Digital Mode Demonstration using WSJT-X software

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Updated Sept 3, 2018

- This presentation was given to the Raleigh Amateur Radio Society (RARS)
- Website addresses were added to the end after the presentation.
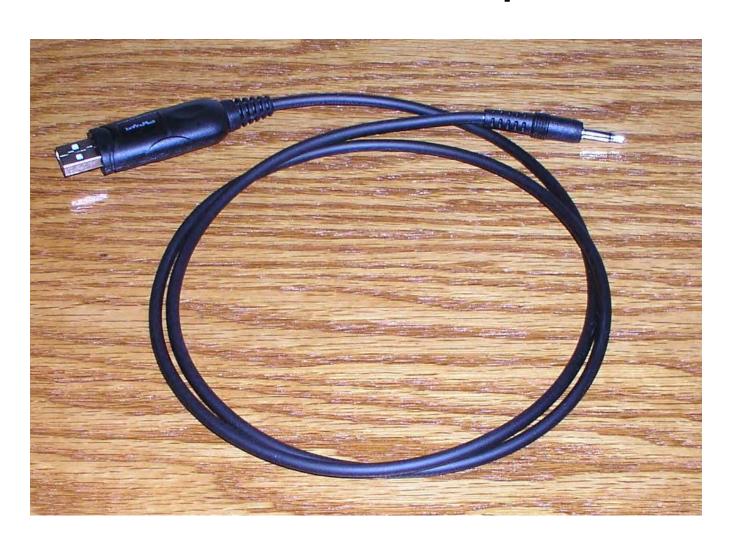- It was given again to QCWA chapter 126 With more updates.

Equipment for Demo

- ICOM IC-706MKIIG
- ICOM IC-756
- FTDI USB serial port cables
- SignalLink USB audio interfaces
- WSJT software
- Two power supplies
- Two dummy loads
- Two laptops

Subjects

- Computer to Radio connections
- 1, for setting or reading the frequency
- 2, to send and receive audio signals
- Software
- Software setup
- Demo
- Website URLs at the end

USB to ICOM serial port cable

USB to ICOM

- I have changed to interface cables that use the FTDI chip. That chip works with windows 10.

- Purchased from Valley Enterprises

- Valley-ent.com

- This cable allows the software to read and write the radios frequency and mode.
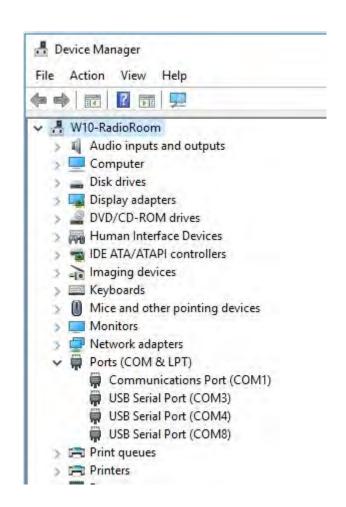
- Same as ICOM CI-V

USB to ICOM

- Some cables have a Prolific USB to Serial chip inside

- The Prolific chip has been counterfeited.

- The counterfeit parts do not work on Windows 10

During the presentation some people said the FTDI chip has been counterfeited too.

Which Serial Port?

- In Windows use the Device manager to see what port is assigned to the USB cable

- Open the device manager and plug in the cable. A new port will show up

- Right click on the one for the radio and select properties and port settings.
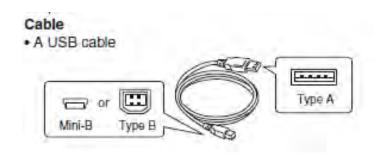
- The setting should match the radio

Tigertronics SignalLink USB

- Integrated USB sound card
- USB cable to the computer
- Special radio cable plugs in the back
- Need to set jumpers inside to match the radio and cable you are using.
- They sell a plug an play module to do the jumpers

Newer radios have both interfaces built in

- First down load a device driver from the manufacturer and install it.
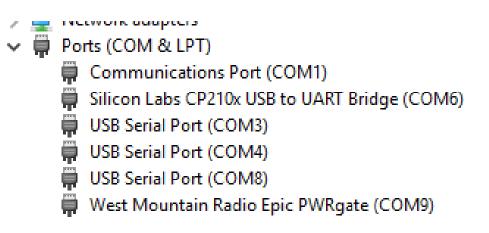
- Then use an A-B USB cable

Cable
• A USB cable

Mini-B   Type B

Type A

USB Driver

- Check the manufacturers website for your brand of radio.

