WSPR-X User's Guide

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Overview

WSPR-X is an experimental version of WSPR that offers an optional slow mode with 15-minute T/R sequences and 9 dB better sensitivity than the normal 2-minute mode. Version 0.7 of WSPR-X does not support I/Q audio (for use with direct conversion receivers and transceivers) and does not do "band hopping". This release is primarily intended to facilitate experimentation with the "WSPR-15" mode on the MF and LF bands. For background information and a full description of the WSPR protocol, see the WSPR 3.0 User's Guide. This brief document should help you get started with WSPR-X. It assumes that you are familiar with previous versions of WSPR.

Basic Operating Instructions

1. Install the program in the usual way. The suggested installation directory is C:\wsprx.

2. On initial program startup WSPR-X displays two windows. One (normally the upper window) shows spectral information in a vertically scrolling "waterfall" format, centered on the audio frequencies used by WSPR:
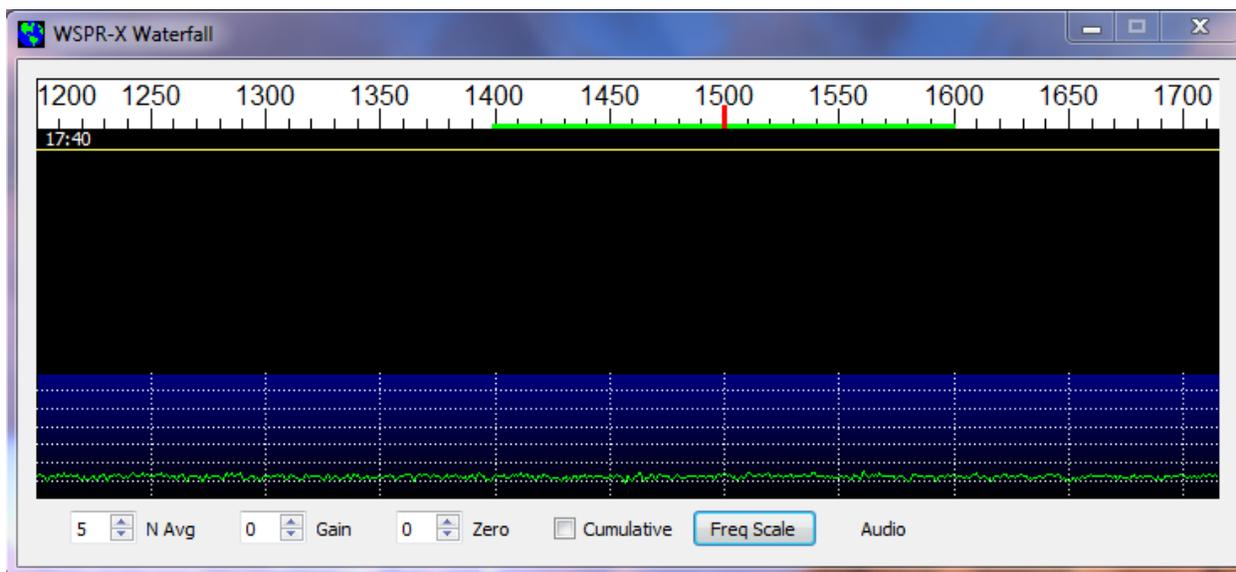
The second window shows decoded information from received WSPR signals and contains most of the controls for user interactions, as illustrated on the next page. Both windows can be resized (within certain limits) for operator convenience.
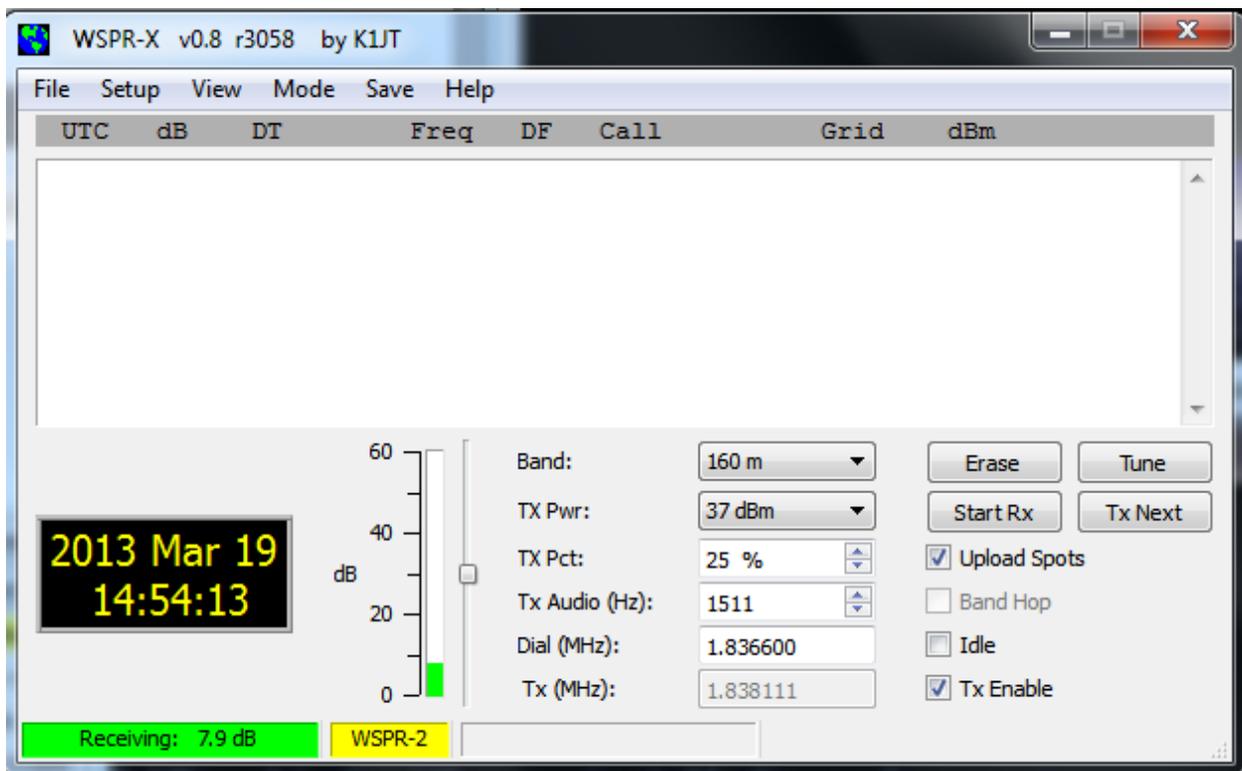
3. Hit **F2** to activate the **Setup | Options** screen. Enter your callsign and grid locator, and select the COM port to be used for PTT control.
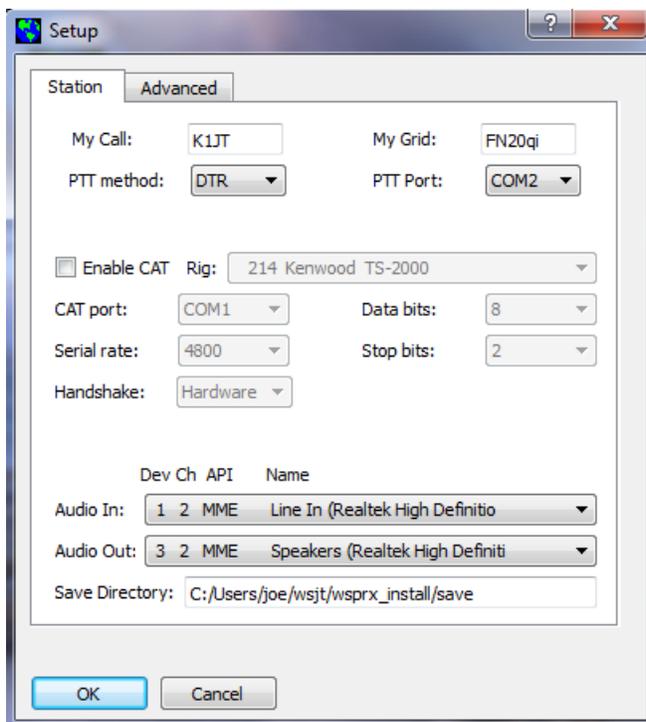
Select the desired devices for **Audio In** and **Audio Out**. If your rig is interfaced for "CAT control" you may configure that interface here as well. This will let WSPR-X set your dial frequency automatically when the selected band is changed.

