 BERL	1	1230	1235	13	1.7			
	3000 BERL	1	1231.5	1235	6.5	2.9			
	33 UPIC	46 C	1233.3	1234.5	8.7				
	228 HARS	45 C	1233.3	1233.7	1	40	17		
	29 UPIC	46 C	1233.5	1235	8.7				
	245 SGMR	6 S	1233.8	1234.3	4.1	92.2	27.7		5,CONT
	237 TRST	41 F	1234.7	1235.3	.8	276			R
	536 ONDR	8 S	1327.6	1327.6	.3	75			
	536 ONDR	8 S	1331	1331	.3	59			
	2800 OTTA	20 GRF	1730	1734.5	30	2.8	0.7		
	7000 SAOP	1 S	1733.6	1734.5	2.9	5	2.5		
	930 BORD	46 C	1733	1736.6		4	54		C
	2695 BCUL	3 S	1733	1735.5	6.5	4	1		
	1420 BCUL	8 S	1733	1734.5	2.5	5	2		
	2800 OTTA	21 GRF	1820	1833	40	1	0.5		
	606 SGMR	4 S/F	1822.7	1827.6	7.4	5	1.5		S
	4995 SGMR	22 GRF	1823	1827.3	21.4	46.5	13.9		S
	1415 SGMR	4 S/F	1825.3	1827.8	3.6	14.1	4.2		S
	9400 HUAN	1 S	1825.5	1827.3	3.9	14.6	4.4		L
	8800 SGMR	4 S/F	1825.8	1827.2	7.3	12.9	3.9		S
	18 MCHA	41 F	1825	1830	12				
	1420 BCUL	45 C	1825	1827	4	4	1		2
	2800 OTTA	28 PRE	1826.2	1826.5	0.5	2.4	1.8		
	2800 OTTA	4 S/F	1826.7	1827.3	2.3	41	10		
	245 SGMR	6 S	1826.4	1827.1	3	154	46.1		5
	2695 BCUL	8 S	1826.5	1828	2.5	33	11		
	7000 SAOP	2 S/F	1826.9	1827.2	1.3	24	7.8		
	4995 BCUL	8 S	1826	1827	2	32	11		
	930 BORD	3 S	1827	1827.8		1	16		B
	2800 OTTA	20 GRF	1925	2015	85	1.6	0.8		
	18 MCHA	6 S	2030	2034	6				
	2800 OTTA	240 R	2240	2245	5	0.8	0.4		1
10	3100 CRIM	26 FAL	0855	1040		3			

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JUN 1977	FREQUENCY STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY $10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$		INT	POLARIZATION OR REMARKS
			UT	UT	MINUTES	PEAK	MEAN		
11	930 BORD	41 F	0939.3	0939.3			.7		B
	536 ONDR	8 S	1036.8	1036.8	.3		46		
	2800 OTTA	20 GRF	1550	1630	190		1.6	0.8	B
	930 BORD	46 C	1559	1559.1			.4	46	3
	245 SGMR	43 NS	1700.9	1742.3	435.10		19.3		
	2000 TYKW	5 S	0559	0600.7	8		7	1.5	DL
	3750 TYKW	5 S	0600	0600.7	2		4	1	OR
	260 ONDR	44 NS	0608	E	558 D		29		
	127 TORN	43 NS	0955	U	240 D				V=0
	245 SGMR	43 NS	1057.2	1057.9	154.8		34		
	9100 ARGE	4	0751.9	0753.3	3				
	3100 CRIM	5 S	1004	1011	17		4	1	
	550 KIEV	42 SER	1103.7		95		1.2		
	245 SGMR	43 NS	1842.9	2309.5	333.10		77		
2800 OTTA	240 R	1957	1958	1		0.8	0.4		
2800 OTTA	20 GRF	2010	2020	40		1.6	0.8		
2800 OTTA	20 GRF	2135	2143	25		0.8	0.4		
12	260 ONDR	44 NS	0600	E	554 D		6		
	2950 GORK	20 GRF	0736.3	0742.3	11.7		5.7	2.9	
	9100 ARGE	20	0737.7	0742.5	31.5				
	950 GORK	1 S	0739.3	0742.2	3.5		8.5		
	1420 ARGE	40	0739.6	0740.1	6.5				
	650 GORK	1 S	0739.7	0742.2	3.1		7.5	2.2	
	3100 CRIM	1 S	0740	0747	6		3	1	
	808 ONDR	8 S	0741.6	0741.6	.3		38		
	930 BORD	41 F	0742	0742.1			.5	97	B
	3100 CRIM	5 S	0814	0817	8		5	2	
	3100 CRIM	1 S	0942	0945	7		4	1	
	3100 CRIM	1 S	1105	1107	6		2	1	
	2800 OTTA	1 S	1233	1234.4	7		1.6	0.8	
	2800 OTTA	20 GRF	1515	1516	15		1.2	0.6	
13	207 VORO	4 S/F	0031	0032	2		125		
	2000 TYKW	45 C	0350	0408.6	30		15	5	15L
	2000 TYKW	30 PBI	0420		160		5	2	
	1000 TYKW	45 C	0350	0408.8	30		20	4	
	1000 TYKW	30 PBI	0420		160		1.5	.8	
	500 HIRA	45 C	0355.6		26			4	
	500 HIRA		0355.6	0408.6			10		ML
	500 HIRA		0355.6	0412			11		ML
	500 HIRA		0355.6	0413.7			13		ML
	500 HIRA		0355.6	0415			8		O
	500 HIRA		0355.6	0415			8		OR, 1010 09F
	3750 TYKW	20 GRF	0355	0410	120		8	3	
	1415 MANI	1	0356	0408.4	38.4		21.6	7.2	
	606 MANI	1	0357.6	0409	38.4		19.7	7.6	
	500 HIRA		0426	0431.4			18		WL
	500 HIRA	45 C	0426		9			7	
	500 HIRA		0426	0429.3			20		ML
	2000 TYKW	45 C	0428	0431.2	4		9	2	65L
	1000 TYKW	45 C	0429.4	E	3 D		26	8 D	
	260 ONDR	44 NS	0603	E	0739.5	231		6	
	3100 CRIM	26 FAL	0717	0753			3		
	3100 CRIM	5 S	0802	0822	25		4	1	
	3100 CRIM	31 ABC	0828	0840	38		3	1	
	3100 CRIM	5 S	0906	0917	15		5	2	
3100 CRIM	5 S	1114	1116	14		3	1		
536 ONDR	8 S	1132.2	1132.2	.3		38			
4995 BCUL	3 S	1802	1803.5	3.5		16	5		
4995 BCUL	3 S	1822.5	1823.5	2.5		10	3		
2695 BOUL	8 S	1825.5	1826.5	1.5		17	6		
4995 BOUL	40 S	2106	2110.5	7.5		34	13		
2695 BOUL	45 C	2113.5	2114	2		10	3		
14	8800 ATHN	2 GRF	0649.3	0657.6	11.7		10.2	6.1	
	8800 ATHN	2 GRF	0704.5	0708.4	15.5		13.6	8.2	
	3100 CRIM	1 S	0855	0858	7		3	1	
	3100 CRIM	1 S	1014	1016	6		2	1	
	3100 CRIM	20 GRF	1212	1250	25		4	1	
	2800 OTTA	20 GRF	1440	1510	120		1.2	0.6	
	4995 BCUL	45 F	2228	2230	3.5		10	3	
	2695 BOUL	8 S	2229	2231.5	3		6	2	
	2695 BOUL	8 S	2235	2235.5	2		4	1	
	15	3100 CRIM	20 GRF	0727	0800	88		5	2
3100 CRIM		25 R	1029	1214			5		
536 ONDR		8 S	1236.7	1236.7	.3		104		
3100 CRIM		5 S	1245	1254	16		5	2	
2800 OTTA		20 GRF	1500	1555	170		1.4	0.7	
2800 OTTA		20 GRF	1820	1840	100		1.2	0.6	
16	260 ONDR	2 S/F	1039.2	1039.2	.8		4	.6	
	930 BORD	46 C	1754	1754			.3	33	B
17	127 TORN	41 F	0911.3	0915.3	8		19		PEAKING



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JUN 1977	FREQUENCY STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$		INT	POLARIZATION OR REMARKS
			UT	UT	MINUTES	PEAK	MEAN		
	550 KIEV		1015		14	2			
	3100 CRIM	5 S	1032	1034		22	1		
	550 KIEV	49 GB	1039		10.5	20 D			
	9100 ARCE	20	1039.5	1054.5	122				
	606 SGMR	4 S/F	1041	1045	6.4	156	46.8		
	536 ONDR	45 C	1041	1045.3	7	68	25		
	1415 SGMR	2 S/F	1042.2	1045.4	6	6.4	2.5		
	410 SGMR	6 S	1043.4	1045.3	3.6	8.5	2.5		
	1420 ARCE	4	1043.5	1045.2	4.6				
	3000 BERL	1	1044.5	1045.4	2	2.4			
	930 BORD	46 C	1044	1046		4	41		E
	808 ONDR	45 C	1044	1045.6	2.5	62	15		
	9500 BERL	20	1045	1052.5	15	5.9			
	1470 BERL	4	1045	1045.5	10	5.3			
	245 SGMR	6 S	1418	1418.6	1.2	8.4	2.5		
	410 SGMR	6 S	1418.6	1418.7	.6	15.9	4.8		
	2800 OTTA	240 R	2100	2120	20	1	0.5		
18	3100 CRIM	24 R	0825	0951		4			
	2800 OTTA	20 GRF	1420	1510	140	2	1.3		
	930 BORD	46 C	1506	1507.2		4	13		B
	245 SGMR	6 S	1824.3	1825.6	1.7	25.1	7.5		
	606 SGMR	3 S	1824.8	1825	.9	98.6	29.6		
	410 SGMR	6 S	1825.1	1825.2	.6	20.9	6.3		
	1415 SGMR	3 S	1826	1826.1	.5	16.3	1.6		
20	550 KIEV	41 F	0814.5	0815	12	12			
	550 KIEV	41 F	0900	0904.2	5	48			
	930 BORD	46 C	0947	0947.4		.4	19		B
	3100 CRIM	1 S	1117	1119	7	7	2		
	3100 CRIM	24 R	1130	1300		3			
22	3100 CRIM	24 R	0647	0759		6			
	536 ONDR	8 S	0914	0914	.3	34			
	930 BORD	8 S	1106	1106		.1	36		A
	2800 OTTA	20 GRF	1130	1155	70	1.6	0.8		
	2800 OTTA	24 R	1450	1512	22	3.4	1.7		
	2800 OTTA	27 RF	1450		190	3.4	3		
	536 ONDR	3 S	1453.2	1453.2	.3	18			
	2800 OTTA	24P R	1512		138	3.4			
	2800 OTTA	26 FAL	1730	1800	30	-3.4	-1.7		
	100 HIRA	45 C	1957.3	1957.5	.7	1170	300		O
	100 HIRA	45 C	2110	2111	2	1200	800		WL
	2800 OTTA	2 S/F	2116.7	2117.7	2.8	6.8	3.3		
	500 HIRA	5 S	2116.9	2117.7	2	7	2		O
	1420 BCUL	3 S	2116	2117.5	3	9	3		
	200 HIRA	45 C	2117	2117.7	1.3	180	40		WL
	207 VORO	4 S/F	2117	2118	1.5	105			
	2695 BCUL	3 S	2118	2119	2.5	7	2		
	1000 TYKW	5 S	2336	2337.2	2	1.2	.3		
	1000 TYKW	45 C	2338	2339	3	3	.7		
	1000 TYKW		2338	2340.1		2.5			
23	1400 SYDN	45 C	0010.2	0017	9.2				
	1000 TYKW	45 C	0010	0012.2	4	13	3.5		
	2000 TYKW	45 C	0010	0012.3	4	6	1.5		75R
	2695 PENT	40 F	0010	0017	12	6.9			
	207 VORO	7 C	0013	0014	4	46			
	207 VORO		0013	0016		61			
	200 HIRA	45 C	0014	0014.7	1	70	20		O
	2000 TYKW	45 C	0014	0017.3	5	13	3.5		80R
	2000 TYKW		0014	0014.9		6			80R
	1000 TYKW	45 C	0014	0017.3	5	23	5.5		
	1000 TYKW		0014	0014.9		13			
	500 HIRA	5 S	0016.3	0017	2.3	8	3		WL
	200 HIRA	45 C	0016.3	0017	1	40	15		O
	700 SYDN	40 F	0016.3	0017	1.2				
	3750 TYKW	5 S	0016	0017	2	3	1		
	1000 TYKW	45 C	0104.9	0105.3	1	35	8		
	2695 PENT	1 S	0104.9	0105.2	1.5	8	1.8		
	1400 SYDN	15	0105	0105.3	.8				
	2000 TYKW	5 S	0105	0105.3	1	5	1		OR
	3100 CRIM	20 GRF	0742	0804	35	5	2		
	3100 CRIM	20 GRF	0830	0840	22	3	1		
	260 ONDR	42 SER	0847	0905.3	27	8			
	3100 CRIM	24 R	1004	1115		5			
	950 GORK	23 GRF	1007.1	1031.8	110.9	3	1.5		
	650 GORK	41 F	1008.9	1109.1	11.1	7.2			
	650 GORK		1008.9	1114.9	1.6	5.7			
	650 GORK		1008.9	1119.6	.9	2.5			
	2800 OTTA	21 GRF	1050	1155	190	4	2		
	9500 BERL	20	1119	1155.5	82	6.3			
	260 ONDR	43 NS	1123		230 D	7			
	245 SGMR	43 NS	1200	1723.3	740 D	582			3G,5
	650 GORK	5 S	1136	1138.1	4.2	8.7	4.3		

# SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$		INT	POLARIZATION OR REMARKS
			UT	UT	MINUTES	PEAK	MEAN		
	950 GORK	1 S	1146.1	1146.8	1.1	6	3		
	2800 OTTA	40 F	1146.5	1153	11	16			
	1420 ARCE	40	1147.2	1152.8	12.8				
	2950 GORK	20 GRF	1147.3	1153	10.7	14.2			
	410 SGHR	6 S	1149.9	1154.3	6.6	13.3	4		
	650 GORK	1 S	1150.3	1153.3	5.6	5	2.5		
	2695 SGHR	4 S/F	1150.7	1153	8.8	20.2	6		
	3000 BERL	46	1150	1152.8	4.7	7.5	2.5		
	245 SGHR	6 S	1151.1	1154.1	6.3	15.4	4.6		
	1415 SGHR	2 S/F	1151.2	1153.2	6.3	5.5	1.7		
	1470 BERL	46	1151	1154	7	6.9	2.6		
	606 SGHR	2 S/F	1152.6	1153.2	3.7	2.4	.7		
	9100 ARCE	1	1155	1155.2	.7				
	950 GORK	20 GRF	1207	1234.5	44	5	1.5		
	2800 OTTA	8 S	1426	1426.1	0.5	1.6			
	2800 OTTA	20 GRF	1500	1600	100	1.4	0.7		
	237 TRST	41 F	1519	1519.4	.7	52			
	4995 BOUL	1 S	1628	1628.5	1.5	10	3		
	2695 BCUL	1 S	1629.5	1630.5	1.5	2	1		
	2695 BOUL	45 C	1640	1641	2	2	1		
	4995 BCUL	1 S	1640	1641	2.5	8	3		
	237 TRST	41 F	1722.3	1722.9	1.1	131			
	228 HARS	45 C	1722.4	1723	1.1	130	40		
	1420 BCUL	40 F	1823.5	1826.5	12.5	20	4		
	2800 OTTA	45 C	1823.8	1825	4.5	9.8	2.5		
	2695 BOUL	45 C	1824.5	1826	6	10	3		
	4995 BOUL	1 S	1826	1826.5	2	6	2		
	1420 BOUL	8 S	2109	2110.5	2	6	2		
	200 HIRA	45 C	2110	2110.7	1.5	3000	300		0
	606 SGHR	4 S/F	2110.2	2110.5	.7	28.8	8.6		5
	2800 OTTA	1 S	2110.3	2110.8	1	1.4	0.7		
	245 SGHR	6 S	2110.4	2111	1.5	121.6	36.5		5
	500 HIRA	45 C	2110.5	2110.8	1.3	14	6		0
	1415 SGHR	4 S/F	2110.6	2110.8	.4	18	5.4		5
	410 SGHR	6 S	2110.9	2111	.2	35	10.5		5
	207 VORO	4 S/F	2110	2111	2	250			
	2695 BCUL	1 S	2111.5	2112	2	3	1		
	18 HCHA	6 S	2111	2114	4			1	
	9400 TYKW	45 C	2205	2206.7	4	14	4		0L
	4995 BCUL	45 C	2229.5	2231	4.5	13	4		
24	2000 TYKW	21 GRF	0000	0028	110	2.5	1		OR
	1000 TYKW	21 GRF	0000	0250	340	5.7	3.4		
	2695 PENT	21 GRF	0003	0035	100	5.2			
	2695 PENT	20 GRF	0004	0010	12	2.8	1.8		
	3750 TYKH	5 S	0020	0024	7	19	7		
	3750 TYKH	29 PBI	0027		65	3	1		
	1420 BOUL	3 S	0021.5	0023.5	6	3	1		
	4995 BOUL	3 S	0021	0023.5	5	27	9		
	9400 TYKH	5 S	0021	0023.8	6	35	12		25L
	9400 TYKH	29 PBI	0027		75	5	2		
	4995 MANI	3	0022	0023.8	11.2	37	16.8		
	8800 MANI	3	0022	0023.8	11	42.8	17.6		
	1415 MANI	3	0022	0023.8	15.5	3.7	1.2		
	2695 MANI	3	0022	0023.8	7.5	8.9	3		
	2695 PENT	1 S	0022.8	0024	8	9.4	3.2		
	2695 BOUL	3 S	0022	0025	8.5	10	3		
	2000 TYKW	5 S	0022	0023.9	5	5	2		15R
	1000 TYKH	5 S	0022	0024	5	19	1.5		
	2695 PENT	20 GRF	0047	0051	13	1.4	0.8		
	100 HIRA	42 SER	0116.7	0120	6	550			0
	200 HIRA	45 C	0119	0120	2	600	100		0
	2695 BCUL	3 S	0128	0129.5	4.5	3	1		
	4995 BCUL	45 C	0128	0128.5	4	16	4		
	200 GORK	44 NS	0300 E		480		5		
	260 ONDR	44 NS	0600 E		200	7			
	127 TORN	44 NS	0720 E	1010 U	460 0				V=1
	100 GORK	43 NS	0828		560 0		5		
	245 SGHR	44 NS	0911 E	2337.9	909 0	79			
	5730 IRKU	2 S	0314	0314.2	.5	25	12		
	9100 GORK	46 C	0343.8	0344.6	4.3	25.5			
	9100 GORK		0343.8	0346		12.8			
	5730 IRKU	1 S	0344	0344.5	3.5	8	3		R
	9400 TYKH	45 C	0344	0344.4	4	23	7		45L
	700 SYDN	8 S	0459.3	0459.5	.3				
	9100 GORK	20 GRF	0531.2	0538.7	17	5	2		
	9100 GORK	23 GRF	0648.3	0903	315 0	31.8	17		
	650 GORK	41 F	0704		33				
	650 GORK		0704	0704.3	.5	4			
	650 GORK		0704	0705.9	.8	4.7			
	650 GORK		0704	0708.2	2.2	17.6			
	650 GORK		0704	0712.3	7.9	44			
	650 GORK		0704	0731.4	3.1	13.5			
	650 GORK		0704	0743.4	5.3	60			
	2950 GORK	20 GRF	0705	0741.6	43.1	6.6	2.5		

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# SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY $10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$		INT	POLARIZATION OR REMARKS
			UT	UT	MINUTES	PEAK	MEAN		
24	1000 TYKW	45 C	0705	0707.6	4.5	52	7		
	950 GORK	21 GRF	0706		342		13.5		
	950 GORK	4 SF	0706.5	0707.8	2	19.5			
	808 ONDR	46 C	0706	0743.2	40	112	7		
	808 ONDR		0712.5E	0712.5		95			
	1000 TYKW	45 C	0709.5	0713.2	9.5	62	5.5		
	1000 TYKW		0709.5	0711.2		28			
	1000 TYKW		0709.5	0711.8		43			
	1000 TYKW		0709.5	0714		37			
	950 GORK	46 C	0711	0711.5	8.5	43			
	950 GORK		0711	0713		51			
	950 GORK		0711	0714		37			
	3100 CRIM	24 R	0711	0904		12			
	3000 BERL	20	0735	0749.4	20	5.1			
	1420 ARCE	23	0737.2	0902.6	128				
	1000 TYKW	45 C	0737	0743.4	13	56	5		
	9500 BERL	4	0739.5	0741.4	6.5	16			
	1470 BERL	1	0740	0743.4	8	2			
	950 GORK	46 C	0741.2	0741.5	3.8	10			
	950 GORK		0741.2	0743.3		46			
	9100 GORK	1 S	0741.4	0741.7	1	14	7		
	9100 ARCE	1	0741.5	0741.8	1				
	9400 TYKW	5 S	0741	0741.7	4	18	3		DL
	550 KIEV		0755 E	0830 U					
	550 KIEV	46 C	0755 E	0820 U	60 0	27 0			
	1470 BERL	22	0801	0902.5	379	18			
	9100 ARCE	22	0802	0903.9	240				
	3000 BERL	22	0805	0902	397	22			
	536 ONDR	47 GB	0805	0824.6	27	280	58		
	536 ONDR	29 PBI	0833	0848.8	32	10	6		
	650 GORK	41 F	0806.1E	0807.8	9.5	30	15		
	650 GORK		0806.1E	0811.4	4.5	24			
	9500 BERL	22	0810	0931	320	30			
	2950 GORK	21 GRF	0811	0902.6	300	23			
	650 GORK	47 GB	0815.8	0824.7	17.7U	474			
	650 GORK		0815.8	0821.8	1.8U	329			
	650 GORK		0815.8	0824	.5U	290			
	650 GORK	29 PBI	0815.8	0828.9	67.1	379			
	550 KIEV	48 C	0816		17.5	27 0			
	808 ONDR	49 GB	0816	0825.7	19	210	102		
	808 ONDR	29 PBI	0835	0843.3	54	80	15		
	950 GORK	46 C	0819.3	0822.3	16.7	37			
	950 GORK		0819.3	0827		39			
	950 GORK		0819.3	0832.1		40			
	500 HIRA	45 C	0820.6		9		50		
	500 HIRA		0820.6	0822		170			WL
	500 HIRA		0820.6	0825.3		220			WL
	3100 CRIM	2 S	0825	0828	2	10	3		
	9100 GORK	1 S	0825.7	0826.2	1.3	8.9	4.5		
	1470 BERL	3	0825	0826	3	13			
	113 POTS	45 C	0825	1009	175	28	6		
	950 GORK	47 GB	0835.9	0844.7	17.3	190			
	950 GORK		0835.9	0841.6		175			
	950 GORK		0835.9	0843.5		186			
	650 GORK	3 S	0842.7	0844.4	3.9	43			
	650 GORK		0842.7	0848.1	3.8	23			
	9100 GORK	1 S	0842.9	0843.9	2.5	11.4	5.5		
	1470 BERL	46	0842	0848	12	27			
	1420 ARCE	45	0842	0847.9	11.5				
	1420 ARCE		0842	0843.9	4.5				
	1420 ARCE		0846.5	0847.9	7				
	9100 GORK	1 S	0846.5	0848	3.3	8.9	4.5		
	950 GORK	3 S	0853.2	0857	6.8	25	8.5		
	950 GORK	3 S	0901.8	0903.8	4.5	54			
	200 GORK	27 RF	0915.5	0934.4	32.1	12	6		
	1420 ARCE	40	0922	0930	15				
	1470 BERL	3	0929	0930	5.5	27			
	1415 SGHR	4 S/F	1007.3	1012.9	9.1	62.1	18.6		
	1420 ARCE	4	1007.5	1013	10				
	1470 BERL	3	1010	1013	7.5	69			
	550 KIEV	42 SER	1120 U		90	2			
	2800 OTTA	26A FAL	1215	1335	80	-3.2	-1.6		
	2800 OTTA	21 GRF	1242	1255	53	3.6	1.8		
	2950 GORK	1 S	1250.5	1253	8.4	8.6	3.6		
	2800 OTTA	1 S	1250	1253	4	3.4	1.8		
	3100 CRIM	1 S	1251	1253	3	5	2		
	2800 OTTA	26A FAL	1415	1450	35	-3.2	-1.6		
	2800 OTTA	2 S/F	1439.5	1440	1.7	2	1		
	1420 ARCE	1	1439.6	1439.7	.7				
	9100 ARCE	2	1440	1440.3	2.3				
	2800 OTTA	26 FAL	1550	1600	10	-1	-0.5		
	8800 ATHN	2 S	1636.8	1638.6	2.4	10.3	6.2		
	4995 ATHN	2 S	1636.9	1638.6	3	4.5	2.7		
	9100 ARCE	1	1638.5	1638.9	1				
	2800 OTTA	22 GRF	1800	1830	90	3.2	1.6		

# SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY		INT	POLARIZATION OR REMARKS	
			UT	UT	MINUTES	$10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$ PEAK	MEAN			
25	2800 OTTA	240 R	1940	2010	30	1.6	0.6			
	4995 BOUL	8 S	2041.5	2042.5	2.5	15	4			
	2800 OTTA	20 GRF	2055	2110	15	2.2	1.1			
	2695 BOUL	45 C	2131	2133	2.5	36	12			
	8800 HANI	3	2207.5	2209.3	3.9	41.3	14.6			
	4995 HANI	3	2207.9	2209.1	3.5	10.4	3.5			
	2695 HANI	3	2207.9	2209	3.5	6.4	1.8			
	9400 HUAN	1 S	2208.7	2209.3	1.3	24.6	8.2		R	
	2800 OTTA	20 GRF	2230	2258	110	4.4	1.6			
	3750 TYKH	20 GRF	2235	2255	70	6	2			
	1420 BCUL	1 S	0050	0050.5	1	1				
	2695 BCUL	3 S	0051	0051.5	1.5	2	1			
	200 GORK	44 NS	0306		414 D		5			
	260 ONDR	44 NS	0610		530 D	84				
	127 TORN	44 NS	0720	1326.2	460 D	77			V=1	
	245 SGMR	43 NS	1200	2158.3	740 D	30.8				
	207 VORO	44 NS	2100	2243	240	27	9			
	3100 CRIM	26 FAL	0530	0634		5				
	3100 CRIM	20 GRF	0738	0755	25	2.5	1			
	3100 CRIM	24 R	0830	1055		6				
	5730 IRKU	1 S	0830.5	0831	1	2.6				
	5730 IRKU	1 S	0850.2	0850.3	1	3.5			R	
	9100 ARCE	21	1024.9	1048.6	120					
	2800 OTTA	20 GRF	1048	1053	60	3.6	1.8			
	8800 ATHN	4 S	1050.7	1052.7	9.7	77.1	23.1			
	9500 BERL	3	1051	1051.8	22	68				
	3000 BERL	3	1051	1052.5	10	6.7				
	4995 ATHN	3 S	1051.1	1052.7	8.1	38.1	11.4			
	9100 ARCE	4	1051.3	1052.7	3.6					
	4995 SGMR	4 S/F	1051.6	1052.6	5.6		8			
	9100 ARCE	29	1054.9		19.5					
	228 HARS	45 C	1237	1240.3	4	60	11			
	410 SGMR	6 S	1239.8	1240.3	.9	69	21			
	536 ONDR	4 S/F	1239	1240	2	39				
	606 SGMR	3 S	1240	1240.4	.9	44.4	13.3			
	245 SGMR	6 S	1240	1240.3	.7	193	58			
	7000 SAOP	28 PRE	1357.7	1357.8	.3	9.6	5.7			
	7000 SAOP	46 C	1357.9	1358.1	2.3	33.1	16.2			
	9100 ARCE	21	1411.7	1504.5	135					
	8800 ATHN	13 S	1455.1	1457.9	4.7	23.9	7.2			
	4995 ATHN	3 S	1455.2	1458	4.6	14.3	4.3			
	4995 SGMR	3 S	1457.6	1459.3	3.4	14.7	7.4			
	2800 OTTA	45 C	1457.9	1459.1	3	5.4	3.8			
	9100 ARCE	40	1457.9	1459.4	2.6					
	1420 ARCE	40	1457.9	1458.3	1.6					
	2800 OTTA	21 GRF	1457	1504	105	3.6	2			
	1415 SGMR	3 S	1458	1458.5	1.1	12.5	6.2			
	2695 SGMR	3 S	1458.3	1459.4	2.8	13.6	6.8			
	8800 SGMR	3 S	1458.3	1458.4	1.7	20.1	10			
	2695 BOUL	45 C	1458	1500	3.5	9	3			
	8800 ATHN	13 C	1459	1459		23.9				
	9400 HUAN	1 S	1502	1504.5	12.9	10	3.6		O	
	4995 ATHN	3 S	1541.2	1541.5	6.9	7.1	2.1			
	8800 ATHN	3 S	1541.2	1541.5	7.2	16	4.8			
	9100 ARCE	2	1541	1541.9	6					
	4995 ATHN	3 S	1549.6	1549.7	.8	4.8	1.4			
	8800 ATHN	3 S	1549.6	1549.7	1.3	8	2.4			
	237 TRST	41 F	1648.2	1648.4	.2	284				
	228 HARS	45 C	1650.8	1652.6	3.7	150	40			
	237 TRST	41 F	1652.2	1652.4	.4	422				
	410 SGMR	6 S	1652.4U	1658.5U	6.2U	21.9U	6.5U			
	245 SGMR	7 C	1652.4U	1658.5U	9.3U	354 J	106 U			
	237 TRST	41 F	1653	1653.7	1	737				
	237 TRST	41 F	1658.4	1658.5	.6	333				
	7000 SAOP	21 GRF	1750	1756.3	40.6	16.8				
	2800 OTTA	21 GRF	1750	1810	90	3.8	1.9			
	7000 SAOP	2 S	1755.3	1756.3	2.8	10.6	5.6			
	245 SGMR	6 S	1755.9	1756	2.7	161	48.2			
	1420 BCUL	3 S	1755	1756	3.5	2	1			
	2800 OTTA	2 S/F	1755	1756.1	4	9.6	3.2			
	2695 BOUL	8 S	1756.5	1757.5	3	9	3			
	2800 OTTA	32 ABS	2040	2050	70	-1.8	-0.9			
	9400 TYKH	5 S	2218	2218.3	5	7	2		DL	
	1000 TYKH	45 C	2241	2243.2	3	11	1			
	500 HIRA	45 C	2242	2242.6	2	22	12		HR	
	2695 PENT	240 AR	2250	2543	173	11.8	5.4			
	3750 TYKH	21 GRF	2310	2640	440	10	5			
	3750 TYKH	45 C	2314	2324	16	5	2			
	9400 TYKH	5 S	2321	2324.8	20	19	7		DL	
	2695 PENT	1 S	2323.2	2324	7	1.8	1			
	2000 TYKH	5 S	2323.7	2324.2	1	2.5	.6		DR	
	2000 TYKH	21 GRF	2358	0240	430	7	2.5		DR	
	9400 TYKH	20 GRF	2355	0200	260	21	10		DL	
	26	1000 TYKH	20 GRF	0110	0235	170	5	1		

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## SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

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JUN 1977	FREQUENCY STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$		INT	POLARIZATION OR REMARKS
			UT	UT	MINUTES	PEAK	MEAN		
26	200 GORK	44 NS	0300		420		5		
	260 ONDR	44 NS	0610 E		540 0	15			
	5730 IRKU	1 S	0342.2	0343	2	3			L
	5730 IRKU	1 S	0406	0407.1	2	3			R
	9400 TYKH	21 GRF	0425	0535	120	11	6		OL
	2000 TYKH	5 S	0439	0439.9	4	1	.3		OR
	3750 TYKH	5 S	0439	0439.8	3	8	2.0		
	9100 GORK	20 GRF	0452.5	0457	16	9.5	3.3		
	3750 TYKH	5 S	0452	0453.3	9	3	1		
	9400 TYKH	5 S	0452	0453.3	9	7	3		OL
	9100 GORK	20 GRF	0541	0810.6	221 0	18.8	7.6		
	3100 CRIM	1 S	0705	0707.5	5	2	1		
	8800 ATHN	2 S	0759.8	0804.4	10.3	5.5	3.3		
	4995 ATHN	2 S	0801.7	0804.6	9.1	6.6	4		
	3100 CRIM	5 S	0802	0804	10	3	1		
	3100 CRIM	20 GRF	0838	0915	38	4	1		
	127 TORN	48 C	0933 U	1001.5	45	54			
	127 TORN		0943.4E	0943.4		39			
	15000 KISV	45 C	0950	1014	45	76 0			
	8800 ATHN	4 S	1010.1	1015.1	26.3	134.3	40.3		
	9100 ARCE	28	1010.4	1012.1	4.1				ATMOS. ATTEN.
	9500 BERL	46	1010	1014.7	35	95	18		
	4995 ATHN	4 S	1012.1	1015.4	24.9	68.2	20.5		
	3100 CRIM	2 S	1014	1015	2	14	5		
	3100 CRIM	29 PBI	1016	1021	27	5.5	2		
	9100 ARCE	3	1014.5	1015.2	2.5				
	3000 BERL	3	1014	1014.7	31	16	2.5		
	9100 ARCE	29	1017	16.5	16.5				
	808 ONDR	2 S/F	1241.3	1241.3	1.5	32			
	2800 OTTA	27A RF	1255		385	3.6	3		
	2800 OTTA	24 R	1255	1315	20	3.6	1.8		
	2800 OTTA	24P R	1315		260	3.6			
	2800 OTTA	21 GRF	1323		42	4.2	3.1		
	1420 ARCE	20	1331.3	1337.8	20.6				
	4995 SGMR	4 S/F	1333.1	1336.8	26.9U	123.1	49.2U		SID, SWF
	4995 ATHN	2 S	1333.4	1336.9	18.2	140	42		
	8800 ATHN	2 S	1334.7	1337.3	16.7	102.2	30.7		
	7000 SAOP	4 S/F	1334.8	1337.2	4.3	101.4	53.2		
	7000 SAOP	29 PBI	1339.1		11.4	19			
	9100 ARCE	4	1334	1337.1	5.2				ATMOS. ATTEN.
	4995 BOUL	8 S	1334	1336.5	5	123	41		
	8800 SGMR	4 S/F	1335.2	1336.2	24.5U	81.6	32.6U		SID, SWF
	2695 SGMR	3 S	1335.3	1336.8	24.7U	39.9	16 U		SID, SWF
	9400 HUAN	45 C	1335.3	1337	3.1	83.3	34.9		L
	9400 HUAN	29 PBI	1338.4	1338.4	9.2	22.9	10		L
	9500 BERL	4	1335	1336.5	20	68	14		
	1470 BERL	1	1335	1337.5	18	2.4			
	3000 BERL	4	1335	1336.5	28	58	10		
	2695 BOUL	3 S	1335	1337.5	14	34	11		
	2800 OTTA	4 S/F	1335	1337.1	15	48	11		
	9100 ARCE	29	1339.2	1340.8	17.5				
	4995 BOUL	8 S	1355.5	1358	3	73	24		
	1420 ARCE	21	1357.7	1507.5	165				
	9100 ARCE	22	1413.4	1438.6	46				
	2800 OTTA	21 GRF	1421.5	1436	118	26.8	7.7		
	7000 SAOP	25 R	1425.3			23.5			
	3000 BERL	20	1425	1454	55	14			
	4995 ATHN	2 S	1430.7	1438.3	67.9	29.8	8.9		
	8800 ATHN	2 S	1430.7	1438.5	57.4	23.6	14.1		
	9500 BERL	20	1430	1439	50	16			
	1470 BERL	20	1431.5	1502	49	3.7			
	1420 ARCE	40	1432.6	1435.7	10.5				
	3000 BERL	4	1433.5	1438	18	34			
	1470 BERL	46	1433.5	1435.7	3	7.8			
	1420 BOUL	45 C	1433.5	1455	2.5	6	3		
	2800 OTTA	1 S	1434	1434.4	1	3.6	1.8		
	2695 BOUL	4 SF	1435.5	1439	15	15	5		
	2800 OTTA	2 S/F	1437.5	1438	1.5	7.6	3.4		
	113 BERL	2	1438	1438.1	.2	700	100		
	7000 SAOP	45 C	1438	1438.1	.5	5.6	3.8		
	8800 ATHN	3 S	1504.6	1510.5	11.7	21	6.3		
	4995 ATHN	3 S	1505	1510.6	22.8	22.8	6.8		
	2800 OTTA	21 GRF	1505	1510	35	3.8	1.9		
	2800 OTTA	1 S	1509.5	1510.6	2	7.4	3		
	3000 BERL	3	1509.5	1510.2	5.5	22			
	9100 ARCE	3	1509.9	1510.5	2.6				
	7000 SAOP	4 S	1510	1510.1	.4	20.2	12.1		
	7000 SAOP	29 PBI	1510.4		.8	7.3			
	9400 HUAN	45 C	1510	1510.5	3.4	16.3	5.7		0
	2695 BOUL	1 S	1510.5	1511.5	3.5	6	2		
	9500 BERL	3	1510	1510.2	7	30			
	4995 BOUL	2 SF	1515	1519	6.5	101	34		
	606 SGMR	4 S/F	1543.5	1547.8	6.7	77.8	23.3		
	4995 ATHN	3 S	1545.1	1549	29.2	40.3	12.1		SID, SWF
	7000 SAOP	28 PRE	1545.2	1547	2.1	5.4			

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			UT	UT	MINUTES	PEAK	MEAN		
	7000 SAOP	4 S/F	1547.3	1549	3.1	63.8	33.2		
	7000 SAOP	29 PBI	1550.4		17.3	14.6			
	8800 ATHN	4 S	1545.3	1549.1	29	62.9	18.9		
	9400 HUAN	28 PRE	1545.4	1547.5	2.1	13.1	5.9		R
	9400 HUAN	45 C	1547.5	1549.2	2.3	71.9	39.8		R
	9400 HUAN	29 PBI	1549.8	1549.8	2.9	18	8.2		R
	1420 BCUL	23 GRF	1546.5	1548.5	21.5	30	9		
	4995 SGHR	4 S/F	1547.2	1548.8	31.8	46	13.8		SID,SHF
	2695 PENT	4 S/F	1547.2	1549	5.8	70	24		
	2800 OTTA	29 PBI	1553	1553	25	5.2	2.6		
	2695 SGHR	4 S/F	1547.3	1548.9	31.7	64	19.2		SID,SHF
	1415 SGMR	4 S/F	1547.3	1549.1	7.7U	36.8	11.1U		SID,SHF
	9100 ARCE	4	1547.3	1549.1	3				
	8800 SGHR	4 S/F	1547.5	1549	31.5	51	15.3		SID,SHF
	1420 ARCE	4	1547	1548.7	3.8				
	9100 ARCE	29	1550.3		27.5				
	1420 ARCE	29	1550.8		14				
	9100 ARCE	8	1716.2	1716.4	.6				
	7000 SAOP	8 S	1716.2	1749.4	.4	14	7		
	2800 OTTA	26 FAL	1735	1920	105	-3	+1.5		
	2800 OTTA	21 GRF	1950	2105	210	3.6	2.2		
	207 VORO	44 NS	2100		240		11		
	4995 BOUL	8 S	2125.5	2127	3	22	7		
	1000 TYKH	42 SER	2125.5	2127.2	3.5	55	5		
	9400 HUAN	1 S	2126.1	2127.3	4	29.4	9.3		R
	4995 SGHR	3 S	2126.4	2127.2	5.7	30.4	9.1		
	2695 SGMR	3 S	2126.4	2127.3	5	23.4	7		
	2800 OTTA	3 S	2126.5	2127.2	2.5	22	7.3		
	2800 OTTA	29 PBI	2129	2129	10	2	1		
	8800 SGHR	3 S	2126.6	2127.4	4.6	24.4	7.3		
	1420 BCUL	3 S	2126	2127.5	3	4	1		
	1415 SGHR	1 S	2127	2127.5	2.6	4	1.2		
	2695 BOUL	8 S	2127	2128	3	20	7		
	2695 SGMR	3 S	2152.2	2153.1	5.8	12.4	3.7		
	4995 SGHR	3 S	2152.4	2153.1	5.3	14.7	4.4		
	2695 BCUL	8 S	2152.5	2154	6	14	5		
	1415 SGHR	1 S	2152.7	2153.2	2.7	1.5	.5		
	1420 BCUL	3 S	2152	2153	2	2	1		
	4995 BCUL	8 S	2152	2152.5	3.5	15	5		
	9400 TYKH	5 S	2152	2153	6	6	2		OL
	2000 TYKH	5 S	2152	2153.2	3	7 J	2 U		OR
	3750 TYKH	5 S	2152	2153.1	3	15	3		OL
	2800 OTTA	3 S	2152	2153	2	15.2	7		
	2800 OTTA	29 PBI	2154	2154	5	3.6	1.8		
	4995 SGHR	4 S/F	2215.4	2217.9	5.9	51.8	15.5		SID,SHF
	8800 SGHR	4 S/F	2215.7	2218.1	21.4	239.1	71.7		SID,SHF
	9400 HUAN	45 C	2216.1	2218	3.9	259.8	85		R
	8800 MANI	4	2216.8	2217.9	3.1	285	91		2-SPA
	4995 MANI	3	2216.8	2217.9	3.1	46.5	14.9		
	4995 BOUL	8 S	2216	2217	4	48	16		
	3750 TYKH	5 S	2216	2217.9	4	7	2		OL
	9400 TYKH	5 S	2216	2217.9	4	305	80		05L
	9400 TYKH	29 PBI	2220		60	15	3		
	1000 TYKH	42 SER	2255	2255.5	2	12	2		
27	3750 TYKH	20 GRF	0123	0135	90	6	3		OL,095054F
	9400 TYKH	21 GRF	0123	0128	55	12	6		OL
	9400 TYKH	5 S	0142 U	0146 U	15 U	20 U	6 U		OL,RAIN
	100 GORK	44 NS	0300 E		560 D		5		
	200 GORK	44 NS	0300 E		540		5		
	260 ONDR	44 NS	0606 E		542 D	27			
	127 TORN	44 NS	0640 E	1005.6	500 D	21			V=1
	160 DWIN	44 NS	0850		306		10		
	169 DWIN	44 NS	0850		306		10		
	9100 GORK	21 GRF	0337 E	0531.8	210.3E	39	9.6		
	2000 TYKH	21 GRF	0340	0438	170	4.5	1.7		OR
	3750 TYKH	28 PRE	0343	0353	34	8	5		OL,095054F
	3750 TYKH	45 C	0417	0418.3	7	22	14		OL,095054F
	3750 TYKH	29 PBI	0424		50	11	7		OL,275035F
	9400 TYKH	28 PRE	0343	0404	34	11	6		OL
	9400 TYKH	45 C	0417	0421	7	40	20		OL
	9400 TYKH	29 PBI	0424		50	20	13		OL
	5730 IRKU	45 C	0344	0346.2	10	6			
	5730 IRKU		0344	0353		16			L
	5730 IRKU	30 PBI	0354		23	5			
	1415 MANI	2	0351.5	0352.2	2.7	2.5	.5		
	2695 MANI	2	0351.5	0352.2	2.7	3.3	.8		
	4995 MANI	2	0351.5	0352.2	2.5	5.7	1.9		
	2000 TYKH	5 S	0352.7	0353.2	2.5	3	1		OR
	4995 MANI	2	0415	0419	9.5	18	5.6		
	2695 MANI	2	0415	0417.2	7	10	4.2		
	8800 MANI	2	0415.5	0420.2	10.5	24.9	8.3		3-SPA
	2000 TYKH	5 S	0416.5	0418.2	15	4	1.5		OR
	4995 ATHN	2 S	0417.5	0419.9	24.9	17.2	10.3		
	5730 IRKU	45 C	0417.6	0420	8	15			L

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			UT	UT	MINUTES	PEAK	MEAN		
27	5730 IRKU		0417.6	0421		15			L
	5730 IRKU	29 PBI	0425		25	10			
	8800 ATHN	2 S	0418.2	0421.1	20.7	36.1	21.7		
	9100 GORK	45 S	0418.6	0420	3.9	13.7			
	9100 GORK		0418.6	0421		18			
	606 MANI	1	0419.3	0424	10.7	29.6	5.1		
	8800 ATHN	2 S	0501.2	0516.9	74.8	23.2	13.9		
	4995 ATHN	2 S	0504.5	0525.5	64.3	17.2	10.3		
	3750 TYKW	28 PRE	0514	0517	12	13	8		OL
	3750 TYKW	45 C	0526	0527.7	9	30	15		OL
	3750 TYKW	30 PBI	0535		105	11	4		
	9400 TYKW	28 PRE	0514	0517	12	18	14		OL
	9400 TYKW	45 C	0526	0528.6	9	155	45		OL
	9400 TYKW	30 PBI	0535		105	28	9		
	5730 IRKU	20 GRF	0514	0518	6	7			R
	2000 TYKW	45 C	0515	0526	55	3	1		OR
	5730 IRKU	45 C	0523.5	0527.5	9	55			R
	5730 IRKU		0523.5	0528.5		55			R
	5730 IRKU	29 PBI	0533		37	24			
	2695 MANI	2	0525.2	0526.8	4.8	2.5	.8		
	4995 MANI	14	0525.2	0527.8	7.8	55	18.9		
	8800 MANI	14	0525.4	0527.8	9.6	122	55		3-SPA
	1000 TYKW	45 C	0525	0525.6	5	1.6	.8		
	3100 CRIM	2 S	0526	0531	14	9	3		
	8800 ATHN	13 C	0526.4	0527.5	15	110.9	33.3		
	9100 GORK	45 S	0526.6	0527.5	3.4	95			
	9100 GORK		0526.6	0528.6		128			
	4995 ATHN	13 C	0526.7	0527.6	10.2	51.5	15.4		
	8800 MANI		0526.7E	0526.7		89			
	4995 MANI		0526.7E	0526.7		53			
	4995 ATHN	13 C	0528.6E	0528.6		56.4	16.9		
	8800 ATHN	13 C	0528.7E	0528.7		147.1	44.1		
	3100 CRIM	20 GRF	0620	0627	24	5	2		
	3750 TYKW	45 C	0620	0622.6	20	8	3		OL
	9400 TYKW	5 S	0622	0625	18	4	2		OL
	8800 ATHN	2 S	0631.5	0640.5	41.8	7.7	2.3		
	4995 ATHN	2 S	0631.7	0635.6	35.2	2.5	.7		
	3100 CRIM	24 R	0731	0857		4			
	9100 GORK	20 GRF	0736	0752.3	117	7.4	3.1		
	9100 GORK	20 GRF	0951.5	1014.3	129.50	13.7	4.9		
	8800 ATHN	2 S	1014.1	1016.2	13.1	7.7	4.6		
	29 UPIC	8 S	1042	1042.1	.4				
	33 UPIC	8 S	1042	1042.1	.4				
	29 UPIC	45 C	1114.3	1115	2.2				
	33 UPIC	45 C	1114.5	1115.2	2.9				
	536 ONDR	8 S	1118.3	1118.4	.3	20			
	9100 ARCE	22	1141.9	1150.6	15.8				
	29 UPIC	2 S/F	1157.4	1158.1	1.3				
	33 UPIC	2 S/F	1157.4	1157.9	1.7				
	2800 OTTA	24 R	1322	1350	18	1.6	0.8		
	2800 OTTA	27A RF	1322		168	1.6	1.4		
	2800 OTTA	24P R	1350		130	1.6			
	33 UPIC	4 S/F	1423.4		.8				
	29 UPIC	2 S/F	1423.5	1423.8	1				
	1420 ARCE	1	1451.7	1452	.8				
	237 TRST	41 F	1451.8	1452.2	.5	180			
	606 SGMR	1 S	1451.8	1452	.5	7.5	2.3		5, SID
	113 POTS	45 C	1452	1452	.2	550	100		
	536 ONDR	2 S/F	1452.2	1452.2	1	10			
	1415 SGMR	1 S	1452.2	1452.3	.3	5.9	1.8		5, SID
	410 SGMR	7 C	1452.3	1452.5	.7	428	129		5, SID
	808 ONDR	1 S	1452.3	1452.3	.2	10			
	260 ONDR	8 S	1452.3	1452.3	.4	219			
	29 UPIC	45 C	1452	1452.4	.9				
	33 UPIC	45 C	1452	1452.2	1				
	7000 SAOP	23 GRF	1500.4	1541.6	64.8	33.8			
	9100 ARCE	20	1500.7	1541.6	79.3				
	9100 ARCE		1500.7	1505.1	38.3				
	4995 SGMR	20 GRF	1500.7	1502.6	38.6	10.6	3.2		
	8800 ATHN	2 S	1501	1502.9	14.3	10.5	6.3		
	4995 ATHN	2 S	1501	1502.9	25.9	8	4.8		
	2695 SGMR	20 GRF	1501.4	1502.8	55.8	8.7	2.6		
	8800 SGMR	20 GRF	1501.8	1504.9	37.1	16.3	4.9		
	2800 OTTA	1 S	1501	1503	4	6	3		
	2800 OTTA	29 PBI	1505	1505	25	3.8	1.9		
	2695 B CUL	23 GRF	1503	1504	6	5	2		
	237 TRST	41 F	1504.1	1504.1	.2	88			
	260 ONDR	8 S	1504.2	1504.2	.3	128			
	29 UPIC	4 S/F	1508.1	1509	1				
	33 UPIC	4 S/F	1508	1508.7	.9				
	9400 HUAN	1 S	1538.7	1541.5	9.9	26.2	11.5		R
	7000 SAOP	4 S/F	1538.8	1541.5	6.2	27.1	16.1		
	7000 SAOP	29 PBI	1545		9	10.2			
	4995 ATHN	2 S	1538.8	1543.5	11.4	5.4	3.2		
	8800 SGMR	20 GRF	1538.9	1541.6	11.6	36.7	11		SID

