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Solar - Geophysical Data

NO. 407 JULY 1978

Part II (Comprehensive Reports)

DATA FOR
JANUARY 1978
DECEMBER 1977
& MISCELLANEA

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
BOULDER, COLORADO

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SOLAR-GEOPHYSICAL DATA

No. 407

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Chief
Solar-Terrestrial Physics Division

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"398A 36" listed under 1977 Aug means that data for August 1977 were contained in *Solar-Geophysical Data* Number 398 - Part I, beginning on page 36.

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----- = no data available.
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ACTIVE REGIONS

CARRINGTON ROTATION 1663

(December 21, 1977 to January 17, 1978)

Region No.	Coordinates Lat.	Coordinates Long.	Age at CMP	IMP.	Spot-less Region	Region No. in Rotation 1662	Activity at West Limb
1	29°S	356°	+2	3			decreasing
2	23 N	321	>6	3			decreasing
3	23 N	252	0	1	x		decreasing
4	22 N	235	>6	5			increasing
5	24 N	220	+4	1	x		disappeared
6	20 S	204	>6	3		(12)	decreasing
7	23 S	185	>6	1	x	(13)	dispersed
8	16 N	182	0	2			stable
9	16 S	180	-2	2			decreasing
10	20 S	175	>6	3			decreasing
11	32 S	175	-5	1	x		(?)
12	37 N	164	>6	2			decreasing
13	17 N	157	>6	1	x		dispersed
14	30 N	155	>6	1	x		disappeared
15	34 N	155	-3	1	x		decreasing
16	27 N	145	>6	1	x		dispersed
17	19 N	144	>6	1	x		decreasing
18	27 S	141	>6	1	x	(18)	decreasing
19	24 N	140	>6	1	x		decreasing
20	24 S	117	+3	1	x		decreasing
21	28 S	117	>6	1	x	(19)	decreasing
22	16 N	115	>6	1	x		decreasing
23	26 S	77	-2	1	x		decreasing
24	20 N	67	>6	3			stable
25	21 S	66	-1	1	x		decreasing
26	21 N	57	>6	1	x	(26)	dispersed
27	7 N	45	>6	1	x	(28)	decreasing

ACTIVE REGIONS

CARRINGTON ROTATION 1664

(January 17 to February 14, 1978)

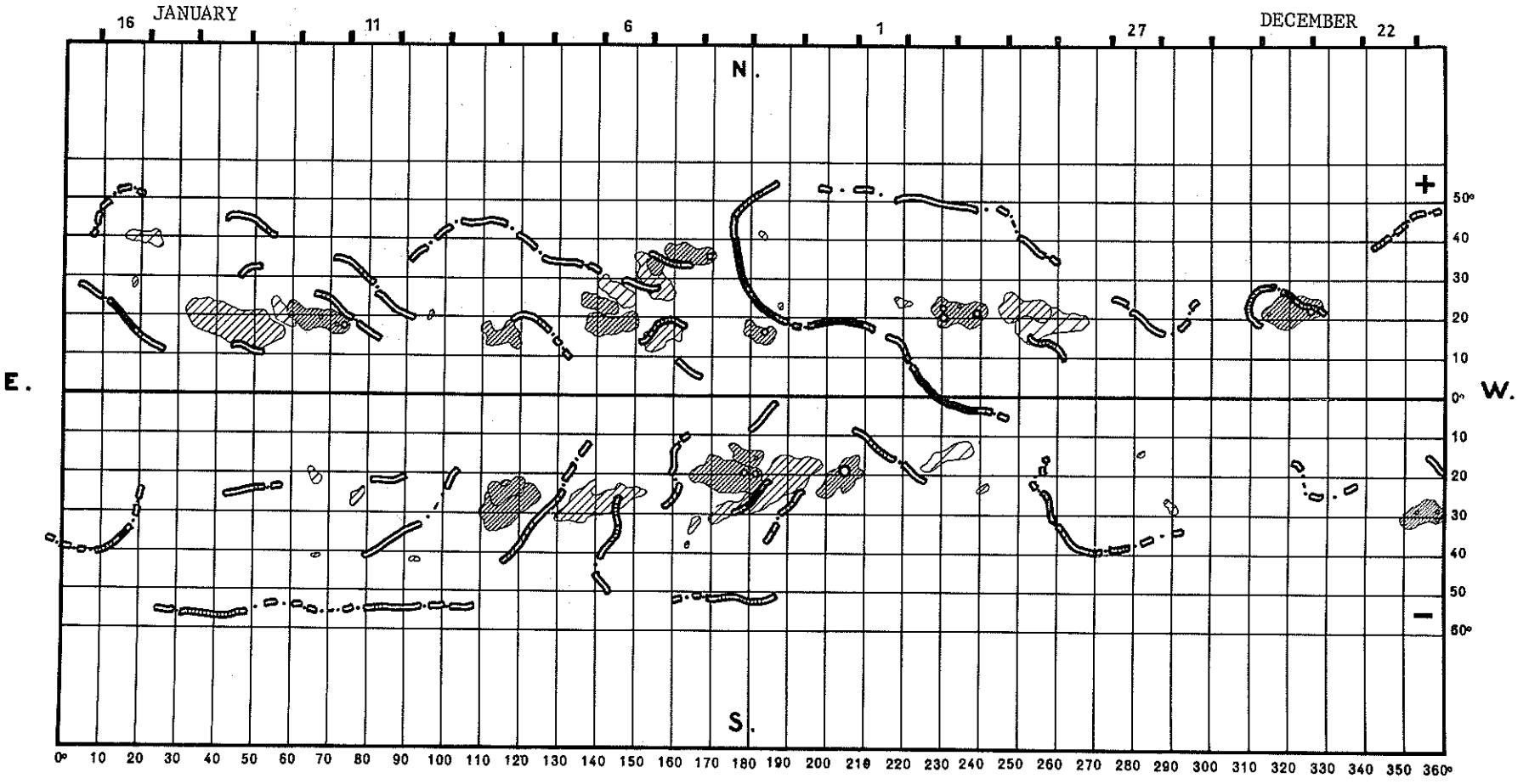
Region No.	Coordinates Lat.	Coordinates Long.	Age at CMP	IMP.	Spot-less Region	Region No. in Rotation 1663	Activity at West Limb
1	15°N	356°	>6	1	x		decreasing
2	25 S	356	>6	2	x		
3	23 S	354	-2	4			increasing
4	27 N	317	>6	1	x	(2)	dispersed
5	27 N	297	+1	1	x		
6	19 N	256	>6	1	x		dispersed
7	18 N	254	+3	4			decreasing
8	27 N	247	>6	1	x		dispersed
9	22 N	234	>6	2		(4)	decreasing
10	40 N	220	+1	1	x		dispersed
11	17 S	209	>6	2			decreasing
12	17 S	168	+4	2			
13	33 S	161	>6	3		(11)	decreasing
14	16 N	160	>6	2			decreasing
15	27 S	159	>6	3			decreasing
16	33 N	153	-1	1	x		decreasing
17	21 N	145	>6	3			decreasing
18	28 S	143	>6	1	x	(18)	decreasing
19	12 N	139	>6	1	x		disappeared
20	26 N	108	+4	2			decreasing
21	28 S	83	>6	3			decreasing
22	19 N	80	>6	3			decreasing
23	25 N	73	>6	4			decreasing
24	17 N	69	>6	4		(24)	decreasing
25	25 N	61	>6	1	x		dispersed
26	28 S	31	0	2			decreasing
27	15 N	30	>6	7			stable

SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1663

DECEMBER 21 TO JANUARY 17, 1978

MEUDON OBSERVATORY

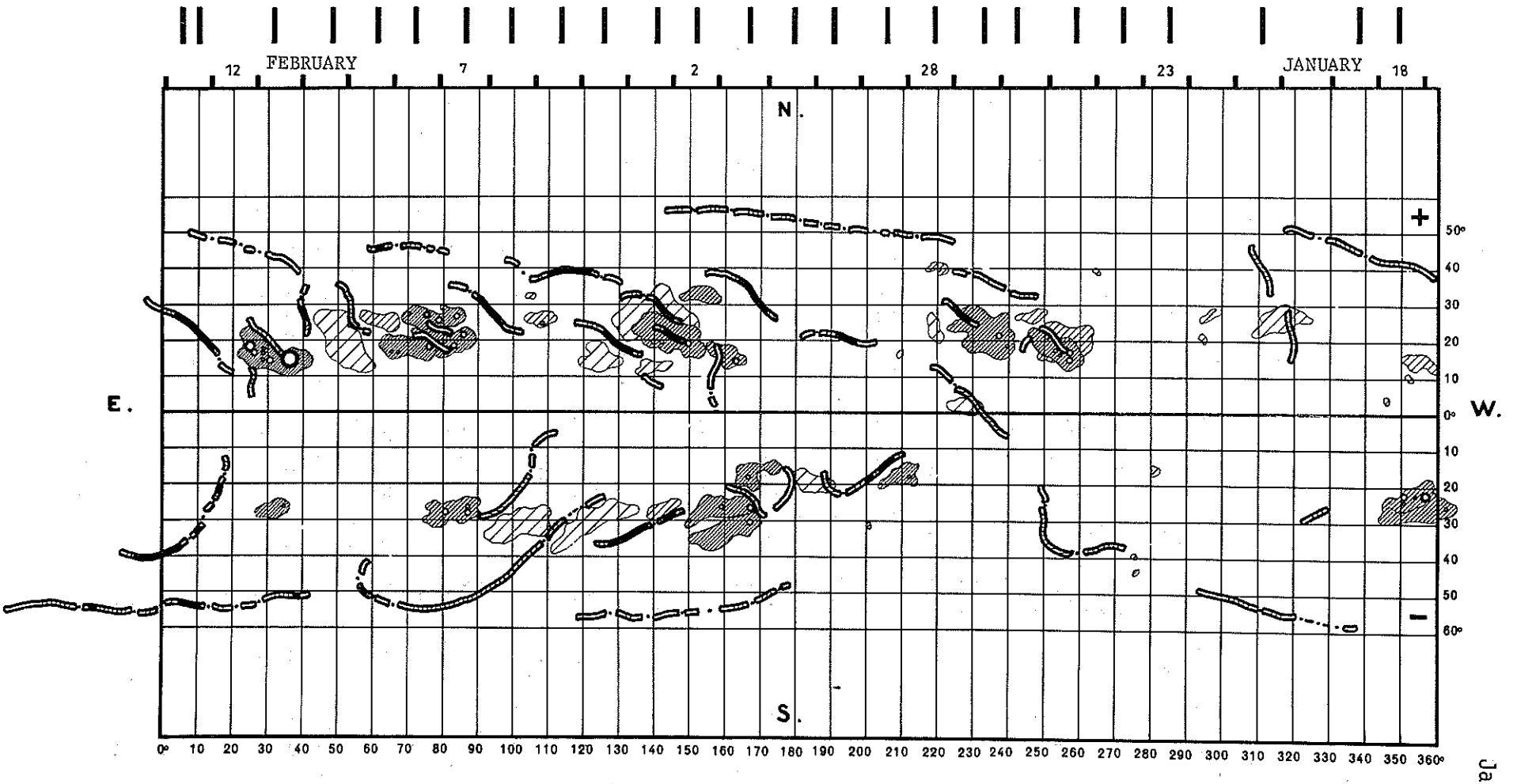


SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1664

JANUARY 17 TO FEBRUARY 14, 1978

MEUDON OBSERVATORY



7 Jan 78

Hα SOLAR FLARES

JANUARY 1978

OBSERVATORY	OBSERVED UT DATE JAN	START	MAX. PHASE	END	LOCATION APPROX LAT.	MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	DURATION MIN.	IMPORTANCE	OBS. COND.	TYPE	MEASUREMENTS TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	REMARKS	
418 CULG	01	0018	0020	0027	S19	E16	.381	15081	2.2	9	-N		C	0020	25	.3		Y5
419 VORO	01	0216	0217	0227	S18	E38	.644	15083	3.9	11	-B		C	0217	134	1.7	E	Y5
GRP65420	01	0554+3	0557+7	0626	S18	E36	.620	15083	3.9	32	1N				200	2.5	F	
TEHR	01	0554	0557	0606	S17	E38	.641	15083	4.1	12	-N	2	C		190		FDE	
MANI	01	0554	0600	0626	S18	E37	.632	15083	4.0	32	1N	3	P		200	2.7	F	
TACH	01	0555	0602	0634	S20	E34	.605	15083	3.8	39	2N		C	0602	574	7.3	F	
CULG	01	0557	0604	0626	S19	E36	.625	15083	3.9	29	1N		C	0604	200	2.6		
GRP65421	01	0725+2	0730+3	0741	S19	E12	.339	15081	2.2	16	-F				90	1.0	FHK	
CULG	01	0725	0731	0747	S19	E12	.339	15081	2.2	22	-N		C	0731	100	1.1		
TEHR	01	0727	0730	0737	S18	E13	.337	15081	2.3	10	-F	2	C		63			
ABST	01	0727	0733	0744D	S17	E10	.294	15081	2.1	17D	1N		P	0733	192	2.1	FK	
ABST	01	0731	0734	0744D	S21	E15	.393	15081	2.4	13D	-F		P	0734	70	.8	D	
MANI	01	0732E	0732U	0738	S19	E12	.339	15081	2.2	6D	-F	3	V		80	.8	H	
422 TEHR	01	0920	0922	0932	S17	E37	.628	15083	4.2	12	-N	1	C		127		FDE	Y5
	01	1126	1137	NO FLARE PATROL														
	01	1202	1228	NO FLARE PATROL														
423 KANZ	01	1347	1347	1350	N22	W23	.554	15080	30.8	3	-F						D	Y5
GRP65424	01	1405	1409	1418	S21	E26	.516	15083	3.5	13	-F						G	
KANZ	01	1405	1409	1413D	S20	E23	.472	15083	3.3	8D	-F						G	
HTPR	01	1410E		1418	S22	E29	.559	15083	3.8	8D	-F		C	1414	50	.6		
425 HTPR	01	1430	1432	1444	S19	E34	.600	15083	4.2	14	-F		C	1432	20	.2		Y5
426 HTPR	01	1435	1438	1448	N21	W22	.534	15080	31.0	13	-F		C	1438	10	.1		Y5
GRP65427	01	1502	1506	1546	S20	E30	.557	15083	3.9	44	-N						E	
HTPR	01	1502	1506	1526	S19	E33	.588	15083	4.1	24	-N		C	1505	80	.9	E	
HTPR	01	1503	1506	1546	S22	E28	.547	15083	3.7	43	-N		C	1506	60	.7		
	01	1550	1930	NO FLARE PATROL														
	01	2030	2041	NO FLARE PATROL														
428 CULG	01	2145	2153	2216D	S21	E06	.324	15081	2.4	31D	2N		C	2153	540	5.7	UV	Y5
429 CULG	01	2147	2155	2216D	S19	E28	.526	15083	4.0	29D	-N		C	2155	80	.9	F	Y5
	01	2215	2236	NO FLARE PATROL														
	01	2315	2342	NO FLARE PATROL														
430 VORO	02	0007	0012	0033	S17	E02	.242	15081	2.2	26	-B		C	0012	152	1.6	EJ	Y5
431 VORO	02	0158	0159	0205	N22	W30	.624	15080	30.8	7	-B		C	0159	72	.9	D	Y5
GRP65432	02	0344	0345+1	0357	N20	W29	.597	15080	31.0	13	-N						E	
VORO	02	0344	0346	0402	N21	W33	.647	15080	30.7	18	-B		C	0346	108	1.4	E	
MANI	02	0345E	0345U	0352	N20	W26	.566	15080	31.2	7D	-F	3	V		40	.5		
433 MANI	02	0345E	0345U	0355	S24	E19	.466	15083	3.6	10D	-F	3	V		30	.3		Y5
	02	0729	0732	NO FLARE PATROL														
434 MONT	02	0947	0948	0953	S17	W01	.240	15081	2.3	6	-F		C	0948	50			Y5
435 MONT	02	1047	1048	1059	N20	W44	.754	15075	30.1	12	-F		C	1048	50		E	Y5
436 KHAR	02	1125	1135	1150	N22	W36	.685	15080	30.8	25	-F		P				D	Y5
437 KANZ	02	1205	1205	1212	N17	E43	.731	15087	5.7	7	-F						DG	Y5
	02	1444	2116	NO FLARE PATROL														
438 RAMY	02	1646	1649	1658	S14	E17	.342	15083	4.0	12	-N	3	C		32		H	Y5
GRP65439	02	1925	1928 1942	1947	N20	W38	.693	15080	31.0	22	-N							
PALE	02	1925	1928	1944	N19	W38	.687	15080	31.0	19	-N	3	C		115		FDE	
RAMY	02	1940E	1942U	1950	N21	W39	.709	15080	30.9	10D	-N	3	C		95		F	
	02	2152	2257	NO FLARE PATROL														

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JAN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
GRP65440	02	2229+2	2242+2	2316	S18	E13	.335	15083	3.9	47	-N				140	1.5	
CULG	02	2229	2242	2312	S17	E13	.323	15083	3.9	43	-N		C	2242	140	1.5	
PALE	02	2231	2244	2319	S19	E14	.358	15083	4.0	48	-N	3	C		136		DE F
441 PALE	02	2358	2359	0000	N19	W43	.740	15080	30.8	2	-F	3	C		62		DE Y5
442 MANI	03	0204	0209	0215	S21	W06	.321	15081	2.6	11	-N	3	P		60	.6	F Y5
GRP65443	03	0226+4	0234+1 0242	0259	N20	W44	.755	15080	30.8	33	-N						
CULG	03	0226E	0242	0331D	N20	W44	.755	15080	30.8	65D	1N		C	0242	130	2.0	
KODA	03	0230E	0234	0249	N20	W45	.765	15080	30.7	19D	-N		V	0230			D
MANI	03	0230	0235	0259	N19	W44	.751	15080	30.8	29	-N	3	P		80	1.2	F
444 CULG	03	0307	0308	0316D	N36	E25	.715	15090	5.0	9D	-F		C	0308	30	.4	Y5
445 CULG	03	0308	0315	0331D	N16	W48	.779	15080	30.5	23D	1F		C	0315	160	2.2	Y5
446 MONT	03	0930E	0935	0943	S15	E07	.236	15083	3.9	13D	-F		C	0935	60		E Y5
447 MONT	03	0930E	0937	0941	N23	W47	.796	15080	30.9	11D	-F		C	0937	50		D Y5
448 KANZ	03	1001	1001	1004	S17	W16	.356	15081	2.2	3	-F						Y5
449 KANZ	03	1001	1004	1008	N35	E32	.750	15088	5.8	7	-F						E Y5
450 KANZ	03	1004	1015	1019	N23	W48	.805	15080	30.8	15	-F						Y5
GRP65451	03	1015+0	1019+1	1059	S15	E07	.236	15083	4.0	44	1B				450	4.6	EU
LOCA	03	1015E	1020	1105	S15	E06	.228	15083	3.9	50D	2N		P	1020	509	5.4	
HTPR	03	1015		1039D	S18	E09	.296	15083	4.1	24D	1B		C	1020	400	4.0	EU
KANZ	03	1015	1019	1053	S15	E06	.228	15083	3.9	38	1B						U
WEND	03	1026E		1050D	S14	E07	.221	15083	4.0	24D	1N		P		400	4.0	
452 KANZ	03	1131	1133	1137	N18	W52	.824	15080	30.6	6	-F						Y5
GRP65453	03	1156+6	1200+2	1210	S19	W19	.412	15081	2.1	14	-N						
RAMY	03	1156E	1200	1209D	S19	W19	.412	15081	2.1	13D	-N	4	C		45		DE
KANZ	03	1202	1202	1210	S20	W19	.422	15081	2.1	8	-N						
454 KANZ	03	1341	1345	1348	N21	W51	.824	15080	30.7	7	-F						Y5
GRP65455	03	1351+2	1351+4	1357	S20	E04	.296	15083	3.9	6	-F						E
KANZ	03	1351	1351	1355	S19	E04	.280	15083	3.9	4	-N						E
HTPR	03	1353	1355	1358	S21	E05	.316	15083	4.0	5	-F		C	1355	30	.3	E
456 MCMA	03	1526	1527	1529D	N23	W52	.839	15080	30.7	3D	-N		P	1527	40	.7	E Y5
457 MCMA	03	1533E	1535	1541D	S20	W22	.458	15081	2.0	8D	-F		P	1535	25	.3	D Y5
GRP65458	03	1617	1620 1626	1630	S20	W22	.458	15081	2.0	13	-N						EK
MCMA	03	1617	1620	1630	S20	W22	.458	15081	2.0	13	-N		C	1620	40	.5	EK
MCMA	03	1617	1626	1630	S20	W22	.458	15081	2.0	13	-N		C				
459 MCMA	03	1700	1701	1709	S20	W22	.458	15081	2.1	9	-F		C	1701	30	.4	E Y5
	03	1734	1744	NO FLARE PATROL													
	03	1801	1820	NO FLARE PATROL													
460 RAMY	03	1802E	1804	1818	S23	E37	.655	15086	6.5	16D	-N	4	C		95		F R Y5
461 MCMA	03	1826	1828	1850	S20	W19	.422	15081	2.3	24	-N		C	1828	25	.3	D Y5
	03	1852	1902	NO FLARE PATROL													
GRP65462	03	1852	1854	1906	S20	E07	.311	15083	4.3	14	1N						
RAMY	03	1852	1854	1906	S20	E07	.311	15083	4.3	14	1N	3	C		206		F
MCMA	03	1902E		1903D	S21	E07	.326	15083	4.3	1D	-N		P	1903	35	.4	D
	03	1903	1942	NO FLARE PATROL													
	03	1953	2058	NO FLARE PATROL													
	03	2131	2138	NO FLARE PATROL													
GRP65463	03	2144+0	2145+0	2157	S17	E02	.240	15083	4.1	13	-F				40	.4	
CULG	03	2144	2145	2203	S15	E02	.207	15083	4.1	19	-N		C	2145	40	.4	
PALE	03	2144	2145	2151	S19	E02	.274	15083	4.1	7	-F	3	C		37		DE

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464 CULG	03	2157	2158	2210	S22	W20	.454	15081	2.4	13	-F		C	2158	20	.2		Y5
	03	2302	2320	NO FLARE PATROL														
465 CULG	03	2343	2346	0006	S21	W21	.455	15081	2.4	23	-F		C	2346	20	.2		Y5
466 VORO	04	0026	0029	0034	N22	W54	.853	15080	31.0	8	-B		C	0029	63	1.2	D	Y5
467 VORO	04	0054	0056	0106	N22	W54	.853	15080	31.0	12	-B		C	0056	36	.6	DJ	Y5
468 VORO	04	0217	0220	0228	S20	W22	.456	15081	2.4	11	-B		C	0220	161	1.8	E	Y5
GRP65469	04	0254+1	0257+1	0306D	N23	W58	.886	15080	30.8	12	1N						E	
VORO	04	0254	0257	0304D	N23	W58	.886	15080	30.8	10D	2N		C	0257	278	6.5	E	
MITK	04	0255	0258	0306	N24	W59	.895	15080	30.7	11	1N		C	0258	180	3.9		
KODA	04	0257E	0340	0356	N21	W54	.850	15080	31.1	59D	-N		V	0257			E	
470 MITK	04	0446	0447	0453	N39	E17	.709	15090	5.5	7	-N		C	0447	70	1.0	E	Y5
471 MITK	04	0624	0628	0639D	N20	W61	.901	15080	30.7	15D	-N		C	0628	70	1.7	D	Y5
472 KANZ	04	0849E		0855	S14	W07	.220	15083	3.8	6D	-N							Y5
473 HTPR	04	0904E		0935D	N20	W80	.990	15075	29.4	31D	-F		C	0911	20	.5		Y5
474 HTPR	04	1236	1237	1244	N20	W83	.996	15075	29.3	8	-F		C	1237	10	.2		Y5
475 HTPR	04	1330	1331	1335	N19	W70	.953	15080	30.3	5	-F		C	1331	20	.5		Y5
	04	1503	2328	NO FLARE PATROL														
GRP65476	04	1812+0	1826+0	1846	N21	W66	.934	15080	30.8	34	-F				30		F	
PALE	04	1812	1826	1846	N21	W66	.934	15080	30.8	34	-F	3	V		26		F	
PALE	04	1812	1826	1846	N21	W66	.934	15080	30.8	34	-F	3	C		26		F	
GRP65477	04	1925+0	1925+0	1936	N21	W66	.934	15080	30.9	11	-F				20		F	
PALE	04	1925	1925	1936	N21	W66	.934	15080	30.9	11	-F	3	C		17		F	
PALE	04	1925	1925	1936	N21	W66	.934	15080	30.9	11	-F	3	V		17		F	
GRP65478	04	2010+0	2011+0	2019	N21	W67	.939	15080	30.8	9	-F				20		F	
PALE	04	2010	2011	2019	N21	W67	.939	15080	30.8	9	-F	3	C		17		F	
PALE	04	2010	2011	2019	N21	W67	.939	15080	30.8	9	-F	3	V		17		F	
GRP65479	04	2115+0	2117+0	2124	N21	W67	.939	15080	30.9	9	-F				30		F	
PALE	04	2115	2117	2124	N21	W67	.939	15080	30.9	9	-F	3	C		33		F	
PALE	04	2115	2117	2124	N21	W67	.939	15080	30.9	9	-F	3	V		33		F	
480 PALE	04	2308	2313	2335	S19	W13	.345	15083	4.0	27	-N	3	C		73		DE	Y5
481 PALE	04	2319	2322	2330	S19	W36	.622	15081	2.3	11	-F	3	C		40		DE	Y5
482 PALE	05	0018	0038	0056	N21	W69	.950	15080	30.8	38	-F	3	C		30		DE	Y5
483 PALE	05	0116	0116	0124	N21	W69	.950	15080	30.9	8	-F	3	C		21		DE	Y5
	05	0225	0240	NO FLARE PATROL														
484 MANI	05	0353E	0353U	0357	N19	W71	.958	15080	30.8	4D	-F	3	P		20	.4		Y5
485 MANI	05	0514E	0514U	0531D	N19	W74	.971	15080	30.7	17D	-F	3	P		20	.5		Y5
	05	0705	0728	NO FLARE PATROL														
486 ABST	05	0806E	0809	0809D	N21	W80	.990	15080	30.3	3D	-F		P	0809	61		DZ	Y5
GRP65487	05	1034+0	1044+0	1108	S15	W20	.388	15083	3.9	34	-F						E	
MONT	05	1034	1044	1106	S14	W20	.381	15083	3.9	32	-F		C	1044	60		E	
HTPR	05	1034	1044	1110	S16	W20	.396	15083	3.9	36	-F		C	1044	20	.2		
488 HTPR	05	1419	1431	1435	S25	E43	.726	15093	8.8	16	-F		C	1431	20	.3		Y5
489 HTPR	05	1438	1442	1448	S25	E43	.726	15093	8.8	10	-F		C	1442	10	.1		Y5
490 HTPR	05	1448	1456	1503	S17	W46	.732	15081	2.2	15	-F		C	1456	20	.3		Y5
491 HTPR	05	1506	1516	1525	S25	E42	.716	15093	8.8	19	-F		C	1516	20	.3		Y5

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OBSERVATORY	OBSERVED UT DATE JAN	START	MAX. PHASE	END	LOCATION APPROX LAT.	MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	DURATION MIN.	IMPORTANCE	OBS. COND	TYPE	MEASUREMENTS TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	REMARKS
	05	1526	2018	NO FLARE PATROL													
492 PALE	05	1858	1859	1903	N21	W79	.988	15080	30.9	5	-F	3	C		21		DE F Y5
493 PALE	05	2028	2030	2037	N21	E13	.463	15089	6.8	9	-F	3	C		28		DE Y5
GRP65494	05	2031>9	2040 2102	2108	S18	W49	.767	15081	2.2	37	-F						
PALE	05	2031	2040	2102	S19	W48	.759	15081	2.3	31	-F	3	C		35		DE
CULG	05	2051	2102	2113D	S18	W50	.777	15081	2.1	22D	-F		C	2102	40	.6	
	05	2113	2120	NO FLARE PATROL													
	05	2228	2300	NO FLARE PATROL													
495 VORO	06	0154	0156	0202	S30	E37	.692	15093	8.9	8	-B		C	0156	54	.7	EGH Y5
496 CULG	06	0302	0307	0335	N35	W05	.627	15090	5.8	33	-F		C	0307	30	.4	F Y5
497 CULG	06	0724	0731	0759D	N35	W04	.626	15088	6.0	35D	-F		C	0731	80	1.0	Y5
GRP65498	06	0810>9	0828+4	0836	S18	W55	.826	15081	2.2	26	-F				45	.8	D
BUCA	06	0810		0845	S16	W56	.833	15081	2.1	35	-F		C	0833	53	1.0	D
KANZ	06	0817	0828	0832	S18	W54	.817	15081	2.3	15	-F						
HTPR	06	0826	0832	0836	S19	W56	.836	15081	2.2	10	-F		C	0832	40	.7	
GRP65499	06	0903+1	0903+3	0911	S18	W56	.835	15081	2.2	8	-F						DJ
HTPR	06	0851	0857	0913	S15	W60	.867	15081	1.9	22	-F		C	0857	20	.4	
HTPR	06	0901	0903	0906	S19	W56	.836	15081	2.2	5	-F		C	0903	40	.7	
KANZ	06	0903		0903D	S18	W54	.817	15081	2.3		-F						
ABST	06	0904	0906	0909	S19	W56	.836	15081	2.2	5	-F		C	0906	105	1.9	DJ
GRP65500	06	1014+1	1015+1	1019	S19	W55	.827	15081	2.3	5	-F				45	.8	D
HTPR	06	1014	1015	1019	S19	W56	.836	15081	2.2	5	-F		C	1015	50	.7	
MONT	06	1015	1016	1018	S20	W55	.829	15081	2.3	3	-F		C	1016	40		D
501 HTPR	06	1022	1025	1031	N17	E33	.623	15092	8.9	9	-F		C	1025	10	.1	Y5
GRP65502	06	1056>9	1101 1110+2	1115	S18	W54	.817	15081	2.4	19	-F				30	.5	
MONT	06	1056	1101	1111	S15	W53	.803	15081	2.5	15	-F		C	1101	50		
HTPR	06	1107	1110	1116	S19	W57	.845	15081	2.2	9	-F		C	1110	20	.3	
MONT	06	1110	1112	1114	S20	W50	.781	15081	2.7	4	-F		C	1112	40		D
503 HTPR	06	1103	1106	1119	N16	W17	.435	15087	5.2	16	-F		C	1106	30	.3	Y5
504 HTPR	06	1321	1323	1326	N17	E32	.612	15092	9.0	5	-F		C	1323	10	.1	Y5
	06	1527	1747	NO FLARE PATROL													
505 RAMY	06	1635E	1638U	1715D	S17	W60	.869	15081	2.2	40D	-N	3	C		95		F Y5
506 PALE	06	1804	1852	1912D	S19	W61	.878	15081	2.2	68D	-F	3	C		53		DE Y5
	06	1815	1828	NO FLARE PATROL													
	06	1912	2019	NO FLARE PATROL													
GRP65507	07	0036+6	0043+1	0051	S20	W64	.901	15081	2.2	15	-N				80	1.9	
CULG	07	0036	0044	0055	S20	W65	.908	15081	2.2	19	-N		C	0044	60	1.4	
MITK	07	0042	0043	0046	S21	W64	.902	15081	2.2	4	-N		C	0043	110		
GRP65508	07	0123+5	0136+3 0146	0217	S21	W63	.895	15081	2.3	54	1F				200	4.7	EJUY
PALE	07	0046E	0136U	0222D	S19	W64	.901	15081	2.2	96D	1N	3	C		250		U F
CLLG	07	0123	0139	0238	S23	W64	.904	15081	2.3	75	1N		C	0130	170		UY
MITK	07	0127	0146	0155	S22	W62	.889	15081	2.4	28	1F		C	0146	120	2.6	E
VORO	07	0128	0136	0212	S20	W64	.901	15081	2.3	44	2F		C	0136	278	6.1	EJ
GRP65509	07	0305+3	0312+2	0329	S23	W65	.911	15081	2.3	24	-N				90		JK
MITK	07	0305	0314	0329	S21	W65	.909	15081	2.3	24	1N		C	0314	130	2.6	
CULG	07	0306	0312	0425	S25	W65	.912	15081	2.3	79	-N		C	0312	80		FK
VORO	07	0308	0312	0322	S22	W66	.916	15081	2.2	14	-B		C	0312	72	1.6	DJ
GRP65510	07	0632	0647	0651D	S16	W65	.906	15081	2.4	19	1F						E
MITK	07	0632	0647	0651D	S18	W66	.914	15081	2.3	19D	1F		C	0647	140		E
MANI	07	0637E	0637U	0639D	S15	W64	.898	15081	2.5	2D	1N	3	V		100	2.1	
	07	0651	0740	NO FLARE PATROL													

