

PART B
SOLAR - GEOPHYSICAL DATA

ISSUED
APRIL 1964

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

SOLAR - GEOPHYSICAL DATA

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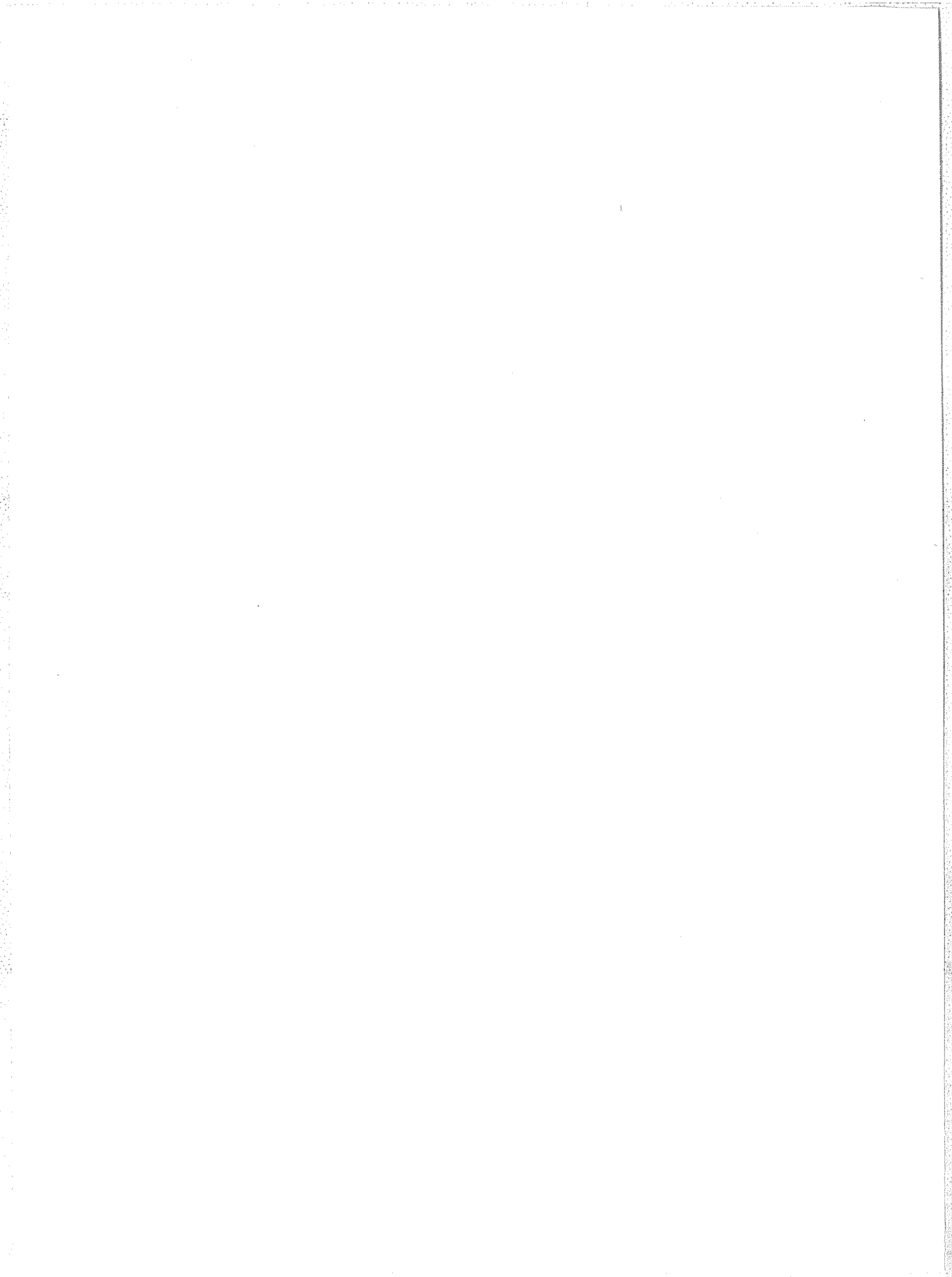
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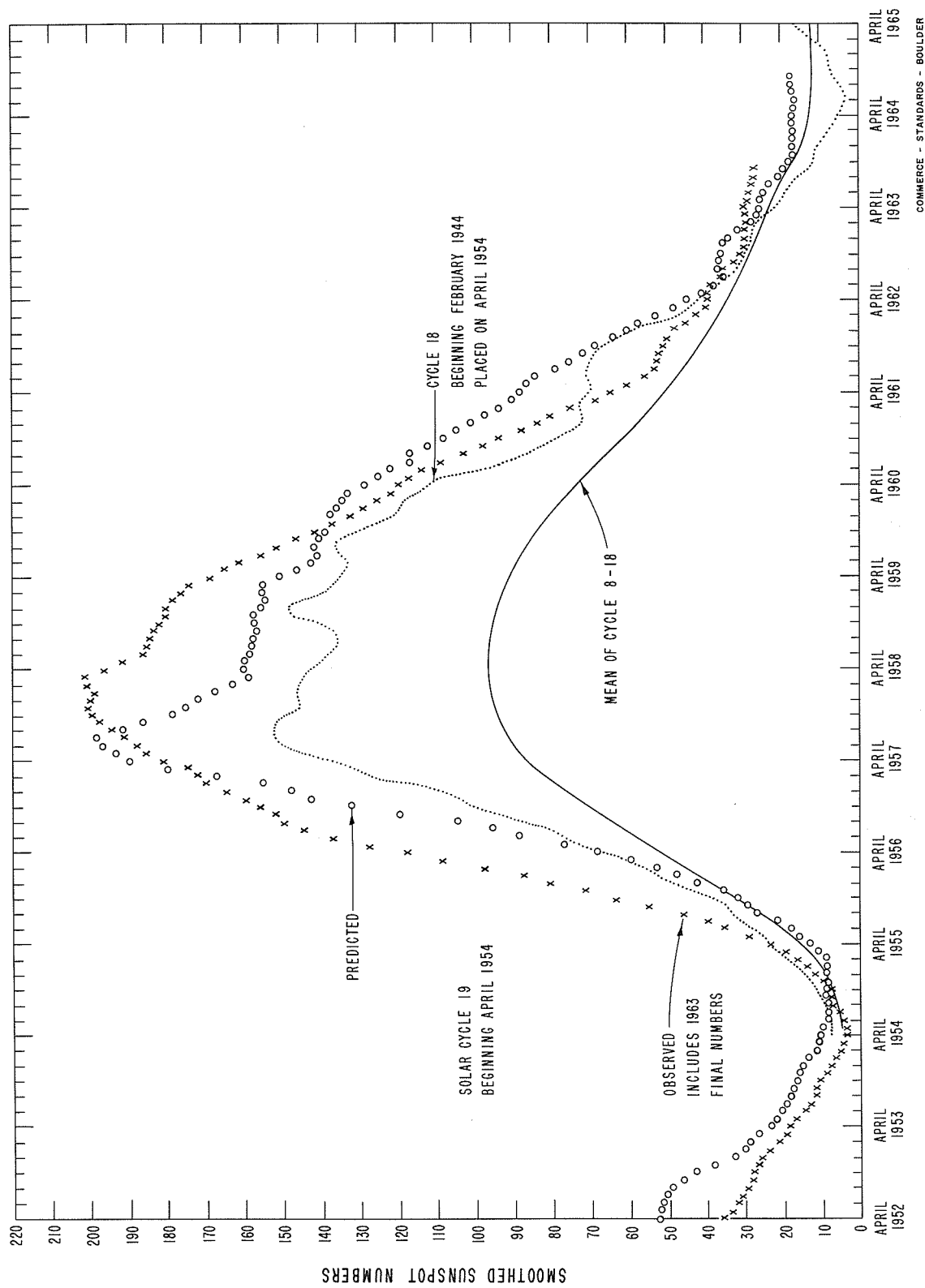


The descriptive text was republished November 1963.

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



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 (ROTA- TIONS)	DATE FIRST SEEN (1)	DURA- TION (DAYS) (1)	CMP VALUES		HISTORY
				AREA	INT.					AREA	COUNT	
01.6	NO7	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	NO4	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	NO2	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	NO7	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	NO7	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

IIb

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^* $\beta\alpha$	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 $\beta\gamma$	29	1705	S09	E13	αp
14	1820	N04 N43	W47 W38	β αp^{**}	30	1725	S10	E03	αf
15-16	No Obs.				31	1705	S10	W11	αf

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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	16	11	10	15
4	x	x	x	x	x	x	x	x	9	12	13	16	12	18	12	14
5	4a	9a	36a	43a	4a	9a	32a	60a	4	7	11	12	9	9	12	16
6	9	14	13	16	7	12	11	15	9	22	x	x	6	6	x	x
7	8	11	25	28	7	14	30	41	19	53	19	38	11	11	7	8
8	11	15	28	36	13	39	47	84	12	27	21	32	10	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	76	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	22	22	8	16
14	x	x	x	x	x	x	x	x	4	6	10	11	8	8	10	12
15	x	x	x	x	x	x	x	x	5	6	13	16	12	12	9	10
16	x	x	x	x	x	x	x	x	8	12	9	12	11	11	8	10
17	12	18	13	19	10	21	10	12	3	4	9	10	3	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	63	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	68	68	13	18
22	18	32	17	32	3	3	15	16	6	17	9	9	50	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	OBSERVED UNIVERSAL TIME		MAX. PHASE	LOCATION			DURATION MINUTES	IM. FOR. TANCE	OBS. COND.	MEASUREMENTS			PROVISIONAL IONOSPHERIC EFFECT
		START	END		APPROX. LAT.	APPROX. LONG.	APPROX. REGION				MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Ha	
LOCKHEED	01	0110	0640	NO FLARE	PATROL									
	01	1325	1340	NO FLARE	PATROL									
	01	1440	1445	NO FLARE	PATROL									
	01	2010	2025	2014	N08 W90				1-	2		1.00		10
SAC PEAK	02	0100	0145	NO FLARE	PATROL									
	02	0230	0255	NO FLARE	PATROL									
	02	0520	0620	NO FLARE	PATROL									
	02	1516 E	1533 D	1523	N29 W34				1-	C		0.68		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									
MANILA	03	0820	0845	NO FLARE	PATROL									
	03	0930	1540	NO FLARE	PATROL									
	03	1545	1555	NO FLARE	PATROL									
	03	2220	2355	NO FLARE	PATROL									
	04	0010	0040	NO FLARE	PATROL									
	04	0120	0315	NO FLARE	PATROL									
	04	0257 E	0314	NO FLARE	S20 W34							0.50		
	04	0330	0520	NO FLARE	PATROL									
MANILA	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	NO FLARE	S03 E21									
	05	0920	0925	NO FLARE	PATROL							0.20		
UCCLE LOCKHEED	05	1020	1100	NO FLARE	PATROL									
	05	1115 E	1124 D	NO FLARE	N10 W25									
	05	1800	1823	1810	N07 W63							0.20		10
	06	0840	0845	NO FLARE	PATROL									
UCCLE UCCLE MCMATH MCMATH	06	0950	1020	NO FLARE	PATROL									
	06	1457	1501 D	NO FLARE	N10 W76									
	06	1600 E	1604 D	NO FLARE	N10 W76									
	06	1633	1654	NO FLARE	N08 W75							0.20		0.80
MANILA	06	1907	1922	1912	S10 E03							0.40		0.40
	07	0120	0240	NO FLARE	PATROL									
	07	0330	0500	NO FLARE	PATROL									
	07	0530	0555	NO FLARE	PATROL									
UCCLE	07	0705 E	0754	0708	N08 W80							0.50		1.25
	07	0840	0900	NO FLARE	PATROL									
UCCLE	07	0910	0940	NO FLARE	PATROL									
	07	1035	1040	NO FLARE	PATROL									
	07	1146	1148	NO FLARE	N11 E42									
	07	1245	1310	NO FLARE	PATROL									
	07	1315	1335	NO FLARE	PATROL									

SOLAR FLARES

MARCH 1964

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME		LOCATION			DURA- TION — MINUTES	IM- POR- TANCE	OBS. COND.	TIME — U T	MEASUREMENTS			PROVISIONAL IONOSPHERIC EFFECT
		START	END	APPROX. LAT.	APPROX. MER. DIST.	MCMATH FLARE REGION					NEAS AREA Sq. Deg.	CORE AREA Sq. Deg.	MAX WIDTH Hc	
MAR 1964														
	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	NO FLARE		S08 W22								
LOCKHEED	09	2334	2400	2344		N13 E03		1- 1-	2	2344	.20	.20		10
	10	0105	0520	NO FLARE		PATROL								
	10	0630	0710	NO FLARE		PATROL								
UCCLE	10	1007 E	1012	NO FLARE		N26 W78								
UCCLE	10	1026	1031			N26 W78								
UCCLE	10	1114	1121			N26 W78								
	10	1205	1325	NO FLARE		PATROL								
LOCKHEED	10	1936	1942	1938		S38 W02				1938	.30	.30		10
LOCKHEED	10	2030	2100	2042		N25 W85				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	NO FLARE		N44 E10								
MANILA	11	0830 E	0847	0834		N42 E15		U	2	0834	.33	.36		
UCCLE	11	0853	0905			N44 E10								
ARCETRI	11	0957 E	1010 D			N44 E07				1010	1.21	1.86		
UCCLE	11	0959	1007			S03 W50								
	11	1015	1025	NO FLARE		PATROL								
	11	1037	1057			N44 E10								
UCCLE	11	1125	1130	NO FLARE		PATROL								
	11	1151	1156			N44 E10								
UCCLE	11	1301	1311			N44 E10								
UCCLE	11	1645	1659	1649		N22 W71				1649	.20	.50		10
LOCKHEED	11	1738	1830 D	1738		S05 W50				1738	.50	.85		
MCMATH	11	1733	1746	1740		S05 W48	7178			1740	.70	.85		
OTTAWA	11	1918	1945	1918		S03 W50				1918	.30	.30		10
LOCKHEED	11	1914	2000 D	1916		S05 W50	7178			1916	.50	.80		
MCMATH	11	2013	2100 D	2017		S05 W50				2017	.50	.80		
MCMATH	11	2115 E	2135 D	2120		S05 W50	7178			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								
	12	0954 E	1044 D			N41 W02	7180							
WENDEL	12	1513 E	1527 D	1516		N41 W12	7180			1514	1.40	2.10		18
CAPRI-S	12	1514 E	1526 D			N42 W09				1514	.62	.76		
SAC PEAK	12	1515 E				N43 W09	7180			1515	1.00	1.60		
MCMATH	12	1515 E												

