PART B

SOLAR - GEOPHYSICAL DATA

ISSUED

AUGUST 1964

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

CRPL-F 240
PART B

NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
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The descriptive text was republished November 1963

Addendum to text:

ADJUSTMENT IN THE 10.7 CM SOLAR NOISE OBSERVATIONS FOR VARIATIONS IN THE SUN-EARTH DISTANCE

The solar radio noise as observed and reported at Ottawa on a wavelength of 10.7 cm, is a measure of this radiation incident on the earth for a particular day. For geophysical studies the use of the observed flux is appropriate, but as an indication of intrinsic or absolute solar activity, it must be modified for the varying distance between sun and earth. The most suitable adjustment is that which places the sun at unit astronomical distance. As a guide for following small changes of radio emission during the IQSY, daily values of the flux adjusted to 1 Astronomical Unit will be reported in addition to the observed values. This measure consists of emissions from the undisturbed solar atmosphere and from any centers of activity. The intensity of the outstanding events will be reported as before.

Recent considerations of the significance of the annual variation of the sun-earth distance have already appeared in geophysical studies [1,2]. Monthly adjusted means for the first part of 1964 are given in Table I and are to be compared with the minimum value of 65.5 flux units which occurred in January 1954.

A. E. Covington,
July, 1964

TABLE I

January	72.0
February	74.3
March	74.8
April	73.0
May	70.7
June	71.3

[1] On the World Wide Component of Variations in the E-Layer Ionization, T. Shimazaki, Jour. A and T Physics 1963, Vol. 25, pp. 331 to 337.

[2] Effect on the Earth's Orbital Eccentricity on Incident Solar Flux at 10.7 cm, M. K. Das Gupta and D. Basu, Jour. A and T Physics 1964, Vol. 26, pp. 135 to 137.

DAILY VALUES OF SOLAR FLUX AT 2800 Mc/s (10.7 cm)
RECORDED AT NATIONAL RESEARCH COUNCIL
OTTAWA, CANADA

OBSERVED FLUX IN WATTS/M^2/C/SEC $\times 10^{-22}$ FOR 2 POLARIZATIONS

1964						1964
	Jan.	Feb.	Mar.	Apr.	May	June
1	--	72.9	77.5	77.4	68.9	67.7
2	70.6	71.6	75.2	75.4	68.4	68.0
3	73.1	70.9	73.8	76.8	69.8	68.2
4	72.8	71.2	75.0	76.8	70.3	68.2
5	73.7	72.4	72.1	76.0	71.9	67.8
6	75.0	72.7	73.5	75.6	70.9	68.4
7	75.3	72.0	72.9	75.5	70.9	69.6
8	73.2	73.2	73.7	73.5	71.5	69.8
9	73.4	71.8	71.6	75.0	70.9	69.0
10	73.3	72.7	73.2	72.8	70.1	70.3
11	74.6	71.7	75.1	73.9	70.1	70.3
12	76.2	72.8	77.2	72.7	69.4	68.9
13	76.1	73.3	78.2	73.0	68.5	70.2
14	75.6	72.6	78.9	71.6	68.3	70.5
15	74.6	72.7	78.7	71.4	68.0	71.6
16	74.4	73.1	77.0	70.7	70.0	70.6
17	71.5	73.9	77.5	71.8	69.6	71.1
18	73.9	76.0	75.3	71.8	70.4	71.7
19	74.8	75.6	74.2	70.9	68.7	70.1
20	75.9	76.2	74.3	71.4	67.7	70.4
21	74.9	78.5	74 4	71.6	68.0	69.7
22	74.6	79.8	78.4	70.7	67.1	69.5
23	74.7	84.4	77.4	70.3	67.3	67.4
24	74.3	85.2	77.0	71.6	68.0	68.0
25	73.2	84.4	74.1	70.6	67.5	67.7
26	73.8	86.5	74.3	69.6	68.4	67.6
27	73.3	84.9	75.2	69.5	67.7	67.4
28	77.2	84.4	75.7	69.9	69.6	67.3
29	77.5	80.8	75.0	68.8	69.1	67.1
30	74.9		78.2	69.0	68.2	67.2
31	74.3		76.9		67.7	
Means	74.4	76.1	75.5	72.5	69.1	69.0

DAILY VALUES OF SOLAR FLUX AT 2800 Mc/s (10.7 cm)
RECORDED AT NATIONAL RESEARCH COUNCIL
OTTAWA, CANADA

FLUX ADJUSTED TO 1 ASTRONOMICAL UNIT
IN WATTS/M^2/C/SEC $\times 10^{-22}$ FOR 2 POLARIZATIONS

1964						1964
Day	Jan.	Feb.	Mar.	Apr.	May	June
1	—	70.8	76.1	77.3	70.0	69.7
2	68.3	69.5	73.9	75.3	69.5	70.0
3	70.7	68.8	72.5	76.8	71.0	70.2
4	70.4	69.2	73.8	76.9	71.5	70.2
5	71.3	70.4	70.9	76.1	73.2	69.8
6	72.5	70.7	72.4	75.8	72.2	70.5
7	72.8	70.1	71.8	75.7	72.2	71.7
8	70.8	71.2	72.7	73.7	72.9	71.9
9	71.0	69.9	70.6	75.2	72.2	71.1
10	70.9	70.8	72.2	73.1	71.5	72.5
11	72.1	69.8	74.1	74.3	71.5	72.5
12	73.7	70.9	76.3	73.1	70.9	71.0
13	73.6	71.5	77.3	73.4	69.9	72.4
14	73.1	70.8	78.0	72.0	69.8	72.8
15	72.1	70.9	77.8	71.9	69.5	73.9
16	72.0	71.3	76.2	71.2	71.6	72.9
17	69.2	72.1	76.7	72.4	71.2	73.8
18	71.5	74.3	74.6	72.4	72.1	74.1
19	72.4	73.9	73.6	71.5	70.3	72.4
20	73.5	74.5	73.7	72.1	69.3	72.7
21	72.5	76.8	73.9	72.3	69.7	72.0
22	72.3	78.0	77.9	71.5	68.8	71.8
23	72.4	82.6	76.9	71.1	69.0	69.6
24	72.0	83.4	76.5	72.5	69.8	70.2
25	70.9	82.7	73.7	71.4	69.3	69.9
26	71.5	84.8	74.0	70.5	70.2	69.9
27	71.1	83.3	74.9	70.5	69.5	69.7
28	74.9	82.8	75.5	70.9	71.5	69.6
29	75.2	79.3	74.8	69.8	71.0	69.4
30	72.7		78.0	70.0	70.1	69.5
31	72.1		76.7		69.6	
Means	72.0	74.3	74.8	73.0	70.7	71.3

DAILY SOLAR INDICES

June 1964	American Relative Sunspot Numbers $R_{A'}$
1	11
2	11
3	10
4	6
5	0
6	0
7	0
8	0
9	0
10	0
11	4
12	2
13	13
14	16
15	25
16	14
17	10
18	24
19	22
20	6
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	4
30	5
Mean:	6.1

July 1964	Zürich Provisional Relative Sunspot Numbers R_Z	Daily Values Solar Flux at 2800 Mc, Ottawa, Canada Flux S	Flux S_A
1	7	67.4	69.7
2	0	67.0	69.3
3	0	67.3	69.6
4	8	68.1	70.4
5	10	67.6	69.9
6	8	67.8	70.1
7	7	67.0	69.3
8	0	67.9	70.2
9	0	67.1	69.4
10	0	66.6	68.9
11	7	67.6	69.9
12	0	66.9	69.1
13	0	66.5	68.7
14	10	69.2	71.5
15	12	69.5	71.8
16	11	69.2	71.6
17	9	68.6	70.9
18	8	68.0	70.2
19	0	67.4	69.6
20	0	66.6	68.8
21	0	66.4	68.5
22	0	66.1	68.2
23	0	66.4	68.5
24	0	66.1	68.2
25	0	65.8	67.9
26	0	64.8 **	66.9
27	0	65.3	67.3
28	0	65.4	67.4
29	0	65.9	67.9
30	0	66.2	68.3
31	7	66.2	68.2
Mean:	3.4	67.0	69.2

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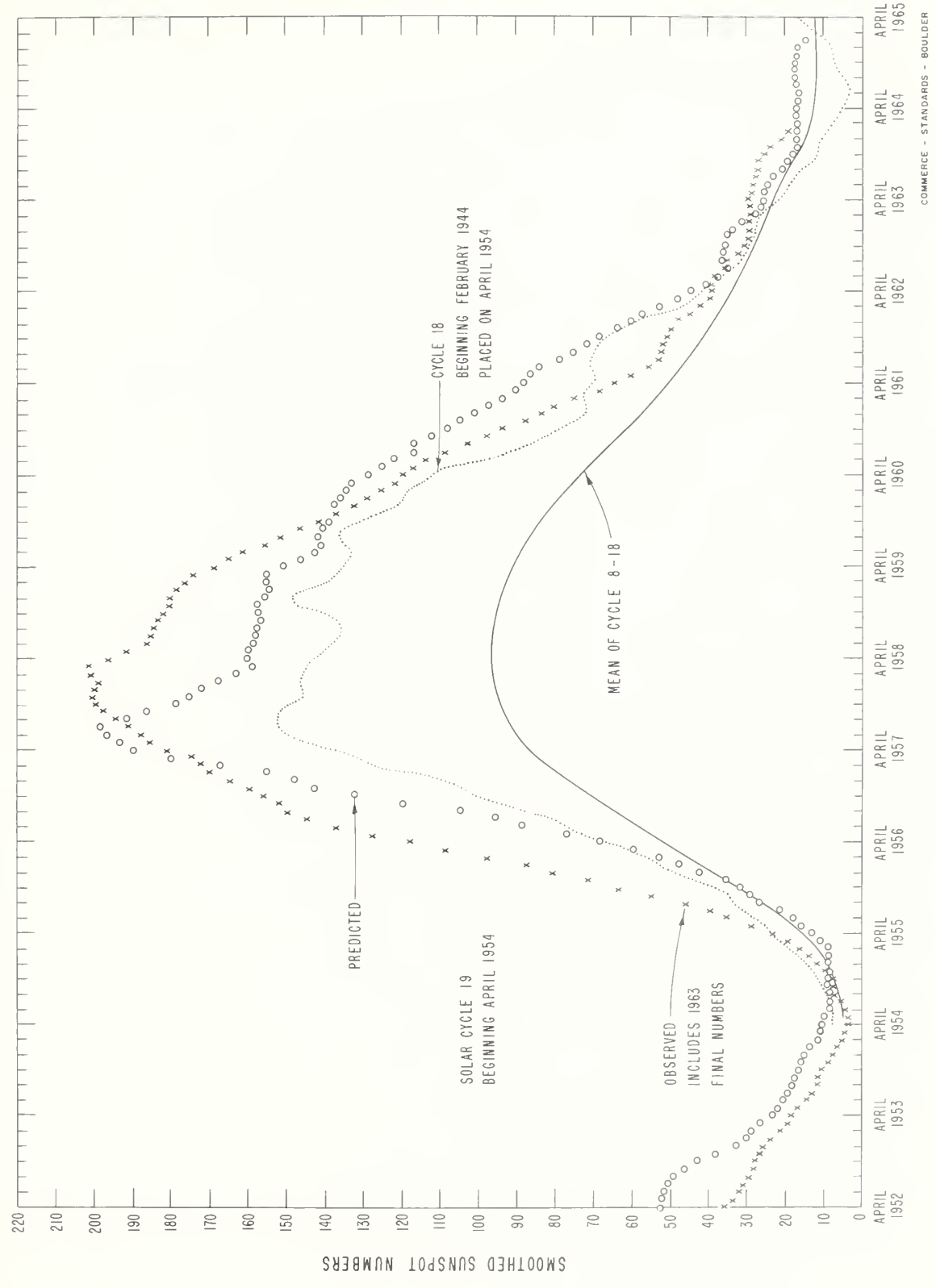
** July 26, 1964: Lowest flux observed since 1954.



PREDICTED AND OBSERVED SUNSPOT NUMBERS

JULY 1964

July 1964	LAT.	McMATH PLAGE NUMBER	RETURN OF REGION	CALCIUM PLAGE DATA						SUNSPOT DATA		
				CMP VALUES		HISTORY	AGE (ROTATIONS)	DATE FIRST SEEN (1)	DURATION (DAYS)	CMP VALUES		HISTORY
				AREA	INT					AREA	COUNT	
3.8	S37	7385 (2)	New	200	2	b — d	1	July 5	1			
4.7	S02	7383	New	400	2	ℓ ⟍ d	1	June 28	≥10	(20)	(1)	ℓ — d
5.4	N24	7390	New	(300)	(1.5)	b — ℓ	1	July 10	1			
6.0	S09	7391 (2)	New	(200)	(1)	b — ℓ	1	July 10	1			
8.1	N05	7386 (2)	New	200	1.5	b — d	1	July 6	1			
8.3	S05	7392 (2)	New	(100)	(2)	b — d	1	July 10	1			
8.7	S14	7393 (2)	New	(100)	(1.5)	b — d	1	July 10	1			
9.0	N05	7394 (2)	New	100	1	b — d	1	July 10	1			
9.3	N32	7384	7343	900	3	ℓ ⟍ ℓ	2	July 2	14	(60)	(1)	b ⟍ d
9.3	N45	7387	New	100	1.5	b — d	1	July 9	2			
9.7	N02	7400	New	(100)	(2.5)	b — d	1	July 13	2			
10.1	S06	7401	New	(100)	(1.5)	b — d	1	July 13	2			
11.7	N07	7388 (3)	7357	500	2	b ⟍ d	2	July 6	10			
12.1	N14	7406	New	(300)	(1.5)	b — ℓ	1	July 16	2			
12.2	N29	7395 (2)	New	200	2	b — d	1	July 10	1			
12.4	S02	7397 (2)	New	200	1	b — d	1	July 11	1			
13.4	N30	7389	New	300	1.5	b — d	1	July 9	3			
13.9	S11	7402	New	200	1.5	b — d	1	July 14	3			
14.8	N07	7403	New	200	2	b — d	1	July 14	5			
14.9	N10	7396 (2)	New	(100)	(1)	b — d	1	July 10	1			
15.0	N29	7398	New	200	2.5	b — d	1	July 11	3			
16.4	N29	7407	New	200	2	b ⟍ ℓ	1	July 16	6			
16.9	N18	7408	New	100	2	b — d	1	July 17	2			
17.5	S01	7399	New	200	1.5	ℓ ⟍ d	1	July 11	6			
17.7	N28	7404	New	400	3	b ⟋ ℓ	1	July 14	10	70	3	b ⟋ d
20.5	N10	7409	New	(300)	(1)	b — d	1	July 23	2			
21.2	N08	7405	New	(400)	(1)	ℓ ⟋ d	1	July 15	4			
22.3	N37	7410	New	100	1.5	b — ℓ	1	July 23	5			
23.5	N15	7418 (2)	New	(200)	(2)	b — ℓ	1	July 28	1			
24.2	S09	7411 (2)	New	200	2	b — d	1	July 24	1			
24.7	N18	7415 (2)	New	(200)	(2.5)	b — d	1	July 27	1			
25.5	N06	7416 (2)	New	(400)	(1.5)	b — d	1	July 27	1			
25.6	S06	7419	New	(100)	(1)	b — d	1	July 28	2			
26.9	S15	7417 (2)	New	100	2	b — d	1	July 27	1			
27.4	S05	7420 (2)	New	200	1.5	b — d	1	July 28	1			
28.1	N11	7421	New	100	1	b — d	1	July 28	2			
28.1	S08	7424	New	(100)	(1)	b — d	1	July 30	4			
28.5	N21	7425	New	(300)	(3)	b ⟋ ℓ	1	July 31	4	(100)	(2)	b — d
28.6	N21	7422 (2)	New	100	1.5	b — d	1	July 28	1			
29.3	N15	7412 (2)	New	(200)	(1)	b — d	1	July 24	1			
30.9	N32	7413	New	(200)	(1.5)	ℓ — d	1	July 24	2			
31.1	N08	7426	New	(200)	3	b ⟋ ℓ	1	Aig. 1	6	(100)	(1)	b — d
31.3	N03	7414	New	(300)	(1.5)	ℓ ⟋ d	1	July 25	4			

(1) No calcium plage observations were secured at the McMath-Hulbert Observatory on July 8, 1964.
(2) These very small and ephemeral plages last for only one day.
(3) Plage 7388 was seen on the disk as a weak plage on July 6 and the days following, but was not reported until July 9.

