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CATALOGUE OF SOLAR
ACTIVITY DURING 1958
BY
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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.	Longitude	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 13110	L,M L,M	1539 563	1269 276	β_γ β_γ	21 11	E C
4530	S.15	82°	05/3.	3	77	11000	3.5/3.5/3	1	2	13197	L,M	2061	1332	β_γ	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 13389	L,M L	1795 1245	901 755	β_γ β_p	23 23	E,F E,G
4686	S.13	86°	08/12.5	3	72	11000	3/3.5/3.5	2	5	13434	L,M	1150	876	β_γ	35	G
4708	N.18	321°	08/22	5	60	8000	4/3.5/3.5	3	1	13464	L,M	1463	1072	β_γ	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	β_γ	26	E
4913	S.03	283°	12/12	2	69	9500	3.5/3.5/3.5	3	2	13763	L,M	1318	710	β_γ	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	β_γ	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	β_γ	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	β_γ	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

Ref. No.	Author	Publication	Vol.	Year	Pages	SOLAR PHENOMENA			RADIO EMISSIONS			SOLAR-TERRRESTRIAL EFFECTS				
						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. A1	17	1962	106 - 112			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	Berprozvannaya	J. Phys. Soc. Japan Supp. A1	17	1962	146 - 149											
6	Boorman, et. al.	M.N. Royal Astron. Soc.	123	1961	87 - 96			X								
7	DeFelder, et. al.	Planet. Space Sci.	2	1961	223 - 227			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								
11	Dvoryashin, et. al.	Soviet Astron. A.J.	5	1961	311 - 325			X								
12	Habura, Goh	J. Radio Res. Lab. Japan	6	1959	633 - 650			X								
13	Haurwitz	J. Geophys. Res.	67	1962	2979 - 2982			X								
14	Jenkins, Paglia	Can. J. Phys.	41	1963	1056 - 1073											
15	Jonah	Proc. Lunar Planet. Explor. Coll.	3 No 2	1963	59 - 64			X								
16	Kable	U. Alaska Geophys. Rep.	R129	1962	68			X								
17	Kamiya	J. Geomag. Geoelect. Japan	13	1961	33 - 41			X								
18	Knapp	J. Geophys. Res.	66	1961	2053 - 2058			X								
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	3659 - 3680			X								
22	Maeda, et. al.	Ann. Geophys.	18	1962	305 - 333			X								
23	Maitson	NASA - TR	R-169	1963	109 - 117			X								
24	Matres & Pick	Ann. Astrophys.	25	1962	293 - 300											
25	Matsumita	J. Geophys. Res.	67	1962	3753 - 3771											
26	Maxwell, Thompson and Garmire	Planet Space Sci.	1	1959	325 - 332											
27	Maxwell, Hughes, and Thompson	J. Geophys. Res.	68	1963	1347 - 1354			X								
28	McLean	Australian J. Phys.	12	1959	404 - 417											
29	Noyes	J. Phys. Soc. Japan Supp. A2	17	1962	275 - 280			X								
30	Obayashi & Habura	J. Geophys. Res.	65	1960	3143 - 3148			X								

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 $K_p \geq 5$ 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 K_p . 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

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

/ 3-1-1

(UED)

RELATED FLARE ACTIVITY			S.W.F.	RADIO EMISSIONS				POLAR CAP ABS.			GEOMAGNETIC STORMS		
Minor/Major Before	First Flare After	Pos./Imp.	Beg./Dur./Imp.	Peak Flux 10 cm.	Flux 1.5 m.	Other Wave Lengths	Dynamic II & IV	Gr. Day/UT	Beg. / Abs. db	Gr. Day/UT	Beg./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)	800Q	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	0858/14,2			m							
81/1	30/0	E89/1	0240/12,3+		(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/-/!	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	-						

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3.1-2

TABLE I 1958 (CONTIN)

Serial No.	Event No.	Gr. Day	MAJOR FLARE				SOLAR REGION				FLARE IMPORTANCE			FLARE AREA SQ. DEG.		
			Beg. UT	End UT	Max. UT	Position	Plage No.	Region No.	Sunspot Mt. W.	Number Greenwich	IAU	No. Rep./No. Max.	M.C. M.	Range	No. Rep.	Mean
43		July 12	0744	<u>0843</u>	0758	S.24 W.74	4636	14	13353	18772	3	15/3	2+	3-24	10	8
44		15	<u>0914</u>	<u>1140</u>	0923	N.07 E.40	4646	29	13370	18782	3	13/1	2	2-23	11	9
45	125	19	<u>1905</u>	2030	1908	N.24 E.13	4651	33	13375 13376	18787	2+	3/3	2+	7/10	3	9
46		20	<u>0636</u>	<u>0756</u>	0643	S.23 W.63	4650	25	13374	18786	3	6/1	2	1-5	5	7
47		20	<u>1203</u>	<u>1330</u>	1211	S.22 W.67	4650	25	03374	18786	3	12/1	2+	2-38	10	12
48		23	<u>0503</u>	0618	0514	S.08 E.39	4658	42	13386	18798	3	4/1	2	5-46	4	17
49		23	<u>1125</u>	<u>1450</u>	1144	N.18 E.41	4657	43	13394	18797	3	10/1	2+	6-25	7	17
50		23	<u>1259</u>	<u>1630</u>	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	<u>0408</u>	0304	S.14 W.44	4659	39	13388	18796	3	2/2	3	12-17	2	15
53		29	<u>1125</u>	<u>1300</u>	1138	N.15 E.01	4664	49	13395	18808	3-	10/1	2+	5-16	8	9
54		Aug. 3	<u>2142</u>	<u>2257</u>	2150	N.08 W.49	4665	52	13397	18810	2+	4/2	2	8-19	3	14
55	137	4	<u>0409</u>	<u>0610</u>	0435	N.30 W.31	4667	56	13404	18813	3	3/1	3	5-35	3	17
56	139	7	<u>1457</u>	1700	1508	S.16 E.71	4686	76	13434	18835	3	10/4	3	10-26	9	17
57		13	<u>1205</u>	<u>1330</u>	1220	S.14 W.18	4686	76	13434	18835	3	9/1	2	5-14	7	8
58	141	16	0432	<u>0831</u>	0440	S.14 W.50	4686	76	13434	18835	3+	9/2	3+	6-32	8	15
59	145	20	<u>0042</u>	<u>0128</u>	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	<u>1417</u>	1717	1450	N.18 W.10	4708	88	13464	18857	3	5/3	3	9-14	4	12
62		23	<u>1012</u>	1048	1016	S.12 W.69	4703	81	13460	18853	3	5/1	2	6-15	5	10
63		25	<u>0949</u>	<u>1050</u>	1003	N.16 W.46	4708	88	13464	18857	3-	5/1	2+	8-37	4	15
64	151	26	<u>0005</u>	<u>0124</u>	0027	N.20 W.54	4708	88	13464	18857	3	1/1	3	25	1	25
65		30	1933	<u>2052</u>	1946 2018	S.05 W.42	4718	96	13476	18878	3	3/1	2+	6-19	3	12
66	155	Sept. 2	<u>2102</u>	<u>2141</u>	2105	S.09 E.84	4741	116	13509	18890	3	4/1	1+	-	-	-
67		4	<u>0504</u>	<u>0545</u>	0524	S.07 E.63	4741	116	13509	18890	3	6/1	1	3-34	5	11
68		4	<u>1401</u>	<u>1617</u>	1419	S.13 W.54	4722	103	13485 13494	18882	3-	7/1	2	2-10	6	7
69		7	<u>1441</u>	<u>1522</u>	1450	N.20 E.70	4744	123	13517	18896	3+	6/1	2	6-25	5	11
70		9	<u>1343</u>	<u>1545</u>	1354	S.15 W.18	4739	115	13508	18888	3+	7/1	2	4-48	7	13
71		9	2321	<u>2545</u>	2409	S.12 W.09	4741	116	13509	18890	3	3/1	2+	7-14	3	10
72		12	<u>0655</u>	<u>0740</u>	0702	S.13 E.67	4757	134	13541	18911	2+	10/2	2	4-22	8	10
73		12	<u>0904</u>	<u>1003</u>	0915	N.15 E.66	4756	135	13535	18909	3	14/2	2	3-14	12	6
74		13	<u>0904</u>	1050	0918	S.11 W.58	4741	116	13509	18890	3	11/2	2+	5-24	8	11
75	159	14	<u>0822</u>	<u>1030</u>	0835	S.10 W.80	4741	116	13509	18890	3+	12/1	2+	8-25	4	15
76		15	<u>1650</u>	<u>1800</u>	1705	S.20 E.48	4765	139	13544	18912	2+	4/2	2+	5-12	4	10
77		16	<u>1443</u>	<u>1624</u>	1503	S.23 E.37	4765	139	13544	18912	3	7/1	2	4-24	7	10
78	162	18	<u>0728</u>	<u>0938</u>	0830	S.12 W.53	4750	126	13524	18897	3	8/3	3	2-15	7	10
79	164	22	<u>0738</u>	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	<u>1023</u>	<u>1140</u>	1032	S.28 E.26	4820	29	13611	18959	3	11/1	2+	3-13	10	8
82		19	<u>0658</u>	<u>0820</u>	0725	S.17 W.35	4819	27	13616	18957	3	7/1	2+	6-26	6	14
83	173	21	<u>2318</u>	<u>2527</u>	2330	S.04 W.22	4826	34	13625	18964	3	5/1	2+	6-9	4	7
84		22	<u>0650</u>	<u>0835</u>	0713	S.05 W.16	4829	34	13633	18970	3	6/1	2	5-24	5	11
85		23	<u>0232</u>	<u>0352</u>	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	Major/Minor 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	<u>400</u>	cm,m			
4-20	2	12	3/0	10/0	E20/1	1208/28/2	-	<u>400</u>	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	<u>1340</u>	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)	<u>400</u>		(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	-		

Serial No.	Event No.	MAJOR FLARE					SOLAR REGION				FLARE IMPORTANCE		
		Gr. Day	Beg. UT	End UT	Max. UT	Position	Plage No.	Region No.	Sunspot Mt. W.	Number Greenwich	IAU No. Rep./No. Max.	Mc.M	
86	179	Oct. 24	<u>1410</u>	<u>1801</u>	1457	S.05 W.57	4826	34	13625	18964	3	10/2	2+
87		28	<u>1505</u>	<u>1617</u>	1516	N.18 W.38	4833	39	13639	18974	3	5/1	2
88		29	<u>0703</u>	<u>0820</u>	0710	N.08 W.50	4841	40	13661	18988	2+	6/2	2
89		31	<u>0945</u>	<u>1049</u>	1001	S.19 E.39	4849	55	13664	18995	3	5/1	2
90	186	Nov. 14	<u>0036</u>	<u>0207</u>	0046	S.19 E.51	4877	76	13696	19018	3	2/1	3
91	187	24	<u>1607</u>	<u>1907</u>	1621	S.12 W.08	4883	84	13718	19031	3	3/2	3
92		25	<u>0807</u>	<u>0855</u>	0816	N.19 E.12	4884	88	13728	19036	3-	6/1	2
93		29	<u>0820</u>	<u>1026</u>	0942	N.19 W.40	4884	88	13728	19036	2+	8/2	2
94		Dec. 3	<u>0702</u>	<u>0741</u>	0706	N.16 E.87	4911	112	13758	19057	3	4/1	1+
95		3	<u>0823</u>	<u>1107</u>	0955	N.15 E.85	4911	112	13758	19057	2+	6/2	2
96		12	<u>0054</u>	<u>0123</u>	0107	S.01 W.06	4913	114	13763	19061	2+	4/2	2
97	206	12	<u>1215</u>	<u>1547</u>	1304	S.03 W.08	4913	114	13763	19061	2+	6/3	2+
98		15	<u>1030</u>	<u>1230</u>	1041	S.16 W.18	4916	117	13771 13777	19066	3	4/1	1
99	215	23	<u>0545</u>	<u>0803</u>	0624	S.15 E.66	4934	134	13804	19083	3	2/1	2+
100	217	31	<u>1656</u>	<u>1803</u>	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	McM	Obs. Reporting Max. Importance	Other Importance Reported
1	2549	Jan. 13	1258	S20 E27	3	2	Uccle	1+,2
5	2631	25	0035	N28 W13	3+	1+	Voroshilov	1,2+
7	2637	25	<u>1205</u>	S20 E11	3	2	Wendelstein	1+,2
10	2799	Feb. 11	0812	S10 W85	3	1	Athenes	1,1,1+,2+
16	2980	Mar. 7	1020	N11 E71	3	2	Uccle	1,1,1+,2,2,2,2+
17	3068	14	<u>1454</u>	S21 W85	3	2	Capetown & Ondrijov	1,
24	3489	Apr. 9	<u>1435</u>	N11 W37	3	1+	Kanzelhone	1,1,1,1+,1+,1+
29	3763	May 5	<u>0856</u>	S16 W25	3	2	Wendelstein	1,1,1,2,2,2,2
31	4028	30	<u>0656</u>	N23 E90	3	1	Kiev, Ko	1,1
35	4140	June 6	0436	N16 W78	3	2	Abastumani	1+,2,2,2,2,2
36	4196	9	<u>0557</u>	N32 E20	3	1	Nizmir	1,1
44	4619	July 15	0914	N07 E40	3	2	Kharkov	1,1,1,1+,1+,1+,1+,2,2,2,2
46	4680	20	<u>0636</u>	S23 W63	3	2	Athenes	1,1,2,2
48	4716	23	<u>0503</u>	S08 E39	3	2	Alma Ata	1+,2
51	4792	27	<u>0855</u>	S16 W22	3	1	Wendelstein	1,1
54	4939	Aug 3	2142	N08 W49	2+	2	Honolulu & Voroshilov	1+,2
57	5087	13	<u>1205</u>	S14 W18	3	2	Bakou	1+,1+,2,2,2,2,2
60	5191	22	<u>0521</u>	N19 W04	2+	1+	Abastumani & Bakou	1,1,1+,1+,1+,2-
62	5213	23	<u>1012</u>	S12 W69	3	2	Uccle	1,1,2,2
66	5374	Sept. 2	2102	S09 E84	3	1+	McMath	1+,1+,1+
67	5390	4	<u>0504</u>	S07 E63	3	1	Alma Ata	1,1,1,1,1+
68	5398	4	<u>1401</u>	S13 W54	3-	2	Pic du Midi	1,1+,1+,2,2,2
69	5436	7	<u>1441</u>	N20 E70	3+	2	Wendelstein	1+,2,2,2,2+
70	5466	9	<u>1343</u>	S15 W18	3+	2	Wendelstein	1,1+,1+,2,2,2
72	5521	12	<u>0655</u>	S13 E67	2+	2	Athenes & Capri.S.	1,1+,2-,2,2,2,2
73	5527	12	<u>0904</u>	N14 E66	3	2	Capri S. & Pic du Midi	1,1,1,1+,1+,1+,1+,2,2,2,2,2
77	5608	16	<u>1443</u>	S23 E37	3	2	Wendelstein	1+,2-,2,2,2,2
79	5682	22	<u>0738</u>	S19 W42	2+	2	Capri S. & Kharkov	1+,1+,1+,1+,2,2,2
80	5877	Oct. 15	0408	S03 E67	3	2	Alma Ata	1,2,2,2
84	5958	22	<u>0650</u>	S05 W16	3	2	Abastumani	1,1+,2,2,2
87	6039	28	<u>1505</u>	N18 W38	3	2	Wendelstein	1,2,2,2
88	6044	29	<u>0703</u>	N08 W50	2+	2	Athenes & Wendelstein	1,1+,2,2
89	6079	31	<u>0945</u>	S19 E39	3	2	Zurich	1,1+,2,2
92	6241	Nov. 25	0807	N19 E12	3-	2	Istanbul	1,1,2,2,2+
93	6296	29	<u>0920</u>	N19 W40	2+	2	Locarno & Pic du Midi	1,2,2,2,2,2
94	6362	Dec. 3	0702	N16 E87	3	1+	Crimee	1,1+,2
95	6367	3	<u>0823</u>	N15 E85	2+	2	Crimee & Nera	1,1+,1+,2
96	6482	12	<u>0054</u>	S01 W06	2+	2	Mitaka & Honolulu	1+,2
98	6518	15	<u>1030</u>	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+

M ^c M 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.	M ^c M	Total Sta. Reported	Plage No.	Area Range	No. Rep.	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				SUNSPOT MEAN DATA				MAJOR FLARE DAY DATA				
	Umb.	Whole	Position	Gr.	Flare	Area	Mt. Wilson		Area	Zurich	Mag.	H	Position
	Spot		Day	ΔT	Umb.	Whole S.	Mag. Cl.	H	Umb.	Whole	Class.	Class.	
Dec. 30.05	90	710	S24 W45	Jan. 2.39		50 368	<i>d\beta l</i>	15					
													Dec. 25 E64 E A - (X) -
Jan. 7.21	161	865	N12 E47	3.46		79 595	<i>l\beta d</i>	17					
													Jan. 1 E72 E E β_p β_p 16 12
11.35	123	1066	S12 W38	14.57	-1	108 788	<i>l\beta y l</i>	22	94	786	E	(β_y)	- S13 W50
													5 Jan. E81 - E (X) (X) -
17.29	283	1476	N13 E38	14.57		216 1180	<i>l\beta p l</i>	36					
													Jan. 11 E76 - E β_p β_p 26 28
15.0							<i>d x d</i>	(2)					Not Seen
													14 Jan.15 A A (X) (X) -
22.95	40	267	N27 E25	20.57	0	26 146	<i>l\beta p d</i>	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	<i>l\beta p l</i>	12	45	281	J	β_p	- N29 E50
													Jan. 18 E72 C C β_p (β_p) -
19.90	92	706	S25 W56	24.4	+1 -1	54 413	<i>d\beta l</i>	(20)	64 59	430 677	E E	(β) (β)	- S25 W40
													Jan. 20 W10 B D β (β_p) 3 -
26.44	40	207	S20 E12	26.26	+1	24 140	<i>d\beta l l</i>	17	24	177	D	(β)	- S16 E05
													Jan.21 E80 C C (β_p) 0 -
28.23	85	588	S10 W03	28.44		51 324	<i>d\beta l</i>	20					
													Jan. 25 E36 C D (β) (β) -
30.35	87	411	N21 E40	27.28	-4	42 198	<i>d\beta l</i>	15	58	241	D	(β)	- N22 W15
													Jan. 25 E82 B D (β) (β) -
Feb. 5.99	122	808	S13 E21	4.34	-6 -7	91 587	<i>d\beta p l</i>	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	<i>l\beta p l</i>	37					
													Feb. 1 E88 - H (β) (β_p) -
9.33	156	1102	S20 E13	8.29		121 746	<i>l\beta l</i>	18					
													Feb. 2 E86 - C (X) - -

②

TABLE II. 1958 (CONTINUED)

