Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS - SOLAR DIVISION

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Table I. Mean Sunspot Numbers for October 2001
[boldface = maximum, minimum]

Day	N	Raw	s.d.	K-corrected	s.d.	s.e.
1	29	229	10.2	**184**	5.7	1.06
2	42	208	7.5	167	3.7	0.57
3	42	190	7.8	147	4.0	0.62
4	37	179	8.0	146	4.5	0.74
5	35	165	7.2	**127**	3.7	0.63
6	32	137	6.5	107	2.9	0.51
7	43	126	5.1	100	3.2	0.49
8	43	101	3.9	83	2.3	0.65
9	36	104	4.5	**80**	2.7	0.35
10	32	129	6.0	104	3.3	0.58
11	33	154	5.7	124	3.5	0.61
12	29	174	7.4	132	3.2	0.59
13	30	157	7.4	117	3.4	0.62
14	35	167	9.5	129	4.2	0.71
15	42	173	7.5	136	2.6	0.40
16	35	170	5.7	138	3.8	0.64
17	38	184	7.4	149	4.4	0.71
18	40	195	7.0	154	4.2	0.66
19	36	217	8.5	170	4.6	0.77
20	43	217	8.2	174	3.8	0.58
21	40	212	7.6	169	4.5	0.71
22	37	193	8.1	159	4.7	0.77
23	29	213	9.8	164	4.4	0.82
24	34	200	8.7	159	4.2	0.72
25	30	221	8.7	174	5.7	1.04
26	38	215	9.6	171	5.2	0.84
27	32	195	7.4	155	4.2	0.74
28	32	181	6.6	148	4.6	0.81
29	36	173	8.5	136	4.6	0.77
30	33	146	10.5	113	5.5	0.96
31	31	143	8.9	108	3.4	0.61

Means: **176.4** **139.5**

Total No. of Observers: 70

Total No. of Observations: 1104

Table II. October Observers

11	AAP	P.Abbott
11	ANDE	E.Anderson
11	BARH	H.Barnes
4	BATR	R.Battaiola
9	BEB	R.Berg
17	BEGM	M.Begbie
4	BLAJ	J.Blackwell
23	BMF	M.Boschat
21	BOSB	B.Bose
24	BRAB	B.Branchett
6	BRAM	M.Bradbury
28	BRAR	R.Branch
23	BROB	R.Brown
2	BURS	S.Burgess
5	CAMP	P.Campbell
20	CARJ	J.Carlson
31	CHAG	G.Morales
18	CKB	B.Cudnik
8	CLZ	L.Corp
13	COMT	T.Compton
27	CORA	A.Coroas
27	CR	T.Cragg
5	DEMF	F.Dempsey
17	DRAJ	J.Dragesco
23	DUBF	F.Dubois
29	ELR	E.Reed
17	FEEC	C.Feehrer
18	FERJ	J.Fernandez
24	FLET	T.Fleming
23	FUJK	K.Fujimori
28	GIOR	R.Giovanoni
7	GOTS	S.Gottschalk
1	HALB	B.Halls
1	HAYK	K.Hay
12	HRUT	T.Hrutkay
4	IMPR	R.Imperi
25	JAMD	D.James
4	JENJ	J.Jenkins
4	JENS	S.Jenner
19	KAPJ	J.Kaplan
14	KHAR	R.Khan
20	KNJS	J&S Knight
3	KUZM	M.Kuzmin
8	LERM	M.Lerman
25	LEVM	M.Leventhal
18	LIZT	T.Lizak
15	MALK	K.Malde
30	MARJ	J.Maranon
20	MCE	E.Mochizuki
8	MILJ	J.Miller
23	MMI	M.Moeller
4	MUDG	G.Mudry
7	OBSO	IPS Obs.
24	RITA	A.Ritchie
21	SCGL	G.Schott
9	SIMC	C.Simpson
8	STEF	G.Stefanopoulis
23	STEM	G.Stemmler
25	STQ	N.Stoikidis
19	SUZM	M.Suzuki
18	SZAK	K.Szatkowski
14	SZUM	M.Szulc
20	TESD	D.Teske
10	THR	R.Thompson
21	URBP	P.Urbanski
18	VALD	D.delValle
22	VARG	A.Vargas
22	WILW	W.Wilson
30	YESH	H.Yesilyaprak

Reporting Addresses

Sunspot Reports -- **email:** solar@aavso.org
postal mail: AAVSO, 25 Birch St. Cambridge, MA 02138
FAX *(AAVSO):* (617) 354-0665

SES Reports -- **email:** noatak@aol.com
postal mail: Mike Hill
114 Prospect St. Marlboro, MA 01752

Magnetometer Reports -- **email:** capaavso@aol.com
postal mail: Casper Hossfield
PO Box 23, New Milford, NY 10959
FAX: (973) 853-2588 or (407) 482-3963

Table III. Means of Raw Group Counts (RG) and Ratios of Spots to Groups (S:G) in October

Day	RG	S:G	Day	RG	S:G	Day	RG	S:G	Day	RG	S:G
1	13.8	6.6	9	6.9	5.1	17	10.1	8.2	25	11.5	9.2
2	13.2	5.8	10	8.6	5.0	18	10.5	8.6	26	11.4	8.9
3	12.8	4.8	11	10.1	5.2	19	11.8	8.4	27	10.8	8.1
4	12.6	4.2	12	10.5	6.6	20	12.3	7.6	28	10.0	8.1
5	11.5	4.4	13	9.6	6.4	21	11.9	7.8	29	8.6	10.1
6	9.5	4.4	14	10.1	6.5	22	11.0	7.6	30	6.1	13.9
7	8.7	4.5	15	10.4	6.6	23	12.0	7.8	31	5.8	14.7
8	7.2	4.0	16	9.7	7.5	24	10.4	9.2	Mn.	10.3	7.28

