FT8 / WSJT-X Presentation
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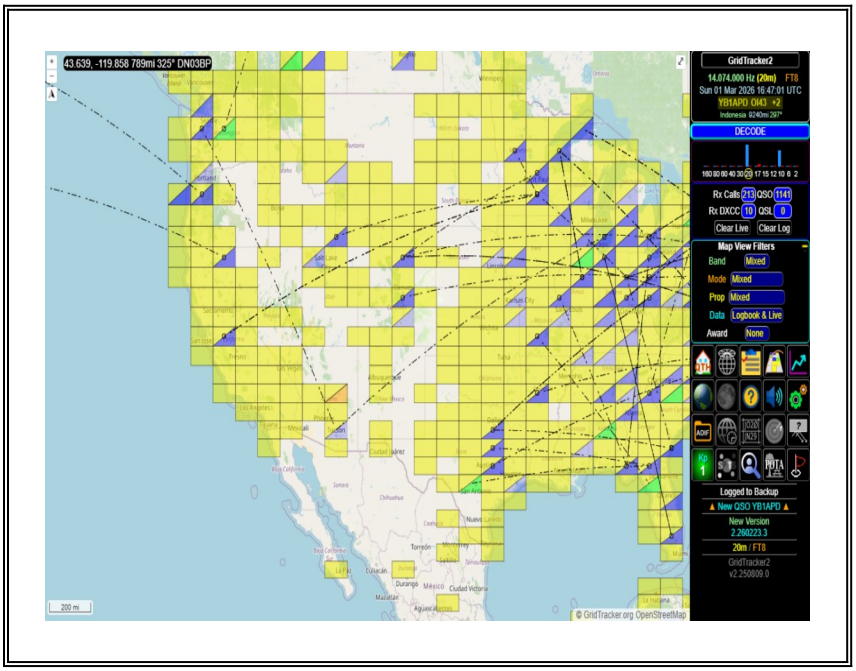


PUT LIVE ON SCREEN (enable TX)
ATAS 15m 17m 20m

Introduction:

FT8 (short for Franke–Taylor design, 8-FSK modulation) it is a frequency shift keying digital mode of radio communication used by amateur radio operators worldwide. It was released in 2017, by its creators Joe Taylor, K1JT and Steve Franke, K9AN, as part of the WSJT software package.

I will show some settings for WSJT but not how to set up your radio, there are too many flavors of radios. I watched (3) YouTube videos to get my radio set up, they all had missing or incorrect information. At the end of this document I have screen shots and notes of how to set up the Yaesu FT991A. I inadvertently messed up one of the settings once and it took a couple hours to recover. I keep these notes and screen shots in case I screw it up again.

GridTracker is described towards the end of this presentation, I want you to see a quick screen shot of it since I will be mentioning Grid Squares quite a bit.

When using WSJT I use dual monitors, one for WSJT and the other for GridTracker. One of the things I enjoy about FT8 is while doing simple chores in the shack, I can glance over at GridTracker and jump in when I want to contact a new Grid Square. I am also getting better at my geography, and it gets me thinking about propagation.

- WSJT can decode a signal -21db below noise floor
- I started with 40W – now I am using 20W (probably still too high) WSJT runs at 50% duty cycle hard on radio finals at full power
- Average of 2 minutes to make a QSO,15 second receive and transmit time slots
- WSJT is **NOT** a set it and forget (let the radio do all the work). There are time outs when calling CQ. If there is a new Grid Square you are trying to work you may need to jump in and make adjustments

CAT Control (Computer Aided Transceiver)

Baud rate I have setup for communication between the radio and the computer is 4800Hz. 4,800 bit/s is the dial up speed in the mid-70s, the computer is just a visual interface of what the radio is doing, at this baud rate you can see all the work is being done by the radio, and not the computer.

Table of Contents

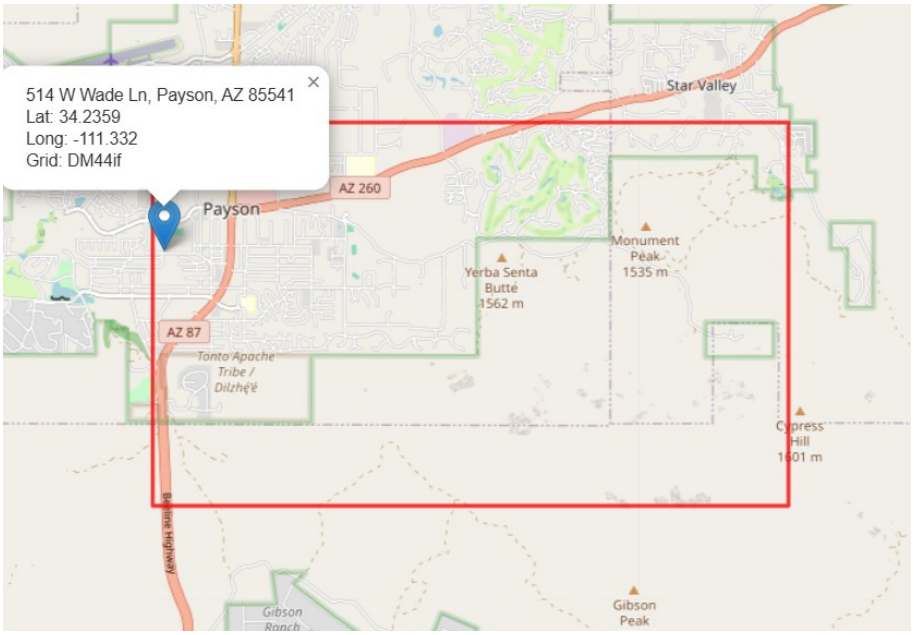
PUT ON SCREEN (Have Saved PDF)

