

U.S. DEPARTMENT OF COMMERCE

C. William Verity, Jr., Secretary

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

William E. Evans, Under Secretary for Oceans and Atmosphere

NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE

Thomas N. Pyke, Jr., Assistant Administrator

FEBRUARY 1989 NUMBER 534 - Part I

Solar-Geophysical Data prompt reports

Data for January 1989, December 1988, and Late Data

International Standard Serial Number: 0038-0911

Library of Congress Catalog Number: 79-640375 //r81

NATIONAL GEOPHYSICAL DATA CENTER

Michael A. Chinnery, Director

Boulder, Colorado

Subscription information is on the inside back cover.

S O L A R - G E O P H Y S I C A L D A T A

NUMBER 534

(Issued in Two Parts)

Editor: Helen E. Coffey

Chief: Joe H. Allen
Solar-Terrestrial Physics Division

Staff: Daniel C. Wilkinson
Carol Weathers
John A. McKinnon

C O N T E N T S

PART I (PROMPT REPORTS)

	Page
DETAILED INDEX FOR 1988-1989	2
DATA FOR JANUARY 1989.	3- 42
DATA FOR DECEMBER 1988	43-154
LATE DATA. . . . .	.155-167
East-West Solar Radio Scans Fleurs 43 cm Dec 88 additions	
Culgoora Solar Radio Spectral Nov 88 updates	
Cosmic Rays ERRATA: Climax Apr 1988	
Geomagnetic Sudden Commencements/sfe's Nov 88	
Dst Provisional Hourly Values Aug-Dec 87	

PART II (COMPREHENSIVE REPORTS)

	Page
DETAILED INDEX FOR 1988 and 1989	2
DATA FOR AUGUST 1988	3-60
MISCELLANEOUS DATA	61-63
Meudon Carte Synoptique Jul 88	

DETAILED INDEX OF OBSERVATIONS PUBLISHED IN "SOLAR-GEOPHYSICAL DATA"

CODE	KIND OF OBSERVATION	JUN 88	JUL	AUG	SEP	OCT	NOV	DEC	JAN 89
A. SOLAR AND INTERPLANETARY EVENTS									
A.1	Sunspot Drawings	528A 50	529A 45	530A 51	531A 55	532A 48	533A 48	534A 60	
A.2aa	Internat. Provisional Sunspot Numbers	527A 11	528A 11	529A 11	530A 13	531A 13	532A 13	533A 13	534A 13
A.2c	American Sunspot Numbers	527A 11	528A 11	529A 11	530A 13	531A 13	532A 13	533A 13	534A 13
A.3a	Mt. Wilson Magnetograms	528A 50	529A 45	530A 51	531A 55	532A 48	533A 48	534A 60	
A.3b	Mt. Wilson Sunspot Magnetic Class	528A 80	529A 76	530A 82	531A 85	532A 79	533A 78	534A 91	
A.3c	Kitt Peak Magnetograms	528A 50	529A 45	530A 51	531A 55	532A 48	533A 48	534A 60	
A.3d	Mean Solar Magnetic Field (Stanford)	527A 45	528A 40	529A 34	530A 40	531A 43	532A 37	533A 37	534A 41
A.3e	Stanford Magnetograms	528A 50	529A 45	530A 51	531A 55	532A 48	533A 48	534A 60	
A.4	H-alpha Filtergrams	528A 50	529A 45	530A 51	531A 55	532A 48	533A 48	534A 60	
A.5	Calcium Plage Photographs/Drawings	Oct 87 in 525A154							
A.5a	Calcium Plage Regions	Aug-Oct 87 in 525A138							
A.5b	Daily Calcium Plage Indices	Aug-Oct 87 in 525A141							
A.6	H-alpha Synoptic Charts	528A 42	529A 36	530A 42					
A.6b	Active Region Carte Synoptique (Paris)	532B 4	534B 62						
A.6c	Stanford Solar Mag Field Synoptic Maps	528A 43	529A 38	530A 44	531A 48	532A 42	533A 42	534A 46	
A.6d	Kitt Peak " Mag Field Synoptic Maps	528A 48	529A 44	530A 50	531A 54	532A 41	533A 41	534A 58	
A.6e	Mass Ejections from the Sun	532B 71	533B 83	534B 48					
A.6f	Active Prominences and Filaments	532B 73	533B 85	534B 49					
A.6g	Sac Peak Coronal Line Synoptic Maps	528A 44	529A 38	530A 46	531A 50	532A 44	533A 44	534A 50	
A.7h	Coronal Line Emission (Sac Peak)	528A 50	529A 45	530A 51	531A 55	532A 48	533A 48	534A 60	
A.8aa	2800 MHz - Solar Flux (Ottawa)	527A 11	528A 11	529A 11	530A 13	531A 13	532A 13	533A 13	534A 13
A.8ac	2800 MHz - Adj. Solar Flux (Ottawa)	527A 11	528A 11	529A 11	530A 13	531A 13	532A 13	533A 13	534A 13
A.8g	Adjusted Daily Solar Fluxes (Sagamore)	527A 11	528A 11	529A 11	530A 13	531A 13	532A 13	533A 13	534A 13
A.10a	Interferometric Chart (164 MHz) Nancay	---	529A132	529A 30	530A 34	531A 35	532A 32	533A 32	534A 34
A.10c	East-West Scans - 21 cm - Fleurs	527A 38	528A 35	529A 28	530A 32	531A 33	532A 30	533A 31	534A 33
A.10d	East-West Scans - 43 cm - Fleurs	---	---	529A 29	530A 33	531A 34	532A 31	533A 31	534A 33
A.10e	East-West Scans - 10 cm - Ottawa	527A 37	528A 34	529A 27	530A 31	531A 32	532A 29	533A 30	534A 32
A.10f	East-West Scans - 3 cm - Toyokawa	527A 36	528A 33	529A 26	530A 30	531A 31	532A 28	533A 29	534A 31
A.11g	Solar X-ray GOES (graphs/event table)	532B 62	533B 73	534B 39					
A.11k	Solar UV NOAA-9	May-Dec 86 in 529B 74							
A.12e	Solar Particles (IMP H & J)	Sep 85-May 86 in 525B 60							
A.13e	Solar Plasma (IMP H & J)	Oct 87-Jan 88 in 525B 56							
A.13f	Solar Wind (Pioneer 12)	Feb 84-Dec 87 in 525A114							
A.16a	SMM Solar Irradiance	Feb 80-Oct 87 in 530B 64							
A.16b	NIMBUS Solar Irradiance	Nov 78-Feb 87 in 523B 49							
A.17	Interplanetary Mag Field (Pioneer 12)	Jan-Jun 88 in 533A130							
A.17c	Inferred Interplanetary Mag Field	Mar 88 in 524A 40							
B. IONOSPHERIC RADIO PROPAGATION									
B.52	Field Strength Graphs-North Atlantic	528A128	529A128	530A124	531A138	532A128	533A126	534A152	
B.53	Quality Indices on Paths to Germany	528A130	529A130	531A148	531A137	532A130	533A128	534A154	
C. SOLAR FLARE-ASSOCIATED EVENTS									
C.1a	H-alpha Flares	527A 16	528A 16	529A 16	530A 18	531A 18	532A 17	533A 16	534A 16
C.1ba	H-alpha Flare Groups	532B 6	533B 6	534B 4					
C.1d	Flare Patrol Observations	527A 35	528A 32	529A 25	530A 29	531A 30	532A 27	533A 28	534A 30
C.1d	Flare Patrol Observations	532B 32	533B 32	534B 20					
C.3	Radio Bursts Fixed Freq.	532B 34	533B 34	534B 22					
C.3	Radio Bursts Fixed Freq. Selected	527A 40	528A 37	529A 31	530A 35	531A 36	532A 33	533A 33	534A 35
C.4d	Radio Bursts Spectral (Culgoora)	528A103	532A132	532A138	531A116	532AA09	534A157	534A129	
C.4e	Radio Bursts Spectral (Weissenau)	530A128	529A101	530A107	531A116	532A109	533A108	534A129	
C.4f	Radio Bursts Spectral (Sagamore Hill)	528A103	529A101	530A107	531A116	532A109	533A108	534A129	
C.4i	Radio Bursts Spectral (Bleien)	---	---	---	---	---	---	---	
C.4k	Radio Bursts Spectral (Learmonth)	528A103	529A101	530A107	531A116	532A109	533A108	534A129	
C.4l	Radio Bursts Spectral (Pahleua)	528A103	529A101	530A107	531A116	532A109	533A108	534A129	
C.6	Sudden Ionospheric Disturbances	528A 99	529A 98	530A105	531A113	532A105	533A108	534A129	
D. GEOMAGNETIC & MAGNETOSPHERIC EVENTS									
D.1a	Geomagnetic Indices	528A122	529A122	530A118	531A132	532A123	533A121	534A147	
D.1ba	27-day Chart of Kp Indices	528A124	529A124	530A120	531A134	532A125	533A123	534A149	
D.1cb	Monthly Mean aa Indices	528A125	529A125	530A121	531A135	532A126	533A124	534A150	
D.1d	Principal Magnetic Storms	528A126	529A126	530A122	531A136	532A127	533A125	534A151	
D.1f	Sudden Commencements/Flare Effects	528A127	529A127	530A123	532A141	533A145	534A162		
D.1g	Equatorial Indices Dst	Jul 87 in 519A 99; Aug-Dec 87 in 534A163							
F. COSMIC RAYS									
F.1a	Cosmic Ray Neutron Cts (Deep River)	529A133	531A137	531A138	531A127	532A120	533A120	534A146	
F.1b	Cosmic Ray Neutron Cts (Climax)	528A117	529A119	530A116	531A127	532A120	533A120	534A146	
F.1e	Cosmic Ray Neutron Cts (Alert)	529A133	533A136	---	---	---	---	---	
F.1h	Cosmic Ray Neutron Cts (Thule)	528A117	529A119	531A138	531A127	532A120	533A120		
F.1i	Cosmic Ray Neutron Cts (Kiel)	528A117	529A119	530A116	531A127	532A120	533A120	534A146	
F.1j	Cosmic Ray Neutron Cts (Tokyo)	528A117	533A136	533A137	533A138	532A120	533A120	534A146	
F.1l	Cosmic Ray Neutron Cts (Huancayo)	528A117	529A119	530A116	531A127	533A139	533A120	534A146	
H. MISCELLANEOUS									
H.60	IUWDS Alert Periods	527A 4	528A 5	529A 5	530A 5	531A 5	532A 5	533A 4	534A 4

The entry "528A 50" under Jun 1988, for example, means that the sunspot drawings for Jun 1988 appear in SOLAR-GEOPHYSICAL DATA No. 528, Part I, and that they begin on page 50. "A" denotes Part I and "B", Part II. Blanks indicate data not yet received and dashes mark unavailable data.

C O N T E N T S

Prompt Reports DATA FOR JANUARY 1989 Number 534 Part I

	Page
IUWDS ALERT PERIODS (Advance and Worldwide)	4- 10
SOLAR ACTIVITY INDICES	
Graph and Table of Monthly Mean Sunspot Numbers 1946-present.	11
Daily Sunspot Numbers and 2800 MHz Solar Flux (12 Months)	12
Daily Solar Indices (Sunspot Numbers and Solar Flux).	13
Smoothed Observed and Predicted Sunspot Numbers	14
Graph of Observed and Predicted Sunspot Numbers	15
SOLAR FLARES	
H-alpha Solar Flares.	16-29
Intervals of No Flare Patrol.	30
SOLAR RADIO EMISSION	
East-West Solar Scans at 3 cm - Toyokawa	31
East-West Solar Scans at 10 cm - Ottawa	32
East-West Solar Scans at 21 cm - Fleurs	33
East-West Solar Scans at 43 cm - Fleurs	33
Solar Interferometric Chart - 164 MHz - Nancay.	34
Selected Fixed Frequency Events	35-39
Selected Graphs of Solar Noise Bursts	40
STANFORD MEAN SOLAR MAGNETIC FIELD	
Table	41
Graph	42

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

Summary of the Geolert Messages JANUARY 1989

Julian Day	Date of Issue	Date of Observation	Wolf No.	10-cm Solar Flux	A-index	Location		Flares			Date of Forecast	Location		Region Forecast ¹	Geoalerts
						°Lat	°Long	Total	M	X		°Lat	°Long		
01	01	31	212	182	010	N22 W88	0	0	0	01	N22 W88	Q	Solalert 01/02, Magalert 01/02, Flare.		
						N22 W58	2	0	0		N22 W58	Q			
						S18 W50	1	0	0		S18 W50	E			
						N17 W43	3	0	0		N17 W43	Q			
						S15 W21	0	0	0		S15 W21	Q			
						S40 W51	0	0	0		S40 W51	Q			
						S18 E15	0	0	0		S18 E15	Q			
						N27 E26	0	0	0		N27 E26	Q			
						S18 W03	1	0	0		S18 W03	Q			
02	02	01	184	192	021	N22 W72	5	0	0	02	N22 W72	E	Solalert 03/04, Magnil.		
						S18 W62	9	1	0		S18 W62	E			
						N17 W57	0	0	0		N17 W57	Q			
						S15 W34	3	0	0		S15 W34	Q			
						S41 W61	0	0	0		S41 W61	Q			
						S17 W01	0	0	0		S17 W01	Q			
						S18 W17	5	0	0		S18 W17	E			
						N23 E69	0	0	0		N23 E69	Q			
			Presto: ² Sydney Culgoora Soflare 1B		S18 W53	01/0620 UT in progress.									
			Weak Type II sweep began 01/0617 UT in progress.												
03	03	02	204	202	007	N23 W83	2	1	0	03	N23 W83	E	Solalert 03/04, Magquiet.		
						S17 W75	9	1	0		S17 W75	E			
						N17 W70	0	0	0		N17 W70	Q			
						S14 W47	1	0	0		S14 W47	E			
						S40 W74	0	0	0		S40 W74	Q			
						S17 W14	1	0	0		S17 W14	Q			
						S18 W32	4	0	0		S18 W32	E			
						N22 E58	0	0	0		N22 E58	Q			
						N10 E68	0	0	0		N10 E68	Q			
						N17 E69	0	0	0		N17 E69	Q			
						N24 E74	1	0	0		N24 E74	Q			
			Presto: ² Boulder Tenflare 240 flux units		began 02/1909 UT duration 10 minutes.										
04	04	03	196	198	002	S17 W86	2	0	0	04	S17 W86	E	Solalert 04/04, Magquiet.		
						N16 W81	0	0	0		N16 W81	Q			
						S15 W60	1	1	0		S15 W60	E			
						S41 W86	1	0	0		S14 W86	Q			
						S18 W28	1	0	0		S18 W28	E			
						S18 W45	6	0	0		S18 W45	E			
						N21 E44	0	0	0		N21 E44	Q			
						N10 E56	1	0	0		N10 E56	Q			
						N18 E57	0	0	0		N18 E57	Q			
						N25 E63	2	2	0		N25 E63	E			
						S11 W24	0	0	0		S11 W24	Q			
						S19 E76	0	0	0		S19 E76	Q			
05	05	04	132	211	008	S15 W73	0	0	0	05	S15 W73	E	Solalert 05/XX, Magalert 05/XX Flare.		
						S18 W41	0	0	0		S18 W41	Q			
						S18 W60	3	1	0		S18 W60	A			
						N11 E43	0	0	0		N11 E43	Q			
						N19 E43	0	0	0		N19 E43	Q			
						N28 E54	1	0	0		N28 E54	E			
						S17 E66	0	0	0		S17 E66	E			
			Presto: ² Boulder Tenflare 290 flux units		began 04/1750 UT duration 13 minutes.										
			Proton event 11 pfu at greater than 10 MeV began 04/2305 UT.												

ALERT PERIODS
INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

5
JAN 89

Summary of the Geoalert Messages

JANUARY 1989

Julian Day	Date of Issue	Date of Observation	Wolf No.	10-cm Solar Flux	A-index	Location		Flares			Date of Forecast	Location		Region Forecast ¹	Geoalerts
						°Lat	°Long	Total	M	X		°Lat	°Long		
06	06	05	158	209	022	S15 W83		0	0	0	06	S15 W83	Q	Solalert 06/XX, Magalert 06/XX.	
						S18 W54		1	0	0		S18 W54	Q		
						S18 W72		2	0	0		S18 W72	E		
						N11 E29		0	0	0		N11 E29	E		
						N18 E29		0	0	0		N18 E29	Q		
						N28 E40		0	0	0		N28 E40	E		
						S18 E55		3	0	0		S18 E55	E		
						S26 E48		0	0	0		S26 E48	Q		
						S13 E70		0	0	0		S13 E70	Q		
						Presto: ² Kakioka Magstorm began 04/2305 UT.									
07	07	06	156	208	010	S18 W68		8	1	0	07	S18 W68	E	Solalert 07XX, Magalert 07/XX.	
						S19 W83		0	0	0		S19 W83	E		
						N11 E16		1	0	0		N11 E16	E		
						N18 E17		0	0	0		N18 E17	Q		
						N28 E27		0	0	0		N28 E27	E		
						S18 E43		4	0	0		S18 E43	Q		
						S25 E34		1	0	0		N25 E34	Q		
						S13 E57		3	0	0		S13 E57	Q		
						S30 E72		2	1	0		S30 E72	A		
						N30 E61		0	0	0		N30 E61	Q		
						Presto: ² Toyokawa Tenflare 100 flux units began 06/0506 UT duration 3 minutes. Sydney Culgoora Type II burst began 06/0641 UT in progress.									
08	08	07	223	248	008	S18 W81		10	3	0	08	S18 W81	A	Major Flare Alert 08/XX S31 E64, Magalert 08/XX.	
						N10 E02		2	0	0		N10 E02	Q		
						N19 E03		0	0	0		N19 E03	Q		
						N30 E14		2	0	0		N30 E14	E		
						S18 E29		1	0	0		S18 E29	E		
						S25 E23		0	0	0		S25 E23	Q		
						S14 E46		2	0	0		S14 E46	E		
						S31 E64		5	2	1		S31 E64	A		
						N25 E49		0	0	0		N25 E49	Q		
						N18 W32		0	0	0		N18 W32	Q		
						N31 E31		1	0	0		N31 E31	Q		
						Presto: ² Boulder X-ray event X1 07/0400 UT in progress. Sydney Culgoora Soflare 2B S30 E75 07/0428 UT in progress.									
09	09	08	243	268	017	S18 W92		1	0	0	09	S18 W92	E	Major Flare Alert 09/XX S31 E54, Magalert 09/XX.	
						N11 W11		0	0	0		N11 W11	E		
						N19 W10		0	0	0		N19 W10	Q		
						N28 E01		2	0	0		N28 E01	E		
						S18 E14		2	0	0		S18 E14	E		
						S26 E12		1	1	0		S26 E12	E		
						S14 E33		1	0	0		S14 E33	E		
						S31 E54		5	3	0		S31 E54	A		
						N33 E21		0	0	0		N33 E21	Q		
						N29 E17		2	0	0		N29 E17	Q		
10	10	09	212	256	017	N11 W25		2	1	0	10	N11 W25	E	Major Flare Alert 10/XX S31 E42, Magnil.	
						N20 W22		1	0	0		N20 W22	Q		
						N28 W11		1	0	0		N28 W11	E		
						S18 E01		0	0	0		N18 E01	Q		
						S24 W00		0	0	0		S24 W00	Q		
						S14 E18		3	1	0		S14 E18	E		
						S31 E42		6	2	0		S31 E42	A		
						S32 E67		2	0	0		S32 E67	E		
						Presto: ² Boulder Tenflare 430 flux units began 09/1918 UT duration 19 minutes.									

ALERT PERIODS
INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

Summary of the Geoalert Messages JANUARY 1989

Julian Day	Date of Issue	Date of Observation	Wolf No.	10-cm Solar Flux	A-index	Location		Flares			Date of Forecast	Location		Region Forecast ¹	Geoalerts
						°Lat	°Long	Total	M	X		°Lat	°Long		
11	11	10	254	251	012	N11 W38	0	0	0	11	N11 W38	E	Major Flare Alert 11/XX S31 E28, Magquiet.		
						N28 W23	0	0	0		N28 W23	E			
						S18 W11	0	0	0		S18 W11	Q			
						S25 W13	2	0	0		S25 W13	Q			
						S14 E05	2	0	0		S14 E05	E			
						S31 E28	15	3	1		S31 E28	A			
						N34 W03	5	1	0		N34 W03	Q			
						S32 E56	1	1	0		S32 E56	E			
						N20 E65	1	0	0		N20 E65	Q			
						N27 E68	0	0	0		N27 E68	Q			
						S19 E53	0	0	0		S19 E53	Q			
						S19 E76	0	0	0		S19 E76	Q			
						Presto: ² Boulder Tenflare 1400 flux units began 10/2023 UT duration 7 minutes. X-ray event X1/1B S31 E30 10/2021 UT duration 82 minutes.									
12	12	11	254	269	026	N11 W53	0	0	0	12	N11 W53	Q	Major Flare Alert 12/XX S30 E15, Magalert 12/13 Flare.		
						N29 W37	0	0	0		N29 W37	E			
						S19 W24	1	0	0		S19 W24	Q			
						S25 W28	0	0	0		S25 W28	Q			
						S14 W09	1	0	0		S14 W09	E			
						S30 E15	11	4	0		S30 E15	A			
						N32 W21	1	0	0		N32 W21	Q			
						S32 E43	0	0	0		S32 E43	Q			
						N21 E50	8	0	0		N21 E50	E			
						N28 E56	2	0	0		N28 E56	E			
						S19 E39	0	0	0		S10 E39	Q			
						S18 E63	0	0	0		S18 E63	Q			
						N19 E73	5	0	0		N19 E73	Q			
						Presto: ² Sydney Culgoora 1B flare N22 W05 11/0505 UT in progress. Intense Type II began 11/0449 UT ended 11/0452 UT. Kakioka Magstorm began 11/1207 UT.									
13	13	12	243	266	014	N11 W65	0	0	0	13	N11 W65	Q	Proton Flare Alert 13/XX S30 E04, Magalert 13/13.		
						N27 W49	2	0	0		N27 W49	Q			
						S18 W38	0	0	0		S18 W38	Q			
						S24 W40	1	0	0		S24 W40	Q			
						S15 W21	1	0	0		S15 W21	E			
						S30 E04	9	1	0		S30 E04	A			
						S32 E32	0	0	0		S32 E32	Q			
						N20 E39	2	1	0		N20 E39	E			
						N29 E42	1	0	0		N29 E42	Q			
						S19 E26	0	0	0		S19 E26	Q			
						S19 E52	0	0	0		S19 E52	Q			
						N18 E64	1	0	0		N18 E64	E			
14	14	13	273	291	010	N11 W75	1	0	0	14	N11 W75	Q		Proton Flare Alert 14/XX S30 W08, Magalert 14/15 Flare.	
						N27 W62	1	0	0		N27 W62	Q			
						S18 W52	0	0	0		S18 W52	Q			
						S25 W55	1	0	0		S25 W55	Q			
						S14 W33	1	0	0		S14 W33	Q			
						S30 W08	8	3	1		S30 W08	A			
						S31 E18	3	0	0		S31 E18	Q			
						N21 E26	3	0	0		N21 E26	E			
						N29 E29	1	0	0		N29 E29	Q			
						S18 E16	0	0	0		S18 E16	Q			
						S19 E39	0	0	0		S19 E39	Q			
						N18 E50	6	2	0		N18 E50	Q			
						Presto: ² Toyokawa Tenflare 140 flux units began 13/0352 UT duration 6 minutes. Boulder X-ray event X2/2B S30 W05 13/0829 UT duration 234 minutes. Sydney Culgoora 1B soft flare S30 W07 14/0434 UT in progress. Weak Type II sweep began 14/0431 in progress.									

ALERT PERIODS
INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

7
JAN 89

Summary of the Geoalert Messages JANUARY 1989

Julian Day	Date of Issue	Date of Observation	Wolf No.	10-cm Solar Flux	A-index	Location		Flares			Date of Forecast	Location		Region Forecast ¹	Geoalerts
						°Lat	°Long	Total	M	X		°Lat	°Long		
15	15	14	241	274	008	N29	W73	0	0	0	15	N29	W73	Q	Proton Flare Alert 15/XX S31 W20, Magalert 15/16 Flare.
						S18	W65	0	0	0		S18	W65	Q	
						S15	W47	3	0	0		S15	W47	Q	
						S31	W21	7	3	2		S31	W21	A	
						S31	E04	2	0	0		S31	E04	Q	
						N22	E14	7	0	0		N22	E14	E	
						N29	E18	3	0	0		N29	E18	Q	
						S20	E26	1	0	0		S20	E26	Q	
						N19	E38	3	0	0		N19	E38	E	
						S16	E16	0	0	0		S16	E16	Q	
						Presto: ² Boulder X-ray event X2/2B S31 W21 began 14/0405 UT duration 132 minutes and associated Type II and Type IV sweeps. X-ray event X1/1B S31 W21 began 14/2231 UT duration 105 minutes.									
16	16	15	247	282	029	N29	W84	0	0	0	16	N29	W84	Q	Major Flare Alert 16/XX S31 W33, Magalert 16/16 Flare.
						S18	W79	0	0	0		S18	W79	Q	
						S15	W65	1	0	0		S15	W65	Q	
						S31	W33	11	3	0		S31	W33	A	
						S32	W08	2	0	0		S32	W08	Q	
						N22	E01	4	0	0		N22	E01	A	
						N28	E07	1	0	0		N28	E07	Q	
						S20	E14	1	0	0		S20	E14	Q	
						N19	E24	1	0	0		N19	E24	E	
						S17	E02	0	0	0		S17	E02	Q	
						N21	E67	0	0	0		N21	E67	Q	
17	17	16	210	299	027	S19	W91	0	0	0	17	S19	W91	Q	Solalert 17/20, Magalert 17/17 Flare.
						S14	W79	5	0	0		S14	W79	Q	
						S32	W46	12	5	0		S32	W46	A	
						S31	W24	1	0	0		S31	W24	Q	
						N22	W14	3	0	0		N22	W14	A	
						N28	W06	0	0	0		N28	W06	Q	
						S20	E01	2	0	0		S20	E01	Q	
						N18	E10	3	0	0		N18	E10	E	
						S17	W12	0	0	0		S17	W12	Q	
						N21	E53	0	0	0		N21	E53	Q	
18	18	17	201	281	018	S15	W93	0	0	0	18	S15	W93	Q	Solalert 18/20, Magalert 18/18.
						S33	W57	4	0	0		S33	W57	A	
						S31	W36	0	0	0		S31	W36	Q	
						N22	W26	7	0	0		N22	W26	A	
						S20	W12	5	0	0		S20	W12	Q	
						N18	W04	2	0	0		N18	W04	E	
						N19	E38	0	0	0		N19	E38	Q	
						N23	E71	0	0	0		N23	E71	E	
19	19	18	200	269	015	S33	W69	5	1	1	19	S33	W69	A	Solalert 19/20, Magalert 19/20 Flare.
						S30	W49	0	0	0		S30	W49	Q	
						N22	W40	1	1	0		N22	W40	A	
						S21	W25	1	0	0		S21	W25	Q	
						N18	W17	2	0	0		N18	W17	E	
						N21	E30	0	0	0		N21	E30	Q	
						N23	E59	0	0	0		N23	E59	E	
						S19	E70	0	0	0		S19	E70	Q	
						N31	W62	0	0	0		N31	W62	Q	
						Presto: ² Sydney Culgoora Type II began 18/0026. Toyokawa Tenflare 600 flux units began 18/0610 duration in progress. Boulder X-ray event X1 S33 W69 18/0610 UT duration 156 minutes. Tenflare 400 flux units began 18/0636 duration 39 minutes. Tenflare 1500 flux units began 18/1809 duration 20 minutes.									

JAN 89

ALERT PERIODS
INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

Summary of the Geolert Messages JANUARY 1989

Julian Day	Date of Issue	Date of Observation	Wolf No.	10-cm Solar Flux	A-index	Location		Flares			Date of Forecast	Location		Region Forecast ¹	Geoalerts
						°Lat	°Long	Total	M	X		°Lat	°Long		
20	20	19	175	249	004	S33 W81	0	0	0	20	S33 W81	E	Solalert 20/XX, Magalert 20/21 Flare.		
						S30 W62	1	0	0		S30 W62	Q			
						N22 W52	2	0	0		N22 W52	A			
						S21 W38	0	0	0		S21 W38	Q			
						N18 W29	1	0	0		N18 W29	E			
						N22 E18	0	0	0		N22 E18	Q			
						N24 E48	0	0	0		N24 E48	E			
						S19 E57	1	0	0		S19 E57	Q			
						N30 W73	1	0	0		N30 W73	Q			
						N22 E05	2	0	0		N22 E05	Q			
21	21	20	144	247	045	S34 W89	2	1	0	21	S34 W89	E	Solalert 21/XX, Magalert 21 Flare.		
						N22 W66	5	0	0		N22 W66	A			
						S20 W52	0	0	0		S20 W52	Q			
						N17 W43	2	0	0		N17 W43	E			
						N21 E04	0	0	0		N21 E04	Q			
						N24 E33	0	0	0		N24 E33	Q			
						S17 E41	0	0	0		S17 E41	Q			
						N23 W11	0	0	0		N23 W11	Q			
						N22 E74	2	0	0		N22 E74	Q			
						Presto: ² Sydney Weak Type II sweep began 20/0556 UT in progress. Kakioka Magstorm began 20/1233 UT.									
22	22	21	144	216	022	N22 W79	5	0	0	22	N22 W79	E	Solalert 22/XX, Magalert 22.		
						S19 W64	0	0	0		S19 W64	Q			
						N19 W58	0	0	0		N19 W58	Q			
						N22 W09	0	0	0		N22 W09	Q			
						N25 E22	0	0	0		N25 E22	Q			
						S16 E25	0	0	0		S16 E25	Q			
						N22 E63	8	0	0		N22 E63	E			
						S17 E82	0	0	0		S17 E82	Q			
						N17 W45	0	0	0		N17 W45	Q			
						Presto: ² Boulder Strong Magstorm began 21/1200 UT.									
23	23	22	194	212	021	N23 W89	2	0	0	23	N23 W89	E	Solalert 23/XX, Magalert 23/24 Coronal Hole.		
						S19 W78	0	0	0		S19 W78	Q			
						N18 W72	1	0	0		N18 W72	Q			
						N22 W22	0	0	0		N22 W22	Q			
						N25 E10	1	0	0		N25 E10	Q			
						S16 E12	0	0	0		S16 E12	Q			
						N19 E48	9	0	0		N19 E48	E			
						S18 E71	2	0	0		S18 E71	E			
						N17 W57	1	0	0		N17 W57	Q			
						S13 W75	2	0	0		S13 W75	Q			
						N27 E27	0	0	0		N27 E27	Q			
24	24	23	196	219	016	S20 W89	0	0	0	24	S29 W89	Q	Solalert 24/XX, Magalert 24 Coronal Hole.		
						N17 W85	1	0	0		N17 W85	Q			
						N21 W35	0	0	0		N21 W35	Q			
						N25 W05	0	0	0		N25 W05	Q			
						S18 E01	0	0	0		S18 E01	Q			
						N19 E35	12	2	0		N19 E35	E			
						S16 E61	2	0	0		S16 E61	E			
						N17 W70	2	0	0		N17 W70	Q			
						S15 W86	0	0	0		S15 W86	Q			
						N27 E08	0	0	0		N27 E08	Q			

ALERT PERIODS
INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

9
JAN 89

Summary of the Geoalert Messages JANUARY 1989

Julian Day	Date of Issue	Date of Observation	Wolf No.	10-cm Solar Flux	A-index	Location		Flares			Date of Forecast	Location		Region Forecast ¹	Geoalerts
						°Lat	°Long	Total	M	X		°Lat	°Long		
25	25	24	162	221	007	N21 W49	0	0	0	25	N21 W49	Q	Solalert 25/XX, Magalert 25 Coronal Hole.		
						N23 W18	2	0	0		N23 W18	Q			
						S19 W09	0	0	0		S19 W09	Q			
						N18 E22	10	2	0		N18 E22	A			
						S17 W52	6	0	0		S17 W52	E			
						N26 W04	0	0	0		N26 W04	Q			
26	26	25	215	234	012	N21 W62	3	0	0	26	N21 W62	Q	Solalert 26/XX, Magnil.		
						N24 W31	0	0	0		N24 W31	Q			
						S19 W22	0	0	0		S19 W22	Q			
						N18 E08	8	0	0		N18 E08	A			
						S17 E39	3	1	0		S17 E39	E			
						S21 E81	8	0	0		S21 E81	E			
Presto: ² Boulder Tenflare 326 flux units began 25/1453 UT duration 8 minutes.															
27	27	26	185	211	009	N20 W75	1	0	0	27	N20 W75	E	Solalert 27/XX, Magquiet.		
						N24 W42	0	0	0		N24 W42	Q			
						N18 W06	10	2	0		N18 W06	A			
						S18 E26	2	0	0		S18 E26	E			
						S19 E68	3	1	0		S19 E68	E			
						Presto: ² Boulder Tenflare 310 flux units began 26/2350 UT duration 5 minutes. Toyokawa Tenflare 290 flux units began 26/2349 UT duration 10 minutes.									
28	28	27	213	230	010	N19 W87	1	0	0	28	N19 W87	Q	Solalert 28/XX, Magquiet.		
						S15 W47	1	0	0		S15 W47	Q			
						N17 W19	11	1	0		N17 W19	A			
						S17 E14	4	1	1		S17 E14	A			
						S20 E56	2	0	0		S20 E56	A			
						Presto: ² Boulder Tenflare 260 flux units began 27/1910 duration 6 minutes. X-ray event X1/2B S19 E17 27/1908 UT duration 37 minutes.									
29	29	28	199	217	010	S20 W62	0	0	0	29	S29 W62	Q	Solalert 29/XX, Magquiet.		
						N17 W31	8	1	0		N17 W31	A			
						S18 E03	2	0	0		S18 E03	A			
						S20 E42	3	1	0		S20 E42	E			
						S12 W59	0	0	0		S12 W59	Q			
						S20 W12	3	0	0		S20 W12	Q			
Presto: ² Boulder Tenflare 350 flux units began 28/2139 duration 3 minutes. Sydney Culgoora Soflare 1B S22 E49 28/2138 UT duration 28 minutes.															
30	30	29	220	209	008	S17 W72	0	0	0	30	S17 W72	Q	Solalert 30/XX, Magquiet.		
						N17 W46	9	0	0		N17 W46	A			
						S18 W11	2	1	0		S18 W11	A			
						S20 E30	6	0	0		S20 E30	A			
						S15 W73	0	0	0		S15 W73	Q			
						S20 W26	2	0	0		S20 W26	Q			
						S20 W52	0	0	0		S20 W52	Q			
						N21 E41	0	0	0		N21 E41	Q			
31	31	30	189	193	013	N17 W59	14	2	0	31	N17 W59	A	Solalert 31/XX, Magquiet.		
						S19 W24	3	0	0		S19 W24	E			
						S21 E17	6	1	0		S21 E17	A			
						S20 W39	7	0	0		S20 W39	E			
						N21 E28	0	0	0		N21 E28	Q			
						S21 E72	0	0	0		S21 E72	Q			
Presto: ² Toyokawa Tenflare 100 flux units began 30/0057 duration 21 minutes. Sydney Culgoora Strong Type II began 30/0155 UT.															

ALERT PERIODS
INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

Summary of the Geoalert Messages JANUARY 1989

Julian Day	Date of Issue	Date of Observation	Wolf No.	10-cm Solar Flux	A-index	Location		Flares			Date of Forecast	Location		Region Forecast ¹	Geoalerts
						°Lat	°Long	Total	M	X		°Lat	°Long		
01	01	31	219	195	023	N19	W69	6	1	0	01	N19	W69	E	Solalert 01/XX, Magalert 01/XX.
						S18	W36	5	0	0		S18	W36	E	
						S21	E04	9	4	0		S21	E04	A	
						S18	W52	0	0	0		S18	W52	Q	
						N20	E17	0	0	0		N20	E17	Q	
						S22	E61	0	0	0		S22	E61	Q	
						S17	E72	0	0	0		S17	E72	Q	
						S27	E76	0	0	0		S27	E76	Q	
						S07	E29	0	0	0		S07	E29	Q	
						N25	E55	0	0	0		N25	E55	Q	

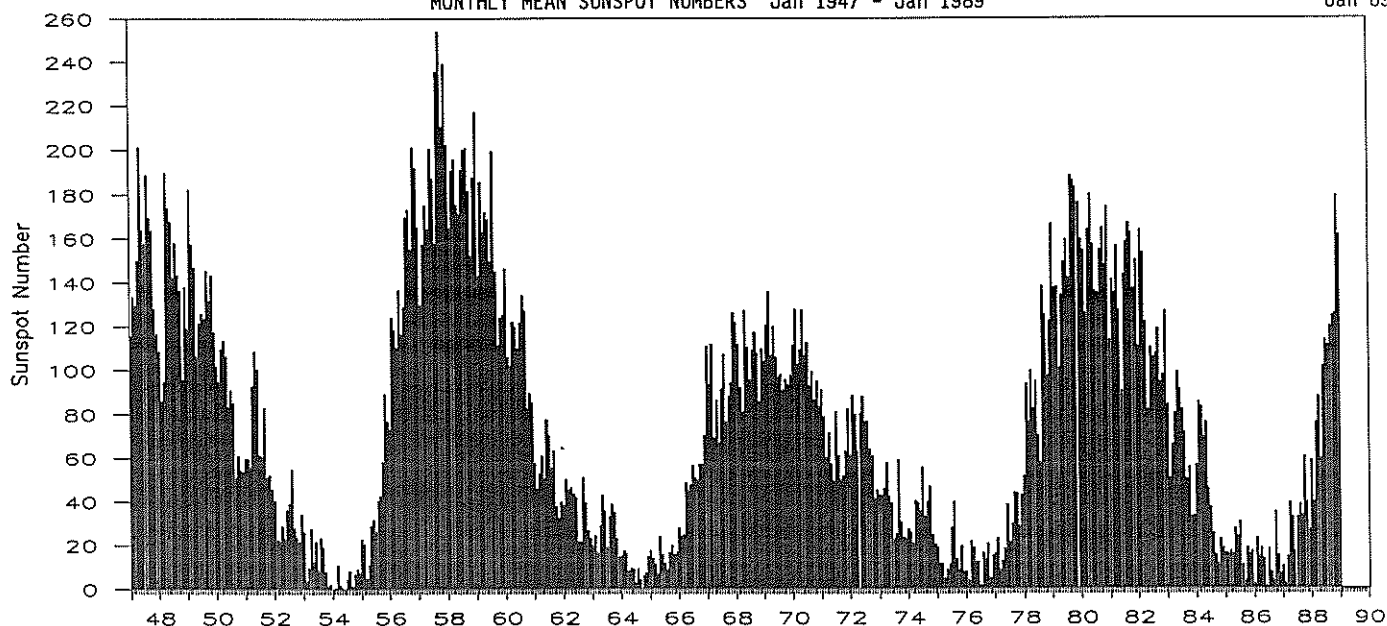
¹Q = quiet, E = eruptive, A = active, P = proton.

²Presto message is a rapid report of a major event.

STRATWARM ALERTS

- 30 January Stratwarm exists. An intense warm center has reached the Canadian arctic, causing temperature increase of more than 40 degrees at 10 HPA within the last 5 days. Temperature gradient reversed between 60° North and the pole from 10 HPA upwards.
- 31 January Stratwarm exists. Intense warm region over the Canadian arctic influences Greenland and the whole of the North American continent. Temperature gradient reversed between 60° North and the pole from 10 HPA upwards.

MONTHLY MEAN SUNSPOT NUMBERS Jan 1947 - Jan 1989



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1947	115.7	133.4	129.8	149.8	201.3	163.9	157.9	188.8	169.4	163.6	128.0	116.5	151.6 M
1948	108.5	86.1	94.8	189.7	174.0	167.8	142.2	157.9	143.3	136.3	95.8	138.0	136.3
1949	119.1	182.3	157.5	147.0	106.2	121.7	125.8	123.8	145.3	131.6	143.5	117.6	134.7
1950	101.6	94.8	109.7	113.4	106.2	83.6	91.0	85.2	51.3	61.4	54.8	54.1	83.9
1951	59.9	59.9	55.9	92.9	108.5	100.6	61.5	61.0	83.1	51.6	52.4	45.8	69.4
1952	40.7	22.7	22.0	29.1	23.4	36.4	39.3	54.9	28.2	23.8	22.1	34.3	31.5
1953	26.5	3.9	10.0	27.8	12.5	21.8	8.6	23.5	19.3	8.2	1.6	2.5	13.9
1954	0.2	0.5	10.9	1.8	0.8	0.2	4.8	8.4	1.5	7.0	9.2	7.6	4.4 m
1955	23.1	20.8	4.9	11.3	28.9	31.7	26.7	40.7	42.7	58.5	89.2	76.9	38.0
1956	73.6	124.0	118.4	110.7	136.6	116.6	129.1	169.6	173.2	155.3	201.3	192.1	141.7
1957	165.0	130.2	157.4	175.2	164.6	200.7	187.2	158.0	235.8	253.8	210.9	239.4	190.2 M
1958	202.5	164.9	190.7	196.0	175.3	171.5	191.4	200.2	201.2	181.5	152.3	187.6	184.8
1959	217.4	143.1	185.7	163.3	172.0	168.7	149.6	199.6	145.2	111.4	124.0	125.0	159.0
1960	146.3	106.0	102.2	122.0	119.6	110.2	121.7	134.1	127.2	82.8	89.6	85.6	112.3
1961	57.9	46.1	53.0	61.4	51.0	77.4	70.2	55.8	63.6	37.7	32.6	39.9	53.9
1962	38.7	50.3	45.6	46.4	43.7	42.0	21.8	21.8	51.3	39.5	26.9	23.2	37.6
1963	19.8	24.4	17.1	29.3	43.0	35.9	19.6	33.2	38.8	35.3	23.4	14.9	27.9
1964	15.3	17.7	16.5	8.6	9.5	9.1	3.1	9.3	4.7	6.1	7.4	15.1	10.2 m
1965	17.5	14.2	11.7	6.8	24.1	15.9	11.9	8.9	16.8	20.1	15.8	17.0	15.1
1966	28.2	24.4	25.3	48.7	45.3	47.7	56.7	51.2	50.2	57.2	57.2	70.4	47.0
1967	110.9	93.6	111.8	69.5	86.5	67.3	91.5	107.2	76.8	88.2	94.3	126.4	93.8
1968	121.8	111.9	92.2	81.2	127.2	110.3	96.1	109.3	117.2	107.7	86.0	109.8	105.9 M
1969	104.4	120.5	135.8	106.8	120.0	106.0	96.8	98.0	91.3	95.7	93.5	97.9	105.5
1970	111.5	127.8	102.9	109.5	127.5	106.8	112.5	93.0	99.5	86.6	95.2	83.5	104.5
1971	91.3	79.0	60.7	71.8	57.5	49.8	81.0	61.4	50.2	51.7	63.2	82.2	66.6
1972	61.5	88.4	80.1	63.2	80.5	88.0	76.5	76.8	64.0	61.3	41.6	45.3	68.9
1973	43.4	42.9	46.0	57.7	42.4	39.5	23.1	25.6	59.3	30.7	23.9	23.3	38.0
1974	27.6	26.0	21.3	40.3	39.5	36.0	55.8	33.6	40.2	47.1	25.0	20.5	34.5
1975	18.9	11.5	11.5	5.1	9.0	11.4	28.2	39.7	13.9	9.1	19.4	7.8	15.5
1976	8.1	4.3	21.9	18.8	12.4	12.2	1.9	16.4	13.5	20.6	5.2	15.3	12.6 m
1977	16.4	23.1	8.7	12.9	18.6	38.5	21.4	30.1	44.0	43.8	29.1	43.2	27.5
1978	51.9	93.6	76.5	99.7	82.7	95.1	70.4	58.1	138.2	125.1	97.9	122.7	92.5
1979	166.6	137.5	138.0	101.5	134.4	149.5	159.4	142.2	188.4	186.2	183.3	176.3	155.4 M
1980	159.6	155.0	126.2	164.1	179.9	157.3	136.3	135.4	155.0	164.7	147.9	174.4	154.6
1981	114.0	141.3	135.5	156.4	127.5	90.9	143.8	158.7	167.3	162.4	137.5	150.1	140.4
1982	111.2	163.6	153.8	122.0	82.2	110.4	106.1	107.6	118.8	94.7	98.1	127.0	115.9
1983	84.3	51.0	66.5	80.7	99.2	91.1	82.2	71.8	50.3	55.8	33.3	33.4	66.6
1984	57.0	85.4	83.5	69.7	76.4	46.1	37.4	25.5	15.7	12.0	22.8	18.7	45.9
1985	16.5	15.9	17.2	16.2	27.5	24.2	30.7	11.1	3.9	18.6	16.2	17.3	17.9
1986	2.5	23.2	15.1	18.5	13.7	1.1	18.1	7.4	3.8	35.4	15.2	6.8	13.4 m
1987	10.4	2.4	14.7	39.6	33.0	17.4	33.0	38.7	33.9	60.6	39.9	27.1	29.2
1988	59.0	40.0	76.2	88.0	60.1	101.8	113.8	111.6	120.1	124.7*	125.6*	179.4*	100.0*
1989	161.6*												161.6*

*Preliminary

For the yearly means, each "M" marks a sunspot cycle maximum and each "m" a minimum.

INTERNATIONAL RELATIVE SUNSPOT NUMBERS

Day	Feb 88	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct†	Nov†	Dec†	Jan†89
01	63	68	110	69	95	139	142	137	109	126	128	148
02	68	66	96	84	96	145	143	144	117	114	105	173
03	68	72	94	76	100	142	146	129	129	121	139	146
04	74	77	74	101	105	129	135	148	128	104	122	120
05	58	64	66	103	125	119	120	128	130	129	139	155
06	43	61	62	77	145	108	123	93	131	124	149	142
07	44	65	84	50	141	103	144	97	128	114	144	157
08	46	67	92	63	151	106	160	88	138	95	111	135
09	50	49	115	74	173	82	171	74	112	110	122	165
10	38	36	107	87	144	78	152	76	146	131	127	190
11	26	20	115	65	108	102	135	81	148	155	152	200
12	14	39	118	56	77	109	133	88	156	159	175	229
13	23	53	120	44	47	103	122	91	150	147	195	233
14	28	62	138	37	53	121	128	94	131	139	213	201
15	33	63	145	44	65	121	121	89	109	156	214	177
16	42	74	157	53	81	111	91	89	120	181	216	164
17	35	99	144	57	76	124	67	79	125	196	232	155
18	55	95	137	44	67	136	47	97	134	175	229	160
19	66	105	108	20	70	105	57	113	133	147	223	140
20	51	85	88	20	77	106	57	153	119	112	234	126
21	27	81	79	25	95	103	40	168	117	145	218	114
22	15	76	72	30	92	106	21	168	109	124	255	165
23	13	74	43	40	91	116	26	190	104	117	235	159
24	23	83	30	48	93	81	43	172	121	116	199	142
25	19	92	40	54	111	76	76	149	124	96	183	144
26	15	93	44	63	107	76	93	151	110	80	174	152
27	31	103	36	66	111	101	142	157	120	69	175	167
28	40	109	41	70	116	117	146	143	119	86	196	172
29	52	104	39	74	121	157	164	111	122	92	194	169
30		108	47	83	121	161	163	106	115	107	190	157
31		120		86		146	151		111		172	154
Mean	40.0	76.2	88.0	60.1	101.8	113.8	111.6	120.1	124.7	125.6	179.4	161.6

† = preliminary. The preliminary yearly mean sunspot number equals 100.2 for 1988.

Algonquin Radio Observatory OTTAWA 2800 MHz (10.7 cm) SOLAR FLUX Adjusted to 1 AU

Day	Feb 88	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec 88	Jan
01	105.5	99.8*	127.2	108.8	149.3*	194.4*	180.9	191.3	179.4	157.2*	150.5	179.5*
02	104.3	99.1	126.5	113.1*	147.6	198.9	187.6	178.9	197.0	156.5*	149.4	193.7
03	103.6	101.9*	127.6	116.4*	149.5	190.2	172.2*	177.3	200.4	164.0	147.3	189.2
04	103.1	102.6*	122.6	127.4	150.9	181.0	163.6	165.9	189.2	159.7	142.7	195.7*
05	102.6	106.7*	114.6	121.1	151.2	171.2	159.2	166.3	191.0	163.8	154.6*	201.6
06	103.6	107.6	116.8	116.5	159.0	156.7	163.4	152.4	193.4	161.2	157.7	198.7
07	105.3	107.3	120.0	112.9	164.6	152.4	170.4	145.4	182.4	151.6	152.9*	239.5
08	102.5	104.1*	121.8*	116.7	168.3	142.4	186.9	138.9	172.6	143.5	164.1	260.2
09	101.0	101.5	121.8*	121.9	165.9*	137.7	182.4	128.0	176.5	152.4	165.2	251.3
10	100.2	99.2	127.2	116.4	149.8	138.3	181.8	117.6	177.8	147.7	161.2*	250.0
11	99.6	102.9	128.0*	114.6	137.8	137.7*	178.2	121.9	168.2	153.8	176.4	254.7*
12	101.3	103.5	130.6*	111.6	125.9	137.9	161.2	127.0	148.4	150.6*	173.9	263.2
13	102.9	107.8	134.6	105.9	115.0	141.3*	159.7	124.8	157.5	157.8*	181.1	291.7*
14	102.6	108.9*	146.3	105.2	111.7	150.1	151.6	130.2	150.4	173.2*	204.4*	274.9
15	100.4	112.6*	143.5	103.4	113.5	150.7	144.0	126.1	149.1	161.1*	212.0	280.1
16	101.0	114.1*	147.6	103.3	121.7	153.3*	137.8	128.5	152.3	186.1*	232.1	292.1
17	106.2	117.4	145.5	103.7	124.8	152.8*	145.6	135.3	175.0	175.6	241.7	266.7*
18	112.5	116.1	145.3	106.7	125.7	152.3	128.5	139.5	162.3	161.8	243.5	271.2
19	109.0	116.1*	138.5	104.8	119.4	142.1	123.9	138.6	164.0	151.2	240.2	241.6
20	106.5	116.3*	134.9	106.1	118.5	141.3	118.1	151.4	166.0	146.6	238.8	222.0*
21	104.7	117.5*	127.6	112.6	122.8*	145.8	116.1	157.8	165.9	152.9	245.2	198.2*
22	102.5	117.6	120.1	114.0	124.4*	141.2	114.9	178.6	166.2	153.1	246.6	203.6
23	100.2	120.9*	111.5	122.2	129.3	144.6	121.7A	177.8*	171.1	135.7	234.8	205.6
24	99.6	123.0*	105.6	119.8	135.7*	138.6	133.7	178.6	168.4	138.0	221.6	211.0
25	96.4	128.5*	106.7	123.8*	153.7	140.9	144.3	177.4	162.1	137.5	210.5	227.3
26	96.7	127.5*	103.8	127.8	157.6*	149.7	157.1	172.0	155.4	137.4	193.0	206.3
27	96.3	128.0*	101.9	130.0	160.5	161.5	166.8	179.6*	161.8	140.9	201.9	211.1
28	97.1	129.8	101.6	130.1	183.2	175.4	174.0	171.0	156.0	138.8	201.6	207.1
29	103.3	131.7	102.1	140.2	189.5	185.9	189.0	172.0	155.9	137.6	196.7	200.5
30		128.3	104.8	142.8	187.4*	188.3	190.0	173.1	154.2*	135.8	179.5	187.3
31		130.6*		153.6*		192.5	194.5		160.4		177.6	187.5
Mean	102.4	113.8	123.6	117.9	143.8	157.6	158.0	154.1	168.7	152.8	193.5	227.8

* = corrected for burst in progress; A = interpolation - interference during calibration. The yearly mean flux equaled 141.1 in 1988.

DAILY SOLAR INDICES

13
Jan 89

January 1989

Day	Julian Day	Bartels Cycle Day	Sunspot Numbers		Obs Flux Ottawa (2800)	Solar Flux Adjusted to 1 Astronomical Unit								
			Int	Amer		SGMR (15400)	SGMR (8800)	SGMR (4995)	Ottawa (2800)	SGMR (2695)	SGMR (1415)	SGMR (610)	SGMR (410)	SGMR (245)
01	1	13	148	150	185.7*	492	315	216	179.5*	179	126	61	34	19
02	2	14	173	149	200.4	483	300	203	193.7	175	125	61	36	29
03	3	15	146	135	195.7	497	308	202	189.2	178	130	63	32	22
04	4	16	120	116	202.4*	500	326	223	195.7*	193	136	67	36	22
05	5	17	155	142	208.5	501	322	215	201.6	184	138	63	38	24
06	6	18	142	146	205.5	506	346	219	198.7	184	142	70	39	24
07	7	19	157	176	247.7	505	346	240	239.5	210	161	80	40	23
08	8	20	135	189	269.1	482	352	245	260.2	221	169	74	36	23
09	9	21	165	170	259.9	528	361	254	251.3	229	177	81	43	68
10	10	22	190	195	258.5	537	376	253	250.0	222	172	67	38	29
11	11	23	200	200	263.4*	615	388	269	254.7*	237	180	77	38	30
12	12	24	229	197	272.1	502	333	275	263.2	235	180	78	35	16
13	13	25	233	206	301.5*	664	455	379	291.7*	270	201	84	39	20
14	14	26	201	189	284.1	606	412	351	274.9	251	191	81	37	21
15	15	27	177	187	289.5	564	426	405	280.1	257	187	75	39	51
16	16	1	164	170	301.8	629	414	429	292.1	270	194	81	41	42
17	17	2	155	154	275.6*	600	385	385	266.7*	247	178	79	43	48
18	18	3	160	151	280.2	---	371	---	271.2	242	178	--	--	--
19	19	4	140	132	249.6	565	356	354	241.6	222	165	69	35	18
20	20	5	126	113	229.3*	593	381	324	222.0*	215	159	70	34	19
21	21	6	114	114	204.7*	587	344	296	198.2*	198	153	64	36	21
22	22	7	165	151	210.2	562	319	282	203.6	188	150	74	41	35
23	23	8	159	154	212.2	564	311	285	205.6	190	149	74	46	40
24	24	9	142	130	217.8	561	311	287	211.0	192	148	78	44	51
25	25	10	144	157	234.5	567	323	301	227.3	207	153	73	40	61
26	26	11	152	156	212.8	513	297	270	206.3	191	146	68	46	--
27	27	12	167	166	217.7	545	292	228	211.1	194	147	70	42	44
28	28	13	172	172	213.5	545	285	230	207.1	193	146	69	38	60
29	29	14	169	168	206.7	545	277	253	200.5	186	140	60	32	24
30	30	15	157	149	193.0	539	277	219	187.3	175	136	62	32	26
31	31	16	154	148	193.2	553	277	216	187.5	173	132	60	32	18
Mean			161.6	159.1	235.4	548	341	277	227.8	210	158	71	38	32

The International numbers shown above are preliminary values; the American numbers are final.

The observed and the adjusted Ottawa fluxes tabulated here are the "Series C" daily values reported by the Algonquin Radio Observatory, Ottawa, Ontario, Canada. Numbers in parentheses in the column headings denote frequencies in MHz. Qualifiers after an entry have the following meaning:

* = corrected for burst in progress

Equipment problems produced any gaps in the Air Weather Service's Sagamore Hill (SGMR) observations.

SMOOTHED (OBSERVED AND PREDICTED) SUNSPOT NUMBERS: CYCLES 21 AND 22

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1980	164	163	161	159	156	155	153	150	150	150	148	143
1981	140	142	143	143	143	142	140	141	143	142	139	138
1982	137	133	129	124	120	117	115	109	101	96	95	95
1983	93	90	86	82	77	70	66	66	68	68	67	64
1984	60	56	53	50	48	46	44	40	34	29	25	22
1985	20	20	19	18	18	18	17	17	17	17	17	15
1986	14	13	13	14	14	14	14	13	12*	13	15	16
1987	18	20	22	24	26	28	31	35	39	44	47	51
1988	58	65	71	78	84	94	104	114 (3)	122 (7)	129 (11)	135 (15)	140 (18)
1989	143 (19)	147 (18)	155 (16)	163 (16)	169 (18)	174 (23)	176 (28)	179 (32)	186 (36)	191 (38)	193 (41)	194 (43)
1990	195 (44)	195 (47)	193 (48)	187 (47)	181 (44)	176 (40)	174 (37)	172 (38)	164 (37)	155 (36)	147 (33)	143 (30)

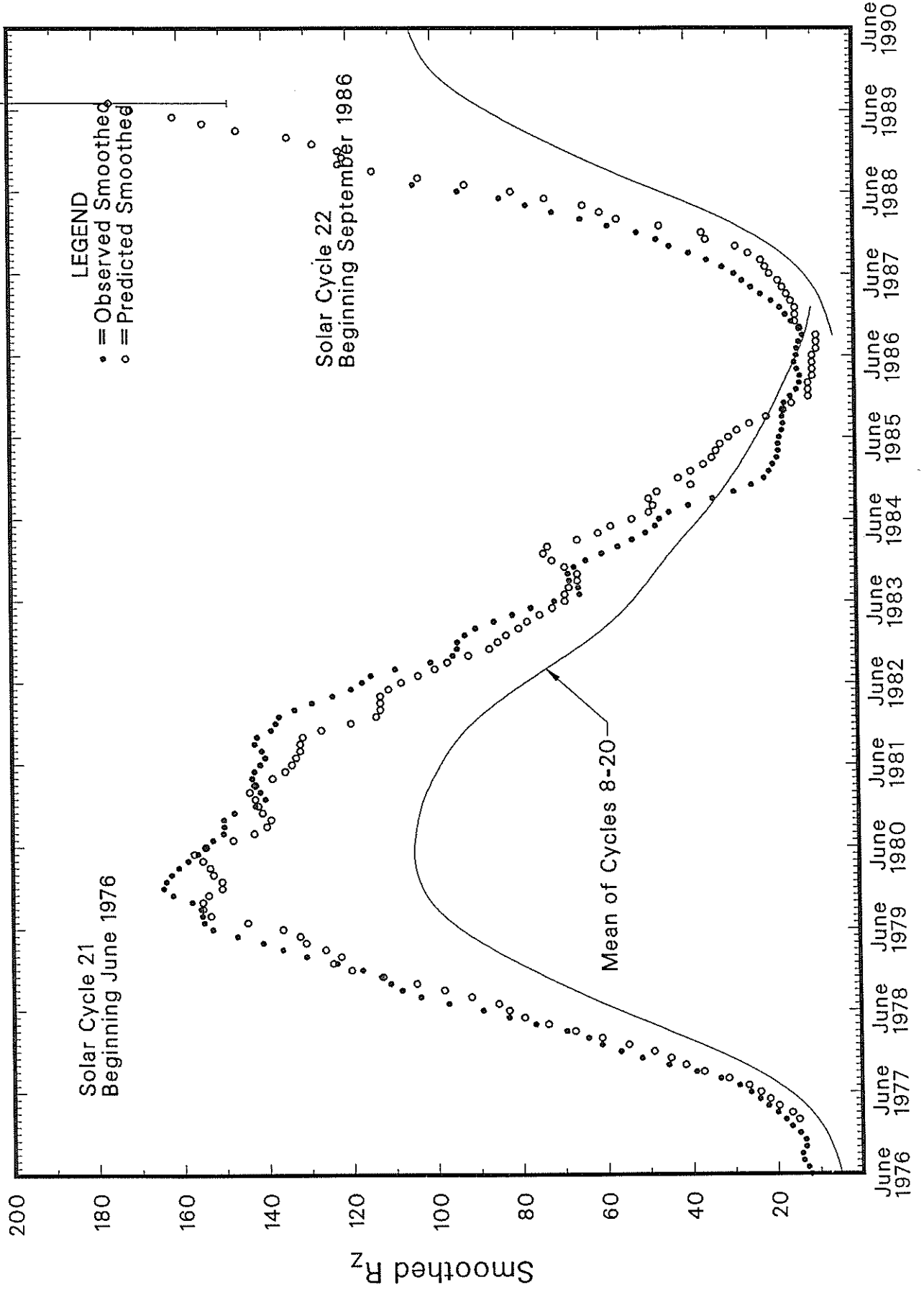
*September 1986 marks the onset of Sunspot Cycle 22.

For the end of Solar Cycle 21, and the beginning of 22, the table gives observed smoothed sunspot numbers up to the one calculated from the most recently available monthly mean. These smoothed observed values are based on final, monthly means through September 1988 and on provisional numbers thereafter.

Table entries, with numbers in parentheses below them, denote predictions by the McNish-Lincoln method. (See page 9 in the July 1987 supplement to *Solar-Geophysical Data*.) Adding the number in parentheses to the predicted value generates the upper limit of the 90% confidence interval; subtracting the number from the predicted value generates the lower limit. Consider, for example, the July 1989 prediction. There exists a 90% chance that in July 1989 the actual smoothed sunspot number will fall somewhere between 148 and 204.

THE MCNISH-LINCOLN PREDICTION METHOD GENERATES USEFUL ESTIMATES OF SMOOTHED, MONTHLY MEAN SUNSPOT NUMBERS FOR NO MORE THAN 12 MONTHS AHEAD. Beyond a year the predictions regress rapidly toward the mean of all 13 cycles used in the computation. Moreover, the method is very sensitive to the data defined as the beginning of the current sunspot cycle, that is, to the date of the most recent sunspot minimum. The new cycle predictions tabulated above are based on the minimum value of 12.3 that occurred in September 1986.

OBSERVED AND ONE-YEAR-AHEAD PREDICTED SUNSPOT NUMBERS



16
Jan 89

H α SOLAR FLARES

JANUARY 1989

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo Day	Dur (Min)	Imp Opt Xray	Obs See Type	Area Measurement			Remarks
												Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)	
LEAR	01	0001E	0007	0019	N20	W58	5290	12 27.7	18D	SF C 8.1	3	E	78		
GOES		0353	0420	0500					67	C 3.1					
YUNN		0411	0422	0447	S17	W05			36	SN		C	126	1.3	
LEAR		0417	0442	0450	S18	W07	5303	12 31.6	33	1F		3	100		
YUNN		0608	0618	0632D	S20	W53			24D	1B		P	236	4.1	F
YUNN		0612	0614	0618	N21	W58			6	SN		C	79	1.7	
LEAR		0612	0620	0657	S21	W53	5292	12 28.3	45	SF M 1.4	3	E	71		F
YUNN		0620	0622	0626	S17	W07			6	SN		C	189	2.0	
LEAR		0709	0709	0715	N20	W62	5290	12 27.6	6	SF		3	16		
SVTO		1052	1103	1116	S19	W11	5303	12 31.6	24	SN C 6.7	3	E	62		
SVTO		1121	1337	1423	N20	W63	5290	12 27.7	182	SF C 8.1	3	E	68		F
RAMY		1206E	1219	1236D	N21	W67	5290	12 27.5	30D	SF		2	20		F
RAMY		1320	1321	1326	S19	W13	5303	12 31.6	6	SF		4	14		
RAMY		1327	1336	1421	N20	W64	5290	12 27.8	54	SF		4	91		F
RAMY		1327	1349	1421	N20	W64			54	SF		E	77		K
SVTO		1336	1336	1343	S20	W55	5292	12 28.4	7	SF		3	18		F
RAMY		1406	1410	1429	S16	W27	5297	12 30.6	23	SF		4	31		H
RAMY		1434	1516	1532D	N21	W70	5290	12 27.3	58D	1N C 8.3	4	E	142		FE
HOLL		1437E	1438U	1456	N20	W70	5290	12 27.3	19D	SF		1	23		
HOLL		1506	1515	1610	N22	W67	5290	12 27.6	64	SN		2	84		F
HOLL		1627	1631	1722	S22	W62	5292	12 28.0	55	SN C 7.1	3	E	50		F
RAMY		1740	1744	1752	S16	W29	5297	12 30.6	12	SN		3	16		F
RAMY		1802	1805	1822D	S18	W14	5303	12 31.7	20D	SF C 2.8	3	E	45		F
HOLL		1802	1805	1848	S19	W15	5303	12 31.6	46	SF C 2.8	3	E	37		F
GOES		1817	1821	1824					7	C 4.8					
RAMY		1818E	1832U	1851	S21	W60	5292	12 28.3	33D	SN		2	81		FE
PALE		1825	1831	1853	S20	W61	5292	12 28.2	28	SF C 6.3	3	E	71		F
HOLL		1827	1830	1959	S20	W60	5292	12 28.3	92	SN C 6.3	3	E	65		F
GOES		1847	1852	1855					8	C 3.4					
HOLL		1914	1915	1932	S18	W60	5292	12 28.3	18	SF		3	23		
RAMY		1914	1915	1933	S18	W60	5292	12 28.3	19	SF		3	18		
PALE		1915	1915	1931	S18	W62	5292	12 28.2	16	SF		3	20		
RAMY		1933	1939	1950	S19	W16	5303	12 31.6	17	SF C 3.5	3	E	59		F
RAMY		2021	2032	2052	S19	W59	5292	12 28.4	31	SF C 3.7	3	E	31		
HOLL		2022	2032	2054	S19	W65	5292	12 28.0	32	SF		3	25		
PALE		2023	2033	2044	S18	W62	5292	12 28.2	21	SF		3	22		
HOLL		2256	2257	2311	S22	W59	5292	12 28.5	15	SF		3	88		F
HOLL		2307	2310	2317	N20	W72	5290	12 27.5	10	SF		3	38		
LEAR		2321	2322	2326	S20	W64	5292	12 28.2	5	SF		3	30		F
HOLL		2321	2322	2330	S19	W60	5292	12 28.5	9	SF		3	86		F
LEAR		2343	2347	2409	S21	W65	5292	12 28.1	26	SF C 8.1	3	E	74		F
PALE		2346E	2347U	2416	S20	W64	5292	12 28.2	30D	SN C 8.1	3	E	88		F
YUNN	02	0210	0213	0246	S19	W20			36	SN		C	94	1.1	
LEAR		0346	0350	0356	N20	W74	5290	12 27.6	10	SF C 3.1	3	E	28		
GOES		0440	0451	0507					27	C 4.1					
GOES		0541	0545	0555					14	C 3.4					
SVTO		0821	0840	0902	S22	W72	5292	12 27.9	41	SF C 4.6	2	E	15		
SVTO		0921	0934	1143	S19	W30	5303	12 31.1	142	SN C 8.5	3	E	90		
LEAR		0926	0933	1024	S18	W30	5303	12 31.1	58	SF C 8.5	3	E	60		
SVTO		1017	1047	1057	S17	W64	5292	12 28.7	40	SF M 1.1	3	E	49		
SVTO		1244	1246	1252	S17	W65	5292	12 28.7	8	SF		3	33		
RAMY		1534	1804	1812	S19	W28	5303	12 31.5	158	SF		4	30		
RAMY		1535	1537	1553	S20	W73	5292	12 28.2	18	SF C 3.6	4	E	74		
RAMY		1540	1546	1550	N29	E83		01 9.1	10	SF		4	82		
RAMY		1630	1631	1637	S19	W75	5292	12 28.1	7	SF		4	26		
RAMY		1645	1646	1712	S18	W08	5301	01 2.1	27	SF		3	12		F
RAMY		1702	1702	1709	S20	W67	5292	12 28.7	7	SF		3	12		
RAMY		1715	1722	1733	S20	W67	5292	12 28.7	18	SF C 4.6	3	E	67		F
RAMY		1731	1732	1741	S18	W29	5303	12 31.5	10	SF		3	16		
RAMY		1745	1746	1803	S15	W42	5297	12 30.6	18	SF		3	21		F
PALE		1745E	1747	1818D	S16	W43	5297	12 30.6	33D	SF		3	22		F
GOES		1848	1910	2209					201	M 2.2					
PALE		1930	1930	1943	S17	W28	5303	12 31.7	13	SF		3	13		
GOES		2306	2311	2315					9	C 8.1					
PALE	03	0024	0025	0032	S17	W33	5303	12 31.5	8	SF		3	21		
YUNN		0301	0306	0315	S15	W35			14	1N		C	189	2.4	
PALE		0304	0307	0317	S19	W37	5303	12 31.3	13	SF C 5.9	3	E	44		F

H α SOLAR FLARES

JANUARY 1989

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	NOAA/ USAF Region	CMP Mo	Dur (Min)	Imp Opt	Xray	Obs See	Type	Area Measurement			Remarks	
													Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)		
L	PEKG 03	0305E	0305	0321	S19	W34		16D	2F			V					
	GOES	1010	1023	1035				25		M 1.2							
	GOES	1054	1101	1114				20		C 8.6							
	RAMY	1124E	1124U	1138	S18	W35 5303	12	31.8	14D	SF C 7.2	1	E		71			
	RAMY	1142	1143	1154	N24	E70 5307	01	8.9	12	SF M 1.0	2	E		46			
	RAMY	1215E	1216U	1221	S18	W39 5303	12	31.5	6D	SF		E		55			F
	RAMY	1222	1223	1229	S42	W85 5300	12	27.6	7	SF		E		20			
	RAMY	1234	1234	1253	S19	W77 5292	12	28.7	19	SF		E		35			
	RAMY	1344	1346	1410D	S15	W53 5297	12	30.6	26D	SF M 1.1	3	E		64			
	RAMY	1450	1454	1507	S18	W59 5303	12	30.2	17	SF		E		21			F
	RAMY	1705	1708	1718D	S20	W78 5292	12	28.8	13D	SF		E		27			
	PALE	1738E	1738U	1748	N24	E67 5307	01	8.9	10D	SF M 1.5	3	E		29			
	GOES	1753	1756	1809					16	C 8.5							
	PALE	1818	1843	1847	S17	W46 5303	12	31.3	29	SF		E		44			
	PALE	1850	1931	1938	S17	W45 5303	12	31.4	48	SF		E		15			F
	RAMY	1923E	1925	2007	S18	W23 5301	01	2.0	44D	SF		E		34			
	PALE	1923	1926	2010	S19	W22 5301	01	2.1	47	SF		E		46			F
	PALE	2054	2056	2105	N09	E59 5305	01	8.3	11	SF		E		11			
	PALE	04	0013	0014	0022	S18	W85 5292	12	28.6	9	SF		E	40			
	PALE	0050	0050	0102	N24	E64 5307	01	9.0	12	SF C 3.5	3	E		25			F
	YUNN	0758E	0810U	0830	S20	W51			32D	SN		P		47	0.8		E
	RAMY	1130	1132	1152	S18	W49 5303	12	31.7	22	SF		E		41			F
	GOES	1448	1456	1504					16	C 9.0							
	GOES	1602	1615	1639					37	C 8.4							
	RAMY	1603	1753	1928	S20	W60 5303	12	31.1	205	1N M 4.7	3	E		173			FE
	GOES	1713	1729	1741					28	M 1.4							
	PALE	1807E	1820U	2005	S20	W58 5303	12	31.3	118D	1N		E		160			F
	GOES	2052	2057	2104					12	C 6.6							
	YUNN	05	0133	0134	0209	S21	W62		36	SN		P		31	0.7		
	YUNN	0416	0420	0428D	S22	E69			12D	SN		P		16			
	LEAR	0635	0635	0644	S19	E59 5309	01	9.8	9	SF		E		28			
	SVTO	0949	0952	1043	S17	E58 5309	01	9.8	54	SF		E		74			
	LEAR	0951	0956	1007D	S19	E57 5309	01	9.8	16D	SF C 3.2	3	E		26			
	GOES	1156	1205	1212					16	C 5.9							
	SVTO	1159	1202U	1202D	S18	E58 5309	01	9.9	3D	SN		E		99			
	RAMY	1203E	1203U	1209	S20	W66 5303	12	31.4	6D	SF		E		34			
	RAMY	1203E	1209U	1219	S18	E56 5309	01	9.8	16D	SN		E		79			
	RAMY	1808	1811U	1823	S19	W68 5303	12	31.6	15	SF C 4.6	3	E		28			
	HOLL	2123	2125	2200	S18	W55 5301	01	1.7	37	1N C 5.7	3	E		101			
	RAMY	2124	2126	2141	S19	W54 5301	01	1.8	17	SN C 5.7	3	E		97			E
	PALE	2126	2126U	2143	S18	W53 5301	01	1.8	17	SN C 5.7	3	E		68			
	PALE	06	0040	0040	0048	S29	E50 5310	01	9.9	8	SF		E	10			
	LEAR	0057	0058	0113	S21	E57 5309	01	10.4	16	SF		E		22			
	PALE	0102	0105	0133	S22	E56 5309	01	10.3	31	SF		E		37			F
	YUNN	0344	0350	0357D	S20	W58			13D	SN		P		31	0.6		
	GOES	0459	0508	0526					27	M 1.4							
	SVTO	1041	1046	1049	S13	E63 5311	01	11.2	8	SF		E		14			
	SVTO	1046	1046	1054	S31	E86	01	13.2	8	SF		E		10			
	SVTO	1105E	1109U	1109D	S19	W61 5301	01	1.8	4D	SF		E		21			F
	RAMY	1753E	1812U	1846D	S31	E78 5312	01	12.9	53D	1N M 8.9	2	E		127			FE
	PALE	1759	1810U	1856	S36	E78 5312	01	13.0	57	SN M 8.9	2	E		98			F
	RAMY	1800	1801U	1813	S15	E59 5311	01	11.2	13	SF		E		26			
	RAMY	1819E	1821	1835	S18	W66 5301	01	1.7	16D	SF		E		15			
	PALE	1910E	1925U	1945	S16	W66 5301	01	1.8	35D	SN M 1.2	2	E		98			F
	RAMY	1914E	1920	1932	S17	W66 5301	01	1.8	18D	SN M 1.2	2	E		49			F
	RAMY	1925	1930	1934	S15	E61 5311	01	11.4	9	SF		E		18			F
	RAMY	1949	1950	2006	S33	E83 5312	01	13.4	17	SN C 6.5	3	E		47			
	PALE	2011	2016	2058	S17	W67 5301	01	1.7	47	SF		E		92			
	PALE	2100	2110U	2119	S16	W68 5301	01	1.7	19	SF		E		40			
	PALE	2135	2138	2144	S16	W69 5301	01	1.7	9	SF		E		42			
	PALE	2218	2219	2226	N09	E17 5305	01	8.2	8	SF		E		18			F
	GOES	2250	2343	2420					90	M 1.1							
	HOLL	2256E	2259U	2310	S18	E42 5309	01	10.1	14D	SF		E		36			
	HOLL	2259E	2322U	2331D	S18	W69 5301	01	1.7	32D	SF		E		66			H
	LEAR	2319	2321	2330	S17	W69 5301	01	1.7	11	SF		E		26			
	GOES	07	0038	0046	0057				19	C 6.6							

18
Jan 89

H α SOLAR FLARES

JANUARY 1989

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/USAF		CMP Mo	Dur (Min)	Imp Opt	Xray	See	Obs Type	Area Time (UT)	Measurement Apparent (10-6 Disk)	Corr (Sq Deg)	Remarks
							Region	Mo										
YUNN	07	0051	0053	0202	S17	W69				71	SN				79			
YUNN		0106E	0107	0116	N26	E31				10D	SN					0.9		
PALE		0109	0110	0113	N27	E28	5307	01	9.2	4	SF		3		63			
YUNN		0132E	0132	0145	N10	E17				13D	SN					0.7		
LEAR		0236	0236	0242	S19	W74	5301	01	1.5	6	SF	C 8.9	3		28			
LEAR		0406	0406	0415	N10	E17	5305	01	8.4	9	SF		4		22			
LEAR		0412	0413	0416	S34	E77	5312	01	13.3	4	SF		3		16			
LEAR		0412	0436	0444	S34	E80	5312	01	13.5	32	1F	X 1.1	3		119			
LEAR		0432	0440	0454	S18	W75	5301	01	1.5	22	SF		3		22			
LEAR		0744	0801	0813	S19	W75	5301	01	1.6	29	SF	C 8.6	4		50			
LEAR		0822	0831	0839	S19	W75	5301	01	1.6	17	SF		3		25			
GOES		1015	1025	1100						45		C 9.0						
RAMY		1154	1204	1235	S14	E48	5311	01	11.1	41	SF		4		51		FH	
SVTO		1224	1235	1253	S20	W76	5301	01	1.7	29	1F		2		154			
RAMY		1306	1331	1401	S19	W79	5301	01	1.5	55	SF	M 1.8	4		41		F	
RAMY		1430	1431	1454	S19	W78	5301	01	1.6	24	SF		4		28		F	
HOLL		1445E	1458	1505	S20	W77	5301	01	1.7	20D	SF		2		59			
HOLL		1517	1518	1527	S20	W78	5301	01	1.7	10	SF		2		32			
RAMY		1529	1529	1537	S29	E69	5312	01	13.0	8	SF		4		11			
HOLL		1627	1628	1644	N27	E20	5307	01	9.2	17	SF		3		60			
RAMY		1628	1628	1634	N27	E20	5307	01	9.2	6	SF		4		32		F	
RAMY		1700	1701	1710	S19	W81	5301	01	1.5	10	SF	M 1.3	3		16			
HOLL		1700	1701	1710	S20	W77	5301	01	1.8	10	SF	M 1.3	3		30			
RAMY		1714	1715	1719	S12	E46	5311	01	11.2	5	SF		3		18			
HOLL		1714	1716	1720	S12	E46	5311	01	11.2	6	SF		3		32			
RAMY		1714	1728	1744	S18	W77	5301	01	1.8	30	SF		3		26			
HOLL		1810	1814	1819	S18	W82	5301	01	1.5	9	SF	M 1.1	3		40			
HOLL		1821	1824	1901	S18	W77	5301	01	1.9	40	SN		3		88			
RAMY		1822E	1825U	1901	S19	W78	5301	01	1.8	39D	SF		2		74			
PALE		1824E	1827	1908D	S18	W77	5301	01	1.9	44D	SF		3		25			
RAMY		1828	1830	1839	S33	E71	5312	01	13.4	11	SF	M 1.2	2		32			
HOLL		1829	1830	1838	S34	E71	5312	01	13.4	9	SF	M 1.2	3		24			
HOLL		1844	1846	1852	S16	E30	5309	01	10.0	8	SF		3		14			
RAMY		1849	1945U	2024	S33	E72	5312	01	13.5	95	SF		2		62		F	
PALE		1905E	1940	2017	S35	E66	5312	01	13.1	72D	SF	M 1.3	3		27		F	
HOLL		1908	1917	1952	S33	E67	5312	01	13.1	44	SF		3		15			
RAMY		1918E	1947U	2012D	S19	W83	5301	01	1.5	54D	SF		2		90			
PALE		1929E	1934U	1959D	S16	W87	5301	01	1.2	30D	SN		3		35			
HOLL		1932	1941	1957	S18	W82	5301	01	1.6	25	SF		3		36			
HOLL		1932	1946	1957	S18	W82				25	SB				50		K	
HOLL		2125	2126	2207	N28	E35	5315	01	10.6	42	SF		3		24		F	
GOES		2129E	2130	2137D						8D		C 8.6						
GOES		2144	2257	2359						135		M 1.6						
YUNN	08	0040E	0043U	0043D	S19	W83				3D	SN				47			
YUNN		0040E	0226	0306	S19	W89				146D	SN				63		AK	
GOES		0514E	0517	0619						65D		C 6.6						
LEAR		0545	0546	0553	S17	W80	5301	01	2.2	8	SF		3		23			
GOES		0757E	0758	0802D						5D		M 2.4						
SVTO		0827E	0828	0856	S14	E43	5311	01	11.6	29D	SN		2		60		F	
LEAR		0828	0828	0844	S15	E42	5311	01	11.5	16	SN	C 9.6	3		65		F	
SVTO		0832	0833	0847	N27	E28	5315	01	10.5	15	SF		3		24			
SVTO		0851	0851	0900	N27	E09	5307	01	9.1	9	SF		3		23			
SVTO		1227	1239	1320D	S30	E58	5312	01	13.1	53D	1N		2		120		UF	
RAMY		1228E	1247	1335	S33	E58	5312	01	13.1	67D	1B	M 7.5	4		101		UF	
RAMY		1228E	1253	1335	S33	E58				67D	1B	M 7.5			96		K	
RAMY		1502	1509	1558	S27	E17	5310	01	9.9	56	SF	M 1.1	3		86		F	
RAMY		1510	1516	1643	N27	E25	5315	01	10.6	93	SF		3		16		F	
HOLL		1511E	1513U	1544	S27	E17	5310	01	9.9	33D	SF		2		47		F	
RAMY		1539	1541U	1549D	N19	E89		01	15.4	10D	SF		2					
GOES		1704	1717	1901						117		M 5.6						
RAMY		1751E	1753U	1805	S18	E13	5309	01	9.7	14D	SF		2		33		F	
HOLL		1812	1815	1832	N27	E06	5307	01	9.2	20	SF		3		24			
RAMY		1817	1817	1827	N27	E06	5307	01	9.2	10	SF		3		11		F	
PALE		1857	1909	1938	S35	E63	5312	01	13.8	41	SF	M 1.5	3		50		F	
HOLL		1902	1907	1925	S35	E62	5312	01	13.7	23	SF		3		37		F	
RAMY		1902	1916	1929	S34	E64	5312	01	13.9	27	SF		3		51		F	
GOES		1948	1955	2019						31		M 1.1						
HOLL		2019	2019	2022	S22	E21	5309	01	10.5	3	SF		3		23		F	

H α SOLAR FLARES

JANUARY 1989

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Day	Dur (Min)	Imp Opt	Xray	Obs See	Type	Area Measurement			Remarks			
															Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)				
GOES	08	2109	2114	2118						9											
[PALE		2142	2245	2303	S35	E53	5312	01	13.1	81	SF		3	E			29			F	
[HOLL		2230	2245	2300	S34	E55	5312	01	13.3	30	SF		3	E			33				
[HOLL		2325	2336	0000D	S34	E53	5312	01	13.2	35D	SN M	4.9	3	E			50			UF	
[PALE		2330	2350	2413	S32	E57	5312	01	13.5	43	SN		3	E			57			FE	
[LEAR		2335	2337	2356	S33	E54	5312	01	13.3	21	SF		3	E			16			F	
[PALE	09	0100	0109	0217	N29	E21	5315	01	10.7	77	2N M	3.2	3	E			408			UF	
[YUNN		0119E	0120U	0222	N29	E19				63D	1B			P			24			G	
[YUNN		0253	0306U	0306D	S17	E37				13D	SN			P			16			0.3	
GOES		0352	0358	0409						17											
LEAR		0458E	0515U	0535	S30	E47	5312	01	12.9	37D	SN M	2.0	3	E			64			UF	
LEAR		0632	0647	0856	S15	E26	5311	01	11.2	144	SF M	2.1	3	E			32			F	
YUNN		0734	0735	0743	S29	E48				9	SN			P			3			1.3	
YUNN		0734E	0800U	0856D	S14	E25				82D	SB			P			157			1.8	
YUNN		0743	0751	0818	S29	E33				35	SN			C			31			0.4	
SVTO		0745	0815	0915	S14	E24	5311	01	11.1	90	SF		3	E			94			F	
YUNN		0752	0755	0810	S30	E49				18	SN			C			31			0.5	
LEAR		0755	0756	0805	S32	E53	5312	01	13.5	10	SF		3	E			31				
GOES		1347	1409	1515						88											
RAMY		1539	1541U	1549D	N19	E89		01	16.4	10D	SF		2	E							
RAMY		1542E	1623U	1737	S31	E44	5312	01	13.1	115D	SF M	1.3	2	E			42			F	
RAMY		1546E	1547U	1553	N13	W13	5305	01	8.7	7D	SF		2	E			25			F	
HOLL		1616	1620	1632	S32	E42	5312	01	13.0	16	SF		3	E			13			F	
HOLL		1822	1828	1844	S31	E68		01	15.1	22	SF		3	E			58			F	
[PALE		1914	1921	2120	S32	E45	5312	01	13.4	126	1B M	8.3	3	E			150			YU	
[HOLL		1914	1922	2052	S33	E43	5312	01	13.2	98	1B M	8.3	3	E			177			UY	
[HOLL		1914	1946	2052	S33	E43				98	1B M	8.3	3	E			128			K	
[RAMY		1919	1923U	2105D	S32	E43	5312	01	13.2	106D	1B M	8.3	3	E			157			Y	
[HOLL		2254	2257	2312	N15	W17	5306	01	8.7	18	SF		3	E			16				
[LEAR	10	0021	0029	0029D	S29	E40		01	13.1	8D	1F M	3.0	3	E			114				
[LEAR		0021	0041	0127	S29	E40	5312	01	13.1	66	1N M	3.0	3	E			120			FK	
[YUNN		0048E	0048U	0048D	S31	E39				66D	SB			P			31			0.5	
[YUNN		0048E	0200	0225	S30	E36				97D	1B			C			157			2.2	
[PALE		0148	0155	0233	S31	E37	5312	01	13.0	45	SF		3	E			49			F	
[YUNN		0238	0243	0351D	S32	E41				73D	SN			P			47			0.7	
LEAR		0444	0446	0500	N25	E40		01	13.3	16	SF		4	E			31				
LEAR		0445	0452	0501	S29	E36	5312	01	13.0	16	SF		3	E			41			F	
LEAR		0446	0446	0508	S25	W03	5310	01	10.0	22	SF		4	E			38				
LEAR		0549	0552	0608	S31	E61	5316	01	15.0	19	1F M	1.4	4	E			133			F	
[LEAR		0622	0625	0648	S35	E43	5312	01	13.7	26	SN M	3.6	3	E			97			FE	
[YUNN		0627E	0634	0750	S35	E41				83D	SN			P			126			2.0	
[LEAR		0720	0722	0726	S30	E36	5312	01	13.1	6	SF		4	E			29				
[YUNN		0815E	0815U	0823	S29	E34				8D	SN			P			47			0.6	
[LEAR		0818	0821	0824	S29	E33	5312	01	12.9	6	SF		3	E			13				
[LEAR		0832	0833	0843	S14	E14	5311	01	11.4	11	SF		4	E			18				
[SVTO		1017	1018	1029	N34	E04	5315	01	10.7	12	SF		3	E			15				
[SVTO		1125	1130	1141	S27	E31	5312	01	12.9	16	SF		3	E			35				
GOES		1304	1312	1328						24											
SVTO		1342	1345	1400	S29	E33	5312	01	13.1	18	SF		3	E			35			F	
SVTO		1356	1403	1417	S27	W09	5310	01	9.9	21	SF		3	E			13				
RAMY		1505E	1506U	1527D	S33	E35	5312	01	13.4	22D	SF		2	E			33			F	
[HOLL		1529	1548	1612D	N30	W01	5315	01	10.6	43D	SF		3	E			99			F	
[RAMY		1541E	1550U	1630D	N31	E02	5315	01	10.8	49D	SF		2	E			97			F	
[RAMY		1541E	1626	1640D	S34	E37	5312	01	13.6	59D	SF		2	E			42			F	
[RAMY		1733E	1755U	1915D	S34	E37	5312	01	13.7	102D	1F M	2.6	2	E			132			UF	
[HOLL		1746	1753	1831	S35	E37	5312	01	13.7	45	SN M	2.6	3	E			67			UF	
[HOLL		1746	1805	1831	S35	E37				45	SN			E			78			K	
[PALE		1752E	1756	1824D	S35	E36	5312	01	13.6	32D	SN		3	E			88			UF	
[PALE		1855	1904	2008D	N32	W01	5315	01	10.7	73D	SF M	1.6	3	E			74			F	
[RAMY		1855	1910U	2010D	N32	W01	5315	01	10.7	75D	SF M	1.6	2	E			72			F	
[HOLL		1857	1910U	2021	N30	W02	5315	01	10.6	84	SF		3	E			93			F	
[PALE		1925	1927	1936	S32	E29	5312	01	13.1	11	SF		3	E			23			F	
[RAMY		2020	2026	2138D	S30	E29	5312	01	13.1	78D	1B X	1.4	2	E			236			YF	
[RAMY		2020	2048	2138D	S30	E29				78D	1B X	1.4	2	E			196			K	
[PALE		2022E	2029U	2146D	S32	E33	5312	01	13.5	84D	1B X	1.4	3	E			243			YF	
[HOLL		2023	2031	2126	S31	E30	5312	01	13.2	63	1B X	1.4	3	E			196			YU	
[HOLL		2023	2046	2126	S31	E30				63	1B			E			166			K	

20
Jan 89

H α SOLAR FLARES

JANUARY 1989

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/USAF		Dur (Min)	Imp Opt	Xray	Obs See	Type	Area Measurement		Remarks	
							Region	Mo Day						Time (UT)	Apparent (10-6 Disk)		Corr (Sq Deg)
HOLL	10	2110	2113	2132	N27	E69	5317	01	16.2	22	SF	3	E	36			
HOLL		2111	2112	2119	N17	E87		01	17.5	8	SF	3	E	20			
HOLL		2303	2312	2326	S15	E06	5311	01	11.4	23	SF	3	E	28			
LEAR		2311	2315	2321	S31	E34	5312	01	13.6	10	SF	3	E	29			
HOLL		2315	2315	2320	S33	E29	5312	01	13.3	5	SF	3	E	18		F	
LEAR		2336	2339	2358	S32	E32	5312	01	13.5	22	SF	3	E	29			
LEAR	11	0030	0032	0045	S31	E34	5312	01	13.7	15	SF M	2.1	3	E	52		F
PALE		0100E	0100U	0148D	S33	E35	5312	01	13.8	48D	SF		2	E	32		F
GOES		0207	0212	0218						11	C	5.8					
YUNN		0241	0245	0253	S17	W01				12	SN		C	31	0.3		
LEAR		0244	0244	0252	N19	E66	5317	01	16.1	8	SF	3	E	13			
LEAR		0257	0300	0314	N20	E68	5317	01	16.3	17	SF C	7.6	3	E	16		
LEAR		0428	0448	0614	N32	W07		01	10.6	106	2N		4	E	296		
YUNN		0440	0444	0638	N33	W07				118	1B		P	393	5.1		
LEAR		0445	0446	0452	S32	E32	5312	01	13.7	7	SF M	1.0	4	E	21		
YUNN		0626	0635	0635D	S28	E30				9D	SB		C	63	0.8		
YUNN		0626	0648	0700	S36	E29				34	1B		C	157	2.2	FK	
LEAR		0635	0650	0705	S34	E28	5312	01	13.5	30	SF M	1.9	3	E	74		F
GOES		0950	0954	1004						14	M	1.2					
GOES		1040	1046	1055						15	C	5.0					
GOES		1131	1209	1214						43	C	6.5					
GOES		1312	1316	1320						8	C	8.7					
HOLL		1517	1519	1616	N19	E61	5317	01	16.3	59	SF		3	E	30		
HOLL		1523	1525	1607	N28	E51	5318	01	15.6	44	SF		3	E	39		
GOES		1528	1533	1639						71	M	1.2					
HOLL		1529	1530	1625	S33	E28	5312	01	13.9	56	SN		3	E	69		FE
HOLL		1536	1537	1544	N19	E85		01	18.1	8	SF		3	E	15		
HOLL		1555	1556	1601	S14	W04	5311	01	11.4	6	SF		3	E	47		
HOLL		1617	1635	1651	N20	E61	5317	01	16.3	34	SF		3	E	71		
HOLL		1628	1628	1640	S16	W28	5309	01	9.6	12	SF		3	E	11		
HOLL		1641	1646	1656	S34	E20	5312	01	13.3	15	SF		3	E	27		
HOLL		1745	1825	1846	S33	E20	5312	01	13.3	61	SF C	5.6	3	E	52		FE
GOES		1800	1803	1807						7	C	8.1					
HOLL		1942	1944	1955	N19	E84	5321	01	18.2	13	SN C	5.7	3	E	72		
HOLL		1952	1952	2004	N20	E53	5317	01	15.9	12	SF		3	E	18		
HOLL		2036	2037	2041	S32	E21	5312	01	13.5	5	SF		3	E	26		
HOLL		2047E	2049	2056	S34	E21	5312	01	13.5	9D	SF C	7.4	3	E	26		
HOLL		2129	2131	2150	N28	E53	5318	01	16.0	21	SF C	5.3	3	E	52		
GOES		2225E	2249	2310D						45D	C	8.9					
HOLL		2247E	2255	2331	N19	E58	5317	01	16.4	44D	1N		3	E	125		F
HOLL		2252	2254	2312	N19	E70	5321	01	17.3	20	SF		3	E	41		
HOLL		2336	2337	2406D	N18	E73	5321	01	17.5	30D	SF		3	E	32		
YUNN	12	0023E	0027U	0043	S27	E17				20D	SN		P	31	0.4		
LEAR		0027	0028	0041	S28	E17	5312	01	13.3	14	SF		4	E	26		
YUNN		0043	0056	0120	S34	E23				37	SB		C	24	0.3		
LEAR		0050	0059	0113	S34	E23	5312	01	13.9	23	SF		4	E	41		
YUNN		0123	0138	0202	N22	E45				39	SN		C	94	1.5		
LEAR		0202	0202	0207	N19	E76	5321	01	17.9	5	SF		4	E	18		
YUNN		0248E	0248U	0257	S35	E21				9D	SN		P	24	0.3		
LEAR		0417	0423	0457	S34	E19	5312	01	13.7	40	1N M	1.4	4	E	150		E
YUNN		0432E	0441U	0512	S34	E17				40D	SN		P	79	1.0		
LEAR		0521	0525	0533	N20	E51	5317	01	16.1	12	SF		4	E	31		F
YUNN		0630	0638	0714	S28	E13				44	SN		C	79	0.9		
LEAR		0633	0643	0656	S30	E15	5312	01	13.4	23	SF C	4.7	3	E	63		F
LEAR		0635	0635	0642	N27	W38	5307	01	9.3	7	SF		3	E	11		
YUNN		0738	0744	0811	S32	E20				33	SN		C	157	1.9		
LEAR		0750	0750	0802	S32	E16	5312	01	13.6	12	SF		3	E	31		F
YUNN		0825	0829	0829D	S31	E15				4D	SN		P	47	0.6		
LEAR		0832	0835	0857	S33	E15	5312	01	13.5	25	SF C	4.2	4	E	27		F
RAMY		1435	1435	1501	N29	W44	5307	01	9.1	26	SF		3	E	24		
RAMY		1646	1646	1650	S30	E02	5312	01	12.8	4	SF		4	E	28		
RAMY		1728E	1752U	1821D	S15	W12	5311	01	11.8	53D	1F C	8.7	1	E	122		F
HOLL		1739	1745U	1857D	S16	W12	5311	01	11.8	78D	1N C	8.7	3	E	158		
HOLL		2029E	2029U	2218	N20	E44	5317	01	16.2	109D	1N M	4.7	2	E	267		U
HOLL		2220	2227	2236	S27	W39	5310	01	9.9	16	SF		3	E	26		
HOLL		2303	2306	2319	N28	W25	5315	01	11.0	16	SF		3	E	11		
LEAR	13	0003	0008	0126	S30	E03	5312	01	13.2	83	SF M	1.5	4	E	58		F

H α SOLAR FLARES

JANUARY 1989

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Dur Day	(Min)	Imp Opt	Xray	Obs See	Type	Area Measurement			Remarks
															Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)	
LEAR	13	0040	0046	0051	N13	W59	5305	01	8.6	11	SF		4	E		40		H
LEAR		0135	0204	0232	S31	E10	5312	01	13.8	57	SF		4	E		46		F
LEAR		0155	0202	0224	S33	E30	5316	01	15.5	29	SF		4	E		98		F
LEAR		0351	0355	0416	S34	E06	5312	01	13.6	25	1N M 2.1		4	E		156		FE
LEAR		0358	0400	0422	N29	E39	5318	01	16.2	24	SF		4	E		58		H
LEAR		0452	0455	0513	N27	W51	5307	01	9.2	21	SF		4	E		39		
LEAR		0829	1018	1045D	S31	W05	5312	01	12.9	136D	2B X 2.3		4	E		243		UF
LEAR		0912	0912	0920	S16	W21	5311	01	11.8	8	SF		4	E		24		
SVTO		0932E	1029U	1410D	S29	W03	5312	01	13.2	278D	2B		2	E		283		UF
SVTO		1200	1200	1212	S31	W47	5310	01	9.8	12	SF		2	E		17		
GOES		1225	1242	1527						182		M 9.2						
SVTO		1255	1255	1306	S33	E23	5316	01	15.4	11	SF		2	E		75		
RAMY		1618E	1742	1859	S30	W07	5312	01	13.1	161D	1N M 6.1		3	E		151		FE
RAMY		1643	1652	1729	N17	E52	5321	01	17.6	46	SF		3	E		31		F
RAMY		1804	1811	1848	N21	E31	5317	01	16.1	44	SF		3	E		51		F
RAMY		1845	1926	2027	N18	E55	5321	01	18.0	102	1F M 1.4		3	E		156		
RAMY		1859	2047	2126	S31	W10	5312	01	13.0	147	1N		3	E		114		F
RAMY		1859	2116	2126	S31	W10				147	1N					42		K
RAMY		1913	2038	2133	N23	E30	5317	01	16.1	140	SF		3	E		40		
GOES		2010	2015	2110						60		M 2.0						
RAMY		2025	2052	2133	S31	E15	5316	01	15.0	68	SF		3	E		43		F
RAMY		2027	2114	2135D	N18	E53	5321	01	17.9	68D	1N M 1.6		3	E		164		
RAMY		2118	2121	2131	S15	W31	5311	01	11.5	13	SF		3	E		36		
GOES		2152	2206	2606						254		M 2.8						
HOLL		2203E	2206U	2408D	S32	W09	5312	01	13.2	125D	1N		2	E		104		UF
LEAR		2209E	2209U	2220	S34	W04	5312	01	13.6	11D	SF		2	E		38		
LEAR		2246	2325	2352	S32	W10	5312	01	13.1	66	SF		3	E		35		F
HOLL		2253E	2254	2312	N20	E28	5317	01	16.1	19D	SF		2	E		11		F
HOLL		2303	2309	2329	N17	E53	5321	01	18.0	26	SF		2	E		39		F
LEAR		2309	2319	2326	N17	E49	5321	01	17.7	17	SF		3	E		11		
LEAR		2334	2334	2345	N17	E49	5321	01	17.7	11	SF		3	E		14		
LEAR	14	0024	0035	0038	N27	E32	5318	01	16.5	14	SF		3	E		21		F
LEAR		0106	0125	0142	N21	E27	5317	01	16.1	36	SF		3	E		20		F
LEAR		0158	0201	0208	S32	E11	5316	01	14.9	10	SF		4	E		20		F
LEAR		0205	0207	0227	N12	W75	5305	01	8.4	22	1F		4	E		128		FH
LEAR		0214	0215	0222	N26	E29	5318	01	16.3	8	SF M 1.0		4	E		15		F
LEAR		0219	0230	0246	S34	W10	5312	01	13.3	27	SF		4	E		61		F
LEAR		0252	0254	0308	S15	W32	5311	01	11.7	16	SF		4	E		28		F
LEAR		0254	0333	0354	S31	W17	5312	01	12.8	60	1N M 6.2		4	E		119		FE
LEAR		0254	0414	0459	S32	W10	5312	01	13.3	125	2B X 2.1		3	E		285		UF
LEAR		0254	0419	0459	S32	W10				125	2B X 2.1			E		161		K
LEAR		0501	0505	0519	S31	W10	5312	01	13.4	18	SF		3	E		26		F
SVTO		0942E	1002	1025	N17	E43	5321	01	17.7	43D	SF		3	E		83		F
SVTO		1019	1021	1033	N25	W73	5304	01	8.8	14	SF		3	E		23		
RAMY		1140	1149	1205D	N28	E27	5318	01	16.6	25D	SF		2	E		66		F
SVTO		1202E	1202U	1229	N30	E25	5318	01	16.5	27D	SF		3	E		30		
RAMY		1353	1353	1418	S30	W22	5312	01	12.8	25	SF M 1.1		4	E		22		FE
SVTO		1353	1355	1406	S31	W22	5312	01	12.8	13	SF M 1.1		3	E		16		F
HOLL		1531	1538	1550	N22	E20	5317	01	16.2	19	SF		3	E		19		
RAMY		1534	1538	1545	N23	E21	5317	01	16.3	11	SF		3	E		12		
HOLL		1552	1553	1607	N22	E20	5317	01	16.2	15	SF		3	E		20		
RAMY		1552	1554	1559	N21	E20	5317	01	16.2	7	SF		4	E		19		F
HOLL		1606	1610	1621	S36	W14	5312	01	13.5	15	SF		3	E		11		
RAMY		1606	1613	1621	S36	W12	5312	01	13.7	15	SF		3	E		19		F
HOLL		1638	1639	1644	N22	E20	5317	01	16.2	6	SF		3	E		16		
HOLL		1718E	1719	1733	N22	E20	5317	01	16.2	15D	SF		3	E		28		
HOLL		1718E	1723	1754	S17	W43	5311	01	11.4	36D	SF		4	E		48		
RAMY		1718	1724	1748	S17	W45	5311	01	11.3	30	SF		3	E		50		
HOLL		1757	1801	1845	N22	E16	5317	01	16.0	48	SF		4	E		60		F
RAMY		1800	1801	1808	N22	E19	5317	01	16.2	8	SF		3	E		21		F
RAMY		1808	1808	1816	S32	E03	5316	01	15.0	8	SF		3	E		22		F
HOLL		1808	1809	1818	S32	E03	5316	01	15.0	10	SF		4	E		29		
RAMY		1818	1853	1933D	N17	E42	5321	01	17.9	75D	SF		2	E		93		
PALE		1851	1855	1917	N16	E43	5321	01	18.0	26	SF		3	E		74		F
RAMY		1856	1904	1914	S21	E32	5320	01	17.2	18	SF		3	E		11		
RAMY		1940	1944	2110D	N18	E42	5321	01	18.0	90D	1N C 8.3		2	E		104		UF
HOLL		1940	1944	2112	N17	E42	5321	01	18.0	92	1N C 8.3		4	E		114		UF
PALE		1940	1945	2112	N17	E44	5321	01	18.2	92	1N C 8.3		3	E		128		F