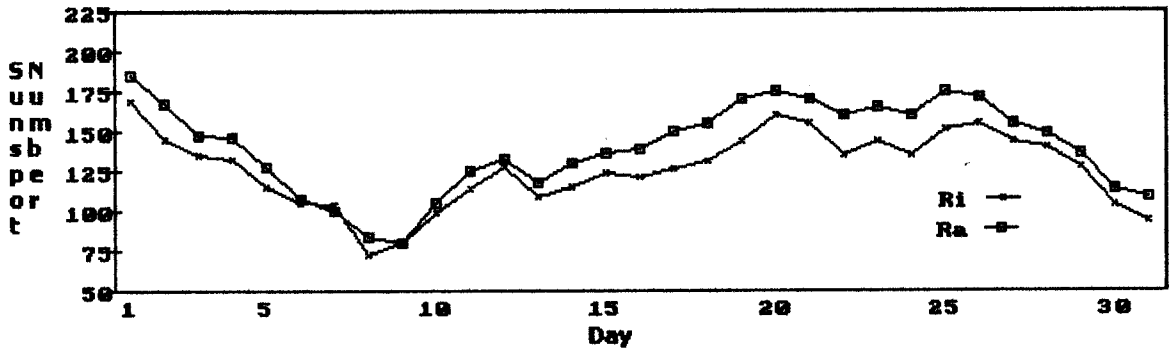


Fig. 1. Comparison of Ri (provisional) and Ra Estimates for October.
(Ri Source:http://sidc..oma.be/index.php3)

Smoothed Mean Sunspot Number (Rsm) for April 2001: 116.5

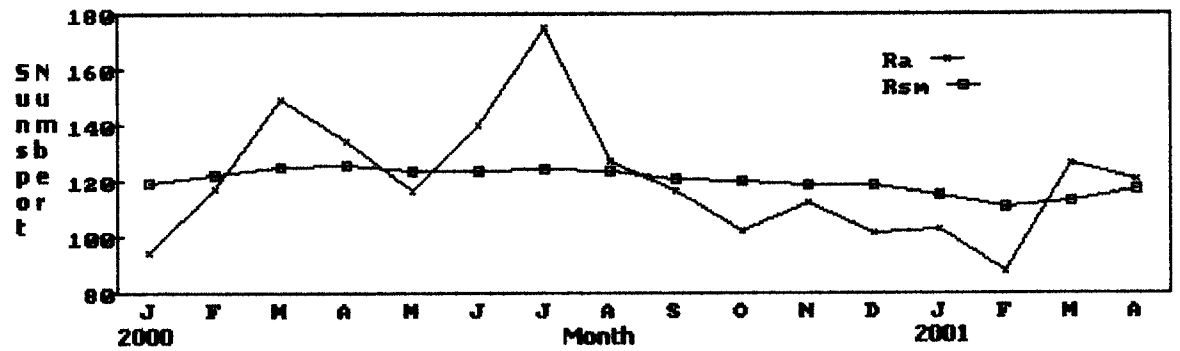


Fig. 2. Monthly Ra and Smoothed Mean Sunspot Numbers (Waldmeier method).

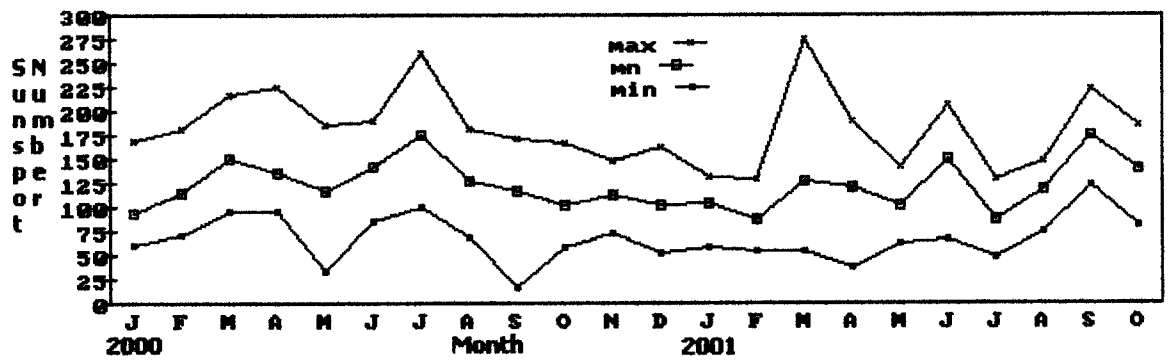


Fig 3. Maximum, Mean, and Minimum Ra Values for Each Month from January 2000 to Present.

Editor's Notes:

On November 6, the Solar Division lost one of its most dedicated and productive members. Arthur J. Stokes (A-62), a member of the organization since 1962 and a major contributor to the work of both the parent organization and its Solar Division died of a heart attack at the age of 83, shortly after returning home from the AAVSO's annual Fall meeting.

Some of the more recent solar observers will have gotten to know Art primarily as the designer of the series of VLF "Gyrator" receivers that are widely used in the SID program, but his participation in the affairs of the organization over the years includes many other activities. He served several terms on the AAVSO's Council and was its President in 1981 and 1982. He played a pioneering role in the establishment of the Photoelectric Photometry Committee and served as its chairman for over ten years. During his association with the AAVSO, he regularly contributed reports on both variable stars and solar activity. Just last month, he completed a new, easier-to-build design of the Gyrator II, which has been posted to our website and, as he had done faithfully for so many months before, sent in his SES report.