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			UT	UT	MINUTES	PEAK	MEAN			
28	4995 SGHR	20 GRF	1539.3	1541.4	12.5	7.1	2.1		SID	
	8800 ATHN	2 S	1539.4	1541.5	11.6	26.2	15.7			
	9100 ARCE	1 S	1539	1541.6	41					
	2800 OTTA	26 FAL	1550	1610	20	-1.6	-0.8			
	2695 PENT	1 S	1651	1652	4.5	1.6	0.8			
	2800 OTTA	20 GRF	1656.5	1700	53	3.8	1.3			
	9400 HUAN	1 S	1730.4	1738.7	18	9.8	3		0	
	7000 SAOP	1 S	1737.8	1739	2.8	7.9	4.8			
	9100 ARCE	1 S	1738.1	1738.8	2.6					
	2800 OTTA	20 GRF	1750		40	1	0.5			
	9400 HUAN	1 S	1831.5	1836	10.7	9.8	2.9		R	
	7000 SAOP	40 F	1843		7.4	3.4				
	9400 HUAN	1 S	1850.7	1851.2	1	49.1	18.8		0	
	9400 HUAN	29 PBI	1851.7	1852.1	13.1	19.7	6.6		0	
	7000 SAOP	3 S	1850.8	1851.4	2	33.9	19.3			
	7000 SAOP	29 PBI	1852.8		7.4	6.8				
	4995 SGHR	1 S	1850.8	1851.4	6.6	4.4	1.3			
	8800 SGHR	3 S	1851.3	1851.6	6.2	38.4	11.5			
	2800 OTTA	20 GRF	1923	1940	52	1.6	1			
	2800 OTTA	20 GRF	2025	2032	15	0.6	0.4			
	2800 OTTA	240AR	2100	2230	90	2.2	1.1			
	207 VORO	44 NS	2100		240		8			
	2800 OTTA	20 GRF	2120	2155	70	4.2	2.1			
	500 HIRA	45 C	2122	2127.4	10	10	3		0	
	2000 TYKW	5 S	2146	2148	3	2.5	.8		OR	
	9400 TYKW	5 S	2305	2306	9	6	2		OL	
	9400 TYKW	45 C	2316	2325	18	8	3		OL	
	2695 PENT	20 GRF	2320	2335	65	3	1.5			
	3750 TYKW	5 S	2323	2324.7	17	3	1		OL	
	9400 TYKW	5 S	2351	2354	17	14	4		OL	
	28	8800 MANI	4	0011.4	0012	5.1	215	52		1-SPA
		4995 MANI	3	0011.4	0012	5.1	37.8	18.9		
		9400 TYKW	45 C	0011.5	0011.8	19	240	12		OL
		2695 PENT	1 S	0054	0057.5	6	1.8	0.9		
		3750 TYKW	5 S	0225	0232	25	4	2		OL, 094028F
		9400 TYKW	5 S	0227	0233	25	7	3		OL
		2000 TYKW	5 S	0227	0232	23	1.5	.6		OR
		9400 TYKW	20 GRF	0303	0330	90	8	4		OL
		3750 TYKW	20 GRF	0305	0345	85	5	2		OL
		200 GORK	44 NS	0312		252		5		
		200 GORK	44 NS	0506		294		5		
		260 ONDR	44 NS	0553		557	D			
		127 TORN	44 NS	0720		460	D	60		V=D
		160 DWIN	44 NS	0744		252		5		
240 DWIN		44 NS	0744		252		2			
169 DWIN		44 NS	0744		252		5			
245 SGHR		44 NS	0913	1919.1	907	D	88			
207 VORO		44 NS	2115		225		11			
2000 TYKW		20 GRF	0325	0345	105		3.5	1.7		
3100 CRIH		5 S	0710	0713	18		8	3		
3100 CRIH		29 PBI	0710	0728	20		2	1		
2000 TYKW		20 GRF	0710	0717	40		4.5	2		
3750 TYKW		20 GRF	0710	0720	40		6	3		
9100 GORK		20 GRF	0715.7	0730	38.3		6	3		
3100 CRIH		24 R	1005	1040			4			
2800 OTTA		20 GRF	1440	1520	70		1	0.5		
2800 OTTA		20 GRF	1730	1810	120		2.4	1.7		
2695 PENT		20 GRF	2310	2345	70		2.4	1.2		
29		200 GORK	44 NS	0300		540		5		
		260 ONDR	44 NS	0604		544	D	8		
	245 SGHR	44 NS	0913	1751.4	907	D	37.1J			
	207 VORO	44 NS	2100	2157	240		14	10		
	127 TORN	40 F	0640	0645.5	7	D	11		SUNRISE	
	33 UPIC	45 C	0752.4	0752.6	2.2					
	29 UPIC	45 C	0752.6	0752.9	2.1					
	29 UPIC	42 SER	1235.7	1247	56.9	U				
	33 UPIC	42 SER	1236.6	1259.8U	55.9					
	2800 OTTA	1 S	1341.5	1342	2		1.4	0.7		
	29 UPIC	4 S/F	1356	1356.1	.3					
	33 UPIC	4 S/F	1356	1356.1	.3					
	2800 OTTA	20 GRF	2100	2113	35		1.6	0.9		
	18 HCHA	42 SER	2201	2204	63				2	
2800 OTTA	2 S/F	2223	2230	10		1.8	1			
30	9400 TYKW	45 C	0302	0302.2	1	14	4		OL	
	3750 TYKW	5 S	0302	0302.3	1	2	1			
	200 GORK	44 NS	0306		414		5			
	127 TORN	44 NS	0640		500	D			RECORD DISTURBED	
	29 UPIC	43 NS	0725.3	0911	418					
	33 UPIC	43 NS	0725.5	1055	418.2					
	260 ONDR	44 NS	0840		390	D	22			
	245 SGHR	44 NS	0913	2059.4	907	D	50.4		3, CONT	
	240 DWIN	44 NS	0946		164		2			



32  
Jun 77

## SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$		INT	POLARIZATION OR REMARKS
			UT	UT	MINUTES	PEAK	MEAN		
30	169 DWIN	44 NS	0946		164		10		
	160 DWIN	44 NS	0946		164		10		
	207 VORO	44 NS	2100	2124	240	15	10		
	3100 CRIM	26 FAL	0740	1020		10			
	8800 ATHN	2 S	1054.7	1058.4	8.1	8.2	4.9		
	4995 ATHN	2 S	1055.7	1056.6	7.9	2.1	1.3		

Reports received from the following observatories:

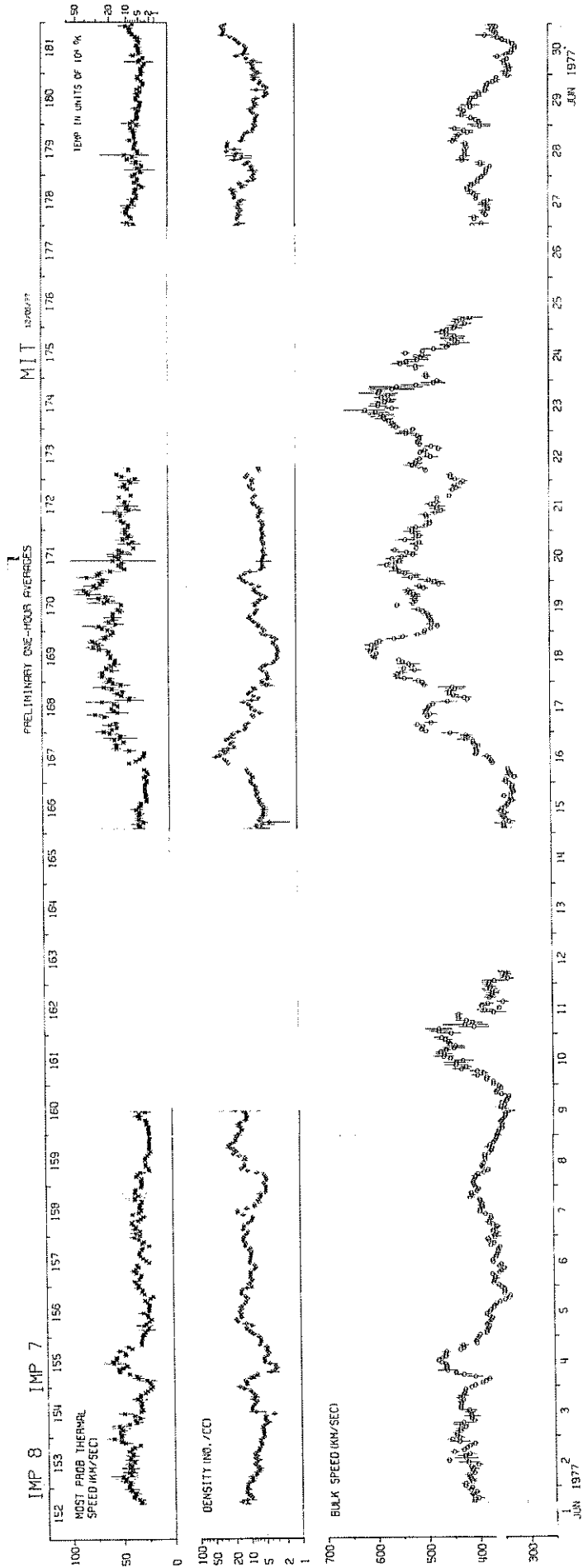
ARCE = Arcetri BERL = Berlin-Adlershof BORD = Bordeaux BOUL = Boulder CRIM = Simferopol	DWIN = Dwingeloo GORK = Gorky HARS = Harestua HIRA = Hiraiso HUAN = Huancayo IRKU = Irkutsk	KIEV = Kiev MANI = Manila MCMA = McMath-Hulbert ONDR = Ondrejov	OTTA = Ottawa PENT = Penticton POTS = Potsdam SAOP = Sao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

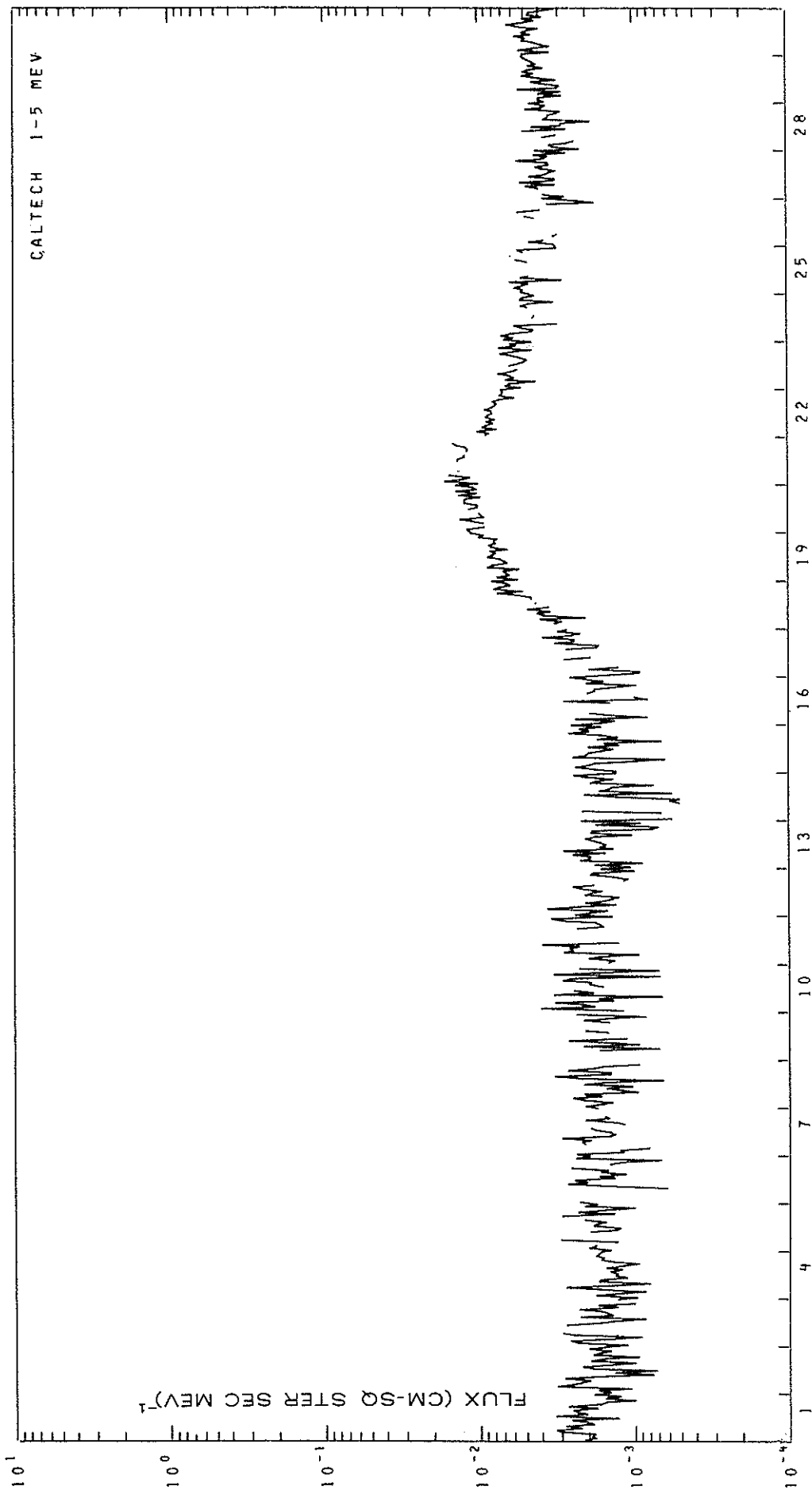
### IMP 7 AND 8 SOLAR WIND PLASMA

JUNE 1977



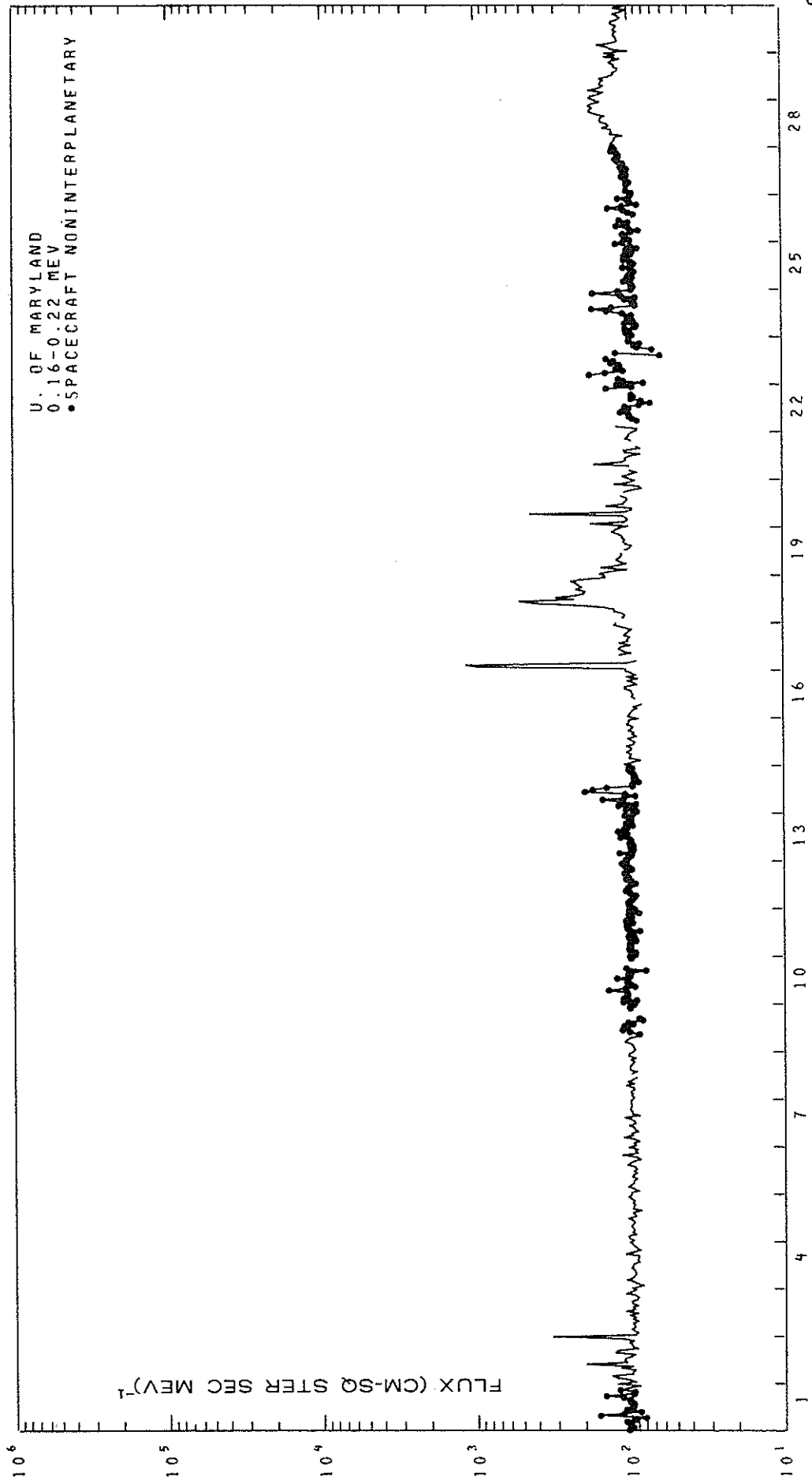
# IMP 7 AND 8 ELECTRONS

JUNE, 1977



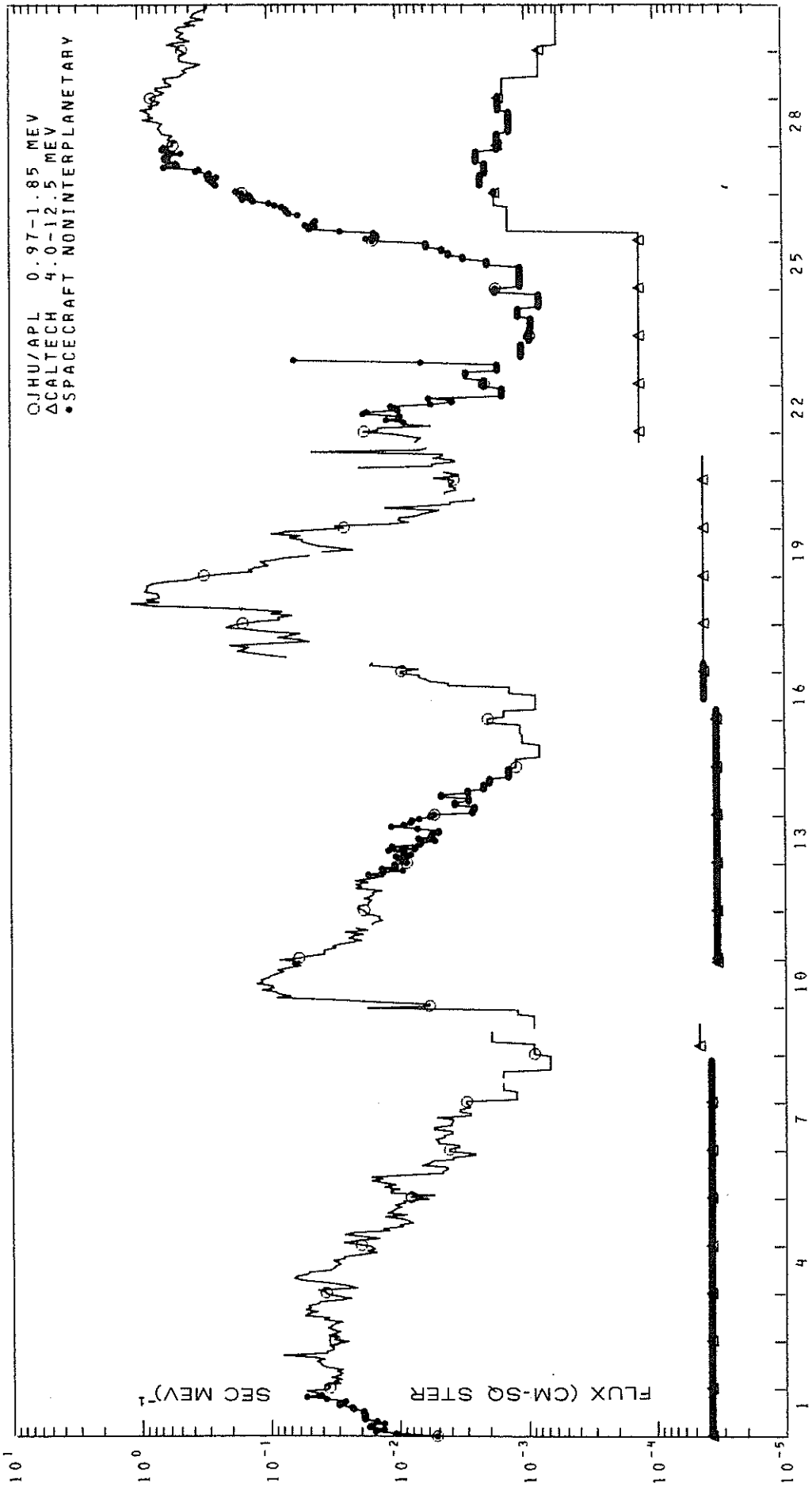
# IMP 7 AND 8 LOW ENERGY PROTONS

JUNE, 1977



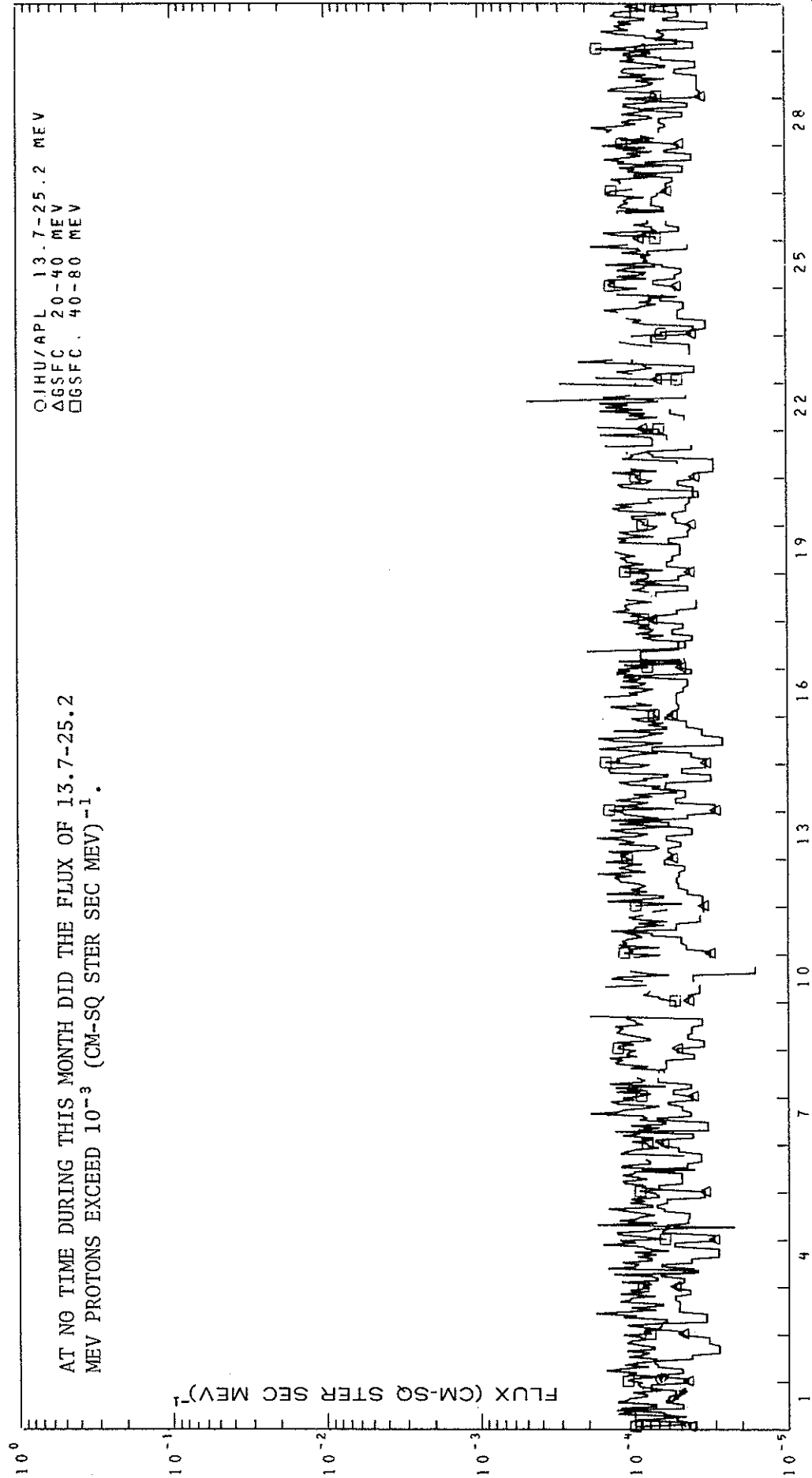
# IMP 7 AND 8 INTERMEDIATE ENERGY PROTONS