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



DISK PASSAGE DATA											RETURN SEQUENCE	GREENWICH DESCRIPTION																																	
Days Seen, Positions Seen, Zurich Class., Mag. Class., Magnetic Strength											Greenwich and/or MT.W.																																		
<p style="text-align: right;">Jan. 5 W80</p> <table border="0"> <tr> <td>R</td><td>B</td><td>C</td><td>D</td><td>D</td><td>E</td><td>E</td><td>E</td><td>D</td><td></td><td></td> </tr> <tr> <td>(X)</td><td>β_p</td><td>β_p</td><td>(β_p)</td><td>β_y</td><td>β_y</td><td>β_p</td><td>β_p</td><td>β_p</td><td>(X)</td><td></td> </tr> <tr> <td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>16</td><td>16</td><td>15</td><td>8</td><td>-</td><td>-</td> </tr> </table>											R	B	C	D	D	E	E	E	D			(X)	β_p	β_p	(β_p)	β_y	β_y	β_p	β_p	β_p	(X)		-	-	-	-	-	16	16	15	8	-	-	18388	A stream of variable spots.
R	B	C	D	D	E	E	E	D																																					
(X)	β_p	β_p	(β_p)	β_y	β_y	β_p	β_p	β_p	(X)																																				
-	-	-	-	-	16	16	15	8	-	-																																			
<p style="text-align: right;">Jan. 12 W55</p> <table border="0"> <tr> <td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>D</td><td>D</td><td>C</td><td>C</td><td></td> </tr> <tr> <td>β_p</td><td>β_y</td><td>β_y</td><td>(β_y)</td><td>β_y</td><td>β_y</td><td>(β_y)</td><td>β_y</td><td>(β_p)</td><td>-</td><td>-</td> </tr> <tr> <td>18</td><td>18</td><td>16</td><td>-</td><td>14</td><td>15</td><td>-</td><td>11</td><td>-</td><td>-</td><td>-</td> </tr> </table>											E	E	E	E	E	E	D	D	C	C		β_p	β_y	β_y	(β_y)	β_y	β_y	(β_y)	β_y	(β_p)	-	-	18	18	16	-	14	15	-	11	-	-	-	A scattered stream until January 8; two spots from January 9.	
E	E	E	E	E	E	D	D	C	C																																				
β_p	β_y	β_y	(β_y)	β_y	β_y	(β_y)	β_y	(β_p)	-	-																																			
18	18	16	-	14	15	-	11	-	-	-																																			
<p style="text-align: right;">Jan. 17 W80</p> <table border="0"> <tr> <td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td> </tr> <tr> <td>β_p</td><td>β_y</td><td>(β_y)</td><td>β_p</td><td>β_y</td><td>β_y</td><td>(β_y)</td><td>(β_y)</td><td>(β_y)</td><td>(β_y)</td><td>(X)</td> </tr> <tr> <td>16</td><td>19</td><td>-</td><td>20</td><td>21</td><td>23</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td> </tr> </table>											E	E	E	E	E	E	E	E	E	E	E	β_p	β_y	(β_y)	β_p	β_y	β_y	(β_y)	(β_y)	(β_y)	(β_y)	(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.	
E	E	E	E	E	E	E	E	E	E	E																																			
β_p	β_y	(β_y)	β_p	β_y	β_y	(β_y)	(β_y)	(β_y)	(β_y)	(X)																																			
16	19	-	20	21	23	-	-	-	-	-																																			
<p style="text-align: right;">Jan. 23 W82</p> <table border="0"> <tr> <td>E</td><td>E</td><td>F</td><td>F</td><td>F</td><td>F</td><td>F</td><td>G</td><td>G</td><td>G</td><td></td> </tr> <tr> <td>(β_p)</td><td>(β_p)</td><td>β_p</td><td>β_y</td><td>β_y</td><td>(β_p)</td><td>(β_p)</td><td>β_p</td><td>(β_p)</td><td>(β_p)</td><td>(=)</td> </tr> <tr> <td>-</td><td>-</td><td>17</td><td>13</td><td>29</td><td>-</td><td>-</td><td>27</td><td>-</td><td>-</td><td>-</td> </tr> </table>											E	E	F	F	F	F	F	G	G	G		(β_p)	(β_p)	β_p	β_y	β_y	(β_p)	(β_p)	β_p	(β_p)	(β_p)	(=)	-	-	17	13	29	-	-	27	-	-	-	18419	A large bi-polar group, of which the rear component dies out as it approaches the limb.
E	E	F	F	F	F	F	G	G	G																																				
(β_p)	(β_p)	β_p	β_y	β_y	(β_p)	(β_p)	β_p	(β_p)	(β_p)	(=)																																			
-	-	17	13	29	-	-	27	-	-	-																																			
<p style="text-align: right;">Jan. 28 W69</p> <table border="0"> <tr> <td>J</td><td>J</td><td>J</td><td>J</td><td>J</td><td>J</td><td>J</td><td>J</td><td>A</td><td>A</td><td></td> </tr> <tr> <td>(β_p)</td><td>β_p</td><td>(=)</td><td>(=)</td><td>(X)</td><td>(X)</td><td>(=)</td><td>(=)</td><td>*p</td><td>-</td><td>-</td> </tr> <tr> <td>-</td><td>15</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>3</td><td>-</td><td>-</td> </tr> </table>											J	J	J	J	J	J	J	J	A	A		(β_p)	β_p	(=)	(=)	(X)	(X)	(=)	(=)	*p	-	-	-	15	-	-	-	-	-	-	3	-	-	12878	A regular spot, with occasional companions.
J	J	J	J	J	J	J	J	A	A																																				
(β_p)	β_p	(=)	(=)	(X)	(X)	(=)	(=)	*p	-	-																																			
-	15	-	-	-	-	-	-	3	-	-																																			
<p style="text-align: right;">Jan. 29 W64</p> <table border="0"> <tr> <td>C</td><td>C</td><td>C</td><td>C</td><td>J</td><td>J</td><td>J</td><td>J</td><td>J</td><td>A</td><td>A</td> </tr> <tr> <td>β_p</td><td>(β_p)</td><td>(β_p)</td><td>(=)</td><td>(=)</td><td>(=)</td><td>(=)</td><td>*p</td><td>*p</td><td>(β_p)</td><td>-</td> </tr> <tr> <td>13</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>12</td><td>8</td><td>-</td><td>-</td> </tr> </table>											C	C	C	C	J	J	J	J	J	A	A	β_p	(β_p)	(β_p)	(=)	(=)	(=)	(=)	*p	*p	(β_p)	-	13	-	-	-	-	-	-	12	8	-	-		A stable regular spot, decreasing in area as it crosses the disk. There are a few companions on January 20.
C	C	C	C	J	J	J	J	J	A	A																																			
β_p	(β_p)	(β_p)	(=)	(=)	(=)	(=)	*p	*p	(β_p)	-																																			
13	-	-	-	-	-	-	12	8	-	-																																			
<p style="text-align: right;">Jan. 26 W82</p> <table border="0"> <tr> <td>E</td><td>E</td><td>E</td><td>E</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>(β)</td><td>(β)</td><td>(β_p)</td><td>(β_p)</td><td>(X)</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td> </tr> <tr> <td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td> </tr> </table>											E	E	E	E								(β)	(β)	(β_p)	(β_p)	(X)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		A stream, developing west of the central meridian.
E	E	E	E																																										
(β)	(β)	(β_p)	(β_p)	(X)	-	-	-	-	-	-																																			
-	-	-	-	-	-	-	-	-	-	-																																			
<p style="text-align: right;">Feb. 1 W78</p> <table border="0"> <tr> <td>C</td><td>C</td><td>D</td><td>D</td><td>D</td><td>D</td><td>D</td><td>C</td><td>D</td><td></td><td></td> </tr> <tr> <td>(X)</td><td>β</td><td>(β)</td><td>(β)</td><td>β</td><td>β</td><td>β</td><td>(=)</td><td>(β)</td><td>-</td><td>-</td> </tr> <tr> <td>-</td><td>-</td><td>-</td><td>-</td><td>18</td><td>15</td><td>1b</td><td>-</td><td>-</td><td>-</td><td>-</td> </tr> </table>											C	C	D	D	D	D	D	C	D			(X)	β	(β)	(β)	β	β	β	(=)	(β)	-	-	-	-	-	-	18	15	1b	-	-	-	-		A small composite spot, appearing suddenly on January 25, which becomes regular in outline by January 29.
C	C	D	D	D	D	D	C	D																																					
(X)	β	(β)	(β)	β	β	β	(=)	(β)	-	-																																			
-	-	-	-	18	15	1b	-	-	-	-																																			
<p style="text-align: right;">Feb. 2 W69</p> <table border="0"> <tr> <td>D</td><td>E</td><td>E</td><td>E</td><td>D</td><td>D</td><td>C</td><td></td><td></td><td></td><td></td> </tr> <tr> <td>γ</td><td>β_p</td><td>β_y</td><td>(β)</td><td>(β)</td><td>(β)</td><td>(β_p)</td><td>-</td><td>-</td><td>-</td><td>-</td> </tr> <tr> <td>21</td><td>16</td><td>13</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td> </tr> </table>											D	E	E	E	D	D	C					γ	β_p	β_y	(β)	(β)	(β)	(β_p)	-	-	-	-	21	16	13	-	-	-	-	-	-	-	-		A compact stream, which soon begins to break up.
D	E	E	E	D	D	C																																							
γ	β_p	β_y	(β)	(β)	(β)	(β_p)	-	-	-	-																																			
21	16	13	-	-	-	-	-	-	-	-																																			
<p style="text-align: right;">Feb. 4 W61</p> <table border="0"> <tr> <td>E</td><td>E</td><td>D</td><td>D</td><td>D</td><td>C</td><td>C</td><td>J</td><td>J</td><td></td><td></td> </tr> <tr> <td>β</td><td>β</td><td>β_p</td><td>(β)</td><td>(β)</td><td>(β)</td><td>(β_p)</td><td>-</td><td>-</td><td>-</td><td>-</td> </tr> <tr> <td>14</td><td>16</td><td>12</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td> </tr> </table>											E	E	D	D	D	C	C	J	J			β	β	β_p	(β)	(β)	(β)	(β_p)	-	-	-	-	14	16	12	-	-	-	-	-	-	-	-		A stream, becoming widely separated in longitude. Only the follower remains on February 3 and 4.
E	E	D	D	D	C	C	J	J																																					
β	β	β_p	(β)	(β)	(β)	(β_p)	-	-	-	-																																			
14	16	12	-	-	-	-	-	-	-	-																																			
<p style="text-align: right;">Feb. 11 W76</p> <table border="0"> <tr> <td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>D</td><td>D</td><td>C</td><td></td> </tr> <tr> <td>(β_p)</td><td>-</td><td>-</td><td>(β_p)</td><td>(β_p)</td><td>β_p</td><td>-</td><td>(β_p)</td><td>(X)</td><td>(X)</td><td></td> </tr> <tr> <td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>17</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td> </tr> </table>											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.
E	E	E	E	E	E	E	D	D	C																																				
(β_p)	-	-	(β_p)	(β_p)	β_p	-	(β_p)	(X)	(X)																																				
-	-	-	-	-	17	-	-	-	-	-																																			
<p style="text-align: right;">Feb. 14 W85</p> <table border="0"> <tr> <td>H</td><td>G</td><td>G</td><td>G</td><td>H</td><td>H</td><td>H</td><td>H</td><td>H</td><td>H</td><td>H</td> </tr> <tr> <td>-</td><td>-</td><td>(X)</td><td>(X)</td><td>*p</td><td>-</td><td>*p</td><td>(β_p)</td><td>*p</td><td>(β_p)</td><td>-</td> </tr> <tr> <td>-</td><td>-</td><td>-</td><td>-</td><td>34</td><td>-</td><td>36</td><td>-</td><td>36</td><td>-</td><td>23</td> </tr> </table>											H	G	G	G	H	H	H	H	H	H	H	-	-	(X)	(X)	*p	-	*p	(β_p)	*p	(β_p)	-	-	-	-	-	34	-	36	-	36	-	23		A large regular spot, with occasional companions.
H	G	G	G	H	H	H	H	H	H	H																																			
-	-	(X)	(X)	*p	-	*p	(β_p)	*p	(β_p)	-																																			
-	-	-	-	34	-	36	-	36	-	23																																			
<p style="text-align: right;">Feb. 15 W75</p> <table border="0"> <tr> <td>D</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>E</td><td>D</td><td>D</td><td>D</td> </tr> <tr> <td>-</td><td>(β_p)</td><td>(β)</td><td>β</td><td>-</td><td>β</td><td>(β)</td><td>(β)</td><td>(β_p)</td><td>β</td><td>(β)</td> </tr> <tr> <td>-</td><td>-</td><td>-</td><td>16</td><td>-</td><td>15</td><td>-</td><td>16</td><td>-</td><td>12</td><td>10</td> </tr> </table>											D	E	E	E	E	E	E	E	D	D	D	-	(β_p)	(β)	β	-	β	(β)	(β)	(β_p)	β	(β)	-	-	-	16	-	15	-	16	-	12	10		A large elongated stream, of which the very variable middle components die out before reaching the limb.
D	E	E	E	E	E	E	E	D	D	D																																			
-	(β_p)	(β)	β	-	β	(β)	(β)	(β_p)	β	(β)																																			
-	-	-	16	-	15	-	16	-	12	10																																			

3. II - 1



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

3-II-2

①

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.

3-II-2

(3)

TABLE II. 1958 (CONTINUED)

C.M.P.	MAXIMUM AREA					SUNSPOT MEAN DATA				MAJOR FLARE DAY DATA					
	Umb.	Whole	Position	Gr.	Flare	Area		Mt. Wilson	H	Area		Zurich	Mag.	H	Position
Spot	Day	ΔT	Umb.	Whole S.	Mag. Cl.	H	Umb.	Whole		Class.	Class.				
29.32	91	572	S06 W25	31.33	44	271	$d\beta$	13							Mar. 23 E74 D D (β) (β) - -
30.39	270	1992	S22 W75	26.30	213	1325	$i\beta p$	17							Mar. 23 E84 - E (α_p) (β_p) - -
27.23	166	563	S07 W53	31.33	43	276	$d\beta\gamma$	11							Mar. 24 E43 J J (β_p) β_p - 11
Apr. 2.22	193	1149	S16 E40	30.32	138	925	$i-p$	(25)							Mar. 27 E76 E E - - - -
4.48	182	1294	N33 E40	1.36	138	925	βi	(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	$d-p$	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	$i-p$	29							Apr. 3 E80 - G - (α_p) - -
9.82	115	648	N15 E50	5.61	-2	57	βi	17	93	512	D	-	-	N15 E30	Apr. 3 E79 - C - (β_p) - -
5.10	90	855	N20 W65	10.35	28	177	$d\beta i$	(15)							Mar. 30 E78 C D - -
21.00	189	1662	S22 W15	22.39	167	1226	$i\beta p$	23							Apr. 14 E84 - E (X) β - 12
26.37	123	671	N11 W25	28.44	64	399	$i\beta i$	(20)							Apr. 20 E77 - C (X) β_j - 13
29.47	93	526	S16 E80	23.37	85	455	$i-p$	17							Apr. 23 E80 H H (α_p) (α_p) - -
May 1.84	154	1101	N18 E30	29.33	127	799	$i\beta p$	17							Apr. 25 E81 - E (α_p) β_p - -

(2)

TABLE II. 1958 (CONTINUED)

MAJOR FLARE DAY DATA					DISK PASSAGE DATA													RETURN SEQUEN		
Area Umb.	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	(β _γ)	-	S15 E50	Apr. 26													May 9	
301	1857	F	(β _γ)	-	S15 E13	E82													W83	
186	1319	F	(β _γ)	-	S14 W25	-	C	E	F	F	F	F	F	F	F	F	G	G	-	
186	1319	F	(β _γ)	-	S14 W28	(*)	(β)	(β)	(β _γ)	(β _γ)	(β _γ)	(β _γ)	(β _γ)	(β _γ)	(β _γ)	(β _γ)	(β _γ)	(X)	-	
132	814	F	(β _γ)	-	S15 W40	-	-	-	-	-	-	20	-	17	-	-	-	-	-	
-	-	-	-	-	Not Seen	Apr. 30														
						E33														
						(X)														
						-														
						May 1													May 13	
						E75													W80	
						H	G	G	G	G	G	G	G	G	G	H	H	H	-	
						(*)	β _γ	β _γ	(β _γ)	β _γ	(β _γ)	(β _γ)	(β _γ)	β _γ	β _γ	(β _γ)	(*)	(*)	(*)	
						-	23	-	24	-	-	-	26	21	-	-	-	-	-	
						May 8													May 21	
						E82													W84	
						-	D	D	D	D	D	D	D	D	D	D	D	D	-	
						(X)	β	β _γ	(β _γ)	(*)	(*)	(*)	(X)	*p	*p	*p	*p	*p	-	
						-	16	-	-	-	-	-	11	10	9	-	-	-	-	
						May 9													May 21	
						E83													W72	
						-	D	D	D	D	C	C	C	C	C	B	B	A	-	
						β	β	(β _γ)	(β)	(β)	(β)	(β)	β _γ	β _γ	β _γ	β _γ	(β _γ)	(X)	-	
						9	-	-	-	-	-	7	17	17	18	-	-	-	-	
						May 15													May 26	
						E72													W62	
						A	C	D	E	E	E	E	D	D	C	J	A	-	-	
						(β _γ)	β _γ	β _γ	β _γ	β _γ	(β _γ)	(β _γ)	(β _γ)	(β _γ)	β _γ	(β _γ)	(*)	-	-	
						-	14	17	20	18	-	13	-	12	-	-	-	-	-	
102	686	E	(β)	-	N29 W43	May 28													June 6	
62	436	D	(β)	-	N28 W68	E32													W80	
16	134	-	(β)	-	N30 W80	B	C	D	D	E	E	E	E	D	-	-	-	-	-	
						β _γ	(β _γ)	β _γ	β	β	(β)	(β)	(β)	(β)	(β)	-	-	-	-	
						-	-	-	14	15	-	-	-	-	-	-	-	-	-	
						May 29													June 10	
						E81													W78	
						H	H	H	H	H	H	H	H	H	H	H	H	H	-	
						(*)	*p	*p	*p	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	
						-	-	25	22	-	21	-	-	20	-	-	-	-	-	
						-														
						May 31														
						E71														
						-														
						(*)														
313	1966	F	(β)	-	N28 E13	June 3													June 17	
						E80													W85	
						-	E	F	F	F	F	F	F	F	F	E	E	D	-	
						(β _γ)	β _γ	(β _γ)	β _γ	(β _γ)	(β _γ)	(β _γ)	(β _γ)	β	β	β _γ	β _γ	(β)	(X)	
						-	18	-	22	-	-	-	-	20	-	12	10	-	-	
						June 4													June 16	
						E62													W78	
						C	D	E	E	E	E	E	E	E	E	D	-	-	-	
						(β _γ)	(β _γ)	β _γ	(β _γ)	(β _γ)	(β)	(β)	(β)	(β)	β _γ	β _γ	(*)	(*)	-	
						-	-	16	-	-	-	-	-	9	2	-	-	-	-	
47	314	C	(β)	-	S17 E65	June 4													June 13	
						E78													W37	
						-	C	C	J	J	J	C	J	C	A	-	-	-	-	
						(β)	(β)	β	(β)	(β)	(β)	(β _γ)	(*)	(β _γ)	(β _γ)	-	-	-	-	
						-	-	7	-	-	-	-	-	-	-	-	-	-	-	
107	799	E	β _γ	24	N15 W20	June 12													June 23	
107	799	E	β _γ	24	N15 W20	E72													W75	
						D	D	D	E	E	E	E	E	E	E	G	H	-	-	
						(X)	β _γ	β _γ	β _γ	β _γ	β _γ	β _γ	β _γ	β _γ	β _γ	β _γ	*p	-	-	
						-	16	16	21	21	18	17	24	21	-	23	-	-	-	
						June 20													June 28	
						E76													W30	
						-	-	C	J	J	A	A	A	A	-	-	-	-	-	
						(X)	(β)	β _γ	β _γ	β _γ	(β)	(β)	(β)	(*)	-	-	-	-	-	
						-	-	8	14	15	-	3	-	-	-	-	-	-	-	
						June 23													July 4	
						E76													W82	
						C	E	E	E	E	E	E	G	G	G	G	G	-	-	
						β _γ	β	(β _γ)	β _γ	(β _γ)	(β _γ)	(β _γ)	β _γ	β _γ	(β _γ)	β _γ	(β _γ)	(*)	(*)	
						6	16	-	26	27	-	13	15	-	15	-	-	-	-	



DISK PASSAGE DATA											RETURN SEQUENCE	GREENWICH DESCRIPTION
Days Seen, Positions Seen, Zurich Class., Mag. Class., Magnetic Strength											Greenwich and/or MT.W.	
												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.
D	D	D	D	D	E	E	E	C	B			
β	β_f	-	-	-	(β_f)	-	-	-	-	-		
9	14	-	-	-	-	-	-	-	-	-		
												A large bi-polar group.
												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.
E	E	E	F	F	F	F	F	F	G	G		
β_p	β_p	-	-	-	(β_p)	-	-	-	-	(β)		
18	18	-	-	-	-	-	-	-	-	-		
												A stream, of which the leader, a composite spot, becomes regular in outline after March 31. The following components die out by April 5.
C	C	C	C	C	C	J						
β_r	-	-	-	(β_r)	-	-						
10	-	-	-	-	-	-						
												A compact stream, which spreads out after April 4 and begins to disintegrate as it approaches the west limb.
E	E	E	E	E	E	E	E	E	E	D	18550	
-	(X)	-	-	-	-	(X)	(α_p)	-	-	β		
-	-	-	-	-	-	-	-	-	-	15		
												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.
D	D	C	D	D	E	E	D	D	C	C	13067 (Part)	
-	-	-	-	(X)	(X)	-	-	α_p	(α_p)	(α_p)		
-	-	-	-	-	-	-	-	-	-	-		
												One or two small spots, developing into a short stream of which only the leader remains on April 7.
J	A	B	A	A	B	A	A					
-	(X)	(α)	-	-	(X)	β_p	-			4		
-	-	-	-	-	-	-	-			-		
												A few small spots on April 4, developing into a large stream.
E	E	E	E	E	E	E	E	E	E	D	18559	
-	-	β_p	(β_p)	(β_p)	(β_p)	(β_p)	(β_p)	(β_p)	(β_p)	(β_p)		
-	-	14	-	-	-	-	-	-	-	-		
												A stable regular spot, with occasional companions.
G	G	G	G	G	G	G	G	G	G	G	13078	
(α_p)	-	-	α_p	(α_p)	(α_p)	(α_p)	(α_p)	(α_p)	(α_p)	(α_p)		
-	-	-	-	-	-	-	-	-	-	-		
												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.
D	D	D	D	C	C	C	A	A	A	-	18551	
(β)	-	-	β_f	(β_f)	(β_f)	β_f	β_f	(β_f)	(β_f)	(α)		
-	-	-	28	-	-	-	-	-	-	-		
												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.
C	B	B	B	B	A	B	C	D	D	-	13068	
-	-	-	-	-	-	-	-	-	-	-		
												A composite spot, developing into a compact stream.
E	E	E	E	E	E	E	E	E	E	E		
β_p	β_r	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 cluster of variable spots, developing into a stream of normal type after April 25.
C	C	C	D	E	E	E	G	G	G	-		
(β)	(β)	(β)	β	β_r	β_r	(β_p)	(β)	β_p	(β_p)	(α)		
-	-	-	-	-	-	-	-	-	-	-		
												A regular spot, with a few occasional companions.
H	H	G	G	G	G	H	H	H	H	-	18590	
(α_p)	α_p	(β_p)	(α_p)	(α_p)	(α_p)	α_p	(α_p)	(α_p)	(α_p)	(α_p)		
-	-	-	-	-	-	18	-	-	-	18		
												A bi-polar group, of which the follower begins to break up and die out after May 3.
E	E	E	E	E	G	G	G	G	G	G	13133	
β_r	(β_r)	(β_p)	(β_p)	(β_p)	β_p	(β_p)	β_p	(β_p)	(β_p)	(β_p)		
-	-	-	-	-	14	-	11	-	-	-		

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. Spot	Whole Spot	Position	Gr. Day	Flare ΔT	Area Umb.	Whole S.	Mt. Wilson Mag. Cl.	H
45	13197	18654	26,L,M 27 28 29 30	4530	S15	348	May 3.09	281	2061	S15 E40	30.31	+1 -1 -5 -5 -6	198	1332	<i>lβpl</i>	19
46	13205	-	25	4531	N30	-	3.4	-	-	-	-		-		<i>dxd</i>	(2)
47	13207	18668	L	4538*	N26	293	7.23	154	872	N26 E50	3.57		128	669	<i>lβpl</i>	26
48	13225	18681	L	4548	S18	191	14.95	63	580	S18 E63	10.34		56	373	<i>l=pd</i>	15
49	13226	18683	L,M	4548	S20	178	15.94	31	517	S20 E75	10.34		29	239	<i>lβyl</i>	17
50	13237	18689	L	4557*	N40	109	21.17	95	620	N40 E13	20.41		45	293	<i>dβpd</i>	19
51	13275	18715	32,L 33 35	4578	N28	341	30.85	89	764	N29 W60	4.67	+1 -1 -2	69	443	<i>dβl</i>	14
52	13278	18718	L	4587*	N25	280	June 4.47	73	536	N26 W78	10.44		73	376	<i>l=pl</i>	25
53	13284	-	31	4591	N00	-	6.0	-	-	-	-		-		<i>l=d</i>	(1)
54	13292	18726	36,L,M	4596	N28	206	10.08	329	2256	N28 E20	8.56	-1	212	1587	<i>lyl</i>	21
55	13294	18728	L	4597	N43	209	9.76	130	969	N44 W20	11.36		88	573	<i>dβl</i>	14
56	13295	18729	34	4598	S17	199	10.60	33	368	S17 E80	4.67	-1	19	122	<i>lβd</i>	(10)
57	13311	18739	37,L 38	4607	N15	103	17.80	107	799	N15 W20	19.33	0 0	91	580	<i>lβpl</i>	23
58	13326	18751	M	4618	S18	352	26.24	136	245	S17 E35	22.61		19	114	<i>dβyd</i>	14
59	13333	18756	L	4622	S18	319	28.75	169	1107	S19 E45	25.34		126	789	<i>dβyl</i>	26

3. II-4 ①

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	356
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 (1)

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

(5)

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

①

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

3-II-4 (3)

TABLE II. 1958 (CONTINUED)

