PART B

SOLAR - GEOPHYSICAL DATA

ISSUED
APRIL 1964

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

CRPL-F 236
PART B

NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

Issued
30 April 1964

SOLAR - GEOPHYSICAL DATA

CONTENTS

The descriptive text was republished November 1963.

DAILY SOLAR INDICES

Feb. 1964	American Relative Sunspot Numbers R_A'
1	0
2	0
3	0
4	0
5	0
6	1
7	5
8	10
9	12
10	5
11	0
12	0
13	0
14	7
15	14
16	15
17	11
18	11
19	16
20	29
21	29
22	43
23	41
24	37
25	25
26	29
27	24
28	29
29	25
Mean:	14.4

Mar. 1964	Zürich Provisional Relative Sunspot Numbers R_Z	Daily Values Solar Flux at 2800 Mc, Ottawa, Canada Flux
1	26	78
2	7	75
3	7	74
4	7	75
5	0	72
6	0	74
7	15	73
8	8	74
9	7	72
10	0	73
11	9	75
12	17	77
13	41	78
14	32	79
15	29	79
16	28	77
17	16	78
18	8	75
19	9	74
20	9	74
21	20	74
22	31	78
23	36	77
24	27	77
25	23	74
26	19	74
27	9	75
28	8	76
29	0	75
30	0	78
31	0	76
Mean:	14.5	75.5

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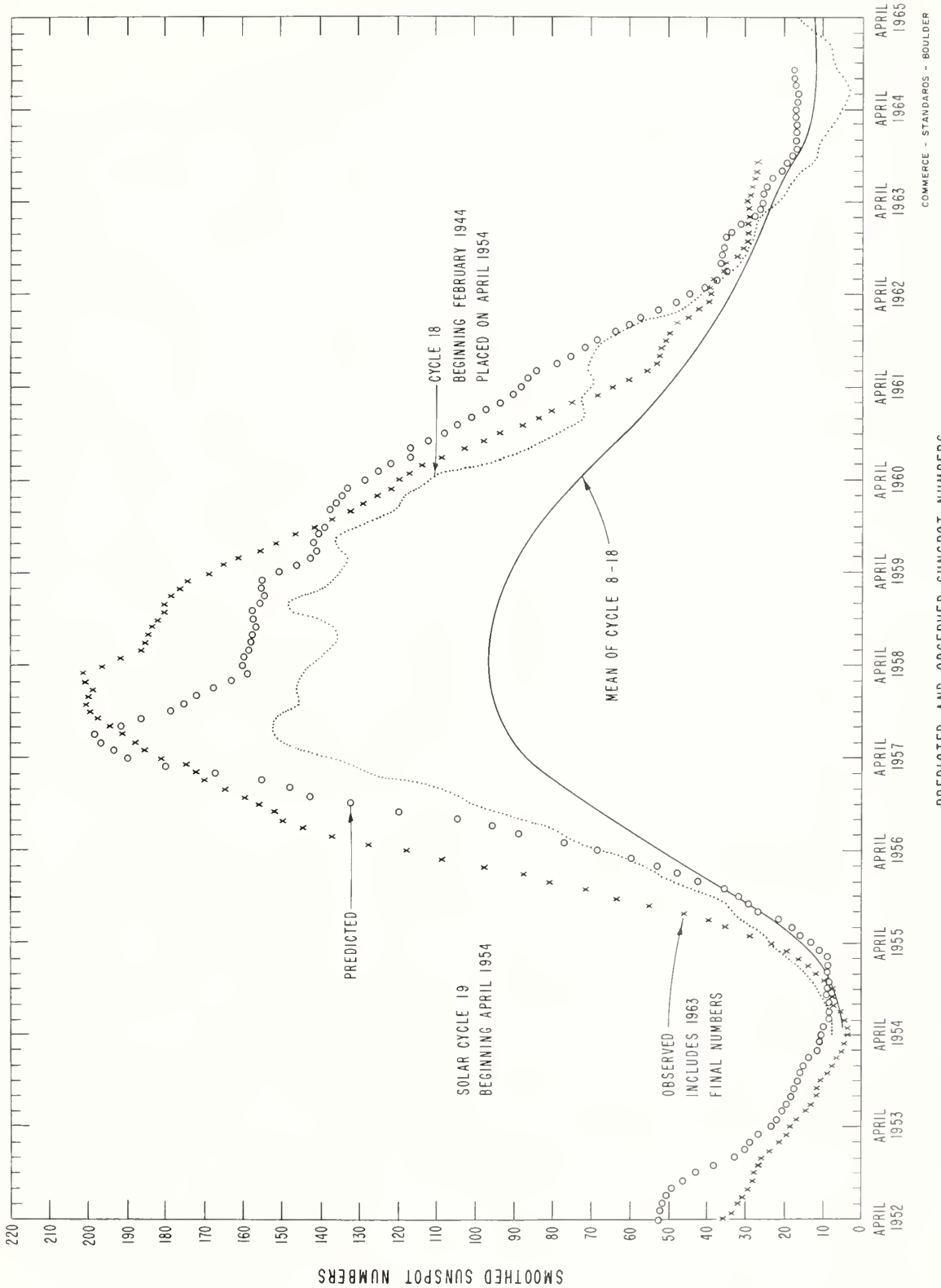

PREDICTED AND OBSERVED SUNSPOT NUMBERS

CALCIUM PLAGE AND SUNSPOT REGIONS

MARCH 1964

MAR. 1964	LAT.	MCMATH PLAGE NUMBER	RETURN OF REGION	CALCIUM PLAGE DATA						SUNSPOT DATA		
				CMP VALUES		HISTORY	AGE (ROTATIONS)	DATE FIRST SEEN (1)	DURATION (DAYS) (1)	CMP VALUES		HISTORY
				AREA	INT					AREA	COUNT	
01.6	N07	7171	New	500	3	b ⌒ ℓ	1	2/28	9	20	1	b ∧ d
03.7	S10	7167	7133	1900	3	ℓ \ ℓ	2	2/25	≥12			
05.2	N28	7174	New	100	1.5	b — d	1	<3/6	> 2			
06.7	S14	7175	New	600	2.5	b \ d	1	<3/6	≥ 2			
06.9	S33	7176	New	100	1	b — d	1	≤3/6	≥ 1			
07.9	S02	7178	New	(300)	(2.5)	b ⌒ ℓ	1	≤3/11	≥ 3	(60)	(4)	b ∧ d
07.9	S11	7173	7149	700	3	ℓ \ ℓ	2	3/1	13			
09.8	N16	7179	New	(100)	(1.5)	b — d	1	≤3/11	≥ 1			
10.6	N12	7177	New	(400)	(3)	b — d	1	3/7	≥ 1			
11.3	N04	7182	New	200	2	b / ℓ	1	3/12	6	(530)	(7)	b ⌒ ℓ
12.2	N42	7180	New	800	3.5	b ⌒ ℓ	1	≤3/11	≥ 7	160	2	b ∧ d
13.8	N02	7186	New	(100)	(2)	b — d	1	3/16	2			
15.2	N11	7181	New	(300)	(1)	ℓ \ d	1	≤3/11	≥ 2			
18.1	S07	7183	7153	600	2.5	ℓ \ ℓ	3	3/12	12			
19.6	N35	7190 (2)	New	(100)	(1.5)	b — d	1	3/21	1			
19.7	N07	7184	7154	1100	2	ℓ ⌒ d	3	3/13	11			
19.7	S15	7185 (2)	New	(200)	(1.5)	b — d	1	3/15	1			
20.6	N10	7189	New	600	3.5	b / ℓ	1	~3/21	6	400	7	b / ℓ
22.6	N10	7187	7161	1400	2	ℓ ⌒ ℓ	3	3/16	12	190	1	ℓ — ℓ
24.8	N14	7196	New	(400)	(1)	b ⌒ ℓ	1	3/27	4			
25.6	S12	7188	New	400	1	ℓ ⌒ d	1	3/19	11			
26.5	N13	7191	New	500	2	ℓ ⌒ d	1	~3/21	10			
27.2	S26	7193 (2)	New	(200)	(1.5)	ℓ — d	1	3/22	1			
28.3	N07	7192	7171	1300	2.5	ℓ ⌒ ℓ	2	3/21	>11			
28.6	N29	7202 (2)	New	(100)	(2)	b — d	1	3/31	1			
28.8	S12	7194 (2)	New	(300)	(1.5)	b — d	1	3/24	1			
30.2	N14	7198	New	200	1.5	b ⌒ d	1	3/29	2			
30.4	S07	7195 (3)	7167	1000	3.5	ℓ ∧ ℓ	3	3/24	13	10	3	b ⌒ ℓ

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(1) No calcium plage data were secured at the McMath-Hulbert Observatory on March 3, 4, 5, 8, 9, 10, 20, 25, 28.
(2) These very small and ephemeral plages last for only one day.
(3) The following part of this plage experienced a resurgence in intensity on and after March 27. Please note that in the February calcium plage data, the antecedent of Region 7195 was incorrectly identified as a plage in its first rotation.

MT. WILSON MAGNETIC CLASSIFICATIONS OF SUNSPOTS

FEBRUARY 1964

Feb. 1964	TIME MEAS. UT	LAT	MER DIST	TYPE	Feb. 1964	TIME MEAS UT	LAT	MER DIST	TYPE
1-2	No Obs.				17	1750	N11	W63	α
3	No Spots				18	No Obs.			
4	No Obs.				19	2225	N11	E33	α
5	1945	S10	E17	βf	20	1920	N11	E22	α
6-10	No Spots				21-26	No Obs.			
11	1645	S03 N43	W50 E04	β* βα	27	2335	N10 S09	W75 E38	α β
12	No Obs.				28	1845	S09	E27	β
13	1715	S05 N04 N42	W76 W33 W22	αf β βγ	29 30	1705 1725	S09 S10	E13 E03	αp αf
14	1820	N04 N43	W47 W38	β αp**	31	1705	S10	W11	αf
15-16	No Obs.								

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* Polarities reversed for old cycle.
** New Cycle
Note: Observations with no comment refer to old cycle.

PROVISIONAL CORONAL LINE EMISSION INDICES

MARCH 1964

CMP Mar 1964	North East Quadrant (observed 7 days earlier)				South East Quadrant (observed 7 days earlier)				South West Quadrant (observed 7 days later)				North West Quadrant (observed 7 days later)			
	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1
1	19	24	22	42	21	24	4	8	x	x	x	x	x	x	x	x
2	12	28	19	25	10	25	22	26	x	x	x	x	x	x	x	x
3	x	x	x	x	x	x	x	x	18	35	10	13	8	11	10	15
4	x	x	x	x	x	x	x	x	9	12	13	16	8	18	12	14
5	4a	9a	36a	43a	4a	9a	32a	60a	4	7	11	12	7	o	12	16
6	9	14	13	16	7	12	11	15	9	22	x	x	5	6	x	x
7	8	11	25	28	7	14	30	41	19	53	19	38	9	11	7	8
8	11	15	28	36	13	39	47	84	12	27	21	32	9	10	12	16
9	12	18	x	x	5	8	x	x	x	x	x	x	x	x	x	x
10	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
11	x	x	x	x	x	x	x	x	14	42	13	16	36	76	10	14
12	12	16	7	10	2	3	9	12	x	x	x	x	x	x	x	x
13	x	x	x	x	x	x	x	x	3	3	9	10	18	22	8	16
14	x	x	x	x	x	x	x	x	4	6	10	11	6	8	10	12
15	x	x	x	x	x	x	x	x	5	6	13	16	9	12	9	10
16	x	x	x	x	x	x	x	x	8	12	9	12	8	11	8	10
17	12	18	13	19	10	21	10	12	3	4	9	10	2	3	10	12
18	18	32	14	24	7	25	8	9	x	x	x	x	x	x	x	x
19	23	50	11	13	6	15	8	9	6	9	7	8	27	63	14	24
20	26	44	x	x	5	8	x	x	x	x	x	x	x	x	x	x
21	21	43	12	16	2	6	13	16	4	6	11	16	31	68	13	18
22	18	32	17	32	3	3	15	16	6	17	9	9	25	50	10	16
23	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
24	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
25	8	11	8	12	7	14	7	10	x	x	x	x	x	x	x	x
26	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
27	33	81	19	40	6	14	16	19	x	x	x	x	x	x	x	x
28	33	75	18	32	6	8	14	23	x	x	x	x	x	x	x	x
29	11	12	18	32	11	24	15	24	x	x	x	x	x	x	x	x
30	9	12	14	26	20	47	14	31	x	x	x	x	x	x	x	x
31	3	10	19	32	4	10	15	25	x	x	x	x	x	x	x	x

x = no observations * = yellow line emission a = index computed from low weight data

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SOLAR FLARES

MARCH 1964

OBSERVATORY	DATE MAR 1964	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Ho	MAX INT. %	PROVISIONAL IONOSPHERIC EFFECT
	01	0110	0640	NO FLARE	PATROL											
	01	1325	1340	NO FLARE	PATROL											
	01	1440	1445	NO FLARE	PATROL											
LOCKHEED	01	2010	2025	2014	N08	W90			1-	2	2014	.20	1.00		10	
	02	0100	0145	NO FLARE	PATROL											
	02	0230	0255	NO FLARE	PATROL											
	02	0520	0620	NO FLARE	PATROL											
SAC PEAK	02	1516 E	1533 D	1523	N29	W34			1-	C		.68	.82		17	
	02	2235	2330	NO FLARE	PATROL											
	03	0000	0105	NO FLARE	PATROL											
	03	0430	0515	NO FLARE	PATROL											
	03	0700	0800	NO FLARE	PATROL											
	03	0820	0845	NO FLARE	PATROL											
	03	0930	1540	NO FLARE	PATROL											
	03	1545	1555	NO FLARE	PATROL											
	03	2220	2335	NO FLARE	PATROL											
	04	0010	0040	NO FLARE	PATROL											
	04	0120	0315	NO FLARE	PATROL											
MANILA	04	0257 E	0314		S20	W34			1-	1	0258	.50	.50			
	04	0330	0520	NO FLARE	PATROL											
	04	0600	0615	NO FLARE	PATROL											
	04	1005	1120	NO FLARE	PATROL											
	04	1125	1335	NO FLARE	PATROL											
	04	1600	1630	NO FLARE	PATROL											
MANILA	05	0853 E	0857		S03	E21			1-	2	0854	.20	.20			
	05	0920	0925	NO FLARE	PATROL											
	05	1020	1100	NO FLARE	PATROL											
UCCLE	05	1115 E	1124 D		N10	W25			1-							
LOCKHEED	05	1800	1823	1810	N07	W63			1-	2	1810	.20	.30		10	
	06	0840	0845	NO FLARE	PATROL											
	06	0950	1020	NO FLARE	PATROL											
UCCLE	06	1457	1501 D		N10	W76			1-							
UCCLE	06	1600 E	1604 D		N10	W76			1-							
MCMATH	06	1633	1654		N08	W75	7171		1-	1	1637	.20	.80			
MCMATH	06	1907	1922	1912	S10	E03	7175		1-	1	1912	.40	.40			
	07	0120	0240	NO FLARE	PATROL											
	07	0330	0500	NO FLARE	PATROL											
	07	0530	0555	NO FLARE	PATROL											
MANILA	07	0705 E	0754	0708	N08	W80			1-	2	0708	.50	1.25			
	07	0840	0900	NO FLARE	PATROL											
	07	0910	0940	NO FLARE	PATROL											
	07	1035	1040	NO FLARE	PATROL											
UCCLE	07	1146	1148		N11	E42			1-							
	07	1245	1310	NO FLARE	PATROL											
	07	1315	1335	NO FLARE	PATROL											

