

INTMINS OBSERVERS

Roster Update

The following is a roster of INTMINS observers including first-time observers. Team number assignments are permanent and will be used to refer to teams in the future. (Unless noted otherwise, all longitudes are West and latitudes are North.)

North American observers:

Team #	Observer	Location	Longitude/Latitude
1.	John Lamb, Jr. University of Mary Hardin-Baylor	Belton, TX	97° 27' 50" / 31° 7' 45"
2.	Stephen G. Davis	Fort Edwards, NY	73° 29' 30" / 43° 18' 00"
3.	Don Shockey	Oklahoma City, OK	97° 40' 5" / 35° 43' 30"
4.	Mike Aiello	Croton, NY	73° 46' 45" / 40°
5.	Jean-Claude Touzin	St. Vital Quebec	79° 10' / 48° 55'
6.	Bill Pine Chaffey High School	Ontario, CA	117° 41' / 34° 14'
7	Dean Knight Sonoma Valley High School	Sonoma, CA	122° 33' / 38° 21'
8	Mike Dormann	Seattle, WA	123.4° / 47.2°
9	Robert Moloch Eastern Elementary School	Greentown, IN	85° 58' / 40° 28'
10	Bill Taylor INSPIRE	Washington, DC	77° 2' / 38° 54'
11	Mark Mueller Brown Deer High School	Brown Deer, WI	87° 56' / 43° 10'
12	Jon Wallace	Litchfield, CT	73° 15' / 41° 45'
13	Bill Combs	Crawfordsville, IN	86° 59' / 40° 4'
14	John Barry Seeger High School	West Lebanon, IN	87° 22' / 40° 18'
15	Robert Bennett	Las Cruces, NM	106° 44' / 32° 36'
16	Leonard Marraccini	Finleyville, PA	80° 00' / 40° 16'
17	Kent Gardner	Fullerton, CA	117° 48' 30" / 34° 12' 13"
18.	David Jones	Columbus, GA	77° 07' / 35° 00'
19.	Larry Kramer / Clifton Lasky	Fresno, CA	119° 49' / 37° 01'
20.	Barry S. Riehle Turpin High School	Cincinnati, OH	84° 15' / 39° 7'
21.	Phil Hartzell	Aurora, NE	98° 0' / 41° 0'
22.	Rick Campbell	Brighton, MI	83° 50' 2.7" / 42° 16' 43.7"
23.	Jim Ericson	Glacier, WA	121° 57.91' / 48° 53.57'
24.	Paul DeVoe Redlands High School	Redlands, CA	116° 52' / 34° 10'
25	Norm Anderson	Cedar Falls, IA	92° 15' / 42° 20'
26	Brian Page	Lawrenceville, GA	83° 45' / 34° 45'
27	Ron Janetzke	San Antonio, TX	98° 47' / 29° 35'
28	Thomas Earnest	San Angelo, TX	100° 25' / 31° 16'
29	Janet Lowry	Houston, TX	95° / 29°
30	Linden Lundback	Watrous, Sask	105° 22' / 51° 41'

European observers:

Team #	Observer	Location	Longitude/Latitude
E1	Flavio Gori	Florence, IT	11° 50' 18" E / 43° 50' 18" N
E2	Silvio Bernocco	Torino, IT	7° 12' E / 44° 54' N
E3	Fabio Courmoz	Aosta, IT	7.7° E / 45.7° N
E4	Joe Banks	London, UK	0° / 50° 52' N
E5	Renato Romero	Cumiana, IT	7° 24' E / 49° 57' N
E6	Marco Ibridi	Finale E., IT	11° 17' E / 44° 50' N
E7	Alessandro Arrighi	Firenze, IT	10° 57' 50" E / 43° 43' 21" N
E8	Zeljko Andreic	Zagreb, Croatia	
	Rudjer Boskovic Institute		
E9.	Dr. Valery Korepanov	Lviv, UKRAINE	24° E / 50° N
	Lviv Center of Institute of Space Research of NASU		
E10.	Sarah Dunkin	London, England	0° 02' E / 51° 40' N
	University College London		

New Observers (11/97):

31	Lee Benson	Indianapolis, IN
	Longitude:	86° 3' W
	Latitude:	39° 23' N
	North Central	Camp Atterbury, 50 miles S. of Indianapolis
	Receiver:	INSPIRE VLF-2
	Recorder:	Sony TCS-580V Stereo
	Antenna:	4 ft. shielded loop, Top 11' AGL, 2nd part, 12 ft vert wire
	WWV:	Sony ICF-SW7600G
32	Shawn Korgan	Gilcrest, CO
	Longitude:	104° 67' W
	Latitude:	40° 22' N
	Open area,	50 ft from paved road, one mile from power lines
	Receiver:	TL071 op-amp (home made)
	Recorder:	Sharp RT-22
	Antenna:	8 foot whip mounted on car
	WWV:	PRO-60

INTMINS - April/99 Data Analysis Report

by Bill Pine
Chaffey High School
Ontario, CA

The April/99 INTMINS observations marked the ninth session in an ongoing series of operations conducted with the cooperation and assistance of the Russian Space Agency (IKI) and ENERGIA, the Russian space engineering organization. INTMINS is an attempt to detect manmade VLF radio waves emitted by instruments on the MIR Space Station.

INTMINS Status Report

The orbit of MIR remained stable during the time between the establishment of the operation schedule and the operations themselves. No modification of the start times was necessary.

The bottom line of the analysis remains unchanged: the VLF signal from the pulsed electron beam was not detected on the ground. This is not an unsurprising result since theoretical calculations of the signal of the power of ISTOCHNIK when propagated to the ground place the signal strength at just about the same as the background of natural VLF. We will continue with INTMINS as long as the Russian Space Agency (IKI) and MIR are able to provide observing opportunities for us. It is beginning to look like (even to an optimist!) the beam strength of ISTOCHNIK is inadequate to propagate a VLF signal to the ground that can be detected by our receivers. In the future, perhaps on the International Space Station, maybe a more powerful electron gun will be available for us to use in this ongoing investigation.

Data Analysis Procedure

The data analysis procedure used consisted of the following:

1. A sound file was created of the 2-minute period of ISTOCHNIK operation.
2. A spectrogram image was made of this file using a frequency range of 0-22.05 kilohertz so that the 12-15 kilohertz range could be examined for the presence of Russian Alpha navigation signals. The 1 kilohertz region of the spectrogram was examined for the 10 seconds on, 10 seconds off signal from ISTOCHNIK.
3. A one-minute portion of the file was cropped, enlarged and an image made using a 0-11.025 kilohertz frequency range. Again the 1 kilohertz region of the spectrograph was examined.
4. Finally, a 30-second portion was cropped, enlarged and an image made. A final examination of the 1 kilohertz region was made.
5. Additional sound files and spectrogram images were made of items of interest noted in the logs.

INTMINS-November/98 Operations Summary

(NOTE: All times are UT on the date indicated.)

European Passes

Pass	ISTOCHNIK Start Time	Path during ISTOCHNIK Firing	Number of Observers Recording Data
E17-1	0824	Central ITALY	0
E17-2	1004	RUSSIA, South of Moscow	0
E17-3	1133	ENGLAND	0
E17-4	1309	ENGLAND	0
E18-1	0853	RUSSIA, South of Moscow	0
E18-2	1028	RUSSIA, South of Moscow	0
E18-3	1201	CROATIA	0
E24-1	0622	West-Central ITALY	0
E24-2	0935	CROATIA	0
E24-3	1109	Northern ITALY	0
E25-1	0510	Central ITALY	1
E25-2	0650	RUSSIA, South of Moscow	1
E25-3	0819	ENGLAND	0
E25-4	0959	South of CROATIA	0

North American Passes

Pass	ISTOCHNIK Start Time	Path during ISTOCHNIK Firing	Number of Observers Recording Data
17-5	1425	TX, OK	4
17-6	1558	So. CA	4
17-7	1742	QUEBEC	3
17-8	2054	VA, NC, SC	0
17-9	2220	WA, OR	1
18-4	1318	VA, DC, MD, DE	4
18-5	1448	AZ, NM	2
18-6	1621	No. CA	4
18-7	1757	WA	1
18-8	1942	PA, MD	1
18-9	2116	MO, MS, AL, FL	1
24-4	1226	IA, WI	1
24-5	1355	No. CA	4
24-6	1532	WA	2
24-7	1716	PA, MD	1
24-8	1847	WY, NE, KS	2
25-5	1249	SD, MN	2
25-6	1427	QUEBEC	3
25-7	1602	QUEBEC	1
25-8	1737	IA, IL, IN	1
25-9	1912	TX	3
25-10	2043	CA	2