22
Jan 89

H α SOLAR FLARES

JANUARY 1989

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/USAF		Dur (Min)	Imp Opt	Xray	Obs See	Type	Area Measurement		Remarks
							Region	Mo Day						Time (UT)	Apparent (10-6 Disk)		Corr (Sq Deg)
RAMY	14	2044	2054U	2104D	N20	E16	5317	01	16.1	20D	SF	2	E	15		
HOLL		2044	2110	2127	N22	E17	5317	01	16.2	43	SF	3	E	26		
RAMY		2109E	2110U	2123D	N22	E18	5317	01	16.3	14D	SF	2	E	21		F
RAMY		2118E	2145U	2148D	S31	W24	5312	01	13.0	30D	SF M 2.4	2	E	48		F
PALE		2145	2239	2309	S29	W26	5312	01	12.9	84	1B X 1.1	3	E	108		F
LEAR		2232	2245	2359	S13	W26	5312	01	13.0	87	SN	3	E	82		UF
PALE		2253	2254	2304	S31	W02	5316	01	14.8	11	SF	3	E	22		
LEAR		2253	2254	2308	S32	W01	5316	01	14.9	15	SF	3	E	34		FH
HOLL		2253	2254	2310	S32	W01	5316	01	14.9	17	SF	3	E	54		
LEAR		2342	2407U	2435	S14	W46	5311	01	11.5	53	1F	3	E	110		F
PALE		2345	2349	2521	S32	W20	5312	01	13.4	96	SF	3	E	22		
PALE		2345	2454	2521	S32	W20				96	SF		E	25		K
PALE		2357	2409	2417	S15	W46	5311	01	11.5	20	SF	3	E	19		
PALE	15	0027	0027	0035	N16	E39	5321	01	18.0	8	SF	3	E	10		
LEAR		0038	0043	0056	S17	W48	5311	01	11.4	18	SF	3	E	71		
LEAR		0043	0045	0107	S32	W20	5312	01	13.4	24	SF	3	E	12		
LEAR		0108	0116	0124	S31	W21	5312	01	13.4	16	SF	3	E	12		
YUNN		0329	0333	0333D	S29	W20				4D	SN		P	16		0.2
YUNN		0329	0416	0416D	S32	W24				47D	SN		P	157		2.0
YUNN		0329	0501	0551	S32	W26				142	1N		P	314		4.0
YUNN		0338	0350	0402	N21	E10				24	SN		C	63		0.7
YUNN		0406	0412	0419	N22	E13				13	SN		C	79		0.9
YUNN		0538	0543	0607	N30	E18				29	1B		P	189		2.5
LEAR		0540	0541	0625	N29	E12	5318	01	16.2	45	SF	3	E	93		F
YUNN		0559	0616	0657	S31	W31				58	SN		P	79		1.1
YUNN		0633	0648	0727	N22	W02				54	1N		C	236		2.7
LEAR		0647	0656	0708	N21	E01	5317	01	15.3	21	SF	3	E	36		
YUNN		0754	0756	0844	S32	W32				50	SN		C	63		0.9
LEAR		0758	0759	0806	S31	W31	5312	01	12.9	8	SF M 1.0	4	E	12		F
SVTO		0801E	0802U	0807	S32	W31	5312	01	12.9	6D	SF	1	E	25		
SVTO		1151E	1151U	1158	S32	W26	5312	01	13.4	7D	SF C 7.0	2	E	39		F
RAMY		1238	1300	1341	S31	W30	5312	01	13.1	63	SF M 1.0	3	E	71		F
RAMY		1304	1305	1332	N21	E05	5317	01	15.9	28	SF	3	E	27		F
SVTO		1310E	1312U	1340	N22	E07	5317	01	16.1	30D	SF	2	E	32		F
RAMY		1316	1316	1329	S32	W08	5316	01	14.9	13	SF	3	E	11		
HOLL		1505	1533U	1604	S32	W10	5316	01	14.8	59	SF	3	E	59		F
HOLL		1515	1550	1703	S31	W37	5312	01	12.7	108	1B	3	E	184		F
RAMY		1532	1534	1544	S32	W29	5312	01	13.3	12	SF	3	E	13		F
RAMY		1546	1550	1651	S31	W36	5312	01	12.8	65	1B M 4.5	3	E	126		F
RAMY		1638	1642	1707	N22	E07	5317	01	16.2	29	SF	3	E	27		F
HOLL		1841	1842	1849	S33	W29	5312	01	13.5	8	SF	3	E	13		F
RAMY		1930E	2011U	2113D	S31	W30	5312	01	13.4	103D	SF	3	E	33		F
HOLL		1931	1935	1944	S32	W31	5312	01	13.3	13	SF	3	E	16		F
PALE		1932	1951	2002	S32	W31	5312	01	13.3	30	SF	3	E	33		
HOLL		1945	2039	2101	S32	W31	5312	01	13.4	76	SN	3	E	84		F
HOLL		2005	2039	2101	S32	W31	5312	01	13.4	56	SN	3	E	84		F
PALE		2005	2039	2105	S31	W34	5312	01	13.1	60	SN	3	E	70		FE
PALE		2159	2218	2233	N20	E30	5321	01	18.2	34	SF	3	E	85		F
HOLL		2218	2222	2239	N18	E28	5321	01	18.1	21	SF	3	E	73		
PALE		2233	2235	2252	N30	E10	5318	01	16.7	19	SF	3	E	19		
LEAR		2313	2426	2449	N21	E02	5317	01	16.1	96	SF	3	E	45		F
LEAR		2315	2321	2341	S30	W36	5312	01	13.1	26	SF C 5.9	3	E	42		
HOLL		2334	2335	2335D	S21	E17	5320	01	17.3	1D	SF	3	E	22		
LEAR	16	0134	0136	0145	S32	W09	5316	01	15.3	11	SF	3	E	27		
PALE		0134	0136	0145	S32	W10	5316	01	15.3	11	SF	3	E	26		
LEAR		0144	0148	0202	S17	W61	5311	01	11.4	18	SF	3	E	31		F
PALE		0145	0148	0151	S14	W59	5311	01	11.6	6	SF	3	E	20		
LEAR		0207	0210	0219	S16	W60	5311	01	11.5	12	SF	3	E	28		
LEAR		0215	0220	0227	N22	W11		01	15.2	12	SF	3	E	11		
PALE		0217	0220	0228	N23	W11		01	15.2	11	SF	3	E	14		
LEAR		0230	0238	0249	S16	W63	5311	01	11.3	19	SF	3	E	29		
LEAR		0234	0234	0241	S31	W43	5312	01	12.7	7	SF	3	E	30		F
PALE		0235E	0237	0243	S30	W45	5312	01	12.6	8D	SF	2	E	34		
LEAR		0307	0325	0328D	S31	W40		01	13.0	21D	2B	3	E	319		
LEAR		0307	0350	0405	S31	W40	5312	01	13.0	58	2B M 1.7	3	E	280		FK
LEAR		0316	0328	0353	N19	E23	5321	01	17.9	37	SF	3	E	99		H
PALE		0324E	0327U	0331D	S31	W43	5312	01	12.7	7D	1F	2	E	102		F

H α SOLAR FLARES

JANUARY 1989

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	Day	Dur (Min)	Imp Opt	Xray	Obs See	Type	Area Measurement			Remarks
															Time (UT)	Apparent (10-6 Disk)	Corr (Sq Deg)	
PALE	16	0324E	0330U	0331D	N17	E20	5321	01	17.7	7D	SF		2	E		32		F
YUNN		0511	0519	0552	S32	W35				41	SN			C		63	0.9	
YUNN		0514	0519	0541	S31	W17				27	SN			C		31	0.4	
LEAR		0520	0529	0536	S28	W36	5312	01	13.4	16	SF		4	E		36		F
YUNN		0614	0616	0621	N23	W14				7	SN			C		47	0.6	
LEAR		0616	0630	0659	S31	W37	5312	01	13.3	43	1N M	1.4	4	E		140		F
LEAR		0616	0638	0659	S31	W37				43	1N			E		60		K
YUNN		0625	0627	0647D	S31	W38				22D	1B			P		189	2.7	
YUNN		0639	0641	0647D	S20	W65				8D	SN			P		31	0.8	
YUNN		0721	0736	0809	S25	W32				48	SN			P		110	1.4	
LEAR		0723	0729	0749	S16	W64	5311	01	11.4	26	SF		4	E		51		
YUNN		0724	0729	0736	S16	W68				12	SN			C		126		
YUNN		0729	0736	0754	N21	E22				25	1F			C		346	4.3	
LEAR		0729	0800	0821	N19	E23	5321	01	18.1	52	SF		4	E		70		
LEAR		0825	0833	1006	S30	W37	5312	01	13.4	101	1F M	2.1	4	E		124		F
LEAR		0825	0932	1006	S30	W37				101	1B			E		39		K
SVTO		0830E	0830U	0918D	S30	W35	5312	01	13.6	48D	SF		2	E		68		F
YUNN		0833E	0843U	0902	S28	W39				29D	SB			P		126	1.8	
YUNN		0852	0900	0914	N29	E87				22				P				AG
YUNN		0904E	0906	0924D	S31	W39				20D	SN			P		79	1.2	
GOES		1051	1101	1504						253		M	5.1					
RAMY		1138E	1140U	1219D	S20	W05	5320	01	16.1	41D	SF		2	E		45		
SVTO		1151E	1158U	1337D	S32	W39	5312	01	13.4	106D	1F		2	E		174		F
RAMY		1156E	1214U	1328	S31	W39	5312	01	13.4	92D	1F		2	E		105		F
RAMY		1504	1507	1651	S32	W42	5312	01	13.3	107	SF M	1.8	3	E		25		F
HOLL		1506	1509	1703	S32	W42	5312	01	13.3	117	SF		3	E		41		F
HOLL		1617	1630	1703	S20	E08	5320	01	17.3	46	SF		3	E		66		F
RAMY		1641	1648	1729	S16	W68	5311	01	11.5	48	SF		3	E		91		F
HOLL		1643	1649	1729	S16	W67	5311	01	11.6	46	SF		3	E		98		F
RAMY		1647	1647	1656	S21	E05	5320	01	17.1	9	SF		3	E		29		
RAMY		1703	1714	1757	N19	E18	5321	01	18.1	54	SF		3	E		88		F
HOLL		1703	1715	1755	N19	E17	5321	01	18.0	52	1F		4	E		101		F
RAMY		1756	1756	1812	S36	W36	5312	01	13.8	16	SN C	6.6	3	E		39		F
HOLL		1756	1757	1808	S36	W36	5312	01	13.8	12	SN C	6.6	4	E		44		FE
HOLL		1949	1950	1956	S36	W37	5312	01	13.8	7	SF		4	E		20		FH
HOLL		1959	2005	2034	S30	W49	5312	01	13.0	35	SF		4	E		25		FH
HOLL		2026	2038	2107	N21	W09	5317	01	16.2	41	SF		4	E		39		F
GOES		2207	2218	2402D						115D		M	7.2					
YUNN	17	0142	0146	0204	S30	W54				22	SN			C		31	0.6	
YUNN		0355	0358	0417	S19	E02				22	SN			C		79	0.8	
YUNN		0501	0502	0506	N18	E08				5	SN			C		47	0.5	
YUNN		0508	0514	0540	N21	W15				32	SN			C		79	0.9	
YUNN		0512	0514	0524	N18	E08				12	SN			C		47	0.5	
GOES		0533E	0540	0552D						19D		C	9.4					
YUNN		0533	0540	0603	N21	E10				30	2B			C		865	10.0	F
YUNN		0559	0616	0635	N29	E12				36	SN			P		126	1.6	F
YUNN		0632	0640	0650	S20	E00				18	SN			C		189	2.0	
GOES		0640	0644	0647						7		C	5.7					
GOES		0817	0820	0825						8		C	3.5					
YUNN		0831E	0831U	0900	S19	W01				29D	SN			P		189	2.0	E
LEAR		0833	0834	0852	S19	W02	5320	01	17.2	19	SF		3	E		85		
LEAR		0837	0838	0843	N20	W17	5317	01	16.0	6	SF		3	E		26		
YUNN		0840	0844	0848	N25	W18				8	SF			C		63	0.8	E
LEAR		0910	0913	0922	S29	W58	5312	01	12.8	12	SF		3	E		22		
LEAR		0919	0919	0929	S18	W03	5320	01	17.1	10	SF		3	E		17		
RAMY		1219E	1219U	1238D	N16	E05	5321	01	17.9	19D	SF		3	E		30		
RAMY		1221	1227	1246	N30	W12	5318	01	16.6	25	SF		3	E		13		
RAMY		1413	1413	1418	S29	W61	5312	01	12.8	5	SF C	4.6	3	E		13		
RAMY		1421	1422	1445	N20	W19	5317	01	16.1	24	SF		3	E		18		
GOES		1529	1532	1536						7		C	4.2					
HOLL		1645	1650	1659	N27	W13	5318	01	16.7	14	SF		3	E		24		
HOLL		1652	1656	1700	N21	W21	5317	01	16.1	8	SF		3	E		16		F
HOLL		1743	1754	1807	N28	W13	5318	01	16.7	24	SF		3	E		14		
HOLL		1809	1827	1908	S20	W07	5320	01	17.2	59	SF		3	E		65		F
HOLL		1853	1853	1904	N21	W22	5317	01	16.1	11	SF		3	E		10		F
HOLL		1931	1935	1959	N21	W22	5317	01	16.1	28	SF		3	E		37		F
HOLL		1946	1947	1959	S21	W10	5320	01	17.0	13	SF		3	E		19		
HOLL		2016	2017	2023	S29	W65	5312	01	12.7	7	SF		3	E		26		

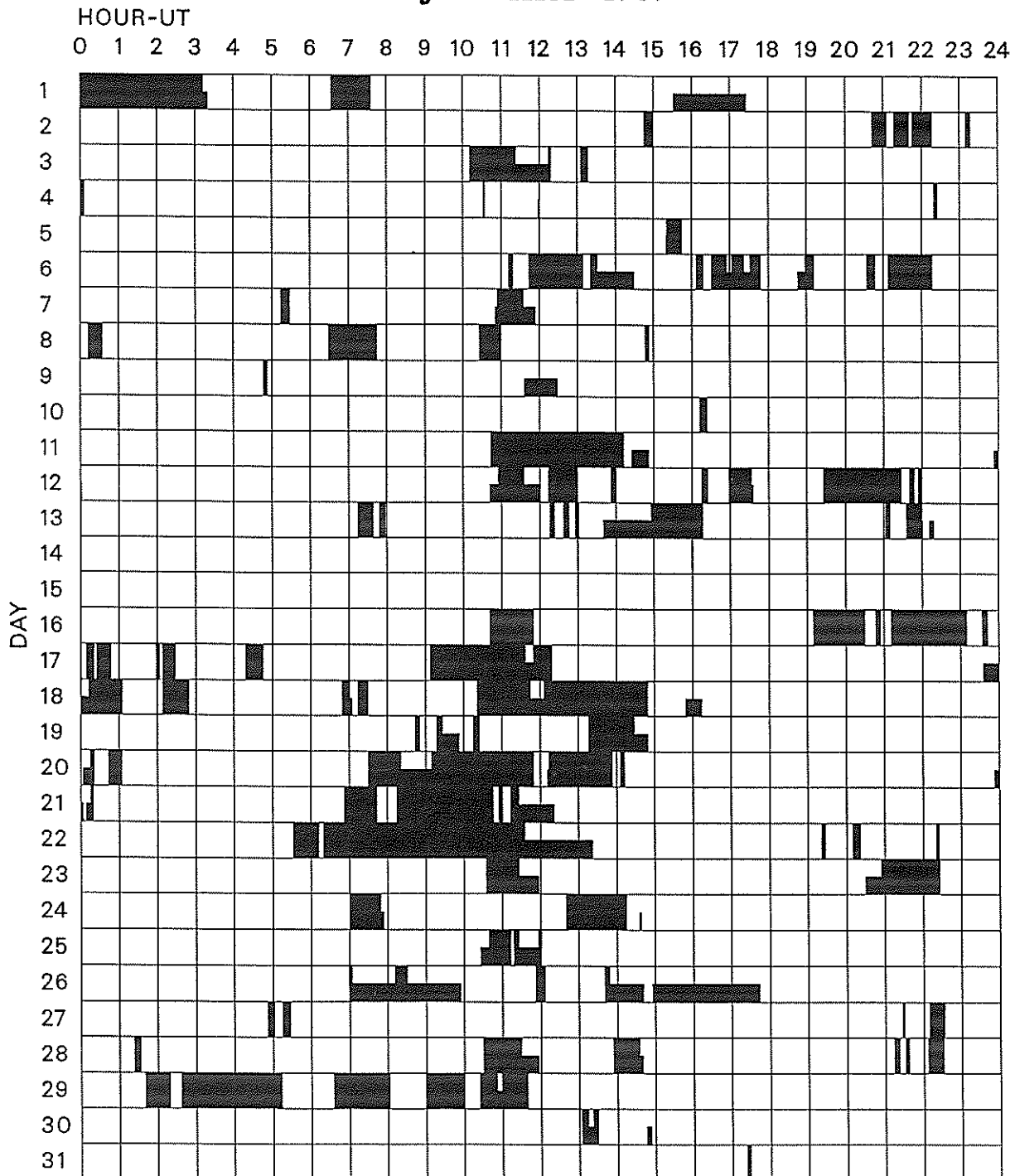
26
Jan 89

H α SOLAR FLARES
JANUARY 1989

Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/USAF		Dur (Min)	Imp Opt	Xray	Imp See	Obs Type	Area Measurement		Remarks
							Region	Mo Day						Time (UT)	Apparent (10-6 Disk)		Corr (Sq Deg)
LEAR	24	0424	0435	0446	N16	E35	5329	01	26.8	22	SF C 3.9	3	E	45		F
LEAR		0542	0551	0557	N20	E32	5329	01	26.7	15	SF		E	41		F
SVTO		0750E	0750U	0828D	S18	E48	5330	01	28.0	38D	SF		E	92		F
SVTO		0818E	0819U	0830D	N13	E37	5329	01	27.1	12D	SF C 3.5	2	E	26		F
SVTO		0854E	0858	0946D	N22	W07	5324	01	23.8	52D	SF		E	30		F
LEAR		0855	0858	0917	N22	W06	5324	01	23.9	22	SF		E	19		FH
LEAR		1005	1014	1035	N24	W03	5324	01	24.2	30	SF C 6.7	3	E	47		F
SVTO		1007	1020	1154	N22	W07	5324	01	23.9	107	SF C 6.7	3	E	45		F
RAMY		1139E	1139U	1225D	N24	W06	5324	01	24.0	46D	SF		E	48		F
HOLL		1456	1456	1502	N14	E26	5329	01	26.6	6	SF		E	33		F
HOLL		1536	1551	1606	N15	E29	5329	01	26.8	30	SF C 5.2	3	E	56		F
HOLL		1711	1733	1800	N17	E23	5329	01	26.5	49	SF C 4.7	3	E	86		F
RAMY		1720	1810U	1811D	N17	E23	5329	01	26.5	51D	1N M 1.1	2	E	146		FE
RAMY		1720	1810U	1848	N15	E25	5329	01	26.6	88	1N M 1.1	2	E	146		FE
PALE		1730E	1808	1851	N15	E26	5329	01	26.7	81D	1N M 1.1	3	E	110		FE
HOLL		1754	1754	1758	S22	E62	5330	01	29.5	4	SF		E	14		F
HOLL		1801	1808	1854	N17	E28	5329	01	26.9	53	1B		E	203		FE
HOLL		1811	1821	1825	S17	E61	5330	01	29.4	14	SF		E	18		F
RAMY		1818	1821	1834	S18	E60	5330	01	29.3	16	SF		E	18		F
PALE		1854	1858	1925	N16	E21	5329	01	26.4	31	SF		E	39		F
RAMY		1856	1857	1907	N17	E26	5329	01	26.8	11	SF		E	34		F
PALE		1931	1931	1953	S19	E56	5330	01	29.1	22	SF		E	19		E
PALE		2131	2133	2136	S25	E90		01	31.9	5	SF		E	29		F
PALE		2158	2203	2217	S19	E56	5330	01	29.2	19	SF		E	35		F
PALE		2243	2305	2412	N17	E23	5329	01	26.7	89	SF M 1.2	3	E	80		F
LEAR		2306	2316	2416	N17	E23	5329	01	26.7	70	SF M 1.2	3	E	48		F
PALE		2333	2334	2413	S22	E64	5330	01	29.9	40	SF		E	34		F
YUNN	25	0256	0300	0309D	N18	E22				13D	SN		P	94	1.1	E
GOES		0345	0401	0431						46	C 3.3					
GOES		0639E	0656	0715D						36D	C 4.4					
SVTO		0712E	0714U	0725	S24	E90		02	1.2	13D	SF C 8.0	2	E			
GOES		1006	1009	1012						6	C 2.4					
GOES		1040E	1042	1049D						9D	C 6.7					
GOES		1137	1141	1144						7	C 2.8					
RAMY		1233	1240	1259	N20	W52	5323	01	21.5	26	SF		E	59		F
RAMY		1240	1243	1255	N15	E15	5329	01	26.7	15	SF		E	17		F
SVTO		1320E	1321U	1327	N12	E17	5329	01	26.8	7D	SF		E	18		F
SVTO		1418	1420	1440	S20	E53	5330	01	29.6	22	SF C 4.0	2	E	45		F
HOLL		1420E	1421U	1440	S22	E52	5330	01	29.6	20D	SF C 4.0	2	E	63		F
RAMY		1449	1455	1616	N00	E43	5330	01	28.8	87	SN M 2.1	4	E	81		FE
HOLL		1455	1502	1520	N17	E11	5329	01	26.4	25	SF		E	65		F
SVTO		1502E	1503U	1525D	S20	E50	5330	01	29.4	23D	SN		E	85		F
RAMY		1503	1503	1524	N17	E12	5329	01	26.5	21	SF		E	60		F
RAMY		1529	1531	1539	N17	E13	5329	01	26.6	10	SF		E	11		F
RAMY		1717	1718	1726	S22	E86		02	1.3	9	SF		E	12		F
GOES		1736	1741	1747						11	C 7.2					
RAMY		1840	1841	1844	S22	E85	5334	02	1.3	4	SF		E	13		F
HOLL		1844	1850U	1903	S18	E43	5330	01	29.0	19	SF		E	68		F
PALE		1852	1900	1922	N13	E18	5329	01	27.1	30	SF		E	32		F
HOLL		1853	1854U	1914	N13	E18	5329	01	27.1	21	SF		E	37		F
RAMY		1924E	1942U	1951D	S21	E76	5334	01	31.6	27D	SF		E	33		F
HOLL		1931E	1942U	1955	S20	E80	5334	01	31.9	24D	SF		E	28		F
HOLL		1959	2026	2034	S20	E87	5334	02	1.5	35	SF		E	25		F
PALE		2006	2006	2031	S20	E82	5334	02	1.1	25	SF		E	16		F
HOLL		2022	2023	2038	N19	W61	5323	01	21.2	16	SF		E	23		F
PALE		2101	2112	2135	N19	E11	5329	01	26.7	34	SF C 3.7	3	E	23		F
PALE		2203	2347	2504	N17	E09	5329	01	26.6	181	SF C 4.6	3	E	45		F
HOLL		2204	2208	2222	S21	E75	5334	01	31.7	18	SF		E	20		F
PALE		2212	2212	2500D	S20	E81	5334	02	1.1	168D	SF		E	28		F
HOLL		2326	2347	2418D	N17	E09	5329	01	26.7	52D	SF		E	89		F
LEAR		2340	2403	2444	N16	E05	5329	01	26.4	64	SF		E	94		F
GOES	26	0001	0008	0018						17	C 6.3					
LEAR		0131	0138	0151	N17	E08	5329	01	26.7	20	SF		E	21		F
PALE		0136	0137	0144	N17	E06	5329	01	26.5	8	SF		E	26		F
PALE		0210	0210	0224	S22	E74	5334	01	31.8	14	SF C 2.3	3	E	33		F
PALE		0254	0317	0323	N17	E07	5329	01	26.6	29	SF		E	48		F
LEAR		0419	0438	0550	N17	E03	5329	01	26.4	91	2N M 2.8	4	E	386		ZF

INTERVALS OF NO FLARE PATROL OBSERVATION FOR PRECEDING SOLAR FLARE TABLE

JANUARY 1989



Times of no flare patrol, shown here as shaded areas, combine reports from the observatories listed below. Portions of a panel completely shaded mark dates and times of no patrol of any kind, that is, of neither visual nor cinematographic; portions of a panel with only the bottom half shaded mark times of strictly visual patrol.

Beijing

Holloman

Learmonth

Palehua
Ramey

San Vito
Yunnan

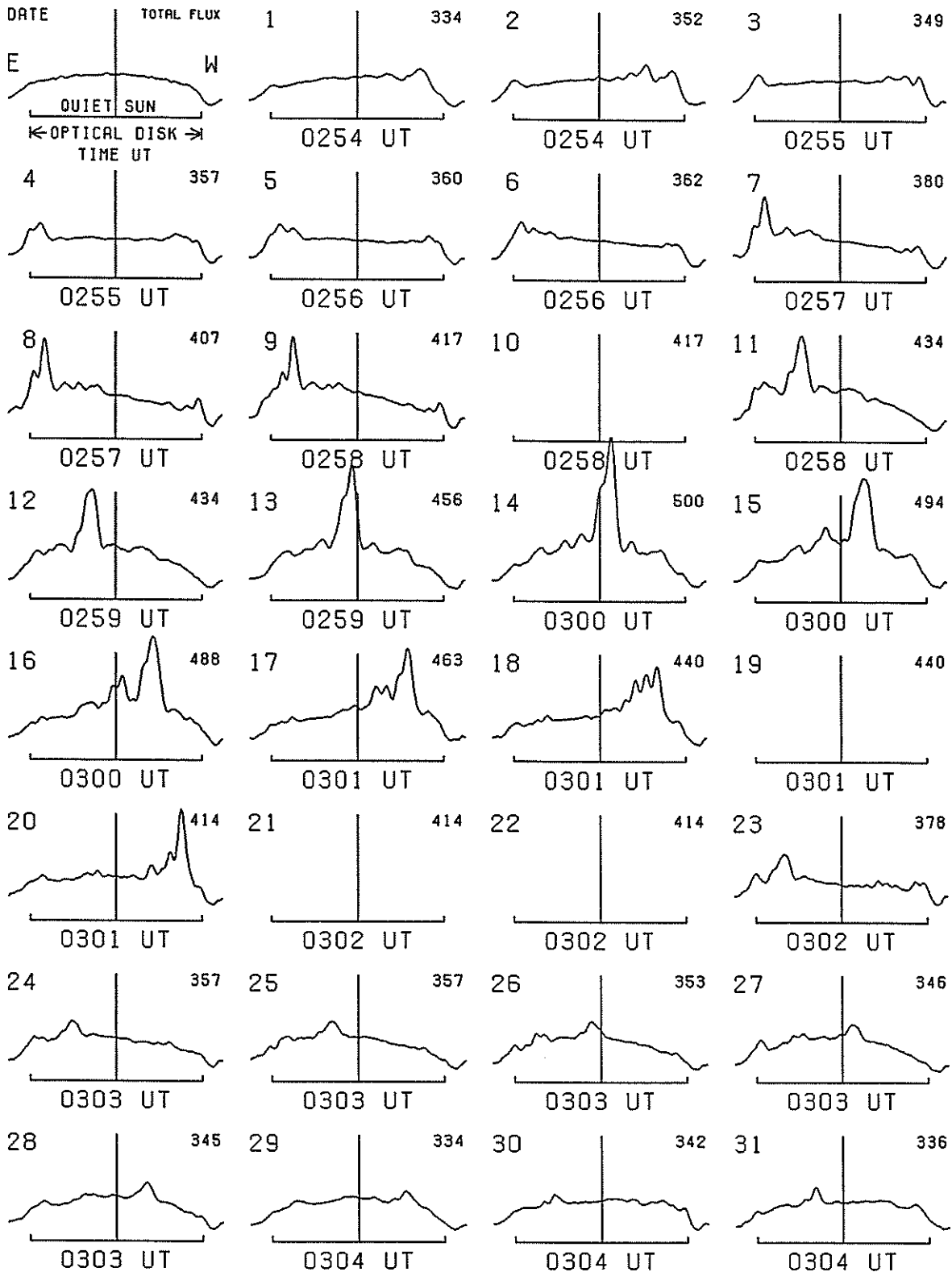
EAST-WEST SOLAR SCANS

JANUARY 1989

31
Jan 89

TOYOKAWA, JAPAN

3 CM
FAN BEAM WITH 1.1 MINUTES OF ARC

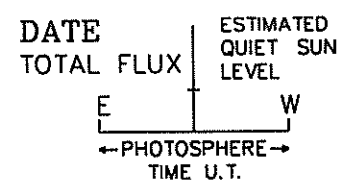
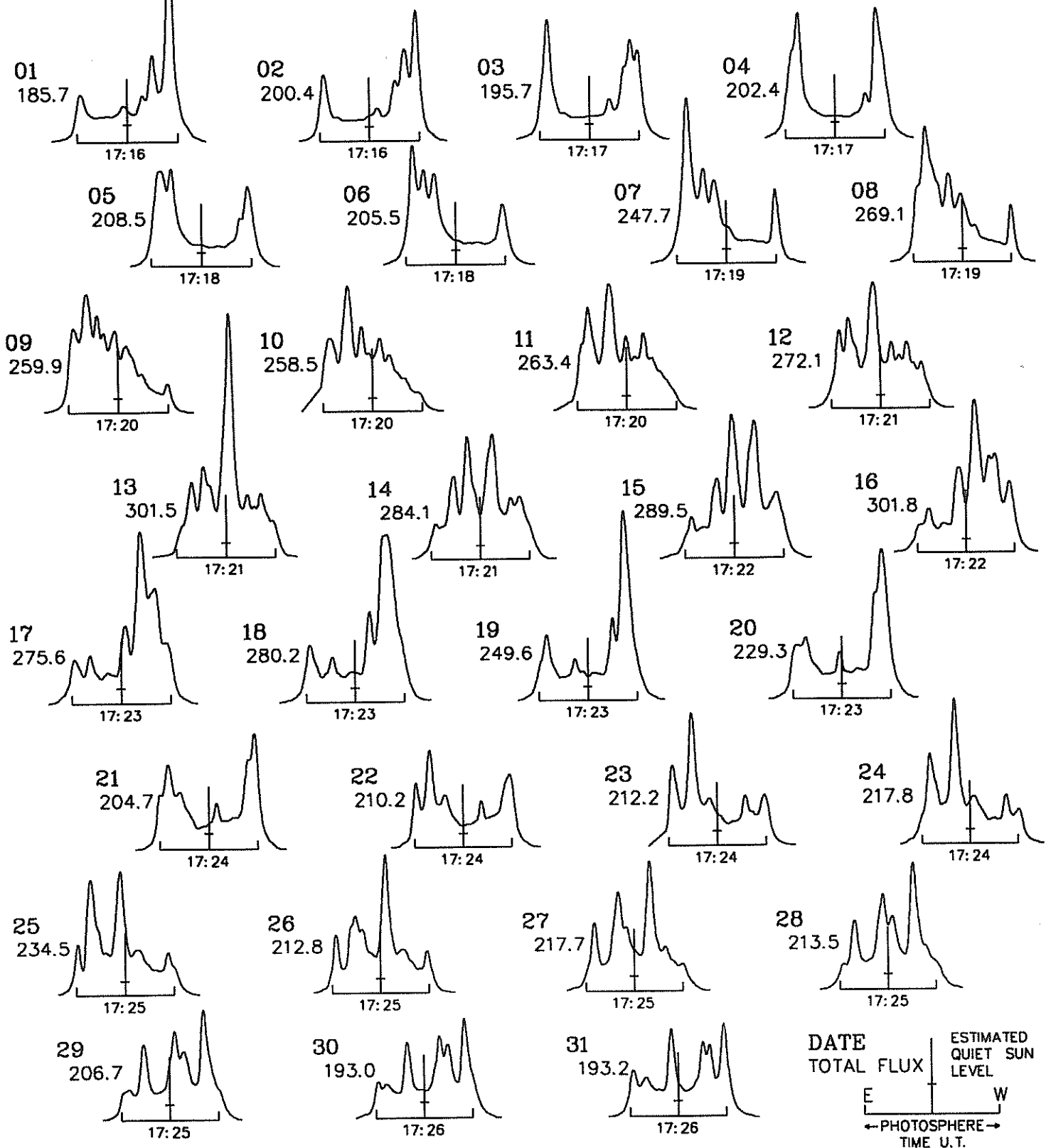


Note: All scans taken with 3 dB attenuation. This means all scans are one-half normal height.

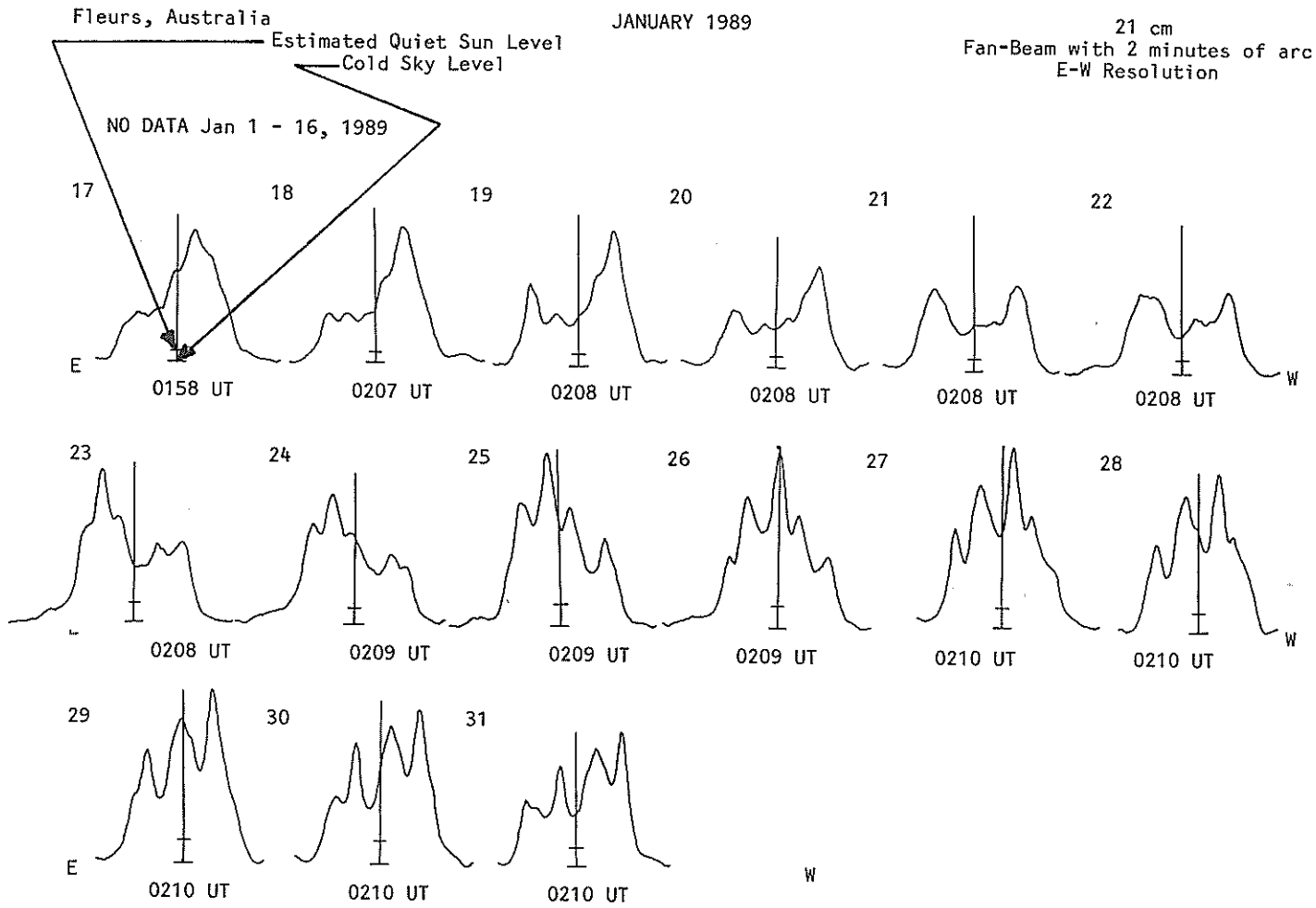
EAST - WEST SOLAR SCANS
JANUARY 1989

ALGONQUIN RADIO OBSERVATORY
CANADA

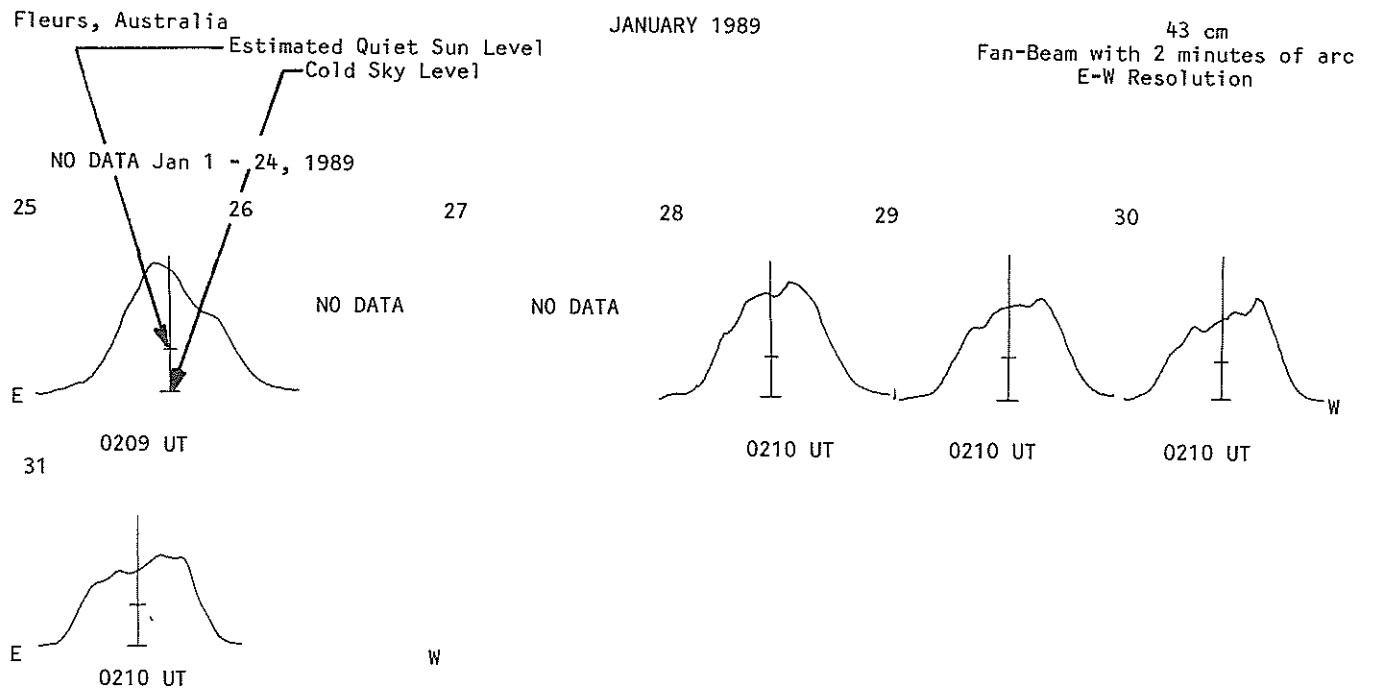
10.7 cm
Fan Beam with 1.5 minutes of arc
E - W Resolution



EAST - WEST SOLAR SCANS



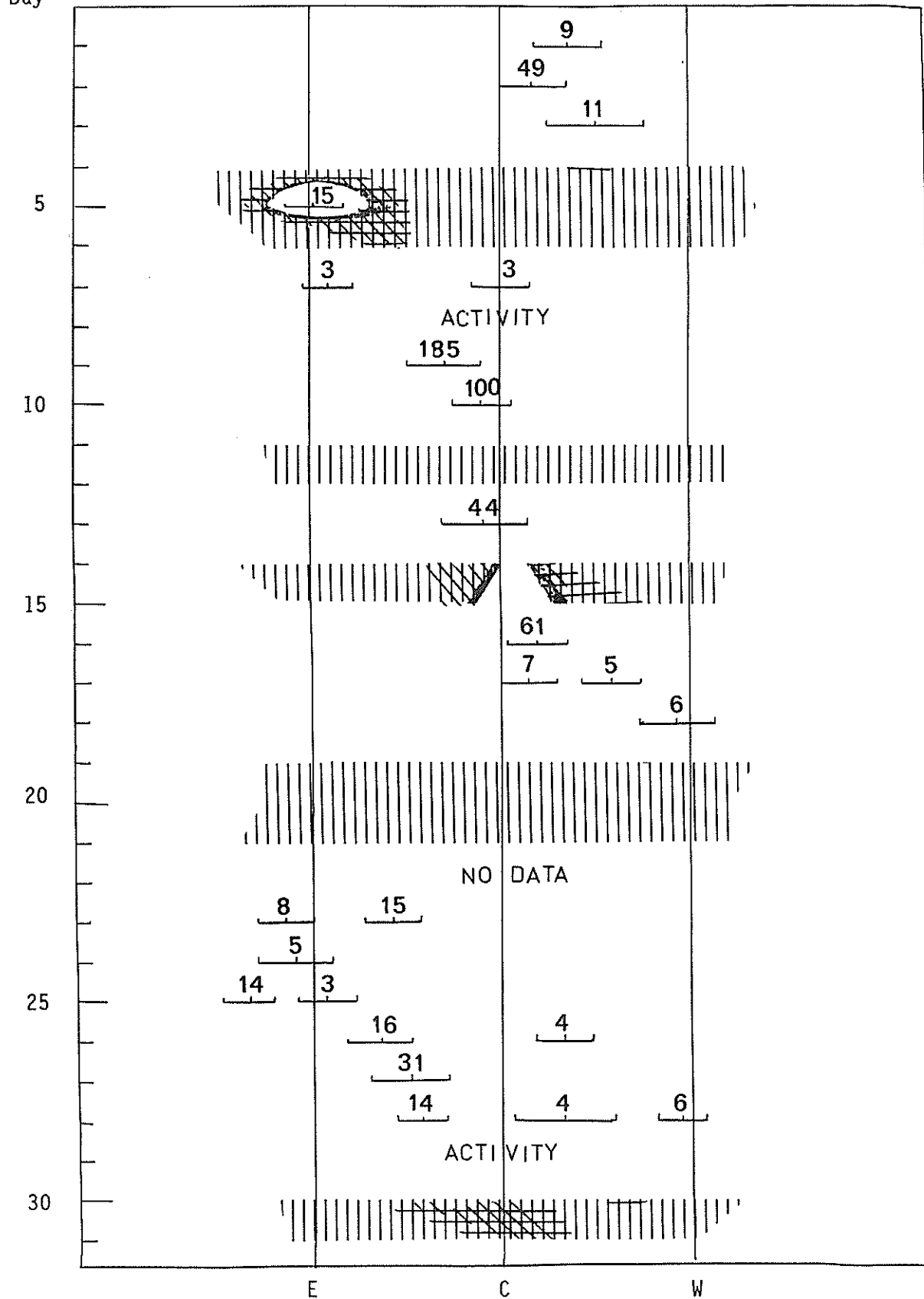
EAST - WEST SOLAR SCANS



SOLAR INTERFEROMETRIC OBSERVATIONS
JANUARY 1989

164 MHz

Nancay
Day



S O L A R R A D I O E M I S S I O N
Selected Fixed Frequency Events

35
Jan 89

JANUARY 1989

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density Peak (10 ⁻²² W/m ² Hz)	Flux Density Mean	Int	Remarks
01	3200	BERN	3 S	1332.0	1336.0	10.0	5.0			
		BERN	3 S	1332.0	1336.0	10.0	57.0			
	2800	OTTA	22 GRF	1604.0	1628.0	120.0	9.5	4.0		
	2800	OTTA	4 S/F	1628.0	1631.0	14.0	21.0	10.0		
02	3200	BERN	4 S/F	0920.0	0927.3	22.0	46.0			
		LEAR	4 S/F	0922.0E	0927.0	18.0D	64.0			QL=1 ST=2 TYP=3
	8800	LEAR	4 S/F	0926.0E	0931.0	11.0D	28.0			QL=1 ST=2 TYP=5
		OTTA	24 R	1330.0	1500.0		21.6			
	2800	OTTA	4 S/F	1850.0	1918.8	90.0	276.4	138.0		
		SGMR	4 S/F	1858.0E	1918.0	30.0D	370.0			QL=1 ST=2 TYP=5
	2695	SGMR	4 S/F	1909.0E	1911.0	9.0D	240.0			QL=1 ST=2 TYP=3
		SGMR	20 GRF	1930.0E	1938.0	22.0D	120.0			QL=1 ST=2 TYP=2
	8800	SGMR	20 GRF	1930.0E	1932.0	22.0D	99.0			QL=1 ST=2 TYP=2
		LEAR	8 S	2307.0E	2308.0	1.0D	26.0			QL=1 ST=2 TYP=3
03	2695	LEAR	8 S	1013.0E	1014.0	1.0D	27.0			QL=1 ST=2 TYP=3
		BERN	4 S/F	1144.3	1145.4	4.0	60.0			
	3200	BERN	4 S/F	1144.3	1145.5	4.0	38.0			
		SGMR	8 S	1734.0E	1734.0	1.0D	62.0			QL=1 ST=2 TYP=3
04	2800	OTTA	4 S/F	1448.0	1452.0	10.0	14.4	7.0		
		OTTA	4 S/F	1602.0	1613.0	33.0	22.2	9.0		
	2800	OTTA	22 GRF	1652.0	1725.0	171.0	28.4	9.0		
		OTTA	4 S/F	1738.0	1758.0	32.0	453.0	180.0		
	2695	PALE	20 GRF	1750.0E	1757.0	12.0D	300.0			QL=1 ST=2 TYP=2
		SGMR	20 GRF	1750.0E	1757.0	12.0D	290.0			QL=1 ST=2 TYP=2
	8800	PALE	4 S/F	1752.0E	1757.0	9.0D	140.0			QL=1 ST=2 TYP=5
		SGMR	20 GRF	1752.0E	1817.0	25.0D	230.0			QL=1 ST=3 TYP=2
05	8800	LEAR	8 S	0950.0E	0950.0	1.0D	52.0			QL=1 ST=2 TYP=3
		SVTO	4 S/F	0950.0E	0950.0	720.0D	56.0			QL=1 ST=2 TYP=3
	2800	OTTA	1 S	1655.0	1655.6	2.3	15.1	4.0		
06	8800	LEAR	49 GB	0504.0E	0506.0	4.0D	530.0			QL=1 ST=2 TYP=6
		LEAR	8 S	0505.0E	0506.0	2.0D	45.0			QL=1 ST=2 TYP=3
	2800	OTTA	4 S/F	1753.0	1800.0	28.0	29.9	12.0		
		PALE	4 S/F	1755.0E	1800.0	17.0D	280.0			QL=1 ST=2 TYP=5
	8800	SGMR	4 S/F	1755.0E	1759.0	14.0D	260.0			QL=1 ST=2 TYP=5
07	2695	LEAR	8 S	0142.0E	0143.0	1.0D	19.0			QL=1 ST=2 TYP=3
		BERN	4 S/F	1251.0	1254.0	20.0	33.0			
08	8400	BERN	46 C	1232.0	1238.0	30.0	192.0			
		BERN	46 C	1232.0	1238.0	30.0	96.0			
	8800	SVTO	4 S/F	1232.0E	1252.0	31.0D	240.0			QL=1 ST=2 TYP=5
		SVTO	4 S/F	1233.0E	1239.0	30.0D	140.0			QL=1 ST=2 TYP=5
	2695	SGMR	4 S/F	1237.0E	1240.0	4.0D	120.0			QL=1 ST=2 TYP=5
		SGMR	4 S/F	1251.0E	1253.0	4.0D	100.0			QL=1 ST=2 TYP=3
	8800	SGMR	4 S/F	1252.0E	1253.0	3.0D	170.0			QL=1 ST=2 TYP=3
		LEAR	4 S/F	2331.0E	2338.0	8.0D	23.0			QL=1 ST=2 TYP=3
	8800	LEAR	4 S/F	2331.0E	2340.0	10.0D	180.0			QL=1 ST=2 TYP=3
		PALE	4 S/F	2339.0E	2340.0	4.0D	160.0			QL=1 ST=2 TYP=3
09	2695	LEAR	4 S/F	0107.0E	0109.0	6.0D	130.0			QL=1 ST=2 TYP=3
		PALE	8 S	0108.0E	0109.0	1.0D	120.0			QL=1 ST=2 TYP=3
	8800	PALE	8 S	0108.0E	0110.0	2.0D	69.0			QL=1 ST=2 TYP=3
		LEAR	8 S	0753.0E	0754.0	1.0D	23.0			QL=1 ST=2 TYP=3
	8800	LEAR	8 S	0755.0E	0756.0	1.0D	27.0			QL=1 ST=2 TYP=3
		BERN	3 S	1007.0	1008.0	3.0	30.0			
	2800	OTTA	28 PRE	1822.4	1824.2	51.6	31.1	9.0		
		OTTA	47 GB	1914.0	1921.2	16.5	628.0	314.0		
	8800	SGMR	49 GB	1914.0E	1920.0	14.0D	840.0			QL=1 ST=2 TYP=7
		PALE	4 S/F	1918.0E	1921.0	19.0D	430.0			QL=1 ST=2 TYP=3
	2695	SGMR	4 S/F	1918.0E	1921.0	10.0D	450.0			QL=1 ST=2 TYP=3
		SGMR	8 S	1928.0E	1928.0	1.0D	55.0			QL=1 ST=2 TYP=3
	8800	SGMR	20 GRF	1928.0E	1938.0	21.0D	190.0			QL=1 ST=2 TYP=3
		OTTA	29 PBI	1930.5	1930.5	210.0D	42.2	21.0		
2800	OTTA	4 S/F	1931.0	1938.2	13.0	64.8	26.0			

36
Jan 89

S O L A R R A D I O E M I S S I O N
Selected Fixed Frequency Events

JANUARY 1989

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density		Int	Remarks
							Peak (10 -22 W/m ² Hz)	Mean		
10	8800	LEAR	4 S/F	0023.0E	0024.0	10.00	88.0			QL=1 ST=2 TYP=3
		2695 LEAR	20 GRF	0024.0E	0029.0	7.00	49.0			QL=1 ST=2 TYP=2
	8800	LEAR	4 S/F	0622.0E	0623.0	11.00	79.0			QL=1 ST=2 TYP=3
	2800	OTTA	40 F	1501.0	1501.5	4.3	8.0	2.0		
	8800	SGMR	4 S/F	1607.0E	1607.0	272.00	54.0			QL=1 ST=3 TYP=3
	2695	PALE	8 S	1734.0E	1734.0	1.00	67.0			QL=1 ST=2 TYP=3
	2800	OTTA	22 GRF	1745.0	1900.0	150.0	12.4	6.0		
	8800	SGMR	4 S/F	1745.0E	1745.0	3.00	120.0			QL=1 ST=2 TYP=3
	8800	PALE	8 S	1747.0E	1748.0	1.00	63.0			QL=1 ST=2 TYP=3
	8800	SGMR	4 S/F	1752.0E	1752.0	3.00	52.0			QL=1 ST=2 TYP=3
	2800	OTTA	47 GB	2021.7	2025.9	31.0	1736.0	521.0		
	2695	PALE	49 GB	2023.0E	2025.0	17.00	1400.0			QL=1 ST=2 TYP=7
	8800	SGMR	49 GB	2023.0E	2025.0	17.00	2200.0			QL=1 ST=2 TYP=7
8800	PALE	49 GB	2023.0E	2025.0	20.00	1500.0			QL=1 ST=2 TYP=7	
2695	SGMR	49 GB	2024.0E	2025.0	14.00	1300.0			QL=1 ST=2 TYP=7	
11	8800	SVTO	8 S	1155.0E	1156.0	1.00	72.0			QL=1 ST=2 TYP=3
	8400	BERN	3 S	1155.4	1156.3	2.5	57.0			
	2800	OTTA	22 GRF	1505.0	1531.0	250.0	20.9	8.0		
	2800	OTTA	3 S	1814.5	1815.0	8.0	16.1	3.0		
	2695	PENT	3 S	2127.0	2129.5	6.8	28.5	8.0		
	2695	PENT	3 S	2226.7	2229.8	8.7	49.8	15.0		
	8800	LEAR	4 S/F	2248.0E	2255.0	12.00	85.0			QL=1 ST=2 TYP=3
	2695	LEAR	4 S/F	2249.0E	2255.0	13.00	58.0			QL=1 ST=2 TYP=3
	2695	PENT	4 S/F	2252.4	2255.3	7.3	32.5	10.0		
12	8800	LEAR	4 S/F	0421.0E	0423.0	5.00	100.0			QL=1 ST=2 TYP=3
	2695	LEAR	4 S/F	0421.0E	0423.0	5.00	59.0			QL=1 ST=2 TYP=3
	8800	LEAR	8 S	0834.0E	0834.0	1.00	21.0			QL=1 ST=2 TYP=3
	2800	OTTA	4 S/F	2011.4	2021.0	48.0	250.4	75.0		
	2695	PALE	4 S/F	2014.0E	2018.0	22.00	240.0			QL=1 ST=2 TYP=3
	8800	PALE	20 GRF	2014.0E	2020.0	21.00	170.0			QL=1 ST=2 TYP=2
	2695	SGMR	20 GRF	2014.0E	2022.0	22.00	250.0			QL=1 ST=2 TYP=2
	8800	SGMR	8 S	2021.0E	2022.0	1.00	100.0			QL=1 ST=2 TYP=3
13	8800	LEAR	4 S/F	0004.0E	0008.0	9.00	77.0			QL=1 ST=2 TYP=3
	8800	PALE	4 S/F	0006.0E	0008.0	3.00	110.0			QL=1 ST=2 TYP=3
	2695	LEAR	4 S/F	0353.0E	0354.0	7.00	150.0			QL=1 ST=2 TYP=3
	8800	LEAR	4 S/F	0353.0E	0354.0	7.00	290.0			QL=1 ST=2 TYP=3
	8800	LEAR	4 S/F	0829.0E	0832.0	5.00	160.0			QL=1 ST=2 TYP=3
	8800	SVTO	4 S/F	0830.0E	0832.0	3.00	160.0			QL=1 ST=2 TYP=3
	2695	LEAR	49 GB	1008.0E	1012.0	17.00	730.0			QL=1 ST=2 TYP=7
	8800	LEAR	49 GB	1010.0E	1013.0	13.00	1500.0			QL=1 ST=2 TYP=6
	2695	SVTO	49 GB	1010.0E	1012.0	28.00	720.0			QL=1 ST=2 TYP=7
	8800	SVTO	49 GB	1010.0E	1012.0	27.00	1600.0			QL=1 ST=2 TYP=7
	8400	BERN	47 GB	1011.0	1013.0	14.0	1200.0			
	3200	BERN	47 GB	1011.0	1013.0	14.0	274.0			
	2695	LEAR	4 S/F	1044.0E	1044.0	7.00	31.0			QL=1 ST=2 TYP=3
	8800	SVTO	49 GB	1221.0E	1226.0	16.00	530.0			QL=1 ST=2 TYP=7
	2695	SVTO	4 S/F	1222.0E	1226.0	15.00	81.0			QL=1 ST=2 TYP=5
	8400	BERN	47 GB	1222.0	1226.4	9.0	368.0			
	3200	BERN	47 GB	1222.0	1226.4	9.0	48.0			
2800	OTTA	22 GRF	1640.0	1715.0	90.0	85.5	17.0			
8800	SGMR	4 S/F	1658.0E	1715.0	28.00	220.0			QL=1 ST=2 TYP=5	
2695	PENT	4 S/F	2111.0	2113.5	9.0	57.2	21.0			
14	8800	LEAR	8 S	0216.0E	0217.0	2.00	61.0			QL=1 ST=3 TYP=3
	8800	LEAR	8 S	0308.0E	0309.0	2.00	270.0			QL=1 ST=3 TYP=3
	8800	PALE	8 S	0308.0E	0309.0	2.00	310.0			QL=1 ST=2 TYP=3
	2695	LEAR	4 S/F	0309.0E	0309.0	7.00	30.0			QL=1 ST=3 TYP=3
	8800	PALE	8 S	0325.0E	0326.0	2.00	170.0			QL=1 ST=2 TYP=3
	8800	LEAR	8 S	0358.0E	0359.0	2.00	130.0			QL=1 ST=2 TYP=3
	8800	LEAR	4 S/F	0407.0E	0411.0	28.00	350.0			QL=1 ST=2 TYP=3
	2695	LEAR	4 S/F	0409.0E	0410.0	3.00	50.0			QL=1 ST=2 TYP=3
	2800	OTTA	3 S	1352.0	1353.0	3.2	45.5	13.0		
	8800	SGMR	8 S	1352.0E	1352.0	2.00	440.0			QL=1 ST=2 TYP=3
	8800	SVTO	4 S/F	1352.0E	1352.0	5.00	440.0			QL=1 ST=2 TYP=3
	8400	BERN	47 GB	1352.1	1352.5	1.8	305.0			
	3200	BERN	47 GB	1352.1	1352.5	1.8	44.0			

S O L A R R A D I O E M I S S I O N
Selected Fixed Frequency Events

37
Jan 89

JANUARY 1989

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density		Int	Remarks
							Peak (10 -22 W/m ² Hz)	Mean		
14	2800	OTTA	3 S	1939.8	1943.0	11.0	48.7	14.0		
15	8800	LEAR	4 S/F	0614.0E	0614.0	28.0D	45.0			QL=1 ST=2 TYP=3
	8800	LEAR	8 S	0619.0E	0620.0	2.0D	55.0			QL=1 ST=2 TYP=3
	8800	LEAR	8 S	0755.0E	0755.0	1.0D	86.0			QL=1 ST=2 TYP=3
	8800	SVTO	8 S	0755.0E	0755.0	1.0D	90.0			QL=1 ST=2 TYP=3
	8800	LEAR	8 S	0904.0E	0905.0	1.0D	50.0			QL=1 ST=2 TYP=3
	8800	SVTO	8 S	0904.0E	0904.0	1.0D	77.0			QL=1 ST=2 TYP=3
	8800	SVTO	8 S	1126.0E	1126.0	1.0D	98.0			QL=1 ST=2 TYP=3
	8400	BERN	4 S/F	1126.1	1126.4	1.5	72.0			
	2800	OTTA	4 S/F	1546.0	1551.0	25.3	182.5	55.0		
	8800	SGMR	49 GB	1546.0E	1546.0	1.0D	540.0			QL=1 ST=2 TYP=6
	2695	SGMR	8 S	1546.0E	1546.0	1.0D	95.0			QL=1 ST=2 TYP=3
	8800	SGMR	4 S/F	1549.0E	1550.0	3.0D	270.0			QL=1 ST=2 TYP=3
	2695	SGMR	4 S/F	1549.0E	1550.0	3.0D	170.0			QL=1 ST=2 TYP=3
	8800	LEAR	8 S	2320.0E	2321.0	2.0D	80.0			QL=1 ST=2 TYP=3
	8800	PALE	4 S/F	2320.0E	2321.0	3.0D	92.0			QL=1 ST=3 TYP=3
8800	PALE	8 S	2321.0E	2321.0	1.0D	92.0			QL=1 ST=2 TYP=3	
16	8800	PALE	4 S/F	0322.0E	0325.0	4.0D	150.0			QL=1 ST=2 TYP=3
	2695	LEAR	8 S	0325.0E	0325.0	1.0D	52.0			QL=1 ST=2 TYP=3
	2695	PALE	8 S	0325.0E	0325.0	1.0D	51.0			QL=1 ST=2 TYP=3
	8800	LEAR	4 S/F	0325.0E	0325.0	17.0D	190.0			QL=1 ST=2 TYP=3
	8800	LEAR	8 S	0453.0E	0453.0	1.0D	76.0			QL=1 ST=2 TYP=3
	8800	LEAR	4 S/F	0621.0E	0622.0	6.0D	190.0			QL=1 ST=2 TYP=3
	8800	LEAR	8 S	0831.0E	0832.0	2.0D	56.0			QL=1 ST=2 TYP=3
	8800	SVTO	8 S	1001.0E	1002.0	1.0D	91.0			QL=1 ST=2 TYP=3
	2695	PALE	8 S	1755.0E	1756.0	2.0D	82.0			QL=1 ST=2 TYP=3
	2695	SGMR	8 S	1755.0E	1756.0	1.0D	91.0			QL=1 ST=2 TYP=3
	8800	SGMR	8 S	1755.0E	1755.0	1.0D	200.0			QL=1 ST=2 TYP=3
	2800	OTTA	4 S/F	1755.5	1756.0	18.0	99.6	30.0		
	8800	LEAR	4 S/F	2215.0E	2216.0	3.0D	360.0			QL=1 ST=2 TYP=3
	2695	PALE	8 S	2216.0E	2217.0	1.0D	62.0			QL=1 ST=2 TYP=3
	17	3200	BERN	3 S	0836.1	0837.0	3.0	32.0		
8400		BERN	3 S	0836.1	0836.5	3.0	71.0			
8800		LEAR	8 S	0816.0E	0816.0	1.0D	42.0			QL=1 ST=2 TYP=3
8800		LEAR	4 S/F	0836.0E	0836.0	5.0D	94.0			QL=1 ST=2 TYP=3
8800		SVTO	8 S	0836.0E	0836.0	1.0D	90.0			QL=1 ST=2 TYP=3
8800		SVTO	8 S	1411.0E	1411.0	1.0D	66.0			QL=1 ST=2 TYP=3
8400		BERN	3 S	1411.1	1411.3	1.2	51.0			
18	2695	LEAR	4 S/F	0619.0E	0700.0	51.0D	270.0			QL=1 ST=3 TYP=3
	8800	SVTO	8 S	0636.0E	0636.0	2.0D	120.0			QL=1 ST=2 TYP=3
	2695	SVTO	4 S/F	0636.0E	0654.0	40.0D	400.0			QL=1 ST=2 TYP=3
	8800	SVTO	8 S	0846.0E	0847.0	2.0D	120.0			QL=1 ST=2 TYP=3
	8800	LEAR	4 S/F	0846.0E	0847.0	31.0D	85.0			QL=1 ST=2 TYP=3
	8800	SVTO	20 GRF	0853.0E	0914.0	64.0D	86.0			QL=1 ST=2 TYP=2
	2800	OTTA	47 GB	1804.0	1829.5	25.5	1473.0	590.0		
	2695	PALE	49 GB	1808.0E	1809.0	21.0D	1500.0			QL=1 ST=3 TYP=6
	8800	PALE	49 GB	1808.0E	1811.0	21.0D	1300.0			QL=1 ST=3 TYP=6
	2800	OTTA	29 PBI	1829.5	1832.0	30.0	93.1	46.0		
2800	OTTA	4 S/F	1845.0	1847.0	8.3	68.8	20.0			
2695	SGMR	8 S	1846.0E	1846.0	2.0D	59.0			QL=1 ST=2 TYP=3	
19	2695	LEAR	4 S/F	0916.0E	0936.0	48.0D	190.0			QL=1 ST=2 TYP=5
	8800	LEAR	4 S/F	0937.0E	0939.0	863.0D	24.0			QL=1 ST=1 TYP=3
	2800	OTTA	1 S	1745.0	1750.0	8.0	5.9	1.0		
	2800	OTTA	20 GRF	1952.0	1957.0	31.0	12.5	4.0		
20	2800	OTTA	22 GRF	1400.0	1526.0	300.0	41.5	20.0		
	8800	SGMR	8 S	1551.0E	1551.0	2.0D	340.0			QL=1 ST=2 TYP=3
21	2800	OTTA	22 GRF	1426.0	1557.0	395.0	14.3	7.0		
	2800	OTTA	4 S/F	1610.0	1617.0	22.0	10.8	3.0		
	2800	OTTA	4 S/F	1939.0	1942.0	12.0	14.8	4.0		
	2695	PENT	4 S/F	2108.0	2117.0	24.0	26.0	7.0		
22	8800	LEAR	4 S/F	0947.0E	0950.0	853.0D	75.0			QL=1 ST=1 TYP=3

S O L A R R A D I O E M I S S I O N
Selected Fixed Frequency Events

JANUARY 1989

Day	Freq Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density Peak (10 ⁻²² W/m ² Hz)	Flux Density Mean	Int	Remarks
22	2695 LEAR	4 S/F	0948.0E	0949.0	7.0D	77.0			QL=1 ST=2 TYP=3
	8800 SVTO	4 S/F	0948.0E	0950.0	11.0D	98.0			QL=1 ST=2 TYP=3
	2695 SVTO	4 S/F	0948.0E	0949.0	11.0D	63.0			QL=1 ST=2 TYP=3
	2800 OTTA	20 GRF	1410.5	1500.0	157.0	10.5	5.0		
23	2695 LEAR	4 S/F	0635.0E	0635.0	852.0D	19.0			QL=1 ST=2 TYP=3
	2800 OTTA	24 R	1335.0	1450.0		16.2	8.0		
	2800 OTTA	1 S	1608.7	1611.0	4.5	9.9	3.0		
24	2695 SVTO	4 S/F	0809.0E	0809.0	3.0D	56.0			QL=1 ST=2 TYP=3
	2800 OTTA	1 S	1806.5	1807.5	2.0	9.3	4.0		
	8800 PALE	8 S	1807.0E	1807.0	1.0D	95.0			QL=1 ST=2 TYP=3
	8800 SGMR	8 S	1807.0E	1807.0	2.0D	83.0			QL=1 ST=2 TYP=3
25	2695 LEAR	8 S	0711.0E	0711.0	1.0D	44.0			QL=1 ST=2 TYP=3
	2800 OTTA	22 GRF	1400.0	1607.0	267.0	20.0	10.0		
	8800 SGMR	4 S/F	1416.0E	1418.0	7.0D	120.0			QL=1 ST=3 TYP=3
	2800 OTTA	4 S/F	1416.5	1418.8	6.0	73.5	36.0		
	8800 SVTO	4 S/F	1417.0E	1418.0	3.0D	110.0			QL=1 ST=2 TYP=3
	2695 SGMR	8 S	1418.0E	1418.0	1.0D	68.0			QL=1 ST=3 TYP=3
	2800 OTTA	3 S	1448.9	1455.8	13.3	321.1	96.0		
	8800 SGMR	4 S/F	1453.0E	1454.0	4.0D	360.0			QL=1 ST=2 TYP=3
	2695 SGMR	4 S/F	1453.0E	1455.0	8.0D	300.0			QL=1 ST=2 TYP=3
	8800 SVTO	4 S/F	1453.0E	1454.0	4.0D	350.0			QL=1 ST=2 TYP=3
26	2800 OTTA	29 PBI	1512.2	1512.2	33.0	28.7	14.0		
	2800 OTTA	1 S	1730.2	1731.0	3.3	5.7	2.0		
	2800 OTTA	4 S/F	1734.8	1739.2	9.1	44.4	22.0		
	2695 LEAR	20 GRF	0427.0E	0445.0	58.0D	67.0			QL=1 ST=2 TYP=2
	8800 LEAR	4 S/F	0427.0E	0445.0	58.0D	120.0			QL=1 ST=2 TYP=5
	8800 LEAR	8 S	0636.0E	0637.0	1.0D	53.0			QL=1 ST=2 TYP=3
	2695 LEAR	4 S/F	0637.0E	0637.0	58.0D	38.0			QL=1 ST=2 TYP=3
	8800 SGMR	49 GB	1411.0E	1411.0	3.0D	750.0			QL=1 ST=2 TYP=6
	8800 SVTO	49 GB	1411.0E	1411.0	2.0D	750.0			QL=1 ST=2 TYP=6
	2800 OTTA	2 S/F	1558.0	1601.0	7.5	19.7	6.0		
27	8800 PALE	4 S/F	2349.0E	2350.0	3.0D	300.0			QL=1 ST=2 TYP=3
	8800 LEAR	4 S/F	2349.0E	2350.0	13.0D	310.0			QL=1 ST=2 TYP=3
	2695 LEAR	4 S/F	2349.0E	2351.0	13.0D	380.0			QL=1 ST=2 TYP=3
	2695 PALE	4 S/F	2350.0E	2351.0	5.0D	310.0			QL=1 ST=2 TYP=3
	2695 LEAR	4 S/F	0328.0E	0329.0	3.0D	89.0			QL=1 ST=2 TYP=3
	8800 LEAR	8 S	0329.0E	0329.0	1.0D	77.0			QL=1 ST=2 TYP=3
	8800 PALE	8 S	0329.0E	0329.0	1.0D	68.0			QL=1 ST=2 TYP=3
	2695 PALE	8 S	0329.0E	0329.0	1.0D	72.0			QL=1 ST=2 TYP=3
28	2800 OTTA	3 S	1520.0	1520.6	2.8	26.5	8.0		
	8800 SGMR	4 S/F	1520.0E	1520.0	589.0D	190.0			QL=1 ST=2 TYP=3
	2800 OTTA	4 S/F	1909.0	1913.8	10.4	279.3	84.0		
	2695 PALE	4 S/F	1910.0E	1913.0	6.0D	260.0			QL=1 ST=2 TYP=3
	8800 PALE	4 S/F	1912.0E	1913.0	3.0D	460.0			QL=1 ST=2 TYP=3
	8800 SGMR	4 S/F	1912.0E	1913.0	4.0D	500.0			QL=1 ST=2 TYP=3
	2800 OTTA	29 PBI	1919.4	2020.0	180.0	28.2	14.0		
	2695 SVTO	4 S/F	0810.0E	0813.0	8.0D	160.0			QL=1 ST=2 TYP=3
	8800 LEAR	4 S/F	0811.0E	0813.0	7.0D	150.0			QL=1 ST=2 TYP=3
	2695 LEAR	4 S/F	0812.0E	0813.0	5.0D	170.0			QL=1 ST=2 TYP=3
29	2695 SVTO	4 S/F	0812.0E	0813.0	6.0D	160.0			QL=1 ST=2 TYP=3
	8800 SVTO	4 S/F	0812.0E	0813.0	6.0D	150.0			QL=1 ST=2 TYP=3
	2695 SVTO	4 S/F	1259.0E	1300.0	5.0D	80.0			QL=1 ST=2 TYP=3
	2695 SGMR	8 S	1300.0E	1300.0	1.0D	66.0			QL=1 ST=2 TYP=3
	8800 SGMR	8 S	1300.0E	1301.0	2.0D	64.0			QL=1 ST=2 TYP=3
	2800 OTTA	4 S/F	1411.7E	1411.7	40.0D	21.9	6.0		
	8800 SGMR	8 S	1554.0E	1555.0	1.0D	61.0			QL=1 ST=2 TYP=3
	2800 OTTA	3 S	1554.7	1554.9	3.0	23.0	7.0		
	2800 OTTA	4 S/F	1752.1	1754.0	4.8	16.2	5.0		
	2695 PENT	4 S/F	2139.0	2141.0	10.0	240.2	72.0		
2695 PALE	4 S/F	2139.0E	2141.0	3.0D	350.0			QL=1 ST=2 TYP=3	
8800 PALE	4 S/F	2139.0E	2139.0	3.0D	250.0			QL=1 ST=2 TYP=3	
29	8800 LEAR	8 S	2327.0E	2327.0	1.0D	20.0			QL=1 ST=2 TYP=3

S O L A R R A D I O E M I S S I O N
Selected Fixed Frequency Events

39
Jan 89

JANUARY 1989

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density		Int	Remarks	
							Peak (10 ⁻²² W/m ² Hz)	Mean			
30	2695	LEAR	4 S/F	0058.0E	0106.0	13.0D	94.0			QL=1 ST=2 TYP=5	
	8800	LEAR	4 S/F	0058.0E	0102.0	16.0D	360.0			QL=1 ST=2 TYP=5	
	8800	PALE	4 S/F	0058.0E	0102.0	11.0D	340.0			QL=1 ST=2 TYP=3	
	2695	PALE	4 S/F	0102.0E	0106.0	5.0D	90.0			QL=1 ST=2 TYP=3	
	8800	LEAR	4 S/F	0350.0E	0352.0	3.0D	59.0			QL=1 ST=2 TYP=3	
	8800	SGMR	8 S	1227.0E	1227.0	1.0D	210.0			QL=1 ST=3 TYP=3	
	2695	SGMR	8 S	1227.0E	1227.0	1.0D	200.0			QL=1 ST=3 TYP=3	
	2695	SVTO	4 S/F	1227.0E	1227.0	5.0D	110.0			QL=1 ST=2 TYP=3	
	8800	SVTO	4 S/F	1227.0E	1227.0	6.0D	250.0			QL=1 ST=2 TYP=3	
	2800	OTTA	4 S/F	2058.0	2101.3	5.5	42.5	12.0			
	2695	LEAR	8 S	2357.0E	2357.0	2.0D	29.0				QL=1 ST=2 TYP=3
31	8800	LEAR	4 S/F	0303.0E	0306.0	7.0D	67.0			QL=1 ST=2 TYP=3	
	8800	PALE	8 S	0306.0E	0306.0	1.0D	77.0			QL=1 ST=2 TYP=3	
	2695	SVTO	4 S/F	1200.0E	1204.0	24.0D	260.0			QL=1 ST=2 TYP=5	
	8800	SVTO	4 S/F	1202.0E	1203.0	22.0D	410.0			QL=1 ST=2 TYP=5	
	2800	OTTA	4 S/F	1732.4	1733.8	7.8	16.2	5.0			
	8800	SGMR	8 S	1733.0E	1733.0	1.0D	94.0				QL=1 ST=2 TYP=3

Reports are received routinely from the following observatories:

BERN = Berne

LEAR = Learmonth

PALE = Palehua

SGMR = Sagamore Hill

OTTA = Ottawa

PENT = Penticton

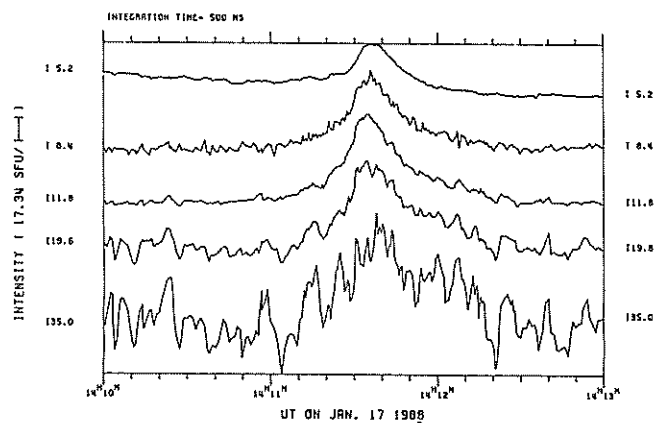
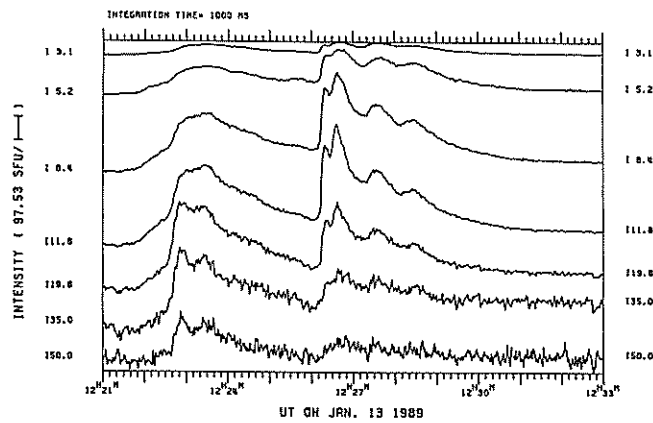
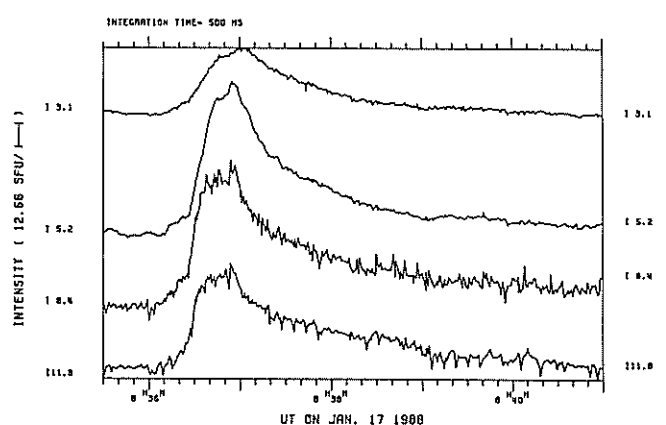
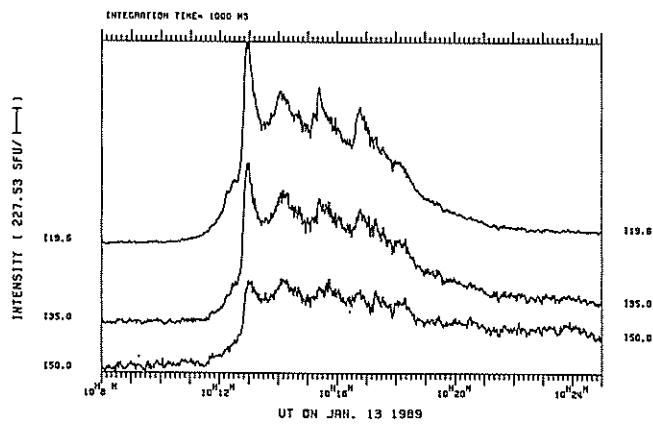
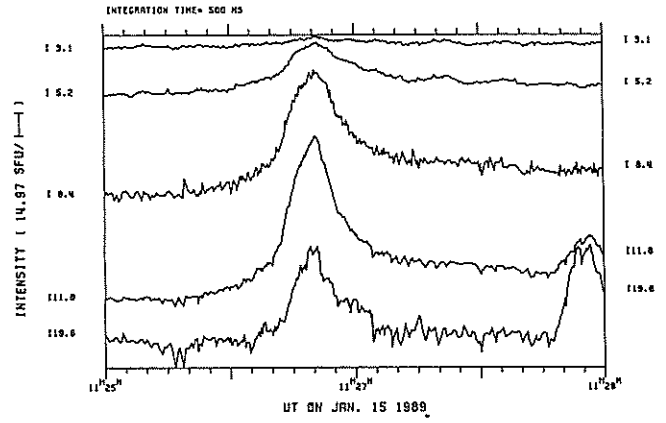
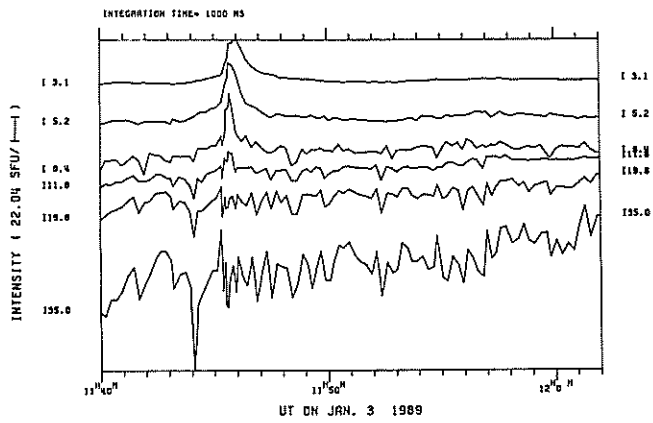
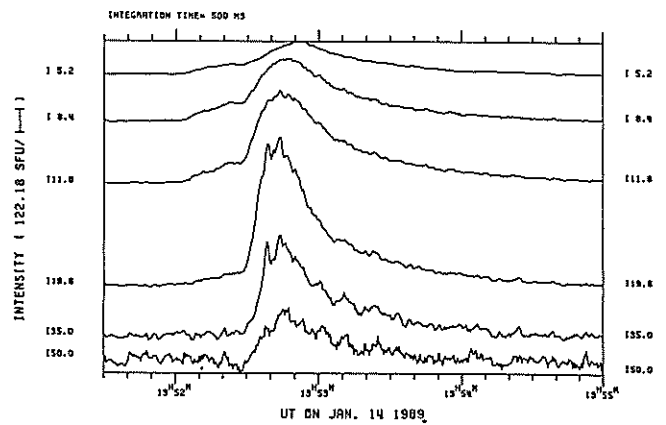
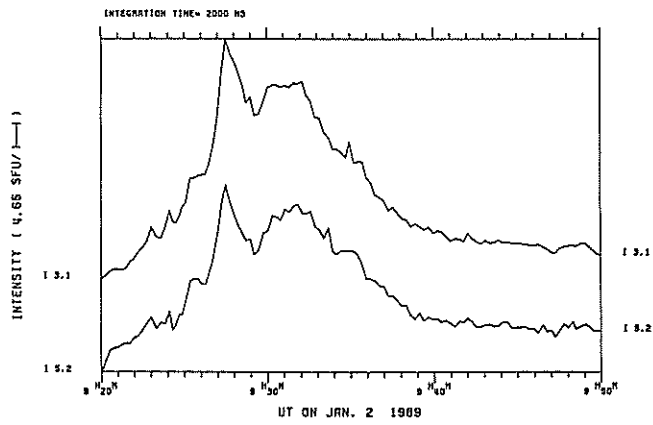
SVTO = San Vito

Explanation of Type Code:

1 Simple 1	7 Minor +	24 Rise	30 Post Burst Increase A	43 Onset of Noise Storm
2 Simple 1F	8 Spike	25 Rise A	31 Post Burst Decrease	44 Noise Storm in Progress
3 Simple 2	20 Simple 3	26 Fall	33 Absorption	45 Complex
4 Simple 2F	21 Simple 3A	27 Rise and Fall	40 Fluctuation	46 Complex F
5 Simple	22 Simple 3F	28 Precursor	41 Group of Bursts	47 Great Burst
6 Minor	23 Simple 3AF	29 Post Burst Increase	42 Series of Bursts	48 Major
1A Simple 1A	4A Simple 2AF	24PF Post Rise F	27F Rise and Fall F	
3A Simple 2A	4O Rise Only	16A Fall A	27AF Rise and Fall AF	
21A Simple 3A GRF	4OF Rise Only F	26O Fall Only	31A Post Burst Decrease A	
2A Simple 1AF	4P Post Rise	26F Fall F	32A Absorption A	

RSTN Site Information: Beginning in April 1986, the RSTN sites LEAR, PALE, SGMR, and SVTO fixed frequency solar radio data are periodically adjusted to several world standard stations. These world standard stations include: Kislovodsk, USSR 15,500 MHz; Ottawa, Canada 2800 MHz; Hiraiso, Japan 500 and 200 MHz; and Toyokawa, Japan 9400, 3750, 2000 and 1000 MHz.

INSTITUTE OF APPLIED PHYSICS, UNIVERSITY OF BERN, SWITZERLAND

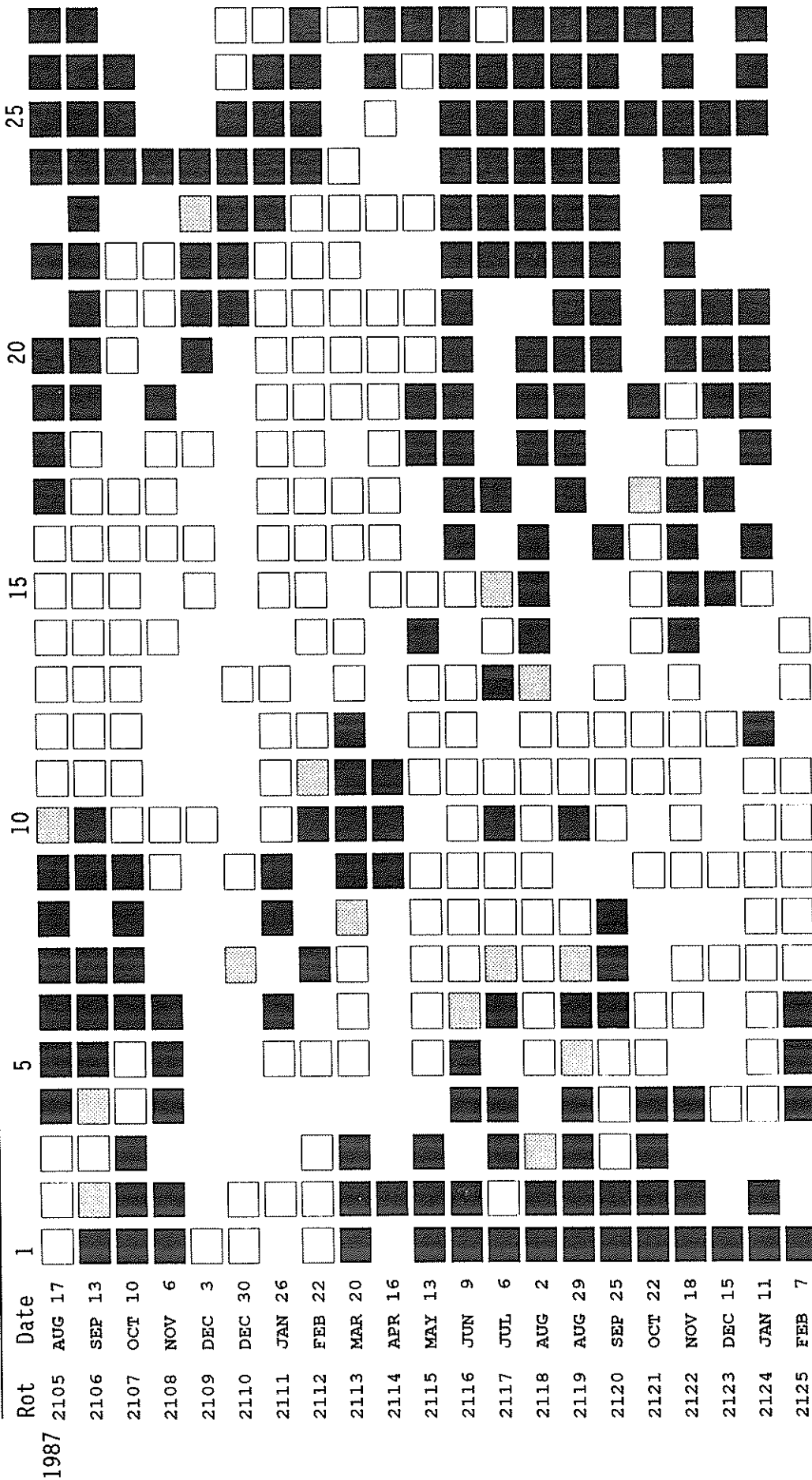


STANFORD MEAN SOLAR MAGNETIC FIELD (MICROTESLA)

Day	1988											1989
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
1	.	.	12	13	14	-35	5	-27	-15	23	-3	.
2	-16	-16	21	12	7	-51	-22	-2	-19	24	-5	-19
3	-5	1	.	28	.	-29	-14	-4	.	.	-4	-22
4	16	22	35	29	33	-9	1	-2	8	40	-12	-41
5	25	.	42	25	.	-13	.	16	12	19	2	.
6	42	49	.	37	.	-39	5	.	15	3	4	-65
7	40	50	45	.	12	39	18	-22	10	0	-24	-85
8	.	49	41	39	-14	-18	43	43	.	.	-27	-101
9	62	44	53	.	-25	-29	48	45	.	-9	-33	.
10	56	53	47	6	-17	.	51	.	-8	.	.	.
11	58	52	43	-8	.	-16	22	.	.	.	-62	-16
12	58	49	36	-11	-14	-1	25	.	.	.	-47	-23
13	48	36	.	-22	-11	14	23	.	.	.	-53	.
14	47	35	.	-29	-1	15	1	-30	-36	.	-38	10
15	23	21	8	-25	13	-6	-14	-44	-33	-35	-30	24
16	16	-13	.	.	22	2	-15	-50	-43	.	.	23
17	-13	-9	-25	10	28	.	-20	-54	-39	-46	.	16
18	-22	-13	.	17	27	-3	.	-46	-52	-43	34	74
19	-25	-9	.	15	30	3	-36	-49	-53	-46	.	101
20	-13	-20	.	12	37	-1	-38	-64	-40	.	.	120
21	11	-14	.	22	35	.	-49	-67	-37	-19	56	119
22	14	-8	.	.	.	-16	.	-64	-34	.	.	-29
23	35	.	.	5	15	.	-57	-57	-38	29	61	.
24	37	18	-6	5	-3	.	-79	-36	-36	31	.	.
25	.	21	-20	4	-35	.	-91	-29	-17	.	.	22
26	17	12	-26	-6	-67	.	-77	-8	14	30	65	-37
27	.	-1	.	7	-75	-49	-57	6	15	31	.	.
28	-14	-13	.	.	-80	-79	-24	34	.	24	.	-50
29	.	-43	.	.	-57	-51	-10	13	.	26	-5	-64
30	.	-40	18	-19	-29	-15	-20	-6	15	18	.	-91
31	.	-11	.	-13	.	-3	-20	.	.	.	-24	-101

Dot symbol indicates no data available for the day.

STANFORD MEAN SOLAR MAGNETIC FIELD



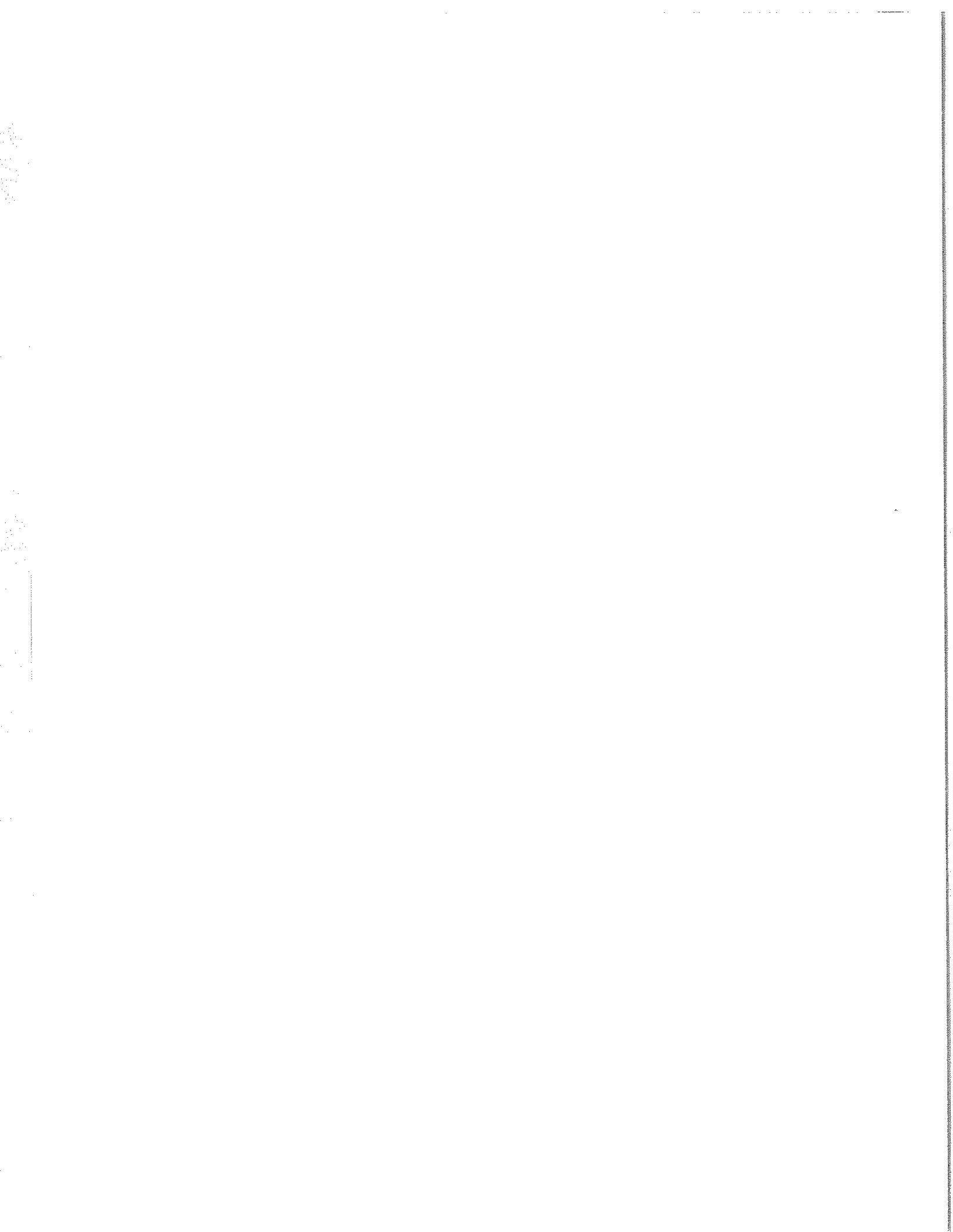
Mean Solar Magnetic Field Polarity: = field > 2 microT; = -2 microT ≤ field ≤ 2 microT; = field < -2 microT; No box = no data available

Observations are taken at 2000 UT. Rotation numbers given are the Bartels series, but the dates are not; these dates mark times of occurrence of phenomena on the Sun that affect the Earth during the given Bartels Rotation.

C O N T E N T S

Prompt Reports DATA FOR DECEMBER 1988 Number 534 Part I

	Page
SOLAR ACTIVE REGIONS	
Solar Synoptic Charts	45- 59
Daily Activity Solar Maps	60- 90
Sunspot Groups.	91-123
SUDDEN IONOSPHERIC DISTURBANCES. . . . .	.124-128
PIONEER XII INTERPLANETARY MAGNETIC FIELD MAGNITUDES (Unavailable at time of publication.)	
SOLAR RADIO SPECTRAL OBSERVATIONS. . . . .	.129-140
COSMIC RAY MEASUREMENTS BY NEUTRON MONITOR	
Chart of Variations . . . . .	.141-145
Daily Counting Rates. . . . .	.146
GEOMAGNETIC INDICES	
Geomagnetic Activity Indices. . . . .	.147
Daily Average Ap. . . . .	.148
Chart of Kp by 27-day Rotation. . . . .	.149
Graph and Table of aa index (1945-present). . . . .	.150
Provisional Values of Hourly Equatorial Dst (Unavailable at time of publication.)	
Principal Magnetic Storms . . . . .	.151
Sudden Commencements/Solar Flare Effects (Unavailable at time of publication.)	
RADIO PROPAGATION INDICES	
Field Strength Diagram - North Atlantic Path. . . . .	.152-153
Quality Indices on Paths to Germany . . . . .	.154



P R E L I M I N A R Y H - A L P H A S O L A R S Y N O P T I C C H A R T
CARRINGTON ROTATION NUMBER 1809
(15 November to 12 December 1988)

Dates of Observations Below

Days of Year:

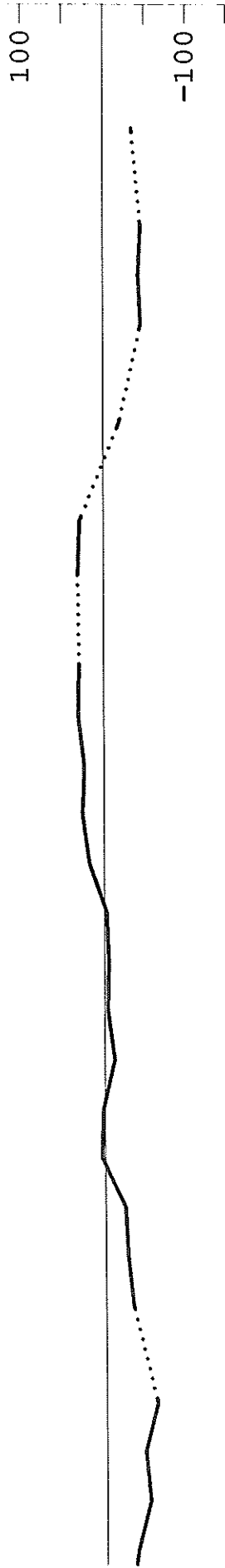
Charts 1809 and 1810 unavailable at time of publication.

