

Space Weather Highlights
21 July 1997 - 27 July 1997

Solar activity was very low to low. Region 8065 (N17, L = 277, class/area Dso/150 on 25 July) produced a long-duration C4/SF flare at 25/2035UT during a brief period of growth. A 1600 SFU Tenflare, and Types II and IV sweep bursts accompanied the flare (estimated Type II shock velocity 0900 km/sec). Activity returned to very low levels following the flare.

Solar wind interplanetary magnetic field (IMF) data were received from the WIND spacecraft a few hours per day (IMF data not available 26 - 27 July due to spacecraft location). Solar wind velocity and density data were received from proton monitor data provided by the University of Maryland from their sensor aboard the SOHO spacecraft. Velocities ranged from 510 - 360 km/sec. Densities were mostly in the 03 - 11 p/cc range, but increased early on 24 July peaking near 025 p/cc. Bz varied from minus 05 - plus 05 nT (GSM). Solar sector orientation was mostly away (phi angle near 135 degrees) through 23 July becoming toward (phi angle near 315 degrees) on 24 July. Orientation was not discernible on 25 July.

There were no significant proton enhancements observed at satellite altitudes.

The greater than 2 MeV electron flux at geosynchronous altitudes was at moderate to normal levels.

The geomagnetic field was quiet to unsettled.

Space Weather Forecast
30 July 1997 - 25 August 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. However, active levels are expected during 30 July due to a favorably positioned coronal hole.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 ⁶ hemi.)	X-ray Background	X-ray Flux			Flares				
					C	M	X	S	1	2	3	4
21 July	71	0	0	A5.5	0	0	0	0	0	0	0	0
22 July	72	11	10	A1.5	0	0	0	0	0	0	0	0
23 July	76	31	60	A2.6	0	0	0	0	0	0	0	0
24 July	79	44	90	A5.0	0	0	0	3	0	0	0	0
25 July	80	65	200	B1.2	3	0	0	8	0	0	0	0
26 July	77	58	180	B1.3	0	0	0	1	0	0	0	0
27 July	75	53	180	A5.0	0	0	0	3	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ² -day-sr)			Electron Fluence (electrons/cm ² -day-sr)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
21 July	1.6E+5	1.8E+4	4.2E+3		2.6E+7	
22 July	2.8E+5	1.8E+4	4.0E+3		2.4E+7	
23 July	5.0E+5	1.9E+4	4.3E+3		2.5E+7	
24 July	5.5E+5	1.8E+4	4.3E+3		3.0E+6	
25 July	2.3E+5	1.9E+4	4.7E+3		5.4E+5	
26 July	3.5E+5	2.4E+4	4.4E+3		7.2E+5	
27 July	2.9E+5	1.9E+4	4.6E+3		1.0E+6	