Summary of European Passes Recorded

Team/Pass	E17-1	E24-1	E24-3	E25-1	E25-2
E1				X	X
E5	X	X	X	X	

Summary of North American Passes Recorded

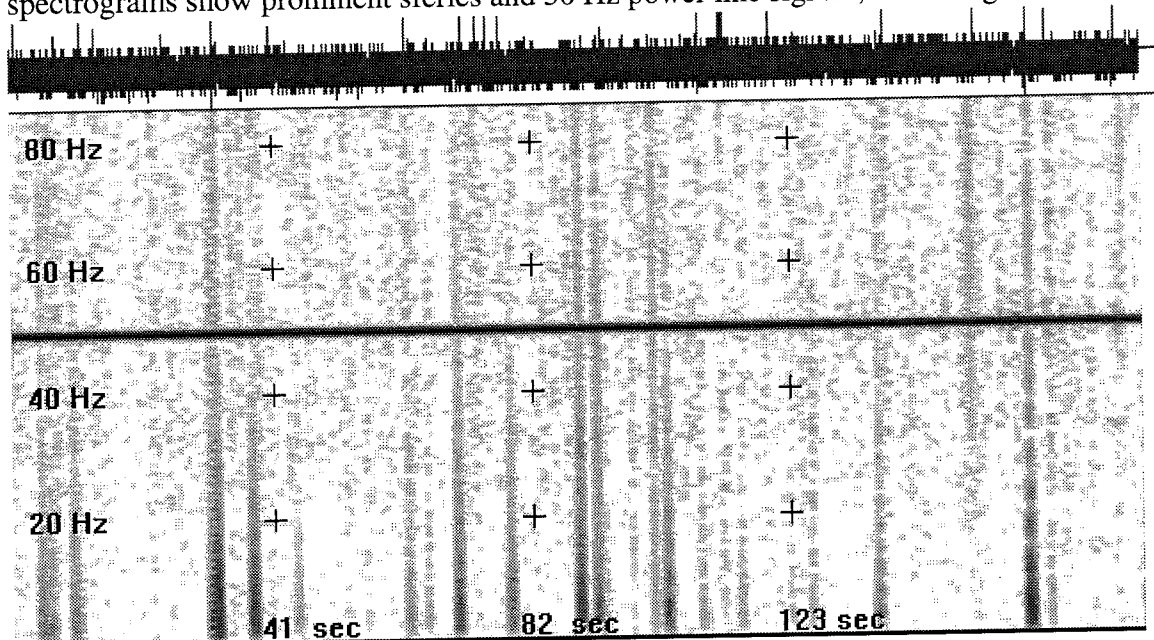
Pass	4/17					4/18					4/24					4/25					10	
	5	6	7	8	9	4	5	6	7	8	9	4	5	6	7	8	5	6	7	8	9	
Team																						
1	x																					x
5			x															x	x			
6		x						x					x									x
7		x						x					x									x
15	x	x	x			x	x	x					x	x	x	x						
16						x				x												
18						x					x										x	
21													x			x						
25												x										
27	x																					
28	x																					x
30		x	x		x			x	x					x				x	x			
31																					x	
32						x	x											x	x			

INTMINS Data

The following spectrograms are taken from data tapes submitted by INSPIRE observers. The first view shown will be that of the entire two-minute interval analyzed. At the top of the image is the sound filename which consists of the Team Number, operation number, and the start time of the operation. Subsequent views will be of portions of the first. Use the time scale at the top to determine the length of the view. Use the frequency scale on the left to determine the frequency range used for that view. Unless otherwise noted, the start time of the cropped view is the same as the start time of the operation.

E17-1

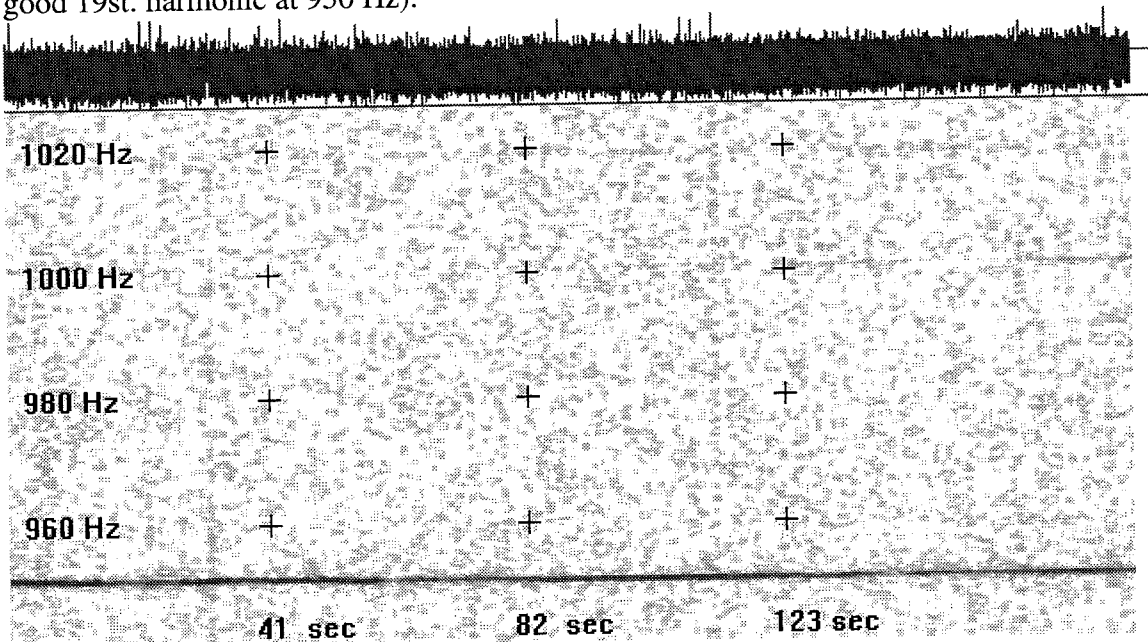
Renato romero, Team E5, submitted spectrograms of his data. He looked at the 10 Hz range and the 1 kHz range for the signals from Ariel and ISTOCHNIK, respectively. His spectrograms show prominent sferics and 50 Hz power line signals, but no signals from MIR



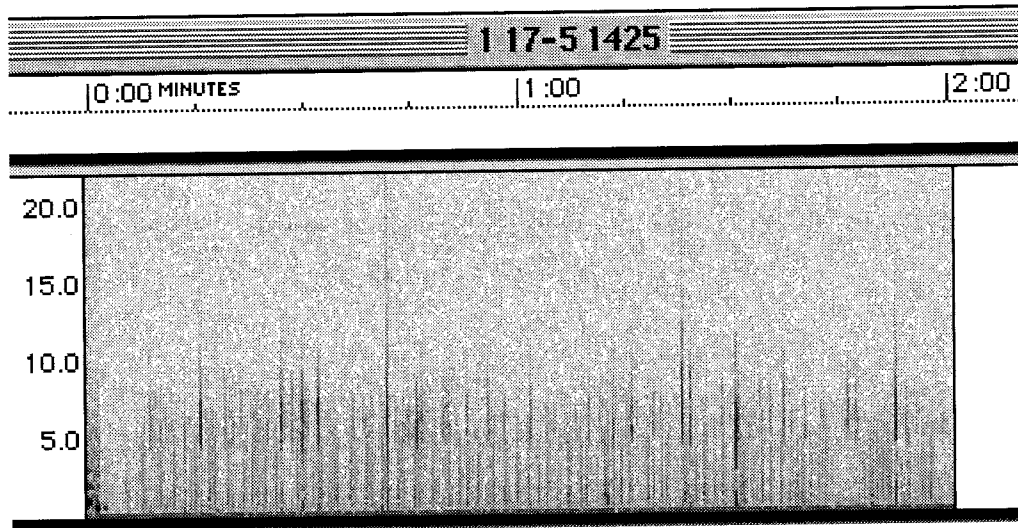
E17-1

Europe 5, R. Romero ñ Pass 17/1 ñ 17/04/99 from 08:24:00 to 08:27:00
 Spectrum analysys: 0 ñ 86 Hz
 Nothing at 10 Hz, strong 50 Hz tone.

