

FT8 and JTAlert

An Efficient QSO Generation System



Larry Banks, W1DYJ

Licensed: 1961 [KN1VFX]

W1DYJ since 1966

Amateur Extra

9B DXCC [297-Cnf / 299-Wkd]

DX Challenge: 1888

8B WAS

6M VUCC [615 grids-Cnf]

All Low Power

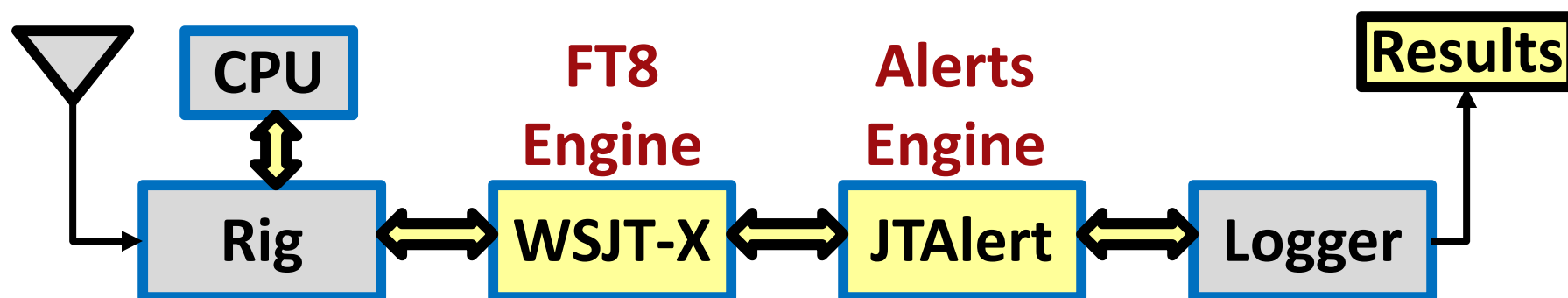
W1DYJ ~ Larry Banks



INDEXA

FT8 and JTAlert ~ Agenda

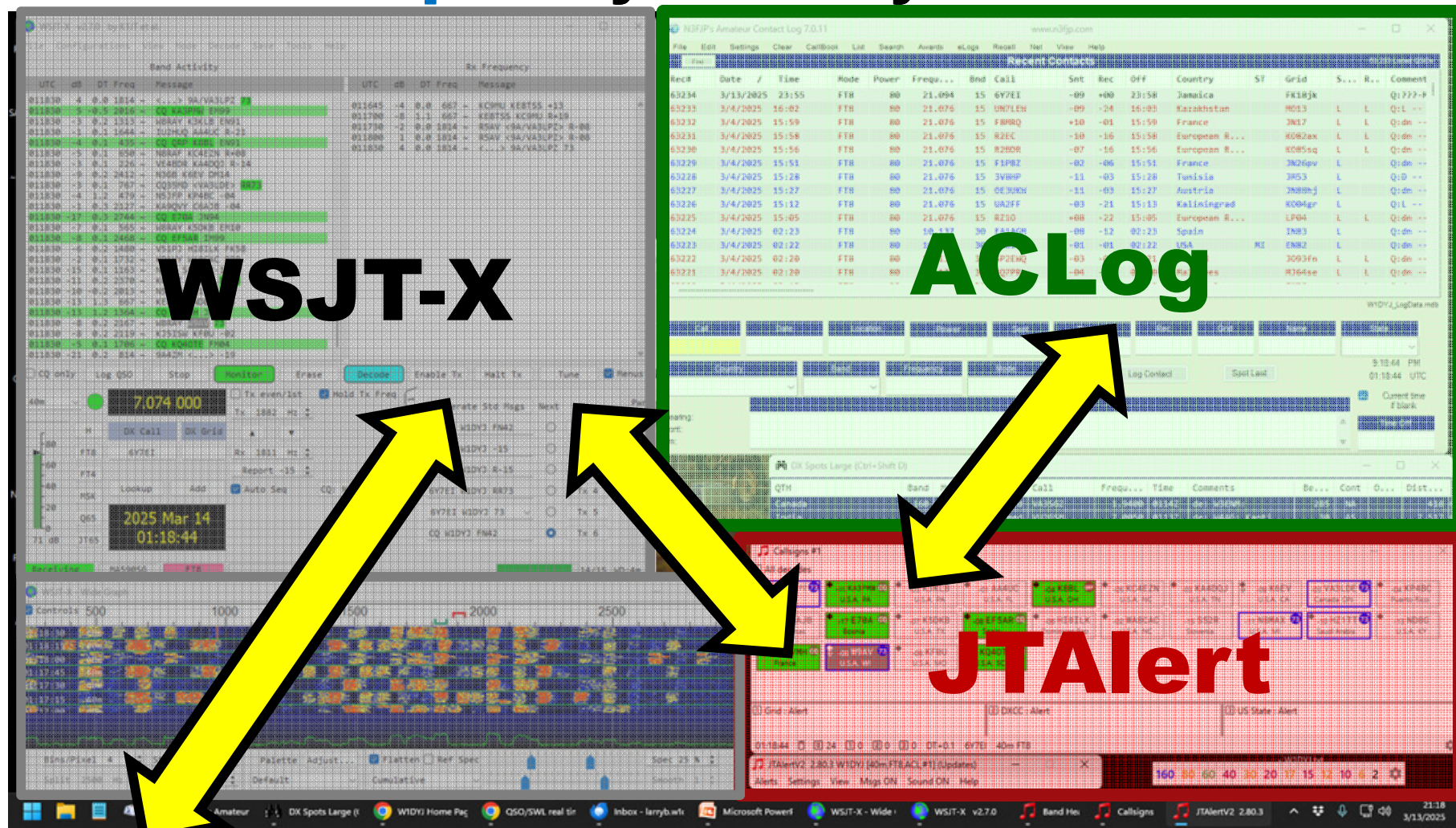
- Basics of WSJT-X & FT8
- HW / SW Setup
- JTAlert
- W1DYJ results



An Efficient QSO Generation System



Overall Setup ~ My Primary 23" Monitor



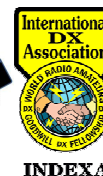
RIG



FT8 and JTAlert ~ Agenda

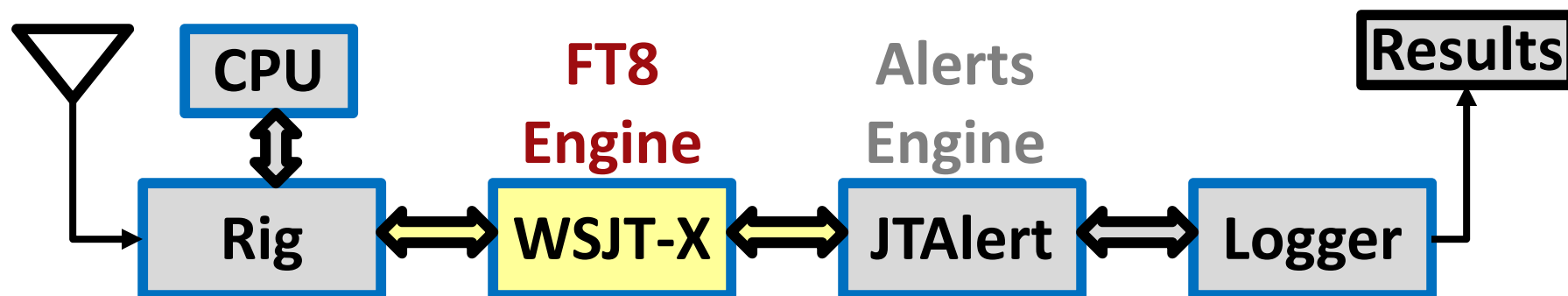
- Basics of WSJT-X & FT8
- HW / SW Setup
- JTAlert
- W1DYJ results

I will be adding my observations and opinions as I have logged nearly 6000 QSOs on FT8 since 2017. They will be in green.



FT8 and JTAlert ~ Agenda

- Basics of WSJT-X & FT8
- HW / SW Setup
- JTAlert
- W1DYJ results



FT8 Basics ~ What Is It???

- A **Weak Signal** semi-automated digital communications mode riding on an **USB** RF signal
- Not for Ragchewing
- It can be “hard” on your rig



FT8 Basics ~ *What Is It???*

Weak- Signal \neq Not QRP

You will hear arguments about this.

I usually run my rig at 80w to be conservative, 1 dB below the 100w of my barefoot rig. Some rigs cannot run this much safely – read the specs!



FT8 Basics ~ *It's Controversial!*

(Disruptive Technology)

FCC Part 97:

Advance the communication and technical skills of radio

FT8, FT4, etc. →→ RTTY, PSK, etc.

is like CW →→ Spark

or SSB →→ AM

You will hear some “old-timers” claiming that FT8 QSOs

ARE NOT REAL QSOs!

or that these shouldn't count for DXCC...



FT8 Basics ~ WSJT [2001]

Weak Signal Joe Taylor

Joe Taylor, K1JT, is a retired Princeton professor and a Nobel Prize in Physics: *(discovered a new type of pulsar)*

The original version was intended for

VHF/UHF communication

...and had many modes for different purposes.



FT8 Basics ~ WSJT-X [2017]

WSJT - *Experimental*

Added

JT9

Optimized for the LF, MF, and HF bands

QRA64

EME

MSK144

Meteor Scatter on the VHF bands

WSPR

Weak Signal Propagation Reporter:
probing potential propagation paths

FT8

**Targeted multi-hop sporadic E propagation on
6m and higher VHF**



FT8 Basics ~ WSJT-X [2017]

WSJT - *Experimental*

Added

JT9 Optimized for the LF, MF, and HF bands

QRA64 EME

MSK144 Meteor Scatter on the VHF bands

WSPR *Weak Signal Propagation Reporter:*
probing potential propagation paths

The popularity of FT8 on HF is largely a happy accident in that it fulfilled a latent frustration of many potential users of WSJT-X with the slow rate of QSOs using 1 minute T/R periods.

Email, 1/10/19, Bill Somerville, G4WJS (SK)



FT8 Basics ~ Sensitivity

From Joe Taylor, K1JT

Typical S/N (BW = 2500 Hz.):

SSB +10 dB

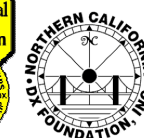
CW + 0 → - 10 dB

- 15 dB (good radio/ears)

FT8 - 21 dB (I often see -24 dB)

WSPR - 31 dB

More sensitive than CW!



FT8 Basics ~ Technically

Named for:

Steven Franke: K9AN & Joe Taylor: K1JT

An 8 tone -frequency shift keying format [FSK]

[1 baud = 3 bits]

15 Second T/R timing

Tone spacing: 6.25 Hz

50 Hz bandwidth

77 bit word + 14 bit CRC

→ $2^{77} = 151,115,727,451,828,646,838,272$
(about 1.5×10^{23}) possible messages



FT8 Basics ~ Operationally

- *Very structured syntax*
- *Maximum of 13 free form characters*
- *Both ends must use the same syntax*
- *Absolute minimum info to be “legal” QSO
— call sign / signal report [+grid]*



FT8 Basics ~ Operationally

- *Very structured syntax*
- *Maximum of 13 free form characters (TX5)*
- *Both ends must use the same syntax*

CQ W1DYJ FN42

W1DYJ W1XXX FN43

W1XXX W1DYJ SN

W1DYJ W1XXX R-SN

W1XXX W1DYJ RRR

W1DYJ W1XXX 73

TX6

TX1

TX2

TX3

TX4

TX5

Local Signal/Noise
ratio. NOT a
traditional signal
report

Don't confuse
S/N with a
signal report

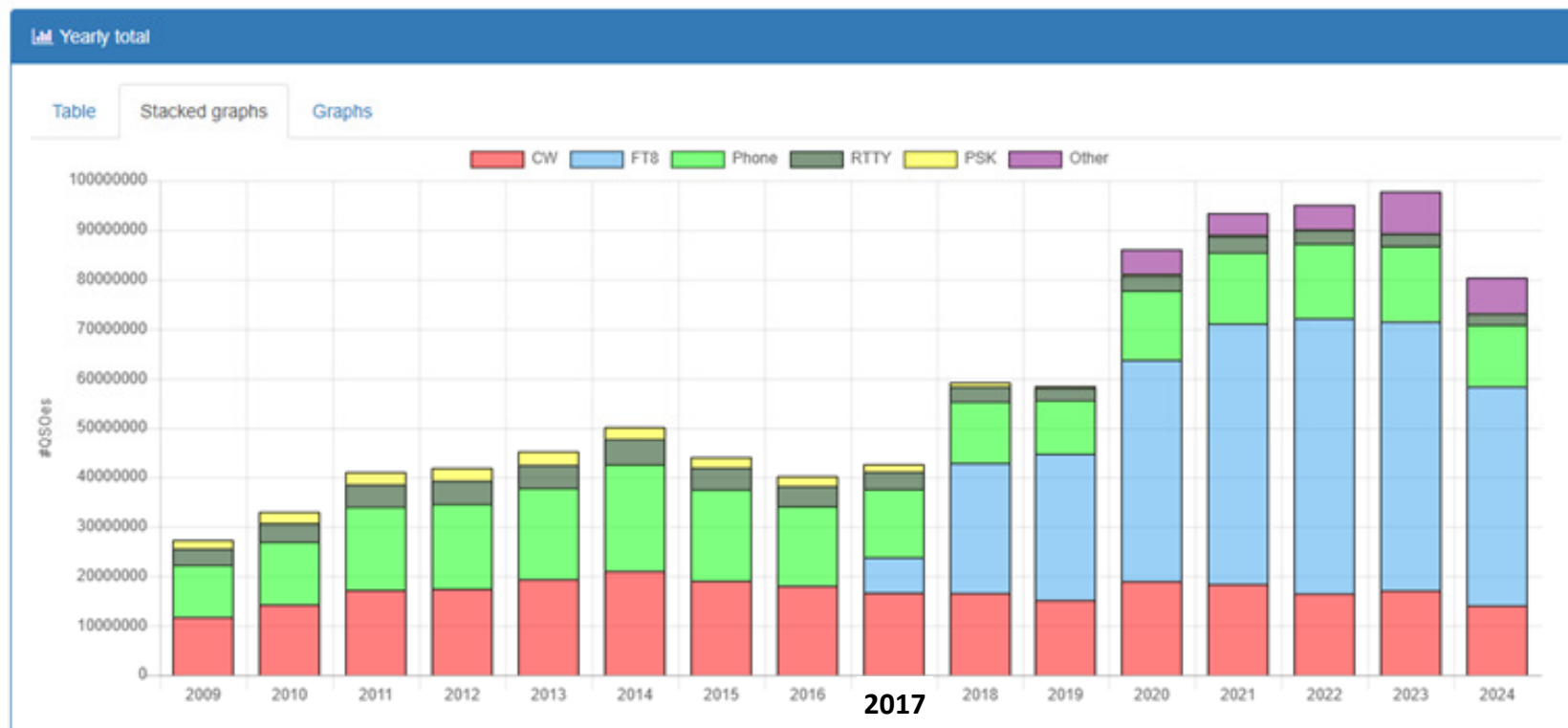
[or RR73]

