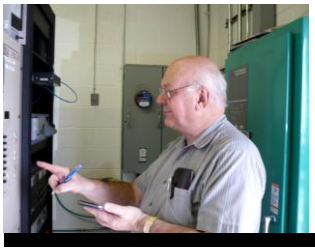

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Checking it Out

DEVA's Band Scanner GPS

by Alan Alsobrook

[April 2013] At the same time companies have been cutting back on staff and tech budgets, recent technology has given us more and better tools to analyze and troubleshoot our signals. One of the more interesting products has come from DEVA Broadcast. Alan Alsobrook has been checking it out.

Recently I have had the opportunity to try out a DEVA Band Scanner GPS. This is a nice little device that is USB powered and is able to act as several different pieces of test equipment.

The primary thing the product is designed for is to be an RDS or RBDS monitor. (If case you are wondering, in North America we send RBDS, not RDS.)

It definitely excels at that function with its ability to tell you everything that is coming from your RBDS encoder. But that is not all. The DEVA Band Scanner GPS can also serve as a modulation monitor, spectrum analyzer, and more.

RDS/RBDS

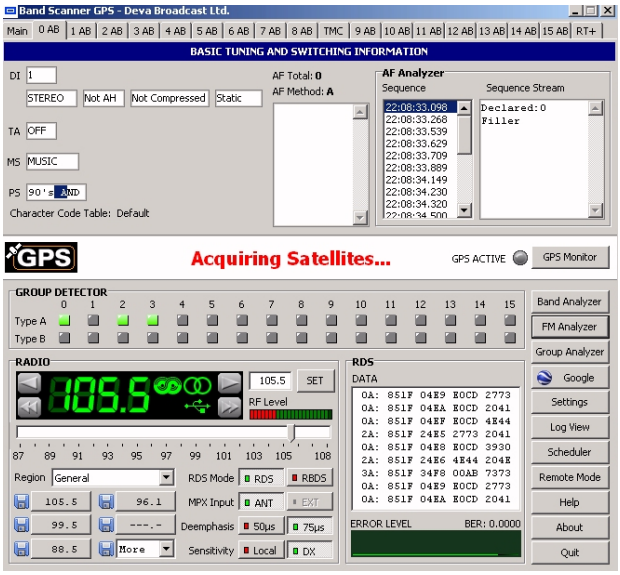
Of course, here in the U.S.A. we do not use the 57 kHz subcarrier anything like the way it is used in Europe where this product was created.

However, even if you are just doing song title and artist data, the DEVA Band Scanner GPS turns out to be a great tool for analysis.

For example, the Band Scanner quickly lets you know what data is being transmitted and from what group. Did you even know there are 16 x 2 different groups of data that can be sent via RBDS? Not having worked much with RBDS, I had not fully realized how many different groups of data RDS was set up to transmit.

DISPLAYING IT ALL

After you get the software and drivers loaded, and start it up you are greeted with a main screen which gives you a great deal of information.



The DEVA Band Scanner GPS main screen

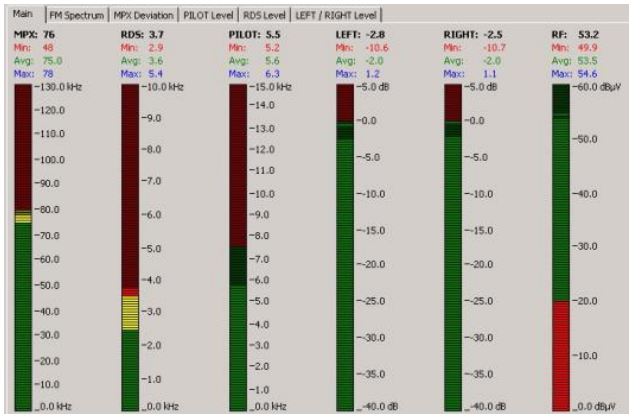
While testing, I got a call from an engineer I assist who was trying to figure out how to make their new RDS encoder (not a DEVA product) work. It was a great opportunity to put the Band Scanner GPS to the test.

Using it, I was able to watch the data being transmitted while I was changing any one of the hundreds of variables in the RDS encoder – and observe what effect that had on the data without running out to my truck each time to see what had happened. I still have not quite convinced the encoder to do what I want it to do, so the Band Scanner GPS will continue getting a workout on this problem.

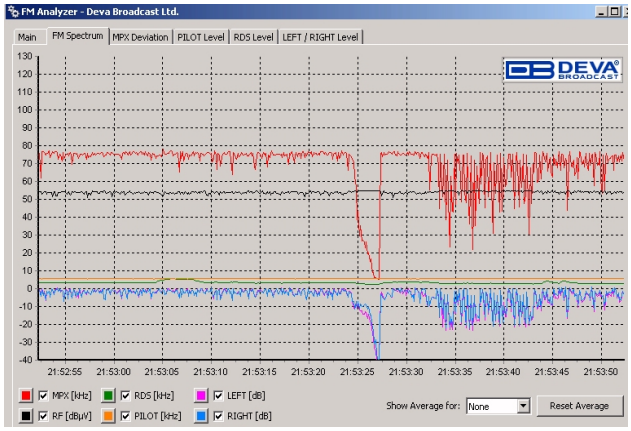
Perhaps you might want to track what is going on across town on the programming side of the fence. The DEVA Band Scanner GPS can tell the whole story if the competition is sending RDS. This unit will happily log their entire playlist and let you review it without ever having to leave your desk.