SOLAR FLARES

MARCH 1964

OBSERVATORY	DATE MAR 1964	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER DIST	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg	MAX. WIDTH Hα	MAX. INT %	PROVISIONAL IONOSPHERIC EFFECT
	07	2240	2355	NO FLARE	PATROL											
	08	0025	0730	NO FLARE	PATROL											
	08	1135	1145	NO FLARE	PATROL											
	08	1210	1230	NO FLARE	PATROL											
	08	1235	1320	NO FLARE	PATROL											
	09	0100	0105	NO FLARE	PATROL											
	09	0300	0330	NO FLARE	PATROL											
UCCLE	09	1408	1417		S08	W22			1-							
LOCKHEED	09	2334	2400	2344	N13	E03			1-	2	2344	.20	.20		10	
	10	0105	0520	NO FLARE	PATROL											
	10	0630	0710	NO FLARE	PATROL											
UCCLE	10	1007 E	1012		N26	W78			1-							
UCCLE	10	1026	1031		N26	W78			1-							
UCCLE	10	1114	1121		N26	W78			1-							
	10	1205	1325	NO FLARE	PATROL											
LOCKHEED	10	1936	1942	1938	S38	W02			1-	2	1938	.30	.30		10	
LOCKHEED	10	2030	2100	2042	N25	W85			1-	2	2042	.20	.60		10	
	11	0015	0520	NO FLARE	PATROL											
	11	0615	0655	NO FLARE	PATROL											
	11	0705	0715	NO FLARE	PATROL											
UCCLE	11	0825 E	0833		N44	E10			U							G-SWF
MANILA	11	0830 E	0847	0834	N42	E15			1-	2	0834	.33	.36			
UCCLE	11	0853	0905		N44	E10			1-							
ARCETRI	11	0957 E	1010 D		N44	E07			1-		1010	1.21	1.86			
UCCLE	11	0959	1007		S03	W50			1-							
	11	1015	1025	NO FLARE	PATROL											
UCCLE	11	1037	1057		N44	E10			1-							
	11	1125	1130	NO FLARE	PATROL											
UCCLE	11	1151	1156		N44	E10			1-							
UCCLE	11	1301	1311		N44	E10			1-							
LOCKHEED	11	1645	1659	1649	N22	W71			1-	2	1649	.20	.50		10	
MCMATH	11	1733	1830 D	1738	S05	W50	7178		1-	2	1738	.50	.80			
OTTAWA	11	1738	1746	1740	S05	W48			1-	C	1740	.70	.85			
LOCKHEED	11	1910	1945	1918	S03	W50			1-	2	1918	.30	.30		10	
MCMATH	11	1914	2000 D	1916	S05	W50	7178		1-	2	1916	.50	.80			
MCMATH	11	2013	2100 D	2017	S05	W50	7178		1-	2	2017	.50	.80			
MCMATH	11	2115 E	2135 D	2120	S05	W50	7178		1-	1	2120	.50	.80			
	12	0110	0250	NO FLARE	PATROL											
	12	0320	0610	NO FLARE	PATROL											
	12	0650	0710	NO FLARE	PATROL											
	12	0715	0730	NO FLARE	PATROL											
	12	0755	0810	NO FLARE	PATROL											
WENDEL	12	0954 E	1044 D		N41	W02	7180	50 D	1				3.00			
CAPRI-S	12	1513 E	1527 D		N41	W12	7180	14 D	1	1	1514	1.40	2.10			
SAC PEAK	12	1514	1526 D	1516	N42	W09			1-	C		.62	.76		18	
MCMATH	12	1515 E			N43	W09	7180		1-	1	1515	1.00	1.60			

SOLAR FLARES

MARCH 1964

OBSERVATORY	DATE MAR 1964	OBSERVED UNIVERSAL TIME START	END	MAX. PNASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX WIDTH Hα	MAX INT. %	PROVISIONAL IONOSPHERIC EFFECT
SAC PEAK	12	2132 E	2158 D	2135	N42	W13			1-	C		.56	.68		18	
SAC PEAK	12	2132 E	2158 D	2143	N42	W13			1-							S-SWF
MCMATH	12	2138 E	2143 D		N43	W13	7180		1-	1	2139	.40	.60			
	13	0055	0105	NO FLARE	PATROL											
	13	0120	0745	NO FLARE	PATROL											
	13	0935	1005	NO FLARE	PATROL											
	13	1015	1150	NO FLARE	PATROL											
MCMATH	13	1331	1342	1333	N43	W22	7180		1-	1	1333	.30	.50			
SAC PEAK	13	1656	1706 D	1659	N02	W32			1-	C		.41	.43		17	
	14	0105	0655	NO FLARE	PATROL											
	14	0725	0815	NO FLARE	PATROL											
	14	0830	0845	NO FLARE	PATROL											
ARCETRI	14	0845 E	0945 D		N03	W43	7182	60 D	1		0911	1.44	2.00			
	14	0925	0930	NO FLARE	PATROL											
	14	1025	1055	NO FLARE	PATROL											
	14	1100	1140	NO FLARE	PATROL											
	14	1325	1430	NO FLARE	PATROL											
	14	1450	1540	NO FLARE	PATROL											
MCMATH	14	1700 E	1730 D		N04	W47	7182	30 D	1	1	1700	1.80	2.70			
	15	0415	0510	NO FLARE	PATROL											
	15	0530	1325	NO FLARE	PATROL											
MCMATH	15	2027	2036 D	2030	N05	W62	7182		1-	2	2030	.50	1.10			
MCMATH	15	2108 E	2130 D		N04	W62	7182		1-	2	2117	.80	1.70			
SAC PEAK	15	2239 E	2255 D	2244	N04	W66			1-	C		1.53	2.54		17	
	16	0150	0530	NO FLARE	PATROL											
MITAKA	16	0446	0458	0449	N03	W68	7182	12	1	V	0449	1.00	2.30	1.90	96	S-SWF
MANILA	16	0555	0616	0603	N04	W57			1-	1	0603	.25	.35			
UCCLE	16	0832 E	0847		N03	W73			U		0832	1.20	3.60			
MANILA	16	0835	0906	0840	N05	W58			1-	2	0840	1.00	1.40			
UCCLE	16	0901	0913 D		N04	W73			1-							
UCCLE	16	1018	1026		N04	W73			1-							
UCCLE	16	1046	1049		N04	W73			1-							
ARCETRI	16	1125 E	1158 D		N05	W70	7182	33 D	1		1153	1.05	2.39			
ONDREJOV	16	1154	1209		N04	W70			1-	3	1155			2.30		
ONDREJOV	16	1214 E	1226		N02	W69			1-	3	1220			1.80		
UCCLE	16	1331	1339		N02	W77			1-							
ARCETRI	16	1405 E	1425 D		N05	W70			1-		1415	.69	1.57			
HTE-PROVEN	16	1553 E	1620 D		N05	W72	7182	27 D	1							
NERA	16	1553 E	1645 D		N06	W75	7182	52 D	2+	2						
OTTAWA	16	1554	1735	1600	N03	W73	7182	101	1+	C	1600	1.63	3.32			
MCMATH	16	1555	1700	1611	N05	W75	7182	65 D	2	1	1611	1.40	5.50			S-SWF
MCMATH	16	1555	1700	1645	N05	W75			2							
HUANCAYO	16	1604 E	1628	1608	N04	W74	7182	24 D	1+	S	1605	1.70	5.10	2.50		
UCCLE	16	1618 E	1640 D		N08	W75	7182	22 D	1+		1618	2.50	8.00			
SAC PEAK	16	2329 E	2335 D	2331	N03	W85			1-	P		.45	.45		18	
LOCKHEED	16	2330	2338	2333	N01	W85	7182	8	1	1	2333	1.30	3.60		20	
OTTAWA	17	1805	1809	1807	N10	E64			1-	C	1807	.18	.30			

SOLAR FLARES

MARCH 1964

OBSERVATORY	DATE MAR 1964	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Ha	MAX INT *.	PROVISIONAL IONOSPHERIC EFFECT
OTTAWA	17	1806	1821	1809	S03	E06			1-	C	1809	.19	.19			
	17	1910	1950	NO FLARE	PATROL											
	17	2125	2135	NO FLARE	PATROL											
	17	2230	2325	NO FLARE	PATROL											
	18	0905	0930	NO FLARE	PATROL											
	18	0935	1015	NO FLARE	PATROL											
	18	1025	1045	NO FLARE	PATROL											
	19	0145	0300	NO FLARE	PATROL											
	19	0315	0340	NO FLARE	PATROL											
	19	0410	0540	NO FLARE	PATROL											
	19	0900	0950	NO FLARE	PATROL											
	19	1035	1100	NO FLARE	PATROL											
	19	1105	1150	NO FLARE	PATROL											
SAC PEAK	19	1655 E	1728 D	1704	N09	E34			1-	P		.27	.29		16	
OTTAWA	19	1700	1726	1717	N14	E43			1-	C	1717	. 9	.10			
MCMATH	19	1700	1730	1714	N10	E36	7187		1-	1	1714	.30	.40			
	20	0300	0330	NO FLARE	PATROL											
	20	0400	0500	NO FLARE	PATROL											
	20	0530	0615	NO FLARE	PATROL											
	20	0900	1015	NO FLARE	PATROL											
	20	1025	1050	NO FLARE	PATROL											
	20	1055	1115	NO FLARE	PATROL											
	20	1120	1145	NO FLARE	PATROL											
OTTAWA	20	1659	1704	1701	N12	E22			1-	C	1700	.12	.12			
LOCKHEED	20	2038 U	2050 U	2042 U	N06	E90	7192	12 U	1	2	2042	.40	2.00		20	
	21	0710	0830	NO FLARE	PATROL											
	21	1025	1030	NO FLARE	PATROL											
CAPRI-S	21	1300 E	1402 D		N09	W11	7189	62 D	1	1	1300	1.50	1.60			
HUANCAYO	21	1524 E	1608	1540	N09	W12	7189	44 D	1	V				1.20		S-SWF
MCMATH	21	1835 E	1845 D		S11	E53	7188		1-	2	1836	.20	.30			
MANILA	22	0147 E	0206	0152	N08	W19			1-	2	0152	.33	.33			
MANILA	22	0338 E	0345	0340	N09	W20			1-	2	0340	.13	.13			
	22	0420	0520	NO FLARE	PATROL											
MANILA	22	0514	0539	0516	N08	W23			1-	2	0516	.25	.25			G-SWF
MANILA	22	0549	0554	0551	N09	W22			1-	2	0551	.25	.25			
MANILA	22	0643 E	0658	0646	N08	W21			1-	2	0646	.25	.25			G-SWF
	22	0745	0925	NO FLARE	PATROL											
ARCETRI	22	0947 E	0950 D		N08	W23			1-		0947	.65	.73			
	22	1000	1015	NO FLARE	PATROL											
	22	1130	1150	NO FLARE	PATROL											
	22	1200	1230	NO FLARE	PATROL											
CAPRI-S	22	1201	1218 D		N09	W24			1-	1						
	22	1300	1310	NO FLARE	PATROL											
	22	1315	1320	NO FLARE	PATROL											
MCMATH	22	1522	1530	1524	N09	W30	7189		1-	1	1524	.20	.20			
MCMATH	22	1602	1615	1605	N10	W28	7189		1-	1	1605	.50	.60			

SOLAR FLARES

MARCH 1964

OBSERVATORY	DATE MAR 1964	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR AREA Sq. Deg.	MAX. WIDTH Hα	MAX INT °₀	PROVISIONAL IONOSPHERIC EFFECT
MCMATH	22	1840	1851	1845	N10	W31	7189		1-	1	1845	.70	.80			
	22	2120	2330	NO FLARE	PATROL											
MANILA	23	0012 E	0018	0014	N12	E48			1-	1	0014	.25	.30			
	23	0015	0400	NO FLARE	PATROL											
	23	0550	0735	NO FLARE	PATROL											
	23	1255	1310	NO FLARE	PATROL											
MCMATH	23	1323	1330	1325	S11	E27	7188		1-	2	1325	.20	.20			
SAC PEAK	23	1440 E	1445 D	1442	N12	W46			1-	C		.55	.68		18	
OTTAWA	23	1441	1448	1442	N11	W44			1-	C	1442	.91	1.11			
	24	0100	0400	NO FLARE	PATROL											
	24	0500	0525	NO FLARE	PATROL											
	24	0545	0620	NO FLARE	PATROL											
CAPRI-S	24	0815	0836		N11	E51			1-	3	0815	.30	.40			
ARCETRI	24	0955 E	1000 D		N09	W51			1-		1000	.39	.63			
MCMATH	24	1613	1640	1619	N10	W54	7189		1-	2	1619	.20	.40			
	24	2055	2330	NO FLARE	PATROL											
	24	2345	2400	NO FLARE	PATROL											
	25	0000	0030	NO FLARE	PATROL											
MANILA	25	0215 E	0220		N07	E41			1-	1	0216	.75	.83			G-SWF
	25	0350	0505	NO FLARE	PATROL											
	25	0515	0705	NO FLARE	PATROL											
MANILA	25	0706 E	0736	0709	N07	E39			1-	2	0709	.75	.83			
ARCETRI	25	0845 E	0999 D		N09	W70			1-		0850	.69	1.62			
	25	1715	1735	NO FLARE	PATROL											
SAC PEAK	25	1917 E	1927 D	1920	N09	W72			1-	C		.27	.56		18	S1-S-SWF
	26	0130	0350	NO FLARE	PATROL											
	26	0600	0640	NO FLARE	PATROL											
	26	0850	0855	NO FLARE	PATROL											
	26	0910	0930	NO FLARE	PATROL											
	26	1235	1315	NO FLARE	PATROL											
	27	0115	0825	NO FLARE	PATROL											
MITAKA	27	0552 E	0558	0555	N14	W90	7189	6 D	1	V	0555	.30		4.20		
	27	0920	0935	NO FLARE	PATROL											
MCMATH	27	1420	1437 D	1421	S09	E45	7195		1-	1	1421	.20	.20			
	28	0110	0545	NO FLARE	PATROL											
SAC PEAK	28	1403 E	1436 D	1419	N14	W87			1-	C		.49			17	
	29	0425	0525	NO FLARE	PATROL											
LOCKHEED	29	2144	2202	2150	N09	E90			1-	1	2150	.30	1.50		10	
LOCKHEED	30	0036	0100	0041	N09	E90	7201	24	1	1	0041	.40	2.00		10	
	30	0500	0545	NO FLARE	PATROL											
	30	1140	1155	NO FLARE	PATROL											
	30	2000	2015	NO FLARE	PATROL											
	30	2020	2115	NO FLARE	PATROL											

SOLAR FLARES

MARCH 1964

OBSERVATORY	DATE MAR 1964	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg	MAX WIDTH Ha	MAX INT. %	PROVISIONAL IONOSPHERIC EFFECT
	31	0535	0550	NO FLARE	PATROL											
	31	0625	0705	NO FLARE	PATROL											
	31	0820	1130	NO FLARE	PATROL											
OTTAWA	31	1644	1657	1647	S10	W13			1-	C	1647	.20	.20			
	31	1915	1925	NO FLARE	PATROL											
	31	2000	2400	NO FLARE	PATROL											

COMMERCE - STANDARDS - BOULDER

ATHENES	ATHENS, GREECE	HONOLULU	HAWAII, USA	NERA	NEDERHORST den BERGH, NETHERLANDS
BAKOU	PIRCULI, USSR	IKOMASAN	KYOTO, JAPAN	NIZMIR	KRASNAYA PAKHRA, USSR
CAPETOWN	ROYAL OBSERVATORY, CAPE OF GOOD HOPE	KIEV KO	KIEV GAO, USSR	SAC PEAK	SACRAMENTO PEAK, N.MEX. USA
CAPRI F	CAPRI, ITALY (GERMAN)	KIEV KY	KIEV UNIVERSITY, USSR	SALTSJÖBADEN	STOCKHOLM, SWEDEN
CAPRI S	CAPRI, ITALY (SWEDISH)	LOCKHEED	LOS ANGELES, CALIF., USA	SCHAUINS	SCHAUINSLAND, GFR
CRIMÉE	SIMEIZ, USSR	MCMATH	MCMATH-HULBERT PONTIAC, MICH., USA	TACHKENT	TASHKENT, USSR
HERSTMONCEU	ROYAL GREENWICH OBSERVATORY, HERSTMONCEUX, ENGLAND	MOSCOU	MOSCOW-GAISH, USSR	WENDEL	WENDELSTEIN, GFR
HTE-PROVEN	HAUTE-PROVENCE	NEW SCHAUIN	FREIBURG, GFR		