JULY 1964

July 1964	TIME MEAS. UT	LAT	MER DIST	TYPE	July 1964	TIME MEAS UT	LAT	MER DIST	TYPE
1	0005	S05	E46	αp	13	No Obs.			
1	1450	S05	W37	αp	14	1745	N27	E37	βp*
2-3	No Spots				15	1630	N27	E26	βp*
4	1730	N28	E56	βp	16	1645	N17	W57	αf
							N28	E13	βp*
5	1810	N29	E43	βp	17	1800	N28	W02	αp*
6	1635	N29	E27	αf	18	No Obs.			
7-8	No Spots				19-30	No Spots			
9	No Obs.				31	1815	N19	W30	βp*
10-12	No Spots								

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*New cycle

Erratum: In CRPL-F 239B for July 1964, the Mt. Wilson data published on page IIb, the latitude and longitude columns have been reversed.

FINAL CORONAL LINE EMISSION INDICES

APRIL 1964

CMP April 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	x	x	x	x	x	x	x	x	7	11	18	23	7	9	11	15
2	5	7	10	14	4	5	10	12	3	4	13	20	3	4	8	13
3	x	x	x	x	x	x	x	x	3	6	8	10	9	12	11	18
4	26	42	20	26	6	14	11	14	6	17	9	11	29	42	12	20
5	37	67	17	28	6	18	10	16	3	6	10	12	14	29	13	20
6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7	61	111	x	x	20	58	x	x	4	15	11	12	6	7	8	9
8	x	x	x	x	x	x	x	x	4	6	14	20	14	20	13	18
9	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
10	x	x	x	x	x	x	x	x	x	x	0	0	x	x	8	18
11	23	29	x	x	12	13	x	x	x	x	x	x	x	x	x	x
12	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
13	x	x	x	x	x	x	x	x	x	x	8	10	x	x	11	19
14	23	32	x	x	12	22	x	x	x	x	x	x	x	x	x	x
15	13	18	16	20	5	9	9	12	x	x	9	11	x	x	13	15
16	9	24	24	48	2	4	9	20	6	11	10	20	25	67	11	14
17	14	27	16	32	2	3	9	12	x	x	x	x	x	x	x	x
18	39	87	18	36	5	8	8	12	3	6	9	13	4	7	9	16
19	8	18	19	40	3	4	9	12	3	6	x	x	3	4	x	x
20	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
21	3	4	8	12	2	3	5	6	15	34	12	16	6	11	10	12
22	9	11	13	16	4	5	15	22	22	42	23	40	8	9	22	26
23	x	x	x	x	x	x	x	x	12	20	10	16	6	8	12	18
24	20	28	3	10	24	26	3	8	x	x	x	x	x	x	x	x
25	x	x	x	x	x	x	x	x	4	6	8	10	3	3	7	8
26	x	x	x	x	x	x	x	x	7	9	10	24	5	6	6	8
27	11	12	17	24	22	40	22	40	x	x	x	x	x	x	x	x
28	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29	x	x	15	22	x	x	16	20	x	x	11	16	x	x	7	9
30	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

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

FINAL CORONAL LINE EMISSION INDICES

MAY 1964

CMP May 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	15	25	8	11	7	11	10	12	x	x	x	x	x	x	x	x
2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3	13	15	6	8	3	3	3	4	9	20	x	x	19	22	x	x
4	7	9	x	x	2	2	x	x	7	8	11	13	13	18	8	10
5	13	20	13	32	2	4	11	16	27	51	x	x	41	64	x	x
6	8	11	15	18	2	6	13	14	x	x	x	x	x	x	x	x
7	8	14	12	17	4	6	17	25	1	3	13	16	11	17	12	16
8	15	18	x	x	17	20	x	x	7	11	10	18	12	14	10	13
9	6	7	12	16	3	4	8	12	6	8	11	15	11	12	12	15
10	18	37	10	24	18	36	6	8	3	8	10	12	17	25	9	13
11	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
12	27	42	0	0	11	15	0	0	1	5	x	x	8	14	x	x
13	x	x	13	17	x	x	10	11	13	15	13	15	34	44	11	14
14	x	x	x	x	x	x	x	x	13	18	18	20	42	65	9	16
15	x	x	x	x	x	x	x	x	7	9	0	0	19	28	0	0
16	x	x	x	x	x	x	x	x	6	7	15	20	12	14	13	18
17	6	8	x	x	4	6	x	x	5	6	12	16	6	8	13	20
18	7	9	11	18	7	8	13	25	x	x	x	x	x	x	x	x
19	34	37	x	x	34	42	x	x	x	x	x	x	x	x	x	x
20	x	x	x	x	x	x	x	x	x	x	13	19	x	x	14	19
21	10	12	13	18	11	16	14	20	11	11	12	16	14	23	15	28
22	1	6	8	10	4	6	10	14	10	16	x	x	8	11	x	x
23	6	8	13	17	7	8	15	22	6	8	5	8	6	8	6	9
24	0	0	11	13	1	6	8	9	x	x	x	x	x	x	x	x
25	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
26	4	6	x	x	3	11	x	x	x	x	x	x	x	x	x	x
27	19	20	12	14	21	24	12	13	16	28	10	16	15	20	0	0
28	26	34	14	18	21	27	15	22	x	x	17	24	x	x	12	15
29	22	30	0	0	11	16	0	0	10	13	11	14	30	37	6	8
30	23	28	8	12	11	16	11	16	14	18	x	x	27	32	x	x
31	12	20	8	10	4	11	10	14	11	18	11	14	12	16	11	17

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

FINAL CORONAL LINE EMISSION INDICES

JUNE 1964

CMP June 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	x	x	x	x	x	x	x	x	18	28	14	25	19	22	15	20
2	x	x	x	x	x	x	x	x	8	9	10	12	9	12	10	13
3	17	25	13	18	9	12	7	11	7	8	12	18	7	11	16	20
4	13	14	12	17	8	12	11	12	19	24	6	7	17	20	9	11
5	7	9	x	x	6	8	x	x	12	15	15	19	16	18	14	18
6	16	18	2	7	10	13	0	0	x	x	x	x	x	x	x	x
7	x	x	x	x	x	x	x	x	15	19	14a	22a	17	22	15a	24a
8	x	x	x	x	x	x	x	x	0	0	19	28	8	9	14	20
9	35	44	x	x	16	23	x	x	11	15	7	9	11	13	7	10
10	19	24	x	x	15	22	x	x	1	3	15	20	9	14	12	16
11	x	x	15	30	x	x	13	16	5	7	12	18	5	7	11	14
12	20	25	9	11	15	22	10	14	8	14	27	43	14	25	19	28
13	25	32	x	x	12	17	x	x	11	12	17	20	9	12	13	22
14	13	20	24	28	7	8	15	20	x	x	19	40	x	x	14	30
15	18	22	29	50	10	14	20	33	8	13	11	15	13	18	10	14
16	14	24	13	24	6	7	9	12	9	31	13	19	9	11	12	15
17	13	20	13	18	18	24	13	20	12	16	14	21	8	17	14	20
18	2	8	3	9	19	23	5	11	15	18	x	x	33	61	x	x
19	13	17	15	18	12	16	13	14	8	9	8	11	14	24	22	64
20	x	x	x	x	x	x	x	x	x	x	14	24	x	x	13	20
21	9	14	13	22	13	17	9	20	x	x	12	15	x	x	11	15
22	5	7	15	20	2	6	14	18	1	3	x	x	2	8	x	x
23	11	11	8	10	15	21	8	13	10	13	11	13	15	18	9	11
24	7	9	12	16	4	6	16	22	8	13	14	20	13	23	2	12
25	6	6	8	10	4	5	10	12	3	6	10	12	6	11	10	15
26	8	11	15	26	5	14	20	24	14	20	24	28	25	29	11	18
27	12	14	14	18	12	13	16	20	x	x	x	x	x	x	x	x
28	x	x	9	21	x	x	10	26	x	x	7	8	x	x	8	12
29	10	13	20	26	6	7	15	25	7	10	0	0	9	12	5	6
30	9	20	12	16	3	6	12	15	12	13	9	11	12	13	6	9

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

PROVISIONAL CORONAL LINE EMISSION INDICES

JULY 1964

CMP July 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	6	8	19	26	0	0	12	18	x	x	x	x	x	x	x	x
2	x	x	x	x	x	x	x	x	x	x	12a	16a	x	x	13a	20a
3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
4	x	x	x	x	x	x	x	x	6	6	13a	17a	8	11	13a	16a
5	x	x	9	14	x	x	7	11	x	x	x	x	x	x	x	x
6	10a	14a	x	x	2a	6a	x	x	2	11	14	16	9	17	12	14
7	x	x	12	17	x	x	10	16	x	x	15	20	x	x	18	27
8	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
9	x	x	x	x	x	x	x	x	14	22	11	17	8	11	11	15
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	0	0	14	17	14	20	11	12
12	x	x	6	9	x	x	6	8	x	x	13	14	x	x	13	18
13	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
14	x	x	x	x	x	x	x	x	6	8	12	15	6	8	16	20
15	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
16	x	x	10a	13a	x	x	8a	10a	x	x	x	x	x	x	x	x
17	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
18	2	6	19a	28a	5	6	14a	18a	3	6	15	20	7	8	23	25
19	x	x	x	x	x	x	x	x	x	x	15	18	x	x	19	28
20	5	8	15	26	0	0	13	14	x	x	x	x	x	x	x	x
21	x	x	14	17	x	x	11	14	x	x	x	x	x	x	x	x
22	x	x	x	x	x	x	x	x	5	6	15	22	6	8	13	17
23	7	14	8	10	1	6	14	17	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	12	31	11	14	3	6	9	12	x	x	x	x	x	x	x	x
26	x	x	13	15	x	x	17	24	0	0	13	16	3	3	9	12
27	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28	8	10	15	28	5	7	19	20	x	x	x	x	x	x	x	x
29	x	x	x	x	x	x	x	x	11	16	17a	22a	6	8	17a	24a
30	x	x	x	x	x	x	x	x	x	x	12	16	x	x	20	30
31	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

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

SOLAR FLARES

JULY 1964

OBSERVATORY	DATE JULY 1964	OBSERVED UNIVERSAL TIME START	END	MAX PHASE	LOCATION APPROX LAT	APPROX 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	0145	0600	NO FLARE	PATROL											
CAPRI-S	01	1330	1347		N29	E90			1-	3	1339	.50				
	04	0345	0425	NO FLARE	PATROL											
	05	0625	0640	NO FLARE	PATROL											
CAPRI-S	05	1505 E	1555 D		N30	E47			1-	3	1530	1.00	1.70			
	06	0220	0230	NO FLARE	PATROL											
	06	0245	0310	NO FLARE	PATROL											
	06	0320	0330	NO FLARE	PATROL											
	07	0215	0315	NO FLARE	PATROL											
	07	0415	0450	NO FLARE	PATROL											
CATANIA	07	0838 E	0850 D		N30	E21			1-							
CATANIA	07	1105 E	1140 D		N30	E21			1-							
MCMATH	07	1145	1210 D	1149	N32	E22	7384		1-	2	1149	.50	.60			
MCMATH	07	1422	1433 D		N32	E20	7384		1-	1	1430	.20	.20			
	08	0250	0320	NO FLARE	PATROL											
	08	0425	0450	NO FLARE	PATROL											
LOCKHEED	09	0137	0155	0141	N32	E01			1-	2	0141	.40	.40		10	
	09	0155	0200	NO FLARE	PATROL											
	09	0245	0300	NO FLARE	PATROL											
CAPRI-S	09	1058	1115		N33	W04			1-	2	1105	.90	1.00			
MCMATH	09	2119	2140	2124	N32	W13	7384		1-	2	2124	.20	.20			
	10	0150	0430	NO FLARE	PATROL											
	11	0200	0255	NO FLARE	PATROL											
	11	0410	0510	NO FLARE	PATROL											
MCMATH	11	1445	1530	1447	S04	E82	7399		1-	1	1447	.30				
CAPRI-S	11	1459 E	1513 D		S05	E85			1-	1	1507	.60				
HUANCAYO	11	1508 E	1531 D	1510	S08	E80			1-	S				1.90		
MCMATH	11	1612 E	1639 D		S04	E80	7399		1-	1	1614	.30				
LOCKHEED	11	1708	1732	1720	S05	E80			1-	2	1720	.30	.80		10	
	12	0330	0400	NO FLARE	PATROL											
	12	0415	0535	NO FLARE	PATROL											
LOCKHEED	12	2131	2200	2140	S47	E17			1-	2	2140	.30	.40		10	
	13	0150	0155	NO FLARE	PATROL											
	13	0220	0450	NO FLARE	PATROL											
MCMATH	13	1736	1800	1740	N28	E53	7404		1-	1	1740	.30	.60			
LOCKHEED	13	2237	2256	2243	S53	E55			1-	2	2243	.30	.60		10	
HTE-PROVEN	14	0715	0750	0724	N28	E45			1-		0724	.50	.70			
ARCETRI	14	0805 E	0825 D		N28	E45			1-	2	0805	.91	1.40			
CAPRI-S	14	0811	0819		N28	E46	7404	8	1	3	0814	1.50	2.30			
HTE-PROVEN	14	0812	0820	0815	N28	E44			1-		0815	.60	.90			

SOLAR FLARES

JULY 1964

OBSERVATORY	DATE JULY 1964	OBSERVED UNIVERSAL TIME START	OBSERVED UNIVERSAL TIME END	OBSERVED UNIVERSAL TIME MAX PHASE	LOCATION APPROX LAT	LOCATION APPROX MER DIST.	LOCATION McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME U T	MEAS. AREA Sq. Deg.	CORR AREA Sq. Deg.	MAX WIDTH He	MAX INT °c	PROVISIONAL IONOSPHERIC EFFECT
CATANIA	14	0815 E	0825 D		N28	E43	7404	10 D	1							
ARCETRI	14	0850 E	0915 D		N28	E45	7404	25 D	1	2	0850	1.50	2.30			
HTE-PROVEN	14	1054	1102	1056	N28	E42			1-		1056	.30	.40			
HTE-PROVEN	14	1128	1139	1130	N28	E42			1-		1130	.40	.60			
SALTSJOBADN	14	1129 E	1145		N27	E41			1-	2	1132	.50	.70			
CATANIA	14	1132 E	1210 D		N28	E43	7404	38 D	1							
HTE-PROVEN	14	1159	1220	1205	N28	E42			1-		1205	.40	.60			
SALTSJOBADN	14	1203	1211		N26	E42			1-	3	1207	.70	.90			
MCMATH	14	1802 E	1814 D	1803	N28	E39	7404		1-	2	1803	.40	.60			
MCMATH	14	1915	2000 D	1920	N28	E38	7404		1-	2	1900	.40	.60			
MCMATH	14	1915	2000 D	1945	N28	E38			1-							
LOCKHEED	14	2124	2144	2137	N03	E73			1-	2	2137	.30	.80		10	
LOCKHEED	14	2210	2222	2215	N23	E08			1-	2	2215	.10	.10		10	
CAPRI-S	15	0641	0649		N29	E29			1-	3	0643	.30	.40			
HTE-PROVEN	15	0725	0733	0729	N28	E30			1-		0729	.30	.40			
CATANIA	15	0725 E	0735 D		N28	E31			1-							
	16	0200	0225	NO FLARE PATROL												
	16	0305	0340	NO FLARE PATROL												
	16	0500	0530	NO FLARE PATROL												
LOCKHEED	16	1920	1942	1925	N00	E72			1-	2	1925	.20	.40		10	
	17	0200	0225	NO FLARE PATROL												
	17	0330	0405	NO FLARE PATROL												
LOCKHEED	18	0120	0134	0124	N06	E36			1-	2	0124	.30	.30		10	
	18	0155	0500	NO FLARE PATROL												
	19	0200	0210	NO FLARE PATROL												
	21	0530	0550	NO FLARE PATROL												
	22	0105	0115	NO FLARE PATROL												
	22	0135	0145	NO FLARE PATROL												
	22	0430	0435	NO FLARE PATROL												
LOCKHEED	22	2153	2210	2159	N26	E31			1-	2	2159	.30	.30		10	
MCMATH	22	2154	2205	2157	N36	W48	7404		1-	2	2157	.20	.30			
LOCKHEED	22	2155	2220	2159	N34	W48			1-	2	2159	.30	.40		10	
MCMATH	23	1813 E	1818 D	1814	N26	W85	7404		1-	1	1814	.20				
LOCKHEED	23	2357	0007	0002	N08	E82			1-	2	0002	.30	.90		10	
MITAKA	23	2358	0010	0003	N10	E90			1-	C						
	25	0240	0440	NO FLARE PATROL												
LOCKHEED	25	2325	2339	2333	N09	W52			1-	2	2333	.10	.10		10	
LOCKHEED	26	1900	1915	1906	N54	W90			1-	2	1906	.30	1.50		10	
LOCKHEED	26	1954	2004	1957	N60	W80			1-	2	1957	.30	.90		10	
	27	0200	0225	NO FLARE PATROL												

