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Solar - Geophysical Data

Part II (Comprehensive Reports)

NO. 454 JUNE 1982

DATA FOR
DECEMBER 1981

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SOLAR-GEOPHYSICAL DATA

No. 454

Issued in two parts

Helen E. Coffey, Editor

Joe H. Allen, Chief
Solar-Terrestrial Physics Division

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----- = no data available.
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DECEMBER 1981 DATA

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SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

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Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density (10 -22 W/m 2 Hz) Peak	Mean	Int	Remarks
01	208	VORO	44	NS	0000.0E				20.0		
	410	LEAR	43	NS	0010.0	0721.1	626.0D	119.0			
	245	LEAR	43	NS	0128.0	0231.1	548.0D	200.0			
	200	GORK	44	NS	0557.0E		357.0D		5.0		
	260	ONDR	44	NS	0821.0E		331.0D	8.0U			
	245	SGMR	43	NS	1536.0	1919.0	310.0D	110.0			
	410	PALE	43	NS	1707.0	1859.3	623.0	100.0			
	245	PALE	43	NS	1707.0	2005.1	623.0	240.0			
	200	HIRA	44	NS	2130.0E	0415.0	590.0D	38.0	10.0		ML
	245	LEAR	43	NS	2149.0	0934.6	768.0	820.0			
	410	LEAR	43	NS	2149.0	0940.0	768.0	71.0			
	3750	TYKW	5	S	0100.0	0100.8	2.0	21.0	6.0		
	9400	TYKW	5	S	0100.0	0100.8	2.0	4.0	1.5		
	2840	PEKG			0100.0	0100.9		36.7			
	2930	VORO	1	S	0100.0	0102.0	3.0	192.0			
	2840	PEKG			0100.0	0103.1		24.5			
	9395	PEKG			0100.0	0103.1		14.4			
	9395	PEKG			0100.0	0104.3		16.6	1.7		
	2840	PEKG			0100.0	0104.3	20.0		6.5		
	9395	PEKG			0100.0	0107.0		87.0			
	9395	PEKG	42	SER	0100.0	0111.2	21.0	9.2			
	2840	PEKG			0100.0	0111.2	20.0	16.0			
	500	HIRA	42	SER	0100.5	0100.6	11.0	100.0			WL
	410	LEAR	47	GB	0100.5	0100.6	3.8	620.0			
	1000	TYKW	45	C	0100.5	0100.7	1.5	29.0	8.0		
	2000	TYKW	5	S	0100.5	0100.9	1.5	24.0	8.0		
	8800	LEAR	4	S/F	0100.5	0104.1	3.8	18.0			
	15400	LEAR	4	S/F	0100.5	0105.3	4.8	17.0			
	4995	LEAR	4	S/F	0100.6	0100.8	3.7	16.0			
	2695	LEAR	4	S/F	0100.6	0100.8	3.7	21.0			
	606	LEAR	4	S/F	0100.6	0100.8	3.5	50.0			
	1415	LEAR	4	S/F	0100.6	0100.8	3.7	24.0			
	3750	TYKW	30	PBI	0102.0		6.0	1.5	.7		
	9400	TYKW	45	C	0102.5	0104.3	5.5	12.0	4.0		
	3750	TYKW	45	C	0102.6	0103.1	2.0	13.0	4.0		
	2000	TYKW	5	S	0102.6	0103.1	1.4	6.0	2.0		
	1000	TYKW	5	S	0102.6	0103.2	1.4	2.0	.7		
	2000	TYKW	5	S	0104.0	0104.2	.7	6.0	2.0		
	1000	TYKW	5	S	0104.0	0104.2	1.0	9.0	1.5		
	3750	TYKW	5	S	0105.1	0105.3	.5	1.0	.3		
	1000	TYKW	5	S	0105.1	0105.3	.5	15.0	3.0		
	2000	TYKW	8	S	0105.2	0105.3	.3	3.0	1.0		
	3750	TYKW	5	S	0107.0	0107.2	.5	1.5	.5		
	3750	TYKW	21	GRF	0109.0	0140.0	80.0	7.0	2.5		
	3750	TYKW	45	C	0109.3	0111.1	2.5U	13.0	3.0U		
	1000	TYKW	45	C	0110.0	0110.2	4.0	18.0	3.0		
	9400	TYKW	21	GRF	0110.0	0140.0	60.0	7.0	3.0		
	2695	LEAR	8	S	0110.8	0111.1	.7	20.0			
	4995	LEAR	8	S	0110.8	0111.1	.7	16.0			
	9400	TYKW	5	S	0110.9	0111.1	.5	6.0	1.5		
	2000	TYKW	5	S	0110.9	0111.2	3.0	17.0	3.0		
	1415	LEAR	8	S	0111.0	0111.1	.6	27.0			
	3750	TYKW	45	C	0116.5	0117.9	2.0	3.0	1.0		
	2000	TYKW	45	C	0116.5	0117.9	2.0	2.0	.7		
	1000	TYKW	8	S	0120.0	0120.2	.4	10.0	3.0		
	2000	TYKW	21	GRF	0120.0	0140.0	50.0	4.0	2.0		
	9395	PEKG	20	GRF	0121.0	0128.4	31.0	8.7			
	9400	TYKW	5	S	0125.0	0128.0	7.0	5.0	2.0		
	1000	TYKW	45	C	0125.0	0128.8	7.0	5.0	1.5		
	2000	TYKW	45	C	0126.0	0126.5	6.0	2.0	1.0		
	410	LEAR	8	S	0126.1	0126.1	1.2	119.0			
	1415	LEAR	8	S	0126.1	0126.3	.7	20.0			
	8800	LEAR	4	S/F	0126.1	0128.0	5.7	15.0			
	15400	LEAR	4	S/F	0126.5	0128.0	3.1	20.0			
	410	PALE	8	S	0126.8	0127.1	.5	40.0			
	410	PALE	8	S	0137.0	0137.3	2.0	90.0			
	1000	TYKW	45	C	0137.0	0137.4	3.0	6.0	1.0		
	500	HIRA	23	GRF	0239.0	0424.0	201.0	8.0	5.0		ML
	2000	TYKW	21	GRF	0300.0	0353.0	165.0	11.0	5.0		
	500	HIRA	45	C	0302.4	0302.7	1.0	250.0	100.0		SR

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

DECEMBER 1981

Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density (10 -22 W/m 2 Hz) Peak	Mean	Int	Remarks
01	100	HIRA	46	C	0302.5		1.5	960.0D	230.0D		
	2000	TYKW	5	S	0302.5	0303.0	1.5	8.0	1.5		
	606	LEAR	47	GB	0302.6	0302.8	1.0	910.0			
	606	PALE	47	GB	0302.6	0302.8	.5	930.0			
	245	LEAR	4	S/F	0302.6	0302.8	2.2	310.0			
	410	LEAR	4	S/F	0302.6	0306.5	4.2	27.0			
	2695	PALE	8	S	0302.8	0303.0	.3	17.0			
	3750	TYKW	5	S	0303.0E	0303.0U	3.0D	4.0D	1.5		
	1000	TYKW	5	S	0303.0E	0303.0U	1.0D	5.0D	2.0D		
	9400	TYKW	20	GRF	0310.0	0440.0	140.0	8.0	4.0		
	1000	TYKW	45	C	0312.0	0320.4	22.0	39.0	8.0		
	3750	TYKW	21	GRF	0312.0	0430.0	150.0	12.0	7.0		
	1415	MANI	2	S/F	0315.0	0320.0	8.0	3.4	1.1		
	2000	TYKW	45	C	0315.0	0321.0	22.0	8.0	3.0		
	606	MANI	4	S/F	0317.0	0320.3	12.0	16.4	5.5		
	3750	TYKW	5	S	0319.0	0322.0	15.0	3.0	1.5		
	606	LEAR	8	S	0320.1	0321.1	2.0	24.0			
	1415	LEAR	8	S	0320.3	0321.3	1.8	11.0			
	1000	TYKW	29	PBI	0334.0		120.0	6.0	3.0		
	3750	TYKW	5	S	0433.0	0433.3	1.0	4.0	1.5		
	3750	TYKW	5	S	0441.0	0441.7	4.0	4.0	1.0		
	245	LEAR	47	GB	0441.3	0441.5	.3	2600.0			
	9395	PEKG	20	GRF	0548.0	0558.5	52.0	8.8	4.1		
	8800	LEAR	4	S/F	0549.3	0557.1	19.0	07.0			
	9400	TYKW	20	GRF	0550.0	0600.0	45.0	4.0	2.0		
	245	LEAR	8	S	0649.1	0649.5	.5	42.0			
	606	LEAR	8	S	0649.3	0649.5	.3	11.0			
	9100	GORK	20	GRF	0709.0U	0849.3U	219.0U	38.0			
	15000	KISV	1	S	0720.5	0721.0	1.5	12.0			
	2950	GORK	21	GRF	0750.4	0915.0	84.6	14.8			
	430	KRAK	42	SER	0807.0	0811.9	332.0	43.0			
	430	KRAK			0807.0	1214.0		100.0			
	430	KRAK			0807.0	1251.0		220.0			
	6100	KISV	21	GRF	0825.0	0843.3	60.0	16.0			
	15000	KISV	27	RF	0826.0	0845.0	46.0	31.0			
	3200	BERN	22	GRF	0826.8	0839.2	25.0	12.0			ONLY PAPER REC
	5200	BERN	22	GRF	0826.8	0839.2	38.0	19.0			ONLY PAPER REC
	950	GORK	40	F	0836.0	0839.3	3.8	3.0			
	9500	POTS	20	GRF	0838.0	0843.3	62.0	16.0			
	4995	ATHN	8	S	0838.3	0839.1	2.0D	15.0			
	1415	ATHN	8	S	0838.3	0839.1	1.8D	15.0			
	2695	ATHN	8	S	0838.3	0839.1	1.8D	11.0			
	2950	GORK	1	S	0838.3	0839.2	1.9	9.1			
	3000	POTS	3	S	0838.5	0839.0	1.5	11.0			
	1470	POTS	1	S	0838.5	0839.3	1.5	5.0			
	930	BORD	41	F	0838.5	0839.4	1.1	34.0	2.0		
	8800	ATHN	8	S	0838.6	0839.1	1.4	08.0			
	8800	LEAR	47	GB	0838.6	0843.3	15.2	31.0			
	4995	LEAR	47	GB	0838.8	0839.1	13.8	13.0			
	2695	LEAR	47	GB	0838.8	0839.1	14.3	11.0			
	1415	LEAR	8	S	0838.8	0839.3	1.0	13.0			
	810	KRAK	8	S	0838.9	0839.0	.4	31.0			
	2650	DWIN	1	S	0839.0	0839.0	1.0	10.0	5.0		
	606	LEAR	8	S	0839.0	0839.1	.3	18.0			
	15400	LEAR	47	GB	0839.6	0843.8	13.0	27.0			
	2950	GORK	1	S	0913.3	0913.9	1.2	5.5			
	2650	DWIN	1	S	0914.0	0914.0	.5	10.0	5.0		
	260	ONDR	8	S	0940.8	0941.0	.8	209.0			
	7000	SAOP	28	PRE	1110.9		62.6	10.0	5.0		
	810	KRAK	8	S	1139.5	1139.6	.2	13.0			
	536	ONDR	8	S	1209.3	1209.8	.8	58.0			
	4995	ATHN	4	S/F	1213.0	1213.6	2.6	28.0			
	2695	ATHN	4	S/F	1213.0	1214.0	2.5D	19.0			
	1415	ATHN	8	S	1213.1	1213.6	1.4D	11.0			
	3200	BERN	3	S	1213.3	1214.4	5.0	18.0			ONLY PAPER REC
	5200	BERN	3	S	1213.3	1214.4	5.0	30.0			ONLY PAPER REC
	810	KRAK	8	S	1213.5	1213.6	.2	10.0			
	9500	POTS	29	PBI	1213.5	1214.0	22.0	13.0			
	1470	POTS	3	S	1213.5	1214.2	1.5	15.0			
	7000	SAOP	3	S	1213.5	1214.3	2.3	58.0	29.0		8R

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Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density (10 -22 W/m 2 Hz) Peak	Mean	Int	Remarks
01	3000	POTS	3	S	1213.5	1214.4	1.5	18.0			
	9400	HUAN	2	S/F	1213.7	1214.3	1.6	19.1	10.5		R
	536	ONDR	3	S	1213.8	1214.2	1.9	69.0	4.0		
	2650	DWIN	2	S/F	1214.0	1215.0	1.0	15.0	5.0		
	9400	HUAN	29	PBI	1215.3	1215.3	17.8	4.8	2.5		0
	7000	SAOP	29	PBI	1215.8			16.0	8.0		
	113	POTS	4	S/F	1216.6	1216.6	.3	175.0	40.0		III
	536	ONDR	8	S	1217.2	1217.4	.2	133.0			
	1415	SGMR	4	S/F	1248.5	1251.6	4.3D	30.0			
	1470	POTS	4	S/F	1249.5	1251.5	3.5	15.0			
	410	SGMR	4	S/F	1249.6	1251.0	3.5	75.0			
	536	ONDR	42	SER	1250.0	1252.3	13.7	39.0	4.0		
	536	ONDR			1250.0	1256.0		46.0			
	810	KRAK	8	S	1252.0	1252.0	.2	10.0			
	2800	OTTA	21	GRF	1440.0	1710.0	280.0	19.0	8.4		
	7000	SAOP	27	RF	1443.4		21.6	6.0	3.0		
	7000	SAOP	4	S/F	1507.0	1507.7	1.0	48.0	24.0		26L
	2800	OTTA	3	S	1507.2	1507.7	1.5	11.8	4.0		
	7000	SAOP	29	PBI	1508.0		7.1	6.0	3.0		
	410	SGMR	8	S	1524.6	1524.8	.2	21.0			
	2800	OTTA	20	GRF	1540.0	1545.0	30.0	7.2	3.6		
	7000	SAOP	46	C	1654.8	1709.0	16.0	179.0	89.0		10R
	9400	HUAN	28	PRE	1658.3	1708.3	10.0	15.9	10.2		R
	2695	PENT	3	S	1704.0	1705.0	3.0	61.0	20.4		
	4995	SGMR	8	S	1704.3	1704.8	1.3	87.0			
	8800	SGMR	8	S	1704.5	1704.8	.8	31.0			
	15400	SGMR	8	S	1704.8	1705.1	.5	21.0			
	245	SGMR	4	S/F	1705.8	1706.5	2.5	92.0			
	2695	PENT	3	S	1708.0	1709.0	3.0	34.0	13.0		
	9400	HUAN	3	S	1708.3	1709.1	2.1	81.2	43.6		R
	15400	SGMR	4	S/F	1710.3	1710.5	9.0	40.0			
	8800	SGMR	47	GB	1710.3	1710.5	8.8	32.0			
	4995	SGMR	4	S/F	1710.3	1710.6	9.7	23.0			
	9400	HUAN	29	PBI	1710.4	1710.4	59.3	14.3	5.7		0
	7000	SAOP	29	PBI	1710.7		77.5	38.0	17.0		
	2695	PENT	3	S	2128.8	2129.5	1.5	10.6	5.0		
02	208	VORO	44	NS	0000.0E		240.0D		20.0		
	100	GORK	44	NS	0558.0E		62.0D		5.0		
	200	GORK	44	NS	0600.0E		339.0D		5.0		
	208	IZMI	44	NS	0818.0E		222.0D	300.0D			
	260	ONDR	44	NS	0822.0E		337.0D	30.0U			
	430	KRAK	43	NS	0827.2	0939.2	88.0D	130.0			
	100	GORK	43	NS	0906.0		153.0D		10.0		
	245	SGMR	43	NS	1219.0	1357.6	507.0D	1199.0			
	245	PALE	43	NS	1717.0	1733.3	618.0	470.0			
	100	HIRA	44	NS	2130.0E	2208.0	140.0D	70.0	20.0		
	200	HIRA	44	NS	2130.0E	2220.0	300.0D	18.0	7.0		ML
	245	LEAR	43	NS	2149.0	0224.6	769.0	470.0			
	410	LEAR	43	NS	2149.0	1014.6	769.0	84.0			
	410	PALE	43	NS	2252.0	2324.3	283.0	100.0			
	2000	TYKW	20	GRF	0040.0	0100.0	60.0	2.0	1.0		
	1000	TYKW	20	GRF	0040.0	0100.0	60.0	2.0	1.0		
	9400	TYKW	20	GRF	0040.0	0100.0	60.0	3.0	1.5		
	3750	TYKW	20	GRF	0040.0	0100.0	75.0	3.0	1.5		
	9395	PEKG	20	GRF	0041.0	0057.3	57.0	59.0			
	2000	TYKW	20	GRF	0150.0	0203.0	30.0	3.0	1.5		
	1000	TYKW	5	S	0205.0	0212.0	20.0	2.0	1.0		
	3750	TYKW	5	S	0209.0	0213.0	10.0	2.0	.7		
	1000	TYKW	21	GRF	0307.0	0343.0	150.0	10.0	4.0		
	2000	TYKW	5	S	0309.5	0310.8	4.0	4.5	1.5		
	9400	TYKW	5	S	0309.8	0310.1	.5	5.0	1.5		
	1000	TYKW	45	C	0309.9	0310.3	2.5	6.0	1.0		
	1000	TYKW			0309.9	0310.9		6.0			
	2000	TYKW	20	GRF	0320.0	0343.0	140.0	15.0	5.0		
	3750	TYKW	20	GRF	0330.0	0353.0	130.0	10.0	5.0		
	9395	PEKG	20	GRF	0332.0	0406.0	84.0	8.2	2.3		
	9400	TYKW	20	GRF	0340.0	0410.0	120.0	5.0	3.0		
	3750	TYKW	20	GRF	0450.0	0500.0	40.0	2.0	1.0		
	9395	PEKG	1	S	0501.0	0502.5	3.0	8.2	1.3		

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Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density (10 -22 W/m 2 Hz) Peak	Mean	Int	Remarks
02	1000	TYKW	45	C	0541.0	0542.7	6.0	66.0	5.0		
	9400	TYKW	45	C	0541.0	0543.5	6.0	22.0	4.0		
	3750	TYKW	45	C	0541.0	0543.5	5.0	12.0	4.0		
	2000	TYKW	45	C	0541.3	0543.5	6.5	20.0	4.0		
	4995	LEAR	8	S	0542.8	0543.5	1.3	13.0			
	9395	PEKG			0543.0E	0543.5U	2.0D	22.0			
	245	LEAR	8	S	0543.1	0543.1	1.5	95.0			
	410	LEAR	8	S	0543.1	0543.3	1.5	46.0			
	15400	LEAR	8	S	0543.1	0543.3	1.0	24.0			
	606	LEAR	8	S	0543.1	0543.5	1.4	05.0			
	8800	LEAR	8	S	0543.3	0543.3	.8	13.0			
	2695	LEAR	8	S	0543.3	0543.5	.8	11.0			
	1415	LEAR	8	S	0543.3	0543.6	1.2	17.0			
	606	MANI	1	S	0543.6	0544.0	2.1	8.0	2.7		
	4995	MANI	1	S	0543.7	0544.2	1.3	6.8	2.3		
	8800	MANI	3	S	0543.7	0544.2	1.3	33.5	11.2		
	2695	MANI	3	S	0543.8	0544.1	1.2	13.1	4.4		
	1415	MANI	3	S	0543.8	0544.3	2.2	16.4	5.5		
	3750	TYKW	29	PBI	0546.0		10.0	3.0	1.5		
	3750	TYKW	5	S	0603.0E	0603.5	5.0D	3.0	1.0D		
	1000	TYKW	45	C	0603.0E	0603.8	1.0D	18.0	2.0D		
	245	LEAR	8	S	0659.0	0659.1	.5	33.0			
	410	LEAR	8	S	0659.1	0659.1	.4	09.0			
	606	LEAR	8	S	0713.3	0713.5	.3	35.0			
	245	LEAR	8	S	0713.3	0713.5	.3	80.0			
	810	KRAK	8	S	0827.1	0827.1	.1	7.0			
	430	KRAK	8	S	1006.3	1006.4	.8	70.0			
	430	KRAK	8	S	1057.6	1057.7	.2	42.0			
	430	KRAK	8	S	1211.6	1211.6	.2	35.0			
	930	BORD	41	F	1224.0	1225.3	3.8	71.0	2.0		
	930	BORD	41	F	1250.4	1250.5	.4	20.0	2.0		
	430	KRAK	8	S	1253.8	1253.8	.2	21.0			
	930	BORD	8	S	1258.7	1258.7	.2	35.0	2.0		
	430	KRAK	42	SER	1338.2	1344.3	15.2	20.0			
	234	POTS	4	S/F	1357.5	1357.7	.8	1450.0	110.0		III/V
	113	POTS	4	S/F	1357.5	1357.7	1.3	125.0	10.0		III/V
	245	SGMR	8	S	1513.1	1513.6	1.0D	38.0			
	410	SGMR	8	S	1513.3	1513.6	.8	130.0			
	2800	OTTA	27A	RF	1535.0		110.0	3.8	3.3		
	2800	OTTA	24	R	1535.0	1548.0	13.0	3.8	1.4		
	930	BORD	41	F	1545.5	1546.7	1.6	23.0	2.0		
	2800	OTTA	24P	R	1548.0		82.0	3.8			
	2695	PENT	4	S/F	1705.0	1707.3	5.0	46.0	11.0		
	7000	SAOP	45	C	1706.1	1707.3	3.1	23.0	11.0		30L
	2800	OTTA	26	FAL	1710.0	1725.0	15.0	-3.8	-1.9		
	2800	OTTA	3	S	2031.0	2032.0	3.0	10.6	4.6		
	245	LEAR	8	S	2322.1	2322.3	.7	280.0			
03	208	VORO	44	NS	0000.0E		240.0D		13.0		
	200	GORK		NS	0618.0E		273.0D		5.0		
	260	ONDR	44	NS	0903.0E		307.0D	64.0U			
	245	SGMR	43	NS	1359.8	1950.6	406.2D	119.0			
	245	PALE	43	NS	2000.0	2142.8	457.0	119.0			
	245	LEAR	43	NS	2150.0	0643.6	647.0	47.0			
	2000	TYKW	20	GRF	0448.0	0500.0	35.0	1.0	.5		
	3750	TYKW	45	C	0555.0	0557.7	5.0U	13.0	6.0		
	9400	TYKW	45	C	0555.0	0558.0	5.0	9.0	5.0		
	2000	TYKW	5	S	0555.0	0558.0	5.0	2.0	1.0		
	8800	LEAR	4	S/F	0555.8	0557.3	3.0	11.0			
	4995	LEAR	4	S/F	0555.8	0557.6	3.8	18.0			
	2695	LEAR	4	S/F	0555.8	0558.1	4.3	11.0			
	1000	TYKW	42	SER	0557.5	0558.7	2.5U	145.0	3.0		
	9400	TYKW	29	PBI	0600.0		15.0	3.0	1.5		
	3750	TYKW	29	PBI	0600.0U		14.0U	4.0	2.0D		
	9100	GORK	23	GRF	0600.0	1014.8	338.0D	24.0			
	200	HIRA			0645.9	0646.5		470.0			0
	200	HIRA	46	C	0645.9	0647.1	2.4	1400.0	200.0		0
	2840	PEKG	45	C	0646.0	0647.6	3.0	15.5	2.0		
	200	GORK	4	S/F	0646.2	0647.5	2.9	50.0D			
	245	LEAR	47	GB	0646.3	0647.5	1.7	1300.0			

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Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density (10 -22 W/m 2 Hz) Peak	Mean	Int	Remarks
03	2695	LEAR	4	S/F	0646.8	0647.3	2.7	28.0			
	4995	LEAR	4	S/F	0647.0	0647.3	2.8	67.0			
	9100	GORK	8	S	0647.0	0647.4	.6	40.0	20.0		
	2950	GORK	3	S	0647.0	0647.5	2.2	28.0			
	3750	TYKW	5	S	0647.0	0647.5	3.0	42.0	6.0		
	950	GORK	1	S	0647.0	0647.5	2.0	7.0			
	9400	TYKW	45	C	0647.0	0647.5	3.0	31.0	3.0		
	2000	TYKW	5	S	0647.0	0647.6	3.0	11.0	4.0		
	9395	PEKG	45	C	0647.0	0647.6	2.0	25.8	3.3		
	100	HIRA	46	C	0647.0	0647.9	1.4	615.0	230.0		
	8800	LEAR	4	S/F	0647.1	0647.3	572.1	47.0			
	410	LEAR	8	S	0647.1	0647.3	1.2	80.0			
	606	LEAR	8	S	0647.1	0647.5	1.5	04.0			
	650	GORK	1	S	0647.1	0647.5	2.0	7.0			
	1415	LEAR	4	S/F	0647.1	0647.6	2.4	11.0			
	6100	KISV	8	S	0647.2	0647.5	1.0	42.0U			
	2695	MANI	3	S	0647.5	0648.0	2.5	26.3	8.8		
	4995	ATHN	4	S/F	0647.6	0648.0	8.4	67.0			
	2695	ATHN	4	S/F	0647.6	0648.1	2.9D	15.0			
	4995	MANI	3	S	0647.7	0648.0	1.5	81.2	27.1		
	1415	MANI	3	S	0647.7	0648.5	2.2	10.7	3.6		
	430	KRAK	42	SER	0918.2	1002.0U	87.5	190.0			
	430	KRAK			0918.2	1014.5U		180.0			
	245	LEAR	8	S	0932.6	0932.6	.7	43.0			
	810	KRAK	8	S	1006.0	1006.2	.3	48.0			
	260	ONDR	8	S	1009.2	1009.7	.7	212.0U			
	245	LEAR	47	GB	1009.5	1009.6	.5	710.0			
	204	IZMI	41	F	1009.5	1009.8	3.0	200.0			
	234	POTS	41	F	1009.5	1009.8	3.6	1050.0	10.0	III	
	410	LEAR	8	S	1009.6	1009.6	.2	10.0			
	260	ONDR	46	C	1011.8	1012.2	2.1	165.0	26.0		
	113	POTS	4	S/F	1012.3	1012.4	1.4	200.0	30.0	III	
	9500	POTS	20	GRF	1013.0	1015.0	8.0	4.0			
	2950	GORK	4	S/F	1013.7	1015.2	2.3	18.0			
	1470	POTS	4	S/F	1014.0	1015.2	2.0	21.0			
	6100	KISV	3	S	1014.2	1014.7	3.0	4.0			
	3000	POTS	4	S/F	1014.3	1015.2	1.2	19.0			
	3200	BERN	4	S/F	1014.4	1015.2	2.5	27.0			ONLY PAPER REC
	2650	DWIN	4	S/F	1015.0	1016.0	1.0	150.0	50.0		
	930	BORD	8	S	1052.6	1052.7	.1	58.0	1.0		
	430	KRAK	42	SER	1154.8	1156.2	91.0	43.0			
	113	POTS	42	SER	1218.8	1222.6	4.8	350.0	7.0	III	
	2800	OTTA	240	R	1450.0	1510.0	20.0	3.8	1.9		
	930	BORD	8	S	1521.7	1521.7	.1	42.0	1.0		
	2800	OTTA	20	GRF	1605.0	1612.0	35.0	4.8	2.4		
	2800	OTTA	21	GRF	1728.0	1745.0	105.0	9.6	5.0		
	9400	HUAN	20	GRF	1733.5	1746.7	45.5	21.4	11.7	0	
	2800	OTTA	45	C	1737.0	1737.4	2.5	9.6	3.2		
	2800	OTTA	8	S	1810.7	1810.9	.5	3.4			
	2800	OTTA	8	S	1900.9	1901.0	.2	3.8			
	2800	OTTA	2	S/F	1950.0	1950.5	1.0	4.8			
	3750	TYKW	5	S	2249.7	2249.9	1.0	7.0	2.0		
	2000	TYKW	5	S	2249.7	2249.9	.5	3.0	1.0		
	2000	TYKW	5	S	2313.0	2316.6	12.0	3.0	1.0		
	3750	TYKW	5	S	2313.0	2317.5	15.0	3.0	1.0		
	410	LEAR	8	S	2323.6	2323.8	.4	13.0			
04	260	ONDR	44	NS	0820.0E		360.0D	8.0U			
	245	SGMR	43	NS	1222.0	1443.0	504.0D	82.0			
	245	LEAR	43	NS	2150.0	0030.3	769.0	270.0			
	200	HIRA	43	NS	2348.0	0310.0	450.0D	10.0	5.0	0	
	9400	TYKW	20	GRF	0015.0	0042.0	55.0	6.0	2.0		
	3750	TYKW	20	GRF	0015.0	0045.0	85.0	4.0	2.0U		
	2000	TYKW	21	GRF	0030.0	0100.0	70.0	3.0	1.5		
	1000	TYKW	21	GRF	0044.0	0100.0	60.0	2.5	1.0		
	1000	TYKW	45	C	0053.5	0055.6	5.5	13.0	2.0		
	1415	PALE	8	S	0054.3	0054.6	1.8	59.0			
	1415	LEAR	8	S	0054.3	0054.6	1.5	64.0			
	2000	TYKW	45	C	0054.4	0055.2	1.0	3.0	1.0		
	1000	TYKW	5	S	0124.5	0124.7	.5	24.0	5.0		