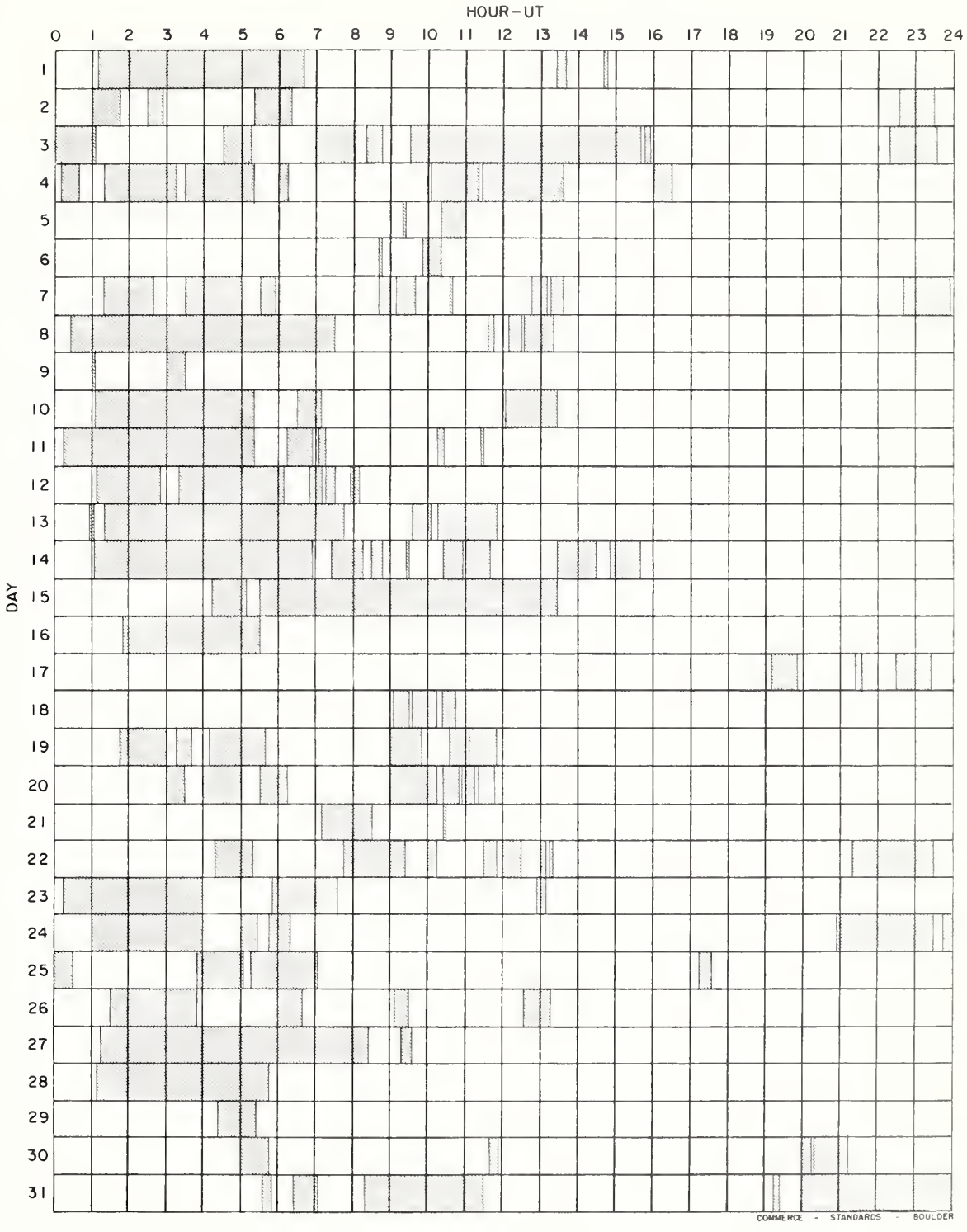
ALL VALUES IN THE MAXIMUM INTENSITY COLUMN FOR SAC PEAK ARE ARBITRARY UNITS (0-40) AND FOR LOCKHEED ARE ARBITRARY UNITS (10-40), NOT PERCENT OF CONTINUOUS SPECTRUM.

SEE DESCRIPTIVE TEXT PUBLISHED NOVEMBER 1961 FOR DEFINITION OF CORRECTED AREA VALUES LISTED FOR CLIMAX, HAWAII, LOCKHEED AND SACRAMENTO PEAK.

E = LESS THAN D = GREATER THAN U = APPROXIMATE □= NOT REPORTED.

INTERVALS OF NO FLARE PATROL OBSERVATIONS

MARCH 1964



Observatories included:

Arcetri
Capri-S (Swedish)
Dunsink
Haute-Provence
Huancayo
Istanbul
Lockheed
Manila
Ondrejov
Ottawa
Sacramento Peak
Uccle

SOLAR FLARES

DECEMBER 1963

OBSERVATORY	DATE DEC 1963	OBSERVED UNIVERSAL TIME START	END	MAX PHASE	LOCATION APPROX. LAT.	MER DIST	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq Deg	MAX WIDTH Ha	MAX INT %	PROVISIONAL IONOSPHERIC EFFECT
	01	0300	0310	NO FLARE	PATROL											
	01	0605	0635	NO FLARE	PATROL											
HTE-PROVEN	01	0750	0806	0756	S07	E75	7053	16	1		0756	1.20				
UCCLE	01	0937 E	0945 D		S12	E80			1-	3						
UCCLE	01	0956	0958		S08	E78			1-	2						
UCCLE	01	1002 E	1007		S12	E80			1-	3						
CLIMAX	01	2217	2224	2219	N06	W70			1-			.30	.60			
CLIMAX	01	2223	2231	2226	S07	E65			1-			.20	.30			
	02	0020	0040	NO FLARE	PATROL											
	02	0200	0315	NO FLARE	PATROL											
	02	0320	0335	NO FLARE	PATROL											
	02	0340	0345	NO FLARE	PATROL											
	02	0350	0355	NO FLARE	PATROL											
	02	0425	0435	NO FLARE	PATROL											
	02	0440	0455	NO FLARE	PATROL											
CAPETOWN	02	1225	1233	1228	N04	W81			1-		1228	.30				
	03	0215	0600	NO FLARE	PATROL											
	03	0630	0705	NO FLARE	PATROL											
UCCLE	03	1145	1148	1147	S11	E45			1-	3						
	04	0010	0045	NO FLARE	PATROL											
	04	0150	0530	NO FLARE	PATROL											
	04	0545	0635	NO FLARE	PATROL											
CAPETOWN	04	1150	1235	1200	S10	E24			1-		1200	1.00	1.10			
	05	0350	0400	NO FLARE	PATROL											
	05	0410	0655	NO FLARE	PATROL											
HTE-PROVEN	05	1005	1015 D		S09	E25			1-		1007	1.60	1.70			
CAPETOWN	05	1132	1148	1135	S10	W74			1-		1135	.70				
CAPETOWN	05	1155	1208	1157	S10	W74			1-		1157	.60				
	06	0500	0630	NO FLARE	PATROL											
UCCLE	06	1012	1018		S15	W48			1-	3						
UCCLE	06	1107	1108		S12	E09			1-	4						
CAPETOWN	06	1213	1234	1216	S10	E07			1-		1216	1.50	1.50			
HTE-PROVEN	06	1215	1237		S09	E12			1-		1220	1.30	1.30			
	06	2350	2400	NO FLARE	PATROL											
	07	0000	0030	NO FLARE	PATROL											
	07	0100	0500	NO FLARE	PATROL											
UCCLE	07	0947	0950	0948	S10	W06			1-	3						
UCCLE	07	1010	1015	1013	S13	W61			1-	4						
	07	1305	1340	NO FLARE	PATROL											
	08	0100	0200	NO FLARE	PATROL											
	08	0210	0220	NO FLARE	PATROL											
	08	0230	0240	NO FLARE	PATROL											
	08	0245	0300	NO FLARE	PATROL											
	08	0425	0450	NO FLARE	PATROL											

SOLAR FLARES

DECEMBER 1963

OBSERVATORY	DATE DEC 1963	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Ha	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
HTE-PROVEN	08	0805 E	0819		S09	W12			1-		0809	.30	.30			
HTE-PROVEN	08	0823	0830 D		S09	W14			1-		0824	.40	.40			
	08	1950	1955	NO FLARE	PATROL											
	08	2010	2015	NO FLARE	PATROL											
	08	2035	2040	NO FLARE	PATROL											
	08	2055	2100	NO FLARE	PATROL											
	08	2115	2300	NO FLARE	PATROL											
UCCLE	09	0940	0941		N27	E90			1-	2						
UCCLE	09	0954	1001		N10	W35			1-							
UCCLE	09	1010	1013		N10	W35			1-	3						
UCCLE	09	1043	1047		S07	W72			1-	5						
	09	1515	1520	NO FLARE	PATROL											
	09	1540	1610	NO FLARE	PATROL											
	09	1640	1805	NO FLARE	PATROL											
	09	1830	1840	NO FLARE	PATROL											
	09	1900	1910	NO FLARE	PATROL											
	09	2050	2400	NO FLARE	PATROL											
	10	0000	0115	NO FLARE	PATROL											
	10	0300	0655	NO FLARE	PATROL											
CAPETOWN	10	0911	0936	0916	N10	W48			1-		0916	.80	1.20			
	10	1415	1455	NO FLARE	PATROL											
	10	1540	1620	NO FLARE	PATROL											
	11	0220	0235	NO FLARE	PATROL											
	11	0240	0250	NO FLARE	PATROL											
HTE-PROVEN	11	0826	0839		N30	E55			1-		0828	.40	.70			
	11	1005	1015	NO FLARE	PATROL											
	11	1020	1040	NO FLARE	PATROL											
	11	1110	1115	NO FLARE	PATROL											
	11	1120	1135	NO FLARE	PATROL											
CAPRI-F	11	1130 E	1210 D		N29	E56	7065	40 D	1	1			3.00			
	11	2035	2040	NO FLARE	PATROL											
	11	2100	2105	NO FLARE	PATROL											
	11	2110	2120	NO FLARE	PATROL											
	11	2125	2130	NO FLARE	PATROL											
	11	2135	2140	NO FLARE	PATROL											
	11	2145	2150	NO FLARE	PATROL											
	11	2155	2200	NO FLARE	PATROL											
	11	2205	2210	NO FLARE	PATROL											
	11	2215	2225	NO FLARE	PATROL											
	11	2230	2240	NO FLARE	PATROL											
NIZAMIAH	12	1040 E	1046	1043	N24	E43	7065	6 D	1	2	1043	1.82	2.76	1.50		
	12	1445	1515	NO FLARE	PATROL											
KODAIKNL	13	0321 E	0326 D		N30	E30			1-	3		1.30	1.60			
UCCLE	13	0922 E	1005		N32	E33			?	3						
UCCLE	13	0925	0949		N33	E34			1-	3						
CAPETOWN	13	0926	0951	0940	N32	E32	7065	25	1		0940	1.70	2.40			

SOLAR FLARES

DECEMBER 1963

OBSERVATORY	DATE DEC 1963	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX LAT.	MER. DIST	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX WIDTH Ha	MAX INT *.	PROVISIONAL IONOSPHERIC EFFECT
HTE-PROVEN	13	0927	0955 D		N30	E28			1-		0940	.90	1.20			
KODAIKNL	13	0935	0948	0940	N30	E28			1-	3	0940			1.56	100	
CAPRI-F	13	0936 E	1008		N29	E29	7065	32 D	1				3.00			
ATHENES	13	0938 E	0951		N30	E26			1-	3		.90	1.10			
UCCLE	13	0939	0955		N31	E30			1-	3						
HTE-PROVEN	14	1208	1226		N30	E14			1-		1214	1.50	1.90			
	14	1355	1435	NO FLARE	PATROL											
	15	0820	0825	NO FLARE	PATROL											
	15	0900	0920	NO FLARE	PATROL											
	15	1105	1135	NO FLARE	PATROL											
	15	1210	1220	NO FLARE	PATROL											
	15	1230	1345	NO FLARE	PATROL											
CLIMAX	15	1601 E	1623 D		N31	E01			1-		1607	.60	.60			
	17	0130	0150	NO FLARE	PATROL											
	17	0650	0710	NO FLARE	PATROL											
HTE-PROVEN	17	1138	1150		N30	W25			1-		1147	.90	1.10			
HTE-PROVEN	17	1324	1332		N30	W26			1-			.70	.90			
KODAIKNL	18	0210	0217	0214	N30	W28			1-	3	0214			1.36	100	
	18	1315	1405	NO FLARE	PATROL											
	18	1410	1440	NO FLARE	PATROL											
	19	0430	0450	NO FLARE	PATROL											
	19	1105	1110	NO FLARE	PATROL											
	19	1120	1205	NO FLARE	PATROL											
	19	1210	1340	NO FLARE	PATROL											
	20	0015	0020	NO FLARE	PATROL											
	20	0110	0120	NO FLARE	PATROL											
	20	0230	0250	NO FLARE	PATROL											
	20	0955	1000	NO FLARE	PATROL											
	20	1005	1045	NO FLARE	PATROL											
	20	1105	1125	NO FLARE	PATROL											
	20	1130	1335	NO FLARE	PATROL											
	21	0450	0510	NO FLARE	PATROL											
	21	0805	0830	NO FLARE	PATROL											
	21	0840	0925	NO FLARE	PATROL											
	21	0945	0950	NO FLARE	PATROL											
	22	0600	0610	NO FLARE	PATROL											
CAPETOWN	22	0714	0744	0728	N15	E32			1-		0728	1.40	1.80			
	23	0100	0105	NO FLARE	PATROL											
UCCLE	23	1224	1231	1228	N11	W50			1-	4						
	24	0130	0240	NO FLARE	PATROL											
	24	0605	0635	NO FLARE	PATROL											

SOLAR FLARES

DECEMBER 1963

OBSERVATORY	DATE DEC 1963	OBSERVED UNIVERSAL TIME START	END	MAX PHASE	LOCATION APPROX. LAT.	MER DIST	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Ha	MAX INT. %	PROVISIONAL IONOSPHERIC EFFECT
UCCLE	24	0903	0910	0906	N18	W63			1-	4		.75	1.50			
UCCLE	24	0949	1003		N18	W63			1-	4						
CAPETOWN	24	1101	1121	1107	N13	W60	7068	20	1		1107	1.40	3.00			
UCCLE	24	1112	1147	1128	N18	W63			1-	4						
UCCLE	24	1218	1229	1220	N18	W63			1-	4						
UCCLE	24	1220	1221		N08	E08			1-	4						
	25	0200	0425	NO FLARE	PATROL											
	25	0440	0445	NO FLARE	PATROL											
CAPETOWN	25	1225	1236	1227	N13	W78			1-		1227	.80				
CAPETOWN	25	1257	1309 D		N13	W78			1-		1258	.80				
	26	1520	1530	NO FLARE	PATROL											
IRKUTSK	27	0459 E	0516	0503	S26	W28		17 D	1			4.75			140	
	29	0130	0145	NO FLARE	PATROL											
	29	0200	0215	NO FLARE	PATROL											
	29	0220	0320	NO FLARE	PATROL											
	30	2355	2400	NO FLARE	PATROL											
	31	0000	0120	NO FLARE	PATROL											

COMMERCE - STANDARDS - BOULDER

These flare reports are addenda to the December 1963 flares published in CRPL-F 233 B for January 1964.

