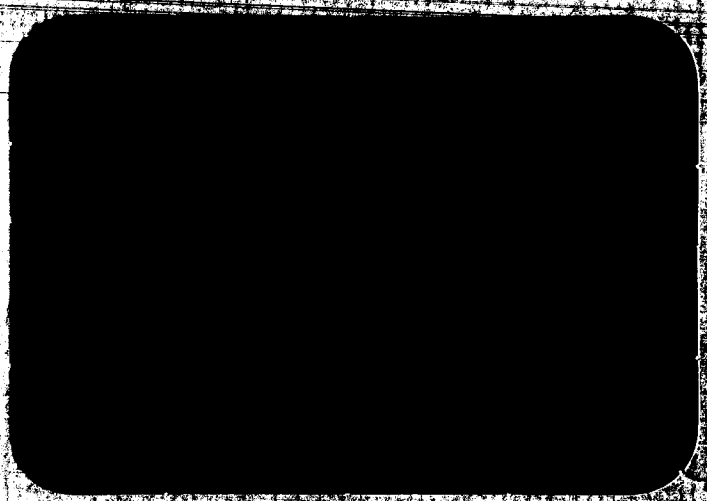


National Aeronautics and Space Administration

HOUSTON, TEXAS

Manned Spacecraft Center

NASA

CATALOGUE OF SOLAR ACTIVITY DURING 1958

BY
FRED C. JONAH
LTV ASTRONAUTICS DIVISION
HELEN DODSON-PRINCE
AND
E. RUTH HEDEMAN
McMATH-HULBERT OBSERVATORY
OF THE UNIVERSITY OF MICHIGAN

VOLUME III

Report No. 00.503 28 August 1964

Prepared under Contract NAS 9-2469
with LTV Astronautics Division

TABLE OF CONTENTS

INTRODUCTION

8.7 Polar-cap absorptions included in Bailey's catalogue (ref. 1) and those weak events generally reported in the literature from Riometer recordings.

In addition to these major events, the catalogue includes:

8.8 200 Mc/s radio emissions that occurred at the time of other solar events.

8.9 Radio emissions at other frequencies unquestionably associated with other solar events.

8.10 Geomagnetic storms

8.11 All events of lower importance that are definitely or reasonably associated with one or more of the major events.

8.12 Notes and comments concerning some of the major solar-terrestrial events are given on pages 3.VIII-vii through 3.VIII-xxvii, following the description of the chronological catalogue of solar events for 1958.

Plage No.	Lat.	Longi-tude	CMP Mo/Gr. Day	No. Major Flares	All Flares	Area	Intensity	Age	No. Spot Groups	Imp. Spet.	Type	Max. Area	Mean Area	Mag. Class	Field Strength H	Zurich Class
4400	S.12	24°	02/8.5	2	91	25000	3.5/3.5/4	4	10	12997	L	808	587	β_p	16	E
4476	S.12	98°	03/28.5	5	90	15000	3.5/3.5/3.5	2	3	13103	L,M	1539	1269	$\beta\gamma$	21	E
										13110	L,M	563	276	$\beta\gamma$	11	C
4530	S.15	82°	05/3.	3	77	11000	3.5/3.5/3	1	2	13197	L,M	2061	1332	$\beta\gamma$	19	F
4607	N.12	101°	06/18	2	52	7000	3.5/3.5/3	3	2	13311	L	799	580	β_p	23	E
4659	S.19	311°	07/26.5	2	112	20000	3/3.5/3	3	3	13388	L,M	1795	901	$\beta\gamma$	23	E,F
										13389	L	1245	755	β_p	23	E,G
4686	S.13	86°	08/12.5	3	72	11000	3/3.5/3.5	2	5	13434	L,M	1150	876	$\beta\gamma$	35	G
4708	N.18	321°	08/22	5	60	8000	4/3.5/3.5	3	1	13464	L,M	1463	1072	$\beta\gamma$	23	E
4722	S.09	202°	08/31	1	54	12000	3/3.5/3.5	2	4	13493	L	956	476	β_p	28	E
4741	S.07	83°	09/09	5	57	7000	3.5/3/3	2	2	13509	L,M	1047	555	γ	15	D,E
4765	S.18	305°	09/19.5	3	58	17000	3.5/3.5/3.5	5	4	13544	L	1824	1289	β_p	36	H,E
4826	S.02	255°	10/20.5	4	50	6500	3.5/3.5/3.5	1	1	13625	L,M	1366	935	$\beta\gamma$	26	E
4913	S.03	283°	12/12	2	69	9500	3.5/3.5/3.5	3	2	13763	L,M	1318	710	$\beta\gamma$	27	E,F

TABLE 3.4 THE MOST ACTIVE PLAGES DURING 1958 WITH THE IMPORTANT ASSOCIATED SUNSPOT GROUPS

Serial No. Table II	Mt. Wilson Number	Gr. Number	Plage Region	Max. Area	Mean Area	Lat.	Long.	CMP Mo/ Gr. Day	Mt. Wilson Mag. Class	Field Strength	No. Major Flares
4	12947	18460	4370	1476	1180	N.12	303°	01/17.29	β_p	36	0
15	13023	18511	4410	1462	1036	N.11	307°	02/13.30	α_p	35	0
20	13063	18544	4445	1778	1253	S.18	15°	03/07.48	β_p	28	3
27	13092	18575	4465	1555	1076	N.22	174°	03/22.75	β	20	0
29	13103	18584	4476	1539	1269	S.13	92°	03/28.96	$\beta\gamma$	21	5
31	13109	18587	4478	1992	1325	S.22	73°	03/30.39	β_p	17	0
41	13157	18628	4508	1662	1226	S.22	148°	04/21.00	β_p	23	0
45	13197	18654	4530	2061	1332	S.15	348°	05/03.09	$\beta\gamma$	19	5
54	13292	18726	4596	2256	1587	N.28	206°	06/10.08	γ	21	1
85	13464	18857	4708	1463	1072	N.18	322°	08/21.89	$\beta\gamma$	23	5
99	13544	18912	4765	1824	1289	S.18	303°	09/19.59	β_p	36	3
118	13733	19040	4897	1556	1123	S.16	74°	11/30.60	β_p	23	0
126	13803	19083	4934	1629	1018	S.16	74°	12/27.89	γ	19	2

TABLE 3.5 LARGE SUNSPOT GROUPS DURING 1958, MEAN AREA >1000 MILLIONTH

TABLE 3.7 SOURCES AND REFERENCE 1958 SOLAR ACTIVITY CATALOGUE

						SOLAR PHENOMENA			RADIO EMISSIONS			SOLAR-TERRESTRIAL EFFECTS				
Ref. No.	Author	Publication	Vol.	Year	Pages	Plage	Sun Spot	Flares	II	IV	Single Freq.	S.W.F.	P.C.A.	Forbush Decrease	Geomag. Storm	Kp
1	Bailey	Planet. Space Sci.	12	1964	495 - 541								⊗			
2	Bailey	J. Phys. Soc. Japan Supp. AI	17	1962	106 - 112			X				X	⊗			
3	Bartels, Romana, Veldkamp	IAGA Bulletin	12m2	1962	10 - 14										⊗	⊗
4	Bartels, Veldkamp	J. Geophys. Res.	63 64 65	1958 1959 1960	551, 828 1353 378											⊗
5	Besprozvannaya	J. Phys. Soc. Japan Supp. AI	17	1962	146 - 149								⊗			
6	Boorman, et. al.	M.N. Royal Astron. Soc.	123	1961	87 - 96			X	⊗							
7	DeFelter, et. al.	Planet. Space Sci.	2	1961	223 - 227			X							⊗	X
8	Dodson, Hedeman	J. Geophys. Res.	65	1960	123 - 131			⊗								
9	Dodson, Hedeman	I.G.Y. Solar Activity Rep.	R12	1960				⊗								
10	Dodson, Hedeman	Planet. Space Sci.	12	1964	393 - 418			X	X	X		⊗			X	
11	Dvoryashin, et. al.	Soviet Astron. A.J.	5	1961	311 - 325			X		X			X		⊗	
12	Hakura, Goh	J. Radio Res. Lab. Japan	6	1959	633 - 650					X	X		X		⊗	
13	Haurwitz	J. Geophys. Res.	67	1962	2979 - 2982										⊗	
14	Jenkins, Paghis	Can. J. Phys.	41	1963	1056 - 1073								⊗			
15	Jonah	Proc. Lunar Planet. Explor. Coll.	3 No 2	1963	59 - 64		X	⊗	X	X			X	X	X	
16	Kahle	U. Alaska Geophys. Rep.	R129	1962	68			X	X	X		X	⊗		X	
17	Kamiya	J. Geomag. Geoel. Japan	13	1961	33 - 41			X		⊗				X	X	
18	Knapp	J. Geophys. Res.	66	1961	2053 - 2058										⊗	
19	Leinbach	U. Alaska Geophys. Rep.	R-127	1962	230								⊗			
20	Lincoln	J. Geophys. Res.	63 64	1958 1959	418, 554, 831 1357										⊗	
21	Lockwood	J. Geophys. Res.	65	1960	3859 - 3880			X					X	⊗	X	
22	Maeda, et. al.	Ann. Geophys.	18	1962	305 - 333			X			X	X		X	⊗	
23	Malitson	NASA - TR	R-169	1963	109 - 117			X		X			⊗		X	
24	Matres & Pick	Ann. Astrophys.	25	1962	293 - 300		X	⊗								
25	Matsushita	J. Geophys. Res.	67	1962	3753 - 3771										⊗	
26	Maxwell, Thompson and Garmire	Planet Space Sci.	1	1959	325 - 332				⊗						X	
27	Maxwell, Hughes, and Thompson	J. Geophys. Res.	68	1963	1347 - 1354			X	⊗	⊗						
28	McLean	Australian J. Phys.	12	1959	404 - 417					⊗						X
29	Noyes	J. Phys. Soc. Japan Supp. A2	17	1962	275 - 280			X					⊗			
30	Obayashi & Hakura	J. Geophys. Res.	65	1960	3143 - 3148			X		X			⊗		X	

TABLE 3.7 1958 (CONTINUED)

Ref. No.	Author	Publication	Vol.	Year	Pages	SOLAR PHENOMENA: Plage	Sun Spot	Flares	RADIO EMISSIONS: II	IV	Single Freq.	SOLAR-TERRESTRIAL EFFECTS: S.W.F.	P.C.A.	Forbush Decrease	Geomag. Storm	Kp
31	Obayashi & Hakura	Rep. Ionos. Space Res. Japan	14	1960	1 - 40					X			X		⊗	
32	Ortner, et. al.	J. Geophys. Res.	67	1962	4169 - 4186			X					X		X	
33	Pick - Gutmann	Ann. Astrophys.	24	1961	183 - 210					⊗	X					
34	Piggott & Shapley	Antartic Res. Geophys. Memo	7	1962	111 - 126								⊗			
35	Pisharoty & Srivastava	J. Geophys. Res.	67	1962	2189 - 2192										⊗	
36	Reid & Leinbach	J. Geophys. Res.	64	1959	1801 - 1805			X					⊗			
37	Romana	J. Geophys. Res.	63 64 65	1958 1959 1960	825 1349 373										⊗	
38	Sinno	J. Geomag. Geoel.	13	1961	1 - 10			X		X			X		⊗	
39	Smith, H.J.	AFCRL Res. Note	62-827	1962	38 pp.			X								
40	Thompson & Maxwell	Planet. Space Sci.	2	1960	104 - 109			X	⊗				X			
41	Waldmeier	Pub. Eigenoss. Sternwarte, Zurich	11	1958	61 - 87		⊗									
42	C. Warwick	I.G.Y. Solar Act. Rep.	R-17	1962												
43	C. Warwick & Haurwitz	J. Geophys. Res.	67	1962	1317 - 1332			X			X		⊗			
44	Williams	J. Geophys. Res.	65	1960	85 - 92										⊗	
45	Weiss	Aust. J. Phys.	16	1963	240 - 271			X	⊗							
46		Annals of I.G.Y.	5	1958	249 - 300											
47		Annals of I.G.Y.	16	1962			X	X	X	X	X		X	X	X	X
48		Annals of I.G.Y.	21,22			X	X									
49		Annals of I.G.Y.	23				X									
50	Balloon Flights	Annals of I.G.Y.	27,28													
51	Atomic Energy of Canada, Deep River		Weekly Reports											X		
52	CRPL	Solar-Geophysical Data	161-173	1958		X		X	X	X	X	X				X
53	CSIRO	Spectral Observations							⊗	⊗						
54	Greenwich Obs.	Photoheliographic Results	60				⊗									
55	High Altitude Obs.	Weekly Solar Bull.		1958				X							X	
56	IAU Quarterly Bull.		121-124	1959				⊗	⊗	⊗	⊗					
57	IGY WDCA Aurora - Instrumental		1 2,3	1960 1961									⊗			
58	McMath-Hulbert	Plage Catalogue	To be published			⊗										
59	Mt. Wilson Obs.	Microfilm					⊗									
60	Mt. Wilson Obs. Sunspot Mag. Class PASP		70 71	1958 1959	321, 417, 510. 613, 60, 175		⊗									
61	Pub. Eidgenossisehen Sternwarte - Zurich		11	1958	61 - 87		⊗									
62	Tokyo Astronomical Obs. Solar Bull.		10	1958		X	⊗	⊗			⊗	⊗				
63	U.S. Naval Obs.	Daily Sunspot Bull.		1958			⊗									

I. CATALOGUE OF MAJOR

SOLAR FLARES DURING 1958

TABLE I. CATALOGUE OF MAJOR SOLAR FLARES DURING 1958

The meaning of the various columns and a description of the data contained in Table I - Catalogue of Major Solar Flares, are given below.

A major flare is defined as a flare which has been reported with importance 3 or 3+ by at least one solar observatory, or with importance 2+ by at least two observatories and published in the Quarterly Bulletin of the IAU (reference 56).

Column 1 Major Flare Serial Number. (starting with number 1 at the beginning of each year.)

Column 2 Solar Event Serial Number. This is the event number assigned to the solar or terrestrial event in the Chronological Catalogue, Table VIII.

Column 3 Greenwich Date of the Flare.

Column 4 Beginning of the Flare U.T. This is the earliest time reported in the IAU Bulletin. If the observatory reported the start of the flare was observed, the fact is indicated by underlining the start time.

Column 5 End Time U.T. This is the latest reported end time in the IAU Bulletin. If the end of the flare was observed, the end time is underlined.

Column 6 Time of Maximum. Since different observatories often report different maximum times for the same flare, the time (or in a few cases, times) entered in this column has been taken from the McMath-Hulbert working list of flares. In general, the tabulated time is the arithmetic mean of the reported times of maximum for all observations that covered the principal maximum of the flare. If a second time is given, there is an indication that a secondary maximum may have occurred as indicated by two well developed phases or that several observers reported them as two separate flares.

Column 7 Position. The heliographic position given in the catalogue are arithmetic means of the values reported in the IAU Bulletin. A reported value is excluded in deriving the mean if the value deviates by a large amount from the other reported positions.

Column 8 Plage Number. This is the serial number of the McMath plage in which the flare occurred.

Column 9 Active Region. This is the serial number assigned to active regions by the Meudon Observatory in the IAU Quarterly Bulletin. The numbering starts with one at the beginning of each quarter. It will be noted that there is not always a one to one correspondence between the plage and the active region, a plage may cover two or more regions.

Column 10 Mt. Wilson Serial Number of Sunspot Group Where the Flare Occurred. Occasionally a flare occurs between two groups and two spot numbers are recorded.

Column 11 Greenwich Serial Number of the Spot Group.

Column 12 Flare Importance. This is the maximum importance reported for the flare in the IAU Quarterly Bulletin.

Column 13 No. Rep./No. Max. This column gives the number of observatories reporting the flare in the IAU Bulletin and the number that reported it with the maximum importance. Occasionally an observer reports the same flare two or more times. These separate reports are all considered in the selection of the start, end, and maximum times use in Columns 4, 5, and 6. But only once for the number of reports. The number of observers reporting the flare with the importance shown in Column 12 is indicated by the second number in this column.

Column 14 This column gives the importance assigned to the flare in the McMath-Hulbert Observatory working list of flares (reference 9). The method that was used to arrive at the value is described in that reference.

FLARE AREA SQUARE DEGREES

Reported areas of flares, in square degrees, frequently vary over a wide range. These differences are due to the methods used by the observer, different times at which the estimate, or measurement was made, and other factors. In order to give the tabulation of this parameter as much value as possible, we have given:

Column 15 The range of areas reported in the IAU Quarterly Bulletin: Smallest area and largest area.

Column 16 Number of Observatories Reporting an Area

Column 17 The Arithmetic Mean of the Reported Values

RELATED FLARE ACTIVITY

Column 18 Other Flares. This column lists the number of minor and major flares associated with the active region during disk passage (plage, sunspot, or IAU active region) before and after the major flare.

Column 19 This column gives the heliographic longitude (or central meridian distance) of the first flare associated with the region and the importance of the first flare. For example: E90/2 indicates that the first flare occurred at E90, and at least one observatory reported it with an importance 2.

Column 20 Short Wave Radio Fadeouts (S.W.F.). Short wave radio fadeouts associated with major flares are listed with the following notation: Beginning/Duration in minutes/importance. Complete data for S.W.F.'s of importance ≥ 3 that lasted 30 minutes or more are given in Table VI, Catalogue of Solar-Terrestrial Effects.

Column 21 Solar Radio Emissions at 10 cm. Peak flux reported at approximately 10 cm. wave length. (The frequencies may be 2800, 2980, or 3000 Mc/s.) Detailed data for important solar radio emissions are given in Table IV, Catalogue of Solar Radio Emissions. The information given in Columns 21-23 is limited to an indication of the radio activity of the region at the time of the flare.

Column 22 Peak flux reported at 1.5 m. wave length (200 Mc/s). If the peak flux was reported as greater than the recorded flux, the recorded flux has been underlined. When the flux given in Columns 20 or 21 represents a smoothed flux (peak flux not reported), the value is enclosed in a bracket.

Column 23 Emissions at Other Wave Lengths. The notation cm. in this column indicates that emissions are reported (and given in Table IV at one or more frequencies greater than 600 Mc/s (except approximately 3000 Mc/s). Similarly, the notation m. indicates that emissions are reported at frequencies less than 600 Mc/s (except 200 Mc/s) and detailed data are given in Table IV.

Column 24 Dynamic Spectral Emissions. The notation II or IV in this column indicates that emissions of Type II (slow drift), or broad band continuum, Type IV, are reported by either the Sweep Frequency Observatory at Sydney, Australia, or the Harvard College Radio Observatory at Fort Davis, Texas.

If no spectral observations are reported, but a broad band continuum, Type IV, has been derived from discrete frequency observations by one or more of several investigators, the symbol has been enclosed in a bracket - (IV). (Detailed data are given in Table IV.)

SOLAR TERRESTRIAL EFFECTS

Column 25 Polar-Cap Absorption. Polar-cap absorptions reported within a reasonable time after a major flare (generally between one and seven hours) are listed. The data in this column are limited to: month/Greenwich day/beginning time U.T./absorption in db. Additional data, including references, are given in Table VI, Catalogue of Solar-Terrestrial Effects.

Column 26 Geomagnetic Storms. Geomagnetic storms with a maximum $Kp \geq 5$ reported by three or more observatories within a reasonable time after the major flare (generally between twelve and seventy two hours). The data in this column are limited to: Month/Greenwich day/onset time, U.T./type/degree of activity/maximum reported Kp. Additional data, including: references, duration, number of reports, etc. are given in the Catalogue of Geomagnetic Storms, Table V, and the Catalogue of Solar-Terrestrial Effects, Table VI.

TABLE I. CATALOGUE OF MAJOR SOLAR FLARES D

		MAJOR FLARE					SOLAR REGION				FLARE IMPORTANCE		
Serial No.	Event No.	Gr. Day	Beg. UT	End UT	Max. UT	Position	Plage No.	Region No.	Sunspot Mt. W.	Number Green-wich	IAU	No. Rep. / No. Max.	M[c].M.
1		Jan. 13	1258	1420	1318	S.20 E.27	4365	24	12956	18452	3	3/1	2
2	6	15	1640	1757	1642	S.13 W.58	4355	19	12924	18445	3	5/1	2+
3		20	1435	1601	1505	N.28 E.46	4381	36	12965	18472	2+	5/2	2+
4		23	0904	1053	0918	S.24 W.45	4372	29	12975	18479	3	8/1	2+
5		25	0035	0135	0039	N.28 W.13	4381	36	12969	18478	3+	3/1	1+
6	12	25	0915	1107	1005	S.24 W.69	4372	29	12975	18479	3+	17/1	3
7		25	1205	1333	-	S.20 E.11	4382	39	12979	18487 18483	3	3/1	2
8		31	1148	1452	1224	N.20 W.13	4387	43	12985	18489	3	7/1	2+
9	18	Feb. 10	1320	1411	1332	S.13 W.63	4400	51	12997	18496	3	11/1	2+
10		11	0812	0847	0823	S.10 W.85	4400	51	12997	18496	3	5/1	1
11		25	0450	0630	0510	S.27 W.23	4427	74	13040	18526	3	4/1	2+
12	26	Mar. 1	0905	1007	0917	S.11 W.46	4436	76	13052	18538	3+	5/1	3
13	31	3	1005	1250	1020	S.16 E.60	4445	85	13063	18544	3+	8/1	3
14	32	5	0500	0632	0540	S.12 E.46	4445	85	13063	18544	3	1/1	3
15		5	0500	0640	0609	S.08 W.34	4442	80	13069	18552	3	1/1	2+
16		7	1020	1224	1112	N.11 E.71	4449	91	13076	18557	3	10/1	2
17	42	14	1454	1541	1507	S.21 W.85	4445	85	13063	18544	3	3/2	2
18	45	23	0947	1627	1005	S.14 E.78	4476	107	13103	18584	3+	17/8	3+
19	54	27	1534	1710	1552	S.16 E.23	4476	107	13103	18584	2+	5/2	2+
20	56	28	1703	1904	1714	S.15 E.09	4476	107	13103	18584	2+	3/3	2+
21	65	30	0915	1421	1000	S.16 W.20	4476	107	13103	18584	2+	9/2	2+
22		Apr. 1	1050	1250	1100	S.13 W.43	4476	3	13103	18584	3-	12/1	2+
23	73	7	1010	1215	1025	N.15 E.33	4493	21	13130	18606	3	5/2	3
24		9	1435	1534	1440	N.11 W.37	4490	16	13123	18601	3	6/1	1+
25		29	1128	1240	1157	N.30 E.50	4531	49	13205	18665	3	5/1	2+
26		29	1855	2013	1912	S.15 E.46	4530	51	13197	18654	2+	4/2	2+
27	83	May 1	2115	2241	2130	S.19 E.15	4530	51	13197	18654	3	4/1	3
28	85	5	0356	0457	0415	S.18 W.29	4530	51	12197	18654	3	3/2	3
29		5	0856	1030	0915	S.18 W.25	4530	51	13197	18654	3	10/1	2
30		6	0335	0410	0339	S.16 W.37	4530	51	13197	18654	3	3/1	2+
31		30	0656	0944	0731	N.23 E.90	4591	97	13284	18718	3	3/1	1
32		June 3	1507	1543	1512	N.30 W.53	4578	86	13275	18715	3	8/1	2+
33	95	5	0835	1015	0850	N.15 W.65	4578	89	13282	18719	2+	15/4	2+
34	96	5	1615	1837	1631	S.18 E.69	4598	105	13295	18729	2+	5/3	2+
35	97	6	0436	0614	0448	N.16 W.78	4578	89	13282	18719	3	7/1	2
36		9	0557	0610	0603	N.32 E.20	4596	103	13292	18726	3	3/1	1
37		19	0212	0255	0225	N.14 W.18	4607	113	13311	18739	3	5/1	2+
38	105	19	0940	1210	1010	N.14 W.21	4607	113	13311	18739	3	14/5	3
39		23	0700	0850	0716	N.25 E.53	4619	126	13336	-	3	9/1	2+
40	109	26	0245	0517	0306	N.10 E.49	4623	131	13335	18758	3	5/1	2+
41	118	July 7	0020	0414	0110	N.25 W.08	4634	12	13356	18773	3+	5/4	3+
42		11	0740	1200	0820	S.25 E.27	4642	21	13362	18779	3	22/2	2+

1 3.1-1

RELATED FLARE ACTIVITY			S.W.F.	RADIO EMISSIONS				POLAR CAP ABS.	GEOMAGNETIC STORMS
Minor/Major Before	After	First Flare Pos./Imp.	Beg./Dur./Imp.	Peak Flux 10 cm.	1.5 m.	Other Wave Lengths	Dynamic II & IV	Gr. Day/Beg. UT/Abs. db	Gr. Day/Beg. UT/Type/Int./Max. Kp
36/0	7/0	E81/1	0757/16/1	329	1900	cm,m			
17/0	23/0	E68/1	0919/46/2	217	-	cm			07/17/1700/g/m/5
7/0	13/0	E51/1	1904/36/3	(390)	8000	m	II (IV)		07/21/1636/sc/ms/7
14/0	6/1	E09/1	0638/50/2+						
15/1	5/0	E09/1	1208/32/2+						
0/0	0/0	E39/2							
1/0	4/1	E60/1				cm			
1/1	4/0	E60/1	1315/40/2		900	m	(IV)		
52/0	59/1	E89/1	0858/15/2			m			
81/1	30/0	E89/1	0240/120/3+		(30,000)	cm,m	II IV	07/29/0430/1.5	07/31/1529/sc/m/5+
4/0	3/0	E90/1							
22/0	4/0	E90/1	2142/23/1			cm			
14/0	12/0	E51/1-	0422/96/3	337		cm			
3/0	67/2	E90/1+	1500/105/3+	(180)		cm,m			
3/1	37/1	E90/1+	1208/42/2+	(115)		cm,m			
8/2	12/0	E90/1+	0432/168/3+	5030	18000	cm,m	(IV)	08/16/0600/12.1	08/17/0623/sc/ms/7
4/0	41/4	E87/1	0042/33/2+	1260	-	cm,m	II (IV)		08/22/0228/sc/ms/6
24/1	31/3	E87/1	0546/-/1	282	150	cm,m		08/22/1530/10.6	
28/2	27/2	E87/1	1435/170/3+	(1500)	1400	cm,m	IV	08/22/1530/10.6	08/24/0140/sc/s/8
4/0	3/0	E46/1	1015/23/2-	275	-	cm,m	-		
42/3	13/1	E87/1	0958/45/2	334	-	cm	-		
46/4	9/0	E87/1	0010/240/3+		85,000	cm,m	II IV	08/26/0330/16.6	08/27/03xx/sc/ms/7
2/0	0/0	W24/1		(18)	-	-	-		
7/0	46/4	E79/1+	2105/32/2+	-	3000	cm,m	II		09/03/0842/sc/s/9
11/1	42/3	E79/1+	0507/47/2+			cm			
46/0	6/0	E76/1							
4/0	16/0	E88/1+	1442/30/2	(85)	500	m			
9/0	7/0	E90/1-	-		180				
32/2	21/2	E79/1+	-			m			
3/0	3/0	E90/1	0700/42/2	-	100	cm,m			
5/0	19/0	E90/1-	0909/34/2	351		cm			
49/3	4/1	E79/1+	0913/70/2	319		cm,m			
52/4	1/0	E79/1+	0851/58/3	1259	120	cm,m	(IV)		09/16/0930/sc/m/5
14/0	40/2	E67/1	1700/50/2+	-	-	-			
19/1	35/1	E67/1	1458/42/2	276	230	cm			
17/0	2/0	E90/1		261	18	cm m			
51/2	3/0	E67/1	0755/35/2	336	-	cm		09/22/1400/5.0	09/25/0408/sc/ms/7
20/0	26/3	E90/1+							
14/0	4/0	E90/1+	1025/25/2	361		cm			
8/0	5/0	E82/1	0720/30/2		1000	cm,m	(IV)		10/22/0315/sc/ms/6
40/1	6/2	E90/1+	2328/72/3+	1900	52000	cm,m	II IV		10/24/0729/sc/ms/7
8/0	27/0	E90/1	0705/33/2-	-	-	-	-		
43/2	3/1	E90/1+		343	-	cm	-		

2 3.1-2

		MAJOR FLARE					SOLAR REGION				FLARE IMPORTANCE			FLARE AREA SQ. DEG.		
Serial No.	Event No.	Gr. Day	Beg. UT	End UT	Max. UT	Position	Plage No.	Region No.	Sunspot Mt.W.	Number Green-wich	IAU	No. Rep./ No. Max.	Mc. M.	Range	No. Rep.	Mean
43		July 12	0744	0843	0758	S.24 W.74	4636	14	13353	18772	3	15/3	2+	3-24	10	8
44		15	0914	1140	0923	N.07 E.40	4646	29	13370	18782	3	13/1	2	2-23	11	9
45	125	19	1905	2030	1908	N.24 E.13	4651	33	13375 13376	18787	2+	3/3	2+	7/10	3	9
46		20	0636	0756	0643	S.23 W.63	4650	25	13374	18786	3	6/1	2	1-5	5	7
47		20	1203	1330	1211	S.22 W.67	4650	25	03374	18786	3	12/1	2+	2-38	10	12
48		23	0503	0618	0514	S.08 E.39	4658	42	13386	18798	3	4/1	2	5-46	4	17
49		23	1125	1450	1144	N.18 E.41	4657	43	13394	18797	3	10/1	2+	6-25	7	17
50		23	1259	1630	1336	N.17 E.34	4657	43	13385	18797	2+	8/2	2+	7-30	5	13
51		27	0855	0920	-	S. 16 W.22	4659	39	13388	18796	3	3/1	1	3-20	3	9
52	131	29	0259	0408	0304	S.14 W.44	4659	39	13388	18796	3	2/2	3	12-17	2	15
53		29	1125	1300	1138	N.15 E.01	4664	49	13395	18808	3-	10/1	2+	5-16	8	9
54		Aug. 3	2142	2257	2150	N.08 W.49	4665	52	13397	18810	2+	4/2	2	8-19	3	14
55	137	4	0409	0610	0435	N.30 W.31	4667	56	13404	18813	3	3/1	3	5-35	3	17
56	139	7	1457	1700	1508	S.16 E.71	4686	76	13434	18835	3	10/4	3	10-26	9	17
57		13	1205	1330	1220	S.14 W.18	4686	76	13434	18835	3	9/1	2	5-14	7	8
58	141	16	0432	0831	0440	S.14 W.50	4686	76	13434	18835	3+	9/2	3+	6-32	8	15
59	145	20	0042	0128	0045	N.16 E.17	4708	88	13464	18857	3	2/1	2+	6-13	2	10
60		22	0521	0844	0529	N.19 W.04	4708	88	13464	18857	2+	8/2	1+	4-19	6	9
61	148	22	1417	1717	1450	N.18 W.10	4708	88	13464	18857	3	5/3	3	9-14	4	12
62		23	1012	1048	1016	S.12 W.69	4703	81	13460	18853	3	5/1	2	6-15	5	10
63		25	0949	1050	1003	N.16 W.46	4708	88	13464	18857	3-	5/1	2+	8-37	4	15
64	151	26	0005	0124	0027	N.20 W.54	4708	88	13464	18857	3	1/1	3	25	1	25
65		30	1933	2052	1946 2018	S.05 W.42	4718	96	13476	18878	3	3/1	2+	6-19	3	12
66	155	Sept. 2	2102	2141	2105	S.09 E.84	4741	116	13509	18890	3	4/1	1+	-	-	-
67		4	0504	0545	0524	S.07 E.63	4741	116	13509	18890	3	6/1	1	3-34	5	11
68		4	1401	1617	1419	S.13 W.54	4722	103	13485 13494	18882	3-	7/1	2	2-10	6	7
69		7	1441	1522	1450	N.20 E.70	4744	123	13517	18896	3+	6/1	2	6-25	5	11
70		9	1343	1545	1354	S.15 W.18	4739	115	13508	18888	3+	7/1	2	4-48	7	13
71		9	2321	2545	2409	S.12 W.09	4741	116	13509	18890	3	3/1	2+	7-14	3	10
72		12	0655	0740	0702	S.13 E.67	4757	134	13541	18911	2+	10/2	2	4-22	8	10
73		12	0904	1003	0915	N.15 E.66	4756	135	13535	18909	3	14/2	2	3-14	12	6
74		13	0904	1050	0918	S.11 W.58	4741	116	13509	18890	3	11/2	2+	5-24	8	11
75	159	14	0822	1030	0835	S.10 W.80	4741	116	13509	18890	3+	12/1	2+	8-25	4	15
76		15	1650	1800	1705	S.20 E.48	4765	139	13544	18912	2+	4/2	2+	5-12	4	10
77		16	1443	1624	1503	S.23 E.37	4765	139	13544	18912	3	7/1	2	4-24	7	10
78	162	18	0728	0938	0830	S.12 W.53	4750	126	13524	18897	3	8/3	3	2-15	7	10
79	164	22	0738	0910	0750	S.19 W.42	4765	139	13544	18912	2+	9/2	2	4-20	7	10
80		Oct. 15	0408	0910	0700	S.03 E.67	4826	34	13625	18964	3	5/1	2	4-22	3	12
81		15	1023	1140	1032	S.28 E.26	4820	29	13611	18959	3	11/1	2+	3-13	10	8
82		19	0658	0820	0725	S.17 W.35	4819	27	13616	18957	3	7/1	2+	6-26	6	14
83	173	21	2318	2527	2330	S.04 W.22	4826	34	13625	18964	3	5/1	2+	6-9	4	7
84		22	0650	0835	0713	S.05 W.16	4829	34	13633	18970	3	6/1	2	5-24	5	11
85		23	0232	0352	0254	S.04 W.38	4826	34	13625	18964	3	3/1	2+	6-13	3	9

URING 1958 WITH ASSOCIATED PHENOMENA AND SELECTED EFFECTS

FLARE AREA SQ. DEG.			RELATED FLARE ACTIVITY			S.W.F.	RADIO EMISSIONS				POLAR CAP ABS.	GEOMAGNETIC STORMS
Range	No. Rep.	Mean	Minor/Major Before	After	First Flare Pos./Imp.	Beg./Dur./Imp.	Peak 10 cm.	Flux 1.5 m.	Other Wave Lengths	Dynamic II & IV	Gr. Day/ Beg. UT/ Abs. db	Gr. Day/ Beg. UT/ Type/ Int./ Max. Kp
12-31	2	22	0/0	1/0	E27/2							01/15/1030/g/m/4
15	2	15	28/0	5/0	E90/1-	1640/120/3	(1350)			(IV)		01/17/08xx/g/m/5
6-20	5	12	1/0	4/1	E30/1	1450/50/2	(320)	230	cm,m	(IV)		
10-19	4	14	4/0	4/1	W31/1	0912/40/1	239	440	cm,m			01/25/1050/sc/m/5
3-26	3	16	4/1	1/0	E30/1		331	70	cm			
7-50	10	22	8/1	0/0	W31/1	0912/74/3	372	400	cm,m			
4-20	2	12	3/0	10/0	E20/1	1208/28/2	-	400	m	(IV)		
4-25	7	13	12/0	4/0	E68/1	1155/56/1+			cm			
4-22	5	10	37/0	1/1	E70/1+	1325/35/3	335	700	cm,m	(IV)		02/11/0126/sc/s/9
4	1	34	38/1	0/0	E70/1+	0809/28/3	235	366	m			
7-36	4	22	0/0	1/0	W22/2+	0505/36/1						
25-47	3	35	14/0	1/0	E12/1	0913/12/2+	458	245	cm,m			03/03/0930/sc/m/5
10-31	5	18	5/0	37/2	E80/1	1010/95/3+	1338	40,000	cm,m	IV		03/05/0530/g/ms/7
34	1	34	31/1	11/1	E80/1				cm			
29	1	29	0/0	10/0	W34/2+							
2-33	5	12	3/0	27/0	E85/1-	1047/43/2	279	-	cm			03/09/0857/sc/m/4
-	-	-	42/2	0/0	E80/1	1455/130/3	375	-	cm,m	(IV)	03/14/1500/Weak	03/17/06xx/sc/m/5
3-47	10	24	5/0	80/4	E90/1	0953/196/3	1340	1000	cm,m	IV	03/23/1500/12	03/25/1540/sc/m/5
5-12	4	8	33/1	52/3	E90/1	1535/83/3	(220)	-	m			
5-9	3	7	38/2	47/2	E90/1	1708/70/3	(575)	400		(IV)		03/30/08xx/g/ms/6
2-22	7	11	50/3	35/1	E90/1	0955/50/3	437	324	cm,m			04/01/14xx/g/m/5
4-25	9	10	77/4	8/0	E90/1	1055/38/2+	(475)	-	cm			
5-22	3	12	12/0	20/0	E72/1+	1016/69/2+	736	500	cm			
3-15	4	6	9/0	3/0	E39/1+	1435/45/1+	(31)	-	cm,m			
9-16	4	11	15/0	44/0	E82/1	1152/30/1+	(74)	900	cm,m			
5-10	3	8	9/0	63/4	E80/1	1855/85/3-	-	-	-			
5-21	3	12	30/1	42/3	E80/1	2130/25/1+	(136)		cm			
4-21	3	13	54/2	18/2	E80/1	0407/53/3	1200	-	cm			
3-24	7	9	57/3	15/1	E80/1	0911/51/2	307	-	cm			
10-17	3	13	64/4	8/0	E80/1	0340/39/2-	307	-	-			
-	-	-	1/0	6/0	E90/1	-			cm			05/31/1652/sc/s/8
6-16	5	10	32/0	11/2	E90/1	1510/25/2+	(215)		cm			
2-17	12	7	39/1	4/1	E90/1	0842/55/2+	868	330	cm,m	(IV)		06/07/0046/sc/s/8
5-10	4	8	1/0	6/0	E90/1-	1620/100/3	586	-	cm	(IV)		
5-32	6	12	42/2	1/0	E90/1	0436/50/2	-	-	cm	IV	06/06/1345/small	06/08/1729/sc/m/5
1-2	2	2	16/0	13/0	E67/1-							
9-16	4	12	34/0	15/1	E76/2	0219/36/2+	249	-	cm,m			
4-33	12	17	37/1	12/0	E76/2	1005/25/2	(140)	111	m			06/21/0200/g/ms/6
3-33	8	14	2/0	3/0	E79/1	0711/68/2-	339	-	cm,m			
8-25	5	14	4/0	11/0	E69/1	0247/85/2+	507	-	cm	IV		06/28/0713/sc/s/8
36-59	4	46	6/0	16/0	E90/1-	0025/125/3	3770	4000	cm,m	II IV	07/07/0330/23.7	07/07/0748/sc/s/9
5-20	18	11	7/0	13/0	E71/1+	0810/59/2	264	380	cm	-		

2

		MAJOR FLARE					SOLAR REGION				FLARE IMPORTANCE		
Serial No.	Event No.	Gr. Day	Beg. UT	End UT	Max. UT	Position	Plage No.	Region No.	Sunspot Mt. W.	Number Green-wich	IAU	No. Rep./No. Max.	MC.M
		Oct.											
86	179	24	1410	1801	1457	S.05 W.57	4826	34	13625	18964	3	10/2	2+
87		28	1505	1617	1516	N.18 W.38	4833	39	13639	18974	3	5/1	2
88		29	0703	0820	0710	N.08 W.50	4841	40	13661	18988	2+	6/2	2
89		31	0945	1049	1001	S.19 E.39	4849	55	13664	18995	3	5/1	2
		Nov.											
90	186	14	0036	0207	0046	S.19 E.51	4877	76	13696	19018	3	2/1	3
91	187	24	1607	1907	1621	S.12 W.08	4883	84	13718	19031	3	3/2	3
92		25	0807	0855	0816	N.19 E.12	4884	88	13728	19036	3-	6/1	2
93		29	0920	1026	0942	N.19 W.40	4884	88	13728	19036	2+	8/2	2
		Dec.											
94		3	0702	0741	0706	N.16 E.87	4911	112	13758	19057	3	4/1	1+
95		3	0823	1107	0955	N.15 E.85	4911	112	13758	19057	2+	6/2	2
96		12	0054	0123	0107	S.01 W.06	4913	114	13763	19061	2+	4/2	2
97	206	12	1215	1547	1304	S.03 W.08	4913	114	13763	19061	2+	6/3	2+
98		15	1030	1230	1041	S.16 W.18	4916	117	13771 13777	19066	3	4/1	1
99	215	23	0545	0803	0624	S.15 E.66	4934	134	13804	19083	3	2/1	2+
100	217	31	1656	1803	1703	S.18 W.54	4934	134	13803	19083	3	2/2	3

TABLE IA. IAU MAJOR FLARES (TABLE I) 1958, REDUCED TO IMPORTANCE ≤2 IN THE McMATH WORKING LIST

Serial No.	MCM Serial	Date	Beg. UT	Position	Importance IAU	Importance MCM	Obs. Reporting Max. Importance	Other Importance Reported
		Jan.						
1	2549	13	1258	S20 E27	3	2	Uccle	1+,2
5	2631	25	0035	N28 W13	3+	1+	Voroshilov	1,2+
7	2637	25	1205	S20 E11	3	2	Wendelstein	1+,2
		Feb.						
10	2799	11	0812	S10 W85	3	1	Athenes	1,1,1+,2+
		Mar.						
16	2980	7	1020	N11 E71	3	2	Uccle	1,1,1,1+,2,2,2,2,2+
17	3068	14	1454	S21 W85	3	2	Capetown & Ondrijov	1,
		Apr.						
24	3489	9	1435	N11 W37	3	1+	Kanzelhone	1,1,1,1,1+,1+,1+
		May						
29	3763	5	0856	S16 W25	3	2	Wendelstein	1,1,1,2,2,2,2,2
31	4028	30	0656	N23 E90	3	1	Kiev,Ko	1,1
		June						
35	4140	6	0436	N16 W78	3	2	Abastumani	1+,2,2,2,2,2
36	4196	9	0557	N32 E20	3	1	Nizmir	1,1
		July						
44	4619	15	0914	N07 E40	3	2	Kharkov	1,1,1,1,1+,1+,1+,2,2,2,2,2
46	4680	20	0636	S23 W63	3	2	Athenes	1,1,2,2
48	4716	23	0503	S08 E39	3	2	Alma Ata	1+,2
51	4792	27	0855	S16 W22	3	1	Wendelstein	1,1
		Aug						
54	4939	3	2142	N08 W49	2+	2	Honolulu & Voroshilov	1+,2
57	5087	13	1205	S14 W18	3	2	Bakou	1+,1+,2,2,2,2,2,2
60	5191	22	0521	N19 W04	2+	1+	Abastumani & Bakou	1,1,1+,1+,1+,2-
62	5213	23	1012	S12 W69	3	2	Uccle	1,1,2,2
		Sept.						
66	5374	2	2102	S09 E84	3	1+	MCMath	1+,1+,1+
67	5390	4	0504	S07 E63	3	1	Alma Ata	1,1,1,1,1+
68	5398	4	1401	S13 W54	3-	2	Pic du Midi	1,1+,1+,2,2,2
69	5436	7	1441	N20 E70	3+	2	Wendelstein	1+,2,2,2,2,2+
70	5466	9	1343	S15 W18	3+	2	Wendelstein	1,1+,1+,2,2,2
72	5521	12	0655	S13 E67	2+	2	Athenes & Capri.S.	1,1+,2-,2,2,2,2,2
73	5527	12	0904	N14 E66	3	2	Capri S. & Pic du Midi	1,1,1,1+,1+,1+,1+,1+,2,2,2,2,2
77	5608	16	1443	S23 E37	3	2	Wendelstein	1+,2-,2,2,2,2
79	5682	22	0738	S19 W42	2+	2	Capri S. & Kharkov	1+,1+,1+,1+,2,2,2
		Oct.						
80	5877	15	0408	S03 E67	3	2	Alma Ata	1,2,2,2
84	5958	22	0650	S05 W16	3	2	Abastumani	1,1+,2,2,2
87	6039	28	1505	N18 W38	3	2	Wendelstein	1,2,2,2
88	6044	29	0703	N08 W50	2+	2	Athenes & Wendelstein	1,1+,2,2
89	6079	31	0945	S19 E39	3	2	Zurich	1,1+,2,2
		Nov.						
92	6241	25	0807	N19 E12	3-	2	Istanbul	1,1,2,2,2+
93	6296	29	0920	N19 W40	2+	2	Locarno & Pic du Midi	1,2,2,2,2,2
		Dec.						
94	6362	3	0702	N16 E87	3	1+	Crimee	1,1+,2
95	6367	3	0823	N15 E85	2+	2	Crimee & Nera	1,1+,1+,2
96	6482	12	0054	S01 W06	2+	2	Mitaka & Honolulu	1+,2
98	6518	15	1030	S16 W18	3	1	Wendelstein	1,1

3.1-3 1

TABLE I 1958 (CONTINUED)

FLARE AREA SQ. DEG.			RELATED FLARE ACTIVITY			S.W.F.	RADIO EMISSIONS					POLAR CAP ABS.	GEOMAGNETIC STORM
Range	No. Rep.	Mean	Minor/Major Before	After	First Flare Pos./Imp.	Beg./Dur./Imp.	Peak 10 cm.	Flux 1.5 m.	Other Wave Lengths	Dynamic II & IV		Gr. Day / Beg. UT / Abs. db	Gr. Day / Beg. UT / Type / Int. / Max. Kp
5-18	10	12	46/3	0/0	E90/1+	1445/110/3+	381	3200	cm,m	II	IV		10/27/1323/sc/ms/6+
5-22	5	12	7/0	1/0	E82/1	-							
5-15	6	10	5/0	12/0	W31/1	-							
1-14	4	10	10/0	38/0	E90/1	0955/39/2-							11/02/10xx/g/m/5
15-16	2	16	0/0	2/0	E51/3	0039/61/3			cm				
6-16	3	12	19/0	14/0	E80/2	1615/80/3-	(285)	180	m		IV		
3-12	5	6	8/0	23/1	E35/1	-	265	220	m				
2-15	6	9	27/1	4/0	E35/1	0933/19/1+	480		cm,m				
-	-	-	1/0	28/1	E90/1	0703/20/1+	-	5000	cm,m				
-	-	-	1/1	28/0	E90/1	-							
3-8	4	5	29/0	39/1	E90/1	0105/37/2							12/13/0002/sc/ms/6
1-10	6	7	34/1	34/0	E90/1	1257/38/2	1270	1200	cm,m		(IV)		12/15/2023/sc/m/5
3-20	3	10	14/0	2/0	E82/1				cm,m				12/17/1547/sc/ms/7
10-27	2	19	15/0	31/1	E89/1	0540/73/3-	1750	200	cm,m		(IV)		
15-22	2	19	37/1	9/0	E89/1	1700/36/2+	(340)	530	m	II	IV		

TABLE IB FLARES REPORTED BY ONLY ONE OBSERVATORY-IAU IMPORTANCE 2+

McM Serial No.	Date	Beg. UT	End UT	Max. UT	Position	Plage No.	Observatory
	Mar.						
3043	12	0024	0233	0037	N08 E02	4449	Mitaka
	July						
4627	15	2120	2314	2236	N12 E30	4646	Voroshilov
4748	24	2327	2528	2443	N10 E85	4665	Voroshilov
4786	27	0342	0358	0349	S17 W20	4659	Alma Ata
4831	29	0050	0216	0146	S17 W42	4659	Voroshilov
	Aug.						
5000	9	0342	0410	0351	S16 E42	4686	Tachkent
5204	22	2247	2400	2249	S20 E05	4712	Voroshilov
5227	24	2209	2613	-	S35 W75	4714	Voroshilov
	Dec.						
6476	11	2120	2215	2142	S09 E26	4916	Sac. Peak
6584	22	1456	1729	1502	S14 E62	4934	U.S. Nav. L.

TABLE IC IMPORTANCE 2+ FLARES NOT LISTED AS MAJOR FLARES

Date	Beg. UT	End UT	Max. UT	Position	IAU MAX	Imp. Rep. By Other Sta.	McM	Total Sta. Reported	Plage No.	Area Range	Area No. Rep.	Area Mean
Jan.												
7	932	1002	0940	S17 E01	2+	2	2+	2	4348	14	1	14
Feb.												
9	2108	2302	2141	S12 W14	2+	2	2+	2	4404	12-12	2	12
June												
11	2037	2110	2044	N44 W25	2+	1+,2	2+	3	4597	4-11	3	9
July												
1	1647	1911	1702	S20 W37	2+	1,2,2,2,2	2+	6	4622	3-10	5	7
3	2006	2249	2020	N08 W54	2+	1+,2,2	2+	4	4623	7-11	3	9
3	2008	2056	2015	N29 E24	2+	2,2,2	2+	4	4630	7-11	3	9
Sept.												
24	1932	2347	2002 2255	N22 W63	2+	1,2	2+	2	4764	6-10	3	7

2

II. CATALOGUE OF IMPORTANT

SUNSPOTS DURING 1958

TABLE II. CATALOGUE OF IMPORTANT SUNSPOT GROUPS DURING 1958

This catalogue will list all sunspot groups that, during disk passage, meet one or more of the following requirements:

(a) All sunspot groups with a maximum area, during disk passage, equal to or greater than 500 millionth of the solar hemisphere, as recorded in the Royal Greenwich Observatory Bulletin No. 60, Photoheliographic Results, 1958 (reference 54).

(b) All sunspot groups that have a $\beta\gamma$ or γ magnetic classification as reported by Mt. Wilson Observatory in Reference 60.

(c) All sunspot groups associated with the major solar flares catalogued in Table I.

The column headings together with any necessary explanations follow:

Column 1 Mt. Wilson Sunspot Number.

Column 2 Greenwich Sunspot Number. In a few cases the identification of a Mt. Wilson spot with a Greenwich spot was difficult and may be subject to change. Occasionally two Mt. Wilson groups correspond to one Greenwich group and vice versa. The associations given in this catalogue were obtained by studying microfilm of the Mt. Wilson sunspot drawings, the Zurich maps and spot positions given in reference 61 with the daily spot data given in reference 54.

Column 3 Catalogue Classification from a, b, or c Above. A sunspot with a maximum area greater than 500 millionth is designated in this column by the letter L. If the entry is due to the magnetic classification, the letter M is used. If the sunspot groups are associated with a major flare, the flare serial number or numbers are used. There will be cases where all three symbols may appear in the column, as well as more than one major flare.

Column 4 McMath Plage Number.

Column 5 Sunspot Mean Latitude During Disk Passage.

Column 6 Sunspot Mean Longitude During Disk Passage.

Column 7 Time of Central Meridian Passage. This date is given to the nearest one-hundredth of a day if the group crossed the central meridian. If the spot was last seen east of the central meridian or was first seen west of the central meridian, the CMP time is estimated and given to the nearest tenth of a day.

Column 8 Maximum Area. This is the corrected area given in the Greenwich Report. The first number gives the area of the umbra, the second number is the area of the whole spots that make up the group. Both values are expressed in units of millionth of the solar hemisphere.

Column 9 Position of the Maximum Area.

Column 10 Greenwich Date of Maximum Area.

Column 11 This is the time interval in days from the date of maximum area to the date of the flare (when applicable). A negative number indicates that the flare occurred after the spot group had attained the maximum area.

Column 12 Mean Area. This is the corrected value given in the Greenwich general catalogue of sunspots. The first number is the mean umbrae area, the second number gives the corrected mean area for the whole spots.

Column 13 Mean Magnetic Class. The value given in reference 60 is used. (The symbols are defined on page 3.II-9.)

Column 14 Mean Magnetic Strength. The values in units of 100 Gauss have been taken from reference 60.

Columns 15-19 give the values on flare day when applicable: (15) Corrected area; (16) Zurich classification; (17) Magnetic classification; (18) Magnetic field strength, and (19) Position.

Column 20 Disk Passage Data. The five lines in this column give the following data:

Top line - The left hand number gives the date on which the sunspot was first seen; the right hand number gives the date on which the sunspot was last seen. These data have been taken from the three references 60, 54, and/or 61.

Second line - The left hand number gives the longitude from the central meridian where the spot was first seen; the right hand number gives the longitude distance from the central meridian where the spot was last seen.

Third line - This line gives the Zurich classification of the spot for each day (on which a classification was made) during disk passage as recorded in reference 61. (An explanation of the classification is given on page 3.II-9.)

Fourth line - The Mt. Wilson magnetic classification of the sunspot on each day that a classification was made during disk passage. If the classification is an estimate, the symbol is enclosed in brackets. The data for this line are taken from the Mt. Wilson daily work sheets.

Last line - This gives the magnetic field strength in units of 100 gauss for each day on which the field strength was measured and shown on the Mt. Wilson daily sunspot maps. The values given on this line are the maximum values shown on the map.

Column 21 Recurrent Spots. If the sunspot group is the return of a previous group determined by Mt. Wilson and/or Greenwich, the serial number, or numbers, of the groups during the previous rotation or rotations are given. The top numbers give the Greenwich sequence, the bottom numbers give the Mt. Wilson sequence.

Column 22 Remarks. A general description of the spot group adapted from reference 54 is given.

TABLE II. CATALOGUE OF IMPORTANT SUNSPOTS DU

C.M.P.	MAXIMUM AREA: Umb.	Whole Spot	Position	Gr. Day	Flare ΔT	SUNSPOT MEAN DATA: Area Umb.	Whole S.	Mt. Wilson Mag. Cl.	H	MAJOR FLARE DAY DATA: Area Umb.	Whole	Zurich Class.	Mag. Class.	H	Position	
Dec. 30.05	90	710	S24 W45	Jan. 2.39		50	368	dβp l	15							Dec. 25 E64 B A - (X) - -
Jan.																
7.21	161	865	N12 E47	3.46		79	595	l β γ d	17							Jan. 1 E72 E E β_p β_p 16 12
11.35	123	1066	S12 W38	14.57	-1	108	788	l β γ l	22	94	786	E	(βγ)	-	S13 W50	5 Jan. E81 - E (X) (X) - -
17.29	283	1476	N13 E38	14.57		216	1180	l β p l	36							Jan. 11 E76 - E β_p β_p 26 28
15.0								d x d	(2)						Not Seen	14 Jan.15 A A (X) (X) - -
22.95	40	267	N27 E25	20.57	0	26	146	l - p d	14	40	267	J	β_p	15	N27 E25	Jan. 17 E72 J J β_p β_p 8 -
24.16	32	298	N28 E72	18.28	-2	27	171	l - p l	12	45	281	J	- p	-	N29 E50	Jan. 18 E72 C C - p ($_p$) - -
19.90	92	706	S25 W56	24.4	+1 -1	54	413	d β l	(20)	64 59	430 677	E E	(β) (β f)	- -	S25 W40	Jan. 20 W10 B D β (β_p) 3 -
26.44	40	207	S20 E12	26.26	+1	24	140	d β f l	17	24	177	D	(β f)	-	S16 E05	Jan.21 F80 C C (- p) 0 - -
28.23	85	588	S10 W03	28.44		51	324	d β l	20							Jan. 25 E36 C D (β) (β) - -
30.35	87	411	N21 E40	27.28	-4	42	198	d β l	15	58	241	D	(β)	-	N22 W15	Jan. 25 E62 B D (β) (β) - -
Feb.				Feb.												
5.99	122	808	S13 E21	4.34	-6 -7	91	587	d β p l	16	93 94	633 219	D C	(X) (X)	- -	S13 W58 S13 W71	Jan. 31 E81 J C (X) (X) - -
8.13	161	756	S15 W15	9.50		133	647	l - p l	37							Feb. 1 E88 - H (- l) ($_{p}$) - -
9.33	156	1102	S20 E13	8.29		121	746	l β l	18							Feb. 2 E86 - C (X) - - -

TABLE II. 1958 (CONTINUED)

MAJOR FLARE DAY DATA						DISK PASSAGE DATA	RETURN SEQUENCE
Area Umb.	Area Whole	Zurich Class.	Mag. Class.	H	Position	*Days Seen, Positions Seen, Zurich Class., Mag. Class., Magnetic Strength*	Greenwich and/or MT.W.
						Feb. 7 — Feb. 19 E80 — W79 H H H H E E E E E E E E - α_p - α_p (α_p) α_p (α_p) α_p α_p α_p α_p α_p (α_p) (α_p) 14 - 33 - 31 - 34 33 29 28 26 - -	18460 12947
						Feb. 16 — Feb. 28 E71 — W82 J H H H G G G G G G H H - α_p α_p α_p (α_p) β_p (β_p) β_p β_p α_p (α_p) (α_p) α_p (α_p) 15 19 21 - 18 - 11 20 17 - - 16 -	
22	143	C	(βp)	-	S26 E60	Feb. 16 — Feb. 28 E85 — W68 - J J J J J J J J C J C A (-) α_p α_p (α_p) α_p (α_p) α_p α_p (β_p) (β_p) α - - - 13 12 - 16 - 21 17 15 - 3 - -	
						Feb.20 — Feb. 27 E12 — W79 A B D D E E E E - (β_p) β_f β β_f (β_p) (β_p) (β) - - 13 18 19 - -	
62	442	E	(β)	-	S15 W50	Feb. 24 — Mar. 3 E14 — W79 C E E E E E D - β_f (β) (β) β_p (β_p) (β) (β_p) (β_p) 13 - - 15 - - - -	
214	1740	F	β	23	S18 E50	Feb. 28 — Mar. 13 E86 — W75 - E F F F F F F F F E E E - (X) (β_f) (β) β β_p β_p - β_p (β_f) β_p β_p (β_f) (β_f) $(-)$ - - - 23 28 28 - 18 - 20 - - - -	
209	1684	F	βp	28	S18 E25		
Not Seen		-	-	-	Not Seen		
						Mar. 3 — Mar. 11 E38 — W72 B C D D E E D C C β_f β_f β_f - β_p (β_p) β_p (α_p) (α_p) 12 9 14 - 22 - 23 - -	
						Mar. 3 — Mar. 13 E51 — W74 D D E E E E E E E C - β β β - β_p (β_p) β_p (β) (β_p) (β_p) - 12 13 12 - 15 - 21 - - - -	
92	427	E	β_f	16	S12 W47	Mar.3 — Mar. 8 W21 — W83 A B E E E - (X) β β_f - (β_f) - - 11 16 - - -	18511 18460
65	394	H		15	N10 E70	Mar. 6 — Mar. 18 E80 — W77 - H H H H D D D D C C J J - α_p (α_p) α_p (α_p) (α_p) (α_p) (α_p) - - (α_p) (α_p) (α_p) (α_p) - 15 - 18 - - - - - - - - -	
						Mar. 8 — Mar. 19 E69 — W79 A D D E E E E E E E E E - (X) β (β) (β_p) (β) (β_p) - - (β_p) (β_p) (β) (β) 12 - - - - - - - - - -	
						Mar. 12 — Mar. 24 E78 — W73 D E E E E E E E E E E C - (X) (β_p) - - (β) (β) β β - - (β) (X) (X) - - - - - - 12 12 - - - - -	
						Mar. 17 — Mar. 28 E70 — W72 C D E E E E E E E E G G (X) β β_p - - (β) (β) (β) β_p β_p - - - - - 11 15 - - - - - 20 14 - - - -	
						Mar. 18 — Mar. 30 E74 — W80 - D E E E E E E E G G G G (α_p) β_f - (β_p) (β) (β_p) β_p β - - - - - - 9 - - - - 15 14 - - - - -	
192	1374	E	(βp)	-	S14 E70	Mar. 22 — Apr. 4 E81 — W83 - E E E E E E E E E E E C - (β) (β_p) (β_p) β β - - - β - - - - - - - - - 20 22 - - - - - - - - -	18552 13069
197	1434	E	-	-	S13 E13		
217	1509	E	-	-	S12 E01		
189	1273	E	β	-	S13 W13		
139	1170	E	-	-	S12 W40		

(2)

DISK PASSAGE DATA Days Seen, Positions Seen, Zurich Class., Mag. Class., Magnetic Strength	RETURN SEQUENCE Greenwich and/or MT.W.	GREENWICH DESCRIPTION
Jan. 5 W80 B B C D D E E E D - (X) β_p β_p (β_p) β_γ β_γ β_p β_p β_p (X) - - - - - 16 16 15 8 -		A stream of variable spots.
Jan. 12 W55 E E E E E E D D C C β_p β_γ β_γ (β_γ) β_γ β_γ (β_γ) β_γ (β_γ) - 18 18 16 - 14 15 - 11 - -	18388	A scattered stream until January 8; two spots from January 9.
Jan. 17 W80 E E E E E E E E E E E β_p β_γ (β_γ) β_p β_γ β_γ (β_γ) (β_γ) (β_γ) (β_γ) (X) 16 19 - 20 21 23 - - - -		A complex group, at first scattered, becoming more compact during its disk passage. A leading regular spot persists throughout.
Jan. 23 W82 E E F F F F F G G G - (β_p) (β_p) β_p β_γ β_γ (β_p) (β_p) β_p (β_p) (β_p) $(\alpha\beta)$ - - 17 13 29 - - 27 -	18419	A large bi-polar group, of which the rear component dies out as it approaches the limb.
Jan. 28 W69 J J J J J J J J A A - (β_p) β_p (α_p) (α_p) (X) (X) (α_p) (α_p) α_p - - - 15 - - - - - - 3 -	12878	A regular spot, with occasional companions.
Jan. 29 W64 C C C C J J J J J A - β_p (β_p) (β_p) (α_p) (α_p) (α_p) (α_p) α_p α_p (α_p) - 13 - - - - - - 12 8 -		A stable regular spot, decreasing in area as it crosses the disk. There are a few companions on January 20.
Jan. 26 W82 E E E E - (β) (β) (β_γ) (β_γ) (X) - - - - -		A stream, developing west of the central meridian.
Feb. 1 W78 C C D D D D D C D - (X) β $(\beta\gamma)$ $(\beta\gamma)$ $\beta\gamma$ $\beta\gamma$ $\beta\gamma$ $(\alpha\gamma)$ $(\beta\gamma)$ - - - - - 18 15 16 - - -		A small composite spot, appearing suddenly on January 25, which becomes regular in outline by January 29.
Feb. 2 W69 D E E E D D C γ $\beta\gamma$ $\beta\gamma$ $(\beta\gamma)$ $(\beta\gamma)$ $(\beta\gamma)$ (β_p) 21 16 13 - - - -		A compact stream, which soon begins to break up.
Feb. 4 W61 E E D D D C C J J β β β_p $(\beta\gamma)$ $(\beta\gamma)$ $(\beta\gamma)$ $(\beta\gamma)$ - - 14 16 12 - - - - - -		A stream, becoming widely separated in longitude. Only the follower remains on February 3 and 4.
Feb. 11 W76 E E E E E E E D D C (β_p) - - (β_p) (β_p) β_p - (β_p) (X) (X) - - - - - 17 - - - -		A stream, developing into a bi-polar group, which begins to break up on February 8.
Feb. 14 W85 H G G G H H H H H H H - - - (X) (X) α_p - α_p (α_p) α_p (α_p) α_p (α_p) - - - - 34 - 36 - 36 - 23 -		A large regular spot, with occasional companions.
Feb. 15 W75 D E E E E E E E E D D D - (β_p) $(\beta\gamma)$ $\beta\gamma$ - $\beta\gamma$ $(\beta\gamma)$ $\beta\gamma$ $(\beta\gamma)$ $\beta\gamma$ $\beta\gamma$ $(\beta\gamma)$ - - - 16 - 15 - 16 - 12 10 -		A large elongated stream, of which the very variable middle components die out before reaching the limb.