- I searched on "ICOM USB Driver" in google and found it

- https://www.icom.co.jp/world/support/download/firm/IC-7600/usb1_20/

- CD-301501-003.zip

- Down load and follow instructions to install

ICOM IC-7300

- The USB driver supports the CI-V commands and the audio interface.

- The ICOM manual has: NOTE: BE SURE to install the USB driver BEFORE connecting the USB cable between the radio and the PC

- COM6 added →

- More if we have time

Network adapters
Ports (COM & LPT)
   Communications Port (COM1)
   Silicon Labs CP210x USB to UART Bridge (COM6)
   USB Serial Port (COM3)
   USB Serial Port (COM4)
   USB Serial Port (COM8)
   West Mountain Radio Epic PWRgate (COM9)

Other Rigs

Read the manual and follow their instructions.

Tom's Demo Station

- SignalLink USB audio interface
- Power supply
- ICOM IC-706MKIIG
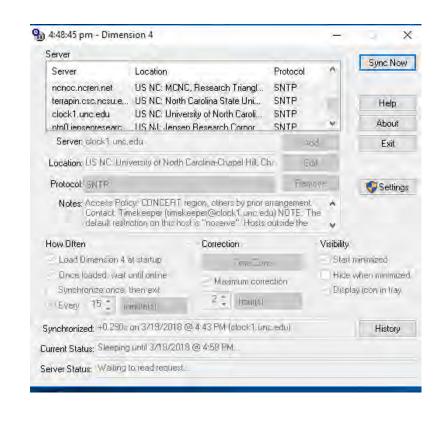- FTDI USB serial port cables
- Dummy load
- Laptop not shown

Louis's Demo Station

- Laptop
- Power supply
- SignalLink USB audio interface
- ICOM IC-756 & speaker
- Dummy load
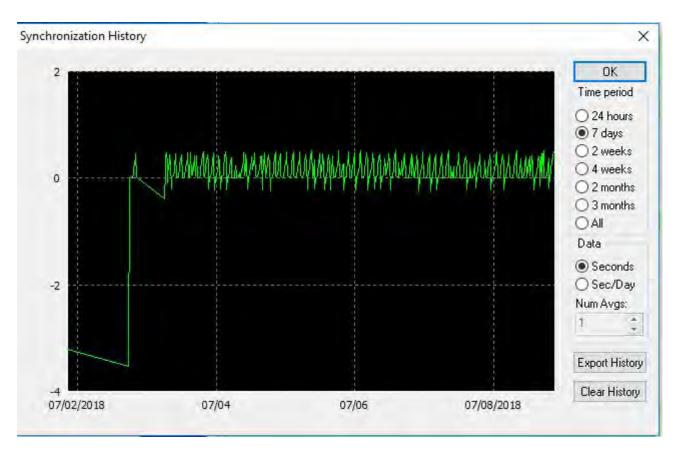- No CI-V cable to the laptop, freq set with the radio's dial

The computer clock has to be correct, Dimension 4

- Install and let it run all the time.

