

Digital Radio Mondiale (DRM) on the Scope.

By Harald Kuhl.

A couple of modern broadband scanners are equipped with a useful tool named scope, which makes it possible to not only hear a signal but also watch it on a built in screen. Such a scope is not only good for finding new signals around the frequency you are currently listening to, but also for seeing how a signal behaves, including its bandwidth. While doing some testing with a new Yaesu VR-5000 broadband receiver, I had the opportunity to watch DRM signals coming from DTK Juelich during the HFCC in Geneva. I monitored the DRM test signals on the 49m frequency of 5900 kHz at my (former) location north of Frankfurt/M. where they reached a strength of up to S9+10 dB. During these tests the transmission was changed back and forth between traditional (analog) AM and (digital) DRM every few minutes, obviously for showing the HFCC people the difference and how well DRM can sound, if one has a DRM receiver (you can actually listen to the really big difference when going to www.drm.org).

I do not have a DRM receiver (yet), so I just heard the digital hiss whenever they changed to digital modulation. First I tried it on my AR7030 in normal AM using a built in 4,1 kHz Kiwa filter. The AM signal on 5900 kHz behaved as usual and more or less stayed on its assigned frequency. On neighbouring 5895 and 5905 kHz there were just slight splattering signals. After activating the SYNCH option or ECSS and choosing the clearer side band there was nothing left of the interfering signal. 5890 and 5910 kHz were also absolutely clear. But whenever Juelich changed on 5900 kHz to DRM, the situation was quite different: on neighbouring 5895 and 5905 kHz it still was very present reaching a level of S9, and on 5890 and 5910 kHz it was strong enough for causing interferences of around S5.

After listening to this QRM massacre I also tried to visualize it on the scope of the VR-5000. I listened in normal AM using a filter bandwidth of 9 kHz. The search range of the scope was chosen at 100 kHz (+/-50 kHz around the center frequency of 5900 kHz) with a resolution of 1 kHz. For making sure to only get real signals I used a PSE61 preselector between the receiver and the ALA1530 broadband loop antenna (btw: the VR-5000 is quite sensitive but tends to overload whenever it gets close to a decent antenna, and it is not a good receiver for the dedicated DXer). Watching the scope of the VR-5000 clearly confirmed the impressions described above: The DRM signal was at least(!) twice as broad as the traditional AM signal coming out of Juelich. To sum it up: For a DXer this was quite a frustrating experience. One single DRM signal (btw. consisting of around 200 carriers) was able to block three 5 kHz channels completely and to cause interferences on two more channels.

I have asked Peter Senger of Deutsche Welle, who currently is the boss of the worldwide DRM consortium, about this matter. He told me that DRM is very keen on staying inside the traditional channel spacing (meaning 9/10 kHz!). Otherwise they would never get approval from ITU. And if a transmission does not behave like it should, it is not a problem of the DRM system itself, but of the transmitter airing the digital signal.

In other words (my own): Like with traditional AM, a DRM signal can get very broad, if the people at the transmitting station have some problems with the implementation of the new modulation. I remember very well hearing heavy digital

noise all over the 40m ham band during a DRM test in the 41m broadcast band coming from a Scandinavian transmitting station. What will happen, if our friends in Eastern Europe start trying to get DRM out of their mostly antique HF transmitters?

Mr. Senger indicated that there are plans for placing future DRM transmissions at the edges of the traditional HF broadcast bands, minimizing interferences to traditional analog AM transmissions. So, we should watch this development very closely, but at this stage there are no reasons to panic. The official launch of DRM is planned for 2003.

Btw: During the Internationale Funkausstellung in Berlin (August 25 to September 2) DRM for the first time will present the future of AM broadcasting live to a large public. Besides test transmissions on several mediumwave channels around Berlin there will also be DRM transmissions on shortwave coming from the Sines/Portugal transmitter site of Deutsche Welle. For receiving the signals at the DRM booth in Berlin, they will use modified AR7030 receivers (modification at IF stage, you cannot simply take the NF). The demodulation will be done by notebook multimedia computers. Watch this space for a detailed report in a future edition of SWN.