ATHENES	ATHENS, GREECE	HONOLULU	HAWAII, USA	NERA	NEDERHORST den BERGH, NETHERLANDS
BAKOU	PIRCULI, USSR	IKOMASAN	KYOTO, JAPAN	NIZMIR	KRASNAYA PAKHRA, USSR
CAPETOWN	ROYAL OBSERVATORY, CAPE OF GOOD HOPE	KIEV KO	KIEV GAO, USSR	SAC PEAK	SACRAMENTO PEAK, N.MEX. USA
CAPRI F	CAPRI, ITALY (GERMAN)	KIEV KY	KIEV UNIVERSITY, USSR	SALTSJÖBADEN	STOCKHOLM, SWEDEN
CAPRI S	CAPRI, ITALY (SWEDISH)	LOCKHEED	LOS ANGELES, CALIF., USA	SCHAUINS	SCHAUINSLAND, GFR
CRIMÉE	SIMEIZ, USSR	MCMATH	MCMATH-HULBERT PONTIAC, MICH., USA	TACHKENT	TASHKENT, USSR
HERSTMONCEU	ROYAL GREENWICH OBSERVATORY, HERSTMONCEUX, ENGLAND	MOSCOU	MOSCOW-CAISH, USSR	WENDEL	WENDELSTEIN, GFR
HTR-PROVEN	HAUTE-PROVENCE	NEW SCHAUIN	FREIBURG, GFR		

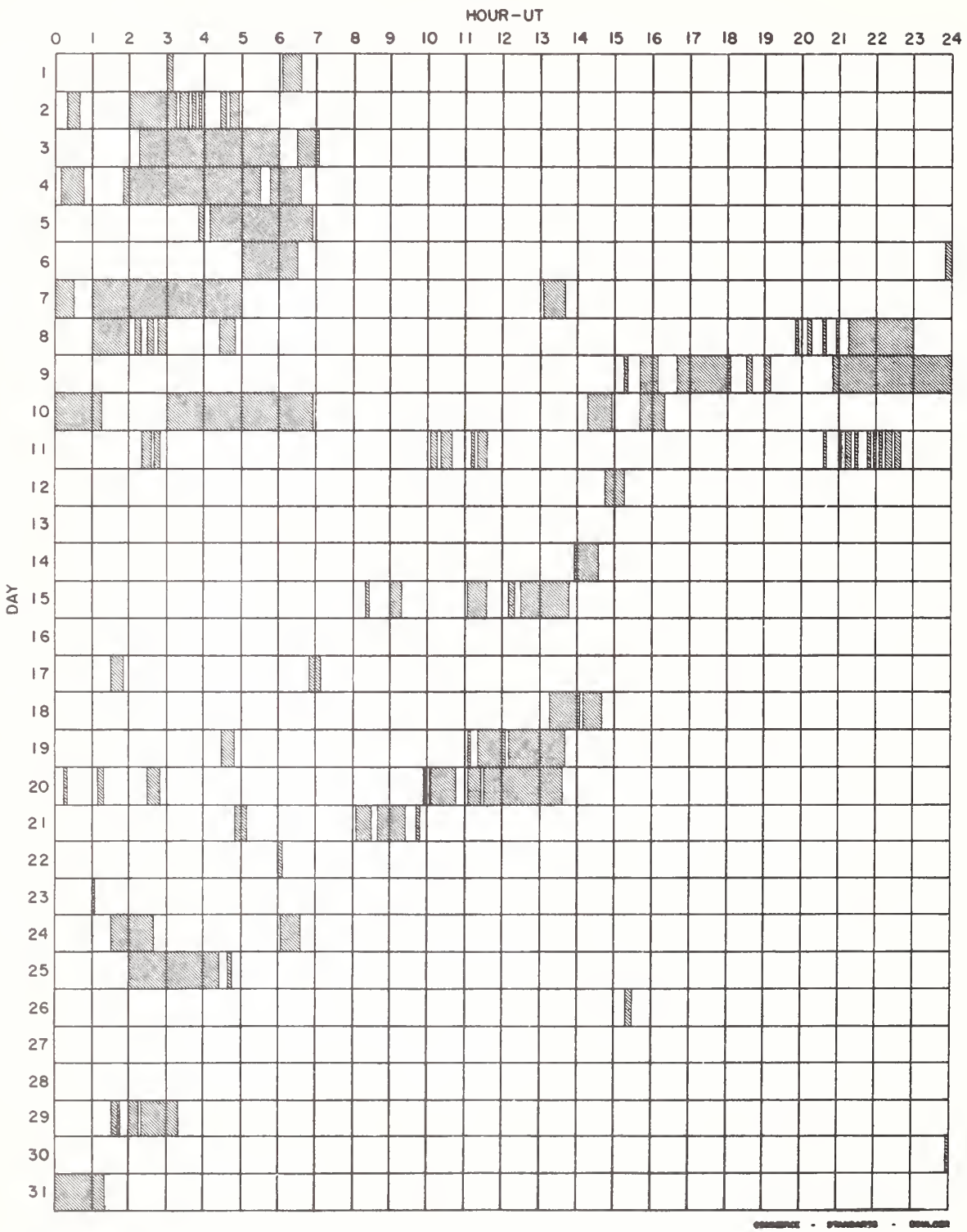
ALL VALUES IN THE MAXIMUM INTENSITY COLUMN FOR SAC PEAK ARE ARBITRARY UNITS (0-40) AND FOR LOCKHEED ARE ARBITRARY UNITS (10-40), NOT PERCENT OF CONTINUOUS SPECTRUM.

SEE DESCRIPTIVE TEXT PUBLISHED NOVEMBER 1961 FOR DEFINITION OF CORRECTED AREA VALUES LISTED FOR CLIMAX, HAWAII, LOCKHEED AND SACRAMENTO PEAK.

E = LESS THAN D = GREATER THAN U = APPROXIMATE □ = NOT REPORTED.

INTERVALS OF NO FLARE PATROL OBSERVATIONS

DECEMBER 1963



Observatories included:

Abastumani	Capetown	Herstmonceux	Kiev-KO	Nizmir	Tachkent
Arcetri	Capri-S (Swedish)	Huancayo	Kodaikanal	Nizamiah	Ucc le
Athenes	Climax	Ikomasan	Lockheed	Ondrejov	Voroshilov
Bakou	Crimee	Irkutsk	McMath-Hulbert	Ottawa	
Bucharest	Haute-Provence	Istanbul	Mitaka	Sacramento Peak	

IONOSPHERIC EFFECTS OF SOLAR FLARES

SHORT WAVE RADIO FADEOUTS — SUDDEN PHASE ANOMALIES
SUDDEN COSMIC NOISE ABSORPTION — SUDDEN ENHANCEMENTS OF SIGNAL
SUDDEN ENHANCEMENTS OF ATMOSPHERICS — SUDDEN FREQUENCY DEVIATIONS
SOLAR NOISE BURSTS AT 18 Mc/s

FEBRUARY 1964

FEB 1964	UNIVERSAL TIME			TYPE SWF	IMPORTANCE						BUR	WIDE SPREAD INDEX	STATIONS	KNOWN FLARE
	START	END	MAX	IMP	ABS	SCNA	SEA	SPA	SES	SFD				
13	2025	2045		S 1								2	ML BO HU	
13	2105	2200									1	3	ML BO (Small noise storm)	

COMMERCE - STANDARDS - BOULDER

RIOMETER EVENTS
(Provisional)

FEBRUARY 1964

South Pole — 26 Mc/s

FEB. 1964	START UT	END UT	MAX. UT	MAX. ABSORP. db, (tenths)	NO. OF PEAKS	FEB. 1964	START UT	END UT	MAX. UT	MAX. ABSORP. db, (tenths)	NO. OF PEAKS
1	2337	0130	0035	24	2	14	0354	0724	0404	9	1
2	0856	1905	1605	9	2	14	1140	1856	1609	6	2
3	0248	1813	1541	6	1	15	0004	0202	0125	8	3
4	*					15	0712	1720	1420	8	1
5	0301	0416	0309	14	1	16	1136	1408	1227	4	1
6	0144	0346	0224	9	2	16	1636	1756	1715	4	1
6	1006	1908	1332	12	2	17	0408	0514	0412	3	1
6	2226	0010	2335	8	3	17	1023	2010	1927	7	3
7	0251	0513	0306	24	3	18	2021	2124	2048	4	1
7	1022	2033	1941	5	2	19	0345	0501	0356	5	1
8	1558	1843	1633	5	1	20	1502	1739	1532	11	1
8	2350	0116	0055	6	2	21	0427	0602	0436	12	1
9	0359	0545	0415	18	1	21	0942	1545	1059	6	1
9	0932	1651	1407	9	1	22	0030	0329	0257	10	3
9	1914	0218	0137	16	3	22	1355	1628	1458	9	2
10	1021	1726	1524	6	2	22	1928	2009	1948	3	1
11	*					23	1705	1916	1804	4	2
12	0253	0319	0303	4	1	24	1236	1614	1423	5	1
12	0622	1631	1014	7	3	25	0529	0616	0552	3	1
13	0302	2313	0332	31	4	26	0352	0429	0358	10	1
						27	**				
						28	**				
						29	**				

COMMERCE - STANDARDS - BOULDER

* No Event.
** No Data.

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

MARCH 1964

ARO - OTTAWA **2800 Mc/s**

MAR. 1964	URANE	DESCRIPTIVE TYPE	START UT	DURATION HRS. MIN.	MEAN FLUX	MAXIMUM TIME	MAXIMUM FLUX	REMARKS
16	1	Simple 1	1330	1	1.5	1330.2	3	
	4	Post Increase		1.5	0.4		0.8	
16	9	Precursor	1547	6	0.8		1.5	
	2	Simple 2 f	1553	59	280	1614	680	
	4	Post Increase		3 58	6		12	

COMMERCE - STANDARDS - BOULDER

HOURS OF OBSERVATION, JANUARY, FEBRUARY, MARCH, 1964

OBSERVING PERIOD:

January	13:20 UT - 21:00 UT
February	13:05 UT - 21:50 UT
March	12:30 UT - 22:40 UT

With the following exceptions:

(1) Observations commenced: Feb. 21 at 13:30 UT
27 at 13:40 UT
Mar. 4 at 13:45 UT
8 at 13:20 UT
10 at 13:30 UT
18 at 13:20 UT
20 at 13:15 UT
21 at 13:10 UT
24 at 13:10 UT

(2) Observations ended: Jan. 12 at 20:10 UT

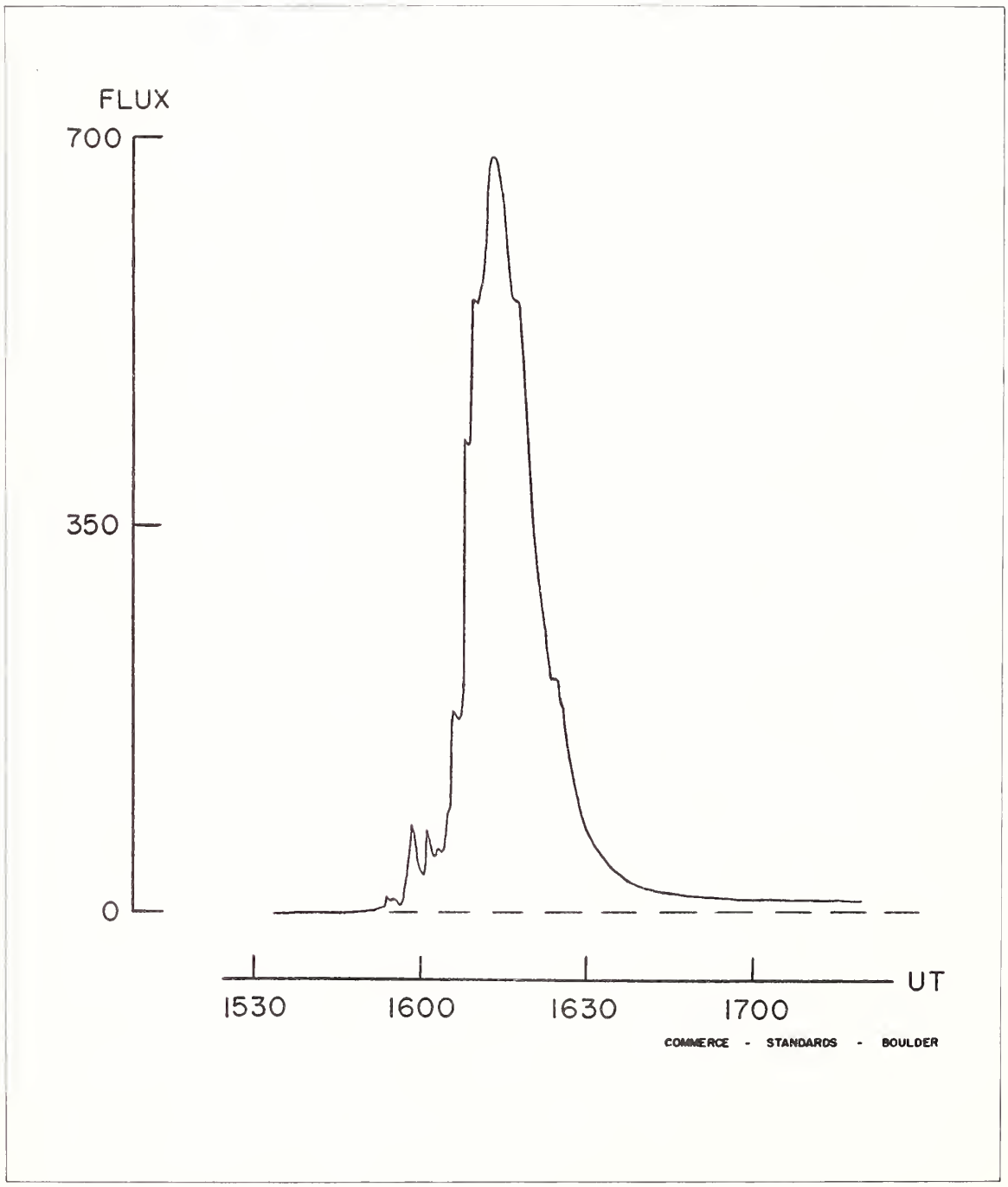
(3) Interruption of observations, approximately 20 minutes in duration, in the periods 16:00 - 17:00 UT and 20:00 - 21:00 UT daily.

(4) Interruption of observations for longer periods:
Feb. 20 14:30 - 16:30 UT
Mar. 23 14:30 - 15:15 UT
23 18:45 - 21:50 UT

SELECTED 2800 Mc/s SOLAR NOISE BURST

OTTAWA, CANADA

MARCH 16, 1964

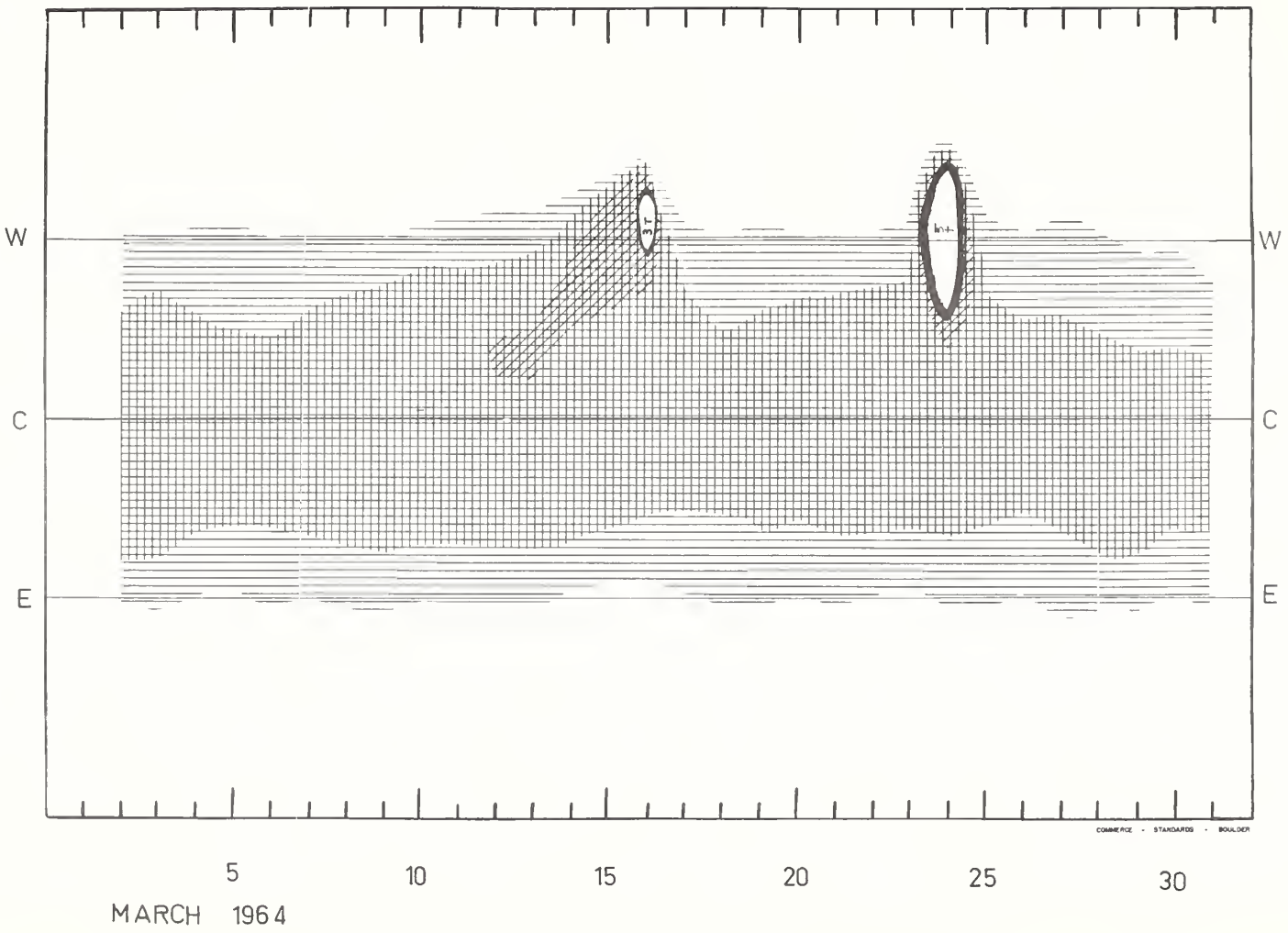


SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATIONS

MARCH 1964

NANÇAY

169 Mc/s



IVc

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

MARCH 1964

NBS BOULDER 108 Mcs

MAR. 1964	TYPE	START UT	TIME OF MAXIMUM UT	DURATION MINUTES	INTENSITY
16	6	1336		250D	1
16	9a	1557	1600	06	3
16	9b	1603	1611	76	2