MAJOR FLARE DAY DATA						DISK PASSAGE DATA															
Area Umb.	Whole	Zurich Class.	Mag. Class.	H	Position	Days Seen, Positions Seen, Zurich Class., Mag. Class., Magnetic Strength															
43	238	H	(α)	-	N18 E06	July 23 E86	-	J	J	J	J	H	H	G	H	H	H	H	H	J	Aug. 5 W84
							(α)	(α)	α	α	α	α	(α)	(α)	α	β	β	(β)	α	α	-
							-	-	20	18	24	24	-	-	26	28	-	26	15	-	-
11	49	E	β	14	N05 W45	July 25 E79	E	E	E	E	E	E	E	E	E	E	G	G	G	Aug. 5 W67	
							β	β	β	β	(β)	β	β	β	(β)	β	β	(β)	(β)	(β)	-
							13	17	15	16	-	22	15	14	-	14	8	-	-	-	-
						July 26 E24	A	B	B	B	C	C	E	E	-	-	-	-	-	-	Aug. 3 W82
							(β)	β	β	(β)	β	β	(β)	(β)	(β)	(β)	(X)	(X)	(X)	(X)	-
							-	-	6	-	14	14	12	-	-	-	-	-	-	-	-
61	294	G	(β)	-	N27 W27	July 27 E74	B	B	D	D	E	G	G	G	G	G	G	G	G	G	Aug. 7 W77
							(X)	β	(β)	β	β	β	(β)	β	(β)	β	(β)	α	α	(α)	(α)
							-	9	-	15	13	16	-	15	-	19	14	-	-	-	-
						July 28 E64	A	C	D	D	E	C	C	C	C	C	C	J	J	J	Aug. 7 W75
							β	(β)	β	β	β	(β)	β	β	β	α	α	(α)	(α)	(α)	-
							6	-	17	12	17	-	13	12	14	9	-	-	-	-	-
						July 29 E74	H	H	E	E	E	G	G	G	G	G	G	G	G	G	Aug. 9 W80
							(X)	β	β	(β)	β	(β)	(β)	α	α	β	(β)	(β)	(X)	(X)	-
							-	16	17	15	-	14	-	15	15	16	-	-	-	-	-
						Aug. 2 E73	A	A	B	D	E	E	E	E	E	E	E	G	G	G	Aug. 14 W84
							(X)	β	(β)	β	β	(β)	β	(β)	β	β	β	β	(β)	(β)	(α)
							-	2	-	18	25	23	-	15	20	20	18	-	-	-	-
						Aug. 5 E78	-	-	-	A	B	B	C	C	C	C	C	J	J	J	Aug. 17 W72
							(α)	α	α	(α)	α	β	β	(β)	β	(β)	β	(β)	(β)	(α)	(α)
							-	13	-	-	11	12	16	19	-	19	-	15	-	-	-
80	686	E	β	23	S14 E62	Aug. 6 E78	-	E	E	E	E	G	G	G	G	G	G	G	G	G	Aug. 18 W82
138	836	G	(β)	-	S13 W14		β	β	(β)	β	β	β	β	(β)	β	(β)	β	(β)	(β)	(β)	(X)
208	935	G	β	31	S13 W50		18	23	-	27	29	34	32	-	34	-	31	-	-	-	-
57	373	D	(β)	-	S11 W63	Aug. 15 E41	C	C	C	C	C	C	J	D	D	-	-	-	-	-	Aug. 24 W76
							(β)	β	β	β	β	α	α	(β)	(β)	(β)	(β)	(β)	(X)	(X)	-
							-	22	16	18	18	-	9	14	-	-	-	-	-	-	-
189	1381	F	(β)	-	N18 E01	Aug. 15 E31	-	D	E	E	E	E	E	E	E	E	E	E	E	E	Aug. 28 W83
112	1192	E	β	24	N18 W03		(β)	β	β	β	β	(β)	(β)	(β)	(β)	(β)	(β)	(β)	(β)	(β)	(X)
112	1192	E	β	24	N18 W10		-	13	17	18	23	-	24	24	20	21	18	-	-	-	-
130	751	E	β	18	N18 W45		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
116	776	E	(β)	-	N17 W53		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	Not Seen	Aug. 21 E81	J	J	C	C	B	A	B	A	-	-	-	-	-	-	-
							(α)	α	α	α	α	α	(X)	(X)	-	-	-	-	-	-	-
							-	13	11	16	16	-	-	-	-	-	-	-	-	-	-
						Aug. 22 E10	B	A	B	E	E	E	E	-	-	-	-	-	-	-	Aug. 29 W77
							(β)	β	β	(β)	(β)	(β)	(β)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	-
							-	3	12	9	-	-	-	-	-	-	-	-	-	-	-
						Aug. 26 E66	B	C	D	D	E	E	E	E	E	E	E	E	E	E	Sept. 5 W70
							(β)	β	β	β	β	β	β	β	β	β	β	β	β	(β)	(β)
							-	14	16	20	16	24	29	25	21	22	19	-	-	-	-
						Aug. 27 E59	B	D	B	C	C	D	E	E	E	E	E	E	E	E	Sept. 6 W80
							β	β	β	β	β	β	β	β	β	β	β	(β)	(β)	(β)	(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. Spot	Whole Spot	Position	Gr. Day	Flare ΔT		Area Umb.	Area Whole	Mt. Wilson S.	Mt. Wilson Mag. Cl.	H	Area Umb.	Area Whole	Zurich Class.	Mag. Class.	H	Position	
65	561	N09 E70	24.30	-2		54	327	<i>lβpl</i>	22		87	543	E	<i>βγ</i>	13	N10 E50	June 23 E82
-	-	-	-	-		-	-	<i>d=pd</i>	(2)		-	-	-	-	-	Not Seen	June 24 E36
141	1002	N25 E30	3.30			60	498	<i>lβyl</i>	20								June 29 E81
229	1573	S23 W50	11.33	-1		155	923	<i>lβl</i>	21		178	1303	E	<i>(βγ)</i>	-	S23 W63	July 1 E77
96	689	N27 E15	6.35	-1		59	373	<i>dβyl</i>	19		138	686	E	<i>βl</i>	18	N27 E08	July 2 E66
63	472	S22 W01	13.14	+2		51	316	<i>lβpl</i>	16		61	398	H	<i>(=p)</i>	-	S22 E20	July 7 E72
228	1407	N09 E08	17.63	+2		156	914	<i>dβpl</i>	27		183	914	E	<i>βp</i>	25	N08 E37	July 12 E73
136	761	S23 W53	19.62	-1	-1	55	353	<i>dβl</i>	13		87	680	D	<i>(β¹¹)</i>	-	S23 W60	July 14 E20
26	152	N21 E30	18.33	-1		17	95	<i>dβd</i>	4		24	147	C	(X)	-	N22 E13	July 14 E82
See description.								<i>lβd</i>	14				C	<i>p</i>	-	N22 E13	July 14 E82
142	682	S15 W65	30.26			72	364	<i>l=pl</i>	20								July 19 E77
18	184	S05 E80	19.62	-4		9	50	<i>l=pd</i>	13		11	56	J	<i>=p</i>	13	S04 E33	July 19 E82
207	1795	S15 W26	28.33	-1	-3	123	901	<i>dβyl</i>	23		230	1490	F	<i>βs</i>	17	S15 W13	July 20 E78
200	1245	S18 E65	22.38			119	755	<i>lβpl</i>	23		164	1608	F	<i>(βp)</i>	-	S15 W40	July 20 E78
9	42	N24 E33	24.34	+1	+1	4	23	<i>dβpd</i>	5		7	32	C	<i>βp</i>	6	N25 E43	July 23 E45
											7	32	C	<i>βp</i>	6	N25 E43	July 23 E45

(2)

DISK PASSAGE DATA											RETURN SEQUENCE	GREENWICH DESCRIPTION
Days Seen, Positions Seen, Zurich Class., Mag. Class., Magnetic Strength											Greenwich and/or MT.W.	
July 5 W74												<p>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.</p> <p>A complex stream; which becomes scattered as it breaks up and dies out.</p> <p>A bi-polar group. After July 7 intermittent spots appear, forming a long stream of which a regular spot is the principal component.</p> <p>A short, compact stream, which slowly breaks up after July 10. Only the rear component remains on July 12.</p> <p>A composite spot, which becomes regular in outline after July 16.</p> <p>A single spot on July 12 and 13, rapidly developing into a large bi-polar group.</p> <p>A stream of small spots.</p> <p>At first a regular spot, which from July 17 begins to break up and disperse.</p> <p>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.</p> <p>At first a regular spot. On July 26, another regular spot appears immediately north of it.</p> <p>A regular spot, which divides into two on July 27.</p> <p>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.</p> <p>A bi-polar group, of which the follower dies out before reaching the west limb.</p> <p>A pair of spots on July 23 and 24; a single spot on the other days.</p>
E	E	E	E	D	D	C	C	C	C	A		
(β _p)	β _y	β	β	β	(β _y)	(β _p)	β _p	(β _p)	(β _p)	(α _p)		
-	13	23	23	17	14	-	11	-	-	-		
July 11 W70												
J	C	E	E	D	D	C	C	B	B	C		
(β _p)	β	β _y	(β _y)	β _y	(β _y)	β _y	(β _y)	β _y	(β _p)	(α _p)		
-	21	20	-	20	-	11	-	-	-	-		
July 14 W78												
G	G	G	G	G	G	E	E	E	E	E		
(β)	(β)	β	(β)	β _p	(β)	(β _p)	β _p	(β _p)	(β _p)	(X)		
-	-	20	-	24	-	-	20	-	-	-		
July 14 W83												
A	D	E	E	E	E	E	D	C	C	J		
(β)	β _f	(β _f)	β _f	(β _f)	(β _f)	β _f	(β _f)	(α _p)	(α)	(α)		
-	20	-	18	-	-	15	-	-	-	-		
July 18 W68												
G	H	H	H	G	H	J	J	J	J	J		
(β)	β _p	(α _p)	β _p	(β _p)	β _p	* _p	* _p	* _p	(α _p)	(α _p)		
-	15	-	15	-	17	13	14	13	-	-		
July 24 W79												
E	E	E	E	E	E	E	E	G	G	-		
β _p	β _p	β _p	β _p	β _p	β _y	β _p	β _p	β	β _y	(α)		
21	25	23	27	21	20	22	20	18	14	-		
July 21 W74												
C	C	D	D	D	C							
β _p	β	β _f	β	(β _f)	(β _f)							
14	12	13	13	-	-							
July 23 W22												
C	C	C	C	C	B	B	B					
(β)	(X)	(X)	(X)	O	O	(α _p)	(α _p)					
-	-	-	-	-	-	-	-					
July 23 W22												
C	C	C	C	C	B	B	B					
β _p	β _p	β	β _f	β	β	(β _f)	β _p					
11	9	14	4	2	-	-	2					
July 31 W78											18756	
J	J	J	J	J	C	J	J	J	J	J		
* _p	* _p	* _p	(α _p)	* _p	* _p	* _p	* _p	(α _p)	(α _p)	(α _p)		
17	16	19	-	16	19	21	17	-	-	-	13333	
July 30 W61												
J	J	J	C	J	J	J	B	B	A			
* _p	* _p	* _p	(α _p)	* _p	* _p	β	β	-	-	-		
14	13	13	-	12	18	22	24	-	-	-		
Aug. 1 W85											18756	
C	D	D	E	E	F	F	F	F	F	-		
β _p	β _p	(β _f)	β _p	β _p	β _y	β _y	(β _f)	β _p	β _p	β _y		
-	15	-	15	16	16	17	-	-	-	-	13333	
Aug 2 W76												
E	E	E	E	G	G	G	G	G	G	G		
β _p	(β _f)	β _p	β _p	β _y	β _y	(β _f)	β _p	β _p	β _p	(X)		
18	-	22	23	21	24	-	21	17	12	-		
July 28 W73												
B	B	A	B									
β _p	(α _p)	-	-									
4	-	-	-									

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(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. 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	<i>l-p l</i> 28		
76	13397	18810	54,L	4665	N06	247	31.35	90 539	N07 E79	25.42	-9	40 247	<i>l β l</i> 21		
77	13399	18811	L	4668	N19	287	28.34	96 722	N19 W55	1.65		33 253	<i>d β l</i> 13		
78	13404	18813	55,L	4667	N27	228	Aug. 1.83	88 576	N27 E20	31.31	-4	50 307	<i>d β l</i> 18		
79	13405	18814	L	4669*	N15	227	1.89	70 598	N15 W20	3.45		47 309	<i>d β l</i> 16		
80	13406	18818	L	4670	S09	205	3.53	94 620	S09 E40	31.31		56 405	<i>l β l</i> 16		
81	13421	18824	L	4680*	N21	145	8.06	113 845	N22 W02	8.32		75 458	<i>d β l</i> 21		
82	13429	18832	L	4684*	S26	100	11.50	56 504	S24 W53	15.63		41 257	<i>l β l</i> 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	<i>l β y l</i> 35		
84	13460	18853	62	4703	S12	7	18.54	57 373	S11 W63	23.33	0	34 193	<i>d β l</i> 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	<i>l β y l</i> 23		
86	13476	18867	65	4718	S08	247	27.60	22 108	S07 E67	22.41	-8	11 61	<i>l-p d</i> 15		
87	13479	18869	L		N21	307	23.0	138 784	N21 W57	27.33		103 595	<i>d β l</i> 18		
88	13485	18872	L	4722	S07	201	31.08	196 1204	S06 W47	2.64		115 676	<i>d β l</i> 28		
89	13489	18875	L	4725*	N15	194	31.58	133 878	N14 W26	2.64		73 472	<i>d β l</i> 21		

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①

POSITION DATA							
Serial No.	Sunspot M.T.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

①

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

3. II-8

(3)

TABLE II. 1958 (CONTINUED)

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

②

DISK PASSAGE DATA										RETURN SEQUENCE	GREENWICH DESCRIPTION
Days Seen, Positions Seen, Zurich Class., Mag. Class., Magnetic Strength										Greenwich and/or MT.W.	
Sept. 6 W78											
E	E	E	E	G	G	J	J				A stream of normal type, which grows rapidly. The follower breaks up and dies out before reaching the west limb.
β_1	β_1	β_p	β	β_p	β_p	β_1	β_1				
28	16	13	17	15	14	-	-				
Sept. 14 W80										18835	A regular spot. On September 6, other spots appear, forming a variable cluster.
J	J	C	D	D	E	E	E	D	D	13434	
β_p	β_p	β_p	β_p	β_p	β	β_1	β_1	β_p	β_p		
18	19	16	20	15	17	15	15	13	-		
Sept. 14 W79											A variable cluster, which becomes a compact stream by September 11.
C	D	D	D	C	E	E	E	E	-		
γ	γ	γ	γ	β_p	β_p	β_1	β_1	(β_1)	(β)		
15	12	16	14	14	14	15	15	-	-		
Sept. 14 W62											A variable stream.
D	C	C	D	D	D	C	C	C	B		
β_1	β_1	β_1	β_1	β_1	β_1	β_1	β_1	(β_1)	(β)		
16	16	19	14	17	14	14	13	-	-		
Sept. 16 W51											A bi-polar stream. Only the leading components are seen on September 15 and 16.
E	D	D	D	D	C	B	B	A	-		
β_1	β_p	β_p	β_p	(β)	β_p	β_p	β_p	β_p	-		
18	14	14	15	-	9	12	-	-	-		
Sept. 20 W76											A variable stream, in the rear part of which a composite spot forms by September 14.
D	D	D	C	D	D	C	C	D	C	Pos. ret. of 13460	
β_p	β_p	β_1	(β_1)	β_1	β_1	β_1	(β_1)	β_1	(β_1)		
5	10	16	-	21	21	20	-	11	12		
Sept. 23 W80											A stream of small spots, of which the leading components coalesce into a regular spot which is the sole survivor on September 21.
C	C	C	D	D	D	D	D	D	D	13464	
(β_1)	β_1	β_1	β_1	(β_p)	β_1	β_p	β_p	β_p	β_p		
-	16	16	15	-	20	20	16	14	-		
Sept. 24 W76										18855 18801 18756	A pair of regular spots, with a few variable companions.
G	G	G	G	G	G	G	G	G	G		
β	β	β	(β)	β_p	β	β	β	β	(β)		
19	19	24	-	23	20	23	21	15	-		
Sept. 17 W12											A small spot.
A	A	B	B	A							
(β)	O	(X)	(β)	-							
-	-	-	-	-							
Sept. 25 W76										18874	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.
H	H	H	E	E	E	E	E	E	E	13470	
β_p	β_p	(β_p)	β_p	β_p	β_p	β_p	β_p	-	β_p		
30	35	-	33	33	30	32	30	-	24		
Sept. 26 W82											A variable stream of small spots.
B	B	C	D	D	C	D	E	E	D		
β	(β_1)	β_1	β_1	β_1	β_1	β_1	-	β_1	β_1		
2	-	14	14	14	17	14	-	13	6		
Oct. 2 W73										18872	A regular spot, with a number of variable companions until September 26.
D	D	D	C	C	H	H	H	H	H	13485	
β_1	-	β_p	β_p	β_p	β_p	(β_p)	β_p	β_p	(β_p)		
24	-	25	25	25	29	-	29	27	24		
Oct. 4 W79											A pair of regular spots, with one or two companions.
G	G	G	G	G	G	G	G	G	G		
β_p	β	β_1	β_p	(β_p)	β_p	β_p	β_1	(β_p)	(β_p)		
26	22	24	26	-	27	28	27	-	-		
Oct. 5 W72											A stream, the leader of which becomes a regular spot and coalesces with the remainder of the group to form a composite structure.
C	D	E	E	E	E	E	E	H	G		
β_p	β_1	β_p	(β_p)	β_1	β_p	β_p	(β)	(β)	β_p		
16	18	17	-	17	18	16	-	-	9		
Oct. 23 W82											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.
E	E	E	G	G	G	G	G	J	J		
β_p	β_p	β_p	β_p	β_p	(β_p)	(β_p)	β_p	β_p	(β_p)		
23	25	30	28	30	-	-	15	16	-		

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

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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

Class

A.		
B.		
C.		
D.		
E.		
F.		
G.		
H.		
J.		

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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	<i>4β1</i>	22						
														Dec. 4 E15 C D <i>β₁ β₂</i> 14 20
113	888	N15 E31	7.28	4 4	71	507	<i>1β1</i>	18	16	184	-	<i>βp</i>	14	N16 E84
									16	184	-	<i>βp</i>	14	N16 E83
														Dec. 3 E79 - E <i>β_p β₁</i> 14 10
222	1318	S01 W03	12.28	0 0	112	710	<i>1β>1</i>	27	222	1318	F	<i>β_y</i>	27	S01 W00
									222	1318	F	<i>β_y</i>	27	S01 W06
														Dec. 5 E85 - D <i>β_p β_p</i> 13 14
115	1041	S07 W72	17.62		86	675	<i>1βp1</i>	22						
														Dec. 6 E74 C D <i>β_p β_p</i> 12 11
80	700	S18 W13	14.41	-1	74	499	<i>1βp1</i> <i>4βd</i>	20 12	79	466	D	<i>β1</i>	16	S18 W25
														Dec. 7 E79 - D <i>β_p β₁</i> 12 -
105	705	N22 W16	18.46		71	489	<i>1β1</i>	22						
														Dec. 11 E74 J D <i>γ γ</i> 5 14
166	1629	S16 E67	22.45	+1 +9	138	1018	<i>1γ1</i>	19	206	1608	E	<i>γ</i>	19	S16 E53
									88	872	E	<i>γ</i>	14	S16 W40
														Dec. 21 E81 - E (X) <i>γ</i> - -
61	615	N13 E64	23.61	-	48	334	<i>4βp1</i>	14						
														Dec. 22 E79 - D (<i>β_p</i>) <i>β</i> - 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

III. CATALOGUE OF PLAGI

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. Wll. No.	Mag. Class	Intensity Gauss	Days Seen
4365	1	S15	Jan. 13.0	2	Jan. 19	11	3000	2/2.5/2	0/2/0	2	4313	12956 12937	<i>ded</i>	(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	<i>B_γ1</i> <i>B_β1</i> <i>capd</i> <i>B_β1</i>	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	<i>B_βd</i> <i>capd</i> <i>capd</i> <i>capl</i>	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 - 4175 - 4147	12975 12976	<i>B_β1</i> <i>capd</i>	(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	<i>B_βd</i> <i>B_βl</i> <i>capd</i> <i>ded</i> <i>ded</i>	12 17 12 (3) (1)	21-30 21-1 20-31 23-29 28-29
4387	8	N22	30	2	24	12	1500	X/X/2	9/4/4	17	4338	12985 13005	<i>B_β1</i> <i>ded</i>	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	<i>B_βl</i> <i>ded</i> <i>ded</i> <i>ded</i> <i>ded</i> <i>capl</i> <i>B_β1</i> <i>B_β1</i> <i>capd</i>	16 (2) (10) (2) (2) (2) 37 4 18 4	31-11 6-7 31-9 Feb. 6-7 Feb. 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	<i>capd</i>	20	16-27
4436	12	S12	25	1	22	7	1400	-/3.5/X	0/11/4	15	NEW	13052 13049	<i>B_β1</i> <i>ded</i>	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	<i>B_β1</i> <i>B_β1</i> <i>ded</i> <i>capl</i> <i>B_β</i>	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	13069	<i>B_βl</i>	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	<i>capl</i> <i>ded</i> <i>ded</i> <i>B_β1</i> <i>B_β1</i>	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	16/58/17	90	4442	13103 13110 13108	<i>B_γ1</i> <i>B_βγ</i> <i>B_β</i>	21 11 13	22-30 24-30 23-30

TABLE III. 1958 (CONTINUED)

IDENTIFICATION			PLACE POSITION			DISK PASSAGE FLARE DATA			LIFE HISTORY		ASSOCIATED SUNSPOTS				
M ^c M Flare No.	Major Flare 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	Plate No.'s Previous Rotations	Mt. Wil. No.	Mag. Class	Intensity Gauss	Days Seen
4493	23	N16	Apr. 9.5	2	Apr. 2	15	15000	3.5/3/3	9/16/9	34	4453	13130 13129 13141 13131 13148 13151	β/γ α/β α/β α/β α/β α/β	17 28 (2) (10) (10) (5)	Apr. 4-16 4-15 9-9 4-5 12-13 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 13124 13127 13135 13128	α/β α/β β/γ β/γ β/γ	4 (5) 13 (5) 16	4-11 4-5 4-13 8-13 4-13
4531	25	N30	May 3.5	3,2	27	14	5500	2/2/1			Part of 4484 - 4444 4488	13205	α/β	(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 13216	β/γ α/β	19 7	26-8 May 4-7
4561	31	N18	June 6	4	May 31	13	5500	3/2.5/2	6/2/0	8	4543 - 4488 - 4456	13284 13286 13289	α/β α/β α/β	(1) (3) (2)	31-31 June 1-6 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 13261 13282	β/γ β/β α/β	14 6 9	May 28-6 23-1 30-6
4588	34	S20	June 11.5	3	June 4	15	7000	3/3/2	5/4/1	10	Part of 4548 - 4516	13295 13298 13299 13299	β/β α/β α/β α/β	(10) (2) (2) 9	June 4-13 6-11 6-16
4596	36	N28	10	1	3	14	10000	3/3.5/3.5	7/21/2	30	NEW	13292	γ/γ	21	3-16
4607	37, 38	N12	18	3	11	14	7000	3.5/3.5/3	15/35/2	52	4563 - 4519	13311 13310	β/β α/β	23 3	11-23 11-14
4619	39	N28	22	5, 7	20	14	6000	2.5/2.5/2	3/2/1	6	4578 - 4529 - 4484 - 4444 4485 - 4446 - 4405 - 4353	13336 13346	α/β α/β	(2) (1)	24-26 28-28
4623	40	N12	29.5	1	23	13	12000	3/3/2	4/11/1	16	NEW	13335 13348 13342	β/β α/β α/β	22 (3) 6	23-5 28-30 26-29
4634	41	N28	July 7.5	2	July 3	15	9000	2.5/3/3	1/19/3	23	4596	13356 13355	β/β α/β	19 7	July 2-14 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	β/β	16	6-18
4636	43	S22	8	4	1	14	8000	3/3.5/3.5	7/27/8	42	4598 - 4548 - 4516	13353	β/β	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	α/β	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 13376 13378 13396	α/β β/β α/β α/β	4 14 10 (2)	14-22 14-23 16-20 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	α/β	13	14-21

TABLE III. 1958 (CONTINUED)