Use if you don't expect a "73"

Can be customized [13 characters]



FT8 Basics ~ *Annual Growth* based on Club Log

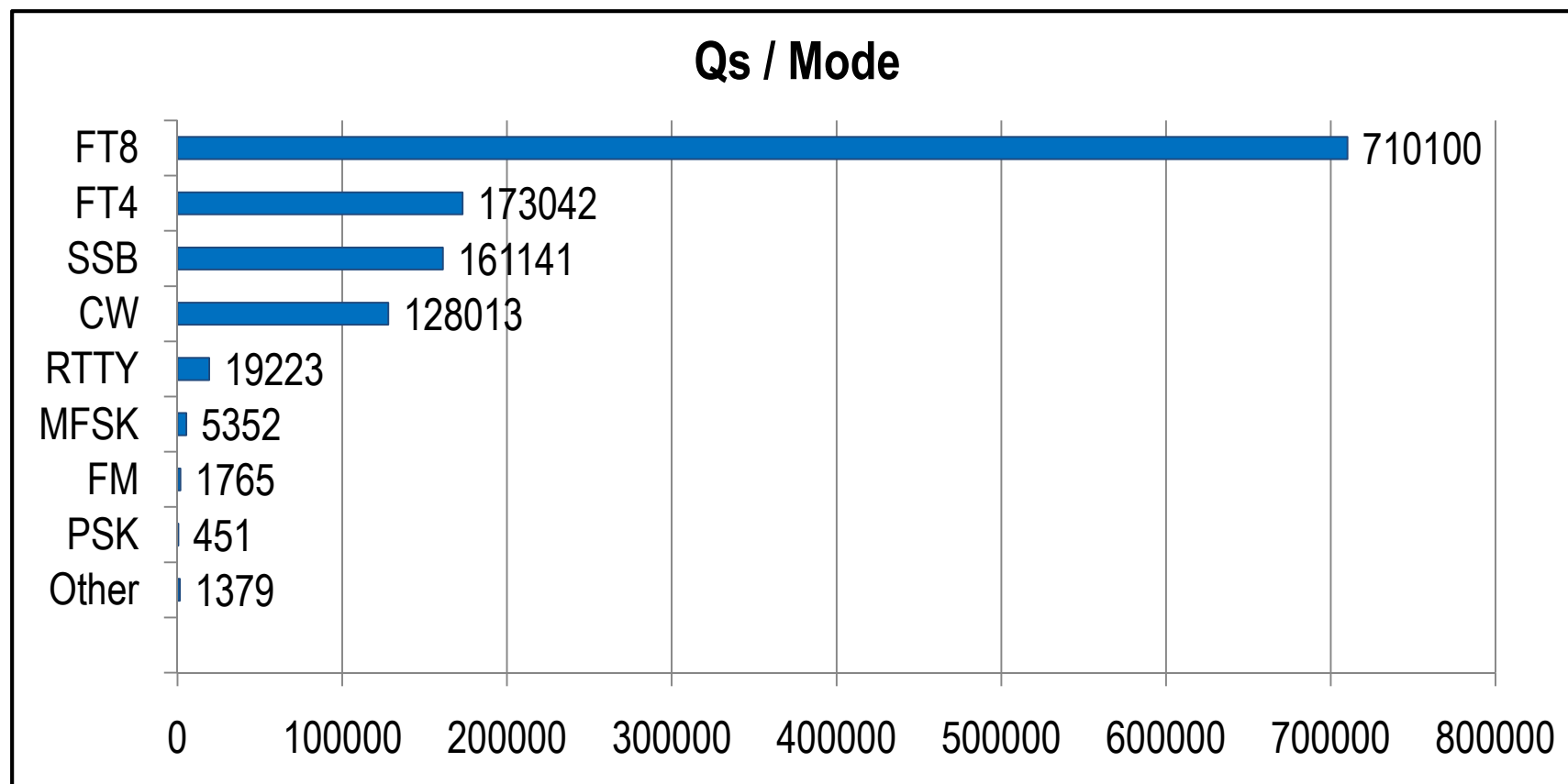


Mode statistics based on data from Club Log – from LA8AJA



FT8 Basics ~ A Single Day's Uploads to Club Log

For: 1 March 2025



Mode statistics based on data from Club Log – from K8TE



INDEXA

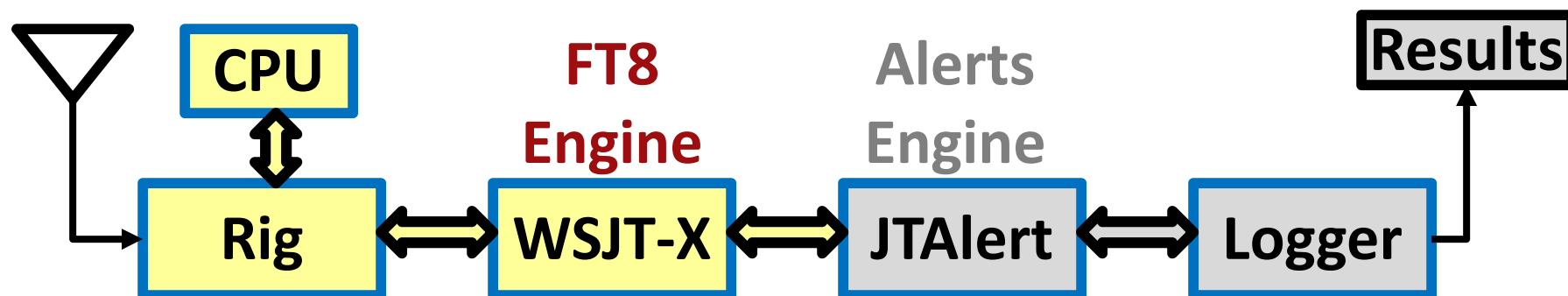
FT8 Basics ~ Why I do it

- ***Gave up on PSK years ago***
- ***Tried JT65 – slow!***
- ***FT8 is More Sensitive than CW***
 - ***Important for someone (like me) with MEAGER CW skills and WORSE typing skills***
- ***Makes running barefoot with homebrew antennas viable for DX***

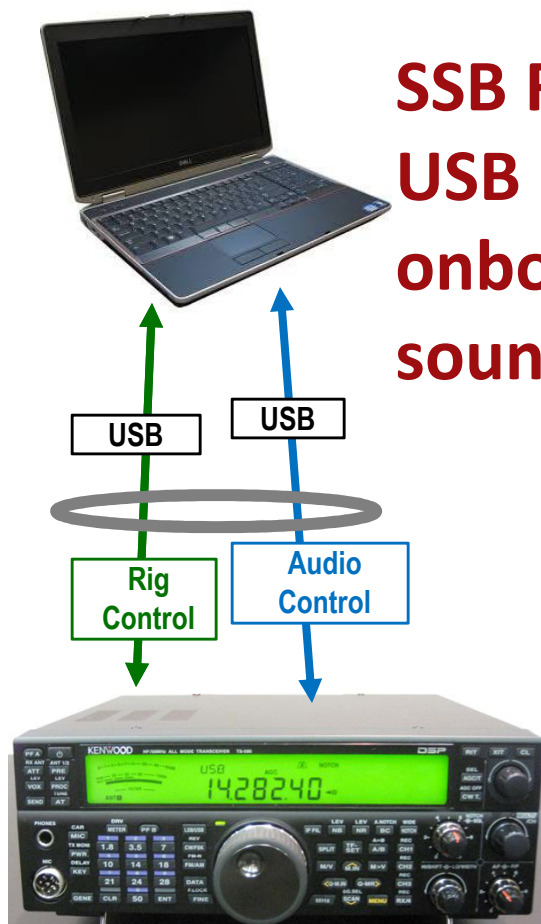


FT8 and JTAlert ~ Agenda

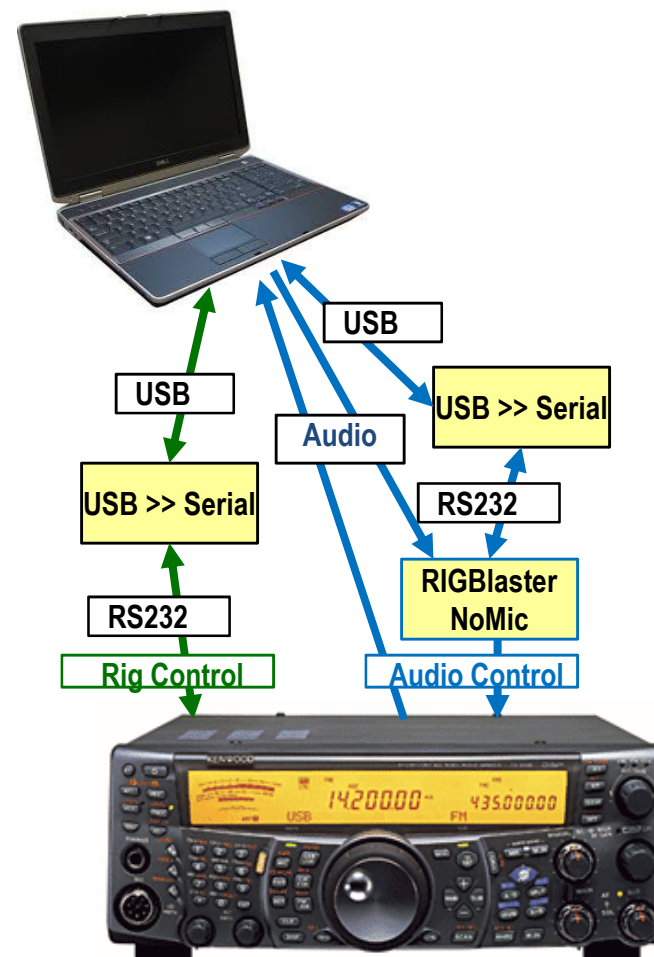
- Basics of WSJT-X & FT8
- HW / SW Setup
- JTAlert
- W1DYJ results



FT8 Setup ~ HW



**SSB Rig with
USB port and
onboard
soundcard**



Older Rig

SSB Rig in Upper Sideband



FT8 Setup ~ HW

Essentially the same as PSK31 or AFSK RTTY

Rig Setup

Transmitting

→ NO processing, **ALC ~0**, FLAT audio equalization

Receiving

→ NO noise reduction, FLAT response, full SSB BW

→ *Let the WSJT-X software do it's thing*

Rig Dependent



FT8 Setup ~ HW

Rig Setup — Receiving: *NO noise reduction, FLAT response, full SSB BW*

Some hams claim they see better S/N ration by limiting their received bandwidth. **NOT TRUE! It is apparent only.**

Joe Taylor, K1JT, 10 Dec 2023:

“This question has been asked and answered many times on this and similar forums. WSJT-X measures noise power by computing the spectrum of the receiver's output, averaged over the reception interval, and fitting a baseline to the regions that have no discernible signal present. The resulting value -- effectively a noise power density, or power per unit bandwidth -- is then scaled to yield noise power in 2500 Hz bandwidth.” “Do NOT use "noise reduction" features, and do NOT use a receiver bandwidth narrower than about 2.5 kHz. Wider bandwidths are even better, up to 4 or 5 kHz. WSJT-X does all necessary narrow-band filtering in software.”

Reino Tararmo, OH3Ma, 22 March 2025:

Also note that the receiver bandwidth should be wider than the waterfall bandwidth for a more accurate S/N calculations especially at the edges of the waterfall.



FT8 Setup ~ SW

Read the Fine Manual

RTFM!

You WILL NOT operate FT8 effectively if you don't.
I'm only covering a small portion of the application.