G-SWF

SOLAR FLARES

MARCH 1964

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME		LOCATION		MATH PLAGE REGION	DURATION MINUTES	IN. POR. TANGE	OBS. COND.	MEASUREMENTS			PROVISIONAL IONOSPHERIC EFFECT
		START	END	MAX. PHASE	APPROX. LAT.					MER. DIST.	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	
SAC PEAK SAC PEAK MCMATH	MAR 1964	12 2132 E	2158 D	2135	N42 W13	7180	1-	C		.56	.68	18	S-SWF
		12 2138 E	2143 D	2143	N43 W13								
MCMATH SAC PEAK	13	0055	0105		PATROL	7180	1-	C		.40	.60	17	S-SWF
		0120	0745		PATROL								
		0935	1005		PATROL								
		1015	1150		PATROL								
		1331	1342		N43 W22								
ARCETRI	14	0105	0655		PATROL	7182	1	C		1.44	2.00		
		0725	0815		PATROL								
MCMATH SAC PEAK	15	2027	2036 D	2030	N05 W62	7182	1-	C		.50	1.10	96	S-SWF
		2108 E	2130 D		N04 W62								
		2239 E	2255 D	2244	N04 W66								
		0150	0530		PATROL								
		0446	0458		N03 W68								
MITAKA MANILA UCCLE MANILA UCCLE UCCLE UCCLE ARCETRI ONDREJOV ONDREJOV UCCLE ARCETRI HTE-PROVEN NERA OTTAWA MCMATH MCMATH HUANCAYO UCCLE SAC PEAK LOCKHEED	16	0555	0616	0603	N04 W57	7182	1-	C		1.00	2.30	96	S-SWF
		0832 E	0847		N03 W73								
		0901	0913 D	0840	N05 W58								
		1018	1026		N04 W73								
		1046	1049		N04 W73								
ONDREJOV ONDREJOV UCCLE ARCETRI HTE-PROVEN NERA OTTAWA MCMATH MCMATH HUANCAYO UCCLE SAC PEAK LOCKHEED	16	1125 E	1158 D		N05 W70	7182	1-	C		1.05	2.39	96	S-SWF
		1154	1209		N04 W70								
		1214 E	1226		N02 W69								
		1331	1339		N02 W77								
		1405 E	1425 D		N05 W70								
MCMATH MCMATH HUANCAYO UCCLE SAC PEAK LOCKHEED	16	1553 E	1645 D		N06 W75	7182	2	C		.69	1.57	96	S-SWF
		1555	1700	1600	N03 W73								
		1611	1645	1611	N05 W75								
		1604 E	1628	1608	N04 W74								
		1618 E	1640 D		N08 W75								
OTTAWA	17	2329 E	2335 D	2331	N03 W85	7182	1	C		1.30	3.60	20	S-SWF
		2330	2336	2333	N01 W85								
		1805	1809	1807	N10 E64								
		1807	1807										
		1807	1807										

COMMERCE - STANDARDS - BOULDER

SOLAR FLARES

MARCH 1964

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME		MAX PHASE	LOCATION		DURA-TION MINUTES	IM. POP. TANCE	OBS. COND.	TIME U T	MEASUREMENTS		MAX. WIDTH H _α	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT		
		START	END		APPROX. LAT. MER. DIST.	MCMATH PLACE REGION					MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.					
OTTAWA	MAR 1964	17	1806	1821	1809	S03 E06		1-	C	1809	.19	.19					
		17	1910	1950	NO FLARE	PATROL											
		17	2135	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											
		19	1655 E	1728 D	1704	N09 E34			1-	P	1717	.27	.29		16		
		19	1700	1726	1717	N14 E43			1-	C	1714	.9	.10				
		19	1700	1750	1714	N10 E36	7187		1-	1		.30	.40				
		OTTAWA LOCKHEED	20	0300	0330	0330	NO FLARE	PATROL		1-	C	1700	.12	.12		20	
				0400	0500	0500	NO FLARE	PATROL		1	2	2042	.40	2.00			
				0530	0615	0615	NO FLARE	PATROL									
0900	1015			1015	NO FLARE	PATROL											
1025	1050			1050	NO FLARE	PATROL											
CAPRI-S HUANCAYO MCMATH	21	1300 E	1402 D	1540	N09 W11	7189		1	1	1300	1.50	1.60					
		1524 E	1608	1608	N09 W12	7189		1	V								
		1835 E	1845 D	1845 D	S11 E53	7188		1-	2	1836	.20	.30					
		0147 E	0206	0152	N08 W19			1-	2	0152	.33	.33					
		0338 E	0345	0340	N09 W20			1-	2	0340	.13	.13					
MANILA	22	0420	0520	0516	NO FLARE	PATROL		1-	2	0516	.25	.25			G-SWF		
		0514	0539	0516	N08 W23			1-	2	0516	.25	.25					
		0549	0554	0551	N09 W22			1-	2	0551	.25	.25					
		0643 E	0658	0646	N08 W21			1-	2	0646	.25	.25			G-SWF		
		0745	0925	0925	NO FLARE	PATROL		1-	2	0947	.65	.73					
ARCETRI	22	0947 E	0950 D	0950 D	N08 W23			1-									
		1000	1015	1015	NO FLARE	PATROL											
		1130	1150	1150	NO FLARE	PATROL											
		1200	1230	1230	NO FLARE	PATROL											
		1201	1218 D	1218 D	NO FLARE	PATROL		1-	1								
CAPRI-S	22	1300	1310	1310	NO FLARE	PATROL											
		1315	1320	1320	NO FLARE	PATROL											
		1522	1530	1524	N09 W30	7189		1-	1	1524	.20	.20					
		1602	1615	1605	N10 W28	7189		1-	1	1605	.50	.60					
		1615	1615	1615	N10 W28	7189		1-	1	1605	.20	.20					

COMMENCE - STANDARDS - BOWLER

SOLAR FLARES

MARCH 1964

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME		MAX. PHASE		LOCATION			DURA- TION MINUTES	IM- POR- TANCE	OBS. COND.	TIME — U T	MEASUREMENTS		MAX. WIDTH H _g	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
		START	END	APPROX. LAT.	APPROX. MER. DIST.	APPROX. LAT.	APPROX. MER. DIST.	MCMATH FLARE REGION					MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.			
MCMATH	MAR 22 1964	1840	1851	1845	NO FLARE	N10 W31	PATROL	7189	1-	1	1845	070	080				
		2120	2330	0014	NO FLARE	N12 E48	PATROL		1-	1	0014	025	030				
MANILA		0012 E	0018	0014	NO FLARE	N12 E48	PATROL										
		0015	0400	0735	NO FLARE	PATROL											
		0350	0735	1310	NO FLARE	PATROL											
MCMATH		1255	1310	1325	NO FLARE	S11 E27	7188										
		1323	1330	1442	NO FLARE	N12 W46											
SAC PEAK		1440 E	1445 D	1442	NO FLARE	N11 W44										18	
OTTAWA		1441	1448	1442	NO FLARE	PATROL											
		0100	0400	0525	NO FLARE	PATROL											
		0500	0525	0620	NO FLARE	PATROL											
		0845	0820	0836	NO FLARE	N11 E51											
CAPRI-S		0815	0836	1000 D	NO FLARE	N09 W51											
ARCETRI		0955 E	1000 D	1619	NO FLARE	N10 W54	7189										
MCMATH		1613	1640	2330	NO FLARE	PATROL											
		2055	2330	2400	NO FLARE	PATROL											
		2345	2400	0030	NO FLARE	PATROL											
		0000	0030	0220	NO FLARE	N07 E41											
MANILA		0215 E	0220	0505	NO FLARE	PATROL											
		0350	0505	0705	NO FLARE	PATROL											
		0515	0705	0736	NO FLARE	N07 E39											
MANILA		0706 E	0736	0709	NO FLARE	PATROL											
ARCETRI		0845 E	0999 D	1920	NO FLARE	N09 W70											
		1715	1735	1927 D	NO FLARE	PATROL											
SAC PEAK		1917 E	1927 D	0350	NO FLARE	PATROL											
		0130	0350	0640	NO FLARE	PATROL											
		0600	0640	0855	NO FLARE	PATROL											
		0850	0855	0930	NO FLARE	PATROL											
		0910	0930	1315	NO FLARE	PATROL											
		1235	1315	0825	NO FLARE	PATROL											
		0115	0825	0558	NO FLARE	N14 W90											
MITAKA		0552 E	0558	1421	NO FLARE	PATROL	7189										
		0920	0935	1437 D	NO FLARE	S09 E45	7195										
MCMATH		1420	1437 D	1419	NO FLARE	PATROL											
		0110	0545	1436 D	NO FLARE	N14 W87											
SAC PEAK		1403 E	1436 D	0525	NO FLARE	PATROL											
		0425	0525	2202	NO FLARE	N09 E90											
		2144	2202	0041	NO FLARE	PATROL											
LOCKHEED		0036	0100	0545	NO FLARE	PATROL											
		0500	0545	1155	NO FLARE	PATROL											
		1140	1155	2015	NO FLARE	PATROL											
		2000	2015	2115	NO FLARE	PATROL											
		2020	2115	0041	NO FLARE	PATROL	7201										
		0036	0100	2150	NO FLARE	PATROL											
		0500	0545	1421	NO FLARE	PATROL											
		1140	1155	0041	NO FLARE	PATROL											
		2000	2015	0041	NO FLARE	PATROL											
		2020	2115	0041	NO FLARE	PATROL											

COMMERCE - STANDARDS - BOULDER

SOLAR FLARES

MARCH 1964

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME		MAX. PHASE	LOCATION			DURA- TION — MINUTES	IM- POR- TANCE	OBS. COND.	TIME — U T	MEASUREMENTS			PROVISIONAL IONOSPHERIC EFFECT
		START	END		APPROX. LAT.	MER. DIST.	MATH PLACE REGION					MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH H _z	
	MAR 1964														
OTTAWA	31	0535	0550	NO FLARE	PATROL										
	31	0625	0705	NO FLARE	PATROL										
	31	0820	1130	NO FLARE	PATROL										
	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

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

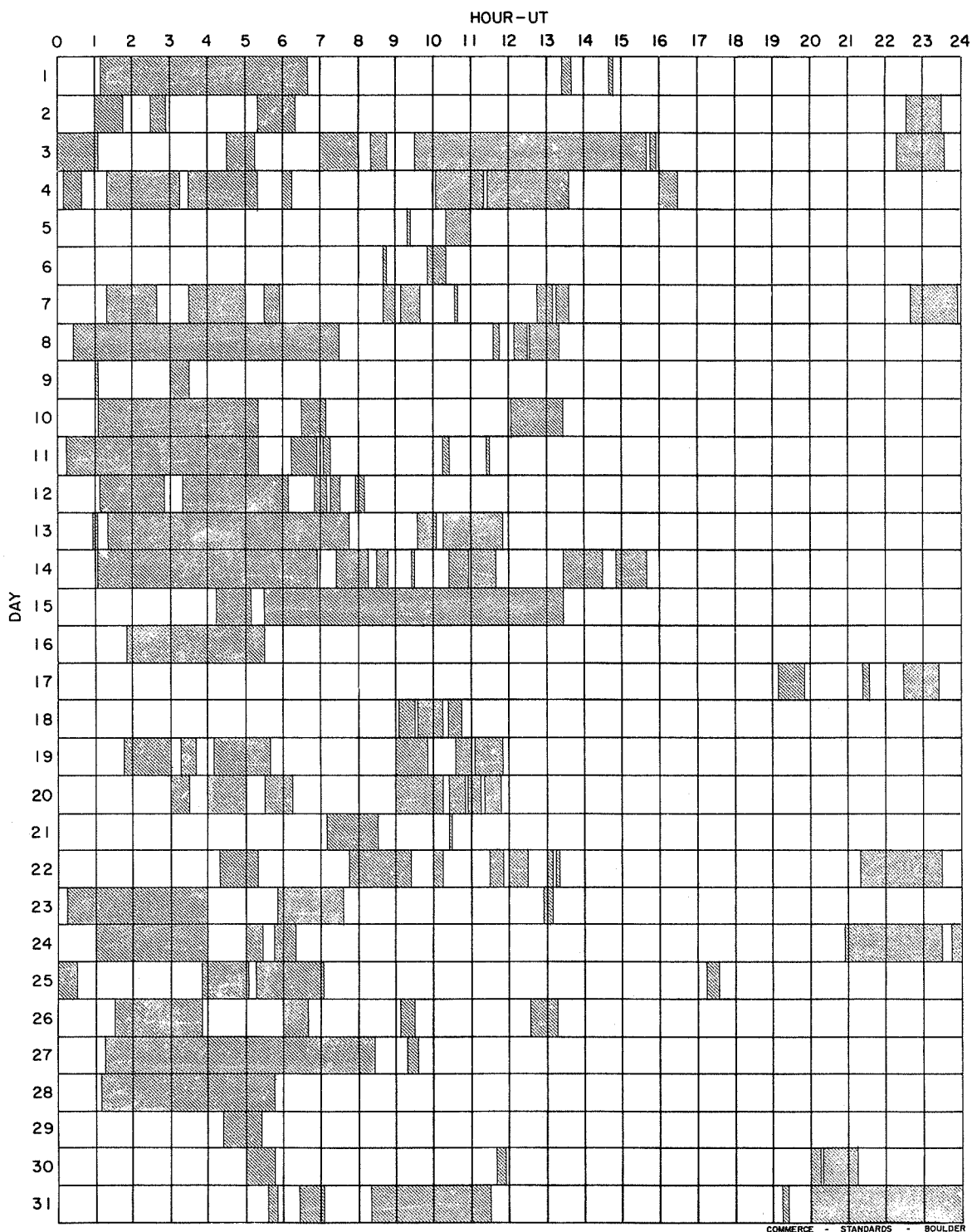
SEE DESCRIPTIVE TEXT PUBLISHED NOVEMBER 1961 FOR DEFINITION OF CORRECTED AREA VALUES LISTED FOR CLIMAX, HAWAII, LOCKHEED AND SACRAMENTO PEAK.

