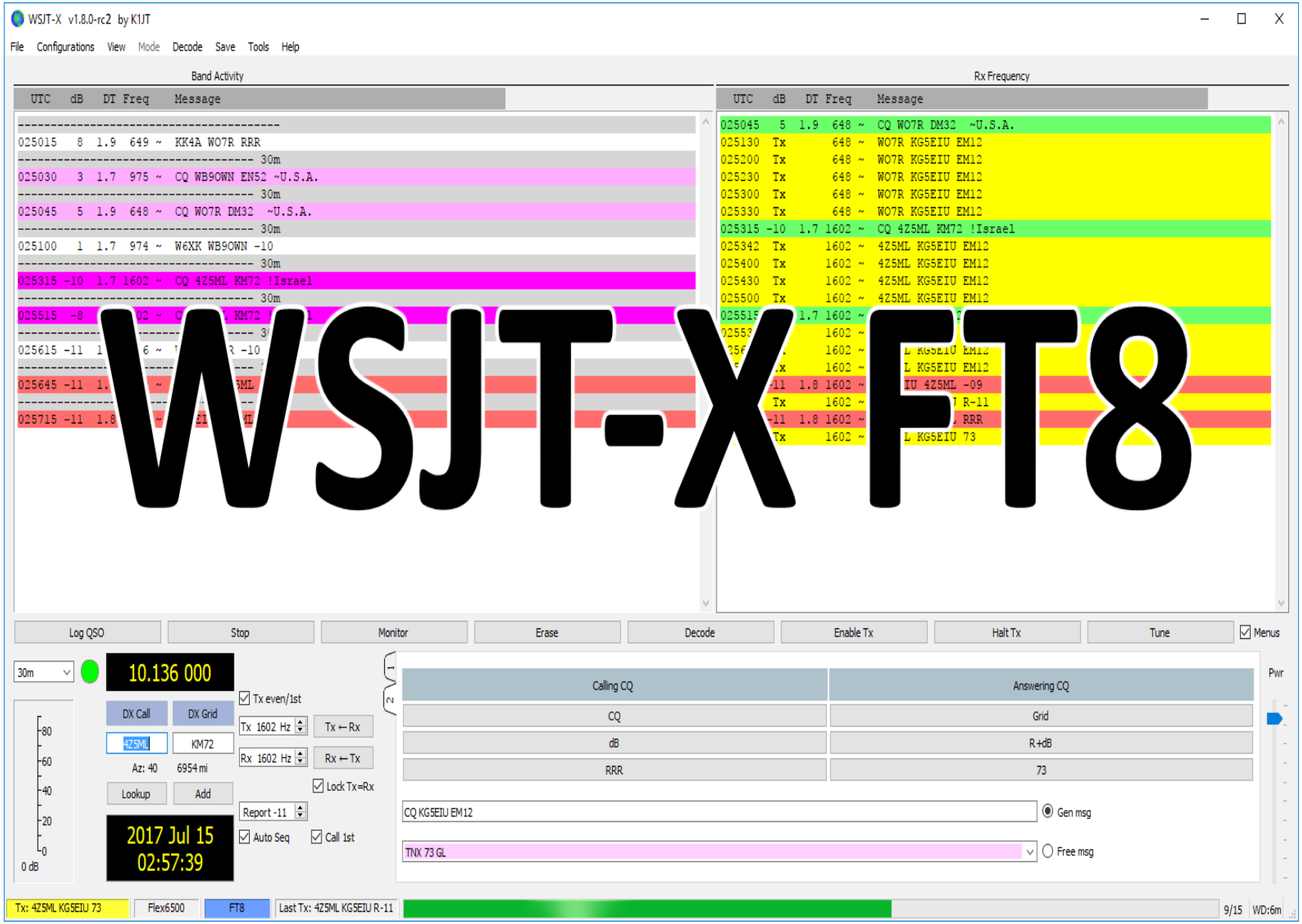
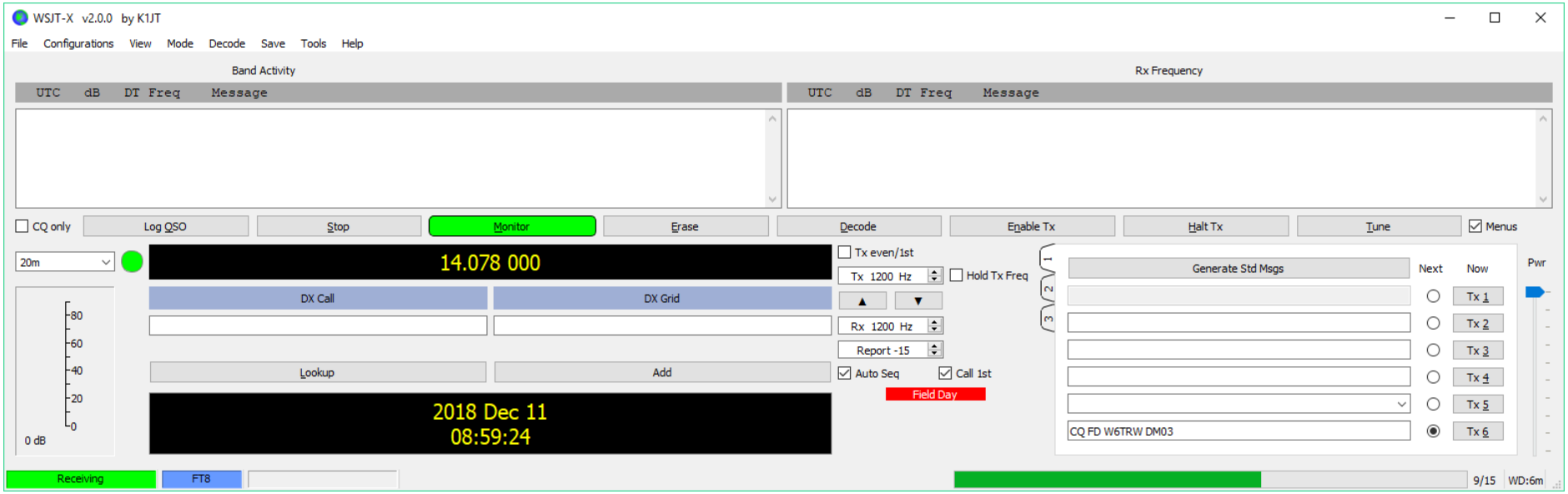

WSJT-X v1.8.0-rc2 by K1JT
File Configurations View Mode Decode Save Tools Help
Band Activity
UTC dB DT Freq Message
025015 8 1.9 649 ~ KK4A WO7R RRR
025030 3 1.7 975 ~ CQ WB9OWN EN52 ~U.S.A.
025045 5 1.9 648 ~ CQ WO7R DM32 ~U.S.A.
025100 1 1.7 974 ~ W6XK WB9OWN -10
025315 -10 1.7 1602 ~ CQ 4Z5ML KM72 !Israel
Rx Frequency
UTC dB DT Freq Message
025045 5 1.9 648 ~ CQ WO7R DM32 ~U.S.A.
025130 Tx 648 ~ WO7R KG5EIU EM12
025200 Tx 648 ~ WO7R KG5EIU EM12
025230 Tx 648 ~ WO7R KG5EIU EM12
025300 Tx 648 ~ WO7R KG5EIU EM12
025330 Tx 648 ~ WO7R KG5EIU EM12
025315 -10 1.7 1602 ~ CQ 4Z5ML KM72 !Israel
025342 Tx 1602 ~ 4Z5ML KG5EIU EM12
025400 Tx 1602 ~ 4Z5ML KG5EIU EM12
025430 Tx 1602 ~ 4Z5ML KG5EIU EM12
025500 Tx 1602 ~ 4Z5ML KG5EIU EM12
WSJT-X FT8
Log QSO
Stop
Monitor
Erase
Decode
Enable Tx
Halt Tx
Tune
Menus
30m
10.136 000
Tx even/1st
DX Call
DX Grid
4Z5ML
KM72
Az: 40
6954 mi
Lookup
Add
Tx 1602 Hz
Rx 1602 Hz
Tx ← Rx
Rx ← Tx
Lock Tx=Rx
Report -11
Auto Seq
Call 1st
2017 Jul 15
02:57:39
Calling CQ
Answering CQ
CQ
Grid
dB
R+dB
RRR
73
CQ KG5EIU EM12
Gen msg
TNX 73 GL
Free msg
Pwr
Tx: 4Z5ML KG5EIU 73
Flex6500
FT8
Last Tx: 4Z5ML KG5EIU R-11
9/15
WD:6m

FT-8 Hello World

- Who uses FT-8 around the room



Description

WSJT-X implements communication protocols or "modes" called **FT8, JT4**, **JT9**, **JT65**, **QRA64**, **ISCAT**, **MSK144**, and **WSPR**, as well as one called **Echo** for detecting and measuring your own radio signals reflected from the Moon. These modes were all designed for making reliable, confirmed QSOs under extreme weak-signal conditions.

FT8

- **FT8** is operationally similar but uses T/R cycles only 15 s long.

