

**Space Weather Highlights**  
**11 August 1997 - 17 August 1997**

Solar activity was very low to low. Isolated C-class subflares occurred on 11 and 14 August.

Solar wind data were received from the WIND spacecraft a few hours per day. Velocities ranged from 350 - 440 km/sec through 12 August increasing to 570 km/sec on 13 August. Velocities gradually declined to 350 km/sec by the end of the period. Densities generally ranged from 03 – 11 p/cc, but increased to a peak of 18 p/cc on 12 August. Bz varied from minus 07 to plus 07 nT. Solar sector orientation was not readily discernible.

There were no significant proton enhancements observed at satellite altitudes.

The greater than 2 MeV electron flux at geosynchronous altitudes was at moderate to high levels during 15 - 17 August.

The geomagnetic field was mostly quiet to unsettled. However, the field became disturbed on 13 - 14 August with active levels reported at all latitudes and isolated minor storm periods at higher latitudes. Another brief disturbance occurred during the latter half of 17 August with active levels reported at all latitudes and isolated minor storm periods observed at higher latitudes.

**Space Weather Forecast**  
**20 August 1997 -15 September 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 at geosynchronous altitudes is expected to be normal to moderate.

The geomagnetic field is expected to be predominately quiet to unsettled.



### *Daily Solar Data*

Date	Radio Flux	Sun spot No.	Sunspot Area	X-ray Background	X-ray Flux			Flares				
	10.7 cm		(10 <sup>6</sup> hemi.)		C	M	X	S	1	2	3	4
11 August	80	53	220	B2.5	1	0	0	1	0	0	0	0
12 August	81	57	140	A9.5	0	0	0	3	0	0	0	0
13 August	82	61	180	A6.6	0	0	0	2	0	0	0	0
14 August	80	49	140	A7.2	1	0	0	1	0	0	0	0
15 August	78	60	120	A4.7	0	0	0	0	0	0	0	0
16 August	78	33	100	A5.7	0	0	0	0	0	0	0	0
17 August	76	23	60	A6.5	0	0	0	0	0	0	0	0

### *Daily Particle Data*

Date	Proton Fluence (protons/cm <sup>2</sup> -day-sr)			Electron Fluence (electrons/cm <sup>2</sup> -day-sr)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
11 August	2.7E+5	1.7E+4	4.0E+3		6.4E+6	
12 August	3.1E+5	1.7E+4	3.9E+3		1.1E+7	
13 August	4.8E+5	1.8E+4	3.8E+3		6.5E+6	
14 August	5.3E+5	1.7E+4	4.1E+3		1.1E+7	
15 August	1.1E+6	1.8E+4	4.1E+3		1.1E+8	
16 August	4.0E+5	1.8E+4	4.1E+3		5.7E+7	
17 August	6.1E+5	1.8E+4	4.3E+3		3.9E+7	

