

# Notes From the Field

## Communications from INTMINS Participants

Edited by Bill Pine  
Chaffey High School  
Ontario, CA

Data submissions are often accompanied by notes and messages from INTMINS participants describing various aspects of their experiences as observers. As an ongoing feature, some of these communications will be summarized in *The INSPIRE Journal*. The following summaries are in the approximate order in which the data was received by INSPIRE. In addition, some communications will be included from INSPIRE participants who did not record and submit data.

### **Team 25                      Norm Anderson                      Cedar Falls, IA**

Norm observes from George Wyth State Park in Waterloo, Iowa. He reported some intermittent problems with a loud hum on the tape that he was successful in correcting. At the end of the fall season, Norm got a new VLF2 kit which he will assemble and test prior to the spring sessions.

### **Team 1                      Jack Lamb                      Belton, TX**

Jack and his wife, Mildred, are among the most faithful INSPIRE observers. They monitor from a park by Lake Belton. Jack reported that one session was interrupted by the need to explain what they were doing to a group of curious onlookers.

### **Team 29                      Janet Lowry                      Houston, TX**

Details of Observing Session on 11/29/98 at San Luis Pass, TX

San Luis Pass is at roughly 29 degrees N and 95 degrees W. It's 18 miles west of the city of Galveston, and approximately 32 miles south of the Johnson Space Center. It's the place where the West [Galveston] Bay enters the Gulf, spanned by an old toll bridge that connects the western tip of Galveston Island to the next finger of land that curls east from just down the coast.

Tape sessions started at 8 and 9 AM local [Central] time; each 12 minutes long. I was using your receiver with a Radio Shack whip antenna and a Radio Shack model 69 recorder. [This was my first time using this recorder; I had the 'ALC' and 'VOX' buttons switched off.] My observing spot was right at the edge of the Gulf on a deep stretch of beach at low tide, with some power lines perhaps 3/8 or 1/2 a mile behind me along a road. The weather was clear with a moderate wind coming off the water.

Although I intended to record sessions at 7, 8, and 9 AM CST, the 7:00 attempt was a failure when my first observing site turned out to have more humming than a barbershop quartet. I was a bit rattled and discouraged, since I had gotten to the site later than planned because of a bit of coastal and driver fog. Realizing that the site was unproductive, I gathered up [nearly] everything, tossed it in the back, and raced off down the beach for my alternate site. That proved

quieter [and much prettier, too]—although with all of that I wasn't able to set up in time for a 7:00 taping. There were lots of birds and clouds for company, though, and I had plenty of opportunity to watch a brown pelican holding class for an assortment of gulls.

I set up with the receiver taped to my tripod, and had intended to put the recorder on the hood of my little truck. When I did a test, though, there was so much interference that I just set the recorder on a towel under the receiver. I didn't know if using the truck as platform would cause problems. Unfortunately, I had left my grounding spike [my moveable ground] back at the first location, and I didn't realize that until I was many miles down the road. So for the 8 AM session I wound up holding the end of the ground wire, and EVERY time I moved I caused feedback. Actually, the problem seemed to be as much with my headphone wire as with the ground. Although I tried adjusting the data gain several times, I still got a lot of feedback. For the 9 AM session I fastened the ground wire to the screw on the license plate holder of my car; I think that helped a bit. Between sessions I was browsing in one of the articles that you sent me a while back and tried shortening the antenna a bit, just to see if it would help to reduce the feedback, but I don't think that it helped. Because of the feedback that my headphone wire seemed to generate every time I moved, I wound up putting fewer time marks on the 9 AM session—it seemed that the less I moved, the better the sound. [I had the data gain set at about 4, and the volume level of the recorder also at about 4. That seemed to be OK when I was perfectly still.]

Other than the feedback that I seemed to cause, I don't think that I recorded anything out of the ordinary. I didn't hear anything but soft popping and crackling; what I've come to think of as that particular a-rhythmic percussion of the VLF.

I did my time marks in CST because I was afraid that I'd get the UT wrong during the tape. I can see that having someone else along would make the operation go a bit smoother!

## **Team 18**

## **David Jones**

## **Columbus, GA**

I am working during the wee hours, so INTMINS Operation 29-4 fit into my crowded work schedule on a day off. The alarm woke me, as planned just in time to make it to the unused mortar range at the scheduled tape-start time.

When I got to the bridge to Alabama, it was blocked by ambulances and police cars. I had to detour an extra ten-minutes through downtown Columbus, Georgia. I crossed the Chattahoochee River north of downtown and sped south down the west side of the river to the Alabama portion of Fort Benning. Unusual fall weather kept storms far distant and the quarter moon lighted the ground fog over the field. Recently the Army had cleared and bulldozed the field. I set-up the antenna and started recording at what I thought was scheduled T-time: 0627Z. I misread my wristwatch. I started the tape moving at a little after 0624Z, and had preliminary noises and squeaks quieted by 0626Z. I announced the hack wrong as "twenty-seven." The time is actually twenty-six. I heard moderate sferics and some tweaks. I didn't hear the transmission from the MIR. I heard illegal deer hunters and their dogs and a coyote nearer to me than the deer hunters.

The gain of the RS-4 was set at 5, and the recorder gain was 9 out of ten. I took special care to get an unplanned hack at forty-one. This final hack actually occurs at forty. Although I had a WWVB long-wave clock with me, I kept it in the car-trunk lest it radiate at VLF. I corrected my wrist watch before and after the recording. I didn't have time to set up the short wave radio, so hacks are voiced. Conditions were excellent to record the MIR transmission except, evidently, I started the tape too late.