Heliographic Longitude

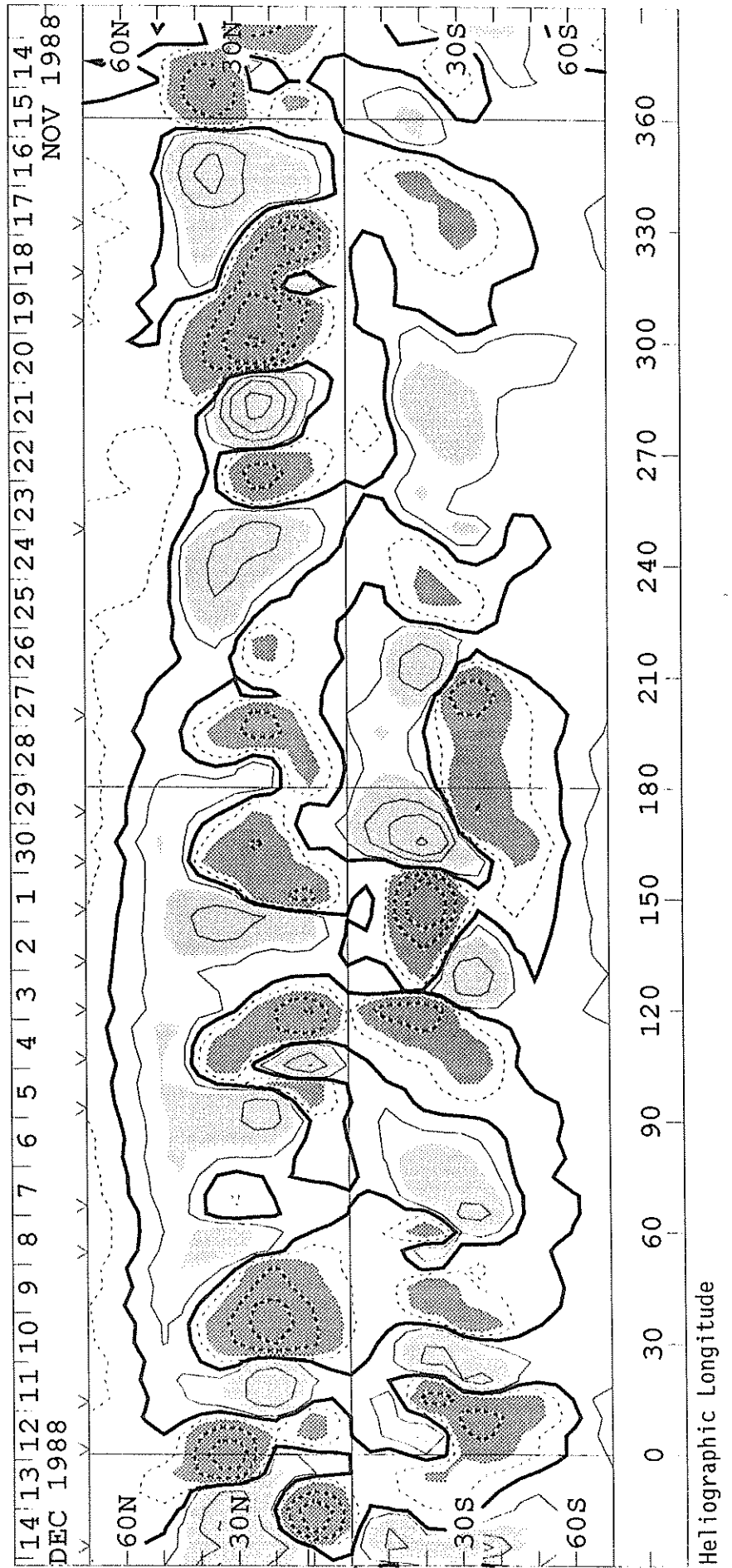
S O L A R M A G N E T I C F I E L D S Y N O P T I C C H A R T
CARRINGTON ROTATION NUMBER 1809
(15 November to 12 December 1988)

0, \pm 100, 500, 1000, 2000 microTesla

Stanford Solar Observatory

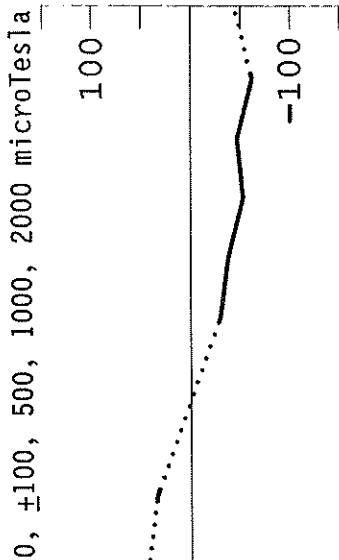


Photospheric Magnetic Field 0, \pm 100, 500, 1000, 2000 MicroTesla

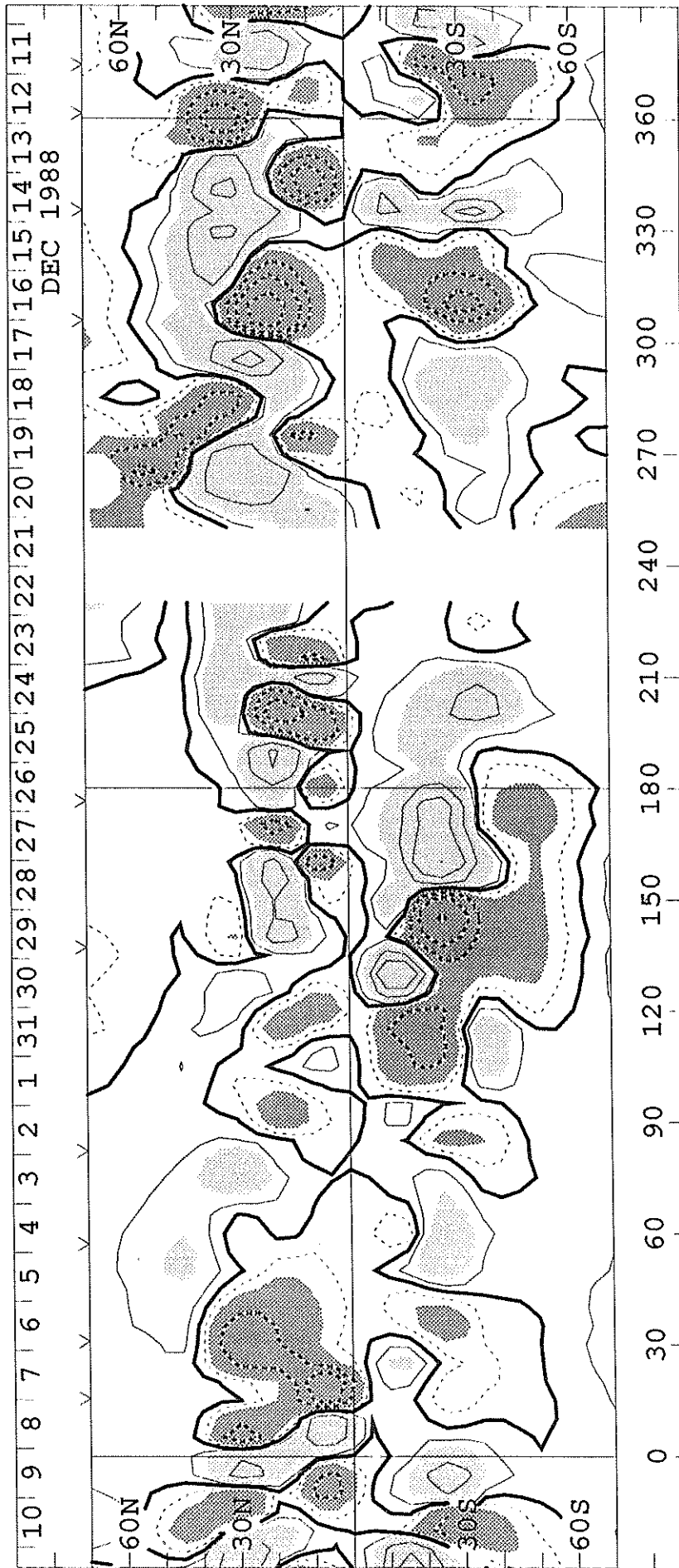


SOLAR MAGNETIC FIELD SYNOPSIS CHART
 CARRINGTON ROTATION NUMBER 1810
 (12 December 1988 to 9 January 1989)

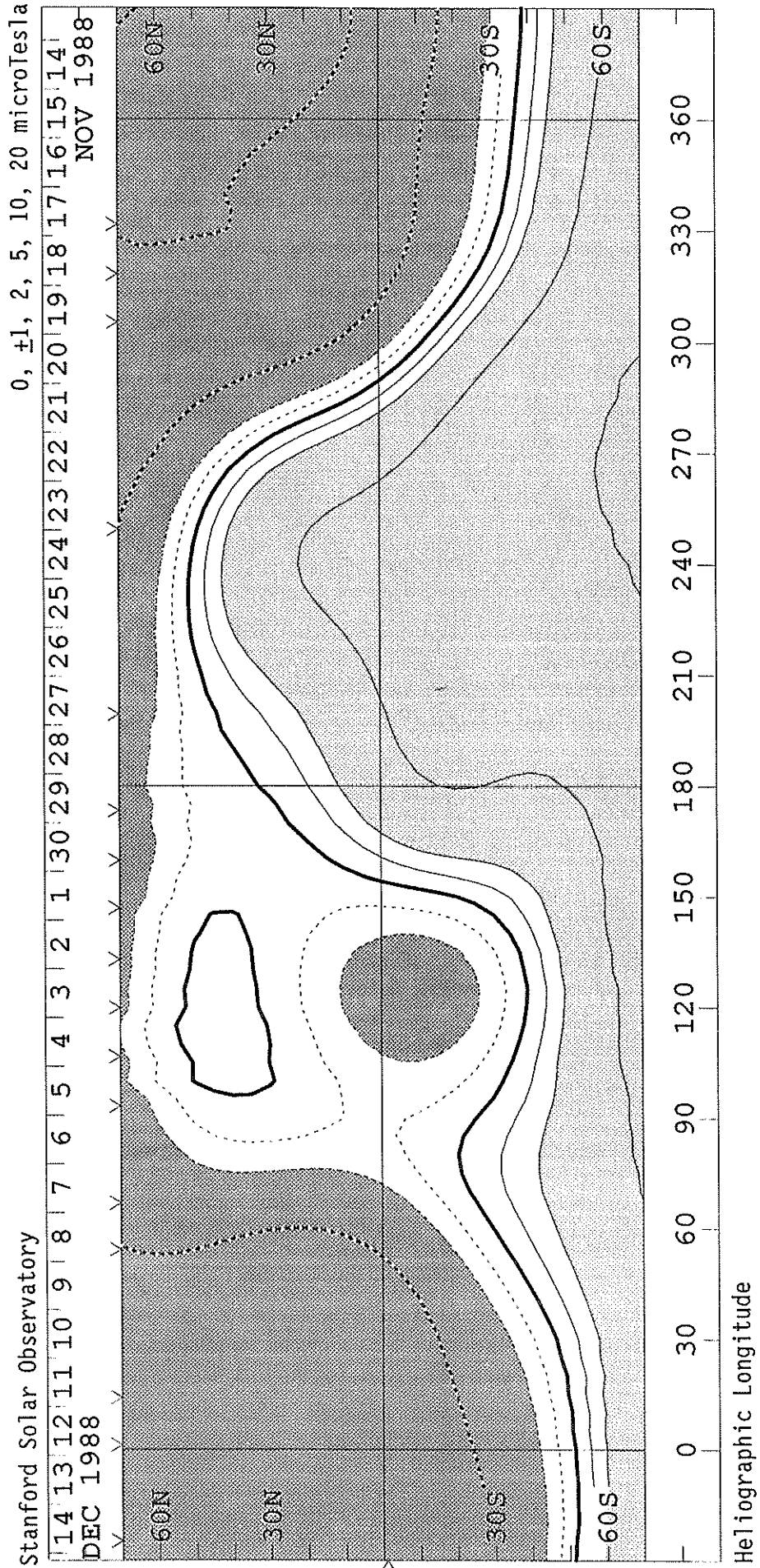
Stanford Solar Observatory



Photospheric Magnetic Field 0, \pm 100, 500, 1000, 2000 MicroTesla



SOLAR MAGNETIC FIELD SYNOPTIC CHART
SOURCE SURFACE FIELD
CARRINGTON ROTATION NUMBER 1809
(15 November to 12 December 1988)

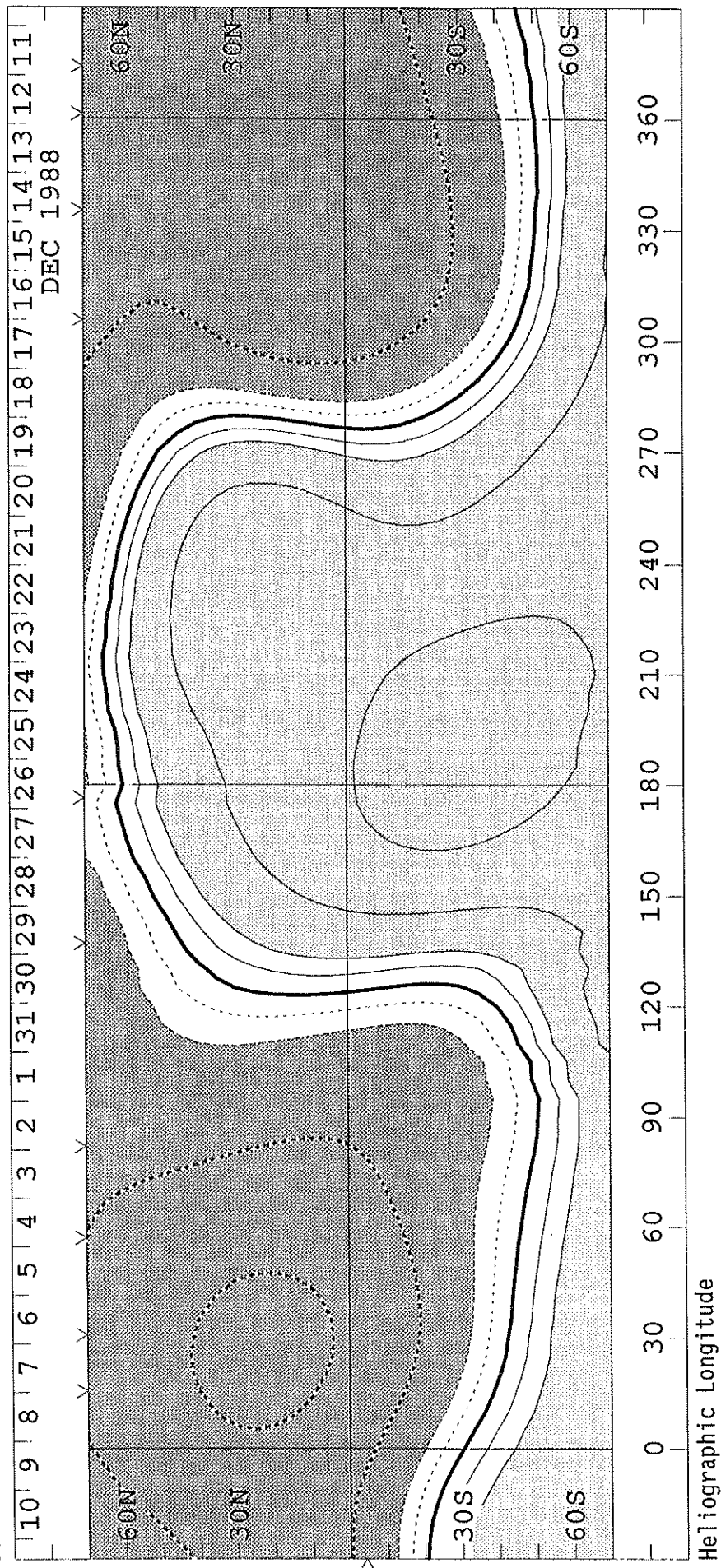


SOLAR MAGNETIC FIELD SYNOPSIS CHART

SOURCE SURFACE FIELD
CARRINGTON ROTATION NUMBER 1810
(12 December 1988 to 9 January 1989)

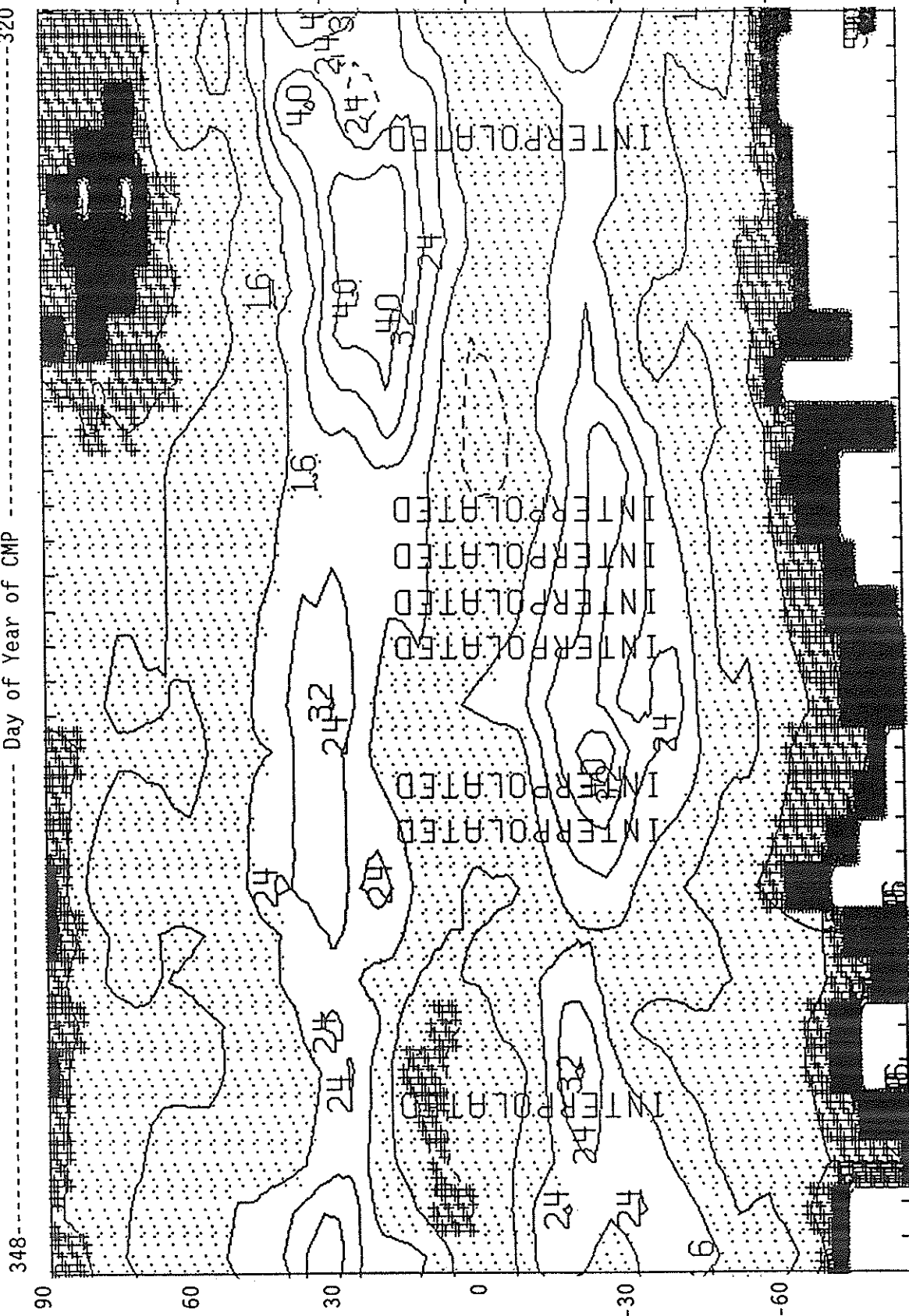
Stanford Solar Observatory

0, ±1, 2, 5, 10, 20 microTesla



SACRAMENTO PEAK CORONAL GREEN LINE SYNOPTIC MAP--EAST LIMB
CARRINGTON ROTATION NUMBER 1809 (15 November to 12 December 1988)

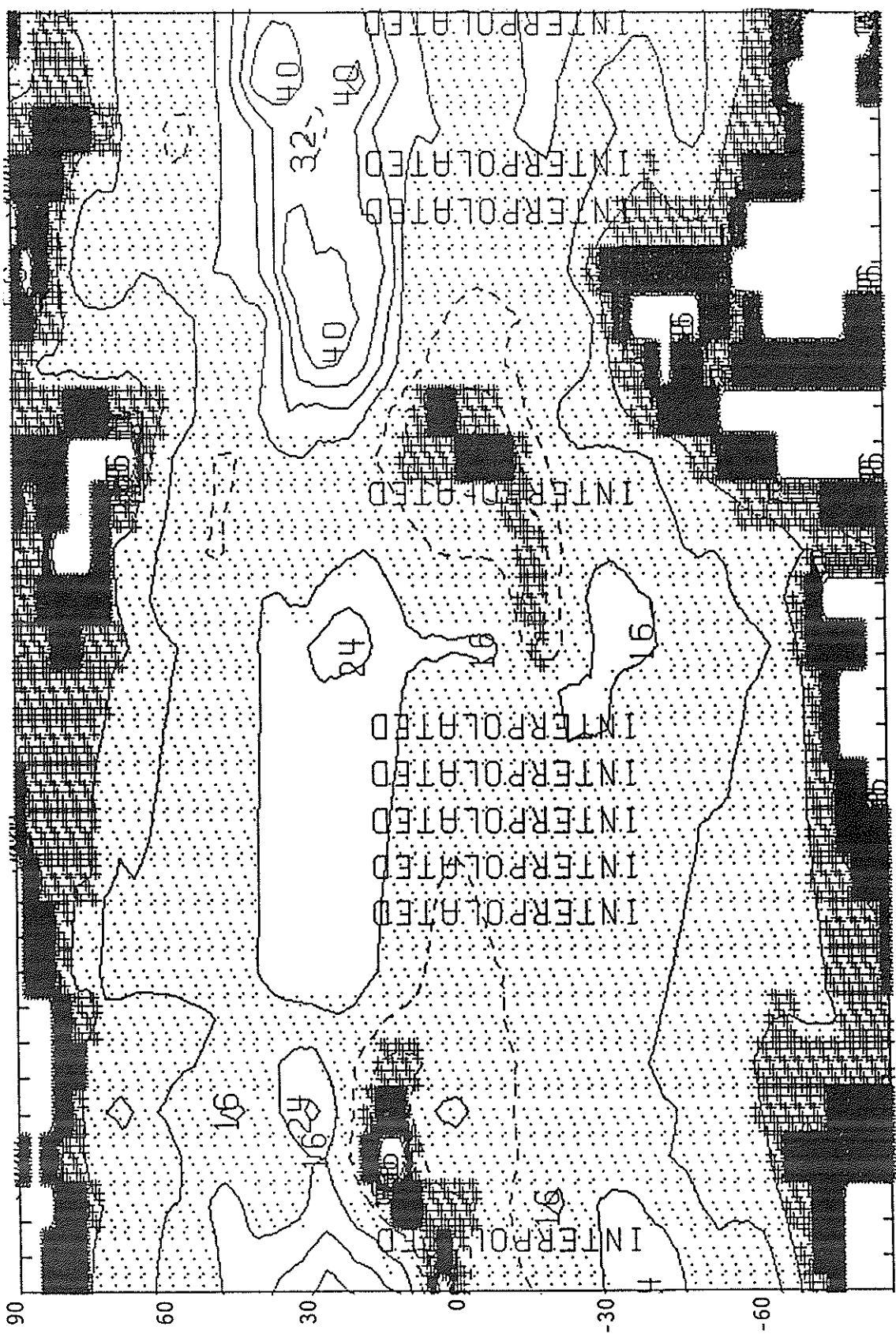
Day of Year of CMP



Heliographic Longitude

SACRAMENTO PEAK CORONAL GREEN LINE SYNOPTIC MAP--WEST LIMB
CARRINGTON ROTATION NUMBER 1809 (15 November to 12 December 1988)

348----- Day of Year of CMP ----- 320



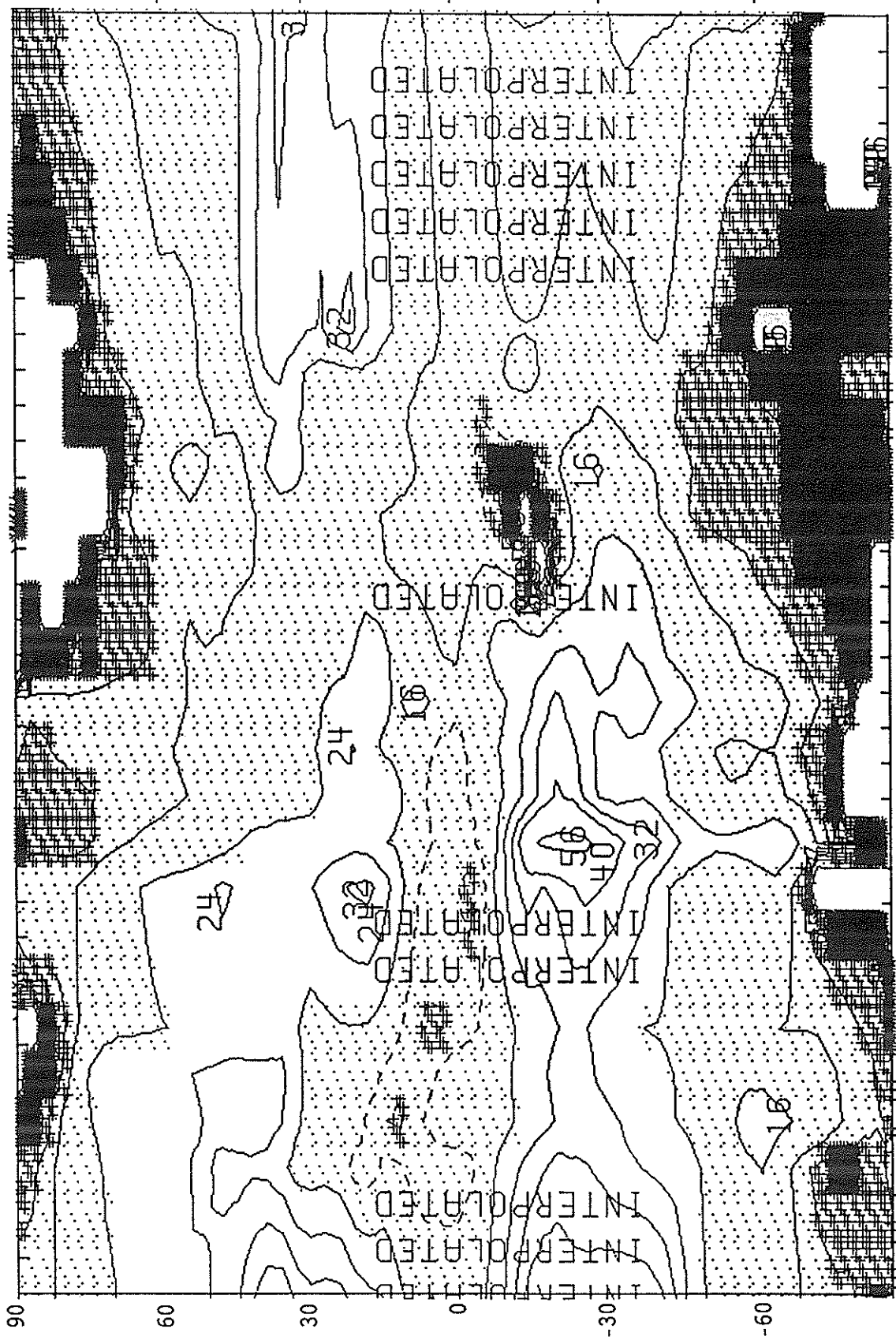
Heliographic Longitude

360

-90

SACRAMENTO PEAK CORONAL GREEN LINE SYNOPTIC MAP--EAST LIMB
CARRINGTON ROTATION NUMBER 1810 (12 December 1988 to 9 January 1989)

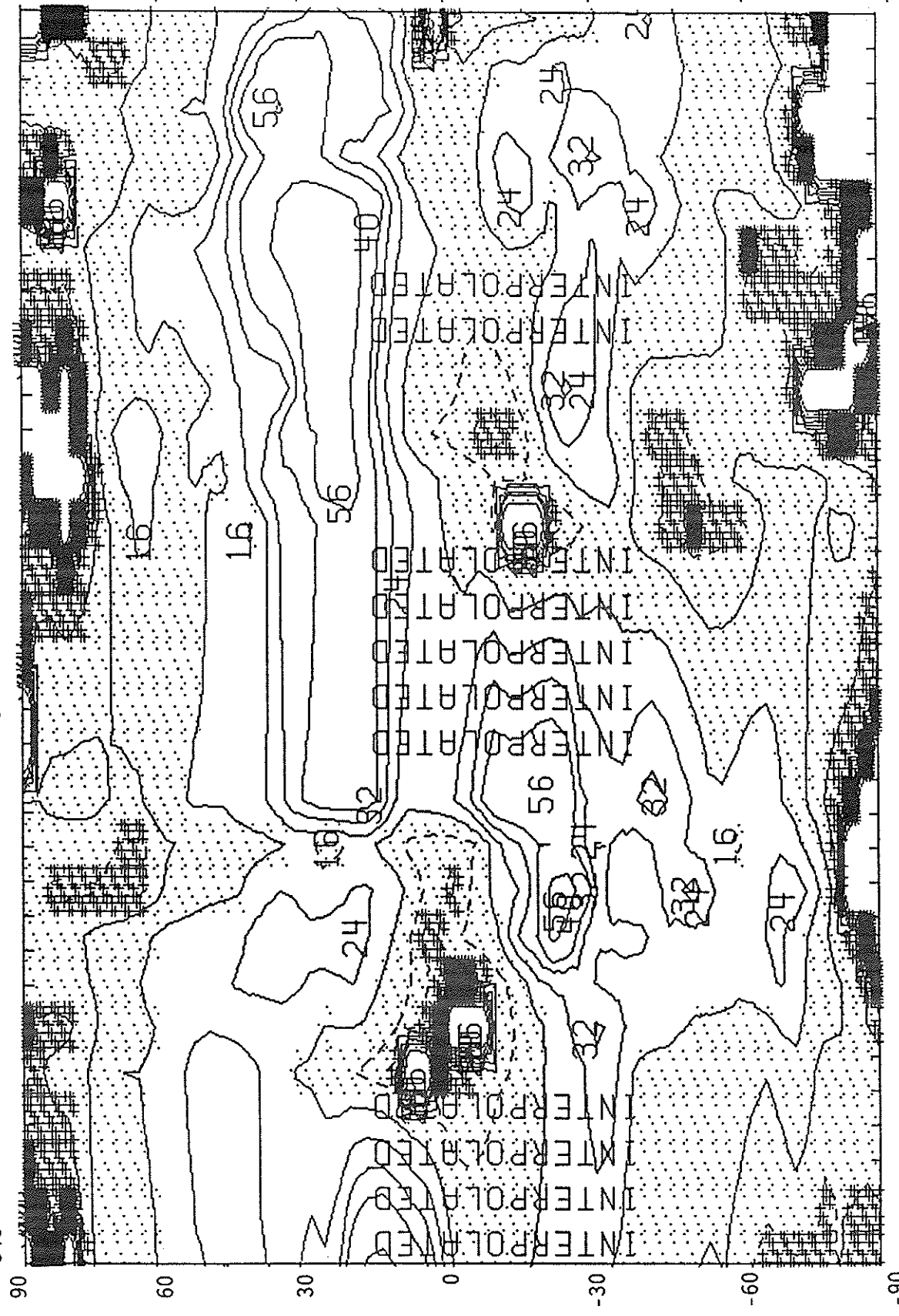
9----- Day of Year of CMP -----348



Heliographic Longitude 0 360

SACRAMENTO PEAK CORONAL GREEN LINE SYNOPTIC MAP--WEST LIMB
CARRINGTON ROTATION NUMBER 1810 (12 December 1988 to 9 January 1989)

348----- Day of Year of CMP ----- 320



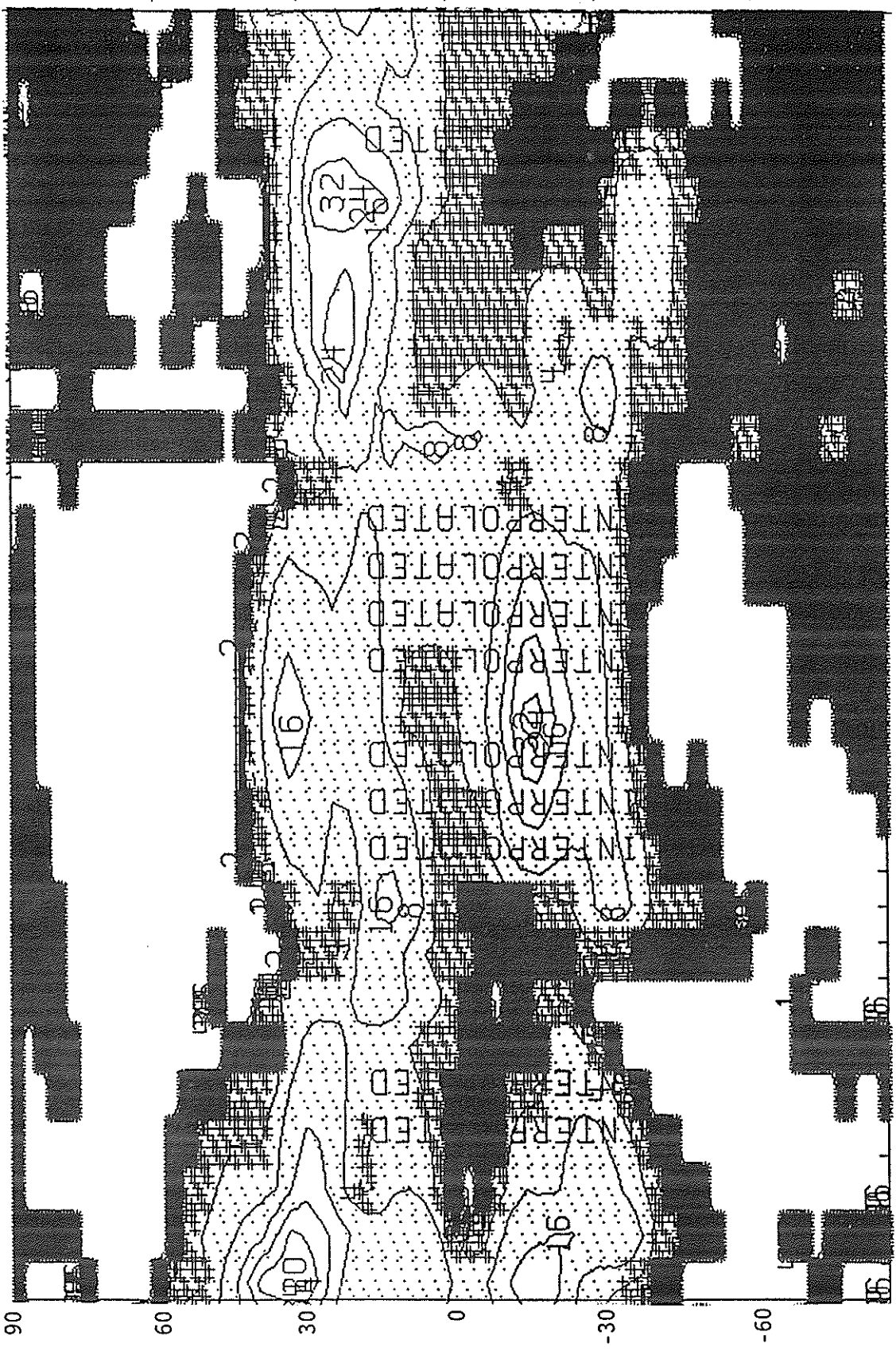
Heliographic Longitude

360

0

SACRAMENTO PEAK CORONAL RED LINE SYNOPTIC MAP--EAST LIMB
CARRINGTON ROTATION NUMBER 1809 (15 November to 12 December 1988)

348----- Day of Year of CMP -----320



90 60 30 0 -30 -60 -90 0 360
Heliographic Longitude

SACRAMENTO PEAK CORONAL RED LINE SYNOPTIC MAP--WEST LIMB
CARRINGTON ROTATION NUMBER 1809 (15 November to 12 December 1988)

----- Day of Year of CMP -----320



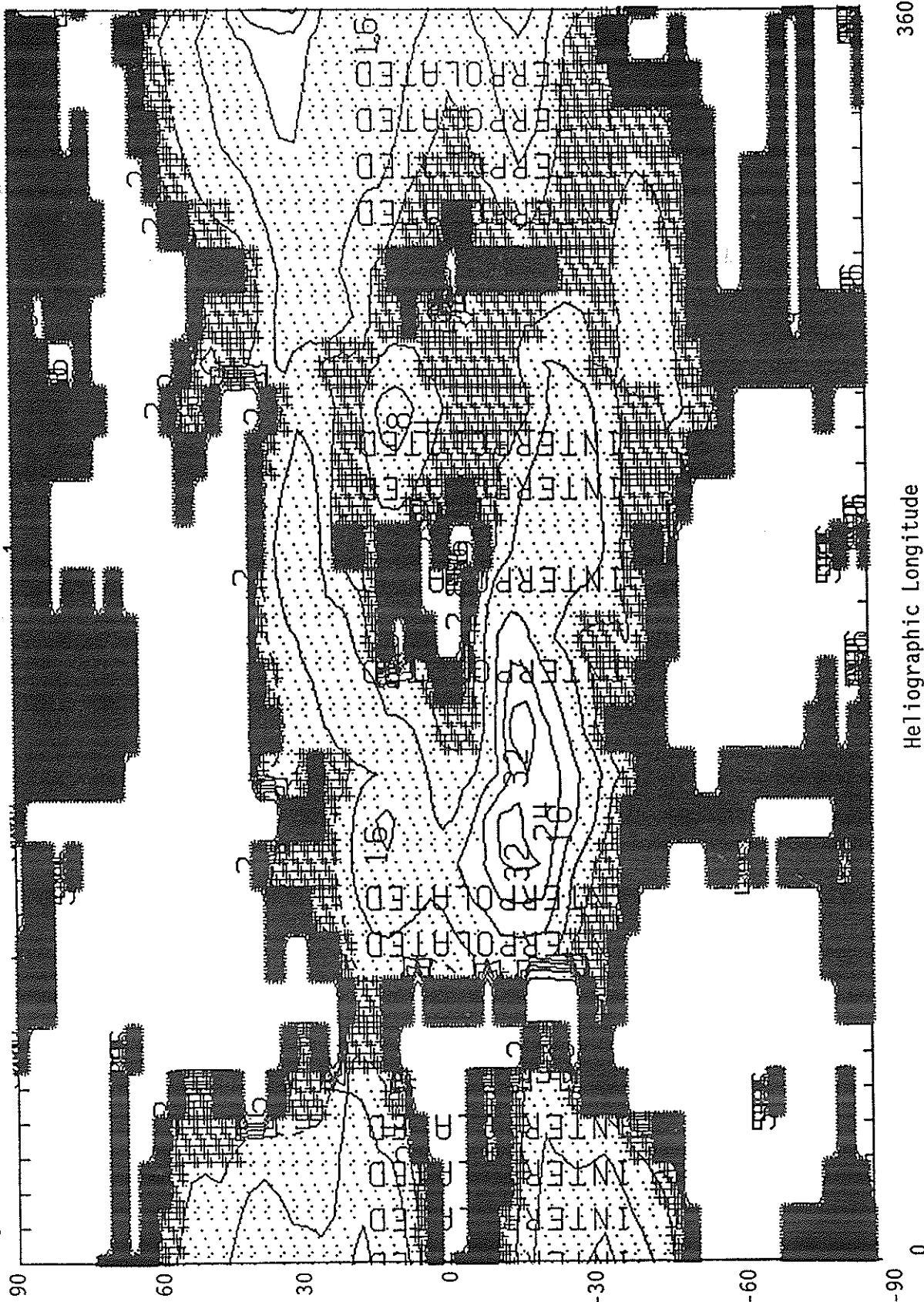
Heliographic Longitude

360

0

SACRAMENTO PEAK CORONAL RED LINE SYNOPTIC MAP--EAST LIMB
CARRINGTON ROTATION NUMBER 1810 (12 December 1888 to 9 January 1889)

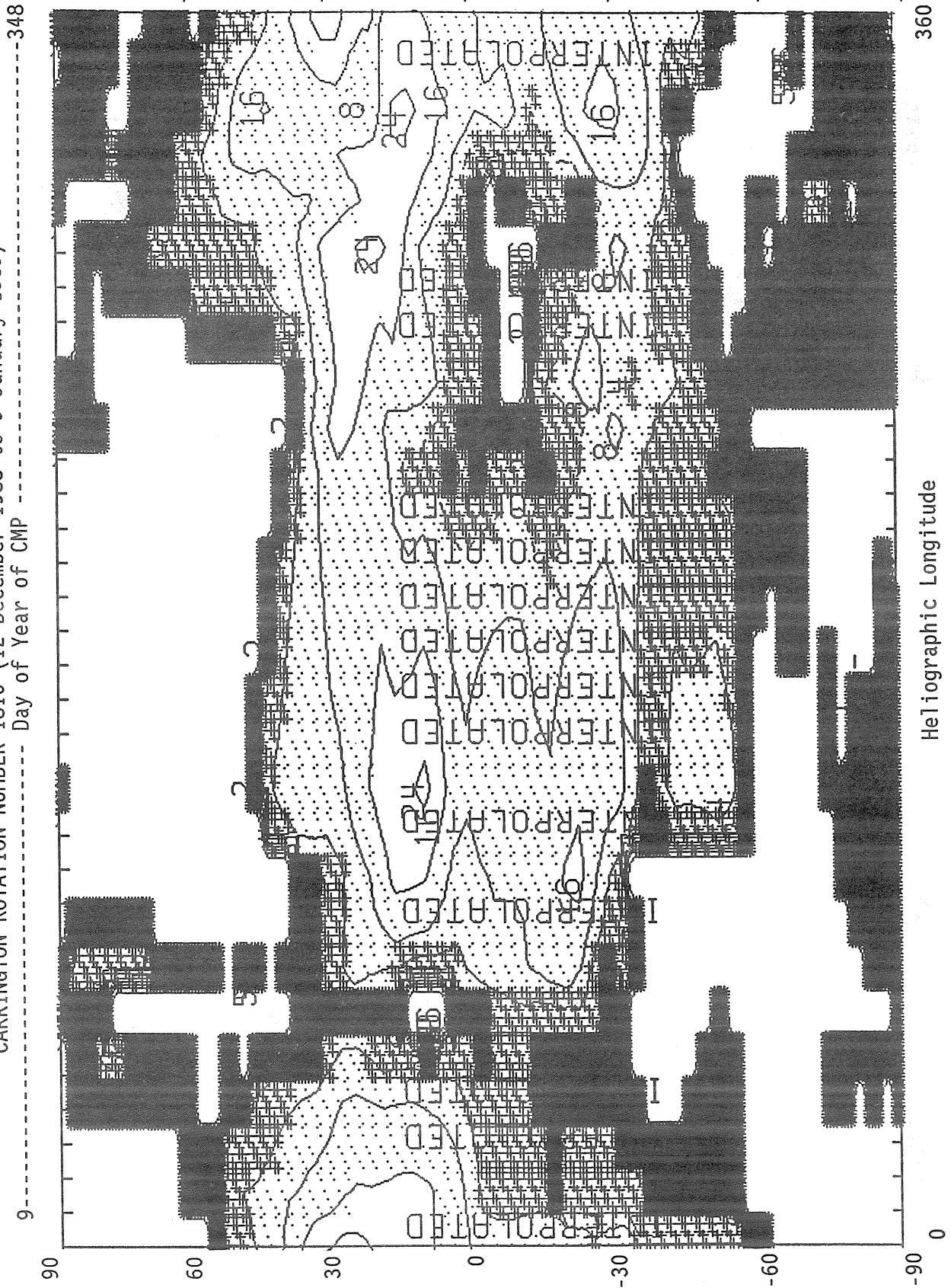
9 ----- Day of Year of CMP ----- 348



0 30 60 90 120 150 180 210 240 270 300 330 360 390 420 450 480 510 540 570 600 630 660 690 720 750 780 810 840 870 900 930 960 990
Heliographic Longitude

SACRAMENTO PEAK CORONAL RED LINE SYNOPTIC MAP--WEST LIMB
CARRINGTON ROTATION NUMBER 1810 (12 December 1988 to 9 January 1989)

348



360

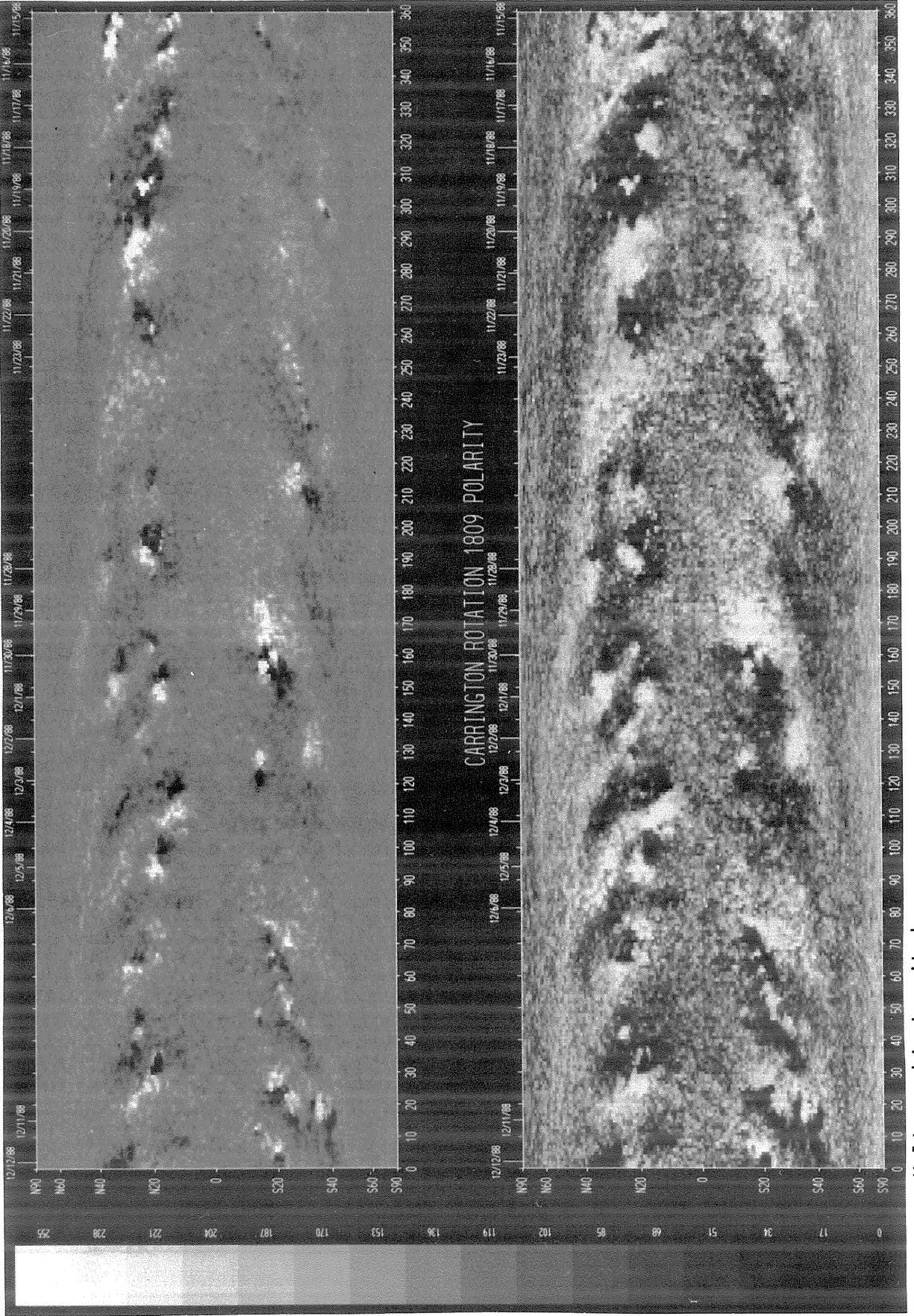
Heliographic Longitude

0

SOLAR MAGNETIC FIELD SYNOPSIS CHART
CARRINGTON ROTATION NUMBER 1809
(15 November to 12 December 1988)

Kitt Peak National Observatory

Dates of Observation

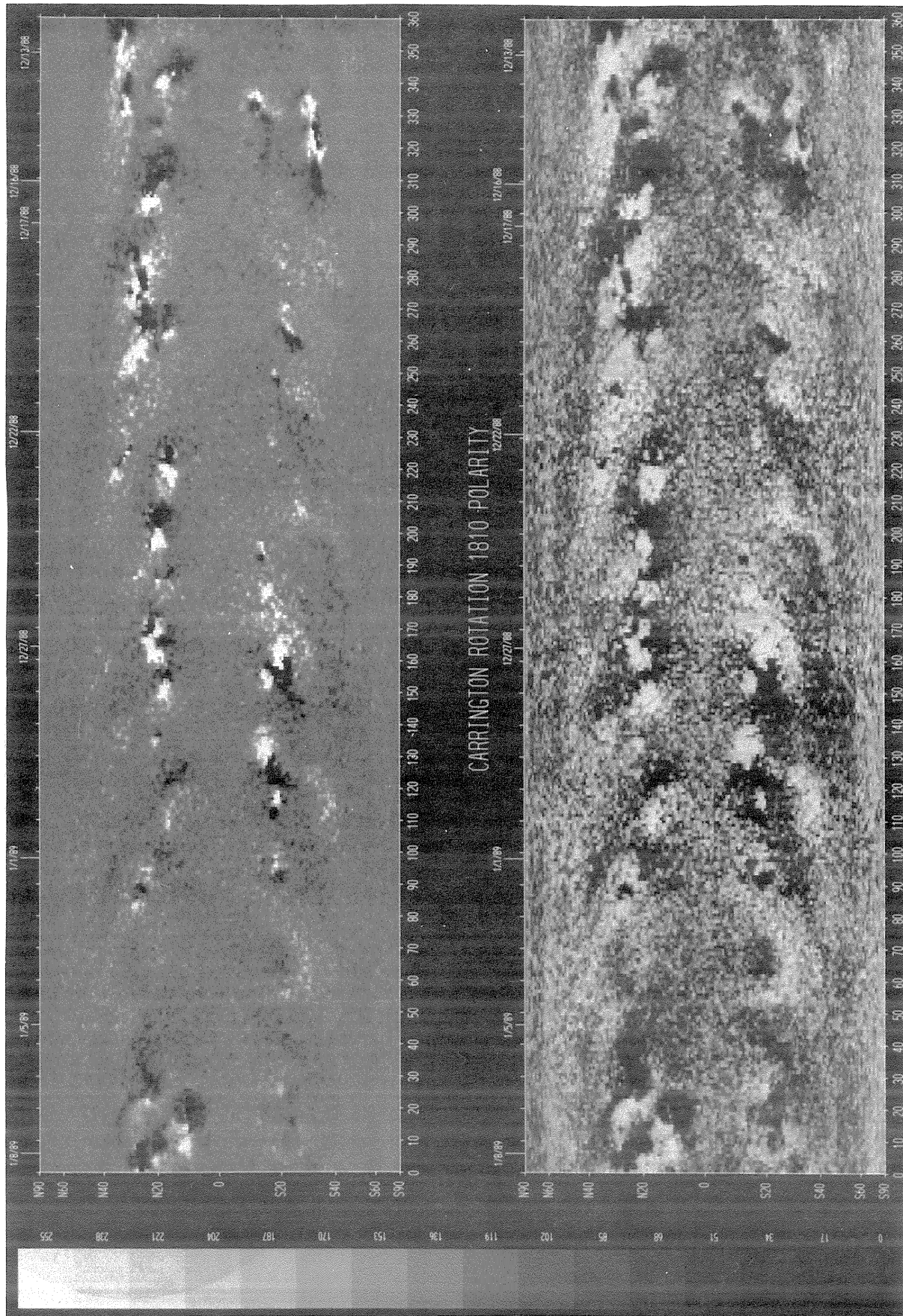


Heliographic Longitude

S O L A R M A G N E T I C F I E L D S Y N O P T I C C H A R T
CARRINGTON ROTATION NUMBER 1810
(12 December 1988 to 9 January 1989)

Dates of Observation

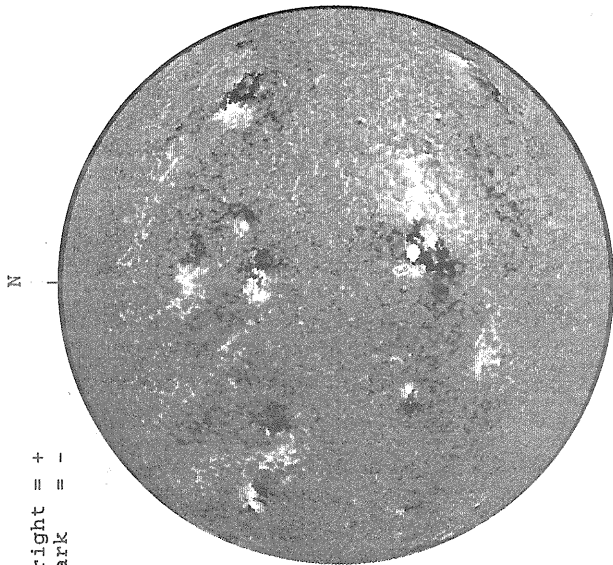
Kitt Peak National Observatory



Heliographic Longitude

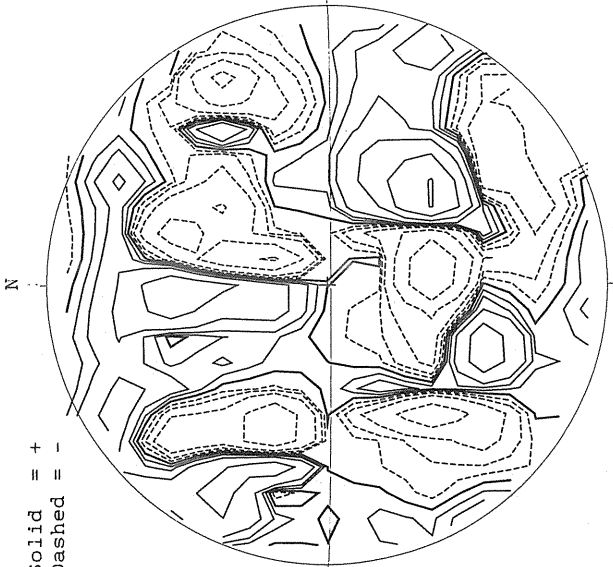
DECEMBER 1, 1988 (P= 16.01, B₀ = 0.83, L₀ = 156.02)

KITT PEAK MAGNETOGRAM



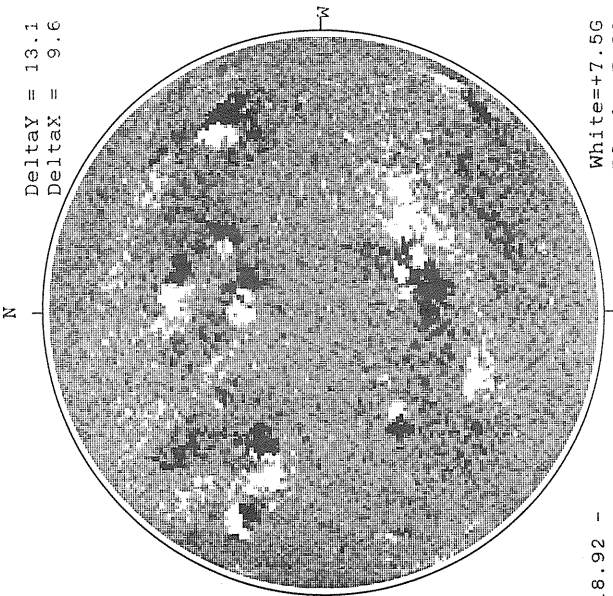
Bright = +
Dark = -

STANFORD MAGNETOGRAM



Solid = +
Dashed = -

MT. WILSON MAGNETOGRAM



DeltaY = 13.1
DeltaX = 9.6

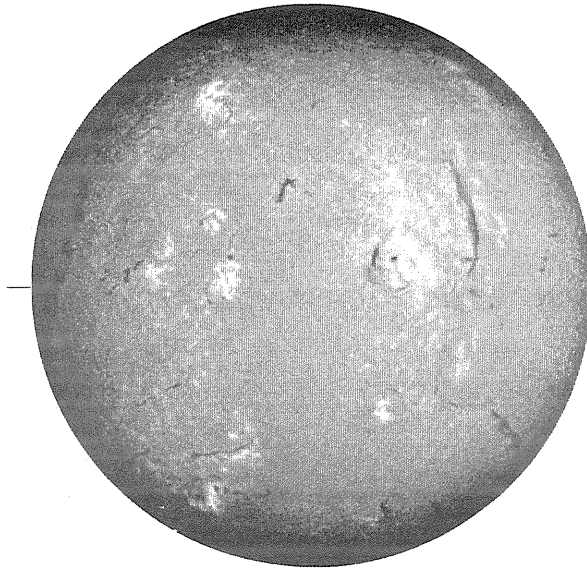
1616 UT

1809 UT

18.92 -
19.90 UT

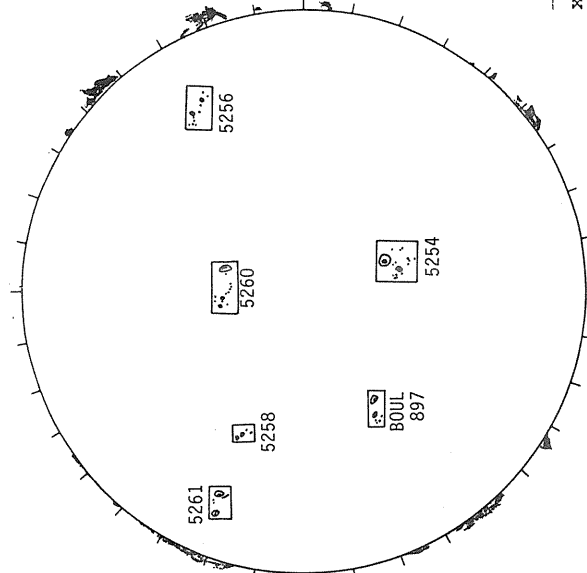
White=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA



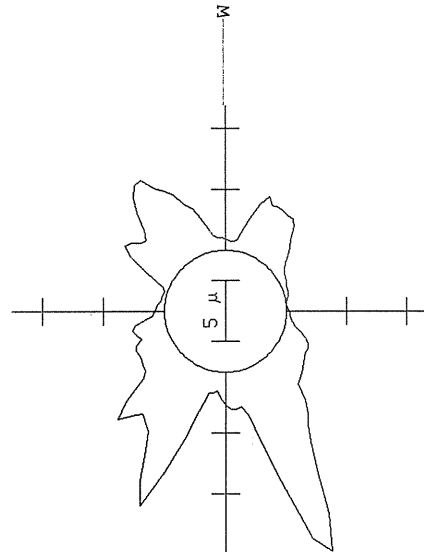
1503 UT

BOULDER SUNSPOT



1540 UT
1555 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



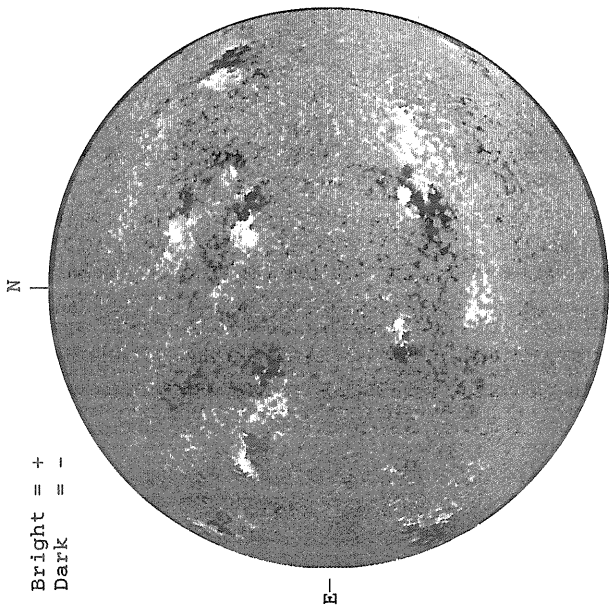
5303A, 1636 UT
xxxxx 5694A, 1618 UT

NO 5694A ACTIVITY TODAY

DECEMBER 2, 1988 (P = 15.62, B₀ = 0.71, L₀ = 142.84)

KITT PEAK MAGNETOGRAM

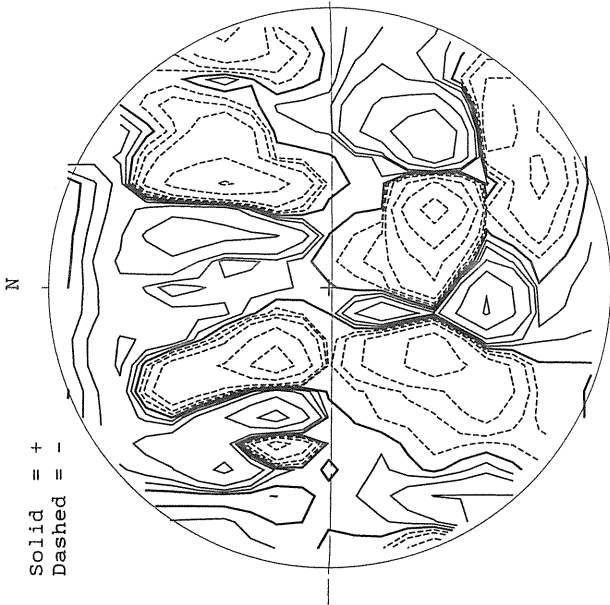
Bright = +
Dark = -



1617 UT

STANFORD MAGNETOGRAM

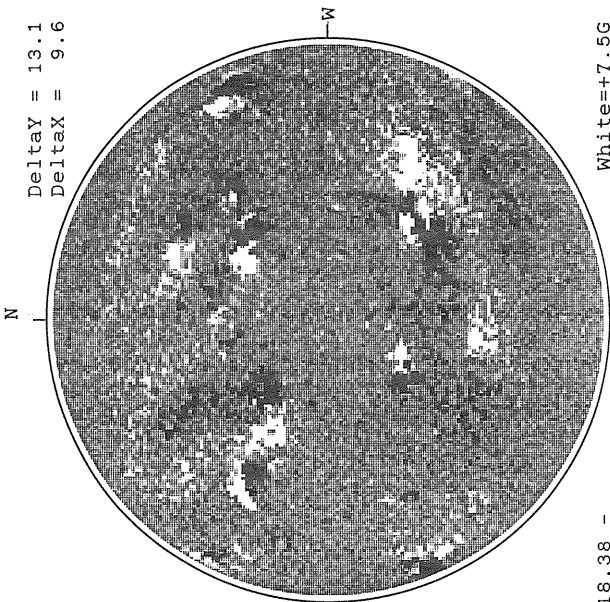
Solid = +
Dashed = -



1918 UT

MT. WILSON MAGNETOGRAM

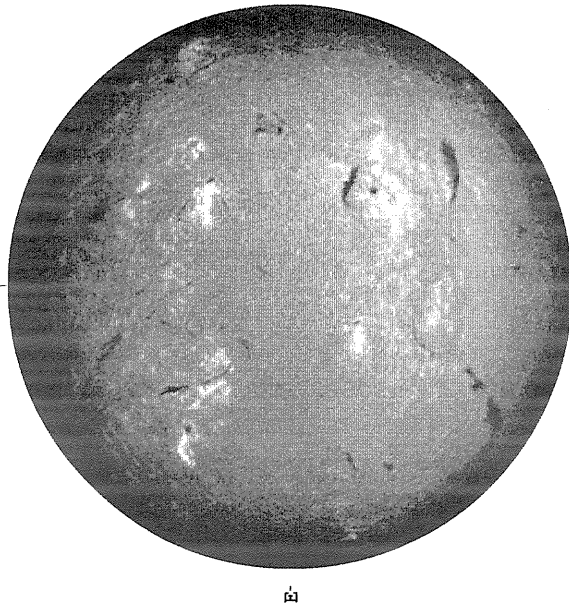
DeltaY = 13.1
DeltaX = 9.6



18.38 -
19.36 UT

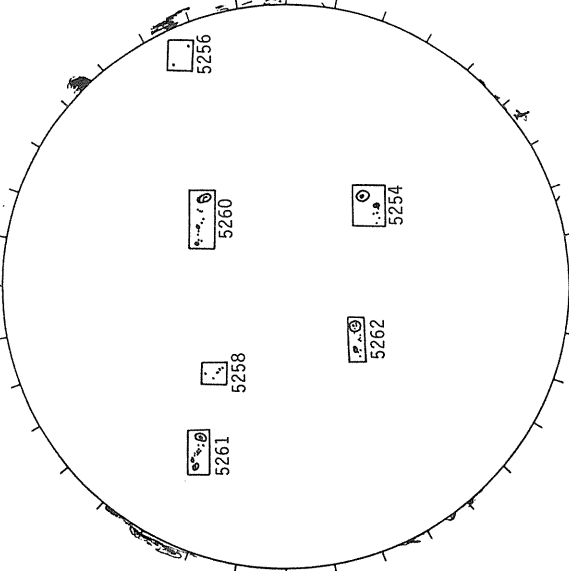
White = +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA



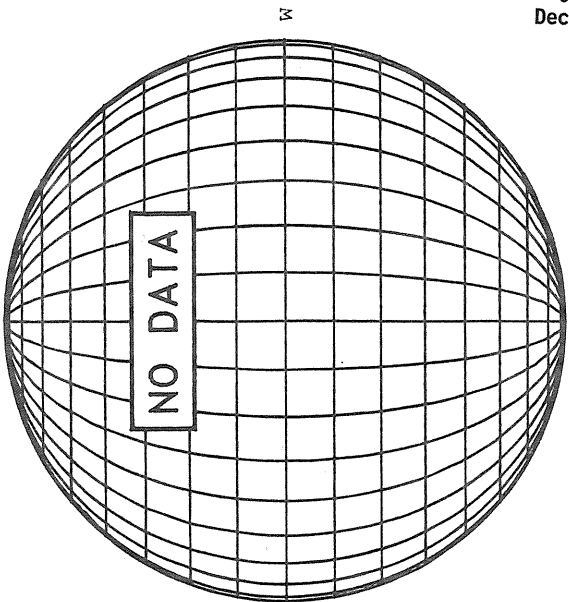
1933 UT

BOULDER SUNSPOT



1530 UT
1545 UT BOUL Prom

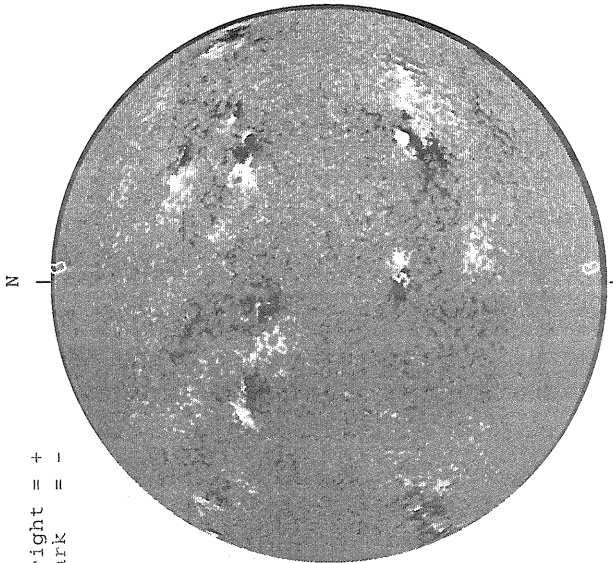
SACRAMENTO PEAK CORONA (1.15 Radii)



S

DECEMBER 3, 1988 (P= 15.23, B₀ = 0.58, L₀ = 129.66)

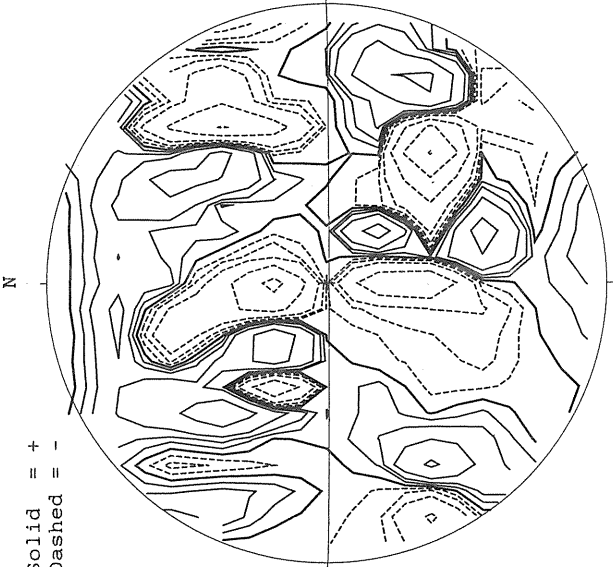
KITT PEAK MAGNETOGRAM



Bright = +
Dark = -

1616 UT

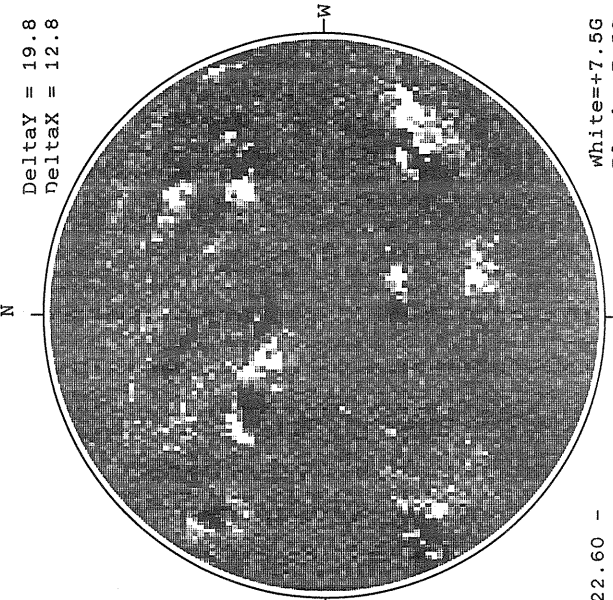
STANFORD MAGNETOGRAM



Solid = +
Dashed = -

1907 UT

MT. WILSON MAGNETOGRAM

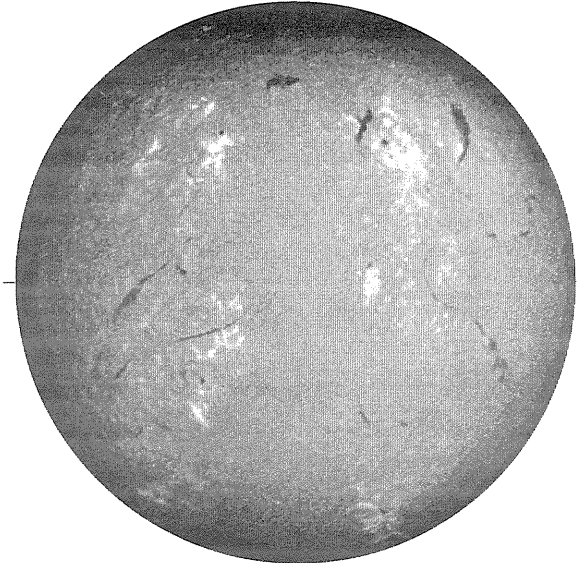


Delta_y = 19.8
Delta_x = 12.8

White = +7.5G
Black = -7.5G

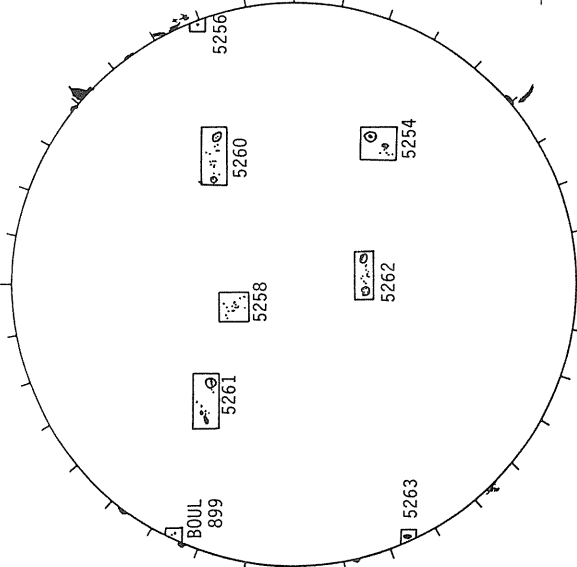
22.60 -
22.95 UT

SACRAMENTO PEAK H-ALPHA



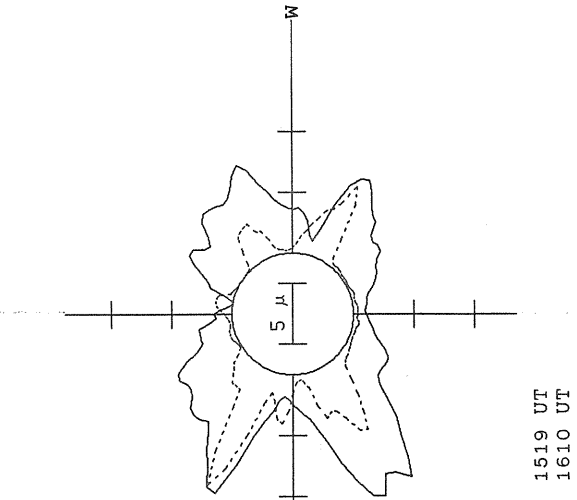
1535 UT

BOULDER SUNSPOT



1538 UT
1536 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



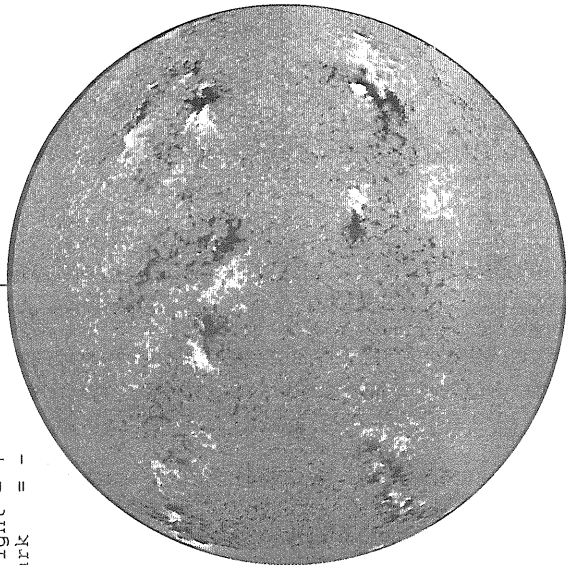
----- 5303A, 1519 UT
..... 6374A, 1610 UT
xxxxx 5694A, 1539 UT
NO 5694A ACTIVITY TODAY

S

DECEMBER 4, 1988 (P= 14.83, B₀ = 0.45, L₀ = 116.48)

KITT PEAK MAGNETOGRAM

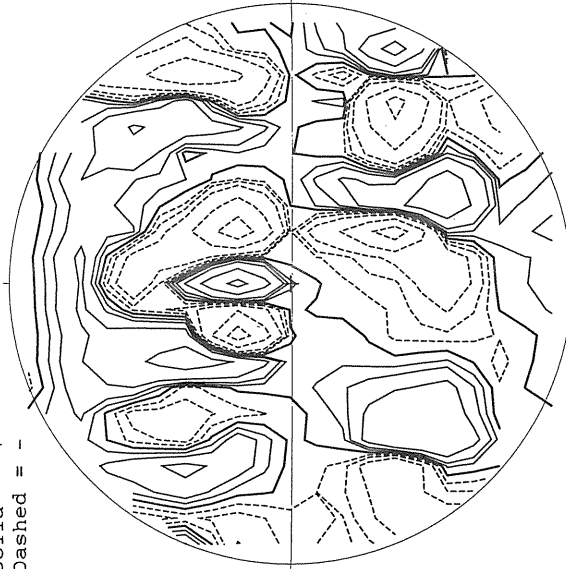
Bright = +
Dark = -



1614 UT

STANFORD MAGNETOGRAM

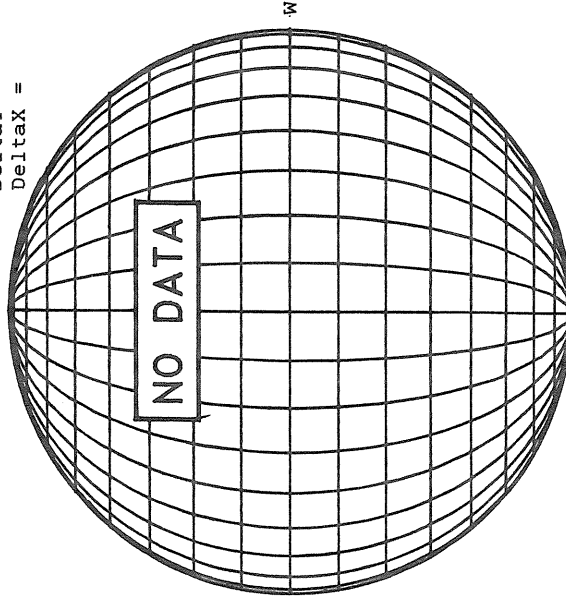
Solid = +
Dashed = -



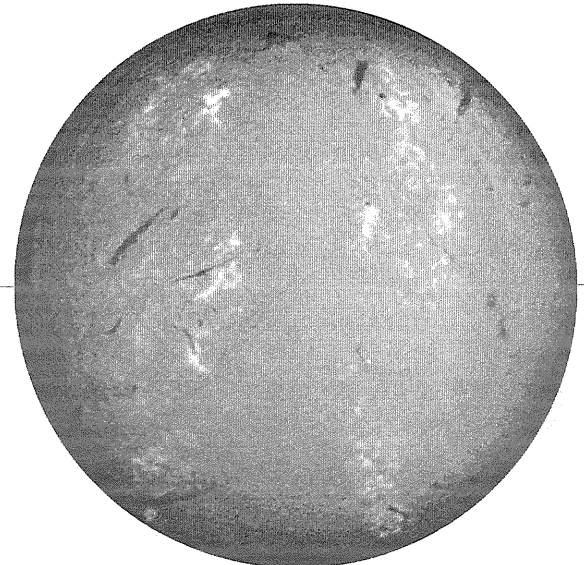
1912 UT

MT. WILSON MAGNETOGRAM

Delta_y =
Delta_x =

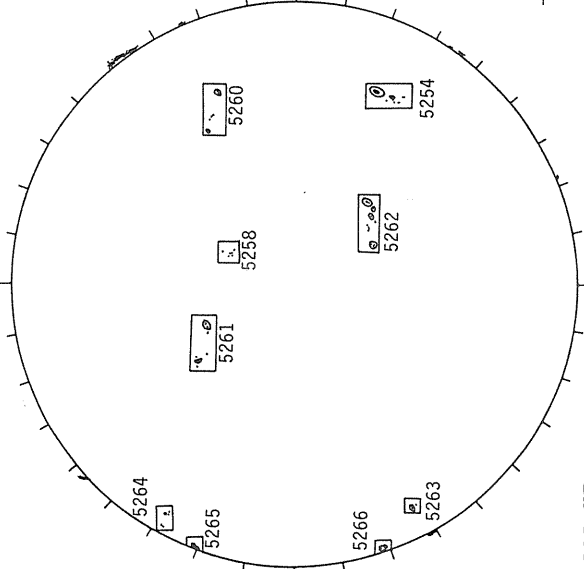


SACRAMENTO PEAK H-ALPHA



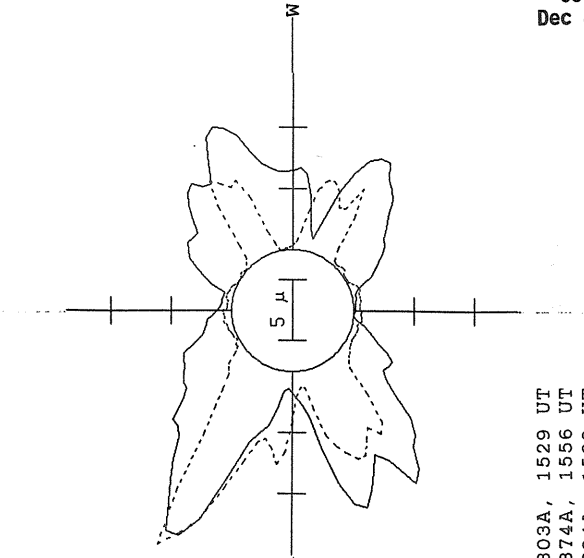
1508 UT

BOULDER SUNSPOT



1525 UT
1545 UT BOUL FROM S

SACRAMENTO PEAK CORONA (1.15 Radii)

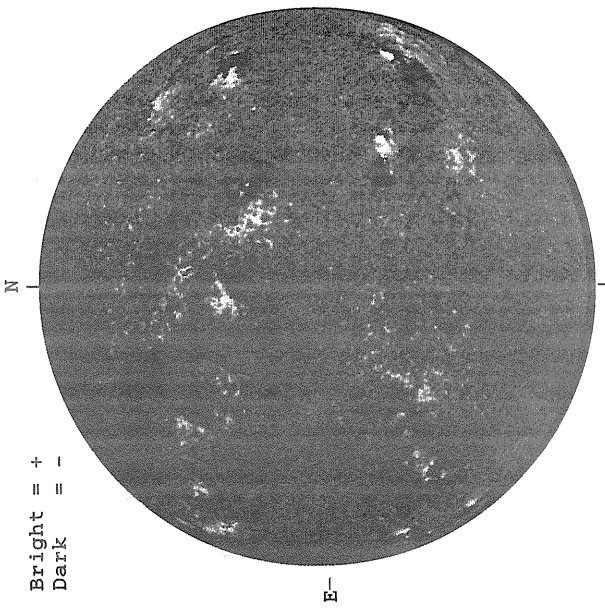


— 5303A, 1529 UT
... 6374A, 1556 UT
XXXX 5694A, 1539 UT
NO 5694A ACTIVITY TODAY

DECEMBER 5, 1988 (P= 14.42, B₀ = 0.32, I₀ = 103.30)

KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



1620 UT

STANFORD MAGNETOGRAM

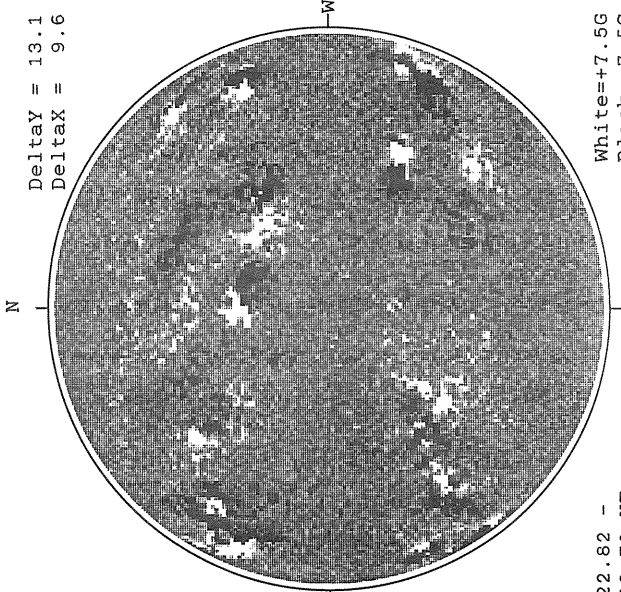
Solid = +
Dashed = -



1928 UT

MT. WILSON MAGNETOGRAM

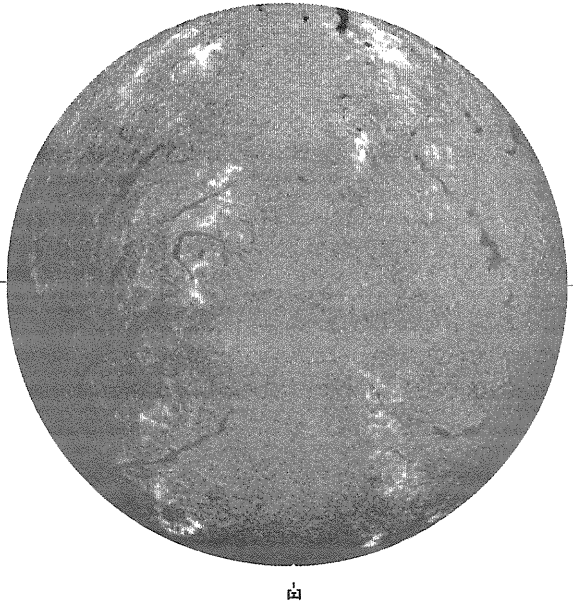
DeltaY = 13.1
DeltaX = 9.6



22.82 -
23.79 UT

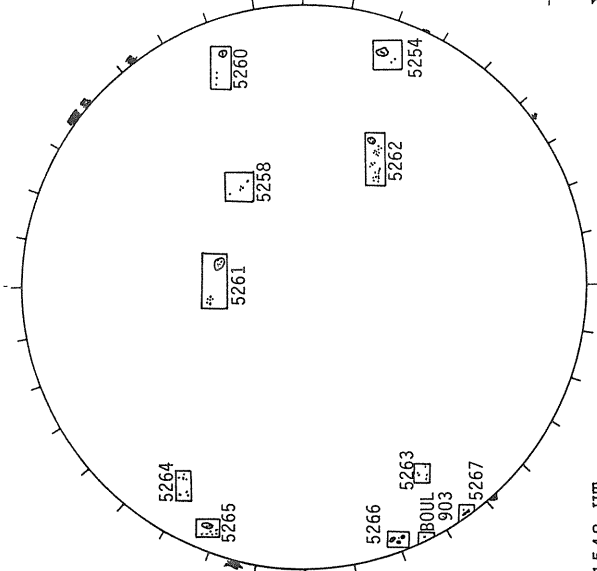
White = +7.5G
Black = -7.5G

HOLLOMAN H-ALPHA



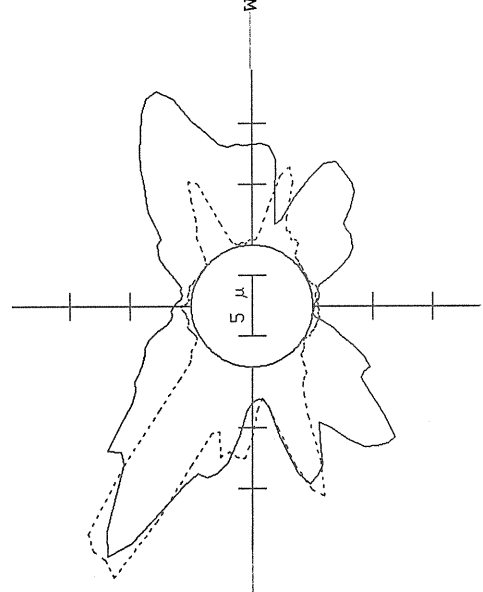
1735 UT

BOULDER SUNSPOT



1548 UT
1535 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)

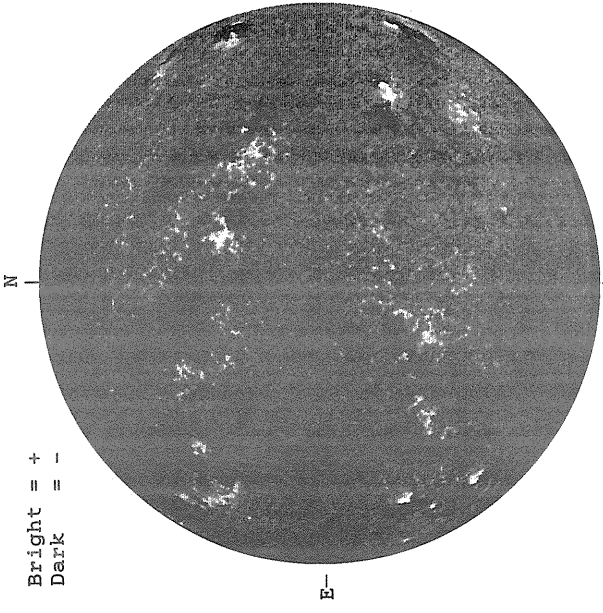


— 5303A, 1533 UT
.... 6374A, 1609 UT
xxxxx 5694A, 1603 UT
NO 5694A ACTIVITY TODAY

S

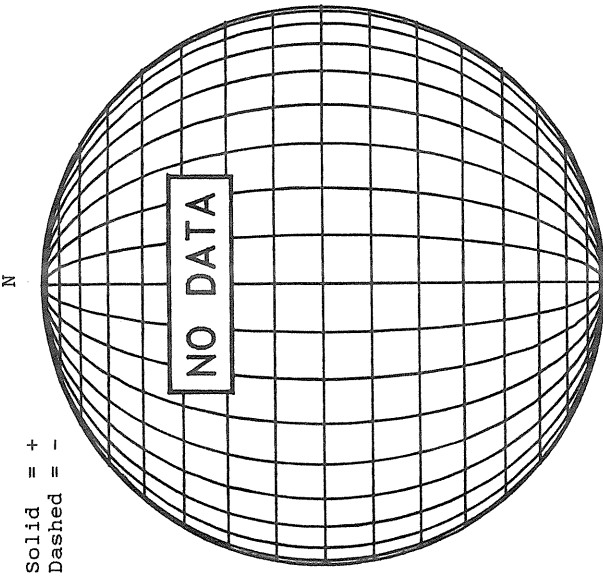
DECEMBER 6, 1988 (P= 14.01, B₀ = 0.20, I₀ = 90.13)

KITT PEAK MAGNETOGRAM



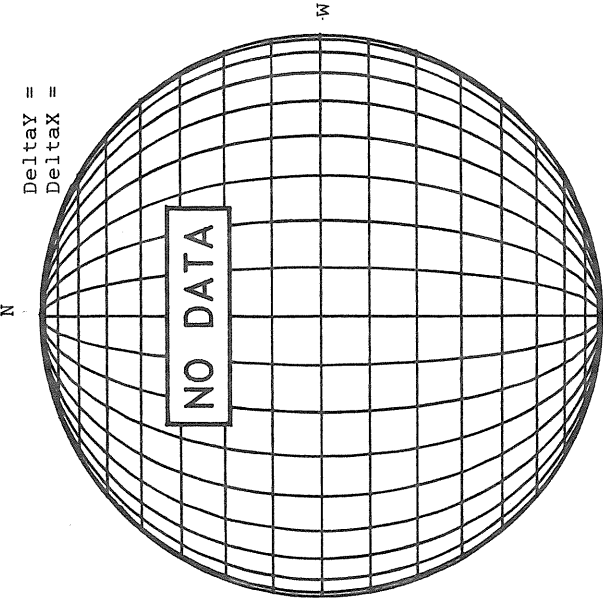
Bright = +
Dark = -

STANFORD MAGNETOGRAM



Solid = +
Dashed = -

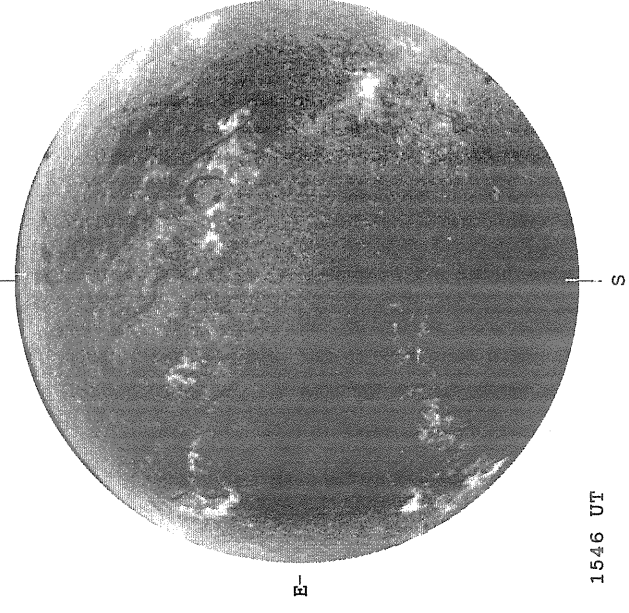
MT. WILSON MAGNETOGRAM



Delta₁ =
Delta₂ =

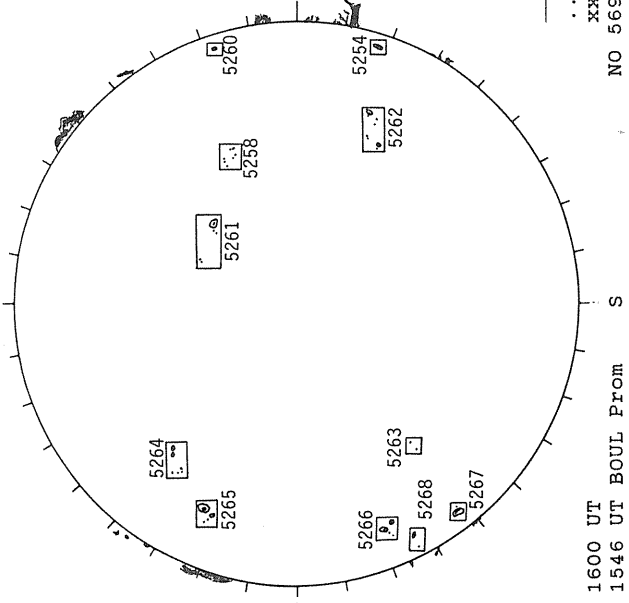
1616 UT

BOULDER H-ALPHA



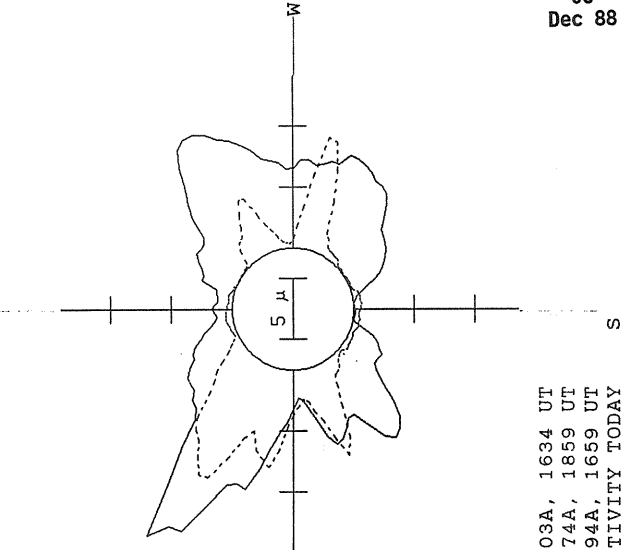
1546 UT

BOULDER SUNSPOT



1600 UT
1546 UT BOUL FROM

SACRAMENTO PEAK CORONA (1.15 Radii)

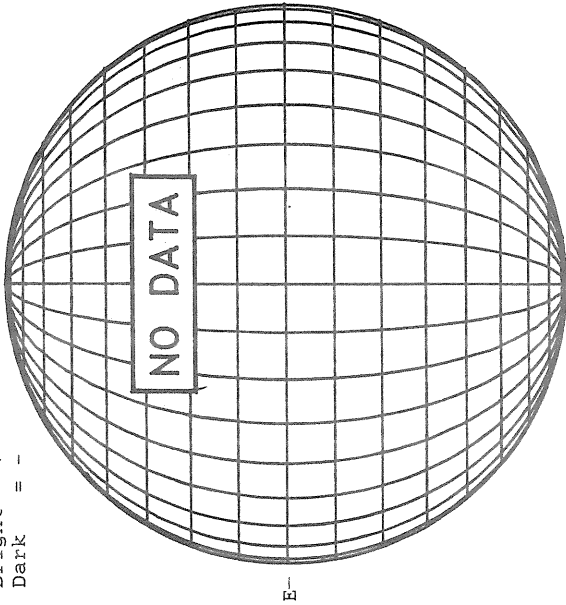


— 5303A, 1634 UT
.... 6374A, 1859 UT
xxxx 5694A, 1659 UT
NO 5694A ACTIVITY TODAY

DECEMBER 7, 1988 (P= 13.59, B₀ = 0.07, L₀ = 76.95)

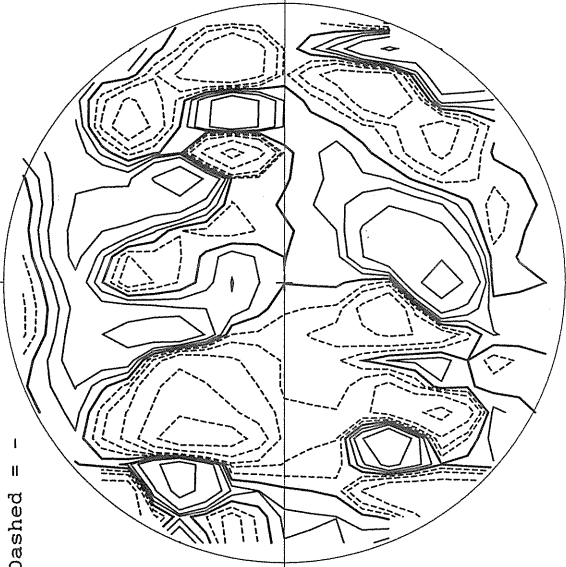
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



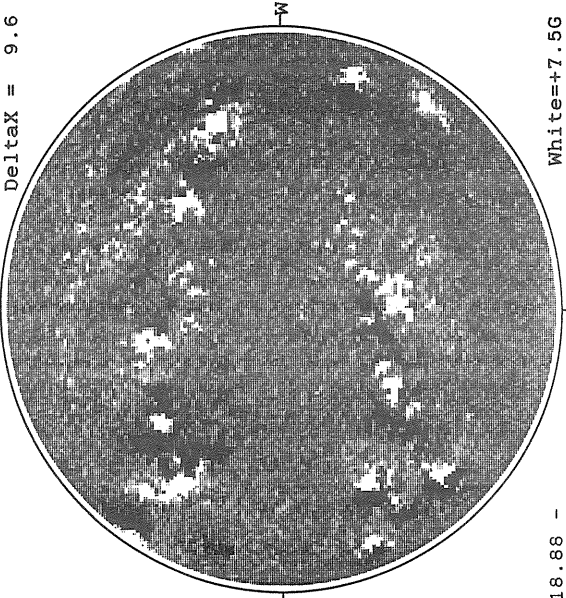
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

DeltaY = 13.1
DeltaX = 9.6

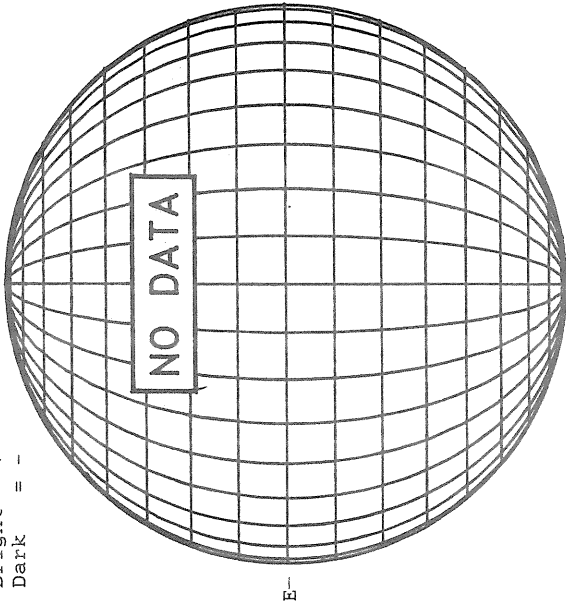


18.88 -
19.85 UT

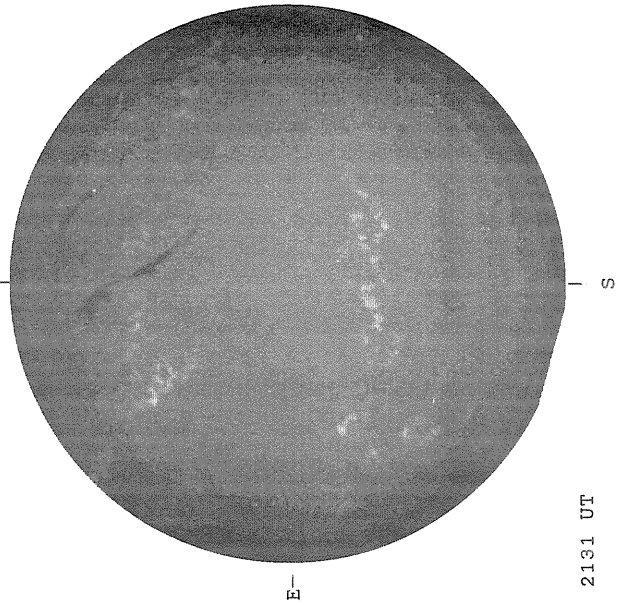
White=+7.5G
Black=-7.5G

KITT PEAK MAGNETOGRAM

Bright = +
Dark = -

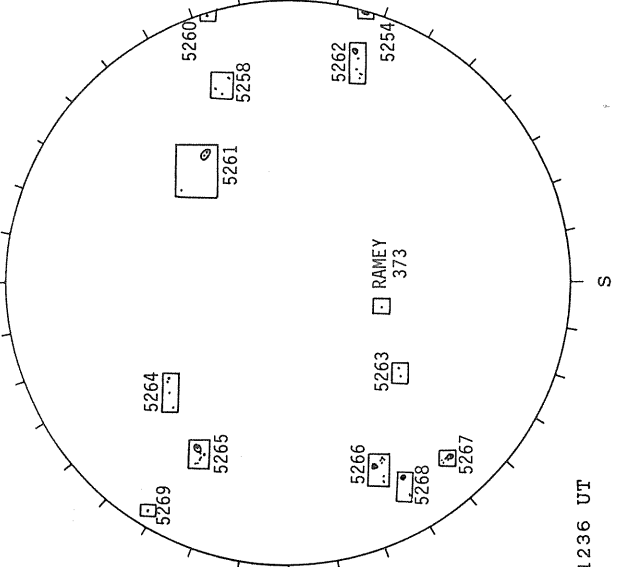


SACRAMENTO PEAK H-ALPHA



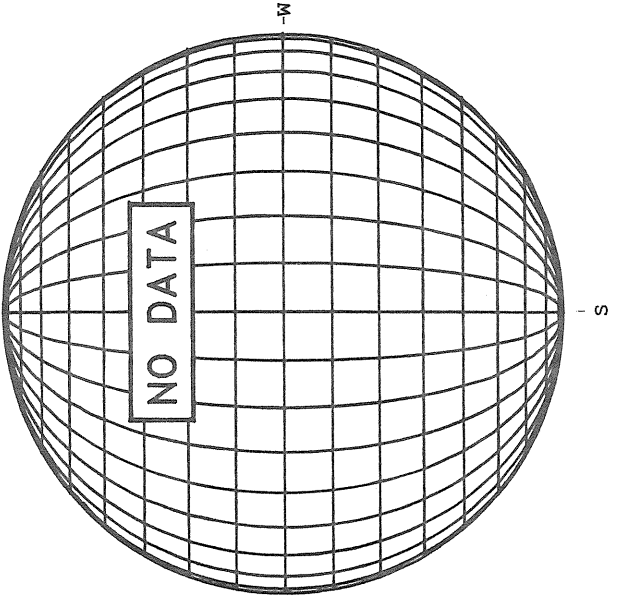
2131 UT

RAMEY SUNSPOT



1236 UT

SACRAMENTO PEAK CORONA (1.15 Radii)



S

S

E

E

N

N

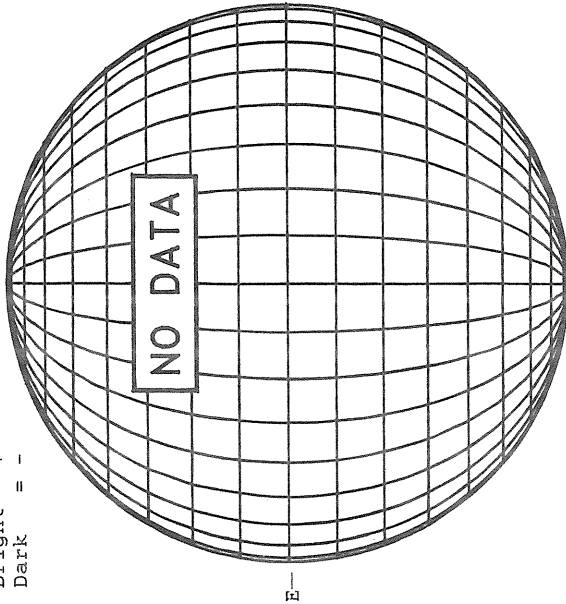
W

W

DECEMBER 8, 1988 (P= 13.17, B₀ = -0.06, L₀ = 63.77)

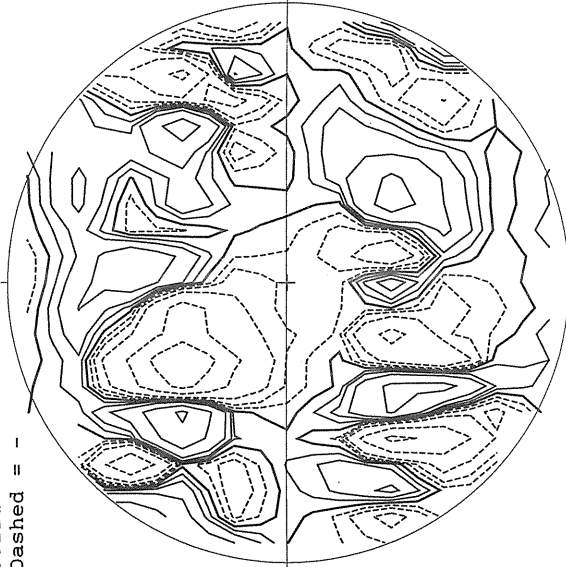
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



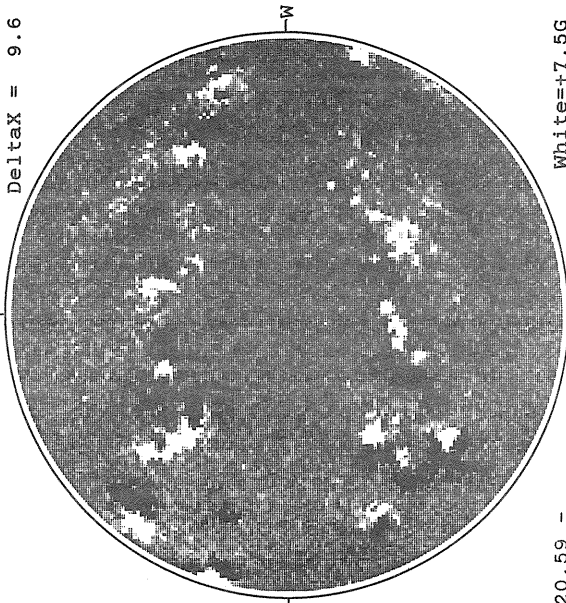
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

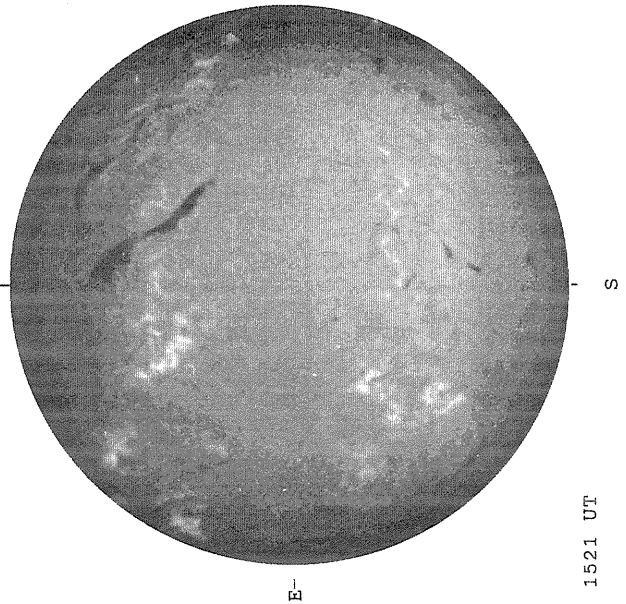
DeltaY = 13.1
DeltaX = 9.6



20.59 -
21.56 UT

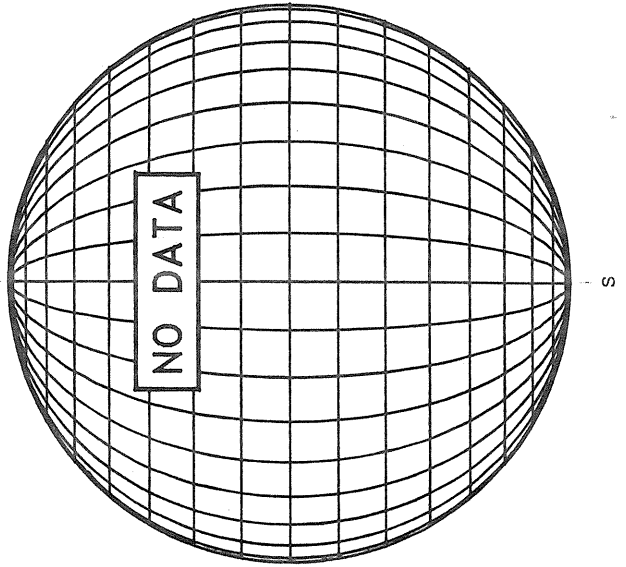
White=+7.5G
Black=-7.5G

SACRAMENTO PEAK H-ALPHA

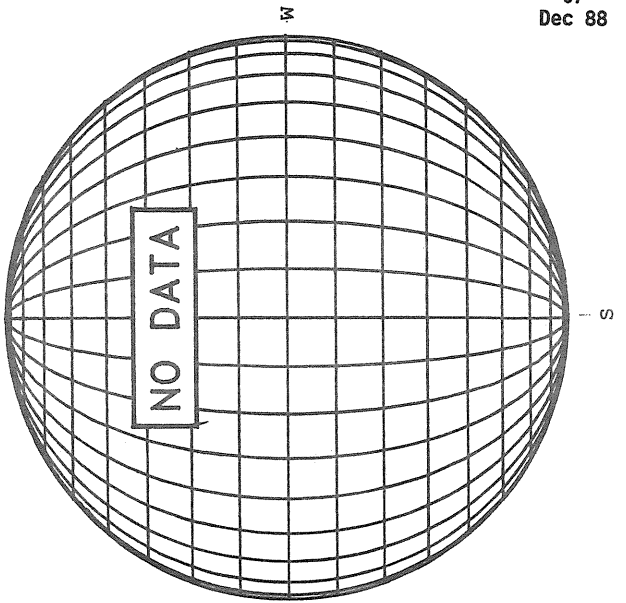


1521 UT

BOULDER SUNSPOT



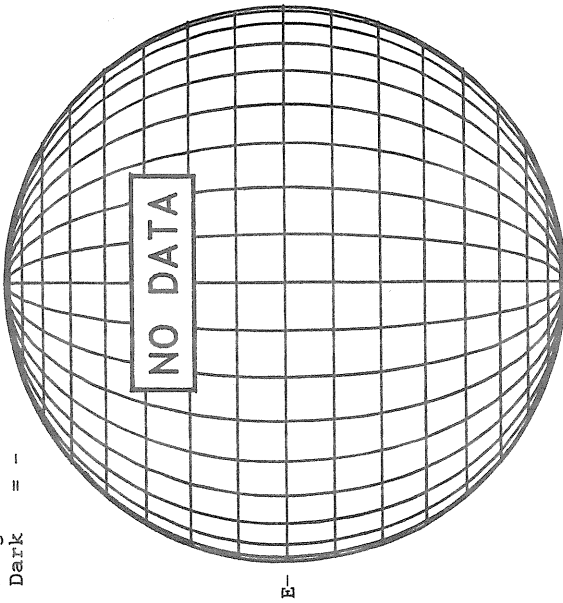
SACRAMENTO PEAK CORONA (1.15 Radii)



DECEMBER 9, 1988 (P= 12.75, B₀ = -0.19, L₀ = 50.60)

KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



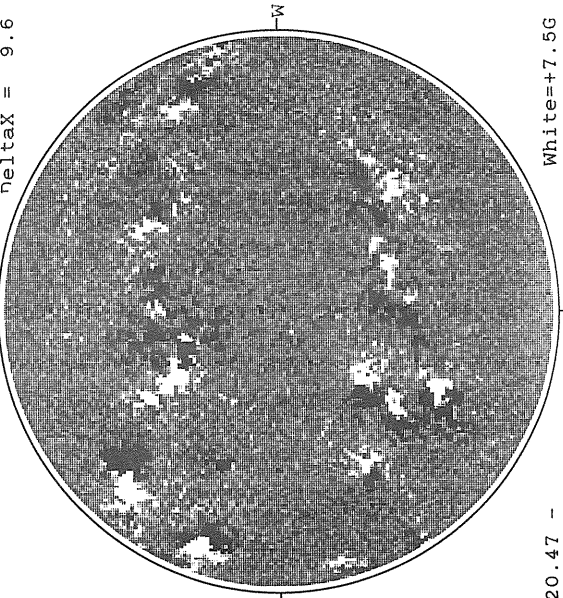
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

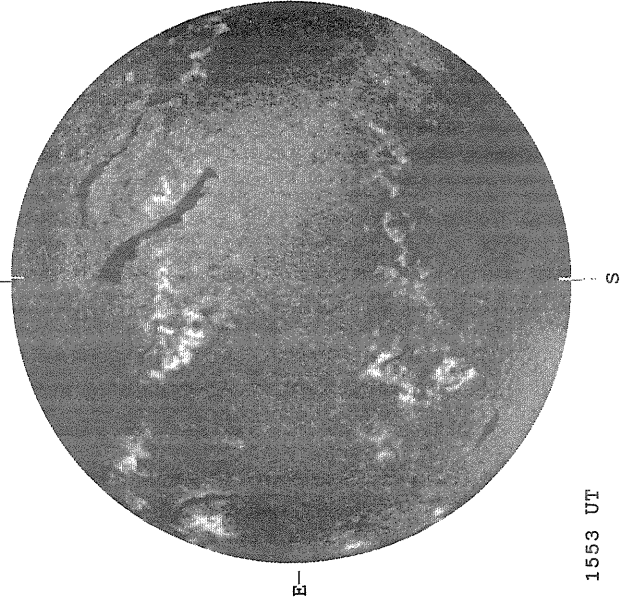
DeltaY = 13.1
DeltaX = 9.6



20.47 -
21.45 UT

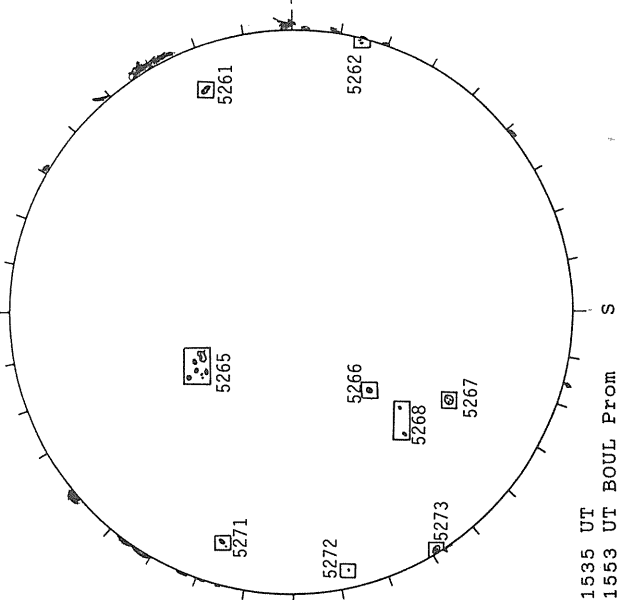
White = +7.5G
Black = -7.5G

BOULDER H-ALPHA



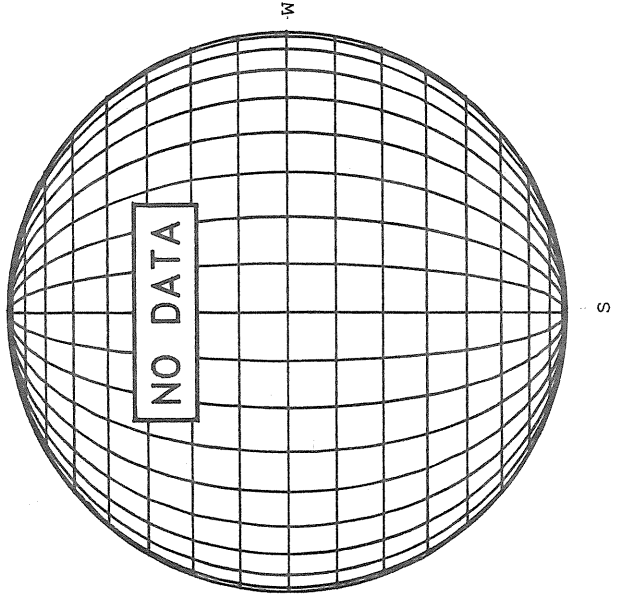
1553 UT

BOULDER SUNSPOT



1555 UT
1553 UT BOUL Prom

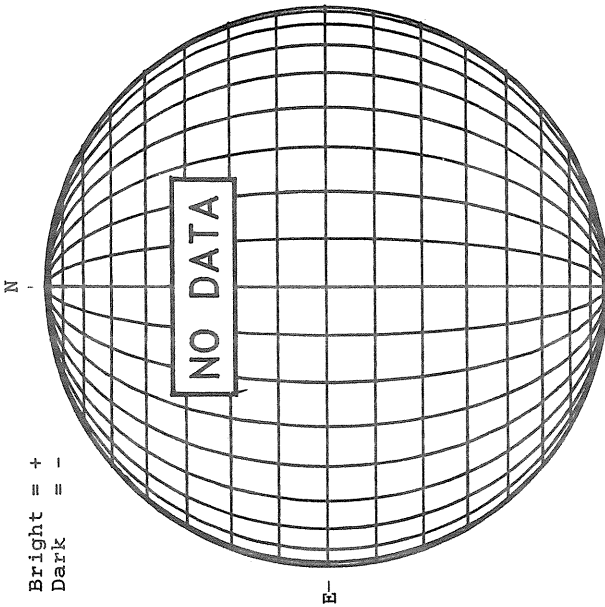
SACRAMENTO PEAK CORONA (1.15 Radii)