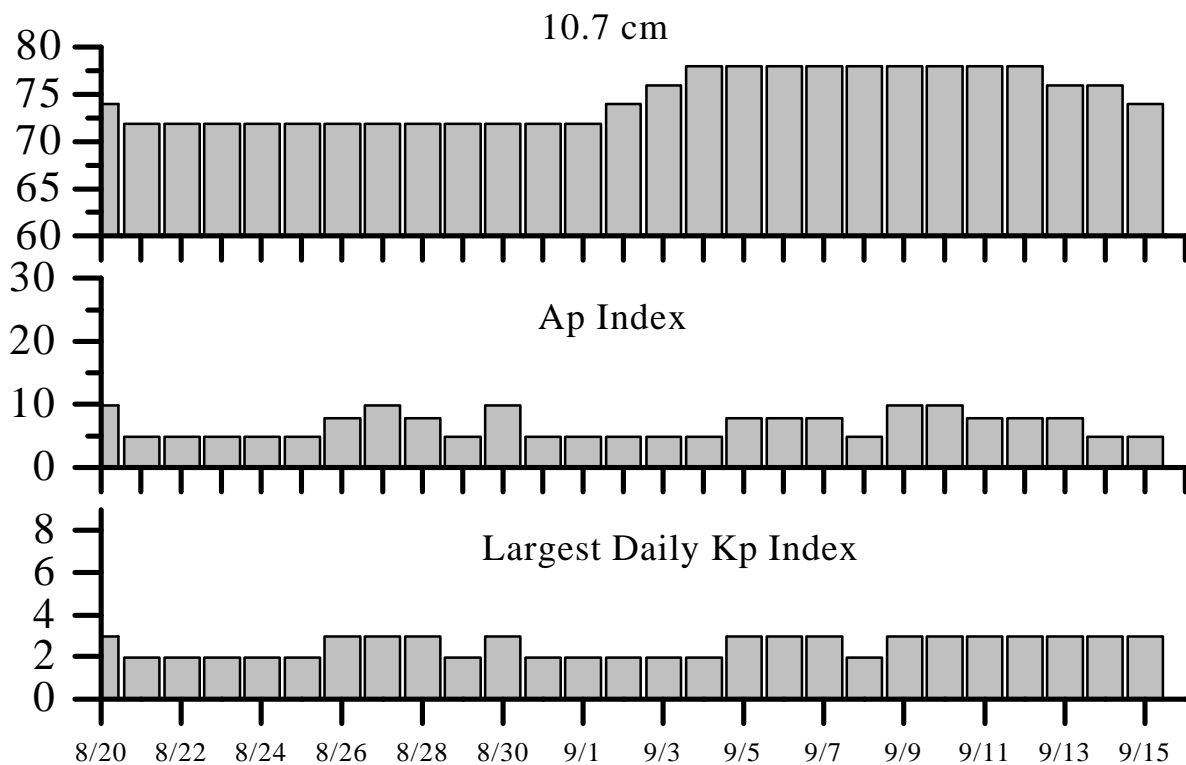
### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
11 August	10	2-4-2-2-2-2-2-2	5	2-1-0-4-1-0-0-0	9	2-4-2-2-3-2-2-2
12 August	7	1-1-1-2-2-1-3-3	*	*-0-1-3-0-0-0-1	5	1-1-1-2-1-2-2-3
13 August	17	3-3-4-4-3-2-3-3	3	2-1-1-1-2-1-1-0	12	3-2-4-3-1-2-2-3
14 August	18	3-5-4-2-2-2-3-3	9	2-4-4-1-0-2-1-0	17	3-5-5-2-1-2-2-3
15 August	8	1-2-3-3-2-2-1-1	4	2-1-2-0-1-1-1-1	8	1-2-3-3-2-2-2-1
16 August	8	3-2-3-2-2-2-1-1	6	1-1-4-3-0-0-0-0	9	3-3-3-3-2-1-2-1
17 August	10	2-1-2-3-3-3-2-2	4	2-0-1-1-2-2-1-2	9	2-1-2-3-3-3-3-2

### *Alerts and Warnings Issued*

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
11 Aug 601	K = 4 observed	11 Aug 03-06
14 Aug 601	K = 5 observed	14 Aug 03-06
15 Aug 1359	>2 MeV Electron Event ≥ 1000pfu	15 Aug 1259
17 Aug 0007	>2 MeV Electron Event in Progress ≥ 1000pfu	15 Aug 1259
18 Aug 0009	>2 MeV Electron Event in Progress ≥ 1000pfu	15 Aug 1259





*Twenty-seven Day Outlook*

Date	Radio Flux	Planetary	Largest	Date	Radio Flux	Planetary	Largest
	10.7 cm	A Index	Kp Index		10.7 cm	A Index	Kp Index
20 Aug	74	10	3	03	76	5	2
21	72	5	2	04	78	5	2
22	72	5	2	05	78	8	3
23	72	5	2	06	78	8	3
24	72	5	2	07	78	8	3
25	72	5	2	08	78	5	2
26	72	8	3	09	78	10	3
27	72	10	3	10	78	10	3
28	72	8	3	11	78	8	3
29	72	5	2	12	78	8	3
30	72	10	2	13	76	8	3
31	72	5	2	14	76	5	2
01 Sep	72	5	2	15	74	5	2
02	74	5	2				



