

**Space Weather Highlights**  
**07 January – 13 January 2008**

**SEC PRF 1689**  
**15 January 2008**

Solar activity was very low to low. Activity was low on the first day of the period due to a C1/Sf flare at 07/1527 UTC from Region 980 (S07, L = 232, class/area Cso/030 on 02 January). Activity dropped to very low levels during the remainder of the period with no flares detected.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels during 07 - 12 January.

The geomagnetic field was quiet to active on 07 January with localized minor to major storming detected at high latitudes. Quiet to active levels persisted on 08 January. Activity decreased to mostly quiet levels during 09 - 11 January. Activity increased to quiet to active levels on 12 January, then decreased to quiet to unsettled levels on the last day of the period. ACE solar wind measurements indicated a recurrent coronal hole high-speed stream was in progress on 07 January. Peak velocity was 763 km/sec at 07/1320 UTC, followed by a gradual decrease in velocities through 12 January. Interplanetary magnetic field (IMF) variations during the high-speed stream included a peak Bt reading of 5.4 nT at 07/0056 UTC and Bz readings in the + 5 to - 5 nT range. Protons densities ranged from 1 - 2 p/cc during the high-speed stream. The activity increase on 12 January was associated with a solar sector boundary crossing (SSBC) in advance of a recurrent coronal hole high-speed stream. IMF changes associated with the SSBC included a peak Bt reading of 10.4 nT at 13/1603 UTC and a minimum Bz reading of -8.0 nT at 12/1504 UTC. The proton density increase associated with the SSBC reached a peak of 11.4 p/cc at 12/1153 UTC. Solar wind velocities showed an unsteady increase following the SSBC with a peak of 586.3 km/sec observed at 12/2311 UTC.

**Space Weather Outlook**  
**16 January – 11 February 2008**

Solar activity is expected to be very low.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels during 16 - 27 January and 03 - 11 February.

The geomagnetic field is expected to be at quiet to unsettled levels during 16 - 17 January. Quiet conditions are forecast for 18 - 31 January. Activity is expected to increase to unsettled to active levels on 01 February due to the onset of a recurrent coronal hole high-speed stream. Quiet to unsettled conditions are expected during 02 - 04 February as the high-speed stream gradually subsides. Quiet conditions are expected during 05 - 08 February. Activity is expected to increase to unsettled to active levels during 09 - 10 February due to another recurrent coronal hole high-speed stream. Quiet to unsettled conditions are expected on 11 February as coronal hole effects subside.



**Daily Solar Data**

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
07 January	78	14	20	<A1.0	1	0	0	1	0	0	0	0
08 January	76	16	20	<A1.0	0	0	0	0	0	0	0	0
09 January	77	0	0	<A1.0	0	0	0	0	0	0	0	0
10 January	76	0	0	<A1.0	0	0	0	0	0	0	0	0
11 January	76	0	0	<A1.0	0	0	0	0	0	0	0	0
12 January	76	0	0	<A1.0	0	0	0	0	0	0	0	0
13 January	75	0	0	<A1.0	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)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
	07 January	2.1E+6	1.6E+4	3.5E+3		3.2E+8
08 January	1.6E+6	1.6E+4	3.2E+3		5.6E+8	
09 January	1.0E+6	1.5E+4	3.3E+3		7.5E+8	
10 January	9.5E+5	1.7E+4	3.3E+3		7.9E+8	
11 January	8.8E+5	1.6E+4	3.4E+3		7.7E+8	
12 January	1.5E+6	1.8E+4	3.6E+3		5.5E+8	
13 January	1.2E+6	1.7E+4	3.6E+3		1.2E+7	

