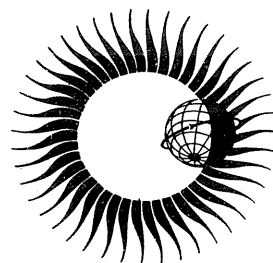


WORLD DATA CENTER A

Upper Atmosphere Geophysics



DATA ON THE SOLAR PROTON EVENT
OF NOVEMBER 2, 1969
THROUGH THE GEOMAGNETIC STORM
OF NOVEMBER 8-10, 1969



May 1971

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National Academy of Sciences

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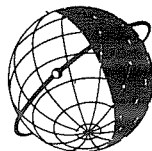
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WORLD DATA CENTER A

Upper Atmosphere Geophysics



REPORT UAG - 13

DATA ON THE SOLAR PROTON EVENT OF NOVEMBER 2, 1969 THROUGH THE GEOMAGNETIC STORM OF NOVEMBER 8-10, 1969

compiled by

Dale B. Bucknam

and

J. Virginia Lincoln

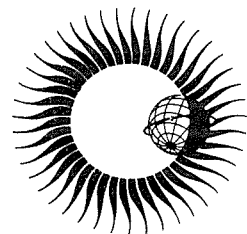
WDC-A, Upper Atmosphere Geophysics
Boulder, Colorado

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Asheville, North Carolina, USA 28801

May 1971



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FOREWORD

This report is intended primarily as a contribution to the COSPAR Symposium on the November 1969 Solar Proton Event, to be held June 16-18, 1971, at Boston College, Chestnut Hill, Massachusetts, U.S.A. It has been prepared with the consent and encouragement of James C. Ulwick, Ionospheric Physics Laboratory, AFCRL, Bedford, Massachusetts, who was co-chairman of Operation PCA-69, and is chairman of the Scientific Program Committee of the June 1971 COSPAR Symposium.

Dale B. Bucknam

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INTRODUCTION

by

Dale B. Bucknam and J. Virginia Lincoln
World Data Center A, Upper Atmosphere Geophysics
National Oceanic and Atmospheric Administration, Boulder, Colorado

This report is one of a series of special data compilations on solar-terrestrial events of special interest. It collects in one place detailed data that have appeared in "Solar-Geophysical Data" plus additional data from World Data Center A - Upper Atmosphere Geophysics archives.

This data compilation covers the period surrounding November 2, 1969, when a very energetic solar proton event began, and continues through the geomagnetic storm of November 8-10, 1969. The particle event is of particular interest for at least two reasons. It was one of the outstanding proton events thus far in this solar cycle, and, it was extensively studied by a special coordinated rocket program (PCA-69) during which several rockets were launched from Churchill, Manitoba, Canada, to investigate various aspects of the event. Fortunately, the particle event occurred just two days prior to the scheduled termination of the three-month long "watch" period at Churchill for the rocket launches.

The geomagnetic storm of November 8-10, 1969, although not especially large, was extensively studied by the OGO-6 experimenters by simultaneous measurements with a variety of instruments aboard OGO-6.

The time periods covered by the various types of data were selected as being most appropriate for the data. In some cases they provide a history of solar activity leading up to the proton event or geomagnetic storm, and in other cases they provide a history subsequent to the beginning of these events.

In most instances the data here presented are only indicative of the total holdings of World Data Center A - Upper Atmosphere Geophysics. In general, the holdings of World Data Center A - Upper Atmosphere Geophysics fall into the following disciplines (Note: in some disciplines much of the data may actually be held at either WDC-A-Geomagnetism, Seismology and Gravity, at Rockville, Maryland, or at WDC-A-Rockets and Satellites, at Greenbelt, Maryland, but inquiries may be made through WDC-A-Upper Atmosphere Geophysics.):

SOLAR AND INTERPLANETARY PHENOMENA

- A.1 Sunspot Positions, Areas, and Classification
- A.2 Sunspot Numbers
- A.3 Solar Magnetic Fields
- A.4 H α Observations (other than flares)
- A.5 Calcium Plages: Positions, Areas, Maximum Intensities
- A.6 Combined and Special Optical Observations
- A.7 Optical Observations of the Corona
- A.8 Total Radio Flux Measurements
- A.9 Radio Maps of Solar Disk
- A.10 Radio East-West Scans of Solar Disk
- A.11 Solar X-ray and UV Background Levels
- A.12 Energetic Solar Protons.
- A.13 Solar Wind
- A.14 Comet Tails, Interplanetary Scintillations, Zodiacal Light
- A.15 Sporadic Radio Emissions from Jupiter

IONOSPHERIC PHENOMENA

- B.1 Ionosphere Vertical Soundings
- B.2 Topside-Vertical Incidence Soundings and Satellite Probe Data
- B.3 Incoherent Scatter Sounding
- B.4 Oblique Incidence Soundings
- B.5 Ionospheric or Aeronautical Rockets
- B.6 Total Electron Content - Satellite Beacons
- B.7 Absorption -- Method A 1 (Pulse echo)
- B.8 Absorption -- Method A 2 (Riometer).
- B.9 Absorption -- Method A 3 (CW Field-strength)
- B.10 Ionospheric Drifts
- B.11 Ionospheric Scintillations from Satellite Beacons
- B.12 Ionospheric Back- and Forward-Scatter
- B.13 Whistlers and VLF Emissions
- B.14 Atmospheric Radio Noise

FLARE-ASSOCIATED EVENTS

- C.1 H- α Flares
- C.2 Solar Magnetic Field in Active Regions and Their Short-term Changes
- C.3 Solar Radio Events, Fixed Frequency
- C.4 Solar Radio Spectrograms of Events
- C.5 Solar X-ray Observations
- C.6 Sudden Ionospheric Disturbances -- Ground-Based Observations
- C.7 Solar Protons - Direct Measurement
- C.8 Solar Protons - Riometer
- C.9 Solar Protons - Ionospheric Vertical Incidence Soundings
- C.10 Solar Protons and Electrons - VHF Forward Scatter
- C.11 Solar Protons - Other Types of Measurements
- C.12 Solar, Ionospheric, or Aeronomical Rockets Launched During an Event
- C.13 Cosmic Ray Ground Level Increases

GEOMAGNETIC PHENOMENA

- D.1 Standard and Rapid Run Measurements
- D.2 Magnetospheric Micropulsation Phenomena
- D.3 Space Magnetism
- D.4 Magnetospheric Particles
- D.5 Measurement of Magnetosphere by Whistler and VLF Emissions

AURORA

- E.1 Photographic All-Sky Camera Observations
- E.2 Visual Observations
- E.3 Other Optical Techniques (Spectral Lines, etc.)
- E.4 Radio and Radar Observations
- E.5 Satellite Measurements

COSMIC RAYS

- F.1 Neutron Monitors and Supermonitors
- F.2 Ionization Chambers
- F.3 Meson Telescope (cubical, crossed, narrow angle and wide angle).
- F.4 Balloon Measurements
- F.5 Aircraft and Ship Measurements

AIRGLOW

- G.1 Ground-based photometers
- G.2 Satellite measurements (photometers)

MISCELLANY

- H.1 Noctilucent Clouds
- H.2 Meteorological Rockets
- H.3 Ozone

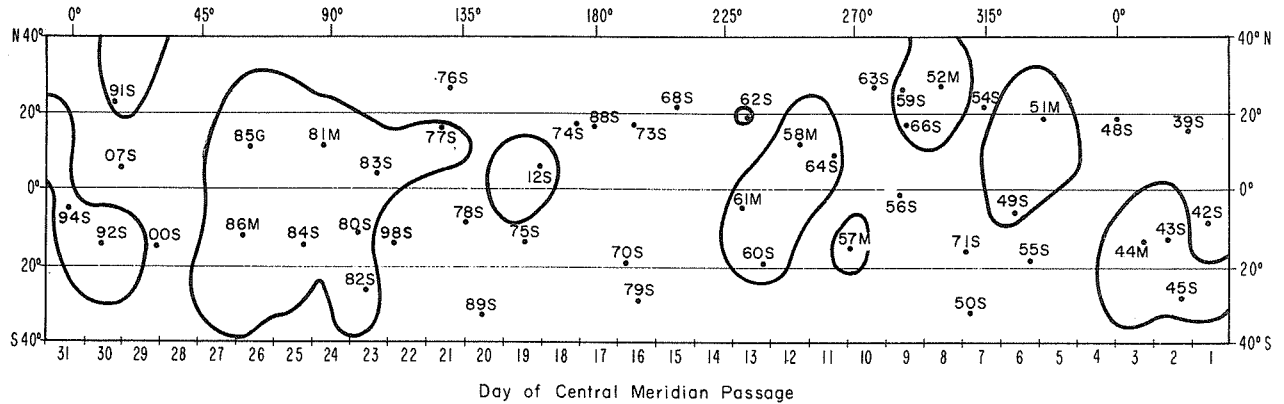
The scientist interested in data with more complete coverage from other stations or with finer time resolution should address his inquiries to World Data Center A, Upper Atmosphere Geophysics, NOAA, Boulder, Colorado, U.S.A. 80302.

This data compilation is ordered, roughly, as the above listing of data disciplines. The Abbreviated Calendar Record for October 26 - November 8, 1969 is intended to give a graphical overview of solar-terrestrial activity from October 26, 1969, the date of central meridian passage of McMath region 10385, which was the source of the flare at 0939 UT, November 2 associated with the particle event through November 8, 1969 the date when the geomagnetic storm began.

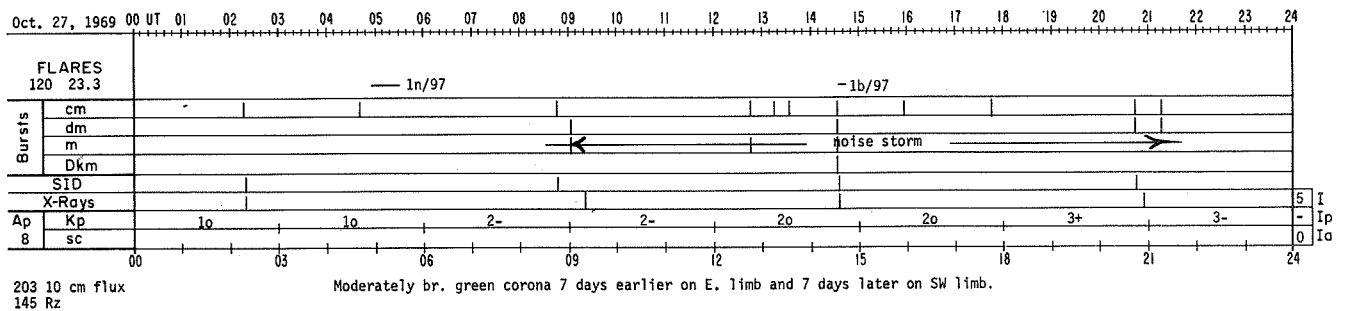
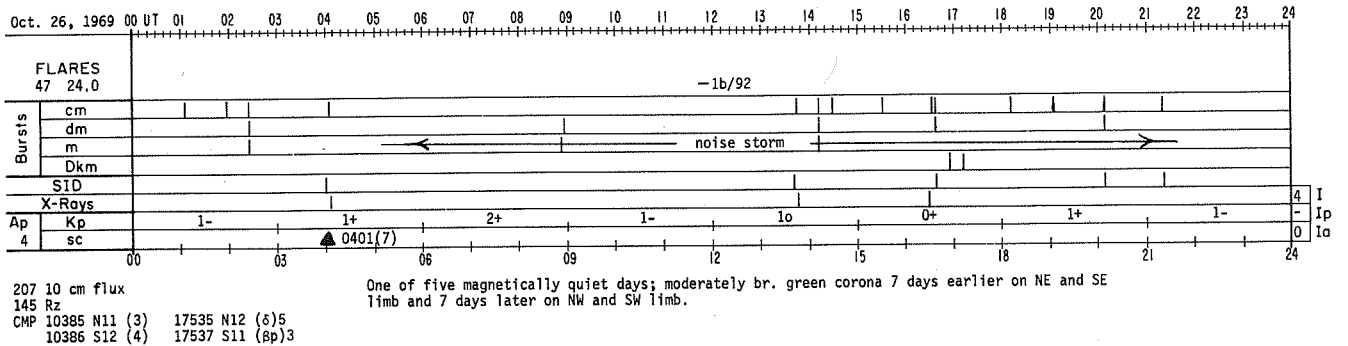
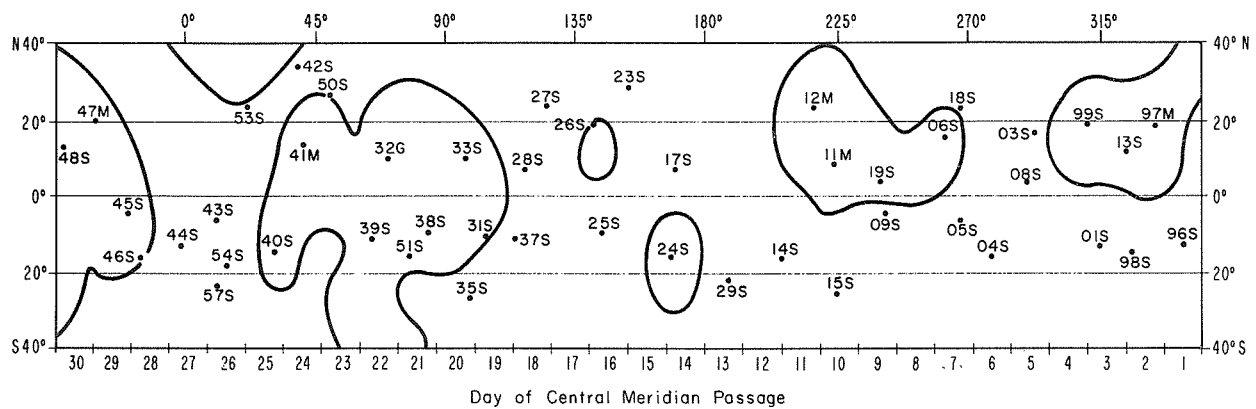
Most of the data of this compilation are self-explanatory, but for details as to data interpretation, instrumentation used, etc., reference should be made to the "Solar-Geophysical Data" Descriptive Text, No. 306 (Supplement), issued February 1970, or No. 318 (Supplement), issued February 1971.

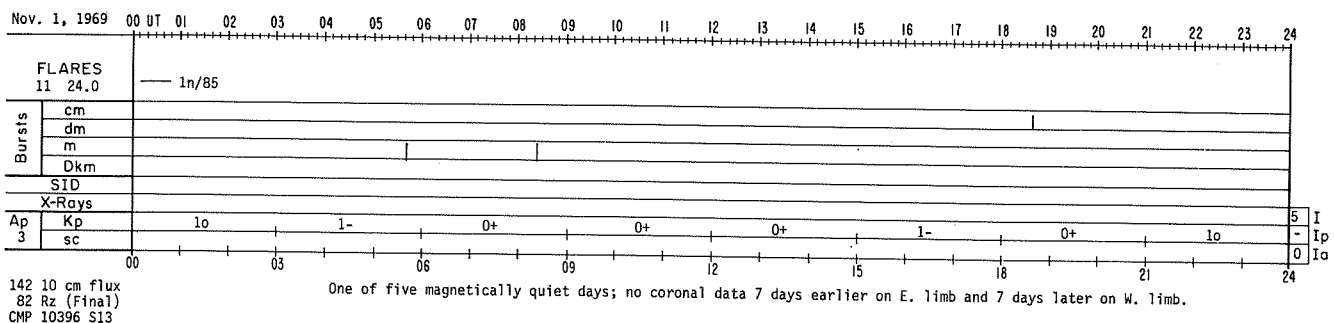
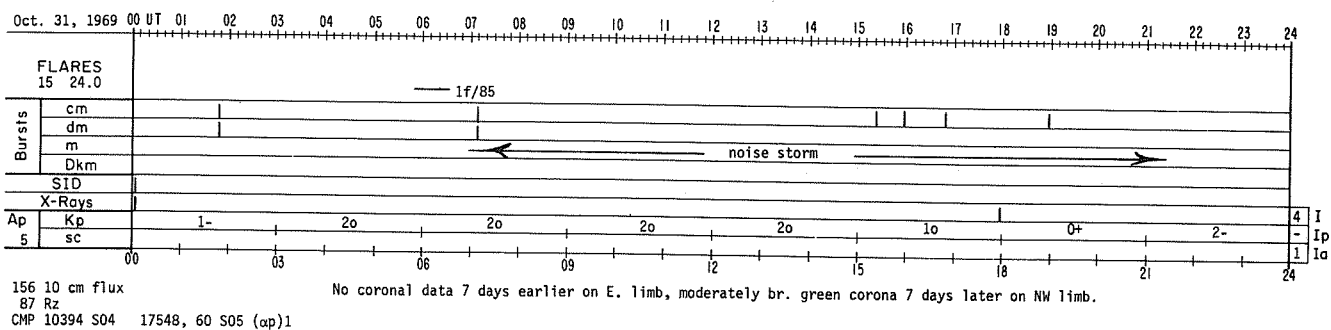
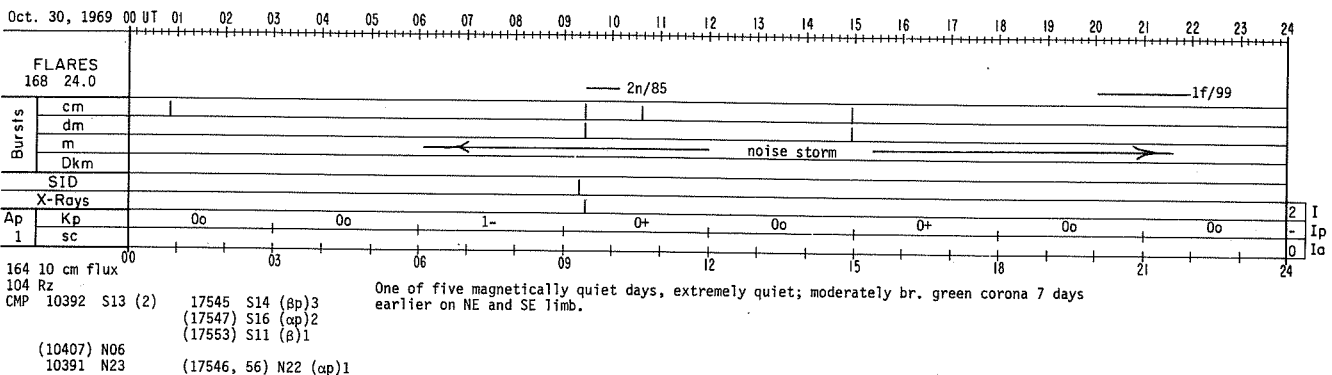
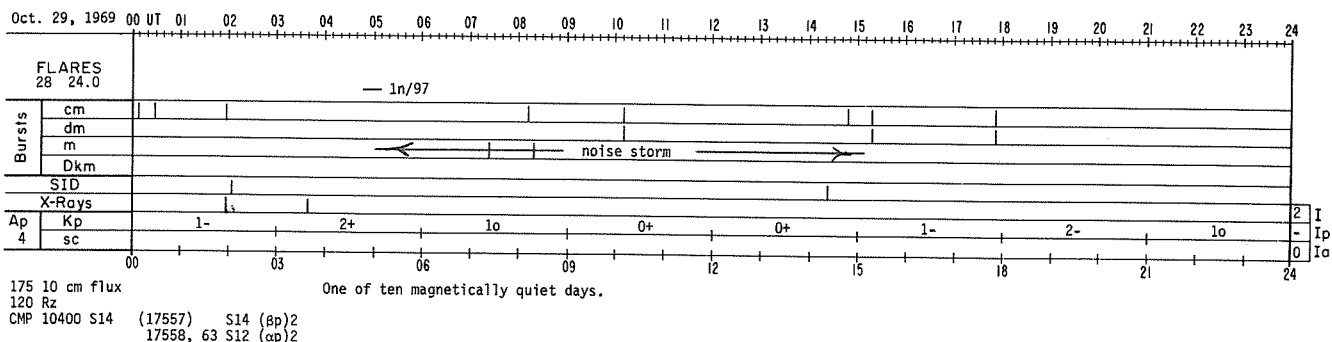
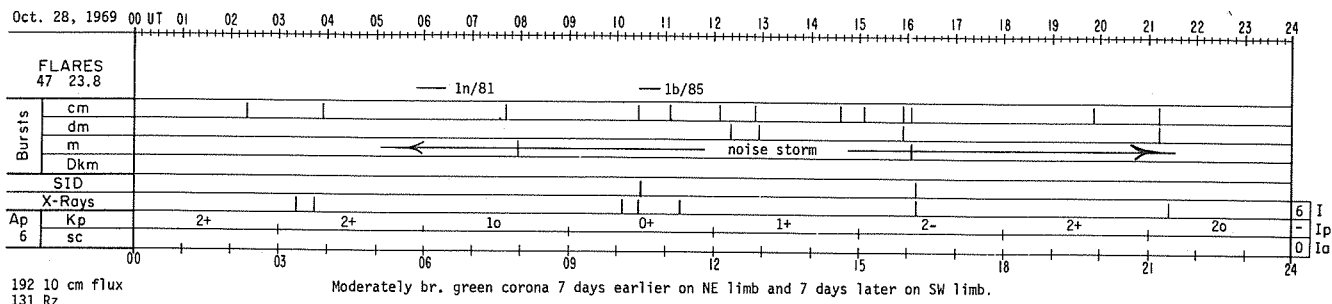
ABBREVIATED CALENDAR RECORD

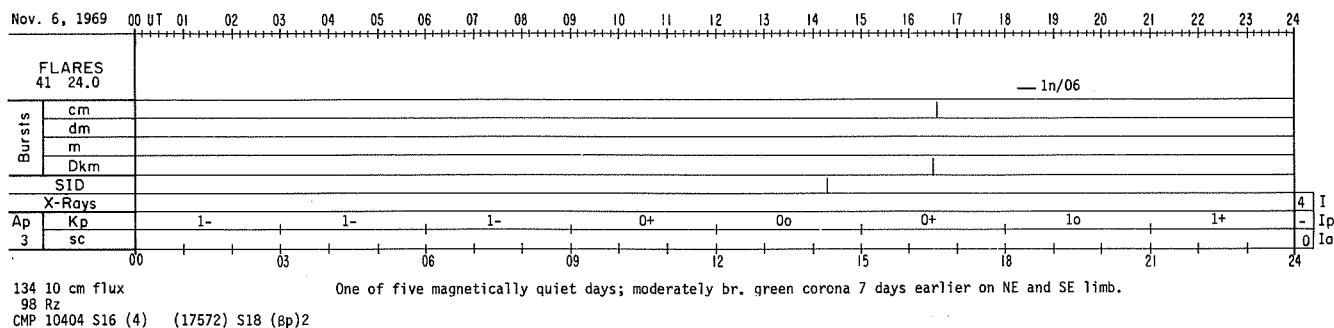
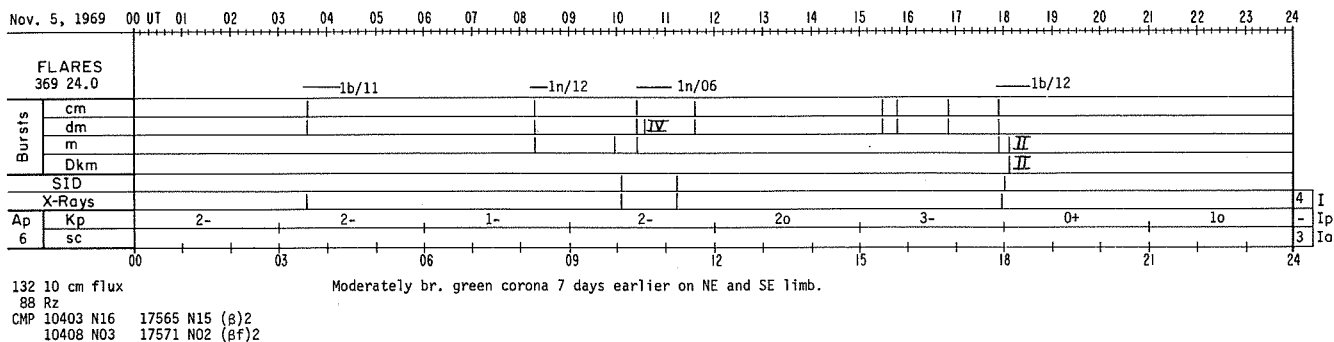
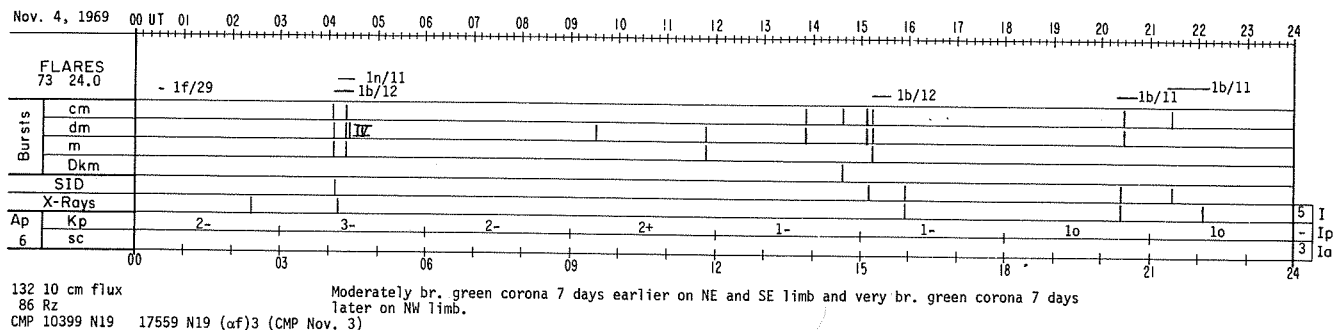
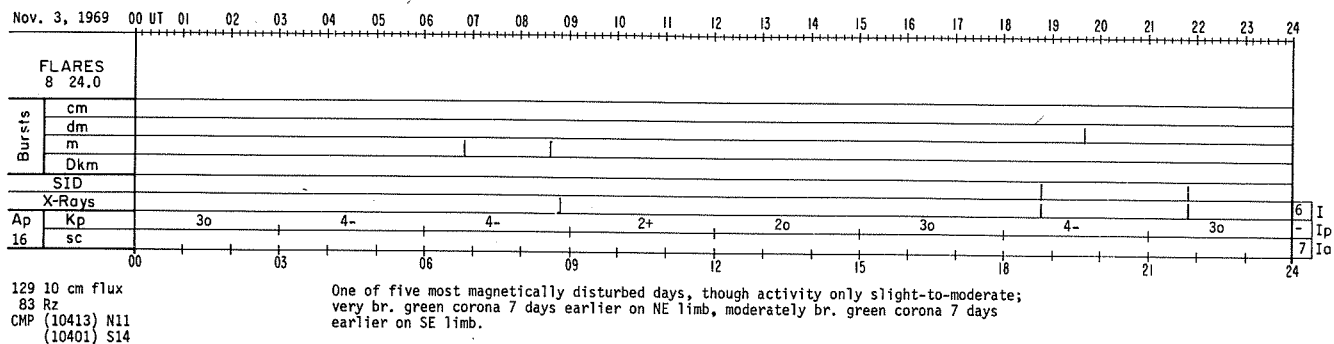
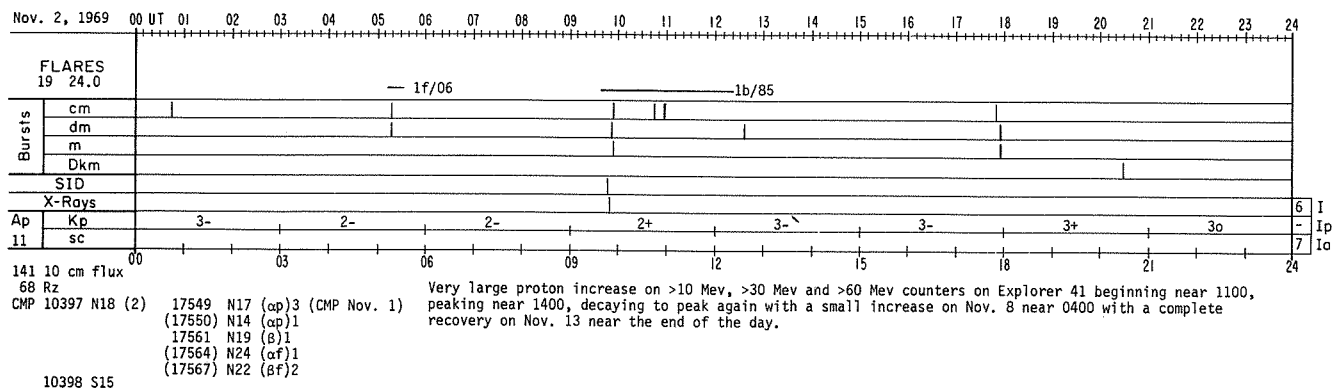
OCTOBER 1969

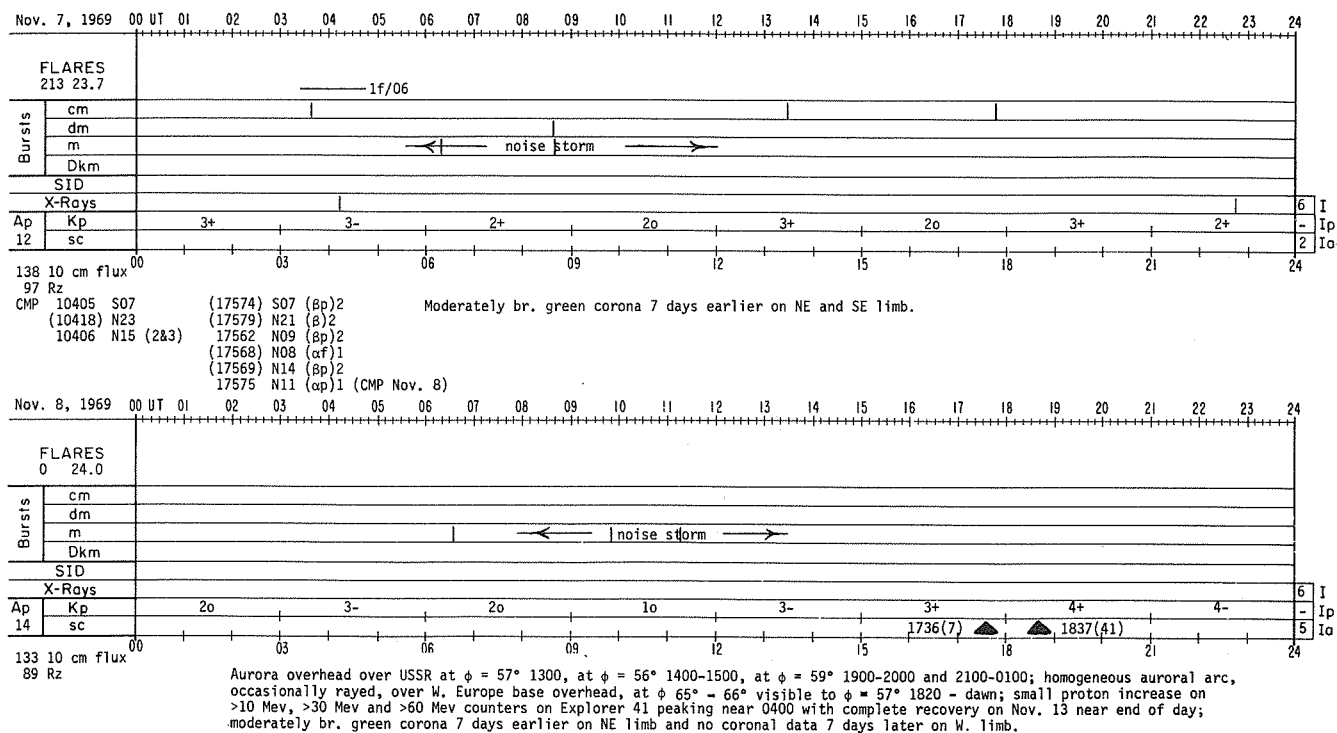


NOVEMBER 1969









DAILY SOLAR INDICES

OCTOBER 1969

OCT. 1969	YEAR DAY	BARTELS 27-DAY CYCLE NUMBER	SUNSPOT NUMBERS		OBSERVED FLUX OTTAWA 2800	SOLAR FLUX ADJUSTED TO I.A.U.						
			R _Z Prov.	R _A		AFCRL 15400	AFCRL 8800	AFCRL 4995	OTTAWA 2800	AFCRL 2695	AFCRL 1415	AFCRL 606
01	274	1	84	107	133.6	539	271	206	133.9	121.9	88.0	61.6
02	275	2	101	117	143.1	541	277	220	143.2	128.6	97.2	66.0
03	276	3	98	113	132.4	541	273	208	132.5	122.4	91.0	67.5
04	277	4	92	106	132.2	527	267	206	132.2	118.0	90.0	63.4
05	278	5	103	118	140.9*	538	276	218	140.9*	127.3	91.8	59.5
06	279	6	117	125	143.3	538	278	226	143.2	130.9	89.3	59.3
07	280	7	120	121	145.1	536	286	227	145.0	134.3	92.8	60.6
08	281	8	92	125	150.4	529	278	227	150.1	131.9	94.9	60.4
09	282	9	89	96	142.1	537	279	230	141.7	127.6	87.6	61.2
10	283	10	78	91	137.1*	541	282	225	136.7*	123.3	86.6	58.8
11	284	11	68	70	130.6	534	275	214	130.1	116.6	84.8	59.3
12	285	12	60	63	128.5	540	275	206	128.0	117.5	85.2	58.4
13	286	13	47	62	124.9	535	271	201	124.3	113.5	83.3	58.3
14	287	14	55	71	119.7	530	266	193	119.1	111.0	84.0	59.1
15	288	15	46	48	118.4	529	262	194	117.7	105.8	80.3	56.6
16	289	16	43	43	116.2	528	261	183	115.4	102.0	80.5	53.3
17	290	17	38	23	123.2	535	271	192	122.3	111.6	84.2	57.1
18	291	18	43	40	129.8	540	274	205	128.8	117.5	87.9	59.3
19	292	19	35	39	147.0	547	291	223	145.8	131.7	93.7	60.1
20	293	20	87	72	163.4	554	303	245	161.9	148.5	101.3	65.3
21	294	21	102	84	178.6	557	318	268	177.0	159.3	110.2	67.9
22	295	22	107	113	188.1	555	325	280	186.2	168.5	118.7	68.4
23	296	23	124	123	195.1	557	326	298	193.1	180.9	125.0	73.4
24	297	24	133	138	206.8	535	323	303	204.5	187.9	127.0	71.8
25	298	25	137	153	206.5*	540	324	293	204.0*	193.6	135.0	73.2
26	299	26	142	161	207.1	559	326	296	204.6	189.5	131.3	72.8
27	300	27	138	130	203.4*	560	321	292	200.8*	189.7	132.6	70.6
28	301	1	121	123	192.1	561	316	268	189.6	174.9	125.3	69.5
29	302	2	113	129	174.9	551	308	255	172.5	162.4	111.8	69.9
30	303	3	95	101	164.0	552	301	241	161.7	150.9	109.7	70.3
31	304	4	80	83	156.2	548	289	230	153.9	142.1	108.3	78.9
MEAN			89.9	96.4	154.0	542	290	235	152.9	140.1	100.3	64.3

NOVEMBER 1969

NOV. 1969	YEAR DAY	BARTELS 27-DAY CYCLE NUMBER	SUNSPOT NUMBERS		OBSERVED FLUX OTTAWA 2800	SOLAR FLUX ADJUSTED TO I.A.U.						
			R _Z Prov.	R _A		AFCRL 15400	AFCRL 8800	AFCRL 4995	OTTAWA 2800	AFCRL 2695	AFCRL 1415	AFCRL 606
01	305	5	78	62	141.5	542	285	214	139.4	131.8	102.5	66.4
02	306	6	60	59	141.2	555	281	211	138.9	126.8	99.2	61.9
03	307	7	78	81	128.8	540	274	198	126.7	118.2	94.4	61.4
04	308	8	79	87	131.8	539	267	202	129.6	118.8	94.8	60.2
05	309	9	83	112	132.3	548	263	198	130.0	116.8	95.7	59.8
06	310	10	95	101	134.3	545	267	203	131.9	121.0	94.3	61.6
07	311	11	86	97	138.3	538	259	203	135.8	120.9	95.0	60.1
08	312	12	79	85	132.9	530	265	197	130.4	120.1	92.6	60.9
09	313	13	89	78	130.2	522	260	199	127.7	117.9	93.9	58.3
10	314	14	66	85	125.3	529	257	189	122.8	111.8	91.2	58.7
11	315	15	75	94	124.5	533	266	191	122.0	110.8	88.4	61.4
12	316	16	68	68	124.9	533	262	190	122.3	109.5	88.8	56.4
13	317	17	61	64	129.3*	538	259	195	126.6*	115.7	85.7	58.6
14	318	18	60	68	137.0*	546	264	217	134.1*	126.1	93.4	58.1
15	319	19	68	67	141.0	551	272	219	137.9	127.7	89.9	58.4
16	320	20	67	61	148.8	550	289	237	145.5	130.2	92.6	59.0
17	321	21	69	75	163.9	564	311	268	160.1	148.1	96.4	61.1
18	322	22	80	101	181.4*	583	350	303	177.2*	167.8	109.4	62.8
19	323	23	91	111	189.8	588	352	319	185.2	166.6	106.8	64.4
20	324	24	120	121	193.5*	578	336	315	188.9*	170.9	105.2	64.6
21	325	25	121	131	203.1	577	352	343	198.2	182.5	110.8	63.5
22	326	26	130	121	210.6*	582	353	345	205.3*	193.0	117.3	66.1
23	327	27	117	130	214.9	586	328	345	209.5	193.0	120.3	65.1
24	328	1	103	124	206.1	578	330	308	200.7	182.3	119.5	68.2
25	329	2	118	126	190.7	588	339	309	185.7	182.7	115.1	67.8
26	330	3	112	121	180.0	578	317	274	175.3	163.3	113.8	64.0
27	331	4	109	119	177.6	576	311	269	172.8	164.6	114.4	68.3
28	332	5	102	92	161.2	570	300	247	156.8	148.9	107.1	65.8
29	333	6	85	97	145.4	544	278	223	141.5	132.9	99.0	62.9
30	334	7	85	102	140.4	545	270	210	136.5	128.9	99.9	64.6
MEAN			87.8	94.7	156.7	556	294	244	153.2	141.7	100.9	62.3

* Adjusted for Burst

OCTOBER 26, 1969

(P = 25.43, B₀ = 4.93, L₀ = 70.19)

MT. WILSON

MAGNETOGRAM

Solid-Plus
Dotted-Minus

DELTA Y = 18.2
DELTA X = 14.5

UNIV. COLLEGE LONDON
LEICESTER UNIV.

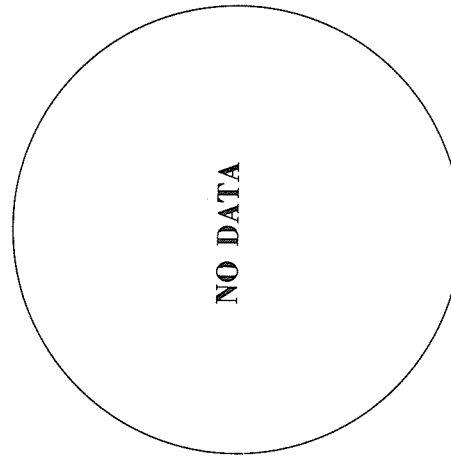
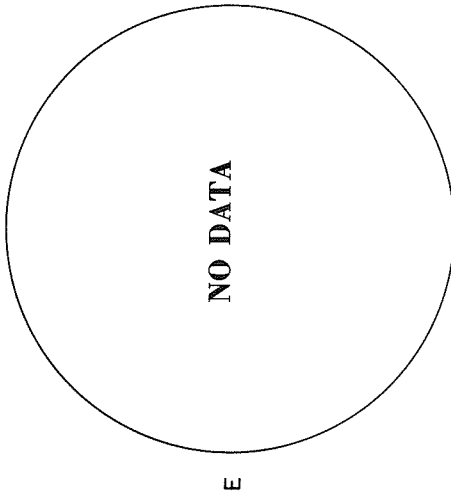
Np

X-RAY
OSO-5

ESSA-BOULDER

Np

SUNSPOTS

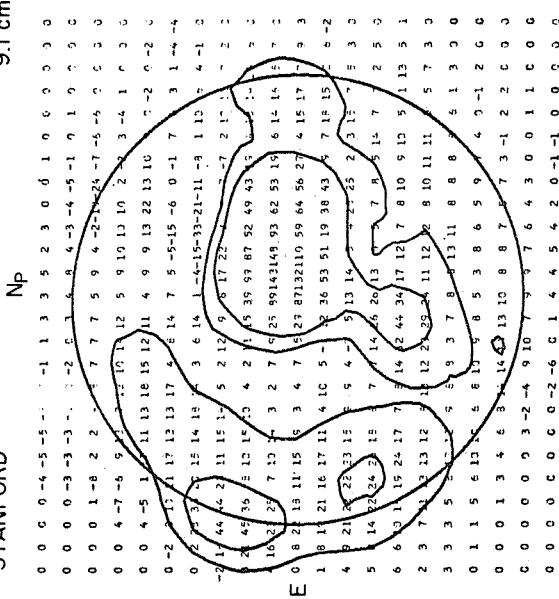


CORONA

Sp Intensities in Units
of 10⁻⁶ ergs cm⁻² sec⁻¹

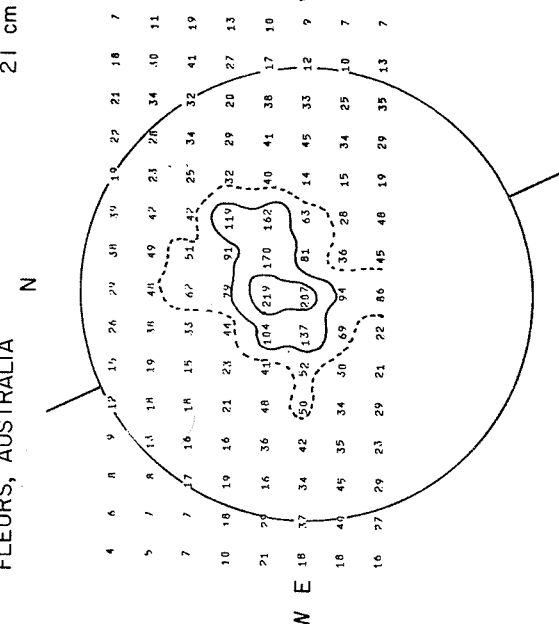
STANFORD

9.1 cm



FLEURS, AUSTRALIA

21 cm



Sp Brightness Unit 5,000° K

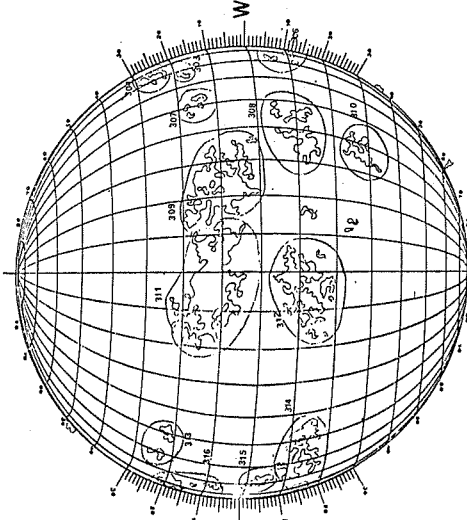
20-21 UT

S Resolution .3 Minutes of Arc
02-03 UT Brightness Unit 1,700° K

21.06-22.49 UT

CALCIUM REPORT

Np



Sp
0820 UT

Levels
±5
±10
±20
±40
±80

08-32-2.6
10-17-3.2
09-75-5.2
11-113-4.4
12-46-3.3
14-54-3.5
16-40--

OCTOBER 27, 1969

(P = 25.31, B₀ = 4.84, L₀ = 57.00)

MT. WILSON

N_p MAGNETOGRAM
Solid-Plus
Dotted-Minus

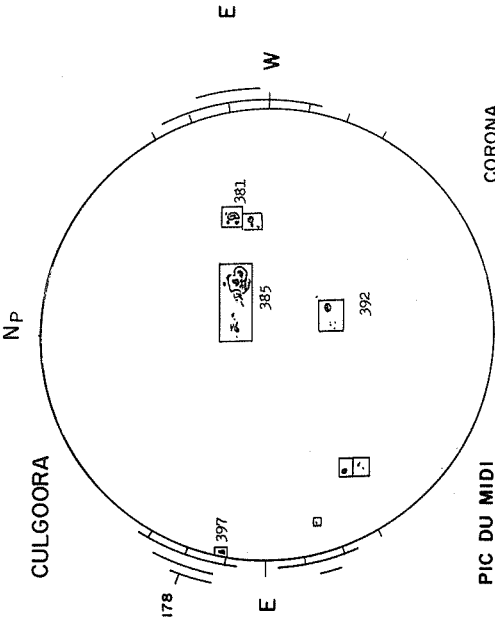
UNIV. COLLEGE LONDON
LEICESTER UNIV.