Art was the recipient of the AAVSO "Merit Award" in 1987 and of the Solar Division's "Honor Award" in 1999. The awards acknowledged not only his service to the organization as a leader and reporter, but also his dedication to and enthusiasm for helping new contributors get started in their activities.

Art's long-standing association with the AAVSO and the Solar Division will be sorely missed.

Rustrak Rolls and Other SID Observing Materials
Because of Art Stokes' death, it will be necessary to revise the procedures used to order Rustrak rolls and other materials that may be required for SID observations. Until the details of these procedures can be worked out, please let me know via my hotmail or postal addresses if you are need of new supplies, and please allow ample time for orders to be placed with the manufacturer.

Reporting Errors
Errors in the computation of the Wolf number (10g + f) continue to be made in reports that do not use the SUNKEY or SolObs programs. These errors present problems during the encoding of report data and slow down the preparation of the monthly report. Please use either of these programs or a simple text program instead of a spreadsheet (e.g., Excel) whenever possible.

Please be certain that your arithmetic computations and the header fields in your report are correct. If you have used the SUNKEY or SolObs software, check to be sure that the name of the file you will transmit is correctly formatted. For example, a file of observations for November, 2001 sent by observer ROHS should have the filename, ROHS0111.raw.

Solar Division Report at the AAVSO Fall Meeting (Nov. 1-4)
Thanks to each of you, the Division has had a very successful year, and I thought I would share with you the summary report I was able to make at the recent AAVSO meeting regarding that success. The report appears below.

Clear Skies,

CEF

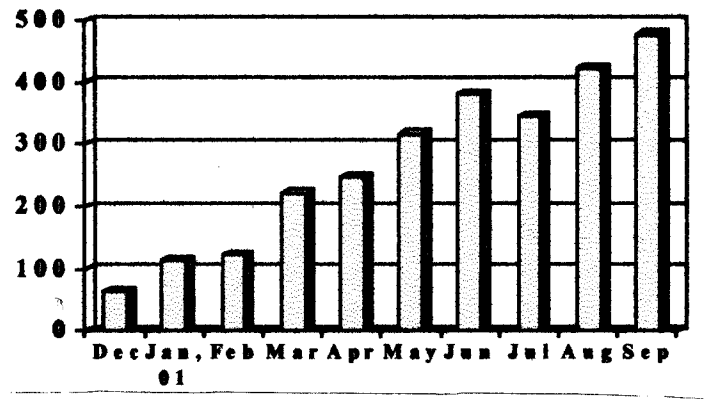
Report of the Solar Division
September 2000-August 2001

The Solar Division has had a very good year. The attention paid by the media to the occurrence of solar maximum together with the enhancement of the solar pages on the AAVSO's website have resulted in dramatic increases in the numbers of new observers who have joined the ranks of contributors to both the sunspot and SID sections of the Division. As of August 2001, monthly reports have been contributed by 11 new sunspot observers, an increase of 13 percent, while the number of new SID observers has grown by seven, an increase of 37 percent. During the period of September 2000 to August 2001, 910 reports incorporating 14,370 observations were contributed by the active group of 86 sunspot reporters, while 195 reports were contributed by the active group of 19 SID reporters.

Solar Pages on the Website

Solar Bulletin

Routine compilations of sunspot and SID data have been presented on the AAVSO's website for several years, but in late November of 2000 we decided to try to gauge the interest that the community outside of the Solar Division might have in its products. As an experiment, we published the monthly *Bulletin* in its entirety on the site. As judged by the numbers of "hits" on the document, the results of this experiment seemed promising, so in January of this year we began routine posting of the document. The increasing numbers of downloads since the beginning of the posting are shown in the figure below.



Downloads per month of the Solar Bulletin

Photo Gallery

From time to time, observers have contributed pictures that they have taken of the sun in the hope that they might be published in the Bulletin. To satisfy these interests, a "Photo Gallery" was created on the website in August. This method of publication preserves the quality of the images, makes them available to a wider community, and does not increase the preparation and mailing costs of the hardcopy version of the *Bulletin*. The response to this initiative has been so impressive--approximately 25 different images have been received to date--that we now face the job of bringing some organization to the collection. This task should be completed by the end of next month.

Other Items

In addition to making the solar data available to a wider community, several other significant activities have been completed during the year. These include,

- Mike Hill's expansion of the SID section of the *Bulletin* through incorporation of monthly data obtained by the Geostationary Operational Environmental Satellite (GOES-8) satellite and his addition to the website of contributions by SID observers on antenna design and general operations.
- Art Stokes' redesign and simplification of the Gyrator II SID receiver.
- Lenny Abbey's production of sunspot reporting software that can be used with the new versions of Windows.

In closing, I want to extend thanks to all who have helped make this a successful year for the Division. In particular, I want to thank the following:

- The many observers who have faithfully made and reported their observations through the year. It has been a pleasure to work with them, and I look forward to continuing the collaboration for another year.
- Mike Hill (A87), our SID Analyst, who, a little over a year ago, stepped in when the Division had lost its analyst and has since made substantial contributions to SID program development and data processing.
- Cap Hossfield (HSF) , for his continuing encouragement of new observers and his dedication in preparing the interesting and insightful pages he contributes each month in the SID Supplement to the Bulletin.
- Arthur Ritchie (RITA), a volunteer at headquarters, who gives unstintingly of his time in the completion of tasks related to the monthly processing of sunspot reports.
- Kate Davis, the AAVSO's webmaster, who, every month and always cheerfully and always before they wind up on the website, tells me what silly mistakes I have managed to make (again!) in file specifications, formats, and other information I have given her for posting.

