

Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS - SOLAR DIVISION

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

Day	N	Raw	s.d.	K-corrected	s.d.	s.e.
1	40	144	5.2	122	2.5	0.40
2	47	153	5.4	126	3.1	0.45
3	43	157	5.0	130	2.7	0.41
4	38	164	7.5	130	3.7	0.60
5	44	182	7.4	145	3.8	0.57
6	46	214	8.9	171	4.4	0.65
7	34	255	12.5	206	6.4	1.10
8	41	260	12.7	208	6.6	1.03
9	40	241	13.0	190	6.8	1.08
10	31	214	11.8	176	6.2	1.11
11	30	206	12.8	161	6.2	1.13
12	39	218	10.8	170	4.6	0.74
13	30	231	12.7	184	5.7	1.04
14	29	199	8.9	168	5.2	0.97
15	40	187	8.7	149	4.3	0.68
16	44	171	8.8	135	3.5	0.53
17	40	159	7.8	125	3.4	0.54
18	32	189	8.6	151	5.5	0.97
19	35	202	8.8	157	3.9	0.66
20	26	245	9.4	193	3.9	0.76
21	32	238	10.6	192	4.5	0.80
22	39	264	11.5	206	4.5	0.72
23	38	284	13.3	221	5.6	0.91
24	28	266	14.8	211	5.3	1.00
25	37	284	12.5	219	5.0	0.82
26	40	259	11.2	201	5.4	0.85
27	36	242	9.5	191	4.9	0.82
28	31	246	8.2	193	4.8	0.86
29	37	229	8.7	186	4.8	0.79
30	37	225	11.3	183	5.9	0.97
31	—	—	—	—	—	—

Means: 217.6 173.3

Total No. of Observers: 68

Total No. of Observations: 1104

Table II. September Observers

12 AAP P. Abbott	23 KAPJ J. Kaplan
7 ANDE E. Anderson	16 KHAR R. Khan
17 BARH H. Barnes	21 KNJS J&S Knight
7 BATR R. Battaiola	4 KUZM M. Kuzmin
11 BEB R. Berg	14 LERM M. Lerman
12 BLAJ J. Blackwell	24 LEVM M. Leventhal
19 BMF M. Boschat	18 MALK K. Malde
18 BOSB B. Bose	6 MARE E. Mariani
20 BRAB B. Branchett	28 MARJ J. Maranon
8 BRAM M. Bradbury	20 MCE E. Mochizuki
29 BRAR R. Branch	9 MILJ J. Miller
24 BROB R. Brown	8 MMI M. Moeller
7 CAMP P. Campbell	8 MUDG G. Mudry
21 CARJ J. Carlson	17 OBSO IPS Obs.
30 CHAG G. Morales	19 RICE E. Richardson
23 CKB B. Cudnik	23 RITA A. Ritchie
11 CLZ L. Corp	20 SCGL G. Schott
19 COMT T. Compton	8 SCHG G. Scholl
22 CR T. Cragg	11 SIMC C. Simpson
11 DEMF E. Dempsey	16 STEF G. Stefanopoulos
27 DRAJ J. Dragesco	14 STEM G. Stemmler
19 DUBF F. Dubois	28 STQ N. Stoikidis
29 ELR E. Reed	21 SUZM M. Suzuki
18 FEEC C. Feehrer	5 SZAK K. Szatkowski
14 FERJ J. Fernandez	11 SZUM M. Szulc
25 FLET T. Fleming	11 TESD D. Teske
19 FUJK K. Fujimori	12 THR R. Thompson
28 GIOR R. Giovanoni	21 URBP P. Urbanski
14 GOTS S. Gottschalk	15 VALD D. delValle
8 HALB B. Halls	24 VARG A. Vargas
4 HAYK K. Hay	22 WILW W. Wilson
3 IMPR R. Imperi	29 YESH H. Yesilyaprak
20 JAMD D. James	
8 JEFT T. Jeffrey	
12 JENJ J. Jenkins	
2 JENS S. Jenner	