I. Ham Radio Maidenhead Grid Square Locator Map

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

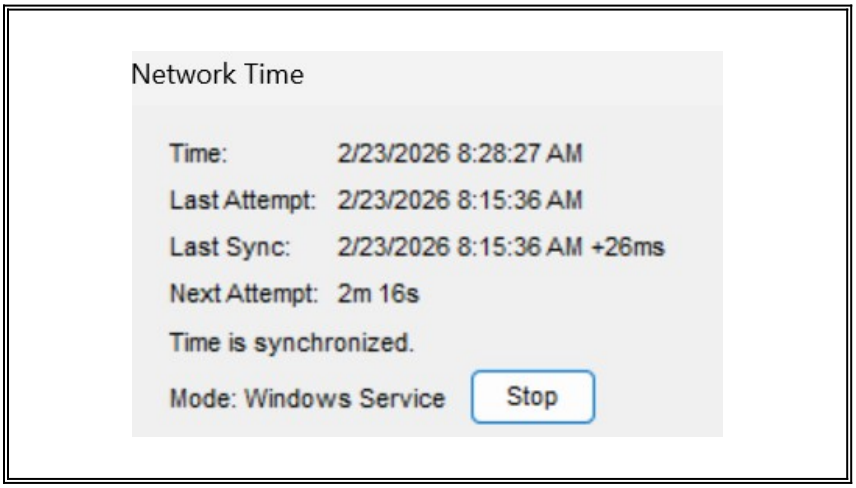
- Geolocation system, developed in Maidenhead, England
- Payson Center for Success, 514 W Wade Ln, Payson, AZ 85541 We are in Grid Square DM44

GO THROUGH EXERCISE OF LOCATING PAYSON CENTER FOR SUCCESS



II. NetTime

https://www.timesynctool.com/



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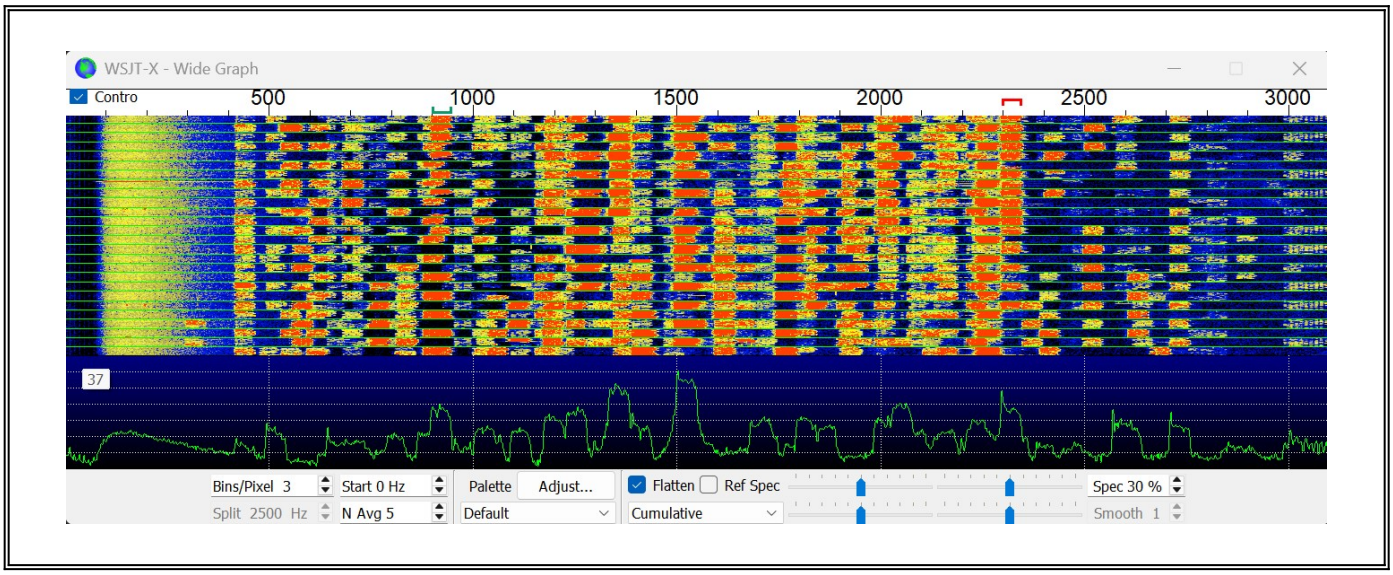
- Time synchronization tool. NetTime is Windows only, macOS has its own variants of this software
- WSJT has a 15 second transmit and a 15 second receive window. To keep everything synchronized this is nice tool to have so you don't need to keep adjusting your computer clock
- NetTime does require an internet connection, If your doing a remote POTA or similar operation without an internet connection and your clock is a few hundred milliseconds off it is no big deal
- I have mine set to adjust the computer clock every 15 minutes, it turns out to be 2ms-30ms off on every adjustment
- Just to emphasize WSJT does **NOT** require an internet connection