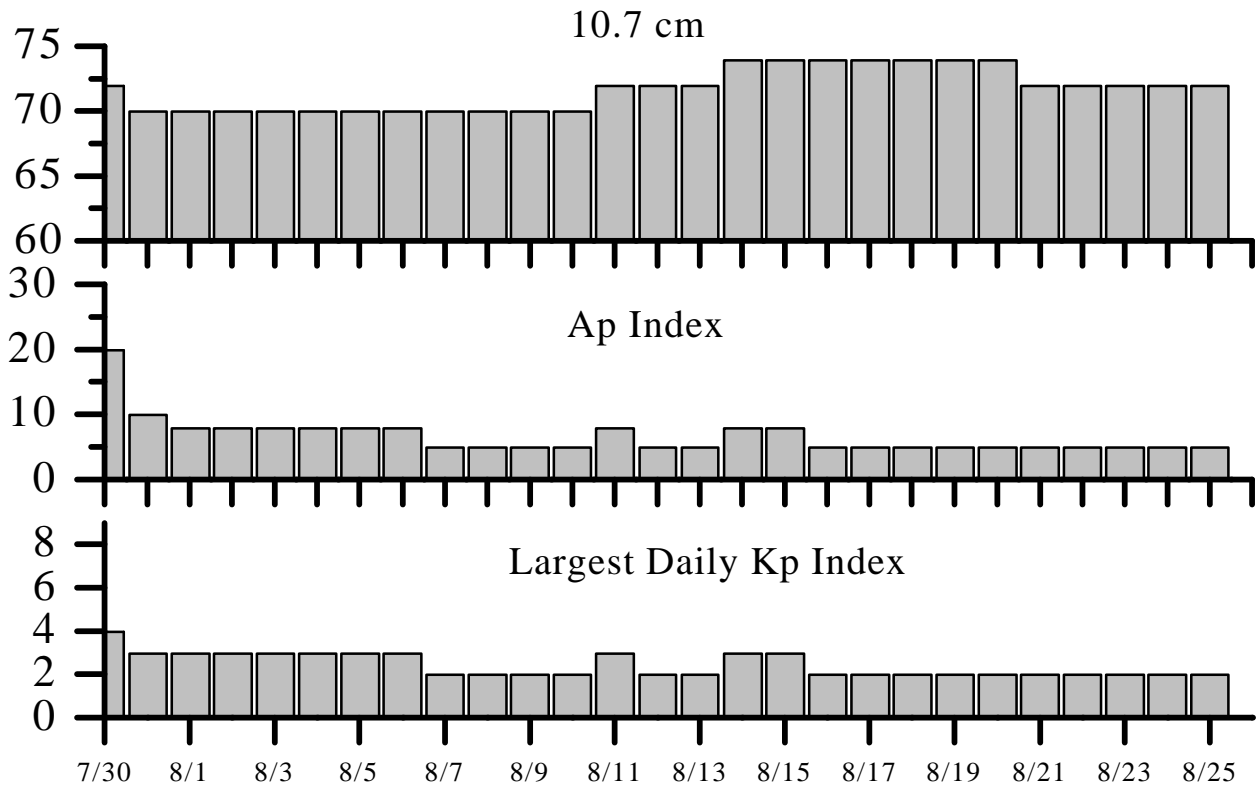
Daily Geomagnetic Data

Date	Middle Latitude		High Latitude		Estimated	
	Fredericksburg		College		Planetary	
	A	K-indices	A	K-indices	A	K-indices
21 July	7	1-1-2-1-2-3-2-2	0	0-0-0-0-1-0-1-0	5	1-1-3-1-2-2-2-1
22 July	7	1-1-1-2-2-3-2-2	1	1-0-0-1-0-1-0-1	4	1-0-0-2-2-2-2-1
23 July	7	1-2-2-1-2-2-2-3	1	1-1-0-0-0-0-0-1	5	1-2-1-0-1-1-1-3
24 July	15	2-2-2-3-4-3-3-4	9	1-1-2-1-5-1-1-1	10	2-1-3-3-3-2-3-3
25 July	8	2-2-1-2-2-3-2-2	1	2-1-0-0-1-0-0-0	5	2-2-1-0-1-2-2-2
26 July	8	2-1-1-1-2-2-3-3	0	0-0-0-0-0-0-1-1	4	1-1-2-0-1-2-2-2
27 July	7	2-2-2-1-2-2-2-2	1	0-0-0-2-0-1-0-1	6	2-1-2-2-2-2-1-2

Alerts and Warnings Issued

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
25 Jul 2055	Type II Radio Emission	25 Jul 2024
25 Jul 2109	Type IV Radio Emission	25 Jul 2018
25 Jul 2118	2695MHz Radio Burst	25 Jul 2018
25 Jul 2132	1- 245MHz Radio Burst	25 Jul 2018
26 Jul 0040	245MHz Radio Noise Storm	25 Jul 0639
27 Jul 1624	A ≥ 20 Watch	29 Jul
27 Jul 1627	A ≥ 20 Watch	30 Jul