COMMERCE - STANDARDS - BOULDER

NOMINAL TIMES OF OBSERVATION

MARCH 1964

NBS BOULDER 108 Mcs

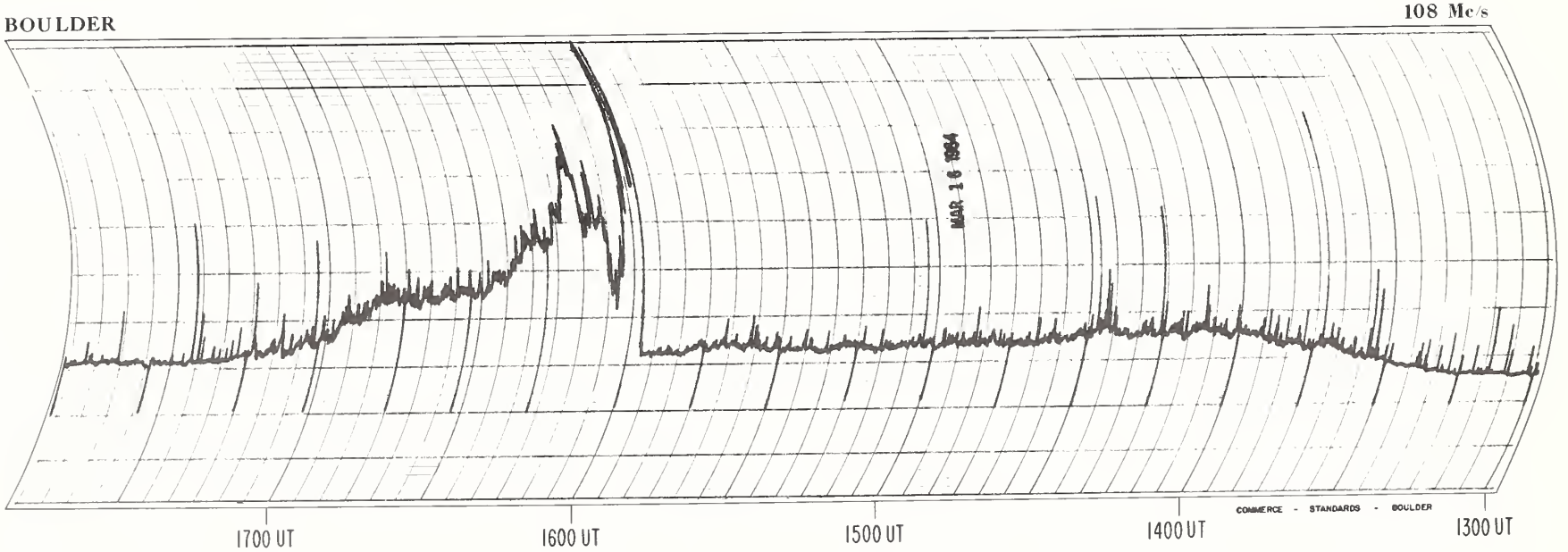
Mar. 1964	HOURS OF OBSERVATION	UT	Mar. 1964	HOURS OF OBSERVATION	UT
1	1339-0037	1451-1454; 1554-1558	16	1316-0053	
			17	1314-0054	1330-1350
2	1337-0038		18	1312-0055	1447-1457
3	1336-1634; 1728-0039		19	1311-0056	
			20	1309-0057	
4	1334-1637; 1658-1958; 2005-0040		21	1307-0058	1527-1535; 1824-1829
5	1333-0041		22	1306-0059	1423-1430
			23	1304-0100	
6	1331-0042		24	1303-0101	
7	1330-0043		25	1301-0102	
8	1328-0044	1803-1816			
9	1327-0045	1649-1652; 1700-1703	26	1259-2133; 2202-0103	
10	1325-0046		27	1258-0104	
			28	1256-0105	
11	1324-0047		29	1254-0106	
12	1322-0049		30	1253-0107	
13	1320-0050	1653-1658; 2130-2134			
			31	1251-0108	1525-1530
14	1319-0051				
15	1317-0052				

COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCE

MARCH 16, 1964



SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MARCH 1964

High Altitude Observatory
Boulder

7.6-41 Mc/s

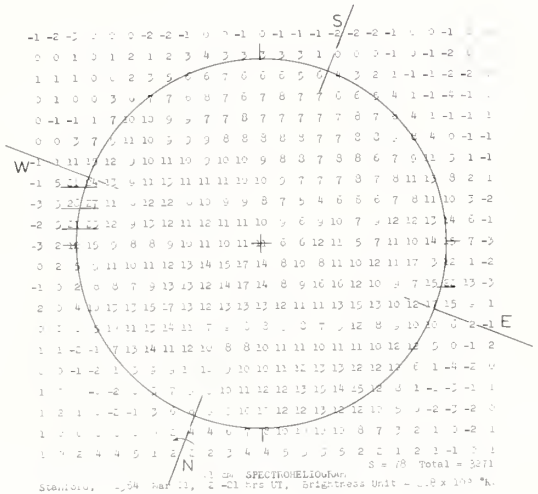
Date MAR. 1964	Bursts			Frequency Range(Mc/s)	Date MAR. 1964	Bursts			Frequency Range (Mc/s)
	Type	Time (U.T.)	Inten-sity			Type	Time (U.T.)	Inten-sity	
					Cont.				
3 Mar	No observ.	1500-1730, 1905-2220			17 Mar	III	2316:30-2316:45	1-	21-41
4	III	2221-2221:15	1-	29-38	18	No observ.	1610-2200		
5	III	1615:15-1615:45	1-	21-38	19	No observ.	1731-1910		
11	III	2221:15-2222	1+	18-41	24	III	2326:45-2327:15	1-	21-41
	III	2224-2225	1	18-41	26	III	1335:15-1335:45	1-	18-38
16	II	1557:30-1627	1	21-41	29	No observ.	1400-2400		
	IV	1604:30-1722	1+	20-41	31	III	0133:15-0133:30	1-	18-41
	III	2330:30-2331:15	1+	21-41					
17	III	2304:30-2304:45	1-	20-41					

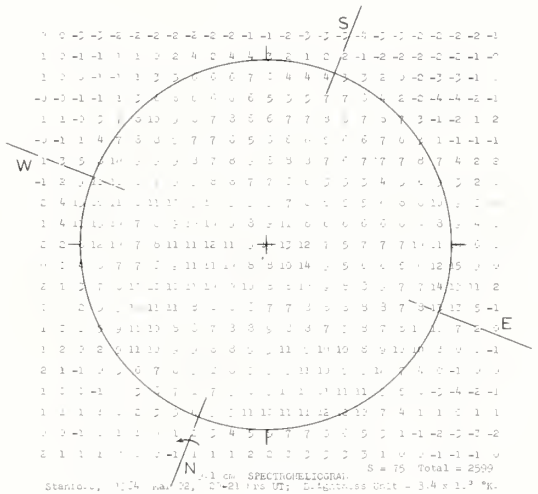
SOLAR RADIO EMISSION SPECTROHELIOGRAMS

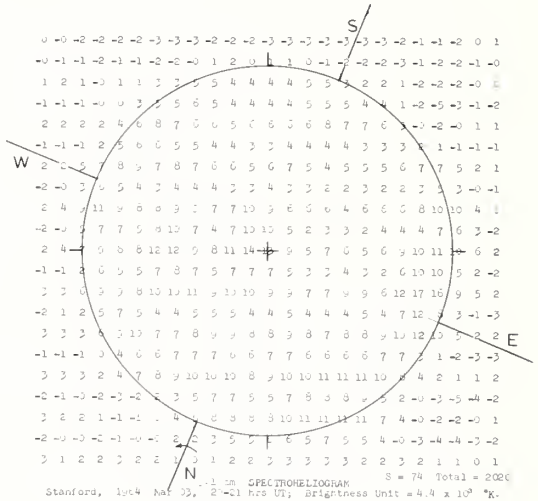
MARCH 1964

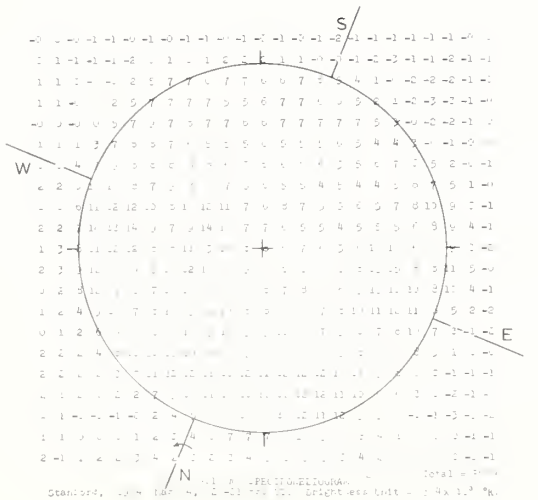
STANFORD

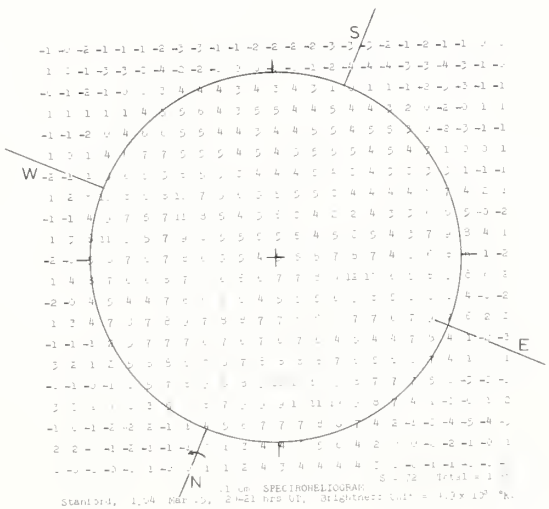
9.1 cm

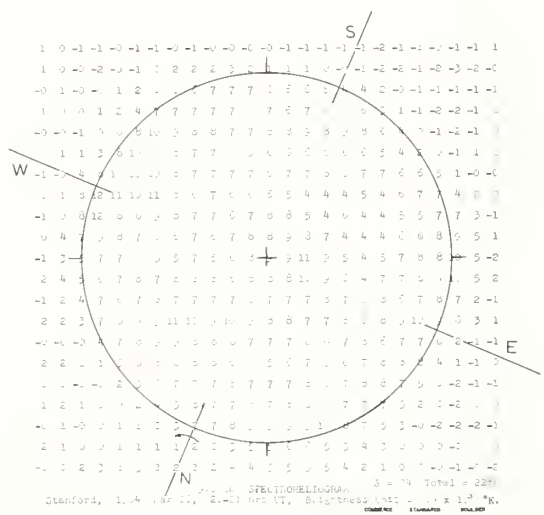












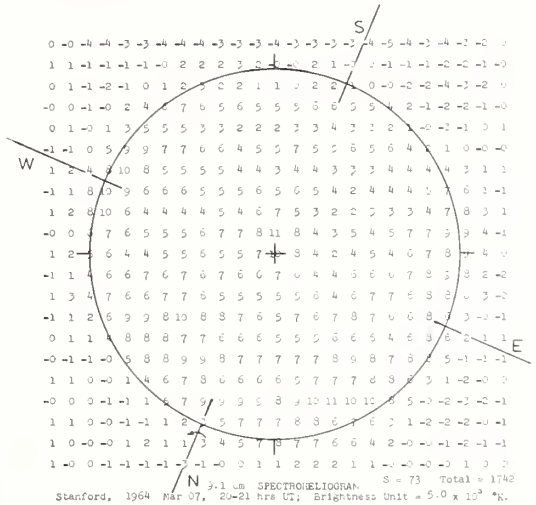
IV6

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

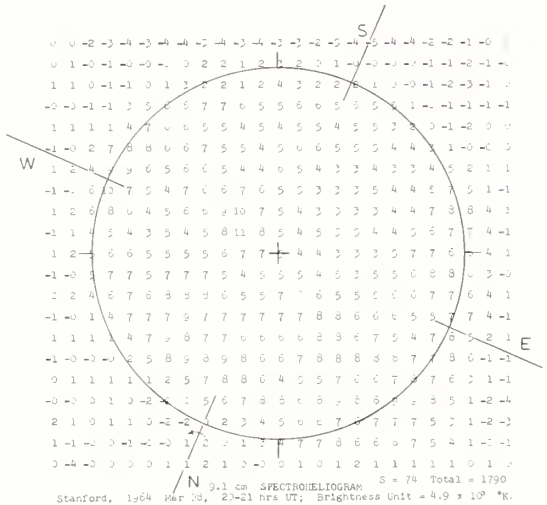
MARCH 1964

STANFORD

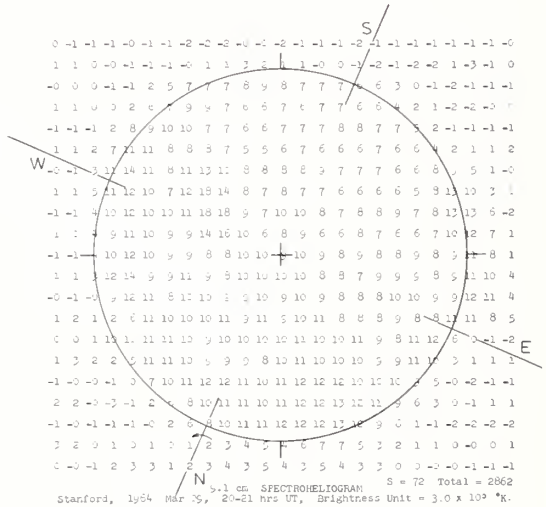
9.1 cm



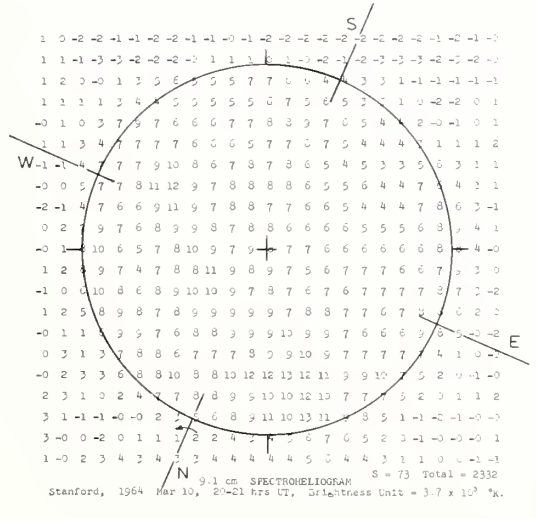
Stanford, 1964 Mar 07, 20-21 hrs UT; Brightness Unit = 5.0 x 10^3 °K.



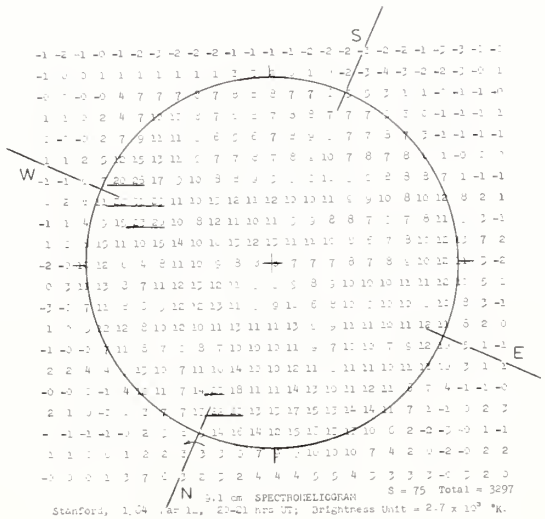
Stanford, 1964 Mar 08, 20-21 hrs UT; Brightness Unit = 4.9 x 10^3 °K.



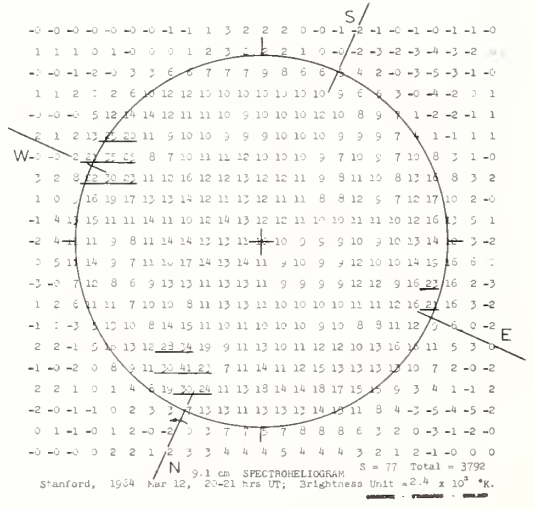
Stanford, 1964 Mar 09, 20-21 hrs UT; Brightness Unit = 3.0 x 10^3 °K.



Stanford, 1964 Mar 10, 20-21 hrs UT; Brightness Unit = 3.7 x 10^3 °K.