3. II-1

(3)

POSITION DATA								MAXIMUM AREA					SUNSPOT MEAN DATA		
Serial No.	Sunspot MT.W.	Number Green.	Category	McM Plage	Lat.	Long.	C.M.P.	Umb.	Whole Spot	Position	Gr. Day	Flare ΔT	Area Umb.	Area Whole S.	Mt. Wilson Mag. Cl. H
15	13023	18511	L	4410*	N11	307	13.30	179	1462	N11 W63	18.63		201	1036	*l-pl* 35
16	13034	18525	L	4426	S15	191	22.12	105	646	S14 W15	23.45		77	460	*l-pl* 20
17	13040	18526	11	4427	S25	177	23.21	29	191	S26 E71	24.38	-1	23	137	*l-pd* 20
18	13048	18534	L	4426*	S22	200	21.4	149	703	S22 W50	25.29		80	415	*dβl* 18
19	13052	18538	12,L	4436	S15	148	25.42	115	714	S15 W13	26.53	-3	74	457	*dβpl* 14
20	13063	18544	13,L 14 17	4445	S18	15	Mar. 7.48	253	1778	S18 E63	2.44	-1 -3 -12	170	1253	*lβpl* 28
21	13066	18549	L	4443*	N24	34	6.03	127	748	N24 W13	7.37		84	450	*dβpl* 22
22	13067	18550	L	4444	N32	19	7.17	178	1167	N32 W25	9.38		103	653	*dβpl* 20
23	13069	18552	15,L	4442*	S12	91	1.80	191	1762	S12 W75	7.37		118	838	*dβll* 15
24	13076	18557	16,L	4449	N11	307	12.69	91	562	N11 E57	8.37	+1	55	342	*l-pl* 17
25	13078	18559	L	4453*	N13	297	13.44	95	1778	N13 W70	18.64		111	882	*dβpl* (20)
26	13083	18564	L	4456*	N12	231	18.41	103	793	N12 E63	13.45		70	538	*lβl* 12
27	13092	18575	L	4465	N22	174	22.75	234	1555	N22 E18	21.37		186	1076	*lβl* 20
28	13096	18578	L	4469*	N25	151	24.53	132	776	N25 E40	21.37		95	531	*lβpl* 14
29	13103	18584	18,L,M 19 20 21 22	4476	S13	92	28.96	268	1539	S13 E45	25.49	+2 -2 -3 -5 -7	184	1269	*lβγl* 21

3.II-2 0

POSITION DATA						
Serial No.	Sunspot MT.W.	Number Green.	Category	McM Plage	Lat.	Long.
1	12901	18427	L,M	4333*	S23	183
2	12918	18438	L,M	4347*	N11	76
3	12924	18445	2,L,M	4355	S12	21
4	12947	18460	L	4370*	N12	303
5	12956	-	1	4365	S16	330
6	12965	18472	3	4381	N28	229
7	12969	18478	5	4381	N29	213
8	12975	18479	4,L 6	4372	S25	269
9	12979	18487	7	4382	S19	183
10	12984	18488	L	4384*	S10	159
11	12985	18489	8	4387	N22	131
12	12997	18496	9,L 10	4400	S13	44
13	13000	18500	L	4400	S14	15
14	13004	18502	L	4400	S19	349

3.II-1 (1)

GREENWICH DESCRIPTION
A regular spot for the first few days; it becomes composite in structure after February 11, when additional spots appear in front to form a stream of normal type.
A regular spot, with occasional companions, which becomes composite in structure on February 22 and divides into two on February 24.
A regular spot until February 23, after which other spots appear, forming a short stream highly inclined to the equator.
A few small spots, developing into a bi-polar group on February 23. The group breaks up as it approaches the west limb.
A stream of small scattered spots when first seen on March 24. These grow very rapidly to form a moderate-sized bi-polar stream which decreases in area as it approaches the west limb.
A large complex stream, of which the rear part soon breaks up. After March 8 the whole group rapidly diminishes in area and has nearly died out at the west limb.
A pair of spots on March 3, developing into a stream. The leader becomes a regular spot by March 8; the remaining components are dying out as the group passes from view.
A pair of spots, developing into a long stream of which the leader becomes a regular spot by March 9.
A compact stream, developing west of the central meridian and growing rapidly as it passes from sight.
A composite spot. From March 10 to 15 preceding spots appear, forming a stream.
A stream, developing from one or two spots at the east limb. Rapid growth occurs after March 13 as the leader becomes a composite spot and the following components form a compact structure which coalesces with the leader on March 18.
An elongated stream, with a following regular spot. The group is breaking up and dying out as it passes round the limb.
A large bi-polar group.
A pair of spots, developing into a stream of normal type. The intermediate spots disappear by March 28 and the follower dies out before reaching the west limb.
A large bi-polar group. After March 28 the follower begins to break up and die out.

TABLE II. 1958 (CONTINUED)

C.M.P.	MAXIMUM AREA Umb.	Whole Spot	Position	Gr. Day	Flare ΔT	SUNSPOT MEAN DATA Area Umb.	Whole S.	Mt. Wilson Mag. Cl.	H	MAJOR FLARE DAY DATA Area Umb.	Whole	Zurich Class.	Mag. Class.	H	Position	
29.32	91	572	S06 W25	31.33		44	271	dβ	13							Mar. 23 E74 D D (β) (β) - -
30.39	270	1992	S22 W75	26.30		213	1325	/βp/	17							Mar. 23 E84 - E (-p) (βp) - -
27.23	166	563	S07 W53	31.33		43	276	dβγ	11							Mar. 24 E43 J J (βp) βp - 11
Apr. 2.22	193	1149	S16 E40	30.32		138	925	/-p/	(25)							Mar. 27 E76 E E - - - -
4.48	182	1294	N33 E40	1.36		138	925	β/	(15)							Mar. 29 E76 - E - (X) - -
4.56	157	613	S17 E25	2.36		67	375	-p/	15							Mar. 29 E82 - D - (X) - -
6.69	16	119	N13 E25	4.38	-5	12	52	d-p/	4	-	-	A	βp	4	Not Seen	Apr. 1 E70 J C - - - -
8.06	148	923	N16 W13	9.39		98	624	βp/	13							Apr. 4 E48 B D (X) (β) - -
9.45	69	604	N13 E80	3.37		92	471	/-p/	29							Apr. 3 E80 - G - (-p) - -
9.82	115	648	N15 E50	5.61	-2	57	335	β//	17	93	512	D	–	-	N15 E30	Apr. 3 E79 - C - (βp) - -
5.10	90	855	N20 W65	10.35		28	177	dβ/	(15)							Mar. 30 E78 C D - -
21.00	189	1662	S22 W15	22.39		167	1226	/βp/	23							Apr. 14 E84 - E (X) β - 12
26.37	123	671	N11 W25	28.44		64	399	/β/	(20)							Apr. 20 E77 - C (X) βγ - 13
29.47	93	526	S16 E80	23.37		85	455	/-p/	17							Apr. 23 E80 H H (-p) (-p) - -
May 1.84	154	1101	N18 E30	29.33		127	799	/βp/	17							Apr. 25 E81 - E (-p) βp - -

TABLE II. 1958 (CONTINUED)

MAJOR FLARE DAY DATA						DISK PASSAGE DATA	RETURN SEQUEN
Area Umb.	Area Whole	Zurich Class.	Mag. Class.	H	Position	Days Seen, Positions Seen, Zurich Class., Mag. Class., Magnetic Strength	Greenwich and/or MT.W.
318	2008	F	$(\beta\gamma)$	-	S15 E50	Apr. 26 E82 — May 9 W83 - C E F F F F F F F F G G - (•) (β) (β) $(\beta\gamma)$ $\beta\gamma$ $(\beta\gamma)$ $\beta\gamma$ $(\beta\gamma)$ $\beta\gamma$ $(\beta\gamma)$ $(\beta\gamma)$ (β_p) (X) - - - - - - - 20 - 17 - - - - -	
301	1857	F	$(\beta\gamma)$	-	S15 E13		
186	1319	F	$(\beta\gamma)$	-	S14 W25		
186	1319	F	$(\beta\gamma)$	-	S14 W28		
132	814	F	$(\beta\gamma)$	-	S15 W40		
-	-	-	-	-	Not Seen	Apr. 30 E33 (X) -	
						May 1 E75 — May 13 W80 H G G G G G G G G G H H - $(\bullet_p)$ β_p (β_p) β_p (β_p) (β_p) (β_p) β_p β_p β_p (β_p) $(\bullet_p)$ $(\bullet_p)$ $(\bullet_p)$ - 23 - 24 - - - 26 21 - - - -	Pos. 13151
						May 8 E82 — May 21 W84 - D D D D D D D D D D D D - (X) β β_p (β_p) $(\bullet_p)$ $(\bullet_p)$ $(\bullet_p)$ (X) $\bullet_p$ $\bullet_p$ $\bullet_p$ $\bullet_p$ - - - 16 - - - - - - 11 10 9 - - -	
						May 9 E83 — May 21 W72 - D D D D C C C C C B B A β β (β_p) (β) (β) (β) (β_p) $\beta\gamma$ $\beta\gamma$ $\beta\gamma$ $\beta\gamma$ $(\beta\gamma)$ (X) 9 - - - - - - 7 17 17 18 - -	
						May 15 E72 — May 26 W62 A C D E E E E D D C J A (β_p) β_p β_p β_p β_p (β_p) β (β_p) β_p (β_p) (β_p) $(\bullet_p)$ - 14 17 20 18 - 13 - 12 - - -	
102	686	E	(β)	-	N29 W43	May 28 E32 — June 6 W80 B C D D E E E E D - β_p (β_p) β_p β β (β) (β) (β) (β) (β) - - - 14 15 - - - - -	
62	436	D	(β)	-	N28 W68		
16	134	-	(β)	-	N30 W80		
						May 29 E81 — June 10 W78 H H H H H H H H H H H H H $(\bullet_p)$ $\bullet_p$ $\bullet_p$ $\bullet_p$ $(\bullet_p)$ $\bullet_p$ $(\bullet_p)$ $(\bullet_p)$ $\bullet_p$ $(\bullet_p)$ $(\bullet_p)$ $(\bullet_p)$ $(\bullet_p)$ - - 25 22 - 21 - - 20 - - - -	18668 13207
-	-	-	-	-	Not Seen	May 31 E71 - (•)	
313	1966	F	(γ)	-	N28 E13	June 3 E80 — June 17 W85 - E F F F F F F F F F F E E D - (γ) γ (γ) γ (γ) (γ) (γ) (γ) β β $\beta\gamma$ $\beta\gamma$ $(\beta\gamma)$ (X) - - 18 - 22 - - - - 20 - 12 10 - - -	
						June 4 E62 — June 16 W78 C D E E E E E E E E E D - (β_p) (β_p) β_p (β_p) (β_p) (β) (β_p) (β_p) (β) $\beta\gamma$ $\beta\gamma$ (β) $(\bullet)$ - - 16 - - - - - - 9 2 - -	
47	314	C	(β)	-	S17 E65	June 4 E78 — June 13 W37 - C C J J J C J C A (β) (β) β (β) (β) (β) (β_p) $(\bullet_p)$ (β_p) (β_p) - - 7 - - - - - - -	18681 13225
107	799	E	β_p	24	N15 W20	June 12 E72 — June 23 W75 D D D E E E E E E E G H (X) β_p β_p β_p β_p β_p β_p β_p β_p (β_p) β_p $\bullet_p$ - 16 16 21 21 18 17 24 21 - 23 -	
107	799	E	β_p	24	N15 W20	June 20 E76 — June 28 W30 - - C J J A A A A (X) (β) $\beta\gamma$ $\beta\gamma$ $\beta\gamma$ (β) $\beta\gamma$ $(\bullet_p)$ - - - 8 14 15 - 3 - -	18704 18654 13262 13197
						June 23 E76 — July 4 W82 C E E E E E E G G G G G β_p β $(\beta\gamma)$ $\beta\gamma$ β_p (β_p) β_p β_p (β_p) β_p $(\beta\gamma)$ $(\bullet)$ 6 16 - 26 27 - 13 15 - 15 - -	

DISK PASSAGE DATA Days Seen, Positions Seen, Zurich Class., Mag. Class., Magnetic Strength	RETURN SEQUENCE Greenwich and/or MT.W.	GREENWICH DESCRIPTION
Apr. 4 W78 D D D D D E E E C B - β β_f - - - (β_f) - - - - - 9 14 - - - - - - - - -		A pair of spots on March 23, developing into a stream. On March 29 the follower increases in area before the whole group breaks up as it approaches the limb.
Apr. 6 W84 E E E F F F F F F G G G - β_p β_p - - - (β_p) - - - - - (β) - - 18 18 - - - - - - - - - - -		A large bi-polar group.
Apr. 2 W85 C C C C C C J - β_γ - - - (β_γ) - - - 10 - - - - - - -		A pair of spots on March 24; a single spot on March 25, developing into a cluster which becomes composite in structure by March 28.
Apr. 8 W81 E E E E E G H H H H H - (X) - - - - (X) (α_p) - - α_p - - - - - - - - - - 15		A stream, of which the leader, a composite spot, becomes regular in outline after March 31. The following components die out by April 5.
Apr. 10 W72 E E E E E E E E E D D - - - - (β_p) (X) - - β_γ β) (X) - - - - - - - - - - -	18550 13067 (Part)	A compact steam, which spreads out after April 4 and begins to disintegrate as it approaches the west limb.
Apr. 10 W77 D D C D D E E D D C C - - - - (X) (X) - - α_p (α_p) (α_p) - - - - - - - - - - -		Two or three small spots, developing into a stream, of which the leader becomes a composite spot. On April 4 a preceding regular spot detaches itself, while the remainder of the group begins to break up and die out.
Apr. 10 W50 J A B A A B A A - (X) (α) - - (X) β_p - - - - - - - 4 -		One or two small spots, developing into a short stream of which only the leader remains on April 7.
Apr. 13 W74 E E E E E E E D - - β_p (β_p) (β_p) (β_p) β_p (β_p) - - 14 - - - - -		A few small spots on April 4, developing into a large stream.
Apr. 15 W78 G G G G G G G G G G G (α_p) - - α_p (α_p) (α_p) (α_p) α_p (α_p) (α_p) (α_p) (α_p) - - - - - - - - - - -	18559 13078	A stable regular spot, with occasional companions.
Apr. 15 W71 D D D D C C C A A A - (β) - - β_f (β_f) (β_f) β_f β_f (β_f) β_f (α_f) - - - 28 - - - - - - -		A stream, consisting of a leading regular and following composite spot. The leader breaks up on April 7, while the composite spot becomes regular in outline on April 8. Only the latter is visible on April 14.
Apr. 11 W79 C B B B B A B C D D - - - - - - - - - - - -	18551 13068	A variable cluster of small spots, not seen on April 6. Fresh activity develops on April 7, when a stream appears which is growing rapidly as it passes from sight.
Apr. 26 W76 E E E E E E E E E E E E β_p β_γ β_p β_p β_p β_p (β_p) (β_p) (β_p) (α_p) (α_p) 15 20 18 20 19 24 - - - - -		A composite spot, developing into a compact stream.
May 2 W79 C C C D E E E G G G - (β_f) (β) (β) β β_γ β_γ (β_p) (β) β_p (β_p) (α_f) - - - - - - - - - - -		A cluster of variable spots, developing into a stream of normal type after April 25.
May 5 W79 H H G G G G H H H H - (α_p) α_p (β_p) (α_p) (α_p) (α_p) (α_p) α_p (α_p) α_p (α_p) - - - - - - - - 18 - 18 -	18590	A regular spot, with a few occasional companions.
May 7 W76 E E E E E G G G G G G β_γ (β_γ) (β_p) (β_p) (β_p) β_p (β_p) β_p (β_p) (β_p) (β_p) (β_p) - - - - - 14 - 11 - - -	13133	A bi-polar group, of which the follower begins to break up and die out after May 3.

3.II-3

(3)

POSITION DATA								MAXIMUM AREA					SUNSPOT MEAN DATA			
Serial No.	Sunspot MT.W.	Number Green.	Category	McM Plage	Lat.	Long.	C.M.P.	Umb.	Whole Spot	Position	Gr. Day	Flare ΔT	Area Umb.	Area Whole S.	Mt. Wilson Mag. Cl.	H
							May									
45	13197	18654	26,L,M 27 28 29 30	4530	S15	348	3.09	281	2061	S15 E40	30.31	+1 -1 -5 -5 -6	198	1332	*Iβγl*	19
46	13205	-	25	4531	N30	-	3.4	-	-	-	-		-		*dxd*	(2)
47	13207	18668	L	4538*	N26	293	7.23	154	872	N26 E50	3.57		128	669	*Iβpl*	26
48	13225	18681	L	4548	S18	191	14.95	63	580	S18 E63	10.34		56	373	*I-pd*	15
49	13226	18683	L,M	4548	S20	178	15.94	31	517	S20 E75	10.34		29	239	*Iβγl*	17
50	13237	18689	L	4557*	N40	109	21.17	95	620	N40 E13	20.41		45	293	*dβpd*	19
51	13275	18715	32,L 33 35	4578	N28	341	30.85	89	764	N29 W60	4.67	+1 -1 -2	69	443	*dβl*	14
							June									
52	13278	18718	L	4587*	N25	280	4.47	73	536	N26 W78	10.44		73	376	*I-pl*	25
53	13284	-	31	4591	N00	-	6.0	-	-	-	-		-		*I-d*	(1)
54	13292	18726	36,L,M	4596	N28	206	10.08	329	2256	N28 E20	8.56	-1	212	1587	*Iγl*	21
55	13294	18728	L	4597	N43	209	9.76	130	969	N44 W20	11.36		88	573	*dβl*	14
56	13295	18729	34	4598	S17	199	10.60	33	368	S17 E80	4.67	-1	19	122	*Iβd*	(10)
57	13311	18739	37,L 38	4607	N15	103	17.80	107	799	N15 W20	19.33	0 0	91	580	*Iβpl*	23
58	13326	18751	M	4618	S18	352	26.24	136	245	S17 E35	22.61		19	114	*dβγd*	14
59	13333	18756	L	4622	S18	319	28.75	169	1107	S19 E45	25.34		126	789	*dβγl*	26

3.II-4 0

POSITION DATA						
Serial No.	Sunspot MT.W.	Number Green.	Category	McM Plage	Lat.	Long.
30	13108	18586	L	4476*	S07	87
31	13109	18587	L	4478	S22	73
32	13110	18588	L,M	4476*	S07	115
33	13112	18590	L	4480*	S16	36
34	13118	18595	L	4484*	N33	6
35	13120	18597	L	4483*	S17	5
36	13123	18601	24	4490	N12	337
37	13127	18607	L	4490	N16	319
38	13129	18605	L	4493	N12	301
39	13130	18606	23,L	4493	N15	296
40	13133	18598	L		N21	358
41	13157	18628	L	4508	S22	148
42	13179	18643	L	4519	N10	77
43	13184	18648	L	4542*	S16	36
44	13193	18652	L	4529	N18	5

3-113 0

CE	GREENWICH DESCRIPTION
	A large elongated stream, of which the rear portion begins to break up and die out after May 4.
	A regular spot.
	A stream, led by a regular spot. The rear portion coalesces after May 17 into a small composite spot.
	A cluster of variable spots.
	A stream of which the leader, a composite spot, begins to break up from May 21. Only the follower remains on May 25 and 26.
	A few small spots on May 28, developing into a stream.
	A regular spot, with preceding companions on June 9 and 10.
	A large complex stream, which begins to break up and die out as it approaches the limb.
	A few small spots on June 4, in high northern latitude, developing into a long stream. The group is dying out as it approaches the limb.
	A cluster of variable spots.
	A cluster of spots on June 12 and 13, developing into a stream of normal type. Only the leader remains on June 23.
	A single spot on June 20 and 21, developing into a scattered stream. Only the leader remains on June 26.
	A cluster of spots, developing into a large stream of normal type. The leader and follower gradually separate in longitude as the group crosses the disk.

3.II-4 (3)

POSITION DATA							
Serial No.	Sunspot MT.W.	Number Green.	Category	McM Plage	Lat.	Long.	C.M.P.
60	13335	18758	40,L	4623	N10	304	29.85
61	13336	-	39	4619	N20	-	27.1
62	13350	18768	L,M,	4630*	N26	224	July 5.87
63	13353	18772	43,L	4636	S23	201	7.65
64	13356	18773	41,L	4634	N27	201	7.62
65	13362	18779	42	4642	S22	129	13.06
66	13370	18782	44,L	4646	N08	60	18.26
67	13374	18786	46,L 47	4650	S24	94	15.69
68	13375	Part of 18787	45	4651	N21	28	20.70
69	13376	Part of 18787	45	4651			
70	13384	18796	L	4659	S16	325	25.49
71	13386	18798	48	4658	S04	320	25.83
72	13388	18801	51,L,M 52	4659	S15	315	26.25
73	13389	18805	L	4659	S18	299	27.41
74	13394	18807	49 50	4657	N24	308	26.80

3.II-5 (0)

TURN SEQUENCE	GREENWICH DESCRIPTION
Greenwich and/or MT.W.	
	A regular spot, with one or two companions.
13351	
	A composite spot, which shows a progressive decrease in area as it crosses the disk.
	A stream of scattered spots, of which the leader becomes regular in outline by the time it reaches the west limb.
	A scattered steam, of which the follower dies out by August 5.
	A stream, of which the leader, the sole survivor after August 4, splits into two regular spots by August 6.
	A variable scattered stream, of which the inclination to the equator increases as the west limb is approached.
	A tiny spot on August 2 and 3, developing into a stream of which the follower breaks up and dies out after August 12.
	A regular spot with a following companion. On August 10 other spots appear, forming a stream.
	A stream, of which the leader, a composite spot, is the sole survivor at the west limb.
	A scattered stream, led by a regular spot. The following components die out by August 20. On August 22 further spots appear, forming a new stream which is growing as it passes from view.
18797	A large compact stream, which breaks up as it approaches the west limb.
13385	
	A regular spot. Numerous faint following companions appear after August 25.
	A bi-polar group, forming west of the central meridian.
	A compact stream.
	A pair of spots, developing into a stream, of which the leader is the most stable component.

3-II-4 (3)

TABLE II. 1958 (CONTINUED)

MAJOR FLARE DAY DATA						DISK PASSAGE DATA	RE
Area Umb.	Area Whole	Zurich Class	Mag. Class.	H	Position	Days Seen, Positions Seen, Zurich Class., Mag. Class.,Magnetic Strength	
43	238	H	(α_p)	-	N18 E06	July 23 E86 … Aug. 5 W84 - J J J J H H G H H H H J - (α) (α_f) α_p α_p α_p α_p (α_p) (α_p) α_p β_p (β_p) β_p α_p - - - 20 18 24 24 - - 26 28 - 26 15 -	
11	49	E	β_p	14	N05 W45	July 25 E79 … Aug. 5 W67 E E E E E E E E E E G G β_f β_f β_f β_p (β_f) β_f β_γ β_γ (β_p) β_p β_p (β) 13 17 15 16 - 22 15 14 - 14 8 -	
						July 26 E24 … Aug. 3 W82 A B B B C C E E - (β) β_f β (β) β_p β β_p (β_p) (X) - - 6 - 14 14 12 - -	
61	294	G	(β_p)	-	N27 W27	July 27 E74 … Aug. 7 W77 B B D D E G G G G G G G (X) β_p (β) β_p β_p β_p (β_p) β_p (β_p) α_p α_p (α_p) - 9 - 15 13 16 - 15 - 19 14 -	
						July 28 E64 … Aug. 7 W75 A C D D E C C C C C J β_p $(\beta$ β_p β_p β_p (β_p) β_p β_p α_p α_p (α_p) 6 - 17 12 17 - 13 12 14 9 -	
						July 29 E74 … Aug. 9 W80 H H E E E G G G G G G G (X) β_f β_p β_p (β_p) β_p (β_p) α_p α_p β_p (X) - - 16 17 15 - 14 - 15 15 16 - -	
						Aug. 2 E73 … Aug. 14 W84 A A B D E E E E E E G G - (X) β_f (β_p) β β β_p (β) β β_p β_p β_p (α_p) (α) - 2 - 18 25 23 - 15 20 20 18 - -	
						Aug. 5 E78 … Aug. 17 W72 - - - A B B C C C C C J - (α_p) α_p α_p (α) α β_p β_p β_p (β_p) β_p (β_p) β_p (α_p) - 13 - - 11 12 16 19 - 19 - 15 -	
80	686	E	β_p	23	S14 E62	Aug. 6 E78 … Aug. 18 W82 - E E E E G G G G G G G G β_p β_f (β_p) β_γ β_γ β_γ β_γ (β_γ) β_γ (β_p) β_γ (β_γ) (X) 18 23 - 27 29 34 32 - 34 - 31 - -	
138	836	G	(β_γ)	-	S13 W14		
208	935	G	β_γ	31	S13 W50		
57	373	D	(β_p)	-	S11 W63	Aug. 15 E41 … Aug. 24 W76 C C C C C C J D D - (β) β_f β_p β_p β_p α_p α β_p (β_p) (X) - 22 16 18 18 - 9 14 - -	
189	1381	E	(β_γ)	-	N18 E01	Aug. 15 E81 … Aug. 28 W83 - D E E E E E E E E E E E - (β) β_f β_γ β_γ β_γ (β_γ) β_γ β_γ β_γ β_γ β_p (β_p) (β) (X) - 13 17 18 23 - 24 24 20 21 18 - - -	
112	1192	E	β_γ	24	N18 W03		
112	1192	E	β_γ	24	N18 W10		
130	751	E	β_p	18	N18 W45		
116	776	E	(β_p)	-	N17 W53		
-	-	-	-	-	Not Seen		
						Aug. 21 E81 … Aug. 28 W08 J J C C B A B A (α) α_f α_p α_p α_p α_p (X) (X) - 13 11 16 16 - - -	
						Aug. 22 E10 … Aug. 29 W77 B A B E E E E - β_f β_p β_p (β) (β) (β_f) (X) - 3 12 9 - - - -	
						Aug. 26 E66 … Sept. 5 W70 B C D D E E E E E E E (β) β_f β β_p β_p β_p β_p β_p β_p β_p β_p β_p - 14 16 20 16 24 29 25 21 22 19	
						Aug. 27 E59 … Sept. 6 W80 B D B C C D E E E E E β β β_p β_p β_p β_p β_p β_p β_γ β_p (β) 6 11 13 14 13 17 22 16 15 11 -	

TABLE II. 1958 (CONTINUED)

MAXIMUM AREA					SUNSPOT MEAN DATA				MAJOR FLARE DAY DATA					
Umb.	Whole Spot	Position	Gr. Day	Flare ΔT	Area Umb.	Whole S.	Mt. Wilson Mag. Cl.	H	Area Umb.	Whole	Zurich Class.	Mag. Class	H	Position
65	561	N09 E70	24.30	-2	54	327	βp	22	87	543	E	$\beta\gamma$	13	N10 E50
-	-	-	-	-	-		α-p	(2)	-	-	-	-	-	Not Seen
141	1002	N25 E30	3.30		60	498	β	20						
229	1573	S23 W50	11.33	-1	155	923	β	21	178	1303	E	(βp)	-	S23 W63
96	689	N27 E15	6.35	-1	59	373	$\alpha\beta$	19	138	686	E	β	18	N27 E08
63	472	S22 W01	13.14	+2	51	316	βp	16	61	398	H	(αp)	-	S22 E20
228	1407	N09 E08	17.63	+2	156	914	$\alpha\beta p$	27	183	914	E	βp	25	N08 E37
136	761	S23 W53	19.62	-1 -1	55	353	$\alpha\beta$	13	87 87	680 680	D D	$(\beta\gamma)$ $(\beta\gamma)$	- -	S23 W60 S23 W60
26	152	N21 E30	18.33	-1	17	95	$\alpha\beta\alpha$	4	24	147	C	(X)	-	N22 E13
See description.							$\beta\alpha$	14			C	$\beta\gamma$	-	N22 E13
142	682	S15 W65	30.26		72	364	βp	20						
18	184	S05 E80	19.62	-4	9	50	β-p	13	11	56	J	γ	13	S04 E33
207	1795	S15 W26	28.33	-1 -3	123	901	$\alpha\beta\gamma$	23	230 164	1490 1608	F F	$\beta\gamma$ $(\beta\gamma)$	17 -	S15 W13 S15 W40
200	1245	S18 E65	22.38		119	755	$\beta\gamma p$	23						
9	42	N24 E33	24.34	+1 +1	4	23	$\alpha\beta\gamma\alpha$	5	7 7	32 32	C C	βp βp	6 6	N25 E43 N25 E43

June 23 E82	-	E
β_p		$\beta\gamma$
-		12
June 24 E36	-	-
(α)		(X)
-		-
June 29 E81	-	J
γ_p		(β)
9		-
July 1 E77	-	G
(β)		β
-		16
July 2 E66	A	A
(X)		-
-		12
July 7 E72	H	G
β_p		(β_p)
10		-
July 12 E73	J	C
(X)		(β_p)
-		-
July 14 E20	B	C
β_p		β_p
10		12
July 14 E82	-	D
β		$(\beta\gamma)$
5		-
July 14 E82	-	D
β		β_p
8		8
July 19 E77	-	J
γ_p		γ_p
8		18
July 19 E82	-	J
(α)		γ_p
-		5
July 20 E78	-	B
(α)		β_p
-		8
July 21 E79	E	E
β_p		β_p
14		14
July 23 E45	C	C
β_p		$(\beta\gamma)$
6		-

DISK PASSAGE DATA Days Seen, Positions Seen, Zurich Class., Mag. Class., Magnetic Strength	RETURN SEQUENCE Greenwich and/or MT.W.	GREENWICH DESCRIPTION
July 5 W74 E E E E D D C C C C A (βp) βγ β β β βγ (βp) βp (βp) (βp) (αp) - 13 23 23 17 14 - 11 - - -		A stream of normal type, of which the leader becomes regular in outline from June 28. The follower breaks up after June 30 and is not seen on July 3.
26 E2 - (αp) -		
July 11 W70 J C E E D D C C B B C (βp) β βγ (βγ) βγ (βγ) βγ (β) (βp) (βp) (αp) - 21 20 - 20 - 11 - - - -		A complex stream; which becomes scattered as it breaks up and dies out.
July 14 W78 G G G G G G E E E E E - (β) (β) β (β) βp (β) (βp) βp (βp) (βp) (X) - - - 20 - 24 - - 20 - - - -		A bi-polar group. After July 7 intermittent spots appear, forming a long stream of which a regular spot is the principal component.
July 14 W83 A D E E E E E D C C J (β) βf (βf) βf (βf) (βf) βf (βf) (αp) (α) (α) - 20 - 18 - - 15 - - - -		A short, compact stream, which slowly breaks up after July 10. Only the rear component remains on July 12.
July 18 W68 G H H H G H J J J J (β) βp (αp) βp (βp) βp αp αp αp (αp) - 15 - 15 - 17 13 14 13 -		A composite spot, which becomes regular in outline after July 16.
July 24 W79 E E E E E E E E G G - βp βp βp βp βp βγ βp βp β βγ (α) 21 25 23 27 21 20 22 20 18 14 -		A single spot on July 12 and 13, rapidly developing into a large bi-polar group.
July 21 W74 C C D D D C βp β βf β (βf) (βf) 14 12 13 13 - -		A stream of small spots.
July 23 W22 C C C C C B B B (β) (X) (X) (X) O O (αf) - - - - - - - - -		At first a regular spot, which from July 17 begins to break up and disperse.
July 23 W22 C C C C C B B B βp βp β βf β β (β) βp 11 9 14 4 2 - - 2		The importance 2+ flare (No. 45 Table I) occurred between Mt. Wilson sunspots 13375 and 13376. All area data are for the combined spots, i.e. Greenwich No. 18787.
July 31 W78 J J J J J C C J J J J αp αp αp (αp) αp αp αp αp αp (αp) (αp) 17 16 19 - 16 19 21 17 - - -	18756 13333	At first a regular spot. On July 26, another regular spot appears immediately north of it.
July 30 W61 J J J C J J J B B A αp αp αp (αp) αp αp αp β - - 14 13 13 - 12 18 22 24 - -		A regular spot, which divides into two on July 27.
Aug. 1 W85 C D D E E F F F F F - βp βp (β) βp βp βγ βγ (βγ) βp βp βp - 15 - 15 16 16 17 - - - -	18756 13333	A stream, appearing in front of Group 18805, extending longitudinally towards, and finally touching, Group 18796. The rear part is dying out as the group passes round the limb.
Aug 2 W76 E E E E G G G G G G G βp (β) βp βp βγ βγ (βγ) βp βp βp (X) 18 - 22 23 21 24 - 21 17 12 -		A bi-polar group, of which the follower dies out before reaching the west limb.
July 28 W23 B B A B βp (αp) - - 4 - - -		A pair of spots on July 23 and 24; a single spot on the other days.

3. II-5 (3)

POSITION DATA								MAXIMUM AREA					SUNSPOT MEAN DATA			
Serial No.	Sunspot MT.W.	Number Green.	Category	McM Plage	Lat.	Long.	C.M.P.	Umb.	Whole Spot	Position	Gr. Day	Flare T	Area Umb.	Area Whole S.	Mt. Wilson Mag. Cl.	H
75	13395	18808	53	4664	N17	265	29.99	25	354	N17 W84	5.34	+6	49	277	*l-pl*	28
76	13397	18810	54,L	4665	N06	247	31.35	90	539	N07 E79	25.42	-9	40	247	*lβl*	21
77	13399	18811	L	4668	N19	287	28.34	96	722	N19 W55	1.65		33	253	*dβpl*	13
78	13404	18813	55,L	4667	N27	228	Aug. 1.83	88	576	N27 E20	31.31	-4	50	307	*dβpl*	18
79	13405	18814	L	4669*	N15	227	1.89	70	598	N15 W20	3.45		47	309	*dβpl*	16
80	13406	18818	L	4670	S09	205	3.53	94	620	S09 E40	31.31		56	405	*lβpl*	16
81	13421	18824	L	4680*	N21	145	8.06	113	845	N22 W02	8.32		75	458	*dβpl*	21
82	13429	18832	L	4684*	S26	100	11.50	56	504	S24 W53	15.63		41	257	*lβpl*	18
83	13434	18835	56,L,M 57 58	4686	S13	88	12.38	197	1150	S13 W26	14.33	+7 +1 -2	147	876	*lβyl*	35
84	13460	18853	62	4703	S12	7	18.54	57	373	S11 W63	23.33	0	34	193	*dβpl*	21
85	13464	18857	59,L,M 60 61 63 64	4708	N18	322	21.89	203	1463	N18 E06	21.39	+1 -1 -1 -4 -5	137	1072	*lβyl*	23
86	13476	18867	65	4718	S08	247	27.60	22	108	S07 E67	22.41	-8	11	61	*l-pd*	15
87	13479	18869	L		N21	307	23.0	138	784	N21 W57	27.33		103	595	*dβpl*	18
88	13485	18872	L	4722	S07	201	31.08	196	1204	S06 W47	2.64		115	676	*dβpl*	28
89	13489	18875	L	4725*	N15	194	31.58	133	878	N14 W26	2.64		73	472	*dβpl*	21

3.II-6 (1)

POSITION DATA							
Serial No.	Sunspot MT.W.	Number Green.	Category	McM Plage	Lat.	Long.	C.M.P.
90	13494 13485	18882	68,L	4722	S09	190	31.94
91	13508	18889	70,L	4739	S15	87	Sept. 8.70
92	13509	18890	66,L,M 67 71 74 75	4741	S08	86	8.75
93	13510	18891	M	4743	N19	73	8.75
94	13517	18896	69,L	4744	N21	33	12.76
95	13524	18897	78,L	4750	S11	10	14.52
96	13535	18909	73,L,M	4756	N16	333	17.36
97	13536	18911	L	4759*	S15	322	18.16
98	13541	18910	72	4757	S12	335	17.2
99	13544	18912	76,L 77 79	4765	S18	303	19.59
100	13546	18914	M	4764	N23	295	20.22
101	13559	18923	L	4771*	S05	206	26.96
102	13562	18925	L	4776*	S18	188	28.29
103	13572	18931	L	4781	S11	166	29.98
104	13611	18959	81,L	4820	S29	299	Oct. 17.21

3.II-7

0

SEQUENCE	GREENWICH DESCRIPTION
ɛenwich or MT.W.	
	A variable cluster.
	A large composite structure which slowly disintegrates as it crosses the disk, leaving a regular spot as the sole survivor on October 25.
	A compact stream, the leader of which becomes regular in outline by October 22, while the follower breaks up.
	A stream, of which the follower is a large regular spot. The rest of the group slowly breaks up as it crosses the disk.
	A group of small variable spots.
	A small spot, which develops into a long broken stream.
	A stream, of which the only stable component is a central regular spot. This is breaking up as it approaches the west limb.
	A cluster.
	A small spot on October 29 and 30, developing rapidly into a large bi-polar group.
	A stream, developing in high northern latitude. The leader becomes regular in outline by November 7.
	A small spot.
	A cluster of spots, developing into a compact stream.
	A cluster of spots, developing into a bi-polar group. The follower is breaking up as it passes from view.
	A large compact stream, of which the follower becomes regular in outline by November 4.
	A few scattered spots, developing into a stream.

3. II-8 (3)

TABLE II. 1958 (CONTINUED)

MAJOR FLARE DAY DATA						DISK PASSAGE DATA	RETU
Area Umb.	Area Whole	Zurich Class.	Mag. Class.	H	Position	Days Seen, Positions Seen, Zurich Class., Mag. Class., Magnetic Strength	G and
46	281	D	(-p)	-	S15 E35	Oct. 10 E80 D D D D D D D D D D D B - β (β'p) - βp βp βp βp -p (-p) (-p) -p -p - - - 15 15 16 15 14 - - 15 16 Oct. 21 W66	
92	1093	E	βf	19	S03 E66	Oct. 14 E80 D E E E E E E E E H H - (β) βf β βγ (βγ) (βγ) γ γ (γ) - - (-) (-) - 19 21 26 - - 24 24 - - - - - Oct. 26 W80	
109	872	E	γ	24	S04 W21		
100	722	E	-	-	S04 W35		
81	439	H	-	-	S04 W57		
						Oct. 16 E26 C E E E E E G G - β β (βp) (βp) βγ βγ (βp) - - 12 18 - - 20 17 - - -	
						Oct. 24 W81	
170	1036	F	(βγ)	-	S09 E01	Oct. 16 E76 C D E E F F F F F F G G G - βf (βf) (βf) βγ βγ (βγ) - (βγ) (βγ) (βγ) - - - 18 - - 22 24 - - - - - - -	Oct. 28 W76
		A	-	-	Not Seen	Oct. 19 E81 - A C C B B C B (-p) -p -p (X) - - (X) (X) - 3 10 - - - - -	Oct. 26 W11
						Oct. 24 E79 - J J D E E E E E D D D C - (-) β βf βγ β β β β (βi (β) (βp) - - - 16 13 17 14 14 13 9 - - -	Nov. 5 W76
						Oct. 28 E77 E E E E E E E D C C C B - βp βγ βγ βγ βγ βγ βp βγ (βγ) -p βp (βp) (X) 17 19 16 20 26 24 22 16 - 13 3 - -	Nov. 9 W80
51	356	C	βf	13	N08 W50	Oct. 28 W40 C C C - βp βf βp (βp) 11 13 4 -	Oct. 31 W78
51	352	C	βp	14	S16 E40	Oct. 28 E79 - B B C E E E E E E E E - (-) βp βp βp βp βγ β β (βi βp βp (βp) (X) - 2 11 14 16 24 27 29 - 34 24 - -	Nov. 9 W77
						Nov. 2 E10 A A C C D E E - - β β (β) βp βp (βp) (X) - 6 5 - 17 16 - -	Nov. 9 W76
0	11	B	-p	Faint	S14 E50	Nov. 12 E71 14 E42 B C B βp βp -p - - -	
115	645	E	(β)	-	S11 W13	Nov. 20 E42 - B D D E E E E E E βp β β βf (βf) β (β) βi βi (X) 10 13 14 21 - 14 - 16 15 -	Nov. 29 W72
16	93	C	β	13	N20 E13	Nov. 23 E11 A B C D E E E E E - β (β) β (βp) β βp βp βp (βp) (X) 3 - 13 - 27 30 28 28 - -	Dec. 2 W76
67	681	E	βp	28	N20 W40		
						Nov. 24 E79 - E E E E E E E E E E E E - (-p) (βp) (βp) (βp) βp βp βi βi βp β β β (β) β - - - - 24 24 23 23 21 19 18 21 - 17	Dec. 7 W81
						Dec. 1 E39 D D D E E E E G G - β βf βf βf βf βf βf (βf) β (X) 9 14 13 17 19 23 19 - 13 -	Dec. 10 W77

18995

13664

TABLE II. 1958 (CONTINUED)

MAXIMUM AREA					SUNSPOT MEAN DATA				MAJOR FLARE DAY DATA						
Umb.	Whole Spot	Position	Gr. Day	Flare ΔT	Area Umb.	Area Whole S.	Mt. Wilson Mag. Cl.	H	Area Umb.	Area Whole	Zurich Class.	Mag. Class.	H	Position	
156	956	S09 E20	30.59	-5	77	476	dβpl	28	46	236	G	βp	14	S09 W46	Aug. 29 E37 A C βp βp 19 26
77	570	S16 W35	11.38	+2	57	382	lβpl	19	78	522	E	β	17	S15 W09	Sept. 2 E79 - J (=) =p - 14
187	1047	S08 W35	11.38	+8 +7 +1 -2 -3	85	555	lγl	15	Not Seen 61 46 145 58	 342 290 880 487	- C C F -	- γ βp (βγ) (β)	- 16 14 - -	Not Seen S08 E60 S08 W02 S08 W62 S08 W75	Sept. 3 E73 C C βp γ 9 16
94	433	N19 W08	9.35		49	254	lβγd	18							Sept. 3 E82 - D βp βγ 5 15
83	766	N22 E70	7.56	0	46	313	lβpd	17	83	766	E	β	12	N22 E70	Sept. 6 E77 - E β β 13 12
92	539	S11 E13	13.57	-5	49	256	lβγl	20	29	197	D	βl	11	S11 W50	Sept. 8 E76 - D (X) βp - 11
61	532	N15 E50	13.57	+1	43	262	lβγl	19	55	269	C	-	9	N16 E65	Sept. 11 E75 C C (β) - - 9
92	567	S16 E75	12.31		86	464	dβl	23							Sept. 12 E76 G G βp (β) 12 -
0	74	S12 E78	11.38	-1	3	36	d-ld	2	6	22	A	-l	2	S12 E67	Sept. 11 E78 - A - -l - 2
269	1824	S18 E38	16.52	+1 0 -6	217	1289	lβpl	36	259 269 209	1460 1824 1087	H H E	βp βp βp	30 35 30	S18 E50 S18 E38 S18 W40	Sept. 13 E78 - H (X) βp - 33
60	436	N22 W40	23.34		33	209	dβγl	16							Sept. 14 E75 A B (β) β - -
100	519	S04 E45	23.34		75	394	l-pl	29							Sept. 20 E85 - H (-p) =p - 16
114	743	S18 E80	22.35		101	584	lβpl	28							Sept. 22 E77 G G β - - -
102	569	S11 E34	27.32		82	478	βpl	17							Sept. 23 E83 - J - βp - 13
165	1104	S28 E50	13.30	-2	102	592	lβpl	30	113	739	E	βp	30	N28 E26	Oct. 11 E72 D E βp (βp) 14 -

DISK PASSAGE DATA Days Seen, Positions Seen, Zurich Class., Mag. Class., Magnetic Strength	RETURN SEQUENCE Greenwich and/or MT.W.	GREENWICH DESCRIPTION
Sept. 6 W78 E E E E G G J J β_1 β_1 β_p β β_p β_p $\beta\gamma$ (α_p) 28 16 13 17 15 14 - -		A stream of normal type, which grows rapidly. The follower breaks up and dies out before reaching the west limb.
Sept. 14 W80 J J C D D E E E D D B α_p α_p β_p β_p β_p β $\beta\gamma$ $\beta\gamma$ β_p (α_p) (α_p) 18 19 16 20 15 17 15 15 13 - -	18835 13434	A regular spot. On September 6, other spots appear, forming a variable cluster.
Sept. 14 W79 C D D D C E E E E - γ γ γ γ β_p β_p $\beta\gamma$ $\beta\gamma$ $(\beta\gamma)$ (β) 15 12 16 14 14 14 15 15 - -		A variable cluster, which becomes a compact stream by September 11.
Sept. 14 W62 D C C D D D C C C B $\beta\gamma$ $\beta\gamma$ β_1 $\beta\gamma$ $\beta\gamma$ $\beta\gamma$ $\beta\gamma$ $\beta\gamma$ $(\beta\gamma)$ (β) 16 16 19 14 17 14 14 13 - -		A variable stream.
Sept. 16 W51 E D D D D C B B A β_p β_p β_p β_p (β) β_p α_p α_p - 18 14 14 15 - 9 12 - -		A bi-polar stream. Only the leading components are seen on September 15 and 16.
Sept. 20 W76 D D D C D D C C D C - β_p β_p β_1 (β_1) $\beta\gamma$ β_1 β_1 (β_1) β_1 β_1 (β_1) 5 10 16 - 21 21 20 - 11 12 -	Pos. ret. of 13460	A variable stream, in the rear part of which a composite spot forms by September 14.
Sept. 23 W80 C C C D D D D D D D - $(\beta\gamma)$ $\beta\gamma$ $\beta\gamma$ $\beta\gamma$ (β_p) $\beta\gamma$ β_p β_p α_p (α_p) - - 16 16 15 - 20 20 16 14 - -	13464	A stream of small spots, of which the leading components coalesce into a regular spot which is the sole survivor on September 21.
Sept. 24 W76 G G G G G G G G G G - β β β (β) β_p β β β β - (α_1) 19 19 24 - 23 20 23 21 15 - -	18855 18801 18756	A pair of regular spots, with a few variable companions.
Sept. 17 W12 A A B B A $(\alpha\mu)$ O (X) (α) - - - - - -		A small spot.
Sept. 25 W76 H H H E E E E E E E - β_p β_p (β_p) β_p β_p β_p β_p β_p - β_p (α) 30 35 - 33 33 30 32 30 - 24 -	18874 13470	A large composite spot, of which the leading part becomes detached and assumes a regular outline by September 20. There is also a small regular spot to the rear throughout the disk passage.
Sept. 26 W82 B B C D D C D E E D - β (β_1) $\beta\gamma$ $\beta\gamma$ β_1 β_1 β_1 - $\beta\gamma$ $\beta\gamma$ (β) 2 - 14 14 14 17 14 - 13 6 -		A variable stream of small spots.
Oct. 2 W73 D D D C C H H H H H H α_p - β_p α_p α_p α_p (α_p) α_p α_p α_p (α_p) 24 - 25 25 25 29 - 29 27 24 -	18872 13485	A regular spot, with a number of variable companions until September 26.
Oct. 4 W79 G G G G G G G G G G - β_p β β_p β_p (β_p) β_p β_p β_p (β_p) (β_p) (α_p) 26 22 24 26 - 27 28 27 - - -		A pair of regular spots, with one or two companions.
Oct. 5 W72 C D E E E E E E H G H β_p $\beta\gamma$ β_p (β_p) $\beta\gamma$ β_p β_p (β) (β) β_p (α_p) 16 18 17 - 17 18 16 - - 9 -		A stream, the leader of which becomes a regular spot and coalesces with the remainder of the group to form a composite structure.
Oct. 23 W82 E E E G G G G G J J - β_p β_p β_p β_p β_p (β_p) (α_p) α_p α_p (α_p) - 23 25 30 28 30 - - 15 16 - -		A stream, lead by a regular spot. The following components are dying out as the group crosses the disk; they are not seen on October 19, 22 and 23.

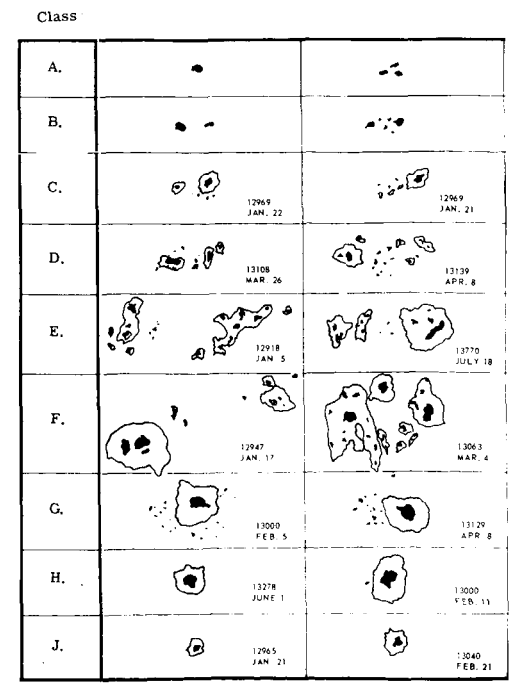
3.II-7

(3)

POSITION DATA								MAXIMUM AREA					SUNSPOT MEAN DATA			
Serial No.	Sunspot MT.W.	Number Green.	Category	McM Plage	Lat.	Long.	C.M.P.	Umb.	Whole Spot	Position	Gr. Day	Flare ΔT	Area Umb.	Whole S.	Mt. Wilson Mag. Cl.	H
105	13616	18957	82	4819	S15	309	16.42	69	363	S15 E65	11.39	-8	34	222	$l-pl$	15
106	13625	18964	80,L,M 83 85 86	4826	S04	257	20.36	207	1366	S04 E40	17.38	+2 -4 -6 -7	131	935	$l\beta yl$	26
107	13630	18969	L	4818*	N20	283	18.38	57	784	N20 W01	18.40		82	584	$d\beta pl$	19
108	13633	18970	84,L,M	4829	S09	230	22.39	178	1145	S09 E13	21.48	-1	141	882	$l\beta yl$	23
109	13639	18974	87	4833	N18	190	25.46	6	76	N18 E52	21.48	-7	6	50	$l-pd$	9
110	13653	18984	L		S14	123	30.53	108	715	S14 E26	28.46		54	403	βl	16
111	13660	18994	L,M	4851	N08	73	Nov. 3.32	122	854	N08 E65	29.36		65	455	$l\beta yl$	26
112	13661	18988	88	4841	N08	191	Oct. 25.41	43	375	N08 E63	30.30	+1	43	305	$d\beta l$	12
113	13664	18995	89,L	4849	S16	72	Nov. 3.43	247	1538	S16 W15	5.29	+5	129	761	$l\beta pl$	29
114	13676	19004	L	4845*	N38	78	2.97	75	661	N39 W73	8.48		47	316	$d\beta pl$	16
115	13696	19018	90	4877	S14	242	17.8	11	82	S14 E65	12.53	-2	8	45	$d-pd$	3
116	13718	19031	91	4883	S10	165	23.67	186	1225	S11 W50	27.42	+3	90	606	$d\beta/l$	20
117	13728	19036	92,L 93	4884	N20	130	26.35	191	1035	N20 W28	28.52	+3 -1	120	685	$d\beta pl$	30
118	13733	19040	L	4897	S16	74	30.60	185	1556	S16 W26	2.60		159	1123	$l\beta pl$	23
119	13748	19053	L	4899*	N08	25	Dec. 4.31	106	782	N09 W16	5.59		77	489	$d\beta/l$	22

3.II-8 0

POSITION DATA							
Serial No.	Sunspot MT.W.	Number Green.	Category	McM Plage	Lat.	Long.	C.M.P.
120	13757	19058	L	4905	S07	11	5.39
121	13758	19057	94,L 95	4911	N14	314	9.66
122	13763	19061	96,L,M 97	4913	S01	283	12.03
123	13765	19062	L	4913	S07	282	12.10
124	13777	19066	98,L	4916	S19	265	13.43
125	13778	19072	L	4920*	N22	215	17.20
126	13803	19083	99,L,M 100	4934	S16	74	27.89
127	13820	19084	L	4936	N13	66	28.52



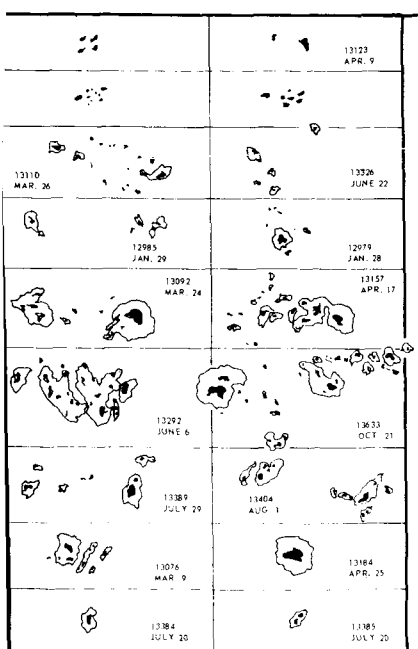
3.II-9

(1)

TABLE II. 1958 (CONTINUED)

MAXIMUM AREA						SUNSPOT MEAN DATA				MAJOR FLARE DAY DATA						
Umb.	Whole Spot	Position		Gr. Day	Flare ΔT	Area Umb.	Whole S.	Mt. Wilson Mag. Cl.	H	Area Umb.	Whole	Zurich Class.	Mag. Class.	H	Position	
139	799	S07	W52	9.39		99	587	$d\beta l$	22							Dec. 4 E15 C D β_l β_l 14 20
113	888	N15	E31	7.28	4 4	71	507	$l\beta l$	18	16 16	184 184	- -	βp βp	14 14	N16 E84 N16 E83	Dec. 3 E79 - E β_p β_l 14 10
222	1318	S01	W03	12.28	0 0	112	710	$l\beta\gamma l$	27	222 222	1318 1318	F F	$\beta\gamma$ $\beta\gamma$	27 27	S01 W00 S01 W06	Dec. 5 E85 - D β_p β_p 13 14
115	1041	S07	W72	17.62		86	675	$l\beta p l$	22							Dec. 6 E74 C D β_p β_p 12 11
80	700	S18	W13	14.41	-1	74	499	$l\beta p l$ $d\beta d$	20 12	79	466	D	βl	16	S18 W25	Dec. 7 E79 - D β_p (β_l) 12 -
105	705	N22	W16	18.46		71	489	$l\beta l l$	22							Dec. 11 E74 J D β_p β_p 5 14
166	1629	S16	E67	22.45	+1 +9	138	1018	$l\gamma l$	19	206 88	1608 872	E E	γ γ	19 14	S16 E53 S16 W40	Dec. 21 E81 - E (X) γ - -
61	615	N13	E64	23.61	-	48	334	$d\beta p l$	14							Dec. 22 E79 - D (β_p) β - 14

ZURICH CLASSIFICATION OF SUNSPOTS



Sunspot composed of a small single spot or a very small group of spots, mostly of short duration, concentrated in a region of 2-3 Sq. Deg. with no systematic structure of the group. The spots are without penumbra.