 Windows Clock

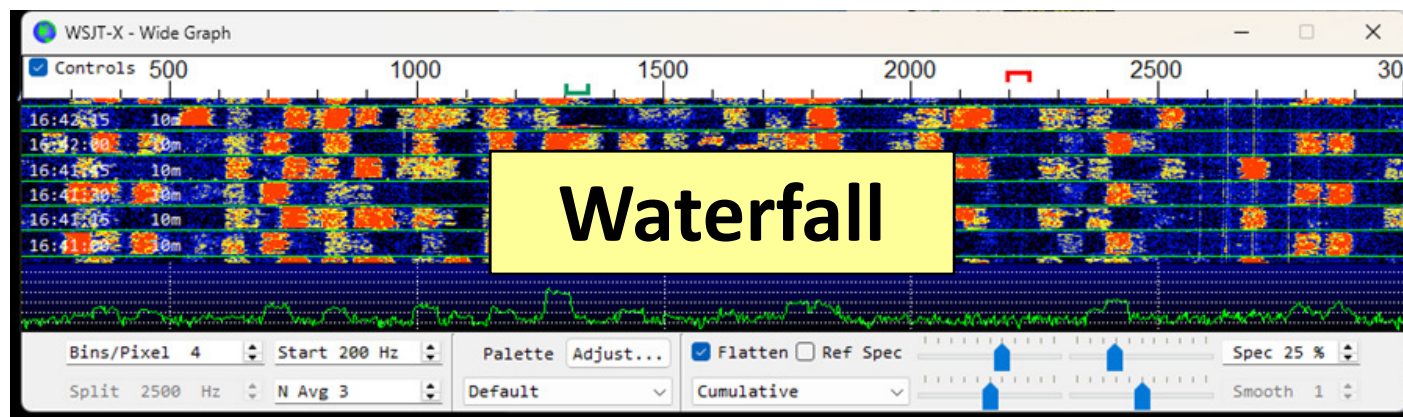
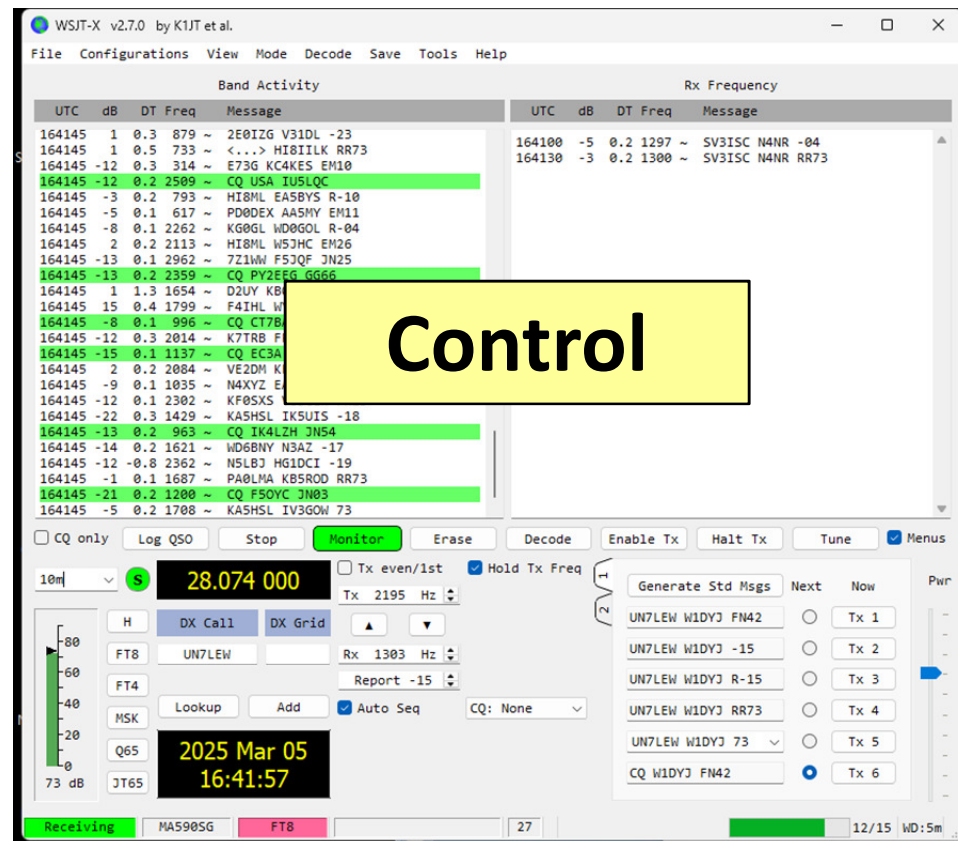
→ **Meinberg NTP**

[or GPS Dongle if no Internet]

Check your computer with: ["time.is"](http://time.is)



FT8 Setup ~ WSJT-X GUI

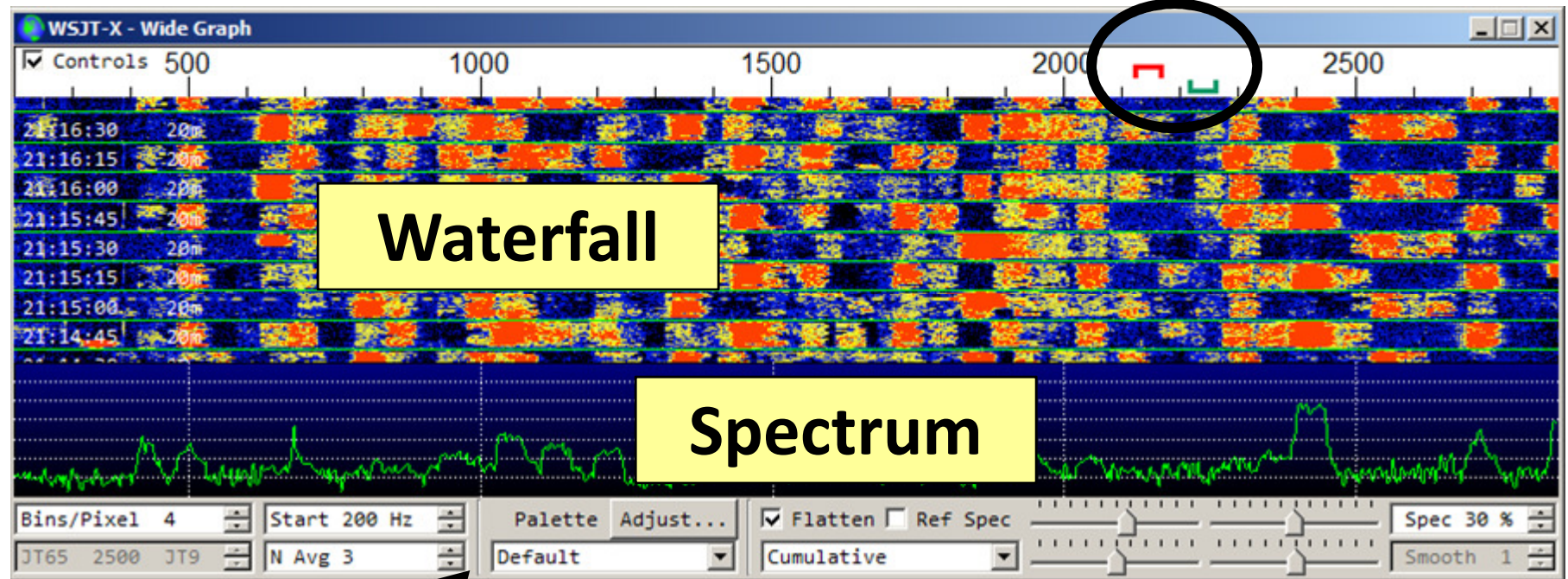


FT8 Setup ~ Waterfall

Your Frequencies

Transmit 

Current  Listening



Control Panel → *RTFM*



INDEXA

FT8 Setup ~ Control

WSJT-X v2.7.0 by K1JT et al.

File Configurations View Mode Decode Save Tools Help

UTC dB DT Freq Message

UTC	dB	DT	Freq	Message
165200	-11	0.1	1022	~ PY2RIO EA3NE R-13
165200	-6	0.1	2028	~ LU6EEG IZ3KVD 73
165200	-1	0.1	2539	~ EC3A EA2DR R-11
165200	-4	0.7	1167	~ CQ S53EO JN65
165200	-9	0.2	1638	~ N3AZ IK2SYK JN45
165200	7	0.1	1280	~ DO1PH W5XO -06
165200	0	0.1	1429	~ IK4LZH K4QAL 73
165200	-3	-0.0	2995	~ CQ WE6Z CM98
165200	-5	0.1	632	~ CQ EF5CR IM99
165200	3	-0.2	2860	~ CQ AA1SL EL95
165200	-10	0.1	573	~ OK1DTC KC0NSS R-04
165200	-18	0.1	2765	~ HB9DQK K0HUU -06
165200	0	0.1	1384	~ ZS4JAN K5VYT DM79
165200	-12	-0.5	837	~ CQ 9A4AA JN75
165200	-10	0.1	2862	~ O06P K0WMX DM79
165200	-18	0.1	2074	~ HC5CG I0UVP JN61
165200	-15	-0.0	536	~ CQ EA2EED IN72
165200	-16	0.3	1658	~ CQ D2UY JI64
165200	-12	-1.9	1617	~ KY4VC WP3RCA FK68
165200	-16	0.7	2024	~ PY5AMF EA4ZG R-14
165200	-20	0.1	1597	~ CQ DX KD7YOX DM41
165200	0	0.1	1767	~ V31DL EA2EWL IN91
165200	-5	0.2	1345	~ LU9XEK KC5ZBO EM12
165200	-6	0.3	1314	~ OH3NXW N4NR -12
165200	-4	-0.0	1328	~ EA7UW N4MTS +02

Rx Frequency

UTC	dB	DT	Freq	Message
164100	-5	0.2	1297	~ SV3ISC N4NR -04
164130	-3	0.2	1300	~ SV3ISC N4NR RR73
164200	0	0.2	1300	~ CQ POTA N4NR EL94
164530	6	0.3	1298	~ WD6BNY N4NR -16
164600	-8	0.2	1298	~ WD6BNY N4NR -16
164630	-9	0.2	1298	~ KD2BRV N4NR +06
164700	0	0.3	1301	~ KD2BRV N4NR RR73
164715	-22	0.0	1307	~ HK3X 9A1AM JN75
164730	-2	0.3	1302	~ CQ POTA N4NR EL94
164800	-5	0.3	1302	~ CQ POTA N4NR EL94
164830	-6	0.3	1302	~ CQ POTA N4NR EL94
164900	-4	0.3	1304	~ N5SLY N4NR +07
164930	-1	0.3	1305	~ N5SLY N4NR RR73
165030	-2	0.3	1313	~ F4ACR N4NR -08

☐ CQ only
 ☐ Log QSO

☒ Menus

10m ☒ S **28.074 000**
☐ Tx even/1st ☒ Hold Tx Freq
 Tx 2195 Hz
 Rx 1303 Hz
 Report -15
☒ Auto Seq CQ: None

H
 FT8 UN7LEW
 FT4
 MSK
 Q65
 JT65

2025 Mar 05 16:52:17
Setup

Receiving MA590SG FT8 29

Generate Std Msgs Next Now Pwr
 UN7LEW W1DYJ FN42 ☐ Tx 1
 UN7LEW W1DYJ -15 ☐ Tx 2
 UN7LEW W1DYJ R-15 ☐ Tx 3
 UN7LEW W1DYJ RR73 ☐ Tx 4
 UN7LEW W1DYJ 73 ☐ Tx 5
 CQ W1DYJ FN42 ☒ Tx 6

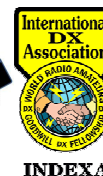
All Signals in Waterfall

What you are listening to

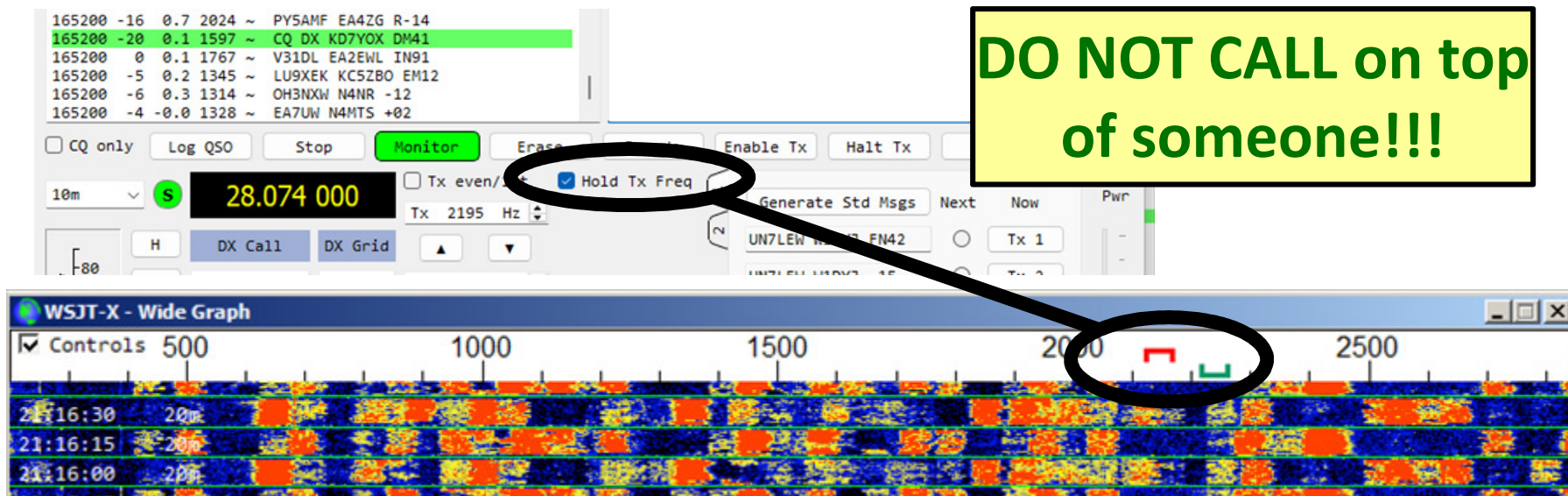
Clicking on CQ call
→ starts Xmit

Predefined Messages

TX5
"13 characters"



