



U.S. DEPARTMENT OF COMMERCE

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ENVIRONMENTAL DATA SERVICE

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Solar - Geophysical Data

NO. 395 JULY 1977

Part I (Prompt Reports)

DATA FOR

JUNE 1977

MAY 1977

**NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
BOULDER, COLORADO**

For obtaining bulletins on a data exchange basis, send request to: World Data Center A for Solar-Terrestrial Physics, NOAA, Boulder, Colorado 80302.

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SOLAR - GEOPHYSICAL DATA

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No. 395

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Director
Solar - Terrestrial Data Services Division

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Daily Solar Activity Centers
Sacramento Peak Corona April 1977

	1976					1977						
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
A. Solar and Interplanetary Phenomena												
A.1 Sunspot Drawings	386A 22	387A 26	388A 26	389A 26	390A 28	391A 34	392A 28	393A 34	394A 32	395A 36		
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A.2b Zürich Final Sunspot Numbers R_z	391A 6	391A 6	391A 6	391A 6	391A 6	391A 6						
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A.5b McMath Daily Calcium Plage Indices	386A 89	387A 93	388A 94	389A 90	390A 95	391A101	392A 88	393A100	394A 96	395A104		
A.6 H α Synoptic Charts	386A 20	387A 26	388A 26	389A 26	390A 26	391A 32	392A 26	393A 32	394A 30	395A 34		
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A.8aa 2800 MHz - Daily Values of Solar Flux (ARO-Ottawa)	385A 7	386A 7	387A 7	388A 7	389A 7	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	
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A.10d 43 cm East-West Solar Scans (Fleurs)	385A 15	387A102	388A102	389A 15	389A 15	391B 44	391A 16	393B 36	393A 16	394A 15	395A 17	
A.10e 10.7 cm East-West Solar Scans (Ottawa-ARO)	385A 13	386A 13	387A 13	388A 13	389A 13	390A 13	391A 14	392A 13	393A 14	394A 13	395A 15	
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A.12e Energetic Solar Particles (IMP H & J)	390B 23	391B 20	392B 18	393B 15	394B 17	395B 17	---	---	---	---	---	
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A.18 Interplanetary Electric Field (Pioneer 8)	---	---	---	---	---	---	---	---	---	---	---	
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C.1d Flare Patrol Observations	385A 11	386A 11	387A 11	388A 11	389A 11	390A 11	391A 12	392A 11	393A 12	394A 11	395A 13	
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C.4a Solar Radio Spectral Obs. (Fort Davis)	386A 91	387A 95	388A 96	389A 92	390A 97	391A103	392A 90	393A102	394A 98	395A106	---	
C.4b Solar Radio Spectral Obs. (Boulder)	---	---	---	---	---	---	---	---	---	---	---	
C.4d Solar Radio Spectral Obs. (Culgoora)	387B 32	389B 29	389B 32	389A 92	391B 47	391A103	393B 37	393A102	394A 98	---	---	
C.4e Solar Radio Spectral Obs. (Weissenau)	386A 91	387A 95	388A 96	389A 92	390A 97	391A103	392A 90	393A102	394A 98	395A106	---	
C.4f Solar Radio Spectral Obs. (Sagamore Hill)	386A 91	387A 95	388A 96	389A 92	390A 97	391A103	392A 90	393A102	394A 98	395A106	---	
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C.4i Solar Radio Spectral Obs. (Dürnten)	386A 91	387A 95	388A 96	389A 92	390A 97	391A103	392A 90	393A102	394A 98	395A106	---	
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D.1c 27-day Chart of C _p	390A110	390A110	390A110	390A110	390A110	---	---	---	---	---	---	
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F.1a Cosmic Ray Neutron Counts (Deep River)	386A 99	387A103	388A103	389A 97	390A106	391A109	393B 44	393A109	394A110	395A114		
F.1b Cosmic Ray Neutron Counts (Climax)	386A 99	387A103	388A103	389A 97	390A106	391A109	392A 96	393A109	394A110	395A114		
F.1e Cosmic Ray Neutron Counts (Alert)	386A 99	387A103	388A103	389A 97	390A106	391A109	393B 44	393A109	394A110	395A114		
F.1f Cosmic Ray Neutron Counts (Calgary)	386A 99	387A103	388A103	389A 97	390A106	391A109	393B 44	393A109	394A110	395A114		
F.1g Cosmic Ray Neutron Counts (Sulphur Mountain)	386A 99	387A103	388A103	389A 97	390A106	391A109	393B 44	393A109	394A110	395A114		
F.1h Cosmic Ray Neutron Counts (Thule)	---	---	---	---	---	---	---	---	---	---	---	
F.1i Cosmic Ray Neutron Counts (Kiel)	386A 99	387A103	388A103	389A 97	390A106	391A109	392A 96	393A109	394A110	395A114		
F.1j Cosmic Ray Neutron Counts (Tokyo)	386A 99	387A103	388A103	389A 97	390A106	391A109	392A 96	393A109	394A110	395A114		
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Note: A = Part I, B = Part II.

386A 22 listed under 1976 Aug shows that data for August 1976 were contained in Solar-Geophysical Data Number 386 - Part I beginning on page 22.

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Jun 77

ALERT PERIODS
INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE

JUNE 1977

SUMMARY OF THE GEOALERT WWA MESSAGES

SUMMARY OF THE GEOALERT TWA MESSAGES											Outstanding events			Forecasts			Alert Situations
Message serial number	Date of issue	Date of obser- vation	Wolf number	10 cm solar flux	A index	Active Regions				Date				Location Lat-Long	Desc*		
						Location Lat-Long	No. of Total	Flares M	X								
152	1	31	49	89	07	N19W40 N18E42	0 0	0 0	0 0		1	N19W40 N18E42	Q Q	SOLQUIET MAGALERT MINOR 01			
153	2	01	61	86	08	S24W49 N20W55 N21E34	0 0 0	0 0 0	0 0 0		2	S24W49 N20W55 N21E34	Q Q Q				
154	3	02	58	89	14	S22W62 N22W67 N20E19 S26E74	0 0 0 0	0 0 0 0	0 0 0 0		3	S22W62 N22W67 N20E19 S26E74	Q Q Q E	SOLQUIET MAGQUIET			
155	4	03	84	91	07	S22W74 N20W79 N20E04 S24E58 S05W23	1 0 1 0 0	0 0 0 0 0	0 0 0 0 0		4	S22W74 N20W79 N20E04 S24E58 S05W23	Q Q Q Q Q	SOLQUIET MAGQUIET			
156	5	04	69	91	06	N20W08 S24E45	0 0	0 0	0 0		5	N20W08 S24E45	Q Q	SOLQUIET MAGQUIET			
157	6	05	72	88	08	N20W21 S24E34 N20W44	0 0 0	0 0 0	0 0 0		6	N20W21 S24E34 N20W44	Q E Q	SOLQUIET MAGQUIET			
158	7	06	53	88	07	S24E19 N20W60 S12E80	0 0 0	0 0 0	0 0 0		7	S24E19 N20W60 S12E80	Q Q Q	SOLQUIET MAGQUIET			
159	8	07	55	89	04	S24E07 N21W73	0 0	0 0	0 0		8	S24E07 N21W73	Q Q	SOLQUIET MAGQUIET			
160	9	08	52	90	05	S24W04 N19W84 S22E55	0 0 0	0 0 0	0 0 0		9	S24W04 N19W84 S22E55	Q Q Q	SOLQUIET MAGQUIET			
161	10	09	43	88	05	S25W17 S22E48	0 0	0 0	0 0		10	S25W17 S22E48	Q Q	SOLQUIET MAGQUIET			
162	11	10	43	88	07	S25W30 S22E35	0 0	0 0	0 0		11	S25W30 S22E35	Q Q	SOLQUIET MAGQUIET			
163	12	11	37	85	04	S24W42 S21E14	0 0	0 0	0 0		12	S24W42 S21E14	Q Q	SOLQUIET MAGQUIET			
164	13	12	29	81	04	S23W55 S19E03	0 0	0 0	0 0		13	S23W55 S19E03	Q Q	SOLQUIET MAGQUIET			
165	14	13	27	82	05	S24W64 S20W03	0 0	0 0	0 0		14	S24W64 S20W03	Q Q	SOLQUIET MAGQUIET			
166	15	14	22	80	09	S24W83 S21W22	0 0	0 0	0 0		15	S24W83 S21W21	Q Q	SOLQUIET MAGQUIET			
167	16	15	13	80	04	S21W34	0	0	0		16	S21W34	Q	SOLQUIET MAGQUIET			
168	17	16	11	79	07	S22W49	0	0	0		17	S22W49	Q	SOLQUIET MAGQUIET			
169	18	17	11	80	10	S21W61	0	0	0		18	S21W61	Q	SOLQUIET MAGQUIET			
170	19	18	36	82	10	S21W75 N25E63 N19E76	0 0 0	0 0 0	0 0 0		19	S21W75 N25E63 N19E76	Q Q Q	SOLQUIET MAGQUIET			
171	20	19	46	83	09	S08E43 N26E50 N21E64 S20E65	0 0 0 0	0 0 0 0	0 0 0 0		20	S08E43 N26E50 N21E64 S20E65	Q Q Q Q	SOLQUIET MAGQUIET			
172	21	20	31	86	08	N20E51 S22E58	0 0	0 0	0 0		21	N20E51 S22E58	Q Q	SOLQUIET MAGQUIET			
173	22	21	47	89	06	N20E34 S20E46	0 0	0 0	0 0		22	N20E34 S20E46	Q Q	SOLQUIET MAGQUIET			
174	23	22	58	96	08	S08E08 N20E24 S21E30	0 0 0	0 0 0	0 0 0		23	S08E08 N20E24 S21E30	Q Q E	SOLQUIET MAGQUIET			

ALERT PERIODS

INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE
JUNE 1977

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of obser- vation	Wolf number	10 cm solar flux	A index	Active Regions				Outstanding events	Forecasts			Alert Situations
						Location Lat-Long	No of Flares Total	M	X		Date	Location Lat-Long	Desc*	
175	24	23	58	96	09	N19E12 N15E73 S21E14	0 1 0	0 0 0	0 0 0		24	N19E12 N15E73 S21E14	Q E Q	SOLQUIET MAGQUIET
176	25	24	77	104	08	N19W03 S21E01 N15E61 N24W05	0 2 2 0	0 0 0 0	0 0 0 0		25	N19W03 S21E01 N15E61 N24W05	Q E E Q	SOLQUIET MAGQUIET
177	26	25	92	110	06	N19W11 S21W10 N15E47 N04W19	0 1 3 0	0 0 1 0	0 0 0 0		26	N19W11 S21W10 N15E47 N04W19	Q E E Q	SOLALERT 26/28 MAGQUIET
178	27	26	77	117	06	N20W28 S20W22 N17E36	0 2 3	0 1 3	0 0 0		27	N20W28 S20W22 N17E36	Q E E	SOLALERT 27/28 MAGQUIET
179	28	27	78	116	07	N19W45 S20W34 N15E23	0 4 5	0 0 1	0 0 0		28	N19W45 S20W34 N15E23	Q E E	SOLALERT 28/29 MAGQUIET
180	29	28	62	110	10	S21W51 N17E12	1 4	0 0	0 0		29	S21W51 N17E12	Q Q	SOLNIL MAGQUIET
181	30	29	36	108	09	S22W64 N16W01	0 0	0 0	0 0		30	S22W64 N16W01	Q Q	SOLQUIET MAGQUIET
182	01	30	42	103	07	S20W80 N16W17	0 0	0 0	0 0		01	S20W80 N16W17	Q Q	SOLQUIET MAGQUIET

* Q=Quiet E=Eruptive A=Active P=Proton C=Caution D=Doubtful O.G.=Other Groups MF=Major Flare

6
Jun 77

RELATIVE SUNSPOT NUMBERS ZURICH, R_z

1976 FINAL							1977 PROVISIONAL					
DAY	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	9	10	17	30	0	0	20	15	0	7	15	44
2	8	16	20	28	0	0	32	19	8	11	14	43
3	10	17	12	30	0	0	25	19	8	10	22	43
4	8	13	11	30	0	0	22	16	8	7	23	49
5	8	16	17	25	0	0	21	18	8	7	16	40
6	10	14	10	24	0	0	13	7	9	8	16	33
7	7	24	9	30	0	7	0	7	8	7	12	41
8	0	27	9	7	0	19	0	26	20	0	19	38
9	0	31	18	14	0	22	0	21	20	0	25	33
10	0	24	22	0	0	19	0	23	19	0	29	29
11	0	23	24	0	0	22	14	25	19	8	34	27
12	0	28	20	13	0	16	19	48	9	12	35	22
13	0	28	18	17	0	12	23	68	8	16	26	20
14	0	15	10	23	0	32	22	61	7	22	33	25
15	0	8	16	25	7	34	20	45	0	34	26	8
16	0	10	14	28	7	36	18	49	0	33	21	8
17	0	19	8	31	14	34	30	44	0	32	20	8
18	0	22	6	24	20	24	26	37	0	29	12	21
19	0	25	7	20	13	15	7	25	0	22	0	36
20	0	20	0	19	12	8	0	10	0	12	11	21
21	0	17	0	15	8	9	15	9	0	20	14	26
22	0	0	0	22	13	9	24	9	10	19	7	40
23	0	9	7	28	11	9	34	9	8	18	7	57
24	0	15	7	36	10	17	35	8	7	8	7	60
25	0	10	16	30	9	22	17	8	14	0	0	74
26	0	14	17	29	9	25	8	8	8	14	7	71
27	0	7	18	24	0	16	0	0	9	8	13	74
28	0	8	18	19	8	17	13	0	16	15	16	65
29	0	9	23	10	8	19	11	0	8	9	20	50
30	0	16	30	8	0	19	8	0	8	8	30	45
31	0	9		0		12	10		8		40	
MEAN	1.5	10.4	13.5	20.6	5.2	15.3	15.7	22.6	8.0	13.2	18.4	38.4

1976 yearly mean = 12.6

DAILY SOLAR FLUX AT 2800 MHz OTTAWA ARO

FLUX ADJUSTED TO 1 A.U., S₁₁

1976							1977					
DAY	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	69.3	75.9	76.3	74.6	70.9	70.2	73.8	81.7*	72.6	74.8	77.2	88.9
2	69.1	77.8	75.3	73.9	69.1	71.6	76.5	82.1	75.4	76.3	78.5	90.9*
3	69.5	82.3	75.7	73.8	69.8	71.2	76.0	80.9	74.8	75.6	81.9	93.0*
4	68.6	82.3	75.9	73.1	69.9	71.3	75.5	78.7	76.9	75.8	81.4*	94.2
5	69.5	84.2	75.4	74.8	70.9	70.1	74.0	77.8	77.6	75.5	79.6	90.2*
6	69.6	84.3	73.1	74.7	69.7	70.1	72.4	75.2	77.6	76.1	78.5	90.6
7	69.5	83.7	73.0	74.5	69.5	69.7	71.4	74.6	77.2	75.5*	77.1*	92.0
8	69.7	82.0	72.9	74.0	69.3	70.8	69.6	78.6	81.6	74.3	77.9	91.9*
9	69.7	82.3	73.2	74.8	70.7	74.3	68.4	83.1	80.3	74.8	83.6	90.9
10	70.1	82.6	75.6	74.9	69.4	76.8	68.8	83.5	80.5	76.5	80.8	89.2*
11	70.2	80.4	75.7	73.7	70.5	78.3	71.2	84.6	78.9	79.2	80.8	87.2
12	69.8	80.6	75.7	73.3	70.8	78.6	74.9	86.9*	78.6	80.2	79.7	83.3
13	69.8	75.7	74.3	72.0	69.4	78.1	77.5	88.5	77.9	82.7	81.5	84.2
14	70.7	73.4	74.7	74.4	69.2	81.0	74.5	85.2	77.2	83.4	84.8	82.3
15	71.4	72.8	73.9	75.5	71.1	79.8	75.6	84.4	74.8	85.8	85.0	82.3
16	69.8	72.9	75.8	77.0	71.1	77.8	77.5	85.7	74.1	83.7	85.1	81.4
17	69.4	77.3	76.5	78.0	72.8	75.5	76.1	89.6*	74.1	83.6	84.1	82.4
18	70.0	78.2	74.3	77.3	75.6	73.8	75.4	86.5	73.9	80.8	82.9	84.3
19	70.2	70.1	73.3	76.6*	74.6*	72.9	76.9	82.8	74.0	79.8*	82.1	85.2
20	69.4	74.5	72.2	75.8	72.9	71.7	75.2	81.1	72.3	80.4*	81.3	88.9
21	70.1	73.2	70.9	73.5	73.2	71.8	74.0	78.6	72.8	80.8	81.4	92.4
22	70.1	72.3	70.5	73.3	73.3	73.4	76.8	75.9	74.6	80.1	82.9	98.8*
23	68.7	70.8	72.0	80.1	72.5	73.7	78.7	75.9	74.7	77.5	82.4	99.4
24	69.4	70.9	72.5	80.1	72.9	74.2	77.4	74.2	74.8	76.5	79.2	107.4
25	68.8	70.6	73.4	84.7	72.7	75.6	74.9	74.3	74.0	76.4	77.4	113.8
26	68.5	70.1	72.8	80.4	72.1	75.6	76.0	72.3	75.1	75.4	76.8	120.7
27	69.4	71.5	73.3	77.4	73.7	75.2	75.3	72.0	74.5	74.9	77.9	115.9*
28	69.4	72.8	73.6	73.8	71.7	74.5	77.1	72.6	74.4	74.2	79.1	113.4
29	69.4	73.3	71.9	72.1	69.7	74.8	76.1		75.4	74.8	81.7	111.9
30	70.7	73.8	72.6	72.1	69.7	75.1	76.3		74.6	76.6	89.9	106.9
31	72.3	73.8		70.4		76.4	79.6		74.1		92.0	
MEAN	69.8	76.6	73.9	75.4	71.3	74.3	74.9	80.3	75.8	78.2	81.4	94.5

* adjusted for burst

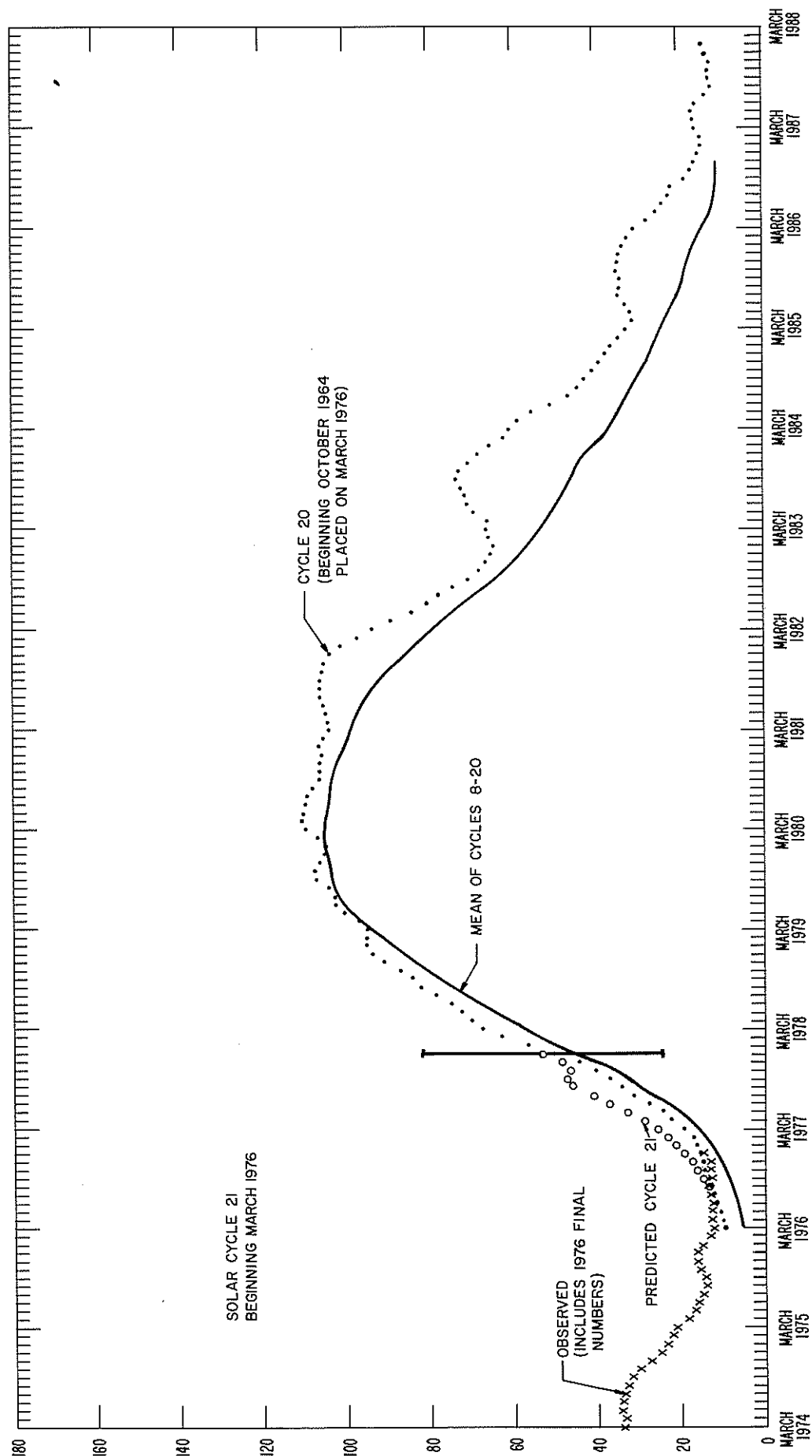
DAILY SOLAR INDICES

JUNE 1977

JUN 1977		YEAR DAY	BARTELS 27-DAY CYCLE NUMBER	SUNSPOT NUMBERS		OBSERVED FLUX OTTAWA 2800	SOLAR FLUX ADJUSTED TO 1 A.U.							
				R _Z	R _{A'}		AFGL 15400	AFGL 8800	AFGL 4995	OTTAWA 2800	AFGL 2695	AFGL 1415	AFGL 606	AFGL 410
1	152	20	44	40	86.4		278	126	88.9	89.4	56.6	42.8	21.5	10.1
2	153	21	43	47	88.3*		283	127	90.9*	90.3	60.0	43.1	23.1	9.0
3	154	22	43	47	90.4*		288	129	93.0*	96.3	61.3	42.8	23.6	11.7
4	155	23	49	40	91.5		274	129	94.2	93.5	61.0	44.1	24.8	19.6
5	156	24	40	40	87.6*		271	125	90.2*	89.7	60.5	43.5	23.8	11.7
6	157	25	33	40	88.0		282	122	90.6	91.1	58.7	43.1	22.6	10.5
7	158	26	41	42	89.3		277	126	92.0	94.7	62.0	43.4	24.6	21.5
8	159	27	38	35	89.2*		280	127	91.9*	96.3	60.7	41.7	22.2	18.0
9	160	1	33	27	83.2		277	125	90.9	87.6	60.7	45.7	22.4	12.4
10	161	2	29	27	86.5*		274	123	89.2*	89.2	62.1	46.7	24.0	10.7
11	162	3	27	25	84.6		271	121	87.2	86.0	58.9	44.4	20.3	10.0
12	163	4	22	22	80.8		269	120	83.3	82.7	55.2	41.7	21.1	9.0
13	164	5	20	19	81.6		271	120	84.2	82.7	53.4	43.0	24.1	10.0
14	165	6	25	21	79.7		276	120	82.3	80.9	53.2	42.1	23.6	9.3
15	166	7	8	10	79.7		268	118	82.3	79.8	49.7	39.4	22.0	8.6
16	167	8	8	6	78.9		274	118	81.4	80.2	49.8	40.3	23.3	9.3
17	168	9	8	14	79.8		275	121	82.4	81.0	52.3	43.2	20.9	9.2
18	169	10	21	18	81.6		280	122	84.3	83.5	52.4	42.1	23.4	8.9
19	170	11	36	36	82.5		273	122	85.2	89.6	55.3	40.6	20.8	9.6
20	171	12	21	25	86.1		273	127	88.9	89.0	57.5	43.0	23.5	10.0
21	172	13	20	30	89.4		275	128	92.4	91.9	58.4	43.6	22.7	8.9
22	173	14	40	34	95.6*		284	138	98.8*	102.0	65.5	45.1	23.7	9.6
23	174	15	57	44	96.2	530	287	136	99.4	98.7	65.1	43.3	22.0	8.8
24	175	16	00	54	104.0	549	297	146	107.4	106.0	69.8	48.0	25.2	9.3
25	176	17	74	54	110.2		312	156	113.8	115.0	70.9	47.2	24.5	10.5
26	177	18	71	58	116.7		308	160	120.7	118.0	75.5	46.8	23.8	
27	178	19	74	54	112.1*		303	152	115.9*	116.0	73.8	48.2	26.5	10.3
28	179	20	65	45	109.7		298	151	113.4	112.0	70.2	46.6	28.3	12.3
29	180	21	50	40	108.2		285	147	111.9	109.0	69.9	47.6	25.2	12.4
30	181	22	45	34	108.4		289	142	106.9	105.0	66.2	46.2	29.5	16.8
MEAN			38.4	34.4	91.5		281	131	94.5	94.0	61.0	44.0	23.6	11.3

* Adjusted for burst.

Note: Data gaps in AFGL Sagamore Hill data are due to equipment problems.



PREDICTED AND OBSERVED SUNSPOT NUMBERS

SMOOTHED OBSERVED AND PREDICTED SUNSPOT NUMBERS
CYCLE 21

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1976	15.2	13.2	12.2	12.6	12.5	12.2	12.9	13.9	14.1	13.3	13.3	14.7
1977	16.6 (1)	18.4 (3)	20.8 (4)	23.6 (6)	26.8 (8)	30.4 (10)	33.8 (12)	37.2 (16)	40.7 (19)	44.7 (23)	49.1 (26)	53.6 (29)
1978	58.2 (32)	63.3 (36)	68.0 (39)	71.7 (42)	74.9 (45)	78.0 (48)	81.2 (49)	85.3 (49)	90.2 (50)	94.3 (52)	98.0 (53)	101.6 (54)
1979	104.6 (55)	107.1 (56)	110.1 (59)	113.6 (61)	116.2 (62)	117.8 (64)	118.6 (65)	118.9 (66)	118.7 (67)	118.2 (66)	117.9 (65)	118.1 (63)
1980	118.6 (63)	118.3 (63)	116.9 (62)	115.5 (60)	114.3 (59)	113.7 (58)	113.4 (57)	112.8 (57)	112.6 (58)	113.0 (59)	112.3 (59)	110.6 (57)
1981	108.5 (55)	107.3 (54)	106.3 (52)	105.8 (50)	105.6 (48)	105.2 (47)	104.3 (46)	102.7 (44)	100.4 (41)	97.7 (40)	94.9 (39)	92.5 (38)
1982	90.7 (36)	88.7 (34)	86.2 (33)	82.7 (32)	79.0 (31)	76.0 (28)	72.7 (25)	70.0 (24)	67.0 (23)	63.9 (22)	61.8 (21)	60.5 (21)
1983	59.1 (21)	57.3 (21)	55.4 (22)	54.1 (22)	53.1 (24)	51.8 (25)	50.7 (27)	49.6 (28)	48.8 (28)	47.8 (28)	46.2 (27)	43.9 (27)
1984	41.3 (27)	39.2 (28)	38.0 (29)	36.7 (30)	35.1 (30)	33.7 (29)	32.6 (28)	31.5 (26)	30.3 (26)	29.1 (26)	28.0 (25)	27.0 (25)
1985	26.4 (25)	25.5 (24)	24.5 (23)	23.5 (22)	22.7 (21)	22.0 (21)	21.1 (22)	20.1 (22)	19.5 (23)	19.4 (23)	19.1 (22)	18.4 (22)
1986	17.4 (21)	16.4 (20)	15.5 (19)	14.5 (18)	13.7 (17)	13.1 (15)	12.8 (14)	12.6 (13)	12.3 (12)	12.0 (10)	12.0 (10)	12.3 (10)
1987	12.8 (11)	13.5 (12)	14.2 (13)	14.9 (14)	15.8 (15)							

For each month, the upper figure is the observed or predicted Zürich smoothed sunspot number. The lower figure in parenthesis is the corresponding absolute value of the 90% prediction interval, an indication of the uncertainty above and below the predicted number. Observed numbers are those with no prediction intervals. The observed smoothed sunspot numbers are based on final Zürich numbers through 1976.

The predicted sunspot numbers are derived from a regression analysis based on cycles 8 through 20. Tests indicate that earlier cycles are from a different statistical population.

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Jun 77

H α SOLAR FLARES

JUNE 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION MIN.	IM- POR- TANCE	OBS. COND. TYPE	MEASUREMENTS			REMARKS	
	DATE	START	MAX. PHASE	END	APPROX.		CENTRAL DISTANCE	MCMA PLAGE REGION	CMP DAY				TIME UT	MEAS. AREA MILL OF Disk	CORR. AREA Sq. Deg.		
					LAT.	MER. DIST.											
HTPR	02	1246E		1353D	S25	E85	.992		8.9	67D	SF		C	1328	50		E
HTPR	03	0907	0920	0935	N20	E19	.536		4.8	28	SB		C	0920	130	1.3	E
HTPR	03	0949	0951	1002	N22	W73	.974		28.9	13	SF		C	0951	20		
HTPR	03	1004	1008	1021	S25	E72	.945		8.8	17	SF		C	1008	20		
RAMY	03	1233E	1238	1241	N23	E11	.520		4.3	8D	SF	3	C		31		H R
RAMY	03	1608	1621U	1636	S21	W70	.934		29.4	28	SN	3	C		95		FDE
MCMA	03	1610		1755	S22	W70	.934	14791	29.4	105	SN		C	1700	50	1.8	E
MONT	04	0950E	0953	1009D	S22	W83	.988		29.2	19D	SF		C	0953	20		D
ZURI	04	1116	1116	1144	N33	E45	.849		7.8	28	SB		C	1116	50	1.0	
ZURI	04	1212	1214	1218	N33	E45	.849		7.9	6	SN		C	1214	100	1.9	
MITK	04	2352	2355	2411	N18	W90	1.001	14785	29.2	19	1N		C	2355	80		E
BUCA	06	0902	0903	0919	S21	E26	.487		8.3	17	SF		P	0903	63	.8	E
BUCA	06	1255		1305	S24	E35	.615		9.2	10	SF		C	1305	15	.2	D
BUCA	06	1312	1313	1320	S24	E35	.615		9.2	8	SN		C	1313	15	.2	D
WEND	06	1332		1355	N20	W36	.696		3.9	23	SN		C				
ZURI	06	1521	1521	1533	N32	E09	.632		7.3	12	SB		C	1521	90	1.1	
HTPR	07	0631	0634	0651	S23	E18	.409		8.6	20	SF		C	0634	10	.1	
HTPR	07	1320	1323	1328	S25	E16	.411		8.8	8	SN		C	1323	50	.5	E
MCMA	07	1321		1323	S25	E17	.421	14796	8.8	2	SN		C	1323	40	.5	E
BUCA	07	1324		1332	S25	E20	.451		9.1	8	SN		C	1324	34	.4	CE
HTPR	07	1503	1516	1522	N22	W68	.952		2.5	19	SF		C	1516	50		E
MCMA	09	1233	1237	1250	S27	W16	.437	14796	8.3	17	SN		C	1237	30	.4	E
MCMA	09	1826		1838	S26	W20	.463	14796	8.3	12	SN		P	1837	40	.5	EH
MCMA	09	1948	2016	2035	S23	E48	.757	14801	13.4	47	SN		C	2016	50	.8	E
MONT	10	0750	0752	0800	S24	E44	.718		13.6	10	SF		C	0752	40		E
MONT	10	0846	0858	0911	S25	E38	.656		13.2	25	SN		C	0858	150		
BUCA	10	0850		0935	S22	E36	.619		13.1	45	SF		C	0850	63	.9	CE
MONT	10	0937	0938	0950	S24	E43	.707		13.6	13	SF		C	0938	40		E
BUCA	10	0940	0941	1006	S22	E41	.678		13.5	26	SN		C	0941	47	.7	E
BUCA	10	1105	1124	1128	S23	W23	.468		8.7	23	SF		C	1124	15	.2	D
WEND	12	1722		1740	S20	W22	.433	14796	11.1	18	1N						
MITK	13	0354	0409	0539	S20	E03	.251		13.4	105	SB		C	0409	110	1.2	E
TEHR	13	0400	0415	0521	S18	E 6	.234		13.6	81	SN	9	C		190		DE
MCMA	14	1305		1317	S23	W19	.426	14801	13.1	12	SF		P	1306	30	.3	E
HTPR	14	1307	1309	1317	S22	W20	.427		13.0	10	SF		C	1309	20	.2	
HTPR	15	0822	0824	0847	S23	W31	.567		13.0	25	SF		C	0824	10	.1	
HTPR	15	1507	1510	1520	S23	W27	.519		13.6	13	SF		C	1510	10	.1	
MCMA	15	1520		1630	S23	W34	.603	14801	13.1	70	SN		C	1535	40	.5	ELT
HTPR	17	0638	0722	0750	S09	E85	.995		23.7	72	SF		C	0722	20		
MONT	17	0657E	0657	0707	S10	E90	1.000		24.0	10D	SF		C	0657	20		D
MONT	17	1042	1052	1126D	S22	W53	.807		13.5	44D	SN		C	1052	180		
HTPR	17	1045	1049	1110	S23	W54	.818	14801	13.4	25	1N		C	1049	150	2.5	E
RAMY	17	1055E	1058U	1120	S21	W55	.824		13.3	25D	SF	1	C		159		F
MONT	18	0835	0837	0845	S22	W64	.898		13.6	10	SF		C	0837	20		D
MONT	18	0947	0957	1013	S22	W65	.905		13.5	26	SF		C	0957	20		D
HTPR	18	0952	1005	1009	S12	W72	.947		13.0	17	SF		C	1005	20	.4	
WEND	18	0953		1014	S21	W65	.905		13.5	21	SN		C				
MONT	18	0957	1030	1115D	S21	E90	.999		25.2	78D	SF		C	1030	20		DK
HTPR	18	1453E		1458D	S21	W73	.952		13.1	5D	SF		C	1454	10	.2	
MONT	20	0808	0811	0822	N25	E57	.891		24.6	14	SF		C	0811	20		D
HTPR	23	0755		0759D	N14	E86	.999		29.8	40	SF		C	0756	20		
MONT	23	1032	1102	1120D	N21	E21	.547		25.0	48D	SF		C	1102	40		E
HTPR	23	1041E		1112D	N22	E22	.566		25.1	31D	SF		C	1053	60	.6	E
MCMA	23	1710		1724	S24	E28	.545	14815	25.8	14	SN		C	1723	30	.4	EH
MCMA	23	1825	1833	1838	N14	E88	1.000	14822	30.4	13	SN		C	1833			EL
HTPR	24	0637	0637	0644	S23	E24	.491		26.1	7	SF		C	0637	40	.4	E
HTPR	24	0652		0706D	N14	E70	.951		29.5	14D	SF		C	0701	30		

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Jun 77H α SOLAR FLARES

JUNE 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION MIN.	IM- POR- TANCE	OBS. COND. TYPE	MEASUREMENTS			REMARKS
	DATE JUN	START	MAX. PHASE	END	APPROX.		CENTRAL DISTANCE	MCMA PLAGE REGION	CMP DAY				TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
					LAT.	MER. DIST.										
▲ MONT	24	0654	0701	0705	N14	E76	.977		30.0	11	SF	C	0701	20		D
┌ MONT	24	0734	0742	0751	N14	E76	.977		30.0	17	SN	C	0742	60		
└ HTPR	24	0735	0742	0746	N14	E70	.951		29.6	11	SB	C	0742	100		
┌ HTPR	24	0800	0817	0925	N15	E75	.974		30.0	85	SN	C	0817	50	1.0	E
└ MONT	24	0801	0826	0926	N15	E76	.978		30.0	85	SF	C	0826	60		EK
┌ MONT	24	0830	0833	0839	S22	E12	.354		25.3	9	SF	C	0833	40		
└ HTPR	24	0831	0833	0840	S22	E12	.354		25.3	9	SF	C	0833	30	.3	
┌ MONT	24	0909	0924	0931	S22	E12	.354		25.3	22	SF	C	0924	40		
└ MONT	24	0937	0942	0945	N15	E75	.974		30.0	8	SN	C	0942	60		E
┌ HTPR	24	0938		0943D	N13	E70	.950		29.7	50	SB	C	0939	40	.8	
└ MONT	24	0956	0959	1002	S22	E11	.345		25.2	6	SF	C	0959	40		D
┌ MONT	24	1006	1007	1010	N15	E75	.974		30.0	4	SF	C	1007	20		D
└ MONT	24	1123	1126	1130D	N15	E75	.974		30.1	70	SF	C	1126	20		D
┌ MCMA	24	1230	1241	1250	S23	E08	.337	14815	25.1	20	SF	C	1241	50	.5	E
└ MCMA	24	1250	1253	1344	S23	E12	.367	14815	25.4	54	SN	C	1253	60	.6	EW
┌ UPIC	24	1257E		1258D	S24	E11	.373		25.4	10	SF	P	1258	82		
└ MCMA	24	1309	1309	1311	N12	E69	.943	14822	29.7	2	SB	P	1309	15	.5	D
┌ RAMY	24	1455	1458	1555	S21	E 8	.308		25.2	60	SN	3 C		32		
└ MCMA	24	1824		1828	N28	W05	.548	14813	24.4	4	SN	C	1827	25	.3	E
┌ MCMA	24	1824		1828	S24	E05	.338	14815	25.1	4	SN	C	1827	125	1.4	EL
└ MCMA	24	1903		1905	S24	E05	.338	14815	25.2	2	SN	P	1903	40	.4	E
┌ RAMY	24	2023	2026	2033	N16	E67	.936		29.9	10	SF	3 C		32		
└ RAMY	24	2212E	2215	2219D	N16	E65	.924		29.8	70	SN	2 C		64		
┌ RAMY	24	2217	2219	2221D	S21	E 5	.290		25.3	40	SN	2 C		128		DE
HTPR	25	0617E		0621D	N14	E60	.886		29.8	40	SF	C	0618	10	.2	
HTPR	25	0653	0655	0700	N14	E60	.886		29.8	7	SF	C	0655	20	.4	E
HTPR	25	0851	0851	0855	N13	E59	.877		29.8	4	SF	C	0851	20	.4	E
┌ UPIC	25	1040E	1045U	1053	S21	W04	.287		25.1	130	SF	P	1045	61		
└ UPIC	25	1040E		1053	S23	W02	.315		25.3	130	SF	P	1040	61		
┌ RAMY	25	1040E	1042	1049	S21	W 5	.291		25.1	90	SN	3 C		159		FDE
└ UPIC	25	1053	1109	1115	N16	E58	.875		29.8	22	SF	P	1109	41		K
┌ HTPR	25	1053E		1102D	N14	E58	.870		29.8	90	SN	C	1054	30	.5	E
└ RAMY	25	1056	1059	1110D	N17	E58	.877		29.8	140	SB	3 C		80		FDE
┌ TEHR	25	1058	1102	1108	N13	E57	.860		29.7	10	SF	3 C		127		DE S
└ RAMY	25	1425E	1429	1441D	N17	E56	.861		29.8	160	SN	4 C		144		DE
┌ MCMA	25	1434		1447	N15	E57	.864	14822	29.9	13	1B	P	1434	125	2.4	EY
└ UPIC	25	1435E	1435U	1435D	N14	E57	.862		29.9		SF	P	1435	82		UNCERT
┌ UPIC	25	1501	1505	1510U	N14	E59	.878		30.1	90	SF	P	1505	41		
└ MCMA	25	1543		1608	N16	E57	.867	14822	29.9	25	SF	P	1543	30	.6	D
┌ MCMA	25	1952	1953	2002	N16	E55	.850	14822	30.0	10	SB	C	1953	50	.9	E
└ MCMA	25	2015	2032	2050	S22	W11	.346	14815	25.0	35	SF	C	2032	30	.3	E
┌ RAMY	25	2031E	2035U	2038D	S22	W12	.355		25.0	70	SF	3 C		80		DE
└ MCMA	25	2038	2040	2100	N16	E55	.850	14822	30.0	22	SB	C	2040	80	1.4	E
┌ MCMA	25	2103	2105	2112	N16	E55	.850	14822	30.0	9	SN	C	2105	25	.4	D
└ MCMA	25	2119	2124	2125	N16	E55	.850	14822	30.0	6	SB	P	2124	40	.7	D
UPIC	26	0613E		0615D	S21	W15	.373		25.1	50	SF	P	0615	61		
┌ UPIC	26	0710	0720	0805D	N18	E48	.793	14822	29.9	550	1F	P	0720	224		K
└ TEHR	26	1018	1021	1043	N14	E44	.737		29.7	25	1N	4 C		286		U Z
┌ RAMY	26	1024E	1026U	1036D	N15	E44	.741		29.7	140	SN	2 C		159		ZDE
└ MCMA	26	1110	1114	1230	N15	E45	.752	14822	29.8	80	SN	C	1114	60	.9	E
┌ MCMA	26	1243	1246	1248	N15	E43	.730	14822	29.8	5	SN	C	1246	40	.6	E
└ MCMA	26	1304	1309	1335	N15	E45	.752	14822	29.9	31	SB	C	1309	50	.7	EF
┌ MCMA	26	1334	1340	1405	S23	W18	.427	14815	25.2	31	1B	C	1340	300	3.3	FI
└ RAMY	26	1336E	1341	1349D	S21	W16	.383		25.4	130	2N	4 C		891		FDE
┌ TEHR	26	1338E	1341	1357	S22	W13	.365		25.6	190	1N	3 C		477		OE
└ MCMA	26	1407	1410	1412	N15	E45	.752	14822	30.0	5	SB	C	1410	25	.4	D
┌ MCMA	26	1422	1438	1605	S23	W18	.427	14815	25.2	103	1B	C	1438	300	3.3	EFIH
└ RAMY	26	1425E	1439	1443D	S21	W17	.394		25.3	180	1N	4 C		350		FDE
┌ MCMA	26	1455	1456	1500	N15	E45	.752	14822	30.0	5	SN	C	1456	25	.4	D
└ MCMA	26	1507	1511	1540	N17	E44	.750	14822	29.9	33	SB	C	1511	65	1.0	E
┌ MCMA	26	1546	1548	1552	N14	E45	.748	14822	30.0	6	SB	C	1548	55	.8	E
└ RAMY	26	1550E	1552U	1557	N17	E41	.718		29.7	70	SF	3 C		95		FDE
┌ MCMA	26	1623	1626	1631	N14	E43	.726	14822	29.9	8	SN	C	1626	40	.6	E
└ MCMA	26	1644	1648	1658	N14	E45	.748	14822	30.1	14	SB	C	1648	50	.7	E
┌ MCMA	26	1709	1718	1725	N15	E43	.730	14822	29.9	16	SN	C	1718	40	.6	E
PALE	27	0418	0419	0423	S22	W25	.497		25.3	5	SF	2 C		57		U R
TEHR	27	0531	0542	0601	N15	E35	.640		29.9	30	1N	3 C		382		Z F
HTPR	27	0620	0623	0624	S20	W26	.494		25.3	4	SN	C	0623	50	.6	
HTPR	27	0626	0628	0648	S22	W28	.533		25.2	22	SF	C	0628	30	.3	E

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Jun 77

H α SOLAR FLARES

JUNE 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION MIN.	IM- POR- TANCE	OBS. COND. TYPE	MEASUREMENTS			REMARKS	
	DATE JUN	START	MAX. PHASE	END	APPROX.		CENTRAL DISTANCE	MCMA PLAGE REGION	CMP DAY				TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.		
					LAT.	MER. DIST.											
MONT	27	0920	0932	0942	S22	H31	.569		25.1	22	SF		C	0932	40		
HTPR	27	1000		1009	N18	E34	.648		30.0	90	SF		C	1006	30	.3	E
MONT	27	1001	1007	1016	N19	E34	.655		30.0	15	SF		C	1007	40		E
MONT	27	1014	1014	1017	N15	E35	.640		30.1	3	SF		C	1014	20		D
MONT	27	1024	1026	1032	N13	E33	.605		29.9	8	SF		C	1026	20		D
HTPR	27	1130	1132	1135	N16	E35	.647		30.1	5	SF		C	1132	10	.1	
HTPR	27	1144		1150	N16	E35	.647		30.1	110	SF		C	1149	40	.5	
MCMA	27	1144	1150	1203	N15	E34	.629	14822	30.0	19	SB		C	1150	60	.7	E
RAMY	27	1148	1151	1156	N17	E33	.631		30.0	8	SN	4	C		80		FDE
MCMA	27	1505		1538	N15	E32	.605	14822	30.0	33	SN		P	1518	60	.7	E
RAMY	27	1540	1555	1615	N16	E29	.578		29.8	35	SN	4	C		140		F
MCMA	27	1541	1544	1558	N15	E30	.582	14822	29.9	17	SN		C	1544	70	.8	E
MCMA	27	1656	1705	1725	S22	H33	.593	14815	25.2	29	SN		C	1705	60	.7	E
HTPR	27	1657	1659	1705	S21	H33	.588		25.2	8	SF		C	1659	20	.2	
HTPR	27	1700	1703	1713	S23	W28	.540		25.6	13	SF		C	1703	10	.1	
HTPR	27	1703	1707	1719	S21	H35	.612		25.1	19	SF		C	1707	30	.3	
HTPR	27	1739	1739	1744	N16	E31	.601		30.1	5	SF		C	1739	20	.2	E
MCMA	27	1851		1852	N15	E30	.582	14822	30.0	1	SN		P	1852	40	.5	E
HTPR	28	0619	0620	0621	N16	E23	.509		30.0	2	SF		C	0620	10	.1	
HTPR	28	0713	0721	0740	S20	W40	.668		25.3	27	SF		C	0721	40	.5	
MONT	28	0714	0724	0743	S22	W40	.676		25.3	29	SN		C	0724	110		E
MONT	28	0819	0825	0852	N15	E21	.477		29.9	33	SF		C	0825	40		E
HTPR	28	0820	0832	0853	N15	E22	.488		30.0	33	SF		C	0832	30	.3	E
RAMY	28	1250E	1258	1303	N16	E19	.466		30.0	130	SN	3	C		160		DE
HTPR	28	1518	1520	1534	S20	W46	.736		25.2	16	SF		C	1534	30	.4	E
MCMA	28	1519	1525	1534	S22	W48	.762	14815	25.0	15	SF		C	1525	40	.6	E
MCMA	28	1810	1813	1826	N14	E16	.412	14822	30.0	16	SN		C	1813	25	.3	D
MONT	29	0906	0908	0913	N14	E13	.382		30.4	7	SF		C	0908	40		OH
MONT	29	0959	1001	1008	S21	W57	.845		25.1	9	SF		C	1001	60		E
HTPR	30	0812	0814	0827	S21	W68	.927		25.2	15	SF		C	0814	10	.2	
HTPR	30	0922	0926	0929	S20	W69	.932		25.2	7	SF		C	0926	30	.6	
HTPR	30	1042	1044	1056	S20	W69	.932		25.3	14	SN		C	1044	120	2.4	E
MCMA	30	1042	1050	1112	S21	W68	.927	14815	25.3	30	1N		C	1050	100	3.0	E
HTPR	30	1127	1132	1140	N20	E42	.742		3.6	13	SF		C	1132	50	.7	

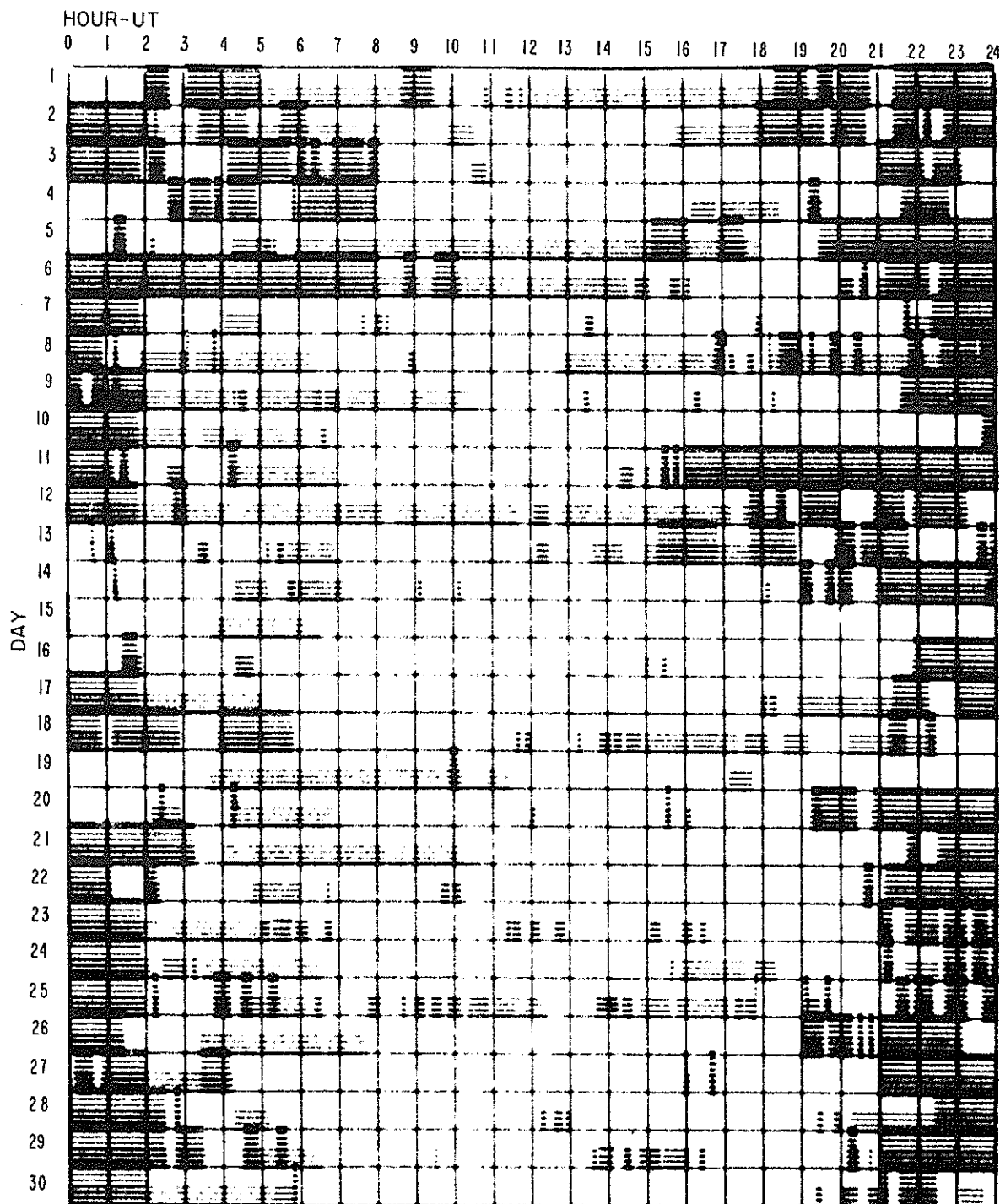
"Remarks":

A = Eruptive prominence whose base is less than 90° from central meridian.
 B = Probably the end of a more important flare.
 C = Invisible 10 minutes before.
 D = Brilliant point.
 E = Two or more brilliant points.
 F = Several eruptive centers.
 G = No visible spots in the neighborhood.
 H = Flare accompanied by a high speed dark filament.
 I = Active region very extended.
 J = Distinct variations of plage intensity before or after the flare.
 K = Several intensity maxima.
 L = Existing filaments show signs of sudden activity.
 M = White-light flare.

N = Continuous spectrum shows effects of polarization.
 O = Observations have been made in the calcium II lines H and K.
 P = Flare shows helium D₃ in emission.
 Q = Flare shows the Balmer continuum in emission.
 R = Marked asymmetry in H α line suggests ejection of high velocity material.
 S = Brightness follows disappearance of filament (same position).
 T = Region active all day.
 U = Two bright branches, parallel (||) or converging (Y).
 V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
 W = Great increase in area after time of maximum intensity.
 X = Unusually wide H α line.
 Y = System of loop-type prominences.
 Z = Major sunspot umbra covered by flare.

