

## Space Weather Highlights 09 - 15 Aug 2004

SWO PRF 1511  
17 Aug 2004

Solar activity levels ranged from low to high. The summary period began with low levels on 09 – 11 August, increased to moderate on 12 August, and further increased to high on 13 - 15 August. Region 656 (S13, L=082, class/area, Fkc/1360 on 13 August) produced most of the activity this period with 63 C-class flares, 17 M-class flares, and 1 X-class flare. The period began with a slow, faint CME visible in LASCO C2 imagery off the south limb beginning at about 10/1854 UTC. The CME was associated with surge activity and a subsequent EIT wave that was observed just north of Region 656 and east of central meridian. The largest flare of the period was an X1.0/1n, with an associated 180 sfu 10cm burst, observed on 13/1812 UTC. Significant activity was also observed on 14 and 15 August when Region 656 produced multiple M-class flares. On 14 August, an M7.4/2n (0544 UTC) and an M5.6/2N (1343 UTC) were reported. During this period, SOHO/LASCO imagery depicted several CMEs that all appeared to have a solar westward component. On 15 August, multiple M-class flare activity was once again observed, the largest an M9.4/1n that occurred at 1241 UTC. A faint, CME was seen on SOHO/LASCO imagery, but did not appear to be Earth-directed. Old Region 652 quietly rotated around the east limb on the 12th and was numbered Region 661 (N07, L=348, class/area, Dko/390 on 15 August).

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft during most of the summary period. The period began on 09 August with solar wind speed near 400 km/s. Early on 10 August, wind speed showed an increasing trend and peaked near 650 km/s by early on 11 August. The increase in velocity and temperature, and a subsequent decrease in density, was consistent with the onset of a high-speed coronal hole wind stream. The IMF Bz responded with variations of +/- 7 nT through midday on the 10th and did not vary beyond +/- 5 nT through late on 13 August. Wind speed slowly decayed for the next few days and ended the summary period near 400 km/s. At approximately 13/2200 UTC, a weak shock passed the ACE spacecraft and was most likely associated with the faint halo CME observed late on 10 August. Wind speed jumped briefly to near 500 km/s for about 2 hours. The IMF Bz rotated +/- 7 nT for about 6 hours and then remained mostly northward 3 - 5 nT for the remainder of the summary period.

There were no greater than 10 MeV proton events at geosynchronous orbit during the summary period.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on 11 - 14 August.

The geomagnetic field ranged from quiet to active levels. The period began with quiet to active levels on 09 - 11 August as a recurrent coronal hole high speed stream influenced the geomagnetic field. Thereafter, activity declined to quiet to unsettled levels, and remained so through the end of the summary period.

## Space Weather Outlook 18 August - 13 September 2004

Solar activity is expected to range from very low to high. Solar activity is expected to be at moderate to high levels through 17 and 18 August. Activity should begin to diminish on 19 August as Region 656 transits the western solar limb. Activity levels are expected to decrease to very low to low through late August. Thereafter, and through to the end of the forecast period, activity levels are expected to increase to low to moderate when old Region 656 (L=082) is due to return.

A greater than 10 MeV proton event is possible through 19 August and again after 01 September upon the return of old Region 656.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 24 - 26 August and 04 - 06 September.

The geomagnetic field is expected to range from quiet to unsettled levels for most of the forecast period. From 23 - 25 August and again on 03 - 05 September, levels are expected to increase to unsettled to active due to a pair of weak, recurrent coronal hole streams that are expected to be in a geoeffective position.



