

FT8 and JTAlert An Efficient QSO Generation System



Larry Banks, W1DYJ

Licensed: 1961 [KN1VFX]

W1DYJ since 1966

Amateur Extra

9B DXCC [300wkd / 298cnf]

PH:243/239 | DIG:273/270 | CW: 245/241

DX Challenge: 1912

8B WAS

6M VUCC 697/678 grids]

All Low Power

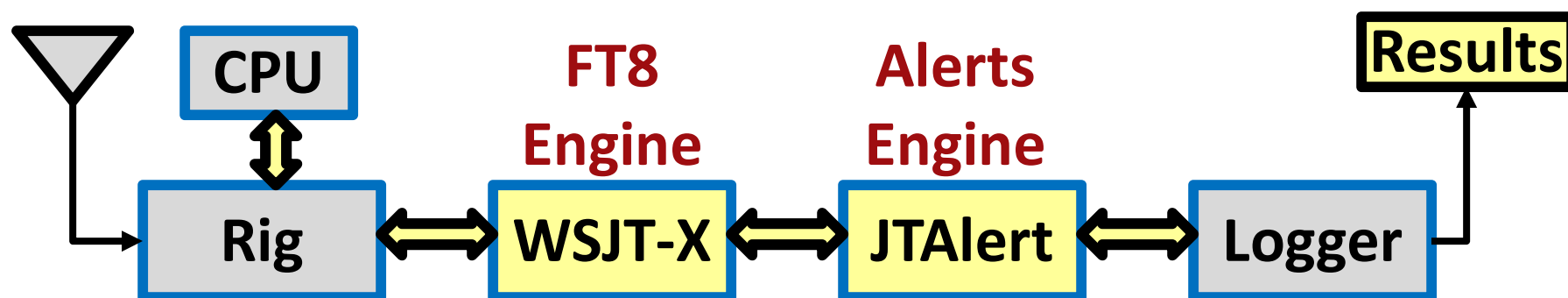
W1DYJ ~ Larry Banks



INDEXA

FT8 and JTAlert ~ Agenda

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

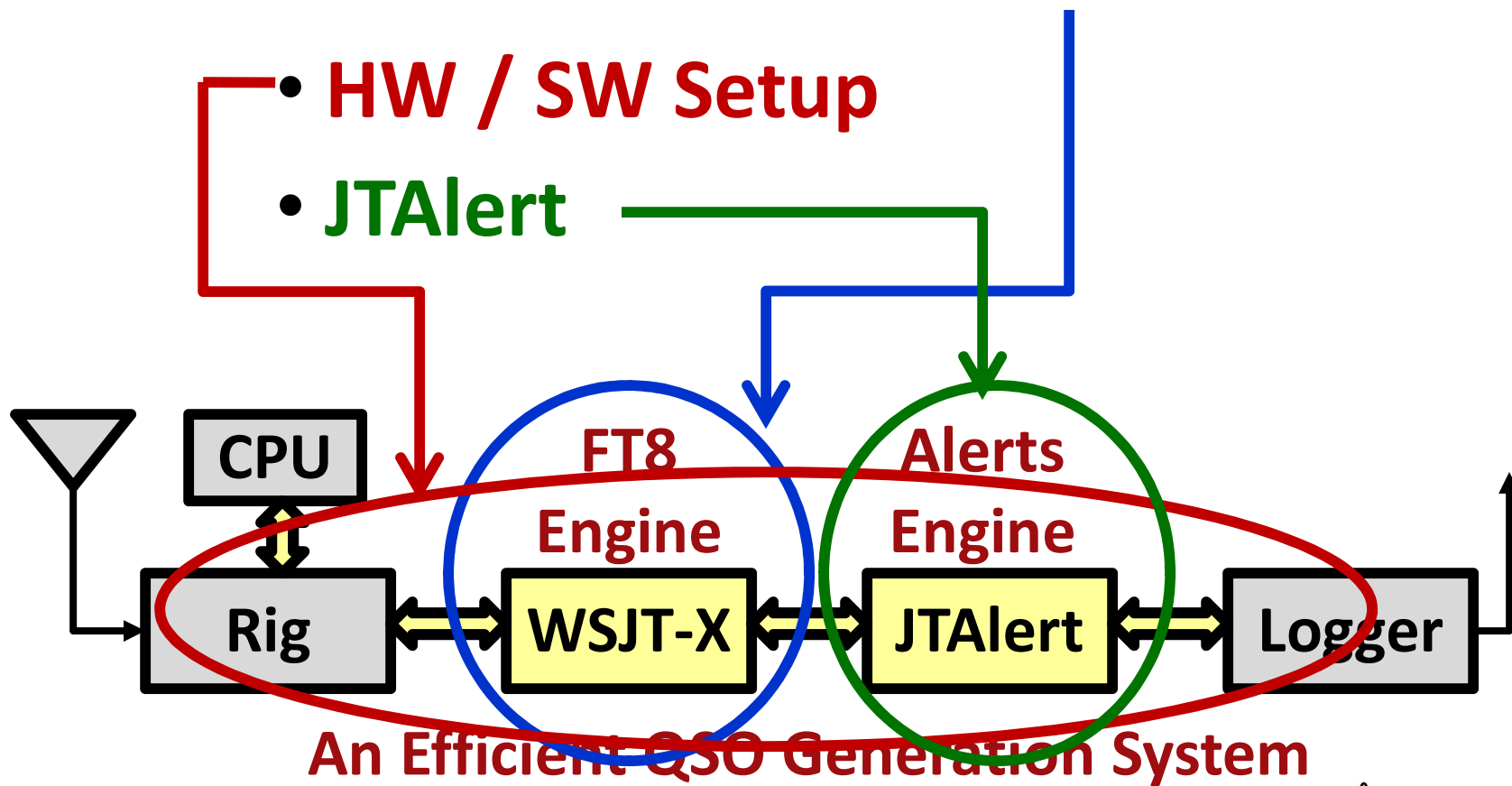


An Efficient QSO Generation System



FT8 and JTAlert ~ Agenda

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



Overall Setup ~ My Primary 23" Monitor

The screenshot shows a radio software interface with the following components:

- WSJT-X v2.7.0:** Main window showing received signals and control panels. The frequency is set to 7.074 000. The date is 2025 Mar 14 01:18:44. The interface includes buttons for Monitor, Decode, and Tx, along with various settings like Log QSO, Stop, and Erase.
- N3JJP's Amateur Contact Log 7.0.11:** A table of recent contacts. The table has columns: Rec#, Date, Time, Mode, Power, Freq..., Bnd, Call, Snt, Rec, Off, Country, ST, Grid, S..., R..., Comment. The table lists contacts from 3/13/2025 to 3/4/2025.
- DX Spots Large:** A table showing DX spots with columns: QTH, Band, Mode, Status, Call, Freq..., Time, Comments, Be..., Cont, O..., Dist... The table lists spots for Canada, India, and other locations.
- Call Signs Grid:** A grid of call signs from various countries, including Croatia, USA, BA, USA, FL, USA, OH, USA, TN, USA, CA, USA, KY, etc.
- Wide Graph:** A graph showing signal activity over time and frequency, with a frequency range from 200 Hz to 3000 Hz.



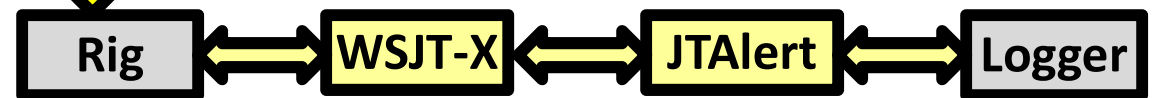
Overall Setup ~ My Primary 23" Monitor

The screenshot shows a computer monitor with three software windows open. On the left is the WSJT-X interface, displaying a list of received messages with columns for UTC, dB, DT, Freq, and Message. In the center is the ACLog interface, showing a table of 'Recent Contacts' with columns for Rec# (e.g., 63234), Date/Time (3/13/2025 23:55), Mode (FT8), Power (80), Freq (21.094), Bnd (15), Call (6Y7EI), Snt, Rec, Off, Country (Jamaica), ST (FK18jk), Grid (M013), S... (L), R... (L), and Comment (Q:777-F). At the bottom is the JTAlert interface, showing a grid of call signs with status indicators (e.g., 6Y7EI, 6Y7EI, 6Y7EI) and a status bar at the bottom with fields for Grid, Alert, DXCC, and US State.

WSJT-X

ACLog

JTAlert



FT8 and JTAlert ~ Agenda

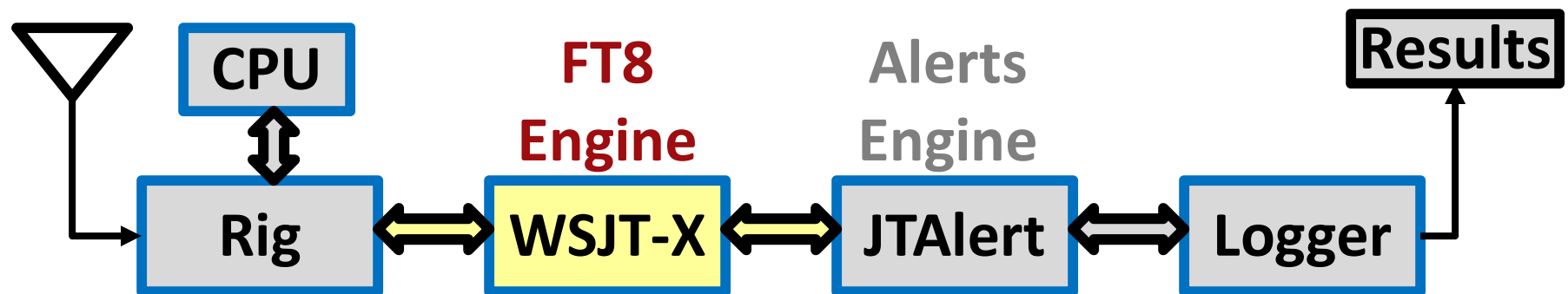
- Basics of WSJT-X & FT8
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I will be adding my observations and opinions as I have logged nearly 6000 QSOs on FT8 since 2017. They will be in green.



FT8 and JTAlert ~ Agenda

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



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 QRP

Weak Signal refers to receiving

QRP refers to Transmitting

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.

