Space Weather Highlights
16 June 1997 - 22 June 1997

Solar activity was very low. A single subflare occurred.

Solar wind data were received from the WIND spacecraft a few hours per day. Solar wind velocities ranged 320 - 420 km/sec. Particle densities ranged 02 - 10 p/cc most of the period with brief increases to 22 p/cc observed on 19 and 22 June. Bz hovered around zero most of the period. However, southward conditions occurred 19 and 22 June (maximum deflections to minus 7 nT (GSM)). Solar sector orientation was mostly away (phi angle near 135 degrees) during 16 - 18 and 21 - 22 June. Orientation was mostly toward (phi angle near 315 degrees) during 19 - 20 June.

There were no significant proton enhancements observed at satellite altitudes.

The greater than 2 MeV electron flux was at mostly normal levels.

The geomagnetic field was mostly quiet to unsettled.

Space Weather Forecast
25 June 1997 - 21 July 1997

Solar activity is expected to be very low.

No significant proton enhancements are expected at satellite altitudes.

The greater than 2 MeV electron flux is expected to be normal to moderate.

The geomagnetic field is expected to be quiet to unsettled.

Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background	Flares: X-ray Flux C	M	X	Flares: Optical S	1	2	3	4
16 June	72	38	70	<A1.0	0	0	0	0	0	0	0	0
17 June	70	31	30	A1.1	0	0	0	1	0	0	0	0
18 June	71	29	40	<A1.0	0	0	0	0	0	0	0	0
19 June	70	16	20	<A1.0	0	0	0	0	0	0	0	0
20 June	70	23	10	<A1.0	0	0	0	0	0	0	0	0
21 June	68	11	0	<A1.0	0	0	0	0	0	0	0	0
22 June	70	15	10	<A1.0	0	0	0	0	0	0	0	0

