

Natural Radio

News, Comments and Letters About Natural Radio

May 2000

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Many thanks to all who participated in the coordinated listening in March. I think those who went out were happy with the results although not everyone heard the great whistler activity on the 25th. We'll definitely try this again during the fall equinox, and maybe schedule a date this summer for those who are interested. I, for one, am going to spend some time this summer looking for a good quiet site that is accessible in the early morning hours.

Whistler activity was non-existent here the first weekend, and reports indicated it was dead across the country. Most activity seemed to be happening on the 25th. Unfortunately we were leaving for the East Coast that morning and all I was able to do was listen from the end of the driveway from 1100-1106 as we finished packing the van. Only sferics were audible over the usual hum and buzz.

I hoped for better conditions the next morning in rural Maryland, but as luck would have it, my sister-in-law's house is within view of two sets of 375 kV transmission lines, so the hum level precluded any listening there.

Both Mike Mideke and Steve Ratzlaff had great results on the morning of the 25th. And I'll let the correspondence from them and the others that participated tell the story. I eliminated the detailed logs due to space constraints, but they are summarized in the Natural Radio Log section. There was not much correlation between logs. Steve Ratzlaff's activity picked up about the time Mike Mideke's was fading out. I have detailed logs from a few people and can make them available if anyone is interested.

Image Satellite Lifts Off NASA's newest space weather probe lifted off March 25 from Vandenberg AFB, CA at 12:34 p.m. PST. The "Imager for Magnetopause-to-Aurora Global Exploration" (IMAGE) spacecraft separated from the Delta II third stage about 56 minutes after launch and is now in an elliptical orbit.

Next Month Because of the large amount of info regarding the coordinated listening, I'll be reviewing John Lauerma's "The Strange Sounds of SLF" tape next month.

Dayton Hamvention If any of you are planning on going to the Dayton Hamvention on May 18, 19 & 20; let me know and maybe we can all get together for an informal breakfast or dinner.

Your Much Appreciated Correspondence

• **Michael Mideke, WB6EER, Benson, AZ** Round 1 For 18-19 March I set up camp at Reddington Pass, between home and Tucson, alongside a dirt road at about 4000 feet, about 10 miles from powerlines to the East and West. Arriving on Friday afternoon I found a nice spot with oak tree shade, set down out of the wind in a minor canyon. Pitched tent, assembled 20 ft. wooden mast with E-field whip on top and wire antenna suspended. I set up a little table inside the tent with my RS-6 receiver connected via coax to the whip, a G.W. Forgey MK III receiver on the wire (which ultimately ran about 200 feet up a ridge where it was able to intercept some signal). The RS-6 fed a Marantz PMD 430 cassette recorder and the MK III was connected to a Sony DAT recorder. Right Channel time code was derived from a Sony 7600 tuned to WWV. A little patch box allows me to insert voice comments on

the right channel. When I got everything hooked up and turned on I was a bit shocked at the hum level but figured that as the natural radio level built up after dark, things would work out - which proved to be the case.

On the 18th I recorded on the hour from 1000 through 1400 UT. At 1100 there was a considerable chorus of coyotes to the southeast. At 1200 a fox was expounding just west of me. By 1300 the birds were starting up. But no whistlers. I thought I had one during the 1200 segment but can't find a trace of it on either tape, so probably it was some sound outside. There were a few whistlers noted prior to the recording periods - I have one noted at 1059, just before I began rolling tape....

After breakfast I took a hike south into the Rincon Mts. Some 15 miles, as it turned out. I crept home at dusk, made dinner, set up the recorders and passed out until 1100 UT. Recorded 1100 through 1400 segments with no whistlers heard. Packed up and drove home.