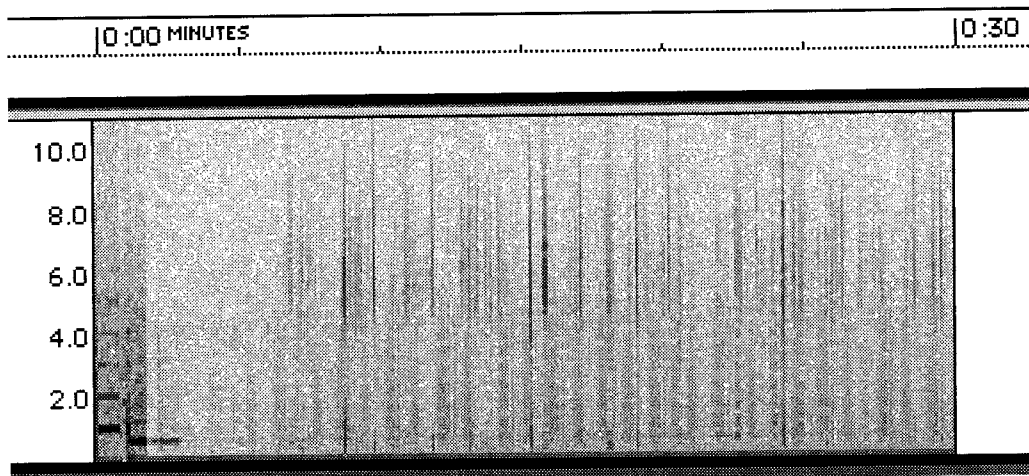
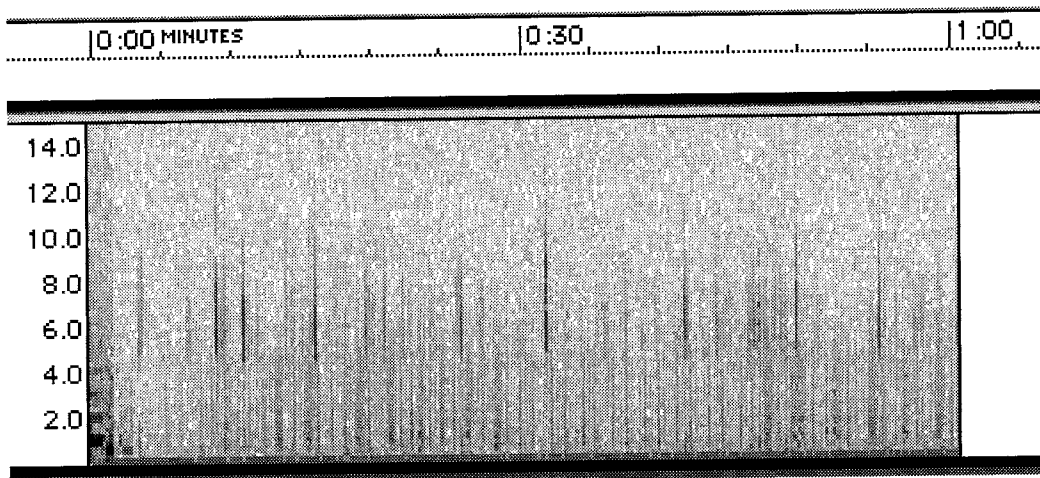
Europe 5, R. Romero ñ Pass 17/1 ñ 17/04/99 from 08:24:00 to 08:27:00
 Spectrum analysys: 940 ñ 1030 Hz
 Nothing at 1000 Hz (only a weak 20st.harmonic of 50 Hz at 1000 Hz at the end of sonogram, and good 19st. harmonic at 950 Hz).



17-5

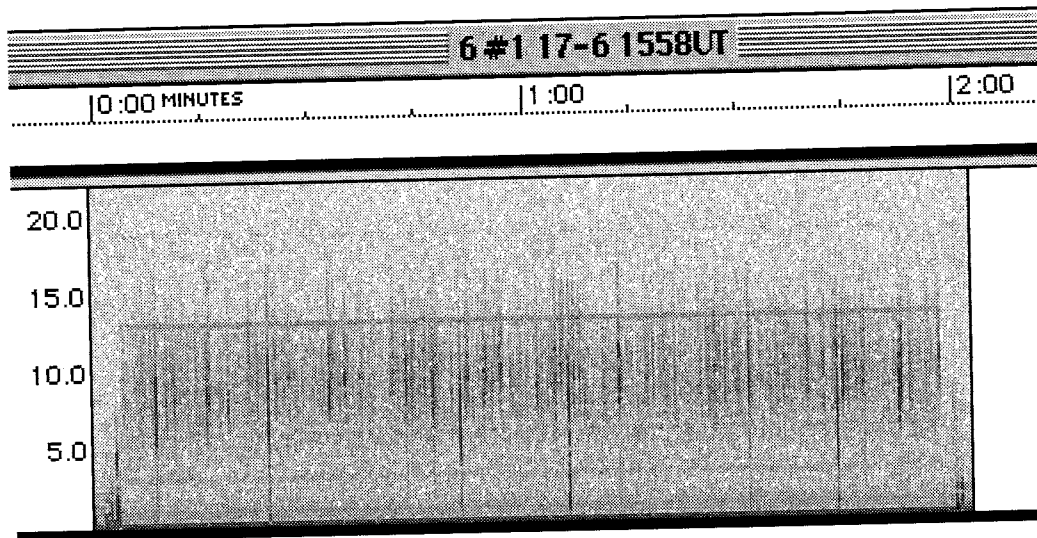


Team 1. Jack Lamb, Belton, TX
Good sferics shown. This was a quiet day in the middle of the country.

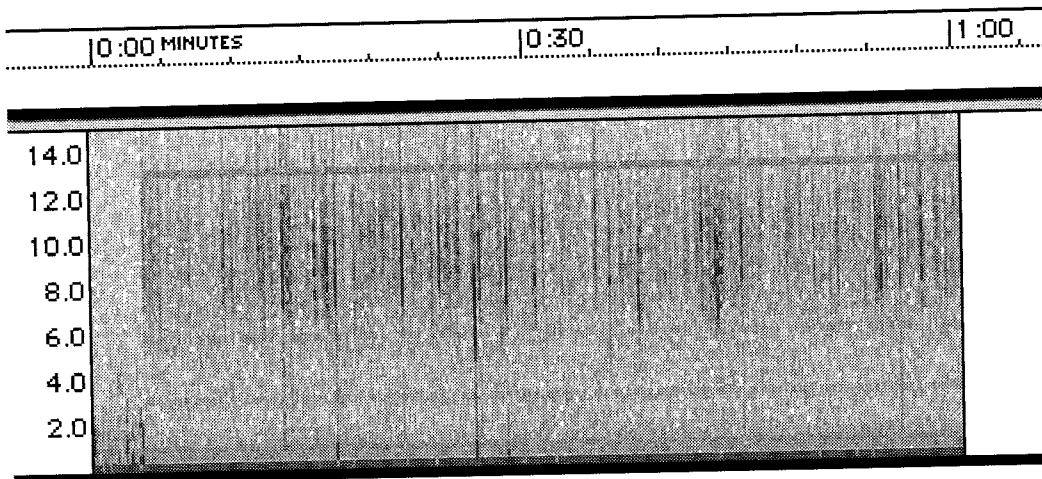


1425 UT WWV 1 kHz tone and several harmonics are present at the start.

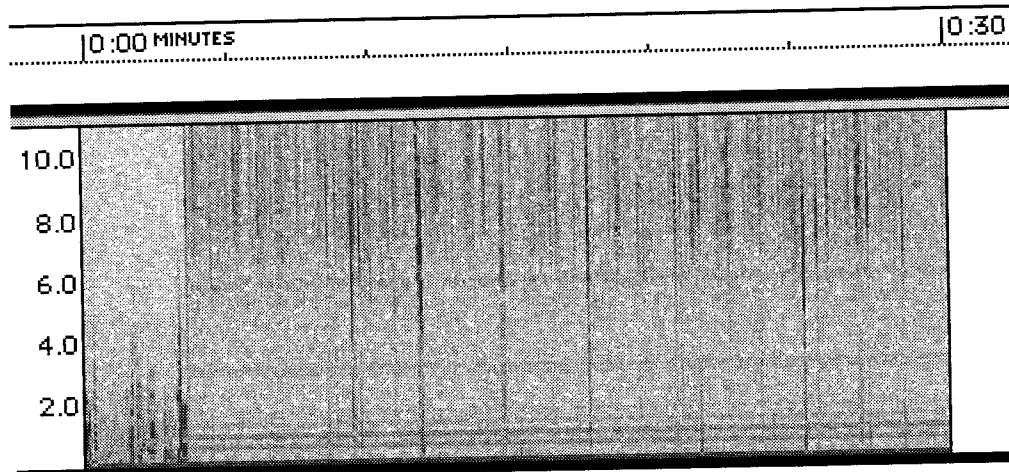
17-6



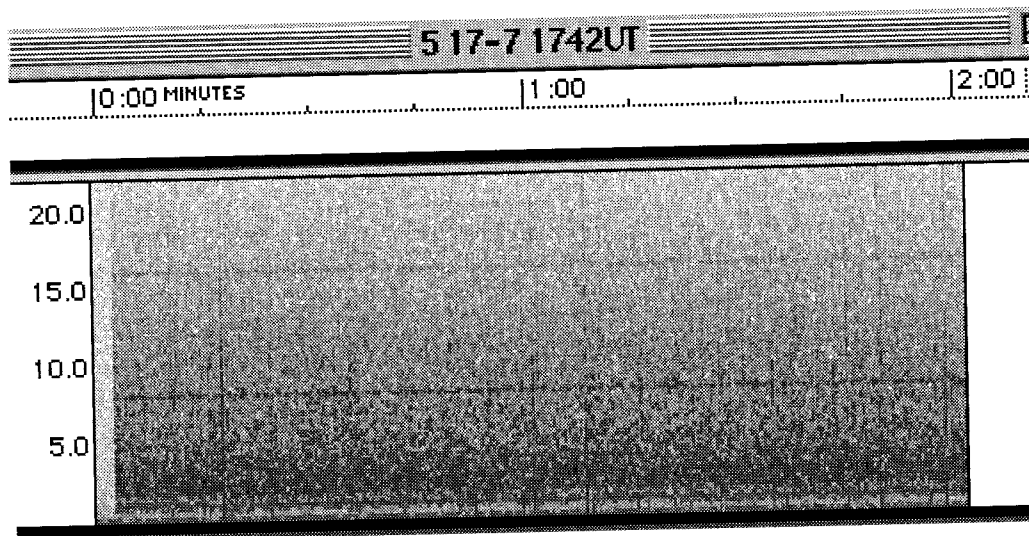
Team 6 Bill Pine, Chaffey High School, Ontario, CA
Receiver #1 is a B-field receiver with a 1 meter square loop with 90 turns, center tapped.
Quiet conditions.