FT8 Setup ~ Control: HOLD TX FREQ

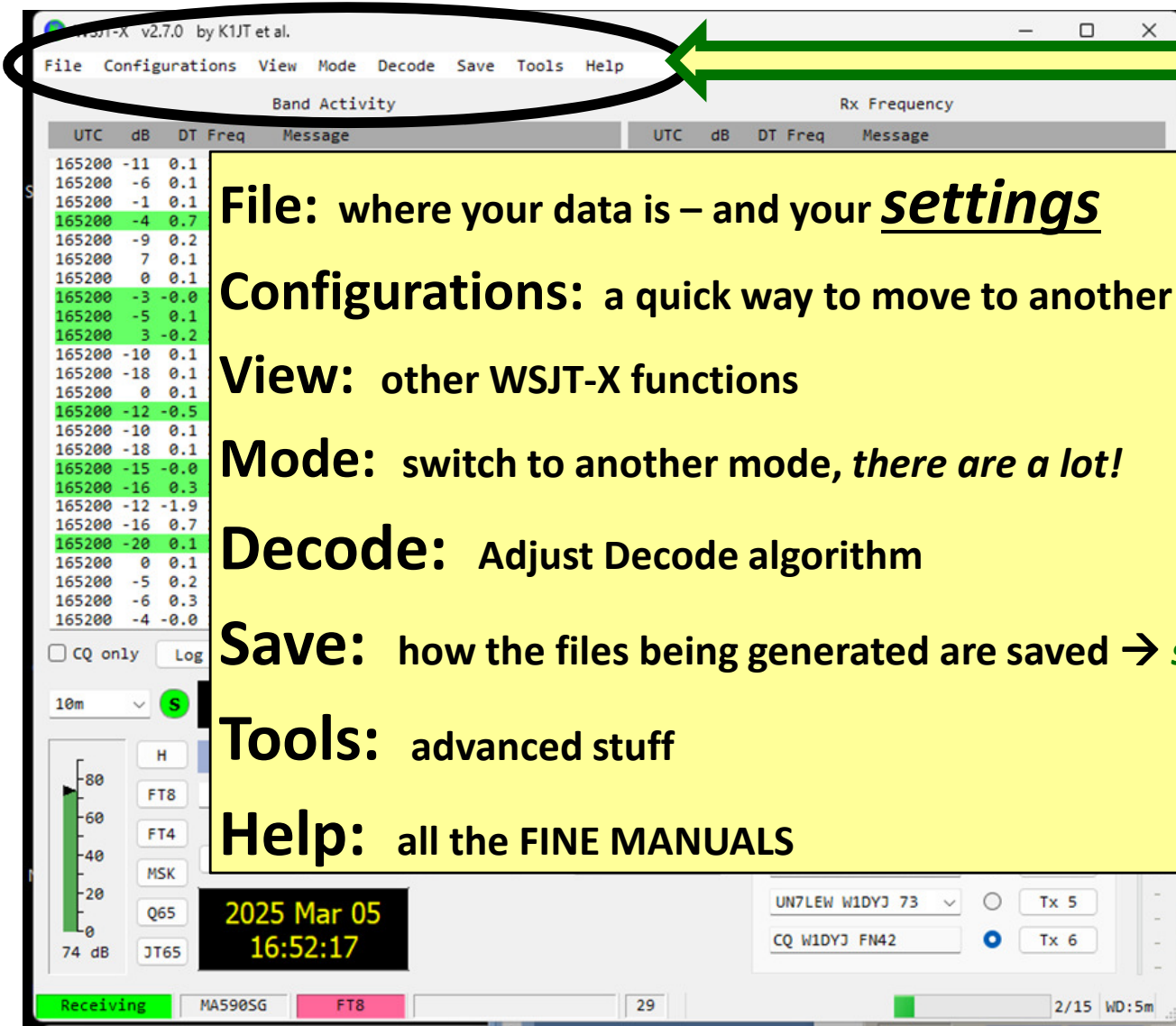


To avoid QRM from competing callers, it is usually best to answer a CQ on a different frequency from that of the CQing station. The same is true when you tail-end another QSO. Choose a Tx frequency that appears to be not in use. *From the Fine WSJT-X manual*



FT8 Setup ~ Control Options

RTFM



File: where your data is – and your settings

Configurations: a quick way to move to another rig or major mode shift

View: other WSJT-X functions

Mode: switch to another mode, *there are a lot!*

Decode: Adjust Decode algorithm

Save: how the files being generated are saved → *split ALL.TXT monthly*

Tools: advanced stuff

Help: all the FINE MANUALS



FT8 Setup ~ *General settings*

“F2”

From
main
menu:
**FILE >>
Settings**

Settings

General Radio Audio Tx Macros Reporting Frequencies Colors Advanced

Station Details

My Call: W1DYJ My Grid: FN42KL ☐ AutoGrid IARU Region: Region 2

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: 5 minutes

Periodic CW ID Interval: 0

OK Cancel

Display

Behavior



FT8 Setup ~ Radio settings

“F2”

CAT
Control

Settings

General Radio Audio Tx Macros Reporting Frequencies Colors Advanced

Rig: Kenwood TS-590SG Poll Interval: 1 s

CAT Control

Serial Port: COM4

Serial Port Parameters

Baud Rate: 9600

Data Bits

☐ Default ☐ Seven ☒ Eight

Stop Bits

☐ Default ☐ One ☒ Two

Handshake

☐ Default ☒ None ☐ XON/XOFF ☐ Hardware

Force Control Lines

DTR: Low RTS: High

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: Hamlib 4.6-git 2024-12-04T23:15:35Z SHA=be045d 64-bit

PTT Method

☐ VOX ☐ DTR ☒ CAT ☐ RTS

Port: COM27

Transmit Audio Source

☒ Rear/Data ☐ Front/Mic

Mode

☒ None ☐ USB ☐ Data/FM

Split Operation

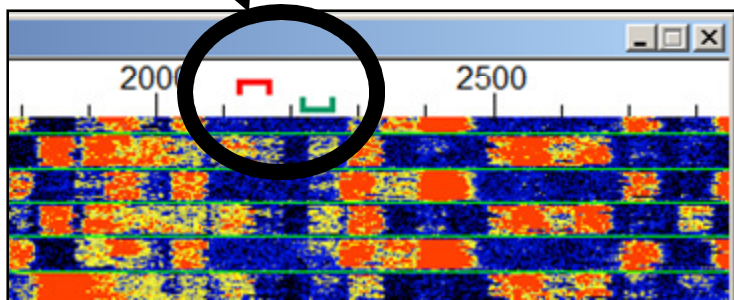
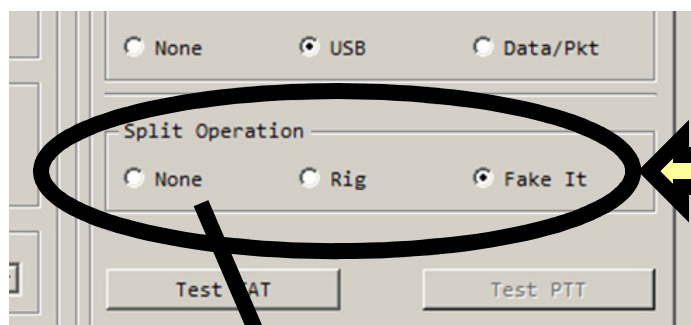
☐ None ☐ Rig ☒ Fake It

Test CAT Test PTT

OK Cancel



FT8 Setup ~ *Radio settings: Fake It*



Moves the RF and Audio frequencies in opposite directions, resulting in a cleaner transmitted signal. It keeps the Tx audio always in the range **1500 to 2000 Hz**, where the audio pass band is flat, and puts audio harmonics above the audio pass band.

20M – audio @ 2120 Hz:

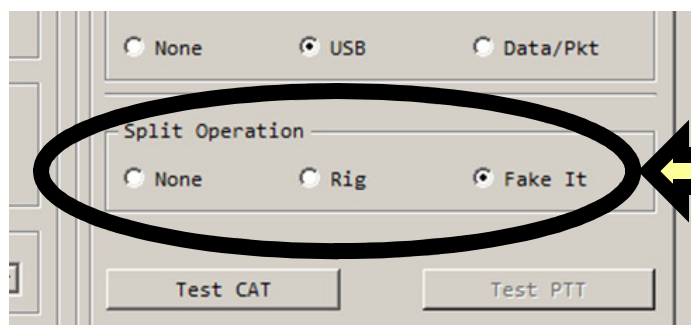
$$14074.00 + 2.120 = 14076.12$$

With Fake It:

$$14074.50 + 1.620 = 14076.12$$

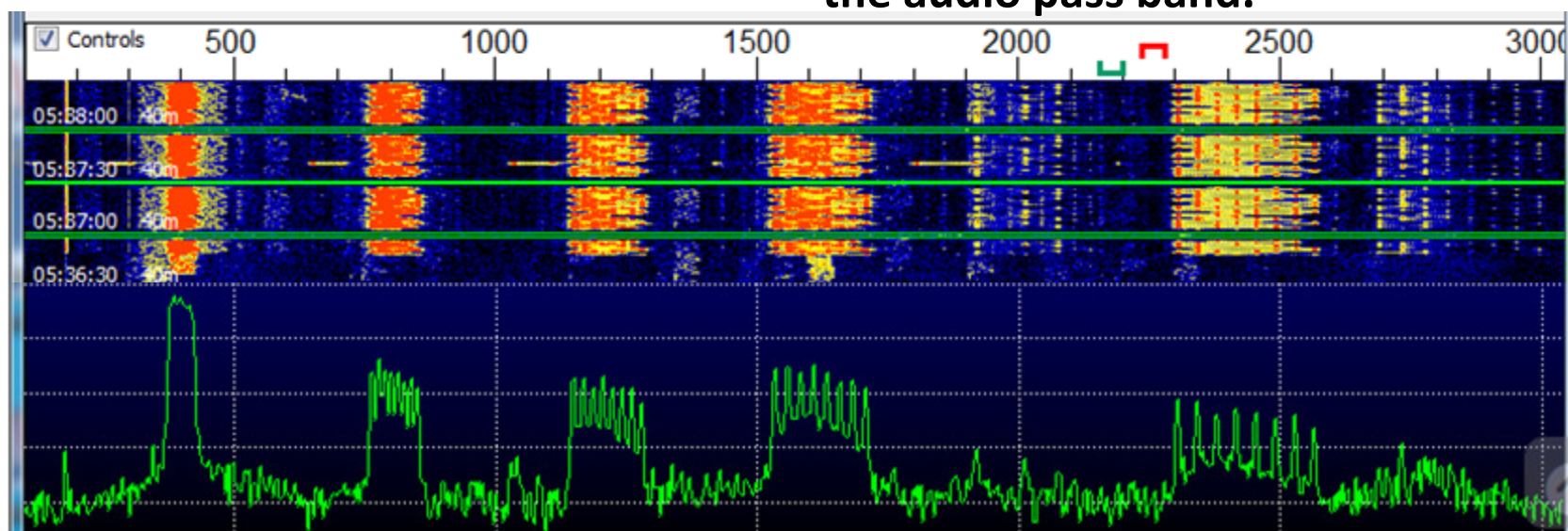


FT8 Setup ~ *Radio settings: Fake It*



Moves the RF and Audio frequencies in opposite directions, resulting in a cleaner transmitted signal. It keeps the Tx audio always in the range **1500 to 2000 Hz**, where the audio pass band is flat, and puts audio harmonics above the audio pass band.

Audio = 400 Hz.