Available for Windows, Linux, and macOS



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	TX6
W1DYJ W1XXX FN43	TX1
W1XXX W1DYJ SN	TX2
W1DYJ W1XXX R-SN	TX3
W1XXX W1DYJ RRR	TX4
W1DYJ W1XXX 73	TX5

Local Signal/Noise ratio. NOT a traditional signal report

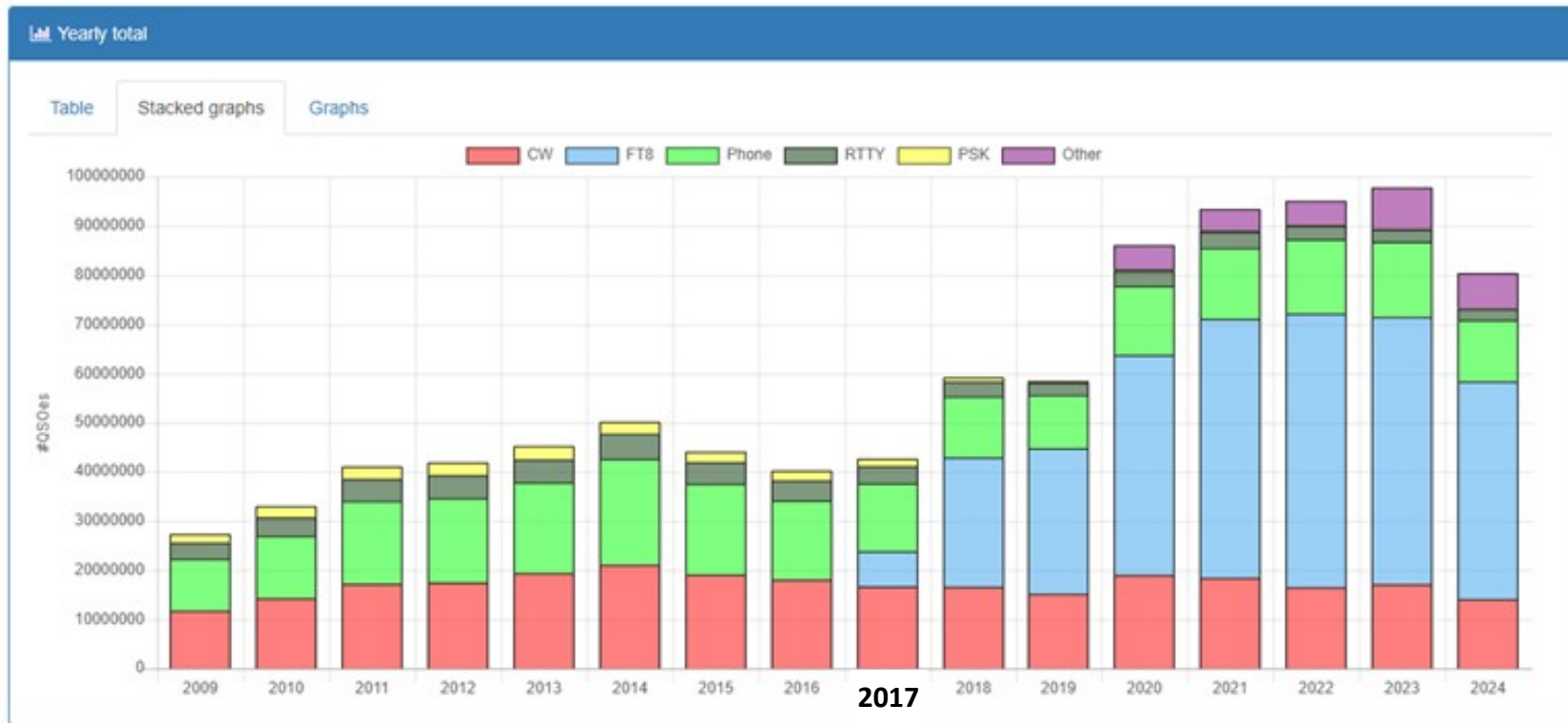
Don't confuse S/N with a signal report

Use if you don't expect a "73"

Can be customized [13 characters]