IDENTIFICATION		PLAGE POSITION			DISK PASSAGE PLAGE DATA				LIFE HISTORY		ASSOCIATED SUNSPOTS			
Major Flare Serial No.	Mean Lat.	Date	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. No.	Mag. Class	Intensity Gauss	Days Seen
4658	S03	July 26	1	19	13	2000	2.5/2.5/2	0/1/0	1	NEW	13386	$\alpha\beta\delta$	13	19-28
4657	N17	26.5	2	19	13	9000	2.5/3.5/2.5	3/4/0	7	4623	13394	$\beta\beta\delta$	5	23-28
4659	S19	26.5	3	19	15	20000	3/3.5/3	5/83/24	112	4622 - 4581	13385	$\alpha\beta\delta$	14	19-30
4664	N16	29.5	4.5	23	14	10000	2.5/3/2.5	1/5/2	8	4627 - 4586 - 4540 Part of 4537 - 4493 - 4453	13392	$\alpha\beta\delta$	(3)	21-24
4665	N04	31	2	24	14	12000	3.5/3.5/3	11/15/4	30	4631	13388	$\beta\beta\gamma\delta$	23	20-1
4667	N27	Aug. 2	2	26	15	15000	3/3.5/3	1/19/7	27	4630	13384	$\alpha\beta\delta$	20	19-31
4686	S13	12.5	2	Aug. 6	14	11000	3/3.5/3.5	11/48/13	72	4653	13389	$\beta\beta\delta$	23	20-2
4708	S18	22	3	15	14	8000	4/3.5/3.5	6/37/17	60	4657 - 4623	13395	$\alpha\beta\delta$	28	23-4
4703	S14	19	1	12	13	3200	-/3/3	1/9/4	8	NEW	13400	$\beta\beta\delta$	14	29-2
4718	S08	27.5	2	21	13	4000	3/3/2	0/3/0	3	4687	13409	$\beta\beta\delta$	14	29-2
4741	S07	Sept. 9	1	Sept. 2	14	7000	3.5/3/3	20/30/7	57	NEW	13410	$\alpha\beta\delta$	(2)	29-29
4722	S09	Aug. 31	2	Aug. 24	14	12000	3/3.5/3.5	9/37/8	54	4670	13400	$\beta\beta\delta$	13	26-2
4744	N23	Sept. 13	1	Sept. 5	15	5500	3.5/3.5/3	14/6/1	21	NEW	13411	$\beta\beta\delta$	11	30-5
4739	S20	8	3	1	14	14000	3/3/3	2/12/3	17	4684 - 4650 4686 - 4653	13404	$\beta\beta\delta$	18	27-7
4757	S12	17	5	11	12	4000	2.5/2.5/2	7/0/0	7	4710 - 4659 - 4622 - 4581	13419	$\beta\beta\delta$	(2)	Aug. 2-3
											13433	$\beta\delta$	7	6-8
											13434	$\beta\beta\gamma\delta$	35	6-18
											13456	$\beta\beta\delta$	(3)	14-17
											13466	$\beta\beta\delta$	(3)	14-17
											13458	$\beta\beta\delta$	4	16-16
											13468	$\beta\beta\delta$	(1)	16-16
											13464	$\beta\beta\gamma\delta$	23	15-28
											13460	$\beta\beta\delta$	21	15-24
											13469	$\beta\beta\delta$	6	18-19
											13476	$\alpha\beta\delta$	15	21-28
											13509	$\gamma\delta$	15	Sept. 2-14
											13511	$\alpha\beta\delta$	11	3-12
											13485	$\beta\beta\delta$	29	Aug. 25-6
											13494	$\beta\beta\delta$	28	28-6
											13480	$\alpha\beta\delta$	23	24-5
											13484	$\alpha\beta\delta$	(1)	25-26
											13517	$\beta\beta\delta$	17	Sept. 5-16
											13538	$\alpha\beta\delta$	(1)	12-12
											13539	$\alpha\beta\delta$	4	12-13
											13508	$\beta\beta\delta$	19	2-14
											13502	$\beta\beta\delta$	5	1-4
											13503	$\alpha\beta\delta$	8	1-6
											13507	$\alpha\beta\delta$	15	2-11
											13519	$\alpha\beta\delta$	1	6-6
											13523	$\alpha\beta\delta$	(2)	8-11
											13541	$\alpha\beta\delta$	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. Wtl. 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	$\beta\gamma^1$	19	11-22
4765	76,77,79	S18	19.5	5	13	14	17000	3.5/3.5/3.5	18/37/3	58	4712 - 4659 - 4622 - 4581 Part of 4710.	13530 13549	$\alpha\beta^1$ $\alpha\alpha$	27 3	10-22 16-17
4750	78	S10	14.5	2	8	13	9000	2.5/3/3	6/11/3	20	Part of 4703	13544 13543 13556 13554	$\beta\beta^1$ $\beta\beta^1$ $\alpha\alpha$ $\beta\beta^1$	36 2 (1) 2	13-25 13-14 19-22 18-19
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	13534 13524 13528	$\alpha\alpha$ β^1 $\alpha\beta^1$	11 20 10	11-17 8-20 9-18
4820	81	S26	17.5	1	10	15	9000	3.5/3/2.5	11/7/1	19	NEW	13625	$\beta\gamma^1$	26	Oct. 14-25
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	13636 13611	$\alpha\beta^1$ $\beta\beta^1$	(7) 30	17-20 10-22
4829	84	S10	22.5	2	16	14	9000	3/3/3.5	5/19/12	36	4779	13610 13616 13643	$\alpha\beta^1$ $\alpha\beta^1$ $\beta\beta^1$	15 15 8	10-21 11-22 21-22
4833	87	N19	26	2.5	19	13	4500	2.5/3/2.5	5/4/0	9	4780 - Part New Part of 4726 - 4678 - 4635	13633	$\beta\gamma^1$	23	16-28
4841	88	N07	26	1	23	9	5500	-/2.5/3	-/12/6	18	NEW	13639 13646	$\alpha\beta^1$ $\alpha\alpha$	9 (1)	19-27 22-22
4849	89	S15	Nov. 3.5	2	28	14	6000	3/3.5/3	13/27/9	49	4817	13661 13651	$\beta\beta^1$ $\beta\beta^1$	12 (10)	28-31 25-28
4877	90	S12	18	3	Nov. 11	14	11000	3/3/2.5	2/2/0	4	4829 - 4779	13664 13681	$\beta\beta^1$ $\alpha\beta^1$	29 5	28-9 Nov. 6-8
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	13694 13696 13710 13707	$\alpha\beta^1$ $\alpha\beta^1$ $\alpha\alpha$ $\alpha\alpha$	3 3 3 (2)	11-18 12-15 17-19 15-15
4884	92,93	N22	25.5	1	18	15	6000	3.5/2.5/2.5	0/26/7	33	NEW	13718 13724 13712 13719 13727	$\beta\beta^1$ $\beta\beta^1$ $\alpha\beta^1$ $\beta\beta^1$ $\alpha\alpha$	20 11 14 13 9	20-29 21-25 18-29 20-25 23-27
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	13713 13728	$\alpha\beta^1$ $\alpha\beta^1$	21 30	18-29 23-2
4913	96,97	S03	12	3	5	13	9500	3.5/3.5/3.5	12/42/15	69	4873 - 4826	13758 13763 13765	β^1 $\beta\gamma^1$ $\beta\beta^1$	18 27 22	Dec. 3-15 5-18 5-17
4916	98	S16	13.5	1	7	13	5000	3/3/2.5	7/10/2	19	NEW	13791 13780 13777 13771	$\alpha\alpha$ $\alpha\alpha$ $\beta\beta^1$ $\beta\beta^1$	(2) (2) 12 20	17-17 13-13 9-15 7-19
4934	99,100	S17	28	4	20	15	10000	3.5/3.5/3	21/19/8	48	4897 - 4849 - 4817	13800 13818 13803 13806	$\alpha\beta^1$ $\alpha\alpha$ β^1 $\beta\beta^1$	25 (2) 24 4	20-1 27-27 21-2 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 ≥ 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 continuum).

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 $10^{-22} \text{ Wm}^{-2} (\text{c/s})^{-1}$.

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 Atmospheric Nagoya, University, Toyakowa		Nag	9400 3750 2000 1000
National Committee for I.G.Y. Ulitzka, 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	Oslo 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	<u>1820</u>	<u>1939</u>	<u>1932</u> <u>1942</u>	S18	E39	2	E(1)				
15	No Flare Reported						E(4)		0335	0355	2
15	<u>1640</u>	<u>1757</u>	<u>1642</u>	S13	W58	3	E(6)	F(2)			
16	<u>2255</u>	<u>2347</u>	<u>2306</u>	S15	E47	2	E(8)		2313	2316	2
18	<u>2253</u>	<u>2335</u>	<u>2256</u>	S11	W32	1	E(10)		2257	2301	3
20	<u>1435</u>	<u>1601</u>	<u>1505</u>	N28	E46	2+		F(3)			
23	<u>0904</u>	<u>1053</u>	<u>0918</u>	S24	W45	3		F(4)			
25	<u>0035</u>	<u>0135</u>	<u>0039</u>	N28	W13	3+		F(5)			
25	<u>0915</u>	<u>1107</u>	<u>1005</u>	S24	W69	3+	E(12)	F(6)			
25	<u>1205</u>	<u>1333</u>	-	S20	E11	3		F(7)			
31 Feb. 9	<u>1148</u>	<u>1452</u>	<u>1224</u>	N20	W13	3		F(8)			
	<u>1330</u>	<u>1501</u>	<u>1341</u>	S20	W02	1+	E(15)				
9	<u>2108</u>	<u>2302</u>	<u>2142</u>	S12	W14	2+	E(16)				
10	<u>1320</u>	<u>1411</u>	<u>1332</u>	S13	W63	3	E(18)	F(9)			
10	<u>1900</u>	<u>2030</u>	<u>1911</u>	S14	W64	1+	E(19)		1911	1917	3
11	<u>0812</u>	<u>0847</u>	<u>0823</u>	S10	W85	3		F(10)			
26	<u>0527</u>	<u>0632</u>	<u>0550</u>	S18	W61	2	E(23)		0602	0611.5	2

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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	AOT
					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 0953	A			MP-G H.G.	3000	ECD	0958	1008	1002	1190	Jod
					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

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(2)

IMPORTANT SOLAR RADIO EMISSIONS DURING 1958

STATIONS 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.							
200-40	Syd	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	1816	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	1993	-	58	Cor							
							202	E	1909	2020	-	71								
							200	F	1835	1837.5	-	450	Par							
							167	CD	1829	1844	1829	110	NBS							
							167	CD	1851	1994	1856	1200	NBS							
							167	CD	1929	2005	1944	520	NBS							
							200-40	Syd	1640				MP-G	2800	SA	1640	1798	1643	(1350)	Ott
														470	ECD	2303.5	2303.8	2303.6	440	NBS
							200-40	Syd						200	CD	2257.5	2259.5	2258	380	Hir
167	ECD	2257	2300	2258.2	3500	NBS														
270-100	Har	1445		A	580-100	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	0910	-	108	Ucc														
1204					580-100	MP-G	600	SA	1241	1355	-	228	Ucc							
							545	CA	1207	1527	-	400	Ned							
							231	SD	1210.1	1213.6	1212.2	19000	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	CA					2138	2210	2152	856	Syd			
							450	CD					2112	2325	2204.3	2300	NBS			
							2105	CD					2109	2204	-	3000	Hol			
												MP-G	200	CD	2158	2201.5	2200	660	Hir	
													167	CD	2115	2410	-	1900	NBS	
1325					580-100	MP-G	9400	SD	1320	1425	1326	563	HHI							
							3000	SD	1320	1343	1327	300	HHI							
							231	CD	1319	1320.5	1325.9	2000	AOP							
							200	CD	1325	1333	-	700	Ned							
							169	ECA	1323	1333	-	117	Ucc							
							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			580-100	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														



TABLE IV. 1958 (CON)

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	<u>0905</u>	<u>1007</u>	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	<u>1250</u>	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	<u>1540</u>	1740	1546	N34 W32	2	E(35)						
11	0030	0042	0034	N11 E12	1	E(36)		0032	0046	2	125-40	Syd
12	<u>0024</u>	<u>0233</u>	0037	N08 E02	2+	E(39)		0043	0103.5	3	125-40	Syd
14	<u>1454</u>	1541	1507	S21 W85	3	E(42)	F(17)					
20	0656	<u>0955</u>		N25 F60	1+							
23	<u>0947</u>	<u>1627</u>	1005	S14 E78	3+	E(45)	F(18)					
24	1607	<u>1643</u>	-	S15 E57	1	E(48)		1643	1651	3	155-100	Har
25	<u>0557</u>	<u>0626</u>	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
27	<u>1534</u>	<u>1710</u>	1552	S16 E23	2+	E(54)	F(19)	0041.5	0047.5	1		
28	<u>1030</u>	<u>1152</u>	1038	S24 E26	2	E(55)						
28	1703	<u>1904</u>	1714	S15 E09	2+	E(56)	F(20)					
28	<u>1833</u>	<u>1922</u>	1838	N20 W58	2	E(57)		1837	1847	3	320-100	Har
28	<u>2042</u>	<u>2131</u>	2047	S24 E21	2	E(58)						

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

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TRUM OBSERVATIONS TYPE IV				SINGLE-FREQUENCY RADIO EMISSIONS								
End UT	Max. Int.	Frequency Range	OBS. or Ref.	Freq. UT	Type	Beg. UT	End UT	Max. UT	Flux	OBS.		
2209	3	580-100	Har MP-G H.G.	9500	ECD	2128	2132	2128.5	829	Tok		
				2800	SA	2127.9	2132.9	2128.5	(136)	Ott		
				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		
				9500	CD	2141	2217	2150	1112	Tok		
				3750	CD	2159.2	2212.2	2159.2	(365)	Nag		
				2000	CD	2201	2212	2201	(475)	Nag		
				1000	CD	2158.6	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
						9400	CD	1618	1755	1710	400	HHI
						3000	SD	1617	-	1622.7	586	HHI
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	Svd Mp-g H.G.			9500	CD	0437	0517	0450	1178	Tok
				9400	CD	0436	0500	0450.6	(840)	Nag		
				1420	CA	0445	0512	0446	343	Svd		
				600	ECA	0444	0450	-	954	Ucc		
				600	F	0446	0511	0447	409	Svd		
				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	F.FD	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	E.C.D.F	0727	0728.5	-	120	Ucc						
536	S	0718	-	-	155	Pra						

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(2)

TABLE 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.
3	280-100	Har						9400	SD	1340	1350	1342	883	HHI
								2980	SD	1341.5	1343	-	624	Ned
								200	CD	1342	1343	-	290	Ned
								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	1944	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						



TABLE IV. 1958 (CONTINUED)

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	<u>2115</u>	<u>2241</u>	2130	S19 E15	3	E(83)	F(27)							
5	<u>0356</u>	<u>0457</u>	0415	S18 W29	3	E(85)	F(28)						0412	
5	<u>0856</u>	<u>1030</u>	0915	S16 W25	3		F(29)							
5	<u>2025</u> <u>2032</u>	<u>2115</u> <u>2115</u>	2035 2037	N24 W50 S15 W39	1+ 1+	E(86)								
6	<u>0335</u>	<u>0410</u>	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 June	<u>0656</u>	<u>0944</u>	0731	N23 E90	3		F(31)							
3	<u>1507</u>	<u>1543</u>	1512	N30 W53	3		F(32)							
4	2147	<u>2356</u>	2152	N14 W58	2	E(94)							2148 2141 2140	
5	<u>0835</u>	1015	0850	N15 W65	2+	E(95)	F(33)						0839	
5	<u>1615</u>	<u>1837</u>	1631	S18 E69	2+	E(96)	F(34)						1656 1617 1655	
6	<u>0436</u>	<u>0614</u>	0448	N16 W78	3	E(97)	F(35)						0434 0437 0433	
14	<u>2112</u>	<u>2146</u>	2118	N14 E38	1	E(104)		2120.5	2125	3	190-100	Har		
19	0212	<u>0255</u>	0225	N14 W18	3		F(37)							
19	<u>0940</u>	<u>1210</u>	1010	N14 W21	3	E(105)	F(38)							
23	<u>0700</u>	<u>0850</u>	0716	N25 E53	3		F(39)							

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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	<u>0405</u>	-	N10 E37	2	E(110)				
July 3	<u>0041</u>	<u>0114</u>	0050	N30 E37	2	E(114)				
4	<u>0513</u>	<u>0534</u>	0517	N29 E26	1+	E(116)				
7	<u>0020</u>	<u>0414</u>	0110	N25 W08	3+	E(118)	F(41)	0032.5 0101	0048 0117	
11	<u>0740</u>	<u>1200</u>	0820	S25 E27	3		F(42)			
12	0744	<u>0843</u>	0758	S24 W74	3		F(43)			
12	2317	2330	2330	N26 W78	1	E(121)		2329.8 2330	2333 2335	
15	<u>0914</u>	<u>1140</u>	0923	N07 E40	3		F(44)			
19	<u>1905</u>	2030	1908	N24 E13	2+	E(125)	F(45)	1907	1915	
23	<u>1125</u>	<u>1450</u>	1144	N18 E41	3		F(49)			
23	<u>1259</u>	<u>1630</u>	1336	N11 E34	2+		F(50)			

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SPECTRUM 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.
0500	200-40	Syd H.G. MP-G	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	
			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	Ost			
	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		
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				

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TABLE 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 0255	0515	1		Syd MP-G	9500 9500 9400 3000 3000 2000 2000 1420 600	CD CD CD CD CD CD CD CD CA	0244 0300 0258 0243 0255 0244 0255 0255 0259	0248 0330 0338 0250 0327 0248 0325 0325 0401	0245.3 0307.8 0258 0245 0307.8 0245.9 0316.2 0316 0334	434 518 (77) 410 507 (34) (100) 189 54	Tok Tok Nag Tok Tok Nag Nag Syd Syd
								9500 3750 3000 2000	ESD SD ESD SD	0305.9 0305 0306 0306	0309.9 0309 0312 0309	0306.5 0306.7 0306.5 0306.8	709 (245) 593 (70)	Tok Nag Tok Nag
								9500 3750 3000 2000 1420 1000	ESD SD SD SD SD SD	0047.3 <u>0048.1</u> 0045 0046 0048 0047	0051.3 <u>0049.1</u> 0051 0049 0050 0050	0048 0048.1 0048.2 0048.2 0048 0048.3	704 (310) 620 (123) 206 (50)	Tok Nag Tok Nag Syd Nag
								9500 3750 536	ESD ESD CD	0516.8 0515 0515.5	0517.8 0517.5 0522.5	0517 0517.1 0516	729 (800) 210	Tok Nag Pra
200-40 200-40	Syd Syd		0052 0145 0026 0027	0147 0221	3 - B	580-100 200-40	Har Syd MP-G H.G.	9500 9500 9400 3750 3750 3000 3000 2800 2000 2000 1420 1000 1000 600 600 545 200 200 200 200	ESD CD SD ECD CD CA CA SD ECD CD CA CD CA CD CA CD ECD CD CD CD CA	0026.7 0055 0103.5 0027 0102.5 0050.2 0026.6 0026.5 0027 0055 0041 0026.5 0101 0028 0040 0027 0026.9 0033 0027 0100	0038.7 0205 0133.5 0037 0132.5 0230.2 0038.6 0035 0037 0133 0212 0031.5 0201 0029 0252 0029.9 0036 0227 0230	0028 0111.8 0111.4 0028 0111.4 0111.3 0027.5 0028 0111.5 0113 0113 0029 0112 0028 0043 - 0027.1 0035.5 0028 0153	1303 1910 (920) (990) (1700) 3770 708 (875) (550) (1300) 827 1370 (800) 145 129 350 4000 300 1620 900	Tok Tok Nag Nag Nag Tok Tok Ott Nag Nag Syd Nag Syd Syd Hol Tok Tok Hir Tok
								9400 3000 2980 2000 1500 1000 545 200	CD SD - CD F CD CD CD	0800 0759 0755 0757 0757 0759 0759 0839 0849.9	0845 0903 0845 0845 0910 0829 0839 0850.8	0835.3 0811.5 - 0811.4 0806.5 0811.7 - -	(38) 244 264 265 191 (260) 350 380	Nag HHI Ned Nag HHI Nag Ned Hir
								208 200 169 167	M CD CD MF	1114 1120 1137 <u>1145</u>	1200 1122 1137.2 2610	1121 - - 1357.6	1070 300 100 <u>1700</u>	Mos Ned Ucc NBS
								9500 9400 3000 2980 1000 545 231 200 200 125	ESD F SD CD CD CD F CD CD CD	0757 0808.5 0815.5 0815.5 0815.5 0814 0755.3 0755.7 0756 0756.5	0800 0821.7 0830.5 0820.5 0820.5 0818 0758.1 0759.2 0758.5 0758.4	0757.4 0817.3 0818.3 - 0817.7 - 0756.9 0757.3 - -	530 303 301 329 330 230 2500 1900 1300 700	Tok HHI HHI Ned Nag Ned AOP Hir Ned Rho
3	130-100 40-200	Har Syd						No Radio Emissions Reported						
								9400 3000	SD SD	0918 0918	0957.5 0927	0918.7 0919	395 217	HHI HHI
3	450-100	Har	1905				MP-G	2800 600 545 200 167 167 167	CD - CD CD ECD CD CA	1905 1910 1905 1905 1905 1912.5 1915	1925 1930 1919 1910 1912.5 1914.5 2605	1907.5 - - - - 1913 2141.1	(390) 305 250 8000 2900 1500 <u>2000</u>	Ott Ucc Ned Ned NBS NBS NBS
								9400 167 600 536 231 167	SD CA CA CD CD ECD	1127 1150 1310 1321.5 1322 1322	1201 1322 1400 1354.5 1402 1400	1152 1211.1 - - 1326.3 1325.1	305 480 135 275 900 420	HHI NBS Ucc Pra AOP NBS



TABLE IV. 1958 (CONTINUED)

FLARE							SPECTRUM OBSERVATIONS TYPE II					SFI	
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	<u>0408</u>	0304	S14 W44	3	E(131)	F(52)	0304	0319		200-40	Syd	0321 0304 0303
29	<u>0458</u>	<u>0526</u>	0458	S14 W38	1	E(133)							
30	<u>1523</u>	<u>1637</u>	1530	S13 W64	2	E(134)							1525
31	<u>1058</u>	1150	1122	S13 W77	1+	E(135)							
Aug 2	<u>1840</u>	<u>1851</u>	1841	S14 W90	1- Sub Flare	E(136)		1843	1851	3	350-100	Har	1840
3	<u>2142</u>	<u>2257</u>	2150	N08 W49	2+		F(54)						
4	<u>0409</u>	<u>0610</u>	0435	N30 W31	3	E(137)	F(55)						
4	<u>2112</u>	<u>2127</u>	2114	S07 W10	1	E(138)		2120	2124	2	190-100	Har	
7	<u>1457</u>	1700	1508	S16 E71	3	E(139)	F(56)						
13	<u>1205</u>	<u>1330</u>	1220	S14 W18	3		F(57)						
14	<u>2137</u>	<u>2225</u>	2203	S14 W37	1+	E(140)		2158	2205	3	200-100	Har	
16	0432	<u>0831</u>	0440	S14 W50	3+	E(141)	F(58)						0444 0438
18	<u>0747</u>	<u>1030</u>	0820	N18 E49	2								082

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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.	
3	175-100 200-40	Har Syd	0042	2207 2140	2401	2 B	580-100	Har MP-G	9500	CD	2159	2202	2200.9	528	Tok
									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
									9500	CD	0042	0052	0044	3610	Tok
									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	1415	1430	1440	2 B	580-100	MHT H.G. MP-G K.S.	9400	CD	1423	1715	1451	718	HHI		
2800	SA	1430	1630				1506	(1500)	Ott						
1500	CD	1427	1635				1509	443	HHI						
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						
9500	ECD	0018	0118	0026	5920	Tok									
3750	CD	0005	0055	0041	(5050)	Nag									
2000	CD	0005	0102	0042	(2100)	Nag									
1420	SD	0016	0145	0042	288	Syd									
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									
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									
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									

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TABLE IV. 1958 (CONTINUED)

FLARE							SPECTRUM OBSERVATIONS TYPE II					SPECT	
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	<u>0822</u>	<u>1030</u>	0835	S10 W80	3+	E(159)	F(75)						0848 0855 0832
16	<u>1443</u>	<u>1624</u>	1503	S23 E37	3		F(77)						
18	<u>0728</u>	<u>0938</u>	0830	S12 W53	3	E(162)	F(78)						
22	<u>0738</u>	0910	0750	S19 W42	2+	E(164)	F(79)						
28	<u>2046</u>	<u>2108</u>	2054	N32 W66	1-	E(167)		2046	2053	3	500-100	Har	
Oct. 2	<u>2143</u>	<u>2201</u>	2148	S06 W38	1	E(169)		2149 2149	2153 2157	3	140-100 210-25	Har Syd	
8	<u>1510</u>	<u>1528</u>	1522	N12 E25	1-	E(171)		1529	1535	2	420-100	Har	
15	<u>1023</u>	<u>1140</u>	1032	S28 E26	3		F(81)						
19	<u>0658</u>	<u>0820</u>	0725	S17 W35	3		F(82)						0722
21	<u>2318</u>	<u>2527</u>	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	<u>0232</u>	<u>0352</u>	0254	S04 W38	3		F(85)						
23	1655	<u>1803</u>	1781	S32 E50	1	E(176)							
24	<u>1410</u>	<u>1801</u>	1457	S05 W57	3	E(179)	F(86)	1452	1500	3	180-100	Har	1442 1443 1439
Nov. 14	<u>0036</u>	<u>0207</u>	0046	S19 E51	3	E(186)	F(90)						
24	<u>1607</u>	<u>1907</u>	1621	S12 W08	3	E(187)	F(91)						1607 1600

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

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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.				
A			H.G.	9400	M	0832	1012	0858	1210	HHI				
			K.S.	3000	M	0830	0939	0904	1259	HHI				
			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	0833	-	450	Ucc				
				231	CD	0852	0827	0904.2	300	AOP				
				200	CD	0855	0818.0	-	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	Osi								
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			
2350	3+ B	K.S.		3000	CD	2345	2430	2345	1900	Tok				
		H.G.		2000	CD	2323	2418	2355	(520)	Nag				
		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 K.S. MP-G	9400	CD	1443	1518	1445	318	HHI
								3000	CD	1442	1517	1445	381	HHI
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 MP-G					2800	SA	1613	1638	1620	(285)	Ott
								202	ECA	1608	1621	1612	180	Cor
				202	F	1629	2116	1642.5	180	Cor				
				167	CA	1608	2320	1612.7	1300	NBS				

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(2)

TABLE IV. 1958 (CONTINUED)