DECEMBER 10, 1988 (P= 12.31, B₀ = -0.32, L₀ = 37.42)

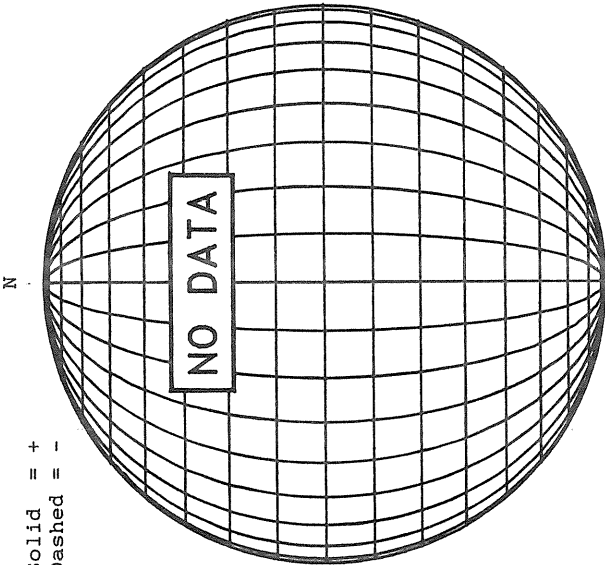
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



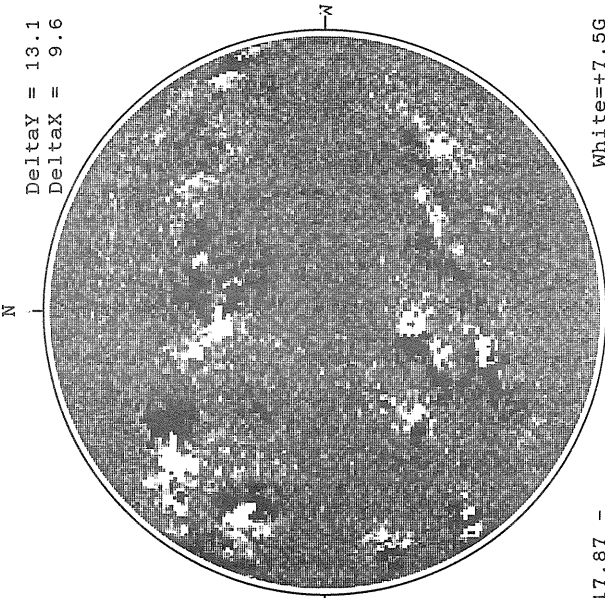
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

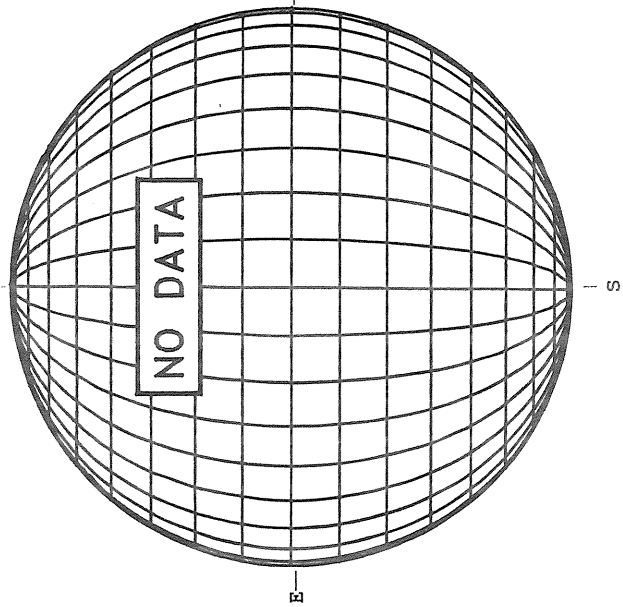
Delta γ = 13.1
Delta α = 9.6



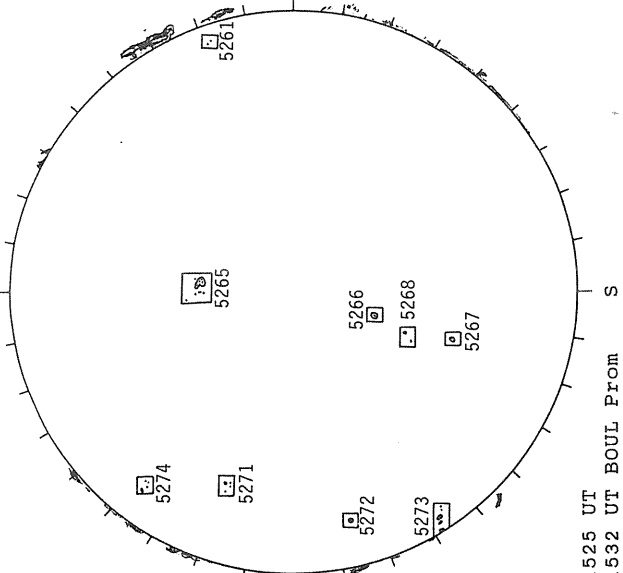
17.87 -
18.84 UT

White = +7.5G
Black = -7.5G

BOULDER H-ALPHA

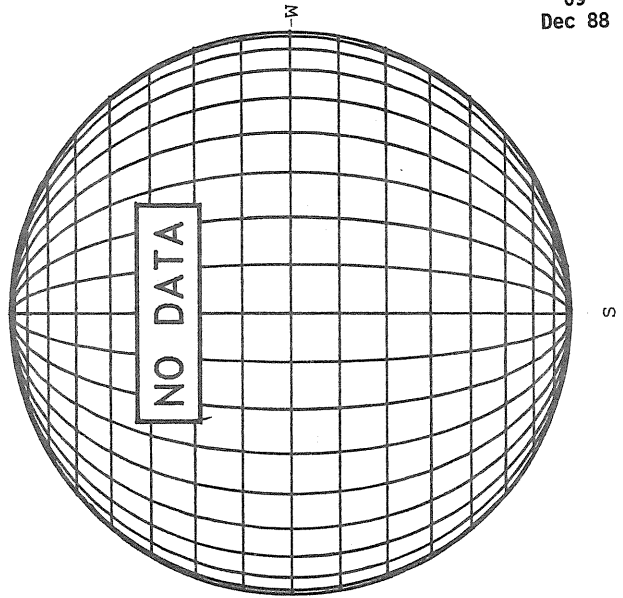


BOULDER SUNSPOT



1525 UT
1532 UT BOUL Prom

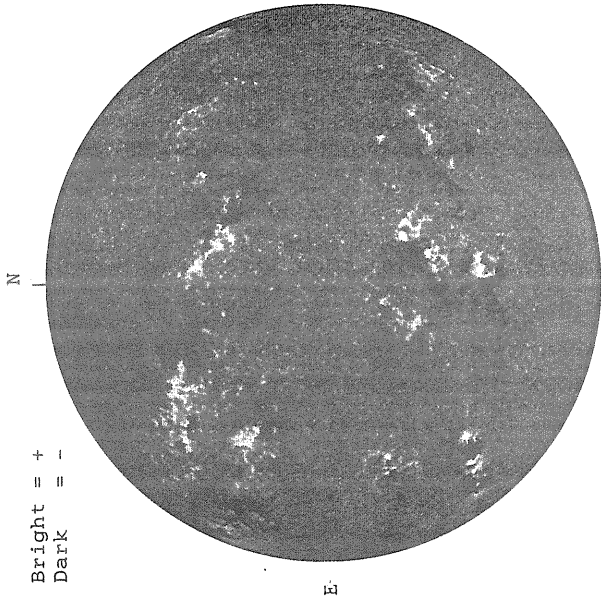
SACRAMENTO PEAK CORONA (1.15 Radii)



DECEMBER 11, 1988 (P = 11.88, B₀ = -0.44, L₀ = 24.25)

KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



1730 UT

STANFORD MAGNETOGRAM

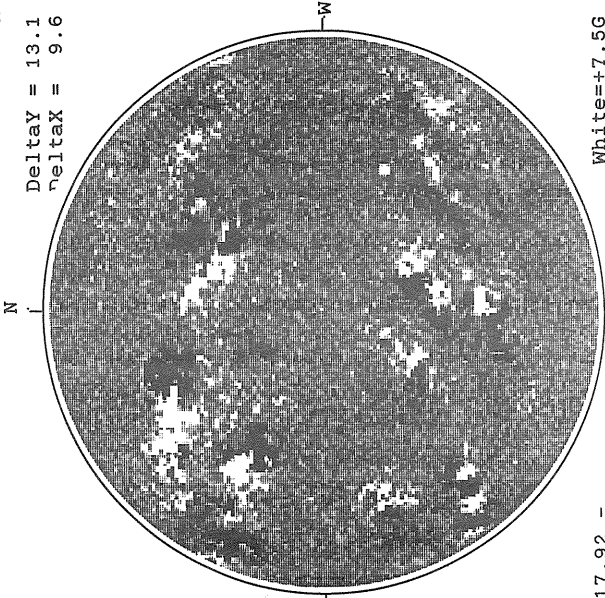
Solid = +
Dashed = -



1924 UT

MT. WILSON MAGNETOGRAM

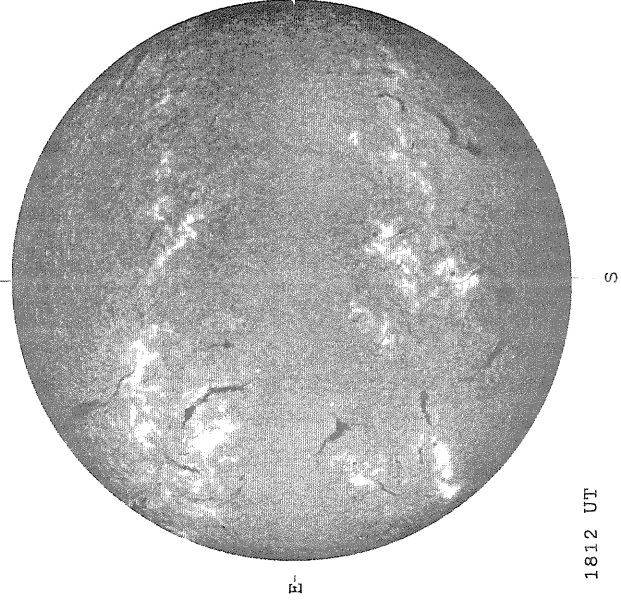
DeltaY = 13.1
DeltaX = 9.6



17.92 -
18.90 UT

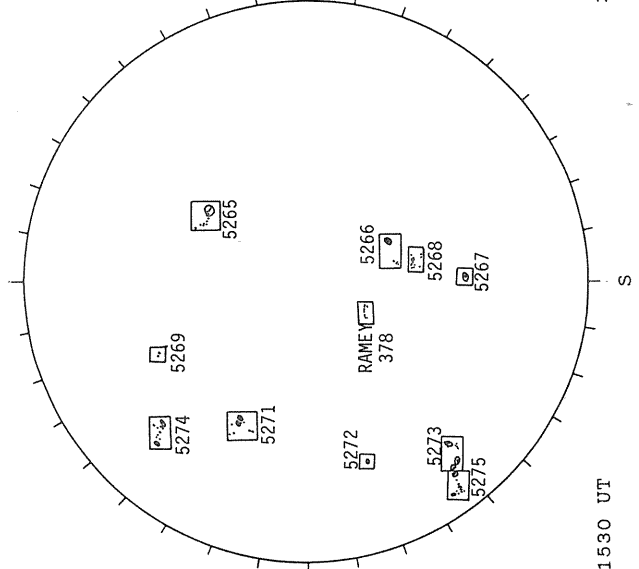
White = +7.5G
Black = -7.5G

HOLLOMAN H-ALPHA



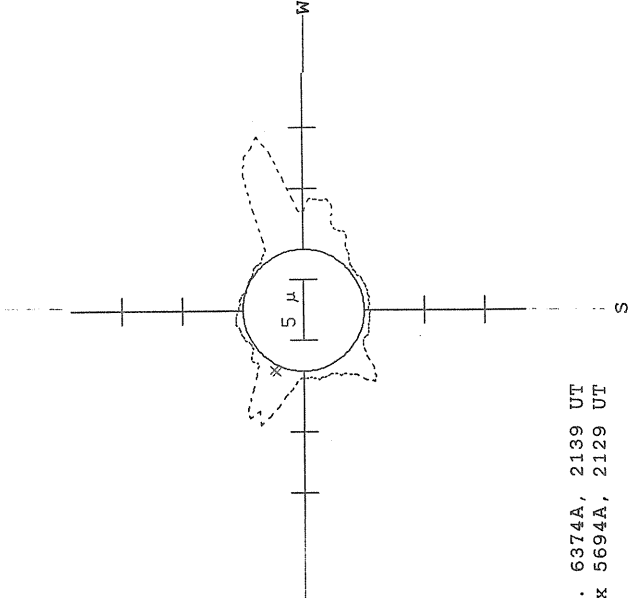
1812 UT

RAMEY SUNSPOT



1530 UT

SACRAMENTO PEAK CORONA (1.15 Radii)

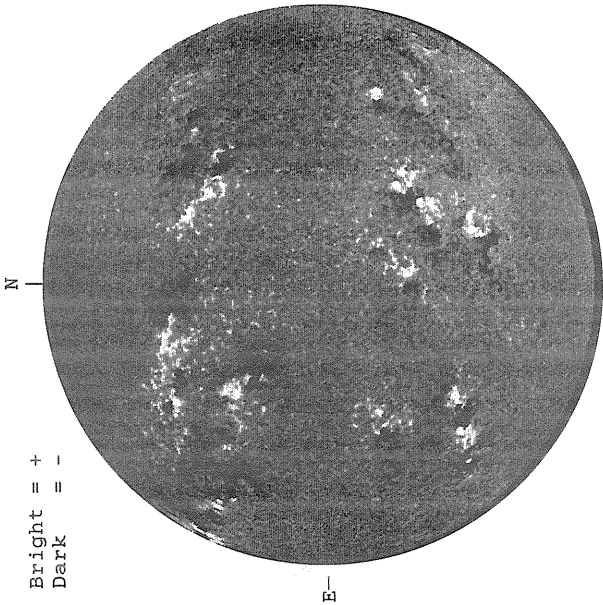


.... 6374A, 2139 UT
XXXX 5694A, 2129 UT

DECEMBER 12, 1988 (P= 11.44, B₀ = -0.57, I₀ = 11.07)

KITT PEAK MAGNETOGRAM

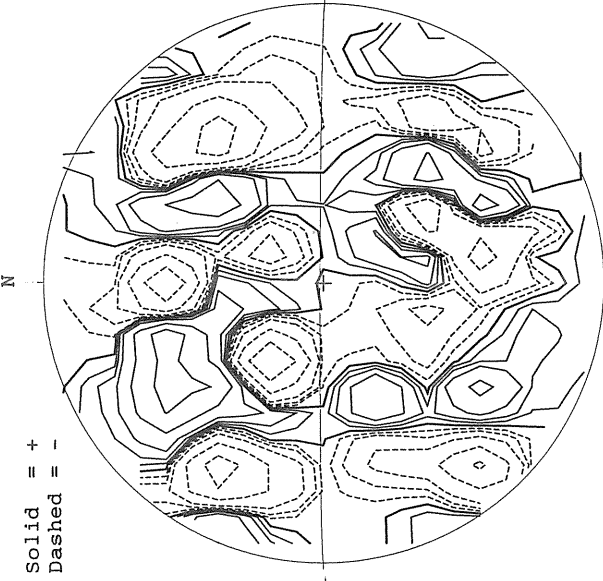
Bright = +
Dark = -



1546 UT

STANFORD MAGNETOGRAM

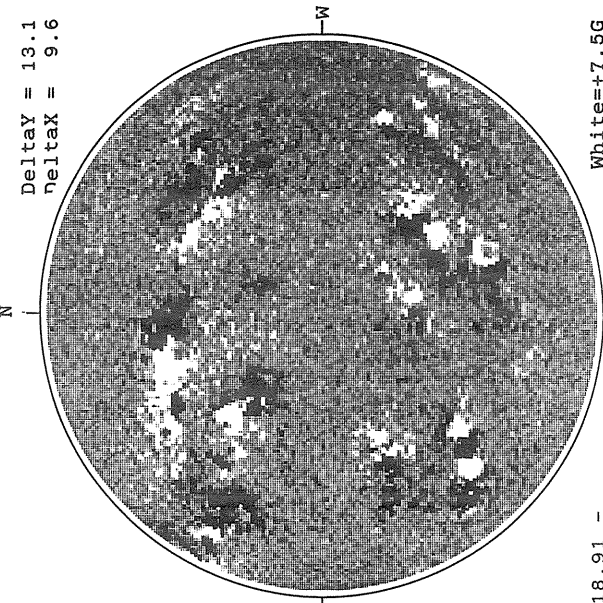
Solid = +
Dashed = -



1857 UT

MT. WILSON MAGNETOGRAM

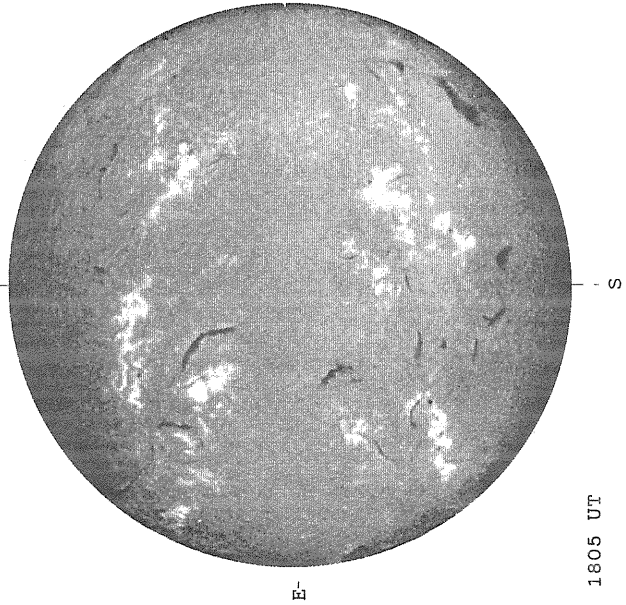
DeltaY = 13.1
DeltaX = 9.6



18.91 -
19.89 UT

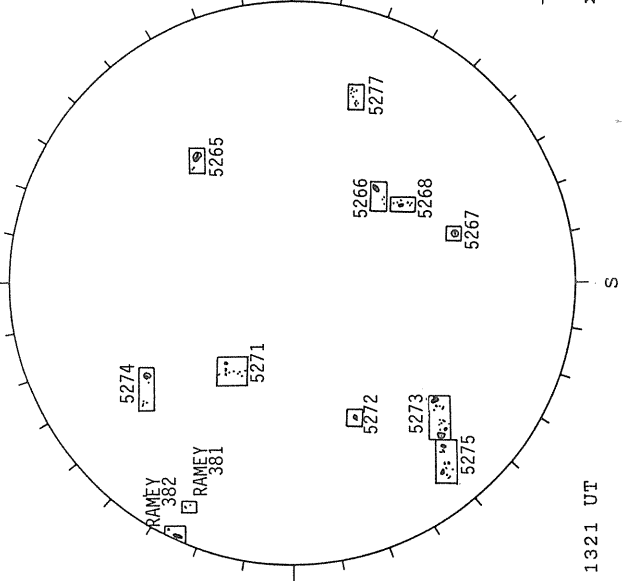
White=+7.5G
Black=-7.5G

HOLLOMAN H-ALPHA



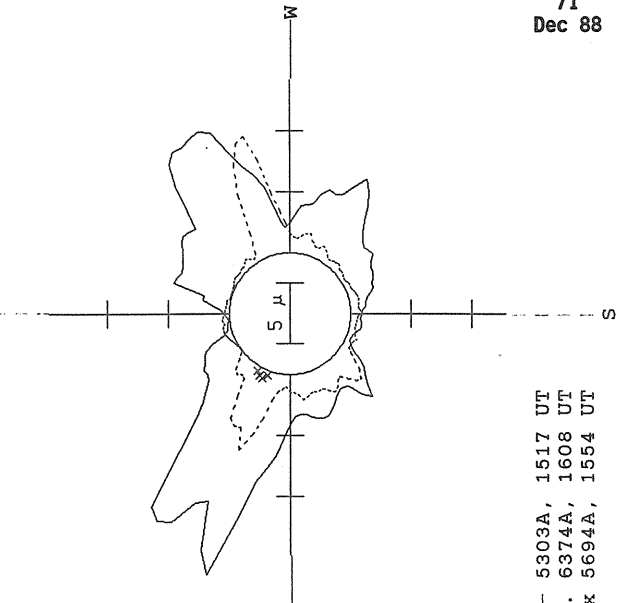
1805 UT

RAMEY SUNSPOT



1321 UT

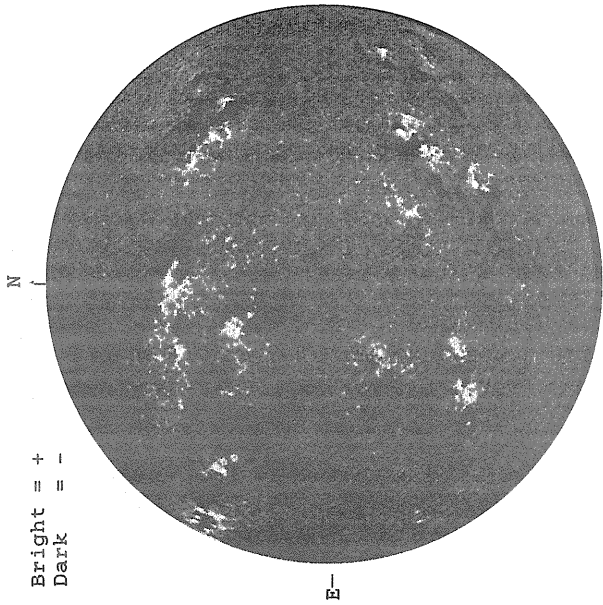
SACRAMENTO PEAK CORONA (1.15 Radii)



— 5303A, 1517 UT
.... 6374A, 1608 UT
XXXX 5694A, 1554 UT

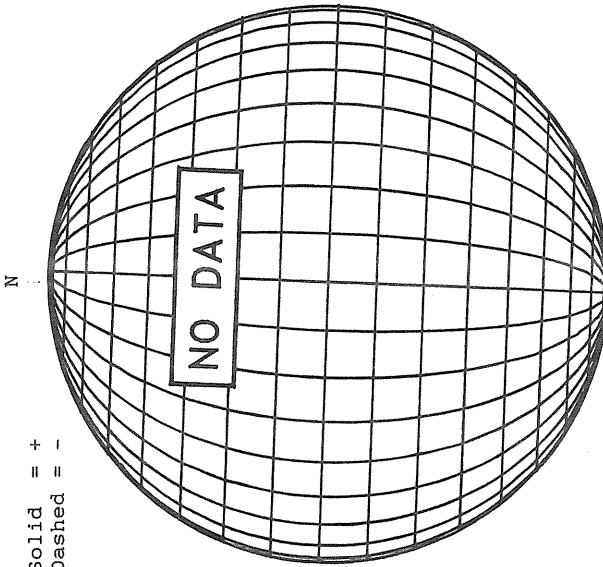
DECEMBER 13, 1988 (P= 10.99, B₀ =-0.70, L₀ = 357.89)

KITT PEAK MAGNETOGRAM



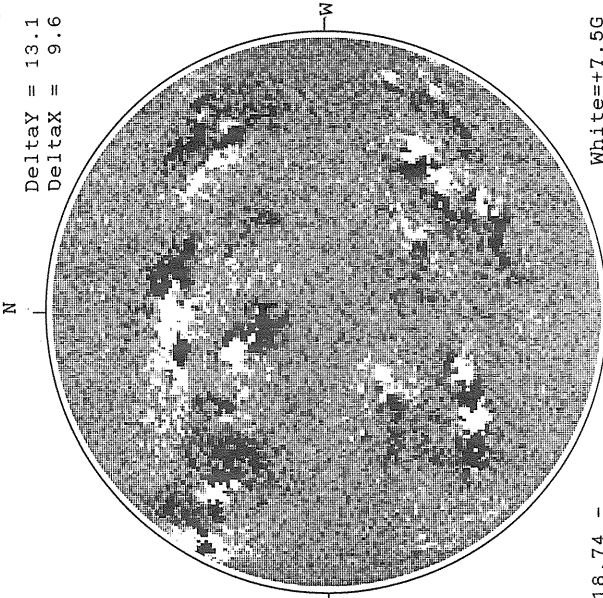
Bright = +
Dark = -

STANFORD MAGNETOGRAM



Solid = +
Dashed = -

MT. WILSON MAGNETOGRAM



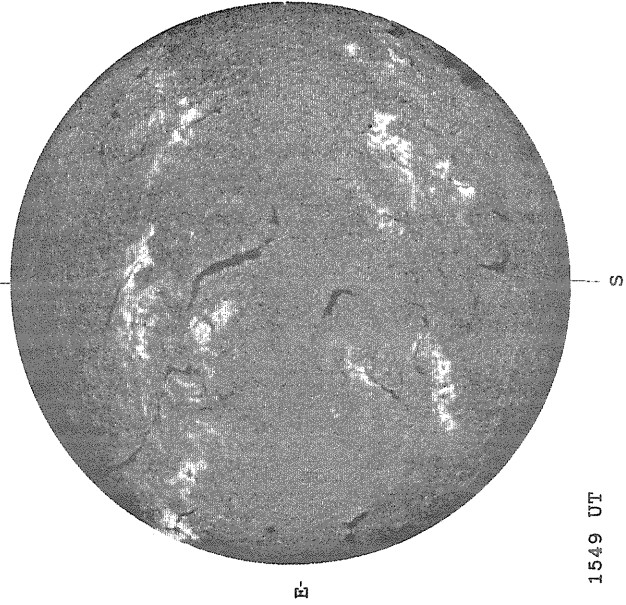
DeltaY = 13.1
DeltaX = 9.6

1626 UT

18.74 -
19.72 UT

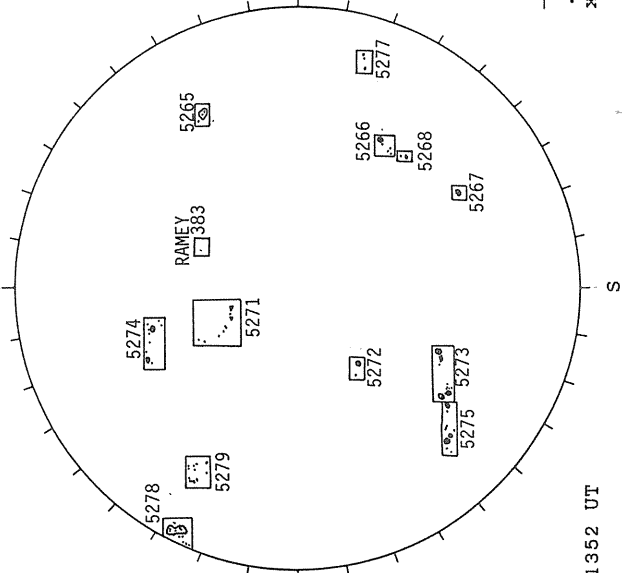
White=+7.5G
Black=-7.5G

HOLLOMAN H-ALPHA



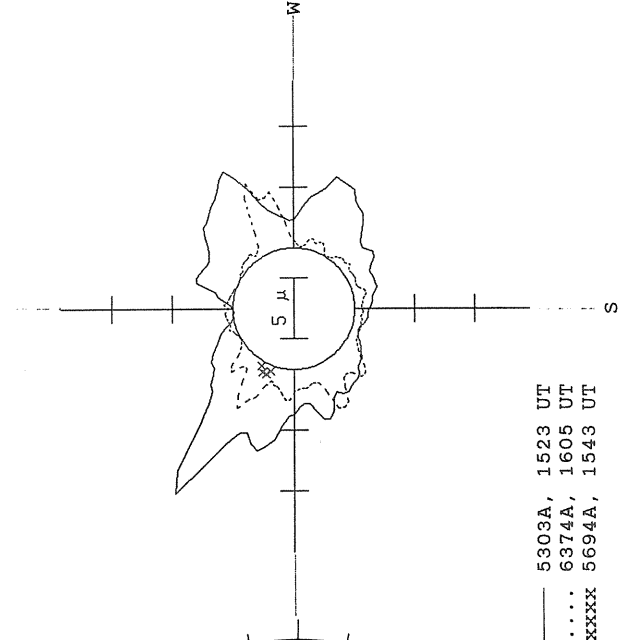
1549 UT

RAMEY SUNSPOT



1352 UT

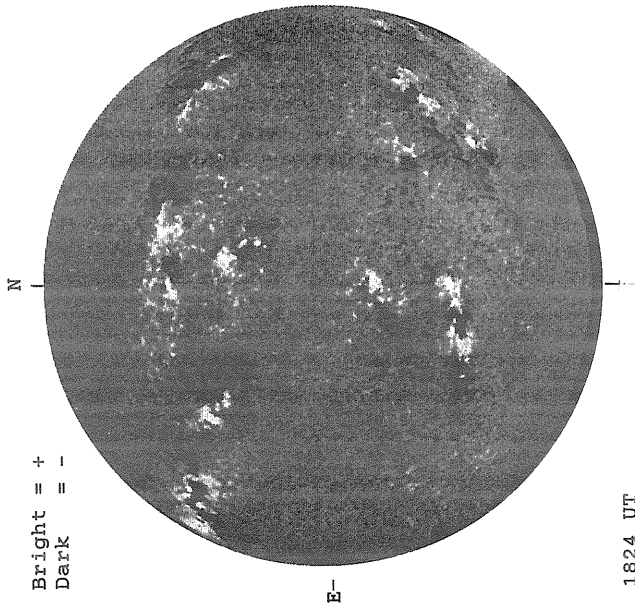
SACRAMENTO PEAK CORONA (1.15 Radii)



— 5303A, 1523 UT
... 6374A, 1605 UT
XXXX 5694A, 1543 UT

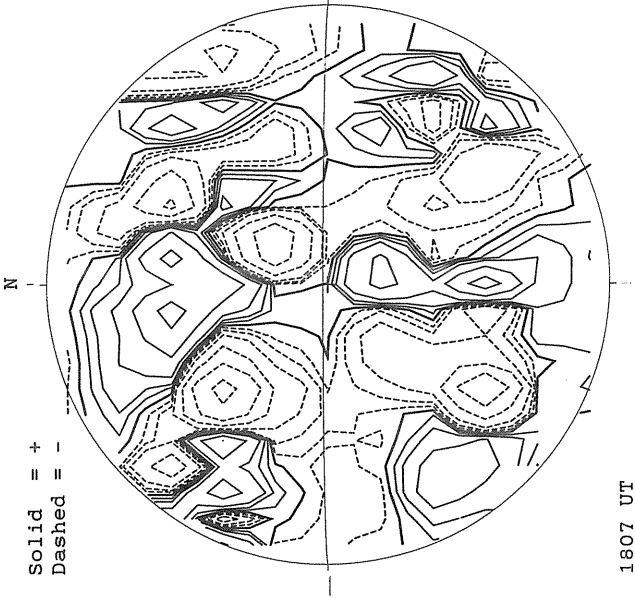
DECEMBER 14, 1988 (P = 10.55, B₀ = -0.83, L₀ = 344.72)

KITT PEAK MAGNETOGRAM



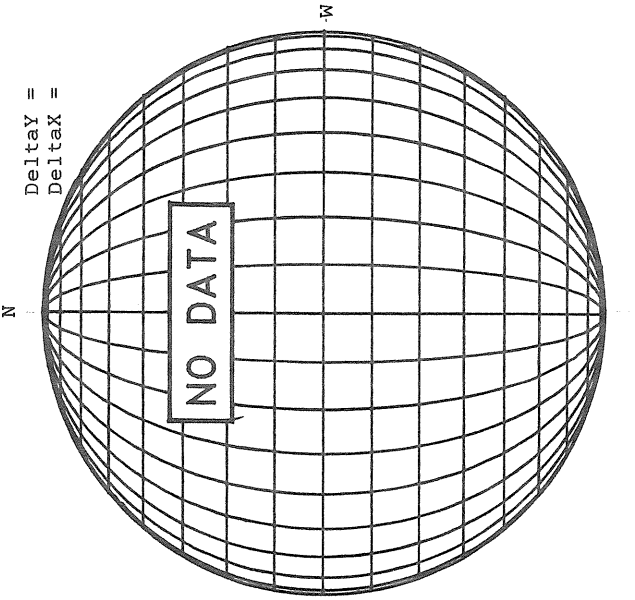
Bright = +
Dark = -

STANFORD MAGNETOGRAM



Solid = +
Dashed = -

MT. WILSON MAGNETOGRAM

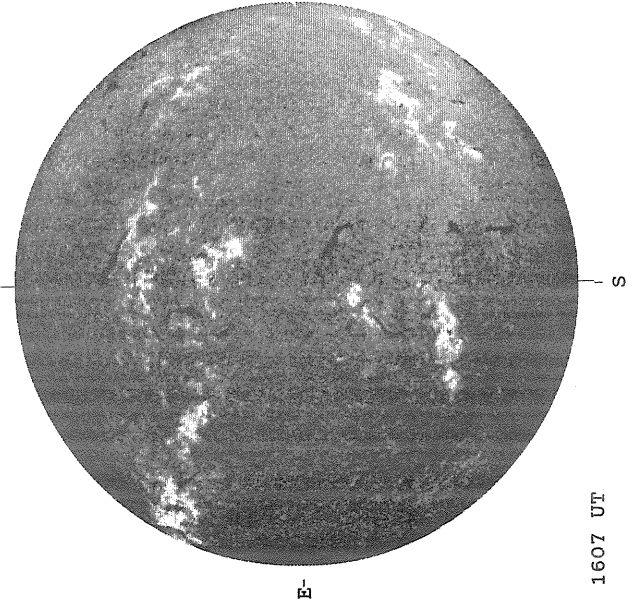


Delta α =
Delta α =

1824 UT

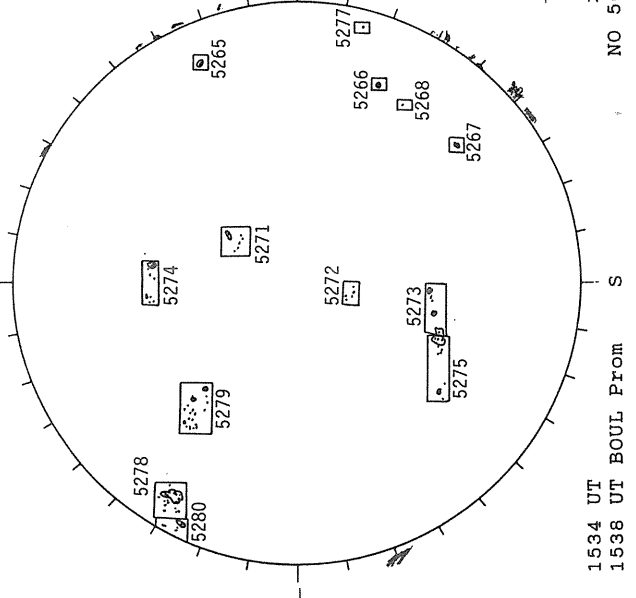
1807 UT

HOLLOMAN H-ALPHA



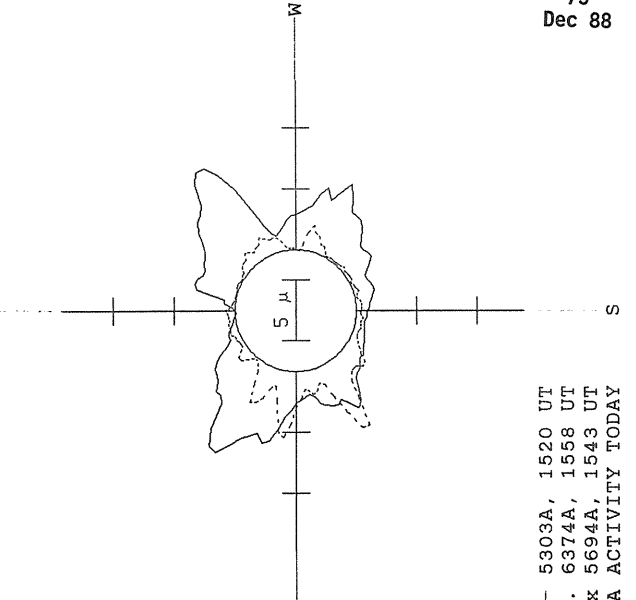
1607 UT

BOULDER SUNSPOT



1534 UT
1538 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)

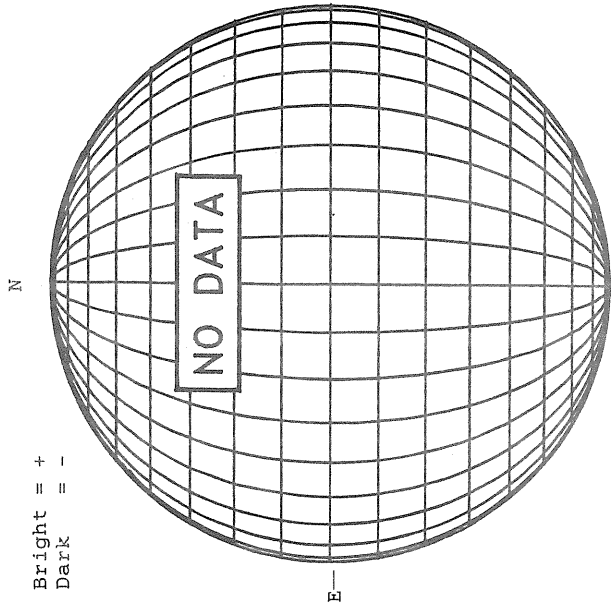


— 5903A, 1520 UT
... 6374A, 1558 UT
xxxx 5694A, 1543 UT
NO 5694A ACTIVITY TODAY

DECEMBER 15, 1988 (P= 10.09, B₀ = -0.95, L₀ = 331.54)

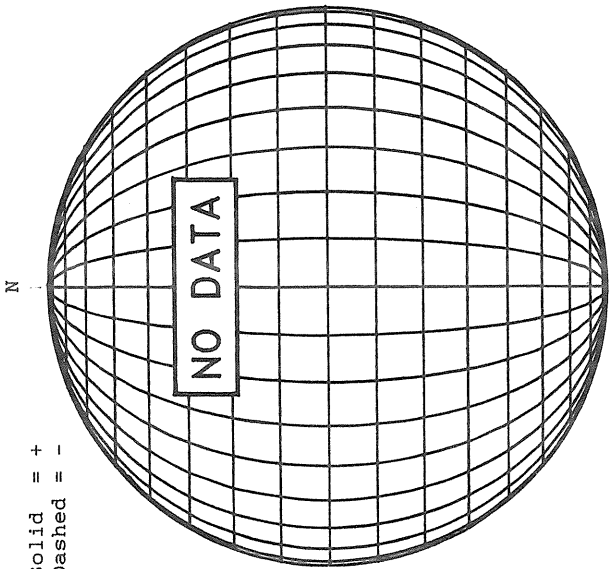
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



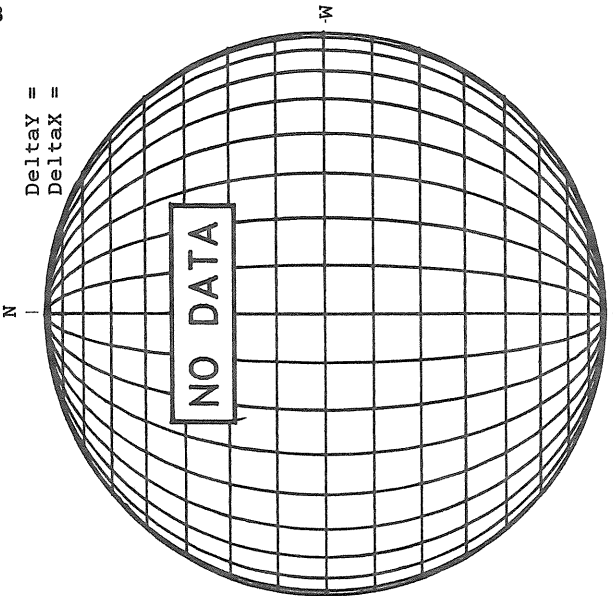
STANFORD MAGNETOGRAM

Solid = +
Dashed = -

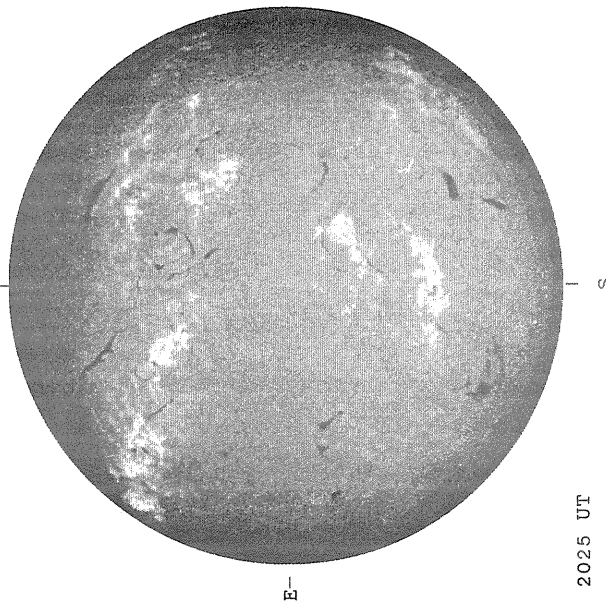


MT. WILSON MAGNETOGRAM

Delta_γ =
Delta_α =

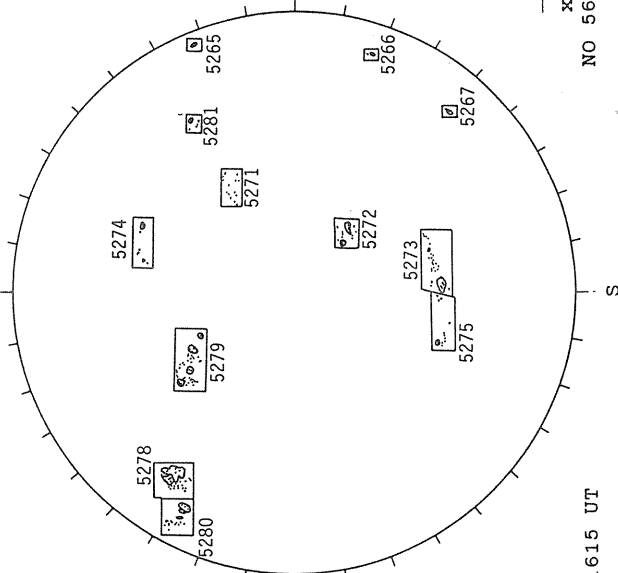


SACRAMENTO PEAK H-ALPHA



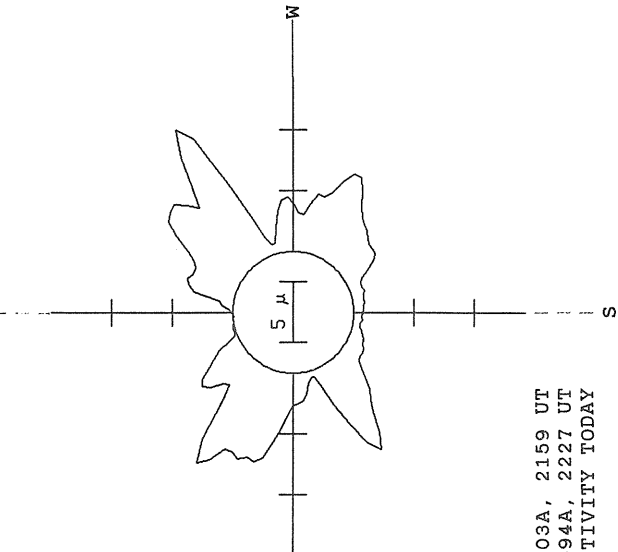
2025 UT

RAMEY SUNSPOT



1615 UT

SACRAMENTO PEAK CORONA (1.15 Radii)

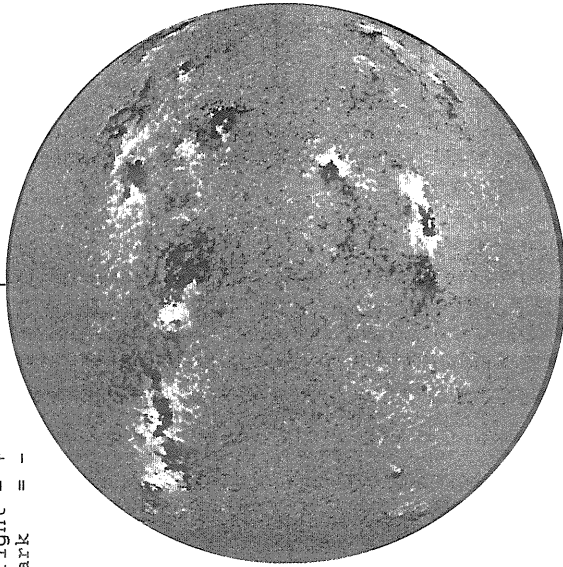


— 5303A, 2159 UT
- - - 5694A, 2227 UT
NO 5694A ACTIVITY TODAY

DECEMBER 16, 1988 (P= 9.64, B₀ = -1.08, L₀ = 318.37)

KITT PEAK MAGNETOGRAM

Bright = +
Dark = -

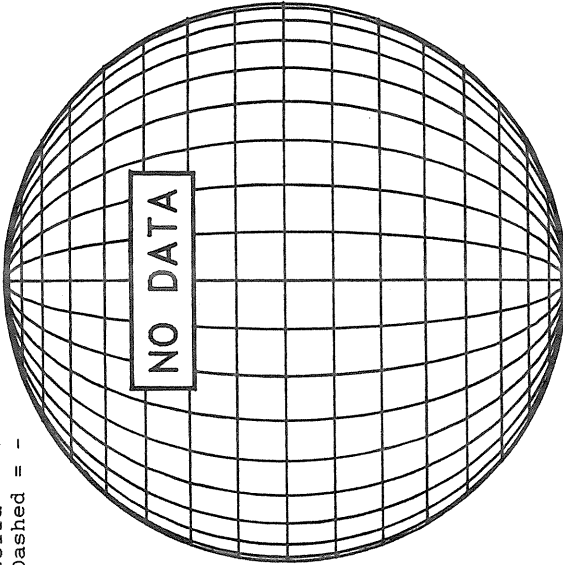


E

1643 UT

STANFORD MAGNETOGRAM

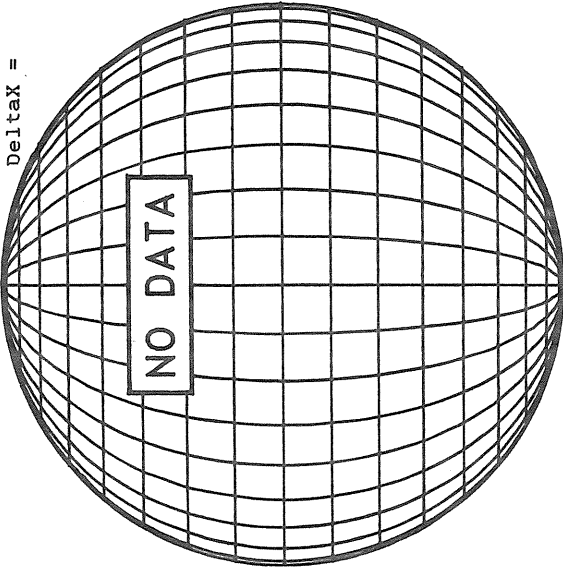
Solid = +
Dashed = -



NO DATA

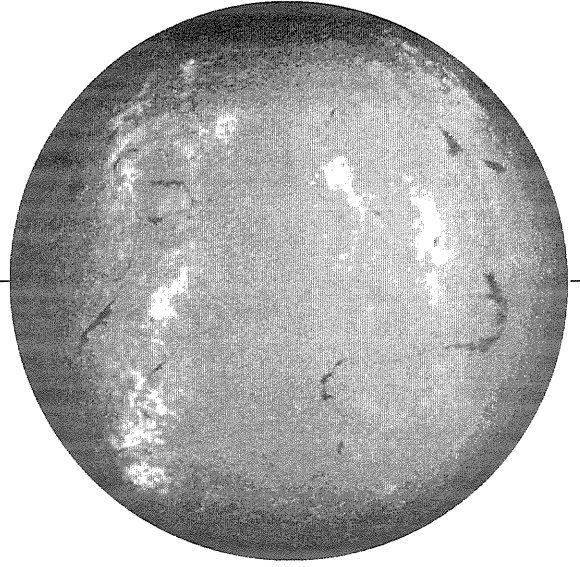
MT. WILSON MAGNETOGRAM

Delta_Y =
Delta_X =



NO DATA

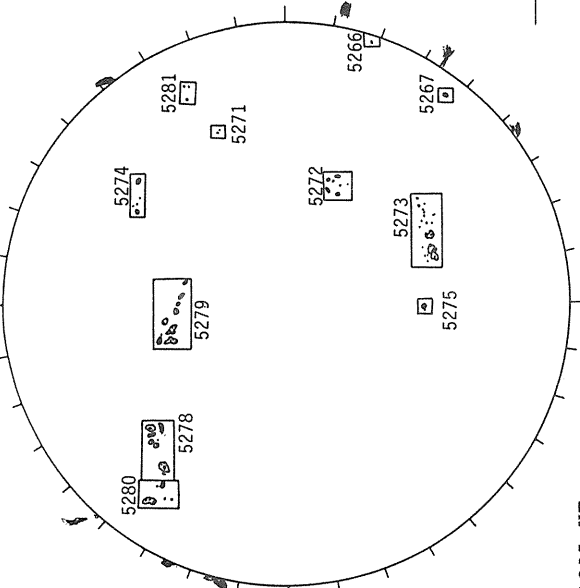
SACRAMENTO PEAK H-ALPHA



E

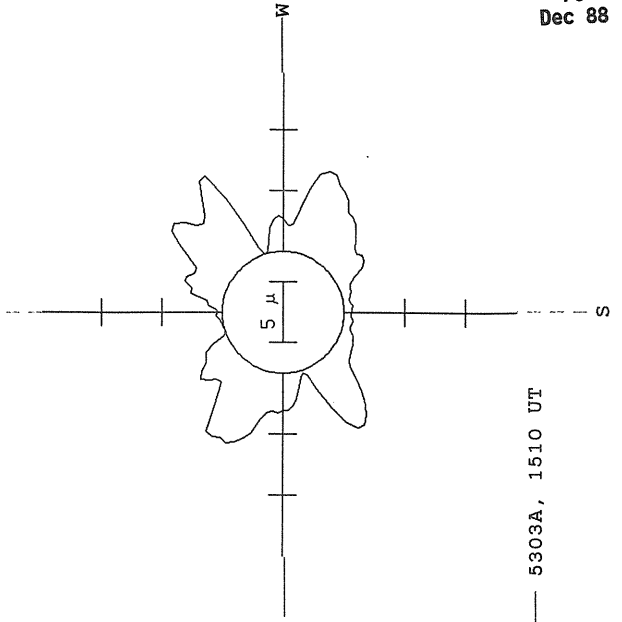
1525 UT

BOULDER SUNSPOT



1605 UT
1623 UT BOUL PROM

SACRAMENTO PEAK CORONA (1.15 Radii)

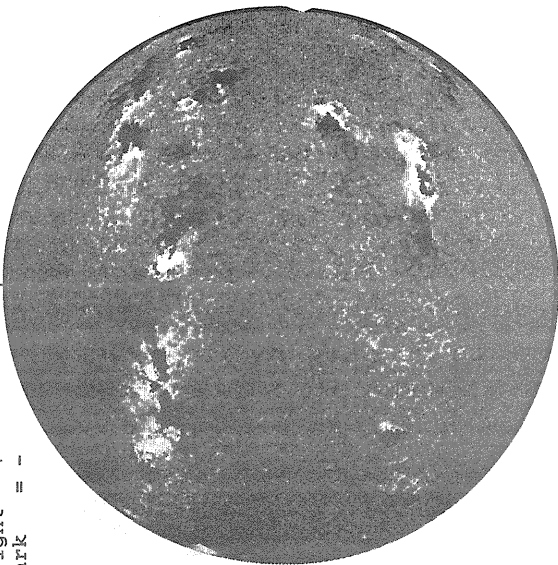


5303A, 1510 UT

DECEMBER 17, 1988 (P= 9.18, B₀ = -1.21, L₀ = 305.20)

KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



1618 UT

STANFORD MAGNETOGRAM

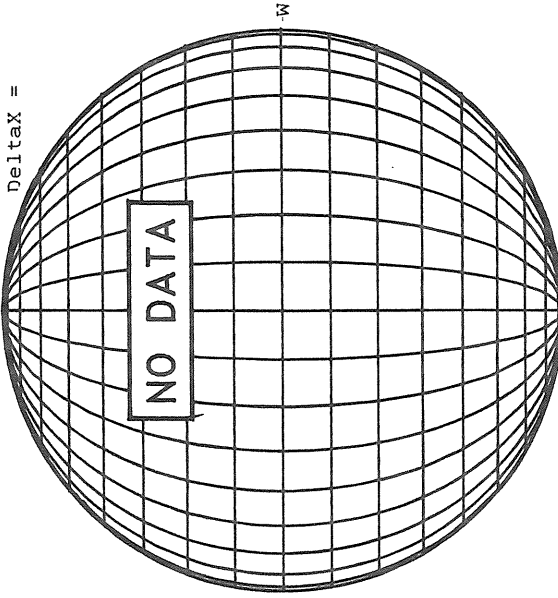
Solid = +
Dashed = -



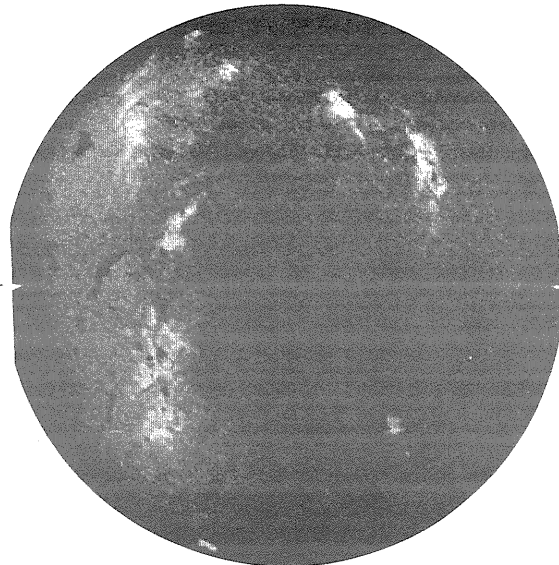
0001 UT

MT. WILSON MAGNETOGRAM

Delta_Y =
Delta_X =

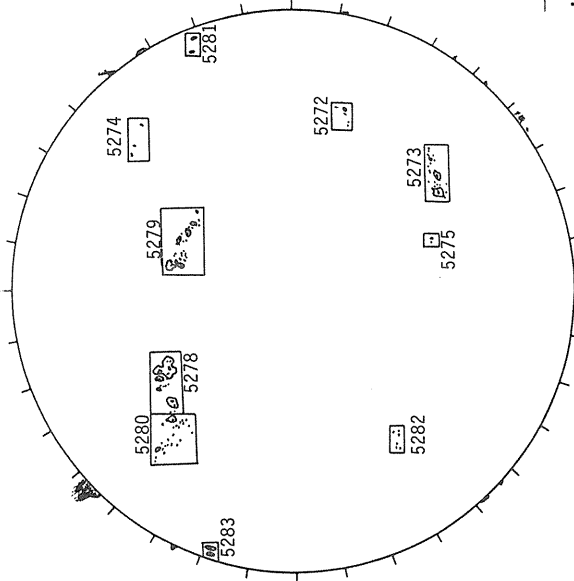


PALEHUA H-ALPHA



2155 UT

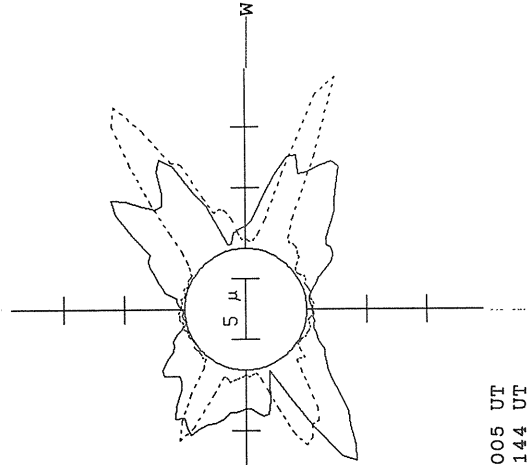
BOULDER SUNSPOT



1628 UT

1615 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



S

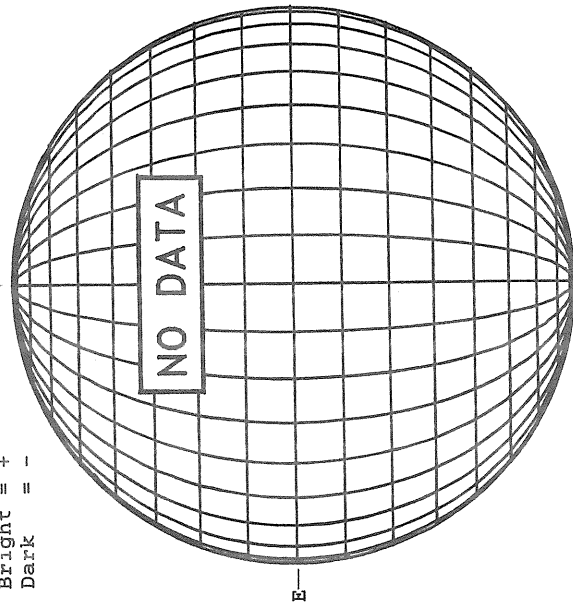
— 5303A, 2005 UT
... 6374A, 2144 UT
XXXX 5694A, 2133 UT

NO 5694A ACTIVITY TODAY

DECEMBER 18, 1988 (P= 8.72, B₀ = -1.33, L₀ = 292.02)

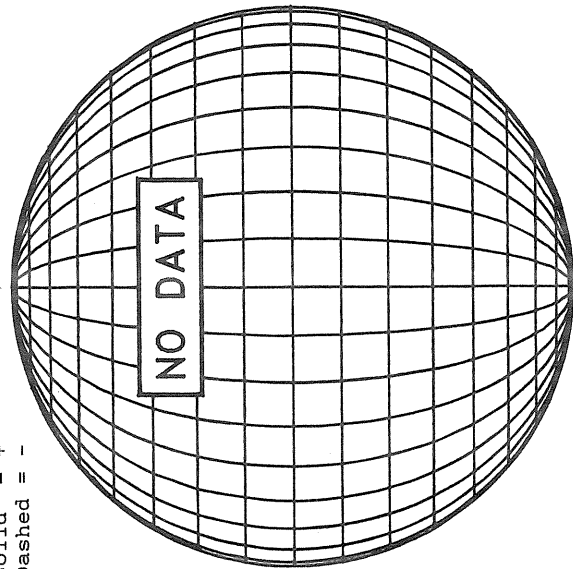
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



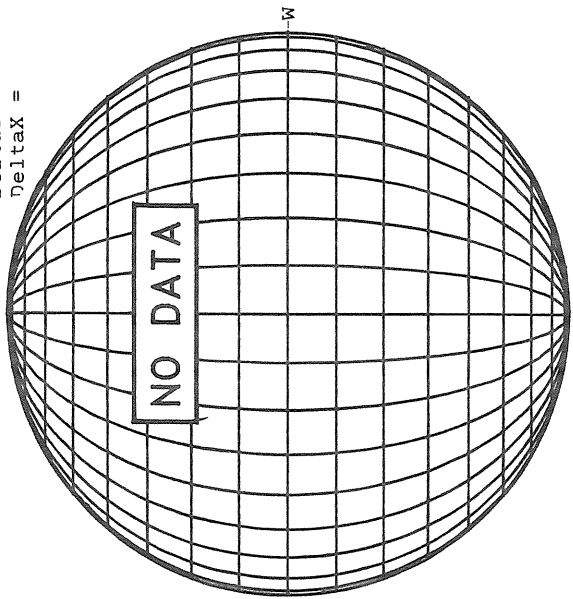
STANFORD MAGNETOGRAM

Solid = +
Dashed = -

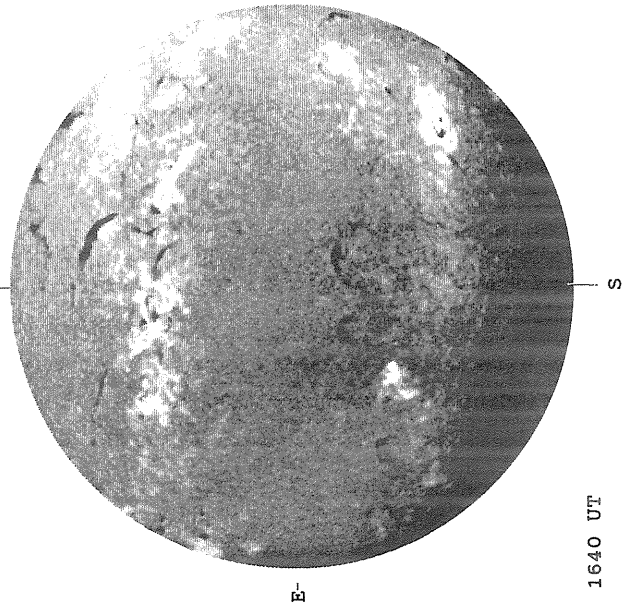


MT. WILSON MAGNETOGRAM

Delta_y =
Delta_x =

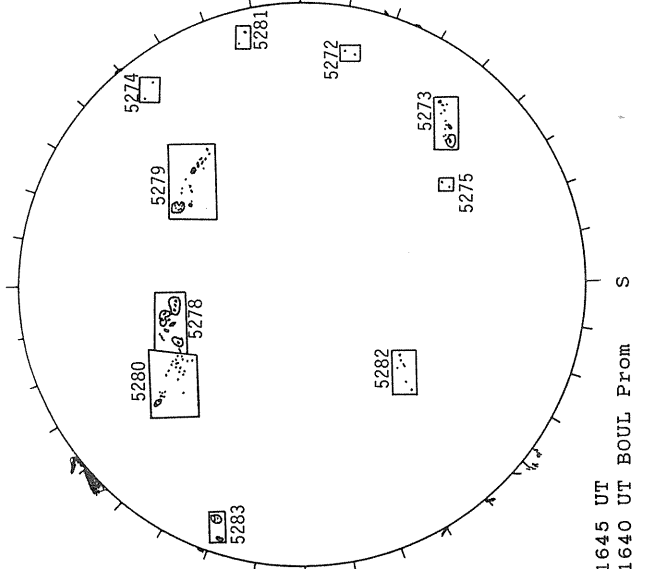


BOULDER H-ALPHA



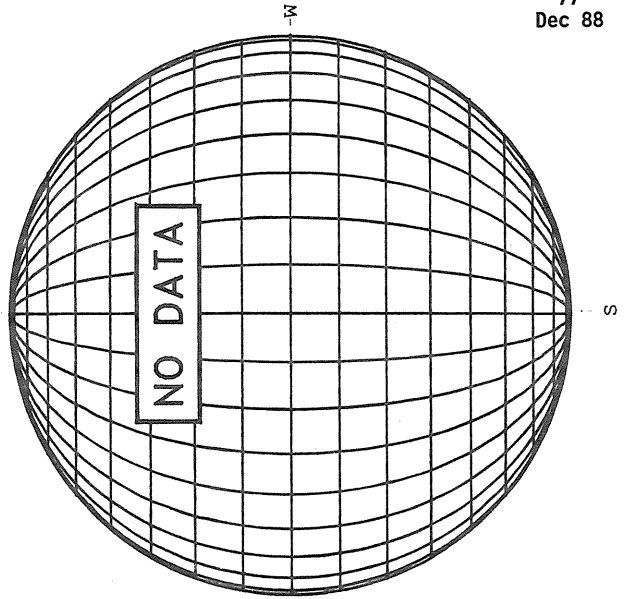
1640 UT

BOULDER SUNSPOT



1645 UT
1640 UT BOUL FROM

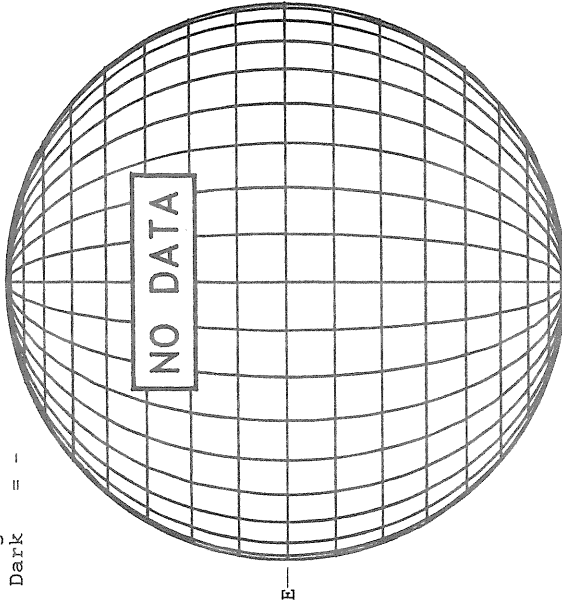
SACRAMENTO PEAK CORONA (1.15 Radii)



DECEMBER 19, 1988 (P= 8.25, B₀ = -1.46, I₀ = 278.85)

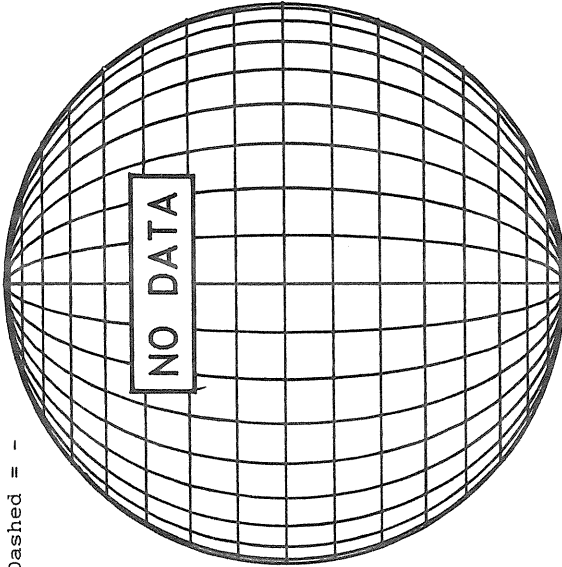
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



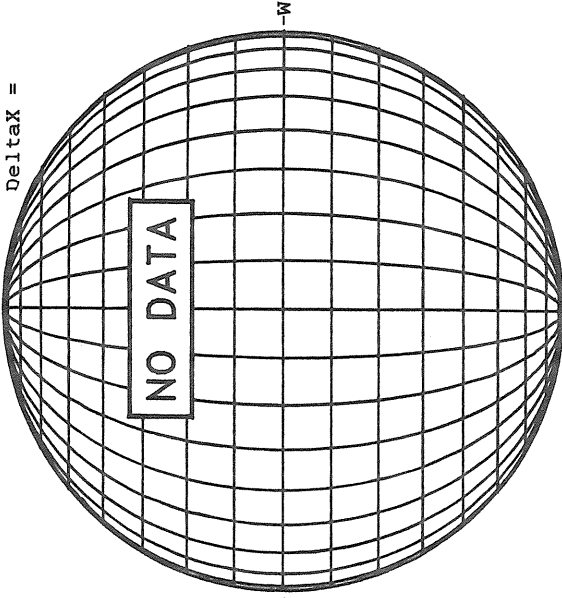
STANFORD MAGNETOGRAM

Solid = +
Dashed = -

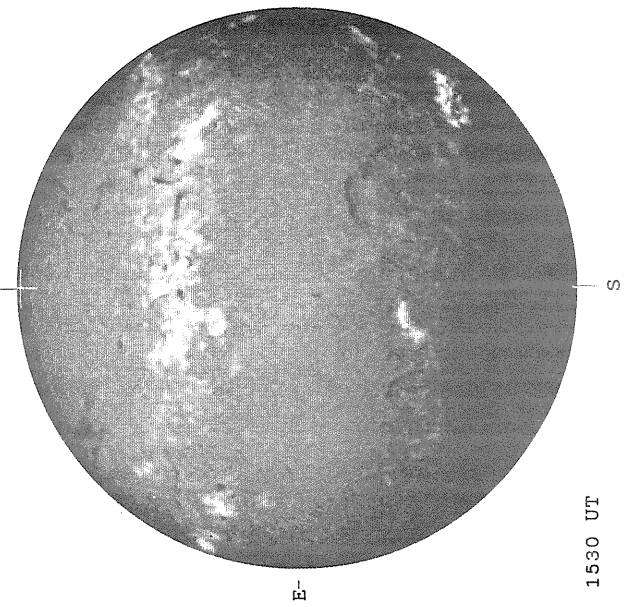


MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =

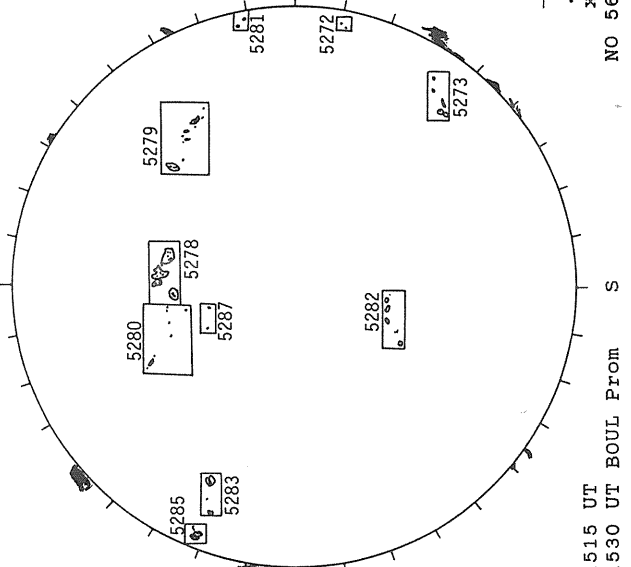


BOULDER H-ALPHA



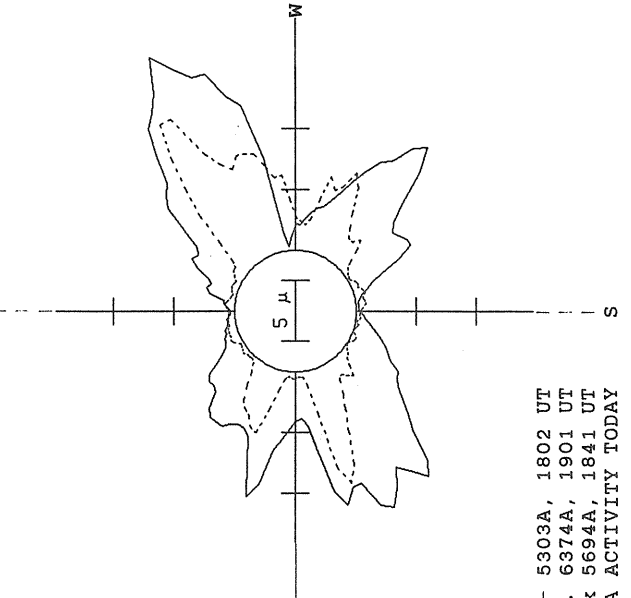
1530 UT

BOULDER SUNSPOT



1515 UT
1530 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)

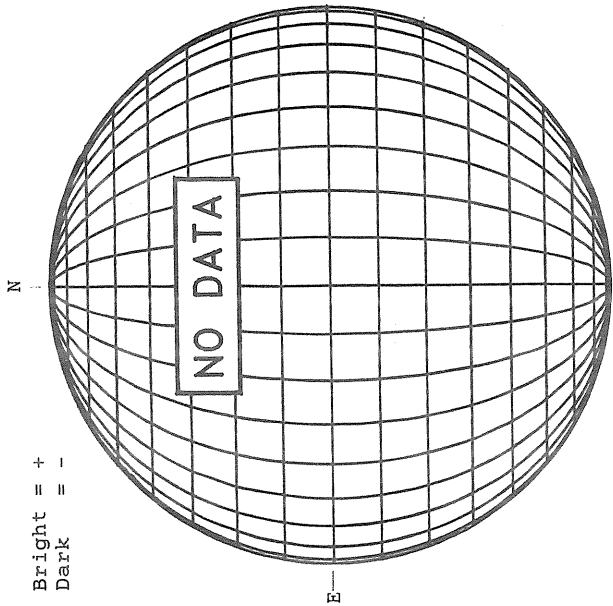


— 5303A, 1802 UT
 6374A, 1901 UT
 XXXX 5694A, 1841 UT
 NO 5694A ACTIVITY TODAY

DECEMBER 20, 1988 (P= 7.78, B₀ = -1.59, L₀ = 265.67)

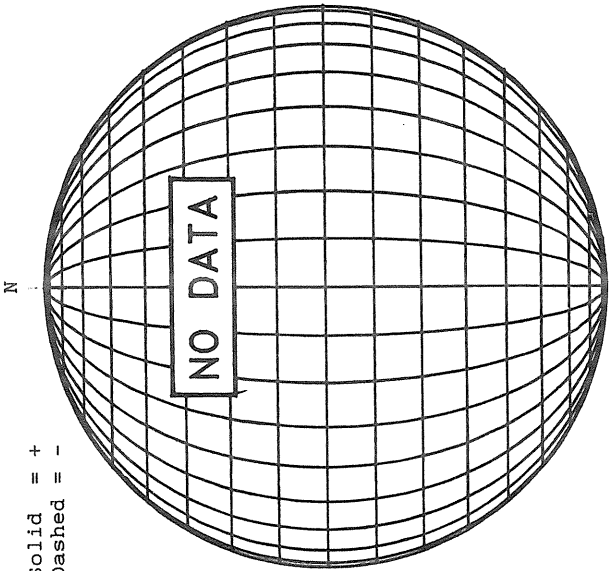
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



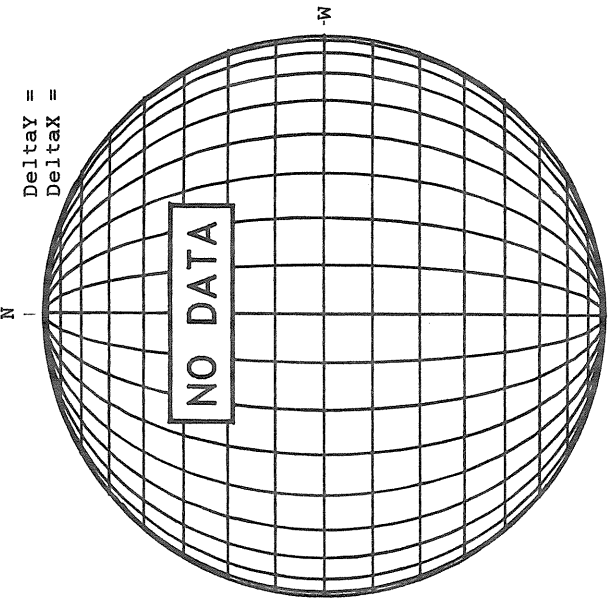
STANFORD MAGNETOGRAM

Solid = +
Dashed = -

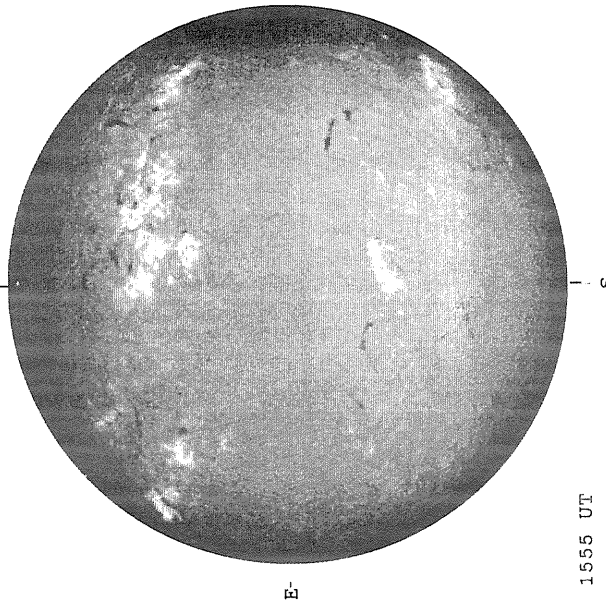


MT. WILSON MAGNETOGRAM

Delta_y =
Delta_x =

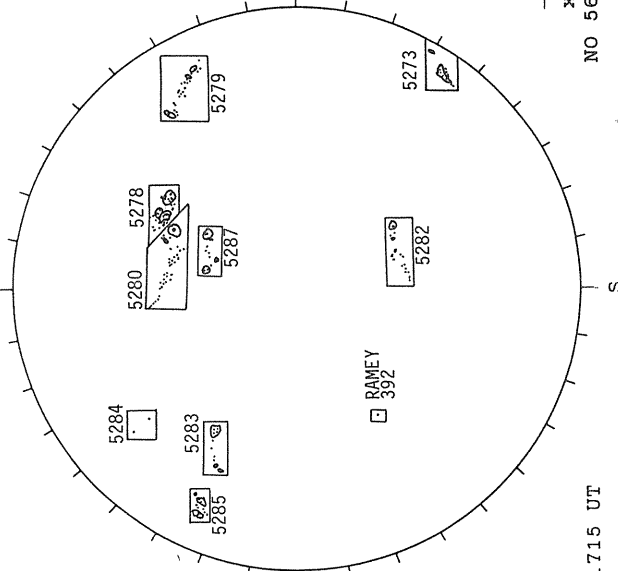


SACRAMENTO PEAK H-ALPHA



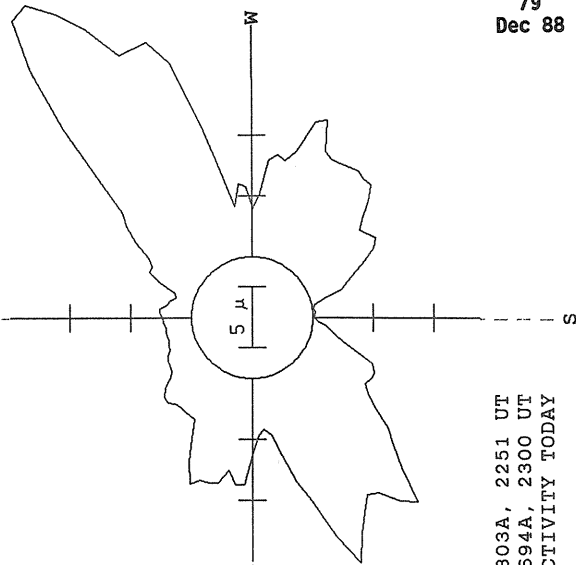
1555 UT

RAMEY SUNSPOT



1715 UT

SACRAMENTO PEAK CORONA (1.15 Radii)

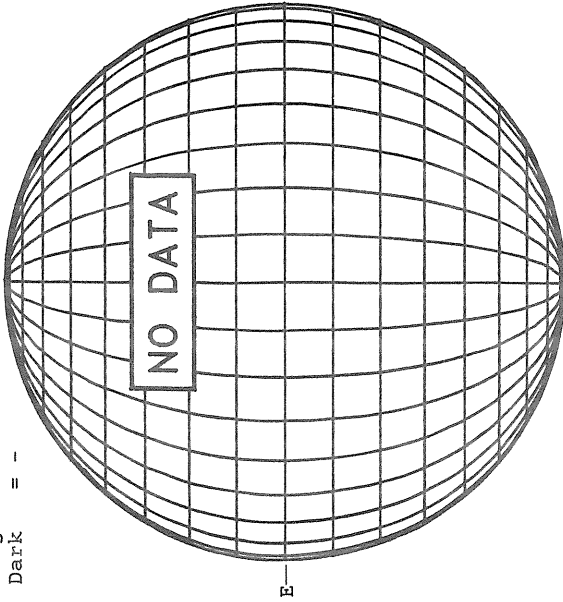


— 5303A, 2251 UT
xxxx 5694A, 2300 UT
NO 5694A ACTIVITY TODAY

DECEMBER 21, 1988 (P= 7.31, B₀ = -1.71, L₀ = 252.50)

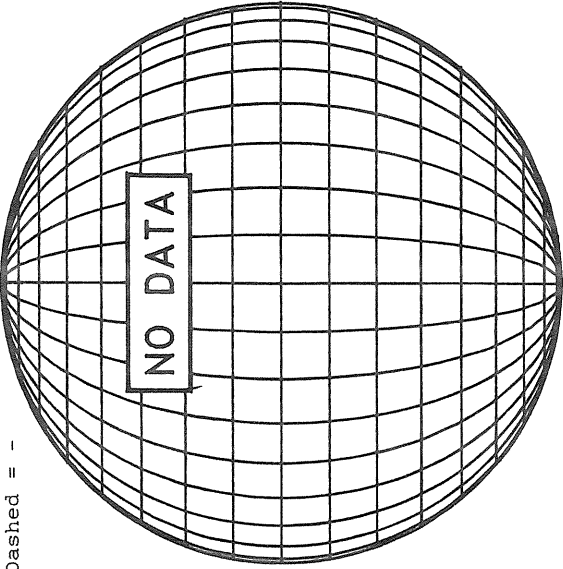
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



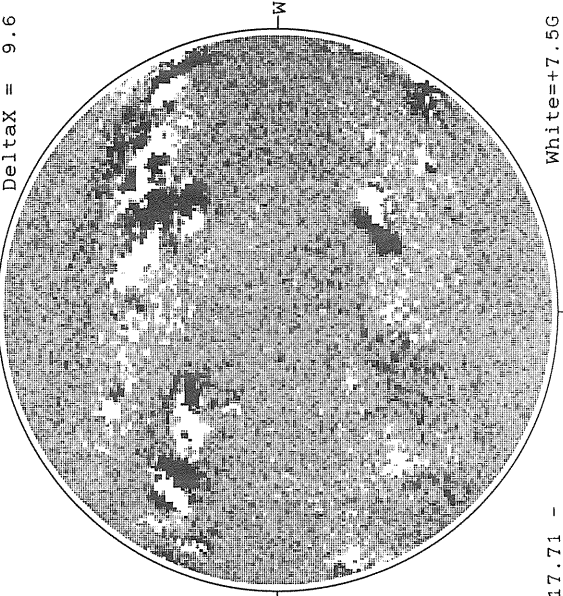
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

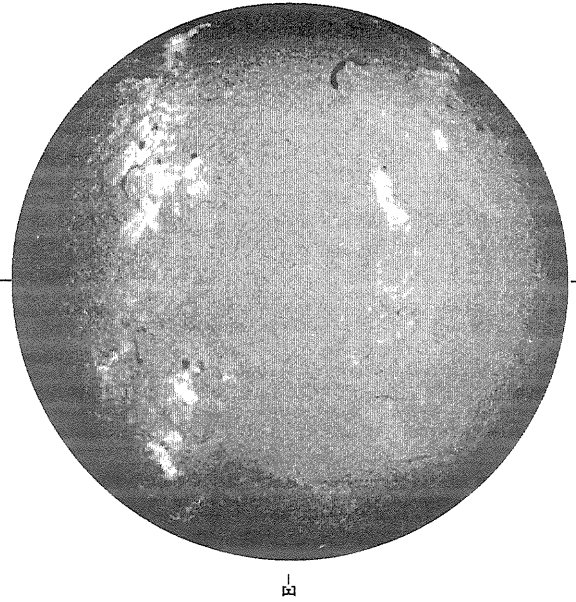
Delta_y = 13.1
Delta_x = 9.6



17.71 -
18.68 UT

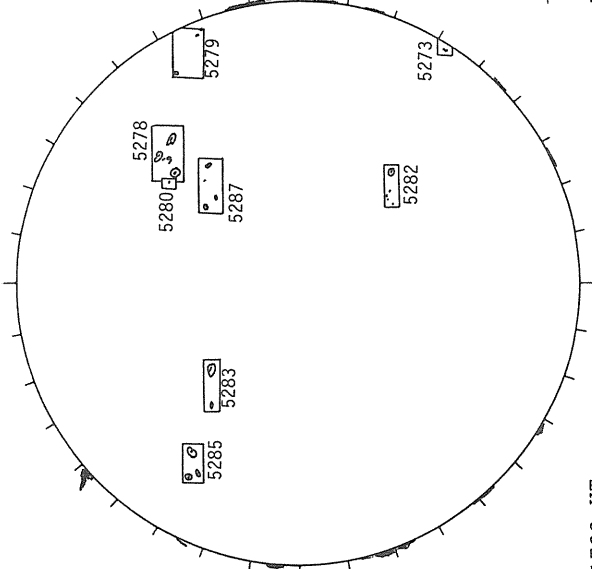
White = +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA



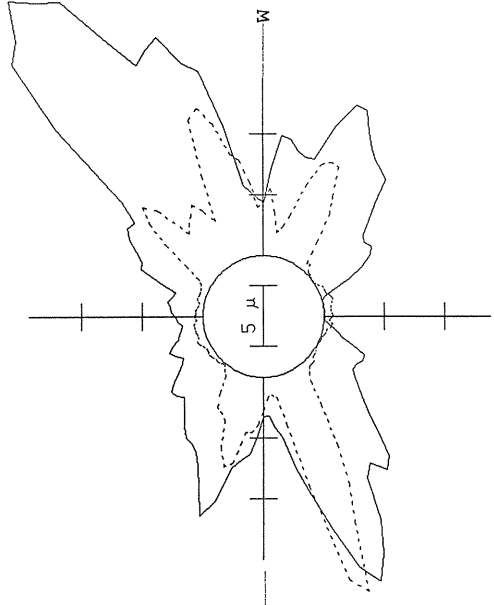
1705 UT

BOULDER SUNSPOT



1700 UT
1710 UT BOUL Prom

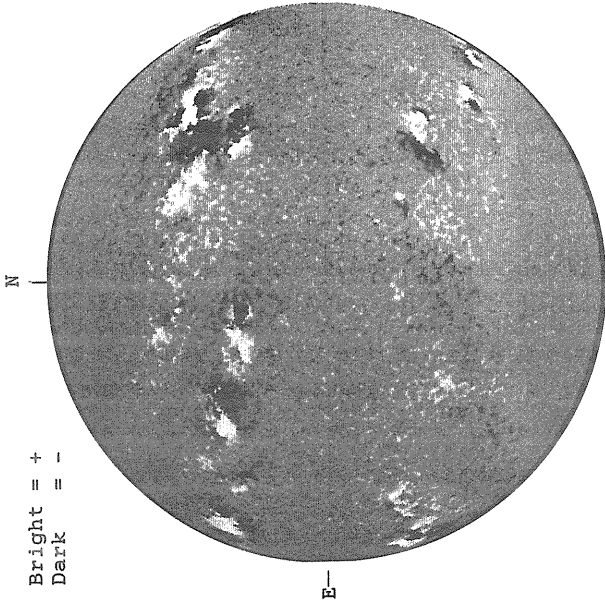
SACRAMENTO PEAK CORONA (1.15 Radii)



— 5303A, 1530 UT
.... 6374A, 1606 UT
xxxx 5694A, 1557 UT
NO 5694A ACTIVITY TODAY

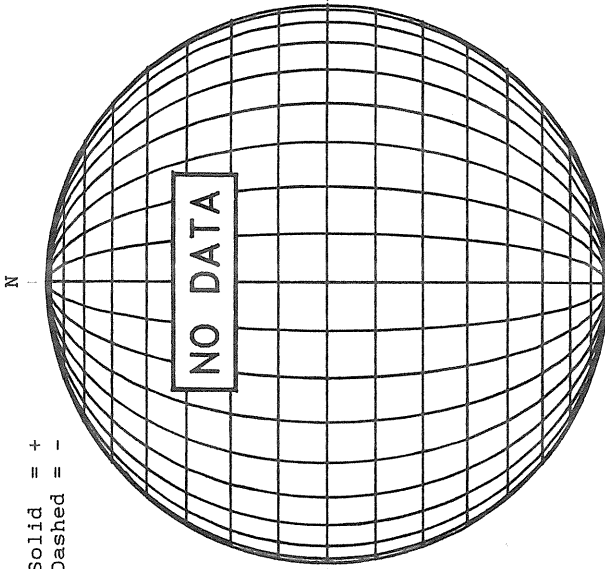
DECEMBER 22, 1988 (P= 6.84, B₀ = -1.83, L₀ = 239.33)

KITT PEAK MAGNETOGRAM



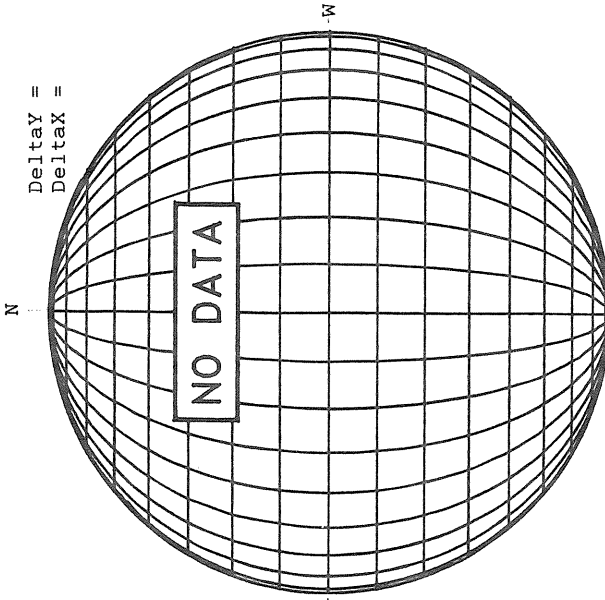
Bright = +
Dark = -

STANFORD MAGNETOGRAM



Solid = +
Dashed = -

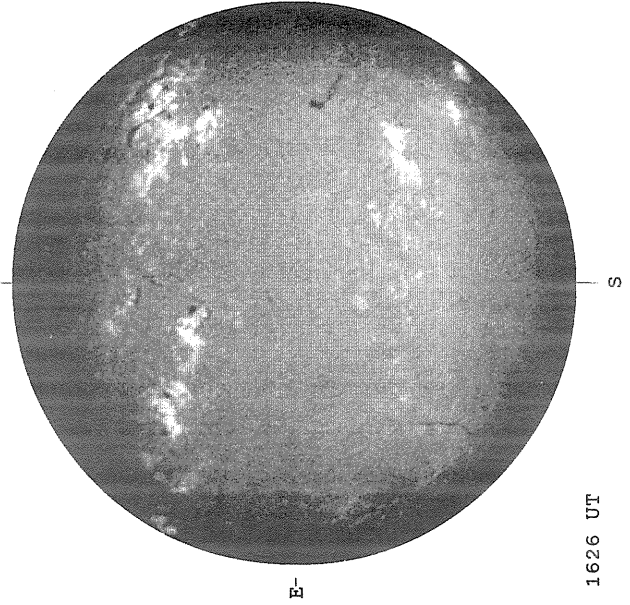
MT. WILSON MAGNETOGRAM



Delta Y =
Delta X =

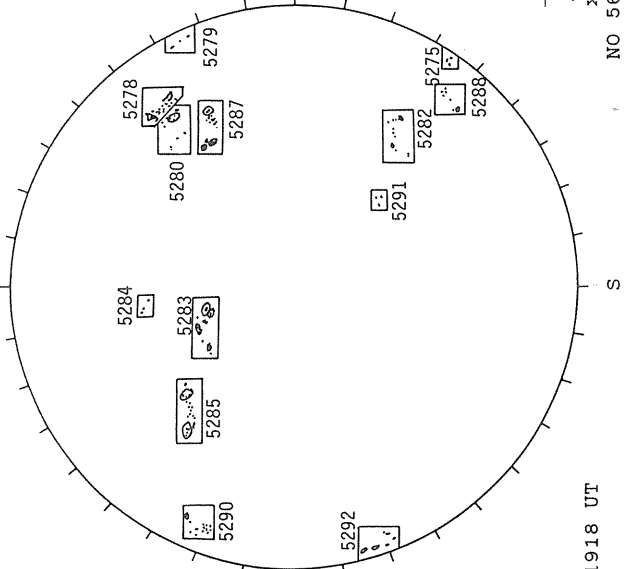
1547 UT

SACRAMENTO PEAK H-ALPHA



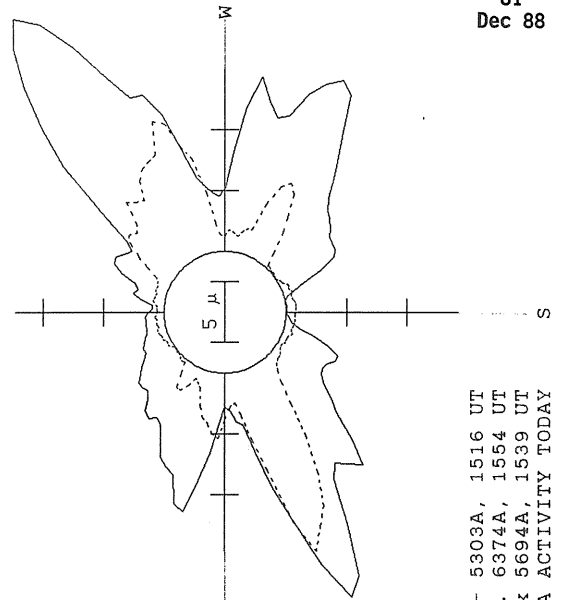
1626 UT

RAMEY SUNSPOT



1918 UT

SACRAMENTO PEAK CORONA (1.15 Radii)

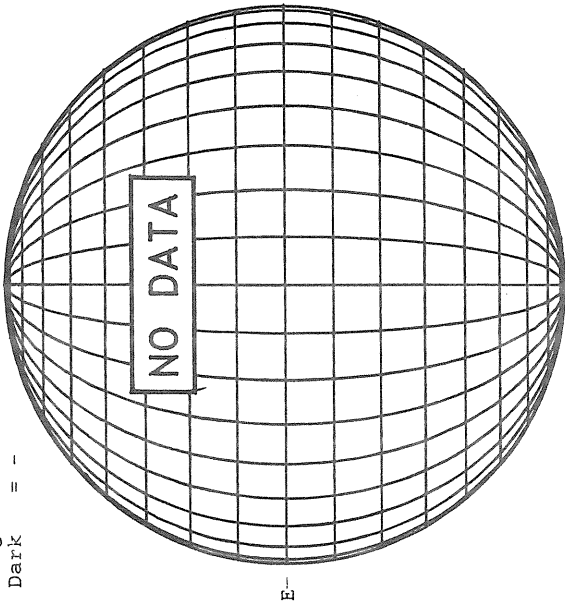


— 5303A, 1516 UT
 6374A, 1554 UT
 xxxxx 5694A, 1539 UT
 NO 5694A ACTIVITY TODAY

DECEMBER 23, 1988 (P= 6.37, B₀ = -1.96, I₀ = 226.15)

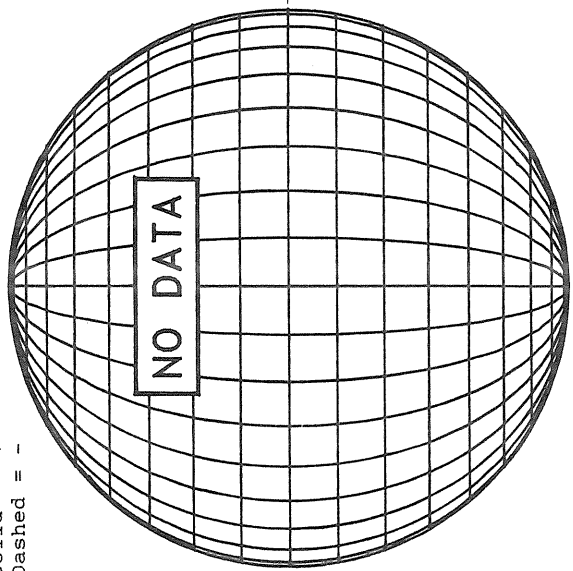
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



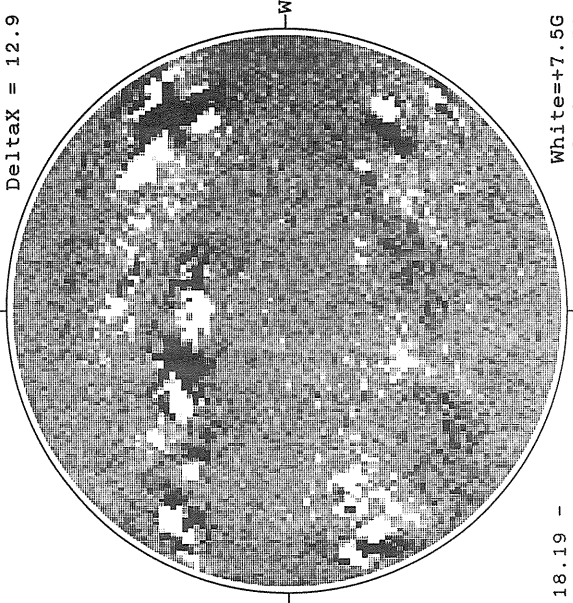
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



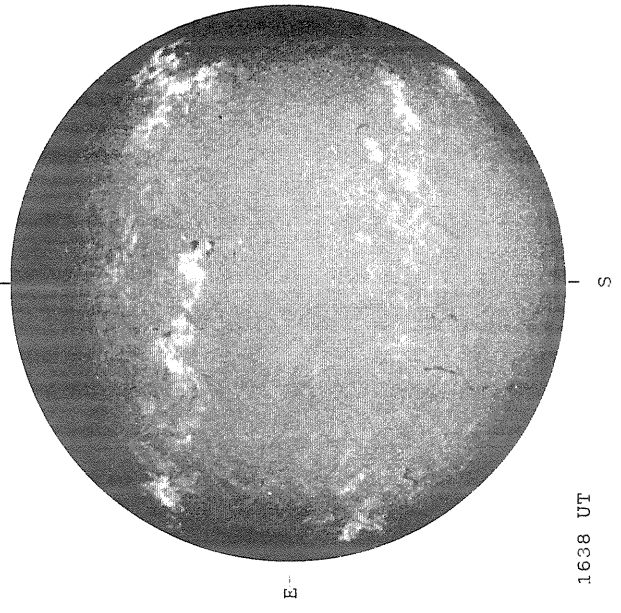
MT. WILSON MAGNETOGRAM

DeltaY = 20.2
DeltaX = 12.9

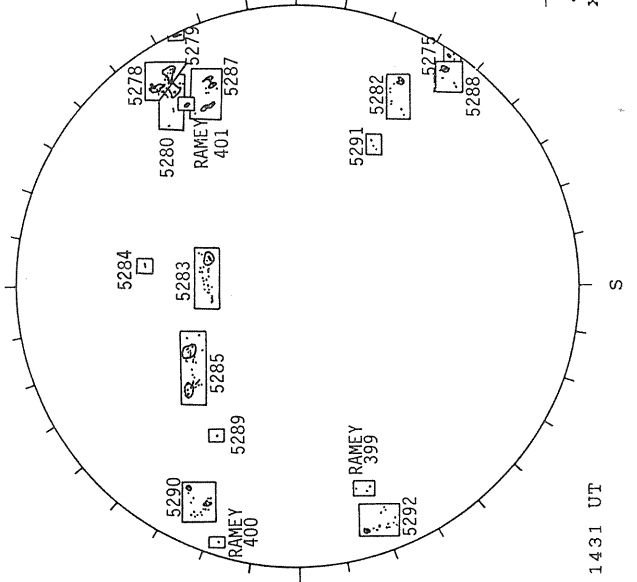


White = +7.5G
Black = -7.5G

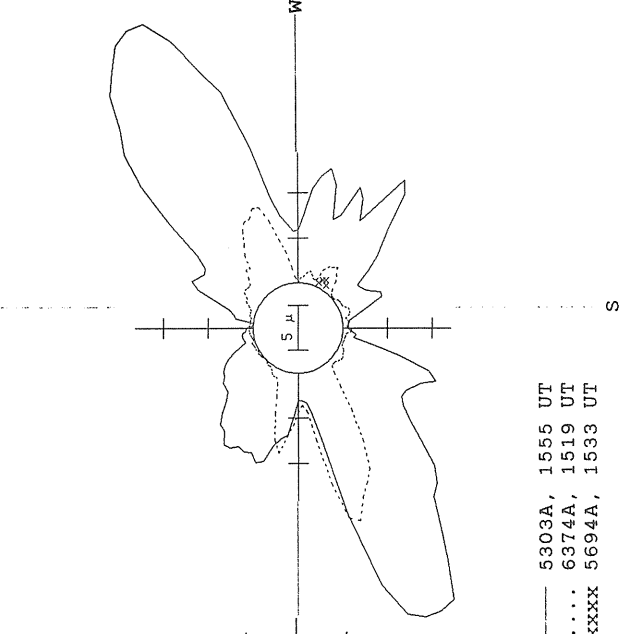
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOT



SACRAMENTO PEAK CORONA (1.15 Radii)

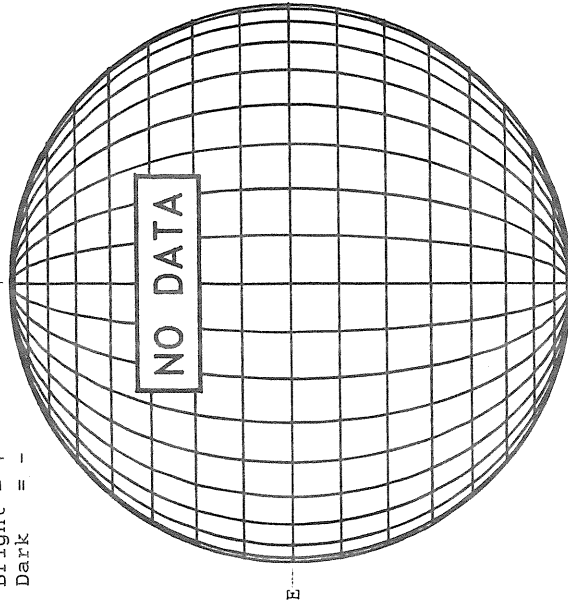


— 5303A, 1555 UT
.... 6374A, 1519 UT
XXXX 5694A, 1533 UT

DECEMBER 24, 1988 (P = 5.89, B₀ = -2.08, I₀ = 212.98)

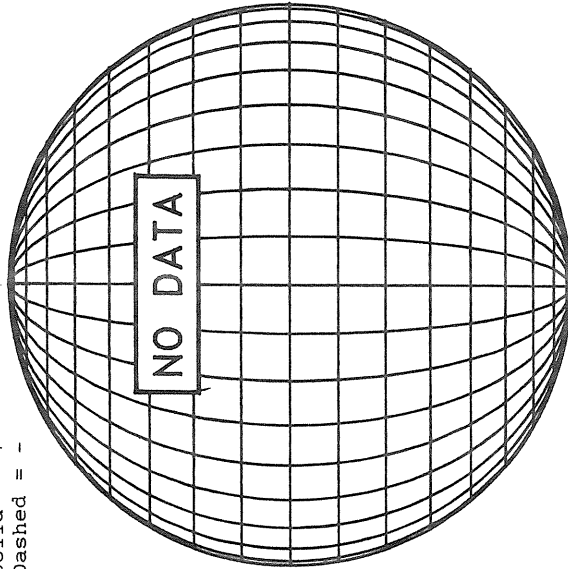
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