SOLAR FLARES

JULY 1961

OBSERVATORY	DATE JULY 1961	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
	27	0300	0325	NO FLARE PATROL												
	27	0400	0415	NO FLARE PATROL												
CAPRI-S	27	1252 E	1303		N09	W25			1-	3	1255	.40	.40			
LOCKHEED	27	2124	2148	2131	N19	W41			1-	2	2131	.50	.50		10	
LOCKHEED	27	2323	2344	2328	S63	E75			1-	2	2328	.50	.60		10	
	28	0230	0300	NO FLARE PATROL												
	29	2015	2020	NO FLARE PATROL												
	29	2110	2120	NO FLARE PATROL												
	29	2150	2155	NO FLARE PATROL												
	29	2240	2245	NO FLARE PATROL												
	29	2300	2305	NO FLARE PATROL												
	29	2325	2400	NO FLARE PATROL												
	30	0000	0035	NO FLARE PATROL												
MCMATH	31	1505	1515	1507	S05	W44	7424		1-	2	1507	.40	.50			
MCMATH	31	1856	1914	1859	N19	W41	7425		1-	1	1859	.30	.40			
LOCKHEED	31	2002	2025	2008	N19	W41			1-	2	2008	.30	.30		10	
MCMATH	31	2003	2030	2008	N19	W43	7425		1-	2	2008	.30	.40			
MCMATH	31	2114	2139	2125	N20	W43	7425		1-	2	2125	.50	.70			
LOCKHEED	31	2119	2137	2128	N19	W41			1-	2	2128	.50	.60			

COMMERCE - STANDARDS - BOULDER

ATHENES	ATHENS, CREECE	HONOLULU	HAWAII, USA	NERA	NEDERHORST den BERGH, NETHERLANDS
BAKOU	PIRCULI, USSR	IKOMASAN	KYOTO, JAPAN	NIZMIR	KRASNAYA PAKHRA, USSR
CAPETOWN	ROYAL OBSERVATORY, CAPE OF COOD HOPE	KIEV KO	KIEV GAO, USSR	SAC PEAK	SACRAMENTO PEAK, N.MEX. USA
CAPRI F	CAPRI, ITALY (CERMAN)	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, ENCLAND	MOSCOU	MOSCOW-GAISH, USSR	WENDEL	WENDELSTEIN, GFR
HTE-PROVEN	HAUTE-PROVENCE	NEW SCHAUIN	FREIBURC, CFR		

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

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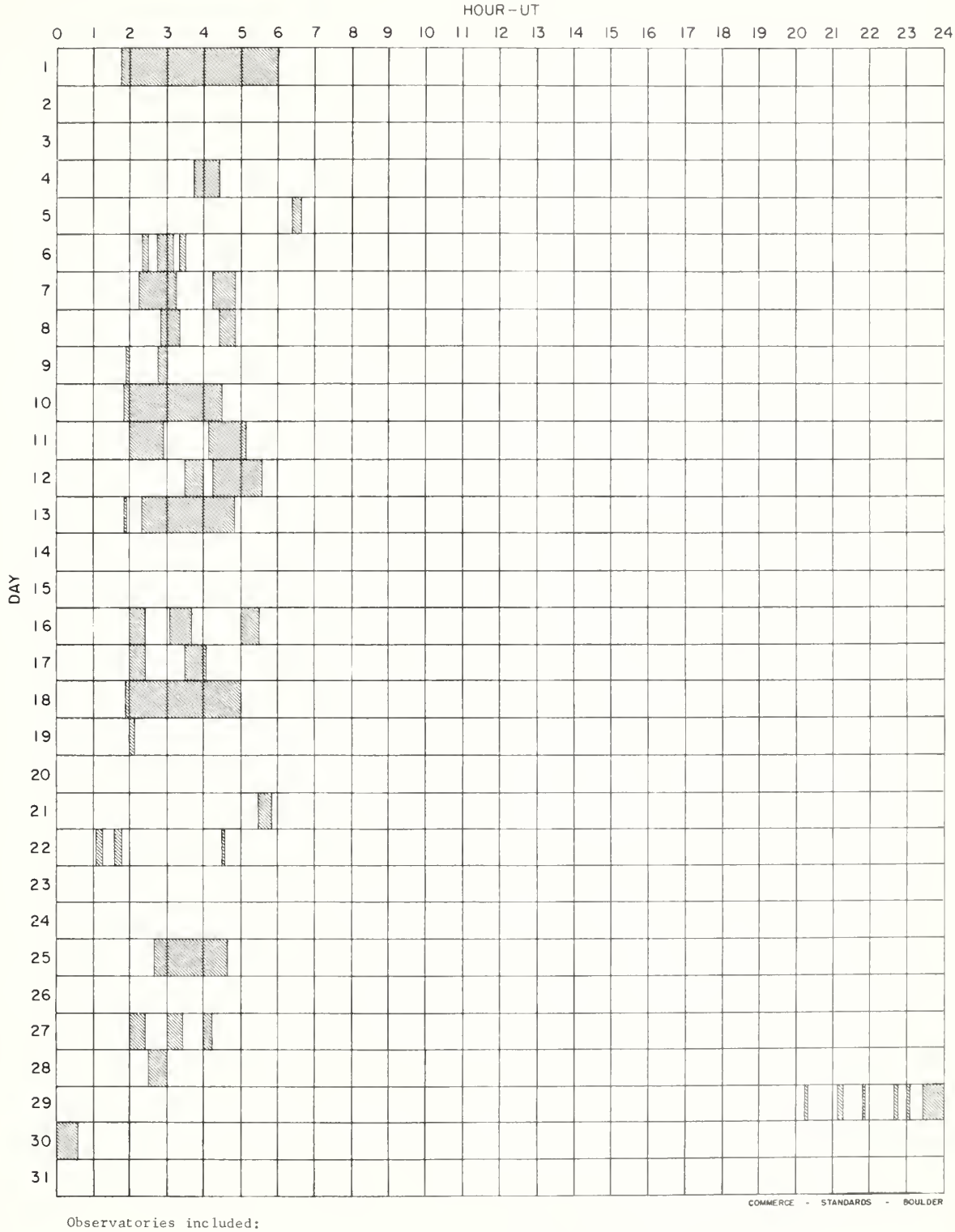
PROVISIONAL

JULY 1964



Observatories included:

Arcetri	Dunsink	Istanbul	McMath-Hulbert	Sacramento Peak
Arosa	Haute-Provence	Locarno	Mitaka	Wendelstein
Capri-S (Swedish)	Huancayo	Lockheed	Ondrejov	Zurich
Catania	Ikomason	Manila	Ottawa	

SOLAR FLARES

APRIL 1964

OBSERVATORY	DATE APRIL 1964	OBSERVED UNIVERSAL TIME START	OBSERVED UNIVERSAL TIME END	OBSERVED UNIVERSAL TIME MAX PHASE	LOCATION APPROX LAT	LOCATION APPROX MER DIST	LOCATION 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	0025	0045	NO FLARE	PATROL											
THESSALONIK	01	0950 E	0956 D		S06	W24			1-	G			1.48	1.31		
	01	1935	1940	NO FLARE	PATROL											
	01	2200	2305	NO FLARE	PATROL											
SYDNEY	03	0248	0305	0259	S08	W46	7195	17	1	C	0259	3.50	5.10			
	03	1440	1530	NO FLARE	PATROL											
	03	1600	1605	NO FLARE	PATROL											
	03	1620	1635	NO FLARE	PATROL											
	03	1645	1655	NO FLARE	PATROL											
	03	1730	1735	NO FLARE	PATROL											
MITAKA	05	0325	0345	0330	N15	E90			1-	C						
MITAKA	05	0724	0741	0733	S06	W90	7195	17	1	C						
OTTAWA	05	1849	1857	1852	N16	E83			1-	C	1852					
	05	2245	2330	NO FLARE	PATROL											
MITAKA	06	0350	0415	0400	N20	E85			1-	C						
SYDNEY	07	0125	0300	0143	N18	E68	7213	95	3	C	0143	5.40	14.00			
VOROSHILOV	07	0129 E	0213 D		N16	E66	7213	44 D	1+	C	0137	2.43	6.53		72	
	09	0430	0500	NO FLARE	PATROL											
UCCLE	09	1517	1518 D		N16	E35			1-							
CLIMAX	09	1518	1532	1523	N16	E31			1-		1523	.40	.40			
SYDNEY	10	0052	0110	0057	N16	E24			1-	C	0057	.60	.70			
SYDNEY	10	0054	0101	0057	N14	E23	7213	7	1	C	0057	1.40	1.60			
SYDNEY	10	0334	0354	0343	N07	W43			1-	C	0343	.60	.80			
UCCLE	10	1022	1025		N14	E23			1-							
UCCLE	10	1208	1218	1211	N15	E20			1-		1211	2.00	2.00			
HONOLULU	11	0054	0138	0111	N16	E11			1-		0111	.90	.90			
LOCARNO	12	1545	1555		N09	E76	7224	10	1	V						
SYDNEY	13	0012 E	0040		N06	E71	7224	28 D	1	P	0017	.40	1.10			
UCCLE	13	0906 E	0913 D		N08	E75			1-		0906	.50	1.30			
THESSALONIK	13	1208 E	1211 D		S56	E17			1-	G			1.32	.85		
SYDNEY	14	0015	0030 D	0025	N08	E59	7224	15 D	1	P	0025	1.00	1.80			
SYDNEY	14	0015	0030 D	0025	N11	E62	7224	15 D	1	P	0025	1.20	2.40			
SYDNEY	14	0023	0028	0025	N06	E58	7224	5	1	C	0025	.60	1.10			
CRIMEE	14	0750 E	0808 D	0753	N10	E56			1-	C	0753	3.65	6.20			
CAPETOWN	14	0750	0814	0753	N11	E56	7224	43	1	C	0753	1.10	2.10			
CATANIA	14	0755 E	0810 D		N09	E55	7224	15 D	1							
BUCHAREST	14	0752 E	0811 D		N13	E56	7224	19 D	1	2			4.10			
CAPETOWN	14	1220	1306	1232	S09	W20		46	1	C	1232	2.00	2.20			
UCCLE	15	0919	0922	0920	N09	E41			1-							
BUCHAREST	15	0920 E	0925 D		N10	E43			1-	3						

SOLAR FLARES

APRIL 1964

OBSERVATORY	DATE APRIL 1964	OBSERVED UNIVERSAL TIME START	OBSERVED UNIVERSAL TIME END	OBSERVED UNIVERSAL TIME MAX PHASE	LOCATION APPROX LAT.	LOCATION APPROX 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
UCCLE	15	1056	1103		S14	W03			1-							
UCCLE	15	1415	1417		N10	E17			1-							
UCCLE	15	1451	1455		N10	E17			1-							
UCCLE	16	1049	1055		S14	W16			1-							
UCCLE	16	1103	1106		S14	W16			1-							
	17	0115	0150	NO FLARE	PATROL											
OTTAWA	18	1341 E	1356 D		N10	W01	7224	15 D	1	C	1345	.55	.55			
	18	1900	2230	NO FLARE	PATROL											
	19	1825	1830	NO FLARE	PATROL											
	19	1940	2140	NO FLARE	PATROL											
	19	2145	2150	NO FLARE	PATROL											
	19	2200	2240	NO FLARE	PATROL											
	19	2300	2310	NO FLARE	PATROL											
	19	2335	2340	NO FLARE	PATROL											
MITAKA	20	0244	0310	0248	N30	E26			1-	C						
UCCLE	20	0905	0908		S08	E37			1-							
UCCLE	20	1100	1104		S09	E37			1-							
UCCLE	20	1550 E	1556	1551	S06	E33			1-							
UCCLE	20	1628	1645		S06	E33			1-							
	20	1710	1935	NO FLARE	PATROL											
	20	1945	2035	NO FLARE	PATROL											
	20	2040	2125	NO FLARE	PATROL											
	20	2130	2250	NO FLARE	PATROL											
CATANIA	21	0713 E	0835 D		S07	E23	7244	82 D	1+							
ARCETRI	21	0910 E	0935 D		S09	E21			1-	3	0930	1.60	1.70			
NIZAMIAH	21	0917	0933	0923	S09	E24	7244	16	1	2	0923	2.43	2.67	1.50		
UCCLE	21	0921	0923		S09	E21			1-							
UCCLE	21	1146	1152		S07	E20			1-							
UCCLE	21	1423	1430	1424	S08	E17			1-							
ARCETRI	21	1430 E	□		S09	E21			1-	3	1430	.20	.20			
IKOMASAN	22	0530	□		S09	E13	7244		1	P	0530	5.00	5.10			
	22	1730	1755	NO FLARE	PATROL											
CATANIA	24	0800 E	0815 D		S07	W25	7244	15 D	1							
CLIMAX	25	2047	2050 D		S10	W45			1-		2049	.60	.70			
	25	2210	2220	NO FLARE	PATROL											
	25	2300	2330	NO FLARE	PATROL											
	29	0215	0240	NO FLARE	PATROL											

COMMERCE - STANDARDS - BOULDER

SOLAR FLARES

APRIL 1964

These flares are addenda to the April 1964 flares published in GRPL-F 237 for May 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	SAG PEAK	SAGRAMENTO 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
GRIMÉE	SIMEIZ, USSR	MCMATH	MCMATH-HULBERT PONTIAC, MICH., USA	TACHKENT	TASHKENT, USSR
HERSTMONGEU	ROYAL GREENWIGH OBSERVATORY, HERSTMONCEUX, ENGLAND	MOSCOU	MOSGOW-GAISH, USSR	WENDEL	WENDELSTEIN, GFR
HTE-PROVEN	HAUTE-PROVENCE	NEW SCHAUIN	FREIBURG, GFR		