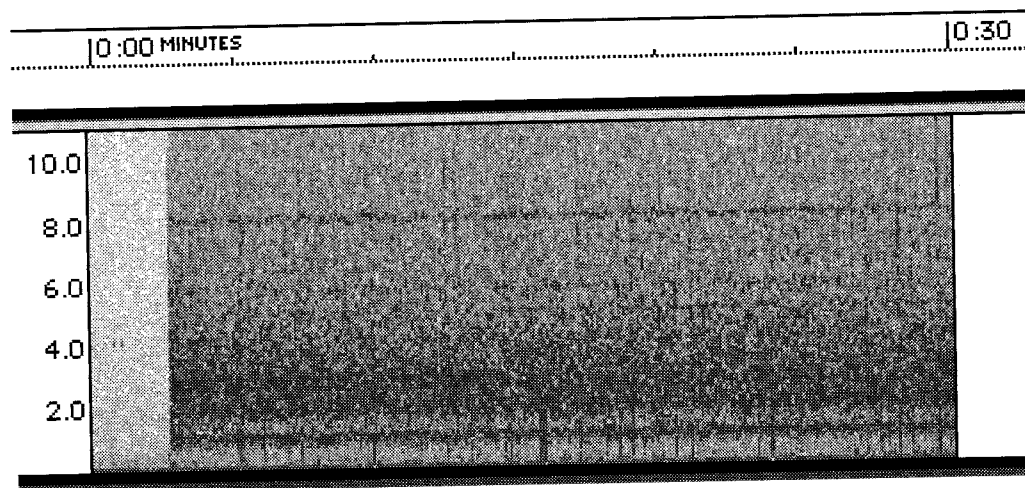
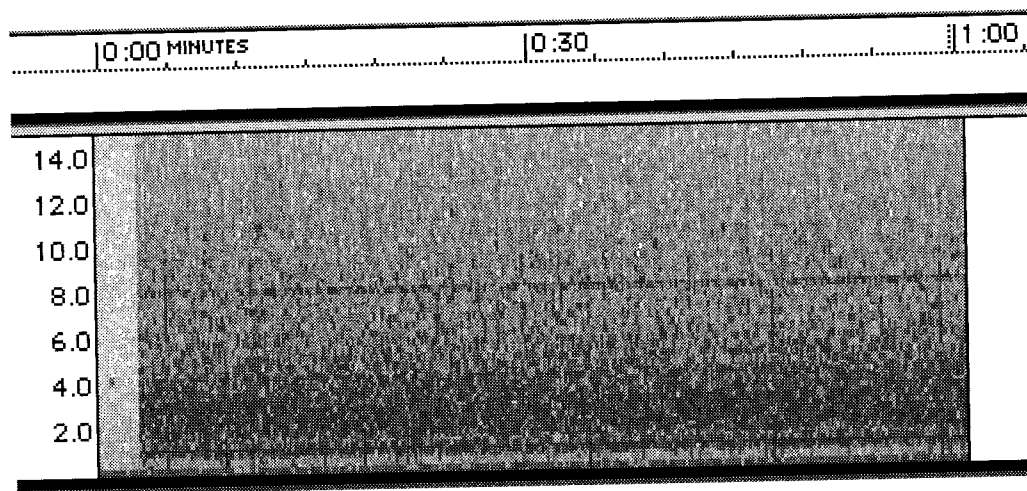
Strong sferics present, low density.



17-7

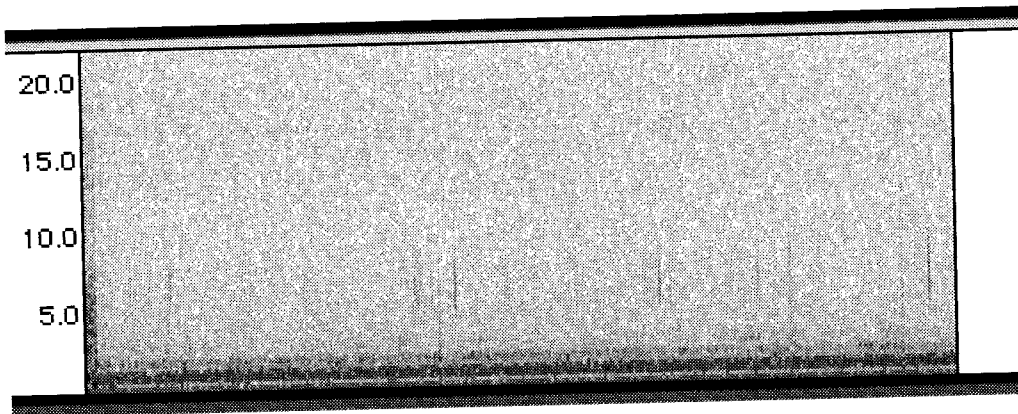
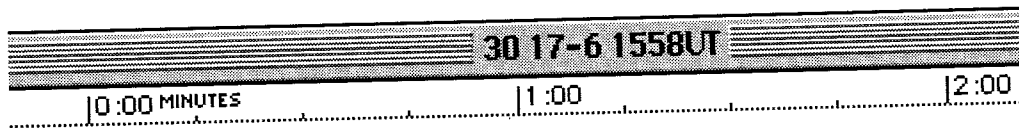


Team 5 Jean-Claude Touzin, St. Vital, Quebec, CANADA
Strong and persistent chorus was present during this session.

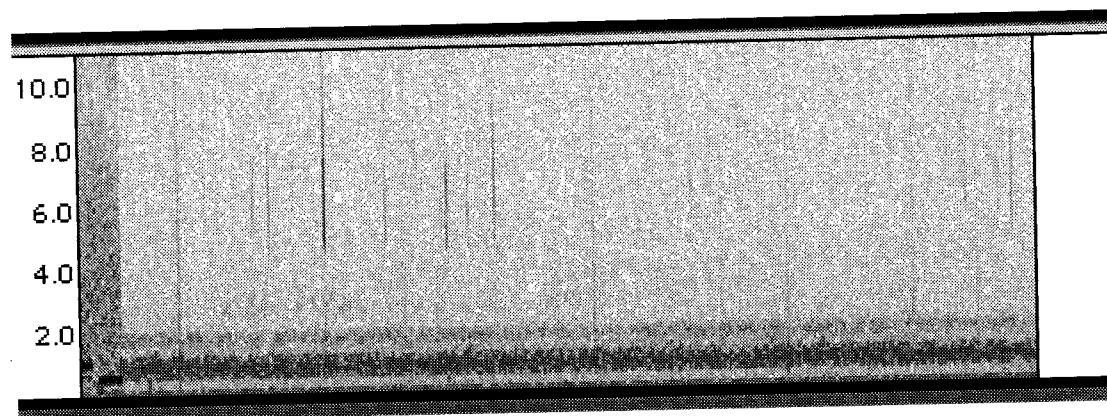
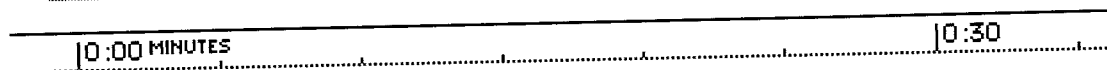
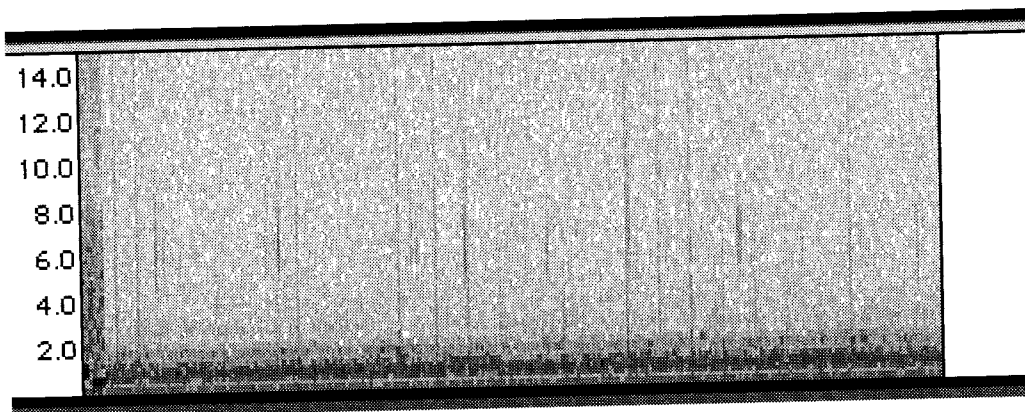
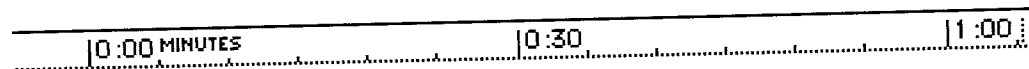


