

Natural Radio

News, Comments and Letters About Natural Radio

November 2001

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We've pretty much recovered from the effects of last month's flood here at the studio. Fortunately all that came in was relatively clean rain water, so a few days of dehumidifiers and fans dried out the carpeting with little damage.

One bright spot this month, I got a copy of Robert Helliwell's book, *Whistlers and Related Ionospheric Phenomenon* from Half.com for \$10.00. Ah, the wonders of the Internet. This should make for some good winter reading.

Once we got through the coordinated listening weekend, solar and whistler activity kicked up. As I write this there is a major geomagnetic storm going on with another CME on the way. There were several more M and X flares this afternoon which means activity should continue for a couple of more days. So I would think we'll have some great reports in next month's newsletter.

New Aurora Monitoring Software I can't cross an interesting piece of software a few days ago. The STD Advanced Auroral Activity and Space Weather Monitoring Software is designed for predicting aurora activity, but seems like it offers many features useful to those of us who like to keep an eye on Solar and geomagnetic activity. A demo version of the program and more details are available at: <http://solar.spacew.com/aurora/>

September Coordinated Listening. The coordinated listening weekends turned out to be somewhat poor from a geomagnetic standpoint. There was no activity at all on the first weekend, the second was almost as bad. Mike Mideke in his excellent New Mexico Location was hearing faint whistlers on Sunday, while Shawn Korgan several hundred miles Northwest of him heard nothing. I made a brief foray out into the pouring rain here but heard only sferics.

The activity on the 27th more than made up for the previous weekend. Unfortunately, I was out of town and missed the activity but others recorded much activity. (See correspondence and logs.) The activity continued on October 2nd and 3rd with lots of chorus due to a geomagnetic storm.

Last Call For Natural Radio CD. If any of you have been thinking of sending material for the Club Natural Radio CD, now is the time. I'd like to wrap it up before the holidays. The response has not been exactly overwhelming (If it weren't for Mike Mideke's contributions there probably wouldn't be a CD.). So come on guys, dig through those archives and send in some of your best or weirdest Natural Radio recordings. Recorded stories or anecdotes would also be most welcome.

Your Much Appreciated Correspondence

•Shawn Korgan, Gilcrest, Colorado (VLFKorgan@aol.com)

(9/16/01) I listened for whistlers this morning during the first six minutes of each hour from 09:00 UT until 15:07 UT and did not hear any whistlers at all. I'm listening to the receiver in the house currently and have not heard any whistlers this Saturday evening either.

(9/22/01) I was able to listen here at the house for the first six minutes of each hour starting from 10:00 UT and going through to 15:07 UT. I have nothing to report; I did not hear any whistlers.

(9/23/01) Well, I planned to head out this morning but awoke feeling very exhausted instead. I ended up staying home this Sunday morning and listening as best I could on my home receiver. I only heard one whistler this morning and that was at 11:01:07 UT. I thought maybe there was another whistler at 12:00:32 UT but I'm unsure at this point. It's been quite a week for all of us I assume. I was up the entire night before the bombing occurred listening to loud whistlers occurring on my home receiver and then left at 3:00 am to record a few of them. I'm glad I did! They were beautiful!

I just heard a light to moderate strength whistler tonight at 5:00 UT on Sept. 24th. I plan to head out for the night. The lightning is down and the tweeks are very clear distinct pops tonight like the ones needed to create the ricochet sounds.

(9/27/01) I made it to my quiet spot on time for once without getting lost in the maze of dirt roads, which end up miles and miles from any paved road. The evening started out rather quiet. There were diffuse whistlers with up to a three-second duration when I arrived just after 2:00 UT. They ended rather abruptly shortly thereafter. The entire time I was out, from 2:00 UT last night until 13:30 UT this morning, I was plagued with an ELF hissband and ELF chorus that just would not go away. I'm adding that to my suspect list—proton events are responsible for creating ELF hiss? Usually when ELF hiss/chorus is in progress, the more exceptional VLF activity stands back and does not take front stage. There are many pieces of this puzzle that are starting to fit together since I started keeping record a record in April of which solar events create different types of VLF sounds and VLF activity. One thing is for sure, I'll take an electron event over a proton event any day!