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

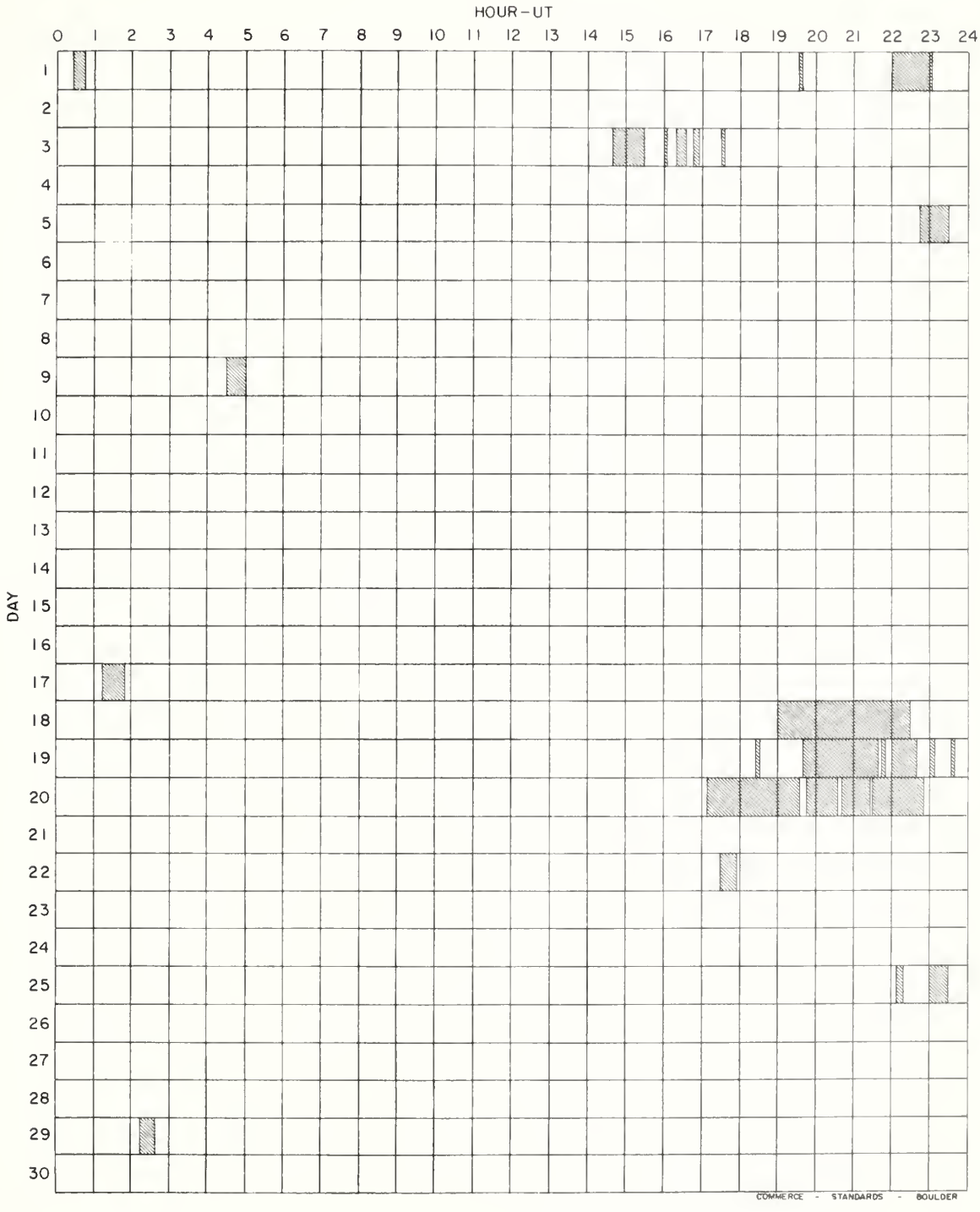
SEE DESCRIPTIVE TEXT PUBLISHED NOVEMBER 1961 FOR DEFINITION OF GORREGTED AREA VALUES LISTED FOR CLIMAX, HAWAII, LOCKHEED AND SACRAMENTO PEAK.

COMMERCE - STANDARDS - BOULDER

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

INTERVALS OF NO FLARE PATROL OBSERVATIONS

APRIL 1964



Observatories included:

Abastumani	Capri-S (Swedish)	Honolulu	Kodaikanal	Mitaka	Tachkent
Arcetri	Climax	Ikomasan	Locarno	Nizamiah	Uccle
Arosa	Crimee	Irkutsk	Lockheed	Ondrejov	Voroshilov
Bucharest	Dunsink	Istanbul	Lvov	Ottawa	Wendelstein
Capetown	Haute-Provence	Izmiran	Manila	Sacramento Peak	Wroclaw
Capri-F(German)	Herstmonceux	Kiev-KO	McMath-Hulbert	Sydney	Zurich

SOLAR FLARES

JANUARY, FEBRUARY, MARCH 1964

OBSERVATORY	DATE 1964	OBSERVED UNIVERSAL TIME START	OBSERVED UNIVERSAL TIME END	OBSERVED UNIVERSAL TIME MAX PHASE	LOCATION APPROX LAT	LOCATION APPROX MER DIST	LOCATION McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS COND	MEASUREMENTS TIME U T	MEASUREMENTS MEAS AREA Sq Deg	MEASUREMENTS CORR AREA Sq Deg	MEASUREMENTS MAX WIDTH Ha	MEASUREMENTS MAX INT	PROVISIONAL IONOSPHERIC EFFECT
JANUARY																
CATANIA	14	1052 F	1102 D		S02	W85			1-							
CATANIA	29	0920 F	□		S03	W58			1-							
FEBRUARY																
CATANIA	04	1158 E	1212		N45	E21			1-							
CATANIA	21	1125 E	1128 D		N10	E02	7108	3 D	1							
CATANIA	22	1100 E	1125 D		N08	E27	7161	25 D	1							
CATANIA	24	1008 E	□		N08	E02			1-							
CATANIA	28	0935 E	□		S07	E55			1-							
CATANIA	28	1019 E	□		N03	W60	7168		1							
CATANIA	28	1018 E	□		N07	W55	7168		?							
MARCH																
CATANIA	05	1115 E	1150 D		N10	W25			1-							
CATANIA	12	0905 E	0915 D		S03	W55			1-							
CATANIA	12	1013 E	1015 D		N42	W05	7180	2 D	1							
CATANIA	13	1055 E	1123 D		N42	W20			1-							
CATANIA	16	0818 E	□		N04	W72	7182		1							
CATANIA	22	0804 E	0815 D		N10	W23			1-							
CATANIA	24	0815 E	0850 D		N07	E47	7192	35 D	1+							

COMMERCE - STANDARDS - BOULDER

These flares are addenda to those published in CRPL-F 234, 235, 236, 237, 238 and 239 Part B for February, March, April, May, June and July 1964.

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

JUNE 1964

JUNE 1964	UNIVERSAL TIME			TYPE SWF IMP	IMPORTANCE						BUR	WIDE SPREAD INDEX	STATIONS	KNOWN FLARE
	START	END	MAX		ABS	SCNA	SEA	SPA	SES	SFD				
None observed.														

COMMERCE - STANDARDS - BOULDER

RIOMETER EVENTS

(Provisional)

JUNE 1964

South Pole **26 Mc/s**

JUNE 1964	START UT	END UT	MAX. UT	MAX. ABSORP. db, (tenths)	NO. OF PEAKS	JUNE 1964	START UT	END UT	MAX. UT	MAX. ABSORP. db, (tenths)	NO. OF PEAKS
1	1218	2053	1618	9	5	17	0328	0412	0400	5	1
2	0127	1925	0952	5	4	17	1441	1602	1514	3	2
3	1009	1504	1129	3	1	18	0306	0348	0317	6	1
4	0849	1150	0949	5	2	18	1133	1500	1418	4	2
5	0227	0436	0247	14	1	18	2208	2342	2216	10	2
6	0929	1633	1056	4	6	19	2315	0616	2353	6	4
7	*					20	1106	1221	1146	4	1
8	0203	0307	0231	3	4	21	0105	0316	0112	30	3
8	0905	1246	0923	7	1	21	0952	1314	1134	4	2
9	0154	1649	1217	4	16	22	1406	1832	1643	5	3
10	0129	0413	1205	26	5	23	0549	1729	1408	7	6
11	0756	1826	1432	6	3	23	2218	0154	2348	28	1
12	0228	**	0236	54	0	24	2014	2128	2107	5	2
13	0020	0224	0115	27	3	25	0017	1811	0028	38	2
13	0638	1946	1112	28	2	26	0054	0326	0205	41	1
13	2150	2317	2232	3	2	26	0852	0300	2322	41	1
14	0452	0632	0530	11	1	27	0730	1809	1434	12	13
14	0850	1818+	0031+	13	3	27	2143	2335	2244	5	2
16	0101	0746	0128	27	1	28	1012	1358	1130	22	1
						28	1833	1845	1837	4	2
						29	0941	0427	1206	14	1
						30	1752	0335	0149	15	2

COMMERCE - STANDARDS - BOULDER

* No event
** Uncertain
\+ June 15, 1964

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

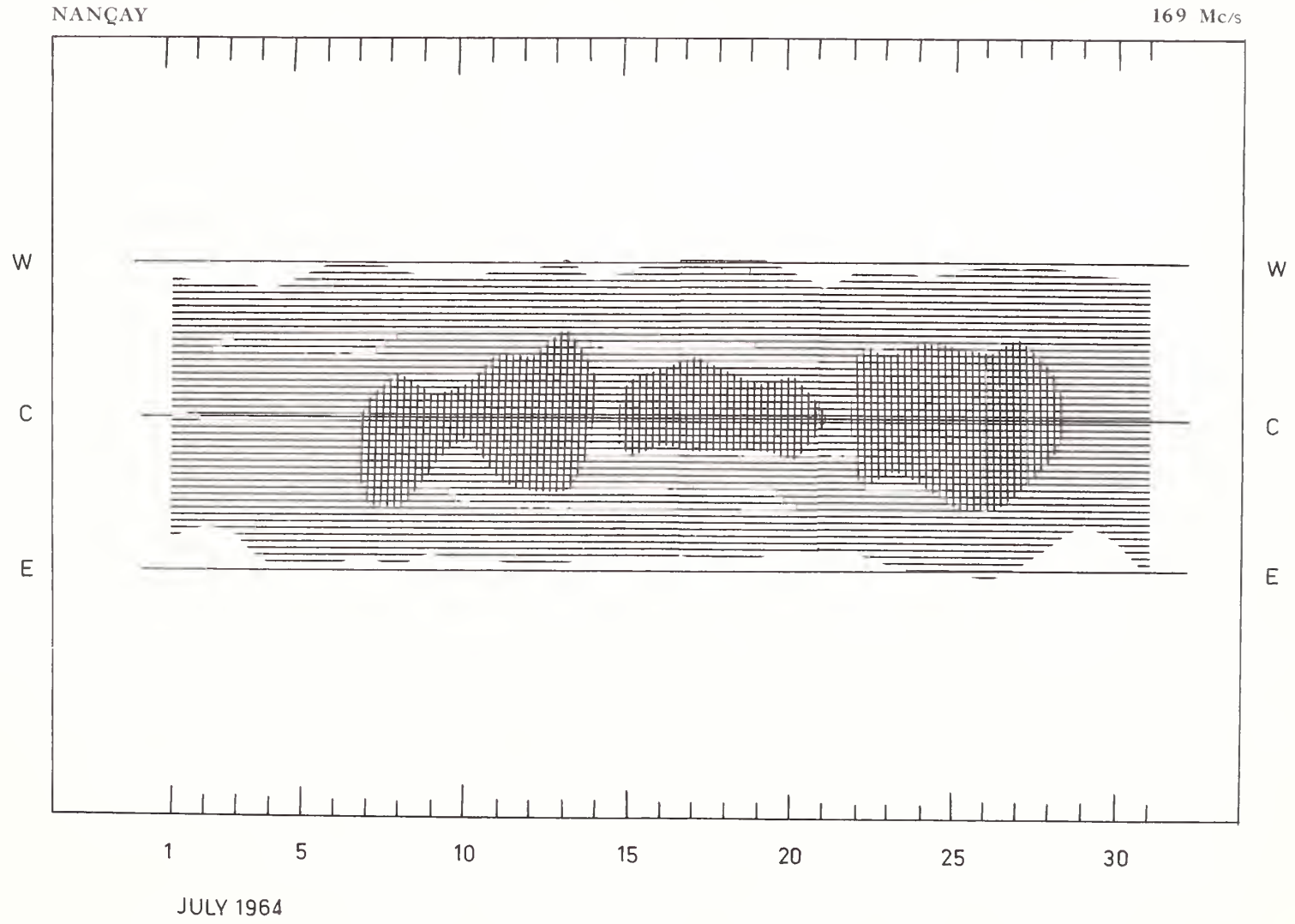
JULY 1964

ARO - OTTAWA **2800 Mc/s**

JULY 1964	URANE	DESCRIPTIVE TYPE	START UT	DURATION HRS. MIN.	MEAN FLUX	MAXIMUM		REMARKS
						TIME	FLUX	
None observed.								

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATIONS

JULY 1964



SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JULY 1964

NBS BOULDER 108 Mc s

None observed.

NOMINAL TIMES OF OBSERVATION

JULY 1964

NBS BOULDER 108 Mc s

1964 July	HOURS OF OBSERVATION U.T.	HOURS OF INTERFERENCE U.T.	July 1964	HOURS OF OBSERVATION U.T.	HOURS OF INTERFERENCE U.T.
1	1140-1618;		16	1149-2302	
	1645-0210		17	1150-0206	2355-0111
2	1140-1245;		18	1151-0205	
	1300-0210	1755-2045	19	1152-2150;	
3	1141-0209			2203-0204	
4	1141-0209	2150-2235;	20	1152-0204	
		2335-2400			
5	1142-0209	2040-2205;	21	1153-0203	2313-0000
		2345-0058	22	1154-0202	1444-1447;
					1824-2224
6	1142-0209	1924-1940;	23	1155-0201	2103-2230
		2009-2012	24	1156-0201	
7	1143-0208		25	1157-0200	0032-0200
8	1144-0208	2004-2025;			
		2147-2250	26	1157-0159	
9	1144-0208	2330-0130	27	1158-0159	
10	1145-0207		28	1159-0127	2213-0127
			29	1550-0157	1947-0157
11	1145-0208	2300-2330	30	1201-0156	1748-1830;
12	1146-0207				2352-0010
13	1147-0207	2145-2225;			
		0130-0145	31	1202-0155	1330-1332;
14	1148-1629;				2342-0028
	1644-0207				
15	1148-2302	2120-2302			

COMMERCE - STANDARDS - BOULDER

Note: Most of the interference is due to atmospherics.