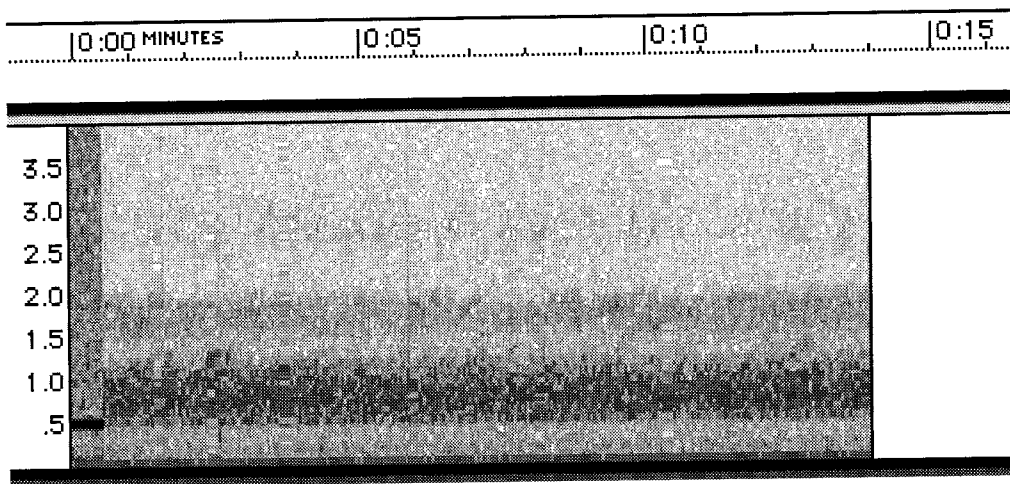
Chorus is not easy to see in spectrograms. This session had quite a bit of hiss-type noise that obscures the lower frequencies where chorus is found.

17-9

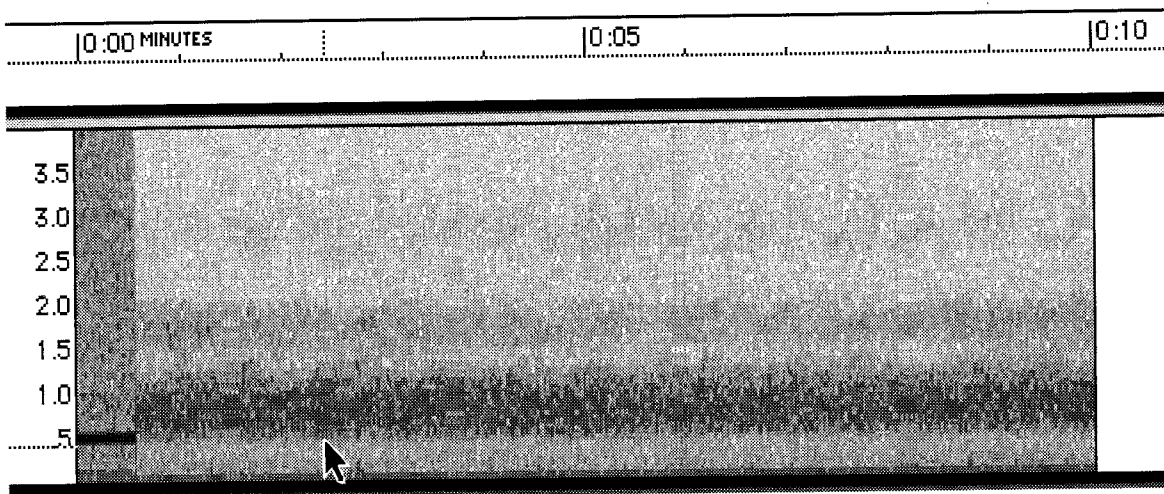


Team 30 Linden Lundback, Watrous, Saskatchewan, CANADA
Quiet sferics conditions with lots of chorus and risers. Some faint whistlers.

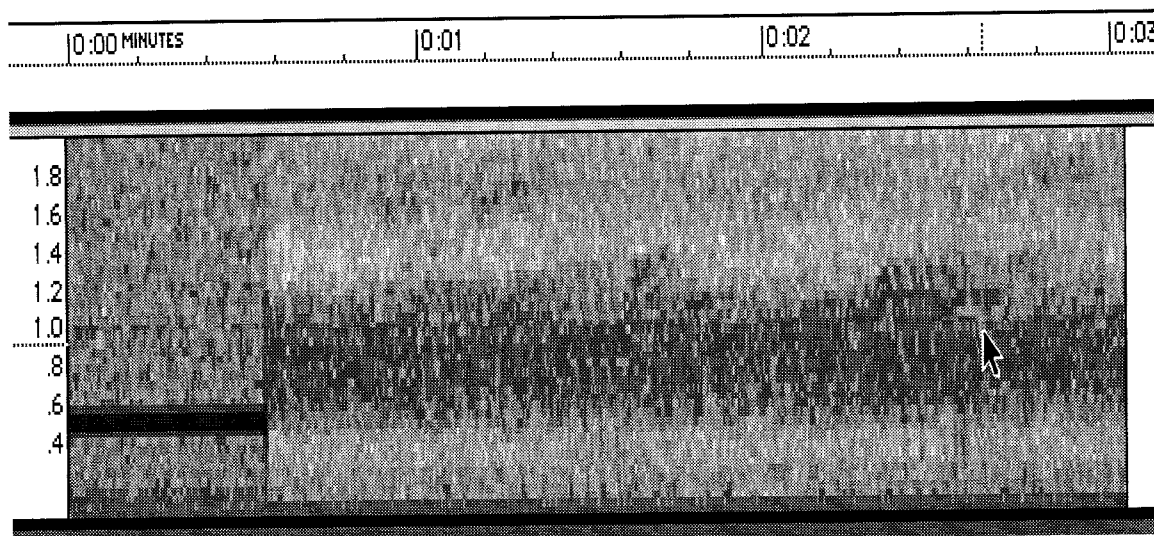




First few seconds of operation. Chorus is down below 2 kHz.

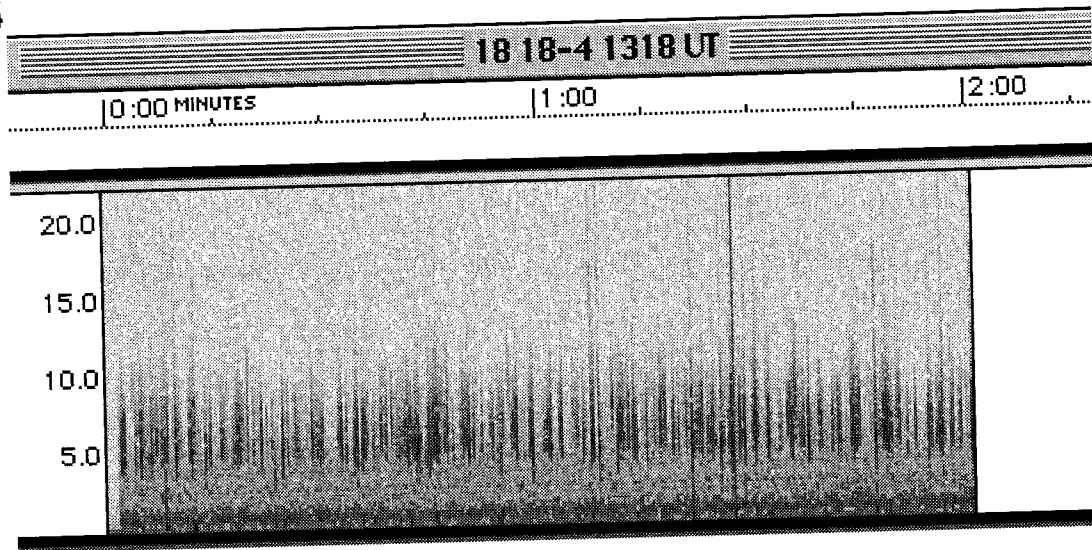


Arrow shows a riser. Note the signal up toward 2 kHz.

