

# Solar Bulletin

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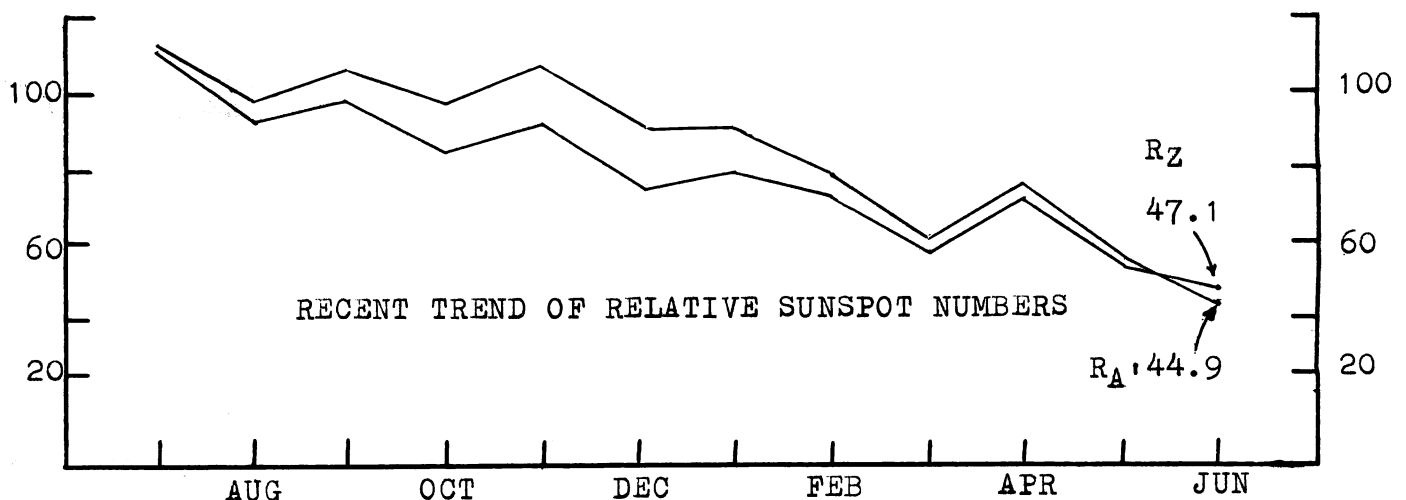
June 1971

## SOLAR ACTIVITY DURING JUNE

Nine separate ionospheric disturbances were recorded during the last six days of the month of June by the Solar Division observers. The last event recorded in June, and what will probably be the first event recorded in July are shown on page two as recorded by Mr. Howard M. Krawetz of Sunnyvale, California. Due to Mr. Krawetz' more westerly location, where the signal path was still sunlit, he was able to record the event early in the 1st day of July in Universal Time (UT).

Sunspot activity increased toward the end of June at which time large spots appeared in the southeast which were a real puzzle for sunspot observers to divide into groups. Using the Mount Wilson magnetic data, Tom Cragg divided this region as follows:

"On June 26 what appeared to be a single group came over the SE limb. Actually the larger spot was a leader, but so was the smaller spot which looked like a follower. However, it had leading polarity. On the 27th, things were much more confused. Our original leader now had a couple of small followers; the leading spot which yesterday looked like a follower had now become a little larger and more complex; and to the south was a third group which at this stage was no more than a double leader. Now, by the 28th, things were really popping. Our original leader was now still a beta-p, and close on its heels was the group which originally looked like a follower which now had developed a complex looking leader portion and a small follower. The group which had formed yesterday to the south was now the dominant group of the whole complex having grown enormously during the last 24 hours. Then to add its weight, a fourth group now formed behind the second one so that now we had three groups head to tail with a fourth lying to the south of the whole mess. The 29th and 30th found the middle group of the three in a row sort of getting squeezed out, but it held out up through the 5th of July when the whole area was on the decline."



AMERICAN (R<sub>A'</sub>) AND ZURICH (R<sub>Z</sub>) RELATIVE SUNSPOT NUMBERS, JUNE 1971

DAY	R <sub>A'</sub>	R <sub>Z</sub>	DAY	R <sub>A'</sub>	R <sub>Z</sub>
1	50	49	16	23	40
2	54	61	17	33	44
3	51	60	18	32	42
4	35	55	19	22	23
5	31	43	20	27	38
6	28	25	21	34	35
7	29	24	22	36	31
8	38	40	23	40	49
9	29	27	24	42	32
10	22	24	25	62	64
11	26	26	26	79	88
12	32	28	27	96	106
13	23	22	28	100	99
14	29	34	29	110	95
15	20	17	30	114	91

Monthly Means  
 R<sub>A'</sub> = 44.9  
 R<sub>Z</sub> = 47.1

SUDDEN IONOSPHERIC DISTURBANCES RECORDED DURING JUNE 1971

DAY	MAX	SEA	SES	DEF	OBSERVERS	DAY	MAX	SEA	SES	DEF	OBSERVERS
24	2145	1-	1-	5	A1,18,19,21,23,27	29	1240		1	5	A1,19
25	2338		1	4	A1,21	29	1546	1-	1+	5	A1,23,26,27
26	1320	1-	1-	5	A1,17,31	29	2241	1	1+	5	A8,19,23,26, 27,30,31
26	1426	1	1+	5	A1,17,21,31						
28	1300*	1-	1-	5	A18,21,22,23,26	30	2152		1	5	A1,21,30

\*This peak appeared to have a 2nd peak at about 1320 on many charts.

Mr. Howard M. Krawetz, Sunnyvale, California (Observer A30) made this chart by recording the amplitude of an unlisted radio station on 37.2 kHz. Note that the amplitude of the signal is decreased rather than increased as is commonly the situation for SES. This phenomena is not new and has been noted for both long and short signal paths. This recording was made over a short signal path and is sometimes explained by pointing out that both a "ground" and "sky" wave is received with the energy from the sky increasing during a SID and cancelling the stronger ground wave giving an "inverted" SES. The exact mechanics of the theory are somewhat controversial. While very high sensitivity is indicated in this recording, the technique may be subject to seasonal variations and other effects limiting universal use.

In addition to the well defined event peaking at 0134 on 1 July, and the one at 2152 on 30 June, there may have been a very small SID just prior to 1800 on 30 June.