## **Team 28**

## **Thomas Earnest**

## **San Angelo, TX**

Thomas recorded from various sites in his area and the hum levels varied accordingly. While all hum levels were quite low, the lowest seemed to be from a site which included "7200 volt lines 1/2 mile, 169 kV lines 2 miles". On one trip Thomas' wife JoAn served as navigator. For Operation 27-4, Thomas reports:

No power lines in sight but probably within 1/2 mile. Parked next to a wire fence which provided plenty of hum. Site was almost on top of a hill which provided a clear horizon to the south and east. This was a "one-time" site, visiting a nearby ranch. It was about 100 miles south of my usual listening post and 100 miles closer to the ground track of Operation 27-4.

**Team 13                      William Combs                      Crawfordsville, IN**  
**Crawfordsville High School**

Joining Bill to make observations of the Leonid Shower on 18 November were D.J. Corey, Aaron Swearingen and Stephen Huffaker. Using a form found at:

<http://liftoff.msfc.nasa.gov/academy/space/solarsystem/meteors/meteor-record.html>

Team 13 included a log which is reproduced below. Good job!

## Leonid Meteor Report Sheet

18-Nov-98

No.	Time	Magnitude	Speed	Color	Train/sec	Remarks
1	11:58	3	F	W		17-Nov-98
2	0:03	3	F	O		W= WHITE
3	0:10	4	S	B	3	O= ORANGE
4	0:16	3	F	W		B= BLUE
5	0:16	2	F	W		
6	0:17	3	F	W		
7	0:36	3	VF	W		
8	0:37	3	F	W		
9	0:50	3	F	W		
10	0:50	1	F	W	2	
11	0:51	3	F	W		
12	0:53	-1	F	W	2	
13	0:54	4	F	W		
14	0:56	5	S	W		
15	0:57	4	F	W		
16	0:57	4	F	W		
17	0:59	3	F	W		
18	1:07	1	VF	W	2	
19	1:09	3	F	W		
20	1:14	3	F	B	2	
21	1:14	3	F	W		
22	1:18	-1	F	W	1	
23	1:21	3	F	W		
24	1:24	3	F	W		
25	1:25	-4	F	W	4	
26	1:26	5	S	W		
27	1:32	3	F	W		
28	1:34	1	F	W	1	
29	1:42	0	M	W	0.5	

**Team 7****Dean Knight****Sonoma, CA****Sonoma Valley High School**

Dean and his students set up 3 RS4 receivers with different antenna arrangements and different recorders. Receiver "RS" uses a Radio Shack CCR-81 recorder and a 91 foot long wire antenna oriented East-West. Receiver "#62" uses a Bell and Howell Model 3185-A recorder and a 198 foot long wire antenna oriented North-South. Receiver "#65" also uses a Bell and Howell Model 3185-A recorder and a 145 foot long wire antenna oriented East-West. Sonoma Valley High School Team members are indicated below.

	21-3	22-3	29-1		21-3	22-3	29-1
Loni Adams			x	Kendal Jarvis	x	x	
Sarah Barbaresco	x			Stephanie Jensen	x	x	x
Michelle Bertrand		x	x	Erin Klenow	x	x	
Rachel Bowman	x		x	Jullian Krause	x		
Meitra Bozorgzadegan	x	x	x	Mike Kruger	x		x
Jillian Buckley	x	x		Will Kwiatkowski	x	x	x
Ben Casias	x	x		Amy Lind			x
Michelle Costanzo	x	x		Scott Mathison		x	
Teresa Cruz		x	x	Trevor Nuccio		x	x
Amelia Dang	x	x		Stuart Price	x	x	
Ariana DuFloth	x	x	x	Cooper Quentin	x		
Eric Field	x	x	x	Jared Reed	x	x	
Lilly Freeland		x		Gina Rolling			x
Courtney Geissenger			x	Christine Schneider	x	x	x
Alea German			x	Josue Solis		x	
Dana Gillespie	x			Tulley Stroud	x	x	x
Jason Green		x		Abby Swann	x	x	
Annika Gustafsson	x	x	x	Travis Tomiampos	x	x	
Joe Hardeman		x	x	Jennifer Ullman			x
Ty Horner	x	x	x	Heather Watson		x	

**Team 30****Linden Lundback****Watrous, Sask., CANADA**

Linden, along with teammate Brian Cowan, submitted this report.

Our team waited in anticipation for the Leonid Meteor Shower observation and data collection on Nov. 17 and 18. The past two weeks were providing solid overcast but an approaching high from the northwest suggested hope for a clear morning. At 1:00 PM local time (0500 UTC) the overcast dissipated to offer a good view of the starry sky. We had a few hours rest hoping the clear sky would remain to offer the possibility of coordinating meteorite viewing to VLF propagation. By 3:00 AM local time, however, overcast conditions prevailed and no visible observations were possible. We continued with the VLF observations at 3, 3:30, 4 and 4:30 local time on Nov. 17 hoping that our data, if relevant, would be compared with meteor sightings at other North American locations. We are looking forward to the next observations with the hope of a clear sky.

Nov. 18 at 12:00 AM proved to be relatively clear and we were hoping for a good meteor show with some associated VLF responses. The meteor show was somewhat thin. We saw about eight all together with three occurring while we were active in the outlined recording sessions. We could not discern any VLF audio response to the meteors.

During portions of the two sessions we ran into an unexplained (to us) VLF emission consisting of a high tone that seemed to grow in strength and many times ended with a flurry of sferics and or tweeks. This process could be compared to that of the noise that the charging capacitors make on a camera flash while it is recharging between shots, the flash fires and the process begins again.

