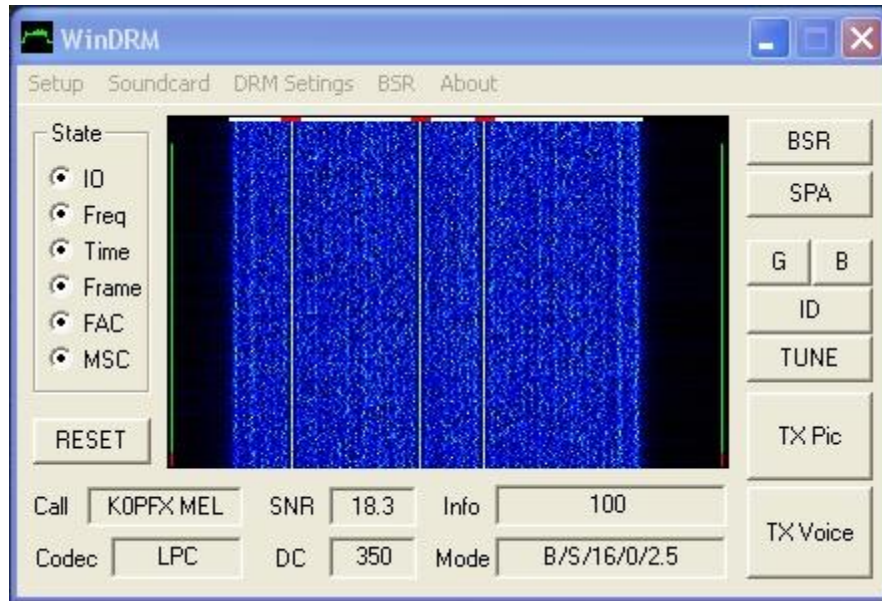# WinDRM Quick Setup V1.1

WinDRM is a soundcard based program for sending and receiving files (pictures) and digital voice using DRM (Digital Radio Mondiale) modified for ham radio by Cesco, HB9TLK.

PC Requirement: Minimum 1GHz CPU with Win2000 or XP, 1 or 2 soundcards
Two cards are highly recommended for digital voice.
Transceiver: Any modern SSB transceiver with good frequency stability. WinDRM may be used on VHF/UHF with SSB or FM transceivers.
PC-Rig Interface: RIGblaster or equivalent. Isolation recommended to avoid common mode noise pick up on signal lines between PC and transceiver. PTT recommended for TX/RX rig control.

Set up steps:
1- Make a WinDRM folder on desktop.
2- Download WinDRM from www.n1su.com/windrm into the WinDRM folder.
3- Unzip all files into WinDRM folder.
4- Run WinDRM.
5- Click on Setup, set com port (for PTT control) and enter your call sign.
6- Go to display and check waterfall (best for receiving).
7- Use program defaults to get started. Make soundcard to radio connections as follows:
For picture transfer with **one** sound card go to Step 8.
For picture transfer and digital voice with **one** sound card go to Step 9.
For picture transfer and digital voice with **two** cards go to Step 10.

8- Make the following sound card to radio connections via the interface:

RX Input = Mixer Recording Line-In (connect to receiver's speaker)
TX Output = Mixer Playback Master Volume (connect to transmitter's mic input)
Retain Mixer Settings at default (no switching)

9- For digital voice with **one** sound card, set Mixer Settings for auto switching
Line In on receive to Microphone on transmit.
Voice input = Mixer Recording Mic-In (connect PC mic to soundcard)
Voice output = Mixer Playback Master Volume (connect to spkr or xcvr)
Note: With only one sound card, the soundcard's Mixer Playback speaker's audio
has to be *manually* switched between the PC speakers (for receive) and
the transmitters Mic input (for transmit). The soundcard mixer can not
perform this function.

10- For digital voice with **two** sound cards (recommended), click on Soundcard and
choose how each card's input/out will be used. Generally, one card is used for
transmit and the other for receive. Connect soundcard to transceiver
cables via the interface as follows:
RX Input = Mixer Recording Line-In (connect to receiver's speaker)
TX Output = Mixer Playback Master Volume (connect to transmitter's mic nput)
Voice input = Mixer Recording Mic-In (connect PC microphone to soundcard)
Voice output = Mixer Playback Master Volume (connect to PC spkrs or headset)
(no mixer or manual switching with two cards required)

11- Under Soundcard go to Open Mixer and adjust "sliders" to set the audio levels.
For one sound card, follow Step 12 and 13. For two sound cards and DV, follow
steps 13 through 16. *Note*: Steps 12-15 are making adjustments on two different
mixers since two sound cards are utilized. Do not use any sound card EQ and
enable only the mixers used for WinDRM. All others should **not** be selected.

12- **Rx Input** slider adjusts the digital audio from the receiver to the sound line input.
First, adjust the receiver for normal listening level and then adjust Recording Line
In for a dark blue waterfall display. Signals and noise will be white. Turn off all
noise blankers, and tone controls or any DSP EQ that alters the audio.

13- **Tx Output** slider adjusts the digital audio from the sound card to the transmitter's
microphone input. First, adjust the transmitter's mic gain for normal full output
on SSB. Turn off any EQ or compression. The audio must be flat and capable of
350Hz to 2850Hz spectrum bandwidth. Next, click on "Tune" and adjust the
Playback Speaker and Wave sliders to for approximately 20-25 watts average
power with no ALC action (assuming a typical 100 watt transceiver). If a typical
1.5KW linear is used, keep output down to approximately 250 watts. Tune will
output three tones and **only** these three should be seen at the receiving station.
Multiple carriers displayed receiving station's waterfall indicates the transmitter
power must be reduced. This adjustment applies for both pictures and digital
voice.

14- **Voice Input** slider adjust the PC microphone level connected to the soundcard.
Adjust level on transmit so the display shows between 50-75% deflection of the
waveform. Generally, the codecs work best when the mic slider is kept low (less
than ¼ of the way up while speaking in a full voice across the microphone
element. High peaks will change the color of the display from green to red and
should be avoided. There is a second or two of delay (latency for processing)

between the voice input and output shown on the display. At the end of the transmission, a couple seconds of õwaitö before returning to receive allows the buffer to clear.

15- **Voice Output** slider adjusts the drive level for the PC speakers (or headset). First, adjust the PC speakers to normal listening level and then adjust the Playback Speaker and Wave to normal listening level while receiving digital voice.

16- **Using WinDRM:**
Find a frequency where pictures are being sent, typically 7.173 and 14.236. Carefully tune in on the stations while they are talking in USB or if a station is sending a picture, align the 3 vertical carriers (pilots) so they are under the 3 red blocks at the top of the waterfall. Once on frequency, WinDRM will begin decoding data to sync with the transmitting station. When the õMSCö (Main Service Channelö is enabled, data is now being decoded for the picture (or voice). To send a picture, click on TX Pic, load a file, then click Transmit. For voice, simply click on Tx Voice and speak into the PC microphone.

17- Most pictures are compressed using jpeg2000 (jpg2) format which requires a viewer such as Irfanview (free download at www.irfanview.com) a long with its companion õplug-insö. Install this program and associate it with images. WinDRM will automatically link to the incoming picture and display it on the PC. For detailed documentation on WinDRM, see WinDRM docs at http://n1su.com/windrm/docs/1.3/