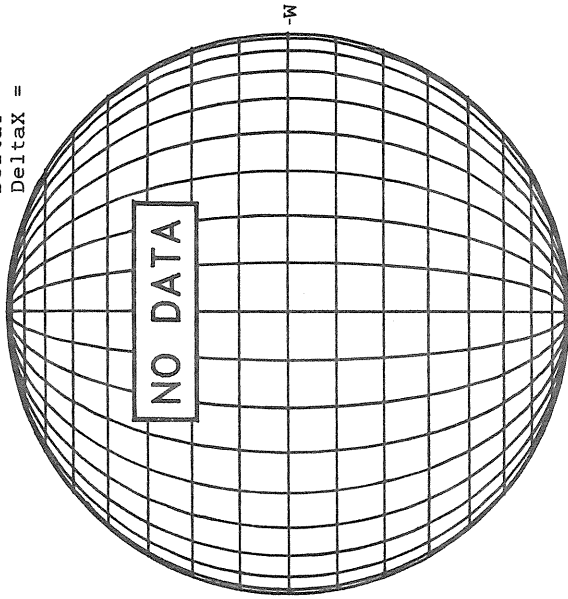
STANFORD MAGNETOGRAM

Solid = +
Dashed = -

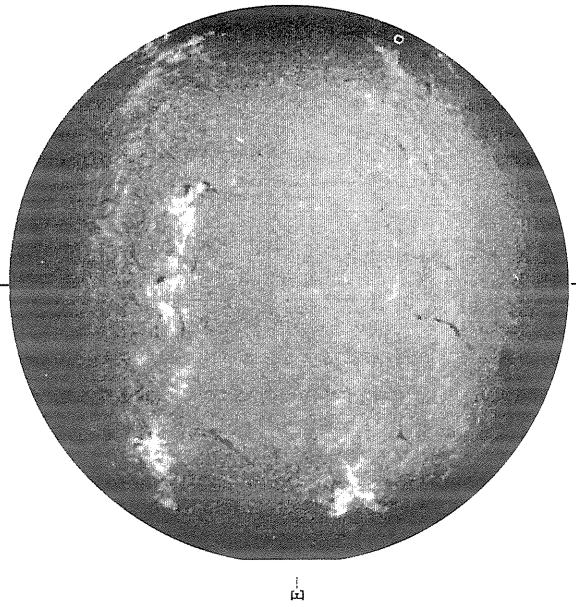


MT. WILSON MAGNETOGRAM

Delta y =
Delta x =

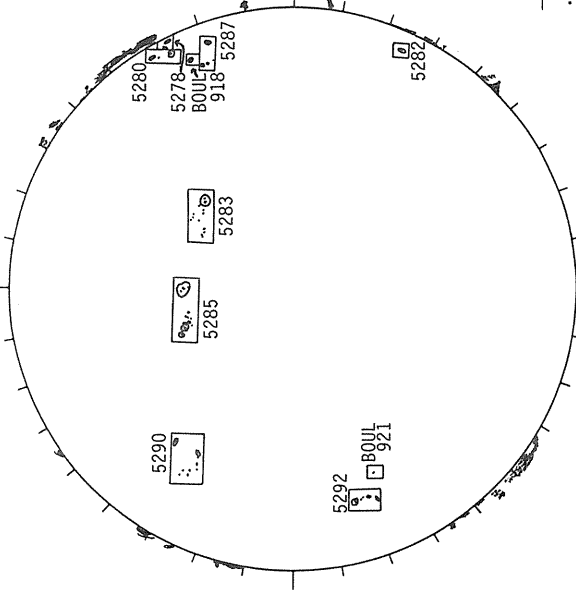


SACRAMENTO PEAK H-ALPHA



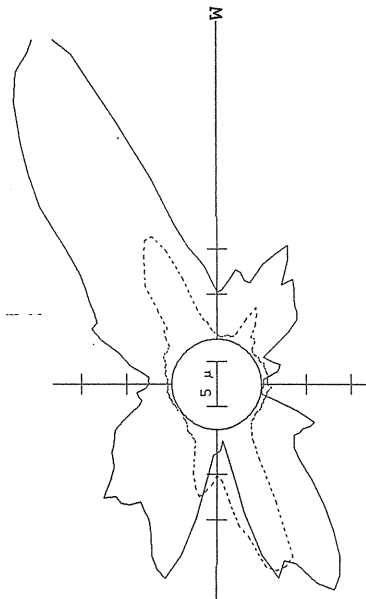
1600 UT

BOULDER SUNSPOT



1600 UT BOUL Prom
1608 UT BOUL From

SACRAMENTO PEAK CORONA (1.15 Radii)

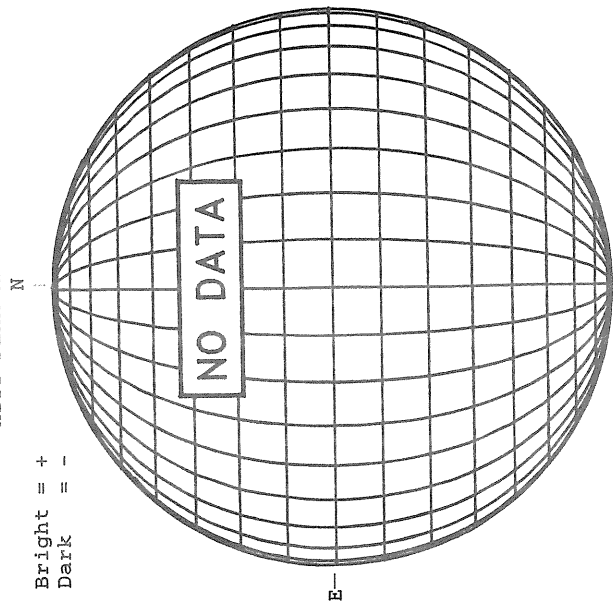


— 5303A, 1621 UT
... 6374A, 1528 UT
xxxx 5694A, 1541 UT
NO 5694A ACTIVITY TODAY

DECEMBER 25, 1988 (P= 5.41, B₀ = -2.20, L₀ = 199.81)

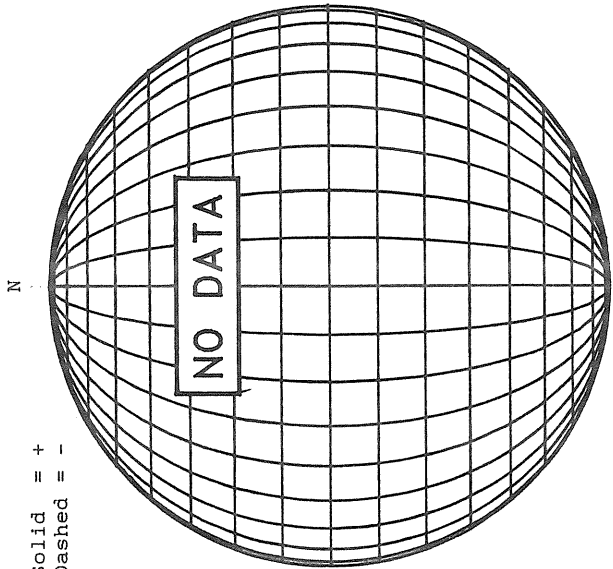
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



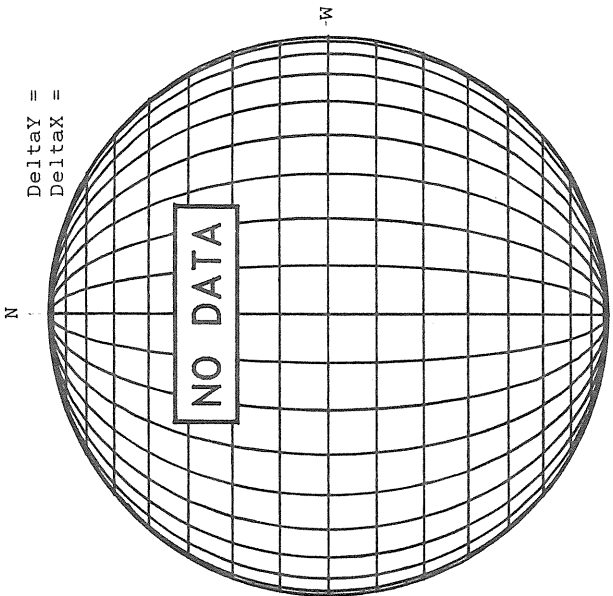
STANFORD MAGNETOGRAM

Solid = +
Dashed = -

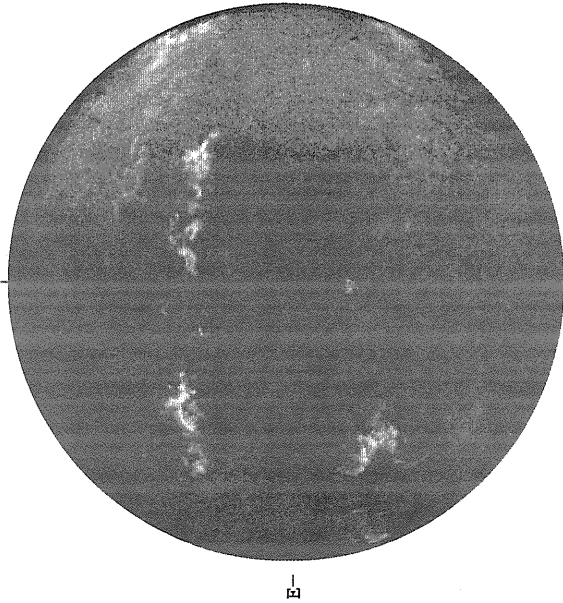


MT. WILSON MAGNETOGRAM

Delta Y =
Delta X =

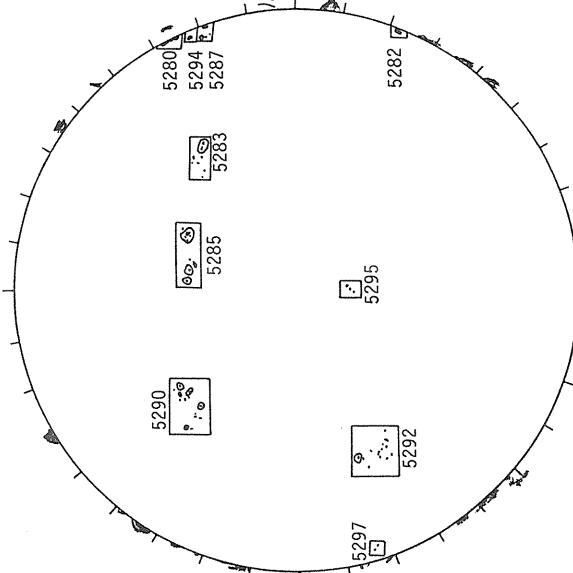


HOLLOMAN H-ALPHA



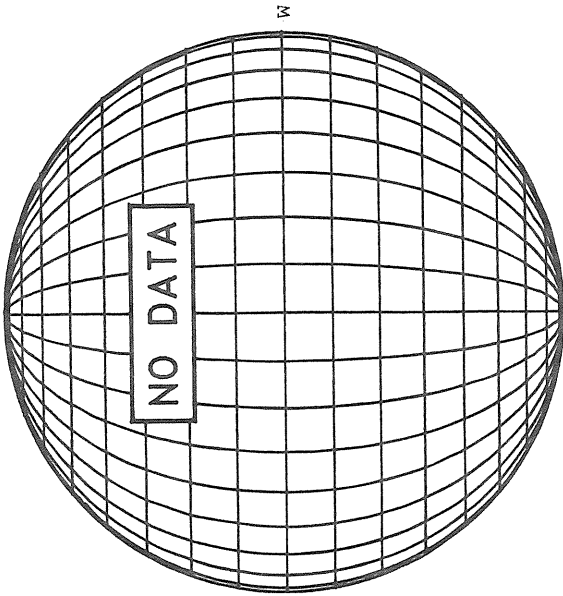
1622 UT

BOULDER SUNSPOT



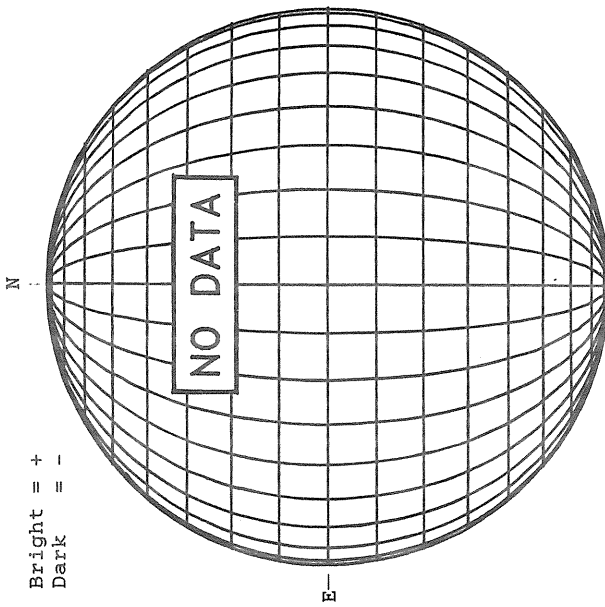
1610 UT
1600 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



DECEMBER 26, 1988 (P= 4.93, B₀ = -2.33, L₀ = 186.63)

KITT PEAK MAGNETOGRAM



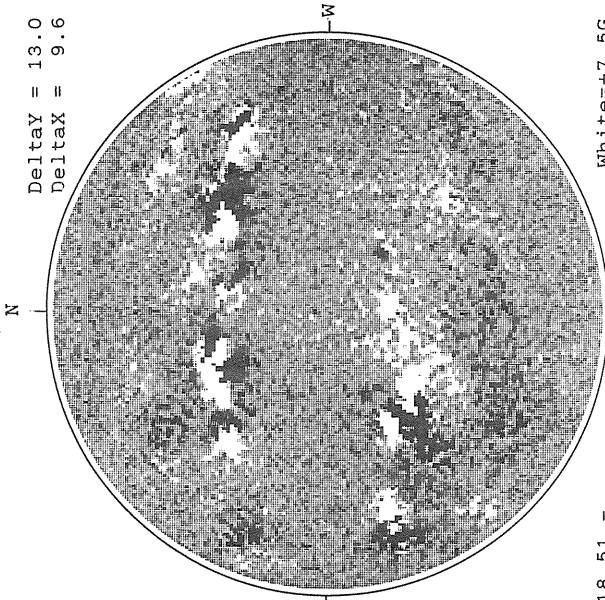
Bright = +
Dark = -

STANFORD MAGNETOGRAM



Solid = +
Dashed = -

MT. WILSON MAGNETOGRAM

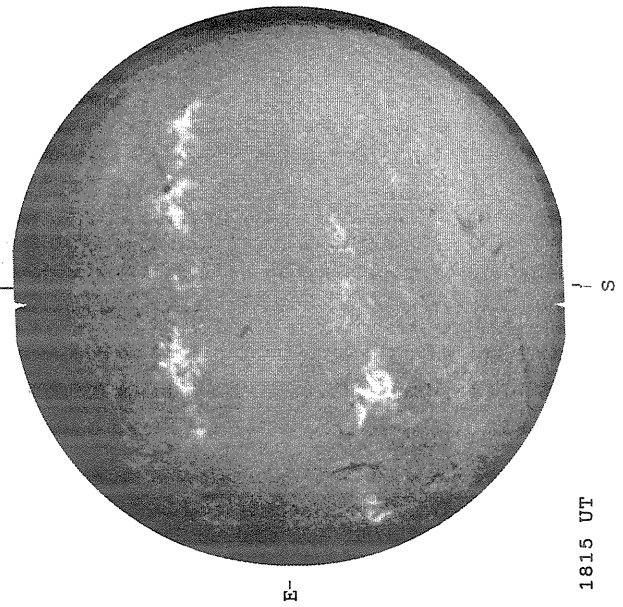


DeltaY = 13.0
DeltaX = 9.6

18.51 -
19.49 UT

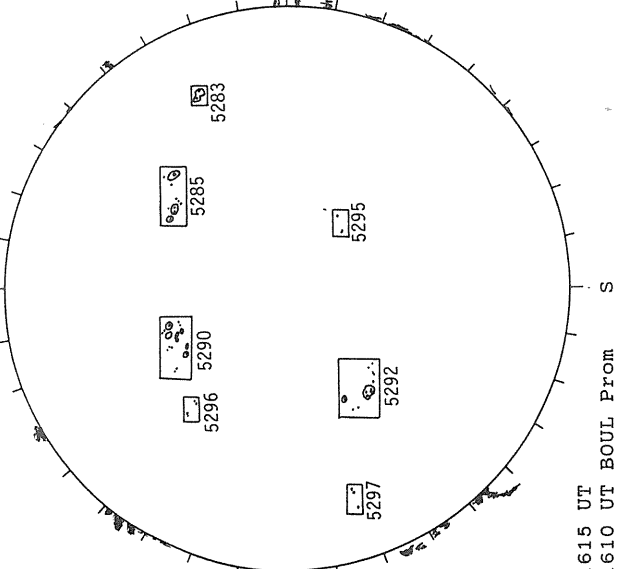
White = +7.5G
Black = -7.5G

PALEHUA H-ALPHA



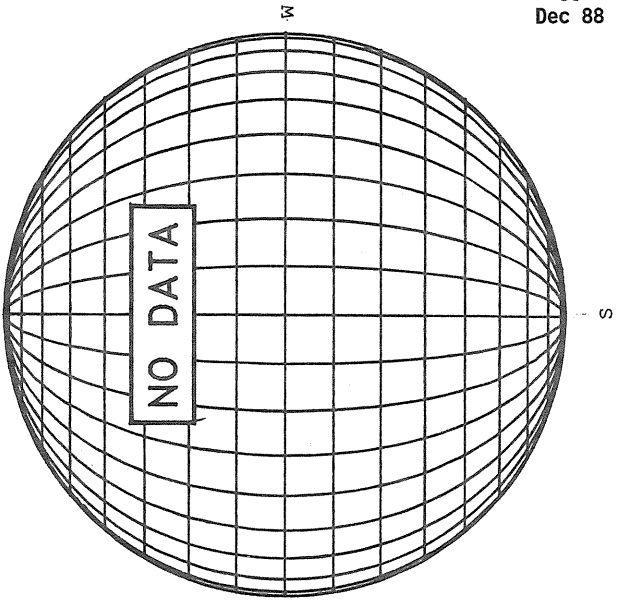
1815 UT

BOULDER SUNSPOT



1615 UT
1610 UT BOUL Prom

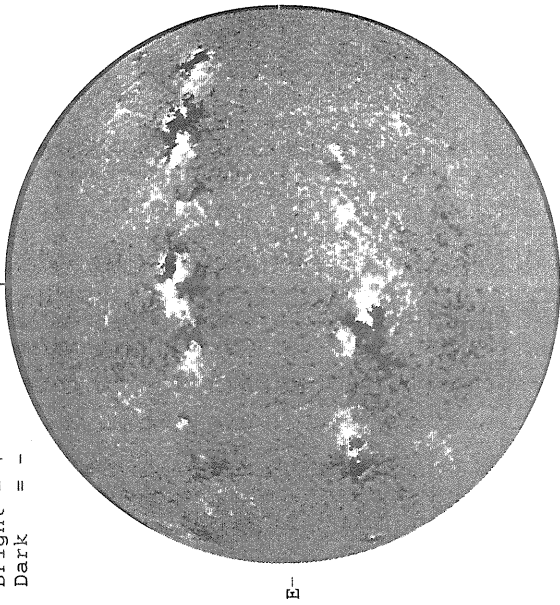
SACRAMENTO PEAK CORONA (1.15 Radii)



DECEMBER 27, 1988 (P= 4.45, B₀ = -2.45, L₀ = 173.46)

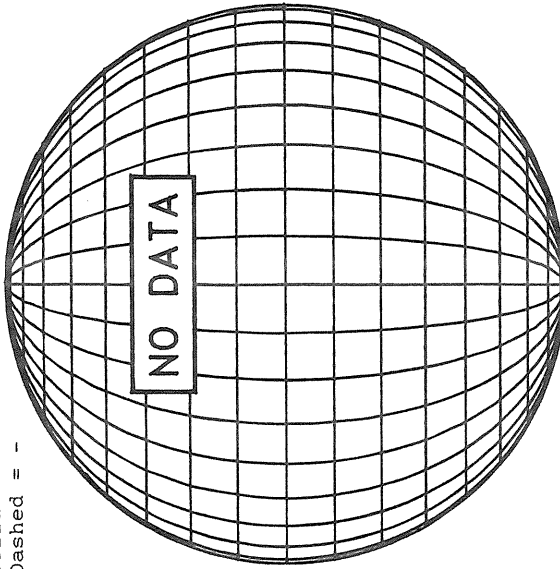
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



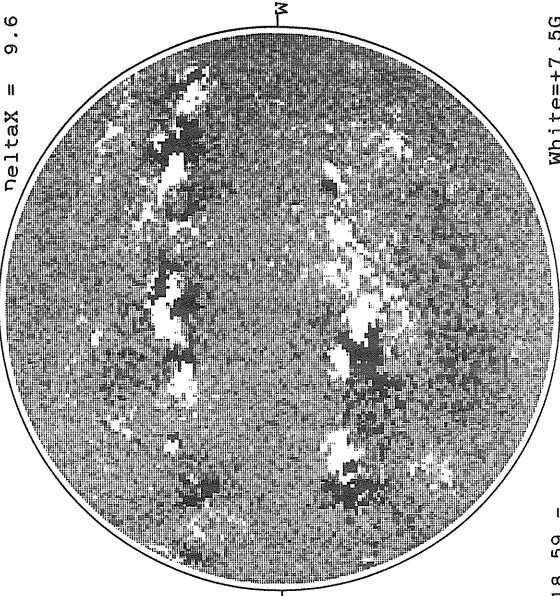
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

DeltaY = 13.0
DeltaX = 9.6

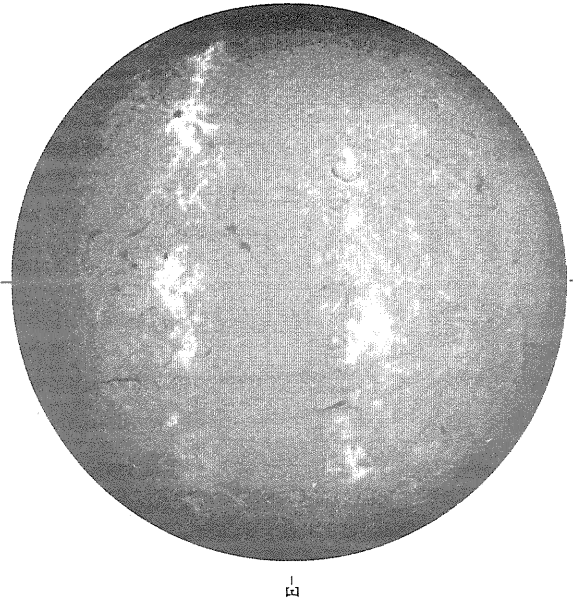


1714 UT

18.59 -
19.57 UT

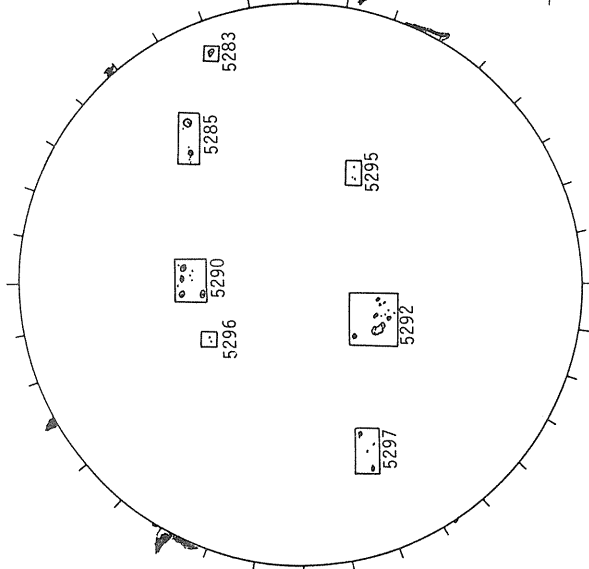
White = +7.5G
Black = -7.5G

SACRAMENTO PEAK H-ALPHA



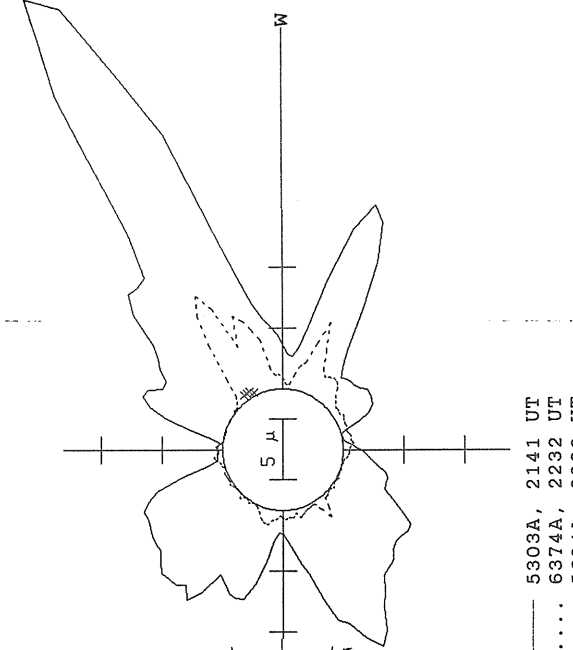
1524 UT

BOULDER SUNSPOT



1520 UT
1630 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)

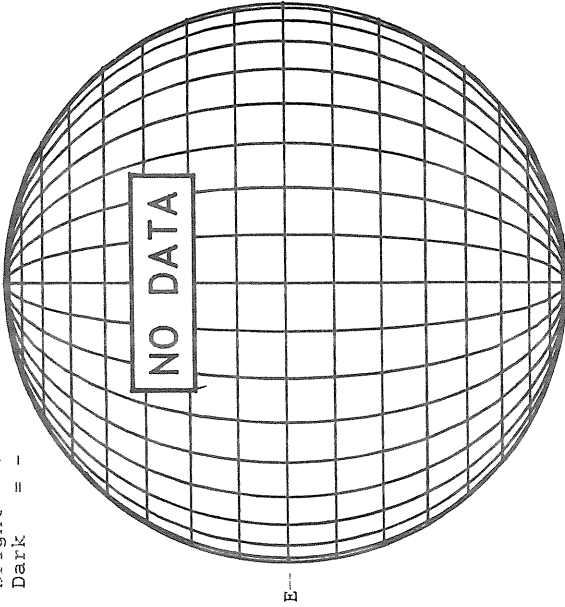


— 5303A, 2141 UT
.... 6374A, 2232 UT
xxxxx 5694A, 2220 UT

DECEMBER 28, 1988 (P= 3.97, B₀ = -2.57, L₀ = 160.29)

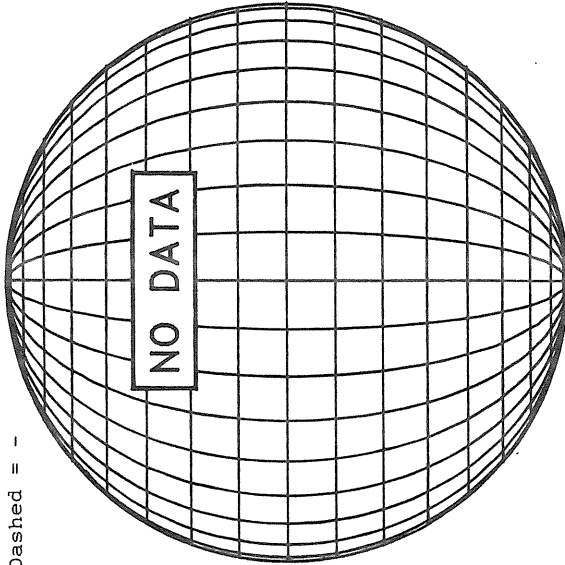
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



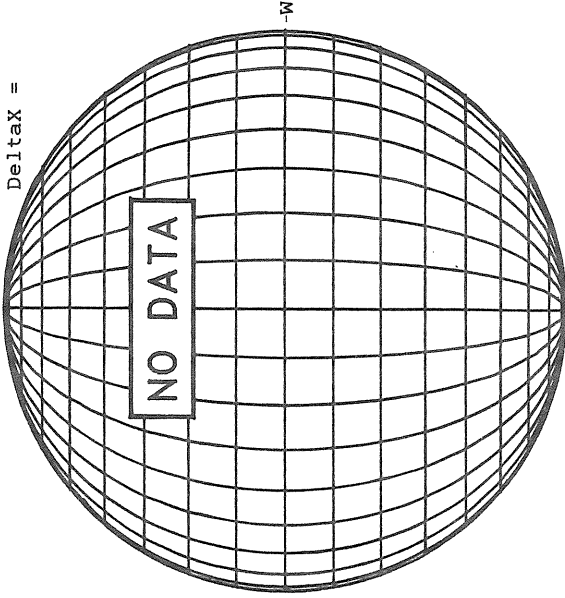
STANFORD MAGNETOGRAM

Solid = +
Dashed = -

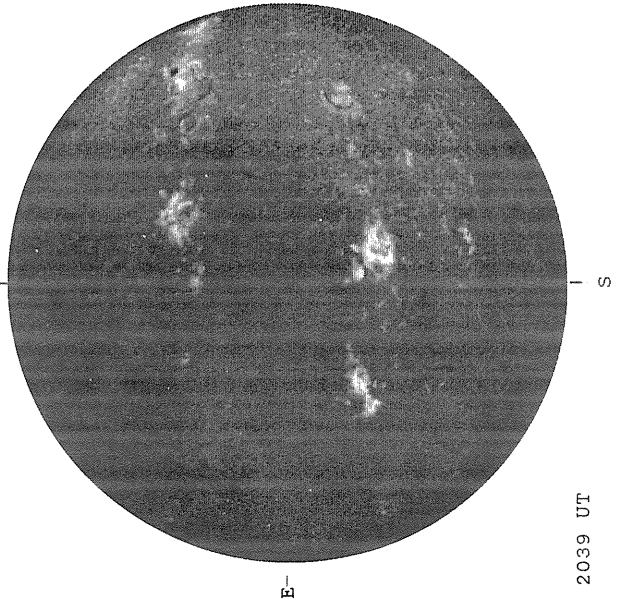


MT. WILSON MAGNETOGRAM

DeltaY =
DeltaX =

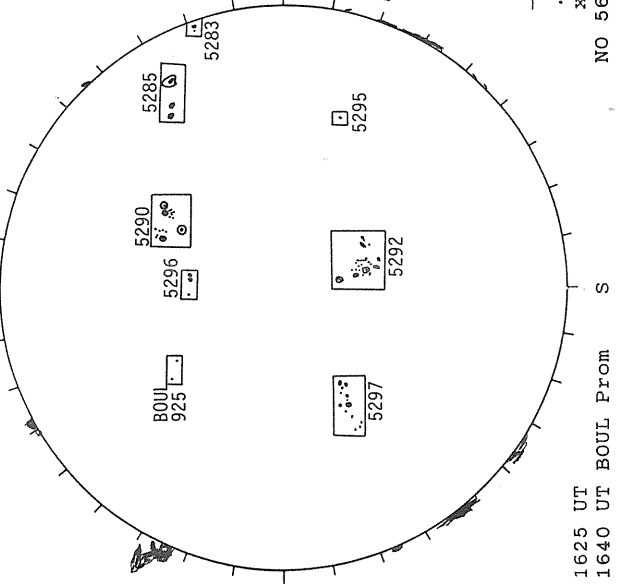


HOLLOMAN H-ALPHA



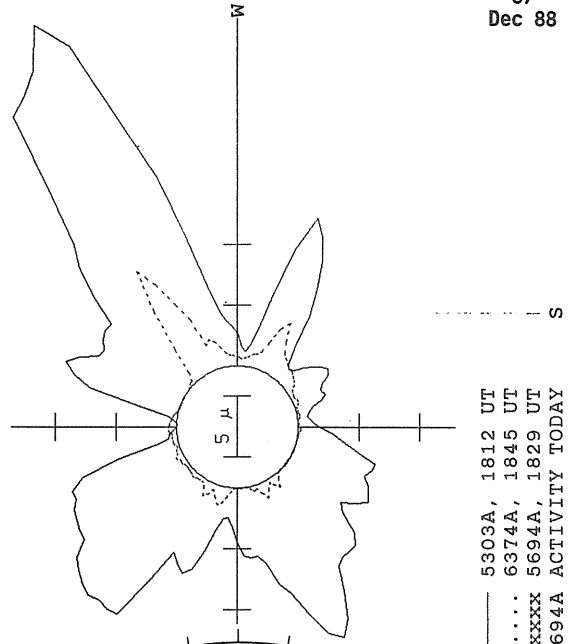
2039 UT

BOULDER SUNSPOT



1625 UT
1640 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)

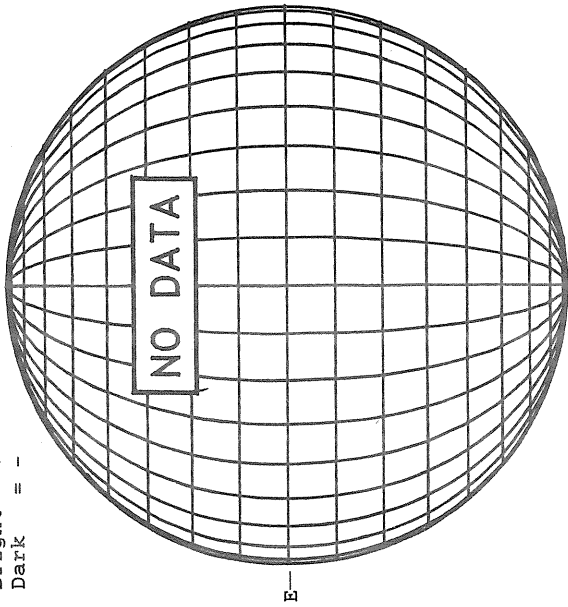


— 5303A, 1812 UT
... 6374A, 1845 UT
xxxx 5694A, 1829 UT
NO 5694A ACTIVITY TODAY

DECEMBER 29, 1988 (P= 3.48, B₀ = -2.69, L₀ = 147.12)

KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



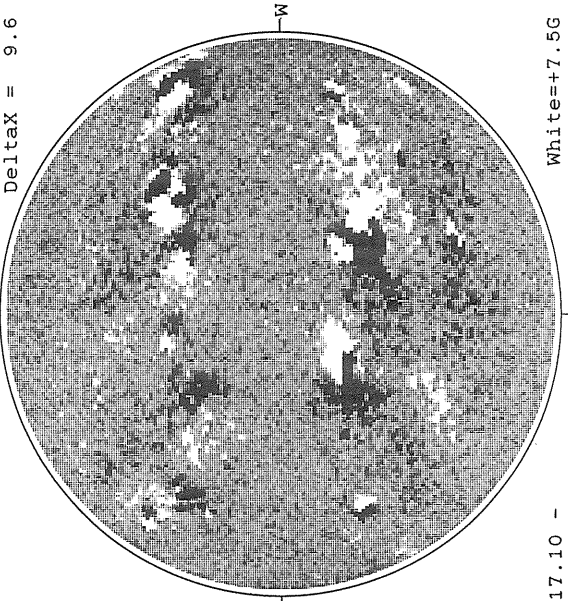
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

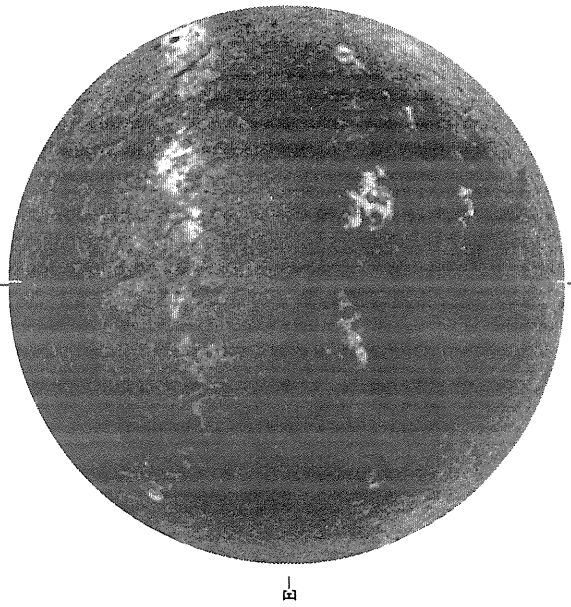
DeltaY = 13.0
DeltaX = 9.6



17.10 -
18.08 UT

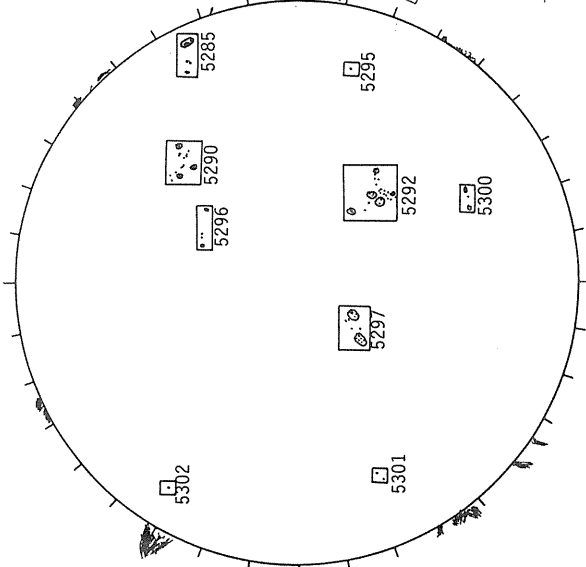
White = +7.5G
Black = -7.5G

BOULDER H-ALPHA



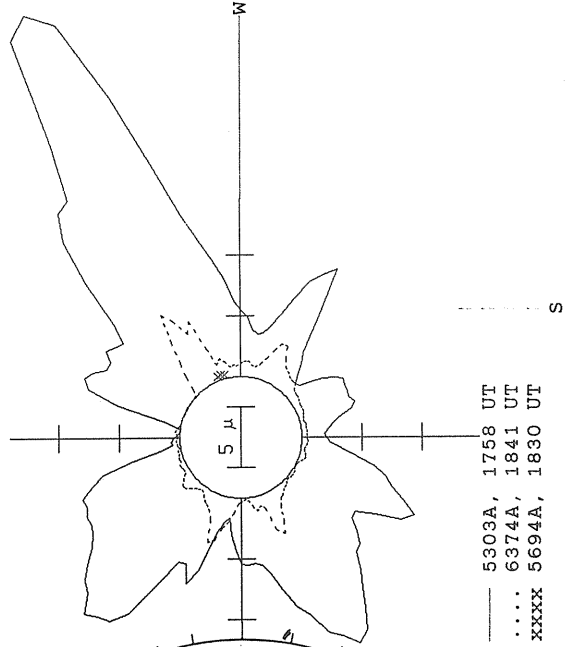
1700 UT

BOULDER SUNSPOT



1645 UT
1700 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)

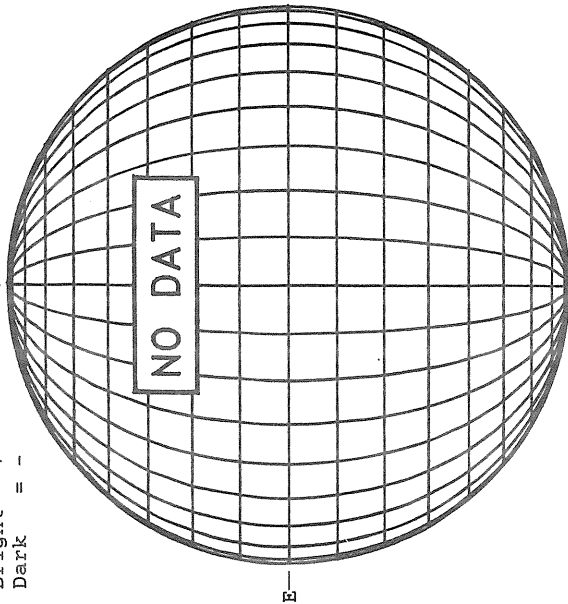


— 5303A, 1758 UT
... 6374A, 1841 UT
XXXX 5694A, 1630 UT

DECEMBER 30, 1988 (P= 3.00, B₀ =-2.81, L₀ = 133.95)

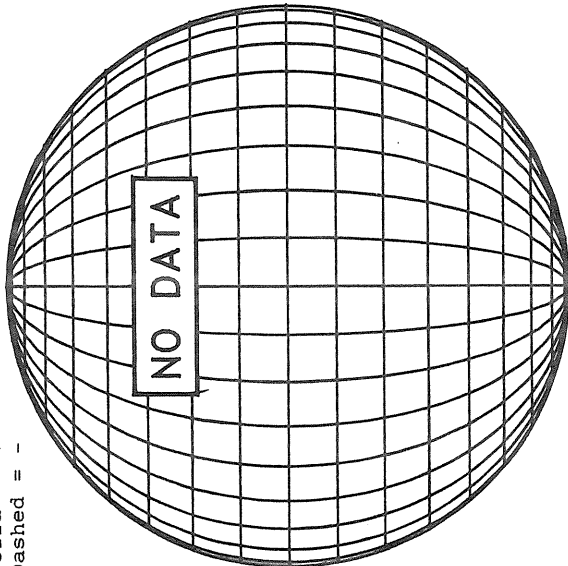
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



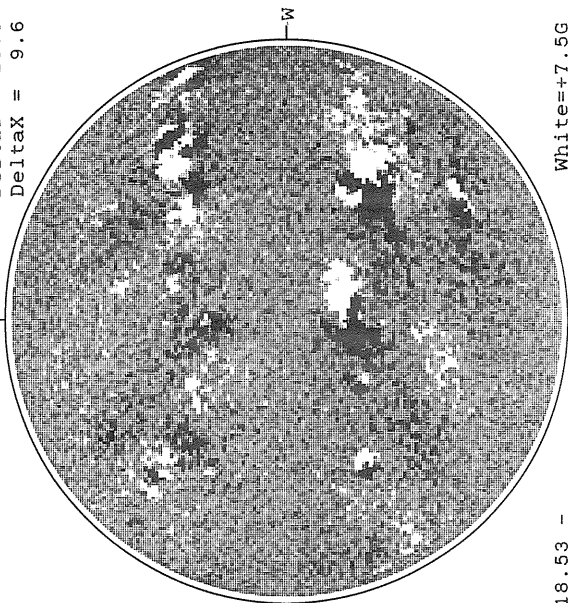
STANFORD MAGNETOGRAM

Solid = +
Dashed = -



MT. WILSON MAGNETOGRAM

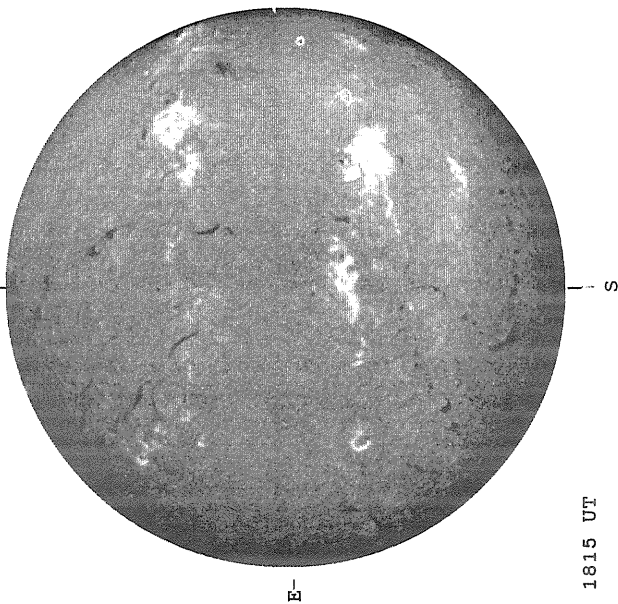
DeltaY = 13.0
DeltaX = 9.6



18.53 -
19.50 UT

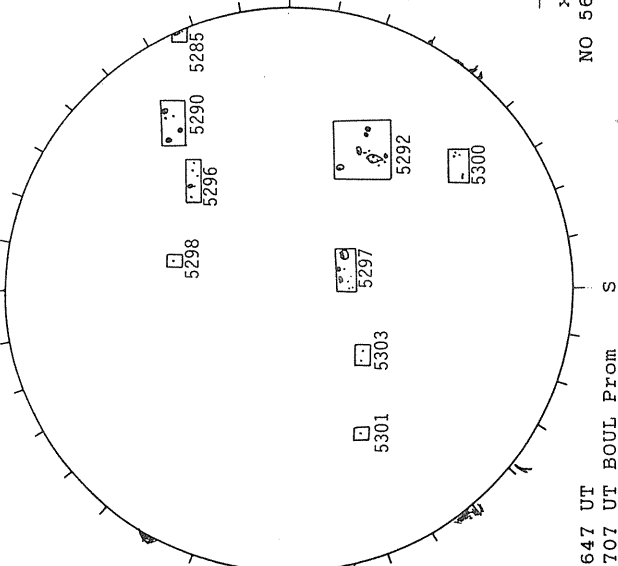
White=+7.5G
Black=-7.5G

HOLLOMAN H-ALPHA



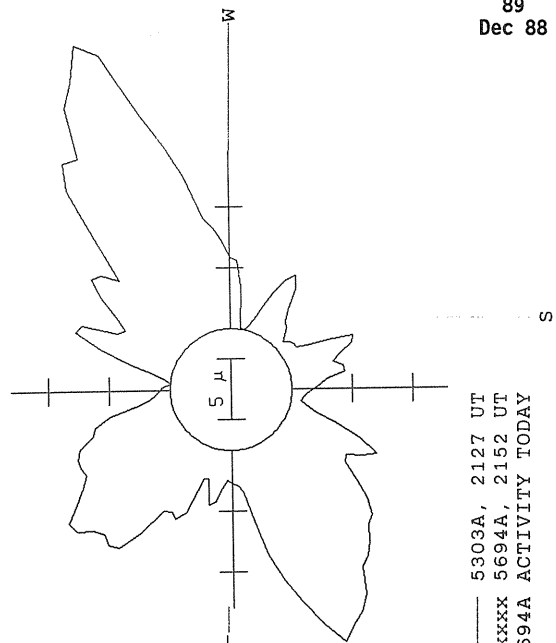
1815 UT

BOULDER SUNSPOT



1647 UT BOUL Prom
1707 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)

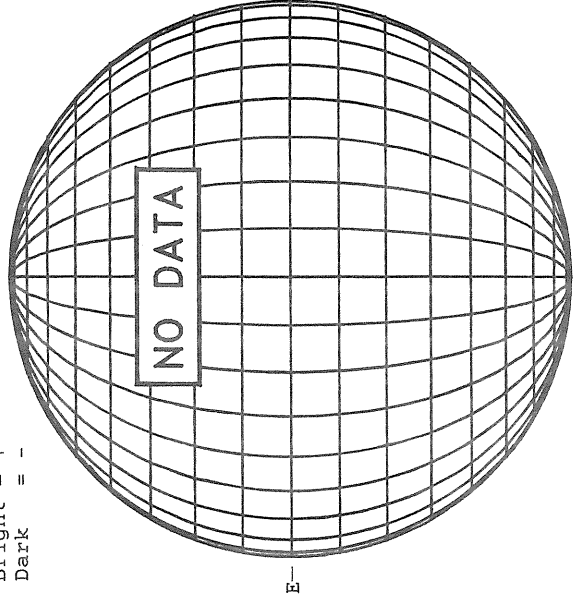


5303A, 2127 UT
xxxx 5694A, 2152 UT
NO 5694A ACTIVITY TODAY

DECEMBER 31, 1988 (P= 2.51, B₀ = -2.92, L₀ = 120.78)

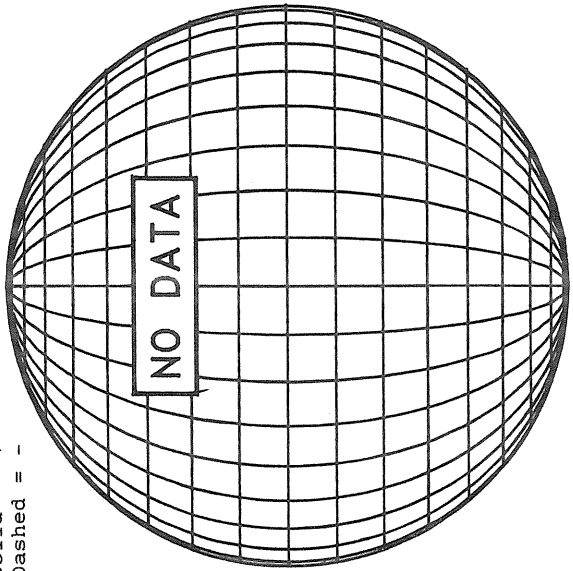
KITT PEAK MAGNETOGRAM

Bright = +
Dark = -



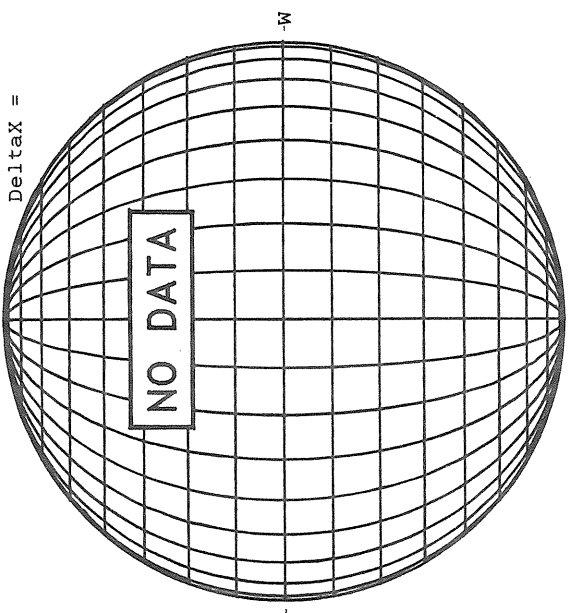
STANFORD MAGNETOGRAM

Solid = +
Dashed = -

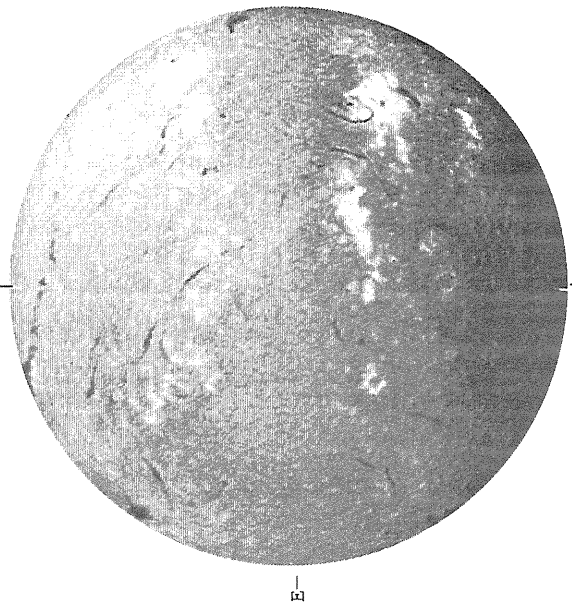


MT. WILSON MAGNETOGRAM

Delta₁ =
Delta₂ =

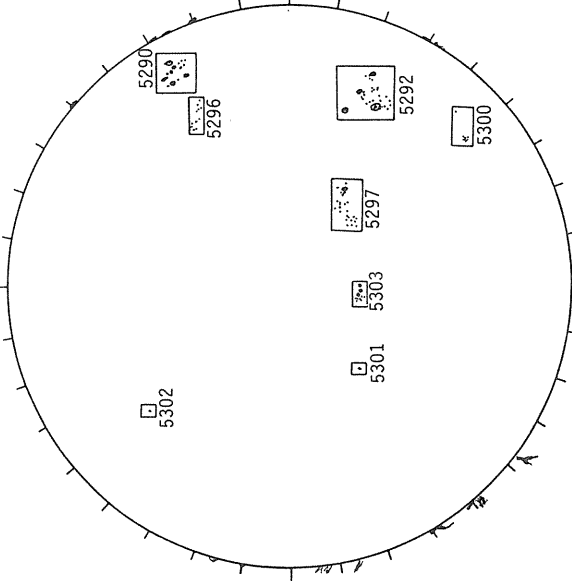


BOULDER H-ALPHA



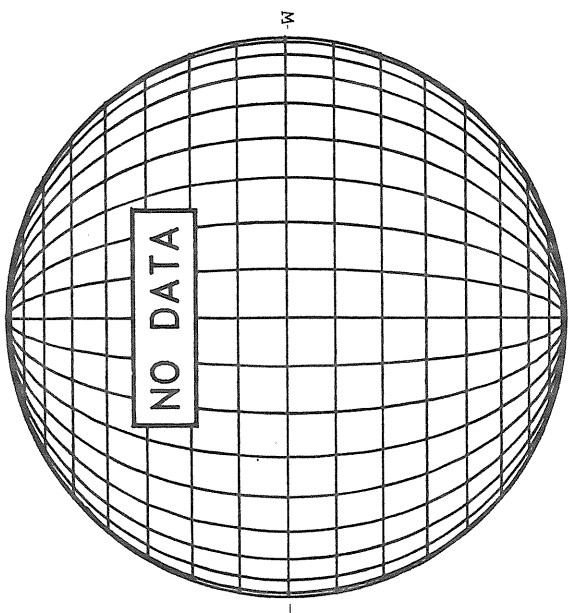
1608 UT

BOULDER SUNSPOT



1620 UT
1608 UT BOUL FROM

SACRAMENTO PEAK CORONA (1.15 Radii)



SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time (UT)	Lat	CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5254	24912	MWIL	12 04 2315	S18	W49	12 1.2	5	(B)					
5254		LEAR	12 05 0035	S17	W50	12 1.2		B	CKO	280	9	8	4
5254		CULG	12 05 0250	S16	W54	12 1.0		B	DHO	270	4	4	2
5254		SVTO	12 05 0833	S19	W53	12 1.3		B	DAO	210	3	6	2
5254		RAMY	12 05 1428	S18	W58	12 1.2		B	DSO	210	3	4	3
5254		BOUL	12 05 1548	S17	W59	12 1.2		B	CSO	160	3	4	3
5254	24912	MWIL	12 05 1630	S17	W60	12 1.1	5	(BP)					
5254		HOLL	12 05 1730	S18	W60	12 1.2		B	CSO	150	3	6	3
5254		LEAR	12 06 0110	S17	W63	12 1.3		B	CHO	200	4	10	4
5254		CULG	12 06 0310	S15	W69	11 30.9		B	CSO	160	2	3	2
5254		SVTO	12 06 1020	S18	W70	12 1.1		B	CAO	230	2	4	1
5254		BOUL	12 06 1600	S17	W74	12 1.0		A	HS	180	1	2	3
5254		RAMY	12 06 1615	S15	W71	12 1.3		A	HS	180	1	2	3
5254		HOLL	12 06 1615	S16	W71	12 1.3		A	HS	140	1	2	3
5254	24912	MWIL	12 06 1630	S16	W73	12 1.1	5	(AP)					
5254		LEAR	12 07 0004	S16	W75	12 1.3		A	HS	80	1	2	4
5254		CULG	12 07 0440	S15	W82	12 1.0		A	HS	150	1	2	2
5254		RAMY	12 07 1236	S16	W83	12 1.2		A	HS	90	1	2	1
5255		LEAR	11 25 0005	N31	E76	12 1.0		B	BXO	10	2	8	3
5255		RAMY	11 25 1345	N29	E66	11 30.7		A	AX	10	1	1	2
5255		PALE	11 25 1800	N29	E64	11 30.8		A	AX	10	1	1	3
5255	24913	MWIL	11 25 2315	N28	E60	11 30.6	4	(AP)					
5255		HOLL	11 27 1610	N30	E38	11 30.7		A	AX		1		3
5255		SVTO	12 03 1012	N33	W28	12 1.2		B	BXO		2	4	2
5255	24926	MWIL	12 03 2315	N33	W33	12 1.3	2	X					
5260		LEAR	11 30 0050	N18	E20	12 1.5		B	BXO	30	6	4	3
5260		CULG	11 30 0427	N16	E19	12 1.6		B	DRO	20	10	4	2
5260		RAMY	11 30 1440	N18	E14	12 1.7		B	DAI	70	23	7	3
5260		BOUL	11 30 1520	N18	E11	12 1.5		B	DAO	70	13	7	3
5260	24920	MWIL	11 30 1600	N17	E12	12 1.6	5	(B)					
5260		HOLL	11 30 1624	N17	E12	12 1.6		B	DSI	70	19	7	3
5260		PALE	11 30 1835	N17	E11	12 1.6		B	DSI	100	20	9	3
5260		LEAR	12 01 0220	N18	E05	12 1.5		B	DSO	150	23	9	2
5260		CULG	12 01 0347	N17	E06	12 1.6		B	DSI	140	14	9	2
5260		RAMY	12 01 1345	N18	E00	12 1.6		B	DAI	230	20	10	2
5260		BOUL	12 01 1540	N18	W01	12 1.6		B	DAI	170	17	10	3
5260		HOLL	12 01 1542	N17	W03	12 1.4		B	DAO	210	24	10	3
5260	24920	MWIL	12 01 1700	N17	W02	12 1.5	5	(BG)					
5260		PALE	12 01 1850	N18	W02	12 1.6		B	EAO	160	17	11	3
5260		LEAR	12 02 0033	N18	W08	12 1.4		B	EAO	180	18	12	3
5260		CULG	12 02 0400	N18	W08	12 1.5		B	ESI	120	11	10	1
5260		RAMY	12 02 1300	N18	W13	12 1.5		B	ESI	200	12	11	4
5260		BOUL	12 02 1530	N18	W14	12 1.6		B	EKI	240	17	11	3
5260	24920	MWIL	12 02 1530	N18	W15	12 1.5	5	(B)					
5260		HOLL	12 02 1645	N18	W17	12 1.4		B	DAO	80	9	10	2
5260		PALE	12 02 2145	N18	W17	12 1.6		B	ESI	150	16	11	3
5260		LEAR	12 03 0020	N17	W20	12 1.5		B	EAI	120	16	12	3
5260		CULG	12 03 0350	N19	W21	12 1.5		B	EAI	140	1	12	2
5260		SVTO	12 03 1012	N19	W25	12 1.5		B	ESI	150	21	11	2
5260		RAMY	12 03 1348	N19	W26	12 1.6		B	ESO	170	12	11	2
5260		BOUL	12 03 1538	N16	W30	12 1.4		B	EAO	120	19	12	4
5260		HOLL	12 03 1540	N17	W29	12 1.4		B	DSO	170	14	10	4
5260		PALE	12 03 1750	N18	W28	12 1.6		B	ESO	130	20	11	3
5260	24920	MWIL	12 03 2315	N17	W32	12 1.5	4	(B)					
5260		CULG	12 04 0000	N18	W33	12 1.5		B	ESI	100	8	12	1
5260		LEAR	12 04 0050	N17	W33	12 1.5		B	EAI	160	21	12	3
5260		RAMY	12 04 1525	N18	W40	12 1.6		B	EAO	90	7	11	2
5260		BOUL	12 04 1525	N18	W41	12 1.5		B	EAO	120	6	11	3
5260		HOLL	12 04 1553	N17	W41	12 1.5		B	EAO	110	7	12	3
5260		PALE	12 04 2025	N18	W44	12 1.5		B	EAO	130	6	12	3
5260	24920	MWIL	12 04 2315	N17	W48	12 1.3	4	(B)					
5260		LEAR	12 05 0035	N17	W46	12 1.5		B	CSO	100	6	12	4
5260		CULG	12 05 0250	N18	W48	12 1.5		B	DSO	60	6	12	2
5260		SVTO	12 05 0833	N18	W48	12 1.7		B	DSO	80	4	9	2
5260		RAMY	12 05 1428	N19	W53	12 1.5		B	EAO	110	4	11	3
5260		BOUL	12 05 1548	N17	W57	12 1.3		B	CAO	40	4	12	3
5260	24920	MWIL	12 05 1630	N17	W58	12 1.3	5	(B)					

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5262		PALE	12 08 1800	S12 W75	12 3.1		B	CSO	80	5	9	3
5262		LEAR	12 09 0008	S14 W72	12 3.6		B	ESO	60	9	13	3
5262		CULG	12 09 0335	S13 W76	12 3.4		B	CRO	40	2	6	2
5262		BOUL	12 09 1535	S14 W80	12 3.6		B	BXO	60	2	2	1
5262		PALE	12 09 1735	S12 W79	12 3.8		A	HS	60	1	2	3
5262	24924	MWIL	12 09 2300	S14 W81	12 3.8	2	AF					
5262		LEAR	12 10 0017	S15 W78	12 4.1		A	HS	30	1	1	3
5258		RAMY	11 27 1425	N13 E85	12 4.0		A	AX	20	2	2	3
5258		HOLL	11 27 1610	N13 E85	12 4.1		A	HA	60	2	3	3
5258		PALE	11 27 2235	N12 E84	12 4.3		A	HA	120	1	2	3
5258		CULG	11 28 0325	N10 E80	12 4.1		A	HS	60	2	1	1
5258		RAMY	11 28 1350	N13 E72	12 4.0		A	HS	90	2	2	4
5258	24917	MWIL	11 28 1600	N13 E71	12 4.0	5	(AP)					
5258		HOLL	11 28 1606	N13 E78	12 4.5		A	HA	60	2	2	2
5258		BOUL	11 28 1735	N13 E71	12 4.1		A	HS	110	1	2	1
5258		PALE	11 28 1950	N13 E69	12 4.0		A	HA	80	2	2	2
5258		LEAR	11 29 0135	N13 E67	12 4.1		A	HA	90	1	2	3
5258		CULG	11 29 0255	N10 E67	12 4.1		A	HA	50	1	1	1
5258		SVTO	11 29 1004	N13 E62	12 4.1		B	CAO	80	2	5	2
5258		RAMY	11 29 1352	N10 E59	12 4.0		B	CAO	70	4	2	3
5258		BOUL	11 29 1525	N15 E59	12 4.1		B	CSO	80	3	3	3
5258		HOLL	11 29 1537	N15 E60	12 4.2		B	CSO	50	3	6	3
5258	24917	MWIL	11 29 1600	N13 E58	12 4.0	5	(BP)					
5258		PALE	11 29 1820	N12 E58	12 4.1		B	CSO	110	5	7	3
5258		LEAR	11 30 0050	N14 E54	12 4.1		B	CAO	120	8	8	3
5258		CULG	11 30 0427	N11 E53	12 4.2		B	CSO	60	2	2	2
5258		SVTO	11 30 0700	N15 E49	12 4.0		B	DSO	60	4	5	2
5258		RAMY	11 30 1440	N14 E46	12 4.1		B	CAO	60	3	2	3
5258		BOUL	11 30 1520	N15 E45	12 4.0		B	CAO	30	3	2	3
5258	24917	MWIL	11 30 1600	N13 E45	12 4.1	5	(AP)					
5258		HOLL	11 30 1624	N15 E45	12 4.1		B	CSO	60	3	3	3
5258		PALE	11 30 1835	N13 E44	12 4.1		B	CSO	50	5	3	3
5258		LEAR	12 01 0220	N15 E40	12 4.1		B	CAO	70	6	5	2
5258		CULG	12 01 0347	N13 E40	12 4.2		B	CSO	30	4	2	2
5258		RAMY	12 01 1345	N14 E34	12 4.1		B	CSO	60	6	3	2
5258		BOUL	12 01 1540	N14 E32	12 4.1		B	DAO	70	6	3	3
5258		HOLL	12 01 1542	N15 E32	12 4.1		B	DAO	60	10	4	3
5258	24917	MWIL	12 01 1700	N14 E32	12 4.1	4	(B)					
5258		PALE	12 01 1850	N13 E30	12 4.0		B	CSO	70	11	4	3
5258		LEAR	12 02 0033	N15 E27	12 4.1		B	DAO	110	8	4	3
5258		CULG	12 02 0400	N13 E26	12 4.1		B	DAO	30	7	4	1
5258		RAMY	12 02 1300	N15 E21	12 4.1		B	CRO	30	7	4	4
5258	24917	MWIL	12 02 1530	N14 E19	12 4.1	5	(BP)					
5258		BOUL	12 02 1530	N16 E18	12 4.0		B	CAO	40	6	3	3
5258		HOLL	12 02 1645	N14 E18	12 4.0		B	CSO	20	5	5	2
5258		PALE	12 02 2145	N13 E16	12 4.1		B	CRO	40	16	6	3
5258		LEAR	12 03 0020	N12 E13	12 4.0		B	CRO	30	9	5	3
5258		CULG	12 03 0350	N13 E13	12 4.1		B	CAI	40	4	4	2
5258		SVTO	12 03 1012	N14 E08	12 4.0		B	CSO	70	14	5	2
5258		RAMY	12 03 1348	N15 E08	12 4.2		B	CAO	50	13	4	2
5258		BOUL	12 03 1538	N13 E05	12 4.0		B	BXI	50	22	6	4
5258		HOLL	12 03 1540	N14 E06	12 4.1		B	CSI	50	19	5	4
5258		PALE	12 03 1750	N13 E04	12 4.0		B	CSO	80	22	4	3
5258	24917	MWIL	12 03 2315	N13 E01	12 4.0	4	(AP)					
5258		CULG	12 04 0000	N14 E01	12 4.1		B	CAI	50	5	5	1
5258		LEAR	12 04 0050	N14 W01	12 3.9		B	CAI	60	16	8	3
5258		RAMY	12 04 1525	N14 W07	12 4.1		B	CRI	30	6	3	2
5258		BOUL	12 04 1525	N14 W07	12 4.1		B	CSO	30	6	3	3
5258		HOLL	12 04 1553	N13 W08	12 4.0		B	CSO	20	8	3	3
5258		PALE	12 04 2025	N13 W10	12 4.1		B	CSO	30	8	3	3
5258	24917	MWIL	12 04 2315	N12 W12	12 4.1	4	(AP)					
5258		LEAR	12 05 0035	N13 W13	12 4.0		B	BXO	20	5	3	4
5258		CULG	12 05 0250	N13 W14	12 4.1		B	CRO	10	4	3	2
5258		RAMY	12 05 1428	N14 W20	12 4.1		B	BXO	20	4	4	3
5258		BOUL	12 05 1548	N13 W21	12 4.1		B	BXO	50	5	3	3
5258	24917	MWIL	12 05 1630	N13 W22	12 4.0	5	(BP)					
5258		HOLL	12 05 1730	N14 W22	12 4.1		B	BXO	10	6	4	3
5258		LEAR	12 06 0110	N14 W26	12 4.1		B	BXO	30	6	5	4

S U N S P O T G R O U P S
(Ordered by Central Meridian Passage Date)

95
Dec 88

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5258		CULG	12 06 0310	N15 W26	12 4.2		B	CRO	20	3	3	2
5258		SVTO	12 06 1020	N12 W31	12 4.1		B	DRO	10	8	4	1
5258		BOUL	12 06 1600	N15 W33	12 4.2		B	BXO	30	7	4	3
5258		RAMY	12 06 1615	N14 W34	12 4.1		B	BXO	10	6	4	3
5258		HOLL	12 06 1615	N15 W35	12 4.0		B	BXO	10	7	5	3
5258	24917	MWIL	12 06 1630	N13 W35	12 4.0	5	(B)					
5258		LEAR	12 07 0004	N13 W38	12 4.1		B	CRO	20	5	4	4
5258		CULG	12 07 0440	N16 W41	12 4.1		A	AX	10	2	2	2
5258		RAMY	12 07 1236	N14 W45	12 4.1		B	BXO	30	3	5	1
5258	24917	MWIL	12 07 1615	N14 W48	12 4.0	4	(AF)					
5258		PALE	12 07 1740	N15 W48	12 4.1		B	BXO	60	3	5	3
5258		LEAR	12 08 0020	N14 W50	12 4.2		B	BXO	10	2	3	4
5258		PALE	12 08 1800	N16 W55	12 4.6		B	BXO	10	2	10	3
5258A		HOLL	12 03 1540	N12 E13	12 4.6		A	AX		1		4
5258A	24931	MWIL	12 05 1630	N09 W15	12 4.6	4	(AF)					
5261		LEAR	11 30 0050	N18 E74	12 5.7		B	CRO	50	3	6	3
5261		CULG	11 30 0427	N14 E76	12 5.9		B	BXO	10	2	8	2
5261		SVTO	11 30 0700	N19 E69	12 5.5		B	CAO	60	2	10	2
5261		RAMY	11 30 1440	N18 E67	12 5.7		B	DAO	100	4	7	3
5261		BOUL	11 30 1520	N19 E68	12 5.8		B	CAO	50	3	8	3
5261	24921	MWIL	11 30 1600	N18 E67	12 5.8	5	(BF)					
5261		HOLL	11 30 1624	N19 E66	12 5.7		B	CSO	70	3	4	3
5261		PALE	11 30 1835	N18 E64	12 5.6		B	CSO	80	4	5	3
5261		LEAR	12 01 0220	N19 E59	12 5.6		B	DAO	180	6	8	2
5261		CULG	12 01 0347	N17 E61	12 5.8		B	DSO	110	4	9	2
5261		RAMY	12 01 1345	N18 E54	12 5.7		B	DSO	260	7	9	2
5261		BOUL	12 01 1540	N18 E52	12 5.6		B	DAO	280	12	9	3
5261		HOLL	12 01 1542	N19 E53	12 5.7		B	DAO	220	13	6	3
5261	24921	MWIL	12 01 1700	N19 E52	12 5.7	5	(B)					
5261		PALE	12 01 1850	N17 E52	12 5.7		B	DAO	200	20	9	3
5261		LEAR	12 02 0033	N18 E46	12 5.5		B	DAO	230	21	9	3
5261		CULG	12 02 0400	N16 E46	12 5.6		B	DAO	170	10	10	1
5261		RAMY	12 02 1300	N19 E43	12 5.8		B	DSI	260	16	9	4
5261	24921	MWIL	12 02 1530	N18 E39	12 5.6	5	(B)					
5261		BOUL	12 02 1530	N19 E39	12 5.6		B	DHC	360	17	10	3
5261		HOLL	12 02 1645	N19 E39	12 5.7		B	DSI	210	16	9	2
5261		PALE	12 02 2145	N17 E37	12 5.7		B	DAI	260	15	10	3
5261		LEAR	12 03 0020	N18 E34	12 5.6		B	DSI	200	14	10	3
5261		CULG	12 03 0350	N16 E32	12 5.6		B	ESO	220	9	11	2
5261		SVTO	12 03 1012	N19 E29	12 5.6		B	DSO	200	17	9	2
5261		RAMY	12 03 1348	N19 E28	12 5.7		B	DSO	240	10	9	2
5261		BOUL	12 03 1538	N18 E23	12 5.4		B	ESO	190	13	11	4
5261		HOLL	12 03 1540	N18 E26	12 5.6		B	DSO	230	15	10	4
5261		PALE	12 03 1750	N18 E26	12 5.7		B	DSO	260	15	10	3
5261	24921	MWIL	12 03 2315	N17 E21	12 5.6	5	(B)					
5261		CULG	12 04 0000	N18 E21	12 5.6		B	EAO	190	7	11	1
5261		LEAR	12 04 0050	N18 E21	12 5.6		B	EHI	180	12	11	3
5261		BOUL	12 04 1525	N18 E13	12 5.6		B	DAO	240	11	10	3
5261		RAMY	12 04 1525	N19 E13	12 5.6		B	CSO	140	14	11	2
5261		HOLL	12 04 1553	N18 E13	12 5.6		B	CSO	190	14	12	3
5261		PALE	12 04 2025	N18 E12	12 5.8		B	CSO	200	16	11	3
5261	24921	MWIL	12 04 2315	N18 E05	12 5.3	5	(B)					
5261		LEAR	12 05 0035	N18 E08	12 5.6		B	CAO	170	13	11	4
5261		CULG	12 05 0250	N18 E06	12 5.6		B	DSO	170	5	10	2
5261		SVTO	12 05 0833	N18 E05	12 5.7		B	EAO	1300	8	11	2
5261		RAMY	12 05 1428	N19 E00	12 5.6		B	EAO	180	14	11	3
5261		BOUL	12 05 1548	N18 W03	12 5.4		B	CAO	110	16	11	3
5261	24921	MWIL	12 05 1630	N18 W03	12 5.4	5	(B)					
5261		HOLL	12 05 1730	N19 W03	12 5.5		B	ESO	140	9	11	3
5261		LEAR	12 06 0110	N16 W06	12 5.6		B	CHO	170	7	11	4
5261		CULG	12 06 0310	N18 W07	12 5.6		B	EAO	140	3	11	2
5261		SVTO	12 06 1020	N18 W10	12 5.7		B	ESO	110	9	11	1
5261		BOUL	12 06 1600	N19 W14	12 5.6		B	CSO	120	5	9	3
5261		HOLL	12 06 1615	N19 W13	12 5.7		B	CSO	120	6	10	3
5261		RAMY	12 06 1615	N19 W13	12 5.7		B	DSO	10	9	10	3
5261	24921	MWIL	12 06 1630	N18 W16	12 5.5	5	(BP)					
5261		LEAR	12 07 0004	N17 W21	12 5.4		B	DSO	100	3	4	4

96
Dec 88

S U N S P O T G R O U P S
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5261		CULG	12 07 0440	N18 W20	12 5.7		B	CSO	130	3	10	2
5261		RAMY	12 07 1236	N20 W25	12 5.6		B	CSO	120	1	9	1
5261	24921	MWIL	12 07 1615	N18 W30	12 5.4	5	(AP)					
5261		PALE	12 07 1740	N19 W30	12 5.4		A	HH	120	2	3	3
5261		LEAR	12 08 0020	N17 W35	12 5.3		A	HA	50	2	2	4
5261		CULG	12 08 0340	N18 W36	12 5.4		A	HA	80	2	2	1
5261		SVTO	12 08 0903	N18 W41	12 5.2		B	CAO	120	3	4	3
5261	24921	MWIL	12 08 1730	N17 W44	12 5.4	4	(AP)					
5261		PALE	12 08 1800	N19 W43	12 5.5		A	HS	80	1	2	3
5261		LEAR	12 09 0008	N17 W48	12 5.3		A	HS	80	2	2	3
5261		CULG	12 09 0335	N18 W51	12 5.3		A	HA	100	3	3	2
5261		BOUL	12 09 1535	N17 W57	12 5.3		A	HA	110	2	2	1
5261		PALE	12 09 1735	N20 W57	12 5.4		A	HA	110	2	2	3
5261	24921	MWIL	12 09 2300	N17 W60	12 5.4	5	(AP)					
5261		LEAR	12 10 0017	N17 W61	12 5.4		A	HS	80	2	3	3
5261		CULG	12 10 0240	N18 W65	12 5.2		A	HA	90	2	3	1
5261		RAMY	12 10 1410	N17 W68	12 5.4		A	HA	90	2	3	4
5261		BOUL	12 10 1525	N18 W68	12 5.5		B	BXO	10	2	1	1
5261	24921	MWIL	12 10 1600	N17 W69	12 5.4	4	(AP)					
5261		LEAR	12 11 0040	N17 W73	12 5.5		A	HS	30	1	1	3
5261		SVTO	12 11 0900	N18 W78	12 5.4		A	HS	20	1		3
5261A		LEAR	12 03 0020	S19 E68	12 8.2		A	AX	10	1	1	3
5261A		LEAR	12 07 0004	S18 E12	12 7.9		A	AX	10	1	1	4
5261A		RAMY	12 07 1236	S19 E06	12 8.0		A	AX	10	1	1	1
5261B		PALE	12 02 2145	S25 E75	12 8.7		B	BXO	20	2	8	3
5261B		CULG	12 03 0350	S23 E69	12 8.5		A	AX		1		2
5261B		SVTO	12 03 1012	S21 E69	12 8.7		B	CSO	60	3	10	2
5263	24925	MWIL	12 02 1530	S20 E85	12 8.4	2	AP					
5263		LEAR	12 03 0020	S23 E81	12 9.2		A	HS	30	1	1	3
5263		CULG	12 03 0350	S27 E80	12 9.4		A	HS	10	1	1	2
5263		RAMY	12 03 1348	S23 E73	12 9.2		A	HS	60	1	2	2
5263		BOUL	12 03 1538	S24 E78	12 9.7		A	HA	60	2	2	4
5263		HOLL	12 03 1540	S23 E71	12 9.1		A	HS	60	1	1	4
5263		PALE	12 03 1750	S24 E69	12 9.1		A	AX	20	3	2	3
5263	24925	MWIL	12 03 2315	S23 E69	12 9.3	4	(AP)					
5263		CULG	12 04 0000	S24 E71	12 9.5		A	HS	10	1	1	1
5263		LEAR	12 04 0050	S23 E67	12 9.2		A	HA	50	1	2	3
5263		RAMY	12 04 1525	S23 E59	12 9.2		A	HA	40	2	1	2
5263		BOUL	12 04 1525	S24 E62	12 9.4		B	CSO	40	3	2	3
5263		HOLL	12 04 1553	S23 E59	12 9.2		A	HS	20	2	2	3
5263		PALE	12 04 2025	S25 E58	12 9.3		A	HS	30	2	1	3
5263	24925	MWIL	12 04 2315	S22 E56	12 9.3	5	AP					
5263		LEAR	12 05 0035	S25 E54	12 9.2		B	CAO	50	4	3	4
5263		CULG	12 05 0250	S27 E55	12 9.4		A	HS	20	3	2	2
5263		RAMY	12 05 1428	S23 E47	12 9.2		B	BXO	20	3	3	3
5263		BOUL	12 05 1548	S24 E46	12 9.2		B	BXO		5	5	3
5263	24925	MWIL	12 05 1630	S24 E46	12 9.2	4	(BP)					
5263		HOLL	12 05 1730	S23 E45	12 9.2		B	CRO	20	3	3	3
5263		LEAR	12 06 0110	S24 E41	12 9.2		B	BXO	30	6	5	4
5263		CULG	12 06 0310	S26 E41	12 9.3		A	HR	10	2	2	2
5263		SVTO	12 06 1020	S24 E38	12 9.4		B	CAO	20	3	3	1
5263		BOUL	12 06 1600	S24 E33	12 9.2		B	BXO	10	2	3	3
5263		RAMY	12 06 1615	S23 E32	12 9.1		B	BXO	30	2	2	3
5263		HOLL	12 06 1615	S23 E33	12 9.2		A	AX		3	2	3
5263	24925	MWIL	12 06 1630	S24 E33	12 9.2	4	(B)					
5263		LEAR	12 07 0004	S23 E28	12 9.2		B	BXO	10	3	3	4
5263		CULG	12 07 0440	S25 E23	12 9.0		B	BXO	10	2	3	2
5263		RAMY	12 07 1236	S22 E21	12 9.1		B	BXO	10	2	2	1
5263		PALE	12 07 1740	S22 E15	12 8.9		A	AX	10	1	1	3
5263		LEAR	12 08 0020	S22 E12	12 8.9		B	BXO	10	3	4	4
5263		CULG	12 08 0340	S22 E09	12 8.8		B	BXO	10	2	2	1
5263		SVTO	12 08 0903	S21 E08	12 9.0		B	CRO	10	2	4	3
5263	24925	MWIL	12 08 1730	S24 E07	12 9.3	5	(B)					
5263		PALE	12 08 1800	S22 E02	12 8.9		B	BXO	10	4	4	3
5263		LEAR	12 09 0008	S22 W02	12 8.8		B	BXO	10	4	6	3
5263		CULG	12 09 0335	S22 W04	12 8.8		B	BXO	10	3	5	2

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5265		SVTO	12 05 0833	N21 E72	12 10.9		B	DSO	110	3	8	2
5265		RAMY	12 05 1428	N20 E66	12 10.6		B	DSO	230	6	7	3
5265		BOUL	12 05 1548	N20 E66	12 10.7		B	CAO	140	7	6	3
5265	24928	MWIL	12 05 1630	N20 E65	12 10.6	5	(BP)					
5265		HOLL	12 05 1730	N20 E65	12 10.7		B	DSO	180	6	7	3
5265		LEAR	12 06 0110	N19 E60	12 10.6		B	DAO	200	8	6	4
5265		CULG	12 06 0310	N18 E63	12 10.9		B	DAO	140	3	6	2
5265		SVTO	12 06 1020	N19 E58	12 10.8		B	DSO	210	8	6	1
5265		BOUL	12 06 1600	N18 E52	12 10.6		B	DHO	250	6	6	3
5265		RAMY	12 06 1615	N19 E53	12 10.7		B	CSO	150	7	6	3
5265		HOLL	12 06 1615	N21 E52	12 10.7		B	DSO	190	8	6	3
5265	24928	MWIL	12 06 1630	N19 E52	12 10.6	5	(B)					
5265		LEAR	12 07 0004	N19 E47	12 10.6		B	DSO	120	8	7	4
5265		CULG	12 07 0440	N17 E47	12 10.8		B	DSO	220	3	7	2
5265		RAMY	12 07 1236	N19 E42	12 10.7		B	CSO	160	6	6	1
5265	24928	MWIL	12 07 1615	N19 E37	12 10.5	5	(AP)					
5265		PALE	12 07 1740	N18 E38	12 10.6		B	CHO	140	11	7	3
5265		LEAR	12 08 0020	N19 E33	12 10.5		B	CAO	90	12	8	4
5265		CULG	12 08 0340	N18 E31	12 10.5		A	HS	120	5	3	1
5265		SVTO	12 08 0903	N20 E29	12 10.6		B	DAO	150	9	6	3
5265	24928	MWIL	12 08 1730	N19 E23	12 10.5	4	(BP)					
5265		PALE	12 08 1800	N19 E26	12 10.7		B	EAO	150	26	13	3
5265		LEAR	12 09 0008	N19 E21	12 10.6		B	DSO	180	30	7	3
5265		CULG	12 09 0335	N19 E19	12 10.6		B	DAI	250	9	5	2
5265		BOUL	12 09 1535	N20 E12	12 10.6		B	DAI	280	9	7	1
5265		PALE	12 09 1735	N19 E13	12 10.7		B	EAI	260	17	13	3
5265	24928	MWIL	12 09 2300	N19 E07	12 10.5	5	(BP)					
5265		LEAR	12 10 0017	N19 E06	12 10.5		B	DAO	190	15	7	3
5265		CULG	12 10 0240	N20 E08	12 10.7		B	DAO	130	10	9	1
5265		RAMY	12 10 1410	N20 E00	12 10.6		B	DKO	180	16	6	4
5265		BOUL	12 10 1525	N20 W01	12 10.6		B	CAO	130	13	5	1
5265	24928	MWIL	12 10 1600	N20 W03	12 10.4	5	(BP)					
5265		LEAR	12 11 0040	N20 W05	12 10.6		B	DAO	140	14	5	3
5265		SVTO	12 11 0900	N20 W11	12 10.5		B	CAO	170	12	7	3
5265		RAMY	12 11 1530	N20 W14	12 10.6		B	CSO	200	11	5	3
5265	24928	MWIL	12 11 1645	N20 W15	12 10.5	5	(BP)					
5265		PALE	12 11 1830	N20 W17	12 10.5		B	DSO	170	9	6	4
5265		HOLL	12 11 1835	N20 W15	12 10.6		B	CSO	180	10	7	4
5265		LEAR	12 12 0025	N19 W18	12 10.6		B	CHO	190	8	5	4
5265		CULG	12 12 0402	N19 W21	12 10.6		B	CSO	140	6	4	2
5265		SVTO	12 12 0930	N19 W24	12 10.6		B	CAO	100	8	4	4
5265		RAMY	12 12 1321	N20 W26	12 10.6		B	CSO	130	3	5	4
5265	24928	MWIL	12 12 1615	N19 W28	12 10.5	5	(BF)					
5265		PALE	12 12 1840	N20 W31	12 10.4		B	CSO	120	7	5	2
5265		HOLL	12 12 2024	N20 W31	12 10.5		B	CSO	110	7	6	3
5265		LEAR	12 13 0106	N20 W36	12 10.3		B	CSO	80	9	5	3
5265		CULG	12 13 0325	N20 W35	12 10.5		B	CSO	130	4	3	1
5265		RAMY	12 13 1352	N20 W40	12 10.5		B	CSO	130	5	4	4
5265		HOLL	12 13 1608	N19 W41	12 10.5		B	CSO	120	3	4	3
5265	24928	MWIL	12 13 1630	N19 W42	12 10.5	5	(AP)					
5265		PALE	12 13 1840	N19 W45	12 10.3		B	CSO	150	5	4	3
5265		LEAR	12 14 0035	N18 W48	12 10.4		A	HS	60	2	2	3
5265		CULG	12 14 0410	N21 W49	12 10.4		A	HS	130	1	2	1
5265		SVTO	12 14 1000	N19 W53	12 10.4		A	HA	100	3	3	1
5265		RAMY	12 14 1515	N20 W55	12 10.4		A	HS	110	3	2	2
5265		BOUL	12 14 1534	N19 W55	12 10.4		A	HS	70	1	2	2
5265	24928	MWIL	12 14 1630	N19 W56	12 10.4	5	(AP)					
5265		HOLL	12 14 1635	N19 W56	12 10.4		A	HS	80	1	2	4
5265		PALE	12 14 2130	N19 W57	12 10.5		A	HS	80	2	2	3
5265		LEAR	12 15 0200	N18 W60	12 10.5		A	HS	40	1	1	2
5265		CULG	12 15 0347	N19 W61	12 10.5		A	HS	40	2	1	2
5265		RAMY	12 15 1615	N21 W69	12 10.4		A	HA	120	1	2	1
5265		HOLL	12 15 2023	N18 W70	12 10.5		A	HS	120	1	2	2
5265		LEAR	12 16 0030	N18 W71	12 10.6		A	HS	30	1	1	2
5265		CULG	12 16 0403	N20 W78	12 10.2		A	HS	30	1	1	1
5265		RAMY	12 16 1350	N20 W83	12 10.2		A	HS	40	1	2	4
5266		BOUL	12 04 1525	S17 E81	12 10.8		A	HA	60	3	1	3
5266		RAMY	12 04 1525	S18 E79	12 10.6		A	HS	60	1	1	2

S U N S P O T G R O U P S
(Ordered by Central Meridian Passage Date)

99
Dec 88

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5266		HOLL	12 04 1553	S18 E83	12 11.0		A	HS	120	1	2	3
5266	24929	MWIL	12 04 2315	S17 E78	12 10.9	4	AP					
5266		LEAR	12 05 0035	S18 E77	12 10.9		A	HK	120	3	3	4
5266		CULG	12 05 0250	S20 E80	12 11.2		A	HA	200	1	3	2
5266		SVTO	12 05 0833	S18 E75	12 11.1		B	CSO	50	5	8	2
5266		RAMY	12 05 1428	S18 E71	12 11.0		B	CAO	220	6	7	3
5266		BOUL	12 05 1548	S19 E73	12 11.2		B	BAO	170	4	6	3
5266	24929	MWIL	12 05 1630	S18 E69	12 10.9	5	(BP)					
5266		HOLL	12 05 1730	S19 E68	12 10.9		B	DSO	170	5	4	3
5266		LEAR	12 06 0110	S18 E64	12 10.9		B	DAO	210	8	5	4
5266		CULG	12 06 0310	S20 E63	12 10.9		B	DSO	110	4	5	2
5266		SVTO	12 06 1020	S19 E61	12 11.1		B	DAI	190	8	4	1
5266		BOUL	12 06 1600	S19 E57	12 11.0		B	DAO	180	7	6	3
5266		HOLL	12 06 1615	S17 E55	12 10.8		B	CSO	140	6	5	3
5266		RAMY	12 06 1615	S18 E55	12 10.9		B	CAO	190	8	7	3
5266	24929	MWIL	12 06 1630	S18 E56	12 10.9	4	(BP)					
5266		LEAR	12 07 0004	S18 E52	12 11.0		B	DSO	80	9	8	4
5266		CULG	12 07 0440	S21 E49	12 10.9		B	CSO	100	5	7	2
5266		RAMY	12 07 1236	S18 E45	12 10.9		B	CAO	140	7	8	1
5266	24929	MWIL	12 07 1615	S18 E42	12 10.9	4	(AP)					
5266		PALE	12 07 1740	S20 E40	12 10.8		B	CHO	160	12	7	3
5266		LEAR	12 08 0020	S18 E39	12 11.0		B	CAI	90	12	8	4
5266		CULG	12 08 0340	S18 E36	12 10.9		B	CSO	120	9	5	1
5266		SVTO	12 08 0903	S18 E33	12 10.9		B	CAO	110	8	7	3
5266	24929	MWIL	12 08 1730	S17 E28	12 10.8	4	(AP)					
5266		PALE	12 08 1800	S19 E28	12 10.9		B	CAO	110	11	7	3
5266		LEAR	12 09 0008	S18 E25	12 10.9		B	CSO	100	9	5	3
5266		CULG	12 09 0335	S18 E23	12 10.9		B	CSO	90	3	3	2
5266		BOUL	12 09 1535	S16 E17	12 10.9		A	HS	60	1	2	1
5266		PALE	12 09 1735	S18 E15	12 10.9		B	CSO	90	5	5	3
5266	24929	MWIL	12 09 2300	S17 E14	12 11.0	5	(BP)					
5266		LEAR	12 10 0017	S18 E13	12 11.0		B	CSO	90	5	7	3
5266		CULG	12 10 0240	S18 E12	12 11.0		B	CSO	60	3	3	1
5266		RAMY	12 10 1410	S17 E07	12 11.1		B	CSO	100	7	7	4
5266		BOUL	12 10 1525	S16 E05	12 11.0		A	HS	80	1	2	1
5266	24929	MWIL	12 10 1600	S17 E04	12 11.0	5	(BP)					
5266		LEAR	12 11 0040	S17 E02	12 11.2		B	CSO	80	4	5	3
5266		SVTO	12 11 0900	S18 W03	12 11.1		B	CAO	80	8	6	3
5266		RAMY	12 11 1530	S18 W07	12 11.1		B	CSO	70	7	5	3
5266	24929	MWIL	12 11 1645	S17 W07	12 11.2	5	(B)					
5266		PALE	12 11 1830	S18 W08	12 11.2		B	CSO	60	8	5	4
5266		HOLL	12 11 1835	S19 W08	12 11.2		B	CSO	60	6	5	4
5266		LEAR	12 12 0025	S18 W12	12 11.1		B	CSO	60	6	4	4
5266		CULG	12 12 0402	S20 W16	12 10.9		B	CSO	60	5	5	2
5266		SVTO	12 12 0930	S18 W17	12 11.1		B	CAO	70	6	5	4
5266		RAMY	12 12 1321	S18 W18	12 11.2		B	CAO	80	4	5	4
5266	24929	MWIL	12 12 1615	S18 W21	12 11.1	5	(BP)					
5266		PALE	12 12 1840	S18 W22	12 11.1		A	HS	70	2	2	2
5266		HOLL	12 12 2024	S18 W22	12 11.2		B	CSO	70	5	6	3
5266		LEAR	12 13 0106	S18 W25	12 11.1		B	CSO	50	2	5	3
5266		CULG	12 13 0325	S18 W27	12 11.1		B	CSO	50	3	2	1
5266		RAMY	12 13 1352	S18 W32	12 11.1		B	CSO	60	7	5	4
5266		HOLL	12 13 1608	S18 W33	12 11.1		B	CSO	30	5	3	3
5266	24929	MWIL	12 13 1630	S18 W33	12 11.2	5	(BP)					
5266		PALE	12 13 1840	S18 W34	12 11.2		B	CSO	80	4	4	3
5266		LEAR	12 14 0035	S18 W38	12 11.1		B	CSO	30	2	5	3
5266		CULG	12 14 0410	S16 W42	12 11.0		A	HS	60	1	2	1
5266		SVTO	12 14 1000	S17 W45	12 11.0		A	HA	40	1	2	1
5266		RAMY	12 14 1515	S17 W48	12 11.0		A	HS	60	1	2	2
5266		BOUL	12 14 1534	S18 W47	12 11.1		A	HS	30	1	1	2
5266	24929	MWIL	12 14 1630	S18 W48	12 11.0	5	(BP)					
5266		HOLL	12 14 1635	S18 W49	12 10.9		A	HS	30	1	1	4
5266		PALE	12 14 2130	S18 W49	12 11.2		B	CSO	60	1	3	3
5266		LEAR	12 15 0200	S18 W52	12 11.1		A	HS	30	1	1	2
5266		CULG	12 15 0347	S18 W56	12 10.9		A	HS	40	1	1	2
5266		RAMY	12 15 1615	S16 W62	12 11.0		A	HA	30	2	2	1
5266		HOLL	12 15 2023	S18 W64	12 11.0		A	HS	50	1	2	2
5266		LEAR	12 16 0030	S17 W65	12 11.1		A	AX	20	1	1	2
5266		HOLL	12 16 0200	S18 W66	12 11.0		A	HS	20	1	1	3

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5266		CULG	12 16 0403	S18 W71	12 10.8		A	HS	30	1	1	1
5266		RAMY	12 16 1350	S16 W73	12 11.0		A	HR	10	1	1	4
5266		BOUL	12 16 1605	S18 W76	12 10.9		A	HS	30	1	1	2
5266		HOLL	12 16 2010	S18 W75	12 11.1		A	AX		1		3
5266A		HOLL	12 11 1835	N22 W06	12 11.3		A	AX		1		4
5268		RAMY	12 05 1428	S25 E76	12 11.5		A	AX	10	1	1	3
5268		BOUL	12 05 1548	S25 E79	12 11.8		A	AX		1		3
5268	24932	MWIL	12 05 1630	S24 E76	12 11.5	4	(AP)					
5268		HOLL	12 05 1730	S25 E73	12 11.4		A	AX	10	2	1	3
5268		LEAR	12 06 0110	S24 E72	12 11.6		B	BXO	30	3	8	4
5268		CULG	12 06 0310	S27 E72	12 11.7		A	HR	10	1	2	2
5268		SVTO	12 06 1020	S24 E70	12 11.8		B	CRO	30	3	5	1
5268		BOUL	12 06 1600	S25 E67	12 11.8		B	CAO	20	2	8	3
5268		RAMY	12 06 1615	S24 E64	12 11.6		B	BXO	20	2	7	3
5268		HOLL	12 06 1615	S24 E65	12 11.7		B	CRO	30	4	8	3
5268	24932	MWIL	12 06 1630	S24 E63	12 11.5	4	(B)					
5268		LEAR	12 07 0004	S24 E60	12 11.6		B	CRO	20	3	6	4
5268		CULG	12 07 0440	S27 E58	12 11.7		B	BXO	10	2	6	2
5268		RAMY	12 07 1236	S24 E53	12 11.6		B	CRO	40	2	7	1
5268	24932	MWIL	12 07 1615	S24 E52	12 11.7	4	(B)					
5268		PALE	12 07 1740	S26 E50	12 11.6		B	CSO	40	2	7	3
5268		LEAR	12 08 0020	S24 E47	12 11.6		B	CRO	20	3	9	4
5268		CULG	12 08 0340	S26 E46	12 11.7		B	CSO	30	3	8	1
5268		SVTO	12 08 0903	S23 E43	12 11.7		B	CRO	20	2	8	3
5268	24932	MWIL	12 08 1730	S24 E35	12 11.4	4	(AP)					
5268		PALE	12 08 1800	S25 E38	12 11.7		B	CSO	50	5	8	3
5268		LEAR	12 09 0008	S25 E35	12 11.7		B	CSO	30	2	9	3
5268		CULG	12 09 0335	S26 E32	12 11.6		B	CRO	20	5	11	2
5268		BOUL	12 09 1535	S23 E25	12 11.6		B	DSO	50	3	8	1
5268		PALE	12 09 1735	S25 E23	12 11.5		B	CSO	30	3	7	3
5268	24932	MWIL	12 09 2300	S23 E22	12 11.6	5	(B)					
5268		LEAR	12 10 0017	S24 E22	12 11.7		B	CSO	30	5	8	3
5268		CULG	12 10 0240	S25 E18	12 11.5		B	CRO	30	3	7	1
5268		RAMY	12 10 1410	S23 E13	12 11.6		B	CRO	20	5	8	4
5268		BOUL	12 10 1525	S23 E10	12 11.4		B	BXO	10	2	3	1
5268	24932	MWIL	12 10 1600	S23 E12	12 11.6	4	(B)					
5268		LEAR	12 11 0040	S24 E04	12 11.3		B	CRO	10	3	4	3
5268		SVTO	12 11 0900	S24 W01	12 11.3		B	BXO	20	5	4	3
5268		RAMY	12 11 1530	S23 W05	12 11.3		B	CRO	30	9	4	3
5268	24932	MWIL	12 11 1645	S23 W05	12 11.3	4	(BF)					
5268		PALE	12 11 1830	S23 W07	12 11.2		B	CSO	20	6	3	4
5268		HOLL	12 11 1835	S24 W06	12 11.3		B	CRO	20	8	3	4
5268		LEAR	12 12 0025	S23 W09	12 11.3		B	CRO	300	5	4	4
5268		CULG	12 12 0402	S25 W14	12 11.1		B	CRO	10	3	1	2
5268		SVTO	12 12 0930	S23 W15	12 11.2		B	CSO	20	6	2	4
5268		RAMY	12 12 1321	S23 W18	12 11.2		B	CAO	30	7	3	4
5268	24932	MWIL	12 12 1615	S23 W18	12 11.3	5	(BF)					
5268		PALE	12 12 1840	S24 W19	12 11.3		A	HR	20	2	2	2
5268		HOLL	12 12 2024	S23 W21	12 11.2		B	CRO	20	10	4	3
5268		LEAR	12 13 0106	S21 W24	12 11.2		B	CSO	50	5	5	3
5268		CULG	12 13 0325	S22 W26	12 11.1		B	CSO	20	2	1	1
5268		RAMY	12 13 1352	S22 W30	12 11.3		B	CRO	10	4	2	4
5268		HOLL	12 13 1608	S21 W31	12 11.3		B	BXO	20	7	4	3
5268	24932	MWIL	12 13 1630	S23 W32	12 11.2	5	(BP)					
5268		PALE	12 13 1840	S22 W34	12 11.2		B	BXO	10	2	2	3
5268		LEAR	12 14 0035	S23 W37	12 11.2		A	HS	20	1	1	3
5268		CULG	12 14 0410	S23 W41	12 11.0		A	AX		1		1
5268		SVTO	12 14 1000	S22 W42	12 11.2		B	BXO	10	4	3	1
5268		RAMY	12 14 1515	S22 W45	12 11.2		A	AX		2	1	2
5268		BOUL	12 14 1534	S23 W43	12 11.3		A	AX		1		2
5268	24932	MWIL	12 14 1630	S23 W45	12 11.2	4	(AP)					
5268		HOLL	12 14 1635	S22 W45	12 11.2		B	BXO	10	5	4	4
5268		PALE	12 14 2130	S22 W46	12 11.4		B	BXO	10	2	2	3
5268		CULG	12 15 0347	S24 W54	12 11.0		B	BXO	10	2	1	2
5267		HOLL	12 04 1553	S33 E89	12 11.7		A	HS	120	1	2	3
5267		PALE	12 04 2025	S32 E87	12 11.7		A	HS	120	1	1	3

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5267	24930	MWIL	12 04 2315	S32 E85	12 11.7	4	AP					
5267		LEAR	12 05 0035	S33 E80	12 11.4		A	HK	120	1	4	4
5267		CULG	12 05 0250	S36 E85	12 11.9		A	HA	150	2	2	2
5267		SVTO	12 05 0833	S33 E71	12 11.0		A	HR	60	1	2	2
5267		RAMY	12 05 1428	S33 E71	12 11.2		B	DAO	180	2	4	3
5267		BOUL	12 05 1548	S34 E68	12 11.1		B	CSO	120	2	5	3
5267	24930	MWIL	12 05 1630	S34 E72	12 11.4	5	AP					
5267		HOLL	12 05 1730	S33 E70	12 11.3		B	DSO	130	4	5	3
5267		LEAR	12 06 0110	S33 E67	12 11.4		B	DHO	170	7	9	4
5267		CULG	12 06 0310	S37 E70	12 11.8		B	DSO	180	3	5	2
5267		SVTO	12 06 1020	S34 E66	12 11.7		B	DAO	230	4	3	1
5267		BOUL	12 06 1600	S36 E63	12 11.7		B	CKO	190	3	4	3
5267		HOLL	12 06 1615	S33 E60	12 11.4		A	HA	110	8	3	3
5267		RAMY	12 06 1615	S34 E58	12 11.3		B	DAO	180	5	4	3
5267	24930	MWIL	12 06 1630	S34 E60	12 11.5	5	(BP)					
5267		LEAR	12 07 0004	S33 E56	12 11.4		B	CAO	160	4	3	4
5267		CULG	12 07 0440	S38 E55	12 11.6		A	HS	160	1	2	2
5267		RAMY	12 07 1236	S34 E49	12 11.4		B	CAO	150	4	4	1
5267	24930	MWIL	12 07 1615	S34 E48	12 11.5	4	(AP)					
5267		PALE	12 07 1740	S37 E45	12 11.4		B	CAO	110	5	3	3
5267		LEAR	12 08 0020	S34 E43	12 11.4		A	HA	140	1	2	4
5267		CULG	12 08 0340	S35 E41	12 11.4		A	HS	130	2	2	1
5267		SVTO	12 08 0903	S32 E41	12 11.6		B	CAO	160	4	4	3
5267	24930	MWIL	12 08 1730	S34 E35	12 11.5	4	(AP)					
5267		PALE	12 08 1800	S36 E34	12 11.5		B	CAO	210	5	3	3
5267		LEAR	12 09 0008	S35 E32	12 11.6		A	HS	120	2	3	3
5267		CULG	12 09 0335	S36 E30	12 11.5		A	HS	120	1	2	2
5267		BOUL	12 09 1535	S34 E22	12 11.4		A	HA	140	3	2	1
5267		PALE	12 09 1735	S35 E20	12 11.3		B	CSO	110	6	2	3
5267	24930	MWIL	12 09 2300	S34 E20	12 11.5	5	(AP)					
5267		LEAR	12 10 0017	S34 E18	12 11.4		B	CSO	90	4	3	3
5267		CULG	12 10 0240	S36 E16	12 11.4		A	HS	80	3	3	1
5267		RAMY	12 10 1410	S33 E12	12 11.5		B	CSO	110	6	4	4
5267		BOUL	12 10 1525	S34 E12	12 11.6		A	HS	40	1	1	1
5267	24930	MWIL	12 10 1600	S34 E12	12 11.6	5	(AP)					
5267		LEAR	12 11 0040	S34 E07	12 11.6		A	AX	50	1	5	3
5267		SVTO	12 11 0900	S34 E03	12 11.6		A	HA	70	1	2	3
5267		RAMY	12 11 1530	S35 W01	12 11.6		A	HS	70	1	2	3
5267	24930	MWIL	12 11 1645	S34 W01	12 11.6	5	(BP)					
5267		PALE	12 11 1830	S35 W04	12 11.4		B	CSO	50	5	4	4
5267		HOLL	12 11 1835	S33 W03	12 11.5		B	CSO	50	5	5	4
5267		LEAR	12 12 0025	S35 W06	12 11.5		B	CAO	50	4	3	4
5267		CULG	12 12 0402	S37 W09	12 11.4		A	HS	50	1	1	2
5267		SVTO	12 12 0930	S35 W10	12 11.6		A	HS	70	1	2	4
5267		RAMY	12 12 1321	S34 W12	12 11.6		A	HS	70	1	2	4
5267	24930	MWIL	12 12 1615	S34 W13	12 11.6	5	(AP)					
5267		PALE	12 12 1840	S35 W13	12 11.7		A	HS	50	1	2	2
5267		HOLL	12 12 2024	S35 W16	12 11.6		A	HS	60	1	2	3
5267		LEAR	12 13 0106	S35 W18	12 11.6		A	HS	50	2	1	3
5267		CULG	12 13 0325	S35 W21	12 11.5		A	HS	80	1	2	1
5267		RAMY	12 13 1352	S34 W25	12 11.6		A	HS	50	1	2	4
5267		HOLL	12 13 1608	S35 W25	12 11.7		A	HS	50	1	2	3
5267	24930	MWIL	12 13 1630	S35 W25	12 11.7	5	(AP)					
5267		PALE	12 13 1840	S35 W28	12 11.5		A	HS	80	1	2	3
5267		LEAR	12 14 0035	S35 W29	12 11.7		A	HS	60	1	1	3
5267		CULG	12 14 0410	S35 W33	12 11.5		A	HS	10	1	2	1
5267		SVTO	12 14 1000	S34 W34	12 11.7		A	HA	50	3	2	1
5267		RAMY	12 14 1515	S35 W38	12 11.6		A	HS	30	1	1	2
5267		BOUL	12 14 1534	S36 W36	12 11.7		A	HS	30	1	1	2
5267	24930	MWIL	12 14 1630	S35 W38	12 11.6	5	(AP)					
5267		HOLL	12 14 1635	S35 W38	12 11.6		A	HS	30	1	2	4
5267		PALE	12 14 2130	S35 W39	12 11.8		B	CSO	60	1	3	3
5267		LEAR	12 15 0200	S36 W41	12 11.8		A	HS	40	2	1	2
5267		CULG	12 15 0347	S36 W45	12 11.5		A	HS	30	1	1	2
5267		RAMY	12 15 1615	S33 W50	12 11.7		A	HA	70	1	2	1
5267		HOLL	12 15 2023	S36 W51	12 11.7		A	HS	80	1	2	2
5267		LEAR	12 16 0030	S34 W53	12 11.8		A	HS	40	1	1	2
5267		HOLL	12 16 0200	S36 W53	12 11.8		A	HA	20	1	1	3
5267		CULG	12 16 0403	S35 W60	12 11.4		A	HS	30	1	1	1