Stanford, 1964 Mar 11, 20-21 hrs UT; Brightness Unit = 2.7 x 10^3 °K.

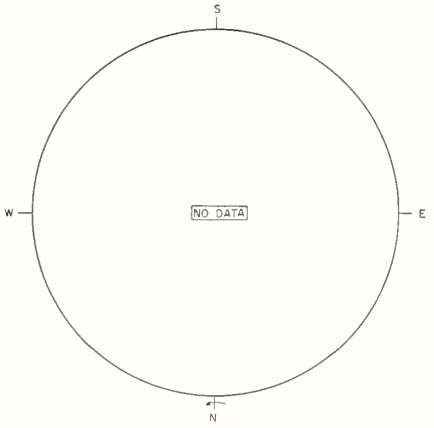


Stanford, 1964 Mar 12, 20-21 hrs UT; Brightness Unit = 2.4 x 10^3 °K.

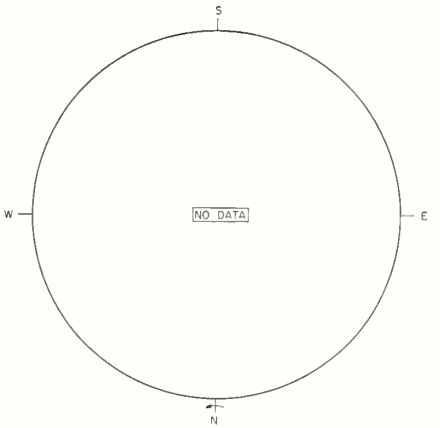
SOLAR RADIO EMISSION SPECTROHELIOGRAMS

MARCH 1964

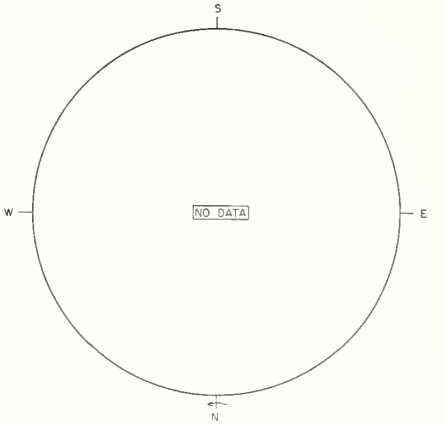
STANFORD **9.1 cm**



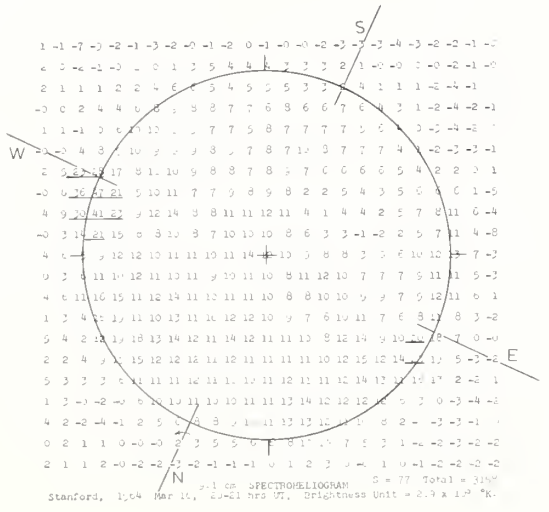
1964 MARCH 13



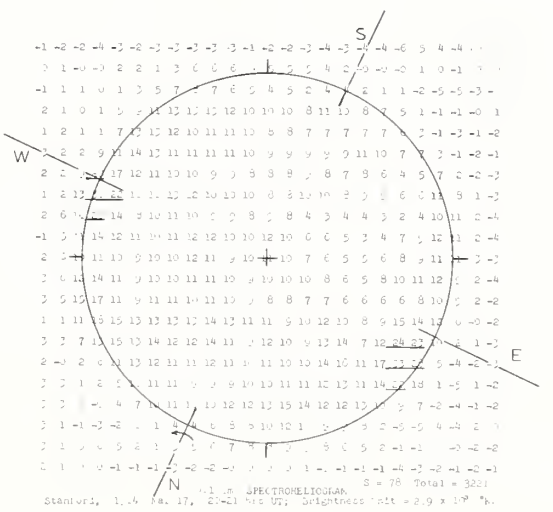
1964 MARCH 14



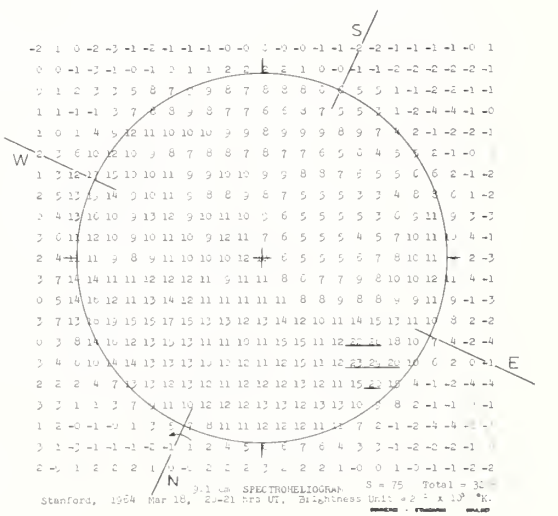
1964 MARCH 15



9.1 cm SPECTROHELIOGRAM S = 77 Total = 319
Stanford, 1964 Mar 16, 20-21 hrs UT. Brightness Unit = 2.9 x 10⁴ °K.



9.1 cm SPECTROHELIOGRAM S = 78 Total = 3221
Stanford, 1964 Mar. 17, 20-21 hrs UT. Brightness Unit = 2.9 x 10⁴ °K.



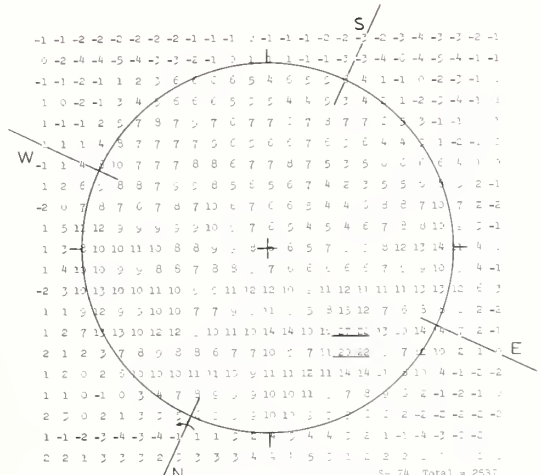
9.1 cm SPECTROHELIOGRAM S = 75 Total = 32
Stanford, 1964 Mar 18, 20-21 hrs UT. Brightness Unit = 2.9 x 10⁴ °K.

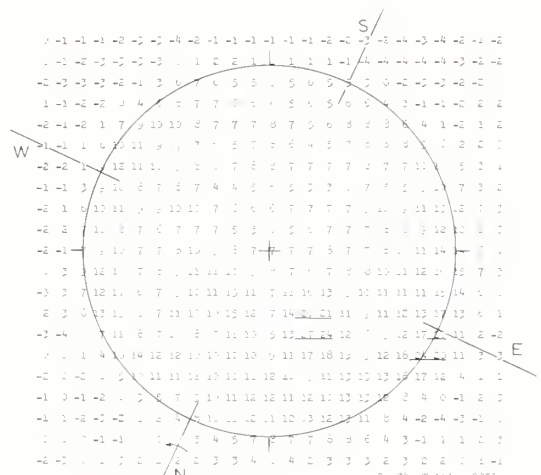
SOLAR RADIO EMISSION SPECTROHELIOGRAMS

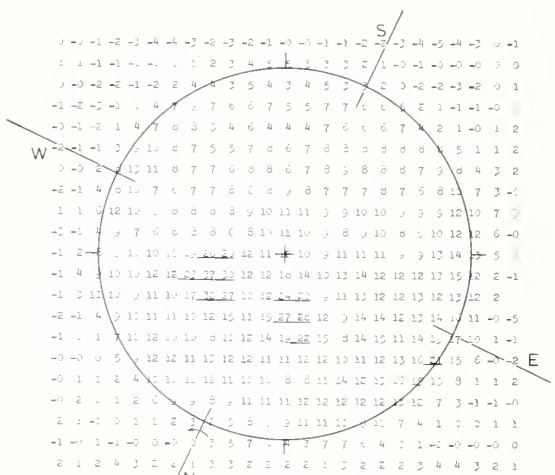
MARCH 1964

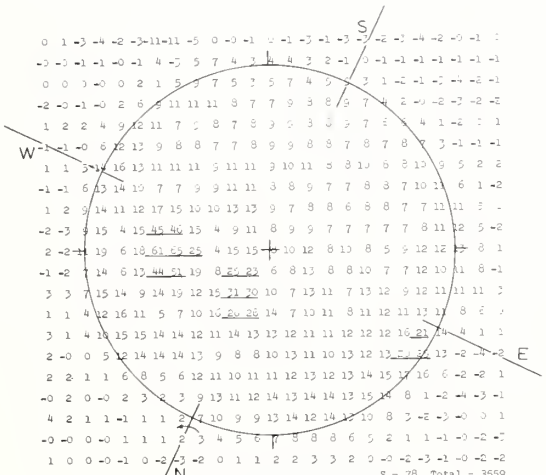
STANFORD

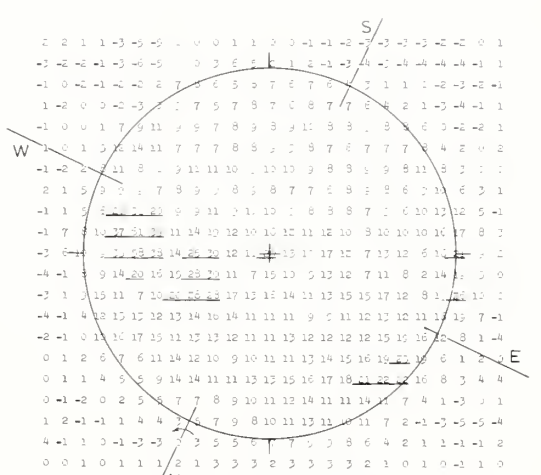
9.1 cm

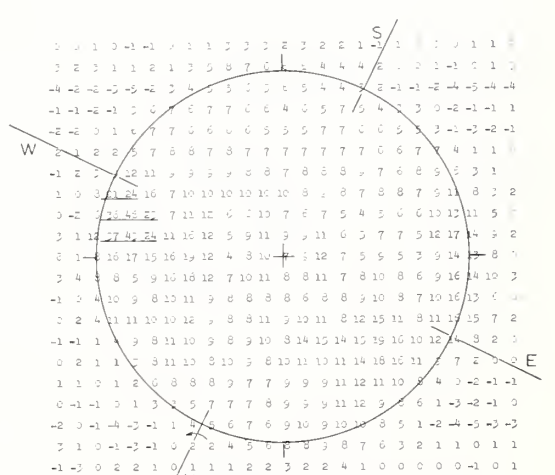










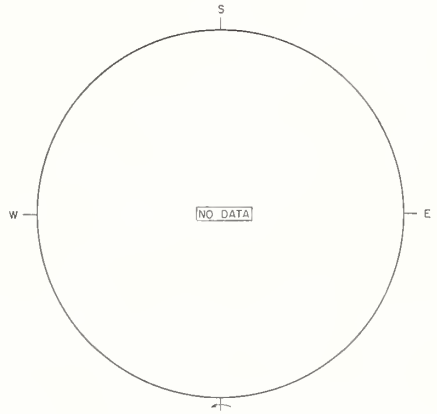


SOLAR RADIO EMISSION SPECTROHELIOGRAMS

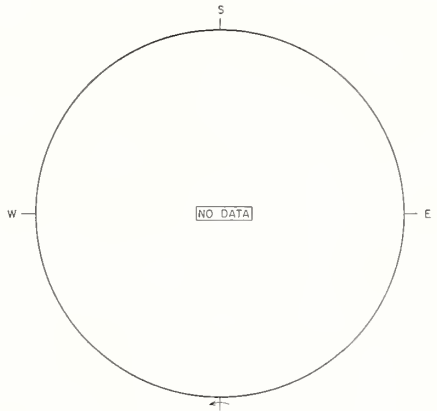
MARCH 1964

STANFORD

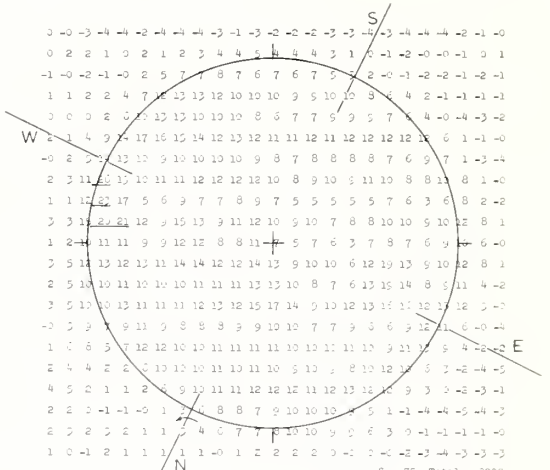
9.1 cm



1964 MARCH 25

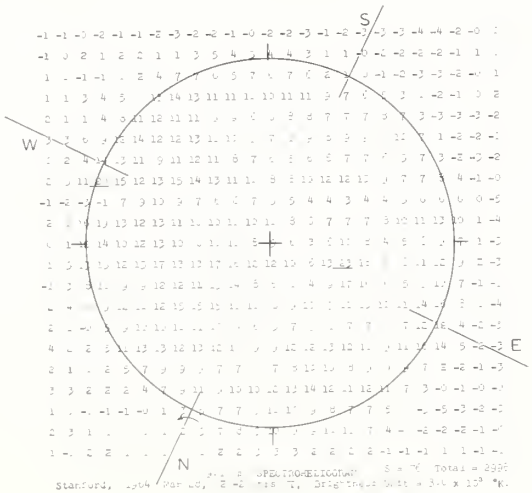


1964 MARCH 26

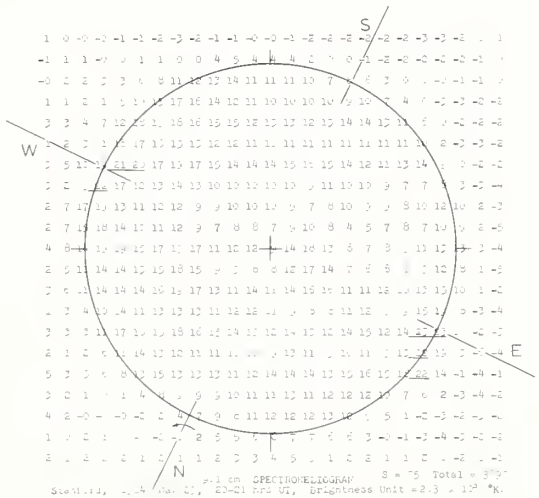


9.1 cm SPECTROHELIOGRAM S = 75 Total = 3227

Stanford, 1964 Mar 27, 22-21 hrs UT, Brightness Unit = 2.8 x 10^3 °K

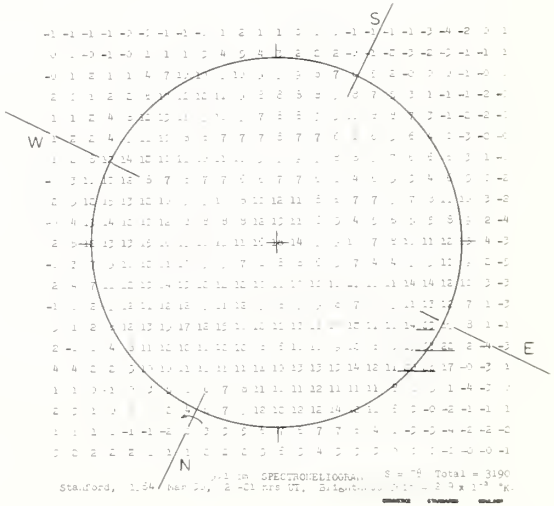


Stanford, 1964 Mar 26, 22-21 hrs UT, Brightness Unit = 3.4 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 75 Total = 3197

Stanford, 1964 Mar 25, 22-21 hrs UT, Brightness Unit = 2.3 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 78 Total = 3190

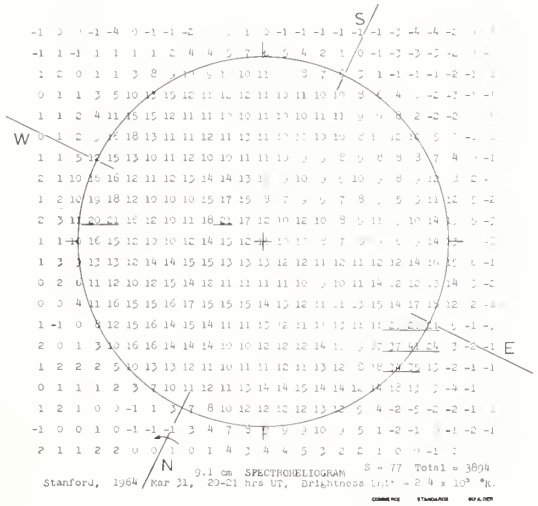
Stanford, 1964 Mar 24, 22-21 hrs UT, Brightness Unit = 2.9 x 10^3 °K.