FT8 Basics ~ Annual Growth based on Club Log

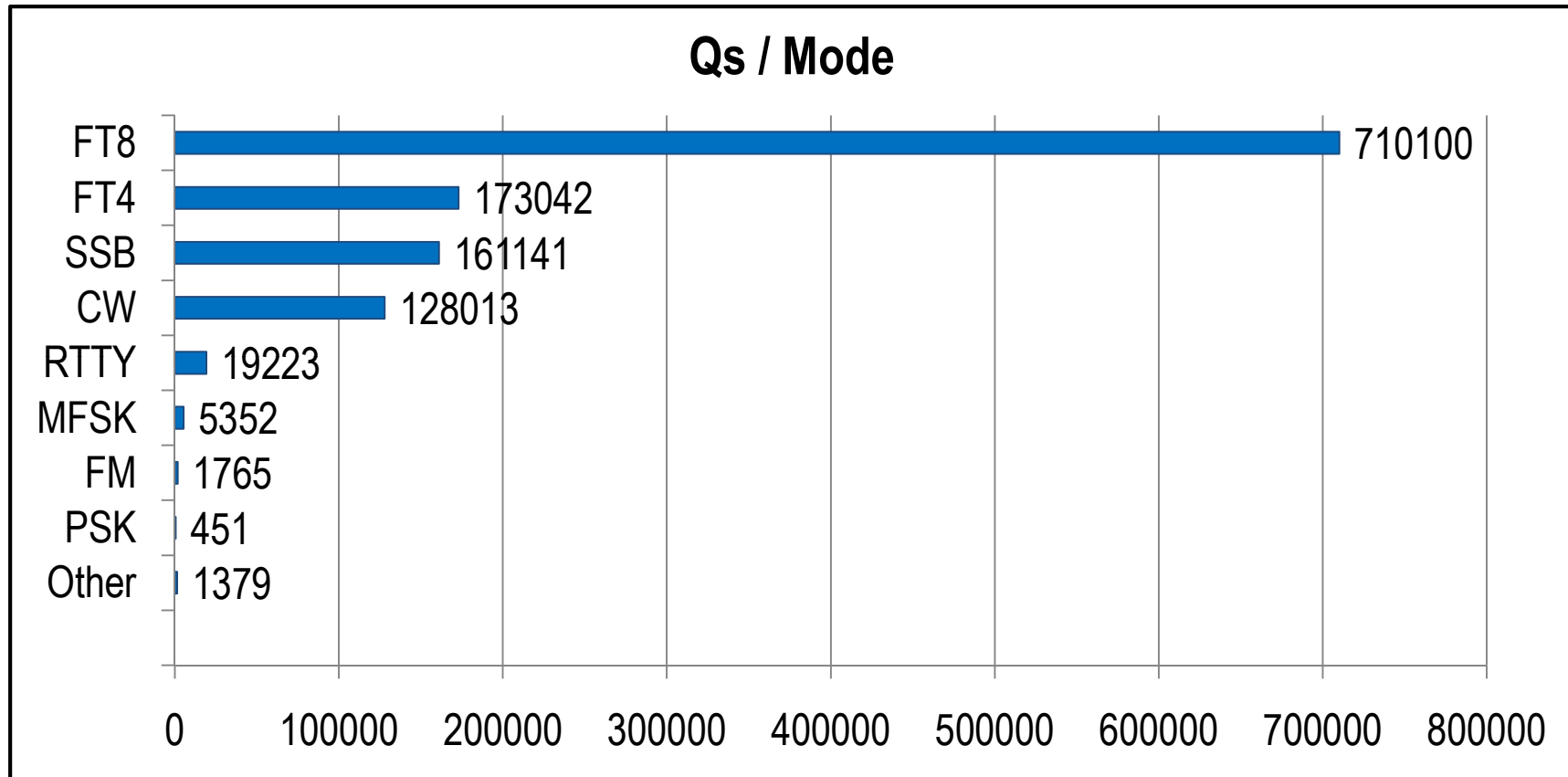


Mode statistics based on data from Club Log – from LA8AJA



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

For: 1 March 2025



Mode statistics based on data from Club Log – from K8TE



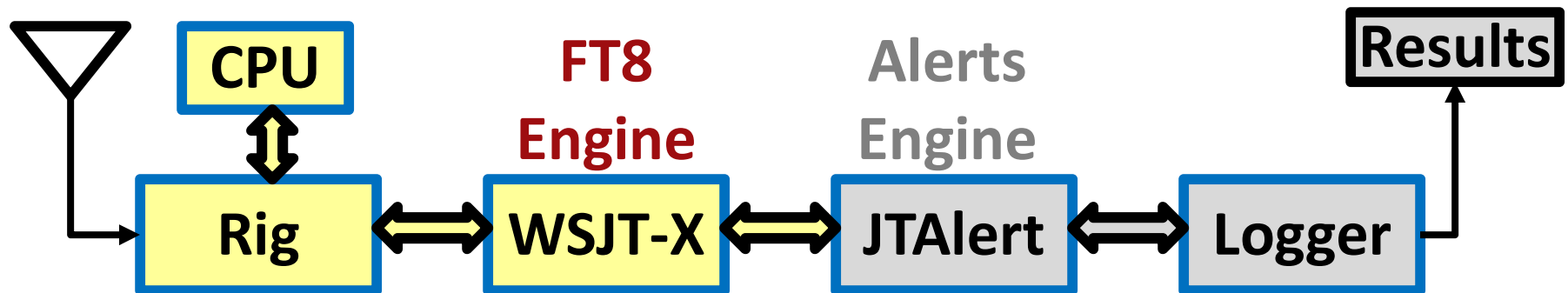
FT8 Basics ~ Why I do it

- ***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***

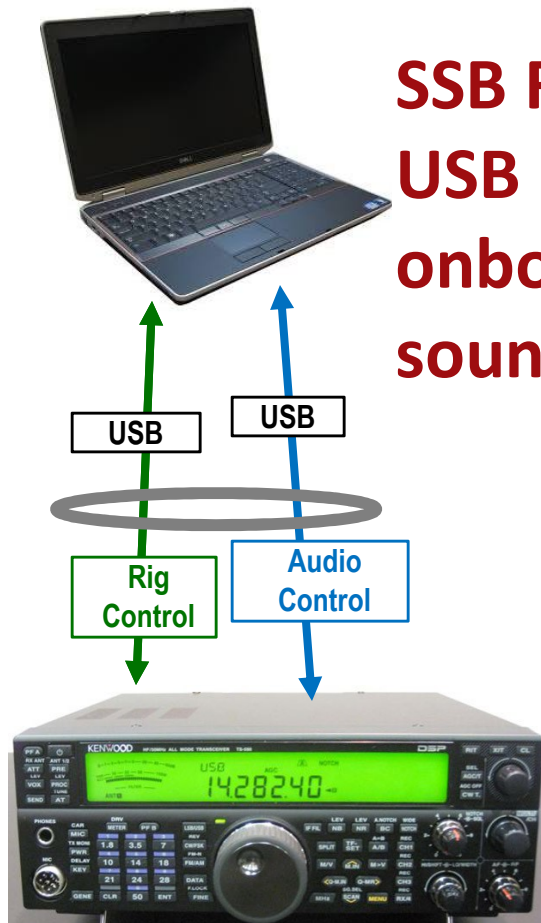


FT8 and JTAlert ~ Agenda

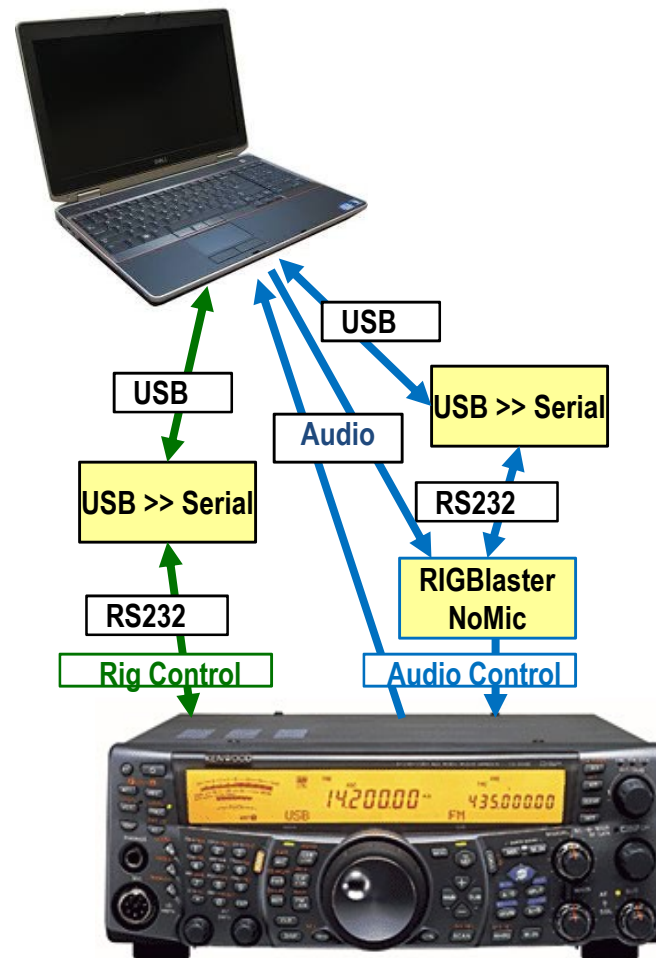
- Basics of WSJT-X & FT8
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FT8 Setup ~ HW



**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

Rig Dependent

Receiving

→ NO noise reduction, FLAT response, full SSB BW

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



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!

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.***



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 ~ 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.***

Most issues with your computer interface will be from not understanding how your audio & usb interfaces work!



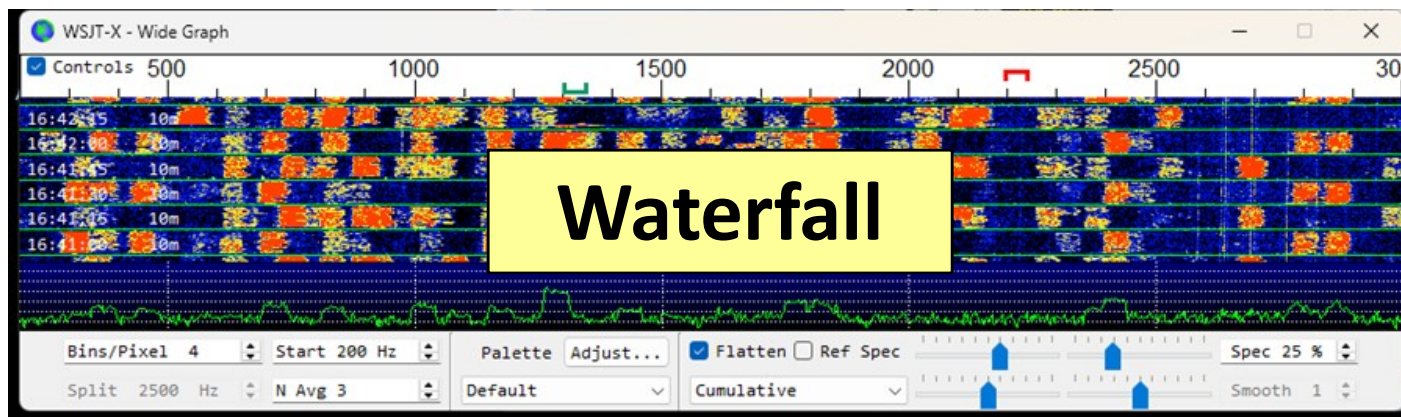
FT8 Setup ~ WSJT-X GUI

WSJT-X v2.7.0 by K1JT et al.

File Configurations View Mode Decode Save Tools Help

Band Activity					Rx Frequency				
UTC	dB	DT	Freq	Message	UTC	dB	DT	Freq	Message
164145	1	0.3	879	~ 2E0IZG V31DL -23	164100	-5	0.2	1297	~ SV3ISC N4NR -04
164145	1	0.5	733	~ <...> HI8IILK RR73	164130	-3	0.2	1300	~ SV3ISC N4NR RR73
164145	-12	0.3	314	~ E73G KC4KES EM10					
164145	-12	0.2	2589	~ CQ USA IUSLOC					
164145	-3	0.2	793	~ HI8ML EA5BYS R-10					
164145	-5	0.1	617	~ PD0DEX AASMY EM11					
164145	-8	0.1	2262	~ KG0GL W00GOL R-04					
164145	2	0.2	2113	~ HI8ML WSJHC EM26					
164145	-13	0.1	2962	~ 7Z1WW FSJQF JN25					
164145	-13	0.2	2359	~ CQ PY2EEG GG66					
164145	1	1.3	1654	~ D2UY KB					
164145	15	0.4	1799	~ F4IHL W					
164145	-8	0.1	996	~ CQ CT7B					
164145	-12	0.3	2014	~ K7TRB F					
164145	-15	0.1	1137	~ CQ EC3A					
164145	2	0.2	2084	~ VE2DM K					
164145	-9	0.1	1035	~ N4XYZ E					
164145	-12	0.1	2302	~ KF0XS					
164145	-22	0.3	1429	~ KA5HSL IKSUIS -18					
164145	-13	0.2	963	~ CQ IK4LZH JN54					
164145	-14	0.2	1621	~ WD6BNY N3AZ -17					
164145	-12	-0.8	2362	~ NSLBJ HG1DCI -19					
164145	-1	0.1	1687	~ PA0LMA KBSROD RR73					
164145	-21	0.2	1200	~ CQ F5OYC JN03					
164145	-5	0.2	1708	~ KA5HSL IV3GOW 73					

Control Panel: 28.074 000, FT8, UN7LEW, 2025 Mar 05 16:41:57

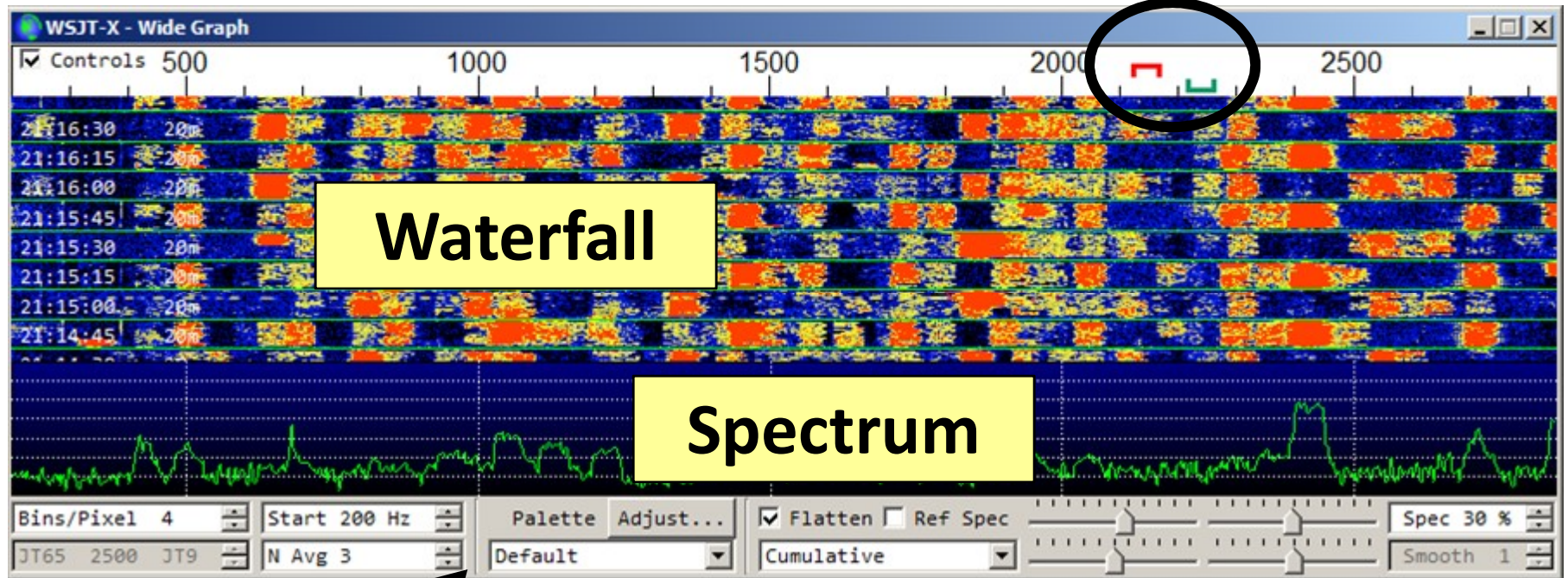


FT8 Setup ~ Waterfall

Your Frequencies

Transmit

Current Listening



Waterfall

Spectrum

Control Panel → *RTFM*



FT8 Setup ~ Control

All Signals in Waterfall

What you are listening to

WSJT-X v2.7.0 by K1JT et al.