Click **OK** to dismiss the Setup window.

4. Select your operating band from the drop-down list labeled **Band** on the main screen. If your operating frequency will be different from the default for that band, enter the suppressed carrier frequency (SSB transceiver dial frequency) in the **Dial (MHz)** entry field. The 200-Hz WSPR-2 sub-band lies 1400 – 1600 Hz above the dial frequency, and is indicated by a green bar on the scale at top of the waterfall window. If you will be transmitting, double-click on the waterfall scale to select your Tx frequency, which will then propagate to the **Tx Audio (Hz)** entry field and the **Tx (MHz)** label. You can also set the **Tx Audio** frequency directly, by adjusting its spinner control. The Tx frequency is indicated by a red tick on the waterfall scale. Select your Tx power from the **dBm** spinner control.
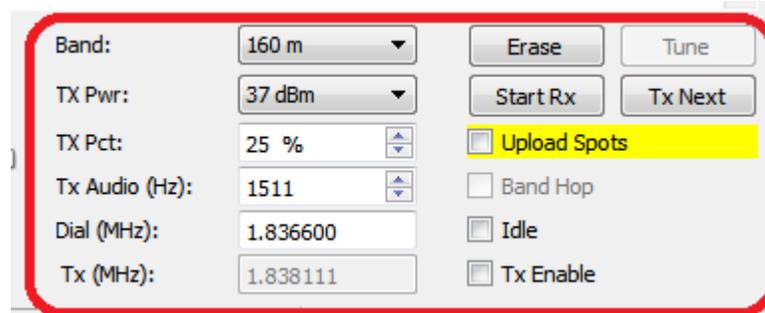
5. The program enters receiving mode automatically on startup. If you wish also to transmit, check **Tx Enable** and set the desired percentage of Tx sequences, e.g., 25%. Checking **Upload Spots** will cause the details of your decoded WSPR transmissions to be uploaded to WSPRnet.org.

6. On an active band, normal operation in WSPR-2 mode will produce waterfall displays like the one below. Horizontal red lines in the waterfall graph indicate the times of Tx sequences.