A bipolar group of spots without penumbra, the long axis of which is directed roughly E-W, concentration of spots on the E & W ends.

Bipolar group like B but with at least one main spot with penumbra.

Bipolar group, the largest spots having penumbra.

Large bipolar group showing a complicated structure. The two major spots each having a penumbra. Numerous small spots between the major spots. Group at least 10° distance in longitude.

Very large bipolar or complex group. Dimension in longitude at least 15°.

Large bipolar group, without small spots between the two major spots. Dimension in longitude at least 10°.

Unipolar spot with penumbra, sometimes with complicated structure. Diameter >2.5°.

Unipolar spot with penumbra, round shape. Diameter < 2.5°.

(2)

DISK PASSAGE DATA Days Seen, Positions Seen, Zurich Class., Mag. Class., Magnetic Strength	RETURN SEQUENCE Greenwich and/or MT.W.	GREENWICH DESCRIPTION
Dec. 11 W78 E E E G G - β_f β_f (β_p) β_p (β_p) (β_p) 23 20 - - 19 - -		A stream, of which the leader is the most stable component.
Dec. 15 W78 E E E E E E G G J J - β β β (β_p) $\beta\gamma$ $\beta\gamma$ β_p β_p γ_f γ_p (γ_p) 18 17 19 - 18 18 19 11 - 6 -		A long variable stream, of which the leader becomes a regular spot by December 10, while the follower dies out by December 14.
Dec. 18 W82 E E E E F F F F E E D - $\beta\gamma$ $(\beta\gamma)$ β_p $\beta\gamma$ $\beta\gamma$ $\beta\gamma$ $\beta\gamma$ $\beta\gamma$ β (β_p) (β) (γ_f) 14 - 26 23 25 27 23 16 14 - - -		A compact stream, breaking up after its central meridian passage. Only the follower remains on December 7.
Dec. 18 W82 E E E E E E E E E E - (β) β_p β β β_p β_p β_p β_p (β_p) (β_p) - - 23 14 16 18 21 19 18 - - -		A variable stream, of which the follower dies out by December 17.
Dec. 17 W53 E E E E E E D D D β_p β_p β_p β_p (β) β_f β_f β_f β_f 10 21 17 16 - 16 16 13 3		A stream, rapidly breaking up and dying out after December 15.
Dec. 23 W78 E E E E E E E E G G - (β) β_f β_f β β_f β_f β_f β_f (β_f) (β) (γ_f) - 23 20 21 20 23 22 20 - - -		A cluster, developing into a stream of normal type.
Jan. 3 W82 E F F F F F E E E E D - γ γ $(\beta\gamma)$ $(\beta\gamma)$ $(\beta\gamma)$ $\beta\gamma$ $(\beta\gamma)$ γ γ γ (X) - 19 20 - - - 19 - 24 14 - - -	19040 18995 13733 13664	A large variable group.
Jan. 3 W75 E E D D D D C D C A - β (β_p) (β_p) (β_p) β_p (β_p) β_p $\beta\gamma$ β (β_f) (β_f) 20 - - - 18 - 12 15 - - -	13740	A group of variable spots.

MT. WILSON MAGNETIC CLASSIFICATION OF SUNSPOTS

I. UNIPOLAR SPOTS

- α - The flocculi is fairly symmetrically distributed on the preceding and following sides of the center of the group.
- α_p - The center of the group precedes that of the surrounding flocculi.
- α_f - The center of the group follows that of the surrounding flocculi.

II. BIPOLAR SPOTS

- β - Both members are of approximately equal area.
- β_p - The header is the principal member.
- β_f - The trailer is the principal member.
- β_γ - The trailer and header are accompanied by small components of opposite polarities.

III. MULTIPOLAR SPOTS

- γ - Irregularly arranged spots of opposite polarities which cannot be classified as bipolar spots.

3. II - 9 (3)

III. CATALOGUE OF PLAGE

DATA FOR 1958

TABLE III. CATALOGUE OF PLAGE DATA FOR 1958

The data in this catalogue are limited to plage regions associated with major solar flares. Data for other outstanding plage regions that did not produce a major solar flare are given in Table VIII. A catalogue of all plage regions that appeared on the solar disk during the 19th solar cycle is being prepared at the McMath-Hulbert Observatory.

Column 1 McMath Plage Number.

Column 2 The Major Flare or Flares Serial Numbers.

Column 3 Mean Latitude During Disk Passage.

Column 4 Greenwich Date of Central Meridian Passage.

Column 5 Life in Rotations.

Column 6 Date First Seen.

Column 7 Number of Days Seen.

Column 8 Central Meridian Area.

Column 9 Intensity. Three regions are used, E/C/W, where:
E = E90° to E45°
C = E45° to W45°
W = W45° to W90°
The intensity is estimated on a scale of 1 = faint to 5 = very bright.

Column 10 Number of Flares During Disk Passage E/C/W
E = E90° to E45°
C = E45° to W45°
W = W45° to W90°

Column 11 Total Number of Flares During Disk Passage.

Column 12 Life Histories. If the plage region is the return of a plage or plages from the previous rotation or rotations, the McMath plage numbers are given in the return sequence.

ASSOCIATED SUNSPOTS - COLUMNS 13-16

Column 13 Mt. Wilson Sunspot Numbers of All Spots Covered by the Plage

Column 14 Mt. Wilson Magnetic Classification of the Spots

Column 15 Field Strength in Units of 100 gauss. A bracket indicates an estimated value.

Column 16 Days Seen.

TABLE III. CATALOGUE OF PLAGES DURING 1958

IDENTIFICATION		PLAGE POSITION				DISK PASSAGE PLAGE DATA					LIFE HISTORY	ASSOCIATED SUNSPOTS			
MCM Plage No.	Major Flares Serial No.	Mean Lat.	Date C.M.P.	Life Rotations	1st Seen	Days Seen	C.M.P. Area	Intensity E/C/W	No. Flares E/C/W	Total Flares	Plage No.'s Previous Rotations	Mt. Wil. No.	Mag. Class	Intensity Gauss	Days Seen
4365	1	S15	Jan. 15.0	2	Jan. 19	11	3000	2/2.5/2	0/2/0	2	4313	12956 12937	$d\alpha d$	(2)	Jan. 14-15
4355	2	S12	11.5	1	4	15	9000	4/3.5/3.5	9/16/8	33	NEW	12924 12930 12949 12961	$l\beta\gamma l$ $d\beta l$ $d\alpha p d$ $d\beta l$	22 13 1 (5)	5-17 7-17 11-11 16-18
4381	3,5	N26	23.0	2	16	14	7000	2.5/3/X	0/8/0	8	4328	12964 12965 12968 12969	$l\beta p d$ $l\alpha p d$ $d\alpha p d$ $l\alpha p l$	13 14 (10) 12	16-25 16-27 17-24 17-29
4372	4,6	S24	20.5	4,6	14	13	3500	2/1.5/3	0/6/4	10	4318 - 4257 - 4214 4319 - 4263 - 4207 - { 4167 - 4136 / 4175 - 4147	12975 12976	$d\beta l$ $d\alpha p d$	(20) 2	20-26 20-23
4382	7	S16	25.5	6	18	14	4000	2/3/X	0/6/7	13	4333 - 4272 - 4218 - 4177 - 4141	12978 12979 12977 12981 12990	$d\beta p d$ $d\beta l l$ $l\alpha p d$ $d\alpha d$ $d\alpha d$	12 17 12 (3) (1)	21-30 21-1 20-31 23-29 29-29
4387	8	N22	30	2	24	12	1500	X/X/2	9/4/4	17	4338	12985 13005	$d\beta l$ $d\alpha l$	15 (10)	25-2 Feb. 5-6
4400	9,10	S12	Feb. 8.5	2,3,4	31	15	25000	3.5/3.5/4	25/52/14	91	{ 4355 4356 4360 - 4313 4362 - 4310 - 4245	12997 13017 12998 13018 13009 13012 13000 13011 13004 13015	$d\beta p l$ $d\alpha d$ $l\alpha\alpha d$ $d\alpha d$ $d\alpha d$ $d\alpha d$ $l\alpha p l$ $d\beta d$ $l\beta l$ $\alpha p l$	16 (2) (10) (2) (2) (2) 37 4 18 4	31-11 6-7 31-9 Feb. 6-7 5-5 5-7 1-14 5-11 2-15 5-11
4427	11	S14	23.5	7	Feb. 16	12	2800	2.5/2.5/2	0/2/0	2	4382 - 4333 - 4272 - 4218 - 4177 - 4141	13040	$l\alpha p d$	20	16-27
4436	12	S12	25	1	22	7	1400	-/3.5/X	0/11/4	15	NEW	13052 13049	$d\beta p l$ $d\alpha d$	14 8	23-3 22-23
4445	13,14,17	S15	Mar. 7.5	3,4,5	28	15	10000	X/3/2.5	16/27/2	45	4400 - 4355 4356 4360 - 4313 4362 - 4310 - 4245	13063 13062 13072 13064 13070	$l\beta p l$ $d\beta d$ $d\alpha\alpha d$ $l\alpha p l$ $d\beta$	28 10 2 26 5	28-11 28-8 Mar. 7-10 28-11 3-11
4442	15	S12	1.5	5	23	4	400	1/X/X			{ 4393 4394 } 4347 - 4296 - 4233	13069	$d\beta l l$	15	3-8
4449	16	N12	12	3	Mar. 6	13	9500	3/2.5/2.5	10/20/1	31	4410 { 4370 4374 - 4316	13076 13073 13077 13074 13075	$l\alpha p l$ $d\alpha d$ $d\beta d$ $d\beta l$ $l\beta p l$	17 (2) (10) 6 11	7-18 7-7 8-11 7-16 7-17
4476	18,19,20, 21,22	S12	28.5	2	22	14	15000	3.5/3.5/3.5	15/58/17	90	4442	13103 13110 13108	$l\beta\gamma l$ $d\beta\gamma$ $d\beta$	21 11 13	22-30 24-30 23-30

TABLE III. 1958 (CONTINUED)

IDENTIFICATION		PLAGE POSTION				DISK PASSAGE PLAGE DATA					LIFE HISTORY	ASSOCIATED SUNSPOTS			
$M^{C}M$ Plage No.	Major Flares Serial No.	Mean Lat.	Date C.M.P.	Life Rotations	1st Seen	Days Seen	C.M.P. Area	Intensity E/C/W	No. Flares E/C/W	Total Flares	Plage No.'s Previous Rotations	Mt. Wil. No.	Mag. Class	Intensity Gauss	Days Seen
4493	23	N18	Apr. 9.5	2	Apr. 2	15	15000	3.5/3/3	9/16/9	34	4453	13130	β/β	17	Apr. 4-16
												13129	$/\alpha\beta/$	29	4-15
												13141	$d\alpha d$	(2)	9-9
												13131	$\alpha\beta d$	(10)	4-5
												13148	$d\beta\beta d$	(10)	12-13
												13151	$\alpha\beta/$	(5)	13-15
4490	24	N12	8	3,4,5	1	14	10000	3/2.5/2	0/12/1	13	4448 - 4412 4449 - 4410 - 4370 4374 - 4316	13123	$d\alpha\beta/$	4	4-11
												13124	$d\alpha d$	(5)	4-5
												13127	$\beta\beta/$	13	4-13
												13135	$d\beta\beta/$	(5)	8-13
												13128	$\beta\beta/$	16	4-13
4531	25	N30	May 3.5	3,2	27	14	5500	2/2/1			Part of 4484 - 4444 4488	13205	$d\alpha d$	(2)	30-30
4530	26,27,28, 29,30	S15	3	1	26	14	11000	3.5/3.5/3	11/60/6	77	NEW	13197	$/\beta\gamma/$	19	26-8
												13216	$d\beta\beta/$	7	May 4-7
4591	31	N18	June 6	4	May 31	13	5500	3/2.5/2	6/2/0	8	4543 - 4498 - 4456	13284	$/\alpha d$	(1)	31-31
												13286	$d\alpha d$	(3)	June 1-6
												13289	$d\alpha d$	(2)	2-6
4578	32,33,35	N24	May 30	4,6	23	15	8000	2.5/3/3.5	3/30/14	47	4529 - 4484 - 4444 4485 - 4446 - 4405 - 4359	13275	$d\beta/$	14	May 28-6
												13261	$/\beta d$	6	23-1
												13282	$d\beta/$	9	30-6
4598	34	S20	June 11.5	3	June 4	15	7000	3/3/2	5/4/1	10	Part of 4548 - 4516	13295	$/\beta d$	(10)	June 4-13
												13298	$d\alpha d$	(2)	6-11
												13299	$d\beta d$	9	6-16
4596	36	N28	10	1	3	14	10000	3/3.5/3.5	7/21/2	30	NEW	13292	$/\gamma/$	21	3-16
4607	37,38	N12	18	3	11	14	7000	3.5/3.5/3	15/35/2	52	4563 - 4519	13311	$/\beta\beta/$	23	11-23
												13310	$/\alpha\beta d$	3	11-14
4619	39	N28	28	5,7	20	14	6000	2.5/2.5/2	3/2/1	6	4578 - 4529 - 4484 - 4444 4485 - 4446 - 4405 - 4359	13336	$/\alpha\beta d$	(2)	24-26
												13346	$d\alpha d$	(1)	28-28
4623	40	N12	29.5	1	23	13	12000	3/3/2	4/11/1	16	NEW	13335	$/\beta\beta/$	22	23-5
												13348	$d\alpha d$	(3)	28-30
												13342	$d\beta\beta d$	6	26-29
4634	41	N28	July 7,5	2	July 3	15	9000	2.5/3/3	1/19/3	23	4596	13356	$d\beta/\beta$	19	July 2-14
												13355	$d\alpha d$	7	2-11
4642	42	S23	13	3,4	6	14	5500	3.5/3/2	5/15/1	21	4604 - 4565 Part of 4553 - 4508	13362	$/\beta\beta/$	16	6-18
4636	43	S22	8	4	1	14	8000	3/3.5/3.5	7/27/8	42	4598 - 4548 - 4516	13353	$/\beta/$	21	1-13
4646	44	N09	18	1	12	13	5500	3.5/3/3	15/24/1	40	NEW in the position of old 4614	13370	$d\beta\beta/$	27	12-24
4651	45	N22	21	1	14	14	8500	2.5/3/2.5	4/14/3	21	NEW in the position of old 4613	13375	$d\beta d$	4	14-22
												13376	$/\beta d$	14	14-23
												13378	$/\alpha\beta d$	(2)	16-20
												13396	$d\beta\beta/$	10	24-27
4650	46,47	S23	16	1	14	9	1000	-/3/3	-/14/9	23	NEW formed on the disk in the position of old 4608	13374	$d\beta/$	13	14-21

TABLE III. 1958 (CONTINUED)

IDENTIFICATION		PLAGE POSITION				DISK PASSAGE PLAGE DATA					LIFE HISTORY	ASSOCIATED SUNSPOTS			
M^{C}M Plage No.	Major Flares Serial No.	Mean Lat.	Date C.M.P.	Life Rotations	1st Seen	Days Seen	C.M.P. Area	Intensity E/C/W	No. Flares E/C/W	Total Flares	Plage No.'s Previous Rotations	Mt. Wil. No.	Mag. Class	Intensity Gauss	Days Seen
4658	48	S03	July 26	1	19	13	2000	2.5/2.5/2	0/1/0	1	NEW	13386	$/\alpha p d$	13	19-28
4657	49,50	N17	26.5	2	19	13	9000	2.5/3.5/2.5	3/4/0	7	4623	13394	$d\beta p d$	5	23-26
												13385	$/\alpha p d$	14	19-30
												13392	$d\alpha p d$	(3)	21-24
4659	51,52	S19	26.5	3	19	15	20000	3/3.5/3	5/83/24	112	4622 - 4581	13388	$d\beta\gamma l$	23	20-1
												13384	$/\alpha p l$	20	19-31
												13389	$/\beta p l$	23	20-2
4664	53	N16	29.5	4,6	23	14	10000	2.5/3/2.5	1/5/2	8	4627 - 4586 - {4540 / Part of 4537 - 4493 - 4453	13395	$/\alpha p l$	28	23-4
												13409	$d\beta d$	14	29-2
												13410	dxd	(2)	29-29
												13400	$d\beta d$	13	26-2
4665	54	N04	31	2	24	14	12000	3.5/3.5/3	11/15/4	30	4631	13397	$/\beta l$	21	24-5
												13411	dxd	(2)	29-29
												13413	$d\beta/d$	11	30-5
4667	55	N27	Aug. 2	2	26	15	15000	3/3.5/3	1/19/7	27	4630	13404	$d\beta p l$	18	27-7
												13419	dxd	(2)	Aug. 2-3
												13433	$d\beta l$	7	6-8
4686	56,57,58	S13	12.5	2	Aug. 6	14	11000	3/3.5/3.5	11/48/13	72	4653	13434	$/\beta\gamma l$	35	6-18
												13456	$d\beta d$	(3)	14-17
												13465	$d\alpha d$	(1)	16-16
												13458	$d\beta l$	4	15-19
												13466	$d\alpha d$	(1)	16-16
4708	59,60,61, 63,64	N18	22	3	15	14	8000	4/3.5/3.5	6/37/17	60	4657 - 4623	13464	$/\beta\gamma l$	23	15-28
4703	62	S14	19	1	12	13	3200	-/3/3	1/3/4	8	NEW	13460	$d\beta p l$	21	15-24
												13469	$d\beta d$	6	18-19
4718	65	S08	27.5	2	21	13	4000	3/3/2	0/3/0	3	4687	13476	$/\alpha p d$	15	21-28
4741	66,67,71, 74,75	S07	Sept. 9	1	Sept. 2	14	7000	3.5/3/3	20/30/7	57	NEW	13509	$/\gamma l$	15	Sept. 2-14
												13511	$/\alpha d$	11	3-12
4722	68	S09	Aug. 31	2	Aug. 24	14	12000	3/3.5/3.5	9/37/8	54	4670	13485	$d\beta p l$	29	Aug. 25-6
												13494	$/\beta p l$	28	28-6
												13480	$/\alpha p l$	23	24-5
												13484	$d\alpha d$	(1)	25-26
4744	69	N23	Sept. 13	1	Sept. 5	15	5500	3.5/3.5/3	14/6/1	21	NEW	13517	$/\beta p d$	17	Sept. 5-16
												13538	$d\alpha d$	(1)	12-12
												13539	$d\alpha/d$	4	12-13
4739	70	S20	8	3	1	14	14000	3/3/3	2/12/3	17	{4684 - 4650 / 4686 - 4653	13508	$/\beta p l$	19	2-14
												13502	$d\beta p d$	5	1-4
												13503	$/\alpha p d$	8	1-6
												13507	$/\alpha p d$	15	2-11
												13519	$d\alpha d$	1	6-6
												13523	$d\alpha d$	(2)	8-11
4757	72	S12	17	5	11	12	4000	2.5/2.5/2	7/0/0	7	4710 - 4659 - 4622 - 4581	13541	$/\alpha x d$	2	12-16

TABLE III. 1958 (CONTINUED)

IDENTIFICATION		PLAGE POSITION				DISK PASSAGE PLAGE DATA					LIFE HISTORY	ASSOCIATED SUNSPOTS			
McM Plage No.	Major Flares Serial No.	Mean Lat.	Date C.M.P.	Life Rotations	1st Seen	Days Seen	C.M.P. Area	Intensity E/C/W	No. Flares E/C/W	Total Flares	Plage No.'s Previous Rotations	Mt. Wil. No.	Mag. Class	Intensity Gauss	Days Seen
4756	73	N17	17.5	4	10	14	9000	3.5/3/2.5	12/11/3	26	4708 - 4657 - 4623	13535	$\beta\gamma$	19	11-22
												13530	α	27	10-22
												13549	α	3	16-17
4765	76,77,79	S18	19.5	5	13	14	17000	3.5/3.5/3.5	18/37/3	58	4712 | - Part of 4710 | - -4659 - 4622 - 4581	13544	β	36	13-25
												13543	β	2	13-14
												13556	α	(1)	19-22
												13554	β	2	18-19
4750	78	S10	14.5	2	8	13	9000	2.5/3/3	6/11/3	20	Part of 4703	13534	x	11	11-17
												13524	β	20	8-20
												13528	α	10	9-18
4826	80,83,85, 86	S02	Oct. 20.5	1	Oct. 14	13	6500	3.5/3.5/3.5	34/13/3	50	NEW	13625	$\beta\gamma$	26	Oct. 14-25
4820	81	S26	17.5	1	10	15	9000	3.5/3/2.5	11/7/1	19	NEW	13636	β	(7)	17-20
												13611	β	30	10-22
4819	82	S14	17.5	6	10	15	9000	3/2.5/2.5	3/9/2	14	4765 - |4712 - 4659 - 4622 - 4581 | Part of 4710	13610	α	15	10-21
												13616	α	15	11-22
												13643	β	8	21-22
4829	84	S10	22.5	2	16	14	9000	3/3/3.5	5/19/12	36	4779	13633	$\beta\gamma$	23	16-28
4833	87	N19	26	2,5	19	13	4500	2.5/3/2.5	5/4/0	9	4780- Part of 4726 - 4678 - 4635 Part New	13639	α	9	19-27
												13646	x	(1)	22-22
4841	88	N07	26	1	23	9	5500	-/2.5/3	-/12/6	18	NEW	13661	β	12	28-31
												13651	β	(10)	25-28
4849	89	S15	Nov. 3.5	2	28	14	6000	3/3.5/3	13/27/9	49	4817	13664	β	29	28-9
												13681	α	5	Nov. 6-8
4877	90	S12	18	3	Nov. 11	14	11000	3/3/2.5	2/2/0	4	4829 - 4779	13694	α	3	11-18
												13696	α	3	12-15
												13710	α	3	17-19
												13707	x	(2)	15-15
4883	91	S12	24.5	1	18	13	12000	3.5/3.5/3	9/22/3	34	NEW in position of 4840 and 4843	13718	β	20	20-29
												13724	β	11	21-25
												13712	α	14	18-29
												13719	β	13	20-25
												13727	x	9	23-27
4884	92,93	N22	25.5	1	18	15	6000	3.5/2.5/2.5	0/26/7	33	NEW	13713	α	21	18-29
												13728	$\alpha\beta$	30	23-2
4911	94,95	N16	Dec. 9.5	1	Dec. 3	13	9000	3.5/3/2.5	16/15/0	31	NEW in position of old 4859	13758	β	18	Dec. 3-15
4913	96,97	S03	12	3	5	13	9500	3.5/3.5, 3.5	12, 42/15	69	4873 - 4826	13763	$\beta\gamma$	27	5-18
												13765	β	22	5-17
4916	98	S16	13.5	1	7	13	5000	3/3/2.5	7/10/2	19	NEW	13791	x	(2)	17-17
												13780	x	(2)	13-13
												13777	β	12	9-15
												13771	β	20	7-19
4934	99,100	S17	28	4	20	15	10000	3.5/3.5, 3	21/19/8	48	4897 - 4849 - 4817	13800	α	25	20-1
												13818	α	(2)	27-27
												13803	γ	24	21-2
												13804	β	19	21-3
												13806	β	4	22-29

IV. CATALOGUE OF IMPORTANT

RADIO EMISSIONS FROM

THE SUN DURING 1958

TABLE IV. CATALOGUE OF IMPORTANT RADIO EMISSIONS FROM THE SUN DURING 1958

This table will include all important radio emissions from the sun that occur within an acceptable time of:

(a) The major flares reported in Table I.

(b) Events listed in Table VIII (Solar Activity Chronological Catalogue) that had important solar radio emission associations. This will include outstanding emissions (peak flux $\geq$ 500) at 2800 Mc/s or 200 Mc/s even though, only a sub flare, a minor flare, or no flare was reported at the time of the emission.

(c) All reported spectral emissions of the Type II (slow drift bursts) and Type IV (broad band continuium).

Due to the period from approximately 0600 UT to 1300 UT when there is no sweep frequency patrol of the sun, we have included data from studies by Pick-Gutman (reference 32 and denoted by MP-G in the table). Hakura and Goh, (reference 11, and denoted by H.G. in the table) and others who have used radio emissions at single frequencies in both the meter and centimeter wave lengths to derive probable spectral emissions of the Type IV.

In order to make this phase of the catalogue as completed and useful as possible, we have included emissions for a wide range of frequencies from 9500 Mc/s to 167 Mc/s, and whenever significant fluxes were reported at low frequencies the data are also included. These single frequency data have been taken from reference 50.

Normal observing hours of the solar radio observatories in both the discrete and sweep frequency programs are shown on page 3.IV-10.

All fluxes at single frequencies are reported in units of 10^{-22} Wm^{-2} $(c/s)^{-1}$.

The following symbols, singly or in groups (reference 46), illustrated on page 3.IV-10 are used to describe single frequency reports of outstanding occurrences:

S = simple rise and fall of intensity.

C = complex variation of intensity.

A = appears to be part of general activity.

D = distinct from (apparently superposed upon) the general background.

M = multiple peaks separated by relatively long periods of quietness.

F = multiple peaks separated by relatively short periods of quietness.

E = sudden commencement or rise of activity.

ECD = a complex distinct disturbance with very sharp rise.

CD = complex disturbance of moderately sharp rise.

Not all emissions reported in reference 56 at the time of the flare are included in the catalogue, and no general minimum flux has been used as a cutoff point. Occasionally more than one report at a given frequency is included.

In general the peak flux, if reported, is given. If the peak flux is not available, the smoothed flux is used, and indicated by enclosing the value in a bracket ( ).

If the peak flux is greater than the reported value, the recorded flux has been underlined.

The list of observatories together with the code used in the table as well as the source of other data is given on Page 3.IV-10. The identification of the observatories that operated during 1958 is given in Table 3.IV-1 Page 3.IV-v.

Table IV is arranged in three general columns.

(a) FLARE, if any, associated with the radio emission.

(b) RADIO EMISSIONS OF THE SPECTRAL TYPE

(c) RADIO EMISSIONS AT SINGLE FREQUENCIES

The column headings together with any necessary explanations follow:

FLARE DATA - (Columns 1 through 7)

Column 1 Date.

Column 2 Beginning Time UT. If the start of the flare was observed the time is underlined.

Column 3 End Time UT. When the end of the flare was observed the time is underlined.

Column 4 Maximum Time UT. This value has been taken from reference 8 (McMath-Hulbert working list).

Column 5 Heliographic Position. The position of the flare is taken as the arithmetic mean of the values reported in the IAU Bulletin.

Column 6 Importance. The method used for major flares has already been described in connection with Table I. The minor flares are reported as 2+, 2, 1+, 1 as the highest importance given reference 56, subflares are denoted with importance 1-. In a number of cases it will be noted that the flare importance given in this column will be greater than the importance given for the same flare in Table VIII, this difference in values is discussed in some detail in the description of Table I.

Column 7 Flare and/or Event Serial Number. These are the serial numbers of the major flare in Table 3.I or the event number in the chronological catalogue Table 3.VIII, for the purpose of cross reference.

SPECTRAL EMISSIONS

Outstanding spectral emissions of Types I, II, III and IV are given in Table VIII. The entries in this table will be limited to emissions of Type II and Type IV reported by CSIRO Sydney (Syd) and/or the Harvard Radio Astronomy Observatory (Har) at Fort Davis, Texas.

We have also included spectral emissions of the Type IV that have been derived by Pick-Gutman (MP-G Ref. 33) or Hakura and Goh (H.G. Ref.12) from single frequency observations. These derived Type IV emissions are particularly useful for the time period from approximately 0600 to 1300 UT when neither the Harvard nor the CSIRO sweep frequency observatories are in the sun light.

TYPE II SLOW DRIFT BURSTS (Columns 8 through 12)

Column 8 Beginning Time UT.

Column 9 End Time UT.

Column 10 Intensity.

Column 11 Frequency Range.

Column 12 Observatory or reference.

TYPE IV BROAD BAND CONTINUUM (Columns 13 through 17)

Column 13 Beginning Time.

Column 14 End Time.

Column 15 Intensity.

Column 16 Frequency Range.

Column 17 Observatory or reference.

RADIO EMISSIONS AT SINGLE OR DISCRETE FREQUENCIES (columns 18 through 24)

Selected frequencies between 9500 Mc/s and 167 Mc/s associated in time with the major solar flares, solar-terrestrial events, or spectral emissions are tabulated in a descending order of frequency with the following data.

Column 18 Frequency.

Column 19 Type.

Column 20 Beginning Time.

Column 21 End Time.

Column 22 Time of Peak Flux

Column 23 Peak Flux (or smoothed flux)

Column 24 Observatory.

TABLE 3.IV-1 LIST OF PRINCIPAL SOLAR RADIO OBSERVATORIES WITH SYMBOL AND FREQUENCIES

Tokyo Astronomical Observatory Mitaka, Tokyo		Tok	9500 3000 200 100 67
Research Institute of Atmospherics Nagoya, University, Toyakowa		Nag	9400 3750 2000 1000
National Committee for I.G.Y. Ulitza, Chkalova 64, Moscow 4, U. S. S. R.	Gorky	Gor	9375 3000 207
	Moscow	Mos	600 208
	Kislovadsk	Kis	178
	Cracow	Cra	810
Radio Astronomy Section P.T.T., The Hague, Netherlands	Nederhorst	Ned	2980 545 200
	Hollandia	Hol	200
	Paramaribo	Par	545 200
Astronomical Institute of the Czechoslovak Academy of Sciences, Ondrejov	Prague	Pra	536 231
Cornell University		Cor	202
National Bureau Standards CRPL, Boulder Colorado		NBS	470 167
Observatory Royal de Belgique, Bruselles	Uccle	Ucc	600 167
Hiraiso Radio Wave Observatory Nakaminto-shi Ibaraki-ken, Japan		Hir	200

TABLE 3.IV-1 LIST OF PRINCIPAL SOLAR RADIO OBSERVATORIES WITH SYMBOL AND FREQUENCIES (cont'd)

Astrophysikalisches Observatorium Potsdam Tremsdorf b. Potsdam, Germany		AOP	231 23
Institutt for Teoretisk Astrefysikk Universitetet Blindern, Oslo, Norway	Oslow	Osl	200
Radiophysics Laboratory Sydney, Australia	Sydney	Syd	1420 600 Spectrum 40-200
Cavendish Laboratory		Cav	178 81
Heinrich Hertz Institute Berlin Adlershof, Germany		HHI	9400 3000 1500
National Research Council Ottawa, Canada		Ott	2800
Jodrell Bank Experimental Station England		Jod	3000 200 80
Harvard Radio Astronomy Station Fort Davis, Texas		Har	Spectrum 100-580
Astronomical Observatory, N. Copernicus University Torun, Poland		Tor	127
I.R.S.A.C., D.S. Bukavu, Belgian Congo		IRS	169
Chalmers Institute of Technology Gothenburg, Sweden		CIT	150

The normal observing times of the solar radio observatories are shown on page 3.IV-10.

TABLE IV CATALOGUE OF IMI

FLARE									SPECTRUM OBSERV.		
Gr. Day	Beg. UT	End UT	Max. UT	Position		Imp.	Event No.	Serial No.	Beg. UT	End UT	Max. Int.
Jan 7	1820	1939	1932 1942	S18	E39	2	E(1)				
15	No Flare Reported						E(4)		0335	0355	2
15	1640	1757	1642	S13	W58	3	E(6)	F(2)			
16	2255	2347	2306	S15	E47	2	E(8)		2313	2316	2
18	2253	2335	2256	S11	W32	1	E(10)		2257	2301	3
20	1435	1601	1505	N28	E46	2+		F(3)			
23	0904	1053	0918	S24	W45	3		F(4)			
25	0035	0135	0039	N28	W13	3+		F(5)			
25	0915	1107	1005	S24	W69	3+	E(12)	F(6)			
25	1205	1333	-	S20	E11	3		F(7)			
31	1148	1452	1224	N20	W13	3		F(8)			
Feb. 9	1330	1501	1341	S20	W02	1+	E(15)				
9	2108	2302	2142	S12	W14	2+	E(16)				
10	1320	1411	1332	S13	W63	3	E(18)	F(9)			
10	1900	2030	1911	S14	W64	1+	E(19)		1911	1917	3
11	0812	0847	0823	S10	W85	3		F(10)			
26	0527	0632	0550	S18	W61	2	E(23)		0602	0611.5	2

3.IV-1

0

(INUED)

SPECTRUM OBSERVATIONS TYPE IV					SINGLE-FREQUENCY RADIO EMISSIONS						
Beg. UT	End UT	Max. Int.	Frequency Range	OBS. or Ref.	Freq.	Type	Beg. UT	End UT	Max. UT	Flux	OBS.
					9400	SD	0913	0940	0914	965	HHI
					2980	SD	0913.5	0915.5	-	458	Ned
					2980	SD	0925	0929	-	296	Ned
					2980	CD	0929	0931.5	-	252	Ned
					1500	SD	0911	0932	0914	225	HHI
					810	CD	0914	0921	0918	149	Cra
					200	CD	0903	0908	-	175	Ned
					200	SD	0907	0908	0907.5	190	Osl
					200	CD	0940	0940.4	-	245	Ned
					178	ESD	1006	1007	1006	264	Kis
					169	SA	0947	1035	-	54	Ucc
					No Important Radio Emissions Reported						
1005		B		MP-G	9400	SD	1010	1131	1016	1160	HHI
					2980	SD	1005	1033	-	1338	Ned
					600	ECD	1013	1040	-	300	Ucc
					545	CD	1012	1033	-	300	Ned
					231	CA	1012.5	1052.3	1015.9	4500	AOP
					208	ESD	1012	1040	1016	1215	Mos
					200	CD	1013	1020	-	40000	Ned
					178	ESD	1014	1044	1018	730	Kis
					169	ECD	1015	1045	-	160	Ucc
					81	ECD	1013	1043	-	23000	Cav
1350	1645	3	175-100	Har	167	CD	1349	1700	1559	420	NBS
					9500	CD	0500.3	0505.3	0500.5	558	Tok
					9400	SD	1028	1039	1033	328	HHI
					9400	SD	1044	1112	1053	338	HHI
					3000	SD	1030	1040	1033	269	HHI
					3000	SD	1049	1059	1053	279	HHI
					2980	SD	1543.5	1548	-	342	Ned
					470	ECD	1655.5	1656	1655.6	260	NBS
					9400	ESD	0041.5	0042	0041.7	(40)	Nag
					3000	CD	0027	0043	0036	348	Tok
					1000	F	0058	0129	0121	(400)	Nag
					545	CD	0113	0129	-	(200)	Hol
1453				MP-G	9400	SD	1457	-	1501	328	HHI
					3000	CD	1458	1532	1501	375	HHI
					1500	CD	1453	-	1455	137	HHI
					169	CD	1457	1509	-	100	Ucc
0634				MP-G	9500	CD	0634	0741	0647	1108	Tok
					3750	SD	0636	0731	0647	(460)	Nag
					2000	CA	0635	0735	0647	(227)	Nag
					1000	CA	0636	0736	0713	(46)	Nag
1003		A		MP-G	3000	ECD	0958	1008	1002	1190	Jod
0953				H.G.	2980	CA	0953	1143	-	1340	Ned
					810	CD	1001	1152	1012	650	Cra
					600	ECD	1001	1018	-	1000	Ucc
					545	CA	1003	1143	-	360	Ned
					231	CD	0957.3	0958.5	0958.4	800	AOP
					208	ECD	1000	1015	1005	430	Sim
					208	ECD,CD	1002	1150	1006	1890	Mos
					200	ECD	1002	1010.5	1006	1000	Osl
					2980	CD	1638	1639.2	-	310	Ned
					200	CD	1635.5	1638	1636.5	750	Osl
					200	CD	1636.5	1639	-	400	Ned
					169	CA	1636	1640	-	100	Ucc
					9500	CD	0558.5	0606.5	0559.2	604	Tok
					3000	ECD	0558.8	0601.8	0559.3	458	Tok
					200	CD	2330.5	2332	-	140	Hol
					200	ECD	0036.7	0046.7	0037	1600	Tok
					2800	CD	1543.8	1554.8	1546.5	(220)	Ott
					169	CA	1537	1611	-	180	Ucc
					9400	SD	1033	1117	1034	928	HHI
					3000	SD	1033	1048	1034	758	HHI
					600	ESD	1034	1035	1034.5	132	Mos
					231	ECD	1147.7	1148.1	1148	1700	AOP
					169	CA	1133	1134	-	450	Ucc
					169	CA	1147	1149	-	450	Ucc
1702				MP-G	2800	SD	1708.5	1722.5	1711.5	(575)	Ott
					200	CD	1736	1738.5		400	Par
					2800	SD	1835	1838.5	1835.7	(100)	Ott
					202	CD	1836.5	1840		240	Cor
					2800	CD	2043	2116	2045.1	(520)	Ott

3.IV-2

(2)

'ORTANT SOLAR RADIO EMISSIONS DURING 1958

.TIONS TYPE II		SPECTRUM OBSERVATIONS TYPE IV					SINGLE-FREQUENCY RADIO EMISSIONS						
Frequency Range	OBS.	Beg. UT	End UT	Max. Int.	Frequency Range	OBS. or Ref.	Freq.	Type	Beg. UT	End UT	Max. UT	Flux	OBS.
		1829	2024	3	580-100	Har	2800	SD	1822	1942	1840	(26)	Ott
							2800	CA	1829.5	1814.5	1831.7	(28)	Ott
							2800	SA	1855	1856	1855.6	(17)	Ott
							545	SD	1826	1841	-	180	Par
							545	CD	1900	2010	-	4000	Par
							202	E	1823	1849	-	58	Cor
							202	ECD	1841.5	1845.5	-	58	Cor
							202	F	1852	1903	-	58	Cor
							202	E	1909	2020	-	71	
							200	F	1835	1857.5	-	450	Par
							167	CD	1829	1844	1829	110	NBS
							167	CD	1851	1904	1856	1200	NBS
							167	CD	1929	2005	1944	520	NBS
200-40	Syd												
		1640				MP-G	2800	SA	1640	1708	1643	(1350)	Ott
200-40	Syd						470	ECD	2303.5	2303.8	2303.6	440	NBS
270-100	Har						200	CD	2257.5	2259.5	2258	380	Hir
							167	ECD	2257	2300	2258.2	3500	NBS
		1445		A		MP-G	9400	CD	1446	1505	1457	330	HHI
							2980	CD	1445.5	1449.5	-	336	Ned
							2980	CD	1453	1503	-	438	Ned
							2800	CD	1445	1507	1458	(320)	Ott
							1500	CD	1443	1505	1457	204	HHI
							470	CD	1447	1505	1454	250	NBS
							202	ECD	1513	1521	1514	159	Cor
							200	CD	1453	1504	-	230	Ned
							169	CD	1511	1519	-	162	Ucc
							9400	SD	0910	0925	0911	283	HHI
							3000	SD	0910	0916	0911	239	HHI
							208	ECD,CD	0915	0923	0918	200	Mos
							200	CD	0915	0919	-	440	Ned
							169	ECAF	0915	0919	-	90	Ucc
							169	CA	0920	1005	-	25	Ucc
							169	CA	0923	0925	-	90	Ucc
							9500	SD	0038	0058	0044	430	Tok
							3000	CD	0036	0103	0039	331	Tok
							200	CD	0038	0043	-	70	Hol
							9400	SA	0935	1111	1015	423	HHI
							3000	SD	0949	1112	1015	358	HHI
							2980	CD	0932	1012	-	278	Ned
							2980	SD	1012	1021	-	372	Ned
							200	CD	1054	1102	-	400	Ned
							169	EFA	0923	0930	-	108	Ucc
		1204				MP-G	600	SA	1241	1355	-	228	Ucc
							545	CA	1207	1527	-	400	Ned
							231	SD	1210.1	1213.6	1212.2	10000	AOP
							200	CD	1212.5	1215	-	400	Ned
							9400	SD	1207	1242	-	273	HHI
							2800	CA	1333.8	1339.8	1334.9	(40)	Ott
							231	CD	1356	1403.4	1357.3	1100	AOP
							200	FD	1357	1404	-	300	Ned
							200	FCD	1414	1421.5	1420.8	570	Osl
							169	SA	1424	1506	-	144	Ucc
		2116	2302	3	580-100	Har	1420	CA	2113	2137.5	2136	207	Syd
		2105		B		MP-G	1420	CA	2138	2210	2152	856	Syd
		2105				H.G.	450	CD	2112	2325	2204.3	2300	NBS
							200	CD	2109	2204	-	3000	Hol
							200	CD	2158	2201.5	2200	660	Hir
							167	CD	2115	2410	-	1900	NBS
		1325				MP-G	9400	SD	1320	1425	1326	563	HHI
							3000	SD	1320	1343	1327	300	HHI
							231	CD	1319	1330.5	1325.9	2000	AOP
							200	CD	1325	1333	-	700	Ned
							169	ECA	1323	1333	-	117	Ucc
210-100	Har						2800	CA	1903	1918	1905.5	(225)	Ott
							470	CD	1904	1925	1906.5	280	NBS
							167	ECD	1910	1913	1919.2	1700	NBS
							2800	CD	0812	0816	-	253	Ned
							600	ESD	0813	0814	-	138	Ucc
							600	SD	0817	0819	0817.5	173	Mos
							231	ECD	0811.3	0815.6	0812	350	AOP
							208	SD	0812	0815	0813	366	Mos
							200	CD	0812	0815	-	260	Ned
							178	ECD	0810	1813	0810.5	365	Kis
200-40	Syd	0551				MP-G	9400	CD	0544	0557	0551.5	(590)	Nag
							3750	CD	0543	0557	0551.7	(500)	Nag
							3000	CD	0543	0548	0545.8	343	Tok
							3000	ECD	0550	0558	0550	1048	Tok
							545	SD	0550	0600	-	50	Hol

FLARE									SPECTRUM OBSERVATIONS TYPE II				
Gr. Day	Beg. UT	End UT	Max. UT	Position		Imp.	Event No.	Serial No.	Beg. UT	End UT	Max. Int.	Frequency Range	OBS.
Mar. 1	0905	1007	0917	S11	W47	3+	E(26)	F(12)					
1	No Flare Reported Between 1532 On 3/1 and 0653 on 3/2						E(27)		2041	2054	2	175-100	Har
2							E(28)		0009	0015	2	480-100	Har
3	1005	1250	1020	S16	E60	3+	E(31)	F(13)					
3	No Flare Reported												
5	0500	0632	0540	S12	E46	3	E(32)	F(14)					
7	1020	1224	1112	N11	E71	3		F(16)					
9	1540	1740	1546	N34	W32	2	E(35)						
11	0030	0042	0034	N11	E12	1	E(36)		0032	0046	2	125-40	Syd
12	0024	0233	0037	N08	E02	2+	E(39)		0043	0103.5	3	125-40	Syd
14	1454	1541	1507	S21	W85	3	E(42)	F(17)					
20	0656	0955		N25	E60	1+							
23	0947	1627	1005	S14	E78	3+	E(45)	F(18)					
24	1607	1643	-	S15	E57	1	E(48)		1643	1651	3	155-100	Har
25	0557	0626	0603	S15	E50	2	E(49)						
25	No Flare Reported						E(52)		2320	2332.5		125-40	Syd
26	0036	0040	-	N21	W50	1	E(53)		0035	0038.5	1	125-40	Syd
									0041.5	0047.5	1		
27	1534	1710	1552	S16	E23	2+	E(54)	F(19)					
28	1030	1152	1038	S24	E26	2	E(55)						
28	1703	1904	1714	S15	E09	2+	E(56)	F(20)					
28	1833	1922	1838	N20	W58	2	E(57)		1837	1847	3	320-100	Har
28	2042	2131	2047	S24	E21	2	E(58)						

FLARE								SPECTRUM	
Gr. Day	Beg. UT	End UT	Max. UT	Position	Imp.	Event No.	Serial No.	Beg. UT	End UT
Mar. 29	1339	1410	1343	N35 E78	2	E(59)			
29	1447	1507	1449	N26 W70	1	E(60)		1452	1455
29	1630	1637	1632	N21 W90	1-	E(61)		1630	1637
29	1819	1915	1823	S24 E08	2	E(62)			
30	0045	0123	0108	N35 E74	2	E(63)			
30	0915	1421	1000	S16 W20	2+	E(65)	F(21)		
31	0005	0036	0014	S17 W22	2	E(66)			
31	0038	0130	0052	S08 W23	2	E(67)			
Apr. 1	1050	1250	1100	S13 W43	2+		F(22)		
2	1951	2025	1954	S15 E23	1+	E(69)		1955	2008
6	1929	2025	1945	S16 W27	1	E(72)			
7	1010	1215	1025	N15 E33	3	E(73)	F(23)		
8	0301	0408	0309	S17 W44	1	E(74)		0304	0311
9	1435	1534	1440	N11 W37	3		F(24)		
11	No Flare Reported Between 1137 and 1950					E(76)		1340	1344
29	1128	1240	1157	N30 E50	3		F(25)		
30	1930 1932	2005 2015	1940 1940	S17 E27 N10 W50	1+ 1+	E(82)		1934	1951

3. III-3

0

:D)

:TRUM OBSERVATIONS TYPE IV				SINGLE-FREQUENCY RADIO EMISSIONS						
End UT	Max. Int.	Frequency Range	OBS. or Ref.	Freq.	Type	Beg. UT	End UT	Max. UT	Flux	OBS.
				9500	ECD	2128	2132	2128.5	829	Tok
				2800	SA	2127.9	2132.9	2128.5	(136)	Ott
			MP-G	9500	ECD	0412	0424	0415	2140	Tok
				9400	CD	0412	0421	0415.1	(1200)	Nag
				3750	CD	0412	0421	0414.1	(900)	Nag
				3000	CD	0412	0424	0414.8	1200	Tok
				3000	SD	0434.2	0435	0434.5	366	Tok
				2000	CD	0412	0421	0414.9	(470)	Nag
				1000	CD	0412.5	0421.5	0415.3	(355)	Nag
				545	CD	0414	0421	-	360	Hol
				9400	SD	0908	1100	0922	343	HHI
				3000	SD	0909	1026	0922	307	HHI
				1500	SD	0906	0927	0920	267	HHI
				1500	SD	1004.3	1005	1004.7	257	HHI
				1500	M	1022	1037	1030	363	HHI
				536	CD	1022.5	1028.5	1026	225	Pra
				231	CA	0840.4	0900	0840.4	850	AOP
				2800	CA	2034.7	2041.7	2036.5	(580)	Ott
				3000	CD	0335.5	0349.5	0336.8	307	Tok
				200	SD	1828.3	1830.1	1829.5	320	Osl
				167	ECD	1829.9	1832.4	1830.6	1800	NBS
				1500	M	0748	0801	0749.8	142	HHI
				9400	SD	1509	1525	1510.5	613	HHI
				2800	SA	1509.3	1515.3	1510.5	(215)	Ott
				536	CD	1514	1520	1515	225	Pra
2209	3	580-100	Har	9500	CD	2141	2217	2150	1112	Tok
	A		MP-G	3750	CD	2159.2	2212.2	2159.2	(365)	Nag
			H.G.	2000	CD	2201	2212	2201	(475)	Nag
				1000	CD	2159.6	2211.6	2159.6	(350)	Nag
				600	SA	2147	2202	2154	176	Syd
				545	CD	2141	2211	-	400	Hol
				200	CD	2140	2216	2148	1130	Hir
				167	CD	2139.4	2146	2143	440	NBS
				167	CD	2146	2226	2148	810	NBS
	A		MP-G	9375	CD	0840	0848	0842	1070	Gor
				3000	SD	0839.5	0905	0843.4	868	HHI
				3000	ESD	0840	0850	0844	403	Jod
				600	ECA	0840	0859	-	675	Ucc
				231	CD	0839.5	0916.9	0842.2	2000	AOP
				208	ECD-CD	0840	0915	0843	1050	Mos
				200	ESD	0840	0900	0900	208	Jod
				200	FCD	0841.5	0915.5	0843	330	Osl
				125	CD	0840.4	0849.8	-	550	Rho
			H.G.	9400	CD	1618	1755	1710	400	HHI
	A		MP-G	3000	SD	1617	-	1622.7	586	HHI
			MP-G	2800	SA	1614	1742	1710	(380)	Ott
				1500	CD	1616	1740	1723.4	635	HHI
				167	ECD	1618	1637	1623	270	NBS
0510	3	200-40	Syd	9500	CD	0437	0517	0450	1178	Tok
			Mp-g	9400	CD	0436	0500	0450.6	(840)	Nag
			H.G.	1420	CA	0445	0512	0446	343	Syd
				600	ECA	0444	0450	-	954	Ucc
				600	F	0446	0511	0447	409	Syd
				200	CD	0434	0518	0458	650	Tok
				169	ECA	0446	0454	-	127	Ucc
				9500	CD	2114	2119	2117	778	Tok
				2800	SD	2115.8	2118.8	2117.2	(70)	Ott
				167	ECD	2119.9	2122.9	2121	610	NBS
				9500	CD	0218	0242	0219.8	771	Tok
				3000	CD	0218	0229	0224	249	Tok
				545	CD	0214	0215	-	(7)	Hol
				2800	SD	0942.8	0947.8	0944.2	(140)	Ott
				1500	CD	0943	1123	0944.5	116	HHI
				600	ECD-CD	1011	1105	1031	300	Mos
				231	CD	1009	1053.7	1016.5	100	Mos
				208	CD	1007	1050	1019	111	Mos
				169	ECD	1015	1020	-	40	Ucc
				9400	SD	0759	0802	0800	(170)	Nag
				9400	CD	0840	0907	0842.5	312	HHI
				3750	SD	0757	0802	0800	(200)	Nag
				3000	SD	0758	0809	0800.3	339	HHI
				3000	SD	0841	0900	0842.5	241	HHI
				600	ECDF	0727	0728.5	-	120	Ucc
				536	S	0718	-	-	155	Pra

3. IV-4

(2)

ABLE IV. 1958 (CONTINUED)

OBSERVATIONS TYPE II			SPECTRUM OBSERVATIONS TYPE IV					SINGLE-FREQUENCY RADIO EMISSIONS						
Max. Int.	Frequency Range	OBS.	Beg. UT	End UT	Max. Int.	Frequency Range	OBS. or Ref.	Freq.	Type	Beg. UT	End UT	Max. UT	Flux	OBS.
								9400	SD	1340	1350	1342	883	HHI
								2980	SD	1341.5	1343	-	624	Ned
								200	CD	1342	1343	-	290	Ned
3	280-100	Har						9400	CD	1447	1457	1449	460	HHI
								2800	CD	1447	1451.1	1449.1	(42)	Ott
								545	CD	1447.5	1449.5	-	260	Ned
								536	CD	1448	1451.5	1449		Par
								231	CD	1450	1453.7	1452.5	2000	
								169	SA	1453	1457	-	300	Ucc
3	270-100	Har						200	CD	1631	1633.5	-	290	Ned
								169	SA	1631	1635	-	300	Ucc
								2800	SD	1820.5	1833	1821.8	(1400)	Ott
								167	CD	1855	2157	-	1600	NBS
								9500	ECD	0107.1	0111.1	0107.2	1342	Tok
								3750	ESD	0107	0108	0107.6	(361)	Nag
								3000	CD	0106.5	0111.5	0107.7	735	Tok
								200	F	0052	0053	-	1300	Tok
								200	ECD	0107.3	0108.3	0107.3	4300	Tok
								9400	SD	0908	1234	1034	415	HHI
								2980	CA	0910	1050	-	437	Ned
								1500	CD	0919	1104	0938	199	HHI
								600	ESA	0957	0960	-	234	Ucc
								600	SA	1008	1022	-	145	Ucc
								208	ECD	0952	0957	0953	324	Sim
								178	CD	0920	0950	-	260	Cav
								169	SA	0915	1005	-	300	Ucc
								169	ECAF	0917	1000	-	990	Ucc
								9500	CD	0006	0019	0100	820	Tok
								3000	CD	0006	0015	0010.3	561	Tok
								3000	SD	0029	0030	0029.5	411	Tok
								3000	CD	0031.5	0033.5	0031.8	482	Tok
								470	CD	0031.4	0032.9	0031.7	1400	NBS
								200	ESD	0031.5	0032	0031.9	350	Tok
								9500	ECD	0047.3	0100.3	0049	1015	Tok
								3000	CD	0047.5	0056.5	0049	486	Tok
								9400	CD	1051	1137	1054.3	600	HHI
								2800	SD	1053	1100	1054.5	(475)	Ott
								1500	CD	1052	1201	1055.5	838	HHI
3+	330-100	Har	1953	1958	2	580-300	MHT	2800	CD	1951.5	1959	1953.4	(260)	Ott
			Not Reported as a Type IV in IAU					545	CD	1951.5	1958	-	200	Par
								202	ECD	1951.5	1953.5	1952	82000	Cor
								202	CD	1955	2015	1957	25000	Cor
								167	ECD	1951	1954.5	1953	2400	NBS
								167	ECD	1955	2011	1959	2400	NBS
			1936	1948	2	580-165	Har	2800	CD	1934	1946	1936.8	(13)	Ott
								545	CD	1935	1950	-	170	Par
								200	CD	1937	1949	-	180	Par
								167	ECD	1935	1950	1947.9	150	NBS
								167	CD	1950	2510	2241.9	240	NBS
								9400	CD	1013	1217	1015.5	1125	HHI
								2980	SD	1014	1022	-	736	Ned
								2980	SD	1057	1057.4	-	300	Ned
								1500	CD	1013	1049	1016.5	564	HHI
								200	CD	1057.5	1058.1	-	500	Ned
3	125-40	Syd						3000	CD	0302	0313	0303	325	Tok
								2000	CD	0301	0317	0303.2	(46)	Nag
								1000	CD	0301	0319	0310.7	(63)	Nag
								200	CD	0304	0308	0305	2500	Tok
								2800	SD	1435.8	1439.3	1436.8	(31)	Ott
								1500	SD	1435	1440	1437	271	HHI
								169	CAM	1435	1447	-	130	Ucc
								167	MF	1500	1930	1817.9	960	NBS
3	160-100	Har						9400	SD	1330	1436	1337.4	595	HHI
								2980	CD	1337	1338.5	-	270	Ned
								2800	SD	1335.5	1339.5	1337.5	(62)	Ott
								1500	SD	1337	1341	1337.5	243	HHI
								200	CD	1337	1340.5	1339	150	Osl
								169	ECD	1336	1343	-	150	Ucc
								2800	SD	1154.1	1156.1	1154.7	(74)	Ott
								1500	SD	1153	1158	1154.7	271	HHI
								208	ECD	1152	1153	1152	324	Sim
								200	CD	1153	1153.8	-	900	Ned
								200	ESD	1154	1155	1154.5	370	Osl
								169	ECD	1153	1154.2	-	105	Ucc
3	135-100	Har						Only Minor Bursts Reported at 200 Mc/s						

FLARE									SPECTRUM OBSERVATIONS TYPE II					SPEC
Gr. Day	Beg. UT	End UT	Max. UT	Position		Imp.	Event No.	Serial No.	Beg. UT	End UT	Max. Int.	Frequency Range	OBS.	Beg. UT
May 1	2115	2241	2130	S19	E15	3	E(83)	F(27)						
5	0356	0457	0415	S18	W29	3	E(85)	F(28)						0412
5	0856	1030	0915	S16	W25	3		F(29)						
5	2025	2115	2035	N24	W50	1+	E(86)							
	2032	2115	2037	S15	W39	1+								
6	0335	0410	0339	S16	W37	3		F(30)						
19	No Flare Reported Between 1420 on 5/19 and 0426 on 5/20						E(90)		1826	1834	3	240-130	Har	
30	0656	0944	0731	N23	E90	3		F(31)						
June 3	1507	1543	1512	N30	W53	3		F(32)						
4	2147	2356	2152	N14	W58	2	E(94)							2148 2141 2140
5	0835	1015	0850	N15	W65	2+	E(95)	F(33)						0839
5	1615	1837	1631	S18	E69	2+	E(96)	F(34)						1656 1617 1655
6	0436	0614	0448	N16	W78	3	E(97)	F(35)						0434 0437 0433
14	2112	2146	2118	N14	E38	1	E(104)		2120.5	2125	3	190-100	Har	
19	0212	0255	0225	N14	W18	3		F(37)						
19	0940	1210	1010	N14	W21	3	E(105)	F(38)						
23	0700	0850	0716	N25	E53	3		F(39)						