### *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
09 August	114	101	840	B3.8	14	0	0	12	1	0	0	0
10 August	121	93	860	B3.3	4	0	0	2	0	0	0	0
11 August	131	115	1110	B4.9	18	0	0	11	0	0	0	0
12 August	147	140	1510	B6.9	11	1	0	11	2	0	0	0
13 August	149	160	1800	B6.8	6	4	1	7	4	0	0	0
14 August	149	111	1690	C2.0	4	7	0	15	2	2	0	0
15 August	139	98	1730	B7.0	8	5	0	6	1	1	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
	09 August	5.6E+5	1.4E+4	5.0E+3		5.3E+6
10 August	7.8E+5	1.4E+4	5.2E+3		4.0E+6	
11 August	6.3E+5	1.5E+4	5.5E+3		1.0E+8	
12 August	6.2E+5	1.4E+4	3.5E+3		1.7E+8	
13 August	5.6E+5	1.5E+4	3.6E+3		2.2E+8	
14 August	1.5E+6	1.7E+4	3.6E+3		3.5E+7	
15 August	8.1E+5	1.5E+4	3.4E+3		3.8E+7	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	09 August	12	2-2-3-2-2-2-3-4	14	2-1-4-4-2-2-4-2	13
10 August	12	4-1-2-2-3-2-3-3	28	4-2-1-4-6-5-3-3	14	4-1-2-2-3-4-3-3
11 August	10	2-2-2-3-3-2-3-2	16	2-2-3-5-4-3-2-1	13	2-2-3-4-3-3-3-3
12 August	6	2-2-2-1-2-1-2-2	*	3-2-1-*-2-2-1-2	9	3-2-2-2-3-3-2-3
13 August	5	2-1-1-0-1-1-3-2	6	2-2-0-1-3-1-1-2	9	2-2-2-1-3-2-3-3
14 August	6	2-1-2-2-2-1-2-2	9	3-2-2-4-2-1-1-1	9	3-1-2-3-3-3-2-2
15 August	3	1-1-0-0-3-0-1-0	1	1-0-0-0-1-0-0-0	7	2-1-1-2-3-3-2-2