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1964

Fort Davis

50-320 Mc/s

1964	OBSERVING HOURS	IMPORTANT BURSTS			FREQUENCY RANGE MC	REMARKS
		TYPE	TIMES U.T	INT		
Apr. 1	1305-2300					
Apr. 2	1305-2300					
Apr. 3	1306-2300					
Apr. 4	1305-2300					
Apr. 5	1306-2300					
Apr. 6	1305-2300					
Apr. 7	1305-2300					
Apr. 8	1306-2300					
Apr. 9	1305-2300					
Apr. 10	1305-2300					
Apr. 11	1305-2300					
Apr. 12	1305-2300					
Apr. 13	1305-2300					
Apr. 14	1305-2300					
Apr. 15	1306-2130 2132-2300					
Apr. 16	1306-2300					
Apr. 17	1306-2300					
Apr. 18	1307-2300					
Apr. 19	1306-2300					
Apr. 20	1307-2300					
Apr. 21	1307-2300					
Apr. 22	1307-2300					
Apr. 23	1307-2300					
Apr. 24	1307-2300					
Apr. 25	1307-2300					
Apr. 26	1254-2300					
Apr. 27	1254-2300					
Apr. 28	1645-2300					
Apr. 29	1300-2300					
Apr. 30	1301-2300					

COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1964

Fort Davis

50-320 Mc/s

1964	OBSERVING HOURS	IMPORTANT BURSTS			FREQUENCY RANGE MC	REMARKS
		TYPE	TIMES U.T	INT		
May 1	1300-2300					
May 2	1300-2300					
May 3	1300-2300					
May 4	1300-2300					
May 5	1300-2300					
May 6	1301-2300					
May 7	1300-2300					
May 8	1300-2300					
May 9	1300-2300					
May 10	1300-2300					
May 11	1300-1619 1845-2300					
May 12	1300-2300					
May 13	1300-2300					
May 14	1300-2300					
May 15	1300-2300					
May 16	1300-2300					
May 17	1300-2300					
May 18	1301-2300					
May 19	1301-2300					
May 20	1300-2300					
May 21	1300-2300					
May 22	1300-2300					
May 23	1300-2300					
May 24	1300-2300					
May 25	1300-2300					
May 26	1300-2300					
May 27	1300-2300					
May 28	1300-2300					
May 29	1300-2300					
May 30	1300-2300					
May 31	1300-2300					

COMMERCE - STANDARDS BOULDER

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

JUNE 1964

Fort Davis

50-320 Mc/s

1964	OBSERVING HOURS	IMPORTANT BURSTS			FREQUENCY RANGE MC	REMARKS
		TYPE	TIMES U.T	INT		
June 1	1230-2230					
June 2	1230-2230					
June 3	1230-2230					
June 4	1230-2230					
June 5	1230-2230					
June 6	1230-2230					
June 7	1230-2230					
June 8	1230-2230					
June 9	1230-2230					
June 10	1230-2230					
June 11	1507-2230					
June 12	1230-2230					
June 13	1230-2230					
June 14	1230-2230					
June 15	1230-2230					
June 16	1230-2230					
June 17	1230-2230					
June 18	1230-2230					
June 19	1230-2230					
June 20	1230-2230					
June 21	1230-2230					
June 22	1230-2230					
June 23	1230-2230					
June 24	1230-1955 2004-2230					
June 25	1230-2230					
June 26	1230-2230					
June 27	1230-2230					
June 28	1230-2230					
June 29	1230-2230					
June 30	1230-2230					

COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

JULY 1964

High Altitude Observatory
Boulder

7.6-41 Mc/s

Date July 1964	Bursts			Frequency Range (Mc/s)
	Type	Time (U.T.)	Intensity	
7	III	1420:30-1421:30	1+	15-41

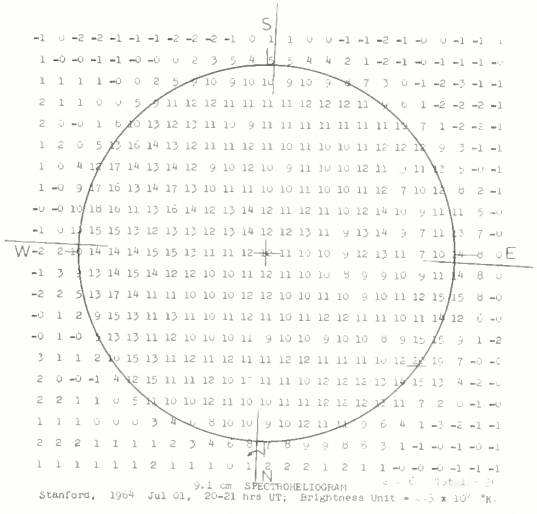
COMMERCE - STANDARDS - BOULDER

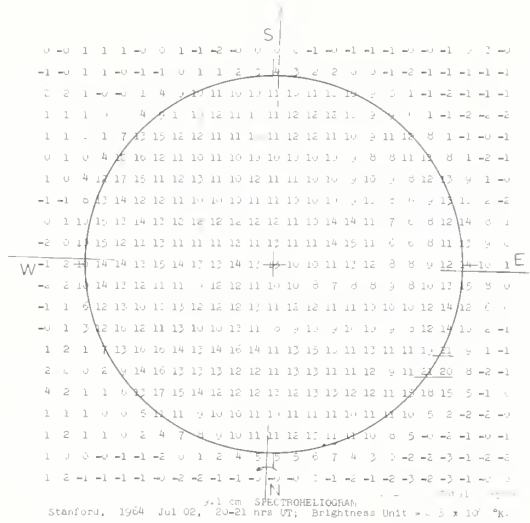
SOLAR RADIO EMISSION SPECTROHELIOGRAMS

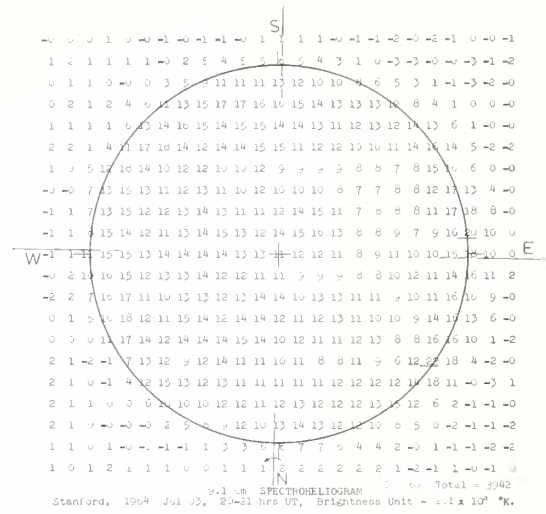
JULY 1964

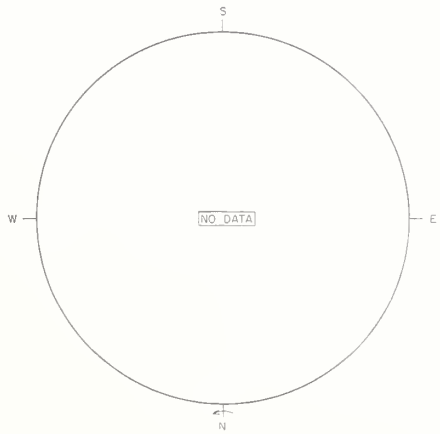
STANFORD

9.1 cm

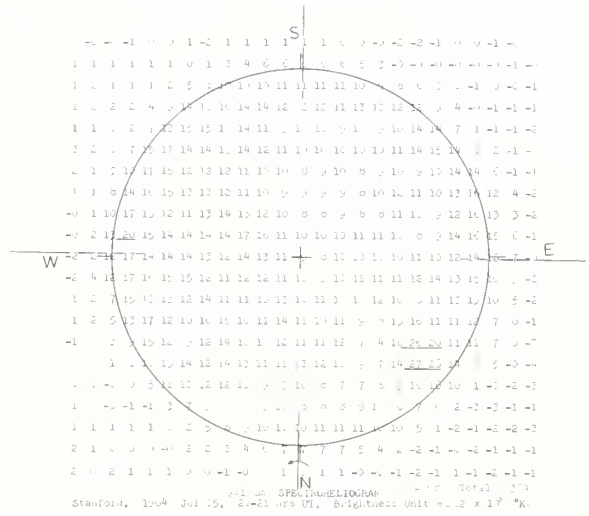


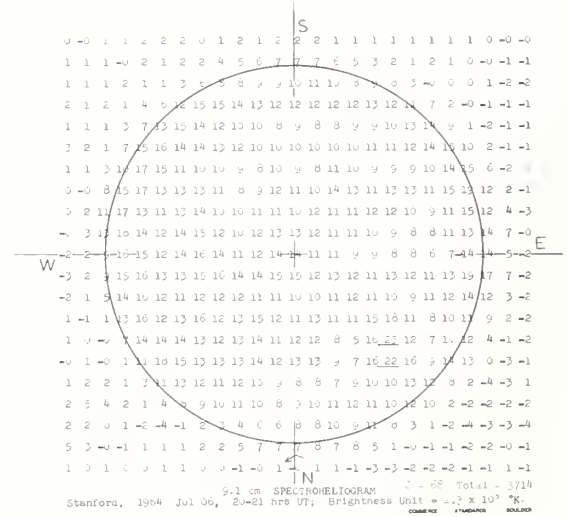






1964 JULY 04



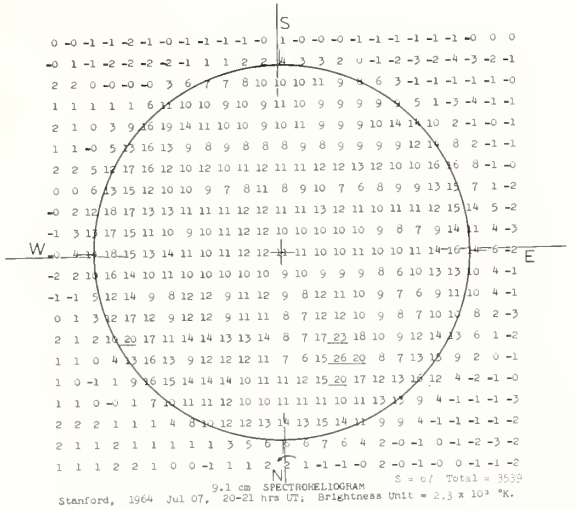


SOLAR RADIO EMISSION SPECTROHELIOGRAMS

JULY 1964

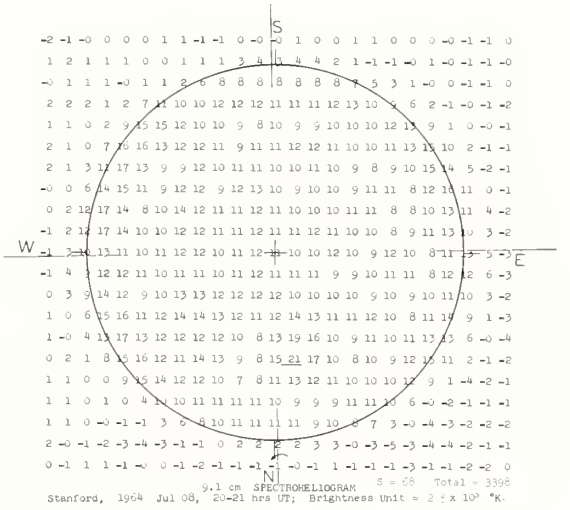
STANFORD

9.1 cm



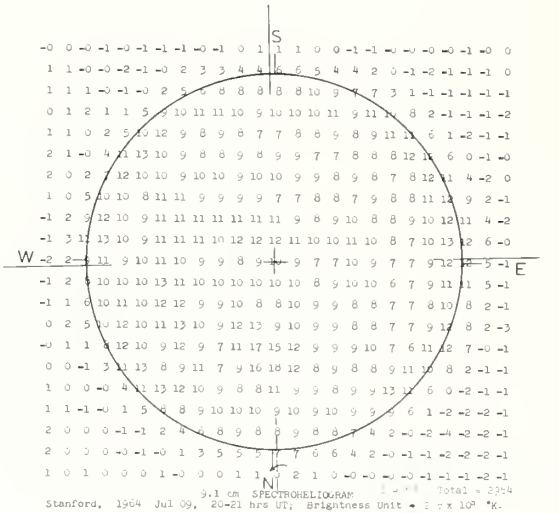
9.1 cm SPECTROHELIOGRAM S = 67 Total = 3539

Stanford, 1964 Jul 07, 20-21 hrs UT; Brightness Unit = 2.3 x 10^3 °K.



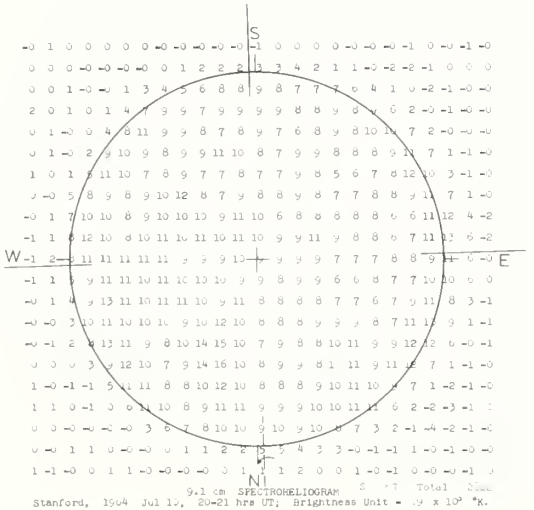
9.1 cm SPECTROHELIOGRAM S = 68 Total = 3398

Stanford, 1964 Jul 08, 20-21 hrs UT; Brightness Unit = 2.5 x 10^3 °K.



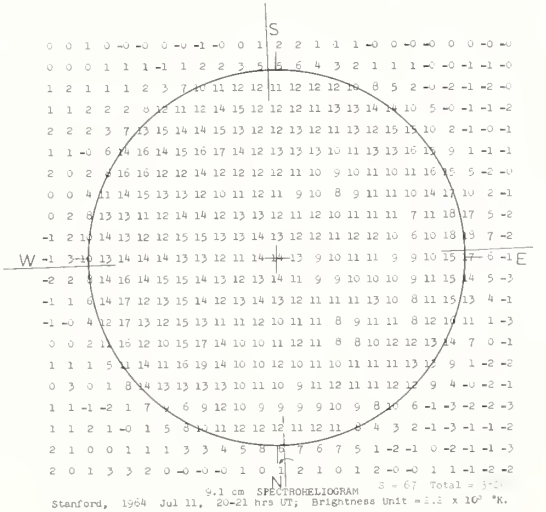
9.1 cm SPECTROHELIOGRAM S = 68 Total = 3354

Stanford, 1964 Jul 09, 20-21 hrs UT; Brightness Unit = 2.7 x 10^3 °K.



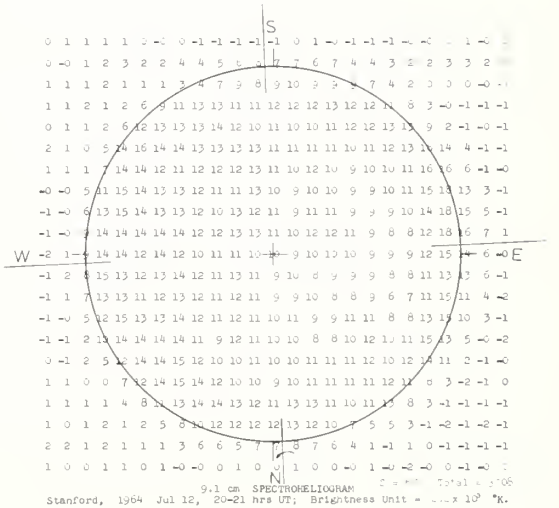
9.1 cm SPECTROHELIOGRAM S = 67 Total = 3366

Stanford, 1964 Jul 10, 20-21 hrs UT; Brightness Unit = 2.9 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 67 Total = 3420

Stanford, 1964 Jul 11, 20-21 hrs UT; Brightness Unit = 3.3 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 68 Total = 3408

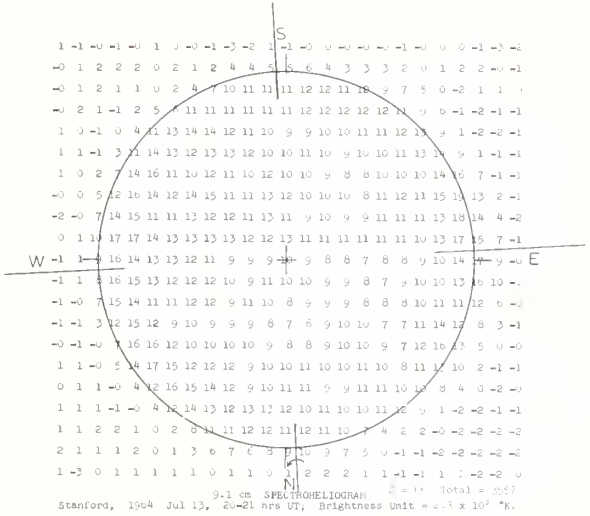
Stanford, 1964 Jul 12, 20-21 hrs UT; Brightness Unit = 3.6 x 10^3 °K.