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

INTERVALS OF NO FLARE PATROL OBSERVATIONS

IIIg

MARCH 1964



Observatories included:

Arcetri
 Capri-S (Swedish)
 Dunsink

Haute-Provence
 Huancayo
 Istanbul

Lockheed
 Manila
 Ondrejev

Ottawa
 Sacramento Peak
 Uccle

SOLAR FLARES

DECEMBER 1963

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME		LOCATION			DURA- TION — MINUTES	IM- POR- TANCE	OBS. COND.	TIME — U T	MEASUREMENTS			PROVISIONAL IONOSPHERIC EFFECT
		START	END	APPROX.	MATH PLACE REGION	LAT.					MER. DIST.	MEAS. AREA Sq. Deg.	COBR. AREA Sq. Deg.	
HTE-PROVEN UCCLE UCCLE UCCLE CLIMAX	DEC 1963													
	01	0300	0310	NO FLARE										
	01	0605	0635	NO FLARE										
	01	0750	0806	0756	PATROL		7053	16						
	01	0937 E	0945 D		PATROL									
	01	0956	0958		S07 E75							1.20		
	01	1002 E	1007		S08 E78									
01	2217	2224	2219	S12 E80							.30	.60		
01	2223	2231	2226	S06 W70							.20	.30		
CAPETOWN	02	0020	0040	NO FLARE										
	02	0200	0315	NO FLARE										
	02	0320	0335	NO FLARE										
	02	0340	0345	NO FLARE										
	02	0350	0355	NO FLARE										
	02	0425	0435	NO FLARE										
	02	0440	0455	NO FLARE										
	02	1225	1233	1228	N04 W81							.30		
	03	0215	0600	NO FLARE										
	03	0630	0705	NO FLARE										
UCCLE	03	1145	1148	1147	PATROL									
	04	0010	0045	NO FLARE										
CAPETOWN	04	0150	0530	NO FLARE										
	04	0545	0635	NO FLARE										
	04	1150	1235	1200	PATROL							1.00	1.10	
	05	0350	0400	NO FLARE										
HTE-PROVEN CAPETOWN CAPETOWN	05	0410	0655	NO FLARE										
	05	1005	1015 D											
	05	1132	1148	1135	S09 E25							1.60	1.70	
	05	1155	1208	1157	S10 W74							.70		
	05	1155	1208	1157	S10 W74							.60		
UCCLE CAPETOWN HTE-PROVEN	06	0500	0630	NO FLARE										
	06	1012	1018											
	06	1107	1108											
	06	1213	1234	1216	S15 W48									
	06	1215	1237		S12 E09									
	06	2350	2400		S10 E07									
UCCLE UCCLE	07	0000	0030	NO FLARE										
	07	0100	0500	NO FLARE										
	07	0947	0950	0948	S09 E12							1.50	1.50	
	07	1010	1015	1013	PATROL							1.30	1.30	
	07	1305	1340	NO FLARE										
	08	0100	0200	NO FLARE										
	08	0210	0220	NO FLARE										
UCCLE	08	0230	0240	NO FLARE										
	08	0245	0300	NO FLARE										
	08	0425	0450	NO FLARE										

SOLAR FLARES

DECEMBER 1963

OBSERVATORY	DATE	OBSERVED TIME		MAX. PHASE	LOCATION			DURA-TION - MINUTES	IM-POR-TANCE	OBS. COND.	TIME	MEASUREMENTS		PROVISIONAL IONOSPHERIC EFFECT
		START	END		APPROX. LAT.	APPROX. MER. DIST.	MCNATH PLAGE REGION					MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	
HTE--PROVEN HTE--PROVEN	DEC 08	0805 E	0819 D		S09 W12				1-		0809	.30	.30	
	1963	0823	0830 D		S09 W14				1-		0824	.40	.40	
	08	1950		NO FLARE	PATROL									
	08	2010		NO FLARE	PATROL									
	08	2035		NO FLARE	PATROL									
	08	2055		NO FLARE	PATROL									
	08	2115		NO FLARE	PATROL									
	08	2300		NO FLARE	PATROL									
UCCLE UCCLE UCCLE UCCLE	09	0940	0941		N27 E90				2					
	09	0954	1001		N10 W35				1-					
	09	1010	1013		N10 W35				1-					
	09	1043	1047		S07 W72				1-					
	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								
CAPETOWN	10	0000	0115		NO FLARE	PATROL								
	10	0300	0655		NO FLARE	PATROL								
	10	0911	0936		0916	N10 W48					0916	.80	1.20	
	10	1415	1455		NO FLARE	PATROL								
	10	1540	1620		NO FLARE	PATROL								
	10	1540	1620		NO FLARE	PATROL								
HTE--PROVEN	11	0220	0235		NO FLARE	PATROL								
	11	0240	0250		NO FLARE	PATROL								
	11	0826	0839		NO FLARE	PATROL								
	11	1005	1015		NO FLARE	PATROL								
	11	1020	1040		NO FLARE	PATROL								
	11	1110	1115		NO FLARE	PATROL								
CAPRI-F	11	1120	1135		NO FLARE	PATROL								
	11	1130 E	1210 D		N29 E56	7065	40	D	1					
	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	2144	2150		NO FLARE	PATROL								
	11	2155	2200		NO FLARE	PATROL								
	11	2205	2210		NO FLARE	PATROL								
NIZAMIAH	11	2215	2225		NO FLARE	PATROL								
	11	2230	2240		NO FLARE	PATROL								
	12	1040 E	1046		1043	N24 E43	6	D	1		1043	1.82	2.76	1.50
	12	1445	1515		NO FLARE	PATROL								
	12	1445	1515		NO FLARE	PATROL								
	12	1445	1515		NO FLARE	PATROL								
KODAIKNI UCCLE UCCLE CAPETOWN	13	0921 E	0926 D		N30 E30	7065	25		1-					
	13	0922 E	1005		N32 E33				?					
	13	0925	0949		N33 E34				1-					
	13	0926	0951		N32 E32	7065	25		1-		0940	1.70	2.40	
	13	0926	0951		N32 E32	7065	25		1-		0940	1.70	2.40	

SOLAR FLARES

DECEMBER 1963

OBSERVATORY	DATE 1963	OBSERVED UNIVERSAL TIME		LOCATION		DURA- TION — MINUTES	IN- FOR- TANCE	ONS. COND.	TIME — U.T.	MEASUREMENTS			PROVISIONAL IONOSPHERIC EFFECT
		START	END	APPROX. LAT.	APPROX. MER. DIST.					McWATH FLARE REGION	MEAS. AREA Sq. Dps.	CORR. AREA Sq. Dps.	
HTE-PROVEN KODAIKNI CAPRI-F ATHENES UCCLE	13	0927	0955 D	N30 E28			1-	3	0940	.90	1.20	1.56	100
	13	0935	0948	N30 E28			1-		0940				
	13	0936 E	1008	N29 E29		7065	1-			.90	3.00		
	13	0938 E	0951	N30 E26			1-	3			1.10		
HTE-PROVEN	13	0939	0955	N31 E30			1-	3					
	14	1208	1226	N30 E14			1-		1214	1.50	1.90		
	14	1355	1435	PATROL									
CLIMAX	15	0820	0825	PATROL									
	15	0900	0920	PATROL									
	15	1105	1135	PATROL									
	15	1210	1220	PATROL									
	15	1230	1345	PATROL									
	15	1601 E	1623 D	N31 E01			1-		1607	.60	.60		
	15	1601 E	1623 D	N31 E01			1-		1607	.60	.60		
HTE-PROVEN	17	0130	0150	PATROL									
	17	0650	0710	PATROL									
	17	1138	1150	N30 W25			1-		1147	.90	1.10		
HTE-PROVEN	17	1324	1332	N30 W26			1-			.70	.90		
	18	0210	0217	N30 W28			1-	3	0214			1.36	100
KODAIKNI	18	1315	1405	PATROL									
	18	1410	1440	PATROL									
	19	0430	0450	PATROL									
	19	1105	1110	PATROL									
CAPETOWN	19	1120	1205	PATROL									
	19	1210	1340	PATROL									
	20	0015	0020	PATROL									
	20	0110	0120	PATROL									
	20	0230	0250	PATROL									
	20	0955	1000	PATROL									
	20	1005	1045	PATROL									
	20	1105	1125	PATROL									
	20	1130	1335	PATROL									
	20	1130	1335	PATROL									
CAPETOWN	21	0450	0510	PATROL									
	21	0805	0830	PATROL									
	21	0840	0925	PATROL									
UCCLE	21	0945	0950	PATROL									
	22	0600	0610	PATROL									
	22	0714	0744	N15 E32			1-		0728	1.40	1.80		
	23	0100	0105	PATROL									
UCCLE	23	1224	1231	N11 W50			1-	4					
	24	0130	0240	PATROL									
	24	0605	0635	PATROL									

SOLAR FLARES

DECEMBER 1963

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME		MAX. PHASE	LOCATION		DURATION MINUTES	INC. FOR. TANCE	OBS. COND.	TIME U T	MEASUREMENTS			PROVISIONAL IONOSPHERIC EFFECT
		START	END		APPROX. LAT.	MER. DIST.					MCMATH FLAG REGION	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	
	DEC 1963													
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	4	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									
	27	0459 E	0516	0503	S26 W28		17 D	1			4.75			140
IRKUTSK	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									

COMMENCE - STANDARDS - BOULDER

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

- | | | | | | |
|------------|--|--------------|--------------------------|--------------|-----------------------------|
| ATHENS | ATHENS, GREECE | HONOLULU | HAWAII, USA | NERA | NERDERHORST den BERGH, |
| BAKOU | PIRCULI, USSR | IKOMASAN | KYOTO, JAPAN | | NETHERLANDS |
| CAPETOWN | ROYAL OBSERVATORY,
CAPE OF GOOD HOPE | KIEV KO | KIEV GAO, USSR | NIZHIR | KRASNAYA PAKHRA, USSR |
| CAPRI F | CAPRI, ITALY (GERMAN) | KIEV KY | KIEV UNIVERSITY, USSR | SAC PEAK | SACRAMENTO PEAK, N.MEX. USA |
| CAPRI S | CAPRI, ITALY (SWEDISH) | LOCKHEED | LOS ANGELES, CALIF., USA | SALTSJOBADEN | STOCKHOLM, SWEDEN |
| CRIMEE | STMEIZ, USSR | MCMATH | MCMATH-HULBERT | SCHAUTINS | SCHAUTINSLAND, GFR |
| HERSTMONEU | ROYAL GREENWICH OBSERVATORY,
HERSTMONEUX, ENGLAND | MOSCOU | PONTIAC, MICH., USA | TACKENT | TASHKENT, USSR |
| HTR-PROVEN | HAUTE-PROVENCE | | MOSCOM-CAISH, USSR | WENDEL | WENDELSTEIN, GFR |
| | | NEW SCHAULIN | FREIBURG, GFR | | |

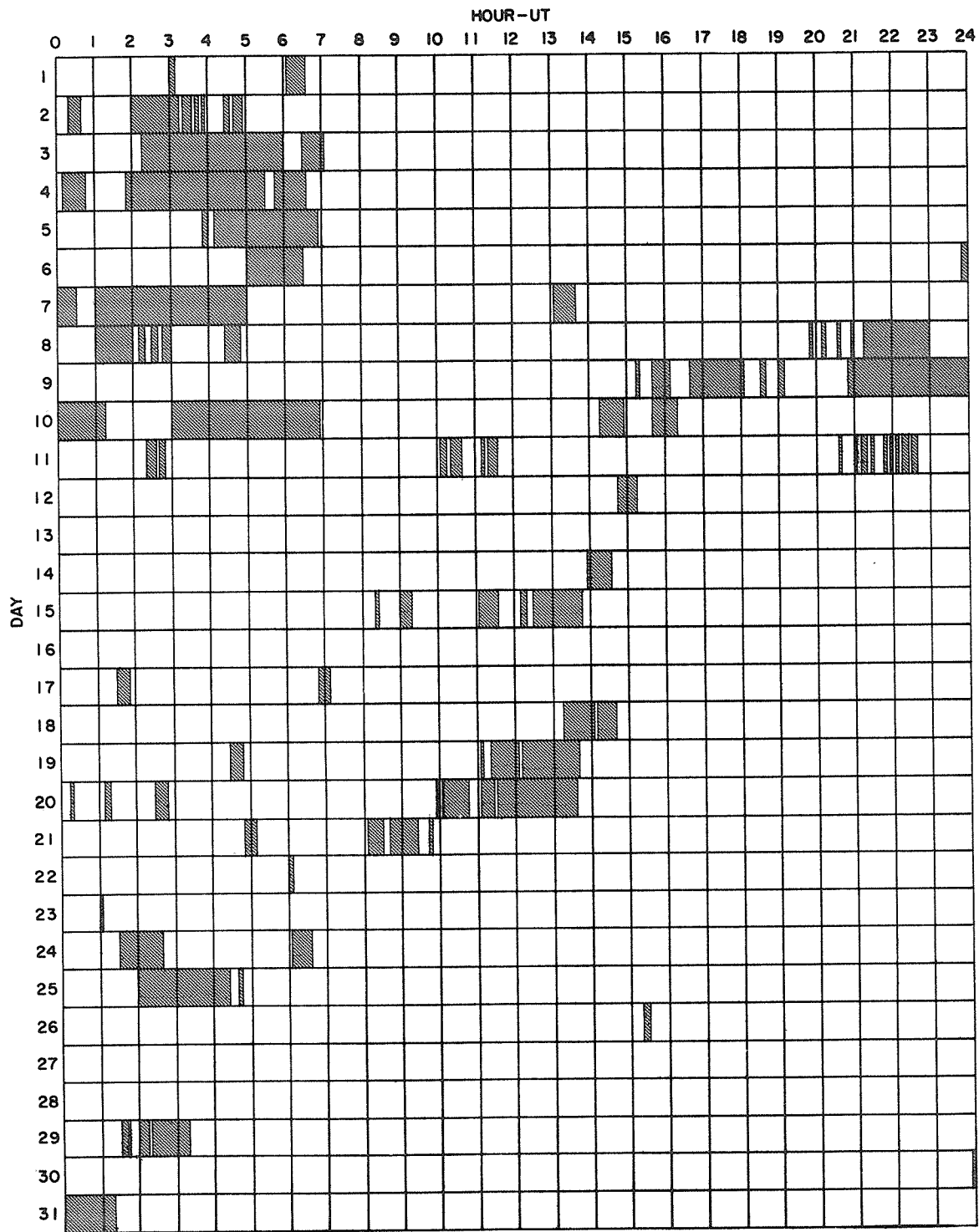
ALL VALUES IN THE MAXIMUM INTENSITY COLUMN FOR SAC PEAK ARE ARBITRARY UNITS (0-40) AND FOR LOCKHEED ARE ARBITRARY UNITS (10-40), NOT PERCENT OF CONTINUOUS SPECTRUM.