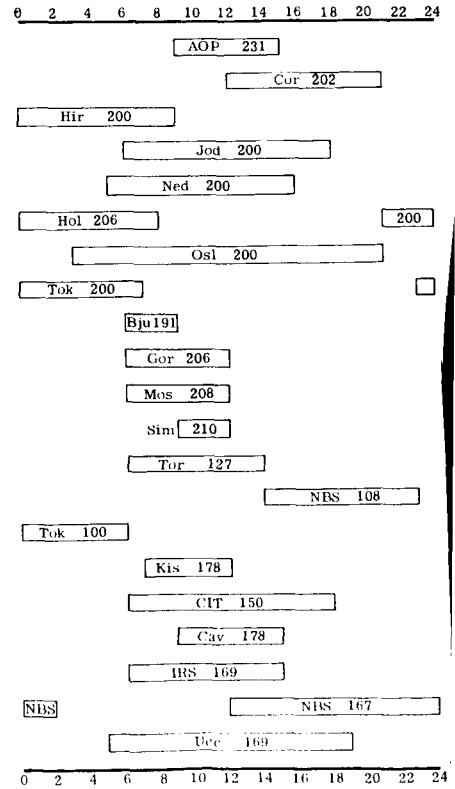
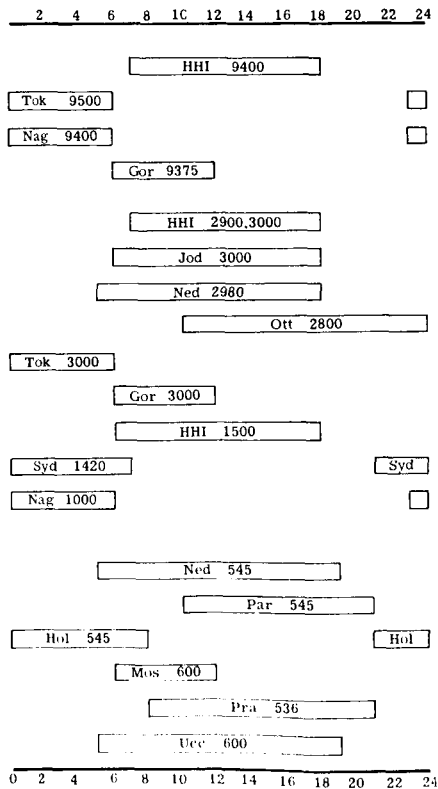
SPECTRUM OBSERVATIONS TYPE II				SPECTRUM OBSERVATIONS TYPE IV					SINGLE-FREQUENCY RADIO EMISSIONS						
End UT	Max. Int.	Frequency Range	OBS.	Beg. UT	End UT	Max. Int.	Frequency Range	OBS. or Ref.	Freq.	Type	Beg. UT	End UT	Max. UT	Flux	OBS.
									2980	SD	0816.5	0817	-	265	Ned
									600	ESD	0815	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
									1900	F	0103	0110	0106	(430)	Nag
									545	CD	0105	0125	-	1100	Hol
									200	ECD	0107	0114	0106	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



TABLE IV. 1958 (CONTINUED)

FLARE						SPECTRUM OBSERVATIONS TYPE II					SPECTRUM OBSERVATIONS			
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
15	1030	1230	1041	S16 W18	3		F(98)							
15	1535	1550	1538	S04 W49	1-	E(208)							1543	1554
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	
31	1656	1803	1703	S18 W54	3	E(217)	F(100)	1705	1711	3	200-100	Har	1700 1657	1712

NORMAL SINGLE FREQUENCY OBSERVING TIMES UT



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

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TYPES TYPE IV		SINGLE-FREQUENCY RADIO EMISSIONS							
Frequency Range	OBS. or Ref.	Freq.	Type	Beg. UT	End UT	Max. UT	Flux	OBS.	
580-100	Har	231	CD	1339.6	1340.4	1340.2	2000	AOP	
		167	CA	1415	2020	1722	1400	NBS	
		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	Uce		
169		-	1042.5	1045.5	-	1890	Uce		
2800		SD	1857.5	1902.2	1859	(250)	OU		
545		CD	1859	1905	-	45	Par		
202		CD	1859	1859.5	-	120	Cor		
200		CD	1900	1902.5	-	150	Par		
MP-G		CD	9500	0559	0621	0605	2150	Tok	
			9400	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
			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

0 2 4 6 8 10 12 14 16 18 20 22 24

Har

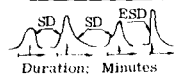
Har 100-540

Syd 40-200

Syd

CLASSIFICATION OF SINGLE-FREQUENCY SOLAR RADIO BURSTS AND ENHANCEMENTS

Short Wavelengths



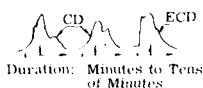
Duration: Minutes



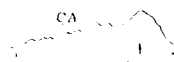
Duration: Hour



Duration: Hour

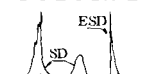


Duration: Minutes to Tens of Minutes



Duration: Hour

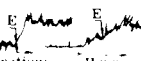
Long Wavelengths



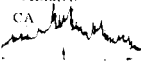
Duration: Seconds to Minutes



Duration: Minutes to Tens of Minutes



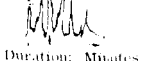
Duration: Hour



Duration: Hours



Duration: Hours



Duration: Minutes

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.

		<u>Geographic</u>		<u>Geomagnetic</u>	
		<u>Lat.</u>	<u>Long.</u>	<u>Lat.</u>	<u>Long.</u>
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 decidedly 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 A_p 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.

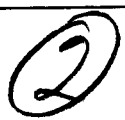
TABLE V CATALOGUE OF GEOMAGNETIC STORMS DURING

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

2

TABLE V 1958 (CONTINUED)

3	20	37	47	Three Hour				Gr. Interval				Σ Kp	Ap	Kp Interval 1st Kp24- Date/Interval	Time Where 3 Consecutive Kp≤4- Day/Interval	D	H	Z	Onset
				1	2	3	4	5	6	7	8								
5	1	5	-	2- 5-	2o 5o	2+ 4+	4+ 3o	5- 3-	4o 3-	3+ 4-	3+ 3+	26- 29+	20 25	Apr. 14/4	15/3	26 42	175 212	105 307	05xx 10xx
-	1	2	-	4o 6-	4o 5o	4+ 5-	4o 4o	4o 4+	4o 6o	5- 6-	5o 6o	34o 41o	32 54	16/1	20/4	150 64	1370 651	850 489	0500 01xx
50	2	38	47	4- 3o	3+ 4-	3o 4-	4+ 2-	3+ 3-	4- 3-	4+ 3-	4+ 4-	30o 24-	24 15						
-	1	-	-	0+ 1o	0+ 2-	1o 2+	1o 1o	3- 1+	5- 3o	4+ 4o	2+ 3o	17- 17o	13 10	26/6 27/7	26/8 2/3	73	665	468	27/1728
8	2	-	-	3+ 5-	4o 5+	4+ 4o	4o 4o	4o 4+	4+ 3+	4- 4-	5- 5o	33+ 33-	31 29						
4	-	2	-	4- 6-	2+ 4+	2- 5o	2- 4-	1+ 5-	1+ 4-	1+ 4+	1o 5-	15o 31+	8 29	May 13/5	16/2	230 23	1200 141	820 132	13/1000 13/13xx
-	1	5	-	4o 4o	5o 4-	4- 3-	3- 4o	4- 4o	4+ 5-	6- 4-	6- 5o	36o 31o	38 27			105 19	732 138	568 48	12/0736 13/09xx
3	-	5	-	4o 4o	3+ 3-	3- 2+	2+ 3o	3o 4o	3- 3-	2o 2o	2o 2o	24o 10-	16 5						
9	-	2	-	2- 0+	1o 3+	1- 3o	1+ 3o	1- 6-	1o 7-	2o 3+	2o 4o	10- 34o	5 39	25/8	28/3	39 121	195 972	140 680	1500 1800
7	-	1	-	3o 5-	3- 4-	2+ 3o	4o 2-	4+ 3-	4- 3-	5o 3+	5o 3+	29o 25o	24 18						
-	4	1	-	5o 3o	5o 3+	6- 4+	6+ 4o	6- 5-	5- 4-	5- 4-	3+ 1-	40+ 29+	52 26	29/1	29/8	140 30	1250 145	740 104	28/23xx 28/23xx 28/24xx 28/18xx
68	17	64	74	4+ 8-	3+ 6+	3+ 6-	3+ 4o	8- 4o	8o 5o	8o 4+	8o 4+	38o 39o	72 60	31/5	2/8	280 33	2460 240	1120 298	1653 1651
-	11	42	61	8- 4+	7o 6+	6+ 7o	7o 4o	5o 3+	4+ 4-	4+ 3-	5+ 3-	42- 20+	77 15	June 6/8	7/8	130 40	1510 220	1040 166	6/1817 6/05xx 6/21xx 7/0046 7/0046
57	11	42	61	1+ 5o	2+ 4+	3o 4-	2+ 4-	3o 3+	5+ 4-	5+ 5o	5+ 6o	20+ 32+	15 32			130 48	1510 705	1040 462	6/1817 6/05xx 6/21xx 7/0046 7/0046
28	3	9	-	5+ 3+	4o 3-	4- 3+	4- 3+	4- 3+	4- 3+	5o 3+	6o 3+	33o 27-	31 18	8/7	11/3	20 48	96 705	51 462	14/1828 14/1828 14/1828
64	6	51	69	2- 3o	1- 5-	2o 5+	2- 4+	1+ 2+	1o 3o	5o 2o	5- 1-	18o 24+	15 21	14/7	15/5	86 7	576 107	371 25	14/1828 14/1828 14/1828
28	-	11	25	4- 6o	3+ 5+	3+ 5-	2- 2+	1o 4-	1o 2+	4- 5-	4- 5-	13o 43+	8 66	20/8	23/2	220 35	1330 173	810 174	20/2100 21/02xx 21/02xx 21/09xx 21/0206
17	7	8	-	6o 4-	5+ 3+	5- 3+	5- 2-	4- 2+	4- 3o	5- 2o	5- 2o	35o 22o	38 13			148 23	688 124	444 65	20/09xx 21/0206
62	11	46	68	2+ 7o	3+ 8o	4o 7-	4- 5+	3o 8-	5- 6+	7o 4+	8- 3-	36- 48o	55 103	28/6	29/8	260 60	2110 370	1740 412	0000 0715 1743 0718 1742
53	4	33	54	5 247	5 1860	5 780	5 45	5 7014	5 780	5 93	5 1742	5 1742			5 27	210 345	45 93	0718 0714 1742	
-	1	-	-	2o 5o	3- 3+	2- 3+	1+ 3-	2- 3o	3- 2-	3o 2-	2+ 2-	17+ 23+	9 17	1/1	1/2	43	507	302	14xx
-	1	-	-	2o 3o	3- 3+	4o 7+	4- 8+	4- 8+	4- 9+	3+ 9-	3+ 9-	28- 55+	21 200	4/3	4/8	45	185	330	0306
13	-	5	-	1- 6+	2- 6o	2+ 6o	4o 7o	3+ 6+	3+ 5o	4+ 3o	4+ 6-	23+ 45o	17 75	7/4	10/2	408 76	2120 1067	2520 751	8/0748 8/0748 8/0748 8/0748
72	17	65	70	5o 395	3+ 2755	3- 1870	2+ 1870	2- 147	2o 147	2+ 147	4- 8/0748	17 17			395 40	2755 503	1870 147	8/0748 8/0748 8/0748	
-	1	-	-	4o 2-	5- 1+	4o 1o	3+ 1-	2- 1o	1+ 1-	1- 1-	1- 1-	21- 16		17/1	17/4	14	75	48	00xx



1958

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

3. V-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
31	Apr. 14 15	0912 1949	15/10xx 20/15xx	g,sc sc	m m	5o 5o	4o	-	5	11	53	-	3	-	-	-	-	-	-	-
32	16 17 18 19 20	01xx	20/09xx	g	ms	6o	4+	-	-	-	-	-	-	-	-	-	-	-	-	-
33	26	1247	26/20xx	sc	m	5-	4o	19	31	12	8	-	1	1	-	-	-	-	-	-
34	27 28	1728	2/06xx	sc	m	5+	4o	-	-	-	-	-	-	-	-	-	-	-	-	-
35	29 30 May 1 2	0523	-	-	m	5+	-	1	7	16	37	4	4	1	-	-	-	2	-	-
36	6	2010	-	-	-	-	-	-	4	4	60	-	2	2	-	1	-	-	-	-
37	13 14 15	12xx 0912	16/02xx -	sc	ms	6-	4+	-	-	-	-	-	-	-	-	-	-	-	-	-
38	16	1414	-	-	-	-	-	1	2	2	65	-	4	-	-	-	-	-	-	-
39	20	2311	-	-	-	-	-	-	9	25	31	-	2	5	-	1	-	-	-	-
40	25 26 27 28	1522	28/06xx	g	ms	7-	4o	-	7	16	46	-	4	-	-	-	-	-	-	-
41	29	0010	29/20xx	g	ms	6+	5+	-	-	-	-	-	-	-	-	-	-	-	-	-
42	31 * June 1 2	1652	2/21xx	sc	s	8o	5o	58	10	1	1	-	3	-	-	-	-	-	-	-
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	9 10 11	2242	11/06xx	sc	ms	6o	4o	-	-	-	-	-	-	-	-	-	-	-	-	-
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 22 23	0206	-	-	-	-	-	2	15	22	25	1	1	3	1	-	1	-	-	-
51	28	0713	-	-	-	-	-	40	22	2	4	-	1	2	-	-	-	-	-	-
52		1542	29/21xx	sc	s	8o	6+	-	-	-	-	-	-	-	-	-	-	-	-	-
53	* 29	1742	-	-	-	-	-	32	21	11	4	-	3	3	-	-	-	-	-	-
54	30 31 July 4	14xx	1/19xx	g	m	5o	3o	-	-	-	-	-	-	-	-	-	-	-	-	-
55		0306	4/22xx	sc	m	5-	4o	-	-	-	-	-	-	-	-	-	-	-	-	-
56	7	0741	-	-	-	-	-	1	12	17	41	1	2	-	-	-	1	-	-	-
57	8 * 9 10	0748	10/03xx	sc	s	9o	7-	62	10	-	1	-	1	-	-	-	-	-	-	-
58	17	00xx	17/13xx	g	m	5-	4o	-	-	-	-	-	-	-	-	-	-	-	-	-

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3. IV-2

Serial No.	Date	Onset	End	Type	Max. Int.	Max. Kp	Average Storm Kp	A
1	Jan. 17 18	08xx	18/22xx	g	m	5o	4o	-
2	20	0734	-					-
3	20 21	2142	21/11xx	g	ms	7-	5+	
4	22	1104	22/15xx	sc	m	5-	4o	3
5	25	1050	25/18xx	sc	m	4+	4+	12
6	Feb. 04	1115	9/06xx	g	m	5-	4o	1
7	04	1304	8/21xx	sc	m	5-		10
8	05 06 07	0528	-	sc	m	5-		1
9	08 09	1342		sc	m	5-		2
10	11 *	0125	13/01xx	sc	s	9o	5o	64
11	11	0159	-					11
12	12 13	0008	-					5
13	13 14	0837	14/19xx	sc	m	5o	4-	-
14	16 17 18 19 20	1642	22/16xx	sc	m	5o	4+	22
15	20 21 22 23	18xx	23/12xx	g	m	5o	4o	-
16	Mar. 03 04	0931	04/21xx	sc	m	5o	4o	21
17	05 06 07 08	0537	08/09xx	g	ms	7-	4+	7
18	11 12 13	1156	13/21xx	g,sc	ms	7o	5o	-
19	14	1212	16/05xx	sc	ms	6-	4o	57
20	15 16	0258	-	sc	m	5-		1
21	17	0750	17/21xx	g,sc	m	5o	4+	7
22	18 19 20 21 22	0201	22/05xx	g,sc	ms	6-	4+	-
23	24	0436	25/03xx	g	m	5o	4+	-
24		1326	24/20xx	g	m	5o		1
25	25 26 27	1540	27/03xx	sc	ms	6o	4o	49
26	30 31	0812 0421	31/06xx	g	ms	6-	5-	-
27	Apr. 01	14xx	3/06xx	g	m	5+	4o	-
28	02 03	0459	-		m	5+		4
29	04 05	06xx	05/12xx	g	ms	6-	4+	-
30	06 07	0042	07/06xx	-	m	5o	4-	-

3. IV-1

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

3. IV-2

(3)

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

3. V-3

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End	Max. Kp	Obs.	Range of Starting Time	Sources
28/21xx	5	Co		12
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)

TABLE V 1958 (CONTINUED)

B	C	D	E	X	si	b	bs	bp	bps	pt	pg	3	20	37	47	Three Hour				Gr. Interval				ΣKp	Ap	Kp Interval 1st Kp≥4- Date/Interval	
																1	2	3	4	5	6	7	8				
13	20	34	1	2	1	1	1	-	-	-	-	15	2	8	-	-	3o	3+	5o	4-	5+	5o	5-	4o	34o	34	July
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3-	3o	5o	3-	3-	2o	5o	5o	28o	25	18/3
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4o	5-	4-	3+	3+	4o	3-	3-	28+	22	19/7
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
15	1	-	-	3	-	-	-	-	-	-	-	71	16	65	70	-	1+	2-	6o	4+	7-	7+	7+	7-	41+	82	Aug.
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5o	5-	4-	3+	3-	2o	2o	2o	25+	20	17/3
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	-
21	2	1	-	2	-	-	-	-	-	-	-	70	15	61	70	-	2o	2-	4o	5+	7-	6o	7-	7-	39o	64	Sept.
10	13	40	2	2	7	-	-	-	-	-	-	11	-	3	-	5o	4+	3+	4-	7+	9-	8+	8+	49o	131	3/3	
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	-	
17	-	2	-	-	-	-	-	-	-	-	-	74	16	61	65	-	1-	5+	6o	5-	3+	5+	6-	5+	36+	47	Oct.
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5-	5+	6-	5o	5-	4+	5-	4+	39-	44	22/2	
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	-	

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TABLE V 1958 (CONTINUED)

pt	pg	3	20	37	47	Three Hour Gr. Interval								ΣKp	Ap	Kp Interval 1st Kp ≥ 4- Date/Interval	Time Where 3 Consecutive Kp ≤ 4- Day/Interval	D	H	Z	Onset
						1	2	3	4	5	6	7	8								
-	-	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						
-	-	6	1	5	-	2-	1+	2-	4-	4+	4o	4o	5+	26o	23	Dec. 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	-	4-	3o	2-	2o	4o	3+	4o	4o	26-	19			37	145	130	0001
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	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=								Consecutive 3 hr-Kp's, No Kp < 5- At Least One Kp ≥ 7+																Ap	Storm No. Table V
	7-	7o	7+	8-	8o	8+	9-	9o	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6			
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
19/4 20/7	34	118	78	01xx	20/07xx	5	Fr	01xx - 06xx	
22/2	148 28 25 15 55 15	1180 215 205 65 325 113	620 82 95 55 280 37	1636 1637 1637 1636 1636 1621	22/17xx 22/23xx - 22/14xx 22/20xx 22/07xx	7 6 - 5 6 5	Co Fr Gr Ho Si Tu		7,11,12,13,18,22,25, 26,32,44,53 * See Table V-A
28/2	220 27 120	1890 115 800	790 96 815	0330 06xx 03xx	28/07xx 28/07xx 28/06xx	8 5 8	Co Fr Si	0323 - 06xx	18
31/7								1529 - 16xx	
18/4	220 41 35 18 105 30	1560 282 250 170 795 255	990 156 140 65 345 71	0622 0623 0623 0623 0623 0623	18/10xx 18/17xx - 18/12xx 18/07xx 18/13xx	6 6 - 7 7 6	Co Fr Gr Ho Si Tu	0623 - 0730	11,12,18,22,23,25,31 32,38 7,11,12,13,18,22,23, 25,26,31,32,35,38,44,53 * See Table V-A
22/5	27 3 80 11	158 150 740 127	66 40 405 26	0228 0228 0226 0227	23/01xx 22/12xx 22/08xx 22/13xx	5 5 7 5	Fr Ho Si Tu	0130 - 0228	7,11,12,13,18,22,23, 25,26,32,35,38,44
25/6	160 36 34 5 115 16	2240 249 245 200 1785 212	1400 115 155 50 790 40	0141 0140 0140 0140 0140 0140	25/16xx 25/15xx - 25/09xx 25/15xx 24/19xx	7 6 - 6 8 6	Co Fr Gr Ho Si Tu		7,11,12,13,18,22,23, 25,31,32,35,38,44,53 * See Table V-A
28/1	170 32 33 3 225 17	1530 183 180 130 1330 147	1110 149 150 30 840 29	0100 2130 0300 26/0942 05xx 0302	27/23xx 28/00xx - 27/21xx 27/23xx 27/16xx	7 5 - 6 8 6	Co Fr Gr Ho Si Tu	26/0942 - 27/2130	7,11,12,13,18,22,23, 31,38,53
5/9	160 61 93 5 225 35	920 666 555 225 1830 377	810 510 695 60 1705 126	3/0840 3/0842 3/0843 3/0848 3/09xx 3/0843	4/05xx 6/00xx 5/xxxx 6/00xx 5/21xx 5/24xx	6 7 - 6 9 7	Co Fr Gr Ho Si Tu	3/0840 - 3/1030	12,18,22,25,26,44,53 * See Table V-A
17/3	37 23	134 109	70 58	16/0930 15/1702	17/02xx 17/05xx	5 6	Fr Tu	15/1702 - 16/0930	7,11,12,18,22,25, 38,51
26/5	240 38 33 3 200 15	1520 252 155 180 1250 195	1010 204 200 15 810 51	0408 0408 0409 0408 0408 0408	26/19xx 26/16xx - 26/15xx 26/16xx 26/13xx	6 6 - 6 8 7	Co Fr Gr Ho Si Tu		12,13,18,22,23,25, 31,32,38,44,53
1/4								0939 - 1005	12,18,22,25,32
25/2	285 48 43 2 215 14	1530 244 210 160 1730 157	1280 237 180 20 1060 50	0314 0315 0315 0315 0315 0315	25/02xx 25/01xx 24/xxxx 23/24xx 25/01xx 23/15xx	7 6 - 6 9 6	Co Fr Gr Ho Si Tu		11,12,13,18,22,25, 32,53
25/2	4 21	130 197	25 52	0730 0730	25/06xx 25/09xx	6 6	Ho Tu		7,11,12,13,18,22,25, 32,38,53
29/2	75 25 38 80 13	600 114 155 470 133	370 81 155 500 39	28/0109 28/0650 27/1523 28/0840 27/1522	28/21xx 29/04xx 28/xxxx 28/22xx 29/01xx	5 5 - 7 5	Co Fr Gr Si Tu	1523 - 28/0840	11,12,18,22,25, 32,38,53

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(3)

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

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.V-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 symbols 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 DURING

SHORT WAVE FADE					SOLAR FLARE EFFECTS			POLAR-CAP ABSORPTIONS					Onset	
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										
1325	3	S	35	5										
1903	3	S	47	4										
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										
0048	3	S	152	3										
1510	3	SL	170	5										
0052	3+	G	227	1										
1455	3	SL	130	5										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 25/0557	1,12,16,19,29 34,43,47	1540
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		Σ Kp	Ap
											3	47		
						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-
						1828	15/12xx	sc	m	5	64	69	18o	15
						0509						28	25	24+
						0206						17		43+
						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



GEOMAGNETIC STORMS									FORBUSH DECREASE				
End	Type	Max. Int.	Max. Kp	No. Final Report Reference		ΣKp	Ap	Probable Flare	Onset	Mag. Dec. %	Duration Hrs.	Probable Flare	References
				3	47								
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. 04/21xx	sc	m	5	49	55	25+	21	01/0905	Mar. 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					
27/08xx	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					

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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 Apr. 1		67	0038	<u>0130</u>	0052	2	S.08	W.23	0050	3+	S	80	5			
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	<u>1534</u>	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	<u>2013</u>	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			<u>1643</u>	<u>1652</u>	1645	1+	N.19	W.30						1644	10	-
5	28	85	<u>0356</u>	<u>0457</u>	0415	3	S.18	W.29	0407	3	SL	53	5	0412	29	S
6																
13																
16																
20																
25																
29																
30	31		<u>0656</u>	0944	0731	3	N.23	E.90								
31																
June 1																
3	32		<u>1607</u>	<u>1543</u>	1512	3	N.30	W.53	1510	2+		25		1510	22	S
5	34	96	<u>1615</u>	<u>1837</u>	1631	2+	S.18	E.69	1620	3	S	100	5			
6			<u>0436</u>	<u>0614</u>	0448	3	N.16	W.78	0436	2	SL	50	5	0919	22	S
7																
8																
14																
15																
19			<u>1425</u>	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	<u>0020</u>	<u>0414</u>	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	<u>1640</u>	1757	1642	2+	S.13 W.58
16		7	<u>1414</u>	1447	-	1+	N.18 E.23
17							
20			0844 <u>0935</u>	<u>0910</u> 0943	0851 -	2 2	N.10 W.42 N.06 W.42
22							
23	4		<u>0904</u>	<u>1053</u>	0918	3	S.24 W.45
25	6	12	0915	<u>1107</u>	1005	3+	S.24 W.69
Feb. 4							
5							
8			<u>1740</u>	<u>1950</u>	1807	2	S.19 E.08
9		15	0654 1330 <u>2108</u>	<u>0734</u> 1501 <u>2302</u>	0659 1431 1332	2+(1) 1+ 2+(1)	S.12 W.48 S.20 W.02 S.12 W.14
10	9	18 19	1320 <u>1900</u>	<u>1411</u> <u>2001</u>	1332 1908	3 2+(1)	S.13 W.63 S.14 W.64
11	10		0812	<u>0847</u>	0823	3	S.10 W.85
12							
16							
27			<u>1155</u>	<u>1210</u>			S.13 W.25
Mar. 1		25					
	12	26	<u>0905</u>	<u>1007</u>	0917	3	S.11 W.45
3	13	31	1005	<u>1250</u>	1020	3+	S.16 E.60
5							
7	16		1020	1224	1112	3	N.11 E.71
9		35	<u>1540</u>	<u>1709</u>	1546	2	N.34 W.32
11		36 38	<u>0030</u>	<u>0042</u>	0034	1	N.11 E.12
12		39	<u>0024</u>	0233	0037	2+	N.08 E.02
13							
14	17	42	<u>1454</u>	1541	1507	3	S.21 W.85
15							
17							
18							
20			<u>0656</u>	0955	0726	1+	N.25 E.60
23	18	45	<u>0947</u>	<u>1627</u>	1005	3+	S.14 E.78
24							
25		49	0529 0557	<u>0553</u> <u>0626</u>	0530 0603	2 2	N.16 E.24 S.15 E.50
26							
27	19	54	<u>1534</u>	<u>1710</u>	1552	2+	S.16 E.23
28		55	1030 1145 1703	1152 1200 <u>1904</u>	1058 1148 1714	2 1 2+	S.24 E.26 N.27 W.58 S.15 E.09
29		59 61 62	1339 1630 1819	1410 1637 1915	1334 1632 1823	2 1- 2	N.35 E.78 N.21 W.90 S.24 E.08
30			0045 <u>0850</u>	0123 <u>1037</u>	0106 0917	2 2	N.35 E.74 S.22 W.09
	21	65	0915	<u>1420</u>	1000	2+	S.16 W.20

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(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

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

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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. 17/10xx	3.5	4d	15/1030	22,51

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TABLE VI 1958 (CONTINUED)

SHORT WAVE FADE					SOLAR FLARE EFFECTS			POLAR-CAP ABSORPTIONS						Onset	End
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	6											
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

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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		ΣKp	Ap
													3	47		
								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							0001	14/03xx	sc	ms	6	68	55	39o	50
	S							1547	18/06xx	sc	ms	7	50	48	25o	30
	S							1817					55	43		

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GEOMAGNETIC STORMS							FORBUSH DECREASE					
Type	Max. Int.	Max. Kp	No. Final Report Reference		Σ Kp	Ap	Probable Flare	Onset	Mag. Dec. %	Duration Hrs.	Probable Flare	References
			3	47								
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					

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(3)

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

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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.

