

Natural Radio

News, Comments and Letters About Natural Radio

December 1999

Copyright © 1999 by Mark S. Karney

What is the attraction to Low Frequency Radio? It's just past midnight and here I sit at the computer after spending several hours in the cold November air watching for the elusive Leonids. There was some great Sferics activity tonight and lots of loud tweeks, but the Leonids were a no-show due to the almost complete cloud cover here in northern Illinois. So my feeble attempts to coordinate what I heard with meteor trails were out of the question. Well, maybe the internet feed from the NASA balloon will show something...

Since I told Bill that I would accept the Natural Radio Editor position, I've been doing a lot of thinking about the hobby, at least as to where my interest came from. I grew up about ½ mile from ship-to-shore station WMI in Lorain, Ohio, on the shores of Lake Erie. Their calling frequency was 2182 kHz, and it could be received on just about anything - the telephone, the hi-fi, crystal set, marginal AM radios -- all that was needed was a bad connection that could rectify and a little bit of audio gain -- and there they were. Hearing their calls to ships on the Great Lakes and seeing the blinking tower lights every night got radio into my blood at an early age. I suppose it didn't help that my dad built a crystal set for me and Al, W8QWI, who lived across the street was teaching a novice license class. I got my ham license in 1962 and worked for WMI during high school, mostly keeping the weeds down in their extensive antenna farm from the back of an old McCormick Farmall, and occasionally replacing bulbs on top of the 285 ft. towers that were used for VHF communications.

I received a degree in Electrical Engineering, but several years of corporate America conflicted with my entrepreneurial personality and I've spent the last 25 years or so running a recording and video studio, producing CD albums as well as training, educational and entertainment programs.

Radio is now more of a hobby than a profession. Seven years ago, when I discovered the LWCA, I received my first issue of ***The Lowdown***. That magazine renewed my interest in experimental radio and specifically Natural Radio through Dan Levit's column. Thanks, Dan, for your years of service to this column. Dan's articles and the references he provided were my starting point in Natural Radio and a continuing source of inspiration. I could always count on his column to provide a new way of looking at Natural Radio or to send me off to research some new topic like sprites or optical receivers for lightning.

Many hams worry about the lack of new blood in their hobby as radio has become commonplace for the average person. We all have cell phones and satellite communications are a commodity. However, Low Frequency and Natural Radio are not commonplace, and that's why I am attracted to it and I suppose, at least partly, why you are. It's a place of innovation, relatively easy to build your own gear, and commercial application doesn't dominate. If science and discovery interests you, a 3

foot E-field whip is a lot easier to construct than a 35 foot dish and the associated tons of concrete to support it. This is one area where an amateur with limited time and budget can explore the unknown with the hope of making a new discovery.

In regards to my own Natural Radio activities, as I live near the convergence of all the power lines in the Midwest, one of my goals is to find a way to do frequent monitoring in spite of the hum. Standing at the end of my driveway, I am about 150 ft. away from all the backyard power lines. I can hear tweeks and spherics quite well most evenings but no whistlers there yet. There are some parks and Forest Preserves in the area that are fairly quiet, but they are closed from sunset to sunrise. As these are the prime hours of Natural Radio activity, my search goes on.

My current equipment for LF is a Rycom receiver, antenna tuner, and a homebuilt loop. For whistlers I have a WR3 and a LF engineering L600 loop receiver along with several partially assembled projects on the workbench. Also, I have a surplus 60 kHz receiver that is tuned to WWVH and provides a digital time readout

Please Write! I am not sure at this point what direction this column will take, so I would appreciate hearing about experiments or projects that you have tried and your comments, suggestions, and listening reports. Let me know what you are interested in reading about and I'll do my best to research it and include it in the column. I'd also like to hear about any bits of science news related to natural radio and any resources that you might find.

Whistlers In Living FM Stereo? I saw an interesting letter from Philip Collier on the LWCA Website (10/19/99) about a mobile VLF receiver he had built. He used a little FM transmitter to broadcast audio from his receiver into his FM car radio. Clever idea. I got to thinking that this might be a way to get back audio from a remote receiver placed in a quieter area away from the house. Another application would be to avoid bringing lightning into the house if it struck an outdoor receiver. Philip, keep us posted on your experimentation.

Early Leonid Reports. As you may know, NASA launched a balloon during the Leonids meteor shower that carried a camera and an Inspire VLF receiver. It seems that the flight was a success, but technical problems arose, and audio and video playback is not on the website yet. I hope NASA will resolve the problems by the time you read this. Check their website for late breaking information at www.leonidslive.com.

Using Pro Audio Equipment to Hear Natural Radio Since I am in the audio recording business, and have a variety of audio equipment, I am investigating the use of Pro audio gear for Natural Radio reception. One of my future projects will be using a mike preamp with a loop antenna on the input as a receiver. Also, Roland made a device to eliminate hum and buzz, the SH-550 Digital Noise Eliminator. The unit contains a comb filter that removes the 60Hz power signal along with its harmonics, thus making it much more effective than a simple low-pass filter. The unit also locks to the hum frequency and adjusts the filters accordingly. This unit is no longer manufactured, but I'm trying to locate a used one, because I think it might allow effective listening in a noisy AC environment. I'll keep you posted on my efforts.

Additionally, much audio processing is now done by computer, so I'll be looking for a comb filter type of hum eliminator that works as a software plug-in. If it doesn't exist now, it probably will soon, given the rapid development of computer audio programs.

Now that the world has gone digital, I'm finding that more and more pieces of gear in the studio are being connected by fiber optics rather than conventional cabling. This again might be a way to get signals back to the shack without bringing in lightning at the same time. It also avoids signal pickup on the feedline and AC ground loops. The devices for studio use are relatively inexpensive, at least by pro audio standards. I'll be looking into this, too.

Bubbling Ozone! There is an excellent article in the December 1999 issue of *QST* by Bob Brown NM7M, on the effect of bubbles in the ozone layer. Bob has been monitoring NPG at 55.5 kHz each morning for over a year and recording the at sunrise. It seems that as the sun comes up each morning, the rays must pass through the ozone layer to hit the D layer. This is not enough to ionize the D layer as the ozone blocks the sun's UV rays. D layer ionization begins only when the sun is high enough in the sky so that its rays pass over the ozone. Thus for MF radio enthusiasts there is an extra 15 minutes or so of good MF propagation after sunrise before the D layer sucks up all the DX.

A more interesting thing he discovered was short signal dropouts before sunrise, which he theorized came from bursts of UV poking through the ozone layer. This was due to thinner parts of the ozone layer or ozone bubbles. He was able to plot their location by using his data from NPG. This is a very innovative use of VLF for remote sensing. Read the article. It's great.

That's about it for this month. May all of you have happy and safe holidays. If the doom and gloom people are right about Y2K and the power grid goes down, it should be some of the best Natural Radio listening ever. In fact, my WR-3 is stored right on top of the crate of freeze dried food sitting next to the wood stove. Hope to hear from some of you with your projects and ideas. Thanks.