

WSJT-X Operation by W2HUV

You will need to install a virtual audio cable (VAC) on your PC to operate in the FT8 and FT4 modes unless you have an Elecraft K3 Remote. The free VB CABLE Virtual Audio Device previously recommended will not work with the TS-480 transceiver now in use. Recommend using the free VAC 4.66 Lite VAC instead.

KC7C (formerly AC7AV) recently identified the facts that 1) the RemoteHams.com audio compression methods distort the WSJT-X output tone and 2) the distortion may be prevented by the injection of white noise. He includes recordings of the distortion and demonstrates the results of white noise injection in his video. **Installation of a white noise source is now a prerequisite for Remote HF Station users desiring to run WSJT-X.** The free White Noise app available at the Windows App Store is recommended.

It is assumed that you are running Windows 10 on your client PC and have already installed the RCForb Client v0.9 Public Alpha.

Installation of VAC 4.66 Lite:

Use the following link to download VAC 4.66 Lite:

<https://software.muzychenko.net/freeware/vac466lite.zip>

Extract all files and run the setup application. Restart after installation.

Installation of White Noise App:

Enter “white noise app” in the Windows search box and install the app.

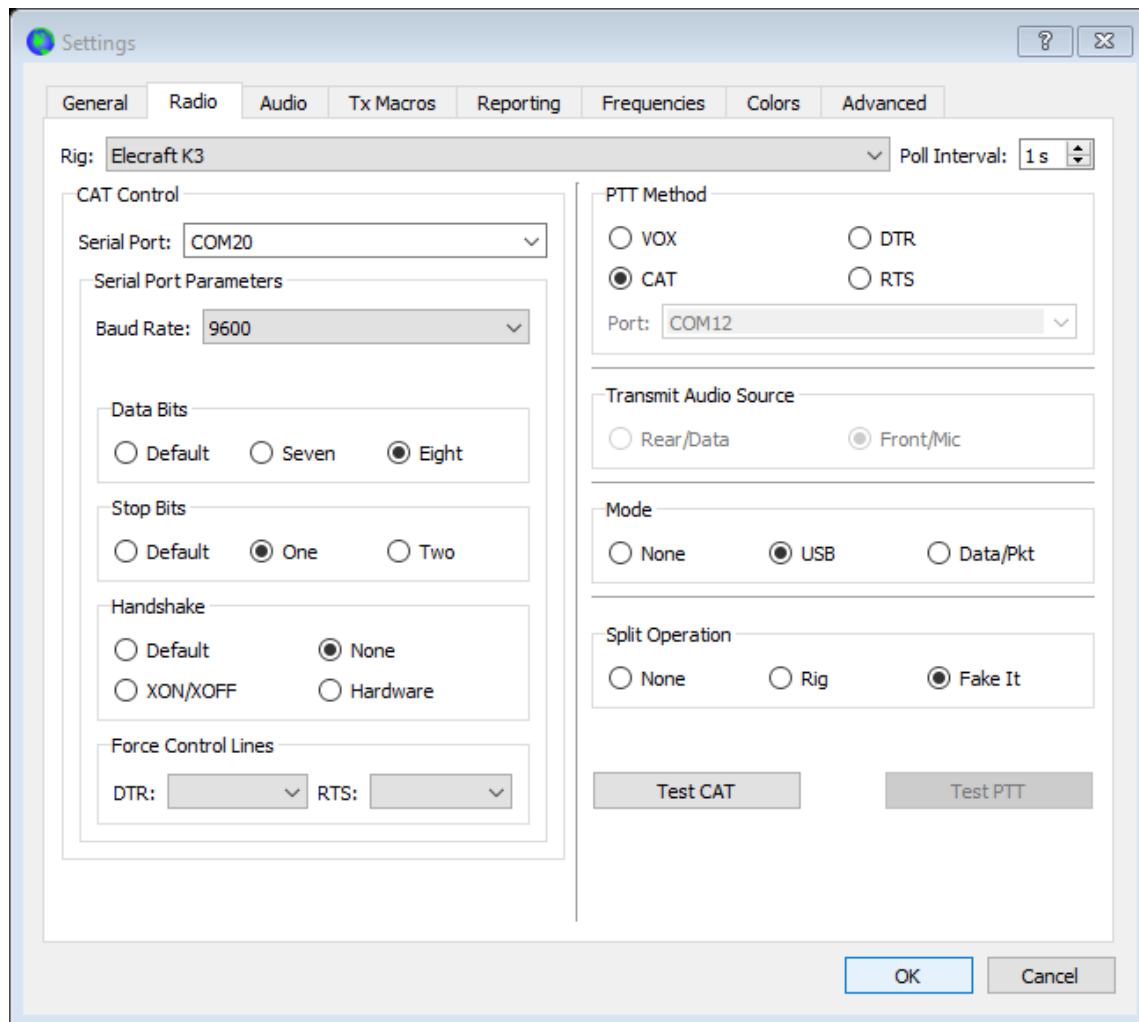
Setup:

RCForb Client

- 1) Open RCForb client.
- 2) Select the “Virtual Devices” tab and look at the “Virtual K3” option. If the option is greyed out, it will be necessary to reinstall the client, this time, checking the “Virtual Serial Port Support” option.
- 3) Turn on the “Virtual K3” option and select a COM port. COM20 is suggested because it is easy to remember and out of the way.
- 4) Select the “Audio” tab. Set SPKR to “Line 1 (Virtual Audio Cable)” and MIC to “Line 1 (Virtual Audio Cable)”. **Set both VOL and MIC audio levels at minimum** and close the client.

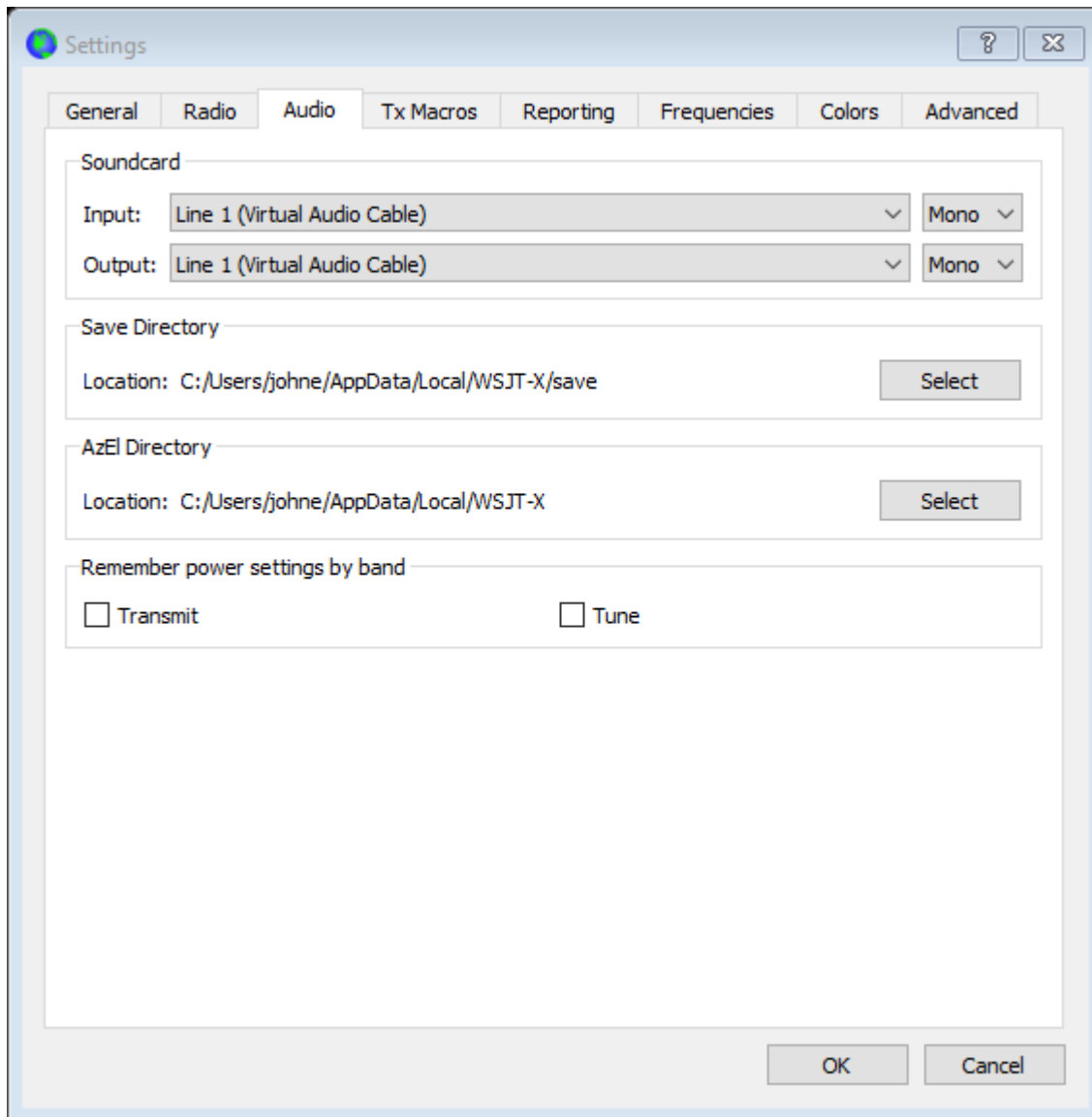
WSJT-X

1) Open WSJT-X and configure the “Radio” tab settings as shown below.