JUNE, 1977



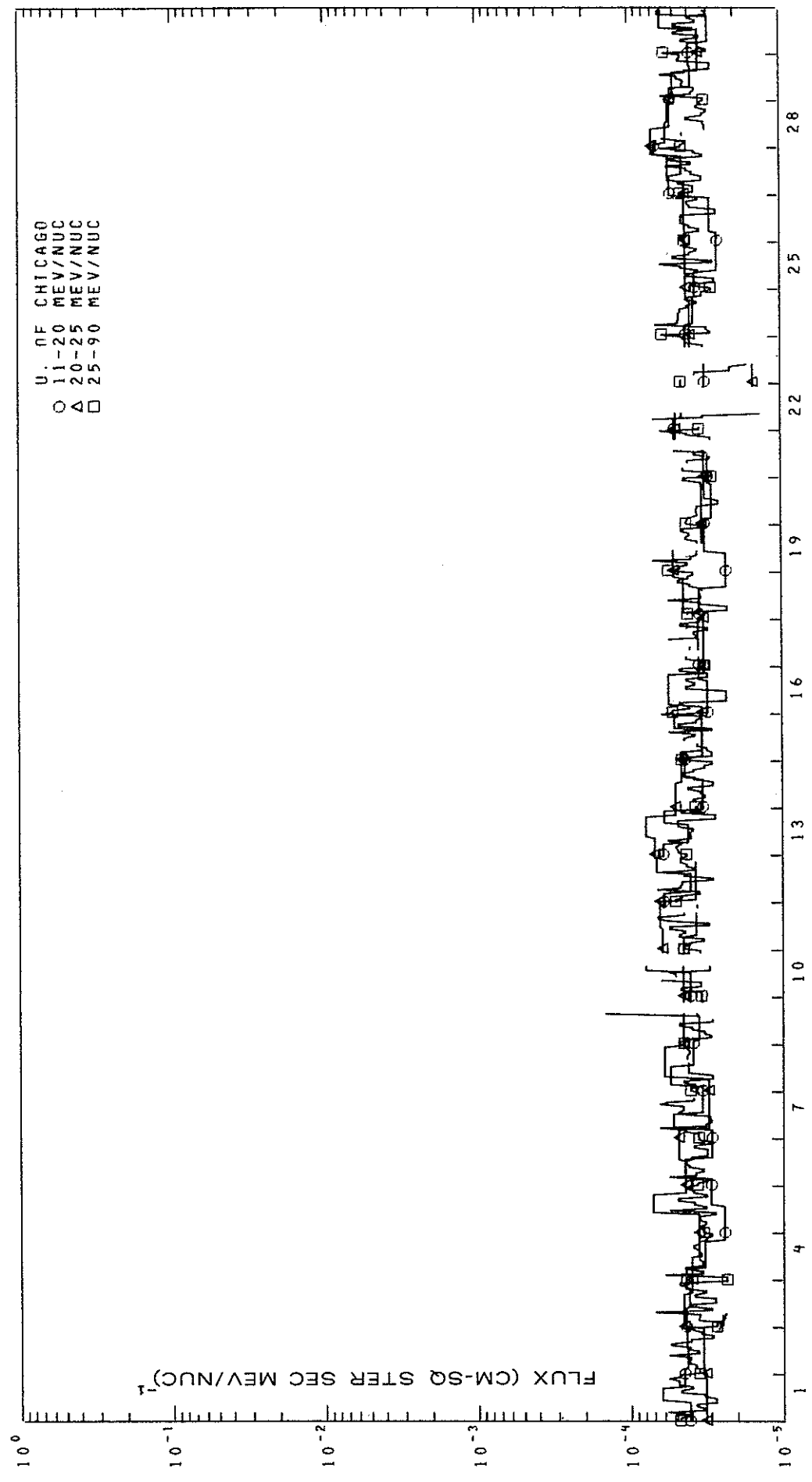
# IMP 7 AND 8 HIGH ENERGY PROTONS

JUNE, 1977



# IMP 7 AND 8 ALPHA PARTICLES

JUNE, 1977



MAY 1977 DATA

Contents

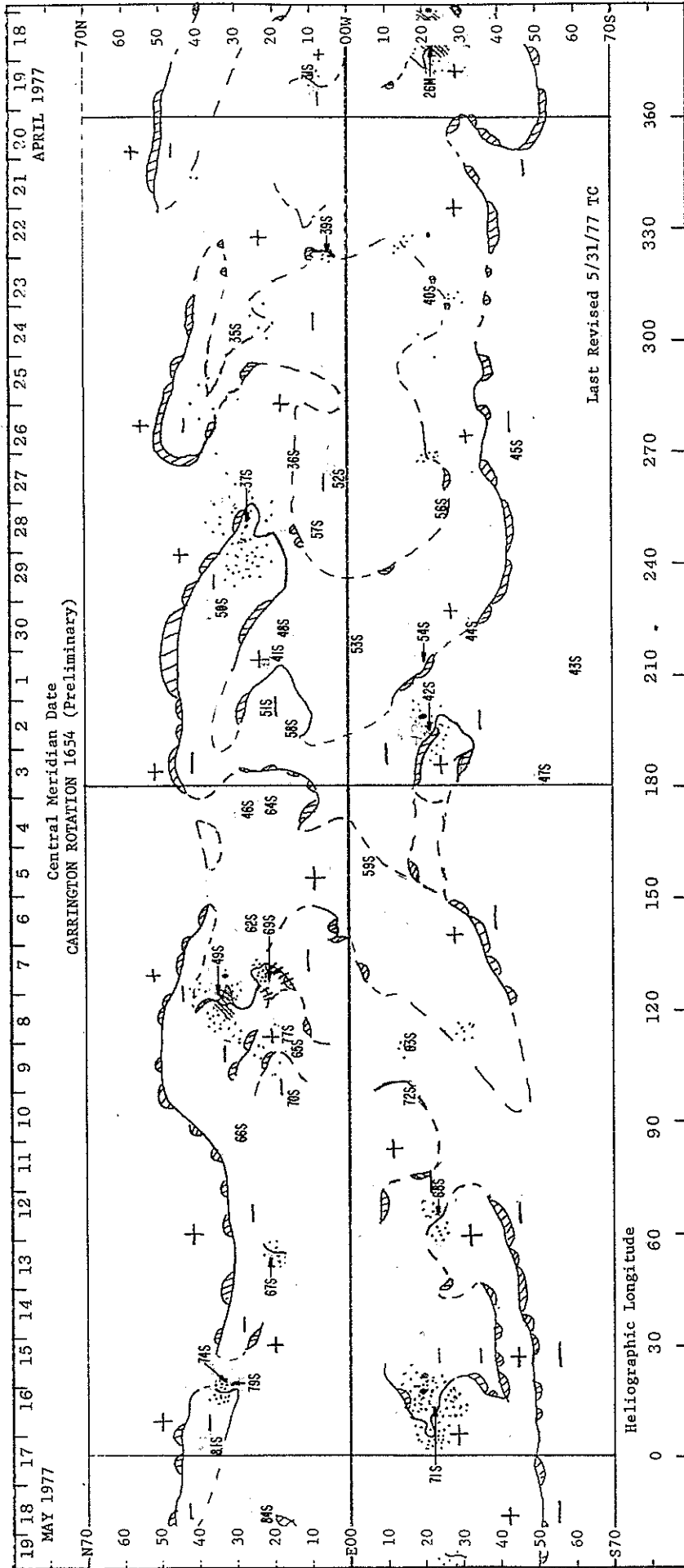
	Page
<u>H<math>\alpha</math> Synoptic Chart</u>	40-41
<u>Abbreviated Calendar Record</u>	42-49
<u>Regional Flare Index</u>	49



# ABBREVIATED CALENDAR RECORD

## H $\alpha$ SYNOPSIS CHART

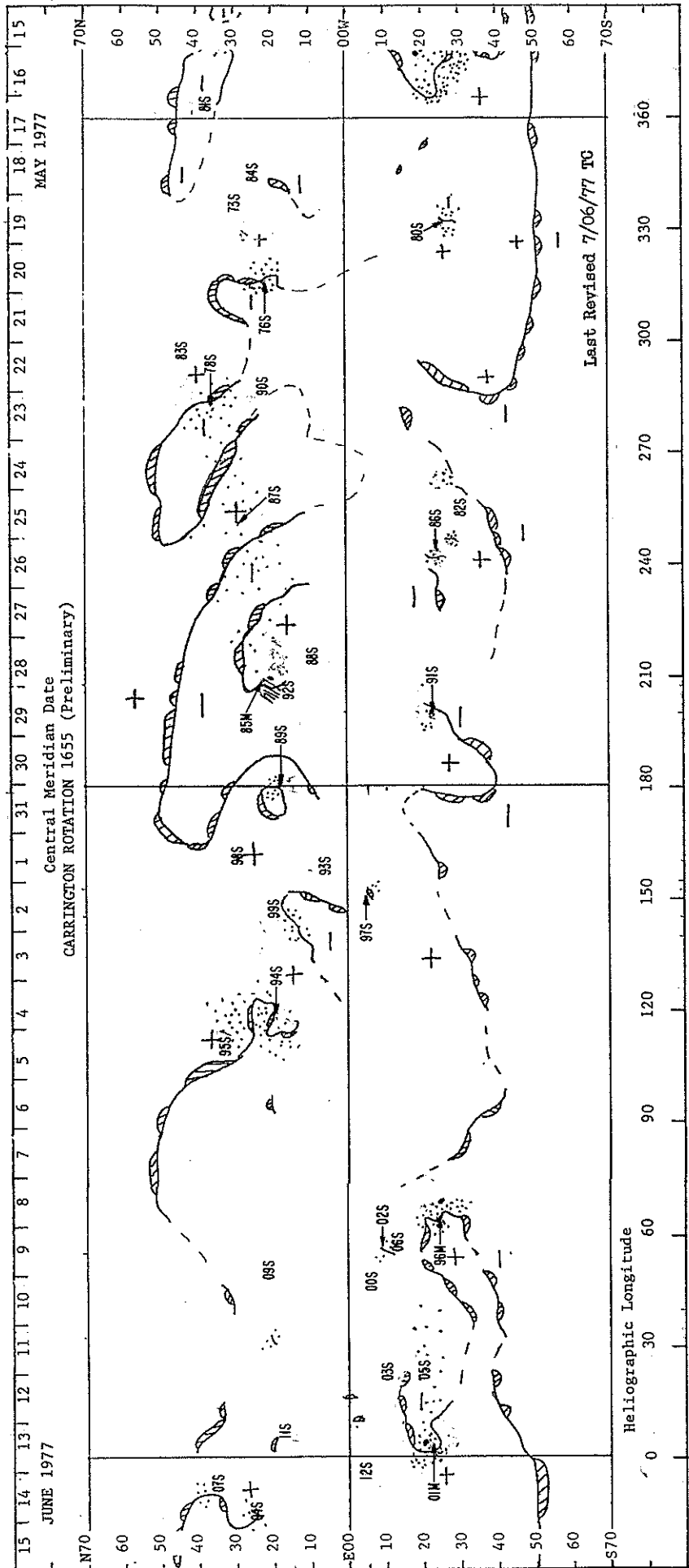
APRIL 1977 - MAY 1977



# ABBREVIATED CALENDAR RECORD

## H $\alpha$ SYNOPSIS CHART

MAY - JUNE 1977



ABBREVIATED CALENDAR RECORD

MAY 1977

May 1, 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																														
SID																															
X-Rays																															
Ap 13	Kp	2+		2+		2-		2-		2-		2o		4+		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-						SW-												
Indices	Rz: 15	IO cm flux: 76						Flare: 6/22.3						Ca: 5.7						Ip: 0						Ia: 1					
Solar Regions	(14741) N20						(14754) S20						(14743) S61																		
Sunspots																															

May 2, 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																														
SID																															
X-Rays																															
Ap 66 01	Kp	6-		5o		4o		5o		6+		6+		6o		6-															
	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-						SW-												
Indices	Rz: 14	IO cm flux: 77						Flare: 0/24.0						Ca: 6.5						Ip: 0						Ia: 6					
Solar Regions	(14751) N22						14782 S22						(14758) N15																		
Sunspots							(19777) S21 ap 1 (19780) S27 (ap)2																								

May 3, 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		—1f/49																													
Bursts	cm																														
	dm																														
	m																														
	Dkm																														
SID																															
X-Rays																															
Ap 15	Kp	5-		4-		4-		3+		2-		1+		1o		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: 22	IO cm flux: 80						Flare: 10/18.5						Ca: 9.1						Ip: 0						Ia: 4					
Solar Regions	(14747) S53																														
Sunspots																															

May 4, 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/49																													
Bursts	cm																														
	dm																														
	m																														
	Dkm																														
SID																															
X-Rays																															
Ap 19	Kp	1o		2-		2o		1+		2+		5+		5o		3+															
	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-						SW-												
Indices	Rz: 23	IO cm flux: 80						Flare: 19/22.4						Ca: no data						Ip: 0						Ia: 2					
Solar Regions	(14764) N22						(14746) N27						N19																		
Sunspots																															

May 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																																			
SID																																				
X-Rays																																				
Ap 11	Kp	3o			2o				3o					2-																						
	sc																										3o									
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: 16	10cm flux: 78							Flare: 2/21.9							Ca: 8.5							Ip: 0							Ia: 2						
Solar Regions	(14759) S05																																			
Sunspots	S24																																			

May 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																																				
Bursts	cm																																			
	dm																																			
	m																																			
	Dkm																																			
SID																																				
X-Rays																																				
Ap 10	Kp	3o				3-				2o					2o																					
	sc																										2o									
Aurora	USSR																																			
	W.E.																																			
Cosmic Rays																																				
Green Corona	E. Limb 7 days earlier: NE-							SE							W. Limb 7 days later: NW-							SW-														
Indices	Rz: 16	10cm flux: 77							Flare: 22/20.2							Ca: 7.7							Ip: 0							Ia: 2						
Solar Regions	14762 N26 (4)																																			
Sunspots	N21																																			

May 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																																			
SID																																				
X-Rays																																				
Ap 6 09	Kp	2+							2-																											
	sc														1o												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: 12	10cm flux: 76							Flare: 23/24.0							Ca: 6.9							Ip: 0							Ia: 0						
Solar Regions	(14769) N22																																			
Sunspots	(19781) N20 (8) 3																																			

May 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																																				
Bursts	cm																																			
	dm																																			
	m																																			
	Dkm																																			
SID																																				
X-Rays																																				
Ap 3 03	Kp	0+																																		
	sc																										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: 19	10cm flux: 76							Flare: 1/24.0							Ca: 7.6							Ip: 0							Ia: 0						
Solar Regions	14749 N34 (14777) N17 (14763) S16																																			
Sunspots	19279 N 31 (ap)4 CMP May 7																																			

May 9, 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																																	
SID																																		
X-Rays																																		
Ap 7	Kp	2-									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: 25											10cm flux: 82											Flare: 4/18.9					Ca: 7.9			Ip: 0			Ia: 1
Solar Regions	(14765) N14																																	
Sunspots																																		

May 10, 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																																						
SID																																							
X-Rays																																							
Ap 9	Kp	3o									2-																												
	sc																																						
Aurora	USSR																																						
	W.E.																																						
Cosmic Rays																																							
Green Corona	E. Limb 7 days earlier: NE-											no data											SE-											W. Limb 7 days later: NW-					SW-
Indices	Rz: 29											10cm flux: 79											Flare: 0/24.0					Ca: 7.7			Ip: 0			Ia: 1					
Solar Regions	(14772) S17 (14770) N15 (14766) N29																																						
Sunspots																																							

May 11, 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																																						
SID																																							
X-Rays																																							
Ap 24 D2	Kp	2o									2-																												
	sc																																						
Aurora	USSR																																						
	W.E.																																						
Cosmic Rays																																							
Green Corona	E. Limb 7 days earlier: NE-											no data											SE-											W. Limb 7 days later: NW-					SW-
Indices	Rz: 34											10cm flux: 79											Flare: 5/24.0					Ca: 9.2			Ip: 0			Ia: 3					
Solar Regions																																							
Sunspots																																							

May 12, 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																																						
SID																																							
X-Rays																																							
Ap 19 D5*	Kp	3o									6-																												
	sc																																						
Aurora	USSR																																						
	W.E.																																						
Cosmic Rays																																							
Green Corona	E. Limb 7 days earlier: NE-											no data											SE-											W. Limb 7 days later: NW-					SW-
Indices	Rz: 35											10cm flux: 78											Flare: 6/21.8					Ca: 8.2			Ip: n			Ia: 3					
Solar Regions	14768 S24																																						
Sunspots	S23																																						

May 13, 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																										
SID																											
X-Rays																											
Ap 6Q10K	Kp	1-					2-				10																
	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: 26	10cm flux: 80					Flare: 0/23.4					Ca: 8.9					Ip: 0					Ia: 1					
Solar Regions	(14767) N21																										
Sunspots																											

May 14, 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																										
SID																											
X-Rays																											
Ap 8	Kp	20					3-				20																
	sc																										
Aurora	USSR																										
	W.E.																										
Cosmic Rays																											
Green Corona	E. Limb 7 days earlier: NE-							SE moderately bright					W. Limb 7 days later: NW-					SW- moderately bright									
Indices	Rz: 33	10cm flux: 83					Flare: 0/23.9					Ca: 7.5					Ip: 0					Ia: 0					
Solar Regions																											
Sunspots																											

May 15, 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																										
SID																											
X-Rays																											
Ap 14	Kp	4-					2+				2+																
	sc																										
Aurora	USSR																										
	W.E.																										
Cosmic Rays																											
Green Corona	E. Limb 7 days earlier: NE-							SE moderately bright					W. Limb 7 days later: NW-					SW- bright									
Indices	Rz: 26	10cm flux: 83					Flare: 0/22.8					Ca: 10.6					Ip: 0					Ia: 2					
Solar Regions	14774 N31 (14779) N31																										
Sunspots	N30																										

May 16, 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																										
SID																											
X-Rays																											
Ap 22 03	Kp	4-					4+				30																
	sc																										
Aurora	USSR																										
	W.E.																										
Cosmic Rays																											
Green Corona	E. Limb 7 days earlier: NE-							SE bright					W. Limb 7 days later: NW- no data					SW- no data									
Indices	Rz: 21	10cm flux: 83					Flare: 5/22.9					Ca: 9.6					Ip: 0					Ia: 6					
Solar Regions	14771 S24 (?)																										
Sunspots	19782 S22 (sp) 4 CMP May 15 (19783) S23 (ap) 3																										

May 17, 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																																											
SID																																												
X-Rays																																												
Ap 18 04	Kp	3+				4o					5-																																	
	sc																																											
Aurora	USSR																																											
	W.E.																																											
Cosmic Rays																																												
Green Corona	E Limb 7 days earlier: NE-											SE- moderately bright											W Limb 7 days later: NW- no data							SW- no data														
Indices	Rz: 20											IO cm flux: 82											Flare: 0/21.2							Ca: 10.7							Ip: 0							Ia: 6
Solar Regions	(14781) N36																																											
Sunspots	(19785) N35 af) 3																																											

May 18, 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																																											
SID																																												
X-Rays																																												
Ap 11	Kp					3o																																						
	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: 12											IO cm flux: 81											Flare: 4/19.1							Ca: 10.9							Ip: 0							Ia: 5
Solar Regions	(14784) N23																																											
Sunspots																																												

May 19, 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																																											
SID																																												
X-Rays																																												
Ap 5 06	Kp			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: 0											IO cm flux: 80											Flare: 15/23.6							Ca: 11.4							Ip: 0							Ia: 0
Solar Regions	(14773) N28 (14780) S26																																											
Sunspots	(19784) S27 (8) 3																																											

May 20, 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																																											
SID																																												
X-Rays																																												
Ap 10	Kp																																											
	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: 11											IO cm flux: 79											Flare: 3/23.6							Ca: 11.3							Ip: 0							Ia: 0
Solar Regions	14776 N22																																											
Sunspots	(19786) N21																																											

May 21, 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																										
SID																											
X-Rays																											
Ap 4 05	Kp	1-				0+				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: 14 IO cm flux: 79 Flare: 4/23.1 Ca: 11.3 Ip: 0 Ia: 0																										
Solar Regions																											
Sunspots																											

May 22, 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																										
SID																											
X-Rays																											
Ap 7	Kp	2o				3o				3o																	
	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: 7 IO cm flux: 81 Flare: 5/23.8 Ca: 9.0 Ip: 0 Ia: 0																										
Solar Regions		14783 N45 (14790) N22																									
Sunspots																											

May 23, 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																										
SID																											
X-Rays																											
Ap 7	Kp	2+				2-				1o																	
	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: 7 IO cm flux: 80 Flare: 0/24.0 Ca: 7.5 Ip: 0 Ia: 0																										
Solar Regions		14778 N35																									
Sunspots																											

May 24, 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																										
SID																											
X-Rays																											
Ap 8	Kp	2o				2+				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- no data SW- no data																										
Indices	Rz: 7 IO cm flux: 77 Flare: 0/23.5 Ca: 7.4 Ip: 0 Ia: 0																										
Solar Regions																											
Sunspots																											

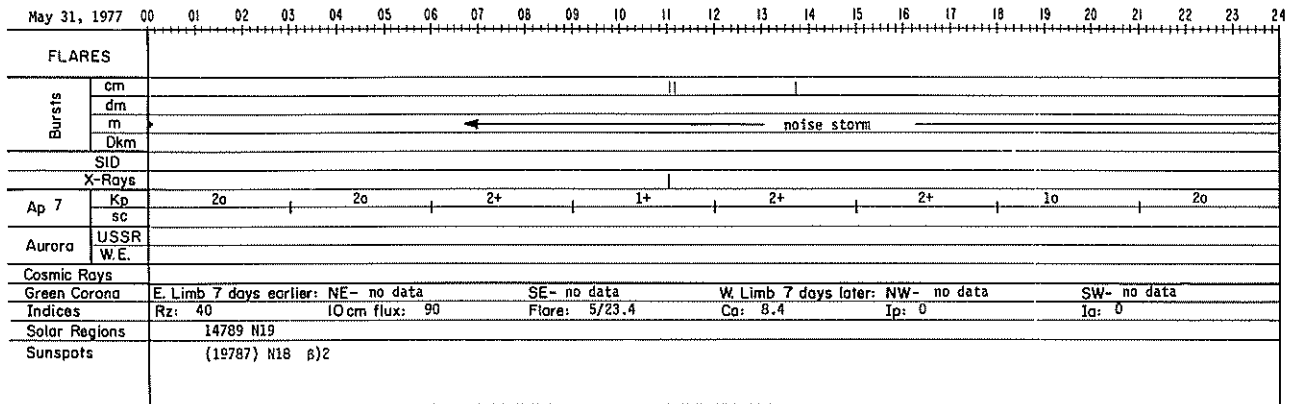
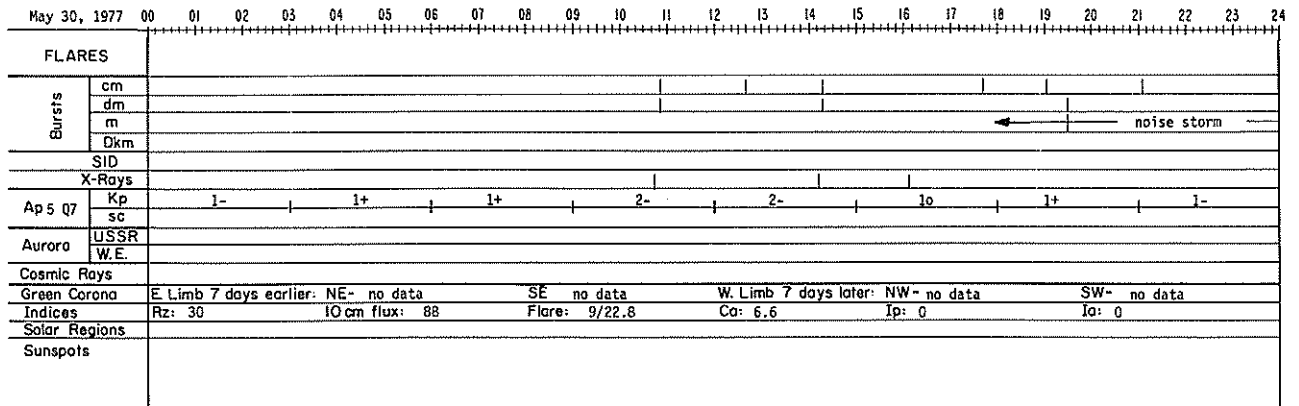
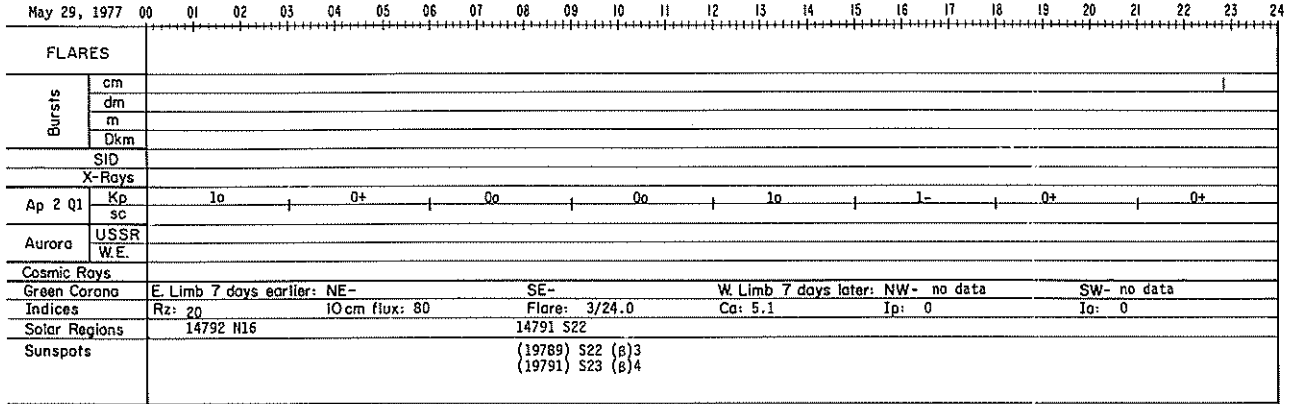