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GRP65511	07	0740E		0821	S18	W68	.927	15081	2.2	41	-F						D
BUCA	07	0740E		0810	S16	W73	.955	15081	1.8	30D	-F		P	0745	43		D
KANZ	07	0748E		0821	S18	W66	.914	15081	2.4	33D	-F						
HTPR	07	0757E		0825	S19	W68	.927	15081	2.2	28D	-F		C	0804	40	.8	
GRP65512	07	1113>9	1209+6 1228+5	1323	S20	W71	.945	15081	2.1	130	-N						EU
KANZ	07	1113	1233	1327	S19	W69	.933	15081	2.3	134	-N						
KANZ	07	1113	1248	1305	S19	W79	.980	15081	1.5	112	-B						
MONT	07	1114	1213	1325D	S22	W71	.946	15081	2.1	131D	1N		C	1213	220		F
HTPR	07	1145	1215	1320	S18	W70	.939	15081	2.2	95	-N		C	1215	60	1.3	E
HTPR	07	1150	1209	1222	S22	W69	.935	15081	2.3	32	-F		C	1209	40	.8	
RAMY	07	1225E	1228	1235D	S18	W71	.944	15081	2.2	10D	-N	2	C		96		DE
WEND	07	1228E		1308	S19	W70	.939	15081	2.3	40D	1F		V		300	9.9	E
KANZ	07	1254	1301	1309	S20	W71	.945	15081	2.2	15	-N						U
KANZ	07	1312	1316	1327	S19	W79	.980	15081	1.6	15	-N						
513 HTPR	07	1334	1338	1347	S24	W43	.721	15083	4.3	13	-F		C	1338	20	.3	Y5
514 HTPR	07	1452	1454	1458	S21	W73	.955	15081	2.1	6	-F		C	1454	40	.9	Y5
	07	1622	2048	NO FLARE PATROL													
515 CULG	07	2244	2247	2258	S28	W05	.419	15086	7.6	14	-N		C	2247	30	.3	Y5
516 CULG	08	0000	0001	0003	S16	W53	.803	15083	4.0	3	-N		C	0001	20	.3	Y5
517 CULG	08	0002	0006U	0100	S22	W80	.983	15081	2.0	58	1F		C	0006	80		F ↑ Y5
GRP65518	08	0205+5	0216+2 0237+9	0321	S20	W79	.979	15081	2.2	76	2N						HJK
CULG	08	0205	0218	0415	S21	W80	.983	15081	2.1	130	1N		C	0218	200		K
VORO	08	0206	0227	0317	S20	W78	.976	15081	2.2	71	3F		C	0227	376	18.7	EHJ
MANI	08	0210	0216	0318D	S12	W80	.983	15081	2.1	68D	1N	3	P		80	2.1	F
MANI	08	0210	0237	0318D	S12	W80	.983	15081	2.1	68D	2N	3	P		200	5.3	F
PALE	08	0219E	0219U	0323D	S19	W78	.976	15081	2.2	64D	1B	3	C		200		FDE
PALE	08	0219E	0246U	0323D	S19	W78	.976	15081	2.2	64D	2B	3	C		250		FDE
519 CULG	08	0432	0448	0520	S22	W80	.983	15081	2.2	48	-F		C	0448	25		Y5
520 MANI	08	0710	0713	0749	S12	W85	.995	15081	1.9	39	2B	3	P		300	8.8	F Y5
GRP65521	08	0903+4	0909	0912	S16	W83	.991	15081	2.2	9	-N						D
HTPR	08	0903	0909	0912	S18	W88	.999	15081	1.8	9	-N		C	0909	20		
KANZ	08	0907		0907D	S14	W78	.976	15081	2.5		-F						D
522 HTPR	08	1150	1155	1220	S14	W60	.866	15083	4.0	30	-F		C	1155	10	.2	Y5
	08	1800	2037	NO FLARE PATROL													
	08	2111	2118	NO FLARE PATROL													
	08	2157	2306	NO FLARE PATROL													
	09	0637	0653	NO FLARE PATROL													
GRP65523	09	0750+5	0806+1	0820	S23	W90	1.000	15081	2.6	30	-F						
KANZ	09	0750	0807	0819	S22	W90	1.000	15081	2.6	29	-F						
CULG	09	0755	0806	0821D	S25	W90	1.000	15081	2.6	26D	1F		C	0806	60		
GRP65524	09	1106+1	1111 1123	1136	S18	W90	1.000	15081	2.7	30	-F						
KANZ	09	1106	1123	1136	S18	W90	1.000	15081	2.7	30	-F						
MONT	09	1107	1111	1124D	S19	W90	1.000	15081	2.7	17D	-F		C	1111	60		
GRP65525	09	1119+1	1124	1133	S23	W09	.358	15093	8.8	14	-F						
HTPR	09	1119	1124	1130	S23	W11	.372	15093	8.6	11	-F		C	1124	10	.1	
KANZ	09	1120	1133	1136	S23	W08	.352	15093	8.9	16	-F						
526 KANZ	09	1218		1311	S19	W90	1.000	15081	2.8	53	-F						Y5
	09	1545	2008	NO FLARE PATROL													
	09	2113	2120	NO FLARE PATROL													
527 CULG	09	2224	2225	2258	S34	W70	.947	15096	4.7	34	-F		C	2225	20		Y5
GRP65528	09	2250+5	2257+1	2306	S18	W82	.988	15083	3.8	16	1B				150		
CULG	09	2250	2257	2302D	S18	W86	.996	15083	3.5	12D	2B		C	2257	180		
PALE	09	2255	2258	2306	S18	W79	.979	15083	4.0	11	1N	3	V		115		FDE

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	09	2258	2355	NO FLARE PATROL														
529 CULG	10	0135	0207	0257D	N15	W90	1.000	15095	3.3	82D	-N		C	0207	30			Y5
530 CULG	10	0402	0405	0407	N20	W42	.740	15089	7.0	5	-N		C	0405	20	.3		Y5
531 CULG	10	0421	0424	0429	S18	W90	1.000	15083	3.4	8	-N		C	0424	20			Y5
	10	0541	0548	NO FLARE PATROL														
532 KANZ	10	0835	0839	0845	S20	W23	.462	15093	8.6	10	-F						G	Y5
533 KANZ	10	1009		1026	S22	W24	.491	15093	8.6	17	-F						G	Y5
534 KANZ	10	1013	1016	1018	N18	W90	1.000	15095	3.7	5	-F							Y5
	10	1958	2021	NO FLARE PATROL														
	10	2118	2124	NO FLARE PATROL														
535 CULG	10	2202	2240	2330	N15	W27	.542	15092	8.9	88	1N		C	2240	180	2.2		Y5
536 PALE	11	0151	0157	0210	N18	E23	.525	15097	12.8	19	-F	3	V		25		F	Y5
537 CULG	11	0223	0225	0244	N15	W31	.590	15092	8.8	21	-F		C	0225	20	.2		Y5
GRP65538	11	0256>9	0322	0359	N15	W31	.590	15092	8.8	63	-F						G	
			0330															
CULG	11	0256	0322	0400	N14	W31	.583	15092	8.8	64	-N		C	0322	85	1.1	F	
MITK	11	0308	0330	0357	N17	W31	.605	15092	8.8	49	-F		C	0330	120	1.5	EG	
	11	0859	0902	NO FLARE PATROL														
539 ABST	11	1010	1014	1020	N19	E24	.546	15097	13.2	10	-F		C	1014	61	.7	DJ	Y5
540 ABST	11	1027	1031	1036	N18	E16	.457	15097	12.6	9	-F		C	1031	79	.9	DJ	Y5
GRP65541	11	1745	1750	1825D	N18	E13	.432	15097	12.7	40	-N						E	
			1758															
HCMA	11	1745	1750	1825D	N18	E12	.424	15097	12.6	40D	-N		C	1750	60	.7	E	
RAMY	11	1755E	1758	1800D	N18	E14	.440	15097	12.8	5D	-F	4	C		64		DE	
542 CULG	11	2150	2201	2210	N19	E11	.431	15097	12.7	20	-N		C	2201	30	.3		Y5
GRP65543	11	2239+2	2249+0	2313	N18	E10	.410	15097	12.7	34	-N				40	.4		
CULG	11	2239	2249	2320	N19	E10	.425	15097	12.7	41	-N		C	2249	30	.3		
PALE	11	2241	2249	2306	N18	E11	.417	15097	12.8	25	-N	3	C		53		DE	
544 CULG	12	0339	0343	0410	N18	E08	.400	15097	12.8	31	-F		C	0343	60	.7		Y5
GRP65545	12	0642>9	0714+6	0750	N18	E06	.391	15097	12.7	68	-F						DJ	
CULG	12	0642	0720	0752	N18	E06	.391	15097	12.7	70	-N		C	0752	40	.4		
ABST	12	0700	0714	0748	N18	E06	.391	15097	12.7	48	-F		C	0714	87	1.0	DJ	
546 ABST	12	1031	1039	1052	N19	E04	.400	15097	12.7	21	-F		C	1039	175	2.0	EJ	Y5
547 RAMY	12	1450E	1453	1459	N19	W01	.395	15097	12.5	9D	-F	3	C		60		DE	Y5
	12	1500	1512	NO FLARE PATROL														
	12	1548	1746	NO FLARE PATROL														
548 CULG	12	2220	2225	2234	N18	W03	.381	15097	12.7	14	-F		C	2225	60	.7		Y5
549 CULG	12	2235	2237	2310	N19	W03	.397	15097	12.7	35	-F		C	2237	60	.6		Y5
550 CULG	12	2325	2330	0008	N18	E04	.384	15097	13.3	43	-F		C	2330	70	.7		Y5
551 CULG	13	0311	0318	0344	S28	W18	.488	15104	11.8	33	-F		C	0318	30	.3		Y5
552 MITK	13	0317E		0325	N18	W07	.397	15097	12.6	8D	-N		C	0317	70	.8	E	Y5
553 MITK	13	0357	0400	0408	N19	W08	.417	15097	12.6	11	-N		C	0400	50	.6	E	Y5
GRP65554	13	0534	0550	0639	N19	W07	.412	15097	12.7	65	-N						FJKZ	
			0612															
CULG	13	0534	0550	0640	N19	W07	.412	15097	12.7	66	-N		C	0550	80	.9	K	
ABST	13	0605E	0612	0638	N19	W08	.417	15097	12.7	33D	1F		P	0612	218	2.5	FJZ	

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555 ABST	13	0805	0819	0853	N19	W10	.428	15097	12.6	48	-F		C	0819	148	1.7	FJZ	Y5
556 ABST	13	0806	0817	0833	S27	W21	.504	15104	11.8	27	-N		C	0817	96	1.1	DH	Y5
GRP65557	13	0840+5	0846	0923	S27	W21	.504	15104	11.8	43	-F						H	
ABST	13	0840	0846	0923	S27	W22	.513	15104	11.7	43	-N		C	0846	105	1.3	FH	
BUCA	13	0845		0900D	S27	W20	.494	15104	11.9	15D	-F		P	0855	53	.6	D	
558 ABST	13	1014	1022	1031D	S27	W22	.513	15104	11.8	17D	-F		P	1022	70	.8	DH	Y5
	13	1500	1813	NO FLARE PATROL														
	13	2007	2041	NO FLARE PATROL														
	13	2104	2117	NO FLARE PATROL														
	13	2131	2152	NO FLARE PATROL														
	13	2240	2253	NO FLARE PATROL														
	13	2321	2338	NO FLARE PATROL														
	14	0011	0028	NO FLARE PATROL														
559 CULG	14	0413	0416	0445	N19	W21	.519	15097	12.6	32	-F		C	0416	20	.2		Y5
560 ABST	14	0714	0719	0725	S21	W23	.466	15104	12.6	11	-F		C	0719	105	1.2	EGJLZ	Y5
561 ABST	14	0727	0734	0742	N19	W24	.549	15097	12.5	15	-F		C	0734	61	.7	DJLZ	Y5
562 ABST	14	0814	0822	0853D	N19	W24	.549	15097	12.5	39D	?F		P	0822	227	2.8	FJLZ	Y5
	IMP.1 NO		KANZ1															
GRP65563	14	0840+0	0848	1032D	S21	W24	.479	15104	12.6	112	-F						DGJLZ	
			1008															
KANZ	14	0840		1153	S20	W24	.471	15104	12.6	193	-F						LT	
ABST	14	0840	0848	0853D	S21	W24	.479	15104	12.6	13D	-F		P	0848	96	1.1	DGJLZ	
ABST	14	1004	1008	1032	S21	W25	.491	15104	12.5	28	-F		C	1008	87	1.0	DGL	
GRP65564	14	0926+1	0927+1	0934	S28	E45	.752	15100	17.8	8	-F						DG	
ABST	14	0926	0928	0934	S28	E46	.762	15100	17.8	8	-F		C	0928	87	1.3	D	
KANZ	14	0927	0927	0933	S28	E45	.752	15100	17.8	6	-F						G	
565 ABST	14	0946	0950	0954	S30	E45	.761	15100	17.8	8	?F		C	0950	175	2.8	E	Y5
	IMP.1 NO		KANZ1															
566 ABST	14	1032	1048	1105D	N18	W26	.560	15097	12.5	33D	-F		P	1048	166	2.0	FL	Y5
567 KANZ	14	1326	1333	1340	N19	W27	.580	15097	12.5	14	-F							Y5
	14	1520	1712	NO FLARE PATROL														
	14	1844	2058	NO FLARE PATROL														
	14	2137	2148	NO FLARE PATROL														
568 ABST	15	0707E	0711	0753D	N19.	W35	.666	15097	12.7	46D	-F		P	0711	79	1.1	DJ	Y5
	15	2045	2157	NO FLARE PATROL														
	15	2158	2222	NO FLARE PATROL														
GRP65569	16	0258+3	0304+9	0335	S27	W58	.862	15104	11.8	37	-N				40	.8	J	
CULG	16	0258	0313	0340	S27	W58	.862	15104	11.8	42	-N		C	0313	40	.8		
VORO	16	0258	0308	0330	S27	W58	.862	15104	11.8	32	-B		C	0308	90	1.7	EJ	
MANI	16	0301	0304	0315D	S27	W58	.862	15104	11.8	14D	-F	3	P		30	.5	F	
	16	0514	0524	NO FLARE PATROL														
570 CULG	16	0731	0740U	0750D	N16	W53	.832	15097	12.3	19D	-F		P	0740	35	.6		Y5
571 KHAR	16	0950		1002	S22	W49	.771	15104	12.7	12	-F		V	0955	15		D	Y5
572 KHAR	16	1005	1007	1024	N18	W53	.838	15097	12.4	19	?F		P	1007	110	2.1	D	Y5
	IMP.1 NO		KIEV2															
	16	1050	1120	NO FLARE PATROL														
	16	1530	2010	NO FLARE PATROL														
GRP65573	17	0123+2	0127+1	0201	S27	E10	.410	15100	17.8	38	-N						J	
VORO	17	0123	0128	0156	S26	E11	.402	15100	17.9	33	1N		C	0128	206	2.3	EJ	
CULG	17	0125	0127	0205	S28	E10	.425	15100	17.8	40	-N		C	0127	70	.8	F	
	17	0746	0803	NO FLARE PATROL														
	17	0929	1008	NO FLARE PATROL														
	17	1020	1112	NO FLARE PATROL														

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	DATE JAN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		COND	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
574 RAMY	17	1359E	1400	1428D	S27	E03	.382	15100	17.8	29D	1N	4	C		28D		F	Y5
	17	1510	1620	NO FLARE PATROL														
	17	1808	1816	NO FLARE PATROL														
	17	1831	2059	NO FLARE PATROL														
	17	2110	2138	NO FLARE PATROL														
	17	2141	2208	NO FLARE PATROL														
	17	2212	2220	NO FLARE PATROL														
	17	2229	2235	NO FLARE PATROL														
	17	2244	2247	NO FLARE PATROL														
	18	0002	0005	NO FLARE PATROL														
575 CULG	18	0243	0300	0330	S26	W05	.370	15100	17.7	47	-F		C	0300	40	.4		Y5
576 CULG	18	0247	0249	0303	N17	W82	.994	15097	12.0	16	-F		C	0249	30			Y5
577 CULG	18	0439	0443	0450	N17	W82	.994	15097	12.0	11	-F		C	0443	40			Y5
	18	1318	1405	NO FLARE PATROL														
	18	1415	1419	NO FLARE PATROL														
	18	1520	1734	NO FLARE PATROL														
	18	2028	2123	NO FLARE PATROL														
	19	0803	0825	NO FLARE PATROL														
	19	1140	1142	NO FLARE PATROL														
	19	1456	1505	NO FLARE PATROL														
	19	1510	1556	NO FLARE PATROL														
	19	1614	1709	NO FLARE PATROL														
	19	1803	2005	NO FLARE PATROL														
	20	0818	0825	NO FLARE PATROL														
	20	1800	1806	NO FLARE PATROL														
578 PALE	21	0100	0101	0104	S27	W41	.704	15100	18.0	4	-F	3	C		26		DE	Y5
579 ABST	21	0605E	0607	0620D	S24	W39	.669	15100	18.3	15D	-F		P	0607	87	1.2	DJ	Y5
	21	0812	0813	NO FLARE PATROL														
580 ABST	21	0838	0845	0911D	S24	W42	.702	15100	18.2	33D	-F		P	0845	122	1.8	EJ	Y5
581 ABST	21	0840	0845	0911D	S24	W51	.793	15100	17.5	31D	-F		P	0845	79	1.3	DJ	Y5
	21	1310	1419	NO FLARE PATROL														
582 RAMY	21	1438E	1440U	1458D	S24	W44	.723	15100	18.3	20D	-N	4	C		32			Y5
583 HTPR	21	1516		1526D	S23	W44	.720	15100	18.3	10D	-F		C	1517	30	.4		Y5
	21	1526	1736	NO FLARE PATROL														
584 PALE	21	1844	1845	1856	S24	W46	.744	15100	18.3	12	-F	3	C		30		F	Y5
585 PALE	21	2134	2139	2145	S24	W48	.764	15100	18.3	11	-F	3	C		29		F	Y5
586 PALE	21	2155	2203	2214D	S24	W48	.764	15100	18.3	19D	-F	3	C		75		DE	Y5
	21	2214	2218	NO FLARE PATROL														
	21	2222	2234	NO FLARE PATROL														
	21	2258	2300	NO FLARE PATROL														
587 VORO	22	0247	0249	0252	N22	E66	.940	15113	27.1	5	-B		C	0249	63	1.8	D	Y5
588 CULG	22	0536	0550	0600	S22	W53	.808	15100	18.3	24	-F		C	0550	40	.7	T	Y5
GRP65589	22	0634	0641+0	0706	S22	W54	.817	15100	18.2	32	-B				70	1.3	DJKRZ	
			0655+4															
ABST	22	0634	0659	0707	S22	W55	.826	15100	18.1	33	-B		C	0659	105	1.8	DJRZ	
ABST	22	0636	0641	0650	S24	W59	.863	15100	17.9	14	-F		C	0641	87	1.7	DJ	
MITK	22	0640E	0641	0645	S22	W54	.817	15100	18.2	5D	-N		P	0641	50	.9	D	
CULG	22	0642E	0655	0711	S22	W53	.808	15100	18.3	29D	-N		C	0655	60	1.1	TK	
MITK	22	0654	0659	0705	S22	W54	.817	15100	18.2	11	-B		C	0659	50	.9	D	
590 ABST	22	0815	0825	0852	S23	W54	.819	15100	18.3	37	-N		C	0825	114	2.0	DJZ	Y5
GRP65591	22	1024+1	1026+4	1048	S22	W57	.844	15100	18.2	24	-F						DHJZ	
ABST	22	1024	1030	1052	S22	W58	.852	15100	18.1	28	-F		C	1030	87	1.6	DJZ	
KHAR	22	1025	1026	1044	S22	W56	.835	15100	18.2	19	-F		V	1026			H	

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592 PALE	22	1818	1843	1904	S24	W60	.871	15100	18.3	46	-F	3	C		37		F	Y5
593 PALE	22	1920	1925	2019	S26	W60	.873	15100	18.3	59	-F	3	C		85		F	Y5
594 PALE	22	2023	2024	2042	S23	W61	.877	15100	18.3	19	-F	3	C		79		F	Y5
595 PALE	22	2049	2054	2200	S24	W60	.871	15100	18.4	71	-F	3	C		58		F	Y5
GRP65596	22	2231>9	2308 2336	2351	S23	W63	.892	15100	18.2	80	-F							
PALE	22	2231	2308	2356	S23	W63	.892	15100	18.2	85	-F	3	C		48		F	
MITK	22	2334	2336	2345	S23	W64	.899	15100	18.2	11	-N		C	2336	80	1.8	D	
597 CULG	23	0004	0006	0020	N23	E72	.969	15113	28.4	16	-N		C	0006	40			Y5
GRP65598	23	0004>9	0018 0028	0032	S23	W63	.892	15100	18.3	28	-F							
PALE	23	0004	0018	0035	S23	W63	.892	15100	18.3	31	-F	3	C		31		F	
MITK	23	0026	0028	0029	S23	W64	.899	15100	18.2	3	-N		C	0028	60	1.4	E	
GRP65599	23	0049>9	0127+0	0132	S23	W64	.899	15100	18.2	43	-F				45			
PALE	23	0049	0127	0132	S23	W64	.899	15100	18.2	43	-F	3	C		41		F	
MITK	23	0126	0127	0131	S23	W65	.906	15100	18.2	5	-F		C	0127	50	1.2	D	
GRP65600	23	0251+1	0253+0	0303	S24	W63	.893	15100	18.4	12	-N				60	1.4		
VORO	23	0251	0253	0258	S25	W62	.887	15100	18.5	7	-B		C	0253	72	1.5	D	
PALE	23	0252	0253	0308	S23	W65	.906	15100	18.2	16	-F	3	C		59		F	
601 PALE	23	0332	0333	0337	S23	W65	.906	15100	18.3	5	-F	3	C		54		F	Y5
602 CULG	23	0355	0412	0450	S22	W56	.835	15100	19.0	55	-F		C	0412	60	1.5	T	Y5
603 ABST	23	0729E	0729	0815D	S23	W68	.925	15100	18.2	46D	?F		P	0729	166		BEKZ	Y5
	IMP.1 NO # TACH1																	
	23	1620	1747	NO FLARE PATROL														
	23	1804	1853	NO FLARE PATROL														
	23	1854	1910	NO FLARE PATROL														
	23	1923	1935	NO FLARE PATROL														
	23	2017	2250	NO FLARE PATROL														
GRP65604	24	0621+1	0622+2	0630	N19	E25	.569	15112	26.1	9	-F				35	.4		
CULG	24	0621	0622	0631	N19	E26	.579	15112	26.2	10	-N		C	0622	40	.5		
MANI	24	0622	0624	0629	N20	E25	.578	15112	26.1	7	-F	3	P		30	.3		
605 LVOV	24	1202	1207	1220	N19	E22	.539	15112	26.2	18	1F		C	1207	200	2.4	DJ	Y5
606 KANZ	24	1359E		1359D	N18	E18	.490	15112	25.9		-F						D	Y5
	24	1815	1825	NO FLARE PATROL														
	24	2048	2055	NO FLARE PATROL														
GRP65607	25	0216+3	0221	0232D	N19	E09	.439	15112	25.8	16	-F						FK	
CULG	25	0216	0235	0305	N19	E11	.450	15112	25.9	49	-N		C	0226	80	.9	FK	
MANI	25	0219	0221	0232	N20	E08	.449	15112	25.7	13	-F	3	P		30	.3	F	
608 CULG	25	0346	0350	0354D	N19	E12	.457	15112	26.1	8D	-F		C	0350	20	.2		Y5
GRP65609	25	0627+2	0630+1	0727	N19	E10	.444	15112	26.0	60	-N				80	.9	DJ	
ABST	25	0627	0631	0727	N19	E11	.450	15112	26.1	60	-N		C	0631	87	1.0	DJ	
MITK	25	0629	0630	0640D	N20	E10	.459	15112	26.0	11D	-B		C	0630	70	.8	D	
610 ABST	25	0735	0739	0751	S28	E90	.999	15124	1.1	16	1F		C	0739	87		ADJ	Y5
611 CATA	25	0835E	0835	0845D	S28	E90	.999	15124	1.1	10D	-F	1		0835	28			Y5
612 KANZ	25	0920		0931	S27	E90	.999	15124	1.1	11	-F							Y5
613 KANZ	25	0947E		0949	S27	E90	.999	15124	1.2	2D	-F							Y5
614 KANZ	25	1203E		1205	S28	E90	.999	15124	1.3	2D	-F							Y5
615 KANZ	25	1354	1400	1404	S28	E90	.999	15124	1.3	10	-F							Y5
616 RAMY	25	1647E	1650U	1705	N20	E02	.431	15112	25.8	18D	-F	3	C		32		F R	Y5
	25	1920	1950	NO FLARE PATROL														

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617 PALE	25	1950E	2000U	2017D	N19	E02	.415	15112	26.0	27D	-F	3	C		45		F	Y5
	25	2018	2034	NO FLARE PATROL														
	25	2138	2356	NO FLARE PATROL														
	26	0021	0035	NO FLARE PATROL														
GRP65618	26	0053E	0055 0207	0210D	S28	E83	.988	15124	4.3	77	1F							
PALE	26	0053E	0055	0210D	S28	E83	.988	15124	1.3	77D	-F	3	C		57		FDE	
PALE	26	0053E	0207	0210D	S28	E83	.988	15124	1.3	77D	1F	3	C		85		FDE	
	26	0230	0239	NO FLARE PATROL														
619 CULG	26	0243	0247U	0337D	S28	E85	.993	15124	1.5	54D	1N		C	0247	150			Y5
620 CULG	26	0431	0440	0508	S27	E86	.994	15124	1.6	37	1N		C	0440	150			Y5
GRP65621	26	0535	0548 0640+7	0657	S30	E83	.988	15124	4.5	82	1N						DJK	
CULG	26	0535	0548	0640	S30	E90	.999	15124	2.0	65	1N		C	0548	160		K	
ATHN	26	0610E	0640	0742	S31	E80	.980	15124	1.3	92D	1N	1		0640	82	3.3		
TACH	26	0638	0647	0657	S28	E83	.988	15124	1.5	19	-N		C	0647	62		DJT	
622 CULG	26	0636	0640	0723D	N18	W04	.405	15112	26.0	47D	-F		C	0640	120	1.3		Y5
GRP65623	26	0857+0	0900+4	0924	N18	W05	.408	15112	26.0	27	-F						E	
HTPR	26	0857	0900	0924	N18	W07	.415	15112	25.8	27	-F		C	0900	10	.1		
MONT	26	0857	0904	0920D	N19	W03	.418	15112	26.1	23D	-F		C	0904	60		E	
624 KANZ	26	1003	1003	1007	N19	W06	.427	15112	26.0	4	-F						E	Y5
GRP65625	26	1011+0	1013+1	1022	S25	E83	.989	15124	4.6	11	-F				60		D	
KANZ	26	1011	1014	1021	S26	E79	.977	15124	1.3	10	-F							
ABST	26	1011	1013	1021	S25	E84	.991	15124	1.7	10	1F		C	1013	90		D	
HTPR	26	1011	1014	1021	S26	E80	.980	15124	1.4	10	-F		C	1014	20			
MONT	26	1020E	1025	1025D	S25	E83	.989	15124	1.7	5D	-N		C		40		D	
CATA	26	1020E	1020	1025	S25	E90	.999	15124	2.2	5D	1N	1		1020	56			
GRP65626	26	1030+2	1035+1	1043	S26	E82	.986	15124	4.6	13	-N				70		ADK	
ABST	26	1030	1035	1042	S26	E87	.996	15124	2.0	12	1N		C	1035	96		DKA	
KANZ	26	1032	1036	1042	S26	E80	.980	15124	1.4	10	-N							
HTPR	26	1032	1036	1043	S26	E80	.980	15124	1.4	11	-F		C	1036	30			
MONT	26	1038E	1038	1046	S25	E83	.989	15124	1.7	8D	-N		C	1038	70		D	
GRP65627	26	1031+4	1037 1043+0	1101	N20	W07	.446	15112	25.9	30	-F				60	.7	AK	
HTPR	26	1031	1043	1105	N20	W08	.450	15112	25.8	34	-F		C	1043	40	.4	E	
ABST	26	1032E	1037	1049D	N20	W06	.442	15112	26.0	17D	-F		P	1037	79	.9	DKA	
KANZ	26	1035	1043	1056	N21	W06	.457	15112	26.0	21	-F							
GRP65628	26	1052+2	1057 1107+1	1118	S26	E80	.980	15124	4.5	26	-F						E	
MONT	26	1052	1108	1118	S25	E83	.989	15124	1.7	26	-F		C	1108	40		E	
KANZ	26	1053	1107	1121	S26	E78	.974	15124	1.3	28	-F							
HTPR	26	1054	1057	1110	S26	E80	.980	15124	1.5	16	-F		C	1057	10			
GRP65629	26	1125+3	1131+0	1146	S27	E81	.983	15124	4.6	21	-N						E	
KANZ	26	1125	1131	1148	S27	E80	.980	15124	1.5	23	-N							
MONT	26	1125	1131	1146	S26	E82	.986	15124	1.6	21	-N		C	1131	60		E	
HTPR	26	1128	1131	1137	S28	E80	.980	15124	1.5	9	-F		C	1131	20			
GRP65630	26	1247+0	1248+1	1252	S32	E84	.990	15124	4.8	5	-F						D	
MONT	26	1247	1249	1253	S33	E85	.992	15124	1.9	6	-F		C	1249	40		D	
KANZ	26	1247	1248	1251	S31	E83	.988	15124	1.8	4	-F							
GRP65631	26	1325+1	1327 1344+1	1350	S26	E80	.980	15124	4.6	25	-F							
MONT	26	1325	1327	1331	S25	E82	.986	15124	1.7	6	-F		C	1327	20		D	
KANZ	26	1326	1345	1351	S25	E80	.980	15124	1.6	25	-F							
HTPR	26	1339	1344	1350	S27	E79	.977	15124	1.5	11	-N		C	1344	60		E	
632 PALE	26	1826	1826	1833	S33	E71	.946	15124	1.1	7	-F	3	C		30		DE	Y5
633 PALE	26	1845	1845	1859	S30	E75	.962	15124	1.4	14	-F	3	C		50		DE	Y5
634 PALE	26	1954	1954	2001	S33	E75	.963	15124	1.5	7	-F	3	C		21		DE	Y5

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	DATE JAN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
635 PALE	26	2017	2018	2026	S33	E75	.963	15124	1.5	9	-F	3	C		41		DE	Y5
636 PALE	26	2029	2031	2053	S33	E75	.963	15124	1.5	24	-N	3	C		45		DE	Y5
637 PALE	26	2121	2127	2137	S33	E74	.959	15124	1.4	16	1N	3	C		115		DE F	Y5
GRP65638	26	2251+0	2251+0	2259	N19	W15	.480	15112	25.8	8	-F				40	.4	F	
PALE	26	2251	2251	2259	N19	W15	.480	15112	25.8	8	-F	3	C		40		F	
PALE	26	2251	2251	2259	N19	W15	.480	15112	25.8	8	-F	3	V		40		F	
639 PALE	26	2312	2313	0020	N19	W14	.472	15112	25.9	68	-N	3	C		71		FDE	Y5
GRP65640	26	2316+0	2316+0	2319	S30	E73	.954	15124	4.4	3	-F				20		F	
PALE	26	2316	2316	2319	S30	E73	.954	15124	1.4	3	-F	3	C		22		F	
PALE	26	2316	2316	2319	S30	E73	.954	15124	1.4	3	-F	3	V		22		F	
641 PALE	26	2357	2417	0021D	S28	E84	.991	15124	2.3	24D	-F	3	C		47		DE	Y5
642 PALE	27	0116	0117	0123	S27	E73	.953	15124	1.5	7	-F	3	V		27		F	Y5
643 PALE	27	0147	0148	0202	S27	E73	.953	15124	1.5	15	-F	3	V		31		F	Y5
644 PALE	27	0231	0232	0236	S27	E73	.953	15124	1.6	5	-F	3	V		18		F	Y5
645 VORO	27	0312	0314	0322	S31	E75	.962	15124	1.8	10	-B		C	0314	36	1.4	D	Y5
GRP65646	27	0328+1	0334+0	0352	N19	E90	1.001	15126	5.9	24	1F				120			
MITK	27	0328	0334	0354	N19	E90	1.001	15126	2.9	26	1N		C	0334	100			
VORO	27	0329	0334	0349	N19	E90	1.001	15126	2.9	20	1F		C	0334	152			
GRP65647	27	0351+2	0357+1	0411	S30	E75	.962	15124	4.8	20	1N				100		DJ	
VORO	27	0351	0357	0410	S30	E74	.958	15124	1.7	19	1N		C	0357	116	4.1	DJ	
MITK	27	0353	0358	0412	S30	E77	.970	15124	1.9	19	1N		C	0358	90			
648 MITK	27	0511	0518	0529	S32	E72	.950	15124	1.6	18	1N		C	0518	80		D	Y5
GRP65649	27	0842+4	0850+1	0900	S31	E71	.945	15124	4.7	18	-N							
KANZ	27	0842	0850	0900	S31	E71	.945	15124	1.7	18	-N							
MONT	27	0846	0851	0900	S32	E72	.950	15124	1.8	14	1N		C	0851	200			
GRP65650	27	0855+1	0856+0	0902	S26	E69	.932	15124	4.5	7	-F						D	
MONT	27	0855	0856	0900	S25	E70	.937	15124	1.6	5	-F		C	0856	20		D	
KANZ	27	0856	0856	0903	S27	E68	.926	15124	1.5	7	-F							
GRP65651	27	0949+0	0952+2	0959	N19	W20	.523	15112	25.9	10	-F						E	
KANZ	27	0949	0954	0958	N19	W19	.514	15112	26.0	9	-F							
MONT	27	0949	0952	1000	N19	W21	.532	15112	25.8	11	-F		C	0952	60		E	
GRP65652	27	1021+0	1025+2	1047	N19	E90	1.001	15126	6.2	26	-N						W	
MONT	27	1021	1025	1047	N19	E90	1.001	15126	3.2	26	-N		C	1025	70		W	
KANZ	27	1021	1027	1047	N19	E90	1.001	15126	3.2	26	-N							
CATA	27	1030E	1030	1055	N17	E90	1.000	15126	3.2	25D	2N	1		1030	196			
GRP65653	27	1413+2	1415+5	1434	N19	E90	1.001	15126	6.3	21	-N							
KANZ	27	1413	1420	1427	N20	E90	1.001	15126	3.3	14	-N							
CATA	27	1415	1415	1440	N18	E90	1.000	15126	3.3	25	1N	1		1415	67			
654 PALE	27	1813	1815	1815	S17	E60	.863	15123	1.3	2	-F	3	C		15		DE	Y5
655 PALE	27	1837	1838	1854	S17	E59	.855	15123	1.2	17	-N	3	C		111		DE	Y5
656 PALE	27	1838	1839	1856	S32	E68	.930	15124	1.9	18	-F	3	C		39		DE	Y5
657 PALE	27	1940	1940	1946	S32	E67	.924	15124	1.8	6	-F	3	C		15		DE	Y5
658 PALE	27	2023	2025	2027	S32	E67	.924	15124	1.9	4	-F	3	C		24		DE	Y5
GRP65659	27	2037	2040+6	2057	S16	E60	.863	15123	4.4	20	-F							
PALE	27	2037	2040	2103	S17	E58	.846	15123	1.2	26	-F	3	C		25		DE	
RAMY	27	2044E	2046	2050	S16	E62	.879	15123	1.5	6D	-F	3	C		80			
660 VORO	28	0146	0152	0202	N14	W33	.619	15112	25.6	16	-B		C	0152	125	1.6	EJ	Y5
661 VORO	28	0248	0250	0303	N23	W27	.629	15112	26.1	15	-B		C	0250	54	.7	EJ	Y5

