

Solar activity ranged from very low to low. Low levels were observed on 20 - 23 September while very low levels occurred on 24 - 26 September. Region 672 (N05, L=349, class/area, Dso/080 on 20 September) produced the largest event of the period, a C7.5/Sf flare at 21/0836 UTC. This region continued to produce low-level C-class activity as it rotated around the west limb on 22 September. The only other region of note was Region 673 (S13, L=269, class/area, Dho/310 on 20 September) which produced low-level C-class activity.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft during most of the summary period. The period began with wind speed near 400 km/s and the IMF Bz weak with fluctuations not varying much beyond +/- 5 nT through early 22 September. At about 22/0555 UTC, a shock was felt at ACE as effects from the 19 September M1.9 flare and associated full halo CME impacted Earth. Shortly after the shock, a 20 nT sudden impulse was observed at Boulder at 22/0637 UTC. Wind speed sharply increased from about 425 km/s to near 500 km/s, but the IMF remained weak not varying much beyond +/- 5 nT, and remained weak for the remainder of the summary period. By midday on the 22nd, wind began a gradual decay and ended the summary period near 350 km/s.

A greater than 10 MeV proton event began at 19/1925 UTC, reached a maximum of 57 pfu at 20/0100 UTC, and ended at 20/1205 UTC. This event followed the 19 September M1.9 flare from Region 672.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 20, 22 - 23, and 25 - 27 September.

The geomagnetic field was at quiet to minor storm levels. The period began with mostly quiet to unsettled levels, but quickly rose to active to minor storming by midday on 22 September as effects from the 19 September CME impacted the geomagnetic field. By early on 23 September, the geomagnetic field had relaxed to mostly quiet to unsettled and remained so for the balance of the summary period.

### **Space Weather Outlook** **29 September - 25 October 2004**

Solar activity is expected to be at predominately very low to low levels. Isolated moderate activity is possible after the return of old Region 667 on 29 September and old Region 672 on 05 October.

A greater than 10 MeV proton event is not expected.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 12 – 17 October.

The geomagnetic field is expected to range from quiet to active. From 11 – 15 October, a recurrent high speed coronal hole wind stream is expected to produce occasional active periods. The remainder of the forecast period is expected to be mostly quiet to unsettled.



### 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	
20 September	101	59	400	B1.9	2	0	0	0	0	0	0	0	0
21 September	95	33	340	B1.4	1	0	0	1	0	0	0	0	0
22 September	91	24	260	B1.4	1	0	0	1	0	0	0	0	0
23 September	90	19	240	A9.8	1	0	0	0	0	0	0	0	0
24 September	89	15	240	A8.1	0	0	0	0	0	0	0	0	0
25 September	90	24	370	A6.1	0	0	0	0	0	0	0	0	0
26 September	90	22	270	A5.9	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)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
	20 September	9.3E+6	1.0E+6	3.9E+3		1.8E+7
21 September	7.5E+6	9.6E+4	3.4E+3		9.0E+6	
22 September	1.6E+6	2.3E+4	3.0E+3		3.0E+7	
23 September	3.2E+6	1.4E+4	3.1E+3		6.6E+7	
24 September	4.3E+5	1.5E+4	3.4E+3		3.7E+7	
25 September	4.5E+5	1.4E+4	3.7E+3		7.6E+7	
26 September	4.8E+5	1.4E+4	3.5E+3		9.1E+7	

### Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	20 September	8	2-1-4-3-2-1-0-1	17	2-1-5-5-3-3-0-1	13
21 September	6	1-3-1-1-2-1-2-1	12	2-4-4-3-2-2-1-1	9	2-3-3-2-2-2-2-2
22 September	12	0-0-3-2-4-3-3-3	23	0-1-3-3-6-5-3-2	16	1-1-3-3-5-4-4-3
23 September	10	4-4-1-1-1-1-1-2	15	4-5-1-3-2-2-2-1	12	4-4-2-2-2-2-2-2
24 September	5	3-2-1-2-0-1-1-1	6	2-1-0-4-1-2-1-0	6	3-2-1-2-2-2-2-2
25 September	2	0-0-0-1-2-1-1-0	7	0-0-0-4-4-1-0-0	5	0-1-0-2-2-3-2-2
26 September	2	1-1-1-0-0-0-1-1	2	1-0-1-0-0-0-1-1	4	1-1-2-1-1-2-2-2