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Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density (10 -22 W/m 2 Hz) Peak	Mean	Int	Remarks
04	3750	TYKW	45	C	0156.0	0159.0	8.0	8.0	2.0		
	2000	TYKW	5	S	0156.0	0208.0	25.0	3.0	1.5		
	3750	TYKW	21	GRF	0156.0	0330.0	155.0	5.0	2.5		
	1415	PALE	8	S	0239.8	0239.8	.3	18.0			
	2695	PALE	8	S	0239.8	0240.0	.3	26.0			
	15400	PALE	8	S	0239.8	0240.1	.5	53.0			
	9400	TYKW	21	GRF	0300.0	0330.0	70.0	5.0	2.5		
	9395	PEKG	1	S	0340.0	0341.7	6.0	5.5	0.9		
	9400	TYKW	5	S	0340.0	0341.7	8.0	6.0	1.5		
	3750	TYKW	5	S	0341.0U	0342.0	25.0U	3.0	1.0U		
	2000	TYKW	20	GRF	0436.0	0500.0	60.0	2.0	1.0		
	3750	TYKW	20	GRF	0436.0	0507.0U	60.0	4.0	2.0U		
	2840	PEKG	20	GRF	0459.0	0534.0	69.0	4.4	1.3		
	1415	LEAR	8	S	0525.6	0525.8	.5	10.0			
	2000	TYKW	45	C	0546.9	0547.0	1.0	7.0	1.5		
	245	LEAR	47	GB	0644.6	0644.8	.7	570.0			
	410	LEAR	8	S	0644.8	0645.0	.3	90.0			
	1470	POTS	8	S	1007.0	1007.4	.6	9.0			
	430	KRAK	2	S/F	1229.2	1230.1	2.5	20.0	4.0		
	2800	OTTA	27A	RF	1440.0		240.0	3.0	2.7		
	2800	OTTA	24	R	1440.0	1455.0	15.0	3.0	1.0		
	2800	OTTA	24P	R	1455.0		195.0	3.0			
	7000	SAOP	3	S	1724.2	1728.4	6.5	212.0	106.0		14L
	2800	OTTA	4	S/F	1725.0	1728.0	8.0	135.0	25.0		
	4995	SGMR	4	S/F	1726.5	1728.3	6.1	139.0			
	15400	SGMR	4	S/F	1726.8	1728.1	4.0	83.0			
	8800	SGMR	4	S/F	1726.8	1728.3	4.5	130.0			
	4995	PALE	47	GB	1727.5	1728.3	10.6	139.0			
	2695	PALE	8	S	1727.6	1727.8	.7	130.0			
	8800	PALE	47	GB	1727.6	1728.3	1.7	180.0			
	7000	SAOP	29	PBI	1730.8		39.0	15.0	7.0		
	2800	OTTA	29	PBI	1733.0	1733.0	20.0	5.0	2.3		
	2800	OTTA	26	FAL	1810.0	1840.0	30.0	-3.0	-1.5		
	2800	OTTA	8	S	1948.8	1948.9	.2	7.2			
05	208	VORO	44	NS	0000.0E		240.0D		15.0		
	410	LEAR	43	NS	0437.8	0856.6	361.2D	40.0			
	260	ONDR	44	NS	0820.0E		346.0D				
	245	LEAR	43	NS	2150.0	1033.8	770.0	260.0			
	200	HIRA	43	NS	2334.0	0200.0	326.0D	5.0	3.0		0
	2000	TYKW	21	GRF	0020.0	0050.0	90.0	2.0	1.0		
	3750	TYKW	21	GRF	0020.0	0053.0	140.0	9.0	4.0		
	2695	LEAR	47	GB	0021.8	0024.8	6.3	11.0			
	15400	LEAR	47	GB	0022.0	0026.3	6.1	08.0			
	8800	LEAR	47	GB	0022.5	0024.8	5.5	16.0			
	4995	LEAR	47	GB	0022.5	0025.0	5.5	21.0			
	3750	TYKW	45	C	0023.0	0025.0	6.0	16.0	5.0		
	9400	TYKW	45	C	0023.0	0025.0	8.0	12.0	2.0		
	9400	TYKW	21	GRF	0023.0	0053.0	120.0	6.0	3.0		
	2000	TYKW	45	C	0024.0	0027.3	4.0	3.0	1.0		
	3750	TYKW	29	PBI	0029.0		10.0	3.0	1.0		
	410	LEAR	4	S/F	0305.8	0306.8	12.2	49.0			
	606	LEAR	4	S/F	0306.1	0306.8	12.7	73.0			
	15400	PALE	47	GB	0319.8	0320.8	3.8	44.0			
	1415	PALE	8	S	0319.8	0321.1	1.7	30.0			
	8800	PALE	8	S	0320.1	0321.1	1.4	31.0			
	2695	PALE	8	S	0320.5	0321.1	1.0	31.0			
	4995	PALE	8	S	0320.8	0321.1	.7	24.0			
	2000	TYKW	45	C	0532.7	0533.7	1.5	36.0	5.0		
	606	LEAR	47	GB	0659.0	0659.5	1.0	1300.0			
	245	LEAR	4	S/F	0659.0	0701.0	2.3	58.0			
	204	IZMI	41	F	0705.5	0708.2	3.1	430.0			
	245	LEAR	8	S	0707.3	0708.1	2.0	270.0			
	2695	LEAR	4	S/F	0707.3	0708.1	2.7	17.0			
	4995	LEAR	8	S	0707.3	0708.1	1.2	21.0			
	2950	GORK	1	S	0707.6	0708.1	1.2	12.0			
	6100	KISV	8	S	0707.8	0708.1	.5	6.0			
	204	IZMI	5	S	0708.0	0708.2	.8	10.0	5.0		
	9500	POTS	20	GRF	0836.0	0844.0	16.0	17.0			
	606	LEAR	8	S	0938.3	0938.6	.5	119.0			

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Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density (10 -22 W/m 2 Hz) Peak	Mean	Int	Remarks
05	536	ONDR	8	S	0938.8	0938.9	.3	25.0			
	1470	POTS	3	S	1102.5	1104.2	6.5	21.0			
	930	BORD	3	S	1103.0	1104.0	4.0	70.0	5.0		
	3000	POTS	3	S	1103.0	1104.0	2.0	58.0			
	4995	ATHN	4	S/F	1103.3	1104.0	2.3	93.0			
	5200	BERN	3	S	1103.3	1104.2	3.0	84.0			ONLY PAPER REC
	3200	BERN	3	S	1103.3	1104.2	3.0	39.0			ONLY PAPER REC
	11800	BERN	3	S	1103.3	1104.2	2.0	113.0			ONLY PAPER REC
	6100	KISV	8	S	1103.5	1104.0	1.0	65.0			
	15000	KISV	45	C	1103.5	1104.0U	.7	45.0D			
	2695	ATHN	4	S/F	1103.5	1104.0	2.1D	48.0			
	1415	ATHN	4	S/F	1103.5	1104.0	2.1	35.0			
	234	POTS	4	S/F	1103.5	1104.4	1.4	325.0	110.0		III/V
	204	IZMI	5	S	1103.5	1104.5	2.0	550.0	230.0		
	9500	POTS	3	S	1103.7	1103.9	1.3	81.0			
	113	POTS	4	S/F	1103.7	1104.4	1.3	800.0	160.0		III/V
	204	IZMI	5	S	1103.8	1104.1	.8	46.0	30.0		
	260	ONDR	4	S/F	1103.8	1104.2	7.0	165.0	24.0		
	29	UPIC	45	C	1103.8	1104.2	2.1				
	33	UPIC	45	C	1104.0	1104.1	1.9				
	536	ONDR	3	S	1104.0	1104.8	2.2	344.0U	100.0U		
	2650	DWIN	1	S	1104.0	1105.0	1.0	60.0	30.0		
	808	ONDR	30	PBI	1104.2	1104.2	3.0	35.0	10.0		
	930	BORD	41	F	1135.0	1135.2	5.0	59.0	2.0		
	113	POTS	4	S/F	1137.1	1138.2	2.2	3900.0	1000.0		III/V
	6100	KISV	4	S/F	1137.2	1137.7	1.5	25.0			
	9500	POTS	3	S	1137.2	1137.8	1.8	24.0			
	3000	POTS	3	S	1137.2	1137.8	1.8	31.0			
	11800	BERN	3	S	1137.4	1138.0	1.0	30.0			ONLY PAPER REC
	3200	BERN	3	S	1137.4	1138.0	2.5	28.0			ONLY PAPER REC
	5200	BERN	3	S	1137.4	1138.0	2.5	42.0			ONLY PAPER REC
	204	IZMI	5	S	1137.5	1137.5	1.2	350.0	250.0		
	1470	POTS	3	S	1137.5	1138.0	2.0	17.0			
	33	UPIC	4	S/F	1137.5	1138.3	2.1				
	15000	KISV	1	S	1137.7	1138.0	.5	12.0			
	29	UPIC	4	S/F	1137.8	1138.3	1.7				
	2650	DWIN	1	S	1138.0	1139.0	1.0	30.0	15.0		
	7000	SAOP	3	S	1315.3	1315.7	1.1	24.0	12.0		22R
	3200	BERN	3	S	1315.9	1316.8	2.0	14.0			ONLY PAPER REC
	5200	BERN	3	S	1315.9	1316.8	2.0	28.0			ONLY PAPER REC
	113	POTS	42	SER	1315.9	1316.8	8.5	4600.0	45.0		III/V
	2650	DWIN	1	S	1316.0	1317.0	1.0	15.0	5.0		
	536	ONDR	8	S	1316.2	1316.2	.2	15.0			
	536	ONDR	8	S	1319.0	1319.1	.2	18.0			
	930	BORD	41	F	1339.4	1340.6	1.6	112.0	2.0		
	2800	OTTA	20	GRF	1430.0	1547.0	150.0	8.0	3.7		
	15400	PALE	47	GB	1736.8	1737.6	6.3	49.0			
	8800	PALE	4	S/F	1737.0	1737.6	6.1	34.0			
	2695	PALE	8	S	1737.3	1737.6	.3	20.0			
	1415	PALE	8	S	1741.0	1742.1	1.3	18.0			
	2800	OTTA	21	GRF	1905.0	1925.0	95.0	9.6	4.8		
	2800	OTTA	45	C	1909.0	1912.0	4.0	6.6			
	410	SGMR	8	S	1911.3	1911.5	.5	62.0			
	410	PALE	8	S	1911.3	1911.6	.5	88.0			
	245	PALE	47	GB	1911.3	1911.6	1.0	760.0			
	245	SGMR	47	GB	1911.5	1911.6	.6	580.0			
	245	PALE	47	GB	2054.8	2055.0	.3	530.0			
	245	PALE	8	S	2304.1	2304.1	.4	130.0			
	410	LEAR	8	S	2304.1	2304.1	.2	13.0			
	245	LEAR	8	S	2304.1	2304.3	.4	100.0			
	245	PALE	8	S	2339.1	2339.3	.5	100.0			
	3750	TYKW	21	GRF	2350.0	0155.0	350.0	14.0	7.0		
06	208	VORO	44	NS	0000.0E		240.0D		12.0		
	200	GORK	43	NS	0746.0		184.0D		5.0		
	260	ONDR	44	NS	0750.0E	1154.0D		364.0U			
	2000	TYKW	21	GRF	0000.0	0250.0	325.0	11.0	5.0		
	1000	TYKW	20	GRF	0050.0	0325.0	260.0	4.0	2.0		
	9400	TYKW	21	GRF	0100.0	0425.0	280.0	6.0	3.0		
	3750	TYKW	5	S	0108.3	0108.7	1.0	2.0	.7		

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06	2000	TYKW	5	S	0108.3	0108.7	1.0	1.5	.5		
	3750	TYKW	20	GRF	0240.0	0248.5U	50.0	8.0D	3.5D		
	2840	PEKG	20	GRF	0241.0	0248.8	42.0D	5.9			
	9400	TYKW	5	S	0245.0	0248.6	15.0	6.0	1.5		
	2000	TYKW	20	GRF	0345.0	0347.5	45.0	2.0	1.0		
	3750	TYKW	20	GRF	0345.0	0357.0	55.0	3.0	1.5		
	9400	TYKW	5	S	0355.5	0356.3	5.0	4.0	1.5		
	9400	TYKW	45	C	0644.0	0644.6	3.0	10.0	3.0		
	3750	TYKW	45	C	0644.0	0644.6	3.0	6.0	1.5		
	2000	TYKW	5	S	0644.0	0644.6	2.0	7.0	2.5		
	1000	TYKW	5	S	0644.0	0644.7	1.5U	3.0U	1.0U		
	200	GORK	4	S/F	0755.5	0756.0	.9	45.0			
	100	GORK	45	C	0755.6	0755.8	.8	35.0D			
	100	GORK			0755.6	0755.9		35.0D			
	100	GORK			0755.6	0756.0		35.0D			
	113	POTS	4	S/F	0755.7	0756.0	.7	120.0	8.0		III
	113	POTS	8	S	0944.7	0944.7	.1	140.0	50.0		III
	204	IZMI	41	F	1033.5	1033.8	.6	96.0			
	234	POTS	4	S/F	1033.5	1033.8	.3	170.0	9.0		III
	113	POTS	4	S/F	1033.6	1033.8	.5	250.0	25.0		III
	3200	BERN	4	S/F	1033.8	1034.6	3.5	17.0			
	5200	BERN	3	S	1033.8	1035.0	3.5	6.0			
	2650	DWIN	2	S/F	1034.0	1036.0	2.0	30.0	15.0		
	930	BORD	41	F	1034.4	1034.4	.2	21.0	2.0		
	810	KRAK	8	S	1236.0	1236.1	.2	19.0			
	430	KRAK	8	S	1323.6	1323.7	.2	23.0			
	2800	OTTA	1	S	1635.0	1635.3	3.0	2.4	1.2		
	2800	OTTA	1	S	1723.0	1723.4	3.0	3.8	1.8		
	2800	OTTA	21	GRF	1800.0	1855.0	190.0	8.6	3.0		
	2800	OTTA	3	S	1954.0	1958.5	16.0	34.0	8.6		
	9400	HUAN	1	S	1956.9	1957.9	2.4	9.9	4.2		0
	9400	TYKW	5	S	2320.0	2327.0	15.0	3.0	1.5		
	3750	TYKW	45	C	2323.0	2323.4	7.0	3.0	1.0		
	2000	TYKW	45	C	2323.0	2325.2	7.0	15.0	1.5		
07	260	ONDR	44	NS	0807.0E	1330.0U	343.0D	25.0U			
	245	SGMR	43	NS	1225.0	1552.0	500.0D	150.0			
	536	ONDR	43	NS	1310.0		20.0	7.0U			
	200	HIRA	44	NS	2135.0E	0628.0	585.0D	13.0	7.0		WR
	245	LEAR	43	NS	2150.0	0919.8	771.0	130.0			
	3750	TYKW	5	S	0044.0	0045.0	15.0	4.0	1.0		
	3750	TYKW	21	GRF	0044.0	0200.0	155.0	12.0	5.0		
	2000	TYKW	5	S	0131.0	0132.6	2.0	3.0	1.0		
	9400	TYKW	20	GRF	0140.0	0200.0	100.0	6.0	2.0		
	2000	TYKW	21	GRF	0143.0	0213.0	50.0	3.0	1.5		
	2000	TYKW	45	C	0145.0	0145.4	7.0	11.0	1.0		
	9395	PEKG	20	GRF	0146.0	0200.0	73.0	8.9	1.0		
	2000	TYKW	20	GRF	0345.0	0515.0	155.0	6.0	3.0		
	3750	TYKW	21	GRF	0350.0	0515.0	150.0	11.0	5.0		
	9400	TYKW	5	S	0413.8	0414.2	1.0	12.0	3.0		
	2840	PEKG	45	C	0418.0	0424.4	7.5	5.9	5.0		
	9400	TYKW	5	S	0442.0	0443.5	4.0	20.0	9.0		
	9395	PEKG	5	S	0442.0	0443.6	3.3	20.0	7.3		
	9395	PEKG	21	GRF	0442.0	0451.0	54.0	5.7	4.1		
	9400	TYKW	21	GRF	0442.0	0515.0	100.0	8.0	4.0		
	3750	TYKW	5	S	0442.5	0443.7	5.0	9.0	3.5		
	17000	NOBE	1	S	0442.8	0443.3	3.0	18.0			0
	2840	PEKG	1	S	0443.0	0443.5	3.0	3.5	0.7		
	9400	TYKW	29	PBI	0446.0		15.0	4.0	2.0		
	9395	PEKG	3	S	0653.5	0654.6	10.5	34.9	2.8		
	6100	KISV	8	S	0654.2	0654.5	1.0	11.0			
	17000	NOBE	1	S	0654.3	0654.4	.5	31.0			L
	9100	GORK	2	S/F	0654.3	0654.5	6.4	34.0			
	810	KRAK	45	C	0851.9	0900.0	15.2	290.0	25.0		
	810	KRAK			0851.9	0902.5		280.0			
	430	KRAK	8	S	0902.5	0902.5	.2	15.0			
	430	KRAK	8	S	1003.4	1003.4	.3	34.0			
	930	BORD	8	S	1055.3	1055.3	.1	89.0	1.0		
	7000	SAOP	21	GRF	1121.7		262.3	46.0	23.0		0
	7000	SAOP	1	S	1222.1	1222.3	.5	8.0	4.0		0

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07	430	KRAK	8	S	1227.0	1227.0	.1	8.0			
	430	KRAK	27	RF	1253.8	1255.4	49.0	140.0	24.0		
	430	KRAK			1253.8	1323.5		150.0			
	9400	HUAN	21	GRF	1329.8	1347.0	135.8	17.9	5.7		L
	2800	OTTA	21	GRF	1340.0	1510.0	140.0D	8.6			
	9400	HUAN	1	S	1408.7	1409.1	1.5	14.7	7.3		L
	7000	SAOP	3	S	1408.8	1409.1	1.5	14.0	7.0		12L
	7000	SAOP	28	PRE	1440.0		10.5	32.0	16.0		
	9400	HUAN	3	S	1450.2	1451.0	3.2	132.2	50.1		L
	11800	BERN	3	S	1450.4	1451.1	4.0	169.0			
	8400	BERN	3	S	1450.4	1451.1	4.0	125.0			
	35000	BERN	47	GB	1450.4	1451.1	2.0	628.0			
	19600	BERN	3	S	1450.4	1451.1	3.0	284.0			
	7000	SAOP	3	S	1450.5	1451.2	11.5	176.0	88.0		7L
	2800	OTTA	1	S	1542.0	1542.2	2.0	3.4	1.7		
	7000	SAOP	24	R	1559.5		228.0D	46.0	23.0		
	2800	OTTA	21	GRF	1635.0	1645.0	50.0	5.6	4.0		
	2800	OTTA	40	F	1637.0	1640.2	4.0	9.4			
	245	PALE	8	S	1811.3	1811.5	.3	72.0			
	2800	OTTA	21	GRF	1815.0	1830.0	115.0	4.6	3.0		
	2800	OTTA	1	S	1846.0	1849.0	5.0	7.0	3.5		
	2800	OTTA	40	F	1901.9	1902.0	3.0	3.8			
	606	PALE	8	S	1903.3	1904.0	1.0	73.0			
	606	SGMR	8	S	1903.3	1904.0	1.2	62.0			
	1415	SGMR	8	S	1903.3	1904.6	1.3	18.0			
	410	SGMR	8	S	1903.5	1904.1	1.6	97.0			
	8800	SGMR	8	S	1903.6	1904.0	2.0	13.0			
	410	PALE	8	S	1903.6	1904.3	1.5	130.0			
	9400	TYKW	5	S	2249.7	2250.0	.6	16.0	5.0		
	3750	TYKW	5	S	2250.0	2253.0	20.0	4.0	2.0		
	9400	TYKW	5	S	2251.0	2253.0	10.0	3.0	1.5		
08	208	VORO	44	NS	0000.0E		240.0D		14.0		
	410	LEAR	43	NS	0134.0	0547.8	547.0D	53.0			
	204	IZMI	43	NS	0700.0		3000.0D	32.0			
	260	ONDR	44	NS	0830.0E		320.0D	14.0U			
	245	SGMR	43	NS	1226.0	1234.0	289.0D	280.0			
	245	PALE	43	NS	1735.0	2202.0	598.0	230.0			
	200	HIRA	44	NS	2136.0E	2253.0	585.0D	30.0	17.0		WR
	245	LEAR	43	NS	2151.0	2202.6	770.0	270.0			
	17000	NOBE	1	S	0033.2	0034.1	5.0	18.0			L
	9400	TYKW	5	S	0033.5	0034.0	2.5	16.0	6.0		
	9395	PEKG	5	S	0033.5	0034.2	2.0D	16.0			
	4995	LEAR	8	S	0033.6	0034.0	1.4	10.0			
	8800	PALE	8	S	0033.8	0034.0	.3	23.0			
	8800	LEAR	8	S	0033.8	0034.0	1.3	18.0			
	15400	PALE	8	S	0033.8	0034.0	.5	28.0			
	15400	LEAR	8	S	0033.8	0034.0	1.0	13.0			
	3750	TYKW	5	S	0034.0	0034.3	2.0	5.0	1.5		
	9400	TYKW	29	PBI	0036.0		30.0	4.0	2.0		
	2000	TYKW	21	GRF	0130.0	0350.0	280.0	8.0	4.0		
	9400	TYKW	28	PRE	0140.0	0140.5	2.0	11.0	5.0		
	3750	TYKW	21	GRF	0140.0	0345.0	270.0	13.0	6.0		
	3750	TYKW	5	S	0141.0	0145.0	20.0	4.0	2.0		
	9400	TYKW	5	S	0142.0	0144.0	5.0	14.0	8.0		
	4995	LEAR	4	S/F	0142.6	0143.3	3.0	11.0			
	17000	NOBE	1	S	0143.2	0143.7	2.0	14.0			0
	15400	LEAR	4	S/F	0143.3	0143.8	2.3	19.0			
	8800	LEAR	4	S/F	0143.3	0144.8	2.3	13.0			
	9400	TYKW	29	PBI	0147.0		40.0	8.0	4.0		
	9400	TYKW	21	GRF	0243.0	0340.0	120.0	8.0	4.0		
	1000	TYKW	21	GRF	0245.0	0325.0	160.0	3.0	1.5		
	2000	TYKW	20	GRF	0303.0	0310.0U	30.0	4.0	2.0D		
	2840	PEKG	2	S/F	0304.0	0306.7	5.0	7.3	1.1		
	2695	LEAR	4	S/F	0305.0	0307.0	4.0	16.0			
	1000	TYKW	5	S	0305.0	0308.0	10.0	1.5	.7		
	1415	LEAR	4	S/F	0305.1	0306.8	3.0	18.0			
	4995	LEAR	4	S/F	0305.6	0308.3	3.4	08.0			
	8800	LEAR	4	S/F	0305.8	0308.0	3.2	08.0			
	9395	PEKG	1	S	0306.0	0307.5	3.0	10.3	2.7		