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FLARES																											
Bursts	cm																										
	dm																										
	m																										
	Dkm																										
SID																											
X-Rays																											
Ap 5 Q8	Kp	2+			1o				1+			1o			1+			2-			1+			1o			
	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: 0 IO cm flux: 75 Flare: 0/22.0 Ca: 6.5 Ip: 0 Ia: 0																										
Solar Regions	(14782) S33 14787 N25 (3)																										
Sunspots																											

May 26, 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																										
SID																											
X-Rays																											
Ap 2 Q2	Kp	0+			1-				0o			0o			0+			1o			1+			1o			
	sc																										
Aurora	USSR																										
	W.E.																										
Cosmic Rays																											
Green Corona	E Limb 7 days earlier: NE- bright SE W Limb 7 days later: NW- no data SW- no data																										
Indices	Rz: 7 IO cm flux: 75 Flare: 0/23.0 Ca: 5.3 Ip: 0 Ia: 0																										
Solar Regions	14786 S25																										
Sunspots		S23																									

May 27, 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																										
SID																											
X-Rays																											
Ap 4 Q4	Kp	1-			1o				2-			0+			1o			1o			1-			0+			
	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: 13 IO cm flux: 76 Flare: 0/24.0 Ca: 5.8 Ip: 0 Ia: 0																										
Solar Regions																											
Sunspots																											

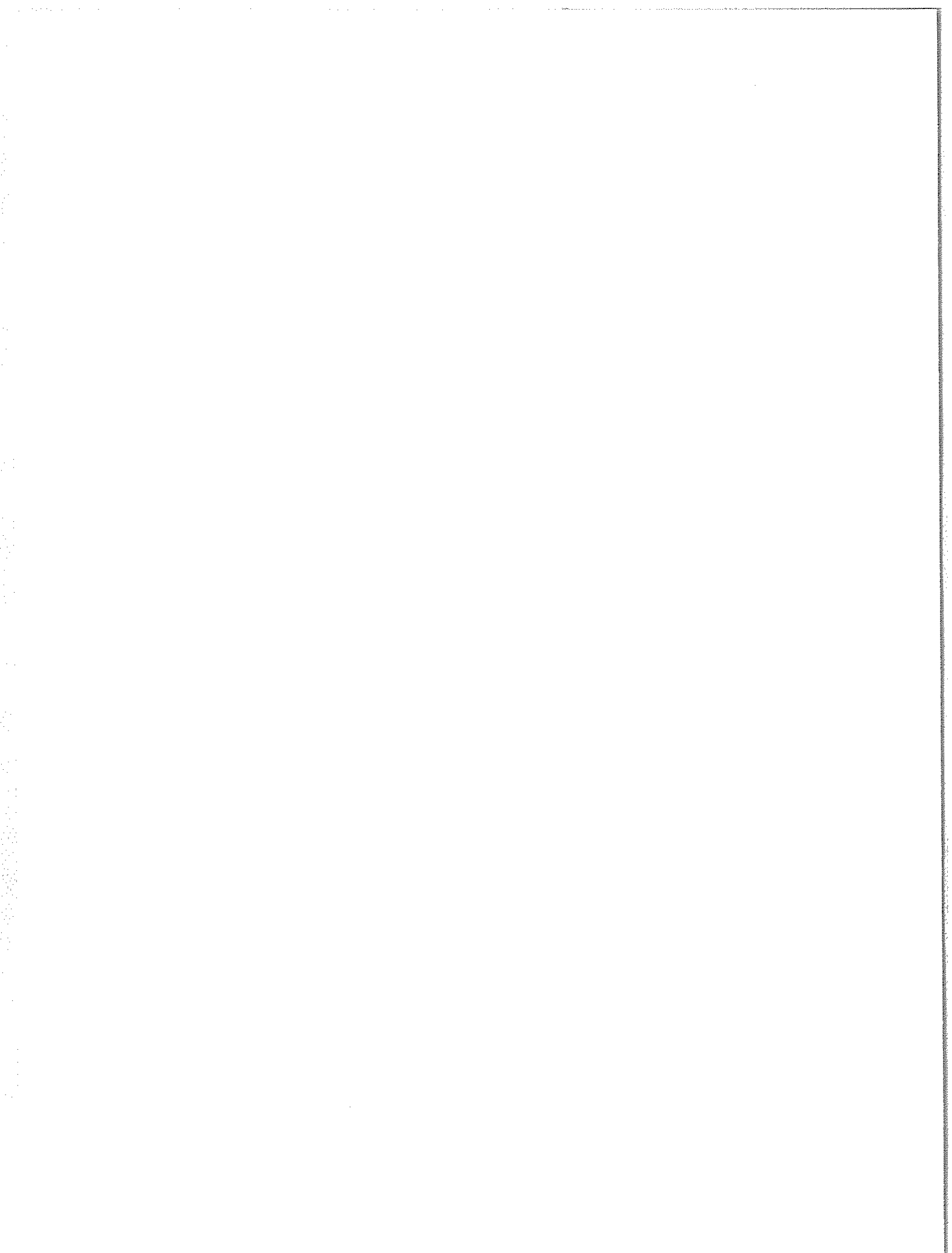
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FLARES																											
Bursts	cm																										
	dm																										
	m																										
	Dkm																										
SID																											
X-Rays																											
Ap 7	Kp	1o			2o				1-			3o			2+			1o			3-			1o			
	sc	▲ 0424(7)																									
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: 16 IO cm flux: 77 Flare: 11/22.8 Ca: 5.5 Ip: 0 Ia: 0																										
Solar Regions	(14788) N08 14785 N22 19788 N21 (ap)3																										
Sunspots																											



REGIONAL FLARE INDEX  
INCLUDES ALL FLARES

MC MATH PLAGE NO.	LAT	CHP DATE	DATE FIRST FLARE	DATE LAST FLARE	FLARE-INDEX SUM	FLARE-INDEX MEAN	TOTAL NO. OF FLARES
14742	S23	77/05/02.5	77/04/26	77/05/01	10.71	1.78	4
14749	N34	77/05/08.0	77/04/30	77/05/09	79.63	7.96	29
14768	S24	77/05/12.5	77/05/08	77/05/11	6.68	1.72	3
14771	S24	77/05/16.6	77/05/09	77/05/19	30.77	2.80	9
14781	N37	77/05/17.2	77/05/21	77/05/22	2.55	1.27	3
14780	S28	77/05/19.6	77/05/20	77/05/20	3.39	3.39	1
14776	N22	77/05/20.8	77/05/21	77/05/22	6.86	3.43	2
14785	N22	77/05/26.9	77/05/30	77/06/04	14.52	2.42	14
14791	S22	77/05/29.5	77/05/28	77/06/04	13.59	1.70	5

Note:  
Because of differences in method of calculation, the dates of Central Meridian Passage for the McMath Plage Regions vary somewhat from those given elsewhere. Any region not listed here produced no flares during its disk passage.

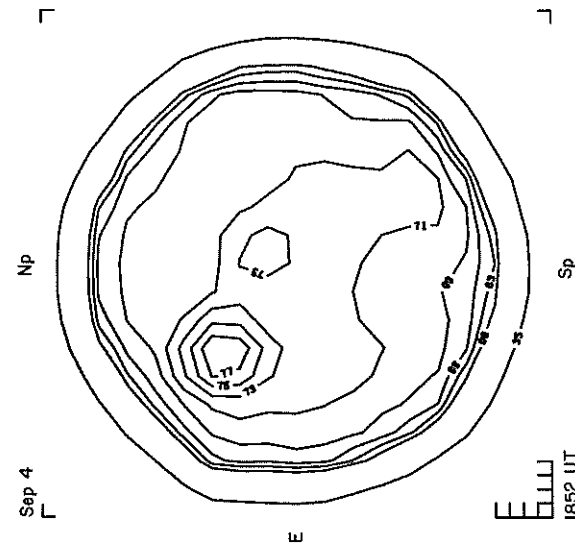
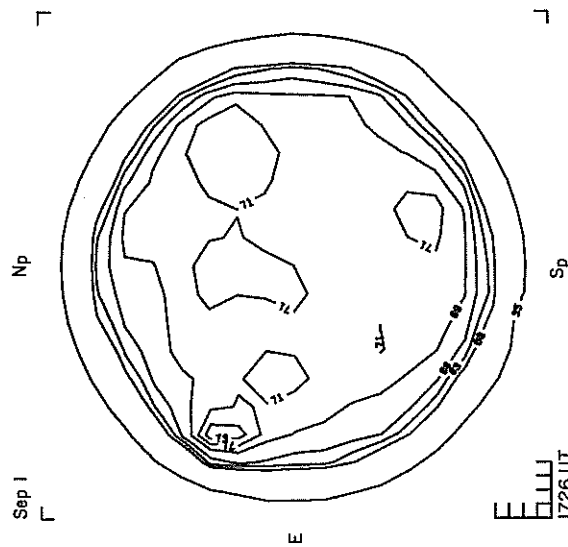
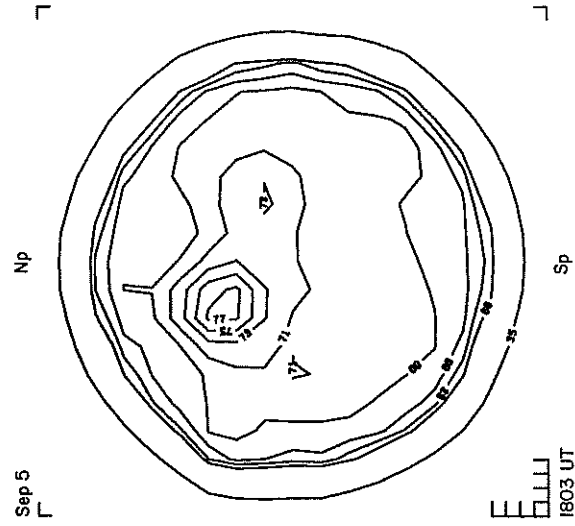
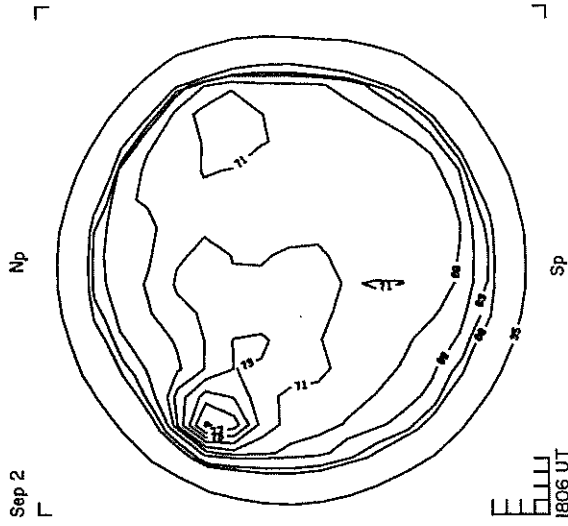
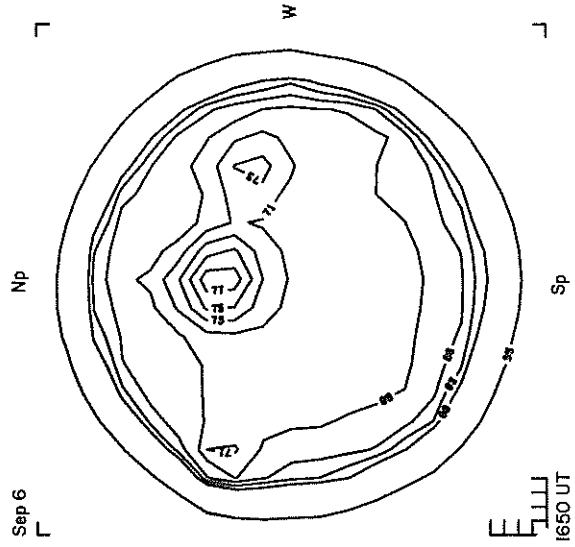
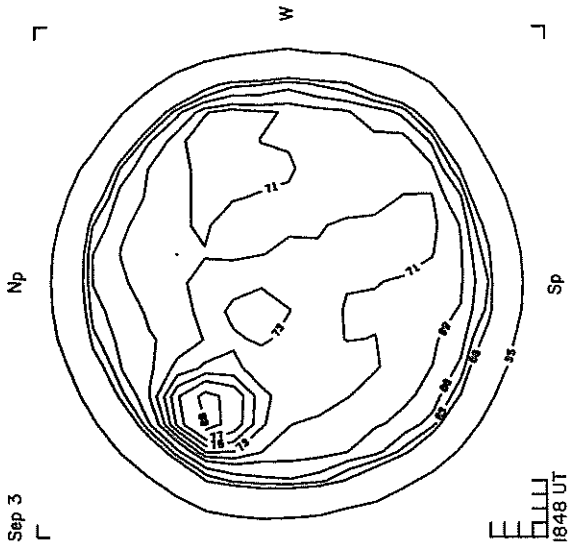


## Miscellaneous Data

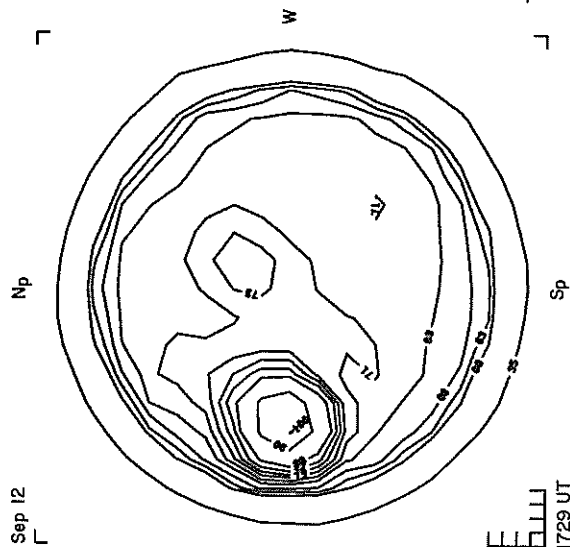
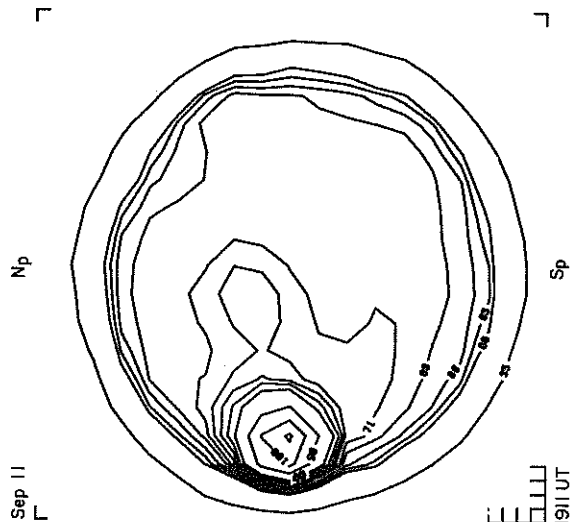
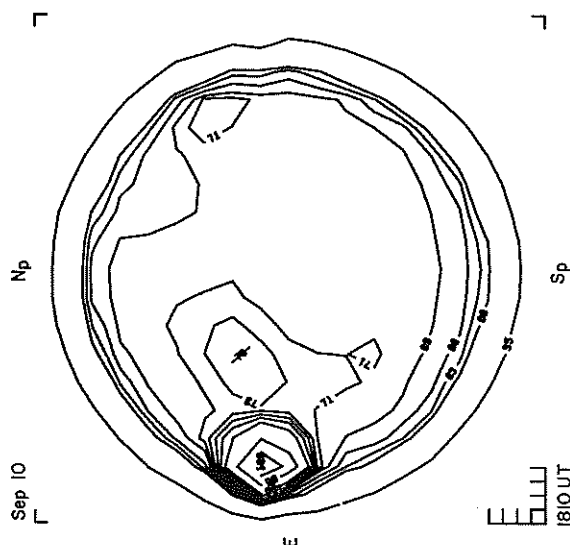
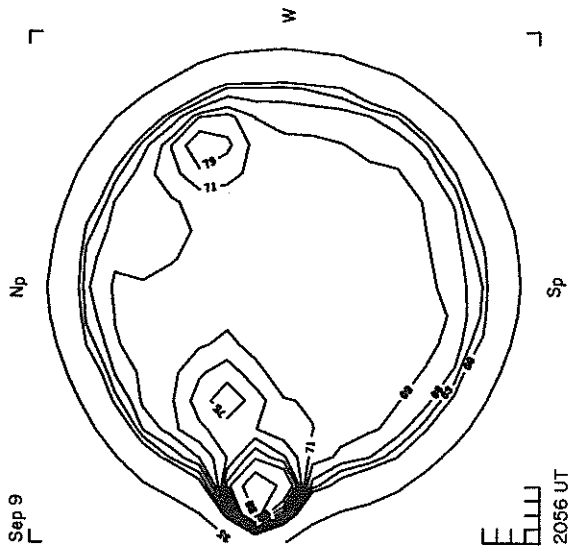
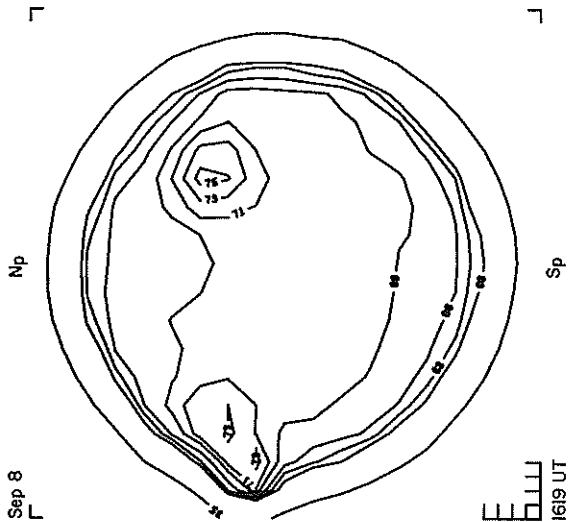
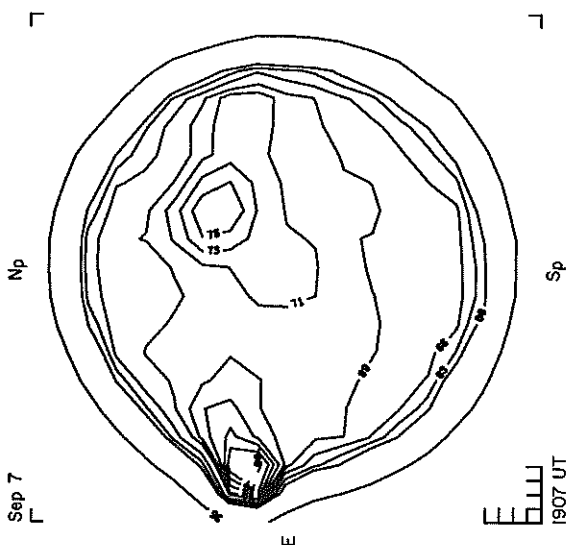
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NOSC LA POSTA  
2.0 CM Spectroheliograms  
Ant. Temp Unit 100°K  
SEPTEMBER 1977

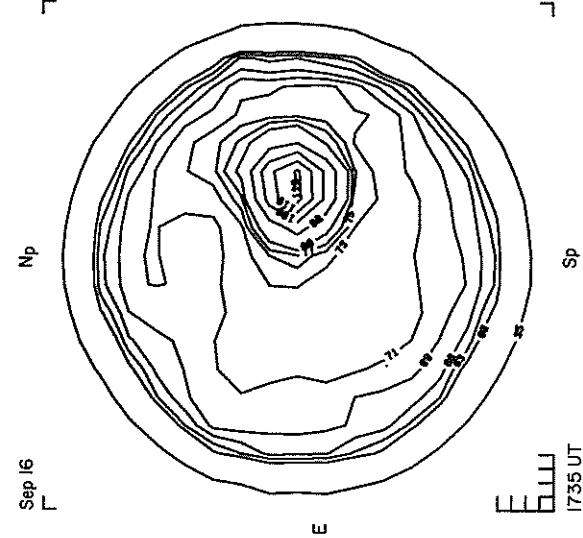
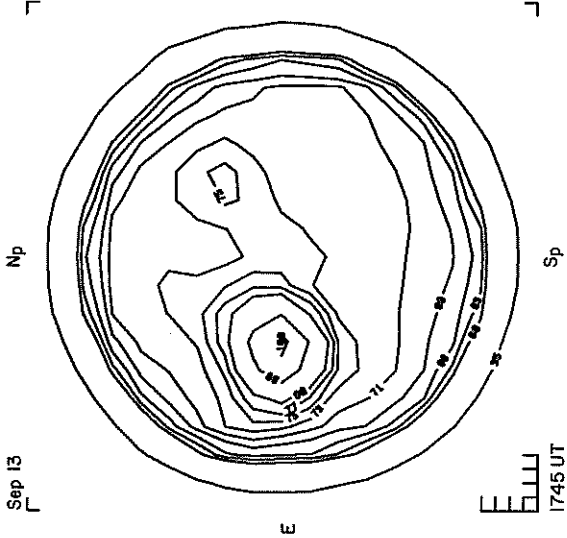
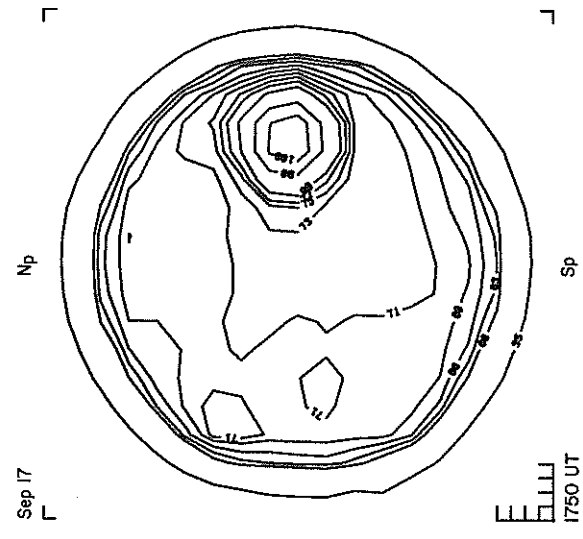
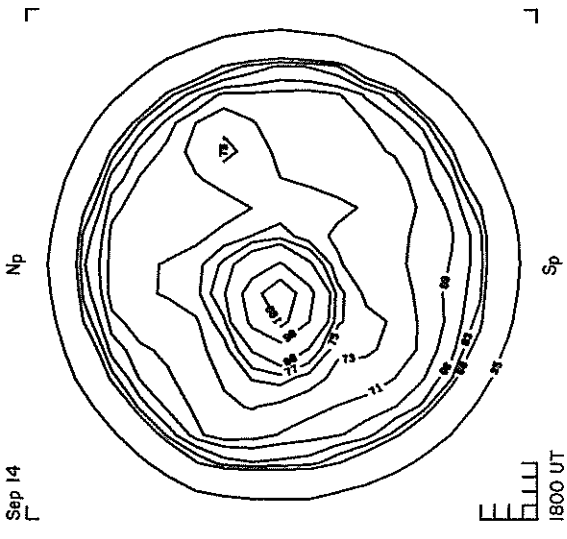
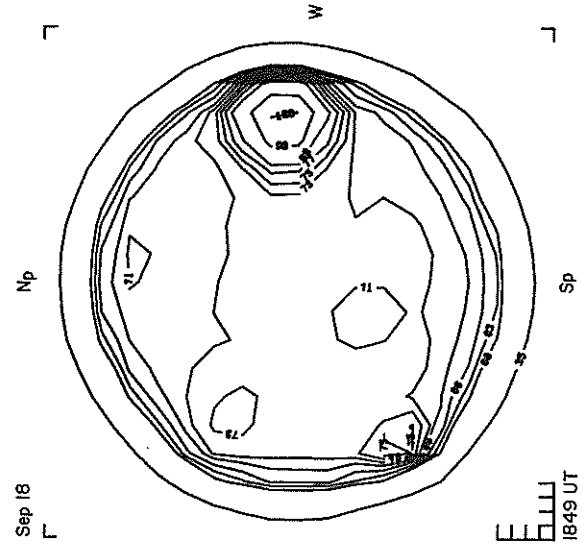
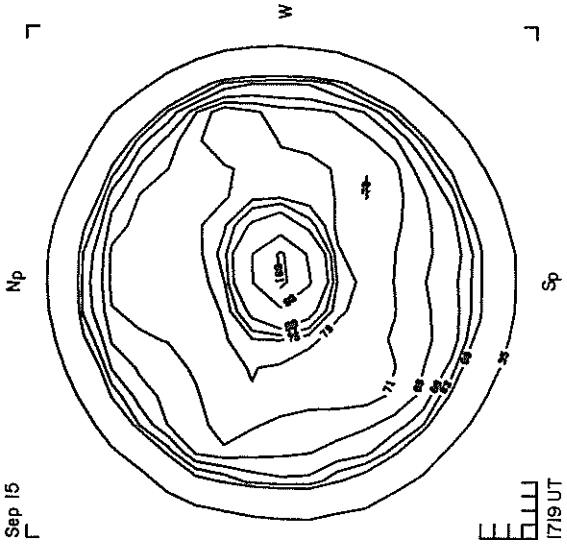