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

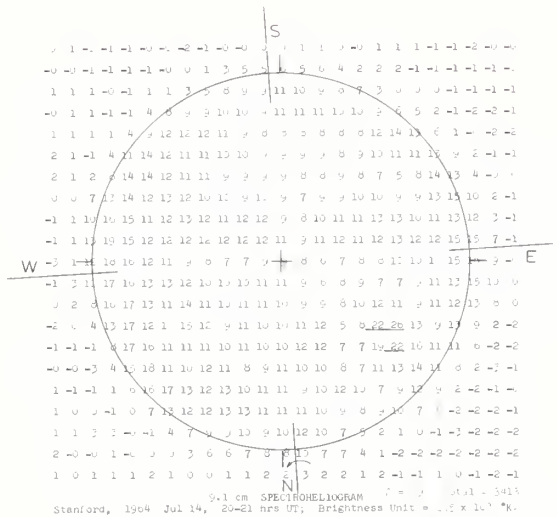
JULY 1964

STANFORD

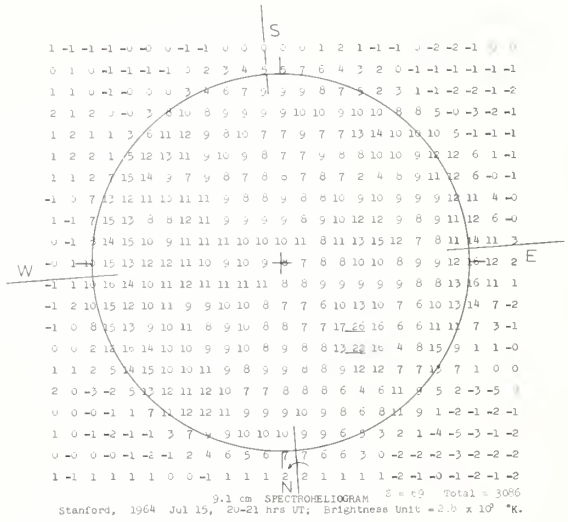
9.1 cm



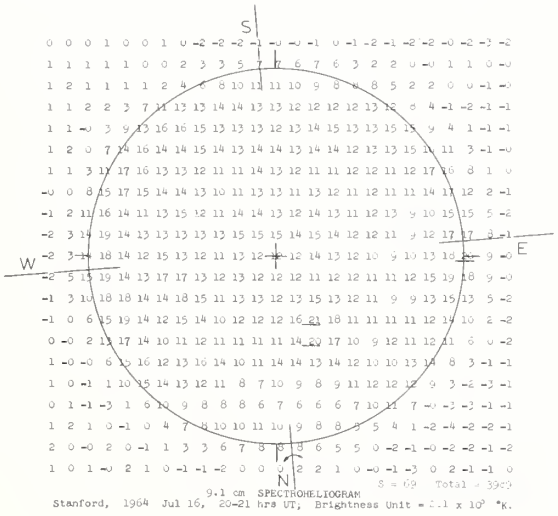
9.1 cm SPECTROHELIOGRAM S = [illegible] Total = 4557
Stanford, 1964 Jul 13, 20-21 hrs UT, Brightness Unit = [illegible] x 10^2 °K.



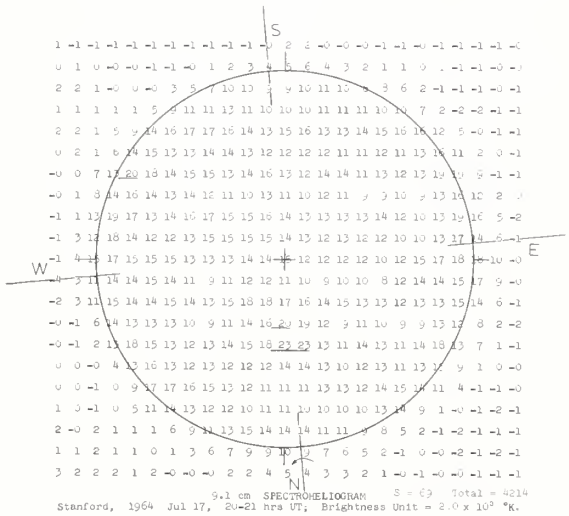
9.1 cm SPECTROHELIOGRAM S = [illegible] Total = 3413
Stanford, 1964 Jul 14, 20-21 hrs UT, Brightness Unit = [illegible] x 10^2 °K.



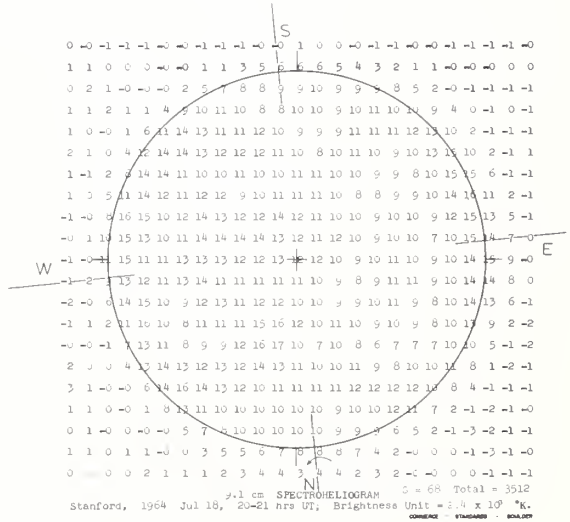
9.1 cm SPECTROHELIOGRAM S = 69 Total = 3086
Stanford, 1964 Jul 15, 20-21 hrs UT, Brightness Unit = 2.6 x 10^2 °K.



9.1 cm SPECTROHELIOGRAM S = 69 Total = 3909
Stanford, 1964 Jul 16, 20-21 hrs UT, Brightness Unit = [illegible] x 10^2 °K.



9.1 cm SPECTROHELIOGRAM S = 69 Total = 4214
Stanford, 1964 Jul 17, 20-21 hrs UT, Brightness Unit = 2.0 x 10^2 °K.

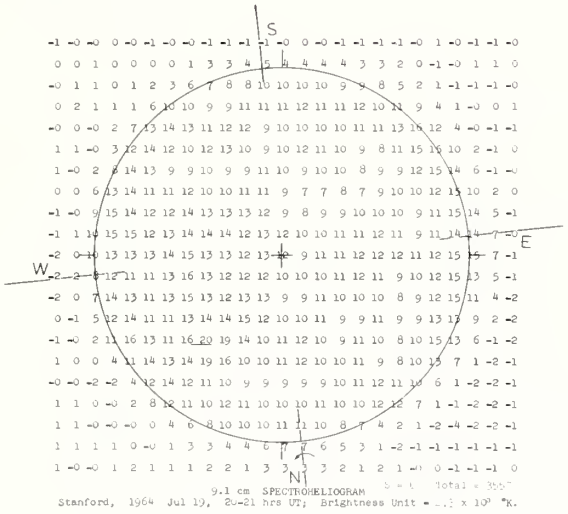


9.1 cm SPECTROHELIOGRAM S = 68 Total = 3512
Stanford, 1964 Jul 18, 20-21 hrs UT, Brightness Unit = 2.4 x 10^2 °K.

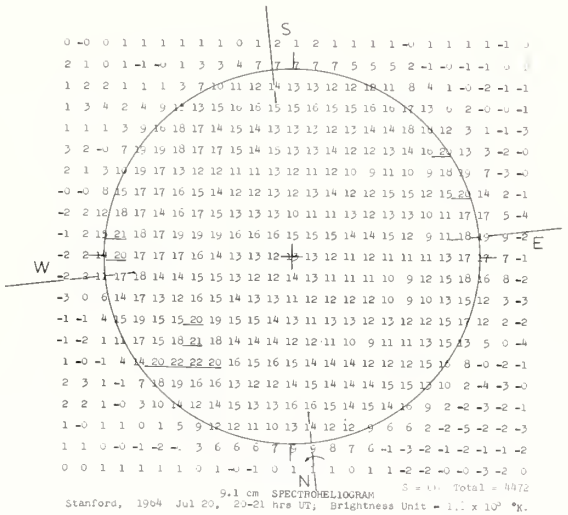
SOLAR RADIO EMISSION SPECTROHELIOGRAMS

JULY 1964

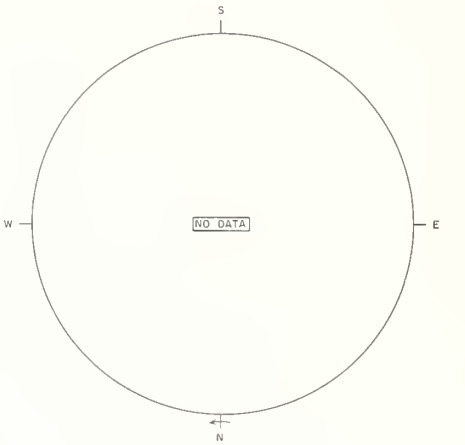
STANFORD **9.1 cm**



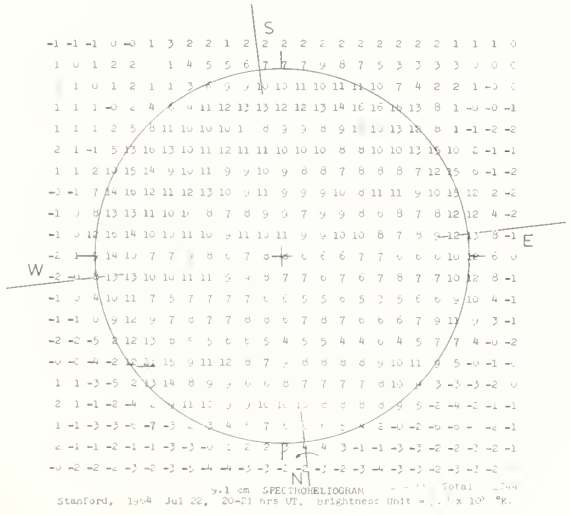
9.1 cm SPECTROHELIOGRAM S = 0.0 Total = 3557
Stanford, 1964 Jul 19, 20-21 hrs UT; Brightness Unit = 1.3 x 10^3 °K.



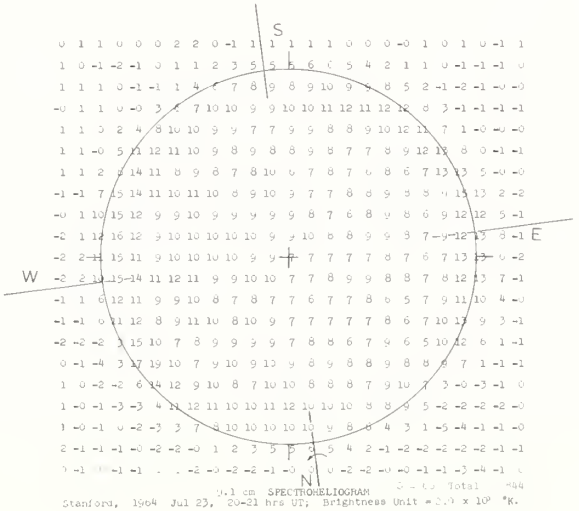
9.1 cm SPECTROHELIOGRAM S = 0.0 Total = 4472
Stanford, 1964 Jul 20, 20-21 hrs UT; Brightness Unit = 1.1 x 10^3 °K.



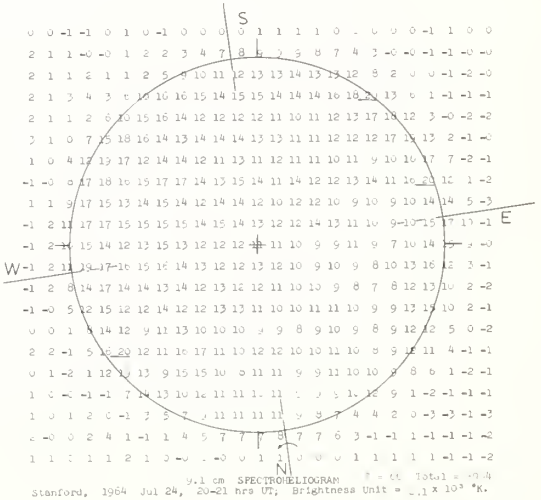
1964 JULY 21



9.1 cm SPECTROHELIOGRAM S = 0.0 Total = 3744
Stanford, 1964 Jul 22, 20-21 hrs UT; Brightness Unit = 1.1 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 0.0 Total = 4444
Stanford, 1964 Jul 23, 20-21 hrs UT; Brightness Unit = 0.9 x 10^3 °K.



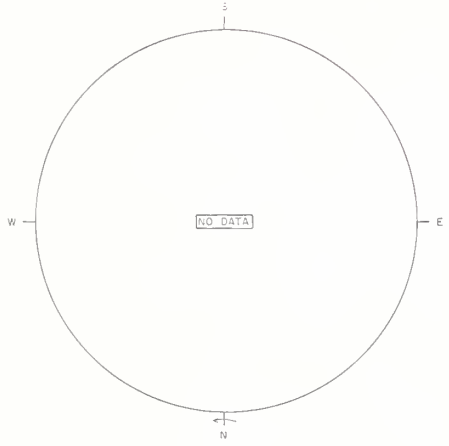
9.1 cm SPECTROHELIOGRAM S = 0.0 Total = 4044
Stanford, 1964 Jul 24, 20-21 hrs UT; Brightness Unit = 1.1 x 10^3 °K.

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

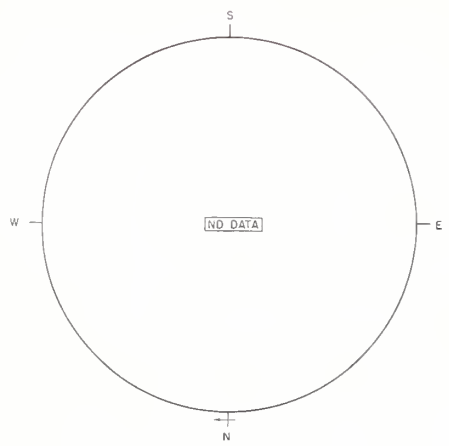
JULY 1964

STANFORD

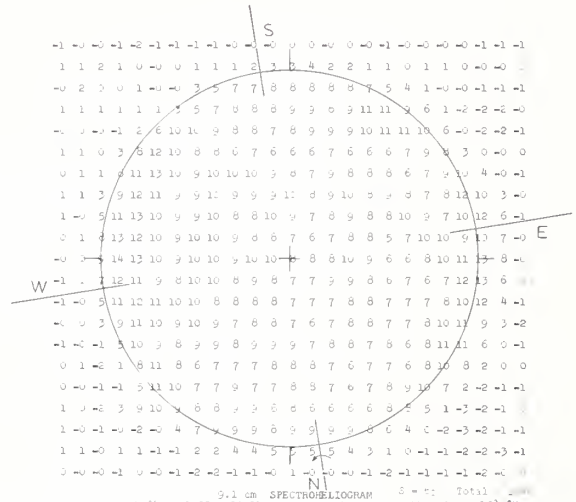
9.1 cm



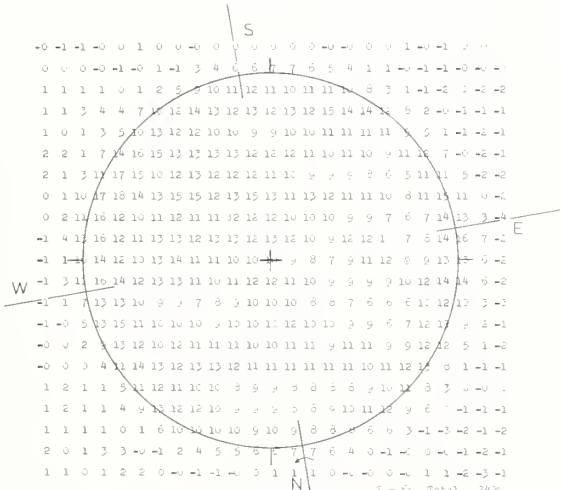
1964 JULY 25



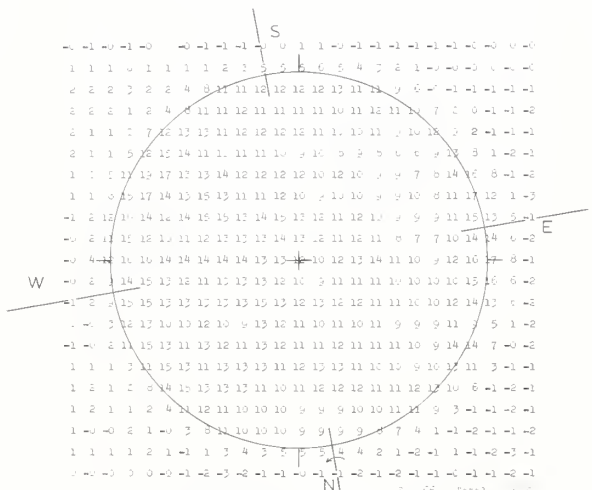
1964 JULY 26



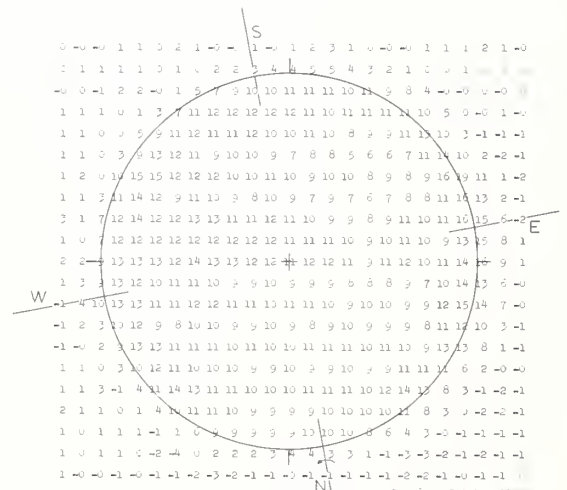
9.1 cm SPECTROHELIOGRAM S = [illegible] Total = [illegible]
Stanford, 1964 Jul 27, 20-21 hrs UT; Brightness Unit = 3.1 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 69 Total = 2490
Stanford, 1964 Jul 28, 20-21 hrs UT; Brightness Unit = 2.5 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = [illegible] Total = [illegible]
Stanford, 1964 Jul 29, 20-21 hrs UT; Brightness Unit = 2.8 x 10^3 °K.