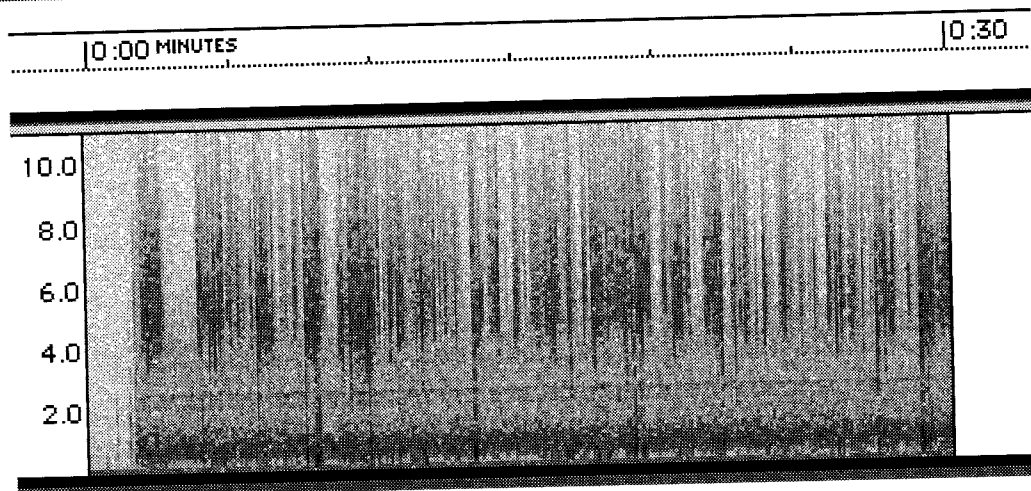
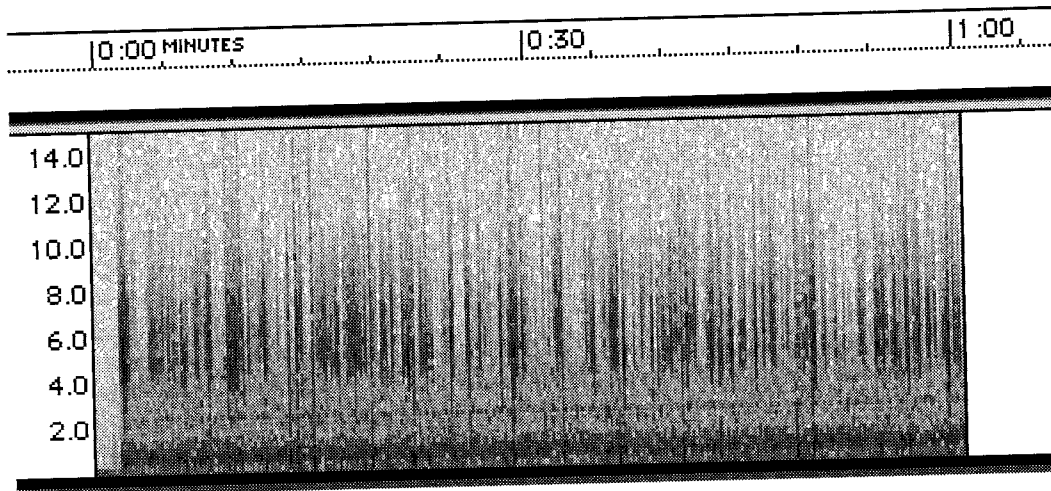


Closeup of riser. When the signal band bulges up in frequency, that is the riser.

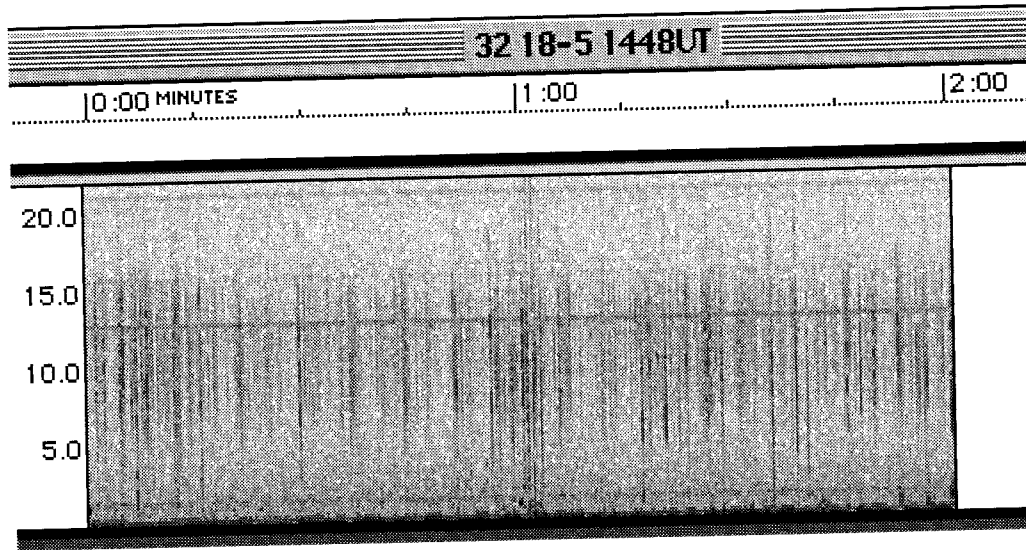
18-4



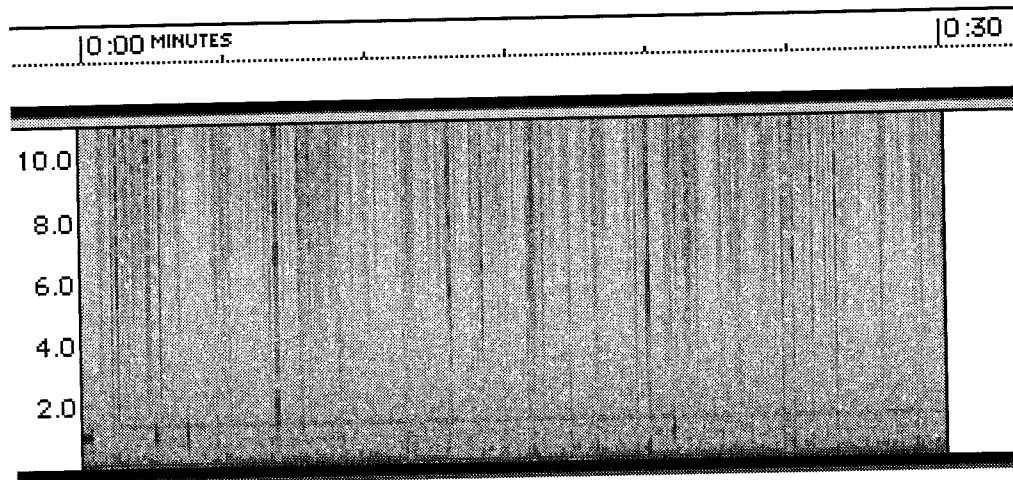
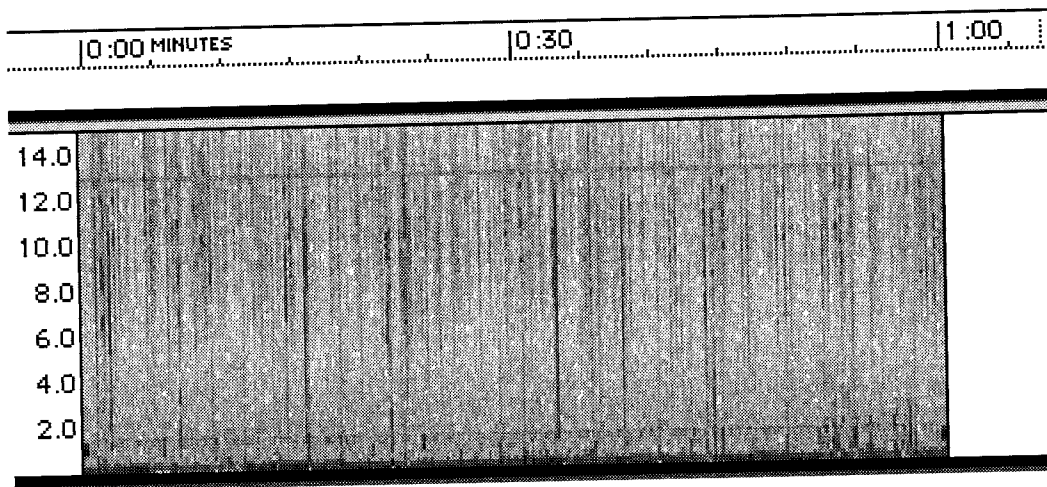
Team 18 David Jones, Columbus, GA
Good signal. Lots of whistlers.



