

WiNRADiO DRM Decoder Plug-in For the G303 and G313 receiver series

By Lee Reynolds KD1SQ

❖ What is DRM?

Digital Radio Mondiale (DRM) is a method of transmitting audio and multimedia programming on shortwave using a digital data stream instead of the traditional analog AM method. This data stream can be demodulated by a suitably equipped receiver and/or computer into analog audio (and multimedia items, such as web pages) that is free of background noise, interference, and fading, and is of considerably better audio fidelity than the average shortwave AM signal.

Excellent audio and tasty multimedia tidbits are the up side of DRM. The down side of DRM is that, like other digital transmission modes, it requires very good signal to noise ratios for continuous decoding of the data stream into analog audio. Clean signal = great audio. Noisy signal = *no* audio.

With digital it's all or nothing – either the stream can be decoded or it's corrupt and cannot be decoded; no listening down in the noise with this mode! Unfortunately, in the real world, this usually translates to very strong signals being needed to produce the necessary signal to noise ratio.

A number of broadcasters are transmitting DRM signals on shortwave and the AM band, but at this time the huge majority of activity is in Europe. Two notable web resources for information on this mode are www.drm.org and www.drmrx.com. Activity is slowly increasing but has a long way to go before it constitutes even 25% of the available shortwave programming hours.

Hardware and software for receiving DRM exists, although there is a very distinct shortage of new standalone DRM capable portable or desktop radios. DRM listeners are usually to be found employing modified shortwave receivers feeding a 12 kHz IF signal into a PC soundcard running decoding software. (Although, again, there are some interesting things being done at this time in Europe in terms of decoder software and hardware.) At this point in time a computer, whether laptop or desktop, is pretty much a fixture in the DRM listener's toolkit.

❖ What are the G303 and G313 WINRADIOs?

These are computer attached (via either an internal PCI slot or an external USB port) Software Defined Radios (SDRs) for shortwave that have reasonably conventional RF

front ends but use DSP (either built-in or in the form of a SoundBlaster-class sound card) to perform the receiver IF and demodulation functions on a 12kHz IF output produced by the front end hardware. These devices also use the computer for a virtual front panel for the radio. (See last month's *MT* for an article on the G131e or visit www.winradio.com and www.monitoringtimes.com for reviews and more details on these devices.)

Such an approach to reception lends itself readily to a modular approach in terms of receiver abilities; you can 'plug-in' a piece of software that adds new abilities to the receiver. One such 'plug-in' is the WiNRADiO DRM Demodulator/Decoder for the G303/G313 and Windows 98/2000/XP. Addition of this plug-in results in a DRM-capable receiver sporting a seamless user interface.

❖ What's needed?

To start using the WiNRADiO DRM decoder you need, of course, a properly installed and configured G303/G313 series receiver. The additional software necessary is the appropriate downloaded demodulator itself (*free*) and the license key that enables it to run (\$US 49.95) – both can be readily obtained at the WiNRADiO web site.

❖ Installation

This is simple – unzip the downloaded decoder, execute it, and install it to the directory where you have already installed the G303/G313 software. Copy the license key to the same directory and you're ready to go.

❖ Startup

To use the DRM decoder, you open the 'Demodulators' tab on the receiver GUI (graphical user interface) and select 'G313 DRM Demodulator/Decoder'.

You'll then see the familiar Mode/Bandwidth/Spectrum display component of the interface change to the DRM decoder display. (For first time startup you'll have to configure the audio input for the decoder if you have a G303. If you have a G313 there's no need for it.)



This is where all the fun stuff is. At the top of the interface display is a spectrum display; when you're tuned to a strong DRM signal you'll notice a distinctive plateau-like signal spectrum about 10 kHz wide. This is also where you'll visually guide the notch filter, if needed, to knock out any interfering signal.



Next area down is the 'DRM Services' display. Here you'll see information on the transmission as to audio bandwidth being transmitted, encoding method in use, broadcaster name, country of origin, and show type. There's also a spiffy little ticker display to provide more information on what you're receiving. If the broadcaster is sending more than one channel of programming, you can use the tabs in this display to switch between the shows.



At the bottom of the interface are indicators for L/R channel audio out, on/off switches/indicators for multimedia/data log-



ging and three DRM status indicators – ‘Sync’ which shows that the demodulator has at least a basic lock on the signal, ‘Data’ indicating that it’s getting enough data demodulated to start displaying alphanumeric information about the transmission that’s being sent by the broadcaster (*analogous to the RDS stream that some FM stations transmit*), and ‘Audio’ that lights when audio is being successfully recovered from the data stream.

The ‘SNR’ box shows you the signal to noise ratio in decibels (*dB*) that the demodulator is seeing. This is a very good indicator of whether or not you should be hearing audio from a station. 16dB upwards is about the minimum for continuously decoding audio from a station transmitting a 22 kHz audio stream, 10-11dB is acceptable for a station transmitting a less-high fidelity 11 kHz audio stream. Any less than that and you’ll be getting audio with dropouts or maybe only the alphanumeric information display data being sent by the broadcaster.

(Take a look at the illustration – you’ll observe that there’s a 14dB SNR shown there and data’s coming in with audio being



decoded. The audio indicator’s on and the audio out indicators are active.)

To the right of the interface are controls for a variable bandwidth notch filter for removing any interfering signal from the DRM data stream, audio muting, volume, decoder setup and the recording/playback controls for either audio-level or IF-level signals being received.

❖ How to use it?

Just make sure you’ve selected the DRM demodulator plug-in, tune to a frequency on which a DRM signal is being transmitted, and see what happens next. It’s that simple. No extra wiring necessary, no receiver modifications. If it’s a good signal, you’ll see a well-defined plateau on the spectrum display, the three status indicators will rapidly light in sequence, and you’ll be listening to near FM quality audio on shortwave!

❖ My take on it.

It’s a no muss, no fuss add-on for your WiNRADiO that gives you easy access to DRM transmissions. The interface design and its integration with the receiver GUI is nicely done, providing more than enough tweak points and controls to satisfy the curious user while not scaring off the person who just wants to listen to DRM without getting bogged down in technical details. Audio quality’s good and reception performance is as good as it can be, given the limitations of the DRM transmission method and shortwave medium.

The WiNRADiO G303 and G313 series radios are available in the US from Grove Enterprises (www.grove-ent.com), but the free DRM software and \$49 DRM license key can only be obtained directly from WiNRADiO (www.winradio.com)

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