X-RAY
OSO-5

ESSA-BOULDER
CULGOORA

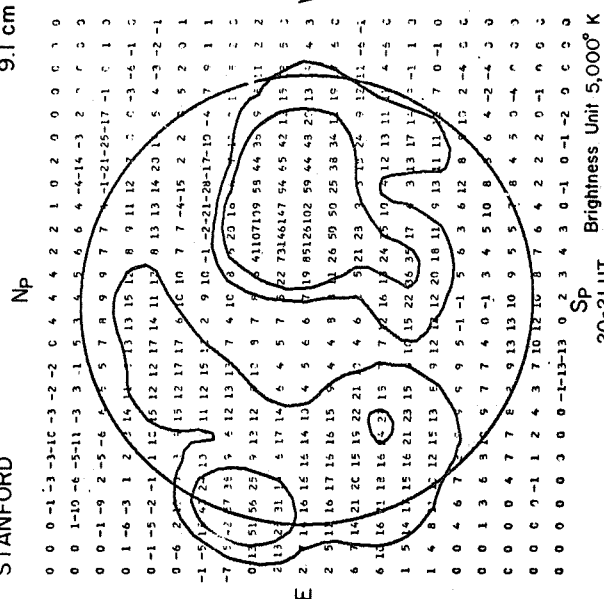
N_p

SUNSPOTS



SP Intensities in Units
of 10⁻⁶ ergs cm⁻² sec⁻¹

STANFORD



SP Brightness Unit 5,000° K

20-21 UT

PIC DU MIDI

SP 0020 UT

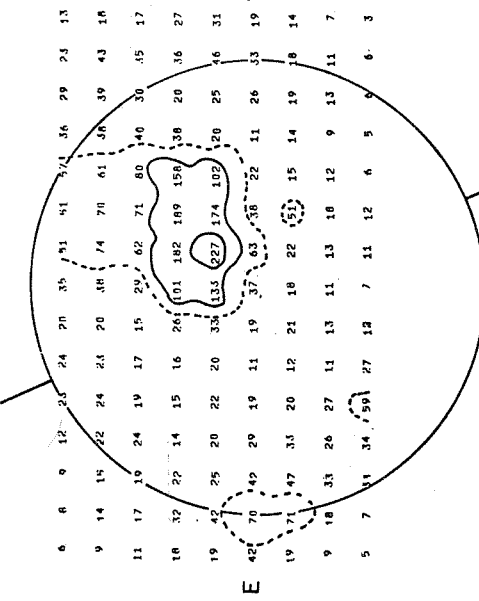
FLEURS, AUSTRALIA

21 cm

N

McMATH-HULBERT
N_p Sp

CALCIUM REPORT



S Resolution 3 Minutes of Arc
02-03 UT Brightness Unit 1,700° K

Sp 1800 UT

Levels
± 5
± 10
± 20
± 40
± 80

GOOD M
81-68-3.5
85-100-3.5
86-38-3.0
91-09-2.5
92-37-2.5
94-10-3.0
97-50-3.5

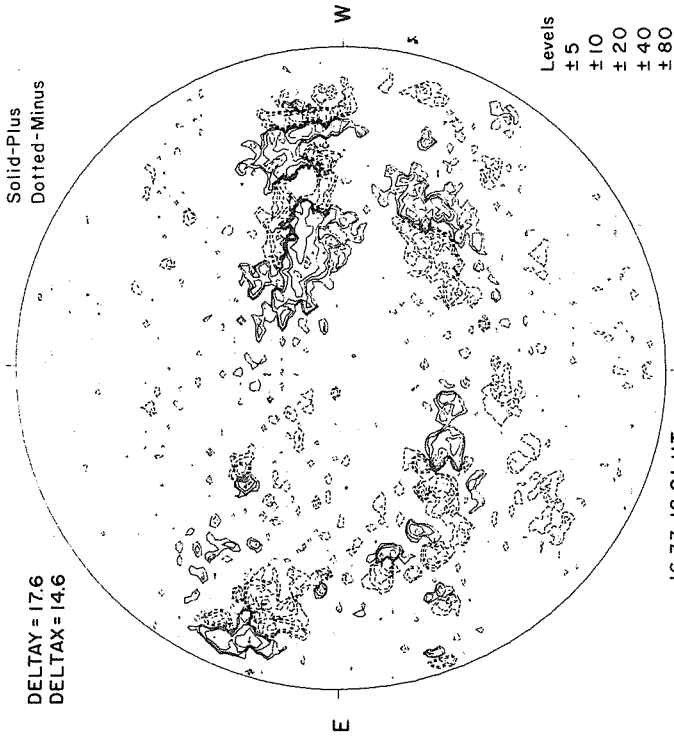
OCTOBER 28, 1969

(P = 25.18, B₀ = 4.74, L₀ = 43.82)

MT. WILSON

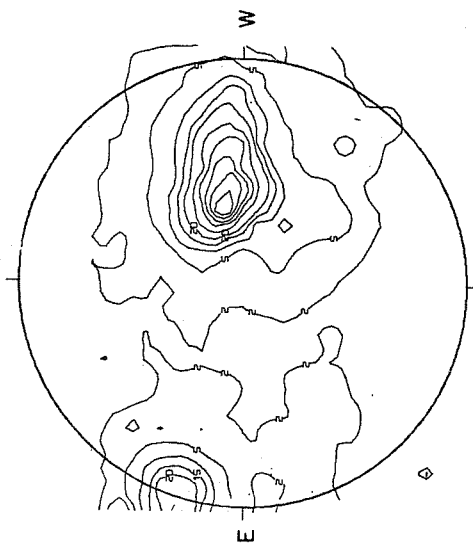
MAGNETOGRAM

DELTA_T = 17.6
DELTA_X = 14.6

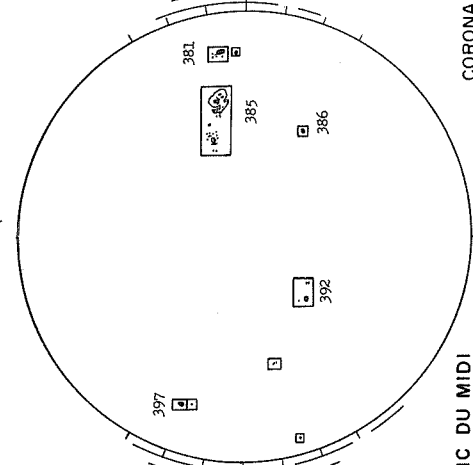


UNIV. COLLEGE LONDON
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X-RAY
OSO-5



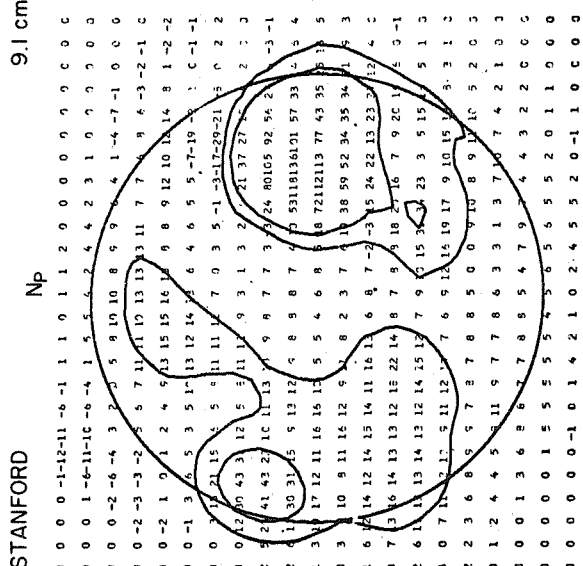
ESSA-BOULDER
Np



PIC DU MIDI
CORONA

Sp
1730 UT

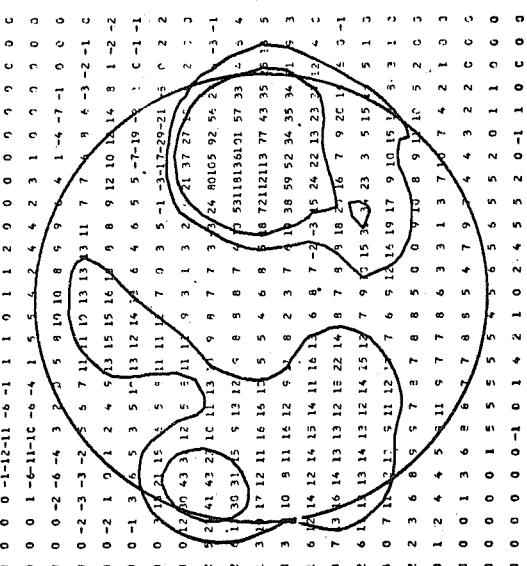
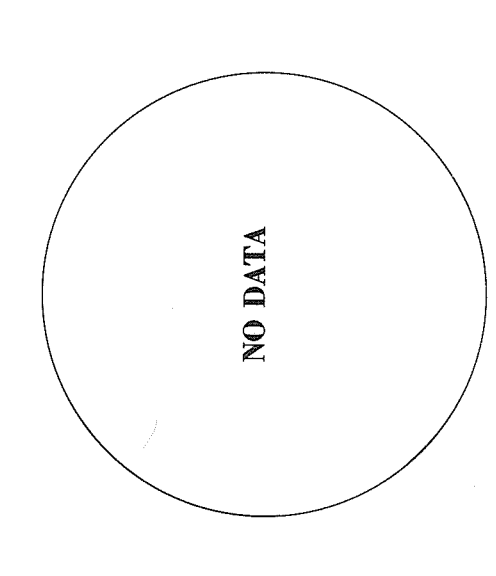
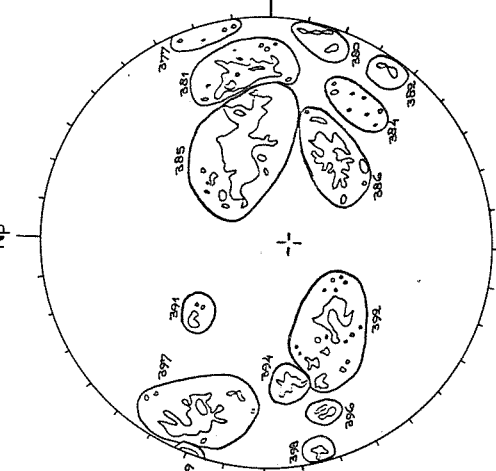
Sp
0205-0251 UT
Intensities in Units
of 10⁻⁶ ergs cm⁻² sec⁻¹



FLEURS, AUSTRALIA
N

21 cm

McMATH-HULBERT
Sp
16.33-18.01 UT



Sp
20-21 UT
Brightness Unit 5,000° K

S
Resolution 3 Minutes of Arc
02-03 UT Brightness Unit 1,700° K

Sp
1300 UT

POOR S

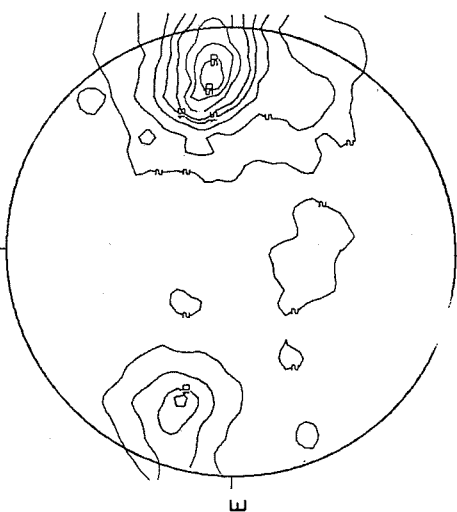
81-65-3.0
82-14-2.5
85-100-3.5
86-40-3.0
91-07-3.0
92-40-3.0
94-12-3.5
97-70-3.0
98-10-2.5

OCTOBER 29, 1969

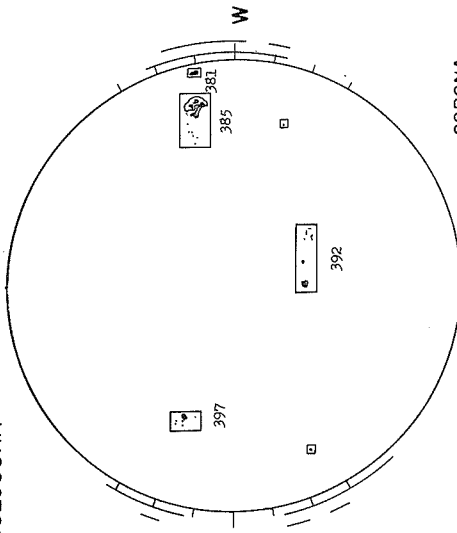
(P = 25.04, B₀ = 4.65, L₀ = 30.63)

UNIV. COLLEGE LONDON
LEICESTER UNIV.

X-RAY
OSO-5



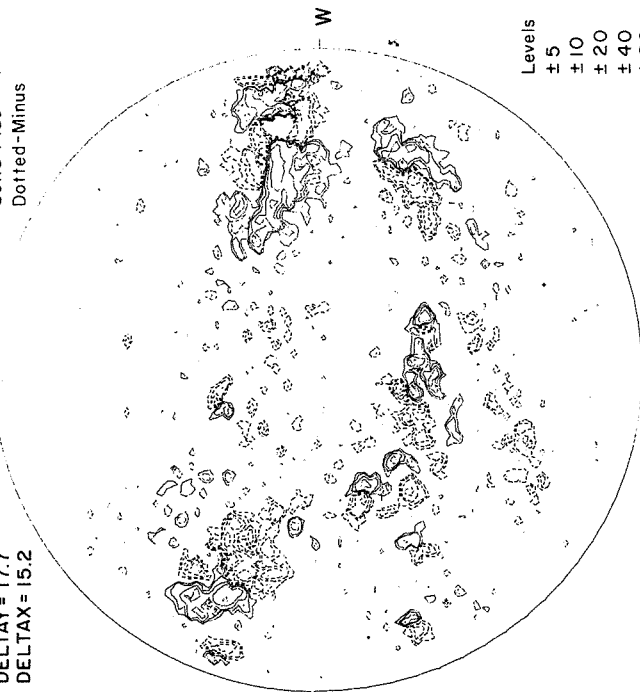
ESSA-BOULDER
CULGOORA



SUNSPOTS

MT. WILSON
DELTA Y = 17.7
DELTA X = 15.2

MAGNETOGRAM
Solid-Plus
Dotted-Minus



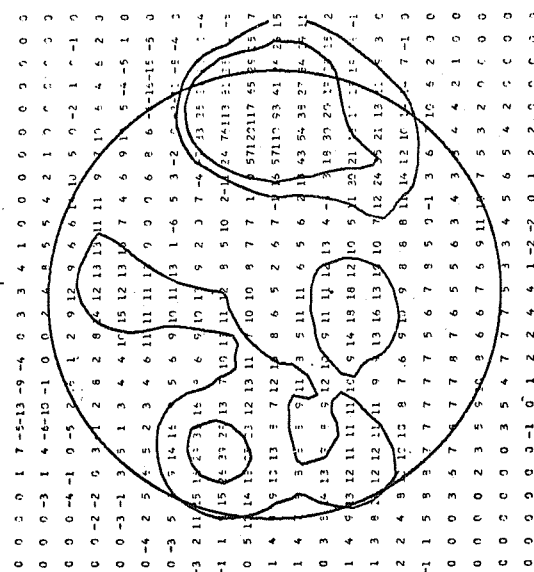
Levels
± 5
± 10
± 20
± 40
± 80

PIC DU MIDI

1823-1859 UT
Sp

STANFORD

9.1 cm



Brightness Unit 5,000° K

Sp

20-21 UT

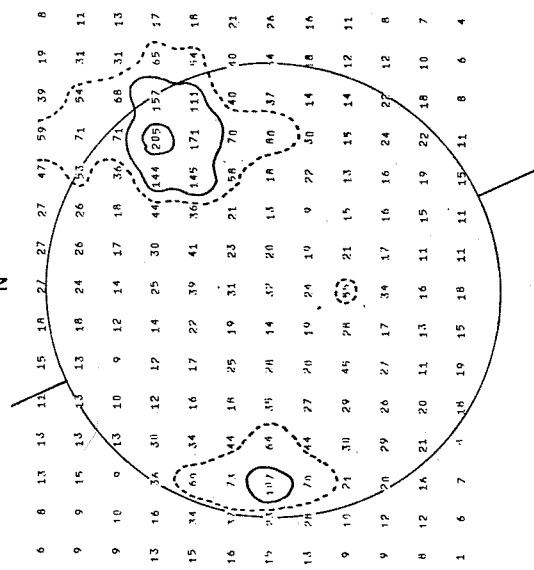
CORONA

Sp

2310 UT

FLEURS, AUSTRALIA

21 cm



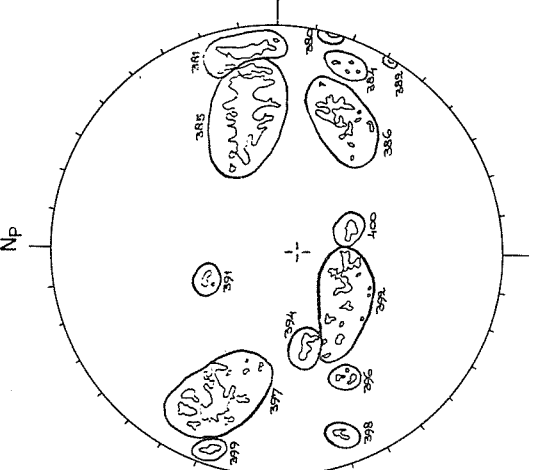
S Resolution 3 Minutes of Arc
02-03 UT Brightness Unit 1,700° K

18:29-19:68 UT
Sp

McMATH-HULBERT

Sp

1350 UT



V POOR M
81-60 -3.0
85-05 -3.5
86-39 -3.5
91-05 -3.0
92-33 -3.0
94-10 -3.0
97-71 -3.5
98-07 -2.5
99-10 -2.5
00-07 -3.0

OCTOBER 30, 1969

(P = 24.89, B₀ = 4.55, L₀ = 17.44)

MT. WILSON

DELTA Y = 17.6
DELTA X = 14.1

UNIV. COLLEGE LONDON
LEICESTER UNIV.

X-RAY
OSO-5

ESSA-BOULDER

SUNSPOTS

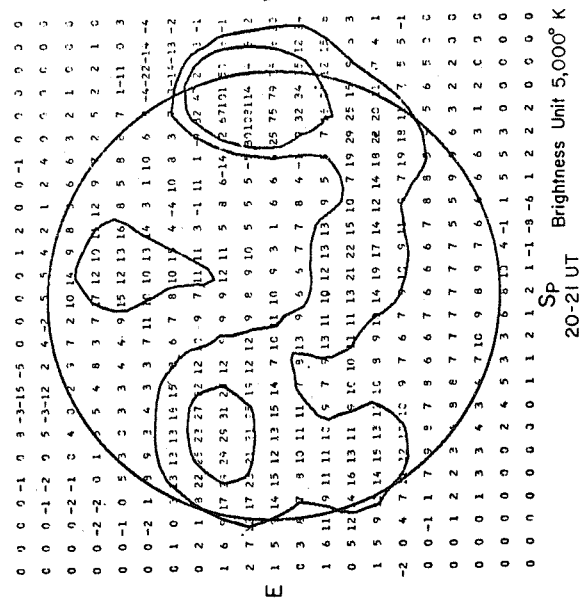
N_P



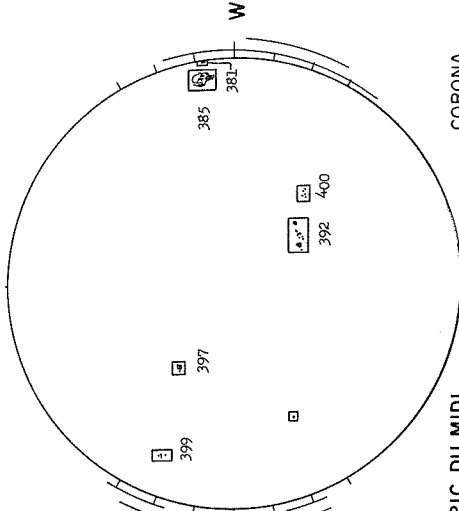
2057-2138 UT
Sp
Intensities in Units
of 10⁻⁶ ergs cm⁻² sec⁻¹

STANFORD

9.1 cm



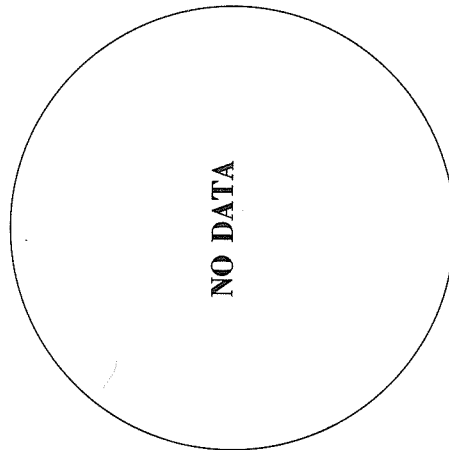
Sp
20-21 UT
Brightness Unit 5,000° K



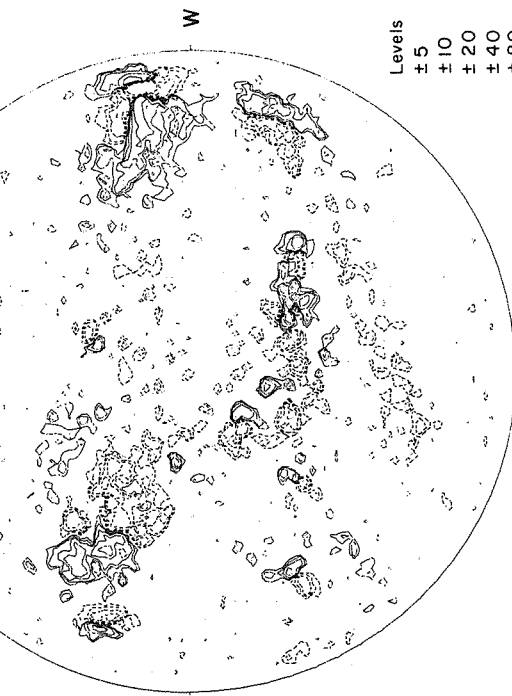
1930 UT
Sp

FLEURS, AUSTRALIA

21 cm



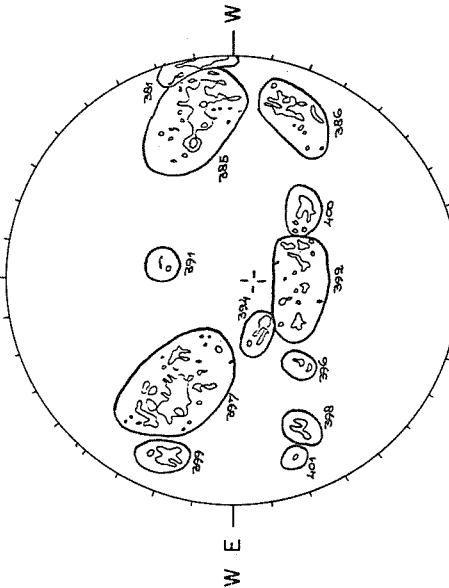
S
Resolution 3 Minutes of Arc
02-03 UT Brightness Unit 1,700° K



17.28-18.73 UT
Sp

McMATH-HULBERT

21 cm



Sp
1300 UT

FAIR	S
81-45-3.0	
85-85-3.0	
86-30-3.5	
91-03-3.0	
92-30-3.0	
94-08-2.5	
97-70-3.5	
98-08-2.5	
99-25-3.0	
00-13-2.5	
01-01-2.5	

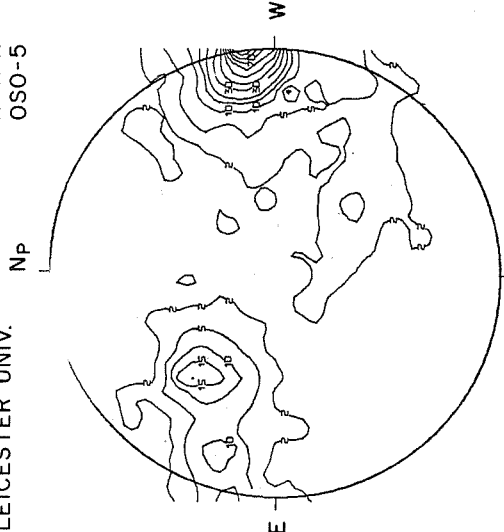
Levels
±5
±10
±20
±40
±80

MAGNETOGRAM
Solid-Plus
Dotted-Minus

OCTOBER 31, 1969

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LEICESTER UNIV.

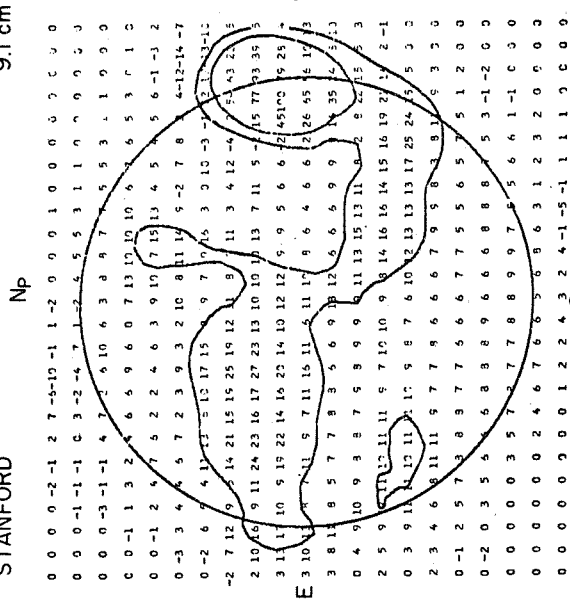
X-RAY
OSO-5



Sp Intensities in Units
of 10^{-6} ergs $\text{cm}^{-2}\text{sec}^{-1}$

0210-0234 UT

STANFORD



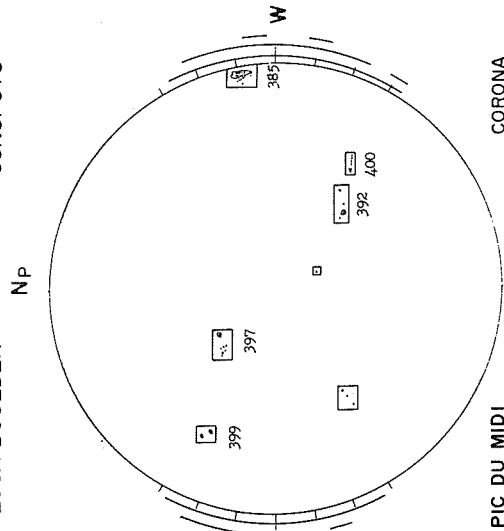
Sp Brightness Unit $5,000^\circ\text{K}$

20-21 UT

($P=24.74$, $B_0=4.45$, $L_0=4.26$)

ESSA-BOULDER

SUNSPOTS



PIC DU MIDI

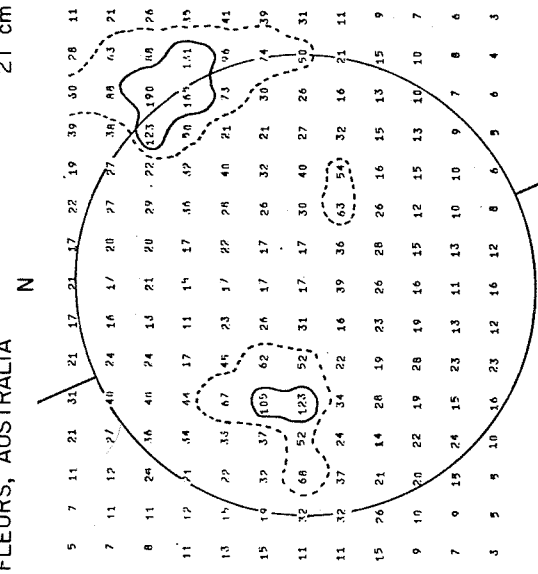
Sp

1500 UT

FLEURS, AUSTRALIA

21 cm

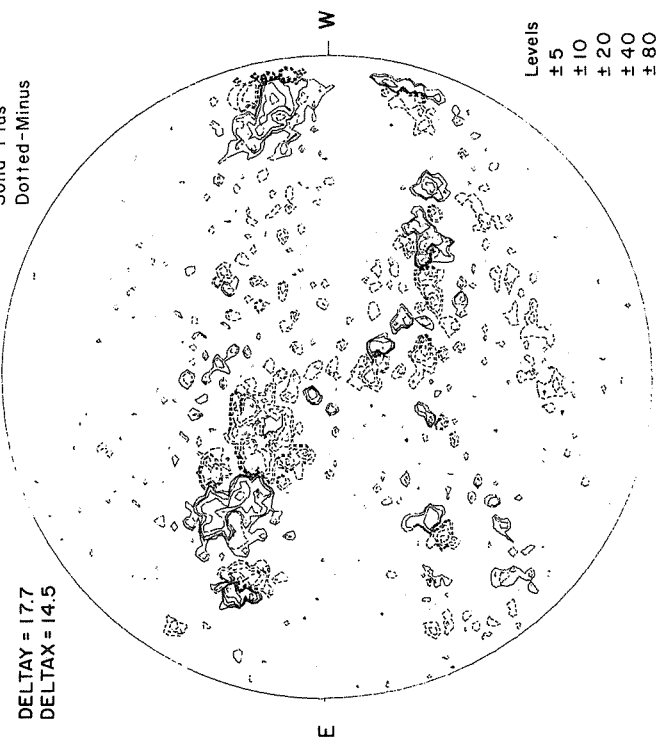
McMATH-HULBERT



S Resolution 3 Minutes of Arc
02-03 UT Brightness Unit $1,700^\circ\text{K}$

MT. WILSON

DELTA TAY = 17.7
DELTA X = 14.5



Levels

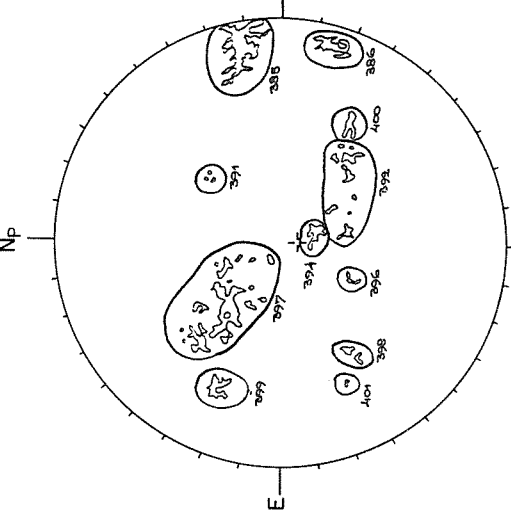
± 5
 ± 10
 ± 20
 ± 40
 ± 80

MAGNETOGRAM

Solid-Plus
Dotted-Minus

17.58-18.98 UT

CALCIUM REPORT



Sp
1330 UT

V POOR M
85-80-3.5
86-34-2.5
91-04-2.5
92-25-3.0
94-08-2.5
97-68-3.5
98-07-2.5
99-18-3.0
00-12-2.5

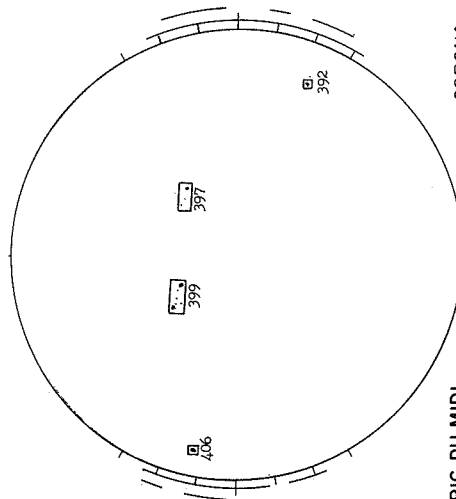
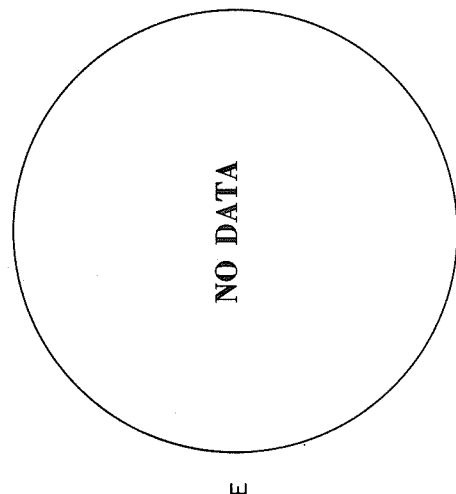
NOVEMBER 2, 1969 (P = 24.41, B₀ = 4.25, L₀ = 337.88)

UNIV. COLLEGE LONDON
LEICESTER UNIV.

X-RAY
OSO-5

ESSA-BOULDER
CULGOORA

SUNSPOTS

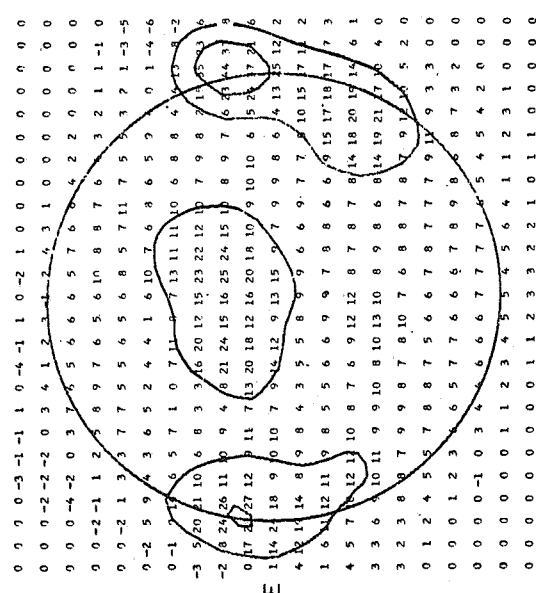


PIC-DU-MIDI

CORONA

Sp Intensities in Units
of 10⁻⁶ ergs cm⁻² sec⁻¹

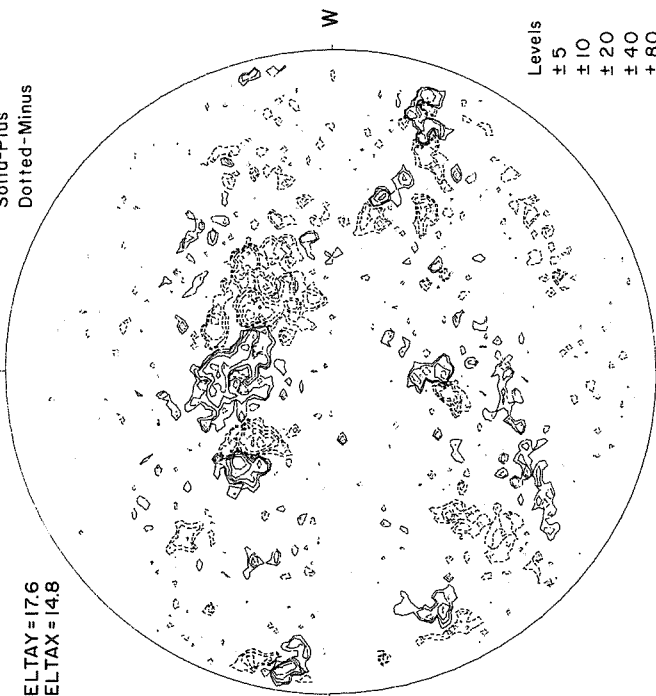
STANFORD Np 9.1 cm



SP 20-21 UT
Brightness Unit 5,000° K

MT. WILSON

DELTA = 17.6
DELTA T = 14.8

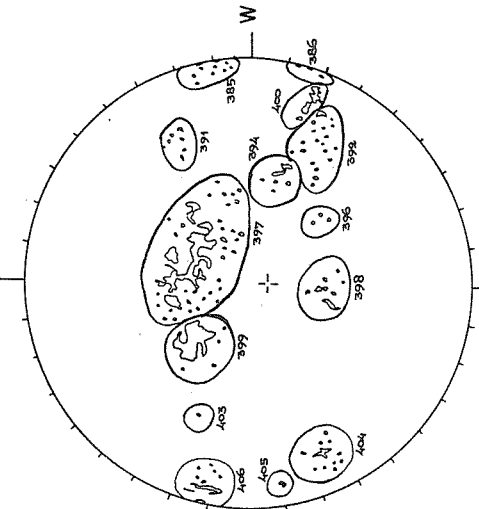


Levels
± 5
± 10
± 20
± 40
± 80

18.29-19.71 UT

McMATH-HULBERT Np

Sp CALCIUM REPORT



SP 1555 UT

FAIR	O
91-05-2.5	
92-19-3.5	
94-07-2.5	
96-03-2.5	
97-60-3.5	
98-08-2.5	
99-33-3.5	
00-12-3.0	
05-03-2.5	
06-23-3.5	

NOVEMBER 3, 1969 (P = 24.23, B₀ = 4.15, L₀ = 324.70)

UNIV. COLLEGE LONDON
LEICESTER UNIV.

X-RAY
OSO-5

ESSA-BOULDER

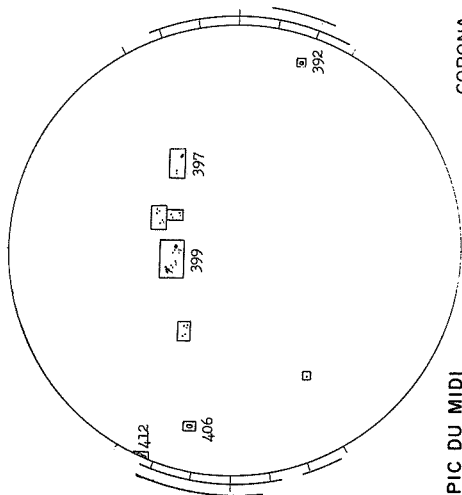
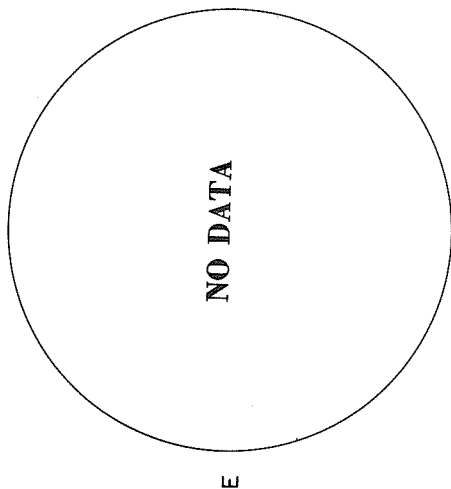
SUNSPOTS

MT. WILSON

DELTA Y = 17.6
DELTA X = 14.2

MAGNETOGRAM

Solid-Plus
Dotted-Minus

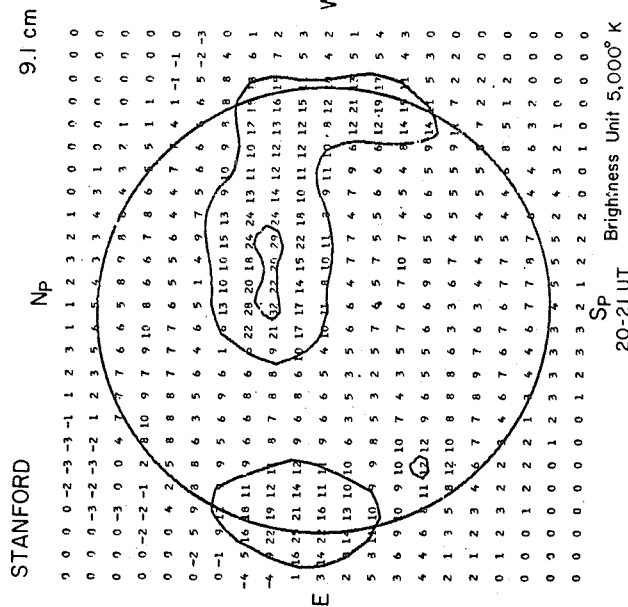


PIC DU MIDI

CORONA

Sp Intensities in Units
of 10⁻⁶ ergs cm⁻² sec⁻¹

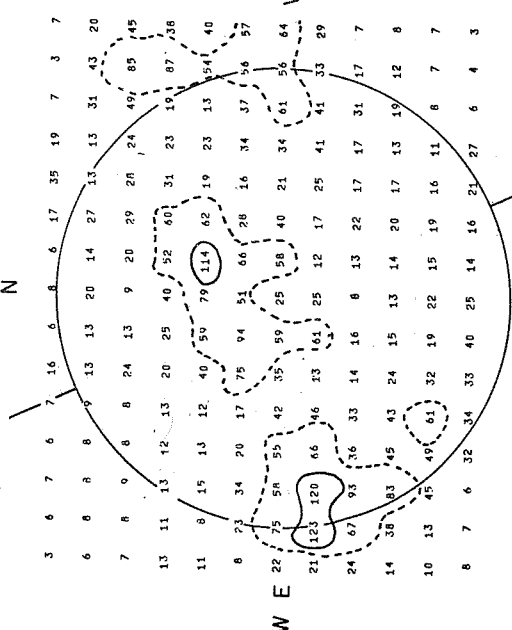
Sp
1455 UT



FLEURS, AUSTRALIA

21 cm

N



S Resolution 3 Minutes of Arc
02-03 UT Brightness Unit 1,700° K

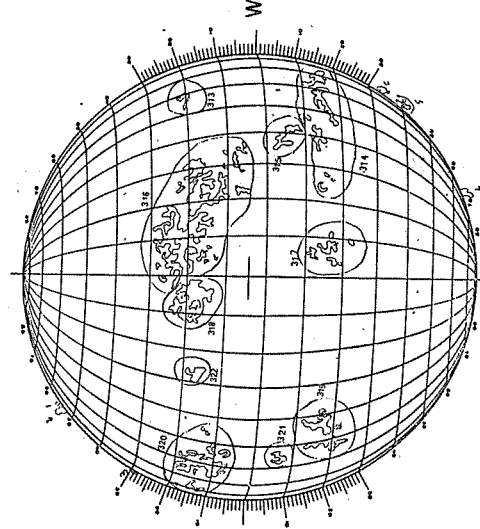
17.30-18.75 UT

Sp

CALCIUM REPORT

Minimum

Np



Sp
0735 UT

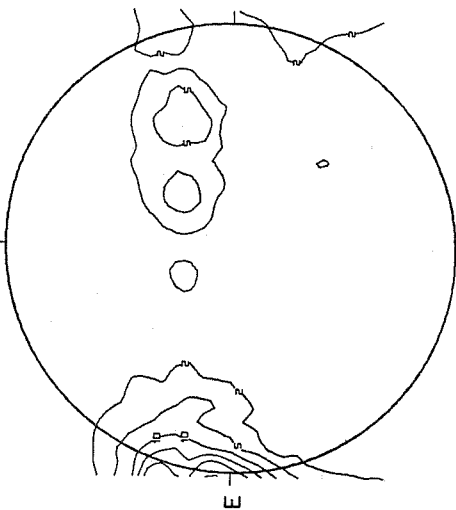
Levels
±5
±10
±20
±40
±80

14-32-26
16-58-26
17-08-25
18-24-32
20-46-34

(P=24.05, B_o=4.04, L_o=311.51)

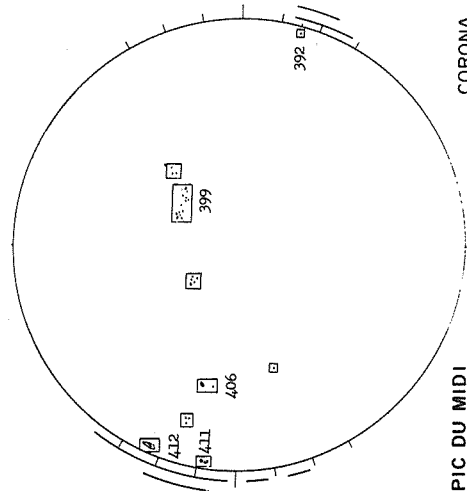
UNIV. COLLEGE LONDON
LEICESTER UNIV.