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 September

Day	RG	S:G	Day	RG	S:G	Day	RG	S:G	Day	RG	S:G
1	7.5	9.2	9	9.2	16.2	17	9.9	6.1	25	13.8	10.6
2	8.2	8.7	10	7.8	17.4	18	12.2	5.5	26	13.5	9.2
3	9.1	7.2	11	7.5	17.5	19	11.9	7.0	27	12.7	8.9
4	8.8	8.6	12	9.4	13.2	20	14.4	7.0	28	13.0	9.2
5	9.5	9.2	13	9.5	14.3	21	11.7	10.3	29	12.5	8.3
6	10.8	9.8	14	9.2	11.6	22	12.5	11.1	30	12.6	7.9
7	10.9	13.4	15	9.3	10.1	23	12.8	12.2	31	—	—
8	11.1	13.4	16	9.2	8.6	24	13.1	10.3	Mn.	10.8	10.4

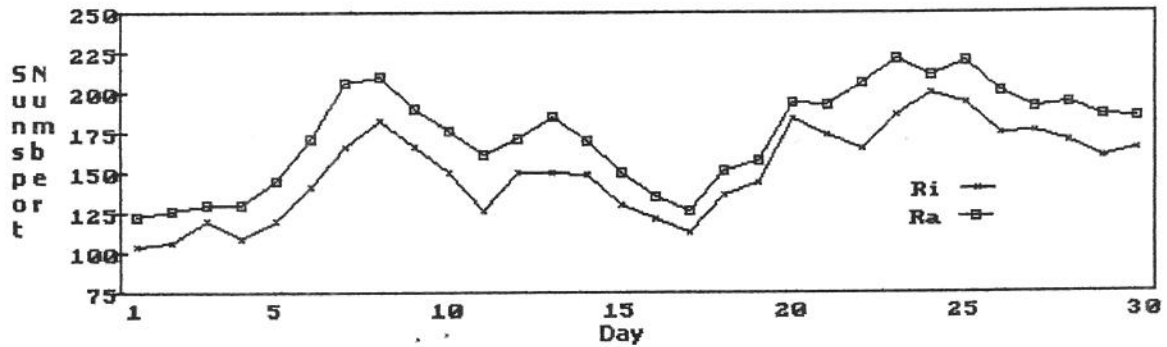


Fig. 1. Comparison of Ri (provisional) and Ra Estimates for September. (Ri Source: <http://sidc.oma.be/index.php3>)

Smoothed Mean Sunspot Number (Rsm) for March 2001: 112.5

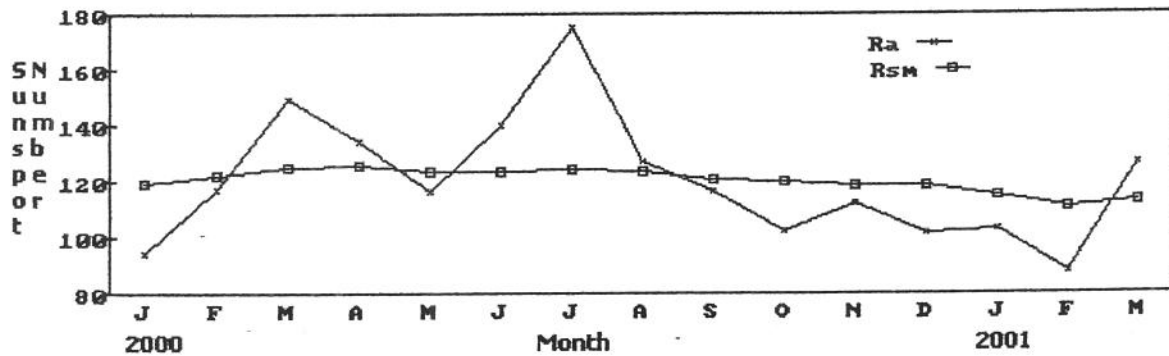


Fig. 2. Monthly Ra and Smoothed Mean Sunspot Numbers (Waldmeier method).