File Configurations View Mode Decode Save Tools Help

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 K0WXX 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 W3RCA 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

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 ~ FAACR N4NR -08

10m S 28.074 000 Tx 2195 Hz Rx 1303 Hz Report -15 Auto Seq CQ: None

Generate Std Msgs Next Now Pwr

Generate Std Msgs	Next	Now	Pwr
UN7LEW W1DYJ FN42	<input type="radio"/>	Tx 1	
UN7LEW W1DYJ -15	<input type="radio"/>	Tx 2	
UN7LEW W1DYJ R-15	<input type="radio"/>	Tx 3	
UN7LEW W1DYJ RR73	<input type="radio"/>	Tx 4	
UN7LEW W1DYJ 73	<input type="radio"/>	Tx 5	
CQ W1DYJ FN42	<input checked="" type="radio"/>	Tx 6	

74 dB Receiving MA590SG FT8 29

Clicking on CQ call → starts Xmit

Predefined Messages

TX5
"13 characters"



FT8 Setup ~ Control: HOLD TX FREQ

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

CQ only Log QSO

10m S **28.074 000** Tx even/odd Hold Tx Freq Tx 2195 Hz Next Now Pwr

H DX Call DX Grid

WSJT-X - Wide Graph

Controls 500 1000 1500 2000 2500

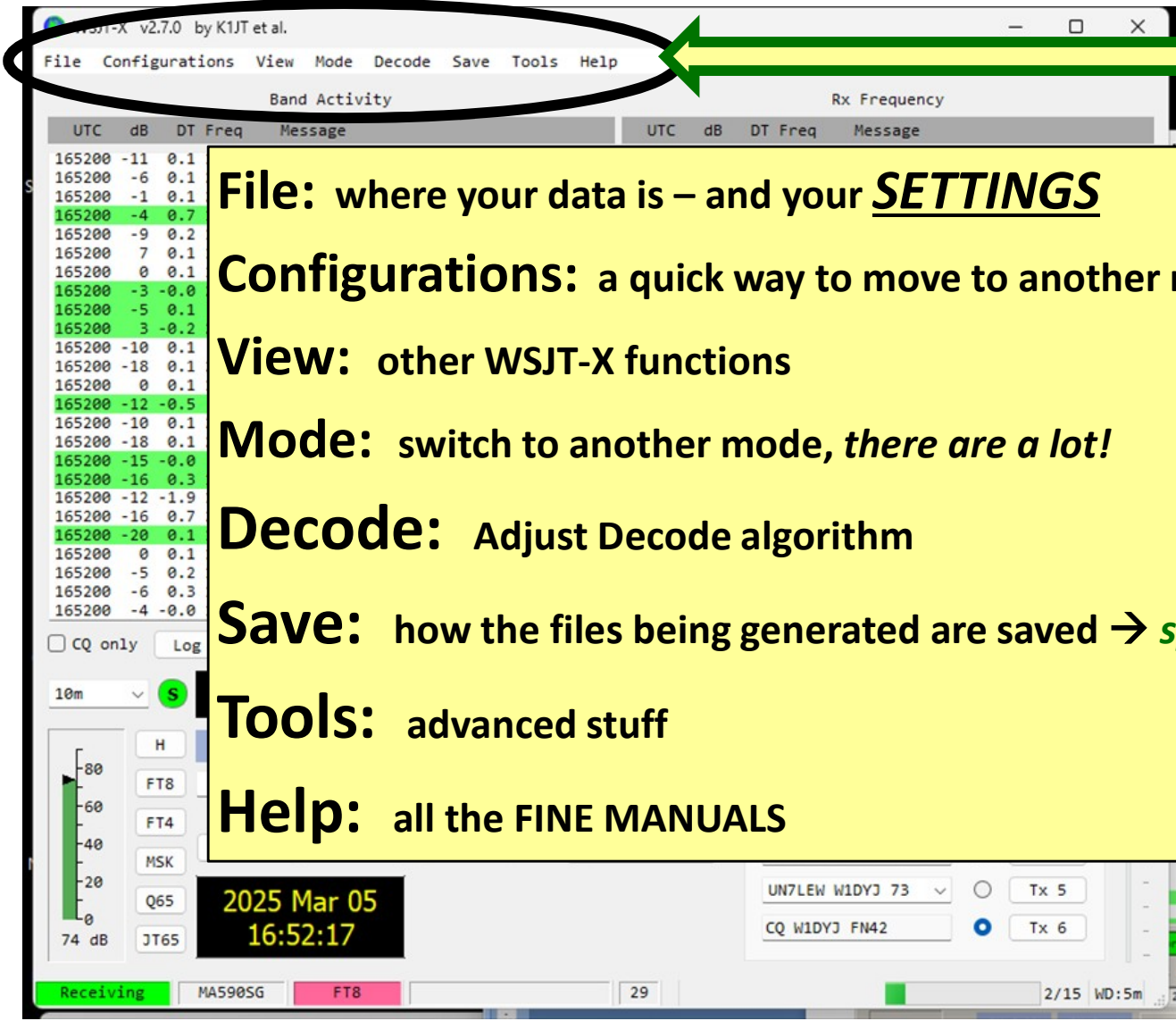
21:16:30 20m
21:16:15 20m
21:16:00 20m

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



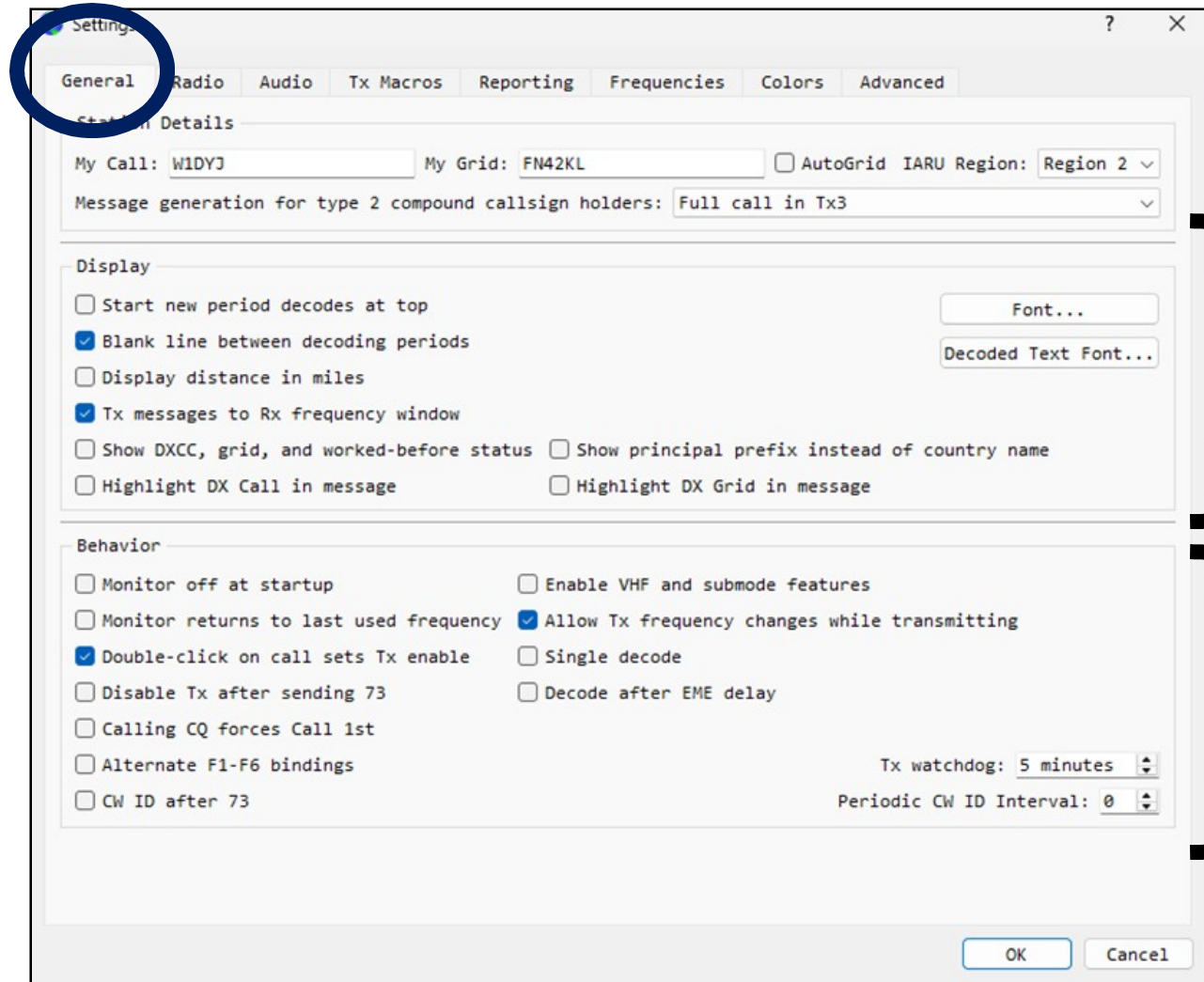
- File:** where your data is – and your SETTINGS
- Configurations:** a quick way to move to another rig or major mode shift
- View:** other WSJT-X functions
- Mode:** switch to another mode, *there are a lot!*
- Decode:** Adjust Decode algorithm
- Save:** how the files being generated are saved → *split ALL.TXT monthly*
- Tools:** advanced stuff
- Help:** all the FINE MANUALS



FT8 Setup ~ General settings

“F2”