- Don't click Synchronize once and exit

- Settings, Server, clock1.unc.edu

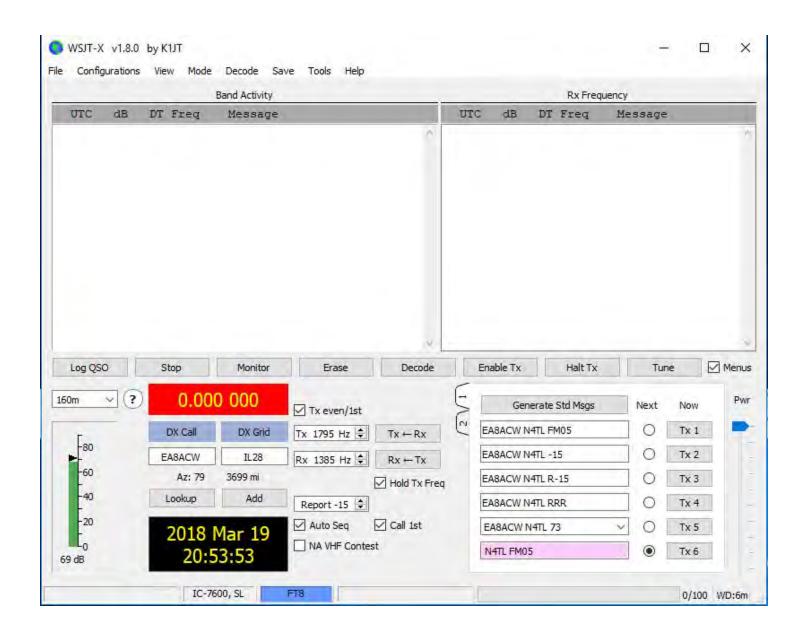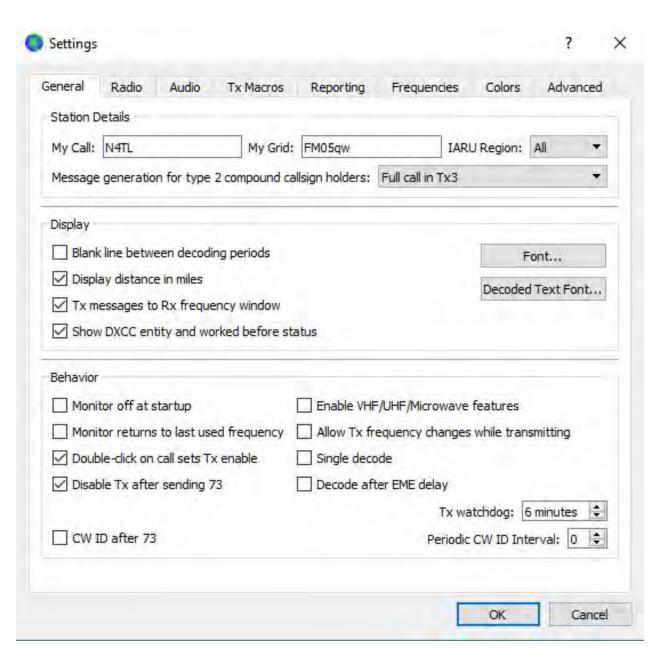- Click sync Now & make sure no errors

Dimension 4 History

Big correction after the computer was off
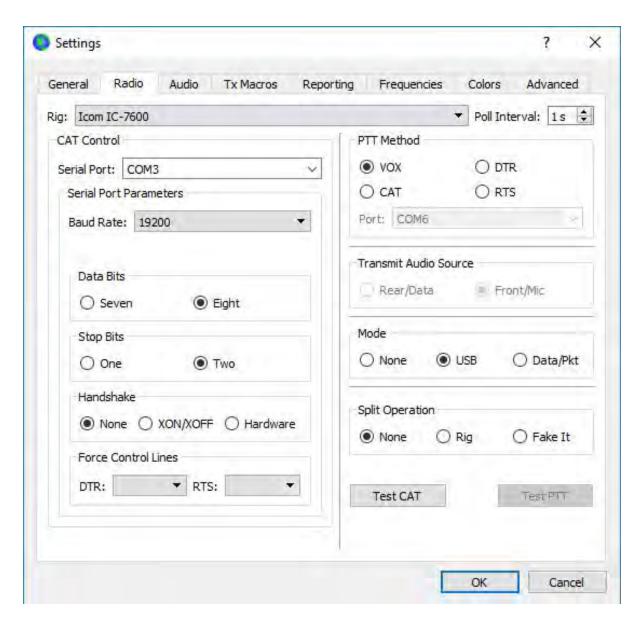Small corrections after that.