**Daily Geomagnetic Data**

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	07 January	10	4-3-2-2-2-1-1-2	23	3-3-3-6-5-1-0-2	12
08 January	11	3-2-2-3-1-3-3-2	16	1-2-3-4-3-4-4-2	13	2-3-2-2-1-4-4-2
09 January	6	3-1-2-1-1-1-2-1	10	3-2-3-3-3-1-1-1	6	3-2-2-1-1-0-1-1
10 January	2	2-0-1-0-1-1-1-0	2	0-0-0-2-2-0-1-0	3	2-0-0-1-1-1-0-1
11 January	2	1-1-1-2-0-0-1-0	1	0-0-0-2-0-0-1-0	2	1-0-1-1-0-0-1-1
12 January	4	0-0-1-1-1-3-2-1	11	0-0-1-3-2-5-3-1	9	0-0-1-1-2-4-3-2
13 January	9	3-2-1-1-3-3-2-1	24	1-1-1-3-6-5-4-3	11	3-2-2-1-3-3-3-2

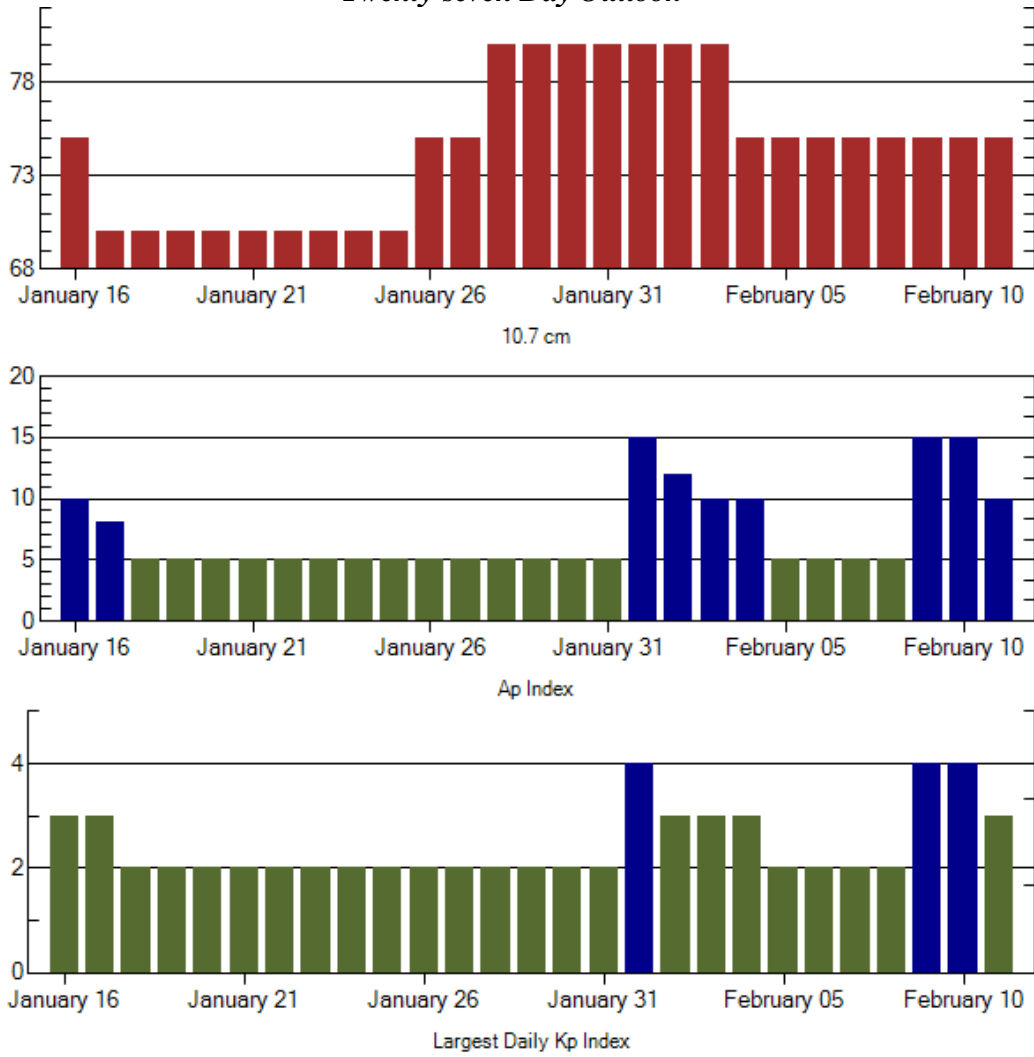


### *Alerts and Warnings Issued*

<u>Date &amp; Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date &amp; Time of Event UTC</u>
06 Jan 1716	ALERT: Electron 2MeV Integral Flux > 1000pfu	06 Jan 1710
07 Jan 0207	ALERT: Geomagnetic K=4	07 Jan 0205
07 Jan 0507	WARNING: Geomagnetic K=4	07 Jan 0507 - 1600
07 Jan 0508	ALERT: Geomagnetic K=4	07 Jan 0508
07 Jan 0519	ALERT: Electron 2MeV Integral Flux >1000pfu	07 Jan 0519
08 Jan 0501	ALERT: Electron 2MeV Integral Flux >1000pfu	08 Jan 0500
08 Jan 1756	WARNING: Geomagnetic K=4	08 Jan 1800 - 2359
09 Jan 0500	ALERT: Electron 2MeV Integral Flux >1000pfu	09 Jan 0500
10 Jan 0523	ALERT: Electron 2MeV Integral Flux >1000pfu	10 Jan 0500
11 Jan 0501	ALERT: Electron 2MeV Integral Flux >1000pfu	11 Jan 0500
12 Jan 0609	ALERT: Electron 2MeV Integral Flux >1000pfu	12 Jan 0500
12 Jan 1554	WARNING: Geomagnetic K=4	12 Jan 1555 - 2359
12 Jan 1617	ALERT: Geomagnetic K=4	12 Jan 1616
12 Jan 2345	EXTENDED WARNING: Geomagnetic K=4	12 Jan 1555 - 13/1600
13 Jan 1530	EXTENDED WARNING: Geomagnetic K=4	12 Jan 1555 - 13/2359
13 Jan 2303	EXTENDED WARNING: Geomagnetic K=4	12 Jan 1555 - 14/1600