It would be interesting to know if anyone else ran into this occurrence during observations and to possibly find an explanation for this phenomenon. The curious thing is that it did not occur on some of our observation sessions and we did not change any settings of our equipment. It therefore doesn't seem to be an occurrence that can be attributed to a quirk of our equipment or location. *(Eidtor's note: The high tone present intermittently on the tapes sounds like oscillation within the receiver due to the level being set slightly too high. This will appear intermittently since it is a response to high amplitude sferics and other signals.)*

There were many sferics and tweeks during our recording sessions. The ones that seemed to be more prominent, I have noted on our log sheets. I have also logged the unexplained tone with a (u) on our logs. We did note one whistler at 06:33:04.

Our team hopes that observations from the Great White North will provide some useful information and we are looking forward to the coming INTMINS and ISTOCRNIK observation sessions.

On Nov. 20 (Nov. 21 UTD), we attempted to pick up some relevant information from the MIR Istochnik firings. The first session provided lots of sferics and tweeks but no discernible tones. The second session provided much of the same with a few whistlers possibly detected.

We wanted to participate in one European firing hoping that the tones would propagate over the pole to our location. We chose a firing that occurred as close to 180 degrees longitude from our location as possible and therefore chose E27-2. The time of the firing did not allow the selection of a reasonably quiet location so we had to set up a few miles from the town of Watrous near our place of work. The site proved very noisy with AC and AM radio broadcast interference from a 50 kW transmitter operating at 540 kHz. Initially we thought the session was a wash but a few whistlers coincidentally (?) occurred near the proposed firing time and we thought we might have picked up a VLF response to the firing.

After work, we looked for a quieter site for the 28-2 firing and found a reasonably good one. The evening was beautiful and clear. The radios were set up with time to spare so we were able to enjoy the stars and a couple of cups of hot chocolate while waiting. There were a great deal of spherics and tweeks during the session and some coincidental (?) whistlers, again close to the proposed ISTOCTMK firing time which strengthened our feeling that the whistlers may be a VLF response to the test firing.

Other commitments prevented us from participating in the Intiniis sessions but we hope the enclosed data will provide some insight to Inspie's VLF studies.

## Team 21

## Phil Hartzell

## Aurora, NE

Phil has a plug for the University of Nebraska at the top of the stationery for Hartzell Auto Interiors. He then reports on some work with loop antennas.

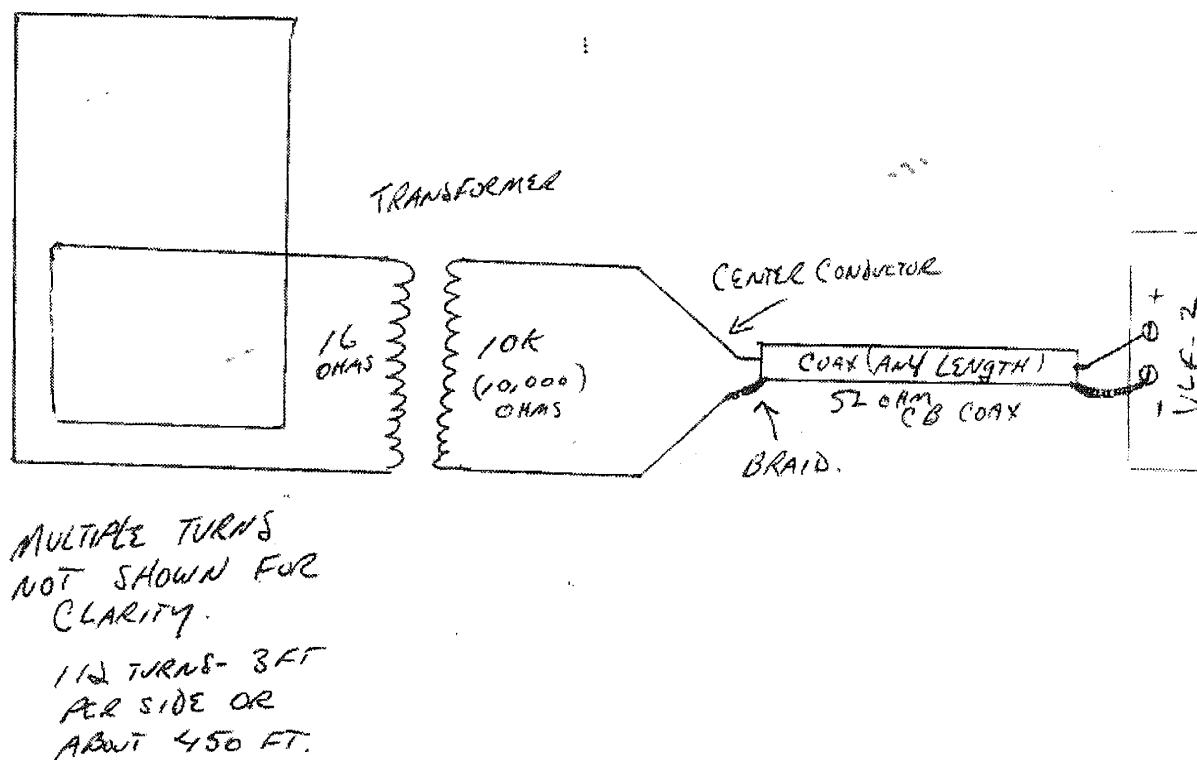
"Home of the National Champion Nebraska Cornuskers  
1970 .. 1971... 1994 .. 1995 .. 1997..One for Solich in 99!"