INTERVALS OF NO FLARE PATROL OBSERVATION FOR PRECEDING SOLAR FLARE TABLE

JUNE 1977



Observatories included in total patrol:

Bucharest
Haute Provence
Herstmonceux

Istanbul
McMath-Hulbert
Mitaka

Monte Mario
Palehua
Ramey

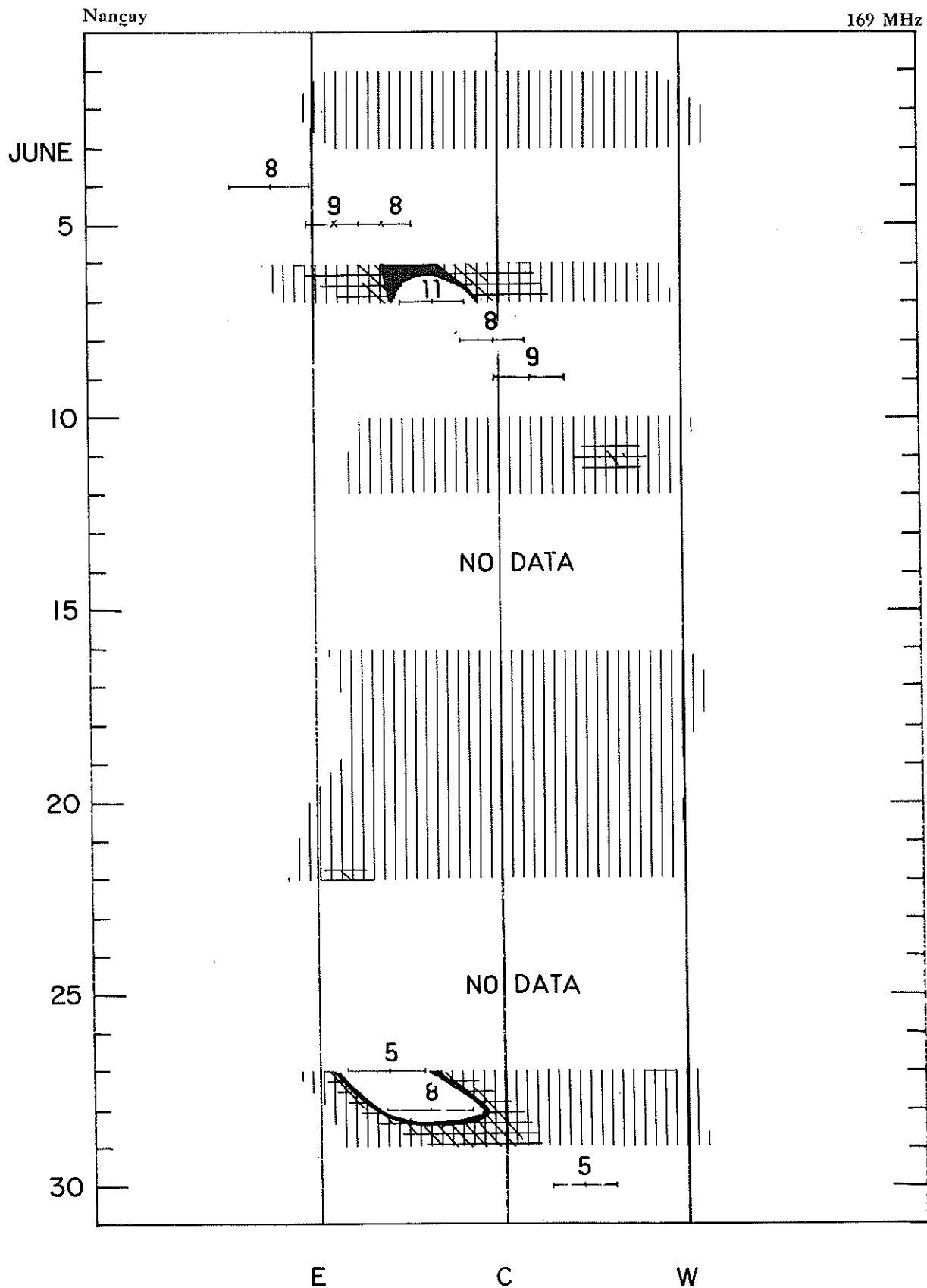
Tehran
Upice
Wendelstein
Zürich

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

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SOLAR RADIO EMISSION INTERFEROMETRIC OBSERVATION

JUNE 1977

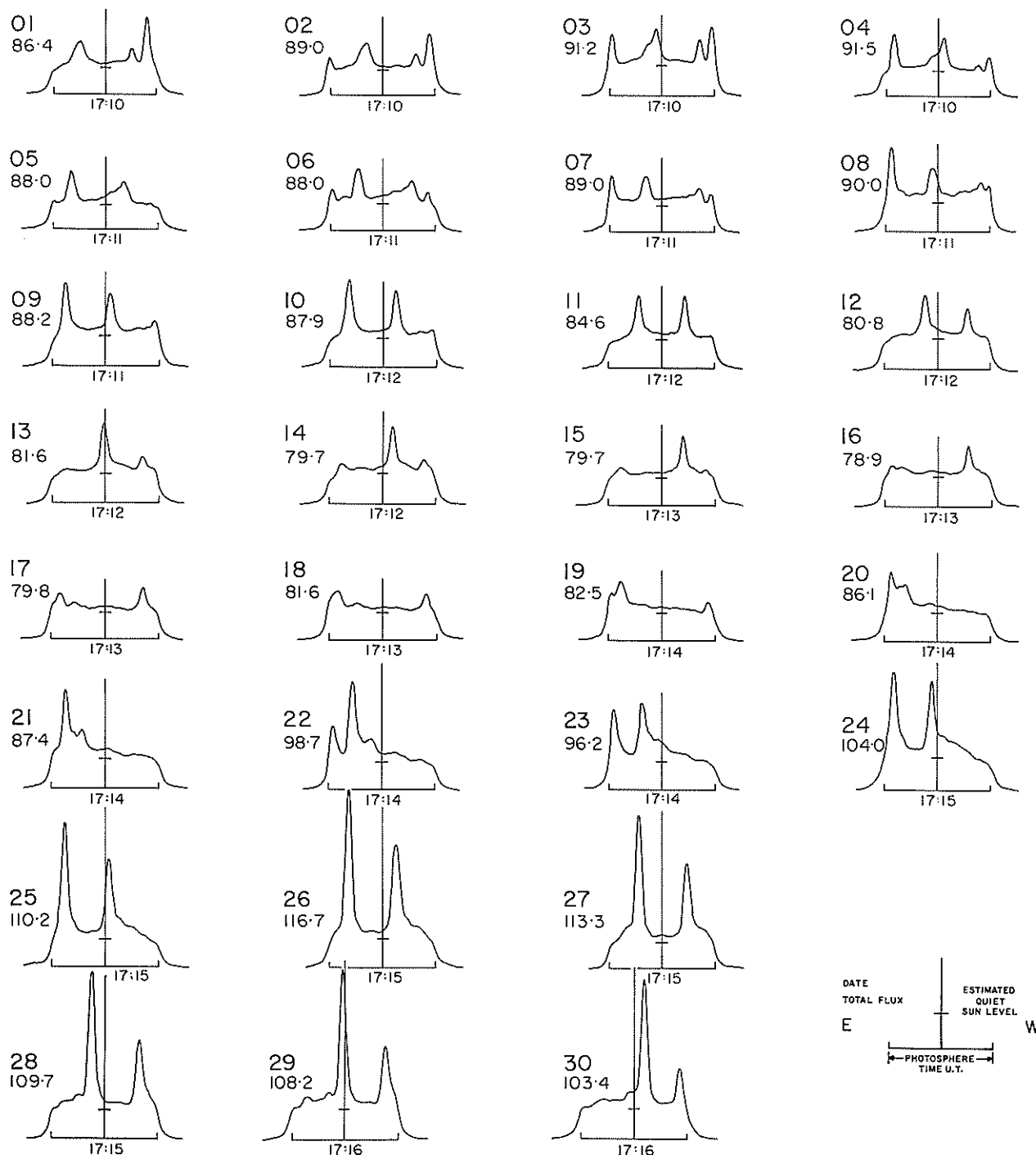


EAST-WEST SOLAR SCANS

JUNE 1977

ALGONQUIN RADIO OBSERVATORY
CANADA

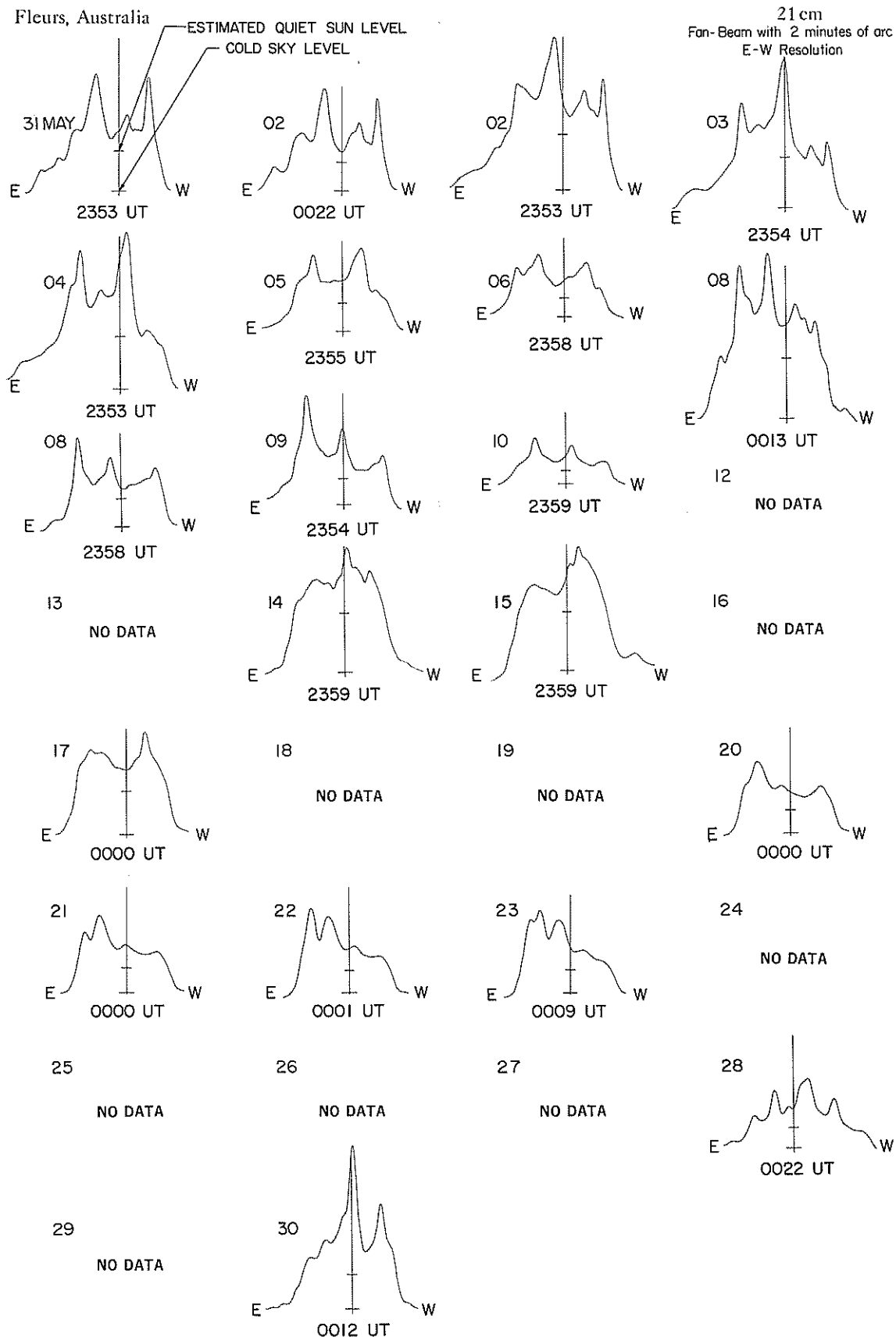
10.7 cm

Fan Beam with 1.5 minutes of arc
E-W Resolution

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EAST-WEST SOLAR SCANS

JUNE 1977



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EAST-WEST SOLAR SCANS

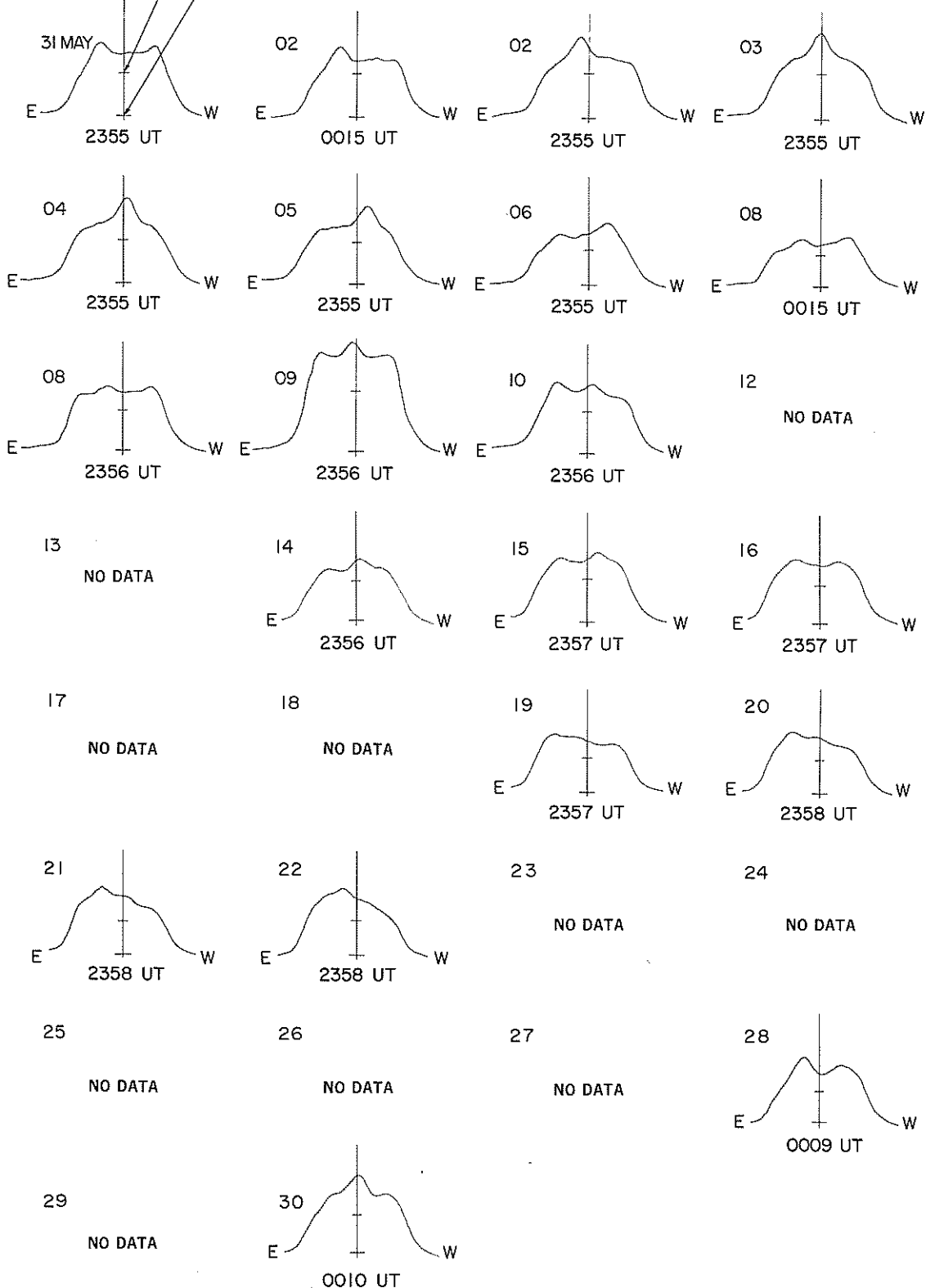
JUNE 1977

Fleurs, Australia

ESTIMATED QUIET SUN LEVEL

COLD SKY LEVEL

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



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SOLAR RADIO EMISSION SELECTED FIXED FREQUENCY EVENTS

JUNE 1977

	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	2800 OTTA	20 GRF	1100	1130	60	1.2	0.6		
	2800 OTTA	240 R	1605	1630	25	1.4	0.7		
	2800 OTTA	27A RF	1900		210	1.4	1.2		
	2800 OTTA	24 R	1900	1934	34	1.4	0.7		
	2800 OTTA	24P R	1934		136	1.4			
	2800 OTTA	1 S	1935	1940	10	0.8	0.4		
	2800 OTTA	21 GRF	2040	2100	50	1	0.5		
	2800 OTTA	1 S	2042	2044	4	1.6	0.8		
	2800 OTTA	26 FAL	2150	2230	40	-1.4	-0.7		
	2800 OTTA								
2	2695 PENT	45 C	0121.8	0122.8	3	9.8	2.6		
	2695 BOUL	3 S	0122.5	0123.5	2.5	8	3		
	2800 OTTA	21 GRF	1450	1635	155	1.8	0.9		
	2800 OTTA	40 F	1905	1920.5	24	3.2			
	2695 BOUL	3 S	1920.5	1921	2.5	5	2		
	2800 OTTA	8 S	1710.5	1710.5	0.5	6.2			
	2800 OTTA	240 R	1905	1935	30	1.4	0.7		
	2695 PENT	45 C	2003	2006.2	5	4.8	1.2		
	2695 BOUL	8 S	2006.5	2007	1.5	5	2		
	2800 OTTA	240AR	2047	2340	173	3	1.5		
	2800 OTTA	40 F	2139	2139.1	2	3.2			
	2695 PENT	3 S	2336.2	2336.9	1	11.4	2.9		
	2800 OTTA								
3	2800 OTTA	26 FAL	1105	1140	35	-1.6	-0.6		
	2800 OTTA	27 RF	1313		41	0.6	0.5		
	2800 OTTA	24 R	1313	1313.2	0.2		0.3		
	2800 OTTA	24P R	1313.2		26.8	0.6			
	2800 OTTA	26 FAL	1340	1354	14	-0.6	-0.3		
	2800 OTTA	20 GRF	1620	1720	130	1.2	0.6		
	2800 OTTA	20 GRF	1835	1900	65	0.8	0.4		
	2800 OTTA	21 GRF	2110	2025	100	2	1		
	2800 OTTA	20 GRF	2111	2112.5	20	1.6	0.6		
	2800 OTTA								
4	2695 PENT	240 R	0055	0105	10	1.6	0.8		
	2800 OTTA	2 S/F	1131	1132.1	5	1.2	0.6		
5	2800 OTTA	20 GRF	1305	1350	95	1	0.5		
	2800 OTTA	20 GRF	1625	1636	95	1	0.5		
6	2695 PENT	20 GRF	0005	0020	60	1.2	0.6		
	2800 OTTA	20 GRF	1815	2000	240	2.6	1.3		
7	2800 OTTA	2 S/F	1322.5	1322.6	1	1.6	0.8		
	2800 OTTA	240 R	1830	1840	10	1.4	0.7		
	2800 OTTA	240 R	1910	1940	30	0.8	0.4		
	2800 OTTA	20 GRF	2120	2255	110	1.6	0.8		
8	2800 OTTA	20 GRF	1500	1537	65	1	0.5		
	2800 OTTA	20 GRF	1640	1655	45	1	0.5		
	2800 OTTA	20 GRF	1810	1930	150	1.2	0.6		
	2800 OTTA	240 R	2235	2255	20	1.2	0.6		
	2695 SGHR	4 S/F	2349.7	2350.1	.5	51	20.4		
9	2695 SGHR	4 S/F	0001.2	0001.3	.7	38.90	15.60		
	2800 OTTA	20 GRF	1730	1734.5	30	2.8	0.7		
	2695 BOUL	3 S	1733	1735.5	6.5	4	1		
	2800 OTTA	21 GRF	1820	1833	40	1	0.5		
	2695 SGHR	4 S/F	1825.8	1827.2	7.3	12.9	3.9		
	2800 OTTA	20 PRE	1826.2	1826.5	0.5	2.4	1.8		
	2695 BOUL	8 S	1826.5	1828	2.5	33	11		
	2800 OTTA	4 S/F	1826.7	1827.3	2.3	41	10		
	2800 OTTA	20 GRF	1925	2015	85	1.6	0.8		
	2800 OTTA	240 R	2240	2245	5	0.8	0.4		
10	2800 OTTA	20 GRF	1550	1630	190	1.6	0.8		
11	2800 OTTA	240 R	1957	1958	1	0.8	0.4		
	2800 OTTA	20 GRF	2010	2020	40	1.6	0.8		
	2800 OTTA	20 GRF	2135	2143	25	0.8	0.4		
12	2800 OTTA	1 S	1233	1234.4	7	1.6	0.8		
	2800 OTTA	20 GRF	1515	1516	15	1.2	0.6		
13	2695 BOUL	8 S	1825.5	1826.5	1.5	17	6		
	2695 BOUL	45 C	2113.5	2114	2	10	3		
14	2800 OTTA	20 GRF	1440	1510	120	1.2	0.6		
	2695 BOUL	8 S	2229	2231.5	3	6	2		
	2695 BOUL	8 S	2235	2235.5	2	4	1		
15	2800 OTTA	20 GRF	1500	1555	170	1.4	0.7		
	2800 OTTA	20 GRF	1820	1840	100	1.2	0.6		
17	2800 OTTA	240 R	2100	2120	20	1	0.5		

CONT 3

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SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

JUNE 1977

	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		
18	2800 OTTA	20 GRF	1420	1510	140	2	1.3		
22	2600 OTTA	20 GRF	1130	1155	70	1.6	0.8		
	2800 OTTA	27 RF	1450		190	3.4	3		
	2800 OTTA	24 R	1450	1512	22	3.4	1.7		
	2800 OTTA	24P R	1512		138	3.4			
	2800 OTTA	26 FAL	1730	1800	30	-3.4	-1.7		
	2800 OTTA	2 S/F	2116.7	2117.7	2.8	6.8	3.3		
23	2695 BOUL	3 S	2118	2119	2.5	7	2		
	2695 PENT	40 F	0010	0017	12	6.9			
	2695 PENT	1 S	0104.9	0105.2	1.5	8	1.8		
	2800 OTTA	21 GRF	1050	1155	190	4	2		
	2800 OTTA	40 F	1146.5	1153	11	16			
	2695 SGMR	4 S/F	1150.7	1153	8.8	20.2	6		1
	2800 OTTA	8 S	1426	1426.1	0.5	1.6			
	2800 OTTA	20 GRF	1500	1600	100	1.4	0.7		
	2695 BOUL	1 S	1629.5	1630.5	1.5	2	1		
	2695 BOUL	45 C	1640	1641	2	2	1		
	2800 OTTA	45 C	1823.8	1825	4.5	9.8	2.5		
	2695 BOUL	45 C	1824.5	1826	6	10	3		
	2800 OTTA	1 S	2110.3	2110.8	1	1.4	0.7		
	2695 BOUL	1 S	2111.5	2112	2	3	1		
24	2695 PENT	21 GRF	0003	0035	100	5.2			
	2695 PENT	20 GRF	0004	0010	12	2.8	1.8		
	2695 BOUL	3 S	0022	0025	8.5	10	3		
	2695 PENT	1 S	0022.8	0024	8	9.4	3.2		
	2695 PENT	20 GRF	0047	0051	13	1.4	0.8		
	2695 BOUL	3 S	0128	0129.5	4.5	3	1		
	2800 OTTA	26A FAL	1215	1335	80	-3.2	-1.6		
	2800 OTTA	21 GRF	1242	1255	53	3.6	1.8		
	2800 OTTA	1 S	1250	1253	4	3.4	1.8		
	2800 OTTA	26A FAL	1415	1450	35	-3.2	-1.6		
	2800 OTTA	2 S/F	1439.5	1440	1.7	2	1		
	2800 OTTA	26 FAL	1550	1600	10	-1	-0.5		
	2800 OTTA	22 GRF	1800	1830	90	3.2	1.6		
	2800 OTTA	240 R	1940	2010	30	1.6	0.8		
	2800 OTTA	20 GRF	2055	2110	15	2.2	1.1		
	2695 BOUL	45 C	2131	2133	2.5	36	12		
	2800 OTTA	20 GRF	2230	2258	110	4.4	1.8		
25	2695 BOUL	3 S	0051	0051.5	1.5	2	1		
	2800 OTTA	20 GRF	1048	1053	60	3.6	1.8		
	2800 OTTA	21 GRF	1457	1504	105	3.6	2		
	2800 OTTA	45 C	1457.9	1459.1	3	5.4	3.8		
	2695 BOUL	45 C	1458	1500	3.5	9	3		
	2800 SGMR	3 S	1458.3	1458.4	1.7	20.1	10		4
	2695 SGMR	3 S	1458.3	1459.4	2.8	13.6	6.8		4
	2800 OTTA	21 GRF	1750	1810	90	3.8	1.9		
	2800 OTTA	2 S/F	1755	1756.1	4	9.6	3.2		
	2695 BOUL	8 S	1756.5	1757.5	3	9	3		
	2600 OTTA	32 ABS	2040	2050	70	-1.8	-0.9		
	2695 PENT	240AR	2250	2543	173	11.8	5.4		
	2695 PENT	1 S	2323.2	2324	7	1.8	1		
26	2800 OTTA	27A RF	1255		385	3.6	3		
	2800 OTTA	24 R	1255	1315	20	3.6	1.8		
	2800 OTTA	24P R	1315		260	3.6			
	2800 OTTA	21 GRF	1323		42	4.2	3.1		
	2800 OTTA	4 S/F	1335	1337.1	15	48	11		
	2695 BOUL	3 S	1335	1337.5	14	34	11		
	2800 SGMR	4 S/F	1335.2	1336.2	24.50	81.6	32.60		SIO,SWF 1
	2695 SGMR	3 S	1335.3	1336.8	24.70	39.9	16 U		SIO,SWF 1
	2800 OTTA	21 GRF	1421.5	1436	118	26.8	7.7		
	2800 OTTA	1 S	1434	1434.4	1	3.6	1.8		
	2695 BOUL	4 SF	1435.5	1439	15	15	5		
	2800 OTTA	2 S/F	1437.5	1438	1.5	7.6	3.4		
	2800 OTTA	21 GRF	1505	1510	35	3.8	1.9		
	2800 OTTA	1 S	1509.5	1510.6	2	7.4	3		
	2695 BOUL	1 S	1510.5	1511.5	3.5	6	2		
	2695 PENT	4 S/F	1547.2	1549	5.8	70	24		
	2695 SGMR	4 S/F	1547.3	1548.9	31.7	64	19.2		SIO,SWF 2
	2800 SGMR	4 S/F	1547.5	1549	31.5	51	15.3		SIO,SWF 2
	2800 OTTA	29 PBI	1553	1553	25	5.2	2.6		
	2800 OTTA	26 FAL	1735	1920	105	-3	-1.5		
	2800 OTTA	21 GRF	1950	2105	210	3.6	2.2		
	2695 SGMR	3 S	2126.4	2127.3	5	23.4	7		3
	2800 OTTA	3 S	2126.5	2127.2	2.5	22	7.3		
	2800 SGMR	3 S	2126.6	2127.4	4.6	24.4	7.3		3
	2695 BOUL	8 S	2127	2128	3	20	7		
	2800 OTTA	29 PBI	2129	2129	10	2	1		
	2800 OTTA	3 S	2152	2153	2	15.2	7		
	2695 SGMR	3 S	2152.2	2153.1	5.8	12.4	3.7		4

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Jun 77

SOLAR RADIO EMISSION SELECTED FIXED FREQUENCY EVENTS

JUNE 1977

	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		
27	2695 BOUL	8 S	2152.5	2154	6	14	5	SID, SHF	5
	2800 OTTA	29 PBI	2154	2154	5	3.6	1.8		
	8800 SGMR	4 S/F	2215.7	2218.1	21.4	239.1	71.7		
	2800 OTTA	27A RF	1322		168	1.6	1.4	SID	2
	2800 OTTA	24 R	1322	1350	18	1.6	0.8		
	2800 OTTA	24P R	1350		130	1.6			
	2800 OTTA	1 S	1501	1503	4	6	3		
	2695 SGMR	20 GRF	1501.4	1502.8	55.8	8.7	2.6		
	8800 SGMR	20 GRF	1501.8	1504.9	37.1	16.3	4.9		
	2695 BOUL	23 GRF	1503	1504	6	5	2		
	2800 OTTA	29 PBI	1505	1505	25	3.8	1.9		
	8800 SGMR	20 GRF	1538.9	1541.6	11.6	36.7	11		
	2800 OTTA	26 FAL	1550	1610	20	-1.6	-0.8		
	2695 PENT	1 S	1651	1652	4.5	1.6	0.8		
	2800 OTTA	20 GRF	1656.5	1700	53	3.8	1.3		
	2800 OTTA	20 GRF	1750		40	1	0.5		
	8800 SGMR	3 S	1851.3	1851.6	6.2	38.4	11.5		
	2800 OTTA	20 GRF	1923	1940	52	1.6	1		
	2800 OTTA	20 GRF	2025	2032	15	0.8	0.4		
	2800 OTTA	240AR	2100	2230	90	2.2	1.1		
	2800 OTTA	20 GRF	2120	2155	70	4.2	2.1		
	2695 PENT	20 GRF	2320	2335	65	3	1.5		
28	2695 PENT	1 S	0054	0057.5	6	1.8	0.9		
	2800 OTTA	20 GRF	1440	1520	70	1	0.5		
	2800 OTTA	20 GRF	1730	1810	120	2.4	1.7		
	2695 PENT	20 GRF	2310	2345	70	2.4	1.2		
29	2800 OTTA	1 S	1341.5	1342	2	1.4	0.7		
	2800 OTTA	20 GRF	2100	2113	35	1.6	0.9		
	2800 OTTA	2 S/F	2223	2230	10	1.8	1		

SOLAR X-RAYS BY SATELLITE
SMS GOES
JUNE 1977

		.5 - 4Å Hourly Averages (10 ⁻⁵ watts/m ²)																									
MO DA		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	
6/1	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/9	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/10	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
6/20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/21	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/23	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
6/24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
6/30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE
SMS GOES
JUNE 1977

1 - 8Å Hourly Averages (10 ⁻⁴ watts/m ²)																										
MO	DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
6/	1	B	B	B	B	B	B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B
6/	2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	9	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	10	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	19	M	M	M	B	B	M	M	M	M	M	B	B	M	B	B	B	B	M	M	B	B	M	B	B	B
6/	20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	21	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	23	M	B	B	B	B	B	B	B	M	B	B	B	B	M	B	B	B	B	B	B	B	B	B	B	B
6/	24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6/	30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE

GOES-1

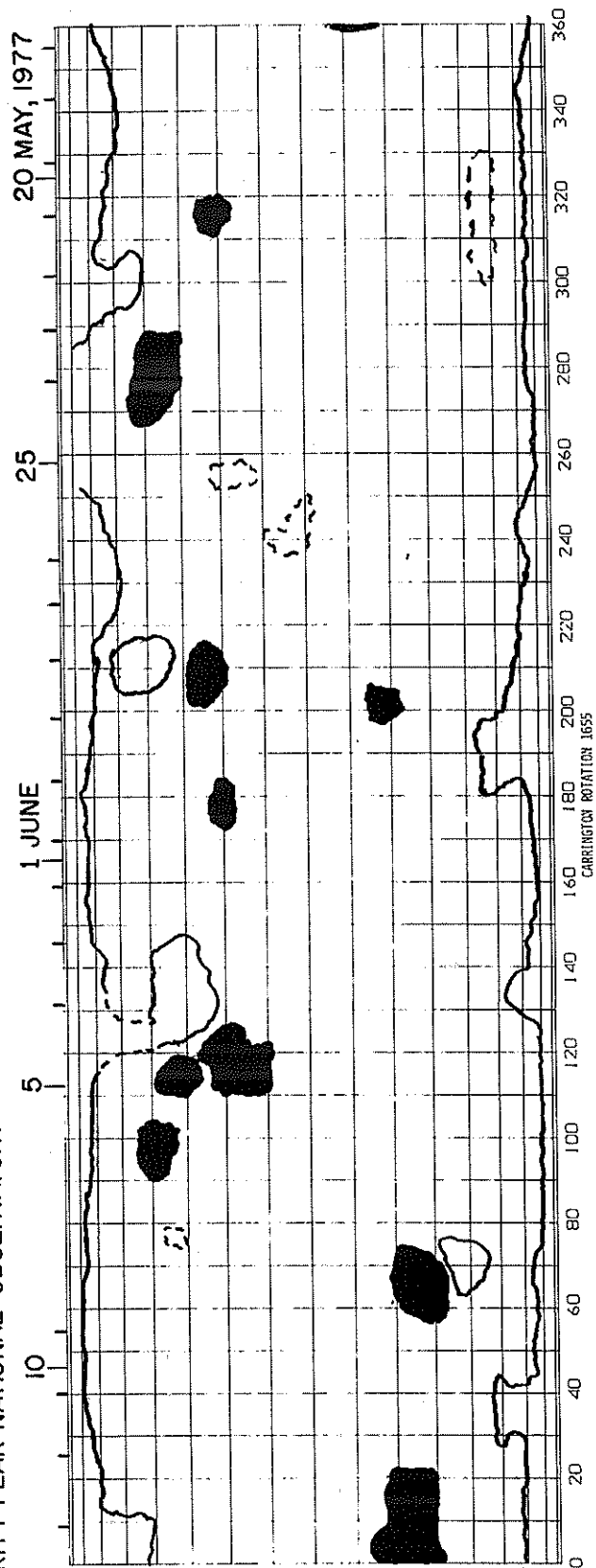
JUNE 1977

DAY	BEGIN TIME	.5-4A Wm ⁻²	1-8A Wm ⁻²	MAX TIME	.5-4A Wm ⁻²	1-8A Wm ⁻²	1/2P TIME	.5-4A Wm ⁻²	1-8A Wm ⁻²
2	0120		1.7E-07	0125		1.6E-06	0134		8.1E-07
2	0423		1.1E-07	0430		5.3E-06	0434		2.8E-06
2	0803		1.7E-07	0811		3.9E-06	0815		1.9E-06
2	1951		3.2E-07	1957		2.4E-06	1959		1.3E-06
2	2002		1.1E-06	2007		2.3E-06	2019		1.7E-06
2	2317		6.9E-07	2321		1.0E-06	2323		8.0E-07
2	2332		6.8E-07	2342		2.9E-06	2347		1.7E-06
3	0413		5.5E-07	0423		4.1E-06	0428		2.0E-06
3	0906		5.3E-07	0921		4.1E-06	0929		2.2E-06
3	1003		7.2E-07	1010		2.3E-06	1019		1.4E-06
3	1310		2.8E-07	1317		1.3E-06	1323		7.9E-07
3	2109		4.3E-07	2116		2.0E-06	2124		1.2E-06
4	0848		4.3E-07	0914		1.0E-06	0922		7.4E-07
4	1129		2.9E-07	1137		1.5E-06	1145		9.0E-07
4	1158		8.4E-07	1202		1.9E-06	1212		1.3E-06
13	0349		1.4E-09	0417		2.3E-06	0447		1.1E-06
17	1040		1.2E-07	1049		1.9E-06	1055		1.0E-06
22	2115		3.4E-07	2121		1.7E-06	2123		9.3E-07
23	1824		1.0E-06	1832		2.1E-06	1839		1.4E-06
23	2203		3.1E-07	2207		2.2E-06	2214		1.1E-06
23	2350		4.1E-07	2354		2.1E-06	2357		1.2E-06
24	0005		7.2E-07	0010		1.9E-06	0017		1.3E-06
24	0020		1.1E-06	0032		2.4E-06	0047		1.8E-06
24	0334		6.1E-07	0345		4.2E-06	0347		1.5E-06
24	0506		4.4E-07	0524		1.2E-06	0555		8.3E-07
24	0735		1.3E-07	0743		5.8E-06	0745		2.9E-06
24	1349		1.2E-06	1352		1.8E-06	1354		1.4E-06
24	1437		1.1E-06	1440		1.6E-06	1442		1.2E-06
24	1453		1.0E-06	1456		1.5E-06	1458		1.2E-06
24	1713		5.5E-07	1719		1.7E-06	1721		1.1E-06
24	1832		1.1E-06	1835		1.6E-06	1837		1.1E-06
24	1900		6.2E-07	1904		1.1E-06	1906		6.8E-07
24	2022		5.7E-07	2025		1.2E-06	2028		8.3E-07
24	2207		6.3E-07	2210		1.7E-06	2214		1.0E-06
24	2238		7.2E-07	2255		3.8E-06	2307		2.2E-06
25	0848		7.6E-07	0851		1.6E-06	0854		1.1E-06
25	1050		1.7E-06	1057		7.0E-06	1107		4.1E-06
25	1430		2.9E-06	1435		9.1E-06	1439		5.5E-06
25	1457		1.6E-06	1505		1.0E-05	1510		5.9E-06
25	1950		8.7E-07	1954		3.4E-06	1957		2.1E-06
25	2037		6.6E-07	2045		2.5E-06	2048		1.3E-06
25	2121		6.5E-07	2124		1.9E-06	2127		1.2E-06
25	2322		9.0E-07	2327		2.3E-06	2333		1.5E-06
26	0906	4.6E-08	1.3E-06	0911	3.5E-07	3.4E-06	0918	1.4E-07	2.3E-06
26	0955	2.6E-08	9.4E-07	0958	5.6E-08	1.6E-06	1000	3.9E-08	1.1E-06
26	1008	8.6E-08	1.5E-06	1017	3.7E-06	1.8E-05	1026	1.0E-06	1.0E-05
26	1333	8.5E-08	1.6E-06	1338	2.7E-06	1.9E-05	1345	8.8E-07	9.5E-06
26	1431	4.1E-07	4.3E-06	1444	1.6E-06	1.2E-05	1502	4.9E-07	8.2E-06
26	1545	5.3E-08	1.5E-06	1549	1.1E-06	8.3E-06	1551	3.2E-07	4.4E-06
26	1645	4.2E-08	1.3E-06	1649	1.2E-07	2.2E-06	1656	8.6E-08	1.8E-06
26	2048	3.3E-08	1.1E-06	2056	3.2E-07	3.2E-06	2105	9.6E-08	2.0E-06
26	2150	2.1E-08	9.4E-07	2156	1.9E-07	2.5E-06	2201	8.0E-08	1.7E-06
26	2214	5.8E-08	1.5E-06	2219	2.8E-06	1.3E-05	2224	4.9E-07	6.3E-06
27	0017	9.4E-09	5.8E-07	0023	6.0E-08	1.0E-06	0029	2.6E-08	7.9E-07
27	0343	1.0E-08	6.9E-07	0355	1.8E-07	2.2E-06	0411	5.9E-08	1.4E-06
27	0415	6.6E-08	1.5E-06	0422	9.7E-07	8.2E-06	0427	2.6E-07	4.8E-06
27	0524	1.3E-07	2.1E-06	0532	2.1E-06	1.3E-05	0540	5.4E-07	7.2E-06
27	0619	1.2E-08	8.3E-07	0628	1.2E-07	2.0E-06	0640	3.9E-08	1.3E-06
27	1010	9.2E-09	7.1E-07	1014	2.1E-07	2.0E-06	1017	4.3E-08	1.1E-06
27	1141	8.6E-09	5.7E-07	1149	2.2E-07	2.3E-06	1153	4.5E-08	1.1E-06
27	1500	2.2E-08	7.8E-07	1509	1.9E-07	2.2E-06	1527	6.0E-08	1.5E-06
27	1538	4.1E-08	1.2E-06	1543	1.0E-06	6.9E-06	1547	2.5E-07	3.8E-06
27	1832	5.3E-09	4.3E-07	1838	5.4E-08	1.0E-06	1841	1.6E-08	7.0E-07
27	1850	3.0E-09	4.3E-07	1853	2.3E-07	2.2E-06	1856	5.2E-08	1.2E-06
27	2316	2.9E-09	4.6E-07	2328	7.2E-08	1.3E-06	2347	2.2E-08	9.0E-07
27	2349	5.5E-08	1.1E-06	2356	4.1E-07	3.5E-06	0001	1.1E-07	2.3E-06
28	0010	1.4E-08	8.6E-07	0013	1.2E-06	6.8E-06	0017	2.5E-07	3.5E-06
28	0228	2.9E-08	6.4E-07	0236	1.0E-07	1.6E-06	0246	5.3E-08	1.1E-06
28	0445	0.0E+00	5.4E-07	0450	7.2E-08	1.2E-06	0455	1.8E-08	9.0E-07
28	0710	8.6E-09	3.7E-07	0722	1.4E-07	1.9E-06	0732	3.7E-08	1.1E-06
28	0828	1.1E-08	4.6E-07	0833	7.2E-08	1.0E-06	0837	2.2E-08	7.1E-07
29	2221	3.5E-09	4.0E-07	2230	7.7E-08	1.2E-06	2235	2.0E-08	8.4E-07

HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1655

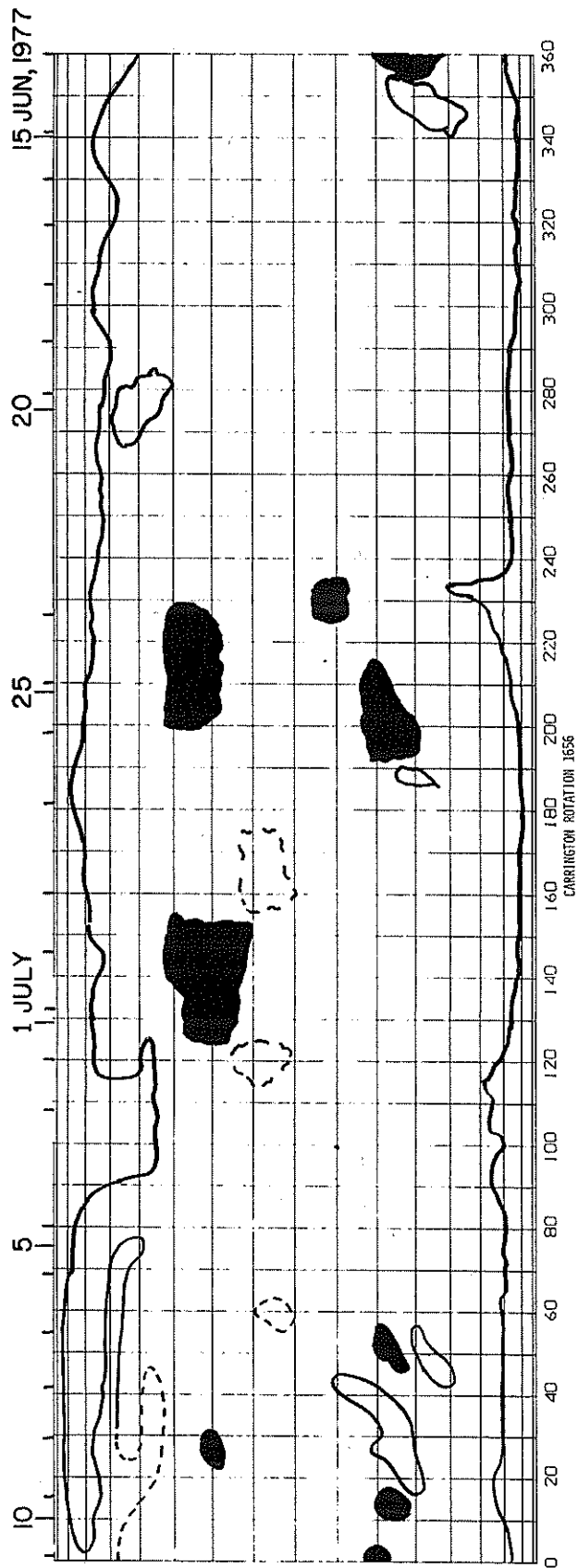
KITT PEAK NATIONAL OBSERVATORY



HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1656

KITT PEAK NATIONAL OBSERVATORY



26
Jun 77

PIONEER VI

JUNE 1977

Date June 1977	DSN Coverage (UT)	Data Time (UT)	ESP (°)	SOLAR WIND				COSMIC RAY PROTONS ³ (particles/sec)		
				AMES ¹		MIT ²		6-13	13-175	>175
				U _{H⁺} (km/sec)	TAU (days)	U _{H⁺} (km/sec)	N _{H⁺} (H ⁺ /cc)	(Mev*)	(Mev**)	(Mev)
27	1606-1731	1600 1700	001.8	448.** 448.	0.91	426. 425.	36.5 12.9	25.1 34.8	0.111 .105	1.92 2.03

¹ Wolfe - NASA/ARC

² Simpson - University of Chicago

* 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/nucleons.

Q Used to indicate that a rate is at its quiescent level.

ESP = Earth-Sun Probe Angle.

† Peak velocity

Note: Data sampled hourly unless otherwise noted.

PIONEER VIII

JUNE 1977

Date June 1977	DSN Coverage (UT)	Data Time (UT)	ESP (°)	SOLAR WIND ¹				IP B-FIELD ² 400 Hz	IMF ³		COSMIC RAY PROTONS ⁴ (particles/sec)	
				U _{H⁺}	N _{H⁺}	T _{H⁺}	TAU		B	φ	>13.9 Mev	>64 Mev
				(km/sec)	(H ⁺ /cc)	(x10 ⁶ °K)	(days)	(mv)	(γ)	(°)		
16	1348-1721	1400	-160.4	363.**			-11.9	0.515	6.7	180.	7.98	0.575
		1500		350.				.437	6.9	171.	7.88	.607
		1600		363.				.491	7.1	170.	7.99	.671
		1700		376.				.455	4.7	101.	7.86	.754
20	1455-1759	1500	-160.7	350.			-11.9	0.251	9.8	264.	7.86	0.74
		1600		350.				.32	11.	254.	7.74	.75
		1700		350.				.379	11.3	272.	7.77	.77
		1800		350.				.376	11.9	277.	7.78	.76
26	1246-1808	1300	-161.1	630.			-12.	0.375	6.5	225.	7.86	0.7
		1400		585.				.29	8.7	180.	8.13	.639
		1500		630.				.332	7.2	154.	7.99	.514
		1600		585.				.413	7.1	100.	8.01	.689
		1700		585.				.395	5.1	161.	8.02	.704
		1800		585.				.413	6.8	169.	8.04	.6

¹ Wolfe - NASA/ARC.

* Peak velocity

² Scarf - TRW, Inc.³ Ness - NASA/Goddard & Mariani - Univ. of Roma

Note: Data sampled hourly unless otherwise noted.

⁴ Webber - Univ. of N.H.

ESP = Earth-Sun Probe Angle.

Errata: The Cosmic Ray Proton data of April 1977 from Pioneer IX have an error in the >13.9 Mev data. Please delete the value "8.34" at 2000 UT. These data appear in SGD 393 Part I on page 26.

INFERRED IP MAGNETIC FIELD

BARTELS ROTATION	DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1945	OCT 24					TA		*				A*	*		*	AT -	AT	AT							*			
1946	NOV 20		*		TA		T*	T*		-	-	-		*	*			AT	AT		*				*			
1947	DEC 17	-						TA	*		*	AT*	TA		*			T*	T*		*				A*TA*	*		
1948	1976 JAN 13	TA	T*	TA	TA	TA	AT	AT				ATA*	TA	*	-	-		-	-					*		TA		
1949	FEB 9				-	-		-	TA				TA						*		T*				*		TA	*
1950	MAR 7							-	TA	A*		TA						*	*	AT			T*			-	TA	
1951	APR 3							*				*								AT	AT	TA	T*		*	AT	TA	*
1952	APR 30		AT					TA	AT	T*				-	-	-			A*	A*	TA	TA		A*				
1953	MAY 27	-						*	TA						-	*			-					T*				
1954	JUN 23						AT			AT		TA	T*	AT			TA	A*					AT	A*	TA	AT		A*
1955	JUL 20		T*								TA	A*								AT	T*	TA	TA	TA				
1956	AUG 16							TA	T*							*		AT				-	AT	TA	-	-	-	-
1957	SEP 12	-	-	AT	-	-	-	-	-	-	-	-	-	AT	AT	-	AT	-	-	-	-	-	AT	-	-	-	-	-
1958	OCT 9	*	A*		A*		*				TA	A*			*	-	-	-	*			TA	AT	AT	-		AT	*
1959	NOV 5	AT	TA			TA		T*		*	AT	*	-		*	-												
1960	DEC 2							TA		*						AT		*		*						-	TA	-
1961	DEC 29	-	AT	*	*	*			AT				*			*	A*	*	*	*	*	*	*	*	*	*	*	AT
1962	1977 JAN 25							-	-	TA		A*		AT			*	*	*	*	*	*	*	*	*	*	*	*
1963	FEB 21	AT		-	-	-	TA		TA			*																
1964	MAR 20		TA		AT					*											A*							
1965	APR 16		TA	TA		TA	AT	TA		TA		AT				-	-	TA		AT	AT			TA				AT
1966	MAY 13	TA	-	-	-	TA		TA											AT		AT							

June data not rec'd.

[] = definitely towards the sun

[] = definitely away from the sun

T = towards the sun

A = away from the sun

* = effect doubtful or not discernible

- = missing data

The table shows daily inferences of the polarity of the interplanetary magnetic field. The first half of the day is based principally on magnetograms produced by the magnetometer at the Vostok Antarctic Station of the USSR. The magnetometer of the U.S. Air Weather Service now operated at Thule by the Danish Meteorological Institute is used for the second half of the day.

Note: The Bartels Rotation numbers after Rotation number 1955 were incorrect in this Table in SGD issues 385 Part I through 389 Part I. Errata: Thule data for December 5, 6, 10, 11, 12 and 19, 1976 have been corrected.

STANFORD MEAN SOLAR MAGNETIC FIELD

BARTELS ROTATION	DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1948	1976 JAN 8																											
1949	FEB 4																											
1950	MAR 2																											
1951	MAR 29																											
1952	APR 25																											
1953	MAY 22																											
1954	JUN 18																											
1955	JUL 15																											
1956	AUG 11																											
1957	SEP 7																											
1958	OCT 4																											
1959	OCT 31																											
1960	NOV 27																											
1961	DEC 24																											
1962	1977 JAN 20																											
1963	FEB 16																											
1964	MAR 15																											
1965	APR 11																											
1966	MAY 8																											
1967	JUN 4																											

POLARITY OF THE MEAN SOLAR MAGNETIC FIELD:
 = FIELD >2μT,  = -2μT ≤FIELD ≤2μT,  = FIELD <-2μT
No box visible indicates no data available for that day.

Note: Data are taken daily at 2000 UT.

STANFORD MEAN SOLAR MAGNETIC FIELD (MICROTESLA)

1976

1977

	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE
DAY												
01	17	8	5	+	-2	-4	+	5	2	-7	-13	13
02	19	6	6	+	-3	-2	+	0	0	-17	-6	15
03	15	0	2	-1	-4	5	4	-6	-2	-16	-5	15
04	14	-8	8	1	1	13	15	-8	-9	-12	1	13
05	7	-14	7	7	1	21	+	-11	-17	-9	7	0
06	-1	-10	6	-5	7	23	3	-17	-22	-4	11	-19
07	-1	-5	3	0	16	25	-7	-12	-20	0	7	-32
08	1	-4	-2	2	25	18	-14	+	-13	5	-5	-31
09	3	-3	1	6	23	13	-9	+	-9	8	+	+
10	6	-5	+	13	12	8	-11	+	-3	2	-22	0
11	6	2	0	19	+	-3	-8	21	3	-4	+	7
12	10	-1	2	21	9	-4	+	19	11	-7	-29	17
13	9	1	8	24	+	-7	+	13	18	-14	-20	28
14	8	-2	12	29	4	-1	8	11	3	-8	-5	38
15	8	4	17	22	-2	0	6	9	+	-8	4	40
16	5	7	20	19	-4	0	9	-3	-9	-11	12	31
17	4	+	30	14	-3	6	6	-12	-12	-9	20	24
18	1	+	20	5	+	3	3	-13	-13	1	29	18
19	0	+	15	-1	0	8	0	-20	-15	13	27	19
20	4	24	11	-9	+	6	-4	+	-12	18	19	16
21	7	33	5	-5	11	5	+	+	-7	21	12	10
22	14	33	-3	-1	9	1	-14	3	2	13	+	2
23	23	25	-12	6	2	-10	-12	7	+	17	1	-2
24	26	19	-10	12	5	-10	-12	12	15	9	-1	-7
25	27	18	-6	14	-5	-14	-7	13	13	6	4	-15
26	30	16	+	20	0	-16	-6	11	13	9	-10	-10
27	24	11	+	8	-6	-16	0	9	10	7	-10	4
28	13	6	+	9	-5	-10	6	5	8	2	-10	15
29	20	6	+	9	-12	-5	8	+	4	-10	-4	19
30	15	8	4	4	-8	+	7	+	7	-11	3	14
31	12	1		-4		11	7		6		6	

", " indicates no data available for that day.

SOLAR WIND
Interplanetary Scintillations

JUNE 1977

UCSD 74 MHZ SCINTILLATIONS

DAY	3C48 VEL ERR	3C144 VEL ERR	3C147 VEL ERR	3C161 VEL ERR	3C237 VEL ERR	3C273 VEL ERR	3C298 VEL ERR	3C459 VEL ERR
1	694 2		395 84	570 60		380 0		
2	625 25		576 53	554 4			268 0	
3	641 22		693 41	555 81	418 14			
4			593 138	486 7			424 28	
5	531 34			590 104		332 23	316 34	
6	693 2						495 6	376 52
7					334 5		410 19	
8	540 14					305 88		
9	587 25		555 110					
10	527 *							
11	503 13			618 59			236 9	392 64
12	436 10		580 88	516 8		372 37		278 1
13	477 22			535 25				
14	428 19		466 24	545 5			345 36	
15	485 25		581 9	514 45				
16	396 14		451 61	604 47		282 7		
17	408 5		573 82	496 30		407 4	468 8	
18	645 25		476 15	344 24				
19	604 32			428 47				
20	577 6		589 3	536 29	343 18	443 1	417 40	
21	567 14		681 83	530 42	341 73	381 8		
22	626 22		557 11	505 0	283 29	405 21	429 49	
23	655 25		610 45	473 25				
24	986 0		518 20		310 23	366 28		
25	889 34		639 104	493 23	342 82	323 17		
26	540 5			450 48	254 10	347 10		
27	618 21		690 153	532 64	339 42	468 140	357 27	
28	499 13		511 53	559 5	393 41	392 29	329 35	
29	456 2			518 58		362 12	296 15	
30	478 14		449 122	499 28	395 34	289 *		392 1

JUNE	5	15	25
	UT LAT DIST DLON	UT LAT DIST DLON	UT LAT DIST DLON
3C48	17. 25. 0.71 38.	16. 20. 0.80 32.	16. 16. 0.88 25.
3C144	21. -15. 0.15 -81.	20. -40. 0.03 87.	19. 0. 0.19 79.
3C147	20. 50. 0.48 -41.	19. 62. 0.45 -21.	19. 63. 0.46 17.
3C161	22. -46. 0.59 -32.	21. -54. 0.52 -21.	21. -58. 0.49 3.
3C237	2. -3. 0.97 -17.	1. -3. 0.91 -23.	0. -4. 0.83 -33.
3C273	4. 0. 1.14 -14.	3. 0. 1.10 -16.	2. 1. 1.05 -17.
3C298	6. 3. 1.22 -10.	5. 4. 1.19 -12.	4. 5. 1.15 -13.
3C459	14. 4. 1.01 17.	13. 5. 1.06 16.	13. 6. 1.11 15.

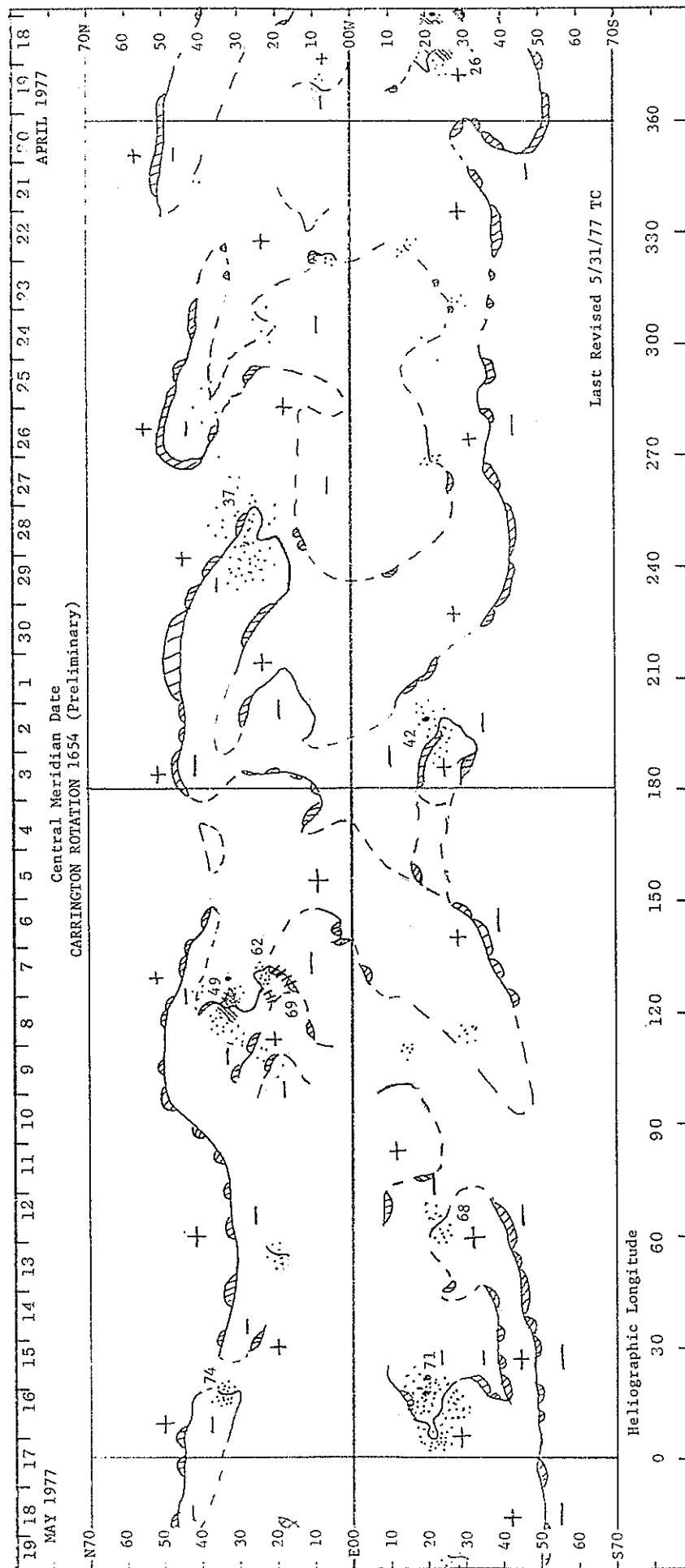
* indicates data for which no error estimate is available since only two antennas were operating.