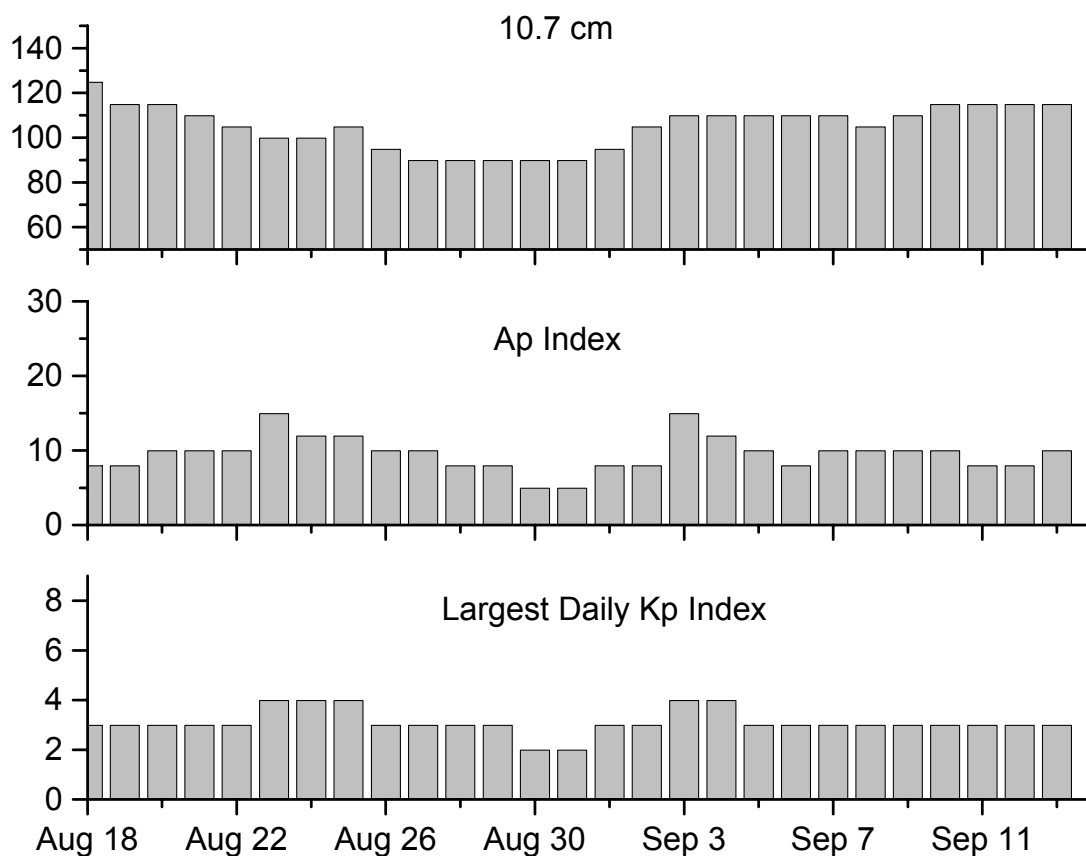


### *Alerts and Warnings Issued*

<u>Date &amp; Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date &amp; Time of Event UT</u>
09 Aug 0728	WARNING: Geomagnetic K= 4	09 Aug 0730 - 1600
09 Aug 0732	ALERT: Geomagnetic K= 4	09 Aug 0733
10 Aug 0007	5 – 245 MHz Bursts	09 Aug
10 Aug 0007	1 – 245 MHz Radio Noise Storm	09 Aug
10 Aug 0250	ALERT: Geomagnetic K= 4	10 Aug 0248
10 Aug 1643	ALERT: Geomagnetic K= 4	10 Aug 1640
10 Aug 1648	ALERT: Geomagnetic K= 5	10 Aug 1646
10 Aug 1653	WARNING: Geomagnetic K=4	10 Aug 1655 – 11 Aug 1500
11 Aug 0010	4 – 245 MHz Bursts	10 Aug
11 Aug 0010	1 – 245 MHz Radio Noise Storm	10 Aug
11 Aug 1251	ALERT: Electron 2MeV Integral Flux > 1000pfu	11 Aug 1235
12 Aug 0007	6 – 245 MHz Bursts	11 Aug
12 Aug 0007	1 – 245 MHz Radio Noise Storm	11 Aug
12 Aug 0819	ALERT: Electron 2MeV Integral Flux > 1000pfu	12 Aug 0755
13 Aug 0027	5 – 245 MHz Bursts	12 Aug
13 Aug 0027	1 – 245 MHz Radio Noise Storm	12 Aug
13 Aug 0539	ALERT: Electron 2MeV Integral Flux > 1000pfu	13 Aug 0505
13 Aug 1811	ALERT: X-Ray Flux $\geq$ M5	13 Aug 1811
13 Aug 1830	SUMMARY: X-ray Event $\geq$ X1	13 Aug 1807
13 Aug 1909	SUMMARY: 10cm Radio Burst	13 Aug 1810
14 Aug 0506	7 – 245 MHz Bursts	13 Aug
14 Aug 0506	1 – 245 MHz Radio Noise Storm	13 Aug
14 Aug 0544	ALERT: X-Ray Flux $\geq$ M5	14 Aug 0543
14 Aug 0555	SUMMARY: X-ray Event $\geq$ M5	14 Aug 0536
14 Aug 1342	ALERT: X-Ray Flux $\geq$ M5	14 Aug 1343
14 Aug 1358	SUMMARY: X-ray Event $\geq$ M5	14 Aug 1331
14 Aug 1543	ALERT: Electron 2MeV Integral Flux > 1000pfu	14 Aug 1520
15 Aug 0007	9 – 245 MHz Bursts	14 Aug
15 Aug 1239	ALERT: X-Ray Flux $\geq$ M5	15 Aug 1239
15 Aug 1258	SUMMARY: X-ray Event $\geq$ M5	15 Aug 1234



## 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
18 Aug	125	8	3	01 Sep	95	8	3
19	115	8	3	02	105	8	3
20	115	10	3	03	110	15	4
21	110	10	3	04	110	12	4
22	105	10	3	05	110	10	3
23	100	15	4	06	110	8	3
24	100	12	4	07	110	10	3
25	105	12	4	08	105	10	3
26	95	10	3	09	110	10	3
27	90	10	3	10	115	10	3
28	90	8	3	11	115	8	3
29	90	8	3	12	115	8	3
30	90	5	2	13	115	10	3
31	90	5	2				