### 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
16 Jan	75	10	3	30 Jan	80	5	2
17	70	8	3	31	80	5	2
18	70	5	2	01 Feb	80	15	4
19	70	5	2	02	80	12	3
20	70	5	2	03	80	10	3
21	70	5	2	04	75	10	3
22	70	5	2	05	75	5	2
23	70	5	2	06	75	5	2
24	70	5	2	07	75	5	2
25	70	5	2	08	75	5	2
26	75	5	2	09	75	15	4
27	75	5	2	10	75	15	4
28	80	5	2	11	75	10	3
29	80	5	2				



***Energetic Events***

Date	Time			X-ray	Optical Information			Peak		Sweep Freq
	Begin	Max	Max	Integ	Imp/	Location	Rgn	Radio Flux		Intensity
				Class	Flux	Lat	CMD	#	245	2695

*No Events Observed*

***Flare List***

Date	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
07 January	0226	0234	0245	B1.2			
	B1530	U1530	A1616	C1.4	Sf	S08W02	980
08 January	No Flares Observed						
09 January	No Flares Observed						
10 January	No Flares Observed						
11 January	No Flares Observed						
12 January	No Flares Observed						
13 January	No Flares Observed						



### *Region Summary*

Location		Sunspot Characteristics										
		Flares										
Date	( ° 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

#### *Region 980*

31 Dec	S09E90	231																
01 Jan	S07E69	238	0030	02	Bxo	002	A	1						1				
02 Jan	S08E58	236	0030	04	Cso	003	B											
03 Jan	S06E42	239	0020	02	Hsx	003	A											
04 Jan	S06E29	239	0010	01	Axx	003	A											
05 Jan	S06E16	239																
06 Jan	S06E03	239																
07 Jan	S06W03	232	0020	03	Dso	004	B	1						1				
08 Jan	S08W23	239	0020	04	Axx	006	A											
09 Jan	S08W36	239																
10 Jan	S08W49	239																
11 Jan	S08W62	239																
12 Jan	S08W75	239																
13 Jan	S08W88	239																
								2	0	0	2	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 239