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5267		RAMY	12 16 1350	S33 W60	12 11.8		A	HA	20	1	2	4
5267		BOUL	12 16 1605	S36 W65	12 11.4		A	HS	40	1	2	2
5267		HOLL	12 16 2010	S36 W66	12 11.5		A	HS	50	1	2	3
5267		CULG	12 17 0233	S34 W69	12 11.6		A	HS	30	1	1	2
5267		RAMY	12 17 1600	S34 W72	12 11.9		A	HS	60	1	2	3
5267		HOLL	12 17 1900	S32 W73	12 12.0		A	AX	10	1	1	2
5276		LEAR	12 11 0040	S13 E15	12 12.1		A	AX	10	2	2	3
5276		SVTO	12 11 0900	S12 E10	12 12.1		B	BXO		5	3	3
5276		RAMY	12 11 1530	S13 E07	12 12.2		B	BXI	20	8	4	3
5276	24938A	MWIL	12 11 1645	S12 E06	12 12.2	3	(BP)					
5276		PALE	12 11 1830	S12 E05	12 12.1		B	BXO	10	5	4	4
5276		HOLL	12 11 1835	S13 E05	12 12.1		B	BXO		4	3	4
5276		LEAR	12 12 0025	S13 E03	12 12.2		A	AX	10	1	1	4
5281A		HOLL	12 11 1835	S19 E13	12 12.8		A	AX		1		4
5281A	24941	MWIL	12 13 1630	S20 W15	12 12.5	3	(AF)					
5269		HOLL	12 06 1615	N31 E80	12 13.0		A	AX		1	1	3
5269		LEAR	12 07 0004	N27 E72	12 12.6		A	AX	10	1	1	4
5269		RAMY	12 07 1236	N30 E67	12 12.8		A	AX	10	1	1	1
5269		PALE	12 07 1740	N28 E68	12 13.0		A	AX	10	5	1	3
5269		LEAR	12 08 0020	N29 E65	12 13.1		A	AX	10	1	1	4
5269		LEAR	12 09 0008	N29 E48	12 12.8		A	AX	10	1	1	3
5269		LEAR	12 10 0017	N33 E38	12 13.0		A	AX	10	1	1	3
5269		RAMY	12 10 1410	N33 E33	12 13.2		B	BXO	10	4	4	4
5269	24936	MWIL	12 10 1600	N32 E30	12 13.0	4	(BP)					
5269		LEAR	12 11 0040	N32 E25	12 13.0		A	AX	10	2	2	3
5269		SVTO	12 11 0900	N32 E20	12 12.9		A	AX	10	3	1	3
5269		RAMY	12 11 1530	N31 E18	12 13.1		A	AX	10	2	2	3
5269	24936	MWIL	12 11 1645	N32 E17	12 13.0	3	(AP)					
5269		PALE	12 11 1830	N32 E16	12 13.0		A	AX	10	2	1	4
5269		HOLL	12 11 1835	N32 E14	12 12.9		B	BXO	10	4	5	4
5269		LEAR	12 12 0025	N30 E13	12 13.0		B	BXO	10	2	3	4
5269		CULG	12 12 0402	N30 E11	12 13.0		A	AX	10	1		2
5269		SVTO	12 12 0930	N32 E07	12 13.0		A	AX		2	2	4
5269		HOLL	12 12 2024	N34 E01	12 12.9		A	AX	10	3	2	3
5281		RAMY	12 13 1352	N19 W10	12 12.8		B	BXO		2	3	4
5281		HOLL	12 13 1608	N19 W09	12 13.0		A	AX		1		3
5281	24942	MWIL	12 13 1630	N19 W10	12 12.9	4	(B)					
5281		PALE	12 14 2130	N21 W29	12 12.7		A	AX	10	2	1	3
5281		LEAR	12 15 0200	N20 W33	12 12.5		A	HS	20	1	1	2
5281		CULG	12 15 0347	N20 W34	12 12.5		B	CRO	10	3	3	2
5281		RAMY	12 15 1615	N20 W40	12 12.6		B	DSO	20	9	3	1
5281		LEAR	12 16 0030	N20 W45	12 12.6		B	CAO	10	4	3	2
5281		HOLL	12 16 0200	N19 W46	12 12.6		B	BXO	10	7	4	3
5281		CULG	12 16 0403	N20 W51	12 12.3		A	HS	10	1	1	1
5281		RAMY	12 16 1350	N21 W53	12 12.5		B	BXO	20	7	6	4
5281		BOUL	12 16 1605	N19 W53	12 12.6		B	CSO	60	3	6	2
5281		HOLL	12 16 2010	N19 W58	12 12.4		B	CSO	20	2	4	3
5281		CULG	12 17 0233	N21 W60	12 12.5		B	DSO	30	5	6	2
5281		RAMY	12 17 1600	N21 W67	12 12.5		B	DAO	120	5	6	3
5281		BOUL	12 17 1628	N20 W68	12 12.5		B	DSO	100	2	10	2
5281		HOLL	12 17 1900	N19 W70	12 12.4		B	CSO	30	3	7	2
5281		LEAR	12 18 0035	N19 W70	12 12.7		B	CSO	150	6	7	2
5281		CULG	12 18 0245	N19 W69	12 12.8		B	CSO	40	2	6	2
5281		SVTO	12 18 0956	N21 W79	12 12.3		B	CRO	70	2	8	3
5281		RAMY	12 18 1345	N22 W79	12 12.5		B	DAO	60	2	10	4
5281		HOLL	12 18 1815	N20 W80	12 12.6		A	AX	10	1	1	2
5281		PALE	12 18 2030	N20 W80	12 12.7		A	AX		1		3
5269B	24943	MWIL	12 13 1630	N34 W00	12 13.7	4	(AF)					
5269B	24943	MWIL	12 14 1630	N33 W08	12 14.0	4	(AP)					
5271A	24944	MWIL	12 13 1630	N27 E01	12 13.8	3	(BF)					
5271A	24944	MWIL	12 14 1630	N28 W08	12 14.1	4	(AF)					
5271		LEAR	12 08 0020	N14 E77	12 13.8		A	HS	60	1	1	4

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5271		CULG	12 08 0340	N12 E77	12 13.9		A	AX	10	1	1	1
5271		SVTO	12 08 0903	N14 E79	12 14.3		B	CRO	50	2	4	3
5271	24933	MWIL	12 08 1730	N13 E72	12 14.2	4	(AP)					
5271		PALE	12 08 1800	N11 E72	12 14.2		B	DSO	80	3	4	3
5271		LEAR	12 09 0008	N13 E67	12 14.1		B	DSO	130	8	8	3
5271		CULG	12 09 0335	N11 E69	12 14.3		B	DSO	70	2	3	2
5271		BOUL	12 09 1535	N15 E59	12 14.1		B	CSO	50	2	2	1
5271		PALE	12 09 1735	N11 E56	12 13.9		B	DSO	80	4	2	3
5271	24933	MWIL	12 09 2300	N14 E55	12 14.1	5	(BP)					
5271		LEAR	12 10 0017	N14 E53	12 14.0		B	DSO	70	8	5	3
5271		CULG	12 10 0240	N12 E54	12 14.2		B	CSO	30	4	4	1
5271		RAMY	12 10 1410	N14 E47	12 14.1		B	CSO	60	11	6	4
5271		BOUL	12 10 1525	N14 E45	12 14.0		B	CSO	30	4	4	1
5271	24933	MWIL	12 10 1600	N14 E45	12 14.1	5	(AP)					
5271		LEAR	12 11 0040	N14 E40	12 14.0		B	DAO	40	6	5	3
5271		SVTO	12 11 0900	N15 E35	12 14.0		B	DAI	50	17	5	3
5271		RAMY	12 11 1530	N13 E32	12 14.1		B	CSI	40	11	5	3
5271	24933	MWIL	12 11 1645	N14 E32	12 14.1	5	(BP)					
5271		PALE	12 11 1830	N14 E30	12 14.0		B	CSO	20	11	6	4
5271		HOLL	12 11 1835	N13 E30	12 14.0		B	CSI	40	17	5	4
5271		LEAR	12 12 0025	N14 E27	12 14.0		B	BXO	60	13	6	4
5271		CULG	12 12 0402	N12 E24	12 14.0		B	CSI	20	7	5	2
5271		SVTO	12 12 0930	N13 E21	12 14.0		B	DRI	20	14	3	4
5271		RAMY	12 12 1321	N13 E19	12 14.0		B	CRI	30	13	4	4
5271	24933	MWIL	12 12 1615	N13 E17	12 13.9	4	(AP)					
5271		PALE	12 12 1840	N13 E15	12 13.9		B	CRO	10	6	3	2
5271		HOLL	12 12 2024	N12 E14	12 13.9		B	CRO	20	10	6	3
5271		LEAR	12 13 0106	N13 E12	12 13.9		B	CSO	30	6	3	3
5271		CULG	12 13 0325	N12 E11	12 14.0		B	DRO	30	5	3	1
5271		RAMY	12 13 1352	N15 E10	12 14.3		B	CRO	40	11	9	4
5271		HOLL	12 13 1608	N13 E05	12 14.0		B	CRO	30	15	6	3
5271	24933	MWIL	12 13 1630	N14 E05	12 14.1	5	(BP)					
5271		PALE	12 13 1840	N15 E05	12 14.1		B	CSO	50	17	6	3
5271		LEAR	12 14 0035	N13 W01	12 13.9		B	CSO	50	4	2	3
5271		CULG	12 14 0410	N12 W02	12 14.0		B	CAO	40	5	4	1
5271		SVTO	12 14 1000	N14 W06	12 14.0		B	DAO	60	10	5	1
5271		RAMY	12 14 1515	N12 W09	12 13.9		B	DAO	80	11	5	2
5271		BOUL	12 14 1534	N12 W08	12 14.0		B	CAO	40	8	5	2
5271	24933	MWIL	12 14 1630	N13 W09	12 14.0	5	(AP)					
5271		HOLL	12 14 1635	N12 W09	12 14.0		B	CRO	60	17	6	4
5271		PALE	12 14 2130	N14 W11	12 14.1		B	DAO	50	12	6	3
5271		LEAR	12 15 0200	N12 W15	12 13.9		B	CSO	40	8	5	2
5271		CULG	12 15 0347	N12 W16	12 13.9		B	DAO	40	10	6	2
5271		RAMY	12 15 1615	N13 W23	12 13.9		B	BXI	30	14	8	1
5271		LEAR	12 16 0030	N12 W27	12 14.0		B	CSO	30	11	5	2
5271		HOLL	12 16 0200	N12 W27	12 14.0		B	BXO	20	12	7	3
5271		CULG	12 16 0403	N12 W32	12 13.7		B	BXO	10	4	1	1
5271		RAMY	12 16 1350	N16 W36	12 13.8		B	BXO	10	5	6	4
5271		BOUL	12 16 1605	N13 W38	12 13.8		B	CRO	20	2	2	2
5271		HOLL	12 16 2010	N13 W42	12 13.7		A	AX		1		3
5271		CULG	12 17 0233	N14 W46	12 13.6		A	AX	10	1	1	2
5271		SVTO	12 18 0956	N12 W59	12 14.0		B	CSO	40	4	5	3
5271		RAMY	12 18 1345	N13 W59	12 14.1		B	DAO	60	4	5	4
5271		HOLL	12 18 1815	N11 W63	12 14.0		B	CSO	50	2	7	2
5271		PALE	12 18 2030	N11 W63	12 14.1		B	CAO	50	3	5	3
5271		LEAR	12 19 0145	N11 W65	12 14.2		B	DAO	120	7	7	3
5271		RAMY	12 19 1630	N13 W76	12 13.9		B	DSO	120	4	8	4
5271		LEAR	12 20 0020	N10 W77	12 14.2		B	DSO	110	2	6	4
5271B	24945	MWIL	12 13 1630	N19 E09	12 14.4	4	(AF)					
5274		LEAR	12 10 0017	N32 E58	12 14.6		A	AX	10	1	1	3
5274		RAMY	12 10 1410	N33 E53	12 14.8		B	CRI	60	10	7	4
5274		BOUL	12 10 1525	N32 E55	12 15.0		B	CSO	20	4	7	1
5274	24937	MWIL	12 10 1600	N32 E54	12 14.9	5	(B)					
5274		LEAR	12 11 0040	N32 E47	12 14.7		B	DSO	80	6	4	3
5274		SVTO	12 11 0900	N31 E43	12 14.8		B	EAO	40	11	7	3
5274		RAMY	12 11 1530	N30 E39	12 14.7		B	DAI	60	9	7	3
5274	24937	MWIL	12 11 1645	N32 E39	12 14.8	4	(B)					

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time			CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual	
			Mo	Day	(UT)									Lat	CMD
5274		PALE	12	11	1830	N32	E38	12 14.8	B	DAO	90	15	8	4
5274		HOLL	12	11	1835	N31	E35	12 14.5	B	DSO	90	11	9	4
5274		LEAR	12	12	0025	N32	E34	12 14.7	B	DAO	100	14	9	4
5274		SVTO	12	12	0930	N31	E29	12 14.7	B	DSO	100	14	8	4
5274		RAMY	12	12	1321	N31	E28	12 14.8	B	DAO	140	7	10	4
5274	24937	MWIL	12	12	1615	N31	E24	12 14.6	5	(B)				
5274		PALE	12	12	1840	N32	E24	12 14.7	B	ESO	80	12	11	2
5274		HOLL	12	12	2024	N31	E24	12 14.7	B	ESO	90	14	12	3
5274		LEAR	12	13	0106	N30	E20	12 14.6	B	DSO	50	9	10	3
5274		CULG	12	13	0325	N31	E19	12 14.6	B	DAO	140	7	9	1
5274		RAMY	12	13	1352	N31	E14	12 14.7	B	ESO	120	14	11	4
5274		HOLL	12	13	1608	N31	E12	12 14.6	B	DSO	80	12	10	3
5274	24937	MWIL	12	13	1630	N32	E12	12 14.6	5	(BG)				
5274		PALE	12	13	1840	N31	E11	12 14.6	B	DSO	130	14	10	3
5274		LEAR	12	14	0035	N30	E08	12 14.6	B	DAO	100	6	10	3
5274		CULG	12	14	0410	N31	E07	12 14.7	BGD	DSO	80	8	9	1
5274		SVTO	12	14	1000	N33	E02	12 14.6	B	DAO	80	12	10	1
5274		RAMY	12	14	1515	N31	E01	12 14.7	B	DSO	120	11	9	2
5274		BOUL	12	14	1534	N31	E00	12 14.6	B	DAO	70	8	9	2
5274	24937	MWIL	12	14	1630	N32	E00	12 14.7	5	(B)				
5274		HOLL	12	14	1635	N32	W01	12 14.6	B	DSO	70	14	10	4
5274		PALE	12	14	2130	N34	W05	12 14.5	B	DSO	80	11	9	3
5274		LEAR	12	15	0200	N31	W05	12 14.7	B	DSO	80	6	10	2
5274		CULG	12	15	0347	N32	W06	12 14.7	B	DSO	50	8	10	2
5274		RAMY	12	15	1615	N32	W12	12 14.7	B	DSO	70	9	9	1
5274		LEAR	12	16	0030	N32	W17	12 14.7	B	DSO	50	7	10	2
5274		HOLL	12	16	0200	N32	W17	12 14.7	B	DSO	40	10	10	3
5274		CULG	12	16	0403	N31	W20	12 14.6	B	DSO	30	6	10	1
5274		RAMY	12	16	1350	N32	W25	12 14.6	B	CAO	40	8	10	4
5274		BOUL	12	16	1605	N31	W26	12 14.6	B	DSO	80	4	9	2
5274		HOLL	12	16	2010	N31	W29	12 14.5	B	CSO	40	7	10	3
5274		CULG	12	17	0233	N32	W31	12 14.6	B	DSO	20	9	12	2
5274		RAMY	12	17	1600	N33	W38	12 14.6	B	CRO	40	7	9	3
5274		BOUL	12	17	1628	N33	W38	12 14.7	B	BXO	3	9	2	2
5274		HOLL	12	17	1900	N32	W40	12 14.6	B	BXO	20	7	9	2
5274		LEAR	12	18	0035	N32	W42	12 14.7	B	CRO	30	7	12	2
5274		CULG	12	18	0245	N32	W46	12 14.5	B	BXO	20	4	9	2
5274		SVTO	12	18	0956	N32	W49	12 14.5	B	CRO	40	3	10	3
5274		RAMY	12	18	1345	N33	W52	12 14.4	B	BXO	30	5	8	4
5274		BOUL	12	18	1645	N32	W54	12 14.4	B	BXO	2	7	2	2
5274		HOLL	12	18	1815	N33	W58	12 14.1	B	BXO	10	3	6	2
5274		PALE	12	18	2030	N33	W57	12 14.3	B	BXO	10	3	7	3
5274		RAMY	12	19	1630	N34	W70	12 14.1	A	AX	10	2	4	4
5272		CULG	12	09	0335	S16	E77	12 15.0	A	HS	30	1	1	2
5272		BOUL	12	09	1535	S12	E69	12 14.8	A	HS	50	1	1	1
5272		PALE	12	09	1735	S15	E65	12 14.6	A	HS	40	1	2	3
5272	24934	MWIL	12	09	2300	S13	E65	12 14.9	4	(AP)				
5272		LEAR	12	10	0017	S13	E63	12 14.8	A	HS	40	1	2	3
5272		CULG	12	10	0240	S13	E63	12 14.9	A	HS	20	1	2	1
5272		RAMY	12	10	1410	S12	E56	12 14.8	A	HS	40	1	2	4
5272		BOUL	12	10	1525	S12	E56	12 14.9	A	HS	30	1	1	1
5272	24934	MWIL	12	10	1600	S12	E55	12 14.8	5	(AP)				
5272		LEAR	12	11	0040	S13	E50	12 14.8	A	HS	30	1	1	3
5272		SVTO	12	11	0900	S12	E45	12 14.8	A	HA	20	1	1	3
5272		RAMY	12	11	1530	S13	E42	12 14.8	A	HS	50	1	2	3
5272	24934	MWIL	12	11	1645	S12	E42	12 14.9	5	(AP)				
5272		PALE	12	11	1830	S12	E40	12 14.8	A	HS	30	1	1	4
5272		HOLL	12	11	1835	S12	E40	12 14.8	A	HR	20	2	1	4
5272		LEAR	12	12	0025	S13	E37	12 14.8	A	HS	30	1	2	4
5272		CULG	12	12	0402	S15	E34	12 14.7	A	HS	10	1	1	2
5272		SVTO	12	12	0930	S13	E32	12 14.8	A	HS	20	3	2	4
5272	24934	MWIL	12	12	1615	S13	E29	12 14.9	4	(BP)				
5272		PALE	12	12	1840	S12	E28	12 14.9	A	HS	10	1	1	2
5272		HOLL	12	12	2024	S12	E26	12 14.8	A	HS	10	1	1	3
5272		LEAR	12	13	0106	S12	E23	12 14.8	A	HS	20	1	1	3
5272		CULG	12	13	0325	S13	E22	12 14.8	A	HR	10	1	1	1
5272		RAMY	12	13	1352	S12	E18	12 14.9	B	CSO	20	2	3	4
5272		HOLL	12	13	1608	S12	E16	12 14.9	B	CSO	30	2	3	3

S U N S P O T G R O U P S
(Ordered by Central Meridian Passage Date)

105
Dec 88

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Mo	Day	Observation Time (UT)	Lat	CMD	CMP Mo	Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5272	24934	MWIL	12	13	1630	S13	E16	12	14.9	5	(B)					
5272		PALE	12	13	1840	S13	E13	12	14.7		B	CSO	20	3	7	3
5272		LEAR	12	14	0035	S13	E10	12	14.8		A	HS	10	1	1	3
5272		CULG	12	14	0410	S12	E08	12	14.8		B	CRO	20	7	2	1
5272		SVTO	12	14	1000	S10	E05	12	14.8		B	DSO	20	5	3	1
5272		RAMY	12	14	1515	S12	E03	12	14.9		B	CRI	30	12	5	2
5272		BOUL	12	14	1534	S11	E03	12	14.9		B	CAO	10	6	3	2
5272	24934	MWIL	12	14	1630	S13	E02	12	14.8	4	(B)					
5272		HOLL	12	14	1635	S12	E02	12	14.8		B	DRO	30	13	5	4
5272		PALE	12	14	2130	S10	W01	12	14.8		B	DSO	50	16	5	3
5272		LEAR	12	15	0200	S13	W05	12	14.7		B	CSO	90	9	4	2
5272		CULG	12	15	0347	S13	W04	12	14.8		B	DAO	40	18	4	2
5272		RAMY	12	15	1615	S15	W13	12	14.7		B	DAI	140	19	5	1
5272		HOLL	12	15	2023	S13	W13	12	14.9		B	DAO	160	18	5	2
5272		LEAR	12	16	0030	S12	W16	12	14.8		B	DAO	70	7	4	2
5272		HOLL	12	16	0200	S12	W16	12	14.9		B	DAO	70	14	5	3
5272		CULG	12	16	0403	S12	W19	12	14.7		B	DAO	50	11	5	1
5272		RAMY	12	16	1350	S11	W24	12	14.8		B	DAO	120	24	6	4
5272		BOUL	12	16	1605	S12	W24	12	14.9		B	DSO	130	7	5	2
5272		HOLL	12	16	2010	S12	W27	12	14.8		B	DSI	180	17	5	3
5272		CULG	12	17	0233	S11	W33	12	14.6		B	DSO	60	12	6	2
5272		RAMY	12	17	1600	S11	W38	12	14.8		B	CSO	40	6	6	3
5272		BOUL	12	17	1628	S11	W38	12	14.8		B	CSO	10	5	5	2
5272		HOLL	12	17	1900	S11	W41	12	14.7		B	CSO	30	5	5	2
5272		LEAR	12	18	0035	S13	W44	12	14.7		B	CSO	100	9	7	2
5272		CULG	12	18	0245	S11	W44	12	14.8		B	CSO	30	5	7	2
5272		SVTO	12	18	0956	S10	W51	12	14.6		B	CAO	30	3	2	3
5272		RAMY	12	18	1345	S10	W50	12	14.8		B	CAO	60	5	5	4
5272		BOUL	12	18	1645	S11	W56	12	14.5		B	BXO	2	2	2	2
5272		HOLL	12	18	1815	S11	W53	12	14.8		B	CSO	30	4	8	2
5272		PALE	12	18	2030	S12	W56	12	14.6		B	CSO	40	4	4	3
5272		LEAR	12	19	0145	S12	W57	12	14.8		B	CSO	30	3	5	3
5272		CULG	12	19	0205	S11	W57	12	14.8		B	CRO	20	2	5	1
5272		BOUL	12	19	1515	S11	W70	12	14.4		B	BXO	30	2	2	2
5272		RAMY	12	19	1630	S10	W67	12	14.6		B	BXO	20	4	3	4
5272		LEAR	12	20	0020	S13	W71	12	14.6		A	AX	10	1	1	4
5272		HOLL	12	21	1628	S17	W78	12	15.7		A	AX	30	1	1	3
5273		CULG	12	09	0335	S33	E85	12	15.9		A	HS	30	1	1	2
5273		BOUL	12	09	1535	S31	E79	12	15.9		A	HA	90	1	2	1
5273		PALE	12	09	1735	S33	E73	12	15.5		B	CAO	70	3	2	3
5273	24935	MWIL	12	09	2300	S32	E75	12	15.9	4	(AP)					
5273		LEAR	12	10	0017	S33	E73	12	15.8		B	CSO	90	3	9	3
5273		CULG	12	10	0240	S34	E73	12	15.9		B	DSO	90	4	10	1
5273		RAMY	12	10	1410	S32	E66	12	15.8		BG	FSI	340	21	21	4
5273		BOUL	12	10	1525	S31	E60	12	15.4		B	FSI	180	5	18	1
5273	24935	MWIL	12	10	1600	S31	E65	12	15.8	4	(AP)					
5273		LEAR	12	11	0040	S31	E55	12	15.4		B	DSO	120	8	10	3
5273		SVTO	12	11	0900	S31	E50	12	15.3		BG	DAI	240	17	10	3
5273		RAMY	12	11	1530	S32	E48	12	15.4		B	DAI	260	12	10	3
5273	24935	MWIL	12	11	1645	S31	E51	12	15.7	5	(BG)					
5273		PALE	12	11	1830	S31	E45	12	15.3		B	DAO	160	17	11	4
5273		HOLL	12	11	1835	S31	E45	12	15.3		B	DAI	220	16	10	4
5273		LEAR	12	12	0025	S32	E44	12	15.5		B	EKO	290	17	11	4
5273		CULG	12	12	0402	S34	E43	12	15.6		B	FKI	270	18	17	2
5273		SVTO	12	12	0930	S32	E37	12	15.3		B	EKI	280	22	13	4
5273		RAMY	12	12	1321	S32	E35	12	15.3		B	EKI	250	18	12	4
5273	24935	MWIL	12	12	1615	S32	E40	12	15.8	5	(BG)					
5273		PALE	12	12	1840	S31	E33	12	15.4		B	EKO	230	18	13	2
5273		HOLL	12	12	2024	S31	E32	12	15.4		B	EKO	230	14	12	3
5273		LEAR	12	13	0106	S30	E28	12	15.2		B	ESO	200	13	12	3
5273		CULG	12	13	0325	S32	E28	12	15.3		B	EKI	200	13	13	1
5273		RAMY	12	13	1352	S31	E22	12	15.3		B	ESO	250	25	13	4
5273		HOLL	12	13	1608	S31	E20	12	15.2		B	EAO	210	26	12	3
5273	24935	MWIL	12	13	1630	S32	E27	12	15.8	5	(BG)					
5273		PALE	12	13	1840	S31	E18	12	15.2		B	EAO	160	32	13	3
5273		LEAR	12	14	0035	S30	E18	12	15.4		B	EAI	240	14	12	3
5273		CULG	12	14	0410	S32	E11	12	15.0		B	EKO	250	10	13	1
5273		SVTO	12	14	1000	S29	E10	12	15.2		B	EAI	180	19	12	1

106
Dec 88

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Mo	Day	Observation Time (UT)	Lat	CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5273		RAMY	12	14	1515	S31	E08	12 15.3		BG	EKI	280	29	13	2
5273		BOUL	12	14	1534	S31	E07	12 15.2		B	EAO	140	7	12	2
5273	24935	MWIL	12	14	1630	S32	E12	12 15.6	5	(BG)					
5273		HOLL	12	14	1635	S31	E06	12 15.2		B	EKO	410	37	15	4
5273		PALE	12	14	2130	S30	E05	12 15.3		B	EAO	220	22	12	3
5273		LEAR	12	15	0200	S31	E03	12 15.3		B	EAO	160	12	12	2
5273		CULG	12	15	0347	S32	E01	12 15.2		B	EAO	270	20	15	2
5273		RAMY	12	15	1615	S30	W08	12 15.0		B	EKI	320	28	14	1
5273		HOLL	12	15	2023	S32	W07	12 15.3		BG	FKI	590	30	16	2
5273		LEAR	12	16	0030	S31	W10	12 15.2		B	EAO	210	19	13	2
5273		HOLL	12	16	0200	S32	W08	12 15.4		B	EAI	190	24	15	3
5273		CULG	12	16	0403	S31	W13	12 15.1		B	FKI	270	16	16	1
5273		RAMY	12	16	1350	S30	W17	12 15.2		B	FKI	500	34	16	4
5273		BOUL	12	16	1605	S32	W18	12 15.2		B	FAI	490	20	16	2
5273		HOLL	12	16	2010	S32	W19	12 15.3		B	FKI	420	28	16	3
5273		CULG	12	17	0233	S32	W23	12 15.3		B	EKI	420	24	13	2
5273		RAMY	12	17	1600	S31	W29	12 15.4		BD	EKI	480	30	14	3
5273		BOUL	12	17	1628	S32	W27	12 15.5		B	EAI	310	26	13	2
5273		HOLL	12	17	1900	S31	W31	12 15.3		B	EKI	500	17	12	2
5273		LEAR	12	18	0035	S32	W34	12 15.3		B	FKI	510	30	16	2
5273		CULG	12	18	0245	S31	W34	12 15.4		B	EAI	350	17	12	2
5273		SVTO	12	18	0956	S29	W37	12 15.5		B	EAI	470	22	15	3
5273		RAMY	12	18	1345	S29	W39	12 15.5		BD	EKI	520	29	16	4
5273		BOUL	12	18	1645	S32	W41	12 15.4		B	ESI	290	13	13	2
5273		HOLL	12	18	1815	S31	W41	12 15.5		B	FKO	600	17	16	2
5273		PALE	12	18	2030	S32	W44	12 15.4		B	FAI	450	27	16	3
5273		LEAR	12	19	0145	S31	W44	12 15.6		BG	FKI	560	29	18	3
5273		CULG	12	19	0205	S30	W48	12 15.3		B	EAI	390	6	13	1
5273		BOUL	12	19	1515	S32	W52	12 15.5		B	EAI	340	6	13	2
5273		RAMY	12	19	1630	S29	W52	12 15.6		BG	EKI	610	22	14	4
5273		LEAR	12	20	0020	S32	W56	12 15.6		BG	FKI	490	22	16	4
5273		CULG	12	20	0245	S31	W59	12 15.4		B	EKI	270	9	13	1
5273		SVTO	12	20	0835	S32	W68	12 15.0		BG	FKO	590	7	20	1
5273		RAMY	12	20	1715	S31	W66	12 15.5		BG	EKI	590	17	14	3
5273		HOLL	12	20	1810	S32	W68	12 15.4		B	DKO	570	14	20	3
5273		PALE	12	20	2130	S33	W70	12 15.3		B	FKI	490	14	20	3
5273		LEAR	12	21	0022	S33	W70	12 15.4		B	FKO	330	13	16	4
5273		CULG	12	21	0120	S32	W70	12 15.5		B	EKO	280	12	14	1
5273		SVTO	12	21	1028	S32	W70	12 15.9		A	DK	280	8	9	3
5273	24935	MWIL	12	21	1600	S33	W74	12 15.8	4	AP					
5273		HOLL	12	21	1628	S32	W77	12 15.6		A	HK	300	4	9	3
5273		RAMY	12	21	1630	S31	W72	12 16.0		B	DKO	180	3	6	3
5273		BOUL	12	21	1700	S32	W76	12 15.7		A	HS	60	1	2	1
5273		PALE	12	21	1930	S33	W75	12 15.8		A	HA	360	2	3	3
5273		CULG	12	22	0530	S32	W80	12 15.9		A	HK	180	2	2	3
5273		SVTO	12	22	0815	S31	W82	12 15.9		A	HA	80	3	10	3
5286		RAMY	12	18	1345	N25	W42	12 15.3		B	BXO	10	3	2	4
5286		HOLL	12	18	1815	N25	W45	12 15.3		B	BXO	10	3	4	2
5286		PALE	12	18	2030	N24	W45	12 15.4		A	AX	10	2	1	3
5286		LEAR	12	19	0145	N24	W49	12 15.3		B	BXO	30	5	12	3
5279A	24946	MWIL	12	13	1630	N18	E39	12 16.6	5	(B)					
5279A	24946	MWIL	12	14	1630	N19	E26	12 16.7	5	(B)					
5279A	24946	MWIL	12	21	1600	N21	W67	12 16.5	4	(AP)					
5275		LEAR	12	11	0040	S31	E66	12 16.2		B	DSO	180	6	10	3
5275		SVTO	12	11	0900	S32	E64	12 16.4		BG	EAI	110	12	11	3
5275		RAMY	12	11	1530	S32	E60	12 16.4		B	DSO	170	14	10	3
5275		PALE	12	11	1830	S32	E59	12 16.4		B	DAI	60	12	10	4
5275		HOLL	12	11	1835	S32	E60	12 16.5		B	ESO	120	17	11	4
5275		LEAR	12	12	0025	S32	E56	12 16.4		B	EAI	200	15	12	4
5275		CULG	12	12	0402	S35	E50	12 16.2		B	DSO	20	6	6	2
5275		SVTO	12	12	0930	S31	E49	12 16.3		B	ESO	240	20	14	4
5275		RAMY	12	12	1321	S32	E49	12 16.4		B	ESO	220	18	13	4
5275		PALE	12	12	1840	S32	E46	12 16.4		B	ESO	100	17	11	2
5275		HOLL	12	12	2024	S32	E46	12 16.5		B	ESO	120	20	13	3
5275		LEAR	12	13	0106	S32	E40	12 16.2		B	ESO	170	15	14	3
5275		CULG	12	13	0325	S33	E40	12 16.3		B	ESI	80	8	13	1

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5275		RAMY	12 13 1352	S32 E36	12 16.4		B	EAO	130	12	12	4
5275		HOLL	12 13 1608	S32 E35	12 16.4		B	EAO	110	15	13	3
5275		PALE	12 13 1840	S34 E33	12 16.4		B	EAO	90	22	12	3
5275		LEAR	12 14 0035	S32 E30	12 16.4		B	ESO	150	11	13	3
5275		CULG	12 14 0410	S33 E26	12 16.2		B	DAO	100	8	14	1
5275		SVTO	12 14 1000	S30 E24	12 16.3		B	FAO	220	16	17	1
5275		RAMY	12 14 1515	S32 E22	12 16.4		B	ESO	60	9	14	2
5275		BOUL	12 14 1534	S31 E21	12 16.3		B	FAO	180	10	16	2
5275		HOLL	12 14 1635	S32 E22	12 16.4		B	ESO	60	18	15	4
5275		PALE	12 14 2130	S31 E19	12 16.4		B	FAO	110	19	17	3
5275		LEAR	12 15 0200	S31 E15	12 16.3		B	ESO	80	9	14	2
5275		CULG	12 15 0347	S33 E14	12 16.3		B	ESO	10	7	11	2
5275		RAMY	12 15 1615	S32 E09	12 16.4		B	EAO	30	15	12	1
5275		LEAR	12 16 0030	S31 E03	12 16.2		B	CSO	40	6	12	2
5275		HOLL	12 16 0200	S32 E09	12 16.8		A	HS	20	2	2	3
5275		CULG	12 16 0403	S33 W01	12 16.1		B	ESO	10	4	11	1
5275		RAMY	12 16 1350	S31 E02	12 16.7		A	HA	20	2	2	4
5275		BOUL	12 16 1605	S31 E01	12 16.7		B	HS	40	2	2	2
5275		HOLL	12 16 2010	S31 E00	12 16.8		B	CSO	20	3	3	3
5275		CULG	12 17 0233	S31 W07	12 16.5		A	HR	10	1	1	2
5275		RAMY	12 17 1600	S30 W11	12 16.8		B	CRO	10	3	3	3
5275		BOUL	12 17 1628	S30 W12	12 16.7		A	AX		2	1	2
5275		HOLL	12 17 1900	S31 W15	12 16.6		A	HR	10	2	1	2
5275		LEAR	12 18 0035	S30 W19	12 16.5		B	CRO	30	5	8	2
5275		CULG	12 18 0245	S31 W19	12 16.6		A	AX	10	1	1	2
5275		SVTO	12 18 0956	S29 W21	12 16.8		A	AX	20	2	1	3
5275		RAMY	12 18 1345	S31 W23	12 16.7		B	BXO	10	2	1	4
5275		BOUL	12 18 1645	S31 W24	12 16.8		B	BXO		2	2	2
5275		HOLL	12 18 1815	S31 W25	12 16.8		B	BXO	10	3	3	2
5275		PALE	12 18 2030	S32 W26	12 16.8		B	BXO	10	3	3	3
5275		LEAR	12 19 0145	S31 W28	12 16.9		B	BXO	20	2	2	3
5275		CULG	12 19 0205	S31 W28	12 16.9		A	AX		2	1	1
5275		RAMY	12 19 1630	S29 W37	12 16.8		A	AX		1	1	4
5275		SVTO	12 22 0815	S33 W66	12 17.1		B	BXO	20	4	5	3
5275		HOLL	12 22 1612	S32 W69	12 17.2		B	DAO	100	2	6	3
5275		RAMY	12 22 1918	S33 W70	12 17.2		B	DAO	100	3	7	2
5275		LEAR	12 23 0203	S34 W75	12 17.1		B	DAO	180	6	10	3
5275		CULG	12 23 0310	S33 W77	12 17.0		B	ESO	30	2	11	3
5275		SVTO	12 23 0815	S33 W82	12 16.8		B	DAO	50	4	7	3
5275		RAMY	12 23 1431	S33 W78	12 17.4		B	CSO	80	4	7	4
5275		PALE	12 23 2125	S33 W83	12 17.3		B	BXO	30	3	3	3
5279		SVTO	12 12 0930	N25 E82	12 18.7		B	BX	50	11	5	4
5279		RAMY	12 12 1321	N22 E59	12 17.1		B	BXO	20	2	2	4
5279	24939	MWIL	12 12 1615	N23 E58	12 17.1	3	(BF)					
5279		PALE	12 12 1840	N24 E58	12 17.2		B	BXO	10	4	3	2
5279		HOLL	12 12 2024	N22 E54	12 17.0		B	BXO	10	6	5	3
5279		LEAR	12 13 0106	N20 E50	12 16.9		B	CRO	20	5	6	3
5279		RAMY	12 13 1352	N20 E46	12 17.1		B	DRO	100	13	9	4
5279		HOLL	12 13 1608	N22 E43	12 17.0		B	DSO	100	19	9	3
5279	24939	MWIL	12 13 1630	N22 E44	12 17.1	5	(BG)					
5279		PALE	12 13 1840	N21 E41	12 16.9		B	DSO	120	23	8	3
5279		LEAR	12 14 0035	N20 E37	12 16.8		B	DSI	150	15	10	3
5279		CULG	12 14 0410	N20 E36	12 16.9		B	EAI	100	12	11	1
5279		SVTO	12 14 1000	N23 E32	12 16.9		B	DAI	190	27	10	1
5279		RAMY	12 14 1515	N21 E30	12 16.9		B	DRI	240	31	10	2
5279		BOUL	12 14 1534	N21 E28	12 16.8		B	EAI	40	22	11	2
5279	24939	MWIL	12 14 1630	N23 E31	12 17.1	5	(B)					
5279		HOLL	12 14 1635	N21 E29	12 16.9		B	DSI	110	41	10	4
5279		PALE	12 14 2130	N22 E27	12 17.0		B	EAI	220	29	13	3
5279		LEAR	12 15 0200	N21 E21	12 16.7		B	ESI	230	20	12	2
5279		CULG	12 15 0347	N21 E21	12 16.8		B	DAI	110	39	12	2
5279		RAMY	12 15 1615	N23 E15	12 16.8		B	EAI	340	47	14	1
5279		LEAR	12 16 0030	N23 E11	12 16.9		B	ESI	220	34	13	2
5279		HOLL	12 16 0200	N22 E13	12 17.1		B	DAI	300	22	13	3
5279		CULG	12 16 0403	N22 E08	12 16.8		B	EAI	180	29	14	1
5279		RAMY	12 16 1350	N23 E03	12 16.8		B	EKI	430	77	14	4
5279		BOUL	12 16 1605	N23 E02	12 16.8		B	EAI	470	23	14	2
5279		HOLL	12 16 2010	N22 W01	12 16.8		B	EAI	500	58	13	3

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5279		CULG	12 17 0233	N22 W03	12 16.9		B	EAI	230	47	15	2
5279		RAMY	12 17 1600	N24 W09	12 17.0		B	FKI	720	55	16	3
5279		BOUL	12 17 1628	N22 W11	12 16.8		B	EAC	420	39	13	2
5279		HOLL	12 17 1900	N22 W12	12 16.9		B	FKI	540	40	16	2
5279		LEAR	12 18 0035	N22 W15	12 16.9		B	FKI	610	51	17	2
5279		CULG	12 18 0245	N23 W16	12 16.9		B	EAI	270	30	14	2
5279		SVTO	12 18 0956	N22 W19	12 16.9		B	FKI	490	36	18	3
5279		RAMY	12 18 1345	N23 W20	12 17.0		B	FKI	650	43	15	4
5279		BOUL	12 18 1645	N22 W23	12 16.9		B	EKI	360	25	14	2
5279		HOLL	12 18 1815	N22 W25	12 16.8		B	FKI	380	32	16	2
5279		PALE	12 18 2030	N24 W26	12 16.8		B	EKI	470	32	15	3
5279		LEAR	12 19 0145	N23 W28	12 16.9		B	FKI	770	33	17	3
5279		CULG	12 19 0205	N24 W27	12 17.0		B	EKI	430	17	15	1
5279		BOUL	12 19 1515	N22 W33	12 17.1		B	EKI	260	13	14	2
5279		RAMY	12 19 1630	N23 W36	12 16.9		B	FKI	550	37	16	4
5279		LEAR	12 20 0020	N23 W42	12 16.8		B	FKI	380	33	17	4
5279		CULG	12 20 0245	N23 W40	12 17.0		B	EAI	230	22	14	1
5279		SVTO	12 20 0835	N23 W46	12 16.8		B	EKO	210	13	15	1
5279		RAMY	12 20 1715	N22 W49	12 16.9		B	EKI	370	32	15	3
5279		HOLL	12 20 1810	N20 W56	12 16.5		B	FKI	440	21	14	3
5279		PALE	12 20 2130	N21 W50	12 17.1		B	EAI	270	19	13	3
5279		LEAR	12 21 0022	N22 W52	12 17.0		B	EAO	230	22	14	4
5279		CULG	12 21 0120	N23 W54	12 16.9		B	EAI	140	12	14	1
5279		SVTO	12 21 1028	N22 W58	12 17.0		B	EKO	150	15	15	3
5279	24939	MWIL	12 21 1600	N24 W56	12 17.3	5	(AF)					
5279		HOLL	12 21 1628	N23 W61	12 17.0		B	FAO	200	8	21	3
5279		RAMY	12 21 1630	N23 W60	12 17.1		B	EAO	160	7	15	3
5279		BOUL	12 21 1700	N23 W61	12 17.0		B	ESO	70	2	15	1
5279		PALE	12 21 1930	N25 W66	12 16.7		B	EAI	280	7	13	3
5279		LEAR	12 22 0020	N23 W65	12 17.0		B	FAO	260	7	16	3
5279		CULG	12 22 0530	N22 W67	12 17.1		B	FAI	100	10	16	3
5279		SVTO	12 22 0815	N24 W70	12 16.9		B	FAO	140	9	16	3
5279		HOLL	12 22 1612	N23 W71	12 17.2		B	FAO	110	3	19	3
5279		RAMY	12 22 1918	N24 W71	12 17.3		B	DAO	180	3	8	2
5279		LEAR	12 23 0203	N24 W74	12 17.4		B	DSO	120	2	6	3
5279		CULG	12 23 0310	N23 W78	12 17.1		B	BXO	10	3	3	3
5279		SVTO	12 23 0815	N23 W82	12 17.0		B	DAO	40	2	9	3
5279		RAMY	12 23 1431	N27 W82	12 17.2		A	HS	30	1	2	4
5288		HOLL	12 20 1810	S31 W30	12 18.4		B	BXO	10	2	1	3
5288		PALE	12 20 2130	S31 W28	12 18.7		A	AX	10	2	2	3
5288		LEAR	12 21 0022	S32 W31	12 18.6		A	AX	10	2	2	4
5288		CULG	12 21 0120	S31 W31	12 18.6		B	BXO		2	3	1
5288		SVTO	12 21 1028	S33 W35	12 18.6		B	DRO	20	4	4	3
5288	24949	MWIL	12 21 1600	S34 W38	12 18.6	4	(B)					
5288		HOLL	12 21 1628	S33 W39	12 18.6		B	BXO	40	5	7	3
5288		RAMY	12 21 1630	S32 W38	12 18.7		B	BXO	20	4	4	3
5288		PALE	12 21 1930	S34 W42	12 18.5		B	BXO	20	7	5	3
5288		LEAR	12 22 0020	S34 W43	12 18.6		B	DSO	50	6	8	3
5288		CULG	12 22 0530	S32 W47	12 18.5		B	BXO	10	5	6	3
5288		SVTO	12 22 0815	S34 W47	12 18.6		B	BXO	30	11	8	3
5288		HOLL	12 22 1612	S32 W50	12 18.7		B	CSO	50	4	9	3
5288		RAMY	12 22 1918	S33 W53	12 18.6		B	CAO	60	7	9	2
5288		LEAR	12 23 0203	S34 W57	12 18.5		B	DSO	80	9	10	3
5288		CULG	12 23 0310	S33 W57	12 18.6		B	DAO	70	7	7	3
5288		SVTO	12 23 0815	S34 W63	12 18.3		B	DAO	80	7	9	3
5288		RAMY	12 23 1431	S33 W62	12 18.7		B	DSO	80	7	9	4
5288	24949	MWIL	12 23 1615	S33 W69	12 18.2	4	AP)					
5288		HOLL	12 23 1715	S32 W68	12 18.3		A	HS	60	3	2	3
5288		PALE	12 23 2125	S32 W68	12 18.5		B	CAO	130	4	4	3
5288		LEAR	12 24 0116	S33 W71	12 18.4		B	CSO	30	3	5	3
5288		CULG	12 24 0350	S33 W80	12 17.8		A	HS	30	1	1	3
5288		SVTO	12 24 0925	S33 W80	12 18.0		B	DAO	70	2	3	3
5288		HOLL	12 24 1611	S32 W82	12 18.2		A	HS	60	1	2	2
5288		PALE	12 24 2031	S32 W69	12 19.4		B	HSO	130	1	3	3
5278		RAMY	12 12 1321	N26 E80	12 18.8		B	DKO	120	2	3	4
5278	24940	MWIL	12 12 1615	N26 E83	12 19.1	4	B			4	8	2
5278		PALE	12 12 1840	N27 E80	12 19.0		B	CKO	330	4	8	2

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5278		HOLL	12 12 2024	N26 E79	12 19.0		B	DKO	360	7	10	3
5278		LEAR	12 13 0106	N26 E75	12 18.9		B	DKO	420	13	6	3
5278		CULG	12 13 0325	N25 E74	12 18.9		B	DKO	600	3	10	1
5278		RAMY	12 13 1352	N25 E73	12 19.2		B	EKO	900	16	14	4
5278		HOLL	12 13 1608	N26 E72	12 19.3		B	EKO	760	13	14	3
5278	24940	MWIL	12 13 1630	N26 E70	12 19.1	5	(BG					
5278		PALE	12 13 1840	N25 E70	12 19.2		B	EKO	900	13	13	3
5278		LEAR	12 14 0035	N24 E68	12 19.3		B	FKI	930	12	18	3
5278		CULG	12 14 0410	N23 E71	12 19.6		B	FKI	600	10	19	1
5278		SVTO	12 14 1000	N28 E65	12 19.5		BG	FKI	960	25	19	1
5278		RAMY	12 14 1515	N26 E60	12 19.3		BGD	EKI	840	24	12	2
5278		BOUL	12 14 1534	N26 E58	12 19.1		BD	DKC	640	15	14	2
5278	24940	MWIL	12 14 1630	N26 E57	12 19.1	5	(D)					
5278		HOLL	12 14 1635	N26 E60	12 19.3		BGD	EKI	860	27	11	4
5278		PALE	12 14 2130	N26 E60	12 19.5		BD	FKI	680	20	17	3
5278		LEAR	12 15 0200	N26 E55	12 19.3		B	EKO	770	14	11	2
5278		CULG	12 15 0347	N26 E56	12 19.5		BD	FKI	1030	22	15	2
5278		RAMY	12 15 1615	N25 E48	12 19.4		BD	EKC	1020	26	11	1
5278		LEAR	12 16 0030	N26 E42	12 19.3		B	DKI	590	24	10	2
5278		HOLL	12 16 0200	N27 E45	12 19.6		BD	EKI	1070	29	15	3
5278		CULG	12 16 0403	N26 E43	12 19.5		B	FKI	1100	28	16	1
5278		RAMY	12 16 1350	N27 E34	12 19.2		BD	DKC	830	26	10	4
5278		BOUL	12 16 1605	N27 E36	12 19.5		BD	FKC	960	14	17	2
5278		HOLL	12 16 2010	N28 E32	12 19.3		BGD	DKC	910	27	9	3
5278		CULG	12 17 0233	N28 E31	12 19.5		BD	EKI	1100	28	14	2
5278		RAMY	12 17 1600	N27 E22	12 19.4		BGD	EKI	960	25	13	3
5278		BOUL	12 17 1628	N27 E22	12 19.4		BD	EKC	730	27	13	2
5278		HOLL	12 17 1900	N27 E19	12 19.3		BGD	DKC	770	31	9	2
5278		LEAR	12 18 0035	N27 E15	12 19.2		BG	DKI	860	31	9	2
5278		CULG	12 18 0245	N27 E16	12 19.4		BGD	EKC	910	23	14	2
5278		SVTO	12 18 0956	N27 E12	12 19.3		BGD	EKC	990	27	10	3
5278		RAMY	12 18 1345	N28 E11	12 19.4		BGD	EKI	1150	19	11	4
5278		BOUL	12 18 1645	N27 E08	12 19.3		BD	EKC	750	31	12	2
5278		HOLL	12 18 1815	N27 E05	12 19.2		BGD	DKI	770	19	9	2
5278		PALE	12 18 2030	N27 E06	12 19.3		BGD	DKC	890	25	8	3
5278		LEAR	12 19 0145	N27 E02	12 19.2		BGD	EKC	790	34	10	3
5278		CULG	12 19 0205	N28 E01	12 19.2		BGD	DKC	530	19	9	1
5278		BOUL	12 19 1515	N27 W02	12 19.5		BGD	EKC	830	16	13	2
5278		RAMY	12 19 1630	N27 W04	12 19.4		BGD	EKC	840	41	11	4
5278		LEAR	12 20 0020	N28 W10	12 19.2		BGD	DKC	710	42	10	4
5278		CULG	12 20 0245	N27 W11	12 19.2		BGD	DKC	700	27	10	1
5278		SVTO	12 20 0835	N26 W17	12 19.0		BGD	DKI	670	25	10	1
5278		RAMY	12 20 1715	N27 W18	12 19.3		BG	DKI	710	35	9	3
5278		HOLL	12 20 1810	N25 W23	12 19.0		BGD	FKI	860	26	10	3
5278		PALE	12 20 2130	N25 W23	12 19.1		BG	DKC	660	20	10	3
5278		LEAR	12 21 0022	N27 W23	12 19.2		BGD	DKI	570	45	10	4
5278		CULG	12 21 0120	N27 W25	12 19.1		BGD	DKC	780	26	9	1
5278		SVTO	12 21 1028	N26 W28	12 19.3		BG	DKI	560	35	10	3
5278	24940	MWIL	12 21 1600	N26 W33	12 19.1	5	(D)					
5278		HOLL	12 21 1628	N27 W32	12 19.2		BD	DKI	940	16	10	3
5278		RAMY	12 21 1630	N27 W30	12 19.3		BG	DKO	600	23	8	3
5278		BOUL	12 21 1700	N26 W30	12 19.4		B	DAI	420	6	12	1
5278		PALE	12 21 1930	N27 W34	12 19.2		BG	DHC	690	22	8	3
5278		LEAR	12 22 0020	N26 W36	12 19.2		BG	DKC	600	40	10	3
5278		CULG	12 22 0530	N27 W38	12 19.3		B	DKC	300	16	8	3
5278		SVTO	12 22 0815	N27 W39	12 19.3		BG	EKC	700	38	13	3
5278		HOLL	12 22 1612	N28 W45	12 19.1		B	DKO	720	11	10	3
5278		RAMY	12 22 1918	N27 W46	12 19.2		B	DKO	780	19	9	2
5278		LEAR	12 23 0203	N27 W47	12 19.4		BG	DKI	540	18	9	3
5278		CULG	12 23 0310	N27 W53	12 19.0		B	DKI	470	10	9	3
5278		SVTO	12 23 0815	N28 W55	12 19.0		BG	EKC	920	23	12	3
5278		RAMY	12 23 1431	N28 W57	12 19.2		BG	EKI	560	28	11	4
5278	24940	MWIL	12 23 1615	N26 W58	12 19.2	5	(B)					
5278		HOLL	12 23 1715	N27 W58	12 19.2		B	DKO	540	16	10	3
5278		PALE	12 23 2125	N29 W58	12 19.3		BG	DKI	570	20	10	3
5278		LEAR	12 24 0116	N27 W62	12 19.2		BG	DKI	450	15	10	3
5278		CULG	12 24 0350	N26 W66	12 19.0		B	DKO	260	9	10	3
5278		SVTO	12 24 0925	N28 W72	12 18.8		BG	DKI	840	15	10	3
5278		BOUL	12 24 1600	N27 W81	12 18.3		B	CSO	120	3	6	1

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5278		HOLL	12 24 1611	N27 W71	12 19.1		B	DKO	600	6	10	2
5278		PALE	12 24 2031	N27 W75	12 19.0		BG	DKI	600	8	10	3
5278		LEAR	12 25 0019	N28 W74	12 19.2		BG	DKI	240	5	10	3
5278		CULG	12 25 0440	N27 W81	12 19.0		B	DAO	150	7	6	1
5278		RAMY	12 25 1340	N28 W79	12 19.4		B	DSO	270	7	5	2
5278	24940	MWIL	12 25 1545	N29 W81	12 19.3	4	AF					
5278		HOLL	12 25 1610	N28 W80	12 19.4		B	CSO	80	2	10	3
5278		PALE	12 25 1910	N27 W86	12 19.1		A	HS	100	1	3	3
5278A		RAMY	12 23 1431	N22 W45	12 20.1		A	HR	20	2	2	4
5282		RAMY	12 16 1350	S23 E49	12 20.3		A	AX	10	1	1	4
5282		HOLL	12 16 2010	S23 E48	12 20.5		B	BXO	10	2	3	3
5282		CULG	12 17 0233	S23 E43	12 20.4		B	CRO	10	3	4	2
5282		RAMY	12 17 1600	S23 E36	12 20.4		B	BXO	40	9	5	3
5282		BOUL	12 17 1628	S22 E35	12 20.4		B	BXO		6	6	2
5282		HOLL	12 17 1900	S22 E33	12 20.3		B	BXO	20	11	5	2
5282		LEAR	12 18 0035	S23 E29	12 20.2		B	BXO	70	13	7	2
5282		CULG	12 18 0245	S22 E28	12 20.3		B	DRO	20	9	9	2
5282		SVTO	12 18 0956	S21 E23	12 20.2		B	CAO	60	15	9	3
5282		RAMY	12 18 1345	S21 E23	12 20.3		B	DAO	70	11	10	4
5282		HOLL	12 18 1815	S21 E20	12 20.3		B	DSO	110	12	10	2
5282		PALE	12 18 2030	S23 E19	12 20.3		B	DSO	80	17	10	3
5282		LEAR	12 19 0145	S22 E15	12 20.2		B	EAI	160	20	12	3
5282		CULG	12 19 0205	S21 E14	12 20.2		B	EAI	100	11	11	1
5282		BOUL	12 19 1515	S22 E08	12 20.2		B	EAI	150	8	12	2
5282		LEAR	12 20 0020	S22 E03	12 20.2		B	EAI	190	26	13	4
5282		CULG	12 20 0245	S22 E00	12 20.1		B	EAI	140	16	12	1
5282		SVTO	12 20 0835	S23 W03	12 20.1		B	EAO	230	15	11	1
5282		RAMY	12 20 1715	S23 W07	12 20.2		B	ESI	160	16	13	3
5282		HOLL	12 20 1810	S21 W09	12 20.1		B	DAO	220	15	15	3
5282		PALE	12 20 2130	S20 W09	12 20.2		B	EAI	170	24	13	3
5282		LEAR	12 21 0022	S22 W11	12 20.2		B	EAO	170	27	13	4
5282		CULG	12 21 0120	S22 W12	12 20.1		B	ESI	190	21	13	1
5282		SVTO	12 21 1028	S22 W18	12 20.0		B	DKI	250	24	10	3
5282	24950	MWIL	12 21 1600	S22 W22	12 20.0	4	(B)					
5282		HOLL	12 21 1628	S21 W22	12 20.0		B	DAO	210	10	10	3
5282		RAMY	12 21 1630	S21 W21	12 20.1		B	EHI	200	14	11	3
5282		BOUL	12 21 1700	S21 W22	12 20.0		B	CSO	70	5	9	1
5282		PALE	12 21 1930	S21 W25	12 19.9		B	EAI	190	15	11	3
5282		LEAR	12 22 0020	S22 W25	12 20.1		B	EAO	190	16	13	3
5282		CULG	12 22 0530	S22 W30	12 19.9		B	DSO	90	12	9	3
5282		SVTO	12 22 0815	S21 W30	12 20.0		B	EAO	130	16	12	3
5282		HOLL	12 22 1612	S21 W34	12 20.1		B	EAO	100	14	11	3
5282		RAMY	12 22 1918	S21 W35	12 20.1		B	EAO	100	12	12	2
5282		LEAR	12 23 0203	S23 W40	12 20.0		B	EAO	110	12	11	3
5282		CULG	12 23 0310	S22 W41	12 20.0		B	DSO	130	10	9	3
5282		SVTO	12 23 0815	S23 W44	12 19.9		B	EAO	110	11	13	3
5282		RAMY	12 23 1431	S22 W47	12 20.0		B	CAI	80	11	11	4
5282	24950	MWIL	12 23 1615	S23 W48	12 20.0	5	(B)					
5282		HOLL	12 23 1715	S22 W48	12 20.0		B	CSO	70	5	10	3
5282		PALE	12 23 2125	S22 W47	12 20.3		B	CAO	100	9	11	3
5282		LEAR	12 24 0116	S23 W53	12 20.0		B	CAO	70	6	11	3
5282		CULG	12 24 0350	S23 W59	12 19.6		A	HS	60	1	1	3
5282		SVTO	12 24 0925	S23 W60	12 19.8		B	CAO	130	6	12	3
5282		BOUL	12 24 1600	S22 W67	12 19.5		A	HS	80	1	2	1
5282		HOLL	12 24 1611	S22 W66	12 19.6		A	HA	130	1	2	2
5282		PALE	12 24 2031	S22 W69	12 19.5		A	HS	130	1	3	3
5282		LEAR	12 25 0019	S23 W68	12 19.8		A	HS	150	1	3	3
5282		CULG	12 25 0440	S23 W70	12 19.8		A	HS	60	1	1	1
5282		RAMY	12 25 1340	S22 W78	12 19.6		A	HS	120	1	2	2
5282	24950	MWIL	12 25 1545	S22 W79	12 19.6	4	AP					
5282		HOLL	12 25 1610	S22 W79	12 19.6		A	HS	60	1	2	3
5282		BOUL	12 25 1610	S22 W82	12 19.4		A	HS	80	1	2	2
5282		PALE	12 25 1910	S23 W82	12 19.5		A	HS	90	1	2	3
5282		LEAR	12 26 0025	S22 W85	12 19.5		A	HS	50	1	2	3
5287		BOUL	12 19 1515	N17 E06	12 20.1		B	DSO	20	2	5	2
5287		RAMY	12 19 1630	N17 E07	12 20.2		B	DAO	70	15	6	4

S U N S P O T G R O U P S
(Ordered by Central Meridian Passage Date)

111
Dec 88

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5287		LEAR	12 20 0020	N17 E02	12 20.2		B	DAI	150	21	9	4
5287		CULG	12 20 0245	N17 E00	12 20.1		B	DAI	100	10	8	1
5287		SVTO	12 20 0835	N15 W04	12 20.0		B	DSO	170	8	8	1
5287		RAMY	12 20 1715	N17 W08	12 20.1		B	DSI	230	12	9	3
5287		HOLL	12 20 1810	N18 W10	12 20.0		B	DHI	380	18	10	3
5287		PALE	12 20 2130	N16 W10	12 20.1		B	DAI	360	15	9	3
5287		LEAR	12 21 0022	N17 W13	12 20.0		B	DAO	220	16	10	4
5287		CULG	12 21 0120	N17 W13	12 20.1		B	DSI	220	13	10	1
5287		SVTO	12 21 1028	N17 W18	12 20.1		B	DHI	280	25	10	3
5287	24948	MWIL	12 21 1600	N16 W22	12 20.0	5	(B)					
5287		HOLL	12 21 1628	N17 W21	12 20.1		B	EAO	230	11	12	3
5287		RAMY	12 21 1630	N17 W21	12 20.1		B	ESI	240	15	11	3
5287		BOUL	12 21 1700	N16 W22	12 20.0		B	DSO	100	4	10	1
5287		PALE	12 21 1930	N16 W23	12 20.1		B	DAO	400	12	10	3
5287		LEAR	12 22 0020	N17 W26	12 20.0		BG	EAO	240	16	11	3
5287		CULG	12 22 0530	N17 W29	12 20.0		B	DSO	180	14	10	3
5287		SVTO	12 22 0815	N17 W30	12 20.1		B	EAO	280	20	12	3
5287		HOLL	12 22 1612	N17 W35	12 20.0		B	EAO	280	17	11	3
5287		RAMY	12 22 1918	N18 W35	12 20.1		B	ESO	390	13	12	2
5287		LEAR	12 23 0203	N16 W40	12 20.0		BG	EKO	270	20	11	3
5287		CULG	12 23 0310	N16 W40	12 20.1		B	ESO	180	8	11	3
5287		SVTO	12 23 0815	N17 W44	12 20.0		B	EKO	440	14	12	3
5287		RAMY	12 23 1431	N22 W47	12 20.0		B	EKO	360	18	12	4
5287	24948	MWIL	12 23 1615	N17 W47	12 20.1	5	(B)					
5287		HOLL	12 23 1715	N18 W48	12 20.1		B	DKO	350	12	10	3
5287		PALE	12 23 2125	N17 W48	12 20.2		B	EAI	420	10	11	3
5287		LEAR	12 24 0116	N17 W52	12 20.1		BG	EAO	290	10	12	3
5287		CULG	12 24 0350	N18 W53	12 20.1		B	EAO	110	8	12	3
5287		SVTO	12 24 0925	N18 W57	12 20.0		B	EKO	350	11	11	3
5287		BOUL	12 24 1600	N19 W62	12 19.9		B	EAO	140	5	12	1
5287		HOLL	12 24 1611	N18 W60	12 20.1		B	EKO	340	5	11	2
5287		PALE	12 24 2031	N18 W65	12 19.9		B	EAI	480	9	11	3
5287		LEAR	12 25 0019	N18 W64	12 20.1		BG	EAI	200	9	11	3
5287		RAMY	12 25 1340	N18 W73	12 20.0		B	EAO	170	11	11	2
5287	24948	MWIL	12 25 1545	N18 W72	12 20.2	4	BF					
5287		HOLL	12 25 1610	N18 W71	12 20.3		B	DSO	110	4	10	3
5287		BOUL	12 25 1610	N18 W75	12 20.0		B	ESO	120	4	12	2
5287		PALE	12 25 1910	N17 W76	12 20.0		B	DAO	150	5	9	3
5287		LEAR	12 26 0025	N18 W77	12 20.1		B	DSO	60	3	9	3
5287		SVTO	12 26 0804	N18 W80	12 20.2		A	HS	40	2	3	3
5294		HOLL	12 23 1715	N22 W46	12 20.2		A	HR	20	1	1	3
5294		LEAR	12 24 0116	N21 W50	12 20.2		B	CSO	30	5	3	3
5294		SVTO	12 24 0925	N22 W55	12 20.2		B	CAO	90	4	4	3
5294		BOUL	12 24 1600	N23 W62	12 19.9		A	HS	40	1	2	1
5294		HOLL	12 24 1611	N22 W58	12 20.2		B	CSO	80	3	4	2
5294		LEAR	12 25 0019	N22 W61	12 20.3		B	CSO	90	3	5	3
5294		HOLL	12 25 1610	N21 W73	12 20.1		A	HA	50	1	1	3
5294		BOUL	12 25 1610	N22 W75	12 19.9		A	HS	60	1	3	2
5294		PALE	12 25 1910	N20 W73	12 20.2		A	HA	90	1	2	3
5294		LEAR	12 26 0025	N21 W77	12 20.1		B	CSO	20	3	4	3
5294		SVTO	12 26 0804	N21 W85	12 19.8		A	HS	40	1	1	3
5280		SVTO	12 14 1000	N28 E82	12 20.8		B	DSO	50	2	2	1
5280		RAMY	12 14 1515	N26 E73	12 20.3		B	EKI	450	10	13	2
5280		BOUL	12 14 1534	N26 E75	12 20.5		B	CAO	210	4	10	2
5280	24947	MWIL	12 14 1630	N25 E70	12 20.1	5	(B)					
5280		HOLL	12 14 1635	N27 E80	12 20.9		B	EAI	380	12	13	4
5280		PALE	12 14 2130	N26 E76	12 20.8		B	DAO	180	8	12	3
5280		LEAR	12 15 0200	N25 E66	12 20.2		B	EKO	290	9	12	2
5280		CULG	12 15 0347	N26 E67	12 20.4		B	DAO	50	19	8	2
5280		RAMY	12 15 1615	N26 E61	12 20.4		B	DKO	500	25	13	1
5280		LEAR	12 16 0030	N26 E56	12 20.4		B	ESO	290	14	15	2
5280		HOLL	12 16 0200	N26 E62	12 20.9		B	DAI	80	20	10	3
5280		CULG	12 16 0403	N24 E56	12 20.5		B	DKO	80	9	10	1
5280		RAMY	12 16 1350	N26 E48	12 20.3		BG	FHI	570	33	17	4
5280		BOUL	12 16 1605	N27 E49	12 20.5		B	DAI	300	9	8	2
5280		HOLL	12 16 2010	N27 E46	12 20.4		B	EAI	530	34	15	3
5280		CULG	12 17 0233	N27 E44	12 20.5		B	EAI	180	27	11	2

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5280		RAMY	12 17 1600	N26 E36	12 20.5		BG	FKI	590	46	17	3
5280		BOUL	12 17 1628	N25 E35	12 20.4		B	EAO	110	28	15	2
5280		HOLL	12 17 1900	N26 E32	12 20.3		B	EAI	530	42	15	2
5280		LEAR	12 18 0035	N25 E30	12 20.3		B	FKI	590	51	18	2
5280		CULG	12 18 0245	N27 E31	12 20.5		B	EAI	160	21	13	2
5280		SVTO	12 18 0956	N27 E27	12 20.5		B	FAO	450	33	21	3
5280		RAMY	12 18 1345	N27 E25	12 20.5		BG	FKI	580	56	20	4
5280		BOUL	12 18 1645	N26 E23	12 20.5		B	CAI	50	31	17	2
5280		HOLL	12 18 1815	N27 E19	12 20.2		B	EKI	480	41	20	2
5280		PALE	12 18 2030	N27 E19	12 20.3		B	FKO	380	38	19	3
5280		LEAR	12 19 0145	N27 E16	12 20.3		B	FKI	410	38	19	3
5280		CULG	12 19 0205	N26 E14	12 20.2		B	FAI	280	16	17	1
5280		BOUL	12 19 1515	N26 E10	12 20.4		B	CAI	70	9	15	2
5280		RAMY	12 19 1630	N27 E09	12 20.4		B	FHI	470	47	22	4
5280		LEAR	12 20 0020	N27 E04	12 20.3		B	FKI	390	49	20	4
5280		CULG	12 20 0245	N26 E03	12 20.3		B	FAI	300	33	19	1
5280		SVTO	12 20 0835	N26 W01	12 20.3		B	FHO	340	30	20	1
5280		RAMY	12 20 1715	N25 W05	12 20.3		B	CHI	390	42	18	3
5280		HOLL	12 20 1810	N25 W10	12 20.0		B	DKI	380	34	20	3
5280		PALE	12 20 2130	N25 W08	12 20.3		B	FKI	310	37	17	3
5280		LEAR	12 21 0022	N28 W10	12 20.2		B	FKO	360	40	19	4
5280		CULG	12 21 0120	N26 W11	12 20.2		B	FAI	280	23	18	1
5280		SVTO	12 21 1028	N27 W13	12 20.4		B	FHO	310	37	20	3
5280	24947	MWIL	12 21 1600	N24 W25	12 19.7	5	(BP)					
5280		HOLL	12 21 1628	N26 W19	12 20.2		B	FAI	330	13	19	3
5280		RAMY	12 21 1630	N26 W18	12 20.3		B	CHI	260	19	18	3
5280		BOUL	12 21 1700	N25 W23	12 19.9		A	AX		1		1
5280		PALE	12 21 1930	N25 W19	12 20.3		B	FAI	290	31	21	3
5280		LEAR	12 22 0020	N27 W23	12 20.2		B	FAO	220	30	20	3
5280		CULG	12 22 0530	N25 W23	12 20.4		B	FSO	150	12	20	3
5280		SVTO	12 22 0815	N25 W24	12 20.5		B	CAO	200	24	24	3
5280		HOLL	12 22 1612	N26 W35	12 19.9		B	CKO	320	9	10	3
5280		RAMY	12 22 1918	N25 W37	12 19.9		B	CKO	420	10	10	2
5280		LEAR	12 23 0203	N24 W44	12 19.7		B	CAO	270	4	5	3
5280		CULG	12 23 0310	N24 W44	12 19.7		A	HA	220	4	3	3
5280		SVTO	12 23 0815	N26 W44	12 19.9		B	CKO	450	14	14	3
5280		RAMY	12 23 1431	N26 W44	12 20.2		B	CKO	270	10	15	4
5280	24947	MWIL	12 23 1615	N25 W51	12 19.7	5	(BP)					
5280		HOLL	12 23 1715	N25 W49	12 19.9		B	CSO	260	6	9	3
5280		PALE	12 23 2125	N25 W47	12 20.2		B	EKO	270	9	11	3
5280		LEAR	12 24 0116	N24 W54	12 19.9		B	CAO	200	5	8	3
5280		CULG	12 24 0350	N21 W56	12 19.9		B	DSO	170	2	6	3
5280		SVTO	12 24 0925	N25 W60	12 19.7		B	CKO	430	5	9	3
5280		BOUL	12 24 1600	N28 W71	12 19.1		B	DSO	240	2	7	1
5280		HOLL	12 24 1611	N25 W65	12 19.6		A	HK	390	2	4	2
5280		PALE	12 24 2031	N25 W67	12 19.7		B	DKO	450	6	5	3
5280		LEAR	12 25 0019	N26 W68	12 19.7		A	HA	240	2	3	3
5280		CULG	12 25 0440	N22 W65	12 20.2		B	DSO	80	2	6	1
5280		RAMY	12 25 1340	N22 W70	12 20.2		B	CAO	140	2	4	2
5280	24947	MWIL	12 25 1545	N25 W76	12 19.8	4	AP					
5280		HOLL	12 25 1610	N25 W78	12 19.6		A	HA	90	2	2	3
5280		BOUL	12 25 1610	N26 W80	12 19.4		B	DSO	180	4	6	2
5280		PALE	12 25 1910	N25 W79	12 19.7		A	HS	150	2	3	3
5280		LEAR	12 26 0025	N24 W80	12 19.8		A	HS	30	1	2	3
5291		CULG	12 22 0530	S17 W13	12 21.2		A	AX	10	1	1	3
5291		SVTO	12 22 0815	S18 W12	12 21.4		A	AX	10	4	3	3
5291		HOLL	12 22 1612	S18 W17	12 21.4		B	BXO	10	4	4	3
5291		RAMY	12 22 1918	S18 W18	12 21.4		B	BXO	10	3	3	2
5291		SVTO	12 23 0815	S18 W27	12 21.3		B	CRO	10	5	4	3
5291		RAMY	12 23 1431	S16 W32	12 21.2		A	AX	70	3	3	4
5291A		SVTO	12 21 1028	N30 E08	12 22.1		A	AX		1		3
5291B		RAMY	12 20 1715	S16 E28	12 22.8		A	AX	10	1	1	3
5291B		HOLL	12 20 1810	S16 E29	12 22.9		A	AX	10	2	1	3
5291B		PALE	12 20 2130	S18 E28	12 23.0		A	AX	10	2	1	3
5291B		LEAR	12 21 0022	S17 E24	12 22.8		A	AX	10	2	2	4

S U N S P O T G R O U P S
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5284		HOLL	12 17 1900	N32 E66	12 23.0		A	AX	10	1	1	2
5284		LEAR	12 18 0035	N30 E64	12 23.0		A	AX	10	1	1	2
5284		SVTO	12 18 0956	N33 E61	12 23.2		A	AX	20	1	1	3
5284		RAMY	12 18 1345	N33 E61	12 23.4		B	BXO	20	3	2	4
5284		HOLL	12 18 1815	N33 E57	12 23.3		A	AX		1		2
5284		RAMY	12 20 1715	N33 E35	12 23.5		B	BXO	10	2	7	3
5284		HOLL	12 20 1810	N35 E29	12 23.1		B	BXO	140	5	8	3
5284		CULG	12 22 0530	N30 E13	12 23.2		A	AX	10	4	3	3
5284		SVTO	12 22 0815	N30 E11	12 23.2		B	BXO	10	6	4	3
5284		HOLL	12 22 1612	N33 E09	12 23.4		B	CRO	20	4	9	3
5284		RAMY	12 22 1918	N31 E04	12 23.1		B	CAO	20	3	4	2
5284		LEAR	12 23 0203	N29 E01	12 23.2		B	CSO	20	2	3	3
5284		CULG	12 23 0310	N31 W01	12 23.0		A	AX	10	2	2	3
5284		SVTO	12 23 0815	N30 W03	12 23.1		B	CSO	20	3	3	3
5284		RAMY	12 23 1431	N32 W05	12 23.2		A	HR	10	1	2	4
5284	24956	MWIL	12 23 1615	N31 W06	12 23.2	4	(AF)					
5284		HOLL	12 23 1715	N31 W07	12 23.2		A	AX		1		3
5284		PALE	12 23 2125	N31 W06	12 23.4		A	AX	20	1	1	3
5284		LEAR	12 24 0116	N31 W12	12 23.1		B	BXO	10	2	4	3
5284		CULG	12 24 0350	N31 W12	12 23.2		A	AX		1		3
5284		SVTO	12 24 0925	N31 W15	12 23.2		A	HR	10	1	1	3
5284		HOLL	12 24 1611	N31 W17	12 23.3		A	AX	10	1	1	2
5284		PALE	12 24 2031	N31 W21	12 23.2		A	AX	10	1		3
5284		LEAR	12 25 0019	N31 W23	12 23.2		A	AX	10	1	1	3
5283		CULG	12 17 0233	N17 E82	12 23.3		A	HS	60	1	1	2
5283		RAMY	12 17 1600	N17 E78	12 23.6		B	DAO	260	4	10	3
5283		BOUL	12 17 1628	N17 E76	12 23.5		B	DAO	180	3	8	2
5283		HOLL	12 17 1900	N16 E75	12 23.5		B	ESO	230	4	11	2
5283		LEAR	12 18 0035	N15 E69	12 23.2		B	DKO	330	7	9	2
5283		CULG	12 18 0245	N17 E71	12 23.5		B	DAO	160	3	1	2
5283		SVTO	12 18 0956	N17 E68	12 23.6		B	DAO	360	5	10	3
5283		RAMY	12 18 1345	N17 E66	12 23.6		B	DAO	380	9	10	4
5283		HOLL	12 18 1815	N18 E65	12 23.7		B	DAO	380	8	12	2
5283		PALE	12 18 2030	N18 E64	12 23.7		B	DAO	390	5	13	3
5283		LEAR	12 19 0145	N17 E57	12 23.4		B	EKO	440	7	11	3
5283		CULG	12 19 0205	N17 E57	12 23.4		B	EAO	340	3	11	1
5283		BOUL	12 19 1515	N17 E53	12 23.7		B	EKO	310	8	14	2
5283		RAMY	12 19 1630	N15 E49	12 23.4		B	EHO	440	18	11	4
5283		LEAR	12 20 0020	N17 E45	12 23.4		B	EKI	390	15	14	4
5283		CULG	12 20 0245	N16 E44	12 23.4		B	EAO	330	8	13	1
5283		SVTO	12 20 0835	N16 E40	12 23.4		B	EHO	380	11	13	1
5283		RAMY	12 20 1715	N16 E36	12 23.4		B	EHI	380	13	12	3
5283		HOLL	12 20 1810	N19 E32	12 23.2		B	DSI	440	15	11	3
5283		PALE	12 20 2130	N17 E34	12 23.5		B	EAI	260	13	12	3
5283		LEAR	12 21 0022	N17 E32	12 23.4		B	EAO	300	20	12	4
5283		CULG	12 21 0120	N16 E31	12 23.4		B	EAO	270	10	12	1
5283		SVTO	12 21 1028	N16 E27	12 23.5		B	EKO	350	17	13	3
5283	24951	MWIL	12 21 1600	N16 E22	12 23.3	5	(B)					
5283		HOLL	12 21 1628	N17 E22	12 23.3		B	DHO	350	11	10	3
5283		RAMY	12 21 1630	N16 E22	12 23.3		B	EHO	290	10	11	3
5283		BOUL	12 21 1700	N16 E22	12 23.4		B	DSO	210	2	10	1
5283		PALE	12 21 1930	N16 E22	12 23.5		B	EKI	390	11	12	3
5283		LEAR	12 22 0020	N16 E19	12 23.4		B	EAO	160	16	13	3
5283		CULG	12 22 0530	N15 E15	12 23.4		B	ESO	230	12	11	3
5283		SVTO	12 22 0815	N16 E15	12 23.5		B	EKO	350	13	12	3
5283		HOLL	12 22 1612	N18 E10	12 23.4		B	EHO	410	13	11	3
5283		RAMY	12 22 1918	N18 E09	12 23.5		B	EHO	480	10	11	2
5283		LEAR	12 23 0203	N16 E04	12 23.4		B	ESI	290	25	13	3
5283		CULG	12 23 0310	N18 E04	12 23.4		B	ESI	230	11	11	3
5283		SVTO	12 23 0815	N17 E01	12 23.4		B	EKI	390	40	12	3
5283		RAMY	12 23 1431	N18 W02	12 23.4		B	EHI	280	34	12	4
5283	24951	MWIL	12 23 1615	N16 W06	12 23.2	5	(B)					
5283		HOLL	12 23 1715	N18 W04	12 23.4		B	DHI	340	22	10	3
5283		PALE	12 23 2125	N18 W05	12 23.5		B	DKI	410	24	10	3
5283		LEAR	12 24 0116	N18 W08	12 23.4		B	DAI	290	25	10	3
5283		CULG	12 24 0350	N17 W10	12 23.4		B	DAI	220	15	9	3
5283		SVTO	12 24 0925	N18 W12	12 23.5		B	DKI	390	35	10	3
5283		BOUL	12 24 1600	N21 W15	12 23.5		B	CAO	200	11	10	1

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5283		HOLL	12 24 1611	N17 W16	12 23.4		B	EKI	390	29	12	2
5283		PALE	12 24 2031	N18 W18	12 23.5		B	CKO	280	25	10	3
5283		LEAR	12 25 0019	N17 W21	12 23.4		B	DAO	280	18	10	3
5283		CULG	12 25 0440	N17 W24	12 23.4		B	DAI	200	11	7	1
5283		RAMY	12 25 1340	N18 W28	12 23.4		B	DHO	370	16	8	2
5283		SVTO	12 25 1410	N18 W29	12 23.4		B	DKO	290	12	9	1
5283	24951	MWIL	12 25 1545	N17 W29	12 23.4	5	(BP)					
5283		HOLL	12 25 1610	N18 W29	12 23.5		B	CAO	260	19	10	3
5283		BOUL	12 25 1610	N19 W29	12 23.5		B	CAO	200	8	10	2
5283		PALE	12 25 1910	N17 W30	12 23.5		B	CKO	240	15	11	3
5283		LEAR	12 26 0025	N17 W35	12 23.3		B	DAO	220	10	9	3
5283		SVTO	12 26 0804	N18 W39	12 23.4		B	DKO	300	11	9	3
5283		RAMY	12 26 1255	N18 W40	12 23.5		B	DKO	290	9	9	4
5283		BOUL	12 26 1615	N17 W45	12 23.2		A	HA	200	2	3	1
5283	24951	MWIL	12 26 1700	N17 W45	12 23.3	5	(BP)					
5283		PALE	12 26 1850	N17 W43	12 23.5		B	CKO	230	5	10	3
5283		HOLL	12 26 2307	N17 W49	12 23.2		A	HK	240	2	4	1
5283		LEAR	12 27 0008	N16 W49	12 23.3		A	HS	130	5	3	3
5283		CULG	12 27 0257	N16 W52	12 23.2		A	HA	200	6	4	2
5283		SVTO	12 27 0855	N18 W56	12 23.1		B	DSO	100	5	4	1
5283		RAMY	12 27 1435	N18 W58	12 23.2		B	DSO	150	3	4	3
5283		BOUL	12 27 1520	N17 W59	12 23.1		A	HA	170	2	3	1
5283		HOLL	12 27 1604	N17 W58	12 23.3		B	DAO	150	4	4	3
5283	24951	MWIL	12 27 1630	N16 W58	12 23.3	5	(AP)					
5283		PALE	12 27 1810	N17 W59	12 23.3		B	DAO	110	4	4	3
5283		LEAR	12 28 0031	N17 W62	12 23.3		B	DSI	50	3	5	2
5283		CULG	12 28 0330	N16 W64	12 23.3		B	DAO	40	2	4	1
5283		RAMY	12 28 1340	N18 W73	12 23.0		B	DSO	140	3	8	3
5283		HOLL	12 28 1605	N17 W70	12 23.3		B	DAO	60	4	6	3
5283		BOUL	12 28 1625	N17 W74	12 23.1		B	CSO	30	2	5	2
5283	24951	MWIL	12 28 1915	N16 W76	12 23.0	4	AP					
5283		PALE	12 28 2025	N18 W75	12 23.1		B	CAO	190	4	6	3
5283		LEAR	12 29 0025	N18 W76	12 23.2		B	CSO	40	2	5	3
5283		CULG	12 29 0355	N16 W77	12 23.3		B	DRO	20	2	6	2
5283		SVTO	12 29 0910	N17 W84	12 23.0		A	HS	20	1	3	3
5283A		HOLL	12 25 1610	S25 W14	12 24.6		A	AX		1		3
5285		RAMY	12 18 1345	N20 E79	12 24.6		B	DRO	30	2	3	4
5285		HOLL	12 18 1815	N21 E80	12 24.9		B	CRO	40	4	8	2
5285		PALE	12 18 2030	N21 E81	12 25.1		B	BXO	20	6	9	3
5285		LEAR	12 19 0145	N22 E74	12 24.8		B	DAO	180	5	8	3
5285		CULG	12 19 0205	N21 E74	12 24.8		B	DRO	40	4	8	1
5285		BOUL	12 19 1515	N21 E71	12 25.1		B	DAI	360	5	9	2
5285		RAMY	12 19 1630	N18 E67	12 24.8		B	DAI	410	16	8	4
5285		LEAR	12 20 0020	N21 E64	12 24.9		B	DKI	480	8	10	4
5285		CULG	12 20 0245	N19 E63	12 24.9		B	DAO	260	7	10	1
5285		SVTO	12 20 0835	N20 E58	12 24.8		B	DAO	340	4	9	1
5285		RAMY	12 20 1715	N20 E54	12 24.8		B	DKI	270	13	9	3
5285		HOLL	12 20 1810	N24 E54	12 24.9		B	DAI	410	23	10	3
5285		PALE	12 20 2130	N20 E54	12 25.0		B	DAI	400	11	10	3
5285		LEAR	12 21 0022	N21 E51	12 24.9		B	DKI	420	17	10	4
5285		CULG	12 21 0120	N21 E49	12 24.8		B	DAI	350	14	10	1
5285		SVTO	12 21 1028	N21 E45	12 24.9		B	DKI	470	32	10	3
5285	24952	MWIL	12 21 1600	N22 E43	12 25.0	5	(B)					
5285		HOLL	12 21 1628	N21 E42	12 24.9		B	EAO	470	18	11	3
5285		RAMY	12 21 1630	N20 E41	12 24.8		BG	DKI	450	16	9	3
5285		BOUL	12 21 1700	N21 E43	12 25.0		B	DAI	330	3	10	1
5285		PALE	12 21 1930	N20 E43	12 25.1		BG	DAI	610	20	10	3
5285		LEAR	12 22 0020	N20 E38	12 24.9		BG	DKO	380	43	10	3
5285		CULG	12 22 0530	N19 E34	12 24.8		B	EAI	330	17	11	3
5285		SVTO	12 22 0815	N21 E35	12 25.0		B	EKI	620	36	12	3
5285		HOLL	12 22 1612	N21 E30	12 25.0		B	EKI	610	32	13	3
5285		RAMY	12 22 1918	N20 E28	12 24.9		B	EKI	700	23	13	2
5285		LEAR	12 23 0203	N21 E24	12 24.9		B	EAI	550	31	12	3
5285		CULG	12 23 0310	N21 E25	12 25.0		B	EAO	320	13	14	3
5285		SVTO	12 23 0815	N21 E23	12 25.1		B	EKI	750	28	14	3
5285		RAMY	12 23 1431	N21 E17	12 24.9		B	EHO	690	34	14	4
5285	24952	MWIL	12 23 1615	N22 E16	12 24.9	5	(B)					

S U N S P O T G R O U P S
(Ordered by Central Meridian Passage Date)

115
Dec 88

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5285		HOLL	12 23 1715	N22 E16	12 24.9		B	EKO	650	25	12	3
5285		PALE	12 23 2125	N21 E16	12 25.1		B	EKI	800	27	13	3
5285		LEAR	12 24 0116	N22 E12	12 25.0		B	EKO	550	23	13	3
5285		CULG	12 24 0350	N21 E09	12 24.8		B	ESO	330	12	12	3
5285		SVTO	12 24 0925	N20 E08	12 25.0		B	EKO	750	34	14	3
5285		BOUL	12 24 1600	N24 E05	12 25.0		B	EKO	370	14	14	1
5285		HOLL	12 24 1611	N22 E04	12 25.0		B	EKO	710	15	12	2
5285		PALE	12 24 2031	N21 E01	12 24.9		B	EKI	660	34	15	3
5285		LEAR	12 25 0019	N21 E00	12 25.0		B	EKO	450	25	13	3
5285		CULG	12 25 0440	N21 W03	12 25.0		B	DSO	400	14	12	1
5285		RAMY	12 25 1340	N21 W07	12 25.0		B	EKO	500	17	12	2
5285		SVTO	12 25 1410	N21 W08	12 25.0		B	EKO	670	11	13	1
5285	24952	MWIL	12 25 1545	N21 W07	12 25.1	5	(B)					
5285		BOUL	12 25 1610	N21 W07	12 25.1		B	EKO	520	12	13	2
5285		HOLL	12 25 1610	N21 W09	12 25.0		B	EKO	640	22	15	3
5285		PALE	12 25 1910	N21 W09	12 25.1		B	EHO	560	27	13	3
5285		LEAR	12 26 0025	N21 W12	12 25.1		B	EAI	390	28	14	3
5285		SVTO	12 26 0804	N22 W17	12 25.0		B	EKO	540	20	13	3
5285		RAMY	12 26 1255	N21 W19	12 25.1		B	EHI	450	32	14	4
5285		BOUL	12 26 1615	N22 W21	12 25.1		B	EHO	370	9	11	1
5285	24952	MWIL	12 26 1700	N22 W22	12 25.0	5	(B)					
5285		PALE	12 26 1850	N21 W22	12 25.1		B	EHO	510	18	12	3
5285		HOLL	12 26 2307	N22 W25	12 25.0		B	EHO	390	8	13	1
5285		LEAR	12 27 0008	N21 W25	12 25.1		BG	EHO	430	15	14	3
5285		CULG	12 27 0257	N21 W27	12 25.0		B	EHO	370	15	13	2
5285		SVTO	12 27 0855	N23 W31	12 25.0		B	EKO	410	13	13	1
5285		RAMY	12 27 1435	N21 W33	12 25.1		B	EKI	470	19	15	3
5285		BOUL	12 27 1520	N21 W33	12 25.1		B	ESO	210	7	12	1
5285		HOLL	12 27 1604	N20 W35	12 25.0		B	EKO	450	19	13	3
5285	24952	MWIL	12 27 1630	N22 W36	12 24.9	6	(BG)					
5285		PALE	12 27 1810	N21 W33	12 25.2		B	EKO	590	19	13	3
5285		LEAR	12 28 0031	N22 W39	12 25.0		BG	EKI	290	11	14	2
5285		CULG	12 28 0330	N20 W41	12 25.0		BG	EKO	490	11	14	1
5285		RAMY	12 28 1340	N23 W46	12 25.0		B	EKO	490	9	15	3
5285		HOLL	12 28 1605	N21 W46	12 25.1		B	EKO	490	9	13	3
5285		BOUL	12 28 1625	N21 W50	12 24.8		B	EKO	430	5	14	2
5285	24952	MWIL	12 28 1915	N22 W52	12 24.8	5	BG					
5285		PALE	12 28 2025	N21 W50	12 25.0		B	EKI	420	20	15	3
5285		LEAR	12 29 0025	N22 W50	12 25.2		B	EHO	410	7	13	3
5285		CULG	12 29 0355	N22 W53	12 25.1		B	EKI	360	7	11	2
5285		SVTO	12 29 0910	N22 W57	12 25.0		B	EKO	450	6	14	3
5285		RAMY	12 29 1615	N22 W59	12 25.1		B	FHO	450	6	16	1
5285		HOLL	12 29 1617	N21 W61	12 25.0		B	CHO	290	6	12	2
5285		BOUL	12 29 1645	N22 W59	12 25.2		B	FKO	410	5	16	1
5285		PALE	12 29 1920	N21 W61	12 25.1		B	CKO	330	9	14	3
5285	24952	MWIL	12 29 2100	N21 W63	12 25.0	5	(BP)					
5285		LEAR	12 30 0115	N22 W65	12 25.0		B	EKO	250	9	14	3
5285		CULG	12 30 0230	N22 W68	12 24.9		B	EKO	310	3	13	1
5285		SVTO	12 30 1040	N22 W71	12 25.0		B	CKO	210	3	16	3
5285	24952	MWIL	12 30 1545	N21 W73	12 25.0	4	(BP)					
5285		HOLL	12 30 1610	N21 W79	12 24.6		A	HH	180	1	3	3
5285		BOUL	12 30 1647	N23 W80	12 24.5		A	HK	240	1	3	1
5285		RAMY	12 30 1957	N22 W78	12 24.8		A	HH	170	1	3	1
5285		LEAR	12 31 0145	N22 W76	12 25.2		B	EAO	90	4	18	3
5295	24960	MWIL	12 25 1545	S12 W01	12 25.6	3	(AP)					
5295		BOUL	12 25 1610	S13 E00	12 25.7		B	BXO		4	3	2
5295		HOLL	12 25 1610	S13 E01	12 25.7		B	BXO	10	5	4	3
5295		PALE	12 25 1910	S13 W01	12 25.7		B	BXO	10	5	4	3
5295		LEAR	12 26 0025	S13 W04	12 25.7		B	DRO	20	4	4	3
5295		SVTO	12 26 0804	S13 W08	12 25.7		B	DSO	40	4	5	3
5295		RAMY	12 26 1255	S12 W12	12 25.6		B	BXO	20	4	4	4
5295		BOUL	12 26 1615	S13 W13	12 25.7		B	BXO		2	4	1
5295	24960	MWIL	12 26 1700	S13 W14	12 25.6	4	(B)					
5295		PALE	12 26 1850	S12 W15	12 25.6		B	DRO	20	2	5	3
5295		HOLL	12 26 2307	S13 W17	12 25.7		B	CSO	10	3	6	1
5295		LEAR	12 27 0008	S13 W17	12 25.7		B	CRO	20	5	5	3
5295		CULG	12 27 0257	S12 W19	12 25.7		B	DRO	10	5	6	2
5295		SVTO	12 27 0855	S12 W23	12 25.6		B	DRO	30	5	5	1

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5295		RAMY	12 27 1435	S13 W26	12 25.6		B	DRI	40	8	5	3
5295		BOUL	12 27 1520	S14 W24	12 25.8		B	BXO	10	3	4	1
5295		HOLL	12 27 1604	S15 W27	12 25.6		B	BXO	30	5	6	3
5295	24960	MWIL	12 27 1630	S14 W27	12 25.6	4	(B)					
5295		PALE	12 27 1810	S13 W28	12 25.6		B	BXO	30	5	5	3
5295		LEAR	12 28 0031	S12 W31	12 25.7		B	CRO	20	4	4	2
5295		CULG	12 28 0330	S14 W34	12 25.6		B	CRO	20	5	6	1
5295		RAMY	12 28 1340	S13 W39	12 25.6		B	CAO	20	3	6	3
5295		HOLL	12 28 1605	S13 W40	12 25.6		B	CRO	20	5	5	3
5295		BOUL	12 28 1625	S14 W38	12 25.8		A	AX		1		2
5295		PALE	12 28 2025	S15 W46	12 25.4		B	CSO	40	3	6	3
5295		LEAR	12 29 0025	S13 W44	12 25.7		B	BXO	10	3	5	3
5295		CULG	12 29 0355	S14 W44	12 25.8		A	AX		1		2
5295		SVTO	12 29 0910	S13 W48	12 25.8		A	AX	10	2	1	3
5295		RAMY	12 29 1615	S13 W51	12 25.8		A	AX	10	1	1	1
5295		HOLL	12 29 1617	S15 W49	12 26.0		A	AX	20	1	1	2
5295		BOUL	12 29 1645	S13 W50	12 25.9		A	AX	10	1	1	1
5295		PALE	12 29 1920	S15 W53	12 25.8		A	AX		1		3
5295	24960	MWIL	12 29 2100	S13 W54	12 25.8	3	(AF)					
5295		LEAR	12 30 0115	S13 W55	12 25.9		A	AX	10	1	1	3
5295		SVTO	12 30 1040	S13 W62	12 25.8		A	AX		1		3
5295	24960	MWIL	12 30 1545	S14 W65	12 25.7	3	(AF)					
5289		LEAR	12 21 0022	N17 E67	12 26.1		A	AX	10	1	1	4
5289	24953	MWIL	12 21 1600	N16 E58	12 26.1	3	(AP)					
5289		HOLL	12 21 1628	N16 E59	12 26.2		A	AX	30	1	1	3
5289		RAMY	12 21 1630	N15 E58	12 26.1		A	AX	10	1	1	3
5289		PALE	12 21 1930	N17 E57	12 26.1		A	AX		1		3
5289		LEAR	12 22 0020	N15 E54	12 26.1		A	AX	10	1	1	3
5289		SVTO	12 22 0815	N15 E49	12 26.0		A	AX		1		3
5289		SVTO	12 23 0815	N15 E35	12 26.0		A	AX		1		3
5289		RAMY	12 23 1431	N16 E33	12 26.1		A	AX		1		4
5289		SVTO	12 24 0925	N17 E26	12 26.4		B	BXO	10	3	3	3
5289	24961	MWIL	12 25 1545	N21 E07	12 26.2	2	X					
5289		HOLL	12 25 1610	N21 E09	12 26.4		B	BXO		2	3	3
5289		PALE	12 25 1910	N20 E06	12 26.2		A	AX		1		3
5289		SVTO	12 26 0804	N21 W01	12 26.2		A	AX		1		3
5289		RAMY	12 26 1255	N19 W04	12 26.2		B	BXO		2	4	4
5289		PALE	12 26 1850	N21 W08	12 26.2		A	AX		1		3
5289A	24962	MWIL	12 25 1545	S14 E11	12 26.5	3	X					
5299		RAMY	12 28 1340	S27 W27	12 26.5		B	BXO	10	2	3	3
5299		HOLL	12 28 1605	S27 W27	12 26.6		B	BXO		3	3	3
5299		PALE	12 28 2025	S28 W29	12 26.6		B	BXO	20	2	2	3
5299		LEAR	12 29 0025	S27 W32	12 26.5		A	AX	10	1	1	3
5293		SVTO	12 23 0815	S14 E53	12 27.3		B	CRO	20	5	3	3
5293	24957	MWIL	12 23 1615	S13 E46	12 27.1	3	(AP)					
5293		HOLL	12 23 1715	S13 E46	12 27.2		B	BXO		3	3	3
5293		PALE	12 23 2125	S15 E45	12 27.3		B	BXO	20	3	3	3
5293		LEAR	12 24 0116	S13 E38	12 26.9		B	BXO	10	2	7	3
5293		SVTO	12 24 0925	S13 E37	12 27.2		A	AX		1		3
5293		HOLL	12 24 1611	S13 E32	12 27.1		A	AX		1		2
5293		PALE	12 24 2031	S12 E30	12 27.1		A	AX		1		3
5293		RAMY	12 25 1340	S13 E22	12 27.2		B	BXO	10	5	4	2
5293		SVTO	12 25 1410	S13 E22	12 27.2		B	CSO	20	4	3	1
5293		SVTO	12 26 0804	S14 E13	12 27.3		A	AX	10	3	2	3
5293		SVTO	12 29 0910	S15 W37	12 26.6		A	AX		1		3
5299A		RAMY	12 23 1431	S14 E48	12 27.2		B	BXO	10	4	3	4
5299A	24966	MWIL	12 28 1915	S17 W18	12 27.4	3	X					
5299A		LEAR	12 29 0025	S17 W21	12 27.4		A	AX	10	1	1	3
5290		SVTO	12 21 1028	N22 E77	12 27.3		B	DAO	50	3	4	3
5290	24954	MWIL	12 21 1600	N23 E76	12 27.5	4	(AP)					
5290		HOLL	12 21 1628	N21 E80	12 27.8		B	FSO	120	3	19	3
5290		RAMY	12 21 1630	N19 E75	12 27.4		B	BXO	30	4	3	3
5290		PALE	12 21 1930	N21 E78	12 27.8		B	CSO	90	6	4	3

S U N S P O T G R O U P S
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5290		LEAR	12 22 0020	N19 E72	12 27.5		B	DSO	150	10	8	3
5290		CULG	12 22 0530	N19 E69	12 27.5		B	DSO	50	4	3	3
5290		SVTO	12 22 0815	N20 E70	12 27.7		B	DSO	110	14	10	3
5290		HOLL	12 22 1612	N19 E66	12 27.7		B	CAO	80	8	5	3
5290		RAMY	12 22 1918	N20 E55	12 27.8		B	DSO	150	14	10	2
5290		LEAR	12 23 0203	N21 E61	12 27.8		B	DSO	140	18	9	3
5290		CULG	12 23 0310	N22 E59	12 27.7		B	DSO	100	4	8	3
5290		SVTO	12 23 0815	N21 E60	12 27.9		B	DAO	130	20	10	3
5290		RAMY	12 23 1431	N20 E54	12 27.7		BG	EAI	170	21	11	4
5290	24954	MWIL	12 23 1615	N23 E52	12 27.7	5	(B)					
5290		HOLL	12 23 1715	N23 E53	12 27.8		B	CSO	80	5	11	3
5290		PALE	12 23 2125	N21 E52	12 27.9		B	DAO	150	20	10	3
5290		LEAR	12 24 0116	N22 E49	12 27.8		B	DAI	150	20	10	3
5290		CULG	12 24 0350	N23 E44	12 27.5		B	DSO	120	9	9	3
5290		SVTO	12 24 0925	N21 E46	12 27.9		B	EAO	200	22	11	3
5290		BOUL	12 24 1600	N23 E41	12 27.8		B	ESO	100	9	11	1
5290		HOLL	12 24 1611	N21 E41	12 27.8		B	EAI	170	27	12	2
5290		PALE	12 24 2031	N23 E38	12 27.8		B	CAI	210	30	11	3
5290		LEAR	12 25 0019	N21 E35	12 27.7		B	EAO	250	43	12	3
5290		CULG	12 25 0440	N21 E29	12 27.4		B	DAI	110	11	7	1
5290		RAMY	12 25 1340	N21 E29	12 27.8		BG	EKI	370	36	12	2
5290		SVTO	12 25 1410	N22 E28	12 27.7		B	EKO	360	21	12	1
5290	24954	MWIL	12 25 1545	N22 E23	12 27.4	4	(B)					
5290		BOUL	12 25 1610	N21 E26	12 27.7		B	EAI	230	23	11	2
5290		HOLL	12 25 1610	N21 E26	12 27.7		BG	EAI	350	31	12	3
5290		PALE	12 25 1910	N22 E26	12 27.8		BG	EAI	360	35	12	3
5290		LEAR	12 26 0025	N21 E22	12 27.7		BG	EAI	310	41	12	3
5290		SVTO	12 26 0804	N23 E19	12 27.8		BG	EKI	420	34	13	3
5290		RAMY	12 26 1255	N21 E15	12 27.7		BG	ESI	400	46	13	4
5290		BOUL	12 26 1615	N22 E13	12 27.7		B	ESI	290	18	12	1
5290	24954	MWIL	12 26 1700	N23 E09	12 27.4	5	(BG)					
5290		PALE	12 26 1850	N21 E12	12 27.7		BG	EHI	350	36	13	3
5290		HOLL	12 26 2307	N22 E07	12 27.5		B	DSO	190	17	9	1
5290		LEAR	12 27 0008	N22 E08	12 27.6		BG	ESI	450	33	12	3
5290		CULG	12 27 0257	N23 E04	12 27.4		BG	DAI	470	39	9	2
5290		SVTO	12 27 0855	N22 E03	12 27.6		BG	DAI	360	33	9	1
5290		RAMY	12 27 1435	N21 W02	12 27.4		BG	DKI	650	28	9	3
5290		BOUL	12 27 1520	N21 W01	12 27.6		B	DSI	280	10	8	1
5290		HOLL	12 27 1604	N22 W03	12 27.4		BG	DAI	490	37	9	3
5290	24954	MWIL	12 27 1630	N23 W02	12 27.5	5	(BG)					
5290		PALE	12 27 1810	N22 W04	12 27.4		BG	DAI	520	32	9	3
5290		LEAR	12 28 0031	N22 W07	12 27.5		BG	DAC	470	37	8	2
5290		CULG	12 28 0330	N20 W10	12 27.4		BG	DAI	590	34	9	1
5290		RAMY	12 28 1340	N23 W14	12 27.5		BG	DAI	370	26	9	3
5290		HOLL	12 28 1605	N21 W14	12 27.6		BG	DAI	450	41	10	3
5290		BOUL	12 28 1625	N20 W14	12 27.6		B	DSI	230	18	9	2
5290	24954	MWIL	12 28 1915	N23 W17	12 27.5	5	BG					
5290		PALE	12 28 2025	N20 W16	12 27.6		BG	DAI	460	48	10	3
5290		LEAR	12 29 0025	N21 W18	12 27.6		BG	EAI	360	38	11	3
5290		CULG	12 29 0355	N21 W22	12 27.5		B	DAI	310	19	10	2
5290		SVTO	12 29 0910	N22 W23	12 27.6		BG	EAI	260	39	11	3
5290		RAMY	12 29 1615	N23 W27	12 27.6		BG	ESI	350	32	11	1
5290		HOLL	12 29 1617	N22 W29	12 27.4		BG	ESI	290	21	14	2
5290		BOUL	12 29 1645	N21 W27	12 27.6		B	DSI	300	15	9	1
5290		PALE	12 29 1920	N21 W29	12 27.6		BG	EAI	280	27	11	3
5290	24954	MWIL	12 29 2100	N22 W30	12 27.6	5	(B)					
5290		LEAR	12 30 0115	N22 W31	12 27.7		B	EAI	210	33	11	3
5290		CULG	12 30 0230	N20 W32	12 27.6		B	DSI	260	15	10	1
5290		SVTO	12 30 1040	N23 W36	12 27.7		BG	DAI	240	32	8	3
5290	24954	MWIL	12 30 1545	N20 W39	12 27.7	5	(B)					
5290		HOLL	12 30 1610	N22 W41	12 27.5		BG	ESO	190	14	11	3
5290		BOUL	12 30 1647	N22 W40	12 27.6		B	DSO	200	5	10	1
5290		RAMY	12 30 1957	N22 W43	12 27.5		BG	ESI	240	16	11	1
5290		LEAR	12 31 0145	N21 W45	12 27.6		B	EAI	200	27	11	3
5290		CULG	12 31 0500	N20 W48	12 27.5		B	DSI	180	16	9	2
5290		SVTO	12 31 1017	N22 W52	12 27.4		BG	DAI	450	16	10	2
5290		RAMY	12 31 1350	N23 W54	12 27.4		BG	ESI	190	33	12	3
5290		HOLL	12 31 1609	N22 W55	12 27.4		BG	DAO	260	18	10	3
5290		BOUL	12 31 1620	N21 W54	12 27.5		B	DSI	220	16	10	2