### *Energetic Events*

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½ Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
									245	2695	II	IV
12 Aug	0438	0505	0520	M1.2	.014	1f	S14E02	656				
12 Aug	2253	2258	2303	C9.9	.004	Sn	S12W07	656				
13 Aug	0636	0729	0738	M1.2	.018	1f	S15W12	656				
13 Aug	1202	1209	1212	M1.1	.003	1f	S13W19	656				
13 Aug	1807	1812	1815	X1.0	.027	1n	S13W24	656	380	180		
13 Aug	2314	2343	2346	M3.0	.017			656				
13 Aug	2346	2350	2354	M2.8	.012	Sf	S12W27	656				
14 Aug	0410	0414	0417	M2.4	.006	Sf	S13W30	656	98			
14 Aug	0536	0544	0552	M7.4	.038	2n	S11W28	656	55	96		
14 Aug	0751	0756	0759	M2.3	.006	1f	S13W32	656				
14 Aug	0952	1007	1017	M3.2	.028	1f	S14W30	656	25			
14 Aug	1331	1343	1350	M5.6	.028	2n	S14W34	656	77			
14 Aug	1809	1818	1832	M1.3	.013			656				
14 Aug	2009	2016	2059	M1.3	.028			656	300			
15 Aug	0445	0506	0522	M1.2	.015	Sf	S12W44	656				
15 Aug	0554	0600	0604	M1.2	.005	Sf	S12W42	656	56			
15 Aug	1123	1132	1148	M2.6	.024	2f	S15W47	656	52			
15 Aug	1234	1241	1243	M9.4	.022	1n	S15W45	656				
15 Aug	1837	1845	1850	M1.2	.006			656	710			

### *Flare List*

Date	Time			X-ray Class.	Optical Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
09 August	0036	0037	0157	C5.1	Sf	S14E43	656
	B0100	0109	0146	C3.0	1n	S11E41	656
	0314	0318	0335	B7.2			656
	0409	0413	0417	B8.9			656
	0423	0425	0437		Sf	S15E43	656
	0458	0459	0502		Sf	S12E40	656
	0716	0716	0721		Sf	S12E39	656
	0731	0732	0741	C2.4	Sf	S12E38	656
	0804	0808	0822	C4.8	Sf	S12E38	656
	0832	0840	0843	C1.1			656
	0922	0928	0932	B9.6			656
	0940	0943	0946	B8.4			656
	1031	1034	1036	B9.0			656
	1101	1106	1115	C1.7			656
	1322	1335	1348	C3.3			656
	1518	1527	1532	C1.1			656
	1536	1550	1559	C1.9			656
	1758	1759	1813	C2.0	Sf	S12E34	656
	1847	1852	1912	C2.2	Sf	S12E32	656
	1933	1934	1939	C1.3	Sf	S12E31	656
1947	1948	2025	C2.2	Sf	S12E31	656	



*Flare List-continued*

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
09 August	2031	2034	2037		Sf	S12E31	656
	2138	2143	2152	B6.9			656
10 August	B2210	2212	2214	C1.8	Sf	S11E30	656
	0105	0111	0122	B7.7			656
	0257	0301	0305	B6.5			656
	0310	0314	0316	B9.6			656
	0604	0607	0612	C1.1	Sf	S12E26	656
	0854	0854	0900	B6.2	Sf	S12E24	656
	1725	1729	1735	C1.0			656
	1735	1738	1743	C1.2			
	2034	2039	2042	B7.6			656
	2202	2207	2212	C1.0			655
11 August	0015	0017	0020	B7.0	Sf	S12E16	656
	0342	0345	0356	C3.2	Sf	S11E10	656
	0438	0441	0444	B8.6			658
11 August	0713	0717	0733		Sf	S12E12	656
	0805	0810	0820	C1.1			656
	0823	0826	0829	C1.3			656
	0852	0852	0856	C2.9	Sf	S13E13	656
	1038	1051	1053	C4.2	Sf	S14E13	656
	1140	1140	1148	C7.6	Sf	S13E11	656
	1205	1209	1211	C1.3			656
	1246	1249	1252	C1.7			656
	1403	1409	1423	C1.8	Sf	S14E09	656
	1428	1433	1446		Sf	S13E08	656
	1449	1450	1452		Sf	S13E09	656
	1502	1505	1507	C1.4			656
	1535	1539	1544	C1.8			656
	1612	1617	1623	C2.8			656
	1633	1636	1638	C1.6			656
	1753	1753	1755	C1.7	Sf	S13E07	656
	1805	1809	1812	B9.9			656
	2109	2114	2118	C1.3			656
	2129	2134	2139	C1.0			656
	2205	2210	2215	C1.0			656
12 August	B2234	2236	2240	C3.4	Sf	S13E02	656
	0113	0118	0121	C1.2			656
	0443	0505	0553	M1.2	1f	S14E02	656
	B0502	0505	0537		1n	S13E02	
	0606	0606	0613		Sf	S14E00	656
	0628	0634	0637	C2.2	Sf	S14W07	656
	0639	0639	0645		Sf	S14W04	656