The weather in this area of the country for Leonid was a bust. I had about a week of cloudy weather before and after the maximum for the shower. The sun did pop out for a few days in the afternoon, (of course). That is typical for Nebraska as the fall turns towards winter and the temperature begins to drop. My recording sessions were very typical for the time of year. Not too much activity, quite a drop compared to summer evenings when levels are much higher. Which at times becomes overpowering and covers some good whistlers

I recorded my sessions this winter on a new loop. I dropped the sides of my loop to 3 foot square and added some turns. I now have 112 turns. This is 450 feet of wire. Wind it side by side, but not super neat. It doesn't need

to be perfect like a coil out of a radio. I made a wooden frame. You can use a cardboard box as a form if you leave the ends on for sturdiness, but don't get it wet! I also changed the tranqfonner from 10 k- 8 ohms to 10 k - 16 ohms. The new transformer has closer coupling match from the loop to the VLF-2. The signal levels are quite a bit higher so I need to turn down the gain level on the VLF-2. The 16 ohm side goes to the two free ends of wire on the loop and the 10 k side goes on my center conductor and braid of my coax. The coax runs to the VLF-2. Connect the braid of the coax to the negative side of the VLF-2 input, and the center conductor to the positive side of the input. All we are doing is tricking the receiver into seeing a high impedance load on the input end at the receiver. The receiver will not work for a loop connected directly to the input. The impedance is too low. But if we put a simple transformer in line and change it, the receiver doesn't know the difference. Why did I use a 10 k to 16 ohms? Because it was in my junk box. I had about a dozen to experiment with. I alligator clipped them in ( one at a time ) and cand checked signal levels in the field. I found the 10 k to 16 gave me the best signal and the best null when I rotated the loop. You can experiment with different values to find the one that works best for your application. Simple audio transformers are found at Radio Shack for just a few bucks.

I have also noticed an effect of a portable loop. I have found that I need to hang it from a tree branch at least a few feet off the ground. When I do set it on the ground, it picks up much more AC hum. Set it on a wooden picnic table, or maybe a wooden painters easel. Rotate it so you have the least AC hum. The more turns on your loop. the .sharper the null My loop works best when the broad side is east and west, which means the wires run north to south. Keeping the loop perpendicular to the ground is best. I have enclosed a drawing showing the basic configuration.

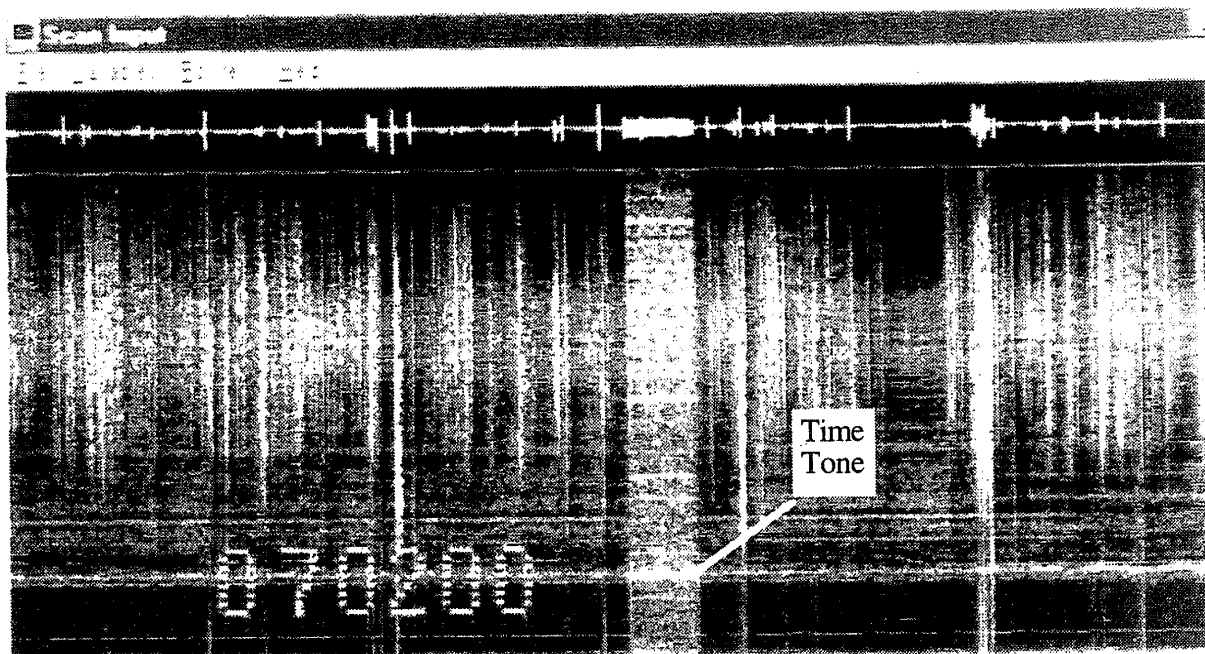


Team E5 • Renato Romero

Cumiana, ITALY

Renato used Mike Aiello's ATM (Automatic Time Marking) software to put time marks on his data. Renato modified the software to include signals on the tape that are read by the analysis software and displayed on the spectrogram as digital time marks. the signal sounds like a musical ringing on the tape and can be read by either type of analysis software used in INSPIRE: GRAM

for the PC and Soundedit 16 for the Mac. Elsewhere in the *Journal* are examples of the output from Soundedit. Below is a sample sent by Renato of the output from GRAM.



The time stamp is followed by a tone also generated by the ATM software.

**Team E2                      Silvio Bernocco                      Torino, ITALY**

Silvio did some of the most precise and well documented Leonid observations. His monitoring location has a high level of manmade hum, but natural signals are still easy to hear and find on the spectrogram. He also included some narrative notes which appear below.

November 16-17, 1998

2200 - 0200 Local Time

Many meteors; scattered radio activity on VHF radio amateur bands.