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GRP65662	28	0447+3	0448	0506	S18	E13	.304	15115	29.2	19	-N						EH	
			0455															
VORO	28	0447	0448	0459D	S18	E13	.304	15115	29.2	12D	-B		C	0448	63	.6	EH	
MANI	28	0450	0455	0506	S19	E13	.315	15115	29.2	16	-F	3	P		40	.4	H	
663 ABST	28	0745E	0748	0754D	S17	E54	.809	15123	1.4	9D	-F		P	0748	35	.6	DJ	Y5
664 ABST	28	0810E	0813	0831	N17	W35	.661	15112	25.7	21D	-F		P	0813	44	.6	DJ	Y5
665 ABST	28	0908	0910	0915	N16	E62	.907	15125	2.0	7	-F		C	0910	70	1.6	EJ	Y5
666 ABST	28	0952E	0956	1032D	N18	W34	.657	15112	25.9	40D	-F		P	0956	79	1.1	DGJ	Y5
	28	1250	1314	NO FLARE PATROL														
	28	1330	1755	NO FLARE PATROL														
667 PALE	28	1818	1819	1825	N18	W39	.710	15112	25.8	7	-F	3	C		19		DE	Y5
	28	1838	1901	NO FLARE PATROL														
668 PALE	28	1910	1912	1916	S30	E51	.806	15124	1.6	6	-F	3	C		20		DE	Y5
	28	1935	1944	NO FLARE PATROL														
669 PALE	28	1944E	1954	2033	N18	W41	.730	15112	25.7	49D	-F	3	C		87		DE F	Y5
GRP65670	28	1949	1949+2	1959	S18	E46	.726	15123	4.3	10	-F						E	
PALE	28	1949	1949	1959	S18	E46	.726	15123	1.3	10	-F	3	C		24		DE	
PALE	28	1949	1951	1959	S18	E46	.726	15123	1.3	10	-F	3	C		24		DE	
671 PALE	28	1958	2002	2022	S30	E50	.797	15124	1.6	24	-F	3	C		91		DE F	Y5
	28	2042	2135	NO FLARE PATROL														
	28	2138	2159	NO FLARE PATROL														
672 PALE	28	2222	2224	2247	N20	W40	.731	15112	25.9	25	-F	3	C		101		DE	Y5
673 CULG	29	0549	0551	0610	N24	W41	.764	15112	26.2	21	-N		C	0551	80	1.2		Y5
	29	0728	0735	NO FLARE PATROL														
	29	0803	0810	NO FLARE PATROL														
	29	0915	0925	NO FLARE PATROL														
	29	1005	1035	NO FLARE PATROL														
	29	1038	1041	NO FLARE PATROL														
674 ABST	29	1040E	1043	1054D	N23	E70	.962	15126	3.7	14D	-F		P	1043	87		DJ	Y5
	29	1054	1059	NO FLARE PATROL														
	29	1100	1110	NO FLARE PATROL														
	29	1140	1358	NO FLARE PATROL														
	29	1401	1407	NO FLARE PATROL														
	29	1413	1434	NO FLARE PATROL														
	29	1438	1508	NO FLARE PATROL														
	29	1640	1712	NO FLARE PATROL														
	29	1739	1936	NO FLARE PATROL														
	29	2000	2009	NO FLARE PATROL														
675 PALE	29	2027E	2027U	2045	S17	E31	.535	15123	1.2	18D	-F	3	C		24		F	Y5
	29	2030	2043	NO FLARE PATROL														
	29	2045	2156	NO FLARE PATROL														
	29	2213	2255	NO FLARE PATROL														
GRP65676	30	0138+1	0140+3	0219	S30	E35	.654	15124	4.7	41	1N				220	3.0	F	
MANI	30	0138	0143	0211D	S31	E36	.670	15124	1.8	33D	1N	3	P		160	2.2	F	
PALE	30	0139	0140	0219	S29	E34	.637	15124	1.6	40	1N	3	C		287		F	
677 ABST	30	0736E	0741	0752	N17	W62	.909	15112	25.7	16D	-F		P	0741	79	1.8	DJ	Y5
678 ABST	30	1004	1006	1010D	N17	E53	.840	15126	3.4	6D	-F		P	1006	70	1.3	DJZ	Y5
679 HTPR	30	1249	1250	1253	N14	W67	.936	15112	25.5	4	-N		C	1250	30	.7		Y5
680 HTPR	30	1305	1308	1311	N13	W67	.935	15112	25.5	6	-F		C	1308	10	.2		Y5
	30	1356	1408	NO FLARE PATROL														
	30	1424	1445	NO FLARE PATROL														

Hα SOLAR FLARES

JANUARY 1978

OBSERVATORY	OBSERVED UT: DATE JAN	START	MAX. PHASE	END	LOCATION: APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	DURATION MIN.	IMPORTANCE	OBS.: COND	TYPE	MEASUREMENTS: TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	REMARKS	
	30	1447	1544	NO FLARE PATROL														
	30	1548	1803	NO FLARE PATROL														
	30	1954	2151	NO FLARE PATROL														
	30	2232	2300	NO FLARE PATROL														
GRP65681	31	0152+2	0157 0206	0211	N18	E41	.731	15126	6.2	19	-N						J	
HITK	31	0152	0157	0200	N19	E41	.737	15126	3.2	8	-N		C	0157	60	.9	D	
VORO	31	0154	0206	0221	N18	E42	.741	15126	3.2	27	-B		C	0206	63	.9	EJ	
	31	0507	0522	NO FLARE PATROL														
	31	0528	0533	NO FLARE PATROL														
682 ABST	31	0659E	0702	0741D	N20	E39	.723	15126	3.2	42D	1F		P	0702	227	3.4	FJ	Y5
GRP65683	31	0702+1	0707 0716	0737	S32	E20	.531	15124	4.8	35	-N				140	1.7	JK	
ABST	31	0702	0707	0733	S31	E18	.503	15124	1.6	31	-F		C	0707	140	1.7	DJ	
ABST	31	0703	0716	0741D	S32	E23	.556	15124	2.0	38D	1N		P	0716	227	2.8	FJK	
CATA	31	0710E	0710	0715D	S33	E20	.542	15124	1.8	5D	-B	2		0710	140	1.7		
GRP65684	31	0837	0837+3	0853	N19	E39	.717	15126	6.3	16	-F						JZ	
KANZ	31	0837	0837	0849	N19	E39	.717	15126	3.3	12	-F						E	
ABST	31	0838E	0840	0854D	N21	E39	.729	15126	3.3	16D	-F		P	0840	87	1.3	DJZ	
HTPR	31	0844E		0853	N18	E39	.711	15126	3.3	9D	-F		C	0847	20	.2		
GRP65685	31	0919>9	0937+4	0945D	N20	E38	.713	15126	6.2	26	-F						DK	
KANZ	31	0919	0941	0945	N19	E38	.707	15126	3.2	26	-F						D	
ABST	31	0930	0937	1059D	N21	E39	.729	15126	3.3	89D	-F		P	0937	87	1.3	DK	
GRP65686	31	1021>9	1035 1046	1052	N16	W81	.993	15112	25.4	31	-F						ADJ	
KANZ	31	1021	1035	1045	N16	W78	.985	15112	25.6	24	-F							
ABST	31	1042	1046	1059D	N16	W85	.998	15112	25.1	17D	-F		P	1046	87		ADJ	
GRP65687	31	1232	1237+1	1245	N18	E37	.690	15126	6.3	13	-F						E	
HTPR	31	1232	1238	1242	N18	E37	.690	15126	3.3	10	-F		C	1238	30	.4	E	
KANZ	31	1233E	1237	1247	N19	E37	.697	15126	3.3	14D	-F							
688 KANZ	31	1301	1315	1326	N17	W78	.986	15112	25.7	25	-F							Y5
GRP65689	31	1328+1	1330+0	1339	N18	E36	.680	15126	6.3	11	-F						E	
HTPR	31	1328	1330	1338	N18	E37	.690	15126	3.3	10	-F		C	1330	50	.6	E	
KANZ	31	1329	1330	1339	N18	E35	.669	15126	3.2	10	-F							
690 HTPR	31	1402	1412	1435	N18	E35	.669	15126	3.2	33	-F		C	1412	50	.6	E	Y5
	31	1430	1445	NO FLARE PATROL														
	31	1558	1732	NO FLARE PATROL														
691 PALE	31	2101	2103	2106	N18	W88	1.000	15112	25.3	5	-F	3	C		18		F	Y5

"Remarks":

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

JANUARY 1978

DAILY FLARE INDICES
Includes all Flares

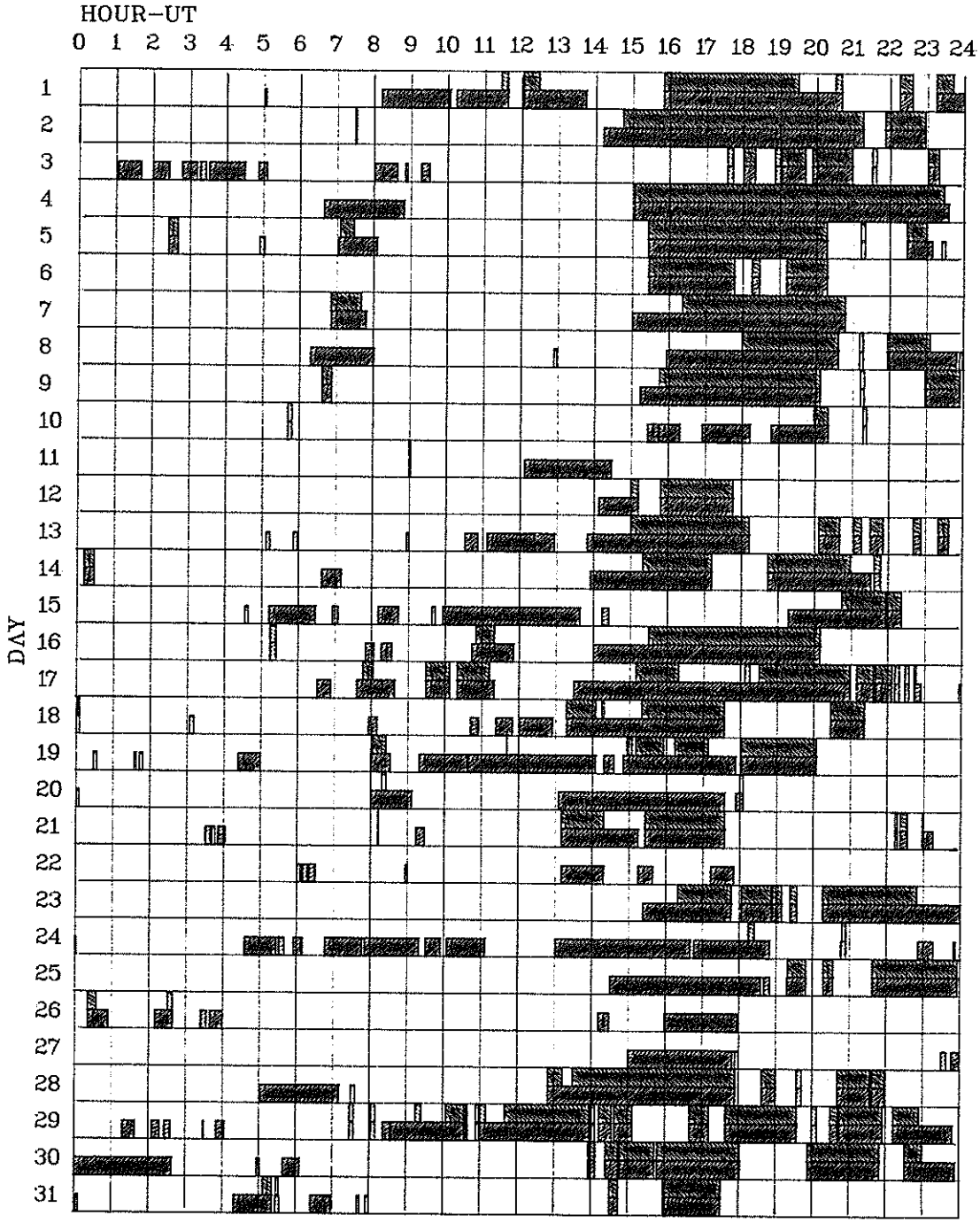
Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.
780101	436.01	18.7	780111	28.29	24.0	780121	19.84	20.4
780102	61.25	16.3	780112	39.32	21.8	780122	13.35	24.0
780103	212.36	21.2	780113	41.65	19.2	780123	9.01	18.7
780104	44.42	15.6	780114	25.37	19.4	780124	21.12	23.7
780105	28.29	17.9	780115	1.93	22.4	780125	33.34	20.9
780106	30.61	20.3	780116	5.73	18.7	780126	51.99	23.6
780107	49.08	18.8	780117	35.59	17.2	780127	31.46	24.0
780108	220.47	20.1	780118	7.46	20.0	780128	37.57	17.4
780109	25.66	18.3	780119	0.00	19.7	780129	7.99	14.8
780110	28.29	23.4	780120	0.00	23.8	780130	34.42	17.8
						780131	35.92	21.9

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

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

JANUARY 1978



Observatories included in total patrol:

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

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

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JANUARY 1978

JAN 1978	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	MEAN	INT	POLARIZATION OR REMARKS
1	5730	IRKU	3	S	0556	0558.4	4	14			L
	2695	ATHN	3	S	0557.8	0558.4	7.4	13.8	4.1		
	4995	ATHN	3	S	0557.8	0558.3	12.2	26.6	8		
	8800	ATHN	3	S	0558.2	0558.8	4.4	21	6.3		
	100	HIRA	7	C	0603.5	0604.5	1	450	200		WL
	500	HIRA	46	C	0604	0608	24	17	5		O
	200	HIRA	27	RF	0606	0609.5	13	10	3		O
	100	HIRA	7	C	0608.2	0609.8	2	600	150		O
	100	HIRA	42	F	0638	0639	2	300	100		WL
	260	ONDR	44	NS	0800 E		360 D	22	3		
	245	SGMR	44	NS	1218 E	1739	538 D	61.2			
	410	SGMR	44	NS	1218 E	1736.8	538 D	22.5			
	9100	ARCE	25	R	0903.1		21				
	8800	ATHN	3	S	0917.9	0920.8	8.9	21	6.3		
	1470	BERL	1	S	0919.3	0919.7	2.2	5			
	3000	BERL	1	S	0919.3	0920.1	1.7	6			
	9500	BERL	1	S	0919.5	0920.2	1.5				
	1420	ARCE	40	F	0919.6	0920.1	2.2				
	4995	ATHN	3	S	0919.6	0920.8	1.7	16.9	5.1		
	930	BORD	41	F	0919.7	0920.2	2	102	2		
	2695	ATHN	1	S	0920.1	0920.5	7	6.9	2.1		
	9100	ARCE	3	S	0920.3	0920.8	2				
	1415	ATHN	3	S	0920.4	0920.5	2.4	19.6	5.9		
	9100	GORK	2	S/F	0920.6	0921	1	16.3	4.4		
	9100	GORK	29	PBI	0920.6	0937.3	37	8.9	4.1		
	6100	KISV	29	PBI	0920	0921	40	16			
	9100	ARCE	20	GRF	0925.9	0936.4	162				
	930	BORD	41	F	1010.7	1011	.3	72	2		
	1420	ARCE	4	S/F	1035.2	1035.5	.5				
	930	BORD	41	F	1035.7	1035.7	.9	72	2		
	1420	ARCE	2	S/F	1104.6	1104.9	.6				
	930	BORD	41	F	1105	1105.7	2.7	66	2		
	1420	ARCE	4	S/F	1107	1107.4	.6				
	8800	ATHN	3	S	1212.3	1214	4.1	13.7	4.1		
	2800	OTTA	45	C	1502.3	1503	4.7	5	1.2		
	2800	OTTA	20	GRF	1520	1524	40	3.2	1.6		
	2800	OTTA	21	GRF	1615	1636	65	4.4	2		
	2800	OTTA	1	S	1634.5	1635.1	1.5	3.8	1.9		
	2695	BOUL	1	S	1636	1636.5	1	3	1		
	2800	OTTA	40	F	1735	1736.5	3	2.6			
	2800	OTTA	20	GRF	1800	1814	30	2.4	1.2		
	2800	OTTA	20	GRF	1845	1915	90	4	2		
	4995	BOUL	2	SF	1941	1943	2	11	4		
	2695	BOUL	1	S	1943.5	1945.5	1.5	4	1		
	2695	PENT	20	GRF	2020	2030	60	1	0.5		
	9400	HUAN	20	GRF	2031.6	2124.5	52.9	16.3	3.1		O
	9400	HUAN	28	PRE	2135.7	2147.7	12	16.3	4.9		L
	9400	HUAN	45	C	2147.7	2206.8	19.1				L
	9400	HUAN	29	PBI	2206.8	2219.7	12.9	65.1	44.8		L
	1420	BOUL	47	GB	2137.5	2149	91 D	239	65		
	2695	PENT	47	GB	2138.5	2152	48	650	145		
	2800	OTTA	29	PBI	2226.5	2226.5	30	18			
	2695	BOUL	47	GB	2139.5	2154	100 D	544	82		
	4995	BOUL	47	GB	2144.5	2156.5	69.5	496	27		
	100	HIRA	48	C	2150 E		310 D	1200 D			WL
	200	HIRA	48	C	2150 E		70 D				MR
	1415	MANI	3	S	2235.5	2236.7	2.3	138	70.8		
	208	VORO	44	NS	2300	0105	360	27	15		
	200	HIRA	27	RF	2320	0025	130	40	10		MR
2	200	GORK	43	NS	0630		267		5		
	100	GORK	44	NS	0630 E		270		5		
	127	TORN	44	NS	0740 E	0956.3	410 D	75			V=2
	260	ONDR	44	NS	0820 E		347 D	50	5		
	245	SGMR	44	NS	1218 E	1530.5	539 D	37.4			3,CONT
	410	SGMR	44	NS	1218 E	1639	539 D	45			3,CONT
	8800	MANI	21	GRF	0701.8	0702.1	.8	131.2	40.2		
	1415	MANI	3	S	0702.3	0702.4	.2	7.1	4.3		
	8800	MANI	8	S	0702.3	0702.3	.1	1850	900		
	202	IZMI	41	F	0723.8	0724.2	11.7	155			
	606	MANI	3	S	0816.9	0817.8	1.5	17.1	8		
	1415	MANI	3	S	0817.5	0817.8	.6	2.8	1.4		
	2695	MANI	3	S	0817.5	0817.8	.6	4	2		
	127	TORN	45	C	0820.9	0821.1	2	155	100		
	6100	KISV	2	S/F	0947	0948	3	4			
	237	TRST	41	F	1158.6	1158.8	.4	110			O
	2800	OTTA	20	GRF	1552	1602	20	1.6	0.8		
	2800	OTTA	20	GRF	1725	1733	30	3.2	1.6		
	2800	OTTA	20	GRF	1920	1940	55	2	1		
	4995	BOUL	8	S	1941.5	1943.5	2	24	8		
	2695	BOUL	2	SF	1943.5	1944	1.5	4	1		
	2695	PENT	20	GRF	2022	2050	90	2.4	1.2		
3	200	HIRA	8	S	0308	0308.5	.8	500	50		O

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JANUARY 1978

JAN 1978	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	MEAN	INT	POLARIZATION OR REMARKS
	100	HIRA	8	S	0308	0308.2	.5	1100	150		WL
	200	HIRA	8	S	0359.5	0359.7	.5	45	15		D
	5730	IRKU	1	S	0543	0543.8	3	10			L
	100	GORK	44	NS	0624 E		96		5		
	127	TORN	44	NS	0740 E		420 D				V=1
	260	ONDR	44	NS	0830 E		328 D	48			
	100	GORK	43	NS	0951		129		200		
	245	SGMR	44	NS	1218 E	1624.5	539 D	288			4,CONT
	410	SGMR	44	NS	1218 E	1534.4	539 D	18.9			4,CONT
	6100	KISV	45	C	0646	0648	14	4			
	9100	GORK	20	GRF	0729.3	0739.4	36.9	13	5.6		
	6100	KISV	4	S/F	0815	0816	5	2			
	3100	GRIM	1	S	0839	0842	6	6	2		
	127	TORN	7	C	0914.4	0915.3	1.5	45	15		
	100	GORK	45	C	0915	0915.3	.9	35			
	100	GORK			0915.5			35			
	237	TRST	41	F	0915.3	0915.4	.7	40			6L
	100	GORK	41	F	0936	0936.5	14	30			
	100	GORK			0936	0946.5		28			
	100	GORK			0936	0949.4		25			
	127	TORN	7	C	0946.3	0947.3	2	70	12		
	1420	ARCE	1	S	0957.1	0957.3	.6				
	930	BORD	46	C	1011	1017.6	22	147	20		
	408	TRST	49	GB	1014	1018.7	19.5	140 D			
	650	GORK	23	GRF	1014.6		77				
	234	POTS	45	C	1014	1048	234	700			
	3100	GRIM	7	C	1015.5	1017	7	24	8		
	3100	GRIM			1015.5	1019		45	15		
	3100	GRIM	29	PBI	1015.5	1023	16	10			
	260	ONDR	49	GB	1015.5		45	216 D	59		
	2695	ATHN	20	GRF	1015.7	1019.6	19.9	471	283		
	808	ONDR	45	C	1015.8	1018.3	18	162	35		
	4995	ATHN	20	GRF	1016.3	1019.7	19.3	24.2	14.5		
	237	TRST	47	GB	1016.4	1022.3	6.9	725			29L
	1470	BERL	4		1016.5	1018.8	35	73			
	1420	ARCE	46	C/F	1016.8	1019.1	13.2				
	1420	ARCE			1016.8	1018.3	1.9				
	1420	ARCE			1018.7	1019.1	4.3				
	1420	ARCE			1023	1023.5	3.3				
	1420	ARCE			1026.3	1027.1	3.7				
	1420	ARCE	30	PBI	1030		50				
	536	ONDR	46	C	1016.8	1018.2	35	130	15		
	3000	BERL	4		1016	1018.7	24	103			
	650	GORK	4	S/F	1017	1018.6	10.7	120			
	1415	ATHN	20	GRF	1017.1	1019.3	16.7	89.4	53.6		
	2950	GORK	4	S/F	1017.3	1019.5	11.6	156			
	200	GORK	46	C	1017.4	1018.2	8.2	130			
	200	GORK			1017.4	1021.7		5200			
	100	GORK	46	C	1017.5	1022.3	5.5	606000			
	9500	BERL	4		1017.5	1019.2	31	17			
	9100	GORK	20	GRF	1017.6	1020.1	25.5	21	8		
	127	TORN	47	GB	1017.8	1022.3	8.5	660	160		
	113	POTS	45	C	1017	1402	237	700			
	6100	KISV	45	C	1017	1020	28	14			
	8800	ATHN	20	GRF	1018.7	1020.1	13.6	9.5	5.7		
	3100	GRIM	3	S	1024	1025	2	15	5		
	200	GORK	46	C	1031.4	1042.3	27.6	140			
	200	GORK			1031.4	1043		290			
	200	GORK			1031.4	1049.8		1300			
	127	TORN	25	R	1031 U		250 D	450	170		INCOMPLETE
	408	TRST	49	GB	1033.5	1043.9	13.5	180			
	237	TRST	47	GB	1036	1044.5	238.50	410			63R
	237	TRST			1036	1049.7		1620			81R
	237	TRST			1036	1051.8		600			85R
	237	TRST			1036	1057.5		650			92R
	1420	ARCE	40	F	1038.9	1039.2	6				
	408	TRST	49	GB	1047	1049.7	12	150			
	9500	BERL	20		1101.5	1102.5	12	6			
	1470	BERL	1	S	1102	1102.3	1.5	3			
	1420	ARCE	1	S	1242.8	1242.9	.5				
	18	MCMA	41	F	1528	1533	5			1	
	2695	PENT	20	GRF	2044	2048	20	1.6	0.8		
	9400	HUAN	1	S	2230	2234.3	4.3	20.2	7.1		L
4	4995	MANI	3	S	0254.5	0255.1	3.5	45.4	27.2		
	8800	MANI	3	S	0254.5	0255	1	26.6	15.7		
	5730	IRKU	45	C	0254	0255.4	9	40			L
	5730	IRKU			0254	0257.2		33			R
	5730	IRKU	49	GB	0304	0305.3	40	31			L
	5730	IRKU			0304	0309.6		41			R
	5730	IRKU			0304	0326		47			R
	5730	IRKU			0304	0327		57			R
	5730	IRKU			0304	0334		27			R
	5730	IRKU			0304	0334.8		25			R
	5730	IRKU	1	S	0355	0357.5	6	9			R

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	208	VORO	45	C	0407.6	0409	3.4	300			
	200	HIRA	46	C	0408	0409	3	700	100		WRWL
	100	HIRA	46	C	0408.2	0409	4	1200	500		WRWL
	5730	IRKU		GB	0633		38	150 D			R
	9100	GORK	2	S/F	0719.2	0720.5	4.5	27	5.8		
	5730	IRKU	1	S	0719	0720.2	3	10			R
	8800	MANI	3	S	0719.4	0720.4	4.1	37.2	11.2		
	6100	KISV	3	S	0720	0723.5	13	9			
	260	ONDR	44	NS	0820 E		323 D	94			
	245	SGMR	44	NS	1218 E	1715	540 D	23.6			
	200	GORK	2	S/F	0826.4	0826.8	1.4	11	5		
	113	POTS	45	C	0828.5	0829.9	5	2000	300		
	3100	GRIM	1	S	0828.5	0830.5	4	7	2		
	100	GORK	46	C	0828.6		4.9	50			
	127	TORN	47	GB	0828.6	0830.4	4.5	600 U			
	200	GORK	46	C	0828.8	0830.7U	6.2	160			
	1420	ARCE	4	S/F	0828.8	0830	2.5				
	1420	ARCE	29	PBI	0831.3		12				
	6100	KISV	1	S	0828	0830	17	5			
	237	TRST	47	GB	0829.1	0830.2	3.7	265			4L
	650	GORK	1	S	0829.2	0830.4	3	4	2		
	2950	GORK	20	GRF	0829.4	0830.6	9.6	16	4.7		
	6100	KISV	1	S	1053	1055	6	2			
	237	TRST	41	F	1112.7	1112.9	.3	53			4R
	930	BORD	41	F	1251.4	1251.7	.6	13	2		
	2695	PENT	20	GRF	2045	2056	45	2	1		
5	3100	GRIM	1	S	0759	0802	6	3	1		
	260	ONDR	44	NS	0827 E		335 D	34			
	245	SGMR	44	NS	1218 E	1527.8	540 D	17.6			
	1470	BERL	1	S	0947.6	0948.2	.9	4			
	930	BORD	8	S	1103.7	1103.7	.1	16	1		
	237	TRST	41	F	1431.2	1431.2	.4	55			21L
	9400	HUAN	20	GRF	1542.7	1556.4	13.7	10	5.4		L
	2800	OTTA	8	S	1934.2	1934.5	0.8	2.6	1.3		
6	100	HIRA	8	S	0435.4	0436	1	400	80		WL
	200	HIRA	8	S	0435.5	0435.9	.6	600	500		WL
	9100	GORK	1	S	0808.3	0808.5	2.3	12.8	2.8		
	6100	KISV	29	PBI	0808	0830	5	2			
	9100	GORK	1	S	0831	0832.2	5.3	4	2		
	260	ONDR	44	NS	0840 E		320 D	16			
	127	TORN	43	NS	1150 U	1219.1	160 D	12			UNCERTN
	410	SGMR	44	NS	1218 E	1434.5	541 D	44.3			
	245	SGMR	44	NS	1218 E	1943	541 D	32.4			
	2800	OTTA	20	GRF	1650	1735	110	2.6	1.8		
	200	HIRA	44	NS	2150 E	0600	600 D	15	5		SR
	208	VORO	44	NS	2300	0405	360	35	28		
7	100	HIRA	48	C	0017		450 D		350		
	100	HIRA			0017	0200		900			SR
	100	HIRA			0017	0325		700			SR
	100	HIRA			0017	0425		650			SR
	208	VORO	49	GB	0113.5	0152	82.3	145			
	208	VORO			0113.5	0209		160			
	200	HIRA	48	C	0117		220		60		
	200	HIRA			0117	0124		150			MR
	200	HIRA			0117	0145		500			MR
	200	HIRA			0117	0407		130			SR
	500	HIRA	24	R	0120	0129	220	10	3		MR
	500	HIRA	46	C	0130	0130.2	1.2	13	8		MR
	4995	MANI	3	S	0305	0309.7	9	51.9	17.3		
	8800	MANI	3	S	0305	0305.3	5.8	99.2	37.2		NT
	4995	MANI	3	S	0323.8	0327.1	3.2	57.1	34.6		
	2695	MANI	3	S	0323.8	0327.3	3.2	35	22.7		
	8800	MANI	3	S	0323.8	0326.2	2.7	24.8	14.9		
	2930	VORO	7	C	0323	0327	10	22			
	606	MANI	3	S	0330.2	0333.6	4.8	13	4.3		
	500	HIRA	46	C	0332.7	0333.6	2.3	30	12		WR
	1415	MANI	3	S	0333.8	0334.7	1.4	30.8	20		
	500	HIRA	46	C	0355.3	0357.4	5	18	8		MR
	500	HIRA	46	C	0418	0430.4	20	20	5		WR
	500	HIRA	46	C	0614		39		20		
	500	HIRA			0614	0625.4		210			WL
	500	HIRA			0614	0620.7		35			WL
	500	HIRA			0614	0647		60			D
	500	HIRA			0614	0637.5		150			D
	606	MANI	3	S	0625.3	0626	2	65.1	43.4		
	1415	MANI	3	S	0625.3	0625.8	1.7	12.3	7.7		
	4995	MANI	3	S	0625.3	0625.7	2.3	86.5	5.2		
	3100	GRIM	1	S	0631	0631.5	1.5	3	1		
	9100	GORK	47	GB	0632.5E	0646.8U	26	412			
	9100	GORK	29	PBI	0632.5E	0658.7	108	35	15.6		
	3100	GRIM	47	GB	0633	0639	41	450	150		
	606	MANI	4	S/F	0633	0637.5	7.5	86.8	56.4		

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	8800	MANI	47	GB	0633.6	0638.3	24.9	2250	1350		
	4995	MANI	47	GB	0633.5	0638.6	23	2200	495		
	1415	MANI	4	S/F	0633.8	0639.2	20.2	215.6	138.6		
	200	HIRA	46	C	0633	0636	20	200	20		WL
	35000	NAGO	49	GB	0634	0639	16 D	950			A
	650	GORK			0638.7E	0638.8	16.1	47			
	100	GORK	27	RF	0639 E	0641 U	13	870 U			
	200	GORK	46	C	0639.6	0646	29.6	120			
	200	GORK			0639.6	0651.2		120			
	200	GORK			0639.6	0657		150			
	2950	GORK			0640.5		32				
	100	GORK	44	NS	0650		190		5		
	650	GORK	20	GRF	0657.7	0702.2	16	4	2		
	1415	MANI	3	S	0730.2	0731.8	1.8	9.2	6.2		
	606	MANI	3	S	0730.5	0731.8	1.9	43.4	21.7		
	127	TORN	26	FAL	0740 E		120 U	15			SUNRISE
	127	TORN	44	NS	0740 E		410 D				V=0
	100	GORK	43	NS	1058		44		20		
	410	SGMR	44	NS	1219 E	1526.7	542 D	18.9			CONT
	245	SGMR	44	NS	1219 E	1526.2	542 D	48.6			CONT
	3100	GRIM	26	FAL	0826	1026	120	12			
	536	ONDR	42	SER	0921	1303	222	36			
	930	BORD	41	F	0952.4	0952.6	.2	29	2		
	408	TRST	7	C	0957.9	0958.1	.3	330 D			
	260	ONDR	42	SER	0958	0958	237	27			
	100	GORK	41	F	1024.7	1025.5	4.1	50			
	100	GORK			1024.7	1026.5		55			
	100	GORK			1024.7	1028.2		40			
	408	TRST	7	C	1031.9	1032.1	.3	150 D			
	408	TRST	42	SER	1050.3	1112	46	25			
	3100	GRIM	24	R	1101	1126	25	6			
	6100	KISV	4	S/F	1101	1112.5	19	15			
	237	TRST	41	F	1103.1	1103.3	.3	190			D
	9100	ARCE	21	GRF	1104.3	1229.4	152				
	237	TRST	47	GB	1105.2	1150.3	193.5	255			68R
	237	TRST			1105.2	1219.8		1150			16R
	237	TRST			1105.2	1233.3		2500			14R
	127	TORN	45	C	1105.7	1106.7	2.2	130	10		
	9100	GORK	2	S/F	1106.1	1108	3.2	6.8	3.4		
	1420	ARCE	1	S	1106.7	1106.8	.5				
	930	BORD	41	F	1106	1106.9	1.2	13	2		
	200	GORK	46	C	1110	1129.5	54	150			
	200	GORK			1110	1139		240			
	200	GORK			1110	1143.7		340			
	3100	GRIM	1	S	1110	1125	6	3	1		
	202	IZMI	25	R	1110	1128.5	32.5	110	38		
	9400	HUAN	1	S	1110.5	1116	5.5	31.2	10.9		R
	260	ONDR	49	GB	1110		92	216 D	78		
	113	POTS	45	C	1110	1213	130	100			
	234	POTS	45	C	1110	1233.5	150	1400			
	9100	GORK	2	S/F	1111	1113	3.4	15	3.8		
	3000	BERL	20		1111.5	1201	243	14			
	9500	BERL	2	SF	1111	1113	4	9			
	9100	ARCE	3	S	1112.3	1112.7	1.8				
	127	TORN	27	RF	1123 U	1159	190 D	145	55		
	6100	KISV	45	C	1124	1217	66	214			
	1420	ARCE	21	GRF	1126.6		74				
	9100	GORK	4	S/F	1128.9	1130.8	3	66			
	650	GORK	40	F	1131.2	1134.6	4.3	5			
	1470	BERL	46		1135	1147.5	102	49			
	408	TRST	49	GB	1139.3	1148.6	15.7	220 D			
	100	GORK	46	C	1141	1149	32	2850			
	100	GORK			1141	1159.9		2770			
	9500	BERL	46		1142.5	1217.6	155	580			
	202	IZMI	7	C	1142.5	1144.3	3.7	114	43		
	930	BORD	46	C	1142	1149.3	10	115	25		
	808	ONDR	49	GB	1142	1232.4	57	242	58		
	808	ONDR			1142	1149.5		222			
	808	ONDR			1142	1210		227			
	650	GORK	46	C	1143.3	1144.5	8.3	38			
	650	GORK			1143.3	1146		43			
	650	GORK			1143.3	1149.9		85			
	1420	ARCE	4	S/F	1143.4	1146.6	12				
	9400	HUAN	28	PRE	1143.4	1203.3	19.9	26.3	15.8		R
	9400	HUAN	45	C	1143.4	1159	15.6	123.2	44.3		R
	9100	ARCE	4	S/F	1143.6	1145.9	11				
	536	ONDR	49	GB	1143	1234.5	56	416	93		
	536	ONDR			1143	1220.7		403			
	2950	GORK			1144	1146.3U	15.5	130			
	3100	GRIM	47	GB	1144	1146.5	43	100	33		
	3100	GRIM			1144	1210.5		72	24		
	3100	GRIM			1144	1216.5		125	42		
	3100	GRIM			1144	1221		100	33		
	3100	GRIM	29	PBI	1144	1227		4			
	2650	DWIN	45	C	1144	1217	50	120	50		