*Flare List-continued*

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
12 August	0909	0910	0914	C1.8	Sf	S12W02	656
	0932	0950	0956	C4.0	Sf	S14W03	656
	1035	1039	1043		Sf	S14W04	656
	1127	1143	1152	C4.9			656
	1257	1301	1304	C2.1			656
	1422	1423	1427		Sf	S14W07	656
	1615	1617	1719	C6.5	Sf	S18W06	656
	1714	1716	1719		Sf	S15W08	656
	1855	1858	1901	C4.4	Sf	S15W13	656
	2223	2227	2229	C6.1			656
	B2257	2257	2310	C9.9	Sn	S12W07	656
	2343	2346	2349	C1.2			656
	13 August	0056	0102	0108	C2.2		
0252		0255	0258	C1.9			656
0426		0427	0447		Sf	S12W16	656
0641		0646	0654		Sf	S14W15	656
0702		0703	0708		Sf	S14W16	656
0722		0729	0743		Sf	S12W18	656
0723		0729	0745	M1.2	1f	S15W12	656
0936		0943	0957	C2.4			656
1206		1209	1219	M1.1	1f	S13W19	656
1326		1326	1331		Sf	S14W17	656
1512		1514	1524	C8.6	1f	S14W21	656
1656		1658	1659	C2.3	Sf	S12W23	656
1808		1815	1826	X1.0	1n	S13W24	656
2304		2307	2310	C3.5			656
2314		2343	2346	M3.0			656
2347		2348	2352	M2.8	Sf	S12W27	656
14 August		0413	0414	0425	M2.4	Sf	S13W30
	0432	0437	0441		Sf	S13W31	656
	0540	0544	0646	M7.4	2n	S11W28	656
	0624	0624	0627		Sf	S13W30	656
	0751	0756	0826	M2.3	1f	S13W32	656
	0934	0935	0938	C8.1	Sf	S13W30	656
	0956	1008	1021	M3.2	1f	S14W30	656
	1022	1023	1030		Sf	S14W30	656
	1113	1115	1117		Sf	S12W34	656
	1204	1205	1219	C7.4	Sf	S14W31	656
	1333	1343	1410	M5.6	2n	S14W34	656
	1454	1455	1459		Sf	S13W36	656
	1515	1525	1532	C5.9			656
	1610	1610	1615		Sf	S13W36	656
1631	1633	1639	C5.2	Sf	S14W33	656	



*Flare List-continued*

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
14 August	1646	1649	1654		Sf	S13W37	656
	1809	1818	1832	M1.3			656
	2009	2016	2059	M1.3			656
	2242	2242	2248		Sf	S14W37	656
	2249	2249	2255		Sf	S14W37	656
	2316	2327	2330		Sf	S13W39	656
	2339	2340	2344		Sf	S12W41	656
	15 August	0330	0333	0338	C6.9	Sf	S12W41
0344		0345	0351		Sf	S12W41	656
0459		0502	0551	M1.2	Sf	S12W44	656
0557		0603	0608	M1.2	Sf	S12W42	656
B1128		U1132	1150	M2.6	2f	S15W47	656
B1153		1159	1216		Sf	S14W51	656
1238		1240	1304	M9.4	1n	S15W45	656
1421		1421	1427	C1.7	Sf	S14W52	656
1642		1650	1656	C2.9			656
1716		1721	1726	C1.4			656
1759		1803	1812	C1.6			656
1837		1845	1850	M1.2			656
2037		2046	2054	C4.9			656
2255		2300	2302	C2.1			656
2355		0013	0022	C2.3			656





### Region Summary

Date	Location		Sunspot Characteristics				Flares														
	Helio		Area (10 <sup>-6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical										
	(° Lat ° CMD)	Lon						C	M	X	S	1	2	3	4						
<i>Region 655</i>																					
30 Jul	S09E71	175	0110	02	Hax	001	A														
31 Jul	S09E57	175	0170	09	Dao	005	B														
01 Aug	S09E44	175	0180	12	Eao	013	B														
02 Aug	S09E33	173	0170	12	Eao	013	B	1													
03 Aug	S09E16	177	0200	14	Eac	027	Bg					3									
04 Aug	S09E03	176	0190	15	Eso	039	B														
05 Aug	S09W09	174	0170	15	Eai	026	B														
06 Aug	S09W25	177	0160	15	Eai	020	B														
07 Aug	S10W38	177	0230	16	Fsi	022	B														
08 Aug	S10W54	178	0150	14	Eai	015	B														
09 Aug	S09W69	182	0140	08	Dao	009	B														
10 Aug	S10W83	183	0100	05	Cao	004	B	1													
								2	0	0	3	0	0	0	0	0					

Crossed West Limb.