The hiss was up and down for the next hour. Diffuse whistlers once again became the dominant event at 3:12 UT and lasted for nearly an hour. Most of them were weak at best - some just peaking their head above the underlying hissband as it quieted down a notch. Nonetheless, it gave me something to jot down in my log. The volume of the tweeks was up and down as well. I did not find any correlation between the strength of the tweeks and other events occurring last night.

From 4:30 UT until 5:30 UT I was basically listening once again to the ELF hiss rise and fall in signal strength. This hiss was loud enough here in Colorado that I did not even hear the hum of distant power lines two miles away until almost morning when the hiss began to die off a little. At 5:33 UT I began to hear what would become a dominant event for the remainder of my VLF expedition. I began to hear risers and many of them! The risers were still occurring when I left at 13:30 UT although their signal strength had dropped substantially. Very frequently there were upwards of 40 risers per minute (or greater) occurring. I'm curious to know if anyone else heard these risers throughout the night. Some of them were as strong as the loudest whistlers out this way.

Oh yes, I took a break from 5:10 - 5:30 UT to listen for the beacon Mike "HCN" at 510.46 kHz. Sorry, no sign of it up this way. I tried again just before sunrise and the conditions

seemed to have worsened - no beacons were being heard at all. I did hear at least four beacons during the night that appeared to be centered on 510 kHz. The first and strongest was "HMY" followed by "RRQ," "GCT," and finally "PN." I don't know if any of these ring a bell but this is what I copied around 510 kHz.

Where were we ... about 5:52 UT some crunchy sounding lightning started up on this end. This lightning lasted at least an hour and was intermixed with many little risers. Growing tired of listening to an undulating hissband I unknowingly slipped off to sleep and awoke a little over an hour later at 7:52 UT. There were a few whistlers and risers and also ELF hiss/chorus occurring just after I awoke. Just shortly after 9:00 UT the little risers took to town! They were still going strong when over an hour later both periodic and discrete emissions began occurring. There were dual rising tones, a few low frequency chorus sounding thumps and also hooks which began at 10:22:34 UT. From 10:16 - 10:18 UT there was a very noticeable wave like sound to the hiss band. The hiss was strengthening and decreasing in volume about one cycle every two seconds. This activity continued until 10:47 UT when combined with them were once again an increase in whistlers. I have over a dozen whistlers from 10:47 until 10:51 UT. After this the whistlers waned a touch before taking off again around 11:08 UT. From this point onward until I left for the morning I have pages of whistlers that were captured.

From 11:30 to 11:32 UT I began to hear what I refer to as the morning surprise -- this can be any number of strange sounds that begin around sunrise here in Colorado and further up north into Canada. This morning it was a low frequency sound similar to an engine running. It had a faint repetitive low frequency sound to it. This event did not last long but turned rather quickly into a different frequency of ELF hiss than what was already occurring.

Just shortly after 12:00 UT I began to hear what I thought were whistler shower traces. By 12:33:17 there definitely appeared to be a very faint whistler shower in progress. I continued to hear very faint traces of a whistler shower until just shortly after the sun arose at 12:45 UT. After this time, there were faint repetitive sounds which were either whistler shower traces or a mixture of whistler shower traces along with the wavy hissband which I had also heard earlier on several occasions. From 12:50 until I left there were also short high pitch whistlers which I've heard referred to as one hop whistlers. At times they occur nearly every "morning" here in Colorado and when they stop it is a sure indicator that the best activity of the morning is over. When I hear these quick, high pitched whistlers around sunrise, I know that I've reached what is often the peak of activity. They were still occurring when I left.

• **Jim Mandaville** (zygo@azstarnet.com) I participated with Mike Mideke, Steve McGreevy, and Shawn Korgan in a joint natural radio listening session the night of 26-27 September with hopes that the recent magnetic storm had produced some unusual activity.