Daily Particle Data

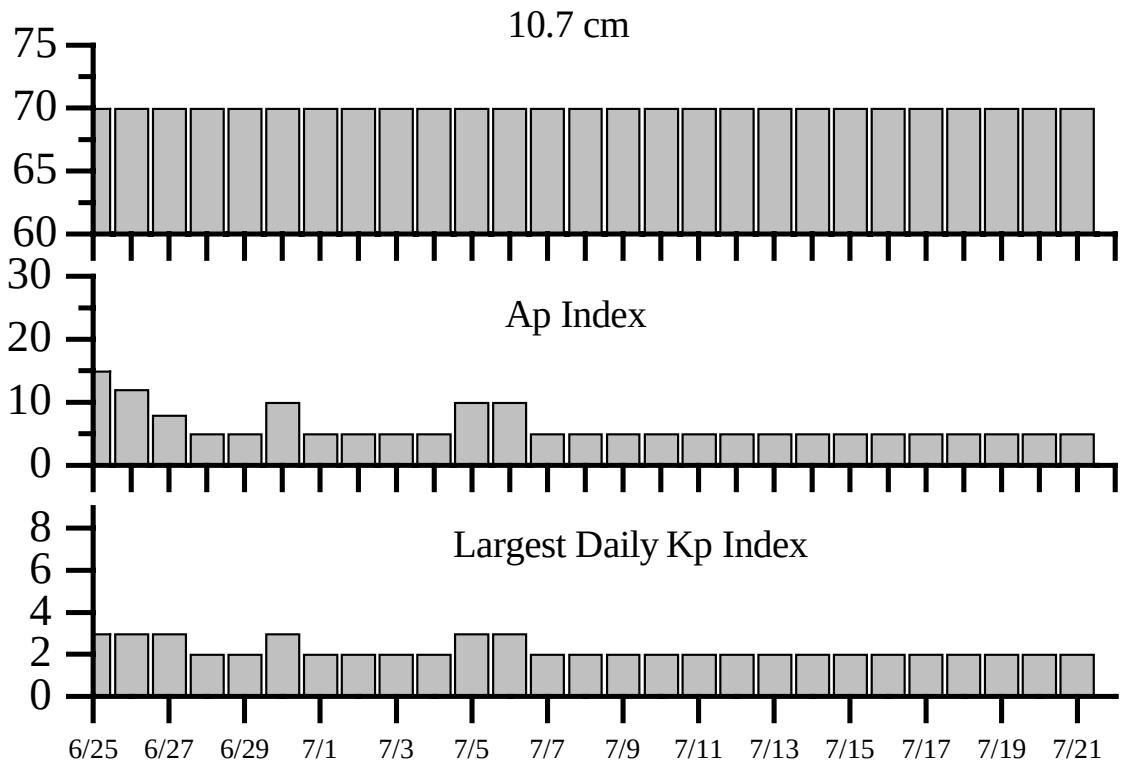
Date	Proton Fluence (protons/cm^2-day-sr) >1MeV	>10MeV	>100MeV	Electron Fluence (electrons/cm^2-day-sr) >.6MeV	>2MeV	>4MeV
16 June	1.9E+5	1.8E+4	4.0E+3		3.7E+6	
17 June	1.3E+5	1.7E+4	4.0E+3		2.5E+6	
18 June	1.3E+5	1.8E+4	4.3E+3		3.5E+6	
19 June	1.3E+5	1.7E+4	4.1E+3		2.5E+6	
20 June	1.0E+5	1.7E+4	3.8E+3		1.5E+6	
21 June	1.0E+5	1.7E+4	4.0E+3		1.5E+6	
22 June	1.2E+5	1.8E+4	4.0E+3		7.3E+5	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg A	K-indices	High Latitude College A	K-indices	Estimated Planetary A	K-indices
16 June	8	1-2-1-2-2-3-3-1	3	1-0-0-3-0-1-1-0	5	1-1-0-2-2-2-3-1
17 June	6	1-2-2-1-1-2-2-2	1	0-1-1-0-0-0-1-0	5	0-2-2-1-1-2-2-2
18 June	3	1-1-1-1-1-1-1-1	0	0-0-0-0-0-0-0-0	4	0-1-1-1-1-2-1-2
19 June	11	2-2-4-2-2-2-2-3	6	1-2-3-3-2-0-0-1	10	3-2-4-3-2-2-2-2
20 June	6	2-1-2-2-2-2-1-2	2	0-1-2-0-2-0-0-0	5	2-1-1-1-2-2-1-2
21 June	2	0-0-0-0-0-1-1-2	2	0-0-0-3-0-0-0-0	3	0-0-0-1-1-2-1-1
22 June	15	2-4-3-3-3-3-3-2	4	1-2-3-1-1-0-1-0	9	1-3-3-2-3-2-2-2

Alerts and Warnings Issued

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
16 Jun 0008	>2MeV Electron Event in Progress ≥1000pfu	15 Jun
22 Jun 0601	K= 4 observed	22 Jun 03-06



Twenty-seven Day Outlook

Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index
25 Jun	70	15	3	09	70	5	2
26	70	12	3	10	70	5	2
27	70	8	2	11	70	5	2
28	70	5	2	12	70	5	2
29	70	5	2	13	70	5	2
30	70	10	3	14	70	5	2
01 Jul	70	5	2	15	70	5	2
02	70	5	2	16	70	5	2
03	70	5	2	17	70	5	2
04	70	5	2	18	70	5	2
05	70	10	3	19	70	5	2
06	70	10	3	20	70	5	2
07	70	5	2	21	70	5	2
08	70	5	2	22	70	5	2

Energetic Event

Date	Time (UT) Begin	Max	½ Max	X-ray Class	Integ Flux	Optical Information Imp	Location Brtns	Lat	CMD	Rgn #	Peak Radio Flux 245	2695	Sweep Freq Intensity II	IV

