

On the Road with WiNRADiO

By Bob Grove

A recent trip from Brasstown, North Carolina, to Sun City Center, Florida, gave me a great opportunity to try a computer-hosted receiver in a mobile/portable environment. With quite a selection in our sales inventory to choose from, I elected to take the WiNRADiO WR3150e—a 100 kHz-1500 MHz, all-mode, scanning receiver with a built-in spectrum display capable of showing signals present on any band up to 100 MHz wide. This is a favorite among government and military buyers, and is the high-spec version of the popular WR1550e that hobbyists generally select, and which would have worked just as well in my applications.

Conventional scanner features like memory scan, search, data storage, squelch, delay, and so on are included in the operational software. Sensitivity is on par with scanners and shortwave receivers, as are selectivity and dynamic range. Scanning speed is typically 50 channels per

second, and simultaneous spectrum sweep and audio recovery of swept signals is offered.

I decided to host the receiver with my trusty little notebook computer; the entire series of WR portables will run on any Pentium, or even a 486 platform, and under Windows 95, 98, ME, NT4, or 2000 operating systems. A serial interconnect is provided and that's what I used, even though much faster PCMCIA and USB adaptor options are available.

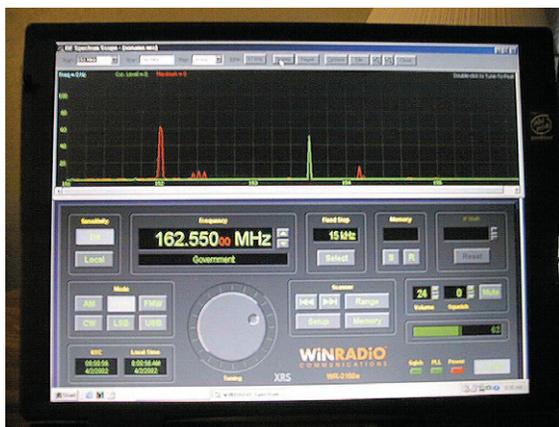
With the computer sitting in the seat next to me, the companion 3150 powered by the vehicle's cigarette lighter socket, and a Nil-Jon Super-M magnet-mount antenna on the roof, I headed down Interstate 75.

Lunchtime at Cracker Barrel is always a good excuse for me to enjoy their delicious grilled chicken salad with the house Italian dressing, my personal favorite. And this visit near Macon, Georgia, provided an additional bonus—several of the serving staff were wearing headsets! I asked the manager what frequency they were using, but all he could offer was that it was channel 4 of some kind, and he thought CB because he kept hearing truckers!

That was tantalizing; I could hardly wait to finish lunch so that I could get back to the car and switch on the spectrum display function of the WiNRADiO. But this game came to a sudden halt when I saw one of the radios



The WinRadio motel monitoring post was compact and sophisticated, but affordable, especially if you already have the notebook computer.



The screen clearly showed where there was radio activity: a click of the mouse would also tune it in!

protruding from a server's pocket—a Radio Shack FRS transceiver! Too easy.

Nonetheless, just to finish the game, I left for my car where I spent the next few minutes checking out the 462 MHz range with my trusty intercept station. While the Cracker Barrel radios didn't come alive during that short period, other drivers on the adjacent interstate were keeping in touch with each other via their FRS transceivers, clearly the "CB truckers" that the restaurant manager thought he was hearing!

Back on I-75, an overpass gave me a great view of a typical interstate complex just north of Unadilla, Georgia—fast food restaurants galore, a gold mine for a scanner sleuth with a new toy! I pulled well off the road, shut off the engine, and switched on the gear. In a tiny town like this, the 151-156 MHz range is a prime target.



A spectrum scan using the top-of-the-line Nil-Jon mobile antenna brought up plenty of signals on the screen in the small town of Unadilla, Georgia.

For this exercise, I decided to invoke a multiple display of re-sweeps to give me an idea of the amount of activity on each occupied frequency. WiNRADiO also has a clever “waterfall display” function,

downloadable from their web site, which provides a 3D look at the chosen spectrum and displays active frequencies over time.

I wasn’t disappointed; the first sweep of the spectrum revealed multiple hits – spikes on the spectrum display popped up on 154.510, 154.570, 154.725, 155.205, and 155.640 MHz. Switching on the monitoring function I heard nearby law enforcement simplex and repeaters, fast food windows, and itinerant/business activities.

While I could have searched this out with any scanner, the additional visual features of the WiNRADiO showed the dynamics of the activity on each channel along with relative signal strengths, plus the ability to simply click and drag the cursor to any frequency on the display for instant access to transmissions

(“Visa-Tune”). These are distinct advantages when time is an important consideration while looking for brief transmissions.

Finally arriving at my destination, I set

up the WiNRADiO monitoring position on a small table in my motel room; a length of coax through the doorway to an experimental portable antenna (see photo) linked me to the outside world.

Soon after I settled down, the electric power went off, so I quickly reloaded the package into my car so I could monitor local public safety activity. It’s bad enough when power goes off anywhere, but when all the traffic signals go out at the massive retirement community of Sun City Center, that’s time to worry! Fortunately, drivers behaved rather well, and there were no collisions – a relief from a humanitarian standpoint even if it did deprive me of monitoring excitement!

