

Natural Radio

News, Comments and Letters About Natural Radio

October 2000

Copyright © 2000 by Mark S. Karney

Coordinated Monitoring -- Early Results Well, two weekends of coordinated monitoring have come and gone and were quite successful at least for several of us. Family commitments and work schedule kept me from making a camping trip out of the first weekend so I was only able to listen at my semi-quiet site.

A full-halo CME and several other CMEs from a couple of solar flares stirred up the geomagnetic field enough to make things quite interesting. There was plenty of whistler activity here even though my available listening time was brief. On the 16th I began listening at about 11:30 UT, just before sunup. I was hearing 3 or 4 whistlers per minute and they were somewhat diffuse. I began the monitoring at 1200 UTC, heard three whistlers the first minute, and then like someone turned off a switch at 1202 -- they were gone.

On the 17th I was hearing 3-5 weak whistlers /minute during the 1200 UTC Monitoring period. After that, I drove to my quieter site and monitored for about 15 minutes (1245-1300 UTC) and heard bits of faint chorus but not much else.

Mike Mideke also had great results that weekend with a whistler storm at his location (see correspondence for his report).

The second weekend was a bust for me with thunderstorms and heavy rain in the area on both days that made monitoring impossible. This was also the weekend of Radio Expo, a large hamfest here in the Chicago area. The rain put pretty much of a damper on that, too, but I did stock up on components and connectors. I also found a good deal on some well-built metal boxes that will be perfect for building whistler receivers in, so the weekend wasn't a total loss! I haven't received any other reports yet, but if you were listening, please send them in so we can have a full report next month.

Commercial Whistler Receivers I received several pieces of correspondence this month requesting information on sources for pre-built or kit Natural Radio receivers. This sounds like a good idea for a future article, as well as an update to the LWCA website. The currently available receivers I have identified are the Kiwa, the Inspire VLF-2, and the loop and E-Field receivers from LF engineering. If anyone knows of any other available receivers or kits, please drop me a line. Let me know of your experiences with these or other receivers also.

I built the Inspire VLF-2 receiver from the kit this month, with the intention of having something with which to compare my homebrew receiver. The assembly instructions were complete and the quality of components and design were good. However, initial testing received the local three 50 kW AM stations quiet well with barely audible sferics in the background. It seems like the front end is rectifying rather than

amplifying. I'll be troubleshooting my wiring this week and will have a review of the receiver next month.

Now Is The Time For those of you who have had poor results in your natural radio listening, now is the time to hear some whistlers. The sun has been active lately in stirring up the geomagnetic field and creating favorable conditions for Natural Radio Listening. The fall weather should mean less sferics to interfere with weaker whistlers and the later sunrise puts the prime listening time at a more civilized hour.

My favorite websites for monitoring solar and geomagnetic activity are the Space Weather site at www.sec.noaa.gov/today.html and Space Weather Now at the www.sec.noaa.gov/SWN/index.html. The Space Weather Now site recently added an animation feature to its real-time solar wind monitoring. It is worth checking out. If you don't have internet access listen to WWV (2.5, 5, 10, 15 or 20 MHz.) at 18 minutes past the hour. If the Boulder K index is above 7, head for your quiet site!

Your Much Appreciated Correspondence

• **Michael Mideke, WB6EER , Benson, AZ** Just back from two days at Stockton Pass, a nice VLF campsite about two hours from home. Whistlers and weak chorus on the 16th, whistlers, chorus bits and a full scale whistler storm on the 17th.

I'll get logs and details to you in a day or two but I'm most eager to know if anyone else caught the whistler storm.

A brief definition of a Whistler Storm based on the Mielke and Mideke paper in Radio Science, Sept-Oct. '94:

A sustained rate of whistlers from 1 to 10 or more per second, having an abrupt upper cutoff of most elements somewhere between 1.8 and 5.5 kHz and a lower cutoff ranging from 1.5 to 0.5 kHz. Often occupies hissband and frequently associated with chorus, particularly intermittent bursting riser clusters. Normal (full spectrum) whistlers may or may not be present.

On Sept. 17 I noted weak - very weak - chorus during the 1300 UT recording session, pretty much continuous. By 1306 I had convinced myself it was probably a whistler storm. I checked again at 1320 and found hiss with bits of chorus. At 1333 there was a definite whistler storm in progress and I began recording. The event faded in and out, dwindling overall to typical late phase condition by 1400. I continued to record until 1450, when no activity was heard. Rising emission bursts were present and perhaps some wandering tones. There were few if any full spectrum whistlers - maybe some very fast sharp 1-hops.

Hasty analysis of the peak period shows a hiss band extending from ~2.5 to 0.8 kHz, occupied by or composed of densely packed whistler segments, seen in spectrogram to reach densities of 6-8 per second at around 1333.

Well - I sure hope somebody else caught some of this, even though here in AZ the main bang was outside the scheduled periods. Did similar events occur at other

locations, either at the same time at other times? It would be really helpful to get this information. Needless to say, I'd like to get my hands on copies of any recordings - or offer to make copies for anyone who lacks to means. Hoping everyone heard SOMETHING.

In between schedules I tried out something new - a 2 channel broadband detector, which is basically 2 untuned crystal sets feeding inputs of a stereo recorder. A couple of 300 ft. wires laid out in different directions. All the stations come in at once, from Loran C through WWV, but of course they are sorted by the complex dynamics of propagation so there is a continual interfading. Results in an amazing audio snapshot of the time and its technology. I'm going to do more of this.

Natural Radio Log

Month Day	Time UTC	What Heard (whistlers/hour where applicable)	ID Grid Sq.
09/16	1000-1006	tweeks, one possible weak whistler	MM-DM42
	1100-1106	3-4 whistlers/min.	MM-DM42
	1130-1210	3-4 diffuse whistlers/min.	MK-EN52
	1200-1206	2-3 diffuse whistlers/min. whistler storm traces	MM-DM42
	1300-1306	very faint chorus, several very short whistlers	MM-DM42
	1400-1406	very weak chorus and some whistler storm elements	MM-DM42
09/17	1000-1006	2-3 whistlers/min.	MM-DM42
	1100-1106	several whistlers	MM-DM42
	1200-1206	2-3 whistlers/min.	MM-DM42
	1200-1206	2-3 faint whistlers/min.	MK-EN52
	1245-1306	bits of faint chorus	MK-EN52
	1300-1306	whistler storm, chorus traces	MM-DM42
	1400-1406	chirpy chorus, scattered traces of storm	MM-DM42

MM - Michael Mideke, Benson, WB6EER , Benson, AZ Equipment - RS-6 receiver with active whip on 25 ft. mast, Marantz PMD 430 cassette recorder, and Sony DAT recorder.

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.