X-RAY
OSO-5

$$\frac{a}{N}$$


ESSA-BOULDER

29



PIC DU MIDI

Sp
1847-1917 UT
Intensities in Units
of 10^{-6} ergs $\text{cm}^{-2} \text{sec}^{-1}$

Sp
1500 UT

CORONA

STANFORD

9.1 cm

FLEURS, AUSTRALIA N

21 cm

E

Brightness Unit 5,000° K

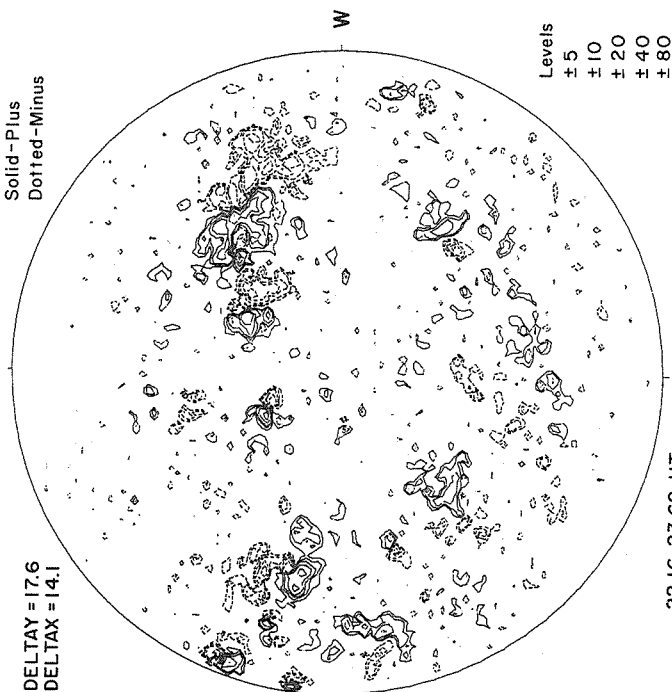
20-21 UT

S Resolution 3 Minutes of Arc
02-03 UT Brightness Unit 1,700° K

MT. WILSON

DELTAY = 17.6
DELTAX = 14.1

MAGNETOGRAM
Solid-Plus
Dotted-Minus

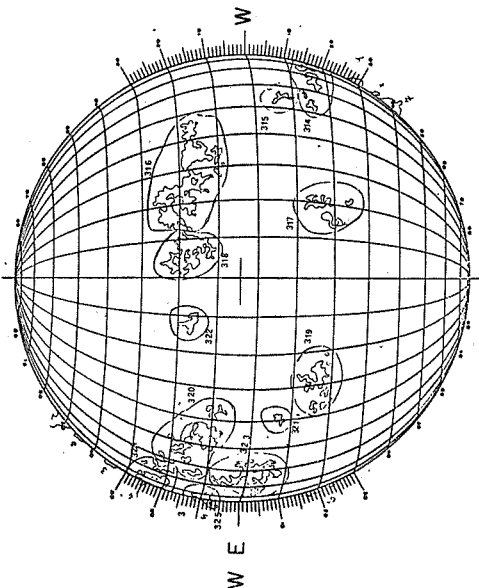


Levels	±5	±10	±20	±40	±80
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22.16-23.62 UT

5

CATANIA

$$N^p$$


16-65-2.2
17-11-2.9
18-23-2.8
19-18-2.5
20-40-3.2
23-39-—
24-44-—

Sp
1010 UT

NOVEMBER 5, 1969

(P = 23.85, B₀ = 3.93, L₀ = 298.33)

MT. WILSON

DELTA Y = 17.6
DELTA X = 14.2

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LEICESTER UNIV.

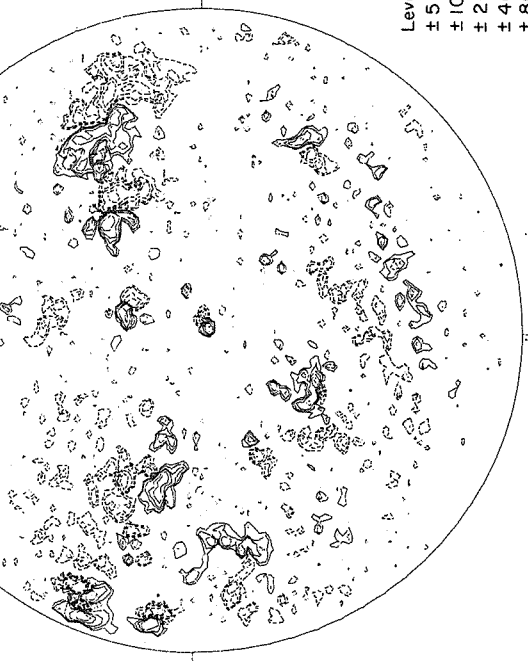
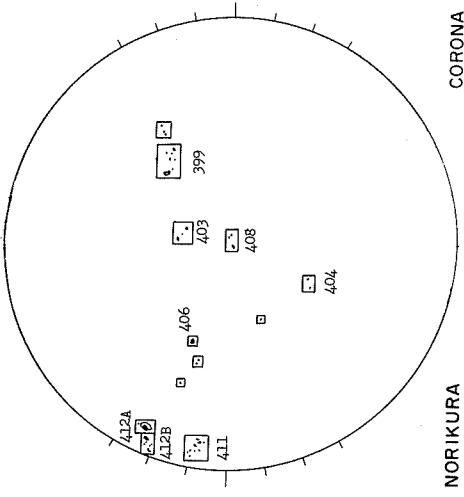
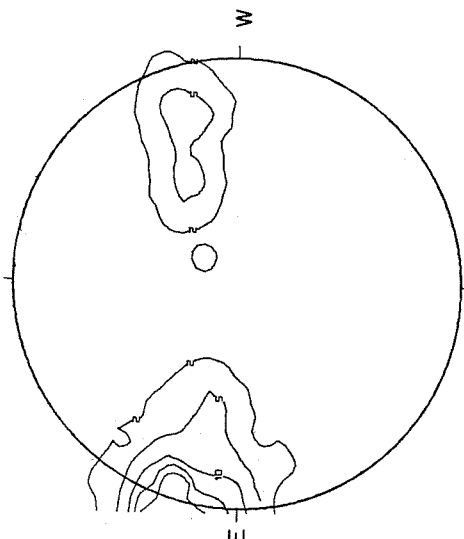
X-RAY
OSO-5

ESSA-BOULDER

SUNSPOTS

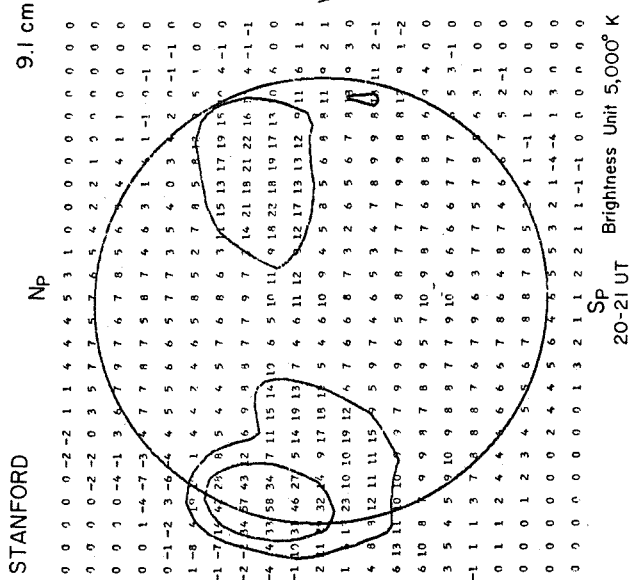
MAGNETOGRAM

Solid-Plus
Dotted-Minus

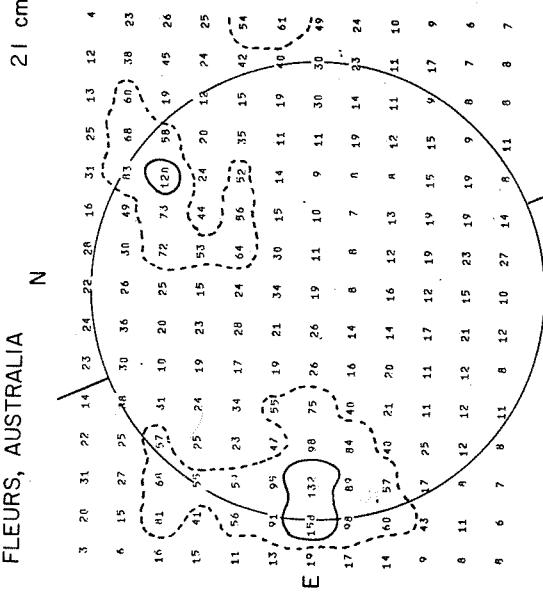


Levels
± 5
± 10
± 20
± 40
± 80

STANFORD
1600-1730 UT
Sp
Intensities in Units
of 10⁻⁶ ergs cm⁻² sec⁻¹



FLEURS, AUSTRALIA
1500 UT
Sp

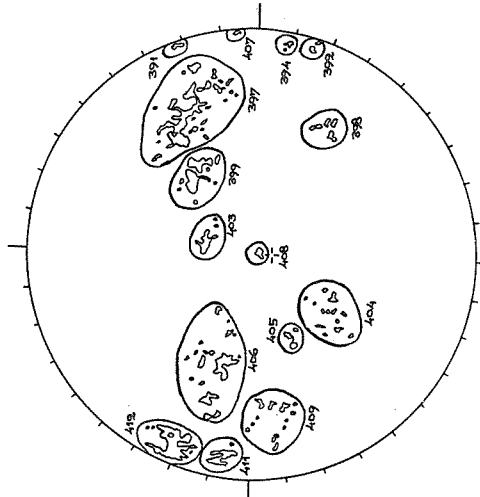


20-21 UT
Sp
Brightness Unit 5,000° K

S
Resolution 3 Minutes of Arc
02-03 UT Brightness Unit 1,700° K

16.76-18.20 UT
Sp
DATA INCOMPLETE

McMATH-HULBERT
Np
CALCIUM REPORT



Sp
1500 UT

GOOD D
97-65-30
99-24-30
03-09-30
04-11-25
06-39-30
08-04-25
11-20-30
12-65-35

NOVEMBER 6, 1969 (P=23.65, B₀=3.83, L₀=285.14)

UNIV. COLLEGE LONDON
LEICESTER UNIV.

X-RAY
OSO-5

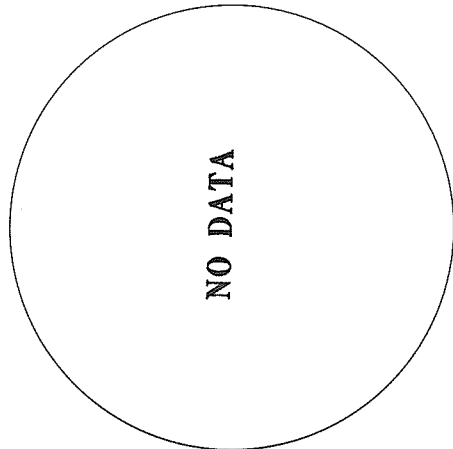
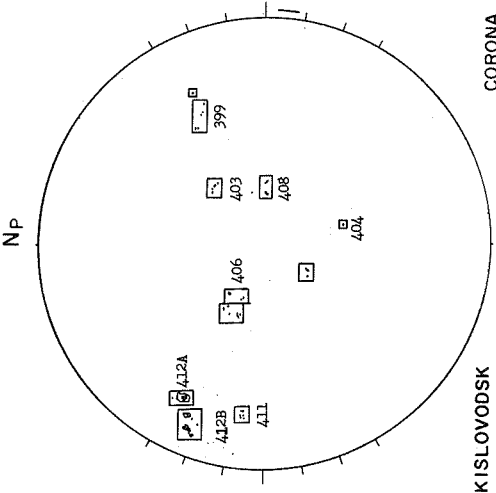
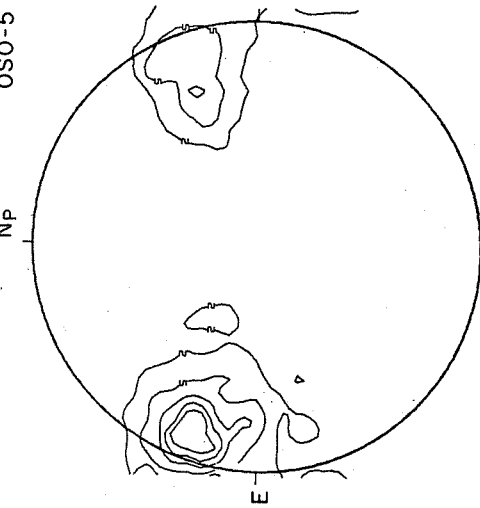
ESSA-BOULDER

SUNSPOTS

MT. WILSON

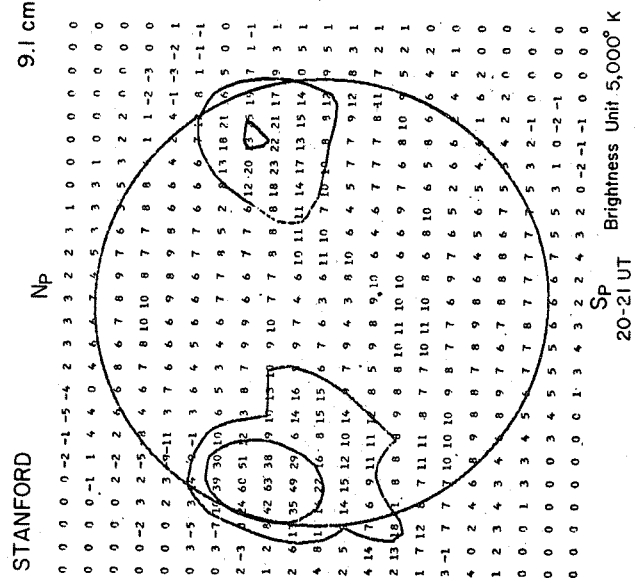
Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus



Levels
± 5
± 10
± 20
± 40
± 80

2020-2050 UT
Sp Intensities in Units
of 10⁻⁶ ergs cm⁻² sec⁻¹



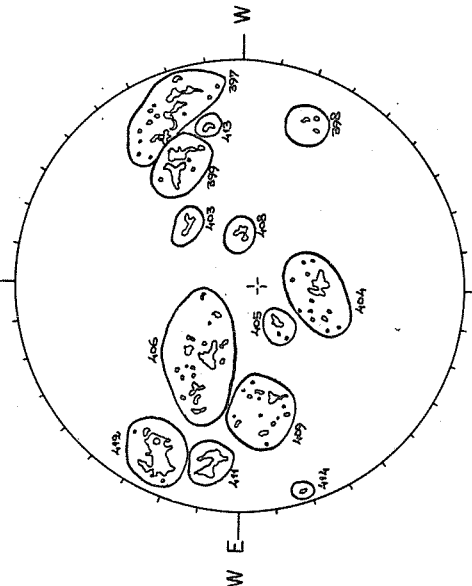
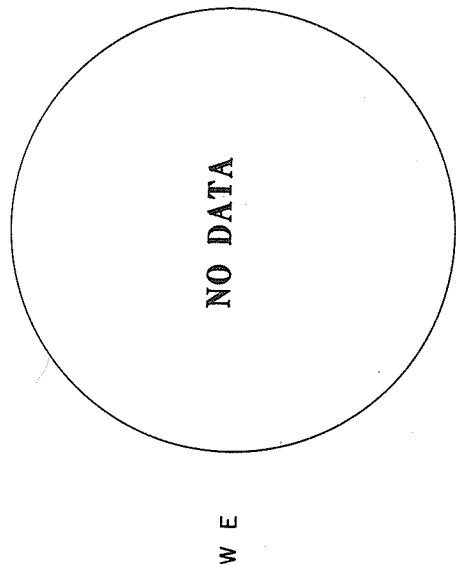
STANFORD

FLEURS, AUSTRALIA

21 cm

McMATH-HULBERT
Sp Np

CALCIUM REPORT



S Resolution 3 Minutes of Arc
02-03 UT Brightness Unit 1,700° K

Sp
1335 UT

NOVEMBER 8, 1969

(P=23.22, B₀=3.61, L₀=258.77)

MT. WILSON

N_p

MAGNETOGRAM

Solid-Plus
Dotted-Minus

UNIV. COLLEGE LONDON
LEICESTER UNIV.

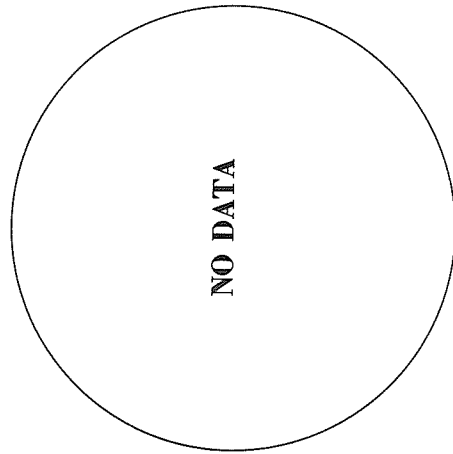
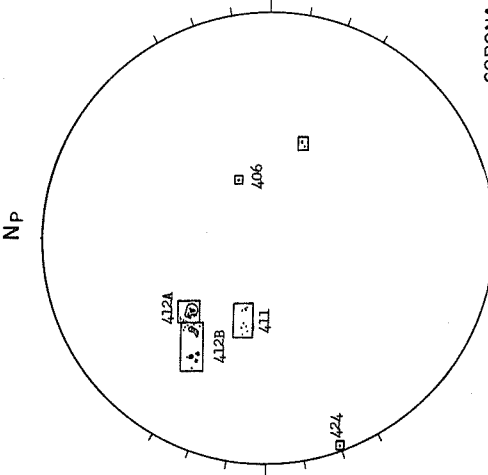
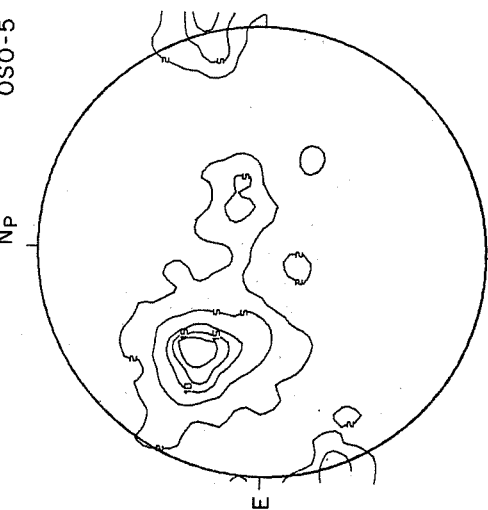
N_p

X-RAY
OSO-5

ESSA-BOULDER

N_p

SUNSPOTS



Levels
±5
±10
±20
±40
±80

CORONA
NO DATA

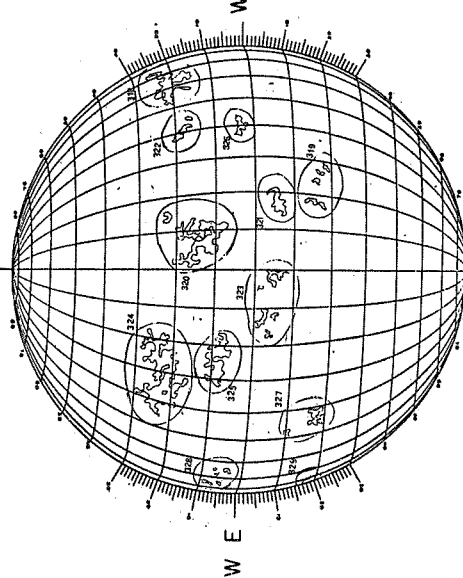
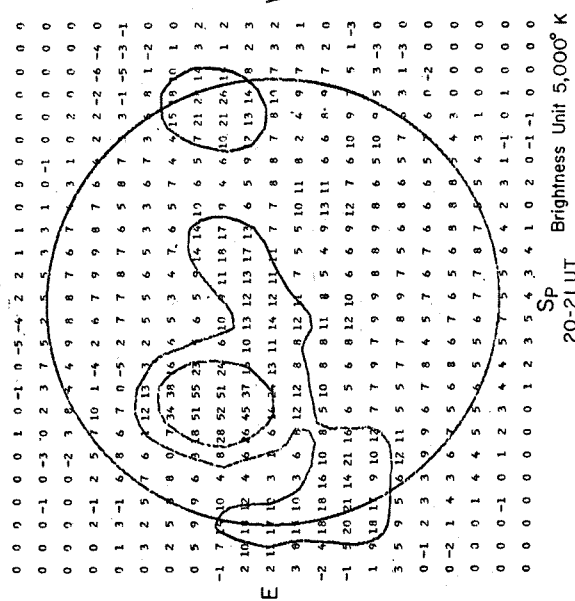
STANFORD
2132-2202 UT
Sp Intensities in Units
of 10⁻⁶ ergs cm⁻² sec⁻¹

9.1 cm
FLEURS, AUSTRALIA
N_p

1900 UT
Sp

21 cm
CATANIA
N_p

CALCIUM REPORT
Sp
N_p



18-35-2.6
20-31-2.2
24-54-1.8

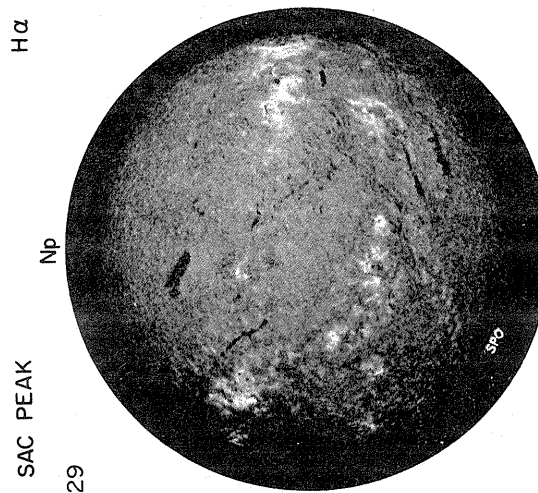
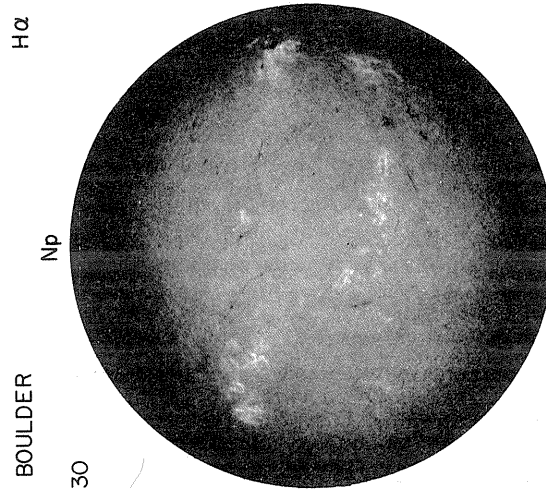
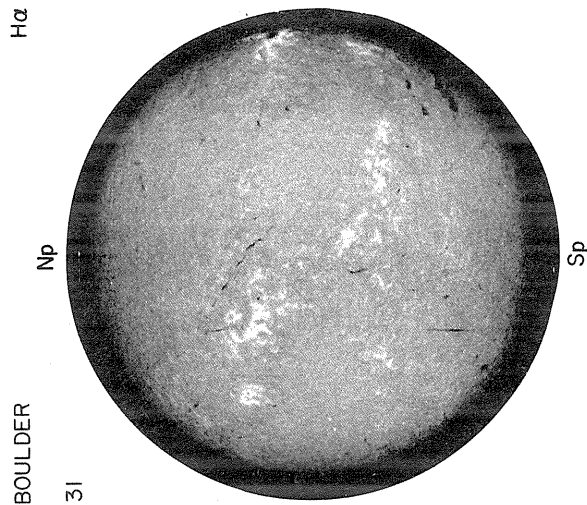
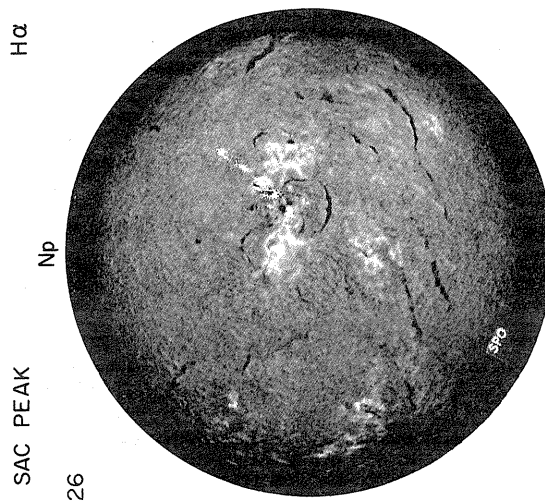
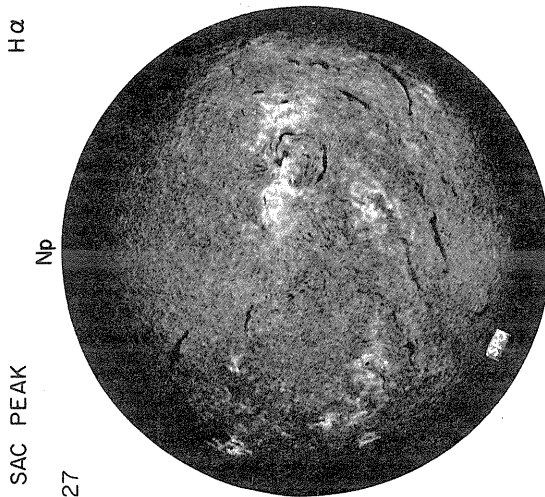
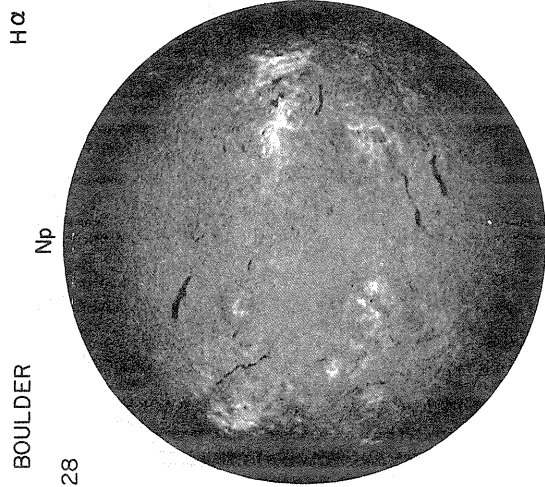
S Resolution 3 Minutes of Arc
02-03 UT Brightness Unit 1,700° K

Sp
20-21 UT
Brightness Unit 5,000° K

Sp
1410 UT

H α SPECTROHELIOGRAMS

OCTOBER 1969



Note: Arrows indicate McMath Region 10385.

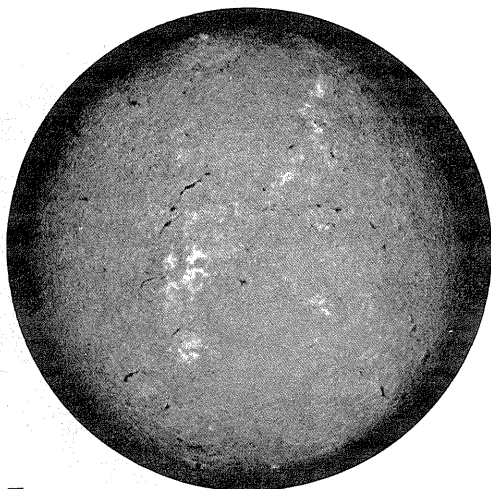
H α SPECTROHELIOGRAMS

NOVEMBER 1969

BOULDER

Np

H α



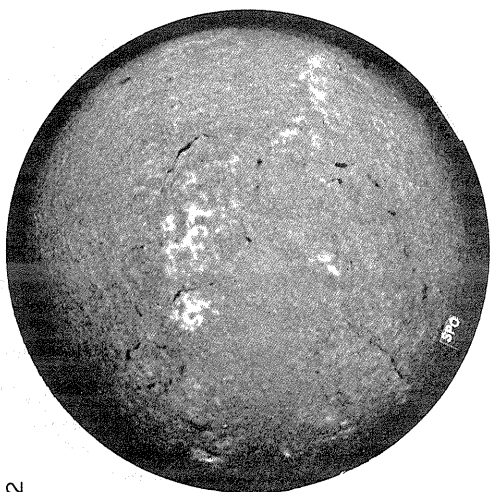
Sp

2005 UT

SAC PEAK

Np

H α



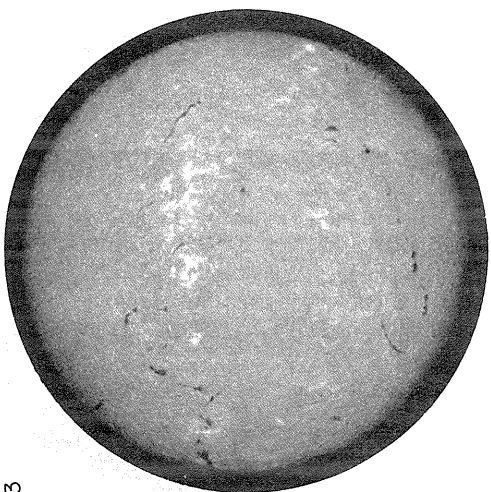
Sp

1617 UT

BOULDER

Np

H α



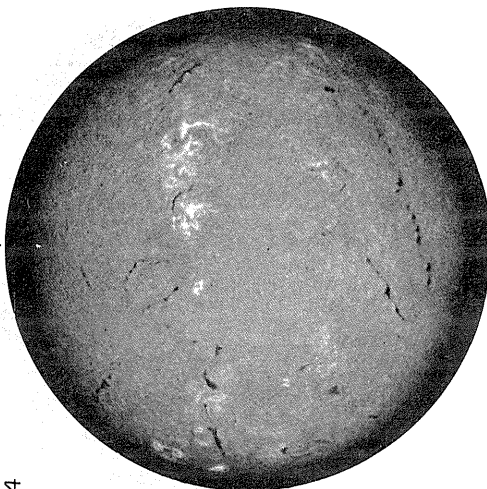
Sp

1407 UT

BOULDER

Np

H α



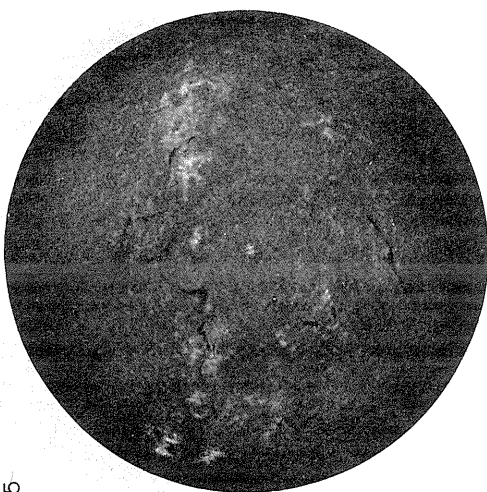
Sp

1513 UT

BOULDER

Np

H α



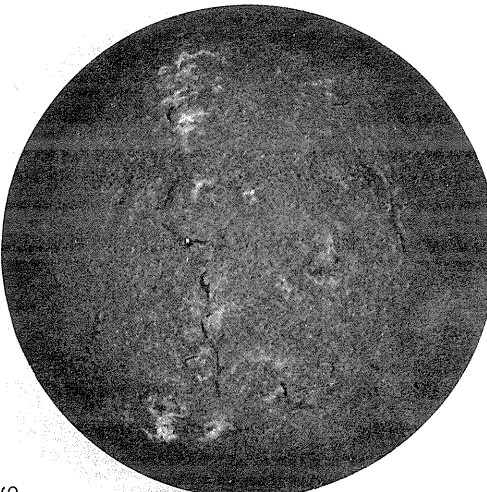
Sp

1437 UT

BOULDER

Np

H α

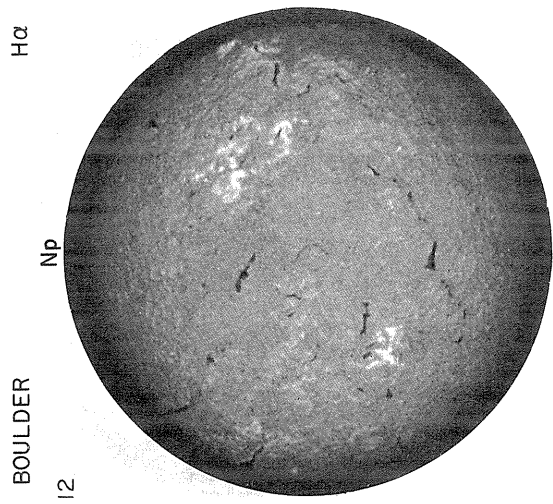
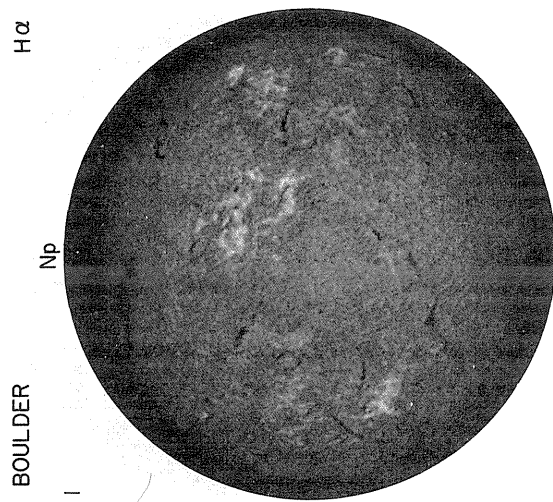
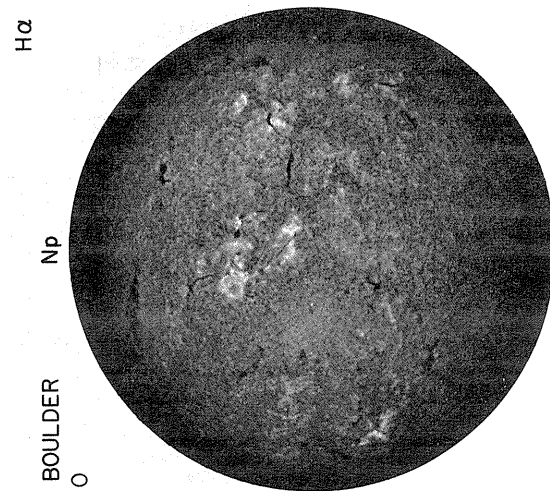
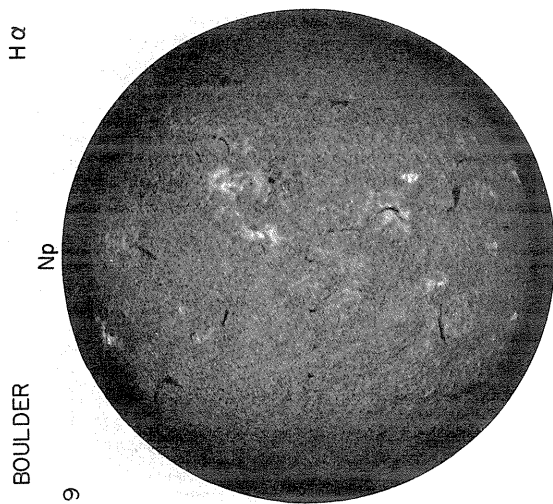
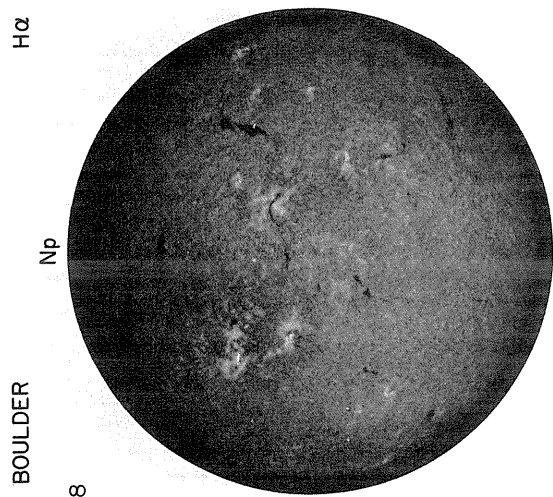
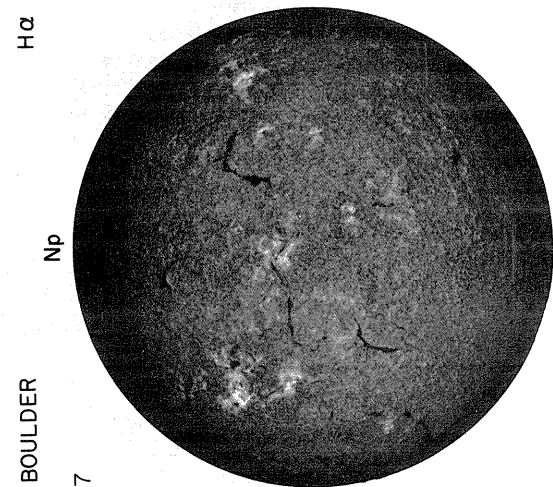


Sp

1452 UT

H α SPECTROHELIOGRAMS

NOVEMBER 1969



Principal Flare Regions of the Period Oct. 26 - Nov. 8, 1969

MCMATH REGION 10381				CMP DATE 24.6				RETURN OF REGION 10333				ROTATION 4				
				CALCIUM PLAGE DATA				SUNSPOT DATA				9.1 CM				
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT FLUX
69	10	17	10381	N15 E90	90	600	1.5									20 9
69	10	18	10381	N12 E78	90	3900	3.5	17533	N09 E77	90	(BP)	3	250	6	D	31 13
69	10	19	10381	N00 E00	0	0	0.0	17533	N09 E65	85	(D)	4	410	6	D	49 21
69	10												390	4	D	
69	10	20	10381	N00 E00	0	0	0.0	17533	N10 E52	86	(D)	4	290	10	C	43 18
69	10	21	10381	N12 F42	86	7000	3.0	17533	N10 F37	88	(D)	4	300	8	H	
69	10	22	10381	N12 E27	87	7000	3.0	17533	N11 E25	89	(BY)	4	230	10	H	
69	10	23	10381	N12 E15	87	6500	3.0	17533	N11 E13	88	(BY)	5	0	0	0	
69	10	24	10381	N12 F01	88	7000	3.0						270	30	D	33 14
69	10	25	10381	N10 W13	89	7700	3.5	17533	N11 W17	90	(D)	5	290	17	D	31 14
69	10							17544	N05 W14	87	(BP)	3	40	21	D	
69	10	26	10381	N00 E00	0	0	0.0	17533	N10 W34	91	(BP)	4	0	0	0	29 13
69	10							17544	N05 W31	88	(BP)	4	0	0	0	
69	10	27	10381	N12 W43	90	6800	3.5	17533	N11 W44	90	(BP)	5	0	0	0	
69	10							17544	N06 W43	89	(BP)	4	0	0	0	
69	10	28	10381	N11 W53	89	6500	3.0	17533	N10 W57	91	(AP)	4	160	7	C	
69	10							17544	N06 W56	90	(AP)	3	20	1	H	
69	10							17544	N05 W44	78	(AP)	2	0	0	0	
69	10	29	10381	N11 W65	88	6000	3.0	17533	N10 W70	91	(AP)	3	140	6	D	56 25
69	10							17544	N05 W69	90	(BP)	3	0	0	0	
69	10	30	10381	N11 W78	88	4500	3.0	17533	N09 W81	88		0	100	3	C	62 28

MCMATH REGION 10385				CMP DATE 26.6				RETURN OF REGION 10335				ROTATION 3					
				CALCIUM PLAGE DATA				SUNSPOT DATA				9.1 CM					
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
69	10	19	10385	N00 E00	0	0	0.0	17535	N09 E80	70	(AF)	3	350	7	H		
69	10												350	1	H		
69	10	20	10385	N00 E00	0	0	0.0	17535	N10 E70	68	(D)	4	880	38	F		
69	10	21	10385	N14 E63	65	7500	3.5	17535	N10 E60	65		0	790	43	F	58	25
69	10	22	10385	N12 E55	59	8600	3.5	17535	N12 F49	65	(D)	5	700	35	F	59	25
69	10	23	10385	N12 E41	61	10000	3.5	17535	N12 E35	66	(D)	6	0	0	0	84	36
69	10	24	10385	N12 E28	61	10000	3.5						670	85	F	77	33
69	10	25	10385	N11 E15	61	10300	3.5	17535	N11 F06	67	(D)	5	420	16	F	72	32
69	10	26	10385	N00 F00	0	0	0.0	17535	N12 W09	66	(D)	5	0	0	0	73	32
69	10	27	10385	N12 W15	62	10000	3.5	17535	N11 W21	67	(D)	5	0	0	0	72	32
69	10							17552	N16 W02	48	(AP)	1	0	0	0		
69	10	28	10385	N11 W26	62	10200	3.5	17535	N12 W34	68	(BY)	5	280	37	F	66	30
69	10	29	10385	N11 W39	62	10500	3.5	17535	N12 W47	68	(BY)	4	0	45	F		
69	10	30	10385	N11 W52	62	7000	3.0	17535	N10 W66	73	(BP)	4	0	0	0		
69	10	31	10385	N11 W65	61	8000	3.5	17535	N10 W78	73	(AP)	4	740	9	H		
69	11	2	10385	N12 W90		2000	1.5										

