WSJT-X Operation
by W2HUV

You will need to install virtual audio cables on your PC to operate in the FT8 and FT4 modes unless you have an Elecraft K3 Remote or an ORB Control Device. The free VB CABLE Virtual Audio Device is recommended. (See below for link)

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 http://youtu.be/lO5Da4fyt2k. **Installation of a white noise source is now a prerequisite for users of the K2AA Remote Station 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 VB CABLE Virtual Audio Device:

Use the following link to download the VB CABLE Virtual Audio Device
http://download.vb-audio.com/Download_CABLE/VBCABLE_Driver_Pack43.zip

Extract all files and Run Setup Program in administrator mode. Reboot 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 "CABLE Input (VB-Audio Virtual Cable)" and MIC to "CABLE Output (VB-Audio Virtual)". **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.
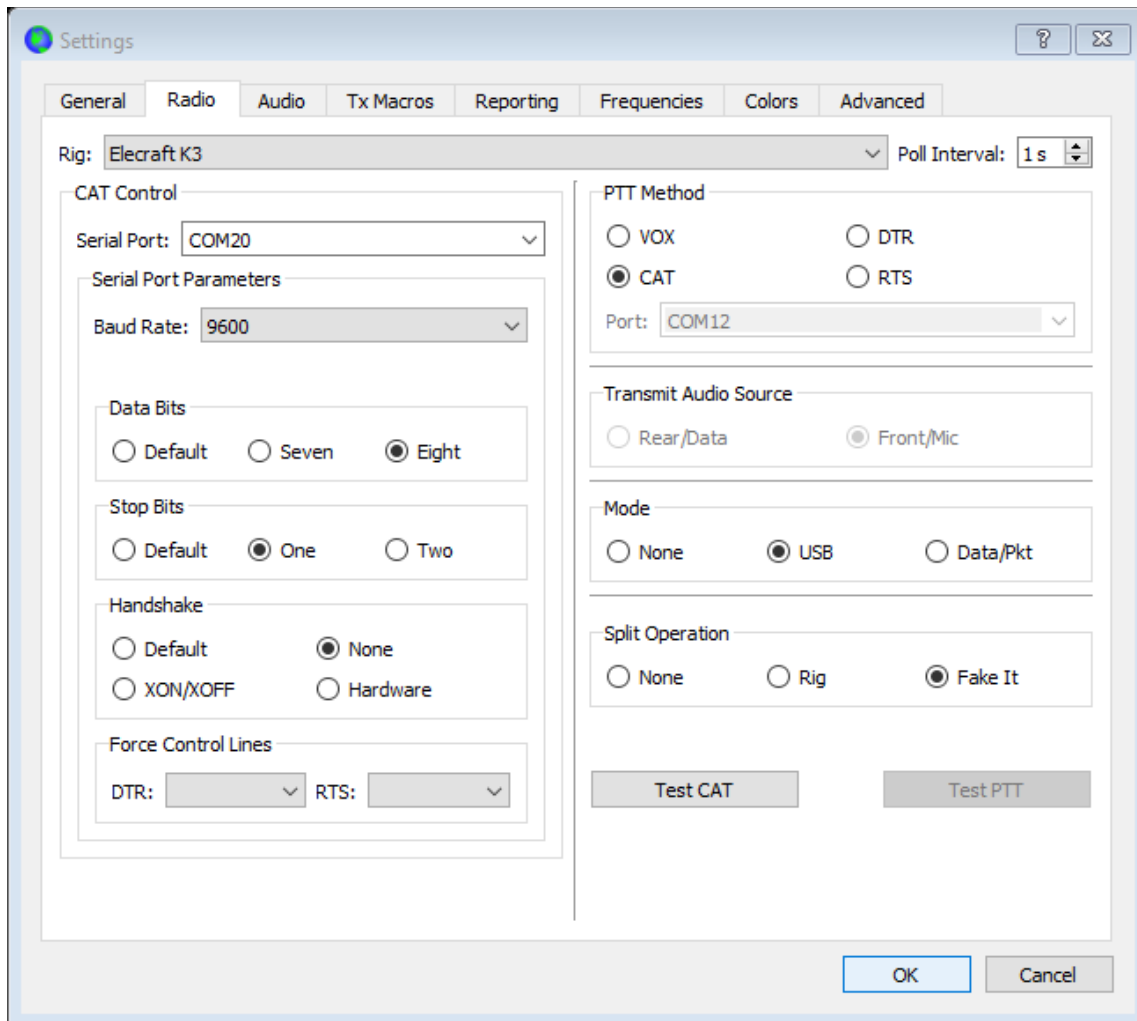
Note that the rig is an Elecraft K3. This is because the Cat Control Serial Port indicated is for the "Virtual K3" turned on in Step 3) in the previous section. Split Operation may be set to "Rig" or "Fake It" to allow WSJT-X to change the transmit frequency as needed to keep the tones well within the 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:
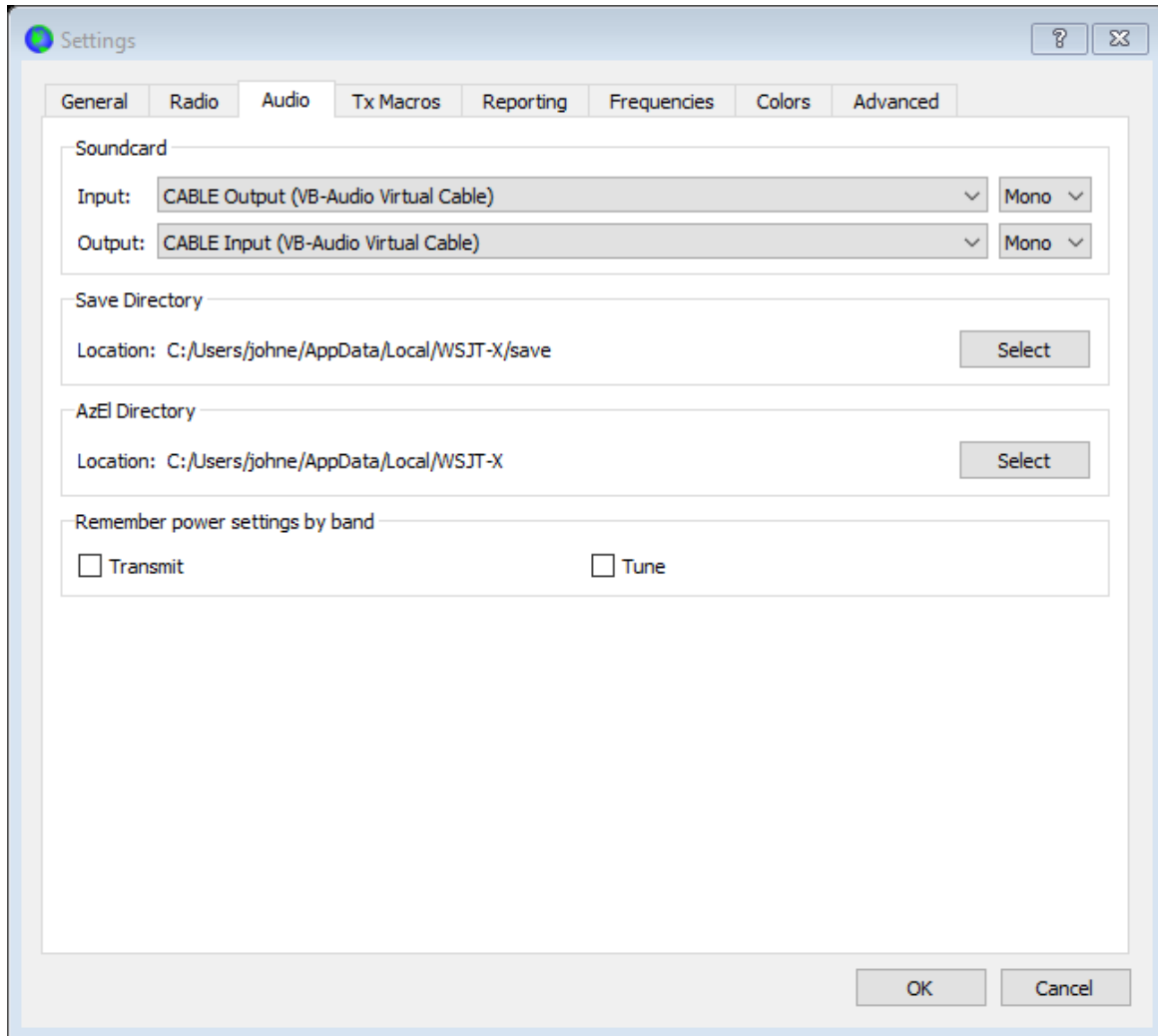
Client PC

Right click speaker at end of Windows 10 task bar. Select "Open Sound settings".
Select "CABLE Input (VB-Audio Virtual 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 and refer to the screen shot on the
next page.