MAY 1977 DATA

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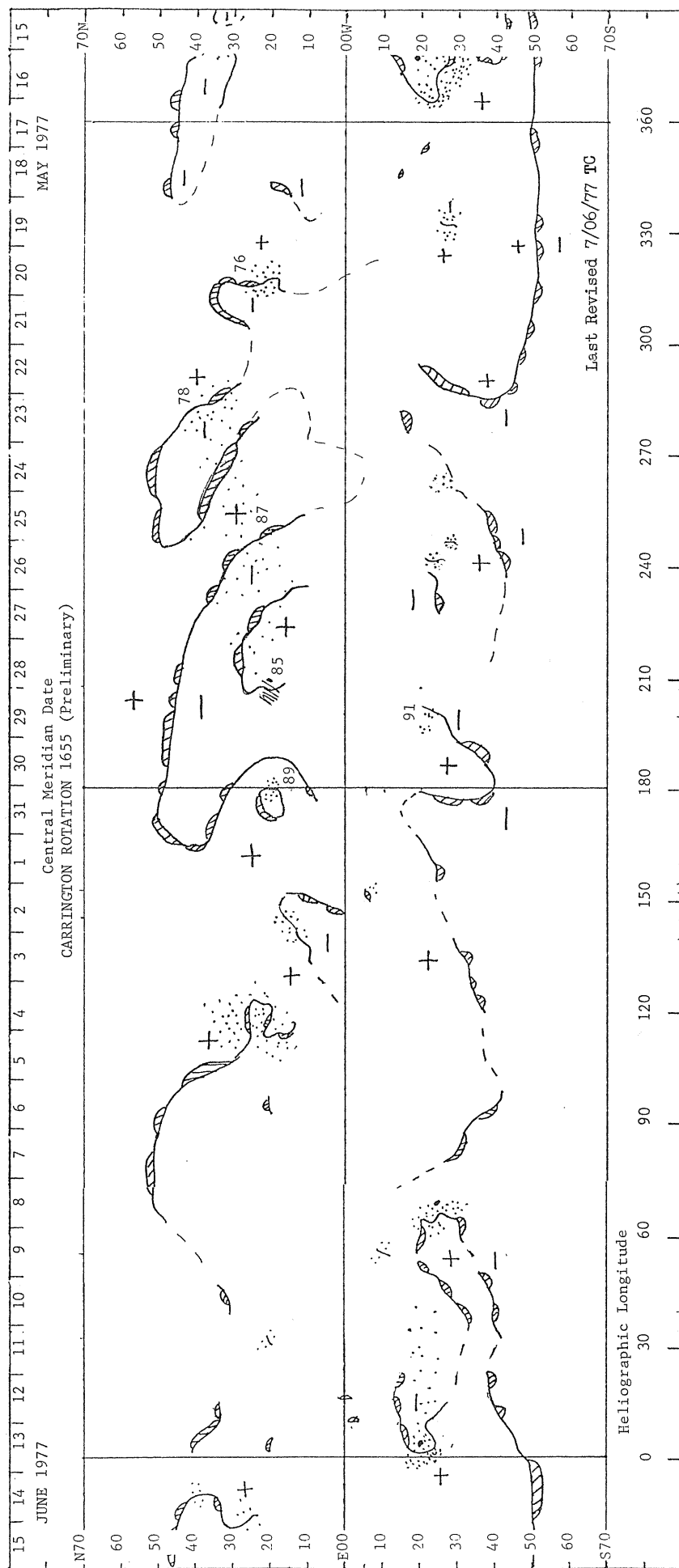
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H α SYNOPTIC CHART CARRINGTON ROTATION 1654 (PRELIMINARY)



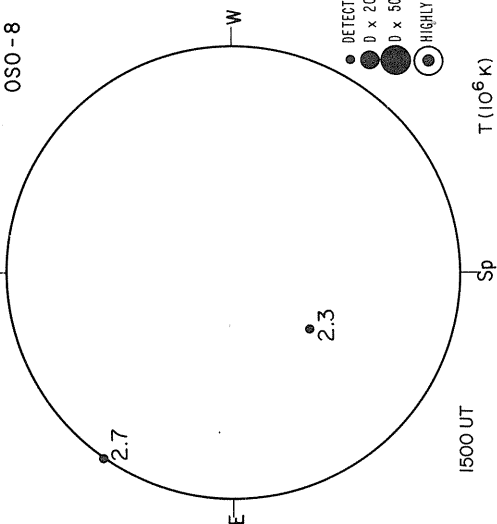
H α SYNOPTIC CHART

CARRINGTON ROTATION 1655 (PRELIMINARY)



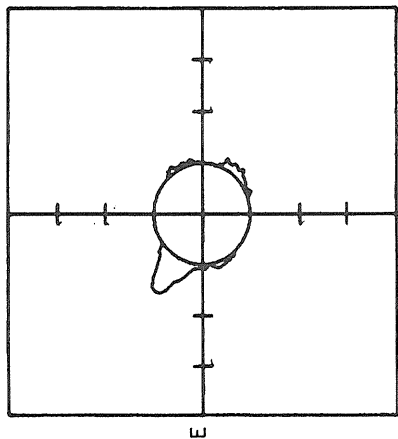
MAY 1, 1977 (P = -24.20, B₀ = -4.14, L₀ = 216.19)

LOCKHEED X-RAY (2-14 keV)
OSO-8

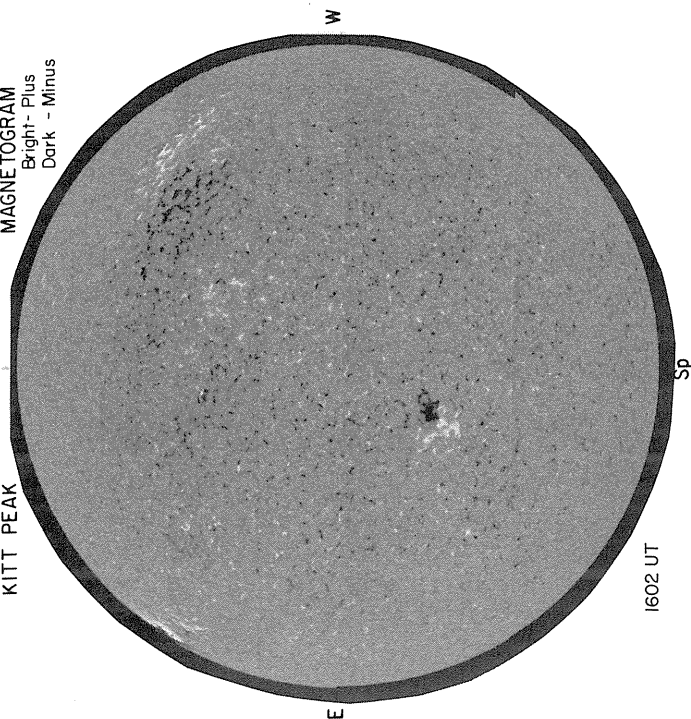


SACRAMENTO PEAK

CORONA (1.15 R₀)
5303 Å



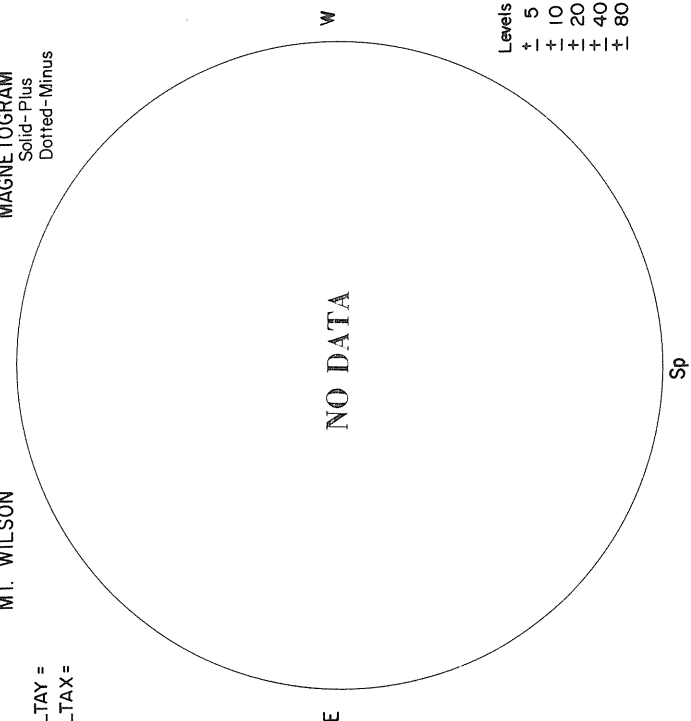
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



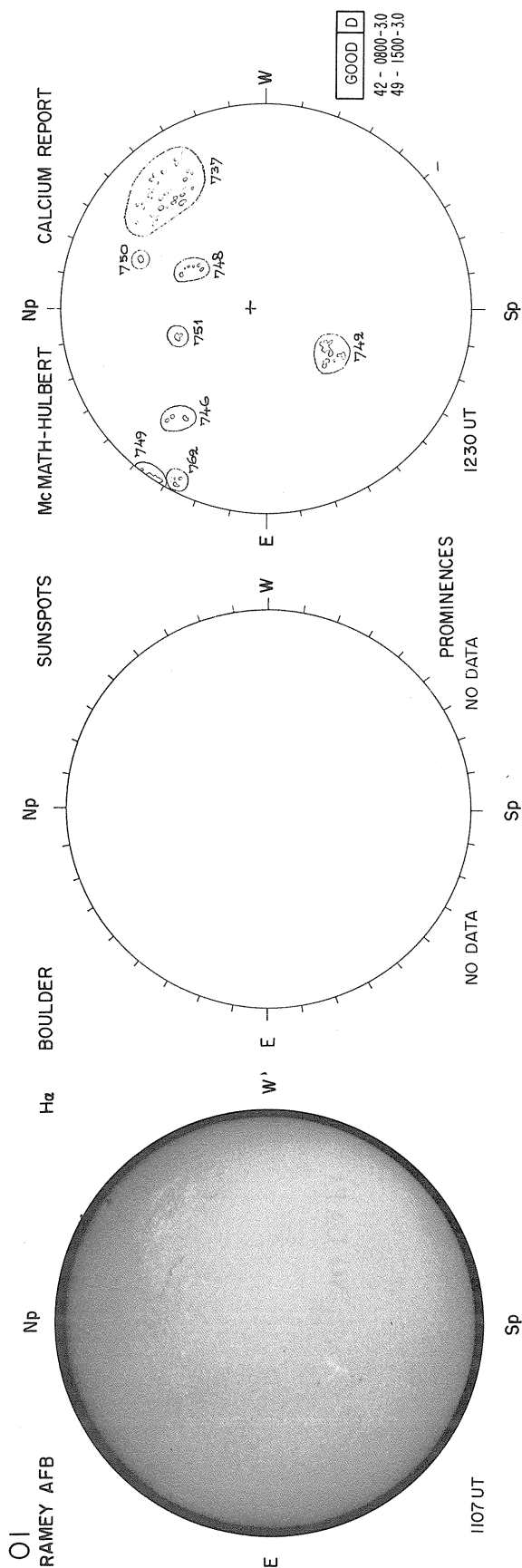
MT. WILSON

DELTA =
DELTA =

MAGNETOGRAM
Solid - Plus
Dotted - Minus



Levels
+ 5
+ 10
+ 20
+ 40
+ 80



NOSC LA POSTA

Np

2.0 CM

8.6 MM

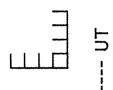
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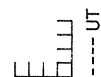
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W



Sp

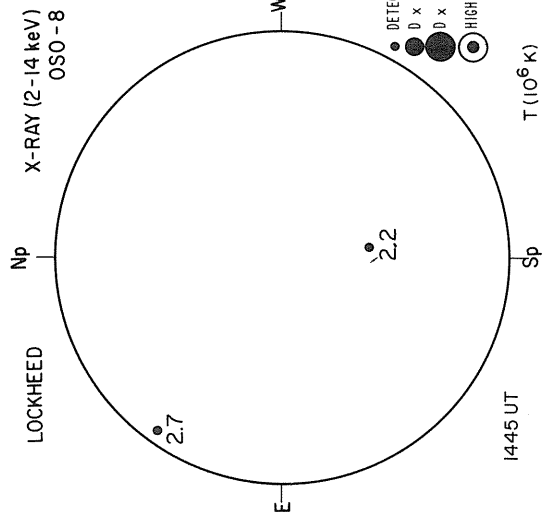
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Sp

Ant. Temp. Unit 100° K

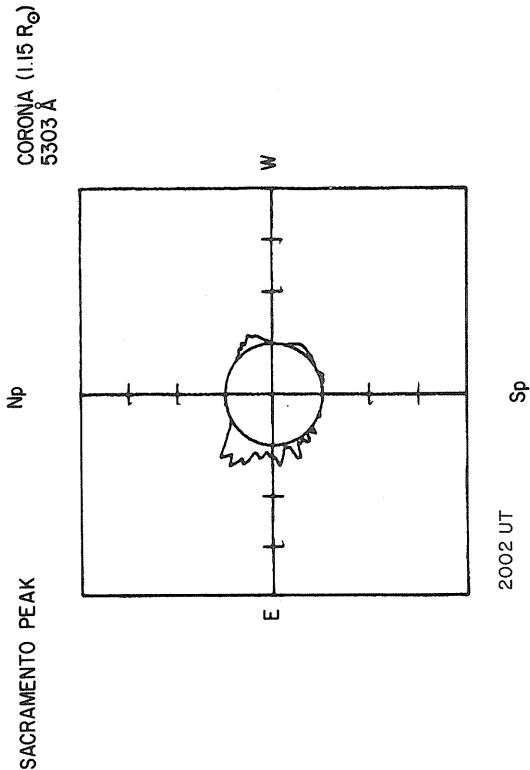
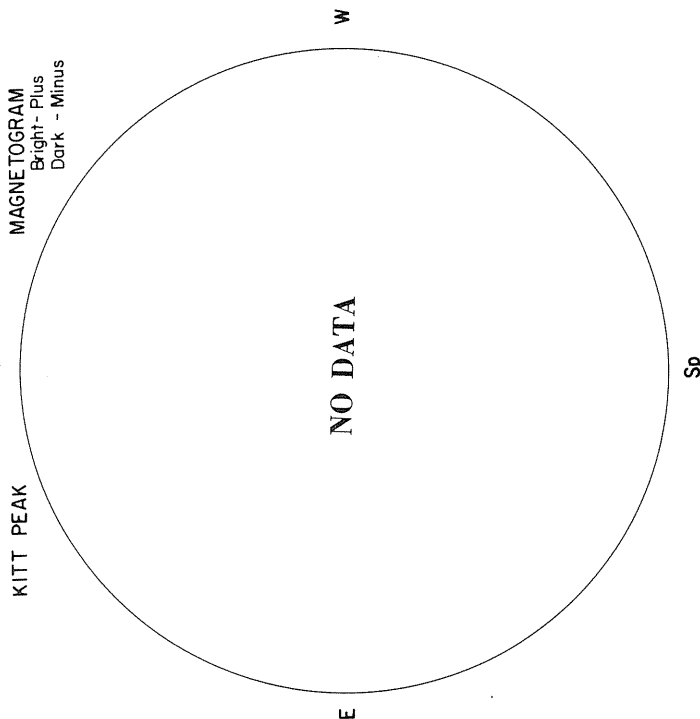
MAY 2, 1977 (P = -24.02, B₀ = -4.04, L₀ = 202.97)



● DETECTABLE (10)
● D x 20
● D x 500
⊙ HIGHLY VARIABLE

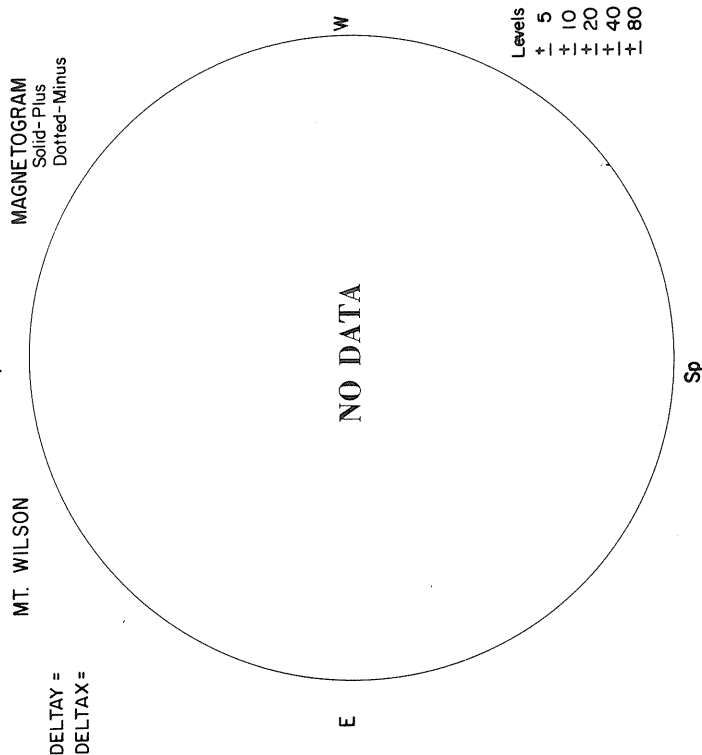
MAGNETOGRAM
Bright - Plus
Dark - Minus

KITT PEAK

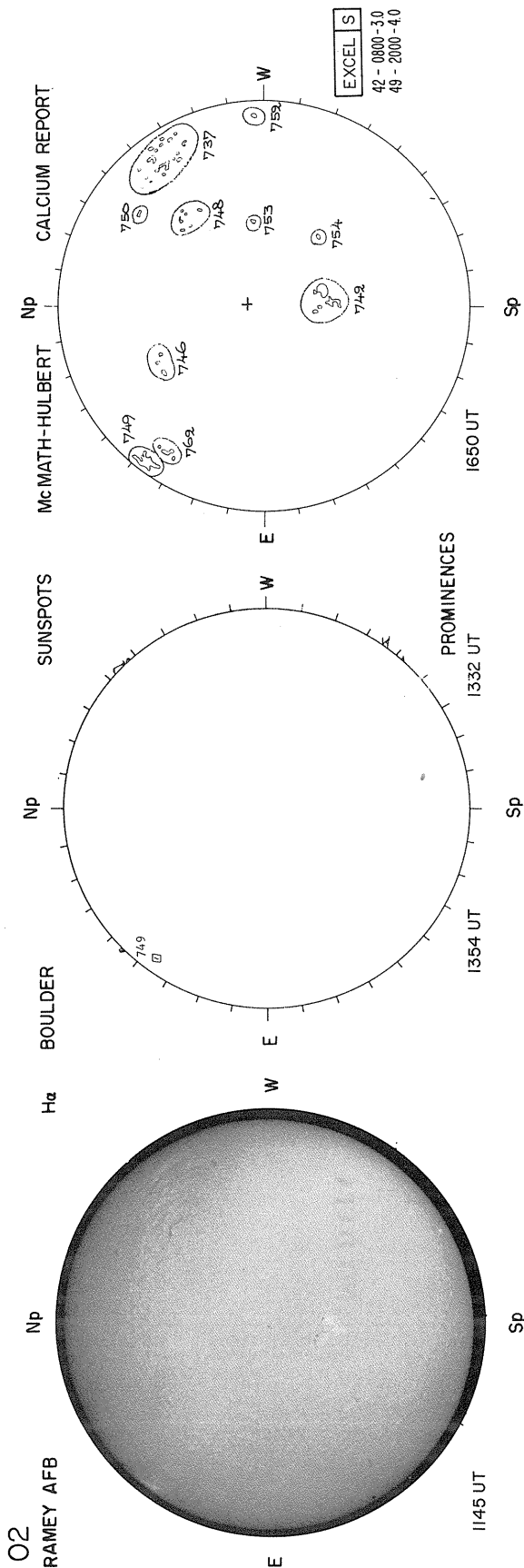


MAGNETOGRAM
Solid - Plus
Dotted - Minus

MT. WILSON



Levels
+ 5
- 10
+ 20
- 40
+ 80



8.6 MM

Np

NOSC LA POSTA

2.0 CM

Np

NOSC LA POSTA

NO DATA

NO DATA

W

EQUIPMENT

E

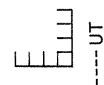
W

EQUIPMENT

E



-----UT

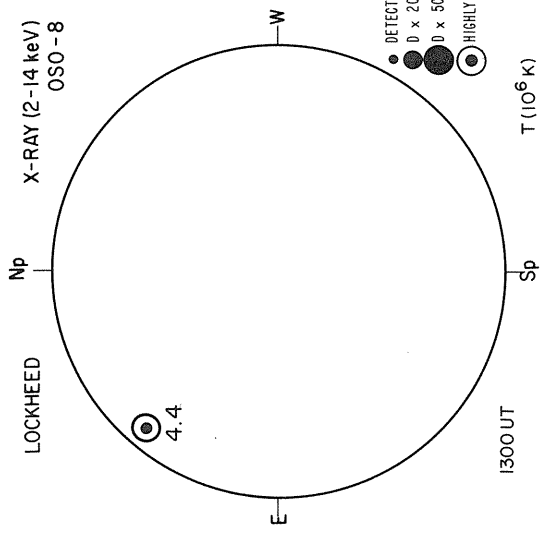


-----UT

Sp Ant. Temp Unit 100°K

Sp Ant. Temp Unit 100°K

MAY 3, 1977 (P = -23.83, B₀ = -3.94, L₀ = 189.76)



CORONA (1.15 R_☉)
5303 Å

Np

SACRAMENTO PEAK

NO DATA

E

W

1300 UT

T (10⁶ K)

MAGNETOGRAM
Bright - Plus
Dark - Minus

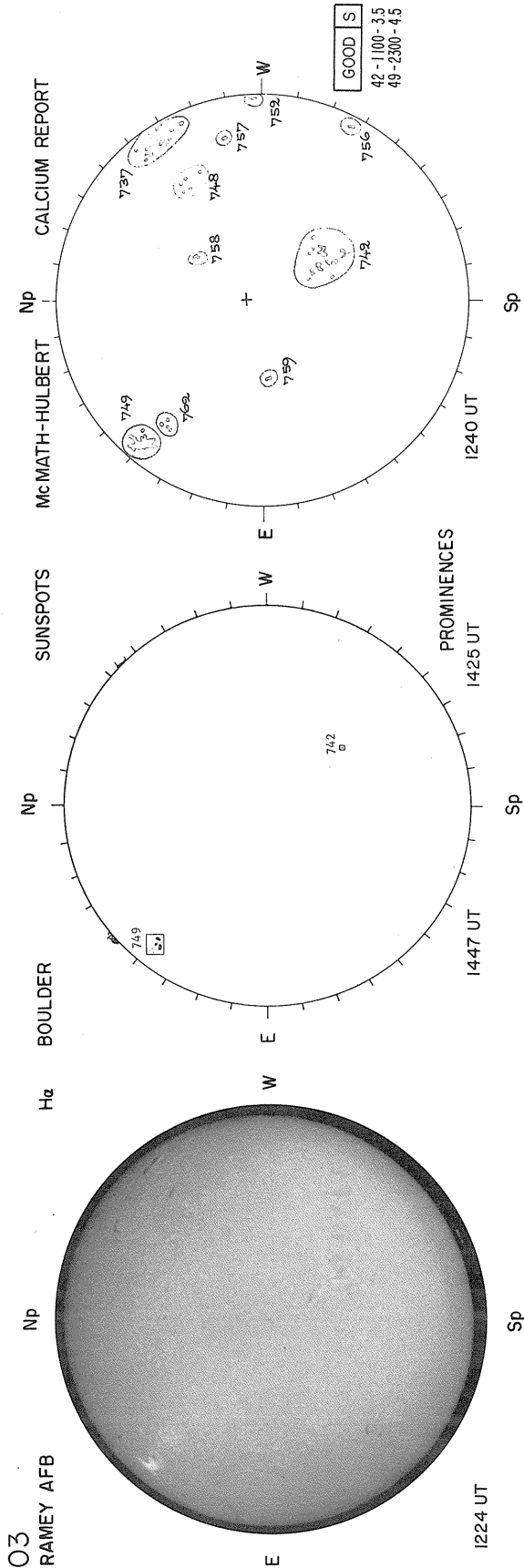
MAGNETOGRAM
Solid - Plus
Dotted - Minus

MT. WILSON

DELTA Y =
DELTA X =

NO DATA

Levels
+ 5
+ 10
+ 20
+ 40
+ 80



8.6 MM

Np

NOSC LA POSTA

2.0 CM

Np

NOSC LA POSTA

NO DATA

NO DATA

W

EQUIPMENT

E

W

EQUIPMENT

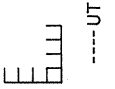
E

Ant. Temp Unit 100°K

Sp

Ant. Temp Unit 100°K

Sp

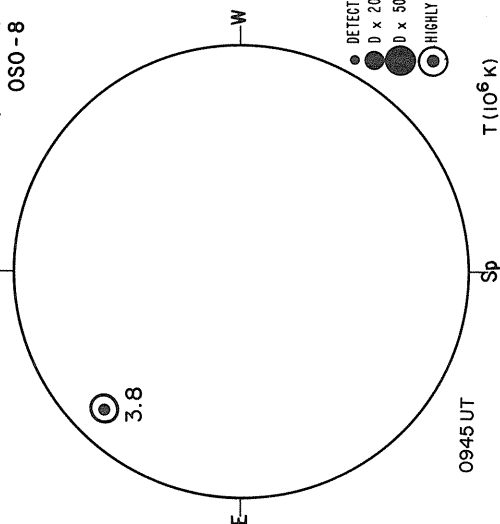


MAY 4, 1977 (P = -23.64, B₀ = -3.84, L₀ = 176.54)

LOCKHEED X-RAY (2-14 keV)
OSO-8

SACRAMENTO PEAK Np

CORONA (1.15 R₀)
5303 Å

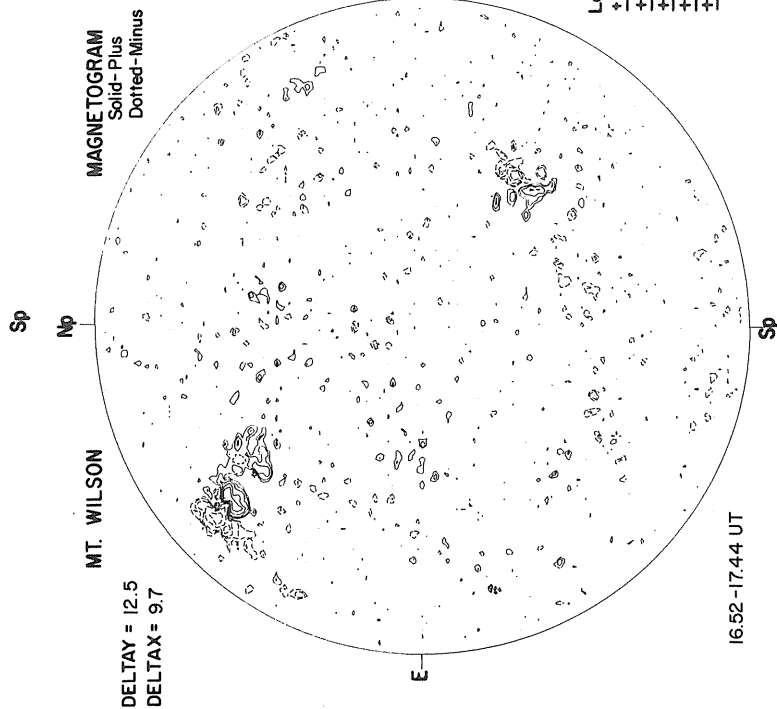


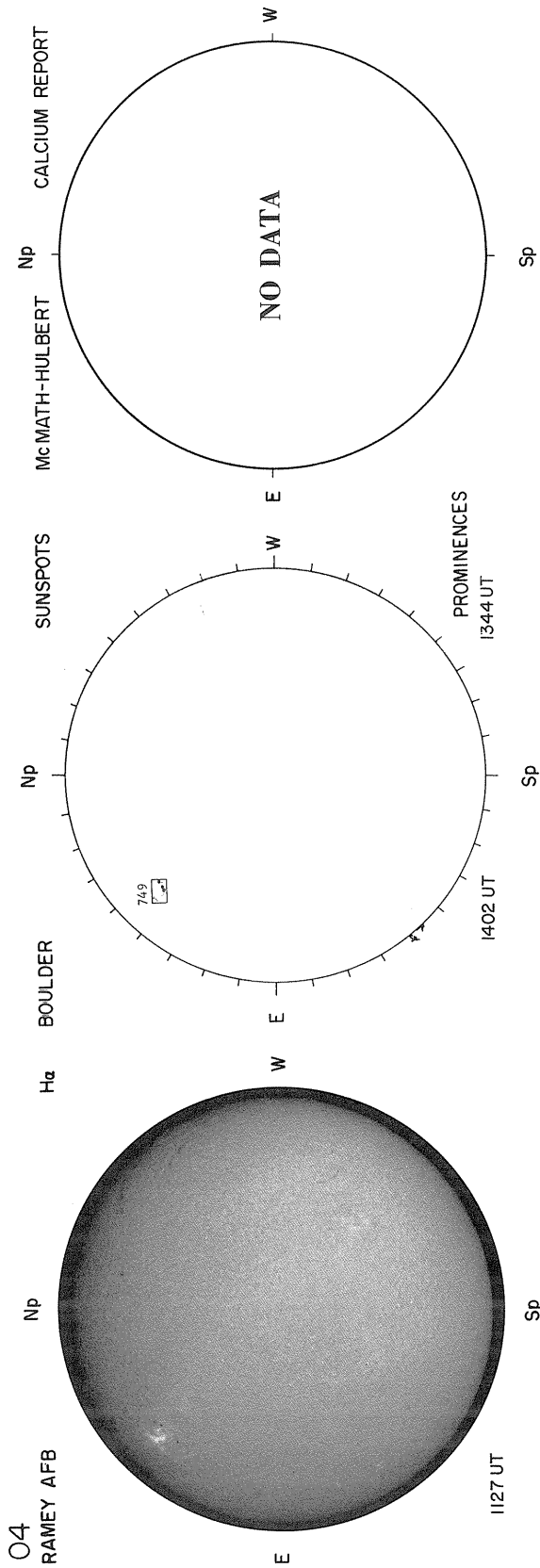
NO DATA E

W

KITT PEAK

MAGNETOGRAM
Bright- Plus
Dark - Minus





NOSC LA POSTA

2.0 CM

8.6 MM

Np

749

NO DATA

EQUIPMENT

-----UT

Ant. Temp Unit 100°K

Ant. Temp Unit 100°K

44
May 77

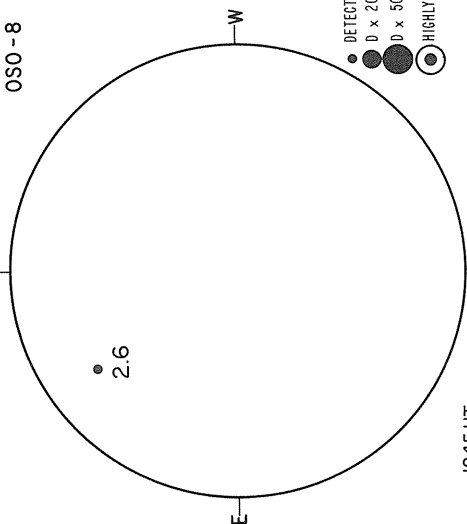
MAY 5, 1977 (P = -23.44, B₀ = -3.73, L₀ = 163.32)

LOCKHEED
X-RAY (2-14 keV)
OSO-8

SACRAMENTO PEAK

Np

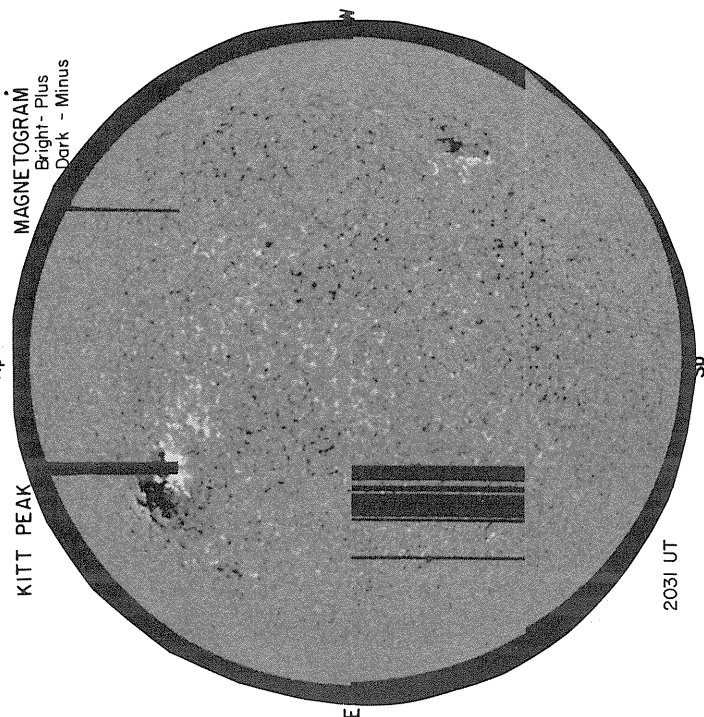
CORONA (1.15 R₀)
5303 Å



1245 UT

T (10⁶ K)

KITT PEAK
MAGNETOGRAM
Bright - Plus
Dark - Minus



2031 UT

W

NO DATA

E

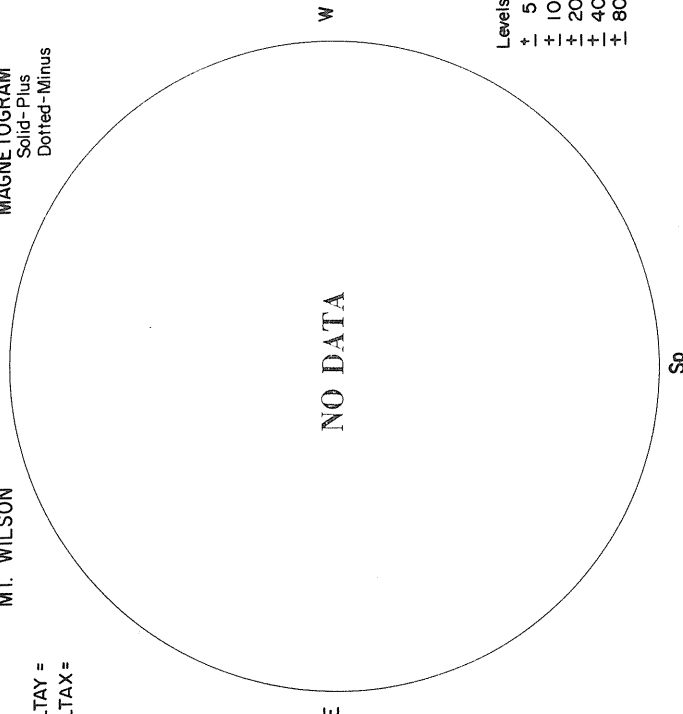
Sp

Np

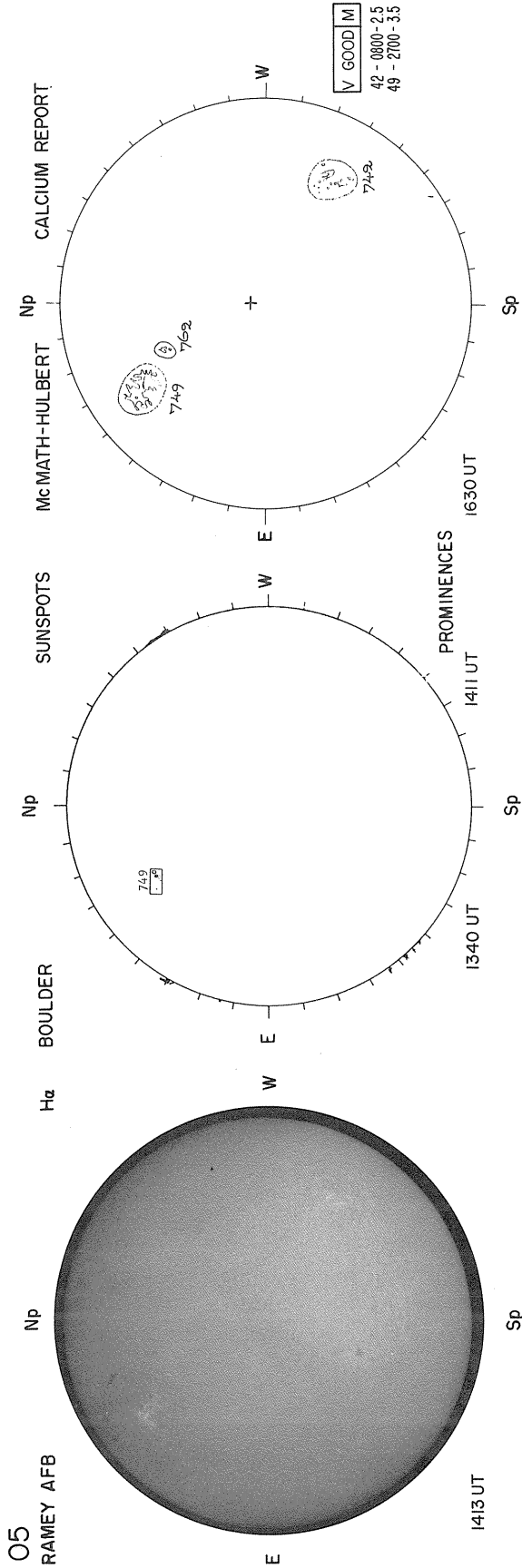
MT. WILSON

DELTA =
DELTA =

MAGNETOGRAM
Solid - Plus
Dotted - Minus



Levels
5
+ 10
+ 20
+ 40
+ 80



NOSC LA POSTA

Np

20 CM

8.6 MM

Np

NO DATA

EQUIPMENT

W

Ant. Temp. Unit 100° K

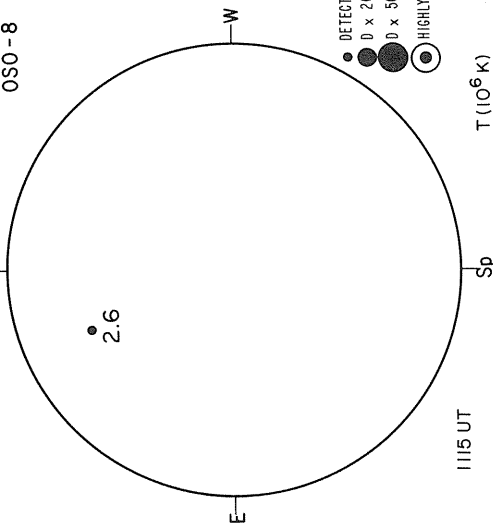
-----UT

Ant. Temp. Unit 100° K

-----UT

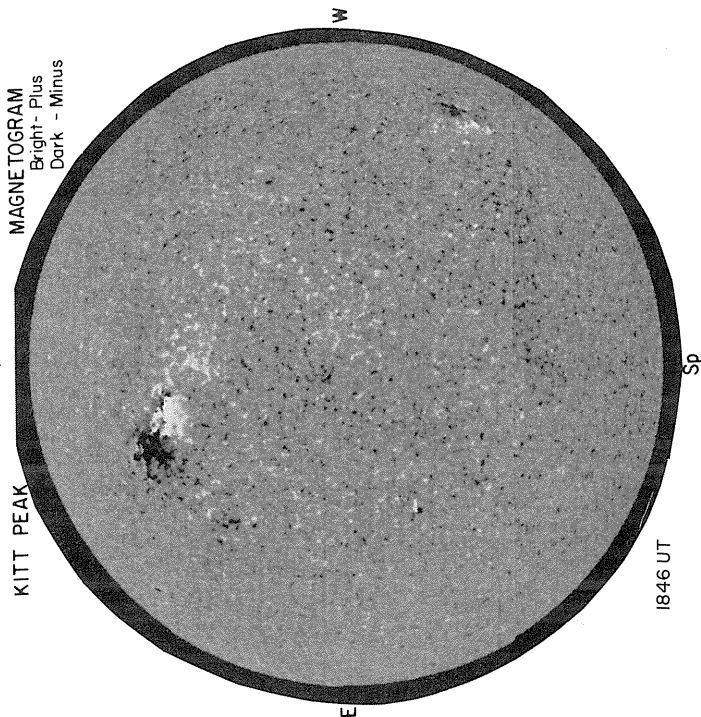
MAY 6, 1977 (P = -23.23, B₀ = -3.63, L₀ = 150.10)

LOCKHEED
X-RAY (2-14 keV)
OSO-8



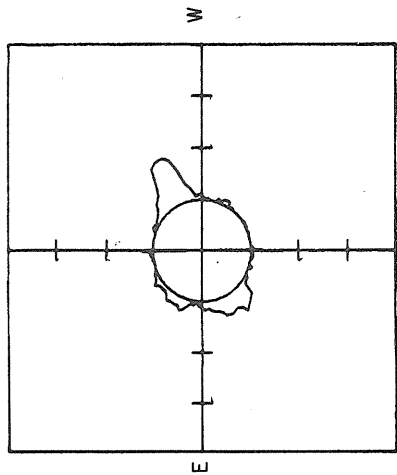
● DETECTABLE (1)
● 0 x 20
● 0 x 500
○ HIGHLY VARIABLE

KITT PEAK
MAGNETOGRAM
Bright- Plus
Dark - Minus

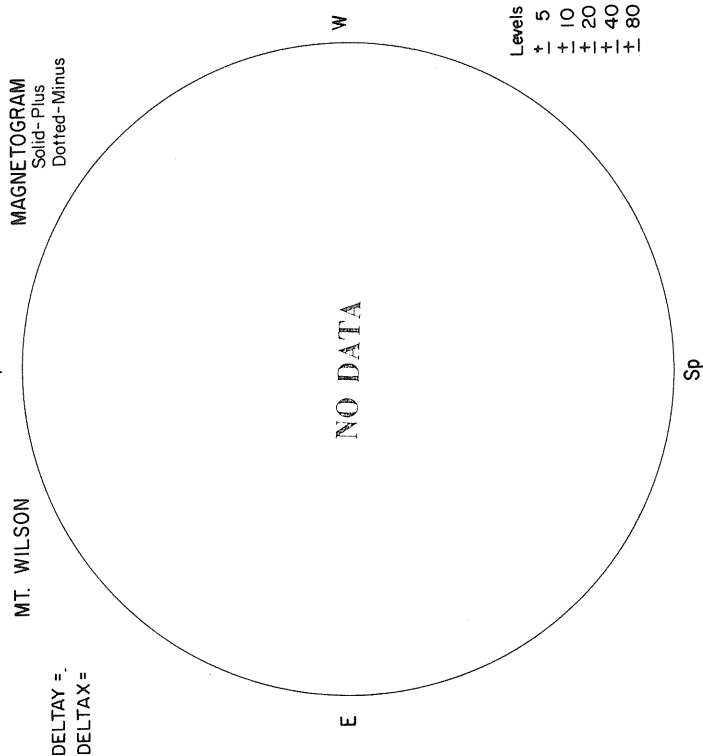


SACRAMENTO PEAK

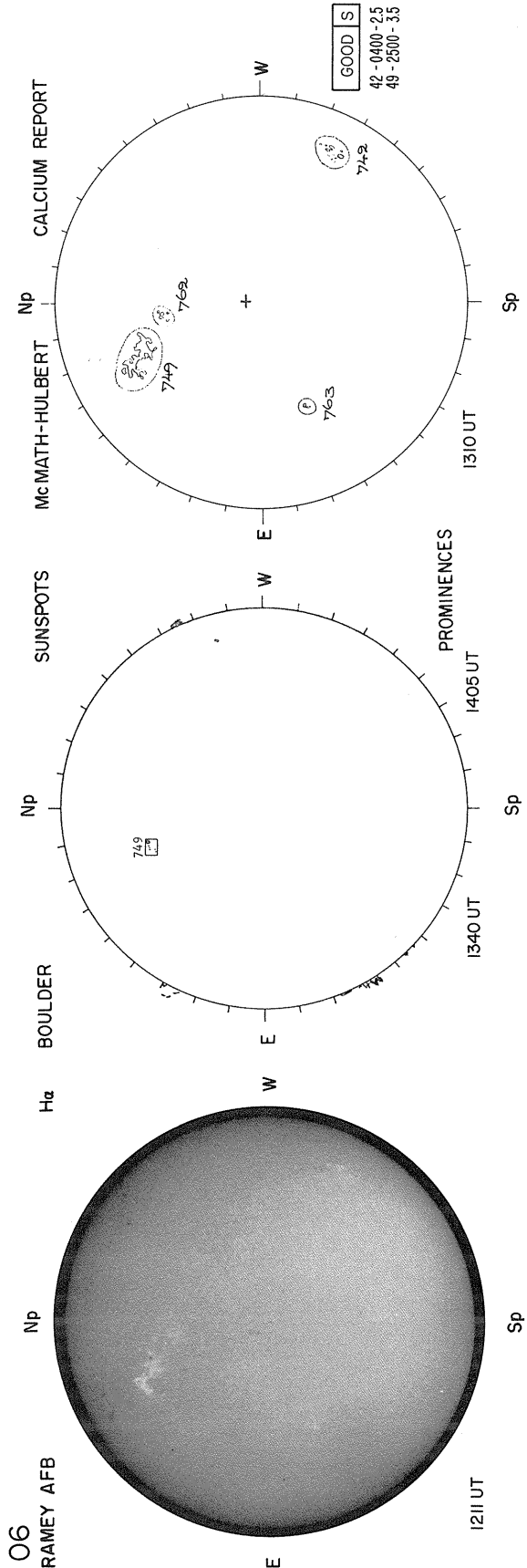
CORONA (1.15 R₀)
5303 Å



MT. WILSON
MAGNETOGRAM
Solid- Plus
Dotted- Minus



Levels
+ 5
+ 10
+ 20
+ 40
+ 80



NOSC LA POSTA 2.0 CM Np 8.6 MM

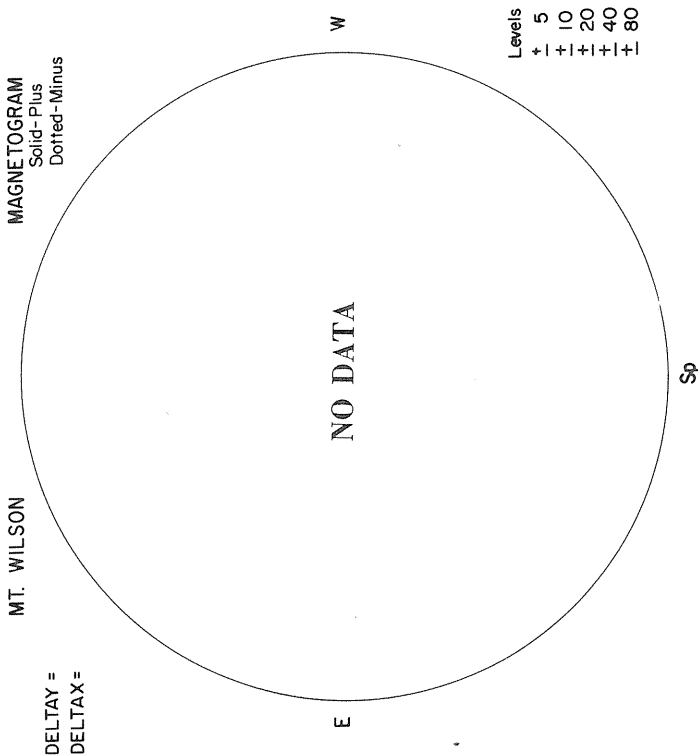
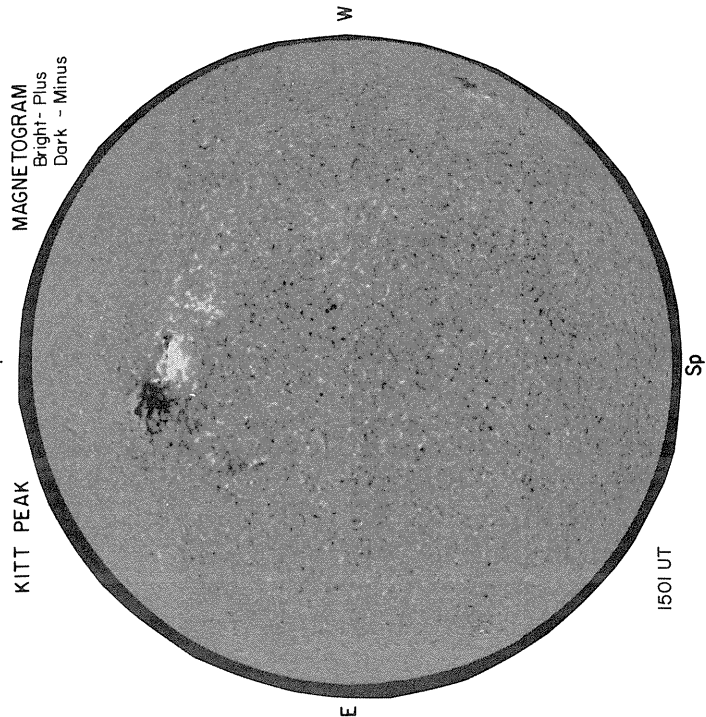
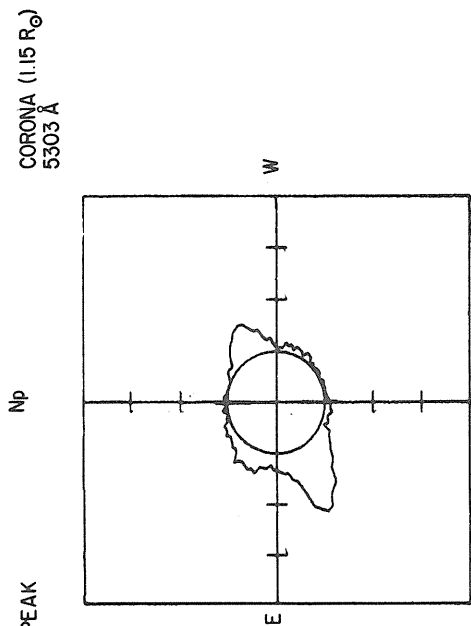
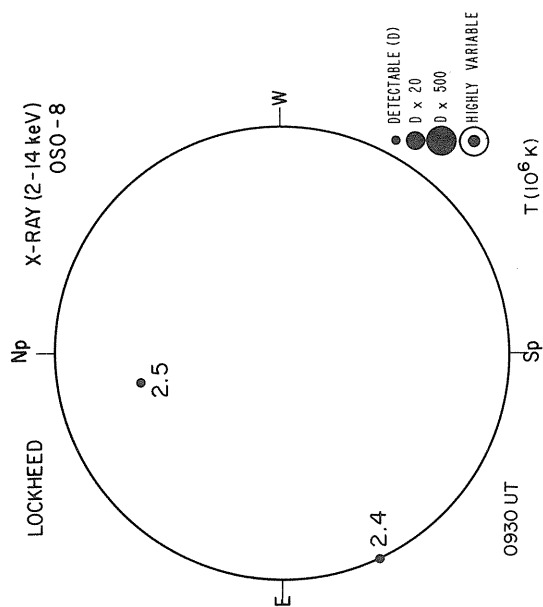
NO DATA NO DATA

EQUIPMENT EQUIPMENT

W W

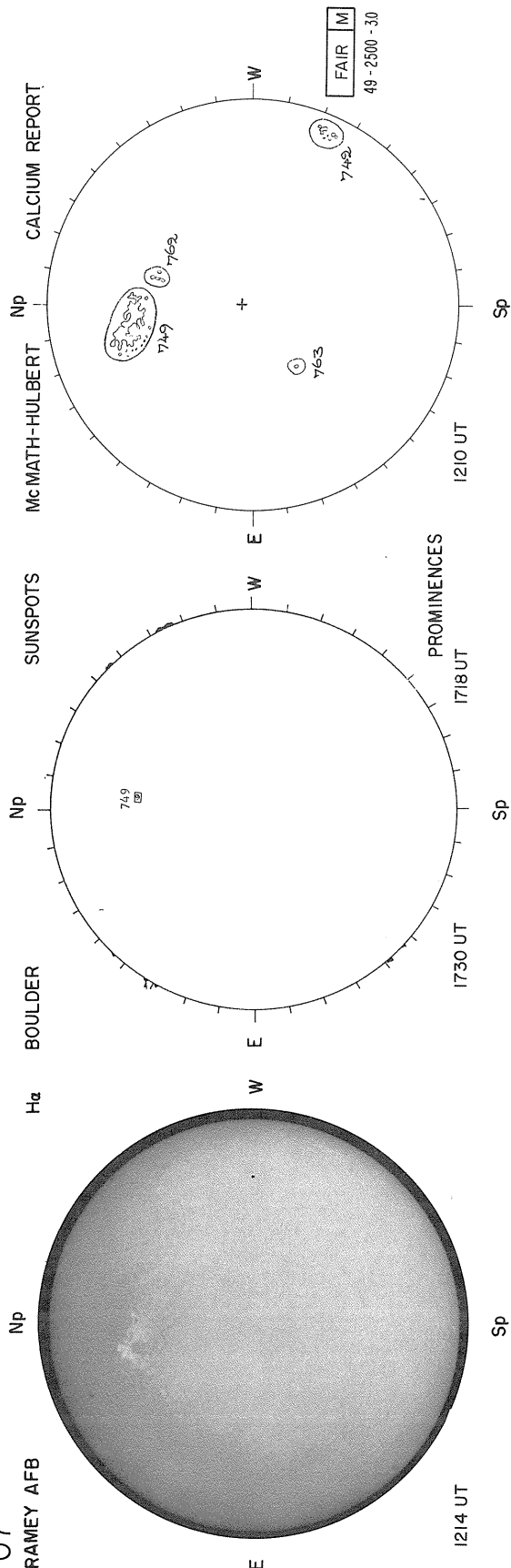
Ant. Temp Unit 100°K Ant. Temp Unit 100°K

MAY 7, 1977 (P = -23.01, B₀ = -3.52, L₀ = 136.88)



07

RAMEY AFB



NOSC LA POSTA

Np

NO DATA

E EQUIPMENT

Ant Temp Unit 100°K

Sp

2.0 CM

└

NOSC LA POSTA

Np

NO DATA

E EQUIPMENT

Ant Temp Unit 100°K

Sp

8.6 MM

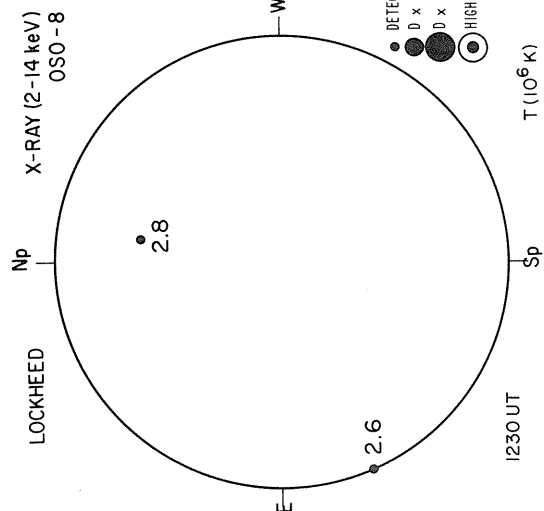
└

Ant Temp Unit 100°K

Sp

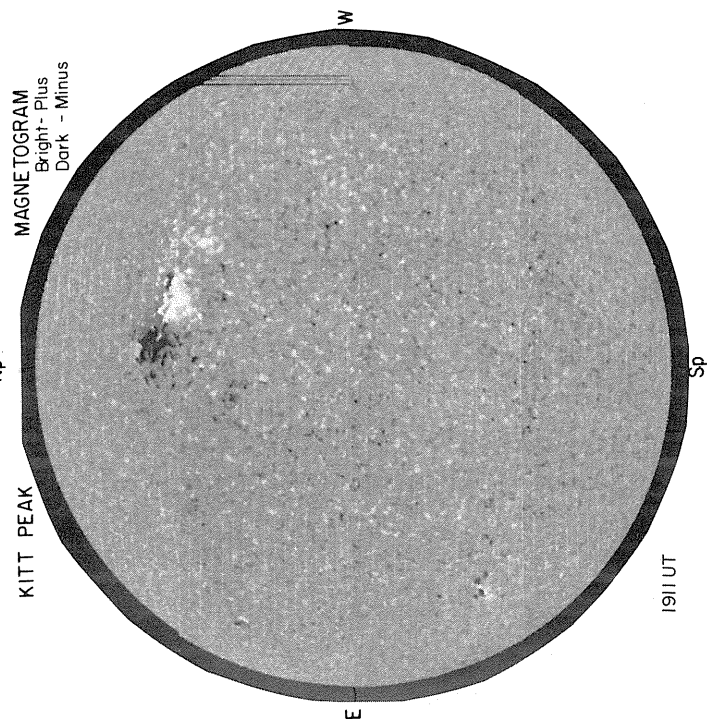
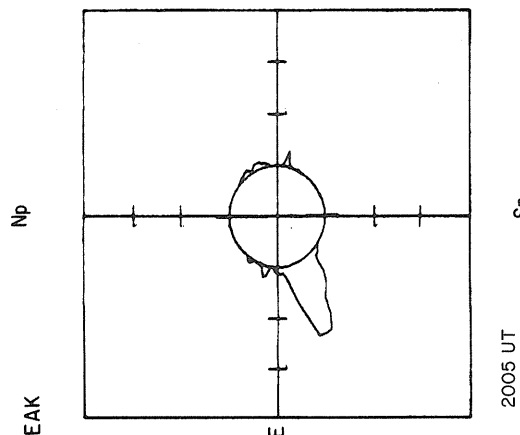
50
May 77