MCMATH REGION 10392				CMP DATE 26.9				RETURN OF REGION 10343 & 10344				ROTATION 2					
				CALCIUM PLAGE DATA				SUNSPOT DATA				9.1 CM					
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
69	10	23	10392	S11 F89	13	200	1.0									9	4
69	10	24	10392	S12 E79	10	900	1.5						50	1	J	7	3
69	10	25	10392	S13 E67	9	2300	2.5	17545	S12 F57	16	(AP)	4	50	1	J	7	3
69	10	26	10392	N00 E00	0	0	0.0	17545	S12 F40	17	(AP)	3	0	0	0	10	4
69	10							17547	S17 F40	17	(BP)	2	0	0	0		
69	10	27	10392	S13 E33	14	3700	2.5	17553	S11 E28	18	(BF)	3	0	0	0	11	5
69	10							17545	S12 F29	17	(BP)	4	0	0	0		
69	10							17547	S16 F29	17	(AP)	2	0	0	0		
69	10	28	10392	S13 W22	58	4000	3.0	17553	S11 E15	19	(B)	1	20	4	A		
69	10							17545	S12 E17	17	(AP)	3	0	0	0		
69	10	29	10392	S13 E13	10	3300	3.0	17545	S12 E04	17	(AP)	3	70	6	D	6	3
69	10	30	10392	S13 E00	10	3000	3.0	17545	S14 W08	15	(BP)	3	50	7	D	9	4
69	10	31	10392	S13 W14	10	2500	3.0	17545	S14 W21	16	(BP)	3	60	6	D	5	2
69	11	1	10392					17545	S14 W37		(AP)	3	50	1	A		
69	11	2	10392	S13 W40		1900	3.5	17545	S14 W48		(AP)	3	30	3	A		
69	11	3	10392					17545	S14 W62		(AP)	3	20	1	A		
69	11	4	10392					17545	S14 W74		(AP)	2	10	1	A		
69	11	5	10392	S13 W79	8	600	1.0										

MCMATH REGION 10397 CMP DATE 2.1 RETURN OF REGION 10351 ROTATION 2

CALCIUM PLAGE DATA								SUNSPOT DATA										9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT FLUX			
69	10	26	10397	N00 E00	0	0	0.0	17549	N18 E76	342	(AP)	3	0	0	0				
69	10	27	10397	N14 E72	336	5000	3.5	17549	N19 E67	340	(AP)	4	0	0	0	24 10			
69	10							17550	N16 E65	342	(AP)	1	0	0	0				
69	10	28	10397	N20 E60	337	7000	3.0	17550	N16 E52	343	(AP)	2	0	1	A	19 8			
69	10							17549	N19 E53	342	(AP)	3	50	2	H				
69	10	29	10397	N18 E48	336	7100	3.5	17550	N16 E39	343	(AP)	2	60	10	D	15 7			
69	10							17549	N19 E40	342	(BP)	3	0	0	0				
69	10	30	10397	N19 E33	338	7000	3.5	17549	N17 E24	344	(AP)	3	40	6	C	13 6			
69	10							17550	N14 E24	344	(AP)	1	0	0	0				
69	10	31	10397	N18 E19	338	6800	3.5	17549	N17 E14	342	(AP)	3	30	4	C				
69	10							17561	N19 E24	332	(AF)	1	0	0	0				
69	11	1	10397	N00 E00	0	0	0.0	17549	N17 W03	343	(AP)	3	0	0	0				
69	11							17561	N18 E04	336	(B)	1	0	0	0				
69	11	2	10397	N18 W07	335	6000	3.5	17549	N17 W14	341	(AP)	3	30	3	D	11 5			
69	11												0	2	A				
69	11	3	10397	N00 E00	0	0	0.0	17561	N19 W07	334	(B)	1	0	5	A				
69	11							17549	N17 W28	341	(AP)	2	10	5	C	12 6			
69	11							17561	N19 W16	329	(BY)	2	10	5	C				
69	11							17564	N24 W14	327	(AF)	1	0	1	A				
69	11	4	10397	N00 E00	0	0	0.0	17567	N22 W20	321	(BF)	2	0	5	B	11 5			
69	11	5	10397	N19 W43	332	6500	3.0	17567	N22 W35	322	(BF)	2	0	3	A	12 16			
69	11	6	10397	N20 W58	335	5100	3.0												
69	11	7	10397	N19 W71	334	4800	2.5									15 7			
69	11	8	10397	N00 E00	0	0	0.0									16 8			

MCMATH REGION 10399 CMP DATE 4.0

CALCIUM PLAGE DATA								SUNSPOT DATA										9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT FLUX			
69	10	28	10399	N20 E85	312	2500	2.0												
69	10	29	10399	N18 E72	312	1000	2.5												
69	10	30	10399	N20 E58	313	2500	3.0	17559	N20 E55	313	(AF)	2	0	1	J	13 6			
69	10	31	10399	N18 E44	313	1800	3.0	17559	N20 E43	313	(B)	3	50	3	D	48 22			
69	11	1	10399	N00 E00	0	0	0.0	17559	N19 E26	314	(B)	3	0	0	0				
69	11	2	10399	N17 E17	311	3300	3.5	17559	N20 E14	313	(B)	3	70	7	D	11 5			
69	11	3	10399	N00 E00	0	0	0.0	17559	N19 E01	312	(AF)	3	40	9	D	14 7			
69	11	4	10399	N00 E00	0	0	0.0	17559	N19 W11	312	(BF)	3	30	8	D	13 6			
69	11	5	10399	N19 W21	310	2400	3.0	17559	N20 W25	312	(BF)	3	40	12	D	12 6			
69	11	6	10399	N19 W35	312	2400	3.5						10	6	D				
69	11												0	1	A				
69	11	7	10399	N18 W48	311	2800	3.5												
69	11	9	10399	N00 E00	0	0	0.0									9 4			

MCMATH REGION 10406 CMP DATE 7.6 RETURN OF REGION 10358 & 10364 ROTATION 2 & 3

CALCIUM PLAGE DATA								SUNSPOT DATA										9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT FLUX			
69	11	1	10406	N00 E00	0	0	0.0	17562	N12 E79	261	(AF)	3	0	0	0				
69	11	2	10406	N14 E75	253	2300	3.5	17562	N12 E66	261	(AP)	3	70	1	G	12 6			
69	11	3	10406	N00 E00	0	0	0.0	17562	N12 E52	261	(AP)	3	80	2	G	9 4			
69	11												0	1	A				
69	11	4	10406	N00 E00	0	0	0.0	17562	N11 E39	262	(AP)	3	20	3	G	22 10			
69	11							17568	N08 E40	261	(AF)	1	0	0	0				
69	11							17569	N14 E54	247	(BP)	2	0	4	A				
69	11	5	10406	N14 E26	263	2600	3.0	17562	N10 E26	261	(BP)	3	20	2	G				
69	11	6	10406	N14 E13	264	2300	3.0						30	5	C				
69	11	7	10406	N15 E08	255	3000	2.5						20	10	C	11 5			
69	11												0	4	A				
69	11	8	10406	N00 E00	0	0	0.0	17562	N09 W12	259	(BP)	2	10	7	C	9 5			
69	11							17575	N11 W02	249	(AP)	1	0	0	0				
69	11	9	10406	N00 E00	0	0	0.0						10	9	C	9 5			
69	11	10	10406	N00 E00	0	0	0.0						20	12	D	11 5			
69	11	11	10406	N13 W44	255	2300	2.5									14 7			
69	11	12	10406	N13 W59	255	2500	2.5									14 7			
69	11	13	10406	N12 W72	256	1500	2.0									8 4			

MCMATH REGION 10411

CMP DATE 10.6

				CALCIUM			PLAGE	DATA						SUNSPOT			DATA						9.1 CM	
YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT	MW NO.	LAT	CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX					
69	11	4	10411	N00	E00	0	0	0.0	17570	N07	E77	224	(D)	3	0	0	0							
69	11	5	10411	N08	E64	225	2000	3.0	17570	N07	E62	225	(BP)	2	40	11	D							
69	11	6	10411	N09	E54	223	2000	3.5							40	5	D							
69	11	7	10411	N08	E40	223	2200	3.5							60	13	D							
69	11	8	10411	N00	E00	0	0	0.0	17570	N07	E24	223	(BF)	2	10	7	C							
69	11	9	10411	N00	E00	0	0	0.0							10	9	C							
69	11	10	10411	N00	E00	0	0	0.0							10	6	C							
69	11	11	10411	N08	W13	224	2200	3.0	17581	N14	W22	231	(AP)	1	0	5	A							
69	11								17580	N17	W23	232	(B)	1	0	0	0							
69	11								17570	N07	W17	226	(AP)	1	0	2	A							
69	11	12	10411	N08	W27	223	2100	3.0	17570	N07	W29	225	(B)	1	0	1	A							
69	11	13	10411	N08	W42	226	2200	2.5	17580	N19	W51	232	(AF)	2	0	0	0							
69	11								17581	N15	W50	231	(AP)	3	0	8	A							
69	11	14	10411	N08	W56	227	2500	3.0	17570	N08	W48	229	(AP)	2	0	4	B							
69	11								17580	N18	W64	232	(AF)	5	480	12	D							
69	11	15	10411	N10	W69	227	1800	3.0	17581	N15	W64	232	(AP)	4	0	3	B							
69	11	16	10411	N09	W83	227	1200	3.0							270	10	D							

MCMATH REGION 10412

CMP DATE 11.1

				CALCIUM			PLAGE		DATA						SUNSPOT			DATA					9.1 CM	
YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT	MW NO.	LAT	CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX					
69	11	3	10412	N00	E00	0	0	0.0	17566	N22	E86	227		0	0	0	0							
69	11	4	10412	N00	E00	0	0	0.0	17566	N22	E72	229	(AP)	4	0	0	0							
69	11	5	10412	N23	E68	221	6500	3.5	17566	N22	E59	228	(BP)	5	360	5	G	36	18					
69	11								17573	N20	E70	217	(B)	3	20	8	C							
69	11	6	10412	N23	E59	218	5000	3.5							340	2	G							
69	11														150	16	D							
69	11	7	10412	N23	E46	217	5500	3.5							410	22	D	49	24					
69	11														310	19	D							
69	11	8	10412	N00	E00	0	0	0.0	17566	N22	E21	226	(AP)	5	460	28	D	37	18					
69	11								17573	N20	E30	217	(BP)	4	60	14	D							
69	11	9	10412	N00	E00	0	0	0.0							450	19	D	21	10					
69	11														60	14	D							
69	11	10	10412	N00	E00	0	0	0.0							350	22	D	20	10					
69	11														40	13	D							
69	11	11	10412	N23	W07	218	5000	3.0	17566	N22	W18	227	(AP)	5	260	8	G	19	10					
69	11								17573	N21	W09	218	(BP)	2	160	12	D							
69	11	12	10412	N23	W23	219	5800	3.0	17566	N22	W31	227	(AP)	4	240	4	G	20	10					
69	11								17573	N21	W20	216	(BP)	3	80	4	C							
69	11	13	10412	N23	W35	219	5600	3.0	17566	N22	W46	227	(AP)	4	80	4	G	16	8					
69	11								17573	N22	W41	222	(AP)	4	150	3	G							
69	11	14	10412	N23	W48	219	5800	3.5	17566	N22	W61	229	(AP)	4	90	4	G							
69	11								17573	N23	W55	223	(AP)	4	110	2	G	26	13					
69	11	15	10412	N23	W62	220	5700	3.5							110	1	G	31	15					
69	11														90	1	G							
69	11	16	10412	N22	W75	219	4100	3.0	17566	N22	W87	231		0	30	1	G	13	7					
69	11								17573	N23	W80	224		0	50	1	G	6	3					
69	11	17	10412	N00	E00	0	0	0.0																

MCMATH REGION 10429

CMP DATE 13.4

CALCIUM PLAGE DATA								SUNSPOT DATA								9.1 CM			
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX		
69	11	13	10429	S22 W03	187	200	2.5												
69	11	14	10429	S22 W16	187	100	2.0												
69	11	15	10429	S21 W29	187	100	1.5												
69	11	16	10429	S20 W43	187	700	3.0	17585	S21 W43	187		0	20	14	C	5	2		
69	11	17	10429	N00 E00	0	0	0.0	17585	S23 W60	190	(BP)	3	30	3	C	5	2		
69	11	18	10429	N00 E00	0	0	0.0	17585	S24 W79	196	(AP)	3	0	0	0				

Pic du Midi Coronal Data
Associated with McMath Region 10385

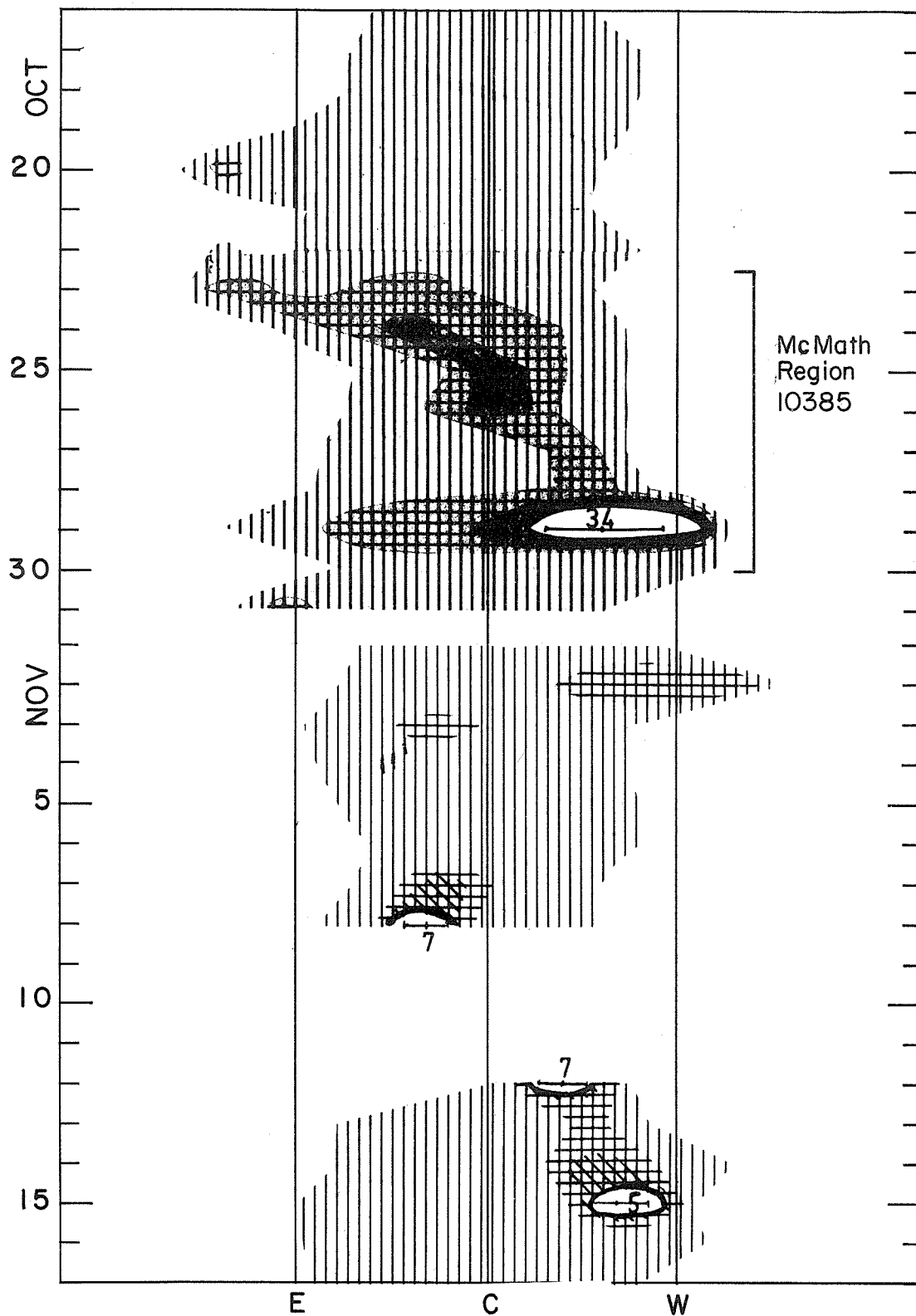
1969	From Astronomical North						Time of Meas. UT
	260°	265°	270°	275°	280°	285°	
	Green line	$\lambda 5303\text{\AA}$					
Oct 30	98	96	88	65	70	68	1252
31	145	95	138	159	120	114	0818
Nov 1	118	82	70	133	105	111	0815
2	122	90	82	71	66	72	0842
3	78	72	83	54	90	104	0823
4	52	44	35	58	40	51	1411
	Red line	$\lambda 6374\text{\AA}$					
Oct 30	10	11	15	38	26	14	1346
31	20	25	46	62	30	32	1212
Nov 1	34	20	26	32	27	21	1201
2	49	21	40	30	28	23	1223
3	22	25	22	33	41	48	1146
4	13	11	8	10	32	26	1457

SOLAR RADIO EMISSION INTERFEROMETRIC OBSERVATION

October-November 1969

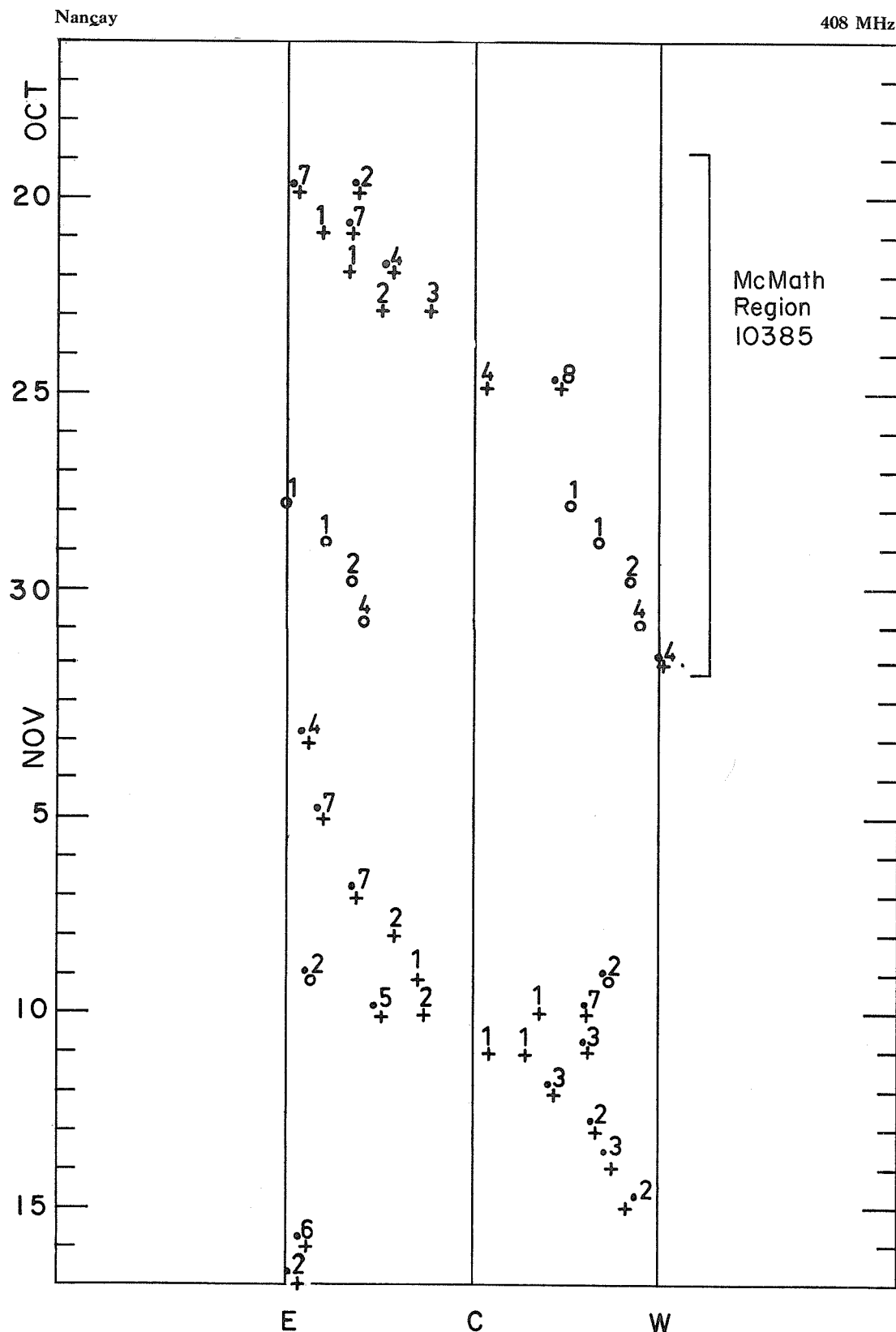
Nangay

169 MHz



SOLAR RADIO EMISSION INTERFEROMETRIC OBSERVATION

October-November 1969



Because of the distance between the main lobes there is sometimes an ambiguity about the position East or West of the Center of Activity. The two possible positions are indicated by circles on the chart.

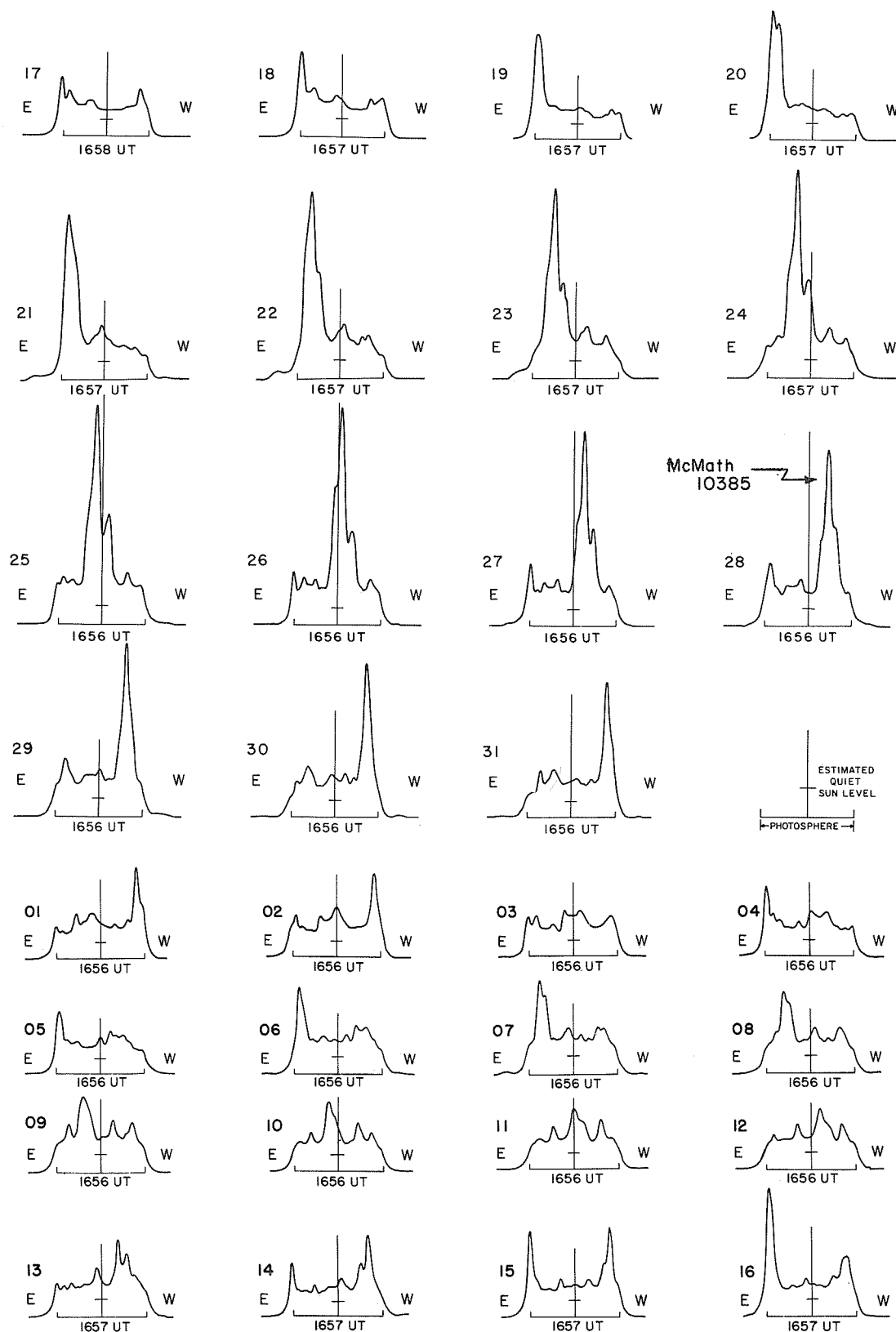
ALGONQUIN RADIO OBSERVATORY
CANADA

EAST-WEST SOLAR SCANS

October-November 1969

10.7 cm

Fan-Beam with 1.5 minutes of arc
E-W Resolution

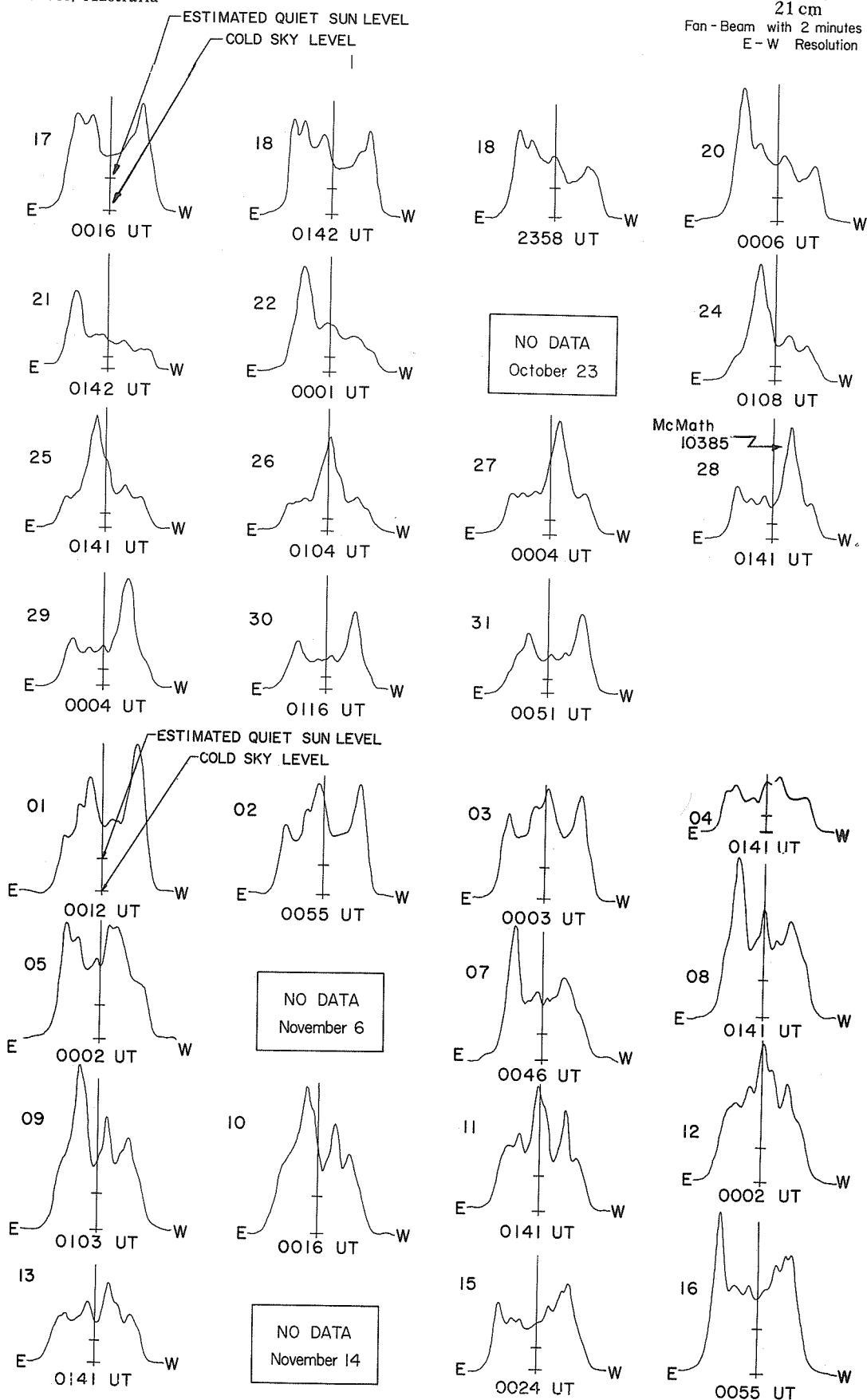


EAST-WEST SOLAR SCANS

October-November 1969

Fleurs, Australia

21 cm
Fan-Beam with 2 minutes of arc
E-W Resolution



EAST-WEST SOLAR SCANS

October–November 1969

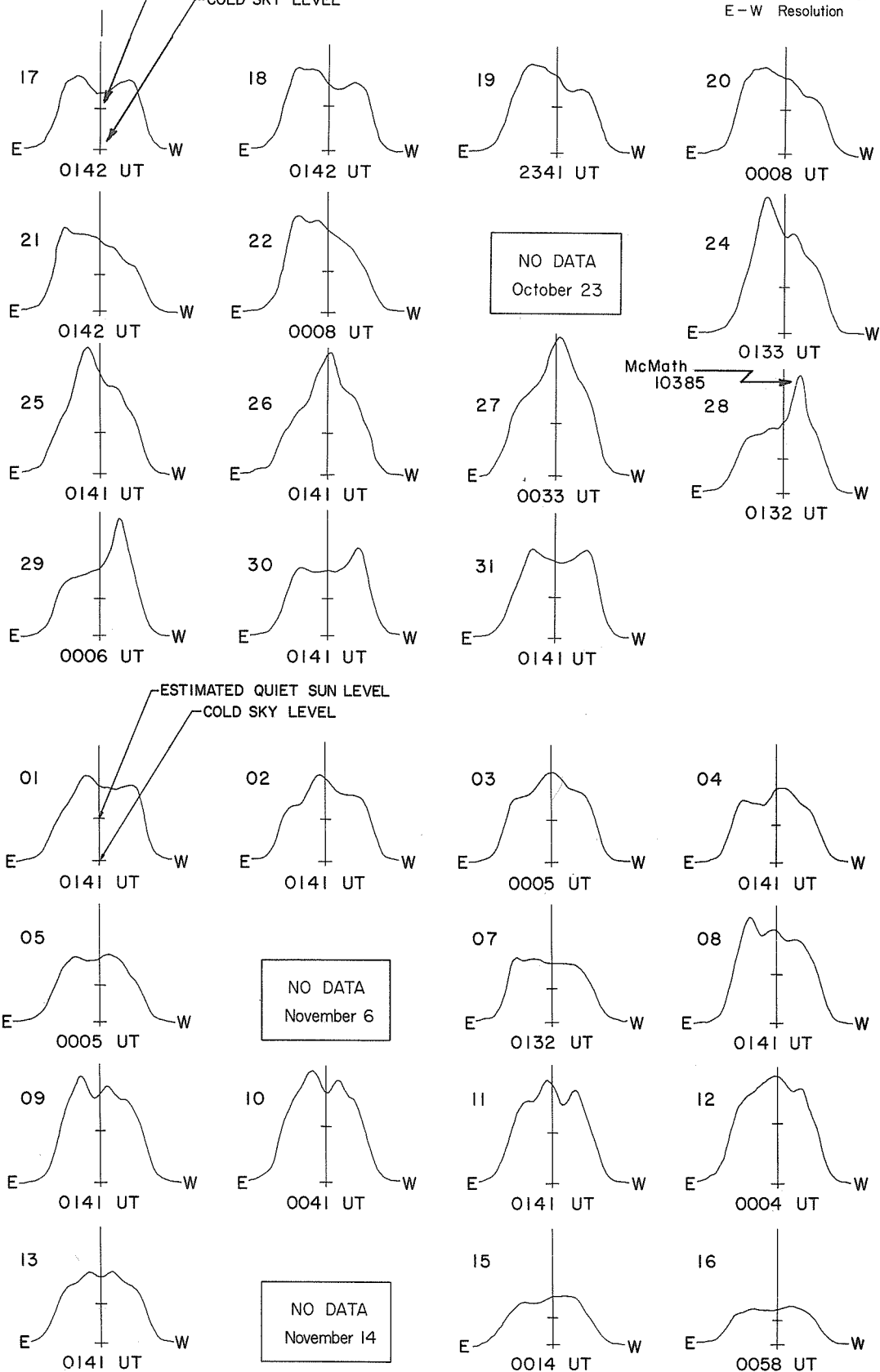
Flours, Australia

ESTIMATED QUIET SUN LEVEL

COLD SKY LEVEL

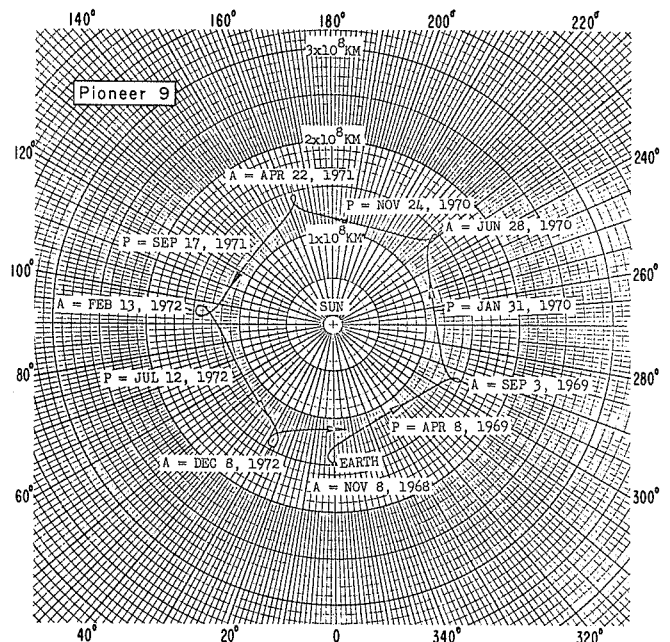
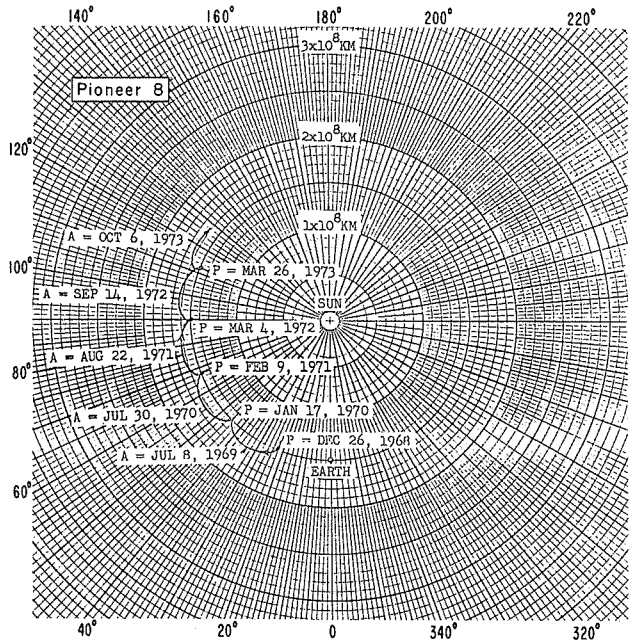
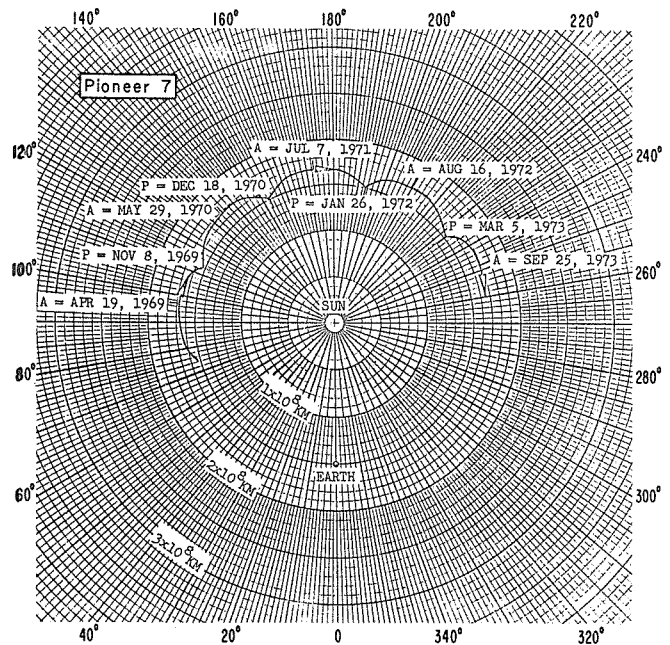
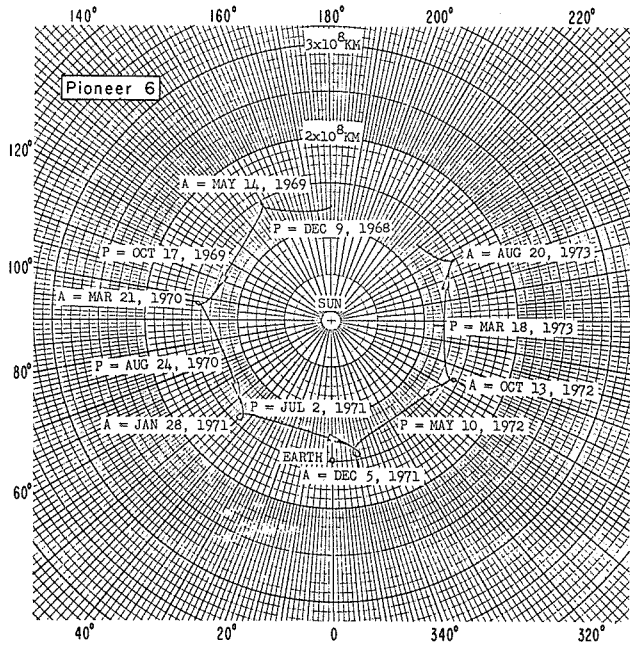
43 cm

Fan-Beam with 4 minutes of arc
E-W Resolution



LOCATION OF PIONEER SPACECRAFTS

A = APHELION
P = PERIHELION



SOLAR WIND VELOCITY and CO-ROTATION DELAY TIMES

NOVEMBER 1969

NASA Ames Research Center

DATE NOV 1969	PIONEER VI				PIONEER VII			
	Time (Z)	Pass	U_H^+	TAU	Time (Z)	Pass	U_H^+	TAU
1	G2108	1417	401.4	-9.48	G2031	1173	401.5	8.58
2	G2131	1418	321.8	-9.72	G2231	1174	374.3	8.59
3								
4	G1720	1420	360.1	-9.49	G1741	1176	358.2	8.60
5	G2048	1421	282.2	-9.61	G2148	1177	373.6	8.58
6	G2048	1422	290.3	-9.67	G2148	1178	286.8	8.65
7	G2111	1423	368.1	-9.34	G2348	1179	321.5	8.61
8	G2048	1424	443.3	-9.14	G2148	1180	395.2	8.55
9	G2048	1425	470.3	-9.05	G2147	1181	418.6	8.54
10								
11	G1954	1427	437.5	-9.04	G2205	1183	467.9	8.51
12	G1755	1428	360.0	-9.20	G1828	1184	410.0	8.50
13	G1951	1429	337.0	-9.21	G2030	1185	329.8	8.56