On 144 Mhz, many contacts with Northern europe, Scandinavia, Russia, Unيتد Kingdom.

The shower has started.

November 17, 1998

0330 - 0730 Local Time

Imposing astronomical event on a clear night.

By tens, bolides and meteors were seen ranging in azimuth from about 20 degrees to 270 degrees.

I centered my observations in the Orion direction with low light pollution.

On the 50 Mhz radioamateur band, 6 European beacons were heard including strong signals from U.K.

0400 - 0500 Local time

High bolide activity. Two bolides lit up the land around me like a camera flash.

Other bolides left long trails remaining in the sky for some minutes.

I could see the slow wrap of the trail from a straight line.

0500 - 0600 Local Time

Minor bolide activity, many meteors.

0600 - 0700 Local Time

In the dawn, many bolides with rainbow colored tails.

November 17 - 18, 1998

1800 - 0130 Local Time

On a clear night, I observed only 3 meteors. VHF bands were close.

I called a long time on 50 Mhz, but no meteor scatter signals were heard.

People reported to me that some meteor activity occurred between 0500 and 0700 local time.

**Team 4**

**Mike Aiello**

**Croton, NY**

Here is my tape from November, along with my hand-written tog. Unfortunately I did not have time to re-type everything, so I hope you can read my notations. Also, I'm not sure if there is still time to include my observations in the Journal - if not, I apologize for taking so long to get them to you.

This particular recording session (28-8) was just a Lovely evening to be out overlooking the Hudson River. It was clear, mild, and just before local sunset. As I was recording, I saw MIR appear out of the southwest, climb to the zenith and pass nearly directly overhead, and then disappear to the northeast, behind the hill above my recording site. It was quite an INSPIRE-ing site!

I didn't hear anything out of the ordinary on the tape. For a period of a few minutes during the session, starting around 22:25:25, my headphones were either causing or picking up audio feedback of some kind, so I disconnected them. Two episodes of loud feedback appear on the tape around this time.

I did want to mention my VLF web page, which can be found at

[www.marymt.edu/~aiello/vlf.html](http://www.marymt.edu/~aiello/vlf.html)

I have some illustrations and photos, a short VLF sound clip, and Links to VLF related material. There is also a page where you can download my Audio Time Marker program for Windows.

Renato Romero, who is apparently using the ATM program, has made a set of sound files which actually add the time stamp to a sonogram as a set of six "dot-matrix" style digits. This sound file set is also available for downloading from my web site.

**Team 6**

**Bill Pine**

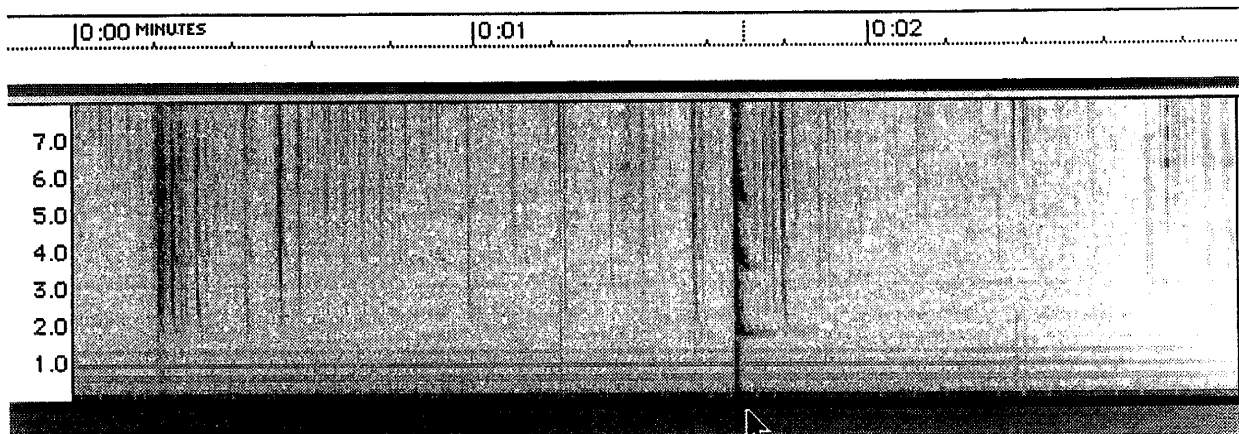
**Ontario, CA**

**Chaffey High School**

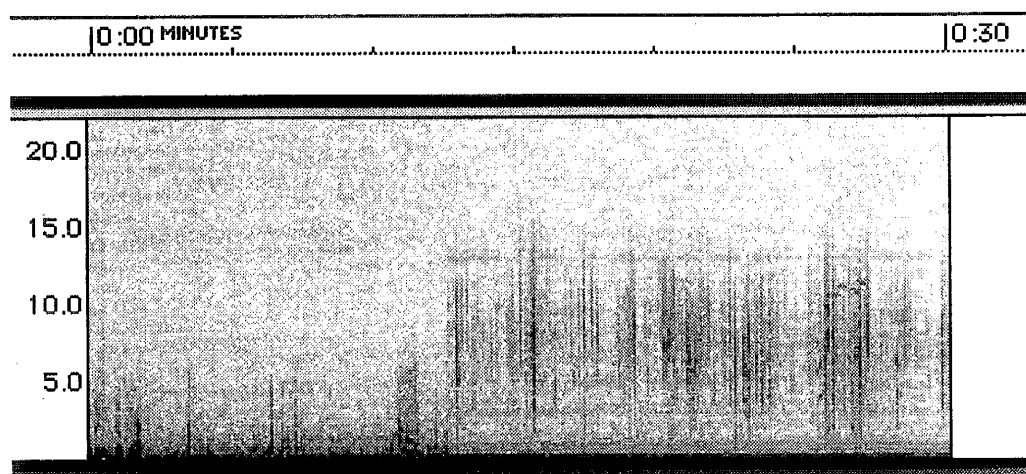
The Chaffey High School INSPIRE team set up three receivers for observations at our site on Glendora Ridge Road in the San Gabriel Mountains overlooking our valley.