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TABLE VII BALLOON FLIGHTS ASSOCIATED WITH MAJOR SOLAR FLARES DURING 1958

Gr. Day	Event No.	FLARE		SPECTRAL		PCA		Time at			LOCATION		Instruments Carried	Group	Notes	
		Serial No.	Beg. UT	Beg. UT	Imp	Type II Beg. UT	Type IV Beg. UT	Gr. Day/Beg. UT	Launch Gr. Day	UT	Altitude Hr.	Altitude Min.				Altitude Km
Jan. 1	1															
07		1820	2	1823					07	1522	3	45	24			
09									09	0702	2	00	29	Swarthmore, Pa.	N39.9 W 75.4	T
10									10	0700	2	15	31	Dolgoprudnaya, USSR	N55.9 E 37.5	C
13									13	1600	3	45	31	Dolgoprudnaya, USSR	N55.9 E 37.5	C
14									14	0703	2	00	29	Swarthmore, Pa.	N39.9 W 75.4	T
15									15					Dolgoprudnaya, USSR	N55.9 E 37.5	C
16	4	No Flare Reported		0335					16	0702	2	20	27	Dolgoprudnaya, USSR	N55.9 E 37.5	C
17	8	2255	2	2313					17	0655	2	30	12	Dolgoprudnaya, USSR	N55.9 E 37.5	C
18	10	2253	1	2257					20	0700	0	53	9	Dolgoprudnaya, USSR	N55.9 E 37.5	C
19									0850	0	55	10		Murmansk, USSR	N69 E 33.1	C
20									1946	3	00	27		Swarthmore, Pa.	N39.9 W 75.4	T
21									21	0701	1	20	15	Dolgoprudnaya, USSR	N55.9 E 37.5	C
22									22	1129	8	50	10	Minneapolis, Minn.	N44.9 W 93.3	C, I, EM
23									23	0902	1	40	32	Dolgoprudnaya, USSR	N55.9 E 37.5	C
24									24	0701	2	05	28	Murmansk, USSR	N69 E 33.1	C
25									25	0904	3			Dolgoprudnaya, USSR	N55.9 E 37.5	C
26									28	0705	2	50	31	Dolgoprudnaya, USSR	N55.9 E 37.5	C
27									29	0630	0	58		Yakutsk, USSR	N62 E 129.6	T
28									27	0617	0	42	85	Yakutsk, USSR	N62 E 129.6	T
29									0702	2	30	31		Dolgoprudnaya, USSR	N55.9 E 37.5	C
30									0859	0	35	7		Murmansk, USSR	N69 E 33.1	C
31									1928	0	37		124	Yakutsk, USSR	N62 E 129.6	T
32									28	0705	2	50	31	Dolgoprudnaya, USSR	N55.9 E 37.5	C
33									29	0630	0	58		Yakutsk, USSR	N62 E 129.6	T
34									31	1526	0	21	100	Yakutsk, USSR	N62 E 129.6	T
35									03	0333	0	36	30	Yakutsk, USSR	N62 E 129.6	T
36									0700	2	10	23		Dolgoprudnaya, USSR	N55.9 E 37.5	C
37									0858	2	05	17		Murmansk, USSR	N69 E 33.1	C
38									04	0700	2	25	30	Dolgoprudnaya, USSR	N55.9 E 37.5	C
39									10	0548	0	22	65	Yakutsk, USSR	N55.9 E 37.5	T
40									1705	0	15		190	Yakutsk, USSR	N62 E 129.6	T
41									11	0440	3	50	10	Minneapolis, Minn.	N44.9 W 93.3	C, I, EM
42									11	0700	2	20	30	Dolgoprudnaya, USSR	N55.9 E 37.5	C
43									12	0556	0	22	84	Yakutsk, USSR	N62 E 129.6	T
44									12	0700	3	25	30	Dolgoprudnaya, USSR	N55.9 E 37.5	C
45									1320	3	45	30		Swarthmore, Pa.	N39.9 W 75.4	T
46									1520	3	45	30		Dolgoprudnaya, USSR	N55.9 E 37.5	C
47									0701	2	05	21	70	Yakutsk, USSR	N62 E 129.6	T
48									0733	0	44			Murmansk, USSR	N69 E 33.1	C
49									0648	1	20	19		Dolgoprudnaya, USSR	N55.9 E 37.5	C
50									14	0705	1	40	33	Yakutsk, USSR	N62 E 129.6	T
51									1725	0	36	140		Yakutsk, USSR	N55.9 E 37.5	T
52									25		4	00	35	Victoria, Australia	S38 E 145	EM
53									0700	1	40	34		Dolgoprudnaya, USSR	N55.9 E 37.5	C
54									0702	2	55	34		Dolgoprudnaya, USSR	N55.9 E 37.5	C
55									27	0903	2	20	17	Murmansk, USSR	N69 E 33.1	C
56									28	0700	1	35	34	Dolgoprudnaya, USSR	N55.9 E 37.5	C
57									12	0905	3+					
58									2041							

* Several flights by a University 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		SPECTRAL		PCA		Launch		Time at Altitude		Place	LOCATION		Instruments Carried	Group	Notes
		Serial No.	Beg. UT	Imp	Type II Beg. UT	Type IV Beg. UT	Gr. Day/ Beg. UT	Gr. Day/ Beg. UT	Gr. Day/ UT	Gr. Day/ UT	Altitude Hr.		Altitude Min.	Altitude Km			
44	28	13	1005	3+	0009	1005		Mar. 03	0703	2	30	30	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU	See 45 A Table VII A
45	31								0903	1	35	19	Murmansk, USSR	N69 E 33.1	C	MSU	
46*		No Flare Reported			1350			04	0701	2	20	20	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU	
48	32	14	0500	3				05	-	1	00	37	New South Wales, Australia	-	EM	Melbourne	
49		15	0500	3					1129	4	30	32	Swardmore, Pa.	N39.3 W 75.4	T	Barcol	
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								14	0703	2	55	23	Murmansk, USSR	N69 E 33.1	C	MSU	
58									0703	2	55	23	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU	
59	14	42	1454	3	1453		Mar. 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	
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	
64	20	18	0656	1+	0634			20	0700	2	00	17	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU	
65									0842	6	00	17	Guantanamo, Cuba	N19.9 W 75.1	C, I, EM	MSU	
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	MSU	
69									0745	6	35	10	Minneapolis, Minn.	N44.9 W 93.3	C, I, EM	MSU	
70									0911	-	-	-	Brownwood, Texas	N32 W 99	C, I, EM, T	MSU	
71								22	0659	0	55	17	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU	
72	23	45	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	10	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	Dolgoprudnaya, USSR	N62 E 129.6	T	Yakutsk	
77									2218	0	27	144	Yakutsk, USSR	N62 E 129.6	T	Yakutsk	
78	25	52	0036	1	2320			26	0458	0	47	78	Yakutsk, USSR	N62 E 129.6	T	Yakutsk	
79	26	53			0035				1136	6	38	10	Minneapolis, Minn.	N44.9 W 93.3	C, I, EM	MSU	
80									1204	7	20	10	Brownwood, Texas	N32 W 99	C, I, EM	MSU	
81									0558	0	42	40	Yakutsk, USSR	N62 E 129.6	T	Yakutsk	
82								27	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	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	1703	2+	1702				1945	0	24	40	Yakutsk, USSR	N62 E 129.6	T	Yakutsk	
87	27	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	30	61	1630	1-	1630				1837	0	03	80	Yakutsk, USSR	N62 E 129.6	T	Yakutsk	
90	30	65	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	
94								Apr. 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		SPECTRAL		PCA	LAUNCH		TIME AT ALTITUDE		Place	LOCATION		Instruments Carried	Group	Notes	
		Serial No.	Beg. UT	Type II Beg. UT	Type IV Beg. UT		Gr. Day/Beg. UT	Gr. Day/UT	Lat. Hr.	Min.		Altitude Km	mb				Geographic Lat.
Apr. 01	96	22	1050	3-			Apr. 02	1012	0	22	48	Yakutsk, USSR	N62 E 129.6	T	Yakutsk		
97	97						0700	0700	2	35	27	Crimea, USSR	N44.9 E 34	C	MSU		
98	98						0700	0700	3	15	34	Crimea, USSR	N55.9 E 37.5	C	MSU		
99	02		1951	1+	1953		03	0902	6	40	32	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
100							04	0403	2	45	28	Murmansk, USSR	N69 E 33.1	C	MSU		
101							04	0403	2	45	28	Crimea, USSR	N44.9 E 34	C	MSU		
102							04	0403	0	50	54	Yakutsk, USSR	N62 E 129.6	T	Yakutsk		
103							0700	0700	2	35	22	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
104							05	0701	0	45	27	Yakutsk, USSR	N62 E 129.6	T	Yakutsk		
105							06	0704	2	40	32	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
106							07	0700	2	10	23	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
107	06		1929	1	1936		07	0727	2	00	34	Murmansk, USSR	N69 E 33.1	C	MSU		
108							08	0542	2	35	35	Crimea, USSR	N44.9 E 34	C	MSU		
109	07	23	1010	3	0304		07	0701	3	00	32	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
110	08		0301	1			11	1109	9	00	10	Minneapolis, Minn.	N44.9 W 93.3	C, I, EM	Minn.	See IIIA Table VIIA	
111*																	
112	09	24	1435	3			10	0425	1	40	18	Crimea, USSR	N44.9 E 34	C	MSU		
113							10	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								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				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							15	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 124A Table VIIA	
125		26	1655	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 76.9	T	Bartol		
127	30		1930	1+			May 01	1447	3	30	33	Durham, N. C.	N36 W 78.9	T	Bartol		
128	82		1932	1+	1934		02	1831	4	30	32	Durham, N. C.	N39.3 W 75.4	T	Bartol		
129	01		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	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							06	1200	2	35	33	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
134	06	30	0355	3				0704	2	30	29	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
135								1011	2	13	20	Crimea, USSR	N44.9 E 34	C	MSU		
136							08	0700	3	30	32	Murmansk, USSR	N69 E 33.1	C	MSU		
137							09	0701	1	37	35	Crimea, USSR	N44.9 E 34	C	MSU		
138								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		
141	19				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	40	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	3	10	34	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
147								0700	4	00	25	Murmansk, USSR	N69 E 33.1	C	MSU		
148								1441	4	00	26	Swarthmore, Pa.	N39.3 W 75.4	T	Bartol		
149							23	0700	2	31	36	Crimea, USSR	N44.9 E 34	C	MSU		
150								0701	3	13	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		SPECTRAL		PCA	Launch Gr. Day	Time at Altitude			Place	LOCATION		Instruments Carried	Group	Notes
		Serial No.	Beg. UT	Imp	Type II Beg. UT			Type IV Beg. UT	Gr. Day/Beg. UT	Day		UT	Altitude Hr. Min. Mb			
152	30	31	0656	3			May 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		
156							June 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		
158	03	32	1507	3			04 0701	2 40	38		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
159	04	94	2157	2	2146		05 0702	1 50	34		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
160							0707	2 40	32		Murmansk, USSR	N69 E 33.1	C	MSU		
161								1 20	21		Crimea, USSR	N44.9 E 34	C	MSU		
162	05	33	0635	2+	0639		06 0700	2 20	20		Murmansk, USSR	N69 E 33.1	C	MSU		
163	06	34	1615	2+	1617	June	0910	1 35	35		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
164	06	35	0436	3	0434	06/1345	0700	3 05	32		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
165	09	36	0557	3			09 0700	1 45	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							0703	2 30	27		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
169							0704	2 13	22		Murmansk, USSR	N69 E 33.1	C	MSU		
170							0816	1 45	31		Crimea, USSR	N44.9 E 34	C	MSU		
171							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							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							0235	6 30	31	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	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							0429	9 30	20		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
191							0505	0 00	15	10	Minneapolis, Minn.	N44.9 W 93.3	C, I, EM	Minn.		
192							0700	1 50	33		Murmansk, USSR	N69 E 33.1	C	MSU		
193							0703	1 55	27		Crimea, USSR	N44.9 E 34	C	MSU		
194							0100	1 00	28	10	Minneapolis, Minn.	N44.9 E 93.3	C, I, EM	Minn.		
195							0659	2 50	28		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
196							0702	2 05	22		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
197							1127	3		40	Victoria, Texas	N28.8 W 97	I	CIT		
198							1152	34		13	Bismark, N. D.	N46.8 W100.7	I	CIT		
199																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							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)

Gr. Day	Event No.	FLARE		SPECTRAL		PCA		Launch			Time at Altitude			Place	Geographic		Instruments Carried	Group	Notes
		Serial No.	Reg. UT	Imp	Type II Beg. UT	Type IV Beg. UT	Gr. Day/Beg. UT	Gr. Day/UT	Hr.	Mn.	Km	mb	Lat.		Long.				
205								June 24	0816	2	08	18		Crimea, USSR	N44.9 E 39	C	MSU		
206								June 24	1151	7			18	Bismark, N. D.	N46.8 W100.7	I	CIT		
207								June 25	0706	3	15	28	30	Bismark, N. D.	N32.1 W 96.5	I	CIT		
208								June 25	0706	3	15	28		Dolgoprudnaya, USSR	N53.1 E 37.5	C	MSU		
209	109	40	0245	3	0319			June 26	0700	2	36	24		Crimea, USSR	N44.9 E 34	C	MSU		
210								June 26	0700	3	03	34		Murmansk, USSR	N69 E 33.1	C	MSU		
211								June 27	0702	4	20	29		Dolgoprudnaya, USSR	N35.9 E 37.5	C	MSU		
212								June 27	1141	8			9	Ardmore, Oklahoma	N34.2 W 96.5	I	CIT		
213								June 27	1253	36			11	Bismark, N. D.	N46.8 W100.7	I	CIT		Neher
214								July 07	0231	8	21	32		Neepawa, Canada	N50.3 W 99.5	SC, T, C	Chicago		
215								July 07	0700	2	52	32		Murmansk, USSR	N69 E 33.1	C	MSU		
216								July 08	0800	1	40	35		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
217								July 08	1047	1	55	10		Moberly, Mo.	N39.4 W 92.4	C, I, EM	Minn.		
218								July 08	1130	8			11	El Dorado, Kansas	N37.8 W 96.8	I	CIT		
219								July 08	1136	17			26	Bismark, N. D.	N46.8 W100.7	I	CIT		Neher
220								July 09	1153	3	25	10		Minneapolis, Minn.	N44.9 W 93.3	C, I, EM	Minn.		
221								July 09	1128	42		14		Bismark, N. D.	N46.8 W100.7	I	CIT		Neher
222								July 09	1130	37		8		Omaha, Nebraska	N41.3 W 90	I	CIT		
223	118	41	0020	3+	0052			July 07	0430	7	39	12		Neepawa, Canada	N50.3 W 99.5	SC, T, C	Chicago		
224					0145			July 07	0659	2	08	22		Murmansk, USSR	N69 E 33.1	C	MSU		
225								July 08	0700	2	20	28		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		See 226 A Table VIIA
226*								July 08	0706	2	20	22	50	Crimea, USSR	N44.9 E 34	C	MSU		
227								July 08	0925	0	47			Yakutsk, USSR	N62 E129.6	T	Yakutsk		
228								July 08	0654	2	45	36		Crimea, USSR	N44.9 E 34	C	MSU		
229								July 09	0700	1	57	29		Murmansk, USSR	N69 E 33.1	C	MSU		
230								July 09	0733	1	55	19		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
231								July 09	1254	2	35	55		Murmansk, USSR	N69 E 33.1	C	MSU		
232								July 10	1200	2	30	30	110	Dolgoprudnaya, USSR	N59.9 E 37.5	C	MSU		
233								July 10	0337	0	41			Yakutsk, USSR	N62 E129.6	T	Yakutsk		
234								July 10	0638	1	50	29		Crimea, USSR	N44.9 E 34	C	MSU		
235								July 11	0704	3	40	30		Murmansk, USSR	N69 E 33.1	C	MSU		
236								July 11	0757	2	03	10		Minneapolis, Minn.	N44.9 W 93.3	C, I, EM	Minn.		
237								July 11	0957	2	23	26		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
238								July 11	1628	0	52	65		Yakutsk, USSR	N62 E129.6	T	Yakutsk		
239								July 11	-	1	00	31		Victoria, Australia	N28.8 W 97	EM	Meibourne		
240								July 11	0137	0	40	10		Minneapolis, Minn.	N44.9 W 93.3	C, I, EM	Minn.		
241	11	42	0740	3				July 11	0700	1	30	25		Crimea, USSR	N44.9 E 34	C	MSU		
242								July 11	0700	2	40	26		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
243								July 12	0700	2	48	29	64	Murmansk, USSR	N69 E 33.1	C	MSU		
244								July 12	0422	0	55			Yakutsk, USSR	N62 E129.6	T	Yakutsk		
245	12	43	0744	3				July 12	0625	6	38	11		Neepawa, Canada	N50.3 W 99.5	SC, T, C	Chicago		
246								July 12	0900	1	28	21		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		Meyer (1959)
247								July 12	1340	40			6	USS ATKA	-	I	CIT		
248	12	121	2317	1				July 13	1357	10		22		Bismark, N. D.	N46.8 W100.7	I	CIT		
249								July 13	0049	9	30		10	Minneapolis, Minn.	N44.9 E 93.3	C, I, EM	Minn.		
250								July 14	0534	0	20	60		Yakutsk, USSR	N62 E129.6	T	Yakutsk		
251								July 14	0658	2	10	25		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
252								July 14	0702	1	17	28		Murmansk, USSR	N69 E 33.1	C	MSU		
253								July 14	0712	2	37	26	8	Crimea, USSR	N44.9 E 34	C	MSU		
254								July 15	1346	79				USS ATKA	-	I	CIT		
255								July 15	1400	40			6	Bismark, N. D.	N46.8 W100.7	I	CIT		
256								July 15	1421	0	05	32		Yakutsk, USSR	N62 E129.6	T	Yakutsk		
257								July 15	0700	2	17	25		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
258								July 15	0706	2	12	18		Crimea, USSR	N44.9 E 34	C	MSU		
259	15	44	0914	3				July 15	0707	2	35	27		Murmansk, USSR	N69 E 33.1	C	MSU		
260								July 15	1352	14			10	USS ATKA	-	I	CIT		
261								July 16	1359	25			13	Bismark, N. D.	N46.8 W100.7	I	CIT		
262								July 16	0423	0	35	16		Yakutsk, USSR	N62 E129.6	T	Yakutsk		
263								July 16	0700	4	11	25		Murmansk, USSR	N69 E 33.1	C	MSU		
264								July 16	0702	1	45	30		Dolgoprudnaya, USSR	N55.9 E 37.4	C	MSU		
265								July 16	1407	0	26	70		Yakutsk, USSR	N62 E129.6	T	Yakutsk		

TABLE VII. 1958 (CONTINUED)

Cr. Day	Event No.	FLARE		SPECTRAL		PCA	Launch Gr. Day/UT	Time at Altitude Hr. Min. Km mzb	Place	LOCATION		Instruments Carried	Group	Notes
		Serial No.	Beg. UT	Type II Beg. UT	Type IV Beg. UT					Geographic Lat. Long.				
266							July 17	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							0654	2 23 21	Murmansk, USSR	N69 E 33.1	C	MSU		
269							1350	01	USS ATKA			CIT		
270							1402	55	Bismark, N. D.			CIT		
271							0640	55	Yakutsk, USSR	N46.8 W100.7	I	Yakutsk		
272							0700	2 37 31	Dolgoprudnaya, USSR	N62 E129.6	T	MSU		
273							0715	2 20 22	Crimea, USSR	N55.9 E 37.5	C	MSU		
274							1446	0 24	Yakutsk, USSR	N44.9 E 34	C	MSU		
275							2201	2 15	Minneapolis, Minn.	N44.9 W 93.3	C, I, EM	MSU		
276							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		
278	125	45	1905	1907	1905		19	46	Bismark, N. D.	N46.8 W100.7	I	CIT		
279							20	30	Minneapolis, Minn.	N44.9 W 93.3	C, I, EM	MSU		
280							20	06	USS ATKA			CIT		
281								37	Bismark, N. D.	N46.8 W100.7	I	CIT		
282							21	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							0419	2 20 26	Murmansk, USSR	N69 E 33.1	C	MSU		
285							0419	0 48	Yakutsk, USSR	N62 E129.6	T	Yakutsk		
286							1442	0 40	Yakutsk, USSR	N62 E129.6	T	Yakutsk		
287							0040	8 51	Minneapolis, Minn.	N44.9 W 93.3	C, I, EM	MSU		
288							0430	5 10	Neepeawa, Canada	N50.3 W 99.5	SC, T, C	Chicago		
289							0700	2 24	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	50 26	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
293								00	Yakutsk, USSR	N62 E129.6	T	Yakutsk		
294							24	03 29	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
295							1103	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				25	9 16	Minneapolis, Minn.	N44.9 W 93.3	C, I, EM	MSU		
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	Yakutsk, USSR	N62 E129.6	T	Yakutsk		
302							1430	4 30 29	Tallahassee, Florida	N30.5 W 84.4	T	Bartol		
303							0941	3 00	Minneapolis, Minn.	N44.9 W 93.3	C, I, EM	MSU		
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 13 31	Tallahassee, Florida	N30.5 W 84.4	T	Bartol		
307							1830	4 13 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							0251	9 24	Minneapolis, Minn.	N44.9 W 93.3	C, I, EM	MSU		
309a							26	34 42 23	Crosby, Minn.		EM, Man			Stratolab III, Yagoda
310	27	51	0855	3			28	0 54	Yakutsk, USSR	N62 E129.6	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*							1511	0 01	Yakutsk, USSR	N62 E129.6	T	Yakutsk		
315	29	52	0259	3	0304	0321	29	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	0 29	Yakutsk, USSR	N62 E129.6	T	Yakutsk		
318	30		1523	2				0 56	Yakutsk, USSR	N62 E129.6	T	Yakutsk		
319							202	0 35	Yakutsk, USSR	N62 E129.6	T	Yakutsk		
320							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		
323							01	0 40	Yakutsk, USSR	N62 E129.6	T	Yakutsk		
324							0700	2 43 32	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		