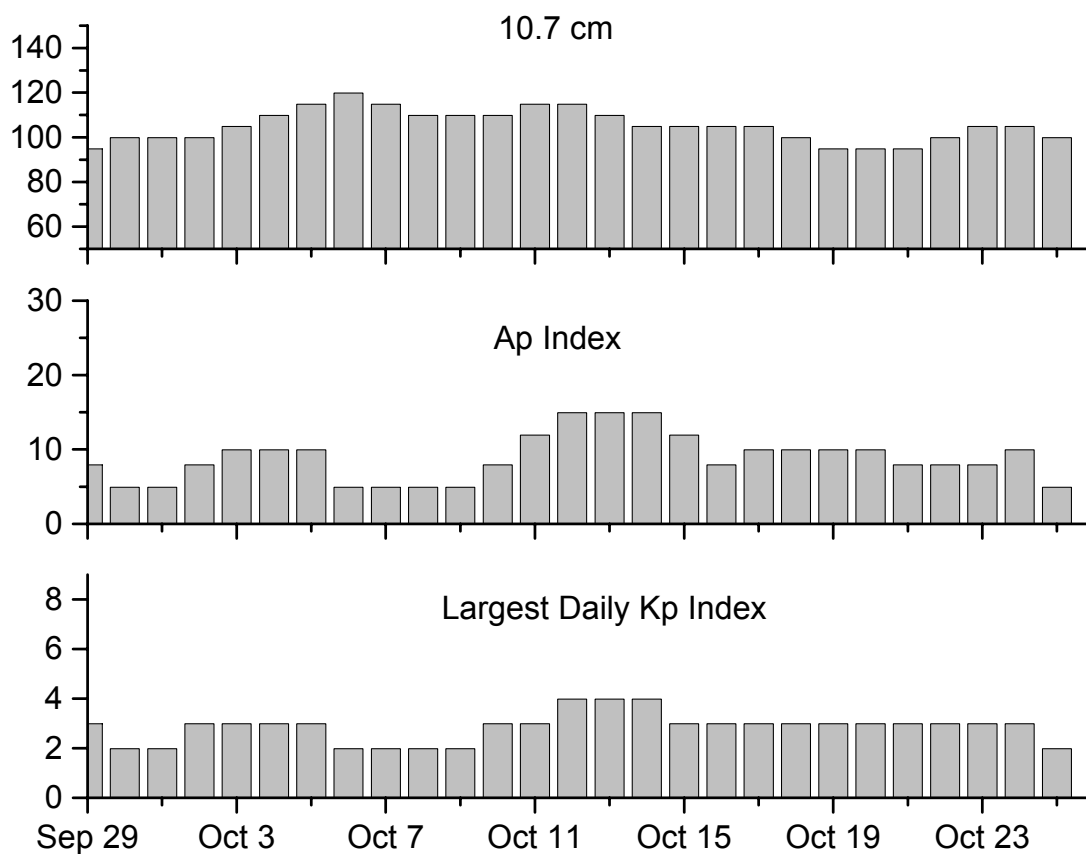


### *Alerts and Warnings Issued*

<u>Date &amp; Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date &amp; Time of Event UT</u>
13 Sep 0013	2 – 245 MHz Radio Bursts	12 Sep
20 Sep 0108	CONT ALERT: Proton Event 10MeV Integral Flux > 10pfu	19 Sep 1925
20 Sep 0842	ALERT: Electron 2MeV Integral Flux > 1000pfu	20 Sep 0820
20 Sep 0844	WARNING: Geomagnetic K = 4	20 Sep 0845 - 1500
20 Sep 0847	ALERT: Geomagnetic K = 4	20 Sep 0845
20 Sep 1940	SUMMARY: Proton Event 10MeV Integral Flux > 10pfu	19 Sep 1925
20 Sep 2107	WATCH: Geomagnetic A $\geq$ 20	22 Sep
21 Sep 0526	ALERT: Geomagnetic K = 4	21 Sep 0523
22 Sep 0634	WARNING: Geomagnetic Sudden Impulse	22 Sep 0635 - 0730
22 Sep 0640	SUMMARY: Geomagnetic Sudden Impulse	22 Sep 0637
22 Sep 1336	WARNING: Geomagnetic K = 4	22 Sep 1336 - 1800
22 Sep 1340	ALERT: Geomagnetic K = 4	22 Sep 1339
22 Sep 1348	ALERT: Electron 2MeV Integral Flux > 1000pfu	22 Sep 1330
22 Sep 1445	ALERT: Geomagnetic K = 5	22 Sep 1444
22 Sep 1450	WARNING: Geomagnetic K = 5	22 Sep 1500 - 1800
22 Sep 1759	EXT WARNING: Geomagnetic K = 4	22 Sep 1336 – 23 Sep 0000
23 Sep 0149	WARNING: Geomagnetic K = 4	23 Sep 0149 – 1500
23 Sep 0156	ALERT: Geomagnetic K = 4	23 Sep 0155
23 Sep 1348	ALERT: Electron 2MeV Integral Flux > 1000pfu	23 Sep 1330
25 Sep 1111	ALERT: Electron 2MeV Integral Flux > 1000pfu	25 Sep 1050
26 Sep 1221	ALERT: Electron 2MeV Integral Flux > 1000pfu	26 Sep 1200



## 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
29 Sep	95	8	3	13 Oct	110	15	4
30	100	5	2	14	105	15	4
01 Oct	100	5	2	15	105	12	3