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	3000	BERL	4		1144	1147	17	105			
	202	IZMI	7	C	1146.2	1149	4.8	162	64		
	202	IZMI	25	R	1151	1155.2	11	56	35		
	408	TRST	49	GB	1155	1158.9	9	290 D			
	1420	ARCE	40	F	1200.3	1214	36.5				
	3000	BERL	45	C	1201	1217.6	36	127			
	9100	ARCE	46	C/F	1202.3	1217	26				
	9100	ARCE			1202.3	1210.5	9.5				
	9100	ARCE			1211.8	1213.7	4.5				
	9100	ARCE			1216.3	1217	12				
	9400	HUAN	46	C	1203.3	1222.7	19.4	290.6	141		R
	9400	HUAN			1203.3	1216.8		385.9			R
	9400	HUAN	29	PBI	1222.7	1313.5	50.8	106.7	34.2		R
	930	BORD	46	C	1203	1211.4	21	133	30		
	408	TRST	49	GB	1204	1221.2	20	1400 D			
	408	TRST	49	GB	1224	1230.5	16	1900			
	930	BORD	46	C	1226	1232.6	11	146	15		
	4995	BCUL	3	S	1842.5	1844	2.5	17	5		
	2695	BOUL	3	S	1844	1845	2.5	3	1		
	8800	SGMR	47	GB	1857	1929.7	63	761	228		CONT
	1420	BCUL	48	GB	1857	1915	91.5	447	12		
	4995	SGMR	47	GB	1858	1929.9	65	781	204		CONT
	245	SGMR	7	C	1858.4	1928.9	99.2	102.6	30.8		CONT
	410	SGMR	7	C	1858.5	1930.5	89.5	122	36.6		CONT
	2800	OTTA	28	PRE	1858.5	1911.2	24.5	28	12.6		
	2800	OTTA	47	GB	1923	1930	27	620	150		
	2800	OTTA	30	PBI	1950	1950	85	8.6	2.8		
	2800	OTTA	20	GRF	1954	1958	14	8.2	4.1		
	606	SGMR	23	GRF	1858.6	1929.9	87.4	74.2	22.3		CONT
	2695	SGMR	47	GB	1858.8	1929.8	77.2	607	182		CONT
	2695	BCUL	49	GB	1859.5	1931	87	619	33		
	1415	SGMR	46	C	1901.5	1930.2		203			CONT
	1415	SGMR	46	C	1901.5	1915.5	63.5	469	141		CONT
	4995	BOUL	47	GB	1902	1929.5	78	581	55		
	9400	HUAN	28	PRE	1907.1	1924.5	17.4	18.1	8		R
	9400	HUAN	45	C	1924.5	1938.8	14.3	3694.5	1387.5		R
	9400	HUAN	29	PBI	1938.8	2036.8	58	821	384.4		R
	245	SGMR	7	C	1935.6	1955		86.6			CONT
	245	SGMR	7	C	1935.6	1944.4	30.7	123	36.9		CONT
	410	SGMR	7	C	1936.7	1958.2		51.3			CONT
	410	SGMR	7	C	1936.7	1939.6	31.4	261	78.3		CONT
	606	SGMR	46	C	1938.2	2002.1		105.4			CONT
	606	SGMR	46	C	1938.2	1938.9	30.1	195	58.4		CONT
	200	HIRA	44	NS	2150 E	0230	440 D	15	5		SR
	208	VORO	44	NS	2300	0116	360	26	12		
8	2930	VORO	7	C	0000	0003	51	55			
	2930	VORO			0000	0025		83			
	100	HIRA	42	F	0001.5	0002	3	800			WL
	4995	MANI	3	S	0001.7	0003.5	12	72.6	47.8		
	1415	MANI	3	S	0001.8	0003.6	5.8	14.6	9.1		
	8800	MANI	3	S	0001.8	0003.5	6.5	60.7	40.5		
	100	HIRA	7	C	0007	0007	1	1200	350		WL
	606	MANI	3	S	0008.5	0009.7	7.1	21.8	13.6		
	500	HIRA	46	C	0008.8	0009.7	10	20	6		O
	100	HIRA	7	C	0009	0009.5	3.5	430	80		WL
	100	HIRA	46	C	0013	0022	20	100	50		SR
	1415	MANI	3	S	0022.6	0027.2	9.9	36.4	18.2		
	606	MANI	3	S	0022.8	0024.4	6.7	51.7	27.2		
	4995	MANI	3	S	0022.8	0025	9.7	123.9	40		
	500	HIRA	46	C	0022.8	0025.3	20	70	15		O
	8800	MANI	21	GRF	0022.9	0025	10.2	161.9	45		I
	8800	MANI	8	S	0032.2	0032.3	.1	1050	500		
	200	HIRA	46	C	0038	0039	6	25	10		O
	200	HIRA	46	C	0047	0051	7	35	15		O
	606	MANI	3	S	0050.2	0051.8	51.9	252.9	16.3		
	1415	MANI	3	S	0052.8	0052.9	5.6	9.1	3.6		
	500	HIRA	46	C	0102	0111	18	28	5		O
	200	HIRA	46	C	0110.5	0117	16	70	15		O
	500	HIRA	48	C	0150	0213	62	4000	150		WR
	2930	VORO	49	GB	0205	0215	19	403 D			
	2930	VORO	30	PBI	0232	0235	8	35			
	208	VORO	47	GB	0207	0213	24.5	240	40		
	1415	MANI	4	S/F	0208.2	0210.3	12.9	279	175		
	4995	MANI	47	GB	0208.3	0213	12.3	515	343.2		
	8800	MANI	47	GB	0208.3	0212.8	11.8	810	506		IG
	5730	IRKU	49	GB	0208.5	0209 U	50	240 D			R
	5730	IRKU			0208.5	0210 U		240 D			R
	5730	IRKU			0208.5	0212 U		240 D			R
	100	HIRA	42	F	0208.5	0217	12	1000			WL
	606	MANI	47	GB	0208.6	0212.5	11.6	2100	1300		
	200	HIRA	48	C	0209	0213	20	500	40		WR
	35000	NAGO	5	S	0210	0213	13	154			
	35000	NAGO	29	PBI	0223	0237	80	25			
	100	HIRA	27	RF	0221	0226	130	200	40		O

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	208	VORO	3	S	0244.5	0246.2	6.5	60	30		
	200	HIRA	46	C	0245	0247.5	7	75	25		O
	500	HIRA	46	C	0307.3	0308.1	2.7	28	15		MR
	500	HIRA	46	C	0311.5	0312.1	1	45	10		MR
	500	HIRA	46	C	0318.1	0319.7	2.3	20	7		WR
	6100	KISV	45	C	0703	0714	42	481			
	3100	GRIM	47	GB	0707	0710.5	10	32	11		
	3100	GRIM			0707	0712		60	20		
	3100	GRIM			0707	0714.5		66	22		
	3100	GRIM	29	PBI	0707	0717		18	6		
	8800	MANI	47	GB	0708	0713.8	18.5	986.7	658		
	9100	GORK	46	C	0708	0711	18.8	439			
	9100	GORK			0708	0712.6		1263			
	9100	GORK			0708	0714.6		1441			
	9100	GORK	30	PBI	0708	0726.8	35.2	40	12		
	4995	MANI	3	S	0708	0714.3	18.5	344.8	218		
	100	HIRA	48	C	0708.8	0713	10	1200 D	500		WL
	1415	MANI	3	S	0709	0712.6	10.5	63.6	41.3		
	500	HIRA	46	C	0709.7	0711	5	200	90		O
	606	MANI	3	S	0709.8	0712.2	4.7	114.1	72		
	200	HIRA	46	C	0709	0711.8	10	600	30		WL
	5730	IRKU	49	GB	0709	0710.8	46	105			R
	5730	IRKU			0709	0712		160			R
	5730	IRKU			0709	0715		160 D			L
	5730	IRKU			0709	0716.7		120			L
	5730	IRKU			0709	0717.8		126			L
	127	TORN	45	C	0710.5	0713.4	5	200 D	50 D		SUNRISE
	3100	GRIM	1	S	0718	0719	2	12	4		
	100	HIRA	46	C	0719.5	0720.8	3.5	350	100		WL
	3100	GRIM	1	S	0729	0732	5	14	1		
	9100	GORK	2	S/F	0730	0732.3	4	9.3	6		
	9100	ARCE	20	GRF	0932.6	1049.3	140				
	410	SGMR	44	NS	1218 E	1946.5	544 D	24.7			3,CONT
	245	SGMR	44	NS	1218 E	1719	544 D	73.2			3,CONT
	2800	OTTA	240	R	1710	1713	3	2.8	1.4		
	9400	HUAN	28	PRE	1854.1	1900	5.9	16.6	5.2		R
	9400	HUAN	3	S	1900	1906.7	6.7	76.4	35.7		R
	9400	HUAN	30	PBI	1906.7	1941.7	35	51.5	21.3		R
	2800	OTTA	46F	C	1855	1910.1	21	76	30		
	2800	OTTA			1855	1903	12.5	68			
	2800	OTTA			1907.5	1910.1	8.5	76			
	2800	OTTA	30	PBI	1916	1916	80	6.8	2.3		
	2695	BOUL	45	C	1854.5	1911.5	25	64	21		
	4995	BOUL	45	C	1854	1902.5	41	89	30		
	2695	SGMR	46	C	1856.3	1903.1		66.2	26.5		CONT
	2695	SGMR	46	C	1856.3	1918.3		75.6			CONT
	1420	BOUL	45	C	1856	1900	18	26	9		
	410	SGMR	6	S	1857	1929		111.1			CONT
	410	SGMR	6	S	1857	1913.5	37.5	91.4	36.5		CONT
	4995	SGMR	4	S/F	1857.1	1903.1	27.9	83.2	33.3		CONT
	8800	SGMR	4	S/F	1858	1902.8	21.5	63.7	25.5		CONT
	1415	SGMR	4	S/F	1859.2	1900.2	15.8	62	24.8		CONT
	606	SGMR	4	S/F	1900	1912.2	30	238	95.2		CONT
	2800	OTTA	20	GRF	1940	1947	20	2.2	1.1		
	200	HIRA	7	C	2304.3	2304.4	1	500	40		O
9	6100	KISV	21	GRF	0755	0803	20	2			
	3100	GRIM	1	S	0800	0803	5	2	1		
	260	ONDR	45	C	1010	1011.8	4.5	10	4		
	808	ONDR	3	S	1035	1035	.3	48			
	260	ONDR	2	S/F	1110.6	1110.8	1	7	2.8		
	930	BORD	8	S	1111.4	1111.4	.1	11	2		
	808	ONDR	2	S/F	1111	1111	.4	20			
	9100	ARCE	32	ABS	1118.7	1154	66				
	808	ONDR	2	S/F	1201.7	1204.3	4	16	2.5		
	260	ONDR	40	F	1202	1342.5	107	27	5		
	127	TORN	43	NS	1213	1319.9	140 D	20			V=1
	113	POTS	45	C	1218	1232.6	20	4000	800		
	930	BORD	41	F	1219.8	1220.7	1.2	13	2		
	3000	BERL	4		1223	1232	43	82			
	9500	BERL	4		1224.5	1230.7	51	64			
	808	ONDR	27	RF	1224.6	1232.4	15	29	20		
	1420	ARCE	46	C/F	1224.9	1232.5	12				
	1420	ARCE			1224.9	1230.8	7.1				
	1420	ARCE			1232	1232.5	4.9				
	1470	BERL	4		1224	1232.5	16	36			
	930	BORD	46	C	1225	1234.3	12	50	2		
	3100	GRIM	47	GB	1225	1232	27 U	70	23		
	9400	HUAN	28	PRE	1225.6	1229.2	3.6	17	7.3		O
	9400	HUAN	3	S	1229.2	1236.1	6.9	105.2	56.7		O
	9400	HUAN	29	PBI	1236.1	1316.9	40.8	25.4	7.3		O
	536	ONDR	40	F	1225	1242.5	35	17	4.8		
	2650	DWIN	45	C	1225	1233	15	65	35		
	408	TRST	7	C	1226	1226.1	.5	47			
	9100	ARCE	28	PRE	1226	1226.2	2.3				

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	9100	ARCE	4	S/F	1228.3	1231.2	9.6				
	9100	ARCE	29	PBI	1237.9		63				
	408	TRST	48	C	1227.3	1228.6	6.2	35			
	127	TORN	47	GB	1228.3	1229.4	5.5	440	260		
	127	TORN			1228.3	1230.2		490			
	127	TORN			1228.3	1232.3		770			
10	500	HIRA	46	C	0656.5	0657.2	3.5	15	5		O
	650	GORK	40	F	0657.3	0657.7	3.9	9			
	650	GORK			0657.3	0659.5		6			
	100	GORK	27	RF	0708.7	0726.8	49.8	65			
	260	ONDR	45	C	0938.2	0939.2	2	13	3		
	536	ONDR	4	S/F	0938.3	0939	1.7	17	2.5		
	808	ONDR	4	S/F	0938.3	0938.3	1.3	40			
	260	ONDR	4	S/F	0945	0945.8	1	5	2		
	930	BORD	41	F	1103.8	1104	.5	16	2		
	650	GORK	4	S/F	1125.9	1126.5	1.2	27	11		
	260	ONDR	42	SER	1247	1302.2	39	10			
	237	TRST	5	S	1302.3	1302.3	.1	80	20		O
	536	ONDR	2	S/F	1324.2	1325	1.5	13			
	808	ONDR	2	S/F	1325	1325	.4	32			
	930	BORD	41	F	1432.2	1432.3	.3	43	2		
	208	VORO	42	SER	2319.5	2325	21	145			
	200	HIRA	41	F	2320.5	2325.5	22	600			WLWR
	100	HIRA	46	C	2321	2321	2	980	150		WL
	100	HIRA	46	C	2323.8	2325	8	1200 D	450		WLWR
	100	HIRA	46	C	2334	2336	13	600	80		WL
11	200	HIRA	46	C	0319.5	0321.5	14	7	2		O
	3100	GRIM	20	CRF	0707	0740	68	7	2		
	1420	ARCE	1	S	0829.3	0829.6	1				
	9100	ARCE	20	GRF	0851.4	1029.1	120				↑
	930	BORD	41	F	1224.8	1224.9	.9	16	2		
	260	ONDR	42	SER	1230	1327.4	80	9			
	2800	OTTA	20	GRF	1740	1815	80	1.4	0.7		
	4995	MANI	3	S	2239.9	2241.7	3.1	33.3	21.2		
	8800	MANI	3	S	2239.9	2241.7	3.1	82.4	47.9		
	2695	MANI	3	S	2240	2241.7	3	16	9.2		
	1415	MANI	3	S	2240.2	2241.7	2.8	3.2	1.6		
12	930	BORD	41	F	0920.8	0921	.4	17	2		
	930	BORD	41	F	0935	0935.1	.3	15	2		
	18	MCMA	6	S	1344	1346	2			1	
	930	BORD	41	F	1437.4	1437.6	.6	13	2		
	2800	OTTA	20	GRF	1500	1538	50	1.4	0.7		
	2800	OTTA	240	R	1927	1930	3	1.2	0.6		
13	208	VORO	42	SER	0141	0143	8	56			
	606	MANI	3	S	0712.9	0713.3	.8	27.5	17.5		
	1415	MANI	3	S	0713.1	0713.3	.4	2.7	1.3		
	3100	GRIM	26	FAL	0717	0831	74	6	2		
	260	ONDR	44	NS	0820 E		341 D	50	1.8		
	245	SGMR	44	NS	1216 E	1426.2	552 D	5.6			
	930	BORD	41	F	0923.8	0924	.3	44	2		
	202	IZMI	41	F	1021	1022.3	6.5	225			
	237	TRST	41	F	1022.2	1022.3	.1	312			10R
	237	TRST	41	F	1026.6	1026.8	.8	223			14R
	930	BORD	41	F	1224.2	1224.3	.8	18	2		
	18	MCMA	6	S	1419	1421	2			2	
	18	MCMA	42	SER	1439	1447	11			2	
	2800	OTTA	27	RF	1755		120	1.4	1.3		
	2800	OTTA	24	R	1755	1805	10	1.4	0.7		
	2800	OTTA	24P	R	1805		100	1.4			
	2800	OTTA	26	FAL	1945	1955	10	-1.4	-0.7		
14	260	ONDR	44	NS	0810 E		360 D	22			
	127	TORN	44	NS	0820 E	1132.3	380 D	45			V=1
	18	MCMA	6	S	1324	1326	2			2	
	18	MCMA	6	S	1348	1349	2			1	
	100	HIRA	44	NS	2150 E	0100	600 D	200	70		SL
	200	HIRA	44	NS	2150 E	0530	600 D	80	40		ML
	208	VORO	44	NS	2300	0245	360	50	25		
15	200	GORK	44	NS	0621 E		339		45		
	100	GORK	44	NS	0621 E		339		30		
	202	IZMI	44	NS	0700		300	42			
	127	TORN	44	NS	0710 E	0802.3	450 D	250			V=2
	260	ONDR	44	NS	0820 E		366 D	74	12		
	410	SGMR	44	NS	1216 E	1559.2	554 D	11.6			
	245	SGMR	44	NS	1216 E	1639.2	554 D	141			
	100	GORK			0621 E						
16	3100	GRIM	20	CRF	0754	0805	45	3	1		
	3100	GRIM	1	S	0828	0828.5	1	3	1		
	1470	BERL	1	S	0856.6	0857.1	1	3			

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	3000	BERL	1	S	0857.6	0958.1	.9	2.5			
	3100	GRIM	26	FAL	0918	1059		2			
	202	IZMI	43	NS	1000		120	60			
	410	SGMR	44	NS	1215 E	1644.1	557 D	8.7			
	245	SGMR	44	NS	1215 E	1416.6	557 D	49			
	127	TORN	43	NS	1227 U	1319.5	140 D	15			V=1
17	606	MANI	3	S	0623.5	0624	1	56.2	35.5		
	1415	MANI	3	S	0623.8	0624	.4	10.7	7.1		
	3100	GRIM	24	R	0712	0926		4			
	245	SGMR	43	NS	1325	1628.9	488 D	20.7			3
	2800	OTTA	20	GRF	1352		130	5.4	2.7		
	113	POTS	45	C	1409.5	1410	1.6	150	40		
	1470	BERL	1	S	1409.7	1410.3	1.3	1.4			
	3000	BERL	1	S	1409.7	1410.4	1.3	4.3			
	2800	OTTA	8	S	1739.9	1740	0.6	1.6	0.8		
18	208	VORO	43	NS	0220		160		7		
	245	SGMR	44	NS	1214 E	1841.2	560 D	106			
	410	SGMR	44	NS	1214 E	1334.7	560 D	10.1			
	8800	ATHN	3	S	1258.5	1303.4	8.3	247.4	130.5		
19	3100	GRIM	1	S	1134	1134	3	3	1		
20	606	MANI	3	S	0605.2	0605.5	1	25.1	15		
	1415	MANI	3	S	0605.4	0605.5	.3	12.7	7.3		
	127	TORN	44	NS	0750 E	1207.2	410 D	11			V=0
	100	GORK	43	NS	0808.3		137		5		
	9100	ARCE	46	C/F	1540.5	1540.9	2.9				AT SUNSET
	9100	ARCE			1540.5	1540.9	1				
	9100	ARCE			1541.5	1542	1.9				
	930	BORO	46	C	1627	1628.4	2	63	2		
21	3100	GRIM	24	R	0718	0742		7			
	3100	GRIM	1	S	0811	0811.5	1	3	1		
	9100	ARCE	1	S	0908.5	0908.6	1				
	9100	ARCE	3	S	1057.9	1058.2	.8				
	9100	ARCE	46	C/F	1103	1105.1	4.4				
	9100	ARCE			1103	1103.4	1.8				
	9100	ARCE			1104.8	1105.1	2.6				
22	2950	GORK	1	S	0640.7	0641.3	2.8	8.3	4		
	9100	ARCE	20	GRF	1149.3	1157.3	92				
	260	ONDR	43	NS	1200		140	16			
	2800	OTTA	20	GRF	1430	1502	130	2.6	1.3		
	2800	OTTA	20	GRF	1645	1802	150	2	1		
	18	MCMA	6	S	2253	2255	3			2	
23	260	ONDR	44	NS	0840 E		318 D	17			
	245	SGMR	44	NS	1210 E	1322.9	570 D	32.5			
	930	BORO	41	F	1105.6	1106	.9	59	2		
	9100	ARCE	1	S	1147.6	1148.5	2				RECORODISTURBED
	930	BORO	41	F	1242.5	1242.7	.9	30	2		
	930	BORO	8	S	1516	1516	.1	16	2		
	18	MCMA	42	SER	2302	2304	8			2	
24	930	BORO	41	F	0828.5	0830.4	2	26	2		
	930	BORO	8	S	0957.6	0958	.4	46	2		
	536	ONDR	4	S/F	1202.6	1204.2	3	14	1.8		
	930	BORO	41	F	1204	1205.7	2	24	2		
	2800	OTTA	20	GRF	1400	1445	140	3.8	1.9		
	2800	OTTA	21	GRF	1715	1720	30	2.2	1.1		
	2800	OTTA	1	S	1716	1717	2	2	1		
	2800	OTTA	24	R	1845	1915	30	1.2	0.6		
	2800	OTTA	27	RF	1845		105	1.2	0.9		
	2800	OTTA	24P	R	1915		55	1.2			
	2800	OTTA	26	FAL	2010	2030	20	-1.2	-0.6		
	2695	PENT	32	ABS	2035	2110	55	-1.2	-0.6		
25	700	SYDN	40	F	0221.7	0223.5	4.6				
	3100	GRIM	20	CRF	0640	0724	60	4	1		
	2695	MANI	3	S	0733	0733.2	.4	2.4	1.4		
	1415	MANI	3	S	0733	0733.2	.4	1.9	1.2		
	4995	MANI	3	S	0733	0733.2	.4	6.3	4.2		
	8800	MANI	3	S	0733.1	0733.2	.2	12	6		
	8800	MANI	3	S	0820	0820.4	.8	12	6		
	2695	MANI	3	S	0820	0820.6	.8	4.8	2.4		
	1415	MANI	3	S	0820	0820.5	.8	3.9	1.9		
	4995	MANI	3	S	0820	0820.4	.8	4.2	2.1		
	1415	MANI	3	S	0855.8	0856.2	.7	1.9	1		
	4995	MANI	3	S	0855.9	0856.2	.6	4.2	2.1		
	8800	MANI	3	S	0855.9	0856.2	.6	6	3		
	930	BORO	8	S	1035.4	1035.6	.2	54	2		
	930	BORO	41	F	1429.2	1429.7	.8	12	2		
	2800	OTTA	240	R	1510	1527	17	2	1		

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	2800	OTTA	20	GRF	1538	1558	40	2	1		
	2800	OTTA	21	GRF	1636	1647	25	1.6			
	2800	OTTA	40	F	1644.5	1644.8	3	2.2			
	18	MCMA	42	SER	1842	2023	175			3	
	2800	OTTA	1	S	1945	1946	6	2.2	1		
26	930	BORD	41	F	0954.6	0954.6	.2	13	2		
	1420	ARCE	22	GRF	1124.2	1133.7	43				
	9100	ARCE	22	GRF	1131.6	1133.8	29				RECORDDISTURBED
	127	TORN	7	C	1258	1259.5	3.5	10	2		
	127	TORN			1258	1300.7		14			
	930	BORD	8	S	1342.8	1343	.2	26	2		
	2800	OTTA	20	GRF	1600	1612	40	1.8	0.9		
	930	BORD	41	F	1621.6	1621.8	.3	21	2		
	2800	OTTA	20	GRF	1700	1800	130	1.8	1.2		
	2800	OTTA	240	R	1955	2030	35	1.8	0.9		
	1400	SYDN	4	S	2310	2311.7	5				
	2695	PENT	1	S	2311.5	2313	2.3	4	2		
	1420	BOUL	45	C	2311	2311.5	2	11	4		
	700	SYDN	2	S	2312	2312.7	1.3				
	2695	BOUL	45	C	2312.5	2314	3.5	7	2		
27	5730	IRKU	3	S	0330.3	0331.3	5	40			R
	2695	MANI	20	GRF	0330.6	0331.5	2.2	26.4	17.6		
	1414	MANI	20	GRF	0330.8	0331.8	2.2	11.5	7.6		
	4995	MANI	20	GRF	0330.8	0331.3	2	63	42		
	8800	MANI	20	GRF	0330.8	0331	1.4	66	44		
	1400	SYDN	20	GRF	0331.2	0332	2.5				
	700	SYDN	2	S	0331.5	0331.7	.7				
	260	ONDR	44	NS	0817 E		353 D	12			
	237	TRST	41	F	0828.9	0829.7	.9	125			
	127	TORN	40	F	0832 U	0837.1	15 U	23			
	9100	ARCE	1	S	0927.1	0927.3	1				
	9100	ARCE	21	GRF	1024.4	1102.9	98				
	260	ONDR	45	C	1101.6	1101.6	1.5	34	16		
	9100	ARCE	1	S	1106.9	1107	1				
	9100	ARCE	1	S	1119.1	1119.3	1				
	9100	ARCE	3	S	1308.7	1308.8	.7				
	2800	OTTA	1	S	1328	1329.5	3	4.6	1.6		
	1420	ARCE	23	GRF	1352.3	1440.1	89				
	9100	ARCE	22	GRF	1354.3	1423.5	73				
	1420	ARCE	3	S	1431.6	1432.1	.8				
	2800	OTTA	20	GRF	1550	1605	45	3	1.4		
	245	SGMR	43	NS	1703	1711	282 D	48.6			
	2695	BOUL	23	GRF	2045.5	2046.5	12.5	3	1		
28	208	VORO	43	NS	0100		240		8		
	260	ONDR	44	NS	0800 E		360 D	94			
	245	SGMR	44	NS	1206 E	1917.2	581 D	41.6			
	3100	GRIM	1	S	0809	0810	7	4	1		
	6100	KISV	4	S/F	0838	0840	5	5			
	237	TRST	41	F	1304.7	1304.8	.2	250			
	2800	OTTA	21	GRF	1420	1442	70	3.6	1.8		
	2800	OTTA	4	S/F	1507.2	1508	1.5	21	5.2		
	2800	OTTA	3	S	1522	1523	1	16.6	4.2		
	2800	OTTA	22	GRF	1610	1705	80	2.2	1.1		
	2800	OTTA	20	GRF	1940	2000	40	2.6			
	208	VORO	44	NS	2300		360		7		
29	208	VORO	48	C	0346	0347	2	330 D			
	202	IZMI	41	F	0736.8	0744.8	8.2	350			
	9100	ARCE	24	R	0817		100				
	202	IZMI	41	F	0830	0833.2	4	433			
	237	TRST	42	SER	0830.2E	0830.5	5.6	1300			
	260	ONDR	44	NS	0836 E		312 D	67			
	245	SGMR	44	NS	1205 E	1346.2	583 D	102			
	237	TRST	41	F	0957.8	0957.8	.1	95			
	237	TRST	42	SER	1234.6	1236.2	1.7	210			
	2800	OTTA	23	GRF	1624	1642	60	2			
	2800	OTTA	1	S	1630.1	1630.9	1	1.4	0.7		
	2695	BOUL	8	S	1630.5	1631	1	4	1		
	2800	OTTA	8	S	1715.5	1715.7	0.5	1.4	1		
	2800	OTTA	20	GRF	2100	2102	33	3.4	1.7		
	2695	PENT	20	GRF	2140	2220	75	2.8	1.4		
30	3100	GRIM	20	GRF	0735	0803	65	7	2		
	9100	ARCE	24	R	0819.5		44				
	1420	ARCE	25	R	1047.8		174				
	1420	ARCE	1	S	1109.3	1109.4	.5				
	1420	ARCE	1	S	1112.6	1112.8	.6				
	1420	ARCE	22	GRF	1120.9	1142	60				
	9100	ARCE	28	PRE	1133.2	1134.3	2.8				
	9100	ARCE	47	GB	1136	1139.7	7.8				
	9100	ARCE			1136	1137.3	1.8				
	9100	ARCE			1137.8	1138.4	1.5				

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JANUARY 1978

JAN 1978	FREQUENCY STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	MEAN	INT	POLARIZATION OR REMARKS
	9100 ARCE		1139.3	1139.7	4.5				
	9100 ARCE	40 F	1153.2	1153.5	2.5				
	9100 ARCE	32 ABS	1205.6	1223.5	28				
	930 BORD	41 F	1219.6	1220	.4	55	2		
	9100 ARCE	20 GRF	1237	1256.8	91				
	408 TRST	49 GB	1249.2	1249.4	.5	470			
	2800 OTTA	1 S	1741	1742	2	0.8	0.4		
	2695 PENT	240 R	2102	2155	53	2.8	1.4		
	1420 ARCE	3 S		1302.7	5				
31	260 ONDR	42 SER	0925	0939.6	67	222 D			
	237 TRST	42 SER	0936.5	0937.2	6.5	200			5R
	237 TRST		0936.5	0942.7		320			5R
	237 TRST	42 SER	1022.9	1026.7	6.9	510			5R
	930 BORD	41 F	1100.2	1104	.2	19	2		
	260 ONDR	3 S	1159.2	1159.2	.2	13			
	9100 ARCE	25 R	1207.6		34				
	1470 BERL	1 S	1231.3	1232	.1	2.3			
	3000 BERL	4	1231.3	1232.3	7.7	6			
	808 ONDR	8 S	1231.7	1231.7	.3	75			
	1420 ARCE	1 S	1231.8	1232.1	.6				
	9100 ARCE	1 S	1232	1232.4	.6				
	3100 GRIM	1 S	1236	1236.5	1	4	1		
	9100 ARCE	20 GRF	1309.6	1329.2	120				
	2800 OTTA	1 S	1344	1345.2	4	3.6	1.8		
	2800 OTTA	27 RF	1357		73	2	1.8		
	2800 OTTA	24 R	1357	1403	6	2	1		
	2800 OTTA	24P R	1403		62	2			
	2800 OTTA	26 FAL	1505	1510	5	-2	-1		
	4995 BOUL	1 S	1634.5	1637.5	4.5	10	3		
	2695 BOUL	45 C	1635.5	1637.5	6.5	9	3		
	2800 OTTA	2 S/F	1635	1637.8	9	3	1.2		
	2800 OTTA	1A S	1635	1637.8	9	3	1.2		
	2800 OTTA	240 R	1750	1840	50	2.8	1.6		

Reports received from the following observatories:

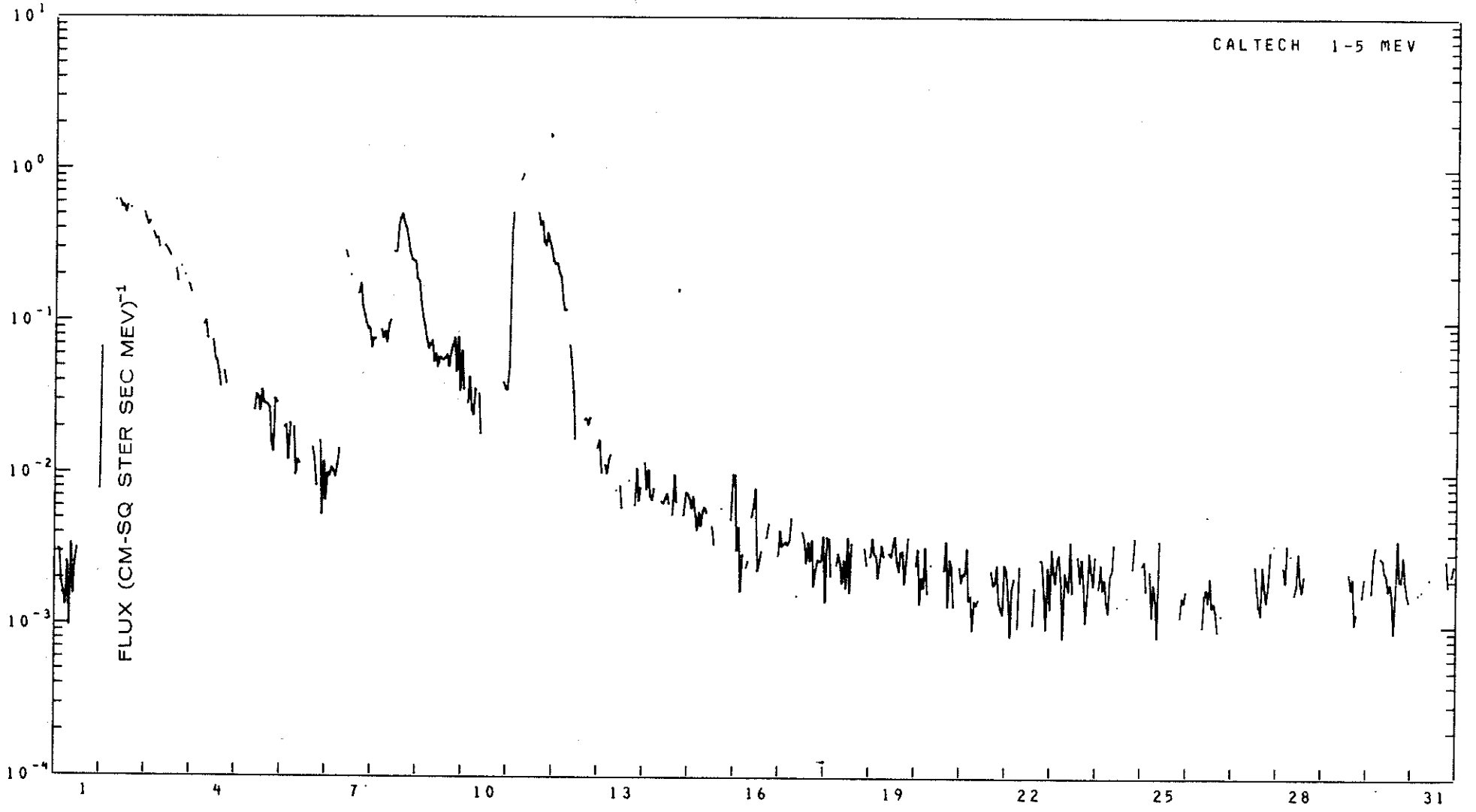
ARCE = Arcetri
BERL = Berlin-Adlershof
BORD = Bordeaux
BOUL = Boulder
CRIM = Simferopol
DWIN = Dwingeloo
GORK = Gorky
HARS = Harestua
HIRA = Hiraiso
HUAN = Huancayo
IRKU = Irkutsk
KIEV = Kiev
MANI = Manila
MCMA = McMath-Hulbert
NAGO = Nagoya
ONDR = Ondrejov
OTTA = Ottawa
PENT = Penticton
POTS = Potsdam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

Explanation of Type Code:

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

IMP 7 AND 8 ELECTRONS

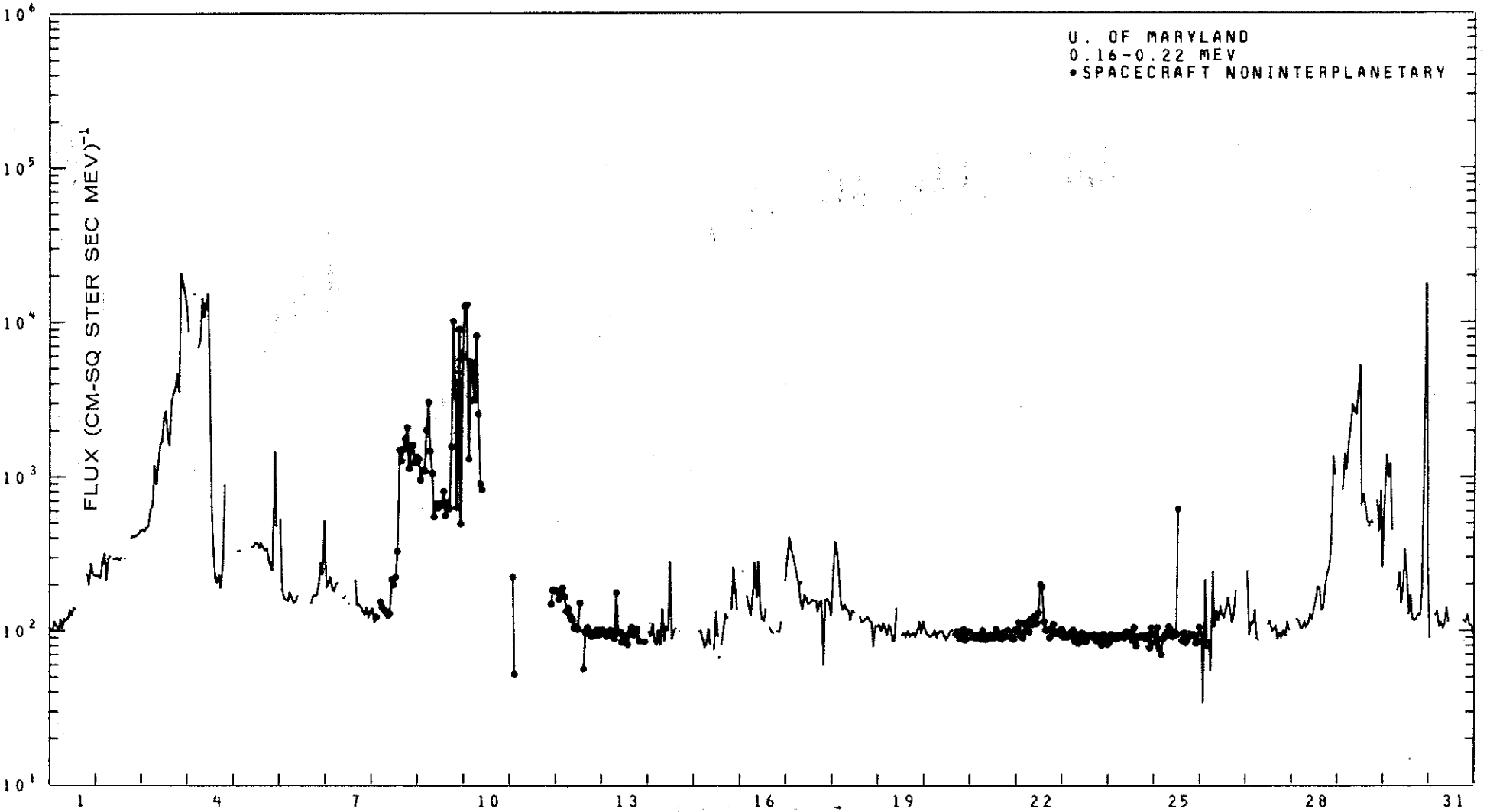
JANUARY 1978



33
Jan 78

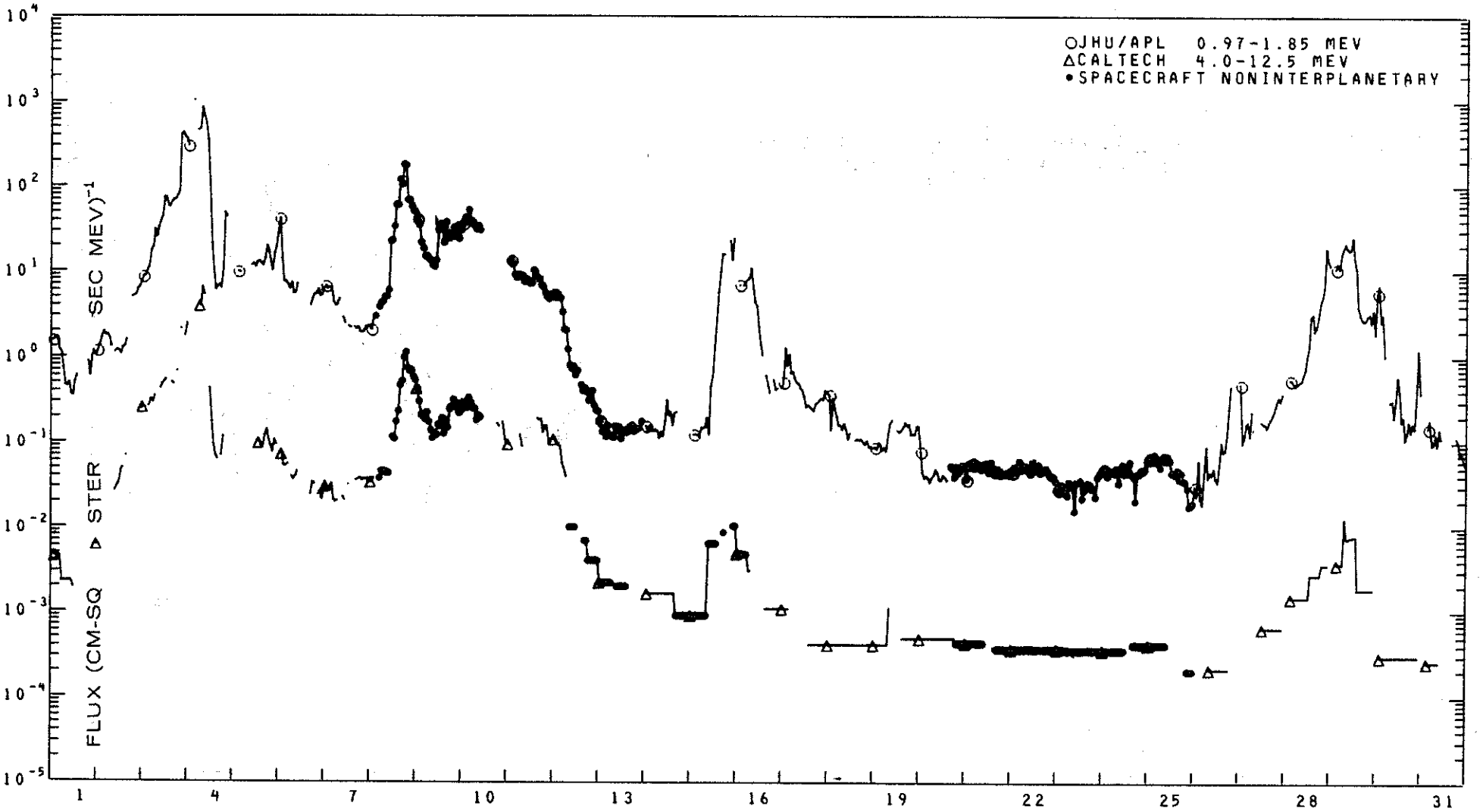
IMP 7 AND 8 LOW ENERGY PROTONS

JANUARY 1978



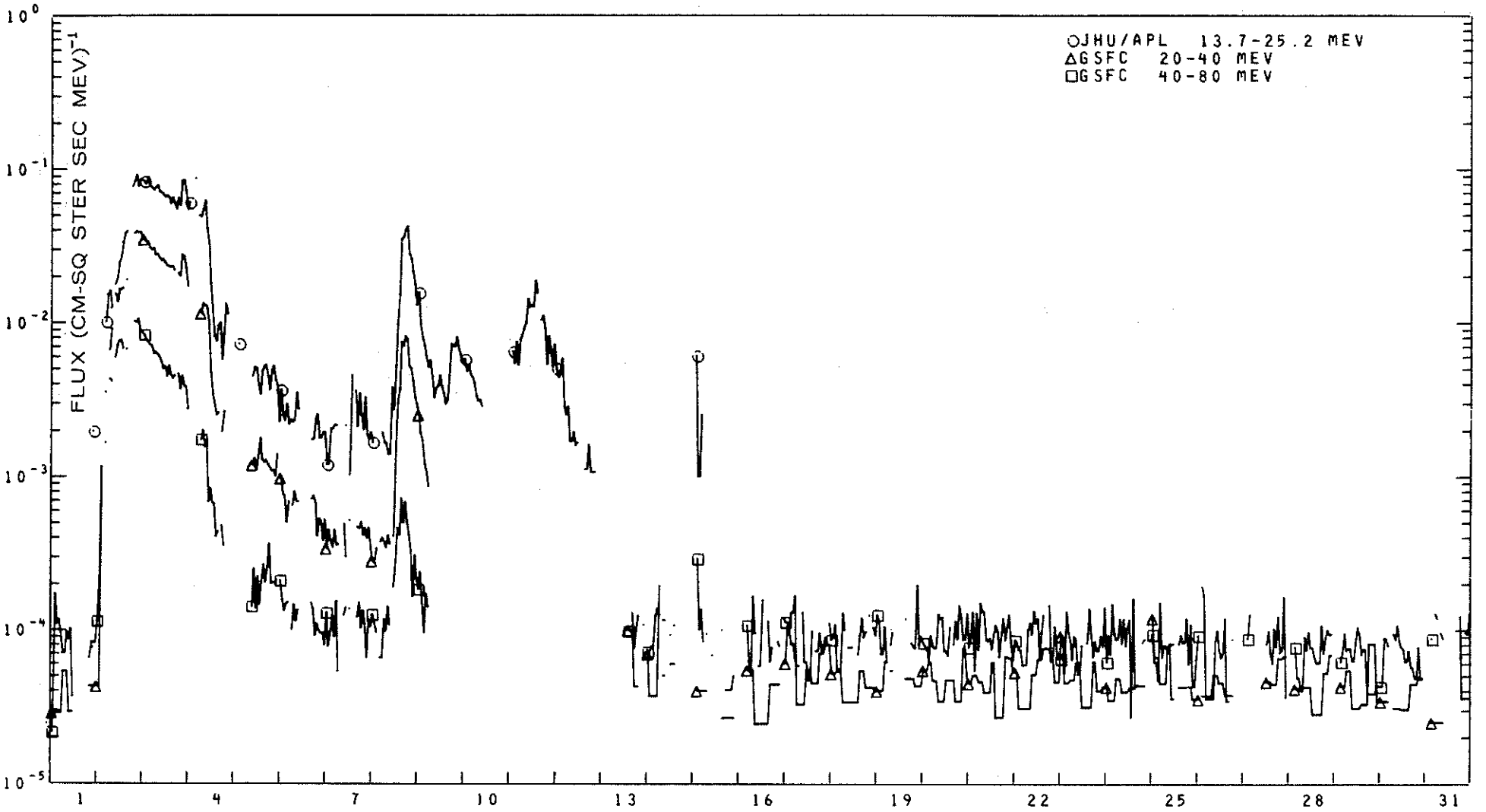
IMP 7 AND 8 INTERMEDIATE ENERGY PROTONS

JANUARY 1978



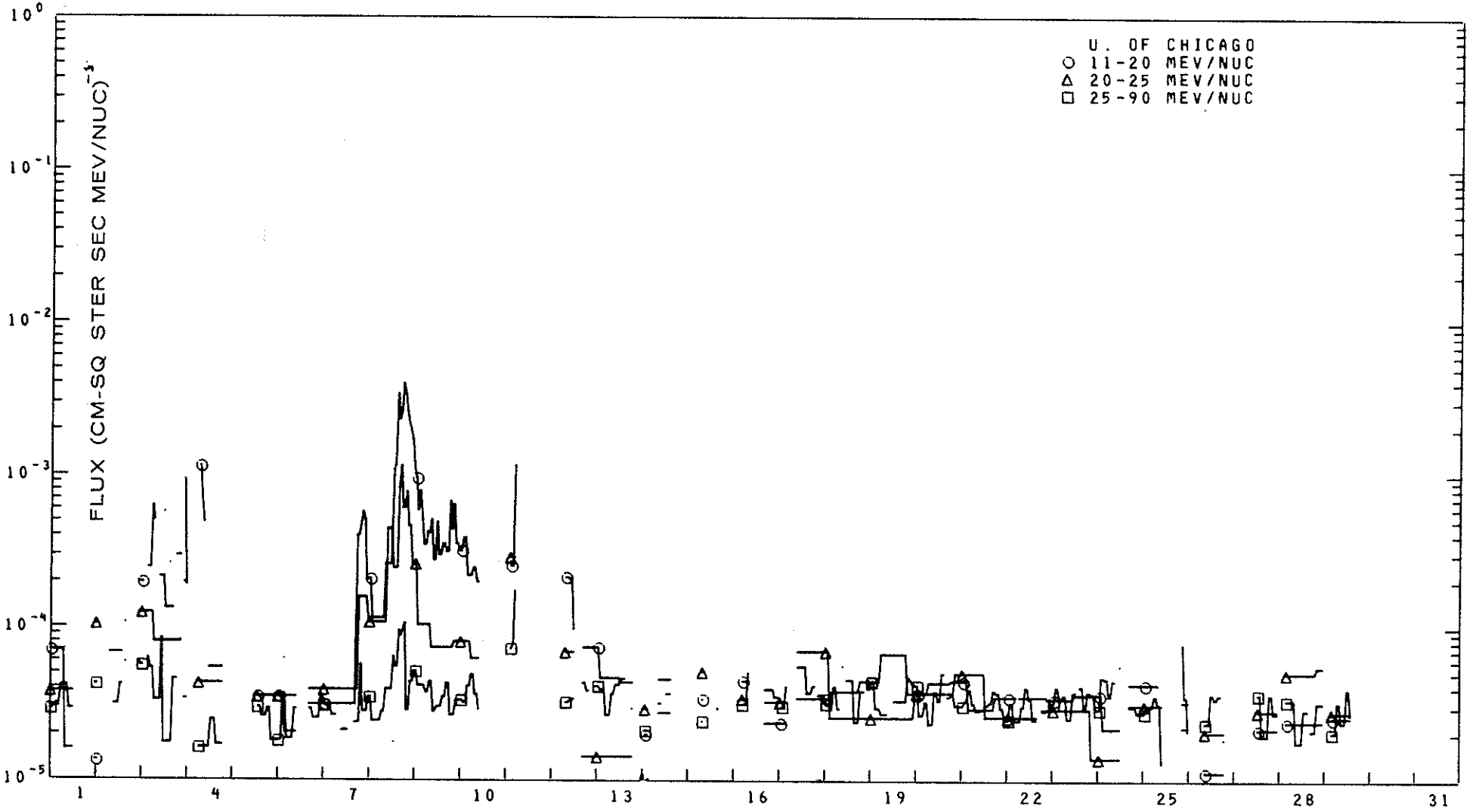
IMP 7 AND 8 HIGH ENERGY PROTONS

JANUARY 1978



IMP 7 AND 8 ALPHA PARTICLES

JANUARY 1978



DECEMBER 1977 DATA

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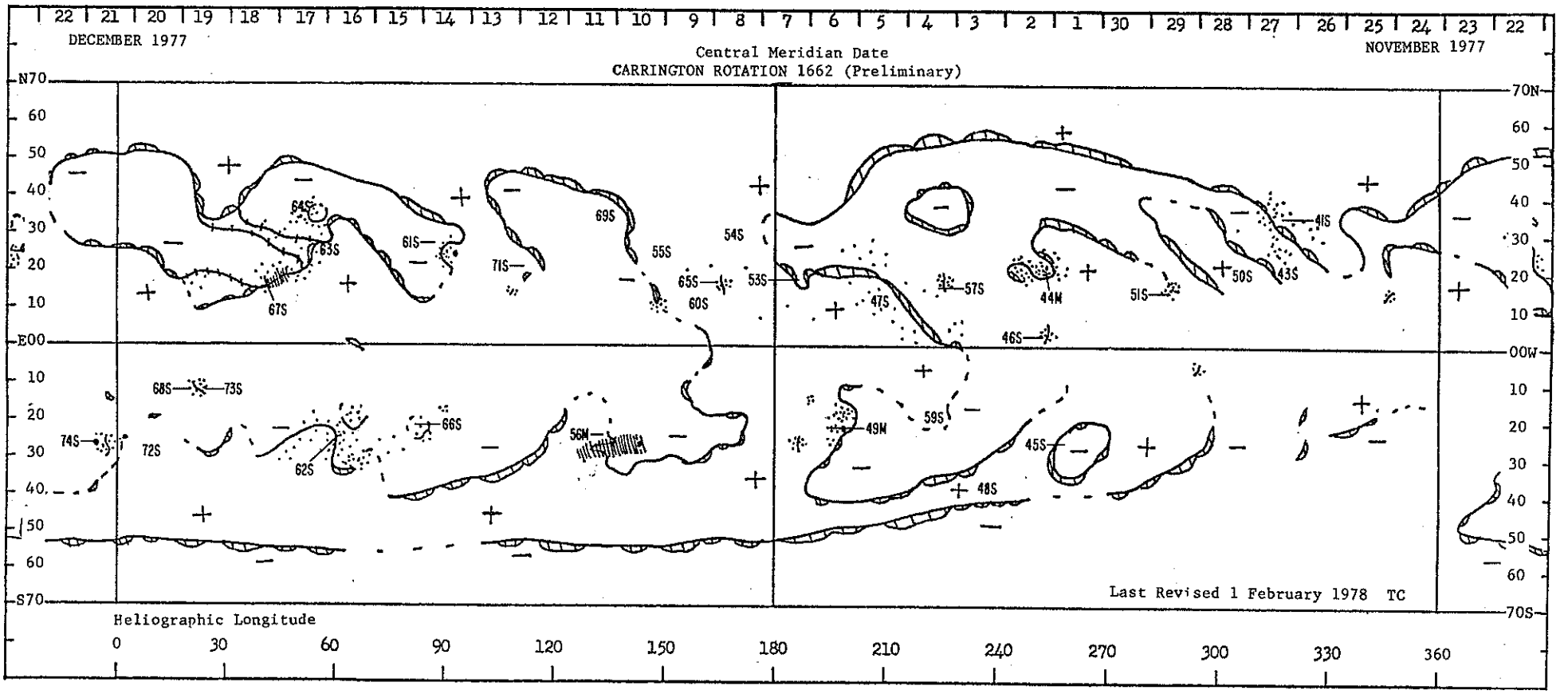
Hα Synoptic Chart	40-41
Abbreviated Calendar Record	42-49
Regional Flare Index	49

ABBREVIATED CALENDAR RECORD

Hα SYNOPTIC CHART

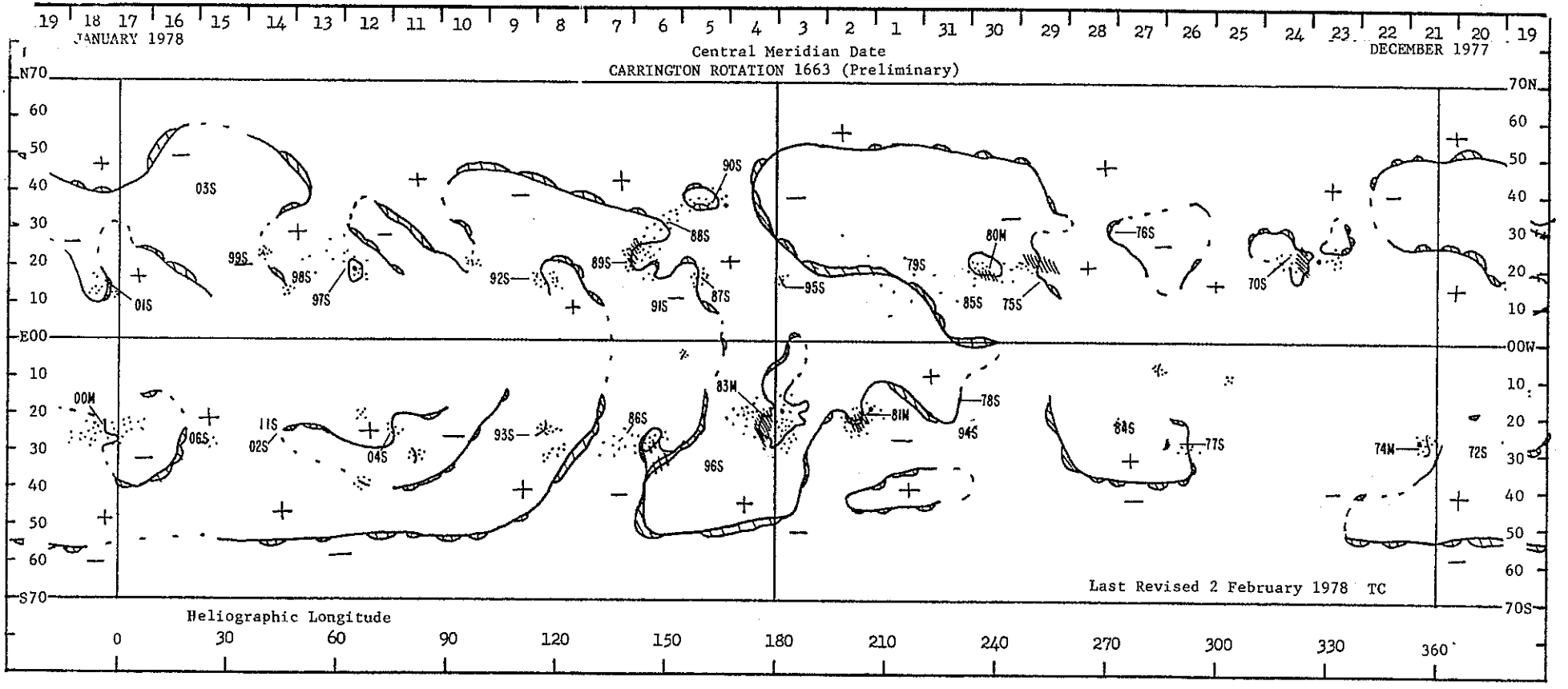
NOVEMBER - DECEMBER 1977

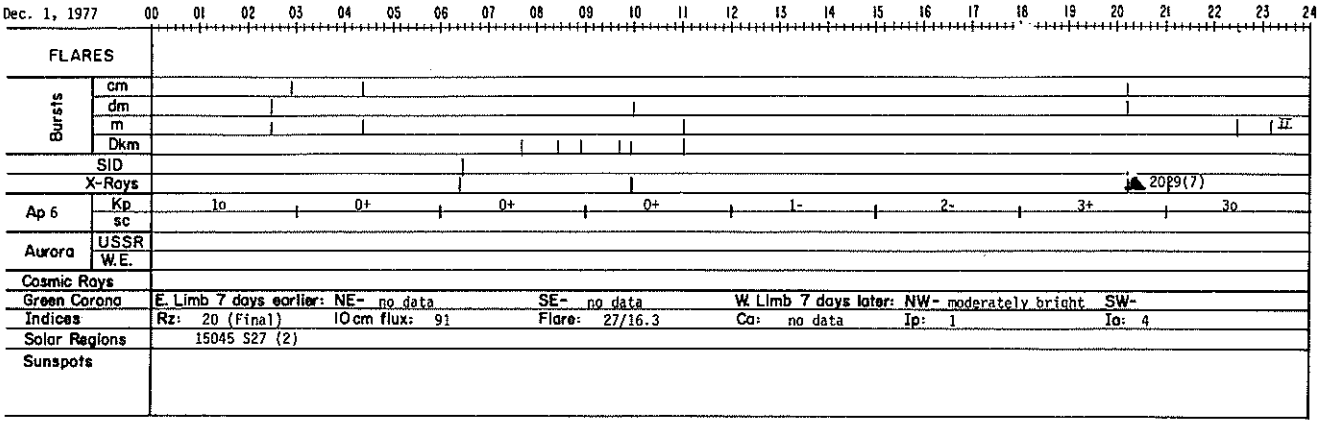


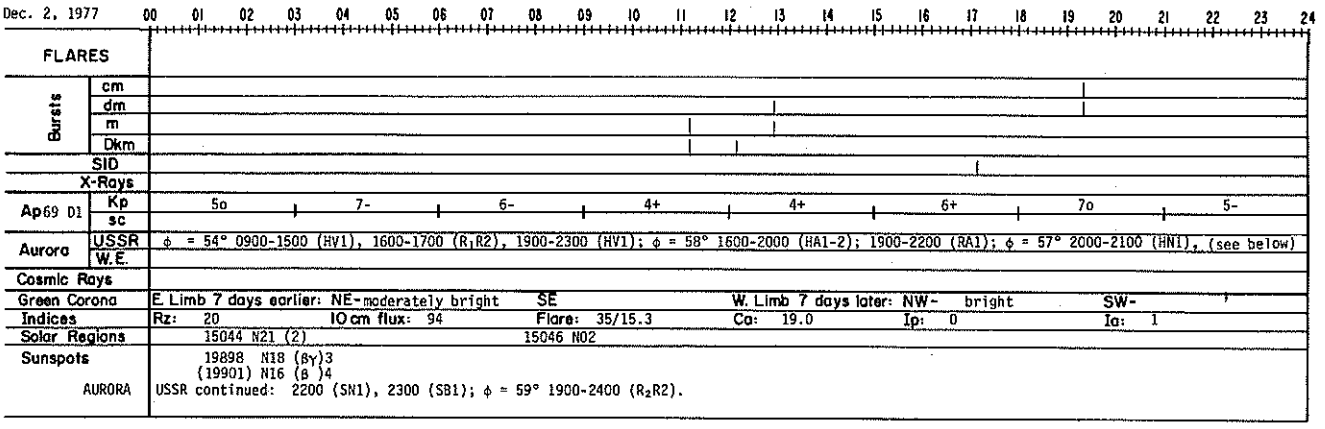
ABBREVIATED CALENDAR RECORD

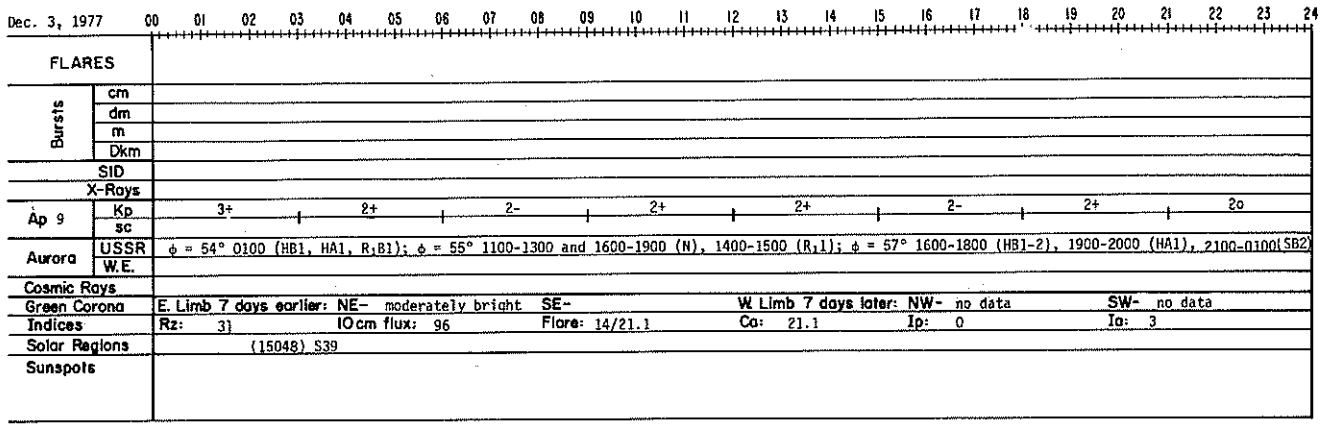
Hα SYNOPTIC CHART

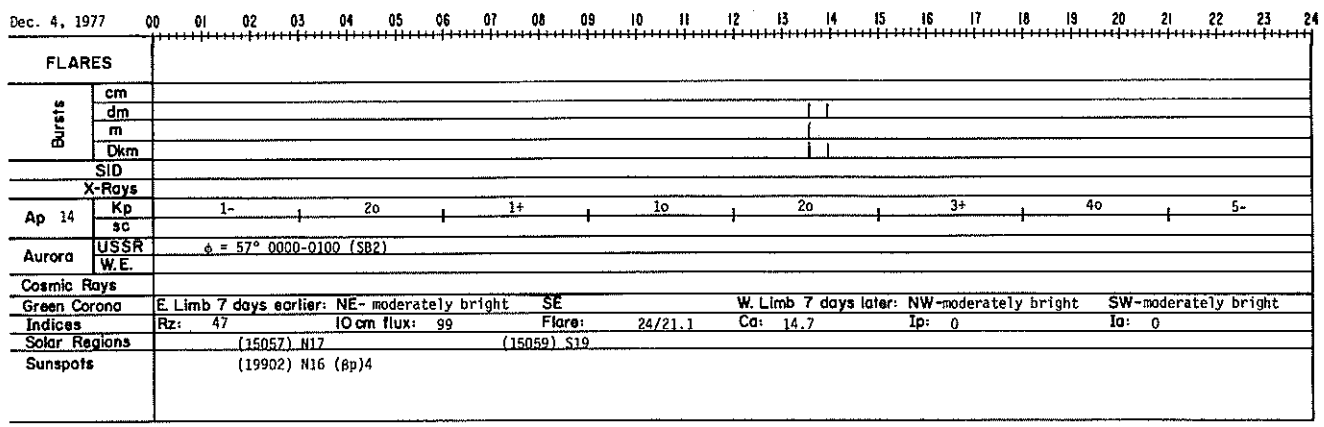
CARRINGTON ROTATION 1663 (PRELIMINARY)

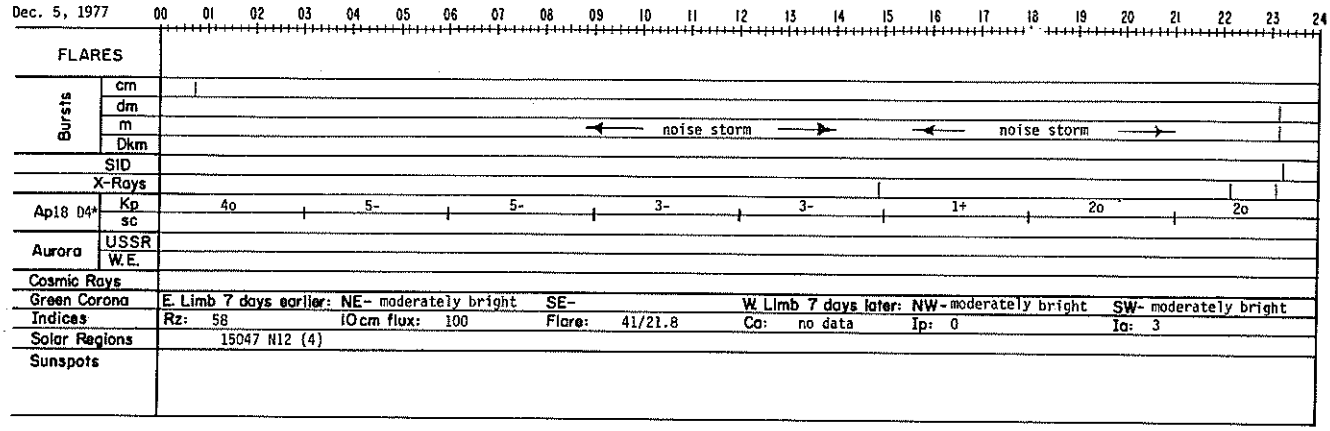


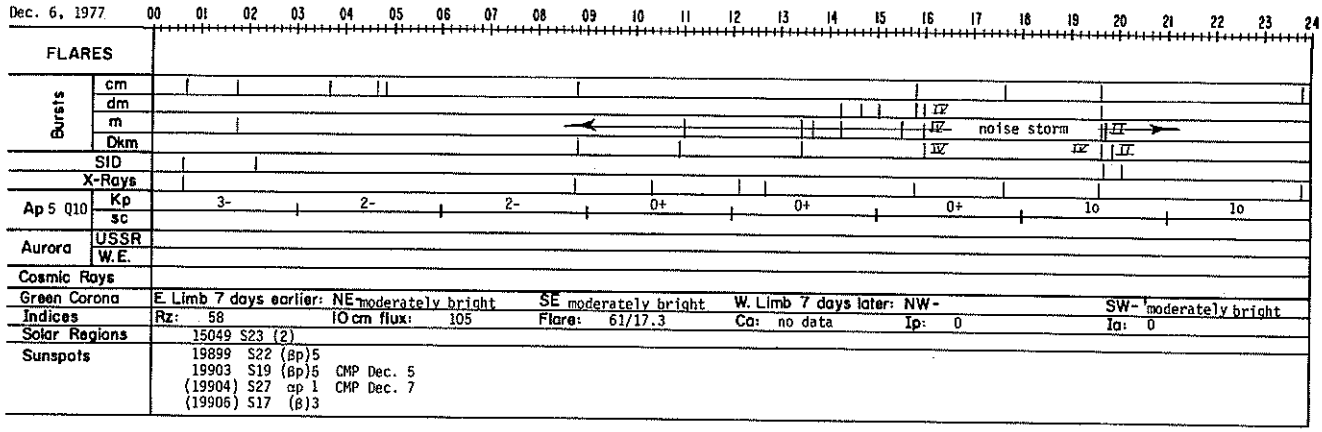

Dec. 1, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
2089(7)
Ap 6
Kp
sc
1o 0+ 0+ 0+ 1- 2- 3+ 3o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- moderately bright SW-
Indices
Rz: 20 (Final) 10cm flux: 91 Flare: 27/16.3 Ca: no data Ip: 1 Ia: 4
Solar Regions
15045 S27 (2)
Sunspots

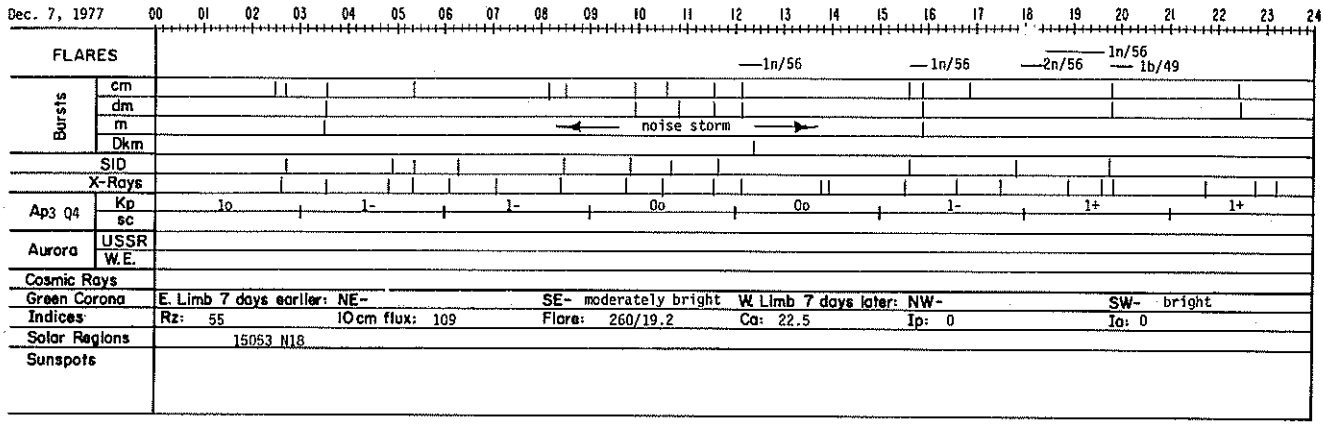

Dec. 2, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap69 D1
Kp
sc
5o 7- 6- 4+ 4+ 6+ 7o 5-
Aurora
USSR
W.E.
φ = 54° 0900-1500 (HV1), 1600-1700 (R1R2), 1900-2300 (HV1); φ = 58° 1600-2000 (HA1-2); 1900-2200 (RA1); φ = 57° 2000-2100 (HN1), (see below)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE-moderately bright SE W. Limb 7 days later: NW- bright SW-
Indices
Rz: 20 10cm flux: 94 Flare: 35/15.3 Ca: 19.0 Ip: 0 Ia: 1
Solar Regions
15044 N21 (2) 15046 N02
Sunspots
19898 N18 (βγ)3
(19901) N16 (β)4
AURORA
USSR continued: 2200 (SN1), 2300 (SB1); φ = 59° 1900-2400 (R2R2).

