

Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS - SOLAR DIVISION

Elizabeth Stephenson, Editor
14205 Washington Boulevard
University Heights, OH 44118



email: AU206265@aol.com
phone: 216-291-0275
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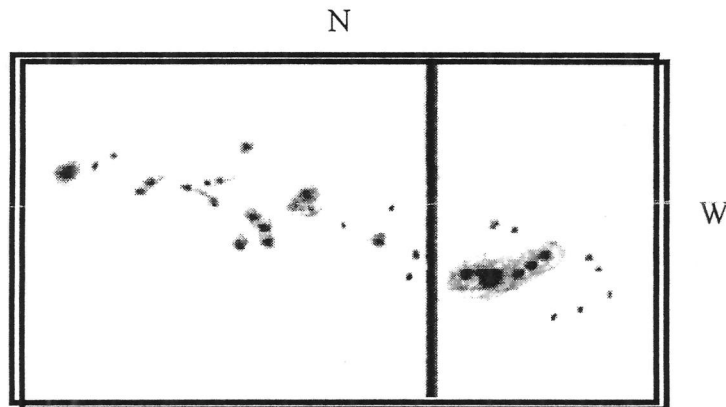
October 1997

American Relative Sunspot Numbers, R_a , for October 1997

| Date | R_a Final | Date | R_a Final | Date | R_a Final |
|------|-------------|------|-------------|------|-------------|
| 1 | 25 | 11 | 29 | 21 | 24 |
| 2 | 25 | 12 | 33 | 22 | 9 |
| 3 | 27 | 13 | 32 | 23 | 2 |
| 4 | 26 | 14 | 30 | 24 | 1 |
| 5 | 26 | 15 | 35 | 25 | 11 |
| 6 | 21 | 16 | 46 | 26 | 13 |
| 7 | 19 | 17 | 49 | 27 | 28 |
| 8 | 14 | 18 | 37 | 28 | 38 |
| 9 | 23 | 19 | 29 | 29 | 41 |
| 10 | 27 | 20 | 26 | 30 | 50 |
| | | | | 31 | 45 |

Monthly Mean = 27.2

(Based on 820 observations contributed by 51 observers.)

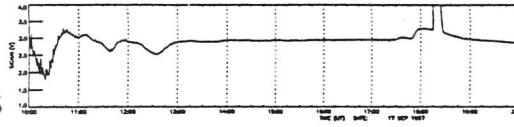


Drawing by David Teske, using a 3-inch refractor, of a large group crossing the solar meridian on November 2, 1997. Penumbrae surround the string of five dark spots and the triplet to the left-of-center. The length of this spot array is about one-tenth of the solar diameter.

Betty Stephenson

Sudden Ionospheric Disturbance Report

Casper Hossfield, SID Coordinator
PO Box 23
New Milford, NY 10959 USA
casper@carroll.com/ FAX 201.327.5246



Joseph Lawrence, SID Analyst
1808 N. Anthony Blvd.
FortWayne, IN 46805 USA
lawrence@cvax.ipfw.indiana.edu

Sudden Ionospheric Disturbances Recorded During October 1997

| Date | Start (UT) |
|--------|------------|
| 971002 | 2145 |
| 971016 | 0333 |
| 971028 | 1253 |
| 971031 | 0314 |

The following observers submitted reports and/or charts for October:

A-05 Hossfield, New York/ A-09 Scharlach, Arizona/ *A-50 Winkler, Texas/ *A-52 Overbeek-Toldo, Republic of South Africa/ *A-62 Stokes, Ohio/ *A-63 Ellerbe, Spain/ *A-72 Witkowski, Florida/ *A-80 King, England.

*observers who analyzed their own charts and submitted an e-mail report.

The events listed above meet the following criteria:

- 1) identified on at least two observer's charts.
- 2) definiteness rating = 5
- 3) overseas observers' events included without confirming correlation
(with so few overseas submissions, all overseas SID events were included)

Only those reports submitted via e-mail can be included in the National Geophysical Data Center (NGDC) report. All observers are strongly encouraged to analyze their own charts and submit a formatted e-mail report to the SID Analyst. Instructions for identifying SID events were published in the October 1992 SID Technical Bulletin. Since several observers have joined the program after the original publication and now that many observers are recording SIDs via computer interface, it is worthwhile to repeat these instructions. As the current solar cycle 23 progresses, more observers worldwide are needed to cover those periods of the day not presently monitored by American observers. Observers who analyze their own charts help lessen the workload on the SID Coordinator and SID Analyst, who greatly appreciate your efforts

With the following instructions and some practice, all SID program contributors can identify events on their own charts and submit monthly reports for inclusion in the NGDC report. At present, results from observers who submit un-analyzed stripcharts are only used for correlation with and confirmation of events identified by observers who analyze their own charts. The data reduction process can be personally rewarding as you become more directly involved with identifying SID events.

Reducing Data Gathered By VLF Monitoring Systems

(Extracted from SID Technical Bulletin Vol. 3, Number 4, Oct. 1992)

The reduction process is quite simple, and consists of the steps which follow. First, the universal time for each of three event-phases must be measured for each SID. Examples are indicated on the recording at the end of this report.

