

Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS — SOLAR DIVISION

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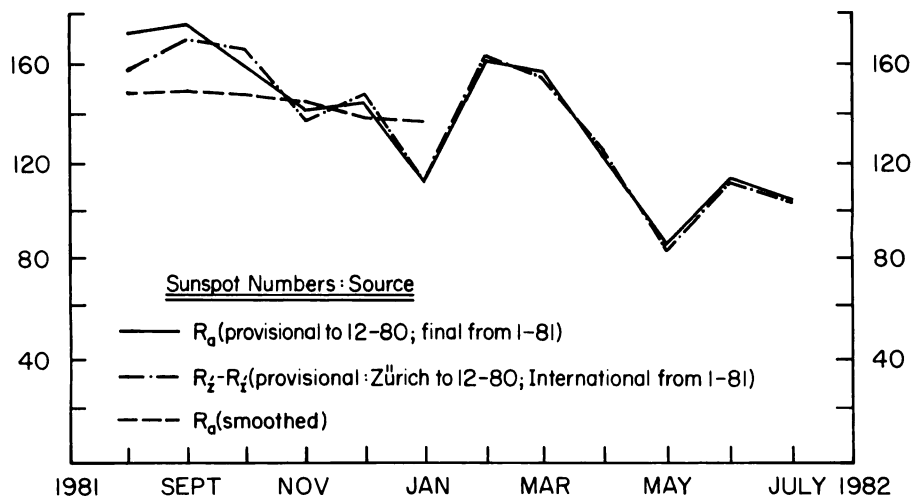
Volume 38

Number 7

July 1982

SOLAR ACTIVITY DURING JULY 1982

July's sunspot data are given in the table of daily numbers (R_a and R_1') on page 2, while recent monthly means are plotted in the graph on this page. Although the monthly mean for AAVSO sunspot numbers fell to 103.5 from 113.5 in June, and the 12-month smoothed mean for January 1982 dropped to 138.3 from 139.8 for December 1981, final daily R_a values showed a large variation. Nearly all the sunspot groups were concentrated in one "longitudinal hemisphere," with the other "side" of the sun virtually bare. The R_a high was 279 on the 17th. This level of sunspot activity has been equalled or slightly exceeded for only three brief periods during the past cycle: two days in November 1979, one in December 1979, and two in October 1980. The minimum R_a of 16 occurred on the 28th, the lowest number since August 1978. During the first week of July, numbers were very low. On the 8th, the first groups in two large chains of active regions, one in each hemisphere, appeared around the east limb. Numbers climbed steadily as these and several following groups developed very complex structures on disc. One huge group contained over 140 individual spots at its peak. By the 17th there were 17 groups visible, 6 with 30+ spots, including one with 60+ and one with 90+ spots. From the 17th, numbers rapidly decreased as active regions rotated off disc, leaving only 2 small, isolated groups by the 28th.



Maximums of the 144 Sudden Enhancements of VLF Signals (SESS) detected by the AAVSO Indirect Solar Flare Patrol in July are listed on page 2. This number represents a considerable decline from the 217 in June but is still much higher than the 60 in April and the 75 in May. Events were fairly well distributed over the month, with none on 9 days (1, 2, 5, 6, 18, 23, 26, 29, 31) and highest frequencies on the 9th (15), 10th (15), and 11th (19). Only 5 of Importance 3 events were noted, and zero of Importance 4, a sharp decline from the corresponding 22 and 3 for June. Part of a record by A28 of amplitude of the VLF signal at 21.4 kHz on July 16 is included on page 2. At first glance, there seems to be little relationship between this tape record and the group table of SES maximums. However, the puzzle is easily solved if it is realized that: (a) events are included in the group table conservatively; (b) SESSs can appear in inverted form; (c) a small transposition in time (time "error") is present; (d) as in all measurement, there is variability here from source to source in values, with a "best estimate" representing the set of numbers.