Hum aside, I decided that the Reddington Pass is not really a good place to spend a full-moon weekend. People are driving up and down the road in loud trucks and firing guns after midnight. It is just too close to the city. So for the 25-26 March sessions I camped closer to home, a bit NE of Soza Mesa (approx. 32 deg. 22 min. N, 110 deg. 17 min W.) A clean, quiet camp at about 4000 feet, again 7 to 10 miles from AC lines and again surprisingly hummy. I hooked the MK III receiver to a 6 turn 60 ft loop and found N-S orientation pretty well nulled the hum. The RS-6 wound up on a 75 ft. wire after I found I'd made a mistake with a mast-top switch on the whip preamp so that its output was shot full of Loran C. As before, the DAT recorder went on the MK III and the cassette machine on the RS-6. Setting up, around 0300, I immediately heard whistlers on both receivers. Made tape. In fact the whistler activity was probably already in decline by the time I started listening. (A solar flare, some hours previous had set things moving...)

No trucks. No gunfire. No coyotes. No foxes. A few of Jack Hughes' cattle bellowing in the distance. Raven wings whoofing close overhead at dawn, checking me out. I spent my Saturday hiking east into the Galiuro Mts., exploring the edge of the Muleshoe Preserve, a large Nature Conservancy holding which is about 8 miles from my house as the raven flies, 50 miles by dirt road.... C limbed a small peak to get the view and found some cross-country running association had placed a cairn and registry. 5300 feet. Last sign-in was 1994...

On the 26th I recorded the 10:00 through 14:00 segments, everything configured as on the 25th. One diffuse whistler was recorded at about 11:03:50.

So that's the report. There may be more stuff on the tapes but it is weak. If other listeners have reports that don't align with what I've noted here I'll be glad to go digging, but otherwise I'll just put my tapes on the shelf and say that for a spring equinox near solar max it was a pretty feeble show. Nonetheless it was great to get out and run the gear and hear the tweeks. I wonder if anyone in Europe joined in this time? Seems like they would have been in place for the best of the post-flare activity. Also, of course, I'm wondering what the higher latitudes produced - the stuff I heard as faint traces might be booming in where you are. That's it for this round. I look forward to the results.

• **John Lauerman, WB7TQT, Issaquah, WA.** I listened on the weekends of March 18-19 and 25-26. Started to tape but was disappointed. The weekend of the 18th and 19th was very quiet with few sferics and tweeks and no whistlers. The 25th and 26th was better, but still no whistlers.

• **Jim Stoughton, Seattle, WA** I received a nice letter from Jim Stoughton this past month: "Have just completed building and checking out my version of 'a poor man's pen type chart recorder.' I'll be using it here in the lab mostly for recording seismic events from

two systems that are in constant operation. The cost of materials for this recorder? Ah, it cost me about five bucks. I plan to write a construction article so the experimenter can at last build his own using mostly scrap components and materials at minimum cost. A good professional chart recorder these days can run \$5K or more, a used one for \$1500. Thus my little project was born after more than 20 years thinking about it." Good to hear from you Jim, I think most of us would like to hear about that chart recorder in the future.

• **Jon Wallace (jwallace@mail1.nai.net) CT.** I used Brian Lucas' Whistler radio at my quiet site on Sat 3/18 and 3/25 at 6AM LT. I only did about 6 minutes of recording because it was remarkably uneventful - just minor sferics on both days. I was trying to get my recordings through the Macrecorder program (I have a student doing it for extra credit) and it is taking longer than I thought. Not sure if you want to see sonograms with very little on them. I had a great time getting up early and driving out to the spot - it was very beautiful and serene. Thanks! Count me in if you ever try it again.

• **Eric Vogel, evogel@flash.net** Over about a twenty minute period, I caught a large number of double hop whistlers during the recent magnetic storm. There appeared to be good activity at my conjugate point. Much to my delight, when I ran a spectrogram on the tape, I discovered what looked like a triple hop whistler - faint, but I think its really there. If you check out my web site, you will see the spectrogram and you will also see the tremendous urban interference I struggle through.