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5290		PALE	12 31 2040	N22 W55	12 27.6		B	DAI	480	18	10	2
5290		CULG	01 01 0230	N21 W61	12 27.5		B	DAI	220	11	9	1
5290		LEAR	01 01 0617	N21 W62	12 27.6		BG	EAI	330	17	14	3
5290		SVTO	01 01 0855	N21 W62	12 27.7		BG	EKO	420	15	11	3
5290		RAMY	01 01 1400	N24 W67	12 27.5		BG	ESI	380	26	11	3
5290	24954	MWIL	01 01 1615	N21 W66	12 27.7	4	(B)					
5290		BOUL	01 01 1647	N22 W68	12 27.6		B	ESI	170	6	12	1
5290		HOLL	01 01 1730	N22 W70	12 27.4		BG	DAI	390	15	10	3
5290		PALE	01 01 1935	N22 W70	12 27.5		B	EAI	420	14	13	3
5290		LEAR	01 02 0100	N22 W71	12 27.7		B	FAI	320	17	19	4
5290		CULG	01 02 0250	N21 W70	12 27.8		B	DSI	120	12	10	2
5290		SVTO	01 02 1010	N23 W73	12 27.9		B	DKI	230	10	10	3
5290		RAMY	01 02 1515	N25 W77	12 27.8		BG	DSI	180	9	8	4
5290		BOUL	01 02 1650	N27 W75	12 27.9		B	DSO	120	2	9	1
5290	24954	MWIL	01 02 1715	N24 W80	12 27.6	4	B)					
5290		PALE	01 02 2015	N24 W86	12 27.3		B	DAI	150	10	10	4
5290A		BOUL	12 24 1600	S15 E42	12 27.8		A	AX		1		1
5290B	24955	MWIL	12 21 1600	N19 E78	12 27.6	4	(AP)					
5290B	24955	MWIL	12 23 1615	N19 E53	12 27.7	4	(AP)					
5290B	24955	MWIL	12 25 1545	N19 E27	12 27.7	4	(BP)					
5290B	24955	MWIL	12 26 1700	N19 E13	12 27.7	4	(BP)					
5290B	24955	MWIL	12 27 1630	N18 E02	12 27.8	5	(BP)					
5290B	24955	MWIL	12 28 1915	N18 W14	12 27.7	5	AP					
5290B	24955	MWIL	12 29 2100	N19 W28	12 27.7	5	(AP)					
5290B	24955	MWIL	12 30 1545	N19 W39	12 27.7	5	(AP)					
5290C		CULG	12 25 0440	N21 E38	12 28.1		B	BXO	10	5	5	1
5292		LEAR	12 22 0020	S16 E87	12 28.6		B	DSO	120	2	6	3
5292		CULG	12 22 0530	S18 E80	12 28.3		B	BXO	10	4	4	3
5292		SVTO	12 22 0815	S16 E79	12 28.3		B	DAO	110	4	2	3
5292		HOLL	12 22 1612	S16 E75	12 28.4		B	ESO	180	9	11	3
5292		RAMY	12 22 1918	S18 E73	12 28.4		B	EAO	300	5	11	2
5292		LEAR	12 23 0203	S16 E68	12 28.2		B	DAO	220	9	9	3
5292		CULG	12 23 0310	S16 E67	12 28.2		B	DSO	80	5	7	3
5292		SVTO	12 23 0815	S17 E68	12 28.5		B	DKO	350	15	10	3
5292		RAMY	12 23 1431	S17 E60	12 28.2		BG	DAI	180	15	9	4
5292	24958	MWIL	12 23 1615	S18 E59	12 28.2	4	(BF)					
5292		HOLL	12 23 1715	S17 E59	12 28.2		BG	DAO	140	8	10	3
5292		PALE	12 23 2125	S16 E61	12 28.5		B	EAI	240	17	12	3
5292		LEAR	12 24 0116	S16 E55	12 28.2		B	DAO	280	10	10	3
5292		CULG	12 24 0350	S16 E56	12 28.4		B	DSO	150	5	9	3
5292		SVTO	12 24 0925	S17 E53	12 28.4		B	DAO	200	17	8	3
5292		BOUL	12 24 1600	S14 E50	12 28.4		B	DSO	150	5	3	1
5292		HOLL	12 24 1611	S16 E48	12 28.3		B	EAO	230	17	11	2
5292		PALE	12 24 2031	S15 E48	12 28.5		B	EKI	160	15	3	3
5292		LEAR	12 25 0019	S17 E43	12 28.3		B	DAO	130	18	10	3
5292		CULG	12 25 0440	S17 E44	12 28.5		B	DSI	60	11	8	1
5292		RAMY	12 25 1340	S17 E38	12 28.4		BG	ESI	180	23	11	2
5292		SVTO	12 25 1410	S18 E39	12 28.6		B	DAI	200	15	8	1
5292	24958	MWIL	12 25 1545	S19 E36	12 28.4	3	(B)					
5292		BOUL	12 25 1610	S17 E36	12 28.4		B	CAO	130	17	10	2
5292		HOLL	12 25 1610	S18 E35	12 28.3		BG	EAO	190	26	12	3
5292		PALE	12 25 1910	S17 E35	12 28.4		BG	DSI	150	24	10	3
5292		LEAR	12 26 0025	S17 E32	12 28.4		BG	DAI	220	24	9	3
5292		SVTO	12 26 0804	S18 E27	12 28.4		B	EKI	330	28	11	3
5292		RAMY	12 26 1255	S17 E25	12 28.4		BG	EKI	460	38	12	4
5292		BOUL	12 26 1615	S16 E21	12 28.3		B	EKO	300	17	11	1
5292	24958	MWIL	12 26 1700	S18 E23	12 28.4	5	(BG)					
5292		PALE	12 26 1850	S17 E22	12 28.4		BG	EKI	400	43	11	3
5292		HOLL	12 26 2307	S18 E17	12 28.2		B	DAO	280	15	9	1
5292		LEAR	12 27 0008	S17 E17	12 28.3		BG	DAI	350	24	10	3
5292		CULG	12 27 0257	S16 E15	12 28.3		B	DAI	310	31	9	2
5292		SVTO	12 27 0855	S17 E13	12 28.3		B	DAI	180	28	9	1
5292		RAMY	12 27 1435	S19 E10	12 28.4		BG	DKI	420	49	10	3
5292		BOUL	12 27 1520	S17 E07	12 28.2		B	DKI	320	13	8	1
5292		HOLL	12 27 1604	S18 E09	12 28.3		BG	EAI	430	52	13	3

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time (UT)		Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5292	24958	MWIL	12 27	1630	S19 E08	12 28.3	5	(B)					
5292		PALE	12 27	1810	S16 E09	12 28.4		BG EAI	450	47	13	3	
5292		LEAR	12 28	0031	S17 E04	12 28.3		BG EAC	390	44	11	2	
5292		CULG	12 28	0330	S18 E01	12 28.2		B EAI	270	37	11	1	
5292		RAMY	12 28	1340	S17 W07	12 28.0		BG EKI	330	41	13	3	
5292		HOLL	12 28	1605	S19 W05	12 28.3		BG EKI	510	31	11	3	
5292		BOUL	12 28	1625	S18 W05	12 28.3		B DAI	190	30	9	2	
5292	24958	MWIL	12 28	1915	S20 W07	12 28.3	5	D *					
5292		PALE	12 28	2025	S18 W05	12 28.5		BG FKI	680	56	16	3	
5292		LEAR	12 29	0025	S19 W09	12 28.3		BG EAC	300	52	12	3	
5292		CULG	12 29	0355	S18 W12	12 28.2		B EKI	360	34	12	2	
5292		SVTO	12 29	0910	S17 W13	12 28.4		BG EAI	330	50	11	3	
5292		RAMY	12 29	1615	S17 W16	12 28.5		BG EKI	540	57	12	1	
5292		HOLL	12 29	1617	S18 W17	12 28.4		BG EAI	330	34	12	2	
5292		BOUL	12 29	1645	S18 W19	12 28.2		B DAI	480	30	10	1	
5292		PALE	12 29	1920	S17 W20	12 28.3		BG EAI	390	46	13	3	
5292	24958	MWIL	12 29	2100	S20 W21	12 28.3	4	(D)					
5292		LEAR	12 30	0115	S19 W23	12 28.3		B EAI	290	38	12	3	
5292		CULG	12 30	0230	S18 W25	12 28.2		B EKI	410	28	12	1	
5292		SVTO	12 30	1040	S19 W26	12 28.5		BG EAI	400	35	14	3	
5292	24958	MWIL	12 30	1545	S20 W31	12 28.3	4	(D)					
5292		HOLL	12 30	1610	S19 W30	12 28.4		B EAO	450	27	13	3	
5292		BOUL	12 30	1647	S17 W32	12 28.3		B EKI	480	20	12	1	
5292		LEAR	12 31	0145	S18 W37	12 28.2		B EAI	390	30	12	3	
5292		CULG	12 31	0500	S18 W41	12 28.1		B EKI	270	24	11	2	
5292		SVTO	12 31	1017	S19 W44	12 28.1		BG EAI	430	33	13	2	
5292		RAMY	12 31	1350	S17 W43	12 28.3		BG EAI	480	48	13	3	
5292		HOLL	12 31	1609	S19 W46	12 28.2		BG EAO	340	33	15	3	
5292		BOUL	12 31	1620	S19 W44	12 28.3		B EAI	220	36	14	2	
5292		PALE	12 31	2040	S18 W47	12 28.3		BG DKI	400	32	10	2	
5292		CULG	01 01	0230	S18 W51	12 28.3		B EAI	210	12	12	1	
5292		LEAR	01 01	0617	S18 W52	12 28.4		BG EKI	390	22	14	3	
5292		SVTO	01 01	0855	S18 W54	12 28.3		B EHO	280	23	13	3	
5292		RAMY	01 01	1400	S15 W58	12 28.3		BG EAI	360	29	13	3	
5292	24958	MWIL	01 01	1615	S19 W59	12 28.3	5	(B)					
5292		BOUL	01 01	1647	S17 W58	12 28.4		B ESO	130	7	16	1	
5292		HOLL	01 01	1730	S20 W59	12 28.3		BG EAI	310	24	12	3	
5292		PALE	01 01	1935	S18 W59	12 28.4		B EAI	300	21	12	3	
5292		LEAR	01 02	0100	S18 W63	12 28.3		BG EKI	320	20	14	4	
5292		CULG	01 02	0250	S18 W62	12 28.5		B EAI	150	13	12	2	
5292		SVTO	01 02	1010	S17 W68	12 28.3		BG EKI	250	18	13	3	
5292		RAMY	01 02	1515	S15 W72	12 28.3		BG ESI	410	13	13	4	
5292		BOUL	01 02	1650	S16 W67	12 28.7		B ESO	130	2	12	1	
5292	24958	MWIL	01 02	1715	S19 W72	12 28.3	5	(B)					
5292		PALE	01 02	2015	S18 W73	12 28.4		B DAO	300	8	13	4	
5292		LEAR	01 03	0150	S17 W74	12 28.5		B ESO	210	7	10	3	
5292		CULG	01 03	0440	S19 W75	12 28.6		B DSO	150	3	8	3	
5292		RAMY	01 03	1430	S16 W79	12 28.7		B DSO	300	3	8	4	
5292	24958	MWIL	01 03	1630	S20 W79	12 28.7	4	AF					
5292		BOUL	01 03	1643	S21 W80	12 28.7		A HA	90	1	2	1	
5292		PALE	01 03	2050	S16 W85	12 28.5		B CAO	110	2	5	4	
5300		RAMY	12 28	1340	S42 W07	12 28.0		B BXO	10	2	3	3	
5300		HOLL	12 28	1605	S42 W06	12 28.2		B BXO	10	2	3	3	
5300		PALE	12 28	2025	S42 W13	12 27.8		B BXO	20	2	4	3	
5300		LEAR	12 29	0025	S41 W12	12 28.0		B BXO	10	4	5	3	
5300		CULG	12 29	0355	S40 W16	12 27.8		B BXO	10	4	5	2	
5300		SVTO	12 29	0910	S40 W19	12 27.8		B CAO	30	5	5	3	
5300		RAMY	12 29	1615	S39 W21	12 28.0		B DAO	80	10	7	1	
5300		HOLL	12 29	1617	S41 W21	12 28.0		B CRO	50	5	6	2	
5300		BOUL	12 29	1645	S40 W22	12 27.9		B DSO	80	4	6	1	
5300		PALE	12 29	1920	S41 W24	12 27.8		B DAO	80	9	8	3	
5300	24967	MWIL	12 29	2100	S40 W25	12 27.8	5	(B)					
5300		LEAR	12 30	0115	S39 W25	12 28.0		B DAO	80	8	7	3	
5300		CULG	12 30	0230	S40 W27	12 27.9		B DAO	100	7	8	1	
5300		SVTO	12 30	1040	S39 W31	12 27.9		B EAO	80	14	10	3	
5300	24967	MWIL	12 30	1545	S40 W34	12 27.9	4	(BG)					
5300		HOLL	12 30	1610	S40 W34	12 27.9		B CAO	80	9	8	3	
5300		BOUL	12 30	1647	S39 W35	12 27.8		B DAO	150	5	9	1	

S U N S P O T G R O U P S
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5300		RAMY	12 30 1957	S40 W35	12 28.0		B	DAO	70	8	9	1
5300		LEAR	12 31 0145	S39 W38	12 28.0		B	DAO	70	8	9	3
5300		CULG	12 31 0500	S40 W42	12 27.8		B	DRO	30	7	9	2
5300		SVTO	12 31 1017	S41 W46	12 27.7		B	CSO	50	10	10	2
5300		RAMY	12 31 1350	S38 W45	12 27.9		B	CSO	70	11	10	3
5300		HOLL	12 31 1609	S40 W46	12 27.9		B	CSO	60	10	9	3
5300		BOUL	12 31 1620	S41 W43	12 28.2		B	BXO	70	7	9	2
5300		PALE	12 31 2040	S37 W50	12 27.8		B	DAO	70	8	10	2
5300		CULG	01 01 0230	S41 W52	12 27.9		B	CRO	20	3	3	1
5300		LEAR	01 01 0617	S41 W51	12 28.2		B	CRO	70	4	5	3
5300		SVTO	01 01 0855	S42 W53	12 28.1		B	CRO	30	4	5	3
5300		RAMY	01 01 1400	S38 W57	12 28.1		B	BXO	10	3	4	3
5300	24967	MWIL	01 01 1615	S41 W55	12 28.3	3	(B)					
5300		HOLL	01 01 1730	S42 W57	12 28.1		B	BXO	10	2	4	3
5300		PALE	01 01 1935	S42 W58	12 28.1		B	BXO	20	4	3	3
5300		LEAR	01 02 0100	S41 W60	12 28.2		B	BXO	40	5	8	4
5300		CULG	01 02 0250	S42 W60	12 28.3		B	BXO	20	3	3	2
5300		SVTO	01 02 1010	S41 W67	12 28.0		B	CKO	80	3	5	3
5300		RAMY	01 02 1515	S37 W69	12 28.2		B	CAO	60	3	8	4
5300		PALE	01 02 2015	S39 W74	12 27.9		B	BXO	30	5	9	4
5300		LEAR	01 03 0150	S41 W74	12 28.1		B	BXO	20	4	9	3
5300A		LEAR	12 22 0020	S22 E83	12 28.4		B	BXO	30	2	5	3
5300A		SVTO	12 22 0815	S20 E79	12 28.4		B	CAO	40	5	4	3
5296A	24959	MWIL	12 23 1615	S15 E63	12 28.4	5	(AP)					
5296A	24959	MWIL	12 25 1545	S14 E37	12 28.4	5	(AP)					
5296A	24959	MWIL	12 26 1700	S14 E24	12 28.5	5	(AP)					
5296A	24959	MWIL	12 27 1630	S15 E12	12 28.6	5	(AP)					
5296A	24959	MWIL	12 28 1915	S15 W04	12 28.5	5	AP					
5296A	24959	MWIL	12 29 2100	S14 W17	12 28.6	4	(AP)					
5296A	24959	MWIL	12 30 1545	S14 W27	12 28.6	5	(AP)					
5296A	24959	MWIL	01 01 1615	S14 W53	12 28.8	4	(AP)					
5296A	24959	MWIL	01 02 1715	S14 W67	12 28.7	5	(AP)					
5296A	24959	MWIL	01 03 1630	S14 W78	12 28.9	4	AP					
5296		RAMY	12 23 1431	N17 E70	12 28.9		A	AX		1		4
5296		SVTO	12 24 0925	N18 E61	12 29.0		A	AX	10	2	1	3
5296		PALE	12 24 2031	N18 E55	12 29.0		A	AX		1		3
5296		LEAR	12 25 0019	N18 E51	12 28.9		A	AX	10	2	2	3
5296		SVTO	12 25 1410	N18 E43	12 28.9		B	BXO	10	4	5	1
5296	24963	MWIL	12 25 1545	N18 E42	12 28.8	3	B					
5296		HOLL	12 25 1610	N18 E42	12 28.9		B	BXO	10	6	5	3
5296		PALE	12 25 1910	N19 E41	12 28.9		B	BXO	10	4	5	3
5296		LEAR	12 26 0025	N19 E37	12 28.8		B	BXO	10	5	5	3
5296		SVTO	12 26 0804	N18 E34	12 28.9		B	DSO	40	6	6	3
5296		RAMY	12 26 1255	N18 E30	12 28.8		B	CRO	20	9	4	4
5296		BOUL	12 26 1615	N18 E27	12 28.7		B	BXO		4	4	1
5296	24963	MWIL	12 26 1700	N18 E27	12 28.8	5	(B)					
5296		PALE	12 26 1850	N18 E27	12 28.8		B	DRO	30	4	5	3
5296		HOLL	12 26 2307	N18 E26	12 28.9		B	CAO	30	5	5	1
5296		LEAR	12 27 0008	N18 E24	12 28.8		B	CAO	40	7	7	3
5296		CULG	12 27 0257	N20 E22	12 28.8		B	CRO	20	5	7	2
5296		SVTO	12 27 0855	N18 E18	12 28.7		B	BXO	20	6	7	1
5296		RAMY	12 27 1435	N18 E15	12 28.7		B	BXO	10	9	6	3
5296		BOUL	12 27 1520	N17 E12	12 28.5		A	AX	10	2	2	1
5296		HOLL	12 27 1604	N17 E14	12 28.7		B	BXO	20	5	6	3
5296	24963	MWIL	12 27 1630	N17 E14	12 28.7	4	(B)					
5296		PALE	12 27 1810	N18 E13	12 28.7		B	BXO	20	5	7	3
5296		LEAR	12 28 0031	N18 E08	12 28.6		B	CAO	40	7	4	2
5296		CULG	12 28 0330	N17 E06	12 28.6		B	CRO	30	6	4	1
5296		RAMY	12 28 1340	N17 E03	12 28.8		B	DAO	60	7	8	3
5296		HOLL	12 28 1605	N18 E01	12 28.7		B	CAO	40	10	8	3
5296		BOUL	12 28 1625	N16 W02	12 28.5		B	DSO	20	3	6	2
5296	24963	MWIL	12 28 1915	N17 W04	12 28.5	4	B					
5296		PALE	12 28 2025	N16 E00	12 28.8		B	CAO	80	13	8	3
5296		LEAR	12 29 0025	N17 W03	12 28.8		B	CAO	40	10	8	3
5296		CULG	12 29 0355	N17 W08	12 28.5		B	CAO	20	2	5	2
5296		SVTO	12 29 0910	N19 W09	12 28.7		B	DAO	40	19	9	3

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time (UT)	Lat CMD	Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5296		RAMY	12 29 1615	N18 W11	12 28.8		B	CAO	40	10	10	1
5296		HOLL	12 29 1617	N17 W13	12 28.7		B	DAO	40	6	8	2
5296		BOUL	12 29 1645	N16 W12	12 28.8		B	DSO	60	4	8	1
5296		PALE	12 29 1920	N15 W17	12 28.5		B	CAO	60	11	9	3
5296	24963	MWIL	12 29 2100	N16 W15	12 28.7	4	(B)					
5296		LEAR	12 30 0115	N18 W17	12 28.7		B	DAO	40	18	9	3
5296		CULG	12 30 0230	N16 W18	12 28.7		B	DAI	30	9	7	1
5296		SVTO	12 30 1040	N18 W22	12 28.8		B	CAI	40	18	9	3
5296	24963	MWIL	12 30 1545	N16 W25	12 28.8	4	(B)					
5296		HOLL	12 30 1610	N16 W25	12 28.8		B	CSO	30	11	8	3
5296		BOUL	12 30 1647	N17 W24	12 28.9		B	DSO	80	6	8	1
5296		RAMY	12 30 1957	N17 W26	12 28.8		B	DAI	60	9	8	1
5296		LEAR	12 31 0145	N18 W31	12 28.7		B	DAI	60	11	9	3
5296		CULG	12 31 0500	N16 W34	12 28.6		B	DAO	40	5	6	2
5296		SVTO	12 31 1017	N17 W37	12 28.6		B	DAO	100	11	7	2
5296		RAMY	12 31 1350	N17 W37	12 28.8		B	CAO	50	16	9	3
5296		HOLL	12 31 1609	N16 W39	12 28.7		B	CSO	30	12	7	3
5296		BOUL	12 31 1620	N16 W37	12 28.9		B	CAO	30	13	9	2
5296		PALE	12 31 2040	N17 W40	12 28.8		B	DAO	60	10	9	2
5296		CULG	01 01 0230	N16 W45	12 28.8		B	DAO	30	7	6	1
5296		LEAR	01 01 0617	N17 W47	12 28.8		B	DAO	170	9	9	3
5296		SVTO	01 01 0855	N16 W48	12 28.8		B	CRO	20	9	6	3
5296	24963	RAMY	01 01 1400	N17 W52	12 28.7		B	DAO	120	17	7	3
5296		MWIL	01 01 1615	N16 W52	12 28.8	4	(B)					
5296		BOUL	01 01 1647	N17 W51	12 28.9		B	CAO	30	6	8	1
5296		HOLL	01 01 1730	N17 W56	12 28.6		B	DAO	140	17	9	3
5296		PALE	01 01 1935	N16 W55	12 28.7		B	DAO	160	9	6	3
5296		LEAR	01 02 0100	N17 W57	12 28.8		B	EAO	200	9	10	4
5296		CULG	01 02 0250	N15 W57	12 28.9		B	DAO	80	10	8	2
5296		SVTO	01 02 1010	N17 W62	12 28.8		B	DAO	150	8	7	3
5296	24963	RAMY	01 02 1515	N18 W66	12 28.7		B	DAO	190	6	7	4
5296		MWIL	01 02 1715	N17 W68	12 28.6	4	(B)					
5296		PALE	01 02 2015	N18 W68	12 28.8		B	DAO	130	6	9	4
5296		LEAR	01 03 0150	N16 W70	12 28.9		B	EAO	90	5	11	3
5296		CULG	01 03 0440	N14 W66	12 29.3		B	DSO	60	3	8	3
5296	24963	RAMY	01 03 1430	N18 W79	12 28.7		B	DSO	80	3	9	4
5296		MWIL	01 03 1630	N17 W79	12 28.8	3	B					
5298		RAMY	12 27 1435	N19 E32	12 30.0		B	BXO	10	3	3	3
5298	24965	HOLL	12 27 1604	N20 E32	12 30.1		B	BXO	20	3	4	3
5298		MWIL	12 27 1630	N20 E32	12 30.1	4	(BP)					
5298		PALE	12 27 1810	N21 E30	12 30.0		B	BXO	20	4	3	3
5298		LEAR	12 28 0031	N21 E27	12 30.1		B	BXO	10	4	3	2
5298		CULG	12 28 0330	N21 E25	12 30.1		B	BXO	10	3	4	1
5298		RAMY	12 28 1340	N20 E19	12 30.0		B	BXO	10	4	5	3
5298		HOLL	12 28 1605	N21 E18	12 30.0		B	BXO	10	5	5	3
5298	24965	BOUL	12 28 1625	N20 E18	12 30.1		B	BXO	2	5	5	2
5298		MWIL	12 28 1915	N20 E16	12 30.0	4	B					
5298		PALE	12 28 2025	N19 E16	12 30.1		B	BXO	20	5	6	3
5298		LEAR	12 29 0025	N20 E13	12 30.0		B	BXO	10	4	6	3
5298		CULG	12 29 0355	N17 E08	12 29.8		A	AX	1	1		2
5298		SVTO	12 29 0910	N20 E06	12 29.8		A	AX	10	2		3
5298		RAMY	12 29 1615	N20 E02	12 29.8		A	AX	1	1	1	1
5298	24970	SVTO	12 30 1040	N22 W04	12 30.1		A	AX	1	1		3
5298		MWIL	12 30 1545	N21 W06	12 30.2	4	(AF)					
5298		BOUL	12 30 1647	N21 W07	12 30.2		A	AX	10	1	1	1
5298		RAMY	12 30 1957	N22 W09	12 30.1		A	AX	1	1	1	1
5297	24964	RAMY	12 25 1340	S17 E69	12 30.8		B	BXO	40	4	4	2
5297		MWIL	12 25 1545	S17 E69	12 30.9	3	(B)					
5297		HOLL	12 25 1610	S16 E69	12 30.9		B	BXO	20	6	5	3
5297		BOUL	12 25 1610	S16 E72	12 31.1		B	BXO	2	4	4	2
5297		PALE	12 25 1910	S16 E68	12 30.9		B	BXO	20	5	7	3
5297		LEAR	12 26 0025	S16 E65	12 30.9		B	CRO	20	4	3	3
5297		SVTO	12 26 0804	S15 E59	12 30.8		B	ESO	50	9	11	3
5297		RAMY	12 26 1255	S16 E55	12 30.7		B	CRO	40	9	10	4
5297	24964	BOUL	12 26 1615	S15 E51	12 30.5		B	BXO	3	7	7	1
5297		MWIL	12 26 1700	S15 E51	12 30.6	4	(AP)					
5297		PALE	12 26 1850	S16 E52	12 30.7		B	CRO	30	7	12	3

S U N S P O T G R O U P S
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time Mo Day (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
5297		HOLL	12 26 2307	S16 E46	12 30.4		B	BXO	30	6	6	1
5297		LEAR	12 27 0008	S15 E48	12 30.6		B	BXO	30	12	10	3
5297		CULG	12 27 0257	S14 E45	12 30.5		B	CRO	10	9	10	2
5297		SVTO	12 27 0855	S13 E42	12 30.5		B	CAO	50	18	11	1
5297		RAMY	12 27 1435	S17 E40	12 30.6		B	DAO	150	16	10	3
5297		BOUL	12 27 1520	S15 E38	12 30.5		B	EAO	60	5	11	1
5297		HOLL	12 27 1604	S16 E40	12 30.7		B	EAO	100	16	13	3
5297	24964	MWIL	12 27 1630	S16 E38	12 30.6	5	(B)					
5297		PALE	12 27 1810	S16 E38	12 30.6		B	EAO	100	18	12	3
5297		LEAR	12 28 0031	S15 E34	12 30.6		BG	EAI	80	19	12	2
5297		CULG	12 28 0330	S16 E33	12 30.6		B	CRO	40	14	13	1
5297		RAMY	12 28 1340	S16 E27	12 30.6		B	EAI	130	32	13	3
5297		HOLL	12 28 1605	S15 E26	12 30.6		BG	EAI	190	31	13	3
5297		BOUL	12 28 1625	S16 E25	12 30.6		B	EAO	100	16	12	2
5297	24964	MWIL	12 28 1915	S16 E23	12 30.5	5	B					
5297		PALE	12 28 2025	S17 E25	12 30.7		BG	EAI	320	27	11	3
5297		LEAR	12 29 0025	S16 E22	12 30.7		B	EAI	190	29	12	3
5297		CULG	12 29 0355	S17 E19	12 30.6		B	CAO	220	17	12	2
5297		SVTO	12 29 0910	S15 E18	12 30.7		B	EAI	170	43	13	3
5297		RAMY	12 29 1615	S15 E13	12 30.7		B	EAI	280	44	12	1
5297		HOLL	12 29 1617	S15 E13	12 30.7		BG	EAI	280	22	12	2
5297		BOUL	12 29 1645	S15 E10	12 30.4		B	DKO	270	13	7	1
5297		PALE	12 29 1920	S17 E11	12 30.6		BG	DAI	180	32	12	3
5297	24964	MWIL	12 29 2100	S15 E08	12 30.5	4	(BD)					
5297		LEAR	12 30 0115	S16 E05	12 30.4		B	DAI	110	21	8	3
5297		CULG	12 30 0230	S15 E04	12 30.4		B	DAI	150	12	8	1
5297		SVTO	12 30 1040	S14 E00	12 30.4		BG	FAI	150	44	16	3
5297	24964	MWIL	12 30 1545	S15 W02	12 30.5	5	(B)					
5297		HOLL	12 30 1610	S16 W01	12 30.6		BG	EAI	180	28	12	3
5297		BOUL	12 30 1647	S14 W04	12 30.4		B	DAO	190	11	8	1
5297		RAMY	12 30 1957	S15 W03	12 30.6		B	EAI	180	24	12	1
5297		LEAR	12 31 0145	S15 W07	12 30.5		B	EAI	140	28	12	3
5297		CULG	12 31 0500	S16 W09	12 30.5		B	EAI	90	18	12	2
5297		SVTO	12 31 1017	S15 W13	12 30.4		BG	DAI	120	27	10	2
5297		RAMY	12 31 1350	S15 W16	12 30.4		B	DSI	160	39	10	3
5297		HOLL	12 31 1609	S16 W16	12 30.4		B	CSI	80	24	9	3
5297		BOUL	12 31 1620	S14 W19	12 30.2		B	CAO	40	26	10	2
5297		PALE	12 31 2040	S15 W19	12 30.4		B	DAI	110	23	8	2
5297		CULG	01 01 0230	S15 W22	12 30.5		B	DAI	110	19	10	1
5297		LEAR	01 01 0617	S15 W24	12 30.5		B	EAI	250	24	12	3
5297		SVTO	01 01 0855	S16 W26	12 30.5		B	EKI	360	30	11	3
5297		RAMY	01 01 1400	S13 W28	12 30.6		B	EKI	300	46	12	3
5297	24964	MWIL	01 01 1615	S15 W28	12 30.6	5	(B)					
5297		BOUL	01 01 1647	S15 W28	12 30.7		B	ESI	130	8	11	1
5297		HOLL	01 01 1730	S16 W31	12 30.5		B	DAI	370	35	9	3
5297		PALE	01 01 1935	S15 W31	12 30.6		B	EAI	400	23	11	3
5297		LEAR	01 02 0100	S15 W34	12 30.6		B	EKC	370	19	12	4
5297		CULG	01 02 0250	S15 W34	12 30.6		B	EAI	310	14	12	2
5297		SVTO	01 02 1010	S14 W39	12 30.6		B	EKI	400	21	12	3
5297		RAMY	01 02 1515	S13 W43	12 30.5		B	EKI	470	23	12	4
5297		BOUL	01 02 1650	S14 W42	12 30.6		B	DSO	130	5	10	1
5297	24964	MWIL	01 02 1715	S15 W43	12 30.6	5	(B)					
5297		PALE	01 02 2015	S15 W45	12 30.5		B	EAO	380	19	11	4
5297		LEAR	01 03 0150	S17 W47	12 30.6		B	EAI	250	25	13	3
5297		CULG	01 03 0440	S16 W49	12 30.6		B	DSO	110	3	8	3
5297		RAMY	01 03 1430	S13 W55	12 30.5		B	ESI	370	18	11	4
5297	24964	MWIL	01 03 1630	S15 W55	12 30.6	5	(B)					
5297		BOUL	01 03 1643	S15 W57	12 30.5		B	EAO	380	4	11	1
5297		PALE	01 03 2050	S15 W60	12 30.4		B	EAI	300	12	12	4
5297		LEAR	01 04 0045	S15 W60	12 30.6		B	ESO	260	8	11	3
5297		CULG	01 04 0425	S14 W63	12 30.5		B	ESO	120	3	11	2
5297		SVTO	01 04 0918	S15 W66	12 30.5		B	EAO	240	9	11	3
5297		RAMY	01 04 1315	S14 W66	12 30.7		B	DSO	310	5	10	3
5297		BOUL	01 04 1643	S15 W66	12 30.8		B	DAO	220	3	9	1
5297		LEAR	01 05 0104	S15 W74	12 30.5		B	ESO	150	4	11	2
5297		CULG	01 05 0417	S17 W74	12 30.6		B	DSO	50	5	8	2
5297		SVTO	01 05 0845	S13 W78	12 30.6		B	DAO	210	3	9	2
5297		RAMY	01 05 1514	S15 W75	12 31.0		B	DSO	100	2	8	3
5297		HOLL	01 05 1555	S14 W78	12 30.9		B	CSO	50	3	6	2

SUNSPOT GROUPS
(Ordered by Central Meridian Passage Date)

DECEMBER 1988

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Time			CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
			Mo	Day	UT									Lat	CMD
5297		PALE	01	05	1845	12 30.8		A HS	30	1	2	3	
5297		LEAR	01	06	0005	12 31.0		A HS	30	1	1	3	
5297B	24971	MWIL	12	30	1545	12 30.8	3	(B)					
5297A		PALE	12	28	2025	12 31.0		A AX	10	1		3	
5297A		LEAR	12	29	0025	12 31.1		A AX	10	1	1	3	
5297A		SVTO	12	29	0910	12 31.0		A AX		1		3	
5303		LEAR	12	30	0115	12 31.7		A AX	10	1	1	3	
5303		CULG	12	30	0230	12 31.8		B BXO		2	2	1	
5303		SVTO	12	30	1040	12 31.9		B BXO	10	8	4	3	
5303		HOLL	12	30	1610	12 31.8		B BXO	10	5	4	3	
5303		BOUL	12	30	1647	12 31.8		B CRO	10	2	3	1	
5303		LEAR	12	31	0145	12 31.7		B BXO	20	7	4	3	
5303		CULG	12	31	0500	12 31.8		B DAO	20	4	3	2	
5303		SVTO	12	31	1017	12 31.7		B DAO	70	12	4	2	
5303		RAMY	12	31	1350	12 31.8		B DAI	60	16	5	3	
5303		HOLL	12	31	1609	12 31.8		B CAO	40	9	4	3	
5303		BOUL	12	31	1620	12 31.8		B DSI	30	10	4	2	
5303		PALE	12	31	2040	12 31.5		B DAI	90	17	6	2	
5303		CULG	01	01	0230	12 31.7		B DSI	40	10	6	1	
5303		LEAR	01	01	0617	12 31.7		B DAI	120	12	7	3	
5303		SVTO	01	01	0855	12 31.7		B DKO	120	17	7	3	
5303		RAMY	01	01	1400	12 31.6		B DAO	100	19	8	3	
5303	24972	MWIL	01	01	1615	12 31.7	5	(B)					
5303		BOUL	01	01	1647	12 31.7		B DSO	40	4	6	1	
5303		HOLL	01	01	1730	12 31.7		B DAI	120	21	8	3	
5303		PALE	01	01	1935	12 31.7		B DAI	130	21	7	3	
5303		LEAR	01	02	0100	12 31.7		BG DAI	150	20	8	4	
5303		CULG	01	02	0250	12 31.7		B DAI	140	12	7	2	
5303		SVTO	01	02	1010	12 31.6		B DKO	290	24	8	3	
5303		RAMY	01	02	1515	12 31.6		B DKI	320	21	9	4	
5303		BOUL	01	02	1650	12 31.6		B DAI	220	7	8	1	
5303	24972	MWIL	01	02	1715	12 31.6	5	(B)					
5303		PALE	01	02	2015	12 31.5		B DAI	250	18	10	4	
5303		LEAR	01	03	0150	12 31.5		B DAI	250	27	9	3	
5303		CULG	01	03	0440	12 31.6		B DAI	190	13	8	3	
5303		RAMY	01	03	1430	12 31.5		B DAI	480	21	10	4	
5303	24972	MWIL	01	03	1630	12 31.6	6	(B)					
5303		BOUL	01	03	1643	12 31.6		B DAO	330	8	10	1	
5303		PALE	01	03	2050	12 31.5		B DKI	380	30	8	4	
5303		LEAR	01	04	0045	12 31.5		BG DAI	360	21	9	3	
5303		CULG	01	04	0425	12 31.2		B EAI	200	9	12	2	
5303		SVTO	01	04	0918	12 31.3		BG EKI	480	24	13	3	
5303		RAMY	01	04	1315	12 31.5		B EAI	400	18	12	3	
5303		BOUL	01	04	1643	12 31.7		B EAI	330	7	11	1	
5303		LEAR	01	05	0104	12 31.7		BG EAI	360	17	12	2	
5303		CULG	01	05	0417	12 31.4		BG EKI	380	18	13	2	
5303		SVTO	01	05	0845	12 31.3		BG EKI	360	10	12	2	
5303		RAMY	01	05	1514	12 31.6		B EAI	430	13	12	3	
5303		BOUL	01	05	1537	12 31.6		B EAI	350	7	14	1	
5303		HOLL	01	05	1555	12 31.6		B EAI	300	12	11	2	
5303		PALE	01	05	1845	12 31.5		B EKI	390	14	13	3	
5303		LEAR	01	06	0005	12 31.6		B EKI	300	15	11	3	
5303		CULG	01	06	0435	12 31.7		B DAI	150	6	9	2	
5303		SVTO	01	06	0912	12 31.6		B EAO	300	6	12	3	
5303		BOUL	01	06	1534	12 31.7		B DAO	210	5	4	3	
5303		HOLL	01	06	1556	12 31.6		B CAO	210	4	7	2	
5303		RAMY	01	06	2015	12 31.9		A HK	280	5	6	3	
5303		LEAR	01	07	0034	12 31.5		B DAO	110	5	10	4	
5303		CULG	01	07	0420	12 31.7		A HS	80	1	2	2	

Stations reporting:

BOUL = Boulder
CULG = Culgoora

HOLL = Holloman
LEAR = Learmonth

MWIL = Mt. Wilson
PALE = Palehua

RAMY = Ramey
SVTO = San Vito

SUDDEN IONOSPHERIC DISTURBANCES

DECEMBER 1988

Day	Start (UT)	Max (UT)	End (UT)	Imp	Wide Spread Index	Number of Station Reports by Type					Flare (UT)	X-ray Class	NOAA Region
						SWF	SEA	SPA	LF-SPA	SES			
01	0339	0346	0502	1-	3			1	1		0338	C2.6	5260
01	1349	1353	1412	1-	3			1		1	1336E		
01	1907	1908	1920	1-	3					2	1905	C2.2	5261
01	2337	2348	2359	1-	1			1			2340	C1.0	
02	0042	0049	0116	1-	1			1			0044	C2.1	5262
02	0451	0457	0600	1-	1			1			0446	C2.6	
02	0720	0726	0756	1+	1		1				*		
02	1046	1051	1111	1	1		1				1030E	C1.5	
02	1246	1252	1256	1-	1		1				1245		5254
02	1340	1350	1423	1-	5			1	1	2	1339	C5.3	5261
02	1436	1451	1500	1	1		1				1446	C3.0	5261
03	0147	0152	0222	1-	1			1			0141	C2.0	5261
04	0147	0150	0210	1-	1			1			0147	C1.1	
04	0305	0314	0341	1-	1			1			0302	C1.3	
04	0502	0511	0608	1-	3			1	1		0512E	C2.9	
04	0937	0938	0950	1	1		1				*		
04	1356	1357	1406	1	1		1				*		
05	0149	0158	0217	1-	3			1	1		0151	C2.3	5265
05	0217	0225	0316	1-	3			1	1		0218	C2.4	
05	0437	0446	0518	1-	1			1			0433	C1.3	
06	0746	0800	0828	1-	1			1			0748	C1.7	5264
06	1109	1119	1140	1-	5		1	1		1	1107	C3.3	5258
07	0155	0200	0211	1-	3			1	1		No flare		
07	0226	0232	0258	1-	3			1	1		0222	C2.1	
07	0415	0421	0518	1-	3			1	1		0412	C3.2	5254
07	0548	0601	0653	1-	3			1	1		0544	C3.3	
07	0715	0720	0804	1-	3			1	1		0714	C6.3	5254
07	1631	1633	1643	1-	3					6	1631	C3.0	
07	1748	1750	1815	1	3					4	1704E	C3.5	5265
07	1827	1830	1843	1-	3					5	1826	C3.7	
07	2333	2342	0112	2	3	1		1			2335E	M1.0	
08	0351	0411	0532	1-	1			1			*		
08	0625	0630	0708	1-	1			1			*		
08	2020	2022	2041	1	1					1	No flare		
09	0107	0114	0158	1-	1			1			0107	C2.9	5265
09	0237	0241	0301	1-	1			1			0232	C2.7	5265
09	0318	0325	0519	3+	3	1		1	1		0316	M2.2	5265
09	0603	0610	0657	1-	3			1	1		0601	C3.0	5265
09	0733	0741	1000	3+	5	2	3	1	1	1	0732	M3.8	5265
09	0921	0950	1053	1	3		2				No flare		
09	1818	1825	1845	1	3					7	1833E	C2.4	5265
09	2110	2120	2216	2	5	2		1		5	2117E	M2.6	5265
09	2316	2321	2341	1-	1			1			2316	C1.7	5265
10	0455	0502	0644	2	3	1		1	1		0453	C9.4	5265
10	0730	0737	0806	1-	1			1			0728	C2.2	5265
10	1416	1445	1631	2	5	1	3	1	1	6	1420	M2.2	
10	1650	1653	1714	1	3					3	1651	M1.1	
10	2256	2304	0015	2	3	1		1			2259	M1.8	5275
11	0101	0115	0149	1-	1			1			0104	C5.0	5275
11	0155	0158	0232	1-	3			1	1		0152	C5.2	5273
11	0327	0347	0508	1-	1			1			0300		
11	0518	0524	0648	2	3	1		1	1		0515	C8.1	
11	0725	0730	0825	1+	3			1	1		0720	C9.2	5275
11	0941	0942	0953	1	1			1			0902	M1.0	5275
11	1025	1030	1053	1	5	1	1	1	1	1	0902	M1.0	5275
11	1227	1237	1252	1-	5			2	1	1	1213		
12	0739	0748	0914	1	3			1	1		0736	C7.8	5269
12	0944	0946	1002	1-	3			1		1	0940	C4.3	5272

* = No flare patrol

SUDDEN IONOSPHERIC DISTURBANCES

125
Dec 88

DECEMBER 1988

Day	Start (UT)	Max (UT)	End (UT)	Imp	Wide Spread Index	Number of Station Reports by Type					Flare (UT)	X-ray Class	NOAA Region	
						SWF	SEA	SPA	LF- SPA	SES				
12	1923	1928	2003	2	3						6	1922	C6.5	
12	2149	2153	2202	1-	1			1				2148	C3.9	5275
13	0035	0045	0111	1-	1			1				No flare		
13	0206	0222	0333	3-	3	1		1	1			No flare		
13	0441	0451	0529	1-	1			1				No flare		
13	0912	0925	0955	1+	1		1					No flare		
13	1028	1032	1111	1-	5			1	1	2		1028E	C7.6	5265
13	1416	1421	1430	1-	1			1				1405	C6.5	5269
14	0201	0224	0316	1-	3			1	1			0202	C2.4	
14	0512	0517	0545	1-	3			1	1			0507E	C2.5	
14	0635	0642	0727	1+	3	1		1	1			0632	C5.9	5279
14	0803	0807	0840	1-	5			1	1	1		0759	C3.0	
14	1011	1016	1045	1-	5			1	1	3		1008	C6.3	
14	1045	1048	1101	1-	5			1	1	2		1044E	C7.2	5273
14	1122	1131	1142	1-	5		2	1				1121	C4.4	
14	1254	1303	1312	1-	5			1		3		1246	C7.5	
14	1335	1342	1428	1+	5	1	4	1	1	3		1337	M2.1	5278
14	1732	1743	1828	2	3					8		1729	M1.3	5278
14	1944	1946	2002	2-	3					5		1943E	C8.6	
14	2037	2042	2051	1-	5			1		2		2035E	M1.0	5273
14	2118	2130	2156	1-	1			1				*		
14	2330	2334	2352	1-	1			1				2325	C2.6	5278
15	0037	0057	0139	1	3			1	1			0047E	C6.3	5278
15	0139	0150	0223	1-	3			1	1			No flare		
15	0234	0258	0321	1-	3			1	1			No flare		
15	0329	0335	0346	1-	1			1				No flare		
15	0403	0411	0426	1-	1			1				No flare		
15	0447	0512	0512D	3+	5	1		1	1	1		0446	X1.1	5278
15	0734E	0734	0900	2+	3			1	1			0724	M1.3	
15	0823	0843	0831	1	1		1					No flare		
15	1213	1221	1249	1-	5	1	3	1	1	2		1208	C5.1	
15	1403	1410	1426	1-	5			1		1		1357E	C5.9	5273
15	1524	1530	1600	2	1					1		1523	C4.4	
15	1603	1611	1624	1-	5			1		4		1602	C6.5	
15	1752	1759	1815	1	3					2		1751	C5.3	5279
15	1817	1822	1855	1	3					2		1817	C5.3	5273
15	2123	2135	2214	1+	5	1		1		2		2123	M1.5	5279
16	0131	0216	0357	1+	1			1				0124		5269
16	0413	0422	0508	1-	1			1				No flare		
16	0521	0537	0609	1-	3			1	1			0537E		
16	0650	0656	0734	1	3			1	1			0649	C9.0	
16	0755	0806	0828	1-	5		2	1				No flare		
16	0828	0845	1244	3+	5	4	3	1	2	4		0838	X4.7	5278
16	1210	1215	1230	1-	1				1			1209		5280
16	1755	1802	1822	2-	3					3		1751	C3.9	5275
16	2120	2133	2209	1	1			1				2116	C3.2	5283
16	2232	2251	2335	1	1			1				2246	C9.3	
16	2321	2338	0011	1-	1			1				*		
17	0249	0301	0341	1	3			1	1			0254E	C7.1	
17	0343	0351	0456	3-	3	1		1	1			0344E	M2.8	
17	0456	0507	0533	3+	5	1		1	1	1		0458	M3.2	5278
17	0533	0546	0757	3+	3	1		1	1			0505	M2.7	5278
17	0958	1000	1025	1-	1					1		0956	C3.2	
17	1630	1633	1711	2-	3					4		1630	C5.1	5278
17	1733	1736	1925	2+	3					6		1732E	M1.5	5272
18	0031	0039	0109	1-	1			1				0034	C3.2	5279
18	0214	0227	0330	1-	3			1	1			0217	C5.5	5274
18	0402	0413	0442	1-	1			1				0400E		
18	0455	0503	0545	1-	3			1	1			0456	C3.9	5278
18	0605	0609	0704	1-	3			1	1			0607	C3.0	
18	0823	0826	0832	1-	1				1			0831		
18	0832	0834	0850	1-	1				1			0831		
18	0915	0921	1013	2-	5	1		1	1	2		0913	M1.0	5278

* = No flare patrol

SUDDEN IONOSPHERIC DISTURBANCES

DECEMBER 1988

Day	Start (UT)	Max (UT)	End (UT)	Imp	Wide Spread Index	Number of Station Reports by Type					Flare (UT)	X-ray Class	NOAA Region
						SWF	SEA	SPA	LF-SPA	SES			
18	1120	1123	1142	1-	1			1			1112	C6.3	5278
18	1141	1145	1156	1-	5			1		1	No flare		
18	1236	1242	1258	1-	5	1	3	1	1	1	1234	C6.2	5282
18	1637	1647	1705	1-	5					5	1636	M1.4	5282
18	1710	1719	1812	1-	5	1		1		8	1651	X1.1	5273
18	2200	2217	2241	1-	1			1			2208E	C7.4	5279
18	2241	2251	2354	1-	1			1			No flare		
19	0021	0054	0213	2	1			1			0030	M1.4	
19	0213	0223	0354	1	3			1	1		0214	C8.4	5282
19	0733	0742	0759	1-	1			1			0745		
19	0943	0955	1007	1-	1			1			0935	C4.3	5272
19	1151	1201	1236	1-	5		1	1	1	2	1140	C7.7	5282
19	1611	1617	1643	1+	1					1	No flare		
19	1845	1848	1945	2	3					5	1843	M1.2	5285
19	2107	2116	2135	1-	1			1			2107E	C5.3	
20	0055	0104	0140	1-	3			1	1		0043	C5.8	5278
20	0155	0209	0319	2+	3	1		1	1		0152	M1.9	5273
20	0538	0547	0617	1-	3			1	1		0539	C4.5	5279
20	0621	0625	0655	1-	1			1			0621		5278
20	0720	0727	0801	1-	1			1			0721		5285
20	0858	0906	1025	2	5		1	1	1	2	0856	M1.0	5285
20	0949	0958	1029	1-	1			1			*		
20	1033	1041	1111	1-	5		1	1	1		1032	C4.3	
20	1126	1130	1201	1-	5		3	1	1	2	1122	C7.0	
20	1220	1235	1500	3-	5	2	5	1	1	3	1218	M7.3	
20	2257	2303	2320	1-	1			1			2259	C4.2	5285
21	0203	0214	0306	1	3	1		1	1		0200	C5.9	5273
21	0609	0617	0725	1-	1			1			0612	C5.2	5278
21	0757	0801	0824	1-	1			1			No flare		
21	0926	0932	0958	1-	3	1		1			No flare		
21	1458	1500	1540	2	1					1	No flare		
21	1555	1600	1634	1-	1			1			1553	M1.5	5273
21	2112	2116	2139	1-	1			1			No flare		
22	0021	0024	0037	1-	1			1			0018	C3.8	5290
22	0112	0135	0152	1-	1			1			No flare		
22	0406	0426	0507	1-	3			1	1		0405	C4.2	
22	0511	0526	0540	1-	1			1			0515	C3.2	
22	0613	0630	0806	2+	5			1	1	1	0617	M1.0	5273
22	0823	0832	0853	1-	1			1			0822	C3.5	
22	0941	0946	0956	1-	5			1		1	0941	C3.0	5278
22	1018	1033	1048	1	3		1			1	No flare		
22	1104	1117	1227	1	5		4	1	1	4	1101	C9.4	5278
22	1231	1246	1315	1	1		1				1243		
22	1552	1558	1725	2+	3					4	1555	M1.0	5275
22	2305	2347	0212	3+	3	1		1			2307	M5.3	5280
23	0223	0235	0312	1	3			1	1		0225	C7.1	
23	0330	0359	0555	1	3			1	1		*		
23	0641	0655	0748	1-	1			1			*		
23	0842	0903	1030	2	5		2	1	1	1	0848	M1.6	
23	1050	1100	1120	1+	1		1				No flare		
23	1418	1430	1519	1-	5		1	1		2	1414	C9.3	
23	1519	1524	1600	1-	5			1		5	1510	M1.9	
23	1922	1936	1955	1+	3					4	1930E	C7.0	5292
23	2311	2333	0114	1	1			1			2326		5290
24	0203	0213	0312	3	3			1	1		0201	M2.9	
24	0342	0414	0512	1-	3			1	1		0350	C4.2	
24	0655	0704	0749	1-	5			1		1	0653	C4.4	
24	0853	0859	0918	1-	1			1			No flare		
24	0928	0933	1000	1-	5			1		1	No flare		
24	1015	1025	1046	1-	1			1			No flare		
24	1115	1122	1152	1-	5			1		1	No flare		
24	1329	1339	1431	1	5		2	1	1	2	1325	M1.5	

* = No flare patrol

SUDDEN IONOSPHERIC DISTURBANCES

127
Dec 88

DECEMBER 1988

Day	Start (UT)	Max (UT)	End (UT)	Imp	Wide Spread Index	Number of Station Reports by Type					Flare (UT)	X-ray Class	NOAA Region
						SWF	SEA	SPA	LF-SPA	SES			
24	1514	1530	1554	1-	5			1			1513	C8.6	
24	1655	1700	1735	2-	3						1656E	M1.1	5292
24	2215	2228	2302	1-	3	1		1			No flare		
25	0000	0014	0103	1-	1			1			No flare		
25	0157	0207	0330	1	3			1	1		0135		5292
25	0518	0526	0629	1-	3			1	1		No flare		
25	0634	0647	0723	1-	3			1	1		0700E		5292
25	0818	0827	0851	1-	1			1			No flare		
25	0853	0900	0911	1-	1			1			0852	C3.3	
25	0917	0923	0935	1-	1			1			0914	C3.4	
25	0957	1006	1023	1-	1			1			0954	C4.1	
25	1111	1121	1209	1+	5	2	2	1	1	4	1110	M1.1	
25	1903	1907	1925	1	3					2	1904	C6.3	5278
25	2230	2245	2258	1	1			1			2229	C8.2	5292
26	0241	0249	0320	1-	3			1	1		No flare		
26	0643	0703	0813	2	5			1		1	0656	C6.4	
26	0825	0834	0855	1-	1			1			0823	C2.5	
26	1044	1047	1110	1-	5			1		1	1040	C3.3	5292
26	1156	1201	1220	1	1		1				1134E		5292
26	1250	1301	1343	1-	5		3	1	1	1	1230	C8.9	5292
26	1413	1415	1440	1+	1					1	1404	C4.4	5292
26	2040	2047	2212	1+	5	1		1		3	2018	M6.1	5292
26	2113	2115	2145	1+	1					1	No flare		
26	2234	2241	2302	1-	1			1			No flare		
26	2250	2304	2321	1-	1			1			2250	C4.4	
26	2326	2338	2350	1-	1			1			No flare		
27	0031	0100	0145	2-	1			1			0029	C7.4	5290
27	0145	0151	0240	1-	3			1	1		0145		5292
27	0241	0315	0455	1-	3			1	1		0238	C5.5	
27	0523	0535	0635	3-	5	1		1	1	1	0530	M1.3	5285
27	0635	0648	0705	1	1			1			No flare		
27	0705	0726	1008	3+	5	1		1	1	1	0712	M1.9	
27	1052	1056	1126	1-	5		4	1	1	2	1051	C7.5	5292
27	1145	1155	1210	1	1					1	1132	C5.5	5292
27	1353	1400	1434	1-	5			1		1	1358E	C4.9	5285
27	2312	2320	2346	1-	1			1			2309		5285
28	0024	0052	0203	2+	3	2		1			0027E	M2.1	5292
28	0203	0211	0416	1+	3			1	1		0144E		5292
28	0425	0432	0457	1-	3			1	1		0426		5285
28	0539	0549	0713	2-	3	1		1	1		0533	C6.6	5285
28	0725	0739	0827	2	5			1	1	1	0726	C8.8	5285
28	0827	0853	0954	2	5		1	1		2	0832E	M1.2	5297
28	1015	1031	1107	1-	1			1			1019		5292
28	1156	1203	1222	1	1		1				No flare		
28	1221	1232	1346	2+	5	3	4	1	1	3	1218	M2.2	5285
28	1423	1443	1539	1	5		1	1		3	1425E	M1.3	5297
28	1845	1847	1913	2-	3					6	1843	M1.4	5297
28	2310	2317	2335	1-	1			1			2313	C2.4	5292
28	2341	2349	0130	3-	3	1		1			2342	M3.6	5285
29	0144	0154	0208	1-	3			1	1		0148E		
29	0334	0340	0415	1-	3			1	1		0331E	C2.0	
29	0414	0419	0520	1-	3			1	1		0415	C5.6	5285
29	1053	1057	1120	1	1		1				No flare		
29	1156	1203	1319	2-	5		3	1	1	2	1155	M2.2	5292
29	1319	1348	1449	2-	5		2	1			No flare		
29	1637	1641	1703	1+	3					4	1637	C7.5	5300
29	1827	1830	1855	1	3					3	1817	C4.4	5285
29	2042	2047	2100	1-	1			1			2044	C6.5	5300
30	0211	0233	0300	1-	3			1	1		0227	C2.2	5300
30	0320	0328	0440	1-	3			1	1		0312	C3.5	5290
30	0625	0636	0654	1-	3			1	1		0630E	C3.2	5297
30	0659	0713	0743	1+	3			1	1		0653	C7.0	
30	0833	0839	0906	1-	5			1		1	0831	C2.9	

SUDDEN IONOSPHERIC DISTURBANCES
DECEMBER 1988

Day	Start (UT)	Max (UT)	End (UT)	Imp	Wide Spread Index	Number of Station Reports by Type					Flare (UT)	X-ray Class	NOAA Region
						SWF	SEA	SPA	LF SPA	SES			
30	0912	0916	0939	1-	5			1		1	0911	C2.4	5292
30	1305	1314	1349	1-	5	1	3	1	1	2	1302	C5.3	
30	1713	1716	1736	1	3					2	1713	C2.6	5297
30	1805	1815	1850	2	3					6	1727	X1.4	5292
30	2256	2306	2335	1-	1			1			2255	C3.2	5292
30	2338	2346	0033	1-	1			1			2338	C3.1	
31	0034	0040	0120	1-	1			1			0033	C3.2	
31	0356	0416	0437	1+	3			1	1		0354	C4.8	
31	0437	0505	0627	1	1			1			No flare		
31	0814	0822	0839	1-	1			1			0815	C3.1	5296
31	1400	1403	1441	1-	5		2	1	1	3	1357	C6.0	5296

OBSERVATORIES REPORTING FOR DECEMBER 1988

Amherst, New Hampshire, USA	SES	Louisville, Kentucky, USA	SES
Darmstadt, German Fed Rep	SWF	Maui, Hawaii, USA	SWF
Edenvale, Rep of S. Africa	SES	Panska Ves, Czechoslovakia	SES, SEA, SWF
Farsta, Sweden	SES	Paterson, New Jersey, USA	SES
Hiraiso, Japan	SWF	Sofia, Bulgaria	SES
Houston, Texas, USA	SES	Somersworth, New Hampshire, USA	SES
Inubo, Japan	SPA	Tavares, Florida, USA	SES
Juliusruh, German Dem Rep	SWF	Tucson, Arizona, USA	SES
Kandilli, Turkey	SEA	Uccle, Belgium	SEA
Kuhlungsborn, German Dem Rep	SEA, SPA	Upice, Czechoslovakia	SEA
LaCrescenta, California, USA	SES	Valley Cottage, New York, USA	SES
Latrobe, Pennsylvania	SES	Vlasim, Czechoslovakia	SEA
Lintong, People's Rep of China	SPA		

Observations are not necessarily continuous.

DECEMBER 1988
SIDs BY NOAA/SESC REGIONS

Day :	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	28	29	30	31		
Reg. No.																																	
5254		1					2																										
5258						1																											
5260	1																																
5261	1	2	1																														
5262		1																															
5264					1																												
5265				1		1		8	2				1																				
5269												1	1			1																	
5272												1					1		1														
5273										1				2	2			1		1	2	1											
5274																			1														
5275										1	4	1				2	1																
5278														3	2	1	3	3		2	1	2			1								
5279														1				2		1													
5280																1																	
5282																			2	2													
5283																	1																
5285																				1	3								3	5	2		
5290																							1	1					1			1	
5292																							1	1	3	5	3	4	1	3			
5296																																	2
5297																													3		2		
5300																														2	1		

Number of events with X-Ray flares																																	
	3	5	1	3	3	2	8		8	5	6	4	2	13	9	5	7	10	6	8	3	9	5	6	6	7	7	9	6	11	4		

Number of events with no flare reported																																	
							1	1	1				4		5	2		2	1		4	2	1	5	3	4	1	1	1		1		

Number of events with no flare patrol																																	
	1									2						1		1								2							

Total SID events																																	
	4	7	1	5	3	2	9	3	9	5	8	4	6	14	15	11	7	15	8	11	7	12	9	11	11	12	10	13	9	11	5		

S O L A R R A D I O E M I S S I O N
Spectral Observations

129
Dec 88

DECEMBER 1988

Day	Observation		Sta	Decimetric Band			Metric Band			Dekametric Band			Spectral Type	
	Start (UT)	End (UT)		Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)		
01			CULG				0052.0	0052.0	1				III	
			LEAR				0052.0	0052.0	1				III	
			CULG				0606.0	0606.0	1				III	
			CULG				0710.0	0711.0	1				III	
			LEAR				0710.0	0711.0	1				III	
	0735	1156	WEIS											
	1255	1505	WEIS											
		CULG				2141.0	2144.0	1					III	
02	0737	1503	WEIS											
03			LEAR				0151.0	0152.0	1				III	
			CULG				0152.0	0152.0	1				III	
			CULG				0221.0	0221.0	2				III	
			LEAR				0221.0	0223.0	3				III	
			PALE				0221.0	0223.0	1				III	
			CULG				0223.0	0223.0	2				III	
			LEAR				0351.0	0351.0	1				III	
			CULG				0352.0	0352.0	1				III	
			LEAR				0531.0	0532.0	2				III	
			CULG				0532.0	0532.0	1				III	
			CULG				0547.0	0547.0	1				III	
			LEAR				0547.0	0548.0	1				III	
	0740	1504	WEIS				0912.6	0912.7	1				IIIB	
			WEIS				1157.3	1157.5	1				IIIG	
			WEIS				1159.3	1159.5	1				IIIB	
			SGMR				1315.0	1324.0	1				S	
			WEIS				1315.6	1317.7	3				IIIG	
		WEIS				1321.9	1324.2	2				IIIG		
		WEIS				1440.2	1440.4	3				IIIG		
		WEIS				1442.1	1442.3	1				IIIG		
		SGMR				1448.0	1830.0	1				CONT		
04			CULG				0006.0	0006.0	1				III	
			PALE				0006.0	0007.0	1				III	
			LEAR				0007.0	0007.0	2				III	
			CULG				0132.0	0132.0	1				III	
			LEAR				0132.0	0133.0	2				III	
			LEAR				0315.0	0315.0	2				III	
	0740	1504	WEIS											
0741	1502	WEIS				1132.8	1133.4	1				IIIG		
05			LEAR				0114.0	0114.0	2				III	
			LEAR				0150.0	0151.0	2				III	
			LEAR				0238.0	0238.0	1				III	
			LEAR				0818.0	0819.0	1				III	
			SGMR				1711.0	1711.0	1				III	
			SGMR				1900.0	1900.0	1				III	
			PALE				1908.0	1910.0	2				V	
			SGMR				1908.0	1910.0	2				III	
			CULG				2059.0	2059.0	1				III	
06			CULG				0133.0	0133.0	1				III	
			CULG				0213.0	0213.0	1				III	
			LEAR				0213.0	0216.0	2				III	
			CULG				0216.0	0216.0	1				III	
			CULG							0502.0	0555.0	1	I	
			CULG				0538.0	0539.0	1				III	
			LEAR				0538.0	0546.0	2				III	
			CULG				0544.0	0544.0	1				III	
			CULG				0547.0	0547.0	2				III	
			LEAR				0547.0	0547.0	3				III	
			LEAR				0627.0	0630.0	3				III	
			CULG				0628.0	0630.0	3				III	
			LEAR				0630.0	0631.0	2				III	
			CULG				0631.0	0631.0	1				III	
			LEAR				0814.0	0815.0	2				III	
0744	1202	WEIS				0947.0	1328.0	2				IIIN		
		LEAR				0956.0	0957.0	2				III		

130
Dec 88

S O L A R R A D I O E M I S S I O N
Spectral Observations

DECEMBER 1988

Observation Day (UT)	Start (UT)	End (UT)	Sta	Decimetric Band			Metric Band			Dekametric Band			Spectral Type
				Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	
06	1212	1503	WEIS				1105.2	1110.0	2				IIIG
			LEAR				2358.0	0246.0	1				CONT
07			LEAR				0123.0	0129.0	2				III
			LEAR				0318.0	0323.0	2				III
			LEAR				0415.0	0545.0	1				CONT
			CULG				0432.0	0610.0	1				I
			CULG				0514.0	0633.0	1				S
			LEAR				0525.0	0527.0	3				III
			LEAR				0553.0	0553.0	2				III
			LEAR				0617.0	0618.0	2				III
			LEAR				0629.0	0633.0	3				III
			LEAR				0705.0	0706.0	1				III
			LEAR				0749.0	0759.0	2				S
			SGMR				1230.0	1230.0	1				III
	0743	1503	WEIS				1230.3	1233.9	2				IIIG
			SGMR				1241.0	1241.0	1				III
WEIS						1241.6	1242.5	2				IIIG	
WEIS						1244.7	1246.4	3				IIIG	
WEIS						1350.9	1351.1	1				IIIB	
SGMR						1420.0	1421.0	1				III	
WEIS						1420.6	1424.3	2				IIIG	
SGMR						1423.0	1424.0	1				III	
CULG						2034.0	2035.0	1				III	
CULG						2051.0	2051.0	1				III	
08			LEAR				0019.0	0019.0	2				III
			LEAR				0348.0	0349.0	1				III
			LEAR				0721.0	0721.0	1				III
			LEAR				0731.0	0732.0	1				III
			LEAR				0944.0	0945.0	2				III
	0744	1503	WEIS				0944.7	0945.1	2				IIIG
			WEIS				1223.2	1223.5	1				IIIG
			WEIS				1316.1	1316.2	1				IIIB
			SGMR				1429.0	1430.0	1				V
			WEIS				1429.0	1430.3	3				IIIG
			SGMR				1447.0	1447.0	1				III
			WEIS				1501.9	1502.9	2				IIIG
			SGMR				1502.0	1502.0	1				III
			PALE				1834.0	1836.0	2				III
			SGMR				1834.0	1835.0	2				V
			SGMR				1845.0	1846.0	1				V
			PALE				1846.0	1847.0	1				III
			SGMR				1912.0	1914.0	1				V
			PALE				1951.0	2005.0	3				S
	SGMR				1953.0	2004.0	2				S		
PALE				2017.0	2017.0	2				III			
CULG				2225.0	2227.0	1				III			
LEAR				2226.0	2226.0	1				III			
LEAR				2324.0	2324.0	1				III			
LEAR				2346.0	2347.0	3				III			
PALE				2346.0	2346.0	2				III			
09			CULG				0001.0	0002.0	1				III
			LEAR				0001.0	0002.0	2				III
			PALE				0001.0	0001.0	1				III
			LEAR				0029.0	0116.0	3				S
			CULG				0058.0	0115.0	2				III
			PALE				0058.0	0115.0	3				S
			CULG				0107.0	0110.0	3				III
			LEAR				0141.0	0150.0	2				III
			LEAR				0201.0	0217.0	2				S
			PALE				0203.0	0203.0	1				III
			LEAR				0227.0	0237.0	3				III
			PALE				0227.0	0236.0	2				S
			CULG				0228.0	0238.0	2				III
			LEAR				0237.0	0246.0	1				CONT
		LEAR				0300.0	0301.0	3				III	
		PALE				0300.0	0301.0	2				III	

S O L A R R A D I O E M I S S I O N
Spectral Observations

131
Dec 88

D E C E M B E R 1 9 8 8

Observation Start End Day (UT) (UT) Sta	Decimetric Band			Metric Band			Dekametric Band			Spectral Type
	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	
09				0301.0	0301.0	1				III
				0307.0	0311.0	2				III
				0313.0	0320.0	3				III
				0315.0	0320.0	2				III
				0315.0	0319.0	2				V
				0322.0	0325.0	2				III
				0334.0	0336.0	2				III
				0356.0	1042.0	1				CONT
				0434.0	0447.0	2				S
				0435.0	0448.0	1				S
				0541.0	0552.0	2				S
				0541.0	0543.0	3				III
				0545.0	0552.0	2				III
				0554.0	0603.0	3				III
				0605.0	0610.0	2				III
				0622.0	0632.0	2				III
				0726.0	0727.0	3				III
				0730.0	0735.0	3				III
				0731.0	0736.0	3				III
				0741.0	0816.0	2				S
0748 1037				0849.2	0850.4	1				IIIG
				0924.0	0932.0	2				III
				0924.9	0925.0	1				IIIB
				0931.5	0932.1	2				IIIG
				0936.6	0941.4	1				II
				0948.0	0957.0	2				II
				0950.4	0954.8	1				II
1113 1503				1120.2	1124.6	3				IIIGG
				1135.4	1136.4	2				IIIG
				1348.0	1349.0	1				III
				1348.7	1349.0	2				IIIG
				1356.7	1357.1	1				IIIG
				1400.0	2045.0	1				CONT
				1402.8	1405.7	2				IIIG
				1437.0	1439.0	2				V
				1437.6	1438.4	2				IIIG
				1443.7	1444.1	2				IIIG
				2031.0	2039.0	1				III
				2039.0	2044.0	1				III
				2106.0	2132.0	1				III
			2109.0 2126.0 2							III
				2109.0	2127.0	3				IV
				2153.0	2154.0	2				III
				2153.0	2207.0	2				S
				2157.0	2201.0	1				III
				2201.0	2208.0	3				III
				2227.0	2234.0	2				III
				2228.0	2240.0	1				III
				2307.0	2321.0	1				III
				2308.0	2317.0	3				III
				2312.0	2317.0	3				III
				2319.0	2321.0	2				III
				2320.0	2325.0	1				
				2325.0	2330.0	1				I
				2339.0	0126.0	1				CONT
				2351.0	2351.0	2				III
10				0007.0	0010.0	2				III
				0007.0	0041.0	2				S
				0010.0	0011.0	1				II
				0014.0	0024.0	1				III
				0028.0	0242.0	1				S
				0042.0	0045.0	1				II
				0047.0	0054.0	2				III
				0047.0	0053.0	3				III
				0056.0	0101.0	2				III
				0112.0	0115.0	2				III
				0112.0	0115.0	3				III
				0127.0	0245.0	2				CONT

S O L A R R A D I O E M I S S I O N
Spectral Observations

DECEMBER 1988

Observation Start End Day (UT) (UT) Sta	Decimetric Band			Metric Band			Dekametric Band			Spectral Type	
	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)		
10	CULG			0140.0	0140.0	1				III	
	LEAR			0140.0	0140.0	3				III	
	CULG			0154.0	0159.0	1				III	
	CULG			0159.0	0200.0	2				III	
	LEAR			0159.0	0201.0	3				III	
	CULG			0225.0	0234.0	2				III	
	LEAR			0226.0	0232.0	3				III	
	CULG			0236.0	0242.0	1				III	
	CULG			0241.0	0501.0	1				III	
	LEAR			0246.0	1042.0	2				CONT	
	CULG			0302.0	0302.0	1				III	
	LEAR			0302.0	0302.0	2				III	
	LEAR			0308.0	0311.0	2				III	
	LEAR			0341.0	0342.0	2				III	
	CULG			0421.0	0541.0	1				I	
	LEAR			0427.0	0431.0	3				III	
	CULG			0428.0	0428.0	2				III	
	LEAR			0450.0	0500.0	3				III	
	CULG			0452.0	0455.0	2				III	
	CULG			0452.0	0504.0	1				III	
	CULG			0454.0	0454.0	3				III	
	CULG			0457.0	0500.0	2				III	
	0747 1503	WEIS			0938.2	0938.7	1				IIIG
	WEIS				1026.2	1026.4	1				IIIG
	WEIS				1146.8	1146.9	1				IIIB
	WEIS				1202.7	1206.5	1				IIIG
	WEIS				1209.0	1209.2	1				IIIB
	WEIS				1216.2	1217.7	1				IIIG
	WEIS				1223.3	1223.7	3				DP
	WEIS				1225.1	1229.3	2				IIIGG
	WEIS				1356.2	1359.7	1				IIIG
	SGMR				1422.0	1439.0	2				IV
	WEIS				1422.7	1430.7	3				IIIGG
WEIS				1426.7	1443.8	3				I,DP,RS	
SGMR				1439.0	2045.0	1				CONT	
SGMR				1451.0	1454.0	2				II	
SGMR				1649.0	1659.0	2				III	
LEAR				2218.0	1043.0	2				CONT	
LEAR				2249.0	2250.0	2				III	
LEAR				2253.0	2254.0	2				III	
LEAR				2300.0	2319.0	2				S	
CULG				2303.0	2319.0	2				III	
11	LEAR			0105.0	0105.0	2				III	
	LEAR			0114.0	0115.0	2				III	
	LEAR			0117.0	0118.0	3				III	
	LEAR			0145.0	0152.0	2				III	
	CULG			0317.0	0326.0	2				III	
	LEAR			0317.0	0323.0	3				III	
	CULG			0338.0	0416.0	1				II	
	LEAR			0347.0	0400.0	2				II	
	LEAR			0347.0	0401.0	2				II	
	CULG			0434.0	0714.0	1				S	
	CULG	0624.0	0627.0	1						III	
	CULG				0633.0	0640.0	1				III
	LEAR				0633.0	0641.0	3				III
	CULG				0653.0	0653.0	1				III
	CULG	0721.0	0724.0	2						III	
	LEAR				0724.0	0725.0	2				III
	LEAR				0758.0	0800.0	3				III
	WEIS				0758.3	0759.7	3				IIIG
	0748 1501	WEIS			0854.0	1454.0					IIIN
	LEAR				0946.0	0949.0	3				III
	WEIS				1025.8	1027.8	3				IIIG,RS
	WEIS				1030.4	1003.14	1				Spikes
	WEIS				1117.6	1126.8	3				IIIG
	WEIS				1121.5	1122.8	3				Spikes
	WEIS				1130.2	1131.6	3				IIIGG
	WEIS				1245.8	1248.3	3				IIIG

S O L A R R A D I O E M I S S I O N
Spectral Observations

133
Dec 88

DECEMBER 1988

Observation Start End Day (UT) (UT)	Sta	Decimetric Band			Metric Band			Dekametric Band			Spectral Type	
		Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)		
11	SGMR				1247.0	1249.0	2				V	
	SGMR				1413.0	1413.0	1				III	
	SGMR				1443.0	1443.0	1				III	
	SGMR				1453.0	1454.0	1				III	
	PALE				1914.0	1915.0	1				III	
	PALE				1927.0	1929.0	1				III	
	PALE				2019.0	2031.0	1				S	
	CULG				2051.0	2052.0	1					
	CULG				2210.0	2226.0	1				III	
	LEAR				2217.0	1043.0	2				CONT	
	CULG				2221.0	2221.0	2				III	
	LEAR				2221.0	2222.0	2				III	
	PALE				2221.0	2222.0	1				III	
	PALE				2244.0	2247.0	2				V	
	CULG				2245.0	2247.0	1				III	
	LEAR				2329.0	2329.0	2				III	
	LEAR				2348.0	2348.0	2				III	
12	CULG				0007.0	0007.0	1				III	
	PALE				0007.0	0007.0	1				III	
	LEAR				0008.0	0008.0	2				III	
	CULG				0024.0	0024.0	2				III	
	CULG				0101.0	0102.0	1				III	
	CULG				0111.0	0129.0	1				S	
	CULG				0204.0	0210.0	1				III	
	CULG				0210.0	0214.0	2				III	
	CULG				0215.0	0235.0	2				II	
	CULG				0245.0	0245.0	2				III	
	LEAR				0245.0	0247.0	3				III	
	CULG				0246.0	0246.0	1				III	
	CULG				0335.0	0335.0	1				III	
	CULG				0421.0	0421.0	1				III	
	CULG				0440.0	0440.0	1				III	
	CULG				0509.0	0510.0	1					
	CULG				0512.0	0512.0	1				III	
	CULG				0604.0	0604.0	1				III	
	LEAR				0803.0	0809.0	3				III	
	WEIS				0803.6	0803.8	1				Spikes	
	0751 0934	WEIS				0803.6	0803.7	2				III B
		LEAR				0930.0	0938.0	3				III
		WEIS				0930.8	0931.4	2				III G
	0941 1502	WEIS				1040.6	1041.8	2				III G
		WEIS				1043.3	1043.5	2				III G
		WEIS				1104.8	1104.9	1				III B
		WEIS				1155.2	1155.7	1				III G
		WEIS				1301.7	1302.2	2				III G
		PALE				1752.0	1725.0	2				III
		SGMR				1753.0	1754.0	2				III
		CULG							2057.0	2057.0	1	III
		PALE				2148.0	2148.0	1				III
	LEAR				2225.0	2243.0	2				S	
	PALE				2242.0	2243.0	1				III	
13	LEAR				0023.0	0024.0	3				III	
	PALE				0023.0	0024.0	1				III	
	LEAR				0055.0	0055.0	1				III	
	LEAR				0111.0	0112.0	1				III	
	LEAR				0127.0	1044.0	1				CONT	
	LEAR				0130.0	0133.0	2				III	
	LEAR				0204.0	0216.0	3				III	
	PALE				0211.0	0212.0	1				III	
	LEAR				0216.0	0237.0	2				II	
	LEAR				0426.0	0428.0	2				III	
	CULG				0609.0	0609.0	1				III	
	LEAR				0753.0	0754.0	2				III	
	LEAR				1027.0	1033.0	3				III	
	0750 1503	WEIS				1027.2	1030.2	3				III GG
		WEIS				1031.6	1034.4	2				III GG
		CULG				2105.0	2106.0	1				III

S O L A R R A D I O E M I S S I O N
Spectral Observations

DECEMBER 1988

Day	Observation		Sta	Decimetric Band			Metric Band			Dekametric Band			Spectral Type
	Start (UT)	End (UT)		Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	
13			LEAR				2252.0	2253.0	2				III
			CULG				2253.0	2253.0	1				III
			LEAR				2322.0	2323.0	1				III
			CULG				2353.0	2355.0	3				III
			LEAR				2353.0	2358.0	3				III
			PALE				2353.0	2358.0	2				III
			CULG				2357.0	2357.0	3				III
14			CULG				0220.0	0220.0	1				III
			LEAR				0220.0	0227.0	2				III
			CULG				0227.0	0227.0	1				III
			CULG				0229.0	0229.0	1				III
			LEAR				0358.0	0400.0	2				III
			CULG				0359.0	0359.0	2				III
			CULG				0431.0	0641.0	1				S
			LEAR				0431.0	0439.0	2				III
			LEAR				0500.0	0517.0	2				S
			LEAR				0606.0	0608.0	2				III
			LEAR				0640.0	0641.0	2				III
	0751	1503	WEIS	0845.4	0845.7	2							Spikes
			WEIS	1009.7	1011.3	2							Spikes,RS
			WEIS				1337.4	1337.7	2				IIIG
			WEIS				1338.7	1345.3	2				II HB
			SGMR				1445.0	2045.0	1				CONT
			PALE				1858.0	1913.0	1				S
			CULG				2031.0	2034.0	1				III
		PALE				2033.0	2035.0	2				V	
		CULG				2126.0	2126.0	1				III	
15			CULG				0118.0	0121.0	1				III
			LEAR				0118.0	0125.0	2				III
			CULG				0124.0	0126.0	1				III
			CULG				0258.0	0258.0	2				III
			LEAR				0258.0	0302.0	3				III
			CULG				0259.0	0303.0	1				III
			CULG				0431.0	0439.0	1				III
			LEAR				0431.0	0439.0	3				III
			CULG				0435.0	0437.0	2				III
			CULG				0503.0	0507.0	3				III
			LEAR				0503.0	0507.0	3				III
			CULG				0505.0	0643.0	1				IV
			CULG				0507.0	0537.0	3				II
			LEAR				0507.0	0537.0	2				II
			LEAR				0522.0	0822.0	1				IV
			CULG				0606.0	0612.0	1				III
	0753	0818	WEIS										
	0825	1503	WEIS										
		SGMR				1519.0	1520.0	1				III	
		SGMR				1607.0	1607.0	1				III	
16			LEAR				0125.0	0127.0	2				III
			LEAR				0152.0	0152.0	1				III
			LEAR				0152.0	0228.0	1				CONT
			LEAR				0642.0	0642.0	2				III
			LEAR				0658.0	0658.0	2				III
	0752	1503	WEIS				0827.9	0828.7	2				Spikes
			WEIS				0828.0	1138.0	3				IV P
			LEAR				0831.0	0845.0	3				S
			SVTO				0831.0	0901.0	3				IV
			WEIS				0831.5	0845.2	3				II H,HB
			WEIS				0831.6	0834.1	3				Spikes,RS
			LEAR				0845.0	0000.0	2				IV
			LEAR				0845.0	1046.0	2				IV
			WEIS				0854.6	0856.3	3				Spikes
			SGMR				1538.0	1538.0	1				III
			PALE				1945.0	1946.0	1				III
			CULG							2101.0	2101.0	1	III
			CULG							2127.0	2127.0	2	III
		CULG							2136.0	2136.0	2	III	

S O L A R R A D I O E M I S S I O N
Spectral Observations

135
Dec 88

DECEMBER 1988

Observation Start End Day (UT) (UT) Sta	Decimetric Band			Metric Band			Dekametric Band			Spectral Type
	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	
16							2139.0	2140.0	2	III
	CULG			2216.0	2221.0	1				III
	CULG	2245.0	2247.0	3						III
	PALE			2245.0	2246.0	3				III
	CULG			2247.0	2252.0	2				III
	LEAR			2315.0	1046.0	1				CONT
	LEAR			2351.0	2351.0	2				III
	PALE			2351.0	2351.0	1				III
17	CULG			0000.0	0013.0	1				I
	CULG			0001.0	0002.0	2				III
	LEAR			0001.0	0002.0	2				III
	PALE			0001.0	0002.0	1				III
	CULG			0013.0	0330.0	2				I
	CULG			0032.0	0133.0	1				III
	CULG			0041.0	0043.0	1				III
	LEAR			0046.0	0049.0	2				III
	PALE			0046.0	0049.0	1				III
	PALE			0052.0	0054.0	1				III
	CULG			0152.0	0152.0	2				III
	LEAR			0152.0	0154.0	2				III
	CULG			0154.0	0154.0	2				III
	CULG			0243.0	0247.0	2				III
	LEAR			0243.0	0303.0	2				S
	CULG			0251.0	0327.0	2				III
	LEAR			0306.0	0306.0	3				III
	LEAR			0320.0	0324.0	2				III
	CULG			0425.0	0431.0	1				III
	LEAR			0425.0	0431.0	2				III
	CULG			0449.0	0457.0	1				III
	CULG	0458.0	0500.0	3						III
	LEAR			0459.0	0504.0	3				III
	CULG			0500.0	0504.0	3				II
	CULG			0502.0	0502.0	2				III
	CULG			0504.0	0504.0	2				III
	CULG			0506.0	0543.0	1				IV
	CULG			0513.0	0513.0	2				III
	LEAR			0513.0	0513.0	3				III
	CULG			0537.0	0538.0	1				III
	CULG			0548.0	0548.0	2				III
	LEAR			0548.0	0548.0	3				III
	CULG			0620.0	0624.0	2				III
	LEAR			0620.0	0625.0	3				III
0753 1502	WEIS			1124.2	1124.3	1				III B
	WEIS			1307.4	1307.8	1				III G
	WEIS			1404.9	1405.2	2				III B
	WEIS			1420.7	1420.9	1				III B
	SGMR			1630.0	1631.0	3				III
	PALE			1927.0	1928.0	1				III
	CULG			2226.0	2226.0	1				III
18	CULG			0223.0	0224.0	2				III
	CULG			0329.0	0329.0	2				III
	LEAR			0522.0	0523.0	1				III
	CULG			0523.0	0523.0	1				III
	LEAR			0541.0	0541.0	1				III
	CULG			0542.0	0542.0	1				III
	LEAR			0812.0	0812.0	1				III
	LEAR			0841.0	0841.0	1				III
	LEAR			0900.0	0900.0	1				III
	LEAR			0901.0	0904.0	1				III
0756 1504	WEIS			0902.4	0904.3	3				III G
	LEAR			0905.0	0913.0	1				III
	LEAR			0919.0	0923.0	1				II
	WEIS			0929.8	0930.7	2				DC
	WEIS			1016.7	1020.0	3				III G G
	WEIS			1234.8	1239.7	3				III G G
	SGMR			1412.0	2046.0	1				CONT
	SGMR			1635.0	1642.0	3				III

S O L A R R A D I O E M I S S I O N
Spectral Observations

DECEMBER 1988

Day	Observation		Sta	Decimetric Band			Metric Band			Dekametric Band			Spectral Type
	Start (UT)	End (UT)		Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	
18			PALE				1716.0	1725.0	1				II
			SGMR				1716.0	1728.0	1				II
			SGMR				2135.0	2142.0	3				III
			LEAR				2241.0	1047.0	1				CONT
			CULG				2242.0	2301.0	1				S
			PALE				2242.0	2343.0	1				CONT
19			CULG				0047.0	0047.0	1				III
			LEAR				0209.0	0210.0	2				III
			CULG				0210.0	0210.0	2				III
	0756	1504	WEIS				2118.0	2118.0	1				III
20			CULG				0111.0	0111.0	3				III
			LEAR				0111.0	0112.0	3				III
			PALE				0111.0	0111.0	1				III
			CULG				0151.0	0204.0	1				III
			LEAR				0151.0	0201.0	2				III
			CULG				0200.0	0202.0	2				III
			LEAR				0201.0	0204.0	3				III
			CULG				0208.0	0223.0	1				III
			LEAR				0208.0	0249.0	1				S
			CULG				0216.0	0216.0	1				III
			LEAR				0217.0	0217.0	2				III
			CULG				0242.0	0242.0	2				III
			LEAR				0242.0	0242.0	3				V
			CULG				0250.0	0250.0	2				III
			LEAR				0250.0	0255.0	2				III
			CULG				0254.0	0254.0	2				III
			CULG				0340.0	0340.0	1				III
			LEAR				0340.0	0340.0	2				III
			LEAR				0704.0	0704.0	1				III
			LEAR				0705.0	0915.0	1				CONT
	0755	0839	WEIS				0949.0	0950.0	2				III
			SVTO				0950.0	0951.0	1				III
			LEAR				1024.0	1245.0	2				II
	0845	1503	SGMR				1159.8	1200.3	3				III
			WEIS				1218.0	1325.0	2				III
			WEIS				1219.0	1245.0	3				IV
			SVTO				1220.5	1241.8	3				IV
WEIS						1409.0	1409.3	1				II	
WEIS										2030.0	2036.0	1	H, HB
CULG						2129.0	2129.0	1					III
CULG						2131.0	2131.0	1					III
CULG						2233.0	2233.0	1					III
CULG						2242.0	2242.0	1					III
LEAR				2334.0	1015.0	1					CONT		
21			CULG				0009.0	0009.0	1				III
			CULG				0123.0	0123.0	1				III
			LEAR				0127.0	0128.0	2				III
			CULG				0144.0	0144.0	1				III
			CULG				0259.0	0259.0	1				III
			CULG				0310.0	0310.0	1				III
			CULG				0314.0	0314.0	1				III
			LEAR				0314.0	0315.0	2				III
			LEAR				0424.0	0425.0	2				III
			CULG				0441.0	0441.0	1				III
			LEAR				0441.0	0441.0	2				III
			CULG				0500.0	0500.0	2				III
			LEAR				0501.0	0508.0	2				III
			CULG				0507.0	0507.0	1				III
			LEAR				0611.0	0621.0	2				III
			CULG				0612.0	0612.0	1				III
			CULG				0657.0	0657.0	1				III
			CULG				0658.0	0658.0	1				III
			LEAR				0658.0	0659.0	2				III
			SVTO				0747.0	0747.0	1				III

S O L A R R A D I O E M I S S I O N
Spectral Observations

137
Dec 88

DECEMBER 1988

Day	Observation		Sta	Decimetric Band			Metric Band			Dekametric Band			Spectral Type		
	Start (UT)	End (UT)		Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)			
21	0758	1505	WEIS				1430.0	2048.0	1				CONT		
			SGMR				1908.0	1910.0	1				V		
			LEAR				2215.0	2216.0	1				III		
			CULG				2216.0	2216.0	1				III		
			CULG				2224.0	2224.0	1				III		
			CULG				2242.0	2244.0	1				III		
			CULG				2319.0	2319.0	1				III		
22			CULG				0118.0	0118.0	1				III		
			CULG				0121.0	0121.0	1				III		
			LEAR				0137.0	0138.0	2				III		
			CULG				0138.0	0138.0	1				III		
			LEAR				0207.0	0208.0	2				III		
			CULG				0255.0	0427.0	1				I		
			LEAR				0256.0	0258.0	1				III		
			LEAR				0351.0	0351.0	2				III		
			LEAR				0617.0	0617.0	1				III		
			LEAR				0626.0	0626.0	1				III		
			LEAR				0817.0	0824.0	2				III		
			0756	1431	WEIS				0817.9	0818.2	1				IIIG
					LEAR				0857.0	0858.0	2				III
					LEAR				0900.0	0900.0	1				III
					WEIS				1038.0	1040.4	2				IIIG
			1441	1505	WEIS				1104.0	1104.2	1				IIIG
SGMR						1602.0	1607.0	1				II			
CULG						2059.0	2100.0	1				III			
CULG						2303.0	2310.0	1				III			
LEAR						2303.0	2310.0	1				V			
LEAR						2318.0	2328.0	3				II			
CULG						2319.0	2323.0	1				II			
CULG						2323.0	2340.0	2				II			
PALE				2325.0	2341.0	2				IV					
LEAR				2328.0	0108.0	2				IV					
23			LEAR				0318.0	1049.0	1				CONT		
			LEAR				0553.0	0553.0	2				III		
			0757	1505	WEIS										
					LEAR				0831.0	0837.0	2				III
					LEAR				0848.0	0857.0	2				III
					SGMR				1525.0	1526.0	1				II
					PALE				1936.0	1938.0	2				III
					SGMR				1936.0	1937.0	1				III
					CULG				2041.0	2041.0	1				III
					CULG				2046.0	2048.0	1				III
					CULG				2048.0	2051.0	1				III
24	0757	1507	WEIS				1256.4	1256.6	1				IIIB		
			SGMR				1510.0	1513.0	2				III		
			PALE				1718.0	1720.0	2				III		
			PALE				1819.0	1820.0	2				III		
			PALE				2056.0	2057.0	2				III		
			CULG				2125.0	2222.0	1				S		
			CULG				2130.0	2130.0	1				III		
			25			CULG				0223.0	0327.0	1			
CULG							0300.0	0300.0	1				III		
LEAR							0300.0	0301.0	2				III		
CULG							0446.0	0509.0	1				S		
CULG							0603.0	0603.0	1				III		
LEAR							0603.0	0604.0	2				III		
CULG							0629.0	0629.0	1				III		
CULG							0714.0	0714.0	1				III		
LEAR							0715.0	0715.0	1				III		
0757	1507	WEIS							1211.3	1211.5	2				IIIG,U
		CULG							2038.0	2042.0	1				III
		CULG							2209.0	2209.0	1				III

S O L A R R A D I O E M I S S I O N
Spectral Observations

DECEMBER 1988

Day	Observation		Sta	Decimetric Band			Metric Band			Dekametric Band			Spectral Type	
	Start (UT)	End (UT)		Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)		
26			CULG				0004.0	0004.0	1				III	
			CULG				0125.0	0127.0	1				III	
			LEAR				0125.0	0126.0	1				III	
			CULG				0205.0	0205.0	1				III	
			LEAR				0205.0	0206.0	2				III	
			CULG				0256.0	0619.0	1				S	
			LEAR				0257.0	0258.0	1				III	
			CULG				0306.0	0309.0	1				III	
			LEAR				0306.0	0309.0	2				III	
			LEAR				0409.0	0410.0	1				III	
			LEAR				0457.0	0457.0	1				III	
			CULG				0502.0	0505.0	2				III	
			LEAR				0503.0	0505.0	3				III	
			CULG				0541.0	0545.0	1				III	
			LEAR				0541.0	0545.0	2				III	
			LEAR				0618.0	0619.0	1				III	
			LEAR				0747.0	0752.0	2				III	
		0758	1507	WEIS										III
				CULG				2057.0	2057.0	1				III
				LEAR				2331.0	2331.0	1				III
27			CULG				0003.0	0146.0	1				S	
			LEAR				0003.0	0004.0	1				III	
			LEAR				0050.0	0155.0	1				CONT	
			LEAR				0144.0	0144.0	2				III	
			LEAR				0245.0	1051.0	1				CONT	
			CULG				0351.0	0416.0	1				S	
			CULG				0511.0	0518.0	2				III	
			LEAR				0515.0	0518.0	2				III	
			CULG				0521.0	0523.0	3				III	
			LEAR				0521.0	0532.0	3				S	
			CULG				0523.0	0525.0	2				III	
			CULG				0525.0	0528.0	2				III	
			CULG	0529.0	0532.0	3							III	
			CULG				0533.0	0544.0	2				S	
			LEAR				0538.0	0545.0	2				II	
			CULG				0633.0	0633.0	1				III	
			CULG				0709.0	0714.0	3				III	
			LEAR				0709.0	0729.0	3				S	
			CULG				0714.0	0720.0	1				III	
			CULG				0714.0	0730.0	3				II	
			LEAR				0837.0	0844.0	3				III	
			SVTO				0839.0	0839.0	3				III	
		0759	1459	WEIS			0839.1	0839.6	2				IIIIGG	
				WEIS			0843.3	0843.7	2				IIIIG	
				WEIS			1055.0	1429.0	3				IIIIN	
				WEIS			1141.7	1142.4	1				Spikes	
				WEIS			1219.4	1221.1	2				IIIIG	
				SGMR			1322.0	1322.0	1				III	
				SGMR			1350.0	1400.0	1				S	
				SGMR			1650.0	1653.0	1				V	
				SGMR			1714.0	1735.0	1				S	
				SGMR			1846.0	1846.0	1				III	
				CULG			2132.0	2133.0	2				III	
			CULG			2150.0	2151.0	2				III		
			CULG			2151.0	2151.0	2				III		
			PALE			2211.0	2211.0	2				III		
			LEAR			2303.0	1052.0	1				CONT		
			LEAR			2320.0	2321.0	2				III		
			PALE			2320.0	2321.0	1				III		
28			LEAR				0024.0	0030.0	2				III	
			LEAR				0032.0	0032.0	3				II	
			PALE				0040.0	0042.0	1				II	
			CULG				0109.0	0110.0	2				III	
			LEAR				0109.0	0123.0	2				S	
			CULG				0113.0	0216.0	2				IV	
			CULG				0114.0	0125.0	1				III	
			PALE				0120.0	0125.0	2				V	

S O L A R R A D I O E M I S S I O N
Spectral Observations

139
Dec 88

DECEMBER 1988

Observation			Decimetric Band			Metric Band			Dekametric Band			Spectral Type
Day	Start (UT)	End (UT)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	
28			LEAR			0123.0	0224.0	2				IV
			CULG			0216.0	0315.0	1				IV
			CULG			0238.0	0254.0	1				III
			CULG			0348.0	0348.0	2				III
			LEAR			0348.0	0348.0	2				III
			CULG			0449.0	0449.0	1				III
			CULG			0524.0	0525.0	1				III
			LEAR			0524.0	0529.0	2				III
			CULG			0535.0	0541.0	1				III
			LEAR			0535.0	0546.0	3				S
			CULG			0546.0	0546.0	1				III
			CULG			0601.0	0601.0	1				III
			LEAR			0601.0	0602.0	2				III
			CULG			0704.0	0704.0	1				III
			CULG			0723.0	0733.0	1				III
			LEAR			0751.0	0752.0	2				III
			LEAR			0810.0	0817.0	2				III
			SVTO			0910.0	0910.0	2				III
			LEAR			0956.0	1000.0	2				III
0852	1510		WEIS			0956.1	1000.1	3				IIIGG
			WEIS			1213.3	1215.4	3				IIIG
			WEIS			1219.2	1221.4	2				IIIG
			WEIS			1237.2	1238.7	2				IIIG
			SGMR			1610.0	1611.0	2				III
			SGMR			1622.0	1623.0	1				III
			CULG			2104.0	2104.0	1				III
			PALE			2106.0	2107.0	2				V
			CULG			2107.0	2107.0	3				III
			CULG			2110.0	2240.0	1				S
			CULG			2202.0	2202.0	1				III
			CULG			2250.0	2250.0	1				III
			LEAR			2341.0	2347.0	2				III
			CULG			2342.0	2342.0	1				III
			PALE			2343.0	2348.0	2				III
			CULG			2344.0	2344.0	3				III
			CULG			2344.0	2351.0	2				III
			LEAR			2344.0	2351.0	2				II
			LEAR			2345.0	0000.0	2				II
			CULG			2346.0	2346.0	3				III
29			CULG			0023.0	0023.0	3				III
			LEAR			0023.0	0023.0	2				III
			PALE			0023.0	0023.0	1				III
			CULG			0107.0	0111.0	1				III
			LEAR			0107.0	0110.0	1				III
			CULG			0406.0	0406.0	1				III
			LEAR			0406.0	0407.0	1				III
			CULG			0411.0	0413.0	2				III
			LEAR			0411.0	0413.0	2				III
			CULG			0414.0	0416.0	2				III
			LEAR			0415.0	0417.0	3				III
			CULG			0417.0	0417.0	1				III
			CULG			0432.0	0432.0	2				III
			LEAR			0432.0	0432.0	2				III
			CULG				0716.0		0716.0	0716.0	1	III
			LEAR			0716.0	0716.0	1				III
			LEAR			0755.0	0755.0	1				III
			LEAR			0759.0	0800.0	2				III
			LEAR			0935.0	0937.0	2				III
0758	1509		WEIS			0935.2	0936.6	2				IIIG
			WEIS	1017.4	1018.5	1						Spikes
			WEIS			1231.9	1233.3	3				IIIG
			SGMR			1301.0	1302.0	1				III
			WEIS			1332.4	1332.7	2				IIIB
			PALE			1819.0	1819.0	1				III
			SGMR			1819.0	1819.0	1				III
			CULG			2036.0	2036.0	1				III
			CULG			2044.0	2219.0	1				S

140
Dec 88

S O L A R R A D I O E M I S S I O N
Spectral Observations

DECEMBER 1988

Day	Observation		Sta	Decimetric Band			Metric Band			Dekametric Band			Spectral Type
	Start (UT)	End (UT)		Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	
30			LEAR				0203.0	0203.0	1				III
	0800	1453	WEIS										
	1500	1511	WEIS CULG				2200.0	2200.0	1				III
31			CULG				0343.0	0343.0	1				III
	0759	1512	WEIS				1159.6	1201.3	1				III B
			LEAR				2320.0	2346.0	1				S
			LEAR				2346.0	1053.0	2				CONT

The symbols used under the column heading SPECTRAL TYPE have the following definitions:

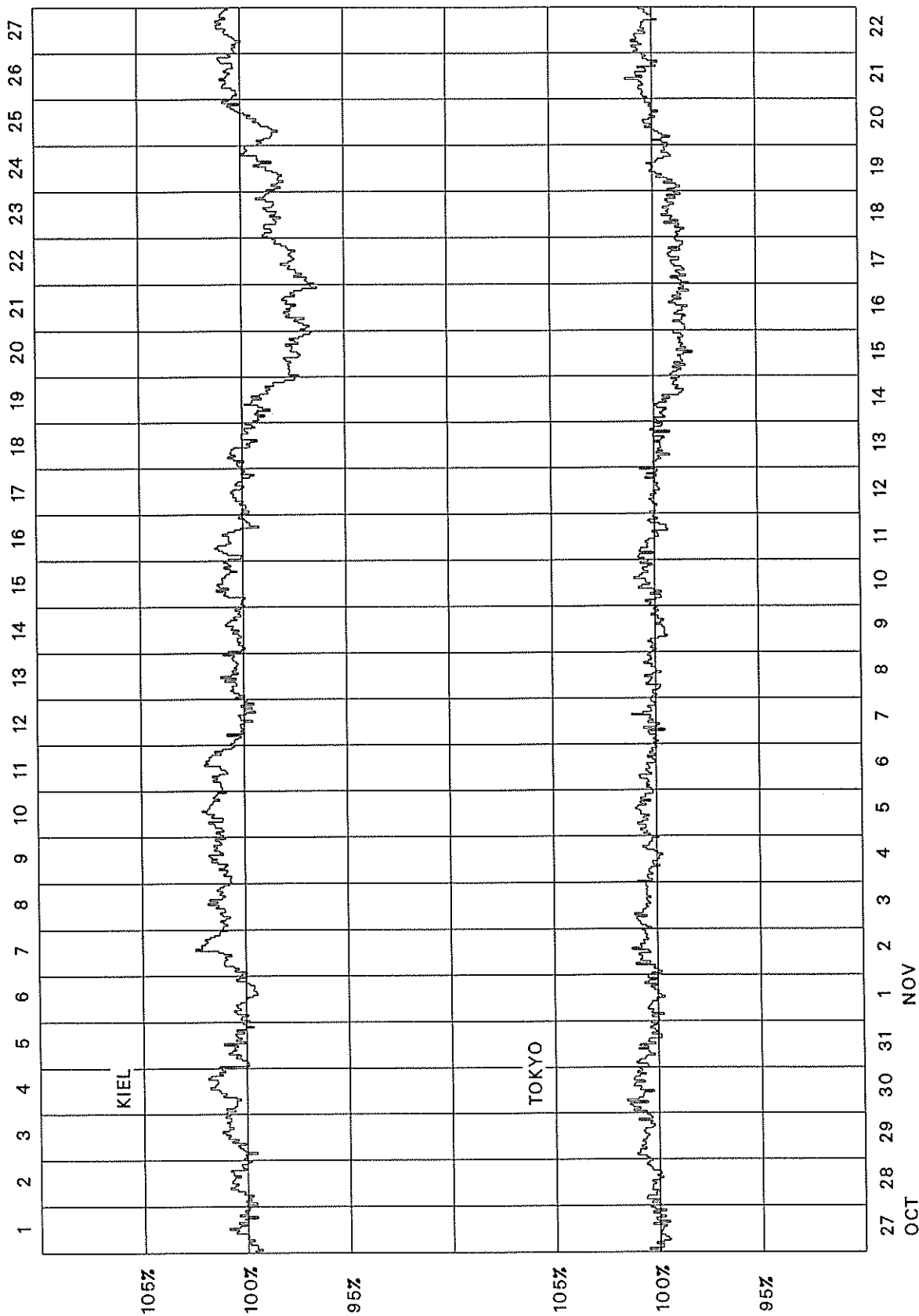
- | | |
|--|-------------------------------|
| B = Single burst | RS = Reverse slope burst |
| G = Small group (< 10) of bursts | DP = Drifting pairs |
| GG = Large group (> 10) of burst | DC = Drifting Chains |
| C = Underlying continuum (particularly with Type I) | H = Herringbone |
| S = Storm in 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 |
| | DCIM = Fast drift |

Stations Reporting:

BLEN = Bleien CULG = Culgoora LEAR = Learmonth PALE = Palehua SGMR = Sagamore Hill
SVTO = San Vito WEIS = Weissenau

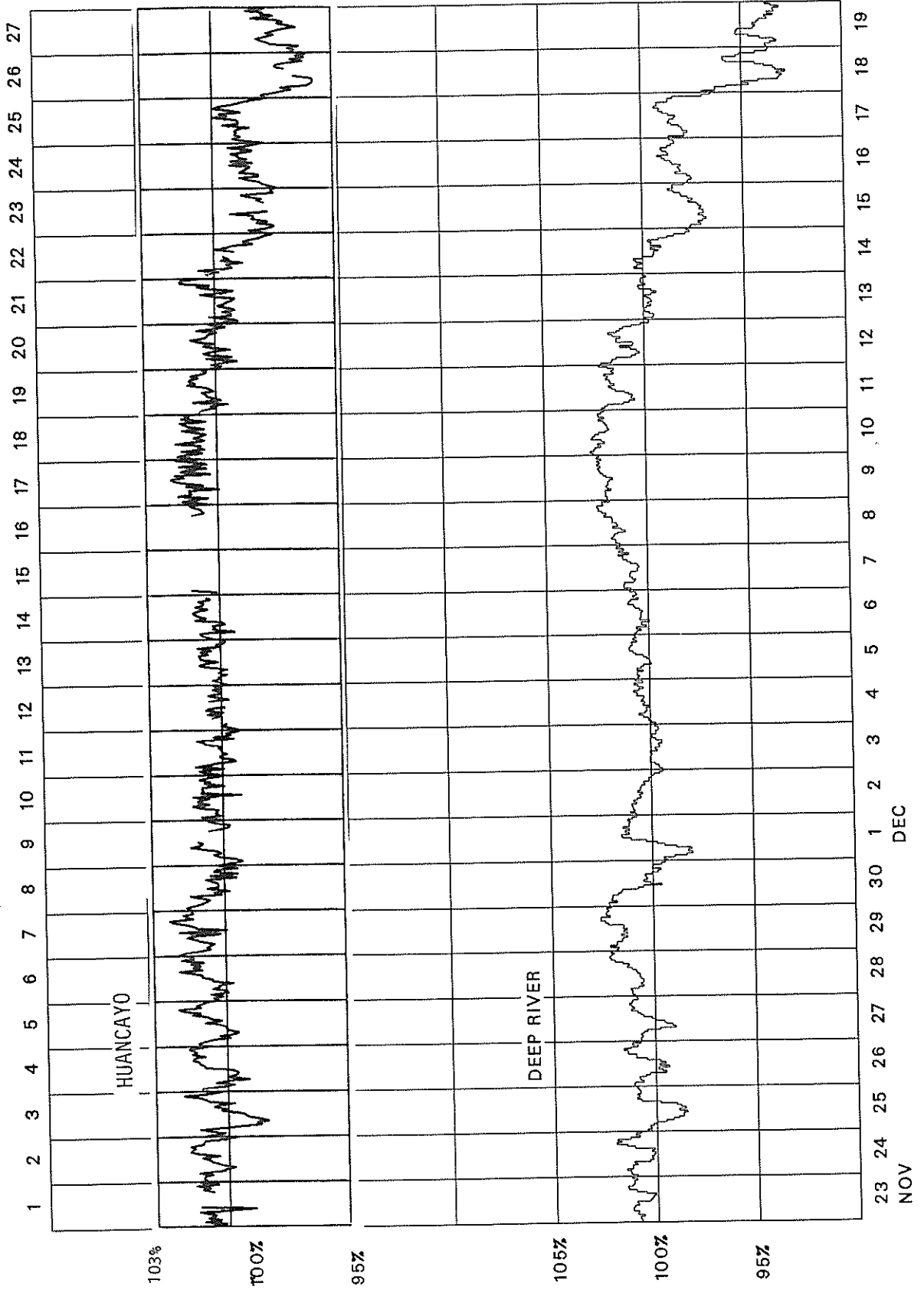
COSMIC RAY INDICES (Neutron Monitor)

Bartels Rotation 2121 (October 1988-November 1988)



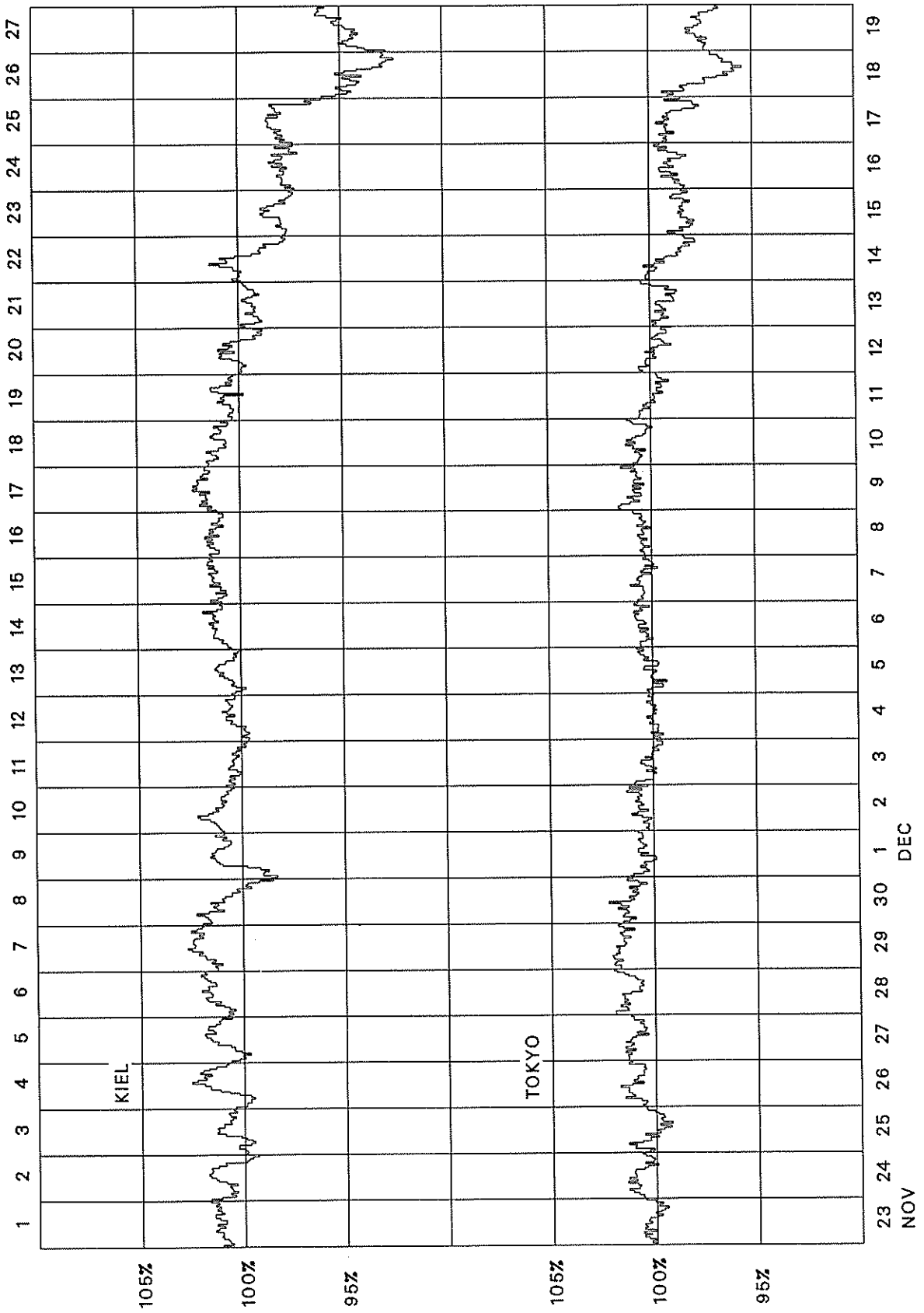
COSMIC RAY INDICES (Neutron Monitor)

Bartels Rotation 2122 (November 1988-December 1988)



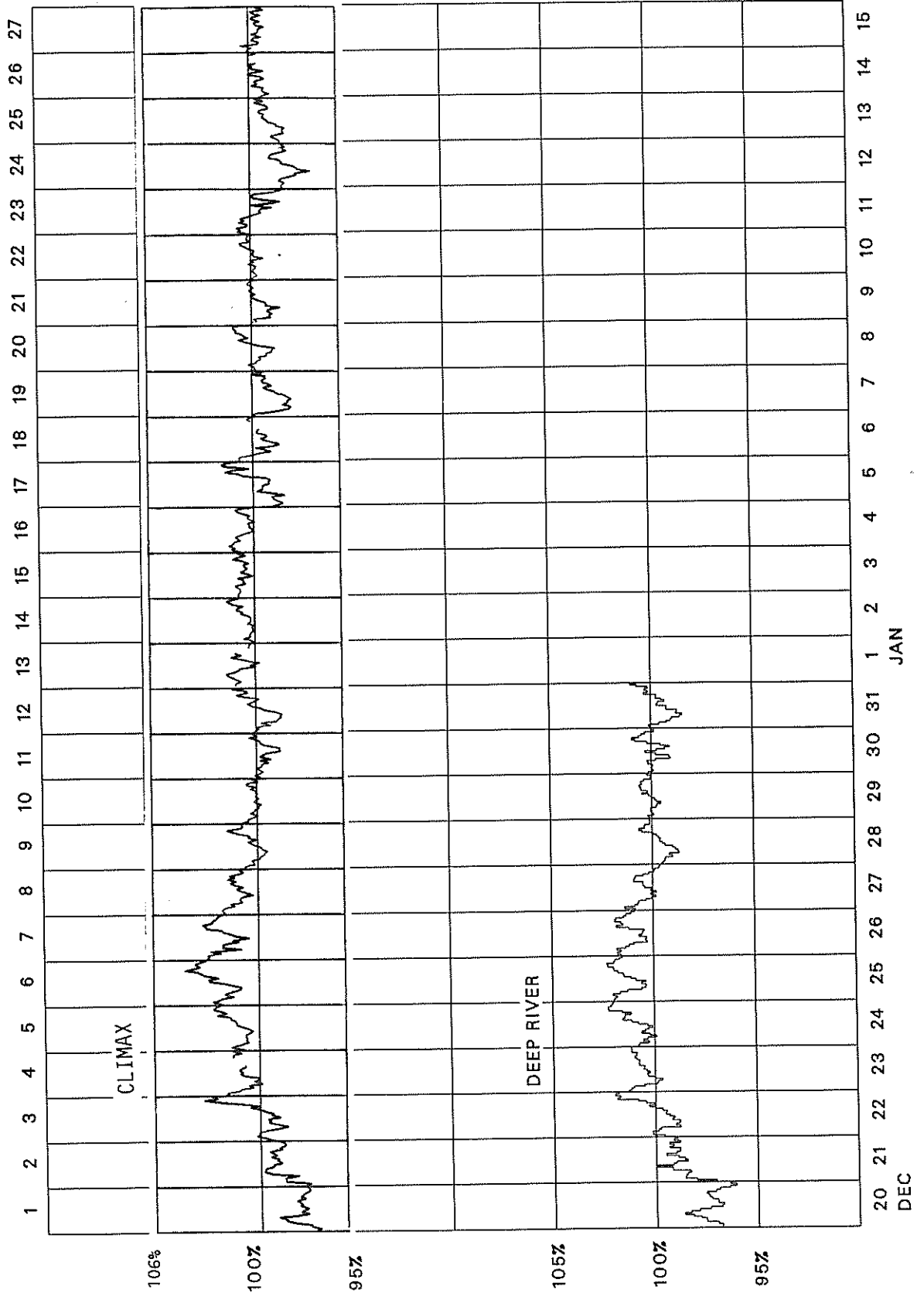
COSMIC RAY INDICES (Neutron Monitor)

Bartels Rotation 2122 (November 1988-December 1988)



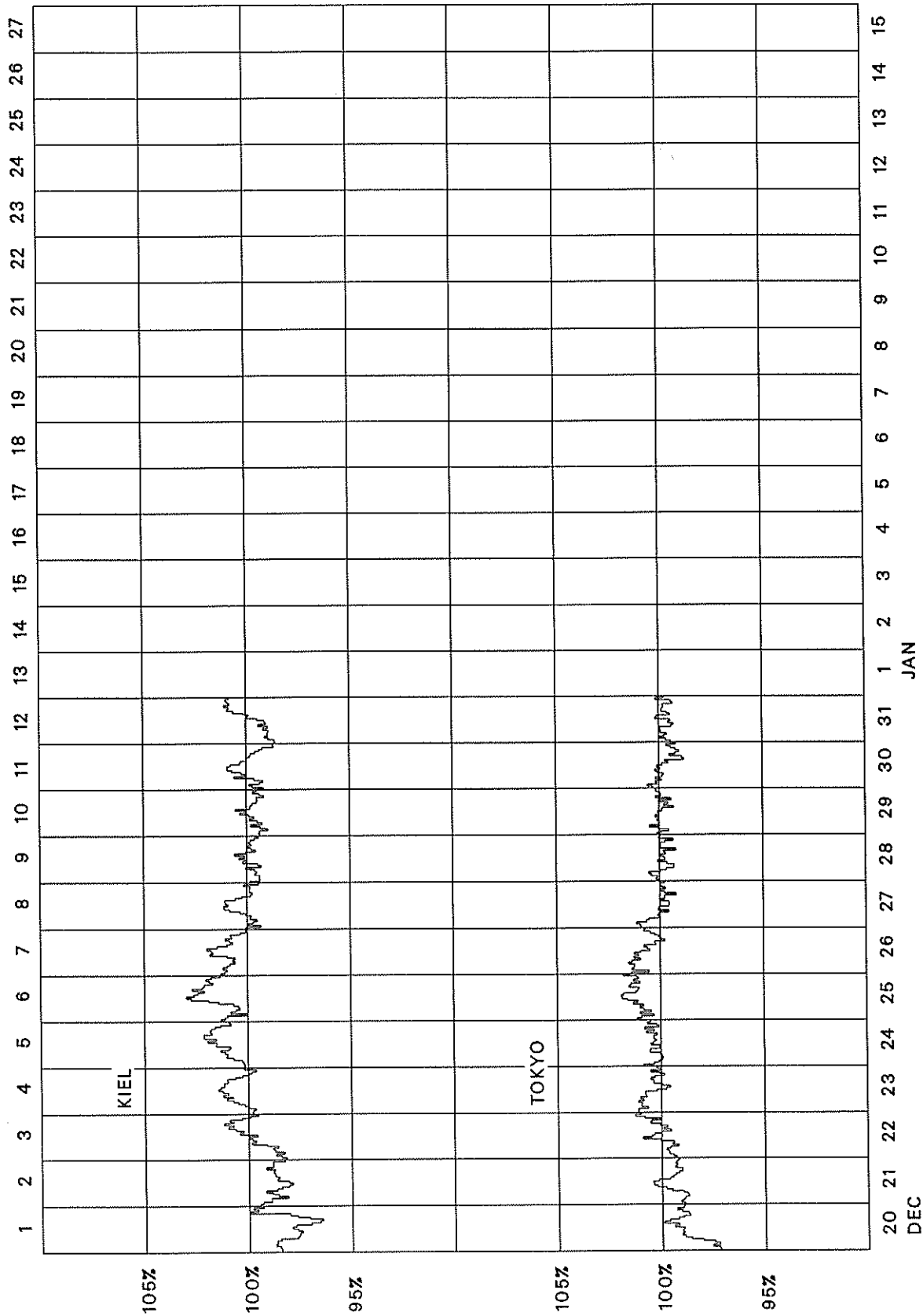
COSMIC RAY INDICES (Neutron Monitor)

Bartels Rotation 2123 (December 1988-January 1989)



COSMIC RAY INDICES (Neutron Monitor)

Bartels Rotation 2123 (December 1988-January 1989)



C O S M I C R A Y I N D I C E S
(Neutron Monitor)

DECEMBER 1988

Day	THULE Average (cts/h)/100	DEEP RIVER Average (cts/h)/300	KIEL Average (cts/h)/100	CLIMAX Average (cts/h)/100	TOKYO Average (cts/h)/256	HUANCAYO Average (cts/h)/100
1		6575.6	5863.8	3818.8	3572.4	1704.7(36)
2		6597.2	5903.3	3830.6	3575.2	1709.4
3		6549.5	5855.2	3810.8	3558.7	1702.5
4		6588.2	5855.0	3803.3	3552.6	1701.6
5		6601.0	5868.9	3805.6	3557.5	1704.6
6		6600.2	5903.5	3831.9	3572.4	1708.9
7		6628.3	5909.1	3852.6	3568.3	1710.0(4)
8		6682.4	5909.9	3876.3	3570.9	1714.5(12)
9		6703.1	5940.4	3875.6	3585.4	1718.5
10		6714.1	5900.5	3879.9	3577.3	1716.8
11		6663.2	5872.7	3844.3	3550.6	1708.2
12		6627.2	5837.2	3816.6	3546.9	1701.7
13		6554.9	5802.0	3788.5	3534.2	1694.9
14		6529.2	5812.9	3781.1	3523.1	1687.1
15		6405.8	5720.7	3703.5	3497.5	1666.9
16		6459.4	5708.8	3716.7	3516.4	1674.7
17		6459.9	5717.0	3714.3	3514.9	1683.2
18		6207.2	5489.5	3559.3	3451.6	1643.1
19		6169.6	5539.5	3591.9	3464.2	1655.5
20		6193.5	5573.5	3600.6	3469.6	1668.4(28)
21		6295.5	5605.7	3645.9	3493.8	1675.4(16)
22		6369.0	5664.1	3691.9	3517.1	---
23		6410.0	5712.1	3721.0	3533.6	1694.0(10)
24		6434.4	5748.1	3735.5	3527.3	1691.2
25		6463.2	5770.9	3779.7	3558.3	1695.6
26		6444.1	5736.6	3766.5	3543.7	1693.8
27		6392.7	5691.2	3733.0	3517.2	1684.2
28		6345.5	5668.2	3700.4	3511.1	1683.1
29		6378.0	5658.7	3693.4	3514.3	1687.7
30		6367.3	5673.3	3672.8	3506.4	1686.5
31		6343.2	5666.8	3679.6	3506.3	1681.5
Mean		6475.9	5760.6	3751.8	3531.8	1691.0

For less than 24-hour coverage, parentheses enclose the number of hours for which data are available. For Climax and Huancayo, parentheses enclose the number of section hours whenever the sum of both sections falls below 40 hours.