***Energetic Event***

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

**No Event Observed**

***Flare List***

Date	Time			X-ray Class.	Imp / Brtns	Optical Location		Rgn #
	Begin	Max	End			Lat	CMD	
11 August	0138	0145	0159	B3.2				
	B0917	U0918	0923	C1.1	SF	N22E02		8072
12 August	0554	0557	0604	B3.6	SF	N28E80		8074
	0931	0936	0941	B2.3	SF	N25E16		8071
	1240	1241	1248		SF	S20W38		8070
	1513	1516	1531	B1.2				
	1612	1616	1619	B1.3				
	2146	2151	2154	B1.8				
13 August	B0511	0517	0525		SF	S20W48		8070
	0642	0647	0706	B2.1				
	1838	1843	1850	B3.3	SF	N26W03		8071
14 August	0129	0132	0147	C1.0	SF	N26W04		8071
15 August	0827	0834	0843	B1.4				
	1605	1611	1619	B1.1				
	1903	1906	1909	B1.2				
16 August	0821	0826	0830	B1.4				
	1343	1348	1358	B1.2				
17 August	0216	0224	0231	B1.8				
	1829	1834	1838	B3.9				



## Region Summary

Date	Location		Sunspot Characteristics				Flares										
	( ° Lat ° CMD)	Helio	Area (10 <sup>6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical						
		Lon						C	M	X	S	1	2	3	4		
<i>Region 8067</i>																	
02 Aug	N06E65	051	0010	00	AXX	001	A										
03 Aug	N05E52	050	0000	00	AXX	001	A										
04 Aug	N05E39	050															
05 Aug	N05E26	050															
06 Aug	N05E13	050															
07 Aug	N05E00	050															
08 Aug	N05W13	050															
09 Aug	N05W26	050															
10 Aug	N05W39	050															
11 Aug	N05W52	050															
12 Aug	N05W65	050															

0 0 0 0 0 0 0 0

Died on Disk.

Absolute heliographic longitude: 050

<i>Region 8068</i>																	
03 Aug	S22E33	069	0030	04	BXO	006	B										
04 Aug	S22E18	071	0020	01	HSX	002	A										
05 Aug	S21E06	070	0020	05	CSO	002	B										
06 Aug	S21W09	072	0010	01	HSX	001	A										
07 Aug	S20W22	072	0010	01	HRX	002	A										
08 Aug	S19W37	072	0000	00	AXX	001	A										
09 Aug	S19W50	072															
10 Aug	S19W63	072															
11 Aug	S19W76	072															
12 Aug	S19W89	072															

0 0 0 3 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 070



*Region Summary - continued.*

Date	Location		Sunspot Characteristics				Flares							
	(° Lat ° CMD)	Helio Lon	Area (10 <sup>6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray		Optical				
							C	M	X	S	1	2	3	4
<i>Region 8070</i>														
05 Aug	S20E53	023	0000	00	AXX	001	A							
06 Aug	S19E39	024	0010	03	BXO	003	B							
07 Aug	S19E25	025	0030	06	DSO	009	B							
08 Aug	S20E11	024	0060	08	DAO	012	B							
09 Aug	S20W01	023	0050	09	CSO	012	B							
10 Aug	S20W15	024	0030	09	CSO	007	B							
11 Aug	S20W30	025	0010	07	BXO	005	B							
12 Aug	S20W42	024	0010	06	BXO	007	B					1		
13 Aug	S20W55	024	0050	08	CAO	010	B					1		
14 Aug	S19W68	023	0040	07	DSO	004	B							
15 Aug	S20W82	024	0010	00	AXX	001	A							
16 Aug	S20W95	024												
												0	0	0

Crossed West Limb.