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
30 Jul	72	20	4	13 Aug	72	5	2
31	70	10	3	14	74	8	3
01 Aug	70	8	3	15	74	8	3
02	70	8	3	16	74	5	2
03	70	8	3	17	74	5	2
04	70	8	3	18	74	5	2
05	70	8	3	19	74	5	2
06	70	8	3	20	74	5	2
07	70	5	2	21	72	5	2
08	70	5	2	22	72	5	2
09	70	5	2	23	72	5	2
10	70	5	2	24	72	5	2
11	72	8	3	25	72	5	2
12	72	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	
21 July	0349	0400	0413	B1.8				
	1019	1023	1028	B1.0				
22 July	No Flares Observed							
23 July	0701	0706	0724	B1.2				
	0729	0733	0737	B1.0				
	0811	0815	0817	B2.1				
	0954	0958	1002	B2.4				
	1105	1109	1118	B1.3				
	1237	1240	1244	B1.5				
	2028	2031	2034	B1.9				
24 July	0245	0249	0257	B1.3				
	0335	0338	0343	B1.1				
	0606	0612	0615		SF	N27W13		8062
	0656	0657	0714	B2.7	SF	N27W14		8062
	1300	1304	1327	B9.1	SF	N17W37		8065
	1844	1852	1903	B5.0				
	2153	2200	2222	B2.5				
25 July	2335	2341	2348	B2.5				
	0019	0028	0036	B1.9				
	0417	0417	0420		SF	N20W43		8065
	0512	0536	0610	C1.2	SF	N20W44		8065
	B1040	U1040	A1102	B5.2	SF	N23E80		8066
	1201	1204	1211	B2.2				
	1232	1238	1246	B3.9				
	1326	1331	1337	B3.1				
	1411	1428	1450	B4.7				
	1507	1515	1520		SF	N27W33		8062
	1538	1538	1543	B9.1	SF	N17W51		8065
	1744	1749	1752	B3.3				
	1824	1830	1834	B1.6				
	1851	1851	1854		SF	N24E68		8066
1854	1856	1909	C1.1	SF	N17W52		8065	
1934	1941	1948	B4.6					
2011	2028	2115	C4.4	SF	N16W54		8065	
2332	2336	2344	B6.4					



Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn #		
	Begin	Max	End			Location Lat CMD				
26 July	0016	0016	0019	B4.3	SF	N22W57	8065			
	0243	0252	0257	B2.2						
	0455	0500	0503	B1.4						
	0528	0531	0534	B1.4						
	0742	0749	0753	B1.6						
	1827	1830	1833	B2.0						
	2106	2110	2115	B1.1						
27 July	0022	0026	0029	B1.1	SF	N32W48	8062			
	0148	0154	0159	B1.2						
	0209	0215	0222	B8.3						
	0330	0332	0342	B9.5						
	0427	0439	0447	B2.6						
	0632	0637	0645	B1.4						
	0813	0815	0823	B2.7				SF	N26W56	8062
	1830	1833	1838	B2.2				SF	N24E50	8066
	2049	2055	2059	B1.4						
2110	2113	2116	B1.0							

Region Summary

Date	Location		Sunspot Characteristics					Flares						
	(° Lat ° CMD)	Helio	Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
		Lon						C	M	X	S	1	2	3

Region 8061

14 Jul	S21W02	008	0010	00	AXX	001	A										
15 Jul	S21W15	008															
16 Jul	S21W28	008															
17 Jul	S21W41	008															
18 Jul	S21W54	008															
19 Jul	S21W67	008															
20 Jul	S21W80	008															
21 Jul	S21W93	008															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 008



Region Summary – continued.

Date	Location		Sunspot Characteristics				Flares														
	° Lat	° CMD	Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical										
								C	M	X	S	1	2	3	4						
<i>Region 8062</i>																					
17 Jul	N23E66	260	0000	00	AXX	001	A														
18 Jul	N23E52	261	0000	00	AXX	001	A														
19 Jul	N23E39	261																			
20 Jul	N23E26	261																			
21 Jul	N23E13	261																			
22 Jul	N23E00	261	0000	00		000															
23 Jul	N27W09	256	0030	06	DRO	007	B														
24 Jul	N27W22	256	0030	06	DRO	004	B											2			
25 Jul	N28W37	258	0020	05	BXO	006	B											1			
26 Jul	N28W52	260	0010	02	AXX	003	A														
27 Jul	N28W65	260	0010	01	AXX	002	A											2			
													0	0	0	5	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 261

<i>Region 8063</i>																					
20 Jul	S25W12	299	0010	03	BXO	002	B														
21 Jul	S25W25	299																			
22 Jul	S25W38	299																			
23 Jul	S25W51	299																			
24 Jul	S25W64	299																			
25 Jul	S25W77	299																			
													0	0	0	0	0	0	0	0	0

Died on Disk.