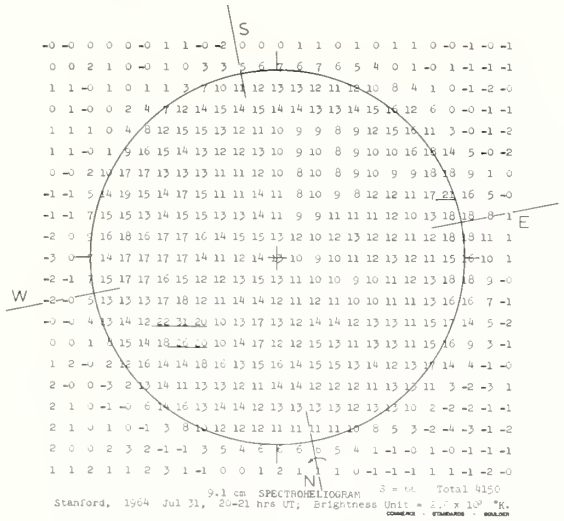
9.1 cm SPECTROHELIOGRAM S = [illegible] Total = 3[illegible]
Stanford, 1964 Jul 30, 20-21 hrs UT; Brightness Unit = 3.4 x 10^3 °K.

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

JULY 1964

STANFORD

9.1 cm



IVm

COSMIC RAY INDICES

(Climax Neutron Monitor)

IGC Station B 305

JUNE 1964

June 1964	DAILY AVERAGE COUNTS / HOUR *	June 1964	DAILY AVERAGE COUNTS / HOUR *
1	3289.0	16	3282.4 **
2	3287.1	17	3299.9 **
3	3289.6	18	3298.0 **
4	3286.4	19	3287.8
5	3293.2	20	3296.4 **
6	3305.3	21	3288.3 **
7	3314.6	22	3269.2 **
8	3304.5 **	23	3270.7 **
9	3276.6	24	3274.7
10	3287.7 **	25	3285.0
11	3290.7	26	3287.7
12	3281.3	27	3286.2
13	- -	28	3289.3
14	3293.7 **	29	3291.3 **
15	3286.2	30	3279.1

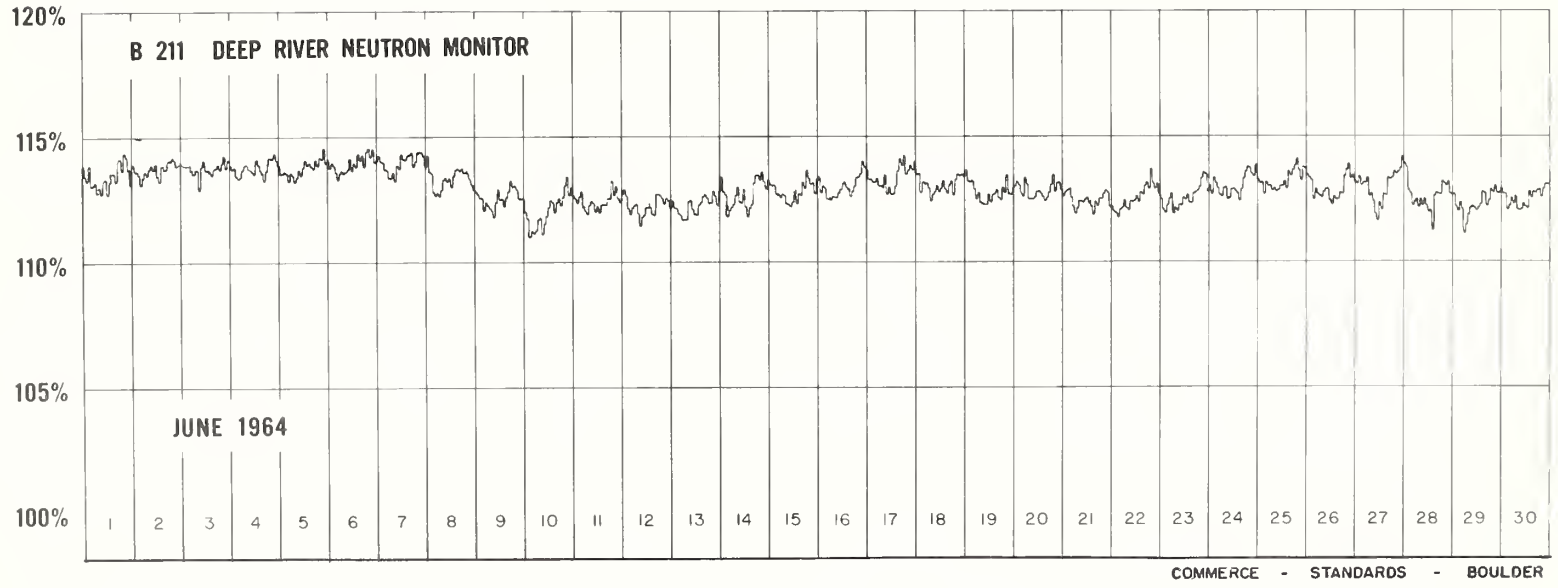
COMMERCE - STANDARDS - BOULDER

* Scaling Factor 128

** No. of Section Hours Less Than 40.

COSMIC RAY INDICES

(Pressure Corrected Hourly Totals)

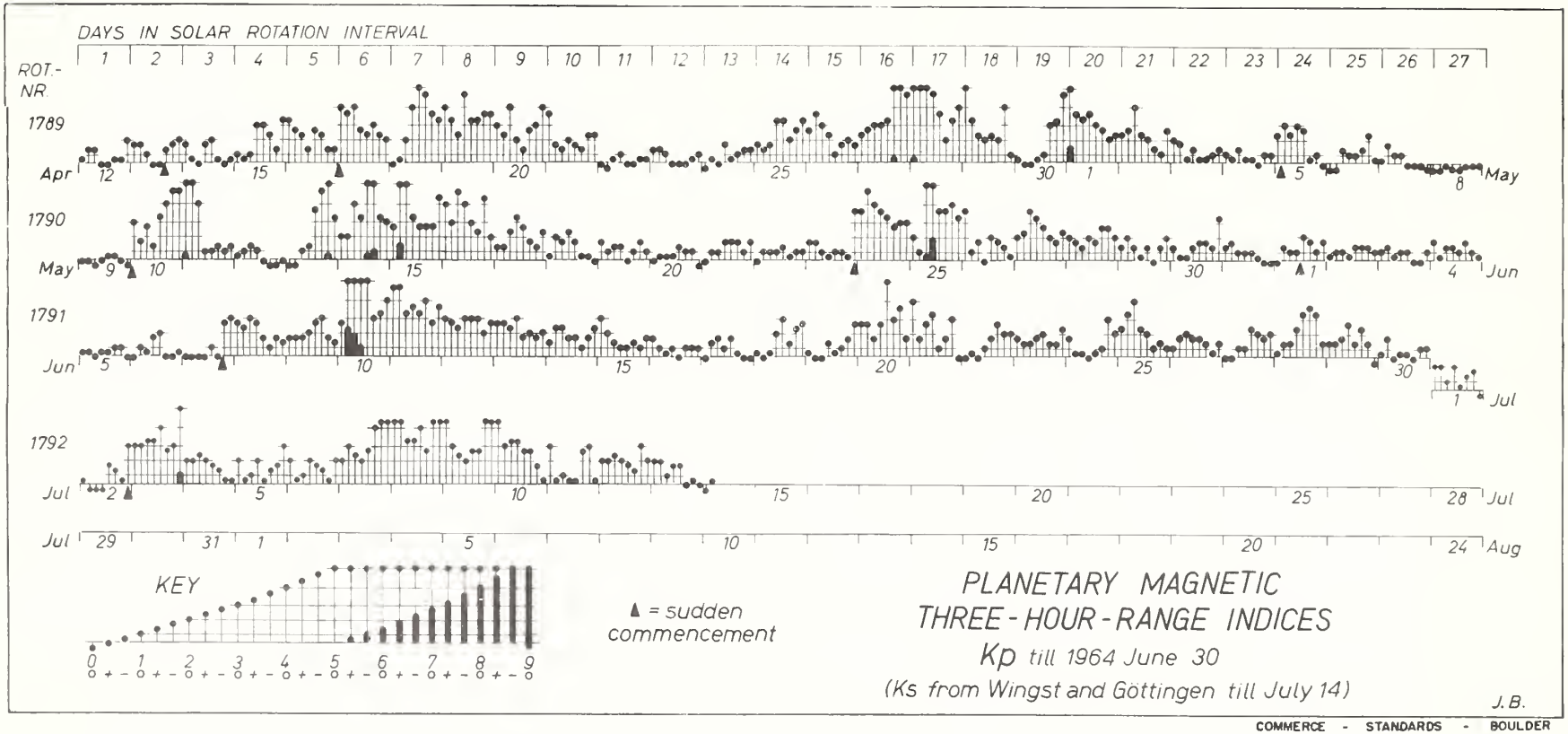


GEOMAGNETIC ACTIVITY INDICES

JUNE 1964

June 1964	C	Values Kp — Three hour Gr. interval 1 2 3 4	5 6 7 8	Sum	Ap	Final Selected Days
1	0.3	0+ 1+ 1o 1o	2o 2- 1o 2-	10o	5	Five
2	0.2	1- 1o 1o 1-	1+ 1+ 1+ 1o	8+	4	Quiet
3	0.2	1o 1+ 1- 1o	1o 0+ 0+ 1o	7-	4	
4	0.2	2- 1- 1+ 1+	1o 2- 1o 1-	9+	4	3
5	0.1	1- 1- 0+ 1-	1- 1o 1o 0+	5+	3	5
						6
6	0.1	0+ 1o 1- 2-	2o 0+ 0+ 1-	7o	4	16
7	0.3	0+ 0+ 0+ 0+	1o 0+ 3- 3o	8+	5	30
8	0.5	3- 2+ 3o 3-	2- 1o 2- 1+	16+	9	
9	0.6	2- 2- 2- 2o	3- 3o 2- 1+	16-	8	
10	1.5	3- 7- 6+ 6-	5o 3o 3+ 4o	37-	49	
11	1.2	5- 5- 3+ 4-	3+ 4o 3- 4-	30o	25	Five
12	0.8	3o 3- 2+ 3o	3o 3o 2o 3-	22-	12	Disturbed
13	0.7	3- 3- 2+ 3o	2- 2o 2- 2o	18o	9	
14	0.4	1+ 2+ 2+ 2-	2- 1o 2- 2+	14+	7	10
15	0.3	3o 2o 1+ 1o	1o 1+ 1o 2-	12+	6	11
						12
16	0.1	2- 1o 1- 1o	0+ 1o 1o 1o	8-	4	20
17	0.1	0+ 1+ 2- 1o	2- 1- 0+ 0+	7+	4	21
18	0.5	1- 0+ 1- 2o	3o 1+ 2+ 3-	13o	7	
19	0.3	1- 0+ 0+ 1+	1- 1o 2- 3-	9-	5	
20	0.9	3- 3- 2- 3-	5o 3o 4- 2-	23o	17	
21	0.8	4o 2- 3- 3+	1o 2- 3o 0+	18-	11	Ten
22	0.4	0+ 1- 0+ 1o	2- 3- 2o 2o	11-	5	Quiet
23	0.4	2- 1+ 1+ 2-	2o 1+ 1+ 2+	13o	6	
24	0.3	2- 1- 1- 0+	1- 1o 3o 2o	10o	5	1
25	0.6	2+ 3+ 4o 2+	2o 1o 1+ 1o	17+	10	2
						3
26	0.4	1o 2- 2o 2-	2- 1+ 1- 1+	11+	5	4
27	0.3	0+ 0+ 1o 1o	2+ 2o 2- 2o	11-	5	5
28	0.7	1- 1+ 1+ 2+	3+ 4- 3+ 1+	17+	11	6
29	0.4	1+ 1+ 2- 3-	1+ 2+ 1+ 0o	12o	6	16
30	0.1	1- 2- 0+ 1-	1- 0+ 1o 1o	6+	3	17
						19
						30
Mean:	0.46			Mean:	9	

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.
1789
Apr 12 15 20 25 30 1 5 8 May
1790
May 9 10 15 20 25 30 1 4 Jun
1791
Jun 5 10 15 20 25 30 1 Jul
1792
Jul 2 5 10 15 20 25 28 Jul
Jul 29 31 1 5 10 15 20 24 Aug
KEY
0 1 2 3 4 5 6 7 8 9
▲ = sudden commencement
PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES
Kp till 1964 June 30
(Ks from Wingst and Göttingen till July 14)
J.B.
COMMERCE - STANDARDS - BOULDER