My location was at Lost Horse Peak (DM32), east of Gila Bend, AZ, and equipment was the G. W. Forgey Mk III receiver with a 12-foot whip lengthened with a 20-ft horizontal wire. Recordings were made on a Sony MiniDisc, using monaural mode and manual gain control (I had found that auto mode sometimes made rather wimpy recordings due to overresponse of the AGC to peak transients). We had agreed to record, at minimum, the first 10 minutes of each hour with WWV timemarks. I began listening after sunset and heard dense dry sferics and tweeks with a rumbling low-end, probably coming at least in part from tropical storm Juliet, then approaching Baja California. One or two very weak whistlers appeared after midnight, but nothing significant showed up until after 0300 LT, when the background had quieted considerably. Sporadic, weak, rather diffuse, long whistlers then appeared. Later, it became clear that these were two-hop events originating in distinct, non-tweaking sferics. As is usually the case in my experience, as the listening period got

closer to local dawn, the whistlers became more discrete. The loudest whistlers came in during the period 1230-1300 UTC (0530-0600 LT), when I recorded three quite strong events that will be of computer analysis quality. After this, the whistlers began to decline in strength although their causative sferics continued strong, or even stronger, suggesting that the whistler duct propagation was falling off much faster than the surface waves of the sferics (high altitude sunlight effect?).

The participants in this group session had begun to exchange some timed data by 2 October. It appears that Shawn almost surely heard some of the same whistlers that I did, and we will be working together to compare recordings with refined timing.

• **George McCormick AA1UM, Belchertown, MA (rock1time@juno.com)** I have not sent any logs because I have been busy with the improvement of the equipment. I am the one, you may recall, with the "POP"TRONICS '59 blackbox for missile listening.

I have added more wire to the loop -- now up to 1000'. I still need 1000 feet more, but what improvement in performance! I also changed the feedline from twin feed, as in the article, to coax cable. What a difference in hum pickup, and boy! what a difference in the pattern of the loop! Maybe everybody else in the hobby knows about that -- sometimes I wonder if I am reinventing the wheel. I have also added a "tuner" on the front end, switchable caps, ranging from .04 to .1 mfd. -- very useful. And, last but not least, I have an amplified speaker on it instead of phones -- big improvement. Also have put apickoff for the scope on it -- more about that another time.

I do have a few items for the log. First, on the day of the massive solar ejection (Sept. 24 or 25?) I heard a very strange critter at (2139 UTC), I would call it a "Howler" for lack of a better description. It occurred for 1.5 sec., then a ½ second pause followed by another one of .75 sec. Duration. to describe it -- constant amplitude for the duration and constant frequency. There is a summer creature, either an insect or tree frog, that sounds just like it. It is rich in harmonic audio overtones, but most predominant is the lowest and highest pitch, about an octave apart is my guess....have any idea what this is???? Very, very spooky to hear.

Next, I am intrigued with the notion that not much happens that's interesting before midnight local...so, I have started listening from approx. 8pm to 11pm local to see what's up.

I would point out one angle I am working on -- I have noticed this strong to weak signal change almost every night I have been listening. My observation is that it is always at about 2 hours AFTER LOCAL SUNSET. I don't know if any work has been done on this, but I am suspicious of the GRAY-LINE effect at work here. Does anyone know of any good write ups on propagation down in the basement that have been done?

• **Michael Mideke, WB6EER, Magdalena, NM (mideke@gilanet.com)**
(9/16/01) Sunday morning. No listening yet. Photo project up by Taos kept me busy up there all week, back here late Friday with monday deadline. In any case the weather has been thunderstorms all over the place. Camping would have been wretched and the opportunities to attach an antenna not too great. I gather from Shawn that all the lightning was not producing whistlers. (and it was HUGE lightning coming down the valley east of Albuquerque Friday evening. Big fat strokes that seemed to go on for several seconds. "Necessary but not sufficient" as they say. Maybe next weekend.

(9/24/01) Well, here it is Monday morning and I feel recovered from the camping expedition. Saturday was pretty much a dud but Sunday was interesting though the whistler activity was mighty weak here in NM. The weather was kind (didn't rain, didn't freeze) and

I had the camp to myself. Had a good long hike in the woods on Saturday. I wonder if you got out? Shawn stayed home on Sunday, didn't hear anything from his house. No report yet from Steve McGreevy, who was thinking of going out for a listen. Somewhere or other these faint things I recorded were louder. I wonder where?