Vastly over modulated and bad harmonics

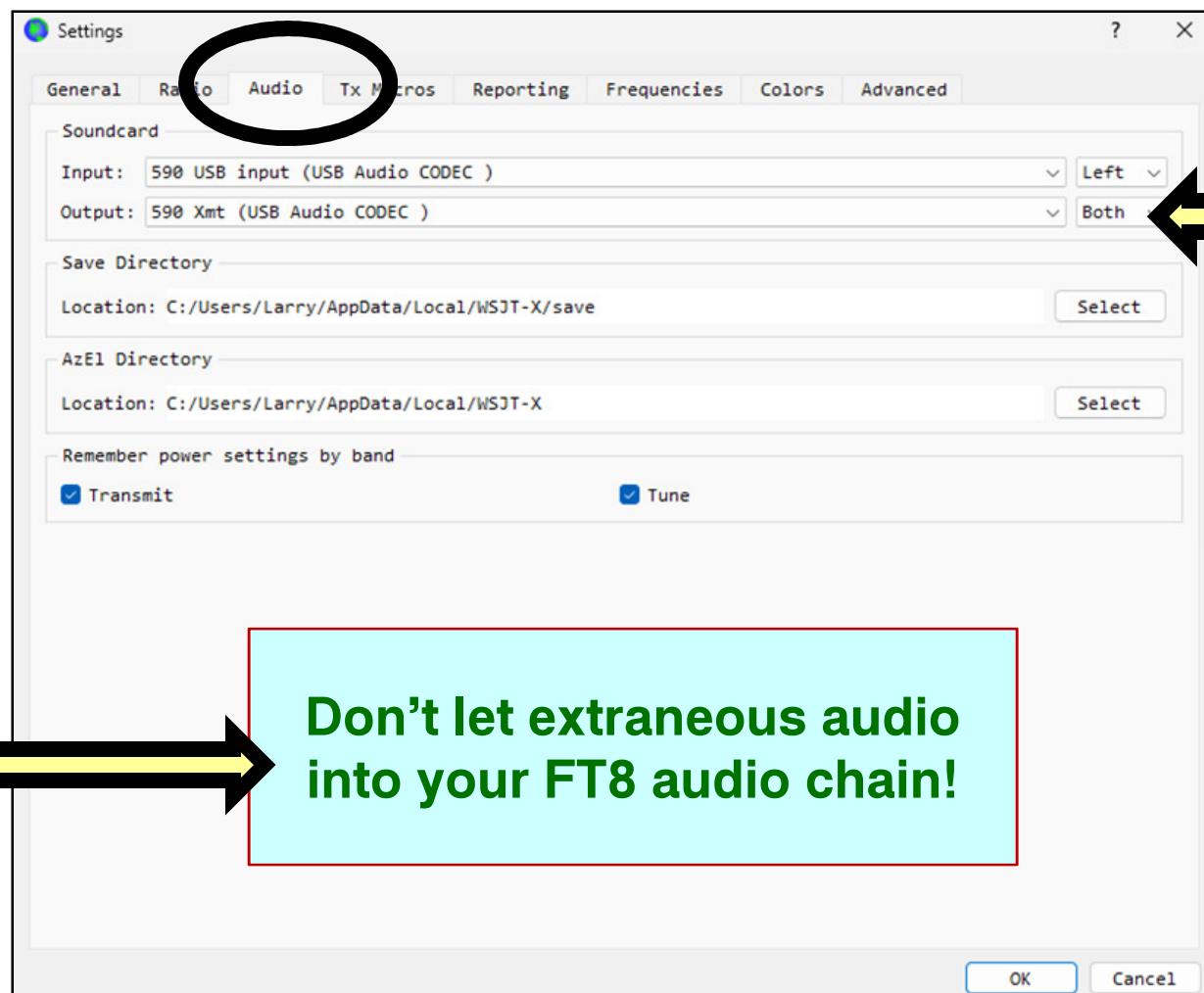


FT8 Setup ~ *Audio settings*

“F2”

Configure
audio
device for
48000 Hz,
16 bits

DO NOT
USE the
windows
default
device



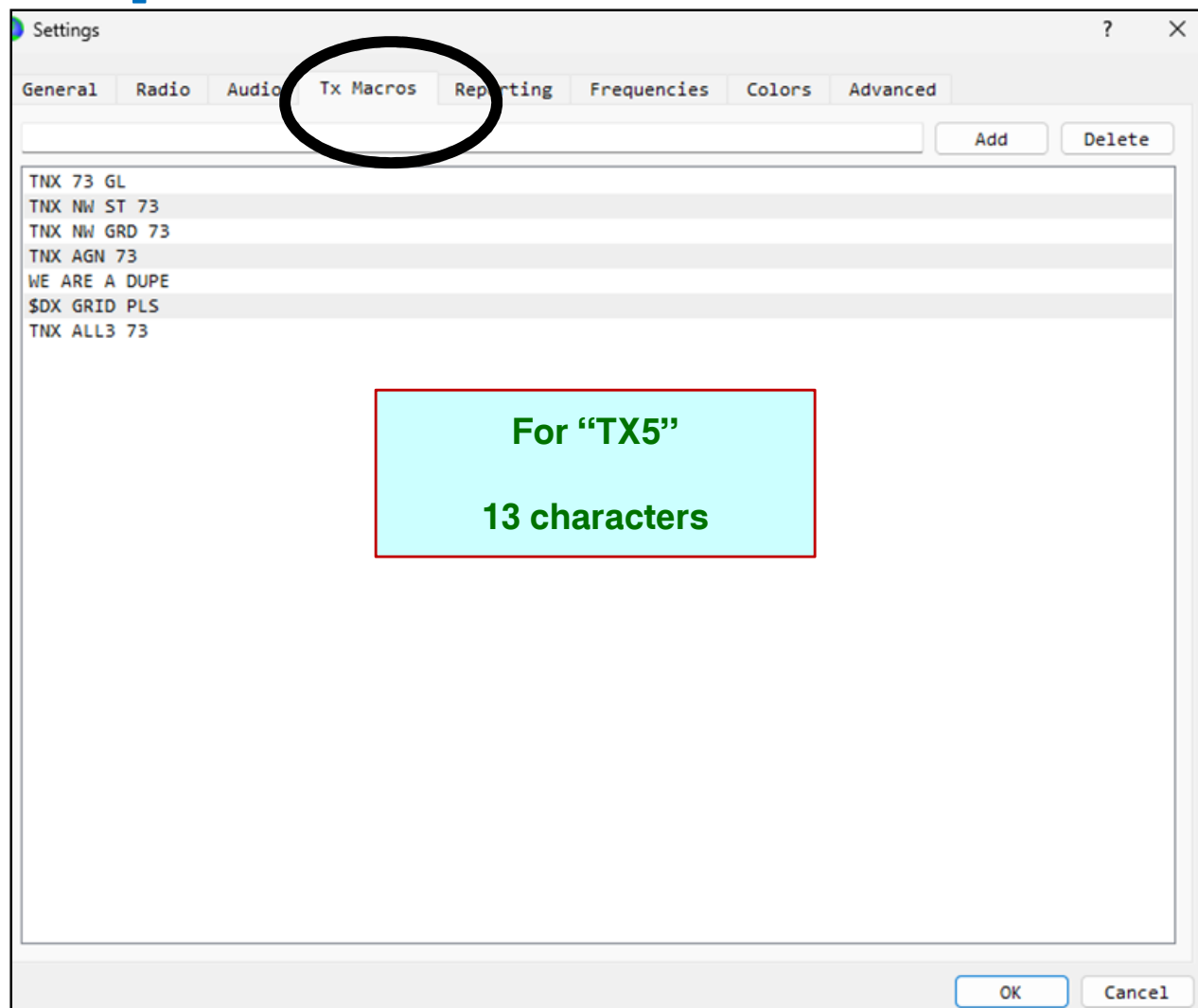
Audio
I/O

Don't let extraneous audio
into your FT8 audio chain!



FT8 Setup ~ TX5 Macros

“F2”



FT8 Setup ~ Reporting

“F2”

The screenshot shows the 'Settings' window with the 'Reporting' tab selected. The 'Logging' section includes options for logging QSOs, RTTY, and comments. The 'Network Services' section includes options for PSK Reporter Spotting and UDP Server settings. The 'UDP Server' section includes fields for IP address, port number, and outgoing interfaces, along with checkboxes for accepting UDP requests and notifying on accepted requests. The 'Secondary UDP Server' section is deprecated and includes fields for server name or IP address and port number.

Logging

- ☒ Prompt me to log QSO
- ☐ 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
- UDP Server port number: 2237
- Outgoing interfaces: loopback_0
- Multicast TTL: 1
- ☒ Accept UDP requests
- ☒ Notify on accepted UDP requests
- ☒ 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

UDP data



INDEXA

FT8 Setup ~ Frequencies

“F2”

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	Pref	Description	Start Date/Time	End Date/Time
All	WSPR	0.136 000 MHz (2190m)	<input type="checkbox"/>			
All	JT65	0.136 130 MHz (2190m)	<input type="checkbox"/>			
All	JT9	0.136 130 MHz (2190m)	<input type="checkbox"/>			
Region 1	FreqCal	0.198 000 MHz (OOB)	<input type="checkbox"/>			
All	JT65	0.474 200 MHz (630m)	<input type="checkbox"/>			
All	JT9	0.474 200 MHz (630m)	<input type="checkbox"/>			
All	WSPR	0.474 200 MHz (630m)	<input type="checkbox"/>			
Region 2	FreqCal	0.660 000 MHz (OOB)	<input checked="" type="checkbox"/>			

Customize frequencies

Station Information

Band	Offset	Antenna Description
160m	0.000 000 MHz	dipole @ 25ft
80m	0.000 000 MHz	dipole @ 25ft
40m	0.000 000 MHz	dipole @ 25ft
30m	0.000 000 MHz	dipole @ 25ft
20m	0.000 000 MHz	moxon rectangle @ 36ft
17m	0.000 000 MHz	15m dipole @ 33ft
15m	0.000 000 MHz	15m dipole @ 33ft
12m	0.000 000 MHz	15m dipole @ 33ft

Set up your station info

OK Cancel



FT8 Setup ~ Colors

“F2”

Settings

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

Decode Highlighting

- ☐ New Continent on Band [f/g unset]
- ☐ New CQ Zone [f/g unset]
- ☐ New CQ Zone on Band [f/g unset]
- ☐ New ITU Zone [f/g unset]
- ☐ New ITU Zone on Band [f/g unset]
- ☐ New DXCC [f/g unset]
- ☐ New DXCC on Band [f/g unset]
- ☐ New Grid [f/g unset]
- ☐ New Grid on Band [f/g unset]
- ☐ New Call [f/g unset]
- ☐ New Call on Band [f/g unset]
- ☐ LoTW User [b/g unset]
- ☒ CQ in message [f/g unset]
- ☒ Transmitted message [f/g unset]

Reset Highlighting

☐ Highlight by Mode Rescan ADIF Log

☐ Only grid Fields sought

☐ Include extra WAE entities

☐ Highlight also messages with 73 or RR73

Logbook of the World User Validation

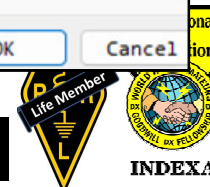
Users CSV file URL: Fetch Now

Age of last upload less than: Loaded 124164 records from LotW.

CTY File Download

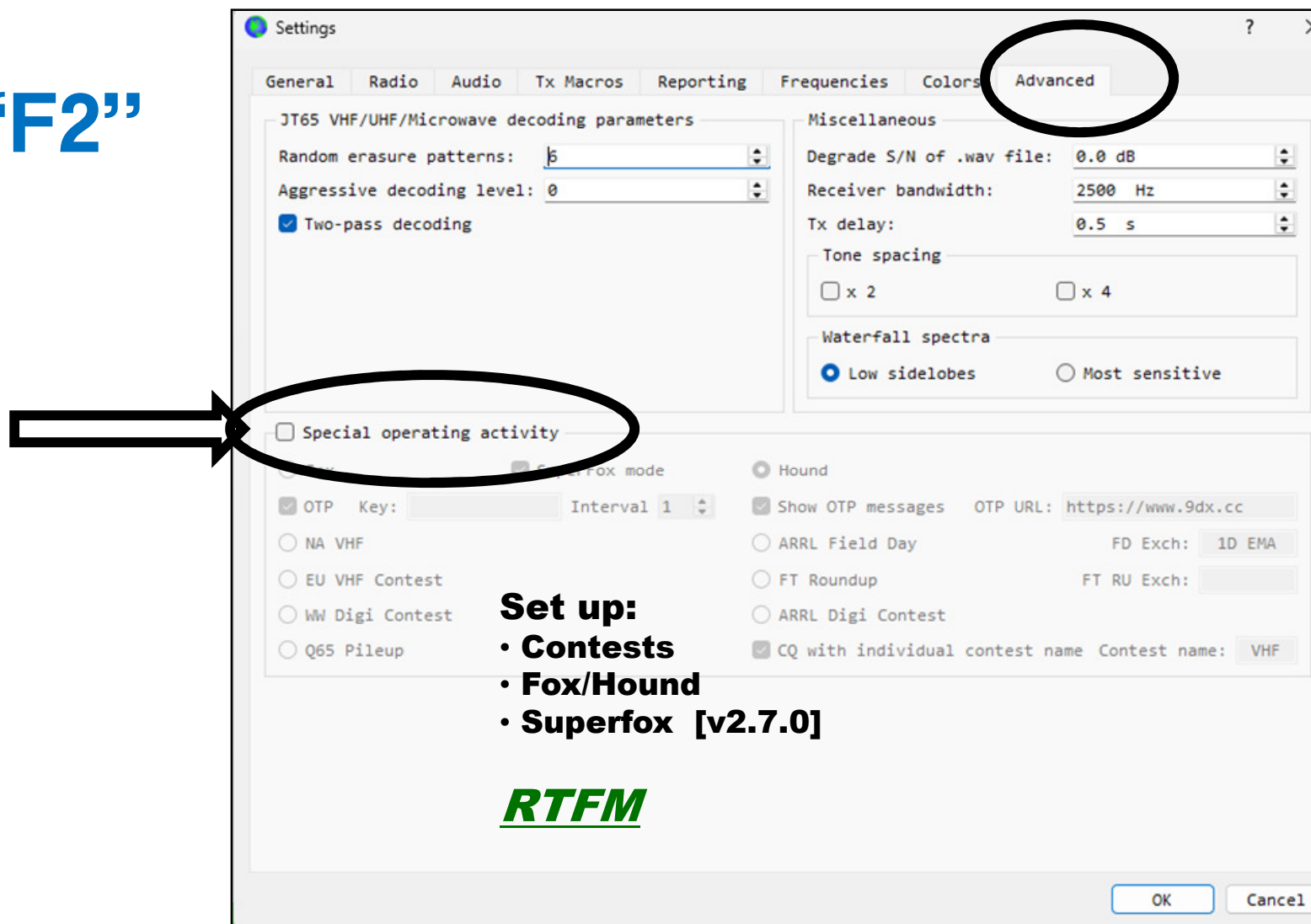
CTY File Version: VER20250115 Download Latest CTY.dat

OK Cancel



FT8 Setup ~ Advanced

“F2”



Set up:

- Contests
- Fox/Hound
- Superfox [v2.7.0]

RTFM



INDEXA

FT8 Setup ~ Advanced

There
are
some
Clones:

WSJT
Improved

MSHV

JTDX

Settings

General Radi

JT65 VHF/UHF/

Random erasure

Aggressive de

☒ Two-pass d

☐ Special

☐ Fox

☒ OTP Key:

☐ NA VHF

☐ EU VHF Con

☐ WW Digi Co

☐ Q65 Pileup

UTC	dB	DT	Freq	Message
005130	-11	0.1	1528	~ VE3USP IZ6FKI JN72
005230	-8	0.1	1528	~ VE3USP IZ6FKI R-10
005230	-12	0.8	1532	~ CQ AB4KK EM90
005230	1	0.1	772	~ TA4RC ZF200 -17
005252	Tx		2116	~ ZF200 W1DYJ FN42
005300	-5	0.1	772	~ N2UVU ZF200 RR73
005315	Tx		2116	~ ZF200 W1DYJ FN42
005330	2	0.1	771	~ N2UVU ZF200 RR73
005345	Tx		2116	~ ZF200 W1DYJ FN42
005400	-3	0.5	772	~ DL7PIA RR73; SV1JFL <ZF200> -1
005415	Tx		2116	~ ZF200 W1DYJ FN42
005400	-24	0.0	476	~
005430	-19	0.0	477	~
005445	Tx		2116	~
005515	Tx		2116	~
005545	Tx		2116	~
005615	Tx		2116	~ D68Z W1DYJ FN42

Two responses on one line indicate a Fox/Hound or similar operation.