FLARE									SPECTRUM C	
Gr. Day	Beg. UT	End UT	Max. UT	Position		Imp.	Event No.	Serial No.	Beg. UT	End UT
June 26	0245	0517	0306	N10	E49	3	E(109)	F(40)		
27	0254	0405	-	N10	E37	2	E(110)			
July 3	0041	0114	0050	N30	E37	2	E(114)			
4	0513	0534	0517	N29	E26	1+	E(116)			
7	0020	0414	0110	N25	W08	3+	E(118)	F(41)	0032.5 0101	0048 0117
11	0740	1200	0820	S25	E27	3		F(42)		
12	0744	0843	0758	S24	W74	3		F(43)		
12	2317	2330	2330	N26	W78	1	E(121)		2329.8 2330	2333 2335
15	0914	1140	0923	N07	E40	3		F(44)		
19	1905	2030	1908	N24	E13	2+	E(125)	F(45)	1907	1915
23	1125	1450	1144	N18	E41	3		F(49)		
23	1259	1630	1336	N11	E34	2+		F(50)		

3.IV-5 (1)

ED)

CTRUM OBSERVATIONS TYPE IV				SINGLE-FREQUENCY RADIO EMISSIONS						
End UT	Max. Int.	Frequency Range	OBS. or Ref.	Freq.	Type	Beg. UT	End UT	Max. UT	Flux	OBS.
				9500	ESD	2441.7	2448.7	2443	1280	Tok
				3750	SD	2441	2445	2443.1	(535)	Nag
				3000	ESD	2441.3	2448.3	2443	828	Tok
				2000	SD	2440	2446	2443.2	(75)	Nag
				200	CD	2450	2451.5	-	180	Hol
				169	ECA	0856.5	0857.5	-	270	Ucc
				169	ECA	0858	0859	-	495	Ucc
0500		200-40	Syd H.G. MP-G	9400	CD	0258	0322	0304	(5800)	Nag
				3750	CD	0258	0319	0304	(2000)	Nag
				2000	CD	0300	0321	0304	(830)	Nag
				1000	CD	0300	0321	0303.6	(1850)	Nag
				545	CD	0303	0312	-	550	Hol
				200	ECD	0304.1	0312.1	0305.5	(30000)	Tok
				200	CD	0305	0642	0305	3000	Hir
				3000	CD	0505.2	0513.2	0512	506	Tok
				2000	CD	0503	0543	0510	(31)	Nag
				1000	CD	0457	0522	0510.8	(65)	Nag
				600	ECD	0505	0820	-	1520	Ucc
				545	CA	0520	0700	-	65000	Ned
				200	CA	0500	0640	0610	700	Tok
			MP-G	9400	SD	1523.5	1740	1529.3	625	HHI
				2800	SD	1525.5	1537.5	1529.5	(400)	Ott
				1500	SD	1525	1543.7	1529	173	HHI
				600	SD	1527	1535	-	99	Ucc
				9400	SD	1107	1145	1125	379	HHI
				3000	SD	1103.5	1130	1125	294	HHI
				231	ECD	1129.6	1130.6	1129.9	2500	AOP
				200	C	1129	1130	-	100	Ned
				200	ESA	1130	1130.8	1130.5	300	Osl
				178	SD	1107	1108	1107	163	Kis
				169	ESA	1131	1133	-	2880	Ucc
			MP-G	2800	SA	1840	1905	1842	(2050)	Ott
				200	CD	1842.5	1847.5	-	170	Ned
				169	ECD	1843	1848	-	3500	Ucc
				167	ECD	1842.9	1848.1	1846	2200	NBS
				9500	CD	2129	2159	2145	518	Tok
				9500	CD	0430	0450	0439	436	Tok
				3750	CD	0428	0438	0431	(130)	Nag
				3000	CD	0427	0447	0431	337	Tok
				1000	CD	0429	0435	0432	255	Nag
				2800	SD	2112.7	2116.2	2114	(45)	Ott
				200	CD	2112	2114.5	-	160	Hol
				167	CD	2118.8	2121.6	2119.9	400	NBS
				9400	SD	1500	1704	1507	340	HHI
				2800	CA	1500	1515.5	1503	(95)	Ott
				2800	CA	1516	1528.5	1522	(180)	Ott
				1500	SD	1500	1557.3	1503	136	HHI
				169	CA	1532	1533	-	175	Ucc
				9400	SD	1204	1255	1210	348	HHI
				2800	CD	1207	1218.5	1210	(115)	Ott
				1500	SD	1208	1238.5	1214	138	HHI
				545	CD	1217.5	1218.0	-	120	Ned
				169	SA	1216	1400	-	54	Ucc
				9500	CD	2152.5	2555.5	2153.4	505	Tok
				200	FD	2153	2203	-	170	Hol
	B		MP-G H.G.	9500	CD	0434	0544	0440	7340	Tok
				3750	CD	0434	0534	0439	(5800)	Nag
				3000	CD	0434	0544	0440	5030	Tok
				2000	CD	0434	0534	0440	(2900)	Nag
				1420	CD	0436	0453	0440	1089	Syd
				1000	CD	0435	0600	0442	(4800)	Nag
				200	ECD	0440	0443	0440.5	18000	Tok
				200	CD	0443	0513	0501	2300	Tok
				169	ECD	0439	0444	-	3500	Ucc
				169	-	0444	0520	-	2650	Ucc
			MP-G	9500	CD	0810	0825	0816	661	Tok
				9500	CD	0834.5	0839.5	0838	551	Tok
				3750	CD	0811	0826.	0818	(220)	Nag
				1500	CD	0811	1041	0933	243	HHI
				600	-	0828	1021	-	198	Ucc
				178	CA	0830	1010	0906	168	Kis
				81	CA	0815	1045	-	225	Cav

3.III-4 (2)

ABLE IV. 1958 (CONTINUED)

OBSERVATIONS TYPE II			SPECTRUM OBSERVATIONS TYPE IV					SINGLE-FREQUENCY RADIO EMISSIONS						
Max. Int.	Frequency Range	OBS.	Beg. UT	End UT	Max. Int.	Frequency Range	OBS. or Ref.	Freq.	Type	Beg. UT	End UT	Max. UT	Flux	OBS.
			0319	0515	1		Syd	9500	CD	0244	0248	0245.3	434	Tok
			0255				MP-G	9500	CD	0300	0330	0307.8	518	Tok
								9400	CD	0258	0338	0258	(77)	Nag
								3000	CD	0243	0250	0245	410	Tok
								3000	CD	0255	0327	0307.8	507	Tok
								2000	CD	0244	0248	0245.9	(34)	Nag
								2000	CD	0255	0325	0316.2	(100)	Nag
								1420	CD	0255	0325	0316	189	Syd
								600	CA	0259	0401	0334	54	Syd
								9500	ESD	0305.9	0309.9	0306.5	709	Tok
								3750	SD	0305	0309	0306.7	(245)	Nag
								3000	ESD	0306	0312	0306.5	593	Tok
								2000	SD	0306	0309	0306.8	(70)	Nag
								9500	ESD	0047.3	0051.3	0048	704	Tok
								3750	SD	0048.1	0049.1	0048.1	(310)	Nag
								3000	SD	0045	0051	0048.2	620	Tok
								2000	SD	0046	0049	0048.2	(125)	Nag
								1420	SD	0048	0050	0048	206	Syd
								1000	SD	0047	0050	0048.3	(50)	Nag
								9500	ESD	0516.8	0517.8	0517	729	Tok
								3750	ESD	0515	0517.5	0517.1	(800)	Nag
								536	CD	0515.5	0522.5	0516	210	Pra
	200-40	Syd	0052	0147	3	580-100	Har	9500	ESD	0026.7	0038.7	0028	1303	Tok
	200-40	Syd	0145	0221	-	200-40	Syd	9500	CD	0055	0205	0111.8	1910	Tok
			0026		B		MP-G	9400	SD	0103.5	0133.5	0111.4	(920)	Nag
			0027				H.G.	3750	ECD	0027	0037	0028	(990)	Nag
								3750	CD	0102.5	0132.5	0111.4	(1700)	Nag
								3000	CA	0050.2	0230.2	0111.3	3770	Tok
								3000	ECD	0026.6	0038.6	0027.3	708	Tok
								2800	SD	0026.5	0035	0027.5	(875)	Ott
								2000	ECD	0027	0037	0028	(550)	Nag
								2000	CD	0055	0133	0111.5	(1300)	Nag
								1420	CA	0041	0212	0113	827	Syd
								1000	CD	0026.5	0031.5	0029	1370	Nag
								1000	CD	0101	0201	0112	(800)	Nag
								600	SD	0028	0029	0028	145	Syd
								600	CA	0040	0252	0043	129	Syd
								545	CD	0027	0227	-	350	Hol
								200	ECD	0026.9	0029.9	0027.1	4000	Tok
								200	CD	0033	0036	0035.5	300	Tok
								200	CD	0027	0227	0028	1620	Hir
								200	CA	0100	0230	0153	900	Tok
								9400	CD	0800	0845	0835.3	(38)	Nag
								3000	SD	0759	0903	0811.5	244	HHI
								2980	-	0755	0845	-	264	Ned
								2000	CD	0757	0645	0811.4	265	Nag
								1500	F	0757	0910	0806.5	191	HHI
								1000	CD	0759	0829	0811.7	(260)	Nag
								545	CD	0759	0839	-	350	Ned
								200	CD	0849.9	0850.8	-	380	Hir
								208	M	1114	1200	1121	1070	Mos
								200	CD	1120	1122	-	300	Ned
								169	CD	1137	1137.2	-	100	Ucc
								167	MF	1145	2610	1357.6	1700	NBS
								9500	ESD	0757	0800	0757.4	530	Tok
								9400	F	0808.5	0821.7	0817.3	303	HHI
								3000	SD	0815.5	0830.5	0818.3	301	HHI
								2980	CD	0815.5	0820.5	-	329	Ned
								1000	CD	0815.5	0820.5	0817.7	330	Nag
								545	CD	0814	0818	-	230	Ned
								231	F	0755.3	0758.1	0756.9	2500	AOP
								200	CD	0755.7	0759.2	0757.3	1900	Hir
								200	CD	0756	0758.5	-	1300	Ned
								125	CD	0756.5	0758.4	-	700	Rho
3	130-100	Har						No Radio Emissions Reported						
	40-200	Syd												
								9400	SD	0918	0957.5	0918.7	395	HHI
								3000	SD	0918	0927	0919	217	HHI
3	450-100	Har	1905				MP-G	2800	CD	1905	1925	1907.5	(390)	Ott
								600	-	1910	1930	-	305	Ucc
								545	CD	1905	1919	-	250	Ned
								200	CD	1905	1910	-	8000	Ned
								167	ECD	1905	1912.5	-	2900	NBS
								167	CD	1912.5	1914.5	1913	1500	NBS
								167	CA	1915	2605	2141.1	2000	NBS
								9400	SD	1127	1201	1152	305	HHI
								167	CA	1150	1322	1211.1	480	NBS
			1322				MP-G	600	CA	1310	1400	-	135	Ucc
								536	CD	1321.5	1354.5	-	275	Pra
								231	CD	1322	1402	1326.3	900	AOP
								167	ECD	1322	1400	1325.1	420	NBS

(2)

TABLE IV. 1958 (CONTINU

FLARE									SPECTRUM OBSERVATIONS TYPE II					SPI
Gr. Day	Beg. UT	End UT	Max. UT	Position		Imp.	Event No.	Serial No.	Beg. UT	End UT	Max. Int.	Frequency Range	OBS.	Beg. UT
July 24	2327	2528	2443	N10	E85	2+	E(129)							
27	0855	0920	-	S16	W22	3		F(51)						
29	0259	0408	0304	S14	W44	3	E(131)	F(52)	0304	0319		200-40	Syd	0321 0304 0303
29	0458	0526	0458	S14	W38	1	E(133)							
30	1523	1637	1530	S13	W64	2	E(134)							1525
31	1058	1150	1122	S13	W77	1+	E(135)							
Aug 2	1840	1851	1841	S14	W90	1- Sub Flare	E(136)		1843	1851	3	350-100	Har	1840
3	2142	2257	2150	N08	W49	2+		F(54)						
4	0409	0610	0435	N30	W31	3	E(137)	F(55)						
4	2112	2127	2114	S07	W10	1	E(138)		2120	2124	2	190-100	Har	
7	1457	1700	1508	S16	E71	3	E(139)	F(56)						
13	1205	1330	1220	S14	W18	3		F(57)						
14	2137	2225	2203	S14	W37	1+	E(140)		2158	2205	3	200-100	Har	
16	0432	0831	0440	S14	W50	3+	E(141)	F(58)						044 043
18	0747	1030	0820	N18	E49	2								082

TABLE IV. 1958 (CONTINUED)

M OBSERVATIONS TYPE II			SPECTRUM OBSERVATIONS TYPE IV					SINGLE-FREQUENCY RADIO EMISSIONS						
Max. Int.	Frequency Range	OBS.	Beg. UT	End UT	Max. Int.	Frequency Range	OBS. or Ref.	Freq.	Type	Beg. UT	End UT	Max. UT	Flux	OBS.
			2207	2401	2	580-100	Har	9500	CD	2159	2202	2200.9	528	Tok
			2140		B		MP-G	9500	CD	2204	2218	2210	760	Tok
								9500	SD	2305	2314	2310	540	Tok
								3750	CD	2206	2216	2210	(315)	Nag
								2800	SA	2204	2221	2210	(335)	Ott
								1420	CD	2139	2141	2140	455	Syd
								1420	CD	2153	2252	2210	205	Syd
								1420	SD	2259	2359	2311	176	Syd
								1000	CD	2159	2209	2209	(366)	Nag
								167	CD	2150	2410	2208	500	NBS
3	175-100	Har	0042				K.S.	9500	CD	0042	0052	0044	3610	Tok
	200-40	Syd						3750	ECD	0041.5	0046.5	0042.4	(1450)	Nag
								3000	CD	0041	0048	0043.3	1260	Tok
								2000	ECD	0040	0047	0044	(620)	Nag
								1420	CD	0040	0053	0044	255	Syd
								1000	CD	0040	0046.5	0042	(740)	Nag
								545	CD	0042	0047	-	300	Hol
								167	CD	0040	0053	0046	1100	NBS
								9500	ESD	0728.5	0729.5	0729	477	Tok
								9500	ECD	0750	0752	0750.8	535	Tok
								2980	CD	0728.5	0731	-	282	Ned
								200	FD	0543	0558	-	150	Ned
								178	CD	0700	1130	0847	466	Kis
			1500	2517	2	580-100	MHT	9400	CD	1423	1715	1451	718	HHI
			1415				H.G.	2800	SA	1430	1630	1506	(1500)	Ott
			1430		B		MP-G	1500	CD	1427	1635	1509	443	HHI
			1440				K.S.	600	CD	1432	1545	-	306	Ucc
								231	SA	1436	1810	1503	1800	AOP
								201	-	1440	2000	1506	630	Cor
								200	CD	1440	1655	-	1400	Ned
								169	CA	1432	2000	-	540	Ucc
								167	CD	1444	1645	1508	2000	NBS
								9400	CD	1014	1041	1021	408	HHI
								2980	CD	1014	1021	-	275	Ned
								169	ECD	1015	1018	-	485	Ucc
								9400	SD	0953	1018	1001	285	HHI
								3000	SD	0952	1106	1005	334	HHI
								1500	SD	0955	1006	1002	(148)	HHI
3	200-40	Syd	0030	0430	3	200-40	MP-G	9500	ECD	0018	0118	0026	5920	Tok
			0023					3750	CD	0005	0055	0041	(5050)	Nag
			0020	0115	3	580-100	MHT	2000	CD	0005	0102	0042	(2100)	Nag
			0012				H.G.	1420	SD	0016	0145	0042	288	Syd
			0019				K.S.	1000	CD	0017	0116	0022	1900	Nag
								545	CA	0012	0227	-	1600	Hol
								200	CD	0019	0229	-	85000	Hol
								167	ECD	0016	0125	0127	2400	NBS
			1028		A		MP-G	9400	CD	1018	1134	1028	698	HHI
								3000	CD	1019	1055	1039	573	HHI
								1500	CD	1009	1102.5	1039	215	HHI
								208	ECD	1023	1039	1037	180	Sim
								200	CD	1025	1047.5	1039	250	Osl
3+	300-100	Har						9500	CD	2103	2108	2105	1174	Tok
								545	CD	2103.5	2105	-	140	Hol
								200	CD	2108	2109.5	-	3000	Hir
								9500	ESD	0507.1	0508.1	0507.5	540	Tok
								9500	CD	0523	0536	0527	472	Tok
								1420	SD	0507	0509	0507	222	Syd
								1000	F	0506	0510	0507.3	320	Nag
								600	SD	0509	0510	0509	163	Syd
								2800	SD	1448	1451.5	1449.1	(85)	Ott
								600	ECD	1450	1052	-	135	Ucc
								231	CD	1449.3	1454.2	1450.4	500	AOP
								169	ECD	1450	1452	-	360	Ucc
								200	CD	1318	1319	-	180	Ned
								125	CD	1346.5	1348.5	-	400	Rho
								3750	CD	0657	0702	0700.9	(54)	Nag
								1500	SD	0658	0705	0701	211	HHI
								600	SD	0658	0704	-	85	Ucc
								200	SD	0658	0701	0659.5	100	Osl
								169	ECD	0657	0703	-	1755	Ucc
								169	CD	0659	0703	-	97	IRS
								9400	CD	0910	0940	0918	388	HHI
								3000	CD	0910	0931	0913	351	HHI
								1500	SD	0910	0935	0913	192	HHI
								3000	SD	0912	0916.5	0914.3	319	HHI
								1500	SD	0911	0917.7	0914	237	HHI
								810	CD	0915	0921	0916	108	Cra
								169	ECD	0950	1020	-	135	Ucc

(2)

FLARE									SPECTRUM OBSERVATIONS TYPE II					SPECTI
Gr. Day	Beg. UT	End UT	Max. UT	Position		Imp.	Event No.	Serial No.	Beg. UT	End UT	Max. Int.	Frequency Range	OBS.	Beg. UT
Sept. 14	0822	1030	0835	S10	W80	3+	E(159)	F(75)						0848 0855 0832
16	1443	1624	1503	S23	E37	3		F(77)						
18	0728	0938	0830	S12	W53	3	E(162)	F(78)						
22	0738	0910	0750	S19	W42	2+	E(164)	F(79)						
28	2046	2108	2054	N32	W66	1-	E(167)		2046	2053	3	500-100	Har	
Oct. 2	2143	2201	2148	S06	W38	1	E(169)		2149 2149	2153 2157	3	140-100 210-25	Har Syd	
8	1510	1528	1522	N12	E25	1-	E(171)		1529	1535	2	420-100	Har	
15	1023	1140	1032	S28	E26	3		F(81)						
19	0658	0820	0725	S17	W35	3		F(82)						0722
21	2318	2527	2330	S04	W22	3	E(173)	F(83)	2328 2328	2341 2400	3+	250-100 100-40	Har Syd	2327 2344 2328 2323 2318
23	0232	0352	0254	S04	W38	3		F(85)						
23	1655	1803	1781	S32	E50	1	E(176)							
24	1410	1801	1457	S05	W57	3	E(179)	F(86)	1452	1500	3	180-100	Har	1442 1443 1439
Nov. 14	0036	0207	0046	S19	E51	3	E(186)	F(90)						
24	1607	1907	1621	S12	W08	3	E(187)	F(91)						1607 1600

FLARE								SPECTR	
Gr. Day	Beg. UT	End UT	Max. UT	Position	Imp.	Event No.	Serial No.	Beg. UT	End UT
Aug. 19	2118	2411	2256	N18 E26	2	E(144)			
20	0042	0128	0045	N16 E18	3	E(145)	F(59)	0046 0046	0051 0105
22	0521	0844	0529	N19 W04	2+		F(60)		
22	1417	1717	1450	N18 W10	3	E(148)	F(61)		
23	1012	1048	1016	S12 W69	3		F(62)		
25	0949	1050	1003	N16 W46	3-		F(63)		
26	0005	0124	0027	N20 W54	3	E(151)	F(64)	0021	0045
28	1025	1045	1030	S18 W64	2+				
Sept. 2	2102	2141	2105	S09 E84	3	E(155)	F(66)	2108	2115
4	0504	0545	0524	S07 E63	3		F(67)		
7	1441	1522	1450	N20 E70	3+		F(69)		
9	1343	1545	1354 1405	S15 W18	3+		F(70)		
12	0655	0740	0702	S13 E67	2+		F(72)		
12	0904	1003	0915	N15 E66	3		F(73)		
13	0904	1050	0918	S11 W58	3		F(74)		

3.14-7

UM OBSERVATIONS TYPE IV				SINGLE-FREQUENCY RADIO EMISSIONS						
End UT	Max. Int.	Frequency Range	OBS. or Ref.	Freq.	Type	Beg. UT	End UT	Max. UT	Flux	OBS.
			H.G.	9400	M	0832	1012	0858	1210	HHI
			K.S.	3000	M	0830	0939	0904	1259	HHI
	A		MP-G	2980	SD	0833.5	0838.5	-	371	Ned
				2980	CD	0847.5	0930.5	-	870	Ned
				1500	CD	0834	1009	0904	460	HHI
				600	ECD	0848	0933	-	450	Ucc
				231	CD	0852	0927	0904.2	300	AOP
				200	CD	0855	0918.0	-	120	Ned
				169	EC	0859	0934	-	93	IRS
				9400	SD	1455	1525	1458	390	HHI
				2980	CD	1445	1448	-	276	Ned
				2800	CA	1455	1500	1458.5	(25)	Ott
				200	SD	1458	1458.1	-	230	Ned
				9400	SD	0827	0835.2	0832	301	HHI
				3000	SD	0827	0838.7	0830	261	HHI
				600	ECD	0828	0832	-	100	Ucc
				209	CD	0842	0846	0845	18	Aba
				169	ECD	0842	0851	-	40	Ucc
				9400	SD	0741	0808.8	0805	311	HHI
				3000	CD	0733	0804.3	0745	314	HHI
				2980	CD	0739	0810	-	336	Ned
				2000	CD	0739	0804	0746	(86)	Nag
				1500	SD	0737	0744.5	0745	207	HHI
				2800	SD	2044	2047	2045.5	(58)	Ott
				200	CD	2047	2050	-	550	Par
				167	ECD	2046.1	2047.7	2047.1	400	NBS
				167	ECD	2047.8	2051.9	2049.8	2000	NBS
				9500	CD	2143.8	2146.8	2144	617	Tok
				2800	SD	2143	2150	2144	(160)	Ott
				545	CD	2143	2145	-	(25)	Hol
				202	ECD	2142	2153	2145	1700	Cor
				167	ECD	2142	2147	2143.7	1500	NBS
				600	SD	1527	1534	-	90	Ucc
				200	CD	1528.5	1533	1531	170	Osl
				169	ECD	1528.5	1530.5	-	126	Ucc
				9400	SD	1022	1056.5	1024	368	HHI
				2980	SD	1023	1029	-	361	Ned
			MP-G	9400	ECD	0723	0725	0723.9	(1600)	Nag
				3750	ESD	0723	0725	0723.9	(585)	Nag
				2000	ESD	0723	0726	0724	(305)	Nag
				1000	ESD	0723	0728	0724	(500)	Nag
				536	CD	0722	0733	-	320	Pra
				231	CD	0723	0730.9	0724	4500	AOP
				200	FD	0723	0730	-	1000	Ned
				169	ECD	0723	0726	-	3870	Ucc
2350	3	580-100	Har	9500	ECD	2323	2413	2327	3600	Tok
2400	3		Syd	3750	CD	2323	2418	2327	(1150)	Nag
			K.S.	3000	CD	2345	2430	2345	1900	Tok
2350	3+		H.G.	2000	CD	2323	2418	2355	(520)	Nag
	B		MP-G	1000	CD	2321	2416	2356	(530)	Nag
				600	CD	2356	2402	-	1354	Syd
				545	CD	2326	2436	-	700	Hol
				200	ECD	2327.7	2332.1	2330	52000	Tok
				200	CA	2332	2442	2354	3600	Tok
				167	ECD	2328.5	2335.5	2331	1700	NBS
				167	CD	2336	2400	-	1700	NBS
				9500	CD	0247	0253	0249	601	Tok
				3000	CD	0246.5	0252.5	0249.2	343	Tok
				2800	CD	1726	1733	1728	(45)	Ott
				545	CD	1726	1728.5	-	20	Par
				202	ECD	1726	1736	1730	7200	Cor
				167	ESD	1729.3	1733.8	1730.5	2800	NBS
1518	3	580-100	Har	9400	CD	1443	1518	1445	318	HHI
			K.S.	3000	CD	1442	1517	1445	381	HHI
			MP-G	1500	M	1439	1535	1445	291	HHI
				600	ECD	1439	1520	-	495	Ucc
				169	ECD	1448	1529	-	540	Ucc
				125	CA	1453	1518.8	-	350	Rho
				9500	SD	0041	0106	0052	457	Tok
				9400	SD	0040	0140	0052	(38)	Nag
1619	3	580-320	MHT	2800	SA	1613	1638	1620	(285)	Ott
			MP-G	202	ECA	1608	1621	1612	180	Cor
				202	F	1629	2116	1642.5	180	Cor
				167	CA	1608	2320	1612.7	1300	NBS

TABLE IV. 1958 (CONTINUED)

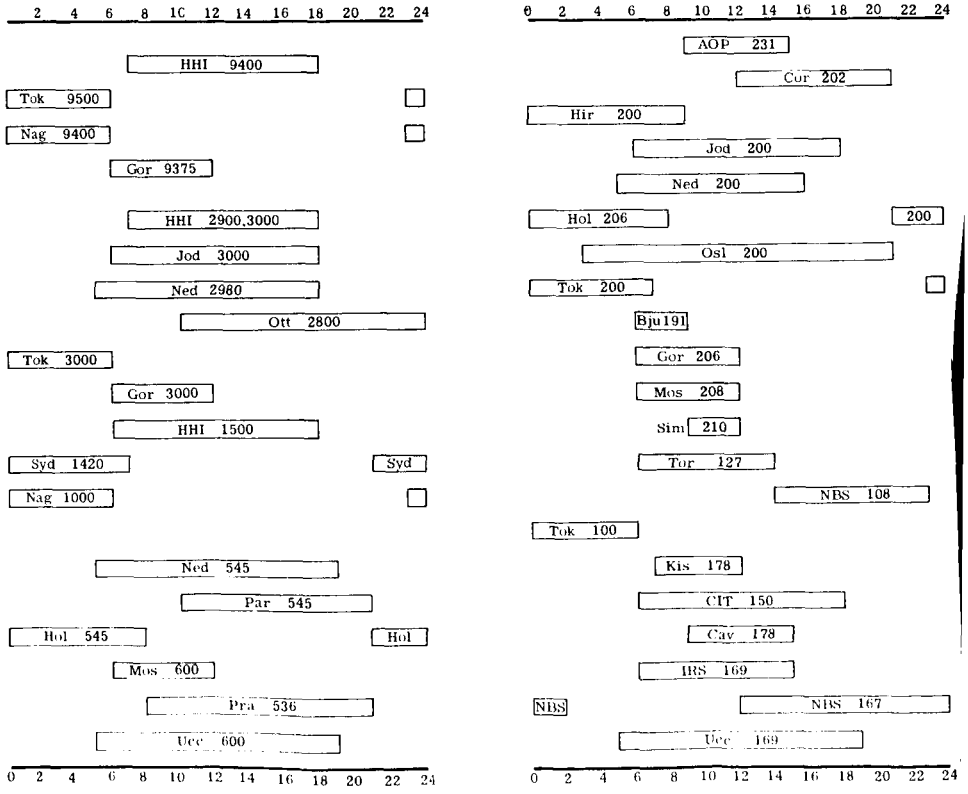
SPECTRUM OBSERVATIONS TYPE II				SPECTRUM OBSERVATIONS TYPE IV					SINGLE-FREQUENCY RADIO EMISSIONS						
End UT	Max. Int.	Frequency Range	OBS.	Beg. UT	End UT	Max. Int.	Frequency Range	OBS. or Ref.	Freq.	Type	Beg. UT	End UT	Max. UT	Flux	OBS.
									2980	SD	0816.5	0817	-	265	Ned
									600	ESD	0815	0818	-	250	Ucc
									231	CA	0814	0854	0816.5	350	AOP
									207	F	0814	0900	0840	220	Gor
									178	CA	0814	0850	0835	138	Kis
1911	2	210-100	Har						2800	SA	1858.2	1900.7	1859	(50)	Ott
									545	M	1856	1904.5	-	90	Par
									200	M	1856	1907.5	-	500	Par
									167	ECD	1856	1903	1859	2400	NBS
									167	CD	1905	1908	1906.4	420	NBS
2401		100-40	CSIRO						9400	CD	2354	2357	2355.4	(357)	Nag
									3750	F	2354	2359	2355.4	(100)	Nag
									1000	CD	2355	2357	2355.6	(170)	Nag
									545	CD	2355	2402	-	160	Hol
									200	M	2355	2401	-	800	Hol
									9400	CD	0932	0948	0934	480	HHI
									3000	CD	0929	0946	0934	363	HHI
									1500	SD	0933.5	0937.5	0935	240	HHI
									536	S	0957	0957.5	-	110	Pra
									231	SD	0954.7	0955	0954.9	800	AOP
2256	3	240-100	Har						167	CD	2251	2254	2253	2300	NBS
1709	3	280-100	Har						2800	SD	1655	1703	1657	(32)	Ott
									202	CD	1655	1711	1701	1000	Cor
									167	ECD	1659	1706	1703	1300	NBS
0231		210-100	Syd						9500	ESD	0220	0221.5	0220.6	663	Tok
									3000	ECD	0220.4	0222	0220.6	416	Tok
									2000	F	0220	0223	0221	(230)	Nag
									1420	CD	0221	0224.5	0221	476	Syd
									1000	CD	0220	0222	0221	(1660)	Nag
									545	CD	0220	0222	-	300	Hol
									200	CD	0219.8	0225.3	0220.5	3200	Hir
									200	ECD	0220	0225	0220.4	7000	Tok
				1427	2335	3	580-100	MHT	2980	CD	1428	1431	-	302	Ned
									600	CD	1426	1437	-	1035	Ucc
									202	F	1426	1529	1429	740	Cor
									167	CA	1430	1805	1519	1200	NBS
									202	F	1539	1554	1539	2800	Cor
				1805				MP-G	2800	SD	1805	1825	1810	(1225)	Ott
									545	CD	1804	1824	-	140	Par
									202	ECD	1804	1823	1809	5500	Cor
									167	ECD	1805	1830	-	1800	NBS
									2800	SD	1855	1859	1856.5	(55)	Ott
									545	CD	1855	1858.5	-	140	Par
									200	CD	1855	1857.5	-	320	Par
									167	ECD	1854	1859	1856	890	NBS
									2800	SD	1934.5	1942.5	1935.9	(300)	Ott
									545	CD	1934	1942	-	140	Par
									200	CD	1935	1940.5	-	500	Par
									167	ECD	1934.5	1940.5	1937.5	1400	NBS
									9500	CD	0105.5	0110.5	0105.8	1210	Tok
									9400	F	0105	0110	0105.8	(580)	Nag
									3750	F	0105	0110	0105.8	(300)	Nag
									2000	F	0106	0114	0106	(155)	Nag
									1420	M	0106	0146	0106	256	Syd
									1000	F	0103	0110	0106	(430)	Nag
									545	CD	0105	0125	-	1100	Hol
									200	ECD	0107	0114	0108	5000	Tok
				0210				MP-G	9500	CD	0210	0229	0226	1250	Tok
									3000	CD	0209	0219	0212	318	Tok
									3000	CD	0225	0228	0226.3	390	Tok
									545	CD	0208	0218	-	1300	Hol
									545	CD	0224.5	0227	-	1300	Hol
									200	F	0209	0221	0210.9	1950	Hir
									200	ECD	0209	0221	0211	5000	Tok
				1258				MP-G	9400	F	1230	1254.8	1253	325	HHI
				1259				K.S.	9400	CD	1255	1321.5	1302	1045	HHI
									3000	SD	1254	1324.5	-	1270	HHI
									2980	CD	1258	1316	-	1799	Ned
									2800	SD	1257	1315	1300.5	(1500)	Ott
									1500	SD	1258	1353	1302	884	HHI
									600	ECD	1258	1314	-	1950	Ucc
									545	CD	1258	1652	-	500	Ned
									231	F	1250.3	1253.1	1252.7	4000	AOP
									231	C	1256	1307	1301	5500	AOP
									200	CD	1252	1253	-	550	Ned
									200	CD	1259	1309	-	550	Ned
									169	ECD	1251	1254	-	2830	Ucc
									169	CD	1257	1310	-	11120	Ucc
									81	ECD	1252	1412	-	360	Cav

(2)

TABLE IV. 1958 (CONTINUED)

FLARE								SPECTRUM OBSERVATIONS TYPE II					SPECTRUM OBSERV		
Gr. Day	Beg. UT	End UT	Max. UT	Position		Imp.	Event No.	Serial No.	Beg. UT	End UT	Max. Int.	Frequency Range	OBS.	Beg. UT	End UT	
12	Several Sub-Flares Between 1359 and 1504			S02 W14 S17 E10 N23 E64										1415 1415 1458	1714 2320 1652	3 3
15	1030	1230	1041	S16	W18	3		F(98)								
15	1535	1550	1538	S04	W49	1-	E(208)							1543	1554	3
17	1040	1115	1041	S04	W49	1	E(210)									
17	1855	1927	1900	N07	W35	1+	E(212)		1901	1907	2	210-100	Har			
23	0545	0803	0624	S15	E66	3	E(215)	F(99)						0559		A
31	1656	1803	1703	S18	W54	3	E(217)	F(100)	1705	1711	3	200-100	Har	1700 1657	1712	2

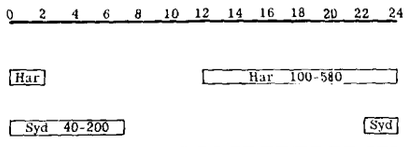
NORMAL SINGLE FREQUENCY OBSERVING TIMES UT



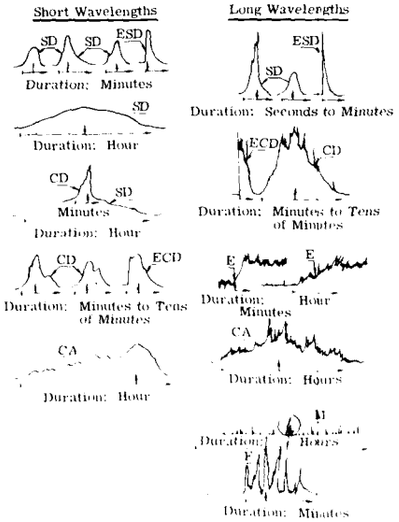
FLARE								
Gr. Day	Beg. UT	End UT	Max. UT	Position	Imp.	Event No.	Serial No.	Be UT
Nov. 25	0807	0855	0816	N19 E12	3		F(92)	
27	1857	1909	1859	N18 W12	1	E(188)		190
27	2354	0020	2356	N19 W19	1	E(189)		235
29	0920	1026	0942	N19 W40	2+		F(93)	
30	2240	2308	2250	N13 E22	1-	E(191)		2250
Dec. 9	1642	1735	1654	N10 W90	1	E(195)		1658
10	0219	0306	0221	N01 E20	2+			0224
11	1430	1445		S02 E03	1			
11	1545	1612	1550	S02 E00	1-	E(199)		
11	1802	1842	1812	S02 W00	2	E(203)		
11	1850	1917	1857	S02 W02	1-	E(204)		
11	1930	2012	1939	S02 E02	2	E(205)		
12	0106	0148	0108	N08 W05	2			
12	0210	0247	0225	S03 W04	2+			
12	1215	1547	1304	S03 W08	2+	E(206)	F(97)	

TIONS TYPE IV		SINGLE-FREQUENCY RADIO EMISSIONS						
Frequency Range	OBS. or Ref.	Freq.	Type	Beg. UT	End UT	Max. UT	Flux	OBS.
	Har	231	CD	1339.6	1340.4	1340.2	2000	AOP
580-100	MHT	167	CA	1415	2020	1722	1400	NBS
	H.G.	202	CA	1451.5	1453.5	1452.5	380	Cor
		202	CA	1503	1507.5	1505.5	1200	Cor
		200	FD	1505	1507	-	550	Ned
		810	CD	1032	1033.5	1032	107	Cra
		231	S	1052	1052.5	-	66	Pra
500-300	MHT	202	SA	1534	1534.5	-	46	Cor
		202	CA	1537	1538.5	1537	37	Cor
		9400	SD	1039	1045	1040.1	388	HHI
		2980	SD	1039.5	1044.5	-	571	Ned
		1500	SD	1039	1058	1041	420	HHI
		209	SD	1040	1042	1041	900	Aba
		200	FD	1039.5	1043.5	-	500	Ned
		169	ECD	1040	1042.5	-	1035	Ucc
		169	-	1042.5	1045.5	-	1890	Ucc
		2800	SD	1857.5	1902.2	1859	(250)	Ott
		545	CD	1859	1905	-	45	Par
		202	CD	1859	1859.5	-	120	Cor
		200	CD	1900	1902.5	-	150	Par
	MP-G	9500	CD	0559	0621	0605	2150	Tok
		9400	CD	0535	0625	0605	(1000)	Nag
		3750	CD	0534	0624	0605	(1020)	Nag
		3000	CD	0536	0626	0605	1750	Tok
		2000	CD	0534	0639	0605	(370)	Nag
		1420	F	0559	0610	0605	163	Syd
		545	CD	0542	0549.5	-	450	Hol
		200	CA	0553	0703	0600	200	Tok
		169	C	0553	0658	-	92	Irs
580-450	MHT	2800	CD	1658	1716	1702	(340)	Ott
	MP-G	545	CD	1700	1715	-	130	Par
		202	ECD	1659	1715.5	1700	530	Cor
		167	CD	1702	1711	1707	350	NBS

NORMAL SPECTRAL OBSERVING TIMES



CLASSIFICATION OF SINGLE-FREQUENCY SOLAR RADIO BURSTS AND ENHANCEMENTS



3.IV-10 (2)

V. CATALOGUE OF GEOMAGNETIC

STORMS DURING 1958

TABLE V. CATALOGUE OF GEOMAGNETIC STORMS DURING 1958

This catalogue has been prepared from geomagnetic storm data from many sources. Data derived from papers published in the scientific literature are referenced in the last column of the table. The lists of sudden commencement storms published in the Journal of Geophysical Research (ref. 20, 37). The Annals of the IGY (ref. 47) and Bulletins 12 m1 and 12 m2, published by the IAGA (ref. 3) have been used to obtain the basic list.

The table has been set up in several sections that will be described in some detail under the column headings; these sections are as follows:

1. General storm classification
2. Number of observatories reporting the storm and type of storm reported (from ref. 3).
3. Sudden commencement reports in references 20, 37, and 47.
4. Planetary three hour Greenwich interval indices during the storm.
5. Values for D, H, and Z and other storm data from six selected magnetic observatories.

		Geographic		Geomagnetic	
		Lat.	Long.	Lat.	Long.
Co	College Alaska	N64°52'	212°10'	N64.5	255.4
Fr	Fredericksburg	N38°12'	282°38'	N49.6	349.9
Gr*	Greenwich	N51°00'	355°31'	N54.6	79.0
Ho	Honolulu	N21°18'	201°54'	N21.1	266.5
Si	Sitka	N57°04'	224°40'	N60.0	275.4
Tu	Tucson	N32°15'	249°10'	N40.4	312.2

*Data published by the Royal Greenwich Observatory in the Observatory 79 (1959) 69-71. The observations were made at the Hartland Magnetic Observatory.

The column heading, together with any necessary descriptions or definitions, follows:

Column 1 Serial number

Column 2 Greenwich Day

GENERAL STORM CLASSIFICATION (Columns 3 through 8)

Column 3 Onset time UT

Column 4 End, Greenwich day/UT

Column 5 Type, g - gradual, sc - sudden commencement

Column 6 Maximum intensity, m - moderate (K - index as great as 5) ms = moderately severe (K = 6 or 7), s = severe (K = 8 or 9).

Column 7 Maximum three hour K_p

Column 8 Average storm K_p. This has been calculated as the average K_p for the period shown in columns 3 and 4.

NUMBER OF OBSERVATORIES REPORTING THE GEOMAGNETIC STORM (Columns 9 through 21)

These data have been taken from the IAGA Bulletin 12 m2 (ref. 3). The names of the observatories reporting in each category are given in that reference. The meanings of the column symbols follow:

A - The phenomenon is a very distinct ssc

B - It is a fair, ordinary, but unmistakable ssc

C - It is a doubtful ssc

D - The ssc was decidely not recorded on the magnetogram although the records were satisfactory

E - The phenomenon cannot be discovered because of heavy disturbance.

X - The recording is missing

Other observatories have classified the phenomena in question with the following symbols:

si - Sudden geomagnetic change or impulse

b - Clear and isolated bays appearing during calm periods without pulsations or sharp beginnings.

bs- Bay with sharp beginnings without pulsations

bp - Bay with pulsation without sharp beginnings

bps- Bay with pulsation and sharp beginning

pt - train of pulsations consisting of several series of oscillations.

pg - giant pulsations

The number of observatories reporting in each of the categories is given:

NUMBER OF ssc IN THE PUBLISHED LISTS (Columns 22 through 25)

Column 22 From reference 3. This is the sum of the A's and B's, Columns 9 and 10.

Column 23 From reference 20

Column 24 From reference 37

Column 25 From reference 47

PLANETARY THREE-HOUR INDICES AND OTHER DATA DURING THE STORM PERIOD

Column 26 Planetary three-hour indices

Column 27 Sum of the K_p for the Greenwich day

Column 28 Ap for the Greenwich day

Column 29 The Greenwich day and three hour interval with the first $K_p \geq 4-$

Column 30 The Greenwich day and the first three-hour interval in which the K_p for three consecutive intervals was less than 4-

Geomagnetic data for the six selected observatories listed on page 3.V-i, with the exception of the Greenwich (Gr) data, the values given in Columns 31 through 37 were taken from reference 20. The Greenwich data were published in The Observatory Vol 70 (1959) 69-71.

Column 31 D-Magnetic Declination - this is the azimuth of the horizontal component or the magnetic intensity measured from the geographic north towards the east from 0 to 360°. Unit in minutes of Arc.

Column 32 H-Horizontal Intensity. The magnitude of the horizontal component, always considered as positive. In units of gammas (10^{-5} gauss)

Column 33 Z-Vertical Intensity. The magnitude of the vertical component. Positives if downward, negatives if upward, in units of gammas (10^{-5} gauss).

Column 34 Onset Time. This is the time reported by the observatory.

Column 35 End Time. Reported by the observatory (Greenwich Day/UT)

Column 36 Maximum K_p. This is the maximum three-hour K_p reported by the observatory.

Column 37 Name of the Observatory. The code is given on page 3.V-i

Column 38 Range of Starting Time.

Column 39 Sources. These are the published sources for the data given in this table. In many cases these references give relations of the storms to other phenomena, such as a solar flare, polar cap absorption, etc.

TABLE V CATALOGUE OF GEOMAGNETIC STORMS DURING

B	C	D	E	X	si	b	bs	bp	bps	pt	pg	3	20	37	47	Three Hour Gr. Interval 1	2	3	4	5	6	7	8	ΣKp	Ap	Kp 1s Dat
-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	3-	4-	4-	4-	4-	4-	4-	4+	29o	22	
																4+	4+	5o	5-	4+	4-	4-	2+	32+	30	
3	3	60	-	1	1	-	-	-	1	2	-	3	2	2	-											
													4	2	-	2o	1+	3-	4-	3+	3+	4-	5+	25+	20	
																6-	7-	4-	4o	3-	2+	3-	2o	30-	33	
6	15	34	2	1	6	1	-	-	2	-	-	9	-	4	-	3-	3o	4o	4o	5-	2+	3o	2+	26o	19	
28	2	9	3	2	15	-	-	-	-	-	-	40	2	27	47	3o	3o	3-	4o	4+	4+	3-	1+	25+	19	
3	4	59	-	1	-	-	-	1	-	2	-	4	3	2	-											
25	14	17	-	1	-	1	-	-	3	-	-	35	2	22	38	3-	0+	1o	3o	4-	3+	5-	4-	22+	17	
9	10	40	5	2	2	-	-	2	-	-	-	10	-	5	-	3+	4+	4-	4o	5-	4-	5-	5-	33o	30	
																4o	4+	4+	4+	4+	5-	3o	4+	33+	30	
1	11	46	3	2	5	1	-	-	-	-	-	3	-	2	-	4o	4-	4o	4o	3+	4o	4o	4o	31o	25	
																4-	5-	4o	4o	4-	4-	4o	4o	32-	27	
																4o	4o	2o	3-	3-	3+	4o	3o	26-	18	
1	-	2	-	3	-	-	-	-	-	-	-	65	14	57	70	9o	8+	9-	8+	8o	5+	6o	6o	60-	199	
1	3	20	22	5	9	-	-	-	-	-	-	12	1	5	-											
6	4	28	11	4	13	-	-	-	-	-	-	11				6o	6-	6+	5+	4o	5-	6o	4+	42+	59	
-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	4-	2-	3+	4-	4+	4-	3o	2+	26-	18	
																4o	5o	4o	3o	3+	4+	2+	2o	28o	23	
29	5	2	2	4	4	-	1	-	-	-	-	51	7	37	57	2+	1-	1+	3+	3o	4o	3+	3o	21o	14	
																4o	5-	4o	4-	5-	4o	5-	4o	34-	31	
																4o	5o	4+	4+	4o	3+	5o	4-	34-	32	
																4+	4-	5-	4-	3+	3o	4o	4-	30+	25	
																4-	4o	3o	4o	4o	3o	5-	5-	31o	26	
-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	4-	4o	3o	4o	4o	3o	5-	5-	31o	26	
																3+	5-	4+	4-	4+	3o	5-	5o	33o	31	
																5-	4o	4-	4o	4-	3o	4-	4o	31-	25	
																4+	4o	4o	4-	3o	3+	3o	3-	28o	21	
28	6	8	-	2	4	-	-	-	-	-	-	49	6	39	55	1o	2o	2o	3+	4-	4o	5o	4+	25+	21	
																5o	5-	4o	4-	4o	3+	4o	3+	32o	28	
21	21	13	2	5	2	-	-	-	-	-	-	28	3	10	-	3+	4o	7-	5o	4o	4-	4-	5-	35o	39	
																5+	5+	4o	4o	4+	4o	4o	4+	35+	36	
																4-	5+	4+	4-	4-	4-	3+	3+	31o	26	
																5o	4+	4+	3+	3+	2o	3-	3-	28-	22	
-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	4o	2-	1o	3o	4-	4o	5-	5-	27-	22	
																7o	7o	7-	5-	4+	4+	4-	3o	41-	64	
																5-	5+	6-	5o	6-	5o	5o	2+	39-	48	
12	1	-	-	1	-	-	-	-	-	-	-	69	9	52	70	3-	1+	1-	2-	6-	5-	3-	3-	22o	20	
10	14	33	2	3	8	-	-	-	-	-	-	11	-	3	-	2+	4+	5-	5-	4-	4o	3-	2o	28+	23	
																5-	4+	2+	2+	1+	2o	3-	3+	23o	16	
25	10	19	-	2	4	-	1	-	1	-	-	32	2	19	-	3-	3+	5-	5o	4o	4o	5-	2-	30o	27	
-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	3o	4o	5-	3-	4+	6-	5+	4-	33+	34	
																4o	4+	5-	4o	5-	5+	6-	6-	38+	44	
																5o	5o	4+	4o	4-	4o	5o	5o	36o	38	
																4o	5o	4o	3+	5-	5o	3+	5-	34o	33	
																6o	5-	2o	2-	3-	2-	2o	4+	25o	24	
-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	3+	4o	3+	3+	4-	5o	5-	4o	31+	27	
9	17	36	-	1	7	-	-	-	-	-	-	10	-	-	-											
16	1	-	1	2	1	-	1	-	-	-	-	65	6	42	67	5o	3+	4o	3+	4-	6o	4o	4o	33+	33	
																3+	3o	2+	4o	5o	5+	4-	4-	30+	27	
																4o	3-	3-	3o	2-	3o	3o	4+	24+	17	
-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	1+	1o	4+	5-	5+	6-	4o	4-	30o	32	
													-	5	-	3o	4+	3o	3o	3o	3+	3o	3o	26o	18	
-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	4-	4-	3-	3-	3+	3+	4o	4-	27o	19	
3	11	48	-	2	3	-	-	-	-	-	-	7		10	-	3+	4+	5+	5o	4+	5o	4-	3+	34+	34	
																4+	4o	3+	3-	2+	2+	3+	4-	26o	18	
-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	3+	4-	4-	4-	5-	4o	6-	6-	34+	36	
																5-	5+	4o	4-	3+	3+	3-	3+	30+	26	
-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	4o	3-	3o	4o	3o	4-	3+	5o	29-	23	
																3+	4o	3o	3o	3o	3o	3+	3o	26-	17	

TABLE V 1958 (CONTINUED)

3	20	37	47	Three Hour Gr. Interval 1	2	3	4	5	6	7	8	ΣKp	Ap	Kp Interval 1st Kp≥4- Date/Interval	Time Where 3 Consecutive Kp≤4- Day/Interval	D	H	Z	Onset
														Apr.					
5	1	5	-	2-	2o	2+	4+	5-	4o	3+	3+	26-	20	14/4	15/3	26	175	105	05xx
				5-	5o	4+	3o	3-	3-	4-	3+	29+	25			42	212	307	10xx
-	1	2	-	4o	4o	4+	4o	4o	4o	5-	5o	34o	32	16/1	20/4	150	1370	850	0500
				6-	5o	4+	4o	4+	6o	6-	6o	41o	54			64	651	489	01xx
				5o	5+	5-	4o	4+	5o	5o	5+	39-	44			20	117	58	06xx
				4-	3+	3o	4+	3+	4-	4+	4+	30o	24						
				3o	4-	4-	2-	3-	3-	3-	4-	24-	15						
50	2	38	47	0+	0+	1o	1o	3-	5-	4+	2+	17-	13	26/6	26/8				
-	1	-	-	1o	2-	2+	1o	1+	3o	4-	3o	17o	10	27/7	2/3	73	665	468	27/1728
				3+	4o	3+	3+	4o	4-	4o	5-	30+	24						
8		2	-	5-	5+	4o	4o	4o	4+	3+	4-	33+	31						
				4+	4+	4o	3+	3+	4+	4+	5-	33-	29						
				4-	3o	3+	4-	2+	4-	4o	4+	28o	21						
				3o	4o	3-	2o	1-	1+	3-	2-	18o	11						
4				3+	3-	2+	2-	1+	1+	1+	1o	15o	8						
														May					
-	1	2	-	4-	2+	3o	3+	5-	4-	4+	6-	31+	29	13/5	16/2	230	1200	820	13/1000
	-	5	-	6-	4+	5o	4-	5-	4-	4+	5-	36o	38			23	141	132	13/13xx
				4o	5o	4-	3-	3+	4o	5-	4-	31o	27			105	732	568	12/0736
3				4o	3+	3-	2+	3o	4o	3-	2o	24o	16			19	138	48	13/09xx
9	-	5	-	2-	1o	1-	1+	1+	1-	1o	2o	10-	5						
7	-	2	-	0+	1+	1o	1-	0+	3-	3+	4+	14o	10	25/8	28/3	39	195	140	1500
				4o	3+	3o	4+	7-	6-	3+	4o	34o	39			121	972	680	1800
				3o	3-	2+	4o	4+	4-	4o	5o	29o	24						
				5-	4-	3o	2-	3-	3-	3+	3+	25o	18						
-	4	1	-	5o	5o	6-	6+	6-	5-	5-	3+	40+	52	29/1	29/8	140	1250	740	28/23xx
																30	145	104	28/23xx
																2	75	25	28/24xx
																16	90	42	28/18xx
68	17	64	74	2+	4o	2o	3+	4+	6+	8-	8o	38o	72	31/5	2/8	280	2460	1120	1653
																33	240	298	1652
				8-	6+	6-	3+	3-	4o	5o	4+	39o	60			58	205	290	1653
				4+	3+	4+	4o	5-	4+	4-	1-	29+	26			5	160	20	1652
																59	905	468	1652
																25	189	90	1652
-														June					
57	11	42	61	1-	2+	3o	2+	1o	3-	3o	5+	20+	15	6/8	7/8	130	1510	1040	6/1817
				8-	7o	6+	7o	4o	3+	4-	3-	42-	77			40	220	166	6/05xx
																34	235	180	6/21xx
																2	180	30	7/0046
																74	1935	583	7/0046
																15	177	41	7/0046
28	3	9	-													30	137	127	1729
-	-	1	-	1+	1+	1+	2-	1o	3+	4+	4+	19-	13	8/7	11/3	48	705	462	1729
				5o	2+	4-	3+	4-	4-	5-	6o	32+	32						
				5+	5-	4o	4-	4-	3+	4-	5-	33o	31						
				3+	4o	3-	3+	3+	3+	3+	3+	27-	18						
64	6	51	69	2-	1-	2o	2-	1+	1o	5o	5-	18o	15	14/7	15/5	20	96	51	14/1828
28	-	11	25	3o	5-	5+	4+	2+	3o	2o	1-	24+	21			86	576	371	14/1828
																7	107	25	14/1828
-	4	-	-	3-	1-	1o	1o	2-	1o	1+	4-	13o	8	20/8	23/2	220	1330	810	20/2100
17	7	8	-	4-	5-	4+	6+	6+	6+	6+	5+	43+	66			35	173	174	21/02xx
				6o	5-	5+	5-	4-	2+	4-	5-	35o	38			34	215	150	21/02xx
				4-	3+	3+	2-	2+	3-	3o	2o	22o	13			5	100	25	21/09xx
																148	688	444	20/09xx
																23	124	65	21/0206
62	11	46	68	2+	3+	4o	4-	3o	5-	7o	8-	36-	55	28/6	29/8	260	2110	1740	0000
-																60	370	412	0713
53	4	33	54													30	340	250	1743
				7o	8o	7-	5+	8-	6+	4+	3-	48o	103			5	210	45	0718
																247	1860	780	0714
																27	345	93	1742
														July					
-	1	-	-	2o	3-	2-	1+	2-	3-	3o	2+	17+	9	1/1	1/2	43	507	302	14xx
				5o	3+	3+	3-	3o	3-	2-	2-	23+	17						
-	1	-	-	2o	3-	4o	4-	4-	5-	4-	3+	28-	21	4/3	4/8	45	185	330	0306
13	-	5	-	1-	2-	2+	4o	3+	3+	4+	4-	23+	17			408	2120	2520	8/0748
72	17	65	70	3o	3-	7+	8-	8+	9o	9-	9-	55+	200	7/4	10/2	76	1067	751	8/0749
				6+	6-	6o	7o	6+	5o	3o	6-	45o	75			109	985	845	8/0748
				5o	3+	3-	2+	3-	2o	2+	4-	24o	17			20	430	105	8/0748
																395	2755	1870	8/0748
																40	503	147	8/0748
-	1	-	-	4o	5-	4o	3+	2-	1+	1o	1-	21-	16	17/1	17/4	14	75	48	00xx

(2)

Interval t Kp≥4- e/Interval	Time Where 3 Consecutive Kp≤4- Day/Interval	D	H	Z	Onset	End	Max. Kp	Obs.	Range of Starting Time	Sources
Jan.										
17/2	18/8	58	496	363	17/08xx	19/00xx	6	Si	08xx - 18/0720	22
		17	80	44	17/16xx	18/21xx	5	Tu		
		32	124	105	20/11xx	23/22xx	6	Fr	0734 - 2230	18,22,26
20/8	21/5	90	410	411	20/0732	21/11xx	7	Si		
		19	128	44	20/0737	23/22xx	5	Tu		
22/3	22/6	-	-	-	-	-	-	-		
25/4	25/7	32	230	239	25/0855	25/21xx	5	Si	0855 - 1055	12,18,22
Feb.		220	1380	780	04/1115	09/05xx	7	Co	1000 - 1304	
04/5	09/3	55	600	440	04/1109	09/05xx	7	Si		
		14	102	53	04/1000	09/06xx	5	Tu		
11/1	13/2	171	2155	745	11/0126	12/15xx	9	Fr	0125 - 0206	7,11,12,13,18,22,23,
		117	905	480	11/0125			Gr		25,26,31,38,44,53
		16	670	110	11/0126	13/01xx	9	Ho		*See Table V-A
		353	3900	1416	11/0126	13/01xx	9	Si		
		44	546	70	11/0126	13/05xx	8	Tu		
13/4	14/4	40	345	341	0837	14/19xx	6	Si		Reported by Sitka only
16/6	20/7	170	1370	760	1009	24/03xx	7	Co	1009 - 1642	12,18,22,25,44
		28	120	63	1642	23/21xx	5	Fr		
		93	444	461	1641	19/21xx	6	Si		
		16	127	51	1641	22/07xx	5	Tu		
20/7	23/4	60	499	433	0946	22/15xx	6	Si	0946 - 18xx	Reported Hermanus only
Mar.										
3/5	4/7	230	1430	630	0800	8/15xx	7	Co	0800 - 0930	12,18,22,25
		30	132	107	0930	8/15xx	6	Fr		
		47	487	393	09xx	4/23xx	6	Si		
		18	111	76	0930	8/09xx	6	Tu		
5/2	8/4	79	879	406	05xx	8/17xx	8	Si	0528 - 0537	7,12,18,22
11/5	13/8	240	1590	1010	1156	14/02xx	7	Co	1156 - 2316	18,22
		41	98	212	22xx	17/20xx	6	Fr		
		136	1064	696	1158	12/21xx	8	Si		
		15	154	72	1210	13/21xx	5	Tu		
14/5	16/3	23	104	46	1213	16/05xx	5	Fr	1212 - 1221	12,18,22,25,38,44
		50	473	300	1212	15/19xx	6	Si		
		14	81	49	1212	15/18xx	5	Tu		
17/3	17/8	19	89	62	0538	17/21xx	5	Fr	0539 - 0930	12,18,22
		62	512	265	06xx	17/21xx	7	Si		
		20	142	65	0537	22/04xx	6	Tu		
18/2	22/3	170	1220	650	19/1045	20/04xx	6	Co	0201 - 19/1045	
		29	126	106	0201	22/05xx	5	Fr		
		77	720	503	06xx	22/05xx	7	Si		
24/2	25/2	34	355	351	0436	24/20xx	6	Si		
25/3	27/2									
		250	1340	850	0700	25/21xx	7	Co	0700 - 1540	7,11,12,18,22,23,25,
		62	538	470	0722	26/02xx	7	Si		31,35,38
		17	138	30	1540	27/03xx	6	Tu		
30/3	31/1	58	430	346	0812	30/22xx	6	Si	0812 - 1330	26
		13	115	46	08xx	31/18xx	5	Tu		
Apr.										
1/7	3/3	55	710	310	14xx	3/13xx	7	Si	14xx - 2/0459	12,18,22,26
4/2	5/5	31	120	86	12xx	7/13xx	5	Fr	06xx - 1930	26
		57	492	452	06xx	5/19xx	6	Si		
6/1	7/3	-	-	-	-	-	-	-		