DAILY AVERAGE INDICES Ap

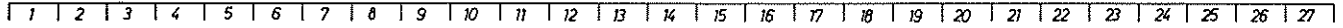
January 1988 to December 1988

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	5	2	4	13	5	6	14	8	21	11	7	5
2	29	5	6	19	7	5	10	5	12	5	30	15
3	7	3	10	48	7	2	7	6	8	3	26	18
4	14	7	19	78	13	3	4	2	7	9	8	10
5	14	29	8	24	20	10	5	6	4	18	10	4
6	31	11	19	48	106	8	11	5	3	38	13	3
7	24	6	11	15	13	6	8	5	5	6	17	3
8	19	5	26	7	13	6	10	3	6	7	18	5
9	7	11	13	10	10	8	3	13	4	17	12	4
10	4	13	12	16	11	9	7	9	7	85	14	8
11	11	11	14	9	6	7	21	8	51	13	10	17
12	21	16	9	14	5	4	15	16	20	6	18	14
13	7	14	5	10	5	6	5	17	10	6	8	20
14	48	7	12	9	4	20	7	21	11	6	11	13
15	63	19	20	6	6	9	11	16	12	6	13	10
16	5	15	14	5	11	6	22	8	6	10	18	25
17	7	14	9	5	24	10	6	5	20	15	11	35
18	12	19	7	7	18	14	9	8	34	30	8	25
19	10	7	4	9	6	21	9	8	23	12	4	20
20	12	5	6	7	6	13	3	17	11	18	2	7
21	9	26	2	8	10	5	26	7	11	7	6	11
22	7	97	3	44	8	12	27	24	20	3	4	13
23	2	36	5	21	6	8	12	10	11	6	2	4
24	5	12	5	7	8	17	7	11	8	6	4	4
25	6	14	10	6	6	27	6	15	12	4	7	22
26	8	9	49	5	8	17	16	9	8	7	20	25
27	12	7	34	6	3	9	12	15	5	8	12	20
28	6	5	26	11	3	10	11	9	5	9	9	14
29	4	3	32	6	7	26	7	13	4	3	8	20
30	3		34	7	12	22	6	12	8	5	37	11
31	3		11		9		8	13		10		12
MEAN	13	15	14	16	12	11	10	10	12	13	12	13

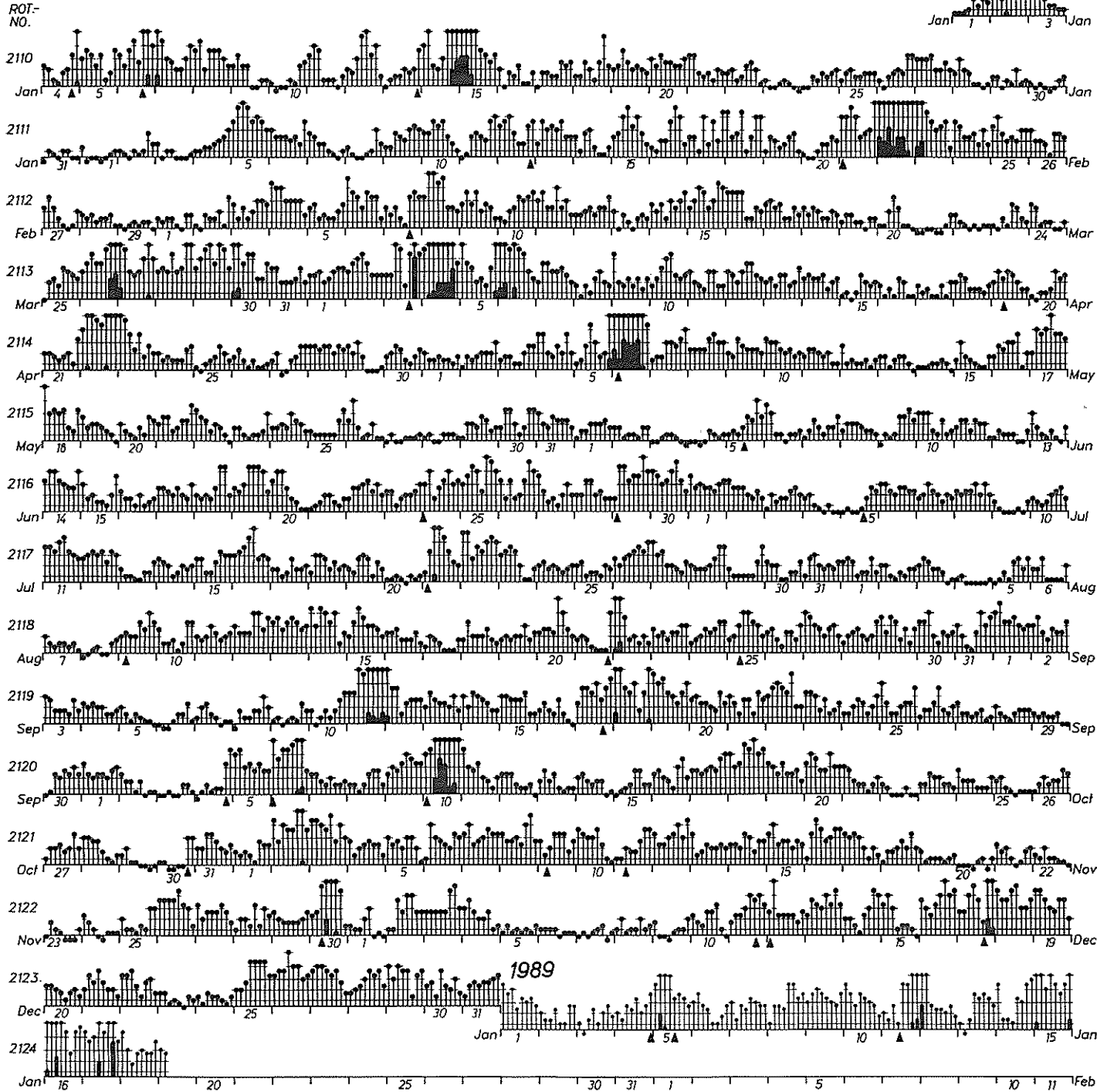
PLANETARY 3-HOUR-RANGE INDICES (Kp) BY 27-DAY SOLAR ROTATION INTERVAL

University of Göttingen

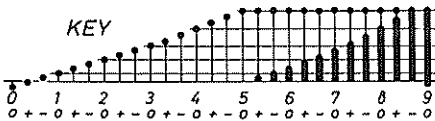
DAYS IN SOLAR ROTATION INTERVAL



1988



KEY

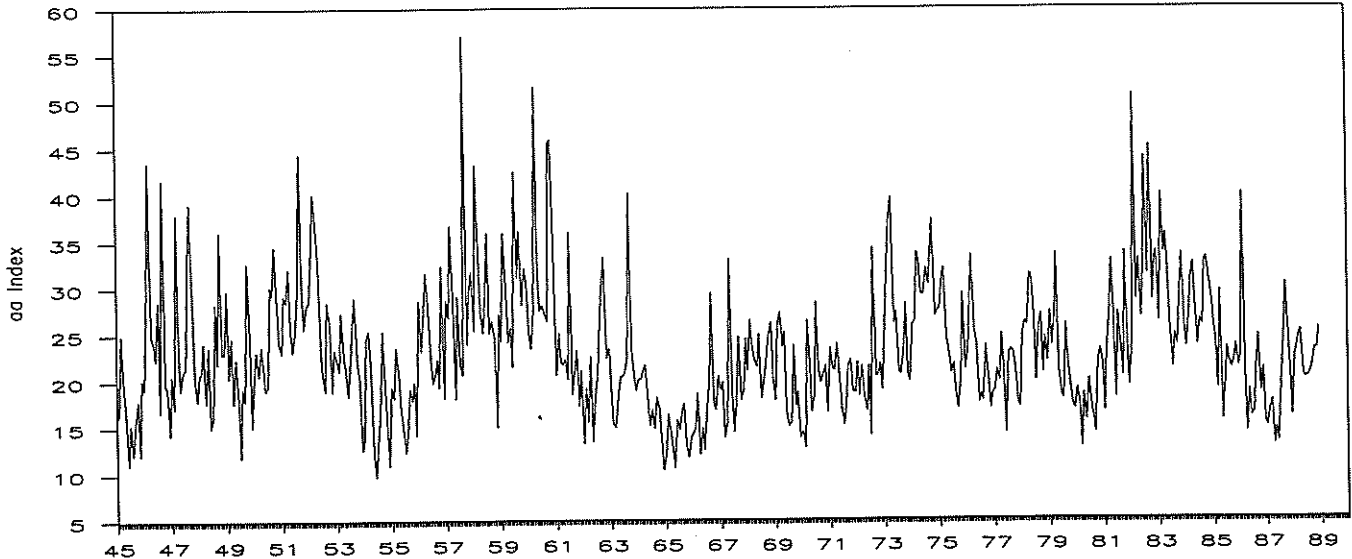


▲ = sudden commencement

PLANETARY MAGNETIC
THREE - HOUR - RANGE INDICES
Kp 1988

(preliminary indices to 1989 January 19)

MONTHLY MEAN aa INDICES 01/45-12/88



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1945	16.1	16.4	25.0	19.1	15.4	11.1	15.3	12.1	15.6	17.9	12.0	20.2	16.3
1946	19.2	30.2	43.5	25.0	24.1	22.3	28.6	16.7	41.7	19.6	19.3	14.3	25.4
1947	20.6	17.1	37.9	23.3	19.1	21.1	21.4	32.9	39.1	31.3	20.7	17.9	25.2
1948	20.8	21.0	24.2	17.7	23.7	15.0	16.2	28.3	22.0	36.1	23.1	23.0	22.6
1949	29.8	20.4	24.7	17.6	22.4	17.9	11.8	19.2	17.8	32.7	24.6	15.1	21.2
1950	19.5	23.2	20.6	23.8	21.7	19.0	19.5	30.2	29.3	34.5	28.0	24.0	24.4
1951	23.1	29.2	28.5	32.1	25.5	23.2	25.2	29.7	44.4	30.3	25.7	28.2	28.8
1952	28.5	34.3	40.1	38.0	33.1	23.8	20.7	19.0	28.5	26.4	18.9	23.4	27.9
1953	22.3	21.2	27.4	22.7	21.4	18.4	22.5	26.1	29.0	22.4	20.2	12.6	22.2
1954	13.9	24.5	25.5	20.6	12.0	9.7	13.1	16.5	25.4	21.1	14.5	10.9	17.3
1955	19.3	18.2	23.6	21.1	16.7	15.1	12.3	14.3	19.1	17.8	19.9	14.1	17.6
1956	28.7	23.3	27.6	31.7	29.3	23.5	19.8	20.7	22.4	19.3	32.3	18.2	24.7
1957	28.7	26.8	36.7	28.8	18.1	29.1	21.7	20.7	57.0	24.0	29.5	31.7	29.4
1958	25.5	43.2	36.1	27.6	25.2	29.7	36.0	25.1	26.5	24.7	15.0	27.2	28.5
1959	24.3	35.9	29.9	24.2	25.7	21.6	42.5	31.2	36.1	28.2	32.1	30.8	30.2
1960	25.2	23.5	27.6	51.5	31.6	27.6	28.1	27.2	26.4	45.6	45.9	34.5	32.9
1961	20.6	25.1	22.0	21.8	22.3	20.1	36.0	18.5	20.7	23.3	17.3	21.1	22.4
1962	13.2	19.2	15.5	22.6	13.4	18.1	21.0	26.2	29.8	33.3	22.5	23.5	21.5
1963	19.3	15.3	14.9	18.2	20.4	20.5	20.8	22.5	40.2	23.5	20.7	18.9	21.3
1964	20.1	20.1	21.0	21.7	17.5	15.1	16.9	14.8	18.2	16.9	13.8	10.3	17.2
1965	11.8	16.3	14.3	12.6	10.5	15.7	14.7	16.8	17.5	13.1	11.7	13.8	14.1
1966	14.2	14.8	18.6	12.0	14.8	12.5	17.1	20.0	29.4	17.5	16.8	20.5	17.3
1967	18.9	19.8	13.8	15.5	33.1	18.6	14.4	17.5	24.7	17.8	18.9	24.5	19.8
1968	21.1	26.5	23.3	22.2	21.4	24.9	18.0	20.1	22.0	24.8	26.2	20.3	22.6
1969	17.8	25.8	27.3	23.6	25.2	16.7	15.0	15.3	23.8	17.2	18.7	13.8	20.0
1970	14.4	12.7	26.4	23.1	16.6	18.3	28.4	21.0	19.7	20.6	21.6	16.5	19.9
1971	23.5	21.2	21.1	23.9	21.1	17.0	15.2	17.1	21.4	22.2	18.8	18.6	20.1
1972	21.9	18.3	21.5	18.1	16.6	21.5	14.0	34.2	20.4	20.4	21.8	18.9	20.6
1973	26.1	32.7	36.9	39.6	26.1	27.3	20.9	20.6	22.8	28.2	20.7	19.9	26.8
1974	25.8	26.4	33.7	32.9	29.2	29.2	32.0	30.2	33.7	37.3	26.8	27.5	30.4
1975	27.6	31.1	32.0	24.3	22.7	20.7	21.7	18.1	16.9	20.2	29.3	21.1	23.8
1976	23.3	28.5	33.4	25.4	23.7	17.5	18.4	17.7	23.7	20.4	16.9	18.6	22.3
1977	18.7	21.0	19.9	24.9	20.1	14.2	22.9	23.2	23.0	20.9	17.3	17.0	20.3
1978	24.6	26.2	25.9	31.3	31.2	28.3	19.9	25.6	27.0	20.8	24.6	22.0	25.6
1979	27.3	23.7	26.9	33.5	21.0	18.3	17.9	26.0	22.0	19.3	17.1	16.8	22.5
1980	19.0	17.3	12.7	18.4	15.6	20.0	17.0	15.9	14.2	21.9	23.3	21.7	18.1
1981	16.5	23.1	26.6	32.8	26.9	18.0	27.2	24.0	20.4	33.7	24.1	19.3	24.4
1982	24.2	50.6	28.5	32.9	26.7	32.1	43.9	31.4	45.1	28.5	33.0	33.8	34.2
1983	26.2	40.0	33.6	35.7	31.6	24.9	21.3	24.9	23.7	28.3	33.5	26.0	29.1
1984	23.5	26.7	30.7	32.5	27.2	23.7	26.4	25.8	32.6	33.1	31.0	29.0	28.5
1985	25.7	24.1	19.0	29.5	15.6	19.9	23.4	22.0	21.2	22.2	23.7	21.4	22.3
1986	22.4	40.0	21.1	14.3	18.8	15.9	16.3	22.3	24.7	18.6	21.2	15.3	20.9
1987	14.8	16.6	17.6	12.9	14.7	13.2	19.3	24.3	30.3	25.8	22.4	16.0	19.0
1988	22.4	23.4	24.8	25.2	20.5	20.0	20.2	20.6	21.4	23.2	23.3	25.5	22.5

PRINCIPAL MAGNETIC STORMS

151
Dec 88

DECEMBER 1988

Sta	Geomag Lat	Commencement Day	Time (UT)	Type	SC Amplitudes			Maximum 3-Hour K Index Day(3-Hour Periods)	Ranges			End Hour Day (UT)
					D (Min)	H (Gamma)	Z (Gamma)		K (Min)	D (Gamma)	Z (Gamma)	
ETT	00.6S	02	0100	..	..	..	..	-	4	109	40	02 24
KRC	16.4N	09	2144	..	..	..	..	11(7) 13(5)	5	5	135	50 14 --
HYB	07.6N	09	2100	..	..	..	..	09(8) 10(4)	4	3	153	19 10 22
GUA	04.0N	09	2141	..	..	..	..	09(8)	5	--	80	30 10 04
FRD	49.6N	11	1827	SC*	2.0	- 19	- 3.8	12(2)	4	16	49	31 12 06
HYB	07.6N	11	0100	..	..	..	..	11(5,6)	5	3	148	22 12 18
ETT	00.6S	11	0130	..	..	..	..		-	6	159	65 12 19
HYB	07.6N	12	2200	..	..	..	..	13(3,5,6,7)	4	2	111	24 14 02
GUA	04.0N	12	0300	SC*	.5	42	- 12	12(2)	5	--	100	20 12 17
KGL	56.5S	12	0300	SC*	..	- 48	- 8	12(2)	4	12	72	28 12 17
ETT	00.6S	12	2200	..	..	..	..		-	4	185	78 14 04
ETT	00.6S	14	1330	..	..	..	..		-	3	75	33 15 10
COL	64.6N	16	11--	..	..	..	..	16(6)	7	205	1100	560 17 02
UJJ	13.5N	16	0100	..	..	..	..		-	4	81	39 17 15
ABG	09.5N	16	0100	..	..	..	..	16(5,6) 17(4,5)	4	5	139	40 17 15
HYB	07.6N	16	0100	..	..	..	..	16(5)	5	3	147	38 17 15
ANN	01.5N	16	0100	..	..	..	..		-	3	174	80 17 15
ETT	00.6S	16	0100	..	..	..	..		-	5	201	74 17 17
GUA	04.0N	17	0426	SC	..	..	..	17(4)	5	--	100	20 17 17
COL	64.6N	17	1824	SC*	58	319	14	17(7)	7	156	1300	590 19 21
COL	64.6N	17	07--	..	..	..	..	17(4)	8	228	1740	590 17 15
FRD	49.6N	17	1824	SC	4.6	26	- 8	17(7,8) 18(1)	5	24	133	40 19 11
BJI	28.5N	17	1824	SC	0.9	63	4	17(7)	6	9	127	22 19 20
HON	21.2N	17	1826	SC	..	..	..		-	--	--	-- -- --
KRC	16.4N	17	1824	SC	- 3.6	67	32	17(7)	7	8	135	65 20 12
UJJ	13.5N	17	1821	SC	- 1.0	41	- 15		-	5	84	40 19 04
ABG	09.5N	17	1821	SC	- 1.6	46	- 13	17(7)	6	5	98	29 19 04
HYB	07.6N	17	1826	SC	- 0.8	50	- 4	17(7)	6	4	104	41 19 20
GUA	04.0N	17	1824	SC*	- .5	31	- 9	17(8)	6	--	160	30 18 10
ANN	01.5N	17	1821	SC	- 2.5	62	37		-	4	120	100 19 04
ETT	00.6S	17	1824	SC	- 1.2	47	27		-	4	167	72 19 21
HER	33.7S	17	1825	SC	- 10	* 38	25	17(7,8)	6	27	115	133 18 03
GNA	43.2S	17	1825	SC	5.4	59	35	17(8)	6	28	120	150 18 19
GUA	04.0N	18	2117	..	..	..	..	19(2)	5	--	90	30 19 21
FRD	49.6N	21	1224	SC*	- 2.0	- 15	3.5	22(1)	4	7	51	17 22 11
KGL	56.5S	22	1649	SC	2	24	8	22(7)	4	13	72	16 22 21
SIT	60.0N	25	08--	..	..	..	..	25(4)	7	--	--	500 26 20
FRD	49.6N	25	----	..	..	..	..	25(4,5,6) 26(4)	5	19	137	44 27 21
BJI	28.5N	25	04--	..	..	..	..	25(4)	6	10	147	24 27 21
KRC	16.4N	25	08--	..	..	..	..	25(4,7)	6	5	135	67 31 --
UJJ	13.5N	25	0400	..	..	..	..		-	4	117	36 27 24
ABG	09.5N	25	0400	..	..	..	..	25(5,6,7)	5	5	178	38 27 24
HYB	07.6N	25	0400	..	..	..	..	25(4,5,6)	6	4	185	29 27 18
GUA	04.0N	25	08--	..	..	..	..	25(4)	6	--	130	10 25 20
ANN	01.5N	25	0400	..	..	..	..		-	5	184	65 27 24
ETT	00.6S	25	0400	..	..	..	..		-	6	221	83 27 21
HER	33.7S	25	10--	..	..	..	..	25(5,6,7)	5	27	92	98 25 20
GNA	43.2S	25	09--	..	..	..	..	25(4,6,7)	5	21	110	140 27 19
UJJ	13.5N	28	0500	..	..	..	..		-	4	55	47 30 24
ABG	09.5N	28	0500	..	..	..	..	29(4)	4	4	83	52 30 24
ANN	01.5N	28	0500	..	..	..	..		-	4	115	69 30 24
ETT	00.6S	28	0100	..	..	..	..		-	4	125	45 28 23

Stations:

ABG = ALIBAG
ANN = ANNAMALAINAGAR
API = APIA
BJI = BEIJING
CNB = CANBERRA
COL = COLLEGE

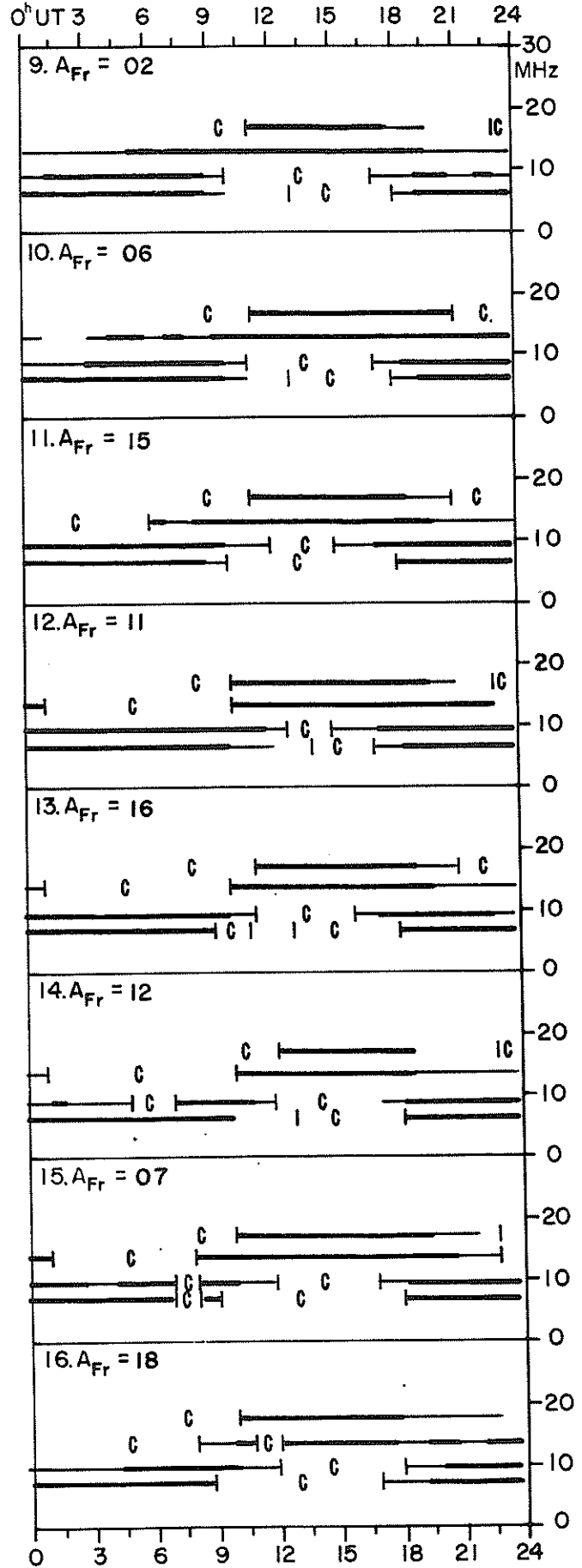
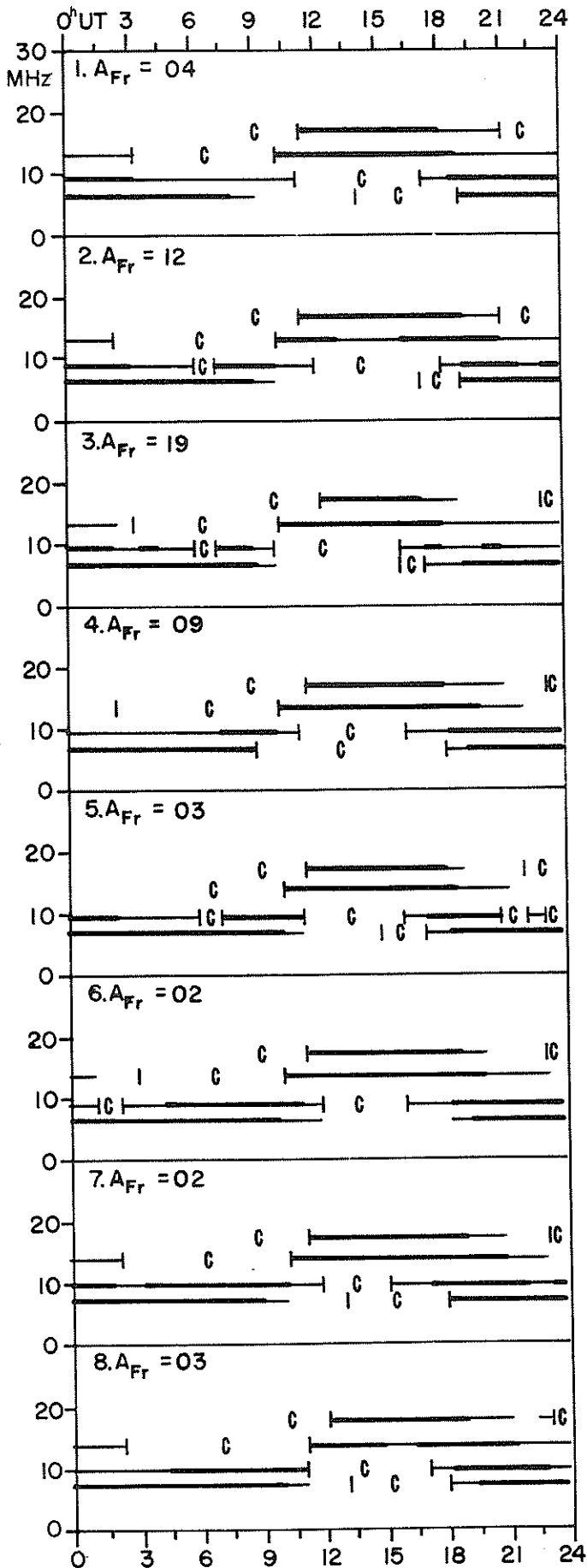
ETT = ETAIYAPURAM
FRD = FREDERICKSBURG
GNA = GNANGARA
GUA = GUAM
HER = HERMANUS

HON = HONOLULU
HYB = HYDERABAD
JAI = JAIPUR
KGL = KERGUELEN
KRC = KARACHI

PMG = PORT MORESBY
SHL = SHILLONG
SIT = SITKA
TRD = TRIVANDRUM
UJJ = UJJAIN
WIT = WITTEVEEN

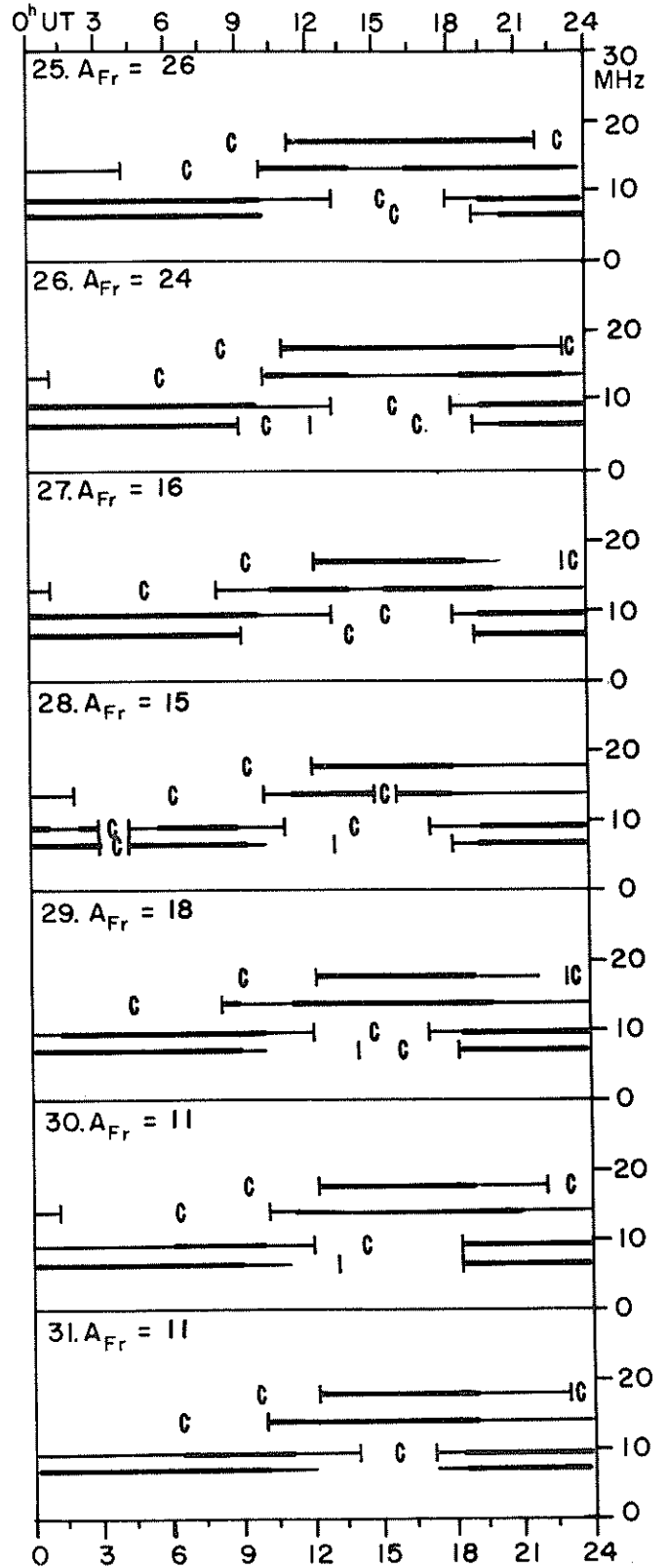
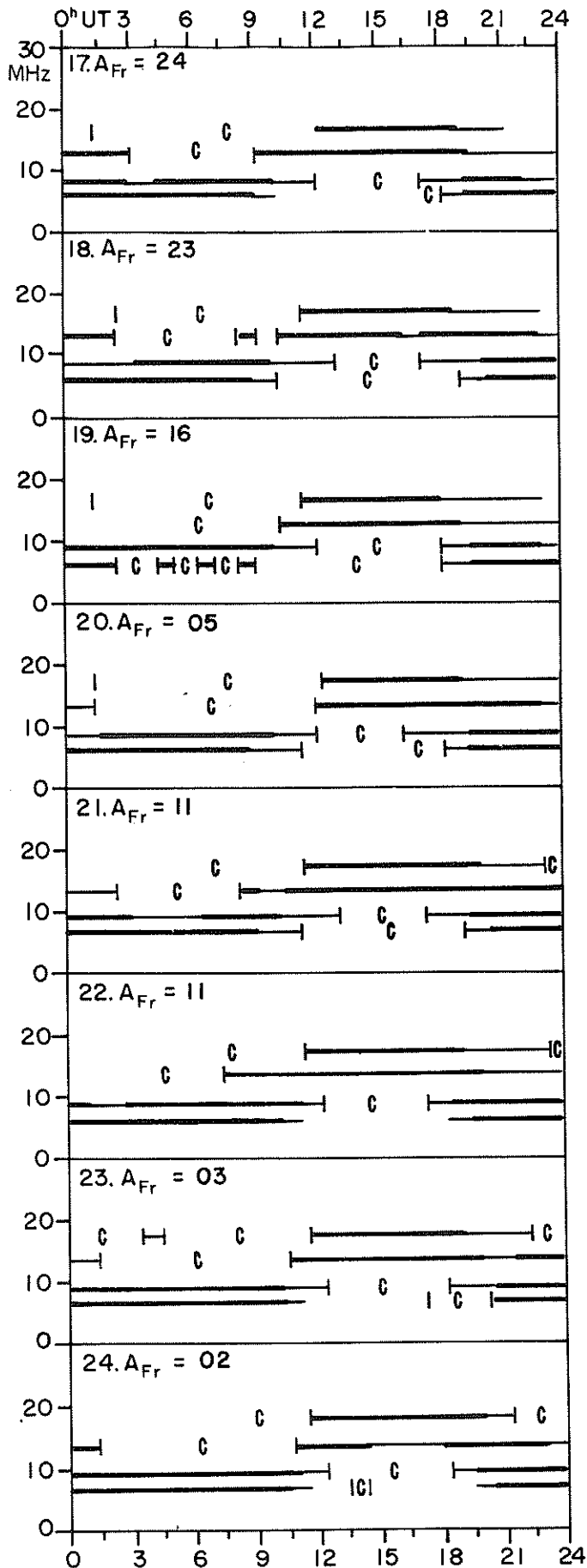
TRANSMISSION FREQUENCY RANGES--NORTH ATLANTIC PATH

DECEMBER 1988



TRANSMISSION FREQUENCY RANGES--NORTH ATLANTIC PATH

DECEMBER 1988



Field strengths from four frequencies, 6.4, 8.6, 13.0, and 17.0 MHz, observed on a Norddeich-New York circuit are represented above. Heavy solid lines represent field strengths \geq -12 dB above $1 \mu\text{V}/\text{m}$ (transmitter power reduced to 1 kW). Observed field strengths between -12 dB and -40 dB above $1 \mu\text{V}/\text{m}$ are represented by the fine line.

RADIO PROPAGATION QUALITY INDICES
DECEMBER 1988

Day	For Circuits from Norddeich to:					
	Bracknell England	Rome Italy	Teheran Iran	New York USA (East)	Tokyo Japan	Canberra Australia
1.	3.6	5.6	3.5	3.4	3.0	4.8
2.	5.2	5.8	5.2	3.8	5.8	5.9
3.	4.5	4.5	4.1	3.2	5.4	5.0
4.	4.3	4.5	4.9	4.4	5.1	4.8
5.	5.4	5.6	4.6	4.5	5.4	5.1
6.	5.6	5.7	5.5	5.7	4.4	6.3
7.	5.6	5.9	5.0	4.9	4.2	6.0
8.	6.5	6.0	6.0	5.4	6.0	6.0
9.	5.2	6.0	6.3	5.1	5.8	5.0
10.	6.9	7.2	6.4	7.2	5.8	7.2
11.	6.7	6.7	7.4	7.0	7.0	6.8
12.	6.7	6.6	6.0	7.7	6.5	6.0
13.	6.3	6.8	6.8	6.4	7.1	6.1
14.	6.1	6.1	5.1	6.1	6.3	5.7
15.	5.3	5.5	5.7	6.2	6.4	5.2
16.	6.0	4.9	6.1	5.0	6.3	5.9
17.	6.2	5.6	4.9	4.6	6.4	5.5
18.	6.7	6.2	6.3	5.2	7.5	5.9
19.	5.8	5.5	6.0	5.0	7.2	5.8
20.	5.4	4.8	5.8	5.6	7.0	5.4
21.	6.4	5.5	5.4	6.2	6.7	5.9
22.	6.7	5.7	6.1	6.6	8.1	6.3
23.	5.8	5.0	5.2	6.2	7.1	5.9
24.	6.6	5.6	5.8	5.9	6.5	5.4
25.	6.5	5.9	6.1	5.9	7.1	6.5
26.	6.4	6.1	5.5	5.2	6.5	6.6
27.	5.7	5.5	5.7	4.8	5.4	5.8
28.	5.1	4.6	5.8	4.6	6.4	5.0
29.	5.2	5.8	7.1	4.8	5.7	2.4
30.	6.2	5.3	5.2	5.6	6.1	5.1
31.	6.3	7.8	6.2	6.3	6.7	6.0
MEAN:	5.8	5.8	5.7	5.4	6.2	5.7

CALCULATION OF QUALITY INDICES (Q):

From all 24 hourly field strength values and from all frequencies of the same circuit a median field strength value is calculated (FD). This daily value is compared with the average value (FA) of the preceeding 27 days (1 sun rotation).

$$Q = 6.0 + 20 \log (FD/FA)/3.0$$

The quality indices vary from 0.1 to 9.9 where 6.0 is normal. Conditions are "normal" (index = 6.0), if they respond to the average of the preceeding 27 days.

SCALE FOR QUALITY INDICES:

- 0.1 - 1.0 = very poor
- 1.1 - 3.0 = poor
- 3.1 - 5.0 = fair
- 5.1 - 7.0 = normal
- 7.1 - 9.0 = good
- 9.1 - 9.9 = very good

C O N T E N T S

Prompt Reports

LATE DATA

Number 534 Part I

Page

SOLAR RADIO EMISSION

East-West Solar Scans at 43 cm - Fleurs December 1988 additions 156
Spectral Observations - Culgoora November 1988 data updated. 157-160

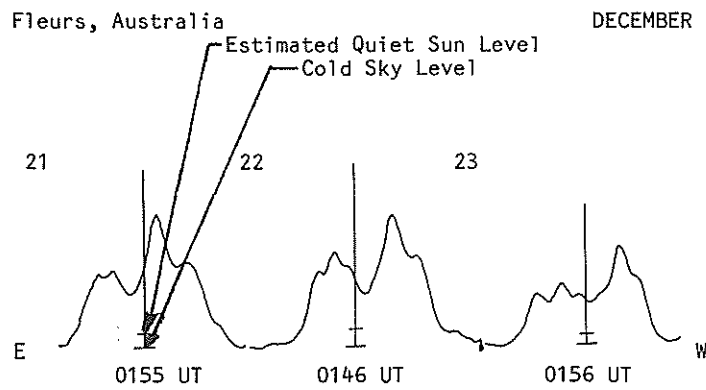
COSMIC RAY MEASUREMENTS BY NEUTRON MONITOR ****ERRATA****. 161
Climax April 1988 Daily Counting Rates

GEOMAGNETIC INDICES

Sudden Commencements/Solar Flare Effects November 1988. 162
Provisional Values of Hourly Equatorial Dst August-December 1987. . . . 163-167

156
Late
Dec 88

EAST - WEST SOLAR SCANS



DECEMBER 1988

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

S O L A R R A D I O E M I S S I O N
Spectral Observations

157
Late
Nov 88

NOVEMBER 1988

Day	Observation		Sta	Decimetric Band			Metric Band			Dekametric Band			Spectral Type
	Start (UT)	End (UT)		Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	
01	0000	0715	CULG										IC
	2015	2400	CULG				2015.0	2252.0	1				
02	0000	0557	CULG				0252.0	0252.5	1				IIIB
			CULG				0322.0	0322.5	1				IIIB
	2015	2400	CULG				2125.0	2125.0	1	2125.0	2125.0	1	IIIB
			CULG				2140.0	2140.0	1	2140.0	2140.0	1	IIIB
			CULG				2151.0	2205.0	1	2151.0	2205.0	1	IIIGG
03	0000	0437	CULG										
	0455	0715	CULG				0459.0	0459.0	1	0459.0	0459.0	1	IIIB
	2015	2400	CULG				2123.0	2124.0	3	2123.0	2124.0	3	IIIB
			CULG				2126.0	2132.0	1	2126.0	2132.0	1	II
			CULG				2144.0	2147.0	2	2144.0	2147.0	2	IIIG
			CULG				2158.0	2207.0	1				IIIB,N
			CULG				2247.0	2258.0	2	2247.0	2258.0	2	IIIG
			CULG				2302.0	2400.0	1	2302.0	2400.0	1	IIIB,N
04	0000	0715	CULG				0000.0	0223.0	1				IIIB,N
			CULG				0224.0	0224.0	2	0224.0	0224.0	1	IIIB
			CULG				0537.0	0537.0	1	0537.0	0537.0	1	IIIB
			CULG				0652.0	0715.0	1				IIIB,N
			CULG				0657.0	0715.0	1				I,DC
	2015	2400	CULG				2015.0	2400.0	1	2015.0	2400.0	1	IIIB,N
05	0000	0715	CULG				0000.0	0430.0	1	0000.0	0430.0	1	IIIB,N
			CULG				0431.0	0715.0	1	0431.0	0715.0	1	IIIS
	2016	2400	CULG				2016.0	2400.0	1	2016.0	2400.0	1	IIIB,N
			CULG				2131.0	2222.0	2	2131.0	2222.0	2	IIIB,N
06	0000	0716	CULG				0000.0	0716.0	1	0000.0	0716.0	1	IIIB,N
			CULG				0017.0	0107.0	2	0017.0	0107.0	2	IIIB,N
			CULG				0111.0	0111.0	2	0111.0	0111.0	2	IIIB
			CULG				0125.0	0125.0	2	0125.0	0125.0	2	IIIB
			CULG				0137.0	0137.0	2	0137.0	0137.0	2	IIIB
			CULG				2016.0	2400.0	1				IIIS
	2016	2400	CULG				2016.0	2400.0	1				IIIS
			CULG				2027.0	2027.0	2	2027.0	2027.0	2	IIIB
			CULG				2328.0	2329.0	1				IIIG
07			CULG				0000.0	0716.0	1				IIIS
	0000	0716	CULG				0000.0	0716.0	1				IIIS
			CULG				0323.0	0323.0	1				IIIB
	2016	2400	CULG				2016.0	2210.0	1				IIIS
			CULG				2051.0	2051.0	2	2051.0	2051.0	2	IIIB
			CULG				2210.0	2400.0	1				IIIN
08	0000	0716	CULG				0000.0	0716.0	1				IIIN
			CULG				0515.0	0515.0	1				IIIB
			CULG				0629.0	0629.0	1				IIIB
	2016	2400	CULG				2016.0	2150.0	1	2016.0	2150.0	2	IIIS
			CULG				2040.0	2400.0	2	2040.0	2400.0	2	IIIB,G
09	0000	0716	CULG				0000.0	0619.0	1	0000.0	0619.0	1	IIIB,N
	2016	2400	CULG				2133.0	2400.0	1	2133.0	2400.0	1	IIIB,N
10	0000	0716	CULG				0000.0	0659.0	1	0000.0	0659.0	1	IIIN
			CULG				0034.0	0034.0	2	0034.0	0034.0	2	IIIB
			CULG				0336.0	0336.0	2	0336.0	0336.0	2	IIIB
			CULG				0605.0	0605.0	3	0605.0	0605.0	3	IIIB
			CULG				0611.0	0611.0	3	0611.0	0611.0	3	IIIB
			CULG				0613.0	0636.0	3	0613.0	0636.0	3	II B
			CULG				0635.0	0651.0	2	0635.0	0651.0	2	II B
	2016	2400	CULG				2045.0	2045.0	1				IIIB
			CULG				2132.0	2132.0	1				IIIG
11	0000	0716	CULG				0003.0	0003.0	1				IIIG
			CULG				0107.0	0107.0	1				IIIG
			CULG				0222.0	0355.0	1				IIIN

158
Late
Nov 88

S O L A R R A D I O E M I S S I O N
Spectral Observations

NOVEMBER 1988

Day	Observation		Sta	Decimetric Band			Metric Band			Dekametric Band			Spectral Type			
	Start (UT)	End (UT)		Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)				
11			CULG				0424.0	0424.0	1				I1IB			
			CULG				0626.0	0628.0	2	0626.0	0628.0	2	I1IG			
	2016	2400	CULG				2055.0	2055.0	1				I1IB			
			CULG				2211.0	2213.0	2	2211.0	2213.0	2	I1IG			
			CULG				2338.0	2339.0	2	2338.0	2339.0	2	I1IB			
			CULG				2358.0	2358.0	1				I1IB			
12	0000	0716	CULG				2025.0	2025.0	1				I1IB			
			CULG				2054.0	2059.0	2	2054.0	2059.0	2	I1IG			
	2016	2400	CULG				2059.0	2107.0	1				I1IGG			
			CULG				2224.0	2225.0	3	2224.0	2225.0	3	I1IG			
			CULG				2225.0	2235.0	1				I1IGG			
			CULG													
13	0000	0716	CULG				0052.0	0053.0	3	0052.0	0053.0	3	I1IG			
			CULG				0056.0	0056.0	1				I1IB			
	2016	2400	CULG				0128.0	0130.0	1				I1IG			
			CULG				0135.0	0137.0	2	0135.0	0137.0	2	I1IG			
			CULG				0137.0	0156.0	1				IS,DC			
			CULG				0248.0	0252.0	2	0248.0	0252.0	2	I1IG			
			CULG				0456.0	0457.0	2	0456.0	0457.0	2	I1IG			
			CULG				0531.0	0539.0	3	0531.0	0539.0	3	I1IGG			
			CULG				0537.0	0555.0	1	0537.0	0555.0	1	I1 B			
			CULG				0556.0	0604.0	1				BN(UNCLF)			
			CULG				0713.0	0716.0	3	0713.0	0716.0	3	I1I/V,B			
			CULG				2016.0	2400.0	1				I1IN			
			CULG				2133.0	2159.0	2	2133.0	2159.0	2	I1IN			
			CULG				2305.0	2309.0	3	2305.0	2309.0	3	I1IG			
CULG				2308.0	2326.0	2	2308.0	2326.0	2	I1 B						
14	0000	0716	CULG				0014.0	0014.0	3	0014.0	0014.0	3	I1IB			
			CULG				0047.0	0051.0	3	0047.0	0051.0	3	I1IG			
	2016	2400	CULG				0058.0	0416.0	1				I1IN			
			CULG				0210.0	0220.0	2	0210.0	0220.0	2	I1IG			
			CULG				0236.0	0250.0	2	0236.0	0250.0	2	I1IG			
			CULG				0642.0	0642.0	1				I1IB			
			CULG				2016.0	2400.0	1	2016.0	2400.0	1	I1IBN			
			CULG				2243.0	2243.0	2	2243.0	2243.5	2	I1IB			
			15	0000	0717	CULG				0256.0	0256.0	1				I1IB
						CULG				0310.5	0319.0	1	0310.5	0319.0		I1IGG
2017	2400	CULG					0438.5	0439.0	1				I1IG			
		CULG					0453.5	0454.5	1	0453.5	0454.5	1	I1IG			
		CULG					0515.5	0636.0	1				I1IB,G,N			
		CULG					2017.0	2400.0	1				I1IB,N			
		CULG					2109.5	2110.0	1				I1IG			
		CULG					2220.5	2228.0	1				I1IGG			
		CULG					2228.0	2234.5	1	2238.0	2234.5	1	I1IGG			
		CULG					2239.0	2400.0	1				IC			
CULG				2243.5	2244.0	2	2243.5	2444.0	2	I1IG						
CULG				2249.0	2249.5	2	2249.0	2249.5	2	I1IG						
CULG				2313.0	2313.5	2	2313.0	2313.5	2	I1IG						
CULG				2348.0	2353.5	3	2348.0	2353.5	3	I1IGG						
16	0000	0716	CULG				0000.0	0716.0	1				I1IG			
			CULG				0000.0	0003.5	1				I1IG			
	2017	2400	CULG				0022.5	0039.0	2	0022.5	0039.0	2	I1IB,N			
			CULG				0051.0	0423.0	1				I1IB,G,N			
			CULG				0113.5	0117.5	2	0113.5	0117.5	2	I1IGG			
			CULG				0614.0	0615.5	1				I1IG			
			CULG				0626.0	0648.0	1				I1IG,B,N			
			CULG				2117.5	2124.0	2	2117.5	2124.0	2	I1IGG			
CULG				2146.0	2147.0	3	2146.0	2147.0	3	I1IG						
CULG				2156.5	2159.0	2	2156.5	2159.5	2	I1IG						
17	0000	0716	CULG				0002.5	0003.5	2	0002.5	0003.5	2	I1IB			
			CULG				0004.0	0007.0	1	0004.0	0007.0	1	I1IB,N			
			CULG				0030.0	0030.0	2	0030.0	0030.0	2	I1IB			
			CULG				0105.0	0106.0	1				I1IG			

S O L A R R A D I O E M I S S I O N
Spectral Observations

159
Late
Nov 88

NOVEMBER 1988

Observation Start End Day (UT) (UT) Sta	Decimetric Band			Metric Band			Dekametric Band			Spectral Type
	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	
17				0107.0	0109.0	1				IIIG
				0202.0	0203.0	1	0202.0	0203.0	1	IIIG
				0322.0	0323.5	1	0322.0	0324.0	1	IIIG
				0329.5	0334.0	2	0329.5	0334.0	2	IIIGG
				0501.0	0505.0	1	0501.0	0505.0	1	IIIGG
				0557.0	0558.0	2	0557.0	0558.5	2	III,V,B
				0631.0	0631.0	1				IIIB
			0639.0	0639.0			0639.0	0641.5	3	III,V,B
2016	2400			1639.0	0641.0	3				IC,DC
				2016.0	2400.0	1				IIIB
				2131.0	2131.0	1				IIIB
				2145.5	2146.5	1	2145.5	2146.5	1	IIIG
18	0000	0716								IC,DC
				0000.0	0716.0	1				IIIN,B
							2017.0	2400.0	1	IC,DC
2017	2400			2017.0	2315.0	1				IIIB
				2048.0	2048.0	2	2048.0	2048.0	2	IIIG
				2050.5	2053.0	1	2050.5	2053.0	1	IIIG
19	0000	0717		0252.0	0252.0	1				IIIB
				0409.0	0409.0	1	0409.0	0409.5	1	IIIB
				0428.0	0428.0	1				IIIB
				0553.0	0717.0	1				IIIB,N
				0636.0	0640.0	1				IIIB,N
				2017.0	2148.0	1				IIIB,N
2017	2400			2017.0	2035.0	1				IC,DC
				2220.0	2220.0	1	2220.0	2220.5	1	IIIB
20	0000	0717		0332.5	0333.0	1				IIIG
				0353.5	0356.0	1	0353.5	0356.0	1	IIIG
				0435.0	0436.0	1				IIIG
				0436.5	0437.0	1	0436.5	0437.0	1	IIIG
				0507.0	0513.0	1				IIIGG
				0530.5	0530.5	1				IIIB
				0544.0	0634.5	1				IIIB,G,N
				0545.0	0545.0	2	0545.0	0545.5	2	IIIB
				0612.0	0612.5	1	0612.0	0612.5	1	IIIG
				0618.5	0620.5	1	0618.5	0620.5	1	IIIG
				0708.5	0709.5	1				II
2017	2400			2017.0	2400.0	1				IC
				2022.0	2400.0	2	2022.0	2400.0	2	IIIB,G,N
				2029.0	2031.0	2	2029.0	2031.0	2	IIIG
				2323.0	2328.0	3	2323.0	2328.0	3	IIIG
21	0000	0717		0000.0	0717.0	1				IC
				0046.0	0047.0	2	0046.0	0047.0	2	IIIG
				0107.0	0108.0	2	0107.0	0108.0	2	IIIG
				0115.0	0118.0	2	0115.0	0118.0	2	IIIGG
				0157.0	0201.0	2	0157.0	0201.0	2	IIIGG
				0205.0	0205.0	2	0205.0	0205.0	2	IIIB
				0238.0	0240.0	3	0238.0	0240.0	3	IIIG
				0244.0	0247.0	2	0244.0	0247.0	2	III/V
				0301.0	0301.0	2	0301.0	0301.0	2	IIIG
				0333.0	0336.0	2	0333.0	0336.0	2	IIIGG
				0437.0	0717.0	1	0437.0	0717.0	1	IIIB,G,N
				0506.0	0506.5	1				IIIG
				0544.0	0544.0	2	0544.0	0544.0	2	IIIB
				0545.5	0546.0	2	0545.5	0546.0	2	IIIG
				0557.0	0557.0	2				IIIB
				2038.0	2038.0	1	2038.0	2038.0	1	IIIB
				2047.5	2048.0	1	2047.5	2048.0	1	IIIG
2108	2400			2108.0	2400.0	1	2108.0	2400.0	1	IC,DC
				2132.0	2132.0	3	2132.0	2132.0	3	IIIB
				2218.5	2200.0	1	2218.5	2200.0	1	IIIG
				2223.0	2226.5	2	2223.0	2226.5	2	IIIG
				2250.0	2255.0	2	2250.0	2255.0		IIIGG
				2314.0	2318.0	1				II
22	0000	0718		0000.0	0030.0	1	0000.0	0030.0	1	IDC
				0216.0	0325.0	1	0216.0	0325.0	1	IIIB,G,N

ERRATA: Climax Apr 87 data printed in SCD 527 p. 150 in error

161
Late
Apr 88

C O S M I C R A Y I N D I C E S
(Neutron Monitor)

APRIL 1988

Day	THULE Average (cts/h)/100	ALERT Average (cts/h)/100	DEEP RIVER Average (cts/h)/300	KIEL Average (cts/h)/100	CLIMAX Average (cts/h)/100	TOKYO Average (cts/h)/256	HUANCAYO Average (cts/h)/100
1	4309	7054.5	6759.3	6035.6	3959.7	3612.5	1743.6
2	4306	7068.0	6754.2	6013.9	3948.3	3609.2	1743.9
3	4269	6997.2	6702.2	5975.9	3924.5	3602.5	1739.3
4	4229	6933.5	6643.6	5946.7	3900.7	3601.9	1726.8(34)
5	4249	6963.7	6682.2	5970.1	3915.1	3597.8	1436.2
6	4262	6986.5	6678.8	5973.2	3897.2	3595.3	1738.9
7	4251	6935.0	6691.6	5956.1	3892.5	3574.0	1726.2(36)
8	4239	6959.0	6686.9	5943.8	3885.0	3568.2	1729.4
9	4255	6988.6	6692.2	5954.9	3889.5	3587.3	1730.0
10	4281	7001.5	6735.2	5987.4	3908.7	3597.7	1731.9
11	4291	7031.9	6748.5	5989.9	3913.3	3594.0	1734.4(28)
12	4310	7067.2	6794.2	6024.4	3946.6	3594.8	1721.0(6)
13	4328	7095.3	6829.8	6056.0	3958.0	3603.7	1726.1
14	4331	7109.0	6839.2	6068.7	3968.8	3619.5	1728.8
15	4329	7074.8	6856.2	6079.8	3968.3	3627.4	1732.6
16	4338	7064.0	6844.6	6058.3	3957.1	3625.4	1729.3
17	4349	7100.2	6833.1	6050.8	3969.3	3622.6	1724.3
18	4336	7041.6	6852.0	6058.3	3973.3	3623.8	1727.8
19	4338	7092.6	6853.2	6055.8	3966.9	3622.0	1729.0(38)
20	4355	7103.1	6877.7	6070.2	3975.2	3626.9	1733.2
21	4357	7139.5	6874.9	6082.9	3982.8	3622.2	1728.9
22	4335	7086.9	6831.8	6054.6	4012.5	3626.3	1729.8
23	4258	6978.9	6748.8	6003.0	3954.4	3615.2	1721.3
24	4288	7063.2	6766.6	6020.2	3933.7	3617.0	1721.5
25	4321	7127.4	6815.5	6060.0	3949.4	3615.3	1725.6
26	4342	7137.1	6840.1	6070.4	3965.3	3619.6	1726.1
27	4354	7175.2	6865.9	6080.0	3975.4	3622.1	1727.7
28	4360	7194.8	6854.1	6082.9	3978.1	3618.6	1733.3
29	4364	7191.2	6862.8	6088.5	3981.2	3613.1	1734.6
30	4353	7160.8	6858.0	6071.2	3973.5	3610.8	1728.2
Mean	4310	7064.1	6789.1	6029.4	3947.5	3610.8	1730.6

For less than 24-hour coverage, parentheses enclose the number of hours for which data are available. For Climax and Huancayo, parentheses enclose the number of section hours whenever the sum of both sections falls below 40 hours.

162
Late
Nov 88

MAGNETIC STORM SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS
(PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS)

NOVEMBER 1988

Storm Sudden Commencements (ssc)				Solar Flare Effects (sfe)		
Day	Time	Quality:	Station Group*	Day	Begin-End	Station(s)
09	0604	B:	WNG* QUE	01	1055-1115	BDV TEN MPO
		C:	NGK CO1 SPT	09	1222-1250	BDV (b: MPO)
		b:	MPO (B)	10	0610-0620	GNA
11	0753	A:	GNA*	11	0753-0835	ALM (see: ssc)
		B:	WNG* CO1 BJI QUE MPO	13	1321-1348	BDV
		C:	NGK* BDV* CLF* NAG* GCK* SPT	14	0430-0439	MPO
		sfe:	ALM		1312-1334	ALM
30	0800	A:	SOD* DOB* NUR NAG* GCK*	17	1306-1312	MPO
			MMB* CO1* BJI ALM KAK	20	1333-1348	MPO
			KNY QUE MPO GNA*	24	1927-1950	ALM (ssc: QUE; si: MPO)
		B:	WNG* NGK* BDV* AQU EBR SPT* FRD			
			AMS* CZT*			
		C:	CLF*			

Reporting Observatories: (up to the 3rd of January 1989)

SOD DOB NUR WNG NGK BDV CLF NAG GCK MMB AQU EBR CO1
BJI SPT FRD ALM KAK KNY QUE TEN MPO GNA AMS CZT KGL DUM

Three-letter codes identify each observatory. Reporting stations have been grouped by the character of the observed event. The letter A means very remarkable; B means fair, ordinary, but unmistakable; and C means very poor, doubtful.

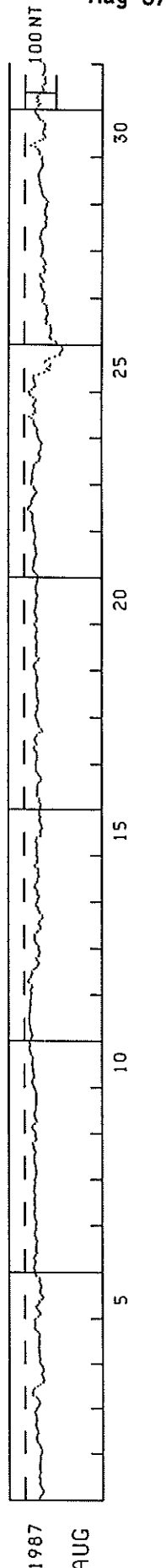
HOURLY EQUATORIAL DST VALUES (PROVISIONAL)

AUGUST 1987

U.T.

UNIT=NT

DAY	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	-46	-50	-55	-58	-59	-55	-51	-48	-48	-50	-48	-46	-46	-49	-50	-48	-47	-48	-47	-49	-50	-49	-50	-52
2	-54	-54	-51	-49	-45	-41	-39	-38	-38	-39	-42	-40	-39	-37	-34	-35	-38	-38	-37	-36	-34	-31	-35	-38
3	-42	-45	-47	-46	-40	-36	-24	-24	-25	-26	-30	-41	-50	-58	-61	-60	-57	-54	-55	-59	-60	-57	-54	-49
4	-46	-48	-49	-46	-47	-46	-45	-44	-44	-45	-46	-45	-44	-46	-48	-46	-40	-34	-33	-33	-33	-32	-30	-34
5	-43	-50	-49	-44	-39	-36	-41	-45	-46	-55	-60	-54	-50	-50	-50	-53	-53	-50	-45	-49	-47	-38	-34	-32
6	-33	-29	-29	-33	-34	-34	-29	-31	-34	-39	-36	-37	-35	-38	-38	-40	-36	-35	-32	-32	-32	-35	-36	-36
7	-38	-38	-36	-33	-32	-30	-31	-33	-34	-32	-31	-32	-30	-30	-33	-34	-31	-29	-30	-31	-33	-34	-32	-32
8	-35	-36	-37	-37	-36	-36	-36	-33	-31	-31	-31	-31	-32	-35	-29	-29	-29	-27	-26	-34	-39	-36	-34	-36
9	-33	-27	-23	-26	-32	-39	-37	-35	-33	-31	-33	-35	-36	-36	-38	-37	-38	-37	-37	-38	-37	-35	-34	-31
10	-29	-26	-24	-26	-30	-30	-29	-27	-27	-27	-25	-24	-26	-26	-28	-25	-21	-20	-17	-15	-17	-18	-16	-18
11	-20	-24	-26	-23	-21	-20	-18	-18	-16	-16	-16	-15	-15	-16	-17	-19	-19	-18	-21	-19	-18	-22	-21	-22
12	-23	-19	-22	-25	-24	-16	-11	-15	-21	-22	-25	-23	-31	-37	-42	-48	-46	-40	-37	-45	-48	-51	-48	-45
13	-45	-41	-38	-34	-34	-34	-33	-40	-44	-53	-53	-48	-48	-50	-56	-60	-57	-51	-50	-46	-44	-39	-37	-43
14	-42	-46	-47	-43	-43	-41	-36	-32	-36	-41	-42	-43	-47	-45	-44	-46	-44	-36	-34	-40	-40	-42	-43	-39
15	-40	-41	-41	-39	-40	-41	-38	-38	-41	-51	-55	-51	-53	-57	-56	-55	-51	-50	-50	-52	-47	-50	-47	-48
16	-51	-53	-53	-48	-50	-48	-41	-40	-42	-41	-42	-43	-43	-45	-53	-54	-52	-48	-44	-39	-37	-38	-38	-38
17	-37	-40	-40	-40	-40	-39	-34	-30	-32	-40	-37	-34	-34	-38	-41	-50	-58	-54	-48	-46	-44	-42	-41	-38
18	-36	-37	-39	-43	-42	-41	-45	-44	-44	-41	-40	-40	-40	-41	-39	-37	-38	-41	-42	-40	-37	-37	-37	-37
19	-32	-30	-32	-38	-44	-47	-41	-38	-39	-41	-39	-39	-39	-40	-41	-37	-35	-38	-38	-40	-41	-39	-34	-32
20	-39	-41	-41	-37	-38	-33	-34	-36	-37	-38	-39	-38	-39	-42	-43	-39	-37	-37	-37	-37	-40	-40	-42	-43
21	-42	-37	-32	-28	-28	-31	-31	-31	-33	-34	-37	-39	-38	-38	-38	-36	-32	-32	-32	-35	-36	-36	-34	-31
22	-30	-31	-31	-28	-26	-27	-26	-27	-26	-20	-12	-14	-19	-23	-22	-25	-28	-32	-38	-40	-36	-31	-30	-22
23	-23	-23	-28	-26	-25	-27	-28	-30	-30	-32	-39	-47	-50	-52	-48	-48	-49	-54	-54	-55	-58	-55	-50	-46
24	-44	-43	-41	-43	-41	-35	-32	-30	-31	-24	-15	-29	-35	-34	-36	-31	-29	-33	-38	-38	-29	-21	-17	-15
25	-24	-31	-35	-35	-33	-30	-29	-31	-47	-64	-80	-73	-81	-84	-67	-70	-80	-99	-113	-116	-120	-124	-121	-111
26	-103	-100	-86	-81	-81	-85	-87	-86	-85	-83	-70	-73	-68	-69	-73	-76	-73	-72	-71	-71	-64	-58	-60	-62
27	-62	-63	-65	-60	-56	-53	-53	-61	-57	-55	-50	-51	-62	-66	-62	-61	-68	-66	-64	-60	-53	-54	-58	-57
28	-58	-59	-58	-55	-54	-50	-49	-52	-52	-54	-60	-66	-70	-68	-67	-69	-71	-67	-65	-67	-64	-68	-71	-70
29	-74	-70	-65	-59	-56	-55	-55	-52	-50	-48	-50	-46	-46	-44	-47	-47	-50	-53	-57	-57	-56	-55	-54	-56
30	-48	-48	-45	-40	-32	-19	-31	-47	-58	-66	-62	-57	-58	-62	-62	-65	-64	-57	-50	-44	-40	-36	-32	-31
31	-36	-42	-48	-39	-42	-38	-41	-47	-49	-59	-57	-55	-61	-67	-64	-64	-64	-56	-60	-62	-63	-62	-62	-59



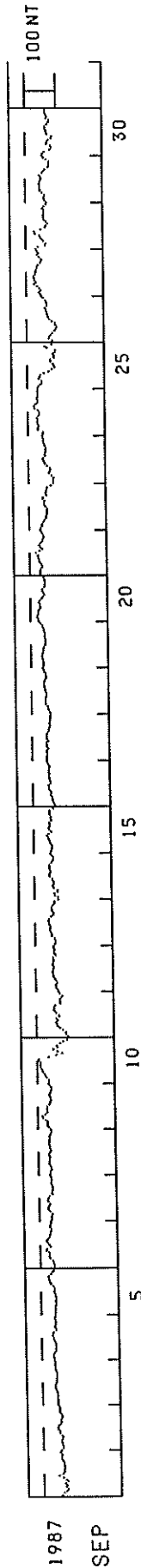
Note: The baselines for the observatories were adjusted for secular change. Therefore there is a small discontinuity in the Provisional Dst values between the last hour of July and the first hour of August.

HOURLY EQUATORIAL DST VALUES (PROVISIONAL)

SEPTEMBER 1987

U.T.

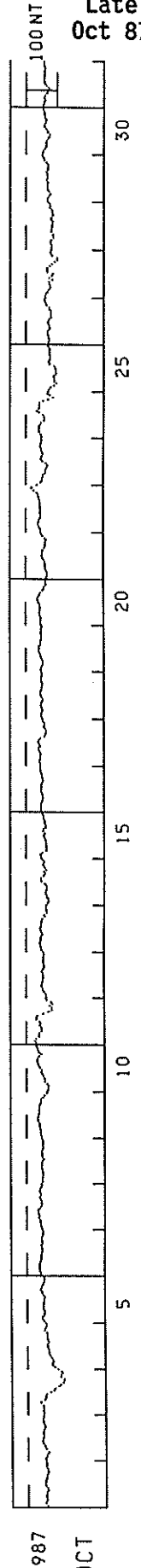
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-58	-65	-73	-78	-71	-74	-70	-76	-72	-63	-49	-61	-66	-67	-68	-68	-66	-65	-61	-57	-57	-61	-55	-57
2	-65	-65	-63	-60	-60	-61	-64	-61	-54	-55	-49	-48	-50	-56	-59	-58	-61	-63	-59	-55	-54	-55	-54	-50
3	-49	-50	-50	-50	-50	-49	-48	-44	-42	-41	-43	-46	-46	-46	-47	-48	-48	-46	-44	-43	-43	-43	-42	-41
4	-39	-38	-38	-40	-46	-46	-45	-45	-45	-43	-39	-39	-35	-37	-39	-47	-45	-43	-45	-46	-45	-42	-44	-46
5	-46	-46	-46	-46	-48	-49	-48	-48	-49	-48	-45	-42	-44	-44	-39	-33	-31	-27	-26	-26	-32	-37	-42	-45
6	-46	-44	-43	-40	-33	-29	-30	-29	-20	-22	-34	-31	-26	-21	-25	-30	-32	-34	-36	-38	-32	-33	-35	-36
7	-40	-39	-41	-42	-35	-29	-29	-33	-35	-29	-27	-30	-34	-43	-40	-44	-44	-44	-40	-39	-40	-40	-39	-35
8	-37	-39	-42	-40	-37	-34	-35	-35	-37	-36	-34	-39	-41	-37	-38	-34	-35	-35	-37	-36	-39	-41	-43	-40
9	-35	-30	-31	-32	-26	-17	-16	-24	-31	-31	-30	-31	-38	-41	-42	-42	-40	-38	-40	-43	-45	-44	-39	-36
10	-37	-38	-31	-28	-23	-19	-17	-14	-11	-10	-12	-7	-5	-38	-62	-81	-67	-52	-66	-65	-74	-84	-99	-112
11	-102	-95	-95	-85	-77	-69	-67	-62	-69	-65	-73	-73	-64	-60	-56	-57	-61	-78	-78	-76	-81	-84	-77	-73
12	-71	-66	-64	-66	-70	-65	-63	-57	-56	-55	-56	-58	-60	-55	-56	-59	-58	-56	-66	-63	-59	-62	-60	-60
13	-64	-66	-67	-62	-55	-55	-52	-48	-49	-51	-48	-45	-44	-46	-53	-60	-61	-56	-54	-55	-60	-65	-64	-76
14	-76	-67	-65	-75	-74	-63	-59	-62	-63	-60	-57	-50	-50	-53	-52	-49	-50	-50	-56	-60	-62	-61	-56	-53
15	-56	-58	-60	-59	-55	-53	-49	-47	-42	-49	-57	-51	-49	-52	-53	-51	-58	-56	-57	-53	-52	-52	-64	-77
16	-71	-68	-65	-62	-62	-57	-61	-57	-53	-53	-51	-57	-57	-55	-54	-52	-54	-53	-52	-54	-56	-51	-47	-47
17	-48	-48	-49	-48	-48	-52	-48	-47	-46	-52	-48	-47	-48	-49	-55	-55	-56	-59	-56	-58	-60	-60	-60	-61
18	-59	-56	-55	-52	-46	-46	-45	-46	-48	-50	-49	-45	-45	-43	-40	-40	-42	-46	-49	-47	-47	-43	-40	-38
19	-40	-41	-41	-39	-37	-36	-37	-39	-40	-41	-43	-47	-47	-47	-47	-46	-46	-45	-43	-44	-41	-38	-33	-28
20	-26	-22	-22	-25	-25	-27	-33	-33	-30	-28	-31	-38	-41	-45	-43	-39	-39	-46	-48	-48	-47	-47	-44	-36
21	-34	-34	-34	-39	-41	-38	-33	-31	-29	-28	-28	-20	-32	-41	-36	-31	-36	-41	-43	-45	-45	-42	-39	-36
22	-38	-43	-41	-45	-50	-54	-55	-58	-60	-58	-60	-55	-51	-49	-51	-44	-45	-58	-54	-56	-57	-59	-71	-80
23	-79	-79	-81	-75	-67	-68	-72	-69	-61	-55	-51	-48	-48	-54	-55	-56	-56	-58	-55	-52	-50	-50	-48	-45
24	-48	-49	-32	-33	-36	-33	-31	-32	-29	-34	-38	-37	-33	-22	-21	-25	-33	-33	-31	-33	-32	-32	-33	-33
25	-36	-43	-47	-46	-37	-39	-43	-55	-69	-80	-89	-86	-83	-77	-75	-86	-86	-83	-90	-91	-64	-58	-80	-94
26	-81	-72	-73	-78	-83	-90	-93	-96	-94	-92	-81	-75	-69	-68	-66	-64	-62	-60	-67	-66	-65	-61	-54	-49
27	-45	-41	-47	-43	-35	-26	-32	-27	-25	-23	-29	-30	-30	-34	-35	-39	-45	-50	-49	-42	-35	-40	-36	-32
28	-39	-62	-65	-57	-52	-47	-44	-41	-28	-49	-62	-64	-71	-67	-60	-57	-57	-57	-60	-59	-54	-59	-66	-68
29	-63	-60	-61	-63	-54	-48	-47	-46	-46	-45	-47	-51	-50	-46	-54	-59	-65	-75	-77	-77	-76	-68	-59	-55
30	-56	-62	-80	-85	-82	-69	-71	-76	-84	-86	-72	-70	-68	-64	-64	-71	-76	-78	-69	-72	-68	-64	-64	-63



HOURLY EQUATORIAL DST VALUES (PROVISIONAL)

OCTOBER 1987

DAY	UNIT=NT		OCTOBER 1987																												U.T.	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24								
1	-62	-56	-58	-61	-60	-58	-60	-60	-64	-62	-57	-54	-56	-56	-59	-60	-61	-65	-64	-62	-58	-59	-59	-57	-51							
2	-56	-60	-61	-67	-66	-60	-56	-55	-50	-46	-47	-50	-51	-50	-50	-51	-54	-56	-53	-50	-49	-48	-51	-51	-51							
3	-52	-50	-51	-51	-49	-42	-43	-54	-59	-57	-61	-75	-84	-89	-100	-105	-113	-117	-117	-107	-107	-112	-109	-98	-98							
4	-88	-81	-79	-83	-82	-78	-73	-70	-69	-69	-67	-67	-65	-69	-67	-65	-65	-65	-62	-56	-58	-61	-62	-59	-59							
5	-54	-49	-50	-54	-56	-56	-52	-53	-52	-53	-54	-55	-57	-52	-50	-47	-43	-45	-49	-51	-54	-56	-54	-49	-49							
6	-46	-42	-40	-41	-40	-39	-42	-44	-45	-46	-45	-47	-49	-50	-47	-46	-49	-49	-48	-48	-48	-51	-51	-52	-51							
7	-47	-46	-46	-44	-44	-39	-41	-39	-37	-35	-40	-46	-50	-47	-48	-42	-42	-45	-44	-41	-42	-46	-49	-48	-48							
8	-52	-51	-51	-52	-52	-52	-51	-50	-50	-50	-49	-52	-56	-51	-50	-49	-49	-51	-54	-53	-52	-52	-52	-49	-49							
9	-47	-46	-45	-45	-44	-43	-42	-41	-37	-36	-38	-39	-40	-40	-40	-40	-42	-45	-45	-46	-52	-58	-64	-67	-67							
10	-69	-69	-72	-66	-59	-60	-57	-55	-51	-48	-49	-44	-41	-38	-35	-34	-36	-41	-47	-41	-38	-36	-33	-30	-30							
11	-31	-28	-33	-40	-40	-43	-50	-49	-47	-43	-46	-40	-33	-32	-35	-55	-72	-82	-81	-75	-83	-80	-67	-63	-63							
12	-64	-62	-57	-54	-52	-50	-50	-51	-53	-54	-54	-54	-53	-50	-54	-58	-57	-56	-55	-56	-55	-56	-57	-54	-54							
13	-50	-48	-45	-44	-44	-48	-45	-48	-53	-50	-45	-44	-48	-48	-49	-50	-52	-60	-57	-66	-64	-64	-62	-64	-64							
14	-69	-73	-72	-68	-66	-62	-62	-66	-67	-65	-59	-50	-48	-47	-56	-61	-58	-64	-59	-56	-54	-58	-55	-49	-49							
15	-47	-45	-52	-65	-66	-64	-64	-65	-62	-61	-57	-58	-61	-55	-56	-62	-62	-60	-61	-57	-56	-56	-53	-52	-52							
16	-48	-50	-48	-47	-49	-52	-54	-54	-53	-51	-48	-49	-49	-50	-51	-55	-55	-53	-51	-49	-47	-46	-45	-45	-45							
17	-46	-42	-44	-45	-46	-47	-44	-41	-41	-45	-42	-39	-41	-46	-59	-62	-65	-64	-61	-58	-60	-59	-55	-52	-52							
18	-49	-49	-50	-53	-53	-50	-48	-49	-52	-54	-51	-47	-45	-47	-50	-51	-53	-52	-50	-49	-50	-51	-51	-49	-49							
19	-48	-50	-53	-55	-55	-52	-49	-47	-46	-43	-40	-43	-43	-47	-46	-48	-50	-49	-49	-48	-49	-50	-53	-50	-50							
20	-48	-48	-48	-49	-46	-44	-44	-45	-46	-46	-44	-40	-39	-38	-41	-44	-48	-54	-57	-60	-65	-65	-62	-64	-64							
21	-67	-69	-69	-68	-65	-63	-62	-62	-61	-58	-55	-51	-53	-53	-55	-60	-62	-62	-63	-67	-61	-54	-51	-47	-47							
22	-47	-45	-42	-39	-41	-43	-45	-47	-48	-46	-47	-46	-45	-46	-46	-44	-43	-41	-39	-36	-26	-18	-18	-35	-35							
23	-48	-51	-53	-55	-56	-62	-63	-64	-68	-70	-64	-54	-47	-50	-53	-54	-51	-49	-47	-46	-47	-50	-51	-50	-50							
24	-51	-48	-43	-40	-42	-42	-46	-50	-57	-60	-59	-54	-43	-36	-41	-44	-43	-44	-56	-72	-86	-77	-69	-71	-71							
25	-74	-80	-90	-99	-92	-91	-90	-90	-96	-96	-96	-95	-91	-77	-73	-76	-78	-78	-77	-76	-77	-76	-72	-70	-70							
26	-73	-74	-74	-73	-72	-70	-71	-76	-76	-75	-71	-72	-75	-81	-79	-80	-81	-77	-74	-68	-64	-61	-60	-62	-62							
27	-61	-64	-69	-73	-78	-78	-74	-75	-85	-74	-83	-86	-70	-68	-68	-76	-83	-91	-100	-100	-85	-79	-78	-81	-81							
28	-82	-83	-79	-78	-81	-88	-86	-88	-81	-82	-83	-83	-85	-87	-82	-81	-86	-87	-85	-83	-76	-78	-76	-70	-70							
29	-69	-71	-77	-80	-75	-70	-69	-69	-69	-71	-67	-69	-70	-69	-67	-71	-72	-72	-71	-66	-59	-57	-54	-53	-53							
30	-55	-56	-61	-65	-67	-64	-66	-71	-75	-76	-70	-69	-64	-59	-57	-61	-65	-64	-61	-59	-59	-58	-55	-52	-52							
31	-55	-58	-60	-61	-58	-61	-66	-69	-75	-73	-66	-61	-59	-58	-57	-59	-60	-59	-60	-61	-60	-57	-57	-58	-58							

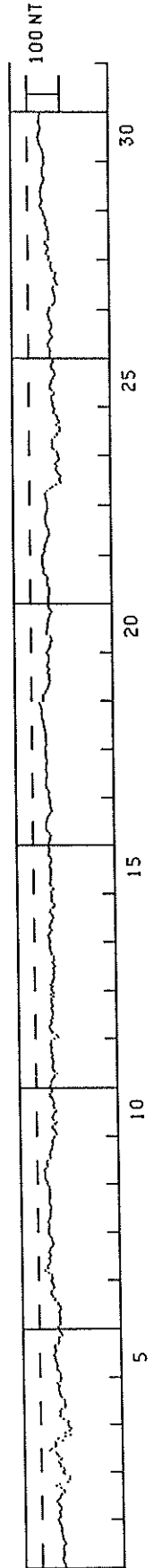


165
Late
Oct 87

HOURLY EQUATORIAL DST VALUES (PROVISIONAL)

NOVEMBER 1987

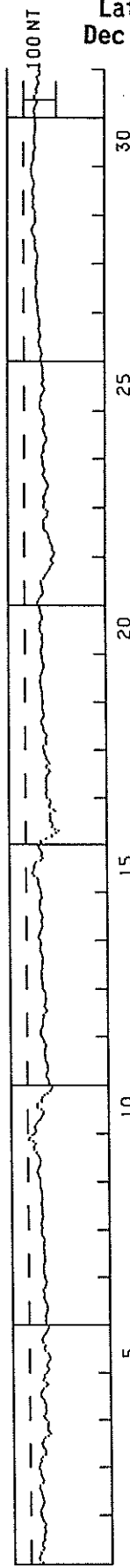
DAY	U.T.																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-69	-69	-65	-62	-62	-67	-67	-66	-65	-64	-66	-71	-69	-65	-63	-62	-61	-60	-59	-59	-58	-55	-52	-49
2	-54	-57	-55	-54	-57	-59	-55	-51	-46	-51	-54	-57	-61	-69	-68	-60	-46	-55	-79	-86	-87	-87	-72	-67
3	-71	-68	-59	-57	-52	-60	-62	-55	-49	-45	-28	-33	-44	-46	-44	-66	-52	-73	-90	-75	-89	-93	-87	-84
4	-83	-84	-70	-61	-59	-61	-60	-64	-74	-76	-75	-73	-73	-67	-61	-61	-58	-56	-57	-57	-53	-61	-63	-64
5	-63	-62	-57	-53	-52	-55	-53	-50	-47	-47	-43	-48	-49	-50	-46	-47	-57	-60	-57	-61	-70	-67	-61	-56
6	-57	-63	-65	-63	-64	-63	-62	-61	-62	-66	-64	-60	-58	-49	-50	-43	-38	-37	-39	-46	-46	-44	-41	-38
7	-42	-41	-40	-30	-21	-29	-28	-31	-35	-36	-32	-37	-37	-33	-35	-37	-43	-45	-45	-43	-42	-38	-32	-32
8	-33	-34	-34	-34	-35	-31	-32	-36	-39	-37	-39	-40	-41	-38	-36	-35	-37	-37	-37	-37	-38	-37	-35	-31
9	-30	-27	-23	-23	-24	-23	-21	-25	-32	-30	-29	-32	-41	-41	-39	-40	-43	-45	-46	-49	-48	-48	-53	-54
10	-61	-58	-54	-47	-50	-56	-61	-52	-49	-49	-52	-57	-61	-55	-52	-52	-54	-51	-48	-43	-43	-47	-48	-44
11	-43	-47	-46	-50	-55	-57	-65	-58	-53	-51	-52	-53	-55	-52	-50	-52	-50	-47	-48	-49	-45	-47	-47	-58
12	-69	-65	-53	-51	-45	-42	-45	-51	-48	-53	-51	-54	-54	-52	-49	-52	-54	-50	-51	-49	-56	-50	-58	-53
13	-50	-55	-50	-55	-55	-57	-59	-56	-59	-59	-58	-62	-60	-54	-60	-60	-60	-62	-62	-52	-50	-47	-46	-50
14	-47	-46	-43	-45	-50	-54	-49	-47	-49	-55	-55	-60	-57	-54	-50	-51	-58	-62	-62	-56	-54	-54	-56	-55
15	-53	-59	-59	-52	-50	-51	-52	-53	-52	-54	-53	-54	-51	-50	-53	-55	-56	-52	-48	-47	-50	-51	-48	-47
16	-47	-51	-52	-53	-56	-51	-45	-41	-40	-40	-40	-43	-44	-45	-50	-55	-59	-57	-56	-55	-54	-53	-54	-51
17	-49	-51	-51	-47	-43	-43	-43	-42	-43	-44	-45	-45	-43	-42	-43	-43	-44	-45	-44	-42	-42	-42	-42	-40
18	-41	-44	-44	-42	-44	-43	-42	-43	-41	-40	-38	-38	-36	-36	-33	-32	-30	-31	-31	-29	-27	-24	-24	-35
19	-37	-35	-36	-42	-44	-50	-52	-53	-56	-57	-55	-55	-56	-51	-53	-56	-51	-50	-53	-55	-55	-54	-52	-48
20	-52	-56	-57	-59	-61	-64	-63	-59	-50	-48	-49	-51	-52	-51	-52	-55	-55	-57	-60	-64	-61	-56	-54	-54
21	-54	-56	-55	-56	-57	-58	-57	-57	-53	-53	-51	-52	-52	-47	-41	-41	-42	-40	-37	-38	-37	-38	-37	-37
22	-42	-46	-43	-46	-45	-49	-52	-53	-58	-60	-59	-57	-56	-52	-49	-49	-47	-47	-48	-49	-52	-54	-55	-54
23	-54	-53	-51	-49	-48	-50	-54	-65	-71	-82	-96	-91	-93	-96	-92	-87	-82	-82	-85	-80	-84	-91	-92	-89
24	-88	-84	-77	-72	-72	-72	-72	-71	-80	-87	-87	-93	-96	-93	-85	-91	-93	-89	-87	-83	-77	-76	-80	-75
25	-73	-73	-71	-69	-70	-76	-78	-71	-66	-65	-67	-69	-70	-75	-78	-81	-80	-76	-71	-70	-70	-74	-74	-66
26	-65	-66	-66	-68	-67	-61	-59	-62	-67	-72	-75	-69	-66	-66	-72	-73	-70	-70	-65	-64	-62	-60	-62	-64
27	-67	-74	-80	-83	-83	-83	-82	-79	-78	-74	-78	-90	-87	-84	-79	-83	-84	-84	-74	-71	-70	-72	-72	-62
28	-66	-65	-57	-58	-62	-63	-59	-53	-54	-63	-64	-62	-64	-62	-60	-61	-56	-54	-57	-55	-52	-49	-50	-47
29	-42	-37	-40	-44	-44	-45	-43	-41	-39	-41	-43	-43	-45	-50	-51	-51	-48	-46	-46	-46	-46	-49	-52	-51
30	-51	-51	-51	-49	-47	-46	-42	-39	-38	-36	-34	-32	-35	-36	-39	-41	-40	-37	-35	-36	-37	-38	-39	-34



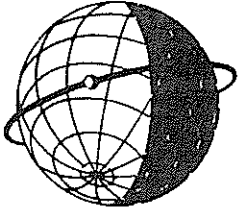
HOURLY EQUATORIAL DST VALUES (PROVISIONAL)

DECEMBER 1987

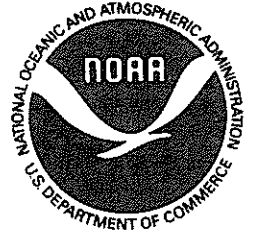
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-35	-28	-26	-28	-30	-31	-37	-40	-35	-35	-37	-42	-41	-40	-42	-45	-44	-42	-44	-45	-41	-37	-35	-32
2	-32	-29	-32	-35	-38	-41	-40	-39	-38	-36	-34	-32	-29	-29	-29	-38	-40	-39	-36	-33	-33	-32	-28	-28
3	-29	-31	-36	-33	-37	-47	-48	-47	-45	-41	-39	-35	-40	-40	-45	-56	-62	-59	-55	-54	-56	-46	-57	-51
4	-46	-43	-48	-50	-51	-50	-50	-49	-46	-44	-39	-36	-34	-35	-39	-42	-51	-56	-51	-43	-44	-46	-45	-52
5	-58	-60	-55	-53	-56	-61	-64	-63	-60	-58	-50	-46	-47	-49	-43	-40	-39	-42	-47	-51	-55	-57	-59	-56
6	-53	-50	-52	-51	-51	-53	-56	-57	-56	-56	-53	-51	-48	-45	-47	-48	-44	-44	-49	-51	-53	-55	-51	-48
7	-49	-45	-46	-46	-45	-45	-48	-50	-49	-50	-50	-48	-47	-47	-46	-47	-46	-47	-49	-47	-43	-41	-41	-41
8	-42	-40	-39	-40	-42	-43	-43	-43	-43	-43	-43	-42	-41	-41	-42	-43	-43	-43	-42	-40	-39	-37	-37	-38
9	-37	-35	-32	-31	-29	-31	-33	-36	-37	-38	-39	-36	-32	-28	-27	-21	-19	-21	-24	-17	-3	-7	-13	-21
10	-25	-24	-20	-24	-27	-32	-39	-42	-46	-50	-50	-43	-31	-30	-31	-44	-42	-45	-53	-61	-69	-73	-76	-70
11	-68	-67	-65	-60	-57	-59	-63	-64	-63	-62	-61	-58	-56	-56	-54	-54	-54	-54	-57	-57	-55	-53	-49	-45
12	-42	-43	-43	-44	-48	-49	-50	-49	-49	-53	-51	-57	-62	-60	-54	-56	-58	-57	-59	-58	-58	-58	-55	-50
13	-49	-49	-49	-48	-46	-46	-46	-45	-44	-47	-47	-48	-49	-49	-51	-50	-48	-44	-43	-42	-42	-44	-44	-42
14	-38	-37	-40	-41	-44	-47	-50	-47	-47	-46	-49	-49	-48	-45	-42	-41	-41	-42	-43	-43	-47	-47	-46	-45
15	-44	-42	-39	-38	-38	-37	-34	-26	-20	-20	-23	-26	-25	-28	-31	-46	-53	-48	-49	-49	-45	-40	-39	-41
16	-48	-45	-62	-81	-79	-93	-102	-90	-82	-83	-82	-75	-76	-77	-74	-76	-92	-86	-75	-73	-76	-78	-74	-66
17	-64	-63	-65	-67	-63	-64	-65	-63	-64	-63	-66	-72	-77	-73	-65	-67	-74	-71	-67	-65	-63	-60	-60	-58
18	-55	-56	-64	-65	-62	-62	-66	-65	-60	-56	-56	-55	-51	-49	-50	-54	-58	-57	-56	-55	-53	-53	-55	-55
19	-54	-52	-52	-53	-52	-51	-50	-49	-48	-45	-48	-47	-48	-51	-52	-54	-58	-58	-57	-55	-54	-53	-52	-51
20	-50	-49	-53	-53	-54	-54	-53	-53	-54	-52	-48	-46	-45	-48	-45	-47	-52	-54	-54	-50	-49	-47	-45	-41
21	-39	-41	-44	-49	-53	-57	-56	-55	-55	-52	-50	-51	-57	-62	-64	-69	-74	-78	-80	-84	-88	-83	-83	-87
22	-91	-93	-89	-86	-86	-84	-80	-79	-75	-75	-73	-69	-63	-60	-59	-59	-57	-60	-67	-71	-71	-73	-67	-60
23	-59	-61	-63	-60	-59	-63	-66	-66	-70	-73	-74	-71	-68	-64	-61	-57	-63	-63	-62	-59	-58	-57	-57	-56
24	-55	-55	-58	-61	-60	-60	-61	-64	-69	-69	-68	-65	-63	-60	-58	-60	-63	-62	-61	-60	-62	-59	-56	-54
25	-50	-50	-49	-50	-53	-51	-53	-56	-60	-63	-63	-59	-55	-58	-61	-58	-58	-58	-57	-57	-57	-56	-54	-52
26	-51	-52	-54	-56	-53	-52	-50	-48	-46	-46	-50	-51	-51	-49	-48	-46	-48	-47	-49	-48	-48	-45	-44	-44
27	-42	-43	-44	-43	-41	-40	-39	-38	-38	-38	-37	-38	-38	-40	-41	-39	-38	-38	-38	-38	-38	-39	-38	-40
28	-42	-41	-42	-42	-42	-39	-36	-35	-34	-35	-34	-35	-34	-31	-28	-26	-26	-28	-31	-35	-36	-35	-35	-34
29	-36	-36	-31	-28	-31	-29	-29	-31	-32	-27	-27	-28	-29	-30	-32	-32	-31	-28	-26	-23	-24	-23	-24	-24
30	-26	-28	-30	-30	-30	-30	-30	-34	-36	-35	-34	-33	-33	-33	-32	-34	-35	-36	-35	-36	-37	-35	-35	-35
31	-34	-34	-31	-32	-34	-37	-40	-41	-37	-33	-34	-39	-40	-38	-40	-44	-46	-46	-43	-41	-48	-51	-48	-47



1987
DEC



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."