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

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

INTERVALS OF NO FLARE PATROL OBSERVATIONS

DECEMBER 1963



CONTINUED - STANDARD - 004.000

Observatories included:

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

IONOSPHERIC EFFECTS OF SOLAR FLARES

III m

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 IMP	IMPORTANCE						BUR	WIDE SPREAD INDEX	STATIONS	KNOWN FLARE
	START	END	MAX		ABS	SCNA	SEA	SPA	SES	SFD				
13 13	2025 2105	2045 2200		S 1							1	2 3	ML BO HU 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

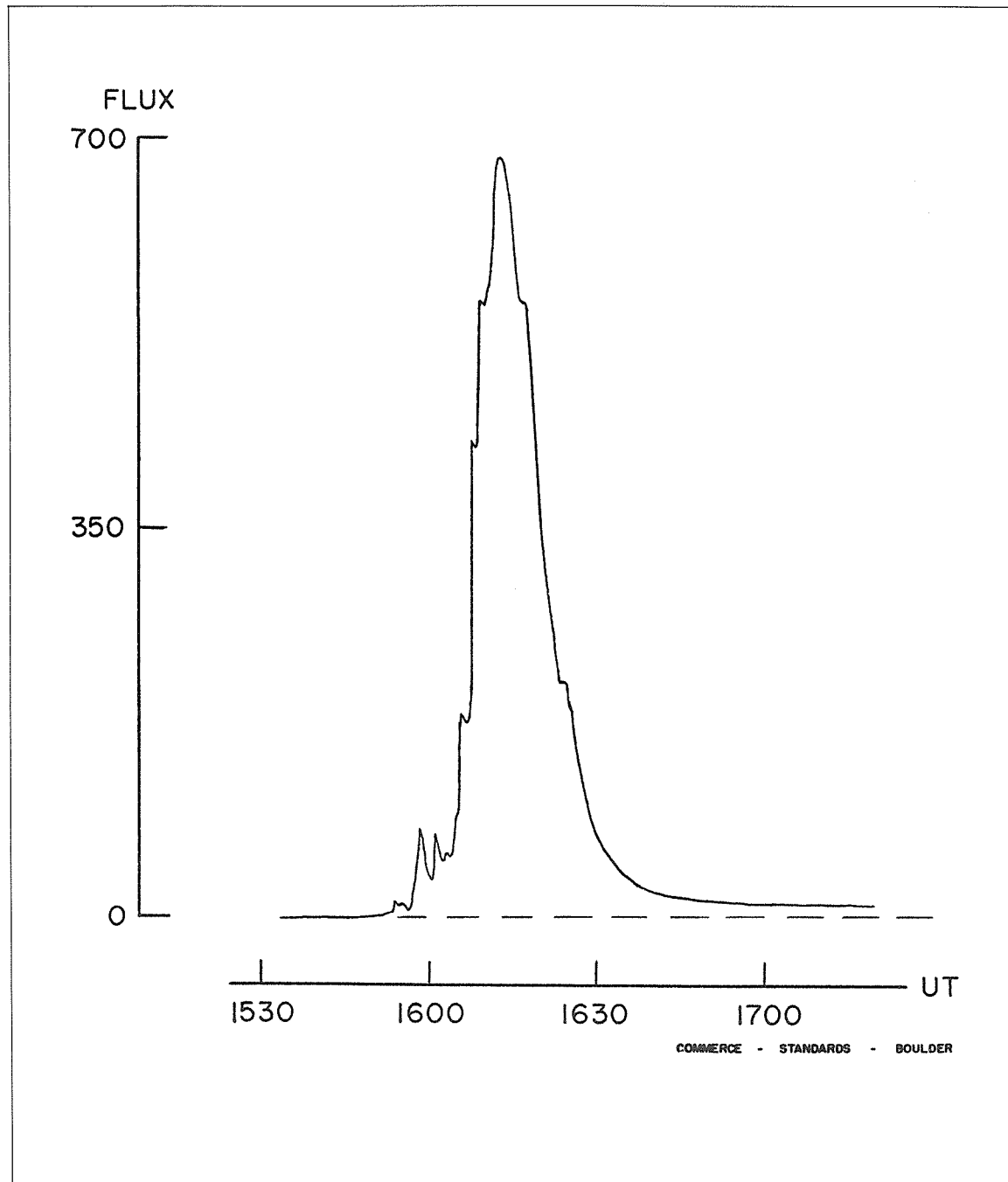
* No Event.

** No Data.

IVb

SELECTED 2800 Mc/s SOLAR NOISE BURST
OTTAWA, CANADA

MARCH 16, 1964

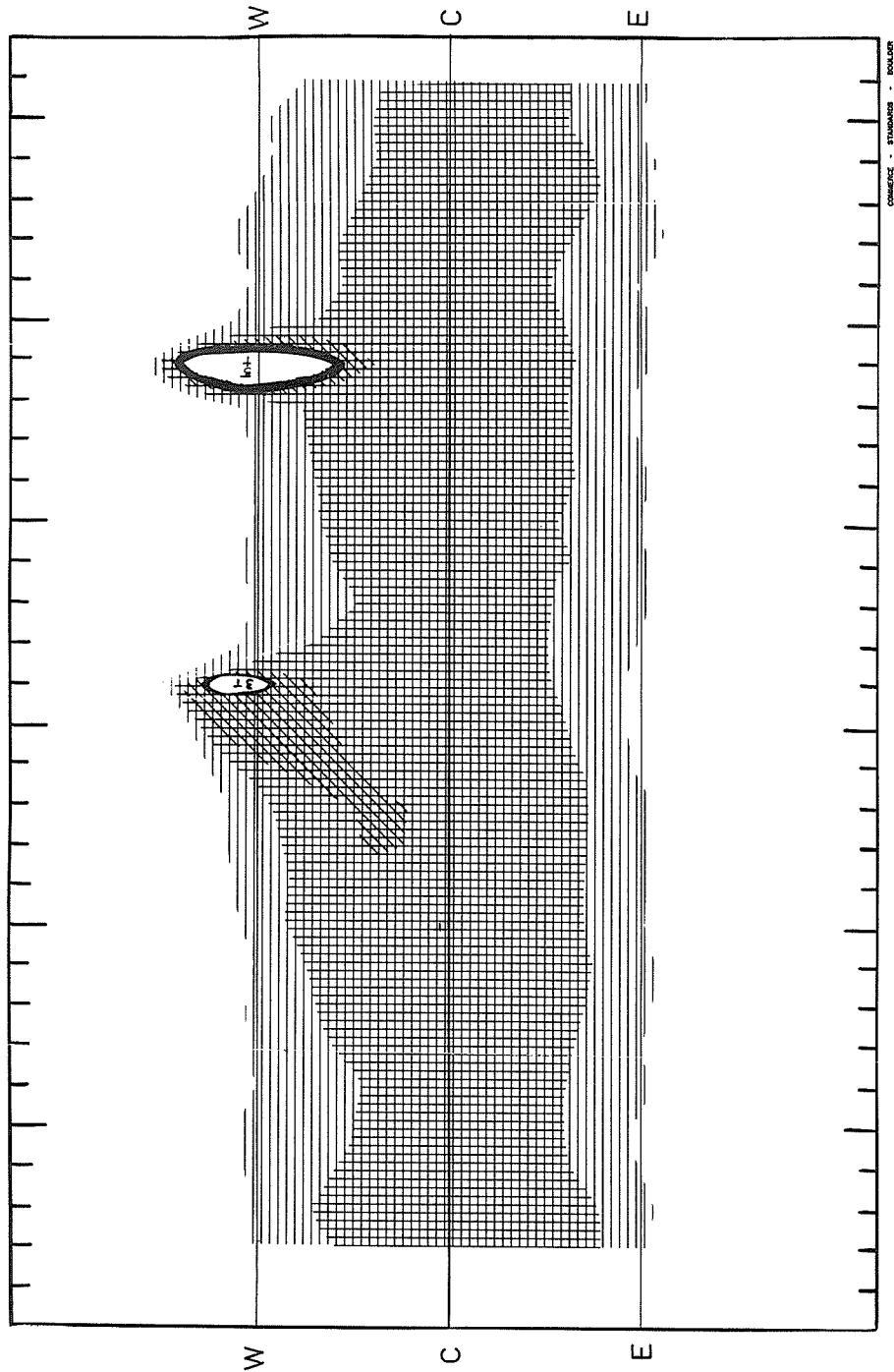


SOLAR RADIO EMISSION INTERFEROMETRIC OBSERVATIONS

MARCH 1964

NANÇAY

169 Mc/s



MARCH 1964

5 10 15 20 25 30

SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

MARCH 1964

NBS BOULDER

108 Mc/s

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

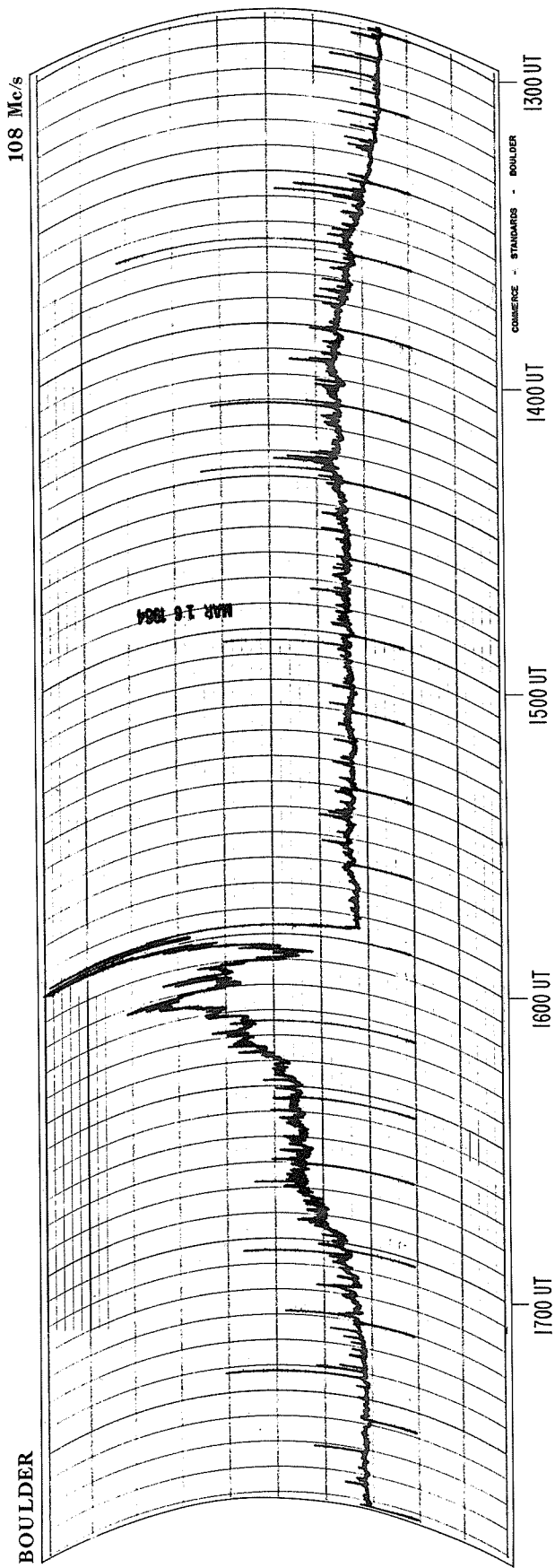
108 Mc/s

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

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	
3 Mar	No observ.	1500-1730, 1905-2220			Cont. 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
					26	III	1335:15-1335:45	1-	18-38
	III	2224-2225	1	18-41	29	No observ.	1400-2400		
16	II	1557:30-1627	1	21-41	31	III	0133:15-0133:30	1-	18-41
	IV	1604:30-1722	1+	20-41					
	III	2330:30-2331:15	1+	21-41					
17	III	2304:30-2304:45	1-	20-41					