No Event Observed

Flare List

Date	Time Begin	Max	End	X-ray Class.	Optical Imp / Brtns	Location Lat CMD	Rgn #
16 June	No Flares Observed						
17 June	0545	0546	0551		SF	N17W1	8052
18 June	No Flares Observed						
19 June	No Flares Observed						
20 June	No Flares Observed						
21 June	No Flares Observed						
22 June	No Flares Observed						

Region Summary

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	M	X	Optical S	1	2	3	4
Region 8050															
08 Jun	N27E56	067	0000	01	AXX	001	A								
09 Jun	N27E43	067	0000	00	AXX	001	A								
10 Jun	N28E30	066	0010	00	AXX	001	A								
11 Jun	N28E17	065	0010	00	AXX	001	A								
12 Jun	N29E03	066	0020	04	BXO	003	B								
13 Jun	N29W10	066	0000	00	AXX	001	A								
14 Jun	N29W22	065	0010	03	BXO	003	B								
15 Jun	N28W34	063	0000	00	AXX	001	A								
16 Jun	N30W46	062	0000	00	AXX	001	A								
17 Jun	N27W60	063	0000	00	AXX	001	A								
18 Jun	N27W73	063													
19 Jun	N27W86	063													
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 066

Date	Location	Helio	Area	Extent	Spot	Spot	Mag	Flares: X-ray			Flares: Optical			
			(° Lat ° CMD)	Lon	(10^{-6} hemi)		(helio)	Class	Count					
	Region 8052													
12 Jun	N17E40	029	0020	03	CRO	003	B							
13 Jun	N17E27	029	0030	05	BXO	006	B							
14 Jun	N18E14	029	0030	05	CRO	008	B							
15 Jun	N18E02	027	0030	05	CRO	008	B							
16 Jun	N18W11	027	0070	07	DRI	017	B							
17 Jun	N19W24	027	0030	06	BXO	010	B				1			
18 Jun	N18W39	029	0020	07	BXO	005	B							
19 Jun	N18W52	029												
20 Jun	N18W65	029												
21 Jun	N18W78	029												
								0	0	0	1	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 027

	Region 8053														
18 Jun	S27E31	319	0020	03	CRO	004	B								
19 Jun	S26E17	320	0020	04	BXO	006	B								
20 Jun	S27E06	317	0010	01	AXX	002	A								
21 Jun	S27W07	317	0000	00	AXX	001	A								
22 Jun	S27W20	317													
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 317

	Region 8054														
20 Jun	N07W72	035	0000	00	AXX	001	A								
21 Jun	N07W85	035													
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 035

	Region 8055														
22 Jun	N15E08	289	0010	04	BXO	005	B								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 289