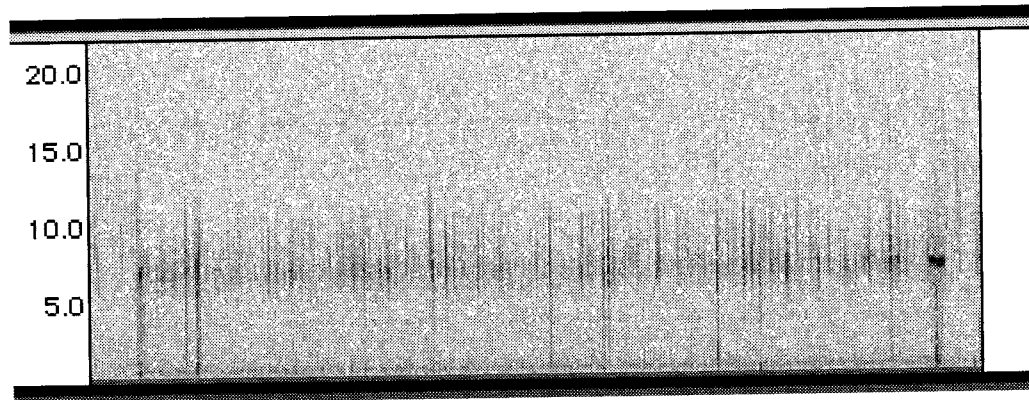
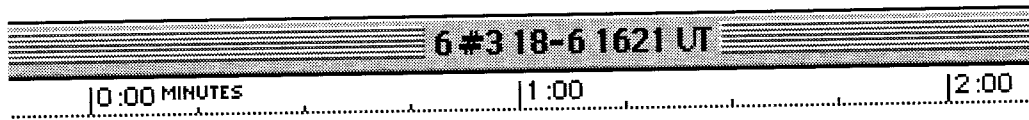
18-5



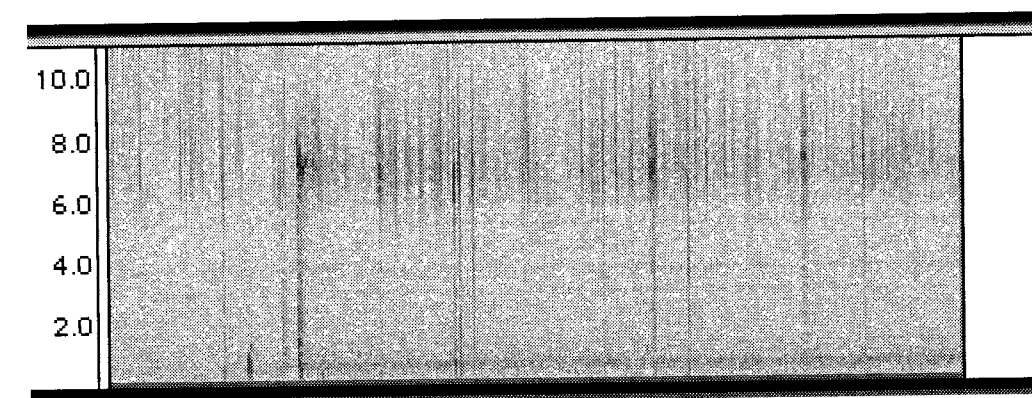
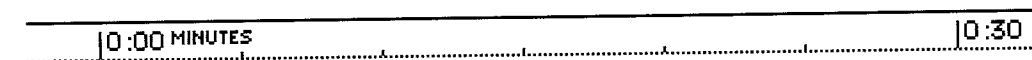
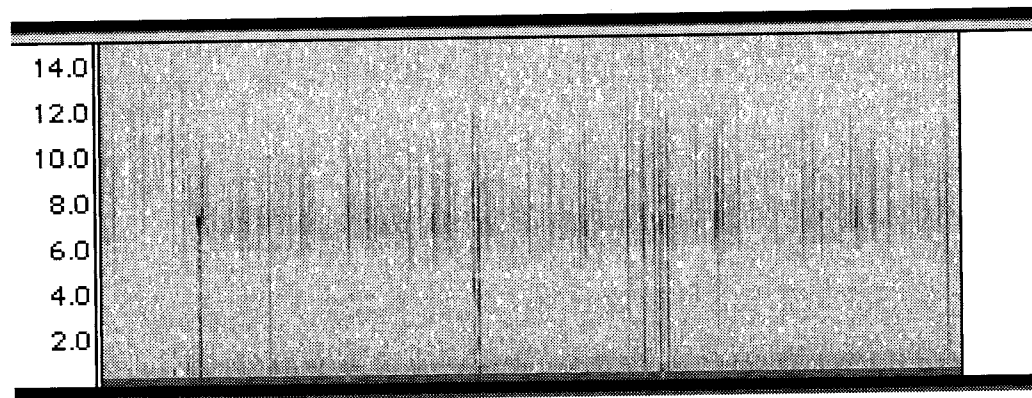
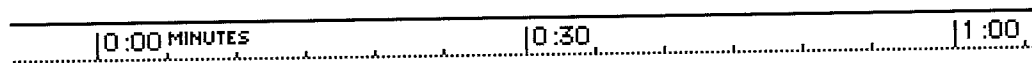
Team 32 Shawn Korgan, Gilcrest, CO
Strong signal. Whistlers present.



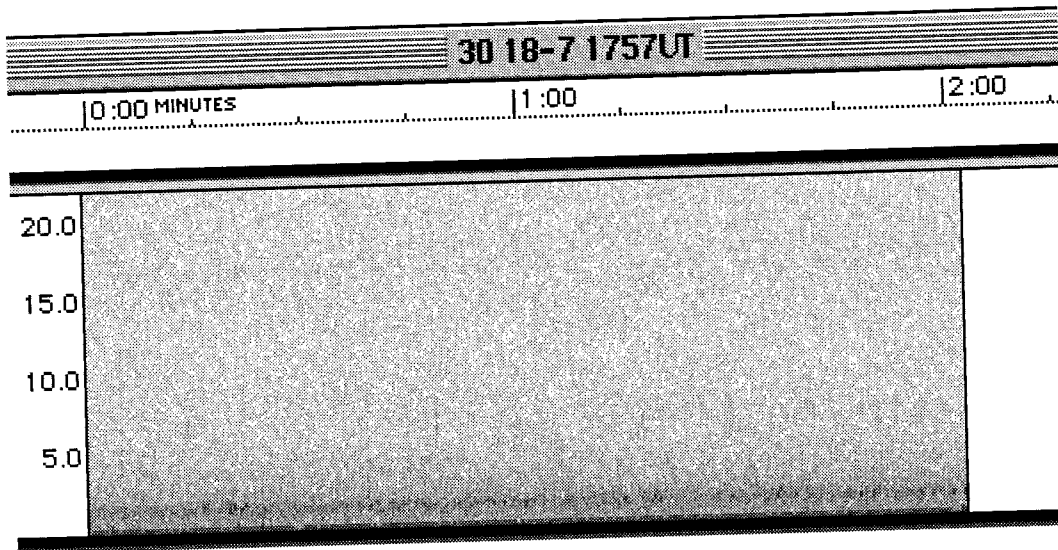
18-6



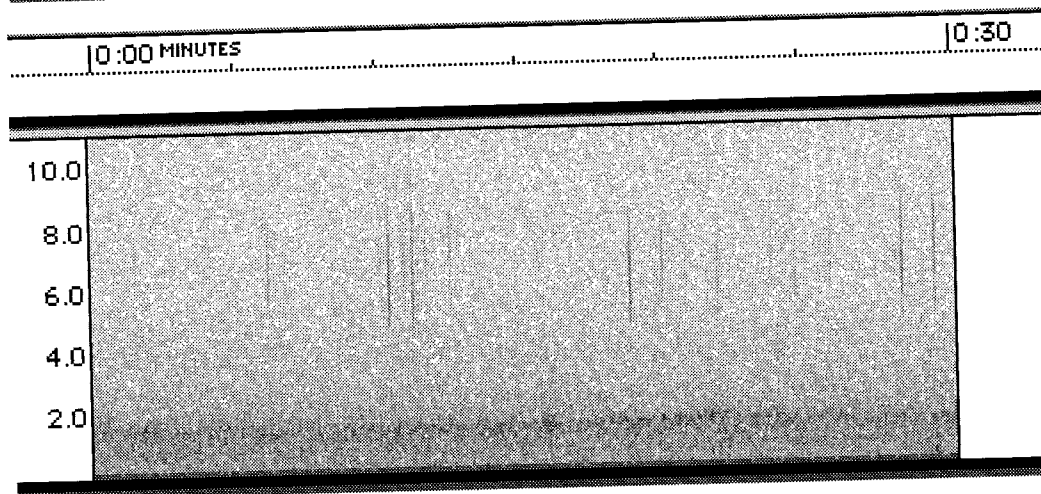
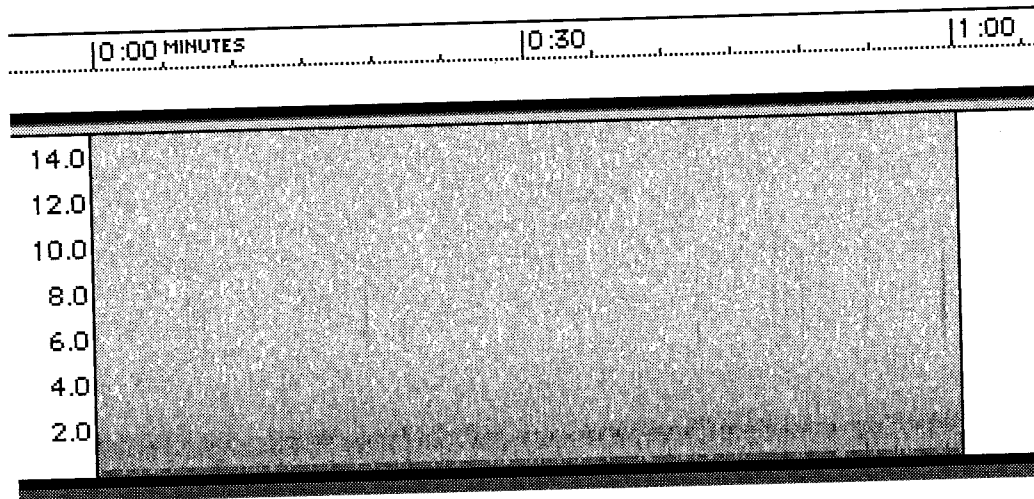
Team 6 Bill Pine, Chaffey high School, Ontario, CA
Quiet conditions.