I have built a Radio Shack Mini Echo Mixer kit (based on a BBD chip) and modified it to try to build a hum blanker. The basic idea is to use a 16.666 ms delay and recirculate the signal in phase at a gain of about 0.9. This reinforces the 60 Hz harmonics and deemphasizes everything else. I intend to mix this out of phase with the original signal and hope to eliminate a lot of the hum. If this works out, I will process my tape of the whistlers and rerun the spectrogram. Hopefully I will then get a much clearer signature.

• **Steve Ratzlaff AA7U, (sratzlaf@flash.net) Palo Alto, CA** Glad to see you're "reviving" some past Mideke activities. I belong to that era also; I've recorded many hours of vlf activity using a large 150' circumference loop and preamp/receiver of my own design (published in a past Lowdown article). That was done at a quiet site in NE Oregon, near my parent's place (I used to go home on vacation over the Equinox period, just to do vlf listening). I haven't done much listening the past 5 years or so. It was good to get my gear collected and go out to my semi-quiet site in the N. Calif. hills about 45 min. from home. My setup uses an efield receiver and is quite easy and fast to setup, compared to setting up a loop. I have a collapsible 25' fiberglass mast I use, and run a vertical wire from it to my simple McGreevy efield receiver (with highpass switched in). (Using 15' or more of vertical wire to any e-field receiver really improves the sensitivity, sufficient to hear fairly weak whistlers.) I did not do any recording, but kept a detailed log.

3/18/00 Saturday morning - Absolutely nothing noteworthy was happening, vlf-wise. I listened from about 5:40 a.m. local to 6:30 a.m. During the brief darkness period occasional tweeks were heard, and weak sferics. After about 6:15a.m. the tweeks ceased. Even sferics activity was low. Frequent insect buzzing as they flew by or landed on my vertical mast. WWV F 192, A 5, K 1.

3/25/00 Saturday morning - The setup was first turned on about 5:40 a.m. to check that the grounding and antenna connections were proper. It was immediately obvious that great things were happening for vlf--a whistler storm was in progress! I was not yet properly setup to begin logkeeping but there seemed to be a whistler every 3-5 seconds.

I stopped detailed logkeeping at the end of 06:52. Activity was still going, tho levels were declining. I turned off the equipment at 07:10 and packed things up to leave. For the first 50 minutes, almost all whistlers had no "pop" (sferic) associated with it, and were semi-diffuse, lasting several seconds. After that, some whistlers approached pure-note, and started at a high pitch, with the stronger ones heard descending to a low pitch. A few whistlers were "sliders"--a fast 1/2 second hi-pitched low-dispersion sound. Also some began to have the sharp "pop" sferic heard with the associated whistler a second or so after it. These began well after sunrise.

It will be very interesting to find how many others heard this very good whistler storm. It was already in progress at 05:40 a.m. local; who knows when it started. My private theory that vlf activity is related to the WWV A index showed some correlation this morning. In the past I've found A's for 10 and above generally show some sort of vlf activity; 15 and higher, definite activity; above that, get your gear and get out there--good things are happening! My WWV check Friday evening showed the same A index of 9 as of this morning's WWV report. That gave motivation to go out again this Saturday. I was not planning to go out if the A index had been 5 or lower, like the previous weekend, when nothing was going on for vlf. When Mike Mideke was living at his isolated home, he was ideally suited for almost continuous checking of the vlf activity, and thus could take advantage of the rare days when "good things" were actually happening. The rest of us have to make do with the vlf activity that's occurring on our random listening occasions. We were truly fortunate this 25th to have a good vlf event occurring, for those of us who actually went out and listened!