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Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density (10 -22 W/m 2 Hz) Peak	Mean	Int	Remarks
08	3750	TYKW	5	S	0307.0U	0307.5U	20.0U	6.0U	2.0U		INTERFERENCE
	9400	TYKW	5	S	0311.0	0312.5	3.0	7.0	3.0		
	9400	TYKW	29	PBI	0314.0		10.0	3.0	1.5		
	9395	PEKG	5	S	0419.0	0422.0	13.0	7.8	2.4		
	9400	TYKW	45	C	0420.0	0421.0	4.0	12.0	4.0		
	3750	TYKW	5	S	0421.0	0421.8	2.5	3.0	1.0		
	3750	TYKW	20	GRF	0510.0	0520.0	30.0	4.0	1.5		
	100	HIRA	46	C	0520.5	0521.8	2.6	200.0	37.0		
	245	LEAR	8	S	0521.6	0521.8	.5	190.0			
	4995	ATHN	4	S/F	0523.6E	0525.1	3.9D	490.0			
	1415	ATHN	4	S/F	0523.6E	0525.1	3.9D	250.0			
	2695	ATHN	4	S/F	0523.6	0525.1	3.9D	370.0			
	3750	TYKW	5	S	0551.5	0551.7	.7	3.0	1.0		
	9400	TYKW	5	S	0551.5	0551.7	.7	4.0	1.5		
	1000	TYKW	5	S	0551.5	0551.7	.7U	2.0	.7U		
	2000	TYKW	5	S	0551.5	0551.7	1.0	2.0	.5		
	1000	TYKW	5	S	0553.7	0554.0	.8	3.0	1.0		
	9100	GORK	21	GRF	0644.5	0751.0	280.0D	30.0			
	6100	KISV	1	S	0644.6	0645.6	15.0	8.0			
	4995	LEAR	8	S	0644.8	0645.6	1.2	11.0			
	8800	LEAR	8	S	0645.0	0645.6	1.0	08.0			
	9100	GORK	20	GRF	0655.0	0700.0	272.0D	9.0			
	6100	KISV	1	S	0756.4	0757.0	1.2	5.0			
	810	KRAK	8	S	0824.5	0824.5	.1	14.0			
	810	KRAK	8	S	0850.8	0850.8	.1	11.0			
	9500	POTS	23	GRF	0945.0	1114.6	190.0	42.0			
	6100	KISV	1	S	0945.4	0945.7	1.0	6.0			
	810	KRAK	42	SER	1037.5	1039.2	18.5	33.0			
	810	KRAK			1037.5	1045.9		29.0			
	810	KRAK			1037.5	1057.2		50.0			
	536	ONDR	40	F	1039.0	1039.0	4.2	31.0	5.0		
	536	ONDR			1039.0	1039.6		28.0			
	536	ONDR			1039.0	1040.7		13.0			
	536	ONDR			1039.0	1041.4		14.0			
	930	BORD	41	F	1040.3	1040.5	.5	25.0	3.0		
	430	KRAK	42	SER	1043.2	1045.9	13.5	210.0			
	430	KRAK			1043.2	1057.2		300.0			
	5200	BERN	22	GRF	1108.0U	1127.2	40.0U	19.0			
	9400	HUAN	21	GRF	1110.7	1134.3	68.1	15.0	6.4		0
	7000	SAOP	28	PRE	1111.5		3.0	4.0	2.0		
	11800	BERN	3	S	1114.2	1114.7	2.0	47.0			
	8400	BERN	3	S	1114.2	1114.7	2.0	53.0			
	15000	KISV	1	S	1114.3U	1114.7U	1.0U	45.0U			
	7000	SAOP	3	S	1114.4	1114.8	.9	46.0	23.0		7L
	6100	KISV	8	S	1114.5	1114.8	1.0	15.0			
	9100	GORK	3	S	1114.6	1114.7	.6	45.0	22.0		
	9400	HUAN	8	S	1114.6	1114.8	.8	31.6	12.3		L
	7000	SAOP	29	PBI	1115.3	1127.2	33.1	17.0	8.0		
	3200	BERN	3	S	1123.6	1127.3	13.0	14.0			
	3000	POTS	3	S	1125.0	1127.3	4.0	14.0			
	6100	KISV	3	S	1125.9	1127.0	2.5	9.0			
	810	KRAK	8	S	1132.5	1132.9	1.1	120.0			
	930	BORD	8	S	1133.2	1133.2	.1	35.0	1.0		
	7000	SAOP	3	S	1135.4	1136.9	1.9	21.0	10.0		0
	536	ONDR	8	S	1140.9	1140.9	.4	2.9			
	810	KRAK	42	SER	1201.3	1209.4	12.7	800.0D			
	536	ONDR	8	S	1203.0	1203.0	.2	58.0			
	808	ONDR	8	S	1209.1	1209.3	.3	131.0			
	930	BORD	42	SER	1209.2	1209.4	6.0	55.0	2.0		
	430	KRAK	8	S	1209.5	1209.5	.2	340.0			
	536	ONDR	4	S/F	1223.5	1223.8	.8	98.0	37.0		
	8400	BERN	3	S	1235.6	1236.8	6.0	25.0			
	11800	BERN	3	S	1235.6	1236.8	6.0	38.0			
	9400	HUAN	2	S/F	1236.1	1237.0	3.3	18.3	8.3		0
	7000	SAOP	29	PBI	1237.2		21.8	8.0	4.0		
	9400	HUAN	29	PBI	1239.4	1239.4	6.3	5.0	2.0		0
	536	ONDR	8	S	1251.4	1251.8	.6	52.0			
	9400	HUAN	22	GRF	1318.3	1328.3	25.3	8.3	2.2		0
	536	ONDR	8	S	1327.2	1327.3	.3	83.0			
	410	SGMR	8	S	1339.3	1340.0	1.8	35.0			

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Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density (10 -22 W/m 2 Hz) Peak	Mean	Int	Remarks
08	606	SGMR	8	S	1339.6	1340.0	.5	230.0			
	536	ONDR	8	S	1339.8	1339.9	.5	19.0			
	930	BORD	8	S	1346.1	1346.2	.1	52.0	1.0		
	430	KRAK	5	S	1355.0	1355.5	1.5	63.0	17.0		
	7000	SAOP	21	GRF	1407.4		31.0	11.0	5.0		10L
	2800	OTTA	21	GRF	1415.0	1427.0	25.0D	6.2			
	2800	OTTA	1	S	1421.5	1421.8	1.0D	7.8	3.8		
	7000	SAOP	1	S	1421.5	1421.9	1.1	8.0	4.0		13L
	930	BORD	46	C	1522.0	1525.8	4.0	104.0	4.0		
	2800	OTTA	40	F	1522.8	1525.0	5.3	11.2			
	7000	SAOP	3	S	1633.3	1634.4	1.9	10.0	5.0		0
	7000	SAOP	29	PBI	1635.2		2.7	3.0	1.0		
	7000	SAOP	20	GRF	1655.8	1659.4	73.9	15.0	7.0		0
	2800	OTTA	20	GRF	1710.0	1714.0	70.0D	8.4			
	2800	OTTA	22	GRF	1826.0	1827.0	16.0	4.4	2.2		
	2800	OTTA	1	S	1844.0	1846.0	5.0	4.0	2.6		
	2695	PENT	20	GRF	1930.0	2007.0	80.0	4.8	2.4		
	245	PALE	47	GB	2202.3	2202.6	2.8	310.0			
	9400	TYKW	45	C	2323.0	2326.3	10.0	10.0	4.0		
	8800	LEAR	4	S/F	2325.3	2326.6	8.0	13.0			
	4995	LEAR	4	S/F	2325.3	2330.3	8.0	08.0			
	15400	LEAR	4	S/F	2325.3	2331.3	8.0	16.0			
	9400	TYKW	29	PBI	2333.0		20.0	3.0	1.5		
09	208	VORO	44	NS	0000.0E		240.0D		23.0		
	200	GORK	44	NS	0607.0E		293.0D		15.0		
	204	IZMI	44	NS	0700.0E		1800.0D	180.0			
	260	ONDR	44	NS	0825.0E		328.0D	15.0U			
	245	SGMR	43	NS	1227.0	1326.1	498.0D	68.0			
	410	SGMR	43	NS	1535.0	1601.0	310.0D	36.0			
	245	PALE	43	NS	1717.0	1742.3	619.0	110.0			
	200	HIRA	44	NS	2136.0E	0434.0	585.0D	25.0	10.0		WR
	245	LEAR	43	NS	2151.0	2239.5	771.0	200.0			
	3750	TYKW	21	GRF	0050.0	0128.0	120.0	7.0	3.5		
	9395	PEKG	20	GRF	0125.0	0146.3	38.0	5.6			
	17000	NOBE	20	GRF	0130.2	0145.5	38.0	14.0			0
	3750	TYKW	45	C	0131.0	0133.7	50.0	12.0	4.0		
	2840	PEKG	5	S	0131.0	0136.8	12.0	14.0	7.9		
	9400	TYKW	45	C	0132.0	0146.0	30.0	13.0	7.0		
	4995	LEAR	4	S/F	0132.1	0133.6	13.9	15.0			
	8800	LEAR	4	S/F	0132.1	0145.3	13.9	17.0			
	4995	PALE	8	S	0132.8	0134.8	2.0	23.0			
	8800	PALE	4	S/F	0133.1	0135.6	4.7	76.0			
	2695	LEAR	4	S/F	0133.1	0138.1	12.9	13.0			
	15400	LEAR	4	S/F	0133.1	0145.1	12.9	13.0			
	2000	TYKW	5	S	0145.0	0150.5	15.0	5.0	1.5		
	9400	TYKW	29	PBI	0202.0		40.0	4.0	2.0		
	245	PALE	8	S	0219.3	0219.5	.5	160.0			
	2695	PALE	8	S	0241.0	0241.3	.3	22.0			
	15400	PALE	8	S	0241.0	0241.3	.5	40.0			
	1415	PALE	8	S	0241.1	0241.1	.2	16.0			
	9400	TYKW	28	PRE	0324.0	0333.0	15.0	25.0	8.0		
	3750	TYKW	28	PRE	0330.0	0340.0	10.0	6.0	3.0		
	2840	PEKG	21	GRF	0330.0	0419.4	90.0D	25.0			
	8800	LEAR	8	S	0333.1	0333.3	.9	13.0			
	2000	TYKW	21	GRF	0335.0	0400.0	180.0	15.0	8.0		
	9400	TYKW	45	C	0339.0	0343.6	60.0	120.0	50.0		
	9395	PEKG	45	C	0339.0	0343.7	48.0	97.0	21.0		
	17000	NOBE	7	C	0339.8	0343.5	55.0	82.0			L
	3750	TYKW	45	C	0340.0	0344.2	55.0	40.0	27.0		
	4995	LEAR	47	GB	0340.8	0344.1	20.8	53.0			
	2695	LEAR	47	GB	0341.6	0343.3	20.0	30.0			
	8800	LEAR	47	GB	0341.8	0343.5	19.8	119.0			
	2695	MANI	4	S/F	0342.0	0343.4	3.0	21.3	7.1		
	2000	TYKW	45	C	0342.0	0344.1	3.0	5.0	1.5		
	15400	LEAR	47	GB	0342.1	0343.5	19.5	119.0			
	8800	MANI	4	S/F	0342.5	0343.5	2.5	104.4	34.8		
	4995	MANI	4	S/F	0343.0	0343.5	1.5	40.6	13.5		
	2840	PEKG	45	C	0343.0	0343.6	2.0	7.1	2.9		
	35000	NAGO	20	GRF	0349.0	0410.0	39.0	19.0			

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09	15400	LEAR	47	GB	0401.6	0402.0	23.4	63.0			
	4995	LEAR	47	GB	0401.6	0402.0	23.4	49.0			
	8800	LEAR	47	GB	0401.6	0402.8	23.4	86.0			
	2695	LEAR	47	GB	0401.6	0420.0	23.4	38.0			
	2000	TYKW	20	GRF	0407.0	0420.0	30.0	5.0	2.0		
	9395	PEKG	30	PBI	0427.0		47.0D	14.0			
	3750	TYKW	30	PBI	0435.0		105.0	18.0	7.0		
	9400	TYKW	30	PBI	0439.0		100.0	20.0	10.0		
	9395	PEKG	1	S	0442.0	0443.6	3.0	8.0			
	9400	TYKW	21	GRF	0447.0	0501.0	40.0	8.0	4.0		
	9395	PEKG	1	S	0452.7	0453.5	3.0	9.0			
	3750	TYKW	5	S	0502.0	0506.0	15.0	3.0	1.5		
	9400	TYKW	45	C	0504.0	0506.0	10.0	22.0	9.0		
	8800	LEAR	4	S/F	0504.3	0505.3	4.2	30.0			
	9395	PEKG	45	C	0504.4	0505.6	5.6	21.0	3.9		
	9400	TYKW	29	PBI	0514.0		10.0	4.0	2.0		
	3750	TYKW	21	GRF	0532.0	0537.0	45.0	6.0	2.5		
	2000	TYKW	45	C	0532.0	0537.2	20.0	8.0	3.0		
	9400	TYKW	5	S	0535.0	0537.0	7.0	5.0	2.0		
	3750	TYKW	5	S	0547.0	0554.0	25.0	4.0	2.0		
	9400	TYKW	5	S	0548.0	0554.0	25.0	4.0	2.0		
	2000	TYKW	29	PBI	0552.0		25.0	3.0	1.5		
	245	LEAR	8	S	0602.1	0602.5	1.7	47.0			
	606	LEAR	8	S	0602.1	0602.6	1.0	32.0			
	9100	GORK	23	GRF	0615.0	0652.1	285.0D	84.0			
	6100	KISV	20	GRF	0621.5	0649.2	55.0	44.0			
	15000	KISV	46	C	0635.0	0648.8U	16.0	54.0D			
	15000	KISV			0635.0	0650.2		28.0			
	9395	PEKG	45	C	0636.0	0649.3	22.0	64.0	12.0		
	606	LEAR	8	S	0637.1	0637.3	.9	36.0			
	3750	TYKW	45	C	0638.0	0644.0	22.0D	25.0U	7.0D		
	9400	TYKW	45	C	0638.0	0649.2	22.0D	75.0U	33.0D		
	410	LEAR	47	GB	0640.1	0642.3	5.0	17.0			
	2695	LEAR	47	GB	0640.8	0644.1	15.0	19.0			
	2000	TYKW	45	C	0641.0	0644.0	19.0D	18.0U	4.0D		
	2840	PEKG	45	C	0641.0	0644.2	27.0	16.0	6.5		
	4995	LEAR	47	GB	0641.3	0644.1	14.0	24.0			
	4995	ATHN	4	S/F	0641.3	0649.1	20.5	43.0			
	8800	LEAR	47	GB	0641.5	0645.1	16.3	30.0			
	606	LEAR	47	GB	0641.8	0643.8	2.8	84.0			
	2695	ATHN	4	S/F	0641.8	0651.0	14.2D	24.0			
	15400	LEAR	47	GB	0642.1	0646.0	15.4	24.0			
	1415	LEAR	47	GB	0642.5	0644.1	5.5	11.0			
	2695	MANI	3	S	0642.6	0643.3	2.4	11.9	4.0		
	17000	NOBE	27	RF	0645.0	0649.4	8.0	37.0			L
	8800	MANI	3	S	0646.5	0649.0	3.5	52.2	17.7		
	4995	MANI	3	S	0648.0	0649.0	2.0	48.7	62.2		
	9100	GORK	2	S/F	0648.0	0649.2	3.1	38.0			
	15000	KISV	29	PBI	0651.0	0651.0	20.0	13.0			
	2950	GORK	20	GRF	0654.0	0700.0	246.0D	11.0			
	9395	PEKG	29	PBI	0658.0	0659.0	24.0	35.0	7.5		
	15000	KISV	8	S	0718.4	0718.5	.2	19.0			
	9395	PEKG	45	C	0733.0	0734.8	4.0D	73.0			
	4995	ATHN	4	S/F	0733.1	0734.6	4.4	46.0			
	8800	LEAR	4	S/F	0733.3	0734.6	5.3	170.0			
	8800	MANI	3	S	0733.3	0734.8	2.7	114.8	38.3		
	4995	MANI	3	S	0733.3	0734.8	2.7	109.6	36.5		
	9100	GORK	3	S	0733.5	0734.3	4.5	140.0	70.0		
	6100	KISV	4	S/F	0733.5U	0734.8	2.0U	60.0			
	4995	LEAR	4	S/F	0733.6	0734.6	3.4	50.0			
	15400	LEAR	8	S	0733.8	0734.6	2.0	38.0			
	15000	KISV	4	S/F	0733.8	0734.7	2.0	55.0			
	234	POTS	4	S/F	0734.7	0735.5	1.2	575.0	30.0		
	6100	KISV	29	PBI	0735.0	0735.4	12.0	19.0			
	650	GORK	1	S	0820.1	0824.6	7.2	3.0			
	8800	LEAR	8	S	0849.3	0849.8	1.0	18.0			
	9500	POTS	4	S/F	0903.5	0907.0	8.5	16.0			
	4995	LEAR	4	S/F	0904.0	0907.1	5.1	30.0			
	6100	KISV	4	S/F	0904.0	0907.2	7.0	23.0			
	8800	LEAR	4	S/F	0904.6	0907.3	3.7	27.0			

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Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density (10 -22 W/m 2 Hz) Peak	Mean	Int	Remarks
09	9100	GORK	2	S/F	0904.7	0907.2	4.4	23.0			
	15000	KISV	45	C	0905.0	0907.5	6.0	15.0			
	3000	POTS	3	S	0906.0U	0907.0	6.0U	12.0			
	15400	LEAR	8	S	0907.0	0907.1	.8	11.0			
	930	BORD	8	S	1007.6	1007.6	.1	16.0	1.0		
	6100	KISV	3	S	1034.6	1035.7	6.0	8.0			
	2800	OTTA	20	GRF	1420.0	1505.0	200.0	10.2	5.1		
	410	SGMR	8	S	1448.1	1448.3	.4	30.0			
	9400	HUAN	22	GRF	1453.3	1503.7	20.1	14.0	3.3		0
	9400	HUAN	21	GRF	1806.6	1933.0	251.4	241.5	134.8		R-L-R
	2800	OTTA	28	PRE	1815.0	1830.0	37.0	7.4			
	245	PALE	8	S	1819.5	1820.8	1.5	260.0			
	9400	HUAN	3	S	1838.2	1838.8	1.6	31.2	13.7		L
	8800	SGMR	8	S	1838.6	1839.0	.5	24.0			
	8800	PALE	8	S	1838.8	1839.0	.2	33.0			
	2800	OTTA	47	GB	1852.0	1928.0	68.0	590.0	233.0		
	2695	SGMR	47	GB	1854.3	1858.6	17.3D	110.0			
	1415	SGMR	47	GB	1854.3	1900.3	17.3D	130.0			
	606	PALE	47	GB	1854.6	1858.6	16.7	240.0			
	410	SGMR	47	GB	1854.6	1858.6	17.0D	220.0			
	2695	PALE	47	GB	1854.6	1858.6	16.7	110.0			
	410	PALE	47	GB	1854.6	1858.6	16.7	130.0			
	1415	PALE	47	GB	1854.6	1858.8	16.7	90.0			
	606	SGMR	47	GB	1854.8	1858.6	16.8D	3700.0			
	245	PALE	47	GB	1856.1	1856.8	15.2	72.0			
	4995	PALE	47	GB	1856.1	1858.6	15.2	58.0			
	4995	SGMR	47	GB	1856.1	1858.6	15.5D	74.0			
	8800	SGMR	47	GB	1856.8	1858.6	14.8D	49.0			
	8800	PALE	47	GB	1857.6	1858.6	13.7	39.0			
	9400	HUAN	45	C	1857.7	1923.8	34.5	281.8	153.4		R
	245	SGMR	47	GB	1901.6	1904.0	10.0	119.0			
	15400	PALE	47	GB	1902.8	1903.1	8.5	20.0			
	15400	SGMR	47	GB	1903.0	1903.8	8.6D	47.0			
	8800	PALE	47	GB	1908.3	1909.8	8.0	180.0			
	2695	PALE	47	GB	1908.3	1909.8	8.0	220.0			
	606	PALE	47	GB	1908.3	1911.0	8.0	119.0			
	2695	SGMR	47	GB	1908.6	1909.8	6.5	210.0			
	8800	SGMR	47	GB	1908.6	1910.0	6.5	160.0			
	15400	SGMR	47	GB	1908.6	1910.1	6.5	93.0			
	606	SGMR	47	GB	1908.6	1911.0	6.5	130.0			
	410	PALE	47	GB	1911.3	1911.6	8.0	32.0			
	245	PALE	47	GB	1911.3	1911.8	8.0	460.0			
	1415	PALE	47	GB	1911.3	1911.8	8.0	200.0			
	15400	PALE	47	GB	1911.3	1911.8	8.0	70.0			
	4995	PALE	47	GB	1911.3	1911.8	8.0	139.0			
	4995	SGMR	47	GB	1911.6	1911.8	6.5	160.0			
	1415	SGMR	47	GB	1911.6	1911.8	6.5	200.0			
	245	SGMR	47	GB	1911.6	1911.8	6.5	540.0			
	410	SGMR	47	GB	1911.6	1911.8	6.5	51.0			
	245	SGMR	47	GB	1918.1	1918.8	9.2	200.0			
	15400	SGMR	47	GB	1918.1	1919.6	9.2	139.0			
	606	SGMR	47	GB	1918.1	1920.3	9.2	78.0			
	410	SGMR	47	GB	1918.1	1920.6	9.2	94.0			
	4995	SGMR	47	GB	1918.1	1924.1	9.2	460.0			
	1415	SGMR	4	S/F	1918.1	1924.1	9.2	420.0			
	2695	SGMR	47	GB	1918.1	1924.3	9.2	500.0			
	8800	SGMR	4	S/F	1918.1	1924.5	9.2	320.0			
	2695	PALE	47	GB	1919.3	1919.5	13.5	340.0			
	8800	PALE	47	GB	1919.3	1919.5	13.5	270.0			
	4995	PALE	47	GB	1919.3	1919.5	13.5	280.0			
	1415	PALE	47	GB	1919.3	1919.6	13.5	270.0			
	15400	PALE	47	GB	1919.3	1920.1	13.5	119.0			
	606	PALE	47	GB	1919.3	1920.3	13.5	72.0			
	410	PALE	47	GB	1919.3	1921.3	13.5	66.0			
	245	PALE	47	GB	1919.3	1921.5	13.5	220.0			
	1415	PALE	4	S/F	1935.6	1935.8	26.2	370.0			
	4995	PALE	47	GB	1935.6	1943.0	26.2	370.0			
	2695	PALE	47	GB	1935.6	1943.0	26.2	540.0			
	8800	PALE	47	GB	1935.6	1943.0	26.2	310.0			
	15400	PALE	47	GB	1935.6	1943.1	26.2	139.0			

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09	606	PALE	47	GB	1935.6	1943.5	26.2	200.0			
	410	PALE	47	GB	1935.6	1944.6	26.2	139.0			
	245	PALE	47	GB	1935.6	1944.8	26.2	390.0			
	606	SGMR	47	GB	1940.6	1940.8	30.9	119.0			
	1415	SGMR	47	GB	1940.6	1940.8	30.9	220.0			
	2695	SGMR	4	S/F	1940.6	1940.8	30.9	290.0			
	15400	SGMR	4	S/F	1940.6	1941.1	30.9	119.0			
	8800	SGMR	4	S/F	1940.6	1941.3	30.9	170.0			
	4995	SGMR	4	S/F	1940.6	1941.3	30.9	230.0			
	410	SGMR	47	GB	1940.6	1941.8	30.9	190.0			
	2800	OTTA	30	PBI	2000.0	2000.0	170.0D	88.0			
	8800	PALE	4	S/F	2001.8	2002.0	12.5	26.0			
	4995	PALE	4	S/F	2001.8	2002.0	12.5	46.0			
	2695	PALE	47	GB	2001.8	2002.1	12.5	72.0			
	1415	PALE	4	S/F	2001.8	2002.1	12.5	33.0			
	245	PALE	47	GB	2001.8	2003.5	12.5	440.0			
	606	PALE	4	S/F	2001.8	2009.6	12.5	310.0			
	15400	PALE	4	S/F	2002.1	2003.1	12.2	19.0			
	410	PALE	47	GB	2003.5	2008.1	10.8	139.0			
	2800	OTTA	3A	S	2006.0	2022.0	55.0	93.0	42.0		
	2695	PENT	3	S	2011.0	2013.5	9.0	66.0	26.0		
	2695	PALE	4	S/F	2011.3	2013.3	10.5	100.0			
	410	SGMR	47	GB	2011.5	2011.6	12.6	500.0			
	606	SGMR	47	GB	2011.5	2012.0	12.6	390.0			
	245	SGMR	4	S/F	2011.5	2012.3	12.6	1399.0			
	4995	SGMR	4	S/F	2011.5	2012.6	12.6	40.0			
	1415	SGMR	47	GB	2011.5	2013.3	12.6	200.0			
	2695	SGMR	4	S/F	2011.5	2013.3	12.6	119.0			
	245	PALE	47	GB	2014.3	2015.1	10.5	1199.0			
	410	PALE	47	GB	2014.3	2016.1	10.5	260.0			
	606	PALE	47	GB	2014.3	2017.1	10.5	360.0			
	1415	PALE	47	GB	2014.3	2019.3	10.5	210.0			
	2695	SGMR	4	S/F	2024.1	2024.5	11.7D	23.0			
	245	SGMR	47	GB	2024.1	2024.5	11.7	570.0			
	1415	SGMR	47	GB	2024.1	2024.6	11.7D	260.0			
	1415	PALE	47	GB	2024.8	2025.1	16.2	300.0			
	245	PALE	47	GB	2024.8	2025.3	16.2	970.0			
	606	PALE	47	GB	2024.8	2025.5	16.2	380.0			
	2695	PALE	4	S/F	2024.8	2026.1	16.2	70.0			
	410	PALE	47	GB	2024.8	2026.3	16.2	240.0			
	1415	PALE	4	S/F	2041.0	2041.1	32.3	119.0			
	606	PALE	4	S/F	2041.0	2041.1	32.3	240.0			
	410	PALE	47	GB	2041.0	2041.1	14.8	700.0			
	2695	PALE	4	S/F	2041.0	2043.0	9.3	39.0			
	245	PALE	8	S	2134.6	2134.8	.2	119.0			
	9400	HUAN	8	S	2212.2	2212.6	.9	43.2	14.7		L
	3750	TYKW	21	GRF	2225.0	2233.0	80.0	10.0	4.0		
	9400	TYKW	20	GRF	2225.0	2233.0	90.0D	12.0U	5.0D		
	3750	TYKW	20	GRF	2254.0	2306.0	40.0	3.0	1.5		
	606	PALE	8	S	2310.1	2310.1	.9	290.0			
	410	PALE	8	S	2311.5	2311.6	1.0	220.0			
	245	PALE	47	GB	2312.1	2314.5	14.5	470.0			
	245	PALE	47	GB	2336.0	2354.1	1379.5	980.0			
	606	LEAR	8	S	2345.8	2346.0	.3	58.0			
10	208	VORO	44	NS	0000.0E		240.0D		18.0		
	260	ONDR	44	NS	0820.0E		330.0D	22.0U			
	410	SGMR	43	NS	1227.0	1447.0D	258.0	13.0			
	245	SGMR	43	NS	1227.0	1518.0D	258.0	290.0			
	245	LEAR	43	NS	2151.0	2303.6	772.0	68.0			
	3750	TYKW	21	GRF	0020.0	0057.0	150.0	13.0	7.0		
	9400	TYKW	21	GRF	0027.0	0100.0	120.0	9.0	4.0		
	17000	NOBE	7	C	0027.8	0038.3	15.0	44.0			L
	9400	TYKW	5	S	0028.0	0030.0	7.0	6.0	3.0		
	15400	LEAR	4	S/F	0028.1	0028.3	2.2	13.0			
	9400	TYKW	45	C	0035.0	0039.6	12.0	16.0	6.0		
	15400	LEAR	4	S/F	0036.0	0038.3	4.8	52.0			
	8800	LEAR	4	S/F	0036.1	0038.3	3.7	21.0			
	15400	PALE	4	S/F	0038.3	0038.3	2.5	52.0			
	245	PALE	47	GB	0044.3	0102.0	19.2	880.0			