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



Display

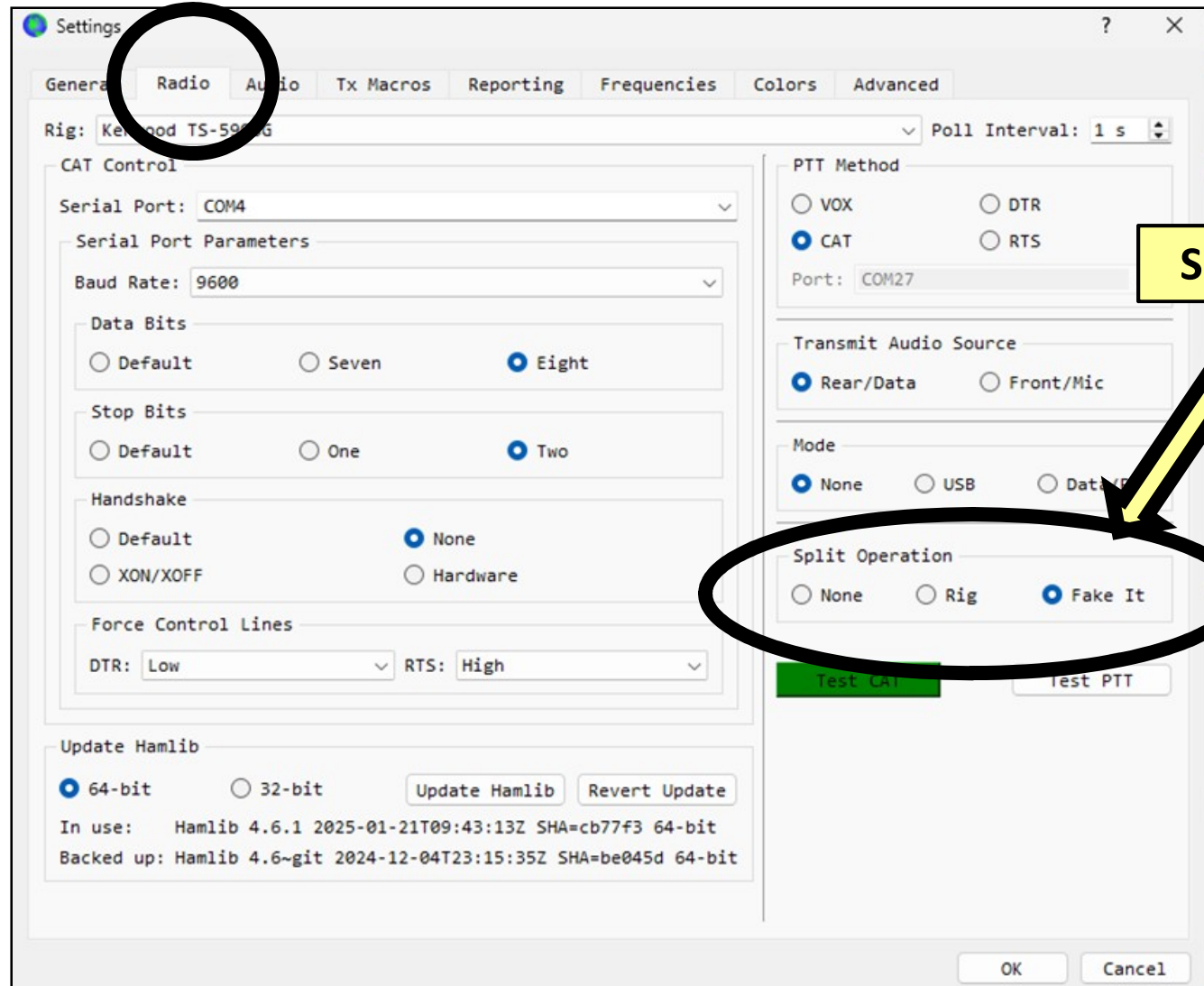
Behavior



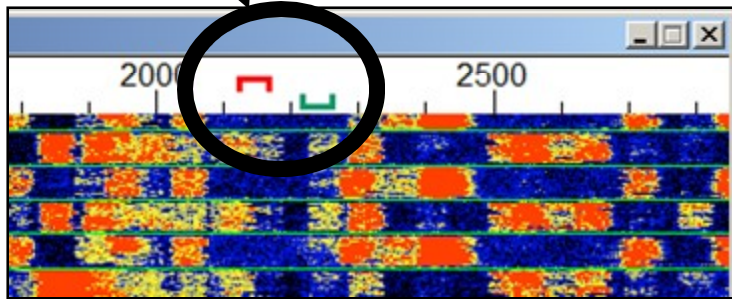
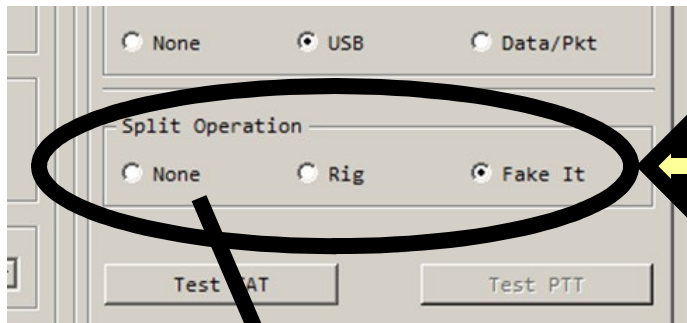
FT8 Setup ~ Radio settings

“F2”

CAT Control



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 @ 1120 Hz:

$14074.00 + 1.120 \Rightarrow \text{RF@ } 14075.12$

Harmonics of 1120KHz will be in audio passband

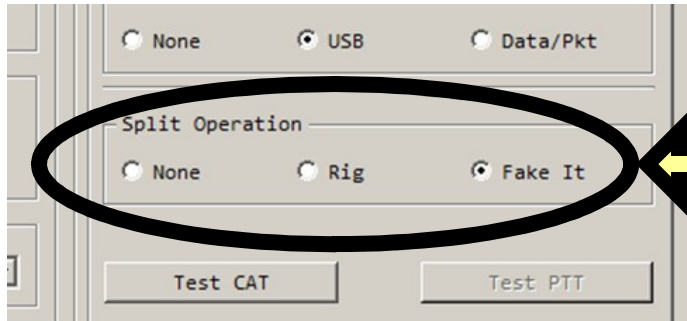
With Fake It:

$14073.50 + 1.620 \Rightarrow \text{RF@ } 14075.12$

Harmonics of 1620KHz WILL NOT be in audio passband

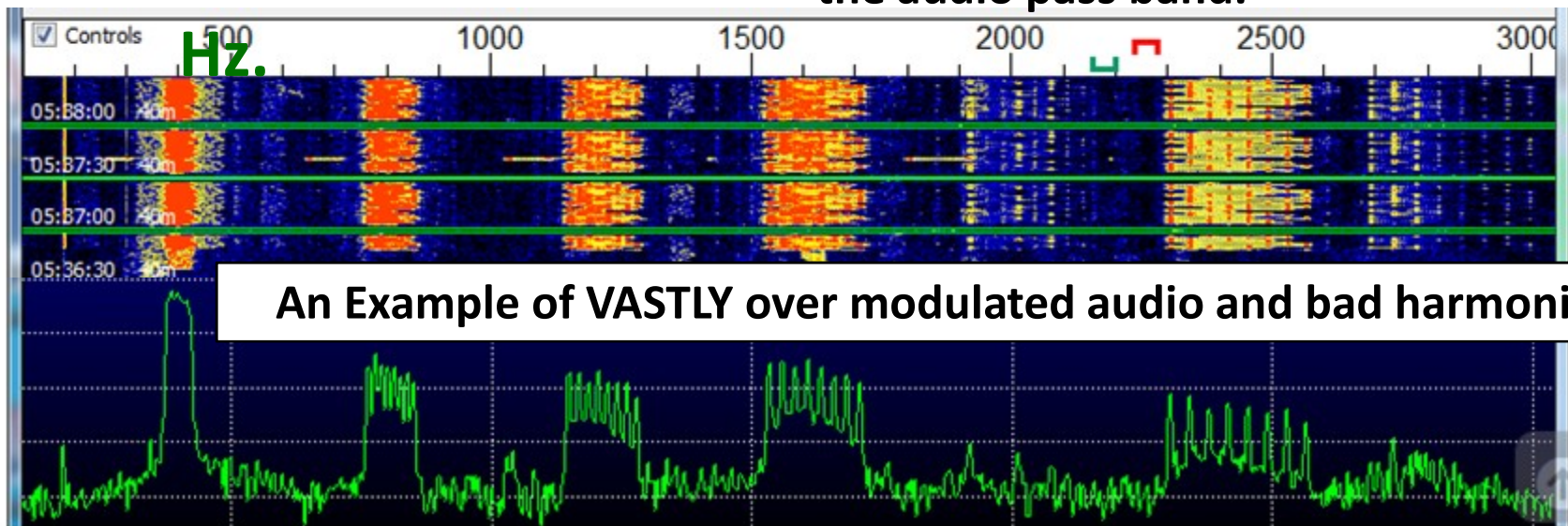


FT8 Setup ~ *Radio settings: Fake It*



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.

FT8 Audio = 400



An Example of VASTLY over modulated audio and bad harmonics

This ham WAS NOT using FAKE IT!