IVE

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

MARCH 1964

STANFORD



COSMIC RAY INDICES

(Climax Neutron Monitor)

IGC Station B 305

FEBRUARY 1964

FEB. 1964	DAILY AVERAGE COUNTS / HOUR*	FEB. 1964	DAILY AVERAGE COUNTS / HOUR*
1	3213.5	16	3191.7
2	3219.2	17	3208.9
3	3228.5	18	3209.1
4	3222.5	19	3221.2
5	3226.1	20	3228.6
6	3246.5	21	3222.0
7	3244.6	22	3228.9
8	3240.1	23	3236.9 +38
9	3243.4	24	3247.5
10	3246.0	25	3246.4
11	3253.8	26	3251.7
12	3259.1	27	3250.6
13	3262.7	28	3247.4
14	3241.2	29	3248.4
15	3216.5		

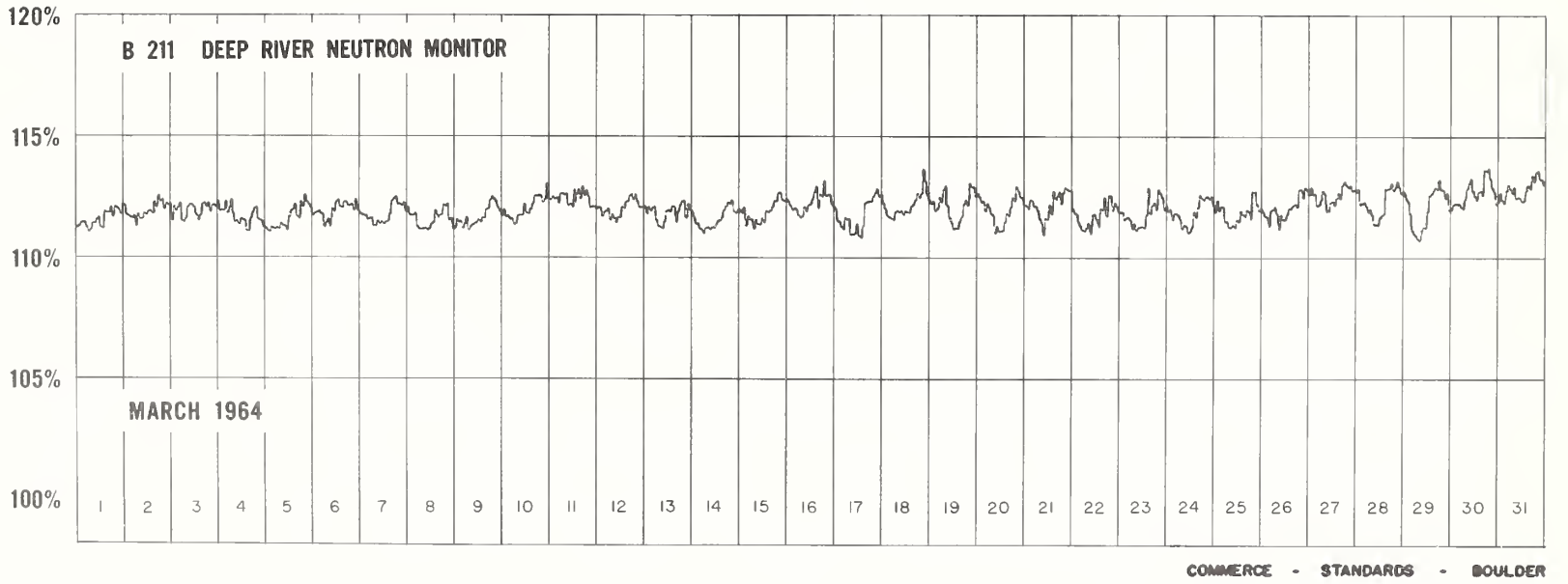
COMMERCE - STANDARDS - BOULDER

* Scaling Factor 128

\+ No. of Section Hours

COSMIC RAY INDICES

(Pressure Corrected Hourly Totals)

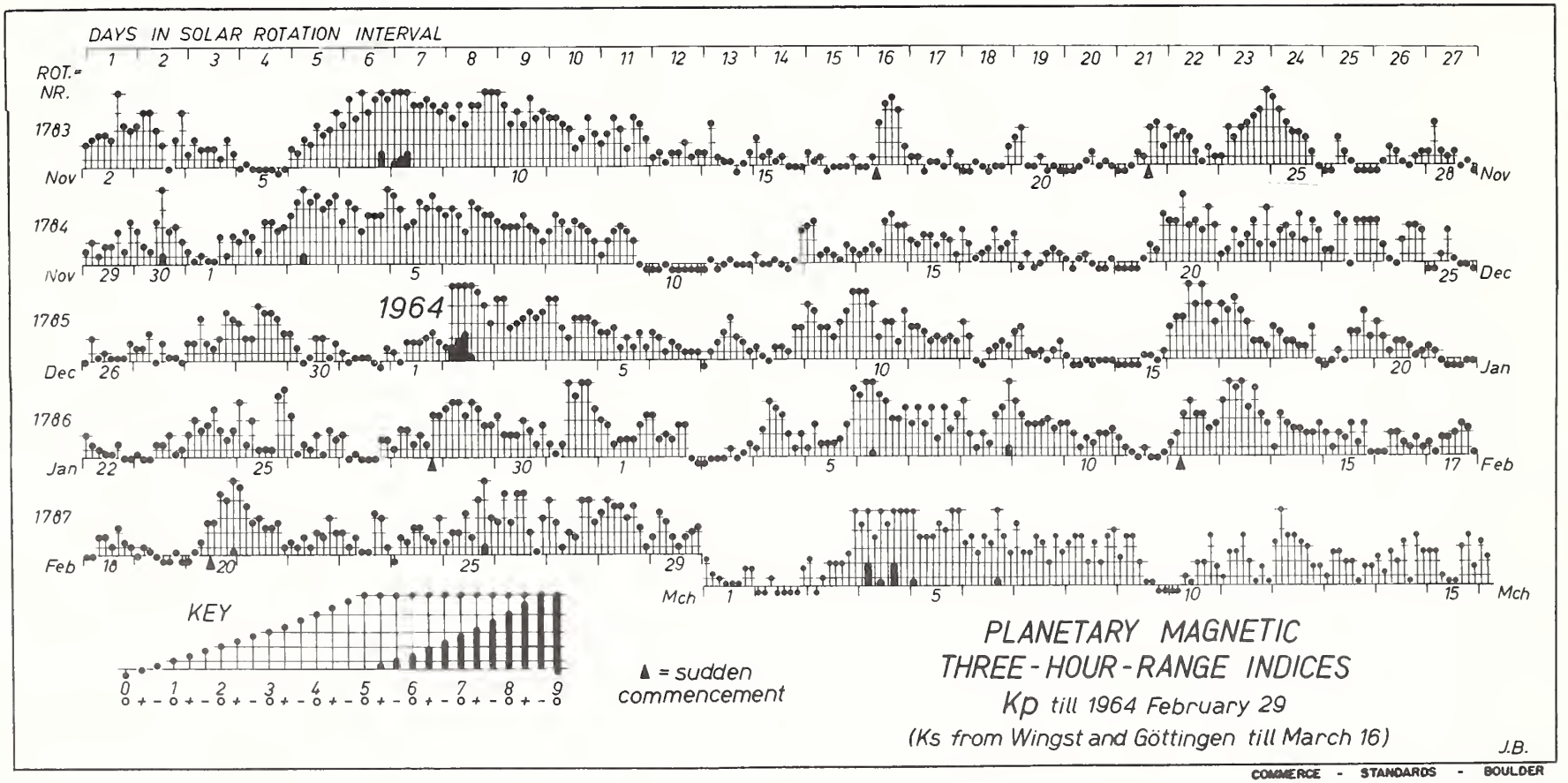


GEOMAGNETIC ACTIVITY INDICES

FEBRUARY 1964

Feb. 1964	C	Values Kp — Three hour Gr. interval 1 2 3 4	5 6 7 8	Sum	Ap	Final Selected Days
1	0.7	3o 3- 1+ 2-	2- 2- 3- 3+	18o	10	Five
2	0.4	3+ 2- 2o 2-	3- 3- 0+ 0o	14+	8	Quiet
3	0.0	0o 0+ 0+ 0+	1o 0+ 1- 1+	4+	2	
4	0.8	1o 2+ 4o 4-	3+ 2o 1o 2o	19+	12	3
5	0.9	1o 3- 1+ 1+	1+ 2- 3- 5-	17-	11	11
						16
6	1.3	4+ 5o 5+ 4+	4o 3o 3o 4-	33-	30	18
7	0.9	3- 4- 3- 4-	2- 4- 2+ 3+	24-	15	19
8	1.1	4o 2o 1o 2o	1+ 3+ 4- 6-	23o	20	
9	0.8	4o 3+ 3- 3-	3- 3o 2+ 3-	23+	15	
10	0.4	3- 2o 1o 2-	1+ 2o 2o 2+	15o	7	
11	0.0	2- 1o 1- 0+	1o 0+ 0+ 1-	6o	3	Five
12	0.8	1+ 2o 3+ 4o	3+ 3+ 2+ 3-	22+	14	Disturbed
13	1.3	4o 5o 5- 5o	4- 5- 3+ 3-	33o	32	
14	0.7	1o 3+ 3- 2+	2+ 2o 2o 3-	18+	10	6
15	0.4	2o 1o 2o 2-	3- 1+ 3- 1-	14o	7	8
						13
16	0.2	1- 1- 2o 2o	1+ 1o 2- 1o	10+	5	25
17	0.4	1+ 1- 2- 2-	2o 3- 2+ 1-	13o	6	26
18	0.3	0+ 0+ 2- 2-	1o 2+ 1+ 1o	10-	5	
19	0.0	0+ 1o 1- 0+	0o 0o 1- 0o	3o	2	
20	1.2	0o 1- 1+ 3-	3- 4+ 4o 5+	21o	18	
21	1.0	5- 4- 3- 3o	2+ 2+ 3- 1o	22+	15	Ten
22	0.5	1+ 1o 2- 1o	2o 2- 3o 2o	14-	7	Quiet
23	0.4	2o 1o 2- 1-	1- 3+ 3o 1o	13+	8	
24	0.4	0o 2- 1+ 2+	2+ 1- 1+ 3o	14-	7	3
25	1.1	1+ 2o 2o 3o	2- 4o 6- 3o	23o	19	11
						15
26	1.0	3- 4+ 3- 4+	4+ 2o 1- 3o	24o	18	16
27	0.9	4o 3- 1o 2o	2- 4o 4o 3-	23o	15	17
28	1.0	3+ 4o 4- 4-	3o 4- 2+ 1o	25-	17	18
29	0.3	2- 3+ 3- 2-	1o 2- 2o 2+	16+	8	19
						22
						23
						24
Mean:	0.66			Mean:	12	

COMMERCE - STANDARDS - BOULDER


DAYS IN SOLAR ROTATION INTERVAL
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
ROT.-NR.
1783
Nov 2 5 10 15 20 25 28 Nov
1784
Nov 29 30 1 5 10 15 20 25 Dec
1964
1785
Dec 26 30 1 5 10 15 20 Jan
1786
Jan 22 25 30 1 5 10 15 17 Feb
1787
Feb 18 20 25 29
Mch 1 5 10 15 Mch
KEY
0 1 2 3 4 5 6 7 8 9
0 + - 0 + - 0 + - 0 + - 0 + - 0 + - 0 + - 0 + - 0
▲ = sudden commencement
PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES
Kp till 1964 February 29
(Ks from Wingst and Göttingen till March 16)
J.B.
COMMERCE - STANDARDS - BOULDER

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

FEBRUARY 1964

NORTH ATLANTIC

FEB 1964	NORTH ATLANTIC 6-HOURLY QUALITY FIGURES				SHORT-TERM FORECASTS ISSUED ABOUT ONE HOUR IN ADVANCE OF:				WHOLE DAY INDEX	ADVANCE FORECASTS (J-REPORTS) FOR WHOLE DAY, ISSUED IN ADVANCE BY				GEOMAGNETIC K_{FR}	
	00 TO 06	06 TO 12	12 TO 18	18 TO 24	00	06	12	18		1-7 DAYS FINAL J_S	1-7 DAYS SQW J	1-3 DAYS	1-7 DAYS	HALF (1)	DAY (2)
01	5-	5-	6+	5+	4	4	6	5	5+	4	4			2	2
02	5o	4+	6+	6o	5	4	6	6	5+	5	5			2	1
03	5o	5+	7-	6+	5	5	7	6	6-	5	5			0	1
04	5o	5-	7-	6o	5	4	6	5	6-	5	5			3	2
05	5-	4o	7-	6o	5	5	7	6	5+	6	6			1	3
06	5+	3+	6-	6-	4	4	6	5	5o	6	6			(4)	3
07	4-	4+	6+	6-	5	4	6	6	5o	6	6			3	2
08	4+	4+	6o	6-	5	5	7	6	5+	6	6			2	3
09	4+	4o	6o	5+	4	4	7	6	5o	6	6			3	2
10	4+	4+	6+	6-	5	5	7	6	5o	5	6			2	2
11	5-	4o	6+	6+	4	5	7	6	5+	6	6			1	0
12	4+	4o	7-	6-	5	4	6	5	5+	5	5			3	2
13	5-	3+	6+	5o	4	4	6	4	5-	4	4			(5)	3
14	4+	3+	6+	6-	4	4	6	5	5o	4	4			2	1
15	5-	4+	6+	5+	5	4	6	5	5o	5	5			1	2
16	4+	4o	6o	6-	5	4	7	5	5o	5	5			1	1
17	5o	4o	7-	6-	5	4	7	6	5+	5	5			1	2
18	5o	4-	6+	6-	5	4	7	6	5+	6	6			1	1
19	5+	5-	7-	6o	5	5	7	6	6-	6	6			1	0
20	5+	4-	7-	6o	5	5	7	5	5+	6	6			1	(4)
21	5o	4o	6o	6-	5	4	6	5	5+	6	6			3	2
22	4+	4o	6+	6o	5	4	7	6	5+	6	6			2	2
23	6o	5o	7-	6+	5	5	7	6	6o	6	6			1	2
24	5+	4+	7-	6+	5	5	7	6	6-	5	5			1	2
25	6o	5-	7-	6-	5	5	6	6	6-	5	5			2	3
26	5+	4-	6-	6+	5	4	6	5	5+	5	5			3	2
27	5+	5-	6+	6+	5	5	7	6	6-	5	5			2	2
28	5o	4+	7-	6o	5	4	6	6	6-	5	5			3	3
29	5o	5-	7o	6o	5	5	7	6	6-	6	6			2	2
Score: Quiet Periods				P	15	6	17	19		9	9				
				S	6	2	12	10		20	20				
				U	0	0	0	0		0	0				
				F	0	0	0	0		0	0				
Disturbed Periods				P	2	12	0	0		0	0				
				S	6	9	0	0		0	0				
				U	0	0	0	0		0	0				
				F	0	0	0	0		0	0				