3. IV-1 (3)

Serial No.	Date	Onset	End	Type	Max. Int.	Max. Kp	Average Storm Kp	A	B	C	D	E	X	si	b	bs	bp	bps	pt	pg
	Apr.																			
31	14	0912	15/10xx	g,sc	m	5o	4o	-	5	11	53	-	3	-	-	-	-	-	-	-
	15	1949	20/15xx	sc	m	5o														
32	16	01xx	20/09xx	g	ms	6o	4+	-	-	-	-	-	-	-	-	-	-	-	-	-
	17																			
	18																			
	19																			
	20																			
33	26	1247	26/20xx	sc	m	5-	4o	19	31	12	8	-	1	1	-	-	-	-	-	-
34	27	1728	2/06xx	sc	m	5+	4o	-	-	-	-	-	-	-	-	-	-	-	-	-
	28																			
35	29	0523	-		m	5+		1	7	16	37	4	4	1	-	-	-	2	-	-
	30																			
	May																			
	1																			
	2																			
36	6	2010	-					-	4	4	60	-	2	2	-	1	-	-	-	-
37	13	12xx	16/02xx	sc	ms	6-	4+	-	-	-	-	-	-	-	-	-	-	-	-	-
	14	0912	-																	
	15																			
38	16	1414	-					1	2	2	65	-	4	-	-	-	-	-	-	-
39	20	2311						-	9	25	31	-	2	5	-	1	-	-	-	-
40	25	1522	28/06xx	g	*ms*	7-	4o	-	7	16	46	-	4	-	-	-	-	-	-	-
	26																			
	27																			
	28																			
41	29	0010	29/20xx	g	ms	6+	5+	-	-	-	-	-	-	-	-	-	-	-	-	-
42	31 *	1652	2/21xx	sc	s	8o	5o	58	10	1	1	-	3	-	-	-	-	-	-	-
	June																			
	1																			
	2																			
43	6	21xx						-	-	-	-	-	-	-	-	-	-	-	-	-
44	7 *	0046	7/22xx	sc	s	8-	6-	30	27	5	3	2	1	5	-	-	-	-	-	-
45	8	1728						8	20	27	2	-	1	3	-	1	-	-	-	-
46		2242	11/06xx	sc	ms	6o	4o	-	-	-	-	-	-	-	-	-	-	-	-	-
	9																			
	10																			
	11																			
47	14	1828	15/12xx	sc	m	5+	5-	36	28	-	2	-	2	3	-	-	-	-	-	-
48	15	0509						12	16	15	15	2	4	8	-	-	-	1	-	-
49	20	2100	23/03xx	g	*ms*	6+	5-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	21	0206	-					2	15	22	25	1	1	3	1	-	1	-	-	-
	22																			
	23																			
51	28	0713	-					40	22	2	4	-	1	2	-	-	-	-	-	-
52		1542	29/21xx	sc	s	8o	6+	-	-	-	-	-	-	-	-	-	-	-	-	-
53	*	1742	-					32	21	11	4	-	3	3	-	-	-	-	-	-
	29																			
54	30	14xx	1/19xx	g	m	5o	3o	-	-	-	-	-	-	-	-	-	-	-	-	-
	31																			
	July																			
55	4	0306	4/22xx	sc	m	5-	4o	-	-	-	-	-	-	-	-	-	-	-	-	-
56	7	0741	-					1	12	17	41	1	2	-	-	-	1	-	-	-
57	8 *	0748	10/03xx	sc	s	9o	7-	62	10	-	1	-	1	-	-	-	-	-	-	-
	9																			
	10																			
58	17	00xx	17/13xx	g	m	5-	4o	-	-	-	-	-	-	-	-	-	-	-	-	-

0

3.II-2

Serial No.	Date	Onset	End	Type	Max. Int.	Max. Kp	Average Storm Kp	A
	Jan.							
1	17	08xx	18/22xx	g	m	5o	4o	-
	18							
2	20	0734	-					-
3	20	2142	21/11xx	g	ms	7-	5+	
	21							
4	22	1104	22/15xx	sc	m	5-	4o	3
5	25	1050	25/18xx	sc	m	4+	4+	12
	Feb.							
6	04	1115	9/06xx	g	m	5-	4o	1
7	04	1304	8/21xx	sc	m	5-		10
8	05	0528	-	sc	m	5-		1
	06							
	07							
9	08	1342		sc	m	5-		2
	09							
10	11 *	0125	13/01xx	sc	s	9o	5o	64
11	11	0159	-					11
12	12	0008	-					5
	13							
13	13	0837	14/19xx	sc	m	5o	4-	-
	14							
14	16	1642	22/16xx	sc	m	5o	4+	22
	17							
	18							
	19							
	20							
15	20	18xx	23/12xx	g	m	5o	4o	-
	21							
	22							
	23							
	Mar.							
16	03	0931	04/21xx	sc	m	5o	4o	21
	04							
17	05	0537	08/09xx	g	ms	7-	4+	7
	06							
	07							
	08							
18	11	1156	13/21xx	g,sc	ms	7o	5o	-
	12							
	13							
19	14	1212	16/05xx	sc	ms	6-	4o	57
20	15	0258	-	sc	m	5-		1
	16							
21	17	0750	17/21xx	g,sc	m	5o	4+	7
22	18	0201	22/05xx	g,sc	ms	6-	4+	-
	19							
	20							
	21							
	22							
23	24	0436	25/03xx	g	m	5o	4+	-
24		1526	24/20xx	g	m	5o		1
25	25	1540	27/03xx	sc	ms	6o	4o	49
	26							
	27							
26	30	0812	31/06xx	g	ms	6-	5-	-
	31	0421						
	Apr.							
27	01	14xx	3/06xx	g	m	5+	4o	-
28	02	0459	-		m	5+		4
	03							
29	04	06xx	05/12xx	g	ms	6-	4+	-
	05							
30	06	0042	07/06xx	-	m	5o	4-	-
	07							

3. K-1 (1)

End	Max. Kp	Obs.	Range of Starting Time	Sources
20/10xx	5	Fr	05xx - 10xx	18,22
15/14xx	5	Si		
20/17xx	6	Co	01xx - 0745	18
20/09xx	6	Si		
19/24xx	5	Tu		
				12,18,22,25
01/11xx	7	Si		18
15/16xx	6	Co	12/0736 - 13/13xx	18
16/02xx	5	Fr		
16/05xx	7	Si		
15/09xx	5	Tu		
29/xxxx	-	Gr		18,53
30/10xx	8	Si		
29/20xx	7	Co	28/18xx - 29/0036	18,22
30/09xx	5	Fr		
30/18xx	5	Ho		
30/09xx	6	Tu		
2/21xx	7	Co		12,18,22,25,44,53
2/21xx	7	Fr		*See Table V-A
1/xxxx	-	Gr		
1/11xx	5	Ho		
1/10xx	7	Si		
1/15xx	6	Tu		
7/22xx	6	Co	6/21xx - 7/0046	7,11,12,13,18,22,23,
8/00xx	7	Fr		25,31,35,38,44,53
7/xxxx	-	Gr		* See Table V-A
7/15xx	7	Ho		
7/22xx	9	Si		
7/17xx	7	Tu		
13/06xx	6	Fr	1729 - 2242	18,22,38
13/06xx	6	Si		
15/11xx	5	Fr	14/1828 - 15/0509	12,18,22,25,44
15/12xx	7	Si		
15/11xx	6	Tu		
23/08xx	7	Co	20/2100 - 21/10xx	13,18,37.53
23/08xx	6	Fr		
-	-	Gr		
22/12xx	6	Ho		
22/08xx	7	Si		
22/12xx	6	Tu		
30/05xx	7	Co	0000 - 1742	12,13,18,22,25,44,53
30/00xx	7	Fr		* See Table V-A
29/xxxx	-	Gr		
29/18xx	5	Ho		
30/00xx	9	Si		
29/18xx	7	Tu		
1/19xx	6	Si	0402 - 14xx	18
4/22xx	6	Si	0306 - 06xx	
10/15xx	8	Co	0748 - 1728	7,11,12,13,18,22,23,
10/06xx	9	Fr		25,31,32,35,38,44,53
9/xxxx	-	Gr		* See Table V-A
9/20xx	7	Ho		
10/20xx	9	Si		
9/16xx	8	Tu		
17/10xx	5	Fr		

3.II-2 (3)

Serial No.	Date	Onset	End	Type	Max. Int.	Max. Kp	Average Storm Kp	A
	July							
59	18	0221	-					2
60		06xx	20/18xx	g	m	5+	4o	-
	19							
	20							
61	21	1622	22/14xx	sc	ms	7+	5o	-
62	*	1637	-					59
	22							
63	27	0323	28/06xx	g	m	5o	4o	1
	28							
64	31	1529	31/18xx	sc	m	5+	4+	34
	Aug.							
65	17 *	0622	18/10xx	sc	ms	7+	6-	56
	18							
66	22	0227	22/13xx	sc	ms	6-	5o	62
67	24 *	0140	25/15xx	sc	s	8-	5-	64
	25							
68	27	0243	27/23xx	sc	ms	7-	5+	4
69		0303	-					16
	28							
	Sept.							
70	3	0843	05/21xx	sc	s	9-	6-	49
71	4	1025	-					1
72	*	1339	-					4
	5							
	6							
73	15	1752	-					2
74	16	03xx	17/05xx	g,sc	m	5+	5-	-
75		0930	-					26
	17							
76	25	0408	26/13xx	sc	ms	7o	5+	52
	26							
77	30	1005	30/23xx	sc	m	5-	4o	36
	1							
	Oct.							
78	22	0315	25/00xx	sc	ms	6o	5+	57
	23							
79	24	0651	-					1
80		0730	25/06xx	sc	ms	7o	6o	43
	25							
81	27	1523	29/01xx	sc	ms	6+	5+	18
82	28	0650	-					18
	29							

3. II-3 (1)

End	Max. Kp	Obs.	Range of Starting Time	Sources
				12
28/21xx	5	Co		
5/08xx	7	Co		12,18,22,25,32,53
5/04xx	5	Fr		
5/xxxx	-	Gr		
5/06xx	5	Ho		
5/13xx	8	Si		
5/05xx	6	Tu		
14/06xx	6	Fr		7,12,18,25,32,
-	-	Gr		35,51,53
14/05xx	7	Si		
14/24xx	5	Tu		
16/15xx	5	Ho		
16/16xx	4	Tu		
-	5	Fr		
18/14xx	5	Fr	1548 - 1817	12,18,22,35,53
18/xxxx	-	Gr		
18/15xx	6	Ho		
18/14xx	6	Tu		

3. V -4 (3)

B	C	D	E	X	si	b	bs	bp	bps	pt	pg	3	20	37	47	Three Hour Gr. Interval 1	2	3	4	5	6	7	8	ΣKp	Ap	Kp Interval 1st Kp≥4- Date/Interval
13	20	34	1	2	1	1	1	-	-	-	-	15	2	8	-											July
-	-	-	-	-	-	-	-	-	-	-	-	-				3o	3+	5o	4-	5+	5o	5-	4o	34o	34	18/3
																3-	3o	5o	3-	3-	2o	5o	5o	28o	25	19/7
																4o	5-	4-	3+	3+	4o	3-	3-	28+	22	
-	-	-	-	-	-	-	-	-	-	-	-	-														
13	1	2	-	1	-	-	-	-	-	-	-	72	15	67	76	3-	3o	4-	2+	2+	7-	7+	6+	34+	53	21/6
																4+	3+	3-	3+	5o	3o	3-	2o	26+	20	
7	18	45	-	-	1	-	-	-	-	-	-	8	3	4	-	2+	4-	5o	4+	5-	2+	5-	4o	31o	28	27/2
																4o	3-	2+	1o	1o	1o	2+	3-	17o	10	
29	3	1	-	-	5	1	-	-	1	-	-	63	1	44	67	2o	1+	2+	3-	2o	5+	3+	2+	21+	15	31/6
																										Aug.
15	1	-	-	3	-	-	-	-	-	-	-	71	16	65	70	1+	2-	6o	4+	7-	7+	7+	7-	41+	82	17/3
																5o	5-	4-	3+	3-	2o	2o	2o	25+	20	
10	2	-	-	2	-	-	-	-	-	-	-	72	11	66	72	6-	6-	6-	4-	3-	3o	3o	2o	31+	34	22/1
8	1	1	-	1	-	-	-	-	-	-	-	72	16	65	70	7+	8-	6o	7-	6+	4o	3+	3o	44+	85	24/1
																4o	4o	3+	3o	5-	1+	2o	1+	24-	18	
15	24	25	2	1	3	-	-	-	1	-	-	19	1	11	-	4+	6o	7-	7-	5o	4o	6o	4-	42+	64	27/1
26	9	7	7	1	9	-	-	-	-	-	-	42	5	23	39											
																2-	2o	3-	3o	3-	3o	4-	3-	21+	13	
																										Sept.
21	2	1	-	2	-	-	-	-	-	-	-	70	15	61	70	2o	2-	4o	5+	7-	6o	7-	7-	39o	64	3/3
10	13	40	2	2	7	-	-	-	-	-	-	11	-	3	-	5o	4+	3+	4-	7+	9-	8+	8+	49o	131	
10	18	35	-	1	2	1	4	-	-	1	-	14	2	4	-											
																8o	8-	4+	4o	3+	4-	6-	3o	40-	71	
																2+	2+	2-	1+	2-	2-	2-	1+	14o	6	
4	19	43	-	-	1	2	2	-	-	-	-	6	2	3	-	1-	1-	1o	2-	1+	2o	3-	2+	12+	6	
-	-	-	-	-	-	-	-	-	-	-	-	-				3+	5-	4o	5-	5+	5+	5+	4+	37o	40	16/2
27	8	7	-	1	6	-	-	-	-	-	-	53	6	39	56											
																4o	4o	2+	2+	3+	2o	1+	1-	20o	13	
21	-	-	-	1	1	-	-	-	-	-	-	73	16	62	71	3+	6o	6o	6o	6+	6+	6o	7o	47o	82	25/2
																5o	5o	4-	4o	3+	3+	2+	2+	29o	25	
31	4	1	-	2	1	-	-	-	-	-	-	67	6	55	67	1o	1-	1+	4-	4-	4-	5-	5-	23-	20	30/4
																2-	3+	4+	2+	1+	2-	3-	4+	22-	15	
																										Oct.
17	-	2	-	-	-	-	-	-	-	-	-	74	16	61	65	1-	5+	6o	5-	3+	5+	6-	5+	36+	47	22/2
																5-	5+	6-	5o	5-	4+	5-	4+	39-	44	
2	5	64	1	-	1	-	-	-	-	1	-	3				5-	5o	7-	6+	7-	7o	6+	6o	49-	89	22/2
26	1	-	2	1	3	-	-	-	-	-	-	69	9	44	54											
																4o	3o	3+	2-	1o	1o	1o	1o	16o	10	
42	10	4	-	1	1	-	-	-	-	-	-	60	6	45	53	3+	3+	2+	2+	2-	4+	6+	5+	29o	30	27/6
37	13	1	1	2	4	-	-	-	-	-	-	55	9	3	44	3+	3-	5+	5+	5o	5-	5-	4o	35o	37	
																4-	3+	3-	3-	2o	3o	4+	5-	26+	20	

(2)

TABLE V 1958 (CONTINUED)

pt	pg	3	20	37	47	Three Hour Gr. Interval 1	2	3	4	5	6	7	8	ΣKp	Ap	Kp Interval 1st Kp≥4- Date/Interval	Time Where 3 Consecutive Kp≤4- Day/Interval	D	H	Z	Onset
																Nov.					
-	-	24				1+	1+	2o	2+	2+	2o	2-	2o	15o	7						
-	-	-	1	-	-	1o	0+	1+	2o	3-	5+	4+	3-	20-	16	2/6	2/8				
-	-	7	1	-	-	1-	2+	3-	4+	2o	3o	3o	2o	20o	12						
-	-	-				5o	4+	4-	2+	2+	1+	1+	1-	21-	17	10/4	11/4				
-	-	8				1+	1-	2-	3-	3o	2-	1-	1-	12+	7						
-	-	48	5	37	43	3+	4o	4o	4-	4o	3-	2+	2-	26-	18	28/2	28/6	75	600	370	0109
						3-	3+	3o	3o	3-	3o	0+	1o	19o	12						
																Dec.					
-	-	6	1	5	-	2-	1+	2-	4-	4+	4o	4o	5+	26o	23	2/4	3/1				
-	-	-																			
-	-	71	15	63	67	4-	3o	4o	5+	6-	5+	7-	6o	40-	54	4/1	5/3	440	1570	1100	0035
						7o	4+	3+	3-	2o	2o	1+	2o	25-	28			25	200	171	0035
																		56	205	170	0036
																		3	135	20	0035
																		165	950	550	0036
																		13	205	63	0036
-	-	68	14	54	55	5+	5+	3+	3o	6-	5o	6o	5+	39o	50	13/1	14/2	24	144	41	0002
			-	5	-													37	145	130	0001
						4-	3o	2-	2o	4o	3+	4o	4o	26-	19			55	470	320	0002
																		15	144	36	0003
-	-	63	6	34	50	2o	2o	1o	3-	2o	3-	3+	3-	18+	10	16/1	16/5	2	50	20	15/2022
						4o	4+	2+	4-	3+	2+	2o	1o	23o	16			9	94	24	15/2022
-	-	50	8	46	48													-	-	-	17/1547
-	-	55	7	26	43	2-	1o	2-	2+	2-	4+	6+	6o	25o	30	17/6	18/3	31	138	92	17/1817
						7o	6-	3+	3-	3+	1+	1o	3-	27-	33			36	130	180	17/1548
																		4	160	35	17/1817
																		17	156	56	17/1547

TABLE VA MAJOR GEOMAGNETIC STORMS 1958

No 3hrs Intervals	No 3 hrs with Kp= 7-	7o	7+	8-	8o	8+	9-	9o	Consecutive 3 hr-Kp's, No Kp < 5- At Least One Kp ≥ 7+ 8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	Ap	Storm No. Table V
12	-	-	-	-	1	2	1	1		9o	8+	9-	8+	8o	5+	6o	6o	6o	6-	6+	5+			199	10
6	-	-	-	2	1	-	-	-							6+	8-	8o	8-	6+	6-				72	42
5	-	2	-	1	-	-	-	-	5+	8-	7o	6+	7o											77	44
9	1	2	-	2	1	-	-	-							5-	7o	8-	7o	8o	7-	5+	8-	6+	103	53
12	-	1	1	1	-	1	2	1				7+	8-	8+	9o	9-	9-	6+	6-	6o	7o	6+	5o	200	57
3	1	-	1	-	-	-	-	-							7-	7+	6+							53	62
6	2	-	2	-	-	-	-	-						7-	7+	7+	7-	5o	5-					82	65
5	1	-	1	-	-	-	-	-		7+	8-	6o	7-	6+										85	67
6	-	-	1	1	1	2	1	-						7+	9-	8+	8+	8o	8-					131	72

Time Where Consecutive Kp≤4-Day/Interval	D	H	Z	Onset	End	Max. Kp	Obs.	Range of Starting Time	Sources
	34	118	78	01xx	20/07xx	5	Fr	01xx - 06xx	
19/4									
20/7									
	148	1180	620	1636	22/17xx	7	Co		7,11,12,13,18,22,25,
22/2	28	215	82	1637	22/23xx	6	Fr		26,32,44,53
	25	205	95	1637	-	-	Gr		* See Table V-A
	15	65	55	1636	22/14xx	5	Ho		
	55	325	280	1636	22/20xx	6	Si		
	15	113	37	1621	22/07xx	5	Tu		
28/2	220	1890	790	0330	28/07xx	8	Co	0323 - 06xx	18
	27	115	96	06xx	28/07xx	5	Fr		
	120	800	815	03xx	28/06xx	8	Si		
31/7								1529 - 16xx	11,12,18,22,23,25,31
									32,38
18/4	220	1560	990	0622	18/10xx	6	Co	0623 - 0730	7,11,12,13,18,22,23,
	41	282	156	0623	18/17xx	6	Fr		25,26,31,32,35,38,44,53
	35	250	140	0623	-	-	Gr		* See Table V-A
	18	170	65	0623	18/12xx	7	Ho		
	105	795	345	0623	18/07xx	7	Si		
	30	255	71	0623	18/13xx	6	Tu		
22/5	27	158	66	0228	23/01xx	5	Fr	0130 - 0228	7,11,12,13,18,22,23,
	3	150	40	0228	22/12xx	5	Ho		25,26,32,35,38,44
	80	740	405	0226	22/08xx	7	Si		
	11	127	26	0227	22/13xx	5	Tu		
25/6	160	2240	1400	0141	25/16xx	7	Co		7,11,12,13,18,22,23,
	36	249	115	0140	25/15xx	6	Fr		25,31,32,35,38,44,53
	34	245	155	0140	-	-	Gr		* See Table V-A
	5	200	50	0140	25/09xx	6	Ho		
	115	1785	790	0140	25/15xx	8	Si		
	16	212	40	0140	24/19xx	6	Tu		
28/1	170	1530	1110	0100	27/23xx	7	Co	26/0942 - 27/2130	7,11,12,13,18,22,23,
	32	183	149	2130	28/00xx	5	Fr		31,38,53
	33	180	150	0300	-	-	Gr		
	3	130	30	26/0942	27/21xx	6	Ho		
	225	1330	840	05xx	27/23xx	8	Si		
	17	147	29	0302	27/16xx	6	Tu		
5/9	160	920	810	3/0840	4/05xx	6	Co	3/0840 - 3/1030	12,18,22,25,26,44,53
	61	666	510	3/0842	6/00xx	7	Fr		
	93	555	695	3/0843	5/xxxx	-	Gr		* See Table V-A
	5	225	60	3/0848	6/00xx	6	Ho		
	225	1830	1705	3/09xx	5/21xx	9	Si		
	35	377	126	3/0843	5/24xx	7	Tu		
17/3	37	134	70	16/0930	17/02xx	5	Fr	15/1702 - 16/0930	
	23	109	58	15/1702	17/05xx	6	Tu		7,11,12,18,22,25,
									38,51
26/5	240	1520	1010	0408	26/19xx	6	Co		12,13,18,22,23,25,
	38	252	204	0408	26/16xx	6	Fr		31,32,38,44,53
	33	155	200	0409	-	-	Gr		
	3	180	15	0408	26/15xx	6	Ho		
	200	1250	810	0408	26/16xx	8	Si		
	15	195	51	0408	26/13xx	7	Tu		
1/4								0939 - 1005	12,18,22,25,32
25/2	285	1530	1280	0314	25/02xx	7	Co		11,12,13,18,22,25,
	48	244	237	0315	25/01xx	6	Fr		32,53
	43	210	180	0315	24/xxxx	-	Gr		
	2	160	20	0315	23/24xx	6	Ho		
	215	1730	1060	0315	25/01xx	9	Si		
	14	157	50	0315	23/15xx	6	Tu		
25/2	4	130	25	0730	25/06xx	6	Ho		7,11,12,13,18,22,25,
	21	197	52	0730	25/09xx	6	Tu		32,38,53
29/2	75	600	370	28/0109	28/21xx	5	Co	1523 - 28/0840	11,12,18,22,25,
	25	114	81	28/0650	29/04xx	5	Fr		32,38,53
	38	155	155	27/1523	28/xxxx	-	Gr		
	80	470	500	28/0840	28/22xx	7	Si		
	13	133	39	27/1522	29/01xx	5	Tu		

3. V-3 (3)

Serial No.	Date	Onset	End	Type	Max. Int.	Max. Kp	Average Storm Kp	A	B	C	D	E	X	si	b	bs	bp	bps
	Nov.																	
83	1	0959	-					6	18	17	25	-	-	9	-	1	-	-
84	2	10xx	2/22xx	g	m	5+	4o	-	-	-	-	-	-	-	-	-	-	-
85	10	0510	-					1	6	15	50	-	1	1	1	-	-	-
86	11	0129	11/09xx	-	m	5o	4+	-	-	-	-	-	-	-	-	-	-	-
87	23	0912	-					2	6	14	40	-	3	10	-	-	1	-
88	28	0109	28/21xx	sc	m	4o	4o	17	31	10	8	2	-	7	-	-	-	-
	29																	
	Dec.																	
89	2	0902	-					-	6	7	57	-	4	1	-	-	-	-
90		0947	2/23xx	sc	m	5+	4+	-	-	-	-	-	-	-	-	-	-	-
91	4	0035	5/04xx	sc	ms	7o	5+	53	18	-	-	-	2	-	-	-	-	-
	5																	
92	13	0001	14/03xx	sc	ms	6o	5-	39	29	2	1	4	-	-	-	-	-	-
		1148	-															
	14																	
93	15	2022	16/15xx	sc	m	4+	4o	25	38	5	2	-	2	4	-	-	-	-
	16																	
94	17	1547	18/06xx	sc	ms	7o	6o	12	38	14	8	-	2	2	-	-	-	-
95		1817	-					40	15	4	2	2	3	10	-	-	-	-
	18																	

Mo.	Day	Onset sc	1st 3hr ≥5-
Feb.	11	0125	11/1
May	31	1652	31/6
June	07	0046	06/8
	28	1742	28/6
July	08	0748	8/3
	21	1637	21/6
Aug.	17	0622	17/5
	24	0140	24/1
Sept.	04	1339	04/5

3.II-4 (1)

VI. CATALOGUE OF SOLAR-TERRESTRIAL

EFFECTS DURING 1958

TABLE VI. CATALOGUE OF SOLAR-TERRESTRIAL EFFECTS DURING 1958

This table will include short wave radio fadeouts of importance 3 that lasted for 30 minutes or more, as well as S.W.F.'s that occur at the times of the major flares catalogued in Table I. All polar cap absorptions reported in the literature; Geomagnetic storms with a maximum $K_p \geq 5$; and Forbush decreases.

A brief note of explanation of the Forbush decrease data is necessary. The only published list of Forbush decreases with onset time and other data is given in reference 21. This is limited to large decreases at Mt. Washington. The decreases indicated by a date but no UT starting time are from the Deep River Neutron charts and/or volume 16 of the Annuals of the IGY (Ref. 47). The list of cosmic ray storms (Forbush decreases) given in reference 22 has been used, but only those with a decrease of 2% or greater have been included. The starting time is indicated by the date with the hour. This is at best an approximation based on the ΔT_2 shown on Figure 1 and given in Table II of reference 22. The duration in that reference is given in days indicated by the superscript d in column 34 of the catalogue. In general, the flare-Forbush decrease association is taken from reference 22.

The column headings together with any necessary descriptions or definitions follow:

Column 1 Date

Column 2 Major Flare Serial Number from Table 3.I

Column 3 Event Serial Number from Table 3.VIII

FLARE DATA (Columns 4 through 8)

A few minor or sub.flares are given when a clear association with an SWF or other terrestrial effect has been made in the literature.

Column 4 Flare Beginning Time

Column 5 Flare End

Column 6 Time of Maximum Intensity

Column 7 Flare Importance

Column 8 Heliographic Position of the Flare

SHORT WAVE FADE (Columns 9 through 13)

Column 9 Onset

Column 10 Importance. S.W.F.'s are given an importance rating on a scale from 1- to 3+, based on the amplitude of the fade, duration of the event, and confidence in the reality of the event.

Column 11 Type (S, SL, or G) the following classifications are used:
S - SWF (S) - sudden drop out and gradual recovery
Slow S - SWF (SL) - drop out takes 5 to 15 minutes and gradual recovery
G - SWF (G) - Gradual disturbance fade irregular in either the drop out or recovery stage

Column 12 Duration in Minutes

Column 13 Wide Spread Index. The degree of confidence in identifying the event by individual stations is combined into an index of certainty that the event is geographically wide spread, ranging from 1 (possible - single station reporting) to 5 (definite - many stations reporting).

SOLAR FLARE EFFECT (Columns 14 through 16)

Preliminary reports of solar flare effects, sometimes referred to as a magnetic crotchet, have been published in the Journal of Geophysical Research, Reference 27, The SFE's recorded in this catalogue are limited to those listed in Table 5a of reference 3. As a "distinctly" SFE or an "unmistakable" SFE (Classes A and B). The list of the reporting observatories is given in Reference 3.

During 1958 no SFE's were reported in January, February, or April.

Column 14 Beginning Time

Column 15 Number of Observatories Reporting the Effect

Column 16 Intensity. Strong effects, indicated by the letter "S", are marked by an asterisk in reference 3. Insofar as possible the SFE has been associated in time with a solar flare.

POLAR-CAP ABSORPTION (Columns 17 through 22)

Column 17 Onset Time. If reference 1 is listed in column 22 the starting time has been taken from that source.

Column 18 Rise Time in Hours from Reference 1

Column 19 Duration in Hours

Column 20 Absorption in db on the 30 Mc/s Riometer.

Column 21 Probable Flare - day/beg. If a polar-cap absorption flare, association is given in the literature.

Column 22 The Sources Checked during the preparation of this catalogue have been listed. Sources that have used data from one or more of the reference lists have not been included.

GEOMAGNETIC STORMS (Columns 23 through 32)

The geomagnetic storms listed in this portion of the catalogue are limited to those with a maximum $K_p \geq 5$ with a storm time average three-hour planetary index ≥ 4. A few minor storms have been included if one or more investigators associated it with a major flare, or it was preceded by a PCA and/or followed by a Forbush decrease.

Column 23 Onset Time

Column 24 End Time

Column 25 Type, the symbols g (gradual) and sc (sudden commencement) have been used. In a few cases both a g and an sc are indicated. In these cases, three or more magnetic observatories listed the storm with a sudden commencement

Column 26 Maximum Intensity - the sumbols m (moderate K_p as great as 5) ms (moderately severe $K_p = 6$ or 7) and s (severe $K_p = 8$ or 9) have been used.

Column 27 Maximum K_p

Column 28 ΣK_p. This is the sum of the 8 three-hour Greenwich day K_p's.

Column 29 A_p from reference 3.

Column 30 Number of Magnetic Observatories Reporting the Storm as an sc in References 3 and/or 47.

Column 31 Probable Flare day/beginning - An entry in this column is based on one or more flare-storm correlations in one or more of the references.

FORBUSH DECREASE (Columns 32 through 36)

Column 32 Onset Time. The day and hour is given if one is published in the literature, otherwise the date only is given.

Column 33 Magnitude of the Decrease in Percent. A number of cosmic ray storms are listed in reference 22. The entries in this portion of the catalogue are limited to decreases of two percent or greater.

Column 34 Duration in Hours, unless designated by the superscript d, which indicates a duration in days.

Column 35 Probable Flare (day/hour) - An entry is given if a flare - Forbush decrease association has been found in the literature.

Column 36 Sources, The numbers refer to the references.

TABLE VI CATALOGUE OF SOLAR-TERRESTRIAL EFFECTS DURII

SHORT WAVE FADE					SOLAR FLARE EFFECTS			POLAR-CAP ABSORPTIONS						
Onset UT	Imp.	Type	Durat. Min.	W.S. Index	Beg. UT	No. Obs. Rep.	Int.	Onset	Rise Time	Duration Hrs.	Abs. db. 30Mc/s Riom	Probable Flare	References	Onset
1640	3	S	120	5										
1416	3	S	33	5										
														08xx
														2143
														1104
0912	1	SL	40	1										
0938	3	S	74	5										1050
														1304
														0528
1755	3-	G	55	4										1341
0654	3	S	45	4										
1332	3	S	46	5										
								Feb.						
1325	3	S	35	5				10/0600	14	37	3.2	09/2108	1,12,16,19,23,	
1903	3	S	47	4									29,34,43,47	
0809	3	S	28	5										0125
														0159
														0008
														1642
1153	3	S	74	1										
0340	3	SL	95	-	0912	26	S							
1010	3+	S	95	5										0931
														0537
1542	3	S	81	5										
								Mar.				March		
0048	3	S	152	3				11/0311			Weak	11/0030	34	1156
1510	3	SL	170	5										
0052	3+	G	227	1										
1455	3	SL	130	5				14/1500	-	31	Weak		34	1212
														0258
														0750
														0201
0642	3	S	88	4										
0935	3	S	196	5	0952	29	S	23/1500	34	53	3.2	23/0947	1,23,43	
														1526
0525	2	SL	35	4				25/1530	13	122	10.0	25/0529	1,12,16,19,29	1540
												25/0557	34,43,47	
1535	3	S	83	5										
1034	3+	S	41	5	1033	23	S							
1149	3	S	50	3										
1708	3	S	70	5										
1340	3	S	35	5	1341	32	S							
1628	3	S	62	5										
1821	3	S	59	5	1819	7	-							
0842	3+	S	34	1	0107	13	-							0812
0955	3	S	50	4										

(2)

TABLE VI 1958 (CONTINUED)

POLAR-CAP ABSORPTIONS						GEOMAGNETIC STORMS								
Onset	Rise Time	Duration Hrs.	Abs. db. 30Mc/s Riom	Probable Flare	References	Onset	End	Type	Max. Int.	Max. Kp	No. Final Report Reference 3	47	ΣKp	Ap
						14xx	Apr. 03/06xx	g	m	5			27o	19
						0459			m	5	7		34+	34
						06xx	05/12xx	g	ms	6			34+	36
						0042	07/06xx		m	5			29-	23
10/0900	9	68	4.4	09/1435	1,12,16,19,29, 34,43									
						0912	15/10xx	g,sc	m	5	5		26-	20
						1949	20/15xx	sc	m	5			29+	25
						01xx	20/09xx	g	ms	6			34o	32
						1247	26/20xx	sc	m	5	50	47	17-	13
						0523			m	5	8	-	33+	31
						2010					4		15o	8
						12xx	May 16/02xx	sc	ms	6			31+	29
						1414					3		24o	16
						2311					9		10-	5
						1522	28/06xx	g	ms	7	7		14o	10
						0010	29/20xx	g	ms	6			40+	52
						1652	June 02/21xx	sc	s	8	68	74	38o	72
05/0815	-	57	Weak		34									
06/1345	-	9		06/0436	12,23,29,43									
						0046	07/22xx	sc	s	8	57	61	42-	77
						1728					28	-	19-	13
						1828	15/12xx	sc	m	5	64	69	18o	15
						0509					28	25	24+	21
						0206					17		43+	66
						0713	29/21xx	sc	s	8	62	68	36-	55
						1742					53	54		
						14xx	July 01/19xx	g	m	5			17+	9
						0306	04/22xx	sc	m	5			28-	21
07/0330	22	96	23.7	07/0020	12,16,19,23,29, 34,43	0741					13			
						0748	10/06xx	sc	s	9	72	70	55+	200

(2)

GEOMAGNETIC STORMS									FORBUSH DECREASE				
End	Type	Max. Int.	Max. Kp	No. Final Report Reference 3	47	ΣKp	Ap	Probable Flare	Onset	Mag. Dec. %	Duration Hrs.	Probable Flare	References
Jan.													
18/22xx	g	m	5			29o	22	15/1640					
21/11xx	g	ms	7			25+	20	20/0844 20/0935					
22/15xx	sc	m	5	9	-	26o	19						
25/18xx	sc	m	4	40	47	25+	19	23/0904					
Feb.													
08/21xx	sc	m	5	35	38	22+	17						
		m	5	10	-	33o	30						
	sc	m	5	3		32-	27						
13/01xx	sc	s	9	65 12	70 -	60-	199	09/2108	Feb. 11/0245	5.2	7d	09/2108	22,47,21,51
		ms	6	11	-	42+	59						
22/16xx	sc	m	5	51	57	21o	14						
Mar.									Mar.				
04/21xx	sc	m	5	49	55	25+	21	01/0905	03/17xx	2.	3d		22
08/09xx	g	ms	7	28		35o	39	03/1005	05/----	2.3	3d		22
13/21xx	g,sc	ms	7			27-	22	09/1540					
16/05xx	sc	ms	6	69	70	22o	20	12/0024	14/14xx	3.0	4d		22
	sc	m	5	11		28+	23						
17/21xx	g,sc	m	5	32		30o	27						
22/05xx	g,sc	ms	6			33+	34						
24/20xx	g	m	5	10		31+	27	23/0947					
27/03xx	sc	ms	6	65	67	33+	33	23/0947	25/1815 26/----	11.1	18	23/0947	21,22,51 47
31/06xx	g	ms	6			30o	32	29/1339					

(3)

3. VI-1

Date	Major Flare No.	Event Serial No.	FLARE						SHORT WAVE FADE					SOLAR FLARE EFFECTS		
			Beg. UT	End UT	Max. UT	Imp.	Position		Onset UT	Imp.	Type	Durat. Min.	W.S. Index	Beg. UT	No. Obs. Rep.	Int.
31		67	0038	0130	0052	2	S.08	W.23	0050	3+	S	80	5			
Apr. 1																
2		69	1951	2025	1954	1+	S.15	E.23	1952	2	S	30	5			
4																
6		72	1929	2025	1940	1	S.16	W.27								
9			1435	1534	1442	3	N.12	W.41	1435	1+	G	45	4			
10			1010	1150	1038	2	N.18	W.79								
14																
15																
16																
26																
27																
29	26		1855	2013	1912	2+	S.15	W.46	1855	3-	SL	85	5			
May 1									1815	3-	S	35	5			
3									1035	3	S	65	1			
4			1643	1652	1645	1+	N.19	W.30						1644	10	-
5	28	85	0356	0457	0415	3	S.18	W.29	0407	3	SL	53	5	0412	29	S
6																
13																
16																
20																
25																
29																
30	31		0656	0944	0731	3	N.23	E.90								
31																
June 1																
3	32		1507	1543	1512	3	N.30	W.53	1510	2+		25		1510	22	S
5	34	96	1615	1837	1631	2+	S.18	E.69	1620	3	S	100	5			
6			0436	0614	0448	3	N.16	W.78	0436	2	SL	50	5	0919	22	S
7																
8																
14																
15																
19			1425	1432	-	1	S.16	E.50	1437	3-	S	25	5	1439	13	-
21																
26	40	109	0245	0517	0306	3	N.10	E.49	0247	2+	SL	85	5			
28																
30																
July 4									1730	3	SL	150	3			
7	41	118	0020	0414	0110	3+	N.25	W.08	0025	3	SL	125	5			
8																

3. VI-2 (1)

Date	Major Flare No.	Event Serial No.	FLARE					
			Beg. UT	End UT	Max. UT	Imp.	Position	
Jan. 15	2	6	1640	1757	1642	2+	S.13	W.58
16		7	1414	1447	-	1+	N.18	E.23
17								
20			0844	0910	0851	2	N.10	W.42
			0935	0943	-	2	N.06	W.42
22								
23	4		0904	1053	0918	3	S.24	W.45
25	6	12	0915	1107	1005	3+	S.24	W.69
Feb. 4								
5								
8			1740	1950	1807	2	S.19	E.08
9			0654	0734	0659	2+(1)	S.12	W.48
		15	1330	1501	1431	1+	S.20	W.02
			2108	2302	1332	2+(1)	S.12	W.14
10	9	18	1320	1411	1332	3	S.13	W.63
		19	1900	2001	1908	2+(1)	S.14	W.64
11	10		0812	0847	0823	3	S.10	W.85
12								
16								
27			1155	1210			S.13	W.25
Mar. 1		25						
	12	26	0905	1007	0917	3	S.11	W.45
3	13	31	1005	1250	1020	3+	S.16	E.60
5								
7	16		1020	1224	1112	3	N.11	E.71
9		35	1540	1709	1546	2	N.34	W.32
11		36	0030	0042	0034	1	N.11	E.12
		38						
12		39	0024	0233	0037	2+	N.08	E.02
13								
14	17	42	1454	1541	1507	3	S.21	W.85
15								
17								
18								
20			0656	0955	0726	1+	N.25	E.60
23	18	45	0947	1627	1005	3+	S.14	E.78
24								
25			0529	0553	0530	2	N.16	E.24
		49	0557	0626	0603	2	S.15	E.50
26								
27	19	54	1534	1710	1552	2+	S.16	E.23
28		55	1030	1152	1058	2	S.24	E.26
			1145	1200	1148	1	N.27	W.58
	20	56	1703	1904	1714	2+	S.15	E.09
29		59	1339	1410	1334	2	N.35	E.78
		61	1630	1637	1632	1-	N.21	W.90
		62	1819	1915	1823	2	S.24	E.08
30			0045	0123	0106	2	N.35	E.74
			0850	1037	0917	2	S.22	W.09
	21	65	0915	1420	1000	2+	S.16	W.20

3. IL-1 (1)

	FORBUSH DECREASE				
Probable Flare	Onset	Mag. Dec. %	Duration Hrs.	Probable Flare	References
Mar. 30/0915					
	Apr. 26/14xx	2.0	8d		22
	May 29/----	5.5	6d		22,51
May 30/0656					
June 05/1615	June 07/----				51
06/0436					
	28/18xx	5.0	9d	26/0245	22,51
July 07/0020	July 08/0915	7.8	12	07/0020	21,22,51

3-VII-2

(3)

Date	Major Flare No.	Event Serial No.	FLARE					
			Beg. UT	End UT	Max. UT	Imp.	Position	
July 17								
18								
19	45	125	1905	2030	1908	2+	N.24	E.13
21								
27								
29	52	131	0259	0408	0304	3	S.14	W.44
30			1523	1637	1531	2	S.13	W.64
			2138	2204	2148	2	S.16	W.65
31			1058	1150	1122	2	S.13	W.77
Aug. 2			1906	1929	1910	1	S.09	E.05
4	55	137	0409	0610	0435	3	N.30	W.31
7	56	139	1457	1700	1508	3	S.16	E.71
13			0903	1040	0938	2	S.13	W.57
16	58	141	0432	0831	0440	3+	S.14	W.50
17								
18								
20	59	145	0043	0128	0045	3	N.16	E.17
			1006	1032	-	1	N.18	E.22
21								
22	61	148	1417	1717	1450	?	N.18	W.10
24								
26	64	151	0005	0124	0027	3	N.20	W.54
27								
28			1027	1045	1030	2+	S.18	W.65
Sept. 1			1027	1102	1035	1+	N.11	E.56
3								
4								
6								
7			1639	1726	1643	2	S.31	E.19
14	75	159	0822	1030	0835	3+	S.10	W.80
15								
16								
18			0350	0544	0413	2	S.14	E.12
22	79		0738	0910	0750	2+	S.19	W.42
			1009	1035	1017	2	N.17	W.65
25								
26								
30								
Oct. 2								
10								
19	82		0658	0820	0725	3	S.17	W.35
21	83	173	2318	2527	2330	3	S.04	W.22
22								
24	86	179	1410	1801	1457	3	S.05	W.57
27								

3. III-3

0

	FORBUSH DECREASE				
Probable Flare	Onset	Mag. Dec. %	Duration Hrs.	Probable Flare	References
24/1607	Nov. 28/03xx	2.4	3d	24/1607	22
29/0920					
03/0702 03/0823					
11/1802					
15/1030	Dec. 17/19xx	3.5	4d	15/1030	22,51

3. VI-4 (3)

TABLE VI 1958 (CONTINUED)

SHORT WAVE FADE					SOLAR FLARE EFFECTS			POLAR-CAP ABSORPTIONS							
Onset UT	Imp.	Type	Durat. Min.	W.S. Index	Beg. UT	No. Obs. Rep.	Int.	Onset	Rise Time	Duration Hrs.	Abs. db. 30Mc/s Riom	Probable Flare	References	Onset	End
														00xx	July 17/13xx
														0221	
1904	3	S	36	5											
														1636	22/14xx
														0323	28/06xx
0240	3+	SL	120	5	0301	24	S	July 29/0405	-	24	1.5	29/0259	1,16,19,23,29, 43		
1525	3+	S	115	5											
2130	3-	S	70	5											
1115	3	SL	45	5										1529	31/18xx
1840	3+	S	153	5											
0422	3	G	96	1											
1500	3+	S	105	5	1501	26	S								
0923	3-	S	57	5											
0432	3+	S	168	5	0434	19	S	Aug. 16/0600	16	71	12.1	Aug. 16/0432	1,12,16,19,23, 29,34,43		
0806	3-	SL	54	5										0622	Aug. 18/10xx
0042	2+	S	33	5	0042	7	-								
								21/1500	-	12	3	20/0142	1,16,19,23,29,43		
1435	3+	S	170	5				22/1530	11	84	10.6	22/1417	1,12,16,19,23, 29,34,43	0227	22/13xx
														0140	25/15xx
0010	3+	SL	240	5				26/0330	17	70	16.6	26/0005	1,12,16,19,23, 29,34,43		
														0243	27/23xx
1023	3	S	62	5										0303	
					1040	28	S								
														0843	Sept. 05/21xx
														1025	
														1339	
1658	3	S	45	5											
0851	3	S	58	5	0851	16	-								
0835	3	S	95	1										1752	
														0930	
0400	3+	S	113	1											
0755	2	S	35	1				Sept. 22/1400	22	80	5.0	22/0738 22/1009	1,12,16,19,23, 29,34,43		
														0408	26/13xx
														1005	30/23xx
0417	3	SL	92	1											
0200	3	S	60	5											
					0723	16	-								
2328	3+	S	72	5											
														0315	Oct. 25/01xx
1445	3+	SL	110	5										0651	
														0730	25/09xx
														1523	29/01xx

(2)

TABLE VI 1958 (CONTINUED)

EFFECTS		POLAR-CAP ABSORPTIONS						GEOMAGNETIC STORMS								
s.	Int.	Onset	Rise Time	Duration Hrs.	Abs. db. 30Mc/s Riom	Probable Flare	References	Onset	End	Type	Max. Int.	Max. Kp	No. Final Report Reference 3	47	ΣKp	Ap
								0650					55	44	35o	37
								0959					24		15o	7
								10xx	02/22xx	g	m	5	8		20-	16
								0912							12+	7
								0109	28/21xx	sc	m	4	48	43	26-	18
								0902	02/23xx	sc	m	5	6	-	26o	23
								0035	05/04xx	sc	ms	7	71	67	40-	54
	-															
	S															
	S															
								0001	14/03xx	sc	ms	6	68	55	39o	50
								1547	18/06xx	sc	ms	7	50	48	25o	30
								1817					55	43		
	S															

GEOMAGNETIC STORMS								FORBUSH DECREASE				
Type	Max. Int.	Max. Kp	No. Final Report Reference 3	47	ΣKp	Ap	Probable Flare	Onset	Mag. Dec. %	Duration Hrs.	Probable Flare	References
g	m	5			21-	16						
			15		34o	34						
sc	ms	7	72	76	34+	53	19/1905	July 21/17xx	4.1	72	19/1905	22,51
g	m	5	8		31o	28						
sc	m	5	63	67	21+	15	29/0259	31/17xx	2	4d	29/0259	22
sc	ms	7	71	70	41+	82	16/0432	Aug. 17/0600	5.8	26		21,22,51
sc	ms	6	72	72	31+	34	20/0043					
sc	s	8	72	70	44+	85	22/1417	24/0230	9.1	8	22/1417	21,22
								26/----				47
sc	ms	7	19		42+	64	26/0005	27/04xx	3.8	5d	26/0005	22
sc			42	39								
sc	s	9	70	70	39o	64	02/2102	Sept. 03/09xx	3.7	5d	01/0036	22
			11	-	49o	131						
			14	-								
			6	-	12+	6						
			53	56	37o	40	14/0822	16/12xx	4.1	7d	14/0832	22
sc	ms	7	73	71	47o	82	22/0738					
sc	m	5	67	67	23+	20		30/11xx	3.4	6d		22
sc	ms	6	74	65	36+	47	19/0658	Oct. 22/04xx	5.5	10d	19/0658	22,51
			3		49-	89	21/2318	24/08xx	2.0	4d	21/2318	22
sc	ms	7	69	54			21/2318					
sc	ms	6	60	53	29o	30	24/1410					

3. III-3

(3)

			FLARE						SHORT WAVE FADE					SOLAR FLARE	
Date	Major Flare No.	Event Serial No.	Beg. UT	End UT	Max. UT	Imp.	Position		Onset UT	Imp.	Type	Durat. Min.	W.S. Index	Beg. UT	No. Ob Rep.
28															
31	89		0945	1049	1001	3	S.19	E.39	0955	2-	S	39	3		
Nov. 1															
2															
23															
28															
29	93		0920	1025	0940	2+	N.19	W.40	0933	1+	S	19	3		
Dec. 2															
3	94		0702	0741	0706	3	N.16	E.87	0703	1+	S	20	4		
	95		0823	1107	0955	2+	N.15	E.85							
4															
11			1802	1842	1812	2	S.02	00	1808	2+	S	32	5	1809	7
12	96		0054	0123	0107	2+	S.01	W.06	0105	2	S	27	5	0106	19
	97	206	1215	1547	1304	2+	S.03	W.08						1257	37
13															
15	98		1030	1230	1041	3	S.16	W.18							
17															
23	99	215	0545	0803	0624	3	S.15	E.66	0540	3-	G	73	4		
24			0946	0101	0950	1+	S.14	E.54						0947	20

3. VI- 4 (1)

VII. CATALOGUE OF BALLON FLIGHTS

ASSOCIATED WITH MAJOR SOLAR

FLARES DURING 1958

TABLE VII. CATALOGUE OF BALLOON FLIGHTS ASSOCIATED WITH MAJOR SOLAR FLARES DURING 1958

At least 871 balloon flights were made during 1958 and reported to the World Data Center A for Cosmic Rays, and listed in the Annals of the IGY Vol. 28 (Ref. 50); 677 of these balloon flights were made within four days after a major solar flare, a solar spectral emission of Type II (slow drift), or Type IV (broad band continuum), or a polar-cap absorption. 14 Additional balloon flights not reported in reference 50 are included in Table VII A. A description of the column headings follow:

Column 1 Flight Serial Number

Column 2 Greenwich Date

Column 3 Event Number. This refers to the event serial number in Table VIII.

Column 4 Flare Serial Number. This refers to the major flare serial number in Table I. Minor flares are those associated with Type II, or Type IV spectral emissions, or Polar-cap absorption, listed in Columns 7, 8 or 9.

Column 5 Beginning Time of the Flare

Column 6 Flare Importance

Column 7 Spectral Observations Type II Beginning Time

Column 8 Spectral Observations Type IV Beginning Time

Column 9 Polar-cap Absorption, Greenwich day/beginning UT

BALLOON DATA (Columns 10 through 17)

Column 10 Launch Date

Column 11 Time the Flight Reached Recording Altitude

Column 12 Maximum Altitude. This is given in either kilometers or milibars as reported in reference 50.

Column 13 Name of the Place Where Balloon was Launched.

Column 14 Geographical Latitude and Longitude.

Column 15 Instrument Carried. Where:
C = Single Geiger Counter
SC = Scintillations Counter
T = Double Coincidence Counter Telescope
EM = Emulsion pack
I = Ionization Chamber

Column 16 Group. These have been designated as follows.

Bartol - Bartol Research Foundation, Dr. Martin A. Pomerantz

MSU - Moscow State University
A. N. Charakchian, or
S. N. Vernon

Minn. - School of Physics, University of Minnesota
Dr. J. R. Winckler

Yakutsk- Yakutsk Filial Academy of Sciences of USSR
Dr. Yu G. Shafer

Melbourne-Department of Physics, University of Melbourne
Dr. V. D. Hopper

New York-Department of Physics, New York University
Dr. S. A. Korff

CIT - Norman Bridge Laboratory of Physics
California Institute of Technology
Dr. H. V. Neher

UC - Department of Physics, University of California,
Berkeley, Dr. Kinsey A. Anderson

Column 17 Published Balloon Flight Data. References that discuss the data obtained during some of the flights are listed. A more detailed reference list will be given in the Bibliography volume. In general, only large or outstanding changes in the radiation count are discussed in the literature.

The references listed in Column 17 are given on pages 3.V-iii through 3.V-v. The balloon flights from which data are discussed are listed following each reference.

REFERENCES FOR TABLE 3.VII
BALLOON FLIGHTS DURING 1958

1. Anderson, H. R., Sudden Increase of Cosmic Ray Intensity, Phys. Rev. 116 (1959) 461-462

   Flights 506, 507, 511, 512

2. Anderson, K. A., Ionizing Radiation Associated with Solar Radio Noise Storm, Phys. Rev. Ltrs. 1 (1958) 335-337

   Flight 372

3. Anderson, K. A., R. Arnoldy, R. Hoffman, L. Peterson, and J. R. Winckler, Observations of Low-energy Solar Cosmic Rays from the Flare of 22 August 1958, J. Geophys., Res. 64 (1959) 1133-1147

   Flights 372, 376, 378, 380, 382, 383, 384

4. Charakhchian, A. N., V. F. Tulinov, and T. N. Charakhchian, Cosmic Rays Emitted by the Sun, Space Research 1, Proc. First International Space Science Symposium, Ed. H. Kallman Bijl. (1960) 649-661

   Flights 59, 228, 230, 388, 489

5. Freier, P. S., E. P. Ney, and C. J. Waddington, Lithium, Beryllium, and Boron in the Primary Cosmic Radiation, Phys. Rev., 113 (1959) 921-927

6. Freier, P. S., E. P. Ney, and C. J. Waddington, Flux and Energy Spectrum of Cosmic-ray -particles During Solar Maximum, Phys. Rev., 114 (1959) 365-373

7. Freier, P. S., E. P. Ney, and J. R. Winckler, Balloon Observations of Solar Cosmic Rays on March 26, 1958, J. Geophys. Res. 64 (1959) 685-688

   Flights 69, 79, 111

8. Haymes, R. C., High Altitude Neutron Intensity, Diurnal Variation, Phys. Rev. 116 (1959) 1231-1237

   Flights 453,477

9. Meyer, Peter, Primary Cosmic-Ray Protons and Alpha-Particle Intensities and Their Variation with Time, Phys. Rev. 115 (1959) 1734-1741

   Flights 245, 288

10. Neher, H. V., Latitude Survey of High Altitude Cosmic Rays, Cal. Inst. Tech. Report (1958)

Flights 199, 206, 213, 219, 248, 255, 261, 281

11. Neher, H. V., Changes of Cosmic Rays in Space, Nature 184 (1959) 423-425

12. Neher, H. V., Cosmic Ray Knee in 1958, J. Geophys. Res. 66 (1961) 4007-4012

13. Peterson, L. and J. R. Winckler, Short Gamma-ray Bursts from a Solar Flare, Phys. Rev. Ltrs. 1 (1958) 205-206

14. Peterson, L. F. and J. R. Winckler, Gamma Ray Bursts from a Solar J. Geophys. Res. 64 (1959) 697-708

Flights 65, 68, 69

15. Pomerantz, M. A., S. P. Agarwal, and V. R. Potnis, Nature of the Current Reduction in the Primary Cosmic-Ray Intensity, Phys. Rev. Ltrs. 1 (1958) 65-68

Flights 124, 125, 126, 127, 128, 129, 130

16. Pomerantz, M. A., S. P. Agarwal, and V. R. Potnis, Nature of the Current Reduction in the Primary Cosmic-Ray Intensity, Phys. Rev. Ltrs. 1 (1958) 65-68

Flights 124, 125, 126, 127, 128, 129, 130

17. Pomerantz, M. A., S. P. Agarwal, and V. R. Potnis, Balloon Flights Investigations of Primary Cosmic Rays During Solar Disturbances, J. Franklin Inst. 269 (1960) 235-244

Balloon Flights 4, 10, 33, 49, 125, 128, 129, 190, 296, 300, 305, 377, 393, 398, 402, 422

18. Rynko, N. P., V. F. Tulinov, and A. N. Charakhchian, A Case of a Sharp Increase in Cosmic Ray Intensity in the Stratosphere, Soviet Physics, JETP 9 (1959) 1202

Balloon Flights 224, 229

19. Shafer, Yu. G., The Effect of Diminishing Solar Activity and Cosmic Ray Intensity from Measurements in the Stratosphere, Moscow Cosmic Ray Conference, July 6-11, 1959, Pub. Proceedings IV (1960) 71-77.

