

Signal Plotter Plus

Patrik Tast and Jerry Martes created a very helpful tool that was added into the APT Decoder Program that is offered for free by Patrik. The operation of the new tool was covered in the December 2008 (GEO Quarterly No 20). If you were fortunate enough to have a R2FX or any of the ICOM PCR series of receivers, you could automatically capture and plot the performance of any antenna that you had attached to the receiver.

For my station, I use a receiver that is of my own design and fabrication. I had talked to Patrik some time ago about providing an alternate method for those of us that do not have computer controlled radios including a RSSI (Received Signal Strength Indicator). We took a short try, but did not complete it. Recently there had been a flurry of inquiries about using the signal plotter with non computer controlled receivers, either home built or commercial such as the R139.

Patrik once again took on the task and has provided a new and functional feature that I have also evaluated. For ingest of the RSSI, the program has a receiver option of "Custom". In addition, the program has been changed so that it will read data from a DATAQ Instruments DI-194RS 4-Channel Data Acquisition Module. This module is available at <http://www.dataq.com> for \$24.95 plus shipping. It is a four channel unit and the price includes a serial cable, software, screwdriver as well as the module.

In order to use the signal plotter with a non-computer controlled receiver, the DI-194RS should be attached to the RSSI or signal level point in your receiver. The input impedance of the DATAQ is only 200K so care must be taken to not load down your RSSI measurement point. For my receiver, the RSSI signal is developed across a 51K resistor, so I used a LMC7111 Single Supply Operational Amplifier to buffer the signal. I had earlier characterized the RSSI volts per dB and wanted to maintain that accuracy.

To use this feature, you can set up the program in accordance with the instructions in the December 2008 GEO article, except, you should chose the “Custom” receiver. This is shown in Figure 1.



Figure 1, Receiver Selection

Once you have made this selection, then click on the yellow dot to start recording. It will ask you if you want to record all passes, in a small text box. After the pass or passes have been made, opening the signal plotter and selecting the file will provide operation as discussed in the GEO article.

I plotted passes using the home made DCA antenna and a commercial Turnstile. They were attached to the same mast and used the same coax and receiver (I just swapped out antennae). A comparison of the two antennas is shown in Figures 2 and 3. As you can see, the DCA antenna is better at the lower elevations while the Turnstile appears better overhead and not as well at the lower elevations. The variability in the DCA is either due to my construction or the nearby interferences such as houses, trees, etc. In both cases, the antenna is approximately 8 meters above ground level at an elevation of 25 meters above sea level. There is no high ground in Florida.

I have found this a very interesting tool and plan on using it to evaluate antennas for Amateur Satellite reception also.

NOTE: You will need to update your APTDecoder software to 2.0.5.88-alpha 9.

