

# Solar Bulletin

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## SOLAR ACTIVITY DURING NOVEMBER

A complete tabulation of all sudden ionospheric disturbances recorded by the AAVSO, Solar Division's indirect flare patrol during November appears on page 2 along with reproductions of the actual recordings of the two most intense events. Most of these disturbances were recorded by the SES (sudden enhancement of signal) method using the signal of very-low-frequency station NBA, Panama (24 kHz). Transmissions from NBA during recent months have been of a type easily utilized for flare detection.

Some of November's sunspot groups were particularly puzzling to many sunspot observers due to two separate groups appearing in very close proximity. We are indebted to Thomas Cragg for the following enlightenment concerning some of these groups which he was able to supply, having observed their magnetic polarity characteristics on the Mount Wilson magnetograph.

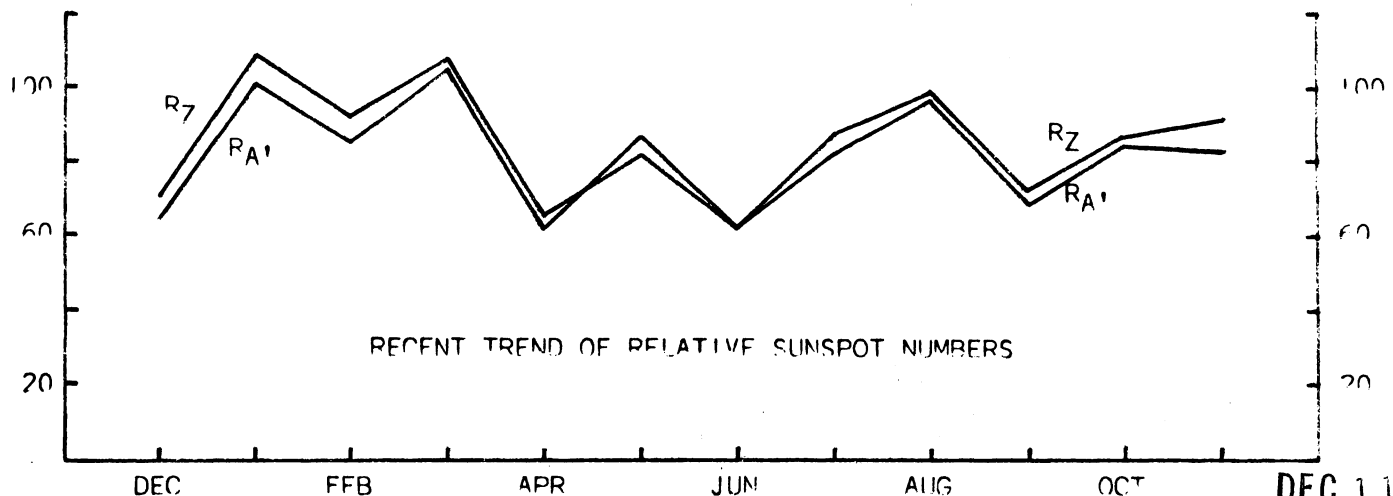
An old single-spot J-type group became surrounded by a developing D-type group of 3 spots as it was nearing the central meridian in the southern hemisphere on 1 November. By the 7th, this D-type group had decayed to several tiny spots as the old J spot passed over the west limb.

A large spot that appeared at the northeast limb on the 12th turned out to be the leader of a large complex naked-eye group that reached the central meridian on the 19th. The follower of this F-type group magnetic polarity normal for a leader but most of the small spots near it and to the south of it were of the normal follower polarity. This mixed polarity during disk passage probably accounted for much of the flare activity that produced the ionospheric disturbances mentioned above.

Another instance of an old J-type group being surrounded by a new developing group occurred near the central meridian in the northern hemisphere on the 15th. The developing D group lay to the south and east of the J spot.

One of the surprising groups of the month started on the 24th as a single small spot just to the northwest of a northern F group then nearing the central meridian. During the next few days this developed into a large complex E group rivaling its close neighbor as the two groups reached the west limb at month's end.

A fast developing group also started in the southern hemisphere on the 24th and had developed into an E group by the 27th. In spite of this southern group's ominous appearance, magnetic polarities showed it to be a normal bipolar group without mixed polarities.



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AMERICAN ( $R_A$ ) AND ZURICH ( $R_Z$ ) RELATIVE SUNSPOT NUMBERS, NOVEMBER 1967

day	$R_A$	$R_Z$	day	$R_A$	$R_Z$
1	109	119	16	109	119
2	119	117	17	88	121
3	118	113	18	109	134
4	76	102	19	111	131
5	49	81	20	89	111
6	43	48	21	76	95
7	35	47	22	66	92
8	13	29	23	79	105
9	25	34	24	96	108
10	26	39	25	97	131
11	41	31	26	113	101
12	62	56	27	122	100
13	79	77	28	110	100
14	72	95	29	132	109
15	76	98	30	137	112

November mean  $R_A$  = 82.6

November mean  $R_Z$  = 91.8

SUDDEN IONOSPHERIC DISTURBANCES RECORDED DURING NOVEMBER

DAY	MAX.	SEA	SES	DEF.	OBSERVERS	DAY	MAX.	SEA	SES	DEF.	OBSERVERS
2	0902	2		4	A-17	17	1540		3	5	A-1, A-20
4	0411	1		1	A-17	18	1520		1	4	A-1
10	1535	1*	1+	2	A-1, A-8*	21	1456		1	2	A-1
12	1659		1+	4	A-1	30	1359		2	4	A-1
16	2140		2+	2	A-1	30	2005		2	3	A-1