Absolute heliographic longitude: 023

<i>Region 8071</i>														
08 Aug	N21E62	333	0060	04	CRO	004	B							
09 Aug	N26E49	333	0010	06	BXO	003	B							
10 Aug	N26E37	332	0010	04	BXO	004	B							
11 Aug	N25E20	335	0030	06	CSO	006	B							
12 Aug	N26E07	335	0030	05	CAO	008	B					1		
13 Aug	N26W07	336	0030	05	CAO	006	B					1		
14 Aug	N26W22	337	0010	01	HRX	002	A	1				1		
15 Aug	N26W36	338	0010	03	BXO	002	B							
16 Aug	N26W49	338												
17 Aug	N26W62	338												
												1	0	0

Still on Disk.

Absolute heliographic longitude: 335



*Region Summary - continued.*

Date	Location		Sunspot Characteristics				Flares							
	(° Lat ° CMD)	Helio Lon	Area (10 <sup>6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
							C	M	X	S	1	2	3	4
<i>Region 8072</i>														
09 Aug	N21E21	001	0000	00	AXX	001	A							
10 Aug	N21E08	001												
11 Aug	N21W05	001						1		1				
12 Aug	N21W18	001												
13 Aug	N21W31	001												
14 Aug	N21W44	001												
15 Aug	N21W57	001												
16 Aug	N21W70	001												
											1	0	0	0

Died on Disk.

Absolute heliographic longitude: 001

<i>Region 8073</i>														
11 Aug	N14E74	281	0090	03	HSX	001	A							
12 Aug	N15E61	281	0070	02	HSX	001	A							
13 Aug	N14E49	280	0060	02	HSX	001	A							
14 Aug	N14E36	279	0060	02	HSX	001	A							
15 Aug	N15E23	279	0070	02	HSX	001	A							
16 Aug	N15E08	281	0070	02	HSX	001	A							
17 Aug	N15W04	280	0060	02	HSX	001	A							
											0	0	0	0

Still on Disk.

Absolute heliographic longitude: 280

<i>Region 8074</i>														
11 Aug	N26E75	280	0090	02	HSX	001	A							
12 Aug	N26E63	279	0030	02	HSX	001	A				1			
13 Aug	N26E52	277	0040	04	CSO	004	B							
14 Aug	N27E38	277	0030	02	HSX	002	A							
15 Aug	N27E27	275	0030	05	CSO	005	B							
16 Aug	N27E11	278	0020	01	HRX	001	A							
17 Aug	N27W02	278	0000	00	AXX	002	A							
											0	0	0	1

Still on Disk.

Absolute heliographic longitude: 278

<i>Region 8075</i>														
15 Aug	N29E46	256	0000	00	AXX	001	A							
16 Aug	N29E31	258	0010	00	AXX	001	A							
17 Aug	N29E18	258												
											0	0	0	0

Still on Disk.