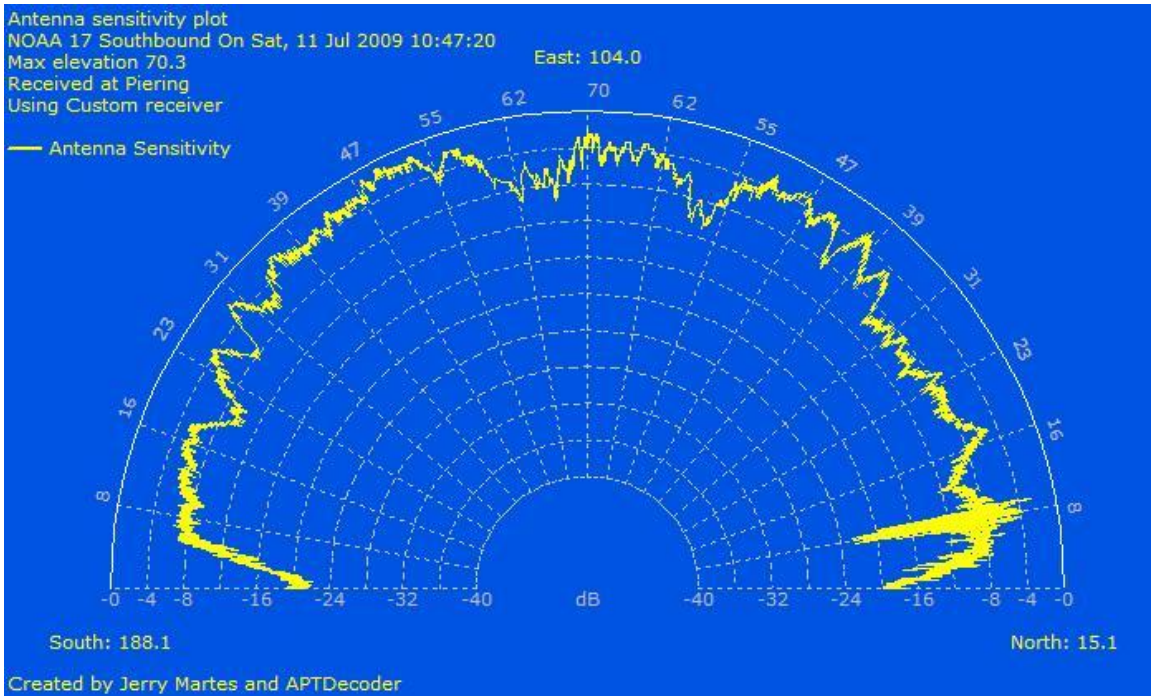


Figure 2, Home Made Double Cross Antenna (DCS)

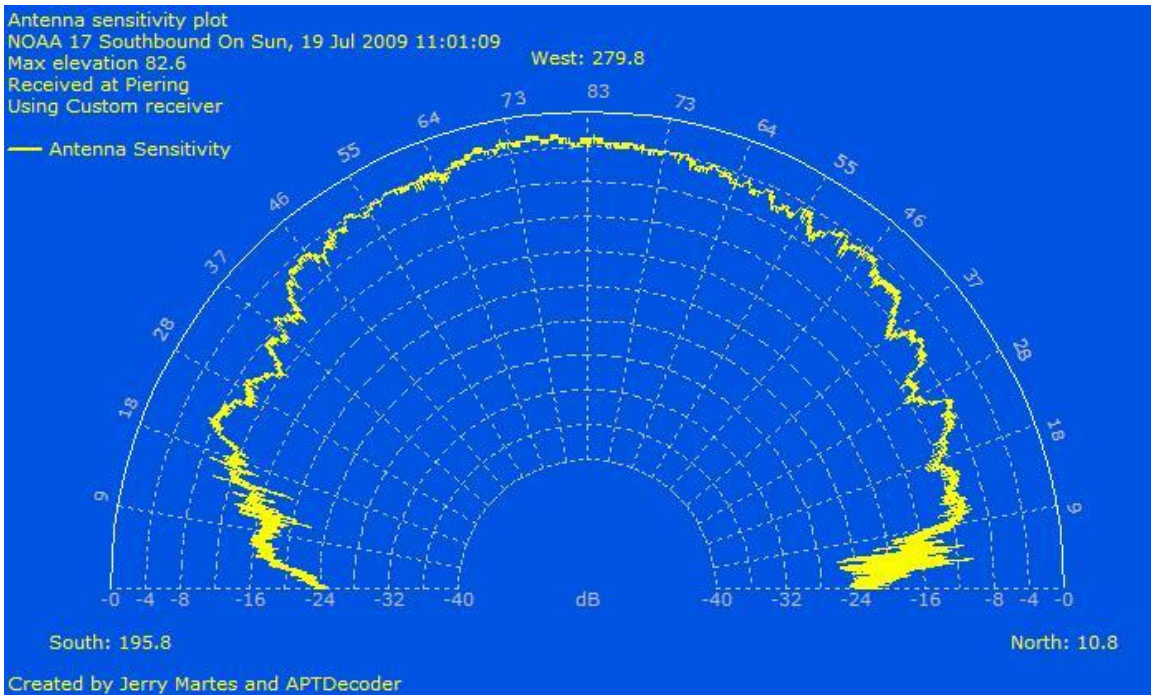


Figure 3, Commercial Turnstile at same location & components