III. **WSJT-X Graph window** (I am going to refer to this as a waterfall)

https://wsjt.sourceforge.io/wsjtx.html



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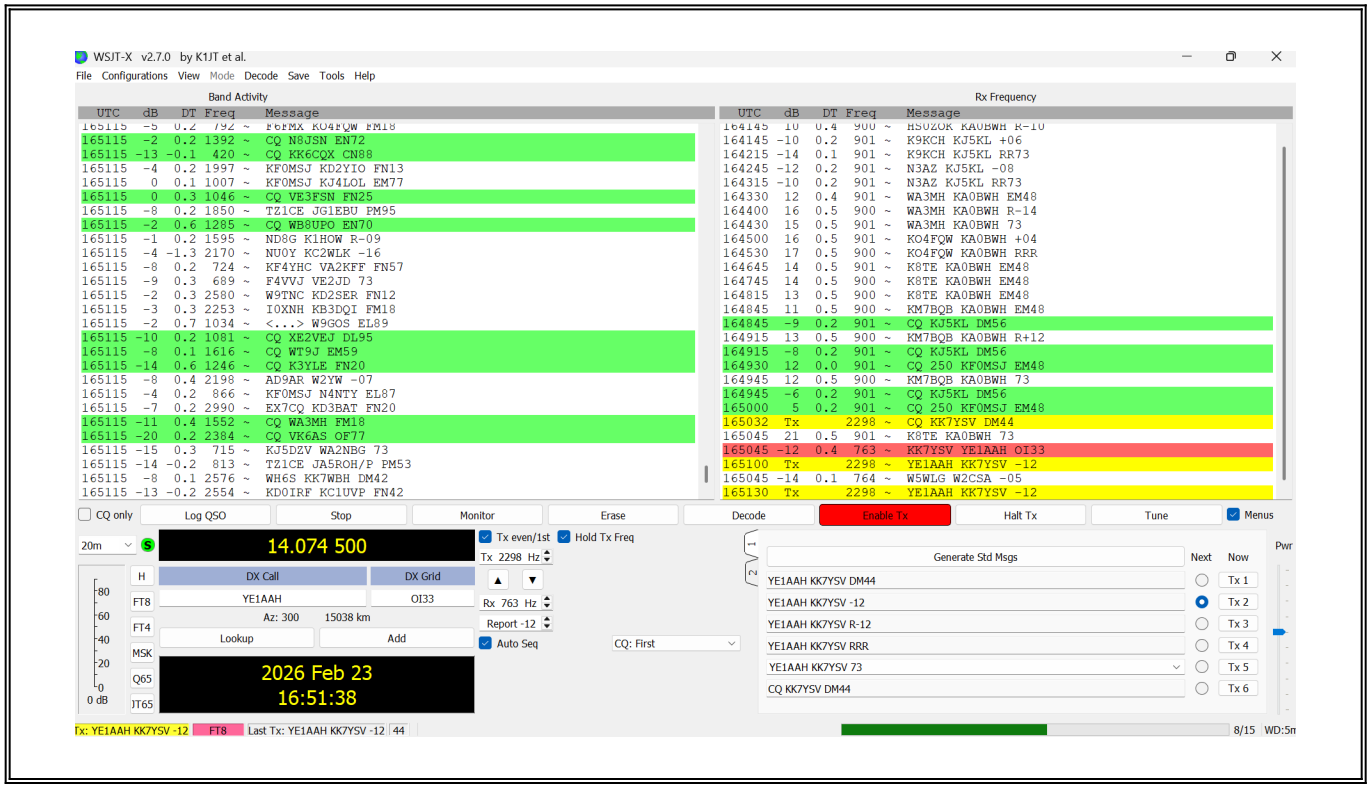
WSJT waterfall opens automatically when WSJT program is launched.

- 3000Hz audio bandwidth
- 50Hz slot
- Transmit Red
- Receive Green
- I sometimes make adjustments to the transmit and receive frequencies when trying to work a new Grid Square. This is done by:
  - Control “mouse click” to change both transmit and receive frequencies
  - Shift “mouse click” to change transmit frequency
  - “mouse click” to change receive frequency
- Although you are changing transmit and receive frequencies the radio is decoding the entire band
- You are looking at the waterfall for your location. You have know idea what there waterfall looks. If I see the QSO progress has stalled. I will pick a new transmit frequency. I may not change the receive frequency if I can “hear” them. What I enjoy about WSJT is it gets you thinking about propagation

IV. WSJT-X User Interface

https://wsjt.sourceforge.io/wsjtx.html



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To set up WSJT (not complete):

‘File > Settings…’ General tab

My Call

My Grid

‘File > Settings...’ Reporting tab

Prompt me to Log QSO

Enable PSK Reporter Spotting (Digimode Automatic Propagation Reporter)

Click “Generate Std Msgs”

1. CQ [Callsign] [Grid]

2. [Your Call] [Their Call] [Your Grid] (Grid Square replaces signal-to-noise ratio)

3. [Their Call] [Your Call] [Report] (e.g., -10)

4. [Your Call] [Their Call] [RR73] (or R+Report)

5. [Their Call] [Your Call] [73] (often considered necessary)

Minimum amount of information for a QSO:

The essential sequence is:
1. Call/Grid,
2. Report/Grid,
3. RR73/R-Report,
4. 73. While some consider it valid without the final 73, exchanging 73s ensures confirmation.

Navigating Around the WSJT Screen:

Band (20m, 40m and many others)

RF Gain, set around 30db, you don't want to overdrive **(radio knob)**

Verify you can hear the FT8 through your radios speaker

Power Slider Audio Level, set about midpoint, you don't want to overdrive

Check the Auto Seq box, this will go through the standard FT8 sequence when contact is made.

Monitor / Stop, if looking to make a contact this could help find the call sign.

Enable TX, ensure the CQ radio button is selected and you will be calling CQ. This will only make 11 attempts then stop.

Halt TX, if you realize your SWR is off, or giving up early on trying to make a contact.

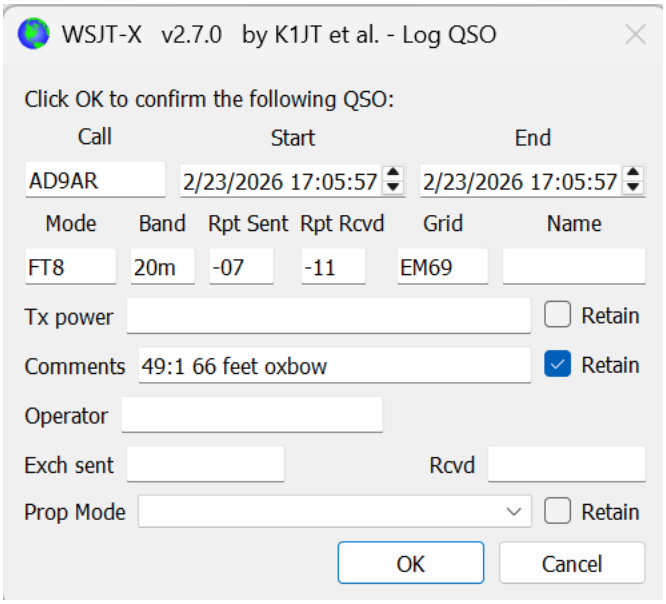
Queued up Sequence
    Double click / will only perform 1 QSO you must monitor the radio

Even / Odd when receiving only you get all receptions when transmitting you wont hear.

Frequency, notice you can set frequency here, I find the waterfall adjustment more intuitive.