02	100	8	3	16	105	8	3
03	105	10	3	17	105	10	3
04	110	10	3	18	100	10	3
05	115	10	3	19	95	10	3
06	120	5	2	20	95	10	3
07	115	5	2	21	95	8	3
08	110	5	2	22	100	8	3
09	110	5	2	23	105	8	3
10	110	8	3	24	105	10	3
11	115	12	3	25	100	5	2
12	115	15	4				



### *Energetic Events*

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

*No Events Observed*

### *Flare List*

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn
	Begin	Max	End			Location	Lat CMD	
20 September	0303	0310	0315	C1.7				672
	0443	0447	0451	B2.6				
	0709	0721	0725	C2.1				672
	1445	1449	1452	B3.4				
	2246	2250	2253	B5.7				672
21 September	0049	0055	0057	B5.2				672
	0808	0812	0815	B2.3				672
	0835	0838	0841	C7.5	Sf	N06W75		672
22 September	0655	0705	0712	B7.8				672
	0818	0829	0836	B7.9				672
	0903	U0907	A0925	C3.2	Sf	S13W08		673
	1601	1606	1617	B4.4				673
	1707	1714	1719	B6.2				672
	1823	1827	1831	B3.8				672
	1844	1901	1910	B8.2				672
23 September	0528	0532	0535	B2.6				
	0624	0628	0633	B1.6				673
	0742	0800	0807	C1.4				672
	0843	0905	0926	B5.3				672
	1212	1235	1245	B4.7				673
	1559	1603	1607	B2.4				673
24 September	0235	0245	0306	B5.4				673
	0411	0427	0445	B3.5				
	0804	0807	0814	B1.3				673
	1339	1344	1351	B1.3				673
	1426	1432	1446	B1.3				673
25 September	1557	1602	1611	B1.6				673
	0143	0146	0150	B1.1				673
	0545	0548	0550	A9.1				673
26 September	0934	0938	0940	A8.7				673
	0058	0102	0105	B2.0				673
	1559	1604	1612	B1.7				
	1718	1722	1725	B1.4				673
	1925	1930	1933	B1.6				673
	2020	2023	2029	B1.0				
	2332	2338	2340	B2.1				673
2349	2352	2354	B1.1					