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10	2000	TYKW	21	GRF	0045.0	0145.0	120.0	6.0	3.0		
	1000	TYKW	20	GRF	0050.0	0145.0	90.0	2.0	1.0		
	3750	TYKW	5	S	0103.8	0104.2	1.2	2.5	1.0		
	2000	TYKW	5	S	0103.8	0104.3	1.2	4.0	1.5		
	2840	PEKG	1	S	0104.0	0104.4	1.0	4.1	2.1		
	9400	TYKW	45	C	0104.0	0104.6	2.0	13.0	4.0		
	9400	TYKW	20	GRF	0115.0	0145.0	65.0	4.0	2.0		
	9395	PEKG	20	GRF	0141.0	0158.3	45.0	12.0	2.1		
	9400	TYKW	5	S	0241.0	0242.0	3.0	3.0	1.0		
	9400	TYKW	21	GRF	0420.0	0443.0	100.0	8.0	4.0		
	3750	TYKW	21	GRF	0420.0	0447.0	120.0	11.0	5.0		
	2000	TYKW	20	GRF	0420.0	0455.0	120.0	6.0	3.0		
	2840	PEKG	1	S	0444.0	0448.4	10.0	6.0	5.2		
	9400	TYKW	20	GRF	0515.0	0520.0	35.0	6.0	3.0		
	3750	TYKW	5	S	0515.0	0520.0	25.0	6.0	2.0		
	9100	GORK	23	GRF	0630.0	0856.5	300.0D	22.0			
	234	POTS	42	SER	0734.2	0739.0	5.1	200.0	1.0		
	2950	GORK	20	GRF	0800.0E	0930.0	150.0D	7.8			
	810	KRAK	8	S	0818.2	0818.2	.1	16.0			
	15400	LEAR	8	S	0825.8	0826.1	.5	27.0			
	15000	KISV	8	S	0825.9	0826.1	1.0	21.0			
	810	KRAK	8	S	0834.5	0834.6	.4	48.0			
	9100	GORK	1	S	0907.4	0908.1	1.9	25.0	13.0		
	4995	LEAR	8	S	0907.5	0908.0	1.1	07.0			
	9500	POTS	3	S	0907.5	0908.0	1.5	20.0			
	8800	LEAR	8	S	0907.5	0908.1	1.3	26.0			
	6100	KISV	3	S	0907.6	0908.2	1.5	8.0			
	15400	LEAR	8	S	0907.8	0908.1	.8	05.0			
	930	BORD	8	S	0914.0	0914.0	.1	71.0	1.0		
	430	KRAK	42	SER	0932.1	0932.3	9.6	27.0			
	430	KRAK			0932.1	0937.2		32.0			
	410	LEAR	8	S	0940.5	0940.8	.5	17.0			
	204	IZMI	4	S/F	1003.5	1003.5	.8	138.0	60.0		
	430	KRAK	8	S	1009.7	1009.7	.2	13.0			
	430	KRAK	8	S	1014.3	1014.3	.2	25.0			
	430	KRAK	42	SER	1044.8	1113.9	46.0	120.0			
	930	BORD	8	S	1046.0	1046.1	.2	41.0	2.0		
	930	BORD	8	S	1058.0	1058.0	.1	50.0	1.0		
	810	KRAK	45	C	1116.2	1121.0	6.6	190.0	12.0		
	234	POTS	42	SER	1131.5	1131.7	2.7	300.0	1.0		
	9500	POTS	23	GRF	1248.0	1249.4	6.0	15.0			
	9400	HUAN	4	S/F	1248.5	1249.6	5.1	17.7	7.9		R
	9400	HUAN			1248.5	1251.3		16.9			R
	9400	HUAN	29	PBI	1253.6	1253.6	50.7	3.2	2.8		0
	8800	SGMR	8	S	1331.1	1331.1	1.0	13.0			
	930	BORD	8	S	1520.2	1520.2	.1	38.0	1.0		
	8800	SGMR	4	S/F	1529.8	1531.5	9.0	130.0			
	15400	SGMR	4	S/F	1530.1	1531.5	8.7	90.0			
	2800	OTTA	20	GRF	1630.0	1635.0	50.0	5.6	3.0		
	7000	SAOP	3	S	1706.3	1706.6	.4	14.0	7.0		0
	7000	SAOP	29	PBI	1706.7		2.1	3.0	1.0		
	8800	PALE	47	GB	1736.3	1737.1	5.2	51.0			
	15400	PALE	47	GB	1736.3	1737.3	4.3	43.0			
	4995	PALE	8	S	1736.5	1736.6	1.1	30.0			
	1415	PALE	8	S	1736.5	1737.3	.8	22.0			
	2695	PALE	8	S	1736.5	1737.3	1.0	26.0			
	2800	OTTA	2	S/F	1745.0	1750.0	10.0	5.0	2.3		
	2800	OTTA	20	GRF	1805.0	1813.0	85.0	12.4	6.0		
	9400	HUAN	1	S	1812.3	1813.2	2.2	15.8	11.3		0
	8800	SGMR	8	S	1812.8	1813.1	.5	21.0			
	9400	HUAN	29	PBI	1814.5	1814.5	24.1	6.3	3.6		0
	245	SGMR	8	S	1934.8	1935.3	1.5	119.0			
	410	SGMR	8	S	1935.0	1935.3	1.0	75.0			
	9400	HUAN	21	GRF	2144.6	2151.5	14.0	15.8	8.5		0
	8800	PALE	4	S/F	2147.6	2148.8	3.5	76.0			
	9400	HUAN	3	S	2147.8	2148.7	3.3	50.5	19.1		L
	2695	PENT	3	S	2148.0	2149.0	4.0	38.0	13.0		
	4995	PALE	4	S/F	2148.3	2148.6	2.8	67.0			
	2695	PALE	4	S/F	2148.3	2148.8	2.3	48.0			
	15400	PALE	8	S	2148.6	2148.8	.4	28.0			

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11	208	VORO	44	NS	0000.0E		240.0D		14.0		
	260	ONDR	44	NS	0820.0E		330.0D	29.0U			
	245	SGMR	43	NS	1228.0	1849.8	497.0D	38.0			
	245	LEAR	43	NS	2152.0	0052.1	771.0	710.0			
	410	LEAR	43	NS	2152.0	0054.8	771.0	37.0			
	200	HIRA	43	NS	2220.0	0118.0	540.0D	60.0	10.0		MR
	9395	PEKG	5	S	0012.0	0015.3	7.0	15.0	5.5		
	9400	TYKW	5	S	0014.5	0015.0	1.5	14.0	5.0		
	3750	TYKW	21	GRF	0015.0U	0028.0U	90.0U	5.0	2.0		INTERFERENCE
	9400	TYKW	29	PBI	0016.0		5.0	4.0	1.5		
	9395	PEKG	5	S	0105.0	0107.4	7.0	32.0	6.4		
	3750	TYKW	20	GRF	0105.0U	0114.0U	35.0U	4.0	2.0		INTERFERENCE
	9400	TYKW	5	S	0106.0	0107.3	5.0	34.0	6.0		
	8800	LEAR	4	S/F	0106.3	0107.1	2.8	37.0			
	4995	LEAR	8	S	0106.6	0107.1	1.2	06.0			
	9395	PEKG	3	S	0147.0	0153.5	12.0	13.0	5.8		
	2840	PEKG	20	GRF	0147.0	0234.8	106.0	19.0	5.3		
	9400	TYKW	5	S	0148.0	0151.6	15.0	5.0	2.0		
	3750	TYKW	20	GRF	0150.0	0210.0	50.0	3.0	1.5		
	208	VORO	22	GRF	0157.0U		29.0U		7.0		
	9395	PEKG	5	S	0222.0	0227.4	9.0	16.0	6.8		
	9400	TYKW	45	C	0223.0	0227.3	7.0	20.0	6.0		
	8800	LEAR	4	S/F	0225.1	0227.6	6.0	32.0			
	9400	TYKW	29	PBI	0230.0		12.0	5.0	2.0		
	9395	PEKG	29	PBI	0231.0	0255.8	42.0	5.7	3.2		
	9395	PEKG	3	S	0303.0	0304.3	3.0	193.0	33.0		
	9400	TYKW	5	S	0303.5	0304.0U	.5D	8.0D	3.0D		
	8800	LEAR	4	S/F	0303.8	0304.1	3.0	270.0			
	4995	LEAR	4	S/F	0303.8	0304.1	2.2	44.0			
	15400	LEAR	8	S	0304.0	0304.1	1.6	110.0			
	3750	TYKW	5	S	0304.0	0304.2	1.0U	5.0	2.0		
	17000	NOBE	3	S	0304.0	0304.3	.8	82.0			R
	4995	MANI	3	S	0304.0	0304.8	1.5	51.3	17.1		
	8800	MANI	3	S	0304.0	0304.8	1.4	214.2	71.4		
	8800	PALE	8	S	0304.1	0304.1	.4	170.0			
	9395	PEKG	29	PBI	0306.0	0312.8	23.0	12.0	5.0		
	9400	TYKW	45	C	0307.0E	0312.6	10.0D	12.0	6.0D		
	3750	TYKW	20	GRF	0310.0U	0313.0U	40.0U	4.0U	1.5U		INTERFERENCE
	2000	TYKW	5	S	0312.0	0312.6	1.0	7.0	2.5		
	2000	TYKW	29	PBI	0313.0		15.0	2.0	1.0		
	9400	TYKW	29	PBI	0317.0		20.0	4.0	2.0		
	9395	PEKG	45	C	0435.0	0440.2	9.0	125.0	26.0		
	9400	TYKW	45	C	0438.0	0440.1	7.0	148.0	33.0		
	8800	LEAR	4	S/F	0438.8	0440.0	8.3	139.0			
	8800	MANI	3	S	0439.0	0440.3	3.0	142.8	47.6		
	4995	MANI	3	S	0439.0	0440.4	3.0	37.0	12.4		
	15400	LEAR	4	S/F	0439.6	0440.0	2.7	39.0			
	17000	NOBE	1	S	0439.7	0440.1	3.0	31.0			0
	4995	LEAR	4	S/F	0439.8	0440.1	4.0	18.0			
	3750	TYKW	45	C	0440.0	0450.0	15.0	3.0	1.5		
	9395	PEKG	29	PBI	0444.0		18.0	11.0	5.7		
	9400	TYKW	29	PBI	0445.0		35.0	10.0	3.0		
	2000	TYKW	20	GRF	0500.0	0510.0	40.0	2.0	1.0		
	3750	TYKW	45	C	0504.0	0512.0	24.0	4.0	1.5		
	9395	PEKG	21	GRF	0612.0	0630.0	31.0	4.2	3.2		
	9395	PEKG	1	S	0620.0	0620.8	3.0	4.2	2.6		
	9100	GORK	2	S/F	0727.0	0729.0	5.2	10.0			
	6100	KISV	3	S	0727.3	0729.0	7.0	10.0			
	2695	LEAR	8	S	0728.8	0728.8	1.3	11.0			
	8800	LEAR	8	S	0729.0	0729.1	1.5	18.0			
	4995	LEAR	8	S	0729.1	0729.1	.2	11.0			
	6100	KISV	4	S/F	0742.0	0743.2	6.0	17.0			
	4995	LEAR	8	S	0742.3	0743.3	2.0	27.0			
	2695	LEAR	8	S	0742.3	0743.5	2.0	17.0			
	9100	GORK	2	S/F	0742.4	0743.1	4.2	27.0			
	8800	LEAR	8	S	0742.5	0743.1	2.0	36.0			
	2950	GORK	20	GRF	0742.7	0743.6	38.0	10.0			
	430	KRAK	8	S	0949.7	0949.7	.1	33.0			
	6100	KISV	1	S	1006.4	1009.0	7.0	7.0			
	430	KRAK	42	SER	1042.9	1043.0	12.7	28.0			

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Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density (10 -22 W/m 2 Hz) Peak	Mean	Int	Remarks
11	430	KRAK	2	S/F	1126.3	1126.5	1.8	37.0	5.0		
	6100	KISV	8	S	1143.0	1143.1	.5	7.0			
	7000	SAOP	3	S	1143.0	1143.1	.4	16.0	8.0		31L
	7000	SAOP	29	PBI	1143.4		5.1	4.0	2.0		
	430	KRAK	8	S	1209.5	1209.5	.2	23.0			
	430	KRAK	8	S	1236.9	1236.9	.2	20.0			
	2800	OTTA	21	GRF	1600.0	1810.0	210.0	12.4	6.0		
	245	PALE	47	GB	1731.3	1731.6	5.2	130.0			
	245	PALE	8	S	1752.6	1754.1	2.0	34.0			
	2800	OTTA	1	S	1805.0	1806.0	2.5	2.4	1.2		
	245	PALE	47	GB	1849.6	1849.6	.4	630.0			
	2800	OTTA	1	S	2014.8	2015.5	2.0	6.4	3.2		
	245	PALE	4	S/F	2035.3	2042.1	13.8	29.0			
	245	PALE	8	S	2227.3	2227.5	.5	36.0			
	1000	TYKW	5	S	2301.0	2301.7	1.5	2.0	.7		
	3750	TYKW	5	S	2301.2	2301.8	1.5	4.5	1.5		
	2000	TYKW	5	S	2301.3	2301.7	.7	3.0	1.0		
	9400	TYKW	5	S	2301.5	2301.8	.7	4.0	1.0		
	3750	TYKW	20	GRF	2320.0	2329.0	30.0	4.0	2.0		
	2000	TYKW	20	GRF	2320.0	2329.0	40.0	2.0	1.0		
	9400	TYKW	5	S	2325.0	2329.0	25.0	3.0	1.5		
12	208	VORO	44	NS	0000.0E		240.0D		28.0		
	410	PALE	43	NS	0138.0	0154.0	114.0D	82.0			
	245	PALE	43	NS	0138.0	0206.5	114.0	910.0			
	200	GORK	44	NS	0618.0E		285.0D		5.0		
	260	ONDR	44	NS	0835.0E		325.0D	29.0U			
	245	SGMR	43	NS	1229.0	1849.8	496.0D	420.0			
	245	LEAR	43	NS	2152.0	0815.3	772.0	210.0			
	245	LEAR	8	S	0010.3	0010.8	1.7	200.0			
	410	LEAR	8	S	0010.3	0011.1	1.5	11.0			
	245	LEAR	47	GB	0022.0	0023.3	13.6	840.0			
	3750	TYKW	5	S	0025.0	0027.0	6.0	3.0	1.5		
	200	HIRA	42	SER	0030.0	0042.7	27.0	400.0			MR
	410	LEAR	8	S	0034.8	0034.8	.8	11.0			
	245	LEAR	47	GB	0035.6	0036.1	2.4	630.0			
	3750	TYKW	5	S	0053.0	0056.0	8.0	3.0	1.0		
	2000	TYKW	20	GRF	0135.0	0150.0	45.0	2.0	1.0		
	1000	TYKW	20	GRF	0140.0	0150.0	40.0	2.0	1.0		
	9400	TYKW	5	S	0145.0	0145.8	10.0	4.0	1.5		
	3750	TYKW	5	S	0145.0	0146.0	4.0	2.0	.7		
	3750	TYKW	21	GRF	0200.0	0210.0	45.0	4.0	2.0		
	245	LEAR	47	GB	0206.6	0207.1	1.2	700.0			
	245	PALE	47	GB	0220.3	0221.5	3.0	840.0			
	245	LEAR	47	GB	0221.1	0221.6	1.5	600.0			
	3750	TYKW	5	S	0232.5	0233.2	11.0	2.0	1.0		
	2000	TYKW	28	PRE	0313.0	0320.0	7.0	2.0	1.0		
	3750	TYKW	28	PRE	0313.0U	0320.0	7.0U	4.0	2.0U		INTERFERENCE
	15400	LEAR	47	GB	0319.8	0322.5	19.3	54.0			
	8800	LEAR	47	GB	0319.8	0322.5	19.0	100.0			
	4995	LEAR	47	GB	0319.8	0322.6	18.3	62.0			
	2930	VORO	45	C	0320.0	0328.0	15.0	56.4			
	9400	TYKW	45	C	0320.0	0328.3	18.0	105.0	30.0		
	2000	TYKW	45	C	0320.0	0328.3	18.0	41.0	17.0		
	3750	TYKW	45	C	0320.0	0328.3	18.0	56.0	20.0		
	2695	LEAR	47	GB	0320.3	0322.6	16.5	23.0			
	8800	MANI	4	S/F	0322.0	0323.1	14.0	133.6	44.5		
	4995	MANI	4	S/F	0322.0	0328.0	13.5	144.8	48.3		
	2695	MANI	4	S/F	0322.0	0328.8	14.5	50.2	16.7		
	1000	TYKW	45	C	0322.0	0331.3	16.0	17.0	5.0		
	1415	LEAR	47	GB	0322.1	0322.8	12.0	11.0			
	17000	NOBE	45	C	0322.2	0328.3	15.0	61.0			LO
	9395	PEKG			0324.0	0328.0D					
	2840	PEKG	5	S	0326.0E	0328.2	10.0D	22.0			
	245	LEAR	4	S/F	0330.1	0332.0	2.5	280.0			
	9400	TYKW	30	PBI	0338.0		120.0	11.0	4.0		
	3750	TYKW	30	PBI	0338.0		150.0	8.0	6.0		
	2000	TYKW	30	PBI	0338.0		160.0	5.0	3.0		
	9400	TYKW	5	S	0349.0	0350.0	2.5	3.0	1.0		
	1000	TYKW	5	S	0349.0	0350.0	1.5	1.0	.3		

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Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density (10 -22 W/m 2 Hz) Peak	Mean	Int	Remarks
12	2000	TYKW	5	S	0349.0	0350.0	2.5	1.5	.5		
	3750	TYKW	5	S	0349.7U	0350.2	1.5U	2.0	1.0U		
	410	LEAR	8	S	0355.1	0355.5	.7	32.0			
	245	LEAR	8	S	0355.3	0355.3	.7	170.0			
	410	LEAR	8	S	0359.5	0400.1	1.8	18.0			
	245	LEAR	47	GB	0359.8	0400.3	2.2	720.0			
	3750	TYKW	5	S	0421.0	0423.1	7.0	15.0	4.0		
	2000	TYKW	5	S	0422.0	0423.1	2.0	20.0	5.0		
	2840	PEKG	3	S	0422.0	0423.1	14.6	10.0	1.6		
	9400	TYKW	5	S	0422.0	0423.1	2.0	20.0	6.0		
	17000	NOBE	45	C	0422.2	0423.1	3.0	18.0			0
	4995	LEAR	8	S	0422.8	0423.0	.3	17.0			
	8800	LEAR	8	S	0422.8	0423.0	.3	19.0			
	1000	TYKW	5	S	0422.8	0423.1	1.5	2.0	.7		
	2695	LEAR	8	S	0422.8	0423.1	.5	16.0			
	4995	MANI	3	S	0422.8	0423.6	1.5	57.9	19.3		
	2695	MANI	3	S	0423.0	0423.7	1.2	28.7	9.5		
	8800	MANI	3	S	0423.0	0423.8	1.3	46.9	15.6		
	9400	TYKW	29	PBI	0424.0		15.0	6.0	3.0		
	2000	TYKW	29	PBI	0424.0		20.0	3.0	1.0		
	3750	TYKW	30	PBI	0428.0		20.0	2.0	1.0		
	3750	TYKW	5	S	0436.5	0437.5	4.0	1.5	.5		
	3750	TYKW	5	S	0452.5	0453.2	1.5	2.5	1.0		
	9400	TYKW	45	C	0500.0	0502.0	4.0	5.0	1.5		
	3750	TYKW	5	S	0512.0	0518.0	20.0	3.0	1.5		
	9400	TYKW	5	S	0541.5	0542.1	1.5	6.0	1.5		
	3750	TYKW	5	S	0551.0	0552.5	7.0	7.0	3.0		
	2840	PEKG	5	S	0551.0	0552.7	13.0	5.2	1.1		
	9400	TYKW	8	S	0552.7	0552.9	.4	9.0	3.0		
	100	GORK	8	S	0644.6	0645.3	1.1	110.0D			
	204	IZMI	8	S	0703.2	0703.2	.2	220.0	190.0		
	245	LEAR	4	S/F	0719.1	0721.0	3.0	310.0			
	410	LEAR	8	S	0720.1	0720.6	1.0	17.0			
	204	IZMI	5	S	0720.8	0720.9	.6	370.0	350.0		
	650	GORK	4	S/F	0903.2	0903.4	.5	29.0			
	430	KRAK	8	S	0941.5	0941.5	.1	48.0			
	234	POTS	4	S/F	1036.3	1036.8	.7	700.0	35.0		
	2800	OTTA	27A	FRF	1424.0		108.0	4.6	4.2		
	2800	OTTA	24	R	1424.0	1434.0	10.0	4.6	2.3		
	410	SGMR	4	S/F	1431.0	1434.1	5.8	29.0			
	606	SGMR	4	S/F	1431.6	1434.1	5.2	37.0			
	2800	OTTA	24P	R	1434.0		81.0	4.6			
	2800	OTTA	2	S/F	1544.3	1544.9	1.2	3.4			
	606	SGMR	4	S/F	1549.3	1552.1	4.7	47.0			
	2800	OTTA	26	FAL	1555.0	1612.0	17.0	-4.6	-2.3		
	2800	OTTA	21	GRF	1635.0	1705.0	110.0	21.4	14.6		
	7000	SAOP	45	C	1638.5	1646.7	9.9	12.5	62.0		4R
	9400	HUAN	21	GRF	1638.6	1656.0	115.2	31.1	20.1		R
	606	SGMR	47	GB	1641.8	1646.5	9.2	60.0			
	2800	OTTA	4	S/F	1642.0	1646.5	11.0	93.0	30.0		
	8800	SGMR	4	S/F	1643.0	1646.5	9.3	99.0			
	1415	SGMR	4	S/F	1643.3	1644.5	9.0	83.0			
	2695	SGMR	47	GB	1643.5	1646.5	8.8	82.0			
	4995	SGMR	47	GB	1644.0	1646.5	8.3	89.0			
	9400	HUAN	4	S/F	1644.2	1645.7	5.6	65.8	29.2		R
	9400	HUAN			1644.2	1646.5		76.1			
	410	SGMR	47	GB	1644.6	1646.5	8.2	43.0			
	15400	SGMR	4	S/F	1645.0	1646.3	7.3	70.0			
	7000	SAOP	29	PBI	1647.8	1648.9	96.4	57.0	2.8		
	2800	OTTA	2	S/F	1654.0	1657.8	6.0	8.4	6.0		
	2800	OTTA	26A	FAL	1830.0	1945.0	75.0	-11.6	-5.8		
	2800	OTTA	20	GRF	1835.0	1844.0	25.0	8.4	4.2		
	2000	TYKW	20	GRF	2320.0	2345.0	90.0	2.0	1.0		
	3750	TYKW	20	GRF	2330.0	0005.0	140.0	4.0	2.0		
13	208	VORO	44	NS	0000.0E		240.0D		12.0		
	200	GORK	43	NS	0645.0		204.0D		5.0		
	100	GORK	43	NS	0715.0		53.0D		10.0		
	260	ONDR	44	NS	0825.0E		335.0D	9.0U			
	245	PALE	43	NS	1729.0	1822.0	605.0	360.0			