MODULATION CHECK – AND MORE

The next function of the Band Scanner GPS is its ability to act as a modulation monitor. It is able to track the total modulation, pilot, left, right, and RDS subcarrier modulation levels along with the RF level. The modulation monitor display has several different views.

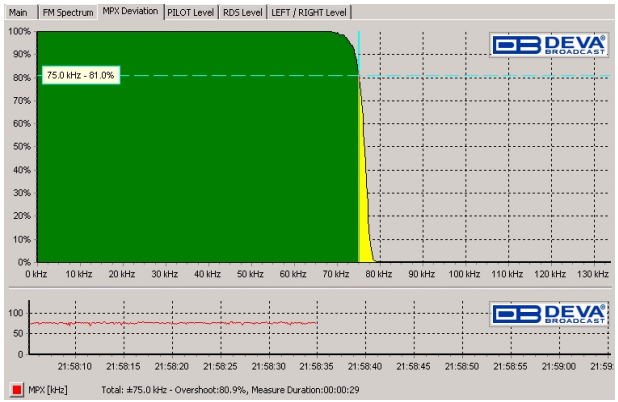


A bar graph display of modulation parameters



This display tracks modulation over time

Using these screens gives you a very good idea of how the processing is set up. For example, the Band Scanner GPS makes it easy to see at a glance if you have some significant dynamic range or if you are compressed and clipped to the highest modulation level that your super-duper processor can achieve.



I liked being able to sit at my shop and tune in one of my close by stations, logging into their processor and make some adjustments while I was listening to the air product in the quiet of my shop.

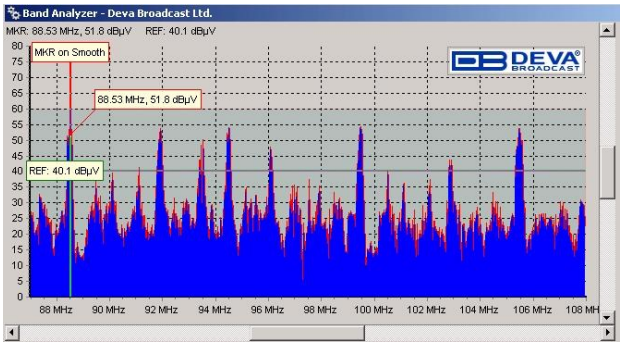
Do keep in mind you have to have a good clean signal before you make any adjustments going by the data from an off air modulation monitor. (If you do not have a strong enough signal even small amounts of noise will cause errors in the deviation levels displayed.) Luckily my shop is located within one mile of three FM stations I take care of.

If you are not as fortunately located as I, it appears there is a plan to be able to remotely operate the Band Scanner GPS in the near future.

For now you just have to resort to remotely operating the computer to which the Band Scanner is attached.

SPECTRUM DISPLAY

Another nice feature is the ability to scan the FM band, getting a spectrum display of all the stations in the area. If they are sending RDS data they will even be identified by that data.



Showing the FM band on the Band Scanner GPS

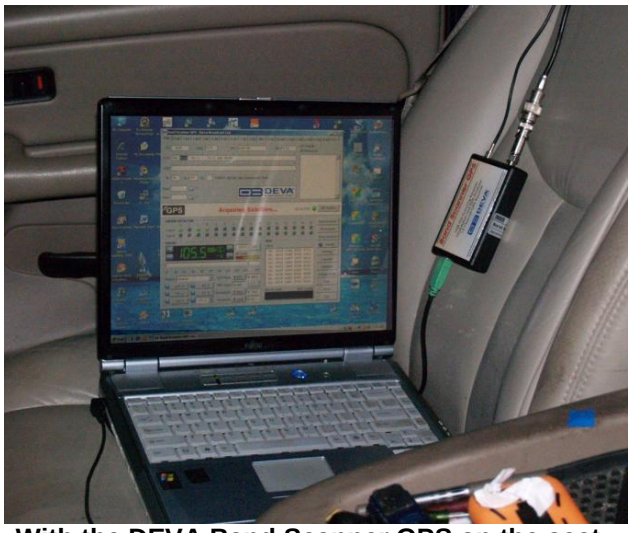
MEASUREMENTS ON THE MOVE

Did I happen to mention that this unit has an integrated GPS receiver and knows where it is? This is a feature that really piqued my interest.

Using the Band Scanner GPS with a laptop now I can easily set up and do a driving run checking relative signal strength over an area. After playing with it for a bit on the bench I decided I was ready to take it on the road.