Absolute heliographic longitude:176

#### *Region 656*

06 Aug	S12E69	083	0040	02	Hsx	001	A													
07 Aug	S13E58	081	0250	09	Dko	007	B													
08 Aug	S12E45	081	0290	11	Eao	020	Bg	2			3									
09 Aug	S12E31	082	0660	11	Ekc	061	Bgd	14			12	1								
10 Aug	S12E18	082	0700	12	Ekc	043	Bgd	2			2									
11 Aug	S13E03	083	0990	14	Ekc	068	Bgd	18			11									
12 Aug	S13W09	082	1320	16	Fkc	083	Bgd	11	1		11	1								
13 Aug	S13W22	082	1360	16	Fkc	099	Bgd	6	4	1	7	4								
14 Aug	S13W35	082	1300	17	Fkc	066	Bgd	4	7		15	2	2							
15 Aug	S13W48	082	1310	22	Fhc	054	Bgd	8	5		6	1	1							
								65	17	1	67	9	3	0	0					

Still on Disk.

Absolute heliographic longitude:083



**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 657*

06 Aug N10E82	074	0080	02	Hax	001	A
07 Aug N11E65	074	0060	02	Hax	001	A
08 Aug N11E51	075	0040	02	Hax	001	A
09 Aug N11E38	075	0040	02	Hax	001	A
10 Aug N11E25	075	0030	02	Hsx	001	A
11 Aug N10E12	074	0060	02	Hsx	001	A
12 Aug N10W02	075	0030	02	Hsx	001	A
13 Aug N10W15	075	0030	02	Hsx	001	A
14 Aug N10W28	075	0020	02	Hsx	002	A
15 Aug N10W41	075	0020	02	Hsx	001	A

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude:075

*Region658*

07 Aug S06E50	089	0020	01	Hsx	001	A
08 Aug S05E38	088	0010	01	Axx	001	A
09 Aug S05E25	088					
10 Aug S05E12	088					
11 Aug S05W01	088					
12 Aug S05W14	088					
13 Aug S05W27	088					
14 Aug S05W40	088					
15 Aug S05W53	088					

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude:088

*Region 659*

10 Aug N17E59	041	0030	06	Cro	005	B
11 Aug N17E46	040	0040	02	Cso	002	B
12 Aug N18E33	040	0030	02	Hax	001	A
13 Aug N18E20	040	0010	06	Bxo	006	B
14 Aug N17E05	042					
15 Aug N17W08	042					

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude:042



**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	4			
<i>Region 660</i>																		
11 Aug	S08E62	024	0020	05	Cro	004	B											
12 Aug	S07E48	025	0050	06	Dso	004	B											
13 Aug	S07E35	025	0040	07	Cao	002	B											
14 Aug	S07E17	030	0030	02	Hsx	001	A											
15 Aug	S07E04	030	0010	01	Hsx	001	A											
																		0 0 0 0 0 0 0 0
Still on Disk.																		
Absolute heliographic longitude:030																		
<i>Region 661</i>																		
12 Aug	N08E84	349	0080	04	Hsx	001	A											
13 Aug	N07E73	347	0360	09	Dao	002	B											
14 Aug	N07E60	347	0340	07	Dao	002	B											
15 Aug	N07E47	348	0390	08	Dko	002	B											
																		0 0 0 0 0 0 0 0
Still on Disk.																		
Absolute heliographic longitude:348																		