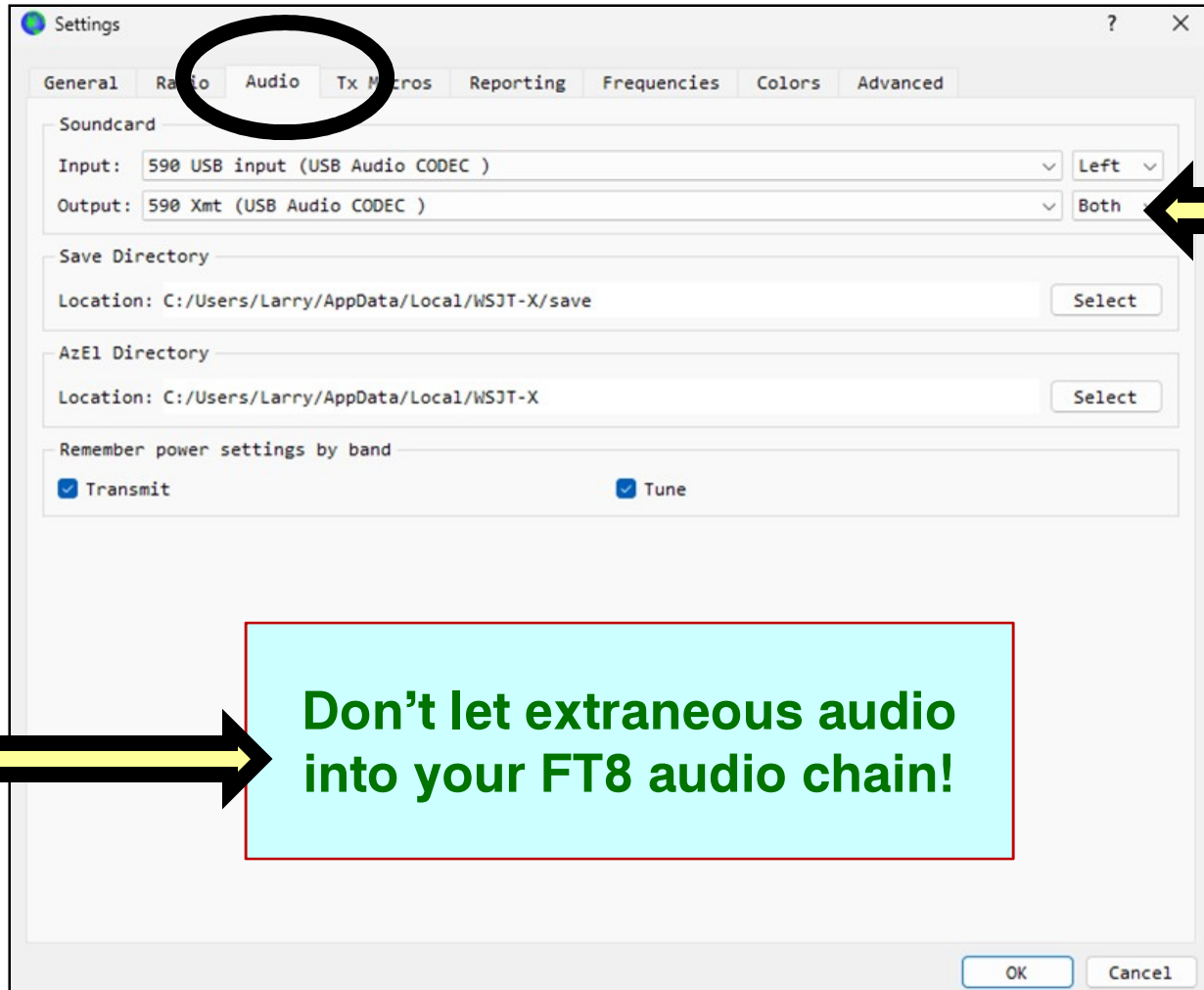


FT8 Setup ~ Audio settings

“F2”

Configure audio device for 48000 Hz, 16 bits

DO NOT USE the windows default device



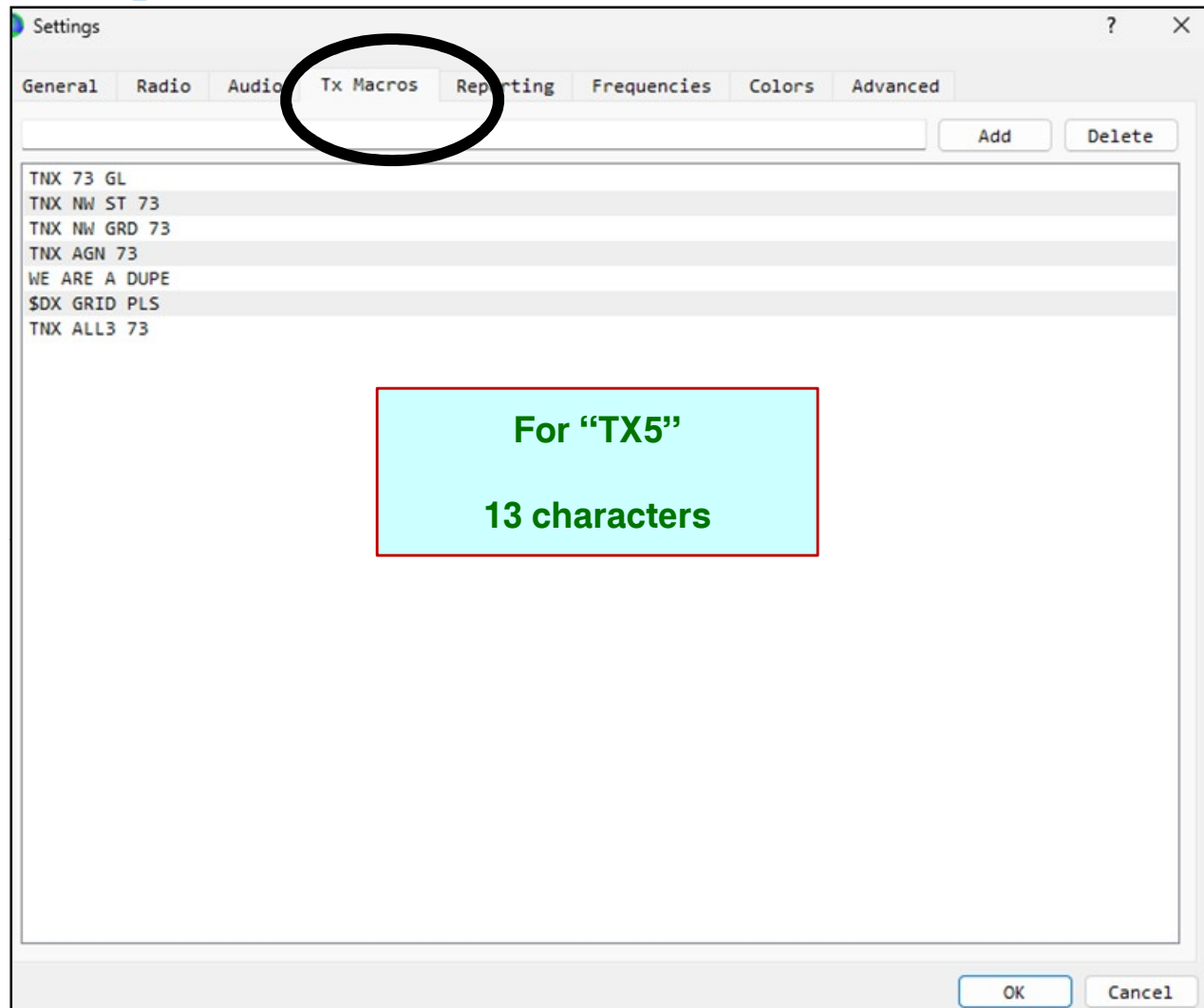
Audio I/O

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



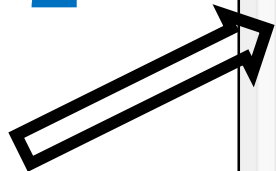
FT8 Setup ~ TX5 Macros

“F2”



FT8 Setup ~ Reporting

“F2”



The screenshot shows the 'Settings' window with the 'Reporting' tab selected. The 'Logging' section includes options for 'Prompt me to log QSO', 'Log automatically (contesting only)', 'Convert mode to RTTY', 'dB reports to comments', and 'Clear DX call and grid after logging'. The 'Network Services' section includes 'Enable PSK Reporter Spotting' and 'Use TCP/IP connection'. The 'UDP Server' section includes fields for 'UDP Server', 'UDP Server port number', 'Outgoing interfaces', and 'Multicast TTL', along with checkboxes for 'Accept UDP requests', 'Notify on accepted UDP requests', and 'Accepted UDP request restores window'. The 'Secondary UDP Server (deprecated)' section includes 'Enable logged contact ADIF broadcast', 'Server name or IP address', and 'Server port number'. The 'Reporting' tab is circled in black. The text 'Logging' and 'Network Services' are overlaid on the screenshot. A bracket on the right side of the UDP Server section is labeled 'UDP data'. The 'OK' and 'Cancel' buttons are at the bottom right.



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

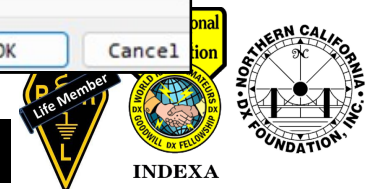
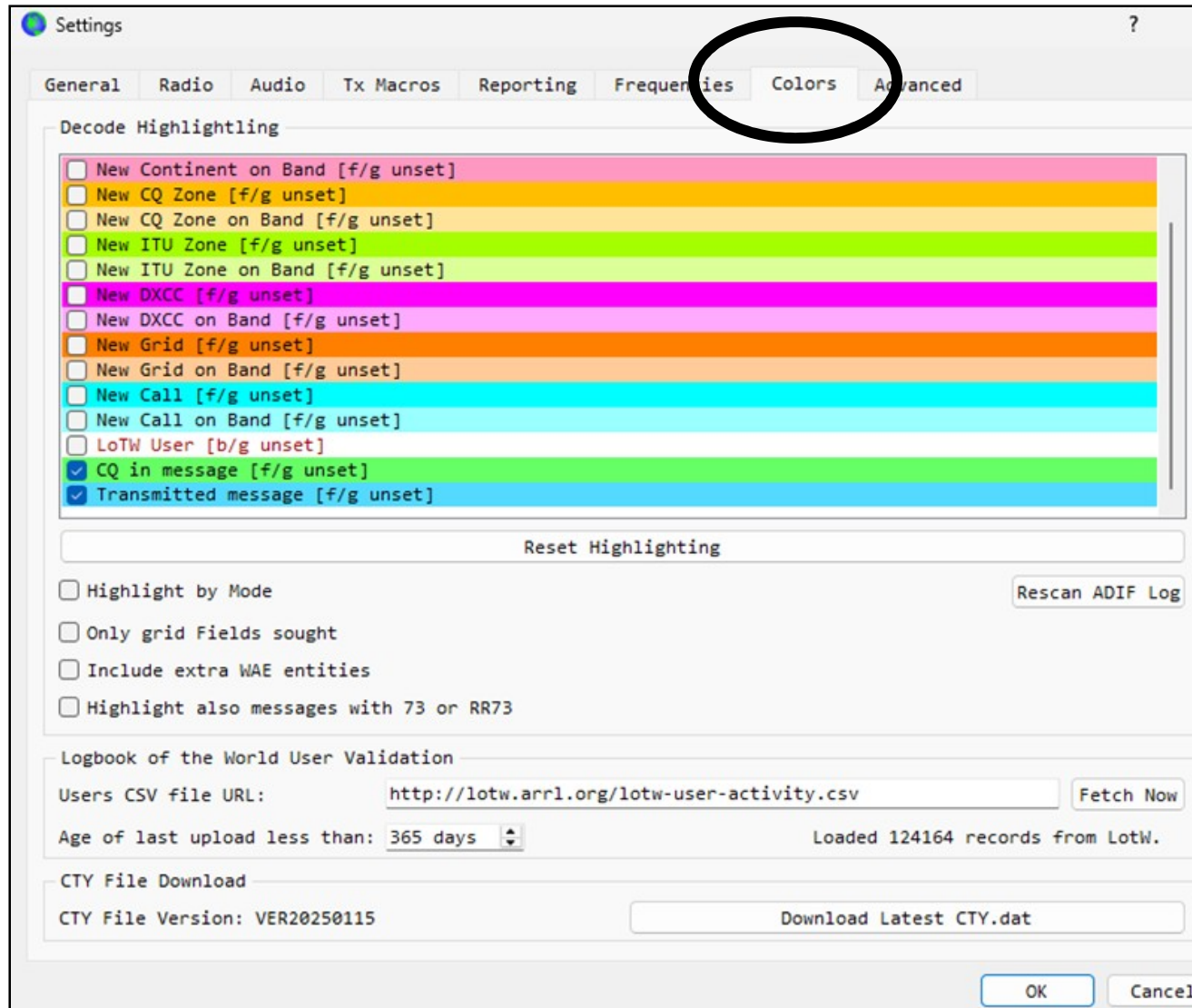
Set up your station info