Joe Taylor, K1JT; Stan Franke, K9AN and Bill Somerville, G4WJS developed a new mode for WSJT-X, FT8 (Frankie-Taylor design, 8 FSK modulation) released on June 29, 2017

Important characteristics of FT8:

– T/R sequence length: 15 s
– Message length: 75 bits + 12-bit CRC
– FEC code: LDPC(174,87)
– Modulation: 8-FSK, keying rate = tone spacing = 5.86 Hz
– Waveform: Continuous phase, constant envelope
– Occupied bandwidth: 47 Hz
– Synchronization: three 7×7 Costas arrays (start, middle, end of Tx)
– Transmission duration: 79*2048/12000 = 13.48 s
– Decoding threshold: -20 dB (perhaps -24 dB with AP decoding, TBD)
– Operational behavior: similar to HF usage of JT9, JT65
– Multi-decoder: finds and decodes all FT8 signals in passband
– Auto-sequencing after manual start of QSO

What makes FT8 work are:

Short messages

13 Characters, 15 second transmission.
Known message format

Specific transmit and receive time intervals

Transmit and receive periods are specific so an accurate computer clock to within at least 1 second is necessary in order to decode FT8.

Most modern computers make use of a time servers. Apple, for example, lets the clock drift a few seconds here and there.

You at least need to set your computer to get NIST. Better yet is to use a time program Meinberg NTP on Windows machines or Dimension 4.

Lower power.

Most stations are running QRP to 100W and 50W is common.

Waterfall Spectrum Display

Band Activity

Band/Freq

Audio in Level

Receive Frequency Activity

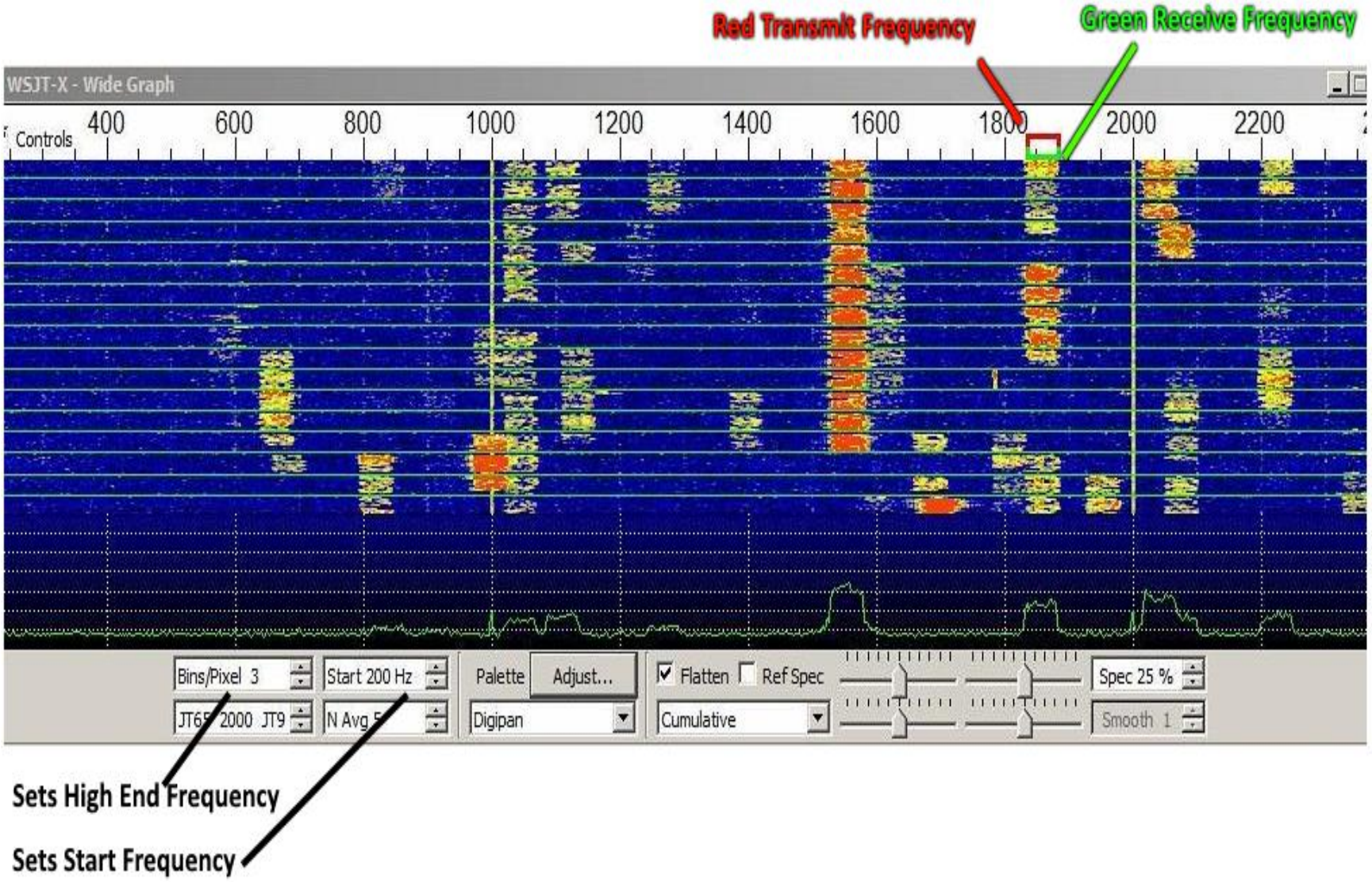
Ur Transmit

Transmit Messages

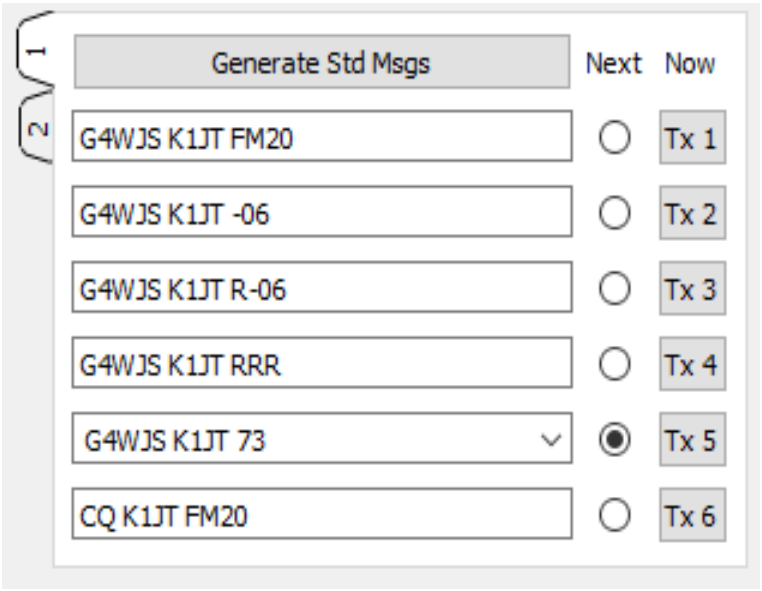
Transmit/Receive Control

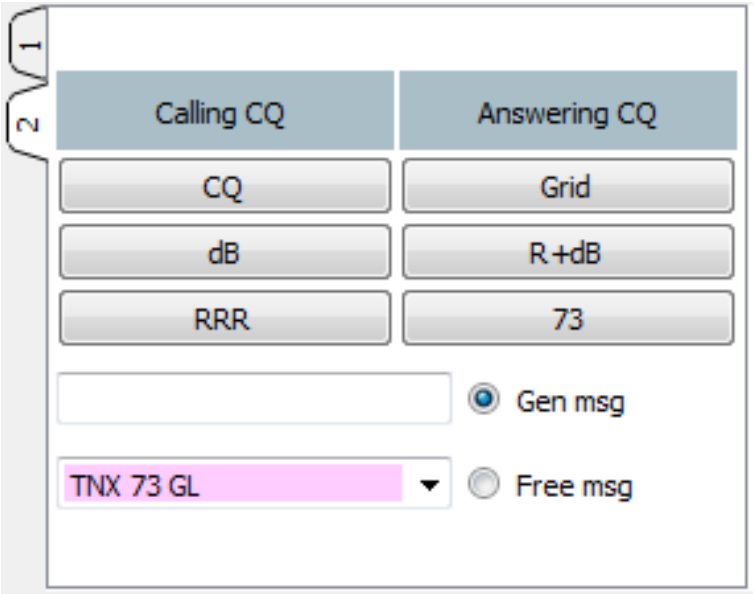
Decode/Transmit time

CQ in Message Wrk B4	WA4CQG	Received message	K6KNS
DX New Country	RI1AN	Transmitted message	W0QL
New Call	W7YL	QSO message text	12W 73s


Red Transmit Frequency
Green Receive Frequency
WSJT-X - Wide Graph
Controls
400
600
800
1000
1200
1400
1600
1800
2000
2200
Bins/Pixel 3
Start 200 Hz
Palette
Adjust...
Flatten
Ref Spec
Spec 25 %
JT65 2000 JT9
N Avg 5
Digipan
Cumulative
Smooth 1
Sets High End Frequency
Sets Start Frequency

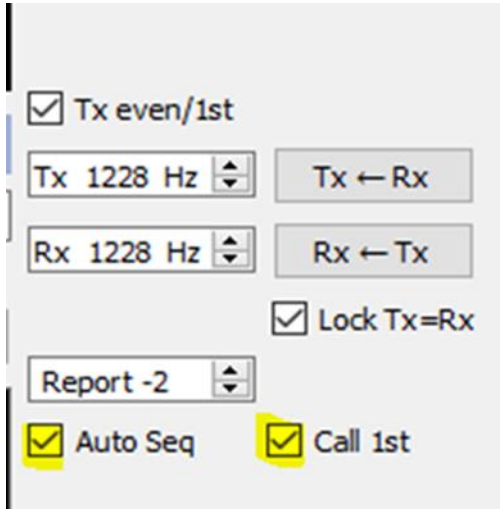
Transmit Messages - Type 1 & 2





Auto Sequence & Call 1st

Even/ Odd Transmission



Sets TX Freq

Sets RX Freq

Locks TX=RX

Auto Sequence – Automatically sequences thru the QSO – Signal Report, Roger & 73

Call 1st – Answers for 1st call found after a CQ – not recommended when call CQ DX

WSJT-X FT8 Download

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

Version 2

- Version 2.0.0: wsjtx-2.0.0-win32.exe. (runs on Vista, Win 7, Win 8, Win10, both 32- and 64-bit).

he current General Availability (GA) release is *WSJT-X* 2.0.0

The FT8 and MSK144 protocols have been enhanced in a way that is not backward compatible with older program versions. The new protocols become the world-wide standards starting on December 10, 2018, and all users should upgrade to *WSJT-X 2.0* by January 1, 2019. After that date, only the new FT8 and MSK144 should be used on the air.