WSJT-X software

- Download from this website
- https://physics.princeton.edu/pulsar/k1jt/wsjtx.html
- Follow the instructions and install it.
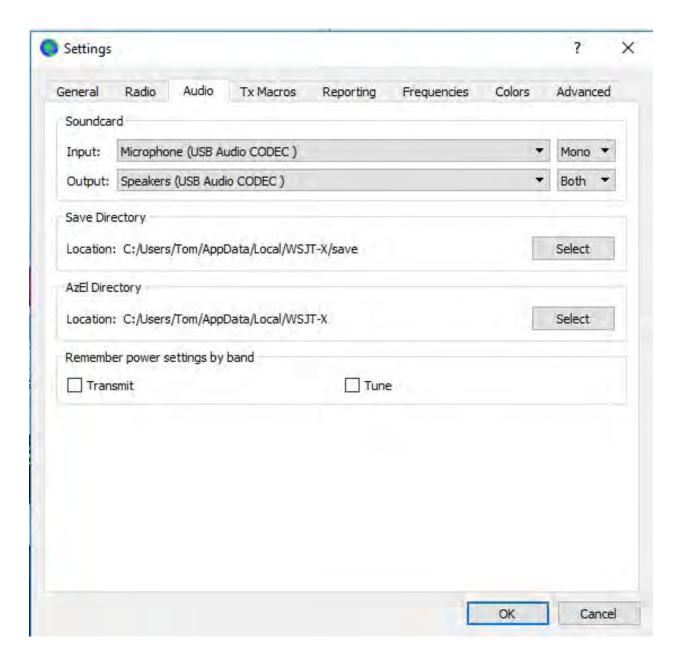- There is a lot of documentation to read

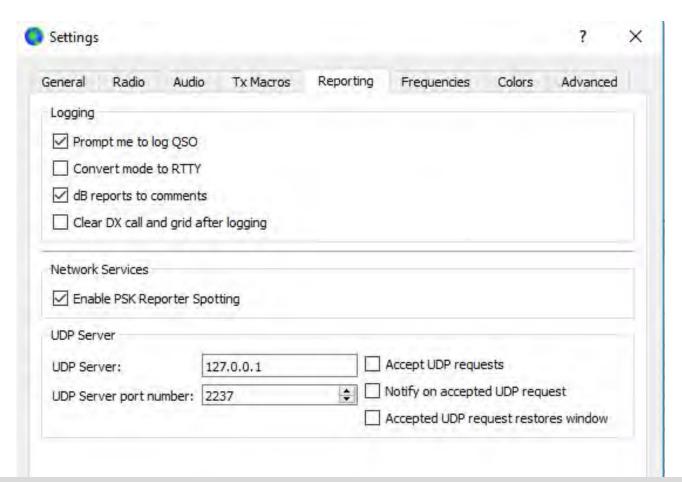This is the main screen. Click on File and go to settings.

Put in your call and the grid

If you are using CAT control put in the Rig and port settings. The SignalLink uses VOX for PTT.
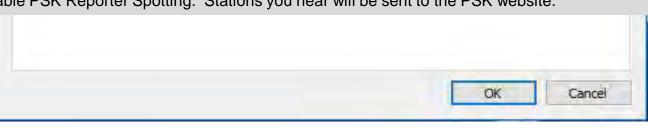
It is important to select the correct soundcard input and output.