• Superfox [v2.7.0]

RTFM

OK Cancel



INDEXA

FT8 Setup ~ *Special Call Signs*

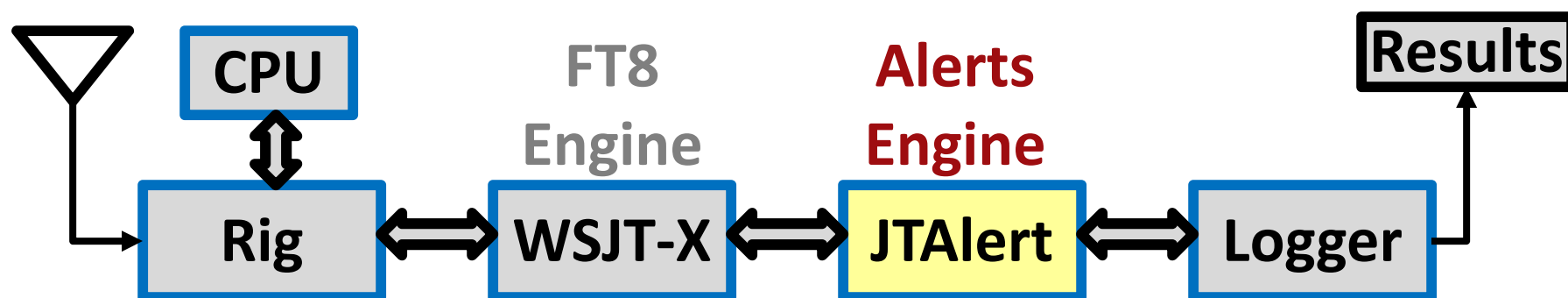
<...> represents a call Sign that is not yet decoded, or a Call Sign that doesn't fit the specified format.

160630	2	-0.0	619	~	N1MCJ S51XA	RR73
160630	-11	0.5	2872	~	CQ HA7EC	JN97
160630	-5	0.1	1743	~	N9QPI S14ZM	JN64
160630	-14	0.1	1182	~	<...> N1LW	-13
160630	-10	0.2	2262	~	CQ N6TBY	CM99
160630	-11	-0.8	2825	~	CQ DL1FTY	JO62
160630	-24	0.2	2183	~	CQ M0SAC	JO01
160630	-3	-0.2	629	~	AC9HP F5KSE	-22
160630	-12	0.2	727	~	WP4PRD KC0BLK	-06
160630	-18	0.2	570	~	CQ G8KHF	IO92
160630	-13	0.1	2640	~	CO9JAB KB9QDI	EM79
160630	-15	0.4	1047	~	ZS1M S05DT	58
160630	-2	0.6	1417	~	LA8ATA <...>	-19
160630	-24	0.2	2627	~	W9DHS PD1RMB	JO32
160630	-22	0.1	910	~	VE1JCC DL1DEU	R+09
160630	-20	0.1	1717	~	<...> ON100A	RR73
160630	-6	-0.3	1404	~	DG5TF HP1SEB	RR73



FT8 and JTAlert ~ Agenda

- Basics of WSJT-X & FT8
- HW / SW Setup
- JTAlert
- W1DYJ results



INDEXA

FT8 and JTAlert ~ JTAlert

JTAlert

Integrates with WSJT-X

and

Provides Real Time Audio & Visual Alerts

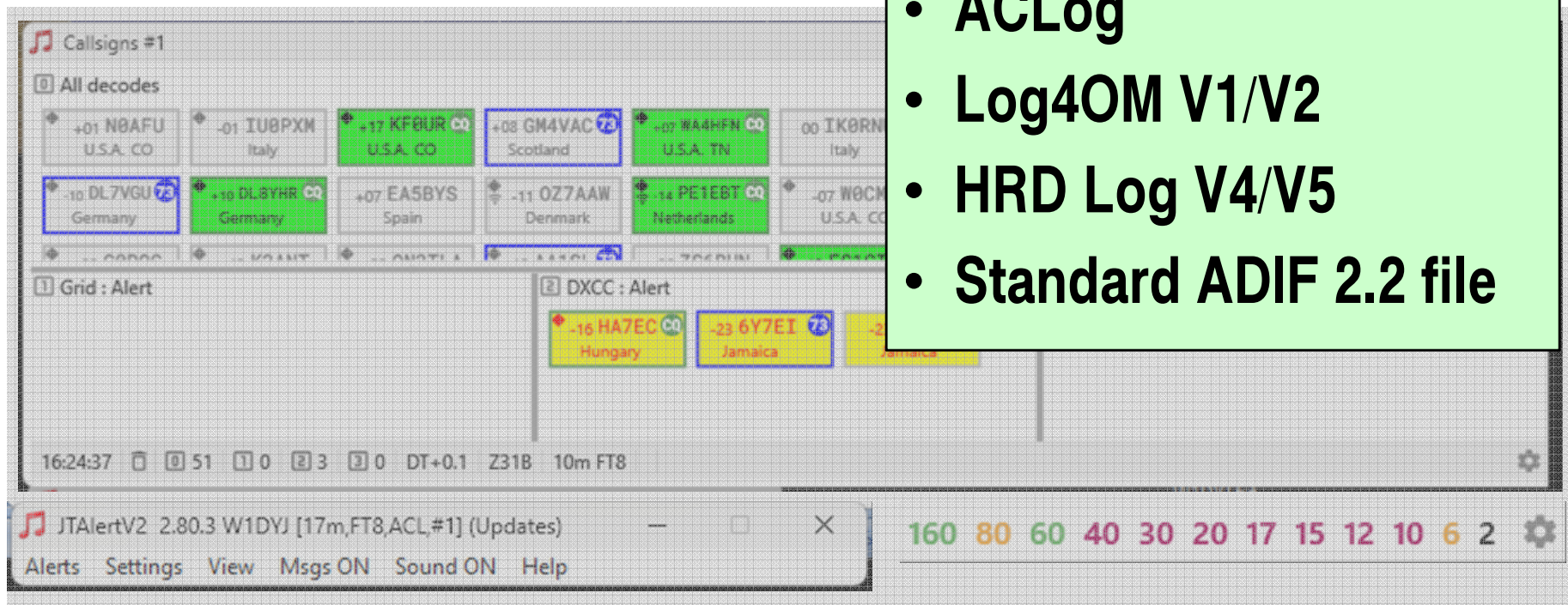
My personal preference for integrating WSJT
with my logger (ACLog from N3FJP)

I know nothing about GridTracker



Compatible Loggers

- DXKeeper
- ACLog
- Log4OM V1/V2
- HRD Log V4/V5
- Standard ADIF 2.2 file

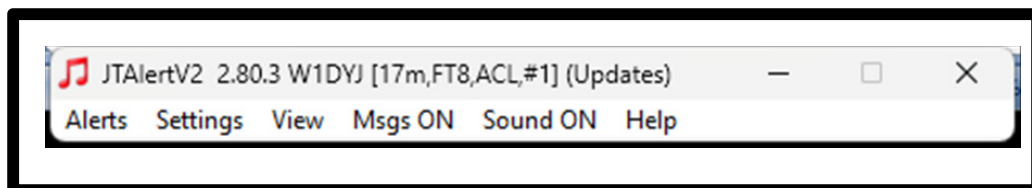
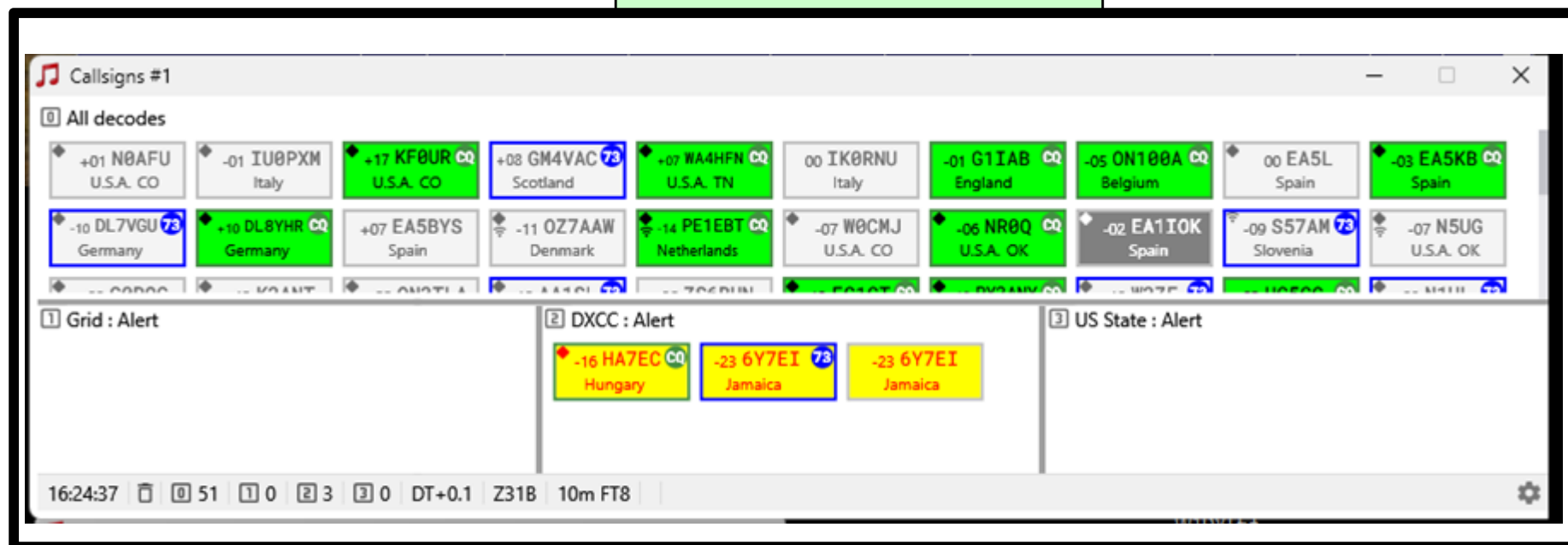


Real Time Audio & Visual Alerts.

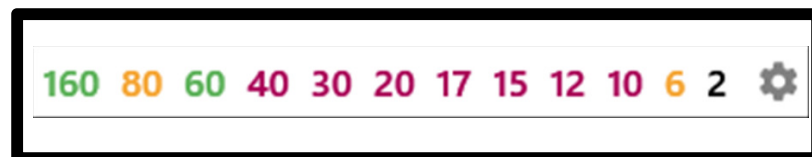


JTAlert ~ The Windows I Use

Callsigns Window



Control Window



Bandheat Window



JTAlert ~ Callsigns Windows

The screenshot shows the JTAlert 'Callsigns #1' window. It features a grid of call sign tiles, each with a color-coded background and a small icon. Annotations include:

- CQ**: An arrow pointing to the top-left tile (+01 N0AFU U.S.A. CO).
- 73**: An arrow pointing to the top-right tile (+03 EA5KB CO).
- Grid : Alert**: A circle around the 'Grid : Alert' button in the bottom-left.
- Subpanels**: A green box with the text 'Subpanels' pointing to the bottom section of the window.
- LoTW "flag"**: An arrow pointing to a small flag icon on a tile (+19 JA7EC CO).
- New DXCC**: An arrow pointing to a tile (+23 6Y7EI 73) with a blue border.
- Worked "B4"**: An arrow pointing to a tile (+02 EA1IOK CO) with a blue border.

The window also displays a status bar at the bottom with various indicators like '16:24:37', '51', '0', '3', '0', 'DT+0.1', '231B', and '10m FT8'.