Discussion of Flights made at Yakutsk, USSR

20. Vernov, S. N., V. F. Tulinov, and A. N. Charakhchian, The 27-day Cosmic-Ray Period in the Stratosphere, Soviet Physics DOKLADY 3 (1958) 980-982

Balloon Flights 2, 3, 5, 6, 7, 8, 9, 11, 13, 14, 15, 17, 18, 20

21. Vernov, S. N., B. E. Sumosudov, V. F. Tulinov, A. N. Charakhchian, and T. N. Charakhchian, Studies of Intensity Variations of Cosmic Radiation in the Stratosphere, presented at the Moscow Cosmic Ray Conference, July 6-11, 1959, Pub. Proceedings IV (1960) 49-60

Report on the data from many of the MSU (Moscow State University flights)

22. Winckler, J. R., L. Peterson, R. Hoffman, and R. Arnoldy, Auroral x-rays, Cosmic Rays and Related Phenomena During the Storm of February 10-11, 1958, J. Geophys. Res. 64 (1959) 597-610

Flight 29

23. Winckler, J. R., Balloon Study of High Altitude Radiation During the International Geophysical Year, J. Geophys. Res. 65 (1960) 1331-1359

Flights 69, 70, 79, 80, 111, 195, 240, 249, 275, 279, 360, 376, 380, 395, 396, 467, 471, 566

24. Yayoda, Herman, Cosmic Ray Monitoring of the Manned Stratolab Balloon Flights, AFCRL- TN-60-640, GRD Res. Notes No. 43 (Sept. 1960)

Flight 309a

TABLE VII BALLOON FLIGHTS ASSOCIATED WITH MAJOR SOLAR FLARES DURING 1958

		FLARE			SPECTRAL		PCA						LOCATION					
Gr. Day	Event No.	Serial No.	Beg. UT	Imp	Type II Beg. UT	Type IV Beg. UT	Gr. Day/ Beg. UT	Launch Gr. Day	Launch UT	Time at Altitude Hr.	Time at Altitude Min.	Altitude Km	Altitude mb	Place	Geographic Lat.	Geographic Long.	Instruments Carried	Group	Notes
Jan.								Jan.											
1 07	1		1820	2		1829		07	1522	3	45	24		Swarthmore, Pa.	N39.9	W 75.4	T	Bartol	Pomerantz (1960)
2								09	0702	2	00	29		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
3								10	0700	2	15	31		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	Vernov et. al. (1960)
4 13		1	1258	3				13	1600	3	45	31		Swarthmore, Pa.	N39.9	W 75.4	T	Bartol	
5								14	0703	2	00	29		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
6 15	4	No Flare Reported			0335			16	0702	2	20	27		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
	6	2	1640	3		1640													
7 16	8		2255	2	2313			17	0655	2	30	12		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
8 18	10		2253	1	2257			20	0700	0	53	9		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
9									0850	0	55	10		Murmansk, USSR	N69	E 33.1	C	MSU	
10									1546	3	00	27		Swarthmore, Pa.	N39.9	W 75.4	T	Bartol	
11 20		3	1435	2+		1445		21	0701	1	20	15		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
12								22	1129	8	50		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	Winckler (1960)
13								23	0700	1	40	32		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
14								23	0902	1	00	11		Murmansk, USSR	N69	E 33.1	C	MSU	
15 23		4	0904	3				24	0701	2	05	28		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
16 25		5	0035	3+				27	0517	0	42		95	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	Shafer et. al. (1960)
17	12	6	0915	3+					0702	2	30	31		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
18		7	1205	3					0858	0	35	7		Murmansk, USSR	N69	E 33.1	C	MSU	
19									1825	0	37		124	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
20								28	0705	2	50	31		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
21								29	0530	0	58		106	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
22 31		8	1148	3				31	1526	0	21		100	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
								Feb.											
23								03	0333	0	36		30	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
24									0700	2	10	23		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
25									0858	2	05	17		Murmansk, USSR	N69	E 33.1	C	MSU	
26								04	0700	2	25	30		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
Feb.																			
27 09	16		2108	2+		2116		10	0548	0	22		65	Yakutsk, USSR	N55.9	E 37.5	T	Yakutsk	
28 10	18	9	1320	3		1325			1705	0	15		150	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
29	19		1900	1+	1911			11	0440	3	50		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	Winckler et. al. (1959)
30 11		10	0812	3				11	0700	2	20	30		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
31								12	0556	0	22		84	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
32*									0700	3	25	30		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	See 32A Table VII A
33*									1520	3	45	30		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
34								13	0701	2	05	21		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
35									0733	0	44		70	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
36									0848	1	20	19		Murmansk, USSR	N69	E 33.1	C	MSU	
37								14	0705	1	40	33		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
38									1726	0	36		140	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
39 25		11	0450	3				25	-	4	00	35		Victoria, Australia	S 38	E 145	EM	Melbourne	
40									0700	1	40	34		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
41 26	23		0527	2	0602	0551		27	0702	2	55	34		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
42									0903	2	20	17		Murmansk, USSR	N69	E 33.1	C	MSU	
43								28	0700	1	35	34		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
Mar.																			
01	26	12	0905	3+															
	27				2041														

* Several flights by aUniversity of New Hampshire group were not listed at the World Data Center. These are listed on page 3. VII - 13, and noted with a * at the appropriate Serial Number.

TABLE VII. 1958 (CONTINUED)

Gr. Day	Event No.	FLARE Serial No.	FLARE Beg. UT	FLARE Imp	SPECTRAL Type II Beg. UT	SPECTRAL Type IV Beg. UT	PCA Gr. Day/ Beg. UT	Launch Gr. Day	Launch UT	Time at Altitude Hr.	Time at Altitude Min.	Altitude Km	Altitude mb	LOCATION Place	Geographic Lat.	Geographic Long.	Instruments Carried	Group	Notes
Mar.								Mar.											
44 02	28				0009			03	0703	2	30	30		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
45 03	31	13	1005	3+		1005			0903	1	35	19		Murmansk, USSR	N69	E 33.1	C	MSU	See 45 A Table VII A
46*									1116	1	05	10		Murmansk, USSR	N69	E 33.1	C	MSU	
47 03		No Flare Reported				1350		04	0701	2	20	20		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
48 05	32	14	0500	3				05	-	1	00	37		New South Wales, Australia	-	-	EM	Melbourne	
49		15	0500	3					1129	4	30	32		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
50								06	0700	2	35	36		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
51									0856	1	00	19		Murmansk, USSR	N69	E 33.1	C	MSU	
52								07	0700	2	15	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
53 07		16	1020	3				10	0658	2	15	27		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
54									0902	2	30	26		Murmansk, USSR	N69	E 33.1	C	MSU	
55 11	36		0030	1	0032			11	0700	2	25	39		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
56 12	39		0024	2+	0043			13	0702	2	00	19		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
57									0900	3	15	21		Murmansk, USSR	N69	E 33.1	C	MSU	
58								14	0703	2	55	25		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
							Mar.												
59 14	42	17	1454	3	1453		14/1500	17	0703	2	05	16		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
60									0907	2	30	28		Murmansk, USSR	N69	E 33.1	C	MSU	
61									1218	3	15	33		Murmansk, USSR	N69	E 33.1	C	MSU	Charakhchian, et. al. (1960)
62									1612	2	15	17		Murmansk, USSR	N69	E 33.1	C	MSU	
63*								18	0703	2	25	28		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	See 63A Table VII A
64 20			0656	1+		0634		20	0700	2	00	17		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
65									0842	8	00		10	Guantanamo, Cuba	N19.9	W 75.1	C, I, EM	Minn.	Peterson, Winckled (1958)
66									0904	2	30	22		Murmansk, USSR	N69	E 33.1	C	MSU	
67								21	0707	1	40	33		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
68									0740	9	00		10	Guantanamo, Cuba	N19.9	W 75.1	C, I, EM	Minn.	Peterson, Winckler (1959)
69									0745	6	35		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	Freier, et. al. (1959)
70									0911	-	-		10	Brownwood, Texas	N32	W 99	C, I, EM, T	Minn.	
71								22	0659	0	55	17		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
72 23	45	18	0947	3+		1003	23/1500	24	0700	1	45	29		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
73									0907	2	05	19		Murmansk, USSR	N69	E 33.1	C	MSU	
74 24	48		1607	1	1643			25	0635	0	16		74	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
75									0700	2	15	21		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
76									1530	0	50		260	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
77									2218	0	27		144	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
78 25	52				2320			26	0458	0	47		78	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
79 26	53		0036	1	0035				1136	6	38		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	Freier, et. al. (1959)
80									1204	7	20		10	Brownwood, Texas	N32	W 99	C, I, EM	Minn.	
81								27	0558	0	42		40	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
82									0702	2	20	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
83									0859	3	15	22		Murmansk, USSR	N69	E 33.1	C	MSU	
84 27	54	19	1534	2+				28	0430	0	45		15	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
85									0703	2	40	29		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
86 28	56	20	1703	2+		1702			1945	0	24		40	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
87	57		1833	2	1837			29	0832	1	40	15		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
88 29	60		1447.1	1	1452			30	1240	0	56		40	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
89	61		1630	1-	1630				1837	0	03		80	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
90 30	65	21	0915	2+				31	0532	0	25		26	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
91									0700	1	40	35		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
92									0900	3	35	-	-	Murmansk, USSR	N69	E 33.1	C	MSU	
93									1725	0	10		242	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
								Apr.											
94								01	0220	0	08		40	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
95									0700	2	10	20		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	

TABLE VII. 1958 (CONTINUED)

Gr. Day	Event No.	FLARE Serial No.	FLARE Beg. UT	FLARE Imp	SPECTRAL Type II Beg. UT	SPECTRAL Type IV Beg. UT	PCA Gr. Day/ Beg. UT	Launch Gr. Day	Launch UT	Time at Altitude Hr.	Time at Altitude Min.	Altitude Km	Altitude mb	LOCATION Place	Geographic Lat.	Geographic Long.	Instruments Carried	Group	Notes
Apr.								Apr.											
96 01		22	1050	3-				02	1012	0	22		48	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
97									0700	2	35	27		Crimea, USSR	N44.9	E 34	C	MSU	
98									0700	3	15	34		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
99 02	69		1951	1+	1955	1953		03	0704	6	40	32		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
100									0902	3	00	40		Murmansk, USSR	N69	E 33.1	C	MSU	
101								04	0403	2	45	28		Crimea, USSR	N44.9	E 34	C	MSU	
102									0443	0	50		54	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
103									0700	2	35	22		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
104									1940	0	45		132	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
105								05	0701	2	00	27		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
106								06	0704	2	40	32		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
107 06	72		1929	1		1936		07	0700	2	10	23		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
108									0727	2	00	34		Murmansk, USSR	N69	E 33.1	C	MSU	
109 07	73	23	1010	3				08	0542	2	35	35		Crimea, USSR	N44.9	E 34	C	MSU	
110 08	74		0301	1	0304				0701	3	00	32		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
111*									1109	9	00		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	See III A Table VII A
112 09		24	1435	3				10	0425	1	40	18		Crimea, USSR	N44.9	E 34	C	MSU	
113									0700	2	00	21		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
114									0704	1	30	30		Crimea, USSR	N44.9	E 34	C	MSU	
115									0710	3	15	27		Murmansk, USSR	N69	E 33.1	C	MSU	
116								11	0700	1	40	32		Crimea, USSR	N44.9	E 34	C	MSU	
117									0703	2	00	25		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
118 11	76				1340			12	0701	3	20	33		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
119								14	0710	3	00	32		Murmansk, USSR	N69	E 33.1	C	MSU	
120									1219	1	50	37		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
121								15	0700	1	35	17		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
122									0705	3	40	29		Crimea, USSR	N44.9	E 34	C	MSU	
123									1200	2	25	28		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
124* 29		25	1128	3				29	1216	2	45	25		Durham, N. C.	N36	W 78.9	T	Bartol	See 124 A Table VII A
125		26	1855	2+				30	1054	4	00	30		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
126									1124	3	30	24		Durham, N. C.	N36	W 78.9	T	Bartol	
								May											
127 30	82		1930	1+	1934			01	1447	3	30	33		Durham, N. C.	N36	W 78.9	T	Bartol	
128	82		1932	1+	1934				1831	4	30	32		Swarthmore, Pa.	N39.9	W 75.4	T	Bartol	
May																			
129 01	83	27	2115	3				02	1110	4	00	31		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
130									1136	4	00	31		Durham, N. C.	N36	W 78.9	T	Bartol	
131 05	85	28	0356	3		0412		05	0702	3	35	33		Murmansk, USSR	N69	E 33.1	C	MSU	
132		29	0856	3					0704	2	50	30		Crimea, USSR	N44.9	E 34	C	MSU	
133									1200	2	35	33		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
134 06		30	0335	3				06	0704	2	30	29		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
135									1011	2	15	20		Crimea, USSR	N44.9	E 34	C	MSU	
136								08	0700	3	30	32		Murmansk, USSR	N69	E 33.1	C	MSU	
137									0701	1	37	35		Crimea, USSR	N44.9	E 34	C	MSU	
138								09	0700	3	10	18		Murmansk, USSR	N69	E 33.1	C	MSU	
139									0710	2	10	27		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
140*									1210	3	25	34		Crimea, USSR	N44.9	E 34	C	MSU	See 140 A Table VII A
141 19	90				1826			20	0700	1	50	38		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
142									0700	3	10	32		Murmansk, USSR	N69	E 33.1	C	MSU	
143									0800	2	50	28		Crimea, USSR	N44.9	E 34	C	MSU	
144									1543	0	40		78	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
145								21	0710	1	50	33		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
146								22	0700	1	55	34		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
147									0700	3	10	34		Murmansk, USSR	N69	E 33.1	C	MSU	
148									1441	4	00	25		Swarthmore, Pa.	N39.3	W 75.4	I	Bartol	
149								23	0700	2	31	36		Crimea, USSR	N44.9	E 34	C	MSU	
150									0700	3	15	34		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
151									0701	3	25	26		Murmansk, USSR	N69	E 33.1	C	MSU	

TABLE VII. 1958 (CONTINUED)

	Gr. Day	Event No.	FLARE Serial No.	FLARE Beg. UT	FLARE Imp	SPECTRAL Type II Beg. UT	SPECTRAL Type IV Beg. UT	PCA Gr. Day/ Beg. UT	Launch Gr. Day	Launch UT	Time at Altitude Hr.	Time at Altitude Min.	Altitude Km	Altitude mb	LOCATION Place	Geographic Lat.	Geographic Long.	Instruments Carried	Group	Notes
	May								May											
152	30		31	0656	3				30	0700	2	37	33		Crimea, USSR	N44.9	E 34	C	MSU	
153										0700	2	15	23		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
154										0700	4	00	34		Murmansk, USSR	N69	E 33.1	C	MSU	
155									31	0700	2	30	40		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
									June											
156									02	0700	4	00	36		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
157										1130	3	35	39		Murmansk, USSR	N69	E 33.1	C	MSU	
	June																			
158	03		32	1507	3				04	0701	2	40	38		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
159	04	94		2147	2		2148		05	0700	1	50	34		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
160										0702	2	40	32		Murmansk, USSR	N69	E 33.1	C	MSU	
161										0707	1	20	21		Crimea, USSR	N44.9	E 34	C	MSU	
162	05	95	33	0835	2+		0839		06	0700	2	20	20		Murmansk, USSR	N69	E 33.1	C	MSU	
163		96	34	1615	2+		1617	June		0910	1	35	35		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
164	06	97	35	0436	3		0434	06/1345	08	0700	3	05	32		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
165	09		36	0557	3				09	0700	1	50	20		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
166										0700	1	45	32		Murmansk, USSR	N69	E 33.1	C	MSU	
167										0817	1	30	31		Crimea, USSR	N44.9	E 34	C	MSU	
168									10	0703	2	30	27		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
169										0704	2	15	22		Murmansk, USSR	N69	E 33.1	C	MSU	
170										0816	1	45	31		Crimea, USSR	N44.9	E 34	C	MSU	
171									11	0703	2	40	30		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
172									12	0700	2	40	28		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
173										0700	3	15	30		Murmansk, USSR	N69	E 33.1	C	MSU	
174									13	0452	2	40	33		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
175	14	104		2112	1	2120.5			16	0424	2	00	29	14	Prince Albert, Canada	N53.2	W105.7	SC, T, C	Chicago	
176										0700	3	42	31		Murmansk, USSR	N69	E 33.1	C	MSU	
177										0702	4	00	28		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
178										0704	1	15	17		Crimea, USSR	N44.9	E 34	C	MSU	
179									17	0703	3	50	33		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
180										0746	3	00	22		Murmansk, USSR	N69	E 33.1	C	MSU	
181										0812	1	20	24		Crimea, USSR	N44.9	E 34	C	MSU	
182									18	0235	8	30		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
183										0700	3	10	31		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
184										0701	2	40	18		Murmansk, USSR	N69	E 33.1	C	MSU	
185	19		37	0212	3				19	0701	2	30	29		Murmansk, USSR	N69	E 33.1	C	MSU	
186										0701	3	15	33		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
187										0810	1	20	18		Crimea, USSR	N44.9	E 34	C	MSU	
188	19	105	38	0940	3					1300	7	00	27		South St. Paul, Minn.	N44.9	W 93	NM	New York	
189										2114	3	00	29		Swarthmore, Pa.	N39.3	W 75.4	I	Bartol	
190									20	0429	9	30	20		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
191										0505	0	00		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
192										0700	3	15	35		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
193										0700	1	50	33		Murmansk, USSR	N69	E 33.1	C	MSU	
194										0703	1	55	27		Crimea, USSR	N44.9	E 34	C	MSU	
195									21	0100	1	00		10	Minneapolis, Minn.	N44.9	E 93.3	C, I, EM	Minn.	
196										0659	2	50	28		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
197									22	0702	2	05	22		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
198										1127	3			40	Victoria, Texas	N28.8	W 97	I	CIT	
199										1152	34			13	Bismark, N. D.	N46.8	W100.7	I	CIT	Neher (1960), 1961
200	23		39	0700	3				23	0700	3	20	33		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
201										0700	3	38	23		Murmansk, USSR	N69	E 33.1	C	MSU	
202										0716	1	45	37		Crimea, USSR	N44.9	E 34	C	MSU	
203									24	0701	2	40	33		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
204										0725	1	50	37		Murmansk, USSR	N69	E 33.1	C	MSU	

TABLE VII. 1958 (CONTINUED)

			FLARE			SPECTRAL		PCA						LOCATION					
	Gr. Day	Event No.	Serial No.	Beg. UT	Imp	Type II Beg. UT	Type IV Beg. UT	Gr. Day/ Beg. UT	Launch Gr. Day	Launch UT	Time at Altitude Hr.	Time at Altitude Min.	Altitude Km	Altitude mb	Place	Geographic Lat.	Geographic Long.	Instruments Carried	Group	Notes
205									June 24	0816	2	08	18		Crimea, USSR	N44.9	E 39	C	MSU	
206										1151	7			18	Bismark, N. D.	N46.8	W100.7	I	CIT	Neher (1960), 1961
207										1339	3			50	Corsicana, Texas	N32.1	W 96.5	I	CIT	
208									25	0706	3	15	28		Dolgoprudnaya, USSR	N55.1	E 37.5	C	MSU	
209	June 26	109	40	0245	3		0319		26	0700	2	36	24		Crimea, USSR	N44.9	E 34	C	MSU	
210										0700	3	03	34		Murmansk, USSR	N69	E 33.1	C	MSU	
211										0702	4	20	29		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
212										1141	8			9	Ardmore, Oklahoma	N34.2	W 96.5	I	CIT	
213										1253	36			6	Bismark, N. D.	N46.8	W100.7	I	CIT	Neher
214									27	0231	8	21		11	Neepowa, Canada	N50.3	W 99.5	SC, T, C	Chicago	
215										0700	2	52	32		Murmansk, USSR	N69	E 33.1	C	MSU	
216										0800	1	40	35		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
217										1047	1	55		10	Moberly, Mo.	N39.4	W 92.4	C, I, EM	Minn.	
218										1130	8			11	El Dorado, Kansas	N37.8	W 96.8	I	CIT	
219										1136	17			26	Bismark, N. D.	N46.8	W100.7	I	CIT	Neher
220										1153	3	25		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
221									29	1128	42			14	Bismark, N. D.	N46.8	W100.7	I	CIT	Neher
222										1130	37			8	Omaha, Nebraska	N41.3	W 90	I	CIT	
223	July 07	118	41	0020	3+	0032.5	0052	July 07/0330	July 07	0430	7	39		12	Neepawa, Canada	N50.3	W 99.5	SC, T, C	Chicago	
224						0101	0145			0659	2	08	22		Murmansk, USSR	N69	E 33.1	C	MSU	
225										0700	2	20	28		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
226*										0706	2	20	22		Crimea, USSR	N44.9	E 34	C	MSU	See 226 A Table VII A
227									08	0325	0	57		50	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
228										0654	2	45	36		Crimea, USSR	N44.9	E 34	C	MSU	
229										0700	1	57	29		Murmansk, USSR	N69	E 33.1	C	MSU	Rynko, et. al. (1959)
230										0703	1	55	19		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
231										1234	2	25	35		Murmansk, USSR	N69	E 33.1	C	MSU	Charakhchian et. al. (1960)
232									09	1200	2	30	30		Dolgoprudnaya, USSR	N55.9	E 57.5	C	MSU	
233									10	0337	0	41		110	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
234										0638	1	50	29		Crimea, USSR	N44.9	E 34	C	MSU	
235										0704	3	40	30		Murmansk, USSR	N69	E 33.1	C	MSU	
236										0757	2	03		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
237										0957	2	23	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
238										1828	0	52		65	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
239									11	-	1	00	31		Victoria, Australia	N28.8	W 97	EM	Melbourne	
240										0137	0	40		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
241	11		42	0740	3				11	0700	1	30	25		Crimea, USSR	N44.9	E 34	C	MSU	
242										0700	2	40	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
243										0700	2	48	29		Murmansk, USSR	N69	E 33.1	C	MSU	
244									12	0422	0	55		64	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
245	12		43	0744	3					0626	6	38		11	Neepawa, Canada	N50.3	W 99.5	SC, T, C	Chicago	Meyer (1959)
246										0900	1	28	21		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
247										1340	40			6	USS ATKA	-	-	I	CIT	
248										1357	10			22	Bismark, N. D.	N46.8	W100.7	I	CIT	
249	12	121		2317	1	2329.8			13	0049	9	30		10	Minneapolis, Minn.	N44.9	E 93.3	C, I, EM	Minn.	
250									14	0534	0	20		60	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
251										0658	2	10	25		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
252										0702	1	17	28		Murmansk, USSR	N69	E 33.1	C	MSU	
253										0712	2	37	26		Crimea, USSR	N44.9	E 34	C	MSU	
254										1346	79			8	USS ATKA	-	-	I	CIT	
255										1400	40			6	Bismark, N. D.	N46.8	W100.7	I	CIT	
256										1421	0	05		32	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
257									15	0700	2	17	25		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
258										0706	2	12	18		Crimea, USSR	N44.9	E 34	C	MSU	
259	15		44	0914	3				15	0707	2	35	27		Murmansk, USSR	N69	E 33.1	C	MSU	
260										1352	14			10	USSR ATKA	-	-	I	CIT	
261										1359	25			13	Bismark, N. D.	N46.8	W100.7	I	CIT	
262									16	0423	0	35		16	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
263										0700	4	11	25		Murmansk, USSR	N69	E 33.1	C	MSU	
264										0702	1	45	30		Dolgoprudnaya, USSR	N55.9	E 37.4	C	MSU	
265										1407	0	26		70	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	

TABLE VII. 1958 (CONTINUED)

Gr. Day	Event No.	FLARE Serial No.	FLARE Beg. UT	FLARE Imp	SPECTRAL Type II Beg. UT	SPECTRAL Type IV Beg. UT	PCA Gr. Day/ Beg. UT	Launch Gr. Day	Launch UT	Time at Altitude Hr.	Time at Altitude Min.	Altitude Km	Altitude mb	LOCATION Place	Geographic Lat.	Geographic Long.	Instruments Carried	Group	Notes
								July											
266								17	0700	2	37	22		Crimea, USSR	N44.9	E 34	C	MSU	
267									0700	2	43	30		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
268									0954	2	25	21		Murmansk, USSR	N69	E 33.1	C	MSU	
269									1350	01			13	USS ATKA	–	–	I	CIT	
270									1402	55			7	Bismark, N. D.	N46.8	W100.7	I	CIT	
271								18	0640		55		115	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
272									0700	2	37	31		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
273									0715	2	20	22		Crimea, USSR	N44.9	E 34	C	MSU	
274									1446	0	24		98	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
275									2201	2	15		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
276								19	0700	3	30	29		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
277									0700	2	07	22		Murmansk, USSR	N69	E 33.1	C	MSU	
	July																		
278	19	125	45	1905	2+	1907	1905	19	1402	46			7	Bismark, N. D.	N46.8	W100.7	I	CIT	
279								20	0040	16	30		8-15	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
280	20		46	0636	3				1356	06			9	USS ATKA	–	–	I	CIT	
281			47	1203	3				1412	37			13	Bismark, N. D.	N46.8	W100.7	I	CIT	
282								21	0700	2	50	24		Crimea, USSR	N44.9	E 34	C	MSU	
283									0701	1	56	30		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
284									0702	2	20	26		Murmansk, USSR	N69	E 33.1	C	MSU	
285									0419	0	48		184	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
286									1442	0	40		46	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
287								22	0040	5	10		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
288									0430	8	51		12	Neepawa, Canada	N50.3	W 99.5	SC, T, C	Chicago	Meyer (1959)
289									0700	2	24	16		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
290									0702	2	10	22		Crimea, USSR	N44.9	E 34	C	MSU	
291									1205	2	50	25		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
292	23		48	0503				23	0702	2	50	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
293			49	1125					1558	0	00		30	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
294			50	1259			1322	24	0700	3	15	29		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
295									0700	1	36	28		Murmansk, USSR	N69	E 33.1	C	MSU	
296									1103	5	00	31		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
297									1149	7	15	26		Tallahassee, Florida	N30.5	W 84.4	T	Bartol	
298	24	129		2327	2+			25	0215	9	16		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
299									0701	1	25	33		Murmansk, USSR	N69	E 33.1	C	MSU	
300									1123	5	00	31		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
301									142	0	18		30	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
302									1430	4	30	29		Tallahassee, Florida	N30.5	W 84.4	T	Bartol	
303								26	0041	3	00		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
304									0700	2	14	24		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
305									1132	5	30	29		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
306									1144	5	15	31		Tallahassee, Florida	N30.5	W 84.4	T	Bartol	
307									1830	4	15	30		Tallahassee, Florida	N30.5	W 84.4	T	Bartol	
308									1834	4	30	27		Swarthmore, Pa.	N39.3	E 75.4	T	Bartol	
309								27	0251	9	24		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
309a								26		34	42	23		Crosby, Minn.			EM, Man		Stratolab III, Yagoda
310	27		51	0855	3			28	0339	0	54		132	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
311									0700	1	28	18		Murmansk, USSR	N69	E 33.1	C	MSU	
312									0702	3	10	30		Crimea, USSR	N44.9	E 34	C	MSU	
313									0710	3	13	28		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
314*							July 29/0430		1511	0	01		90	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	See 314 A Table VII A
315	29	131	52	0259	3	0304	0321	29	0701	1	00	24		Murmansk, USSR	N69	E 33.1	C	MSU	
316									0718	1	50	33		Crimea, USSR	N44.9	E 34	C	MSU	
317	29		53	1125	3			30	0650	0	29		10	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
318	30	134		1523	2		1525		1847	0	38		56	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
319									202	0	35		27	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
320								31	0700	1	23	30		Murmansk, USSR	N69	E 33.1	C	MSU	
321									0701	2	28	31		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
322									0905	3	20	36		Crimea, USSR	N44.9	E 34	C	MSU	
								Aug.											
323								01	0258	0	40		40	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
324									0700	2	43	32		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	

TABLE VII. 1958 (CONTINUED)

		FLARE			SPECTRAL		PCA						LOCATION					Notes
	Gr. Day	Event No.	Serial No.	Beg. UT	Imp	Type II Beg. UT	Type IV Beg. UT	Gr. Day/ Beg. UT	Launch Gr. Day	Launch UT	Time at Altitude Hr.	Time at Altitude Min.	Altitude Km	Altitude mb	Place	Geographic Lat.	Geographic Long.	Instruments Carried	Group	
325									Aug.	0700	1	00	18		Murmansk, USSR	N69	E 33.1	C	MSU	
326										1303	3	10	21		Crimea, USSR	N44.9	E 34	C	MSU	
327										1506	0	18		50	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
328									02	0700	2	35	25		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
	Aug.																			
329	02	136		1840	1-	1843	1840		04	0700	2	43	32		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
330	03		54	2142	2+					0700	3	07	32		Murmansk, USSR	N69	E 33.1	C	MSU	
331	04	137	55	0409	3					0706	1	42	35		Crimea, USSR	N44.9	E 34	C	MSU	
332*										211	0	12		20	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	See 332 A Table VII A
333	04	138		2112	1	2120			05	0700	1	51	30		Dolgoprudnaya, USSR	N55.7	E 37.5	C	MSU	
334										0703	2	55	39		Crimea, USSR	N44.9	E 34	C	MSU	
335										0703	2	20	26		Murmansk, USSR	N69	E 33.1	C	MSU	
336										1712	0	52		70	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
337									06	0207	0	30		16	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
338										0831	2	00	24		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
339									07	0659	2	50	24		Crimea, USSR	N44.9	E 129.5	C	MSU	
340										0701	2	28	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
341*										0920	2	20	19		Murmansk, USSR	N69	E 33.1	C	MSU	See 341 A Table VII A
342	07	139	56	1457	3				08	0110	0	08		62	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
343										0700	2	53	28		Murmansk, USSR	N69	E 33.1	C	MSU	
344										0701	2	20	32		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
345										1308	0	41		28	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
346									10	0700	2	55	29		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
347										1445	6	05		10	Ft. Churchill, Canada	N58.7	W 93.8	I, T, C	UC	
348									11	0226	0	21		20	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
349										0707	3	10	28		Crimea, USSR	N44.9	E 34	C	MSU	
350										1020	2	20	29		Murmansk, USSR	N69	E 33.1	C	MSU	
351*	13		57	1205	3				13	1201	2	20	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	See 351 A Table VII A
352									14	0818	2	35	25		Crimea, USSR	N44.9	E 34	C	MSU	
353*										0854	1	45	19		Murmansk, USSR	N69	E 33.1	C	MSU	See 353 A Table VII A
354	14	140		2137	1+	2158			15	0614	0	00		10	Ft. Churchill, Canada	N58.7	W 93.8	I, T, C	UC	
355										0659	1	50	31		Crimea, USSR	N44.9	E 34	C	MSU	
356										0700	2	51	19		Murmansk, USSR	N69	E 33.1	C	MSU	
357*										1201	1	15	23		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	See 357 A Table VII A
358									16	0425	0	22		100	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
359	16	141	58	0432	3+		0443	Aug. 16/0600	16	1204	1	30	24		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
360									17	0528	1	30		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
361									18	0549	0	23		60	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
362	18			0747	2		0820		18	0702	3	20	41		Crimea, USSR	N44.9	E 34	C	MSU	
363										1547	0	01		42	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
364									19	0700	2	23	28		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
365										1128	1	40	24		Crimea, USSR	N44.9	E 34	C	MSU	
366	19	144		2118	2		2207		20	0625	0	35		70	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
367	20	145	59	0042	3	0046	0042			0700	4	15	31		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
368										0700	2	18	23		Murmansk, USSR	N69	E 33.1	C	MSU	
369									21	0700	1	25	20		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
370										0700	2	08	24		Murmansk, USSR	N69	E 33.1	C	MSU	
371										0702	3	35	33		Crimea, USSR	N44.9	E 34	C	MSU	
372	22		60	0521	2+			22/1530	22	0230	8	00		10	Ft. Churchill, Canada	N58.7	W 93.8	I, T, C	UC	Anderson(1958)
373										0700	3	29	27		Crimea, USSR	N44.9	E 34	C	MSU	
374										0700	2	50	33		Murmansk, USSR	N69	E 33.1	C	MSU	
375										0706	2	33	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
376										0816	4	40		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	

TABLE VII. 1958 (CONTINUED)

	Gr. Day	Event No.	FLARE Serial No.	FLARE Beg. UT	FLARE Imp	SPECTRAL Type II Beg. UT	SPECTRAL Type IV Beg. UT	PCA Gr. Day/ Beg. UT	Launch Gr. Day	Launch UT	Time at Altitude Hr.	Time at Altitude Min.	Altitude Km	Altitude mb	LOCATION Place	Geographic Lat.	Geographic Long.	Instruments Carried	Group	Notes
	Aug.							Aug.	Aug.											
377	22	148	61	1417	3		1500	22/1530	22	1416	4	00	31		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
378									23	0245	1	00		10	Ft. Churchill, Canada	N58.7	W 93.8	I, C, SC	UC	
379										0315	0	56		208	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
380										0545	7	30		10	Fairbanks, Alaska	N64.8	W147.9	C, I, EM	Minn.	Anderson, et. al. (1959)
381										0700	2	43	27		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
382	23		62	1012	3				24	0420	7	45		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	Anderson, et. al. (1959)
383										0539	2	00		10	Ft. Churchill, Canada	N58.7	W 93.8	I, T, SC	UC	
384										1045	7	50		10	Fairbanks, Alaska	N64.8	W147.9	C, I, EM	Minn.	
385									25	0700	1	23	33		Murmansk, USSR	N69	E 33.1	C	MSU	
386										0701	2	28	30		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
387	25		63	0949	3-				25	0734	3	00	26		Crimea, USSR	N44.9	E 34	C	MSU	
388	26	151	64	0005	3	0021	0020	26/0100	26	0700	3	31	34		Murmansk, USSR	N69	E 33.1	C	MSU	Charakhchian, et. al. (1960)
389										0702	2	50	26		Dolgoprudnaya, USSR	N55.7	E 37.5	C	MSU	
390										0735	3	15	36		Crimea, USSR	N44.9	E 34	C	MSU	
391										1100	0	13		100	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
392										1200	1	00		10	Ft. Churchill, Canada	N58.7	W 95.8	I, T, C	UC	
393										1342	4	45	31		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
394									27	0150	0	45		66	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
395										0436	0	00		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
396										0655	8	50		10	Fairbanks, Alaska	N64.8	W147.9	C, I, EM	Minn.	
397										0700	3	29	28		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
398										1325	3	45	25		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
399									28	0659	0	13		45	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
400										0700	2	50	33		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
401										0804	1	25	33		Murmansk, USSR	N69	E 33.1	C	MSU	
402	28			1025	2+		1028		28	1100	6	15	35		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
403										1600	1	18	20		Crimea, USSR	N44.9	E 34	C	MSU	
404									29	0658	2	50	33		Crimea, USSR	N44.9	E 34	C	MSU	
405										0700	1	44	32		Murmansk, USSR	N69	E 33.1	C	MSU	
406										0700	2	51	29		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
407										1122	1	00		10	Ft. Churchill, Canada	N58.7	W 93.8	I, T, C	UC	
408									30	0700	3	14	27		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
									Sept.											
409	30		65	1933	3				01	0700	1	55	32		Crimea, USSR	N44.9	E 34	C	MSU	
410										0700	3	00	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
411									02	-	3	00	34		Victoria, Australia	S 38	E 145	EM	Melbourne	
412										0659	1	17	24		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
413										0747	2	20	35		Crimea, USSR	N44.9	E 34	C	MSU	
	Sept.																			
414	02	155	66	2102	3	2108			03	0700	2	11	23		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
415										2224	11	00		8-15	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
416									04	0424	1	00		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
417	04		67	0504	3					0700	2	38	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
418										0958	3	10	33		Crimea, USSR	N44.9	E 34	C	MSU	
419	04		68	1401	3-				04	1454	3	00	21		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
420									05	0700	3	30	30		Crimea, USSR	N44.9	E 34	C	MSU	
421										0700	2	37	27		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
422										1042	3	30	23		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
423										1104	6	00		10	Ft. Churchill, Canada	N58.7	W 93.8	I, T, C	UC	
424										1602	4	45	31		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
425									06	0700	2	10	21		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
426										0700	2	47	31		Murmansk, USSR	N69	E 33.1	C	MSU	
427	07		69	1441	3+				08	0657	2	15	39		Crimea, USSR	N44.9	E 34	C	MSU	
428										0706	2	55	32		Murmansk, USSR	N69	E 33.1	C	MSU	
429										1200	3	31	33		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
430									09	0700	2	36	26		Murmansk, USSR	N69	E 33.1	C	MSU	

TABLE VII. 1958 (CONTINUED)

			FLARE			SPECTRAL		PCA						LOCATION					
	Gr. Day	Event No.	Serial No.	Beg. UT	Imp	Type II Beg. UT	Type IV Beg. UT	Gr. Day/ Beg. UT	Launch Gr. Day	Launch UT	Time at Altitude Hr.	Time at Altitude Min.	Altitude Km	Altitude mb	Place	Geographic Lat.	Geographic Long	Instruments Carried	Group	Notes
	Sept.								Sept.											
431*	09		70	1343	3+				09	1200	3	31	33		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	See 431 A Table VII A
432			71	2321	3				10	0701	2	26	24		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
433										1120	4	00		10	Ft. Churchill, Canada	N58.7	W 93.8	I, T, SC	UC	
434										2236	6	00		10	Fairbanks, Alaska	N64.8	W147.9	C, I, EM	Minn.	
435									11	0700	3	06	38		Crimea, USSR	N44.9	E 34	C	MSU	
436										0700	2	40	25		Murmansk, USSR	N69	E 33.1	C	MSU	
437	12		72	0655	2+				12	0659	1	34	30		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
438			73	0904	3					0714	4	45	36		Crimea, USSR	N44.9	E 34	C	MSU	
439										0715	2	47	26		Murmansk, USSR	N69	E 33.1	C	MSU	
440										1201	2	25	24		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
441									13	0659	2	37	29		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
442	13		74	0904	3				13	0701	2	15	24		Murmansk, USSR	N69	E 33.1	C	MSU	
443										1102	6	00		10	Ft. Churchill, Canada	N58.7	W 93.8	I, T, SC	UC	
444										2103	7	00	27		Brownwood, Texas	N32	W 99	NM	New York	
445	14	159	75	0822	3+		0348		14	0740	1	50	33		Murmansk, USSR	N69	E 33.1	C	MSU	
446									15	0658	2	06	24		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
447										0931	2	40	29		Murmansk, USSR	N69	E 33.1	C	MSU	
448										1019	2	40	32		Crimea, USSR	N44.9	E 34	C	MSU	
449	15		76	1650	2+				15	1327	7	00		10	Ft. Churchill, Canada	N58.7	W 93.8	I	UC	
450									16	0659	2	08	24		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
451										0700	2	40	24		Crimea, USSR	N44.9	E 34	C	MSU	
452										0840	3	20	42		Murmansk, USSR	N69	E 33.1	C	MSU	
453	16		77	1443	3					2239	7	00	26		Brownwood, Texas	N32	W 99	NM	New York	Haymes (1959)
454									17	0700	3	27	32		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
455	18	162	78	0728	3				18	0700	2	27	27		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
456										0830	2	40	36		Crimea, USSR	N44.9	E 34	C	MSU	
457										1051	2	00	38		Murmansk, USSR	N69	E 33.1	C	MSU	
458									19	0000	6	00	29		Brownwood, Texas	N32	W 99	Slow Nents	New York	
459										0700	2	52	31		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
460										0700	0	55	14		Murmansk, USSR	N69	E 33.1	C	MSU	
461										0712	2	35	33		Crimea, USSR	N44.9	E 34	C	MSU	
462										0921	3	15	25		Murmansk, USSR	N69	E 33.1	C	MSU	
463									20	0705	2	20	23		Murmansk, USSR	N69	E 33.1	C	MSU	
464										1235	3	50	37		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
465										1558	5	00	20		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
466										2235	7	00	29		Brownwood, Texas	N32	W 99	NM	New York	
								Sept.												
467	22	164	79	0738	2+			22/1400	22	0518	9	00		10	Minneapolis, Minn.	N44.9	W 93.9	C, I, EM	Minn.	
468										0700	1	19	23		Murmansk, USSR	N69	E 33.1	C	MSU	
469										0701	1	17	24		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
470										0703	3	00	33		Crimea, USSR	N44.9	E 34	C	MSU	
471										1944	2	00		10	Fairbanks, Alaska	N64.8	W147.9	C, I, EM	Minn.	
472									23	0330	1	40		10	Fairbanks, Alaska	N64.8	W147.9	C, I, EM	Minn.	
473										0700	2	22	25		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
474										0700	2	25	26		Murmansk, USSR	N69	E 33.1	C	MSU	
475										1052	2	40	22		Crimea, USSR	N44.9	E 34	C	MSU	
476									25	1200	2	27	29		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
477										2212	7	00	24		Brownwood, Texas	N32	W 99	NM	New York	Haymes (1959)
478									26	0700	1	20	23		Murmansk, USSR	N69	E 33.1	C	MSU	
479										0701	3	12	29		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
480										0706	2	25	24		Crimea, USSR	N44.9	E 34	C	MSU	
481	28	167		2046	1-	2046			29	0700	1	23	23		Crimea, USSR	N44.9	E 34	C	MSU	
482										0700	2	42	28		Murmansk, USSR	N69	E 33.1	C	MSU	
483										0702	2	06	31		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
484									30	0700	2	31	39		Murmansk, USSR	N69	E 33.1	C	MSU	
485										0710	3	00	31		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
									Oct.											
486									02	0700	3	01	28		Murmansk, USSR	N69	E 33.1	C	MSU	
487										0737	1	45	17		Crimea, USSR	N44.9	E 34	C	MSU	

TABLE VII. 1958 (CONTINUED)

Gr. Day	Event No.	FLARE Serial No.	FLARE Beg. UT	FLARE Imp	SPECTRAL Type II Beg. UT	SPECTRAL Type IV Beg. UT	PCA Gr. Day/ Beg. UT	Launch Gr. Day	Launch UT	Time at Altitude Hr.	Time at Altitude Min.	Altitude Km	Altitude mb	LOCATION Place	Geographic Lat.	Geographic Long.	Instruments Carried	Group	Notes
488								Oct. 02	1139	3	05	28		Crimea, USSR	N44.9	E 34	C	MSU	
Oct. 489 02	169		2143	1	2149			03	0658	3	50	32		Murmansk, USSR	N69	E 33.1	C	MSU	
490									0700	3	31	29		Crimea, USSR	N44.9	E 34	C	MSU	
491									0702	1	00	20		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
492								04	0700	2	15	22		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
493								06	0700	3	22	32		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
494									0701	2	35	26		Murmansk, USSR	N69	E 33.1	C	MSU	
495									0711	2	15	21		Crimea, USSR	N44.9	E 34	C	MSU	
496 08	171		1510	1-	1529			09	0700	1	28	15		Crimea, USSR	N44.9	E 34	C	MSU	
497									0703	0	35	-		Murmansk, USSR	N69	E 33.1	C	MSU	
498									0715	2	00	17		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
499								10	0416	0	41		130	Yakutsk, USSR	N62	E129.6	T	Yakutsk	
500									0700	1	49	28		Murmansk, USSR	N69	E 33.1	C	MSU	
501									0724	2	15	24		Crimea, USSR	N44.9	E 34	C	MSU	
502								11	0659	2	20	25		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
503									0700	2	04	26		Murmansk, USSR	N69	E 33.1	C	MSU	
504 15		80	0408	3				15	0537	0	41		40	Yakutsk, USSR	N62	E129.5	T	Yakutsk	
505									0705	2	15	24		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
506 15		81	1023	3					2029	09			12	Bismark, N. D.	N46.8	W100.7	I	CIT	Anderson, H.R.(1958)
507									2037	09			18	Invercargill, New Zealand	S46.5	E168.3	I	CIT	
508								16	0700	1	54	22		Crimea, USSR	N44.9	E 34	C	MSU	
509									0701	1	50	18		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
510									0701	2	45	26		Murmansk, USSR	N69	E 33.1	C	MSU	
511									2029	10			15	Bismark, N. D.	N46.8	W100.7	I	CIT	
512									2031	36		11		Invercargill, New Zealand	S46.5	E168.3	I	CIT	
513								17	0700	2	15	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
514									0700	2	23	25		Murmansk, USSR	N69	E 33.1	C	MSU	
515									0704	2	03	31		Crimea, USSR	N44.9	E 34	C	MSU	
516								18	0701	1	45	22		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
517 19		82	0658	3		0722		20	0320	0	08		90	Yakutsk, USSR	N62	E129.6	T	Yakutsk	
518									0658	2	05	22		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
519									0700	1	48	29		Murmansk, USSR	N69	E 33.1	C	MSU	
520									0719	1	47	24		Crimea, USSR	N44.9	E 34	C	MSU	
521									1130	0	50		48	Yakutsk, USSR	N62	E129.6	T	Yakutsk	
522								21	0655	1	19	19		Murmansk, USSR	N69	E 33.1	C	MSU	
523									0702	3	13	24		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
524									0710	1	36	22		Crimea, USSR	N44.9	E 34	C	MSU	
525									1115	6	10		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
526 21	173	83	2318	3	2328	2327		22	0245	0	51		80	Yakutsk, USSR	N62	E129.6	T	Yakutsk	
527 22		84	0650	3					0644	6	00	-		Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
528									0700	1	53	19		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
529									1212	0	40		40	Yakutsk, USSR	N62	E129.6	T	Yakutsk	
530 23		85	0232	3				23	0644	6	00		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
531									0657	2	24	9		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
532									1040	3	22	22		Murmansk, USSR	N69	E 33.1	C	MSU	
533									2203	18			14	Invercargill, New Zealand	S46.5	E168.3	I	CIT	
534									2228	78			12	USS Staten Island	-	-	I	CIT	
535								24	0134	0	00		80	Yakutsk, USSR	N62	E129.6	T	Yakutsk	
536									0635	0	39		38	Yakutsk, USSR	N62	E129.6	T	Yakutsk	
537									0700	2	30	25		Crimea, USSR	N44.9	E 34	C	MSU	
538									0700	1	53	22		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
539 24	179	86	1410	3	1452	1442		24	1647	0	19		60	Yakutsk, USSR	N62	E129.6	T	Yakutsk	
540									2200	52			7	Invercargill, New Zealand	S46.5	E168.3	I	CIT	
541									2155	97			13	USS Staten Island	-	-	I	CIT	
542								25	0244	0	20		50	Yakutsk, USSR	N62	E129.6	T	Yakutsk	
543									0700	1	40	16		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
544								26	2156	28			12	Invercargill, New Zealand	S46.5	E168.3	I	CIT	

TABLE VII. 1958 (CONTINUED)

Gr. Day	Event No.	FLARE Serial No.	FLARE Beg. UT	FLARE Imp	SPECTRAL Type II Beg. UT	SPECTRAL Type IV Beg. UT	PCA Gr. Day/ Beg. UT	Launch Gr. Day	Launch UT	Time at Altitude Hr.	Time at Altitude Min.	Altitude Km	Altitude mb	LOCATION Place	Geographic Lat.	Geographic Long.	Instruments Carried	Group	Notes
								Oct.											
545								26	2208	3			185	USS Staten Island	-	-	I	CIT	
546								27	0251	0	48		65	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
547									0700	2	25	29		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
548									0701	2	12	18		Murmansk, USSR	N69	E 33.1	C	MSU	
549									1159	1	31	18		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
550									1206	0	23		60	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
551								28	0720	1	26	22		Murmansk, USSR	N69	E 33.1	C	MSU	
552									0732	1	52	23		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
	Oct.																		
553	28		87	1505	3			29	0700	2	00	22		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
554	29		88	0703	2+				0759	2	22	18		Murmansk, USSR	N69	E 33.1	C	MSU	
555									2152	47			7	Invercargill, New Zealand	S 46.5	E 168.3	I	CIT	
556									2208	-	-	-		USS Staten Island	-	-	I	CIT	
557								30	0701	2	13	20		Murmansk, USSR	N69	E 33.1	C	MSU	
558									0704	1	16	16		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
559									0715	5	00	23		Crimea, USSR	N44.9	E 34	C	MSU	
560									1201	2	20	22		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
561									1527	0	24		82	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
562								31	-	-	-	-		USS Staten Island	-	-	I	CIT	
563									0701	2	05	18		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
564	31		89	0945	3			31	0925	2	12	24		Murmansk, USSR	N69	E 33.1	C	MSU	
565									1004	2	37	23		Crimea, USSR	N44.9	E 34	C	MSU	
566									1148	7	00		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
567									2201	42			8	Invercargill, New Zealand	S 46.5	E 168.3	I	CIT	
								Nov.											
568								01	0702	1	28	31		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
569								02	2158	20	-	-	3	USS Staten Island	-	-	I	CIT	
570									2201	51			6	Invercargill, New Zealand	S 46.5	E 168.3	I	CIT	
571								03	0328	0	23		34	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
572									0700	1	30	30		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
573									0705	2	45	25		Crimea, USSR	N44.9	E 34	C	MSU	
574									0739	2	53	30		Murmansk, USSR	N69	E 33.1	C	MSU	
575								04	0700	2	17	25		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
576									0741	1	30	27		Murmansk, USSR	N69	E 33.1	C	MSU	
	Nov.																		
577	14	186	90	0036	3			14	0700	2	19	23		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
578									0709	1	38	18		Crimea, USSR	N44.9	E 34	C	MSU	
579									1221	2	08	22		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
580									1447	0	24		250	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
581									2201	45			13	USS Staten Island			I	CIT	
582									2201	0			65	Invercargill, New Zealand	S 46.5	E 168.3	I	CIT	
583								15	1201	1	41	27		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
584									2158	54			7	Invercargill, New Zealand	S 46.5	E 168.3	I	CIT	
585								17	0330	0	15		74	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
586									0700	1	30	28		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
587									0701	2	23	20		Crimea, USSR	N44.9	E 34	C	MSU	
588									1725	0	40		180	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
589	24	187	91	1607	3		1607	25	0700	2	34	30		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
590	25		92	0807	3-				0845	1	55	18		Murmansk, USSR	N69	E 33.1	C	MSU	
591								26	-	-	-	-		USS Staten Island	-	-	I	CIT	
592									0408	-	-	-		USS Staten Island	-	-	I	CIT	
593									0520	70			3	Invercargill, New Zealand	S 46.5	E 168.3	I	CIT	
594									0700	2	52	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
595									1039	0	55		146	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
596									2203	03			13	Invercargill, New Zealand	S 46.5	E 168.3	I	CIT	
597								27	0058	0	42		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
598									0342	0	19		20	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
599									0701	2	22	23		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
600									0900	2	30	26		Murmansk, USSR	N69	E 33.1	C	MSU	
601									1220	1	54	25		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	

TABLE VII. 1958 (CONTINUED)

			FLARE			SPECTRAL		PCA						LOCATION				
	Gr. Day	Event No.	Serial No.	Beg. UT	Imp	Type II Beg. UT	Type IV Beg. UT	Gr. Day/ Beg. UT	Launch Gr. Day	Launch UT	Time at Altitude Hr.	Time at Altitude Min.	Altitude Km	Altitude mb	Place	Geographic Lat.	Geographic Long.	Instruments Carried	Group	Notes
	Nov.								Nov.											
602	27	188		1857	1	1905			27	2157	50			4	Invercargill, New Zealand	S46.5	E168.5	I	CIT	
603		189		2354	1	2358				2223	-	-	-		USS Staten Island	-	-	I	CIT	
604									28	0314	0	56		20	Yakutsk, USSR	N62	E129.6	T	Yakutsk	
605										0702	1	39	35		Crimea, USSR	N44.9	E 34	C	MSU	
606										2209	10			13	Invercargill, New Zealand	S46.5	E168.3	I	CIT	
607										2223	00			8	USS Staten Island	-	-	I	CIT	
608									29	0658	2	20	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
									Dec.											
609	29		93	0920	2+				01	0700	2	15	24		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
610	30	191		2240	1-	2250				0702	2	24	40		Crimea, USSR	N44.9	E 34	C	MSU	
611										1301	0	52		90	Yakutsk, USSR	N62	E129.6	T	Yakutsk	
612									02	0129	39			13	USS Staten Island	-	-	I	CIT	
613										0150	31			7	Invercargill, New Zealand	S46.5	E168.3	I	CIT	
614										0701	2	41	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
615										0800	1	24	17		Murmansk, USSR	N69	E 33.1	C	MSU	
616										1205	1	36	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
617										1306	1	36	18		Crimea, USSR	N44.9	E 34	C	MSU	
618										1707	2	48	34		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
619									03	0226	0	05		20	Yakutsk, USSR	N62	E129.6	T	MSU	
	Dec.																			
620	03		94	0702	3				03	0700	3	10	27		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
621			95	0823	2+					2221	6			8	USS Staten Island	-	-	I	CIT	
622										2353	28			7	Invercargill, New Zealand	S46.5	E168.3	I	CIT	
623									04	0700	2	06	23		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
624										0714	2	03	19		Crimea, USSR	N44.9	E 34	C	MSU	
625										0816	1	14	24		Murmansk, USSR	N69	E 33.1	C	MSU	
626									05	1012	2	02	18		Crimea. USSR	N44.9	E 34	C	MSU	
627									07	0700	2	45	29		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
628	09	195		1642	1	1658			10	0708	2	16	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
629	10			0219	2+	0224			11	0700	2	23	30		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
630										0810	2	08	11		Murmansk, USSR	N69	E 33.1	C	MSU	
631	11			1430	1		1427		11	1316	1	39	19		Crimea, USSR	N44.9	E 34	C	MSU	
632										-	-	-	-		Invercargill, New Zealand	S46.5	E168.3	I	CIT	
633	11	203		1802	2		1805			2054	6			11	USS Staten Island	-	-	I	CIT	
634	12		96	0054	2+				12	0700	1	59	21		Crimea, USSR	N44.9	E 34	C	MSU	
635				0210	2+		0210			0702	1	19	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
636										0839	1	50	19		Murmansk, USSR	N69	E 33.1	C	MSU	
637	12	206	97	1215	2+		1258		12	1435	0	44		34	Yakutsk, USSR	N62	E129.6	T	Yakutsk	
638		Several Sub-Flares					1415		13	0317	0	30		80	Yakutsk, USSR	N62	E129.6	T	Yakutsk	
639										0700	2	14	23		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
640										0745	0	57	25		Murmansk, USSR	N69	E 33.1	C	MSU	
641										1219	4	00	27		Swarthmore, Pa.	N39.3	W 75.4	T	Bartol	
642									15	0307	0	26		118	Yakutsk, USSR	N62	E129.6	T	Yakutsk	
643										0701	3	04	30		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
644										0709	2	21	22		Crimea, USSR	N44.9	E 34	C	MSU	
645										0732	0	55	23		Murmansk, USSR	N69	E 33.1	C	MSU	
646	15		98	1030	3				16	0700	2	20	23		Crimea, USSR	N44.9	E 34	C	MSU	
647		208		1535	1-		1543			0700	2	18	26		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
648										0716	0	45	19		Murmansk, USSR	N69	E 33.1	C	MSU	
649									17	0700	1	31	28		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
650										1210	0	41		216	Yakutsk, USSR	N62	E129.6	T	Yakutsk	
651	17	212		1855	1+	1901			18	0659	2	42	24		Crimea, USSR	N44.9	E 34	C	MSU	
652										0705	1	58	22		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
653										0730	1	25	29		Murmansk, USSR	N69	E 33.1	C	MSU	
654										1110	1	15	24		Murmansk, USSR	N69	E 33.1	C	MSU	
655										1248	7	00		10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
656									19	0700	2	27	25		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
657										0703	2	32	19		Crimea, USSR	N44.9	E 34	C	MSU	

TABLE VII. 1958 (CONTINUED)

		FLARE			SPECTRAL		PCA						LOCATION					
Gr. Day	Event No.	Serial No.	Beg. UT	Imp	Type II Beg. UT	Type IV Beg. UT	Gr. Day/ Beg. UT	Launch Gr. Day	Launch UT	Time at Altitude Hr.	Time at Altitude Min.	Altitude Km	Altitude mb	Place	Geographic Lat.	Geographic Long.	Instruments Carried	Group	Notes
								Dec.											
658								19	0740	0	55	16		Murmansk, USSR	N69	E 33.1	C	MSU	
659									1100	1	29	30		Murmansk, USSR	N69	E 33.1	C	MSU	
660								20	0659	2	06	20		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
Dec.																			
661 23	215	99	0545	3		0559		23	0656	1	36	26		Murmansk, USSR	N69	E 33.1	C	MSU	
662									1201	2	18	28		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
663									1305	2	10	25		Crimea, USSR	N44.9	E 34	C	MSU	
664								24	0700	2	12	25		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
665								25	0700	2	47	23		Crimea, USSR	N44.9	E 34	C	MSU	
666									0700	2	32	28		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
667									0700	2	06	19		Murmansk, USSR	N69	E 33.1	C	MSU	
668								26	0700	2	14	20		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
669									0704	1	44	23		Crimea, USSR	N44.9	E 34	C	MSU	
670									1230	0	56		100	Yakutsk, USSR	N62	E 129.6	T	Yakutsk	
								Jan. 1959											
671 31	217	100	1656	3	1705	1700		01	0800	1	12	28		Murmansk, USSR	N69	E 33.1	C	MSU	
672								02	0800	1	54	18		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
673									1520	0	45	17		Crimea, USSR	N44.9	E 34	C	MSU	
674								03	0800	2	38	25		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
675									0801	1	12	23		Murmansk, USSR	N69	E 33.1	C	MSU	
676								04	0800	1	00	21		Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
677									0815	2	12	19		Murmansk, USSR	N69	E 33.1	C	MSU	

TABLE VII A ADDITIONAL FLIGHTS

The following flights not reported to the World Data Center are reported by:

Henkel, J.E. et. al. J. Geophys, Res. 64 (1959)

Times of launch were not given. All flights terminated near Geomagnetic Latitude 53° N Geomagnetic Longitude 355° E. Altitudes range from 200 mb to 10 mb.

	FLARE							BALLOON LAUNCHED	
	Day	Serial No.	Beg.	Imp.	II	IV	PCA		
	Feb.							Feb.	
32A	11	10	0812	3				12	
	Mar.							Mar.	
	01	12	0905	3+					
45A	03	13	1005	3+		1005		03	Before 1956
63A	14	17	1454	3	1453			18	
	Apr.							Apr.	
111A	07	23	1010	3				09	
	08					0304			
124A	29	25	1128	3				29	

	FLARE							BALLOON LAUNCHED
	Day	Serial No.	Beg.	Imp.	II	IV	PCA	
	May							May
140A	06	30	0335	3				10
	July							July
226A	07	41	0020	3+	0032	0052	0330	07
314A	27	51	0855	3				28
	Aug.							Aug.
	03	54	2142	2+				
332A	04	55	0409	3				04
341A	07	56	1457	3				07
351A	13	57	1205	3				13
353A								14
357A								15
	Sept.							Sept.
	07	69	1441	3+				
431A	09	70	1343	3+				09

VIII. CRONOLOGICAL CATALOGUE

OF MAJOR SOLAR EVENTS

DURING 1958

TABLE VIII. CHRONOLOGICAL CATALOGUE OF MAJOR SOLAR EVENTS DURING 1958

The entries in this table will include the following:

1. All major flares that are listed in the McMath-Hulbert working list of solar flares with importance 3 and 3+.

2. All great short wave fades of importance 3 or 3+ that last for 30 minutes or more.

3. All great 10 cm bursts with a peak flux equal to or greater than 500 units (10^{-22} Wm^{-2} $(c/s)^{-1}$).

4. The most active plages. (Produced 30 or more flares during disk passage).

5. The greatest sunspots (area $\geq$ 1000 millionth in the Mt. Wilson list).

6. All spectral radio emission of Type II and Type IV. In addition, outstanding bursts of Type 1 and Type III have been included.

7. Radio emissions at 200 Mc/s at the time of major events.

8. Radio emissions at other frequencies.

9. Polar-cap absorptions

10. Geomagnetic storms

The entries in this section of the catalogue will bring together in chronological order many of the entries already given in Tables I through VI. The exceptions are defined below:

(a) The major solar flare requirement for Table I is based on the list of flares reported in the IAU Quarterly Bulleting and includes some of importance 2+ and all flares of importance 3 and 3+. In Table VIII only flares of importance 3 and 3+ listed in the McMath-Hulbert Observatory working list of flare are included.