Absolute heliographic longitude: 258



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

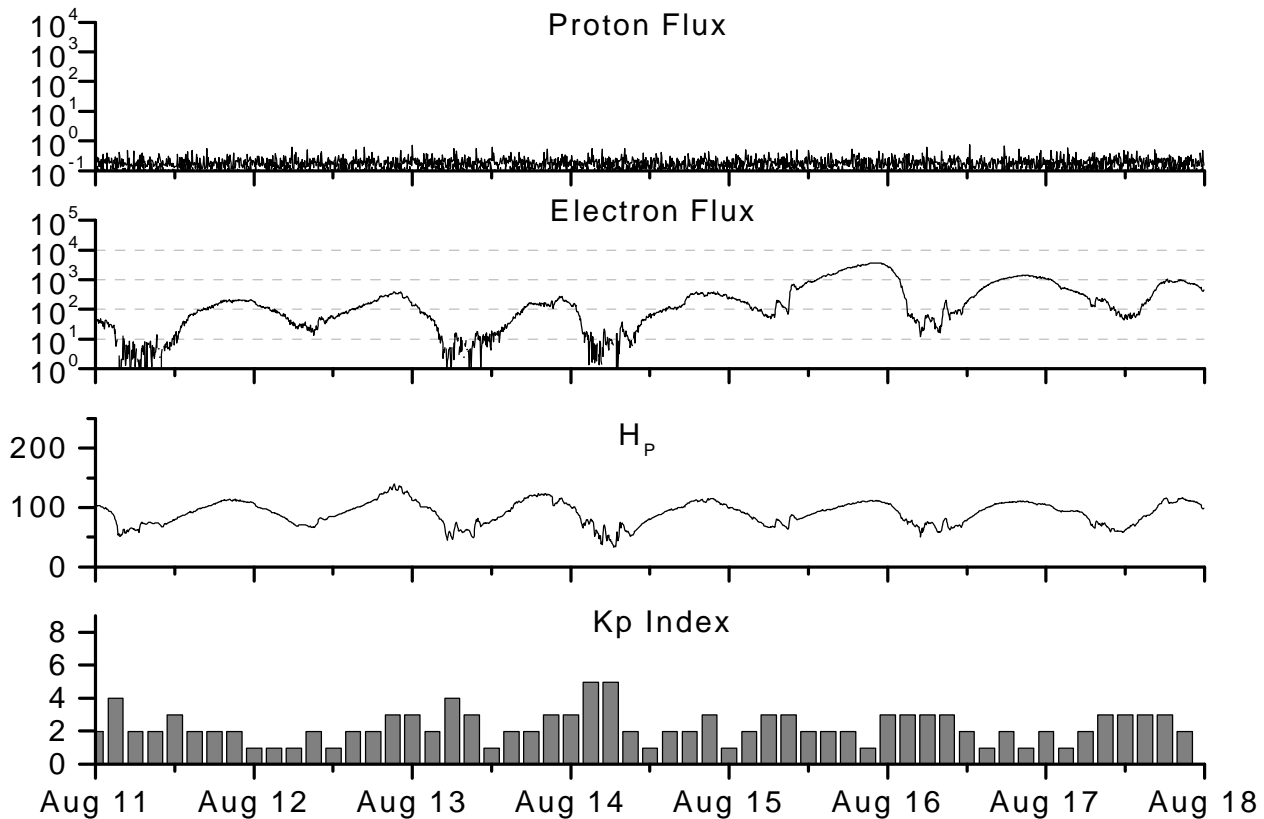
Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		**Penticton	Smooth	Planetary	Smooth
	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
<b>1995</b>									
August	25.1	14.3	0.57	25.4	15.4	73.8	76.0	09	12.1
September	16.5	11.8	0.72	22.0	13.4	72.0	74.8	13	11.8
October	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
<b>1996</b>									
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	72.7	72.1	11	09.9
April	08.5	04.8	0.60	13.6	08.6	69.3	71.6	11	09.7
May	11.8	05.5	0.47	12.9	08.1*	72.1	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*	0.72*	15.4	10.0*	78.7	73.0	08	09.1*
December	21.1	12.7*	0.60*	16.2	10.6*	77.8	73.3	07	09.3*
<b>1997</b>									
January	09.0	06.5*	0.72*	16.5	10.7*	74.0	73.5*	09	09.4*
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*	
June	22.1	13.1*	0.59*			72.4*		08*	
July	17.0	10.5*	0.62*			71.2*		07*	