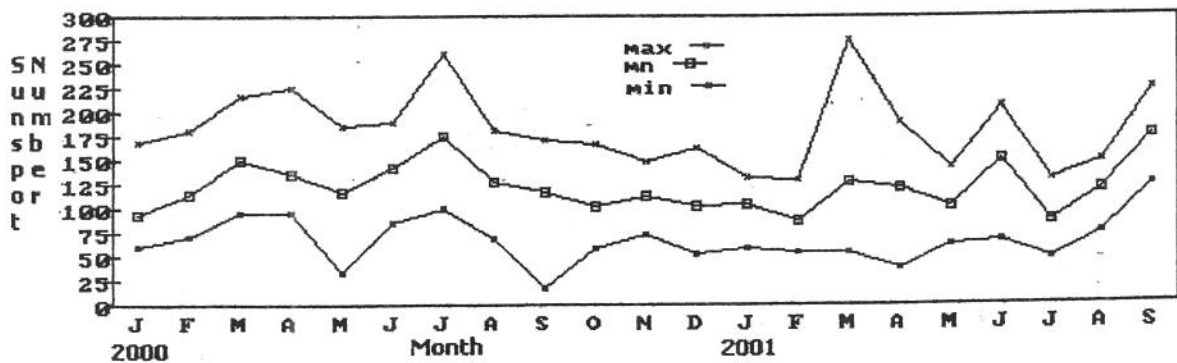
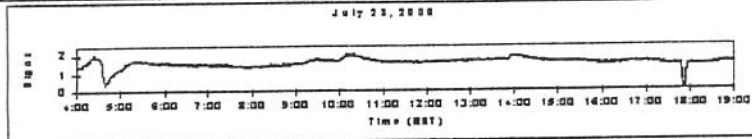


Fig 3. Maximum, Mean, and Minimum Ra Values for Each Month from January 2000 to Present.

Sudden Ionospheric Disturbance Report

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 Marlborough, MA 01752 USA
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Sudden Ionospheric Disturbances (SID) Recorded During September 2001

(Analysis performed by Michael Hill, SID Analyst)

Date	Max	Imp	Date	Max	Imp	Date	Max	Imp
010901	1351	2	010906	1954	2+	010912	1036	1
010901	2047	2	010907	0110	1	010912	1318	2
010902	0920	2	010907	0403	1+	010912	2147	3
010902	1205	2+	010907	0708	1	010913	1603	2
010902	1317	2	010907	1536	2+	010913	1951	2
010902	1348	2+	010907	2119	1+	010914	0606	2+
010902	1519	2	010908	0456	2	010914	0908	1
010902	1750	2+	010908	0710	1	010914	1846	2+
010903	0946	2+	010908	1306	1	010914	2147	2+
010903	1046	2	010908	1529	1	010914	2304	2+
010903	1654	2+	010908	1647	2	010915	0525	2
010903	1825	3	010908	1920	2+	010915	1128	3
010904	1548	2+	010909	0240	1+	010915	1554	2+
010904	1725	1+	010909	0805	1+	010915	2032	2+
010904	1925	2	010909	1003	1+	010915	2122	2
010904	2018	2+	010909	1337	1+	010916	0748	1-
010904	2201	2+	010909	1516	2+	010916	0919	1
010905	1418	1-	010909	1840	2+	010916	1353	2
010905	1431	2+	010909	2044	2+	010916	1609	1+
010905	1635	1+	010910	0830	2	010916	1645	1+
010905	1910	1+	010911	0701	2	010916	1712	1+
010905	2233	2	010911	0937	2	010916	1847	2+
010906	0346	1+	010911	1950	2	010917	0825	1+
010906	1324	2+	010911	2032	2+	010917	0937	2
010906	1537	1+	010912	0445	2	010917	1117	1-

Event Listing - Continued

Date	Max	Imp	Date	Max	Imp	Date	Max	Imp
010917	1253	1	010922	0542	1	010928	2112	2+
010917	1552	2+	010922	0644	1+	010929	1059	3+
010917	2109	1+	010922	1053	1	010930	0843	2+
010917	2143	2+	010922	1507	2	010930	1141	2+
010918	1439	1-	010922	1815	2+	010930	1731	1
010918	1537	1	010923	1005	1+	010930	1747	2
010918	1551	1+	010923	1140	2	010930	2010	2
010918	1707	2+	010923	1400	1	010930	2134	2+
010918	1722	1	010923	1429	2			
010918	1845	2	010924	1018	3+			
010918	1922	1+	010925	1027	2+			
010918	1958	2	010925	1715	2			
010918	2047	2	010926	0850	2+			
010919	0344	2	010926	1225	2+			
010919	0710	2+	010927	1216	3+			
010919	1606	2	010928	0833	2+			
010919	1852	2	010928	1013	3			
010920	1441	2	010928	1715	2			
010920	1816	2+	010928	1830	2+			
010920	1850	1+	010928	1922	2+			