2) The following radio settings are suggested for WSJT-X operation: **Mode,** USB; **AGC,** Fast; **PreAmp IPO,** On; **Attn,** Off; **Filter**, Wide; **RF Gain**, 100%; **Comp Level, NB Level, and NR** - all set to minimum.

3) The screen shot was taken during TX. Note that VFO A increased 500 Hz during TX. That is because the TX audio frequency was set at 2000 Hz.
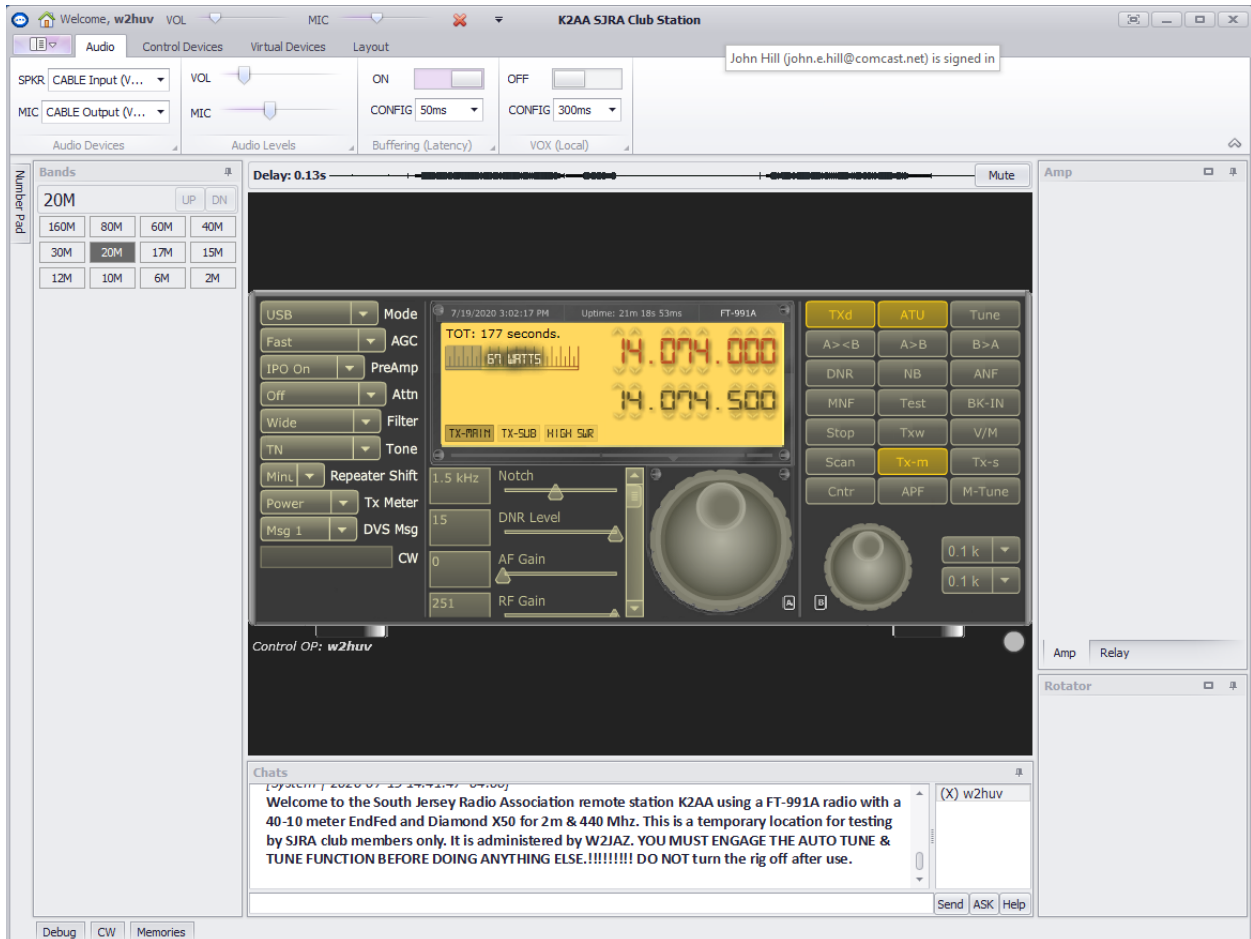
4) Open WSJT-X and refer to the screen shot on the page 6 that follows.