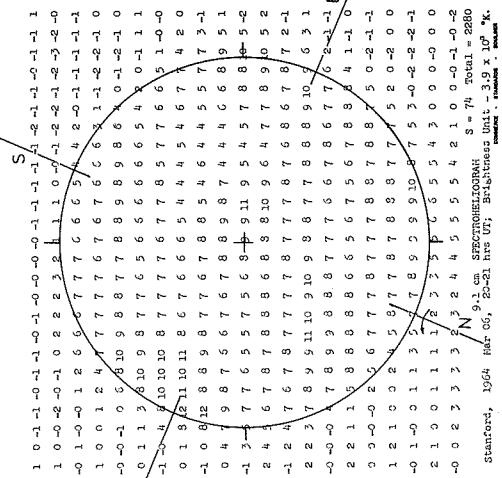
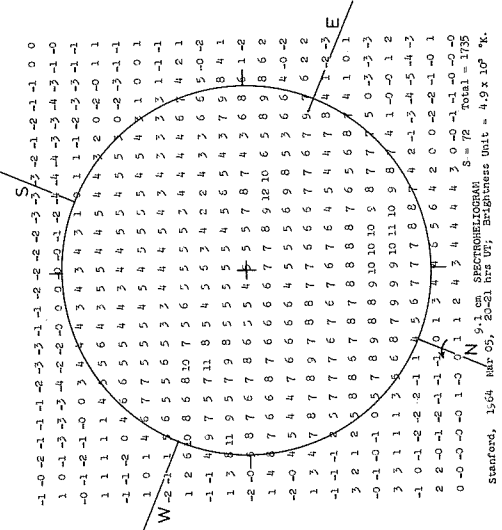
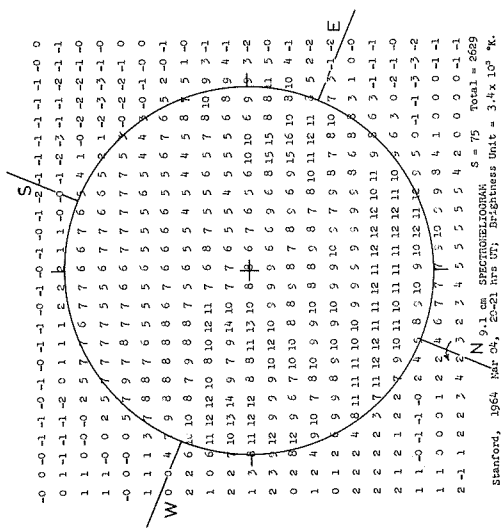
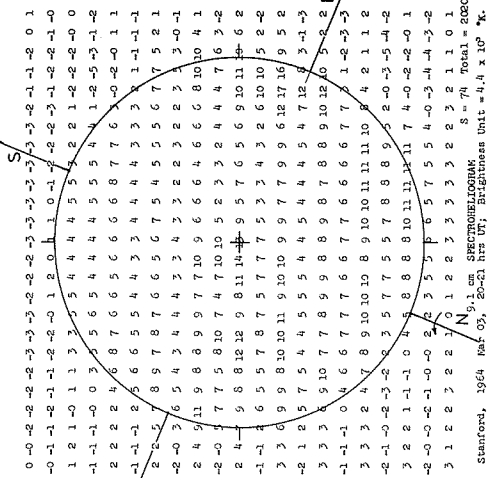
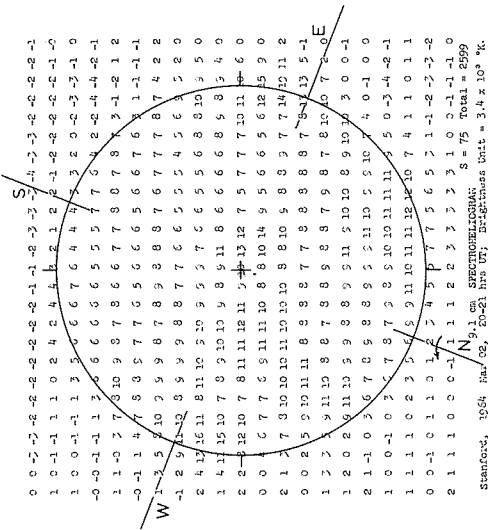
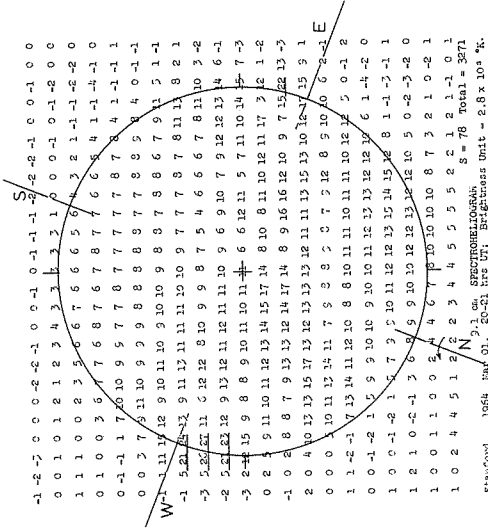
OBSERVE - STANDARDS - BOULDER

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

MARCH 1964

STANFORD

9.1 cm

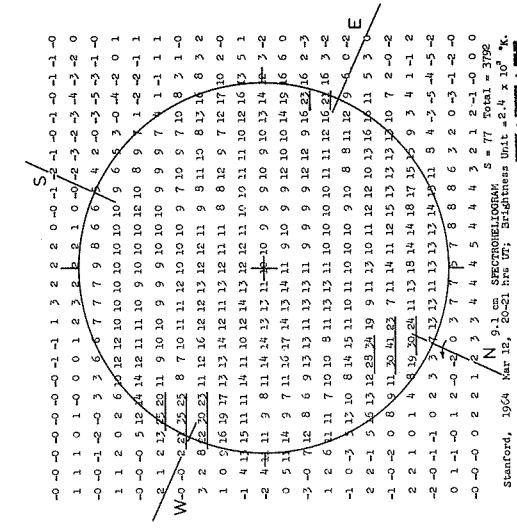
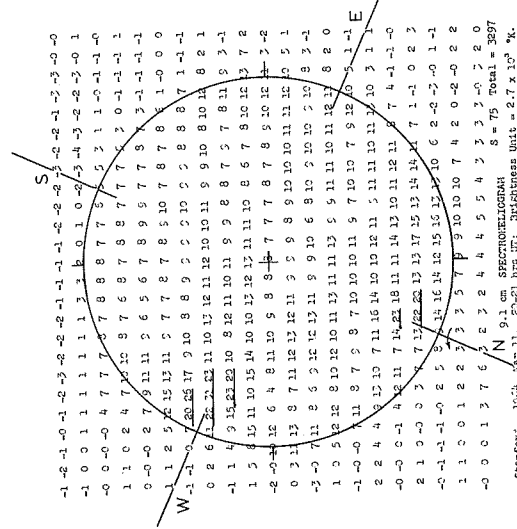
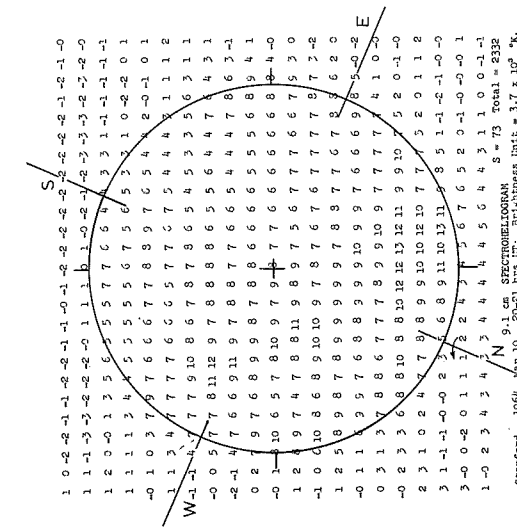
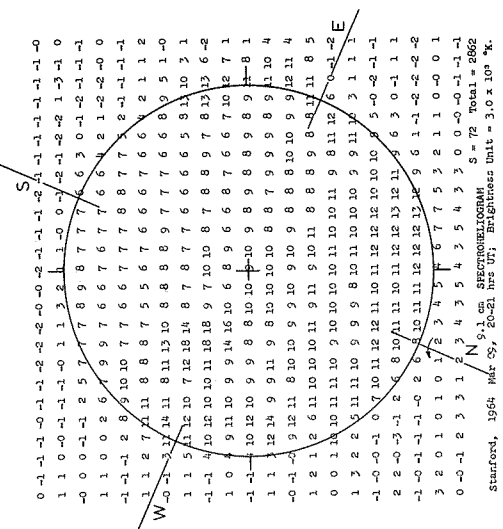
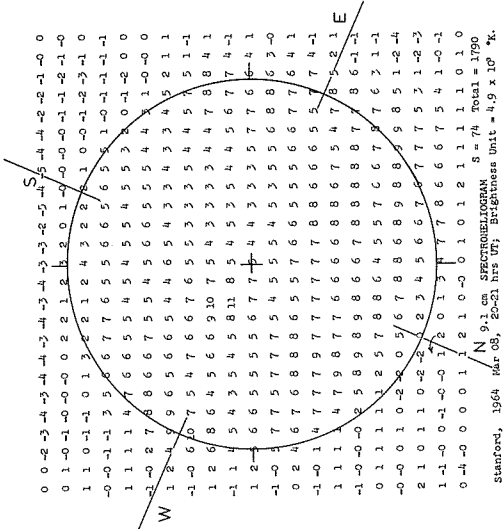
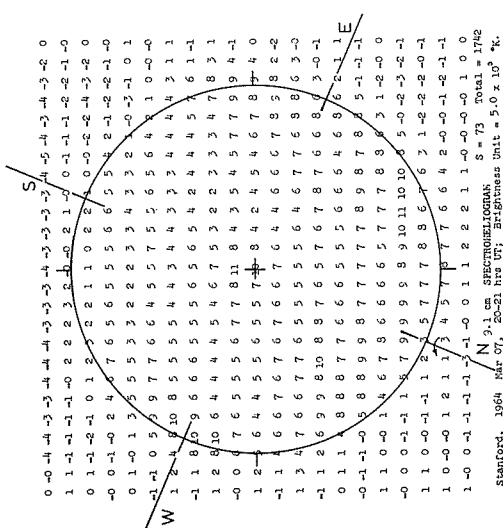


SOLAR RADIO EMISSION SPECTROHELIOGRAMS

MARCH 1964

STANFORD

9.1 cm

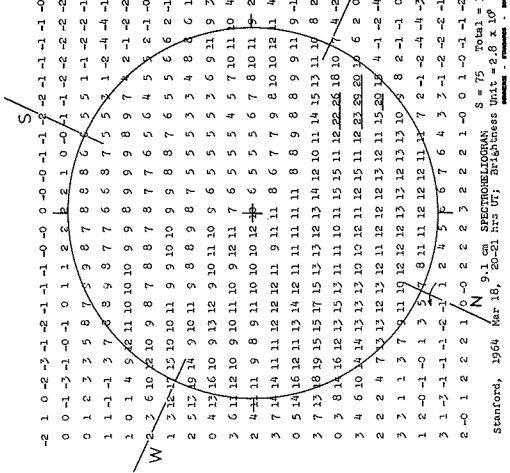
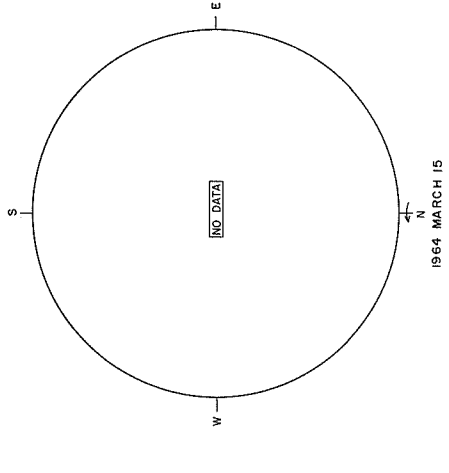
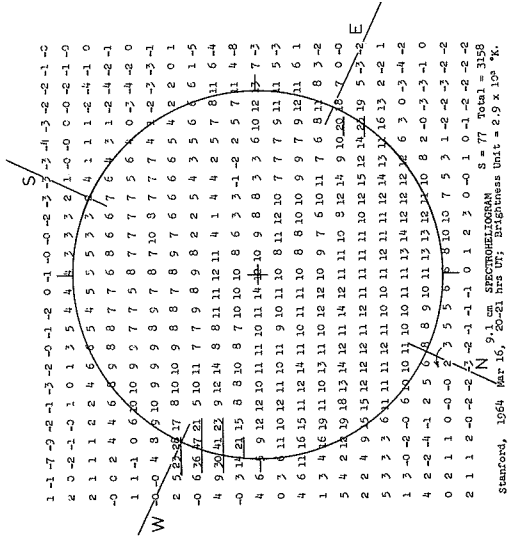
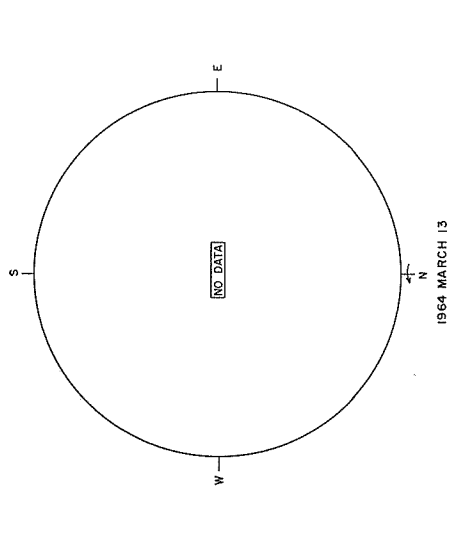