#### *Region 981*

04 Jan	N30E22	246	0020	03	Cso	003	B											
05 Jan	N29E14	241	0020	01	Bxo	002	B											
06 Jan	N27W04	246	0020	02	Axx	002	A											
07 Jan	N27W17	246																
08 Jan	N27W30	246																
09 Jan	N27W43	246																
10 Jan	N27W56	246																
11 Jan	N27W69	246																
12 Jan	N27W82	246																
								0	0	0	0	0	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 246

### *Recent Solar Indices (preliminary)*



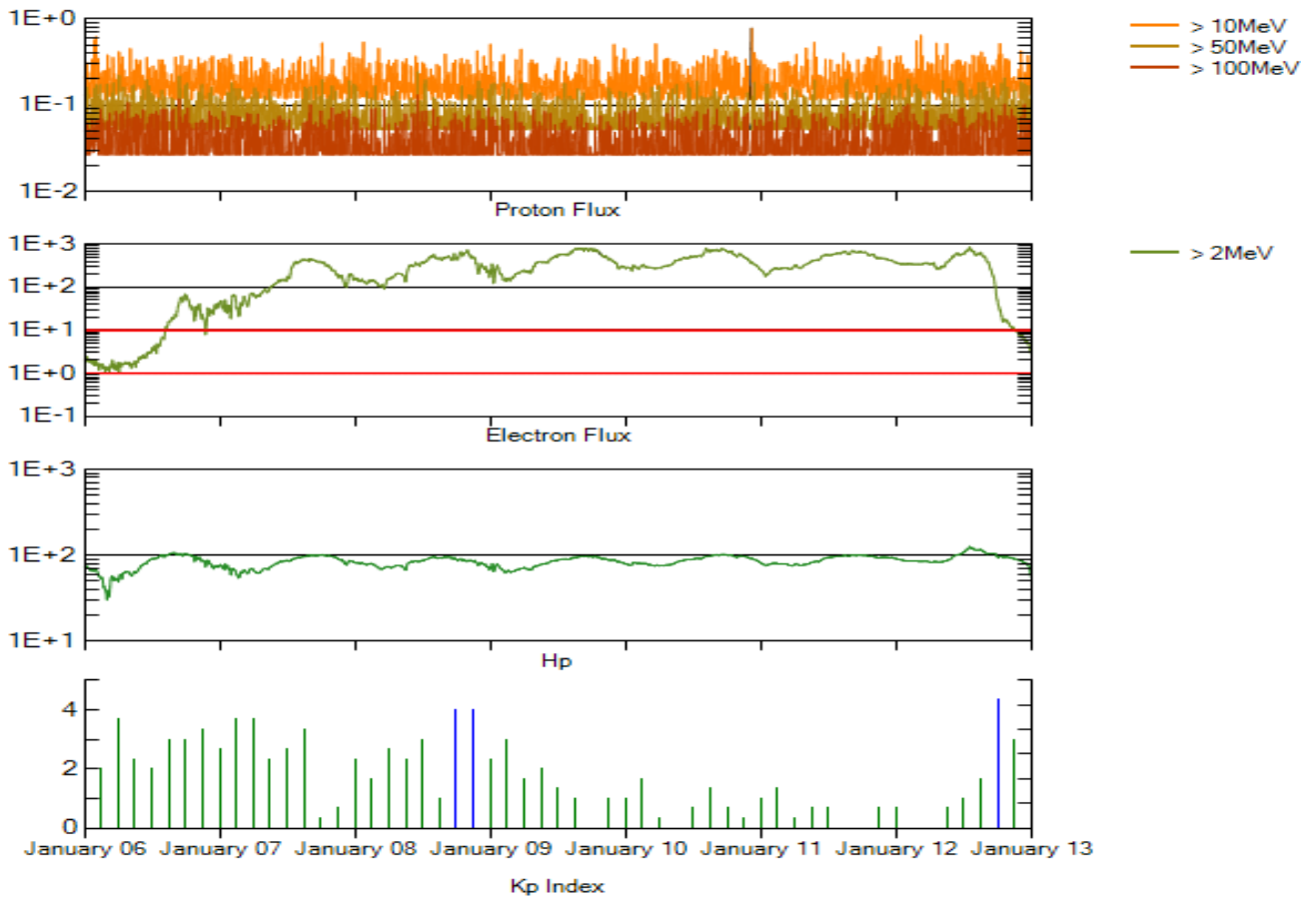
*Of the observed monthly mean values*

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values		Ratio	Smooth values		*Penticton	Smooth	Planetary	Smooth
	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
<b>2006</b>									
January	28.0	15.4	0.55	37.2	20.8	83.8	84.0	6	9.9
February	5.3	4.7	0.89	33.4	18.7	76.6	82.6	6	9.2
March	21.3	10.8	0.51	31.0	17.4	75.5	81.6	8	8.4
April	55.2	30.2	0.55	30.6	17.1	89.0	80.9	11	7.9
May	39.6	22.2	0.56	30.7	17.3	81.0	80.8	8	7.9
June	37.7	13.9	0.37	28.9	16.3	80.1	80.6	9	8.3
July	22.6	12.2	0.54	27.2	15.3	75.8	80.3	7	8.7
August	22.8	12.9	0.57	27.6	15.6	79.0	80.3	9	8.7
September	25.2	14.5	0.58	27.7	15.6	77.8	80.2	8	8.7