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13	245	LEAR	43	NS	2152.0	0836.8	772.0	110.0			
	2000	TYKW	20	GRF	0220.0	0328.0	170.0	3.0	1.5		
	3750	TYKW	20	GRF	0220.0	0328.0	170.0	6.0	3.0		
	245	LEAR	8	S	0642.1	0643.1	1.4	24.0			
	100	GORK	4	S/F	0718.7	0721.0U	4.5	100.0D			
	204	IZMI	41	F	0720.0	0720.1	2.5	140.0			
	1415	LEAR	4	S/F	0807.3	0808.5	2.2	21.0			
	410	LEAR	8	S	0814.0	0814.3	.6	22.0			
	4995	ATHN	4	S/F	1056.5	1057.3	2.5	19.0			
	3000	POTS	3	S	1056.5	1057.4	3.5	22.0			
	6100	KISV	4	S/F	1056.7	1057.3	2.5	11.0			
	2695	ATHN	4	S/F	1056.8	1057.3	5.2D	28.0			
	9500	POTS	3	S	1057.0	1057.2	3.0	11.0			
	1470	POTS	1	S	1057.0	1057.5	2.0	3.5U			
	2650	DWIN	1	S	1057.0	1059.0	2.0	20.0	10.0		
	113	POTS	4	S/F	1245.2	1246.0	2.4	140.0	20.0		III
	2800	OTTA	20	GRF	1655.0	1730.0	70.0	3.6	1.8		
	2800	OTTA	21	GRF	1820.0	1910.0	110.0	7.6	3.4		
	2800	OTTA	1	S	1856.0	1857.0	2.0	5.0	2.5		
	7000	SAOP	4	S/F	1901.6	1903.2	2.2	37.0	18.0		0
	2800	OTTA	3	S	1902.0	1902.8	3.5	22.0	7.4		
	4995	SGMR	8	S	1902.6	1903.1	1.2	36.0			
	2695	SGMR	8	S	1902.6	1903.1	1.0	29.0			
	7000	SAOP	29	PBI	1903.8		12.3	15.0	7.0		
	2695	PENT	3	S	2126.5	2127.7	12.0	35.0	9.0		
	9400	HUAN	3	S	2126.9	2128.1	3.3	31.1	15.0		R
	2695	PALE	4	S/F	2127.1	2127.6	13.0	44.0			
	4995	PALE	4	S/F	2127.1	2128.1	13.0	51.0			
	8800	PALE	47	GB	2127.1	2128.1	13.0	70.0			
	1415	PALE	4	S/F	2127.3	2127.8	12.8	22.0			
	15400	PALE	47	GB	2127.3	2128.0	12.8	57.0			
	9400	TYKW	5	S	2333.0	2333.6	2.0	4.0	1.5		
	3750	TYKW	5	S	2333.0	2333.7	4.0	4.0	1.5		
	9400	TYKW	29	PBI	2335.0		7.0	2.0	1.0		
14	208	VORO	44	NS	0000.0E		240.0D		11.0		
	204	IZMI	43	NS	0755.0		68.0D	220.0			
	260	ONDR	44	NS	0840.0E		310.0D	18.0U			
	3750	TYKW	20	GRF	0005.0	0021.0	40.0	3.0	1.5		
	1000	TYKW	20	GRF	0150.0	0200.0	90.0	2.0	1.0		
	2000	TYKW	20	GRF	0150.0	0205.0	90.0	3.0	1.5		
	3750	TYKW	20	GRF	0150.0	0205.0	95.0	3.0	1.5		
	3750	TYKW	45	C	0330.0	0332.3	4.0	6.0	3.0		
	2000	TYKW	5	S	0330.0	0333.0	15.0	2.0	1.0		
	3750	TYKW	29	PBI	0334.0		20.0U	2.0	1.0U		INTERFERENCE
	3750	TYKW	5	S	0402.0	0403.4	10.0	2.5	1.0		
	410	LEAR	8	S	0819.5	0819.8	.5	17.0			
	9100	GORK	1	S	0828.5	0829.0	.9	7.0	3.5		
	2950	GORK	1	S	0828.5	0829.1	.9	5.7			
	6100	KISV	2	S/F	0828.5	0829.2	1.0	3.0			
	234	POTS	8	S	1144.7	1144.7	.1	250.0	80.0		
	260	ONDR	8	S	1144.7	1144.9	.7	212.0D			
	7000	SAOP	1	S	1202.7	1203.1	.9	7.0	3.0		20R
	7000	SAOP	29	PBI	1203.6	1205.4	31.0	4.0	2.0		
	2800	OTTA	20	GRF	1425.0	1520.0	145.0	3.4	2.0		
	2695	PENT	1	S	2055.0	2056.2	3.0	4.2	1.4		
	410	LEAR	8	S	2328.6	2328.6	.2	17.0			
	245	LEAR	8	S	2332.0	2332.1	.8	21.0			
	3750	TYKW	5	S	2332.0	2332.4	1.0	3.0	1.0		
	2000	TYKW	5	S	2332.0	2332.4	1.0	1.5	.5		
	9400	TYKW	5	S	2332.0	2332.4	2.5	6.0	2.0		
	15400	LEAR	8	S	2332.1	2332.3	.7	11.0			
	9400	TYKW	45	C	2339.6	2339.7	.5	15.0	5.0		
	3750	TYKW	5	S	2357.0	2357.9	3.0	4.0	1.5		
15	208	VORO	44	NS	0000.0E		240.0D		12.0		
	260	ONDR	43	NS	1034.0	1152.0U	290.0D	20.0U			
	9400	TYKW	5	S	0045.0	0047.2	4.0	6.0	1.5		
	3750	TYKW	45	C	0045.0	0047.3	5.0	7.0	2.0		
	2000	TYKW	45	C	0046.0	0047.3	4.0	3.0	1.0		

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Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density (10 -22 W/m 2 Hz) Peak	Mean	Int	Remarks
15	3750	TYKW	5	S	0057.0	0057.6	2.0	1.0	.3		
	2000	TYKW	45	C	0057.0	0057.7	1.5	5.0	1.5		
	1000	TYKW	45	C	0057.5	0057.6	.7	6.0	1.5		
	3750	TYKW	20	GRF	0235.0	0400.0	155.0	5.0	2.5		
	2000	TYKW	20	GRF	0235.0	0400.0	155.0	2.0	1.0		
	1415	LEAR	8	S	0355.1	0355.1	.2	42.0			
	410	LEAR	8	S	0440.0	0440.1	.1	42.0			
	245	LEAR	8	S	0440.1	0440.1	.2	420.0			
	9100	GORK	1	S	0816.1	0817.9	3.4	8.0	4.0		
	6100	KISV	2	S/F	0817.2	0817.8	2.0	4.0			
	930	BORD	8	S	0822.8	0822.8	.1	22.0	1.0		
	2950	GORK	1	S	0948.5	0949.0	3.6	5.6			
	930	BORD	8	S	0959.8	0959.8	.2	46.0	1.0		
	245	LEAR	8	S	1013.3	1013.3	.2	16.0			
	245	LEAR	8	S	1038.6	1038.8	.2	16.0			
	930	BORD	8	S	1047.3	1047.3	.1	53.0	1.0		
	930	BORD	41	F	1115.0	1119.7	5.0	46.0	2.0		
	430	KRAK	8	S	1253.5	1253.5	.1	17.0			
	930	BORD	42	SER	1255.0	1259.7	4.7D	31.0	2.0		
	930	BORD	41	F	1308.3	1308.3	.1	26.0	1.0		
	2800	OTTA	260	FAL	1500.0	1525.0	25.0	-3.2	-2.0		
	2800	OTTA	1	S	1540.0	1547.0	10.0	2.4	1.2		
	2800	OTTA	21	GRF	1615.0	1630.0	40.0	3.2	1.6		
	2800	OTTA	4	S/F	1626.2	1626.4	1.0	12.4			
	2800	OTTA	4	S/F	1944.0	1946.5	7.0	208.0	66.0		
	7000	SAOP	3	S	1945.0	1946.6	6.5	47.0	235.0		
	2695	PALE	4	S/F	1945.1	1946.6	4.0	180.0			
	4995	PALE	4	S/F	1945.1	1946.6	6.0	400.0			
	9400	HUAN	3	S	1945.1	1946.8	3.9	461.3	155.2		R
	8800	PALE	4	S/F	1945.3	1946.6	6.8	380.0			
	1415	PALE	4	S/F	1945.5	1946.6	3.8	80.0			
	2695	SGMR	4	S/F	1945.5	1946.6	4.1	190.0			
	4995	SGMR	4	S/F	1945.5	1946.6	4.6	370.0			
	245	PALE	4	S/F	1945.6	1946.1	10.5	37.0			
	15400	PALE	4	S/F	1945.6	1946.6	7.7	190.0			
	1415	SGMR	4	S/F	1945.6	1946.6	4.2	74.0			
	15400	SGMR	4	S/F	1945.8	1946.6	3.5	130.0			
	8800	SGMR	4	S/F	1945.8	1946.6	3.2	230.0			
	606	PALE	4	S/F	1946.5	1946.8	2.1	13.0			
	606	SGMR	8	S	1946.6	1946.6	.2	13.0			
	9400	HUAN	29	PBI	1949.0	1949.0	50.1	85.1	11.8		R
	245	SGMR	47	GB	1950.5	1950.8	1.1	1600.0			
	2800	OTTA	30	PBI	1951.0	1951.0	20.0	8.2	2.0		
	7000	SAOP	29	PBI	1951.5		8.3	13.0	6.0		
	410	PALE	8	S	1953.8	1954.3	1.3	160.0			
	2800	OTTA	8	S	1954.0	1954.1	.2	9.4			
	3750	TYKW	5	S	2246.0	2246.6	1.5	1.5	.5		
	410	LEAR	8	S	2303.6	2303.8	.4	19.0			
	3750	TYKW	5	S	2332.0	2333.2	3.0	9.0	3.0		
	9400	TYKW	5	S	2332.5	2333.2	1.5	12.0	4.0		
	8800	PALE	8	S	2332.8	2333.1	.5	24.0			
	4995	LEAR	8	S	2333.0	2333.1	.8	20.0			
	8800	LEAR	8	S	2333.1	2333.1	.5	18.0			
	9400	TYKW	29	PBI	2334.0		20.0	3.0	1.5		
	245	PALE	8	S	2334.3	2334.3	.2	28.0			
	245	LEAR	8	S	2334.3	2334.6	.5	22.0			
	3750	TYKW	29	PBI	2335.0		15.0	2.0	1.0		
	410	LEAR	8	S	2346.1	2347.8	1.7	23.0			
16	260	ONDR	43	NS	1100.0	1155.0U	70.0D	3.0			
	3750	TYKW	20	GRF	0030.0	0105.0	80.0	3.0	1.5		
	245	LEAR	8	S	0152.6	0152.6	.4	96.0			
	245	LEAR	8	S	0318.3	0318.3	.2	18.0			
	2000	TYKW	21	GRF	0340.0	0405.0	95.0	2.0	1.0		
	410	LEAR	8	S	0341.0	0341.1	.1	04.0			
	245	LEAR	8	S	0341.0	0341.1	.1	52.0			
	3750	TYKW	21	GRF	0345.0U	0410.0	100.0U	4.0U	2.0U		
	9400	TYKW	20	GRF	0345.0	0410.0	90.0	3.0	1.5		
	2000	TYKW	5	S	0425.4	0425.6	.5	.6	1.5		
	1000	TYKW	5	S	0425.4	0425.6	.5	1.5	.5		

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16	3750	TYKW	5	S	0454.5	0454.9	2.0	12.0	2.5		
	2000	TYKW	5	S	0526.4	0526.6	.5	21.0	5.0		
	245	LEAR	8	S	0712.6	0712.8	.2	17.0			
	245	LEAR	8	S	0814.1	0814.8	1.0	18.0			
	245	LEAR	8	S	0945.3	0946.1	.8	24.0			
	430	KRAK	8	S	0947.9	0947.9	.1	16.0			
	930	BORD	8	S	1046.0	1048.0	2.1D	57.0	1.0		
	930	BORD	8	S	1422.6	1422.6	.1	56.0	1.0		
	2800	OTTA	20	GRF	1425.0	1455.0	65.0	2.8	1.4		
	930	BORD	8	S	1527.0	1527.0	.1	20.0	1.0		
	2800	OTTA	20	GRF	1615.0	1730.0	210.0	5.2	3.0		
	410	LEAR	8	S	2157.6	2157.8	.5	13.0			
	606	LEAR	8	S	2219.8	2220.0	.3	15.0			
	410	PALE	8	S	2328.6	2329.6	1.0	130.0			
17	260	ONDR	43	NS	0836.0	1224.0U	284.0D	7.0			
	2000	TYKW	28	PRE	0229.0	0233.6	6.0	280.0	30.0		
	2000	TYKW	47	GB	0235.0	0236.8	7.0	5000.0	400.0		
	1000	TYKW	5	S	0237.9	0238.1	.5	8.0	2.0		
	245	PALE	4	S/F	0319.1	0319.8	2.7	37.0			
	410	LEAR	8	S	0737.1	0737.3	.2	57.0			
	245	LEAR	8	S	0801.6	0801.8	.4	08.0			
	410	LEAR	4	S/F	0802.0	0802.0	.1D	17.0			
[	410	LEAR	8	S	0915.5	0915.6	.3	22.0			
[	245	LEAR	8	S	0915.5	0915.6	.3	10.0			
	930	BORD	8	S	1058.0	1058.0	.1	84.0	1.0		
	430	KRAK	8	S	1155.5	1155.5	.1	110.0			
[	3750	TYKW	20	GRF	2320.0	2335.0	100.0	4.0	2.0		
[	2000	TYKW	20	GRF	2320.0	2335.0	100.0	2.0	1.0		
[	9400	TYKW	20	GRF	2325.0	2334.0	60.0	3.0	1.5		
18	260	ONDR	43	NS	1000.0	1227.0U	240.0D	5.0			
	245	LEAR	4	S/F	0449.1	0450.1	2.7	42.0			
[	245	LEAR	4	S/F	0638.8	0638.8	.1D	11.0			
[	410	LEAR	4	S/F	0638.8	0638.8	.1D	17.0			
[	606	LEAR	4	S/F	0638.8	0638.8	.1D	07.0			
[	410	LEAR	4	S/F	0704.0	0704.0	.1D	06.0			
[	245	LEAR	4	S/F	0704.0	0704.0	.1D	13.0			
[	606	LEAR	4	S/F	0704.0	0704.0	.1D	16.0			
[	606	LEAR	8	S	0808.8	0808.8	.2	11.0			
[	410	LEAR	8	S	0808.8	0808.8	.2	16.0			
[	245	LEAR	8	S	0808.8	0808.8	.2	23.0			
	606	LEAR	8	S	0905.8	0906.0	.3	42.0			
	260	ONDR	8	S	0921.6	0921.8	.7	23.0			
	260	ONDR	46	C	1003.0	1004.8	3.0	4.0			
	930	BORD	8	S	1041.2	1041.2	.1	42.0	1.0		
	2800	OTTA	21	GRF	1440.0	1630.0	200.0	3.0	1.5		
	2800	OTTA	1	S	1541.8	1542.2	1.2	4.0	2.0		
	245	PALE	8	S	1919.8	1919.8	.2	33.0			
[	245	PALE	47	GB	1945.6	1946.5	19.4	76.0			
[	410	PALE	47	GB	1945.8	1946.6	19.2	130.0			
19	245	LEAR	43	NS	0214.8	0242.0	512.2D	38.0			
	245	LEAR	8	S	0214.8	0215.0	.3	20.0			
[	410	LEAR	4	S/F	0638.8	0638.8	.1D	17.0			
[	606	LEAR	4	S/F	0638.8	0638.8	.1D	07.0			
[	245	LEAR	4	S/F	0638.8	0638.8	.1D	11.0			
[	606	LEAR	4	S/F	0704.0	0704.0	.1D	16.0			
[	245	LEAR	4	S/F	0704.0	0704.0	.1D	13.0			
[	410	LEAR	4	S/F	0704.0	0704.0	.1D	06.0			
[	204	IZMI	4	S/F	0738.5	0738.7	2.3	66.0	20.0		
[	245	LEAR	8	S	0738.8	0739.3	.7	30.0			
[	410	LEAR	8	S	0808.8	0808.8	.2	16.0			
[	245	LEAR	8	S	0808.8	0808.8	.2	23.0			
[	606	LEAR	8	S	0808.8	0808.8	.2	11.0			
	260	ONDR	8	S	0822.0	0822.1	.3	26.0			
	606	LEAR	8	S	0905.8	0906.0	.3	42.0			
	930	BORD	8	S	0936.8	0936.8	.1	21.0	1.0		
	930	BORD	8	S	0941.8	0941.8	.1	41.0	1.0		
20	260	ONDR	44	NS	0824.0E		182.0D	30.0			

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20	9400	TYKW	5	S	0045.5	0046.0	1.5	8.0	1.5		
	245	LEAR	4	S/F	0217.0	0217.0	.1D	11.0			
	2000	TYKW	5	S	2314.4	2314.8	1.0	4.0	1.5		
	3750	TYKW	5	S	2314.5	2314.9	1.0	1.5	.5		
	1000	TYKW	45	C	2314.5	2315.1	1.0	3.0	.5		
21	245	LEAR	43	NS	0350.0	0433.6	231.8	34.0			
	260	ONDR	43	NS	0910.0	0937.0U	30.0D	3.0U			
	260	ONDR	43	NS	0940.0	0949.0U	60.0D	3.0U			
	245	LEAR	43	NS	2310.0	0308.8	699.0	56.0			
	245	LEAR	8	S	0100.6	0101.0	.5	30.0			
	9400	TYKW	20	GRF	0420.0	0450.0	108.0D	3.0	1.5D		
	2000	TYKW	20	GRF	0420.0	0450.0	120.0	1.5	.7		
	3750	TYKW	20	GRF	0420.0	0450.0	120.0	2.0	1.0		
	950	GORK	6	S	0855.0	0857.4	2.5	2.0			
	9100	GORK	1	S	0856.0	0857.7	2.5	9.0	4.5		
	930	BORD	41	F	1014.4	1015.8	1.8	44.0	1.0		
	2950	GORK	20	GRF	1057.7	1059.2	10.0	9.8			
	950	GORK	1	S	1058.0	1059.5	5.2	5.0			
	9100	GORK	1	S	1058.8	1059.4	4.8	14.0			
	2800	OTTA	240	R	1620.0	1635.0	15.0	2.0	1.0		
22	260	ONDR	44	NS	0818.0E	0842.0U	122.0D	4.0U			
	260	ONDR	43	NS	1250.0	1337.0U	75.0D	3.0U			
	245	LEAR	43	NS	2329.3	0253.8	679.7	37.0			
	3750	TYKW	20	GRF	0405.0	0417.5	35.0	3.0	1.0		
	9400	TYKW	5	S	0416.0	0417.0	8.0	3.0	1.5		
	245	LEAR	8	S	0641.1	0641.3	.2	16.0			
	606	LEAR	8	S	0641.1	0641.3	.2	04.0			
	410	LEAR	8	S	0641.1	0641.3	.2	11.0			
	113	POTS	4	S/F	0904.8	0905.1	.8	280.0	70.0		
	930	BORD	8	S	0945.0	0945.0	.1	19.0	1.0		
	930	BORD	8	S	1245.7	1245.7	.1	17.0	1.0		
	2800	OTTA	20	GRF	1340.0	1400.0	20.0D	5.0			
23	260	ONDR	43	NS	0930.0	1107.0U	130.0D	4.0U			
	260	ONDR	43	NS	1140.0	1243.0U	90.0D	7.0U			
	245	LEAR	8	S	0605.1	0605.1	.2	08.0			
	410	LEAR	8	S	0605.1	0605.1	.2	17.0			
	606	LEAR	8	S	0605.1	0605.1	.2	17.0			
	245	LEAR	8	S	0632.6	0632.6	.2	09.0			
	410	LEAR	8	S	0632.6	0632.6	.2	08.0			
	260	ONDR	8	S	1154.0	1154.1	.1	10.0			
	113	POTS	8	S	1353.6	1353.6	.2	250.0	80.0		
	2800	OTTA	240	R	1605.0	1615.0	10.0	3.0	1.5		
	2800	OTTA	21	GRF	1750.0	1753.0	30.0	2.6	1.6		
	2800	OTTA	1	S	1756.0	1757.0	4.0	4.2	1.4		
	245	LEAR	8	S	2333.8	2334.0	.3	18.0			
	410	LEAR	8	S	2334.0	2334.0	.1	07.0			
24	208	VORO	44	NS	0000.0E		240.0D		12.0		
	2000	TYKW	20	GRF	0420.0	0510.0	150.0	2.0	1.0		
	3750	TYKW	20	GRF	0420.0	0510.0	150.0	3.0	1.0		
	245	LEAR	8	S	0901.8	0901.8	.2	11.0			
	410	LEAR	8	S	0901.8	0901.8	.2	19.0			
	245	LEAR	8	S	0920.8	0920.8	.2	11.0			
	410	LEAR	8	S	0920.8	0920.8	.2	20.0			
	2800	OTTA	20	GRF	1625.0	1720.0	95.0	3.0	2.2		
	2800	OTTA	240	AR	1825.0	1905.0	40.0	4.6	2.5		
	2800	OTTA	4	S/F	1826.9	1827.0	1.0	19.0	7.0		
	2800	OTTA	2	S/F	1840.0	1841.0	1.5	3.6			
	2800	OTTA	1	S	1851.5	1853.0	3.5	9.4	4.7		
	2695	PENT	1	S	2039.0	2039.3	1.0	2.4			
	2695	PENT	1	S	2055.0	2055.5	2.0	2.0	1.0		
	2695	PENT	1	S	2058.0	2100.5	5.0	5.4	2.0		
25	245	SGMR	43	NS	1237.0	1746.1	493.0D	23.0			
	2000	TYKW	20	GRF	0230.0	0250.0	100.0	3.0	1.5		
	9400	TYKW	20	GRF	0230.0	0300.0	100.0	3.0	1.5		
	3750	TYKW	20	GRF	0235.0	0255.0	100.0	3.0	1.5		

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25	606	LEAR	8	S	0607.0	0607.1	.3	20.0			
	410	LEAR	8	S	0732.6	0732.6	.2	23.0			
	2800	OTTA	20	GRF	1715.0		80.0	3.0	2.3		
	1000	TYKW	45	C	2257.8	2258.0	2.0U	2.0U	.5U		
	2000	TYKW	5	S	2257.8	2258.2	1.0	7.0	2.5		
	1415	LEAR	8	S	2257.8	2258.3	1.0	20.0			
26	2840	PEKG	20	GRF	0418.5	0438.9	41.0D	9.1	5.8		
	2800	OTTA	240	R	1520.0	1645.0	85.0	5.2	2.6		
	2800	OTTA	20	GRF	1720.0	1810.0	80.0	3.6	1.6		
	2695	PENT	1	S	2208.2	2209.2	1.5	4.4	1.5		
	245	LEAR	8	S	2312.8	2313.0	.3	31.0			
	410	LEAR	8	S	2312.8	2313.0	.3	08.0			
27	245	LEAR	43	NS	0310.0	0318.8	230.0	19.0			
	245	LEAR	43	NS	2320.6	2322.1	359.9	11.0			
	1000	TYKW	28	PRE	0153.0	0203.2	42.0	6.0	2.0		
	2000	TYKW	28	PRE	0155.0	0203.2	40.0	9.0	3.0		
	1415	LEAR	4	S/F	0159.1	0203.1	10.7	10.0			
	9395	PEKG	20	GRF	0200.0	0306.5	106.5D	15.0			
	3750	TYKW	21	GRF	0200.0	0310.0	300.0D	21.0	14.0D		
	9400	TYKW	20	GRF	0200.0	0340.0	300.0D	18.0	13.0D		
	2695	LEAR	4	S/F	0201.8	0203.1	3.0	05.0			
	3750	TYKW	5	S	0202.0	0203.2	15.0	3.0	1.0		
	2840	PEKG	1	S	0203.0	0203.8	3.0	2.4	1.2		
	2840	PEKG	21	GRF	0203.0	0333.6	130.6D	6.2			
	1000	TYKW			0235.0	0258.4U		27.0D			
	1000	TYKW	45	C	0235.0	0311.6	55.0	28.0	15.0D		
	2000	TYKW	45	C	0235.0	0313.0	55.0	25.0	16.0D		
	1415	LEAR	4	S/F	0244.3	0247.5	6.7	17.0			
	2840	PEKG	5	S	0245.0	0300.7	44.0	7.5	1.8		
	3750	TYKW	5	S	0246.8	0247.2	2.0	13.0	4.0		
	1415	LEAR	4	S/F	0251.3	0300.3	102.6	27.0			
	245	LEAR	8	S	0251.8	0252.3	1.2	10.0			
	500	HIRA	45	C	0252.0	0300.3	10.0	60.0	20.0		WR
	4995	LEAR	4	S/F	0252.0	0301.8	12.1	11.0			
	606	PALE	47	GB	0252.8	0255.6	8.5	40.0			
	606	LEAR	47	GB	0252.8	0300.3	32.2	53.0			
	410	LEAR	4	S/F	0254.5	0300.3	9.6	99.0			
	410	PALE	47	GB	0255.3	0256.8	6.0	21.0			
	2695	LEAR	8	S	0256.0	0256.6	1.0D	11.0			
	1415	PALE	8	S	0300.1	0300.3	.4	26.0			
	2000	TYKW	30	PBI	0330.0		210.0D	22.0	16.0D		
	1000	TYKW	29	PBI	0330.0		210.0D	11.0	7.0D		INTERFERENCE
	2000	TYKW	20	GRF	0400.0	0445.0	100.0	3.0	1.5		
	3750	TYKW	20	GRF	0400.0	0445.0	100.0	3.0	1.5		
	100	HIRA	46	C	0423.9	0424.6	1.4	930.0	125.0		
	245	LEAR	8	S	0424.1	0424.3	.7	139.0			
	200	HIRA	46	C	0424.1	0424.7	9.3	685.0	11.0		0
	500	HIRA	3	S	0424.4	0425.3	3.0	25.0	14.0		ML
	410	LEAR	4	S/F	0424.5	0424.8	2.8	41.0			
	606	LEAR	8	S	0424.8	0425.3	1.7	17.0			
	245	LEAR	8	S	0714.3	0714.8	.8	61.0			
	33	UPIC	8	S	1121.2	1121.2	.3				
	29	UPIC	8	S	1121.4	1121.5	.2				
	430	KRAK	2	S/F	1127.3	1127.5	2.1	50.0	7.0		
	3000	POTS	3	S	1127.5	1128.0	1.1	10.0U			
	1470	POTS	3	S	1127.5	1128.0	1.5	6.0U			
	2650	DWIN	1	S	1128.0	1128.0	1.0	35.0	20.0		
	15400	PALE	8	S	1750.8	1751.1	1.3	19.0			
	3750	TYKW	20	GRF	2315.0	0010.0	120.0	7.0	4.0		
	2000	TYKW	20	GRF	2330.0	2400.0	90.0	3.0	1.5		
28	245	SGMR	43	NS	1238.0	1312.3	134.3	40.0			
	260	ONDR	43	NS	1306.0	1316.0U	42.0D	10.0D			
	9395	PEKG	21	GRF	0237.0	0239.5	8.0	6.5	1.2		
	2930	VORO	20	GRF	0310.0	0320.0	38.0	37.5			
	6100	KISV	21	GRF	0648.0	0711.7	35.0	6.0			
	245	LEAR	8	S	0847.6	0847.6	.4	11.0			
	2950	GORK	20	GRF	1007.9	1023.4	82.0D	12.0			