SOLAR WIND NOVEMBER 1969

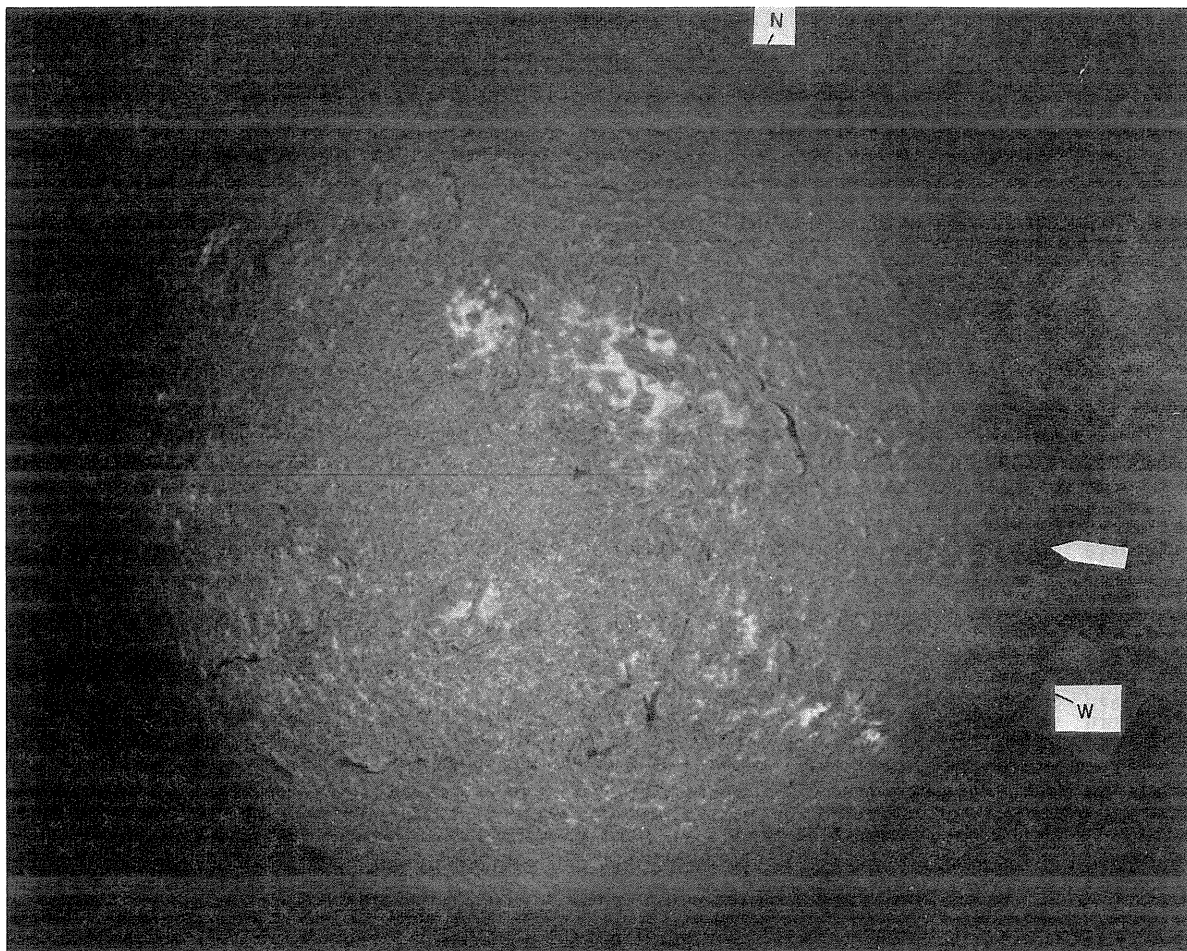
Massachusetts Institute of Technology

PIONEER VI					PIONEER VI				
DATE Nov. 1969	Wind Speed (Up) (km/sec) σ	Number Density (Np) (protons/cm ³) σ	Day of Predicted Earth Arrival		DATE Nov. 1969	Wind Speed (Up) (km/sec) σ	Number Density (Np) (protons/cm ³) σ	Day of Predicted Earth Arrival	
1.7	397 2	6.5 1.5	11.0		12.7	359 0	7.1 0.7	21.8	
1.8	410 9	10.4 1.2	11.1		12.8	358 5	7.9 0.4	21.9	
1.9	394 4	6.7 1.8	11.3		12.9	361 4	8.4 0.4	22.0	
2.7	410 15	7.8 4.3	12.0		13.7	353 22	5.0 0.3	22.7	
2.8	387 23	4.9 0.4	12.1		13.8	336 5	5.1 0.3	22.9	
2.9	363 10	4.9 0.4	12.3		13.9	336 10	5.3 0.5	23.0	
4.7	381 5	7.9 1.0	14.0		21.7	400 11	8.8 0.1	30.4	
4.8	368 5	10.2 1.1	14.1		21.8	400 12	8.9 0.4	30.5	
4.9	377 14	10.6 1.3	14.2		21.9	397 7	8.4 0.3	30.6	
5.0	375 2	11.0 1.3	14.3		22.0	405 --	8.5 --	30.7	
5.7	318 23	1.9 0.6	15.1		23.7	374 --	4.7 --	Dec. 2.4	
5.8	287 9	1.4 0.3	15.3		23.8	362 1	5.8 0.2	2.5	
5.9	277 2	2.0 0.3	15.4		23.9	361 2	5.9 0.2	2.6	
6.0	292 20	2.0 0.3	15.4		25.7	392 6	12.4 1.4	4.3	
6.7	276 1	3.1 0.7	16.2		25.8	411 31	14.3 2.4	4.4	
6.8	278 3	4.3 1.4	16.3		25.9	405 7	15.2 1.7	4.5	
6.9	283 3	1.4 0.1	16.4		26.0	424 36	12.7 0.9	4.5	
7.0	279 5	6.3 1.0	16.5		26.7	434 9	11.9 0.5	5.2	
7.7	381 8	5.7 1.9	16.9		26.8	430 7	15.5 0.9	5.3	
7.8	387 13	8.2 2.4	17.0		26.9	439 26	15.4 1.3	5.4	
7.9	374 11	13.7 1.0	17.1		27.7	547 16	4.2 0.2	6.1	
8.0	393 2	19.1 3.3	17.1		27.8	575 16	4.5 0.3	6.1	
8.7	465 8	5.4 0.7	17.7		27.9	560 14	4.2 0.2	6.2	
8.8	466 7	6.8 0.7	17.8		28.7	492 8	5.4 0.1	7.1	
8.9	444 22	6.5 0.5	17.9		28.8	478 4	5.5 0.7	7.2	
9.0	452 15	6.7 0.5	18		28.9	477 7	5.8 0.6	7.3	
9.7	489 6	5.0 0.1	18.6		29.0	480 2	7.8 2.3	7.4	
9.8	470 4	5.7 0.2	18.8		29.7	466 2	13.9 0.4	8.1	
9.9	434 11	5.1 0.2	18.9		29.8	463 8	13.9 0.4	8.2	
10.0	458 17	4.9 0.1	19.0		29.9	851 133	19.4 9.0	8.0	
11.7	454 6	4.2 0.2	20.6		30.0	815 60	14.9 7.1	8.1	
11.8	451 7	4.6 0.2	20.7		30.8	725 17	1.1 0.0	9.0	
					30.9	690 15	1.0 0.2	9.1	

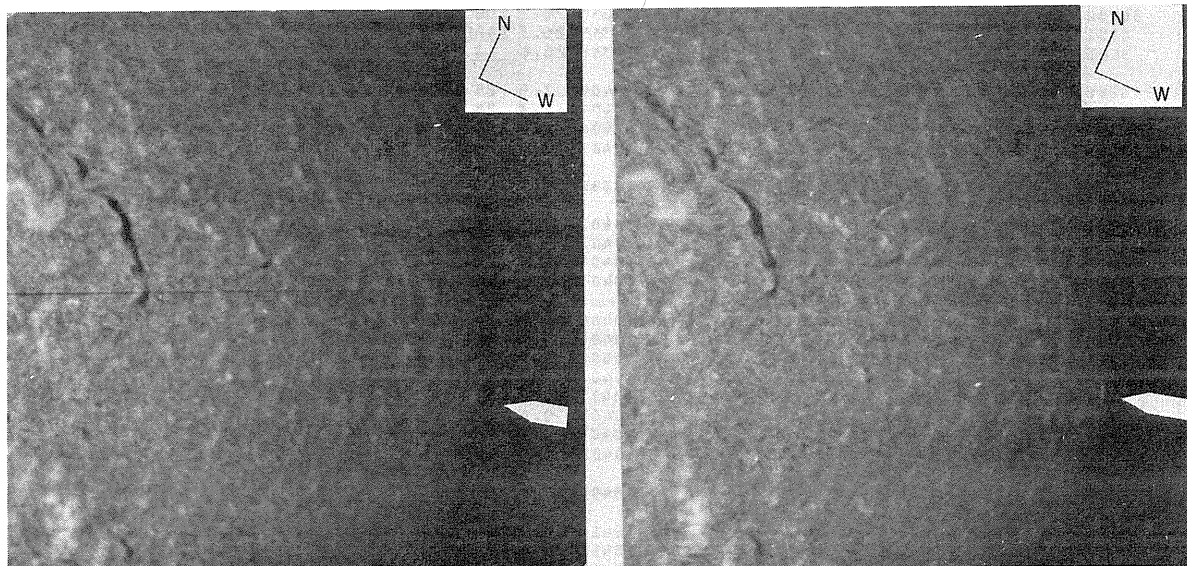
SOLAR WIND
VELA 3, 4 & 5

NOVEMBER 1969

Date NOV 1969	UT	Spacecraft	Velocity V_{H^+} (km/sec)	Density N_{H^+} (cm ⁻³)
07	0200	VELA-5	315	--
09	1900	3	541	--
	2200	3	646	--
10	1230	5	637	--
	1300	5	637	--
	1700	5	637	--
	1800	5	606	4.0
	2200	5	520	1.8
11	2300	5	495	--
16	2200	5	300	--
	1600	5	259	--
20	0000	5	348	3.2
	0500	5	365	2.2
	0800	5	331	2.7
	1700	5	384	--
	1800	5	348	--
25	0200	5	365	--
	0500	5	404	--
29	0400	5	446	--
	0600	5	404	--
	0700	5	470	--



The arrow shows the visible portion of the flare at N15 west limb at 0957 UT (time of maximum), November 2, 1969. The major portion of the flare occurred beyond the limb, in McMath region 10385 (NASA/NOAA SPAN Observatory at Canary Islands).



The enlarged image shows the first evidence of the flare at 0939 UT, accompanied by an ejection off the limb.

An enlarged image at time of maximum, 0957 UT.

SOLAR FLARES Confirmed

NOVEMBER 1969

OBSERVATORY	OBSERVED UT				LOCATION					DURATION MIN.	IM- POR- TANCE	OBS. COND. TYPE	MEASUREMENTS					REMARKS
	DATE	START	END	MAX. PHASE	APPROX.		CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY				TIME UT	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hq	MAX. INT. %	
					LAT.	MER. DIST.												
	1969 NOV																	
GRP26266	01	0007	0049	0016	N10	W87	.998	10385	25.5	42	1N		.67				3 3 3 5	
CRON	01	0007	0030	0010	N09	W80	.983	10385	26.0	23	1N	C	.83	2.60				
CULG	01	0007	0049	0016	N10	W87	.998	10385	25.5	42	1N	C	.67					
VORG	01	0012	0026	0016	N04	W87	.998	10385	25.5	14	1F	C	.84	5.60		57	E	
GRP26271	01	1500	1519	1505	N07	W90	1.000	10385	25.9	19	-N		.73				4 4 4 7	
MEUD	01	1459	1504D		N08	W90	1.000	10385	25.9	50	-N	C	.52					
HTPR	01	1500	1520	1503	N05	W90	1.000	10385	25.9	20	-N	C	.83				A	
CAPE	01	1500	1520	1505	N07	W90	1.000	10385	25.9	20	-N	C	.88					
CANR	01	1501	1518	1506	N08	W90	1.000	10385	25.9	17	1N	C	.70	2.80				
272 PALE	01	1738	1754	1741	N11	E85	.995	10406	8.1	16	--F	C	.21				3	
GRP26273	01	2139	2200	2148	S06	W20	.383	10394	31.4	21	--F		.52				2 2 1 5	
PALE	01	2139	2200	2148	S05	W21	.391	10394	31.3	21	-N	C	.52					
BOUL	01	2145E	2147D		S07	W18	.363	10394	31.6	20	-F	S						
GRP26274	01	2319	2342	2326	N22	E03	.306	10397	2.2	23	-N		1.06				3 3 3 5	
SACP	01	2318	2341	2324	N22	E03	.306	10397	2.2	23	-N	C	1.11	1.10			F	
CRON	01	2320	2345	2328	N22	E05	.313	10397	2.3	25	-F	C	1.55	1.60			D	
MITK	01	2323E	2340		N23	E02	.321	10397	2.1	17D	-N	C	.52	.60				
GRP26275	02	0022	0049	0033	N25	E04	.359	10397	2.3	27	--F		1.60				2 2 2 4	
CULG	02	0008	0105	0031	N26	E05	.378	10397	2.4	57	1N	C	2.89	3.08			RLS	
CRON	02	0015	0045	0016	N25	E01	.354	10397	2.1	30	-F	C	1.13	1.20				
MANI	02	0029	0053	0035	N24	E04	.343	10397	2.3	24	-F	2	.31	.32				
GRP26277	02	0430	0456	0441	S04	W26	.458	10394	31.2	26	-F		1.19				2 2 2 5	
CULG	02	0424	0459	0442	S03	W27	.469	10394	31.2	35	1N	C	1.86	2.07				
MANI	02	0436	0452	0440	S05	W25	.449	10394	31.3	16	-F	2	.52	.58				
GRP26278	02	0513	0533	0518	N12	E79	.979	10406	8.1	20	1F		1.08				2 2 2 5	
CRON	02	0512	0530	0515	N11	E80	.983	10406	8.2	18	1F	C	1.44	4.20			H	
MITK	02	0514	0535	0520	N13	E77	.972	10406	8.0	21	1N	C	.72				EH	
6 STATIONS REPORTING GROUP 26280. 6 STATIONS OBSERVING AND NOT REPORTING.																		
GRP26280	02	1102	1220	1138	N16	W90	1.000	10385	26.7	78	1B		.97				4 3 1 11	
KODA	02	1028	1157D	1139	N22	W90	1.000	10385	26.7	89D	3B	P	1139		4.96		C	
CAPE	02	1102	1220	1137	N13	W90	1.000	10385	26.7	78	-N	C	1137		.97		AK	
CAPE	02	1102	1220	1146	N12	W90	1.000	10385	26.7	78	-N		1146		.88			
CAPP	02	1103E	1130D		N14	W87	.998	10385	26.9	27D	1N	P	1106		.62		AH	
HURB	02	1108E	1201D		N15	W90	1.000	10385	26.7	53D	1B				7.30		A	
26280	02	0939	1125	0939	N15	W90	1.000	10385	26.7	106	*1F		1.07				2 1 1 14	
ABST	02	0939E	1125D	0939	N15	W90	1.000	10385	26.7	106D	1F	P	0939		1.07		A	
MONT	02	0955	1008	0959	N14	W88	.999	10385	26.8	13	-N	C	0959		1.13			
GRP26286	02	1245	1310	1253	N15	E71	.943	10406	7.9	25	--F		.67				3 3 2 9	
HTPR	02	1240	1308	1253	N14	E70	.937	10406	7.8	28	-F	C	.62					
HURB	02	1249	1305		N14	E72	.948	10406	7.9	16	1F				2.20			
CAPS	02	1250E	1317		N16	E70	.937	10406	7.8	27D	-N	3	.72			160		
288 PALE	02	1749	1804	1752	N17	W07	.249	10397	2.2	15	--F	C	.17				3	
GRP26291	03	0840	0849	0842	N16	E28	.499	10403	5.5	9	--B		.56				3 3 3 11	
BUCA	03	0840	0849	0842	N16	E29	.513	10403	5.5	9	-B	C	.55	.60			CD	
CATA	03	0840	0847	0840	N16	E28	.499	10403	5.5	7	-B		.23	.27		380		
ABST	03	0840E	0850D	0843	N15	E28	.494	10403	5.5	100	-N	P	0843		1.03		D	
GRP26292	03	0846	0914	0856	N12	E78	.976	10406	9.2	28	-N		.41				7 7 4 12	
CANR	03	0845	0900D	0853	N10	E85	.995	10406	9.7	15D	1B	C	1.00	3.30				
CATA	03	0845	0920	0900	N12	E77	.972	10406	9.1	35	-B		.52					
CRON	03	0845	0909D	0851	N10	E80	.983	10406	9.4	24D	-N	C	.41	1.30				
HTPR	03	0846E	0917		N11	E85	.995	10406	9.7	31D	-N	C	.83					
CAPS	03	0846	0920		N13	E80	.983	10406	9.4	34	-N	V	.26			180	H	
BUCA	03	0849	0915D		N13	E80	.983	10406	9.4	26D	-F	C	.43				C	
HURB	03	0853E	0904		N12	E72	.949	10406	8.8	11D	1N				2.00			
295 PALE	03	1820	1919	1911	S16	W77	.981	10400	29.0	59	-N	C	.41				3	
GRP26297	03	2112	2133	2116	N19	E83	.990	10412	10.1	21	-N		.72				3 3 2 3	
CULG	03	2110E	2145	2117	N18	E83	.990	10412	10.1	35D	1N	P	2117		1.03		RF	
SACP	03	2111	2124	2114	N22	E85	.994	10412	10.3	13	-N	C	.40				L	
BOUL	03	2115	2130	2117	N18	E80	.982	10412	9.9	15	-N	V						
GRP26299	03	2321	2338	2327	S16	W80	.989	10400	29.0	17	-N		.77				2 2 2 3	
CULG	03	2321	2339	2327	S15	W80	.989	10400	29.0	18	1N	C	.62					
SACP	03	2321	2336	2327	S16	W79	.987	10400	29.0	15	-N	C	.92					

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION MIN.	IM-POR-TANCE	OBS. COND. TYPE	MEASUREMENTS					REMARKS
	DATE	START	END	MAX. PHASE	APPROX. LAT.	MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY				TIME UT	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH H α	MAX. INT. %	
300 VORO	1969 NOV 04	0029	0041	0032	S18	W84	.997	10400	28.7	12	1F	C	0032	.93	4.50		62	DJ 2
GRP26303	04	0406	0426	0410	N22	E79	.979	10412	10.1	20	1B	C		1.55				1 1 1 5
CRON	04	0406	0421	0410	N22	E80	.982	10412	10.2	15	1B	C		1.55	4.50			I
CULG	04	0406	0426	0411	N23	E78	.976	10412	10.0	20	1N	C	0411	1.44				
GRP26304	04	0412	0430	0414	N08	E89	1.000	10411	10.9	18	1N	C		.83				2 2 1 4
CULG	04	0407	0435	0420	N08	E86	.997	10411	10.6	28	1B	C	0420	.72				RT
CRON	04	0410	0435	0414	N07	E90	1.000	10411	10.9	25	1B	C		.83	3.20			I
STBE	04	0413	0424		N09	E90	1.000	10411	10.9	11	1F	V						H
306 CRON	04	0444	0510	0448	N19	E80	.982	10412	10.2	26	-N	C		.62	1.80			I 4
306 CULG	04	0436	0527	0504	N21	E80	.982	10412	10.2	51	*1N	C	0504	1.44				4
GRP26308	04	0812	0824	0816	N09	E87	.998	10411	10.9	12	-N			.55				3 3 3 9
CRON	04	0811	0822	0815	N07	E90	1.000	10411	11.1	11	-N	C		.31	1.20			I
HTPR	04	0813	0825	0817	N09	E85	.995	10411	10.7	12	-B	C	0817	.62				
CAPS	04	0815E	0824D		N11	E85	.995	10411	10.7	9D	-N	V	0818	.72			160	
GRP26312	04	0939	0952	0941	N08	E87	.998	10411	10.9	13	-N			.64				4 3 3 10
MONT	04	0938	0946	0941	N08	E87	.998	10411	10.9	8	-N	C	0941	.77				
UCCL	04	0939	0944	0939	N07	E90	1.000	10411	11.2	5	-B	C	0939	.52				AD
ABST	04	0940	0950	0943	N10	E89	1.000	10411	11.1	10	1N	C	0943	.90				A
HTPR	04	0940	1007	0942	N08	E85	.995	10411	10.8	27	-N	C	0942	.62				
GRP26313	04	0945	1005	0958	N08	E84	.994	10411	10.7	20	-N			.65				3 3 2 9
HTPR	04	0940	1007	1000	N08	E85	.995	10411	10.8	27	-N							
MONT	04	0949	1002	0958	N08	E87	.998	10411	10.9	13	-N	C	0958	1.13			214	
CATA	04	0957E	1005D	0957	N08	E80	.983	10411	10.4	8D	-B		0957	.17				
GRP26317	04	1334	1355	1339	N08	E80	.983	10411	10.6	21	-N			.47				4 4 4 8
CANR	04	1330E	1405	1335U	N06	E85	.996	10411	10.9	35D	-N	C		.50	1.70			H
ZURI	04	1332	1350	1338	N08	E79	.980	10411	10.5	18	-N	C	1338	.55				
SACP	04	1335	1352	1341U	N09	E76	.968	10411	10.3	17	-N	C		.42	.96			F
HTPR	04	1338	1353	1340	N10	E81	.986	10411	10.6	15	-F	C	1340	.41				
GRP26320	04	1514	1534	1517	N24	E73	.955	10412	10.1	20	1B			1.11				7 7 6 7
HOUT	04	1513	1520	1515	N23	E71	.945	10412	10.0	7	1B	C		1.90	4.80			H
SACP	04	1514	1546	1516	N25	E71	.946	10412	10.0	32	-B	C		.80	1.58			EF
BOUL	04	1514	1544	1516	N26	E78	.976	10412	10.9	30	1N	V						
ZURI	04	1514	1522D	1516	N24	E71	.945	10412	10.0	8D	-N	C	1516	.69				
HUAN	04	1514	1535		N25	E72	.951	10412	10.0	21	-F	2	C	1516	.31			E
CANR	04	1515	1533	1518	N24	E73	.955	10412	10.1	18	1B	C		1.50	3.80			
HTPR	04	1515	1538	1518	N24	E78	.976	10412	10.5	23	1B	C	1518	1.44				
GRP26321	04	1554	1625	1559	N08	E79	.980	10411	10.6	31	--N			.32				4 4 3 5
BOUL	04	1552	1630	1557	N07	E73	.955	10411	10.1	38	-N	V						
HUAN	04	1552	1630		N07	E84	.994	10411	11.0	38	-F	2	C	1556	.25			D
CANR	04	1555	1620	1601	N08	E80	.983	10411	10.7	25	-B	C		.40	1.20			D
SACP	04	1555	1618	1558	N08	E77	.973	10411	10.4	23	-B	C		.30	.72			
GPP26325	04	2017	2040	2027	N07	E76	.969	10411	10.5	23	1B			1.35				6 6 5 6
PALE	04	2012	2033	2025	N08	E76	.969	10411	10.5	21	1B	C		.89				
HUAN	04	2014E	2036D	2028	N07	E77	.973	10411	10.6	22D	-N	2	P	2028	.50			E
CULG	04	2015	2048	2027	N06	E76	.969	10411	10.5	33	1B	C	2027	1.86				
BOUL	04	2016E	2039	2028	N07	E75	.964	10411	10.5	23D	1B	V						
SACP	04	2018	2040	2026	N07	E74	.960	10411	10.4	22	1B	C		1.40	2.98			EF
HOUT	04	2024	2045	2029	N05	E78	.977	10411	10.7	21	2N	C		2.10	5.70			
GPP26326	04	2120	2210	2132	N07	E75	.964	10411	10.5	50	1B			2.27				6 6 5 6
BOUL	04	2116	2204D	2140	N06	E70	.938	10411	10.1	48D	2N	S						
HUAN	04	2117	2130D	2127	N07	E75	.964	10411	10.5	13D	-B	2	P	2127	.75			D
CULG	04	2118	2225	2130	N07	E76	.969	10411	10.6	67	2B	C	2130	3.30				FR
SACP	04	2123	2300	2129	N08	E75	.964	10411	10.5	97	1B	C		1.21	2.64			DH
HOUT	04	2125	2200	2135	N04	E75	.965	10411	10.5	35	3B	C		5.80	15.10			H
PALE	04	2128E	2142	2129	N09	E76	.968	10411	10.6	14D	-B	C		.29				
GRP26327	05	0332	0350	0336	N07	E76	.969	10411	10.8	18	1B			7.16				3 2 2 4
MANI	05	0331	0415	0335	N09	E79	.980	10411	11.1	44	1N	3		1.55	3.90			
CRON	05	0332	0353	0335	N05	E78	.977	10411	11.0	21	1B	C	0335	1.86	5.00			HI
KODA	05	0335E	0347	0336	N08	E74	.959	10411	10.7	12D	2N	P	0340	12.45	12.40	2.00		CI
328 CRON	05	0509	0530	0516	N23	E65	.910	10412	10.1	21	-N	C		.72	1.50			2
329 CRON	05	0539	0547	0544	N05	E70	.938	10411	10.5	8	-N	C		.52	1.10			I 3

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OBSERV- ATORY	OBSERVED UT				LOCATION					DURA- TION MIN.	IM- POR- TANCE	OBS. COND. TYPE	MEASUREMENTS					REMARKS
	DATE	START	END	MAX. PHASE	APPROX.		CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY				TIME UT	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH H _g	MAX. INT. %	
					LAT.	MER. DIST.												
	1969 NOV																	
GRP26332	05	0718	0741	0724	N07	E72	.949	10411	10.7	23	-N		.62				4 4 4 8	
ABST	05	0713E	0740	0722	N07	E72	.949	10411	10.7	27D	1F	C	0722	.90		55	D	
CRON	05	0718	0739	0723	N05	E70	.938	10411	10.6	21	-N	C		.52	1.10		I	
CATA	05	0722	0735	0727	N07	E69	.932	10411	10.5	13	-B		0727	.52		206		
MANI	05	0725E	0748		N08	E76	.969	10411	11.0	23D	-F	3	0728	.52	1.22			
GRP26335	05	0811	0834	0818	N25	E65	.911	10412	10.2	23	1N		1.04				9 9 8 12	
CRON	05	0808	0830	0810	N23	E65	.910	10412	10.2	22	-N	C		.72	1.50			
ISTA	05	0808	0836	0820	N26	E68	.930	10412	10.4	28	1N							
BUCA	05	0810	0834	0820	N26	E61	.885	10412	9.9	24	-B	C	0820	.88	1.90		C	
CATA	05	0810	0837	0822	N24	E64	.904	10412	10.1	27	1B		0822	1.04	2.47	288	E	
ABST	05	0811	0830	0819	N24	E65	.911	10412	10.2	19	1N	C	0819	1.79	4.10	61	E	
CRIM	05	0813	0831	0817	N26	E62	.892	10412	10.0	18	1F	C	0817	.90	2.20		D	
UCCL	05	0814E	0838	0821	N22	E69	.934	10412	10.5	24D	1N	P	0821	1.29			E	
CANR	05	0815	0833	0817U	N26	E64	.906	10412	10.1	18	-N	C		.90	1.90			
MANI	05	0816E	0837	0819	N25	E68	.930	10412	10.4	21D	-N	3	0819	.83	1.71			
GRP26337	05	0853	0908	0857	N07	E73	.955	10411	10.8	15	-N		.67				3 3 3 10	
CANR	05	0852	0904D	0856	N09	E74	.959	10411	10.9	12D	-N	C		.50	1.30			
CRON	05	0852	0904	0854	N05	E75	.965	10411	11.0	12	-N	C		.52	1.40			
ABST	05	0854	0915D	0901	N07	E71	.944	10411	10.7	21D	1F	P	0901	.99			F	
338 UCCL	05	1005	1012	1007	N07	E80	.984	10412	11.4	7	-N	C	1007	.77			E 7	
GRP26339	05	1005	1029	1008	N07	E68	.925	10411	10.5	24	-N		.56				5 5 5 7	
ABST	05	1004	1050	1007	N07	E70	.938	10411	10.7	46	1F	C	1007	.99		48	E	
CAPS	05	1005	1013		N08	E67	.918	10411	10.4	8	-N	3	1010	.31		176		
UCCL	05	1005	1032D	1007	N04	E70	.939	10411	10.7	27D	-N	P	1007	.52			D	
CATA	05	1005	1030	1010	N09	E67	.918	10411	10.4	25	-B		1010	.69		240		
MEUD	05	1006	1018	1007	N08	E68	.925	10411	10.5	12	-F	C	1007	.31			E	
6 STATIONS REPORTING GROUP 26340. 1 STATIONS OBSERVING AND NOT REPORTING.																		
GRP26340	05	1024	1103	1037	N12	E31	.525	10406	7.8	39	1N		2.81				6 6 6 7	
MEUD	05	1021	1055	1038	N12	E32	.540	10406	7.8	34	1N	C	1038	1.86	2.10		EL	
CATA	05	1025	1110	1040	N12	E32	.540	10406	7.8	45	1B		1040	2.78	3.32	316	F	
CAPS	05	1025	1105		N10	E31	.520	10406	7.8	40	1B	3	1038	3.61	4.00	192	H	
CANR	05	1026	1100	1033	N11	E32	.537	10406	7.8	34	1N	C		1.80	2.20		L	
UCCL	05	1032E	1039D		N11	E30	.508	10406	7.7	7D	2N	P	1032	4.13	5.80		E	
ABST	05	1032E	1050D	1036	N13	E31	.529	10406	7.8	18D	1N	P	1036	2.69	3.10		E	
340 ABST	05	1032E	1050D	1036	N14	E36	.600	10406	8.1	18D	*-N	P	1036	1.34	1.60		D 7	
GRP26341	05	1111	1132	1115	N07	E66	.912	10411	10.4	21	-N		.78				6 5 5 8	
ABST	05	1110	1140	1113	N08	E67	.918	10411	10.5	30	1N	C	1113	1.79	4.10	61	E	
UCCL	05	1111	1129	1111	N07	E80	.984	10411	11.5	18	1N	C	1111	1.03			E	
CANR	05	1111	1137	1114	N05	E66	.912	10411	10.4	26	1N	C		1.10	2.30		H	
HUAN	05	1111E	1133D		N07	E67	.919	10411	10.5	22D	-F	2	1116	.25			E	
MEUD	05	1111	1121	1112	N07	E67	.919	10411	10.5	10	-F	C	1112	.52				
CATA	05	1112	1130	1120	N07	E65	.904	10411	10.3	18	-F		1120	.23	.55		D	
GRP26347	05	1750	1829	1800	N25	E60	.876	10412	10.2	39	1B		2.55				4 4 3 5	
BOUL	05	1750	1837	1800	N27	E62	.894	10412	10.4	47	2B	V						
SACP	05	1750	1840	1801	N25	E59	.869	10412	10.2	50	1B	C		2.00	2.99		EH	
HOUT	05	1800E	1815	1800E	N24	E59	.867	10412	10.2	15D	2B	C		4.10	7.80		H	
MCMA	05	1805E	1825D		N25	E61	.884	10412	10.3	20D	1B	C	1805	1.55	3.50		EH	
GRP26349	05	1900	1921	1907	S19	E10	.423	10404	6.5	21	--F		.46				2 2 2 4	
SACP	05	1900	1921	1907	S18	E10	.408	10404	6.5	21	-F	C		.51	.50			
MCMA	05	1901E	1917D		S19	E10	.423	10404	6.5	16D	-F	C	1903	.41	.50		E	
GRP26352	05	2107	2115	2108	N19	W26	.492	10399	3.9	8	--F		.10				2 2 1 4	
PALE	05	2106	2115D	2108	N19	W26	.492	10399	3.9	9D	-N	C		.10				
BOUL	05	2107	2114	2108	N19	W25	.480	10399	4.0	7	-F	V						
GRP26359	06	0157	0209	0200	N21	E58	.855	10412	10.4	12	-N		.86				3 3 3 7	
CRON	06	0155	0208	0200	N15	E60	.866	10412	10.6	13	-N	C		.93	1.70			
MANI	06	0158	0209	0200	N24	E59	.868	10412	10.5	11	-N	1	0200	.83	1.26			
PALE	06	0200E	0201D	0201	N25	E56	.845	10412	10.3	1D	-N	C		.81				
GRP26360	06	0418	0440	0423	N12	E23	.409	10406	7.9	22	-N		1.03				2 2 2 4	
MITK	06	0416	0441	0423	N11	E24	.420	10406	8.0	25	-N	C	0423	.93	1.00		E	
CRON	06	0419	0438	0423	N12	E22	.394	10406	7.8	19	-N	C		1.13	1.10			
GRP26366	06	1147	1221	1152	N19	E61	.878	10412	11.1	34	--N		.45				3 3 3 6	
CATA	06	1147	1205D	1152	N20	E61	.879	10412	11.1	18D	-B		1152	.17	.37	240		
CAPS	06	1150E	1235D		N18	E60	.869	10412	11.0	45D	-N	3	1154	1.03	2.00	160		
SANM	06	1154E	1206		N18	E63	.892	10412	11.2	12D	-F	1	1158	.15	.33		D	

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION MIN.	IM- POR- TANCE	OBS. COND. TYPE	MEASUREMENTS					REMARKS
	DATE	START	END	MAX. PHASE	APPROX.		CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY				TIME UT	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH H α	MAX. INT. %	
					LAT.	MER. DIST.												
	1969 NOV																	
GRP26368	06	1610	1622	1612	N20	E60	.871	10412	11.2	12	--F			.31			2 2 1 5	
MCMA	06	1610	1621	1612	N19	E60	.870	10412	11.2	11	-F	C	1612	.31	.60		E	
BOUL	06	1610	1622	1612	N20	E60	.871	10412	11.2	12	-F	V						
GRP26369	06	1633	1647	1635	N20	E58	.854	10412	11.0	14	-N			.61			4 4 3 5	
MCMA	06	1632	1648	1635	N20	E58	.854	10412	11.0	16	-N	C	1635	.52	1.00		EL	
BOUL	06	1633	1645	1635	N21	E58	.855	10412	11.0	12	-N	V						
CANR	06	1634	1647	1636	N19	E58	.853	10412	11.0	13	-N	C		.80	1.40		F	
SACP	06	1634	1646	1635	N20	E58	.854	10412	11.0	12	-N	C		.51	.72			
371 HOUT	06	1812E	1835	1812E	N26	E33	.624	10406	9.2	23D	1N	C		2.10	2.70		H 3	
GRP26373	06	2024	2043	2028	N20	E57	.846	10412	11.1	19	--B			.50			2 2 1 4	
BOUL	06	2024	2039	2029	N21	E57	.847	10412	11.1	15	-N	V						
PALE	06	2024	2046	2027	N19	E57	.844	10412	11.1	22	-B	C		.50				
4 STATIONS REPORTING GROUP 26374. 1 STATIONS OBSERVING AND NOT REPORTING.																		
GRP26374	06	2118	2142	2133	N19	E46	.736	10412	10.3	24	-N			1.10			3 3 3 4	
SACP	06	2118	2148	2133	N19	E46	.736	10412	10.3	30	-N	C		.60	.73			
PALE	06	2118	2149	2134	N19	E48	.757	10412	10.5	31	-N			.89				
CULG	06	2123E	2133D	2132	N20	E46	.738	10412	10.3	10D	1N	P	2132	1.55	2.10		FRL	
PALE	06	2128	2135	2131	N20	E43	.705	10412	10.1	7	-N	C		.25				
26374	06	2119	2144	2122	N19	E50	.778	10412	10.6	25	*-F			.73			2 2 1 5	
PALE	06	2118	2149	2122	N19	E48	.757	10412	10.5	31	-N	C		.73				
BOUL	06	2119	2140	2122	N18	E47	.744	10412	10.4	21	-F	V						
PALE	06	2130	2147	2133	N21	E57	.847	10412	11.2	17	-N	C		.17				
GRP26376	06	2321	2343	2324	N13	E09	.220	10406	7.6	22	--B			.71			2 2 2 5	
PALE	06	2320	2349	2324	N13	E08	.209	10406	7.6	29	-N	C		.40				
VORO	06	2321	2336	2324	N13	E10	.233	10406	7.7	15	-B	C	2324	1.02	1.00		77 E	
GRP26379	07	0322	0443	0345	N14	E11	.257	10406	8.0	81	1F			6.19			3 2 2 4	
CRON	07	0320	0500	0345	N15	E12	.281	10406	8.0	100	2N	C		8.25	8.40		L	
MANI	07	0324	0426		N13	E10	.234	10406	7.9	62	1F	1	0344	4.13	4.02			
KODA	07	0421E	0459		N11	E12	.241	10406	8.1	38D	2N	P	0427	6.65	6.65	1.24	BI	
381 ABST	07	0617	0625	0618	N23	W41	.695	10399	4.2	8	--F	C	0618	.90	1.20		49 D 3	
GRP26382	07	1353	1410	1400	N19	E48	.758	10412	11.2	17	-N			.51			2 2 1 2	
SACP	07	1353	1410	1400	N19	E45	.725	10412	11.0	17	-N	C		.51	.61		F	
HURB	07	1359E	1406D		N19	E51	.788	10412	11.4	7D	1N					1.90		
	07	1617	1634	NO FLARE PATROL														
4 STATIONS REPORTING GROUP 26383. 1 STATIONS OBSERVING AND NOT REPORTING.																		
GRP26383	07	1800	1847	1831	N27	E32	.621	10412	10.2	47	-N			1.26			3 3 2 4	
SACP	07	1800	1844	1836U	N26	E33	.625	10412	10.2	44	-N	C		.90	1.00		FHI	
PALE	07	1804E	1851D	1828	N29	E31	.626	10412	10.1	47D	-B			1.62				
PALE	07	1804E	1851D	1837	N29	E31	.626	10412	10.1	47D	-B			1.30				
BOUL	07	1830E	1846	1830	N27	E32	.621	10412	10.2	16D	1F	S						
26383	07	1804	1851	1807	N28	E32	.628	10412	10.2	47	*2B			6.27			2 2 2 4	
PALE	07	1804E	1851D	1807	N29	E31	.626	10412	10.1	47D	3B	C		11.51				
MCMA	07	1809E	1820D		N26	E33	.625	10412	10.2	11D	-B	P		1.03	1.40		EH	
GRP26384	07	1849	1906	1854	N20	E44	.717	10412	11.1	17	--N			.46			2 2 1 4	
BOUL	07	1849E	1910	1856	N20	E46	.739	10412	11.2	21D	-N	V						
PALE	07	1850E	1902	1851	N20	E41	.683	10412	10.9	12D	-N	V		.46				
GRP26385	07	2026	2047	2040	S20	E90	1.000	10424	14.6	21	-N						2 1 0 5	
BOUL	07	2026	2047	2040	S20	E90	1.000	10424	14.6	21	-N	V						
PALE	07	2026	2046	2029	S17	E90	1.000	10424	14.6	20	-B	C						
GRP26386	07	2307	2319	2310	N25	E30	.585	10412	10.2	12	--N			.23			2 2 2 5	
SACP	07	2305	2320	2310	N25	E30	.585	10412	10.2	15	-N	C		.30	.32		H	
PALE	07	2309	2318	2310	N25	E30	.585	10412	10.2	9	-N	C		.15				
GRP26387	08	0022	0046	0029	N22	E43	.714	10412	11.2	24	--N			.63			2 2 2 4	
VORO	08	0022	0046	0032	N22	E42	.703	10412	11.2	24	-B	C	0032	.93	1.27		82 EJ	
PALE	08	0026E	0032D	0026	N21	E44	.721	10412	11.3	6D	-F	C		.32				
GRP26390	08	0209	0228	0209	N23	E33	.606	10412	10.6	19	--B			.71			2 2 2 4	
VORO	08	0207E	0239	0207	N23	E32	.595	10412	10.5	32D	-B	C	0207	1.02	1.24		81 D	
PALE	08	0210	0217	0210	N23	E33	.606	10412	10.6	7	-N	C		.40				
GRP26391	08	1927	1936	1932	N25	E22	.501	10412	10.5	9	--F			.33			2 2 2 4	
SACP	08	1926	1935	1930	N25	E21	.491	10412	10.4	9	-N	C		.40	.42			
PALE	08	1927	1936	1933	N25	E22	.501	10412	10.5	9	-F	C		.25				

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NOV. 1969	FREQUENCY STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY $10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$		INT	REMARKS
			UT	UT	MINUTES	PEAK	MEAN		
1	100 GORK	44	0536 E		60 D		20.0		
	200 GORK	44	0545		75		5.0		
	221 ABST	41	0630	0631.3	2.2	9.0	5.0		
	100 GORK	44	0636		60		5.0		
	200 GORK	6	0638.4	0638.6	1	180.0	46.0		
	200 GORK	6	0823.9	0824.5	2	62.0	9.0		
	100 GORK	41	0824	0824.5	.9	5.0			
	930 BORD	5	0912	0912.6	1	18.0	2.0		
	2800 OTTA	20	1830	1842	50	4.4	2.0		
	2700 PENN		1837.7	1842.3	22.1	5.0	2.5		
	2695 SGMR	20	1839	1842.2	9.3	3.4	1.0		
	9400 HUAN	20	1924.9	1926.6	3.1	3.7	1.2		
	9400 HUAN	22	1939.2	1941	20.3	3.7	1.4		
2	9400 TYKW	5	0146	0148	4	11.0	3.0		
	2000 TYKW	5	0146	0147	2	2.0	1.0		
	3750 TYKW	5	0518	0518.3	1	95.0	6.0		
	2695 MANI	2	0518.1	0518.3	1.1	6.5	3.2		
	2000 TYKW	5	0518	0518.3	1	6.0	2.0		
	1415 MANI	2	0518.1	0518.2	1.1	2.9	1.5		
	1500 NEUS	47	0936 U	1042.5	300 U	750.0U			
	3000 NERA	28	0945		22.8	14.0	8.0		
	536 ONDR	45	0950	1043	70	55.0			
	9100 GORK	47	0951		129 D	680.0D			
	234 POTS	45	0954 U	1010 U	41 U	75.0	15.0		
	9500 BERL	47	0955	1041	240	720.0			
	235 TRST	27	0955	1003.8	44	200.0			
	204 IZMI	48	0959.8	1010.5	35	300.0	100.0		
	808 ONDR	45	1000		60				
	204 KIEV	24	1000	1010.5	35	44.0			
	260 ONDR	45	1005	1010	25	50.0			
	111 POTS	45	1006 U	1016 U	106 U	250.0	25.0		
	3000 NERA	47	1007.8	1040	38.7	1275.0	700.0		
	2800 SLOU	47	1007.5	1040	85	1065.0			
	9400 SLOU	47	1008 U	1038.7	60 U	1150.0			SUNSET
	9500 NERA	28	1009		8.6	15.0	8.0		PERCENT INCR
	930 BORD	27	1009	1042	83	180.0	60.0		
	19000 SLOU	20	1012	1041	36 U	163.0			
	19000 SLOU	21	1014	1115 U	75	32.0			
	9500 NERA	47	1017.6	1041	27.4	155.0	75.0		PERCENT INCR
	610 NERA	45	1018 U	1041.7	36 U	30.0			
	9400 HUAN	46	1041.8E	1042.7	17.2U	1767.2	200.9		PERCENT INCR
	9500 NERA	29	1045		106	100.0	50.0		
	3000 NERA	29	1046.5		283 D	725.0	350.0		
	9400 HUAN	29	1059		306.8	71.1	33.0		
	204 KIEV	42	1105	1121.6	35	11.0	4.0		
	930 BORD	5	1238	1238.8	1	15.0	1.0		
	9400 SLOU	1	1313	1313.5	1.5	9.0			
	260 ONDR	41	1357	1358	70	35.0			
	9400 SLOU	3	1449	1449.5	1.5	11.0			
	9400 HUAN	22	1722	1726.8	21.5	7.5	3.3		
	9400 HUAN	22	1750.3	1751.9	6.5	3.7	1.9		
	606 SGMR	1	1757.6	1757.7	.7	4.3	2.1		
	245 SGMR	1	1757.5	1757.7	.6	1.3	.7		
	9400 HUAN	20	1800.3	1811.5	17.2	7.5	3.2		
	18 MCMA	42	2028	2031	18			1	
	18 BOUL	41	2029	2037	25			1	
3	221 ABST	42	0647	0648	1.5	18.0			
	221 ABST	42	0650	0651	1	22.0			
	235 TRST	45	0838.9	0839.7	1.3	190.0	40.0		
	234 POTS	45	0839.6	0839.7	.2	100.0	25.0		
	204 KIEV	6	0839.1	0839.7	1	68.0			
	204 IZMI	6	0839	0839.5	1.2	100.0	50.0		
	225 HARS	45	1035	1051.5	22	40.0	10.0		
	1500 NEUS	20	1129 U	1153	27 U	19.0	1.0		
	7000 SAQP	20	1239.6		50.3	11.9			
	2700 PENN		1730	1938		8.2			
	1415 SGMR	40	1937.2	1939.1	2.4	23.2	2.9		
	606 SGMR	1	1939.3	1939.4	.3	3.8	1.4		
4	500 HIRA	45	0406	0409	6	160.0	24.0		
	1415 MANI	4	0407.7	0409.9	30.3	27.2	9.1		
	612 TOKO	45	0407.2	0408.4	2.8	394.0			
	606 MANI	46	0407.7	0409.1	3.6	330.0	56.0		
	9620 IRKU	3	0408	0414.8	12	155.0			
	9400 TYKW	45	0408	0414.8	12	160.0	50.0		
	8800 MANI	4	0408.4	0414.8	16.6	175.0	81.0		
	4995 MANI	4	0408.4	0414.8	16.6	177.0	85.0		
	3750 TYKW	45	0408	0414.8	12	115.0	15.0		
	2695 MANI	4	0408.4	0414.8	16.6	82.0	31.6		
	2000 TYKW	45	0408	0414.8	27	52.0	9.0		
	1000 TYKW	45	0408	0432.1	29	1370.0	85.0		
	200 HIRA	45	0408.5	0409	2.5	60.0	10.0		
	100 HIRA	45	0408	0409	12	250.0	20.0		
	9400 TYKW	29	0420		120	10.0	5.0		
	3750 TYKW	29	0420		120	6.0	3.0		
	606 MANI	46	0420.8	0431.5	23	570.0	205.0		
	500 HIRA	45	0420.5	0433	21.5	145.0	14.0		
	612 TOKO	45	0423	0431	16.7	573.0			