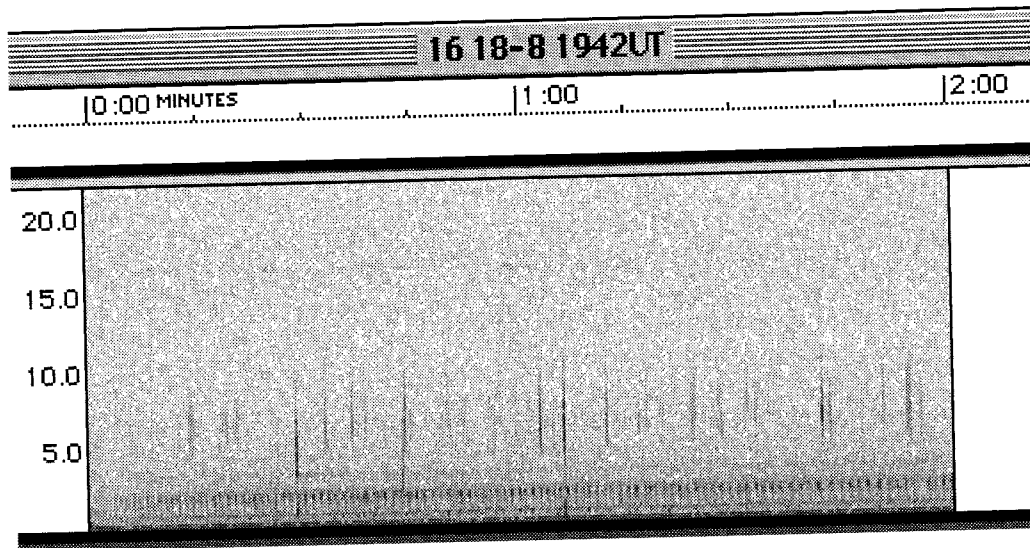
18-7



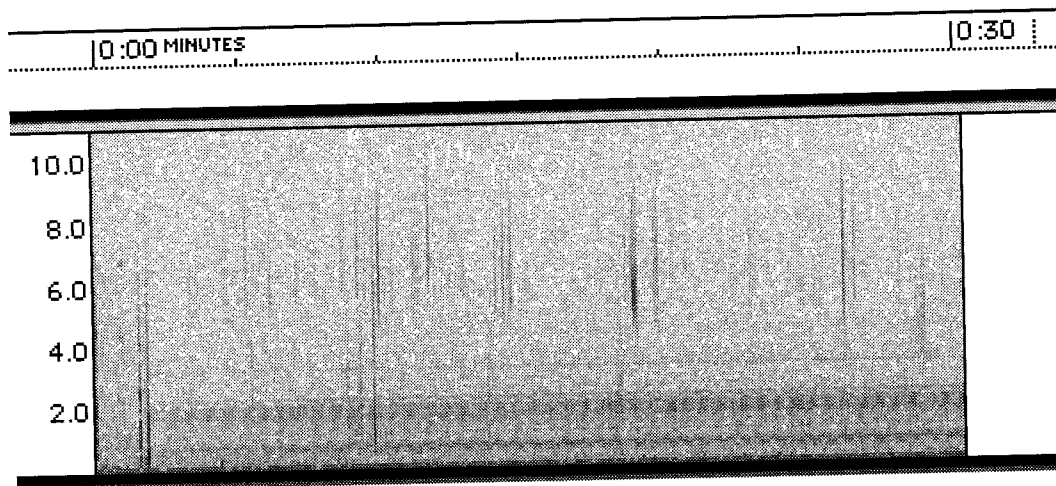
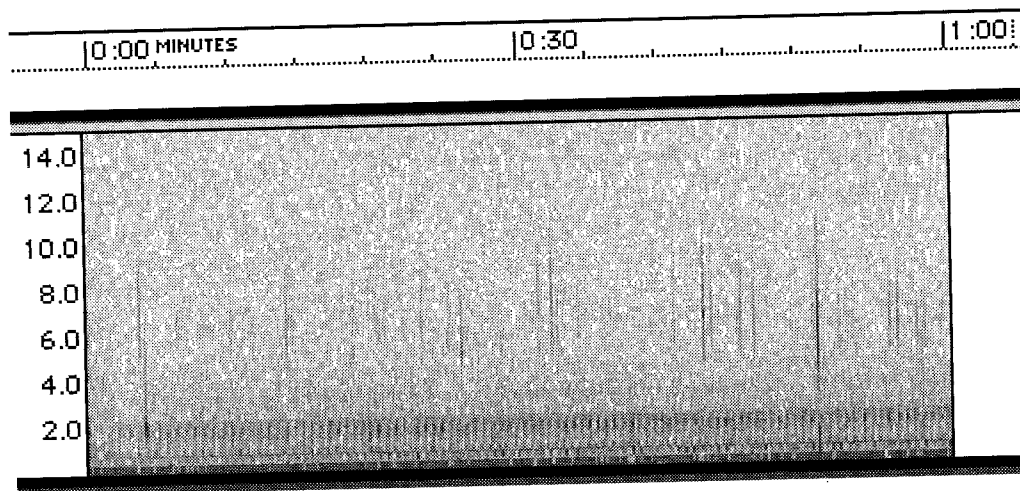
Team 30 Linden Lundback, Watrous, Saskatchewan, CANADA
Quiet conditions.



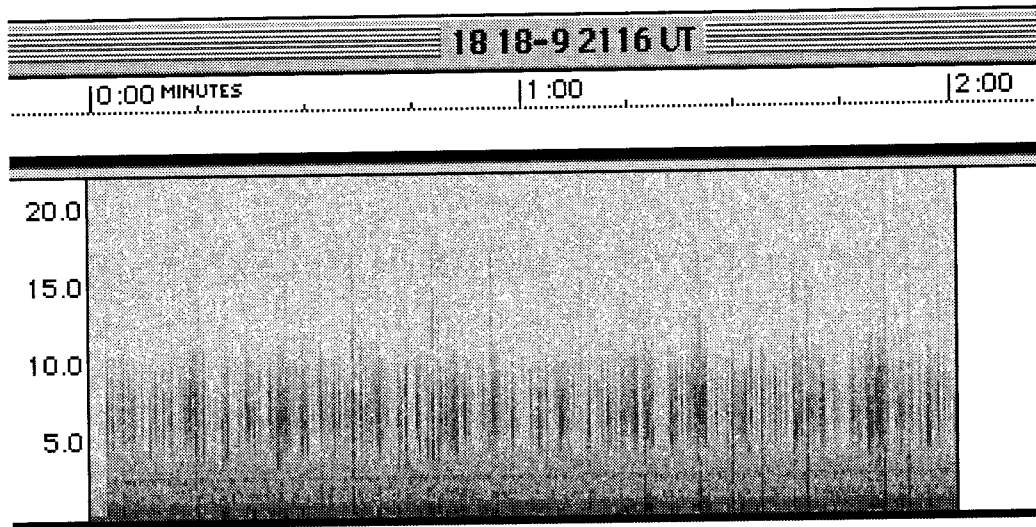
18-8



Team 16 Leonard Marraccini Finleyville, PA
Quiet conditions.



18-9



Team 18 David Jones, Columbus, GA
Strong signal. Many whistlers logged.