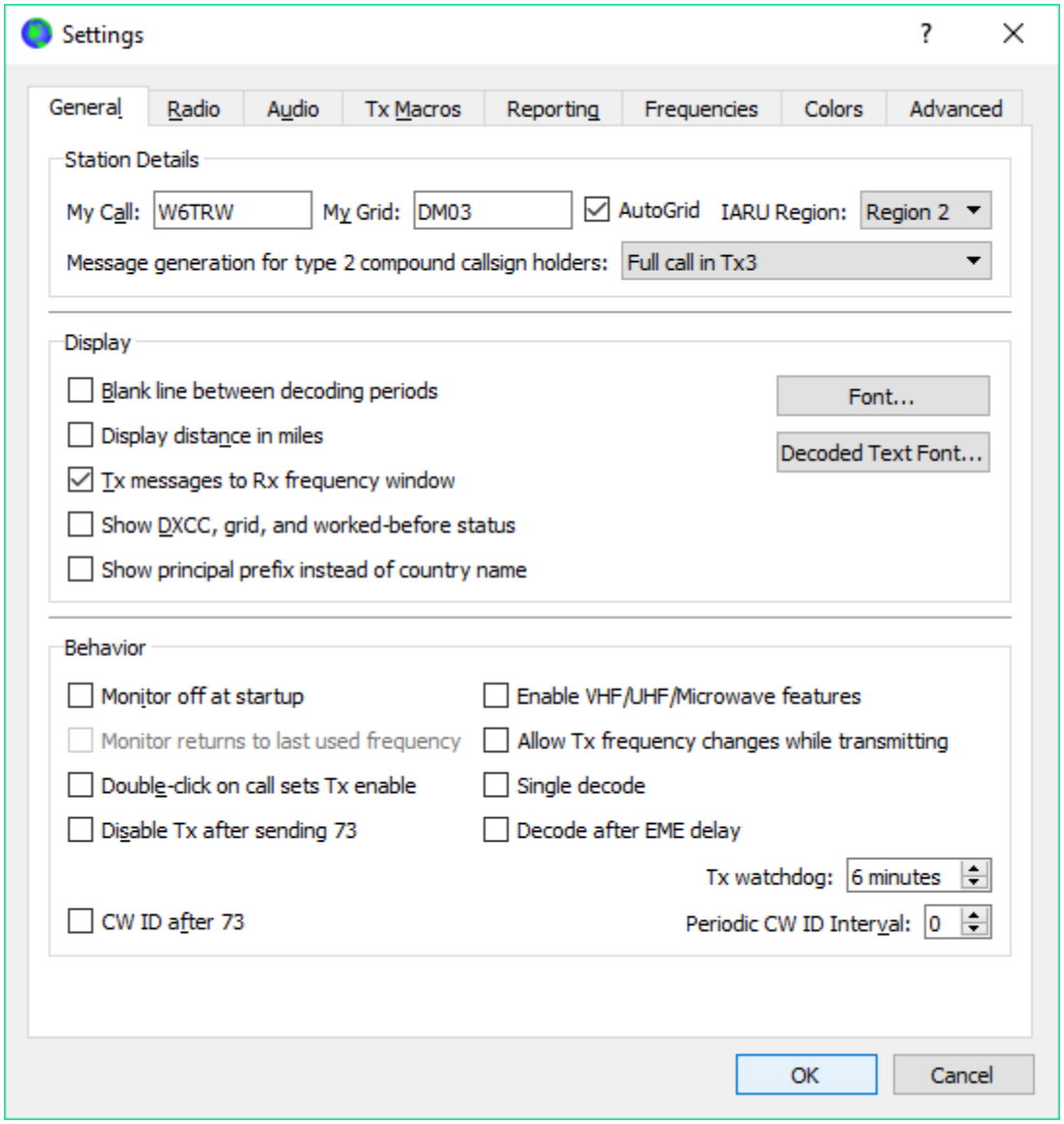
FT8 Setup – Internet Reference

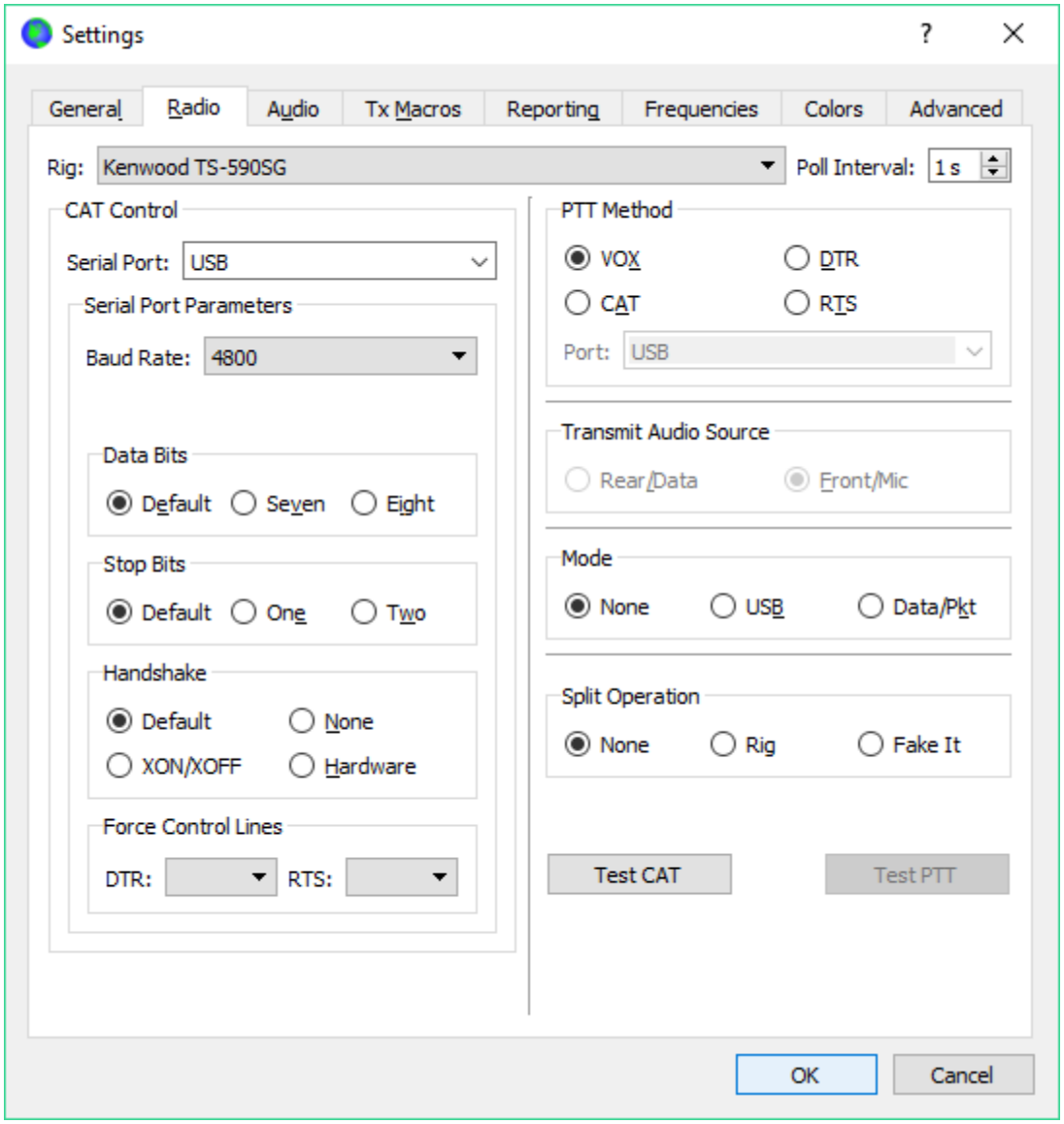
FT8 Setup
Jim Carson WT8P

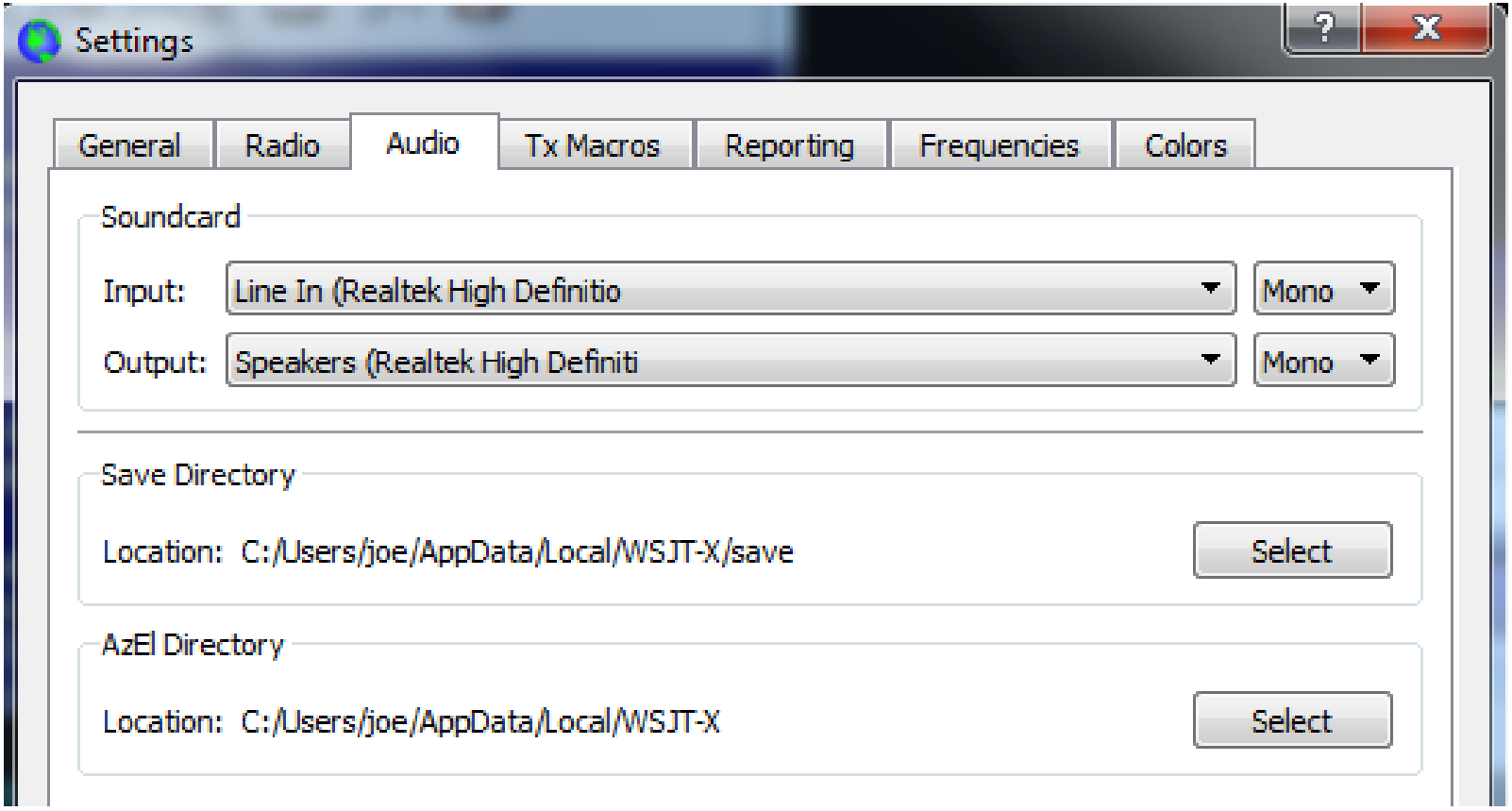