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

DECEMBER 1981

Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density (10 -22 W/m 2 Hz) Peak	Mean	Int	Remarks
28	6100	KISV	27	RF	1010.0	1051.0	110.0	7.0			
	9100	GORK	22	GRF	1020.8	1024.1	36.4	6.0			
	260	ONDR	8	S	1023.0	1023.3	.9	10.0			
	15400	LEAR	8	S	1024.8	1025.3	1.2	52.0			
	2695	LEAR	8	S	1025.0	1025.1	.8	29.0			
	8800	LEAR	8	S	1025.0	1025.1	.8	41.0			
	4995	LEAR	8	S	1025.0	1025.1	.8	29.0			
	1415	LEAR	8	S	1025.0	1025.1	.8	23.0			
	260	ONDR	8	S	1043.1	1043.2	.1	6.0			
	260	ONDR	8	S	1220.8	1220.9	.2	9.0			
	260	ONDR	8	S	1255.6	1255.7	.3	6.0			
	930	BORD	8	S	1440.0	1440.0	.1	21.0	1.0		
	2800	OTTA	240	R	1715.0	1735.0	20.0	3.0	2.0		
	2800	OTTA	3	S	1800.0	1801.2	5.0	10.2	6.8		
	2800	OTTA	30	PBI	1805.0	1805.0	65.0	5.6	3.0		
	2800	OTTA	1	S	1827.0	1828.0	2.0	5.4	2.7		
	2695	PENT	1	S	2021.5	2022.5	2.5	3.8			
29	260	ONDR	43	NS	1145.0	1231.0U	129.0D	3.0D			
	410	LEAR	8	S	0127.8	0128.1	.5	22.0			
	3750	TYKW	20	GRF	0155.0	0230.0	75.0	6.0	3.0		
	2000	TYKW	20	GRF	0200.0	0213.0	60.0	3.0	1.5		
	9400	TYKW	20	GRF	0200.0	0220.0	50.0	2.0	1.0		
	9395	PEKG	20	GRF	0202.0	0238.0	65.0D	7.5			
	2840	PEKG	20	GRF	0210.0	0315.4	73.0	7.8	1.2		
	245	LEAR	8	S	0310.3	0310.6	.5	19.0			
	2840	PEKG	5	S	0408.0	0412.8	19.0	7.0	1.3		
	245	LEAR	8	S	0453.3	0453.5	.3	17.0			
	200	HIRA	46	C	0637.3	0637.8	1.0	280.0	48.0		0
	100	HIRA	45	C	0637.5	0638.0	1.5	950.0	150.0		
	245	LEAR	8	S	0637.8	0638.1	.5	230.0			
	410	LEAR	8	S	0638.0	0638.1	.3	17.0			
	606	LEAR	8	S	0652.1	0652.3	.4	42.0			
	2840	PEKG	1	S	0717.0	0718.5	6.0	8.9	1.1		
	410	LEAR	8	S	0745.1	0745.3	.2	20.0			
	2695	PENT	1	S	2047.0	2049.0	6.0	4.6	1.6		
	245	LEAR	8	S	2215.8	2215.8	.2	13.0			
30	260	ONDR	44	NS	0810.0E		360.0D	30.0U			
	1000	TYKW	45	C	0143.0	0217.6	40.0	10.0	3.0		
	2840	PEKG	21	GRF	0145.0	0218.5	76.0D	11.0			
	2000	TYKW	21	GRF	0145.0	0219.0	150.0	7.0	3.0		
	3750	TYKW	21	GRF	0145.0	0230.0	165.0	8.0	3.5		
	200	HIRA	42	SER	0145.3	0145.6	9.3	16.0			0
	9400	TYKW	20	GRF	0150.0	0230.0	160.0	4.0	2.0		
	1000	TYKW	30	PBI	0223.0		120.0	3.0	1.5		
	2000	TYKW	5	S	0231.0	0231.3	1.0	10.0	3.0		
	3750	TYKW	45	C	0304.5	0305.4	2.5	5.0	2.0		
	3750	TYKW	29	PBI	0307.0		10.0	1.5	.7		
	2840	PEKG	45	C	0321.0	0324.6	12.0	3.2			
	1415	MANI	4	S/F	0322.0	0323.3	4.0	30.0	10.0		
	2000	TYKW	5	S	0323.5	0324.6	3.5	17.0	5.0		
	1000	TYKW	5	S	0324.0	0324.6	3.0	9.0	3.5		
	3750	TYKW	5	S	0324.0	0324.6	3.0	13.0	4.0		
	4995	MANI	4	S/F	0324.8	0325.0	5.7	15.6	5.2		
	2695	MANI	4	S/F	0324.8	0325.0	6.2	20.9	7.0		
	606	MANI	1	S	0324.8	0325.2	1.2	4.8	1.6		
	2000	TYKW	30	PBI	0327.0		6.0	2.0	1.0		
	3750	TYKW	30	PBI	0327.0		10.0	1.5	.7		
	1000	TYKW	5	S	0329.0	0329.7	3.0	2.0	.7		
	2000	TYKW	45	C	0329.0	0330.1	3.0	6.0	2.0		
	3750	TYKW	45	C	0329.0	0330.1	2.0	3.0	1.5		
	100	GORK	41	F	0818.7	0820.1	13.0	90.0D			
	100	GORK			0818.7	0824.5		1570.0			
	100	GORK			0818.7	0829.8		1200.0			
	113	POTS	41	F	0819.0	0829.5	13.0	600.0	50.0		
	810	KRAK	41	F	0822.5	0828.6	7.6	50.0			
	650	GORK	41	F	0823.0	0824.1	8.2	6.0			
	650	GORK			0823.0	0829.1		19.0			
	950	GORK	2	S/F	0823.1	0824.2	1.6	16.0			

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

DECEMBER 1981

Day	Freq	Sta	Type		Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density (10 -22 W/m 2 Hz) Peak	Mean	Int	Remarks
30	930	BORD	46	C	0823.2	0824.2	1.5	48.0	3.0		
	200	GORK	4	S/F	0823.2	0824.2	1.7	30.0			
	204	IZMI	4	S/F	0823.2	0829.5	8.3	49.0			
	430	KRAK	41	F	0823.4	0826.9	10.0	24.0			
	200	GORK	4	S/F	0827.2	0829.5	5.0	40.0			
	930	BORD	41	F	0828.8	0829.0	.8	80.0	2.0		
	260	ONDR	8	S	1026.9	1027.0	.1	41.0			
	260	ONDR	8	S	1251.9	1252.0	.1	25.0			
	2800	OTTA	21	GRF	2043.0	2055.0	23.0	4.6	1.6		
	2800	OTTA	8	S	2047.9	2048.0	.8	11.2	3.8		
	100	HIRA	41	F	2219.7	2220.6	7.6	980.0			
	2695	PENT	3	S	2229.0	2230.0	2.0	11.2	5.0		
31	260	ONDR	43	NS	1020.0	1111.0U	72.0D	3.0U			
	3750	TYKW	20	GRF	0210.0	0226.0	45.0	3.0	1.0		
	204	IZMI	5	S	0925.8	0925.9	.8	123.0	90.0		
	260	ONDR	8	S	0926.0	0926.2	2.0	37.0			
	33	UPIC	45	C	1045.4	1046.1	1.8				
	113	POTS	4	S/F	1045.5	1046.3	1.5	550.0	50.0		
	29	UPIC	4	S/F	1046.3	1046.5	1.0				
	33	UPIC	2	S/F	1107.6	1107.7	.4				
	29	UPIC	4	S/F	1107.8	1108.5	1.0				
	204	IZMI	5	S	1145.7	1146.1	1.0	50.0	30.0		
	536	ONDR	8	S	1202.8	1202.9	.1	43.0			
	260	ONDR	8	S	1203.8	1203.9	.2	24.0			
	536	ONDR	8	S	1224.8	1224.8	.1	46.0			
	260	ONDR	8	S	1234.6	1234.8	.2	24.0			
	7000	SAOP	40	F	1740.0						
	7000	SAOP	41	F	1919.1						2
	7000	SAOP	28	PRE	1919.1		2.9	13.0	6.0		
	2800	OTTA	21	GRF	1920.0	1921.0	11.0	7.6			
	7000	SAOP	45	C	1922.0	1922.8	6.8	32.0	16.0		
	2800	OTTA	3	S	1922.0	1923.0	3.0	15.2			
	7000	SAOP	27	RF	1931.2	1934.3	6.7	13.0	6.0		
	9400	TYKW	5	S	2341.0	2341.2	.5	30.0	7.0		

Reports are received routinely from the following observatories:

ATHN = Athens
BERN = Berne
BORD = Bordeaux
CRIM = Crimea
DWIN = Dwingeloo
GORK = Gorky
HARS = Harestua
HIRA = Hiraiso
HUAN = Huancayo
IRKU = Irkutsk
IZMI = IZMIRAN
KISV = Kislovodsk
KRAK = Krakow
LEAR = Learmonth
MANI = Manila
NAGO = Nagoya
NOBE = Nobeyama
ONDR = Ondrejov
OTTA = Ottawa
PALE = Palehua
PEKG = Peking
POTS = Potsdam
SOAP = Sao Paulo
SGMR = Sagmore Hill
SYDN = Sydney
TORN = Torun
TYKW = Toyokawa
YUNN = Yunnan
TRST = Triste
UPIC = Upice
VORO = Voroshilov

Explanation of Type Code:

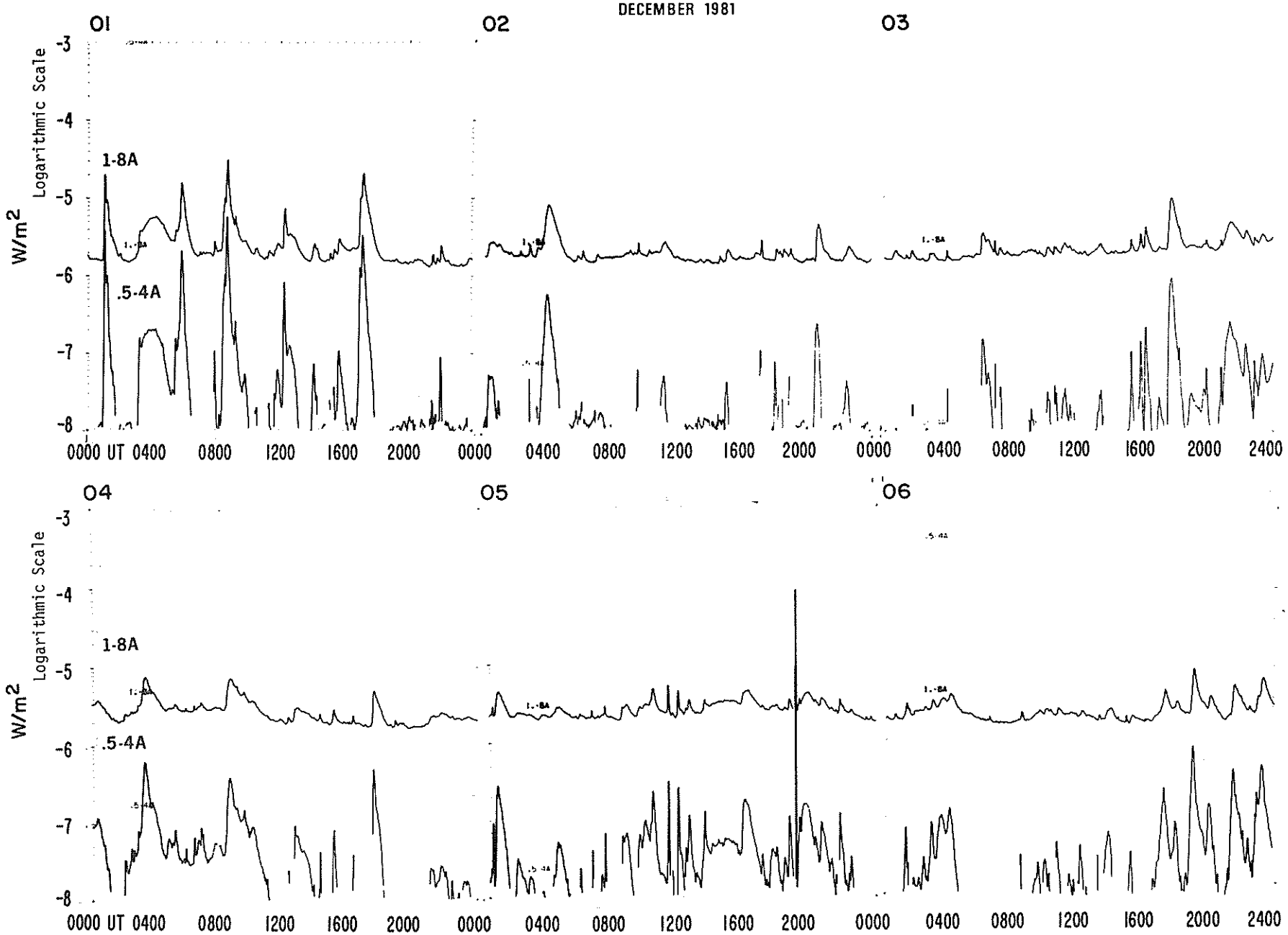
1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
33 Absorption
40 Fluctuation
41 Group of 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 +

1A Simple 1A
3A Simple 2A
21A Simple 3A GRF
2A Simple 1AF
4A Simple 2AF
240 Rise only
240F Rise only F
24P Post Rise
24PF Post Rise F
16A Fall A
260 Fall Only
26F Fall F
27F Rise and Fall F
27AF Rise and Fall AF
31A Post Burst Decrease A
32A Absorption A
46F Complex F

Under the "Remarks" column heading, RIF stands for Relative Increase in Flux. The expression "RIF 469.2", for example, denotes a flux increase of 469.2% above background.