Sudden Ionospheric Disturbance Report

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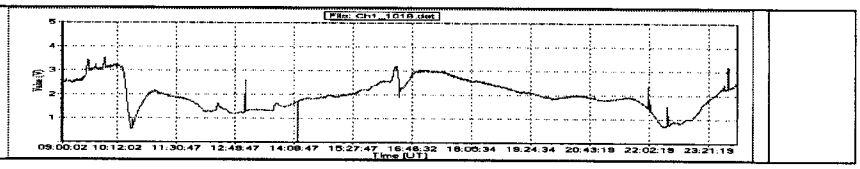


Sudden Ionospheric Disturbances (SID) Recorded During October 2001

(Analysis performed by Michael Hill, SID Analyst)

Date	Max	Imp	Date	Max	Imp	Date	Max	Imp
011001	1414	1+	011014	2045	2+	011025	1048	1
011002	1024	2+	011015	1626	2	011025	1455	3
010102	1131	2	011016	1638	1+	011025	1920	2
011002	1219	2	011016	1816	2+	011026	0925	1+
011002	1256	1-	011016	1925	2	011026	1006	2+
011002	1547	2	011017	1130	2	011026	1435	2+
011002	1715	2+	011017	1620	3	011027	1311	2
011003	0641	1-	011018	1348	2	011027	1525	1+
011003	1103	1+	011018	1613	2	011027	1632	2
011004	1220	2	011018	1904	2	011027	1830	1+
011004	1438	1+	011019	0702	2	011028	1000	2+
011004	1730	2	011019	0946	2+	011028	1105	1-
011005	0811	1+	011019	1227	1+	011028	1650	2
011005	1200	2	011019	1341	1	011029	1118	2
011005	1537	1-	011019	1625	3	011029	1135	2
011009	0746	2	011021	1134	2+	011029	1924	1-
011009	1113	3	011021	1425	1-	011029	1934	1+
011009	1602	1+	011021	1955	1-	011030	1017	2
011009	0826	1	011022	1006	1	011030	1122	1+
011009	0926	1	011022	1147	1	011030	1147	1-
011009	1103	2	011022	1221	2	011030	1220	1-
011012	0926	1-	011022	1500	2+	011030	1357	2+
011012	1103	2	011022	1751	2+	011030	1454	2
011012	1202	2+	011022	2102	2+	011030	1517	2
011014	1337	1	011023	1209	1-	011030	1655	2+
011014	1458	1-	011023	1230	1+	011030	2030	2+
011014	1550	1+	011023	1508	2+	011031	0809	2+
011014	1659	2+	011024	0933	2+	011031	1045	2+
011014	2020	1	011024	1418	2	011031	1606	2

Observer	Code	Station(s) monitored
A. Clerkin	A29	NAA
J. Winkler	A50	NAA, NPM
J. Ellerbe	A63	ICV
A. Panzer	A83	NAA
W. Moos	A84	FTA, ICV
M. Hill	A87	NAA
G. Difillipo	A93	HWU
T. Poulos	A95	NAA
R. Battaiola	A96	HWU
J. Wallace	A97	NAA
M. King	A99	GYA, GBR
G. Bressan	A101	HWU

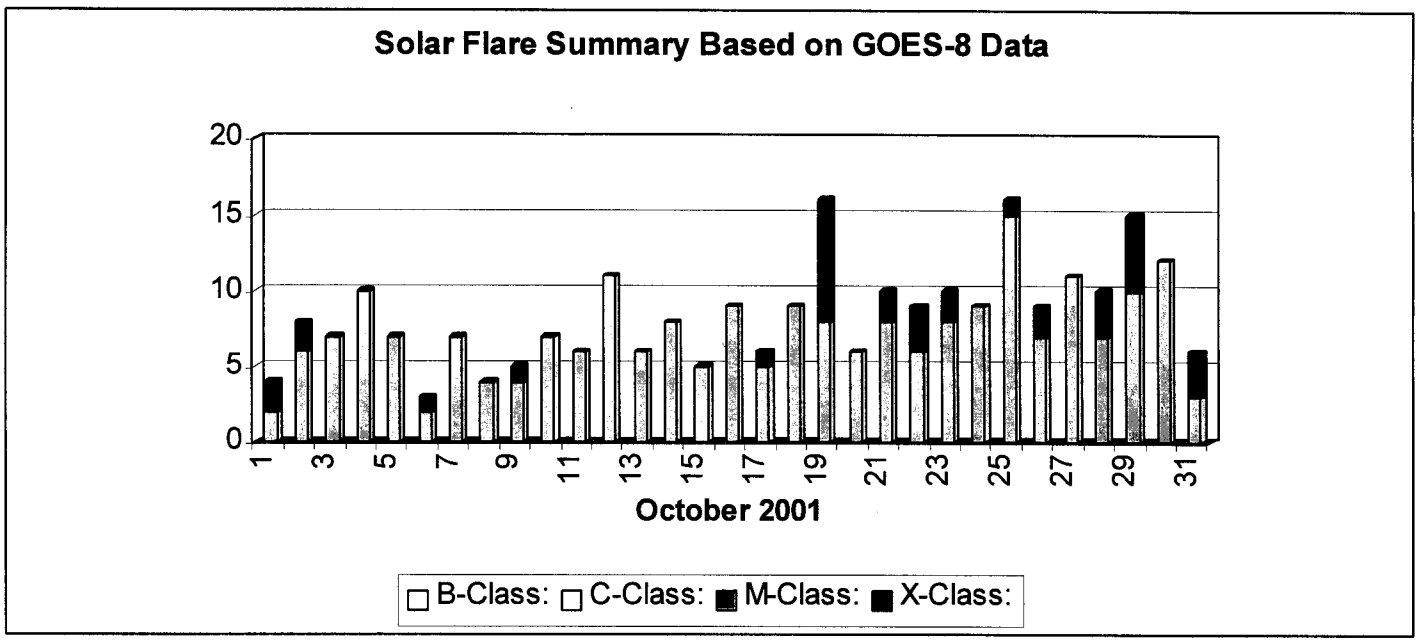
The events listed above meet at least one of the following criteria
1) Reported in at least two observer reports
2) Visually analyzed with definiteness rating = 5
3) Reported by overseas observers with high definiteness rating