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

Observer	Code	Station(s) monitored
A Clerkin	A29	NAA
J Winkler	A50	NAA, NPM
D Toldo	A52	NWC, NAA, xxx
A Stokes	A62	NAA
J Ellerbe	A63	ICV
A Panzer	A83	NAA
W Moos	A84	FTA, ICV
G DiFillipo	A93	HWU
T Poulos	A95	NAA
R Battaiola	A96	NWU
J Wallace	A97	NAA
M King	A99	GYA
P Campbell	A100	NLK
G Bessen	A101	NDH

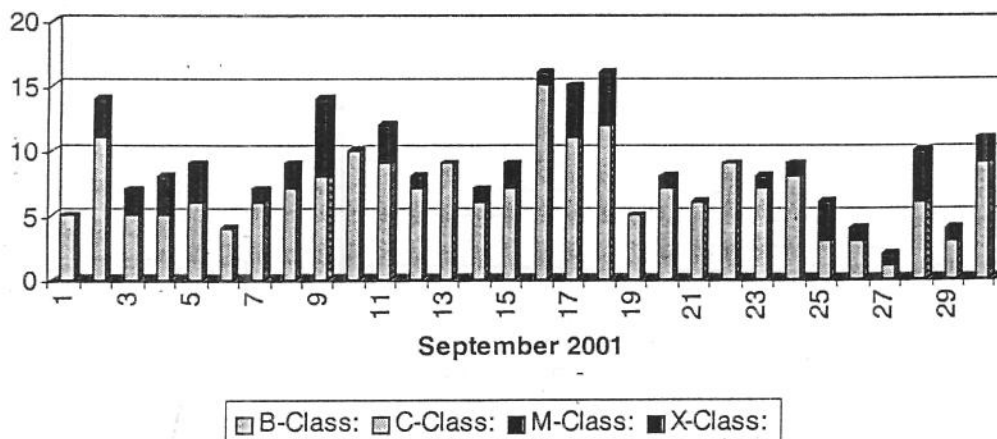
Importance	Duration (min)
1-	< 19
1	19 - 25
1+	26-32
2	33-45
2+	46-85
3	86-125
3+	> 125

Solar Events

Once again, we had a very active month. There were 260 X-Ray flares reported by the GOES-8 spacecraft. Of those, 50 were M-Class flares and one was an X-Class flare. A number of the M-Class flares were very close to being X-Class however; A very energetic sun indeed. The most active days were around the 8th and the 18th.

Our observers recorded many SID Events due to the large number of flares. The total number of correlated events came to 123 for September. The most active days were the 5th to the 9th and then again around the 16th to the 19th of September. Of these events 76 had an importance rating of 2 and 2+, while 7 of them had importance ratings of 3 and 3+. It is unusual for so many events with such a high importance rating.