Sept. 22 was not too exciting. The few whistlers that were heard were weak to very weak. All similar in being soft (semi-diffuse) with no causative sferics noted. AC hum levels were disappointingly high on both mornings but only intrusive during the 1200 and 1300 segments when the sferic background had largely dropped away.

Sept 23 had more activity and slightly stronger whistlers. All were similar, being long, having a semi-diffuse musical tone indicating multi - stroke or multi - duct propagation or maybe both. No causative sferics were identified. The most notable whistler was probably that at 1305:14 which appears by the stopwatch to run for more than 3 seconds. Others were probably of similar length but this one stood out by being a bit stronger relative to the background.

Natural Radio Log

Month Day	Time UTC	What Heard (whistlers/hour where applicable)	ID Grid Sq.
09/16	0900-1507	No Whistlers	SK-DM79
09/17	1300-1315	Weak sferics	MK-EN52
09/22	0900-0906	Several weak diffuse whistlers	MM-DN42
	1000-1100	Nothing	MM-DN42
	1200-1206	Only sferics	MK-EN52
	1200-1206	Several Weak whistlers	MM-DN42
	1300-1306	Weak whistlers, 1 or 2 per minute	MM-DN42
	1000-1507	No Whistlers	SK-DM79
09/23	1000-1006	Several whistlers	MM-DN42
	1100-1106	Whistlers, 1 or 2 per minute	MM-DN42
	1101	The only whistler of the day	SK-DM79
	1200-1206	Whistlers, 2 or 3 per minute	MM-DN42
	1300-1306	Sferics and heavy rain	MK-EN52
	1300-1306	Whistlers, 2 or 3 per minute	MM-DN42
	1000-1507	1 or 2 faint whistlers	SK-DM79
09/27	0200-0210	Weak diffuse whistlers	SK-DM79
	0300-0400	Diffuse whistlers	SK-DM79
	0430-0530	ELF Hiss	SK-DM79
	0500-0700	Dense sferics and tweeks; very noisy	JM-DM32
	0530-1330	Lots of risers	SK-DM79
	0700-0900	Sferics and tweeks; 1 or 2 very weak diffuse whistlers	JM-DM32
	0900-1000	Rare, weak, diffuse whistlers	JM-DM32
	1000-1200	Weak, diffuse, 2-hop whistlers increasing	JM-DM32
	1047-1250	Whistlers, chorus & ELF Hiss	SK-DM79
	1200-1315	More discrete, 2-hop whistlers w/causatives; a few strong	JM-DM32

	1250-1330	Short 1-hop whistlers	SK-DM79
10/01	0133-1059	Tweeks & multiple tweeks.	GM-FN32
	0200-0210	Tweeks, many multiples, 20 or 30 per minute.	GM-FN32
	0211	I've had enough...curiosity no longer tweaked.	GM-FN32
10/02	1330-1500	Chorus and sferics	MK-EN52
10/03	1430-1500	Chorus and sferics	MK-EN52

GM - George McCormick AA1UM, Belchertown, MA Equipment – 4 ft. loop with homebrew receiver.

JM - Jim Mandaville Equipment - G. W. Forgey Mk III receiver with a 12-foot whip lengthened with a 20-ft horizontal wire. Recordings were made on a Sony MiniDisc.

MK - Mark Karney, N9JWF, Barrington, IL. Equipment - WR-3, LF Engineering loop, homebrew receiver with 60” whip and -24db/octave hi-pass active filter, 350 Hz. cutoff.

MM - Michael Mideke, Benson, WB6EER, Magdalena, NM (mideke@gilanet.com)
Equipment: Dual channel Orthogonal loop receiver based on Steve Ratzlaff design. Five turn 14 ga loops, 56 feet circumference deployed as triangles with 28 foot base. Sony Walkman MiniDisk recorder. Sony ICF SW 7600 for WWV.

SK - Shawn Korgan, Gilcrest, CO. Equipment - Homemade e-field receiver I refer to as the SK-1 with 8’ whip.