### 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 672</i>																		
09 Sep	N05E73	350	0300	07	Dai	005	B	2										
10 Sep	N05E60	350	0260	08	Dai	013	B	7										
11 Sep	N05E47	350	0270	13	Eai	030	Bg	1										
12 Sep	N05E33	350	0260	11	Eai	049	Bg		1							1		
13 Sep	N04E22	348	0270	09	Dao	032	Bg	2										
14 Sep	N05E10	347	0310	11	Eai	049	Bd	1	1				1					
15 Sep	N05W03	347	0320	12	Eai	046	Bd	3				2						
16 Sep	N05W17	348	0230	12	Eai	045	Bd					2						
17 Sep	N05W29	347	0150	11	Eai	037	B											
18 Sep	N06W45	349	0100	06	Cao	016	B											
19 Sep	N05W58	349	0070	06	Cro	007	B	1	1									
20 Sep	N05W71	349	0080	08	Dso	007	B	2										
21 Sep	N04W86	351	0050	02	Hsx	001	A	1				1						
								20	3	0	5	1	1	0	0			

Crossed West Limb.

Absolute heliographic longitude:347

<i>Region 673</i>																		
15 Sep	S13E72	272	0140	03	Hax	001	A	1										
16 Sep	S12E61	269	0240	10	Eki	015	Bg											
17 Sep	S13E51	267	0320	12	Eko	019	B											
18 Sep	S13E35	269	0360	13	Eso	014	B	1										
19 Sep	S13E22	269	0300	11	Eso	015	B											
20 Sep	S13E09	269	0310	10	Dho	018	B											
21 Sep	S13W04	269	0290	10	Dho	012	B											
22 Sep	S13W17	269	0260	10	Dao	014	B	1				1						
23 Sep	S13W31	269	0240	09	Dso	009	B											
24 Sep	S13W44	269	0240	08	Dso	005	B											
25 Sep	S13W57	269	0250	03	Hhx	003	A											
26 Sep	S14W73	272	0180	03	Hsx	001	A											
								3	0	0	1	0	0	0	0	0		

Still on Disk.

Absolute heliographic longitude:269



***Region Summary - continued.***

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

*Region 674*

20 Sep	S10W23	301	0010	04	Bxo	004	B										
21 Sep	S10W36	301															
22 Sep	S10W49	301															
23 Sep	S10W62	301															
24 Sep	S10W75	301															
25 Sep	S10W88	301															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude:301