Absolute heliographic longitude: 299

<i>Region 8064</i>																					
22 Jul	N22E75	186	0010	00	AXX	001	A														
23 Jul	N24E61	186	0030	07	CRO	004	B														
24 Jul	N23E47	187	0040	07	CRO	004	B														
25 Jul	N22E33	188	0010	02	BXO	005	B														
26 Jul	N22E20	188	0010	03	BXO	003	B														
27 Jul	N22E04	191	0010	01	AXX	002	A														
													0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 191



Region Summary – continued.

Date	Location		Sunspot Characteristics				Flares							
	(° Lat ° CMD)	Helio	Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
		Lon						C	M	X	S	1	2	3

Region 8065

24 Jul	N17W43	277	0020	04	BXO	006	B					1					
25 Jul	N18W56	277	0150	08	DSO	011	BG	3				5					
26 Jul	N17W70	278	0140	08	DAO	009	B					1					
27 Jul	N16W82	277	0150	09	DAO	006	B										
									3	0	0	7	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 277

Region 8066

25 Jul	N22E73	148	0020	04	BXO	003	B					2					
26 Jul	N23E59	149	0020	04	BXO	003	B										
27 Jul	N24E46	149	0010	05	BXO	003	B					1					
									0	0	0	3	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 149



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

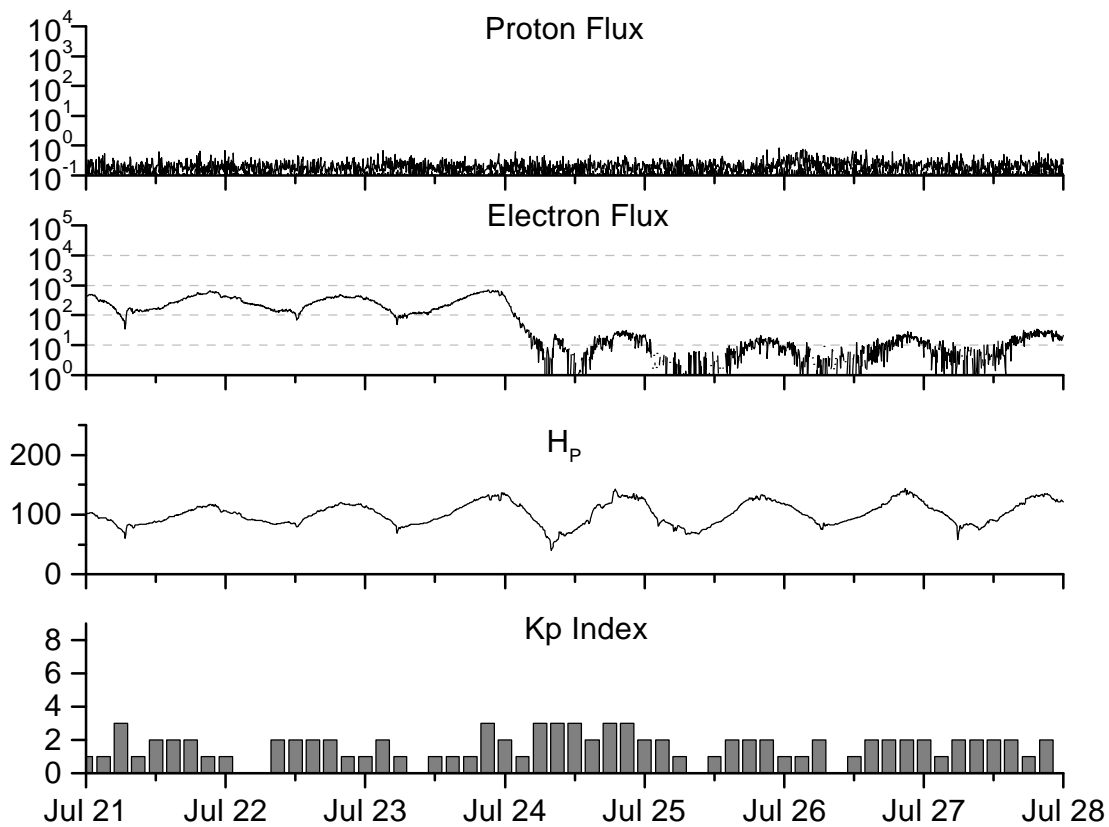
Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		**Penticton	Smooth	Planetary	Smooth
	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
1995									
July	23.8	14.5	0.61	28.1	17.0	73.9	76.9	08	12.4
August	25.1	14.3	0.57	25.4	15.4	73.8	76.0	09	12.1
September	16.5	11.8	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	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*	12.7	10.6*	77.8	73.3*	07	09.3*
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*	
June	22.1	13.1*	0.59			72.4*		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 21 July 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.