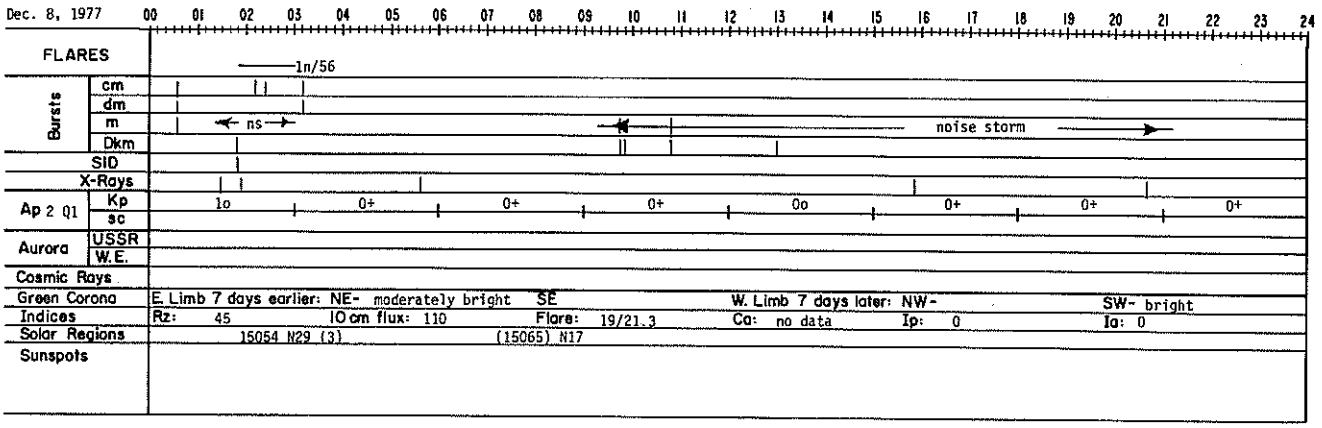

Dec. 3, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 9
Kp
sc
3+ 2+ 2- 2+ 2+ 2- 2+ 2o
Aurora
USSR
W.E.
φ = 54° 0100 (HB1, HA1, R1B1); φ = 55° 1100-1300 and 1600-1900 (N), 1400-1500 (R11); φ = 57° 1600-1800 (HB1-2), 1900-2000 (HA1), 2100-0100(SB2)
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: 31 10cm flux: 96 Flare: 14/21.1 Ca: 21.1 Ip: 0 Ia: 3
Solar Regions
(15048) S39
Sunspots

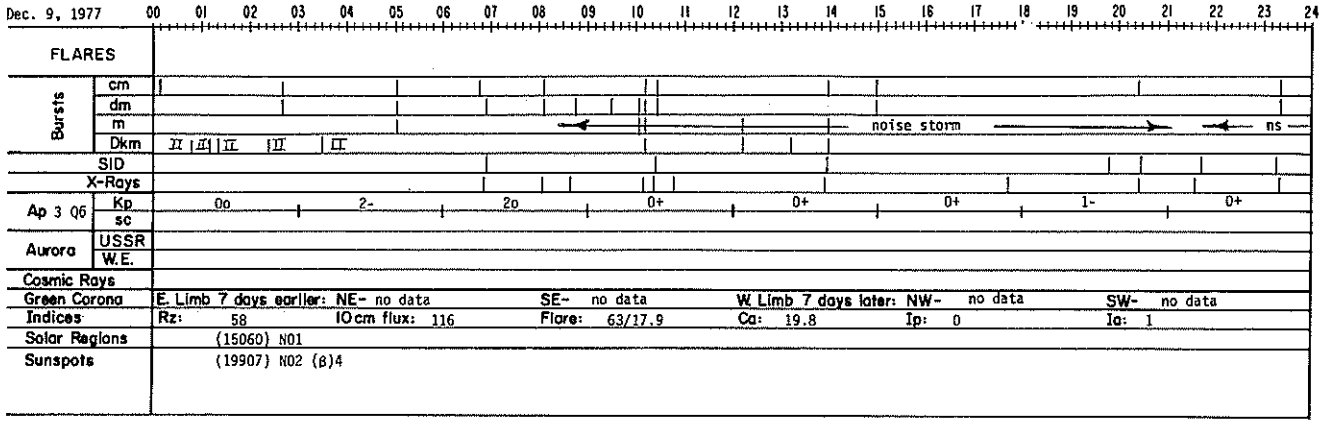

Dec. 4, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 14
Kp
sc
1- 2o 1+ 1o 2o 3+ 4o 5-
Aurora
USSR
W.E.
φ = 57° 0000-0100 (SB2)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE W. Limb 7 days later: NW-moderately bright SW-moderately bright
Indices
Rz: 47 10cm flux: 99 Flare: 24/21.1 Ca: 14.7 Ip: 0 Ia: 0
Solar Regions
(15057) N17 (15059) S19
Sunspots
(19902) N16 (βp)4

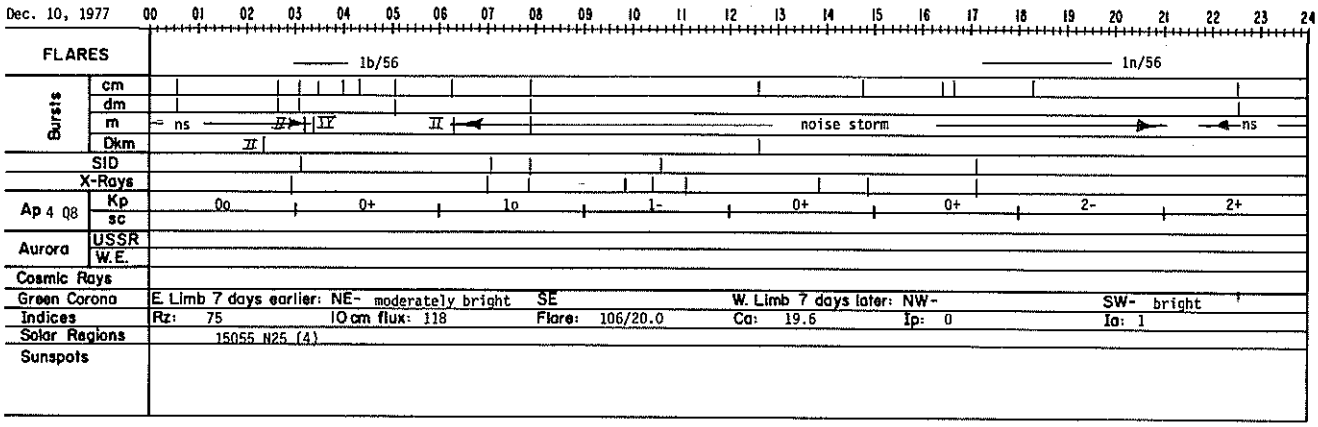

Dec. 5, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
noise storm
SID
X-Rays
Ap18 D4*
Kp
sc
4o 5- 5- 3- 3- 1+ 2o 2o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE-
W. Limb 7 days later: NW- moderately bright SW- moderately bright
Indices
Rz: 58 10cm flux: 100 Flare: 41/21.8 Ca: no data Ip: 0 Ia: 3
Solar Regions
15047 N12 (4)
Sunspots

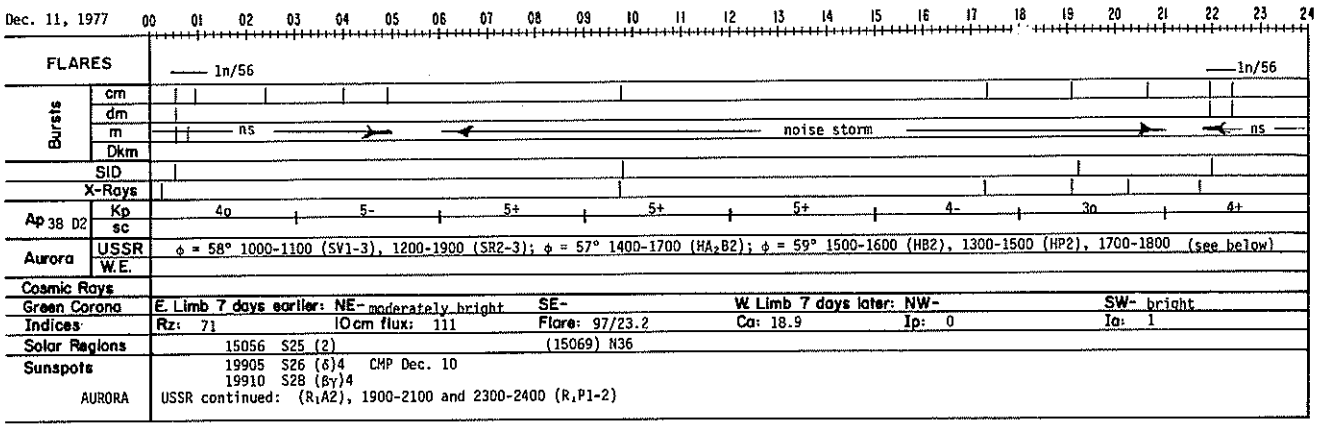

Dec. 6, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 5 Q10
Kp
sc
3- 2- 2- 0+ 0+ 0+ 1o 1o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE moderately bright SE moderately bright
W. Limb 7 days later: NW- SW- moderately bright
Indices
Rz: 58 10cm flux: 105 Flare: 61/17.3 Ca: no data Ip: 0 Ia: 0
Solar Regions
15049 S23 (2)
Sunspots
19899 S22 (βp)5
19903 S19 (βp)5 CMP Dec. 5
(19904) S27 αp 1 CMP Dec. 7
(19906) S17 (β)3

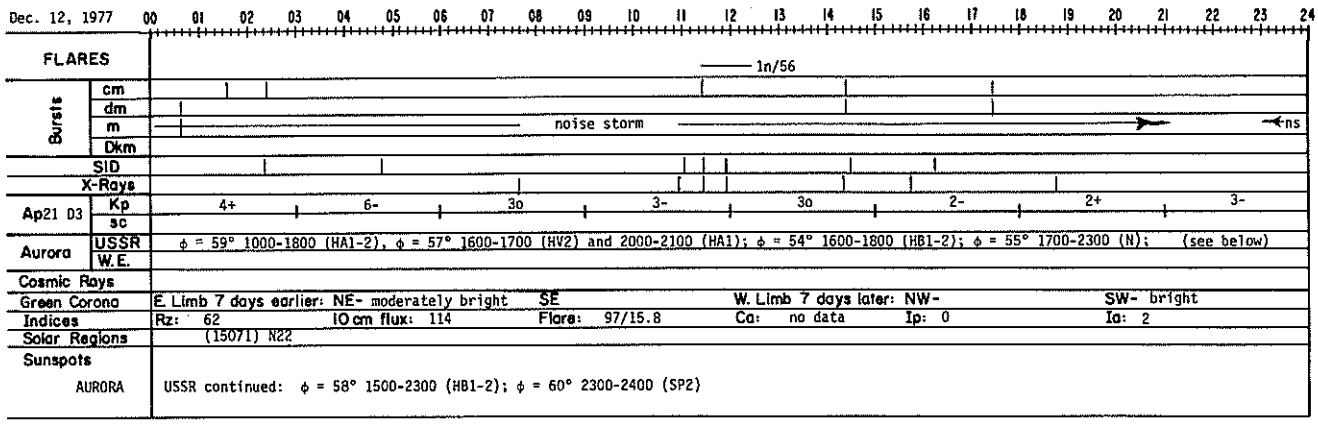

Dec. 7, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/56
1n/56
2n/56
1n/56
1b/49
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap3 Q4
Kp
sc
1o 1- 1- 0o 0o 1- 1+ 1+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE- moderately bright
W. Limb 7 days later: NW- SW- bright
Indices
Rz: 55 10cm flux: 109 Flare: 260/19.2 Ca: 22.5 Ip: 0 Ia: 0
Solar Regions
15053 N18
Sunspots


Dec. 8, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/56
Bursts
cm
dm
m
Dkm
ns
noise storm
SID
X-Rays
Ap 2 Q1
Kp
sc
1o 0+ 0+ 0+ 0o 0+ 0+ 0+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE
W. Limb 7 days later: NW- SW- bright
Indices
Rz: 45 10cm flux: 110 Flare: 19/21.3 Ca: no data Ip: 0 Ia: 0
Solar Regions
15054 N29 (3) (15065) N17
Sunspots


Dec. 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
noise storm
ns
SID
X-Rays
Ap 3 Q6
Kp
sc
0o 2- 2o 0+ 0+ 0+ 1- 0+
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: 58 IOcm flux: 116 Flare: 63/17.9 Ca: 19.8 Ip: 0 Ia: 1
Solar Regions
(15060) N01
Sunspots
(19907) N02 (β)4


Dec. 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
1b/56
1n/56
Bursts
cm
dm
m
Dkm
ns
noise storm
ns
SID
X-Rays
Ap 4 Q8
Kp
sc
0o 0+ 1o 1- 0+ 0+ 2- 2+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE W. Limb 7 days later: NW- SW- bright
Indices
Rz: 75 IOcm flux: 118 Flare: 106/20.0 Ca: 19.6 Ip: 0 Ia: 1
Solar Regions
15055 N25 (4)
Sunspots


Dec. 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
1n/56
1n/56
Bursts
cm
dm
m
Dkm
ns
noise storm
ns
SID
X-Rays
Ap 38 D2
Kp
sc
4o 5- 5+ 5+ 5+ 4- 3o 4+
Aurora
USSR
W.E.
φ = 58° 1000-1100 (SV1-3), 1200-1900 (SR2-3); φ = 57° 1400-1700 (HA2B2); φ = 59° 1500-1600 (HB2), 1300-1500 (HP2), 1700-1800 (see below)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE- W. Limb 7 days later: NW- SW- bright
Indices
Rz: 71 IOcm flux: 111 Flare: 97/23.2 Ca: 18.9 Ip: 0 Ia: 1
Solar Regions
15056 S25 (2) (15069) N36
Sunspots
19905 S26 (δ)4 CMP Dec. 10
19910 S28 (βγ)4
AURORA
USSR continued: (R1A2), 1900-2100 and 2300-2400 (R1P1-2)


Dec. 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
1n/56
Bursts
cm
dm
m
Dkm
noise storm
ns
SID
X-Rays
Ap21 D3
Kp
sc
4+ 6- 3o 3- 3o 2- 2+ 3-
Aurora
USSR
W.E.
φ = 59° 1000-1800 (HA1-2), φ = 57° 1600-1700 (HV2) and 2000-2100 (HA1); φ = 54° 1600-1800 (HB1-2); φ = 55° 1700-2300 (N); (see below)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE W. Limb 7 days later: NW- SW- bright
Indices
Rz: 62 IOcm flux: 114 Flare: 97/15.8 Ca: no data Ip: 0 Ia: 2
Solar Regions
(15071) N22
Sunspots
AURORA
USSR continued: φ = 58° 1500-2300 (HB1-2); φ = 60° 2300-2400 (SP2)

Dec. 13, 1977

FLARES		1n/56
Bursts	cm	
	dm	
	m	noise storm → ← noise storm → ← ns
	Dkm	
SID		
X-Rays		
Ap16 05*	Kp	4o 3o 3o 3- 3o 4- 3+ 2o
	sc	
Aurora	USSR	ϕ = 60° 0100-0200 (HA2, SB2); ϕ = 55° 1600-1800 (HA1); ϕ = 57° 1600-1900 (HB); ϕ = 58° 1400-2000 (A1); ϕ = 59° 2200-2400 (HA1)
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- moderately bright SE- W. Limb 7 days later: NW- SW- moderately bright
Indices		Rz: 44 10cm flux: 104 Flare: 38/24.0 Ca: no data Ip: 0 Ia: 2
Solar Regions		
Sunspots		

Dec. 14, 1977

FLARES		
Bursts	cm	
	dm	
	m	noise storm → ← noise storm →
	Dkm	II | |II |II |II |II II |II
SID		
X-Rays		
Ap 8	Kp	3- 3- 2+ 1+ 2o 2- 1+ 1o
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- SW- moderately bright
Indices		Rz: 37 10cm flux: 97 Flare: 11/19.0 Ca: no data Ip: 0 Ia: 4
Solar Regions		15061 N27
Sunspots		19908 N24 (αp)4

Dec. 15, 1977

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	II ||II
SID		
X-Rays		
Ap 5 09	Kp	2- 2- 2- 2- 2o 1- 1- 0+
	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: 41 10cm flux: 96 Flare: 5/23.4 Ca: no data Ip: 0 Ia: 5
Solar Regions		(15066) S22
Sunspots		

Dec. 16, 1977

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	|II |II
SID		
X-Rays		
Ap 9	Kp	0+ 1o 1+ 1- 2o 3- 3o 4-
	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: 39 10cm flux: 96 Flare: 18/22.2 Ca: 17.9 Ip: 0 Ia: 5
Solar Regions		15062 S26
Sunspots		(19909)S24 (αp)2 CMP Dec. 15 19912 S23 (β)4

Dec. 17, 1977

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	II | |II |II
SID		
X-Rays		
Ap 12	Kp	4- 5o 2o 1- 1o 1- 2- 2-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- moderately bright SW- moderately bright
Indices		Rz: 29 10cm flux: 94 Flare: 16/16.4 Ca: 15.6 Ip: 0 Ia: 0
Solar Regions		15063 N25 (2) 15064 N37 (2)
Sunspots		

Dec. 18, 1977

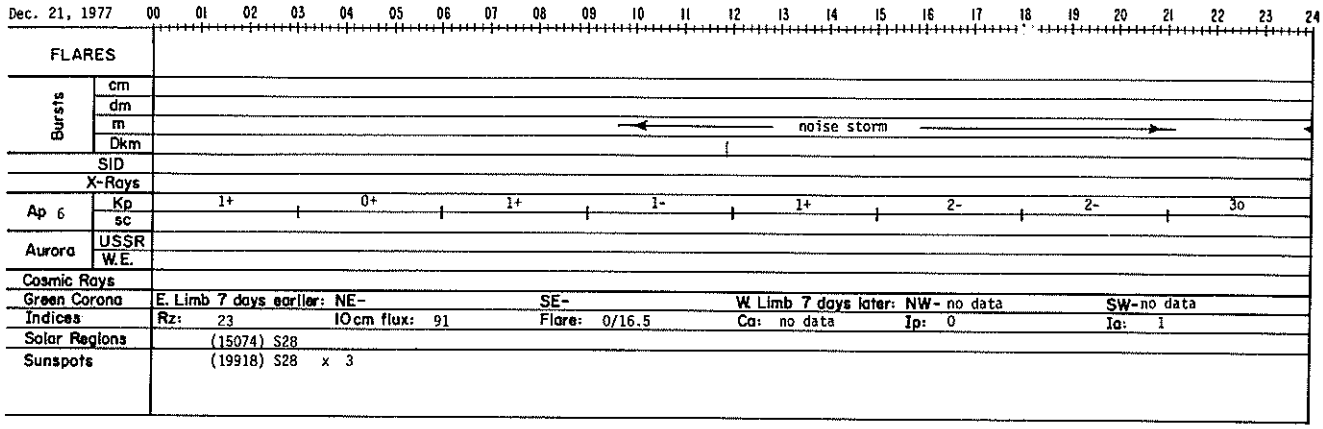
FLARES		
Bursts	cm	
	dm	
	m	← noise storm →
	Dkm	
SID		
X-Rays		
Ap 3 Q2	Kp	1o 1o 0+ 1- 0+ 0+ 0+ 0+
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- moderately bright SE W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 33 10cm flux: 97 Flare: 7/16.7 Ca: 15.0 Ip: 0 Ia: 0
Solar Regions		15067 N18 (2)
Sunspots		(19911) N16 (αp)4 CMP Dec. 17 19913 N15 (β)3 (19915) N17 αp 2 CMP Dec. 17 (19917) N15 (β)2

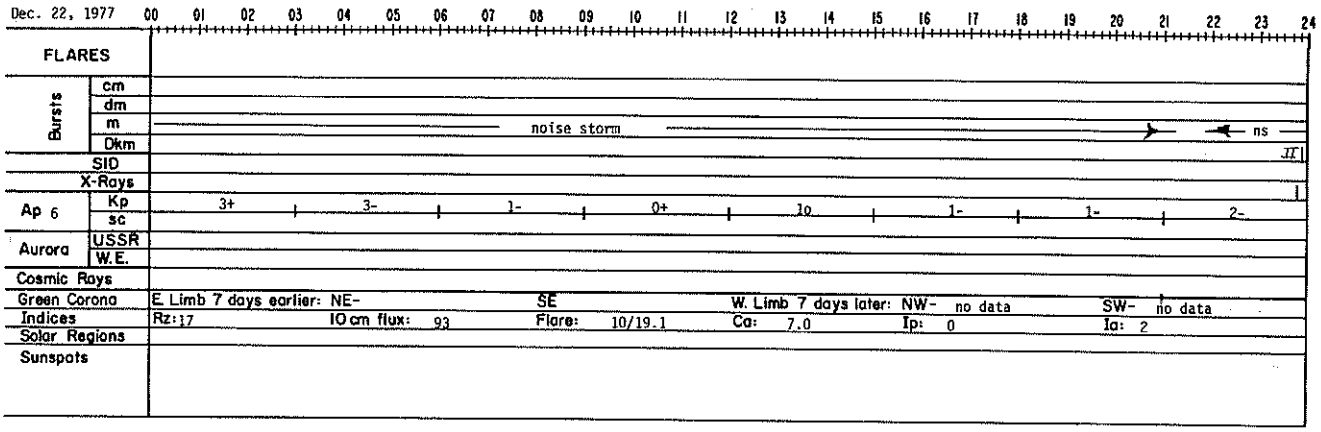
Dec. 19, 1977

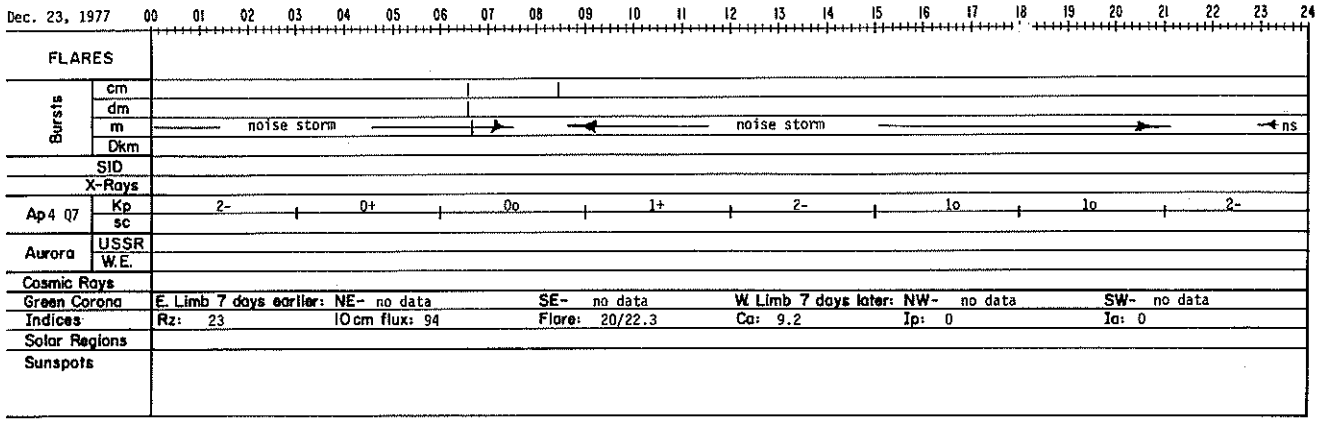
FLARES		
Bursts	cm	
	dm	
	m	← noise storm →
	Dkm	
SID		
X-Rays		
Ap 3 Q3	Kp	1- 0+ 1- 0+ 0+ 2- 0+ 1-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 40 10cm flux: 94 Flare: 9/23.7 Ca: no data Ip: 0 Ia: 0
Solar Regions		(15073) S12 (15068) S12
Sunspots		(19914) S12 (β)4

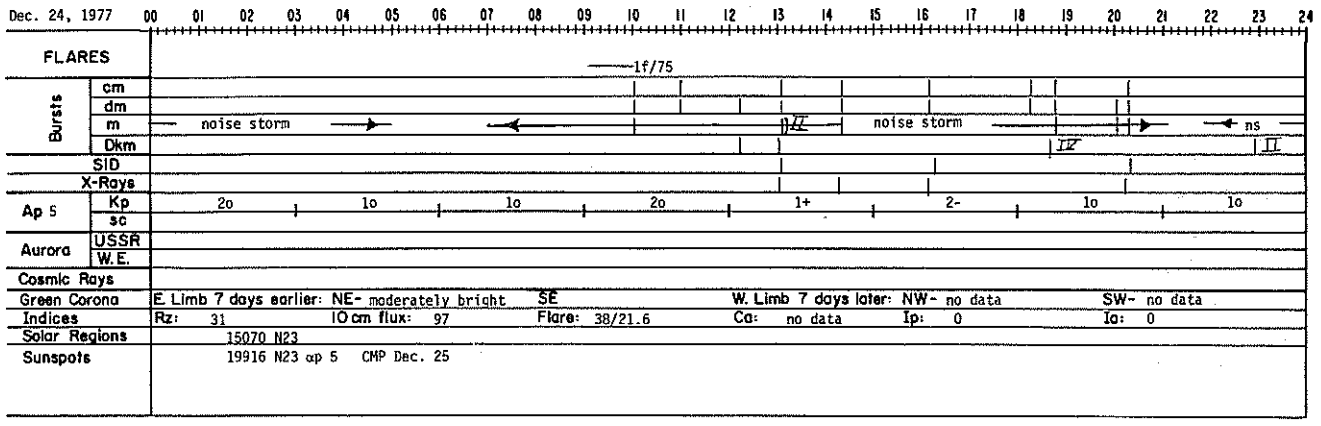
Dec. 20, 1977

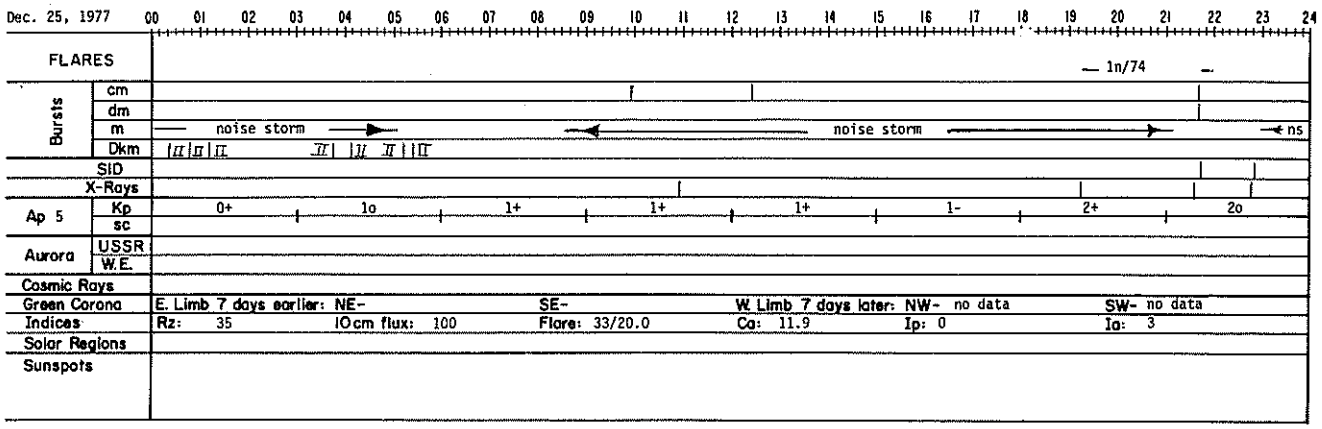
FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 4 Q5	Kp	1o 0+ 0+ 1+ 1- 1- 2- 1-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 23 10cm flux: 92 Flare: 12/19.1 Ca: no data Ip: 0 Ia: 2
Solar Regions		(15072) S30
Sunspots		

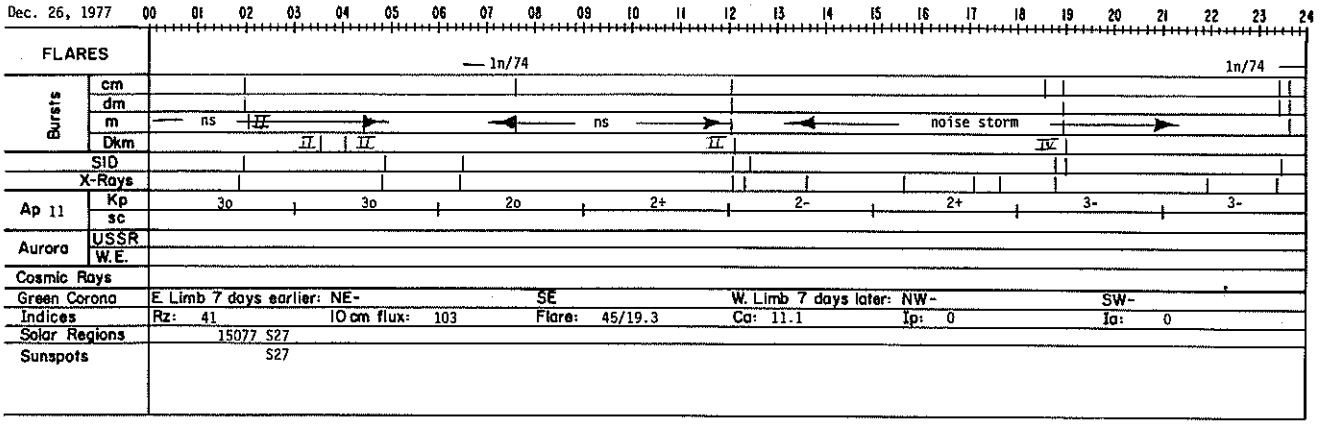

Dec. 21, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 6
Kp
sc
1+ 0+ 1+ 1- 1+ 2- 2- 3o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE-
SE-
W. Limb 7 days later: NW- no data
SW-no data
Indices
Rz: 23
10cm flux: 91
Flare: 0/16.5
Ca: no data
Ip: 0
Ia: 1
Solar Regions
(15074) S28
Sunspots
(19918) S28 x 3

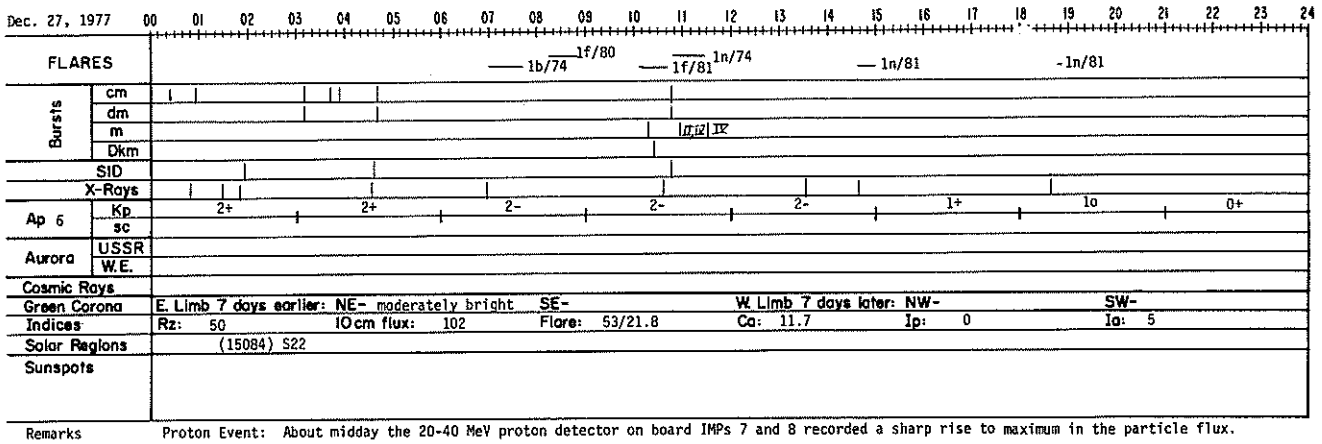

Dec. 22, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
ns
SID
X-Rays
Ap 6
Kp
sc
3+ 3- 1- 0+ 1o 1- 1- 2-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE-
SE
W. Limb 7 days later: NW- no data
SW- no data
Indices
Rz: 17
10cm flux: 93
Flare: 10/19.1
Ca: 7.0
Ip: 0
Ia: 2
Solar Regions
Sunspots


Dec. 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
noise storm
noise storm
ns
SID
X-Rays
Ap 4 Q7
Kp
sc
2- 0+ 0o 1+ 2- 1o 1o 2-
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: 23
10cm flux: 94
Flare: 20/22.3
Ca: 9.2
Ip: 0
Ia: 0
Solar Regions
Sunspots

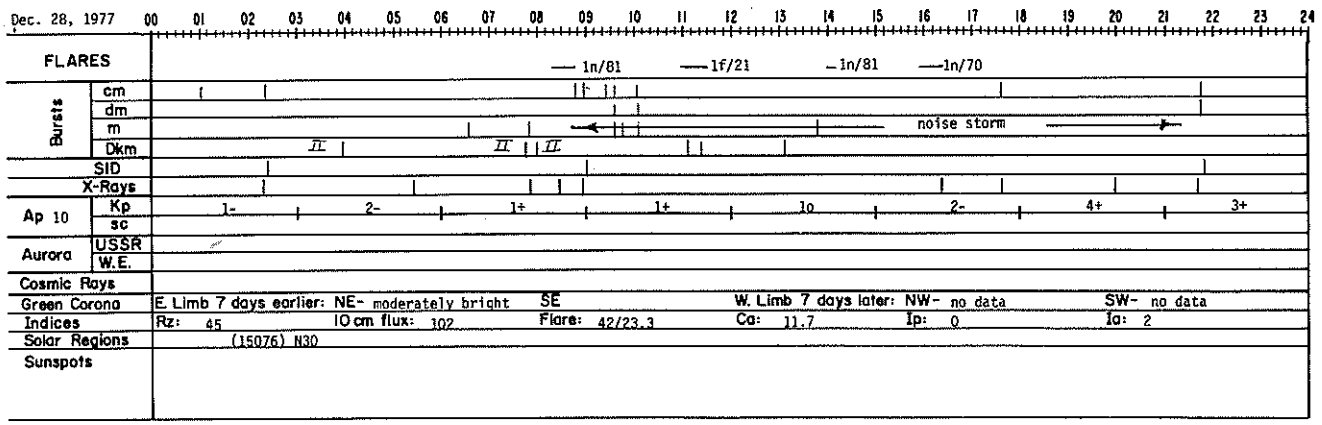

Dec. 24, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1f/75
Bursts
cm
dm
m
Dkm
noise storm
noise storm
ns
SID
X-Rays
Ap 5
Kp
sc
2o 1o 1o 2o 1+ 2- 1o 1o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright
SE
W. Limb 7 days later: NW- no data
SW- no data
Indices
Rz: 31
10cm flux: 97
Flare: 38/21.6
Ca: no data
Ip: 0
Ia: 0
Solar Regions
15070 N23
Sunspots
19916 N23 αp 5 CMP Dec. 25

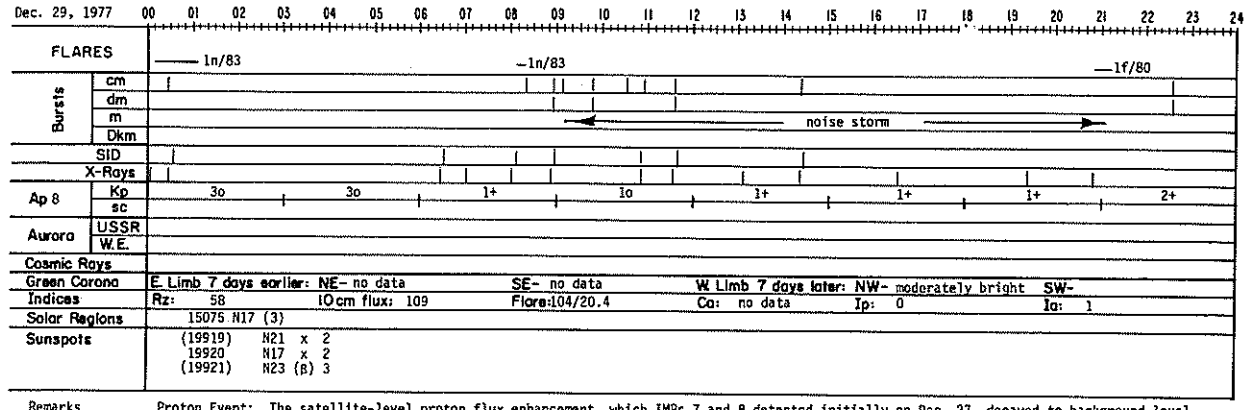




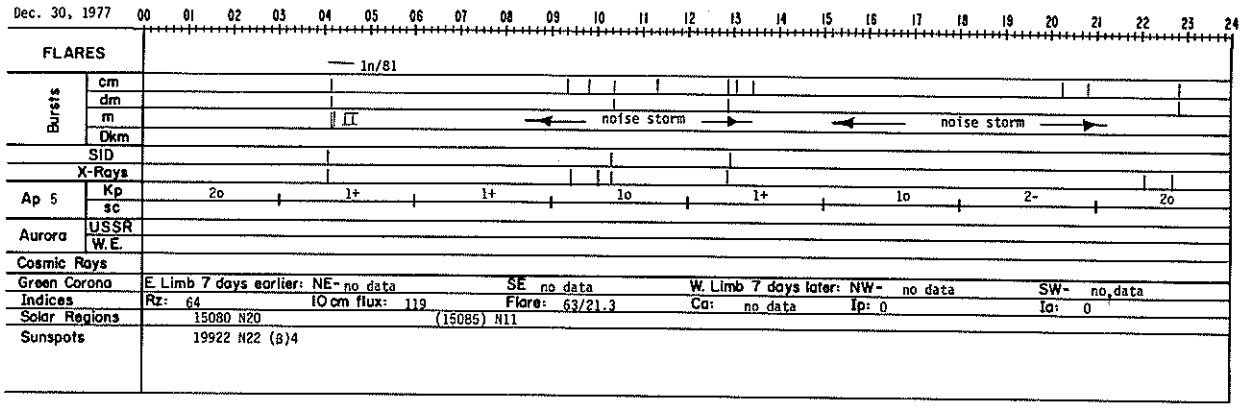


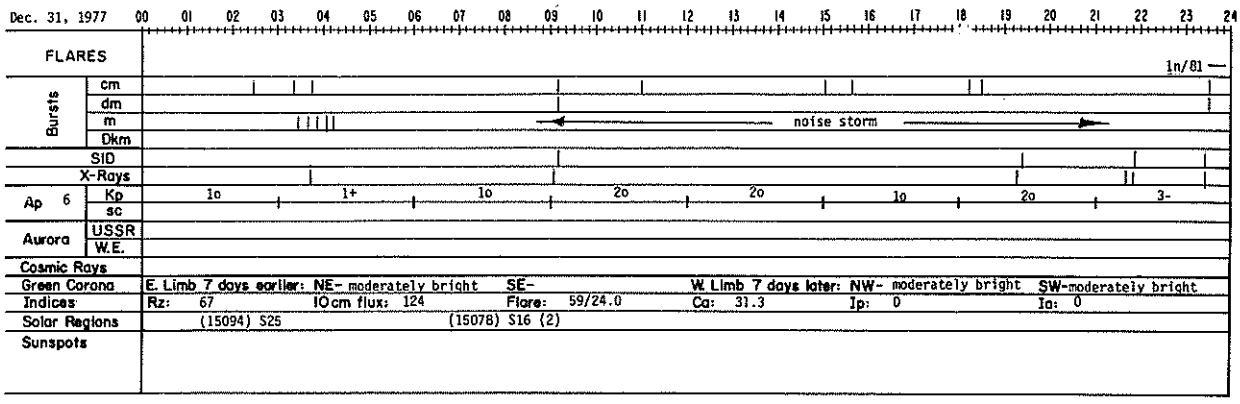
Remarks Proton Event: About midday the 20-40 MeV proton detector on board IMPs 7 and 8 recorded a sharp rise to maximum in the particle flux.