Clicking on a call → Sets up WSJT-X

Also has Voice Annunciations: [DX](#) [New State](#) [Calling You](#)



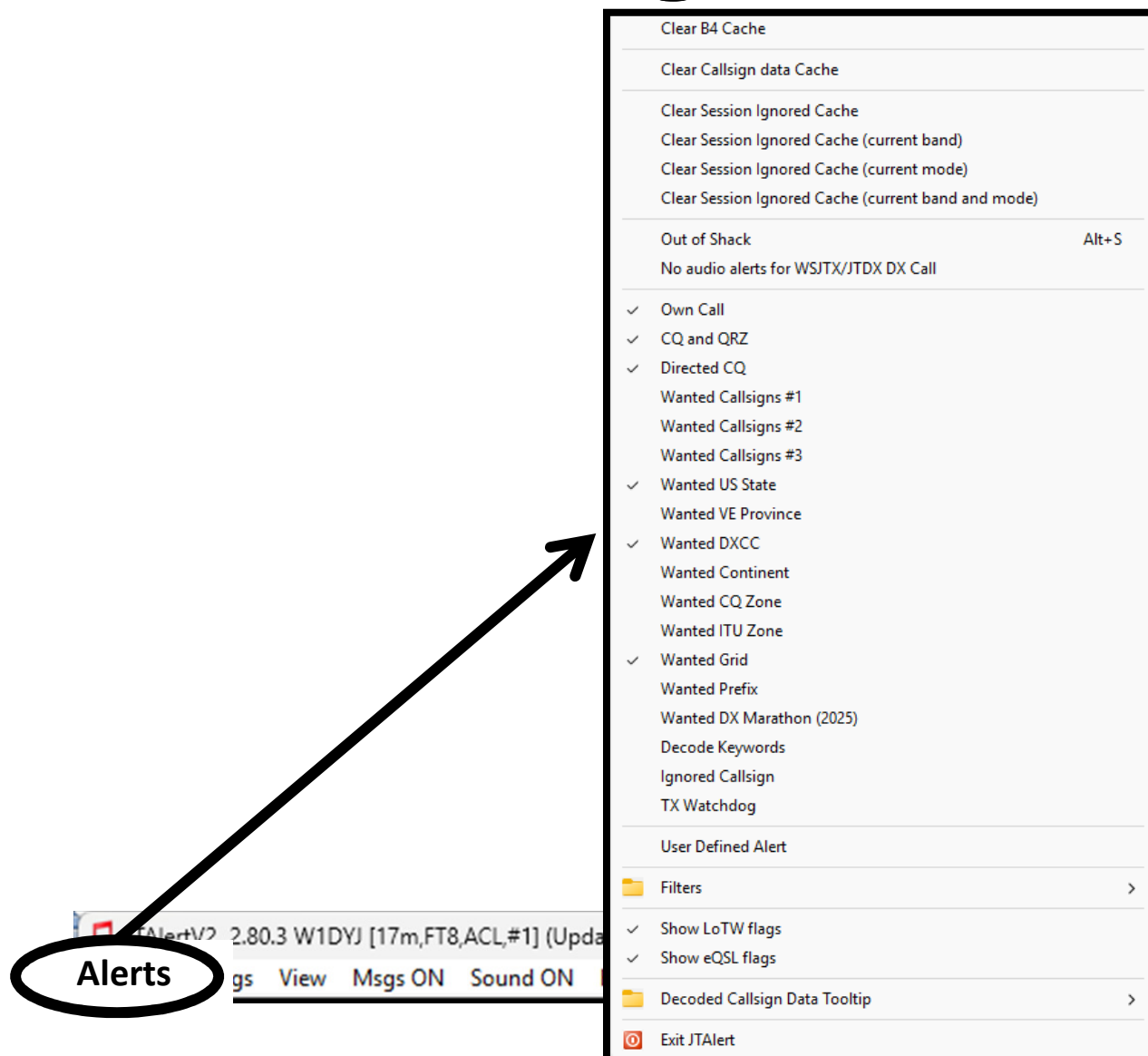
JTAlert ~ *Alert Types*

Audio and visual alerts for several alert conditions

- Your Callsign decoded (someone calling you)
- CQ
- Wanted Callsign
- All below by Band/Mode
 - Prefix
 - Grid
 - US State
 - VE Province
 - DXCC
 - CQ Zone
 - Continent
 - CQ Marathon

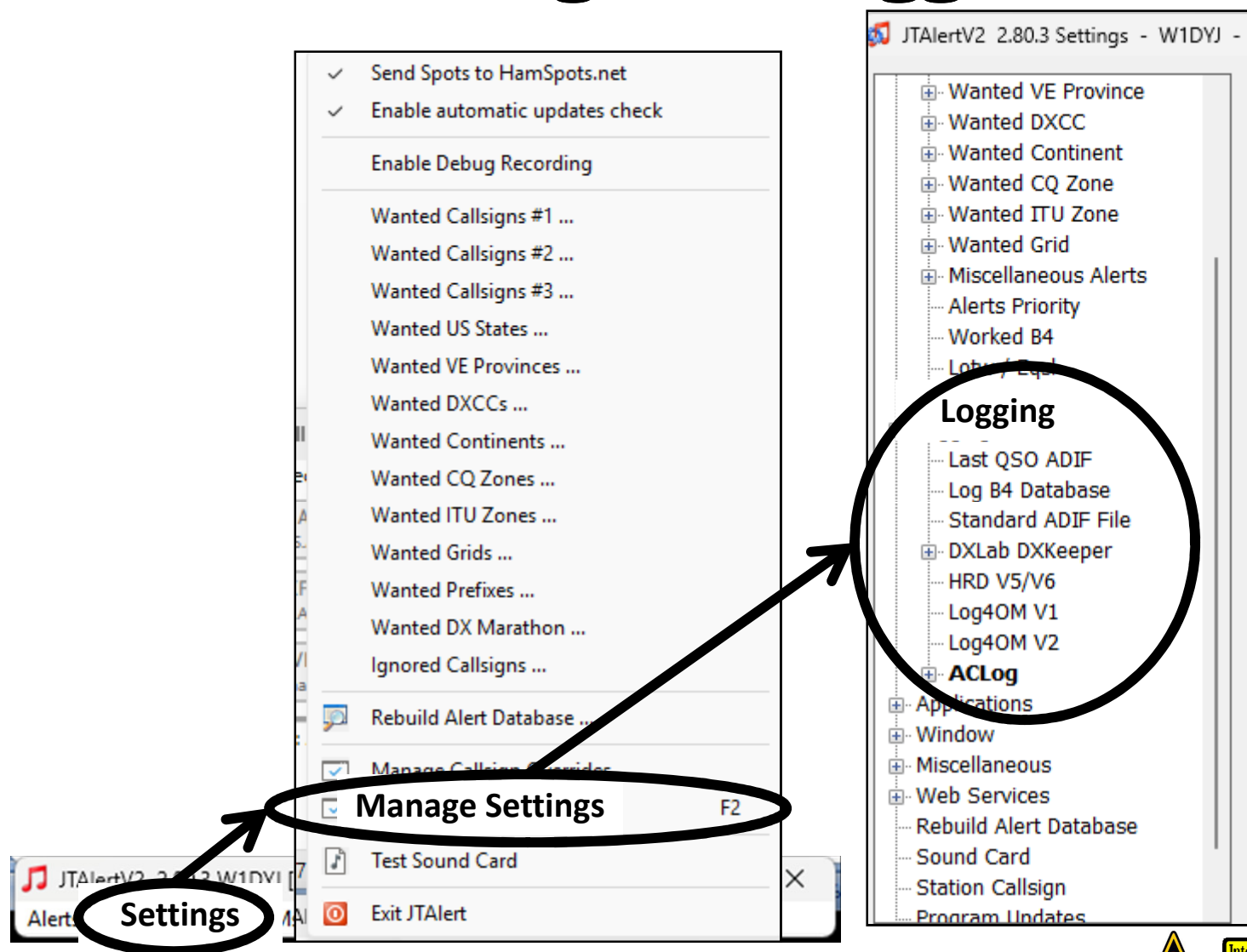


JTAlert ~ Selecting Alerts



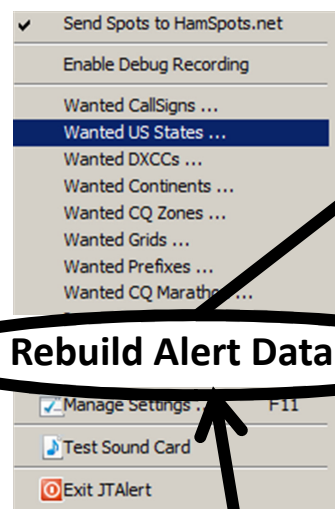
INDEXA

JTAlert ~ Selecting Your Logger



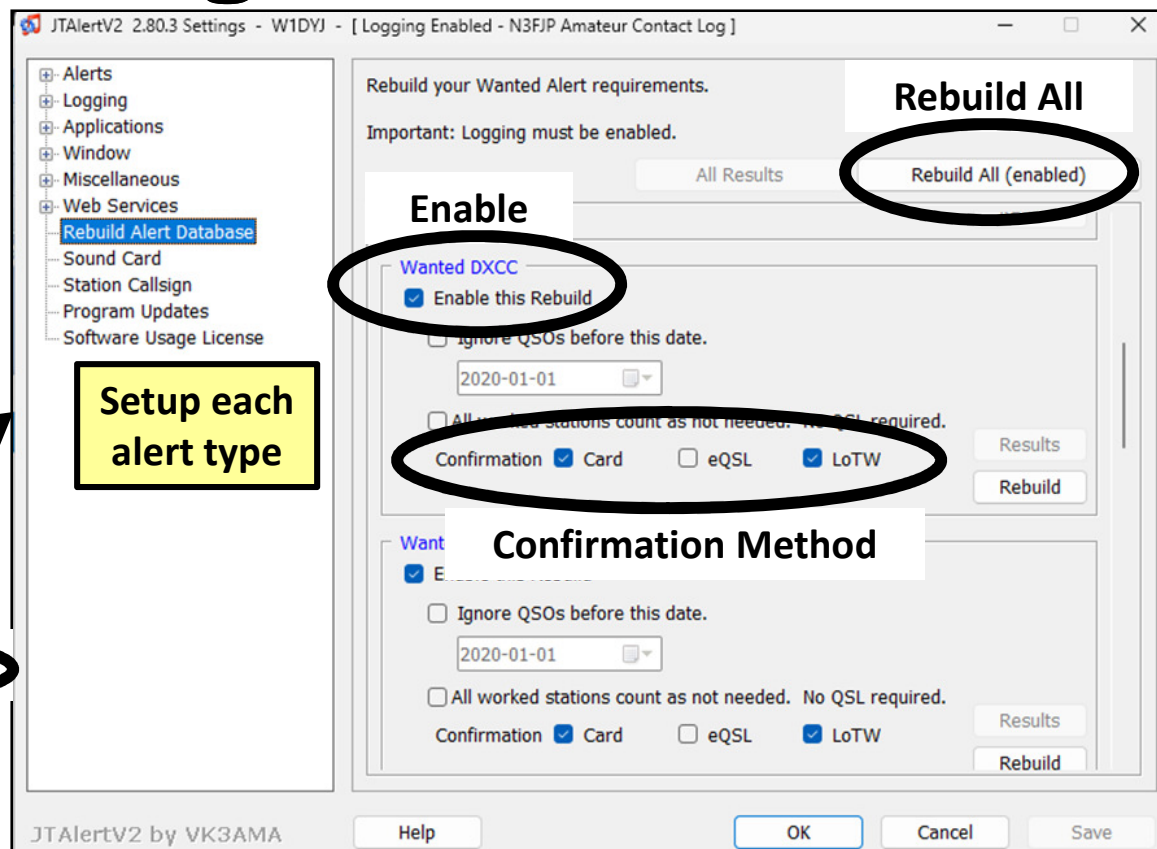
JTAlert ~ Building Alert dB

Pulls Info from
your logger to
JTAlert



Rebuild Alert Database

Setup each
alert type



Rebuild All

Enable

Confirmation Method

Settings



JTAlert ~ Building Alert dB

Manually Building
your dB

Alerts

Alerts

- Own Call
- CQ
- Directed CQ
- Wanted Prefix
- Wanted DX Marathon
- Wanted US State
- Individual Bands
- Wanted DXCC
- Wanted Continent
- Wanted CQ Zone
- Wanted ITU Zone
- Wanted Grid
- Miscellaneous Alerts
- Alerts Priority
- Worked B4
- Lotw / Eqs
- Filters
- Logging
- Applications
- Window
- Miscellaneous
- Web Services
- Rebuild Alert Database
- Sound Card
- Station Callsign
- Program Updates

Not Enabled

Rebuild your Wanted Alert requirements

Important: Logging must be enabled.

Wanted US State

☐ Enable this Rebuild

2020-01-01

☐ All worked stations count as not needed. No QSL required.

Confirmation ☒ Card ☒ eQSL ☒ LoTW

Results

Rebuild

Individual Band

By Individual Band

Any Mode

Band Enable and Select

160	80	60	40	30	20	17	15	12	10	6	4	2
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Click on them

2 of 50 States wanted

Click the checkbox for each wanted State.