MAY 8, 1977 (P = -22.79, B₀ = -3.41, L₀ = 123.66)



SACRAMENTO PEAK

CORONA (1.15 R₀) 5303 Å



MAGNETOGRAM
Bright-Plus
Dark-Minus

DELTAY =
DELTAX =

MT. WILSON

MAGNETOGRAM
Solid-Plus
Dotted-Minus

2005 UT

Np

Sp

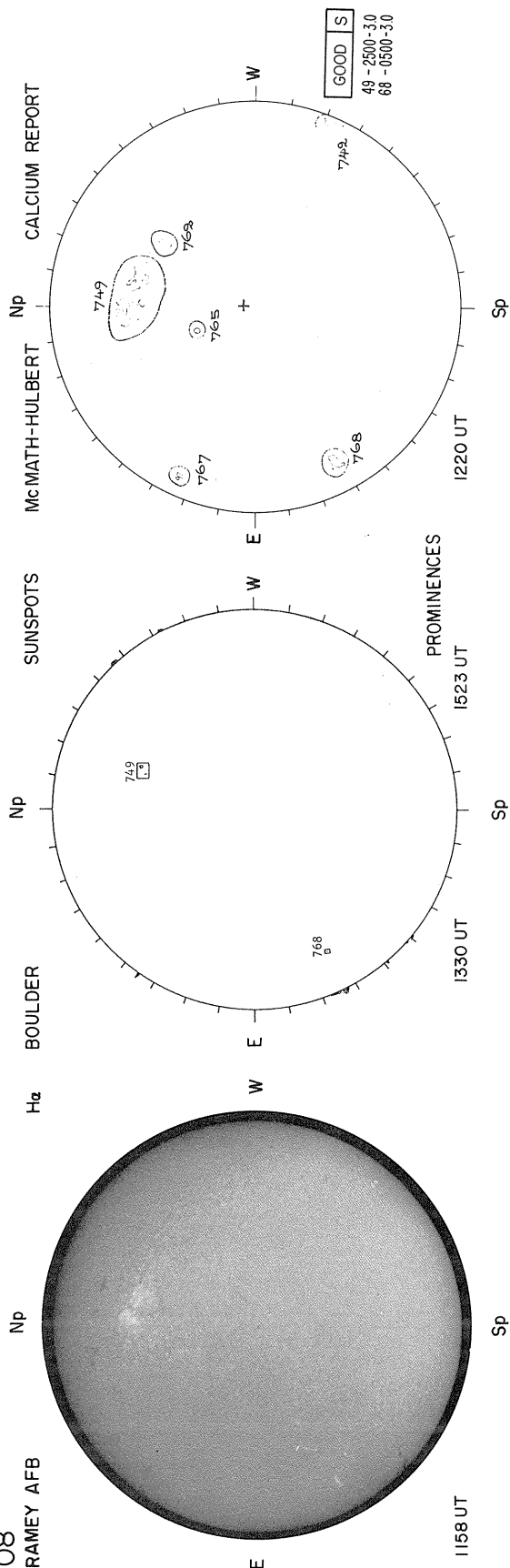
NO DATA

E

W

Levels
 + 5
 + 10
 + 20
 + 40
 + 80

08
RAMEY AFB



NOSC LA POSTA

Np

20 CM

└

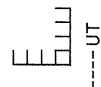
NO DATA

EQUIPMENT

W

Sp

Ant. Temp Unit 100°K



-----UT

NOSC LA POSTA

Np

8.6 MM

└

NO DATA

EQUIPMENT

W

Sp

Ant. Temp Unit 100°K

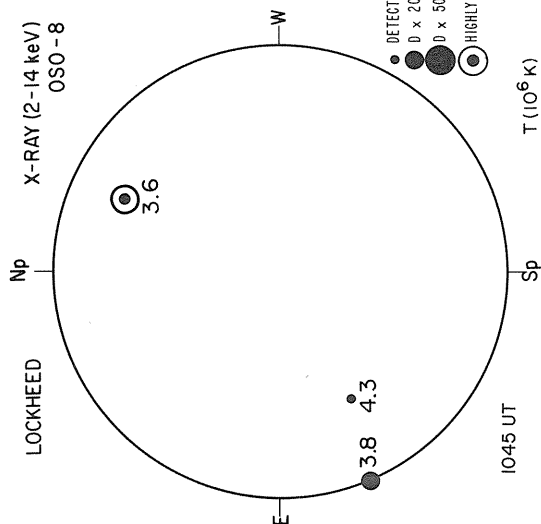


-----UT

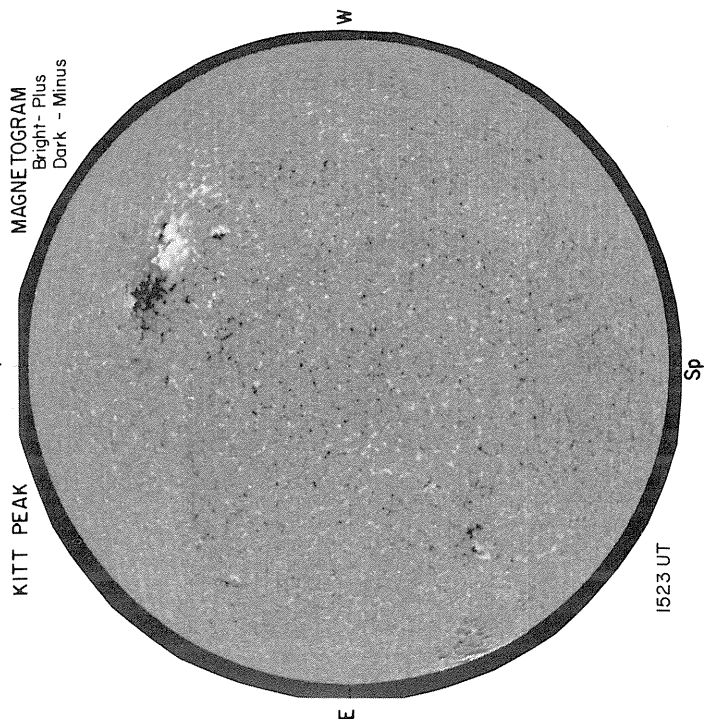
52
May 77

MAY 9, 1977 (P = -22.56, B₀ = -3.31, L₀ = 110.43)

LOCKHEED X-RAY (2-14 keV)
OSO-8

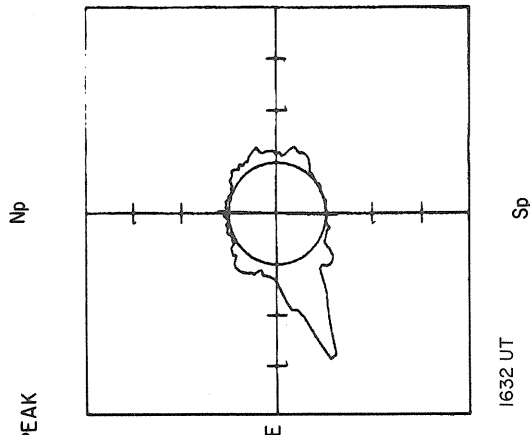


KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



SACRAMENTO PEAK

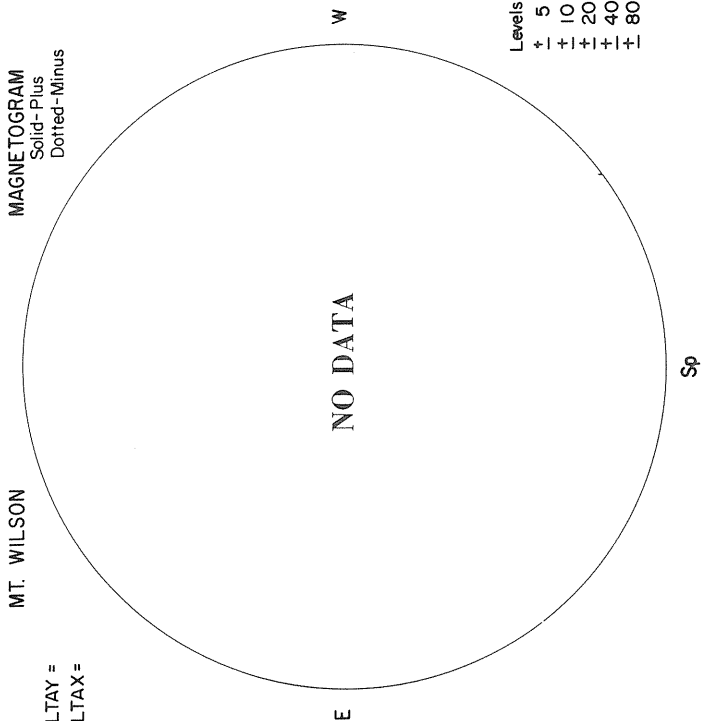
CORONA (1.15 R₀)
5303 Å



DELTA Y =
DELTA X =

MT. WILSON

MAGNETOGRAM
Solid - Plus
Dotted - Minus



Levels
+ 5
+ 10
+ 20
+ 40
+ 80

80

RAMEY AFB

NP

HI

BOULDER

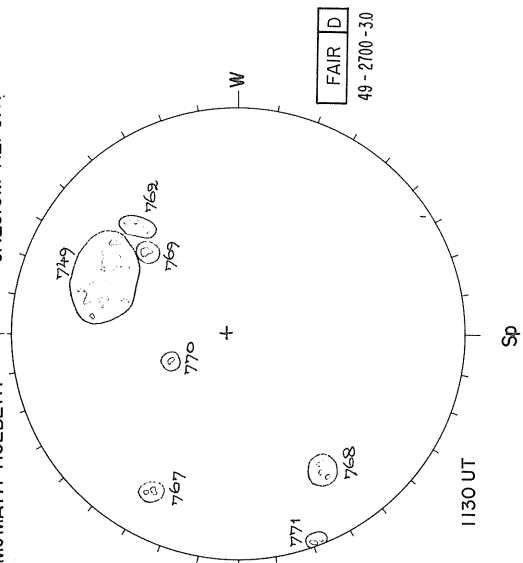
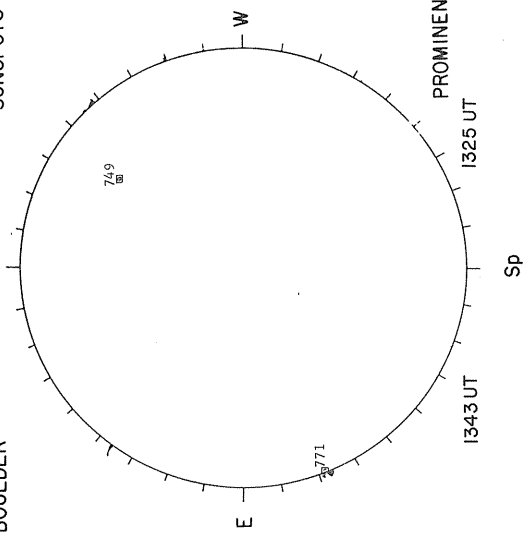
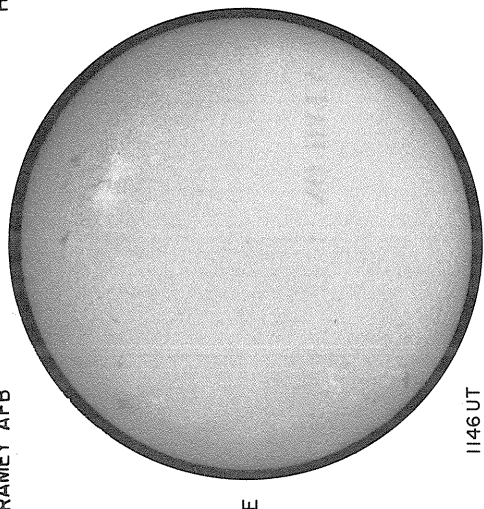
 dN

SUNSPOTS

dn

MC MATH-HULBERT

CALCIUM REPORT



NOSC LA POSTA

20

2.0 CM

NOSC LA POSTA

३८

8.6 MM



NO DATA

NO DATA

u

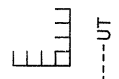
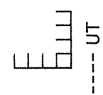
WEATHER

W

W

WEATHER

M



5

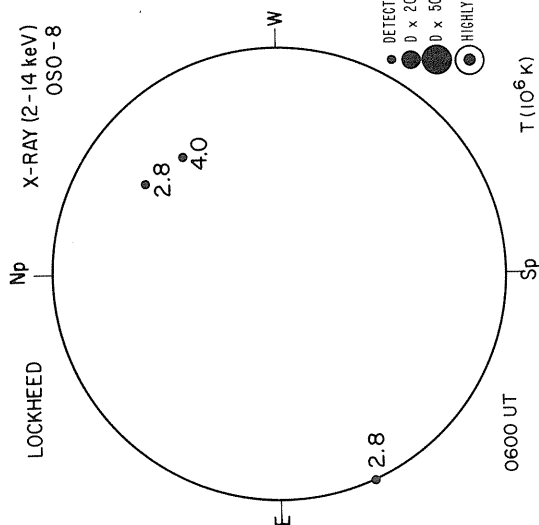
Ant. Temp. Unit 100°K
└─┘

5

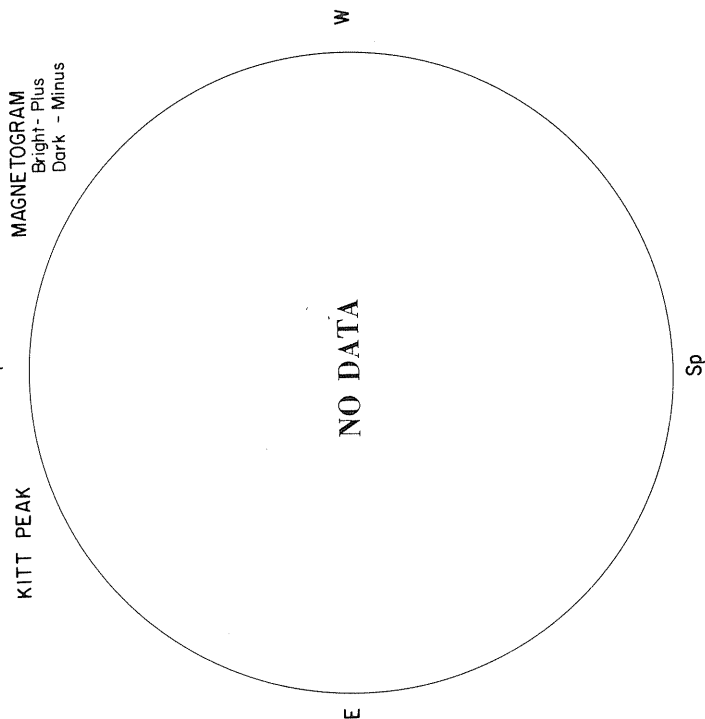
Ant. Temp. Unit 100°K

MAY 10, 1977 (P = -22.32, B₀ = -3.20, L₀ = 97.21)

LOCKHEED
X-RAY (2-14 keV)
OSO-8

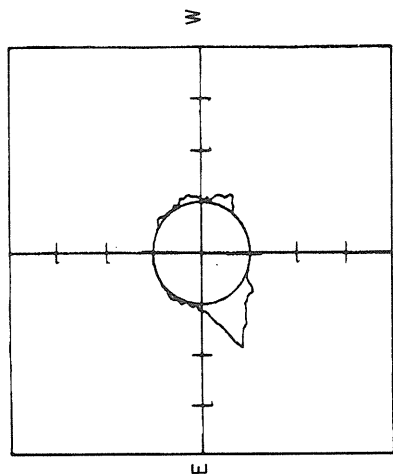


KITT PEAK
MAGNETOGRAM
Bright- Plus
Dark - Minus



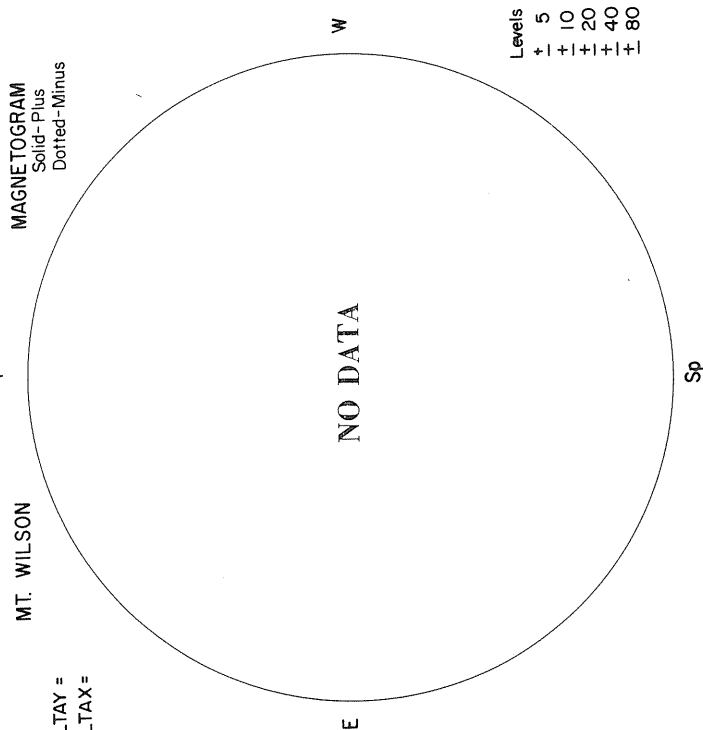
SACRAMENTO PEAK

CORONA (115 R₀)
5303 Å

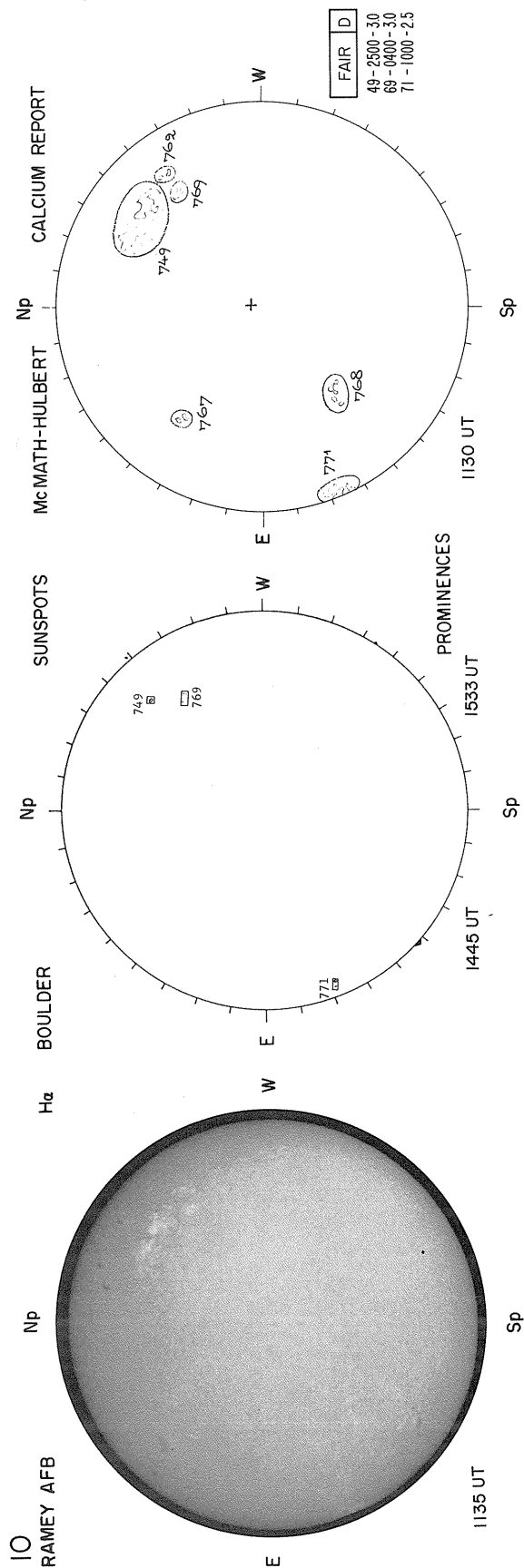


1419 UT

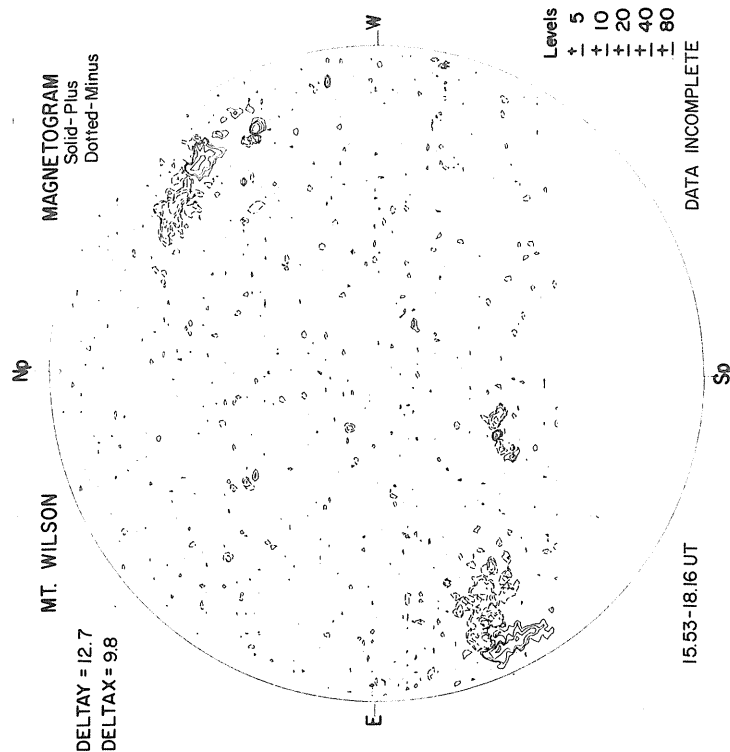
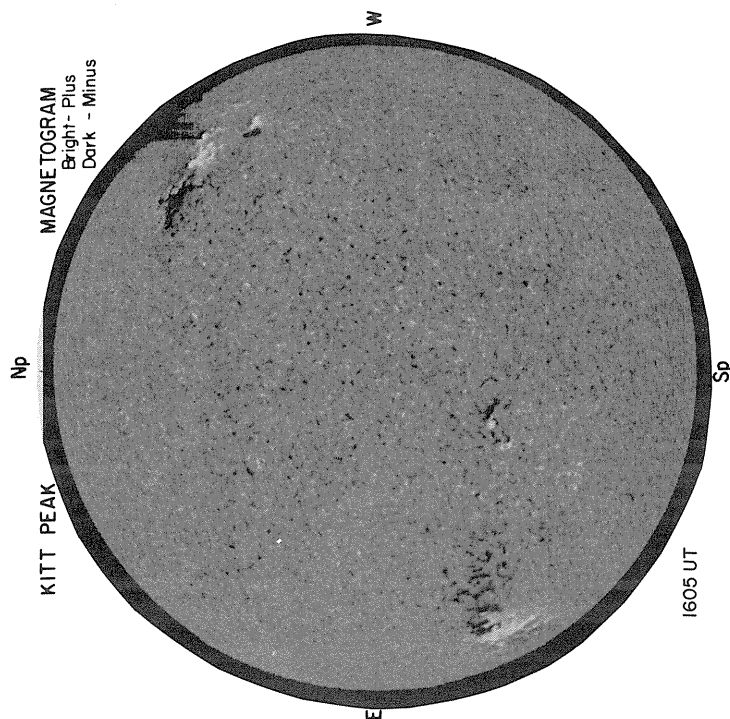
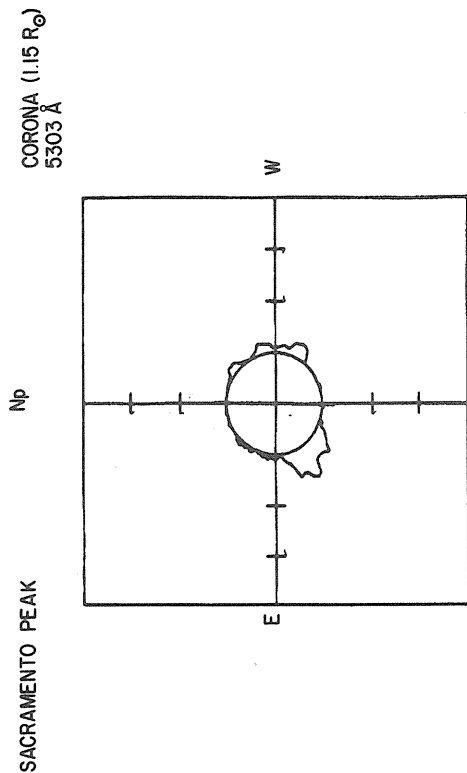
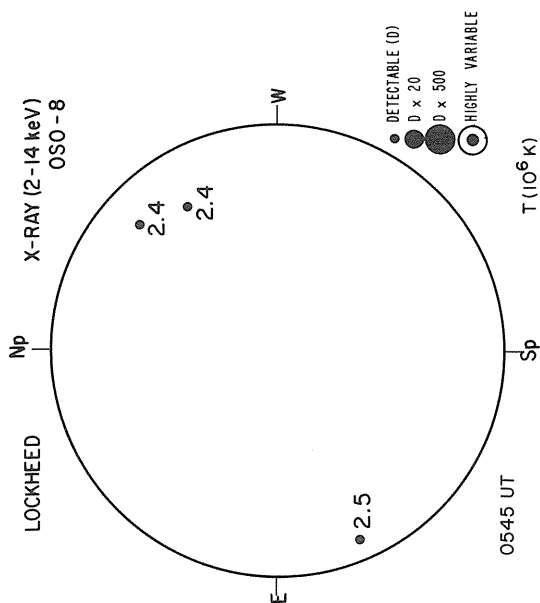
MT. WILSON
MAGNETOGRAM
Solid- Plus
Dotted- Minus

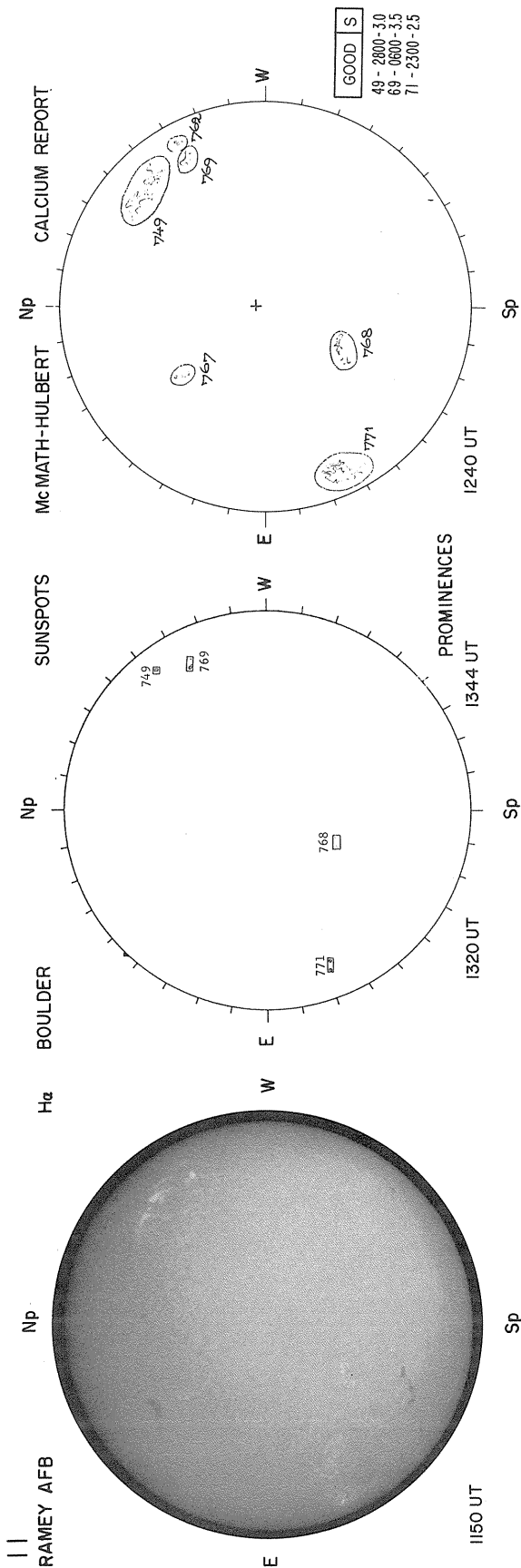


Levels
+ 5
+ 10
+ 20
+ 40
+ 80



MAY 11, 1977 (P = -22.08, B₀ = -3.09, L₀ = 83.99)





NOSC LA POSTA Np 20 CM 8.6 MM

NO DATA

WEATHER W

Ant. Temp Unit 100°K

NOSC LA POSTA Np

NO DATA

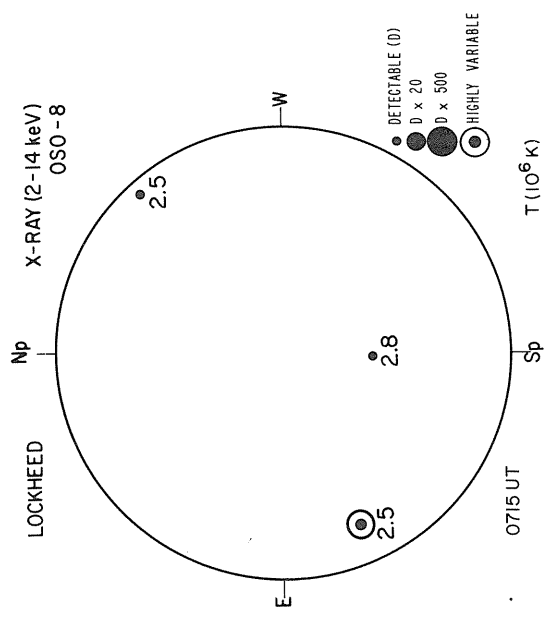
WEATHER W

Ant. Temp Unit 100°K

-----UT

-----UT

MAY 12, 1977 (P = -2.83, B₀ = -2.98, L₀ = 70.77)

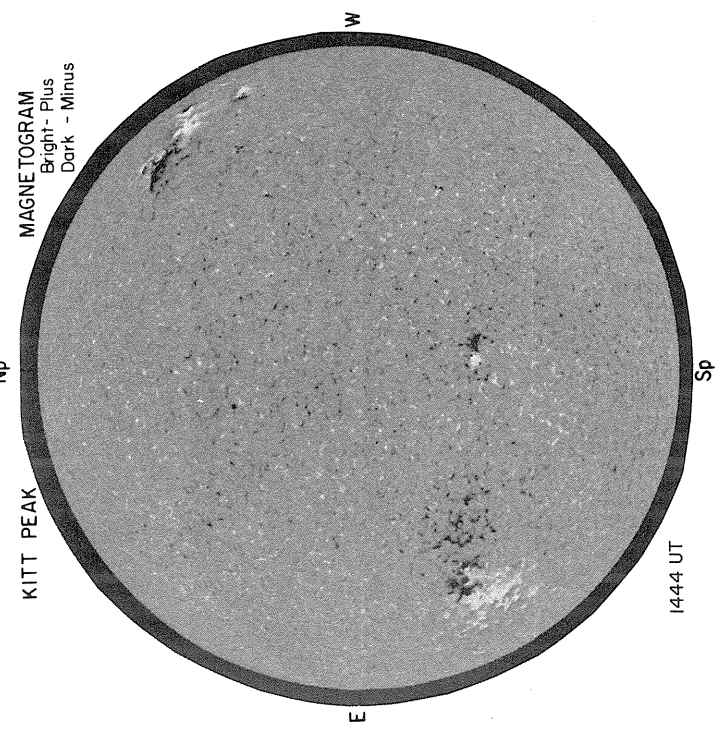


CORONA (1.15 R₀)
5303 Å

Np

SACRAMENTO PEAK

E NO DATA W



MAGNETOGRAM
Solid - Plus
Dotted - Minus

MT. WILSON

DELTA T =
DELTA X =

Sp

Np

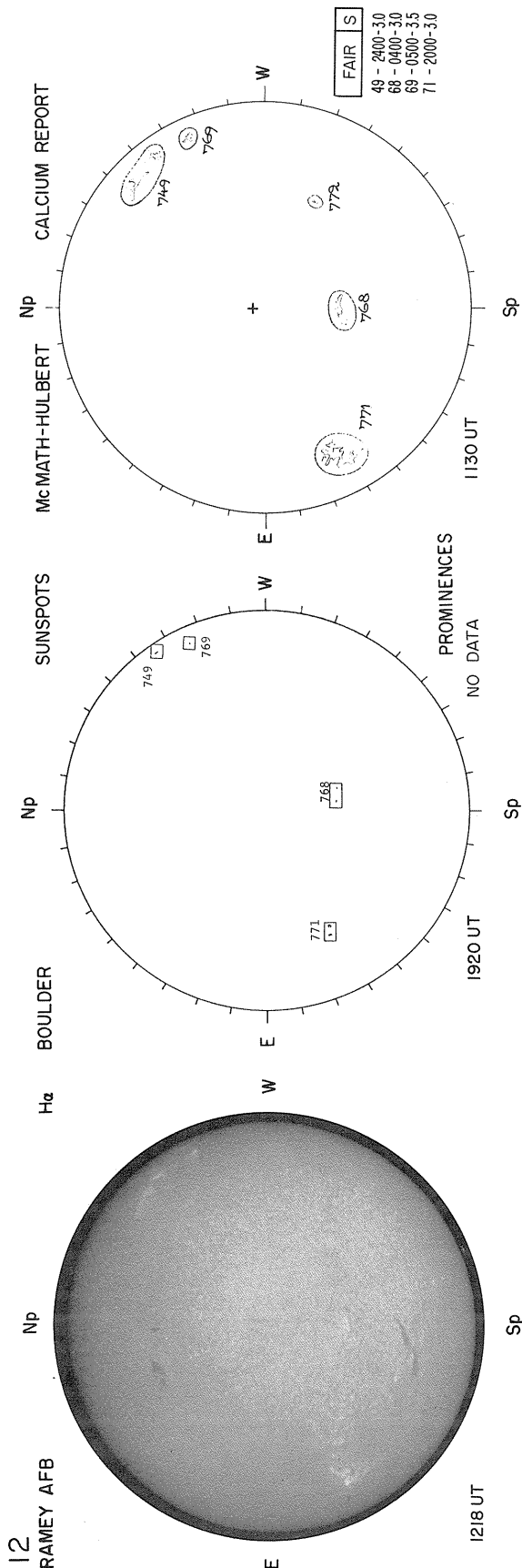
W

E

NO DATA

Levels
+ 5
+ 10
+ 20
+ 40
+ 80

Sp



86 MM

Np

NOSC LA POSTA

2.0 CM

Np

NOSC LA POSTA

NO DATA

EQUIPMENT

E

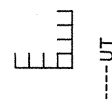
W

EQUIPMENT

E

Ant. Temp. Unit 100°K

Sp

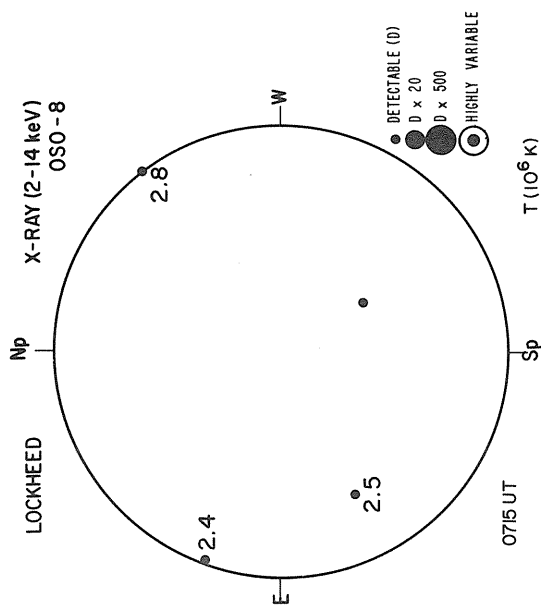


Ant. Temp. Unit 100°K

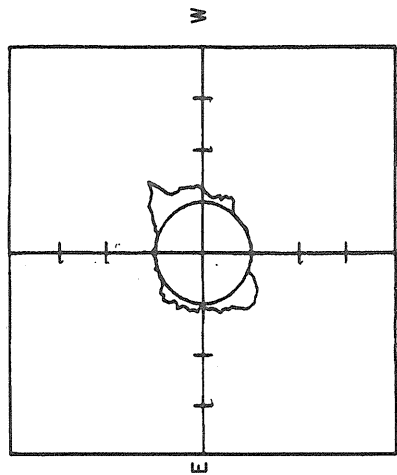
Sp



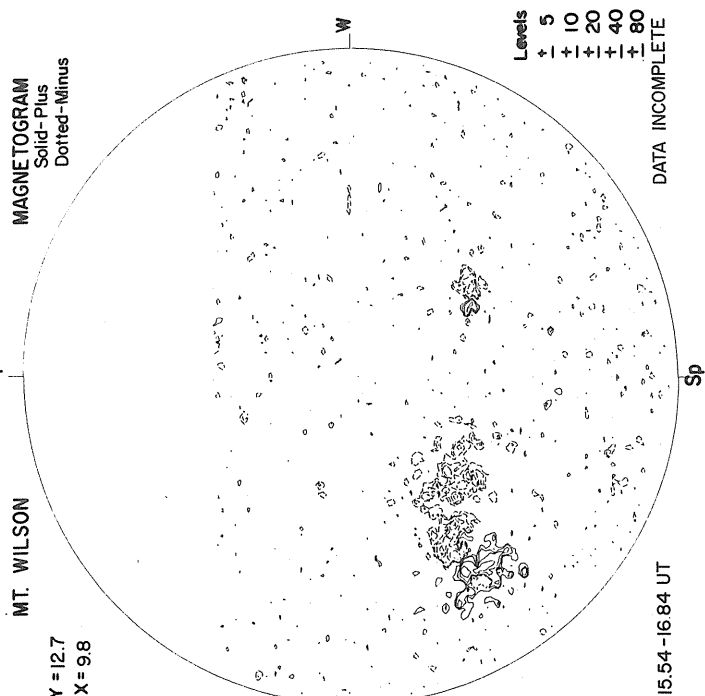
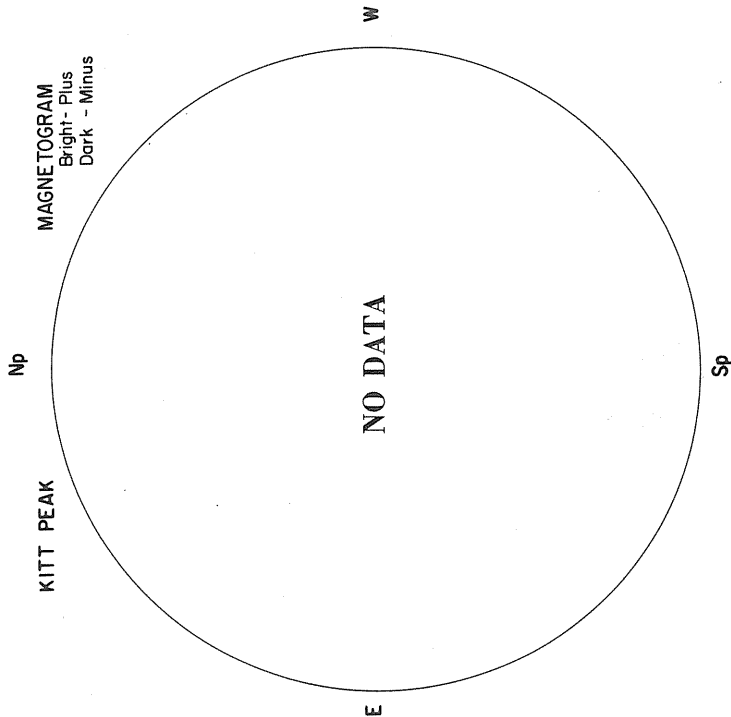
MAY 13, 1977 (P = -21.57, B₀ = -2.86, L₀ = 57.54)

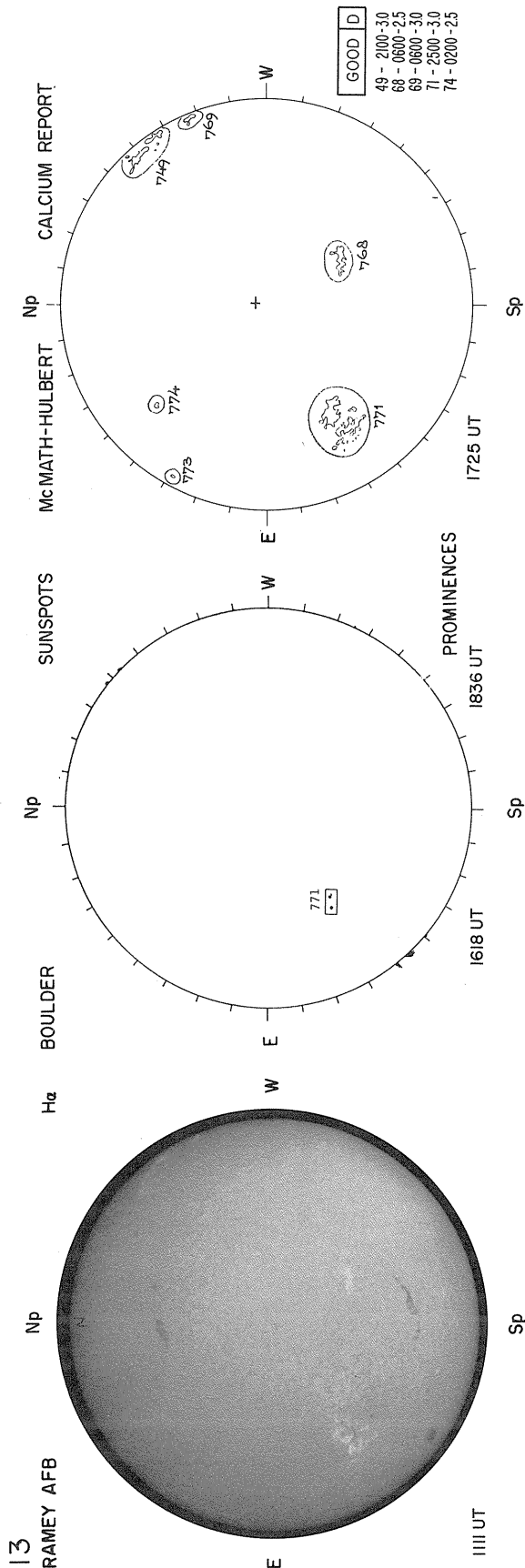


SACRAMENTO PEAK
CORONA (1.15 R₀)
5303 Å



1556 UT
MT. WILSON
DELTA Y = 12.7
DELTA X = 9.8
MAGNETOGRAM
Solid-Plus
Dotted-Minus





NOSC LA POSTA

Np

20 CM

8.6 MM

1725 UT

Sp

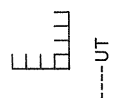
NO DATA

WEATHER

W

Ant. Temp. Unit 100°K

Sp



NOSC LA POSTA

Np

20 CM

8.6 MM

1725 UT

Sp

NO DATA

EQUIPMENT

W

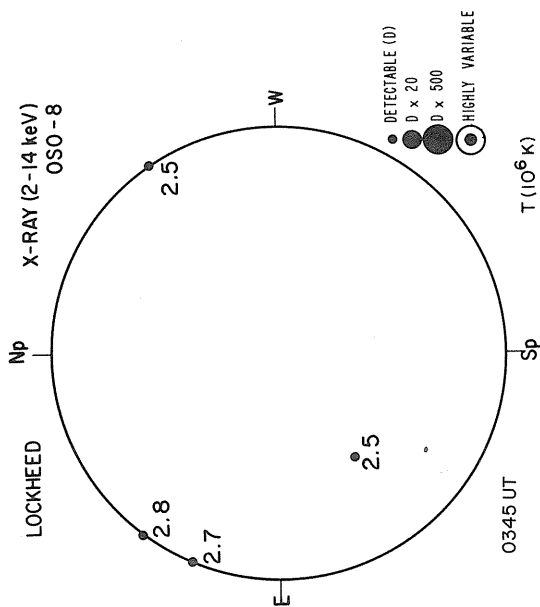
Ant. Temp. Unit 100°K

Sp

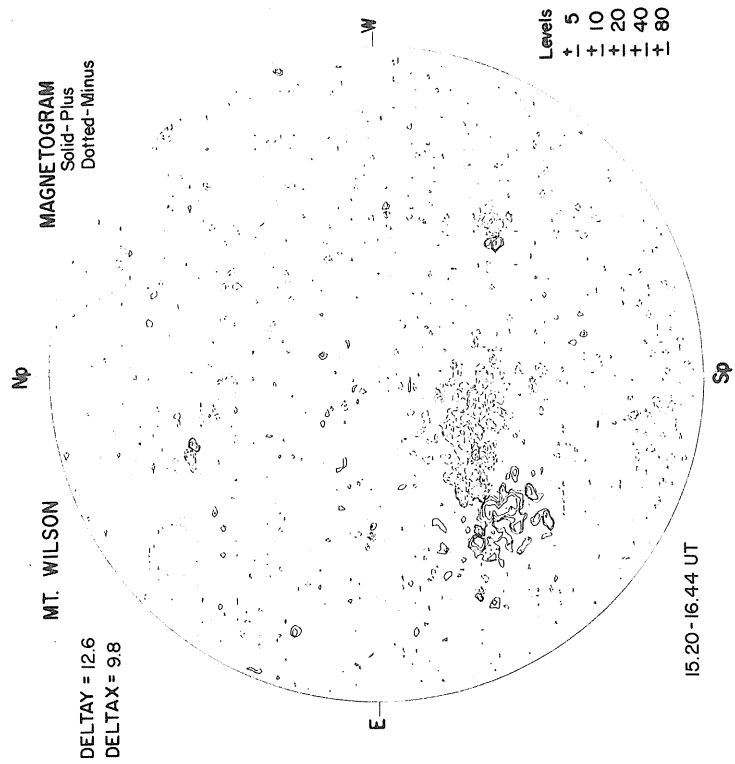
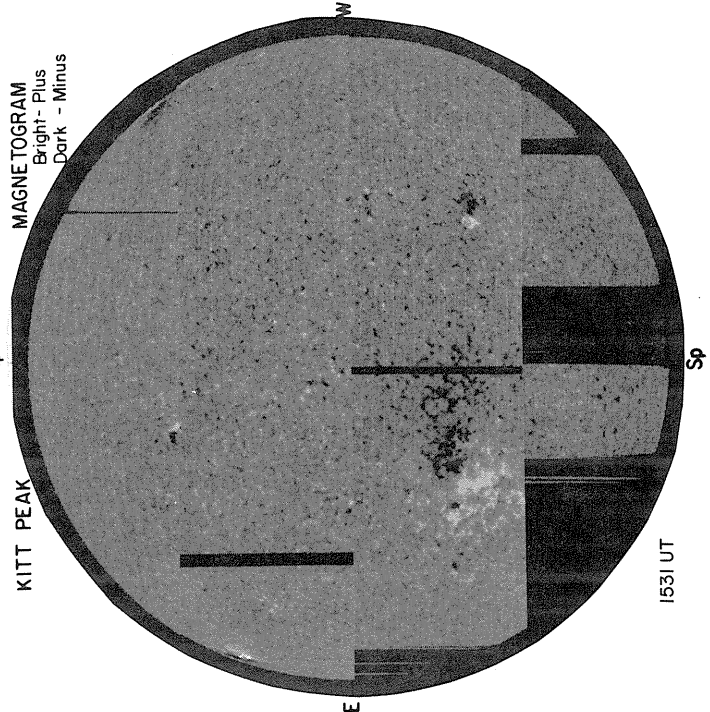
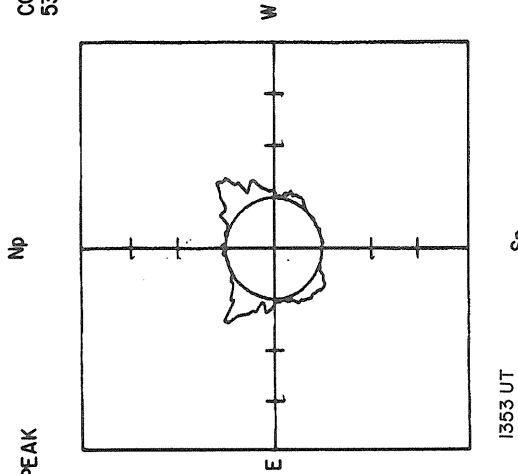


62
May 77

MAY 14, 1977 (P = -21.31, B₀ = -2.75, L₀ = 44.32)



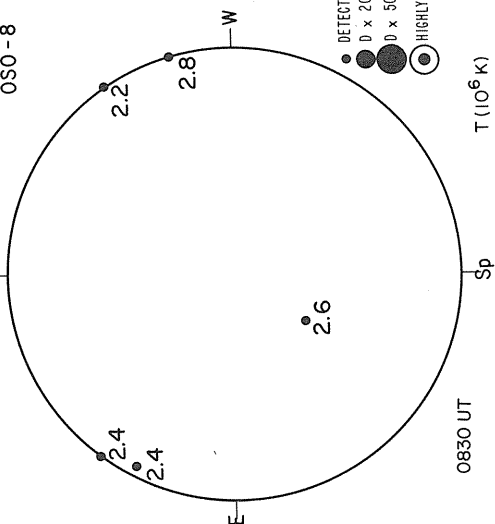
CORONA (1.15 R₀)
5303 Å



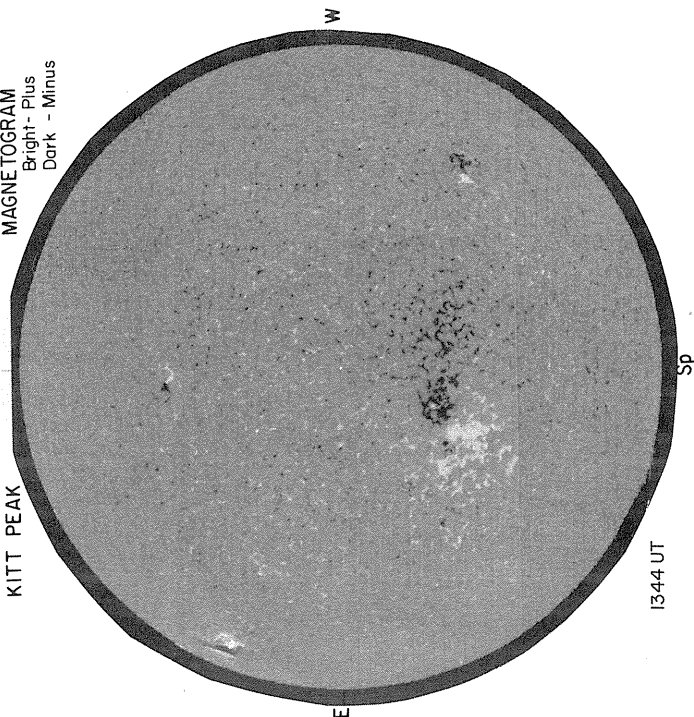
64
May 77

MAY 15, 1977 (P = -21.04, B₀ = -2.64, L₀ = 31.09)

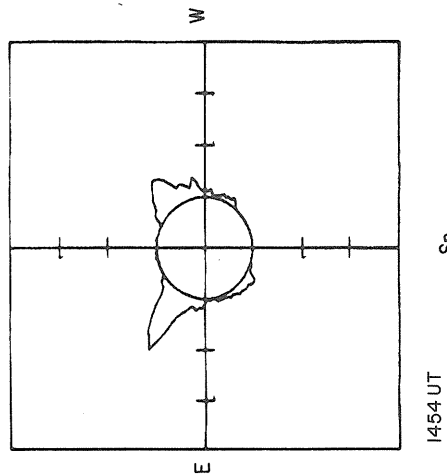
LOCKHEED
X-RAY (2-14 keV)
OSO-8



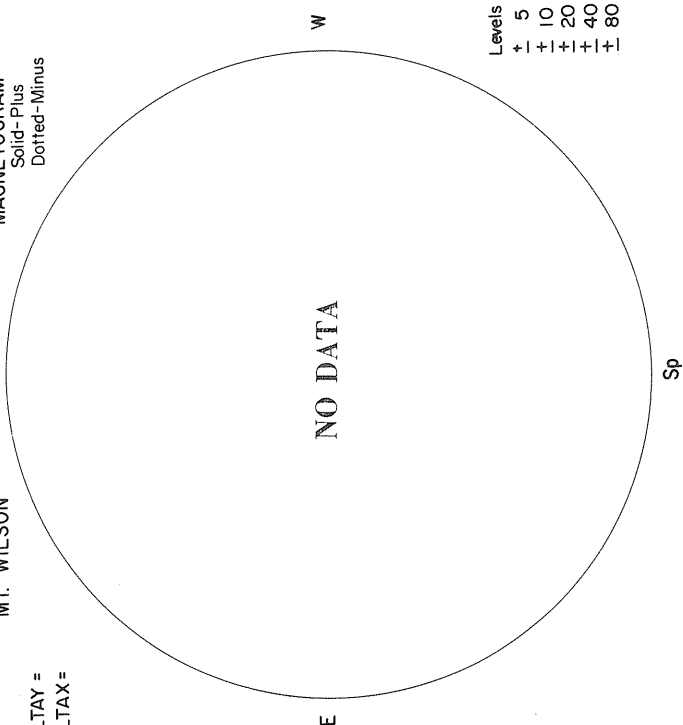
KITT PEAK
MAGNETOGRAM
Bright - Plus
Dark - Minus