Remarks Proton Event: The satellite-level proton flux enhancement, which IMPs 7 and 8 detected initially on Dec. 27, decayed to background level by the end of the day.





REGIONAL FLARE INDEX

INCLUDES ALL FLARES

HC MATH PLAGE NO.	LAT	CMP DATE	DATE FIRST FLARE	DATE LAST FLARE	FLARE-INDEX SUM	FLARE-INDEX MEAN	TOTAL NO. OF FLARES
15044	N21	77/12/02.1	77/11/28	77/12/08	48.88	4.44	17
15057	N17	77/12/04.2	77/12/05	77/12/05	1.44	1.44	1
15049	S22	77/12/06.6	77/11/30	77/12/10	220.73	20.07	57
15053	N16	77/12/07.1	77/12/03	77/12/03	2.10	2.10	1
15065	N17	77/12/08.8	77/12/12	77/12/12	2.14	2.14	1
15060	N 1	77/12/09.2	77/12/10	77/12/10	7.09	7.09	2
15056	S25	77/12/11.2	77/12/05	77/12/17	588.02	45.23	76
15061	N27	77/12/14.6	77/12/08	77/12/19	19.76	1.65	14
15062	S25	77/12/16.6	77/12/11	77/12/16	22.42	3.74	6
15067	N18	77/12/18.2	77/12/10	77/12/20	42.04	3.82	11
15074	S28	77/12/21.6	77/12/20	77/12/27	78.39	9.80	41
15070	N23	77/12/24.3	77/12/18	77/12/29	87.75	7.31	26
15077	S27	77/12/26.5	77/12/27	77/12/27	3.59	3.59	1
15075	N19	77/12/29.4	77/12/22	78/01/04	72.23	5.16	14
15080	N20	77/12/30.7	77/12/27	78/01/05	98.80	9.88	35
15079	N21	77/12/31.9	77/12/26	77/12/31	23.19	3.86	5

Miscellaneous Data

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Cosmic Rays	
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SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
01	0000	1005	MANI							0146.0	0146.5	1	III
			MANI							0258.2	0301.7	1	IIIG
			MANI							0538.6	0539.1	1	III
	0943	2339	SGMR				1000.0	2339.0	1				CONT
			SGMR				1545.0	1547.1	3				IIIG
	1245	2245	HARV				1546	1547	3	1546	1547	3	IIIG
			HARV				1612		2	1612		2	I
			HARV				1620	1920	1				IN
			HARV				1715	1718	3	1715	1718	3	IIIG
			HARV				1806	1917	2	1806	1917	2	IIIN
			SGMR				1824.5	1828.0	2				IIIG
			HARV	1828	1829	2	1821	1830	3	1821	1830	3	IIIGG
			HARV				1845		3				IIIG
			HARV	1921	1929	2	1918	1930	2				I
			SGMR				1927.0	1943.0	3				IIIG
			HARV	1932	1933	2	1927	1937	3	1927	1937	3	IIIGG
			HARV	1939	1942	2							IV
			HARV				1940	2028	3	1940	2028	3	IC
			HARV	1942	2108	3	1942	2028	3				IV
			HARV				1942	2028	3	1942	2028	3	IIIS
			SGMR				1943.0	1949.0	3				II
			SGMR				1949.0	1959.0	3				IV
			HARV				2028	2245	2	2028	2245	2	IC
	2141	2400	MANI										
02	0000	1000	MANI							0116.7	0116.9	1	III
			MANI							0306.1	0306.4	1	III
			MANI							0611.2	0616.5	1	IIIG
			MANI							0638.8	0641.5	1	IIIG
	0941	2340	SGMR				1115.6	1115.9	1				III
			SGMR				1245.3	1245.5	1				III
			SGMR				1407.0	1800.0	1				CONT
	1245	2245	HARV				1407	2245	1				IN
			HARV				1453		2				IIIG
			SGMR				1511.0	1515.5	3				V
			HARV				1559		2	1559		2	IIIB
			HARV				1607		2	1607		2	IIIB
			HARV				1611	1615	3	1611	1615	3	IIIGG,V
			HARV				1657	1700	2	1657	1700	2	IIIGG
			HARV				1725	2233	1	1732	2233	1	IIIN
			HARV				1737	1738	2	1737	1738	2	IIIG
			SGMR				1744.2	1746.0	2				IIIG
			HARV				1744	1753	3	1744	1753	3	IIIGG
			HARV				2001	2004	2	2001	2004	2	IIIGG
			HARV				2019	2028	2	2019	2028	2	IIIGG
			SGMR				2125.0	2125.1	1				III
			HARV				2125	2127	2	2125	2127	2	IIIG
	2128	2400	MANI										
			HARV				2145	2157	3	2145	2157	3	IIIGG
			SGMR				2147.0	2151.1	1				IIIG
03	0000	1001	MANI							0121.8	0122.1	1	III
			MANI							0254.4	0256.5	1	IIIG
			MANI							0449.8	0450.3	1	III
			MANI							0459.5	0501.0	1	IIIG
			MANI							0659.3	0700.3	1	III
	0940	2341	SGMR				1028.0	2341.0	1				CONT
			SGMR				1150.8	1204.1	3				V
			SGMR				1207.5	1242.0	3				V
			SGMR				1242.0	1329.0	2				IV
	1245	2245	HARV				1306	1528	1				IN
			HARV				1331		2	1331		2	IIIB
			HARV				1422	1423	2				IIIG
			HARV				1426	1427	2	1426		2	IIIG
			HARV				1459	1500	1	1459	1500	1	IIIG
			HARV				1528	1638	2				IC
			HARV				1538	1642	2	1538	1642	2	IIIN
			HARV				1638	2017	3	1748	2017	3	IC
			SGMR				1642.8	1656.2	2				IIIG
			HARV				1643	1711	3	1643	1711	3	IIIS

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
03			SGMR				1656.2	1702.3	3				IV
			HARV	1656	1703	3	1656	1704	3	1656	1704	3	IIIGG,V
			SGMR				1703.0	1712.0	2				IIIG
			HARV				1711	2131	3	1711	2131	3	IIIN
			HARV				1829	1831	3	1829	1831	3	V
			HARV	1908	1909	2	1908	1909	2				IIIG
			HARV				2017	2245	2				IC
	2140	2400	MANI										
04	0000	1000	MANI										
	0939	2342	SGMR				1102.4	1102.6	3				III
			SGMR				1102.6	2342.0	1				CONT
			SGMR				1145.2	1158.9	3				V
	1245	2245	HARV				1254	1323	1				IN
			HARV				1323	1340	2				I
			SGMR				1335.3	1339.2	3				V
			HARV				1335	1339	3	1335	1339	3	IIIGG
			HARV				1340	1519	1				IN
			HARV				1519	2245	2				I
			HARV				1556	2212	2	1556	2212	2	IIIN
			HARV				1556		2				U
			HARV				1749	1750	3	1749	1750	3	IIIG
			HARV				1812	1815	3	1812	1815	3	IIIGG
			SGMR				1821.0	1823.0	3				IIIG
			HARV				1822	1826	3	1822	1826	3	IIIGG,V
			HARV				1832	1841	3	1832	1841	3	IIIGG,V
			SGMR				1833.8	1839.2	3				V
			SGMR				1847.7	1856.0	3				IIIG
			HARV				1849	1858	3	1849	1858	3	IIIGG
			HARV				1902		3	1902		3	IIIG
			HARV				2055	2056	3	2055	2056	3	IIIG
			HARV				2233	2238	3	2235	2238	3	IIIGG
	2128	2400	MANI							2329.2	2332.0	1	IIIG
05	0000	1000	MANI							0305.3	0306.0	1	III
			MANI							0317.3	0317.9	1	III
			MANI							0325.0	0325.5	1	III
			MANI							0524.0	0527.8	1	IIIG
			MANI							0557.4	0557.6	1	III
			MANI							0614.2	0614.6	1	III
			MANI							0624.6	0624.8	1	III
			MANI							0654.8	0656.1	1	IIIG
			MANI							0745.4	0745.6	1	III
	0937	2343	SGMR				1026.3	1036.3	3				V
			SGMR				1227.6	2343.0	2				IIIS
	1245	2245	HARV				1300	2245	1				INW
			HARV				1308	1309	1				IIIG
			HARV				1316	1318	2				IIIG
			HARV				1330	1331	1	1331		1	IIIG
			HARV				1356	1358	2	1356	1358	2	IIIG
			SGMR				1403.1	1405.4	3				IIIG
			HARV	1403	1405	3	1403	1409	3	1403	1409	3	IIIGG
			HARV	1411	1412	2	1411	1412	2	1411	1412	2	IIIGG
			HARV	1416		2	1416		2				IIIG
			HARV				1435	1438	2				IIIGG
			HARV				1445	1449	2	1445	1449	2	IIIGG
			HARV				1507	1514	1	1507	1514	1	IIIGG
			HARV				1524	1529	2	1524	1529	2	IIIGG
			HARV				1603		2				U
			HARV				1606	1607	3	1607		3	IIIG,V
			HARV				1633	1645	3	1634	1645	3	IIIGG
			SGMR				1639.9	1644.0	3				V
			HARV				1650	1653	2	1650	1653	2	IIIG
			HARV				1707		1	1707		1	IIIB
			SGMR				1714.2	1714.5	3				V
			HARV				1714	1715	3	1714	1715	3	IIIG,V
			HARV				1806		1	1806		1	IIIB
			HARV				1833	1847	2	1833	1847	2	IIIGG
			HARV				1852	1858	3	1852	1858	3	IIIGG
			SGMR				1856.4	1857.5	3				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
05			HARV				1956	2005	2	1956	2005	2	IIIGG
			HARV				2038		3	2038		3	IIIB
			HARV				2052	2056	2	2052	2056	2	IIIGG
			HARV				2105	2110	2	2105	2110	2	I,IIIGG
			HARV				2136	2150	2	2140	2149	2	IIIG
			SGMR				2155.7	2208.7	3				V
	2130	2400	MANI							2201.3	2203.0	1	IIIG
			HARV	2204	2208	3	2155	2209	3	2155	2209	3	IIIGG
			HARV				2211	2219	2				IIIGG
			HARV				2243	2245	2	2243	2244	2	IIIGG
			MANI							2354.1	2354.6	1	III
06	0000	1003	MANI							0211.9	0212.5	1	III
			MANI							0410.5	0410.7	1	III
			MANI							0436.7	0437.2	1	III
	0936	2344	SGMR				1216.3	1217.5	1				III
	1245	2245	HARV	1300	1301	3							IIIG
			SGMR				1413.3	1413.4	1				III
			HARV				1843	1855	2	1843	1855	2	IIIGG
			SGMR				1853.3	1854.3	2				IIIG
			HARV				1950	1954	2	1950	1954	2	IIIG
			HARV				2004		2	2004		2	IIIB
			HARV				2016	2025	2	2016	2025	2	IIIG
			HARV	2019	2021	3	2019	2043	3	2026	2043	3	II
			SGMR				2024.3	2034.0	3				V
			HARV				2026	2034	3	2026	2034	3	H '
			SGMR				2034.0	2140.0	1				CONT
			HARV				2047		3				IIIB
			HARV	2058	2115	3							IVN
			HARV				2058	2215	2				I
			SGMR				2120.2	2123.1	3				V
			HARV	2122		1	2118	2125	3	2118	2125	3	IIIGG,V
	2139	2400	MANI										
			HARV				2158		2				IIIG
07	0000	1005	MANI							0329.9	0351.5	3	IV
	0935	2345	SGMR				1111.6	1126.7	1				IIIG
			SGMR				1227.8	1243.1	3				IIIG
	1245	2245	HARV	1531	1536	2	1533	1538	3	1533	1538	3	IIIGG,V
			SGMR				1533.4	1535.2	3				V
			HARV				1548	1549	1				IIIG
			SGMR				1550.7	1554.0	3				V
			HARV	1550	1556	3	1550	1556	3	1551	1556	3	IIIGG,V
			HARV	1550	1557	3	1550	1557	2				IV
			SGMR				1554.0	2345.0	1				CONT
			HARV				1555	1620	3	1603	1620	3	II
			SGMR				1558.0	1608.0	3				II
			HARV				1601	1620	3				IIIGG,RS
			SGMR				1607.5	1615.0	3				IV
			HARV	1625		1	1625		1	1625		1	IIIG
			HARV	1710	1711	3	1710	1711	3	1710	1711	3	IIIG
			HARV	1758	1759	3	1759	1801	3	1759	1801	3	IIIGG
			HARV				1807	1957	2	1825	1957	2	IIIN
			HARV				2025	2026	2	2025	2026	2	IIIG
			HARV	2124		2	2124	2125	2	2124	2125	2	IIIGG
	2130	2400	MANI										
08	0000	0508	MANI							0216.8	0218.0	1	III
			MANI							0327.5	0329.5	1	III
			MANI							0404.2	0404.4	1	III
	0552	1003	MANI							0807.2	0807.3	1	III
	0934	2346	SGMR				1215.8	1225.0	3				II
			SGMR				1221.3	1227.1	3				IIIG
			SGMR				1228.3	1235.0	3				IV
			SGMR				1235.0	2230.0	2				CONT
			SGMR				1244.0	1344.0	2				IV
	1245	2245	HARV	1255	1256	2							IV
			HARV	1312	1322	2	1312	1322	2				IV
			HARV				1450	1451	1				IIIG
			HARV	1542	1546	2	1543	1546	3	1543	1546	3	IIIGG,V

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
08			SGMR				1543.6	1546.7	3				IIIG
			HARV				1726		2	1726		2	IIIG
			HARV				1818	1821	3	1818	1821	3	IIIG
			SGMR				1903.8	1905.0	3				V
			HARV				1903	1904	3	1903	1904	3	IIIG,V
			HARV				1929	1930	3	1929	1930	3	IIIG
	2126	2400	MANI										
09	0000	1001	MANI							0641.2	0645.2	1	IV
			MANI							0705.5	0709.0	1	IIIG
	1245	2245	HARV	1437		2							UNCL
			HARV				1439	1453	3				II
	0932	2348	SGMR				1440.6	1447.0	1				II
			HARV	1445	1447	2	1445	1447	2				IV
			SGMR				1503.0	1900.0	1				CONT
			HARV	1511	1530	2							IVN
			HARV				1531		2	1531		2	IIIG
			HARV				1558		1	1558		1	I
			HARV				2017		2				IIIB
			HARV				2103		1				IIIB
			HARV				2142		1				IIIB
	2130	2400	MANI							2336.0	2336.5	1	III
10	0000	1002	MANI										
	1245	2245	HARV				1846		1	1846		2	IIIB
	0931	2349	SGMR				2202.3	2202.6	2				V
			HARV				2202	2205	2	2202	2205	2	IIIG,U
			SGMR				2208.6	2222.5	3				IV
	2123	2400	MANI							2209.0	2216.3	3	IV
			HARV				2209	2223	3	2209	2223	3	UNCL,H,C
11	0000	1000	MANI							0259.9	0312.8	2	IV
	0930	2350	SGMR				1215.8	1216.5	1				V
			SGMR				2022.5	2222.8	2				III
	1245	2245	HARV	2022	2023	1	2022	2023	2	2022	2023	2	IIIG
	2135	2400	MANI										
12	0000	1000	MANI										
	0929	2351	SGMR										
	1245	2245	HARV										
	2116	2400	MANI										
13	0000	1004	MANI							0744.5	0750.0	1	IV
	1245	2245	HARV										
	0928	2352	SGMR				1511.4	1511.6	1				III
	2136	2400	MANI										
14	0000	1003	MANI										
	0927	2353	SGMR				1353.0	1401.0	2				IIIG
	1245	2400	HARV				1358	1401	2				II
			HARV	1403	1410	1							IV
			HARV				1449	1456	2	1450	1452	1	II
			SGMR				1450.0	1458.1	1				II
			HARV				1511		1	1511		1	IIIB
			HARV				1933		1	1933		1	IIIG
	2120	2400	MANI										
15	0000	1002	MANI							0242.7	0243.0	1	III
			MANI							0251.3	0251.5	1	III
			MANI							0301.0	0301.7	1	IIIG
			MANI							0329.1	0330.1	1	IIIG
	0926	2354	SGMR				1533.7	1533.9	2				III
	1245	2245	HARV				1534		3	1534		3	IIIB
			HARV				1542		2	1542		2	IIIG
			SGMR				1627.0	1627.7	2				V
			HARV				1627		3	1627		3	IIIG
			HARV				1655		2	1655		2	IIIG
			SGMR				1810.5	1811.4	1				IIIG
			HARV				1810	1811	2	1810	1811	3	IIIG
			HARV				2032		2				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
16	0000	1000	MANI							0839.2	0839.4	1	III
	0925	2355	SGMR				1307.7	1308.0	1				IIIG
	1245	2245	HARV				1530	1830	1				I
			HARV				1558	1636	2	1627	1636		I
			HARV				1611	1617	2	1611	1616	2	IIIGG
			SGMR				1613.3	1636.6	1				IIIG
			HARV				1619	1629	2	1623	1629	2	II
			SGMR				1622.8	1627.3	1				II
			HARV				1636	1830	1				IN,W
			HARV				1829		3	1829		3	IIIG
			HARV				1911		2	1911		2	IIIG
			SGMR				1929.0	1929.8	3				V
			HARV				1929		3	1929		3	IIIG,V
			HARV				2042		1				IIIB
	2131	2400	MANI										
			SGMR				2157.1	2158.5	3				V
			HARV	2157		2	2157	2158	3	2157	2158	3	IIIG,V
17	0000	1005	MANI										
	0924	2356	SGMR				1220.7	1222.0	1				V
			SGMR				1503.0	1505.5	1				IIIG
	1245	2245	HARV				1503	1505	3	1503	1505	3	IIIGG
			HARV	1515		1							IIIG,V
			HARV				1617		2	1617		2	IIIB
			HARV				1710		1	1710		1	IIIB
			HARV				1750		2	1750		2	IIIB'
			HARV				1842	1927	1	1842	1927	1	IIIN,W
	2124	2400	MANI										
18	0000	1001	MANI							0010.4	0010.5	1	III
			MANI							0029.4	0029.8	1	III
			MANI							0113.4	0113.7	1	III
			MANI							0520.5	0525.0	1	III
	0923	2357	SGMR				1030.0	1715.0	1				CONT
	1245	2245	HARV				1320	1340	1				IN,W
			HARV				1340	1428	1				I,IIIN
			HARV				1428	1943	1				IN,W
			HARV				1717	2134	1	1717	2134	1	IIIN
			HARV	1752	1754	2	1751	1754	1	1751	1754	1	IIIG
			SGMR				1828.5	1832.3	2				IIIG
			HARV				1828	1833	3	1828	1833	3	IIIGG
	2124	2400	MANI										
19	0000	0955	MANI										
	0922	2358	SGMR				1118.0	1123.4	2				V
	1245	2245	HARV				1735		2	1735		2	IIIB
	2126	2400	MANI										
20	0000	1000	MANI										
	0921	2359	SGMR				1245.2	1245.4	1				III
	1230	2245	HARV	1302	1311	2							IIIG,C
			SGMR				1319.3	1319.4	1				III
			SGMR				1411.8	1412.0	1				III
			HARV				1506		1				IIIB
			SGMR				1635.9	1640.7	2				IIIG
			HARV				1635	1640	3	1635	1640	3	IIIGG
			HARV				1811		2	1811		2	IIIG
	2135	2400	MANI										
21	0000	0945	MANI										
	0920	2400	SGMR				1233.0	1233.3	1				III
	1230	2245	HARV				1527		2				IIIG
			SGMR				1607.7	1607.9	2				III
			HARV				1608		3	1608		3	IIIB
			SGMR				1650.2	1651.5	2				V

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
21			HARV				1650	1651	3	1650	1651	3	IIIG
			HARV				1658		1	1658		1	IIIB
			SGMR				1759.8	1800.2	3				IIIG
			HARV				1800		3	1800		3	IIIB,V
			HARV				2046	2049	2	2046	2049	2	IIIG
			SGMR				2048.5	2048.9	1				IIIG
	2124	2400	MANI										
			HARV				2136	2147	3	2136	2147	3	IIIG
			SGMR				2138.3	2142.6	3				IIIG
22	0000	0951	MANI							0204.5	0208.4	2	IIIG
			MANI							0308.2	0309.0	2	III
	0919	2401	SGMR				1039.6	1245.0	2				IIIS
			SGMR				1338.3	1339.8	2				V
	1230	2345	HARV				1432	1434	2	1434		2	IIIG
			SGMR				1433.9	1435.0	3				V
			SGMR				1624.7	1628.8	3				V
			HARV	1624	1625	1	1624	1627	3	1624	1627	3	IIIGG,V
			HARV				1633		1	1633		1	IIIB
			SGMR				1836.3	1839.0	3				V
			HARV				1837	1841	3	1837	1841	3	III,V
			HARV	1905		3	1905		3				IIIG
	2128	2400	MANI										
23	0000	0948	MANI										
	0919	2402	SGMR										
	1230	2245	HARV				2019		1	2019		1	IIIG
	2136	2400	MANI										
24	0000	0945	MANI										
	0918	2403	SGMR				1752.6	1808.8	2				IIIG
	1230	2235	HARV				1752	1756	3	1752	1756	3	IIIGG
			HARV				1759	1815	3	1801	1815	3	II
			HARV				2013	2014	3	2013	2014	3	IIIG
			HARV				2041		2	2041		2	IIIG
			HARV	2123		1	2122	2124	1				IIIG
	2137	2400	MANI										
25	0000	0945	MANI										
	0917	2404	SGMR				1329.8	1330.0	1				III
			SGMR				1527.8	1528.7	3				V
	1230	2245	HARV				1528		3	1528		3	IIIB,V
			HARV				1531	1533	1	1531	1533	1	IIIG
			HARV				1657	1707	2	1657	1707	2	IIIN
			SGMR				1752.3	1754.9	3				V
			HARV				1752	1755	3	1752	1755	3	IIIG,V
			SGMR				1848.0	1849.1	1				V
			HARV				1848	1849	3	1848	1849	3	IIIG
			HARV				2032	2034	2	2032	2034	2	IIIG
	2115	2400	MANI										
26	0000	0950	MANI										
	0916	2404	SGMR				1026.0	2200.0	1				CONT
	1230	2245	HARV				1314	1750	1				IN
			HARV				1604	2225	1	1604	2225	1	IIIN
			HARV	1752	1758	2	1752	1759	3	1752	1759	3	IIIGG
			SGMR				1754.8	1756.3	3				IIIG
			SGMR				1759.8	1823.4	2				IIIG
			HARV				1858	1903	3	1858	1903	3	IIIGG,V
			HARV				1922	1923	3	1922	1923	3	IIIG
	2142	2400	MANI										
			SGMR				2221.5	2225.5	2				IIIG
27	0000	0536	MANI										
	0632	0945	MANI										
	0916	2405	SGMR				1120.0	2405.0	1				CONT
	1230	2245	HARV				1637	2113	2	1637	2113	2	IIIN
			HARV				1705	1713	3	1705	1713	3	IIIGG,DC
	2145	2400	MANI										
28	0000	0733	MANI										

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

MAY 1978

MAY 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
28	0742	0940	MANI										
	1230	2245	HARV				1314	1318	2	1314	1318	2	IIIGG
			HARV				1627	1629	1	1627	1629	1	IIIG
			HARV				1649		3	1649		3	IIIB
	2152	2400	MANI										
			SGMR										
29	0005	0359	MANI										
	1230	2245	HARV				1508	1509	1				IIIG
	2235	2400	MANI										
			HARV	2242	2243	3	2242	2243	3				IIIGG
			SGMR										
30	0000	0947	MANI										
	1230	2245	HARV				1310		1	1310		1	IIIB
			HARV	1515	1516	2	1516	1517	2	1516	1517	2	IIIG
			HARV	1522		3							IIIG
	2131	2400	MANI										
			SGMR										
31	0000	0950	MANI										
	1230	2245	HARV				1507		3	1507		3	IIIB
			HARV				1610	2217	1				IN
			HARV				1630	1632	2	1630	1632	2	IIIG
			HARV				1742		2	1742		2	IIIB
			HARV				1845	1846	3	1845	1846	3	IIIG
	1900	2409	SGMR										
	2140	2400	MANI										

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

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

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

Note: See page 139 of *Solar-Geophysical Data*, Prompt Reports, Number 407, for the May 1978 spectral observations from Culgoora, Durnten and Weissenau. NGSDC must take the blame for failing to include the Manila and Sagamore Hill data tabulated here with those from Culgoora, Durnten and Weissenau. The Harvard data, on the other hand, simply arrived too late.

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
01	0000	0735	CULG				0223.5		1				IIIB
			CULG	0403	0403.5	1	0403	0403.5	1				IIIG
			CULG	0407	0407.5	1	0407	0407.5	1				IIIG
			CULG	0601	0601.5	1	0601	0601.5	1				IIIG
			CULG	0614	0725								IS,W
			CULG				0709	0710					IIIG,W
	2036	2400	CULG	2036	2040	1							I
			CULG				2117.5	2118	1				IIIG
			CULG	2321	2321.5	1	2321	2321.5	1				IIIG
02	0000	0720	CULG				0025	0105					IN,W
			CULG	0101		1							IIIB
			CULG	0127.5		1	0127.5		1				IIIB
			CULG				0142	0144.5	1				IIIG
			CULG	0144	0251								IN,W
			CULG	0225.5	0226.5	2	0225.5	0226.5	2				IIIG,U
			CULG				0245	0310	1				IIIS
			CULG	0300.5	0301.5	1	0300.5	0301.5	1				IIIG
			CULG				0304.5	0305.5	2				IIIG
			CULG				0315	0330					IN,W
	2036	2400	CULG	2141	2214								IN,W
03	0000	0735	CULG				0301	0319					IS,W
			CULG				0542	0551	1				II
			CULG				0643	0722					IIIN,W
			CULG	0648	0715.5								IN,W
	2035	2400	CULG				2035	2400					IIIS,W
			CULG	2050	2151.5								IIIN,W
			CULG	2051.5	2052	2	2051.5	2052.5	2				IIIG,V,U
			CULG				2056	2057	1				SLOW DRIFT
			CULG				2353	2354	1				IIIG,U
04	0000	0735	CULG				0000	0735					IIIS,W
			CULG	0144.5		1	0144.5	0145	2	0145.5		1	IIIG,U
			CULG	0224	0224.5		0224	0224.5					IIIG,W
			CULG				0304	0500					IS,W
			CULG				0457	0458.5	1				IIIG,U
			CULG				2035	2057	1				IS,C
	2035	2400	CULG				2035	2314					IIIS,W
			CULG				2057	2120					IS,W
05	0000	0735	CULG				0047.5		1				IIIB,U
			CULG				0106.5	0735					IIIN,W
			CULG				0509	0511.5	1				IIIGG,U
			CULG	0512	0513.5								IIIG,W
	2035	2400	CULG				2035	2400					IIIS,W
			CULG	2035	2040	1							IIIN
			CULG	2306	2307	1							IIIG
			CULG	2308.5	2309	1							IIIG
			CULG	2316.5		1	2316.5		1				IIIB
			CULG	2340	2400								IS,W
06	0000	0734	CULG	0000	0734	1							IS,DC
			CULG				0000	0734					IIIN,W
			CULG				0000	0430					IS,W
			CULG	0058.5	0059	1	0058.5	0059	1				IIIG
			CULG				0109	0109.5	1				IIIG
			CULG				0237.5	0238	1				IIIG,U
			CULG				0312	0313	1				IIIG
			CULG				0430	0734	1				IS
			CULG	0511	0714	1							IIIGN
			CULG				0541	0542.5	1				IIIGG,V
			CULG				0545		2				IIIG,U
			CULG				0548		1				IIIG,U
			CULG				0552		1				IIIG,U
			CULG	2035	2400	1	2035	2217.5	1				IS
			CULG	2049.5		1	2049.5		1				IIIB
			CULG	2120	2121	1	2120	2121	2				IIIG
			CULG				2131		1				UNCLF
	2035	2400	CULG	2157	2400	1	2035	2400	1				IIIS

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APR 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
06			CULG				2200.5	2201.5	1				IIIB,U
			CULG	2209.5	2210.5	2	2209.5	2211	3				IIIG,V,U
			CULG				2217.5	2400	1				IS
			CULG	2221	2221.5	1	2221	2221.5	1				IIIG
			CULG	2236.5	2237	1							IIIG
			CULG				2236		1				IIIB
			CULG	2345	2346	1	2345	2346	1				IIIG
			CULG	2348	2352	1	2347.5	2352	2				IIIGG
			CULG	2357.5	2358	1	2357.5	2358	1				IIIG
07			CULG	0000	0035		0000	0221					IN,W
	0000	0734	CULG	0000	0129		0000	0130					IIIN,W
			CULG				0001	0002	3	0001.5		2	IIIGG
			CULG				0031.5		1				IIIB
			CULG	0049	0050	1	0049	0050	2				IIIG
			CULG				0102	0102.5	1				IIIG
			CULG	0129	0129.5	2	0129	0129.5	2				IIIG,U
			CULG				0130	0734	1				IIIS
			CULG	0131	0734	1	0131	0419	1				IIIG,N
			CULG				0221	0312.5	1				IS
			CULG				0323	0323.5	2				IIIB,U
			CULG				0419		2				IIIG,V,U
			CULG				0435.5	0436	2				IIIG
			CULG	0513.5	0514	2							IIIG
			CULG	0521.5	0522	2							IIIG
			CULG	0541.5	0734	2	0541.5	0734	2				IIIG,N
			CULG	0621	0622	2	0621	0622	3				IIIG,V,U
			CULG	0639	0640	2	0639	0640	3				IIIG,V
			CULG	0705.5	0708	2	0705.5	0708.5	2				IIIGG,U
			CULG	0709.5	0711.5	2	0709.5	0711.5	3				IIIGG,V
			CULG				2034	2400	1				IIIS
			CULG				2034	2141	2				IS,C,DC
	2034	2400	CULG	2034	2400								IS,W
			CULG	2049	2136	1	2049	2136	2				IIIG,N
			CULG				2049	2056.5	1			II?	DC
			CULG				2116	2117	2				IIIG
			CULG				2120	2124	2				IIIGG
			CULG				2141	2400	1				IS,DC
			CULG	2224.5	2225	2	2223	2226	2				IIIGG,V,U
			CULG				2353	2354.5	2				IIIGG
08			CULG	0000	0147								IN,W
	0000	0740	CULG				0000	0050	2				IS,DC
			CULG				0000	0734	1				IIIS
			CULG	0044.5	0049.5	1	0044.5	0049.5	1				IIIGG
			CULG				0049.5	0225.5	1				IIIN
			CULG				0050	0147					IS,W
			CULG				0137.5	0138.5	1				IIIGG
			CULG	0147	0535	1	0147	0734	1				IS,DC
			CULG	0147	0445	2	0155	0734	2			IV	
			CULG				0208.5	0209.5	1				IIIG
			CULG				0208	0220.5	2			II	
			CULG	0422.5	0434	2	0422.5	0434	2	0423.5	0425	1	IIIGG
			CULG				0429	0429.5	1				UNCLF
			CULG				0438	0444	1			II?	DC
			CULG	0440.5	0442	3	0440.5	0442.5	3	0441	0442.5	2	IIIGG,V
			CULG	0509	0513	1	0509	0513	1				IIIG
			CULG	0535	0730								IN,W
	2034	2400	CULG				2034	2400	1				IS,DC
			CULG				2034	2400	1				IIIS
			CULG	2034	2400	1							IIIN
			CULG	2036	2400	2	2036	2400	2				IIIG,N
			CULG	2043.5	2044.5	1	2043.5	2044.5	2				IIIG
			CULG	2052	2053	2	2052.5	2053	3	2053		1	IIIGG
			CULG	2113	2114	1	2113	2114	1				IIIG
			CULG				2207	2212	2				DC
			CULG	2214.5	2215	2	2214.5	2215	2				IIIG
			CULG				2238.5	2239	2				IIIG
			CULG	2310	2312.5	1	2309.5	2312.5	2				IIIGG,U
			CULG	2319	2320	2	2319	2320	2				IIIGG