Receiver #1 is an ACTIVE B-field receiver from the first project in 1989 that eventually became INSPIRE. The antenna is a center-tapped 1-meter square loop antenna with 90 turns. The recorder is a Radio Shack CTR 69. Ivan Seigneur captured several interesting twecks during Operation 21-3.

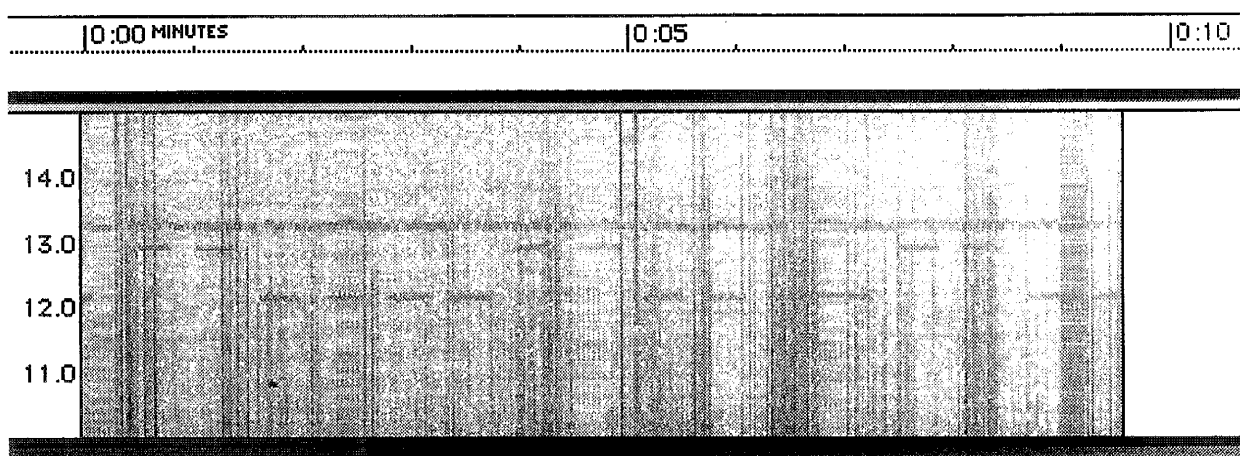




Ivan Seigneur, Receiver #1, Operation 21-3  
Strong tweeek with the "hook" at 1.8 kHz and harmonics above that.

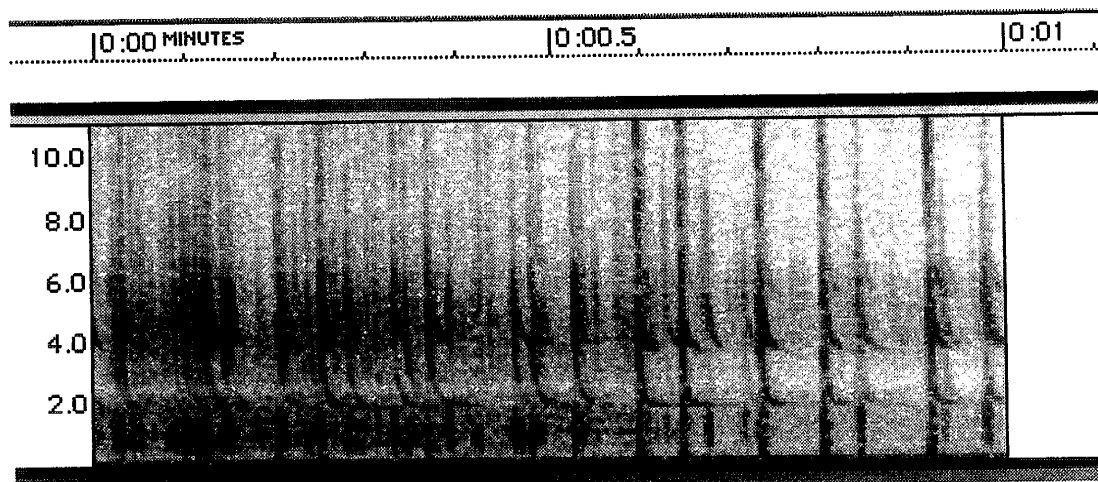


La Reina Whatley, Receiver #1, Operation 22-2.  
Alpha appears a smudges between 10 and 15 kHz.

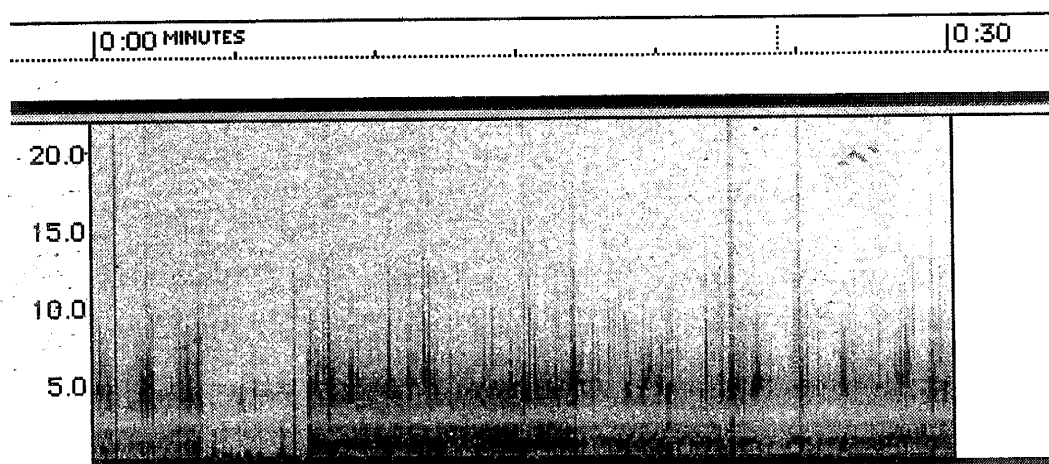


Andre Oullette, Receiver #1, Operation 28-1.  
Alpha appears prominently on this receiver.