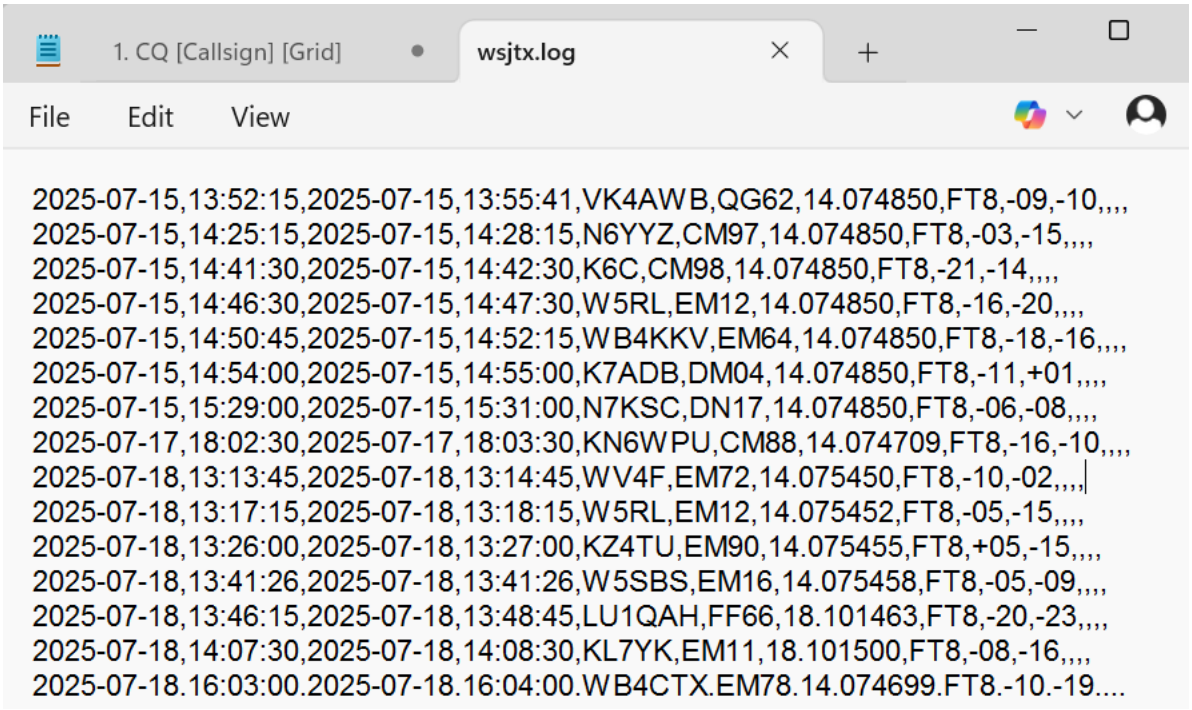
Prefixed that can be added prior to CQ
    DX
    POTA
    22 characters is the max, this will get compressed to 13 characters

Once a QSO is completed a pop up to log the QSO will appear:



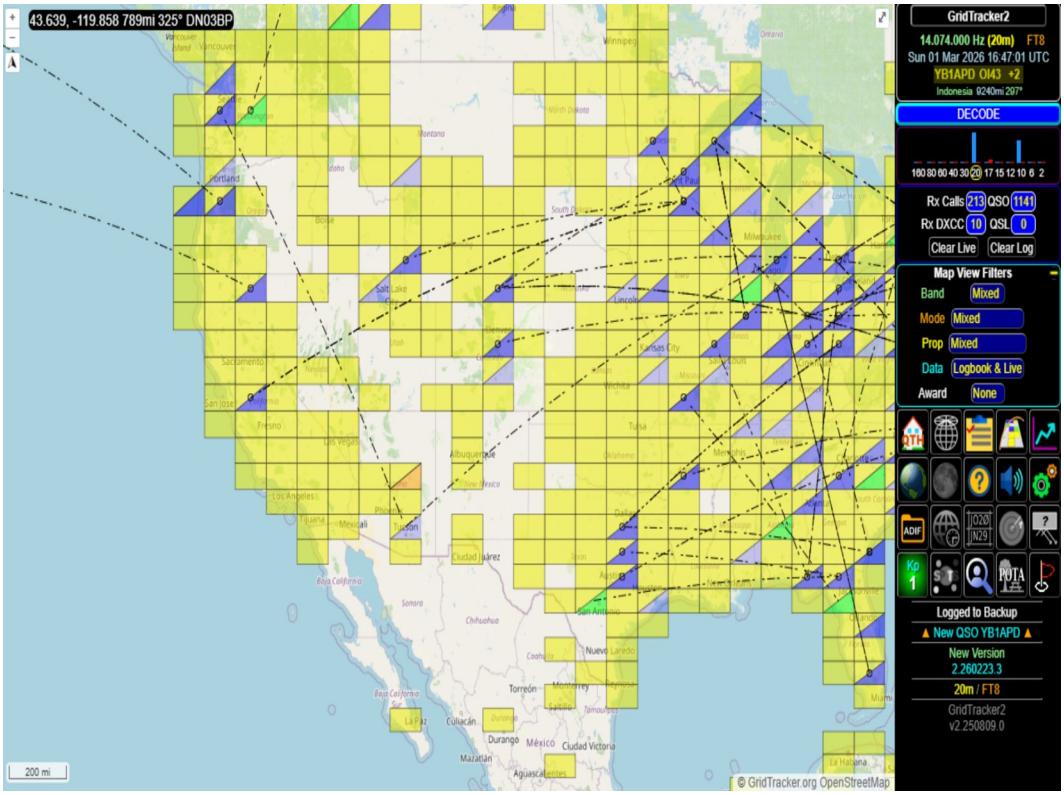
THIS WILL POP UP ONCE A QSO IS COMPLETE

‘File > Open log directory’