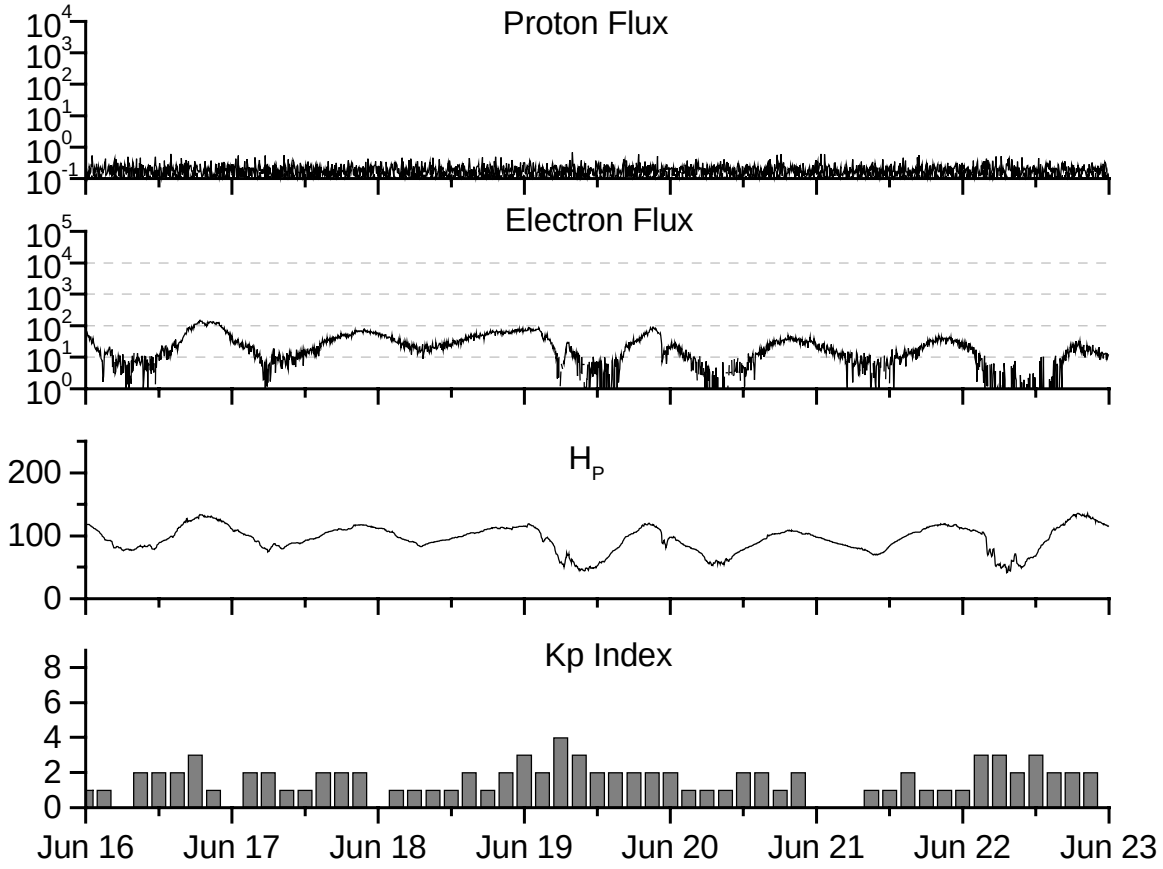
Recent Solar Indices (preliminary) of the observed monthly mean values

	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		**Penticton	Smooth	Planetary	Smooth
Month	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
				1995					
June	27.8	15.6	0.56	29.9	18.2	75.7	77.7	11	12.7
July	23.8	14.5	0.61	28.1	17.0	73.9	76.9	08	12.4
August	25.1	14.3	0.57	25.4	15.4	73.8	76.0	09	12.1
September	16.5	11.8	0.72	22.0	13.4	72.0	74.8	13	11.8
October	31.6	21.1	0.67	19.7	12.1	77.9	73.8	16	11.4
November	15.7	09.0	0.57	18.5	11.4	74.2	73.2	09	10.7
December	16.2	10.0	0.62	17.6	10.8	72.6	72.8	09	10.0
				1996					
January	17.6	11.5	0.55	16.8	10.4	74.5	72.4	09	09.8
February	09.1	04.4	0.48	16.2	10.1	71.5	72.2	10	09.8
March	12.1	09.2	0.76	15.4	09.7	70.7	72.1	11	09.9
April	08.5	04.8	0.60	13.6	08.5*	69.3	71.6	11	09.7*
May	11.8	05.5	0.47	12.9	08.1*	70.1	71.4	07	09.5*
June	18.8	11.8	0.63	13.5	08.6*	69.6	71.8	05	09.4*
July	13.2	08.2	0.67	13.4	08.5*	71.2	72.0	07	09.3*
August	20.5	14.4	0.68	13.1	08.4*	72.4	72.1	09	09.4*
September	02.9	01.6	0.62	13.3	08.5*	69.4	72.3	15	09.3*
October	02.3	01.8*	0.78*	14.0	09.0*	69.2	72.6	13	09.1*
November	26.7	18.6*	0.70*	15.4	10.0*	78.7	73.0	08	09.1*
December	21.1	12.7*	0.60*			77.8		07	
				1997					
January	09.0	06.5*	0.72*			74.0		09	
February	11.3	07.6*	0.67*			73.8		11	
March	14.4	08.8*	0.61*			73.5		08	
April	24.5	15.8*	0.64*			74.5		10	
May	28.6	18.5	0.64			74.6		08	

*Preliminary estimates.