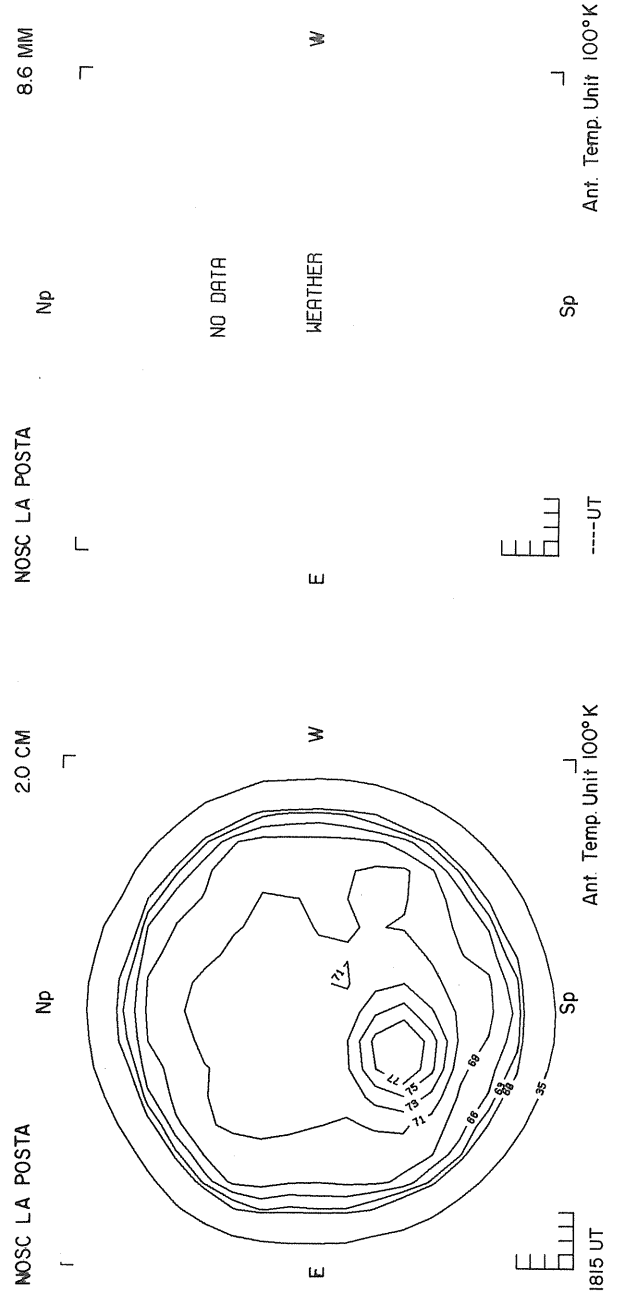
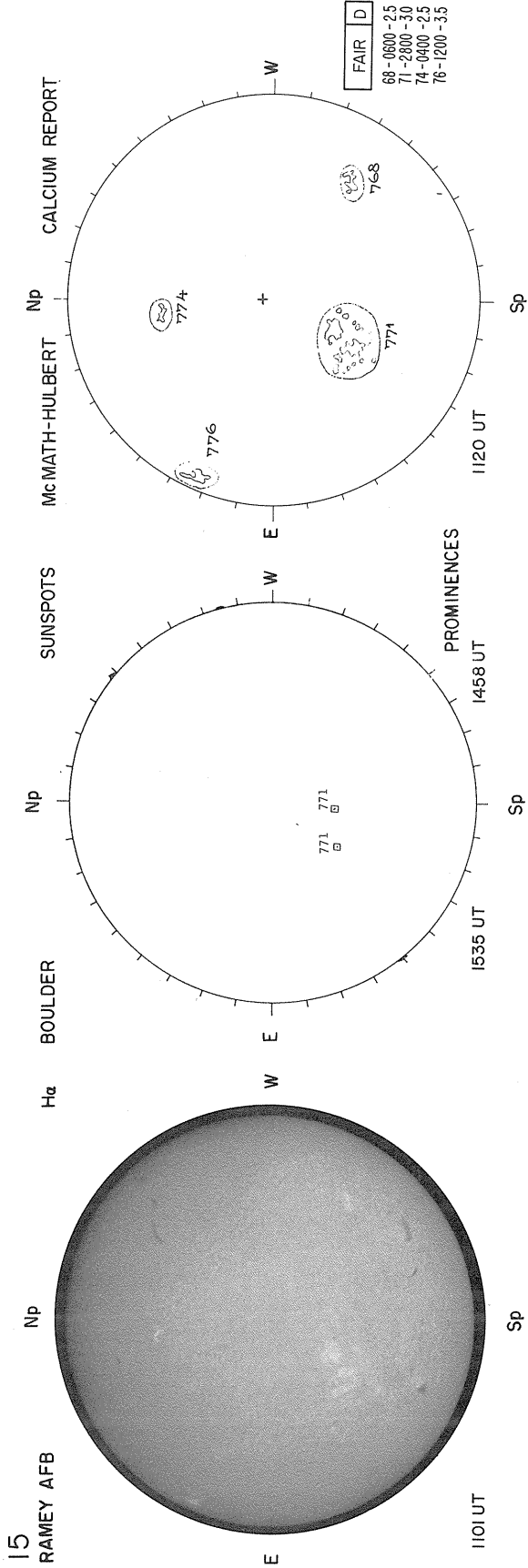
SACRAMENTO PEAK
CORONA (1.15 R_⊙)
5303 Å



MT. WILSON
MAGNETOGRAM
Solid - Plus
Dotted - Minus



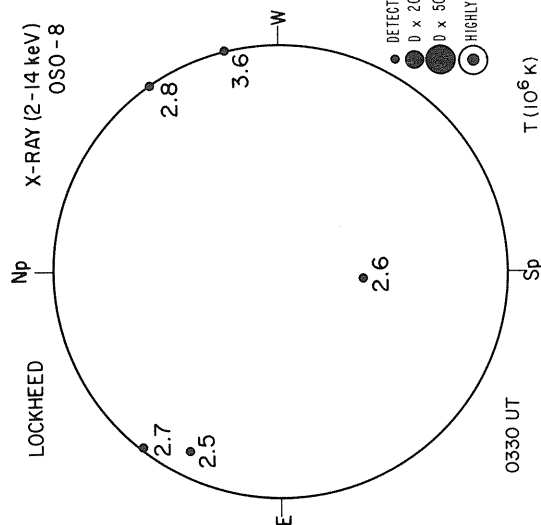
Levels
+ 5
+ 10
+ 20
+ 40
+ 80



66
May 77

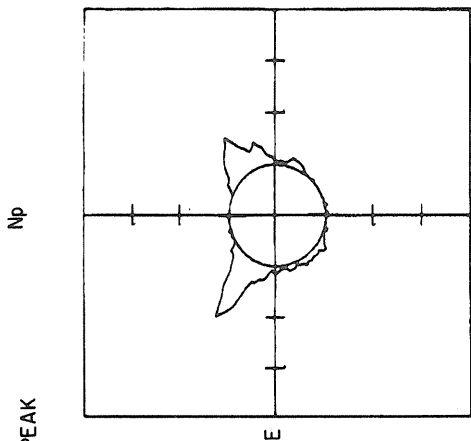
MAY 16, 1977 (P = -20.76, B₀ = -2.53, L₀ = 17.87)

LOCKHEED X-RAY (2-14 keV)
OSO-8

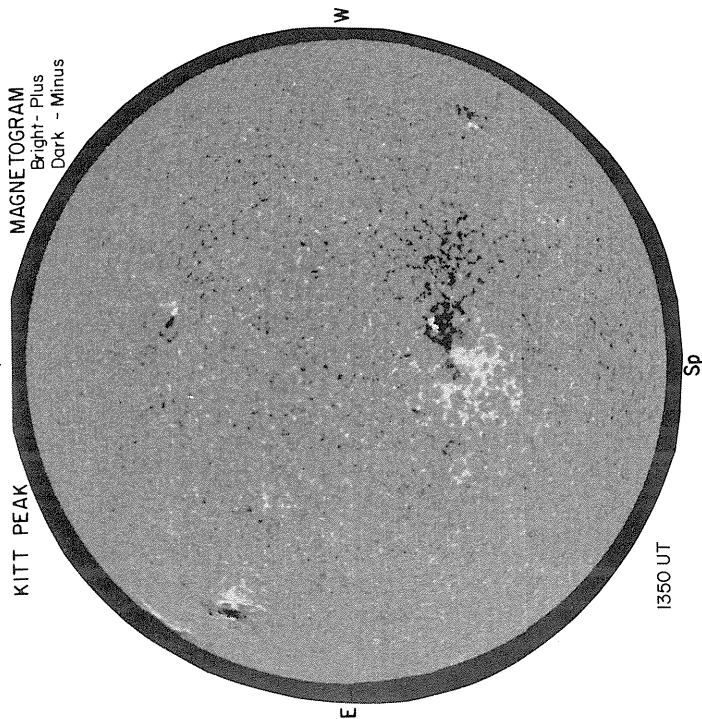


SACRAMENTO PEAK

CORONA (1115 R₀)
5303 Å



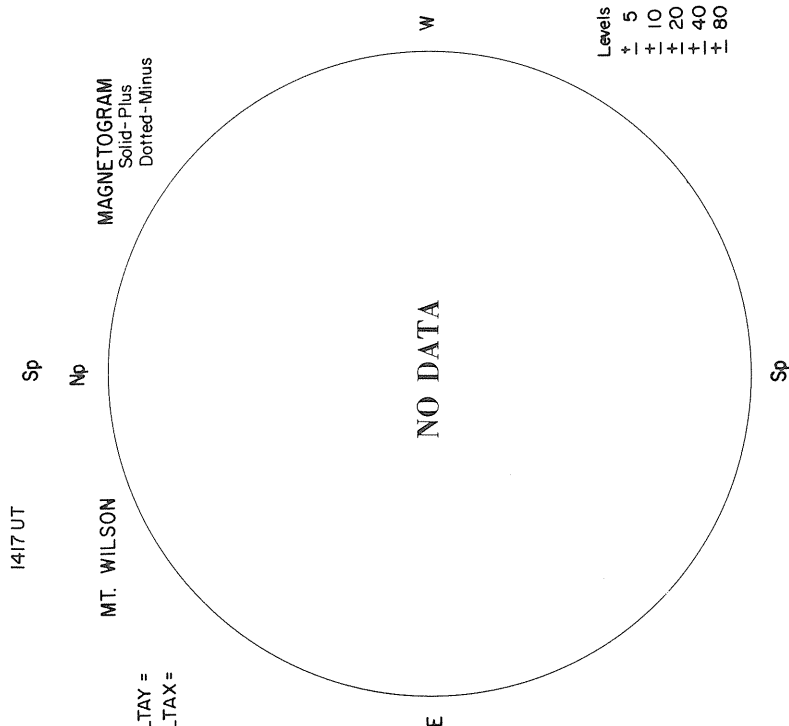
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON

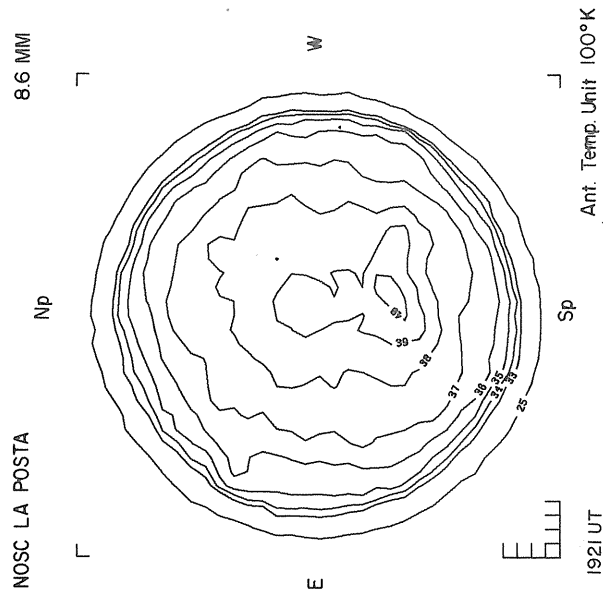
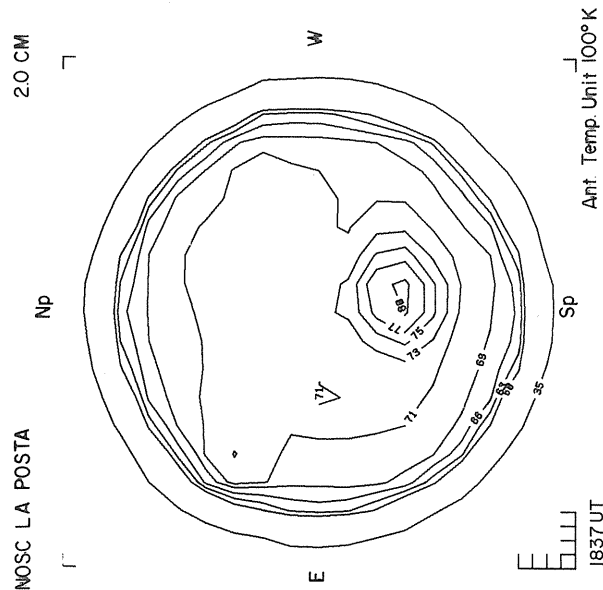
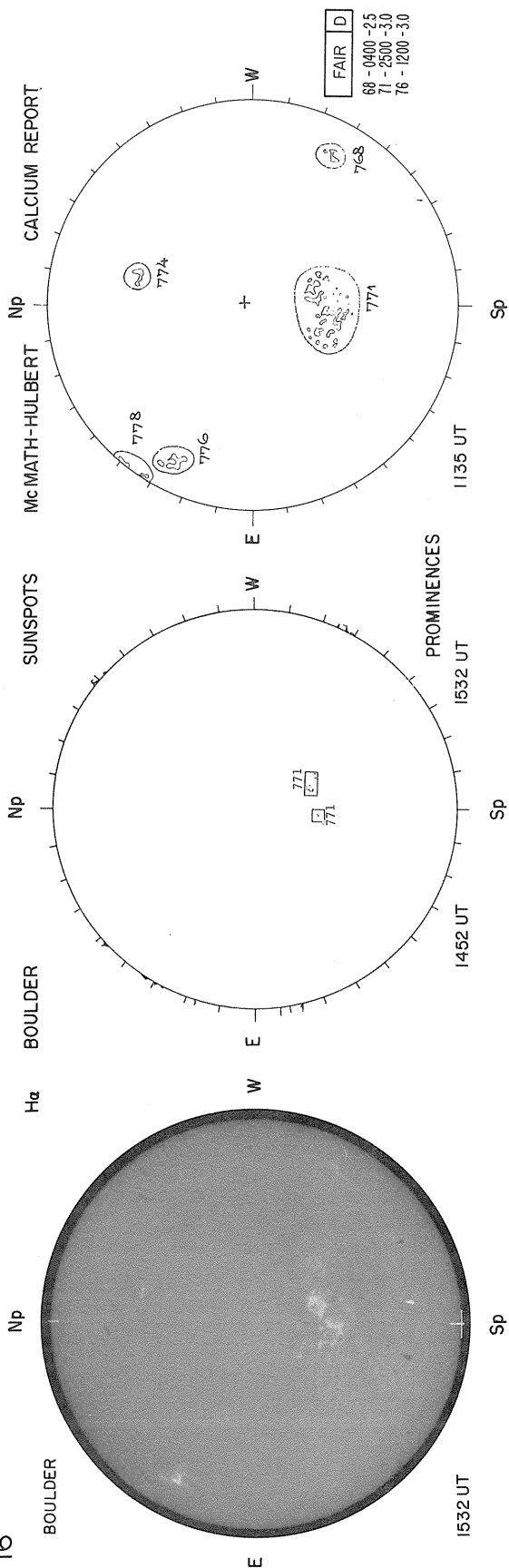
DELTA Y =
DELTA X =

MAGNETOGRAM
Solid - Plus
Dotted - Minus

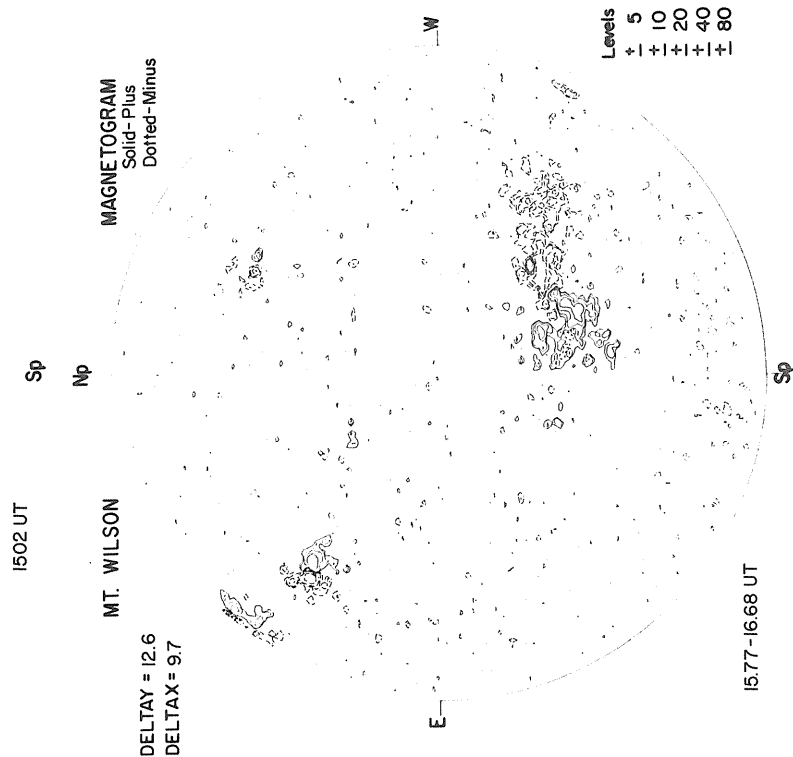
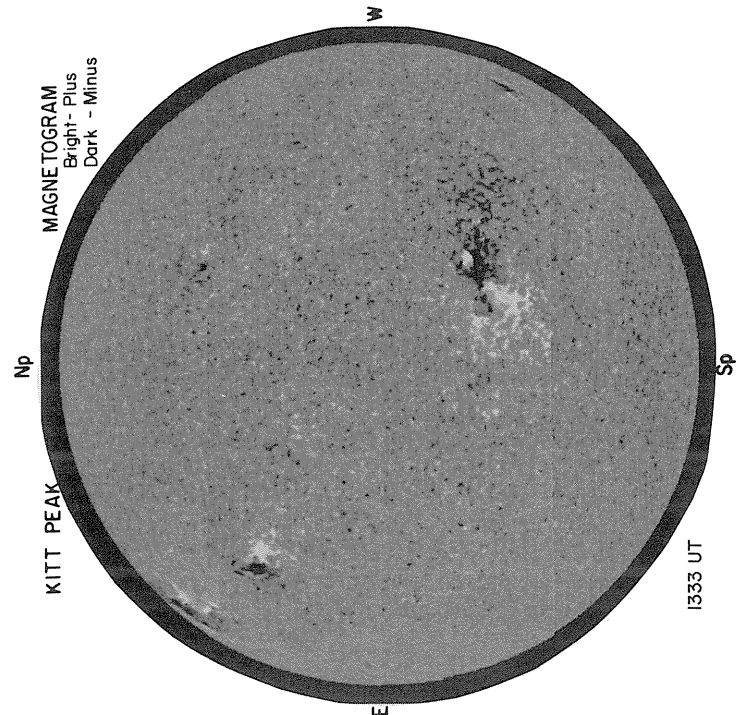
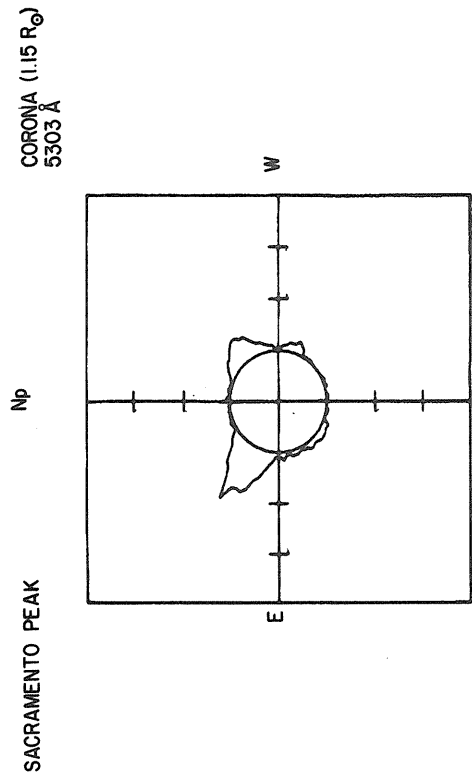
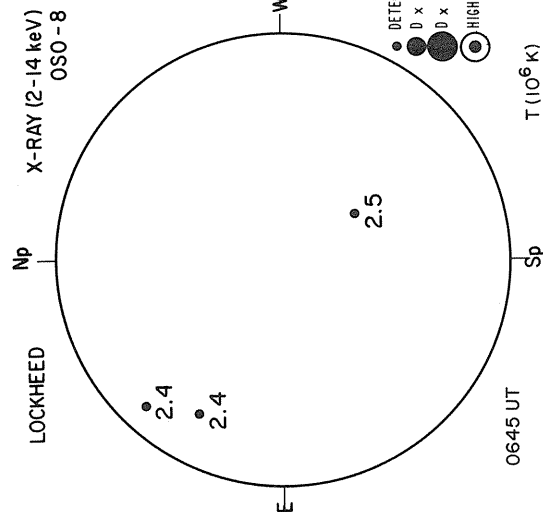


Levels
+ 5
+ 10
+ 20
+ 40
+ 80

16



MAY 17, 1977 (P = -20.48, B₀ = -2.4I, L₀ = 4.64)



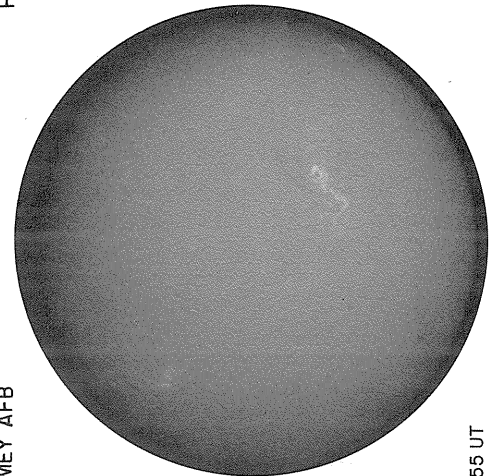
17

RAMEY AFB

Np

H α

BOULDER



E

1255 UT

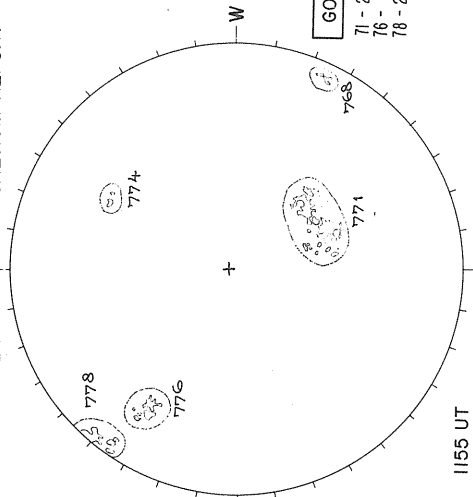
Sp

Np

SUNSPOTS

McMATH-HULBERT

CALCIUM REPORT



E

1155 UT

Sp

GOOD S
71 - 2500-30
76 - 1100-35
78 - 2500-25

PROMINENCES

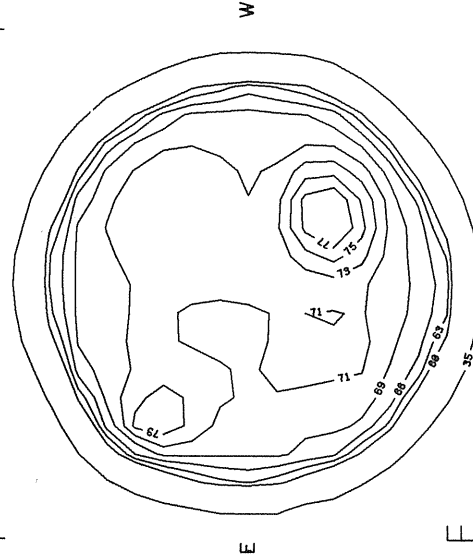
1441 UT

Sp

NOSC LA POSTA

Np

2.0 CM



E

1814 UT

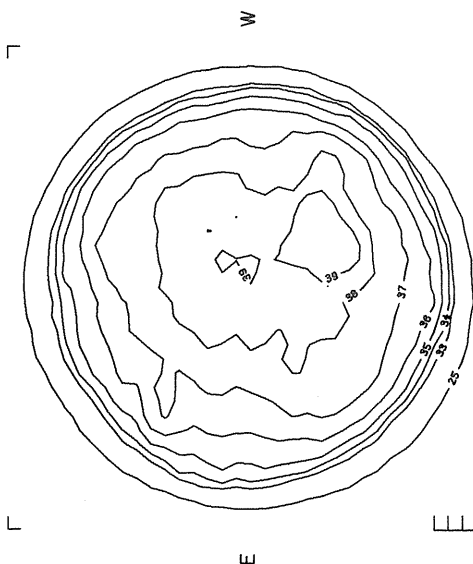
Sp

Ant. Temp. Unit 100°K

NOSC LA POSTA

Np

8.6 MM



E

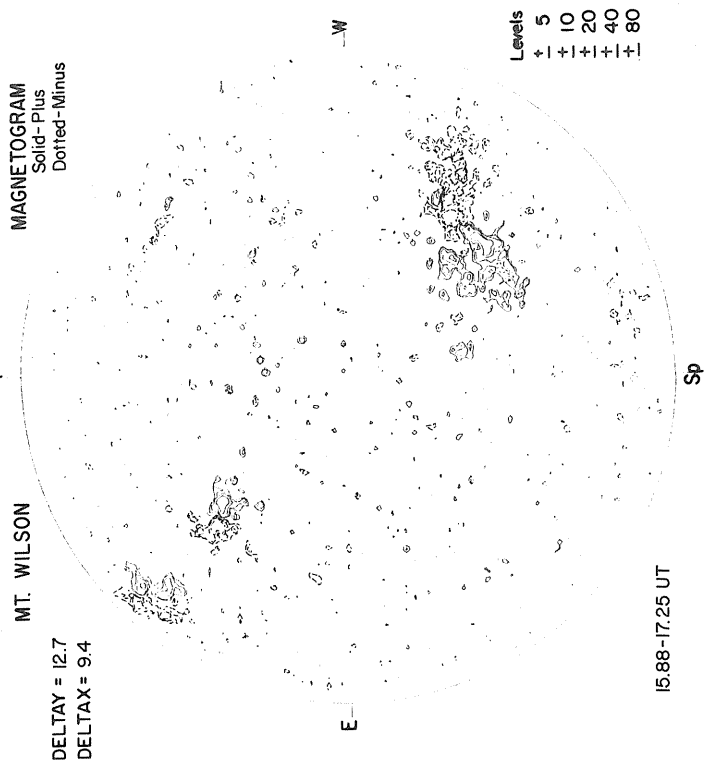
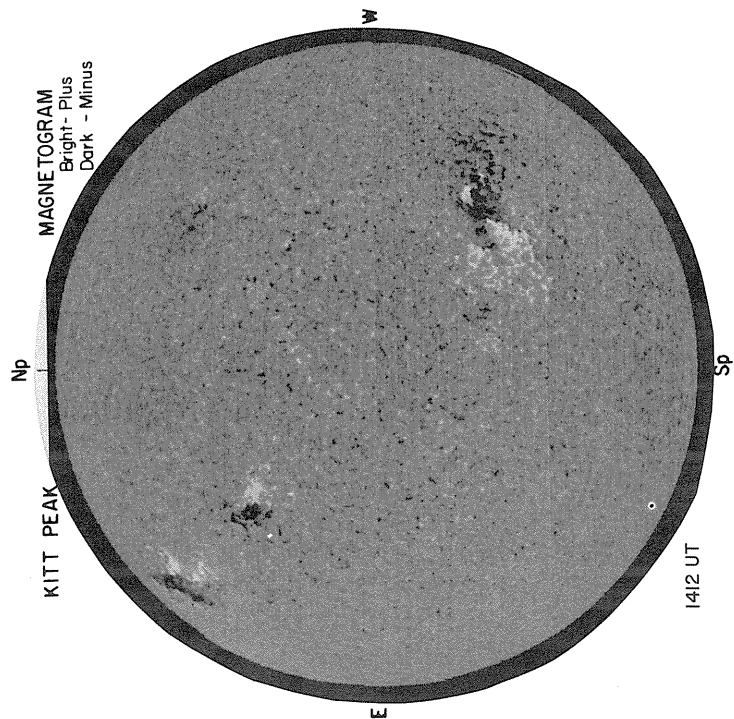
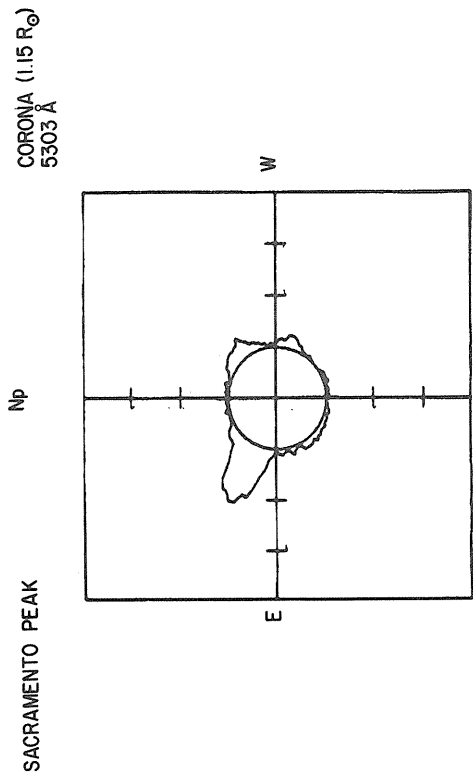
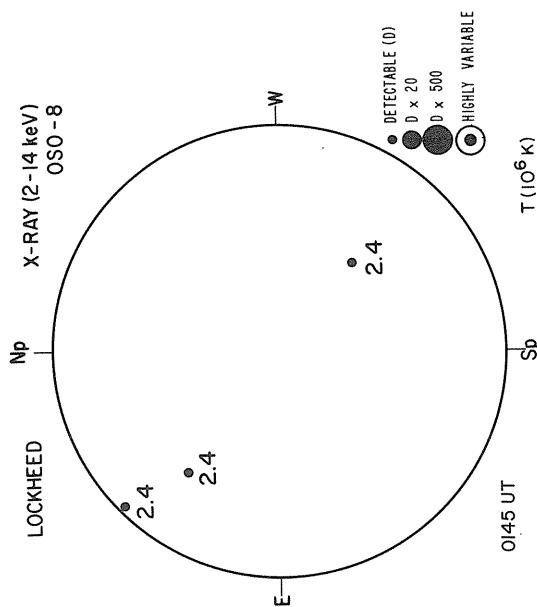
1906 UT

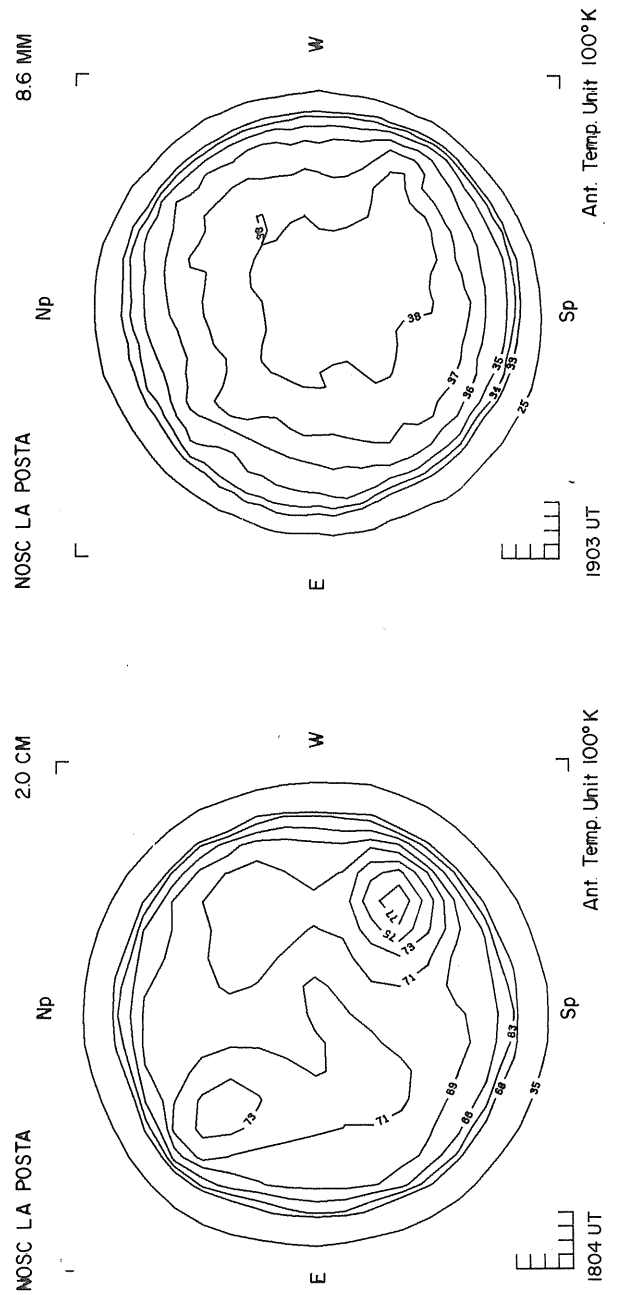
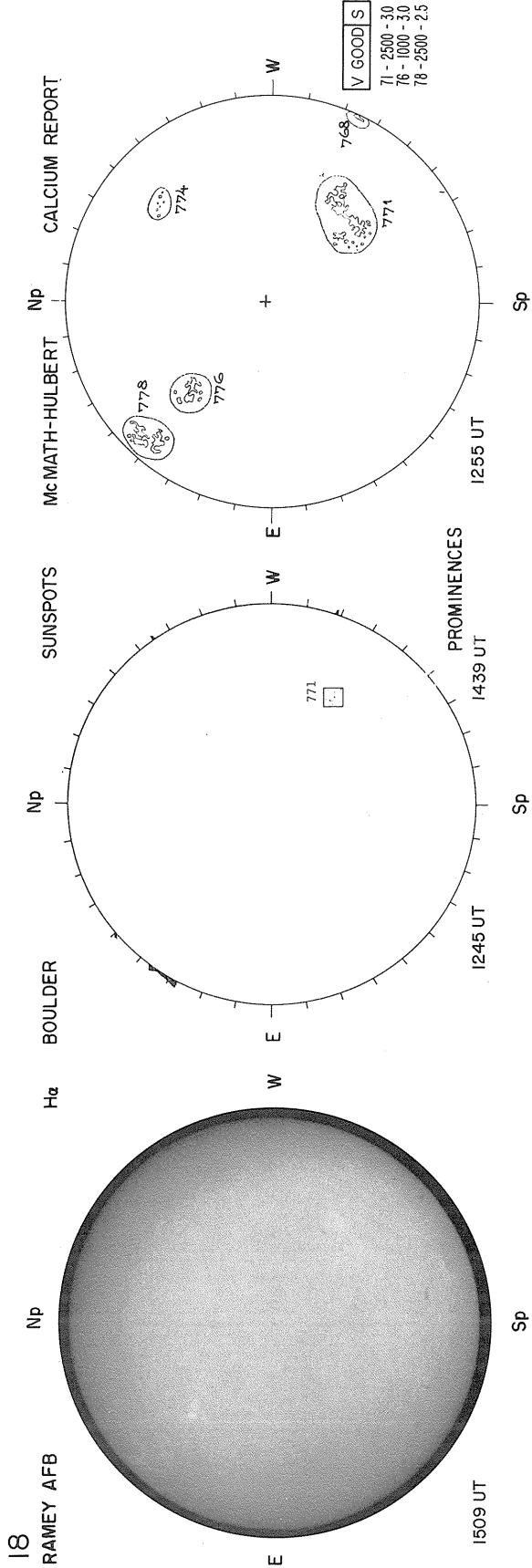
Sp

Ant. Temp. Unit 100°K

70
May 77

MAY 18, 1977 (P = -20.19, $B_0 = -2.30$, $L_0 = 351.41$)

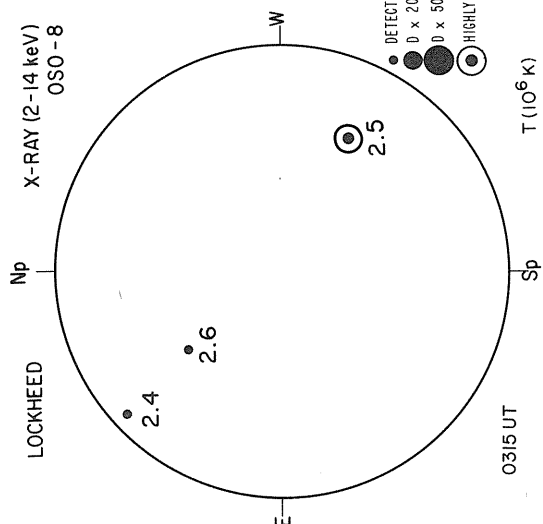




72
May 77

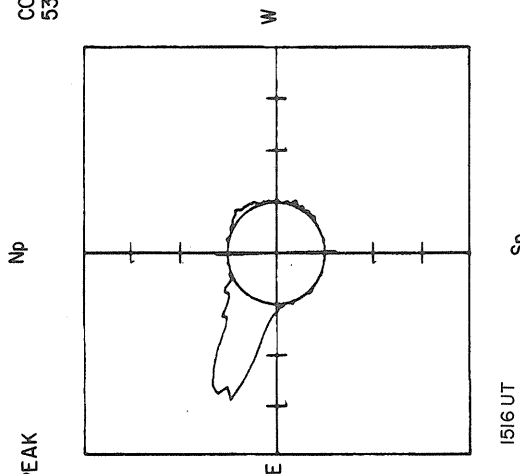
MAY 19, 1977 (P = -19.89, B₀ = -2.18, L₀ = 338.18)

LOCKHEED X-RAY (2-14 keV)
OSO-8

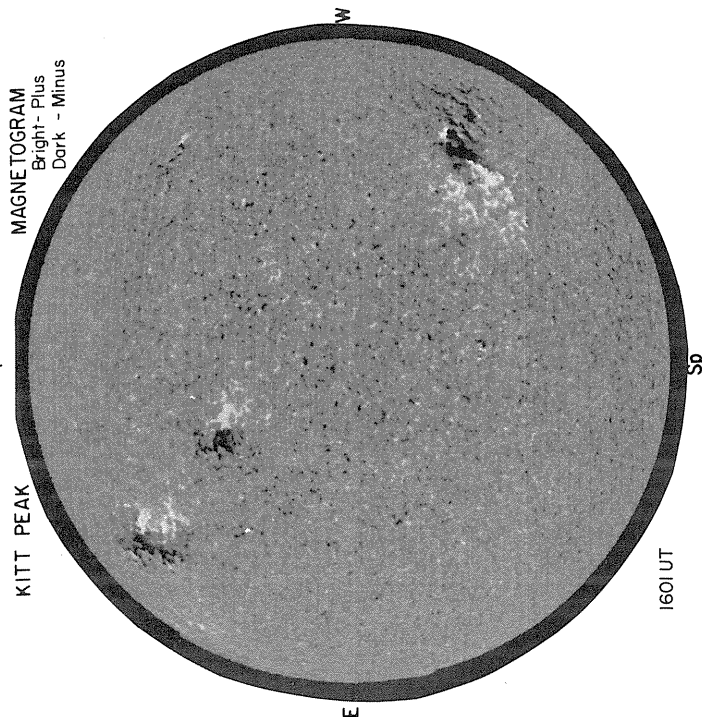


SACRAMENTO PEAK

CORONA (1.15 R₀)
5303 Å



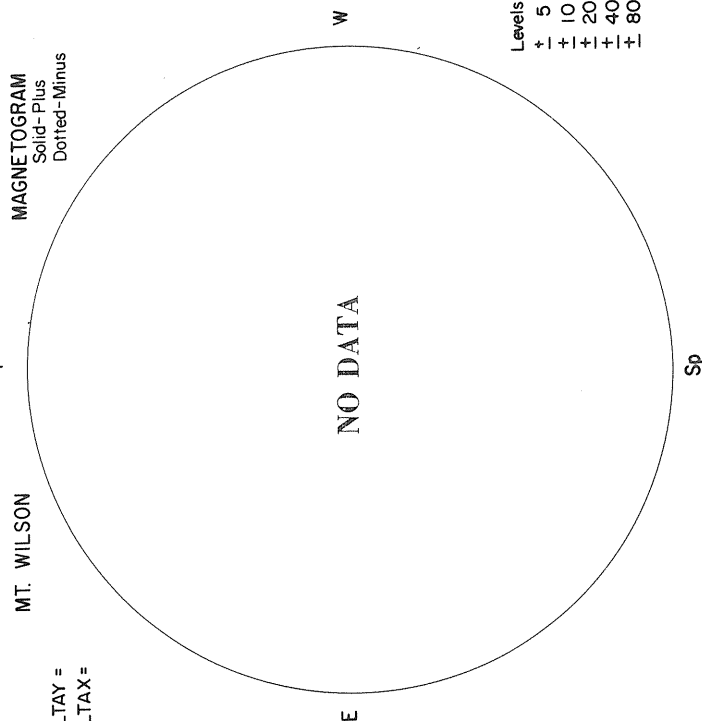
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



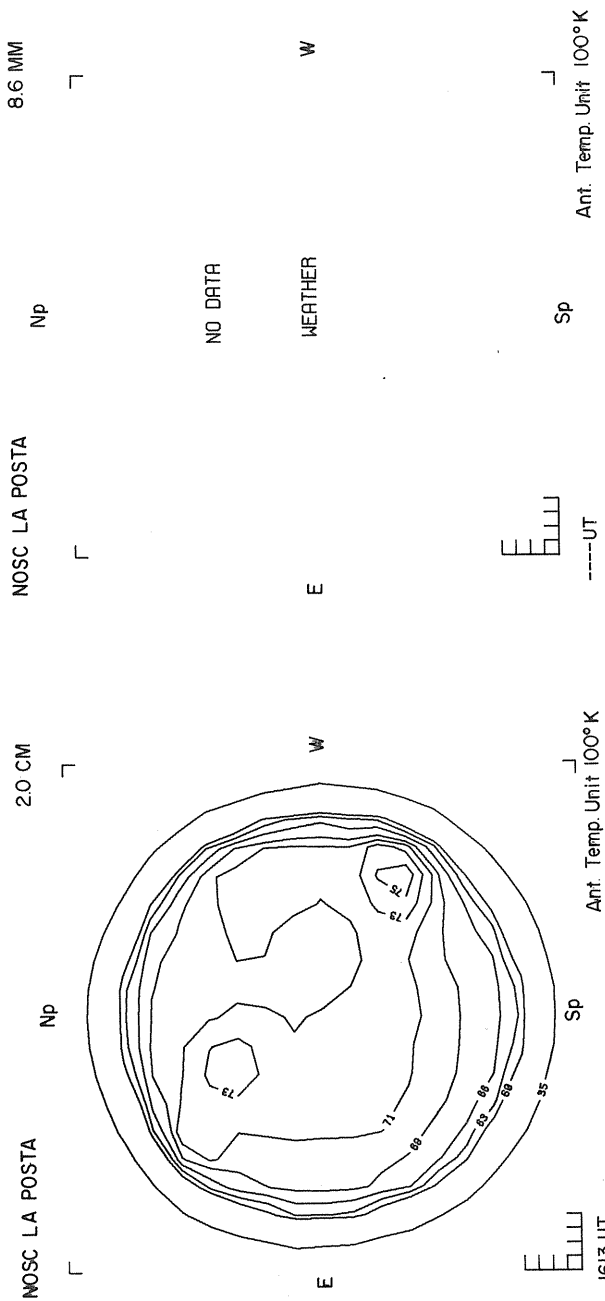
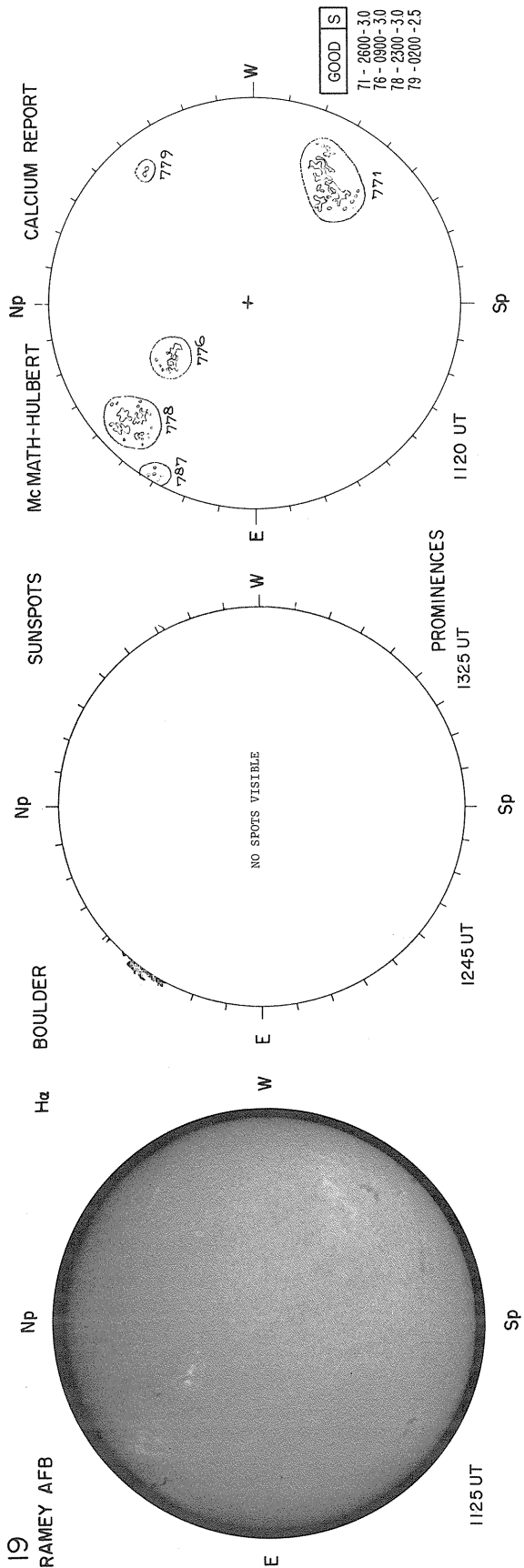
MT. WILSON

DELTA =
DELTA =

MAGNETOGRAM
Solid - Plus
Dotted - Minus

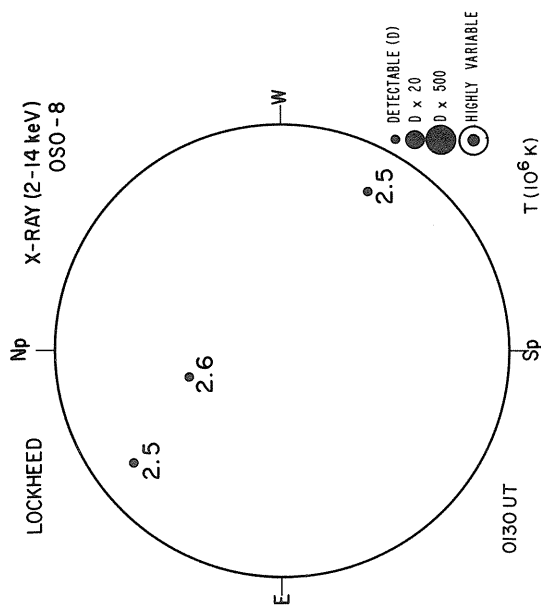


Levels
+ 5
+ 10
+ 20
+ 40
+ 80



74
May 77

MAY 20, 1977 (P = -19.59, $B_0 = -2.06$, $L_0 = 324.96$)



CORONA (1.15 $R_\odot$)
5303 Å

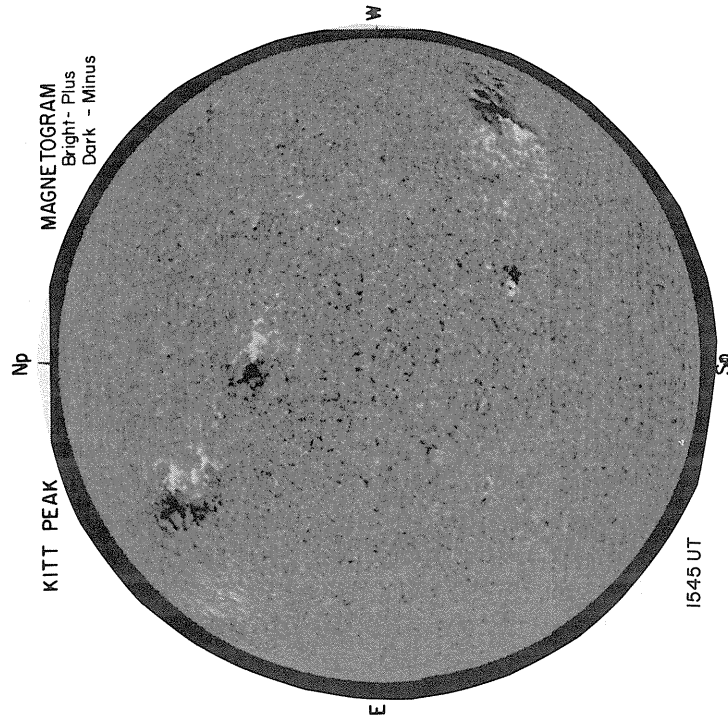
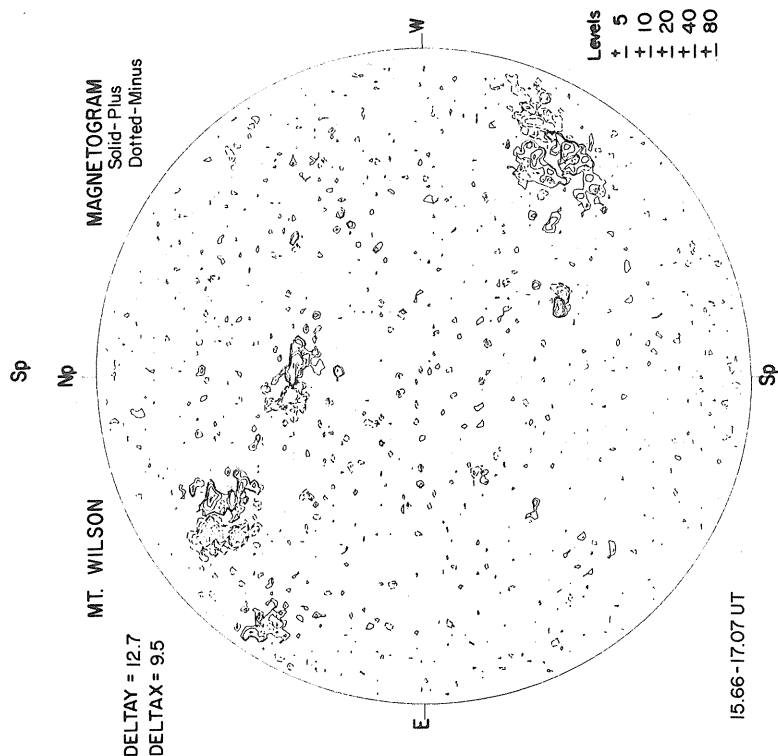
Np

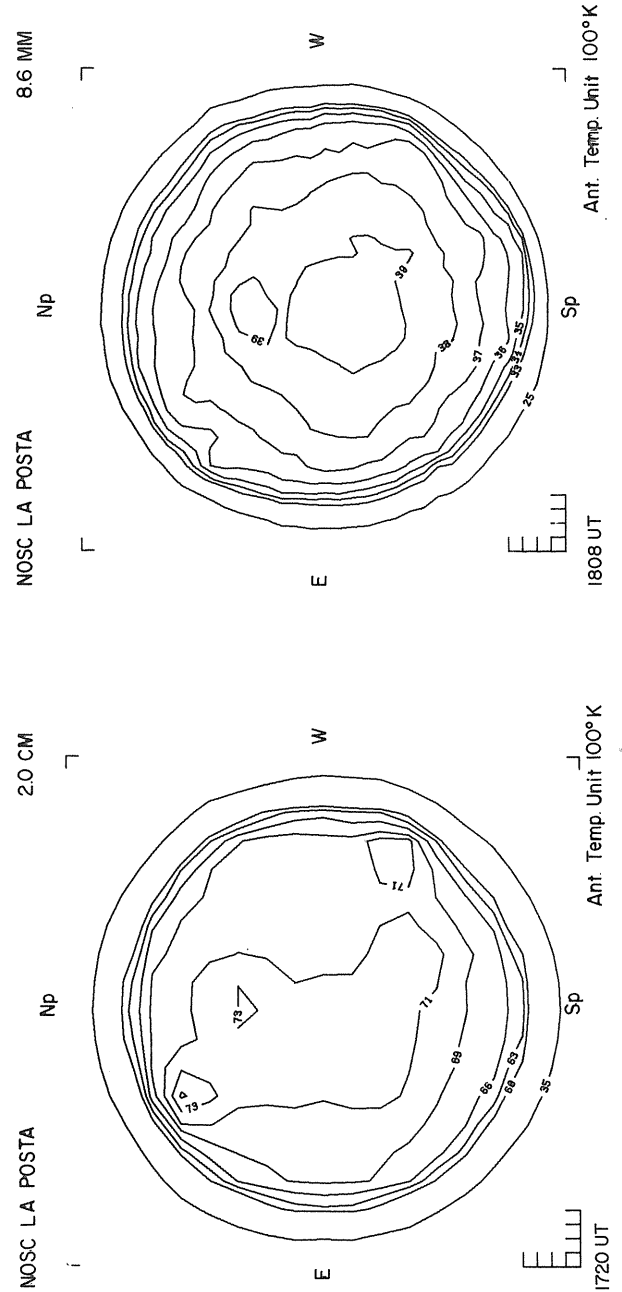
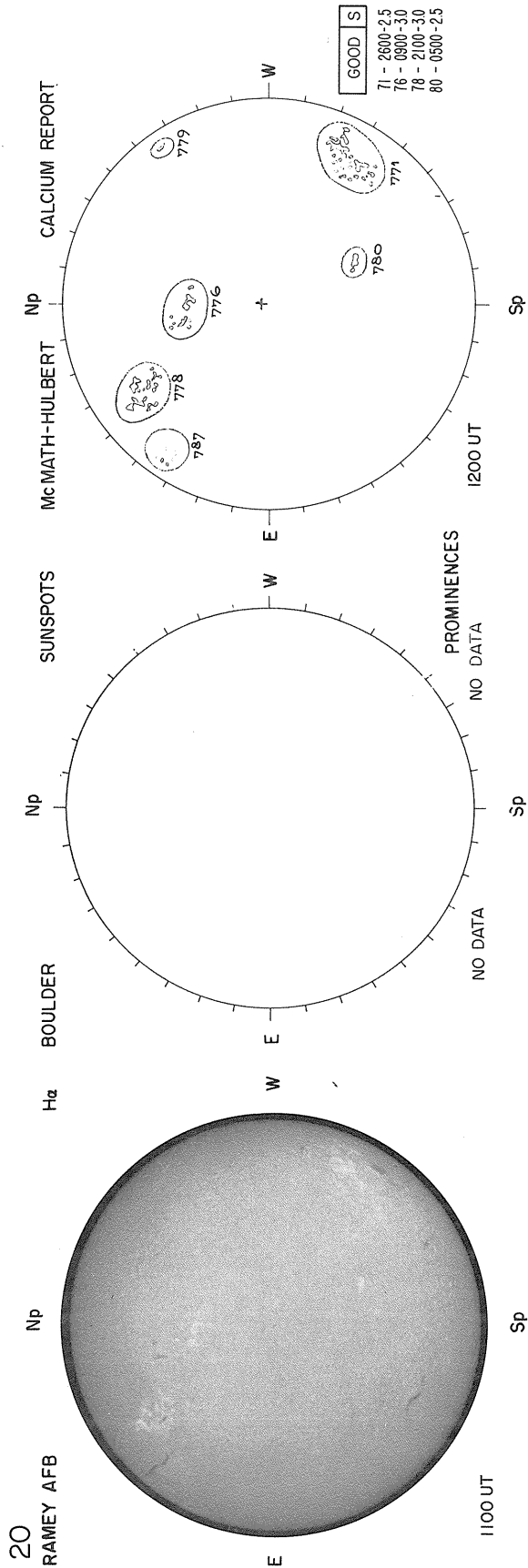
SACRAMENTO PEAK