The little WiNRADiO certainly enhanced the enjoyment of the trip; I still kept my trusty Uniden BC3000XLT with me for casual scanning – and for entering frequencies I spotted on the dynamic WR screen. But for spectrum profiling as the scenes continued to change over the course of the trip, nothing could outperform the spectrum display function of the ‘3150.

Hints to Increase Hits

Naturally, it helps to have a knowledge of frequency ranges before you start; for example, you won’t find road crews on the aircraft bands, nor will you likely find pub-



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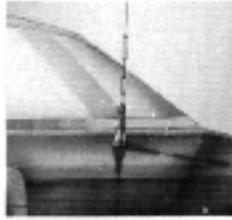
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lic safety operations in the FM broadcast band! Frequency directories, databases, and magazines like *Monitoring Times* will keep you informed – especially our current "Who's Who in the Radio Spectrum" series.

The WiNRADiO has highly-flexible database management; load your most desirable search ranges into memory, then call them up when you are ready to do a spectrum search. Naturally, you can also load a virtually unlimited number of memory chan-

nels as well for scanning, so you may wish to do this in banks by geographical location, or by service.

When doing a spectrum sweep on screen, keep the span limits as narrow as possible to increase the number of successful hits in a given time period, and make the steps as large as possible, no smaller than the actual channel separation likely to be used in a given swath of spectrum.

Since the sweep rate is 50 steps per

second, it is helpful to select the step sizes as close to the channel spacing as possible. Even if it is off by a few kilohertz, you are still likely to hear the transmission because of the wide bandwidth of frequency-modulated transmissions.

Use a small antenna, and perhaps the attenuator function, for close-by intercept applications; this will decrease the number of false hits from unwanted distant transmitters.

Recreational and Serious Applications

Our Interstate foray barely touched on the many uses for this versatile, portable, signal-intercept system. Beginning at \$500 for the basic unit, its visual and audible signal-detection functions are a very suitable alternative to far more expensive spectrum analyzers costing many thousands of dollars, and because the WiNRADiO products are full receivers, audio recovery of modulated signals is much better than that of far-more-expensive spectrum analyzers.

Consumer/hobby applications:

Tracking down sources of electrical interference to TV sets, shortwave receivers, scanners, wireless mikes, and radio control models can be expedited by watching the levels of the spikes on the screen while moving the portable system from room to room, and by using an antenna probe mounted on a long coaxial lead while sampling signal levels at various suspect locations.

Short-term monitoring on the road can often reveal the communications channels of road crews, military and government installations, convoys, sports and helmet radios, press and media, wireless mikes, airports and air shows, industrial and business complexes and malls, public safety operations, incident command and fire/accident/crime scenes, unlicensed truckers and poachers, tower user identification, security, hotels and motels, amusement parks, casinos, and more.

Professional intercept and test applications:

More serious uses for the WinRADiO involve the detection and determination of specific communications or signals. Such users include security consultants, law enforcement agencies, private investigators, communications service shops, TV and cable installation and maintenance technicians, electric and telephone companies, cellular service providers and cell-site technicians, federal and military agencies, research labs, wildlife telemetry

tracking personnel, broadcast engineers, and communications equipment manufacturers, to name but a few.

Technical surveillance countermeasures (TSCM) is the vernacular for "bug" detection, and determining the signatures of transmitters as well as the contents of the transmissions is entitled Communications Intelligence and Signals Intelligence (COMINT/SIGINT). WiNRADiO has a number of excellent optional software packages for such enhanced monitoring applications.



For scanning from the motel room, an experimental portable antenna was set up outside the room for better reception.

Additional uses for the WR systems seem virtually unlimited. Several which come to mind would include checking RF security systems and remote telemetry transmitters; maintaining two-way radios (signal tracing, waveform analysis, harmonic identification, modulation/deviation adjustment, IF alignment, spurious signal detection); conducting site surveys to detect potential interference to co-located radio and antenna systems; locating sources of intentional and incidental interference generated by radios, jammers, appliances, vehicles, computers, and power lines; conducting spectrum usage profiling and propagation studies; antenna, filter and preamplifier design and alignment; relative field strength measurements; tuning duplexers, cavities and diplexers; and FCC Part 15 screening of new products.

For the convenience and economic considerations of the user, WiNRADiO offers several models of their receiving systems in both plug-in cards for desktop computers, and external modules for laptops and notebooks. All models offer continuous coverage for authorized users, and cellular-blocked for consumers, beginning at 150 kHz up, and continuing through 1500 MHz (WR1550 and WR3150), 2.4 GHz (WR3500), and 4 GHz (WR3700). Prices for these radios start at about \$500 and increase to \$2900. Integrated eight-receiver packages in a custom host computer are also available for advanced multi-tasking requirements.

For high-end security and electronic warfare applications, WiNRADiO has announced their new WD3000 radio direction finder which can be used with other companion WR receivers, or with suitable receiving systems from other manufacturers. Perhaps we will have an opportunity to review this exceptional product in a future issue.

For complete information on WiNRADiO products available in the U.S., visit the web site of the North American representative for WiNRADiO, Grove Enterprises, at <http://www.grove-ent.com>.