OK Cancel



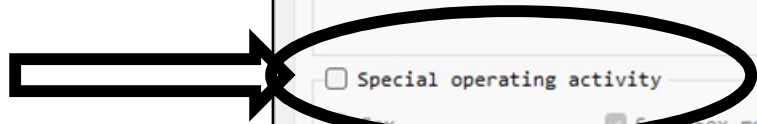
FT8 Setup ~ Colors

“F2”



FT8 Setup ~ Advanced

“F2”



Settings

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

JT65 VHF/UHF/Microwave decoding parameters

Random erasure patterns: 5

Aggressive decoding level: 0

Two-pass decoding

Miscellaneous

Degrade S/N of .wav file: 0.0 dB

Receiver bandwidth: 2500 Hz

Tx delay: 0.5 s

Tone spacing

x 2 x 4

Waterfall spectra

Low sidelobes Most sensitive

Special operating activity

OTP Key: Interval 1

NA VHF

EU VHF Contest

WW Digi Contest

Q65 Pileup

Fox mode

Hound

Show OTP messages OTP URL: <https://www.9dx.cc>

ARRL Field Day FD Exch: 1D EMA

FT Roundup FT RU Exch:

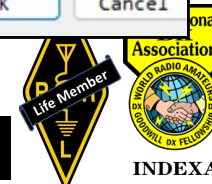
ARRL Digi Contest

CQ with individual contest name Contest name: VHF

OK Cancel

- Set up:**
- Contests
 - Fox/Hound
 - Superfox [v2.7.0]

RTFM



FT8 Setup ~ Advanced

There
are
some
Clones:

WSJT
Improved

MSHV

JTDX

Settings

General Radi

JT65 VHF/UHF/

Random erasur

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	~ D68Z W1DYJ FN42
005615	Tx		2116	~ D68Z W1DYJ FN42

• Superfox [v2.7.0]

RTFM

OK Cancel

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



FT8 Setup ~ Special Call Signs

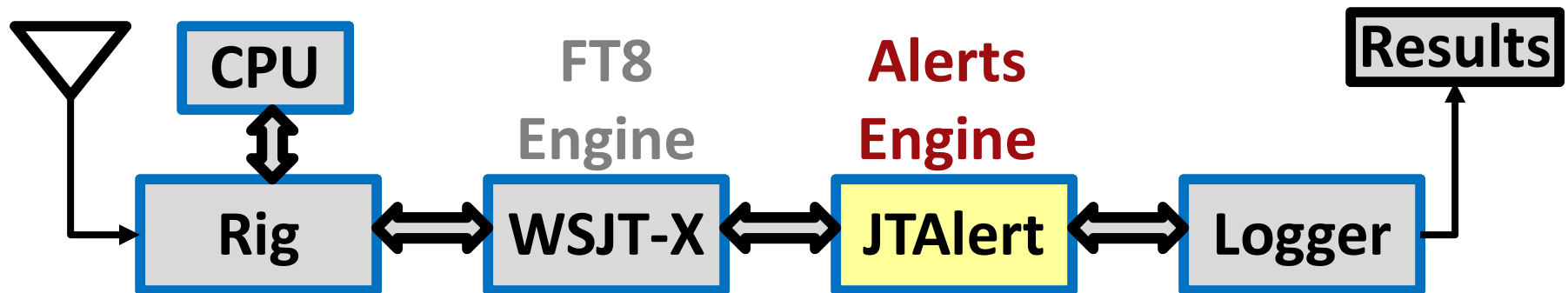
<...> represents a call Sign that is not yet decoded, or a Call Sign that doesn't fit the specified format.

160630	2	-0.0	619	~	N1MCJ S51XA RR73
160630	-11	0.5	2872	~	CQ HA7EC JN97
160630	-5	0.1	1743	~	N9QPI EA4ZV JN64
160630	-14	0.1	1182	~	<...> N1 LW -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	~	C09JAB KB9QDI EM79
160630	-15	0.4	1047	~	ZS1M GU5DT 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



FT8 and JTAlert ~ JTAlert

JTAlert

Integrates with WSJT-X

and

Provides Real Time Audio & Visual Alerts

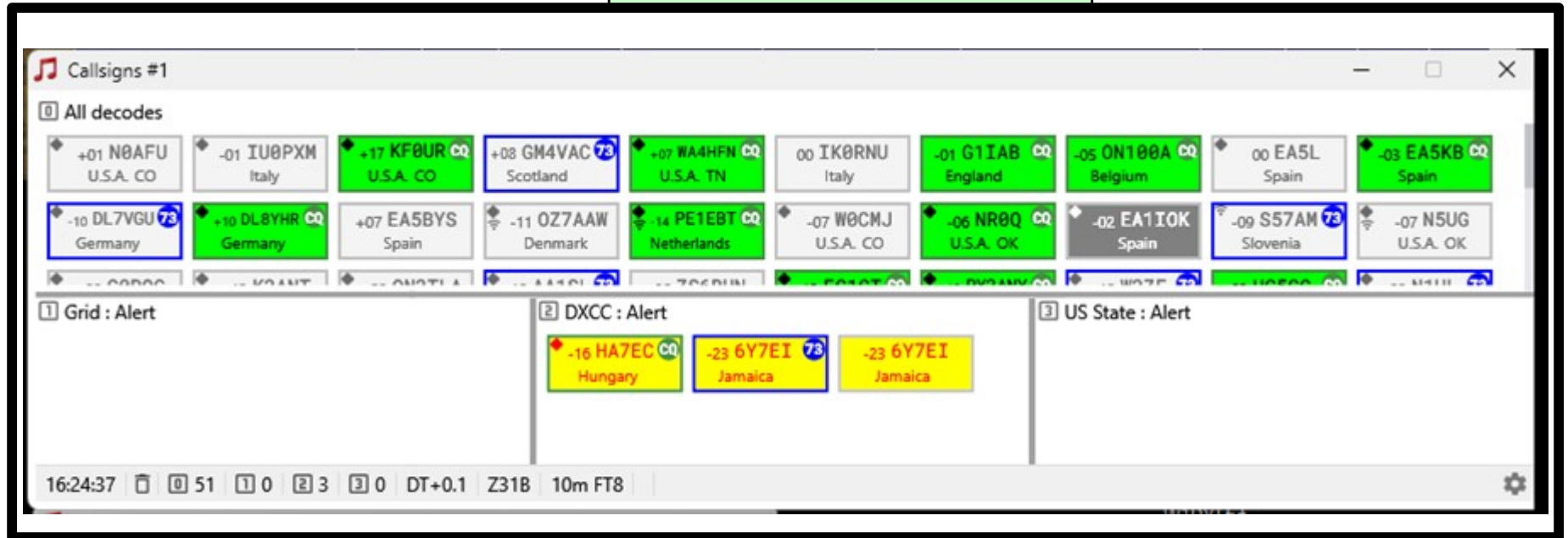
My personal preference for integrating WSJT
with my logger (ACLog from N3FJP)

I know nothing about GridTracker



JTAlert ~ The Windows I Use

Callsigns Window



Control Window



Bandheat Window



JTAlert ~ Callsigns Windows

Main Panel

The screenshot shows the JTAlert software interface. At the top, a window titled "Callsigns #1" contains a grid of call sign windows. Each window displays a call sign, a number, and a country. For example, "+01 N0AFU U.S.A. CO", "-01 IU0PXM Italy", "+17 KF0UR U.S.A. CO", "+08 GM4VAC 73 Scotland", "+07 WA4HFN U.S.A. TN", "00 IK0RNU Italy", "-01 G1IAB U.S.A. CO", "-05 ON100A Belgium", "00 EA5L Spain", "-03 EA5KB Spain", "-10 DL7VGU 73 Germany", "+10 DL8YHR U.S.A. CO", "+07 EA5BYS Spain", "-11 OZ7AAW Denmark", "-14 PE1EBT U.S.A. CO", "-07 W0CMJ U.S.A. CO", "-06 NR0Q U.S.A. CO", "-02 EA1I0K Spain", "-09 S57AM 73 Slovenia", and "-07 N5UG U.S.A. CO". Below the grid are three alert panels: "Grid : Alert", "DXCC : Alert" (showing "-16 HA7EC Hungary", "-23 6Y7EI Jamaica", and "-23 6Y7EI Jamaica"), and "US State : Alert". At the bottom, a status bar shows the time "16:24:37", a volume icon, "51", "1 0", "2 3", "3 0", "DT+0.1", "Z31B", "10m FT8", and a settings icon.

Subpanels

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



JTAlert ~ Callsigns Windows

The screenshot shows the 'Callsigns #1' window in JTAlert. It displays a grid of call signs with their respective countries and status. Annotations include:

- A green box labeled 'CQ' with an arrow pointing to the call sign '+17 KF8UR CQ U.S.A. CO'.
- A blue box labeled '73' with an arrow pointing to the call sign '-09 S5IAM 73 Slovenia'.
- A circle around the call sign '00 I0RNU Italy' with an arrow labeled 'SN'.
- A circle around the call sign '07 GTLAK CQ England' with an arrow labeled 'QTH'.
- A yellow box labeled 'New DXCC' with an arrow pointing to the call sign '+23 6Y7EI 73 Jamaica'.
- An arrow labeled 'LoTW "flag"' pointing to the call sign '-19 HA5EC CQ Hungary'.
- An arrow labeled 'Worked "B4"' pointing to the call sign '-09 S5IAM 73 Slovenia'.