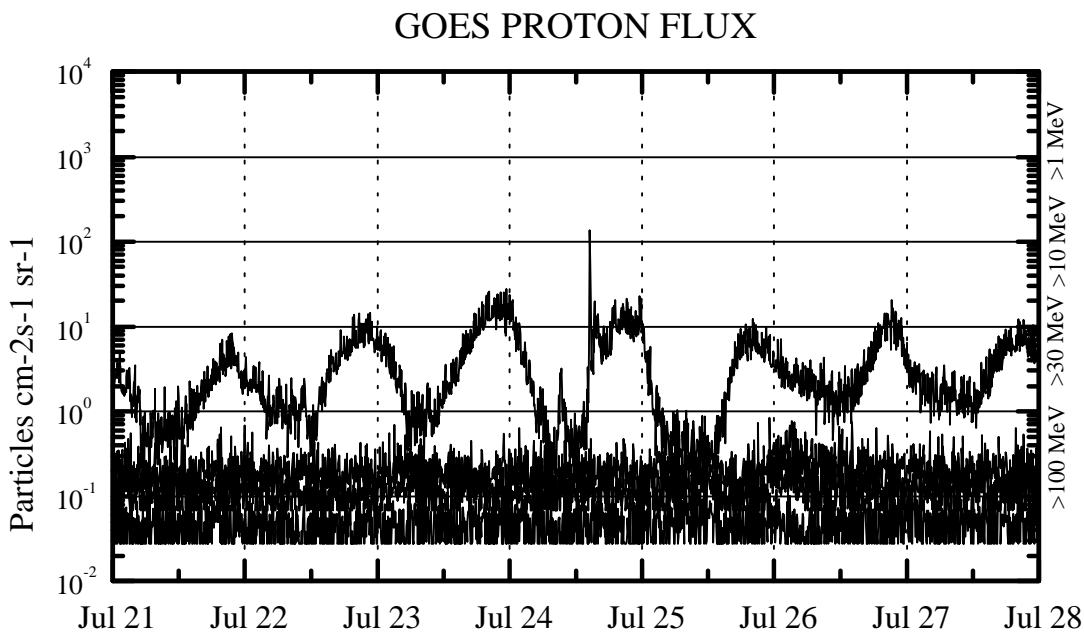
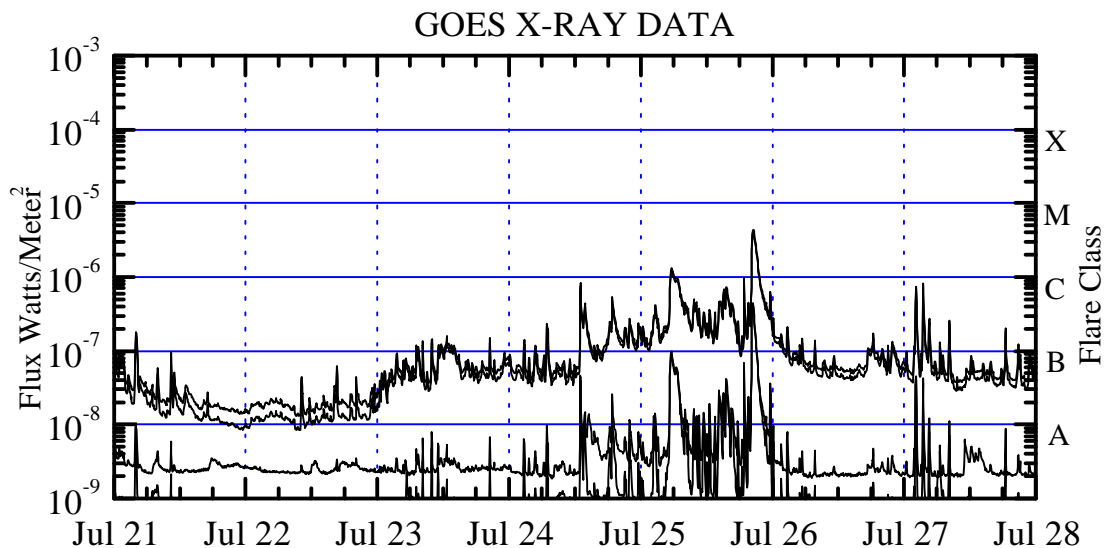
Electrons plot contains the five minute averaged integral electron flux (electrons/ cm^2 -sec-sr) with energies greater than 2 MeV at GOES-9.