V. GridTracker 2

https://gridtracker.org/



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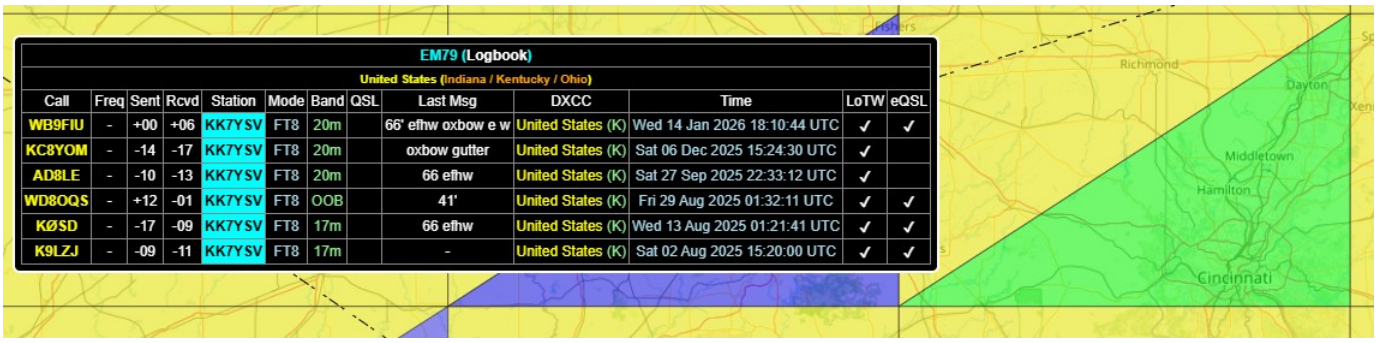
GridTracker is a visual representation of what WSJT is seeing

Grid Colors:

- Orange — My entered Grid Square
- Yellow — Stations I have worked (pulled from my log file)
- None — Grid Square I have not worked
- Green — Station Calling CQ
- Purple — Station heard recently but not calling CQ
- Blue — CQ DX (definition of DX is another country)
- Mixture of Colors — Combination of above
- Fading Colors — Station last heard is increasing in time

Mouse over Grid Square to obtain:

- Location
- Grid Square
- Signal Strength
- Last Heard
- Stations I Have Worked

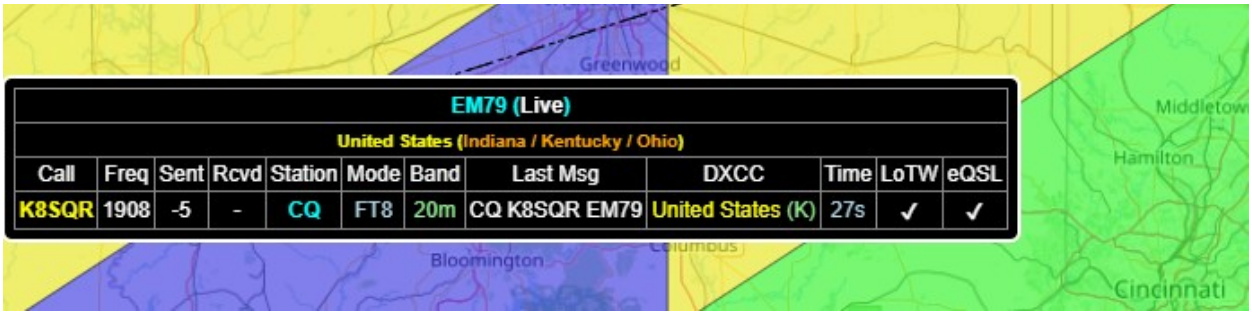


EM79 (Logbook)

United States (Indiana / Kentucky / Ohio)

Call	Freq	Sent	Rcvd	Station	Mode	Band	QSL	Last Msg	DXCC	Time	LoTW	eQSL
WB9FIU	-	+00	+06	KK7YSV	FT8	20m		66' efhw oxbow e w	United States (K)	Wed 14 Jan 2026 18:10:44 UTC	✓	✓
KC8YOM	-	-14	-17	KK7YSV	FT8	20m		oxbow gutter	United States (K)	Sat 06 Dec 2025 15:24:30 UTC	✓	
AD8LE	-	-10	-13	KK7YSV	FT8	20m		66 efhw	United States (K)	Sat 27 Sep 2025 22:33:12 UTC	✓	
WD8OQS	-	+12	-01	KK7YSV	FT8	OOB		41'	United States (K)	Fri 29 Aug 2025 01:32:11 UTC	✓	✓
KØSD	-	-17	-09	KK7YSV	FT8	17m		66 efhw	United States (K)	Wed 13 Aug 2025 01:21:41 UTC	✓	✓
K9LZJ	-	-09	-11	KK7YSV	FT8	17m		-	United States (K)	Sat 02 Aug 2025 15:20:00 UTC	✓	✓

Mousing over Top Left (past information from log file)



EM79 (Live)

United States (Indiana / Kentucky / Ohio)

Call	Freq	Sent	Rcvd	Station	Mode	Band	Last Msg	DXCC	Time	LoTW	eQSL
K8SQR	1908	-5	-	CQ	FT8	20m	CQ K8SQR EM79	United States (K)	27s	✓	✓

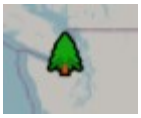
Mousing over Bottom Right (current information)

Display options for GridTracker:

- Azimthal Equidistant Projection
- POTA (requires internet connection, restart program)

Tent/Tree: A POTA station active on your Band/Mode that you have not worked.