Natural Radio Log

| Month Day | Time UTC | What Heard (whistlers/hour where applicable) | ID - Grid Sq. |
|-----------|-----------|---|---------------|
| 3/14 | 0830-0910 | Moderate sferic & tweek activity, 4 whistlers | JL-CN87 |
| 3/18 | 1000-1006 | No Whistlers | MM-DM42 |
| | 1100-1106 | Minor sferics | JW- |
| | 1100-1106 | No Whistlers | MM-DM42 |
| | 1100-1106 | Light sferics - few tweeks | MK-EN52 |
| | 1200-1206 | No Whistlers | MM-DM42 |
| | 1200-1206 | Light sferics | MK-EN52 |
| | 1300-1320 | Light sferics, no tweeks, no whistlers | DL-DM41 |
| | 1300-1306 | No Whistlers | MM-DM42 |
| | 1400-1406 | No Whistlers | MM-DM42 |
| | 1100-1106 | Light sferics - few tweeks | MK-EN52 |
| | 1200-1206 | Light sferics | MK-EN52 |
| 3/19 | 1000-1006 | No Whistlers | MM-DM42 |
| | 1100-1106 | No Whistlers | MM-DM42 |
| | 1200-1206 | No Whistlers | MM-DM42 |
| | 1300-1306 | No Whistlers | MM-DM42 |
| | 1400-1406 | No Whistlers | MM-DM42 |
| Month Day | Time UTC | What Heard (whistlers/hour where applicable) | ID - Grid Sq. |
| 3/25 | 1000-1006 | 21 Whistlers | MM-DM42 |
| | 1100-1106 | Sferics & tweeks | JL-CN87 |

| | | | |
|------|-----------|---|---------|
| | 1100-1106 | Minor Sferics | JW- |
| | 1100-1106 | 14 Whistlers | MM-DM42 |
| | 1100-1106 | Sferics - few tweeks - no whistlers | MK-EN52 |
| | 1200-1206 | Sferics & tweeks | JL-CN87 |
| | 1200-1206 | 7 Whistlers | MM-DM42 |
| | 1300-1306 | 3 Whistlers | MM-DM42 |
| | 1400-1406 | Sferics & tweeks | JL-CN87 |
| | 1400-1406 | No Whistlers | MM-DM42 |
| | 1400-1406 | 49 Whistlers | SR |
| | | | |
| 3/26 | 1000-1006 | No Whistlers | MM-DM42 |
| | 1100-1106 | Sferics & tweeks, SLF sferics @ 1 Hz. | JL-CN87 |
| | 1100-1106 | 1 Diffuse Whistler | MM-DM42 |
| | 1200-1206 | Sferics & tweeks | JL-CN87 |
| | 1200-1206 | No Whistlers | MM-DM42 |
| | 1257-1400 | Light sferics, no tweeks, whistler at 1340 | DL-DM41 |
| | 1300-1306 | Sferics & tweeks | JL-CN87 |
| | 1300-1306 | No Whistlers | MM-DM42 |
| | 1400-1406 | Sferics & tweeks, SLF sferics | JL-CN87 |
| | 1400-1406 | No Whistlers | MM-DM42 |
| | | | |
| 4/11 | 0200-0320 | Infrequent sharp sferics, musical tweeks, 3 whistlers | DL-DM41 |

DL - Dave Laida, Sierra Vista, AZ. Equipment - Homebrew 57 in. vertical whip and preamp described in Lowdown, July 1999, RC Hi-pass filter with 1200 Hz. cutoff, Radio Shack 32-2040 amplified speaker. Setup is earth grounded.

JL - John Lauerma, Issaquah, WA. Equipment - Homebrew VLF Receiver, 300 Hz - 20 kHz. Homebrew ELF/ULF/SLF Receiver 0.03 to 300 Hz., 47,000 turn loop.

JW - Jon Wallace, CT Equipment - Brian Lucas receiver.

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, Benson, AZ Equipment - RS-6 receiver with whip, G.W. Forgey Mark III receiver. Marantz PMD 430 cassette recorder, and Sony DAT recorder.

SR - Steve Ratzlaff, Palo Alto, CA. Equipment - I have a collapsible 25' fiberglass mast I use, and run a vertical wire from it to my simple McGreevy efield receiver (with highpass switched in).