NOSC LA POSTA  
2.0 CM Spectroheliograms  
Ant. Temp Unit 100°K  
SEPTEMBER 1977

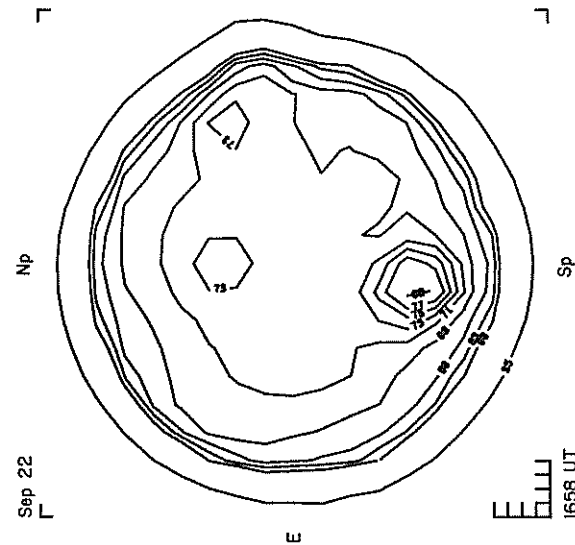
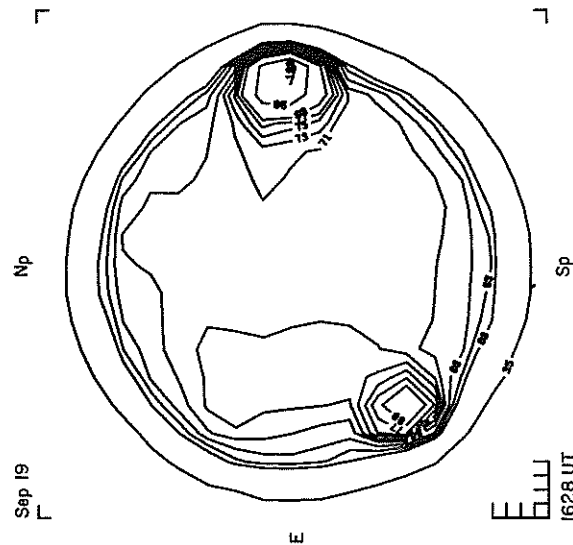
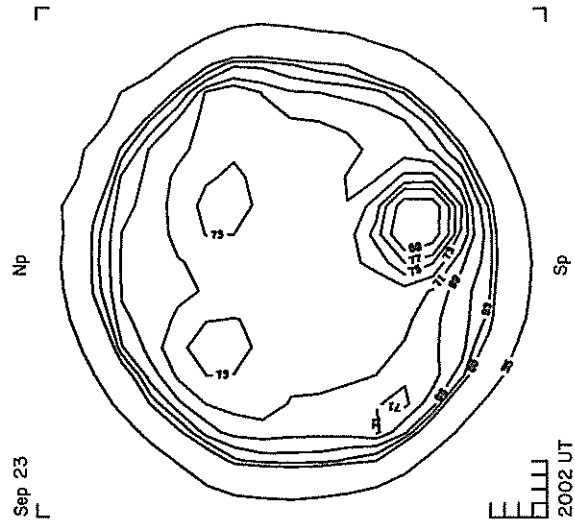
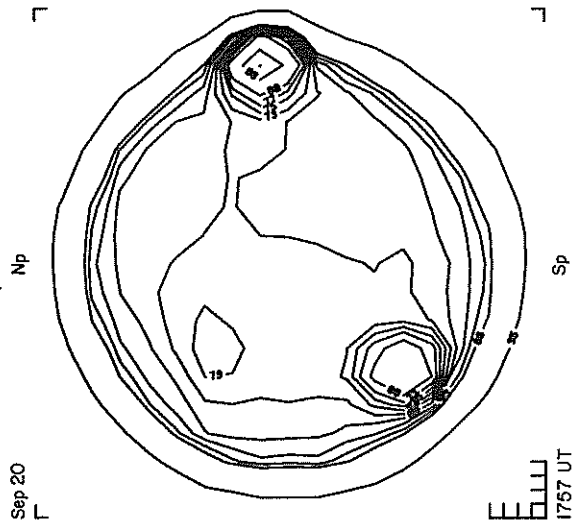
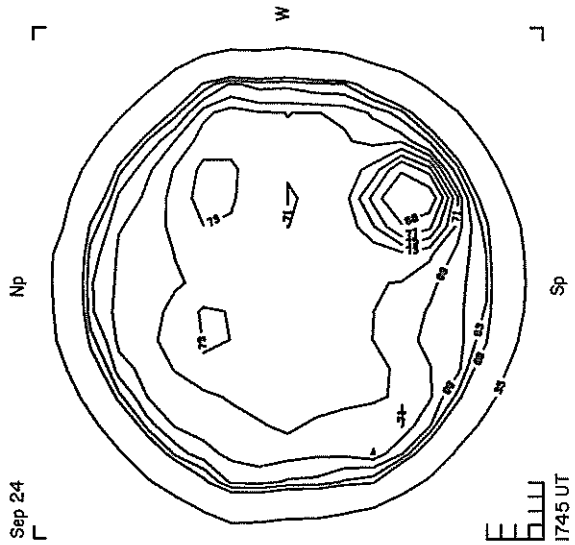
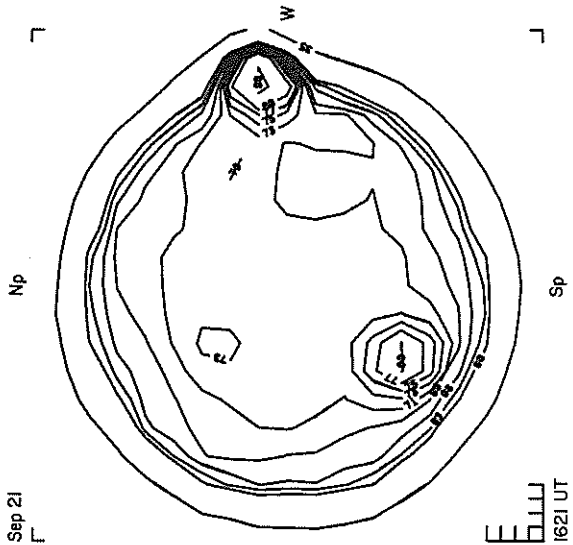


NOSC LA POSTA  
2.0 CM Spectroheliograms  
Ant. Temp Unit 100°K

SEPTEMBER 1977



NOSC LA POSTA  
2.0 CM Spectroheliograms  
Ant Temp Unit 100°K  
SEPTEMBER 1977



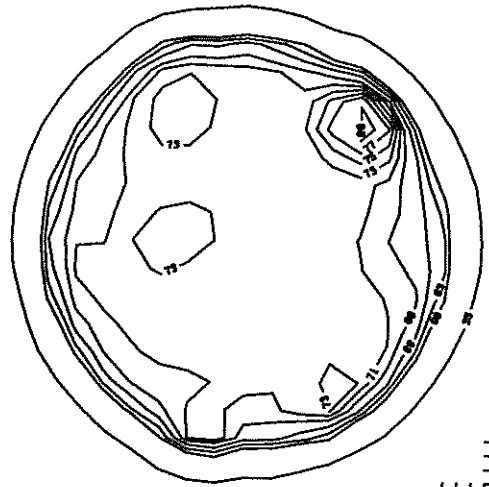


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2.0 CM Spectroheliograms  
Ant. Temp Unit 100°K

SEPTEMBER 1977

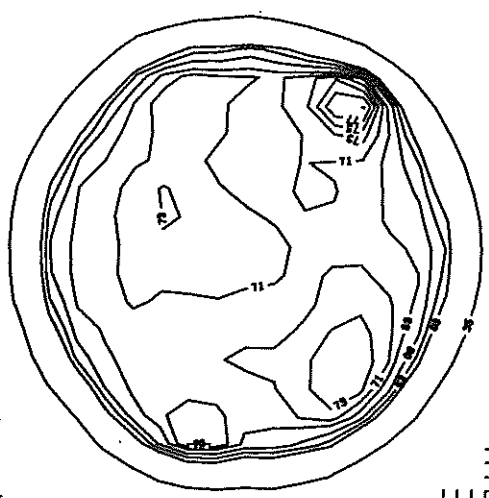
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Np



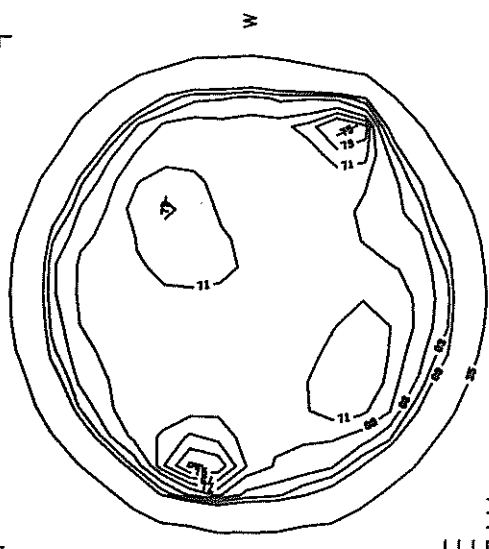
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Np



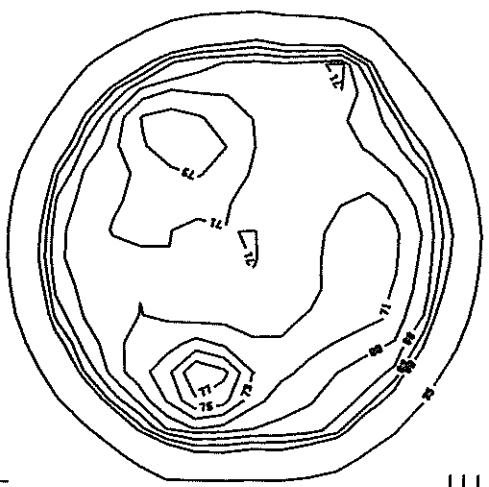
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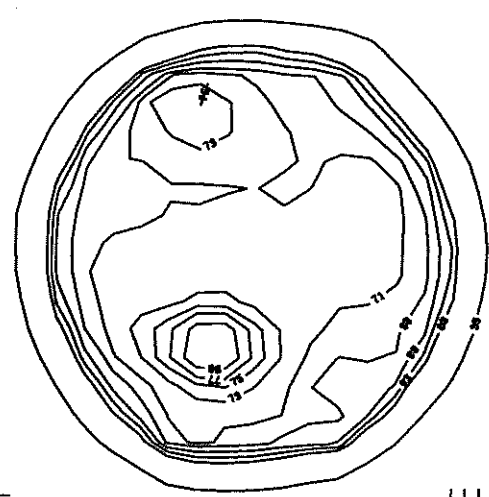
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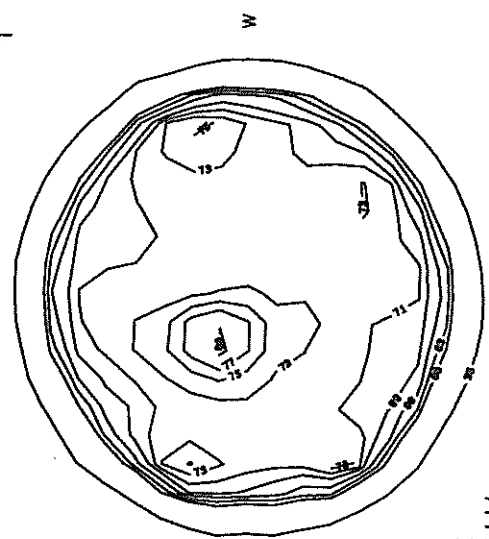
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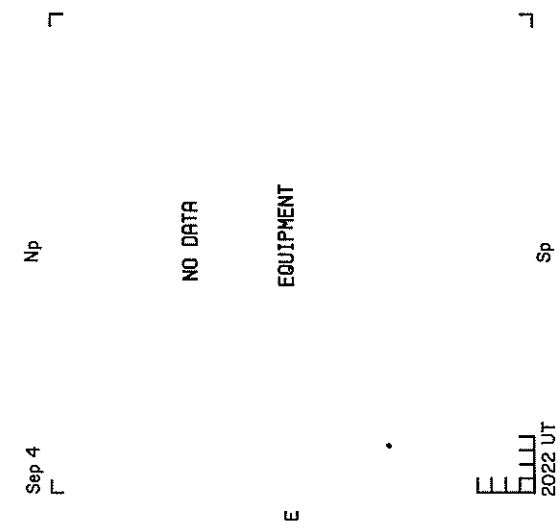
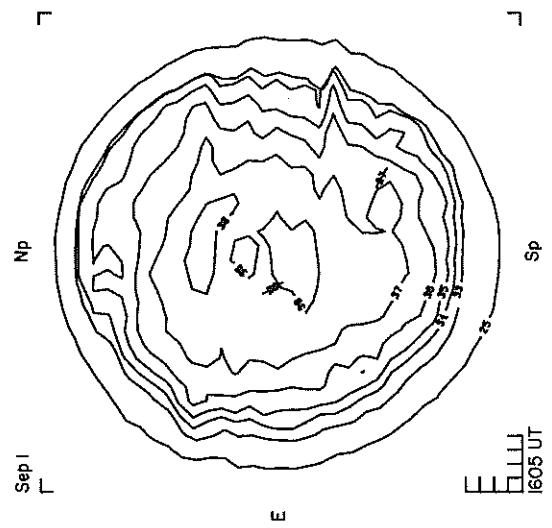
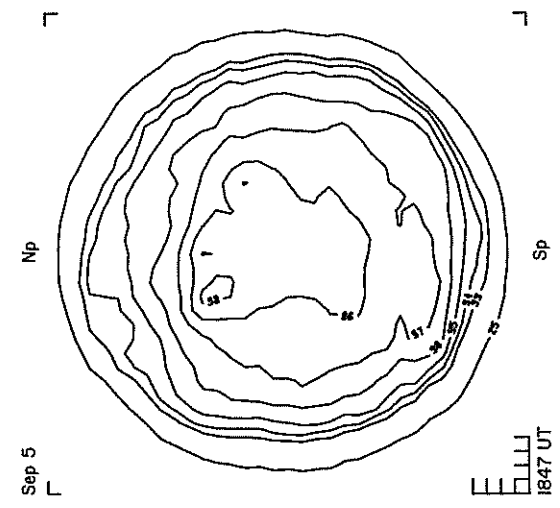
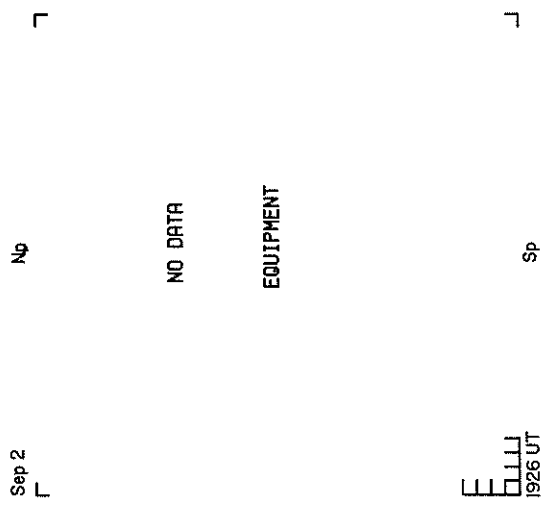
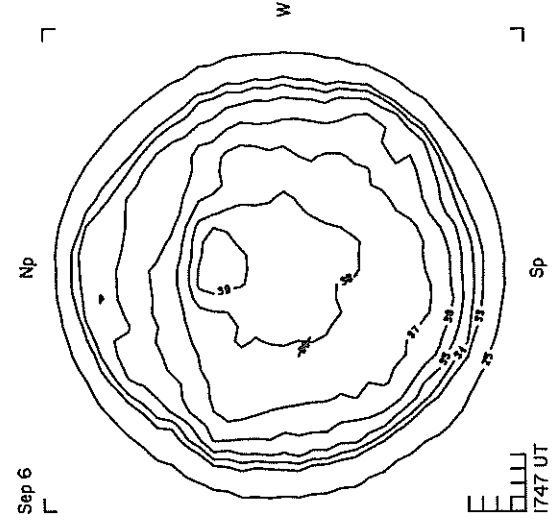
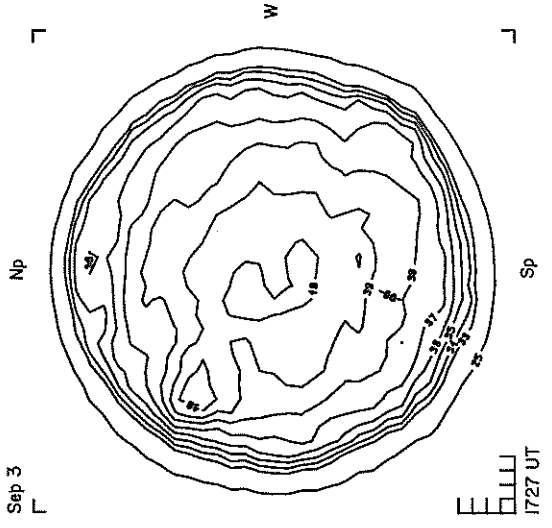


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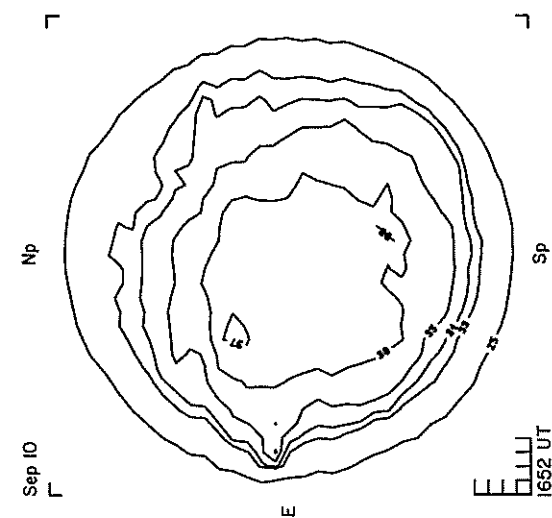
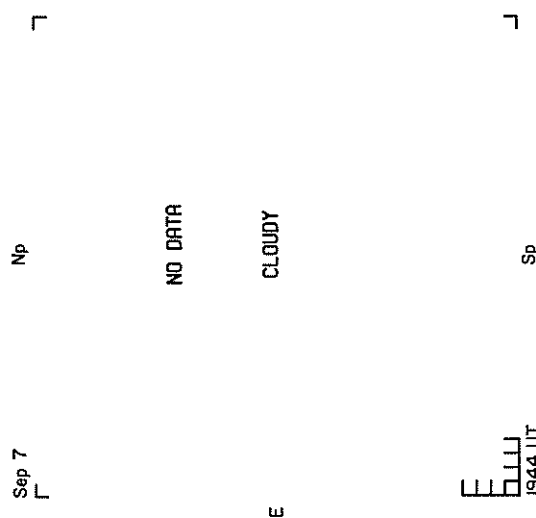
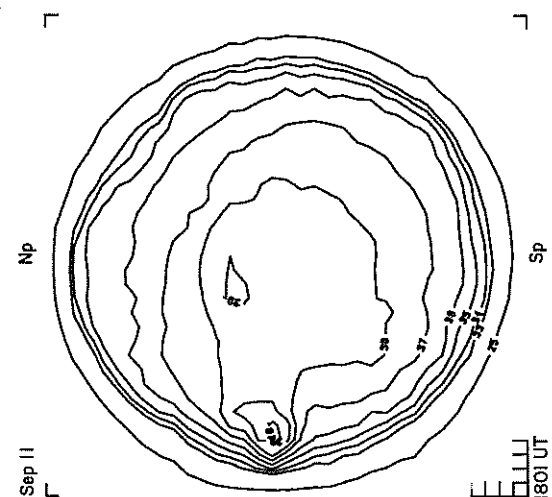
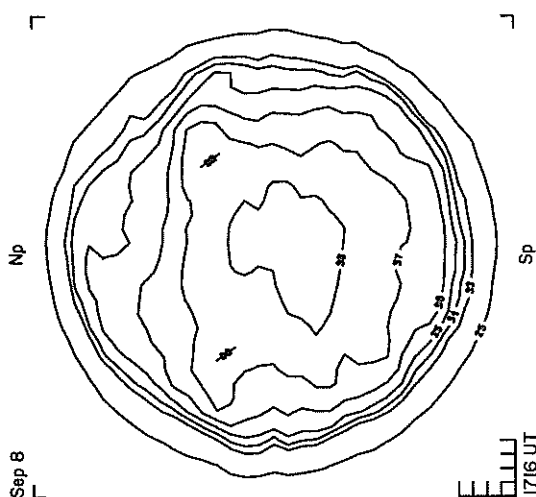
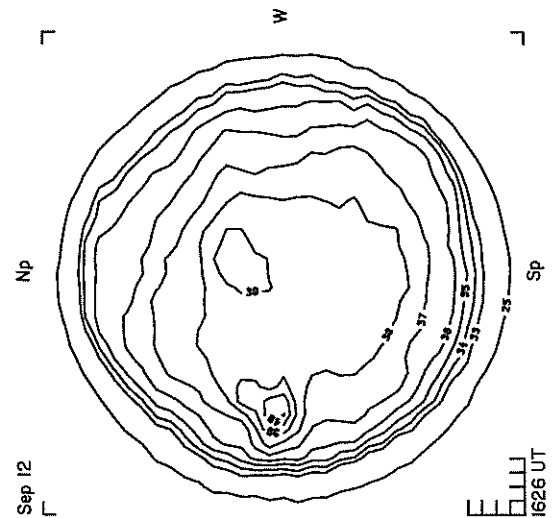
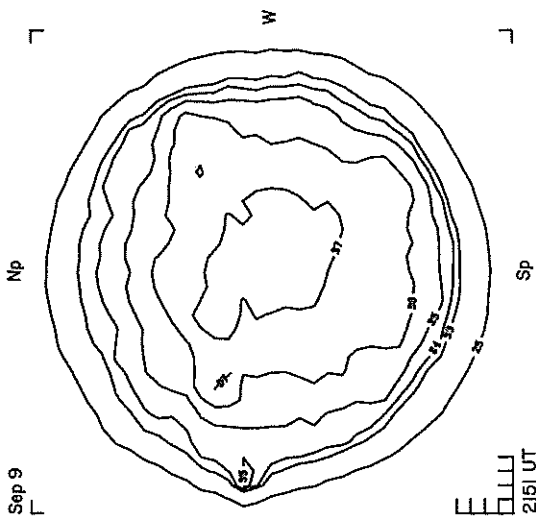
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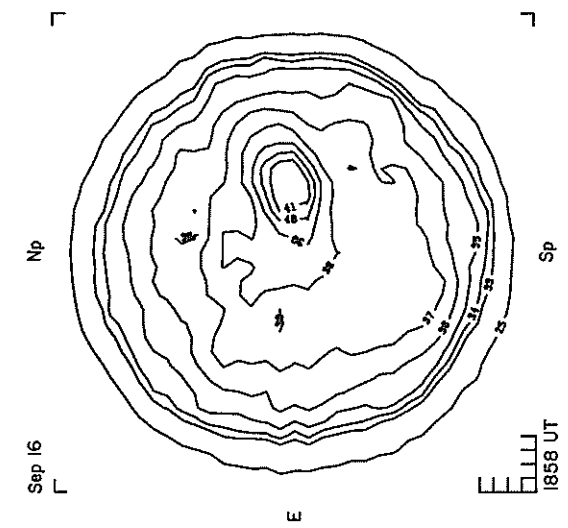
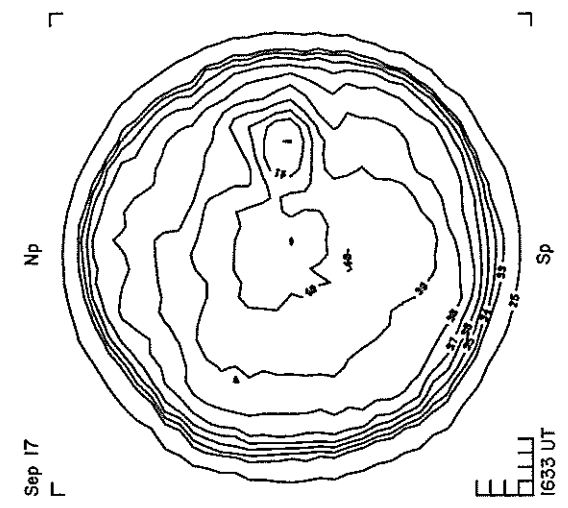
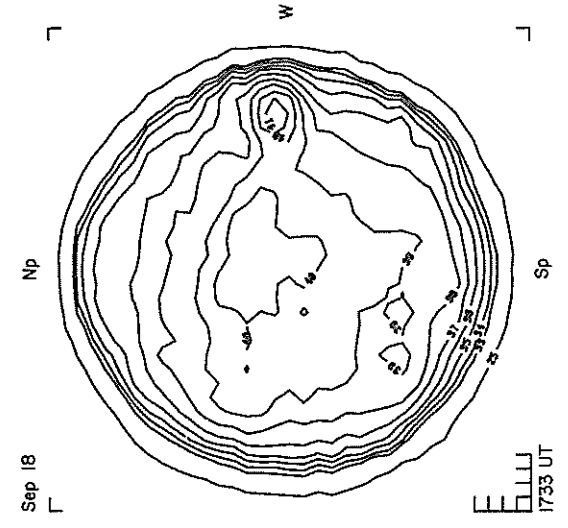
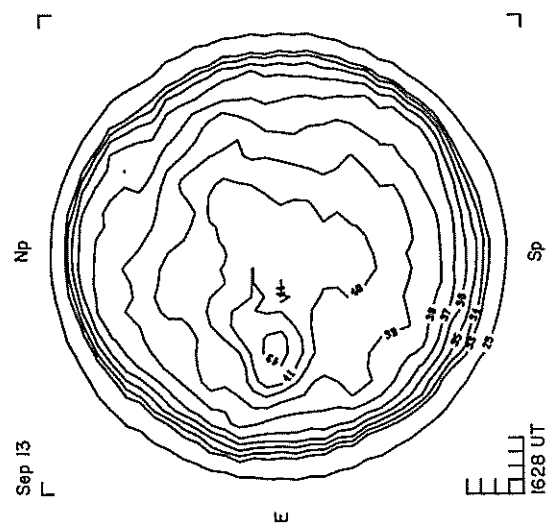
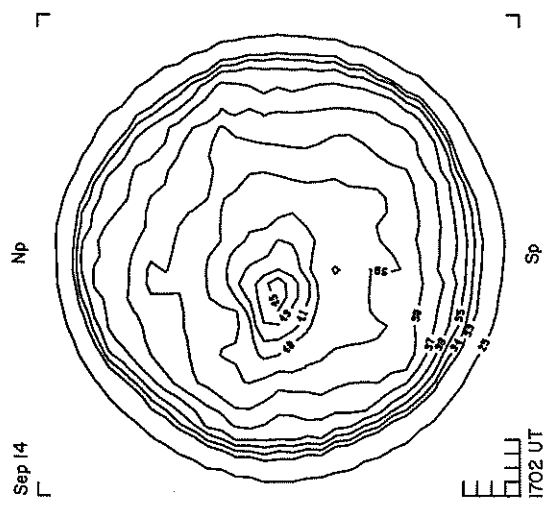
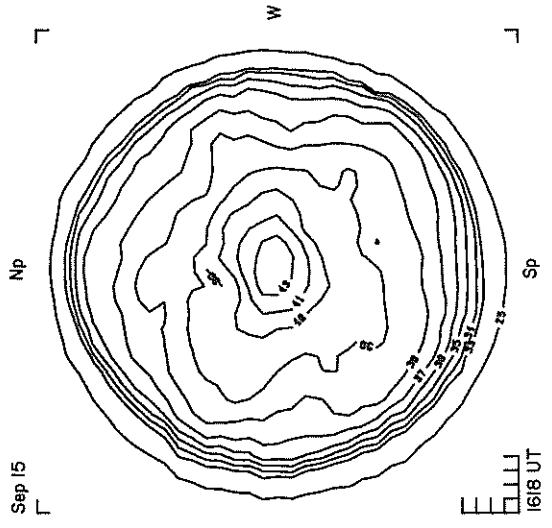
NOSC LA POSTA  
8.6 MM Spectroheliograms  
Ant. Temp Unit 100°K  
SEPTEMBER 1977