*Region 675*

25 Sep	S08E75	137	0120	02	Hax	001	A										
26 Sep	S08E61	138	0090	03	Hsx	001	A										

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude:138



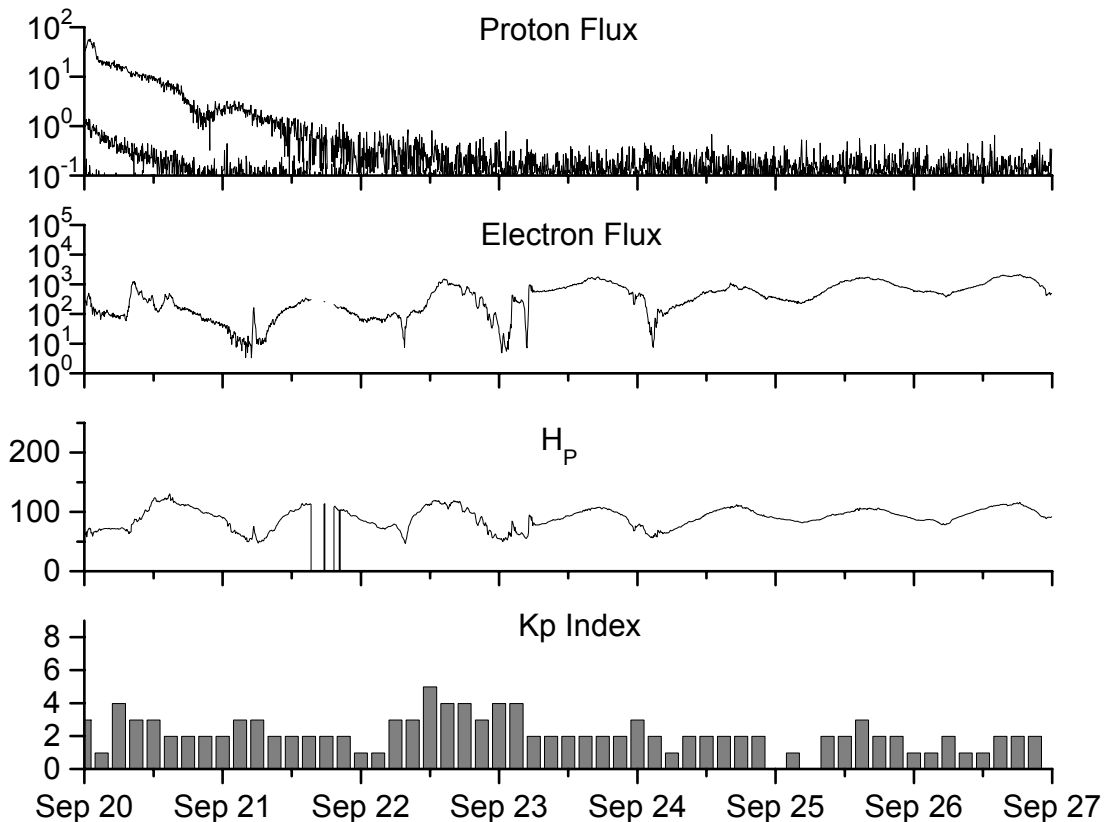
**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed SWO	values RI	Ratio RI/SWO	Smooth SWO	values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
<b>2002</b>									
September	206.4	109.6	0.53	163.4	94.6	175.8	164.1	14	15.0
October	153.9	97.5	0.63	158.8	90.5	167.0	159.4	23	15.6
November	159.8	95.5	0.60	150.9	85.2	168.7	154.8	16	16.3
December	147.9	80.8	0.55	144.6	82.1	158.6	150.9	13	17.0
<b>2003</b>									
January	149.3	79.7	0.53	141.7	81.0	144.0	149.2	13	18.2
February	87.0	46.0	0.53	136.4	78.5	124.5	144.7	17	18.9
March	119.7	61.1	0.51	128.1	74.2	132.2	139.5	21	19.4
April	119.7	60.0	0.50	121.5	70.3	126.3	135.0	20	20.1
May	89.6	55.2	0.62	118.3	67.8	129.3	133.1	26	21.0
June	118.4	77.4	0.65	113.6	65.2	129.4	130.2	24	21.5
July	132.8	85.0	0.64	106.9	62.0	127.8	127.2	19	22.0
August	114.3	72.7	0.64	102.8	60.3	122.1	125.2	23	22.2
September	82.6	48.8	0.59	100.7	59.8	112.3	123.7	18	21.8
October	118.9	65.6	0.55	96.6	58.4	153.1	121.8	35	21.1
November	118.9	67.2	0.57	93.6	57.0	153.1	120.1	28	20.0
December	75.4	47.0	0.62	91.4	55.0	115.1	118.0	16	18.6
<b>2004</b>									
January	62.3	37.2	0.60	87.9	52.0	114.1	116.3	22	18.1
February	75.6	46.0	0.61	84.2	49.4	107.0	115.5	13	17.7
March	81.0	48.9	0.60			112.2		14	
April	59.3	39.3	0.66			101.2		11	
May	77.3	41.5	0.54			99.8		8	
June	78.9	43.2	0.55			97.4		8	
July	87.8	51.0	0.58			118.5		23	
August	69.5	40.9	0.59			110.1		10	

**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 20 September 2004*

*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-11 (W100) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