October	15.7	10.4	0.66	25.2	14.2	74.3	79.4	8	8.6
November	31.5	21.5	0.68	22.3	12.7	86.4	78.5	9	8.5
December	22.2	13.6	0.61	20.7	12.1	84.3	77.9	15	8.5
<b>2007</b>									
January	26.6	16.9	0.64	19.7	12.0	83.5	77.5	6	8.4
February	17.2	10.6	0.62	18.9	11.6	77.8	76.9	6	8.4
March	9.7	4.8	0.49	17.5	10.8	72.3	76.0	8	8.4
April	6.9	3.7	0.54	16.0	9.9	72.4	75.2	9	8.5
May	19.4	11.7	0.60	14.2	8.7	74.5	74.2	9	8.4
June	20.0	12.0	0.60	12.8	7.7	73.7	73.2	7	7.8
July	15.6	10.0	0.64			71.6		8	
August	9.9	6.2	0.63			69.2		7	
September	4.8	2.4	0.50			67.1		8	
October	1.3	0.9	0.70			65.5		9	
November	2.5	1.7	0.68			69.7		5	
December	16.2	10.1	0.62			78.6		4	

**NOTE:** All smoothed values after September 2002 and monthly values after March 2003 are preliminary estimates. The lowest smoothed sunspot index number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 23, RI= 120.8, occurred April 2000.

\*After June 1991, 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 06 January 2008*

Protons plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-11 (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<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-12 (W075).