TABLE VII. 1958 (CONTINUED)

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

TABLE VII. 1958 (CONTINUED)

Gr. Day	Event No.	FLARE		SPECTRAL		PCA		Launch		Time at		Place	Geographic		Instruments Carried	Group	Notes
		Serial No.	Beg. UT	Imp	Type II Beg. UT	Type IV Beg. UT	Gr. Day/Beg. UT	Gr. Day/Beg. UT	Gr. Day/UT	Altitude Hr.	Altitude Min.		Altitude Mb	Lat.			
Aug 377	148	61	1417	3	1500		Aug. 22/1530	1416	4	00	31	Swarthmore, Pa.	N39.3 W 75.4	T	Bartol		
378								0245	1	00	28	Ft. Churchill, Canada	N58.7 W 93.8	I, C, SC	UC		
379								0315	0	56	20	Yakutsk, USSR	N62 E 129.6	T	Yakutsk		
380								0545	7	30	10	Fairbanks, Alaska	N64.8 W 147.9	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				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 W 147.9	C, I, EM	Minn.		
385								0700	1	23	33	Murmansk, USSR	N69 E 33.1	C, I, EM	MSU		
386								0701	2	28	30	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
387	25	63	0949	3-				0734	3	00	26	Crimea, USSR	N44.9 E 34	C	MSU		
388	26	64	0005	3	0021		26/0100	0700	3	31	34	Murmansk, USSR	N69 E 33.1	C	MSU		
389								0735	2	50	26	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
390								1100	0	13	36	Crimea, USSR	N44.9 E 34	C	MSU		
391								1200	1	00	10	Yakutsk, USSR	N62 E 129.6	T, C	Yakutsk		
392								1342	4	45	31	Ft. Churchill, Canada	N58.7 W 93.8	I, T, C	UC		
393								0150	0	45	66	Swarthmore, Pa.	N39.3 W 75.4	T	Bartol		
394								0436	0	00	10	Yakutsk, USSR	N62 E 129.6	T	Yakutsk		
395								0655	8	50	28	Minneapolis, Minn.	N44.9 W 93.3	C, I, EM	Minn.		
396								0700	3	29	28	Fairbanks, Alaska	N64.8 W 147.9	C, I, EM	Minn.		
397								1325	3	45	25	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
398								0659	0	13	45	Swarthmore, Pa.	N39.3 W 75.4	T	Bartol		
399								0700	2	50	33	Yakutsk, USSR	N62 E 129.6	T	Yakutsk		
400								0804	1	25	33	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
401								1100	6	15	35	Swarthmore, Pa.	N39.3 W 75.4	T	Bartol		
402	28		1025	2+	1028			1600	1	18	20	Crimea, USSR	N44.9 E 34	C	MSU		
403								0658	2	50	33	Crimea, USSR	N44.9 E 34	C	MSU		
404								0700	1	44	32	Murmansk, USSR	N69 E 33.1	C	MSU		
405								0700	2	51	29	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
406								1122	1	00	10	Ft. Churchill, Canada	N58.7 W 93.8	I, T, C	UC		
407								0700	3	14	27	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
408								0700	1	55	32	Crimea, USSR	N44.9 E 34	C	MSU		
409	30	65	1933	3				0700	3	00	26	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
410								-	3	00	34	Victoria, Australia	S 38 E 145	EM	Melbourne		
411								0659	1	17	24	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
412								0747	2	20	35	Crimea, USSR	N44.9 E 34	C	MSU		
413								0700	2	11	23	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
414	02	66	2102	3	2108			2224	11	00	8-15	Minneapolis, Minn.	N44.9 W 93.3	C, I, EM	Minn.		
415								0424	1	00	26	Minneapolis, Minn.	N44.9 W 93.3	C, I, EM	Minn.		
416								0700	2	38	26	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
417	04	67	0504	3				0958	3	10	33	Crimea, USSR	N44.9 E 34	C	MSU		
418								1454	3	00	21	Swarthmore, Pa.	N39.3 W 75.4	T	Bartol		
419	04	68	1401	3-				0700	3	30	30	Crimea, USSR	N44.9 E 34	C	MSU		
420								1042	2	37	27	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
421								1104	3	30	23	Swarthmore, Pa.	N39.3 W 75.4	T	Bartol		
422								1602	4	45	31	Ft. Churchill, Canada	N58.7 W 93.8	I, T, C	UC		
423								0700	2	10	21	Swarthmore, Pa.	N39.3 W 75.4	T	Bartol		
424								0700	2	10	21	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
425								0700	2	47	31	Murmansk, USSR	N69 E 33.1	C	MSU		
426								0657	2	15	39	Crimea, USSR	N44.9 E 34	C	MSU		
427	07	69	1441	3+				0706	2	55	32	Murmansk, USSR	N69 E 33.1	C	MSU		
428								1200	3	31	33	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU		
429								0700	2	36	26	Murmansk, USSR	N69 E 33.1	C	MSU		
430																	

TABLE VII. 1958 (CONTINUED)

Gr. Day	Event No.	FLARE		SPECTRAL		PCA		Launch		Time at		Altitude km	Place	LOCATION		Instruments Carried	Group	Notes
		Serial No.	Beg. UT	Imp	Type II Beg. UT	Type IV Beg. UT	Gr. Day/Beg. UT	Gr. Day/UT	Gr. Day/UT	Gr. Day/UT	Gr. Day/UT			Gr. Day/UT	Gr. Day/UT			
431* 09		70	1343	3+			Sept. 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	10	Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
433								1120	4	00			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	10	Murmansk, USSR	N69	E 33.1	C	MSU	
443								1102	6	00			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	0922	3+	0:48		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	5	20	42		Murmansk, USSR	N69	E 33.1	C	MSU	
453 16		77	1443	3			17	2239	7	00	26		Brownwood, Texas	N32	W 99	NM	New York	
454								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 Neuts	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							20	0921	3	15	25		Murmansk, USSR	N69	E 33.1	C	MSU	
463								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	
467 22	164	79	0738	2+			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								0830	1	40		10	Fairbanks, Alaska	N64.8	W147.9	C, I, EM	Minn.	
473							23	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	
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	
486							Oct. 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		SPECTRAL		PCA	LOCATION			Instruments Carried	Group	Notes
		Serial No.	Beg. UT	Type II Beg. UT	Type IV Beg. UT		Place	Geographic Lat.	Geographic Long.			
488							Oct. 02	1139	3 05 28		MSU	
489	169		2143	2149			03	0658	3 50 32		MSU	
490							03	0700	3 31 29		MSU	
491							04	0702	1 00 20		MSU	
492							04	0700	2 15 22		MSU	
493							06	0700	3 22 32		MSU	
494								0701	2 35 26		MSU	
495								0711	2 15 21		MSU	
496	171		1510	1529			09	0709	1 28 15		MSU	
497								0703	0 35 -		MSU	
498								0715	2 00 17		MSU	
499							10	0416	0 41 18	130	Yakutsk	
500								0700	1 49 28		MSU	
501								0724	2 13 24		MSU	
502							11	0659	2 20 25		MSU	
503								0700	2 04 26		MSU	
504	15		0408				15	0637	0 41 40		Yakutsk	
505								0705	2 15 24		MSU	
506	15		1023				20	0237	09 09 12		MSU	
507								2037	09 09 18		CIT	
508							16	0701	1 54 22		MSU	
509								0701	1 50 18		MSU	
510								2029	2 45 26		MSU	
511								2031	10 11 15		CIT	
512							17	0700	2 15 26		MSU	
513								0700	2 23 25		MSU	
514								0704	2 03 31		MSU	
515							18	0701	1 45 22		MSU	
516								0701	1 45 22		MSU	
517	19		0658		0722		20	0320	0 08 90		Yakutsk	
518								0658	2 05 22		MSU	
519								0700	1 48 29		MSU	
520								0719	1 47 24		MSU	
521								1130	0 50 48		Yakutsk	
522							21	0655	1 19 19		MSU	
523								0702	3 13 24		MSU	
524								0710	1 36 22		MSU	
525								1115	6 10 10		Minn.	
526	21		2318	2328	2327		22	0245	0 51 80		Yakutsk	
527	22		0650					0644	6 00 -		Minn.	
528								0700	1 53 19		MSU	
529								1212	0 40 40		Yakutsk	
530	23		0232				23	0644	6 00 10		Minn.	
531								0657	2 24 9		MSU	
532								1040	3 22 22		MSU	
533								2228	18 78		CIT	
534								2228	78		CIT	
535								0134	0 00 80		Yakutsk	
536							24	0635	0 39 38		Yakutsk	
537								0700	2 30 25		MSU	
538								0700	1 53 22		MSU	
539	24		1410	1442	1442		24	1647	0 19 60		Yakutsk	
540								2200	52 7		CIT	
541								2155	97 13		CIT	
542							25	0240	0 20 50		Yakutsk	
543								0700	1 40 16		MSU	
544							26	2156	28 12		CIT	

Anderson, H.R. (1958)

TABLE VII. 1958 (CONTINUED)

Gr. Day	Event No.	FLARE		SPECTRAL		PCA		Launch		Time at Altitude		Place	LOCATION		Instruments Carried	Group	Notes	
		Serial No.	Beg. UT	Imp	Type II Beg. UT	Type IV Beg. UT	Gr. Day/ Beg. UT	Gr. Day/ Beg. UT	Day	UT	Hr.		Min.	Km				mb
545								Oct.	2208	3	48	185	USS Staten Island	N62	E129.6	I	CIT	
546								26	0251	0	25	65	Yakutsk, USSR	N55.9	E 37.5	T	MSU	
547								27	0700	2	12	28	Dolgoprudnaya, USSR	N69	E 33.1	C	MSU	
548									1159	1	31	18	Murmansk, USSR	N55.9	E 37.5	C	MSU	
549									1206	0	23	60	Dolgoprudnaya, USSR	N62	E129.6	T	MSU	
550								28	0720	1	26	22	Yakutsk, USSR	N69	E 33.1	C	MSU	
551									0732	1	52	23	Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
552								29	0700	2	00	22	Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
553	28	87	1505	3					0759	2	22	18	Murmansk, USSR	N69	E 33.1	C	MSU	
554	29	88	0703	2+					2152	47	-	7	Invercargill, New Zealand	S 46.5	E168.3	I	CIT	
555									2208	-	-	-	USS Staten Island	-	-	I	CIT	
556								30	0701	2	13	20	Murmansk, USSR	N69	E 33.1	C	MSU	
557									0704	1	16	16	Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
558									0715	5	00	23	Crimea, USSR	N44.9	E 34	C	MSU	
559									1201	2	20	22	Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
560									1527	0	24	82	Dolgoprudnaya, USSR	N62	E129.6	T	MSU	
561								31	-	-	-	-	USS Staten Island	-	-	I	CIT	
562									0701	2	05	18	Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
563								31	0925	2	12	24	Murmansk, USSR	N69	E 33.1	C	MSU	
564	31	89	0845	3					1004	2	37	23	Crimea, USSR	N44.9	E 34	C	MSU	
565									1148	7	00	10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	MSU	
566									2201	42	-	8	Invercargill, New Zealand	S 46.5	E168.3	I	MSU	
567								Nov.	-	-	-	-	-	-	-	-	CIT	
568								01	0762	1	28	31	Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
569								02	2152	30	-	-	USS Staten Island	-	-	I	CIT	
570								03	0328	0	23	34	Invercargill, New Zealand	S 46.5	E168.3	I	CIT	
571									0700	1	30	30	Yakutsk, USSR	N62	E129.6	T	MSU	
572									0705	2	45	23	Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
573									0739	2	53	30	Crimea, USSR	N44.9	E 34	C	MSU	
574								04	0700	2	17	25	Murmansk, USSR	N69	E 33.1	C	MSU	
575									0741	1	30	27	Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
576								Nov.	-	-	-	-	-	-	-	-	-	-
577	14	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	E129.6	T	MSU	
581									2201	45	0	13	USS Staten Island	-	-	I	CIT	
582									2201	0	0	65	Invercargill, New Zealand	S 46.5	E168.3	I	CIT	
583								15	1201	1	41	27	Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
584									2158	54	0	7	Invercargill, New Zealand	S 46.5	E168.3	I	CIT	
585								17	0330	0	15	28	Yakutsk, USSR	N62	E129.6	T	MSU	
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	E129.6	T	MSU	
589	24	91	1607	3				25	0700	2	34	30	Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
590	25	92	0807	3-					0845	1	35	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	2	3	Invercargill, New Zealand	S 46.5	E168.3	I	CIT	
594									0700	2	52	26	Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
595									1039	0	55	146	Yakutsk, USSR	S 46.5	E129.6	T	MSU	
596									2203	03	03	13	Invercargill, New Zealand	S 46.5	E168.3	I	CIT	
597									0058	0	42	10	Minneapolis, Minn.	N44.9	W 93.3	C, I, EM	Minn.	
598								27	0342	0	19	20	Yakutsk, USSR	N62	E129.6	T	MSU	
599									0701	2	22	23	Dolgoprudnaya, USSR	N55.9	E 37.5	C	MSU	
600									0900	2	30	28	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)

Gr. Day	Event No.	FLARE		SPECTRAL		PCA		Launch			Time at.			LOCATION		Instruments Carried	Group	Notes
		Serial No.	Beg. UT	Beg. UT	Type IV Beg. UT	Gr. Day/Beg. UT	Gr. Day/UT	Gr. Day/UT	Altitude Hr. Min.	Altitude Km	mb	Place	Geographic Lat.	Long.				
Nov. 602	188		1857	1	1905			Nov. 27	2157	50	4			Invercargill, New Zealand	846.5 E 168.5	I	CIT	
603	189		2354	1	2358			28	0314	0	56	20		USS Staten Island Yakutsk, USSR	N62 E 129.6	T	Yakutsk	
604								28	0702	1	39	35		Crimea, USSR	846.5 E 168.3	I	MSU	
605								29	2209	10				Invercargill, New Zealand	-	I	CIT	
606								29	0658	2	20	26		USS Staten Island	N55.9 E 37.5	C	MSU	
607														Dolgoprudnaya, USSR				
608																		
609	29	93	0920	2+				Dec. 01	0700	2	15	24		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU	
610	30		2240	1-	2250			02	0702	2	24	40	90	Crimea, USSR	N44.9 E 34	C	MSU	
611									1301	0	52		13	Yakutsk, USSR	N62 E 129.6	T	Yakutsk	
612								02	0129	39			7	USS Staten Island	-	I	CIT	
613									0150	31				Invercargill, New Zealand	846.5 E 168.3	I	CIT	
614								0701	0701	2	41	26		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU	
615								0800	0800	1	24	17		Murmansk, USSR	N69 E 33.1	C	MSU	
616								1205	1205	1	36	26		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU	
617								1306	1306	1	36	18		Crimea, USSR	N44.9 E 34	C	MSU	
618								1707	1707	2	48	34	20	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU	
619								03	0226	0	05			Yakutsk, USSR	N62 E 129.6	T	Yakutsk	
Dec. 620	03	94	0702	3				03	0700	3	10	27	8	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU	
621		95	0623	2+					2221	6			7	USS Staten Island	-	I	CIT	
622									2353	28	06	23		Invercargill, New Zealand	846.5 E 168.3	I	MSU	
623								04	0700	2	03	19		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		1642	1	1658			10	0708	2	16	26		Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU	
629	10		0219	2+	0224			11	0702	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	846.5 E 168.3	I	CIT	
633	11		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	97	1215	2+	1258			12	1435	0	44		34	Yakutsk, USSR	N62 E 129.6	T	Yakutsk	
638					1415			13	0317	0	30	80		Dolgoprudnaya, USSR	N62 E 129.6	T	Yakutsk	
639									0745	0	57	25		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	118	Swarthmore, Pa.	N39.3 W 75.4	T	Bartol	
642								15	0307	0	26	30		Yakutsk, USSR	N62 E 129.6	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			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	216	Dolgoprudnaya, USSR	N55.9 E 37.5	C	MSU	
650									1210	0	41			Yakutsk, USSR	N62 E 129.6	T	Yakutsk	
651	17		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	MSU	
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)

Gr. Day	Event No.	FLARE		SPECTRAL		PCA	Launch		Time at		Place	LOCATION		Instruments Carried	Group	Notes
		Serial No.	Beg. UT	Imp	Type II Beg. UT		Type IV Beg. UT	Gr. Day/ Beg. UT	Gr. Day/ UT	Day		UT	Altitude Hr.			
658								19	0740	0	55	16				
659							20	0659		1	29	30				
660										2	06	20				
661	215	99	0545	3			23	0656		1	36	26				
662					0559		23	1201		2	18	28				
663							24	1305		2	10	25				
664							24	0700		2	12	25				
665							25	0700		2	47	23				
666							25	0700		2	32	28				
667							26	0700		2	06	19				
668							26	0700		2	14	20				
669							26	0704		1	44	23				
670								1230		0	56	100				
671	31	100	1658	3	1705	170C	Jan. 1959	01 0800		1	12	28				
672							02	0800		1	54	18				
673							03	0800		2	38	25				
674							04	0801		1	12	23				
675								0800		1	00	21				
676								0815		2	12	19				
677																

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.

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

Day	Serial No.	Beg.	Imp.	I	IV	PCA	BALLOON LAUNCHED	
							FLARE	BALLOON LAUNCHED
Feb. 11	10	0812	3				Feb. 12	
Mar. 01	12	0905	3+				Mar.	
45A	03	1005	3+	1005			03	
63A	14	1454	3	1453			18	
Apr. 07	23	1010	3				Apr. 09	
124A	29	1128	3				0304	
							29	

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 ($10^{-22} \text{ Wm}^{-2} (\text{c/s})^{-1}$).
4. The most active plages. (Produced 30 or more flares during disk passage).
5. The greatest sunspots (area ≥ 1000 millionth in the Mt. Wilson list).
6. All spectral radio emission of Type II and Type IV. In addition, outstanding bursts of Type I 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 Bulletin 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 date 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 40×10^{-22}
 $\text{Wm}^{-2} (\text{c/s})^{-1}$, 2 = 40 - $200 \times 10^{-22} \text{ Wm}^{-2} (\text{c/s})^{-1}$ and 3 = 200
 $\times 10^{-22} \text{ Wm}^{-2} (\text{c/s})^{-1}$

- 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

Column 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_p 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 $\alpha\rho$ spot (Mt. Wilson No. 13064) is a return of the $\alpha\rho$ 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 $\alpha\phi$ spot No. 13076 is a return of the $\alpha\phi$ spot No. 13023 in Region 4410 which was a return of a $\beta\phi$ 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 disturbance 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 $\beta\rho$ spot No. 13333 in region 4622. The $\alpha\rho$ 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 $H\alpha$ 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 $\beta\rho$ spot No. 13389 in region 4659. The $\alpha\rho$ spot No. 13480 in region 4722 is a return of the $\beta\rho$ spot No. 13406 in region 4670. The $\alpha\rho$ 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 $\beta\rho$ 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 $\alpha\beta$ 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 1831.7	26 28	*4355	Jan. 11.5	19°	S12	3.5	9000	33	1	NEW	* <i>lβyl</i> <i>dβl</i>	Jan. 11.3 11.7	S12 S17	22 13	Jan. 5-17 7-17	12924 12930	
		4347	7.0	78°	N13	3	13000	22	3	4296	* <i>lβyd</i>	7.3	N12	17	31-11	12918	
1720 1642.7	40 1350	4355															
1418.5	20	4370	17.5	300°	N15	2.5	6000	26	1	NEW	* <i>lβpl</i>	17.5	N13	36	10-23	12947	
		4377	20.5	261°	S14	2	3000	6	3	Part of 4319	<i>l-d</i>	20.5	S15	(5)	14-17	12958	
		4368	16.5	313°	S07	3	6000	3	1	NEW	<i>lβpl</i> <i>l-βd</i>	16.2 16.3	S08 S04	19 21	10-21 10-20	12945 12946	
	278	4372	20.5	261°	S24	2	3500	10	4,6	4318 + 4319	<i>dβl</i>	19.9	S25	(20)	20-26	12975	
1400 1334.9	23 40	*4400	Feb. 8.5	24°	S12	3.5	25000	91	2,3	4355 4356 4360 4362	<i>dβpl</i> <i>l-d</i> <i>l-βpl</i> <i>lβl</i>	Feb. 6.2 6.9 8.1 9.3	S13 S10 S14 S18	16 (10) 37 18	31-11 31-9 1-14 2-15	12997 12998 13000 13004	
Indet.	70	4400															
1321.7 1327	12 100	4400															
1920 1905.5	20 225	4400															
0545.8 0550	343 1048	4426	22	193°	S16	3	6000	6	7	4382	<i>l-βd</i> <i>l-βl</i>	22.0 22.1	S18 S16	11 20	15-23 15-28	13035 13034	
0346 0400.3	384 424																
	458 296 252 -	4436	25	153°	S12	3.5	1400	15	1	NEW	<i>dβpl</i>	25.2	S15	14	23-3	13052	

- 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 *Bp* 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.

Event No.	Gr. Day.	FLARE DATA						SHORT-WAVE RADIO FADEOUTS						10 CM. EVE		
		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	<u>1820</u>	<u>1939</u>	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	<u>1640</u>	<u>1757</u>	1642	2+	S13W58	5/4	*S	3	1640	120	5	12	3 *2	1640 1640	240 28
7	16	<u>1414</u>	<u>1447</u>		1+	N18E23	2/0	*S	3	1416	33	5	3	3	1409	60
8	16	<u>2255</u>	<u>2347</u>	2306	2	S15E47	2/2									
9	17															
10	18	<u>2253</u>	<u>2335</u>	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	<u>1330</u>	<u>1501</u>	1341	1+	S20W02	4/2	*S	3	1332	46	5	6	3 6	1330 1333.8	95 6
16	09	<u>2108</u>	<u>2302</u>	2142	2+	S12W14	2/2	SL	1	2124	20	5	5	3	2105	<u>60</u>
17	10															
18	10	1320	<u>1411</u>	1332	2+	S13W64	11/3	*S	3	1325	35	5	7	2 2	1320.5 1323	2.5 11
19	10	<u>1900</u>	<u>2030</u>	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	<u>0527</u>	<u>0632</u>	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	<u>6</u> 34
26	01	* <u>0905</u>	<u>1007</u>	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															

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OF MAJOR SOLAR EVENTS FOR 1958

Event No.	DYNAMIC SPECTRUM DATA				200 MC/S DATA					Freq. Mc/s	Type
	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		
1				*1829- 2024/3	E ECD F E	1823 1841.5 1852 1909	26 4 11 71		58 58 58 71	545 545	SD CD
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			g 2258/1 G2300- 2307/2	*2313- 2316/2							470 ECD
9											
10			b2256/2	*2257- 2301/3	CD	2258.5	1.5		200		
11											
12					CD CD	0924 0933	4.5 4.5	0926 0937	140 110	545	CD
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 1420 545	CA CA CD
17											
18	c	1405- 1655/1			CD CD	1319.5 1325	3.5 8		180 700	545 169 169 81 81 18	CD ECA ECA SA CD SD -
19	I _s - ALL DAY		g1900/3 G1904- 1903/3	*1911- 1917/3	SD	1910	2		450	545 470 167 18	CD CD ECD -
20											
21											
22											
23			b0550/2 g0550- 0551/3	*0602- 0611.5/2						9500 1420 545	CD SD SD
24											
25										9500 9500	CD CA
26					CD CD CDM M	0903 0926 0939 0943	5 4 4 137	0928 0941 1012	175 59 72 72	9400 1500 545 169 169	SD SD CD SA SA
27			b2037/1	*2041- 2054/2							

3. VIII-1R

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TABLE VIII.