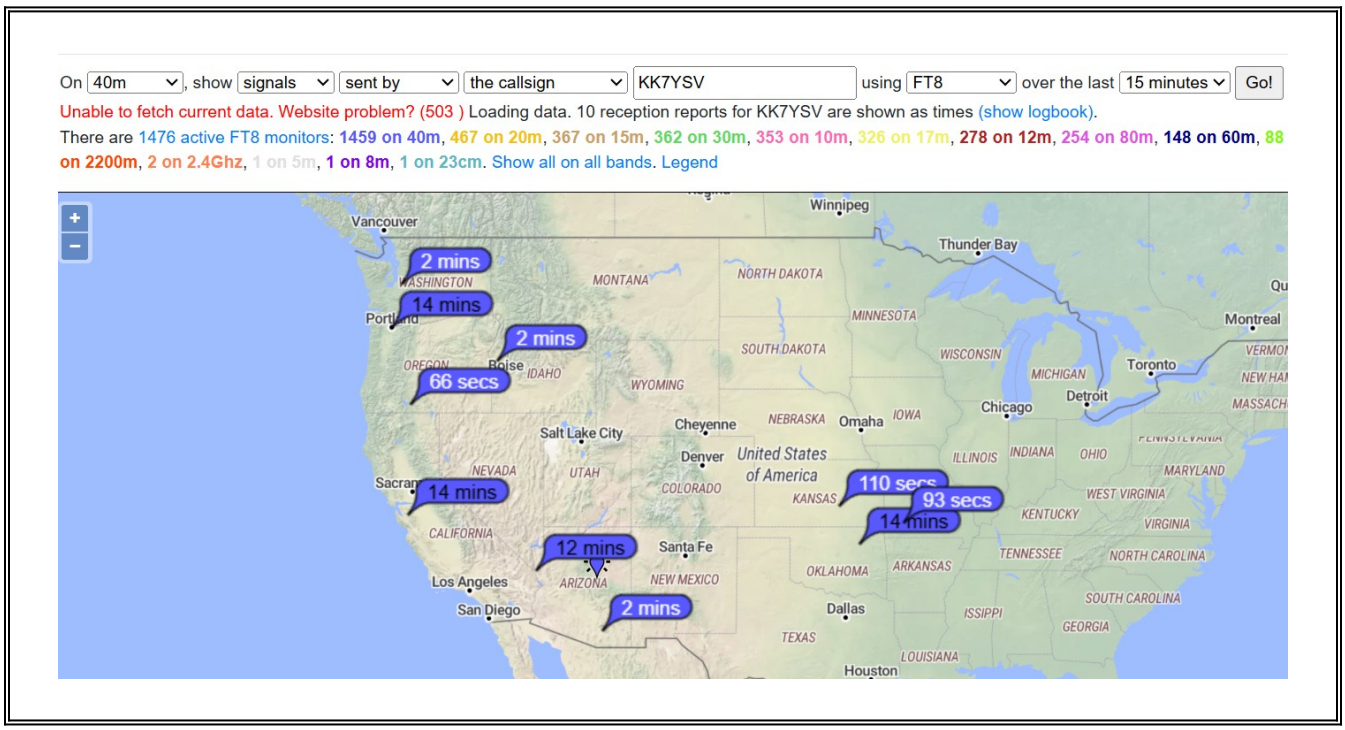
Sunrise over a Mountain: A POTA Station you have worked on your currently active Band/Mode.



Pine Tree: POTA station on a Band or Mode other than the one on which you are currently active.

VI. Digimode Automatic Propagation Reporter

https://www.pskreporter.info/pskmap.html



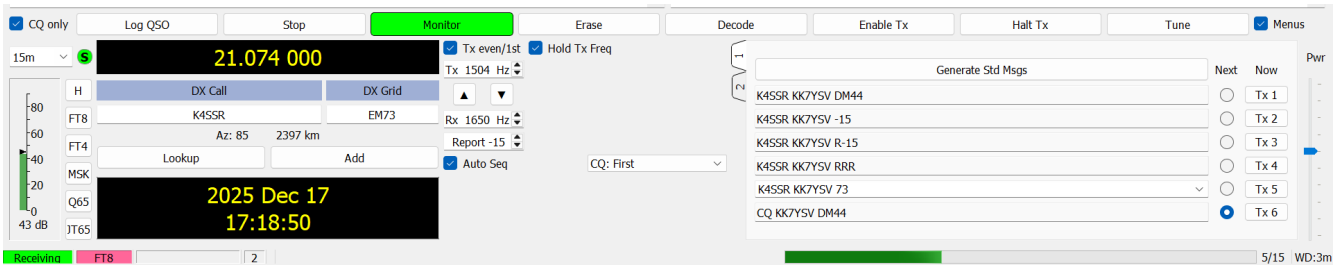
PUT LIVE ON SCREEN

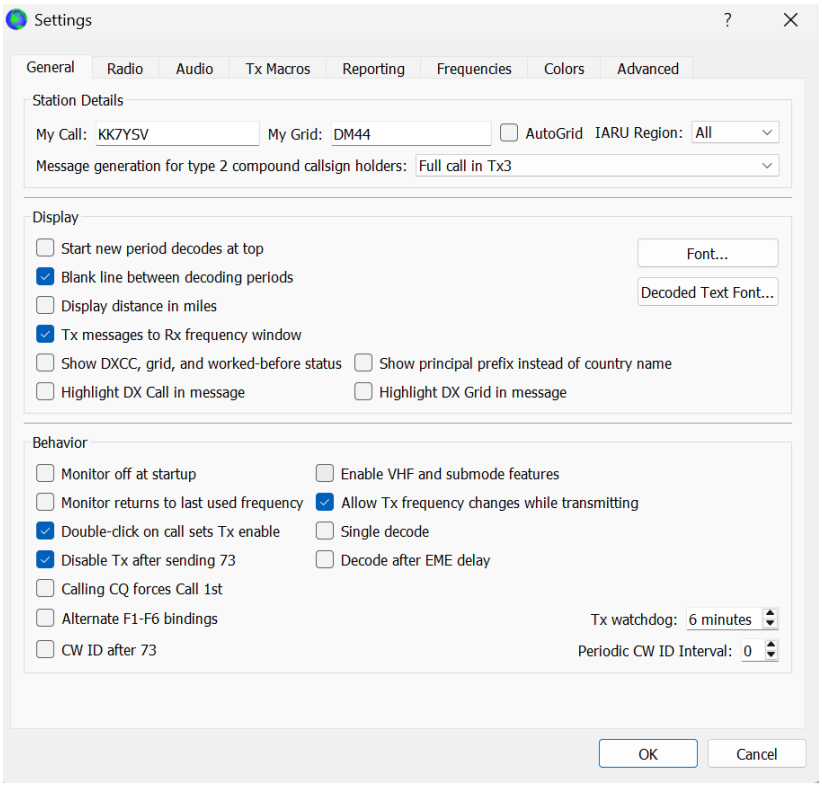
FT8 does **NOT** require an internet connection. However with an internet connection you can see your who is receiving your signals.

