

Digital Audio over Ham Radio

By Dan W1DAN

Over the last few years there has been a push for transmitting digital audio over broadcast shortwave radio. This has taken the technical format of Digital Radio Mondiale.

DRM is an audio software encoder and decoder ("Codec") that emerged from an informal meeting in Paris in September 1996, between some of the large international broadcasters and broadcasting equipment manufacturers.

These included representatives from Radio France Internationale, TéléDiffusion de France, Deutsche Welle, Voice of America, and Thomcast. Current shortwave broadcasters who are using DRM include the VOA, Deutsche Welle, China Radio, BBC, Radio Netherlands, Radio Sweden, and the Voice of Russia among others.

The DRM receiver has been around for some time and uses a 12 kHz IF output fed into a sound card of a PC. Digital DRM and analog AM and SSB demodulation as well as variable bandwidth selection is supported by the software.

Fidelity of some of the available HF broadcasts is quite impressive. You can use a Tentec RX-320 feeding the 12KHZ IF to the sound card. The DRM software cost about \$60. The transmitting station broadcasts a digitally encoded signal that sounds like loud noise when tuned in with a standard AM receiver. When using a converter, the software and a good PC, this noise is decoded as audio.

Recently two software based transmitter versions have been developed to allow homebrew transmission of DRM signals for ham radio. One is Dream DRM and the other is WinDRM.

A few hams I know are experimenting with this on the HF ham bands. They have downloaded and installed the software on their home PC's and built or bought a 455kc to audio converter using a single chip, the SA612. A converter can also be purchased. The result is clean audio with no static or fading.

Here are some web links:

Info on DRM is available at:

<http://www.drm.org/indexdeuz.htm>

Here is a link for what the Dream DRM receiver and transmitter look like:

[http://www.mynetcologne.de/~nc-](http://www.mynetcologne.de/~nc-keilje/drm/dream/index.htm)

[keilje/drm/dream/index.htm](http://www.mynetcologne.de/~nc-keilje/drm/dream/index.htm)

Here is the link to download a Windows version of the open source RX and TX Dream DRM software:

<http://pessoal.onda.com.br/riamorim/dream.zip>

WinDRM is a second version of encoder and decoder ("CODEC"):

<http://www.gsinet.de/member/hb9tlk/>

Here's a basic down converter circuit:

<http://home.t-online.de/home/sat-service/sat/download/Mixerflyer.pdf>.

73,

Dan W1DAN