SOLAR RADIO EMISSION SPECTROHELIOGRAMS

MARCH 1964

STANFORD

9.1 cm

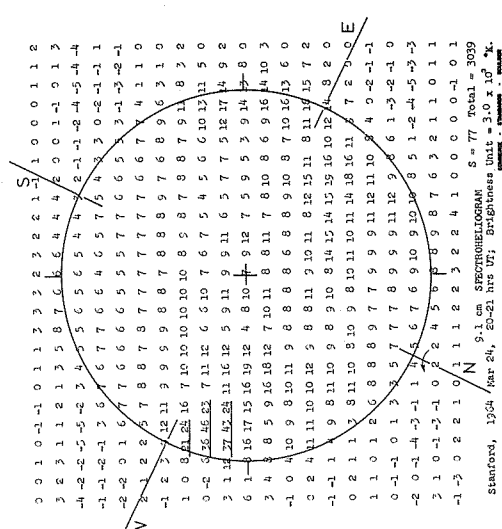
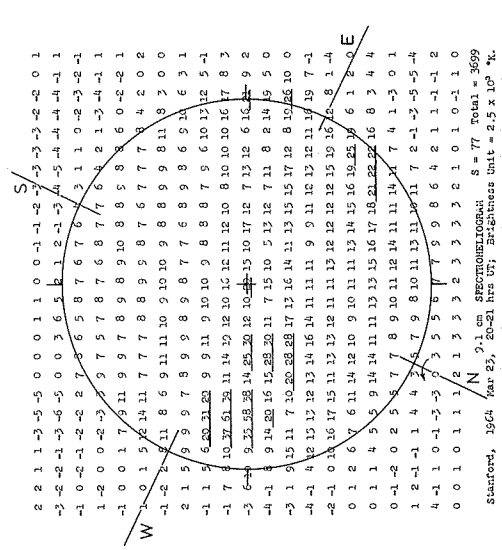
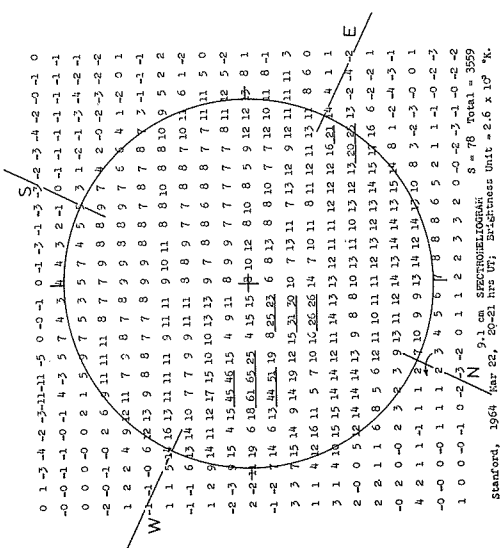
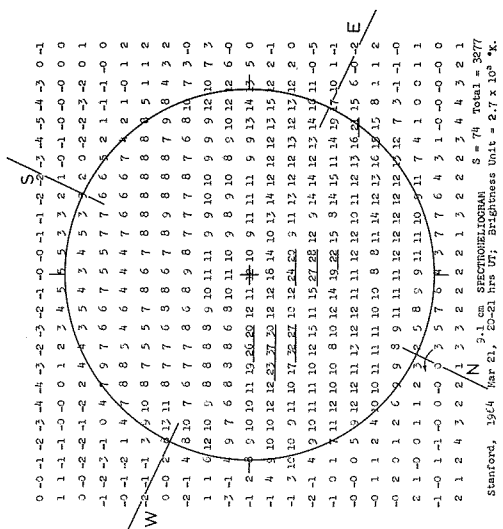
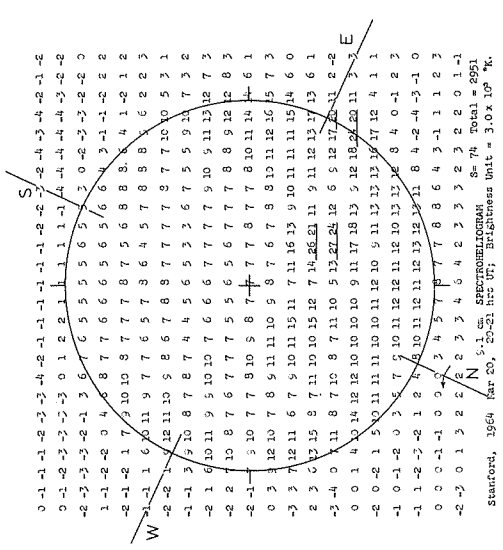
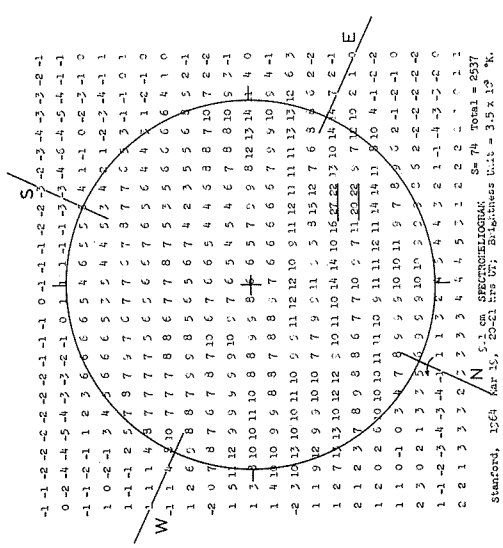


SOLAR RADIO EMISSION SPECTROHELIOGRAMS

MARCH 1964

STANFORD

9.1 cm

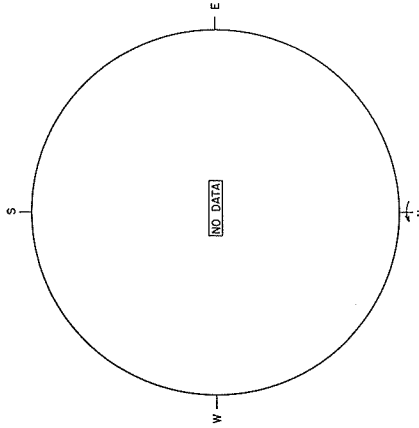


SOLAR RADIO EMISSION SPECTROHELIOGRAMS

MARCH 1964

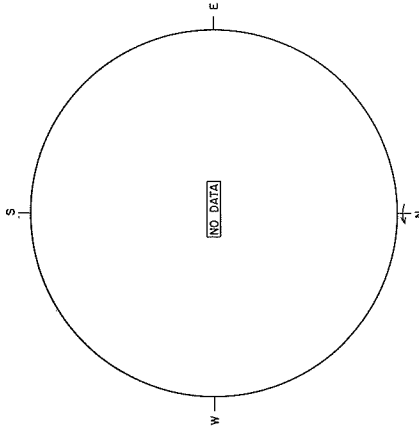
STANFORD

9.1 cm



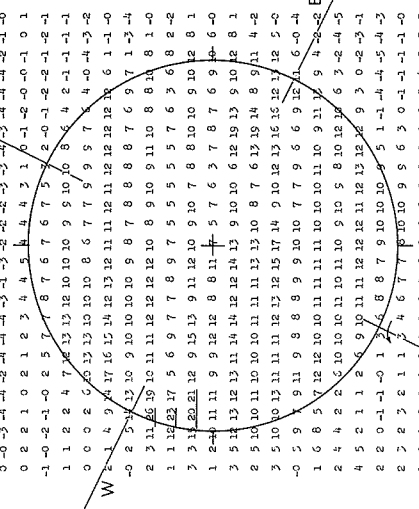
1964 MARCH 25

1 -1 -0 -2 -1 -1 -2 -3 -2 -1 -0 -2 -2 -3 -1 -2 -3 -4 -2 -0 0
-1 0 2 1 2 1 3 5 4 5 4 3 1 1 5 -2 -2 -2 -1 1 0
1 0 -1 -1 0 2 4 7 6 5 7 6 7 6 8 0 -1 -2 -3 -2 -0 1
1 1 3 4 5 9 14 12 11 10 10 11 9 7 6 8 3 0 -2 -1 0 2
2 1 1 4 8 12 11 11 9 6 6 8 7 7 8 1 3 -3 -3 -2
3 2 6 9 12 12 13 11 10 9 7 8 9 8 9 9 10 1 -2 -2 -0
0 2 8 13 11 9 11 12 11 8 7 6 5 6 7 6 5 7 3 -2 -3 -2
2 5 11 12 13 15 14 13 11 10 8 8 10 12 13 9 7 8 4 -1 -0
-1 -2 -1 7 9 10 9 7 6 6 7 5 4 4 3 4 4 5 6 6 0 -5
2 6 14 19 13 12 13 11 10 10 10 10 8 6 7 7 8 10 11 10 1 -4
0 1 -4 10 12 13 10 6 10 8 6 6 3 6 10 8 4 5 8 9 1 -5
1 5 11 15 12 15 17 17 16 12 10 6 13 22 13 9 8 11 11 9 2 -3
-1 3 8 10 9 12 12 15 15 13 10 9 10 9 11 13 10 11 14 8 0 -4
2 4 6 9 12 11 12 15 14 8 6 6 4 9 17 16 6 5 9 10 7 -1 -5
2 1 -0 9 10 10 11 10 9 6 5 7 5 6 7 6 7 8 7 8 4 -2 -3
4 2 5 11 13 13 12 12 10 9 12 12 13 12 11 9 11 10 14 5 -2 -3
1 0 2 5 7 9 9 7 6 7 8 10 10 9 9 7 7 2 -2 -1 -3
3 2 2 2 4 7 9 11 9 10 12 13 14 12 11 12 11 7 3 -0 -1 -0
1 0 -0 -1 -0 1 2 3 4 5 7 8 9 10 10 9 8 7 5 0 -5 -3 -2 -3
-1 0 2 2 1 0 1 0 1 2 3 3 3 3 2 2 2 -1 -1 1 1 -1 -0
Stanford, 1964, Mar 25, 20-21 hrs UT; Brightness unit = 3.0×10^6 K.



1964 MARCH 26

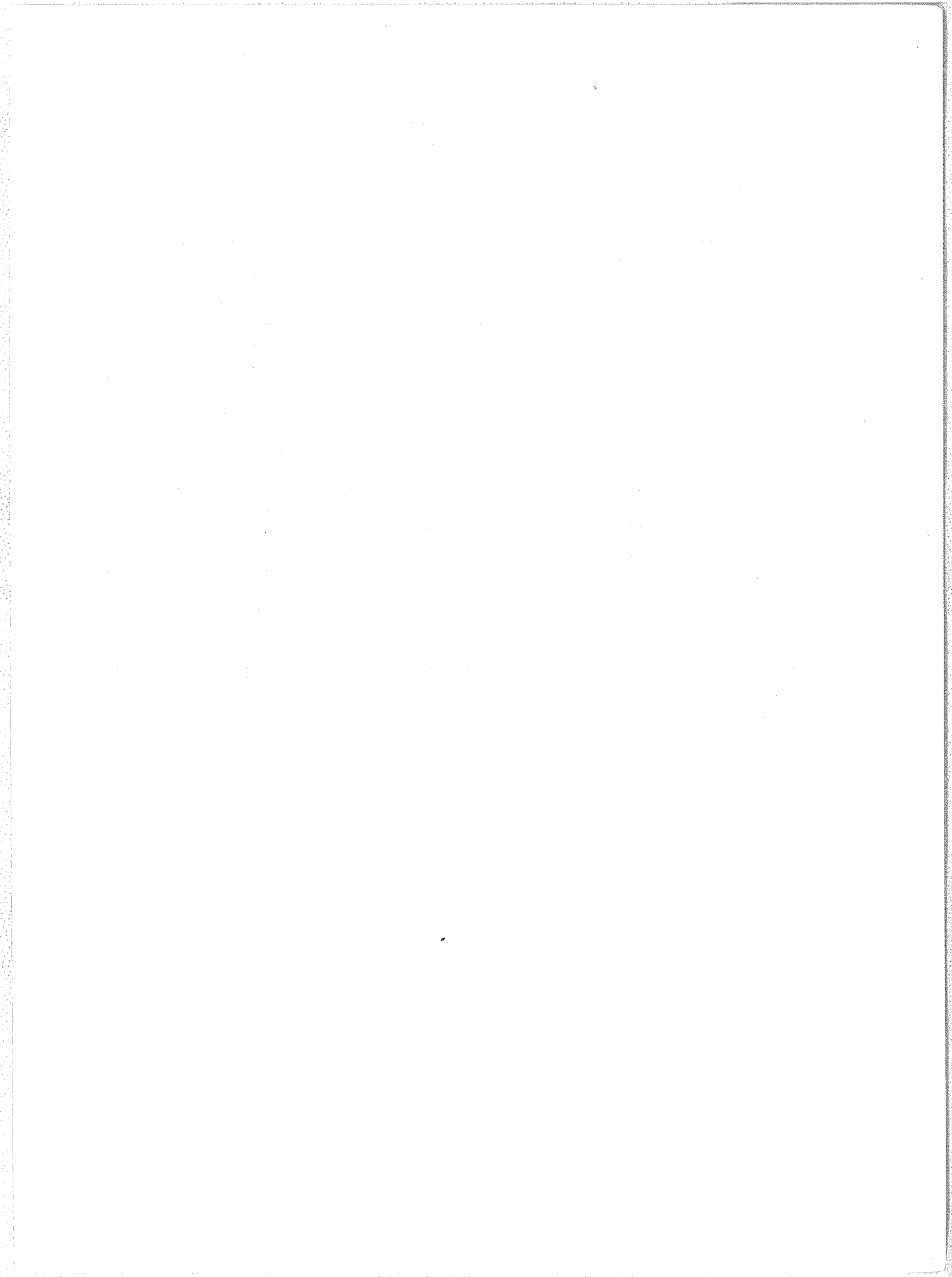
1 0 -0 -0 -1 -1 -2 -3 -2 -1 -0 -0 -1 -2 -2 -2 -3 -2 0 1
-1 1 -0 0 1 1 0 4 5 4 4 4 2 0 0 -2 -2 -2 -2 -1 0
-0 2 3 6 8 11 12 13 14 11 11 10 7 6 3 0 0 -1 -1 0
1 2 1 5 10 17 16 14 12 11 10 10 10 9 10 4 0 -3 -2 -2
3 2 4 7 12 18 18 16 15 12 13 13 14 13 11 6 0 -2 -2 -2
W 1 2 3 11 17 17 15 15 12 12 11 10 11 11 11 11 2 -3 -3 -2
3 5 10 17 19 17 15 14 14 14 15 15 14 12 11 13 14 9 0 -2 -2
2 2 2 17 12 13 14 13 10 10 10 10 9 11 10 9 7 8 3 -3 -4
2 7 19 13 11 12 12 9 9 10 10 9 7 8 10 9 8 10 12 10 2 -5
7 18 14 10 11 12 9 7 8 7 9 10 8 4 5 7 8 7 10 9 2 -5
4 8 19 15 17 15 17 11 12 12 14 14 13 8 7 8 9 11 13 3 -4
2 5 11 14 14 15 18 15 9 8 8 12 17 14 7 6 8 9 12 8 1 -5
3 6 11 14 14 16 19 17 13 11 11 11 14 15 16 11 12 10 13 10 1 -2
1 3 4 10 14 13 13 13 11 12 12 11 8 8 11 12 9 9 15 14 8 -3 -4
2 3 3 17 16 15 18 16 15 14 15 15 14 12 14 15 14 22 10 -2 -3
2 1 2 6 14 13 12 11 10 10 9 13 11 9 10 11 5 13 12 9 3 -4 -4
5 3 6 8 13 13 13 13 11 12 14 14 13 15 16 15 16 14 14 -1 -1
3 2 1 0 1 4 8 9 9 10 11 11 12 12 12 12 7 6 2 -4 -2
4 2 -0 -0 -2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 -3 -2
1 0 2 1 0 -0 -2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 -2 -2
2 1 2 2 2 2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 1 -1
Stanford, 1964, Mar 26, 20-21 hrs UT; Brightness unit = 2.3×10^6 K.