https://www.jimcarson.com/cool-geek-tricks/

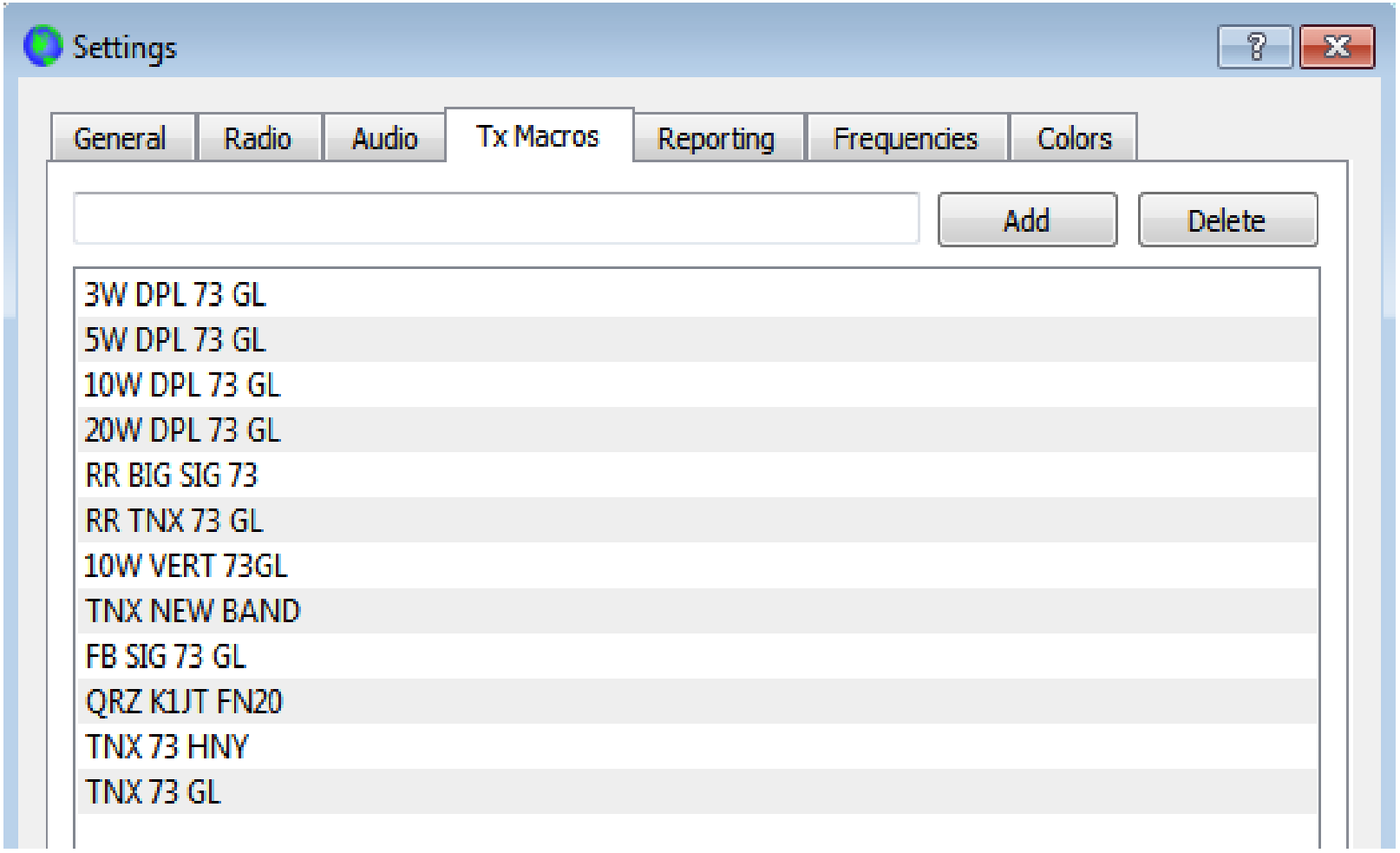
FT8 Setup

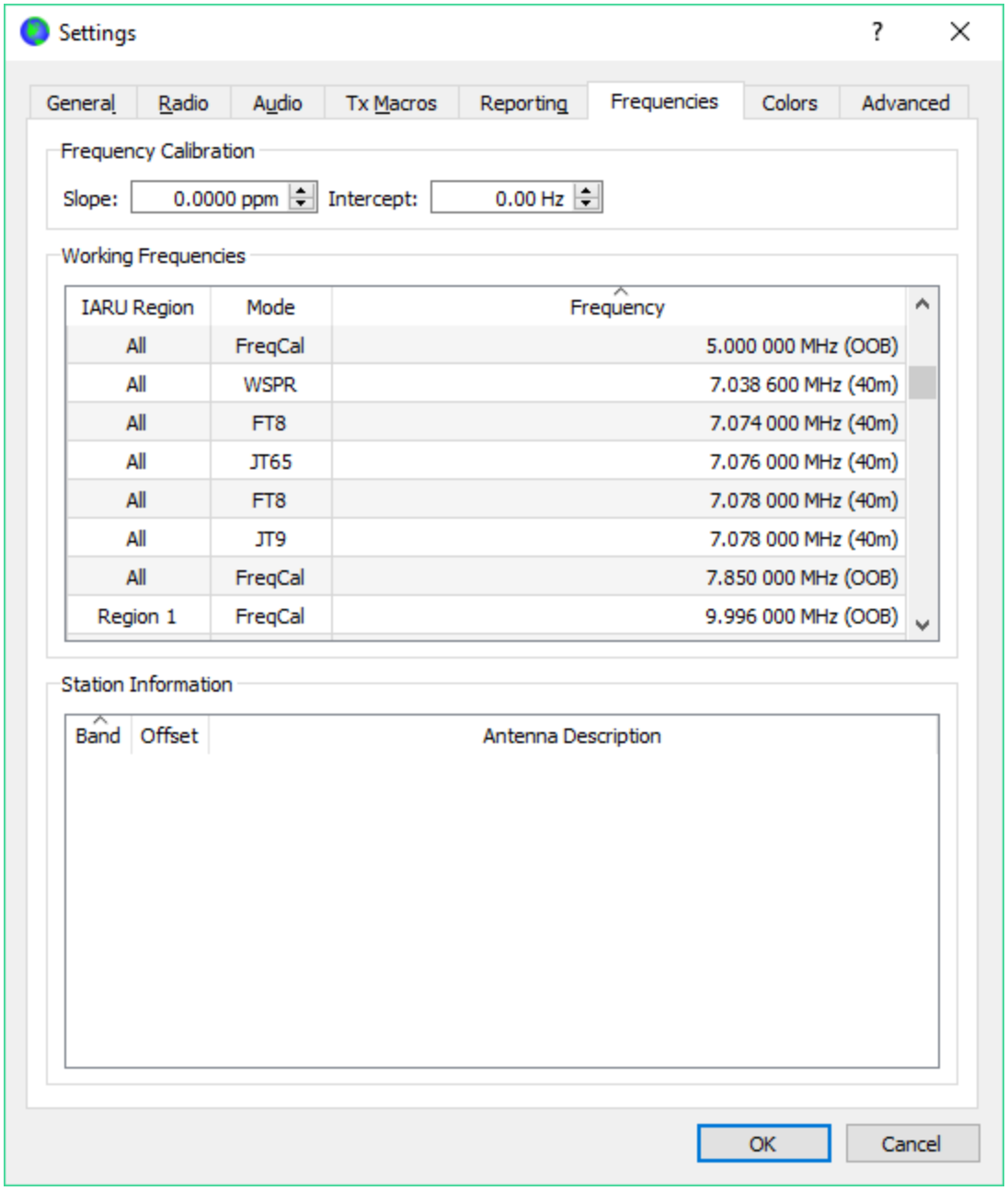
- Select “File”
- Select “Settings”