Importance	Duration (min)
1-	< 19
1	19 – 25
1+	26-32
2	33-45
2+	46-85
3	86-125
3+	> 125

Solar Events

I had the pleasure of attending the AAVSO Meeting this past month and it was a very enjoyable time. I only have one regret. I was meaning to get together with Art Stokes but when I got a chance to do so he had gone up to his room because he was not feeling very well. I didn't see him again till later at the evening banquet. I did not talk to him right away because I figured I'd see him after we had all eaten. By then he had once again retired to his room, again not feeling well. Unfortunately I never did get to chat with him that day. Art died four days later. We have all lost a most active and important member of the SID program and the AAVSO. Art will be missed but will live on among us as we all use our Stokes Gyrator receivers which he designed and perfected, thereby making SID monitoring so approachable. I learned from this how important it is to seize each moment; to not let things wait if possible. I wish I had talked to Art that day. I will forever miss that final chat we would have had. God Bless you Art – Rest in Peace.

There were 257 flares detected by the Goes-8 Satellite. Most of them were C-Class flares with 32 rated as M-Class events and 4 as X-Class events. These X –Class events caused a lot of activity here, including some wonderful auroras. There were only 87 SID Events detected. The most active days occurred on or around the 2nd, 14th, and 18th. The X-Class events resulted in some very strong SID events, especially on the 19th and 25th.



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SUDDEN IONOSPHERIC DISTURBANCES SUPPLEMENT

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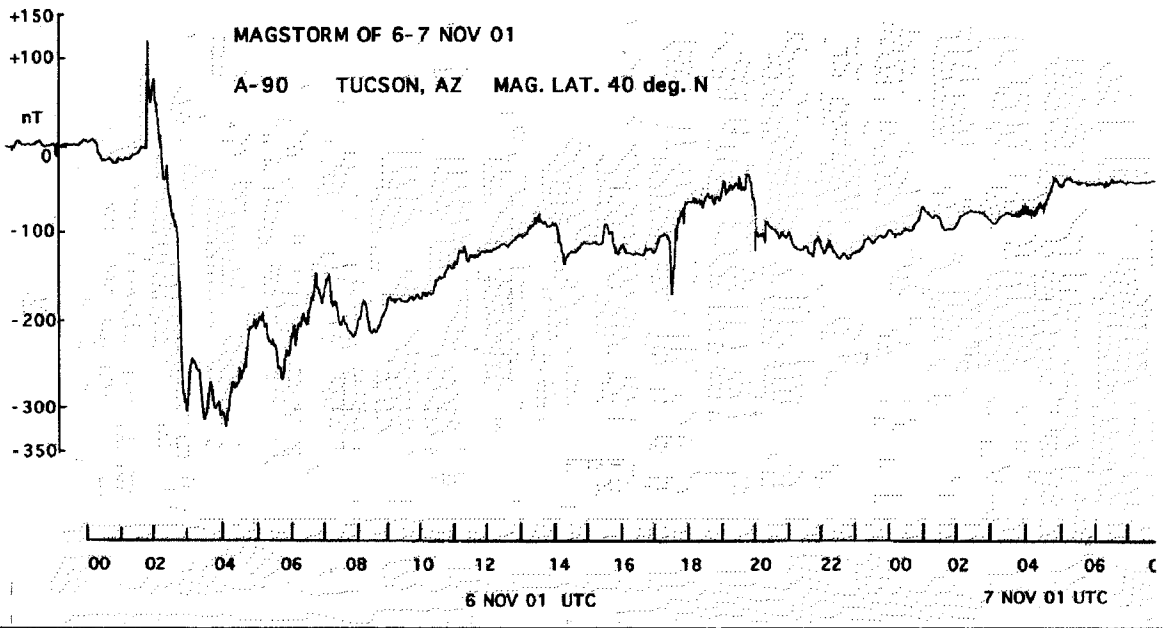
SUDDEN IONOSPHERIC DISTURBANCES RECORDED DURING OCTOBER 2001



The Magnetogram above shows the great magnetic storm on 6-7 November. This storm, starting near 0200 UT (9PM EST Monday evening, 5 November), produced an aurora that was seen as far south as Georgia in the Eastern United States. I had received an email from AAVSO sunspot observer, Jim Carlson, saying there had been a major X flare that produced a coronal mass ejection so the great magnetic storm and aurora were not unexpected. This storm recording was made by Jim Mandaville, A-90, in Tucson, AZ, USA. Jim recorded the magnetogram with his homemade McWilliams torsion balance magnetometer. Here is how Jim describes it: "The vertical scale is in nanoTeslas relative to the baseline before the storm onset. Total amplitude of the storm variation was 450nT. This is truly a classic magstorm, starting with the sharp positive spike of the 'sudden commencement' near 02 hrs UTC. Then comes the 'main phase,' characterized by a rapid plunge in field strength. After bottoming out it begins the 'recovery phase' working its way gradually back toward the original station baseline." Jim has calibrated his magnetometer with a Helmholtz coil so the 450 nT range of the storm is accurate. A McWilliams magnetometer that was built from a Solar Division kit as a science fair project is described below. This is taken from a paper I presented at the recent AAVSO meeting in Somerville, Massachusetts, USA.