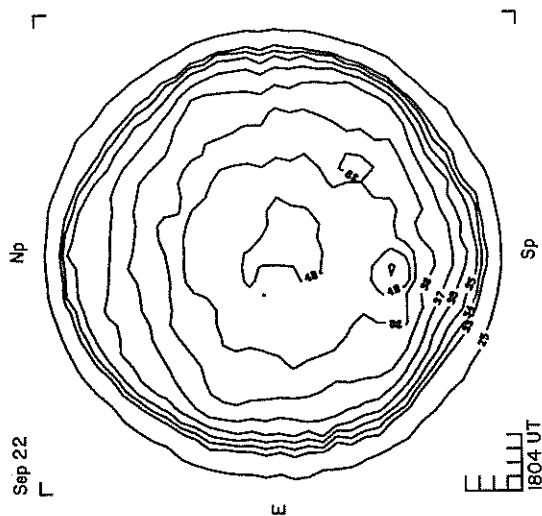
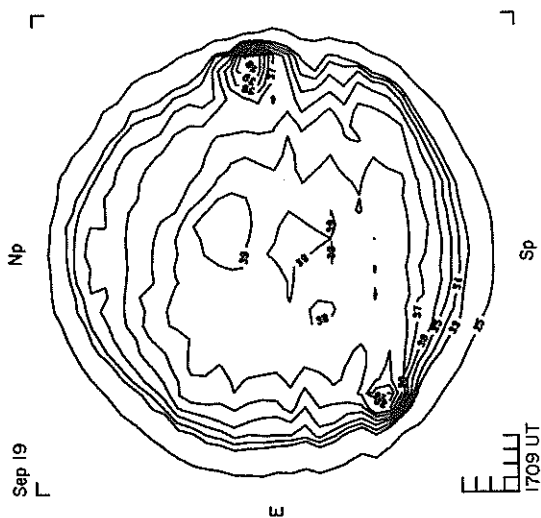
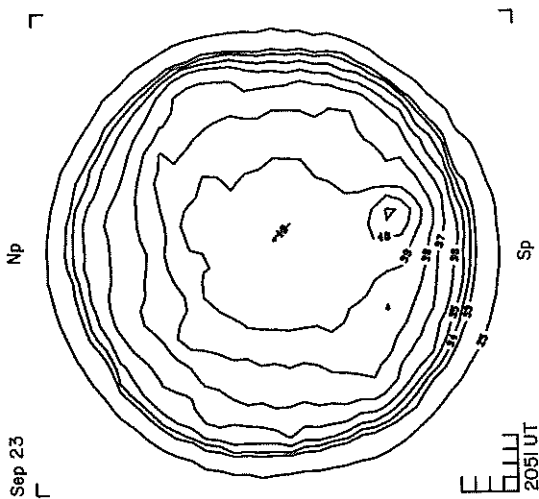
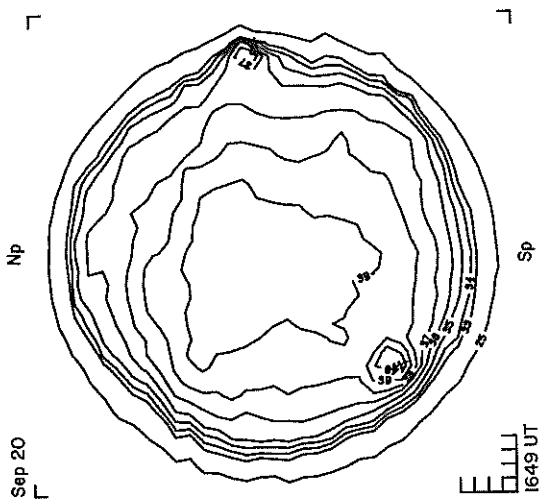
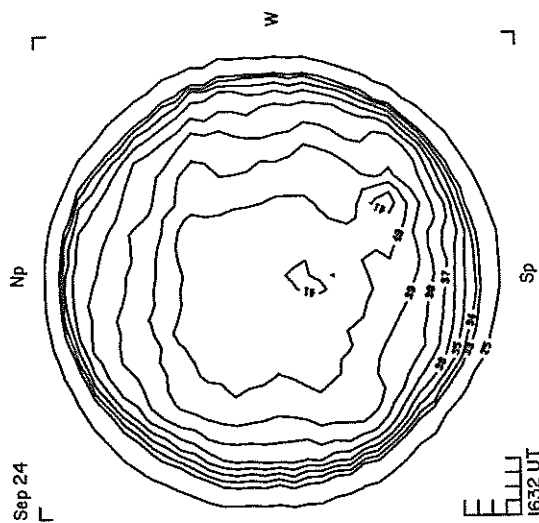
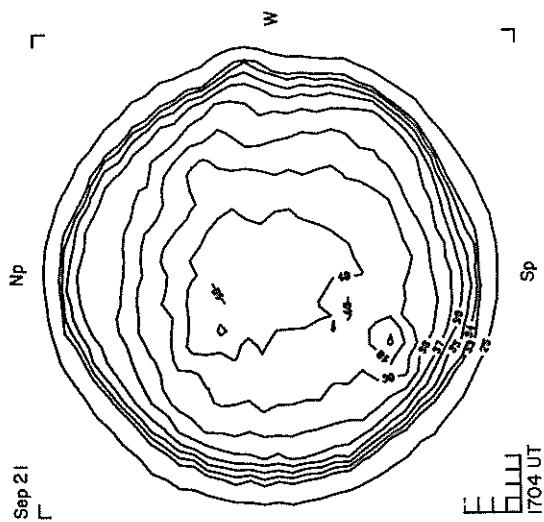
NOSC LA POSTA  
8.6 MM Spectroheliograms  
Ant. Temp Unit 100°K  
SEPTEMBER 1977



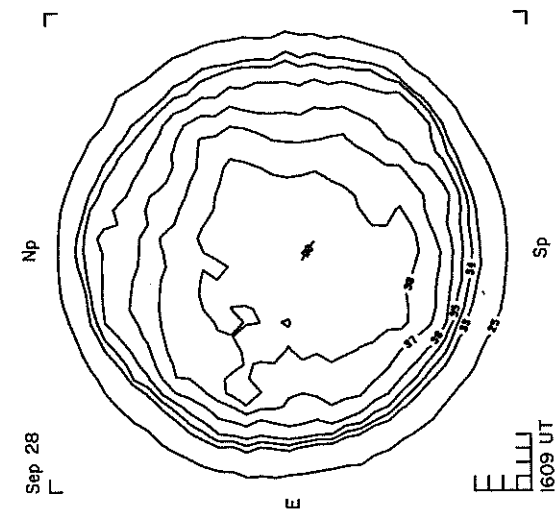
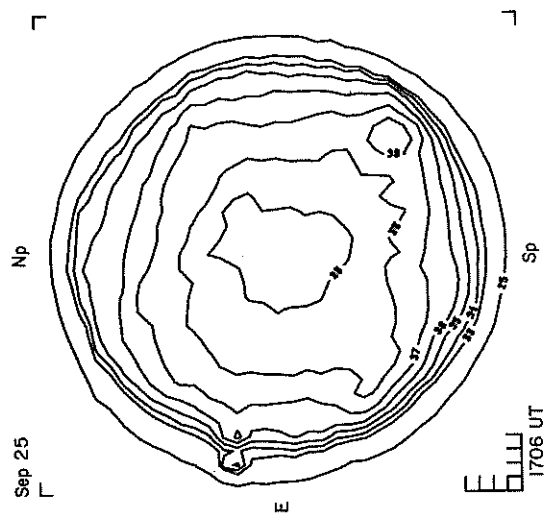
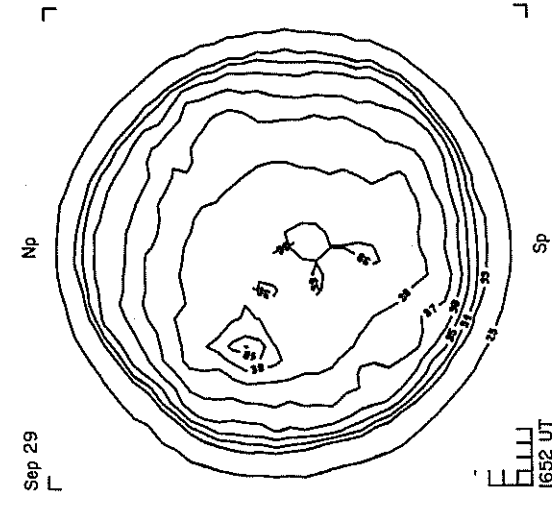
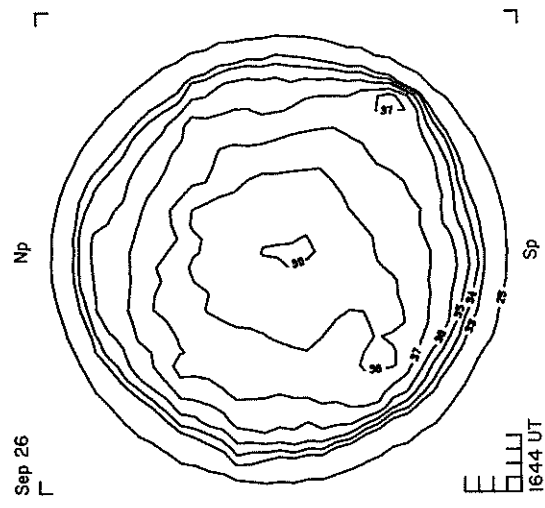
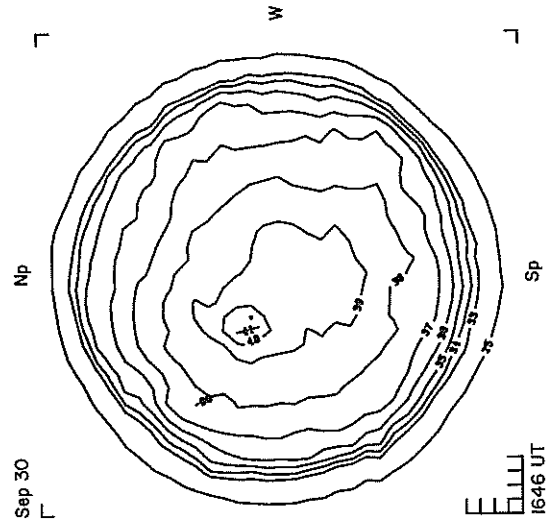
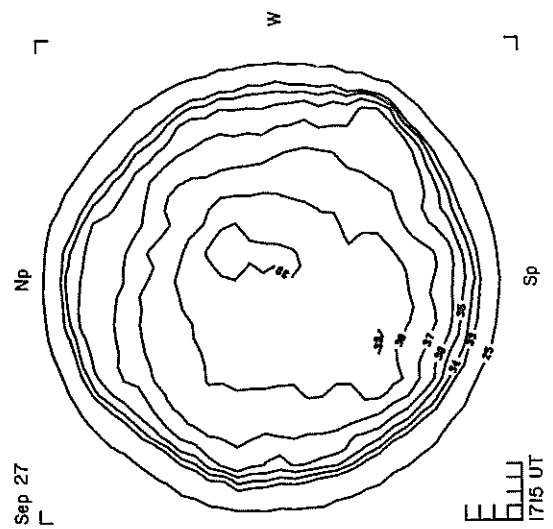
NOSC LA POSTA  
8.6 MM Spectroheliograms  
Ant. Temp Unit 100°K  
SEPTEMBER 1977



NOSC LA POSTA  
8.6 MM Spectroheliograms  
Ant. Temp Unit 100°K  
SEPTEMBER 1977



NOSC LA POSTA  
8.6 MM Spectroheliograms  
Ant Temp Unit 100°K  
SEPTEMBER 1977



62  
Misc  
Aug 77

# SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

AUGUST, 1977

AUG 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE	
	START UT	END UT		DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND				
				START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT		
01	0000	0737	CULG											
	2039	2400	CULG											
02	0000	0737	CULG				2255			1				IIIB,U
	2039	2400	CULG											
03	0000	0737	CULG				0037			1				IIIB
			CULG				0632.5			1				IIIB
	2034	2400	CULG											
04	0000	0738	CULG				2128	2400						IIIN,W
	2038	2400	CULG											
05	0000	0738	CULG				0000	0105						IIIN,W
	2038	2400	CULG				2107	2300						IIIN,W
06	0000	0738	CULG				0005.5							IIIB,W
			CULG				0017.5	0018	1	0017.5	0018	1		IIIG
			CULG				0236							IIIB,W
	2038	2400	CULG				2322	2400						IIIN,W
07	0000	0738	CULG				0000	0120						IIIN,W
			CULG				0332							IIIB,W
			CULG				0340	0341	1					IIIG
			CULG				0404	0406.5	1					IIIG,U
			CULG				0553							IIIB,W
			CULG				2158.5							IIIB,W
			CULG				2201	2204.5						IIIG,W
	2038	2400	CULG				2310.5							IIIB,W
08	0000	0733	CULG				0010.5	0011.5						IIIG,W
			CULG				0110.5							IIIB,W
			CULG				0521							IIIB,W
			CULG				0559	0733						IIIN,W
	2038	2200	CULG											
	2218	2400	CULG				2218	2340						IIIN,W
09	0000	0737	CULG				0237.5							IIIB,W
			CULG				0302.5	0303						IIIG,W
	2038	2400	CULG				0452.5	0453						IIIG,W
10	0000	0737	CULG				0004							IIIB,W
			CULG				0456	0457						IIIG,W
			CULG				0501							IIIB,W
			CULG				0536							IIIB,W
	2038	2400	CULG				2221	2221.5						IIIG,W
11	0000	0737	CULG				0651.5	0652.5	1					IIIG,U
	2038	2225	CULG											
12	0044	0737	CULG											
	2038	2400	CULG											
13	0000	0737	CULG											
	2037	2400	CULG											
14	0000	0737	CULG				0401							IIIB,W
	2037	2400	CULG											
15	0000	0737	CULG				0021.5		1					IIIB
			CULG				0205	0206	1					IIIG
			CULG				0342							IIIB,W,U
	2315	2400	CULG											
16	0000	0737	CULG				0540	0540.5						IIIG,W
	2037	2400	CULG											
17	0000	0736	CULG											
	2036	2400	CULG				2304	2307.5	2	2304.5	2307.5	1		IIIG6

# SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

AUGUST 1977

AUG 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
	START UT	END UT		DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
				START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
19	0000 2036	0736 2400	CULG CULG				0048.5						IIIB,W
20	0000 2035	0735 2400	CULG CULG CULG	2358	2400		2208.5 2304	2209 2400					IIIG,W IS,W
21	0000 2035	0735 2400	CULG CULG CULG CULG	0000 2035 2250	0735 2210 2251		0000 0007.5 2115 2250	0735 0008 2330 2252		2250.5	2251.5	1	IS,W IIIG,W IS,W IIIG,V,U
22	0000 2035	0735 2400	CULG CULG CULG CULG CULG CULG	0235.5	0236	1	0118 0122 0234 0235.5 0548.5 0719.5	0118.5 0123.5 0234.5 0236.5 0550		0235.5	0236.5	2	IIIG,W IIIG IIIG IIIG IIIG IIIB,U
23	0000 2035	0735 2400	CULG CULG CULG CULG CULG CULG CULG	0154		1	0154 0433 2037 2155.5 2211 2215.5 2217.5 2222.5 2335.5	0434					IIIB IIIG,W IIIB,W IIIB IIIB,W IIIG IIIG,W IIIG,W IIIG,W
24	0000 2035 2146	0734 2132 2400	CULG CULG CULG CULG CULG CULG CULG				0530 0540 0612 0620.5 0626 2058.5 2124 2215 2245.5 2333	0532 0540.5 0614 0622.5 0627.5 2101.5 2125 2220 2246 2337		2100	2100.5	1	IIIG IIIG,W IIIG IIIG,W IIIG,W IIIG,V,U IIIG IIIG,V IIIG,W IIIG,V,W
25	0000 2035	0734 2400	CULG CULG CULG CULG CULG CULG CULG CULG				0007.5 0020 0023.5 0121 0156.5 2058.5 2150 2229.5 2233 2241 2250.5	0008 0021 0031 0200 2101.5 2154 2230 2233.5 2241.5 2251.5		0024	0031	2	IIIG,W IIIG,W IIIG,V IIIB,W IIIG,V,U IIIG,W IIIG IIIG,W IIIG,W IIIG
26	0000	0734	CULG CULG CULG CULG CULG CULG CULG CULG CULG CULG CULG CULG	0131	0132		0112 0131 0231.5 0303.5 0347.5 0349.5 0403.5 0411.5 0421 0501 0502.5 0505 0510 0524	0112.5 0132 0304 0405 0421.5 0502 0505 0506 0734 0526		0503.5	0504	1	IIIG,W IIIG,W IIIB,W IIIG IIIB IIIB IIIG IIIB,U IIIG IIIG IIIG,V,U IIIG IIIN IIIG



64  
Misc  
Aug 77

# SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

AUGUST 1977

AUG 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE				
	START UT	END UT		DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND							
				START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT					
26	2034	2400	CULG				0535	0536.5	1				II IIIG, V, U				
			CULG				0537	0543	2	0538.5	0540	1					
			CULG				0541.5	0553	2								
			CULG				0630	0631.5	3								
			CULG				2034	2330									
			CULG				2034	2400									
			CULG				2034	2035.5	1								
			CULG				2155	2202	1								
			CULG				2210	2212	1	2211	2212	1					
			CULG				2343.5	2345	1								
			CULG				2347.5	2350	1	2348	2350	1					
			27	2033	2400	CULG				0000	0408						IIIN, W IN, W IIIG, V IIIG IS IIIN, W IS, W IIIB IIIB IIIG IIIG
CULG	0008	0733					0045	0047	2	0046	0047	1					
CULG							0710	0711.5	1								
CULG							2033	2100	1								
CULG							2033	2342									
CULG	2140	2400					2100	2400									
CULG							2158		1								
CULG							2214		1								
CULG							2258.5	2259.5	1								
CULG							2319	2319.5	1								
28	2034	2400				CULG	0000	0733		0000	0733					IS, W IIIG IIIG IIIG, U IIIGG IIIB IIIG, W	
						CULG	0153	0153.5	1	0152.5	0154	1					
			CULG				0156	0159	1								
			CULG				0202	0203	2								
			CULG				0252	0300	1								
			CULG				0427.5		1								
			CULG	2335.5	2336		2335.5	2336									
			29	0413	0733	CULG				0455	0456						IIIG, W IIIG, W
						CULG				0540.5	0541.5						
						CULG											
						CULG											
			30	2033	2400	CULG				0116							IIIB, W IIIB, W IIIB, W IIIB, W IIIB, W IIIG, U IIIG IIIG, W IIIG
CULG							0233										
CULG							0236.5										
CULG							0239			0239							
CULG							0253										
CULG							2037.5	2039	2								
CULG	2040	2040.5				1	2040	2041.5	1								
CULG							2137	2138									
31	2032	2400	CULG				0452.5	0458	1				IIIGG IIIB, W IIIB, W IIIB, W IIIB, W IIIG IIIG IIIG, U IIIG, W IIIG, W				
			CULG				2045.5										
			CULG				2122										
			CULG				2125.5										
			CULG	2127	2127.5	1	2127	2128	1								
			CULG				2222.5	2223	1								
			CULG				2240.5	2241	1								
			CULG				2317	2317.5									
CULG				2336.5	2337.5												

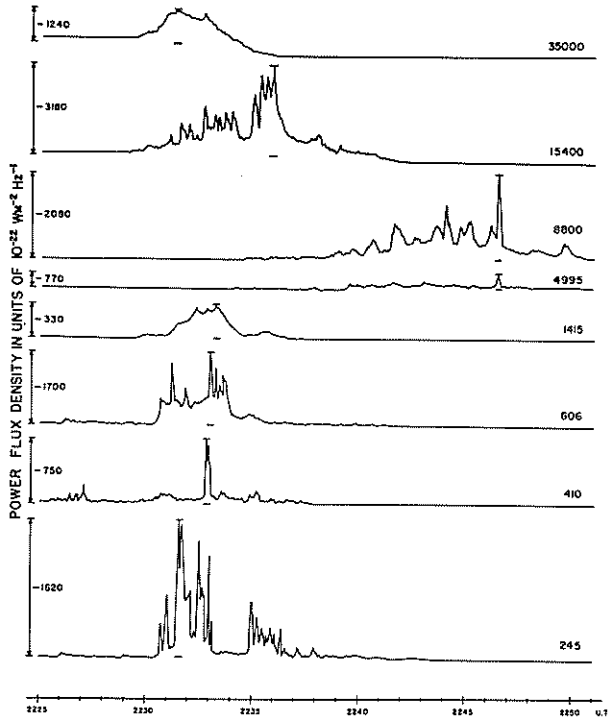
The symbols used in connection with the spectral type in describing the important bursts are as follows:

- |   |                               |
|---|-------------------------------|
| B = Single burst  | RS = Reverse slope burst      |
| G = Small group (< 10) of bursts  | DP = Drifting pairs           |
| GG = Large group (> 10) of bursts   | DC = Drifting Chains          |
| C = Underlying continuum (particularly with type I)                         | H = Herringbone               |
| S = Storm in the sense of intermittent but<br>apparently connected activity | W = Weak                      |
| N = Intermittent activity in this period                                    | P = Pulsations                |
| U = U-shaped burst of Type III  | CONT = Continuum              |
|   | UNCLF = Unclassified activity |