(b) The Table VIII requirement for "the greatest" sunspots is based on the Mt. Wilson list and only those with an area greater than a 1000 millionth qualify. On the other hand, Table II includes all sunspot groups from the Royal Greenwich Observatory list with a maximum area, during disk passage, equal to or greater than 500 millionth, and all groups with $\beta\gamma$, and γ, Mt. Wilson magnetic classification.

As in the previous tables, minor flares, small sunspot groups, plages, and the other solar and solar-terrestrial effects associated with any of the major entries are included if an observation is available.

A major entry, i.e., one qualifying under 1 through 6 above is indicated by an asterisk in the appropriate column. The column headings and explanations, where necessary, are given below:

Column 1 Event number, starting with one at the beginning of each year.

Column 2 Greenwich date of the event.

FLARE DATA (Columns 3 through 8)

These will include all 3 and 3+ flares (reference 9) as well as minor flares, and in some cases - sub-flares that may be associated with a solar or terrestrial event given in subsequent columns of the table:

Column 3 Beginning of the flare UT. If the start of the flare was observed, the beginning time is underlined.

Column 4 End time UT. If the end of the flare was observed, the time is underlined.

Column 5 Time of maximum, UT.

Column 6 Importance - This is the value assigned to the flare in the McMath-Hulbert working list of flares (reference 9).

Column 7 The heliographic position is the arithmetic mean of positions reported in the IAU Bulletin and given in reference 9.

Column 8 Number of Observations

SHORT WAVE RATIO FADEOUTS (Columns 9 through 14)

Sudden ionosphere disturbances may be detected in a number of ways: short wave fadeouts (SWF), enhancement of low frequency atmospherics (SEA), increase in cosmic absorption (SCNA), sudden phase anomalies at VLF (SPA), and sudden signal enhancements at VLF (SES).

The data included in this catalogue are limited to SWF's and includes all outstanding short wave radio fadeouts of importance 3 or 3+ that lasted for 30 minutes or more. In addition minor SWF's that occurred at the time of the flares catalogued in Columns 3 through 8 are included. The following data are given.

Column 9 Type (S, SL, or G) The following classifications are used:
S-SWF (S): sudden dropout and gradual recovery
Slow S - SWF (SL): dropout takes 5 to 15 minutes and gradual recovery
G-SWF (G): Gradual disturbance: fade irregular in either the dropout or recovery stage

Column 10 Importance: SWF's are given an importance rating on a scale from 1- to 3+ based on amplitude of the fade, duration of the event, and confidence in the reality of the event.

Column 11 Beginning time UT

Column 12 Duration in Minutes

Column 13 Widespread Index. The degree of confidence in identifying the event by the individual stations is combined into an index of certainty that the event is geographically widespread, ranging from 1 (possible - single station) to 5 (definite - many stations).

Column 14 Number of Observations: The column gives the number of observatories reporting the event.

SOLAR RADIO EMISSIONS AT 10 cm (Columns 15 through 19)

Column 15 Type: Two different classifications are used: (1) numerical, on a scale from 1 to 9, used in reference 52 and defined in "Descriptions Test and Index for CRPL-F, Part B. Solar-Geophysical Data", Issued November 1962. (2) Alphabetical symbols used in reference 56. These are defined in the introduction of Table IV and illustrated on page 3.IV-10.

Column 16 Beginning Time UT

Column 17 Duration in Minutes

Column 18 Time of Maximum Flux, UT

Column 19 Peak Flux. If the value given in this column is underlined, the actual peak flux is greater than the recorded values.

PLAGE DATA: (Columns 20 through 28)

The data in this section of Table VIII are taken from the McMath-Hulbert Plage Catalogues. The entries in this table are limited to: plage regions that were the source of 30 or more flares during disk passage, indication in Column 20 with an asterisk, and/or plage regions associated with flares tabulated in Columns 3 through 8. The column headings, in general, self-explanatory, follow:

Column 20 McMath-Hulbert Plage Number

Column 21 Greenwich day of Central Meridian Passage.

Column 22 Mean Longitude

Column 23 Mean Latitude

Column 24 Average Intensity - The intensity of Calcium plages are estimated on a scale from 1 (faint) to 5 (very bright). The values given in this column are the average intensity during dark passage.

Column 25 Maximum Area - In units of millionth of the area of the solar hemisphere.

Column 26 Number of Flares - This is the total of all flares associated with the plage during disk passage.

Column 27 Age in Rotations - The number 1 indicates that the plage is new.

Column 28 Identification - This is the number of the plage region during the previous rotation. If two or more numbers are given in this column, those plages or parts are then combined to form the tabulated plage.

SUNSPOT DATA (Columns 29 through 34)

This portion of the catalogue is limited to the sunspots in the plage region given in column 20.

Column 29 Mt. Wilson Magnetic Classification from reference 60.

Column 30 Greenwich day of Central Meridian Passage.

Column 31 Mean Latitude during disk passage.

Column 32 Mean Magnetic field strength H, in units of 100 gauss from reference 60.

Column 33 When seen: The first number gives the data the sunspot was first seen, the second number is the last date on which the spot was seen.

Column 34 Mt. Wilson Sunspot numbers, of all spots located in the plage of Column 20.

DYNAMIC SPECTRUM DATA (Columns 35 through 38)

Column 35 Type I bursts. The following information is given: amount of activity indicated by the Symbols I_S, b, G, g, or s; duration of the burst - beginning time, end time; and the intensity on a scale from 1 (weak) to 3 (strong). The activity symbols are defined as follows:

At 100 Mc/s intensity 1 corresponds to 5 to 40 x 10^{-22} Wm^{-2} $(c/s)^{-1}$, 2 = 40 - 200 x 10^{-22} Wm^{-2} $(c/s)^{-1}$ and 3 200 x 10^{-22} Wm^{-2} $(c/s)^{-1}$

I_S - A noise storm
C - A noise storm with a slowly varying enhancement over a broad spectrum
b - Single bursts
g - Small group (< 10) of bursts
G - Large group (≥ 10) of bursts
s - Storm intermittent but apparently connected activity.

Column 36 Type III bursts, activity, duration and intensity.

Column 37 Type II (slow drift) bursts, duration, and intensity.

Column 38 Type IV (broad band continuum) duration and intensity.

200 Mc/s DATA (Columns 39 through 43)

Column 39 Type alphabetical symbols

Column 40 Beginning time UT

Column 41 Duration in minutes

Column 42 Time of maximum flux

Column 43 Peak flux

OTHER RADIO DATA (Columns 44 through 49)

Column 44 Frequency Mc/s

Column 45 Type

Column 46 Beginning time UT

Column 47 Duration in minutes

Column 48 Time of peak flux

Column 49 Peak flux

POLAR-CAP ABSORPTION DATA (Columns 50 through 55)

Column 50 Greenwich day

Column 51 Onset time

Column 52 Time to rise to peak

Column 53 Duration in hours

Column 54 Intensity

Colunn 55 Observer

B - Bailey

H - Hakura and Goh

K - Kiruna

L - Leinbach

GEOMAGNETIC STORMS (Columns 56 through 62)

Column 56 Greenwich day

Column 57 Beginning of the storm

Column 58 Duration of the storm (h) indicates hours, (d) indicates days.

Column 59 Type

g = gradual

sc = sudden commencement

Column 60 Intensity

m = moderate

ms = moderately severe

s = severe

Column 61 Number of stations reporting the storm

Column 62 Maximum K_D during the storm

Note: Remarks and comments about many of the events listed in this catalogue are given on pages 3.VIII-vii through 3.VIII-xxvii. The notes were prepared by Miss Hedeman.

TABLE VIII. NOTES AND COMMENTS ABOUT SOME SOLAR-TERRESTRIAL EVENTS

This section contains selected information and pertinent data concerning some of the events listed in the Chronological Catalogue of Solar Events for 1958. The numbers refer to the number of the event in the catalogue. Not every event will necessarily be accompanied by remarks in this section.

No. 3 This very long-enduring storm was reported by only one station--Apia. The maximum 3-hr. K_p value of 5 was reached on January 14 and 18. Most other stations start the period of storminess on January 17.

No. 4 No known flare or SWF was reported with the Type II burst on January 15 at 0335 UT; therefore, no plage or spot data are available.

No. 5 This evidently minor magnetic disturbance was reported as a storm by only one station--Hermanus.

No. 6 The plage and spot data for this event are the same as that given for Event No. 1. This major optical flare with its large 10 cm. burst was not accompanied by any distinctive event at meter wavelengths (200 Mc) or at any other single radio frequencies. In the dynamic spectrum there was also a lack of events such as Type II or Type IV bursts. Indeed, the flare was marked only by a decrease in continuum emission and noise at low frequencies.

No. 7 This major SWF was not accompanied by a major optical event, nor were there any distinctive events reported at any single radio frequencies. The related βp spot No. 12947 is one of the largest spots of the year, with an area of 1000 millionths of the hemisphere (Mt. Wilson data).

No. 8 No known SWF or 10 cm. event was reported with the Type II burst on January 16 at 2313 UT. There was also no distinctive event at meter wavelengths.

No. 10 No known SWF or 10 cm. event was reported with the Type II burst on January 18 at 2257 UT.

No. 11 This gradual magnetic storm was called "sudden commencement" by three of the nine stations reporting the storm.

No. 12 No dynamic spectrum observations were being made at the time of the major flare and major SWF. The single radio events were not great, and the 10 cm. event consisted

only of a period of irregular activity. The flare occurred in a relatively old (calcium) plage, which was marked, however, by a brightening and a resurgence of activity on the disk, in the west.

No. 14 Three of the seven stations reporting this storm designated it as a "sudden commencement" storm.

No. 15 No dynamic spectrum observations were being made at the time of the major SWF on February 9 at 1332 UT. This event, as well as events No. 16, 18, and 19, took place in a very remarkable and unusual calcium plage of great extent and intensity. Events No. 17 and 20 are also indirectly attributable to activity in this region.

No. 16 The plage and spot data for this event are the same as that given for Event No. 15. The Type IV burst reported by Fort Davis at 2116 UT was not accompanied by a Type II burst within their observable frequency range of 500-100 Mc. A large major + burst is reported at low and intermediate single radio frequencies. The two stations reporting the optical flare rated the event as importance 2+; however, the area measured at maximum intensity would make this a flare of importance 3.

No. 18 The plage and spot data for this event are the same as that given for Event No. 15. No dynamic spectrum observations were being made at the time of the start of the major SWF. The single frequency reports indicate a major burst at meter wavelengths followed by a long-enduring rise and fall in flux.

No. 19 The plage and spot data for this event are the same as that for Event No. 15.

No. 20 This great magnetic storm is preceded by a small initial impulse on February 10 at 1040 UT.

No. 23 No known event at meter wavelengths is reported with the Type II burst on February 26 at 0602 UT.

No. 24 This evidently minor magnetic disturbance was reported as a storm by only one station--Hermanus.

No. 25 No known flare is reported with the major SWF; therefore, no plage or spot data are available. No dynamic spectrum observations exist at the time of the SWF. No distinctive single frequency radio events are reported at meter wavelengths or at any of the low frequencies.

No. 26 This major flare occurred in a new region in which both spot and plage formed on the visible solar disk. No dynamic spectrum observations exist at the time of the flare.

No. 27 No known flare or SWF are reported with the Type IV burst on March 1 at 2041 UT; therefore, no plage or spot data are available. No events at any other single radio frequencies--at meter, decimeter, or centimeter wavelengths--are reported at the time of the Type IV burst.

No. 28 No known flare or SWF is reported with the Type II burst on March 2 at 0009 UT; therefore, no plage or spot data are available. No events at any other single radio frequencies--at meter, decimeter or centimeter wavelengths--are reported at the time of this Type II burst.

No. 29 No known flare is reported at the time of the large 10 cm, microwave burst on March 2 at 1134 UT; therefore, no plage or spot data are available. No dynamic spectrum observations exist at the time of the burst.

No. 31 This very major event occurred in a plage which is the return of the extensive and active region of February, described in the remarks for Event No. 15. The αp spot (Mt. Wilson No. 13064) is a return of the αp spot No. 13000 in Region 4400. No dynamic spectrum observations exist for the start of the event at 1005 UT, and we therefore have no knowledge of any Type II burst. A very great burst is indicated at meter wavelengths and throughout the entire range of the single frequency reports.

No. 32 This flare is a questionable flare of importance 3, in view of the fact that no SWF, no 10 cm. event, no dynamic spectrum events and no events at 200 Mc were reported at the time of the flare, which occurred in the region described above. The plage and spot data are the same as that given for Event No. 31.

No. 33 Four of the stations reporting this storm include it as a part of the storm described under Event No. 30.

No. 34 This very weak event is evidently only a minor disturbance and is reported as a storm by only one station--College (Alaska).

No. 35 No dynamic spectrum events, and no event at meter wavelengths, were reported with the major SWF on March 9 at 1542 UT.

No. 36 The Type II burst and major SWF on March 11 at 0032 UT occurred in a large and active plage in its third rotation. The αp spot No. 13076 is a return of the αp spot No. 13023 in Region 4410 which was a return of a βp spot No. 12947 in Region 4370. No event at meter wavelengths is reported with the Type II burst, which was observed on a frequency of 125-40 Mc.

No. 37 Two of the nine stations reporting this storm call it an SC storm.

No. 38 No known flare is reported at the time of the major SWF on March 11 at 1510 UT; therefore, no plage or spot data are available. The relatively modest 10 cm burst accompanying the SWF is superposed on a very long-enduring-gradual rise and fall of flux. The dynamic spectrum response consists only of a brief interval of weak noise storm-type bursts, and no distinctive events are reported at meter wavelengths or at any of the intermediate single frequencies.

No. 39 The plage and spot data for this event are the same as that given for Event No. 36. No distinctive event at meter wavelengths is reported with the Type II burst on March 12 at 0043 UT and its accompanying major SWF.

No. 40 This storm is included as a part of the storm reported in Event No. 37, by seven of the stations reporting the latter.

No. 42 The plage and spot data for this event are the same as that given for Event No. 31. The 10 cm. event accompanying the major SWF is one of those rare bursts preceded by a "precursor." The only event reported in the dynamic spectrum (by Fort Davis) is an unclassified burst of intensity 3 from 1458-1509 UT, in the frequency range 580-100 Mc. This is coincident with the rather large 10 cm. burst reported at the same time, and also a major off-scale burst reported at meter wavelengths.

No. 43 This gradual storm was called an "SC" storm by two of the five stations reporting the storm. Two stations continue the storm for five days and therefore run it through the period of the storm listed as a separate event under No. 44.

No. 45 This great flare is one of those rare events observed in "white light." The flare occurred in a very bright and extensive region, that contained several large and complex spots. This unusually active region (plage 4476) is a return of a plage which formed and developed on the disk in the west on March 3, in the previous rotation. The $\beta\gamma$ spot

No. 13103 is one of the largest spots of the year--area equal to 1600 millionths of the hemisphere (Mt. Wilson data)--and is a return of the βf spot No. 13069 which developed in region 4442a when the plage formed on March 3. The flare was accompanied by an extensive system of loops, and by a very great 10 cm. burst with a very long-enduring post-burst increase. Although no dynamic spectrum observations exist at the time of the flare, Type IV radiation has been deduced (by Hakura) from the very great response at single frequencies.

No. 46 The duration of this PCA event (Bailey) is based on extrapolation into event No. 50.

No. 47 This minor disturbance is reported as a storm by only two stations--Sitka (Alaska) and Hermanus. One station calls the storm "SC;" the other calls it a gradual storm.

No. 48 The plage and spot data for this event are the same as that given for Event No. 45.

No. 49 This event does not fulfill any of the criteria for inclusion in this catalogue as a "major" solar event. It is given here, however, as a possible predecessor of the next PCA event (No. 50). The plage and spot data are the same as that given for event No. 45. No observations of the dynamic spectrum, or at meter wavelengths, were being made at the time of the event.

No. 50 It is difficult to find any solar event immediately preceding this very large PCA event within several hours, except for the event described in No. 49.

No. 51 Note the closeness of the starting time of this storm (1540 UT) to that of the PCA (1530 UT). Two of the stations reporting this storm,start it earlier, at 07--UT.

No. 52 No known flare or SWF are reported at the time of the Type II burst on March 25 at 2320 UT; therefore, no plage or spot data are available. No 10 cm. observations were being made at this time.

No. 53 No known SWF or 10 cm. event are reported at the time of the Type II burst on March 26 at 0035 UT.

No. 54 The plage and spot data for this event are the same as that given for event No. 45. No distinctive event at meter wavelengths is reported with the major SWF on March 27 at 1535 UT, and only a minor burst in the dynamic spectrum is reported.

No. 55 This major SWF and large 10 cm. burst are due to activity in a large and bright plage in its second rotation. The βp spot No. 13109 is one of the largest spots of the year-area equal to 1100 millionths of the hemisphere (Mt. Wilson data). No dynamic spectrum observations exist at the time of the event, and no distinctive event is reported at meter wavelengths.

No. 56 The plage and spot data for this event are the same as that given for event No. 45. The large 10 cm. burst is preceded by a "precursor" and followed by a long-post-burst increase. Although observations were in progress, no dynamic spectrum events were reported at the time of the major SWF and large 10 cm. burst. At meter wavelengths, no distinctive events are reported with the start of the optical event on March 28 at 1703 UT, but a period of noise is reported as starting about 30 minutes later. No events are reported at any other single radio frequencies.

No. 57 The plage and spot data for this event are the same as that given for event No. 53. Note that the 10 cm. burst accompanying the Type II burst on March 28 at 1837 UT is superposed on the long post-burst increase which is a part of event No. 56.

No. 58 The plage and spot data for this event are the same as that given for event No. 55. Note that the large 10 cm. burst is followed by a long-enduring rise and fall of flux. There is very little response to this event at the low frequencies, other than a noise storm in the dynamic spectrum. No distinctive events are reported at meter wavelengths or at any of the other single radio frequencies.

No. 59 This major SWF and large 10 cm. burst were produced by a flare in a region at high latitude, and very close to the limb. The large, bright and active plage (region 4484) is in its second rotation, and contains a β spot No. 13118 which is probably a return of the βp spot No. 13067 in Region 4444.

No. 60 The Type II event reported by Ft. Davis on March 29 at 1452 UT covers the frequency range 280-100 Mc in the dynamic spectrum. No distinctive event is reported at meter wavelengths at the time of the Type II burst, but the other reported single radio events cover a wide range of frequencies.

No. 61 The plage and spot data for this event are the same as that given for event No. 53. The major SWF and Type II burst on March 29 at 1630 UT were accompanied by only a minor $H\alpha$ brightening at the limb. Note the onset of a noise storm in the dynamic spectrum following the Type II burst and while the major SWF is still in progress.

No. 62 The plage and spot data for this event are the same as that given for event No. 55. The major SWF on March 29 at 1821 UT is accompanied by a very large 10 cm. burst which is followed by a long post-burst increase. In the dynamic spectrum, there is only a minor Type III burst, and at the single frequencies the only event reported is a period of noise at 169 Mc, starting about 30 minutes after the start of the SWF.

No. 63 The plage and spot data for this event are the same as that given for event No. 59.

No. 65 The plage and spot data for this event are the same as that given for event No. 45. The major SWF on March 30 at 0955 UT is accompanied by a long-enduring burst at 10 cm., characterized as a "gradual rise and fall with irregular activity." No dynamic spectrum observations exist at the time of the major SWF. The single frequency events are started by an earlier flare in another region, and reflect the combined effect of the two flares. The 169 Mc event represents a noise storm with a rise and fall of flux.

No. 66 & 67 The plage and spot data for these events are the same as that given for event No. 45.

No. 69 The region responsible for the Type II burst is an old plage which is still fairly large, bright, and active. It contains an αp spot No. 13117 which is a return of the αp spot No. 13064 in region 4445, which is in turn a return of the αp spot No. 13000 in region 4400. This latter plage is the remarkably active region of February, described in event No. 15.

No. 71 This minor disturbance, reported by only two stations, is characterized as an SC storm by one of them.

No. 72 The plage and spot data for this event are the same as that given for event No. 69. Note the short duration of the Type IV event on April 4 at 1936 UT and its similarity to the microwave burst reported at 10 cm., and to the single frequency events. At 167 Mc, a major burst is reported, followed by a noise storm. The rather minor gradual SWF is not listed in the F-series Bulletin, but was reported by one station in the preliminary list of SWF's compiled by NBS (called the"checklist").

No. 73 This major flare and large 10 cm. burst occurred in a very large, bright and active region in its second rotation. It contains an αp spot No. 13129, which is a return of the βp spot No. 13078 of region 4453. No dynamic spectrum observations exist at the time of the flare on April 4 at 1010 UT, and no distinctive event is reported at meter wavelengths.

No. 74 The plage and spot data for this event are the same as that given for event No. 69.

No. 75 This is a curious and baffling PCA event--very difficult to explain by any solar events closely related to it in time.

No. 76 No known flare is reported with the Type II burst on April 11 at 1340 UT; therefore, no plage or spot data are available.

No. 77 This storm is evidently only a minor disturbance. Two of the three stations that reported this storm continue it through the period of the next storm given in event No. 78.

No. 79 This event is a part of this catalogue only because the plage region contained a very large spot and had 30 flares during its transit across the solar disk. Region 4508 is an unusual plage--very large, very bright, active, with a very large spot--but it did not have the kind of activity that produces the great solar optical and radio events listed in the catalogue. The βp spot No. 13157 was one of the largest spots of the year--area equal to 1400 millionths of the hemisphere (Mt. Wilson data).

No. 80 & 81 This is evidently only a minor disturbance. There is a long and involved period of storminess from April 26 to May 2, which is called a storm by only two stations.

No. 82 The flare event to be ascribed to the Type II burst on April 30 at 1943 UT is ambiguous. Two flares occurred simultaneously between 1930 and 2015 UT in two different regions on the sun. Information concerning both of these flares is given. The Type II burst covers the frequency range 135-100 Mc. Only a few minor bursts are reported at meter wavelengths, and these are superposed on a noise storm in progress 1821 - 2004 UT. No events are reported at any of the other single frequencies.

No. 83 The plage and spot data for this event are the same as that given for event No. 82a in the dynamic spectrum, the only response to this major flare is a weak noise storm. No distinctive event is reported at meter wavelengths, and only a relatively minor burst superposed on a weak rise and fall of long duration is reported at 10 cm.

No. 84 This event is similar to No. 79. It represents the disk passage of a very large and bright plage with many flares during its transit. However, the activity was not of the type necessary to produce any great solar optical and radio events such as those listed in this catalogue. The spot No. 13193 is a return of the β spot No. 13133 in region 4485.

No. 85 The plage and spot data for this major event are the same as that given for event No. 82a. No dynamic spectrum observations exist at the time of the flare on May 5 at 0356 UT. No distinctive event at meter wavelengths is reported with the flare.

No. 86 The flare event to be ascribed to the large 10 cm. burst on May 5 at 2035 UT is ambiguous. Two flares occurred simultaneously between 2025-2115 UT in two different regions on the sun. Information concerning both of these flares is given. The plage and spot data for one of these flares are the same as that given for event No. 84; the data for the other are similar to that given for event No. 82a. The large and complex 10 cm. burst is superposed on a very long-enduring gradual rise and fall in flux. There is very little response in the dynamic spectrum other than the onset of a noise storm. At meter wavelengths, no distinctive event is reported, and events at any of the other single radio frequencies are conspicuous by their absence.

No. 87 This long period of storminess is reported by one station--Apia. The interval from May 8 - 13 is evidently a period of only a very weak disturbance for the value of the three hour Kp's never exceeds 4.

No. 89 This active region is similar to the plage described in Note No. 84.

No. 89a This minor magnetic disturbance is reported as a storm by only one station--Sitka (Alaska).

No. 90 No known flare,SWF, or 10 cm. events are reported at the time of the Type II burst on May 19 at 1826 UT; therefore, no plage or spot data are available. The Type II burst covered the frequency range 240 - 130 Mc, and several unclassified bursts were also reported by Ft. Davis in the interval between 1822 - 1857 UT. A major burst occurred at 200 Mc., but no distinctive events at any other single radio frequencies were reported.

No. 91 Two of the stations that report this storm continue it through the interval of the next storm, described in No. 92.

No. 93 This major magnetic storm was evidently not produced by any major solar event such as those listed in this catalogue.

No. 94 The Type IV burst on June 4 at 2148 UT covers the frequency range 580-100 Mc. Although no Type II burst was observed, an unclassified burst was reported at 2149 UT. The large burst that occurred at 10 cm. is superposed on a lengthy rise and fall in flux. The βp spot No. 13261 in region 4578 is a return of the βp spot No. 13204 in region 4529.

No. 95 The plage and spot data for this event are the same as that given for event No. 94. The large 10 cm. burst on June 5 at 0839 UT is followed by a long post-burst increase. No dynamic spectrum observations exist at the time of the burst.

No. 96 The plage region involved in this event is a return of the region described in event No. 89. The major SWF on June 5 at 1620 UT showed no response in the dynamic spectrum except for an unclassified burst from 1621-1629 UT, "Having many features of a Type II burst." (Ft. Davis)

No. 97 The plage and spot data for this event are the same as that given for event No. 94. The Type IV burst on June 6 at 0434 UT was not originally reported as such by Sydney, but has been deduced by Hakura. No 10 cm. event was reported at the time of the Type IV burst, although there is a very large burst at 9500 Mc.

No. 98 The duration and intensity of this PCA event on June 6 at 1345 UT are not known.

No. 99 Although most of the stations agree that this major storm had a sudden commencement, three of the 14 reporting stations give the storm a gradual start on June 6 at 1800 UT.

No. 100 Two of the four stations that report this storm call it a sudden commencement storm; the other two stations start the storm gradually.

No. 101 This active region is similar to the plage described in note No. 84. The γ spot No. 13292, located in the plage, is one of the largest spots of the year--area equal to 1900 millionths of the hemisphere (Mt. Wilson data).

No. 102 This active region is similar to the plage described in note No. 84.

No. 104 The Type II burst on June 14 at 2121 UT occurred over a frequency range of 190-100 Mc. (Ft. Davis). No distinctive event at meter wavelengths was reported at the time of the Type II burst.

No. 105 The plage and spot data for this event are the same as that given for event No. 104. No dynamic spectrum observations exist at the time of the major flare on June 19 at 0940 UT.

No. 106 Five stations start this gradual storm earlier, on June 20 at 2100 UT. Three of the 13 stations designate the storm as "SC," instead of gradual.

No. 107 This interval of weak magnetic distrubance is reported as a storm only by the two Alaskan stations (Sitka and College).

No. 108 This active region is included in this catalogue only because of the presence of a complex $\beta\gamma$ spot in the plage.

No. 109 No distinctive events at meter wavelengths are reported with the Type II burst and large 10 cm. event on June 26 at approximately 0304 UT.

No. 110 The plage and spot data for this event are the same as that given for event No. 109. No distinctive events are reported at meter wavelengths at the time of the large 10 cm. microwave burst on June 27 at 0306 UT.

No. 112 This active region is similar to the plage described in event No. 84.

No. 113 This rather weak magnetic disturbance was called a storm by only one station--Sitka (Alaska).

No. 114 The large 10 cm. microwave burst on July 3 at 0045 UT evidently has only a very slight related effect at the lower frequencies. No distinctive event is reported at meter wavelengths, and only a group of Type III bursts in the dynamic spectrum. The SWF is taken from the unpublished CRPL "checklist."

No. 115 This interval of storminess is quite real, if one examines the three-hour Kp values. However, it was reported as a storm by only one station--Sitka (Alaska).

No. 116 The plage and spot data for this event are the same as that given for event No. 114. The large 10 cm. microwave burst on July 4 at 0516 UT shows very little effect at the lower frequencies. No distinctive events are reported at meter wavelengths, and only a small group of Type III bursts in the dynamic spectrum. In addition, Sydney reports a series of reversed drift bursts from 0507-0530 UT.

No. 117 An examination of our own WWV record at the McMath-Hulbert Observatory indicates that the starting time of the major SWF on July 4 at 1730 UT could be as early as 1700 UT. No distinctive events are reported at meter wavelengths at the time of the SWF.

No. 118 It seems evident that this great flare has a "double aspect," as indicated by the related events at radio frequencies and in the dynamic spectrum. The very great 10 cm. burst on July 7 at 0026 UT is in two parts, as is the Type II burst, as well as the Type III and Type I bursts. The single frequency reports also indicate this "double aspect."

No. 120 This is one of the few very great magnetic storms for which the three hour Kp value reaches its maximum value of 9. During this storm, the Kp value remained at the maximum value of 9 for three 3-hour intervals.

No. 121 The plage and spot data for this event are the same as that given for event No. 118. The Type II burst on July 12 at 2330 UT was observed over a frequency range of 130-100 Mc. and was reported by Sydney as well as Ft. Davis. Numerous pairs of reverse drift bursts between 2305-2345 UT were also observed in the dynamic spectrum. The radio response to the optical flare event is evidently confined to the lower frequencies. No event is reported either at 10 cm., or at meter wavelengths, nor at any of the other single radio frequencies at the time of the Type II burst. The SWF is taken from the CRPL checklist.

No. 122 This storm was reported by only two stations, and is a short but very real minor disturbance.

No. 124 This active region is similar to the plage described in note No. 84. The plage is a new one, and both plage and spot appear on the disk on the same day.

No. 126 No known flare is reported at the time of the Type II burst on July 20 at 0251 UT; therefore, no plage and spot data are available.

No. 128 This weak interval of magnetic disturbance was called a storm by only one station--Sitka (Alaska).

No. 129 Note that the large 10 cm. microwave burst on July 25 at 0041 UT occurs near the time of flare maximum. Any related effect in the dynamic spectrum evidently consists only of a noise storm with flux enhancement. The β spot No. 13397 in plage region No. 4665 is a return of the spot No. 13351 in region 4631.

No. 131 This very major solar event occurred in a very extensive and bright plage that was the most active region of the year. Plage No. 4659 is a return of the active plage No. 4622, that produced event No. 112 in this catalogue. Note the numerous events for which this remarkable plage 4659 is

responsible--No. 131, 132, 133, 134, 135 and 136. The spot No. 13384 is a return of the βp spot No. 13333 in region 4622. The αp spot No. 13388 is one of the largest spots of the year--area equal to 1400 millionths of the hemisphere (Mt. Wilson data), 1795 millionths in the Greenwich data.

No. 133 The plage and spot data for this event are the same as that given for event No. 131. No dynamic spectrum observations are available at the time of the large 10 cm. burst on July 29 at 0505 UT. At meter wavelengths the radio event consists of a major burst followed by a rise and fall in flux. No known SWF is reported at the time of the event.

No. 134 The plage and spot data for this event are the same as that given for event No. 131. The major SWF on July 30 at 1525 UT is accompanied by a large 10 cm. burst that is followed by a long post-burst increase. No distinctive event is reported at meter wavelengths.

No. 135 The plage and spot data for this event are the same as that given for event No. 131. No dynamic spectrum observations are available at the time of the major SWF on July 31 at 1115 UT.

No. 136 The plage and spot data for this event are the same as that given for event No. 131. The major SWF on August 2 at 1840 UT is accompanied by a great 10 cm. event and a Type II burst, but the related Hα optical event consists only of a minor flare at the limb, followed by surge activity. Note that the great 10 cm. burst is superposed on a very long-enduring rise and fall in flux.

No. 137 This major flare on August 4 at 0409 UT. occurs in a very large and very bright plage, No. 4667, in its second rotation. It is a return of the active plage No. 4630, that was responsible for events No. 144 and 116 in this catalogue. The Type II burst at 0439 UT is called a "possible" Type II by Sydney. No distinctive events at meter wavelengths are reported at the time of the flare.

No. 138 No known SWF is reported in connection with the Type II burst on August 4 at 2120 UT, which occurred over a frequency range of 190-100 Mc. Ft. Davis also reports an inverted U burst at 2112 UT.

No. 139 This major flare and SWF on August 7 at 1457 UT occurs in a very large, very bright and active plage in its second rotation. The complex $\beta\gamma$ spot No. 13434 is one of the largest spots of the year--area equal to 1100

millionths of the hemisphere (Mt. Wilson data). The 10 cm. event consists of several bursts superposed on a long-enduring rise and fall in flux. There is very little effect at the low frequencies--a single Type III burst and the onset of a noise storm is reported in the dynamic spectrum, and no distinctive events are reported at meter wavelengths.

No. 140 The plage and spot data for this event are the same as that given for event No. 139.

No. 141 The plage and spot data for this great solar event on August 16 at 0433 UT are the same as that given for event No. 139. No dynamic spectrum observations are available at the time of the great flare, but a Type IV radio emission has been deduced by Hakura on the strength of the very great 10 cm. burst and the great bursts indicated by the reports at single radio frequencies.

No. 143 Until the commencement of this storm, a long period of geomagnetically undisturbed conditions had prevailed since July 31.

No. 144 This remarkable plage No. 4708 is evidently responsible for 10 of the major events listed in this catalogue--Nos. 144, 145, 146, 147, 148, 149, 150, 151, 152, and 153.

No. 145 The plage and spot data for this event are the same as that given for event No. 144.

No. 146 The intensity of this PCA event has been measured by Leinbach, from his 30 Mc riometer record.

No. 147 This magnetic disturbance is a very short-lived storm.

No. 148 The plage and spot data for this event are the same as that given for event No. 144. The major flare on August 22 at 1428 UT is accompanied by a great 10 cm. burst that is superposed on a very long-enduring rise and fall in flux which lasts for more than six hours. In the dynamic spectrum, the start of the Type IV burst is inferred from the 60 Mc single frequency record, since the Ft. Davis dynamic spectrum observations did not begin until 1540 UT when the event was already well in progress. The single frequency radio events indicate that very probably a Type II burst also occurred.

No. 151 The plage and spot data for the event are the same as that given for event No. 144. The great solar flare on August 26 at 0005 UT is accompanied by other major events. The Type IV burst reported by Sydney at 0030 UT is also

reported by Ft. Davis, over a frequency range of 580-100 Mc. The large burst reported at 10 cm. was observed by Nagoya at 3750 Mc.

No. 153 The type of storm described here is ambiguous--six of the twelve stations call this a gradual storm, and the other six stations call it an SC storm.

No. 154 The flare event associated with the large SWF on August 28 at 1023 UT, and the large 10 cm. burst, is ambiguous. Three flares occurred simultaneously between 1025-1210 UT, in three different regions on the sun. Information concerning all three of these flares is given. Flares a and c occurred in plages 4712 and 4710, which together represent the return of the very active plage 4659, described in the notes for event No. 131. Flare b occurred in a plage which is the return of the active region of event No. 138. All three of these plages contain spots that are older than one solar rotation. The spot No. 13470 in region 4712 is a return of the βp spot No. 13389 in region 4659. The αp spot No. 13480 in region 4722 is a return of the βp spot No. 13406 in region 4670. The αp spot No. 13462 in region 4710 is a return of the $\beta\gamma$ spot No. 13388 in region 4659. No dynamic spectrum observations exist at the time of the SWF at 1023 UT., but a major + burst is reported at meter wavelengths, and large bursts occur at other single radio frequencies.

No. 155 No known 10 cm. observations exist at the time of the Type II burst on September 2 at 2108 UT. The Type II burst covered the frequency range of 300-100 Mc.

No. 156 Four of the 17 stations that report this storm indicate that there evidently was a second start on September 4 at 1400 UT. The 3-hour Kp's show two maxima.

No. 157 The large SWF on September 7 at 1658 UT is associated with a flare in a region which is the return of the active region described in the notes for event No. 139. The βp spot No. 13508 is a return of the large $\beta\gamma$ spot No. 13434 in region 4686. It is a curious circumstance that no dynamic spectrum events, no events at meter wavelengths, and no events at any other single radio frequencies, are reported at the time of the SWF. The only known related event is a modest 10 cm. burst superposed on a rise and fall in flux.

No. 158 This complex spot and bright plage do not produce the kind of activity necessary to generate any major optical and/or radio events such as those listed in this catalogue.

No. 159 The plage and spot data for this event are the same as that given for event No. 155. No dynamic spectrum observations are available at the time of the large 10 cm. burst on September 14 at 0830 UT, with its large SWF. However, a major + burst is reported at meter wavelengths, and large bursts occur throughout the entire range of the single frequency radio events.

No. 160 Three of the 10 stations that report this storm start the storm earlier at 0000 UT., and four stations call it an SC storm, rather than gradual.

No. 161 This complex spot and bright plage are similar to those described in note No. 158. The $\beta\gamma$ spot No. 13535 is a return of the $\beta\gamma$ spot No. 13434 in region 4908, and described in note No. 144.

No. 162 No known SWF is reported at the time of this major flare September 18 at 0728 UT. However, Nera reports a sudden enhancement of atmospherics of importance 2 at 0826 UT, duration 58min. No dynamic spectrum observations are available at the time of the flare. The single frequency reports indicate that only relatively minor bursts occurred throughout the range of the radio spectrum.

No. 163 See the notes accompanying events No. 84 and No. 158.

No. 164 This event, while not fitting the criterion of a "major" event, seems to be the most suitable antecedent to the PCA event that follows, and it therefore is included in this catalogue. The flare on September 22 at 0738 UT occurred in a large, bright, and active plage which is the return of the active regions 4712 and 4710, described in the note for event No. 154. The βp spot No. 13544 is one of the largest spots of year--area equal to 1500 millionths of the hemisphere (Mt. Wilson data). No dynamic spectrum observations are available at the time of the flare.

No. 167 The Type II burst on September 28 at 2046 UT was observed over the frequency range 500-100 Mc. The related flare occurred in a new plage, at rather high latitude, near the west limb. Both the plage and its related βf spot form on the disk near the central meridian.

No. 169 No known SWF is reported at the time of the Type II burst on October 2 at 2149 UT. The Type II event was observed by Ft. Davis over a frequency range of 140-100 Mc, and was also reported by Sydney. A major burst is reported at meter wavelengths.

No. 170 This very minor disturbance was reported as a storm by only one station--Hermanus.

No. 171 No known SWF or 10 cm. events are reported with the Type II burst on October 8 at 1529 UT. The Type II event was observed by Ft. Davis over a frequency range of 420-100 Mc., and was also reported by Michigan.

No. 172 No known flare is reported at the time of the major SWF on October 10 at 0200 UT; therefore, no plage and spot data are available. No dynamic spectrum observations exist at the time of the SWF, and no distinctive events are reported at meter wavelengths.

No. 173 This is a very great solar event. The strong Type II burst reported on October 21 at 2328 UT was observed by Ft. Davis over a frequency range of 250-100 Mc, the Type IV event over the entire observable spectrum range of 580-100 Mc. Both of these bursts were also observed and reported by Sydney. Very large bursts are also reported throughout the entire range of the single radio frequencies. A great 10 cm. burst is indicated in progress late in the lifetime of the solar event, which occurred in a large, very bright, and very active region. This plage (4826) is a new region in its first rotation, and contains a complex $\beta\gamma$ spot No. 13625 which is one of the largest spots of the year--area equal to 1200 millionths of the hemisphere (Mt. Wilson data). It is worthy of note that this great solar optical and radio event was not accompanied by any known polar cap absorption.

No. 174 See the note accompanying event No. 158.

No. 175 This storm occurred after a long interval of geomagnetically quiet conditions extending from October 4-21. Six of the 16 stations continue the storm through one more day, which covers the period of the next storm. It is tempting to associate this storm with the major solar event described above in No. 173, but a time interval of four hours transit time for the storm-producing particles hardly seems likely.

No. 176 The Type II burst reported by Michigan on October 23 at 1729 UT was called an "unclassified burst" by Ft. Davis, who also comment that "it has some features of a Type II burst."

No. 177 No known flare, SWF, or 10 cm. events are reported at the time of the Type II burst on October 24 at 0420 UT. Therefore, no plage or spot data are available. Also, no distinctive events are reported at meter wavelengths, or at any other single radio frequencies, at the time of the Type II burst.

No. 178 This magnetic storm began before the preceding storm--described in note No. 175--had completely subsided.

No. 179 The plage and spot data for this event are the same as that given for event No. 173. The Type II burst on October 24 at 1452 UT was observed over a frequency range of 180-100 Mc, the Type IV event covered the entire observable range of 580-100 Mc. (Ft. Davis). Note that the modest complex 10 cm. burst is followed by a long post-burst increase.

No. 180 Three of the 8 stations that reported this storm continue the storm through the interval covered by the next storm (event No. 181).

No. 182 This brief interval of magnetic disturbance was reported as a storm by only one station--Hermanus.

No. 183 See note accompanying event No. 84.

No. 184 See note accompanying event No. 158.

No. 186 No known 10 cm. event is reported at the time of the major flare and SWF on November 14 at 0036 UT. The flare occurred in region 4877, which is a return of the plage described in event No. 174. The αp spot No. 13694 is a return of the $\beta\gamma$ spot No. 13633 in region 4829.

No. 187 This major flare on November 24 at 1607 UT is accompanied by a 10 cm. burst which is superposed on a long-enduring rise and fall in flux that lasted for more than 5 hours. The Type IV radio emission in the dynamic spectrum is of very brief duration, but a strong noise storm with enhanced continuum emission is indicated. At meter wavelengths, the reported event is described as a major burst followed by a long-enduring noise storm.

No. 189 The plage and spot data for this event are the same as those given for event No. 188. No known 10 cm. observations exist at the time of the Type II burst on November 27 at 2358 UT, but reports at 3750 Mc and 9400 Mc indicate that perhaps only a minor burst occurred at the higher frequencies.

No. 190 This storm represents only a relatively weak geomagnetic disturbance. However, the interval stands out as a disturbed period because of the long period of extremely quiet geomagnetic conditions that has prevailed since the end of the preceding storm on November 11.

No. 202 This Type IV burst on December 11 at 1745 UT seems to be associated with a flare that is not in the radio noisy region described above, but is in a region near the west limb. No known SWF, or 10 cm. bursts, or events at meter wavelengths, or at any of the single radio frequencies, are reported at the time of the Type IV event.

No. 203 The Type IV event on December 11 at 1803 UT is accompanied by a very large 10 cm. microwave burst, and Ft. Davis also reports an "unclassified" burst from 1812 -1819 UT, "Having many features of a Type II burst." A very large major + event is reported at meter wavelengths.

No. 206 The plage and spot data for this event are the same as those given for event No. 197. The Type II burst on December 12 at 1259 UT and the Type IV event starting at 1301 UT were accompanied by a very large 10 cm. burst which was followed by a long post-burst increase of more than 4 hours duration. Observations at Ft. Davis began at 1415 UT, and their report states "intermittent Type IV throughout the day." At meter wavelengths, the response is a major burst followed by a rise and fall in flux, and the same type of response seems to be indicated by the single frequency reports.

No. 208 The plage and spot data for this event are the same as that given for event No. 197. No known SWF or 10 cm. bursts are reported with the Type IV burst on December 15 at 1543 UT. This very brief burst of Type IV emission was observed over a frequency range of 500-300 Mc, and was accompanied by only minor bursts at meter wavelengths. There were no other known events at any of the other single radio frequencies.

No. 210 The plage and spot data for this event are the same as those given for event No. 197. No known SWF is reported at the time of the large 10 cm. microwave burst on December 17 at 1040 UT. No dynamic spectrum observations are available at the time of the burst.

No. 213 No known flare or 10 cm. event is reported at the time of the Type II burst on December 18 at 0438 UT. Only a minor burst occurred at meter wavelengths, and no events are reported at any other single radio frequencies.

No. 214 No known flare, SWF, or 10 cm. events are reported at the time of the Type II burst on December 19 at 0527 UT. A minor burst occurred at meter wavelengths, but no events are reported at any other single radio frequencies.

TABLE VIII. CHRONOLOGICAL CATALOGUE

NTS		PLAGE DATA									SUNSPOT DATA					
Max. UT	Peak Flux	McM. Plage No.	CMP Gr. Day	Mean Long.	Mean Lat.	Ave. Int.	Max. Area	No. Flares	Age in Rotations	Identification	MT.W. Type	CMP Gr. Day	Mean Lat.	H	When Seen	MT.W. No.
1840	26	*4355	Jan. 11.5	19°	S12	3.5	9000	33	1	NEW	* $i\beta y l$	Jan. 11.3	S12	22	Jan. 5-17	12924
1831.7	28										$d\beta l$	11.7	S17	13	7-17	12930
		4347	7.0	78°	N13	3	13000	22	3	4296	* $i\beta y d$	7.3	N12	17	31-11	12918
1720	40	4355														
1642.7	1350															
1418.5	20	4370	17.5	300°	N15	2.5	6000	26	1	NEW	* $i\beta p l$	17.5	N13	36	10-23	12947
		4377	20.5	261°	S14	2	3000	6	3	Part of 4319	$i-d$	20.5	S15	(5)	14-17	12958
		4368	16.5	313°	S07	3	6000	3	1	NEW	$i\beta p l$	16.2	S08	19	10-21	12945
											$i-p d$	16.3	S04	21	10-20	12946
	278	4372	20.5	261°	S24	2	3500	10	4,6	4318 + 4319	$d\beta l$	19.9	S25	(20)	20-26	12975
1400	23	*4400	Feb. 8.5	24°	S12	3.5	25000	91	2,3	4355	$d\beta p l$	Feb. 6.2	S13	16	31-11	12997
1334.9	40									4356	$i-d$	6.9	S10	(10)	31-9	12998
										4360	$i-p i$	8.1	S14	37	1-14	13000
										4362	$i\beta l$	9.3	S18	18	2-15	13004
Indet.	70	4400														
1321.7	12	4400														
1327	100															
1920	20	4400														
1905.5	225															
0545.8	343	4426	22	193°	S16	3	6000	6	7	4382	$i-p d$	22.0	S18	11	15-23	13035
0550	1048										$i-p i$	22.1	S16	20	15-28	13034
0346	384															
0400.3	424															
	458	4436	25	153°	S12	3.5	1400	15	1	NEW	$d\beta p l$	25.2	S15	14	23-3	13052
	296															
	252															
	-															

(2)

No. 215 The large 10 cm. burst on December 23 at 0536 UT is associated with activity in region 4934. This plage is a return of the plage described in note 192. The spot No. 13803 is a return of the βp spot No. 13733 in region 4897.

No. 216 See the note accompanying event No. 84. This plage is a return of the plage that was responsible for events No. 191 and 195.

No. 217 The plage and spot data for this event are the same as those given for event No. 215.

		FLARE DATA						SHORT-WAVE RADIO FADEOUTS						10 CM. EVE		
Event No.	Gr. Day.	Beg. UT	End UT	Max. UT	Imp.	Position	No. of Obs.	Type	Imp.	Beg. UT	Dur. Min.	Wide Spread Index	No. of Obs.	Type	Beg. UT	Dur. Min.
1	Jan. 07	1820	1939	1832 1842	2	S18E39	4/4	S	1+	1820	20	4	4	3 6	1822 1829.5	80 5
2	07															
3	09															
4	15															
5	15															
6	15	1640	1757	1642	2+	S13W58	5/4	*S	3	1640	120	5	12	3 *2	1640 1640	240 28
7	16	1414	1447		1+	N18E23	2/0	*S	3	1416	33	5	3	3	1409	60
8	16	2255	2347	2306	2	S15E47	2/2									
9	17															
10	18	2253	2335	2256	1	S11W32	3/3									
11	20															
12	25	*0915	1107	1005	3	S23W70	18/5	*S	3	0938	74	5	4	CD	0931.5	40
13	25															
14	Feb. 04															
15	09	1330	1501	1341	1+	S20W02	4/2	*S	3	1332	46	5	6	3 6	1330 1333.8	95 6
16	09	2108	2302	2142	2+	S12W14	2/2	SL	1	2124	20	5	5	3	2105	60
17	10															
18	10	1320	1411	1332	2+	S13W64	11/3	*S	3	1325	35	5	7	2 2	1320.5 1323	2.5 11
19	10	1900	2030	1911	1+	S14W64	3/3	*S	3	1903	47	4	5	3 6	1840 1903	130 15
20	11															
21	16															
22	20															
23	26	0527	0632	0550	2	S18W61	3/1	SL	2+	0540	56	4	4	ECD *ECD	0543 0550	5 8
24	28															
25	Mar. 01							*SL	3	0340	95	5	6	CD CA	0346 0352	6 34
26	01	*0905	1007	0917	3	S11W45	5/1	S	2+	0913	12	4	5	SD SD CD	0913.5 0925 0929 0930.5	2 4 2.5 9
27	01															

OF MAJOR SOLAR EVENTS FOR 1958

Event No.	DYNAMIC SPECTRUM DATA				200 MC/S DATA						
	Type I Time/Max. Int.	Type III Time/Int.	Type II Time/Int.	Type IV Time/Int.	Type	Beg. UT	Dur. Min.	Max. UT	Peak Flux	Freq. Mc/s	Type
1				*1829-2024/3	E	1823	26		58	545	SD
					ECD	1841.5	4		58	545	CD
					F	1852	11		58		
					E	1909	71		71		
2											
3											
4		S0329-0335/2	*0335-0355/2								
5											
6	C 1425-1807/3										
	I_s 1425-2400/3										
7	I_s 1425-2053/2										
8		g2258/1 G2300-2307/2	*2313-2316/2							470	ECD
9											
10		b2256/2	*2257-2301/3		CD	2258.5	1.5		200		
11											
12					CD	0924	4.5	0926	140	545	CD
					CD	0933	4.5	0937	110		
13											
14											
15					FD	1357	7	1400	300		
16	I_s 2151-2405/3	g2120/3 g2159/3		*2116-2302/3	CD	2109	95		3000	1420	CA
										1420	CA
										545	CD
17											
18	c 1405-1655/1				CD	1319.5	3.5		180	545	CD
					CD	1325	8		700	169	ECA
										169	ECA
										169	SA
										81	CD
										81	SD
										18	-
19	I_s - ALL DAY	g1900/3 G1904-1903/3	*1911-1917/3		SD	1910	2		450	545	CD
										470	CD
										167	ECD
										18	-
20											
21											
22											
23		b0550/2 g0550-0551/3	*0602-0611.5/2							9500	CD
										1420	SD
										545	SD
24											
25										9500	CD
										9500	CA
26					CD	0903	5		175	9400	SD
					CD	0926	4	0928	59	1500	SD
					CDM	0939	4	0941	72	545	CD
					M	0943	137	1012	72	169	SA
										169	SA
27		b2037/1		*2041-2054/2							

3. VIII- 1R 0

TABLE VIII.

Peak Flux	McM. Plage No.	CMP Gr. Day	Mean Long.	Mean Lat.	Ave. Int.	Max. Area	No. Flares	Age in Rotations	Identification	MT.W. Type	CMP Gr. Day	Mean Lat.	H	When Seen	MT.W. No.
		PLAGE DATA								SUNSPOT DATA					
941															
		Mar.									Mar.				
1338	*4445	7.5	15°	S15	3	10000	45	3,4	4400	$d\beta d$	6.7	S12	10	28-8	13062
–										$l-pl$	7.4	S14	26	28-11	13064
										$l\beta pl$	7.5	S17	28	28-11	13063
	4445														
														Mar.	
85	4444	7	22°	N31	2.5	4000	18	1	NEW	$d\beta pl$	7.2	N33	20	2-11	13067
22															
407	*4449	12	316°	N12	2.5	9500	31	3	4410	$d\beta d$	11.7	N23	(10)	8-11	13077
										$l\beta pl$	12.7	N12	11	7-17	13075
										$l-pl$	12.8	N12	17	7-18	13076
13															
50															
348	4449														
13	4445														
210															
40															
1340	*4476	28.5	98°	S12	3.5	15000	90	2	4442a	* $d\beta$	27.3	S08	11	24-30	13110
45										* $l\beta$	29.0	S13	21	22-30	13103
										$d\beta$	29.3	S07	13	23-30	13108
4476															
458	4476														
	4465	22.5	177"	N21	3	7000	66	1	NEW	$l\beta l$	22.8	N22	20	16-26	13092

(2) 3. VIII-2L

OTHER RADIO DATA				POLAR CAP ABSORPTION						GEOMAGNETIC STORMS						
Beg. UT	Dur. Min.	Max. UT	Peak Flux	Gr. Day	Onset UT	Rise to Peak	Dur.	Int.	Obs.	Gr. Day	Beg. UT	Dur.	Type	Int.	No. Sta. Rep.	Max. Kp
1826	15		180													
1900	90		4000													
										Jan. 09	09xx	11^d	g	m	1	5
										15	1030	6^h	g	m	1	4
2303.5	0.3	2303.6	440													
										17	08xx	2.5^d	g	m	4	5
										20	21xx	4^d	g	m	9	7
0931.5	6		30													
										25	1050	1^d	sc	m	3	5
										Feb. 04	11xx	5^d	g	m	7	5
2113	24.5	2136	207													
2138	32	2152	856													
2111	85		800													
				Feb. 10	0600	14^h	37	26	B,L,H							
1325	7		130													
1320	3		117													
1323	10		117													
1333	147		117													
1320	4		300													
1345	50		300													
1325	40		-													
1905	4		200													
1904	21	1906.5	280													
1910	3	1912.2	1700													
1902	33	1913	-													
										11	0126	4^d	sc	s	15	9
										16	1642	4^d	sc	m	9	5
										20	18xx	3^d	g	m	7	5
0551	13	0551.5	1023													
0551	8	0552	168													
0550	10		50													
										28	07xx	8^h	g	m	1	4
0337	13	0344	720													
0353	33	0400.3	796													
0913	27	0914	965													
0911	21	0914	225													
0913.5	2	-	140													
0915	16	-	45													
0947	48	-	54													

(2)

		FLARE DATA						SHORT-WAVE RADIO FADEOUTS						10 CM. EVENTS			
Event No.	Gr. Day.	Beg. UT	End UT	Max. UT	Imp.	Position	No. of Obs.	Type	Imp.	Beg. UT	Dur. Min.	Wide Spread Index	No. of Ob.s	Type	Beg. UT	Dur. Min.	Max. UT
28	Mar. 02																
29	02							S	1	1136	21		1*	*CD	1134	6.5	1138
30	03																
31	03	*1005	1411	1020	3	S16E60	8/2	*S	3+	1010	95	5	6	*SD	1005 1033	28 25	-
32	05	*0500	0632	0540	3	S12E46	1/1										
33	05																
34	09																
35	09	1540	1740	1546	2	N34W32	3/3	*S	3	1542	81	5	10	2 4	1543	8 315	1545.9
36	11	0030	0042	0034	1	N11E12	1/1	*S	3	0048	152	3	2	CD	0021	38	0024.8
37	11																
38	11							*SL	3	1510	170	5	7	3 6	1500 1512.6	455 10	Indet. 1516.6
39	12	0024	0233	0037	2+	N08 E02	1	*G	3+	0052	227	1	1	CD	0027	16	0036.
40	13							*SL	3	1455	130	5	10				
41	14																
42	14	1454	1541	1507	2	S21W85	3/2	*SL	3	1455	130	5	10	9 6 4	1453 1458.5 1511.5	5.5 13 165	1501
43	17																
44	18																
45	23	*0947	1445	1005	3+	S14E78	19/7	*S	3	0953	196	5	7	*6 4	0953 1143	110 500	1002
46	23																
47	24																
48	24	1607	1643		1	S15E57	3/2	G	2+	1542	70	4	6	6	1638	1.2	310
49	25	0557	0626	0603	2	S15E50	2/0	SL	2	0603	27	5	4	ECD	0558.8	3	0559.3
50	25																
51	25																
52	25																
53	26	0036	0040		1	N21W50	1/1										

1958 (CONTINUED)

	DYNAMIC SPECTRUM DATA				200 MC/S DATA					OTHER R		
Event No.	Type I Time/Max. Int.	Type III Time/Int.	Type II Time/Int.	Type IV Time/Int.	Type	Beg. UT	Dur. Min.	Max. UT	Peak Flux	Freq. Mc/s	Type	Beg. UT
28			*0009- 0015/2									
29					CD	1134.5	6.5	-	480	9400 545 169 81	SD CD ECD CD	1134 1133 1135 1137
30												
31				*1350- 1645/3	CD	1013	7	-	40000	9400 545 536 169 81 23	SD CD CA ECD ECD C	1010 1012 1010 1015 1013 1018.2
32										9500	CD	0500.5
33												
34												
35										600 470	SD CD	1557 1530
36	S0027- 0601/3	g0029.5/1 G0031- 0036/1 b0038/1	*0032- 0046/2							3750 2000 1000	CD CD CD	0020 0020 0022
37												
38	S1540- 1557/1											
39	S0200- 0450/3		*0043- 0103.5/3							9400 3750 2000 1000	ESD F F CD	0041.5 0030 0030 0022
40												
41												
42					ECD	1457	20	-	54	9400 1500 600 169 169 81	SD CD CD CD CD ECD	1457 1453 1452 1457 1510 1459
43												
44												
45				*1002- 1142/3	CD CM CD	0957 0957 1003	12 123 7	1003 1003 1007	182 - 240	810 545 178 178 81 81 23	CD CA ECD CA CD CA -	1001 1003 1003 1010 1005 1020 1003
46												
47												
48	C1638- 1639/3	g1635- 1636/1 G1636- 1639/3	*1643- 1651/3		ECD	1635	6	-	190	545 169 81	SD CA ECD	1638 1636 1647
49										9500 3750	CD CD	0558.5 0558.8
50												
51												
52	S2328- 2358/1	g2318- 2320/1 G2322.5- 2323.5 2 b2324.5 1	*2320- 2324 2 *2325- 2332.5 2		CD	2330.5	1.5	-	140	81		2330
53	C0034- 0036 3	g0034- 0036 3 g0037- 0038 3	*0035- 0038.5 1 *0041.5- 0047.5 1		CD	0034.5	6	-	160	9500 545	ECD CD	0034.3 0034.5

3. VIII-2R 0

TABLE VIII.