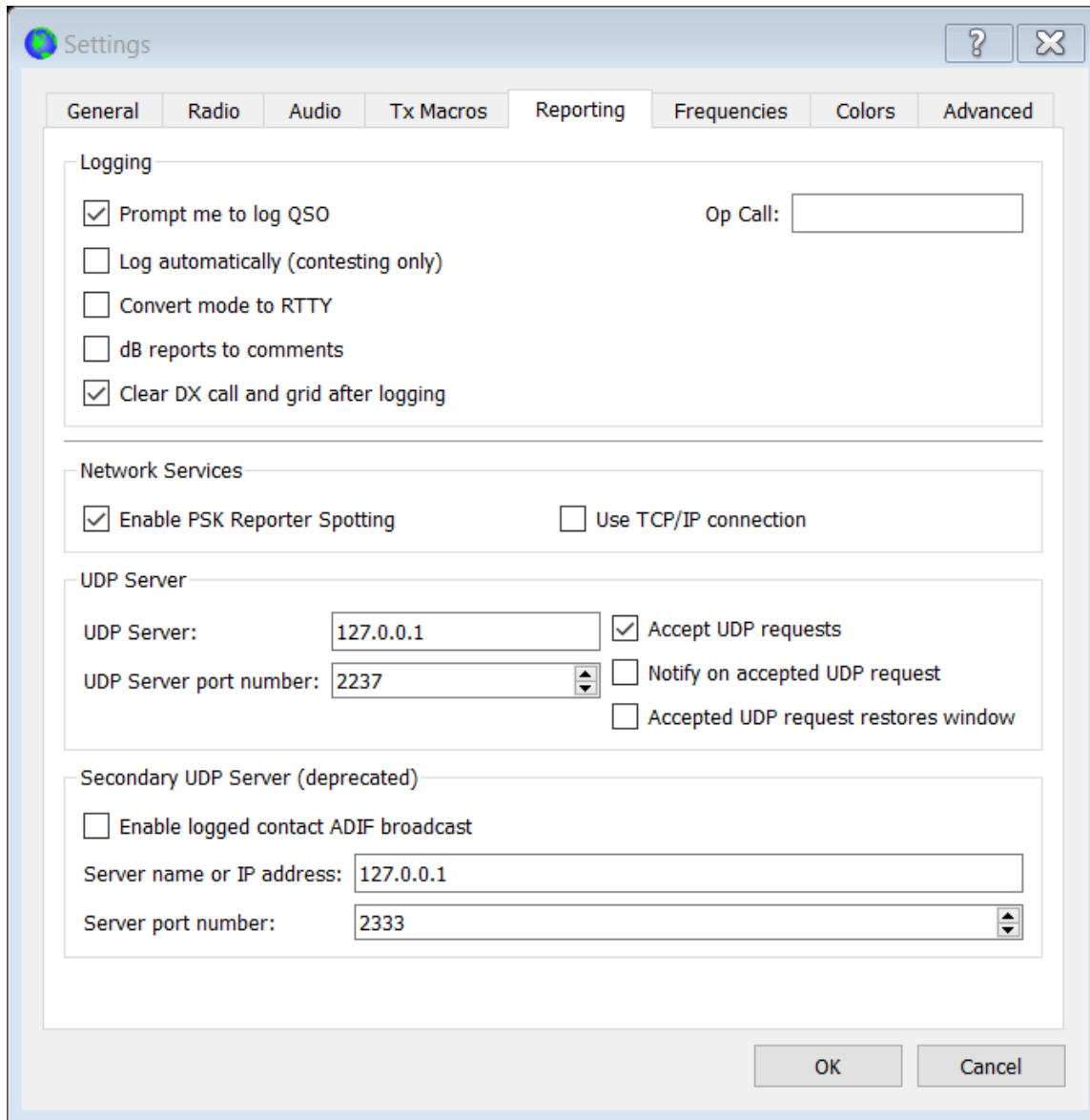


Note that the rig is an Elecraft K3. This is because the Cat Control Serial Port indicated is for the “Virtual K3” turned on in Step 3) in the previous section. Split Operation may be set to “Rig” or “Fake It” to allow WSJT-X to change the transmit frequency as needed to keep the tones well within the 2.7 KHz transmit bandwidth of a typical transmitter. “Fake It” is preferred because less handshaking is required, making it more reliable. The difference is that it changes the VFO A frequency between RX and TX instead of switching between VFO A and VFO B.

2) Configure the “Audio” tab settings as shown below:



3) Configure the “Reporting” tab settings as shown below:



“Enable PSK Reporter Spotting” is a great idea because it allows you to use the PSK Reporter to check your coverage around the world. “Accept UDP requests” allows N1MM+ and other logging software to automatically fill-in a log with data obtained from WSJT-X.

Client PC

Right click speaker at end of Windows 10 task bar. Select “Open Sound settings”. Select “Line 1 Virtual Audio Cable” for the “Output” device. This is necessary because the White Noise app output is directed to the default “Output” device.

WSJT-X Operation

1) Open the RCForb client, connect to the remote, turn on the radio and refer to the screen shot below.

2) The following radio settings are suggested for WSJT-X operation:

Buttons: Only PWR button should be lit when not transmitting.

Dropdowns: Mode, USB; AGC, Fast; Tx Meter, ALC, Quick Memory, Tx EQ and Rx EQ, Off.

Sliders: RF Power, 100%; RF Gain, 100%; DSP Low Cut-Off, minimum; DSP High Cut-Off, maximum; FC Shift, mid-scale; Proc In, Proc Out and NR level, minimum.