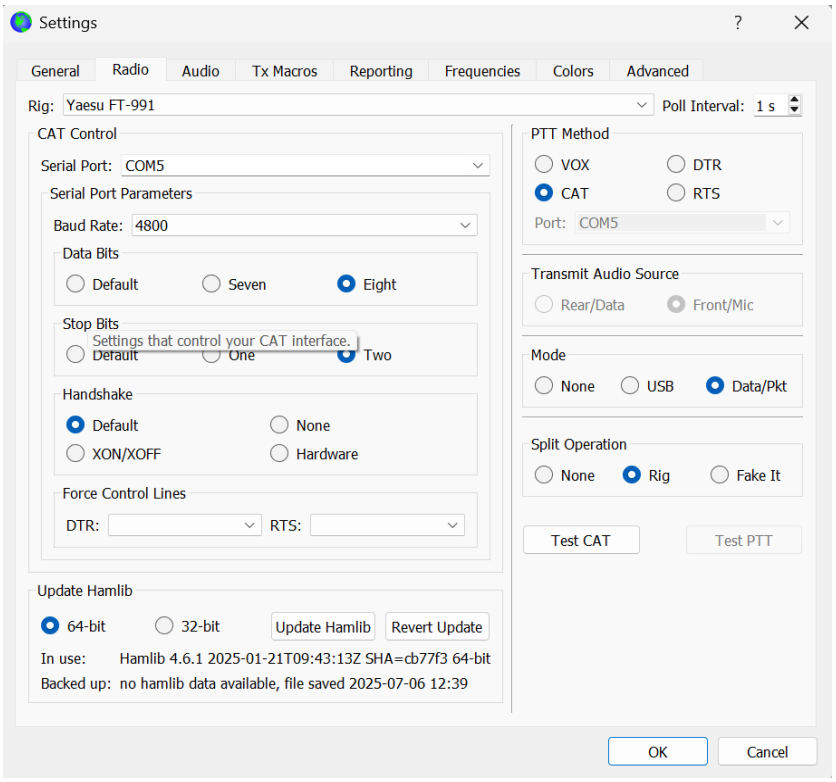
VII. Yaesu FT991A and WSJT-X setup

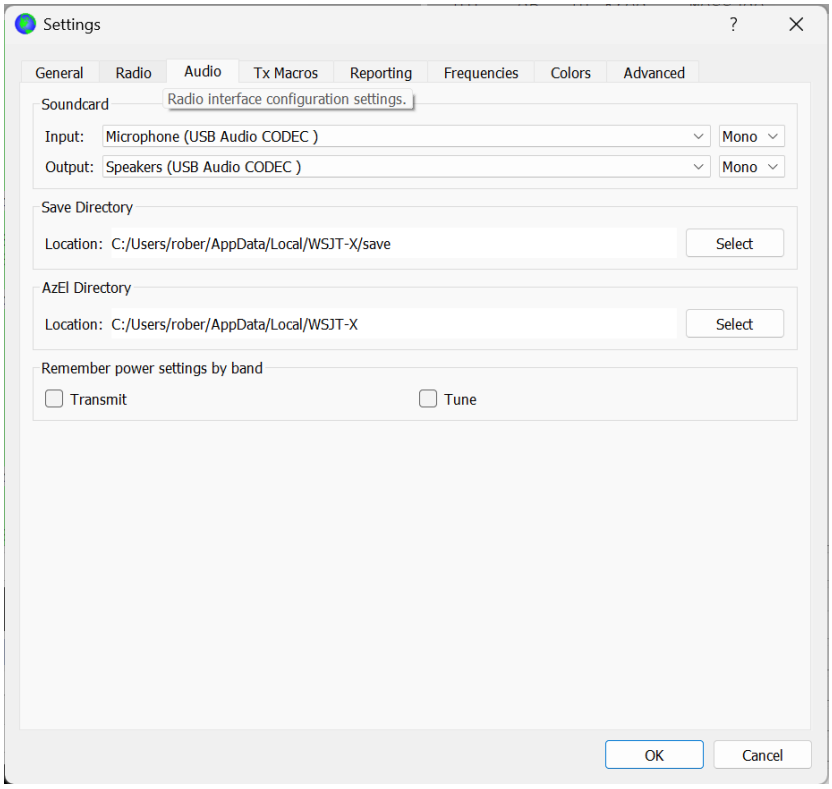
Menu item	Menu description	Setting
29	232C RATE	4800
30	232C TOT	10 msec
31	CAT RATE	4800
32	CAT TOT	msec
60	PC KEYING	off
62	DATA MODE	others
64	OTHER DISP (SSB)	1500 Hz
65	OTHER SHIFT (SSB)	1500 Hz
66	DATA LCUT FREQ	off
68	DATA HCUT FREQ	off
70	DATA IN SELECT	rear
71	DATA PTT SELECT	Daky
72	DATA PORT SELECT	USB
106	SSB MIC SELECT	mic
107	SSB OUT LEVEL	50
108	SSB PTT SELECT	RTS
109	SSB PORT SELECT	USB
141	Tuner	ATAS / internal
	Notch	off
	Contour	off
	DNR	off
	DNF	off
	Shift	0
	Width	3K
	Squelch	0

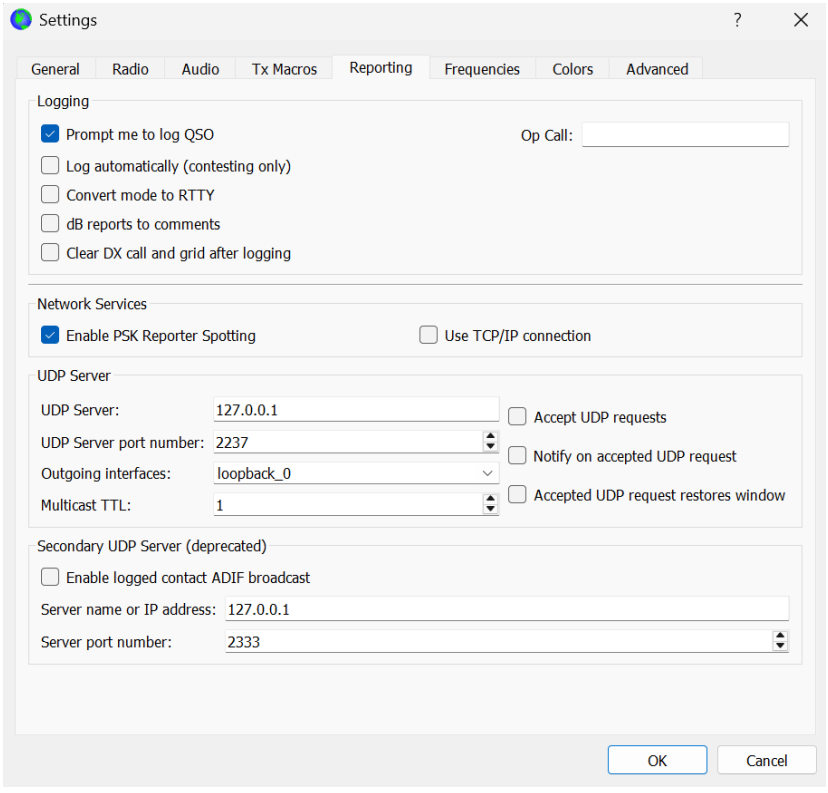
Make sure the RF gain knob is set to the correct level, you should be able to hear the FT8 signal with the volume up