Settings ? ✕

General Radio Audio Tx Macros **Reporting** Frequencies Colors Advanced

Logging

☑ Prompt me to log QSO

☐ Convert mode to RTTY

☑ dB reports to comments

☐ Clear DX call and grid after logging

Network Services

☑ Enable PSK Reporter Spotting

UDP Server

UDP Server: 127.0.0.1   ☐ Accept UDP requests

UDP Server port number: 2237   ☐ Notify on accepted UDP request

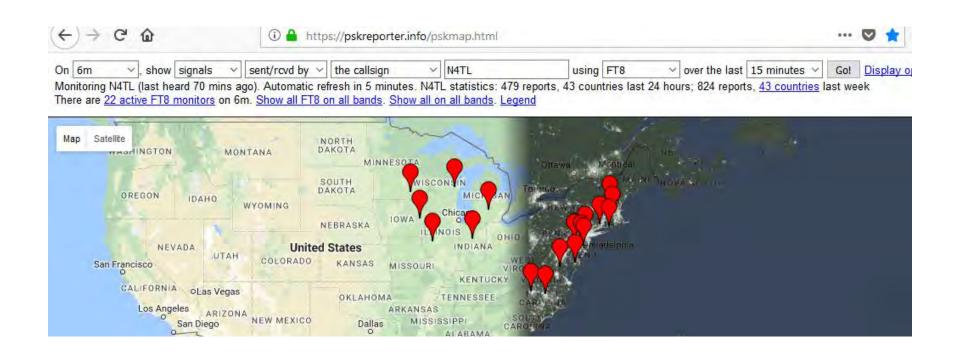☐ Accepted UDP request restores window

OK   Cancel

Check Prompt me to log QSO. When you log the QSO a text file and an ADIF file will be updated. You can use the ADIF file to import into your logging program.
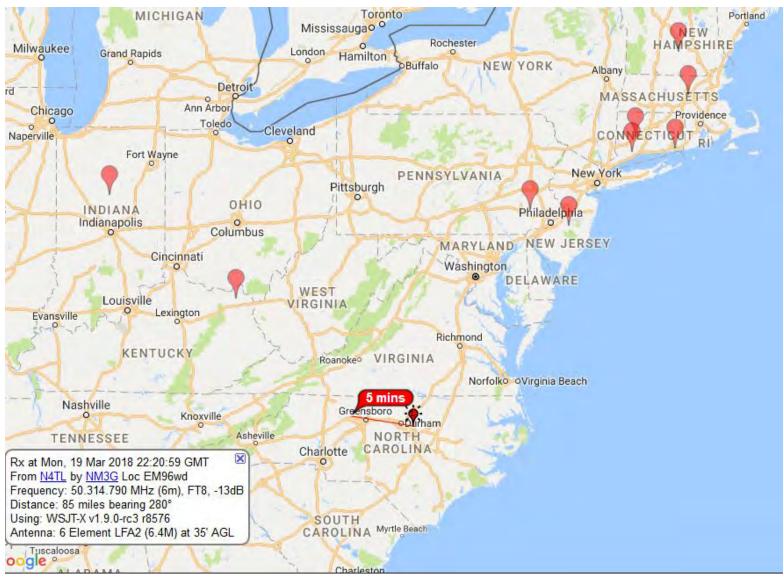Check Enable PSK Reporter Spotting. Stations you hear will be sent to the PSK website.

PSK Reporter website
Set filters at the top

I called CQ on 6 meters to see who was hearing me.