The lowest smoothed sunspot indices number for Cycle 21, RI = 12.3, occurred September 1986. The highest smoothed sunspot number for Cycle 22, RI=158.5, occurred July 1989.

** From June 1991 onward, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.



Weekly Geosynchronous Satellite Environment Summary

Week Beginning 16 June 1997

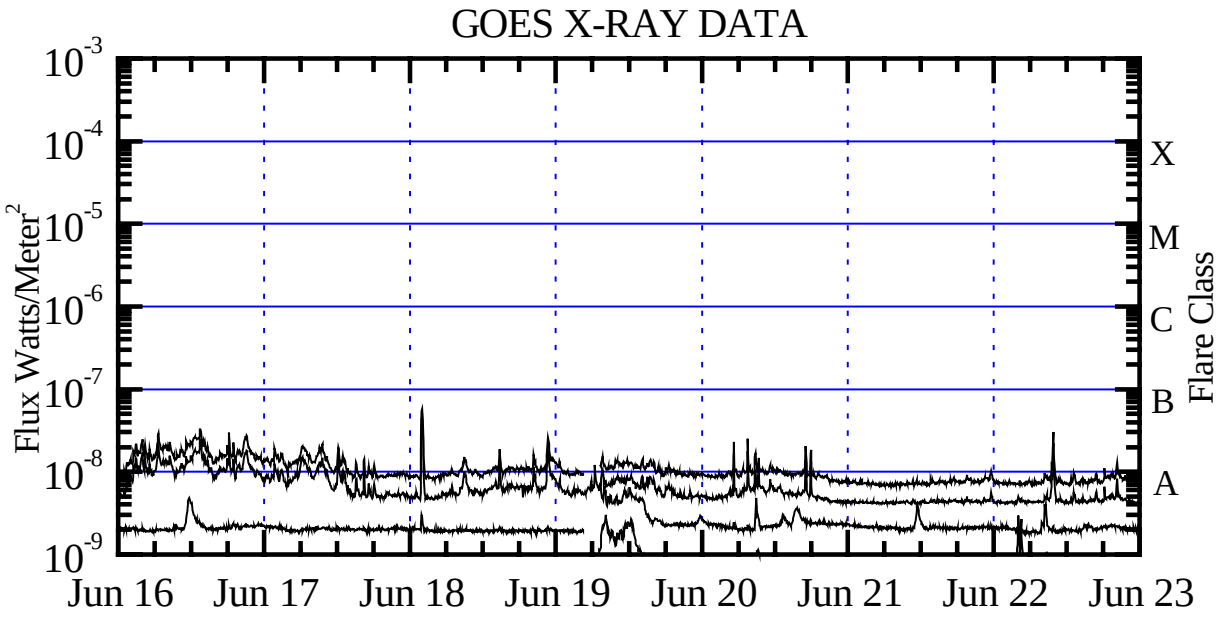
Protons plot contains the five minute averaged integral proton flux (protons/ cm^2 -sec-sr) as measured by GOES-9 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