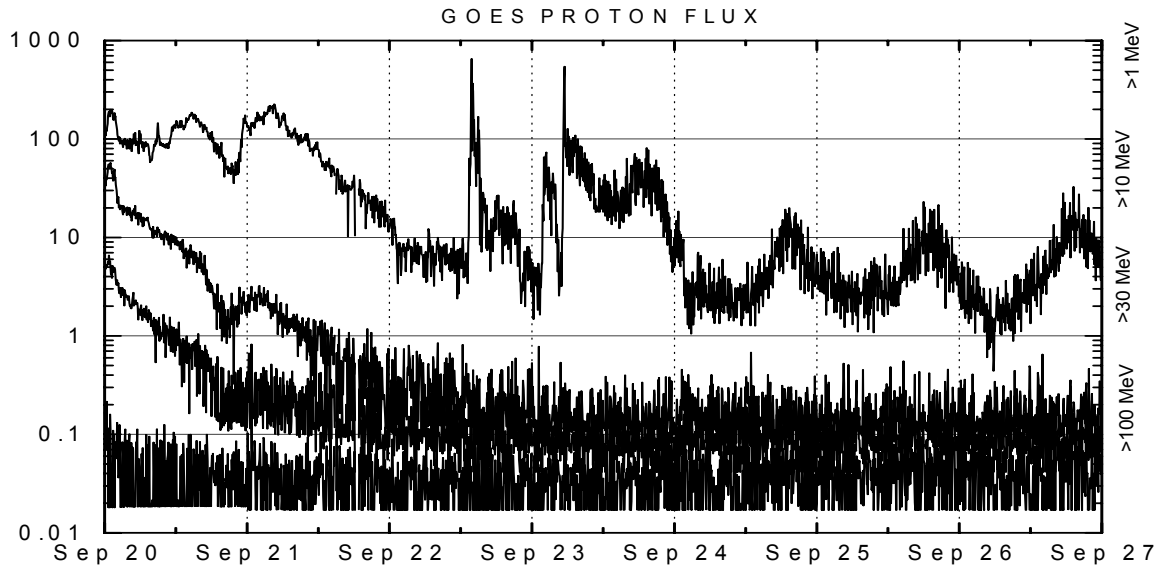
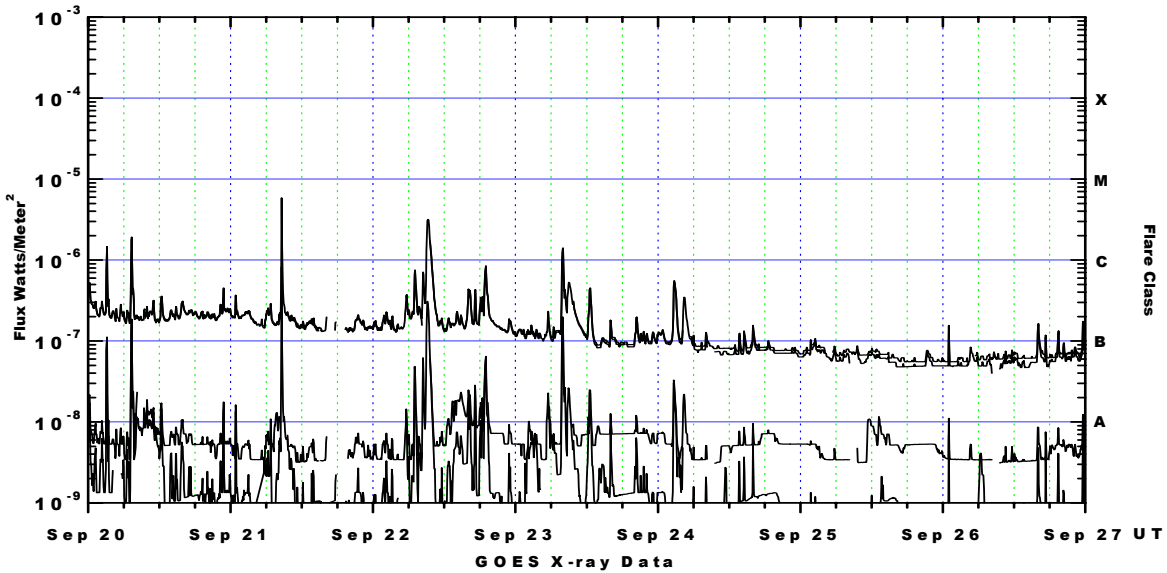
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-12 (W74).

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

*K<sub>p</sub>* 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 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 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 (watts/m<sup>2</sup>) as measured by GOES 12 (W75) and GOES 10 (W136) 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 (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W100) 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.