SMS-GOES X-RAYS

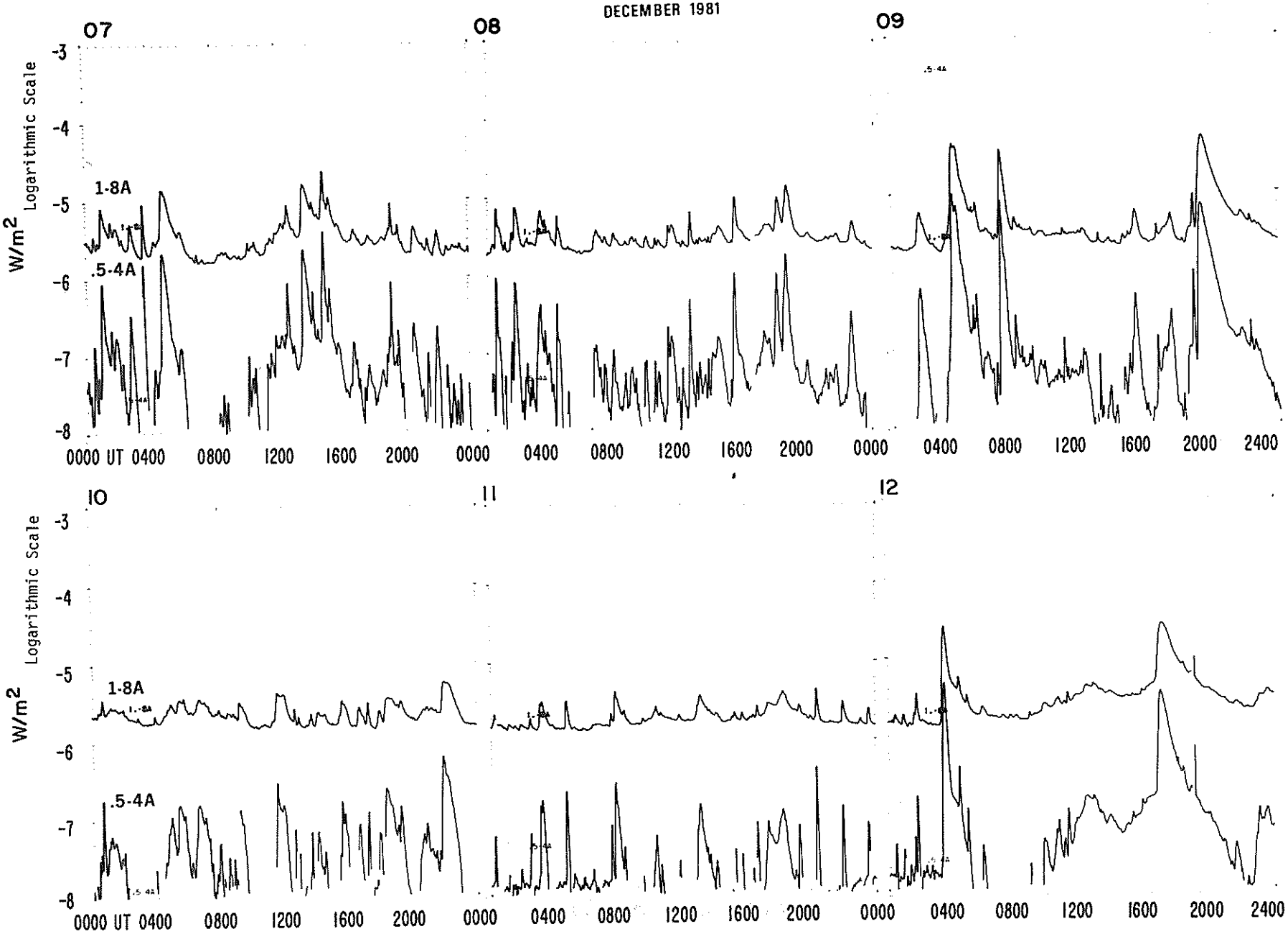
DECEMBER 1981



29 Dec 81

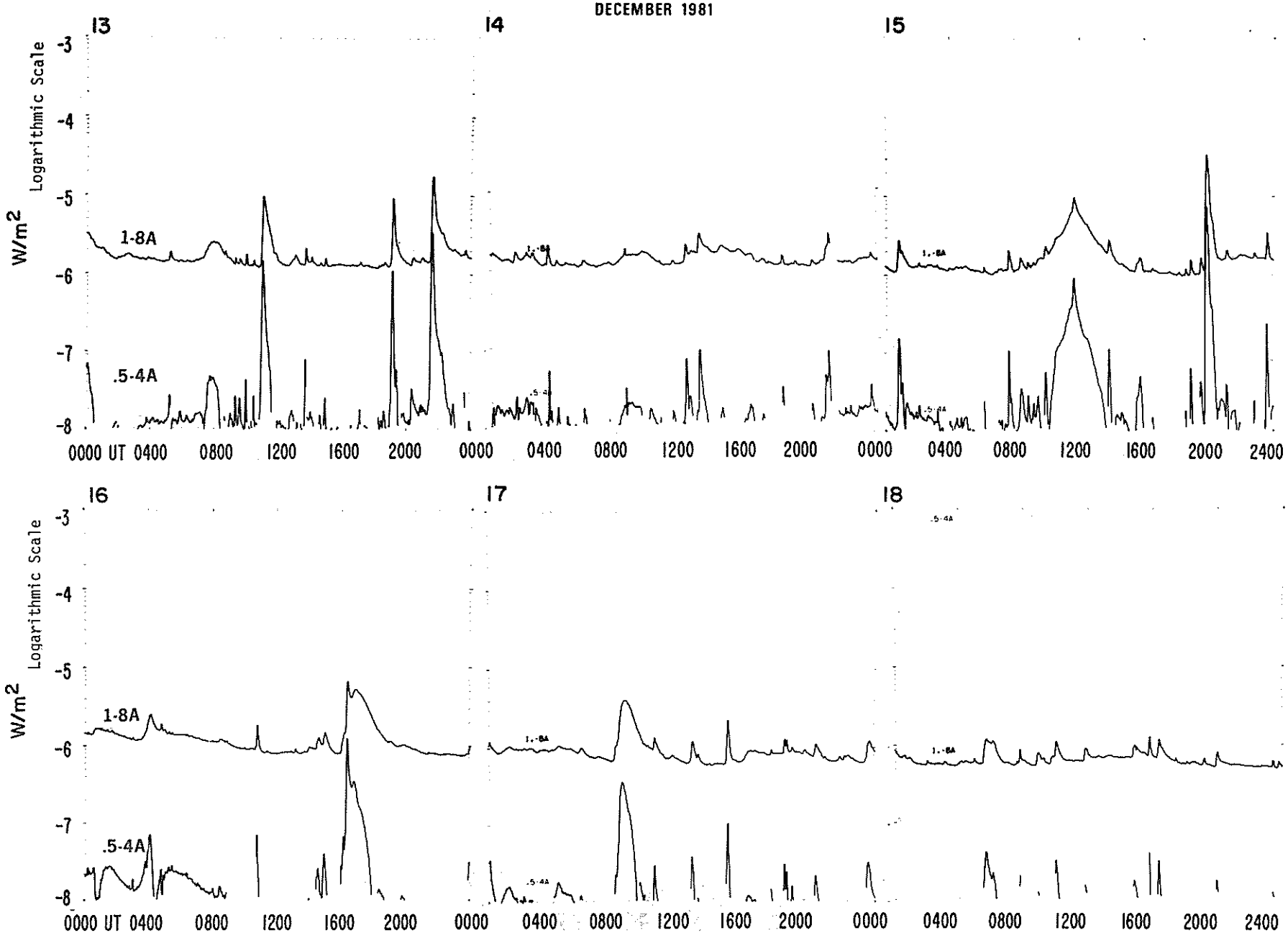
SMS-GOES X-RAYS

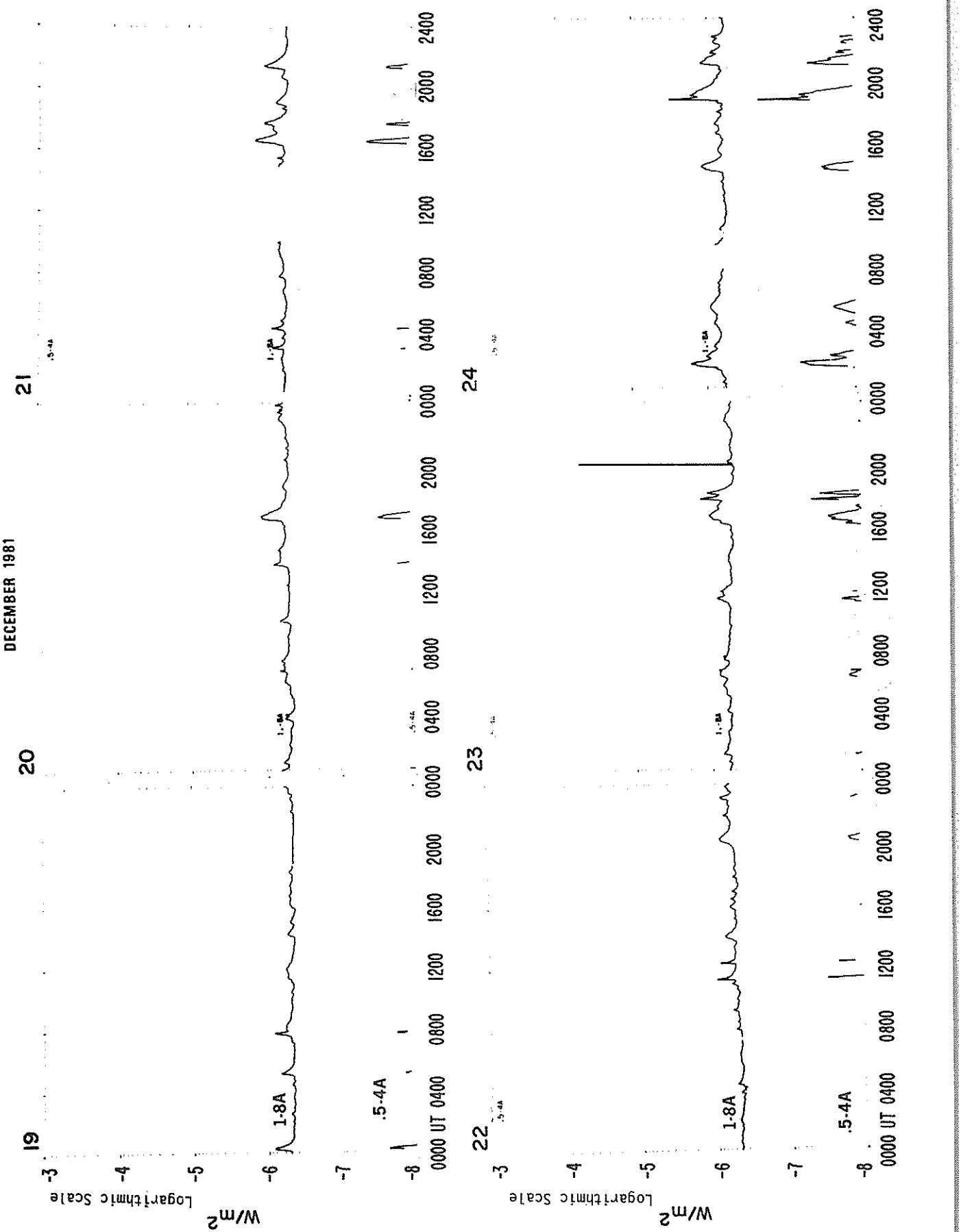
DECEMBER 1981



SMS-GOES X-RAYS

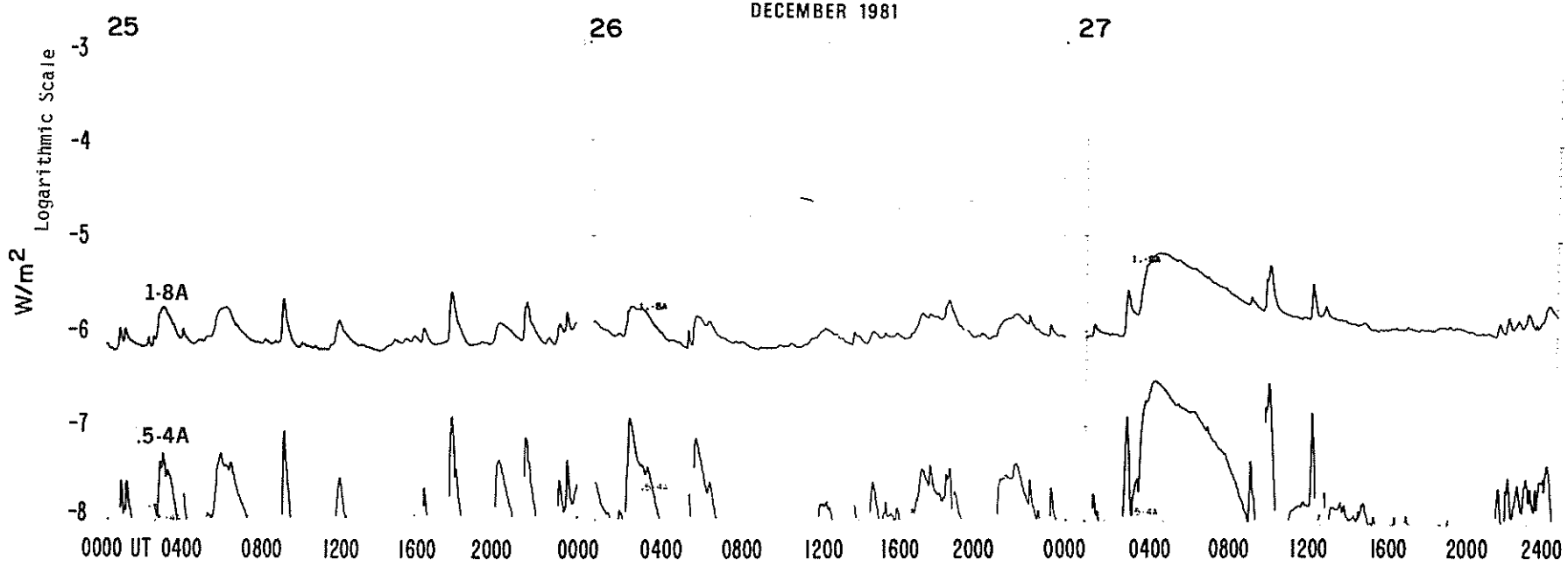
DECEMBER 1981

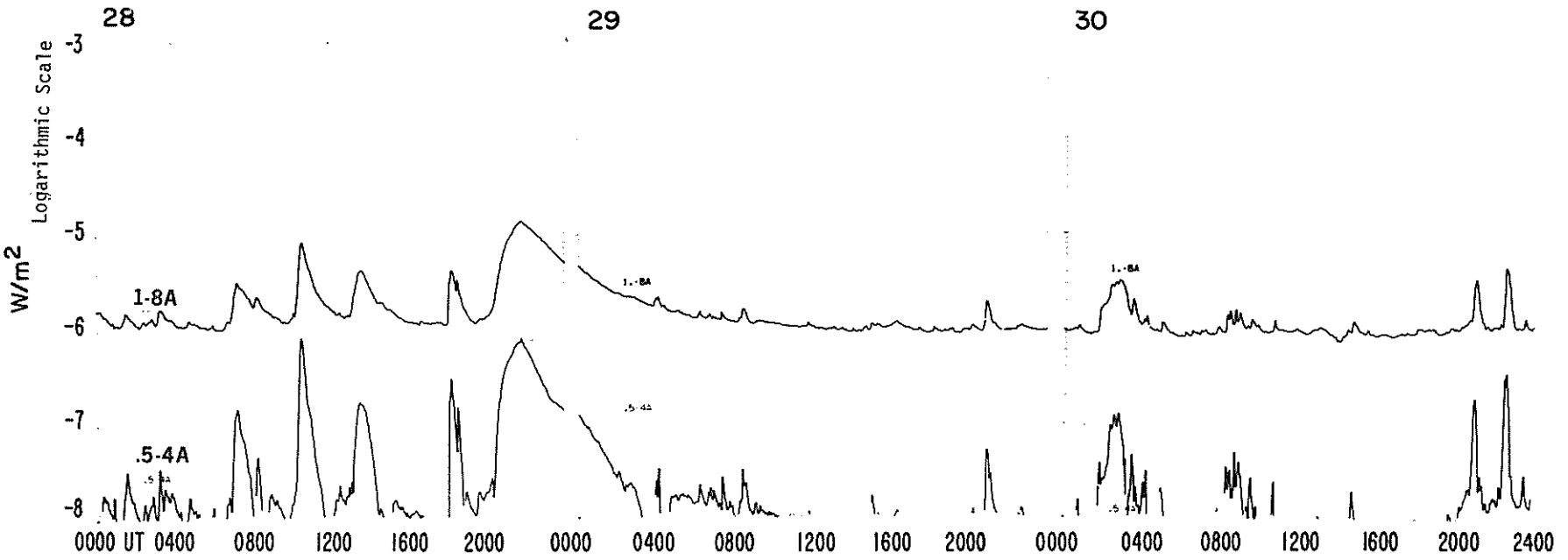


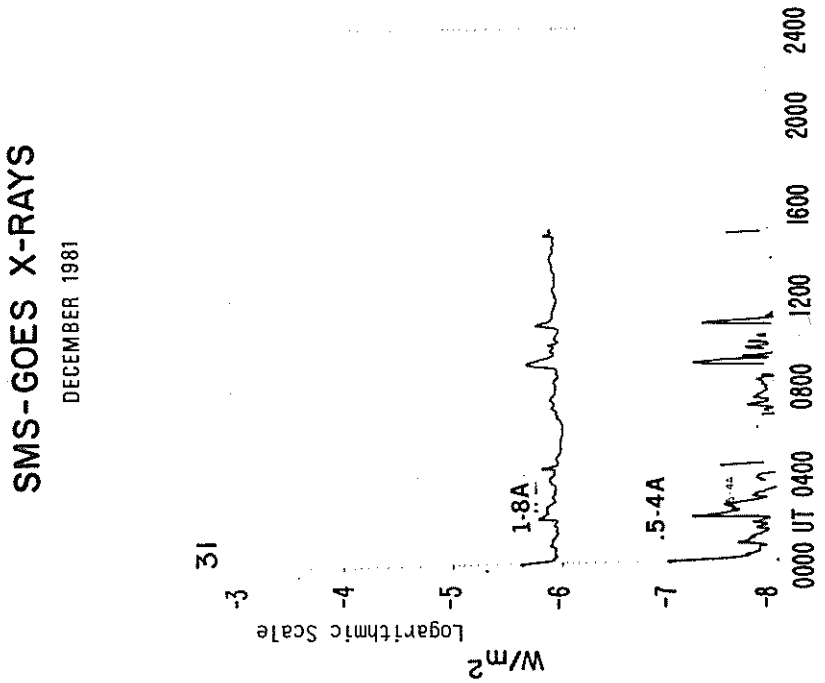

SMS-GOES X-RAYS
DECEMBER 1981
19
20
21
22
23
24
1-8A
.5-4A
W/m2
Logarithmic Scale
-3
-4
-5
-6
-7
-8
0000 UT 0400 0800 1200 1600 2000 0000 0400 0800 1200 1600 2000 0000 0400 0800 1200 1600 2000 2400

SMS-GOES X-RAYS

DECEMBER 1981






SMS-GOES X-RAYS
DECEMBER 1981
31
-3
-4
-5
-6
-7
-8
W/m²
Logarithmic Scale
1-8A
.5-4A
0000 UT
0400
0800
1200
1600
2000
2400

MASS EJECTIONS FROM THE SUN

December 1981

Sta	Day	Start (UT)	Max (UT)	End (UT)	Location RA°	Location R/R_0	Freq or Wavelength	Kind of Event
VORO	Dec 01	0109	0118	0135	319	0.36	H-alpha	SP
VORO	Dec 02	0215	0219	0237	238	0.36	H-alpha	S
VORO	Dec 06	0112	0119	0137	079	0.82	H-alpha	S
VORO	Dec 07	0032	0102	0107	095	0.99	H-alpha	S
PALE	Dec 10	1900.1		1909.0			Meter	IV
VORO	Dec 13	0215	0224	0250	313	0.35	H-alpha	S
HARV	Dec 15	1951		1956			Meter	II
HARV	Dec 15	1954		1956			Decimeter; meter	IV
WEND	Dec 20	1328		1445	069	1.0	H-alpha	A
CULG	Dec 27	0246		0733			Meter	IV
CULG	Dec 27	0250.5		0300			Meter; dekameter	II Herringbone
CULG	Dec 28	2043.5		2048			Meter	II
CULG	Dec 30	2226		2233			Meter	II
HARV	Dec 30	2229		2232			Meter	II
LEAR	Dec 30	2229.0		2231.5			Meter	II
HARV	Dec 31	2110		2123			Meter	II
CULG	Dec 31	2110		2125			Meter	II

QUALIFIERS ON START, MAX AND END TIMES
D = event ended after tabulated time
E = event began before the tabulated time
U = uncertain time

TYPE OF EVENT
A = eruptive active region prominence
CB = coronal cloud bubble
D = coronal depletions
E = coronal enhancement
EL = coronal expanding loop
II = Type II radio burst
IVm = moving Type IV radio burst
Q = eruptive quiescent prominence
R = coronal ray or streamer
S = flare-surge if there is a known flare association
SP = flare-spray if there is a known flare association
* = movement may be caused by ionospheric refraction

REPORTING STATIONS
ABST = Abastumani
BIGB = Big Bear
BLEN = Bleien
CULG = Culgoora
DWIN = Dwingeloo
GEOR = Georgiana
HALE = Haleakala
HAOC = High Altitude Observatory's SMM Coronagraph/Polarimeter
HAOK = High Altitude Observatory's MARK-III Coronameter at Mauna Loa
HARV = Harvard (Fort Davis)
KHAR = Kharkov
LEAR = Learmonth
LVOV = Lvov
MANI = Manila
MITK = Mitaka
NRLC = Naval Research Laboratory's White-Light Coronagraph Experiment on P78-1
PALE = Palehua
SGMR = Sagamore Hill
TELV = Tel Aviv
VORO = Voroshilov
WEIS = Weissenau
WEND = Wendelstein
UDAI = Udaipur

NOTE: Because only a small fraction of the data taken by satellite-borne coronagraph had been analyzed at the time this table was assembled, many events are defined solely by ground-based observatory reports.

MISCELLANEOUS DATA

Contents

ACTIVE REGIONS
CARRINGTON ROTATION 1714
(October 12 to November 11, 1981)

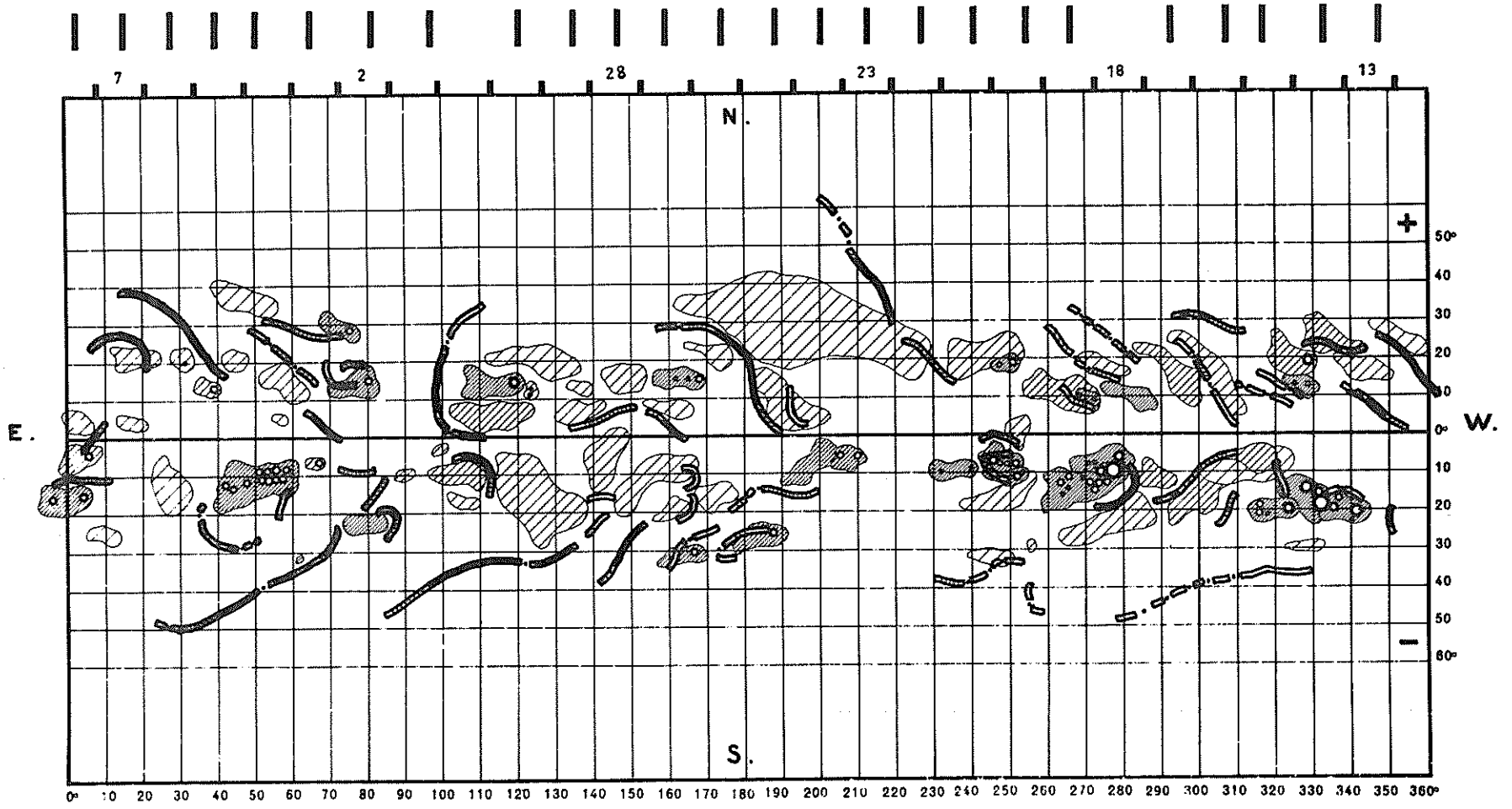
Region No.	Coordinates Lat.	Coordinates Long.	IMP	Age at CMP	Spot-less Region	Region No. in Rotation 1713	Activity at West Limb
1	17°N	345	1	>6	x	3	dispersed
2	20°S	337	5	>6			decreasing
3	25°N	335	1	>6	x	5	dispersed
4	17°S	328	4	>6			decreasing
5	12°N	327	2	-1			decreasing
6	19°N	325	3	>6		6	decreasing
7	20°S	320	4	+4			stable
8	7°S	314	1	>6	x	11	decreasing
9	16°N	305	1	>6	x		dispersed
10	16°S	300	1	>6	x	14	decreasing
11	16°N	295	1	>6	x		decreasing
12	11°S	289	1	>6	x	17	stable
13	10°N	282	1	>6	x		decreasing
14	18°N	276	1	>6	x		dispersed
15	24°S	276	1	>6	x		dispersed
16	7°S	274	3	>6			decreasing
17	10°N	271	2	-3			decreasing
18	13°S	271	6	>6			decreasing
19	11°N	264	1	>6	x	21	decreasing
20	1°N	252	1	>6	x		dispersed
21	12°S	250	3	>6		22	decreasing
22	19°N	249	2	+1			stable
23	7°S	248	4	>6			decreasing
24	17°S	248	1	>6	x		dispersed
25	20°N	244	1	>6	x	24	dispersed
26	10°S	236	2	+6			decreasing
27	6°S	208	3	-4			increasing
28	7°S	198	1	>6	x		decreasing
29	8°N	191	1	>6	x	34	dispersed
30	26°S	184	3	+5			decreasing
31	15°N	163	3	>6			decreasing
32	31°S	163	2	>6			decreasing
33	20°S	160	1	>6	x		dispersed
34	10°S	155	1	>6	x		dispersed
35	16°N	148	1	>6	x		dispersed
36	5°S	143	1	>6	x		dispersed
37	7°N	137	1	>6	x		dispersed
38	13°N	137	1	>6	x		dispersed
39	16°S	124	1	>6	x		dispersed
40	12°N	123	2	+2			decreasing
41	6°N	114	1	>6	x		decreasing
42	14°N	113	3	>6		51	decreasing
43	17°S	105	1	>6	x	52	dispersed
44	10°S	104	1	>6	x		dispersed
45	3°S	99	1	-5	x		?
46	10°S	89	1	-4	x		?
47	22°S	79	1	>6	x		decreasing
48	15°N	76	3	>6			decreasing
49	29°S	72	3	>6			decreasing
50	7°S	66	2	>6		65	dispersed
51	15°N	57	1	>6	x	64	dispersed
52	10°S	50	6	>6			decreasing
53	21°N	44	1	>6	x		dispersed
54	14°N	36	2	>6			decreasing
55	22°N	30	1	>6			decreasing
56	22°N	18	1	>6	x	71	decreasing
57	5°N	17	1	>6	x		dispersed
58	4°S	3	3	>6			decreasing
59	5°N	2	1	>6	x		dispersed
60	15°S	0	4	>6			decreasing