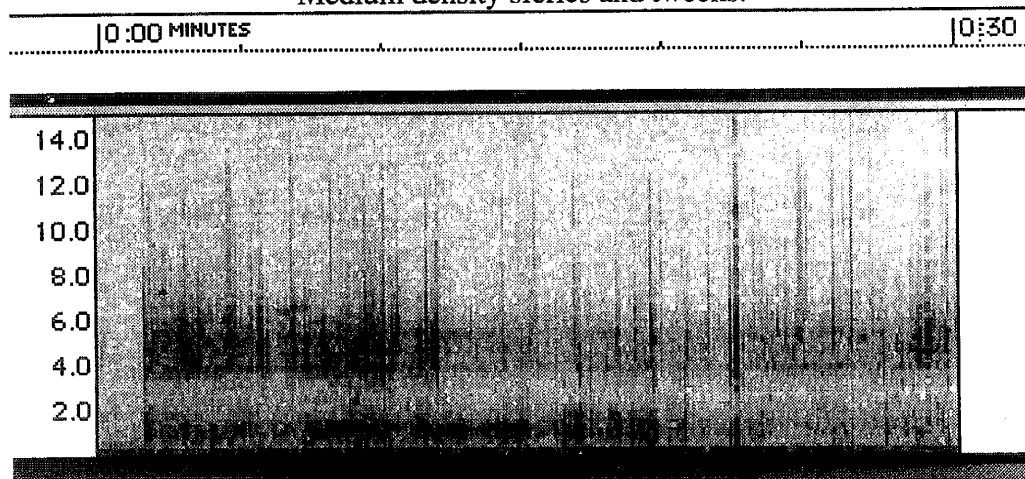
Receiver #2 is an INSPIRE RS4 using a 2-meter whip antenna. The recorder is a Toshiba Walkman-style portable.



Andre Ouellette, Receiver #2, Operation 21-3.  
A burst of tweeks showing at least 10 strong tweeks and many weaker ones in one second.

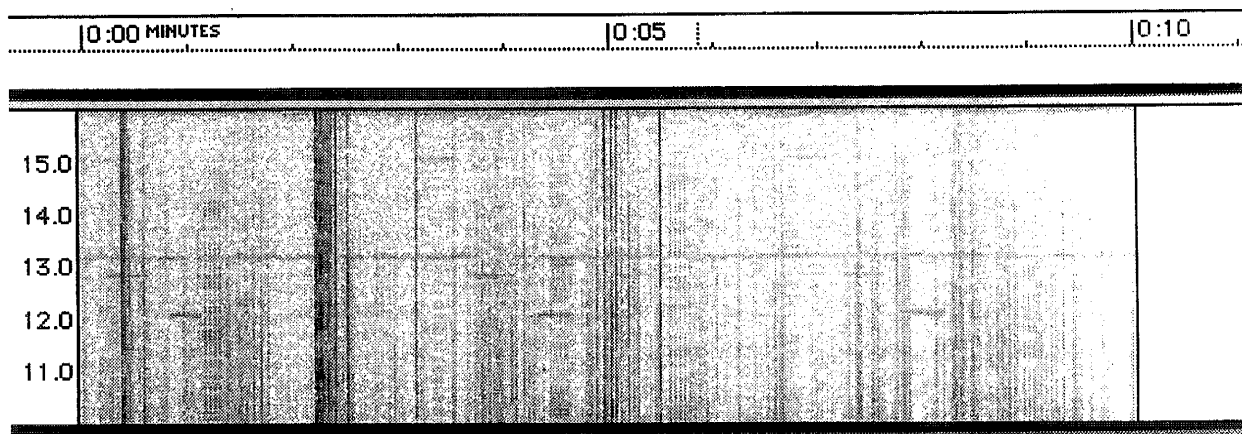


Daniel Silva, Receiver #2, Operation 22-2.  
Medium density sferics and tweeks.

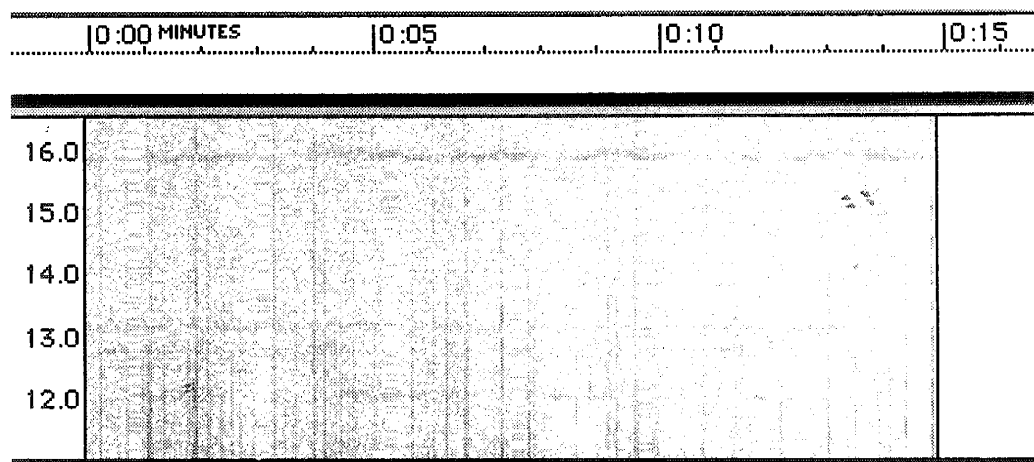


Daniel Silva, Receiver #2, Operation 28-1.  
Higher density and amplitude on these sferics.