Event Start: The moment when an event begins. Be aware that the amplitude of different events varies considerably, and some may appear in inverted form. If it is obvious that an event began before the first definable start time, an 'E' (before) is appended to the recorded time.

Event End: Of the three times, the end time is the most difficult to determine. It is defined as the moment when the trace returns to the diurnal trend line, or is interrupted by the onset of a new event. In the latter situation, the letter 'D' (after) is appended to that time, which in turn becomes the start time for the following event.

Event Maximum: The moment when the ascending (descending in the case of inverted events) branch slows its sharp rise. Note that this generally does not coincide with the event's peak amplitude.

If the trace goes off-scale as maximum is approached, or is interfered with in some other manner such as the onset of sunset, device failure, etc., we append a 'U' (uncertain) to the last identifiable time. For example, if the SID maximum occurs somewhere off-scale and the last determinable time is fourteen hours, ten minutes (1410), the time is recorded as 1410U.

After each of these times have been recorded, the event's 'Importance' and 'Definiteness' ratings can be determined. **Importance** generally refers to the length of an event, found by subtracting the start time from the end time. The table at right associates the Importance rating with event duration.

| Duration | Importance |
|--------------|------------|
| < 19 minutes | 1- |
| 19 - 25 | 1 |
| 26 - 32 | 1+ |
| 33 - 45 | 2 |
| 46 - 85 | 2+ |
| 86 - 125 | 3 |
| > 125 | 3+ |

With respect to the observer's typical daily trace, a class 1 SID is an event with small intensity change and a relatively short duration. Class 2 is a moderate intensity event with a fairly long duration, and a class 3 describes a SID with a 'great' change in intensity and long duration.

Definition is a subjective estimate of an observer's confidence in the event. Normally, the events which are included in our reports have Definitions equal to 3 or greater. Use the righthand scale as a guide to Definition. Careful study and experience teaches observers how to recognize false SID events caused by man-made interference. Beginners should not hesitate to assign high Definition values to those events which are not correlated with known noise sources. Other observers' results will be compared to eliminate suspect events before a final report is submitted to the NGDC.

| Confidence | Definition |
|------------------------|------------|
| Questionable | 0 |
| Possible | 1 |
| Fair | 2 |
| Reasonable | 3 |
| Reasonably Definite | 4 |
| Definite | 5 |

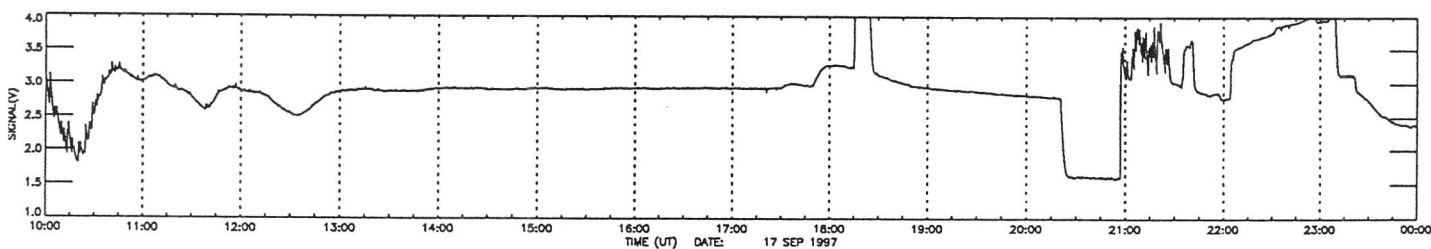
E-Mail Format For SID Event Reports

The format prescribed by the NGDC always begins with the '40' NOAA SID identifier code. The AAVSO SID Coordinator assigns observer codes after the station is operating correctly and data is received regularly from that observer.

| Column | Description |
|--------|--|
| 1-2 | Data code; always 40 |
| 3-5 | Blank |
| 6-7 | Year |
| 8-9 | Month |
| 10-11 | Day |
| 12-13 | Blank |
| 14-17 | Start time; UT hours and minutes event began |
| 18 | Start time qualifier; D = after, E = before, U = uncertain |
| 19-22 | End time; UT hours and minutes event ended |
| 23 | End time qualifier; D, E, U |
| 24-27 | Maximum time; UT hours and minutes of event maximum |
| 28 | Maximum time qualifier; D, E, U |
| 29-44 | Blank |
| 45-46 | SID Importance; sign in column 46 |
| 47-50 | Blank |
| 51 | Definiteness |
| 52-55 | Code for monitored transmitter. The field consists of the final two station call letters and the two numbers which represent the frequency (kHz). The latter is rounded to the nearest integer. Example; the code for NSS at 21.4 kHz is recorded as SS21. |
| 56-69 | Blank |
| 70-72 | Observer code; Example A82 |

The SIDFORM program described in the September 1997 SID report prompts the observer for all necessary SID event data and then formats the output file to conform to the above standard.

SID Sample Trace and Analysis



| | | | | | | | |
|----|--------|------|-----------|--|----|-------|-----|
| 40 | 970917 | 1727 | 1752D1732 | | 1 | 5AA24 | A82 |
| 40 | 970917 | 1752 | 1915 1756 | | 2+ | 5AA24 | A82 |