REBECCA'S MAGNETOMETER

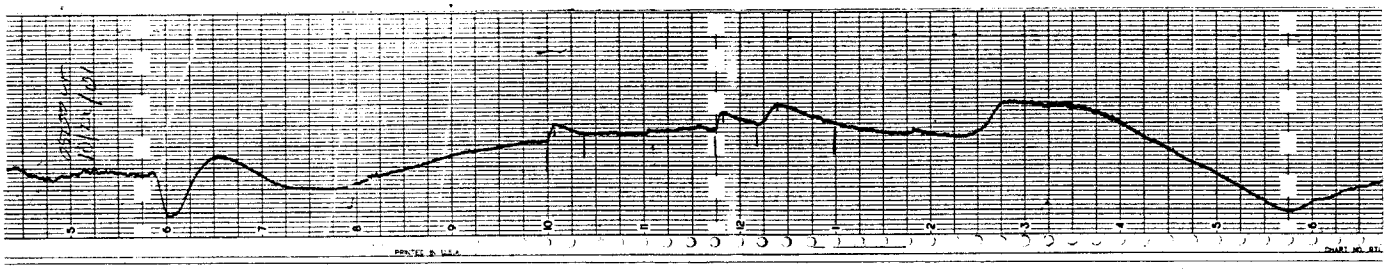
I helped Rebecca Ragar, a high school senior, in Arkansas, USA, build a McWilliams torsion-balance magnetometer as a science fair project. Rebecca's magnetometer was one of the winners at the regional fair which qualified her to enter it in the Arkansas State Science Fair. At the state fair Rebecca won two awards. One was from The United States Geological Survey and the other from the United States Navy. I believe these awards probably played a significant part in Rebecca's being accepted by the college of her choice. Helping students build science fair projects is a good way for scientists, whether amateur or professional, to help students learn about science through hands-on experience. I am a judge each year at the regional science fair in Orlando, Florida and know from experience that a student who actually builds something stands a much better chance of being a winner than those who simply download stuff from the Internet for their project. This is probably the reason Rebecca's homemade magnetometer was a winner that made it into the state fair to win additional awards.

For me, helping Rebecca build her science fair project was a very rewarding experience. I hope my experience might inspire other scientists to get involved with helping students build science fair projects. A good way to get started is to offer to be a judge at your regional science fair. Judges are also always needed so get in touch with a science teacher at your local high school. As an amateur scientist you will be most welcome as a volunteer judge. With that in mind I have built a homemade magnetometer similar to the one Rebecca built from a Solar Division kit and brought it to the fall meeting of the AAVSO so others can see what it looks like. If you are interested in building a magnetometer for yourself or know a student you might want to help build one, please contact me at my address above. For $5.00 you can have a Solar Division minimum kit which consists of drawings and detailed instructions how to build the magnetometer. Also included is the hard-to-find .006 inch diameter

torsion wire. Software on floppies to record the magnetometer's output on a computer comes with the minimum kit. A list of suppliers and what to buy is also included. Plans for building an A/D converter for the software can be found on the AAVSO web site at << WWW.aavso.org >>. By the time you buy all the stuff you need you will have spent about $100.00 and you will need some home workshop tools to build it. A complete kit with the more difficult work already done is available for $120.00 and you can probably put it together on the kitchen table if you don't have a home workshop. The complete kit is the minimum kit above plus everything you will need to build the magnetometer and set it up and record magnetic storms. The larger parts for the base and the torsion wire suspension post are already cut to size from wood from Home Depot. All you will have to do is drill some holes for wood screws with a hand drill and glue the torsion wire suspension post assembly together with five minute epoxy which is supplied. The shadow vane and magnet assembly that are suspended on the torsion wire are made from model airplane wood that you would have to find at a hobby shop. A tiny model maker's miter box and saw to cut this small wood to size are included with the kit as is the Cyanoacrylate glue to fasten it all together (the glue hardens in 30 seconds). The Plexiglass for the wind screen is also cut to size and all you have to do is put it together with cyanoacrylate. The photocells, light source, power supply and associated electronics to make the motion sensor are all included. The kit also includes a 4-inch long Alnico 8 magnet, all the brass screws, brass tubing, miscellaneous hardware and small round files needed to make clearance holes in the wind screen for the torsion wire and electrical connections.