SUDDEN IONOSPHERIC DISTURBANCES (SESs) RECORDED DURING JULY 1982

Records were received from A1, 9, 19, 26, 28, 31, 49, 50, 51, 52, 54, 55, 56, 57, J. Barsby

Day	Max	Imp	Def	Observers	Day	Max	Imp	Def	Observers	Day	Max	Imp	Def	Observers
3	08:07	1	5	A52	12	19:12	1-	5	A19,26,31,51,55,56	25	14:41	2	5	A19,31,56
3	12:51	1-	5	A19,26,49,51	12	20:50	1+	5	A19,26,31,51,55,56	25	18:16	1-	5	A19,26,28,31,49,54,56
3	17:46	1	5	A9,19,26,31,49,51,54,55,56	13	10:02	2+	5	A52	27	12:30	1	4	A19
4	05:00	2	5	A31,52,55,56	13	14:14	1+	5	A9,19,31,49,50,55,56	27	16:11	2	5	A19,31,55,56
7	13:49	1-	4	A31,56	13	16:37	1	5	A9,31,55,56	27	19:05	1-	5	A31
7	19:06	1-	5	A31,55	13	17:48	1-	5	A31	28	03:13	1-	4	A31
7	20:16	1	5	A9,19,26,31,49,50,51,54,55,56	13	20:43	1+	5	A9,31,55,56	28	18:54	1+	5	A28,31,51,55
7	23:21	1	5	A9,26,31,50,54,55,56	13	21:58	2	5	A55,56	30	03:51	1-	5	A31
8	02:30	1-	5	A31,56	14	13:27	1	5	A9,19,26,50,51,54					
8	04:16	1	4	A31	14	15:15	3	5	A9,19,26,31,51,55,56					
8	05:15	1-	5	A31,52,56	14	17:50	2	5	A9,19,26,31,51,55,56					
8	07:05	3	5	A31,52,56	14	18:49	1+	5	A9,19,26,31,51,55,56					
8	14:32	1-	5	A19,26,31,49,50,51,54,55,56,57	14	20:16	1-	5	A31,55,56					
8	20:42	2	5	A19,26,31,49,51,55,56	14	20:51	1-	5	A9,19,31,55,56					
9	00:32	1	5	A31,50	14	21:26	1-	5	A31,55					
9	04:58	2	5	A52	14	21:35	1-	5	A9,31					
9	06:06	1	4	A31	14	22:20	1-	4	A31,56					
9	07:23	1	5	A31,52,56	15	02:35	1	5	A55,56					
9	07:44	2+	5	A31,52,55,56	15	09:46	2+	5	A55					
9	08:55	3	5	A31,52,56	15	14:49	1-	5	A19					
9	09:19	2	5	A31,55,56	15	15:31	1-	5	A19,55					
9	15:25	1-	4	A31,51,55,56	15	16:19	1-	5	A19,31,55					
9	16:24	1+	5	A9,19,26,31,51,55,56,57	15	17:48	1	4	A19,31					
9	17:09	1-	5	A9,19,26,31,51,55,56	15	18:45	1-	5	A19					
9	18:45	1	5	A19,26,31,51,55,56	15	22:15	1	5	A9,19,26,31,49,50,54,55,56					
9	20:49	1-	4	A19,26,31,51,55	16	00:36	1+	5	A31					
9	21:12	1	5	A9,19,26,31,51,54,55,56	16	01:45	1-	5	A31					
9	22:14	1-	5	A9,19,26,31,49,50,51,55,56	16	09:12	1	5	A52					
9	22:54	1+	5	A9,19,26,31,49,50,54,56	16	12:51	1-	5	A19,26,28,50,51					
10	01:50	1	5	A31,50,55,56	16	15:06	1-	5	A19,26,28,31,50,51,55,56,57					
10	02:09	1-	5	A55,56	16	15:25	1-	5	A19,28,31,50,51,55,56,57					
10	03:22	1-	5	A55,56	16	16:32	1	5	A19,26,28,50,55,56					
10	04:14	1-	5	A31,55,56	16	18:34	1	5	A19,31					
10	07:36	1	5	A55	16	18:56	2	5	A9,19,26,28,31,49,51,55,56					
10	08:48	1+	5	A31,55	16	00:05	1	5	A31,50					