One station, NM3G

Rx at Mon, 19 Mar 2018 22:20:59 GMT
From N4TL by NM3G Loc EM96wd
Frequency: 50.314.790 MHz (6m), FT8, -13dB
Distance: 85 miles bearing 280°
Using: WSJT-X v1.9.0-rc3 r8576
Antenna: 6 Element LFA2 (6.4M) at 35' AGL
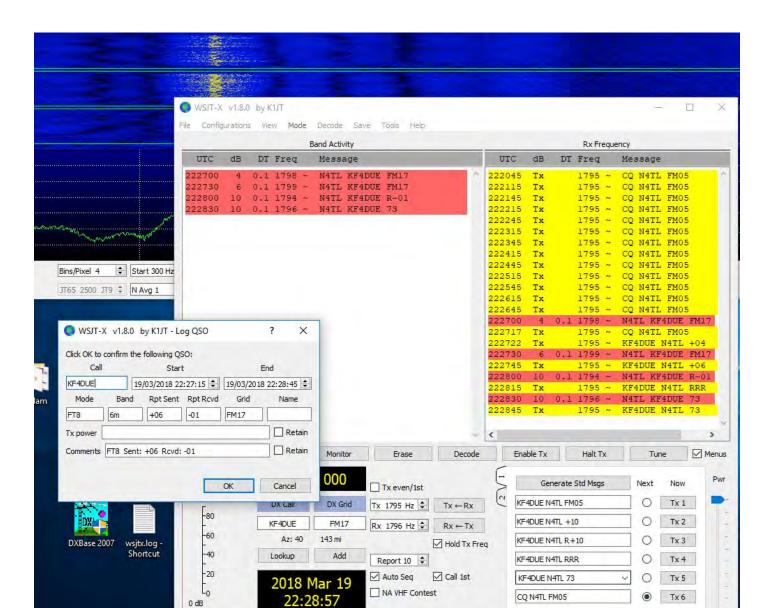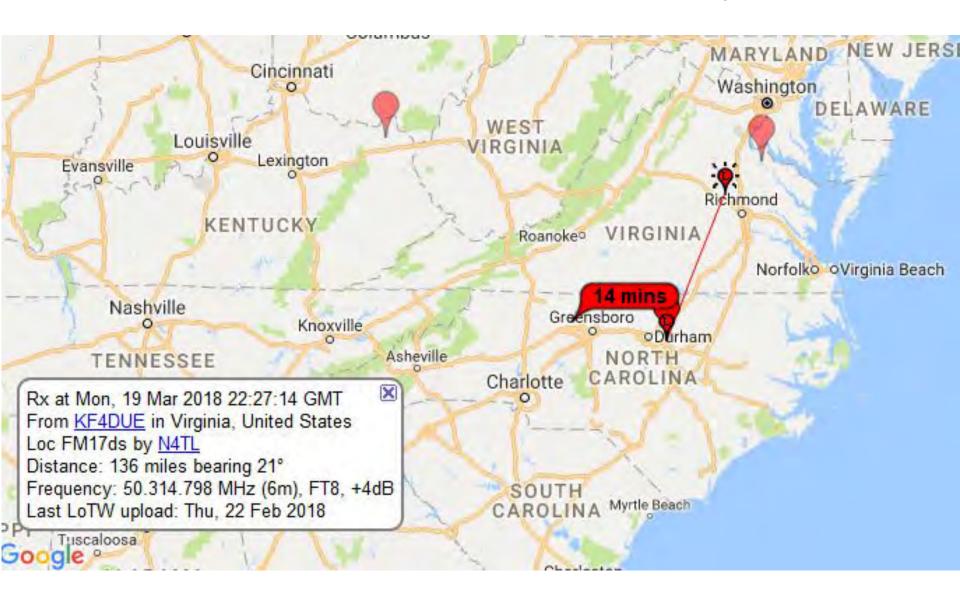
After calling CQ for a while I checked the PSK reporter website. One station was reporting that it heard me. 85 miles to the west.
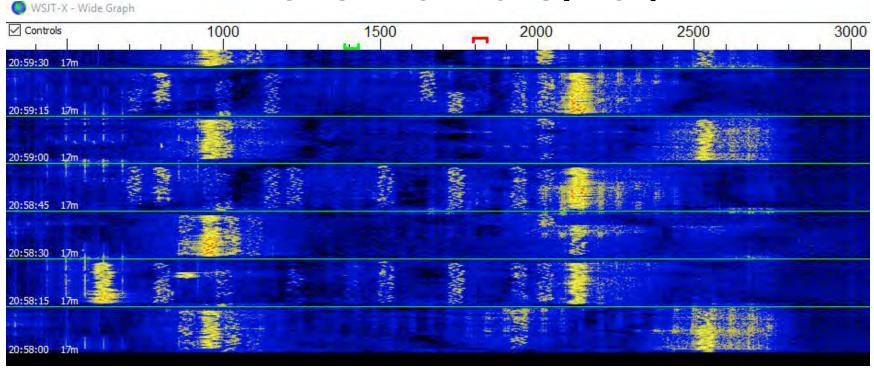
KF4DUE answered my CQ

I worked one station on 6 meters and then went back to the PSK reporter website.