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NOV 1969	FREQUENCY STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$		INT	REMARKS
			UT	UT	MINUTES	PEAK	MEAN		
	A								
	200 HIRA	45	0423	0424.1	3	80.0	10.0		
	221 ABST	41	0717	0717.4	1	9.0	5.0		
	600 UCCL	5	0809.5	0810	1.2	4.0	2.0		
	600 UCCL	45	0929.5		.5	23.0	6.0		
	600 UCCL	5	0930.2		.2	85.0	40.0		
	606 SGMR	1	1147.7	1148.2	1.3	5.4	2.6		
	245 SGMR	40	1147.5	1148.3	1.5	20.5	7.0		
	235 TRST	41	1147.6	1148.4	1.3	40.0			
	204 KIEV	41	1147.3	1148.3	1.4	21.0			
	111 POTS	5	1147.9	1147.9	.1	175.0	60.0		
	23 POTS	40	1147.8	1148.9	.8	8000.0	1200.0		
	9400 HUAN	20	1255.8	1314.7	34.9	5.5	3.1		
	600 UCCL	45	1332		1.5	6.0	3.0		
	600 UCCL	45	1350.5		1	18.0	7.0		
	9400 HUAN	20	1351.7	1356.5	19.6	3.7	2.8		
	9400 HUAN	22	1419.5	1441.2	34.2	3.7	2.1		
	18 MCMA	6	1434	1436	3				
	2700 PENN	1	1439.1	1439.3	.6	5.6	1.2		
	235 TRST	45	1451.6	1451.7	.6	85.0	15.0		
	9400 HUAN	23	1508.6	1520.7	34.4	16.5	6.4		
	600 UCCL	5	1508.7		.3	76.0	38.0		
	10700 PENN	20	1509.8	1528.4	34.8	26.4	6.3		
	4995 SGMR	22	1509.9	1528.6	25.7	23.0	11.5		
	2700 PENN	3	1509.8	1516.2	8	15.3	3.3		
	2800 OTTA	21	1510	1520	30	2.0	1.0		
	15400 SGMR	22	1511.4	1528.5	19.3	9.9	4.9		
	7000 SAOP	23	1513.2		22.7				
	2695 SGMR	22	1513.5	1528.5	19.5	10.0	5.0		
	1415 SGMR	22	1513.9	1521.6	17.6	11.8	5.8		
	245 SGMR	40	1513.2	1527.2	16.4	29.7	11.8		
	8800 SGMR	22	1514.4	1528.5	20.2	14.5	7.3		
	2800 OTTA	1	1514	1516	.3	8.4	2.8		
	960 PENN	45	1514.2	1516	18.8	61.2	2.1		
	606 SGMR	45	1514.3	1514.8	14.5	31.9	11.3		
	930 BORD	45	1515	1516	2	92.0	7.0		
	600 UCCL	45	1515.5	1516	1.5	63.0	30.0		
	2700 PENN	29	1517.8	1517.8	30.9	3.8	1.9		
	2800 OTTA	2	1519.5	1521.5	3.5	4.2	2.4		
	2700 PENN	1	1519.6	1521	3.6	6.7	3.5		
	600 UCCL	45	1519.5		2.5	8.0	3.0		
	930 BORD	5	1520	1520.6	1	22.0	2.0		
	2700 PENN	3	1525.8	1528.6	4.2	15.3	3.9		
	930 BORD	5	1526	1526.8	1	15.0	1.0		
	9400 HUAN	3	1527.7	1528.4	1.4	16.5	6.7		
	7000 SAOP	3	1527.5	1528.5	1.7	28.2	14.1		
	2800 OTTA	4	1527	1528.5	2	10.0	2.6		
	9400 HUAN	22	1549.5	1555.1	60.4	9.2	5.2		
	2800 OTTA	20	1555	1600	13	2.0	1.0		
	930 BORD	5	1556	1556.4	1	9.0	1.0		
	2700 PENN	24	1637.6	1835		5.9			
	9400 HUAN	22	1652.1	1657	49.9	5.5	3.3		
	2700 PENN		1808.6	1808.8	1.1	14.5	5.2		
	9400 HUAN	20	2020.7	2025.3	19.3	12.9	6.0		
	2800 OTTA	21	2022	2025	25	3.6	1.8		
	2800 OTTA	8	2029.2	2029.8	.8	6.0	3.0		
	2700 PENN	1	2029.4	2029.8	1	9.9	3.6		
	960 PENN	45	2029.4	2029.7	1	8.1	2.8		
	9400 HUAN	23	2126.3	2140.8	19.8	16.5	8.7		
	9400 HUAN	3	2126.6	2127.1	1.4	20.2	9.2		
	2695 PENT	21	2126	2220	120.0	10.8			
	2695 PENT	1	2126.5	2127	1.5	7.4	5.0		
	2695 PENT	30	2128		12	4.2	2.1		
	2695 PENT	3	2129.5	2129.6	1	12.0	6.0		
	5								
	9620 IRKU	3	0332		4.5	40.00			
	9400 TYKW	45	0332.5	0334	8	50.0	13.0		
	3750 TYKW	45	0332.7	0334	10	67.0	15.0		
	2000 TYKW	5	0333	0335	6	17.0	5.0		
	8800 MANI	3	0335.2E	0335.2E	5.80	18.3U	9.2U		
	4995 MANI	3	0335.2E	0335.2E	2.30	34.7U	16.5U		
	2695 MANI	3	0335.2E	0335.2E	3.30	15.2U	7.6U		
	1415 MANI	1	0335.2E	0335.2E	1.80	1.5U	.8U		
	1500 NEUS	1	0800.7	0800.8	2.3	3.8	1.0		
	930 BORD	45	0801	0801	1	210.0	4.0		
	1500 NEUS	22	0806.5	0815.5	22.5	5.1	1.3		
	204 IZMI	41	0808.2	0819.5	16	150.0			
	235 TRST	42	0809	0816.2	13	230.0			
	200 NERA	45	0809.1	0815.4	13	480.0	100.0		
	3100 CRIM	45	0810	0812	15	13.0	4.0		
	3100 CRIM		0810	0817		25.0	8.0		
	204 KIEV	48	0810	0816.4	10	68.0			
	606 MANI	4	0814	0816.3	7	19.0	6.7		
	600 UCCL	45	0814	0816.5	4	25.0	9.0		
	9620 IRKU	1	0815	0820.4	10	13.0			
	9500 BERL	2	0815	0816	2	6.8	2.7		
	9500 NERA	45	0815	0820	10	15.0	8.0		
	4995 MANI	4	0815.4	0820.4	7.3	28.7	10.1		
	3000 NERA	45	0815	0820	10	15.0	7.0		
	2695 MANI	4	0815.3	0820.3	6.2	8.3	3.3		
	1415 MANI	2	0815.3	0816.3	2.4	3.1	1.6		
									PERCENT INCR

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NOV 1969	FREQUENCY STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY $10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$		INT	REMARKS
			UT	UT	MINUTES	PEAK	MEAN		
	930 BORD	45	0815	0815.8	2	13.0	3.0		
	8800 MANI	4	0816.7	0820	5.3	10.6	5.3		
	234 POTS	40	0816	0819.8	8.9	100.0	2.0		
	111 POTS	40	0816	0816.3	3.9	160.0	5.0		
	9500 BERL	4	0818	0820.5	6	14.0	4.1		
	9100 GORK	1	0819.3	0820.5	3.9	16.0	6.0		
	600 UCCL	45	0819.7	0820.5	2.8	8.0	4.0		
	930 BORD	45	0820	0820.3	1	28.0	2.0		
	1500 NEUS	2	0900.7E	0900.7		3.2			
	930 BORD	40	0900	0900.7	3	120.0	2.0		
	930 BORD	45	0914	0914.7	1	405.0	2.0		
	1500 NEUS	1	0915 E	0915		1.8			
	204 KIEV	6	0957.7	0957.9	.8	50.0			
	204 IZMI	6	0957.5	0957.7	.5	220.0	20.0		
	111 POTS	40	0957.4	0957.4	.7	240.0	4.0		
	1500 NEUS	21	1020	1037	34	3.2			
	600 UCCL	5	1020		3	5.0			
	260 ONDR	45	1020		20	60.0			
	235 TRST	42	1021.8	1031.4	13.2	2700.0			
	204 IZMI	48	1023.8	1024.7	1.8	1100.0	500.0		
	1500 NEUS	4	1024	1025	2				
	930 BORD	47	1024	1036	24	1100.0	162.0		
	600 UCCL	45	1024.5	1026	2.5	18.0	10.0		
	234 POTS	40	1024.3	1031.3	10.2	550.0	25.0		
	225 HARS	45	1024.5	1025.5	3.5	200.00	140.0		
	204 KIEV	6	1024.1		2.3	80.00			
	200 NERA	40	1024	1031	11	1000.0			
	3100 CRIM	1	1029	1030	4	7.0	2.0		
	204 KIEV	6	1029.4		2.3	80.00			
	204 IZMI	48	1029.3	1030.7	2.5	800.0	200.0		
	3000 NERA	5	1030	1045	35	7.0	3.0		
	600 UCCL	47	1030	1037.5	32	540.0	126.0		
	225 HARS	45	1030	1032	6	200.00	150.0		
	808 ONDR	45	1032.5	1035	21				
	610 NERA	47	1032.3	1037.1	30	1200.0	500.0		
	536 ONDR	45	1032		29	240.0			
	1500 NEUS	4	1033	1034	2	1.3			
	600 UCCL	45	1109.5	1117	18	10.0	2.0		
	1500 NEUS	1	1131.3E	1131.3		3.1			
	1500 NEUS	21	1134.5	1152	31.5	2.3	1.0		
	600 UCCL	45	1136.9	1137.3	1.1	27.0	15.0		
	1500 NEUS	1	1142 E	1142		2.5			
	930 BORD	5	1242	1242.6	1	24.0	2.0		
	408 SANM	45	1308.8		3.5		8.0		
	7000 SAOP	22	1405						
	408 SANM	45	1426.3	1427	1.2	32.0	12.0		
	235 TRST	41	1443.2	1443.6	1.5	140.0			
	10700 PENN	1	1529.9	1530	2.1	8.8	2.5		
	2700 PENN	41	1529.4	1530.6	1.3	78.8			
	960 PENN		1529.5	1529.6	.2	5.8	4.9		
	2700 PENN	8	1547.4	1547.5	.2	274.0			
	960 PENN	8	1547.4	1547.5	.2	2.9			
	9400 HUAN	22	1652.8	1701.7	16	5.6	1.9		
	10700 PENN	20	1656.7	1809	124	15.5	7.8		
	2700 PENN	20	1657.7	1750.6	119	6.5	3.3		
	9400 HUAN	20	1715.4	1717.6	8.8	3.7	1.4		
	2800 OTTA	23	1720	1800	60	5.0	2.0		
	9400 HUAN	28	1741.8	1759.5	17.7	9.3	4.6		
	606 SGMR	45	1750.3	1757.1	13.1	53.0	10.6		
	4995 SGMR	45	1752.3	1801.3	20.5	190.0	30.4		
	960 PENN	45	1752	1757.9	11	15.9	3.7		
	245 SGMR	40	1753	1800.9	12.3	48.6	9.7		
	1415 SGMR	45	1754.2	1801.2	9.1	30.8	11.3		
	2700 PENN	45	1755.9	1801.3	7.5	94.2	20.4		
	2695 SGMR	45	1756.8	1801.3	9	56.0	18.4		
	7000 SAOP	28	1757.5		2.5	9.4			
	2800 OTTA	46	1757.5	1801.3	6	75.0	23.0		
	2800 OTTA	46	1757.5	1800.3	3.2	48.0			
	2800 OTTA	46	1800.7	1801.3	2.8	75.0			
	10700 PENN	3	1759.4	1801.3	4.9	91.2	24.7		
	9400 HUAN	45	1759.5	1801.2	2.5	118.9	45.0		
	8800 SGMR	3	1759.5	1801.8	13.2	145.0	28.8		
	7000 SAOP	46	1800	1801.6	5	127.7	38.6		
	408 SANM	3	1801.6	1802	.8	90.0	22.0		
	9400 HUAN	29	1802	1802	42	26.0	8.5		
	7000 SAOP	29	1805						
	2800 OTTA	20	1850	1915	70	2.4	1.2		
6	1000 TYKW	5	0322.8	0323.2	1	3.0	1.0		
	23 POTS	40	1045.2	1045.4	1.7	4000.0	400.0		
	9400 HUAN	20	1443.8	1529.2	72.9	3.8	2.4		
	9400 HUAN	20	1618	1634	39.1	3.8	2.2		
	18 MCMA	6	1629	1631	2				
	2800 OTTA	20	1632	1634	20	2.6	1.0		
	2700 PENN	24	1710	1850		6.4			
	2700 PENN	8	1816.4	1816.5	.2	8.1			
	960 PENN	8	1816.4	1816.5	.2	14.7			
	9400 HUAN	20	2021.4	2032.6	44.9	3.8	2.7		
	2695 PENT	24	2115		10	2.2			
7	606 MANI	20	0339.3	0345.6	19	15.1	7.6		

SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

NOVEMBER 1969

NOV. 1969	FREQUENCY STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY $10^{22} \text{ Wm}^{-2} \text{ Hz}^{-1}$		INT	REMARKS
			UT	UT	MINUTES	PEAK	MEAN		
8	100 GORK	44	0535 E		386 D		65.0		
	200 GORK	44	0536		156		5.0		
	200 GORK	41	0616.7	0617	3.8	120.0			
	200 GORK		0616.7	0618.8		200.0			
	100 GORK	41	0616.5	0617.2	3.8	1000.0			
	100 GORK		0616.5	0618.8		2000.0D			
	111 POTS	45	0701 E	0701 U		120.0U			
	930 BORD	45	0838	0838.7	1	26.0	2.0		
	204 KIEV	6	0839	0839.5	1.2	38.0			
	100 GORK	6	0924	0924.3	.4	1000.0D			
	260 ONDR	41	1030		60	80.0			
	9400 HUAN	20	1239.2	1347.3	121.6	7.4	3.2		
	600 UCCL	5	1307	1308	2	3.0			
	260 ONDR	45	1317	1320	4	70.0			
	2800 OTTA	20	1330	1400	60	2.0	1.0		
	2800 OTTA	2	1500	1501	5	8.6	2.8		
	600 UCCL	40	1521		1	18.0			
	2700 PENN	20	1653	1834	124	6.6	3.3		
	2800 OTTA	22	1740	1815	65	2.0	1.0		
	9400 HUAN	25	1802.5		264.5		4.9		
	1415 SGMR	45	1851	1856.3	9.5	66.0	10.8		
	9400 HUAN	20	2013.4	2025.6	35.9	7.4	3.7		
	2695 PENT	1	2128	2129	1.5	2.2	1.1		
	200 GORK	44	0630		60		5.0		
	100 GORK	41	0653.4	0653.6	1.1	10.0			
	100 GORK		0653.4	0654.1		20.0			
	200 GORK	6	0654	0654.2	.7	140.0	25.0		
	100 GORK	44	0753.5		76		5.0		
	204 KIEV	44	0800 E	1315 U	330	42.0	8.0		
	100 GORK	6	0832.5	0832.6	.2	32.0	15.0		
	221 ABST	44	0848	0850.2	3	6.0	4.0		
	200 GORK	44	0900		60		5.0		
	100 GORK	44	0909.5		149		10.0		
	240 KIEL	44	0910	1212		700.0	20.0		
	200 GORK	41	0933	0933.6	.8	60.0			
	100 GORK	6	0948.9	0949.2	.9	30.0			
	234 POTS	45	0950.6	0951.1	.8	175.0	15.0		
	200 GORK	44	1000		120		8.0		
	234 POTS	45	1015.6	1016.1	.6	180.0	25.0		
	111 POTS	45	1113.6	1113.8	.3	500.0	100.0		
	100 GORK	41	1113.6	1114.6	1.3	500.0			
	111 POTS	5	1259.9	1300	.1	1100.0	400.0		
	9400 HUAN	20	1337.3	1355.1	43.4	5.7	2.1		
	111 POTS	45	1414.2	1414.2	.4	600.0	25.0		
	408 SANM	3	1531.7	1531.8	.9	50.5	19.0		
	2700 PENN	24	1614.6	1715.3		7.8			
	18 MCMA	41	1718	1722	9			1	
9	100 GORK	44	0554 E		204		5.0		
	100 GORK	6	0613.3	0613.4	.4	30.0			
	111 POTS	40	0711.1	0711.4	1.1	400.0	20.0		
	200 GORK	44	0744		47		10.0		
	204 KIEV	42	0745	0746.5	45	5.0	7.0		
	204 IZHI	41	0745	0751	47	160.0			
	111 POTS	45	0800.2	0800.4	.8	400.0	80.0		
	2950 GORK	20	0822.1	0836.2	19.5	18.2	9.5		
	100 GORK	6	0822.1	0822.4	.5	40.0	20.0		
	111 POTS	45	0824.8	0824.9	.1	400.0	150.0		
	100 GORK	6	0824.8	0825	.7	100.0			
	2950 GORK	20	0843.2	0930	99	29.1	14.9		
	950 GORK	1	0849.9	0850.3	.6	2.5	1.6		
	650 GORK	1	0849.6	0850.4	1.1	3.4	1.5		
	235 TRST	45	0849.7	0849.9	.7	1830.0	400.0		
	204 KIEV	6	0849.7	0850.3	1	74.0			
	204 IZMI	6	0849.7	0850	1	300.0	80.0		
	200 GORK	6	0849.8	0850	.5	500.0D			
	600 UCCL	27	0850.5		.8	3.0			
	234 POTS	45	0850	0850	.3	175.0	30.0		
	100 GORK	41	0856.4	0856.5	3.5	40.0			
	100 GORK		0856.4	0859		40.0			
	100 GORK	6	0909.6	0909.8	.3	35.0			
	200 GORK	6	1033.5	1033.7	.3	20.0	11.0		
	100 GORK	42	1033.6	1033.7	7.4	40.0			
	100 GORK		1033.6	1040.9		30.0			
	100 GORK	6	1114.9	1115.7	1	35.0			
	200 GORK	6	1117.9	1117.9	.1	20.0	11.0		
	9400 HUAN	22	1211.7	1212.8	3.7	3.8	2.8		
	9400 HUAN	20	1315.2	1325.2	34.3	3.8	2.4		
	111 POTS	45	1323.4	1323.5	.4	1800.0	350.0		
	18 MCMA	42	1349	1406	89			2	
	9400 HUAN	20	1351.4	1415.8	54.3	3.8	2.3		
	234 POTS	45	1352.3	1352.4	.1	175.0	40.0		
	2700 PENN	20	1512.3	1545	66.9	3.9	1.9		
	408 SANM	40	1551.6	1558.3	21.6	13.0	9.3		
	2695 PENT	22	2125	2155	70	2.2	1.1		
10	100 GORK	44	0535 E		163 D		5.0		
	221 ABST	6	0650	0651.3	3	8.0	3.0		
	204 KIEV	44	0700 E		325	34.0	6.0		

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

NOVEMBER 1969

NOV. 1969	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE	
	START UT	END UT		DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND				
				START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.		
11 01	0000	0811	CULG				0008	0627.5	1				I	
			CULG				0207	0210	1				IIIG	
			CULG				0524.5	0630	1				IIIN	
			CULG				0535		1				IIIB,U	
			CULG				0546		1				IIIB,U	
	0648	1530	WEIS				1000	1425	1				IS	
			SGMR											
	1100	2230	WEIS				1350.6	1351.3	1				IIIB	
			WEIS				1400.3	1400.6	1				UNCLF	
	1856	1831	BOUL				1557.5	1559.3	2	1557.5	1559.3	2	IIIG	
			BOUL				1630.1	1630.3	2				III	
	1330	2339	BOUL				1648.2	1649.3	1				IIIG	
			HARV	1650	1658	1							I	
			BOUL				1658.4	1658.6	1				III	
			BOUL				1726.4	1726.6	1	1726.4	1726.6	1	III	
			BOUL				1730.7	1731.6	2	1730.7	1731.6	2	IIIG	
	2007	2400	BOUL				1813.9	1814.1	1				III	
			HARV	1821	2036	1							III	
			CULG										IN	
11 02	0000	0811	CULG				0150.5	0151	1				IIIG	
			WEIS				1000.1	1037	1				III,CONT	
	0648	1534	WEIS				1009	1035	2				IIIGG	
			WEIS				1043	1050	1				IIIGG	
	1100	2230	SGMR											
			BOUL				1754.1	1800.6	3	1754.1	1800.6	3	IIIGG	
	1330	2338	HARV				1755	1800	2	1755	1800	2	IIIGG	
			CULG				2352	2353	1				IIIG	
	11 03	0000	0800	CULG	0145		1							IIIB
				CULG				0246.5	0247	1	0246.5	0247	1	IIIG,U
CULG							0440		1	0440		1	IIIB	
CULG							0615	0622.5	1				IIIG	
CULG													ONCLF	
0648		1800	WEIS	0819.7	0820	1								
			SGMR											
			HARV				1338	1352	1				I	
			BOUL				1627.5	1627.8	1	1627.5	1627.8	1	III	
			BOUL				1638.7	1639	1	1638.7	1639	1	III	
1100	2230	HARV				1755	1939	2	1755	1939	2	IIIN		
		BOUL				1755	1755.3	2				III		
		HARV				1824	2330	1				IN		
		BOUL				1832.6	1833.3	3	1832.6	1833.3	3	IIIG		
		BOUL				1859	1859.3	2	1859	1859.3	2	III		
1330	2337	BOUL				1937.3	1938.8	2	1937.3	1938.8	2	III		
		CULG				2045	2250	1				I		
		CULG				2106	2400	1				IIIN		
11 04	0000	0811	CULG				0122	0122.5	1				IIIB,U	
			CULG	0409	0410	1	0405	0425	1				IIIG,V	
			CULG	0424	0438.5	1							IV	
			CULG				0453	0456	1				IIIG	
			CULG				0507	0508	1				IIIG	
			CULG				0513	0514	1				IIIG	
			CULG				0524	0526.5	1				IIIG	
			CULG				0558		1				IIIB	
			CULG				0717		1				IIIB	
			CULG				0754		1				IIIB	
	1100	2230	SGMR											
			WEIS				1147.7	1149.2	2				IIIG	
	0630	1528	HARV	1350	1351	1	1350	1351	1				IIIG	
			WEIS				1350	1350.3	1				IIIB	
	1330	2336	WEIS				1441.6	1442	1				IIIG	
			HARV	1442		1	1442		2				IIIG	
	2002	2400	HARV				1513	1516	2	1516		2	IIIG,U	
			HARV				1513	1522	1				I	
			WEIS	1516	1520	1	1513.2	1513.5	2				UNCLF	
			HARV										IIIGG	
WEIS						1516	1516.2	1				IIIB		
1627	1931	HARV				1526	1530	2				IIIGG		
		BOUL				1817.2	1817.6	2	1817.2	1817.6	2	III		
		HARV				1840	1842	2				UNCLF		
		BOUL				1841.2	1842.2	2	1841.2	1842.2	2	IIIG		
		CULG				2139		1				IIIB		
2005	2400	CULG				2207.5		1				IIIB		
		CULG				2331		1				IIIB		
		CULG				2334		1				IIIG		
		HARV	2334		1							IIIG		
		CULG				2334	2334.5	2				IIIG,U		
		CULG				2349	2400	1				IIIG		
11 05	0000	0810	CULG				0000	0004.5	1				IIIG	
			CULG				0205	0207	1				IIIG	
			CULG				0231.5		1				IIIB,U	
			CULG				0235	0235.5	1				IIIG	
			CULG				0339	0343	1				IIIG	
			CULG				0508	0509	1				IIIG,V,U	
			CULG				0516	0519	1				IIIG	
			CULG				0542	0543	1				IIIG	
			CULG				0552		1				IIIB	
			CULG				0623		1				IIIB	
	0709	1527	WEIS				0815	0821.5	2				IIIGG	

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

NOVEMBER 1969

NOV. 1969	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	
11 05			WEIS				0957.4	0958	2				IIIG
			WEIS				1021.8	1027.2	3				IIIGG
			WEIS				1029.6	1034.8	2				IIIGG
			WEIS	1032	1117	2							IV
			WEIS				1442	1445	2				IIIGG
			HARV	1443	1444	1	1443	1444	1				IIIGG
	1345	2336	BOUL				1624.5	1624.9	1	1624.5	1624.9	1	III
	1616	2300	BOUL				1744	1822	2	1744	1822	2	CONT
			HARV				1748	1751	2	1748	1751	1	IIIGG
			HARV	1753	1757	2	1753	1758	2	1756	1758	2	IIIGG
			BOUL				1755.9	1757.8	2	1755.9	1757.8	2	IIIG
			HARV	1800	1804	2	1800	1806	2				IIIGG
			BOUL				1805.4	1809.9	3	1805.4	1809.9	3	II
			HARV				1805.5	1812	2				II
			BOUL				1813.7	1816.4	3	1813.7	1816.4	3	
	1100	2230	SGMR							1813.9	1816.2		IIIG
			HARV				1814	1816	3	1814	1816	3	IIIGG
			HARV				1817	1818	1				UNCLF
	2120	2400	CULG				2120		1				IIIB
			CULG				2138	2138.5	1				IIIG,U
			CULG				2222		1				IIIB
11 06	0000	0145	CULG				0057.5		1				IIIB
			CULG				0108.5	0109	1				IIIG,U
	0710	1117	WEIS				1045	1047	1				IIIG
	1100	2230	SGMR										
	1136	1522	WEIS										
	1615	1804	BOUL										
	1915	2158	BOUL										
	1345	2335	HARV	1933	1934	1	1932	1934	1				I
	2215	2301	BOUL										
11 07	0700	1522	WEIS										
	1100	2230	SGMR										
	1345	2335	HARV	1801	1802	1	1345	1755	1				IN
			HARV				1755	1910	1				I
			HARV				1812	1815	2	1815		1	IIIG
	1615	2258	BOUL				1812.8	1814.4	2	1812.8	1814.4	2	IIIG
			BOUL				1823.6	1829.3	2	1823.6	1829.3	2	IIIG
			HARV				1824	1829	2	1825	1829	2	IIIGG
			HARV				1910	2113	1				IN
	2010	2400	CULG				2054.5		1				IIIG
			HARV				2113	2332	1				I
11 08	0000	0815	CULG				0100	0102	1				IIIG,U
			CULG				0117.5	0120	1				I
			CULG				0123.5	0239	1				IIIN
			CULG				0315		1				IIIB
			CULG				0345		1				IIIB
			CULG				0356	0358.5	1				IIIG
			CULG				0414	0754	1				IIIN,U
			CULG				0459	0745	1				I
			CULG				0654		1				IIIB
			WEIS				0903	1445	2				IS
	0700	1519	SGMR										
	1100	2230	WEIS				1113.6	1114.2	2				IIIG
			WEIS				1259.8	1300	2				IIIB
	1345	2335	HARV				1345	1840	2				I
			HARV				1414	1415	2	1414		2	IIIG
			WEIS				1414.1	1414.7	2				IIIG
			HARV				1420	1422	2	1420	1422	2	IIIG
			WEIS				1420.5	1421.7	1				IIIG
			HARV				1525	1750	2	1525	1750	2	IIIN
			HARV				1624	1629	3	1624	1629	3	IIIG
	1615	2305	BOUL				1625.2	1629.3	2	1625.2	1629.3	2	IIIG
			HARV				1750	1834	2	1750	1834	2	IIIS
			HARV				1815	1817	3	1816	1817	3	IIIG
			BOUL				1815.8	1816.9	2	1815.8	1816.9	2	IIIG
			HARV				1837	2131	2	1837	2128	2	IIIN
			HARV				1840	2000	1				I
			HARV				1853	1854	3	1853	1854	3	IIIG,V,U
			BOUL				1853	1853.7	2	1853	1853.7	2	IIIG
			BOUL				1931	1932.8	3	1931	1932.8	3	IIIG
			HARV	1932		2	1931	1932	3	1931	1932	3	IIIGG
			HARV				2000	2132	2				I
			BOUL				2019.9	2020.1	1	2019.9	2020.1	1	III
	2005	2400	CULG				2020	2359	1				IIIN
			CULG				2023	2400	1				I
			CULG				2118		1				IIIB
			CULG				2126.5	2132	1				IIIG,U
			CULG				2127		2				IIIG
			HARV				2132	2335	3				I
			CULG				2150	2306.5	1				N,RS,DP
			CULG				2351	2352	1				IIIG,U

SOLAR X-RAY FLARES (2-12 A°)
SATELLITES EXPLORER 33 AND EXPLORER 35

NOVEMBER 1969

University of Iowa

Date 1969	Onset U.T.	Maximum U.T.	Peak-Ratio to Quiet Sun	Remarks and Values of Maximum Flux F(2-12 A°)
2 November	0945	1059	68	Strong electron/proton/alpha particle emitter 0.120 erg (cm ² sec) ⁻¹
3 November	1838 2146	1849 2154	4 ⁻ 5	
4 November	0408	0418	~ 60	Rapid rise and rapid decline followed by slow decline ~ 0.110 erg (cm ² sec) ⁻¹
	1505 1553 2020 2124 2152	1516 1604 2027 2133 2203	4 ⁻ 4 8 15 7	
5 November	0333 1002 1110 1753	0337 1007 1113 1805	8 4 5 12	0.020 erg (cm ² sec) ⁻¹ Complex structure Complex structure 0.014 erg (cm ² sec) ⁻¹
10 November	--	--	--	Notably quiet day

SOLAR X-RAYS BY SATELLITE
EXPLORER 37

NOVEMBER 1969

NAVAL RESEARCH LABORATORY

OUTSTANDING EVENTS

DAY	START TIME	0.5-3A FLUX XE-5	PEAK TIME	1-8A FLUX XE-4	PEAK TIME	8-20A FLUX XE-3	PEAK TIME	END TIME	COMMENTS
2	0949	130,000	1201E	3000.000	1100E	710.00	1108	2006	TWO EVENTS
3	0848	5.60	0850	41.00	0850	27.00	0854	0857	
3	1844	32.00	1846	82.00	1848	40.00	1850	1907	
3	2149	49.00	2151	130.00	2156	53.00	2156	2227	
4	0222E	17,000	0222E	38.000	0223E	23,000	0226E	0227	
4	0410	96.00	0421	1800.00	0416	240.00	0418	0502D	
4	1555	60.00	1602	170.00	1603	53.00	1606	1617	
4	2025E	120.00	2026	260.00	2027	67.00	2028	2035	
4	2204E	23,000	2204E	170.000	2207E	67,000	2221E	2245	
5	0334	97.00	0335	260.00	0335	67.00	0335	0353	
5	1005	31.00	1007	79.00	1008	28.00	1009	1013	
5	1112E	55,000	1112E	130.00	1113	40.00	1115	1129	
5	1759	130,000	1805	340.00	1805	93.00	1808	1817	
7	0413E	4,500	0514E	49.000	0413E	40.00	0513	0613	
7	2244	10.00	2245	39.00	2246	21.00	2249	2249	
15	1140	14.00	1142	56.00	1143	40.00	1145	1147	

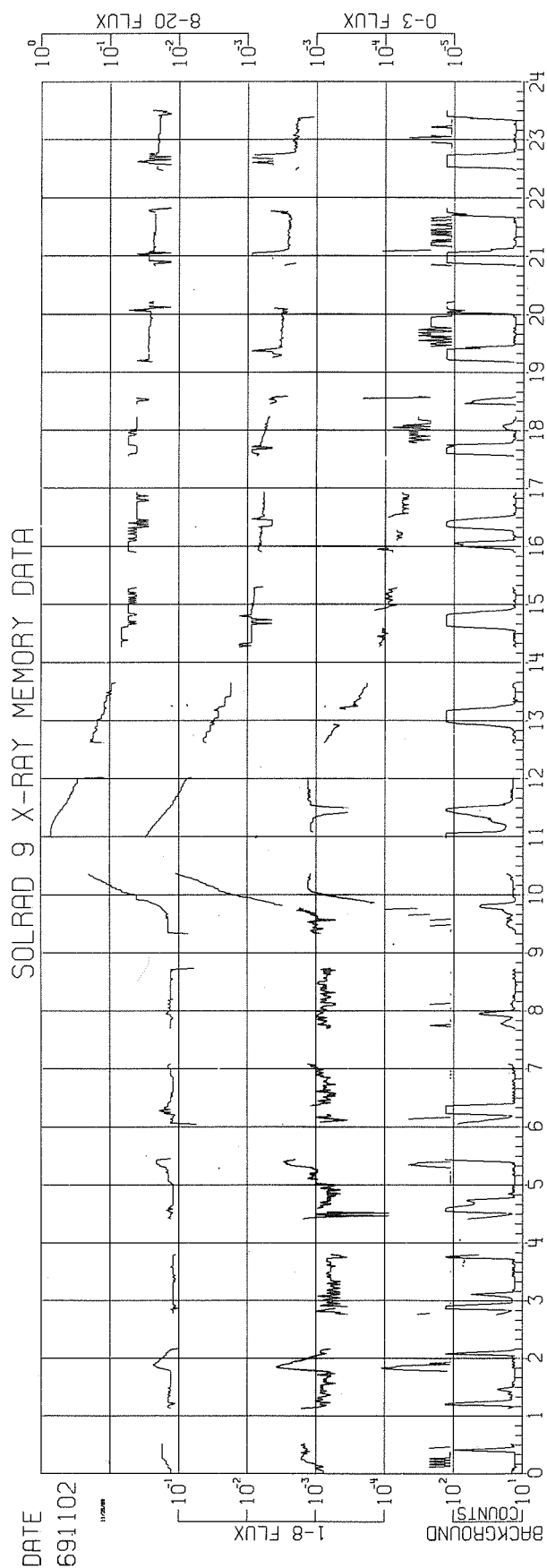
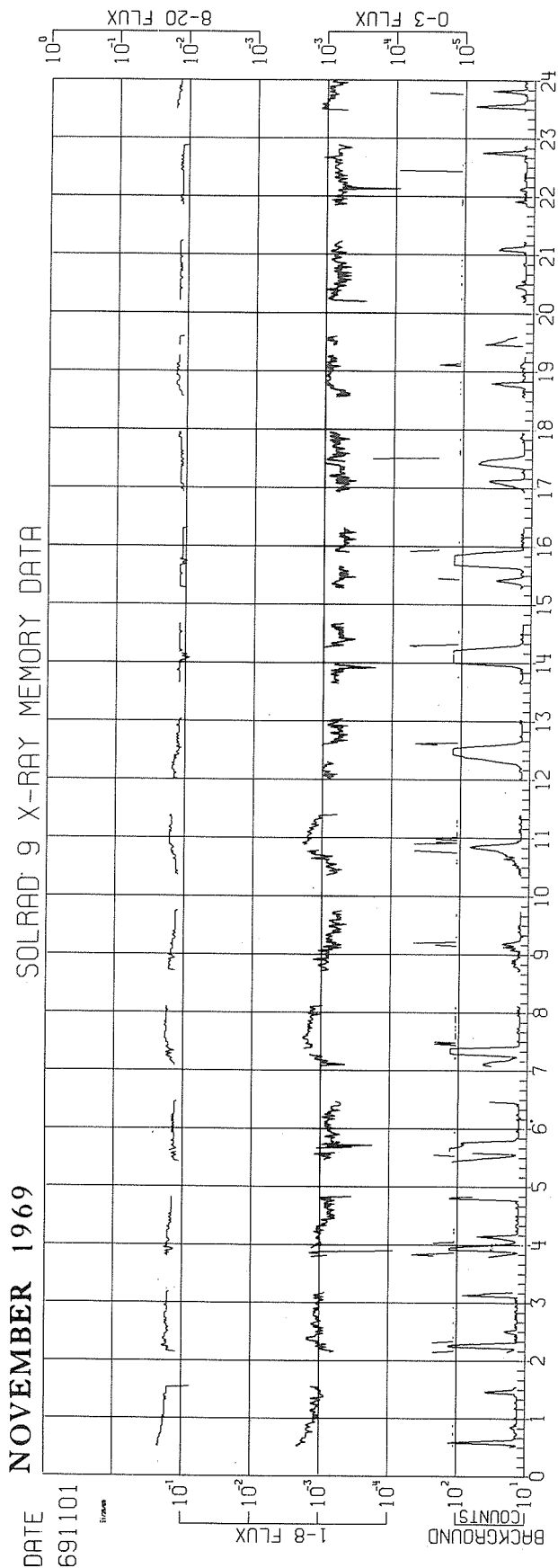
SOLAR X-RAYS MEASURED BY SATELLITE SOLRAD 9-EXPLORER 37

NOVEMBER 1969

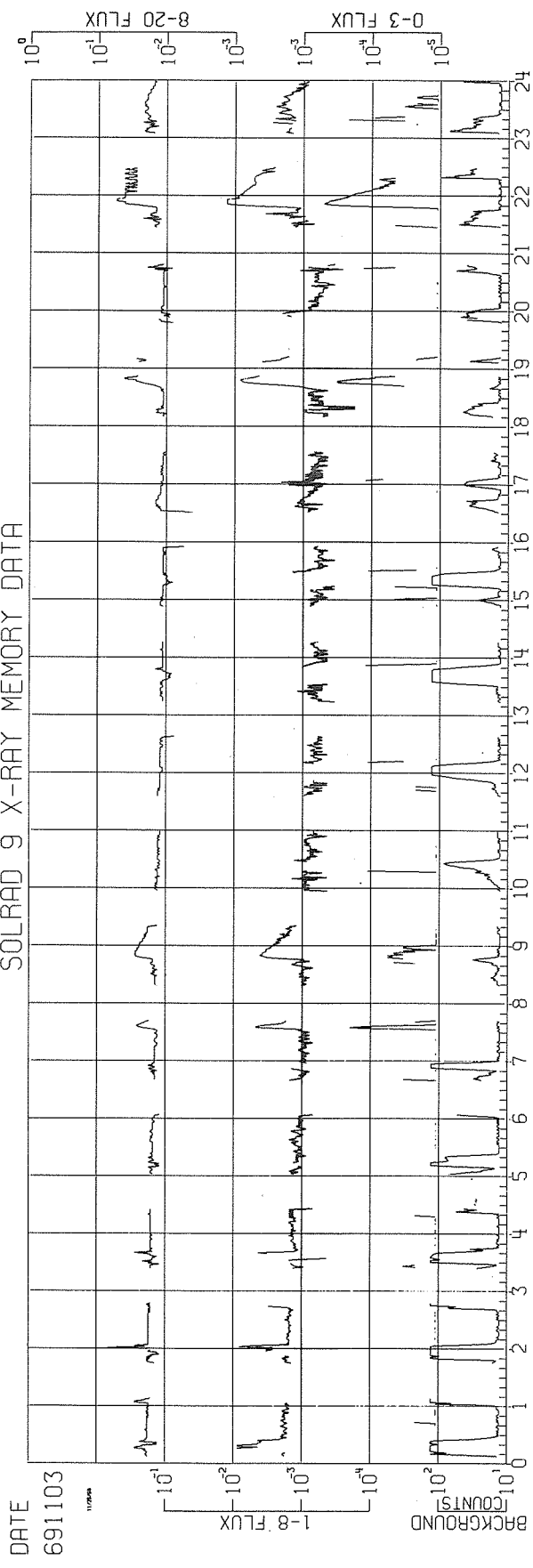
NAVAL RESEARCH LABORATORY		1=8A HOURLY AVERAGES												(10 ⁻³ ergs/cm ² /sec.)											
DAY		HOUR																							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	1.51	1.07	1.06	0.88	0.85	0.60	0.69	1.21	1.02	0.68	0.91	1.30	0.54	0.58	0.38	0.46	0.50	0.63	0.78	0.80	0.67	0.67	0.64	0.87	24
2	1.24	1.15	0.71	0.58	0.63	1.42	0.60	0.86	0.72	2.68	58.2	156.	39.5	21.8	8.78	7.51	5.85	6.53	4.73	3.28	2.04	2.83	2.82	1.57	
3	2.29	1.38	1.71	1.18	1.34	1.09	0.82	1.32	1.71	1.74	0.69	0.50	0.47	0.42	0.63	0.47	0.87	0.68	1.87	1.38	0.59	4.45	5.25	1.49	
4	1.04	0.84	1.96	0.77	17.4	1.52	1.17	0.76	0.57	0.51	0.94	0.39	0.41	1.35	0.65	2.18	6.12	0.60	0.53	0.51	4.79	1.34	6.58	0.96	
5	0.40	0.51	1.06	3.18	0.46	0.54	0.86	0.49	1.05	0.95	2.74	2.90	0.71	0.39	0.35	0.58	0.46	0.76	10.0	0.50	0.44	0.34	0.34	0.32	
6	0.36	0.33	0.63	0.59	0.67	0.34	0.71	0.67	0.32	0.29	0.23	0.43	0.44	0.27	0.39	0.88	0.54	0.60	0.46	0.37	0.41	0.52	0.52	0.69	
7	1.00	1.91	1.13	1.09	4.19	3.66	2.76	1.36	1.22	0.69	0.82	0.62	0.46	0.73	0.51	0.45	0.45	0.52	1.09	0.47	0.55	0.49	1.24	0.68	
8	0.61	0.56	0.59	1.08	0.83	0.59	0.42	0.32	0.31	0.41	0.32	0.44	0.33	0.27	0.31	0.37	0.41	0.31	0.33	0.41	0.26	0.34	0.32	0.32	
9	0.40	0.39	0.33	0.30	0.29	0.28	0.31	0.27	0.29	0.19	0.33	0.31	0.35	0.34	0.39	0.37	0.36	0.33	0.23	0.27	0.28	0.33	0.31	0.27	
10	0.27	0.32	0.24	0.23	0.21	0.29	0.23	0.30	0.24	0.14	0.24	0.24	0.24	0.24	0.24	0.19	0.34	0.33	0.24	0.18	0.22	0.27	0.21	0.25	
11	0.23	0.20	0.27	0.31	0.25	0.32	0.31	0.21	0.13	0.27	0.25	0.30	0.20	0.20	0.26	0.33	0.32	0.39	0.29	0.27	0.36	0.33	0.29	0.26	
12	0.19	0.37	0.94	1.67	1.30	0.50	0.45	0.28	0.33	0.21	0.24	0.34	0.18	0.24	0.26	0.39	0.40	0.20	0.21	0.25	0.23	0.25	0.23	0.30	