Here I found my first difficulty: finding a decent vertical FM mobile antenna. Also I needed to adapt it to the F type connector the Band Scanner GPS. My initial thought, that an old 27 MHz magnetic mount antenna would work, did not prove to be the case.

I ended up having to do some modifications to the antenna, like removing the loading coil and replacing the whip with a longer one. This antenna still seemed to have more attenuation than I really wanted but it would work for field testing the unit. Once I had an antenna to use it only took a moment to set up a schedule of three stations to sample and set out on a test run.



With the DEVA Band Scanner GPS on the seat, measure and record the signals as you drive

My first test run did not turn out so well because, for some unknown reason, the laptop I used kept disconnecting the Band Scanner GPS, causing it to restart. Once restarted it did not resume the schedule and collected no data.

On run two, realizing the disconnect problem, I was checking more often to restart the test as needed.

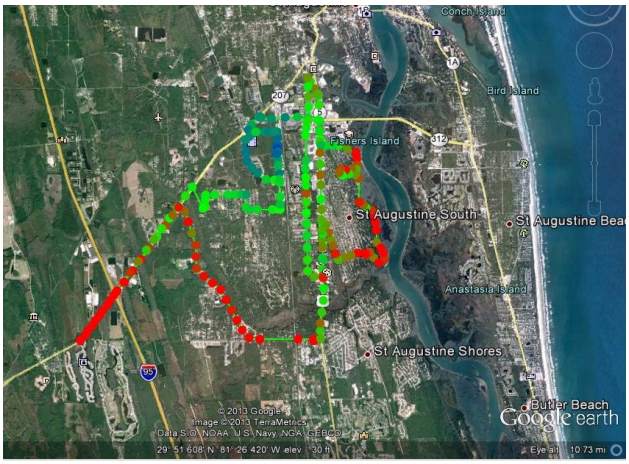
By the time I performed run three, I knew what to do – and got some interesting test results.

Eventually I tried using another – same model laptop – with the same DEVA drivers and have since noticed that it has not disconnected once. That leaves me thinking that this was a problem with the laptop's USB driver or some other software issue on it. I need to investigate further.

DATA ANALYSIS

Once you collect the data then next concern is analyzing it. To that end the Band Scanner has the ability export the data in several formats including .KMZ for use with Google Earth.

For this test, I selected a station where I had suspected there was a null in the signal from their translator antenna.



Displaying the data via Google Earth link

With the data I collected using the DEVA tool, I was able to easily identify a null exactly in the very direction I had suspected. That means some antenna work to alleviate the problem will be scheduled in the near future.

INPUT CALIBRATION

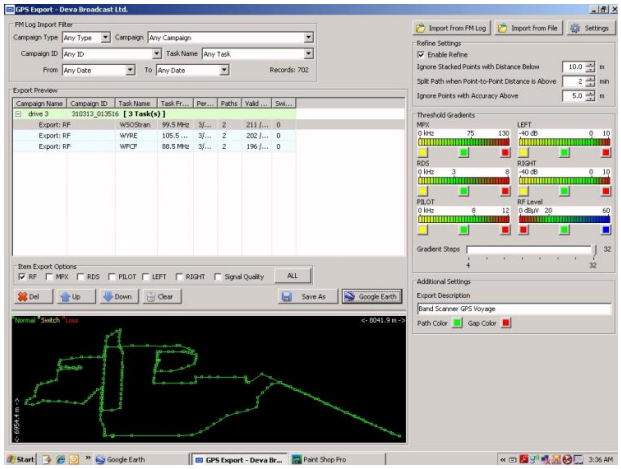
I also came to the conclusion that when looking at antenna patterns having an attenuated antenna is not a bad thing, especially for full power stations.

The Band Scanner GPS does have software attenuation available, so it should not be a problem if you do have a good antenna. In fact, you can set specific attenuation for the antenna you are using should you need to make somewhat calibrated measurements.

What I would really like to do is take the Band Scanner GPS airborne and do some circle measurements around different FM antennas and see how that data comes out. I suspect a circle maintaining two miles out from the antenna should show any anomalies with the radiated pattern in just a few minutes of flying time.

EAST MEETS WEST – SORT OF

One oddity I found was on the export screen's travel path preview. It displays East towards the left side and West to the right – coming out as a mirror image of what you would expect to see. This is not a real problem since there is no real data displayed; it is just a bit confusing. Once it gets to Google Earth it displays properly.



Oddity on the Export screen. (This is the same data as shown on the Google Earth screen.)

A warning before you try it: one capability the Band Scanner GPS does not have is the ability to be hooked directly to the RF sample port of a transmitter. If you attempt that you can expect a non-functional unit to result.

All things considered the DEVA Band Scanner GPS is a really nice tool to have available for many forms of testing. I am looking forward to trying out more of the features included in the Band Scanner GPS.

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You can get more information on the DEVA Broadcast web site or call 855-428-7272.

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