		PLAGE DATA									SUNSPOT DATA					
Max. UT	Peak Flux	McM. Plage No.	CMP Gr. Day	Mean Long.	Mean Lat.	Ave. Int.	Max. Area	No. Flares	Age in Rotations	Identi-fication	MT.W. Type	CMP Gr. Day	Mean Lat.	H	When Seen	MT.W. No.
1546.4	220 50	4476														
1034	758	4478	Mar. 30	78°	S22	3	6000	29	2	4438	* $\beta p l$	Mar. 30.5 -	S22	17	23-5	13109
1711.5	7 575 60	4476														
1835.7	100	4465														
2045.1 -	520 24	4478														
1342	624 -	4484	Apr. 4.5	6°	N30	3	9000	48	2	4444	$d\beta l$ βl	Apr. 4.3 4.5	N29 N33	(15) (15)	5-10 30-10	13132 13118
1449.1	42	4469	Mar. 25	144°	N25	3	6000	19	1	NEW	$\beta p l$	Mar. 24.6	N25	14	18-26	13096
1628.5 1646	7	4465														
1821.8	1400 34	4478														
0107.7	735	4484														
	437	4476														
0010.3	561	4476														
0049	486	4476														
1953.4	260 12	*4483	Apr. 4.5	6°	S22	3	5000	33	4,5	4445	$d\beta l$ $l-p d$ $-p l$	Apr. 3.4 3.8 4.6	S24 S15 S16	(10) (7) 15	4-9 30-5 30-10	13122 13117 13120
1936.8	13	4483														
- -	736 -	*4493	9.5	300°	N18	3	5000	34	2	4453	$l-p l$ $\beta l l$ $-p d$ $d\beta p d$	9.4 9.7 9.9 10.1	N12 N16 N09 N16	29 17 (10) (10)	4-15 4-16 4-5 12-13	13129 13130 13131 13148
0303	325	4483														

(2)

ADIO DATA			POLAR CAP ABSORPTION						GEOMAGNETIC STORMS						
Dur. Min.	Max. UT	Peak Flux	Gr. Day	Onset UT	Rise to Peak	Dur.	Int.	Obs.	Gr. Day	Beg. UT	Dur.	Type	Int.	No. Sta. Rep.	Max. Kp
14	1138	450													
7	-	160													
3	-	90													
3	-	120													
									Mar. 03	0930	1.5^{d}	sc	ms	8	5
81	1016	1160													
21		300													
236		115													
30		160													
30		23000													
8.3	1022.3	-													
5	0500.8	558													
									05	0530	3.5^{d}	g	ms	9	7
									09	0857	10^{h}	sc	ms	1	4
11	-	48													
18	1547.6	110													
32	0024.7	(80)													
37	0026.7	(187)													
37	0026.7	(293)													
									11	1200	2.5^{d}	g	ms	9	7
0.5	0041.7	(40)													
15	0036	(17)													
	0036.4	(17)													
22	0040	(14)													
									13	10xx	12^{h}	g	ms	3	6
									14	1212	2^{d}	sc	m	9	6
-	1501	328													
-	1455	137													
32		50													
12		100													
22		55													
12		30													
									17	06xx	15^{h}	g	ms	5	5
									18	12xx	4^{d}	g	ms	6	6
111	1012	650													
100	-	360													
8.5	-	65													
180	-	65													
15	1008	140													
90	-	45													
1	1003.2														
			Mar. 23	1500	34^{h}	53	26	B							
									24	04xx	1^{d}	g	m	2	5
1		30													
4		100													
4		(220)													
8	0559.2	604													
10	0559.3	(106)													
			25	1530	13^{h}	122	80	B,L,H							
									25	1540	3.5^{d}	sc	ms	9	5
3	0034.5	871													
6		20													

(2)

		FLARE DATA						SHORT-WAVE RADIO FADEOUTS						10 CM. EVENT		
Event No.	Gr. Day.	Beg. UT	End UT	Max. UT	Imp.	Position	No. of Obs.	Type	Imp.	Beg. UT	Dur. Min.	Wide Spread Index	No. of Obs.	Type	Beg. UT	Dur. Min.
54	Mar. 27	1534	1710	1552	2+	S16E23	5/3	*S	3	1535	83	5	12	6 4	1543.8 1554.8	11 190
55	28	1030	1152	1038	2	S24E26	8/2	*S	3+	1034	41	5	7	*SD	1033	15
56	28	1703	1904	1714	2+	S15E09	3/3	*S	3	1708	70	5	10	9 *2 4	1702.5 1708.5 1722.5	6 14 140
57	28	1833	1922	1838	2	N20W85	2/2	S	2+	1833	27	5	5	2	1835	3.5
58	28	2042	2131	2047	2	S24E21	3/3	S	2+	2042	26	4	7	*6 3	2043 2125	33 100
59	29	1339	1410	1343	2	N35E78	7/4	*S	3	1340	35	5	11	*2 4	1341.5 1343	1.5 7
60	29	1447	1507	1449	1	N26W70	5/4	S	2	1448	14	5	7	6	1447.1	4
61	29	1630	1637	1632	1-	N21W90	1	*S	3	1628	62	5	10	1 3	1627 1536	3 70
62	29	1819	1915	1823	2	S24E08	3/3	*S	3	1821	59	5	10	*2 4	1820.5 1833	12.5 90
63	30	0045	0123	0108	2	N35E74	2/1	S	2	0109	12	5	6	*CD	0106.5	5
64	30															
65	30	0944	1421	1000	2+	S16W20	10/3	*S	3	0955	50	4	4	CA	0910	100
66	31	0005	0036	0014	2	S17W22	4/3	G	2+	0006	44	5	4	*CD	0006	9
67	31	0038	0130	0052	2	S08W23	4/3	*S	3+	0050	80	5	4	CD	0047.5	9
68	Apr. 01															
69	02	1951	2025	1954	1+	S15E23	3/3	S	2	1952	30	5	7	6 4	1951.5 1959	7.5 18
70	04															
71	06															
72	06	1929	2025	1940	1	S15W27	2/2	G	1-	1925	35	(From check list)		6	1934	12
73	07	*1010	1215	1025	3	N14E32	5/1	S	2+	1016	69	5	5	*2 4	1014 1022	8 30
74	08	0301	0408	0309	1	S17W44	2/1	S	1+	0306	69	3	2	CD	0302	11
75	10															

(1)

TABLE VIII.

		PLAGE DATA								SUNSPOT DATA					
Max. UT	Peak Flux	McM. Plage No.	CMP Gr. Day	Mean Long.	Mean Lat.	Ave. Int.	Max. Area	No. Flares	Age in Rotations	Identification	MT.W. Type	CMP Gr. Day	Mean Lat.	H	When Seen	MT.W. No.
1332	7															
1337.5	62															
			Apr.									Apr.				
		*4508	21.5	141°	S21	3.5	7500	30	1	NEW	$1\beta p1$	21.1	S22	23	14-26	13157
1931	15	*4530	3	82°	S15	3.5	11000	77	1	NEW	$1\beta\gamma1$	3.2	S15	19	26-8	13197
		4519	26	349°	N09	3.5	6000	6	1	NEW	$1\gamma p1$	25.4	N08	16	19-30	13176
											$1\beta1$	26.4	N12	(20)	20-2	13179
2157	25	4530														
2128.5	136															
			May									May				
		*4529	2	3°	N22	3	14000	60	3,5	4484, 4485	$1\beta p1$	2.0	N18	17	25-7	13193
											$d\beta p1$	2.9	N25	15	30-8	13204
0414.8	1200	4530														
2036.5	580	4529														
	8															
-	25	4530														
		*4548	15.5	184°	S21	3.5	13000	49	2	4516						
Indet.	20	*4578	30	352°	N24	3	8000	47	4.6	4529	$1\beta d$	29.8	N24	6	23-1	13261
2156	570										$d\beta1$	30.7	N29	14	28-6	13275
0843.4	868	4578														
-	-															
			June									June				
Indet.	25	4598	11.5	187°	S20	3	7000	10	3	4548	$1\beta d$	10.6	S17	(10)	4-13	13295
1623	380										$d\beta2$	11.7	S26	9	6-16	13299
	25															
		4578														
		*4596	10	207°	N28	3.5	10000	30	1	NEW	$*1\gamma1$	10.3	N29	21	3-16	13292
		*4597	10	207°	N43	3	7000	77	1	NEW	$d\beta1$	9.8	N43	14	4-16	13294

(2)

1958 (CONTINUED)

	DYNAMIC SPECTRUM DATA				200 MC/S DATA					OTHER RA		
Event No.	Type I Time/Max. Int.	Type III Time/Int.	Type II Time/Int.	Type IV Time/Int.	Type	Beg. UT	Dur. Min.	Max. UT	Peak Flux	Freq. Mc/s	Type	Beg. UT
54	S1318- 2400/1	b1523/2								169 18	CA	1537 1534
55										9400 1500 545	SD SD SD	1033 1035 1034
56					E	1736.5	92		-			
57	S1317- 2043/2		*1837- 1847/3		CD	1836.5	3.5		240	18		1836
58	S2136- 2400/2											
59	C1342/3 S1336- 1420/2	g1342/3 g1344, 1346/1 b1359/1			CD	1342	1		290	9400 1500 545 81 23 18	SD SD CD SD - (BURSTS)	1340 1340 1342 1341 1341.1 1341
60	S1442- 1605/2	g1448- 1449/2	*1452- 1455/3							9400 1500 545 231 169 18	CD SD CD CD SA -	1447 1447 1447.5 1450 1453 1450
61	S1713- 2137/3		*1630- 1637/3		ECA	1631.5	2		204	169 18	SA (BURSTS)	1631 1628
62	I_s in Progress	b1820/1+								167	CD	1855
63		g0027/2+ g0030/2-			ECD	0107.3	1	0107.3	4300	9500 2000 1000	ECD ESD ESD	0107.1 0107 0107.4
64												
					ECD	0952	2	0953	324	9400 1500 600 600 545 169 169	SD CD ESA SA CA SA ECAF	0908 0919 0957 1008 0915 0915 0917
66		b0007/1			SD	0007	0.5	-	180	9500 3750 2000 1000 600	CD CD CD F CA	0006 0006 0007 0007 0007
67		g0032/3- g0033/1 b0042, 0043/1			ESD	0031.5	0.5	0031.9	350	9500 9500 2000 2000 1000 600	ESD ECD F SD CD F	0031.5 0047.5 0029 0047.5 0031.5 0032
68												
69	C1946/3 C1952- 1954/3	G1945- 1947/2 G1952- 1953/1	*1955- 2008/3+	*1953- 1958/2	ECD CD	1951.5 1955	2 20	1952 1957	82000 25000	545 167 167	CD ECD ECD	1951.5 1951.5 1955
70												
71												
72				*1936- 1948/2	CD	1937	12	-	180	545 167 167	CD ECD CD	1935 1935 1950
73										9400 1500 810 545	CD CD CD CD	1013 1013 1014 1016
74			*0304- 0311/3		CD	0304	10	0305	2500	2000 1000 545	CD CD CD	0301 0301 0302
75												

3.VIII-3Q

0

DIO DATA			POLAR CAP ABSORPTION						GEOMAGNETIC STORMS						
Dur. Min.	Max. UT	Peak Flux	Gr. Day	Onset UT	Rise to Peak	Dur.	Int.	Obs.	Gr. Day	Beg. UT	Dur.	Type	Int.	No. Sta. Rep.	Max. Kp
34	-	180													
66		-													
44	1034	928													
5	1035	179													
1		50													
14															
10	1342	883													
10	1342	186													
8	1345	40													
2		120													
3.2	1342.7	-													
29	-	-													
10	1449	460													
6	1447	156													
2	-	260													
3.7	1452.5	2000													
4	-	300													
20	-	-													
4	-	300													
37	-	-													
182	-	1600													
4	0107.2	1342													
2	0107.6	(180)													
1.5	0107.8	(117)													
									Mar. 30	08xx	1.5d	g	ms	6	6
206	1034	415													
105	0938	199													
3	-	234													
14	-	145													
66	-	180													
50	-	300													
43	-	990													
13	0010	820													
7	0010.3	(188)													
7	0010.3	(86)													
5	0010.3	(63)													
5.5	0007	75													
0.5	0031.7	608													
13	0049	1015													
5	0031.8	(66)													
3	0048.4	(10)													
2	0031.6	95													
3	0032	174													
									Apr. 01	14xx	2d	g	m	2	5
6.5	-	200													
3.5	1953	2400													
16	1959	2400													
									04	06xx	1.5d	g	m	4	6
									06	00xx	1.5d	-	m	2	5
15	-	170													
15	-	150													
320	2242	240													
124	1015.5	1125													
36	1016.5	564													
10	1018	73													
4	-	30													
16	0303.2	(46)													
18	0310.7	(63)													
17	-	70													
			Apr. 10	0900	9h	68	35	B							

(2)

		FLARE DATA						SHORT-WAVE RADIO FADEOUTS						10 CM. EVENTS		
Event No.	Gr. Day.	Beg. UT	End UT	Max. UT	Imp.	Position	No. of Obs.	Type	Imp.	Beg. UT	Dur. Min.	Wide Spread Index	No. of Obs.	Type	Beg. UT	Dur. Min.
76	Apr 11							*S	3-	1333	38	5	13	1 2	1330.5 1335.5	3 4
77	14															
78	16															
79	21															
80	26															
81	27															
82	30	a 1930 b 1932	2005 2015	1940 1940	1+ 1+	S17E27 N10W50	5/5 3/3	S	1	1935	20	4	3	3	1920	40
83	May 1	* 2115	2241	2130	3	S18E15	4/4	SL	1+	2130	25	5	5	3 2	2127.9 2127.9	152 5
84	2															
85	5	* 0356	0457	0415	3	S18W29	3/2	*S	3	0407	53	5	5	*CD	0412	12
86	5	a 2025 b 2032	2115 2115	2035 2037	1+ 1+	N24W50 S15W39	1/1 2/2	S	2+	2032	38	5	8	*6 4 3	2034.7 2041.7 1815	7 15 345
87	8															
88	13															
89	15															
89a	17															
90	19															
91	25															
92	29															
93	31															
94	June 04	2147	2356	2152	2	N14W58	2/2	SL	2+	2142	58	5	9	3 *6	2125 2138	115 47
95	05	0835	0956	0850	2+	N15W65	15/6	S	2+	0842	55	5	4	*2 4	0839.5 0850.5	11 60
96	05	1615	1656	1631	2+	S18E69	4/2	*S	3	1620	100	5	9	3 2 4	1614 1614 1632	180 18 23
97	06	0436	0614	0448 0505	2	N16W78	7/4	SL	2	0436	30	5	4			
98	06															
99	07															
100	08															
101	10															
102	10															
103	14															

(1)

1958 (CONTINUED)

Event No.	DYNAMIC SPECTRUM DATA				200 MC/S DATA					OTHER RAI		
	Type I Time/Max. Int.	Type III Time/Int.	Type II Time/Int.	Type IV Time/Int.	Type	Beg. UT	Dur. Min.	Max. UT	Peak Flux	Freq. Mc/s	Type	Beg. UT
76	C1338/2	g1336-1337/1	*1340-1344/3		SD	1337	2	-	80	9400	SD	1330
										1500	SD	1337
										169	ECD	1336
77												
78												
79												
80												
81												
82	S1921-2020/1		*1943-1951/3		SD	1923.3	0.3	1923.4	-			
					SD	1451.1	0.2	1951.2	-			
					SD	1956.1	0.1	1956.2	-			
83	S2216-2340/1									9500	ECD	2128
84												
85										9500	ECD	0412
									17	2000	CD	0412
										1000	CD	0412.5
										545	CD	0414
86	S2025-2246/3	g2034-2038/1										
87												
88												
89												
89a			*1826-1834/3									
90					CD	1825	4.5	1829	210			
91												
92												
93												
94		b2144/2 G2147-2151/2 b2152/3		*2148-2209/3	CD	2140	36	2148	1130	9500	CD	2141
										2000	CD	2201
										1000	CD	2159
										600	SA	2147
										545	CD	2141
										167	CD	2139.4
										167	CD	2146
95					CD	0839.5	25		150	9400	CD	0839.5
										1500	SD	0833
										600	ECA	0840
										545	CD	0839.5
										169	ECA	0840
										169	-	0849
96					ECD	1617	18	1623	65	9400	CD	1618
										1500	CD	1618
										600	SA	1619
										169	ECA	1617
97	S0434-0521/2	S0351-0533/1 G0433-0438/2 G0445-0456/3		*(0434-0510/3)	CD	0434	40	0458	650	9500	CD	0437
										2000	CD	0433
										1000	F	0433
										600	SA	0434
										600	ECA	0444
										600	-	0450
										169	EFA	0434
										169	ECA	0446
										169	-	0454
98												
99												
100												
101												
102												
103												

3.VIII-4R 0

TABLE VIII.

S		PLAGE DATA									SUNSPOT DATA					
Max. UT	Peak Flux	McM. Plage No.	CMP Gr. Day	Mean Long.	Mean Lat.	Max. Area	Ave. Int.	No. Flares	Age in Rotations	Identification	MT.W. Type	CMP Gr. Day	Mean Lat.	H	When Seen	MT.W. No.
		June										June				
2117.2	70	*4607	18	101°	N12	3.5	7000	52	3	4563	*1βp1*	17.9	N15	23	11-23	13311
2120.7	8															
0944.1	133	4607														
–	23															
		4618	26.5	1°	S16	3	11000	15	3	4579	* *dβγd*	26.0	S15	14	20-27	13326
0245	410	4623	29.5	309°	N12	3	12000	16	1	NEW	*1βp1*	29.9	N10	22	23-5	13335
0307.8	507															
0306.5	593	4623														
		*4622	29	315°	S19	3.5	7000	38	2	4581	*dβp1*	28.8	S19	26	23-4	13333
			July									July				
0048.2	620	*4630	05	236°	N24	3	11000	39	1	NEW	* *1βγ1*	5.3	N25	20	28-12	13350
0517	789	4630														
1715.8	7	*4636	08	196°	S22	3.5	8000	42	4	4598	*1β1*	7.7	S22	21	1-13	13353
0027.3	780	4634	07.5	203°	N28	3	9000	23	2	4596	*dβγ1*	7.6	N20	19	2-14	13356
0111.3	3770															
		4634														
		*4646	18	64°	N09	3	5500	40	1	NEW	*dβp1*	18.3	N09	27	12-24	13370
1907.5	(390)	4651	21	24°	N22	2.5	8500	21	1	NEW	*1βd*	20.6	N20	14	14-23	13376
	12										*dβp1*	21.1	N26	10	24-27	13396
0242.5	597															
0043	828	*4665	31	252°	N04	3.5	12000	30	2	4631	*1β1*	31.0	N04	21	24-5	13397
											dβγd	31.4	N08	11	30-5	13413

(2)

IO DATA			POLAR CAP ABSORPTION						GEOMAGNETIC STORMS						
Dur. Min.	Max. UT	Peak Flux	Gr. Day	Onset UT	Rise to Peak	Dur.	Int.	Obs	Gr. Day	Beg. UT	Dur.	Type	Int.	No. Sta. Rep.	Max. Kp
66	1337.4	595													
4	1337.5	243													
7		150													
									Apr. 14	10xx	1d	g	m	3	5
									16	06xx	4d	g	ms	9	6
									26	1247	10h	sc	m	2	5
									27	1728	4.5d	sc	m	2	5
4	2128.5	829													
12	0415	2140													
9	0414.9	(470)													
9	0415.3	(355)													
7	-	360													
									May 8	2025	11d	g	m	1	6
									13	12xx	3d	g	m	11	6
									17	0916	2d	sc	m	1	4
									25	15xx	2d	g	ms	6	7
									29	00xx	1.5d	g	ms	10	6
									31	1652	2d	sc	ms	17	8
36	2150	1112													
11		(475)													
12		(350)													
15	2154	176													
30		400													
6.6	2143	440													
40	2148	810													
68	0842.7	771													
37	0841.5	451													
19	-	675													
7	-	150													
9	-	108													
33	-	54													
97	1710	400													
84	1723.4	635													
12		99													
21		81													
40	0450	1178													
26	0447.2	420													
40	0446.1	(263)													
6	-	108													
6	-	954													
24	-	450													
8	-	127													
8	-	127													
8	-	95													
			June 06	1345	-	-	-	H,A,K							
									June 07	0046	1d	sc	ms	14	8
									08	1729	2.5d	-	ms	4	5
									14	1828	.75d	sc	m	6	5

(2)

		FLARE DATA						SHORT-WAVE RADIO FADEOUTS						10 CM. EVENT		
Event No.	Gr. Day.	Beg. UT	End UT	Max. UT	Imp.	Position	No. of Obs.	Type	Imp.	Beg. UT	Dur. Min.	Wide Spread Index	No. of Obs.	Type	Beg. UT	Dur. Min.
104	June 14	2112	2146	2118	1	N14E38	4/4	S	1+	2115	13	5	8	2 2	2115.8 2120	3 1
105	19	*0940	1210	1010	3	N14W21	12/4	S	2	1005	25	3	2		0943 0958.5	15.5 74
106	21															
107	23															
108	26															
109	26	0245	0517	0306	2+	N10E49	5/2	SL	2+	0247	85	5	5	CD *CD	0243 0255	7 32
110	27	0254	0405	0308	1+	N10E37	3/1	S	2	0308	25	5	4	*ESD	0306	6
111	28															
112	29															
113	30															
114	July 03	0041	0114	0050	1+	N30E37	3/3	S	1-	0050	7		1	*SD	0045	6
115	04															
116	04	0513	0534	0517	1+	N29E26	1/1	S	1	0517	11	5	2	*CD	0516	4
117	04	1712.5 1747.5	1722.5 1755	1717.5 1750	1- 1-	S23E32 S23E32	1/1 1/1	*SL	3	1730	150	3	3	1	1715.2	2
118	07	*0020	0414	0110	3+	N25W08	5/4	*SL	3	0025	125	5	6	*ECD *CA	0026.6 0050.2	12 100
119	07															
120	08															
121	12	2317	2330	2330	1	N26W78	1/1	G	1	2320	35		1			
122	17															
123	18															
124	18															
125	19	1905	2030	1908	2+	N23E13	3/3	*S	3	1904	36	5	12	6 4	1905 1925	20 40
126	20							S	1	0244	31	4	2	*ESD	0241	4
127	21															
128	24															
129	25	0000	0128	0043	2+	N10E85	1/1	G	2	0044	56	5	4	*ESD	0041.3	7
130	27															

TABLE VIII.

M. EVENTS			PLAGE DATA								SUNSPOT DATA					
Dur. Min.	Max. UT	Peak Flux	McM. Plage No.	CMP Gr. Day	Mean Long.	Mean Lat.	Ave. Int.	Max. Area	No. Flares	Age in Rotations	Identification	MT.W. Type	CMP Gr. Day	Mean Lat.	H	When Seen	MT.W. No.
3	0244	421	*4659	July 26.5	311°	S19	3	20000	112	3	4622	$I-\beta I$	July 25.6	S18	20	19-31	13384
25	0304	2100										* $d\beta\gamma I$	26.1	S15	23	20-1	13388
												$I\beta I$	27.5	S19	23	20-2	
8	0512	506	4659														
12	1529.5	(400)	4659														
70		25															
26.5	1125	294	4659														
300	Indet.	30	4659														
25	1842.1	2050															
20	0431.3	337	*4667	Aug. 02	225°	N27	3.5	15000	27	2	4630	$d\beta I$	Aug. 2.0	N26	18	27-7	13404
3.5	2114	45	*4670	04	199°	S09	3.5	5000	31	1	NEW	$I\beta I$	3.6	S11	16	28-8	13406
	Indet.	25	*4686	12.5	86°	S13	3.5	11000	72	2	4653	* $I\beta\gamma I$	12.5	S14	35	6-18	13434
	1503	95															
	1521.8	180															
	1547.6	12															
	2153.5	55	4686														
	0439.4	5030	4686														
	2225	(90)	*4708	22	321°	N18	3.5	8000	60	3	4657	* $I\beta\gamma I$	21.8	N17	23	15-28	13464
	2210	(335)															
	2311	65															
	0043.3	1260	4708														
	Indet.	45	4708														
	1506.3	(1500)															
50	0041	(5000)	4708														
22	0145	(77)															

(2)

1958 (CONTINUED)

	DYNAMIC SPECTRUM DATA				200 MC/S DATA					OTHER RADIO DATA			
Event No.	Type I Time/Max. Int.	Type III Time/Int.	Type II Time/Int.	Type IV Time/Int.	Type	Beg. UT	Dur. Min.	Max. UT	Peak Flux	Freq. Mc/s	Type	Beg. UT	Dur. Min.
104		g 2117/1- g 2121/2	*2121- 2125/3							9500 167	CD ECD	2114 2119.9	5 3
105					CD	1007	43	1019	111	1500 1500 600 231 178	CD CD ECD CD ECA	0943 1001 1011 1009 1019	4 75 54 44.7 210
106													
107													
108													
109	S 0405- 0516/3		*0304- 0320/3							9500 9500 2000 2000 1420 600	CD CD CD CD CD CA	0344 0300 0244 0255 0255 0259	4 30 4 30 30 62
110		b 0345/1								9500 2000	ESD SD	0305.9 0306	4 3
111													
112													
113													
114		g 0043- 0046/1 G0047- 0050/3								9500 2000 1000 1420 600	ESD SD SD SD CD	0047.3 0046 0047 0048 0049	4 3 3 2 3
115													
116	G0524.5- 0525/2	g 0519- 0519.5/2								9500 1000 545	ESD ESD CD	0516.8 0516.9 0515	1 3 5
117		g 1710/2 b 1715/1 g 1717/3								600 536	ESD CD	1716 1715.5	1 2.5
118	C0027- 0029.5/3 S 0118- 0245/1	G0027- 0028.5/3 g 0046/2 g 0054.5/1 g 0059- 0100.5/3	*0032.5- 0048/3 0101- 0117/3	*0052- 0221/2	ECD CD CA	0026.9 0033 0100	3 3 90	0027.1 0035.5 0153	4000 300 900	9500 9500 1000 1000 1000 600 600 545	ECD CD CD CD CD SD CA CD	0026.7 0055 0026.5 0041 0101 0028 0040 0027	12 70 5 3 60 1 92 120
119													
120													
121			*2330- 2334/3										
122													
123													
124													
125	I_S all day C 1906- 1908/3 C1913- 1914/3	G1905- 1908/3	*1907- 1915/3		CD	1905	5	-	8000	600 600 545 169	CD - CD CD	1905 1910 1905 1905	5 20 14 7
126		G0242- 0244/3	*0251.5- 0254/1		CD	0241.9	2	0242.3	3000	9500 2000 1000	ESD SD SD	0341 0241 0241	4 2 3
127													
129	S 0010- 0143/2 C0010- 0143/2				CD	0050	1.5	-	180	9500 2000	ESD SD	0041.7 0040	5 6
130													

		POLAR CAP ABSORPTION						GEOMAGNETIC STORMS						
Max. UT	Peak Flux	Gr. Day	Onset UT	Rise to Peak	Dur.	Int.	Obs.	Gr. Day	Beg. UT	Dur.	Type	Int.	No. Sta. Rep.	Max. Kp
2117	778													
2121	610													
0944.4	116													
1011.5	-													
1031	300													
1016.5	100													
-	76													
								June 21	0200	2.3d	g	ms	13	6
								23	20xx	1.5d	-	ms	2	4
0245.3	434													
0307.8	518													
0245.9	(34)													
0316.2	(100)													
0316	189													
0334	54													
0306.5	709													
0306.8	(70)													
								28	0713	1.5d	sc	ms	16	8
0048	704							30	14xx	1d	g	ms	1	5
0048.2	(125)													
0048.3	(50)													
0048	206													
0051	31													
								July 04	0306	18h	sc	ms		5
0517	729													
0517.4	(144)													
	180													
	240													
1717.5	220													
0028	1303													
0111.8	1910													
0029	1370													
0042	(140)													
0112	(800)													
0028	145													
0043	129													
-	350													
		July 07	0330	22	96	190	B,L,H,K							
								08	0748	2d	sc	s	17	9
								17	1700	10h	g	m	2	5
								18	0200	2.5d	g	m	6	5
-	300													
-	305													
-	250													
-	2250													
0242.5	494													
0242.6	115													
0242.7	32													
								21	1636	1d	sc	m	15	7
								24	12xx	2d	g	ms	1	5
0043	1280													
0043.2	(75)													
								27	03xx	1d	g	ms	5	5

(2)

		FLARE DATA						SHORT-WAVE RADIO FADEOUTS						10	
Event No.	Gr. Day.	Beg. UT	End UT	Max. UT	Imp.	Position	No. of Obs.	Type	Imp.	Beg. UT	Dur. Min.	Wide Spread Index	No. of Obs.	Type	Beg. UT
131	July 29	*0259	0408	0304	3	S14W44	2/1	*SL	3+	0240	120	5	11	CD *CD	0243.8 0303
132	29														
133	29	0458	0526	0458	1	S14W38	1/1							*CD	0505
134	30	1523	1637	1530	2	S13W64	15/8	*S	3+	1525	115	5	13	2 4	1525.5 1537.5
135	31	1058	1150	1122	1+	S13W77	11/3	*SL	3	1115	45	5	8	SD	1103.5
136	Aug. 2	1840	1851	1841	1-	S14W90	1/1	*S	3+	1840	153	5	8	3 *2	1840 1840
137	4	*0409	0610	0435	3	N30W31	3/3	*G	3	0422	96	1	1	CD	0427.3
138	4	2112	2127	2114	1	S07W10	2/2							2	2112.7
139	7	*1457	1700	1508	3	S16E71	12/8	*S	3+	1500	105	5	15	3 6 6 2	1458 1500 1515.5 1547
140	14	2137	2225	2203	1+	S14W36	2/2	S	2+	2152	42	5	9	2	2151
141	16	*0433	0831	0440	3+	S14W50	9/2	*S	3+	0432	168	5	9	*CD	0434
142	16														
143	17														
144	19	2118	2411	2256	2	N18E26	7/6	S	2	2200	65	5	5	3 2 2	2030 2203. 2303
145	20	0042	0128	0045	2+	N16E18	3/2	S	2+	0042	33	5	8	*CD	0041.
146	21														
147	22														
148	22	*1428	1717	1450	3	N18W10	6/3	*S	3+	1435	170	5	10	3 *2	1305 1430
149	22														
150	24														
151	26	*0005	0124	0027	3	N20W54	1/1	*SL	3+	0010	240	5	8	*CD F	0005 0130

3.VIII-6L (1)

TABLE VIII.

NTS		PLAGE DATA								SUNSPOT DATA					
Max. UT	Peak Flux	McM. Plage No.	CMP Gr. Day	Mean Long.	Mean Lat.	Ave. Int.	Max. Area	No. Flares	Age in Rotations	Identification	MT.W. Type	CMP Gr. Day	Mean Lat.	H	When Seen	MT.W. No.
			Aug.									Aug.				
1039	573	a 4712	24	294°	S18	3	7500	15	4	4659	a *l*β*f* *l*	23.8	S18	12	18-29	13470
		*b 4722	31	202°	S09	3.5	12000	54	2	4670	b *l*-*p* *l*	30.3	S11	23	24-5	13480
											*d*β*p* *l*	31.1	S08	29	25-6	13485
		c 4710	22	321°	S15	3	9000	12	4	4659	c *l*-*p* *l*	21.7	S15	21	15-27	13462
			Sept.									Sept.				
		*4741	09	83°	S07	3	7000	57	1	NEW	* *l*-*y* *l*	8.8	S09	15	2-14	13509
											l-*d*	9.7	S09	11	3-12	13511
Indet.	10	4739	08	96°	S20	3	14000	17	3	4684	*l*-*p* *d*	7.7	S15	15	2-11	13507
1659.2	145									4686	*l*β*p* *l*	8.7	S15	19	2-14	13508
		4743	9.5	76°	N17	3	6000	17	1	NEW	* *l*β*y* *d*	9.8	N18	18	3-14	13510
0835	-	4741														
0904	1259															
		4756	17.5	331°	N17	3	9000	26	4	4708	*l*-*p* *l*	16.6	N14	27	10-22	13530
											• *l*β*y* *l*	17.4	N15	19	11-22	13535
0830	261	4750	14.5	11°	S10	3	9000	20	2	4703	*d*-*d*	13.6	S10	11	11-17	13534
											*l*β*f* *l*	14.2	S12	20	8-20	13524
											l-*p* *d*	15.2	S08	10	9-18	13528
		4764	20	298°	N23	3.5	6000	22	3, 4	4711	* *d*β*y* *l*	20.2	N23	16	14-26	13546
-	336	*4765	19.5	305°	S18	3.5	17000	58	5	4712	* *l*β*p* *l*	19.7	S18	36	13-25	13544
										4710						
2045.5	58	4777	24	245°	N30	3	3000	7	1	NEW	*d*β*f* *l*	24.1	N30	16	24-30	13565
2144.2	160	4781	30	166°	S10	3.5	7500	22	1	NEW	β*f* *d*	29.5	S07	10	24-2	13570
											β*p* *l*	30.0	S12	17	24-5	13572
			Oct.									Oct.				
		4806	10.5	27°	N13	3.5	3000	6	2	4748	*l*β*p* *d*	10.8	N13	18	4-15	13599
0205	332															
2345	1900	*4826	20.5	255°	S02	3.5	6500	50	1	NEW	* *l*β*y* *l*	20.3	S05	26	14-25	13625
		*4829	22.5	229*	S10	3	9000	36	2	4779	* *l*β*y* *l*	22.2	S10	23	16-28	13633

(2)

1958 (CONTINUED)

Event No.	DYNAMIC SPECTRUM DATA				200 MC/S DATA					OTHER RA		
	Type I Time/Max. Int.	Type III Time/Int.	Type II Time/Int.	Type IV Time/Int.	Type	Beg. UT	Dur. Min.	Max. UT	Peak Flux	Freq. Mc/s	Type	Beg. UT
131	S0321-0500/2	g0319-0321/3 G0334.5-0335/3	*0304-0319/3	*0321-0500/3	ECD ECD	0304 0311.5	7.5 50	- -	105 180	9500 2000 1000 545 545 545	CD CD CD CD CA CA	0243.8 0300 0300 0303 0332.5 0350
132												
133					CD CD	0501.5 0512.5	11 90	- -	200 300	2000 1000 1000 545	CD CD F CA	0503 0457.0 0550 0520
134		G1527-1529/2 G1551-1553/3								9400 1500 600	SD SD SD	1523.5 1525 1527
135					CD	1129.5	1	-	80	9400 178	SD SD	1107 1107
136			*1843-1851/3		CD	1842.5	5	-	150	545 169	SD ECD	1841 1843
137			*0439-0453/3							9500 2000 1000	CD CD CD	0429.5 0427 0429
138	C2113-2114/3	G2112-2114/2	*2120-2124/2		CD	2112	2.5	-	150	167	CD	2118.8
139	S1533-1744/2	g1452/3								9400 1500 600 600 545	SD SD ECDM ESD CD	1500 1500 1501 1521 1508.5
140		b2153/1 g2154/2	*2158-2205/3+		CD	2152.5	10	-	150	9500 2000 1000	CD SD SD	2152.5 2152 2153
141				*0438-0535/3+	ECD CD	0440 0443	3 30	0440.5 0500.5	18000 2300	9500 2000 1420 1420 1000 600 545 169 169	CD CD CD SD CD CA CA ECD -	0433.6 0434 0436 0453 0435 0440 0437.5 0439 0444
142												
143												
144	S2204-2411/2	g2113/2 G2200-2203/2 g2204-2206/3 b2207/1		*2207-2401/3	CD	2150	180	-	50	9500 9500 9500 1420 1420 545	CD CD SD CD SD CD	2159 2204.2 2305 2153 2259 2150
145	S0000-0120/1	G0040-0046/3 g0054/1	*0046-0105/3		CD	0042	6	-	155	9500 2000 1420 600 545	CD ECD CD CD CD	0041.6 0040 0040 0041 0042
146												
147												
148				*1500-0117/2	CD M+	1440 1438.5 1440	135 0.5 320	- - 1506	1400 180 630	9400 1500 600 545 169	CD CD CD CD CA	1423 1427 1432 1437 1432
149												
150												
151		g0023-0024/3 g0034-0035/3 g0038/3 b0040/3 g0042/3 g0043/3	*0021-0045/3	*0030-0430/3	CD	0019	130	-	85000	9500 2000 1420 1000 1000 545	ECD CD SD CD F CA	0018 0005 0016 0017 0130 0012

3.VIII-6R 0

DIO DATA			POLAR CAP ABSORPTION						GEOMAGNETIC STORMS						
Dur. Min.	Max. UT	Peak Flux	Gr. Day	Onset UT	Rise to Peak	Dur.	Int.	Obs.	Gr. Day	Beg. UT	Dur.	Type	Int.	No. Sta. Rep.	Max. Kp
60	0304.2	5900													
21	0304	(830)													
21	0303.6	(1830)													
9	-	550													
6.5	-	780													
6	-	1000													
			July 29	0450		48	1.5	L							
40	0510	(31)													
25	0510.8	(65)													
20	0553.7	(175)													
100	-	65000													
136.5	1529.3	625													
18.7	1529	173													
8	-	99													
38	1125	379													
1	1107	163													
11	-	15													
5	-	3500													
20	0438.7	436													
10	0432	(96)													
6	0432	255													
2.8	2119.9	400													
124	1507	340													
57.3	1503	136													
13	-	95													
3	-	80													
11	-	180													
3	2153.4	505													
4	2153.6	(37)													
4	2154.6	(18)													
70	0440	7340													
60	0440	(2900)													
17	0440	1089													
59	0515	659													
85	0442	(4800)													
80	0530	224													
85	-	150													
5	-	3500													
36	-	2650													
			Aug. 16	0600	16h	71	97	B,L,H,K	Aug. 17	0623	1d	sc	ms	16	7
3	2200.9	528													
14	2210	760													
9	2310	540													
59	2210	205													
59	2311	176													
145	-	250													
10	0043.8	3610													
7	0044	(620)													
13	0044	255													
9	0045	72													
7	-	300													
			21	1500	-	24	(3)	L							
									22	0228	12h	sc	m	11	6
172	1451	718													
128	1509	443													
73	-	306													
86	-	190													
208	-	540													
			22	1530	11	84	85	B,L,H,K							
									24	0140	1.5d	sc	ms	16	8
60	0026	5920													
57	0042	(2100)													
89	0042	288													
59	0022	1900													
40	0146	(80)													
135	-	1600													

(2)

		FLARE DATA						SHORT-WAVE RADIO FADEOUTS						10 CM. EVE		
Event No.	Gr. Day.	Beg. UT	End UT	Max. UT	Imp.	Position	No. of Obs.	Type	Imp.	Beg. UT	Dur. Min.	Wide Spread Index	No. of Obs.	Type	Beg. UT	Dur. Min.
152	Aug. 26															
153	27															
154	28	a 1025 b 1028 c 1032	1045 1047 1210	1030 1030 1043	2 1 1+	S18W65 S09E38 S14W90	7/2 2/1 6/1	*S	3	1023	62	5	5	*CD	1019	36
155	Sept. 02	2102	2141	2105	1+	S08E84	5/5	S	2+	2105	32	5	12			
156	03															
157	07	1639	1726	1643	2	S32E18	2/2	*S	3	1658	45	5	8	3 2	1649 1658	120 9
158	09															
159	14	0822	1030	0835 0900	2+	S10W80	12/3	*S	3	0851	58	5	6	*M	0830	69
160	16															
161	17															
162	18	*0728	0938	0830	3	S11W53	8/2							SD	0827	11.3
163	20															
164	22	0738	0910	0750	2	S19W42	9/4	S	2	0755	35	1	1	CD	0739	31
165	22															
166	25															
167	28	2046	2108	2054	1-	N32W66	1/1	SL	1	2045	10	4	3	2	2044	3
168	30															
169	Oct. 02	2143	2201	2148	1	S06W38	2/2							2	2143	7
170	03															
171	08	1510	1528	1522	1-	N12E25	1/1									
172	10							*S	3	0200	60	5	4	CD	0156.5	16
173	21	2318	0127	2330	2+	S04W22	5/5	*S	3+	2328	72	5	9	*CD	2345	35
174	22															
175	22															

1958 (CONTINUED)

	DYNAMIC SPECTRUM DATA				200 MC/S DATA						
Event No.	Type I Time/Max. Int.	Type III Time/Int.	Type II Time/Int.	Type IV Time/Int.	Type	Beg. UT	Dur. Min.	Max. UT	Peak Flux	Freq. Mc/s	Type
152											
153											
154					CD	1024.5	18	1038	400	9400 1500 545 545 125 125 125 81	CD CD SD CD CD CD S ECD
155	S2114-2142/2 I_s weak all day	g2104/2	*2108 2115/3+		CD	2108.5	1.5	-	600	9500 545	CD CD
156											
157											
158											
159					CD	0855	23	-	110	9400 1500 810 600 169 81	M CD CD ECD EC ECD
160											
161											
162					CD	0842	4	0845	18	9400 1500 600 600 169 169	SD SD ECD ECD ECD ECD
163											
164					F	0735	35	0738	60	9400 2000 1500 1000	SD CD SD CD
165											
166											
167		b2045/1	*2046-2053/3		CD	2047	3	-	550	167 167	ECD ECD
168											
169	C2144/3	G2143-2144/3 g2145/2 b2146/3 g2155-2156/2	*2149-2153/3		ECD	2142	11	2145	1700	9500 545	CD CD
170											
171		b1528/1	*1529-1535/2		ECD	1528.5	4	1532	140	600 600 169 169	SD SD ECD -
172										9500 2000	CD CD
173		g2326-2327/2	*2328-2341/3+	*2327-2350/3	ECD CA	2327.7 2332	4.3 70	2330 2354	52000 3600	9500 3750 2000 1000 545	ECD CD CD CD CD
174											
175											

3.VIII-7R 0

TABLE VIII.

	PLAGE DATA									SUNSPOT DATA					
Peak Flux	McM. Plage No.	CMP Gr. Day	Mean Long.	Mean Lat.	Ave. Int.	Max. Area	No. Flares	Age in Rotations	Identification	MT.W. Type	CMP Gr. Day	Mean Lat.	H	When Seen	MT.W. No.
45	4838	Oct. 27.5	163°	S30	2	2000	5	1	NEW	*ekc*	Oct. 27.5	S32	(2)	22-26	13648
185	4826														
40															
	*4849	Nov. 3.5	71°	S15	3	6000	49	2	4817	*ifkpi*	Nov. 3.3	S17	29	28-9	13664
	4851	3.5	71°	N08	3	5500	11	1	NEW	*ifkci*	3.3	N07	26	27-8	13660
	4877	18	240°	S12	3	11000	4	3	4829	*hrd*	17.8	S10	3	11-18	13694
35	*4883	24.5	154°	S12	3.5	12000	34	1	NEW	*dfkii*	23.6	S12	20	20-29	13718
285										*dfkd*	23.6	S06	11	21-25	13724
										hrd	24.4	S13	14	18-29	13712
										dfkd	24.9	S13	13	20-25	13719
10	*4884	25.5	141°	N22	3	6000	33	1	NEW	*hrd*	25.1	N17	21	18-29	13713
50										*dfkpi*	26.2	N20	30	23-2	13728
	4884														
	4898	Dec. 02	55°	N15	2.5	7500	8	3.4	4854	*dfkpi*	Dec. 2.2	N15	16	17-8	13740
										dfki	2.8	N12	13	30-8	13747
	*4897	Nov. 30.5	75°	S18	2.5	12000	31	3	4849	*dfkpd*	Nov. 29.6	S17	11	24-2	13736
										ifkpi	30.6	S17	23	23-7	13733
32	4898														
	*4911	Dec. 09.5	316°	N16	3	9000	31	1	NEW	*ifki*	Dec. 9.7	N14	18	3-15	13758
416	*4913	12	283°	S03	3.5	9500	69	3	4873	*ifkci*	11.7	S02	27	5-18	13763
										ifkpi	12.1	S06	22	5-17	13765
293	4913														
150	4913														
13															

3. VIII - 8L (2)

OTHER RADIO DATA				POLAR CAP ABSORPTION						GEOMAGNETIC STORMS						
Beg. UT	Dur. Min.	Max. UT	Peak Flux	Gr. Day	Onset UT	Rise to Peak	Dur.	Int.	Obs.	Gr. Day	Beg. UT	Dur.	Type	Int.	No. Sta. Rep.	Max. Kp
				Aug. 26	0330	17	70	133	B,L,H,K							
										Aug. 27	03xx	1d	-	ms	12	7
1018	76	1028	698													
1009	53.5	1039	215													
1026.5	0.5	-	50													
1034.5	0.5	-	60													
1010	5.8	-	350													
1018	2.5	-	350													
1024	2.5	-	100													
1024	80	-	30													
2103	5	2105	1174													
2103.5	1.5	-	140													
										Sept. 03	0842	2.5d	sc	ms	17	9
0832	104	0858	1210													
0834	85	0835	-													
		0904	460													
0856	38	0859	225													
0848	45	-	450													
0859	35	-	93													
0906	60	-	75													
										16	0930	1d	g	m	10	5
0827	8.2	0832	301													
0828	5	0829.5	222													
0828	4	-	100													
0842	11	-	105													
0829	2	-	220													
0842	9	-	40													
0741	27.8	0805	311													
0739	25	0746	(86)													
0737	27.5	0745	207													
0735	20	0747	(23)													
				Sept. 22	1400	22h	80	40	B,L,H							
										25	0408	1.5d	sc	ms	16	7
2046.1	1.6	2047.1	400													
2047.8	4.1	2049.8	2000													
										30	1005	1d	sc	m	6	5
2143.8	3	2144	617													
2143	2	-	50													
										Oct. 03	02xx	20h	g	m	1	4
1527	7	-	90													
1534	4	-	80													
1528.5	2	-	126													
1530.5	3.5	-	99													
0201.4	6	0204.5	570													
0156	14	0205.1	(73)													
2323	50	2326.7	3600													
2323	55	2327	(1150)													
2323	55	2355	(520)													
2321	55	2356	(530)													
2326	70	-	700													
										22	0315	2d	sc	ms	16	6

(2)

		FLARE DATA						SHORT-WAVE RADIO FADEOUTS						10 CM. EVENTS			
Event No.	Gr. Day.	Beg. UT	End UT	Max. UT	Imp.	Position	No. of Obs.	Type	Imp.	Beg. UT	Dur. Min.	Wide Spread Index	No. of Obs.	Type	Beg. UT	Dur. Min.	Max. UT
	Oct.																
176	23	1655	1803	1728	1	S32E50	2/2	S	1	1725	15	5	6	6	1726	7	1727.5
177	24																
178	24																
179	24	1432	1801	1457	2+	S05W57	10/5	*SL	3+	1445	110	5	8	6 4	1439 1524	45 190	1510.5
180	27																
181	28																
	Nov.																
182	02																
183	03																
184	03																
185	10																
186	14	*0036	0207	0046	3	S19E51	2/2	*SL	3	0039	61	5	4				
187	24	*1607	1907	1621	3	S11W08	4/4	*SL	3-	1615	80	5	7	3 2	1600 1612.5	300 25	Indet. 1620.2
188	27	1857	1909	1859	1	N18W12	1/1	S	1	1857	11	5	5	3 2	1853 1858.2	15 2.5	Indet. 1859
189	27	2354	0020	2356	1	N19W19	3/2	S	1-	2358	10	4	2				
190	28																
191	30	2240	2308	2250	1-	N13E22	1/1										
192	30																
	Dec.																
193	02																
194	04																
195	09	1642	1735	1654	1	N10W90	2/2	SL	2	1655	35	5	8	2	1654.5	8	1656.5
196	09																
197	10	0219	0306	0221	2	N01E20	2/1	S	1+	0220	17	1	1	ECD	0220.4	1.6	0220.6
198	10	1312	1514	1318 1428	1	S03E18	3/3	G	1-	1410	30	1		SD	1415	2.5	-
199	11	1545	1612	1550	1-	S02E00	1/1	SL	2-	1520	25	5	7	2 2	1516.5 1533	4.5 3	1519.2 1534

0

1958 (CONTINUED)

	DYNAMIC SPECTRUM DATA				200 MC/S DATA					OTHER
Event No.	Type I Time/Max. Int.	Type III Time/Int.	Type II Time/Int.	Type IV Time/Int.	Type	Beg. UT	Dur. Min.	Max. UT	Peak Flux	Freq. Mc/s	Type	Beg. UT
176	C1727-1729/3	G1727/3 g1729-1731/3	*1729-1731/3		ECD	1726	10	1729.5	7200	545 167	CD ESD	1726 1729.3
177			*0520-0533/1									
178												
179		G1443-1445/2 g1450/3	*1452-1500/3	1442-1518/3	ECD	1442	53	1510.5	260	9400 1500 600 545 169 81	CD M ECD CD ECD F	1443 1439 1439 1439 1448 1452
180												
181												
182												
183												
184												
185												
186										9500 3750 1000	SD CD SD	0041 0035 0037
187	I_S-weak, all day S1642-2106/3 C1635-2106/2	G1610-1614/2 G1615-1617/2 g1619/2		*1607-1619/3	ECA F	1608 1629	13 287	1612 1642.5	180 180	545 167	CD CA	1606 1608
188	C1859/3 I_S1919-2332/2	G1855-1904/3	*1905-1911/2		M	1856	11.5	-	500	545 167 167	M ECD CD	1856 1856 1905
189	I_S weak all day	G2355-2356/2	*2358-2401/2		M	2355	6	-	800	9400 3750 2000 1000 545	CD F CD CD CD	2354 2354 2355 2355 2355
190												
191	I_S weak all day	g2246-2247/2	*2250-2256/3							167	CD	2251
192												
193												
194												
195		g1656/1	*1658-1709/3		CD	1655	16	1700.5	1000	167	ECD	1659
196												
197	C0220/3	g0220/3 g0226-0227/2 g0258-0259/2	*0224-0231/2		ECD	0220	5	0220.4	7000	9500 3750 2000 1420 1000 545	ESD CD F CD CD CD	0220 0220 0220 0221 0220 0220
198	C1409-1419/3 C1445-1457/2	g1358-1401/2 g1404-1406/3 g1409-1419/3 g1445-1457/2		*1501-1600/1	F CD CD CD F	1359 1430 1446 1501 1545	246 15.5 7.5 27 134	- 1442 1451 1516 1600	- 2800 260 630 91	1500 600 600 545 167	F ESD ECD CD CA	1414.2 1415 1451 1416 1415
199		g1518-1520/2 g1523-1525/2 g1539-1540/2		*1515-1615/3	F	1539	17	1539	2800	600 545 167	ECD CD CA	1515 1517 1430

3.VIII- 8 R 0

TABLE VIII.

Max. UT	Peak Flux	McM. Plage No.	CMP Gr. Day	Mean Long.	Mean Lat.	Ave. Int.	Max. Area	No. Flares	Age in Rotations	Identification	MT.W. Type	CMP Gr. Day	Mean Lat.	H	When Seen	MT.W. No.
		PLAGE DATA									SUNSPOT DATA					
		4913														
		4913														
		4905	Dec. 5.5	9°	S07	2.5	3000	5	1	NEW	*dβl*	Dec. 5.4	S06	22	3-11	13757
1800	20	4913														
1809.8	1225															
	15															
1856.5	55	4913														
1935.9	300	4913														
1300.5	1500	4913														
	20															
		4913														
-	571	4913														
1859	250	4919	15	244°	N10	3	5000	10	1	NEW	*rβd*	15.1	N08	14	8-19	13773
	5															
0605	1750	*4934	28	73°	S17	3.5	10000	48	4	4897	*rxpl*	27.0	S19	25	20-1	13800
											* *rxl*	27.6	S17	24	21-2	13803
											rβxi	28.4	S14	19	21-3	13804
		*4936	29	59°	N16	3.5	15000	30	4,5	4898	*dβpl*	28.5	N12	14	28-2	13820
											rβpl	28.8	N15	19	22-3	13805
											rβxd	29.8	N20	12	23-31	13809
											dβpd	30.2	N19	18	24-3	13811
1701.5	340	4934														
	5															

		FLARE DATA						SHORT-WAVE RADIO FADEOUTS						10 CM. EVE		
Event No.	Gr. Day.	Beg. UT	End UT	Max. UT	Imp.	Position	No. of Obs.	Type	Imp.	Beg. UT	Dur. Min.	Wide Spread Index	No. of Obd.	Type	Beg. UT	Dur. Min.
	Dec.															
200	11	1640	1707	1647	1-	S02E10	1/1									
201	11	1705	1745	1720	1-	S02E00	1/1									
202	11	1740	1755	1745	1-	S07W88	1/1									
203	11	1802	1842	1812	2	S02E00	2/2	S	2+	1808	32	5	12	2 *2 4	1759 1805 1824	4 20 25
204	11	1850	1917	1857	1-	S02W02	1/1	SL	1	1858	17		1	2	1855	4
205	11	1930	2012	1939	2	S02E02	2/2	S	2	1935	25	5	6	2	1934.5	8
206	12	1229	1547	1304	2+	S03W08	6/3	S	2	1257	38	5	9	*2 4	1257 1315	18 260
207	13															
208	15	1535	1550	1538	1-	S04W49	1/1									
209	15															
210	17	1040	1115	1041	1	S04W82	1/1							*SD	1039.5	5
211	17															
212	17	1855	1927	1900	1+	N07W35	1/1	S	1	1858	17	4	5	2 4	1857.5 1902.5	5 60
213	18							S	1-	0435	10	5	3			
214	19															
215	23	0545	0730	0624	2+	S15E66	2/2	*G	3-	0540	73	4	2	*CD	0536	50
216	29															
217	31	*1656	1741	1703	3	S18W54	2/1	S	2+	1700	36	5	10	6 4	1657.5 1715.5	18 20

DIO DATA			POLAR CAP ABSORPTION						GEOMAGNETIC STORMS						
Dur. Min.	Max. UT	Peak Flux	Gr. Day	Onset UT	Rise to Peak	Dur.	Int.	Obs.	Gr. Day	Beg. UT	Dur.	Type	Int.	No. Sta. Rep.	Max. Kp
2.5	-	20													
4.5	1730.5	2800													
									Oct. 24	0730	1d	sc	ms	9	7
35	1445	318													
56	1445	291													
41	-	495													
19	-	140													
41	-	540													
15	-	60													
									27	1523	0.4d	sc	ms	8	6
									28	0650	1d	sc	m	12	5
									Nov. 02	10xx	0.5d	g	ms	1	5
									10	05xx	1d	g	m	3	5
25	0052	457													
65	0040	(32)													
6	0039	(10)													
105	-	120													
432	1612.7	1300													
8.5	-	90													
7	1859	2400													
3	1906.4	420													
3	2355.4	(357)													
5	2355.4	(100)													
2	2355.6	(91)													
2	2355.6	(170)													
7	-	160													
									28	0110	0.6d	sc	m	5	4
3	2253	2300													
									Dec. 02	09xx	0.6d	g	ms	4	5
									04	0035	1.5d	sc	ms	17	7
7	1703	1300													
1.5	0220.6	663													
6	0220.6	(92)													
3	0221	(230)													
3.5	0221	476													
2	0221	(1660)													
2	-	300													
3.3	1416.2	204													
3	-	162													
2	-	140													
60	-	150													
545	-	630													
20	-	1125													
30	-	140													
215	1519	1200													

(2)

1958 (CONTINUED)

	DYNAMIC SPECTRUM DATA				200 MC/S DATA					OTHER RADIO DATA			
Event No.	Type I Time/Max. Int.	Type III Time/Int.	Type II Time/Int.	Type IV Time/Int.	Type	Beg. UT	Dur. Min.	Max. UT	Peak Flux	Freq. Mc/s	Type	Beg. UT	Dur. Min.
200	S1708-1718/2	g1657/2		*1652-1712/2									
201	S1718-1835/1	g1725-1726/2 g1727/3		*1722-1731/2						545	CD	1723	3
202	S in progress	g1738/2		*1745-1802/2									
203	S1835-1914/2	G1806-1807/2 g1810/3		*1803-1851/3	ECD F	1804 1834	19 48.5	1809 1855.5	5500 320	545 167 167	CD ECD CA	1804 1805 1830	20 25 290
204	S in progress	G1855-1857/2 g1858/1		*1851-1928/3	CD	1855	2.5	-	320	545 167	CD ECD	1855 1854	3.5 5
205		G1935-1940/2 g1942-1943/2 G1944-1945/2		*1933-1950/3	ECD	1934	11	1936.5	4700	545 167	CD ECD	1934 1934.5	8 6
206	S1415 1836/1	g1257-1258/3 g1302-1303/3 g1305-1307/2	*1259-1312/3	*1301-1655/2	CD CD	1259 1300	10 50	- -	550 170	9400 1500 600 600 545 169 169	CD SD ECD CD CD CD CD	1255 1258 1258 1314 1258 1257 1310	26.5 55 16 96 234 13 50
207													
208		g1534/2		*1543-1554/3	SA CA	1534 1537	0.5 1.5	- 1537	46 37				
209													
210					CD	1039.5	4	-	500	810 600 545 169 169 81	CD ECD CD ECD - ECD	1040 1040 1039.5 1040 1042.5 1046	16 6 4 2.5 3 8
211													
212		G1858-1900/2	*1901-1907/2		CD	1859	0.5	-	120	545	CD	1859	6
213		g0432-0434/1 G0441-0443/2	*0438-0451/2		ESD	0433	2	0434	91				
214		g0521-0525/1	*0527-0532/1		CD	0524	25	0524	40				
215		b0501/3			CD	0544	95	-	120	9400 2000 1420 1000 545 545 169	CD CD F CD CD CD C	0535 0534 0559 0534 0542 0623 0553	50 65 11 70 7.5 52 65
216													
217	S1658-1714/1	G1659-1701/2 G1703-1705/2 g1707-1708/2 b1709/1	*1705-1711/3	*1700-1712/2	ECD	1659	16.5	1700	530	545 167	CD CD	1700 1702	15 9

		POLAR CAP ABSORPTION						GEOMAGNETIC STORMS						
Max. UT	Peak Flux	Gr. Day	Onset UT	Rise to Peak	Dur.	Int.	Obs.	Gr. Day	Beg. UT	Dur.	Type	Int.	No. Sta. Rep.	Max. Kp
-	140													
-	140													
-	1800													
-	790													
-	140													
1856	890													
-	140													
1937.5	1400													
1302	1045													
1302	884													
-	1950													
-	-													
-	500													
-	11120													
-	100													
								Dec. 13	0002	2d	sc	ms	15	6
								15	2022	1d	sc	m	6	4
1042	171													
-	110													
-	10													
-	1035													
-	1890													
-	65													
								17	1547	1d	sc	ms	14	7
-	45													
0605	(1000)													
0605	(370)													
0605	163													
0544	(158)													
-	450													
-	300													
-	92													
-	130													
1707	350													

(2)