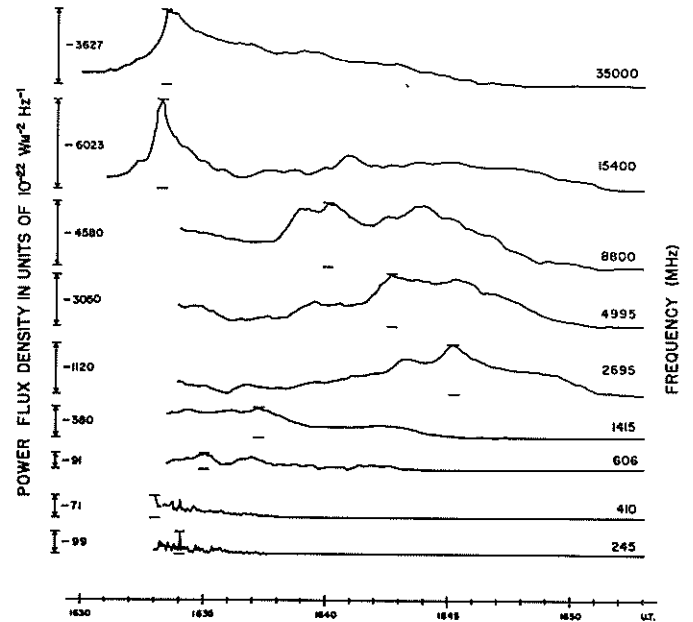
SELECTED SOLAR NOISE BURSTS

7 - 19 SEPTEMBER 1977

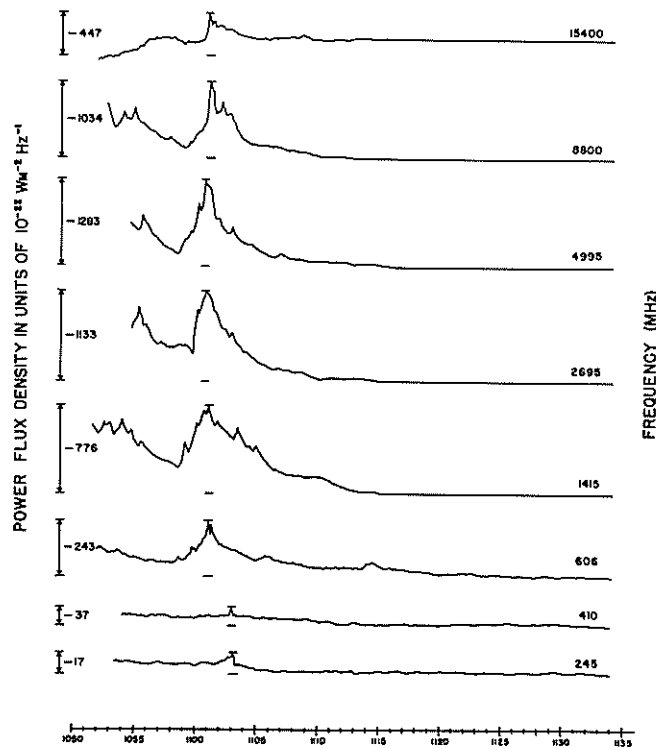
65  
Misc  
Sep 77



SEPTEMBER 7, 1977

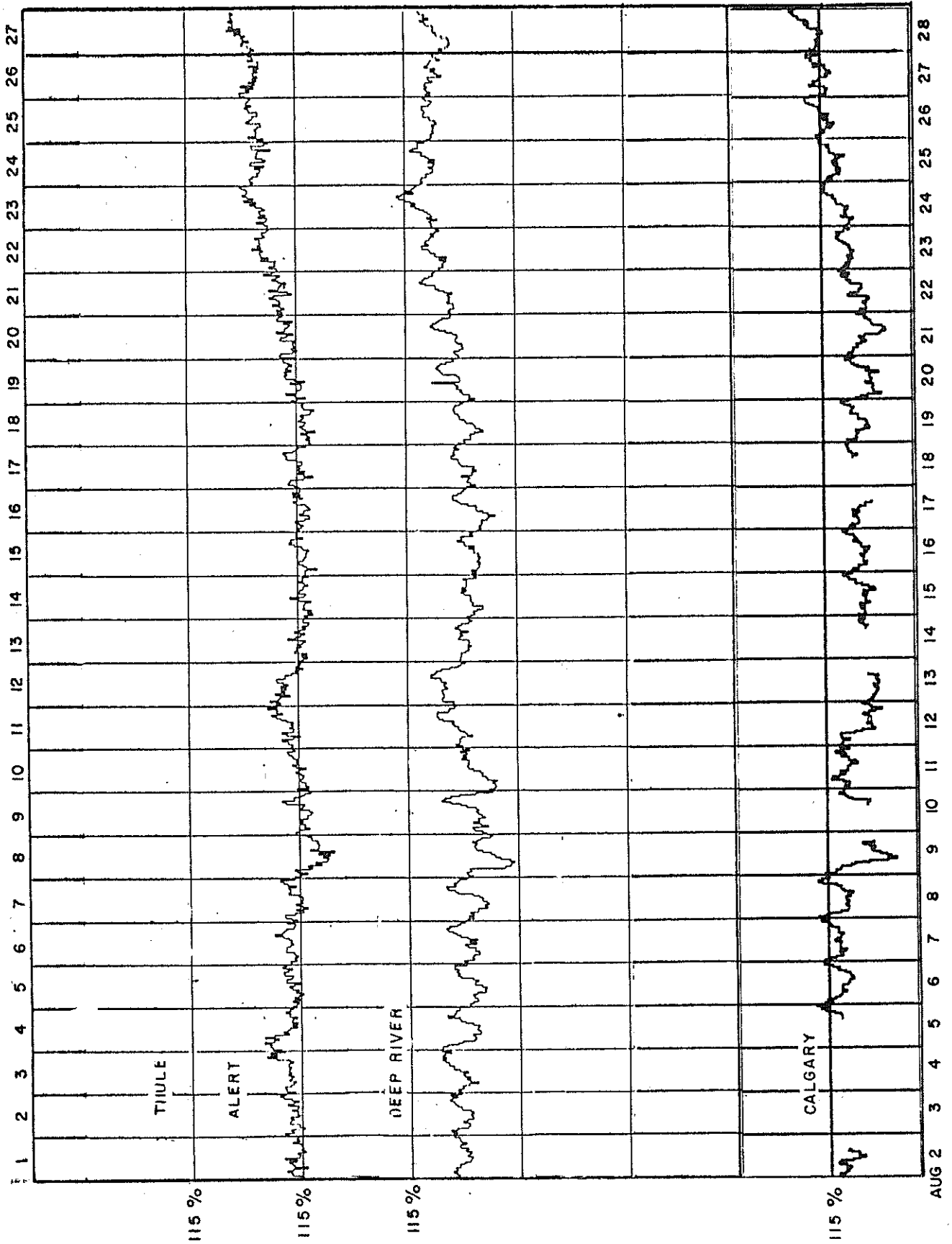


SEPTEMBER 9, 1977

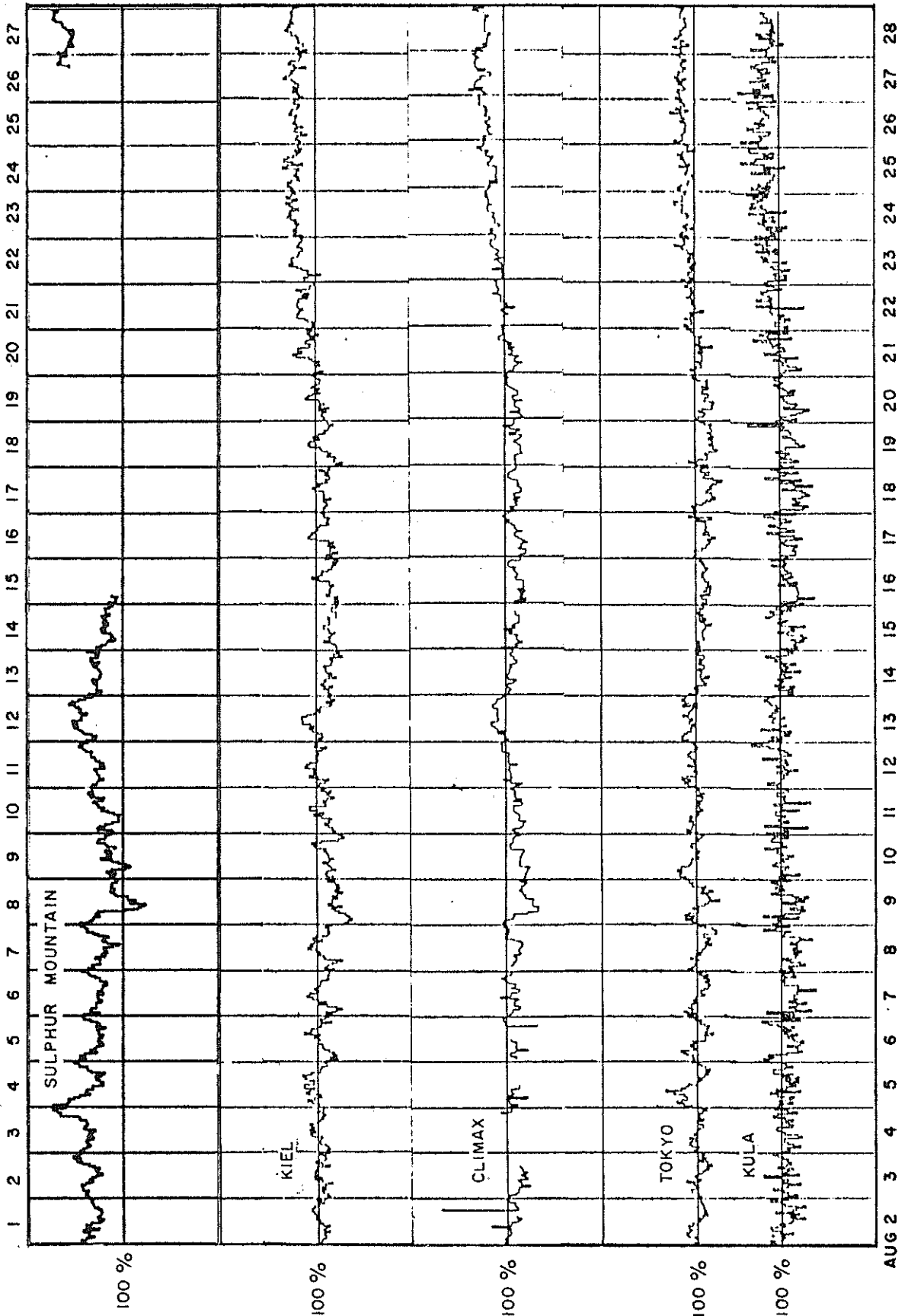


SEPTEMBER 19, 1977

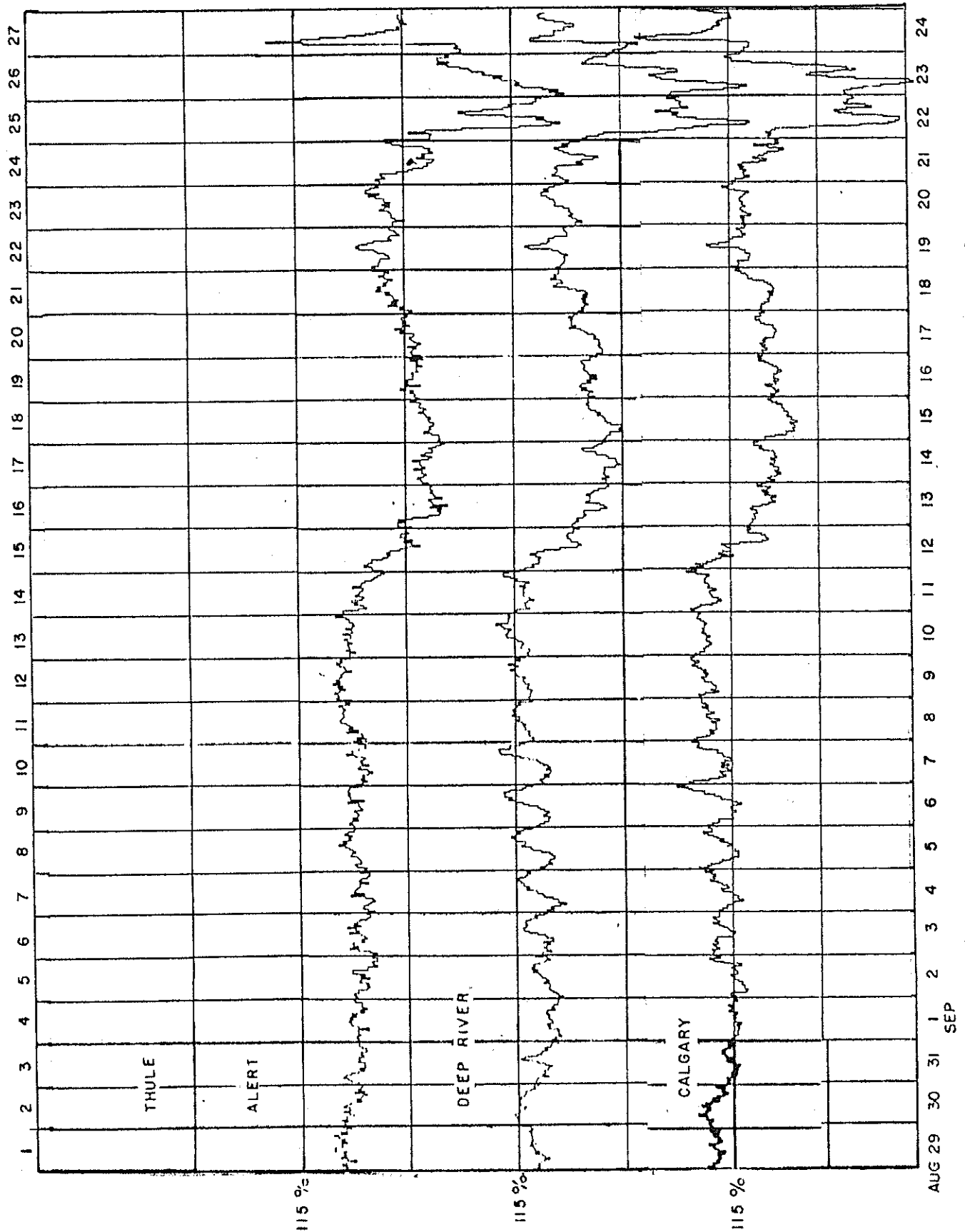
COSMIC RAY INDICES  
(Neutron Monitors)  
Bartels Rotation 1969 (August 1977)



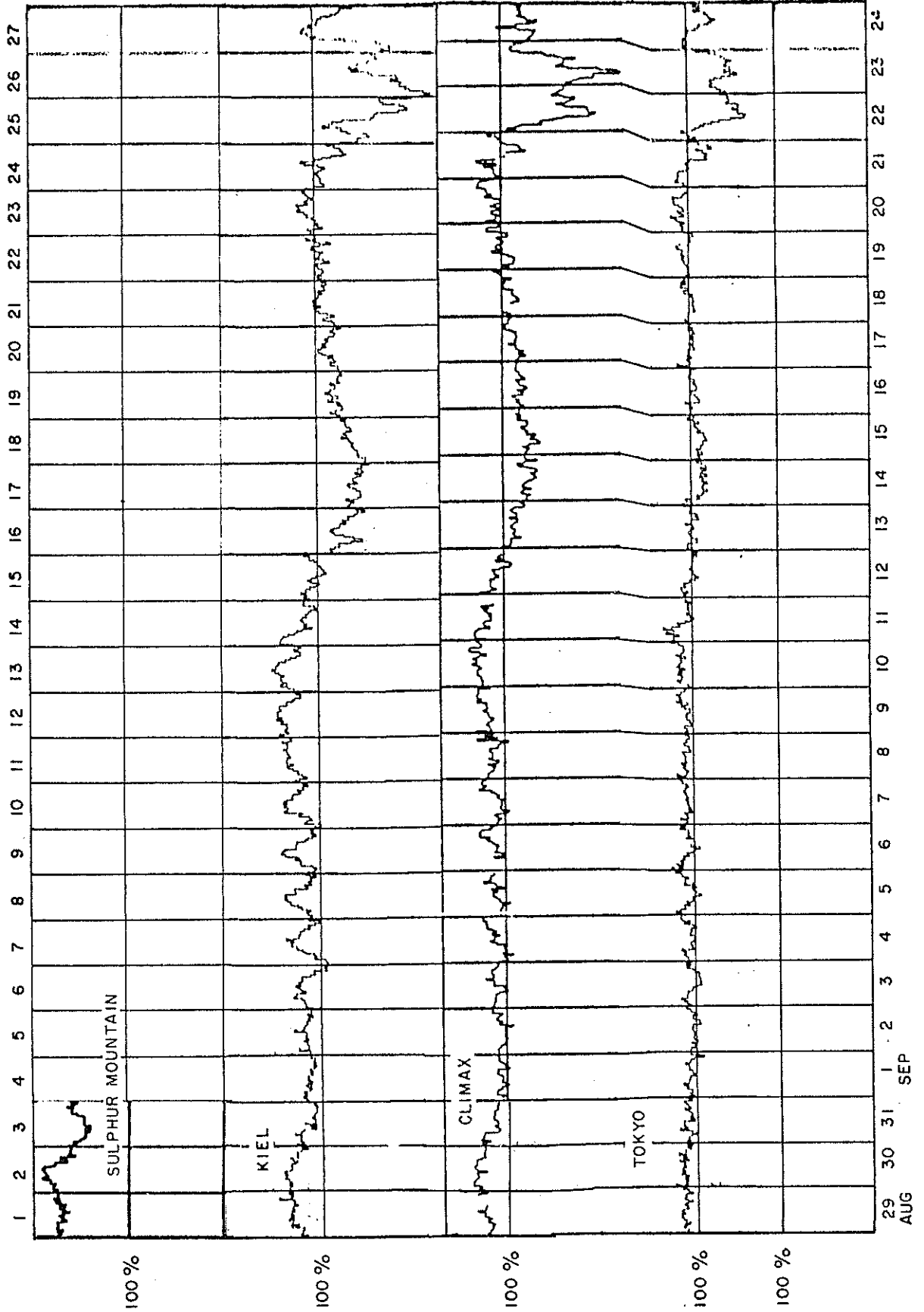
COSMIC RAY INDICES  
(Neutron Monitors)  
Bartels Rotation 1969 (August 1977)



COSMIC RAY INDICES  
(Neutron Monitors)  
Bartels Rotation 1970 (August - September 1977)



COSMIC RAY INDICES  
(Neutron Monitors)  
Bartels Rotation 1970 (August - September 1977)



29  
AUG

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AUG

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AUG

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COSMIC RAY INDICES  
(Neutron Monitors)  
AUGUST 1977

August 1977	CALGARY Average cts/hr	SULPHUR MT Average cts/hr	September 1977	CALGARY Average cts/hr	SULPHUR MT Average cts/hr
1	11527.1	8932.7	1	11702.0	No data due to mechanical problems and paper punch difficulties.
2	11644.3(16)	8921.1	2	11710.8	
3	---	8947.1	3	11798.4	
4	---	8977.6	4	11769.9	
5	11691.7(8)	8954.8	5	11787.8(23)	
6	11626.8	8915.2	6	11804.6	
7	11652.8	8903.6	7	11821.6	
8	11634.8	8892.3	8	11866.0	
9	11462.9(19)	8820.6	9	11897.1	
10	11533.5(9)	8837.7	10	11893.4	
11	11585.1	8869.8	11	11876.7	
12	11473.9	8916.5	12	11696.0	
13	11382.6(16)	8975.2	13	11505.8	
14	11454.2(7)	8906.1	14	11443.7	
15	11462.7	8858.5	15	11352.2	
16	11480.3	8821.3(5)	16	11431.9	
17	11481.8(16)	---	17	11468.9	
18	11532.5(8)	---	18	11502.7	
19	11490.5	---	19	11656.6	
20	11423.8	---	20	11634.8	
21	11423.2	---	21	11527.6	
22	11479.3	---	22	10980.7	
23	11544.5	---	23	11091.8	
24	11596.5	---	24	11799.3	
25	11629.2	---	25	11869.1	
26	11704.8	---	26	11937.4	
27	11707.5	9062.6(6)	27	11922.1(23)	
28	11773.4	9054.2	28	11940.6	
29	11823.9	9102.0	29	11943.8	
30	11846.2	9121.3	30	11898.0	
31	11727.2	9011.7			
MEAN	11579.2	8942.9	MEAN	11684.4	

( ) Number of hours for which data are available if less than 24. Number of Section Hours at Climax if sum of both sections is less than 40 hours.

Thule, Alert, Calgary, Sulphur Mountain, Kiel, Climax and Kula Scaling Factors = 100.  
Deep River Scaling Factor = 300.

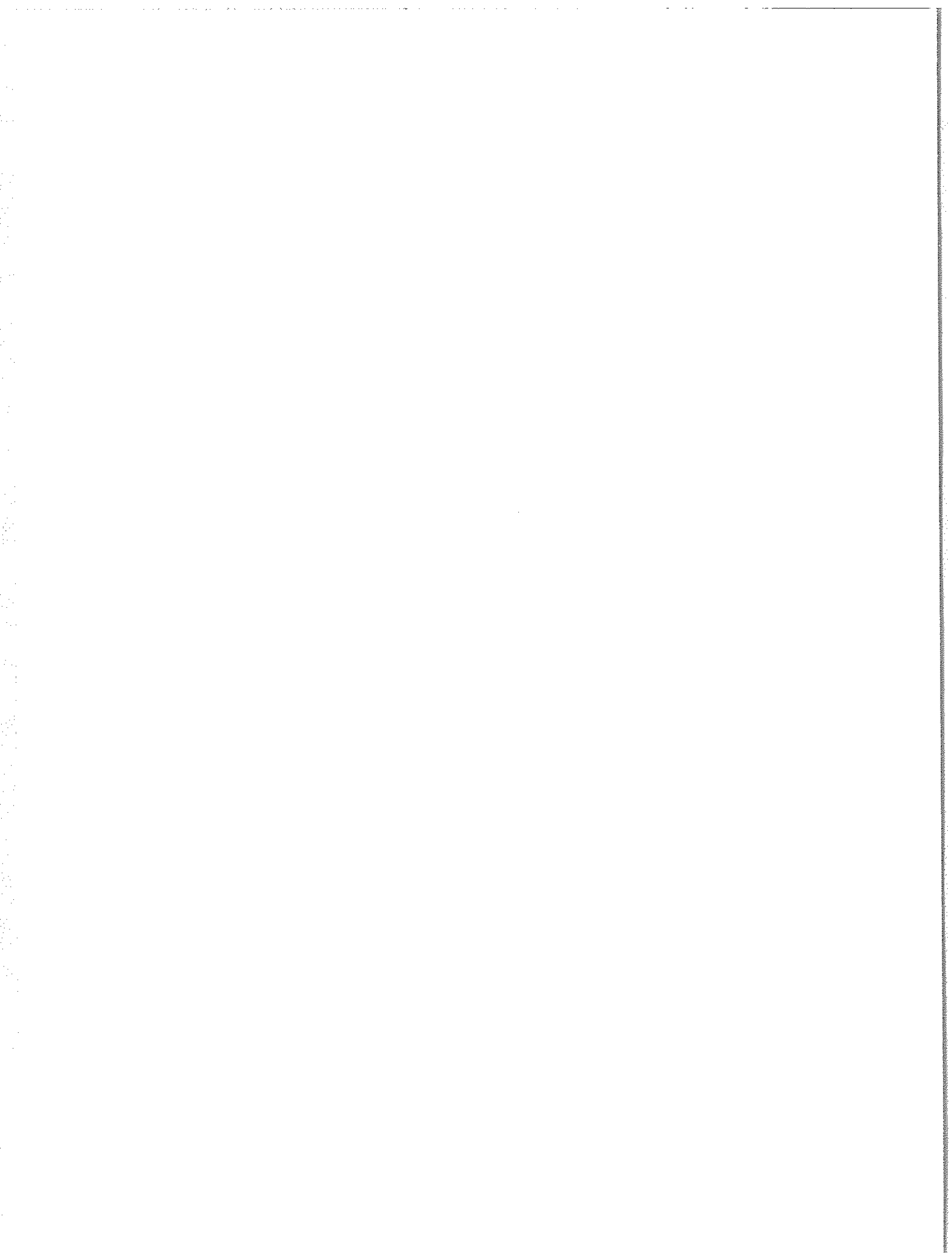
\* Kula data are available on magnetic tape from the World Data Center A for Solar-Terrestrial Physics. These data include the periods July 1967 - December 1970 and October 1975 to the present.

# U.S.S.R AURORA

APRIL 1977

- |    |   |    |  |
|----|---|----|--|
| 06 | $\phi = 59^\circ$ 1500-1600 (HA 2); $\phi = 58^\circ$ 1700 (RB2), 1900-2100 (R <sub>1</sub> R2) and $\phi = 60^\circ$ 2100-2200 (HA2) and 2300 (SP2)                        | 08 | $\phi = 59^\circ$ 1500-1800 (SB2)  |
| 07 | $\phi = 56^\circ$ 1200-1300 (HB1), 1800 (HA3); $\phi = 58^\circ$ 1400-1600 (HA1), 1900 (R <sub>1</sub> R2) 2000-2200 (HA1-2) and $\phi = 57^\circ$ 2300 (R <sub>2</sub> R3) | 10 | $\phi = 57^\circ$ 1400 and 1500 (R <sub>2</sub> R1), 1600 (R <sub>2</sub> B1), 1700 (R <sub>2</sub> R2); $\phi = 59^\circ$ 1900 (HP1), 2000-2100 (HA1) and 2200-2300 (HB1) |
|    |   | 16 | $\phi = 59^\circ$ 2100-2200 (HA2) and 2100-2200 (HB1)  |
|    |   | 20 | $\phi = 59^\circ$ 1600-1700 (HA2)  |





UAG Series of Reports

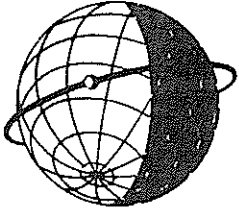
Prepared by World Data Center A for Solar-Terrestrial Physics, NOAA, Boulder, Colorado, U.S.A.

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.

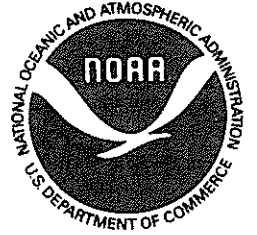
Some issues are now out of print and are available only on microfiche as indicated. Requests for microfiche should be sent to World Data Center A for Solar-Terrestrial Physics, NOAA, Boulder, CO 80302, with check or money order made payable to Department of Commerce, NOAA.

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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:

"Data used in this study were provided by WDC-A for Solar-Terrestrial Physics, NOAA E/GC2, 325 Broadway, Boulder Colorado 80303, USA."