Natural Radio

News, Comments and Letters About Natural Radio

November 2008

Over Labor Day weekend I got to combine a short vacation with a little Natural Radio listening expedition. For the past 5 or 6 years we have taken a long weekend type vacation with a group of good friends. Typically we rent a house within a half-day's drive from Chicago, and this year we found a great deal on a house right on the shore of Lake Michigan near Sheboygan, Wisconsin.

I checked the address on Mapquest and found that it was far enough north of Sheboygan (about 15 miles) to be well away from power plants and hopefully, transmission lines. So I packed my WR-3 and Microtrack 24/96 recorder, stopped at a Radio Shack on the way since I grabbed the wrong connecting cable and hoped for the best.

As we approached the site I was encouraged by the fact that I didn't see any high-voltage transmission lines. The house, on the western shore of the lake, was up on a bluff about 60 ft. above the beach. The first night as we were sitting around a campfire after dark, I brought out the WR-3. The hum level was pretty loud but I heard sferics and some decent tweeks. I thought that the reception would be better on the shore since it would be 300 feet or more from the house and maybe there would be some shielding from the bluff.

We got up at 5:30 the next morning to go down to the beach to watch the sunrise, and I headed down the steps to the beach with all the radio and recording equipment and a video camera on a tripod. Surprisingly, the hum level was almost as loud as it was up on the bluff by the house. I was able to hear sferics, but nothing else. I was surprised at the hum level and still don't have an explanation for why it was so high other than the WR-3 has no filtering, and I'm used to listening on my homebuilt receiver that has a sharp high-pass filter at about 300 Hz. A repeat trip to the beach the next morning produced the same results but the sunrise was beautiful and I got some great video.

It was nice to be away from the lights of major urban areas and the view of the Milky Way was spectacular – I can't see it at all from home. So, despite the lack of Natural Radio activity, the clear skies, warm weather, good food and drink and great companionship made for a wonderful Labor Day weekend

INSPIRE VLF-3 – The INSPIRE VLF-3 is the 3rd incarnation of the INSPIRE receivers – there are over 2500 INSPIRE receivers out in the world today, and I would guess many of us do our listening on one of the versions of this fine receiver.

I recently communicated with Kathleen Franzen, the president of INSPIRE and she has been made aware of some issues with long shipping times and missing parts in the VLF-3 kits. Kathleen was very concerned about these issues and has taken immediate steps to remedy the problem. Here is her official statement:

A Few Words to Friends of INSPIRE and All Receiver Buyers

The INSPIRE Project, Inc. has a sterling reputation as a science education organization. We have worked diligently to maintain a very high degree of Customer Service and provide timely responses to kit or parts requests.

Over the last several months, there has been a sharp increase in the number of kit orders and our current manufacturer is unable to meet our desired turnaround time of 30 days. Due to this problem, INSPIRE has found a new manufacturer who will be able to fulfill orders in a more timely manner. We are currently in the process of making this transition and it will be complete in approximately six weeks. INSPIRE sincerely apologizes for this inconvenience.
I would like to encourage all of you who have not received your kits or have missing parts to please send me an email to: customerservice@theinspireproject. Please be as specific to the number of weeks you have been waiting to receive your order or what parts you are missing. Your requests will be a priority.

Again, on behalf of The INSPIRE Project, Inc. my apologies to all of you who have experienced these kinds of kit problems. I would also like to thank you for your patience and continuing support.

My regards,
Kathleen Franzen
President

Sunspots & Solar Wind – We finally had a few sunspots move across the blank face of the sun in the past couple of weeks and while this solar minimum period of no sunspots is longer than normal, it's not setting any records. There have also been a couple of geomagnetic storms that produced auroral displays in Finland.

What is interesting, however, is the revelation in late September that the solar wind is on the decline. On September 23, in a briefing at NASA headquarters, it was announced that analysis of the data from the SWOOPS solar wind sensor onboard the Ulysses spacecraft indicated that the pressure of the solar wind had decreased to the lowest value that has been measured in the 50 years that such measurements have been made. The solar wind pressure has decreased 20% since 1995 and it seems to be a long-term trend. While the solar wind speed has remained somewhat constant the temperature and density of the wind has decreased. Possibly related to this observation, the intensity of the Sun's magnetic field has also decreased by 30% since the mid 1990's.

The effect is that the heliosphere is shrinking. The heliosphere is the bubble of magnetism inflated by the solar wind that encircles the solar system far beyond the orbit of Pluto. The shrinking heliosphere could allow more cosmic rays from interstellar space to enter the solar system. While those of us living on the surface of the Earth are protected by our thick atmosphere and planetary magnetic field, satellites in high orbits could suffer damage and astronauts in interplanetary flights could be subject to more radiation.

Since we only have 50 years of data, we don't know if this is a normal variation or not. It will be interesting how the current solar cycle plays out and if there is any correlation between solar activity and solar wind. It is also unclear what effect, if any, this will have on Natural Radio signals.

IBEX Launched – In a related item, IBEX, the Interstellar Boundary Explorer, was successfully launched on Sunday, October 19, 2008. IBEX will fly in extremely high-altitude orbits above Earth to investigate and construct images of processes taking place at the interstellar boundary, which is the edge of the heliosphere, where the solar wind meets interstellar space.

IBEX can monitor the helisophere and determine if it is actually shrinking. It will also be able to predict when the Voyager spacecraft will cross this boundary.

“IBEX will let us make the first global observations of the region beyond the termination shock at the very edges of our solar system. This region is critical because it shields out the vast majority of the deadly cosmic rays that would otherwise permeate the space around the Earth and other planets,” says Dr. David J. McComas, IBEX Principal Investigator (PI) from the Southwest Research Institute (SwRI) in San Antonio, Texas.

IBEX, the latest in NASA's series of low-cost, rapidly developed Small Explorers spacecraft, will begin its active mission after 45 days of systems checkout and positioning into its final orbit.

Although IBEX is in Earth orbit, it will detect high-speed particles known as energetic neutral atoms and build an image of the outer boundary of the solar system from them. These particles are formed in the boundary where the bubble created from the solar wind collides with the gases of interstellar space.

“The solar system’s frontier is billions of miles away, so it’s difficult for us to go there, but interesting things happen at boundaries, and with IBEX, we will see them for the first time,” said Dr. Robert MacDowall, IBEX Mission Scientist at NASA’s Goddard Space Flight Center in Greenbelt, Md.

The Earth's magnetosphere also produces energetic neutral atoms, so IBEX's orbit needs to be well beyond the magnetosphere. The orbit can take the satellite up to 200,000 miles from earth. After six months, IBEX will have made observations of the entire sky, and for the first time we'll have a picture of the global structure of the heliosheath and termination shock.

The instrumentation consists of two very large aperture single pixel “cameras” that measure energetic neutral atoms with energies of 10 eV to 2 keV (IBEX-Lo) and 300 eV to 6 keV (IBEX-Hi).

Physically, the satellite is 23 inches high x 38 inches across (eightsided shape, like a STOP sign) and weighs 236 pounds with fuel. During nominal operations, the spacecraft uses 66 Watts; payload uses 16 Watts. The solar array produces 116 Watts.