H_p 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_p 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 K_p 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_p are "global" parameters that are applicable to a first order approximation over large areas. H_{parallel} is subject to a more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.



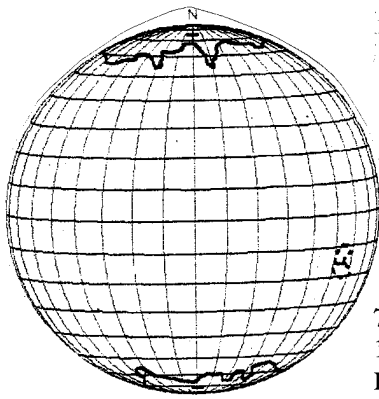


Weekly GOES Satellite X-ray and Proton Plots

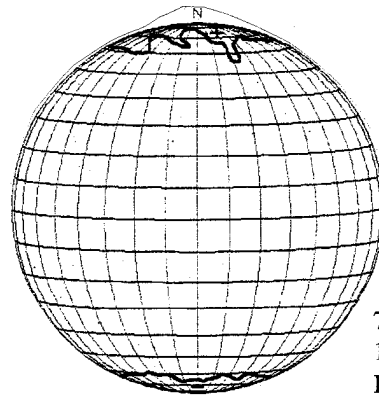
Proton plot contains the five minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-9 (W135) for each of the energy thresholds: >1 , >10 , >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm²-sec-sr) at greater than 10 MeV.

X-ray plot contains five minute averaged x-ray flux (watts/m²) 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