The station I worked (KF4DUE) was near Richmond Virginia

14 mins

Rx at Mon, 19 Mar 2018 22:27:14 GMT
From KF4DUE in Virginia, United States
Loc FM17ds by N4TL
Distance: 136 miles bearing 21°
Frequency: 50.314.798 MHz (6m), FT8, +4dB
Last LoTW upload: Thu, 22 Feb 2018

Water fall display

Horizontal is audio frequency from low to high. If the right side is all dark, check the filters on your rig. Use wide filters. A narrow filter will cut off higher frequency signals.
The vertical is time. The newest is at the top. The yellow shows stations being received. Notice they transmit for a period of time then go to receive. Then back to transmit, every 15 seconds for FT8.
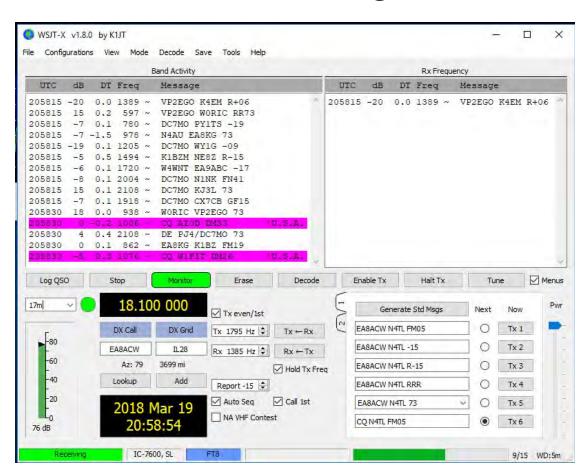
keyboard shortcuts

- Here are a few WSJT-X keyboard shortcuts

- F3 Display Keyboard Shortcuts

- F5 Display Special Mouse Commands

Set the radios' RF frequency (band) with the drop down box below Log QSO
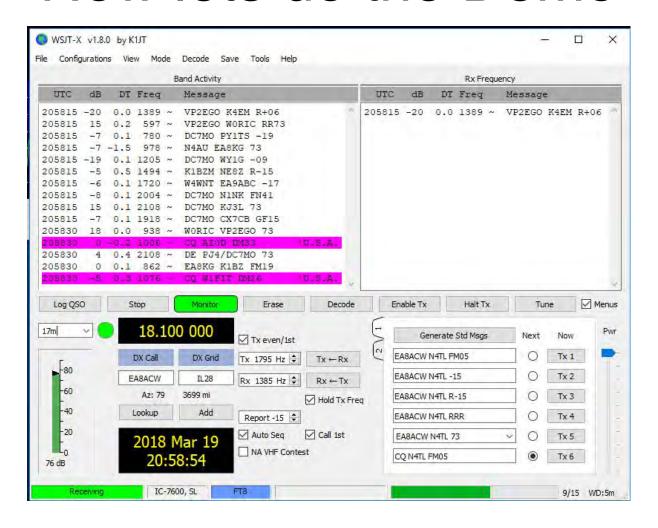
Double click on a station calling CQ and the call will be put in the various boxes
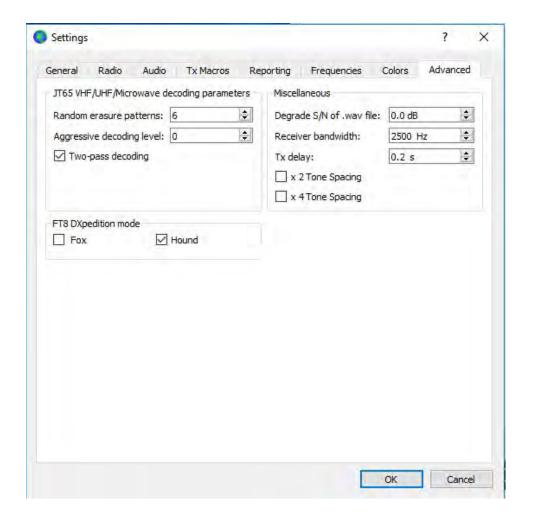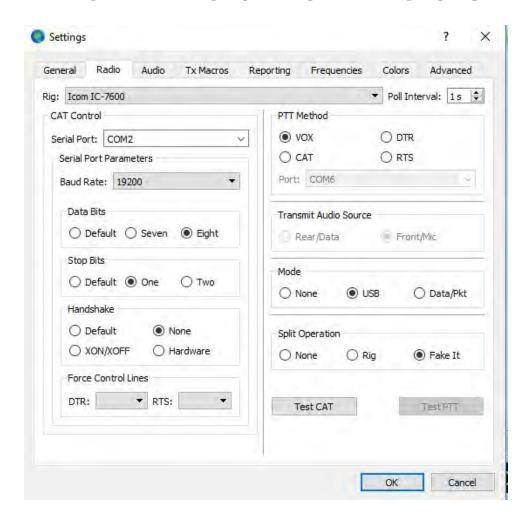
Click on Enable Tx to answer the CQ

Make sure any notch filter is off, Set the rig to USB and use the wide filter setting.