10	15:13	1-	5	A19,26,31,49,55	17	02:12	1	5	A31,52,55,56,57					
10	15:37	1-	5	A19,26,31,50,55,56	17	10:32	2	5	A52					
10	16:25	2+	5	A9,19,26,31,50,51,55,56	17	13:08	1	5	A19,26,56					
10	17:01	1	5	A19,31,51,55,56	17	17:21	1-	5	A9,19,31,55,56					
10	19:56	1-	5	A9,19,26,31,51,55,56	17	18:34	1-	5	A9,19,31,50,55					
10	20:21	2	5	A9,19,26,31,50,51,55,56,57	17	23:23	1+	5	A19,26,31,49,50,51,55,56					
10	20:54	1-	5	A19,31,55	19	01:01	1+	5	A31,56					
10	21:50	1+	5	A9,19,26,31,49,50,51,55,56	19	04:24	1-	5	A31					
10	23:24	1	5	A9,19,26,31,49,50,51,54,55,56	19	09:06	2+	5	A55					
11	01:36	1-	5	A31	19	09:30	1	5	A55					
11	02:24	1	5	A31,55,56	19	11:56	1	5	A52					
11	02:42	1	5	A31,55,56	19	12:57	1-	5	A19,26,52					
11	04:27	1-	5	A31,55,56	19	18:22	1+	5	A9,26,31,51,55,56					
11	06:45	1+	5	A52	19	18:51	1+	5	A26,31,51,55,56					
11	07:23	1	5	A52	19	19:52	1	5	A9,26,31,55					
11	07:58	1+	5	A52	19	20:23	1-	5	A9,26,31,49,51,55,56					
11	09:49	1+	5	A52	19	22:15	3	5	A31,54,55,56					
11	10:50	1-	5	A52	20	00:45	1	5	A31,50,55,56					
11	12:59	1-	5	A19,26	20	02:09	1-	4	A31,55					
11	13:50	1-	5	A19,26,50,55	20	02:49	1+	5	A31,55,56					
11	14:06	1+	5	A9,19,26,31,50,51,55,56,57	20	04:23	1+	5	A31,55,56					
11	15:26	1-	5	A19,31,50	20	10:10	1+	5	A52, Barsby					
11	17:14	2+	5	A9,19,26,31,51,55,56	20	22:07	2+	5	A9,19,26,28,31,49,54,55,56					
11	19:00	1	5	A9,19,26,31,51,54,55,56	21	23:16	1	5	A31,55,56					
11	19:39	1+	5	A9,19,26,31,51,55,56	21	10:17	1+	5	A52, Barsby					
11	21:53	1-	4	A31,56	21	17:00	2	5	A19,26,31,51,54,55,56					
11	22:16	1-	5	A19,31,49,55,56	21	18:26	2	5	A9,19,26,31,50,51,55,56					
11	23:28	2+	5	A9,19,26,31,49,51,55,56	22	07:44	1	5	A52, Barsby					
12	01:03	1-	5	A31,55,56	22	14:24	2+	5	A19,26,28,31,51,55,56					
12	03:23	1+	5	A31	22	17:10	3	5	A26,28,31,51,55,56					
12	16:36	1-	5	A19,26,31,51,55	22	20:14	1-	4	A26,31,55					
					24	13:39	1	5	A19,31,55,56,57					
					24	18:02	2	5	A19,26,28,31,51,54,55					
					24	18:29	2+	5	A19,31,55,56					
					24	21:29	2	5	A19,31,56					

July 1982		
RELATIVE SUNSPOT NUMBERS (R):		
AAVSO (a), INTERNATIONAL (I)		
Day	R _a	R _I
1	44	50
2	32	41
3	26	33
4	35	42
5	36	50
6	32	32
7	34	33
8	40	49
9	72	61
10	129	110
11	145	146
12	192	177
13	221	219
14	224	222
15	244	234
16	262	263
17	279	272
18	261	220
19	209	200
20	174	180
21	133	129
22	91	99
23	56	74
24	27	27
25	26	25
26	25	37
27	20	22
28	16	19
29	25	23
30	42	38
31	58	54
Mean	103.5	102.6