W

NO DATA

E

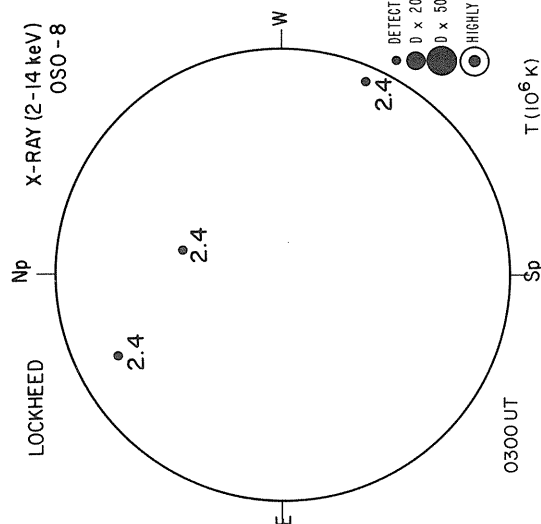




76
May 77

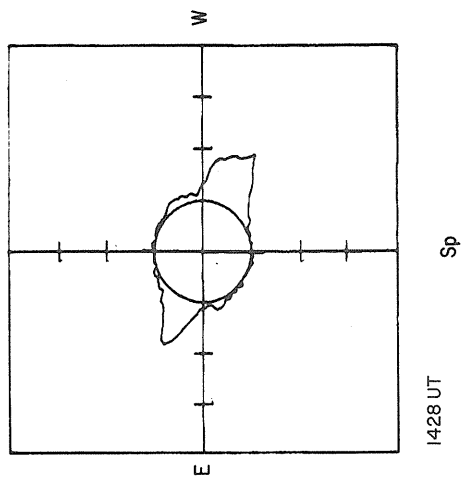
MAY 21, 1977 (P = -19.28, $B_0 = -1.95$, $L_0 = 311.73$)

LOCKHEED
X-RAY (2-14 keV)
OSO-8

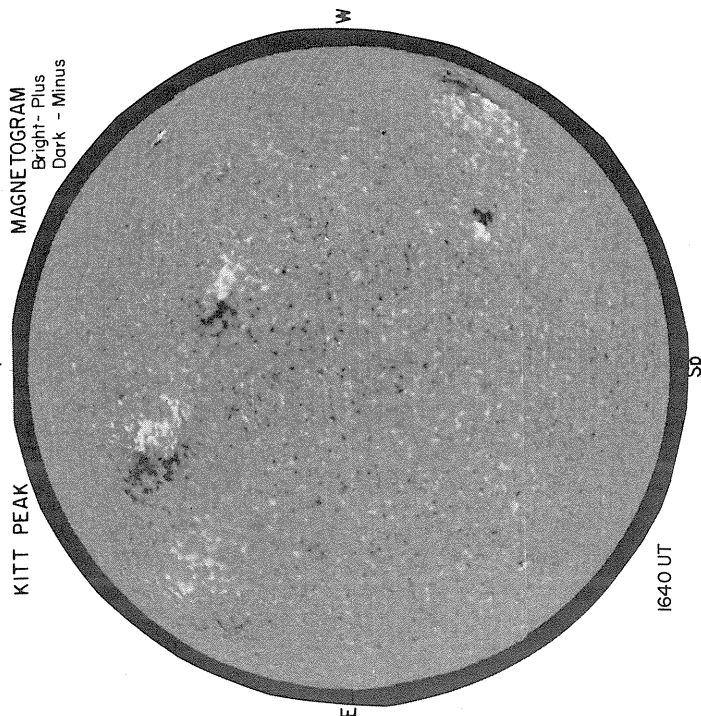


SACRAMENTO PEAK

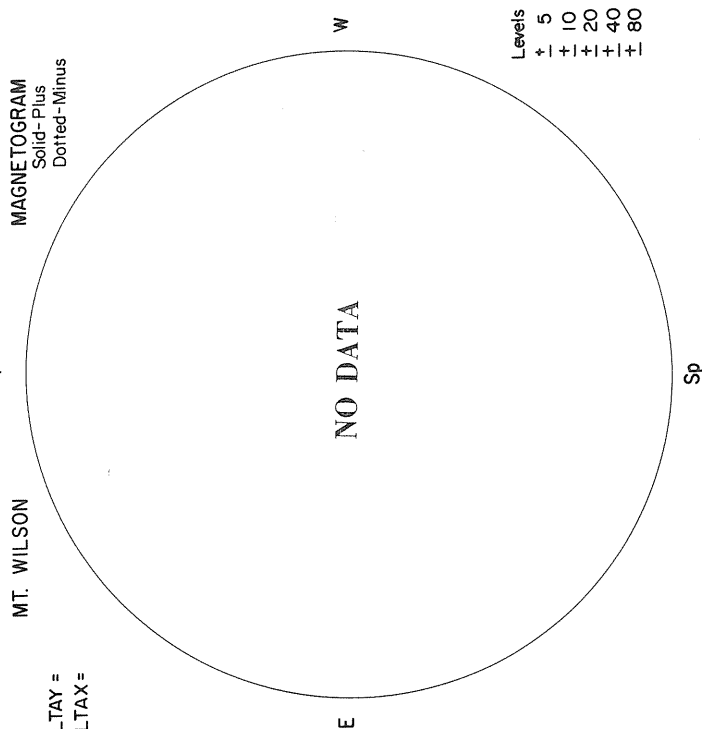
CORONA (1.15 $R_\odot$)
5303 Å



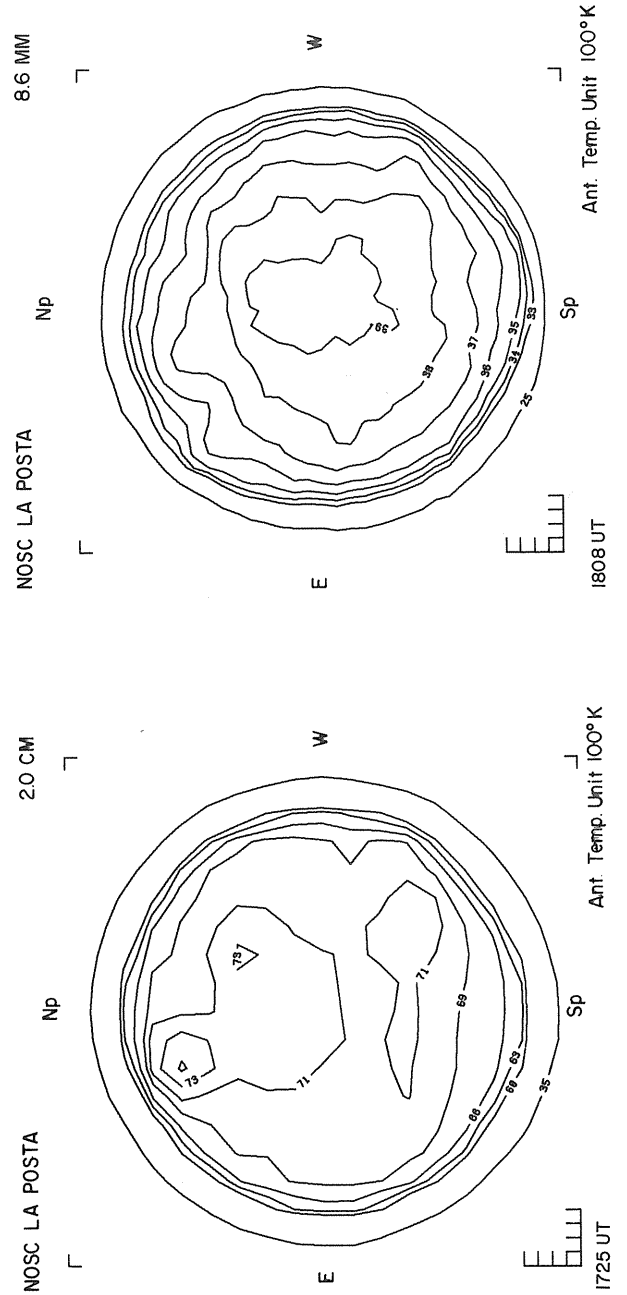
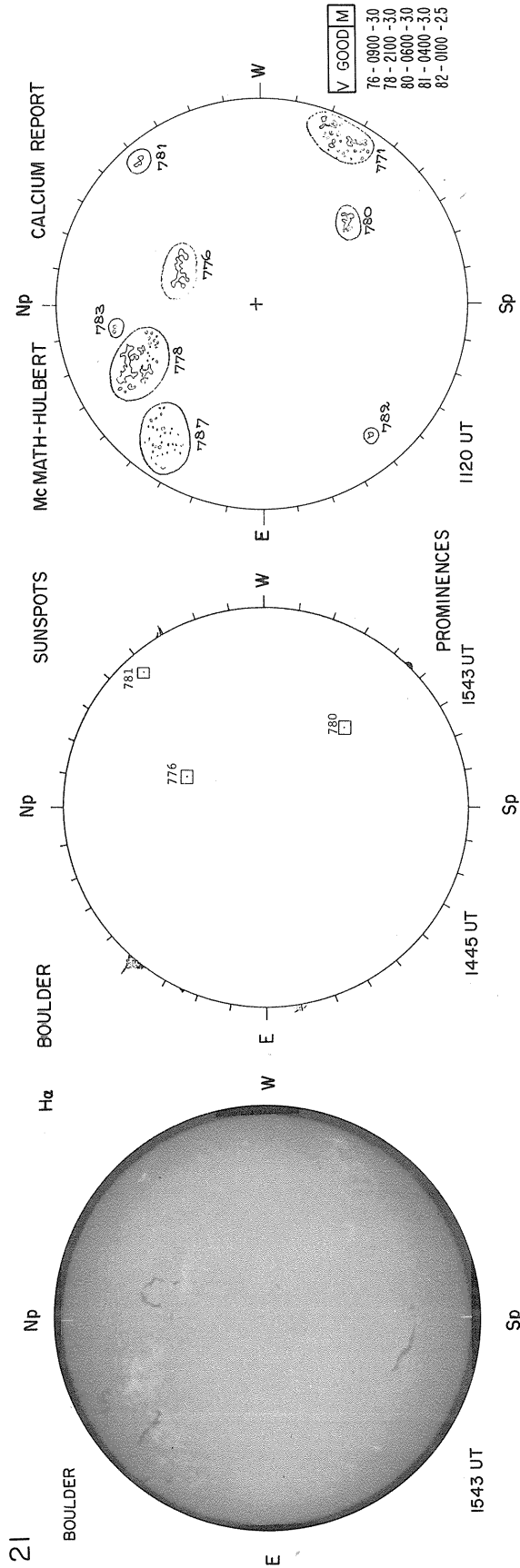
KITT PEAK
MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON
MAGNETOGRAM
Solid - Plus
Dotted - Minus

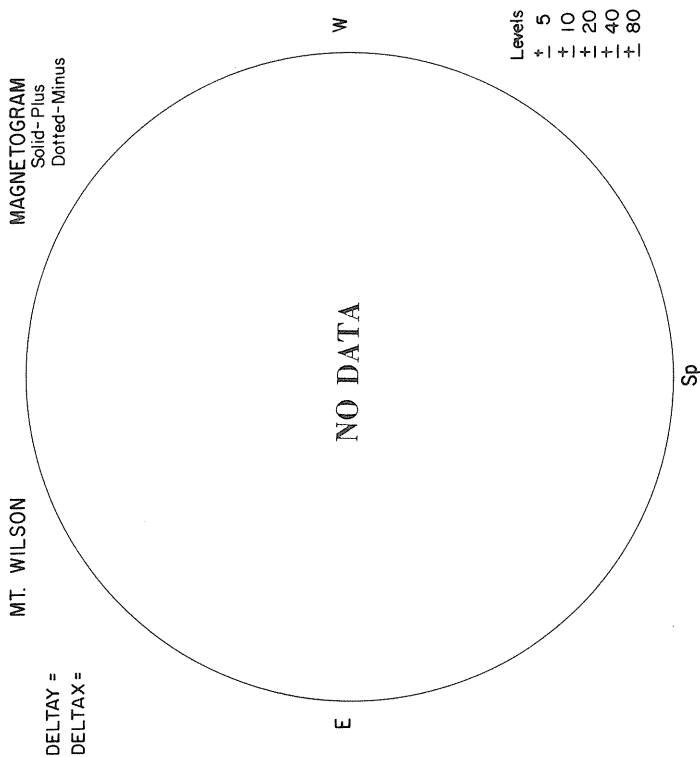
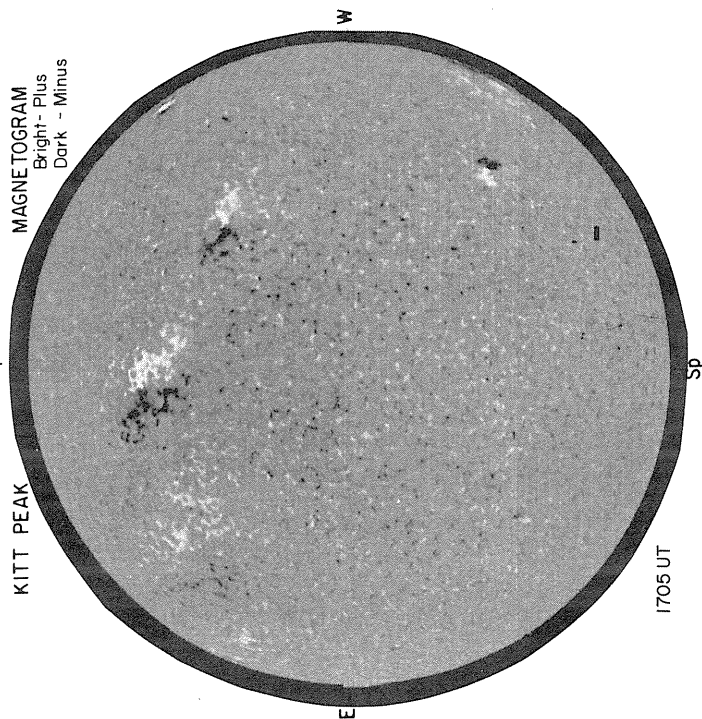
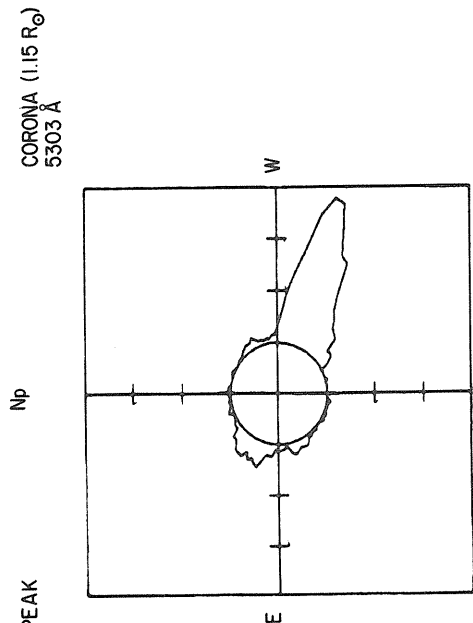
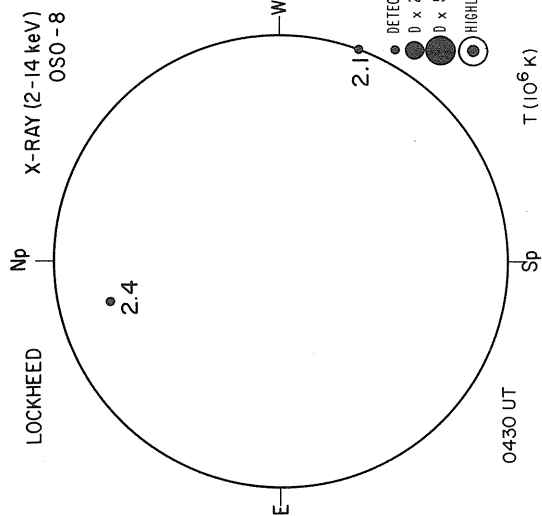


Levels
+ 5
+ 10
+ 20
+ 40
+ 80



78
May 77

MAY 22, 1977 (P = -18.96, B₀ = -1.83, L₀ = 298.50)



22

RAMEY AFB

NP

112

BOULDER

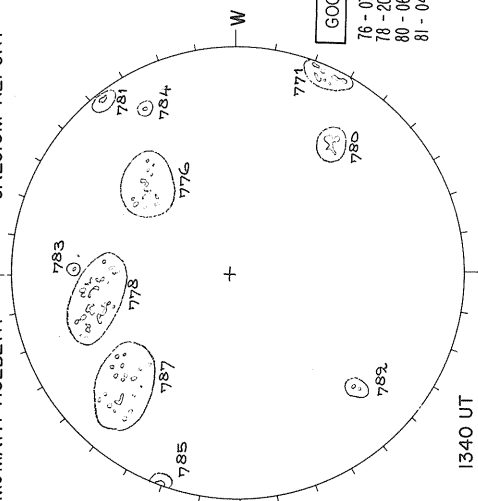
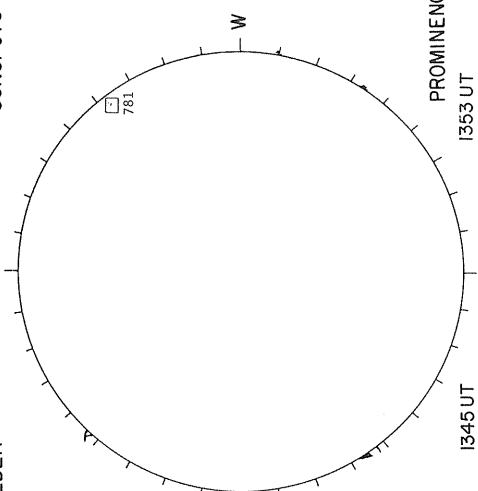
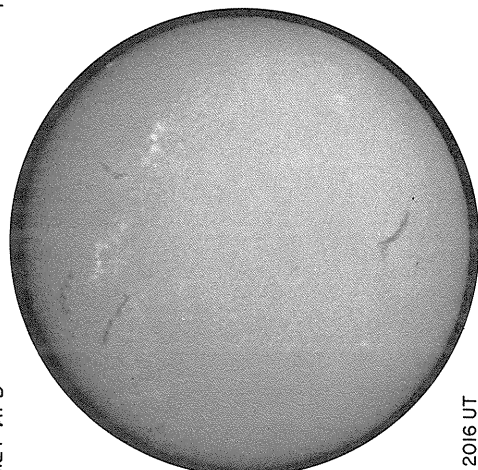
၇၃

SUNSPOTS

and

NP
McMATH-HULBERT - CALCIUM REPORT

CALCIUM REPORT



GOOD	S
------	---

76 - 0700 - 2.5

8 - 2000 - 3.0
10 - 0600 - 3.0

31 - 0400-4.0

NOSC LA POSTA

NP

2.0 CM

NOSC LA POSTA

 dN

8.6 MM

NO DATA

NO DATA

W

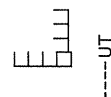
EQUIPMENT

W

W

EQUIPMENT

W



ds

Ant. Temp. Unit 100°K

ds

Ant. Temp. Unit 100°K

80
May 77

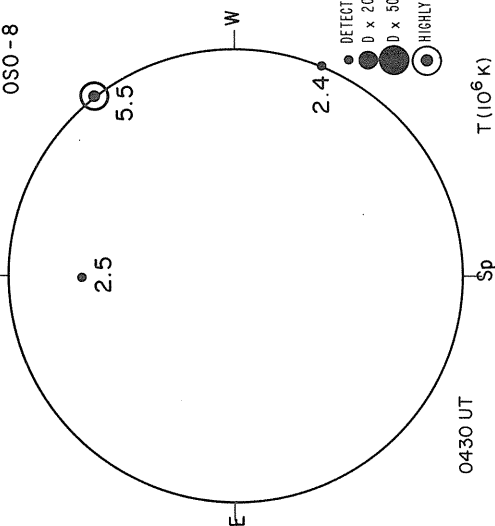
MAY 23, 1977 (P = -18.64, B₀ = -1.71, L₀ = 285.27)

CORONA (1.15 R_☉)
5303 Å

Np

SACRAMENTO PEAK

LOCKHEED
X-RAY (2-14 keV)
OSO-8



W

NO DATA

E

Sp

Np

MT. WILSON

MAGNETOGRAM
Solid-Plus
Dotted-Minus

DELTAY =
DELTAX =

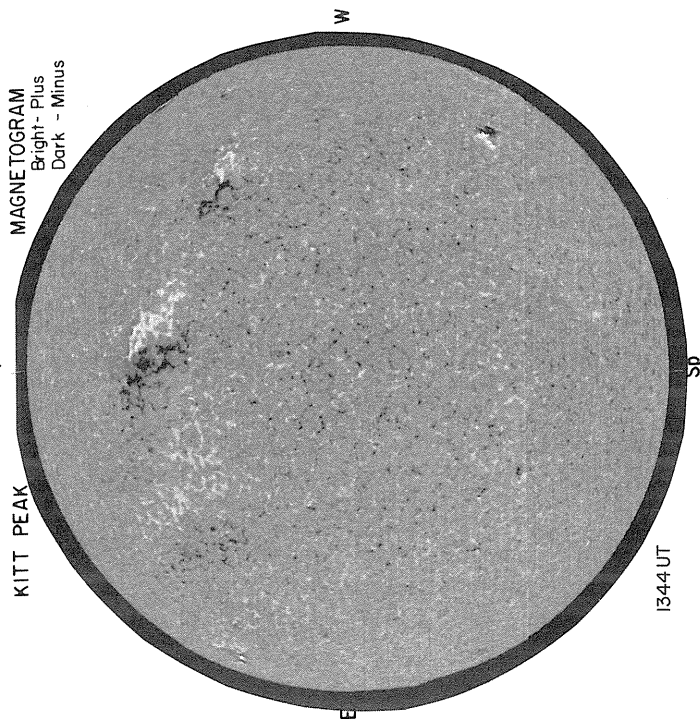
W

NO DATA

E

Sp

Levels
+ 5
+ 10
+ 20
+ 40
+ 80



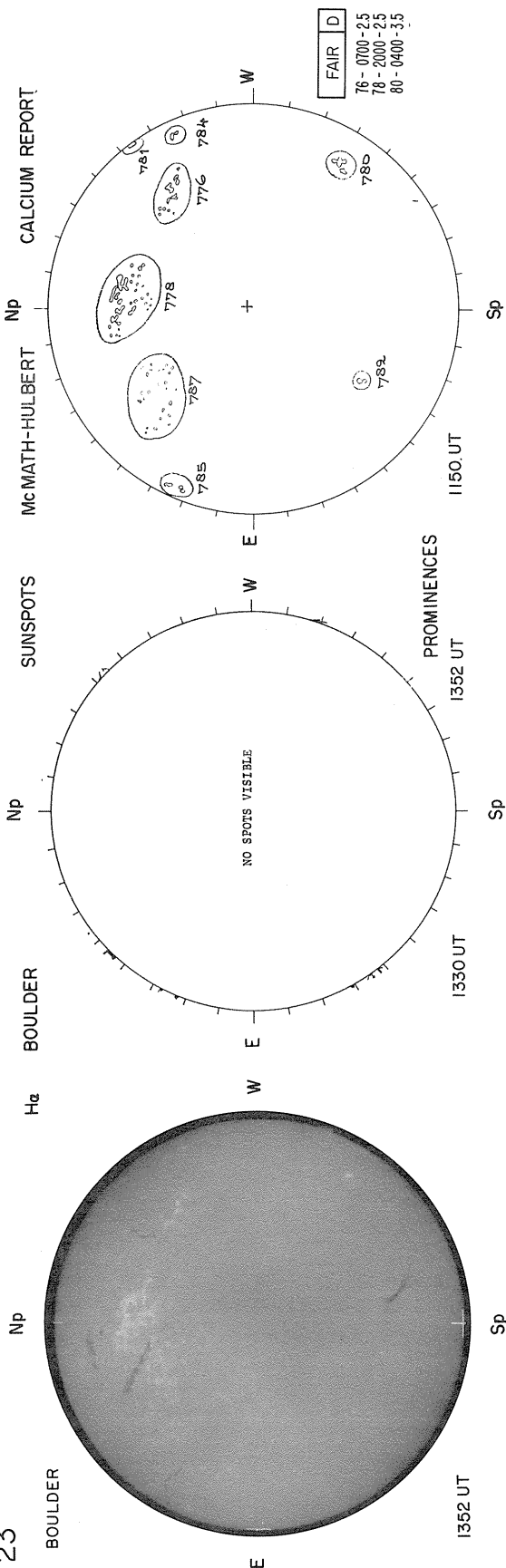
MAGNETOGRAM
Bright-Plus
Dark-Minus

KITT PEAK

1344 UT

23

BOULDER



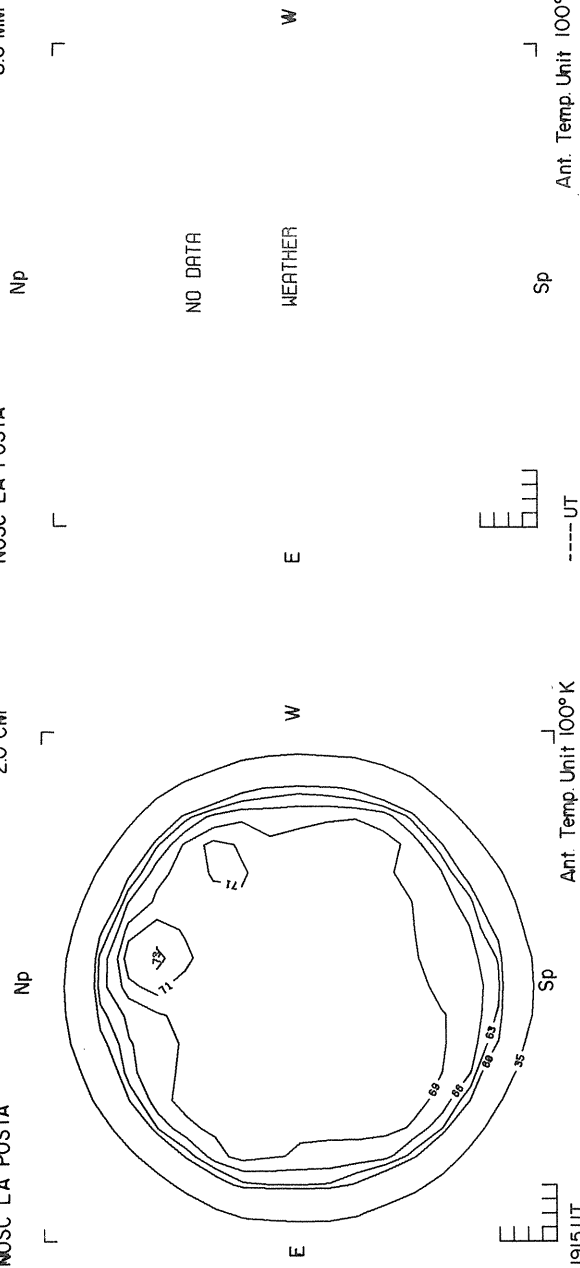
8.6 MM

Np

NOSC LA POSTA

2.0 CM

NOSC LA POSTA



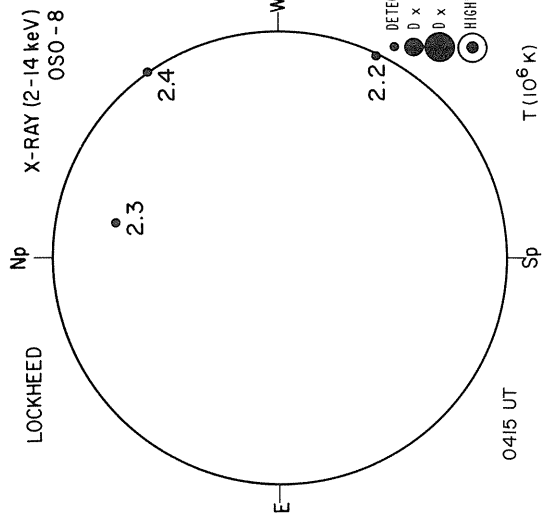
Ant. Temp. Unit 100°K

Sp

Ant. Temp. Unit 100°K

1915 UT

MAY 24, 1977 (P = -18.31, B₀ = -1.59, L₀ = 272.04)



Np

SACRAMENTO PEAK

CORONA (1115 R₀)
5303 Å

E

NO DATA

W

KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus

MT. WILSON

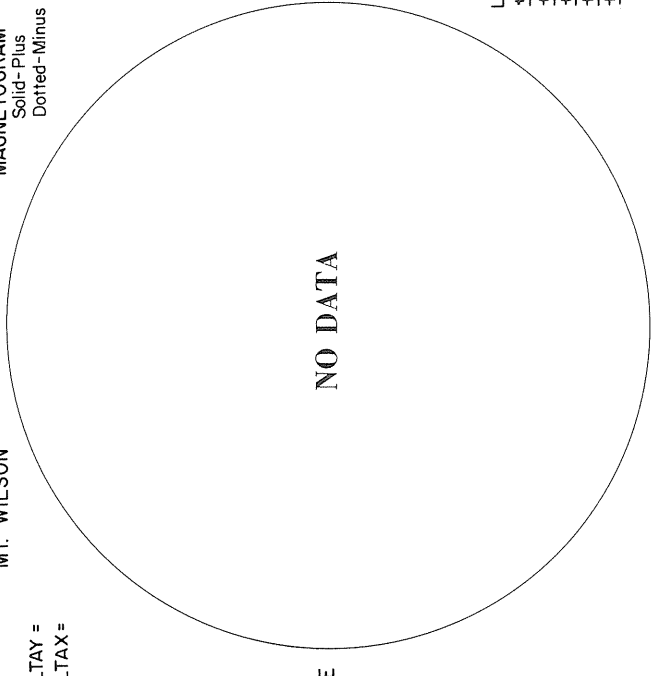
DELTA =

DELTA =

MAGNETOGRAM
Solid - Plus
Dotted - Minus

Sp

Np



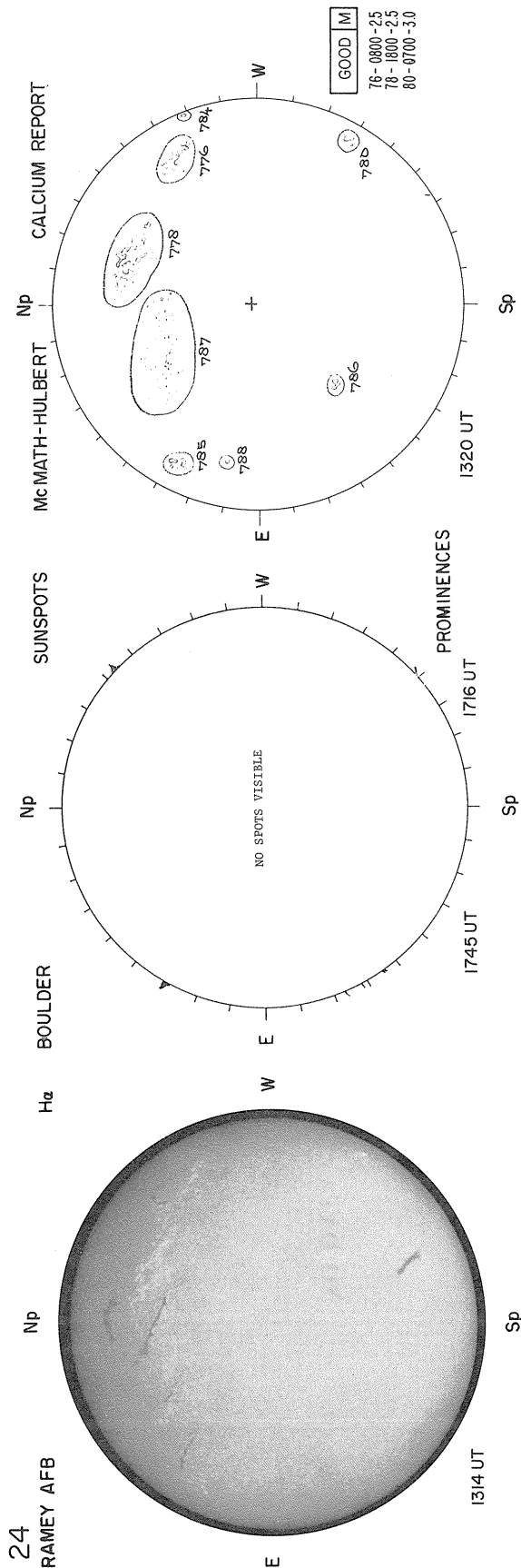
Levels
+ 5
+ 10
+ 20
+ 40
+ 80

NO DATA

W

E

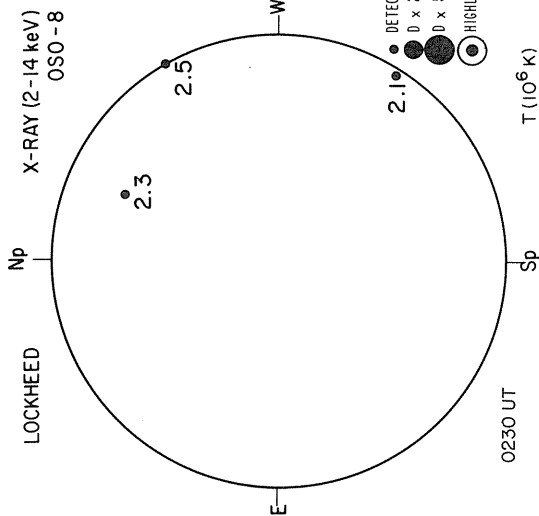
Sp



NOSC LA POSTA	Np	2.0 CM	NOSC LA POSTA	Np	8.6 MM
		└			└
NO DATA	NO DATA		NO DATA	NO DATA	
WEATHER	WEATHER	W	WEATHER	WEATHER	W
E	E		E	E	
Sp	Sp	Ant Temp Unit 100°K	Sp	Ant Temp Unit 100°K	Sp
┌┌┌┌┌┌	┌┌┌┌┌┌	-----UT	┌┌┌┌┌┌	┌┌┌┌┌┌	-----UT

84
May 77

MAY 25, 1977 (P = -17.98, B₀ = -1.48, L₀ = 258.81)



Np

SACRAMENTO PEAK

CORONA (1115 R₀)
5303 Å

W

NO DATA

E

0230 UT

T (10⁶ K)

Np

KITT PEAK

MAGNETOGRAM
Bright+ Plus
Dark - Minus

MT. WILSON

MAGNETOGRAM
Solid+ Plus
Dotted- Minus

Sp

Np

DELTA Y =
DELTA X =

NO DATA

W

E

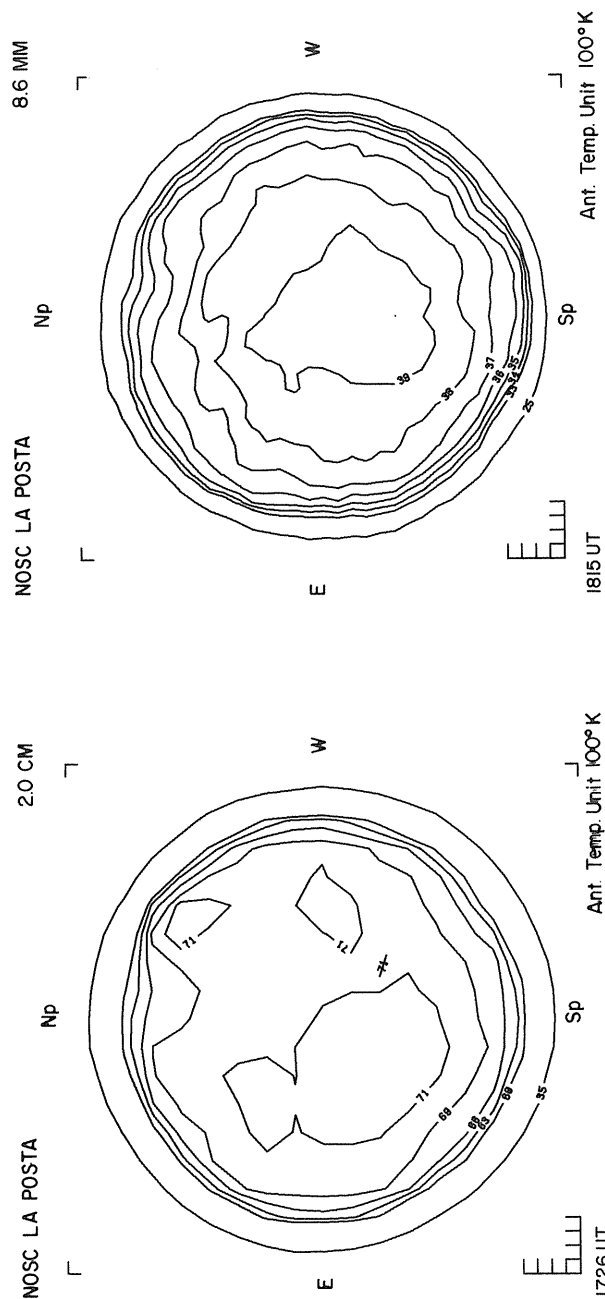
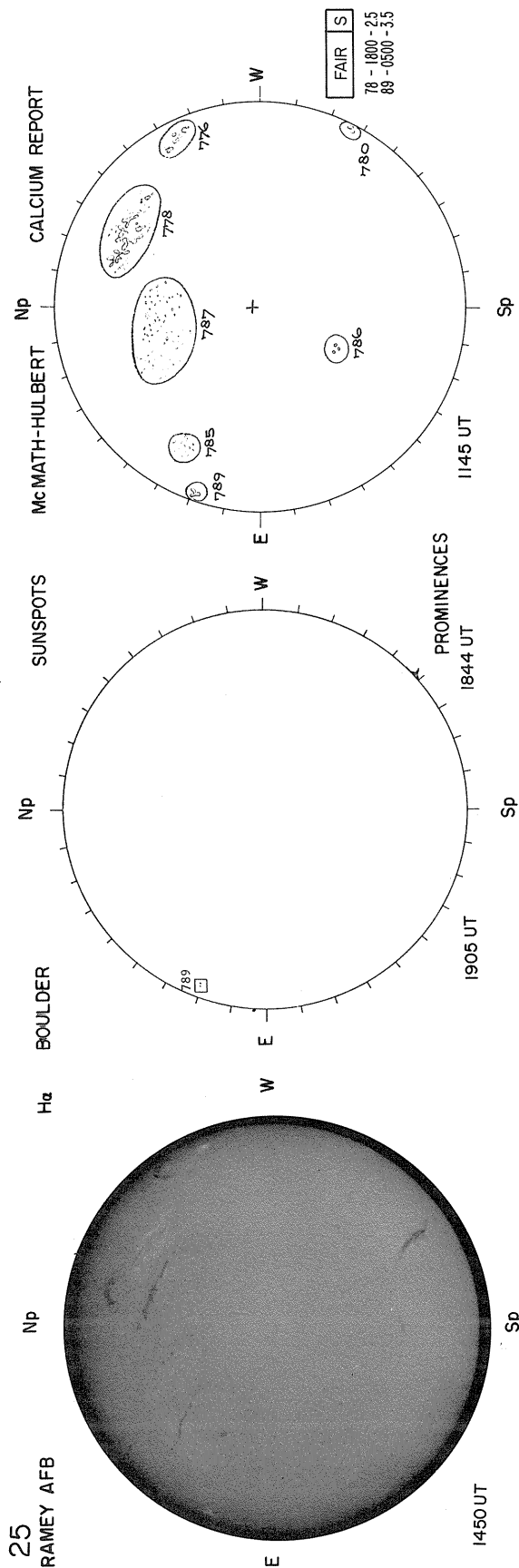
NO DATA

W

Sp

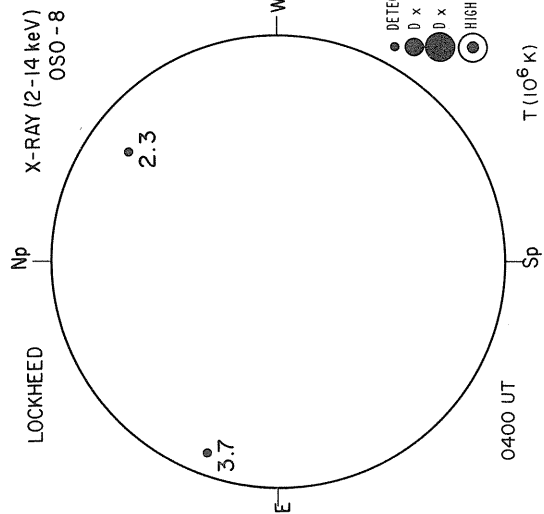
Sp

Levels
+ 5
+ 10
+ 20
+ 40
+ 80



86
May 77

MAY 26, 1977 (P = -17.64, B₀ = -1.36, L₀ = 245.58)



CORONA (1.15 R₀)
5303 Å

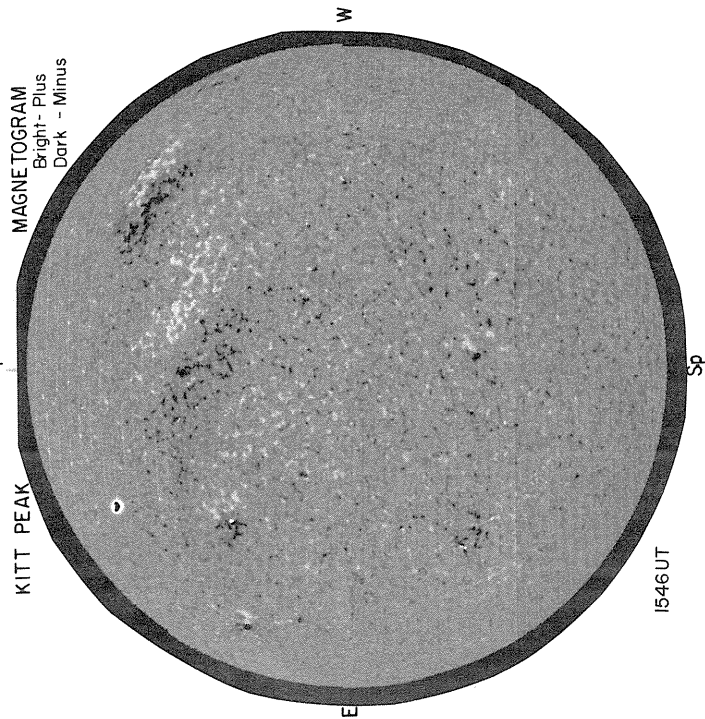
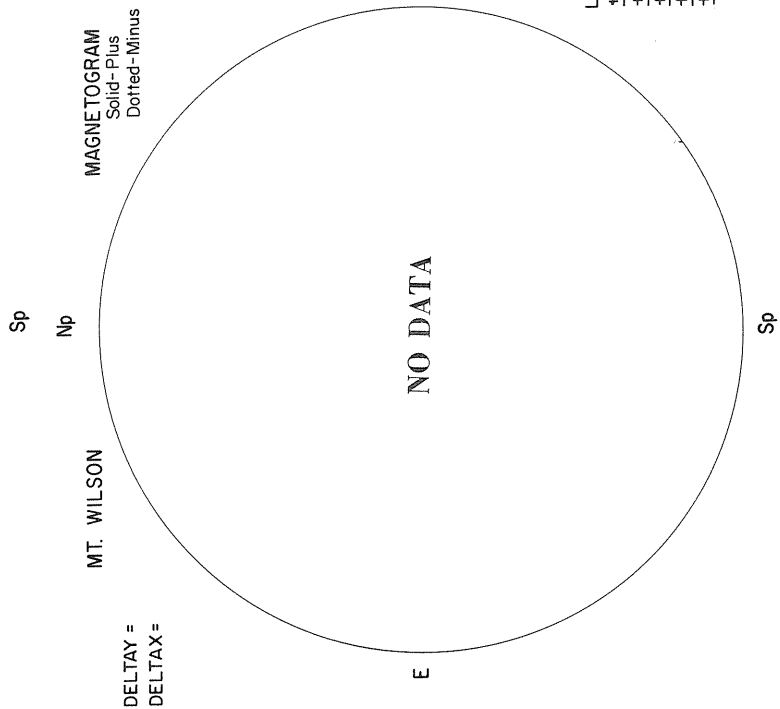
Np

SACRAMENTO PEAK

NO DATA

E

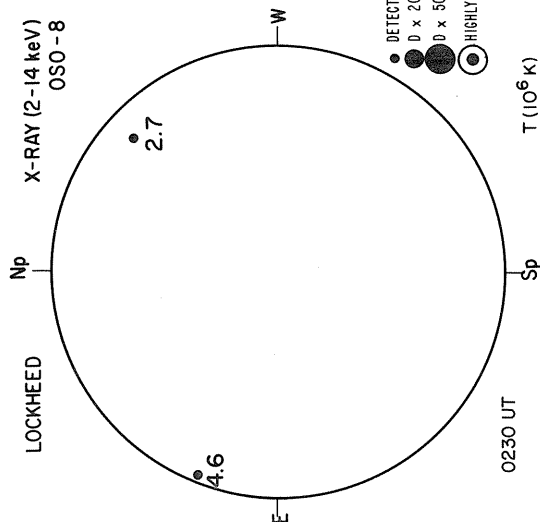
W



Ant. Temp. Unit 100°K

MAY 27, 1977 (P = -17.30, B₀ = -1.24, L₀ = 232.35)

LOCKHEED
X-RAY (2-14 keV)
OSO-8



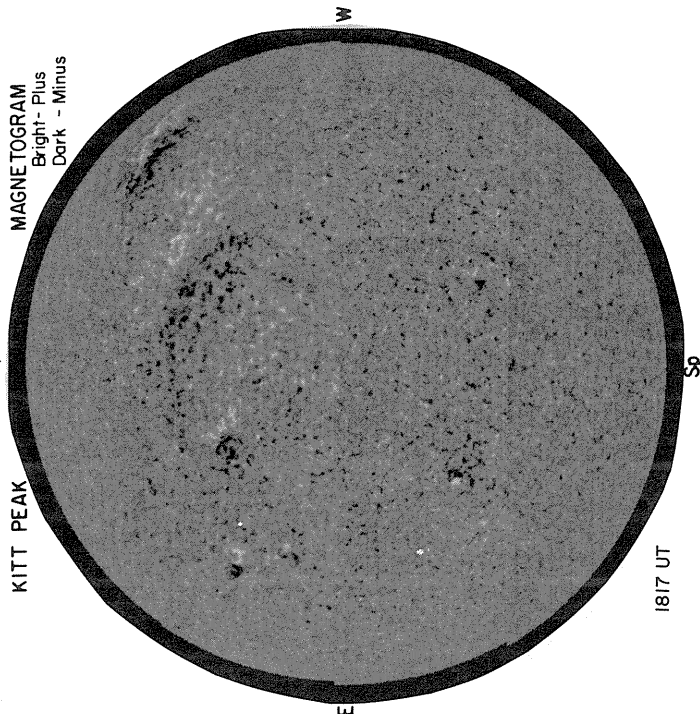
• DETECTABLE (0)
● 0 x 20
● 0 x 500
⊙ HIGHLY VARIABLE

T (10⁶ K)

KITT PEAK

MAGNETOGRAM

Bright - Plus
Dark - Minus



SACRAMENTO PEAK

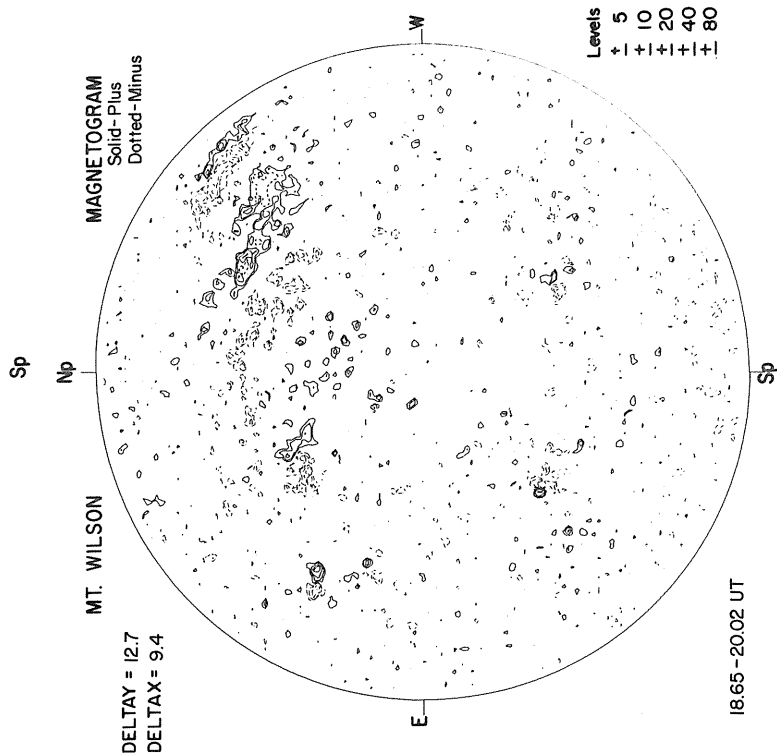
Np

NO DATA

E

W

CORONA (1115 R₀)
5303 Å



MAGNETOGRAM

Solid-Plus
Dotted-Minus

Levels
+ 5
+ 10
+ 20
+ 40
+ 80

NP



NP

 $\frac{dN}{dt}$

T



GOOD	D
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89 - 0600-2.5

PROMINENCES

✓ 444 UT

1345 UT

1310 UT

NOSC LA POSTA

2



Ant. Temp. Unit 100° K

2.0 CM

NOSC LA POSTA

 dN 

Ant. Temp. Unit 100°K

8.6 MM

90
May 77

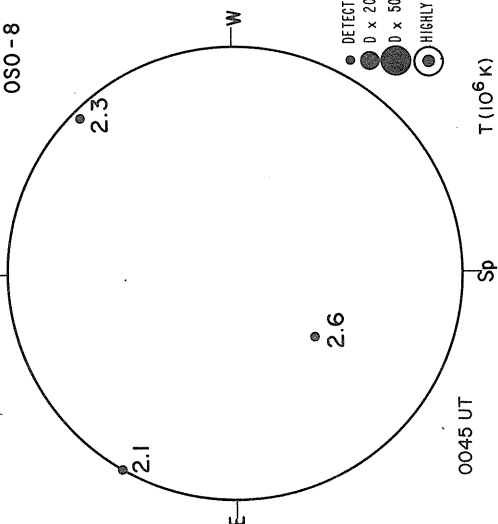
MAY 28, 1977 (P = -16.95, B₀ = -1.12, L₀ = 219.12)

LOCKHEED X-RAY (2-14 keV)
OSO-8

SACRAMENTO PEAK

CORONA (1.15 R₀)
5303 Å

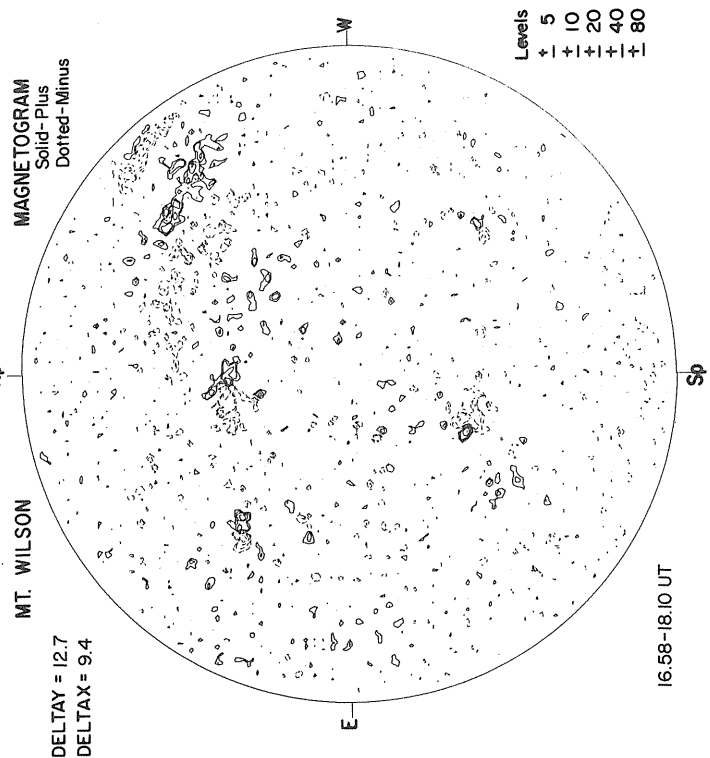
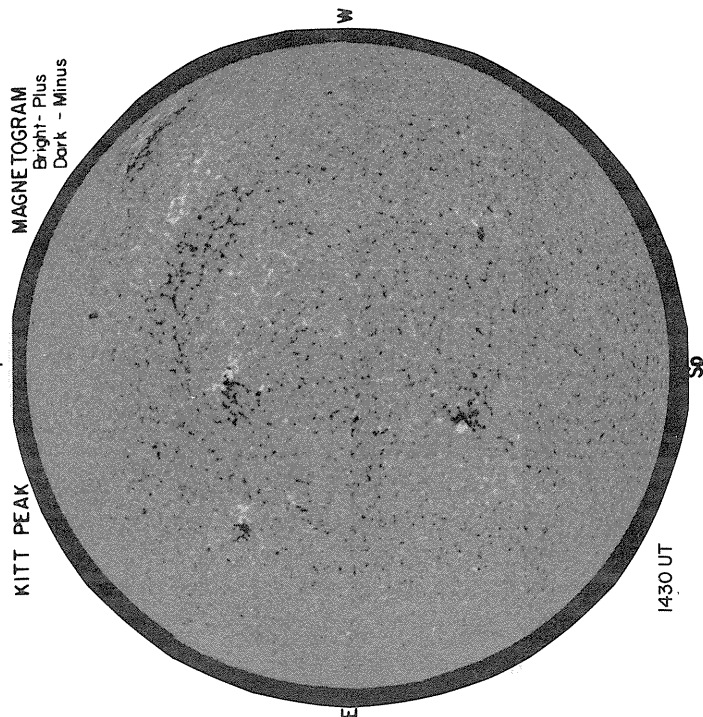
Np