Solar Flare Summary Based on GOES-8 Data

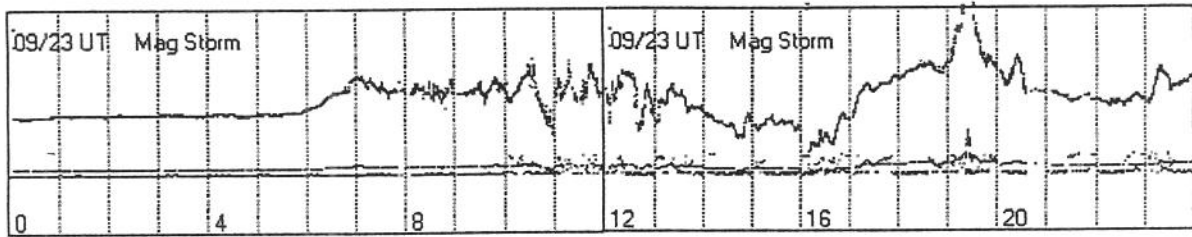


SUDDEN IONOSPHERIC DISTURBANCES SUPPLEMENT

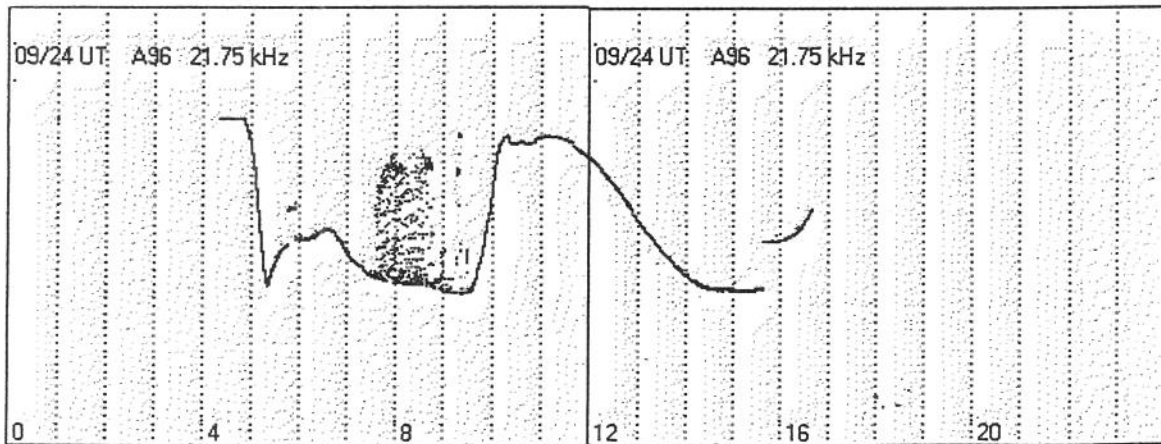
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New Milford, NY 10959, USA