Band 6m

Check All

UnCheck All

AK AL AR AZ CA CO CT DE FL GA

HI IA

ME MI MN MO MS MT NC ND NE NH

NJ NM NV NY OH OK OR PA RI SC

SD TN TX UT VA VT WA WI WV WY

OK Cancel Save



INDEXA

JTAlert ~ Some Additional Stuff

Alert Types Summary Window Setting colors

JTAlert : Alert Types











Alert Types

ON <input checked="" type="checkbox"/>	Own Call
ON <input checked="" type="checkbox"/>	CQ
ON <input checked="" type="checkbox"/>	Directed CQ
OFF <input type="checkbox"/>	Wanted Callsigns #1
OFF <input type="checkbox"/>	Wanted Callsigns #2
OFF <input type="checkbox"/>	Wanted Callsigns #3
OFF <input type="checkbox"/>	Wanted Prefix
ON <input checked="" type="checkbox"/>	Wanted Grid
ON <input checked="" type="checkbox"/>	Wanted US State
OFF <input type="checkbox"/>	Wanted VE Province
ON <input checked="" type="checkbox"/>	Wanted DXCC
OFF <input type="checkbox"/>	Wanted CQ Zone
OFF <input type="checkbox"/>	Wanted ITU Zone
OFF <input type="checkbox"/>	Wanted Continent
OFF <input type="checkbox"/>	Wanted DX Marathon
OFF <input type="checkbox"/>	Ignored Callsign
OFF <input type="checkbox"/>	Decode Keywords
	Worked B4
	No Alert

Setting Badges and Borders

Badges & Borders

Top Right Badge position

Standard CQ	73
<input checked="" type="checkbox"/> Show border	<input checked="" type="checkbox"/> Show border
<input checked="" type="checkbox"/> Show badge	<input checked="" type="checkbox"/> Show badge
 <input type="text" value="Text"/>	 <input type="text" value="Text"/>
 Back	 Back
Directed CQ	POTA
<input checked="" type="checkbox"/> Show border	<input type="checkbox"/> Show border
<input checked="" type="checkbox"/> Show badge	<input type="checkbox"/> Show badge
 <input type="text" value="Text"/>	 <input type="text" value="Text"/>
 Back	 Back
SOTA	
<input type="checkbox"/> Show border	
<input type="checkbox"/> Show badge	
 <input type="text" value="Text"/>	
 Back	

Some Callsign Options

Callsign Options

Callsign section

<input type="checkbox"/> B4/State	<input checked="" type="checkbox"/> Lotw
<input checked="" type="checkbox"/> SNR dB	<input type="checkbox"/> Eql
	<input checked="" type="checkbox"/> Online

☒ Country section

<input type="checkbox"/> SNR dB	<input checked="" type="checkbox"/> State
<input type="checkbox"/> B4 date replaces Country	
<input checked="" type="checkbox"/> Grid replaces Country for VHF	

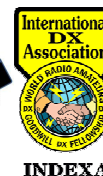
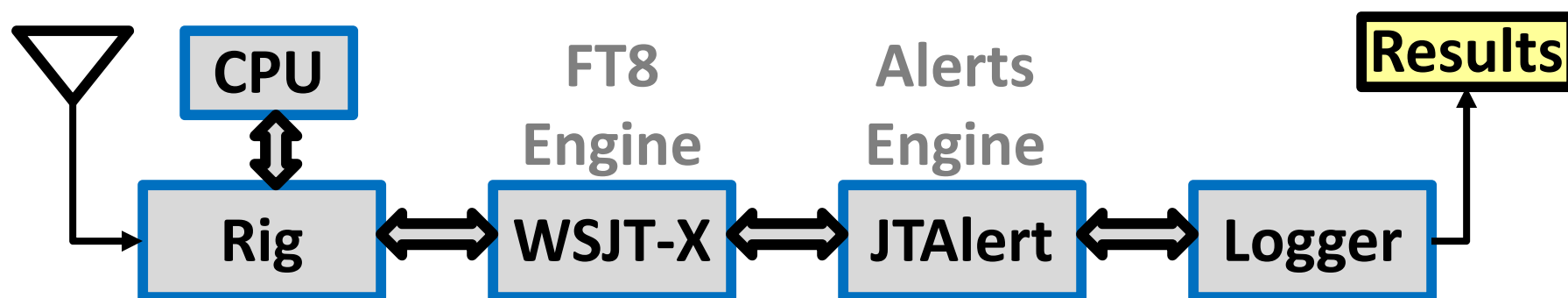
Visual display

☒ Allow ATNO blinking effect



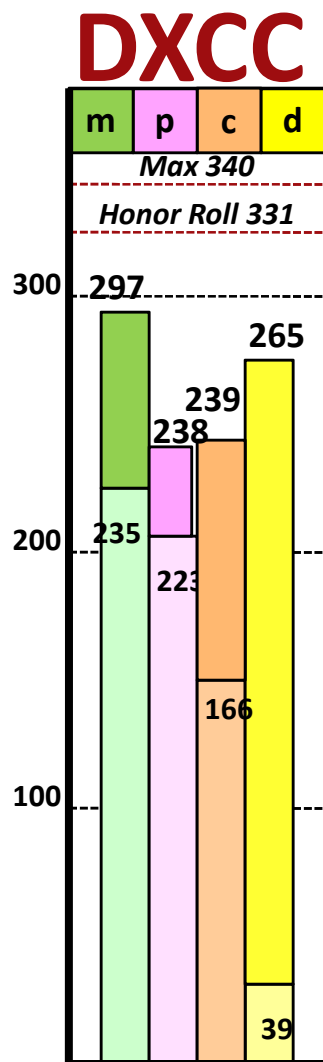
FT8 and JTAlert ~ Agenda

- Basics of WSJT-X & FT8
- HW / SW Setup
- JTAlert
- W1DYJ results



FT8 and JTAlert ~ W1DYJ Results — DXCC

As of 20 March 2025



DXCC

Count of overall Entities

Minimum = 100

Endorsements by band and mode

2025

mixed	phone	cw	digital
-------	-------	----	---------

2017

mixed	phone	cw	digital
-------	-------	----	---------

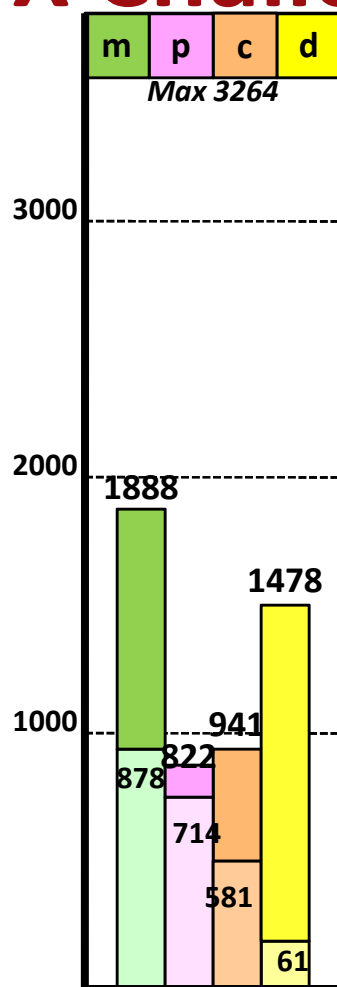


INDEXA

FT8 and JTAlert ~ W1DYJ Results — DX Challenge

As of 20 March 2025

DX Challenge



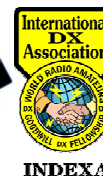
DX Challenge

Count of overall Band-Entities

Minimum = 1000

2025 mixed phone cw digital

2017 mixed phone cw digital



INDEXA

FT8 and JTAlert ~ W1DYJ Results — DXCC Details

As of 20 March 2025


DXCC by Band


DXCC by Band

	2017	2025
Mixed:	4 bands	9
Phone:	4 bands	4
CW:	3 bands	4
Digital:	0 bands	9

2017	mixed	phone	cw	digital
2025	mixed	phone	cw	digital

		m	p	c	d		m	p	c	d	
2017	160					17					
2025	160	92	7	60	68	17		50	38		
2017	80					15					
2025	80		74	96		15					
2017	60					12					
2025	60		0	0		12		26	33		
2017	40					10					
2025	40					10					
2017	30					6					
2025	30		na	90		6		86	27	13	78
2017	20										
2025	20										







Some Final Thoughts

- *Be sure your computer clock is accurate*
 - *WINDOWS clock is not!*
- *Be aware of different FTx modes:*
 - *Contests, Fox/Hound, etc.*
- **SPLIT is good** *[Fake It / Hold TX Freq]*
- *Don't allow extraneous audio in audio chain*
- *How much power???*
 - *"Keep received reports to ~ -5 dB" (Joe T.)*



Some Resources

Web Sites

This talk: <https://www.qsl.net/w1dyj/FT8%20for%20web.pdf>

WSJT-X: <https://wsjt.sourceforge.io/>

JTAlert: <http://hamapps.com/>

Email Reflectors

WSJT-X: wsjtgroup@groups.io

WSJT-X AND all other forks or add-ons to the program. *The “official” email reflector.*

WSJT-X: main@WSJTX.groups.io

WSJTX.group.io is a private forum and is NOT operated by the Core WSJT Group! Messages MUST include a hashtag. *Moderator very strict!*

JTAlert: Support@HamApps.groups.io



Thank you!

www.qsl.net/w1dyj



Appendix



Abstract

FT8: An Update

Larry first gave this talk in 2019. Since then a lot has changed and FT8 is now very popular. This talk will review the 2019 talk which discusses how to use WSJT-X and FT8, and will add some insights that Larry has discovered with the nearly 6000 contacts he has logged on FT8.

Licensed in 1961 as novice KN1VFX, Larry became W1DYJ in 1966. After acquiring three degrees in EE from MIT, Larry was hired in 1969 by Hewlett-Packard Medical's Cardiac lab in Waltham, MA, working on Electrocardiographs and then Cardiac Ultrasound systems. He moved to HP Medical Education in 1993, responsible for technical and project management training. When HP split apart, he became Agilent Technology's global program manager for their Learning Management System. "Retiring" in 2005, he consulted for Avago (now Broadcom) on eLearning technologies through 2012. He now spends his time chasing DX and contesting in Woburn, traveling with his wife Maren, and attending many jazz and classical concerts. He is the net manager and newsletter editor for the MMRA, publications editor for HamXposition, and a member of the YCCC.



Ham Radio ~ Who Am I?

- Mom was a high School cafeteria worker. Dad was an electrician and had a dual workshop: woodworking and electronics (my two continuing favorite hobbies). They both highly valued education.
- As a kid: I “played” in his workshop, had an erector set, and read all the **Tom Swift** books...
- Built a **crystal radio** when I was 12 (1958) –the first station heard was the BBC and I was **hooked on radio**.
- Obtained my ham radio license at 15 in 1961 (a junior in HS).
- Went to MIT (SBEE’67, SMEE’69, EE’70)
in part because of my ham radio experience.
- Hired (1969) by HP Medical (Waltham/Andover) developing hospital cardiac instrumentation (electrocardiographs, then real-time cardiac ultrasound)
in part because of my practical experience with ham radio.
- Moved to HP/Agilent Corp Ed (project management experience) in 1993
- “Retired” in 2005; then part-time consulted for Avago (now Broadcom) as their eLearning platform WW PM
- Finally retired (for real) in 2012 – **now play with ham radio**



Ham Radio ~ What have I logged...

What I have logged, as of 25 February 2025:

Mode	#	1st Q	Confirmed			
FT4	268	8/2019	BND	#Qs	#WAS	#DXCC
FT8	5848	8/2017 >>>>>>>>>>	160	426	48	68
JT65	97	6/2017	80	449	48	87
MSK144	1	5/2017	60	329	49	106
PSK31	64	5/2003	40	365	41	105
PSK63	1	3/2017	30	512	50	136
Q65	1	8/2024	20	738	43	99
RTTY	10336	1/2017	17	432	50	182
=====			15	424	48	143
Total digital	16616		12	411	50	167
			10	384	50	90
SSB	27642	7/1994	6	1481	48	77
CW	18528	9/2014	2	342	17	2
FM	86	11/1993	0.7	45	7	1
Total Qs			63215			



Use Split

From the WSJT-X online manual:

"To avoid QRM from competing callers, it is usually best to answer a CQ on a different frequency from that of the CQing station. The same is true when you tail-end another QSO. Choose a Tx frequency that appears to be not in use. You might want to check the box Hold Tx Freq. "

From the Hinson document linked from same:

"The CQing station doesn't need to say up 3 or anything else. He will decode all stations in the audio spectrum. You can call him at 300Hz or 2300Hz and it won't make any difference. They all display. You don't have to (and don't want to) move to his frequency. If there is more than one station calling him, they will hopefully be spread all over the audio spectrum, not causing QRM to the station trying to make a QSO or each other. If a bunch call on his frequency, they just QRM each other and the guy CQing will be working those who are split. Additionally, if he starts a QSO with someone close to your transmit frequency, your transmitter will be disabled so you don't cause him QRM. If you are transmitting further away, you can keep calling him and he should pick you up as he works through the list of callers."



Random stuff

In the v2.0 FT8 and MSK144 protocols there are $2^{77} = 151,115,727,451,828,646,838,272$ (about 1.5×10^{23}) possible messages. If AP is not enabled, the decoder's job of finding the correct message is equally difficult for every one of these integers. The inner-most layer of the decoder knows nothing about what type of user-meaningful message may emerge from the process. At this stage, "F6ABC ON4KHG 73", "73 XYZ TU", and "ABCDEFGHIIJK" are all nothing more than different integer numbers between 0 and 51,115,727,451,828,646,838,271.

Hash codes are a one-way function, a.k.a. lossy compression. Many callsigns can have the same hash code, the point is to represent a callsign using less bits than necessary to exactly represent the callsign, which is necessary if the callsign is non-standard, or the other callsign is non-standard. A standard callsign requires 28 bits to store, a non-standard callsign in WSJT-X v2.0.0 FT8 and MSK144 modes can take up to 58 bits to store.

