

# Natural Radio

News, Comments and Letters About Natural Radio

January 2000

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Winter has finally settled in here in the Midwest, snow is on the ground, and LF listening is getting better. Now that the holidays are upon us it might be a good time to relax and retire to the basement with a glass of eggnog and try out some projects that were sitting on the back burner during times of outdoor activity.

Bill Oliver sent the location of an interesting website in Italy. I couldn't log on for several days, (maybe the server was down) but did manage to get on this morning. The site was developed by Renato Romero, IK1QFK, and contains a wealth of information on VLF topics. I haven't had a chance to check out the site in detail yet, but an exceptionally interesting section was the O.PE.RA. section which lists the data from a year of listening he did for whistlers. This data helps answer some questions I've been asking myself this month about the best time to hear whistlers. Check it out at <http://space.tin.it/scienza/rromero/>. This article was also published in the November 1998 edition of the Inspire Journal.

**Whistler Reporting.** Most of us seem to be listening from noisy non-ideal listening locations, and from what I've been reading in the correspondence, it seems that many of us are frustrated in our listening attempts. Although we may know vaguely when we might hear whistlers, it might be nice to develop some data that would give us a rough idea of the probability of hearing whistlers at a given time. Also, knowing about the success of others in similar receiving conditions might encourage the rest of us to start monitoring on a regular basis.

So, I am proposing a monthly listing of whistler reports similar to the *Loggings - Dx Downstairs* section of this publication. It would include single line natural radio reports in the following format:

| Month<br>Day | Time UTC  | What Heard (whistlers/hour where applicable) | Listener ID<br>Grid Square |
|--------------|-----------|--|----------------------------|
| 02/12        | 2000-2130 | Occasional tweeks & Spherics                 | MK-EN52                    |
| 02/13        | 1215-1315 | Hissy Whistlers (20/hour)                    | MK-EN52                    |
| 02/14        | 1215-1315 | Chorus, Strong sferics                       | MK-EN52                    |

The listener and equipment information would be located in another place, just like in the *Loggings - Dx Downstairs* column.

Grid squares are easier than specifying latitude and longitude, and because of the nature of natural radio listening, much of it may be done away from a person's home location. Grid squares are an easy way to locate the listening location. For those of you not familiar with grid squares, see [www.arrl.org/locate/gridinfo.html](http://www.arrl.org/locate/gridinfo.html).

Of course, this format is just a suggestion and I am open to modifications and other ideas. E-mail, fax or write if you have other ideas. We'll try this next month, so send your reports in by the 15th of the month. According to a report from Italy, the winter months might be the best for whistlers, so let's get out there and do some listening. (See my introductory comments, above.)

***Radio Science Observing - Volume II*** I just received a copy of Joe Carr's *Radio Science Observing - Volume II* and found it an excellent reference source. If you are build your own LF gear these are books that are a must for your library.

Joseph J. Carr is an electronics engineer by profession and has been a ham radio operator since 1959. He has written more than 600 articles and 83 books, most of them on topics in electronics. He regularly writes for Popular Electronics, Nuts 'n' Volts, Popular Communications, 73, Shortwave, Practical Wireless and Elektor Electronics.

These books are not project books per se, although many diagrams and projects are included, but are a reference source on designing equipment that can be used by the amateur experimenter interested in natural radio phenomenon.. There is sufficient depth for those who need it, but most of the language is plain enough for those who are not engineers. Mr. Carr has done an excellent job.

If you don't already own *Radio Science Observing - Volume I*, it was published in 1998. The book covers all aspects of observing natural phenomenon by radio, but a large portion of the material is pertinent to LF. This volume contains information on whistlers, general receiver design principles, loop antennas, SID monitoring, general theory of measurements, spectrum analysis and doing good radio science observing.

*Radio Science Observing - Volume II* expands on the data in the first volume as well as covering some entirely new topics. The contents include more on receiver design, lightning, ULF/ELF/VLF circuits, magnetometers, finding & solving EMI problems, seismographs, design and component information, as well as a section on VLF receiver improvement. There are also sections on radio astronomy and HF and VHF circuits for those of you who venture above 2 MHz.

A CDROM is included with each volume. The Volume II CD contains all the material that was on the Volume I CD as well as much new material. There is a wealth of design programs, including many on antenna design. There is lots of other good design information here also.

If you do any serious project building or research, these books should be the first ones in your library. My only criticism is that better documentation on the CD would be helpful, but browsing through it is like finding buried treasure.

This book is published by Prompt Publications, a division of Howard W. Sams & Co. and is available from amazon.com, as well as bookstores and electronics stores that handle Sams publications.