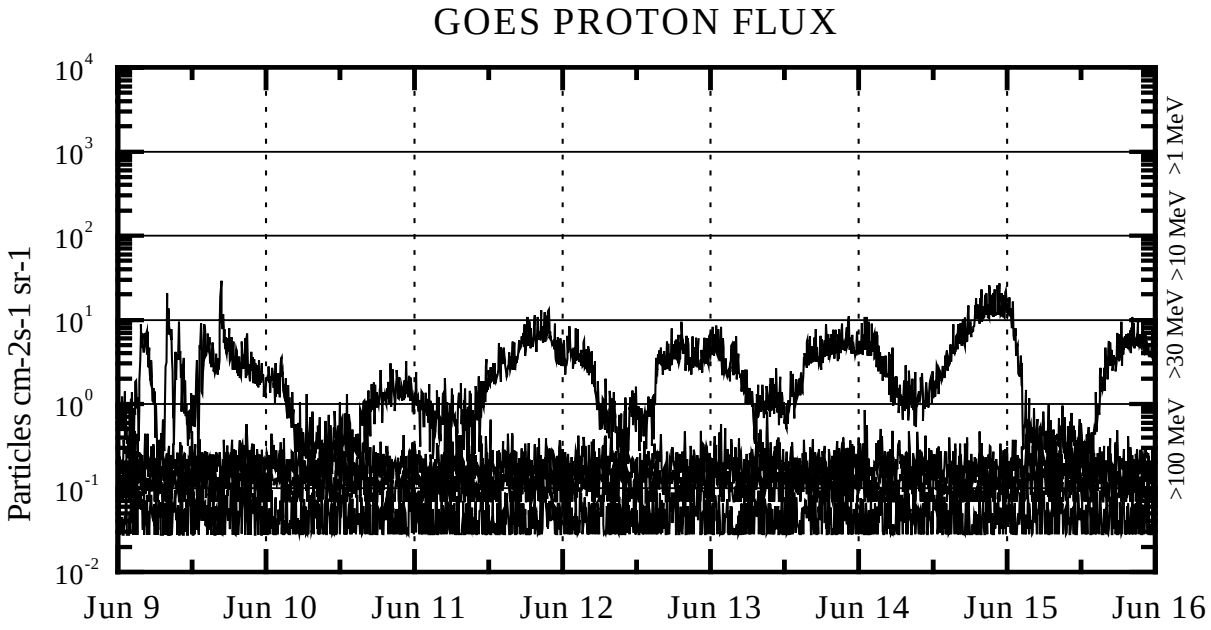
Electrons plot contains the five minute averaged integral electron flux (electrons/ cm^2 -sec-sr) with energies greater than 2 MeV at GOES-9.

Hp plot contains the five minute averaged magnetic field H component in nanoteslas (nT) as measured by GOES-9. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

Kp plot contains the estimated planetary 3-hour K-index (derived by the USAF 55th Space Weather Squadron) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA. These data are made available through cooperation from the Geological Survey of Canada (GSC) and the US Geological Survey. These may differ from the final Kp values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWO and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and Kp are "global" parameters that are applicable to a first order approximation over large areas. Hparallel is subject to a more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.