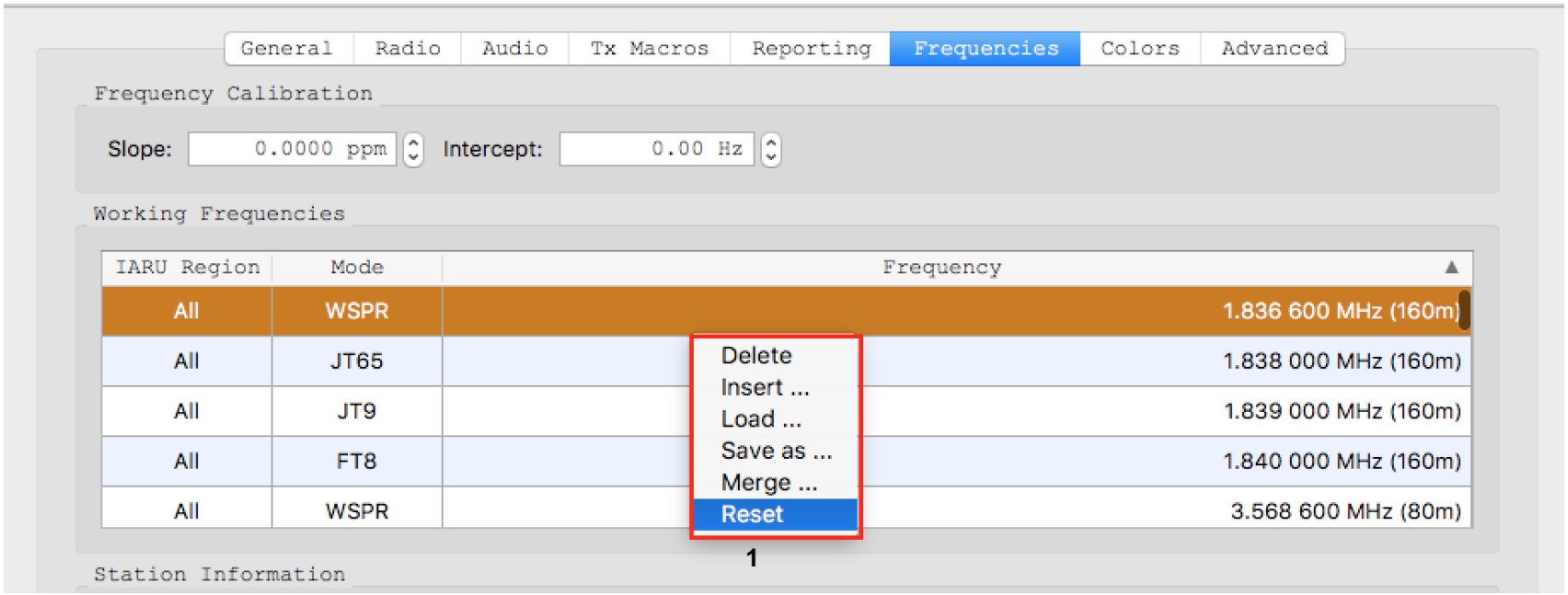

Settings
General
Radio
Audio
Tx Macros
Reporting
Frequencies
Colors
Advanced
Station Details
My Call: W6TRW
My Grid: DM03
AutoGrid
IARU Region: Region 2
Message generation for type 2 compound callsign holders: Full call in Tx3
Display
Blank line between decoding periods
Display distance in miles
Tx messages to Rx frequency window
Show DXCC, grid, and worked-before status
Show principal prefix instead of country name
Font...
Decoded Text Font...
Behavior
Monitor off at startup
Monitor returns to last used frequency
Double-click on call sets Tx enable
Disable Tx after sending 73
CW ID after 73
Enable VHF/UHF/Microwave features
Allow Tx frequency changes while transmitting
Single decode
Decode after EME delay
Tx watchdog: 6 minutes
Periodic CW ID Interval: 0
OK
Cancel


Settings
General
Radio
Audio
Tx Macros
Reporting
Frequencies
Colors
Advanced
Rig:
Kenwood TS-590SG
Poll Interval:
1 s
CAT Control
Serial Port:
USB
Serial Port Parameters
Baud Rate:
4800
Data Bits
Default
Seven
Eight
Stop Bits
Default
One
Two
Handshake
Default
None
XON/XOFF
Hardware
Force Control Lines
DTR:
RTS:
PTT Method
VOX
DTR
CAT
RTS
Port:
USB
Transmit Audio Source
Rear/Data
Front/Mic
Mode
None
USB
Data/Pkt
Split Operation
None
Rig
Fake It
Test CAT
Test PTT
OK
Cancel


Settings
General
Radio
Audio
Tx Macros
Reporting
Frequencies
Colors
Soundcard
Input:
Line In (Realtek High Definitio
Mono
Output:
Speakers (Realtek High Definiti
Mono
Save Directory
Location: C:/Users/joe/AppData/Local/WSJT-X/save
Select
AzEl Directory
Location: C:/Users/joe/AppData/Local/WSJT-X
Select


Settings
General
Radio
Audio
Tx Macros
Reporting
Frequencies
Colors
Add
Delete
3W DPL 73 GL
5W DPL 73 GL
10W DPL 73 GL
20W DPL 73 GL
RR BIG SIG 73
RR TNX 73 GL
10W VERT 73GL
TNX NEW BAND
FB SIG 73 GL
QRZ K1JT FN20
TNX 73 HNY
TNX 73 GL


Settings
General
Radio
Audio
Tx Macros
Reporting
Frequencies
Colors
Advanced
Frequency Calibration
Slope: 0.0000 ppm
Intercept: 0.00 Hz
Working Frequencies
IARU Region
Mode
Frequency
All FreqCal 5.000 000 MHz (OOB)
All WSPR 7.038 600 MHz (40m)
All FT8 7.074 000 MHz (40m)
All JT65 7.076 000 MHz (40m)
All FT8 7.078 000 MHz (40m)
All JT9 7.078 000 MHz (40m)
All FreqCal 7.850 000 MHz (OOB)
Region 1 FreqCal 9.996 000 MHz (OOB)
Station Information
Band
Offset
Antenna Description
OK
Cancel