5) Set the **Mode** to FT8 and the **Pwr** slider to the right as shown.

6) 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.

7) The green vertical bar to the left in the WSJT-X screen shot should not appear initially. Increase "VOL" slightly **on the RCForb client** until the top of the green vertical bar is at about 40.

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8) Open the White Noise app. Scroll down the list to the left to "White Noise" and play it. "White Noise" will be selected the next time that you open the app.

9) Right click speaker at end of Windows 10 task bar and select "Open Volume Mixer". The "CABLE Input (VB-Audio Virtual Cable)" volume mixer will appear as shown below. Set the CABLE Input level at 100% and the "White Noise" level at 13% as shown. **You must restore the "White Noise" level each time that the client PC is started.**

Setting White Noise Level

The 13% "White Noise" level setting was determined by clicking the TXd button on the radio and reducing the level until the "Power" level displayed on the TX Meter is zero continuously. Do not change the setting if 13% works.

Note: All unused inputs must be muted.
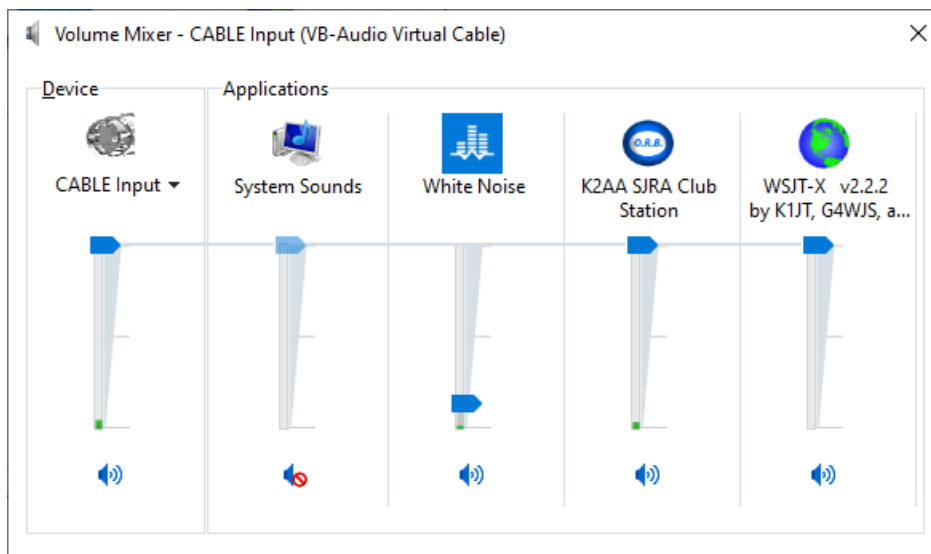
Distortion Detection

The TX Meter "Power" and "ALC" levels shown on the radio both ramp up when distortion is occurring. It is suggested that you use "ALC" level as a distortion indicator and monitor it continuously.

Note: The lowest that "ALC" level goes on this radio is 6%. "ALC" level is zero when 6% is indicated.

Setting WSJT-X "Pwr"

a) Verify that the "**Pw**r" slider is set at the fourth tic up as shown in the screen shot on the next page.

b) Toggle "Enable TX" button on to start sending CQ. Verify that "ALC" level does not increase during TX.

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c) Decrease "**Pwr**" slider setting if "ALC" level increases and see if "ALC" level increases during TX. Repeat until "ALC" level does not increase.

d) Observe "Power" level and decrease "**Pw**r" slider setting if desired.

Note: Slight "**Pw**r" slider adjustments may be needed if you change the TX frequency.

Suggested Startup Sequence

- Open RCForb client and connect to remote radio.

- Open WSJT-X.

- Open White Noise app and start "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 changing the AGC setting or reducing the RF gain.

Congratulations! You are ready to operate in the FT8 and FT4 modes via the K2AA remote.

Please address all questions, comments and issues to w2huv@arrl.net.