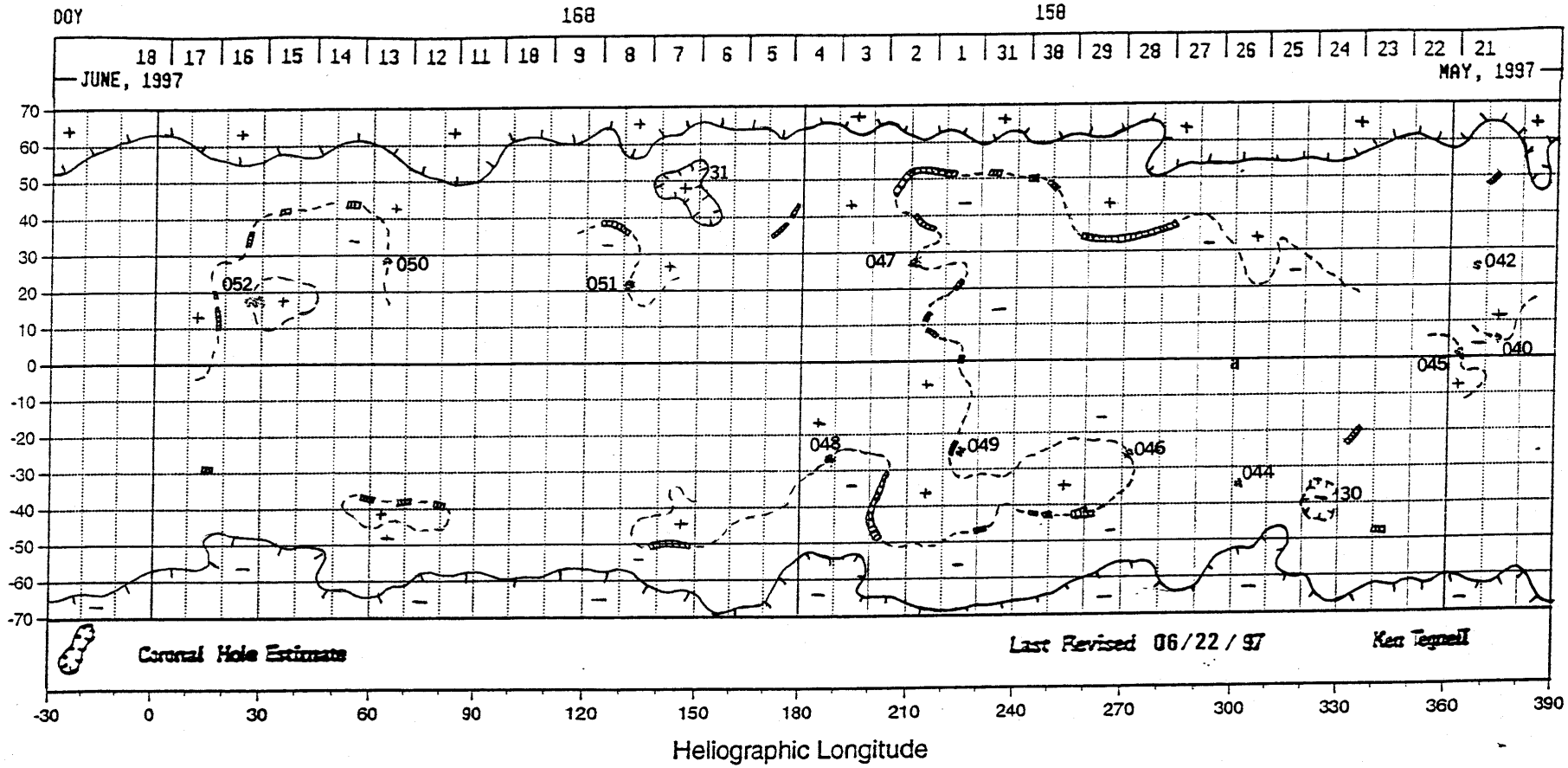


Weekly GOES Satellite X-ray and Proton Plots

Proton plot contains the five minute averaged integral proton flux (protons/cm^2-sec-sr) as measured by GOES-9 (W135) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm^2-sec-sr) at greater than 10 MeV.

X-ray plot contains five minute averaged x-ray flux (watts/m^2) as measured by GOES 8 and 9 in two wavelength bands, .05 -.4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Carrington Rotation 1923



Hα Synoptic Chart- - a partial and preliminary map of the sun in absolute heliographic coordinates (solar latitude and longitude). The Carrington Rotation serial number appearing at the top of the chart is a continuation of the sequence begun by R. Carrington on 09 November 1852. Dates along the top of the chart are the times of central meridian passage of the solar longitudes directly below those dates. Dates along the top of the chart are the times of central meridian passage of the solar longitudes directly below those dates. Features on the map are as follows: filaments (cross-hatched areas), filament channels (solid lines outside an active area), plage corridors (solid lines inside an active area), 01 and estimated neutral lines (dashed lines) are lines of magnetic polarity change (neutral lines), plages (dotted areas whose dot density is roughly equal to brightness), strong active regions (stippled areas overlaid with diagonal lines; source of x-ray flares class M2 or greater, or two or more class M1 flares), large sunspots (large dots), coronal holes (solid lines with tick marks directed toward center of coronal hole, from 1083 nm spectroheliograms), SWO region number showing the last 3 digits of a 4-digit number.