FT8 Frequencies

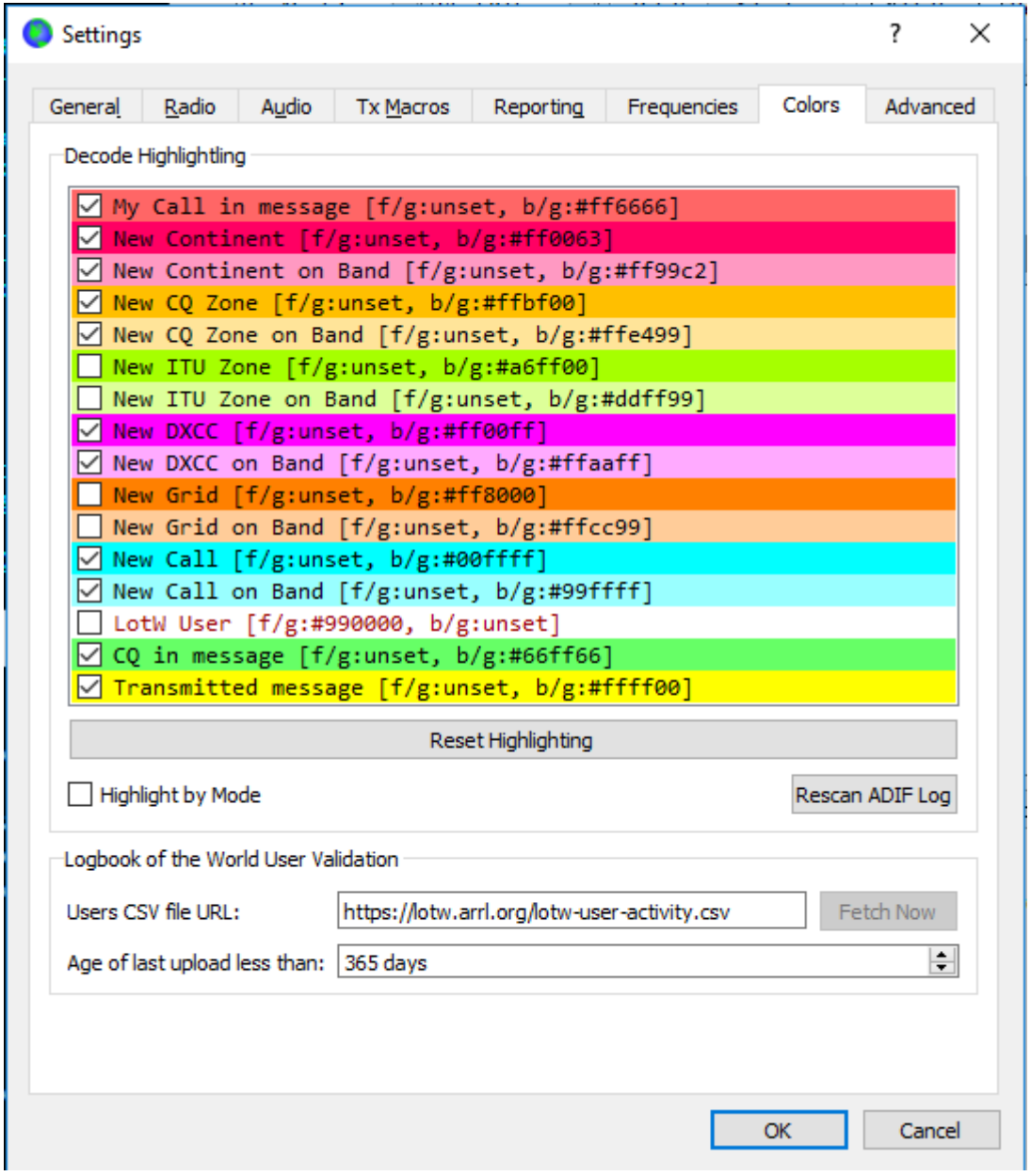
Band	MHz
160M	1.840
80M	3.573
40M	7.074
30M	10.136
20M	14.074
17M	18.100
15M	21.074
12M	24.915
10M	28.074
6M	50.313

Added FT8 Frequencies

Band	MHz
60M*	5.357
2M*	144.125 & 144.165
1 ¼M*	222.065
70CM*	432.065

* Not to Frequency list - to add use “Insert”

You will need to do a “Reset” after you install WSJT-X to have the frequencies added in the list.


Settings
General
Radio
Audio
Tx Macros
Reporting
Frequencies
Colors
Advanced
Decode Highlighting
My Call in message [f/g:unset, b/g:#ff6666]
New Continent [f/g:unset, b/g:#ff0063]
New Continent on Band [f/g:unset, b/g:#ff99c2]
New CQ Zone [f/g:unset, b/g:#ffbf00]
New CQ Zone on Band [f/g:unset, b/g:#ffe499]
New ITU Zone [f/g:unset, b/g:#a6ff00]
New ITU Zone on Band [f/g:unset, b/g:#ddff99]
New DXCC [f/g:unset, b/g:#ff00ff]
New DXCC on Band [f/g:unset, b/g:#ffaaff]
New Grid [f/g:unset, b/g:#ff8000]
New Grid on Band [f/g:unset, b/g:#ffcc99]
New Call [f/g:unset, b/g:#00ffff]
New Call on Band [f/g:unset, b/g:#99ffff]
LotW User [f/g:#990000, b/g:unset]
CQ in message [f/g:unset, b/g:#66ff66]
Transmitted message [f/g:unset, b/g:#ffff00]
Reset Highlighting
Highlight by Mode
Rescan ADIF Log
Logbook of the World User Validation
Users CSV file URL:
https://lotw.arrl.org/lotw-user-activity.csv
Fetch Now
Age of last upload less than:
365 days
OK
Cancel

Logs

- Log All - logs all reception and transmissions
- Log Text – Text log
- Log ADI – ADIF log (Used for LOTW & eQSL)

Note: Don’t erase the ADI log, it is used to find the stations you have worked.

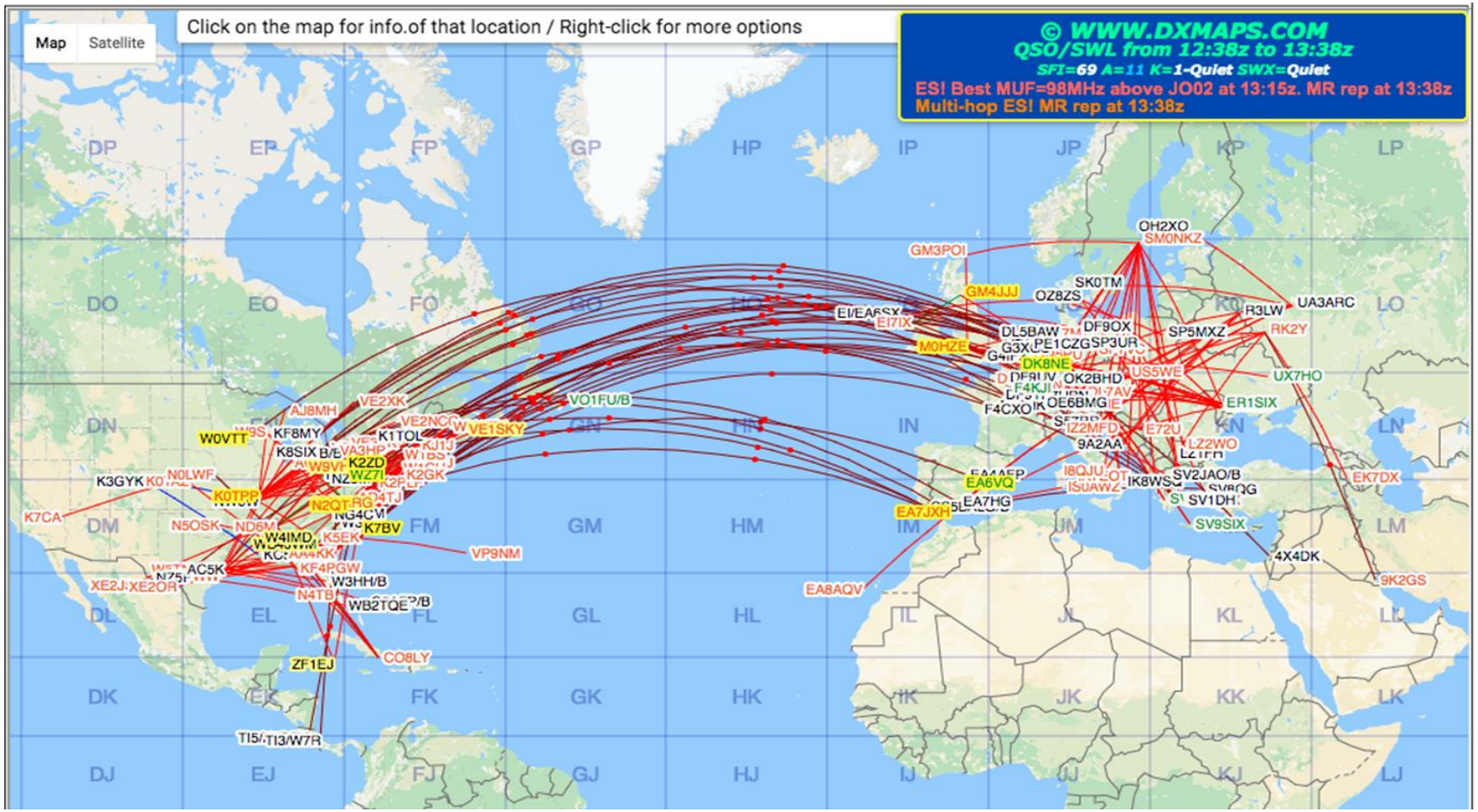
Support Programs

- PSK Reporter – Reverse Beacon Network
- DX Maps – DX Spotting Map
- JT Alert

PSK Reporter

Can be setup to show the stations that are receiving you.

DX Maps



6 meter opening to Europe last Summer, but what is important is where it is open from and to.

Operating Hints

- When using a computer sound card, turn off computer sounds
- Also turn off any voice announcements
- Remove the mic from your rig if using aux audio inputs. Most rig don’t mute the mic when using the aux input.
- Use the rig monitor to check your audio for hum and RF.
- Check the “DT”, delta time, should be .5 seconds or less.
- If you use 100 Watts, be sure your radio can handle it for the long operating time. Add extra fans if needed.

Advanced Operating Hints

- In crowded band conditions or working DX, try using split transmit & receive frequencies.
- When calling DX try sending the signal report first instead of your call/grid square.
- When working DX, try calling him split, Either just off his frequency or on the low end of band. Calls are displayed starting at the low end of band. Call 1st will work the first station found when the station is calling CQ.
- Listen to the DX station to see the transmit sequence, 1st or 2nd and how they are handling the pile up and if they are working split.
- Try tail ending, listen when the DX station send 73 and call then. You might try a different frequency or split.
- Look for DX stations that are working S&P and call them.
- If the receiving frequency on the waterfall display is red, this is a strong signal or multiple stations calling and it can be hard to decode.