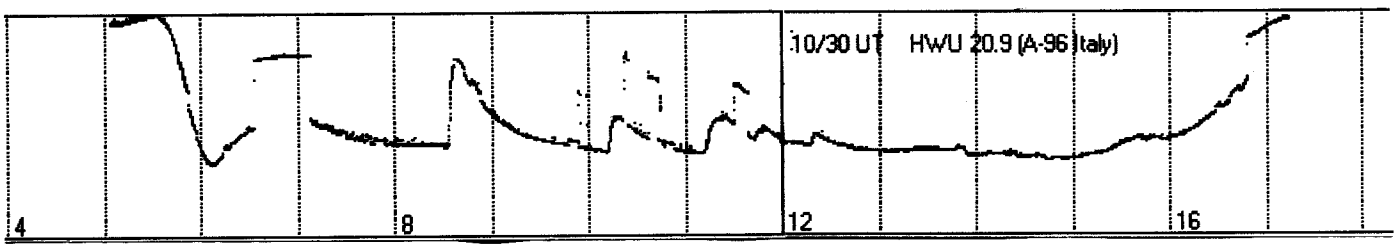
The McWilliams torsion balance magnetometer was designed by Al McWilliams, A-94, about twenty years ago when he was a physics professor at the University of St. Cloud in Minnesota. It is a very simple instrument but nevertheless will produce magnetograms that look exactly like those made by a nearby United States Geological Survey magnetic observatory using professional flux-gate magnetometers. Basically it is a magnetic compass needle suspended on a length very thin music wire. The needle would normally point north and south but the torsion wire is twisted enough to produce enough torque to make the needle point east and west. The needle is therefore balanced against the Earth's magnetic field by the torsion wire. This accounts for the name, torsion balance magnetometer. Magnetic storms are produced by the Sun when solar flares or coronal holes radiate charged particles that become trapped in the Earth's magnetosphere. They produce a magnetic field that adds to or subtracts from the Earth's normal magnetic field thus changing the balance on the torsion wire and therefore the direction the needle points from the direction it normally points when there is no storm. A shadow vane on one end of the needle shades two Cadmium Sulfide photocells from a light source to act as a motion detector. The torsion wire is adjusted so the shadow vane shades the photocells equally, half of each cell being exposed to the light source. Cadmium Sulfide photocells are variable resistors. Their resistance varies with the amount of light they are exposed to. They are connected in series as two elements of a four element Wheatstone bridge in which no current flows when each pair of elements have equal resistance. A meter connected across the bridge will therefore read zero. When a magnetic storm disturbs the balance of the torsion wire the needle moves and the shadow vane attached to it moves to cover the photocells unequally thus unbalancing the Wheatstone bridge and causing current to flow in the meter. The changing value of the current and its polarity is recorded on a strip chart recorder or computer , preferably at a chart speed of ¼ inch/hour to make the magnetogram. Storms can last from a few hours to more than a day. Having your own magnetogram allows one to predict the possibility of an aurora which often occur in response to magnetic storms. Rebecca built her magnetometer as an experiment to see if she could predict an aurora. Science fair projects are more apt to be winners if the student performs an experiment and then writes a scientific paper to report the results of the experiment. Chances of winning are enhanced by building your own homemade scientific instrument to perform the experiment. The homemade McWilliams magnetometer apparently makes a very favorable impression on science fair judges and therefore stands a good chance of being a winner. It is also interesting just to build a magnetometer for your own use to keep track of magnetic storms, predict auroras and follow what the Sun is doing to the Earth's magnetosphere. If you are an amateur radio operator you can make your own K index. CHH

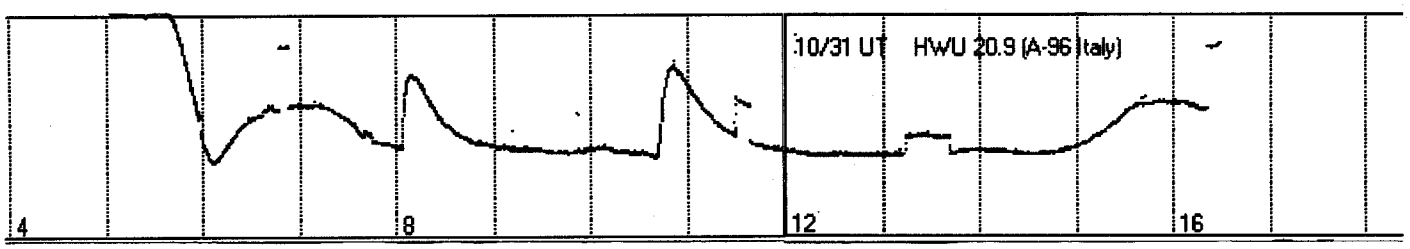
Jim Ellerbe, A-63, in Spain sent the chart below that shows four SESs he recorded on 22 October. This is a nice clean recording with no interference that shows a typical sunrise pattern starting just before 0600 UT. It was made with one of Art Stokes's gyrator receivers and recorded on a Rustrak strip chart recorder running at 1-inch/hr chart speed.