1964 MARCH 27

0 -0 -3 -4 -1 -2 -4 -4 -3 -1 -3 -2 -2 -2 -3 -3 -4 -4 -2 -1 -0
0 2 1 0 2 1 4 4 4 5 4 4 3 1 1 1 -2 -0 -0 -1 0 1
-1 -0 -2 1 0 2 5 7 7 8 7 6 7 6 7 5 2 -0 -1 -2 -2 -1
1 2 2 4 7 8 13 12 10 10 8 6 7 5 9 5 7 4 0 -4 -2 -2
0 0 2 5 13 13 10 10 8 6 7 5 9 5 7 4 0 -4 -2 -2
W 1 4 9 14 17 16 12 14 12 11 11 12 11 12 12 12 12 6 1 -1 -0
-0 2 5 13 10 9 10 10 10 9 8 7 8 8 8 7 6 9 7 1 -3 -4
2 3 11 19 10 11 12 12 12 12 10 8 9 10 9 11 10 8 11 8 1 -0
1 1 1 22 17 5 6 9 7 8 7 5 5 5 5 5 7 6 3 8 2 -2
3 2 1 20 21 9 13 13 9 11 12 10 9 10 7 8 10 10 9 10 2 8 1
1 2 11 11 9 12 12 8 11 5 7 6 3 7 8 7 6 9 8 6 -0
3 5 14 12 13 11 14 12 12 14 13 9 10 10 12 13 9 10 12 8 1
2 5 10 11 10 10 11 11 11 13 13 10 8 7 6 13 10 14 8 9 11 4 -2
3 5 10 13 11 11 12 12 15 17 14 9 10 12 13 16 15 12 5 -0
-0 2 9 9 11 9 8 8 9 10 10 7 9 6 6 9 12 11 6 -0 -4
1 6 8 5 7 12 12 10 11 11 11 10 10 11 10 9 11 9 4 -2 E
4 5 2 1 2 6 9 11 12 12 12 11 12 13 12 9 3 0 -2 -1
2 2 0 -1 -1 -0 1 2 5 8 7 9 10 10 9 5 1 -1 -4 -5 -4 -3
2 2 3 6 1 1 2 4 6 7 8 10 10 9 6 3 0 -1 -1 -1 -0
1 0 -1 2 1 1 1 1 -0 1 2 2 2 0 0 -0 -2 -3 -4 -3 -3
Stanford, 1964, Mar 27, 20-21 hrs UT; Brightness unit = 2.8×10^6 K.

IVk



COSMIC RAY INDICES
(Climax Neutron Monitor)
IGC Station B 305

FEBRUARY 1964

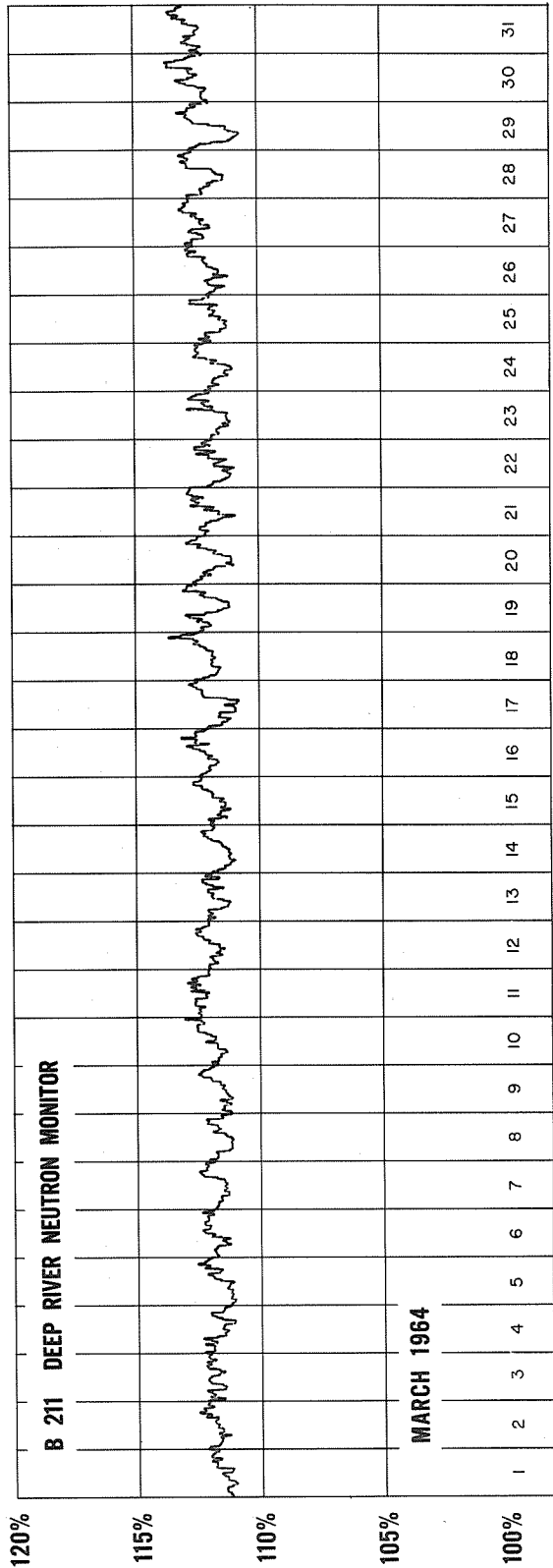
FEB. 1964	DAILY AVERAGE COUNTS / HOUR *	FEB. 1964	DAILY AVERAGE COUNTS / HOUR*
1	3213.5	16	3191.7
2	3219.2	17	3208.9
3	3228.5	18	3209.1
4	3222.5	19	3221.2
5	3226.1	20	3228.6
6	3246.5	21	3222.0
7	3244.6	22	3228.9
8	3240.1	23	3236.9 +38
9	3243.4	24	3247.5
10	3246.0	25	3246.4
11	3253.8	26	3251.7
12	3259.1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



COMMERCE - STANDARDS - BOULDER

GEOMAGNETIC ACTIVITY INDICES

FEBRUARY 1964

Feb. 1964	C	Values Kp								Sum	Ap	Final Selected Days	
		Three hour Gr. interval											
		1	2	3	4	5	6	7	8				
		338	242	248	202	158	112	68	22				
1	0.7	3o	3-	1+	2-	2-	2-	3-	3+	18o	10	Five Quiet	
2	0.4	3+	2-	2o	2-	3-	3-	0+	0o	14+	8		
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
6	1.3	4+	5o	5+	4+	4o	3o	3o	4-	33-	30	16	
7	0.9	3-	4-	3-	4-	2-	4-	2+	3+	24-	15	18	
8	1.1	4o	2o	1o	2o	1+	3+	4-	6-	23o	20	19	
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 Disturbed	
12	0.8	1+	2o	3+	4o	3+	3+	2+	3-	22+	14		
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
16	0.2	1-	1-	2o	2o	1+	1o	2-	1o	10+	5	13	
17	0.4	1+	1-	2-	2-	2o	3-	2+	1-	13o	6	25	
18	0.3	0+	0+	2-	2-	1o	2+	1+	1o	10-	5	26	
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 Quiet	
22	0.5	1+	1o	2-	1o	2o	2-	3o	2o	14-	7		
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
26	1.0	3-	4+	3-	4+	4+	2o	1-	3o	24o	18	15	
27	0.9	4o	3-	1o	2o	2-	4o	4o	3-	23o	15	16	
28	1.0	3+	4o	4-	4-	3o	4-	2+	1o	25-	17	17	
29	0.3	2-	3+	3-	2-	1o	2-	2o	2+	16+	8	18	
												19	
												22	
												23	
												24	
Mean:	0.66									Mean:	12		

DAYS IN SOLAR ROTATION INTERVAL

ROT. NR.

1783

Nov

1784

Nov

1785

Dec

1786

Jan

1787

Feb

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CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

FEBRUARY 1964

FEB. 1964		NORTH ATLANTIC				NORTH PACIFIC				NORTH PACIFIC				GEOMAGNETIC	
		6-HOURLY QUALITY FIGURES				SHORT-TERM FORECASTS ISSUED ABOUT ONE HOUR IN ADVANCE OF:				ADVANCE FORECASTS (4-REPORTS) FOR WHOLE DAY, ISSUED IN ADVANCE BY:				K _p	
		00 06 12 18				00 06 12 18				17-17 13-17 DAYS SDW J _p				K _p	
		06 12 18 24				00 06 12 18				17-17 13-17 DAYS SDW J _p				K _p	
		5- 5- 6+ 5+				4 4 6 5				4 4 4 4				K _p	
		50 4+ 6+ 60				5 4 6 6				5 5 5 5				K _p	
		50 5+ 7- 6+				5 5 7 6				5 5 5 5				K _p	
		50 5- 7- 60				5 4 6 5				5 5 5 5				K _p	
		5- 40 7- 60				5 5 7 6				6 6 6 6				K _p	
		5+ 3+ 6- 6-				4 4 6 5				6 6 6 6				K _p	
		4- 4+ 6+ 6-				5 4 6 6				6 6 6 6				K _p	
		4+ 4+ 60 6-				5 5 7 6				6 6 6 6				K _p	
		4+ 40 60 5+				4 4 7 6				6 6 6 6				K _p	
		4+ 4+ 6+ 6-				5 5 7 6				6 6 6 6				K _p	
		5- 40 6+ 6+				4 5 7 6				6 6 6 6				K _p	
		4+ 40 7- 6-				5 4 6 5				6 6 6 6				K _p	
		5- 3+ 6+ 50				4 4 6 4				5 5 5 5				K _p	
		4+ 3+ 6+ 6-				4 4 5 5				4 4 4 4				K _p	
		5- 4+ 6+ 5+				5 4 6 5				5 5 5 5				K _p	
		4+ 40 60 6-				5 4 7 5				5 5 5 5				K _p	
		4+ 40 60 6-				5 4 7 5				5 5 5 5				K _p	
		50 40 7- 6-				5 4 7 6				5 5 5 5				K _p	
		50 4- 6+ 6-				5 4 7 6				6 6 6 6				K _p	
		5+ 5- 7- 60				5 5 7 6				6 6 6 6				K _p	
		5+ 4- 7- 60				5 5 7 5				6 6 6 6				K _p	
		50 40 60 6-				5 4 6 5				6 6 6 6				K _p	
		4+ 40 6+ 60				5 4 7 6				6 6 6 6				K _p	
		60 50 7- 6+				5 5 7 6				6 6 6 6				K _p	
		5+ 4+ 7- 6+				5 5 6 6				7 7 7 7				K _p	
		60 5- 7- 6-				5 5 6 6				7 7 7 7				K _p	
		5+ 4- 6- 6+				5 4 6 5				7 6 7 7				K _p	
		5+ 5- 6+ 6+				5 5 7 6				7 7 7 7				K _p	
		50 4+ 7- 60				5 4 6 6				7 6 6 6				K _p	
		50 5- 70 60				5 5 7 6				7 6 6 6				K _p	
Score: Quiet Periods		P 15 6 17 19				9 9				14 12 19				10	
		S 6 2 12 10				20 20				12 12 10				16	
		U 0 0 0 0				0 0				1 1 0				2	
		F 0 0 0 0				0 0				0 1 0				1	
Disturbed Periods		P 2 12 0 0				0 0				0 0 0				0	
		S 6 9 0 0				0 0				2 1 0				0	
		U 0 0 0 0				0 0				0 0 0				0	
		F 0 0 0 0				0 0				0 2 0				0	