Computer Audio Rig Interface

- Rig Baster – MFJ

- Tigertronics SignaLink
http://www.tigertronics.com/sl_suprt.htm

- Homebrew resistor dividers – Mic & Speaker audio
http://www.wa1wa.net/filespdf/pskhandbook.pdf

- FlexRadio uses a virtual audio connections

- USB Sound Adapters ($5 up)

Still need to build interface (2 resistor dividers)

Logging Programs that support FT8

- Ham Radio Deluxe V6
- N3FJP
- Log44M
- LOTW
- eQSL

Version 2.0

1. NA VHF Contest operation with full and transparent support of grid locators and "/R" (Rover) callsigns

2. EU VHF Contest operation with the exchange of 6-digit locators, QSO serial numbers, and "/P" (portable) callsigns

3. ARRL Field Day operation with standard Field Day exchanges

4. ARRL RTTY Roundup operation with standard contest exchanges

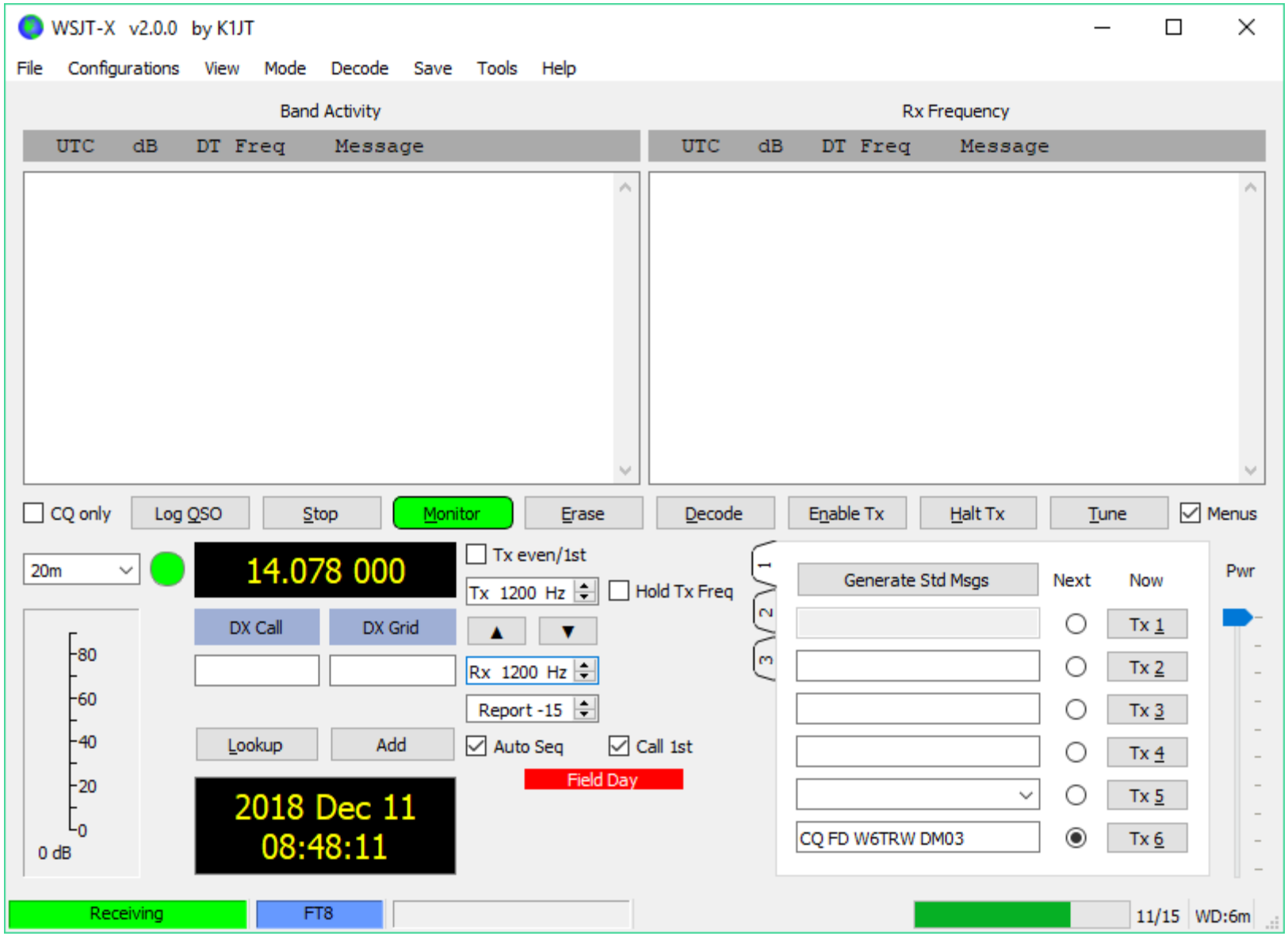
5. Better and more user-friendly support for compound and nonstandard callsigns 6. A special "telemetry" message format for exchange of arbitrary information (up to 71 bits)

Version 2.0 cont.

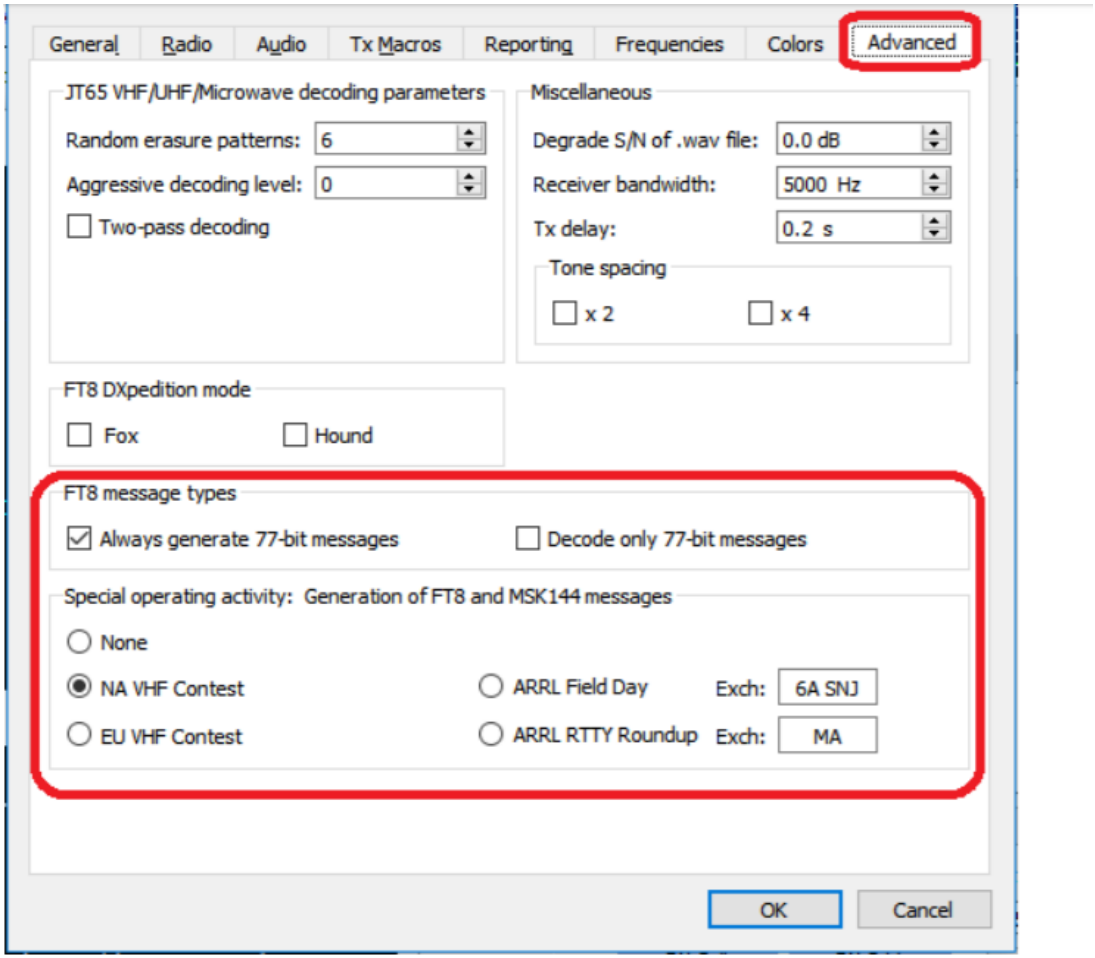
- Our proposed schedule should make WSJT-X Version 2.0 usable for relevant ARRL operating events in 2019.