\*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 11 Aug 1997

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

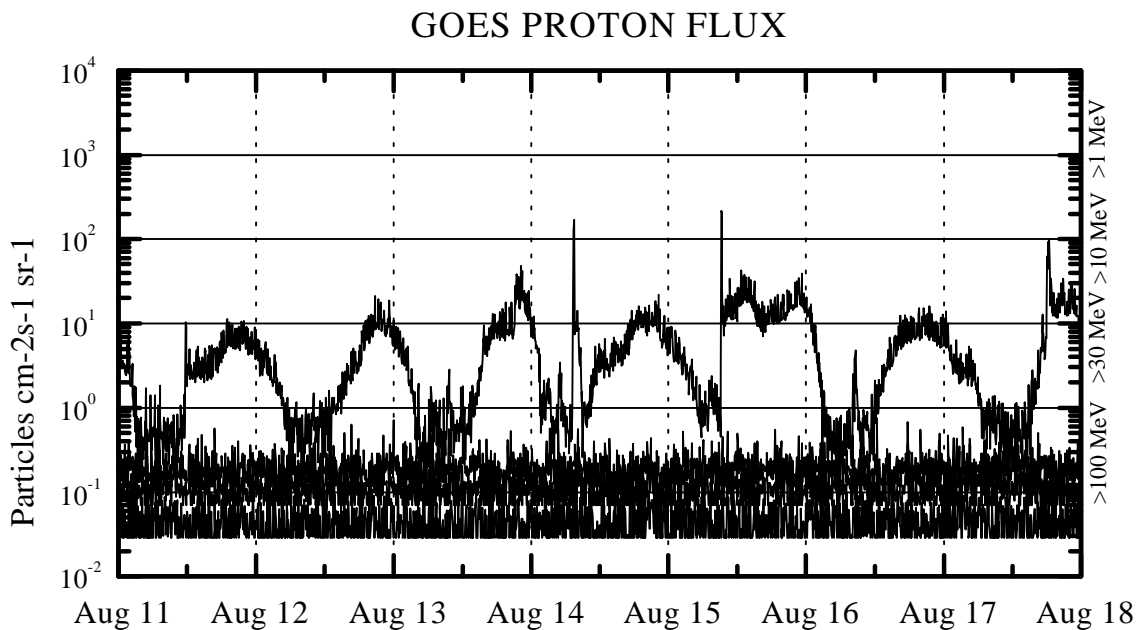
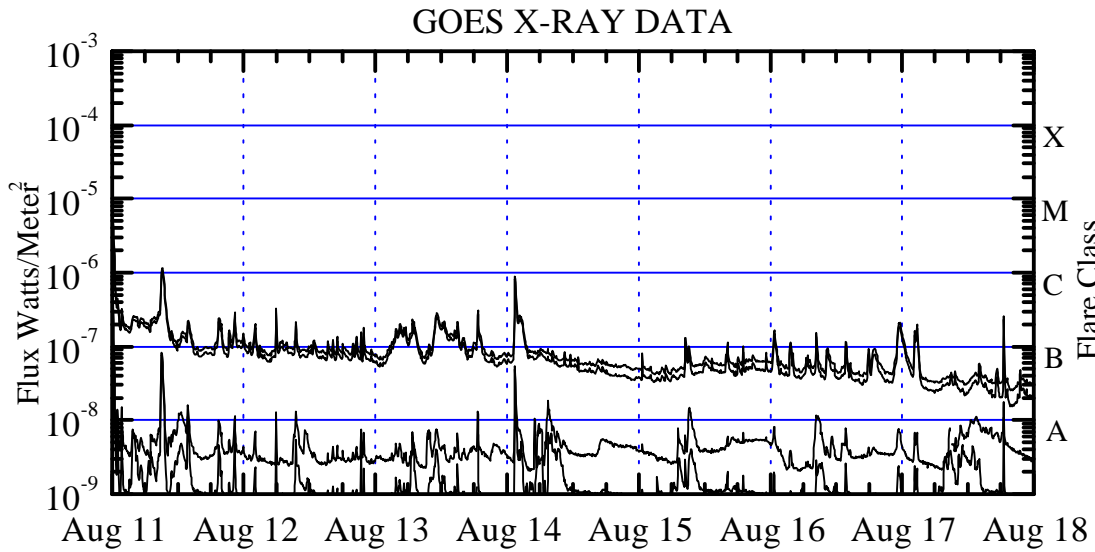
*Electrons* plot contains the five minute averaged integral electron flux (electrons/  $\text{cm}^2\text{-sec-sr}$ ) with energies greater than 2 MeV at GOES-9.

*H<sub>p</sub>* 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.