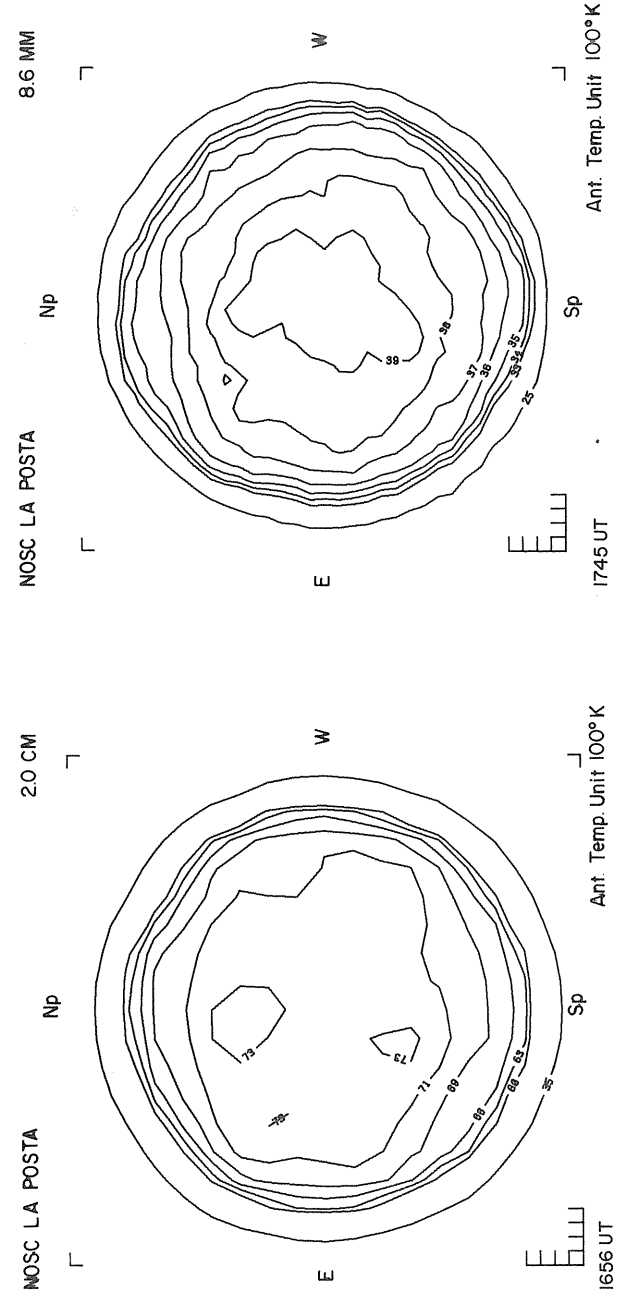
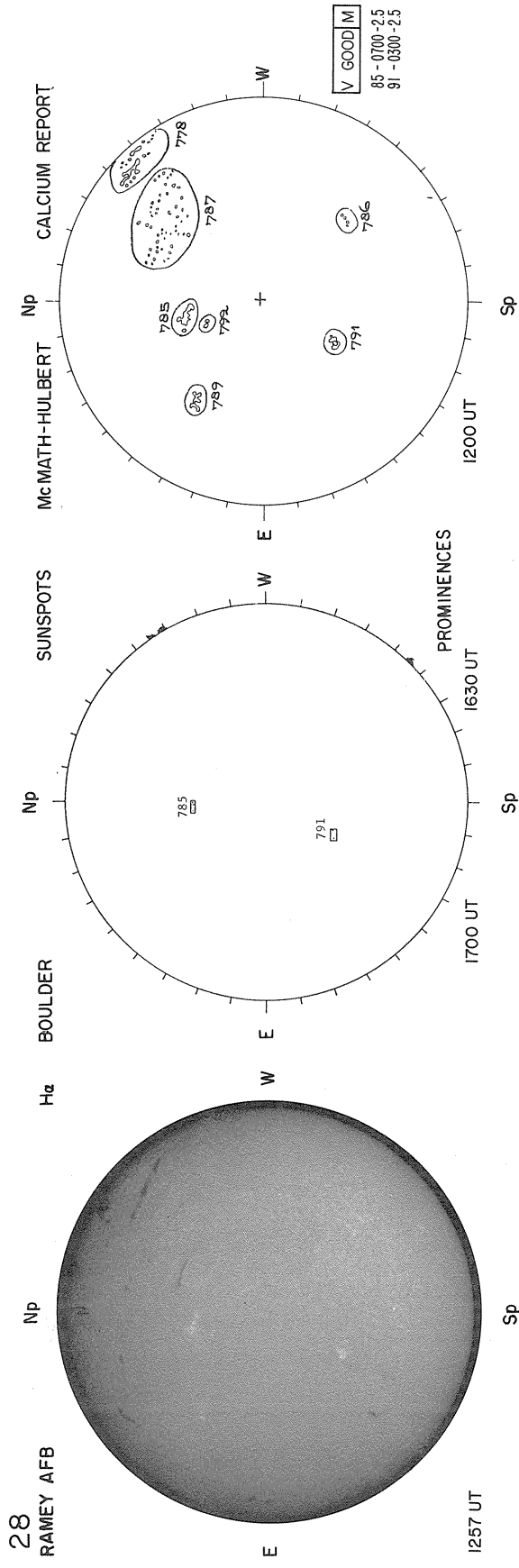
NO DATA

E

W



Levels
 ± 5
 ± 10
 ± 20
 ± 40
 ± 80



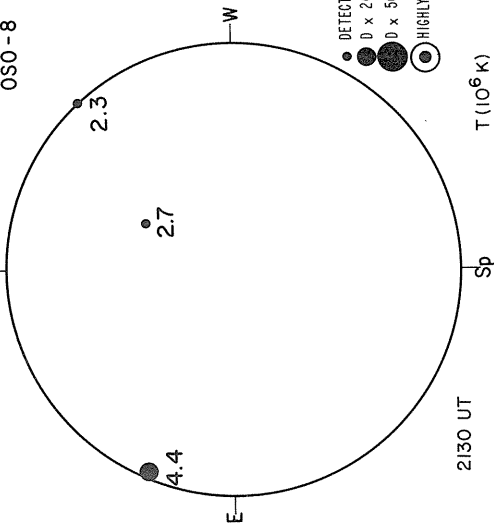
MAY 29, 1977 (P = -16.60, B₀ = -1.00, L₀ = 205.88)

CORONA (1.15 R₀)
5303 Å

Np

SACRAMENTO PEAK

LOCKHEED
X-RAY (2-14 keV)
OSO-8



W

NO DATA

E

Sp

Np

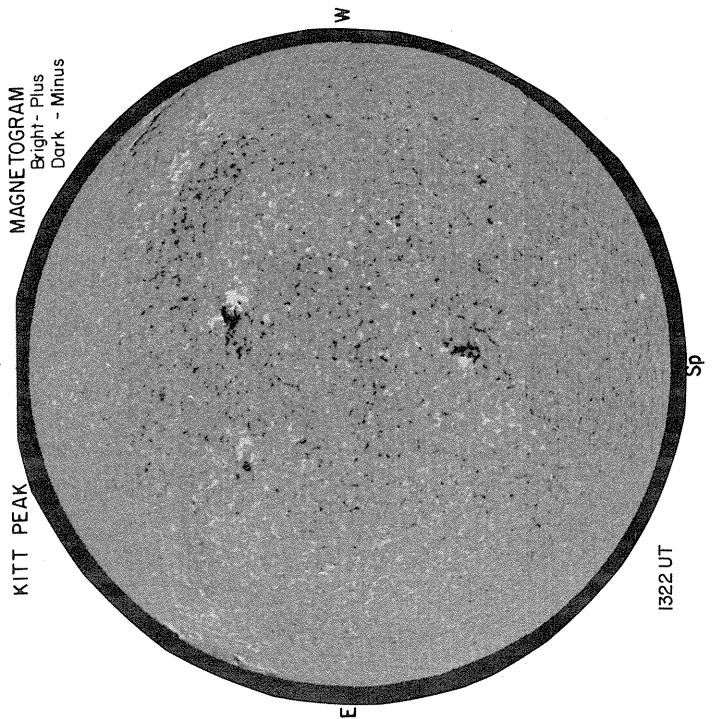
MT. WILSON

MAGNETOGRAM
Solid-Plus
Dotted-Minus

DELTA Y =
DELTA X =

MAGNETOGRAM
Bright-Plus
Dark-Minus

KITT PEAK

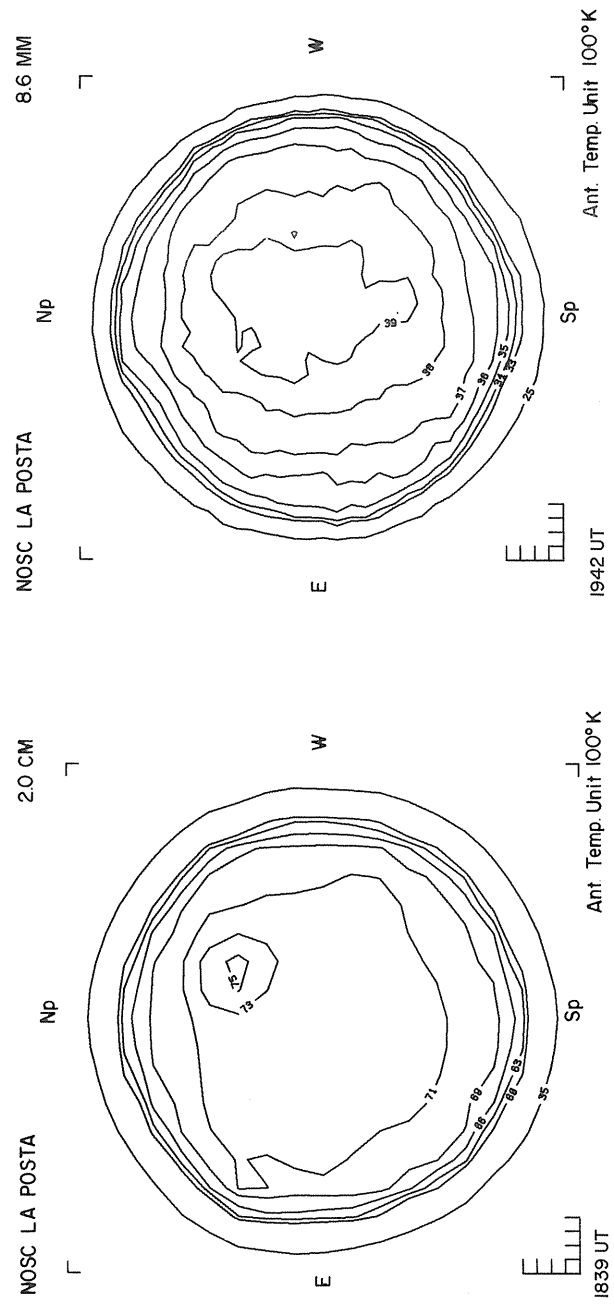
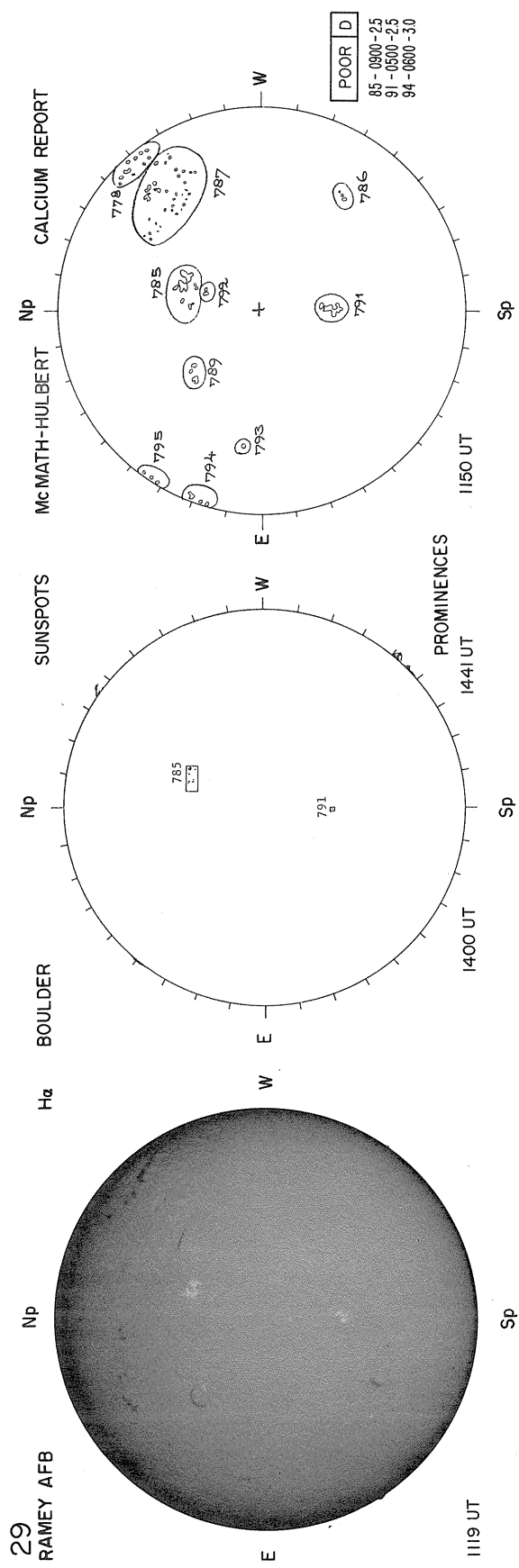


NO DATA

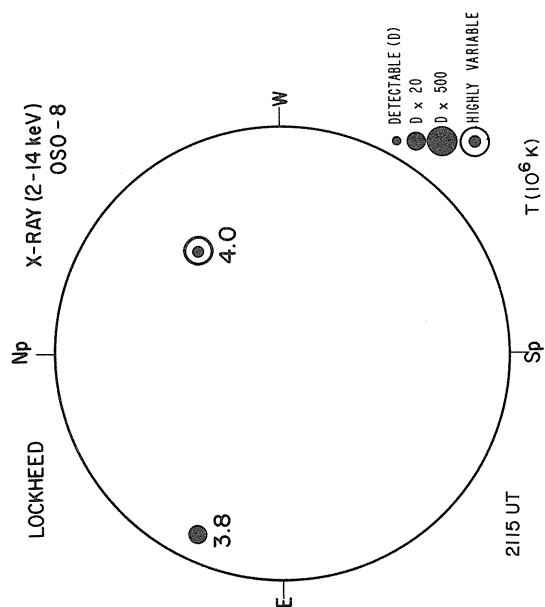
E

W

Levels
+ 5
+ 10
+ 20
+ 40
+ 80



MAY 30, 1977 (P = -16.24, B₀ = -0.88, L₀ = 192.65)



CORONA (1.15 R₀)
5303 Å

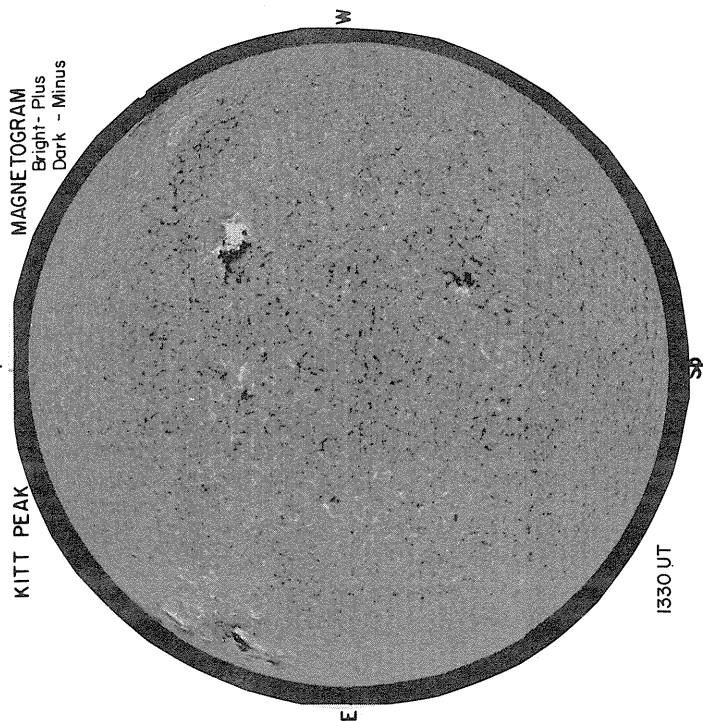
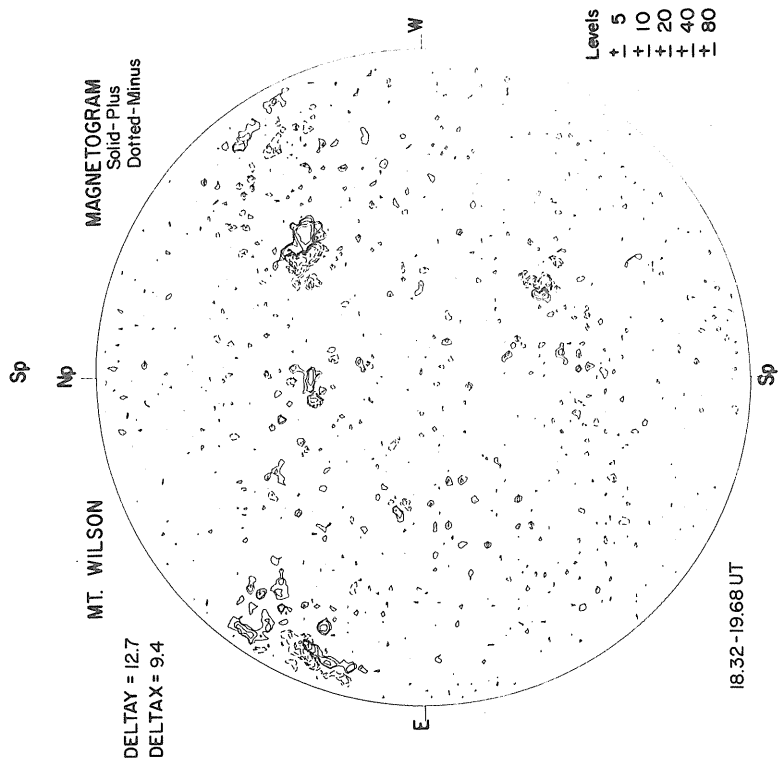
SACRAMENTO PEAK

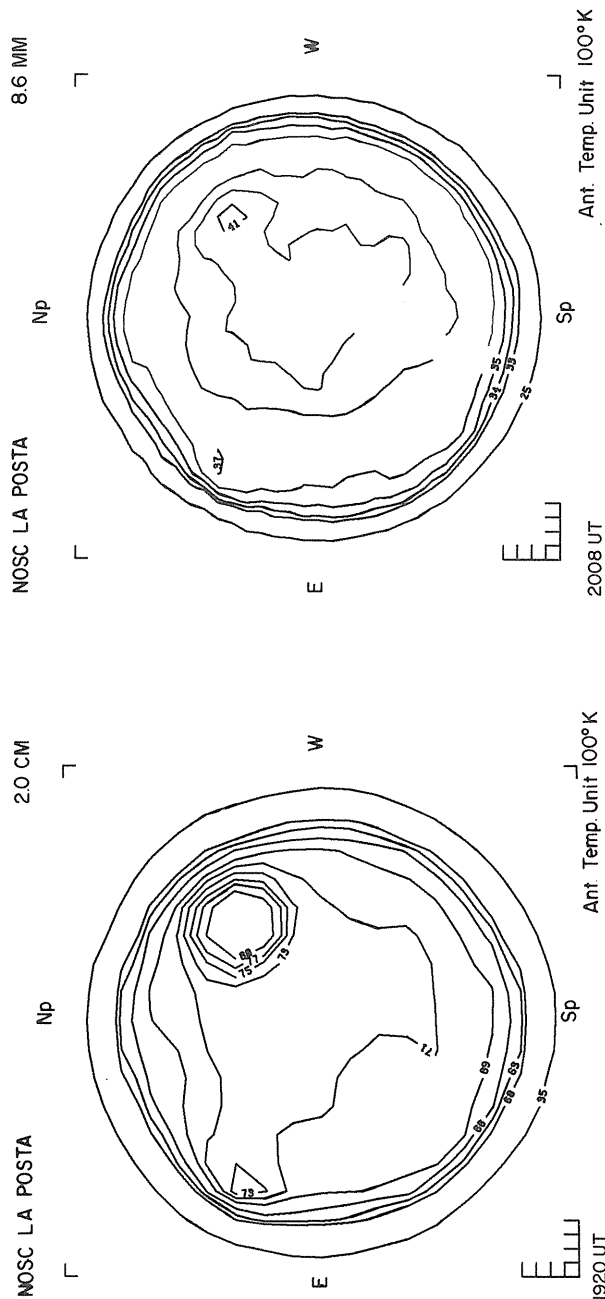
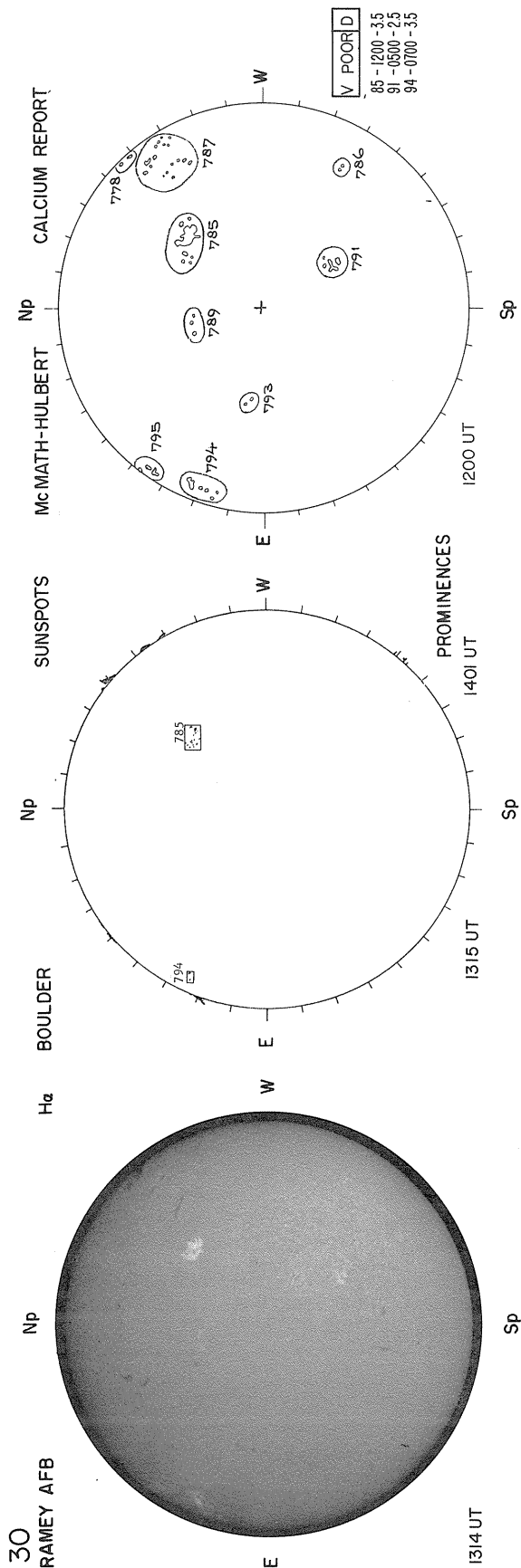
Np

E

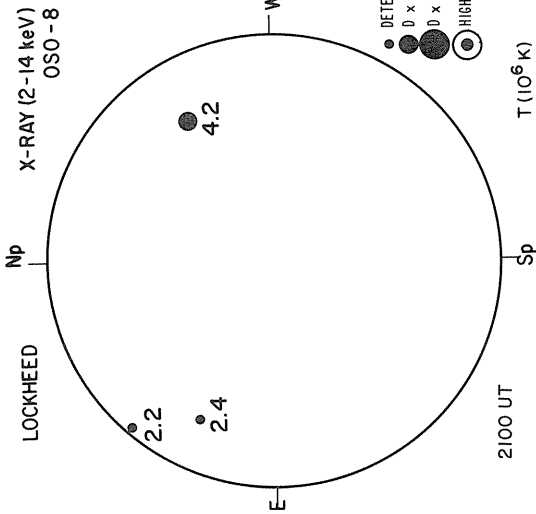
NO DATA

W





MAY 31, 1977 (P = -15.87, B₀ = -0.76, L₀ = 179.42)



CORONA (1.15 R_☉)
5303 Å

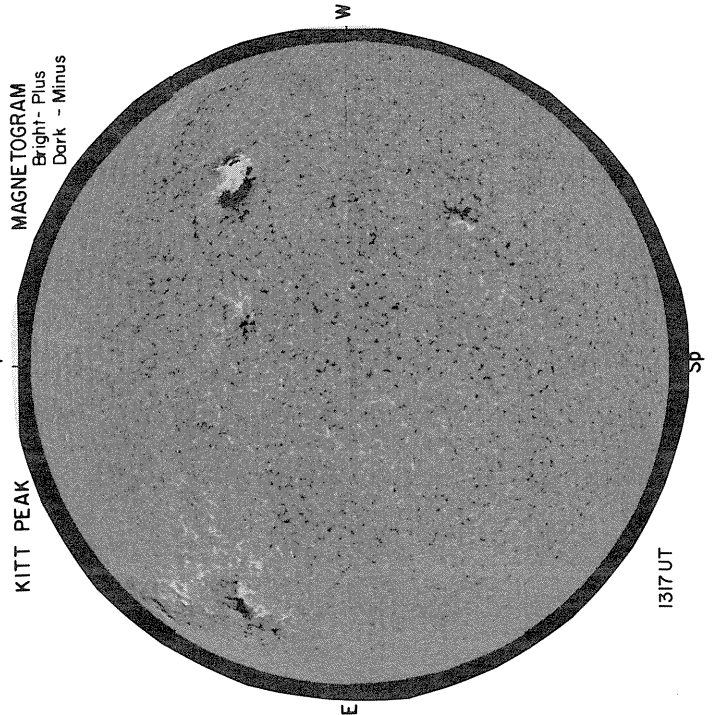
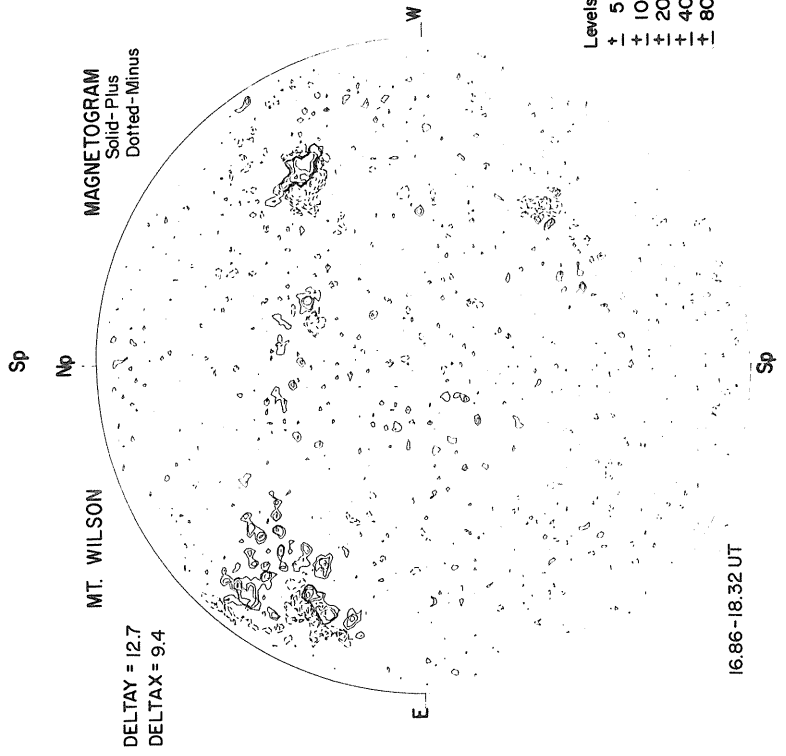
Np

SACRAMENTO PEAK

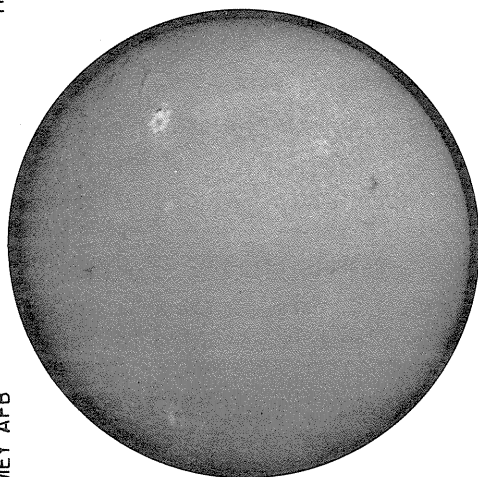
W

NO DATA

E

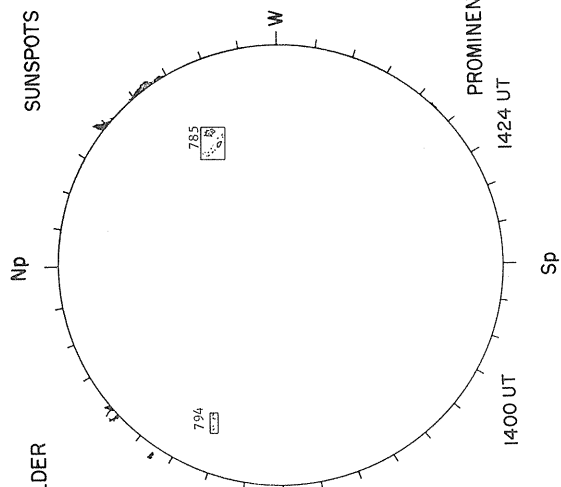


dN

H₂ BOULDER

BOULDER

NP

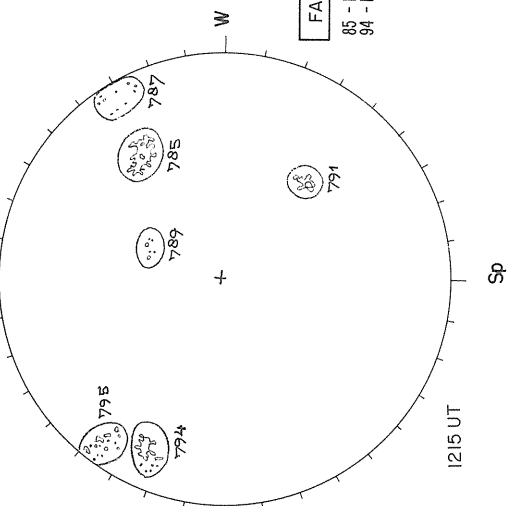


SUNSPOTS

20

McMATH-HULBERT

CALCIUM REPORT



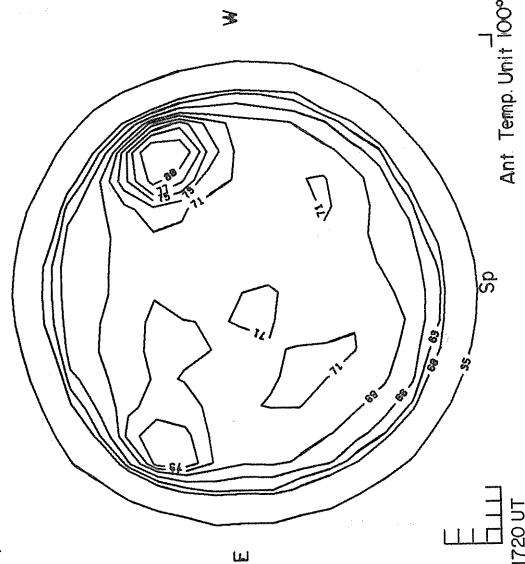
FAIR	S
85 - 1800 - 40	
94 - 1000 - 30	

85 - 1800 - 4.0
94 - 1000 - 3.0

NOSC LA POSTA

द्व

2.0 cm



Ant. Temp. Unit 100°K

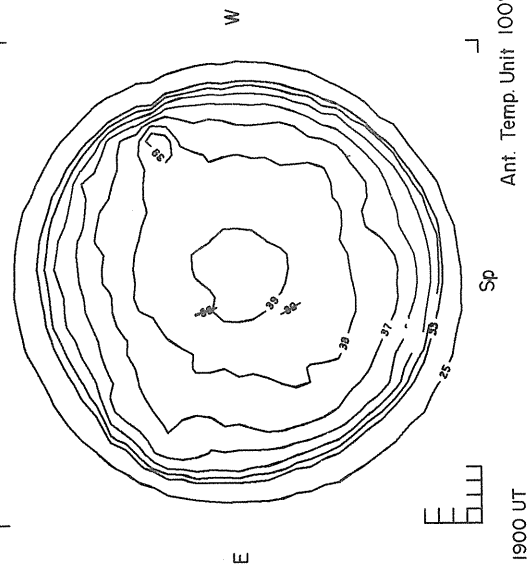
Ant. Temp. Unit 100°K

Ant. Temp. Unit 100°K

NOSC LA POSTA

дн

8.6 MM



Ant. Temp. Unit 100°K

Ant. Temp. Unit 100°K

100
May 77

REGIONS OF SOLAR ACTIVITY

MAY 1977

MCMATH REGION 14763 CMP DATE 8.9

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
77	5	6	14763	S16 E32	110	100	2.0								
77	5	7	14763	S16 E19	110	100	2.0								

MCMATH REGION 14765 CMP DATE 9.0

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
77	5	8	14765	N14 E07	109	100	1.5								

MCMATH REGION 14772 CMP DATE 10.0

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
77	5	12	14772	S17 W33	96	100	1.0								

MCMATH REGION 14770 CMP DATE 10.1

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
77	5	9	14770	N15 E08	95	100	1.5								

MCMATH REGION 14766 CMP DATE 10.9

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
77	5	8	14766	N29 E32	84	100	1.0								

MCMATH REGION 14768 CMP DATE 12.5

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
77	5	8	14768	S26 E58	58	500	3.0								
77	5	9	14768	S25 E42	61	300	2.0								
77	5	10	14768	S25 E29	61	300	2.0								
77	5	11	14768	S24 E14	63	500	2.0								
77	5	12	14768	S24 E00	63	400	3.0		S22 E10			8	10	3	BXX
77	5	13	14768	S24 W13	60	600	2.5		S23 W05			8	10	3	BX0
77	5	14	14768	S24 W26	60	400	3.0		S23 W17			8	10	2	AXX
77	5	15	14768	S24 W39	63	600	2.5								
77	5	16	14768	S24 W52	63	400	2.5								
77	5	17	14768	S24 W66	63	300	2.0								
77	5	18	14768	S24 W80	64	300	1.5								

MCMATH REGION 14767 CMP DATE 13.3

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
77	5	8	14767	N20 E64	52	200	1.5								
77	5	9	14767	N22 E50	53	300	1.0								
77	5	10	14767	N22 E37	53	300	1.5								
77	5	11	14767	N21 E23	54	100	1.5								

MCMATH REGION 14774 CMP DATE 15.8

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
77	5	13	14774	N31 E32	15	200	2.5								
77	5	14	14774	N31 E18	16	300	3.0		N30 E27			8	0	1	AXX
77	5	15	14774	N31 E05	19	400	2.5		N30 E15			8	0	1	AXX
77	5	16	14774	N31 W08	19	300	2.0								
77	5	17	14774	N31 W21	18	200	1.5								

↓ Continue

MCMATH REGION 14791						CMP DATE 29.5								
						CALCIUM PLAGE DATA	SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CHD	L AREA INT	MW NO.	LAT CHD	L MAG.	H STA	AREA CNT CLASS				
77	5	27	14791	S22 E26	200 300 2.0		S21 E23		B	0 2 AXX				
77	5	28	14791	S22 E13	200 300 2.5	19789	S22 E12	199 (B)	3 B	10 2 BXO				
77	5	29	14791	S22 E00	200 500 2.5		S21 E00		B	0 1 AXX				
77	5	30	14791	S22 W13	200 500 2.5									
77	5	31	14791	S22 W26	200 400 2.0									
77	6	01	14791	S23 W41	800 3.5	19791	S23 W45	(B)	4 B	50 9 C				
77	6	02	14791	S23 W59	1300 3.0	19791	S22 W58	(B)	4 B	60 5 D				
77	6	03	14791	S22 W68	1400 3.0	19791	S23 W70	(B)	4 B	70 3 D				
77	6	04	14791	S22 W81	1200 2.0									

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May 77

REGIONS OF SOLAR ACTIVITY

MAY 1977

MCMATH REGION 14789

CMP DATE 31.0

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
77	5	25	14789	N19 E75	178	500	3.5	19787	N19 E69				8	10	2 BX0
77	5	26	14789	N19 E62	178	600	3.0		N18 E58	181	8)	2	8	100	1 AXX
77	5	27	14789	N19 E48	178	600	2.5		N18 E45				8	0	1 AXX
77	5	28	14789	N19 E34	179	500	2.0								
77	5	29	14789	N19 E19	181	300	2.0								
77	5	30	14789	N19 E06	181	200	2.0								
77	5	31	14789	N19 W07	181	100	1.5								
77	6	01	14789	N19 W20		100	1.0								

Note: No calcium spectroheliograms were secured at the McMath-Hulbert Observatory on April 22, 23 and 25, 1977.
Sunspot observations were made at Mt. Wilson for the entire month of April 1977.

DAILY CALCIUM PLAGE INDEX

MAY 1977

YR	MO	DAY	INDEX	YR	MO	DAY	INDEX	YR	MO	DAY	INDEX
77	5	1	5.7	77	5	11	9.2	77	5	21	11.3
77	5	2	6.5	77	5	12	8.2	77	5	22	9.0
77	5	3	9.1	77	5	13	8.9	77	5	23	7.5
77	5	4	*	77	5	14	7.5	77	5	24	7.4
77	5	5	8.5	77	5	15	10.6	77	5	25	6.5
77	5	6	7.7	77	5	16	9.6	77	5	26	5.3
77	5	7	6.9	77	5	17	10.7	77	5	27	5.8
77	5	8	7.6	77	5	18	10.9	77	5	28	5.5
77	5	9	7.9	77	5	19	11.4	77	5	29	5.1
77	5	10	7.7	77	5	20	11.3	77	5	30	6.6
								77	5	31	8.4

* NO OBSERVATIONS

SUDDEN IONOSPHERIC DISTURBANCES

MAY 1977

DAY	UNIVERSAL TIME				WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE							KNOWN FLARE	MC MATH REGION
	START	END	MAX	IMP		SWF	SCNA	SEA	SPA	LF- SPA	SES	SFD		
03	0524	0557	0532	1-	1				1		1		*	
03	0928	1000	0933	1	1			1					0925	14749
03	1447	1530	1455	1	5	3		3	3	1		10	1428	14749
03	1617	1655	1621	1	3			2		1	4		NF	
03	1808	1840	1822	1	5	2	1		2	1	8		1756	14749
03	2218	2300	2229	1-	5	1			1		8		2213	X-RAY
03	2347	0038	0007	1-	1				1				*	
04	1215	1245	1220	1-	3				1		2		1208	X-RAY
04	1632	1725	1638	1-	3	1				1	1		1640E	14749
04	1724	1745	1732	1-	1						1		1725E	14749
06	0634	0704	0640	1-	3				1		1		0630	14749
06	0744U	0753	0745	1-	1			1					0740	14749
19	0021	0126	0029	1-	1				1				0019	14775

PERIODS OF NO OBSERVATIONS:

DATE	TIME (UT) and STATION	DATE	TIME (UT) and STATION
01-31	0000-2400 A36	10	0000-2400 A32, 0505-0630 UM (10 kHz),
01	0000-2400 A26, 0000-2400 A32		1945-2050 UM (10 kHz)
03	1255-2400 UM (13 kHz)	11-22	0000-2400 A37
04	1318-1400 TM	11	0207-0415 UM (10 kHz), 0438-0544 UM (10 kHz)
05	0320-0440 UM (10 kHz), 0504-0600 UM (10 kHz),	12	0030-0150 UM (13 kHz), 0838-0947 UM (13 kHz)
	1949-2104 UM (10 kHz)	15-31	0000-2400 UM (10 kHz), 0000-2400 UM (13 kHz)
06	1939-2101 UM (10 kHz)	22-31	0000-2400 A32
08	2125-2232 UM (13 kHz)	26	0000-2400 A19
09	0000-2400 A32, 0456-0553 UM (10 kHz),	28-31	0000-2400 A30
	2215-2315 UM (10 kHz)		

STATIONS REPORTING FOR MAY 1977

AAVSO (A1, A19, A21, A30, A31, A34, A35,
A36, A37, A40) (SES) (A1, A26,
A31, A32) (SEA) (A31) (SWF)
HAWAII (HA) (SFD)
HERSTMONCEUX (HC) (SEA)
HIRAISO (HI) (SWF)
HOBART (TA) (SEA, SES)
INUBO (IN) (SPA)
KUHLLUNGSBORN (KU) (SEF, SEA, SPA)
MANTLA (MA) (SCNA)
MCMATH (MC) (SWF, SCNA)
PANSKA VES (PU) (SWF, SEA, SES)
PRESTON (LO) (SEA)
SAO PAULO (UM) (SES, SPA)
SOFIA (SF) (SES)
ST CLOUD (SC) (SES)
TABLE MOUNTAIN (TM) (SPA, LF-SPA)
TORINO (TN) (SPA)
UPICE (UI) (SEA)

SID's BY McMATH REGION

MAY 1977

[illegible]

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May 77

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

MAY 1977

MAY 1977	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	
01	0000	1006	MANI										
	0443	1756	WEIS										
	0446	1524	DURN										
	0943	2339	SGMR										
	1247	2245	HARV										
	1549	1822	DURN										
	2137	2400	MANI										
02	0000	1006	MANI										
	0443	0736	WEIS										
	0447	1312	DURN										
	0941	2340	SGMR							1700.0	1700.8	2	IIIG
	1247	2200	HARV				1700	1701	3	1700	1701	3	IIIG
	2135	2400	MANI										
	2207	2245	HARV										
03	0000	1006	MANI										
	0940	2341	SGMR										
	1200	1825	DURN										
	1251	2245	HARV										
	2135	2400	MANI										
04	0000	1006	MANI										
	0445	1827	DURN										
	0938	2341	SGMR										
	1244	2245	HARV				1632		1	1632		1	IIIB
	2135	2400	MANI										
05	0000	0953	MANI										
	0443	1828	DURN										
	0937	2343	SGMR										
	1245	2245	HARV										
	2135	2400	MANI										
06	0000	1009	MANI										
	0442	0544	DURN										
	0936	2345	SGMR							1306.8	1307.3	1	III
			SGMR							1329.9	1330.0	1	III
	0923	1727	DURN	1346.1	1346.1	1							III
			SGMR							1519.0	1525.0	3	V
	1245	2245	HARV				1519	1525	3	1519	1525	3	IIIGG
			DURN	1523.3	1523.5	3	1519.0	1523.5	3				IIIG
			HARV				1527	1528	3	1527	1528	1	IIIG
			HARV				1539	1542	2	1539	1542	2	IIIG
			SGMR							1542.5	1608.3	1	IIIS
			HARV				1559	1608	1	1559	1608	1	IIIG
			SGMR							1651.8	1652.3	1	III
			HARV				1652		3	1652		3	IIIG
			HARV				1758		2	1758		2	IIIB
			HARV				1822	1823	1	1822	1823	1	IIIB
			SGMR							1836.9	1837.3	1	III
			HARV				1836	1837	3	1836	1837	3	IIIG
			SGMR							1919.3	1919.7	1	III
			HARV				1919	1920	3	1919	1920	3	IIIG
			HARV				2002		1	2002		1	IIIBW
			HARV				2012		1	2012		1	IIIG
			SGMR							2033.0	2051.8	2	V
			HARV				2033	2038	3	2033	2038	3	IIIGG
			HARV				2040	2042	1	2040	2042	1	IIIB
			HARV				2115		1	2115		1	IIIB
	2134	2400	MANI				2141	2143	1	2141	2143	1	IIIG
			HARV										
07	0000	1008	MANI							0013.8	0015.3	2	IIIG
			MANI							0054.2	0055.6	3	IIIG
			MANI							0219.7	0220.2	3	III
			MANI							0243.5	0249.0	3	IIIG
			MANI							0306.0	0313.9	3	IIIG
			MANI							0324.3	0324.8	3	III
			MANI							0407.5	0407.9	3	III

MAY 1977	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		
07			MANI								0451.0	0456.2	3	IIIG
	0629	1822	MANI								0550.0	0550.2	3	III
	1245	2245	DURN	1336.8	1337.1	2	1336.8	1337.1	2					IIIG
			HARV				1757		2	1757			2	IIIB
			HARV				1814		3	1814			3	IIIB
			HARV				1848	1853	2	1848	1853		2	IIIB
			HARV				1939	1945	1	1939	1945		1	IIIG
			HARV				1951		1	1951			1	IIIB
			HARV				2000		2	2000			2	IIIB
	0935	2346	SGMR								2026.5	2028.0	2	V
2134	2400	HARV				2026	2028	3	2026	2028		3	IIIG,V	
		MANI												
08	0000	1008	MANI								0142.9	0143.5	3	III
	0441	1825	MANI								0332.4	0333.0	3	III
	0933	2347	DURN											
	1245	2245	HARV				1758		1	1758			1	IIIG
	2134	2400	MANI											
09	0000	0201	MANI											
	0316	1008	MANI											
	0440	1828	DURN											
	0932	2348	SGMR											
	1245	2245	HARV											
	2134	2400	MANI											
10	0000	1008	MANI											
	0440	0820	DURN											
	1245	2245	HARV											
	1403	1806	WEIS											
	0931	2349	SGMR							2053.3	2053.6	1	III	
			SGMR							2055.9	2056.3	1	III	
			SGMR							2123.6	2123.9	1	III	
	2134	2400	MANI											
11	0000	1008	MANI											
	0429	1808	WEIS				0431.3	0431.5	1					IIIG
			WEIS				0457.3	0457.4	1					IIIB
			WEIS				0503.2	0504.0	2					IIIG
			WEIS				0528.9	0529.0	1					IIIB
			WEIS				0535.4	0535.5	1					IIIB
			WEIS				0552.4	0552.5	1					IIIB
	0930	2350	SGMR											
	1245	2245	WEIS				1146.4	1146.5	1					IIIB
	2133	2400	HARV				1347.5	1347.7	2					IIIB
		MANI												
12	0000	1008	MANI											
	0428	0542	WEIS											
	0716	1808	WEIS											
	0929	2351	SGMR											
	1245	2245	HARV											
	2132	2400	MANI											
13	0000	1008	MANI											
	0426	1251	WEIS				0905.3	0905.7	2					IIIB
	0928	2352	SGMR											
			WEIS				1000.4	1001.3	2					IIIG
	1245	2245	HARV											
	1259	1315	WEIS											
	1406	1515	WEIS											
	1608	1810	WEIS											
	2131	2400	MANI											
	14	0000	1008	MANI										
0426		0652	WEIS											
0737		1812	WEIS											
0927		2353	SGMR											

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May 77

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

MAY 1977

MAY 1977	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	
14	1245 2131	2245 2400	HARV MANI										
15	0000 0424 0717 0926 1245 2131	1008 0541 1813 2354 2245 2400	MANI WEIS WEIS SGMR HARV MANI										
16	0000 0424 0525 0925 1245 2131	0400 1235 1008 2355 1814 2245 2325	MANI WEIS MANI SGMR WEIS HARV MANI										
17	0156 0422 0924 1245 2130	1008 1815 2356 2245 2400	MANI WEIS SGMR WEIS HARV MANI				0838.5 1020.4	0838.7 1021.6	2 3				IIIGU,RS IIIG
18	0000 0610 0720 0742 0923 1203 1245 2130	0516 1008 0740 0928 2357 1816 2245 2400	MANI MANI WEIS WEIS SGMR WEIS HARV MANI										
19	0000 0922 1245 0419 2130	1008 2358 2245 1817 2400	MANI SGMR HARV WEIS MANI				1352.7	1353.0	2				IIIG
20	0000 0419 0921 1230	1008 1819 2359 2245	MANI WEIS SGMR HARV										
21	0417 0000 0920 1235 0910 2129 2129	0630 1008 2400 2245 1820 2400 2400	WEIS MANI SGMR HARV WEIS WEIS WEIS MANI MANI				1330.5 1332.2 1503.3 1517.9	1330.7 1332.3 1503.9 1518.2	 2 3 2	0503.8	0504.1	1	III IIIG IVU IIIG IIIG
22	0417 0000 1335 0919 1235	1242 1006 1821 2401 2245	WEIS MANI WEIS MANI WEIS WEIS WEIS SGMR HARV HARV HARV HARV				0638.4 0643.7 1014.3 1021.3 1026.4 1029.4 1636.9 1637 1846 1908 1926	0639.7 0650.3 1014.8 1021.9 1027.3 1031.1 1639.2 1639 1846 1910 1637 1639 1846 1910 1926	3 3 3 2 1 2 3 3 1 1 1	0639.2 0644.1 1637.2	0639.7 0647.6 1638.5 1639	3 2 1 3 1 1 1	IIIGG III IIIGG IIIG IIIG IIIGG IIIGG IIIG IIIG IIIGG IIIG IIIG IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

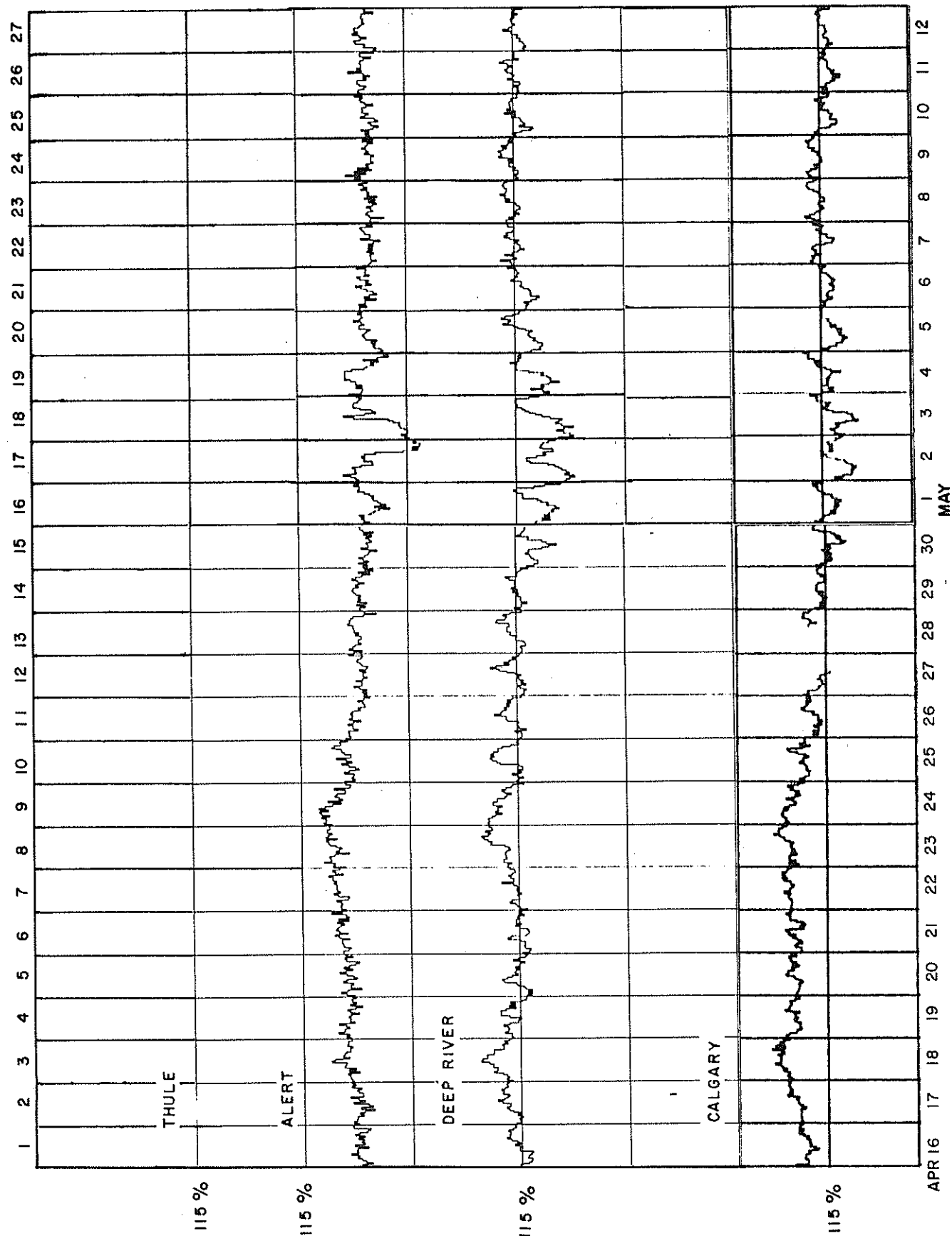
MAY 1977

MAY 1977	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	
22	2129	2400	MANI										
23	0000	1006	MANI										
	0416	1822	WEIS										
	0918	2402	SGMR										
	1236	2245	HARV										
	2129	2400	MANI										
24	0000	1006	MANI										
	0416	0527	WEIS										
	0658	1923	WEIS										
	0918	2403	SGMR										
	1230	2245	HARV										
	2129	2400	MANI										
25	0000	0845	MANI										
	0414	1220	WEIS										
	0910	1006	MANI										
	0917	2404	SGMR										
	1230	2245	HARV										
	1249	1824	WEIS										
	2128	2400	MANI										
26	0000	1006	MANI										
	0413	0728	WEIS										
	0916	2405	SGMR										
	1230	2245	HARV										
	2128	2400	MANI										
27	0000	1004	MANI										
	0916	2406	SGMR										
	1156	1826	WEIS										
	1230	2245	HARV										
	2127	2400	MANI										
28	0000	1000	MANI										
	0413	0748	WEIS										
	0807	1827	WEIS										
	0915	2406	SGMR										
	1230	2245	HARV										
	2132	2400	MANI										
29	0000	1000	MANI										
	0412	1254	WEIS										
	0914	2407	SGMR										
	1230	2245	HARV										
	1312	1828	WEIS										
	2130	2400	MANI										
30	0000	1000	MANI										
	0411	1524	WEIS										
	0914	2408	SGMR										
			DURN	1414.6	1414.7	3							III
	1436	2245	HARV										
	1548	1554	WEIS										
	1802	1829	WEIS										
	2129	2400	MANI										
31	0000	1000	MANI										
	0658	0938	WEIS										
	0913	2409	SGMR										
			WEIS				1124.1	1804.0	2				IS
	1230	2245	HARV										
	0945	1830	WEIS				1236.8	1239.1	3				IIIGG
	2129	2400	MANI										

The symbols used in connection with the spectral type in describing the important bursts are as follows:

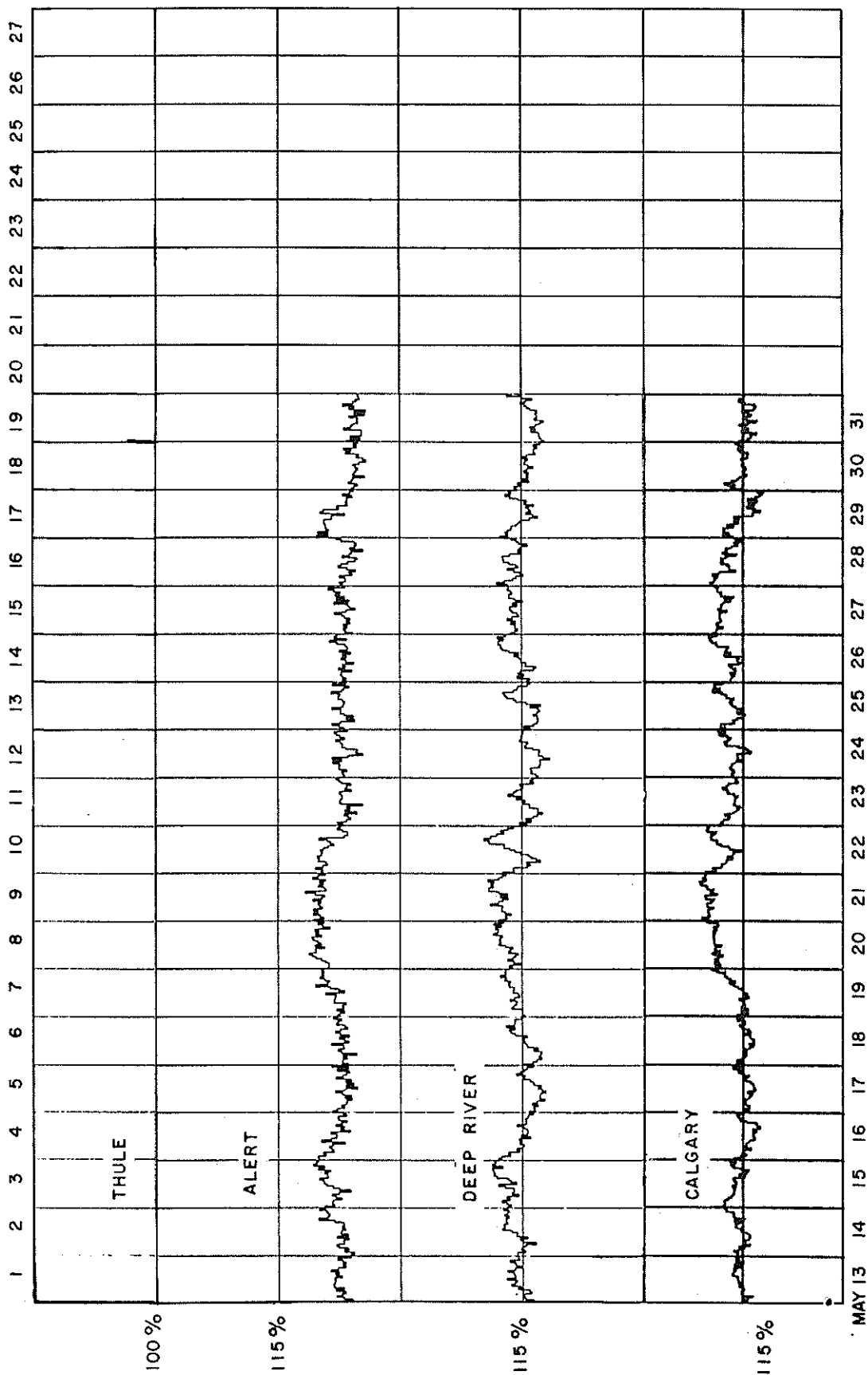
- | | |
|--|-------------------------------|
| B = Single burst | RS = Reverse slope burst |
| G = Small group (< 10) of bursts | DP = Drifting pairs |
| GG = Large group (> 10) of bursts | DC = Drifting Chains |
| C = Underlying continuum (particularly with type I) | H = Herringbone |
| S = Storm in the sense of intermittent but apparently connected activity | W = Weak |
| N = Intermittent activity in this period | P = Pulsations |
| U = U-shaped burst of Type III | CONT = Continuum |
| | UNCLF = Unclassified activity |