NAVAL RESEARCH LABORATORY		8=20A HOURLY AVERAGES												(10 ⁻² ergs/cm ² /sec.)											
DAY		HOUR																							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	1.95	1.65	1.63	1.58	1.45	1.31	1.32	1.64	1.50	1.35	1.40	1.48	1.30	1.20	1.15	1.14	1.10	1.19	1.30	1.31	1.25	1.27	1.21	1.35	
2	1.57	1.47	1.24	1.19	1.25	1.56	1.28	1.33	1.28	1.92	13.7	49.7	16.4	11.2	5.82	4.62	4.07	4.72	3.78	2.64	2.51	2.23	2.08	1.87	
3	1.83	1.65	1.82	1.61	1.54	1.51	1.39	1.52	1.78	1.84	1.28	1.23	1.16	1.06	1.13	1.06	1.23	1.11	1.52	1.30	1.13	2.34	3.22	1.81	
4	1.93	1.26	1.72	1.19	5.15	2.18	1.64	1.37	1.16	1.02	1.35	0.95	0.99	1.42	1.22	1.45	2.92	0.99	0.90	0.93	2.32	1.27	4.78	1.32	
5	0.90	0.92	1.06	1.97	0.98	0.90	1.08	0.87	1.12	1.27	1.87	2.06	1.14	0.97	0.97	0.97	0.86	1.04	4.19	0.91	0.86	0.75	0.74	0.75	
6	0.76	0.74	0.89	0.87	1.04	0.86	0.99	1.07	0.74	0.68	0.74	0.78	0.86	0.77	0.82	1.13	0.99	0.97	0.93	0.84	0.83	0.90	0.93	1.10	
7	1.27	1.82	1.62	1.56	3.61	3.46	2.74	1.90	1.66	1.34	1.28	1.27	1.11	1.18	1.01	0.93	0.92	1.01	1.29	1.01	1.17	1.01	1.24	0.98	
8	1.04	0.98	1.03	1.32	1.21	1.04	0.86	0.82	0.77	0.79	0.83	0.88	0.79	0.76	0.74	0.81	0.78	0.73	0.78	0.67	0.75	0.79	0.68	0.76	
9	0.72	0.79	0.74	0.70	0.74	0.65	0.74	0.73	0.70	0.68	0.70	0.71	0.71	0.71	0.88	0.78	0.74	0.75	0.73	0.71	0.68	0.68	0.74	0.68	
10	0.68	0.65	0.62	0.60	0.63	0.66	0.60	0.61	0.66	0.63	0.63	0.61	0.60	0.58	0.59	0.56	0.63	0.67	0.62	0.60	0.59	0.63	0.63	0.62	
11	0.64	0.66	0.68	0.79	0.65	0.60	0.56	0.61	0.59	0.65	0.62	0.57	0.57	0.62	0.61	0.66	0.71	0.73	0.66	0.63	0.67	0.69	0.3	0.61	
12	0.59	0.69	1.24	1.52	1.67	0.84	0.87	0.73	0.71	0.68	0.67	0.63	0.61	0.64	0.66	0.81	0.70	0.62	0.63	0.66	0.65	0.6	0.6	0.71	

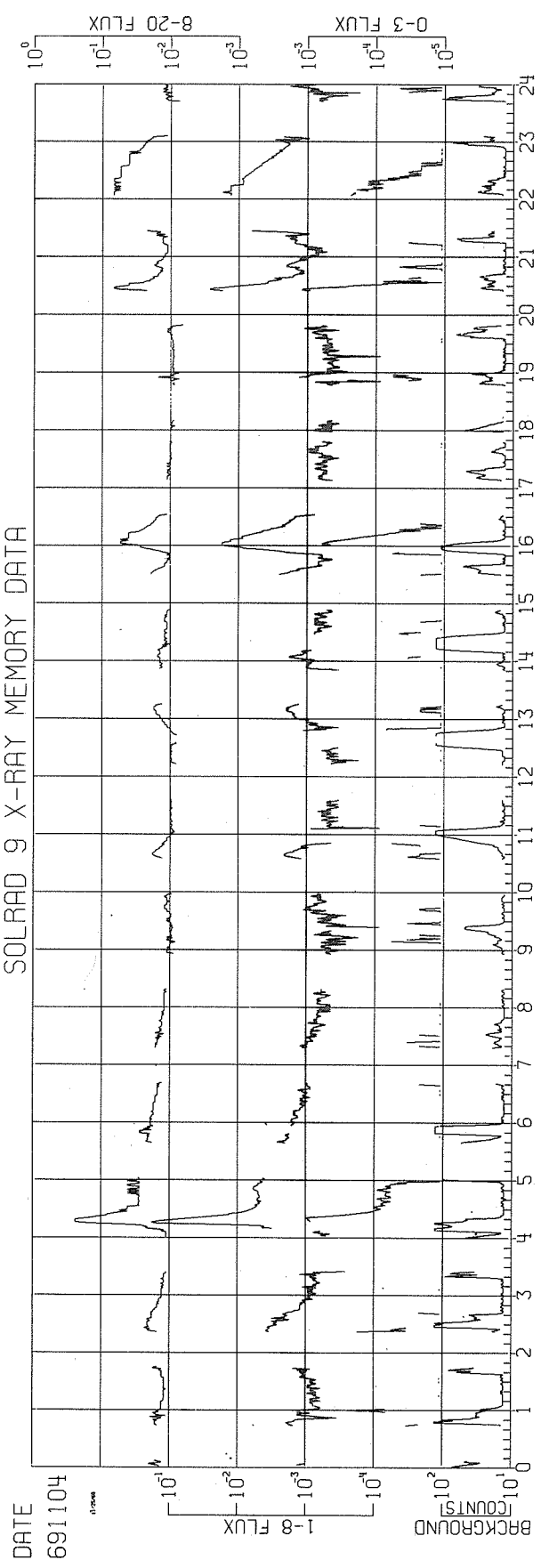
SOLAR X-RAYS MEASURED BY SATELLITE SOLRAD 9-EXPLORER 37



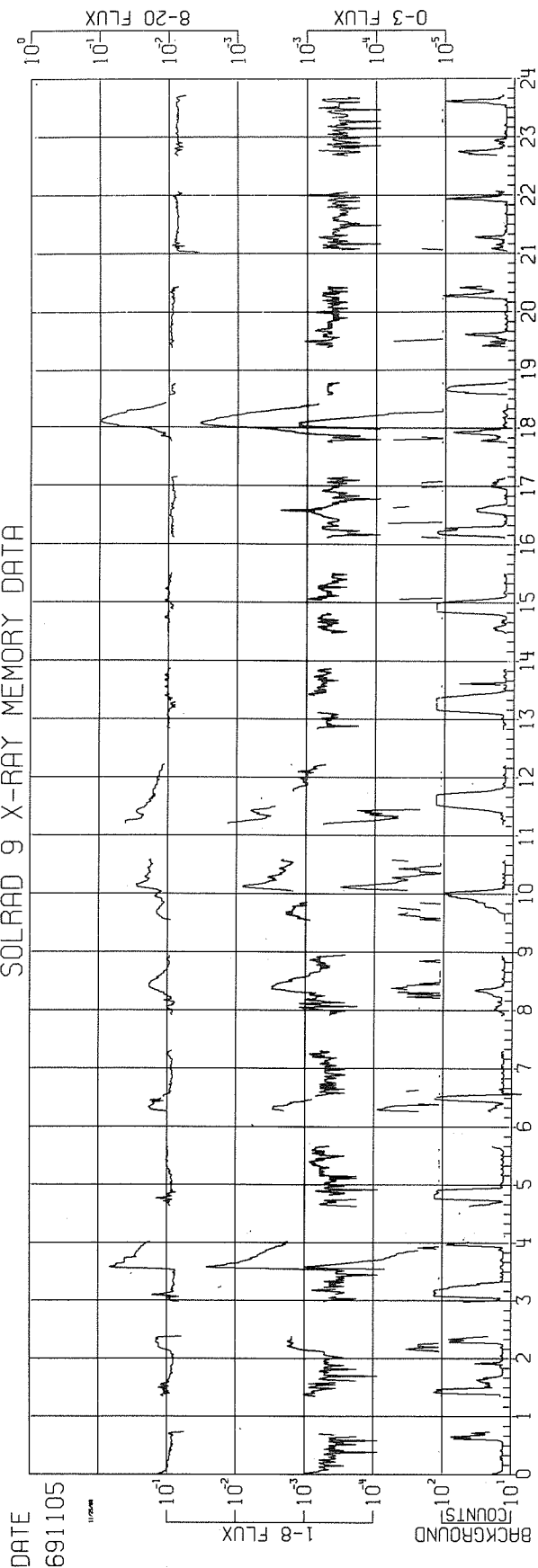
SOLRAD 9 X-RAY MEMORY DATA



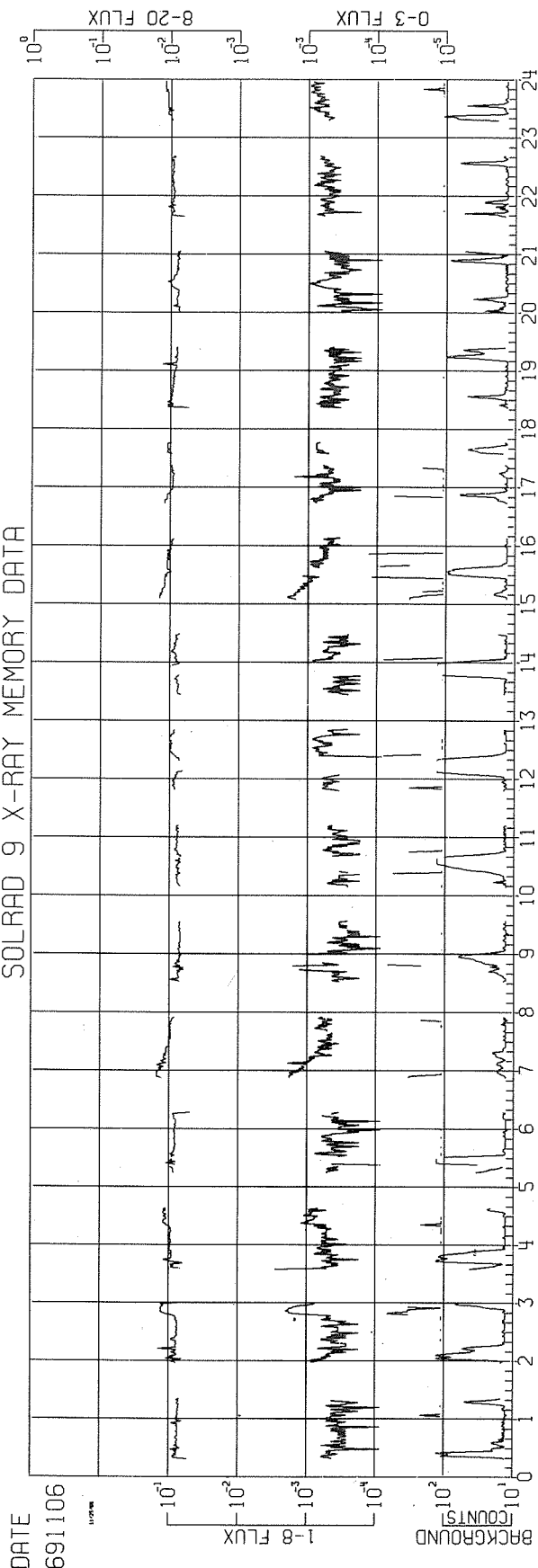
SOLRAD 9 X-RAY MEMORY DATA



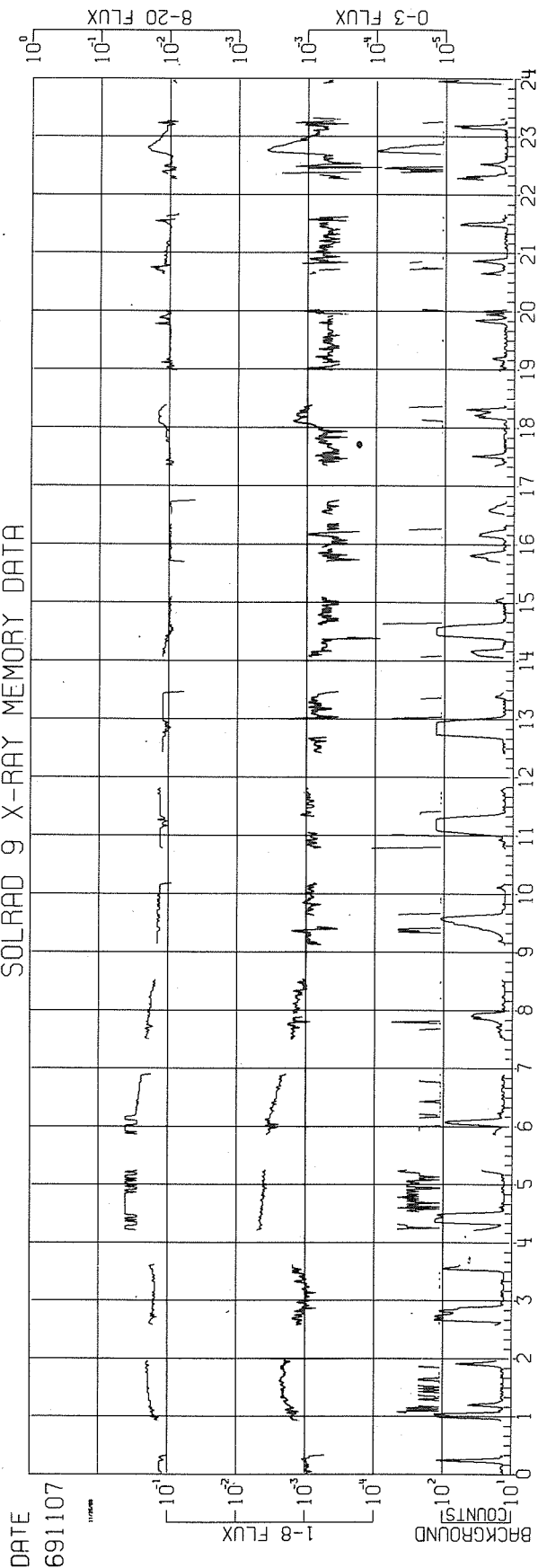
SOLRAD 9 X-RAY MEMORY DATA



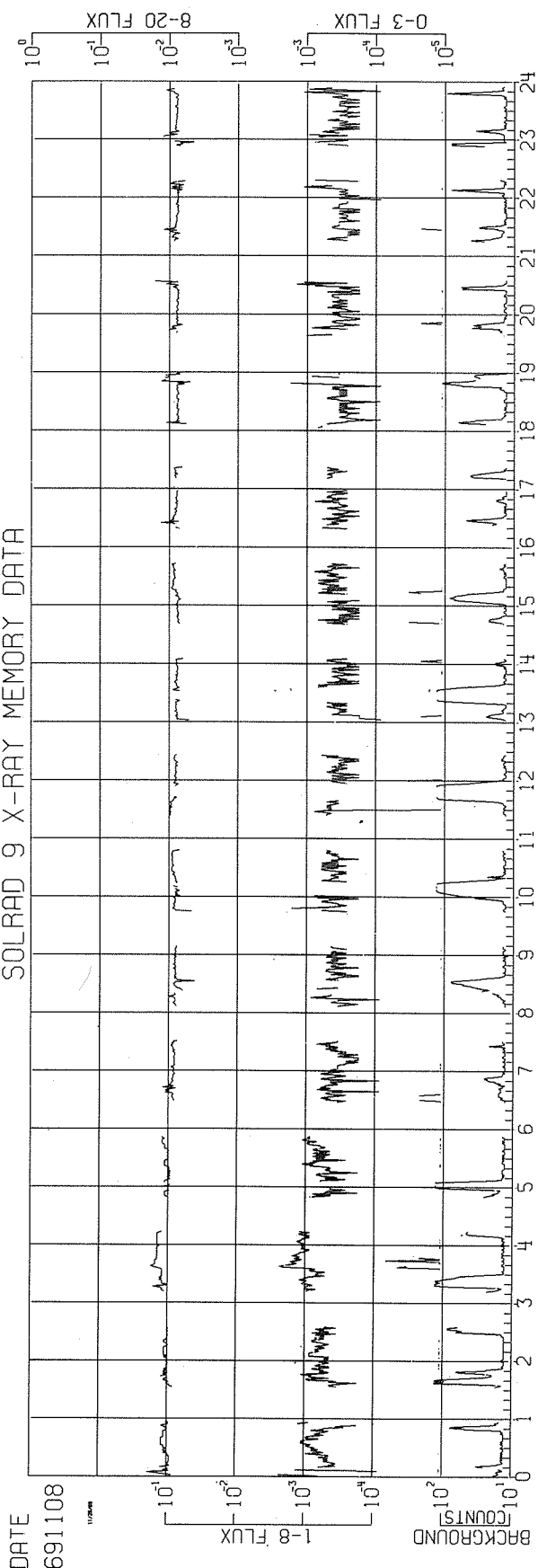
SOLRAD 9 X-RAY MEMORY DATA



SOLRAD 9 X-RAY MEMORY DATA



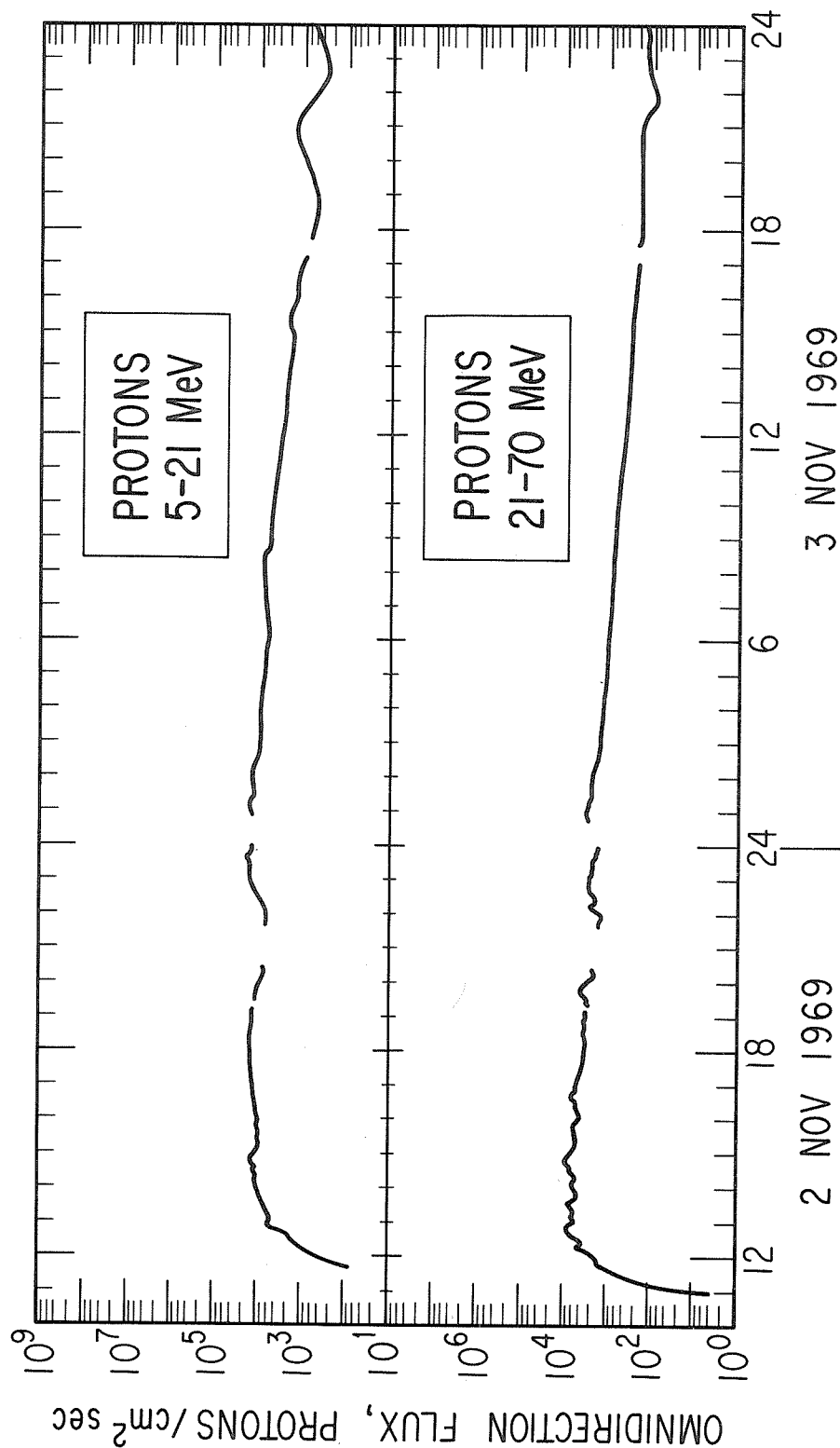
SOLRAD 9 X-RAY MEMORY DATA



SHORT WAVE RADIO FADEOUTS	SUDDEN PHASE ANOMALIES
SUDDEN COSMIC NOISE ABSORPTION	SUDDEN ENHANCEMENTS OF SIGNAL
SUDDEN ENHANCEMENTS OF ATMOSPHERICS	SUDDEN FREQUENCY DEVIATIONS

NOV. 1969	UNIVERSAL TIME			WIDE SPREAD INDEX	SWF TYPE IMP	IMPORTANCE					STATIONS	KNOWN FLARE
	START	END	MAX			ABS SCNA	SEA	SPA	SES	SFD		
01	0455		0505					147			MR-GE-MR/ 147	*
01	0455		0459						18		MR-GE/ 18 GE-MR/ 11	
02	0149		0153					61			GE-MR-GE/ 61	NF
02	0148		0150						3		MR-GE-MR/ 3 PU NU	NF
02	0946	1240		5	SL 3						HC	
02	0950	1240	1045	1		1+					DE(AA17-330)	
02	0945	1500	1050	1				330			DA PU SO RY	0955
02	1017	1218	1022	3	S 3+						AN-A / 115	
02	1036	1300						115			PU	
02	1018	1139		1					1		CP-SA/ 36	1103E
02	1058		1120					36			CP-SA/ 10	
02	1056		1116						10			
03	1845	1940	1848	1				22			HA(**-22)	NF
03	1843	1940	1849					-259			TM-JP/-259 CP-JP/ 216 TM-C / 100	
03	1843		1848						15		CP-JP/ 15	
03	2150	2320	2154	1				36			HA(**-36)	*
03	2149	2305	2157					144			TM-C / 144 TM-JP/ 75	
04	0409	0453	0412	5	S 1						MA TO	NF
04	0414	0442	0418	1		2 1					MA	
04	0414	0534	0420	1				168			MA(K18-168, AA17-108,R16-108)	
04	0410		0416					280			MR-GE-MR/ 280	
04	0414		0415						12		GE-MR-GE/ 12	
04	1512	1526D	1526	1				26			UM(R16-26, AA17-22)	1513
04	1510	1554	1522					39			TM-B / 39	
04	1508	1526D	1526	1					2		UM	
04	1555	1703	1607	1				58			UM(R16-58, AA17-54)	NF
04	1558		1606					244			CP-JP/ 244 TM-JP/-151 TM-B / 151	
04	1557		1600						15		NT-JP/ 108 NT-JP/ 15	
04	1555	1703	1607	1					3		CP-JP/ 12 UM	
04	2023	2100	2028	1			1	57			A19	2024
04	2023	2123	2028	5							TM(M23-57) HA(**-43)	
04	2023	2115	2032					-234			TM-JP/-234	
04	2023	2110	2028	3					2		A21 A20	
04	2127	2146		1	S 2-						TO	2125
04	2127	2315	2137	5				79			TM(**-79) HA(**-65)	
04	2127	2255	2139					-306			TM-JP/-306	
04	2126		2128						3		MR-GE/ 43	
04	2128	2240	2133	1					2+		GE-MR/ 18 GE-MR-GE/ 3 A21	
05	0333	0359	0337	1	S 2						MA	0331
05	0332	0402	0339	1				58			MA(R16-58, AA17-54,K18-30)	
05	0333		0340					126			MR-GE-MR/ 126	
05	0335		0342						4		GE-MR-GE/ 4	
05	1005	1022	1010	1				36			SL(R16-36)	1005
05	1111	1130	1118									

The solar proton flux in two energy channels as observed by The Aerospace Corporation from ATS-1 on the directional spectrometer given below has been furnished by G. A. Paulikas, Director, Space Physics Laboratory. A description of the experiment is published in the "Solar-Geophysical Data" Descriptive Text No. 318 (Supplement) issued February 1971.



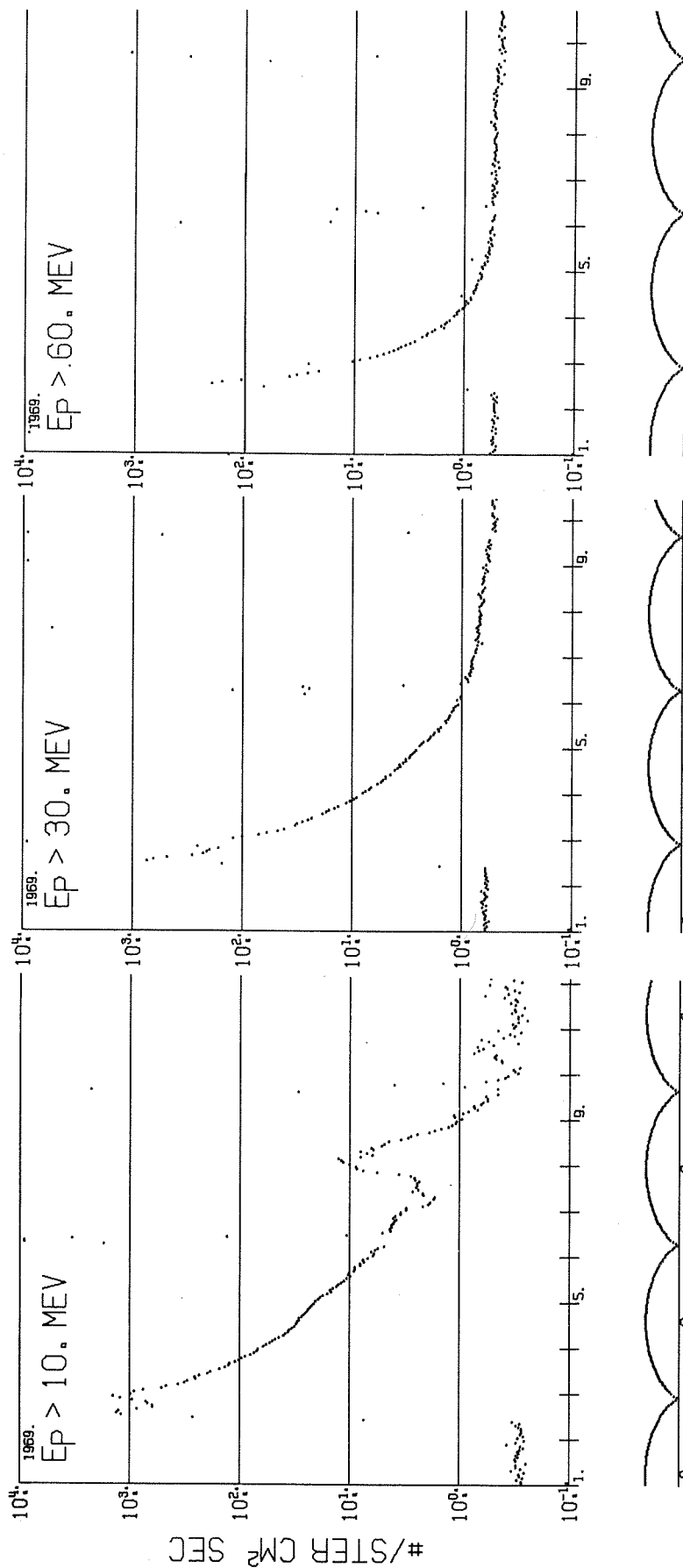
NOVEMBER 1969

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SOLAR PROTONS BY SATELLITE EXPLORER 41 (1969-53A)

NOVEMBER 1969

HOURLY AVERAGES



COSMIC RAY PROTONS

NOVEMBER 1969

Counting Rates (particles/sec)

Univ. of Chicago

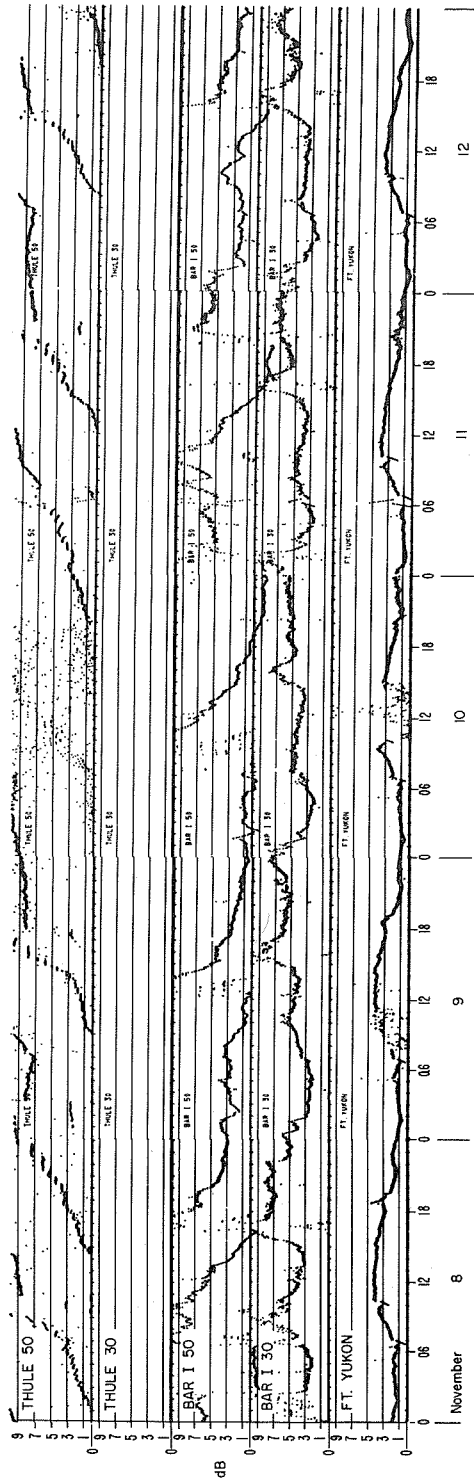
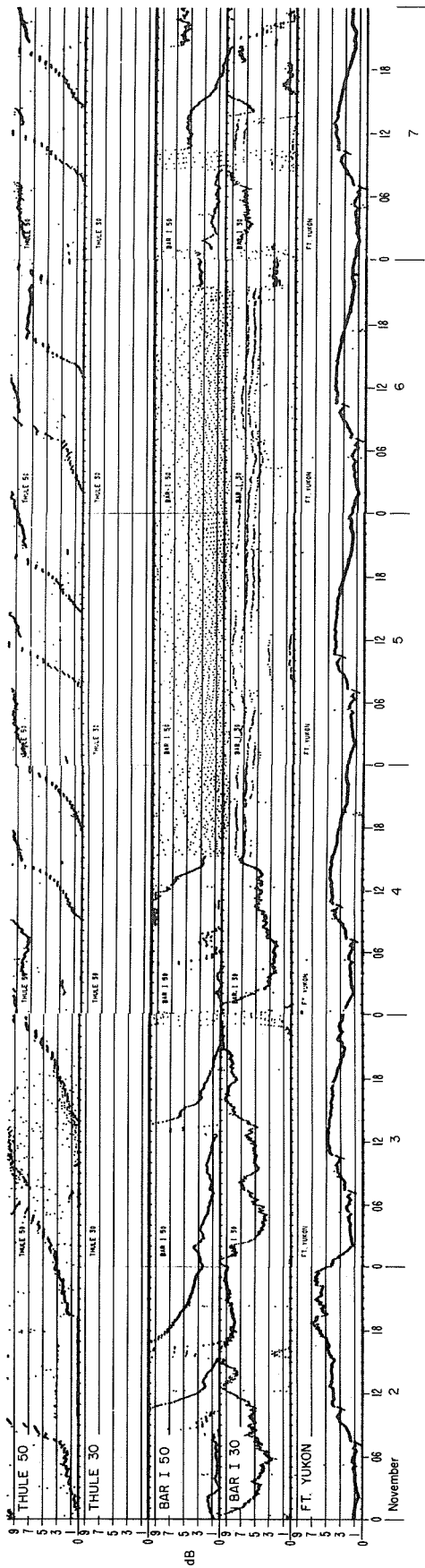
Pioneer VI					Pioneer VII			
Date Nov.	Time (UT)	0.6-13 Mev*	13-175 Mev**	>175 Mev	Time (UT)	0.6-13 Mev*	13-175 Mev**	>175 Mev
1	1800	4.74	0.0481	0.1945	1800	8.78	0.0550	0.142
2	1800	2.09	0.0517	0.176	1800	4.30	0.0673	0.209
4	1930	91	0.669	0.259	1930	0.275	0.421	0.277
5	1800	152	0.631	0.283	1800	45.0	0.445	0.244
6	1745	187	0.557	0.231	1745	274	0.474	0.197
7	1745	>1000	2.11	0.336	1745	>1000	2.69	0.571
8	1745	400	0.609	0.226	1745	559	0.765	0.271
9	1800	280	0.265	0.269	1800	289	.330	.208
11	1800	86.7	0.118	0.229	1800	86.1	.115	.178
12	1800	65.1	0.0945	0.228	2200	53.2	0.0939	0.165
13	1800	69.9	0.0962	0.213	1900	50.4	0.0845	0.160
21	1800	24.4	0.190	0.208	1850	43.7	0.277	0.158
23	1800	8.68	.1186	.1866	1830	7.88	0.112	0.143
25	1800	20.67	.132	.227	1900	13.0	0.169	0.156
26	1800	112	.0454	.218	1800	100	.0795	.1284
27	1800	103	.0604	.228	1800	110	.0514	.145
28	2200	64	.0540	.191	1800	66.9	.0510	.121
29	2000	750	7.8	.200	1820	715	1.86	.130
30	2330	>1000	.204	.220	2000	>1000	.318	.174

* Includes He 0.6-13 Mev/nucleons and electrons ~ 0.5 Mev - see J. Retzler and J. A. Simpson, J. Geophys. Res. 74, 9, 2149-2160, 1969 for discussion of the electron response of Pioneer VII.

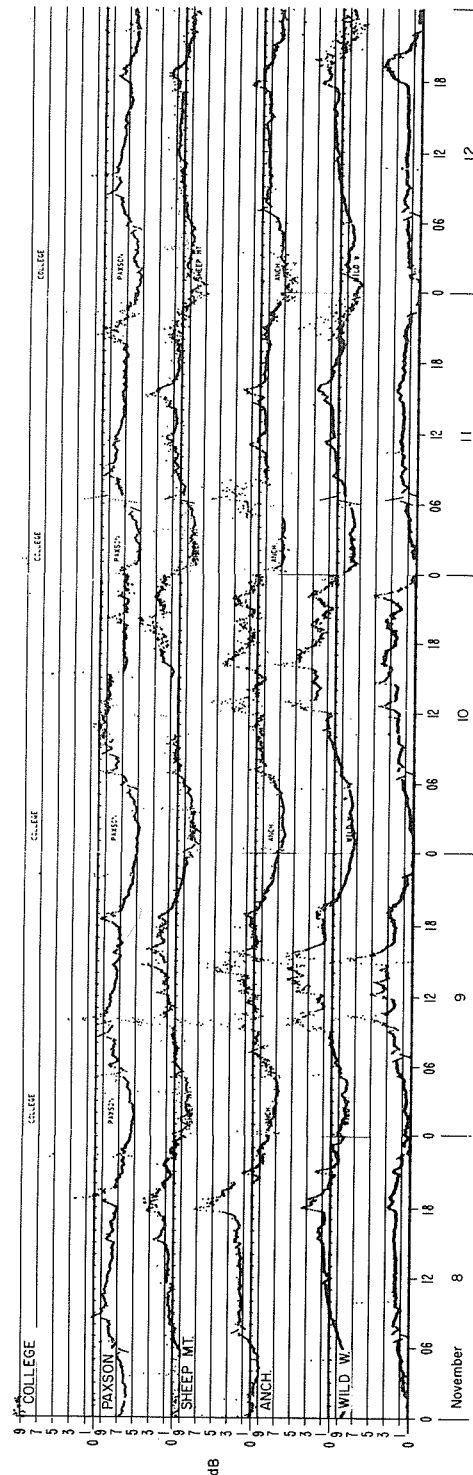
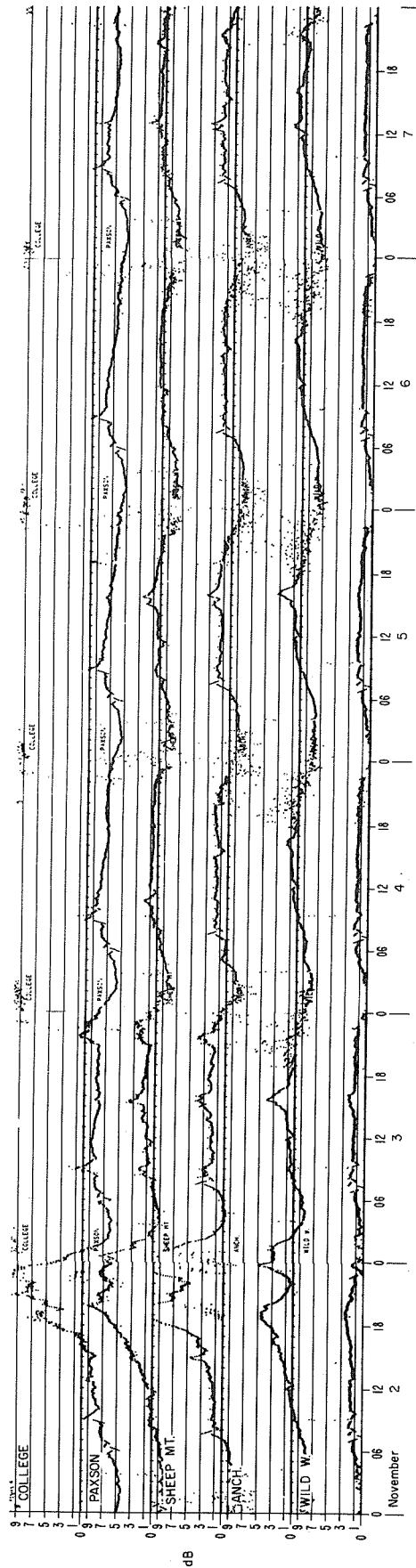
** Includes He >13 Mev/nucleon.

- Notes: (1) Data are subject to future determination of possible saturation during enhanced flux observations.
- (2) Pioneer heliographic longitude is given in the solar wind tabulations in terms of "co-rotation" delay time (days).
- (3) Unidirectional geometrical factors are 5.8×10^{-4} , 1.15×10^{-4} , $1.7 \times 10^{-4} \text{ m}^2 \text{ ster}$ for the three ascending energy intervals given above. The two higher energy intervals have a bidirectional response at energies greater than ~ 100 Mev/nucleon. See Fan, Pick, Pyle, Simpson, and Smith, J. Geophys. Res., 73, 5, 1552-1582 for a description of the University of Chicago instruments.
- (4) Quiescent counting rates are:
Pioneer 6 0.1, 0.056, 0.3 counts per second
Pioneer 7 0.1, 0.055, 0.14 counts per second for the three ascending energy intervals.
- (5) Times are only approximate (time accurate to approximately ± 15 minutes).

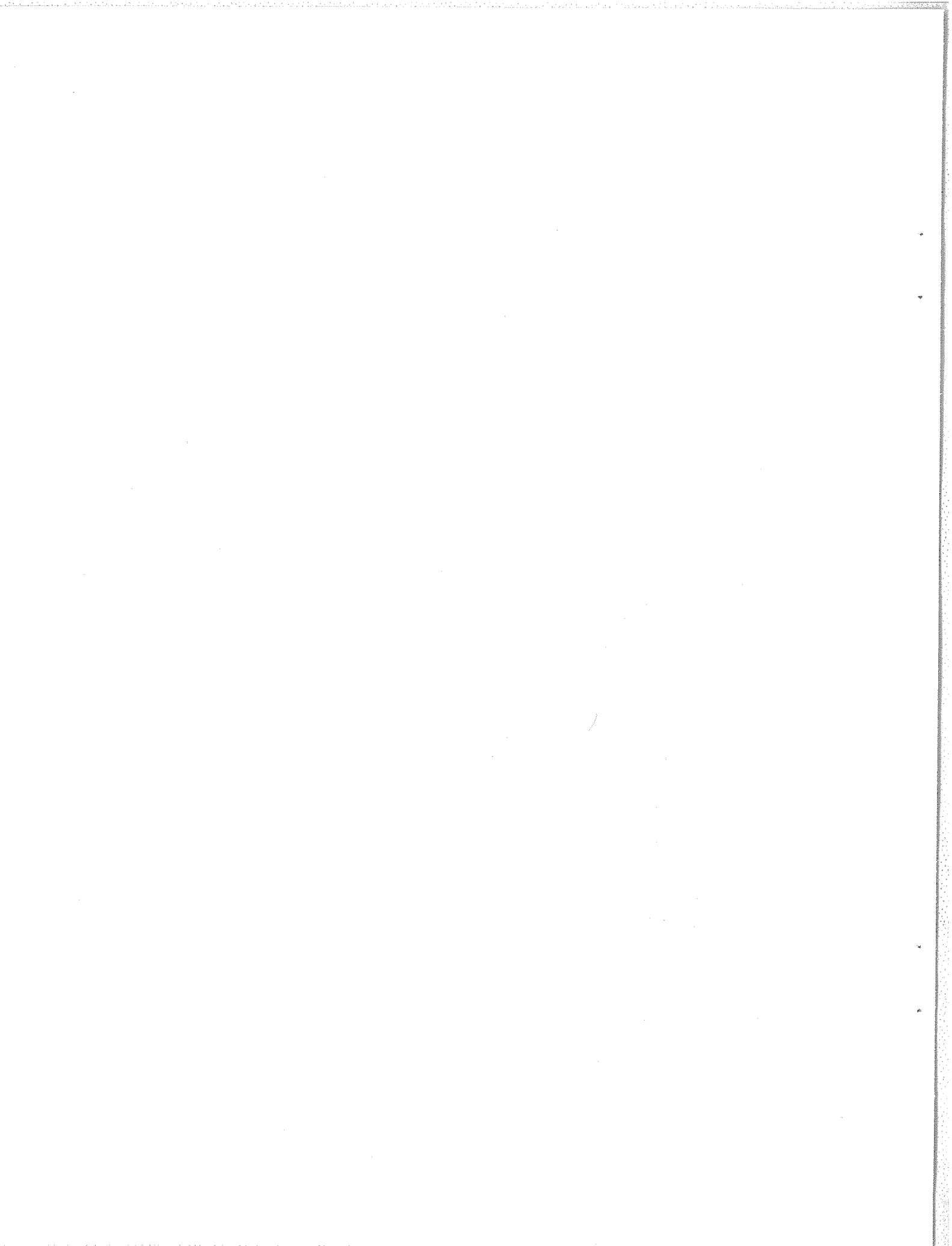
November 2-12, 1969



November 2-12, 1969



Riometer data for November 2-12, 1969 from selected high latitude stations (Thule plus the Alaskan riometer chain). Data are scaled in dB from a computer generated quiet day curve.



"Hourly Values of Ionospheric Data from Fifteen Locations for November 1-12, 1969"

by

S. M. Ostrow

National Oceanic and Atmospheric Administration, Boulder, Colorado

The f-plot type graphs of Figure 1 show the behavior of the ionosphere at fifteen stations for the period November 1-12, 1969. Table 1 lists the geographic and geomagnetic coordinates of these locations. Examination of all available ionospheric data for this period indicated that the pattern of ionospheric variation exhibited at this selection of stations was quite typical of all locations of corresponding geomagnetic latitude. The first twelve stations show the progression of behavior from high to middle geomagnetic stations in the northern hemisphere. Maui and Huancayo are typical low and equatorial stations, and Scott Base, in the Antarctic, is comparable in location to Godhavn.