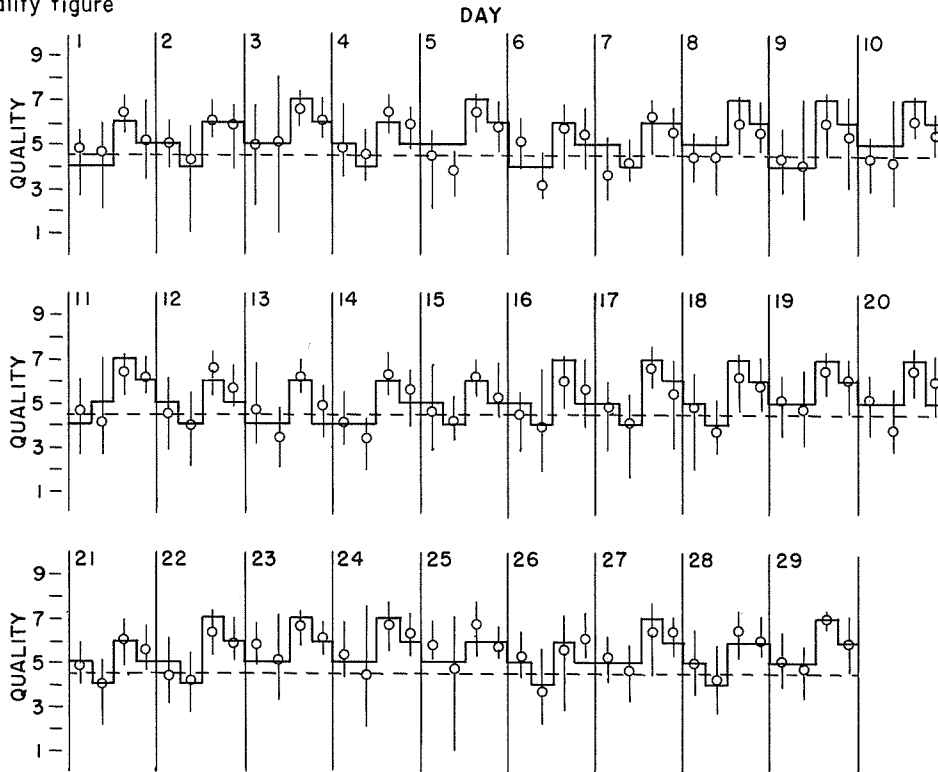
COMMERCE - STANDARDS - BOULDER

NORTH ATLANTIC

FEBRUARY 1964

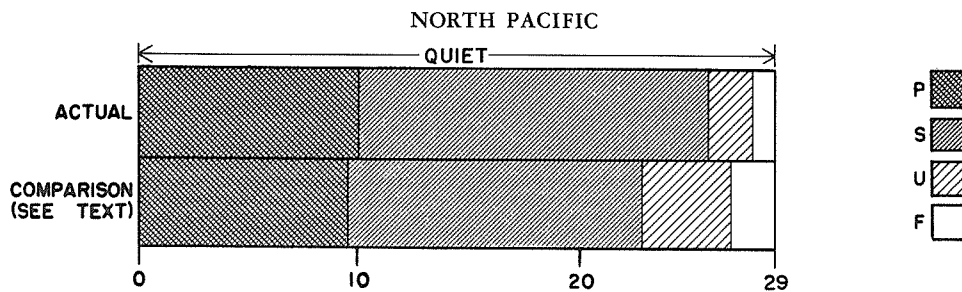
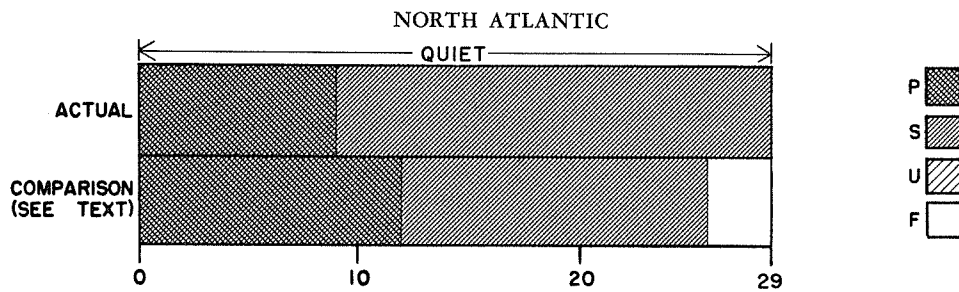
— Short-term forecast
 • Quality figure

| Range of reports



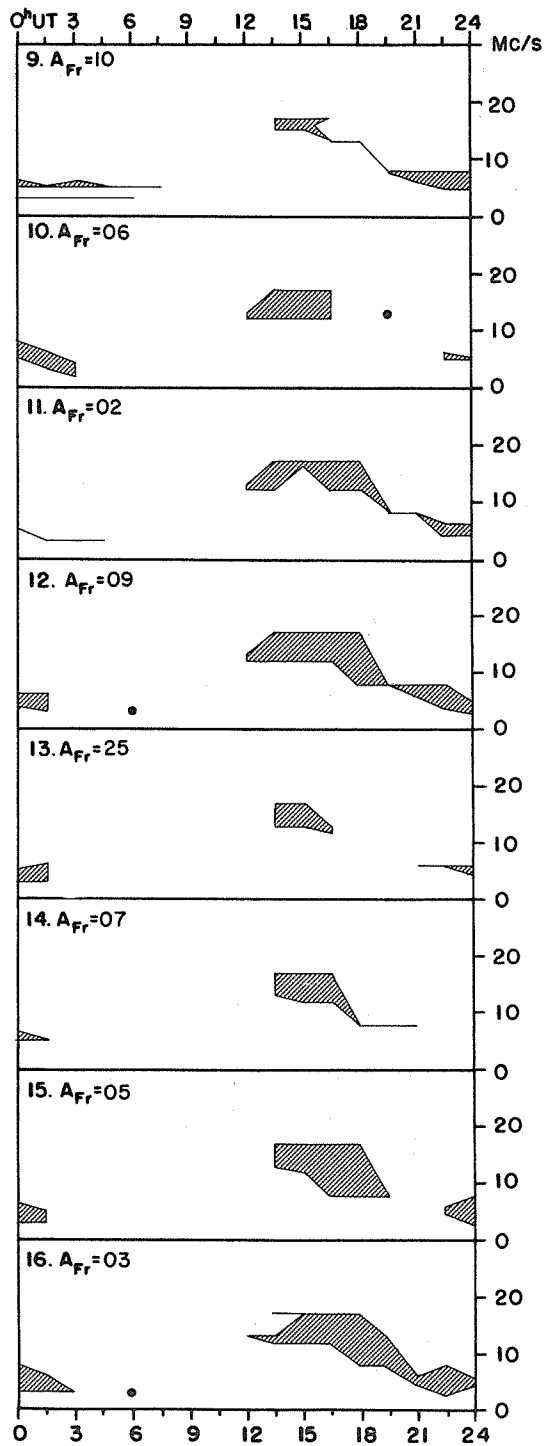
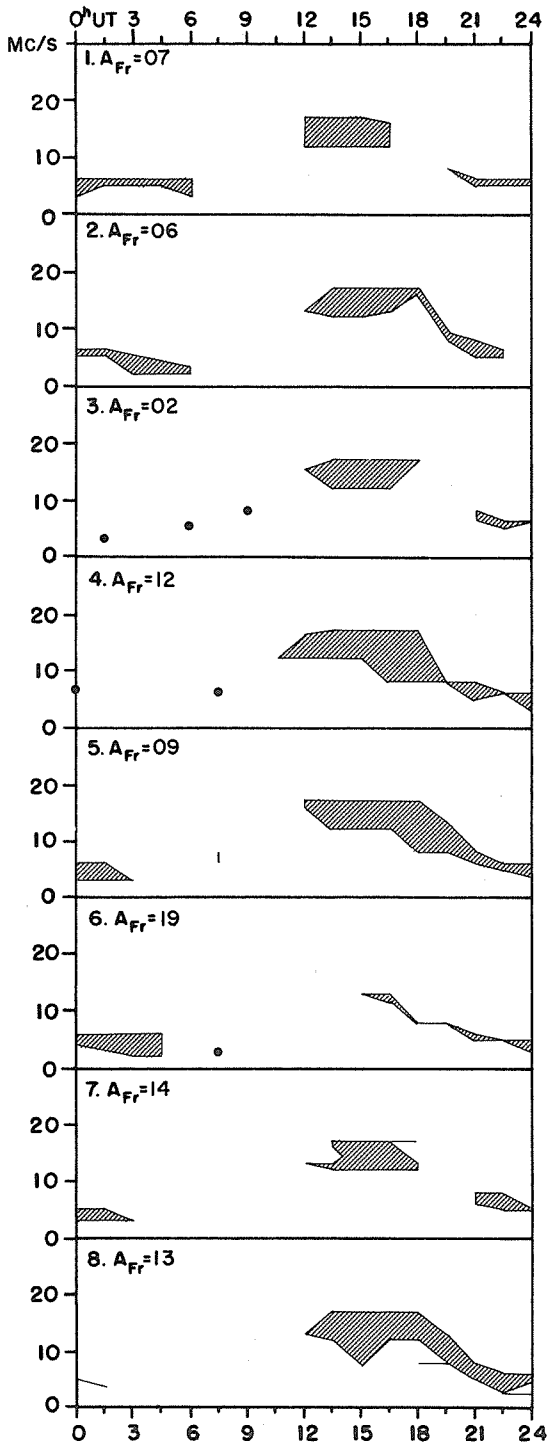
Outcome of advance forecasts-- final estimates (1 to 7 days ahead)

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FEBRUARY 1964

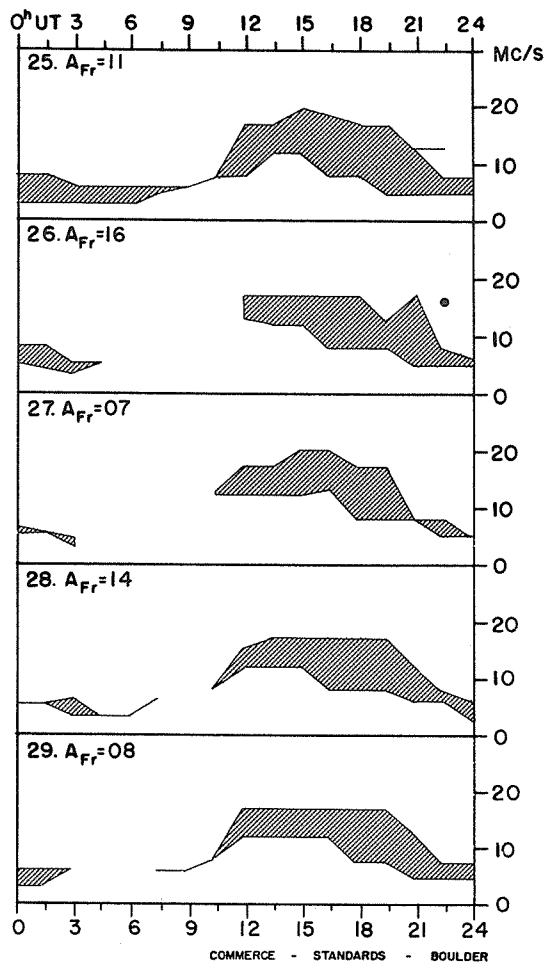
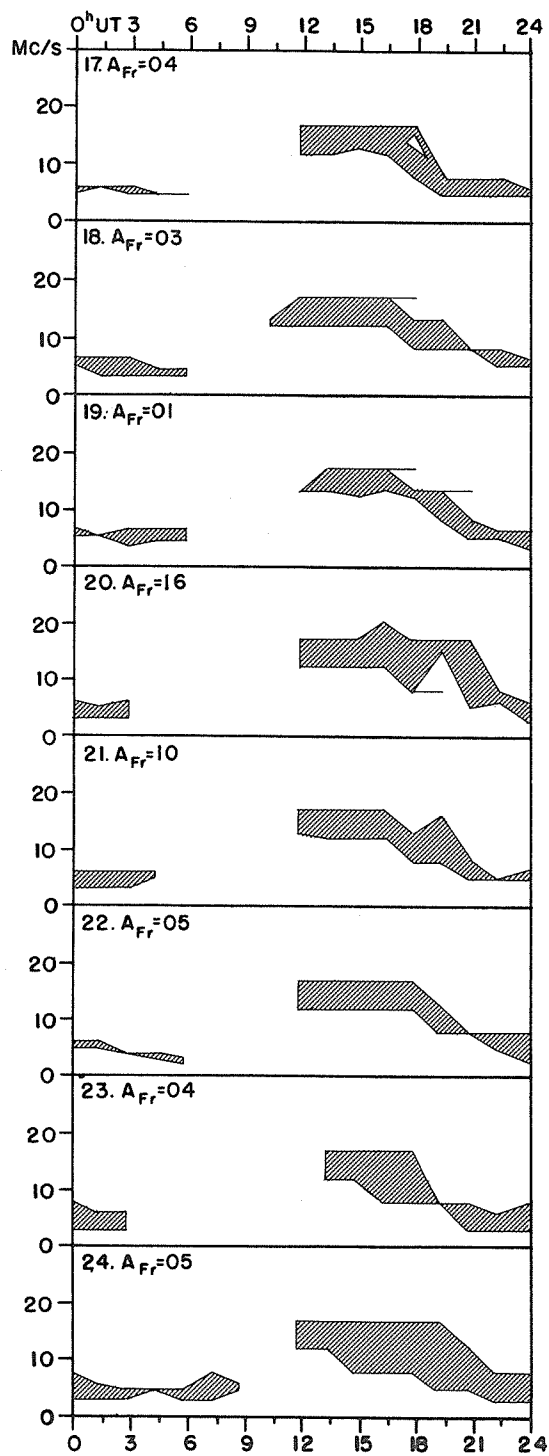


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USEFUL FREQUENCY RANGES -- NORTH ATLANTIC PATH

VII d

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	Ft. Belvoir, Magnetic Storm 3/21XXZ	39	Strat Warming	(Exists) (1)	Over Baffin Island moving Greenland
4	0400		40	Strat Warming	Exists	Over Baffin Bay moving Greenland
4	1810					
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 Center over Eurasia
13	0400		49	Strat Warming	Exists	Stable Warm Center Pole Active Warm Center Eurasia
14	0400		50	Strat Warming	Exists	Stable Warm Center Pole Active Warm Center Eurasia
15	0400		51	Strat Warming	Exists	Warm Centers 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	Circulation Changes 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.