***Your Much Appreciated Correspondence***

Thanks for your encouragement and wishes for success this past month. Keep those cards and letters coming in, this column will be impossible without them. I am going to assume that all correspondence is information I can share in this column, unless you tell me otherwise. There isn't space to publish everything that comes in, so I'll excerpt items that are of general interest and include them in the column as space permits. I won't publish phone numbers or mailing addresses without your specific permission. Now, on to some interesting items.

•**Rick Francis, VE3OXX** ([marick@sympatico.ca](mailto:marick@sympatico.ca)) writes: “Just got back from the Balloon launch at NASA in Huntsville last week. Met Ed (KE4ROC) - the project wizard, his sidekick - Fred (WA4IWY), Bill (WB8ELK) - the balloon expert, his friend Mark (KA9SZX) and Barry (N4MSJ) who provided a backup ATV system. I went down to video record the event and had a spectacular time helping out. Another chap, Dennis Gallagher - NASA scientist, was responsible for the VLF experiment with the INSPIRE gear. One was in the payload and he had another in his van for ground reference. We monitored the whole trip but really did not hear much more than plain Sferics but further analysis by Dennis may produce other related sounds. Both audio streams were time-stamped and recorded and maybe, just maybe, we'll hear a snap from the ground rx and a whistler from the balloon or vice-versa. Would be nice to be able to synch multiple path sounds from a single activity.

Unfortunately, the meteor shower did not materialize but some spectacular video of Jupiter and Venus were recorded. I will attempt to edit my video of the ATV screen to isolate other star patterns and also try to capture the ground lights when the payload was released from the balloon and spiraled to ground. Those NASA chaps really did their homework on the calculated path and the payload parachuted down within 15 miles of the chase vehicle. I had to leave before it was recovered and I hope it was.

My hat is off to those that made the event a success and to me it was one of those events in one's life that will be remembered for quite awhile. Nice to see ATV, 2M packet and APRS all integrated together in a real-time activity.”

Sounds like an exciting time, Rick. I hope the further analysis produces something useful.

•**Charles R. Patton** ([charles.r.patton@ieee.org](mailto:charles.r.patton@ieee.org)) mentions that he recently retired and sent an excellent article on a comb filter. Looks like I have another project for those long winter nights.

“In the July 10, 1995 issue of “Electronic Design” magazine there was an “Idea for Design” called “Eliminate Periodic Noise” by W. Stephen Woodward. It won best of issue and was later reprinted in the Oct. 24, 1996 “Supplement to Electronic Design” which was a collection of the “Best of Issue” designs. The design uses a CD4016 to create an analog comb (and I emphasize the words analog comb) filter – in this case a 60 Hz filter, but by changing the reference frequency it could just as easily be 50 Hz or any other frequency you desire. It has a DC response but is supposed to have infinite rejection at all comb frequencies. It sounds like exactly what you were describing.”

• **Michael Mideke, WB6EER** writes that he found my invisible-till-published typo of referring to the 60 kHz. time and frequency station as WWVH. Of course it should be WWVB, WWVH is in Hawaii. (I never could type.)

Michael writes, "I've recently moved (after some four years in "town") to rural Arizona. To a desert valley largely inhabited by all sorts of power lines, as it turns out. But, I've already got my ham station on the air, done some LF listening and found both reasonably and completely hum-free VLF sites not too far from home. Also, not very much farther, I've found Frank Cathell (co-designer of the WR-3) and Jim Mandaville (pioneer of whistler hunting in the Arabian deserts). With neighbors like that I'm sure some VLF mischief lies not too far in the distant future!"

It was good to hear from Michael who is the originator of this department of *The Lowdown*. Hopefully we'll hear about some of that "VLF mischief" in the not too distant future.

• **Bill Hooper** (woh@magick.net) sent in the location of a website he found that has lots of interesting circuit design data. It's Harry Lythall's site and located at <http://members.xoom.com/sm0vpo/>.

• **Jon Wallace** (jwallace@mail1.nai.net) "I have done some INSPIRE stuff and thought the organized observations lead by Michael Mideke were a great idea. Perhaps you could organize another sometime in spring - pick a weekend when everyone will observe together???"

That's a great idea, Jon. Coordinated monitoring around the spring equinox might provide some good data, and also be a good excuse for whistler enthusiasts to get out in the early spring weather. I'll have information on this in next month's column.

As Natural Radio listeners we have the best of both worlds. If the millennium comes with no effects from the Y2K bug we can rejoice in the fact that the doom and gloom people were wrong. If the worst happens, and the power grid goes down, we'll have one of the best listening opportunities ever. Merry Christmas and a happy and prosperous New Year to all.