When transmitting watch the ALC on the rig and set the audio out level so there is a little ALC.

Now lets do the Demo

Fox Hound Mode

In setting, under advanced, click Hound

Fox Hound Mode

Split has to be enabled, I have been using Fake It

Fox Hound Mode

- Set the audio frequency above 1000hz
- Use the dial frequency for the DX station
- Baker island KH1/KH7Z used 14.090MHz
- Standard dial frequencies are not used
- Double click on the DX to set DX call and which 15 second period to transmit
- The DX will transmit with a low audio frequency, probably 330Hz or so.

Fox Hound Mode

- When the DX calls you. The WJST software will see your call and move your transmit frequency below 1000Hz.

Fox Hound Mode

Only two transmissions are needed

The same as working a regular pileup, your call and then TU 59 after the DX calls you.

Websites

Software used is "WSJT-X" You can down load it from this website,

https://physics.princeton.edu/pulsar/k1jt/wsjtx.html

This is the website for the PSK Reporter.

https://pskreporter.info/pskmap.html

Grid Square and Tips

http://www.levinecentral.com/ham/grid_square.php

https://www.physics.princeton.edu/pulsar/K1JT/FT8_Operating_Tips.pdf

https://physics.princeton.edu/pulsar/k1jt/FT8_DXpedition_Mode.pdf

CAT Control

Cables for rig control are sold at this company. You can use others or make your own. The ones used at the demo are, ICOM CT-17 USB FTDI Chipset CI-V Cat Control Programming Cable 3 Feet. You can also set the rigs frequency by hand. The program does not have to do it.

Valley-ent.com

Audio Interface

- This is the audio interface that was used, Tigertronics SignalLink USB. It is sold by many dealers. You can use others or make your own.

- If you only want to listen, just run an audio cable from the audio out on the radio to the audio in on the computer.

Dimension 4

The clock has to be correct on your computer. Dimension 4 software is used for this.

You can down load it for free from this website,

http://www.thinkman.com/dimension4/

Don't run it once, let it run all the time to keep the clock correct.

COM Port Sharing

- Normally two programs can't use the same com port. This can be a problem if you have a logging program to run with WSJT-X

- Eterlogic publishes a program called VSPE

- It does com port splitting. I use it for com3 to com2. My radio is on com3 and the software is on com2

- http://www.eterlogic.com/Products.VSPE.html

Questions

- We were asked how we pick the frequency to use.

- We click on the drop down box just below the Log QSL box. The recommended frequencies are supplied with the software.

Questions

- We were asked how we monitor the software when we are not home. A control operator is needed for a repeater.

- The software is not setup to make automatic contacts. The Enable Tx is always turned off after a contact. The operator has to turn it back on. Also there is a watch dog timer that will stop CQs after a preset time.

Windows 10 Update breaks WSJT operation

I have been using WSJT and FT8 for a while now. The computer is a 64 bit windows 10 system. Microsoft did an update on May 21st. It took a long time to run and when it was done I could no longer operate FT8. When I started WSJT this error was shown "Error in Sound Input".

The program was not receiving any audio from the radio. I did a lot of searching on the internet and finally found the solution. It was hard to find the solution because I was searching for audio input problem and not a microphone input problem. When windows 10 was new I turned off a lot of things to improve my privacy. One of them was the Microphone input. The computer does not have a microphone but I turned it off anyhow.

This search found the solution "windows 10 microphone access permissions".

To fix it, go to Settings, Privacy, Microphone and enable the microphone access.

WSJT now works okay like it did before the update.

The End