

# Natural Radio

*News, Comments and Letters About Natural Radio*

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There has not been much news on the Natural Radio front, although after a year of predictions and false starts, it appears that Sunspot Cycle 24 has finally begun officially on January 4 with the appearance of a high-latitude reversed polarity sunspot, AR10981.

While reading through the postings on the VLF\_Group, I found a bulleting from the ARRL that the HAARP station in Alaska would be conducting some moonbounce experiments in the 7 MHz. range this past weekend, so I thought it might be interesting to give a listen and see if I could detect the return echo.

I fired up my old Hammarlund SP-600 about an hour before the event as my Kenwood ham receiver didn't quite make it down to the 6.72925 MHz. frequency of the first test. I was surprised by the amount of noise on the band which was equally bad with both the longwire horizontal and the GAP vertical antennas.

Since I had about an hour before the first test, I decided I might do a little bit of listening for beacons while I waited. I hadn't done any listening on this band in months and was surprised by the noise on the band that made hearing anything but the closest beacons nearly impossible.

Sadly, it seems that my local RF environment has become increasingly polluted by a variety of modern electronic devices. So, another project on the list will be to start switching off circuits one by one and determine if the source is within the house or without and then continue the detective process to find and possibly eliminate the offending devices or at least re-orient antennas to try and null out some of the noise. It was very frustrating, and needless to say I couldn't hear the HARRP broadcasts or echoes, although several VLF\_Group subscribers did without the benefit of any fancy equipment.

Also, this month, I received the last printed issue of the Inspire Journal. Bill Pine, one of the founders of the project has stepped down as editor. The new editor is Kathleen Franzen, the president of The INSPIRE Project, Inc. The Journal will continue in online format and the good news is that it is free. We wish Bill good luck in his retirement and look forward to the new directions and continued contributions of The INSPIRE Project.

This move to online publication seems to be happening frequently and of course there are a lot of advantages such as making the publication available to a wider audience and making it affordable in the face of rapidly increasing postage costs. However, I wonder what percentage of online material will still be available to researchers 10, 25 and 50 years down the road. I can only hope that libraries and private collectors are preserving the important online papers and articles for future generations.

Speaking of online information, I've been using my available time at the bottom of the sunspot cycle to launch a new website, [www.naturalradiolab.com](http://www.naturalradiolab.com). My purpose is to have a site that is friendly for those new to Natural Radio listening, but that also provides references and links for more experienced listeners. The site is somewhat "bare bones" at the present, but I will be adding content as time permits. I'd appreciate any feedback and comments.

I have built the site using an open source content management program called Drupal. Theoretically, this will make updating and expanding the site very simple – or so I hope. The program has had a bit of a learning curve but it seems to be working as it should. I am currently hosting the site on my own server because it makes working with Drupal a lot easier. Please let me know if you are having any access or slow performance problems.

***THEMIS Observes Magnetic "Flux Ropes" Connecting Sun & Earth*** – In my March 2007 column, I wrote about the THEMIS (Time History of Events and Macroscale Interactions during Substorms) project shortly after the launch of the satellite portion of the project. THEMIS's five satellites along with a network of ground stations with whole-sky cameras and another network of magnetic observatories have a two-year mission to determine the triggering event for geomagnetic substorms.

The THEMIS constellation of five satellites seems to be gathering data as planned and giving the researchers lots to think about. Several of the first discoveries were presented in papers delivered at the December meeting of the American Geophysical Union.

During a substorm on May 20, 2007, THEMIS observed "magnetic flux ropes" in the magnetopause that connected the Earth's upper atmosphere to the Sun's magnetic field. These flux ropes provided a conduit for the flow of Solar Wind particles and energy into the Earth's magnetosphere providing energy for geomagnetic storms and auroras.

Project scientist Dave Sibeck said, "A "magnetic rope" is a twisted bundle of magnetic fields organized much like the twisted hemp of a mariner's rope. Spacecraft have detected hints of these ropes before, but a single spacecraft is insufficient to map their 3D structure. THEMIS's five satellites were able to perform the feat."

The five satellites, all in different orbits of varying distances from the earth, line up for about 15 hours every four days on the midnight side of the earth. They have electrical and magnetic field sensors and in conjunction with the all-sky auroral cameras in Canada and Alaska, and a series of magnetic sensors across the Northern US, can determine the progress of any substorms that may happen during that time.

These results will help our understanding of the near-earth geomagnetic environment and give us a better idea of how energy from the sun is transferred to the magnetosphere. Ultimately it will help us predict geomagnetic storms more accurately and allow us to better protect satellites and the power grid. I suspect we'll also learn a lot more about chorus and VLF emissions.