Peak Flux	PLAGE DATA									SUNSPOT DATA					
	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.
941															
1338	*4445	Mar. 7.5	15°	S15	3	10000	45	3,4	4400	<i>dβd</i> <i>l-βl</i> <i>iβpl</i>	Mar. 6.7 7.4 7.5	S12 S14 S17	10 26 28	28-8 28-11 28-11	13062 13064 13063
	4445														
85 22	4444	7	22°	N31	2.5	4000	18	1	NEW	<i>dβpl</i>	7.2	N33	20	Mar. 2-11	13067
407	*4449	12	316°	N12	2.5	9500	31	3	4410	<i>dβd</i> <i>iβpl</i> <i>l-βl</i>	11.7 12.7 12.8	N23 N12 N12	(10) 11 17	8-11 7-17 7-18	13077 13075 13076
13 50															
348	4449														
13 210 40	4445														
1340 45	*4476	28.5	98°	S12	3.5	15000	90	2	4442a	* <i>dβs</i> * <i>iβpl</i> <i>dβ</i>	27.3 29.0 29.3	S08 S13 S07	11 21 13	24-30 22-30 23-30	13110 13103 13108
4476															
458	4476														
	4465	22.5	177°	N21	3	7000	66	1	NEW	<i>iβl</i>	22.8	N22	20	16-26	13092

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3. VIII-26

Event No.	Gr. Day.	FLARE DATA						SHORT-WAVE RADIO FADEOUTS						10 CM. EVENTS			
		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
28	Mar. 02																
29	02							S	1	1136	21		1*	*CD	1134	6.5	1138
30	03																
31	03	*1005	<u>1411</u>	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	<u>1540</u>	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	<u>455</u> 10	indet. 1516.6
39	12	<u>0024</u>	<u>0233</u>	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	<u>1454</u>	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	* <u>0947</u>	<u>1445</u>	1005	3+	S14E78	19/7	*S	3	0953	196	5	7	*6 4	0953 1143	110 <u>500</u>	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	<u>0626</u>	0603	2	S15E50	2/0	SL	2	0603	27	5	4	ECD	0558.8	<u>3</u>	0559.3
50	25																
51	25																
52	25																
53	26	0036	0040		1	N21W50	1/1										

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1958 (CONTINUED)

Event No.	DYNAMIC SPECTRUM DATA				200 MC/S DATA					OTHER R		
	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

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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.
1546.4	220 50	4476														
1034	758	4478	Mar. 30	78°	S22	3	6000	29	2	4438	* <i>ββ</i>	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	<i>δββ</i> <i>ββ</i>	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	<i>βββ</i>	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	<i>δββ</i> <i>βββ</i> <i>ββ</i>	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	<i>βββ</i> <i>ββ</i> <i>βββ</i> <i>δββ</i>	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														

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

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TABLE VIII.

Max. UT	Peak Flux	PLAGE DATA									SUNSPOT DATA					
		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 1337.5	7 62	*4508	Apr. 21.5	141°	S21	3.5	7500	30	1	NEW	<i>1β_{pl}</i>	Apr. 21.1	S22	23	14-26	13157
1931	15	*4530 4519	3 26	82° 349°	S15 N09	3.5 3.5	11000 6000	77 6	1 1	NEW NEW	<i>1β_{pl}</i> <i>1α_{pl}</i> <i>1β_{pl}</i>	3.2 25.4 26.4	S15 N08 N12	19 16 (20)	26-8 19-30 20-2	13197 13176 13179
2157 2128.5	25 136	4530 *4529	May 2	3°	N22	3	14000	60	3.5	4484, 4485	<i>1β_{pl}</i> <i>4β_{pl}</i>	May 2.0 2.9	N18 N25	17 15	25-7 30-8	13193 13204
2036.5 -	580 8 25	4529 4530 *4548														
Indet. 2156	20 570	*4578	30	352°	N24	3	8000	47	4.6	4529	<i>1β_d</i> <i>4β_{pl}</i>	29.8 30.7	N24 N29	6 14	23-1 28-6	13261 13275
0843.4 -	868 -	4578														
Indet. 1623	25 380 25	4598	June 11.5	187°	S20	3	7000	10	3	4548	<i>1β_d</i> <i>4β_{pl}</i>	June 10.6 11.7	S17 S26	(10) 9	4-13 6-16	13295 13299
		4578														
		*4596	10	207°	N28	3.5	10000	30	1	NEW	* <i>1α_{pl}</i>	10.3	N29	21	3-16	13282
		*4597	10	207°	N43	3	7000	77	1	NEW	<i>4β_{pl}</i>	9.8	N43	14	4-16	13294

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
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 in s 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 ECA	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-3P

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Event No.	Gr. Day.	FLARE DATA						SHORT-WAVE RADIO FADEOUTS						10 CM. EVENTS			
		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 <u>1930</u> b <u>1932</u>	<u>2005</u> <u>2015</u>	1940 1940	1+ 1+	S17E27 N10W50	5/5 3/3	S	1	1935	20	4	3	3	1920	40	
83	May 1	* <u>2115</u>	<u>2241</u>	2130	3	S18E15	4/4	SL	1+	2130	25	5	5	3 2	2127.9 2127.9	<u>132</u> 5	
84	2																
85	5	* <u>0356</u>	<u>0457</u>	0415	3	S18W29	3/2	*S	3	0407	53	5	5	*CD	0412	12	
86	5	a <u>2025</u> b <u>2032</u>	<u>2115</u> <u>2115</u>	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 <u>345</u>	
87	8																
88	13																
89	15																
89a	17																
90	19																
91	25																
92	29																
93	31																
94	June 04		<u>2147</u> <u>2356</u>	2152	2	N14W58	2/2	SL	2+	2142	58	5	9	3 *6	2125 2138	115 47	
95	05		<u>0835</u> <u>0956</u>	0850	2+	N15W65	15/6	S	2+	0842	55	5	4	*2 4	0839.5 0850.5	11 60	
96	05		<u>1615</u>	1656	1631	2+	S18E69	4/2	*S	3	1620	100	5	9	3 2 4	1614 1614 1632	180 18 23
97	06		<u>0436</u> <u>0614</u>	0448 0505	2	N16W78	7/4	SL	2	0436	50	5	4				
98	06																
99	07																
100	08																
101	10																
102	10																
103	14																

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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
76	C1338/2	g1336- 1337/1	*1340- 1344/3		SD	1337	2	-	80	9400 1500 169	SD SD ECD	1330 1337 1336
77												
78												
79												
80												
81												
82	S1921- 2020/1		*1943- 1951/3		SD SD SD	1923.3 1451.1 1956.1	0.3 0.2 0.1	1923.4 1951.2 1956.2	- - -			
83	S2216- 2340/1									9500	ECD	2128
84												
85									17	9500 2000 1000 545	ECD CD CD CD	0412 0412 0412.5 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 2000 1000 600 545 167 167	CD CD CD SA CD CD CD	2141 2201 2159 2147 2141 2139.4 2146
95					CD	0839.5	25		150	9400 1500 600 545 169 169	CD SD ECA CD ECA -	0839.5 0833 0840 0839.5 0840 0849
96					ECD	1617	18	1623	65	9400 1500 600 169	CD CD SA ECA	1618 1616 1619 1617
97	S0434- 0521/2	S0351- 0533/1 G0433- 0438/2 G0445- 0456/3		*0434- 0510/3)	CD	0434	40	0458	650	9500 2000 1000 600 600 600 169 169 169	CD CD F SA ECA - EFA ECA -	0437 0433 0433 0434 0444 0450 0434 0446 0454
98												
99												
100												
101												
102												
103												

3.VIII-4R

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TABLE VIII.

Max. UT	Peak Flux	PLAGE DATA									SUNSPOT DATA					
		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.
2117.2 2120.7	70 8	June *4607	18	101°	N12	3.5	7000	52	3	4563	<i>βββ</i>	June 17.9	N15	23	11-23	13311
0944.1 -	133 23	4607														
0245 0307.8	410 507	4618	26.5	1°	S16	3	11000	15	3	4579	* <i>δβγδ</i>	26.0	S15	14	20-27	13326
		4623	29.5	309°	N12	3	12000	16	1	NEW	<i>βββ</i>	29.9	N10	22	23-5	13335
0306.5	593	4623														
		*4622	29	315°	S19	3.5	7000	38	2	4581	<i>δβββ</i>	28.8	S19	26	23-4	13333
0048.2	620	July *4630	05	236°	N24	3	11000	39	1	NEW	* <i>ββββ</i>	July 5.3	N25	20	28-12	13350
0517	<u>789</u>	4630														
1715.8	7	*4636	08	196°	S22	3.5	8000	42	4	4598	<i>βββ</i>	7.7	S22	21	1-13	13353
0027.3 0111.3	780 3770	4634	07.5	203°	N28	3	9000	23	2	4596	<i>δβββ</i>	7.6	N20	19	2-14	13356
		4634														
1907.5	(390) 12	*4646	18	64°	N09	3	5500	40	1	NEW	<i>δβββ</i>	18.3	N09	27	12-24	13370
		4651	21	24°	N22	2.5	8500	21	1	NEW	<i>ββδ</i> <i>δβββ</i>	20.6 21.1	N20 N26	14 10	14-23 24-27	13376 13396
0242.5	597															
0043	828	*4665	31	252°	N04	3.5	12000	30	2	4631	<i>βββ</i> <i>δββδ</i>	31.0 31.4	N04 N08	21 11	24-5 30-5	13397 13413

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		<u>150</u>														
									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	<u>829</u>														
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	<u>1112</u>														
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	-	<u>150</u>														
9	-	108														
33	-	54														
97	1710	400														
84	1723.4	635														
12		99														
21		81														
40	0450	<u>1178</u>														
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)

Event No.	Gr. Day.	FLARE DATA						SHORT-WAVE RADIO FADEOUTS						10 CM. EVENT		
		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	<u>2112</u>	<u>2146</u>	2118	1	N14E38	4/4	S	1+	2115	13	5	8	2 2	2115.8 2120	3 1
105	19	* <u>0940</u>	<u>1210</u>	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	<u>0405</u>	0308	1+	N10E37	3/1	S	2	0308	25	5	4	*ESD	0306	6
111	28															
112	29															
113	30															
114	July 03	<u>0041</u>	<u>0114</u>	0050	1+	N30E37	3/3	S	1-	0050	7		1	*SD	0045	6
115	04															
116	04	<u>0513</u>	<u>0534</u>	0517	1+	N29E26	1/1	S	1	0517	11	5	2	*CD	0516	4
117	04	<u>1712.5</u> <u>1747.5</u>	<u>1722.5</u> <u>1755</u>	1717.5 1750	1- 1-	S23E32 S23E32	1/1 1/1	*SL	3	1730	150	3	3	1	1715.2	2
118	07	* <u>0020</u>	<u>0414</u>	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	<u>2317</u>	2330	2330	1	N26W78	1/1	G	1	2320	35		1			
122	17															
123	18															
124	18															
125	19	<u>1905</u>	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															

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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 25	0244 0304	421 2100	*4659	July 26.5	311°	S19	3	20000	112	3	4622	<i>l-βpl</i> * <i>dβyl</i> <i>lβpl</i>	July 25.6 26.1 27.5	S18 S15 S19	20 23 23	19-31 20-1 20-2	13384 13388
8	0512	506	4659														
12 70	1529.5	(400) 25	4659														
26.5	1125	294	4659														
300 25	Indet. 1842.1	30 2050	4659														
20	0431.3	337	*4667	Aug. 02	225°	N27	3.5	15000	27	2	4630	<i>dβpl</i>	Aug. 2.0	N26	18	27-7	13404
3.5	2114	45	*4670	04	199°	S09	3.5	5000	31	1	NEW	<i>lβpl</i>	3.6	S11	16	28-8	13406
	Indet. 1503 1521.8 1547.6	25 95 180 12	*4686	12.5	86°	S13	3.5	11000	72	2	4653	* <i>lβyl</i>	12.5	S14	35	6-18	13434
	2153.5	55	4686														
	0439.4	5030	4686														
	2225 2210 2311	(90) (335) 65	*4708	22	321°	N18	3.5	8000	60	3	4657	* <i>lβyl</i>	21.8	N17	23	15-28	13464
	0043.3	1260	4708														
	Indet. 1506.3	45 (1500)	4708														
50 22	0041 0145	(5000) (77)	4708														

1958 (CONTINUED)

Event No.	DYNAMIC SPECTRUM DATA				200 MC/S DATA					OTHER RADIO 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	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 7 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 C 1913- 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 C 0010- 0143/2				CD	0050	1.5	-	180	9500 2000	ESD SD	0041.7 0040	5 6
130													

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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													
0245.3	434													
0307.8	518													
0245.9	(34)													
0316.2	(100)													
0316	189													
0334	54													
0306.5	709													
0306.8	(70)													
0048	704													
0048.2	(125)													
0048.3	(50)													
0048	206													
0051	31													
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													
	300													
	305													
	250													
	2250													
0242.5	494													
0242.6	115													
0242.7	32													
0043	1280													
0043.2	(75)													
		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	2.5a	g	m	6	5
								21	1636	1d	sc	m	15	7
								24	12xx	2d	g	ms	1	5
								27	03xx	1d	g	ms	5	5

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Event No.	Gr. Day.	FLARE DATA						SHORT-WAVE RADIO FADEOUTS						Type	Beg. UT
		Beg. UT	End UT	Max. UT	Imp.	Position	No. of Obs.	Type	Imp.	Beg. UT	Dur. Min.	Wide Spread Index	No. of Obs.		
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	0427.5
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

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TABLE VIII.

RTS		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.	
1039	573		Aug.														
		a	4712	24	294°	S18	3	7500	15	4	4659	a <i>lβll</i>	23.8	S18	12	18-29	13470
		*b	4722	31	202°	S09	3.5	12000	54	2	4670	b <i>l-βl</i>	30.3	S11	23	24-5	13480
		c	4710	22	321°	S15	3	9000	12	4	4659	c <i>dβpl</i>	31.1	S08	29	25-6	13485
			Sept.														
		*4741	09	83°	S07	3	7000	57	1	NEW	* <i>lyl</i>	8.8	S09	15	2-14	13509	
											<i>l-d</i>	9.7	S09	11	3-12	13511	
Indet. 1659.2	10 145	4739	08	96°	S20	3	14000	17	3	4684 4686	<i>l-βd</i> <i>lβpl</i>	7.7 8.7	S15 S15	15 19	2-11 2-14	13507 13508	
		4743	9.5	76°	N17	3	6000	17	1	NEW	* <i>lβyd</i>	9.8	N18	18	3-14	13510	
0835 0904	- 1259	4741															
		4756	17.5	331°	N17	3	9000	26	4	4708	<i>l-βl</i> * <i>lβyl</i>	16.6 17.4	N14 N15	27 19	10-22 11-22	13530 13535	
0830	261	4750	14.5	11°	S10	3	9000	20	2	4703	<i>d-d</i> <i>lβll</i> <i>l-βd</i>	13.6 14.2 15.2	S10 S12 S08	11 20 10	11-17 6-20 9-18	13534 13524 13528	
		4764	20	298°	N23	3.5	6000	22	3, 4	4711	* <i>dβyl</i>	20.2	N23	16	14-26	13546	
-	336	*4765	19.5	305°	S18	3.5	17000	58	5	4712 4710	* <i>lβpl</i>	19.7	S18	36	13-25	13544	
2045.5	58	4777	24	245°	N30	3	3000	7	1	NEW	<i>dβll</i>	24.1	N30	16	24-30	13565	
2144.2	160	4781	30	166°	S10	3.5	7500	22	1	NEW	<i>βld</i> <i>βpl</i>	29.5 30.0	S07 S12	10 17	24-2 24-5	13570 13572	
		4806	Oct. 10.5	27°	N13	3.5	3000	6	2	4748	<i>lβpd</i>	Oct. 10.8	N13	18	4-15	13599	
0205	332																
2345	1900	*4826	20.5	255°	S02	3.5	6500	50	1	NEW	* <i>lβyl</i>	20.3	S05	26	14-25	13625	
		*4829	22.5	229°	S10	3	9000	36	2	4779	* <i>lβyl</i>	22.2	S10	23	16-28	13633	

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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	g 0319- 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	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	g 1452/3								9400 1500 600 600 545	SD SD ECDM ESD CD	1500 1500 1501 1521 1508.5
140		b 2153/1 g 2154/2	*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	g 2113/2 G2200- 2203/2 g 2204- 2206/3 b 2207/1	*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 g 0054/1	*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		g 0023- 0024/3 g 0034- 0035/3 g 0038/3 b 0040/3 g 0042/3 g 0043/3	*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

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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	July 29	0450		48	1.5	L								
21	0304	(830)														
21	0303.6	(1830)														
9	-	550														
6.5	-	780														
6	-	1000														
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														
3	2200.9	528	Aug. 16	0600	16h	71	97	B, L, H, K								
14	2210	760														
9	2310	540														
59	2210	205														
59	2311	176														
145	-	250														
10	0043.8	3610														
7	0044	(820)														
13	0044	255														
9	0045	72														
7	-	300														
172	1451	718	21	1500	-	24	(3)	L								
128	1509	443														
73	-	306														
86	-	190														
208	-	540														
172	1451	718														
128	1509	443														
73	-	306														
86	-	190														
208	-	540														
60	0026	5920	22	1530	11	84	85	B, L, H, K								
57	0042	(2100)														
89	0042	288														
59	0022	1900														
40	0146	(80)														
135	-	1600														
60	0026	5920														
57	0042	(2100)														
89	0042	288														
59	0022	1900														
40	0146	(80)														
135	-	1600														
Aug. 17	0623	1d	sc	ms	16	7										
22	0228	12h	sc	m	11	6										
24	0140	1.5d	sc	ms	16	8										

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Event No.	Gr. Day.	FLARE DATA						SHORT-WAVE RADIO FADEOUTS						10 CM. EVENTS		
		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 <u>1025</u> b <u>1028</u> c <u>1032</u>	<u>1045</u> <u>1047</u> <u>1210</u>	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	<u>2102</u>	<u>2141</u>	2105	1+	S08E84	5/5	S	2+	2105	32	5	12			
156	03															
157	07	<u>1639</u>	<u>1726</u>	1643	2	S32E18	2/2	*S	3	1658	45	5	8	3 2	1649 1658	120 9
158	09															
159	14	<u>0822</u>	<u>1030</u>	0835 0900	2+	S10W80	12/3	*S	3	0851	58	5	6	*M	0830	69
160	16															
161	17															
162	18	* <u>0728</u>	<u>0938</u>	0830	3	S11W53	8/2							SD	0827	11.3
163	20															
164	22	<u>0738</u>	0910	0750	2	S19W42	9/4	S	2	0755	35	1	1	CD	0739	31
165	22															
166	25															
167	28	<u>2046</u>	<u>2108</u>	2054	1-	N32W66	1/1	SL	1	2045	10	4	3	2	2044	3
168	30															
169	Oct. 02	<u>2143</u>	<u>2201</u>	2148	1	S06W38	2/2							2	2143	7
170	03															
171	08	<u>1510</u>	<u>1528</u>	1522	1-	N12E25	1/1									
172	10							*S	3	0200	60	5	4	CD	0156.5	16
173	21	<u>2318</u>	<u>0127</u>	2330	2+	S04W22	5/5	*S	3+	2328	72	5	9	*CD	2345	35
174	22															
175	22															

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1958 (CONTINUED)

Event No.	DYNAMIC SPECTRUM DATA				200 MC/S DATA					Freq. Mc/s	Type	
	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			
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												

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TABLE VIII.

Peak Flux	PLAGE DATA									SUNSPOT DATA					
	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	<i>d.s.d</i>	Oct. 27.5	S32	(2)	22-26	13648
185 40	4826														
	*4849	Nov. 3.5	71	S15	3	6000	49	2	4817	<i>l.p.p.l</i>	Nov. 3.3	S17	29	28-9	13664
	4851	3.5	71	N08	3	5500	11	1	NEW	* <i>l.p.p.l</i>	3.3	N07	26	27-8	13660
	4877	18	240°	S12	3	11000	4	3	4829	<i>l.p.p.d</i>	17.8	S10	3	11-18	13694
35 285	*4883	24.5	154°	S12	3.5	12000	34	1	NEW	<i>d.p.l.l</i>	23.6	S12	20	20-29	13718
										<i>d.p.d</i>	23.6	S06	11	21-25	13724
										<i>l.p.p.d</i>	24.4	S13	14	18-29	13712
										<i>d.p.d</i>	24.9	S13	13	20-25	13719
10 50	*4884	25.5	141°	N22	3	6000	33	1	NEW	<i>l.p.p.d</i>	25.1	N17	21	18-29	13713
										<i>d.p.p.l</i>	26.2	N20	30	23-2	13728
	4884														
	4898	Dec. 02	55°	N15	2.5	7500	8	3.4	4854	<i>d.p.p.l</i>	Dec. 2.2	N15	16	17-8	13740
										<i>d.p.l</i>	2.8	N12	13	30-8	13747
	*4897	Nov. 30.5	75°	S18	2.5	12000	31	3	4849	<i>d.p.p.d</i>	Nov. 29.6	S17	11	24-2	13736
										<i>l.p.p.l</i>	30.6	S17	23	23-7	13733
32	4898														
	*4911	Dec. 09.5	316°	N16	3	9000	31	1	NEW	<i>l.p.l</i>	Dec. 9.7	N14	18	3-15	13758
416	*4913	12	283°	S03	3.5	9500	69	3	4873	* <i>l.p.p.l</i>	11.7	S02	27	5-18	13763
										<i>l.p.p.l</i>	12.1	S06	22	5-17	13765
293	4913														
150 13	4913														

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Event No.	Gr. Day.	FLARE DATA						SHORT-WAVE RADIO FADEOUTS						10 CM. EVENTS			
		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
176	Oct. 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																
182	Nov. 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																
193	Dec. 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

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1958 (CONTINUED)

Event No.	DYNAMIC SPECTRUM DATA				200 MC/S DATA				OTHER			
	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 _s 1919- 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	1414.4 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

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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.
		4913														
		4913														
		4905	Dec. 5.5	9°	S07	2.5	3000	5	1	NEW	<i>4913</i>	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 20	4913														
		4913														
	571	4913														
1859	250 5	4919	15	244°	N10	3	5000	10	1	NEW	<i>4919</i>	15.1	N08	14	8-19	13773
0605	1750	*4934	28	73°	S17	3.5	10000	48	4	4897	<i>4934</i>	27.0	S19	25	20-1	13800
											<i>4934</i>	27.6	S17	24	21-2	13803
											<i>4934</i>	28.4	S14	19	21-3	13804
		*4936	29	59°	N16	3.5	15000	30	4.5	4898	<i>4936</i>	28.5	N12	14	28-2	13820
											<i>4936</i>	28.8	N15	19	22-3	13805
											<i>4936</i>	29.8	N20	12	23-31	13809
1701.5	340 5	4934									<i>4934</i>	30.2	N19	16	24-3	13811



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

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1958 (CONTINUED)

Event No.	DYNAMIC SPECTRUM DATA				200 MC/S DATA				OTHER RADIO 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	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

(1)

		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
-	<u>140</u>													
-	<u>140</u>													
-	<u>1800</u>													
-	<u>790</u>													
-	<u>140</u>													
1856	<u>890</u>													
-	<u>140</u>													
1937.5	<u>1400</u>													
1302	1045													
1302	884													
-	1950													
-	-													
-	<u>500</u>													
-	<u>11120</u>													
-	100													
								Dec.						
								13	0002	2d	sc	ms	15	6
								15	2022	1d	sc	m	6	4
1042	171													
-	110													
-	10													
-	1035													
-	1890													
-	<u>62</u>													
-	45							17	1547	1d	sc	ms	14	7
0605	(1000)													
0605	(370)													
0605	163													
0544	(158)													
-	<u>450</u>													
-	<u>300</u>													
-	<u>92</u>													
-	<u>130</u>													
1707	350													

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