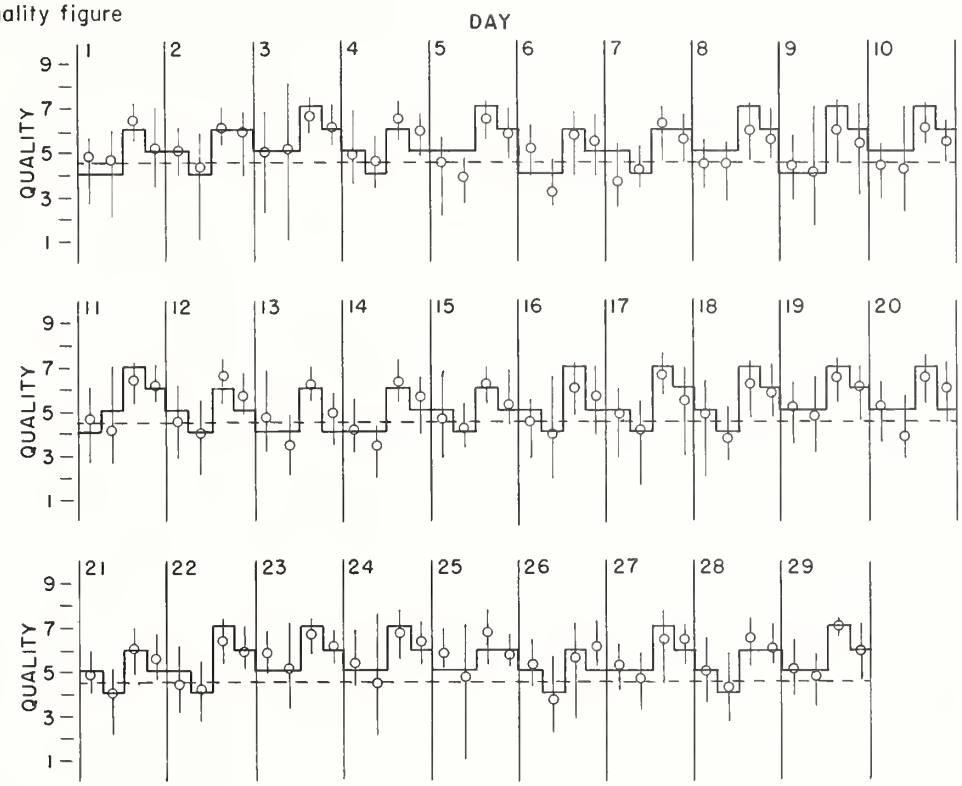
NORTH PACIFIC

FEB 1964	NORTH PACIFIC 8-HOURLY QUALITY FIGURES			SHORT-TERM FORECASTS ISSUED AT			WHOLE DAY INDEX	ADVANCE FORECASTS (J_P REPORTS) FOR WHOLE DAY, ISSUED IN ADVANCE BY				GEOMAGNETIC K_{SI}	
	03 TO 11	11 TO 19	19 TO 03	02	09	18		1-7 DAYS FINAL J_{PS}	1-7 DAYS SQW J_P	1-3 DAYS	1-7 DAYS	HALF (1)	DAY (2)
01	5	6	6	5	4	6	6	5	5			2	0
02	4	5	6	5	5	6	5	6	6			2	1
03	4	5	6	5	5	7	5	6	6			1	0
04	5	6	6	5	5	7	6	6	6			2	1
05	6	6	6	5	6	6	6	6	6			1	2
06	6	5	5	5	6	6	6	4	4			(4)	3
07	6	4	5	6	6	5	5	5	5			2	2
08	6	5	5	6	5	6	5	6	6			2	3
09	6	6	6	5	6	6	6	6	6			3	2
10	6	5	6	6	6	5	6	6	6			2	1
11	5	6	6	6	6	6	6	6	6			1	0
12	5	5	6	6	6	6	5	5	5			2	2
13	7	4	5	5	6	5	6	5	5			(4)	3
14	5	4	6	5	5	6	5	5	5			2	2
15	5	5	6	5	6	6	6	5	5			1	1
16	6	6	7	6	6	7	7	6	6			2	1
17	6	6	7	6	7	7	7	6	6			2	1
18	6	6	7	6	7	7	7	6	6			1	1
19	6	6	6	7	7	7	7	6	6			0	0
20	6	5	6	7	7	6	6	7	7			0	3
21	6	6	6	5	5	6	6	7	7			3	1
22	7	6	6	6	6	7	7	6	6			1	2
23	7	6	6	6	6	7	7	6	6			1	1
24	7	6	6	6	6	6	7	6	6			0	2
25	7	6	6	6	7	6	7	5	5			1	3
26	7	6	6	7	6	7	7	5	5			(4)	2
27	7	6	6	7	6	7	7	7	7			2	2
28	7	6	6	7	7	6	7	6	6			(4)	2
29	7	6	6	7	7	7	7	6	6			2	1
				14	12	19		10					
				12	12	10		16					
				1	1	0		2					
				0	1	0		1					
				0	0	0		0					
				2	1	0		0					
				0	0	0		0					
				0	2	0		0					

NORTH ATLANTIC

FEBRUARY 1964

—Short-term forecost
° Quality figure
I Range of reports



Outcome of advance forecasts-- final estimates (1 to 7 days ahead)

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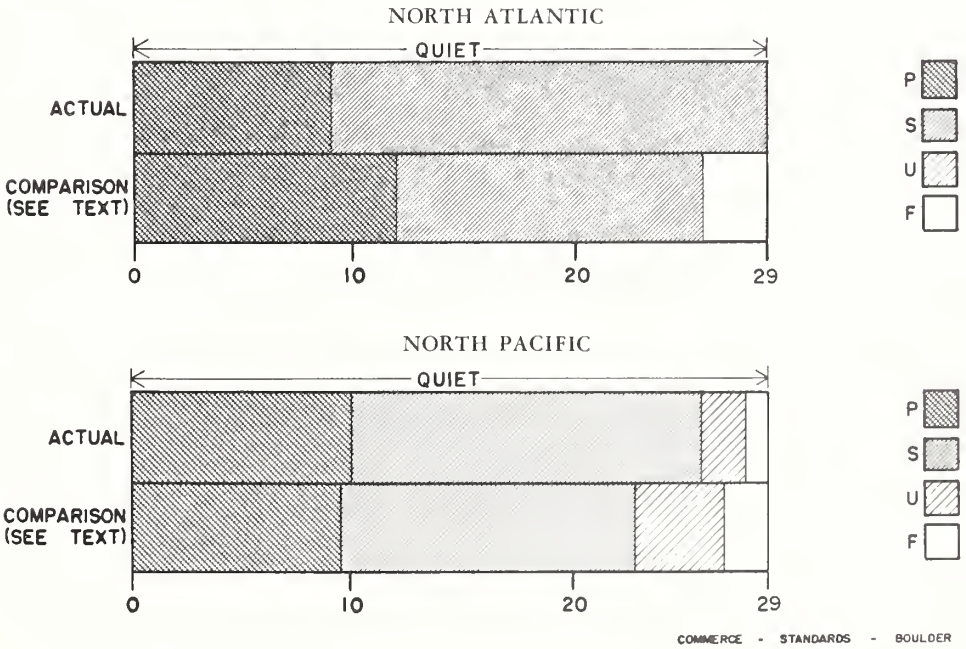

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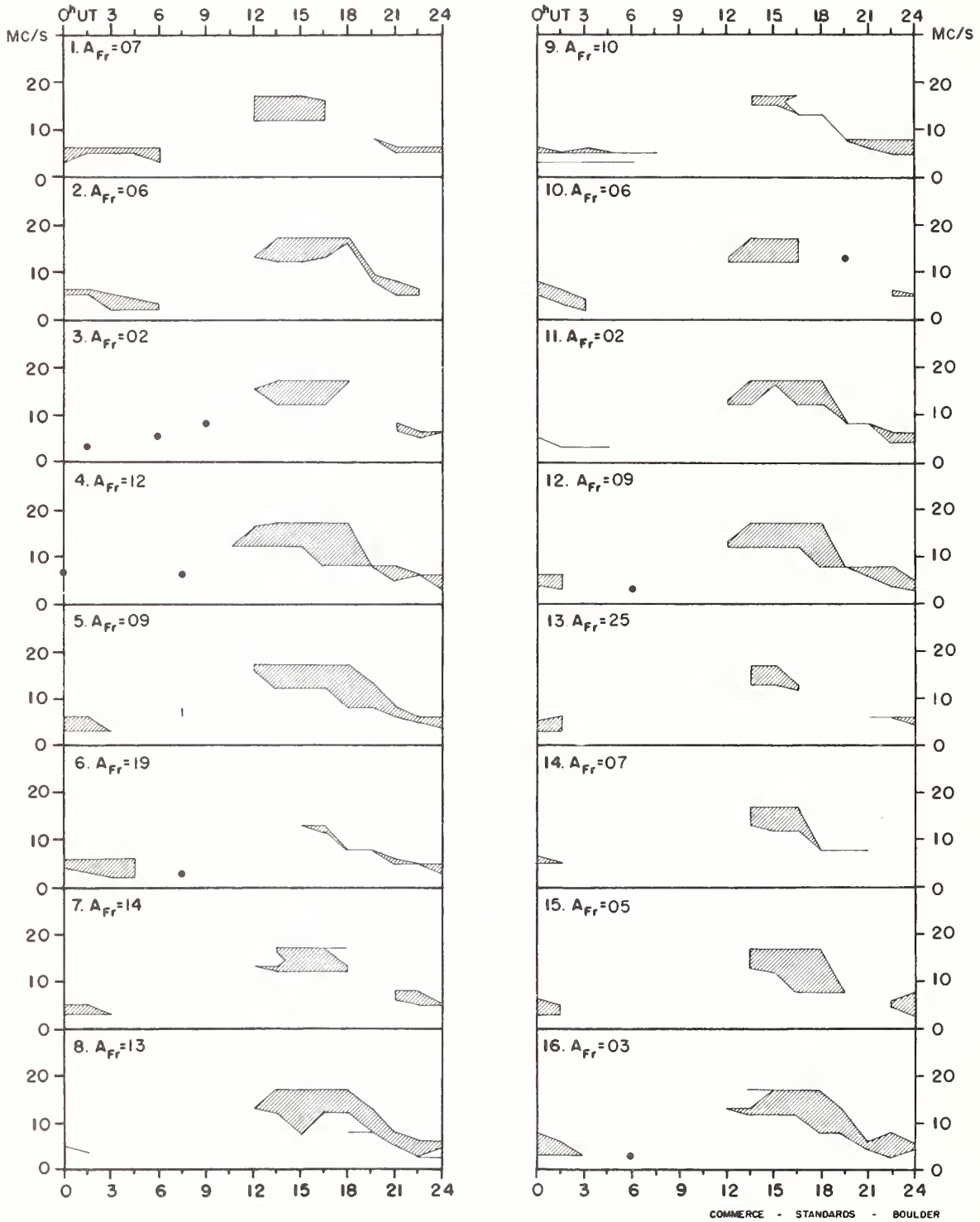
FEBRUARY 1964



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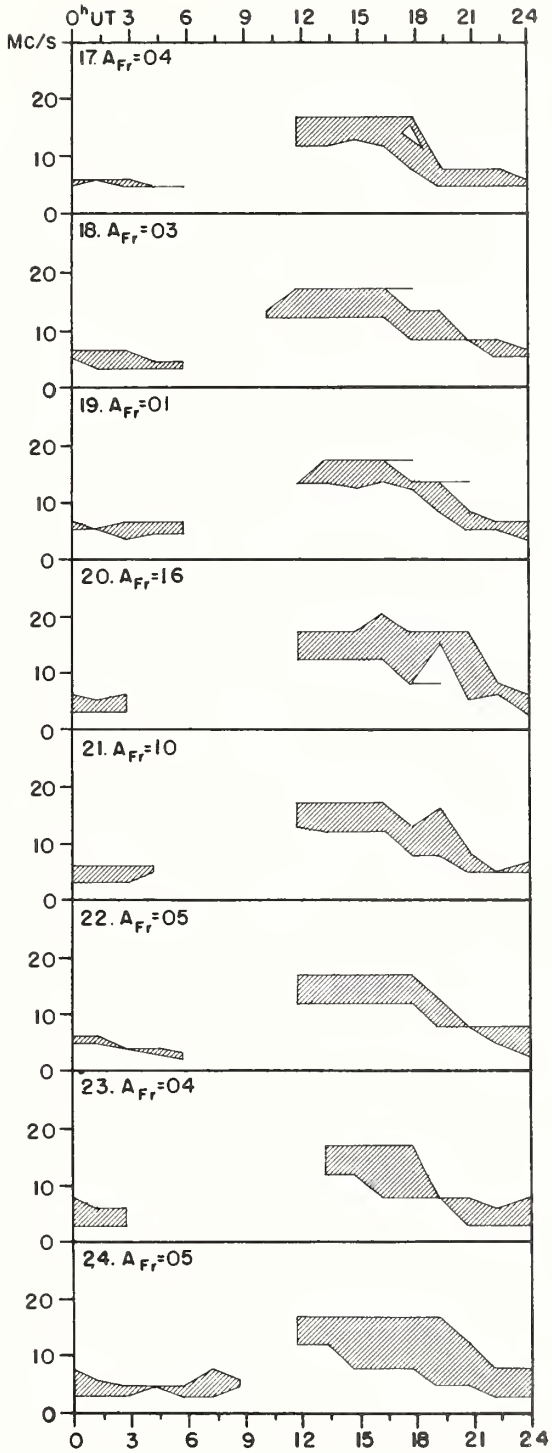
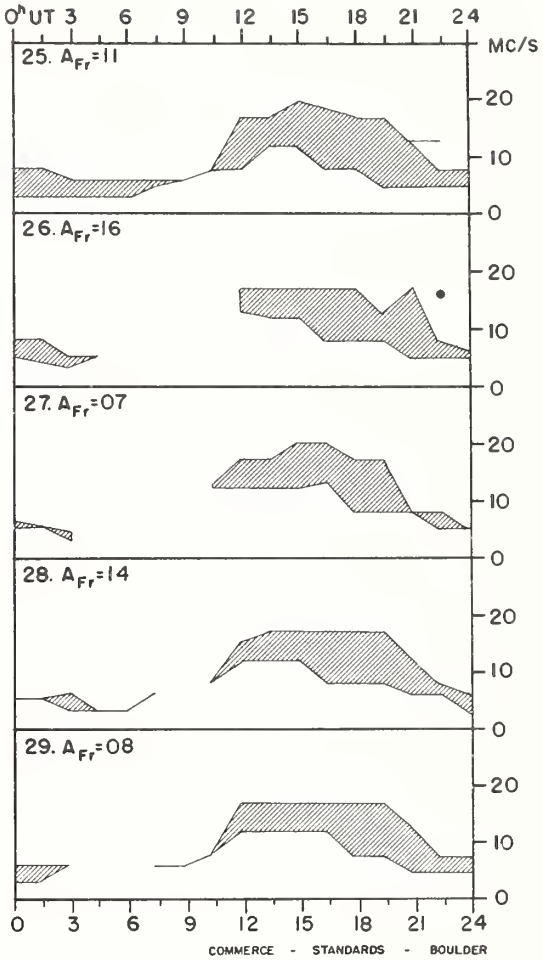
FEBRUARY 1964





Adapted from Observations by Deutsches Bundespost

IQSY ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

MARCH 1964

MAR. 1964	TIME OF ISSUE UT	ADVANCE GEOPHYSICAL ALERT	WORLDWIDE GEOPHYSICAL ALERT			
			NO.	TYPE	TIMING	ELABORATION
3	0400		39	Strat Warming	(Exists)(1)	Over Baffin Island moving Greenland
4	0400		40	Strat Warming	Exists	Over Baffin Bay moving Greenland
4	1810	Ft. Belvoir, Magnetic Storm 3/21XXZ				
5	0400		41	Strat Warming Magnetic Storm	Exists Exists	Stationary over Baffin Bay
6	0400		42	Strat Warming	Exists	Over Baffin Bay moving Greenland
7	0400		43	Strat Warming	Exists	Northern Greenland moving Poleward
8	0400		44	Strat Warming	Exists	Northern Greenland moving Poleward
9	0400		45	Strat Warming	Exists	Northern Greenland moving Poleward
10	0400		46	Strat Warming	Exists	Polar Region
11	0400		47	Strat Warming Magnetic Storm	Exists Expected	Polar Region
12	0400		48	Strat Warming	(Exists)(1)	Stable near Pole New Warm Genter over Eurasia
13	0400		49	Strat Warming	Exists	Stable Warm Center Pole Active Warm Genter Eurasia
14	0400		50	Strat Warming	Exists	Stable Warm Genter Pole Active Warm Genter Eurasia
15	0400		51	Strat Warming	Exists	Warm Genters Northern Greenland Stationary and Eurasia moving East
16	0400		52	Strat Warming	Exists	Stationary Warm Center over Northern Greenland
16	1715	McMath, Solar Flare 16/1550 Z				
17	0400		53	Strat Warming Solar Activity Magnetic Storm	Exists Exists Expected	Stationary near Pole
18	0400		54	Strat Warming Solar Activity Magnetic Storm	Ends Exists Expected	Girculation Ghanges in Progress
19	0400		55	Magnetic Storm	Expected	
21	1720	Huancayo, Solar Flare 21/1525 Z				
22	0400		56	Solar Activity	Exists	New Region
30	0400		57	Magnetic Storm	Expected	
31	0400		58	Magnetic Storm	Expected	

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(1) (Exists): The word exists did not actually appear on the telegraphic alert message but was implied by the message.