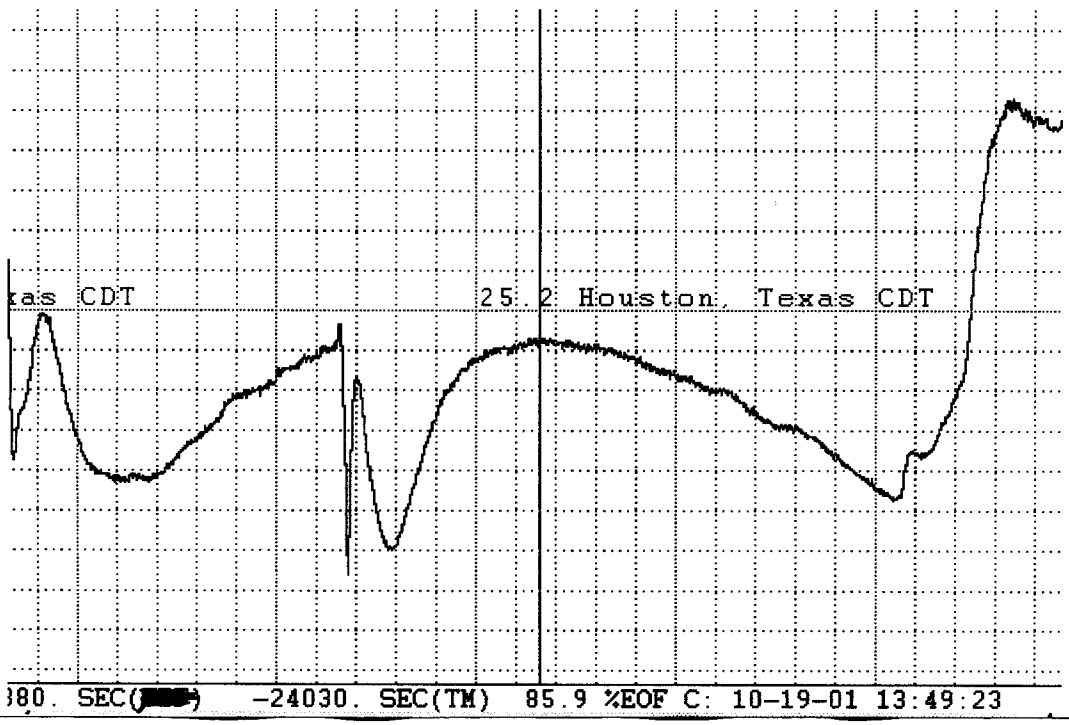
There is sad news to report. We have lost Art Stokes, A-62, who died unexpectedly of a heart attack Monday, 6 November after returning home from the AAVSO meeting (3-4 November) in Somerville, Massachusetts. It is good that we all had a chance to see Art one more time at the meeting. Art and I are the two oldest SID observers (both of us 83) who regularly attend the meetings. We remarked about how lucky we were to still make it to the meetings both of us have been attending for over 35 years. That was Saturday. By Monday Art was gone. It shows how vulnerable we are when we reach 80. About the only thing that can be predicted with reasonable certainty is we are not apt to have many more years left. We can hope to make it to 90 but most of us won't. We can also hope to go suddenly like Art without pain and suffering but that too, is just a matter of luck.

October was a month of high solar activity that produced many SIDs. Below are SIDs Roberto Battaiola, A-96, recorded as SESs on 30 and 31 October. Roberto lives in Italy and records VLF station HWU in Le Blanc, France transmitting on 20.9 kHz.

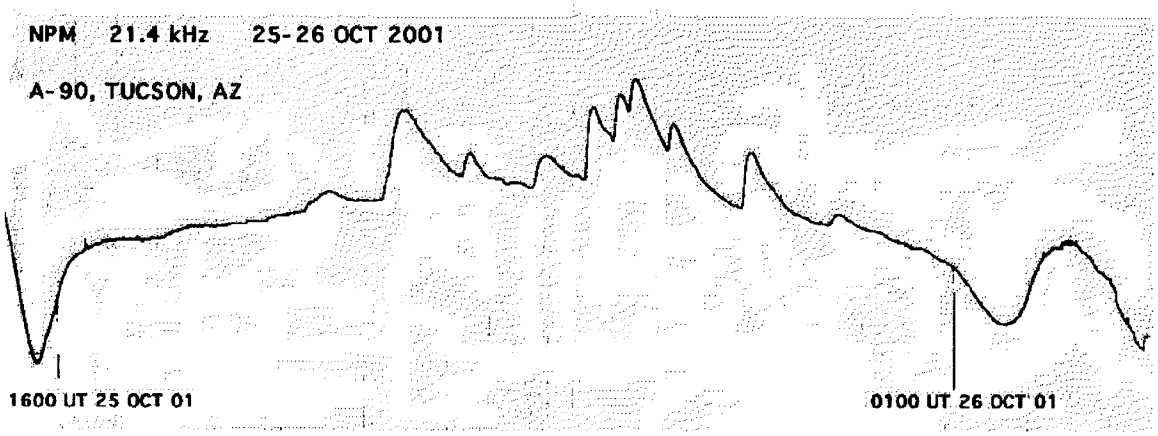




Below is an interesting SES recording of the VLF station in La Mourie. North Dakota, USA transmitting on 25.2 kHz. Jerry Winkler, A-50, in Houston Texas, USA made this one with its multiple inversions in its rise to maximum. There is a normal sunrise pattern at the left end of the chart followed by an SES that starts out as a sudden short rise followed by an inversion that brings the traceto the bottom of its travel and then suddenly back up again where it reverses again and drops more slowly to the bottom. Then it returns to normal near the middle of the chart. The second time it reaches the bottom is actually the maximum of the SES and everything before that is its "rise" to maximum. The chart was made with a Dataq A/D converter and plotting software that is sold by Radio Shack.



An SES chart below made by Jim Mandaville, A-90, sows ten SESs recorded on 25 October. The station recorded is NPM in Hawaii transmitting on 21.4 kHz.



Most AAVSO observers who record solar flares by their effect on the Earth's ionosphere use the Gyrator VLF receiver which is Art Stokes's Legacy. Over the years Art has helped many of them get their receivers working properly when they were not quite able to adjust it for optimum performance themselves. Jim Ellerbe's chart above is a good example. Now that Art is gone there will be no one to help observers put the finishing touches on their receivers or help them get their receivers going in the first place if they run into trouble. Sometimes Art built a gyrator receiver for overseas observers who might find it difficult to find the parts to build the receiver. At the recent meeting Art promised to build a receiver for Jaime Garcia who lives in Mendoza, Argentina. Jaime is an AAVSO variable star observer who attended the meeting and we saw this as opportunity to add a South American observer to our group. Jaime lives on a four-hectare farm and would be able to place the receiver's antenna far enough away from household interference to produce nice clean interference-free recordings. Art was going to tune his receiver to NAA in Cutler, Maine, USA so he would have a long north-south propagation path which usually is very sensitive to ionospheric disturbances produced by solar flares. It would be nice if someone would carry out these plans for him now that Art is gone. If you would be interested in doing this please get in touch with Solar Division Chairman Carl Feehrer or me for Jaime's address and other information.