SYNOPTIC SOLAR MAP

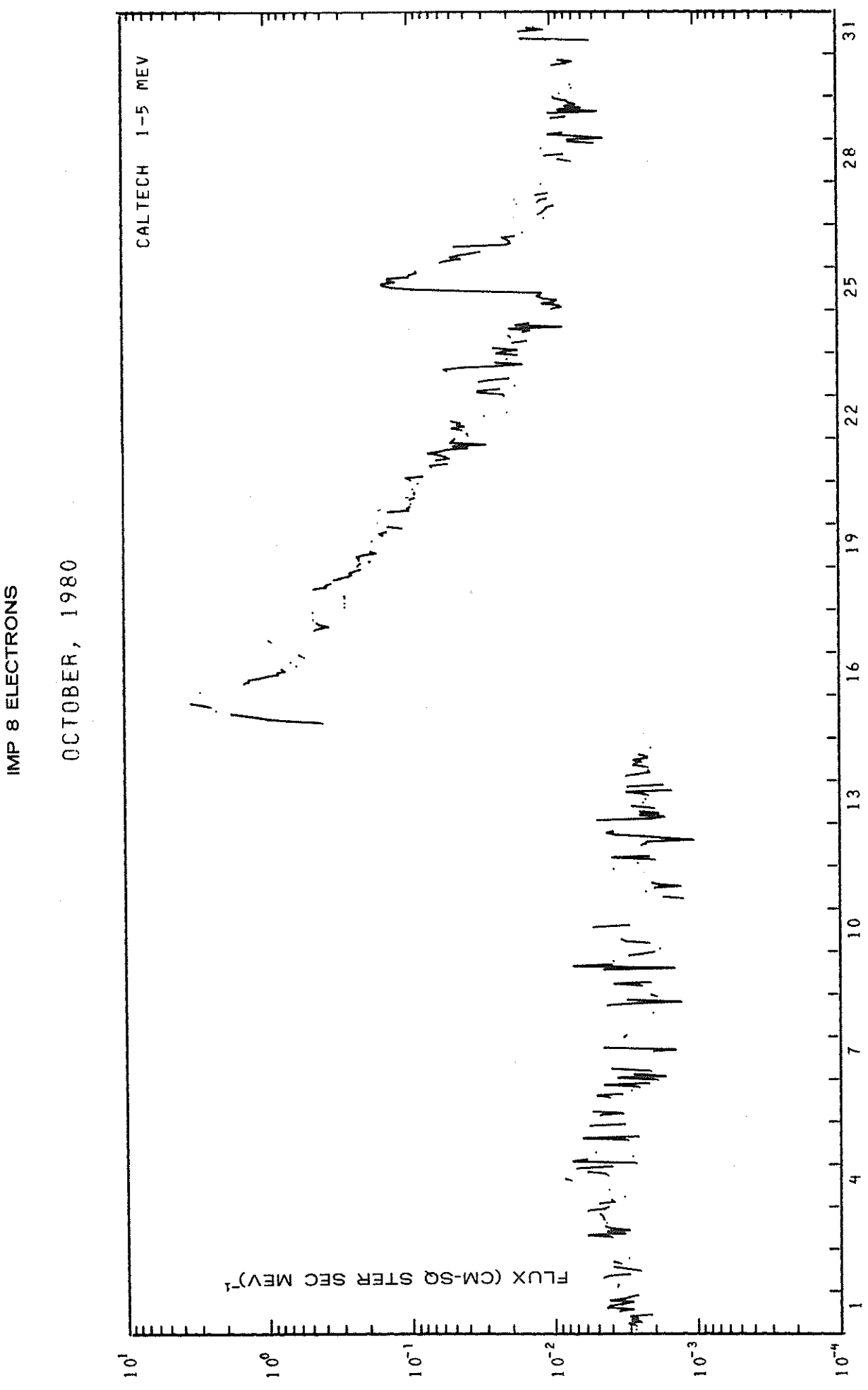
CARRINGTON ROTATION 1714

OCTOBER 12–NOVEMBER 8, 1981

MEUDON OBSERVATORY

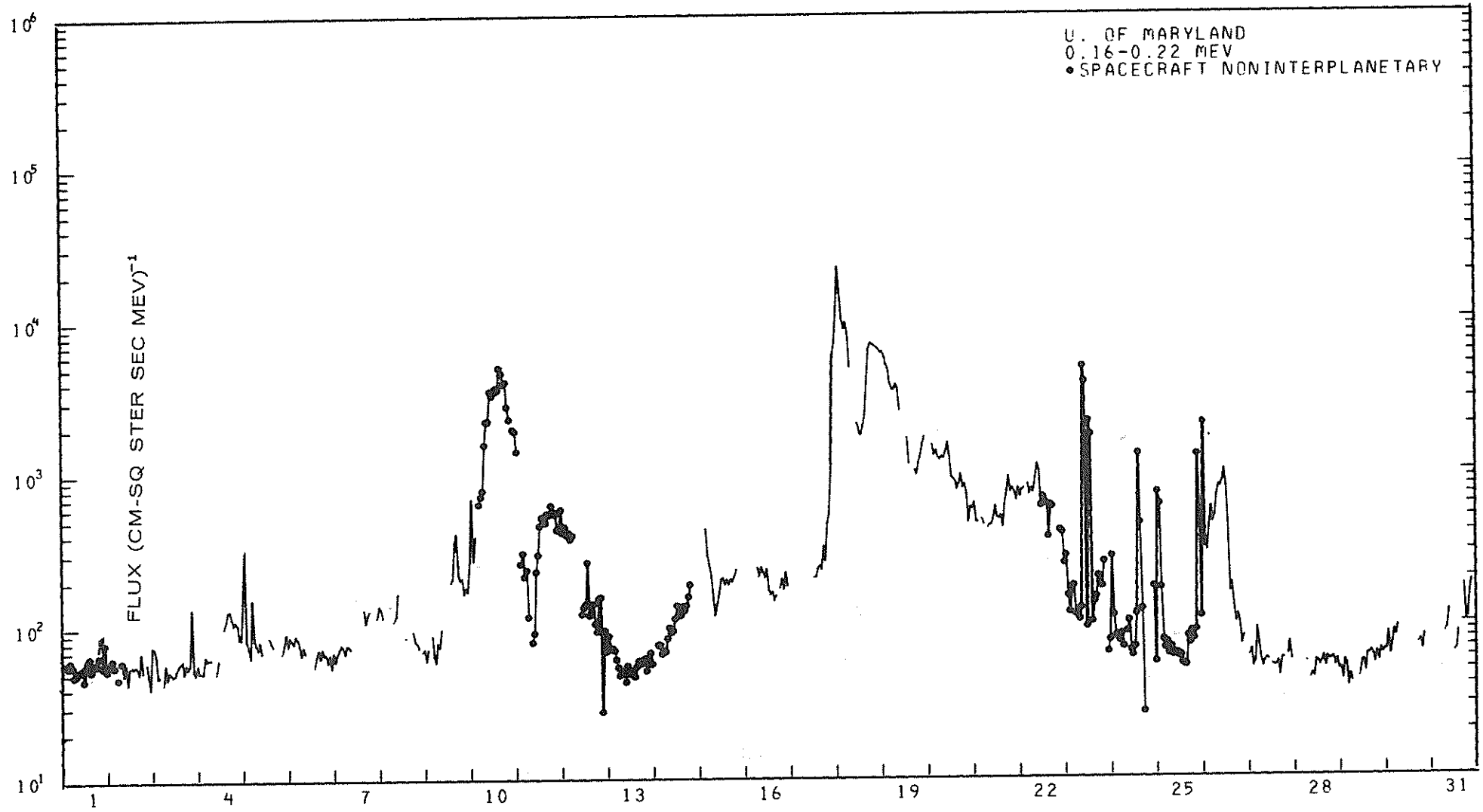


40
Misc
Oct 80



IMP 8 LOW ENERGY PROTONS

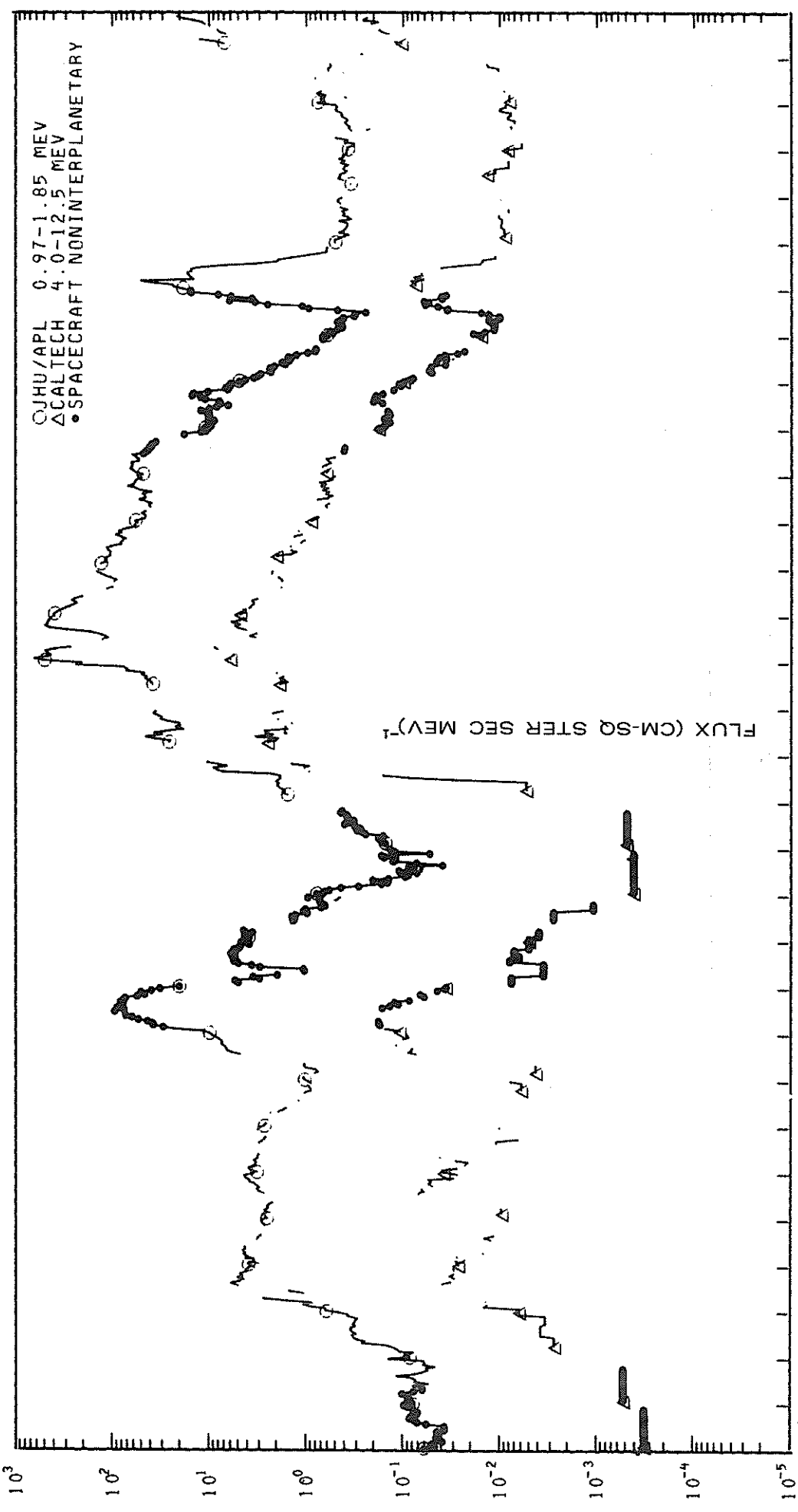
OCTOBER, 1980



41
Misc
Oct 80

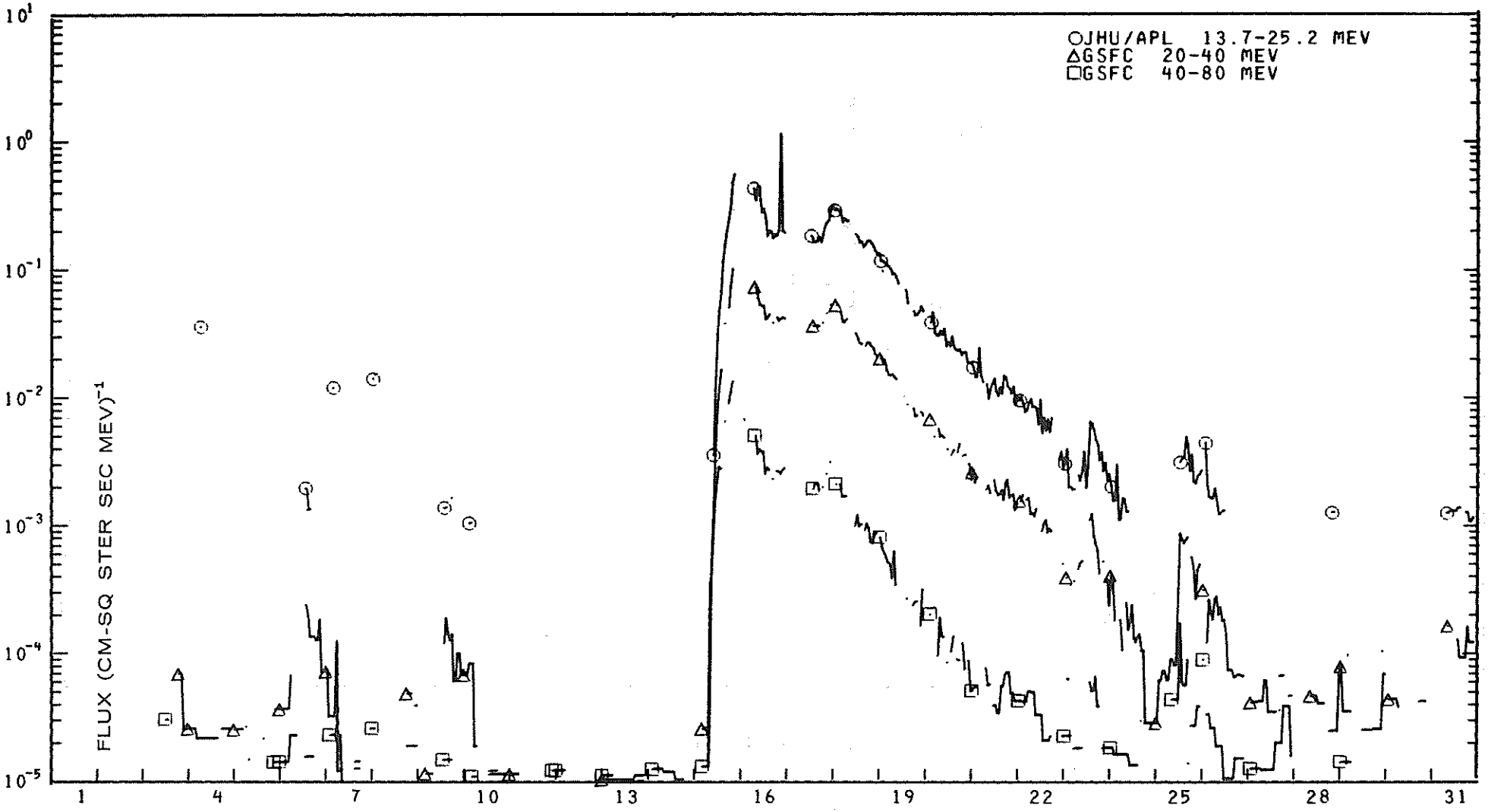
IMP 8 INTERMEDIATE ENERGY PROTONS

OCTOBER, 1980



IMP 8 HIGH ENERGY PROTONS

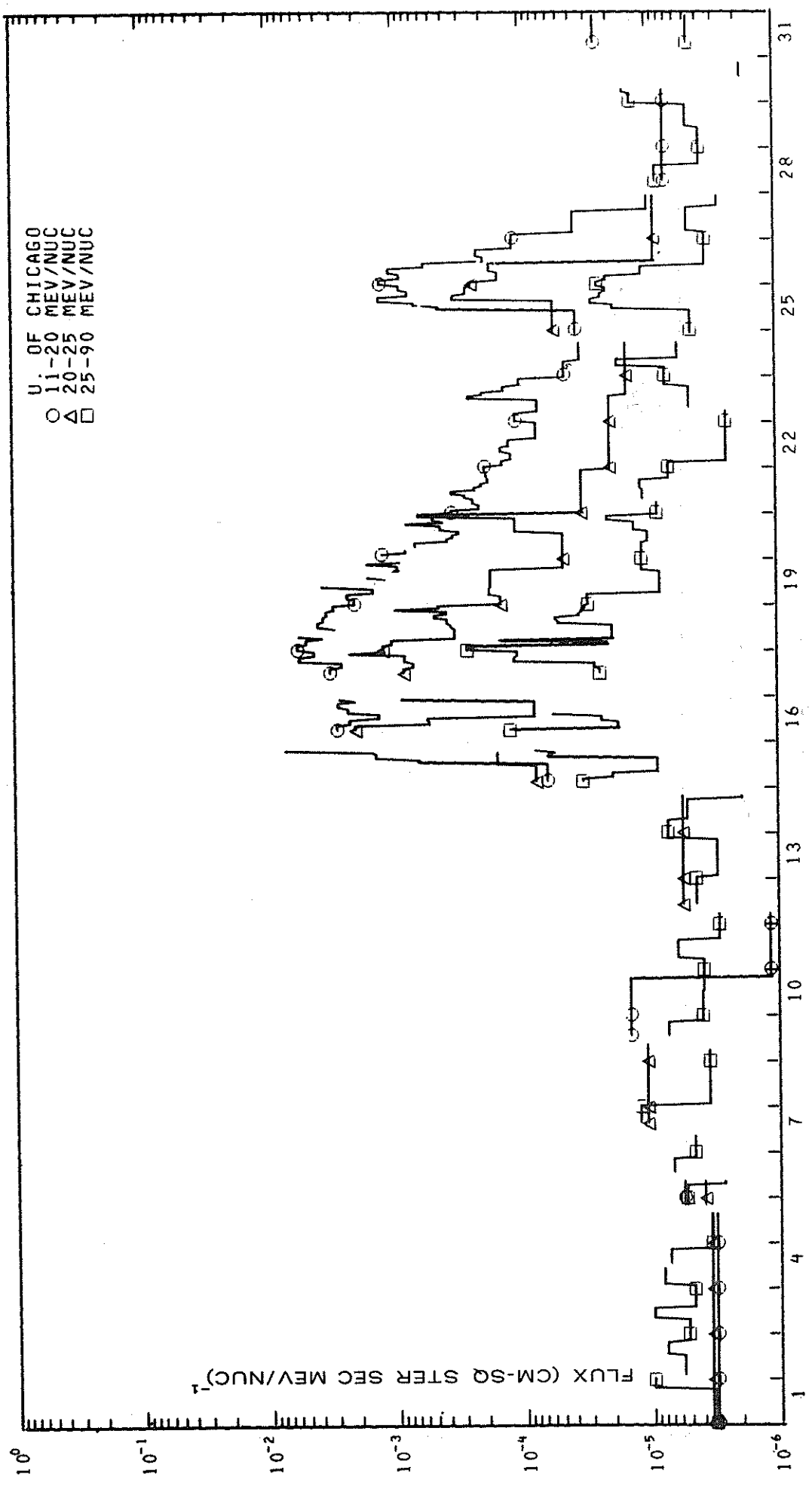
OCTOBER, 1980



43
Misc
Oct 80

IMP 8 ALPHA PARTICLES

OCTOBER, 1980



ERRATA TO GROUPED H-ALPHA SOLAR FLARES (STANDARDIZED DATA) FOR FEBRUARY 1980.

H - ALPHA S O L A R F L A R E S

FEBRUARY 1980

Group	Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	Hale Plage Region	CMP Mo	CMP Day	Duration (Min)	Imp	See	Obs Type	Time (UT)	Area Measurement Apparent (10^{-6} Disk)	Area Measurement Corr (Sq Deg)	Remarks
81644	YUNN	01	0155	0157	0200	N11	E35	16627	02	3.7	5	- N		C		32	.4	
81650	ABST	01	0609	0613	0634	N09	E35	16627	02	3.9	25	? F		C	0613	244	3.1	E
81652	ABST	01	0828	0830	0836	N11	E30	16627	02	3.6	8	- F		C	0830	157	2.0	E
81656	RAMY	01	1429	1435	1435	N13	E27	16627	02	3.6	6	- F	3	C		22		
81658	RAMY	01	1507	1522	1530	N13	E27	16627	02	3.7	23	- F	3	C		26		
81659	RAMY	01	1555	1629	1641	N13	E27	16627	02	3.7	46	- F	3	C		30		
81660	RAMY	01	1643	1645	1652	N11	E23	16627	02	3.4	9	- F	3	C		61		
81800	CULG	07	0501	0521	0604	N10	W80	16625	02	1.2	63	1 F		C	0521	120		
81814	RAMY	07	1608	1612	1614	N10	W80	16625	02	1.7	6	- F	3	C				
81826	CULG	07	2238	2256	2308	N22	W03	16635	02	7.7	30	? N		C	2256	220	2.5	T
81844	MONT	08	0906	0908	0911	N05	W62		02	3.7	5	- F		C	0908	60		E
81879	CULG	09	2203	2210	2224	S11	W55		02	5.8	21	? N		C	2210	120	2.0	FI
81882	CULG	10	0015	0020	0036	N25	W71	16637	02	4.7	21	? F		C	0020	90		G
81893	CATA	10	1015	1023	1035	N12	W90	16627	02	3.7	20	2 N	2		1023	281		A
81951	MONT	12	1450	1453	1500D	S17	W39		02	9.7	10D	- F		C	1453	60		E
81960	CULG	12	2131E	2131U	2140	S18	E51	16655	02	16.7	9D	- F		C	2131	60	1.0	
82008	CULG	13	2334	2342	0008	S20	W56		02	9.8	34	1 N	*	C	2342	200	3.2	H
82009	VORO	14	0227	0230	0236	S12	W50	16644	02	10.4	9	- N		C	0230	116	1.8	D
82010	YUNN	14	0333	0346	0357	N29	W70	16639	02	8.9	24	- N		C		63		
82011	YUNN	14	0400	0405	0420	N11	W62	16641	02	9.5	20	- F		C		31	.7	E
82012	YUNN	14	0433	0435	0450	S05	W52	16644	02	10.3	17	- N		C		47	.8	
82015	PURP	14	0608	0610	0633	S04	W55	16650	02	10.1	25	? N		C				
82016	ABST	14	0833E	0833	0902D	S22	E10	16651	02	15.1	29D	- F		P	0833	131	1.4	BE
82019	KHAR	14	0124E		1101D	S22	E07	16651	02	15.0	37D	- F		P	1035			EH
82022	CULG	15	0058	0102	0107	N09	W88	16641	02	8.4	9	- F		C	0102	30		T
82024	CULG	15	0121	0129	0206	S22	W48	16644	02	11.5	45	? F		C	0129	140	2.0	L
82027	CULG	15	0255	0310	0447	S23	W52	16644	02	11.2	112	? F		C	0310	240	3.9	
82029	CULG	15	0416	0426	0448	S09	W75	16650	02	9.6	32	- F		C	0426	40		
82030	CULG	15	0452	0507	0609	S19	W06	16651	02	14.8	77	- F		C	0507	180	1.8	H
82031	CULG	15	0545	0552	0612	N10	W84	16641	02	8.9	27	? F		C	0552	110		T
82032	CULG	15	0646	0649	0707	N10	W85	16641	02	8.9	21	- N		C	0649	40		T
82034	CULG	15	0751	0756	0807	S07	W75	16650	02	9.7	16	- F		C	0756	50		
82035	CULG	15	0824	0826	0832	N12	W87	16641	02	8.8	8	- N		C	0826	30		T
82038	KHAR	15	0950E		1003	S06	W70	16650	02	10.2	13D	- F		V	0950			OH
82042	RAMY	15	1535	1536	1544	S10	W69	16644	02	10.5	9	- F	3	C		17		
82044	RAMY	15	1656	1657	1701	N09	W84	16641	02	9.4	5	- F	3	C		15		
82048	CULG	15	2234U	2238	2320	S20	W18	16651	02	14.6	46D	- N		C	2238	100	1.0	H
82050	CULG	16	0139	0144U	0200	N15	W22	16652	02	14.4	21	- N		C	0144	100	1.2	
82052	CULG	16	0241	0243	0258	S11	W81	16644	02	10.0	17	- F		C	0243	40		
82054	CULG	16	0440	0443	0451	S08	W80	16644	02	10.2	11	- F		C	0443	40		
82055	CULG	16	0509	0513	0522	S19	W19	16651	02	14.8	13	- F		C	0513	60	.6	
82056	CULG	16	0717	0723U	0735	S12	W85	16644	02	9.9	18	- F		C	0723	80		
82067	RAMY	16	1751	1802	1829	N16	W32	16652	02	14.4	38	- F	3	C		18		
82070	BIGB	17	0009	0013	0015	S29	E90		02	23.8	6	- N	3	P	0013	40		
82072	CULG	17	0556	0603	0625	N15	W42	16652	02	14.1	29	- F		C	0603	90	1.3	KT
82074	CULG	17	0716	0710	0725	N15	W43	16652	02	14.1	9	- F		C	0718	110	1.5	T
82077	CULG	17	0753	0754	0756	N15	W42	16652	02	14.2	3	- F		C	0754	80	1.1	T
82081	RAMY	17	1406	1408	1410	N17	W43	16652	02	14.4	4	- F	3	C		28		
82086	CULG	17	2134	2143	2155	N15	W50	16652	02	14.2	21	? N		C	2143	200	3.4	F
82087	CULG	17	2325	2327	2332D	S18	W43	16651	02	14.8	7D	- F		P	2327	60	.8	
82088	CULG	18	0012E	0020	0033	N16	W51	16652	02	14.2	21D	- F		P	0020	70	1.2	
82090	CULG	18	0111U	0113	0145U	N18	W50	16652	02	14.3	34D	- F		C	0113	100	1.8	
82100	CULG	18	2122	2127	2130	N18	W66	16652	02	13.9	8	- F		C	2127	30		
82103	CULG	19	0049	0055U	0105	N17	W65	16652	02	14.2	16	- F		C	0055	60		

H - ALPHA S O L A R F L A R E S

FEBRUARY 1980 (Continued)

Group	Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	Hale Plage Region	CMP Mo	CMP Day	Duration (Min)	Imp	See	Obs Type	Time (UT)	Area Measurement Apparent (10^{-6} Disk)	Area Measurement Corr (Sq Deg)	Remarks
82132	KHAR	20	0930	1000	1155	S12	E90	16665	02	27.1	145	? F		P	1000			K
82138	ABST	20	1208E	1209	1214D	S13	E49		02	24.2	6D	- F		P	1209	87	1.4	E
82155	WEND	21	1133	1141	1151	S12	E78	16665	02	27.3	18	1 N		C	1141	140		
82156	WEND	21	1206	1231	1256	S12	E73	16665	02	27.0	50	? N		C	1231	88		
82159	WEND	21	1450E		1515D	S11	E74	16665	02	27.2	25D	- F		C	1455	31		
82162	VORO	22	0033	0034	0038	S10	E72	16665	02	27.4	5	- F		C	0034	45		D
82169	BIGB	22	1859	1911	1923	N11	E90		02	29.5	24	? B	3	C	1911	60		
82174		23	0649E	0649	0654	S16	W70	16655	02	18.0	5	- F						D
82181	KHAR	23	1115E		1128D	S17	E53	16665	02	27.4	13D	? F		V	1117			H
82183	KANZ	23	1300	1307	1319	S10	W75		02	17.9	19	- N	1					
82191	CULG	24	0625	0631	0652	N38	W70		02	19.0	27	? F		C	0631	140		K
82201	VORO	24	2334	2334	2335	S14	E88	16676	02	31.6	1	- F		C	2334	45		DH
82221		25	2104	2154	2311	S09	E90		03	3.7	127	? B						
82229	CULG	26	0330	0337U	0347	N10	W37	16660	02	23.4	17	- F		C	0337	70	.9	
82232	CULG	26	0551	0601	0610	S12	E07	16665	02	26.8	19	? F		C	0601	210	2.1	L
82247	KANZ	26	1418	1422	1426	N14	E40	16670	02	29.6	8	- F	2					
82252	CULG	26	2102	2106	2107E	S13	E00	16665	02	26.9	5D	- F		P	2106	170	1.7	
82263	ABST	27	0720	0729	0744	S08	W02	16665	02	27.2	24	- F		C	0729	87	.9	E
82269	KANZ	27	0856	0900	0916	S08	W04	16665	02	27.1	20	- F	2					
82278	HOLL	27	1930	1932	1938	N24	E83	16683	03	5.0	8	- F	3	C				
82279	CULG	27	2201	2206	2214	S12	W08	16665	02	27.3	13	- N		C	2206	160	1.6	
82285	CULG	28	0528	0528	0537	S07	W15	16665	02	27.1	9	- N		C	0528	70	.7	
82288	KANZ	28	1123	1127	1131	N11	W09	16667	02	27.8	8	- F	2					
82303	CULG	29	0158	0204	0211	S08	W28	16665	02	27.0	13	- F		C	0204	80	.9	L
82310	CULG	29	0655E	0657	0703	S06	W27	16665	02	27.3	8D	- F		P	0657	80	.9	

For the flares tabulated above, the February 1980 standardized data, published in SGD 447, Part II, pages 44-73 (November 1981 issue) give an incorrectly associated Hale plage region. This errata may be used to correct that published listing for the 79 events in error.

The central meridian passage date tabulated for all flares west of the central meridian are wrong, too; unfortunately, these dates were calculated as if the flares had occurred east of the central meridian. Central meridian passage dates included in this errata, however, are correct.

ERRATA TO GROUPED H-ALPHA SOLAR FLARES (STANDARDIZED DATA) FOR MARCH 1980.

H - ALPHA S O L A R F L A R E S

MARCH 1980

Group	Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	Hale Plage Region	CMP Mo	CMP Day	Duration (Min)	Imp	See	Obs Type	Time (UT)	Area Measurement Apparent (10^{-6} Disk)	Area Measurement Corr (Sq Deg)	Remarks
82338	CULG	01	0528	0537	0545	N13	W90	16660	02	23.5	17	- F		C	0537	40		
82362	CULG	02	0525	0530	0538	N17	W75	16679	02	25.6	13	- F		C	0530	40		
82370	CULG	02	2102	2104	2108	N18	E40		03	5.9	6	1 F		C	2104	160	2.2	
82389	CULG	04	0022	0033U	0044	S07	W10	16689	03	3.3	22	- N		C	0033	120	1.2	
82392	CULG	04	0352	0358	0407	S28	W90	16686	02	26.4	15	- N		C	0358	30		
82398	HTPR	04	0745		0750D	S29	W90	16686	02	26.6	5D	- N		C	0747	30		
82400	KHAR	04	0916E		0931	N27	W85		02	27.0	15D	- F		V	0916			
82406	HTPR	04	1454	1508	1515	S29	W90	16686	02	26.9	21	- F		C	1508	40		
82408	HTPR	04	1520	1544	1552	S29	W90	16686	02	26.9	32	- F	*	C	1544	20		
82409	BIGB	04	1644E	1647U	1655D	S27	W90	16686	02	26.9	11D	1 B	3	P	1647	70		
82410	BIGB	04	2238	2243	2252	S27	W90	16686	02	27.2	14	? B	2	C	2243	70		
82426	HOLL	06	0013	0014	0019	S25	W59	16673	03	1.6	6	- F	3	C		19		
82439	CULG	07	0335	0358	0426	S15	W63	16676	03	2.4	51	1 F		C	0358	120	2.4	F
82485	CULG	13	0634	0635	0639	N09	E54		03	17.3	5	- F		C	0635	60	1.1	
82503	ABST	14	1129E	1131	1135	N14	E35	16712	03	17.1	6D	- F		P	1131	87	1.2	D
82513	CULG	15	0630	0743U	0747D	N36	E04		03	15.6	77D	? F		P	0743	280	3.8	G
82533	WEND	18	1040		1145D	S12	E32	16718	03	20.8	65D	- N		C	1103	138	1.7	E
82556	YUNN	19	0613	0645	0738	S29	E74	16728	03	24.8	85	- N		C		32		
82579	CULG	19	2346	2352	0013	N18	W46	16711	03	16.5	27	- N		C	2352	70	1.1	
82588	CULG	20	0522	0525	0535	S31	W88	16706	03	13.6	13	- F		C	0525	40		
82629	CULG	22	0320	0333	0344	S18	W54		03	18.1	24	- F		C	0333	30	.5	G
82631	WEND	22	1013	1016	1032	S22	W19	16717	03	21.0	19	- F		C	1016	75	.9	
82695	KHAR	24	1002E		1013D	S29	W90		03	17.7	11D	- F		V				H
82773	CULG	26	2225	2235	2251	S26	W47	16725	03	23.4	26	? N		C	2235	280	3.7	F
82793	HTPR	27	1156E		1240	S26	W52	16725	03	23.6	44D	- F		C	1200	60	.9	E
82797	CATA	27	1250E	1300	1315D	S27	W54	16725	03	23.5	25D	- N	2		1300	84	1.5	
82801	BIGB	27	1838	1840	1920	N24	W59	16726	03	23.4	42	2 B	2	P	1840	310	6.2	
82804	HUAN	27	2045E		2052D	N12	E42	16738	03	31.0	7D	- F	1	P				
82832	HTPR	28	0949	0953	0958	N24	E05		03	28.8	9	- B		C	0953	60	.7	E
82860	CULG	29	0314	0321	0330	S20	W12		03	28.2	16	- F		C	0321	30	.3	G
82862	CULG	29	0337	0338	0341	S10	E21		03	30.7	4	- F		C	0338	30	.3	G
82865	CULG	29	0441	0445	0456	S03	E19		03	30.6	15	- F		C	0445	50	.5	G
82871	ABST	29	0737E	0737	0739	N22	E45	16740	03	1.7	2D	- N		P		87	1.4	DJ
82898	CULG	29	2317	2320	2327	S22	W90	16725	03	23.2	10	- F		C	2320	30		
82917	CULG	30	0539	0540	0555	S23	E33		03	1.7	16	- N		C	0540	60	.8	GH
82949	CULG	31	2324	2325	2337	N13	W34	16737	03	29.4	13	- F		C	2325	60	.8	
82950	CULG	31	2334	2345	0013	N23	W60	16731	03	27.5	39	? F		C	2345	120	3.0	G

For the flares tabulated above, the March 1980 standardized data, published in SGD 449, Part II, pages 68-94 (January 1982 issue), give an incorrectly associated Hale plage region. This errata may be used to correct that published listing for the 37 events in error.

The central meridian passage date tabulated for all flares west of the central meridian are wrong, too; unfortunately, these dates were calculated as if the flares had occurred east of the central meridian. Central meridian passage dates included in this errata, however, are correct.

SOME OTHER SOURCES OF DATA

Data Available: Some data available in publication form are cited here. A list is given, along with addresses of the responsible institutions. The WDC-A for Solar-Terrestrial Physics publishes the Toyokawa, Ottawa and Penticton radio data in its monthly publication, *Solar-Geophysical Data*. The WDC-A for Solar-Terrestrial Physics also receives most of the periodicals when they become available.

Belgium: *Bulletin d'Observations: Activite Solaire - Observations Radio-electriques Solaires - 600 MHz (Humain, Belgium)* Observatoire Royal de Belgique, Ave. Circulaire 3, Brussels, Belgium (monthly since 1962)

Canada: *Solar Noise Observations at 2800 Mc/s (Ottawa - ARO) and 2700 Mc/s (Penticton - DRAO)* Series C Monthly Report, National Research Council, Radio Astronomy Section Ottawa 7, Ontario, Canada (since 1947)

France: *Carte Synoptiques de la Chromosphere Solaire* Observatoire de Paris, 92 Meudon, France (monthly since 1931)

Germany: *Daily Mean Value of Solar Flux Density* Heinrich-Hertz Institut, 1199 Berlin-Adlershof, Rudower Chaussee 5, G.D.R. (monthly since Jul 1957)

Italy: *Solar Phenomena - Monthly Bulletin and Photographic Supplement* Osservatorio Astronomica di Roma, Monte Mario, Rome, Italy (monthly since 1958); *Osservazion Solari, Solar Flux and Distinctive Events* Osservatorio Astronomico Di Trieste (quarterly since 1965); *Solar Observations made at Catania Astrophysical Observatory* (annually since 1967)

Japan: *Monthly Report of Solar Radio Emission* Radio Astronomy Section, Research Institute of Atmospherics, Nagoya University, Toyokawa, Japan (since 1956); *Solar Activity Chart* WDC-C2, Toyokawa Observatory, Nagoya University, Toyokawa, Japan (annually since 1968); *IAU Quarterly Bulletin on Solar Activity* Tokyo Astronomical Observatory, Mitaka, Tokyo, Japan (since 1978)

Netherlands: *Geomagnetic Data* IAGA Bulletin No. 12 (1932-69), No. 32 (since 1970) IUGG Publications Office, 39 ter, Rue Gay-Lussac, Paris V, France (annually)

Philippines: Manila Observatory "Solar Maps and Activity", Manila Observatory, P.O. Box 1231, Manila, Philippines (monthly)

Switzerland: Bulletin of "Berne Solar Observations", Institute of Applied Physics, Div. of Solar Observations, Sidlerstrasse 5, 3012 Berne, Switzerland (since 1968)

Taiwan: *Report on Sunspot Observations* Taiwan Provincial Weather Bureau Observatory, Taipei, Taiwan (quarterly since 1957)

USSR: СОЛНЕЧНЫЕ ДАННЫЕ *(Solar Data)* USSR Academy of Science (monthly since 1958); КОСМИЧЕСКИЕ ДАННЫЕ *(Cosmic Data)* (monthly since 1962); *Magnetic Fields of Sunspots* (bimonthly since 1964)

USA: *Preliminary Report and Forecast of Solar-Geophysical Activity* Space Environment Services Center, NOAA, Boulder, Colorado 80303 USA (weekly); *Solar-Geophysical Data* NOAA, Boulder, Colorado 80303 USA (monthly since November 1955)

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The ICSU Panel on WDCs has recommended that it would be appropriate courtesy to acknowledge in publications that data were obtained from the originating station or investigator through the intermediary of the WDCs. The following statement is suggested:

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