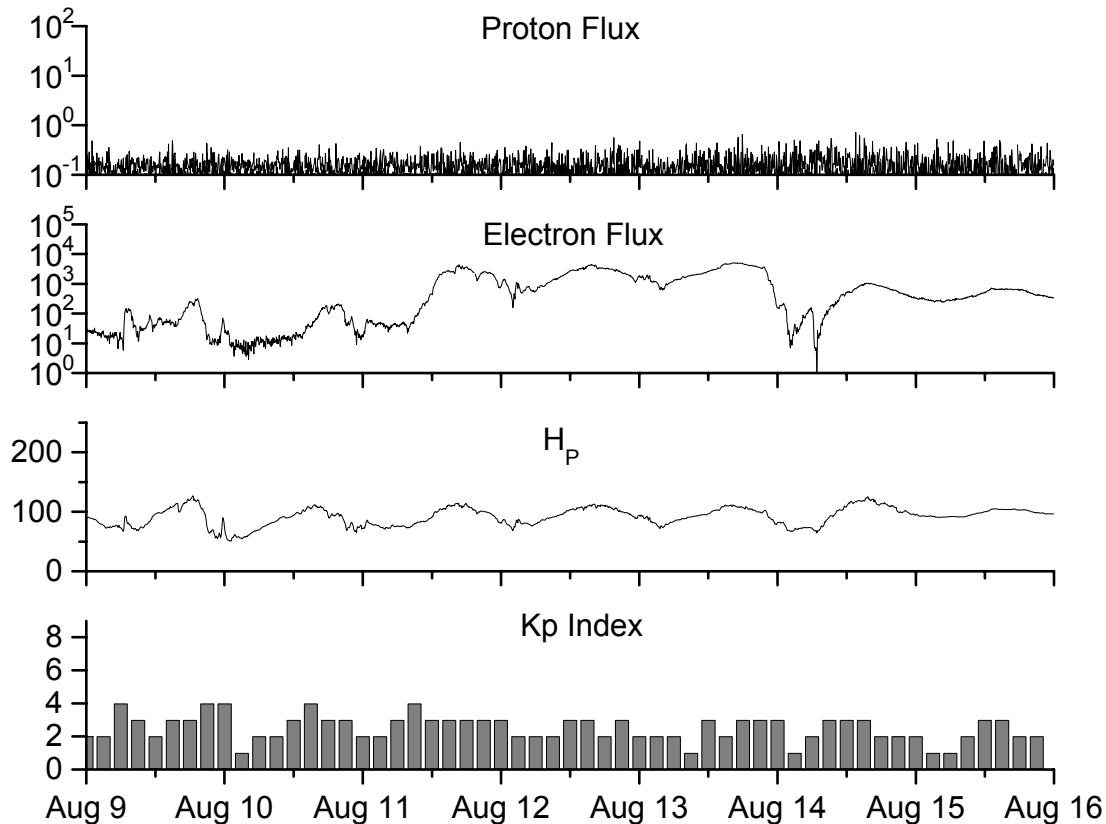


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

Month	Sunspot Numbers			Smooth values		Radio Flux		Geomagnetic	
	Observed SWO	values RI	Ratio RI/SWO	SWO	RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
<b>2002</b>									
August	191.0	116.4	0.61	169.2	98.7	183.9	169.5	16	14.2
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	136.3	20	20.0
May	89.6	55.2	0.62	118.3	67.8	129.3	135.0	26	21.0
June	118.4	77.4	0.65	113.6	65.2	129.4	132.6	24	21.8
July	132.8	85.0	0.64	106.9	62.0	127.8	129.5	20	22.3
August	114.3	72.7	0.64	102.8	60.3	122.1	127.5	23	22.4
September	82.6	48.8	0.59	100.7	59.8	112.3	126.0	19	21.9
October	118.9	65.6	0.55	96.6	58.4	153.1	124.1	32	21.1
November	118.9	67.2	0.57	93.6	57.0	153.1	121.8	31	20.0
December	75.4	47.0	0.62	91.4	55.0	115.1	119.4	18	18.6
<b>2004</b>									
January	62.3	37.2	0.60	87.9	52.1	114.1	117.7	20	18.0
February	75.6	46.0	0.61			107.0		13	
March	81.0	48.9	0.60			112.2		12	
April	59.3	39.3	0.66			101.3		10	
May	77.3	41.5	0.54			99.7		9	
June	78.9	43.2	0.55			99.7		9	
July	87.8	51.0	0.58			118.6		21	

**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 09 August 2004*

*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-11 (W98) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