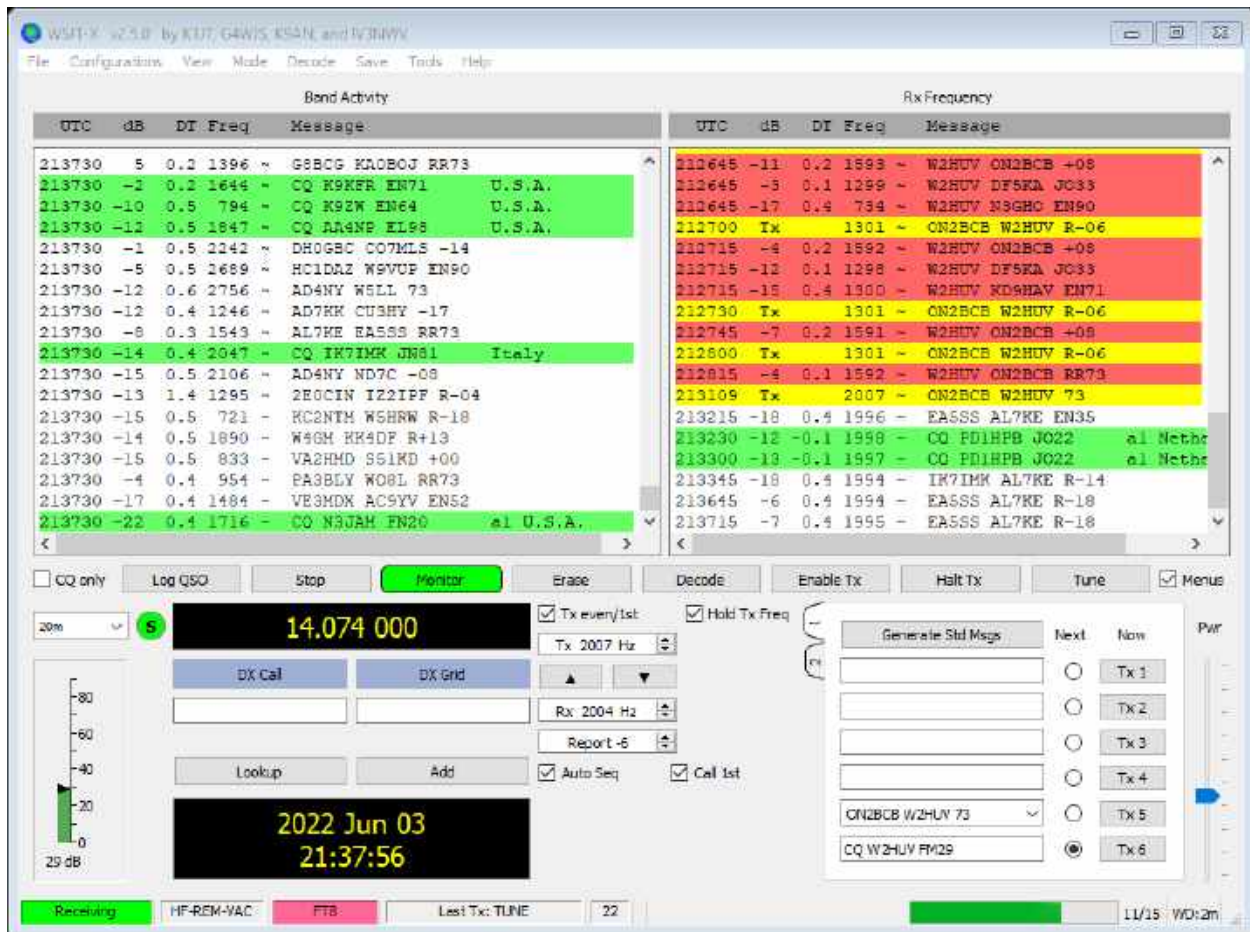
3) Do not use the TS-480 "Tune" button unless the KPA1500 is off. The KPA1500 is normally on and in STBY, meaning that tuning is accomplished by the KPA1500 ATU.

4) The screen shot below was taken during TX. Note that VFO A increased 500 Hz. That is because the TX audio frequency was set at 2000 Hz. Note that TXd is lit during transmission.



5) Open WSJT-X and refer to the screen shot on the next page.

6) Set the mode at the top to FT8 and the "Pwr" slider to the right as shown.