*K<sub>p</sub>* plot contains the estimated planetary 3-hour K-index (derived by the USAF 55<sup>th</sup> 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 K<sub>p</sub> 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 K<sub>p</sub> are "global" parameters that are applicable to a first order approximation over large areas. H<sub>p</sub> is subject to a more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





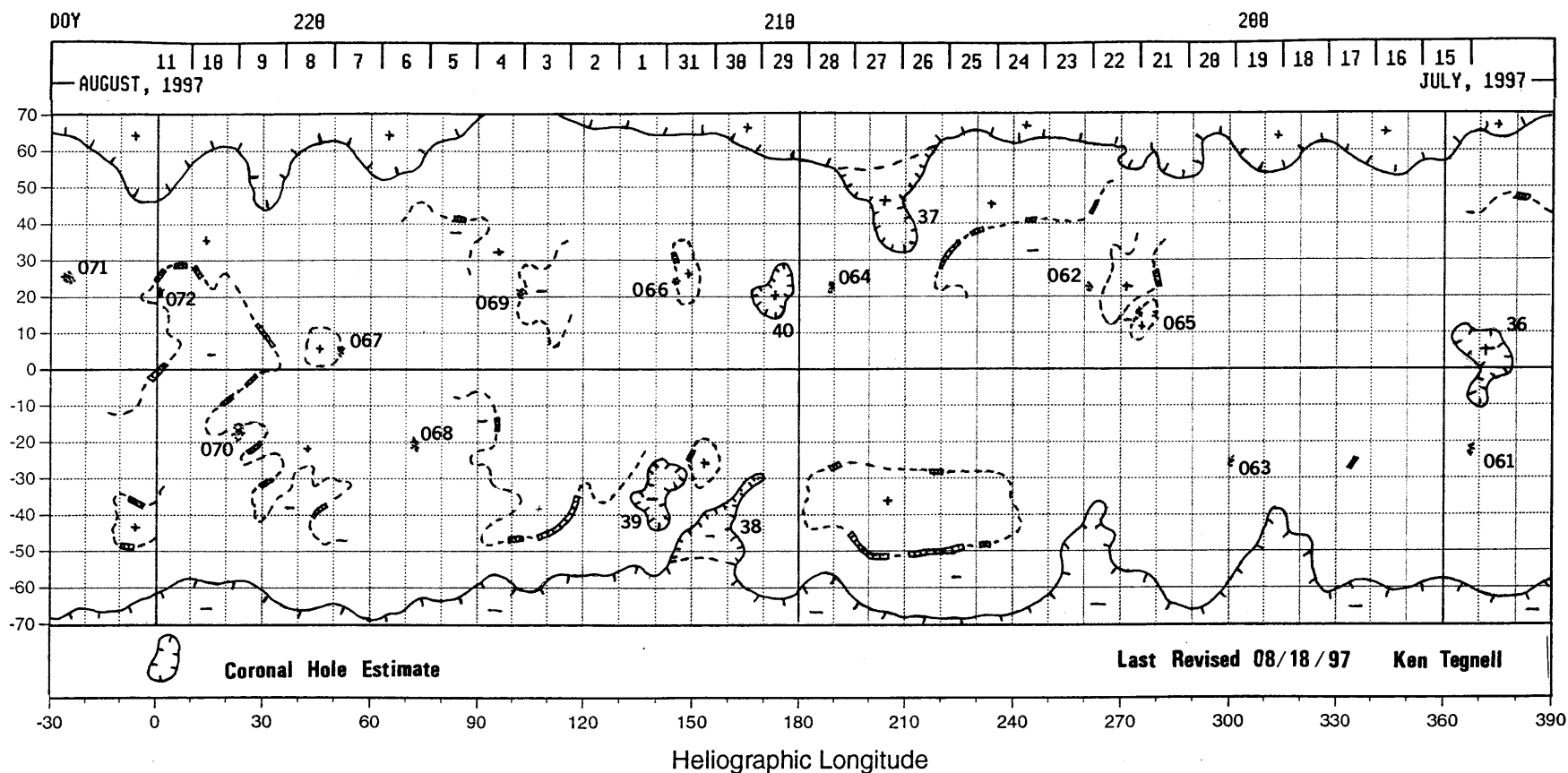
*Weekly GOES Satellite X-ray and Proton Plots*

Proton plot contains the five minute averaged integral proton flux (protons/cm<sup>2</sup>-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<sup>2</sup>-sec-sr) at greater than 10 MeV.

X-ray plot contains five minute averaged x-ray flux (watts/m<sup>2</sup>) 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 1925



*H-alpha 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. 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), O1 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.