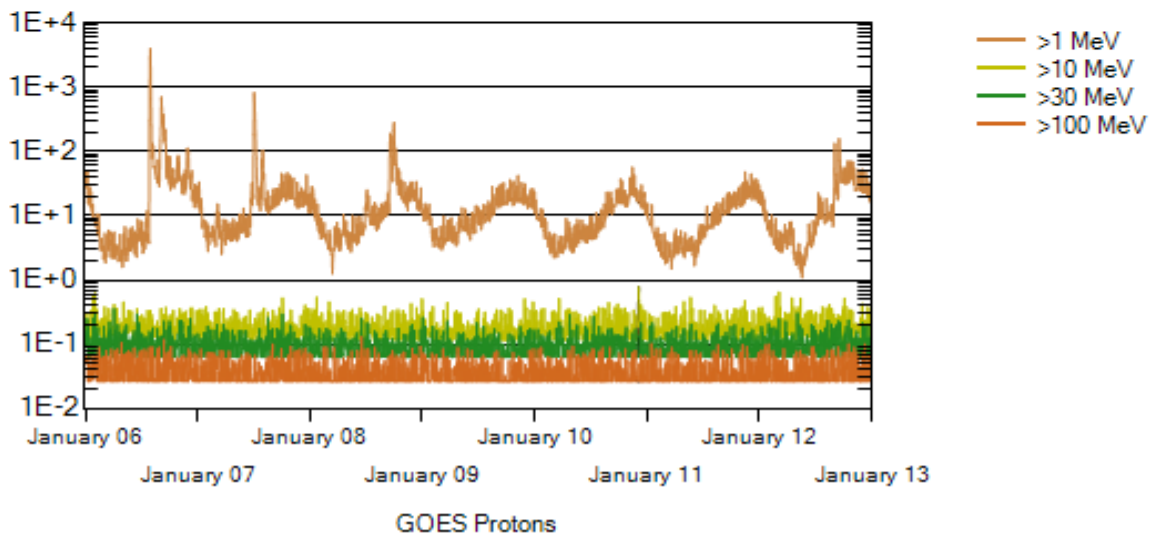
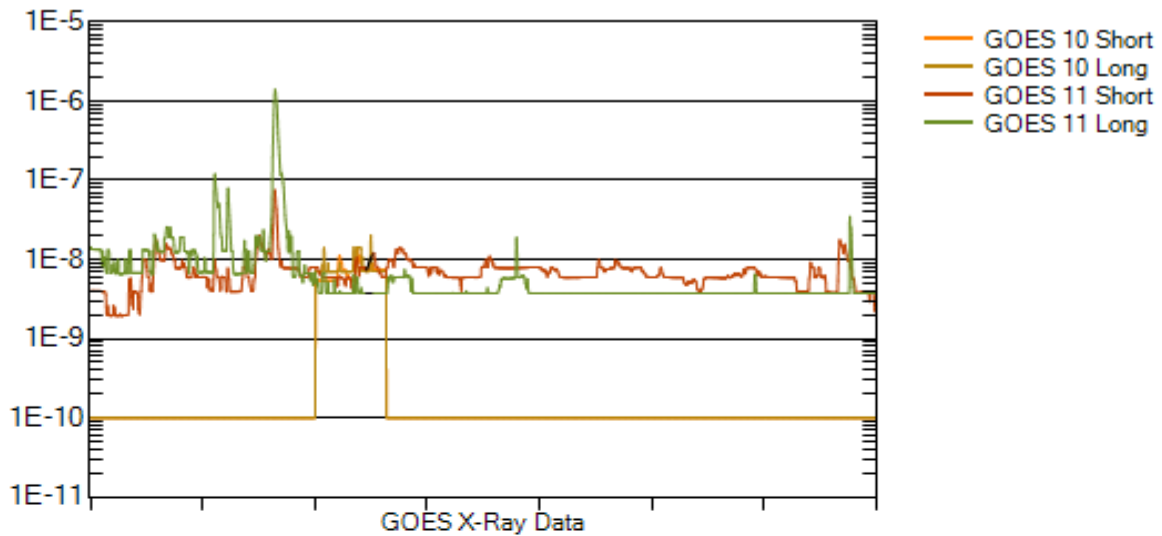
Hp plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

Kp plot contains the estimated planetary 3-hour K-index (derived by the Air Force Weather Agency) 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 and Hartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC), British Geological Survey (BGS) 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 SEC 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. H parallel is subject to 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*

X-ray plot contains five-minute averaged x-ray flux ( $\text{watts/m}^2$ ) as measured by GOES 10 (W060) and GOES 11 (W135) 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.

Proton plot contains the five-minute averaged integral proton flux ( $\text{protons/cm}^2\text{-sec-sr}$ ) as measured by GOES-11 (W135) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu ( $\text{protons/cm}^2\text{-sec-sr}$ ) at greater than 10 MeV.