What's New in 2.0

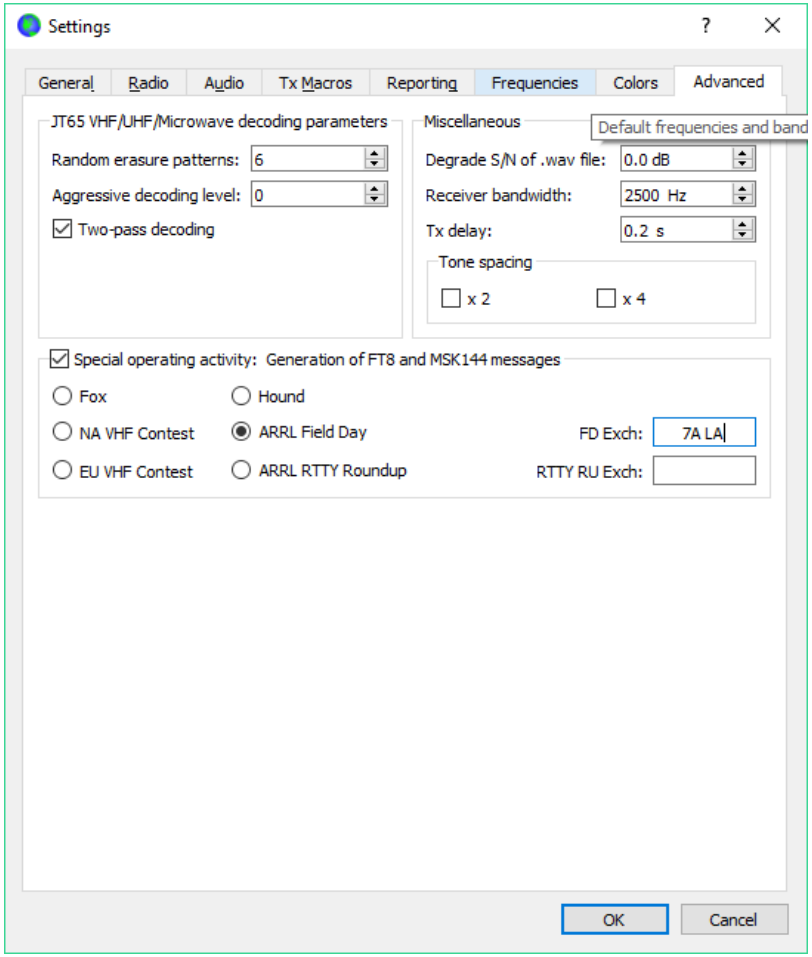
- For quick reference, here's a short list of features and capabilities added to *WSJT-X* since Version 1.9.1:
- New FT8 and MSK144 protocols with 77-bit payloads permit these enhancements:
- Optimized contest messages for NA VHF, EU VHF, Field Day, RTTY Roundup
- Full support for "/R" and "/P" calls in relevant contests
- New logging features for contesting
- Integration with N1MM Logger+ and Writelog for contesting
- Improved support for compound and nonstandard callsigns
- Nearly equal (or better) sensitivity compared to old protocols
- Lower false decode rates
- Improved color highlighting of received messages
- Improved WSPR sensitivity
- Expanded and improved UDP messages sent to companion programs
- Bug fixes and other minor tweaks to user interface


WSJT-X v2.0.0 by K1JT
File Configurations View Mode Decode Save Tools Help
Band Activity
UTC dB DT Freq Message
Rx Frequency
UTC dB DT Freq Message
CQ only
Log QSO
Stop
Monitor
Erase
Decode
Enable Tx
Halt Tx
Tune
Menus
20m
14.078 000
Tx even/1st
Tx 1200 Hz
Hold Tx Freq
DX Call
DX Grid
Rx 1200 Hz
Report -15
Lookup
Add
Auto Seq
Call 1st
Field Day
2018 Dec 11
08:48:11
80
60
40
20
0
0 dB
Generate Std Msgs
Next
Now
Tx 1
Tx 2
Tx 3
Tx 4
Tx 5
Tx 6
CQ FD W6TRW DM03
Pwr
Receiving
FT8
11/15
WD:6m

Configuration for FD V2.0



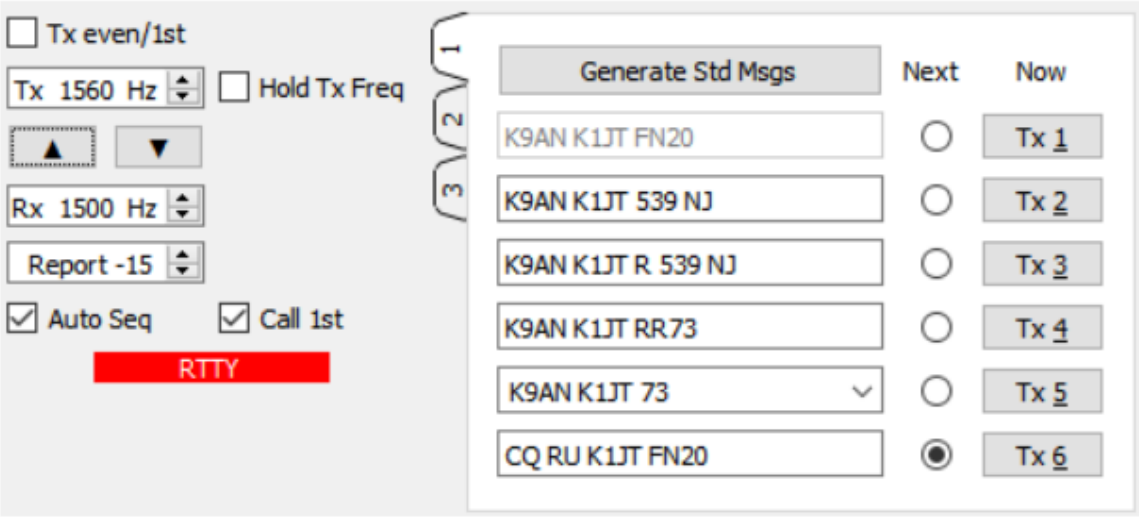
W6TRW FD FT8



More FD setup info

Be sure to enter your relevant exchange information. For **ARRL Field Day**, enter your operating Class and ARRL/RAC section; for **ARRL RTTY Roundup**, enter your state or province. Use "DX" for section, state, or province if you are not in the US or Canada.

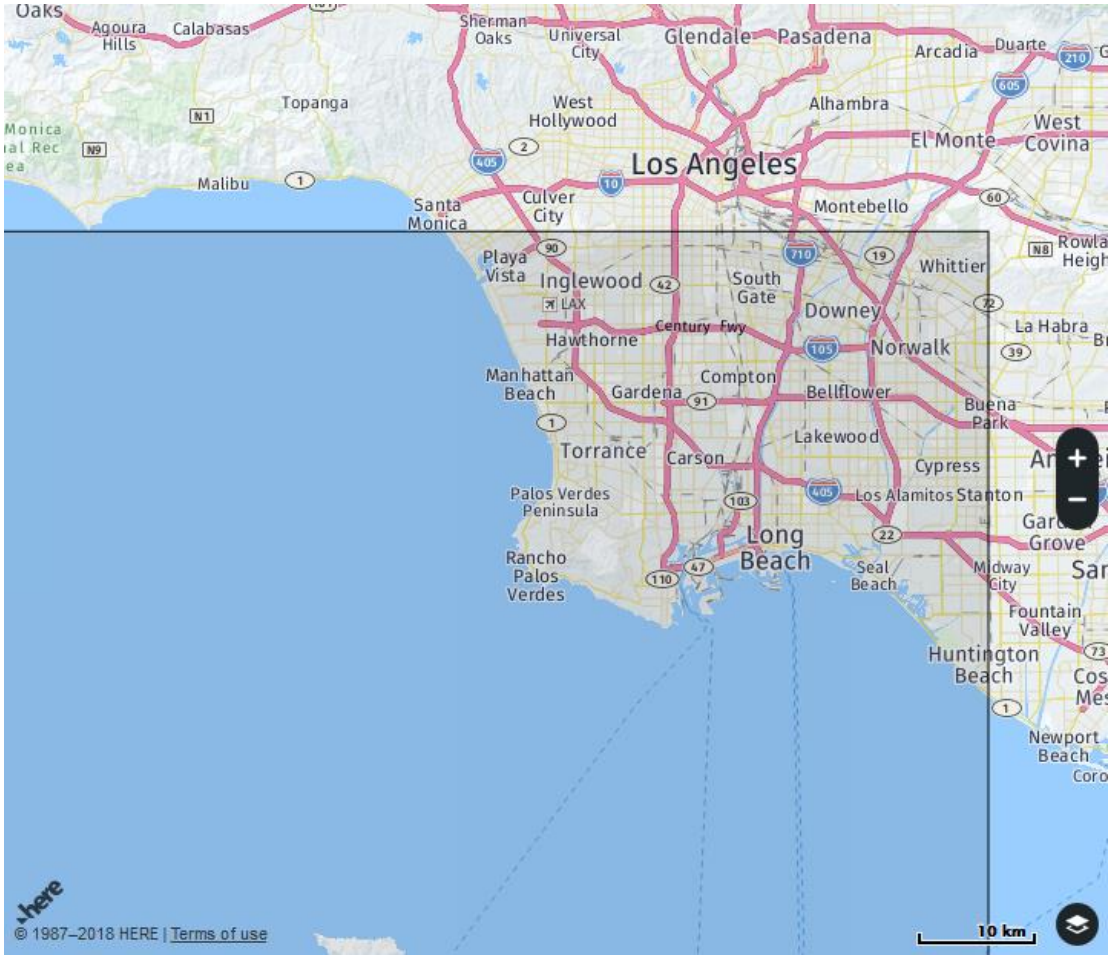
When one of the special operating activities has been selected a red-highlighted message appears on the *WSJT-X* main window, as shown here for RTTY Roundup:



FD Use with V 2.0

- CQ FD W6TRW DM03
  - K1ABC W6TRW 7A LA
- W6TRW K1ABC R 2B EMA
  - K1ABC W6TRW RR73

DM03 Grid Square



October and November QST has a 2 part series on FT8

Source and Credits

The End

Indianapolis Radio Club

KJ9B & K9RU