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

JUNE 1964

NORTH ATLANTIC

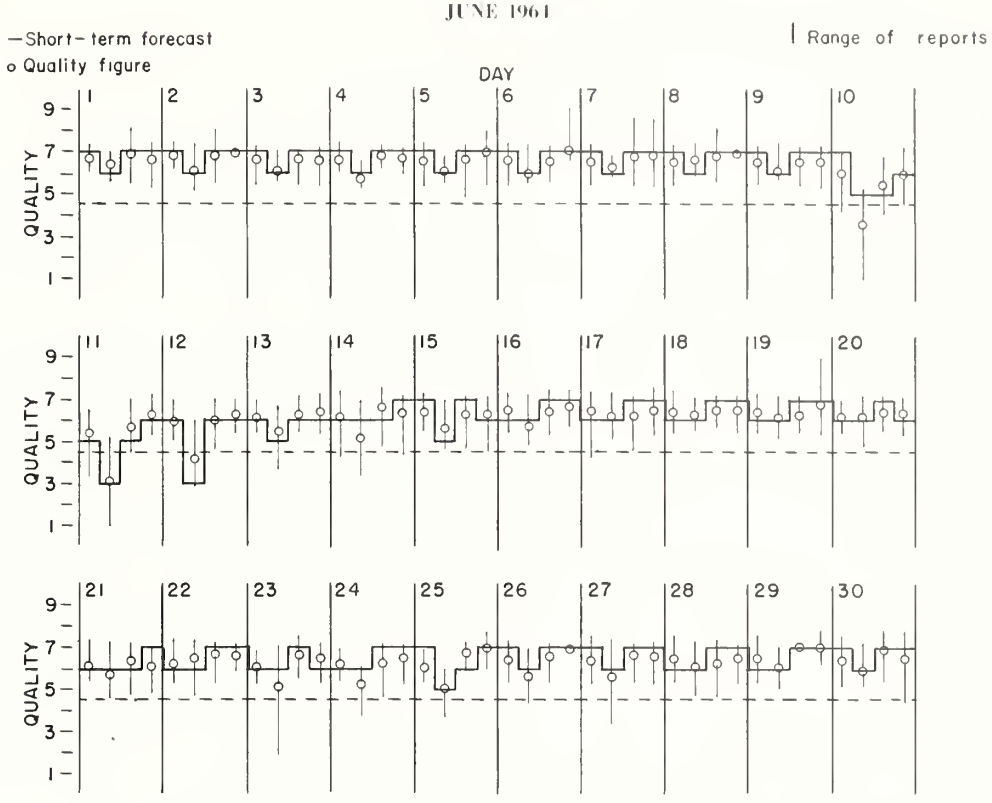
JUNE 1964	NORTH ATLANTIC 6-HOURLY DUALITY FIGURES				SHORT-TERM FORECASTS ISSUED ABOUT ONE HOUR IN ADVANCE OF:				WHOLE DAY INDEX	ADVANCE FORECASTS (J-REPORTS) FOR WHOLE DAY, ISSUED IN ADVANCE BY			GEOMAGNETIC K_{FR}	
	00 TO 06	06 TO 12	12 TO 18	18 TO 24	00	06	12	18		1-7 DAYS FINAL J_S	1-7 DAYS SDW	1-3 DAYS J	HALF (1)	DAY (2)
01	7-	6+	7o	7-	7	6	7	7	7-	6	6		1	2
02	7-	6o	7-	7o	7	6	7	7	7-	6	6		1	2
03	7-	6+	7-	7-	7	6	7	7	7-	7	7		1	1
04	7-	6-	7-	7-	7	6	7	7	7-	7	7		2	1
05	7-	6+	7-	7o	7	6	7	7	7-	7	7		1	1
06	7-	6o	7-	7o	7	6	7	7	7-	7	7		1	1
07	7-	6+	7-	7-	7	6	7	7	7-	6	6		0	2
08	7-	7-	7-	7o	7	6	7	7	7-	6	6		3	2
09	7-	6o	7-	7-	7	6	7	7	6+	6	6		2	2
10	6o	4-	5+	6o	7	5	5	6	5+	5	5		(5)	3
11	5+	3o	6-	6+	5	3	5	6	5o	4	4		(4)	3
12	6o	4+	6o	6+	6	3	6	6	6-	5	5		3	3
13	6o	6-	6+	6+	6	5	6	6	6o	6	6		3	2
14	6+	5o	7-	6+	6	6	6	7	6o	6	6		3	2
15	6+	6-	6+	6+	7	5	7	6	6+	7	7		2	2
16	7-	6-	6+	7-	6	6	7	7	6+	7	7		1	1
17	6+	6o	6o	7-	6	6	7	7	6+	7	7		1	1
18	6+	6+	7-	7-	6	6	7	7	6+	7	7		1	2
19	6+	6+	6+	7-	6	6	7	7	6+	6	6		1	2
20	6+	6+	6+	6+	6	6	7	6	6+	5	5		2	3
21	6+	6-	6+	6+	6	6	6	7	6+	5	5		2	1
22	6+	7-	7-	7-	6	6	7	7	7-	6	6		1	2
23	6+	5+	7-	7-	6	6	7	6	6+	6	6		2	1
24	6+	5+	6+	7-	6	6	7	7	6o	6	6		1	2
25	6o	5o	7-	7o	7	5	6	7	6+	7	7		(4)	2
26	6+	6-	7-	7o	7	6	7	7	6+	7	7		2	1
27	6+	6-	7-	7-	7	6	7	7	6+	7	7		1	2
28	7-	6+	6+	7-	6	6	7	7	6+	7	7		2	3
29	7-	6o	7o	7o	6	6	7	7	7-	7	7		2	1
30	6+	6o	7o	7-	7	6	7	7	6+	7	7		1	1
Score: Quiet Periods				P	21	20	20	27		12	12			
				S	9	7	10	3		18	18			
				U	0	0	0	0		0	0			
				F	0	0	0	0		0	0			
Disturbed Periods:				P	0	1	0	0		0	0			
				S	0	2	0	0		0	0			
				U	0	0	0	0		0	0			
				F	0	0	0	0		0	0			

NORTH PACIFIC

JUNE 1964	NORTH PACIFIC 8-HOURLY DUALITY 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 SDW	1-3 DAYS J_P	HALF (1)	DAY (2)
01	6	6	6	7	6	6	6	7	7		1	1
02	6	6	6	7	6	6	6	7	7		0	0
03	6	7	6	7	7	6	7	7	7		1	0
04	7	6	6	7	7	6	6	7	7		0	0
05	7	6	6	7	7	6	6	7	7		1	1
06	7	6	6	7	7	6	7	7	7		0	1
07	6	6	6	7	7	6	6	7	7		3	1
08	6	6	6	7	6	6	7	6	6		2	2
09	6	6	6	7	6	6	6	6	6		(6)	3
10	4	4	4	7	4	5	5	5	5		(4)	3
11	4	5	5	6	5	5	5	4	4		3	2
12	5	5	5	6	5	6	5	5	5		3	2
13	6	5	5	6	6	6	5	5	5		2	1
14	6	6	6	6	6	6	6	6	6		2	1
15	6	6	6	7	6	7	6	6	6		1	0
16	6	6	6	7	7	7	6	7	7		1	0
17	6	5	6	7	7	7	6	7	7		0	2
18	7	7	5	7	7	7	7	7	7		0	1
19	6	6	6	7	7	6	6	7	7		2	3
20	6	6	5	7	6	6	6	6	6		3	1
21	6	6	5	6	6	6	6	6	6		0	2
22	6	6	6	6	6	6	6	6	6		2	1
23	6	6	6	7	6	6	7	6	6		1	1
24	6	6	6	7	6	6	6	7	7		3	1
25	6	6	6	7	6	7	6	7	7		2	1
26	6	6	6	7	7	6	6	7	7		0	2
27	6	6	6	6	7	7	6	7	7		2	2
28	6	5	6	6	6	6	6	7	7		2	1
29	6	6	6	6	6	6	6	7	7		0	0
30	6	6	6	6	6	6	6	7	7		1	0
				12	18	19		12				
				16	10	9		18				
				0	1	1		0				
				0	0	0		0				
				0	1	0		0				
				0	0	1		0				
				0	0	0		0				
				2	0	0		0				

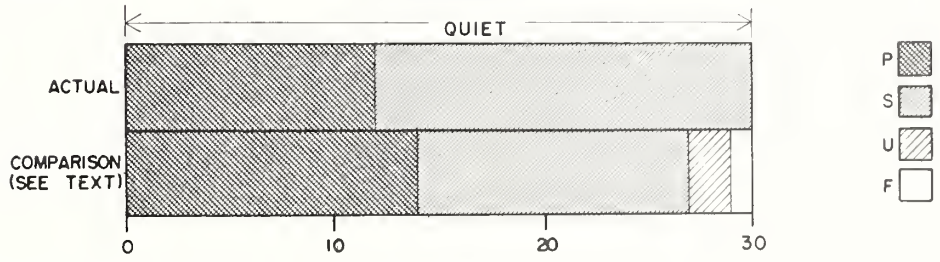
NORTH ATLANTIC

JUNE 1964

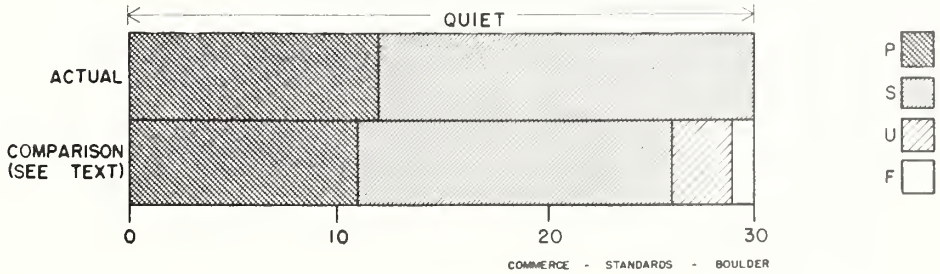


OUTCOME OF ADVANCE FORECASTS--FINAL ESTIMATES (1 TO 7 DAYS AHEAD)

NORTH ATLANTIC

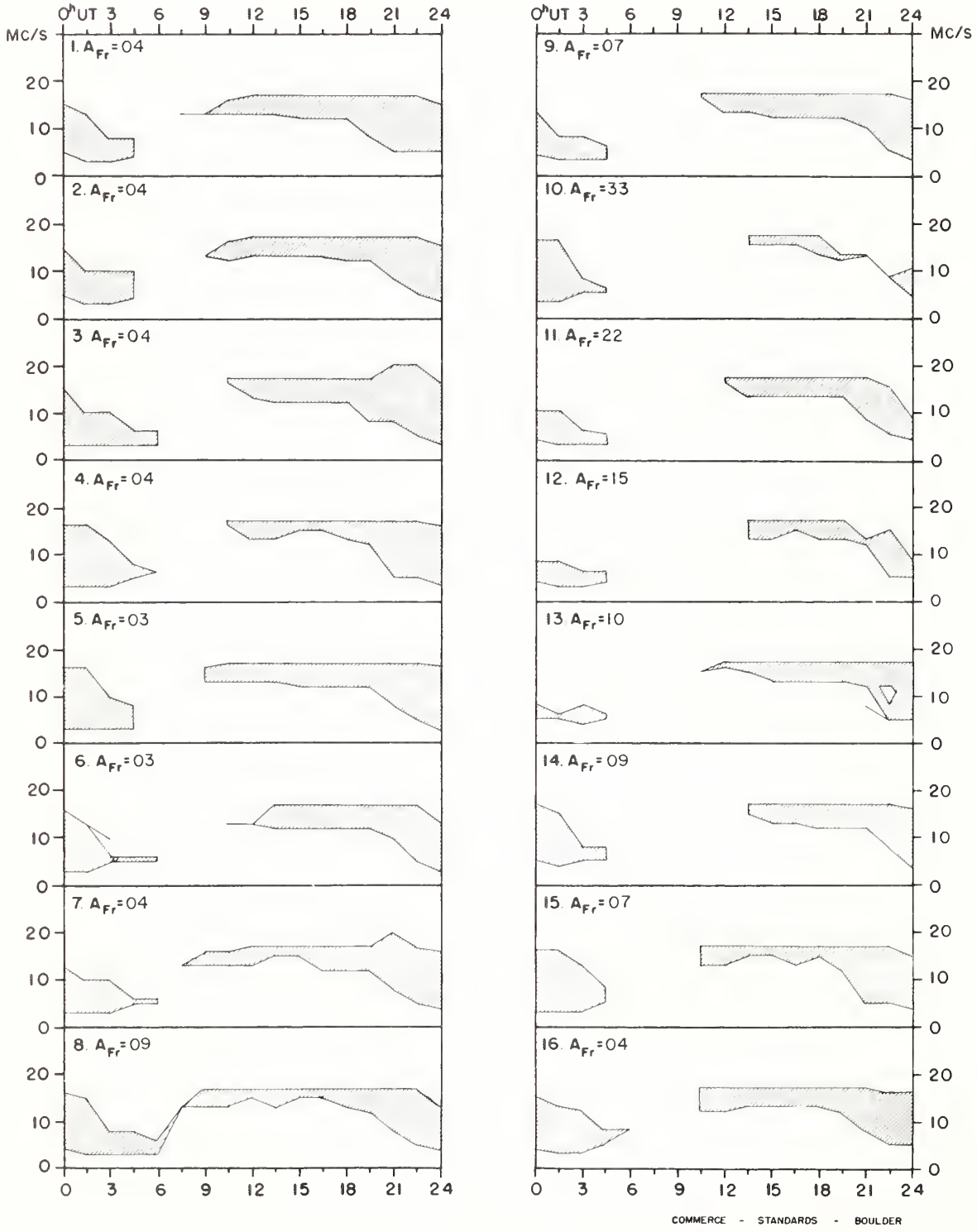


NORTH PACIFIC

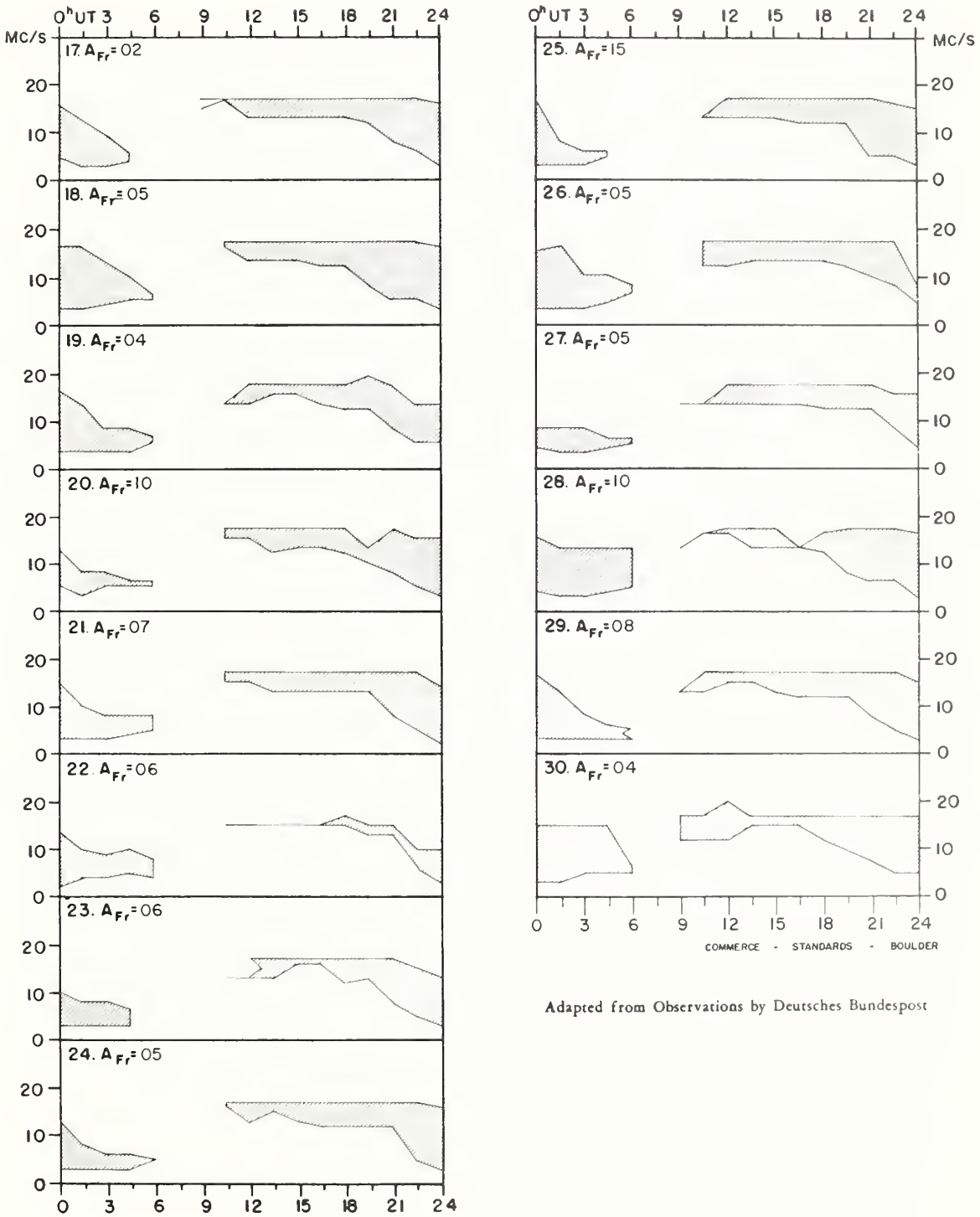


USEFUL FREQUENCY RANGES -- NORTH ATLANTIC PATH

JUNE 1964



JUNE 1964



Adapted from Observations by Deutsches Bundespost

IQSY ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

JULY 1964

JULY 1964	TIME OF ISSUE UT	ADVANCE GEOPHYSICAL ALERT	WORLDWIDE GEOPHYSICAL ALERT			
			NO.	TYPE	TIMING	ELABORATION
6	0400		81	Magnetic Storm	Expected	
7	0400		82	Magnetic Storm	Expected	
8	0400		83	Magnetic Storm	Expected	
16	0400		84	Magnetic Calm	Exists	
23	0400		85	Solar Calm	Exists	
24	0400		86	Solar Calm	Exists	
25	0400		87	Solar Calm	Exists	
26	0400		88	Solar Calm	Exists	
27	0400		89	Solar Calm	Exists	
28	0400		90	Solar Calm	Exists	
29	0400		91	Solar Calm	Exists	
30	0400		92	Solar Calm	Exists	
31	0400		93	Solar Calm	Exists	

COMMERCE - STANDARDS - BOULDER