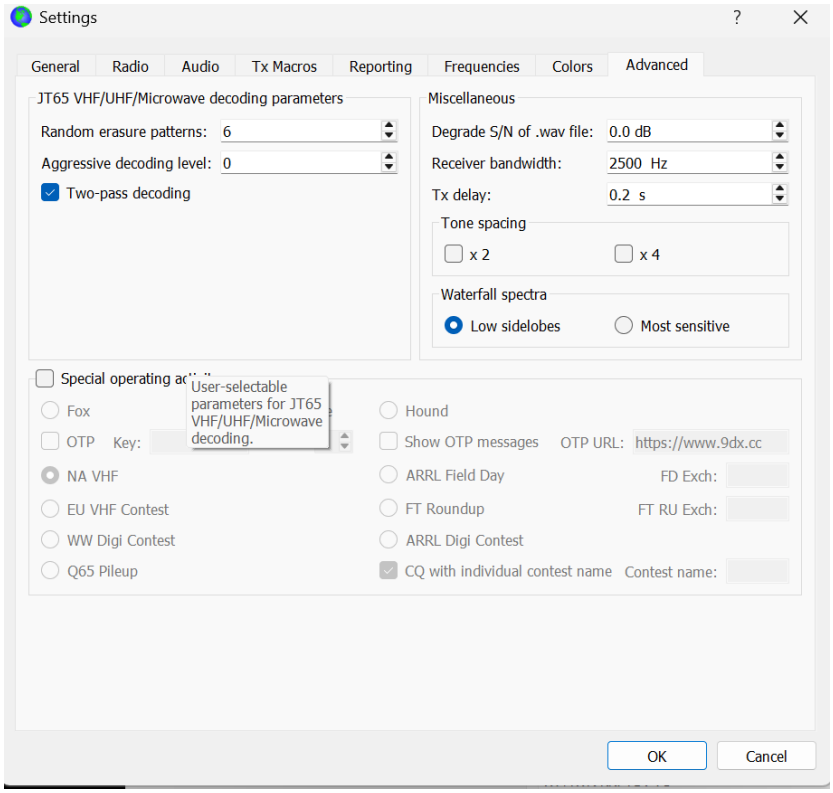



Settings
General
Radio
Audio
Tx Macros
Reporting
Frequencies
Colors
Advanced
Station Details
My Call: KK7YSV
My Grid: DM44
AutoGrid
IARU Region: All
Message generation for type 2 compound callsign holders: Full call in Tx3
Display
Start new period decodes at top
Blank line between decoding periods
Display distance in miles
Tx messages to Rx frequency window
Show DXCC, grid, and worked-before status
Show principal prefix instead of country name
Highlight DX Call in message
Highlight DX Grid in message
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
Calling CQ forces Call 1st
Alternate F1-F6 bindings
CW ID after 73
Enable VHF and submode 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: Yaesu FT-991
Poll Interval: 1 s
CAT Control
Serial Port: COM5
Serial Port Parameters
Baud Rate: 4800
Data Bits
Default
Seven
Eight
Stop Bits
Default
One
Two
Settings that control your CAT interface.
Handshake
Default
None
XON/XOFF
Hardware
Force Control Lines
DTR:
RTS:
Update Hamlib
64-bit
32-bit
Update Hamlib
Revert Update
In use: Hamlib 4.6.1 2025-01-21T09:43:13Z SHA=cb77f3 64-bit
Backed up: no hamlib data available, file saved 2025-07-06 12:39
PTT Method
VOX
DTR
CAT
RTS
Port: COM5
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
Advanced
Soundcard
Radio interface configuration settings.
Input:
Microphone (USB Audio CODEC)
Mono
Output:
Speakers (USB Audio CODEC)
Mono
Save Directory
Location:
C:/Users/rober/AppData/Local/WSJT-X/save
Select
AzEl Directory
Location:
C:/Users/rober/AppData/Local/WSJT-X
Select
Remember power settings by band
Transmit
Tune
OK
Cancel


Settings
General
Radio
Audio
Tx Macros
Reporting
Frequencies
Colors
Advanced
Logging
Prompt me to log QSO
Op Call:
Log automatically (contesting only)
Convert mode to RTTY
dB reports to comments
Clear DX call and grid after logging
Network Services
Enable PSK Reporter Spotting
Use TCP/IP connection
UDP Server
UDP Server:
127.0.0.1
Accept UDP requests
UDP Server port number:
2237
Notify on accepted UDP request
Outgoing interfaces:
loopback_0
Multicast TTL:
1
Accepted UDP request restores window
Secondary UDP Server (deprecated)
Enable logged contact ADIF broadcast
Server name or IP address:
127.0.0.1
Server port number:
2333
OK
Cancel


Settings
General
Radio
Audio
Tx Macros
Reporting
Frequencies
Colors
Advanced
JT65 VHF/UHF/Microwave decoding parameters
Random erasure patterns: 6
Aggressive decoding level: 0
Two-pass decoding
Miscellaneous
Degrade S/N of .wav file: 0.0 dB
Receiver bandwidth: 2500 Hz
Tx delay: 0.2 s
Tone spacing
x 2
x 4
Waterfall spectra
Low sidelobes
Most sensitive
User-selectable parameters for JT65 VHF/UHF/Microwave decoding.
Fox
OTP
Key:
NA VHF
EU VHF Contest
WW Digi Contest
Q65 Pileup
Hound
Show OTP messages
OTP URL:
https://www.9dx.cc
ARRL Field Day
FD Exch:
FT Roundup
FT RU Exch:
ARRL Digi Contest
CQ with individual contest name
Contest name:
OK
Cancel