In Figure 1, the hourly data are plotted against universal time for November 1-12, 1969, with monthly median values for each station presented in a separate graph at the extreme right. Midnight on local standard time is marked. Vertical lines drawn from the bottom of each graph indicate values of f_{min} . Dots connected by a continuous line represent values of f_oF_2 . Reasons for missing data are indicated by standard symbols (see Piggott and Rawer, 1961, "URSI Handbook of Ionogram Interpretation and Reduction", for explanation of the symbols and format of the graph).

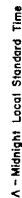
Ordering of the graphs by geomagnetic latitude produced a more consistent sequence than ordering by geographic coordinates or geomagnetic dip. Very little change would occur if the ordering were according to ground L value. In spite of the considerable dispersion in longitude of the locations, a smooth transition in general behavior is apparent. Some of the variation in timing for finer details may be due to the considerable differences in equipment and operating conditions among the stations.

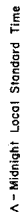
A striking feature of these graphs is the rapid transition between polar cap and middle latitude behavior occurring between, roughly, 65°N and 63°N geomagnetic latitude. This is most prominent in f_{min} , which exhibits numerous periods of absorption higher than normal poleward of the boundary, that are almost, if not quite, imperceptible at lower latitudes. The more modest changes in f_oF_2 patterns suggest that a transition in F2-layer behavior also occurs at these latitudes. Patterns for Maui and Huancayo seem to show unusual f_oF_2 variations associated with some high latitude events. The significance of these patterns, and of the differences in behavior between the Arctic and Antarctic, require careful evaluation because the ionosphere is quite variable, particularly at high latitudes.

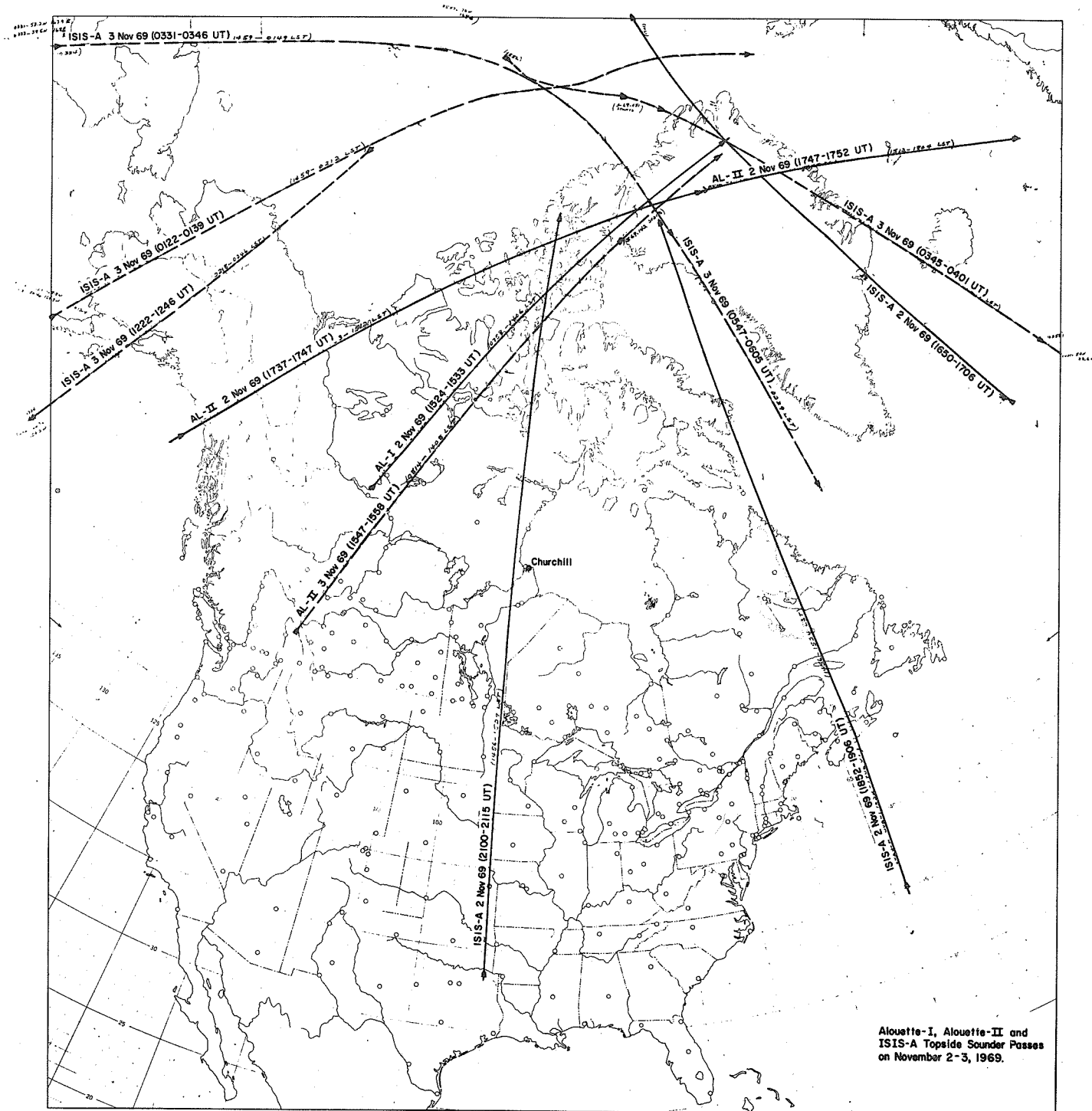
Table 1

Station	Geographic		Geomagnetic		Computed Dip
	Lat.	Long.	Lat.	Long.	
	ϕ	λ	Φ	Λ	
Godhavn	69.3°N	53.5°W	79.9°N	32.7°E	81.6°
Narssarssuaq	61.2°N	45.4°W	71.2°N	36.8°E	77.5°
Churchill	58.8°N	94.2°W	68.7°N	322.6°E	83.4°
Kiruna	67.8°N	20.4°E	65.2°N	115.6°E	76.8°
Sodankyla	67.4°N	26.6°E	63.8°N	120.0°E	76.8°
Lycksele	64.7°N	18.8°E	62.8°N	111.0°E	75.5°
Winnipeg	49.8°N	94.4°W	59.8°N	326.6°E	77.9°
Salekhard	66.5°N	66.7°E	57.3°N	149.0°E	79.4°
Ottawa	45.4°N	75.9°W	56.8°N	351.1°E	75.2°
Leningrad	60.0°N	30.7°E	56.3°N	117.4°E	73.5°
Sverdlovsk	56.7°N	61.1°E	48.5°N	140.7°E	73.6°
Tomsk	56.5°N	84.9°E	45.9°N	159.6°E	75.4°
Maui	20.8°N	156.5°W	20.9°N	268.1°E	38.8°
Huancayo	12.0°S	75.3°W	0.6°S	353.8°E	-1.4°
Scott Base	77.9°S	166.8°E	79.0°S	294.6°E	-82.2°

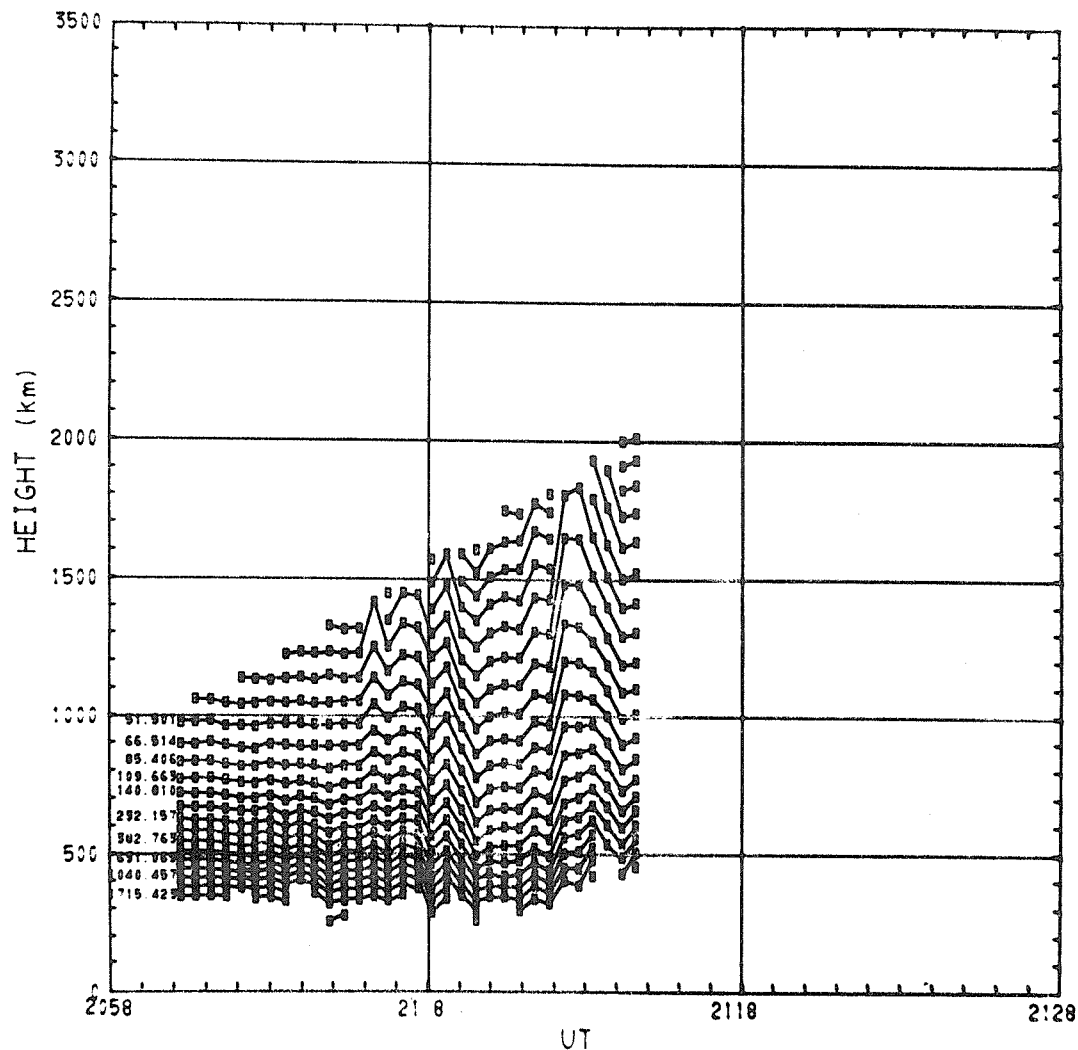
(Compilers' Note: The f-plots for the fifteen stations presented here are only a representative sample of the ionospheric data available at World Data Center-A, Upper Atmosphere Geophysics, at Boulder, for November 1969. Formats in which the data are held include ionogram film, daily/hourly value tabulations and f-plots, and may be available on paper copy, punched cards and magnetic tape.)







Map shows ISIS-1, ALOUETTE-1 and ALOUETTE-2 passes for which data have been scaled at Boulder for November 2-3, 1969.



Contours of constant electron density vs. height and time (UT) for the pass of ISIS-A, going north and passing over Churchill between 2058 and 2115 UT, November 2, 1969. The electron density scale is in units of 10^3 electrons/cm³. The data for many such passes of ISIS-A, ALOUETTE-1 and ALOUETTE-2 exist in Boulder for the period November 2-12, 1969.

COSMIC RAY INDICES
(Neutron Monitors)

NOVEMBER 1969

Nov. 1969	DEEP RIVER	CLIMAX
	DAILY AVERAGE COUNTS PER HOUR	DAILY AVERAGE COUNTS PER HOUR
1	6465.9	3845.0(28)
2	6416.7	3825.5(16)
3	6387.2	3799.7
4	6400.4	3795.9
5	6407.1	3797.1
6	6387.1	3787.2
7	6381.7	3788.5
8	6378.1	3783.0
9	6254.7	3722.2
10	6144.9	3609.9(32)
11	6214.8	3688.8(22)
12	6255.2	3695.6
13	6333.0	3743.4
14	6419.5	3805.4
15	6463.7	3839.5
16	6477.7	3861.1
17	6441.6	3846.7
18	6442.4	3842.6
19	6472.7	3839.8
20	6512.5	3843.8
21	6543.7	3863.9
22	6542.3	3889.7
23	6413.4	3818.2(38)
24	6435.5	3820.0(12)
25	6401.4	3766.4(10)
26	6442.9	3845.7(14)
27	6380.7	3777.4
28	6395.5	3789.8
29	6389.1	3793.2
30	6425.7	3804.2

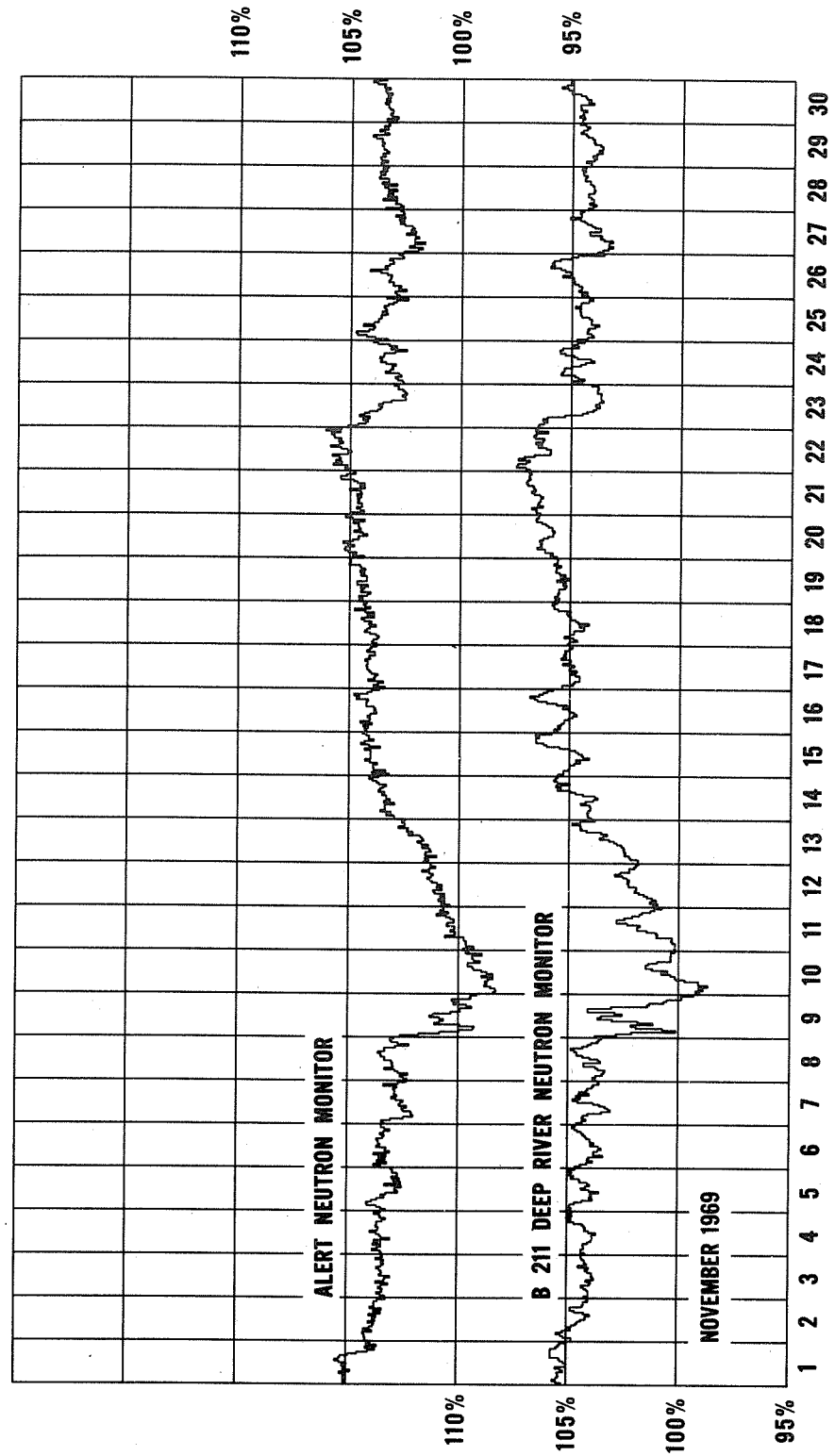
() Number of hours for which data are available if less than 24 (or number of section hours if less than 40 for Climax).

Deep River Neutron Monitor, Scaling Factor 300.

Climax IGC Station B305, Scaling Factor 100.

COSMIC RAY INDICES **(Pressure Corrected Hourly Totals)**

NOVEMBER 1969



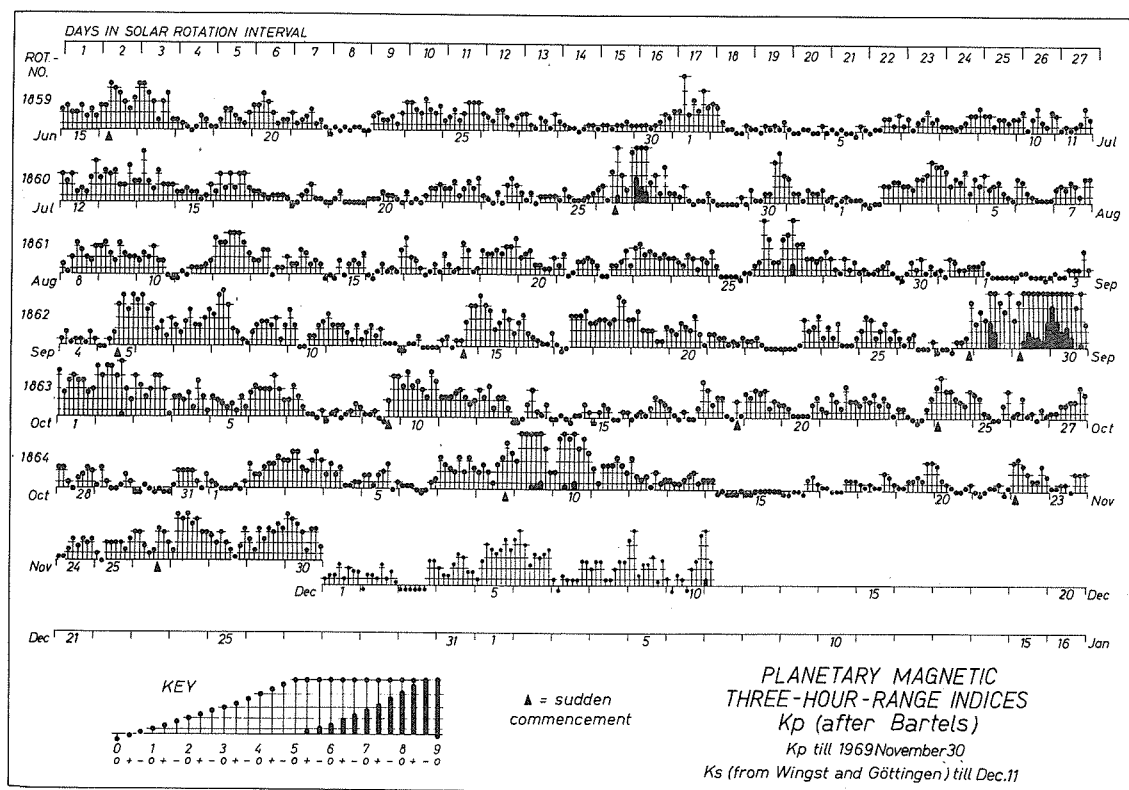
GEOMAGNETIC ACTIVITY INDICES

NOVEMBER 1969

DAY		K _p THREE-HOUR RANGE INDICES								SUM	C _i	C _p	A _p
		1	2	3	4	5	6	7	8				
1	QQ	1	1-	0+	0+	0+	1-	0+	1	5-	0.0	0.0	3
2		3-	2-	2-	2+	3-	3-	3+	3	20	0.6	0.6	11
3	D	3	4-	4-	2+	2	3	4-	3	24+	0.9	0.9	16
4		2-	3-	2-	2+	1-	1-	1	1	12-	0.2	0.3	6
5		2-	2-	1-	2-	2	3-	0+	1	12-	0.3	0.3	6
6	QQ	1-	1-	1-	0+	0	0+	1	1+	5	0.1	0.0	3
7		3+	3-	2+	2	3+	2	3+	2+	21+	0.8	0.7	12
8		2	3-	2	1	3-	3+	4+	4-	22-	0.9	0.8	14
9	D	3	5	5	5+	5+	6-	4	2	35+	1.5	1.5	40
10	D	2	5-	5+	5-	6-	4	5-	4-	35-	1.4	1.4	37
11		2+	1	3-	3-	3-	3+	3-	2	19+	0.8	0.6	11
12		3+	2-	1+	2-	1-	2	1	1+	13	0.3	0.3	7
13		1+	1	1	1+	2-	2	1	1+	11-	0.2	0.2	5
14	QQ	1+	1+	0	0+	0	0	0	0+	3+	0.0	0.0	2
15	QQ	0	0	0+	0+	0+	0+	0+	0+	2	0.0	0.0	2
16	Q	0	0	0+	0+	0	1+	2-	1	5-	0.0	0.0	2
17	Q	1-	1-	0+	0+	0+	1+	1+	1+	6+	0.1	0.1	3
18	Q	1	1-	1	1-	1-	2	2-	1	9-	0.3	0.1	4
19		1-	1-	1+	1+	2-	1+	3	3	13	0.4	0.4	7
20	Q	3-	1+	1	1-	0+	0+	1-	1	8	0.2	0.2	4
21	QQ	0+	0	0+	1-	1-	1	0	1-	4-	0.0	0.0	2
22		3	3+	3-	2	1+	1+	3-	2-	18	0.5	0.6	10
23	Q	1-	1-	1	1	0+	2	2	2	10-	0.3	0.2	5
24		1-	1-	1+	2+	2-	2+	2	2+	13+	0.4	0.3	6
25		1	0+	2	2	2	2	1+	2+	13	0.2	0.3	6
26		3	3	2-	1	1+	3+	3	2	18+	0.8	0.6	11
27	D	1+	4+	4	4+	4-	4	3	3	28-	1.1	1.1	22
28		3-	2	3	2	1+	1-	2-	3+	17-	0.5	0.5	9
29		2+	1+	3+	2+	3+	3	4-	3+	23-	0.9	0.8	14
30	D	4+	4	4-	3	1+	3+	3+	2-	25-	0.9	1.0	18
MEAN 0.49												0.46	10

Preliminary storm sudden commencements occurred in November 1969 on 08/1837, 22/0255 and 26/1509 UT.

GEOMAGNETIC ACTIVITY INDICES



DAILY AVERAGE INDICES A_p

	1968	1969										
	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.
1	9	8	3	10	24	8	5	17	3	3	20	3
2	6	4	47	9	16	28	6	6	5	2	31	11
3	18	1	54	3	17	15	5	3	14	4	18	16
4	21	3	13	6	11	8	5	3	13	4	10	6
5	25	3	10	10	10	10	6	2	7	18	6	6
6	9	1	16	14	11	8	4	4	5	20	16	3
7	5	9	9	17	20	5	8	6	8	13	6	12
8	11	8	9	11	8	5	14	5	9	19	3	14
9	6	4	4	9	12	11	15	7	11	10	9	40
10	14	3	12	5	6	10	11	7	6	8	21	37
11	6	4	62	18	7	5	8	6	4	8	10	11
12	8	6	10	39	11	8	18	12	21	4	9	7
13	6	1	10	8	20	39	15	14	7	2	5	5
14	3	9	10	8	16	50	32	13	6	11	3	2
15	6	13	18	18	14	131	8	5	4	19	3	2
16	8	10	11	15	17	43	18	10	4	7	5	2
17	4	21	4	38	21	14	18	4	6	12	6	3
18	7	20	1	11	15	20	4	3	7	19	7	4
19	12	11	8	17	5	10	6	2	13	9	10	7
20	24	11	8	22	8	8	10	3	7	8	5	4
21	13	6	8	13	6	13	5	4	6	5	8	2
22	13	4	4	11	10	11	2	7	5	3	7	10
23	14	5	9	47	5	10	5	5	11	7	4	5
24	9	12	6	79	9	10	12	4	6	6	14	6
25	20	29	7	22	9	7	10	4	4	10	7	6
26	4	23	12	10	6	4	6	20	15	4	4	11
27	13	12	32	6	11	3	5	45	21	6	8	22
28	5	5	15	6	60	9	4	4	6	47	6	9
29	9	2	13	13	12	5	4	2	4	71	4	14
30	8	6	16	16	27	11	5	13	4	90	1	18
31	11	6	15			12		6	5		5	
MEAN	9	8	15	17	14	17	9	8	8	15	9	10

PRINCIPAL MAGNETIC STORMS

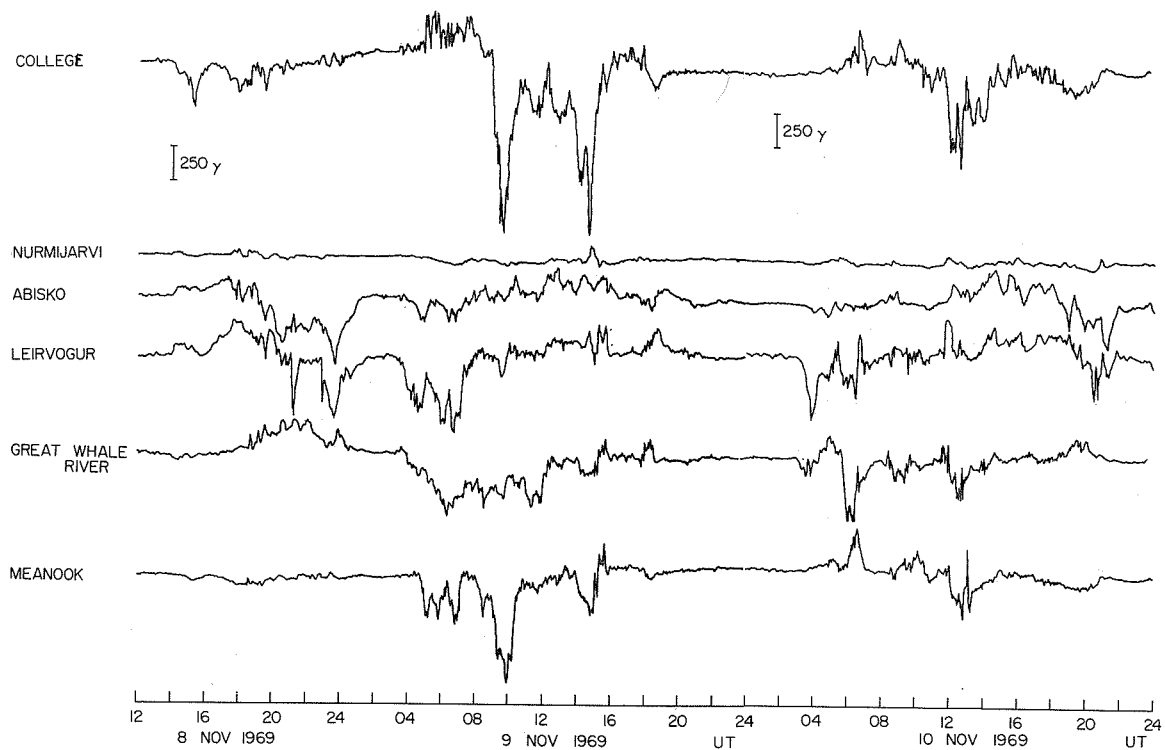
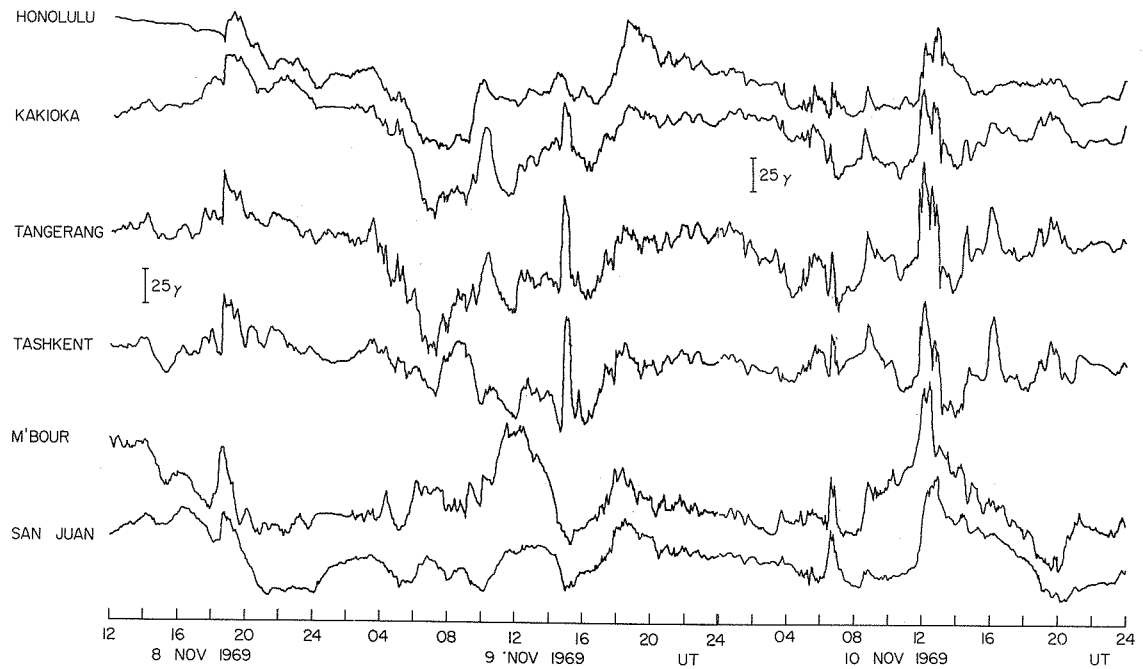
NOVEMBER 1969

DATE 1969 MO. DA.	STORM TIME		OBS.	GEO- MAG. LAT.	SUDDEN COMMENCEMENT				C FIGURE DEGREE OF AC- TIVITY	MAXIMAL ACTIVITY ON K-SCALE 0 TO 9			RANGES			STORM NUMBERS
	UT START	UT END MO. DA. HR.			TYPE	AMPLITUDES				MO. DA.	3-HOUR PERIOD	K INDEX	D (°)	H (γ)	Z (γ)	
						D(°)	H(γ)	Z(γ)								
11 08	06--	11 10 17	COLL	64.6N	..	..	..	..	MS	11 09	4,5	7	369	1920	1020	50
	1837	11 10 21	SITK	60.0N	SC *	+ ..	- ..	- ..	S	11 09	4	8	130	870	470	50
	1837	11 10 21	NEWP	55.1N	SC *	11	43	6	M	11 09	4	6	40	231	197	50
	14--	11 11 24	WITT	54.1N	..	..	..	..	MS	11 09	5,6	6	40	180	80	50
	1837	11 10 21	FRED	49.6N	SC *	+ 3	+47	- 9	M	11 09	4,5,6	5	23	191	44	50
	1837	11 11 01	BOUL	49.0N	SC *	+ 5	- 8	- 9	M	11 09	4,6	5	23	155	45	50
										11 10	3,5	5				50
	1836	11 09 20	IRKU	40.8N	SC *	- 2.4	52	9	MS	11 09	4,5	6	23	124	36	50
	1837	11 10 21	TUCS	40.4N	SC *	+ 2	+10	+ 1	M	11 09	4,6	5	15	140	10	50
										11 10	3,5	5				50
	1837	11 10 21	SJUA	29.9N	SC	- 0.2	+18	+05	M	11 08	7	5	10	96	46	50
										11 09	6					50
										11 10	5,3					50
	1837	11 11 02	MBOR	21.3N	SC	- 1	+36	- 5	MS	11 10	5	6	4	100	45	50
	1836	11 10 22	HYDE	7.6N	SC	- 0.3	+35	- 1	MS	11 10	5	6	5	113	25	50
	1837	11 11 03	GUAM	4.0N	SC	--	17	04	M	11 09	4	5	00	50	10	50
	1837	11 12 03	APIA	16.1S	SC	+ 0	+15	- 9	M	11 09	5,7					50
										11 10	5	5	6	148	34	50
	1837	11 10 21	PMOR	18.6S	SC	+ 0.9	+22	+19	MS	11 10	5	6	9	120	80	50
	1836	11 12 02	HRMN	33.3S	SC	+ 1.1	+23	+12	MS	11 09	3,6	5	24	96	108	50
										11 10	5	6				50
	1837	11 09 21	GNAN	43.2S	SC *	+ 6 *	+21	+33 *	MS	11 09	5	6	17	100	120	50
	1836	11 11 18	TOOL	46.7S	SC *	3.6	14	--	MS	11 10	5	6	24	160	70	50
	1402	11 10 21	KGLN	57.3S	SC	--	--	-	MS	11 09	5	7	--	--	--	50
11 10	03--	11 10 22	IRKU	40.8N	..	..	..	..	MS	11 10	4,5	6	13	116	30	51
	0340	11 10 03	HONO	21.1N	SC	- 1	+55	+ 3	M	11 10	5	5	20	65	19	51
	0452	-- -- --	GUAM	4.0N	SC	--	13	05	M	11 10	4	5	00	50	10	51
	0633	-- -- --	GUAM	4.0N	SC	--	26	05	M	11 10	5	5	00	50	10	51
	03--	11 10 22	GNAN	43.2S	..	..	..	..	M	11 10	3,4,5	5	12	90	80	51
11 22	0253	11 22 22	HYDE	7.6N	SC	- 0.1	+23	- 3	M	11 22	1,2,4,5	3	1	76	13	52
	0254	11 22 14	HRMN	33.3S	SC	+ 2.8*	+14	+13	-	11 22	1	3				52
	0255	11 23 --	KGLN	57.3S	SC	--	--	-	M	11 22	7	4	--	--	--	52
11 26	1507	11 27 21	COLL	64.6N	SC *	- 6	+33	-15	MS	11 27	4,5	6	248	1180	680	53
	1507	11 27 16	SITK	60.0N	SC *	- *	+ *	+	M	11 27	4	6	40	230	370	53
	1506	11 27 22	IRKU	40.8N	SC	0.5	26	5	M	11 27	5	5	12	91	15	53
	1507	11 27 22	HYDE	7.6N	SC	- 0.4	+15	- 1	M	11 26	6	5	2	106	28	53
	1509	11 28 --	KGLN	57.3S	SC	--	--	--	M	11 27	2,3,5 6	4	--	--	--	53
11 29	18--	11 30 21	WITT	54.1N	..	..	..	..	M	11 29	7	5	20	90	40	54

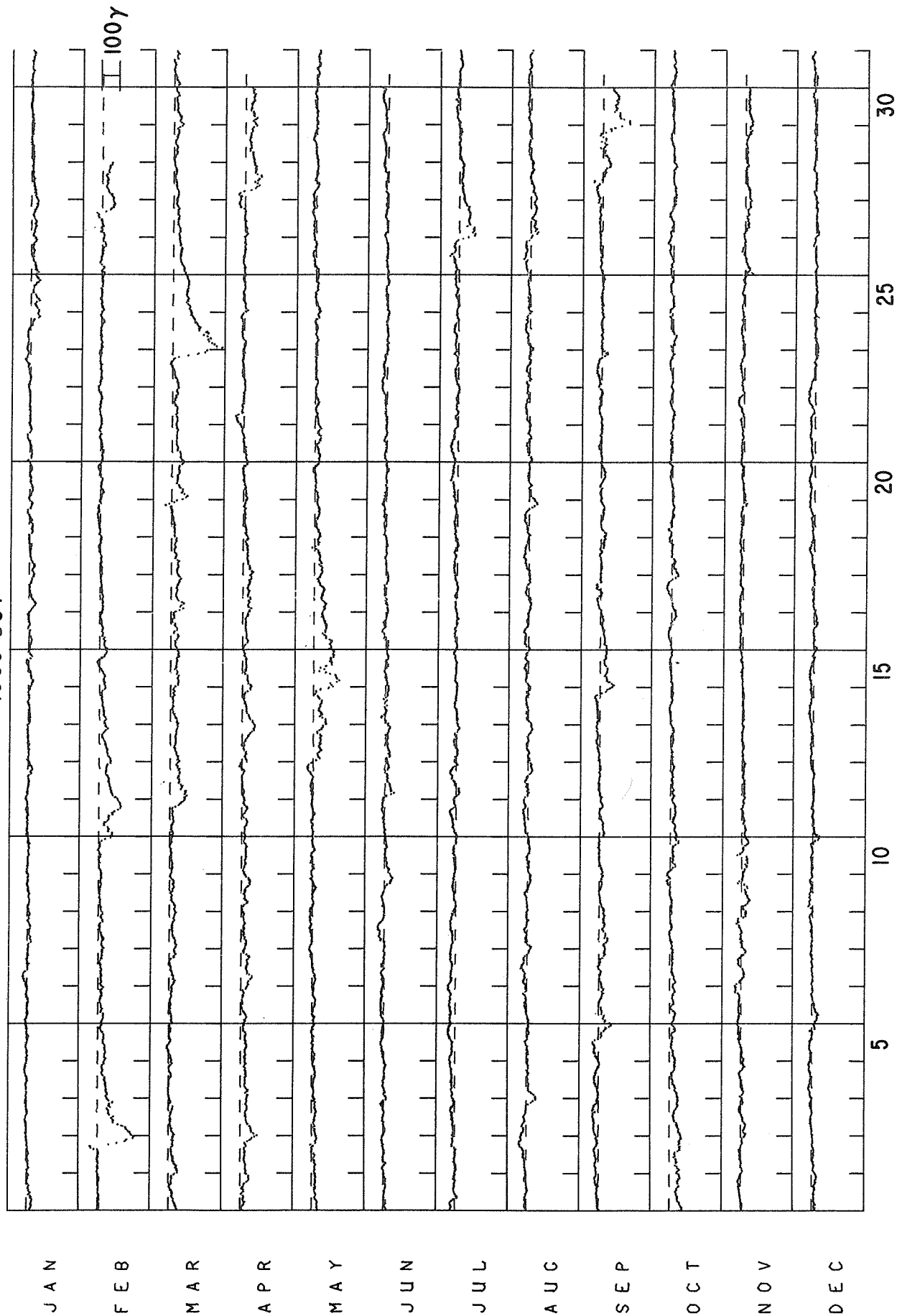
Errata: The principal magnetic storm observed at Hermanus, as reported on page 99 of SGD-304-Part I issued December 1969, occurred on October 24 at 0141 instead of October 23 at 0241.

MAGNETOGRAMS OF GEOMAGNETIC STORMS

8-10 NOVEMBER 1969



1969 DST



DAILY MEANS OF EQUATORIAL DST FOR 1969

DAY	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	-15	-6	-21	-20	-21	-7	8	7	11	-48	6	-12
2	-5	-34	-26	-30	-12	2	4	22	16	-44	-0	-5
3	3	-101	-12	-42	-16	0	14	8	24	-38	-8	5
4	4	-39	-3	-28	-10	-4	21	-12	10	-25	-4	14
5	-0	-33	-3	-23	-5	8	27	-2	-1	-17	5	6
6	-0	-20	-11	-16	-8	12	30	6	-19	-19	17	-11
7	4	-17	-18	-36	-3	5	26	16	-12	-16	1	3
8	-12	-19	-25	-17	9	14	21	4	-30	-4	2	7
9	-6	-12	-18	-25	-1	-8	8	-1	-11	1	-18	12
10	-3	-12	-9	-20	1	-12	5	-5	-3	-17	-18	3
11	3	-75	-23	-19	2	6	16	17	-13	-23	-9	-1
12	-6	-59	-60	-4	12	-19	8	-2	-1	-11	-9	1
13	-1	-40	-33	-30	-34	-18	2	-4	11	-8	-2	11
14	-5	-23	-20	-29	-42	-4	1	4	7	-0	-4	16
15	-8	-18	-37	-23	-98	-7	7	10	-38	1	5	12
16	-4	-17	-25	-20	-69	0	6	11	-18	1	14	-5
17	-16	-11	-42	-35	-45	-3	7	-0	8	3	13	4
18	-13	-4	-28	-28	-27	-1	11	14	-5	-6	14	13
19	-6	7	-8	-11	-18	10	12	3	-11	1	8	17
20	-6	-1	-47	-7	-6	1	25	-2	-7	3	4	24
21	0	-3	-34	-2	-22	6	25	3	2	6	11	21
22	3	3	-23	13	-9	10	6	14	5	3	16	26
23	10	4	-35	4	-5	16	11	6	11	7	13	6
24	-2	-0	-170	8	-7	-1	15	13	-0	3	12	1
25	-32	-3	-84	1	-8	2	11	9	-3	7	8	-1
26	-21	-4	-46	2	5	4	22	22	6	15	-2	5
27	-23	-15	-28	4	14	8	-58	-22	14	8	-13	-3
28	-15	-37	-15	-40	2	11	-18	-10	8	-4	-12	7
29	-6	0	-15	-35	6	20	-2	6	-19	7	-13	9
30	-2	0	-24	-43	3	20	13	12	-88	8	-22	11
31	-6	0	-11	0	-7	0	-1	10	0	2	0	17
MEAN	-6	-21	-4	-18	-14	2	9	5	-5	-7	1	7

ANNUAL MEAN

Preliminary Hourly Values of Equatorial Dst for November 1969

DAY	UNIT=GAMMAS										G.M.T.													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	3	-2	-4	-5	-3	-2	0	1	3	5	6	7	10	10	12	15	12	14	17	17	14	10	6	2
2	-1	-8	-5	-3	1	1	0	1	2	5	6	7	6	8	9	9	1	1	-1	-8	-6	-7	-6	-17
3	-23	-25	-16	-13	-18	-20	-24	-24	-19	-11	-10	-8	-5	-0	3	8	10	10	8	3	-7	-9	-4	-4
4	-2	3	-5	-14	-13	-7	-7	-6	-4	-4	-3	-3	-1	6	12	11	10	4	-5	-12	-21	-14	-10	-9
5	-11	-11	-7	-5	-4	-6	-3	-2	-3	2	4	10	12	12	10	10	8	12	14	13	15	17	17	21
6	19	18	15	14	13	12	12	14	15	15	15	13	13	12	12	11	10	11	14	21	36	35	34	32
7	37	28	9	9	-2	-8	-12	-13	-13	-11	-7	-4	6	11	16	16	16	19	6	-1	-13	-23	-25	-18
8	-8	-1	0	-0	5	-5	5	4	2	3	0	2	3	9	15	17	29	18	21	16	-11	-24	-21	-23
9	-22	-9	-9	-10	-23	-34	-38	-44	-43	-32	-29	-22	-23	-20	-19	-32	-29	-13	21	12	-3	-5	-5	-7
10	-5	-7	-14	-18	-26	-26	-19	-34	-30	-30	-30	-24	25	8	-1	-7	-6	-10	-18	-30	-36	-36	-32	-23
11	-14	-17	-15	-16	-20	-19	-16	-16	-7	-8	-12	-9	-8	-4	-3	-8	-4	1	3	-3	-5	-12	-6	-6
12	-11	-15	-9	-10	-12	-10	-11	-9	-11	-10	-11	-11	-11	-7	-4	-2	-4	-9	-8	-5	-7	-9	-14	-15
13	-7	-4	-3	-2	-2	-0	0	-2	-3	-6	-8	-5	-1	1	4	1	2	3	1	2	0	-3	-7	-4
14	2	1	-3	-5	-6	-4	-4	-4	-4	-3	-3	-3	-2	-3	-3	-3	-5	-8	-8	-6	-4	-2	-3	-4
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