SUDDEN IONOSPHERIC DISTURBANCES
RECORDED DURING SEPTEMBER 2001

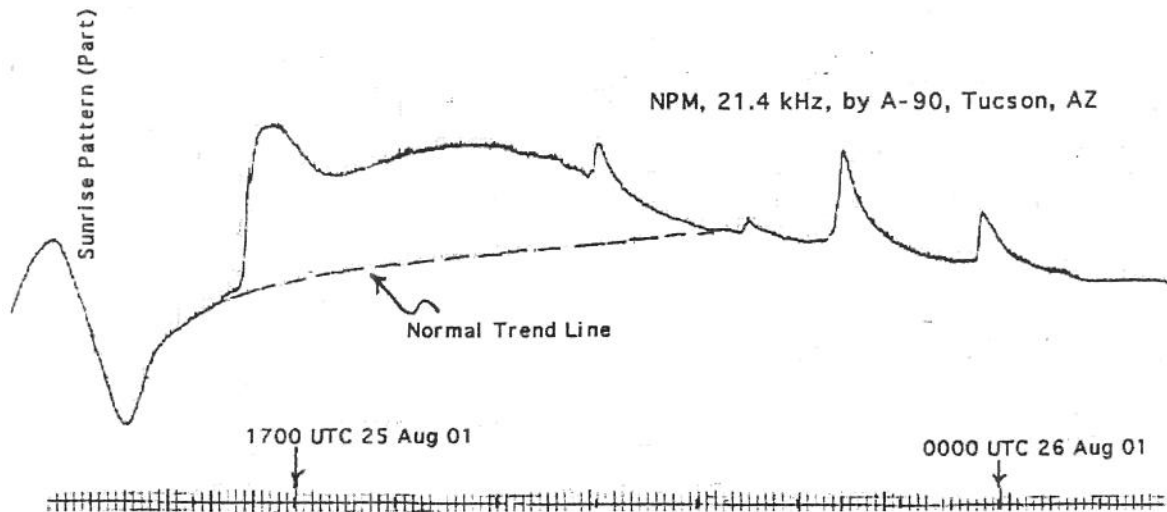
capaavso@aol.com
Fax 973 853 2588



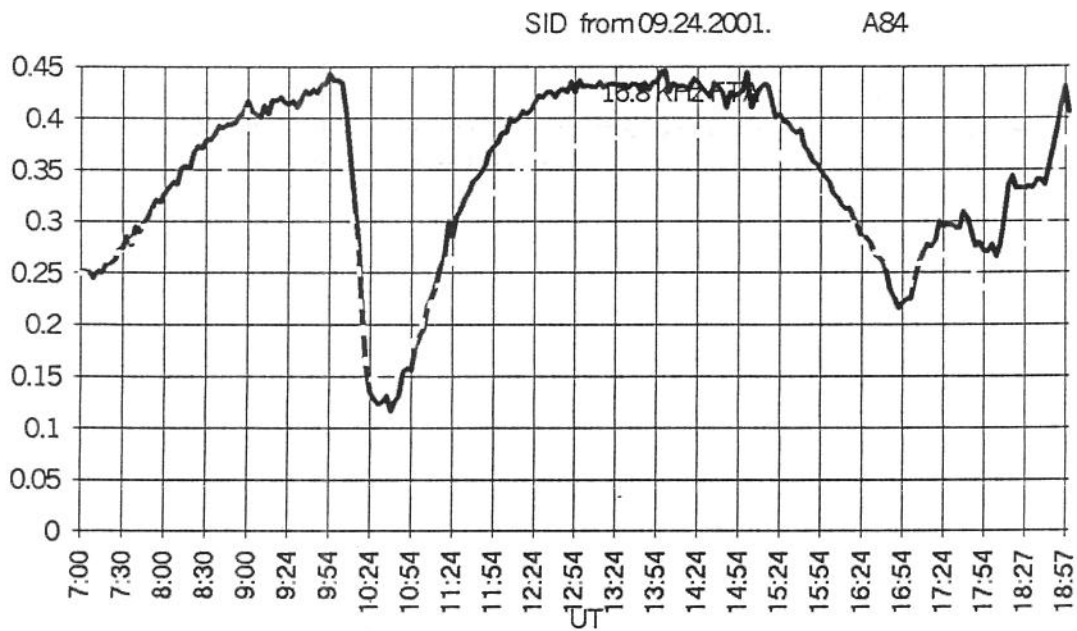
Lars Pettersson, in Odensbacken, Sweden made the above magnetogram using a Flodqvist magnetometer. He emailed it to me as a DAT file and I used Piclogger32D plotting software to plot it as it would appear if recorded on a Rustrak strip chart recorder running at the standard chart speed of ¼ inch/hr. Piclogger32D can plot any DAT file as a Rustrak recording including SID recordings at 1-inch/hour. This software is free from the AAVSO. If you would like a copy send me an email at my address above. Complete instructions how to build the Flodqvist magnetometer can be found in the October, 1993 issue of Sky & Telescope magazine. It is a very simple magnetometer made from an ordinary magnetic compass. A solenoid balances the compass in an East-West direction with the needle acting as a shadow vane over a photo transistor. The balancing current in the solenoid is controlled by the phototransistor. If the Earth's magnetic field changes in response to a magnetic storm it disturbs the balance and the phototransistor automatically restores the balance. The change in current to restore balance is amplified and recorded to make the chart above. You can also get instructions how to build the magnetometer by sending an email to << gote.flodqvist@ebox.tninet.se >> For additional information see also Gote's website at << <http://user.tninet.se/%7Esdt522w/> >>. Some of you may remember Gote as an AAVSO SID observer who made excellent multiplexed charts of three SES recordings using very sensitive VLF receivers of his own design. Some of you may also have met him at the AAVSO Eclipse Site in Petersburg, Virginia for an annular eclipse. It was raining the morning of the eclipse so we drove down to a clear site in Greensboro, North Carolina and barely made it in time for Gote to set up his eclipse camera and take some nice photographs. We had to hurry in order to make it to Greensboro in time and I got a ticket for speeding 85mph but that is the price you pay for being an eclipse chaser.



Roberto Battaiola, A-96, in Italy made the interesting SID recording above. It shows a big SES lasting 5 hours! It took ½ hour to rise to maximum and stayed at maximum for almost 2 hours. I cannot remember seeing an SES last this long before. Roberto used Piclogger32D to plot this recording at ¼ inch/hour. Another very long lasting SES is shown below on the next page.



Jim Mandaville, A-90, recorded another long lasting SES on 25 August, the next day after Roberto recorded his long lasting one. Jim's recording is shown above. His lasted about 4 ½ hours and shows four other SESs, one of them superimposed on the long lasting SES. Jim lives near Tucson, Arizona and records NPM in Hawaii transmitting on 21.4 kHz



Walter Moos, A-84, made the inverted SES recording above of VLF station FTA. He lives near Bern, Switzerland about 500 km from FTA in St. Assis, France. It is not unusual to record inverted SESs from a station at this distance. The SES takes about 20 minutes to reach maximum intensity at 1024 UT and about an hour to decay to normal at 1254 UT