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APR 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
08			CULG				2322.5	2326.5	1				DC
09			CULG				0000	0734	1				IIIS
			CULG	0000	0135								IN,W
	0000	0734	CULG				0000	0042	1				IS
			CULG	0004.5	0010	1	0004.5	0010	2				IIIGG,U
			CULG	0011	0012.5	1	0011	0012.5	1				IIIG
			CULG	0016.5	0018.5	1	0016.5	0018.5	1				IIIG
			CULG				0042	0224					IS,W
			CULG	0105.5	0107	2	0105.5	0107	3				IIIGG,V,U
			CULG	0108.5	0110.5	1	0108.5	0110.5	2				IIIGG
			CULG	0111.5		1	0111.5		1				IIIG
			CULG	0113		1	0113		1				IIIC
			CULG	0135	0734	1							IN,DC
			CULG				0217.5	0218	1				UNCLF
			CULG				0224	0450	1				IN,DC
			CULG				0228.5	0229.5	2				IIIG
			CULG	0315	0320.5	2	0314.5	0322.5	3	0315	0315.5	2	IIIGG
			CULG				0325	0328.5	2	0327.5		1	IIIGG
			CULG	0337	0338	1	0337.5	0338.5	1				SLOW DRIFT
			CULG				0353	0420.5	1				IIIG,N
			CULG	0419	0419.5	1	0418	0420.5	2				IIIG
			CULG	0444.5	0450	1	0444.5	0450	2	0446.5	0447.5	1	IIIGG,U
			CULG				0446.5	0447.5	3				IIIGG,V
			CULG				0450	0734	1				IS,DC
			CULG				0523	0524	1				IIIG
			CULG	0536	0724.5	1							IS,C
			CULG	0652	0652.5	1	0651	0652.5	2				IIIG
			CULG	0655	0655.5	1	0655	0655.5	1				IIIG
			CULG	0703.5	0705	2	0703.5	0705	2				IIIG
			CULG	0709.5	0711	1	0709.5		1				IIIG
			CULG				0711.5		2				IIIB
			CULG	0714.5	0715	1	0714.5	0715	1				IIIG
	2035	2400	CULG				2035	2400	1				IIIS
			CULG	2042.5	2342								IIIN,W
			CULG	2045	2048	2	2045	2045.5	2				IIIG
			CULG	2053	2053.5	1	2053	2054	2				IIIG
			CULG				2054	2055	1				II? SLOW DRIFT
			CULG				2054	2055	1				UNCLF
			CULG				2058.5	2110	1				IIIB,N
			CULG				2102	2400	1				IS,DC
			CULG				2140.5		2				UNCLF
			CULG				2157	2158	2				IIIG,U
			CULG				2212.5	2216	2				IIIGG,V
			CULG	2222.5		1	2222.5		1				IIIB
			CULG				2239	2240	2				IIIG
			CULG	2248	2250.5	1							IIIN
			CULG	2251.5		1	2251.5	2253.5	3	2251	2252	1	IIIGG,V,U
			CULG	2255	2257	1	2249.5	2257	3				IIIGG
10	0000	0733	CULG				0000	0733					IIIN,W
			CULG	0037		1	0037		1				IIIB
			CULG				0129	0129.5	1				IIIB
			CULG				0134.5	0136.5	2				IIIGG
			CULG	0136.5	0139	1	0136.5	0139	1				IIIN
			CULG	0148	0148.5	1	0148	0149	2	0148	0148.5	2	IIIG
			CULG	0217.5	0219	1	0219	0224	2	0219.5	0221.5	1	IIIGG,U
			CULG	0222.5	0224	1							II? SLOW DRIFT
			CULG				0223.5	0229	2				II, HB
			CULG				0248.5	0249.5	3	0248.5	0249	2	IIIGG,V
			CULG	0248.5	0256.5	1	0247	0256.5	1	0248	0249	1	IIIGG,V
			CULG	0253	0306	1	0253	0306	1				IIIS
			CULG				0258	0303	1				II? SLOW DRIFT
			CULG				0259		2				IIIB
			CULG				0313	0314.5	3	0313.5	0314	2	IIIG,V
			CULG	0313	0314.5								IIIG,W
			CULG				0316	0317	2				IIIG
			CULG				0337	0337.5	1				IIIG
			CULG	0406	0458								IN,W
			CULG	0447	0449	2	0447	0449.5	3	0447	0448.5	2	IIIGG

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APR 1978	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
10			CULG				0458	0459	1				UNCLF
			CULG				0504		1				UNCLF
			CULG				0532.5		1				UNCLF
			CULG				0532	0533	1				IIIB
			CULG				0551.5	0553	3				IIIGG,V
			CULG	0611	0619	2	0611	0613.5	1				IIIGN
			CULG				0633.5	0722	2				IIIGN
			CULG				0709		1				UNCLF
	2034	2400	CULG				2034	2400					IIIN,W
			CULG	2048		1							UNCLF
			CULG	2101	2101.5	2	2101	2102	3				IIIG
			CULG	2103.5		1	2103	2104	2				IIIG
			CULG	2200.5		1	2200.5	2202.5	2				IIIG
			CULG				2228	2229.5	2	2228.5	2229	2	IIIG
			CULG	2324.5		1	2324.5	2329	2	2324.5	2328.5	1	IIIG
			CULG	2349.5	2351	1	2349	2352	2	2351.5	2352	1	IIIGG
11	0000	0733	CULG				0000	0733					IIIN,W
			CULG	0055	0056.5	1							IIIG
			CULG				0056		1				IIIB
			CULG				0159	0201.5	1				IIIG
			CULG				0234.5	0235	1				IIIB
			CULG	0301	0303	1	0301	0303	2				IIIG,V
			CULG				0338.5	0339.5					I
			CULG				0414		1				IIIB
			CULG	0444.5	0539	1	0444.5	0733	2				IS,DC
			CULG	0504	0504.5	1	0503.5	0504.5	2				IIIGG
			CULG	0605	0606	1	0604.5	0607.5	2				IIIGG,V
			CULG				0619	0620	1				IIIG
			CULG				0642.5	0647	1				UNCLF
			CULG	2033	2347	1	2033	2120.5	2				IIIG,N
	2033	2400	CULG				2033	2124	1				IIIS
			CULG				2106	2109.5	1				IS
			CULG				2121.5	2125.5	1				II?
			CULG	2121	2121.5	1	2121	2121.5	1				IIIG
			CULG				2124.5	2400					IIIN,W
			CULG				2149.5	2347.5	2				IIIG,N
			CULG	2154	2154.5	2	2154	2156	3				IIIG,V
			CULG				2216.5	2217	3				IIIG
			CULG				2235	2236.5	2				IIIG,U
			CULG				2237	2241	2				IIIG,U
			CULG	2344.5		1	2344.5		3				IIIG
			CULG	2346	2347		2346	2347					IIIG,W
12	0000	0733	CULG	0000	0010.5	1	0000	0733	1				IIIN
			CULG				0022.5	0121.5	1				IS
			CULG	0023.5	0024	2	0023.5	0025.5	3	0024	0025.5	2	IIIG,U
			CULG				0039	0040.5	1				IIIGG
			CULG				0047.5	0049	2				IIIGG
			CULG				0052	0052.5	2				IIIB,U
			CULG				0114.5	0733	2	0117	0117.5	1	IIIG,N
			CULG	0148.5	0149	2	0148.5	0149	2				IIIG
			CULG				0202	0204	2	0202.5	0203	2	IIIGG
			CULG				0206	0207	2	0206.5		1	IIIGG
			CULG				0211	0213.5	2	0212.5		1	IIIGG
			CULG	0223	0223.5	2	0223	0224.5	2	0223	0224	2	IIIG,V
			CULG				0236.5	0241	2	0237	0237.5	2	IIIGG
			CULG				0304	0304.5	3	0304	0304.5	1	IIIG
			CULG				0328.5	0330	2	0329		1	IIIGG
	2033	2400	CULG	2036	2036.5	1	2036	2036.5	3				IIIG
			CULG				2037	2041	2				IIIGG
			CULG				2037	2400					IN,W
			CULG				2041.5	2400					IIIN,W
			CULG				2115	2137	2				IIIS
			CULG				2208	2324.5	2				IIIG,N
			CULG	2214	2224.5	1							IIIN
			CULG				2242	2245	2	2242.5	2244.5	1	IIIGG,V
			CULG				2325.5	2328	3	2325.5	2327	2	IIIGG,V
13	0000	0732	CULG				0000	0732	2				IIIG,N

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APR 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS: DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
13			CULG				0000	0732	1				IIIN
			CULG	0001.5	0003	1	0001.5	0003	3	0001.5	0003	2	IIIGG
			CULG				0032.5	0039	2	0036.5	0037.5	1	IIIGG,V
			CULG	0046.5	0049	1							IS
			CULG				0121.5	0123.5	2				IIIG,V
			CULG				0236		2	0236		1	IIIB,V
			CULG				0241.5	0242.5	3	0241.5	0242.5	2	IIIGG
			CULG				0247	0248	2	0247		1	IIIG
			CULG				0404	0405	3	0404.5	0405	1	IIIGG,V,U
			CULG				0408	0409	1	0408	0409	1	IIIGG
			CULG				0446.5	0449.5	3				IIIGG,V,U
			CULG				0626	0630	3				IIIGG,V
			CULG	0708.5	0709	2	0706	0710.5	3				IIIGG
	2022	2400	CULG				2022.5	2400	1				IS,DC
			CULG				2022.5	2400					IIIS,W
			CULG				2044	2318	2				IIIG,N
			CULG	2257.5	2258	1							IIIG
14	0000	0732	CULG				0000	0732	2				IS
			CULG				0000	0130					IIIS,W
			CULG				0010.5	0031	2				IIIS
			CULG	0021.5	0022.5	1	0021.5	0031	2				II
			CULG	0022	0026	1	0029	0145	2				IV
			CULG	0130	0732		0130	0732					IIIN,W
			CULG				0132	0725	2	0132.5		1	IIIG,N
			CULG				0132	0133	2	0133		1	IIIG
			CULG				0158	0159.5	2	0158		1	IIIG
			CULG				0202		2	0202		1	IIIG
			CULG				0323.5	0327.5	2	0326.5	0327.5	1	IIIGG
			CULG				2032	2400	1				IIIS
	2032	2400	CULG				2032	2400	2				IIIGN
			CULG	2032	2400	1							IS
			CULG				2032	2400	2				IS,C
			CULG	2037	2038	1	2036.5	2037.5	2				IIIG
			CULG				2201	2202.5	2				IIIG
			CULG	2206.5	2207	1	2205.5	2207.5	3				IIIGG
15	0000	0732	CULG				0000	0244.5	1				IIIS
			CULG	0000	0732	1							IS
			CULG				0000	0640	2				IS,C,DC
			CULG				0047	0051.5	2				IIIGG
			CULG				0215	0228.5	2				IIIGG
			CULG				0244	0732	1				IIIN
			CULG				0340.5	0348	2				IIIGG
			CULG	0529.5	0531	2	0515.5	0534.5	2				IIIG,N
			CULG	0631	0657	2	0630.5	0646	3				IIIS
			CULG				0637.5	0648	1				UNCLF
			CULG				0648	0732	1				IV
	2032	2400	CULG				2032	2400	2				IS,C,DC
			CULG				2045	2341					IIIS,W
			CULG				2120.5	2126	2				IIIS
			CULG				2131.5	2138	2				IIIS
			CULG				2154	2155	2				IIIG
			CULG	2158		2	2158	2158.5	2				IIIG
			CULG				2211	2218.5	1				IIIS,U
			CULG				2213.5	2215	1				RS,DC
			CULG	2341	2342	1	2341	2343	2	2342.5		1	IIIG
			CULG				2345	2400	1				IIIS
16			CULG				0000	0412	1				IS,D,DC
	0000	0732	CULG				0000	0030	1				IIIS
			CULG				0000	0042.5	1				IIIS
			CULG				0042.5		1				IIIB
			CULG				0043	0239					IIIN,W
			CULG	0144.5		1	0144.5	0146	2	0144.5	0145	1	IIIGG
			CULG	0147.5		2							IIIG
			CULG				0214	0216	2	0214.5		1	IIIGG
			CULG				0239	0732					IIIS,W
			CULG	0355	0400	1	0355	0401.5	2				IIIN
			CULG				0412	0732	1				IS,DC

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
16			CULG	0435	0732								IN,W
			CULG				0453		2				IIIB,U
			CULG				0520	0732	2				IIIG,N
			CULG				2032	2400	1				IIIS
	2032	2400	CULG				2032	2400	1				IS,C,DC
			CULG	2108.5	2400	1							IN
			CULG				2125	2131.5	2				IIIS
			CULG				2316	2317	1				SLOW DRIFT
			CULG				2323	2325.5	1				SLOW DRIFT
			CULG				2340	2345	1				II
			CULG				2347.5	2349.5	1				IIIGG
17			CULG	0000	0730								IN,W
			CULG				0000	0023.5					IIIS,W
	0000	0730	CULG				0000	0320	1				IS,C,DC
			CULG				0023.5	0051	1				IIIS
			CULG				0051	0730					IIIN,W
			CULG	0216	0217	1	0216	0217	1				IIIG
			CULG				0249.5	0301	1				SCINTLLTNS
			CULG				0320	0400	2				IS,DC
			CULG				0400	0546					IS,W
			CULG				0546	0730	1				IS
			CULG	0621	0621.5	1	0616.5	0623.5	1				IIIGG
	2034	2400	CULG				2034	2152	2				IS,C,DC
			CULG				2034	2400					IIIN,W
			CULG				2152	2310	1				IS,DC
			CULG				2310	2400	1				IS
18	0000	0730	CULG				0000	0106					IS,W
			CULG				0106	0630	1				IS
			CULG	0109	0113	1	0109	0115	3	0109	0112	2	IIIGG
			CULG							0109	0224	1	S.W.F.
			CULG	0109	0123	2	0121	0500	2				IV
			CULG				0111	0126	3				II
			CULG				0120	0122	2	0120.5	0121	2	IIIG
			CULG				0121	0122	3				II?
			CULG	0123	0730	1							IV
			CULG				0214	0216	2				IIIG
			CULG				0216.5		1				IIIB
			CULG				0412	0730	1				IIIN
			CULG				0611		2				IIIB
			CULG				0617		2				IIIG
	2031	2400	CULG				2031	2400					IIIN,W
			CULG				2038		1				IIIB
			CULG				2138		1				IIIB
19	0000	0717	CULG				0045	0717					IIIN,W
			CULG				0208.5	0209	2				IIIG
			CULG				0325	0326	2	0325.5	0326	1	IIIG
			CULG				0542	0549	1				II?
			CULG	0544	0545	1	0544	0545.5	2				IIIGG
			CULG				0548.5	0549	2				IIIG
			CULG				0559	0613	1				II
	2031	2217	CULG				2050.5						IIIB,W
			CULG				2052.5						IIIB,W
			CULG				2217	2217.5					IIIG,W
20	0530	0731	CULG				0542	0657					IIIN,W
	2031	2400	CULG				2056	2400					IIIN,W
			CULG				2103.5		1				IIIB
			CULG				2234.5	2242					II, W
			CULG				2304.5	2305.5	2				IIIG,U
			CULG				2345	2351	2				IIIG
			CULG				2350	2400					IS,W
21	0000	0731	CULG				0000	0010					IS,W
			CULG				0556	0706					IIIN,W
			CULG	0717.5	0718		0716	0721.5					IIIGG,W
			CULG	0725.5	0727	1	0724	0727	2				IIIGG
			CULG				0729.5	0731	1				II

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS: DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
21	2031	2400	CULG				2044	2400					IIIN,W
			CULG				2211.5	2218.5					IIIGG,W
			CULG				2303.5	2305	1				IIIGG
			CULG				2314.5	2317					IIIG,W
22	0000	0730	CULG	0035.5	0730		0003	0730					IIIN,W
			CULG	0053.5	0054	1	0053.5	0054.5	2	0053.5	0054	1	IIIG
			CULG				0059.5	0100	2				IIIB
			CULG				0232.5		1				IIIB
			CULG				0450.5	0453	2				IIIGG
	2031	2400	CULG				2033	2055.5	1				IS
			CULG				2035.5	2400					IIIN,W
			CULG				2036		1				IIIB
			CULG				2055.5	2203					IN,W
			CULG				2134.5	2135.5	2				IIIG,U
			CULG	2159.5	2400	1							IIIG,N
			CULG	2201	2201.5	1							IIIG
			CULG				2203	2243	1				IS
23	0000	0730	CULG				0000	0046	1				IIIS
			CULG				0002.5	0003	2				IIIG
			CULG	0002.5	0046	1							IIIN
			CULG				0009	0010.5	2				IIIGG
			CULG	0030.5	0504		0006	0053					IN,W
			CULG				0105	0441					IIIN,W
			CULG	0120	0121	2	0120	0121	3	0120	0121	2	IIIGG
			CULG				0352.5	0353	2				IIIG
			CULG	0430	0730								IN,W
			CULG	0435.5		2	0435.5	0436	2				IIIG
			CULG	0441		1	0441	0443	3				IIIGG,V
			CULG	0441	0506	2							IIIG,N
			CULG				0443	0508	2				IIIS
			CULG				0457	0500	1				II?
			CULG				0508	0730					IIIN,W
			CULG				0516	0517	1				I
			CULG				0538	0541.5	2				IIIGG,V,U
			CULG				0623	0710	2				IS
			CULG				0713	0713.5	2				IIIB,U
	2030	2400	CULG	2030	2040	1	2030	2141	1				CONT
			CULG	2046	2047	1							IIIG
			CULG				2131	2400	1				IIIN
			CULG				2137.5	2400	1				IS,DC
			CULG				2357.5	2359	2				IIIG
24	0000	0730	CULG				0000	0730	1				IS,DC
			CULG				0110.5	0730	1				IIIN
			CULG	0200	0201.5	1	0159.5	0205.5	2	0200.5	0201	1	IIIGG
			CULG				0434	0435	1				IIIB,V
			CULG				0723	0725	2				IIIGG
			CULG				0723	0725	1				SLOW DRIFT
	2030	2400	CULG				2054.5	2208					IIIN,W
25	0000	0730	CULG	0304	0305	1							I
			CULG				0314.5	0645					IIIN,W
			CULG				0426	0429	1				IIIGG
	2030	2400	CULG				2118.5	2400	1				IIIN
			CULG	2209	2216.5	1	2209	2216.5	1				IIIG
26	0000	0257	CULG				0053.5						IIIB,W
			CULG				0056.5		1				IIIB
			CULG				0108.5	0109.5	1				IIIG
			CULG				0253	0254.5	1				IIIG,U
	0625	0730	CULG										
	2030	2400	CULG				2132	2136	2				IIIGG
			CULG				2230.5	2231	1				UNCLF
27	0000	0726	CULG				0035	0038	2				IIIGG,V,U
			CULG				0038.5	0040	2				IIIG
			CULG	0049.5	0052.5	1							IN
			CULG				0128.5	0136	1				IIIGG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1978

APR 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS: DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
27			CULG	0208.5	0458	1	0208.5	0708	1				IIIG,N
			CULG	0307.5	0308	1	0306.5	0308.5	1				UNCLF
	2033	2400	CULG				2033	2400					IS,W
			CULG				2130	2400					IIIN,W
			CULG	2356.5	2357	1							IIIG
28	0000	0730	CULG				0000	0425					IN,W
			CULG	0009	0014.5	2	0009.5	0014.5	2				IIIGG,V,U
			CULG	0010.5	0017	1	0010.5	0015	1			IV	
			CULG				0015	0730					IIIN,W
			CULG				0425	0550	1				IS,C
			CULG				0550	0730	1				IS
	2030	2400	CULG				2044	2045	1				IIIG
			CULG				2115.5		1				IIIG
			CULG				2126	2400	1				IIIN
			CULG				2158		2				IIIB
			CULG	2310	2320	1							I
			CULG				2315.5	2316	1				IIIG
			CULG				2338		1				IIIB
			CULG	2342.5	2346.5	1	2342.5	2346.5	1				IIIGG
			CULG	2353	2356	1	2353	2356	1				IIIG
29	0000	0730	CULG	0000	0022		0000	0730					IIIN,W
			CULG	0057	0730	1							IN
			CULG	0159	0200	1							IIIG
			CULG	0411.5	0412	1							IIIG
			CULG				0623.5		2				IIIB
	2030	2400	CULG	2035	2400	1	2035	2400	1				IS,C,DC
			CULG				2115	2400	1				IIIN
			CULG				2208	2210	2				IIIGG
30	0000	0715	CULG				0000	0715	1				IIIN
			CULG	0018.5	0338	1	0207.5	0221	1				I
			CULG	0107		1	0105.5	0108	2	0105.5		1	IIIGG,U
			CULG				0432	0432.5	1				IIIG
			CULG				0434	0438	1				IIIGG
			CULG	0454.5	0455.5	2							IIIG
			CULG				0644	0657.5	1				IIIS
			CULG				0710		1				IIIB
	2030	2400	CULG	2030	2400	1	2030	2400	2				IS,C
			CULG				2040	2146	1				IIIS
			CULG	2113	2113.5	1	2113	2113.5	1				IIIG
			CULG				2134	2141	1				UNCLF
			CULG				2146	2400	2				IIIS
			CULG				2223.5	2225.5	1				DC
			CULG				2245	2252	1				DC

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

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

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

Note: The quality of the Culgoora spectrograph film was poor during the period 23/0555 UT to 27/0620 UT.

SELECTED SOLAR EVENTS

APRIL 1978

Culgoora

UT Date 1978 April	HELIOGRAPH EVENT Start (UT)	End (UT)	Freq. (MHz)	Positions Central Dist. ($R_\odot$)	Position Angle (Deg.)	Polarization	Intensity (1-3)	Spectral Type	REMARKS
2	0226	0227	80) 160)	1.0	300		2) 3)	IIIG,U	*
5	0200	0500	80) 160)	.8	10	See remarks	1	IS	Type I persisted from 4th - 10th 160 MHz becoming unpol. on 7th
	0509	0511	43.25) 80) 160)	.2	245		3) 2) 2)	IIIGG,U	
5/6	2300	0500	80) 160)	1.0	105	Unpol		IS	Type I persisted from 4th - 8th The region becoming RH pol. on the 7th
6	0058	0059	80) 160)	.9	30		1	IIIG	*
7	0129	0130	80) 160)	.8	0		3	IIIG,U	*
8	0044	0049	43.25) 80) 160)	.6	60) 90) 95)		3	IIIGG	*
	0150	0448	43.25) 80) 160)	1.0) .7) .7)	300		3)	IVM)) IVS))	Complex source IVM moves to 1.6 $R_\odot$ then fades

Days without Heliograph observations: ..19,20.....

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

UT Date 1978 April	HELIOGRAPH EVENT Start (UT)	End (UT)	Freq. (MHz)	Positions Central Dist. ($R_\odot$)	Position Angle (Deg.)	Polarization	Intensity (1-3)	Spectral Type	REMARKS
8	0213	0218	43.25	1.0	300	-	3	II)	
	0440	0525	43.25) 80) 160)	.4	320	-	3) 3) 1)	IVS)	
9	0105	0113	43.25) 80) 160)	1.3 1.2 1.1	40	-	3	IIIGG,V,	U*
	0314	0323	43.25) 80) 160)	.8) .6) .2)	300	-	3	IIIGG	*
	2252	2253	43.25) 80) 160)	1.3 1.2 1.1	30	-	3) 3) 1)	IIGG,V,	U* Complex source Structure
10	0148	0150	43.25) 80) 160)	1.3 1.1 .9	300		3) 2) 2)	IIIG	*
	0219	0223	43.25) 80) 160)	1.3 1.2 1.1	30		3) 3) 2)	IIIGG,U	) Complex source Structure
	0223	0232	43.25) 80) 160)	1.3) 1.2) 1.1)	30		3	II	
	2349	2352	43.25) 80) 160)	1.3) 1.0) .7)	230	-	3) 3) 2)	IIIGG	*

- Days without Heliograph observations: .19,20.....

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

SELECTED SOLAR EVENTS

APRIL 1978

Culgoora

UT Date 197A April	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions		Polar-ization	Inten-sity (1-3)		
				Central Dist. ($R_\odot$)	Position Angle (Deg.)				
11	0301	0303	43.25) 80) 160)	.9	45	-	3	IIIG,V	*
	2249	2250	43.25) 80)	1.0	310	-	2	IIIG	*
12	0023	0026	43.25) 80) 160)	1.3) 1.2) 1.1)	240	-	3	IIIG,U	*
	0223	0225	43.25) 80) 160)	1.1) 1.0) .9)	25	-	3	IIIG,V	*
13	0122	0124	43.25) 80) 160)	1.0) .9) .7)	10		) 3))))	IIIG	* Complex source
			43.25) 80)	1.2	20		))	V	
13/14	2300	0500	80) 160)	.8	35	L	1	IS	Complex type I source persist-ed until 19th

Days without Heliograph observations: 19,20.....

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

UT Date 197A April	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions		Polar-ization	Inten-sity (1-3)		
				Central Dist. ($R_\odot$)	Position Angle (Deg.)				
14	0016	0017	43.25) 80) 160)	1.3) 1.1) .9)	15	-	3	IIIG	*)))) Complex) source) Structure)))
	0021	0031	43.25) 80) 160)	1.1) 1.1) .9)	15	-	3	II	
	0031	0053	80) 160)	1.1 .9	15	- L	2	IV	
	0322	0331	43.25) 80) 160)	.8	15	-	3	IIIGG	*
15	0221	0224	43.25) 80) 160)	.8	10	-	3	IIIGG	*
16	0358	0401	43.25) 80) 160)	1.3) 1.1) .9)	340	-	3) 2) 2)	IIIGG	*
	2340	2345	43.25	1.3	270	-	3	II	
	2347	2349	43.25) 80) 160)	1.3	290	-	3	IIIGG	*
17/18	2300	0500	80) 160)	.8	140	R	1	IS	

Days without Heliograph observations: 19,20.....

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

SELECTED SOLAR EVENTS

APRIL 1978

Culgoora

UT Date 197.8 April	HELIOGRAPH EVENT Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)	Spectral Type	REMARKS
18	0109	0113	43.25) 80) 160)	1.3) 1.0) .8)	270		3	IIIGG	*)
	0114	0120	43.25	1.0	260		3	II	)
	0120	0122	43.25) 80) 160)	1.3) 1.0) .8)	270		3) 3) 2)	IIIG	)
	0122	0520	43.25) 80)	1.0	260	See remarks	3	IV	) Complex polarization at 80 MHz.
19	0325	0326	43.25) 80) 160)	1.2	100	-	3	IIIG	*
21	2303	2305	43.25) 80) 160)	.8	150		2) 2) 1)	IIIGG	* Type III activity from this region also on 23rd.
	0052	0054	43.25) 80) 160)	1.0	0		3 2 2	IIIG	* Type III activity from this region also on 23rd
	0059	0101	43.25) 80) 160)	1.2) 1.1) 1.0)	260		3 3 2	IIIB	* Type III activity from this region also on 23rd.
23	0104	0105	80) 160)	1.0 .9	300	-	1	IIIG*	

Days without Heliograph observations: 19,20

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

UT Date 197.8 April	HELIOGRAPH EVENT Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)	Spectral Type	REMARKS
23	0443	0458	43.25) 80) 160)	1.0	250	-	3	IIIGG,V	
	0458	0505	80) 160)	1.2 1.1	0))	-	2) 1)	II	Spectral type not easily distinguishable
			160	1.1	55)	-	1)		
24	2359	0000	43.25) 80) 160)	.5	315	-	3	IIIG	
26	0108	0109	80) 160)	.7	250	-	3	IIIG	*
27	0035	0040	43.25) 80) 160)	1.0	45	-	3)	IIIGG,V,U	Complex source Structure
			80) 160)	.5	0		)		
	0128	0136	43.25) 80) 160)	.8	180		3) 2) 3)	IIIGG	
28	0010	0012	43.25) 80) 160)	.9	70		3	IIIGG,V,U	
	2342	2347	80)) 160)	.9	20		2) 3) 3)	IIIGG	*

Days without Heliograph observations: 19,20

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

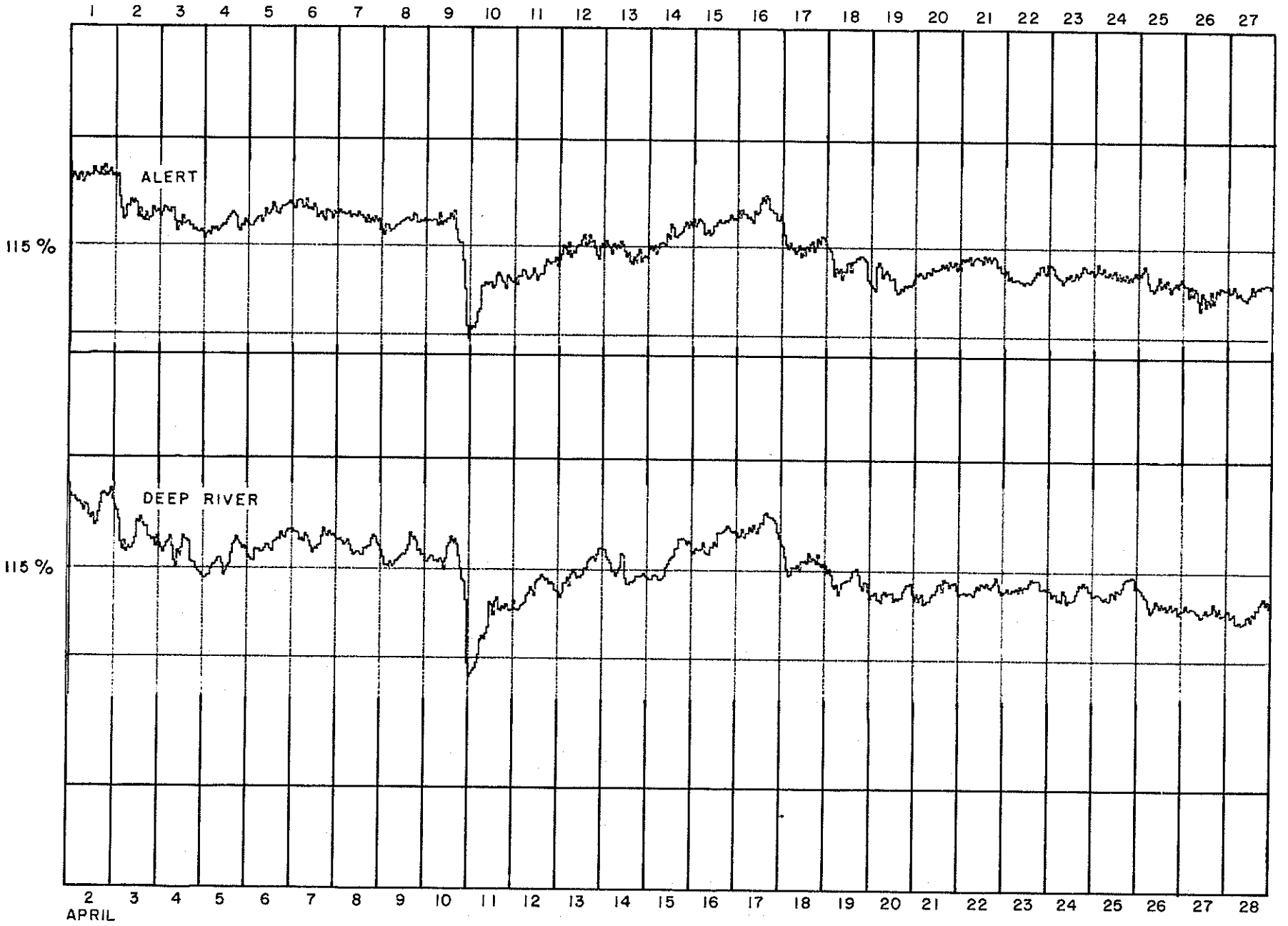
COSMIC RAY INDICES
(Neutron Monitors)
MARCH-APRIL 1978

Date March 1978	ALERT Average cts/hr	DEEP RIVER Average cts/hr	Date April 1978	ALERT Average cts/hr	DEEP RIVER Average cts/hr
1	7360	6909	1	7462	7021
2	7352	6912	2	7477	7024
3	7371	6918	3	7342	6909
4	7342	6955	4	7289	6837
5	7392	6935	5	7272	6814
6	7414	6976	6	7323	6869
7	7405	6953	7	7337	6896
8	7339	6927	8	7308	6869
9	7072	6634	9	7284	6838
10	6910	6504	10	7230	6802
11	6935	6560	11	7007	6557
12	7086	6664	12	7091	6699
13	7177	6744	13	7188	6774
14	7248	6818	14	7170	6779
15	7298	6867	15	7232	6816
16	7356	6923	16	7287	6891
17	7401	6967	17	7337	6947
18	7428	6973	18	7202	6814
19	7453	6995	19	7124	6747
20	7468(21)	6700	20	7057	6694
21	7508	7001	21	7105	6705
22	7499	7041	22	7139	6715
23	7409	6972	23	7078	6722
24	7379	6962	24	7091	6700
25	7345	6886	25	7089	6711
26	7323	6892	26	7058	6663
27	7343	6890	27	7013	6635
28	7337	6902	28	7026	6628
29	7377	6927	29	7010	6636
30	7411	6962	30	6917	6544
31	7420	6974			
MEAN	7328	6879	MEAN	7185	6775

( ) Number of hours for which data are available if less than 24.
Scaling factors for Alert and Deep River are 100 and 300, respectively.

COSMIC RAY INDICES
Neutron Monitors)

Bartels Rotation 1978 (April 1978)



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Misc
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