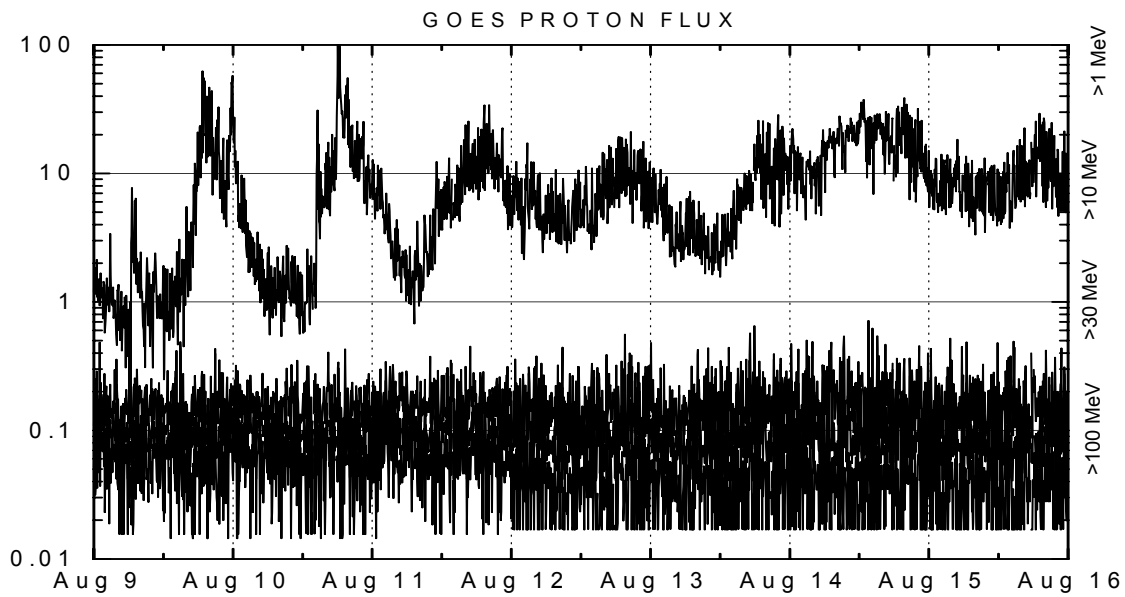
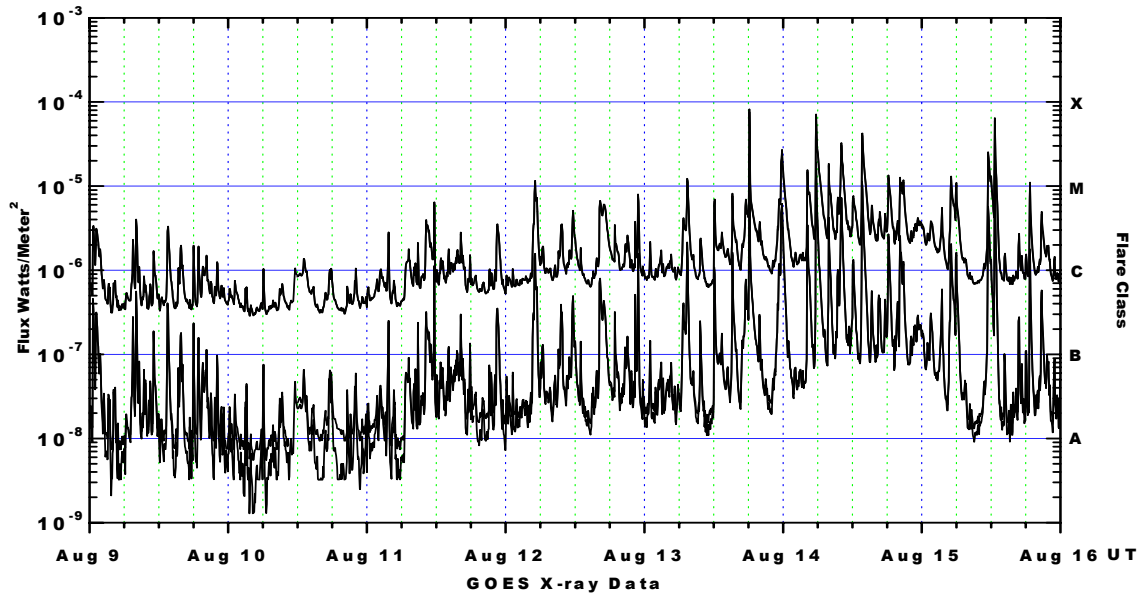
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

*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 (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 (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W98) 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.