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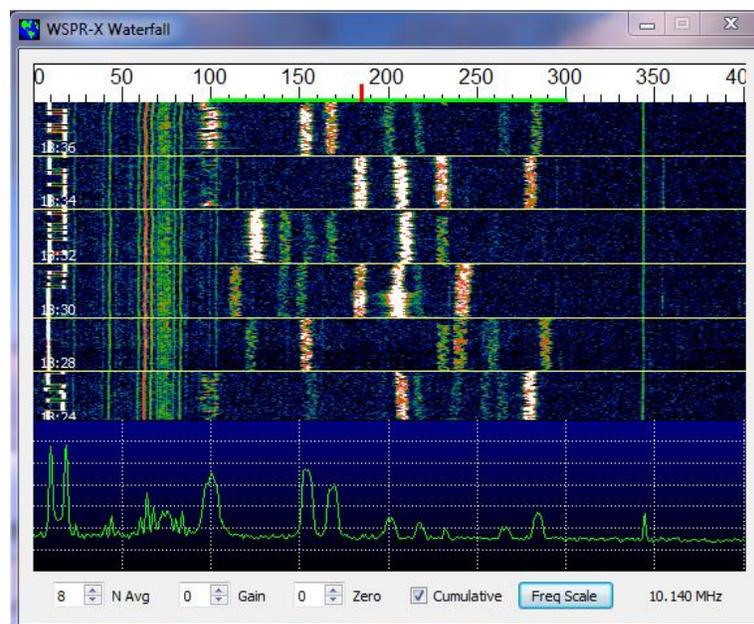
7. To operate in the slow mode, select **WSPR-15** on the **Mode** menu. The suggested WSPR-15 sub-band is 25 Hz wide, starting just above the WSPR-2 sub-band. The normal audio frequencies for WSPR-15 are thus in the range 1600 – 1625 Hz. In this mode T/R sequences will start at xx:00, xx:15, xx:30, and xx:45, rather than on even-numbered minutes. The following screen shot shows transmissions starting at 00:30 and 00:45 with S/N = –35 dB, followed by four transmissions at S/N = –37 dB, still above the decoding threshold for WSPR-15 mode.
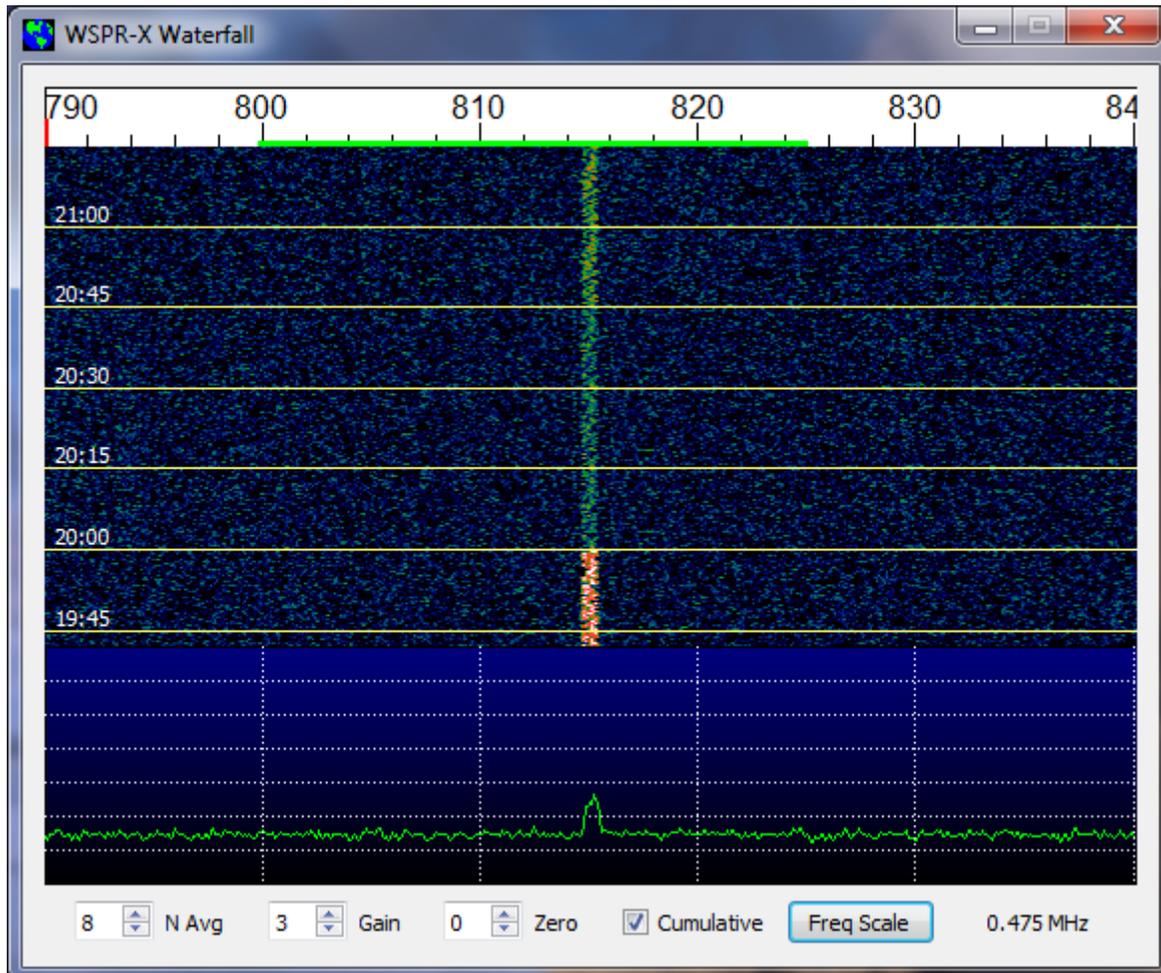
8. The standard WSPR-X installation contains two sample files useful for testing your installation. Select **Open** from the **File** menu, navigate to the subdirectory …\save\Samples under your installation directory, and select the previously recorded file named 130107_1834.wav. The file will be opened and decoded, producing a waterfall display like this
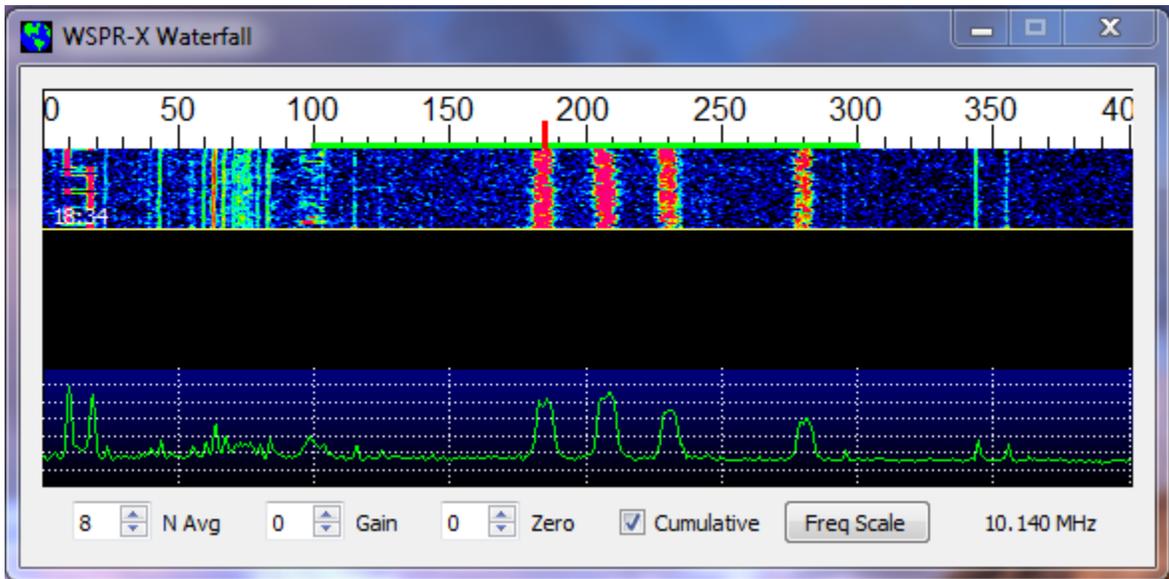
and the following contents in the main-screen window for decoded text:

UTC	dB	DT	Freq	Drift		
1834	-4	-1.5	0.001484	0	W1FVB	FN44 17
1834	-2	-1.4	0.001507	-1	VE3PKT	FN03 23
1834	-7	0.1	0.001530	0	AK4T	EM74 33
1834	-11	-1.2	0.001580	0	N8ABY	EN72 33

Alternatively, you could select the compact file 130107_1834.c2 from **File | Open**. The two files contain essentially the same WSPR information; the ".wav" file contains 16-bit integer samples at 12000 samples per second, while the ".c2" file contains complex 32-bit floating-point data at 375 samples per second. The .c2 file is 1/8 the size of the .wav file. It produces exactly the same decoded text (but no waterfall display).

9. The **Advanced** tab on the **Setup** window offers a few additional options.
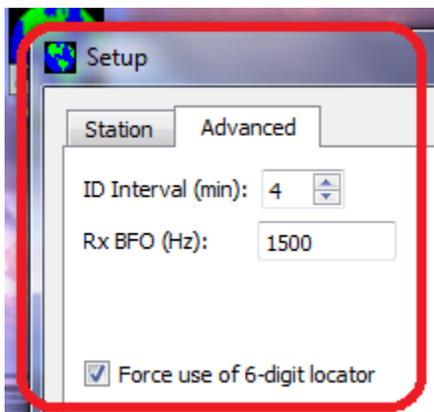
Select a nonzero **ID Interval** to have a CW ID appended to your WSPR transmission at stated intervals. Enter a **Rx BFO** frequency in the range 0 – 5000 Hz if your receiving hardware requires a different value from the standard 1500 Hz.