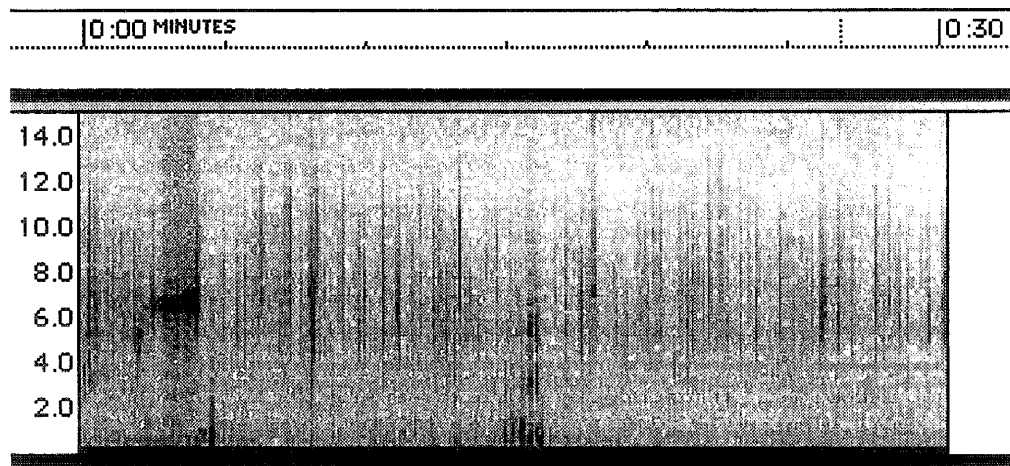
Receiver #3 is an INSPIRE VLF2 receiver using a 2-meter whip antenna. The recorder is a Marantz PMD 430 portable cassette recorder.



Vince Mangione, Receiver #3, Operation 21-3.  
Alpha signals appear as dashes at three frequencies.



Vince Mangione, Receiver #3, Operation 22-2.  
Alpha signals faintly visible (and audible) at 12 kHz and above.



Megan Souter and Eric Reed, Receiver #3, Operation 28-1.  
Signal at about 4 seconds is oscillation in the receiver.

Data Log Cover Sheet

(copy as needed)

INSPIRE Observer Team \_\_\_\_\_ Receiver \_\_\_\_\_

Operation \_\_\_\_\_

Date \_\_\_\_\_ Tape Start Time (UT) \_\_\_\_\_

\*\*\*\*\*

Operation details: Tape start time: \_\_\_\_\_ UT \_\_\_\_\_ local

Operation start time: \_\_\_\_\_ UT \_\_\_\_\_ local

Operation type: \_\_\_\_\_

Operation stop time: \_\_\_\_\_ UT \_\_\_\_\_ local

Tape stop time: \_\_\_\_\_ UT \_\_\_\_\_ local

Equipment: Receiver \_\_\_\_\_ WW V reception: \_\_\_\_\_

Recorder \_\_\_\_\_

Antenna \_\_\_\_\_

WWV radio \_\_\_\_\_

Site description: \_\_\_\_\_

Longitude: \_\_\_\_\_ ° \_\_\_\_\_ ' W Latitude: \_\_\_\_\_ ° \_\_\_\_\_ ' N

Local weather: \_\_\_\_\_

Personnel: \_\_\_\_\_

\_\_\_\_\_

Team Leader address: Name \_\_\_\_\_

Street \_\_\_\_\_

City, State, Zip, Country \_\_\_\_\_

INSPIRE Data

(copy as needed)

INSPIRE Observer Team \_\_\_\_\_

Receiver \_\_\_\_\_

Operation \_\_\_\_\_

Date \_\_\_\_\_ Tape Start Time (UT) \_\_\_\_\_

\*\*\*\*\*

Code: S - sferics    0 1 2 3 4 5    M - Mark T - tweek W - whistler O - OMEGA C - chorus  
                              L M H

Time	Entry	Observer
_____	_____ S: 0 1 2 3 4 5	_____
_____	_____ S: 0 1 2 3 4 5	_____
_____	_____ S: 0 1 2 3 4 5	_____
_____	_____ S: 0 1 2 3 4 5	_____
_____	_____ S: 0 1 2 3 4 5	_____
_____	_____ S: 0 1 2 3 4 5	_____
_____	_____ S: 0 1 2 3 4 5	_____
_____	_____ S: 0 1 2 3 4 5	_____
_____	_____ S: 0 1 2 3 4 5	_____
_____	_____ S: 0 1 2 3 4 5	_____
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_____	_____ S: 0 1 2 3 4 5	_____
_____	_____ S: 0 1 2 3 4 5	_____
_____	_____ S: 0 1 2 3 4 5	_____
_____	_____ S: 0 1 2 3 4 5	_____
_____	_____ S: 0 1 2 3 4 5	_____
_____	_____ S: 0 1 2 3 4 5	_____
_____	_____ S: 0 1 2 3 4 5	_____