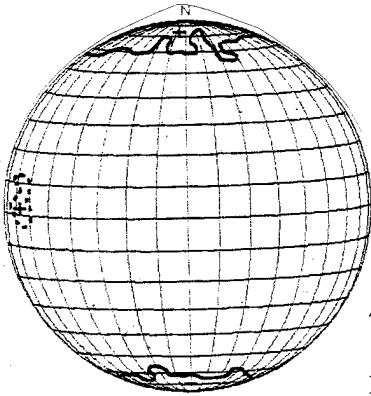




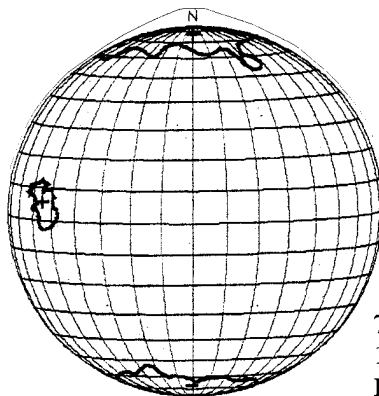
7/7/97
1659UT
B=+4°



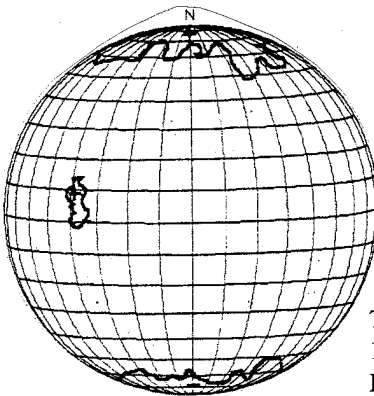
7/8/97
1454UT
B=+4°



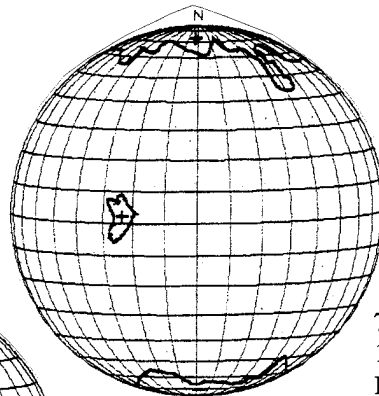
7/9/97
1654UT
B=+4°



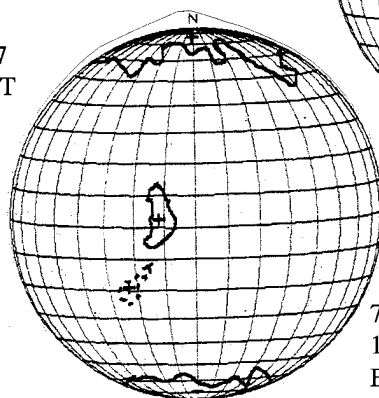
7/10/97
1455UT
B=+4°



7/11/97
1446UT
B=+4°



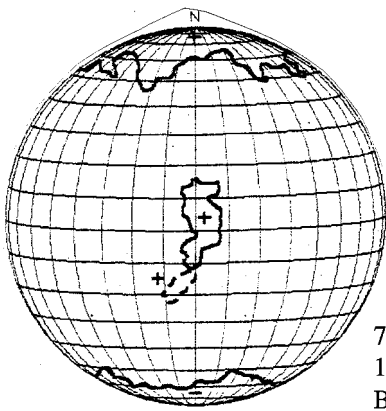
7/12/97
1616UT
B=+4°



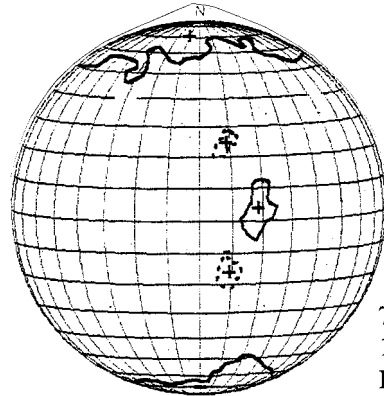
7/13/97
1536UT
B=+4°

Coronal hole maps from the National Solar Observatory, Kitt Peak, Arizona These maps are reproductions of the coronal hole contours as derived from the Kitt Peak 1083 nm raw data images. These are preliminary data, where solid (and dashed) lines are used to indicate more (and less) confidence in an inference and are printed whenever they are available at SWO.

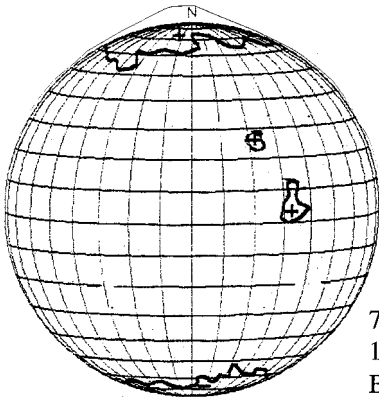




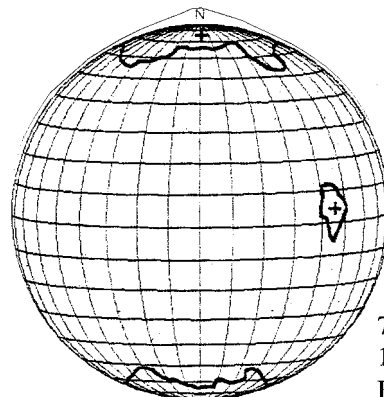
7/14/97
1641UT
B=+4°



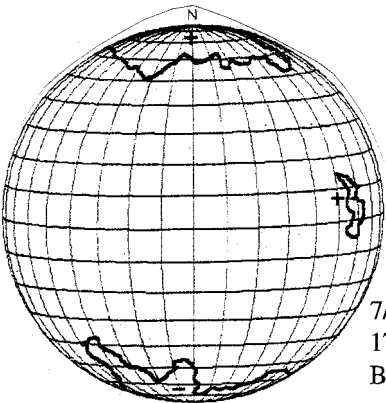
7/15/97
1837UT
B=+4°



7/16/97
1707UT
B=+5°



7/17/97
1708UT
B=+5°



7/18/97
1729UT
B=+5°

No Data
7/19/97
7/20/97

Coronal hole maps from the National Solar Observatory, Kitt Peak, Arizona

These maps are reproductions of the coronal hole contours as derived from the Kitt Peak 1083 nm raw data images. These are preliminary data, where solid (and dashed) lines are used to indicate more (and less) confidence in an inference and are printed whenever they are available at SWO.