COSMIC RAY INDICES
(Neutron Monitors)
Bartels Rotation 1965 (April-May 1977)



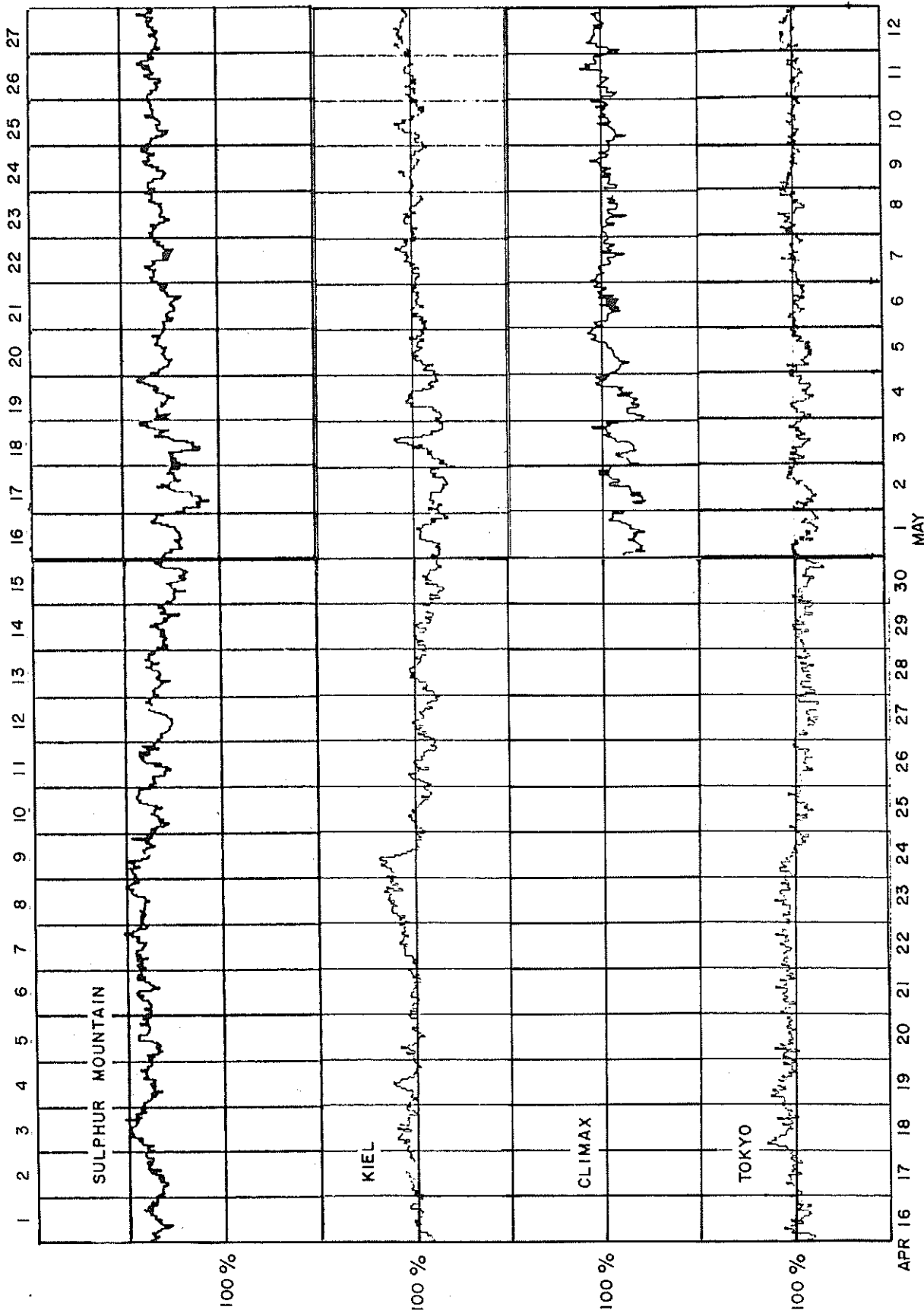
COSMIC RAY INDICES (Neutron Monitors)

Bartels Rotation 1966 (May 1977)



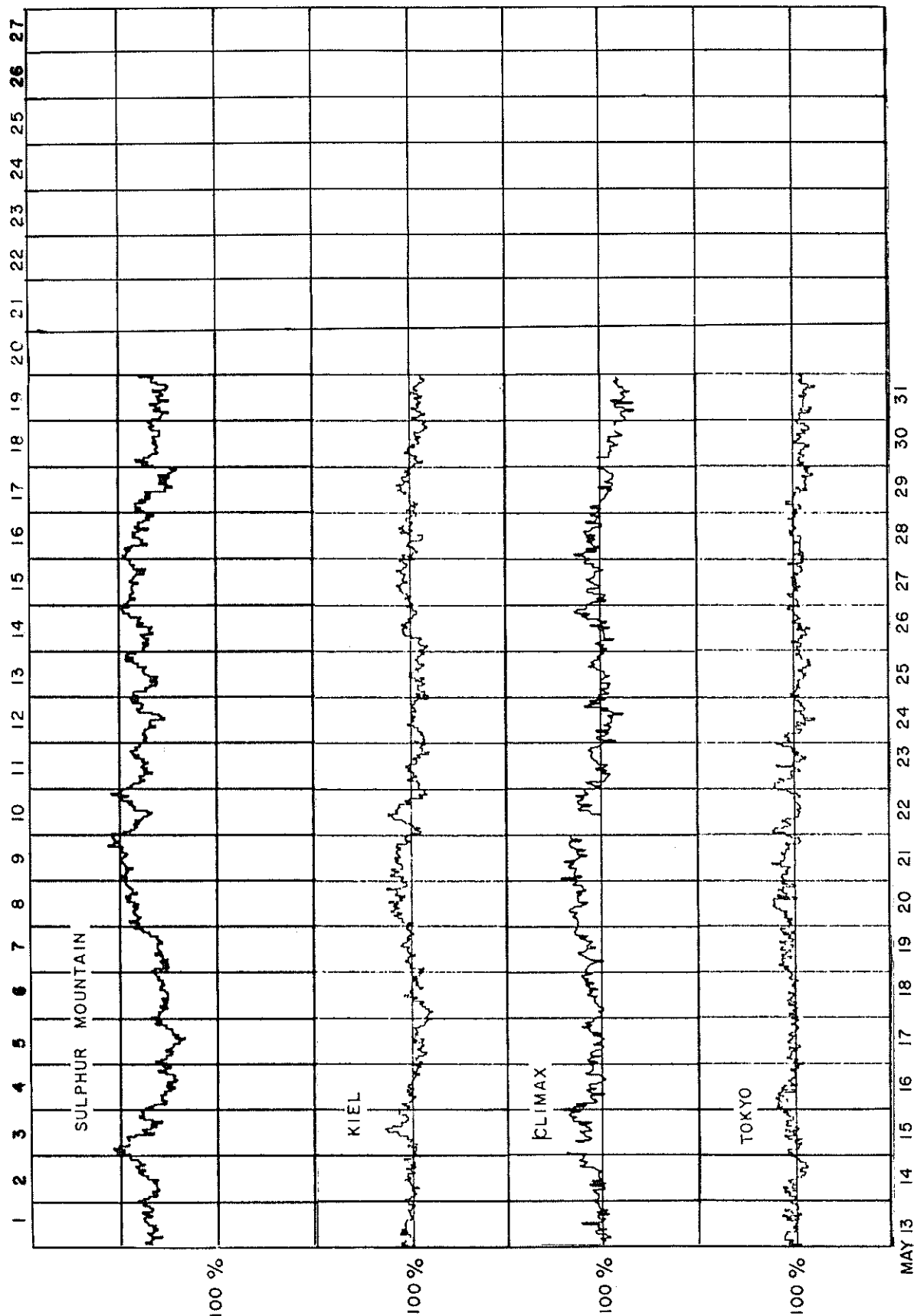
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1965 (April-May 1977)



COSMIC RAY INDICES (Neutron Monitors)

Bartels Rotation 1966 (May 1977)



COSMIC RAY INDICES
(Neutron Monitors)

MAY 1977

May 1977	THULE Average cts/hr	ALERT Average cts/hr	DEEP RIVER Average cts/hr	CALGARY Average cts/hr	SULPHUR MT Average cts/hr	KIEL Average cts/hr	CLIMAX Average cts/hr	TOKYO Average cts/hr	KULA * Average cts/hr
1	Data not available at time of publication.	7464.0	7010.4	11682.8	9009.1	6295.5	4213.1	3645.9	1212.8
2		7441.8	6975.3	11603.0	8956.7	6274.9	4227.9	3653.6	1216.8
3		7432.4	6996.3	11632.0	9001.3	6300.5	4233.8	3657.0	1215.5
4		7485.5	7025.6	11701.9	9060.6	6308.4	4223.4	3650.7	1211.5
5		7465.6	7049.3	11640.2	9040.1(23)	6322.9	4256.7	3651.1	1214.4
6		7470.0	7050.5	11664.3	9007.3	6334.8	4263.0	3658.2	1216.2
7		7457.0	7080.5	11716.8	9054.8	6360.3	4263.2	3662.8	1208.9
8		7454.8	7087.7	11738.2	9061.1	6350.7	4252.3	3670.8	1215.2
9		7466.5	7087.0	11750.9	9081.1	6348.1	4261.1	3668.7	1217.9
10		7462.2	7067.6	11669.9	9067.4	6347.0	4257.0	3664.0	1213.0
11		7475.8	7076.5	11652.6	9084.5	6354.9	4273.0	3662.2	1212.3
12		7473.3	7065.3	11678.2	9073.8	6382.5	4277.4	3675.6	1215.3
13		7510.0	7086.3	11731.6	9093.6	6391.4	4275.7	3674.6	1216.0
14		7513.8	7096.5	11732.0	9110.8	6380.3	4290.0	3666.1	1216.9
15		7541.8	7122.3	11765.2	9145.4(22)	6401.5	4318.2	3675.0	1218.5
16		7524.4	7079.6	11683.8	9023.0	6375.2	4296.0	3680.9	1215.3
17		7498.6	7048.2	11689.7	9004.0	6347.3	4288.6	3669.7	1217.6
18		7504.0	7068.7	11696.9	9037.3	6349.6	4290.3	3670.4	1216.6
19		7530.8	7099.0	11748.9	9058.8	6380.8	4307.4	3684.0	1220.8
20		7565.5	7117.4	11875.0	9167.2	6414.6	4325.1	3687.4	1225.3
21		7567.1	7132.2	11924.2	9217.9	6412.7	4331.4	3681.1	1222.7
22		7542.5	7102.2	11848.7	9169.6	6383.0	4307.9(28)	3672.2	1221.5
23		7495.8	7064.4	11781.1	9134.6	6355.2	4277.2	3674.3	1216.1
24		7501.3	7049.4	11769.6	9102.6	6355.5	4261.2	3657.3	1214.4
25		7504.9	7064.4	11793.3	9120.9	6345.4	4270.6	3651.5	1215.5
26		7501.2	7092.4	11803.2	9128.6	6366.0	4279.0	3656.7	1219.3
27		7499.9	7097.7	11843.9	9160.1	6392.3	4283.7	3660.4	1214.8
28		7487.0	7096.6	11815.9	9138.4	6369.4	4290.8	3659.3	1215.7
29		7524.2	7082.8	11706.0	9053.4	6381.5	4260.6	3650.6	1214.2
30		7467.9	7060.8	11725.7	9068.7	6349.2	4244.4(36)	3648.5	1214.4
31		7467.8	7046.8	11682.7	9040.5	6345.1	4222.1	3644.2	1214.1
MEAN		7493.5	7070.3	11733.8	9079.8	6357.3	4271.5	3664.0	1216.1

() Number of hours for which data are available if less than 24. Number of Section Hours at Climax if sum of both sections is less than 40 hours.

Thule, Alert, Calgary, Sulphur Mountain, Kiel, Climax and Kula Scaling Factors = 100.

Deep River Scaling Factor = 300.

Tokyo Scaling Factor = 128.

* Kula data are available on magnetic tape from the World Data Center A for Solar-Terrestrial Physics. These data include the periods July 1967 - December 1970 and October 1975 to the present.

GEOMAGNETIC ACTIVITY INDICES

MAY 1977

Day	Three-Hourly Indices Kp										Three-Hourly Indices Km										Ap	aa *			Cp
		1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	N	S		M			
1	D1	2+	2+	2-	2-	2-	2	4+	4+	20+	2+	2	2-	1+	2	2	4-	4-	13	27	19	11	36	0.8	
2		6-	5	4	5	6+	6+	6	6-	44	5	4	3	5-	5+	6-	5	4+	66	67	71	55	103	1.7	
3		5-	4-	4-	3+	2-	1+	1	2	21+	3+	3	3	3+	2	1+	1	2-	15	25	17	30	12	0.9	
4		1	2-	2	1+	2+	5+	5	3+	22	1	2-	2	1+	2+	4+	4	3	19	42	23	12	54	1.0	
5		3	2	3	2-	2	3-	3-	3	20	3	2	3+	1+	2-	2+	2+	3-	11	25	14	19	21	0.6	
6	Q9 Q3	3	3-	2	2	2	3-	3-	2	19	3+	3-	2	2+	2+	2+	3-	2-	10	24	22	25	21	0.6	
7		2+	2-	2-	1	0+	1-	2	2+	12	2	2	2-	1	0+	0+	2-	2	6	18	7	14	12	CK	0.3
8		0+	1	0+	1-	1	1-	1-	1+	6	1-	1-	0+	1-	1-	0+	1-	1	3	7	4	4	7	CC	0.1
9		2-	2	1+	2	2	3-	2-	1+	15-	1+	2-	1	2	2-	2+	1+	1	7	18	9	12	15	CK	0.3
10		1	2-	4-	2	2	2+	2-	2+	17-	1-	1+	3+	3-	2	2+	1+	2+	9	21	17	18	20	0.5	
11	D2	2	2-	4	3	3	5	5+	3	27	2	1+	3+	3+	3-	4-	5	3-	24	54	24	23	56	1.1	
12	D5*	3	6-	4	3	3-	2-	1+	1-	22	2+	5	4-	3-	2	1+	1+	1	19	27	17	32	12	1.0	
13	Q0K	1-	2-	1	1+	1-	0+	3	2+	11	1-	2-	1	1+	1-	0+	3-	2	6	14	8	6	16	KK	0.3
14		2	3-	2	1+	1+	1+	2-	3	15+	2	2	2+	2-	1+	1+	1+	3-	8	22	13	17	18	0.4	
15		4-	2+	2+	3	3	3-	2+	3+	23-	4	2	2+	3	3-	2+	3-	3	14	27	25	27	26	0.8	
16	Q3	4-	4+	3	4	3	3+	4	4-	29	4-	4-	3	3	3-	3	4-	3+	22	45	30	40	36	1.1	
17	Q4*	3+	4	5-	3-	3	3	3-	2	25+	3+	4-	4-	3-	3-	3	3-	2-	18	33	32	39	26	1.0	
18		3	3	3+	3	3-	2	2	1	19+	3-	3-	3	3	3-	2-	2-	1	11	23	15	23	15	0.6	
19	Q6	2-	1	1+	1+	1	1+	1+	1-	10-	2-	1+	1	1	1+	2-	1	1	5	14	5	10	10	CC	0.2
20		2	2	2	2-	2+	3-	4-	2	18+	1+	2	2	2-	2+	2+	3+	2-	10	22	16	16	23	0.5	
21	Q5	1-	0+	1	1-	0+	1+	1	2-	7+	1-	0+	1	1	0+	1+	1-	2-	4	14	6	9	11	C	0.1
22		2	3	3	1	1	1-	1	1	13-	2-	3	3	1+	1	0+	1	1	7	16	12	20	9	KK	0.4
23		2+	2-	1	1-	2-	3	1+	1	13+	2	2-	1+	1	1+	2+	1+	2-	7	21	5	11	16	K	0.3
24		2	2+	2	2	2	3	2	2	17+	2-	2+	2+	2	2-	2+	2+	2-	8	20	13	17	16	0.4	
25		Q8	2+	1	1+	1	1+	2-	1+	1	11	2	1+	2	1+	1+	2+	1	1	5	14	8	10	13	CC
26	Q2	0+	1-	0	0	0+	1	1+	1	5-	0+	1-	0+	0	0+	1-	1	1+	2	9	4	5	8	CC	0.0
27	Q4	1-	1	2-	0+	1	1	1-	0+	7-	1-	1-	1+	1-	1	1	0+	0+	4	11	4	8	7	CC	0.1
28		1	2	1-	3	2+	1	3-	1	14-	1	2-	1-	3	2+	1	2	1	7	20	10	16	14	K	0.4
29	Q1	1	0+	0	0	1	1-	0+	0+	4-	1	1-	0+	0+	1	0+	1-	1-	2	8	4	5	7	CC	0.0
30	Q7	1-	1+	1+	2-	2-	1	1+	1-	10-	1-	1-	1+	2	2-	1	1	1-	5	13	6	11	9	CC	0.2
31		2	2	2+	1+	2+	2+	1	2	15+	2-	2+	3-	1	2+	2-	1	2	7	21	9	14	16	K	0.4
																		Mean	11	24.0	15.1	19.7		0.53	

Day	Three-Hourly Indices Kn									Three-Hourly Indices Ks								
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8
1		2	2	2-	2-	2	2+	3+	4-		2+	2-	1+	1+	2-	2	4	4-
2		5-	4+	3+	5-	5+	6-	5	4+		5+	4-	3-	5-	5+	6-	5	4+
3		4-	3	4-	4-	2	1+	1+	2+		3	3	2+	3	2-	1	1-	1
4		1	2-	2-	2-	3-	5	4	3		1-	2	2	1	2-	4-	4+	3
5		3-	2-	3+	1+	2	2+	2	3-		3+	2	3+	1+	2-	2	3-	3
6		3-	3	2	2	2+	2+	2+	2-		4-	3-	2	3-	2	2+	3-	2-
7		2-	2-	2	1	0+	0+	2-	2+		2+	2+	1+	1	0	0+	2-	2
8		1-	1	0+	1	1-	0+	1-	1		1-	1-	0	1-	1-	0+	0+	1
9		1	2-	1	2+	2-	2+	2-	1+		1+	2-	1	2	1+	2+	1+	0+
10		1	1+	4-	3-	2+	3-	1+	2+		1-	1+	3	3-	1+	2+	1	2+
11		2-	1+	3+	4-	3	4	5-	2+		2	1+	3+	3	2+	4-	5	3
12		2+	5+	4-	3-	2+	1+	1+	1		2+	5-	4	3-	2-	1+	1	1-
13		1	2-	1	1+	1	0+	3-	2		1-	2-	1	1+	0+	0	3	2
14		2-	2+	2+	2-	2-	1+	2-	3		2+	2-	2	2	1-	1	1+	3-
15		3+	2-	3-	3	3-	2+	2+	3-		4+	2+	2	3	3-	2	3-	3+
16		3+	4-	3	3+	3-	3+	3+	3+		4+	4	3+	3-	3-	3	4	4-
17		3	4-	4-	3	3	3	2+	2		4-	4-	4-	3	3-	3	3	2-
18		3-	3	3-	3	3-	2	2-	1+		3	3-	3+	3-	2+	1+	2-	1-
19		2-	1	1+	1+	2-	2-	1+	1		2-	2-	1-	1-	1	1+	1	1
20		2-	2-	2	2	3-	2+	3+	2		1+	2	2-	2-	2+	2	3	1+
21		1	1	1	1	1-	2-	1	2		0+	0	1-	1-	0	1-	0	1
22		2	3+	3+	2-	1+	1-	1+	1+		1+	3	3-	1-	1	0	1	0+
23		2+	2	2-	1+	2-	2+	2-	2		2	1+	1-	1-	1+	2-	1-	2-
24		2	2+	2	2+	2	3-	2+	2		2-	2+	2+	2	1	2	2+	2-
25		2+	1+	2	2	2	3-	1+	1+		2	1+	2-	1	1-	2-	1-	0+
26		1-	1	0+	0	1	1+	1+	2-		0+	0+	0+	0	0	0	0+	0+
27		1	1	2-	1	1+	2-	1-	1-		1-	0+	1-	0+	0+	0+	0+	0
28		1	2	1+	4-	2+	1+	3-	1		1	1+	0	3-	3-	1-	1+	1-
29		1+	1	1-	0+	2-	1-	1+	1		1	0	0	0	0+	0	0	0
30		1+	1	2-	2+	2-	2-	2-	1		0+	0	1	1+	1+	0+	0+	0+
31		2-	2+	3-	1+	3-	2+	1+	2+		2-	2	3-	1-	2-	1+	1-	1+

* Errata: Note that the N and M values of aa published in these tables for January 1974 through January 1977 values were slightly in error. The correct values (resulting in some modifications in the classification of the days C and K) will be given in a supplementary IAGA Bulletin and the Bulletin 32 series. The magnetic tape deposited in World Data Center A for Solar-Terrestrial Physics has been corrected.

Quiet days (Q) and disturbed days (D), geomagnetic planetary three-hour-range indices (Kp) (integers alone are equivalent to those normally given with a small zero), magnetic character figures (Cp), and average amplitude (Ap) (unit 2y) prepared by Geophysikalisches Institut at the University of Göttingen, F.R. of Germany for the International Service of Geomagnetic Indices. Ten most quiet days [Q1-Q10] and five most disturbed days [D1-D5] are ordered from most quiet or disturbed, respectively. A or K means "not really quiet" (A = "Ap6", K = "Ap6 but one Kp 30 or two Kp values 3-"). An * means "not really disturbed" (Ap<20). Geomagnetic three-hourly indices (Kn), (Ks) and (Km) as in IAGA-Bulletin No. 32 and indices (aa), "antipodal", as in IAGA-Bulletin No. 33 prepared by P. N. Mayaud of the Institut de Physique du Globe, Paris, France. Really quiet (C) and quiet but slightly disturbed three-hourly intervals (K) are given for 24-hour and 48-hour intervals centered on 12 UT.

DAILY AVERAGE INDICES Ap

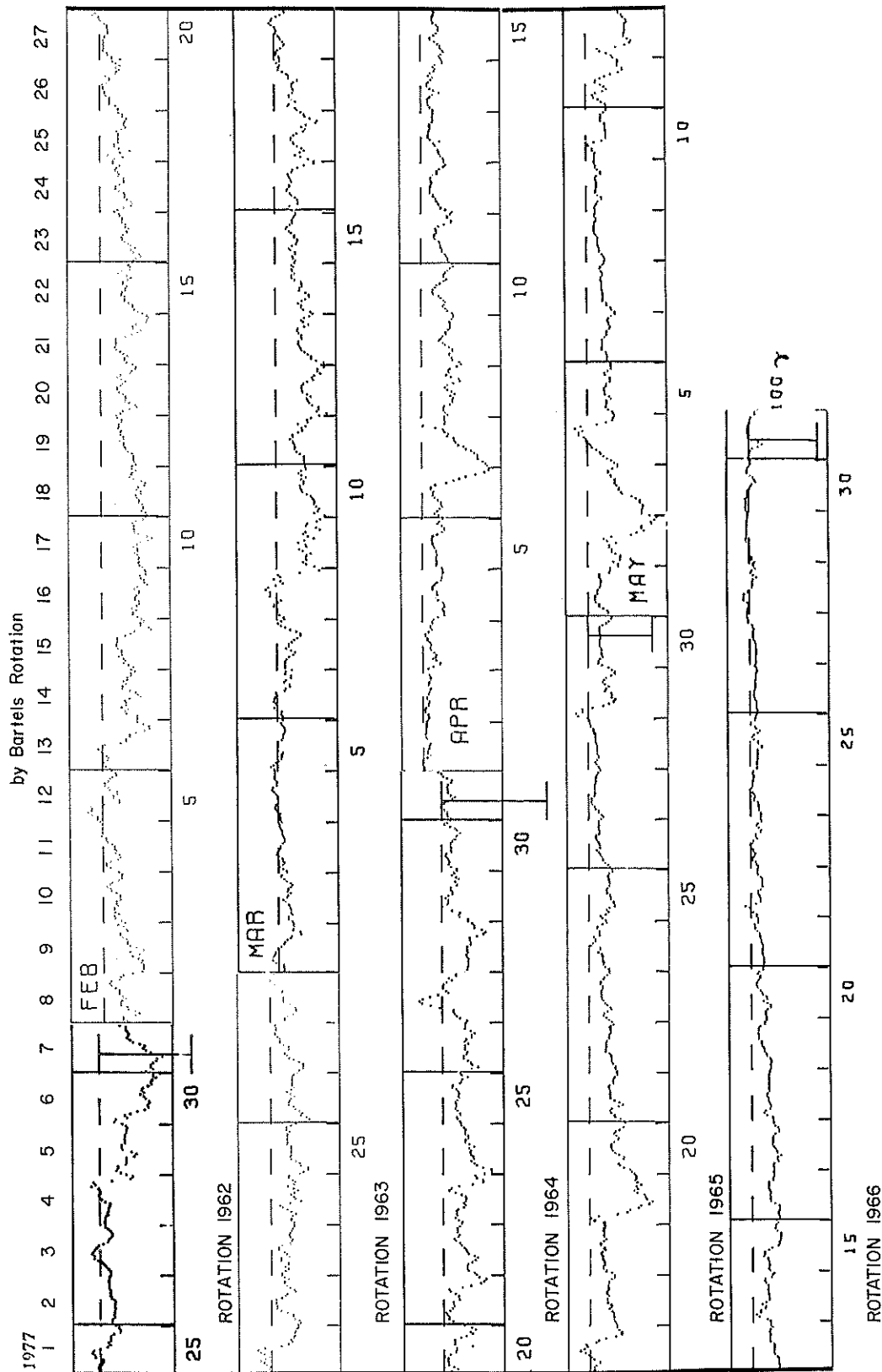
1977

1976

DAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
1	6	18	8	10	14	10	7	17	7	11	4	13
2	6	9	8	24	21	7	3	5	21	5	5	66
3	12	12	10	10	9	6	4	6	11	4	12	15
4	20	14	5	14	6	4	15	10	4	3	24	19
5	20	6	6	9	13	3	6	15	9	4	12	11
6	7	6	5	7	11	2	3	10	14	6	49	10
7	13	9	5	10	6	3	10	7	18	5	48	6
8	8	13	4	7	6	6	23	6	18	12	27	3
9	4	10	12	6	6	8	16	6	25	38	22	7
10	6	6	9	5	6	18	13	3	12	19	13	9
11	26	4	5	4	8	23	13	14	13	18	14	24
12	7	5	3	8	14	24	15	12	7	22	8	19
13	4	4	3	5	8	31	8	7	12	13	5	6
14	3	6	4	10	7	16	4	18	11	12	12	8
15	4	19	2	10	33	9	2	13	8	5	10	14
16	5	16	6	6	29	5	8	7	6	6	17	22
17	14	5	5	10	30	7	10	6	9	9	9	18
18	21	6	4	33	19	5	28	10	17	11	8	11
19	4	6	6	20	7	9	7	8	6	5	48	5
20	5	4	5	51	7	7	5	12	5	13	28	10
21	3	3	8	24	7	4	4	5	7	10	12	4
22	3	4	5	17	5	5	8	7	8	7	6	7
23	4	5	30	12	6	4	5	6	18	14	5	7
24	16	4	25	7	6	3	6	8	14	12	11	8
25	18	9	24	24	5	11	9	9	11	12	22	5
26	7	4	18	13	4	9	6	4	8	16	4	2
27	6	8	13	12	7	8	6	4	3	8	4	4
28	5	16	10	5	5	2	6	13	7	15	4	7
29	5	18	6	10	3	6	45	15		14	18	2
30	29	19	6	9	16	11	13	30		5	8	5
31		7	5		34		12	19		4		7
MEAN	10	9	9	13	12	9	10	10	11	11	16	11

[illegible]

GEOMAGNETIC ACTIVITY INDICES Hourly Equatorial Dst



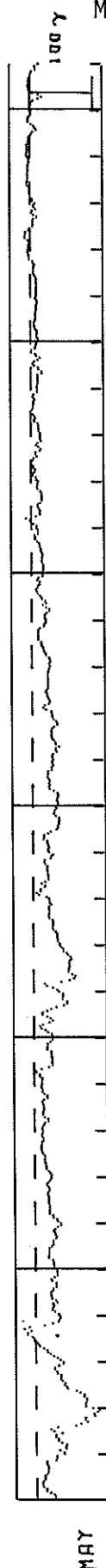
Note the sensitivity indicator for each month on the last day of the month and also note that the zero reference level is different for each month.

HOURLY EQUATORIAL DST VALUES (PROVISIONAL)

MAY 1977

NASA/GODDARD SPACE FLIGHT CENTER

DAY	(Time-UT)										(Units-Gammas)													
	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	-28	-29	-26	-21	-15	-10	-11	-9	-9	-10	-14	-13	-15	-18	-19	-19	-20	-17	-15	-16	-31	-33	-33	-44
2	-44	-35	-47	-47	-48	-38	-34	-33	-30	-30	-41	-26	-23	-34	-62	-70	-80	-75	-76	-91	-88	-95	-98	-86
3	-75	-75	-78	-79	-77	-73	-73	-67	-61	-48	-46	-43	-43	-40	-37	-38	-38	-33	-31	-28	-29	-36	-43	-41
4	-37	-33	-26	-22	-13	-16	-12	-5	-3	-1	3	3	6	14	12	8	19	9	-14	-27	-36	-37	-39	-36
5	-34	-25	-25	-27	-28	-28	-34	-30	-24	-23	-22	-24	-27	-28	-31	-31	-31	-24	-23	-29	-33	-33	-32	-32
6	-28	-27	-27	-26	-25	-20	-19	-22	-22	-21	-22	-25	-26	-29	-28	-31	-34	-30	-29	-27	-31	-35	-39	-38
7	-35	-32	-28	-26	-22	-21	-22	-22	-22	-20	-19	-20	-19	-19	-18	-20	-23	-22	-19	-17	-20	-23	-25	-26
8	-27	-23	-20	-17	-17	-10	-15	-14	-14	-15	-14	-12	-10	-9	-9	-9	-10	-11	-14	-13	-10	-11	-13	-12
9	-10	-13	-15	-17	-20	-21	-15	-12	-12	-12	-15	-16	-13	-12	-11	-15	-20	-20	-15	-12	-12	-10	-10	-11
10	-11	-11	-13	-8	-7	-3	-1	-12	-23	-28	-29	-27	-27	-26	-27	-26	-25	-20	-20	-20	-22	-25	-29	-29
11	-28	-26	-21	-17	-10	-8	-13	-24	-29	-25	-20	-12	-14	-21	-27	-36	-47	-52	-52	-43	-43	-46	-44	-37
12	-35	-28	-19	-16	-43	-56	-63	-65	-59	-53	-54	-55	-56	-55	-54	-56	-59	-55	-52	-49	-46	-44	-42	-39
13	-38	-36	-36	-35	-35	-35	-33	-30	-28	-29	-30	-31	-28	-24	-22	-24	-25	-23	-22	-25	-28	-24	-24	-23
14	-19	-7	-4	-10	-12	-17	-19	-12	-18	-23	-23	-22	-21	-21	-20	-21	-21	-18	-16	-18	-27	-29	-31	-24
15	-22	-23	-25	-22	-21	-20	-15	-15	-18	-23	-27	-37	-35	-39	-41	-40	-42	-39	-35	-31	-34	-35	-37	-33
16	-39	-38	-36	-38	-40	-40	-37	-31	-25	-24	-27	-24	-27	-24	-22	-22	-23	-24	-30	-30	-32	-30	-29	-32
17	-30	-29	-32	-38	-35	-37	-41	-36	-34	-32	-30	-28	-30	-29	-29	-31	-34	-39	-37	-36	-32	-30	-30	-29
18	-28	-20	-17	-20	-25	-25	-25	-24	-22	-22	-20	-23	-25	-25	-24	-25	-25	-25	-25	-24	-25	-26	-27	-28
19	-28	-27	-29	-26	-25	-22	-20	-18	-17	-16	-14	-13	-13	-10	-9	-9	-8	-11	-9	-13	-19	-20	-22	-21
20	-20	-19	-19	-24	-27	-28	-22	-17	-22	-20	-16	-14	-12	-9	-7	-6	-9	-11	-13	-12	-8	-12	-17	-17
21	-16	-19	-19	-18	-17	-15	-15	-16	-16	-18	-15	-13	-13	-12	-12	-11	-8	-5	-5	-4	-10	-11	-10	-7
22	-7	-3	1	3	5	7	-14	-13	-13	-11	-9	-11	-14	-17	-16	-15	-16	-15	-13	-10	-8	-9	-10	-12
23	-7	-6	-2	-3	-6	-7	-3	-2	0	1	-3	-5	-8	-6	-7	-15	-16	-11	-7	-11	-15	-13	-15	-15
24	-14	-14	-12	-10	-12	-9	-5	-4	-7	-4	-2	1	-2	-4	-4	-5	-5	-6	-5	-2	-5	-8	-10	-9
25	-10	-11	-12	-10	-11	-10	-11	-17	-17	-12	-10	-5	-2	-6	-10	-14	-8	-6	0	-2	-6	-8	-9	-11
26	-12	-10	-8	-9	-5	-3	-6	-5	-4	-4	-6	-8	-8	-8	-7	-8	-9	-9	-10	-10	-11	-8	-6	-9
27	-8	-8	-9	-9	-10	-9	-7	-7	-3	-6	-4	-3	-3	-4	-5	-7	-3	-2	3	3	4	5	5	5
28	3	3	0	0	0	0	9	9	7	4	0	-3	-5	-4	-4	-6	-9	-5	-1	-4	-7	-5	-4	-8
29	-3	-2	0	1	2	2	1	2	5	6	4	3	3	3	3	4	3	3	3	2	1	2	2	5
30	6	0	5	5	5	6	2	2	1	1	-1	-3	-5	-9	-7	-5	-1	3	4	3	0	-2	-1	-1
31	1	1	-2	-2	-5	-13	-19	-13	-3	1	3	4	4	2	3	2	-1	-1	-2	-4	-7	-7	-8	-13



MAY

Erratum: In the Provisional Dst for April 1977, the tenth hourly Dst value on April 13 should read -17 gamma instead of -30 gamma. This change is made based on a correction of the average value of H from Hermanus for the corresponding hourly interval.

120
May 77

PRINCIPAL MAGNETIC STORMS

MAY 1977

OBS. 2 letter IAGA code	GEOMAG- NETIC LATI- TUDE	COMMENCEMENT		SC - AMPLITUDES			MAXIMUM 3 HOUR - INDEX K		RANGES			UT END	
		hr min	TYPE	D(')	H(γ)	Z(γ)	DAY (3 HOUR PERIOD)	K	D(')	H(γ)	Z(γ)	DAY	HOUR
		DAY (UT)											
CO	64.6N	1 20--	..	..	..	..	02(4,5,6)	7	347	1670	1210	03	13
SI	60.0N	1 20--	..	..	..	..	2(5)	7	90	--	640	03	12
NE	55.1N	1 18--	..	..	..	..	02(5)	6	31	240	219	03	13
FK	49.6N	1 17--	..	..	..	..	02(1)	6	27	142	100	03	13
BU	48.9N	1 20--	..	..	..	..	02(1)	6	24	161	87	03	12
IR	41.0N	1 1400	..	..	..	..	2(5,6)	6	27	104	54	03	13
SJ	29.9N	1 1600	..	..	..	..	02(5)	5	10	123	32	02	10
HO	21.1N	1 16--	..	..	..	..	2(4)	5	09	105	38	03	12
HD	07.6N	1 1500	..	..	..	..	02(6)	6	6	117	28	03	12
GU	04.0N	1 2135	..	..	..	..	02(5)	5	0	90	20	03	13
HU	06.1S	1 1430	..	..	..	..	02(5)	6	5	214	34	03	04
AP	16.0S	1 15--	..	..	..	..	02(4)	5	5	92	26	03	03
PM	18.7S	1 14--	..	..	..	..	2(4,5,6) 4(6)	5	6	110	60	05	10
HR	33.7S	1 18--	..	..	..	..	01(1)	6	33	109	124	03	12
GN	43.3S	1 14--	..	..	..	..	02(5,6)	6	28	90	150	03	01
TO	46.7S	1 20--	..	..	..	..	02(5)	6	30	170	70	02	22
W1	54.2N	2 11--	..	..	..	..	02(6)	7	42	265	110	03	05
JP	17.3N	2 05--	..	..	..	..		-	8	155	44	05	03
SH	14.6N	2 05--	..	..	..	..		-	7	152	29	05	03
UJ	13.5N	2 05--	..	..	..	..		-	7	151	48	05	03
AL	09.5N	2 05--	..	..	..	..	05(2)	6	6	139	53	05	03
TV	01.1S	2 05--	..	..	..	..		-	4	194	129	05	03
KG	50.5S	2 11--	..	..	..	..	02(6)	8	--	--	--	03	06
HD	07.6N	3 1700	..	..	..	..	34(6)	5	6	84	35	05	08
NE	55.1N	4 0410	SC*	1	13	..	04(6) 05(3)	5	22	89	39	06	12
WI	54.2N	4 0416	SC*	- 1 *	+ 8	0	04(6)	6	20	165	55	05	02
BU	48.9N	4 12--	..	..	..	..	04(6)	5	17	76	40	07	08
GU	04.0N	4 0416	SC*	..	10	-03	04(6)	5	0	70	30	05	09
HU	06.1S	4 0416	SC	1	10	2	04(6)	7	6	256	34	04	22
HR	33.7S	4 0415	SC	+ 1	+ 3	+ 4	04(8)	5	12	80	64	05	04
KG	50.5S	4 0415	SC	..	..	..	04(7)	5	--	--	--	05	06
KG	50.5S	4 1716	SC	..	..	..		5	--	--	--	05	06
NE	55.1N	10 0627		..	..	..	12(2)	6	42	111	116	12	14
CO	64.0N	11 00--	..	..	..	..	11(5) 12(2,3)	6	226	1340	1040	12	14
W1	54.2N	11 0014	SC*	+ 1	- 6 *	0	11(7)	6	41	200	85	12	09
BU	48.9N	11 06--	..	..	..	..	12(2)	5	22	89	41	12	15
IR	41.0N	11 0500	..	..	..	..	11(3,7) 12(2)	5	17	94	40	12	15
HD	07.6N	11 0500	..	..	..	..	11(6,7) 12(2)	5	5	144	33	12	14
GU	04.0N	11 0016	..	..	..	..	12(2)	6	0	120	20	12	14
HU	06.1S	11 0017	..	..	..	..	11(6)	7	6	172	32	11	21
PM	18.7S	11 06--	..	..	..	..	12(2)	6	4	120	50	13	00
HR	33.7S	11 06--	..	..	..	..	11(7) 12(2)	5	28	81	91	12	12
HD	07.6N	14 2100	..	..	..	..	17(5)	4	6	114	34	17	20
NE	55.1N	15 0027		..	..	..	16(2) 17(2,3)	5	28	98	109	18	14
HD	07.6N	28 0423	SC	- 0.1	+19	- 2	28(2,4)	3	2	71	14	28	22

Reports were received from the following observatories:

College	Witteveen	Tucson	Jaipur	Alibag	Annamalaingar	Port Moresby	Toolangi
Sitka	Fredericksburg	San Juan	Shillong	Hyderabad	Huancayo	Hermanus	Port-aux-Francais
Newport	Boulder	Honolulu	Ujjain	Guam	Trivandrum	Gnangara	

SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS

MAY 1977

PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS (by Dr. A. Romana)

The meaning of the station symbols is given in the IAGA-Bulletin nr. 32.

Times of ssc are mean values.

Sudden commencements followed by a magnetic storm or a period of storminess (ssc)

04 0417 B: DO CI TA GN; C: WN WI NI VI CF AE SS SZ HU KG (si: A: SO)

28 0424 B: AQ; C: WN WI HU (si: A: TL; B: FU - sfe: NI)

Solar-flare effects (sfe)

Effects confirmed by ionospheric or solar observations are underlined.

28 1028-1052 WI NI EB AE (ssc: B: SO LM - si: A: TA; B: DO; C: TL)

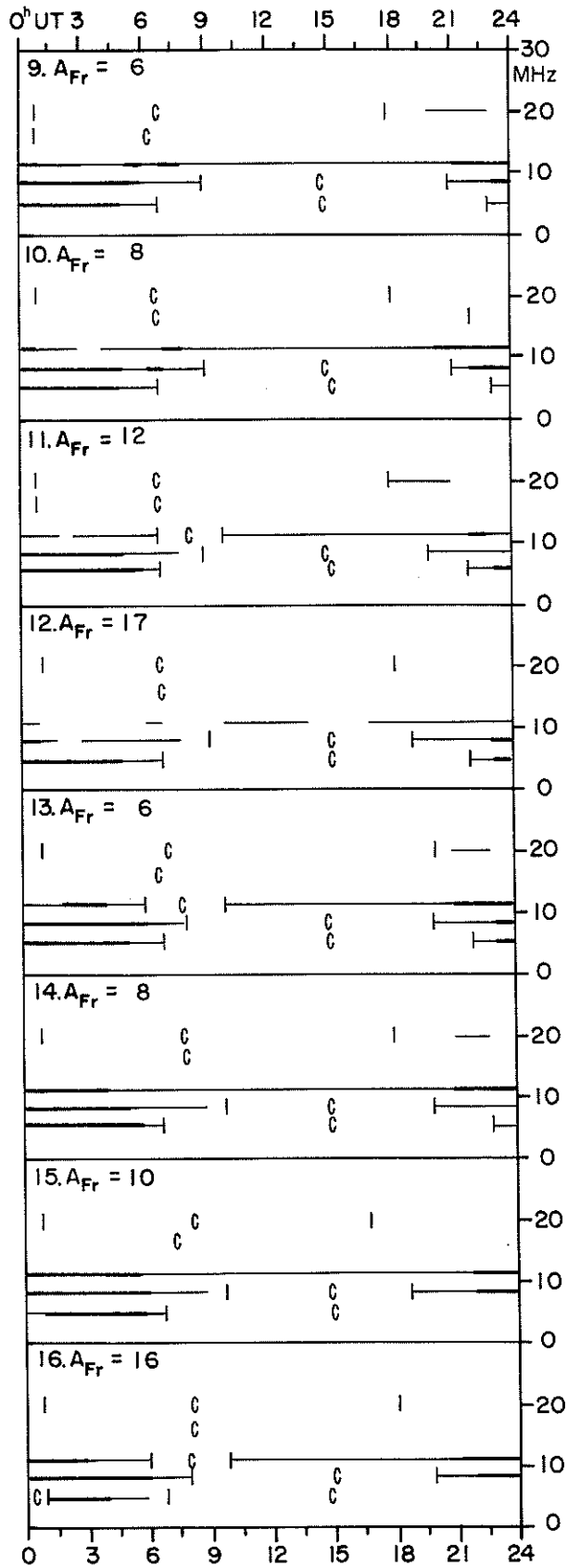
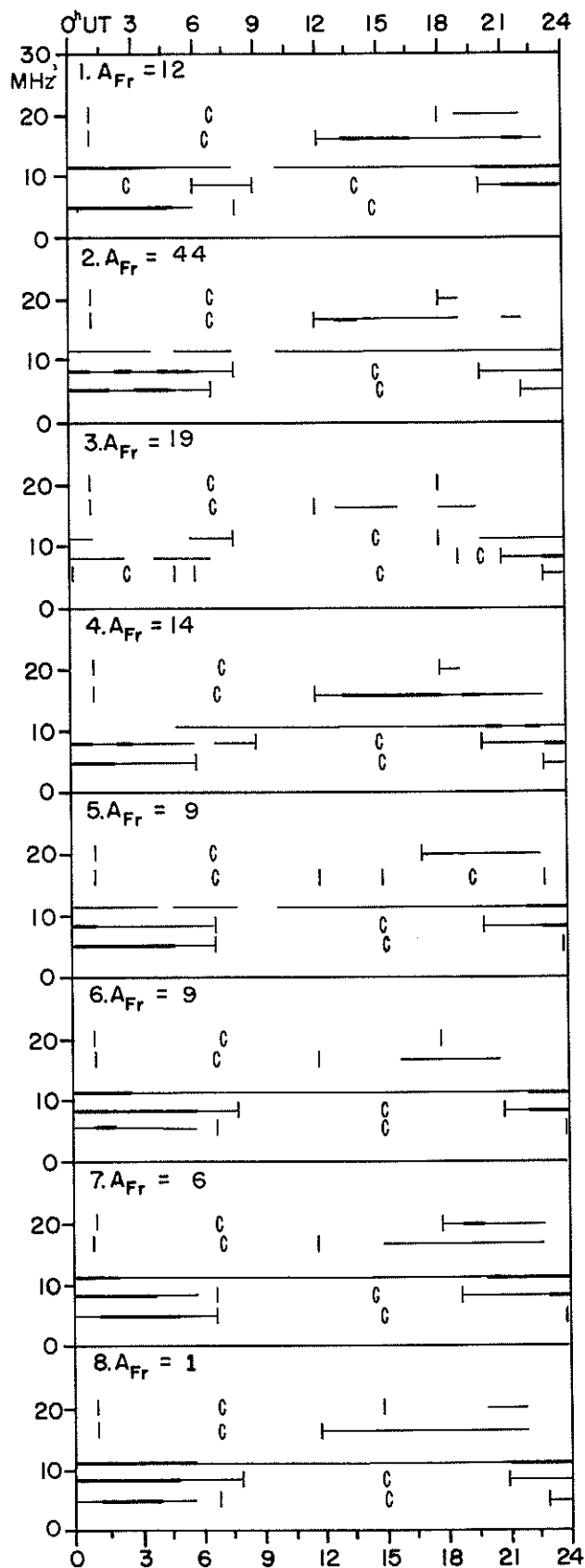
Very unusual events

04 1716 si: A: WI(- +) FU(- +) AE(- +) HU (- -)

122
May 77

TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

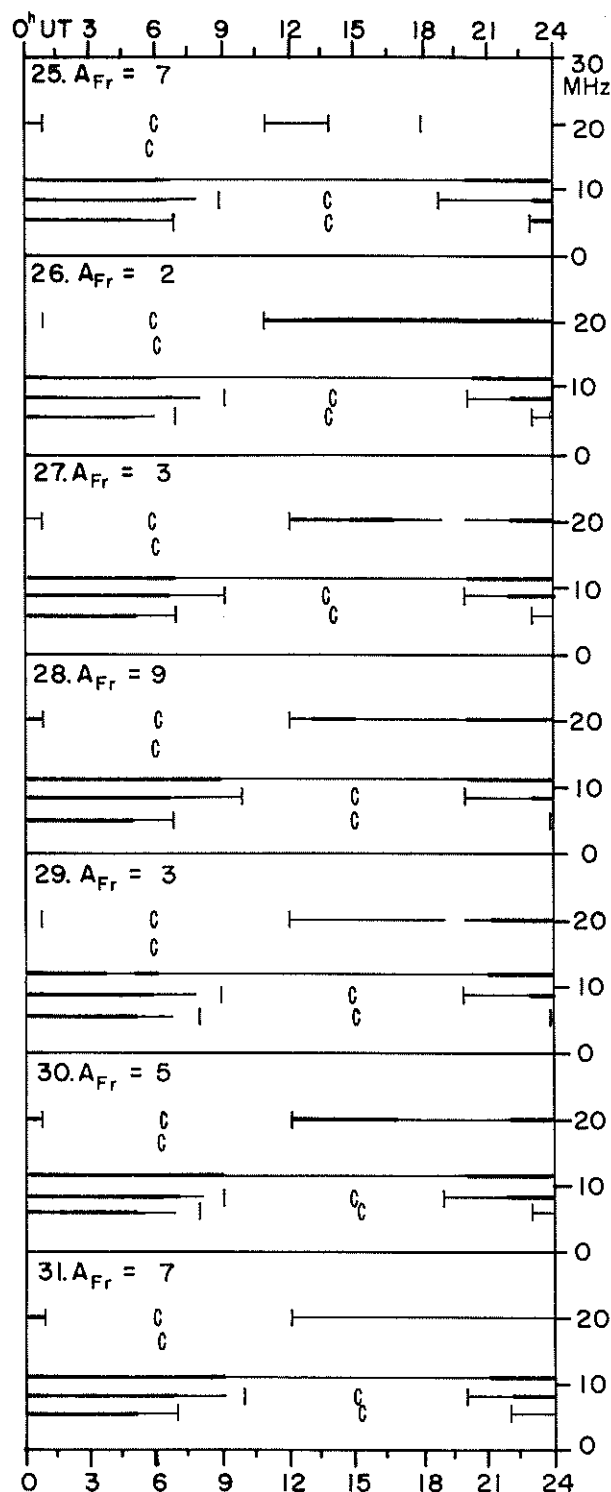
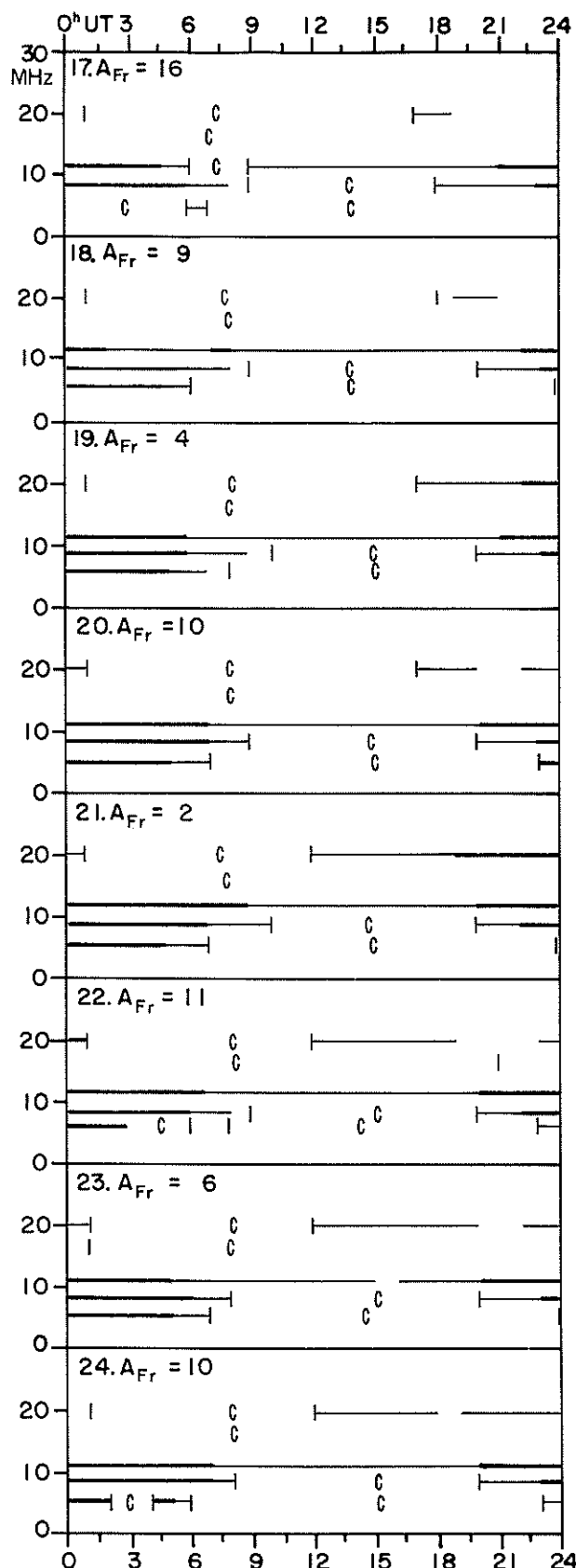
MAY 1977



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

123
May 77

MAY 1977



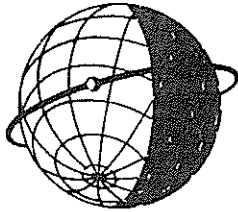
Field strengths from five frequencies, 5.0, 8.1, 10.9, 16.4 and 20.0 MHz, observed on a Lüchow -Norfolk circuit are represented above. Heavy solid lines represent field strengths -12 dB above $1 \mu\text{v/m}$ (transmitter power reduced to 1 kW). Observed field strengths between -12 dB above $1 \mu\text{v/m}$ and -40 dB above $1 \mu\text{v/m}$ are represented by the fine line. Adapted from Observations by Deutsche Bundespost

RADIO PROPAGATION QUALITY INDICES

MAY 1977

Quality indices calculated for reception at Lüchow

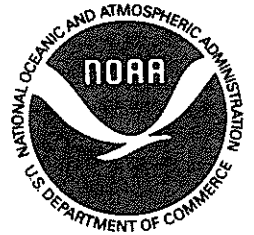
DAY	TOKYO	NORFOLK	MOSCOW	CANBERRA	BRACKNELL
1	4.7	3.9	11.1	2.9	11.9
2	3.4	2.5	10.4	3.2	10.7
3	2.1	2.2	10.1	1.6	11.0
4	3.2	4.0	11.6	3.0	11.5
5	3.9	3.2	11.4	3.4	11.8
6	3.7	3.0	11.5	3.5	11.8
7	3.8	3.5	11.2	4.0	11.5
8	6.0	3.4	10.9	3.8	11.8
9	6.0	3.8	11.7	2.6	11.3
10	4.9	4.3	11.4	2.8	11.4
11	3.9	3.4	11.4	1.9	11.0
12	3.6	3.4	10.7	3.2	10.2
13	5.1	3.7	11.4	3.5	11.0
14	5.9	4.1	11.0	3.3	11.1
15	4.8	3.9	11.6	3.6	11.2
16	4.5	3.6	11.0	3.3	11.1
17	4.5	3.8	11.3	2.9	11.3
18	4.9	3.7	11.5	3.3	11.5
19	6.6	4.0	11.1	3.5	11.5
20	5.0	4.4	11.5	4.1	11.4
21	6.0	5.1	11.4	3.8	10.7
22	6.7	4.3	11.5	3.9	10.9
23	6.7	4.0	12.0	3.8	11.4
24	6.5	4.4	11.2	4.2	11.3
25	7.0	4.0	11.5	4.1	11.4
26	7.1	5.4	11.5	4.4	11.9
27	7.0	5.3	11.7	4.9	12.0
28	6.5	5.1	11.3	4.3	11.4
29	6.3	4.5	11.4	4.2	10.6
30	6.7	5.4	11.6	4.2	11.1
31	6.8	4.9	12.0	4.1	11.3
MEAN	5.3	4.0	11.3	3.5	11.3



WORLD DATA CENTER A

FOR

SOLAR-TERRESTRIAL PHYSICS



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

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