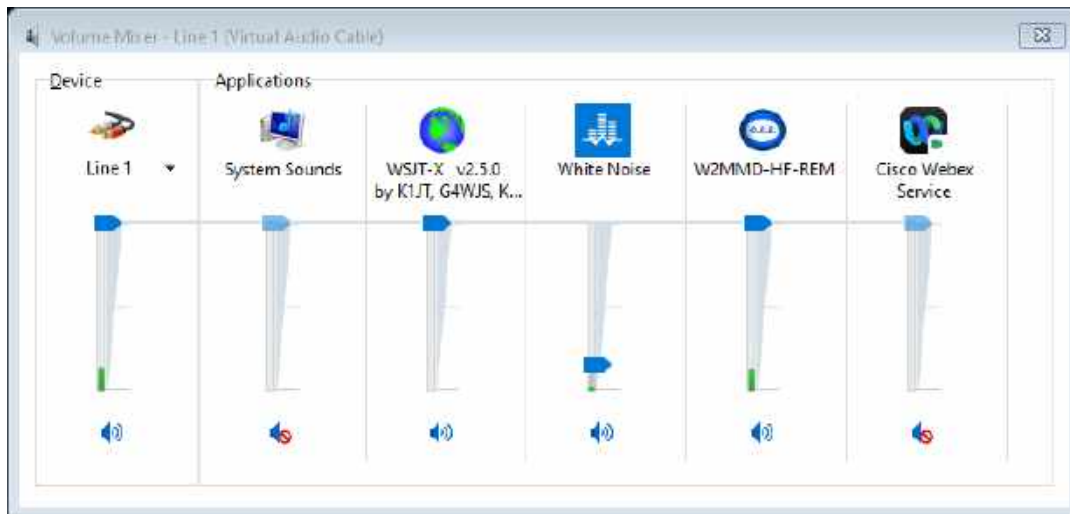


- 7) Click the down arrow in the band selector to the left of the frequency display on the WSJT-X screen and select 20m. The displayed WSJT-X frequency and radio VFO A frequency should be 14.074.
- 8) Increase “VOL” slightly on the RCForb client until signals appear on the waterfall.
- 9) Open the White Noise app. Scroll down the list to the left to “White Noise” and start it. “White Noise” will be selected the next time that you open the app.
- 10) Right click speaker at end of Windows 10 task bar and select “Open Volume Mixer”. The “Line 1 (Virtual Audio Cable)” volume mixer will appear (see screen shot on next page). Set the “Line 1” Input level at 100% and the “White Noise” level at 15% as shown. You must restore the “White Noise” level each time that the client PC is started.

Setting White Noise Level

The 15% “White Noise” level setting was determined by trial and error. Do not change the setting if 15% works.

Note: All unused inputs must be muted.



Distortion Detection

The TX Meter “Power” and “ALC” levels both ramp up when distortion is occurring. It is suggested that you use “ALC” level as a distortion indicator and constantly monitor it.

Setting WSJT-X “Pwr”

- a) Toggle WSJT-X "Tune" button on and increase “Pwr” slider setting until “ALC” level is indicated. Toggle "Tune" off.
- b) Decrease “Pwr” setting slightly and toggle "Tune" on. Observe “ALC” level and toggle "Tune" off. Repeat until “ALC” level remains zero for the duration of an FT8 transmission.

Note: Slight “Pwr” slider adjustments may be needed if you change the TX frequency.

c) Observe PowerOut on KPA1500 display. You may use the amplifier if the power is not high enough. **Be very cautious!** Set rig RF Power (amplifier drive) at about 20W as a starting point, select OPER on the KPA1500 display and increase or decrease drive as needed to achieve the desired PowerOut during transmission. A **FAULT will result if the RF Power is too high!** The KPA1500 automatically switches back to STBY if a fault occurs. Correct the condition and switch back to OPER to clear a fault. Remember to constantly monitor the ALC level.

Suggested Startup Sequence

- Open RCForb client, connect to remote radio and turn it on.
- Open WSJT-X.
- Open White Noise app and play “White Noise”.
- Open volume mixer and restore normal white noise level.

It will not hurt to leave WSJT-X running when you switch to another mode.

Note: Distortion may occur on the RX audio stream as indicated by a wide orange band if a very strong signal is encountered. You may be able to stop it by reducing the RF gain.

Congratulations! You are ready to operate in the FT8 and FT4 modes via the Remote HF Station.

Please address all questions, comments and issues to w2huv@arri.net or call or text him at the number listed in the Club Roster.