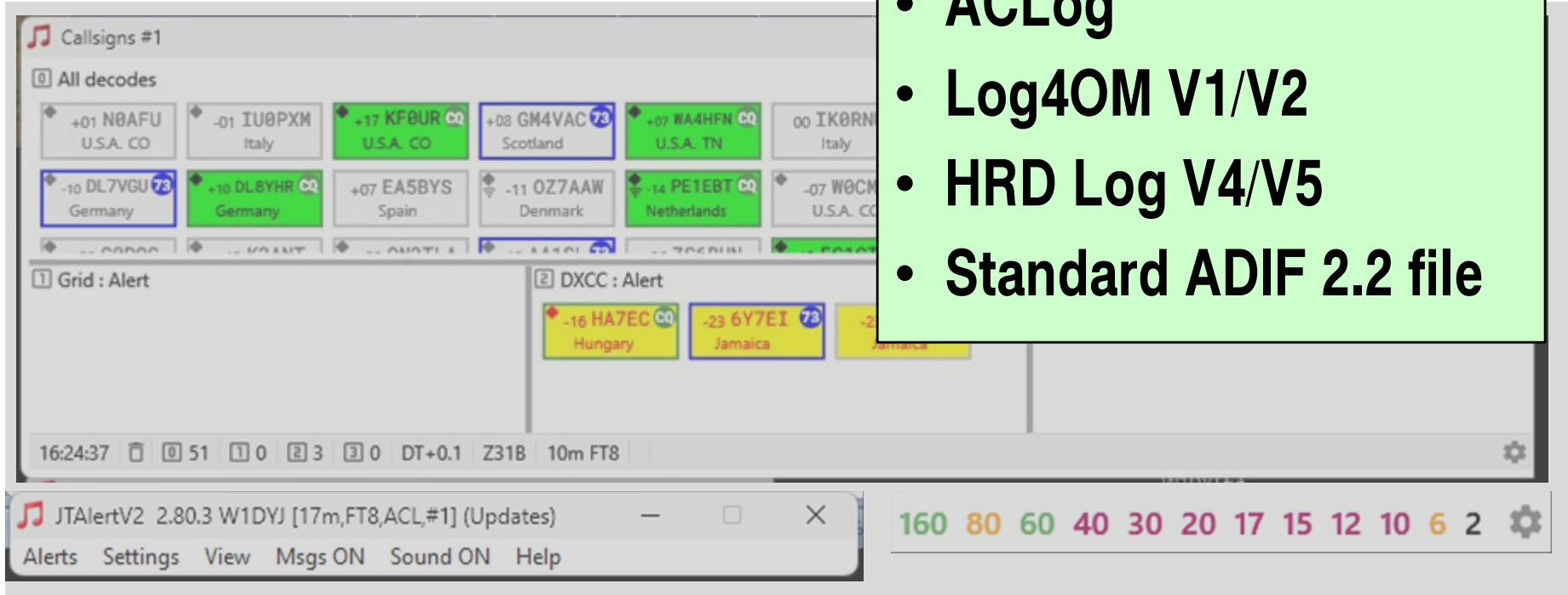
Other call signs visible include: +01 N0AFU U.S.A. CO, -01 IU0PXM Italy, +08 GM4VAC 73 Scotland, +07 WA4HFN CQ U.S.A. TN, -05 ON100A CQ Belgium, 00 E0S00 Spain, -03 EA5KB CQ Spain, -10 DL7VGU 73 Germany, +10 DL8YHR CQ Germany, +07 EA5BYS Spain, -11 OZ7AAW Denmark, -14 PE1EBT CQ Netherlands, -07 W0CMJ U.S.A. CO, -06 NR0Q CQ U.S.A. OK, -02 EA1I0K Spain, -07 N5UG U.S.A. OK.

Clicking on a call → Sets up WSJT-X



Compatible Loggers

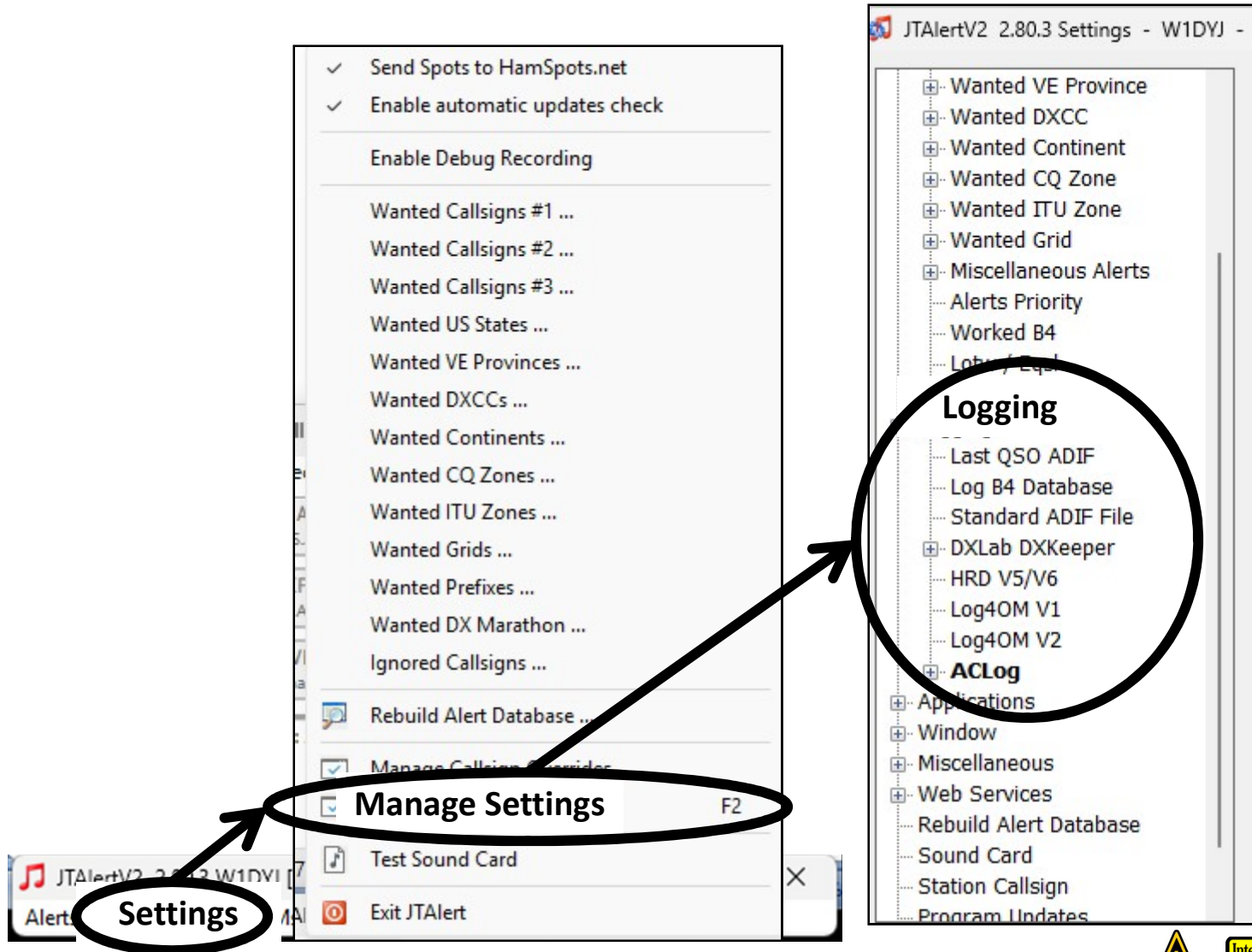
- DXKeeper
- ACLog
- Log4OM V1/V2
- HRD Log V4/V5
- Standard ADIF 2.2 file



Real Time Audio & Visual Alerts.



JTAlert ~ Selecting Your Logger



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

The screenshot shows the JTAlert software interface. In the bottom left corner, the word "Alerts" is circled in black. A large black arrow points from this circle to a menu that is open. The menu contains the following items:

- Clear B4 Cache
- Clear Callsign data Cache
- Clear Session Ignored Cache
- Clear Session Ignored Cache (current band)
- Clear Session Ignored Cache (current mode)
- Clear Session Ignored Cache (current band and mode)
- Out of Shack Alt+S
- No audio alerts for WSJTJ/JTDX DX Call
- ✓ Own Call
- ✓ CQ and QRZ
- ✓ Directed CQ
- Wanted Callsigns #1
- Wanted Callsigns #2
- Wanted Callsigns #3
- ✓ Wanted US State
- Wanted VE Province
- ✓ Wanted DXCC
- Wanted Continent
- Wanted CQ Zone
- Wanted ITU Zone
- ✓ Wanted Grid
- Wanted Prefix
- Wanted DX Marathon (2025)
- Decode Keywords
- Ignored Callsign
- TX Watchdog
- User Defined Alert
- Filters >
- ✓ Show LoTW flags
- ✓ Show eQSL flags
- Decoded Callsign Data Tooltip >
- Exit JTAlert



JTAlert ~ Building Alert dB

Pulls Info from your logger to JTAlert

- Send Spots to HamSpots.net
- Enable Debug Recording
- Wanted Callsigns ...
- Wanted US States ...
- Wanted DXCCs ...
- Wanted Continents ...
- Wanted CQ Zones ...
- Wanted Grids ...
- Wanted Prefixes ...
- Wanted CQ Marathons ...
- Manage Settings ... F11
- Test Sound Card
- Exit JTAlert

Rebuild Alert Database

First Setup each alert type

The screenshot shows the 'Rebuild Alert Database' settings in JTAlertV2. The left sidebar has 'Rebuild Alert Database' selected. The main window has a 'Rebuild All' button circled in yellow, labeled 'Second'. Below it, the 'Enable' section for 'Wanted DXCC' has 'Enable this Rebuild' checked, circled in black, with a yellow arrow pointing to the 'First Setup each alert type' box. The 'Confirmation Method' section has 'Card', 'LoTW', and 'eQSL' options, with 'Card' and 'LoTW' checked and circled in black. The window title is 'JTAlertV2 2.80.3 Settings - W1DYJ - [Logging Enabled - N3FJP Amateur Contact Log]'. Buttons for 'All Results', 'Results', and 'Rebuild' are visible.

Not Automatic

The screenshot shows the taskbar icon for JTAlertV2. The icon is circled in black, and the word 'Settings' is written below it. The taskbar text includes 'JTAlertV2 2.80.3 W1DYJ [17m,FT8,ACL,#1] (Updates)' and 'Alerts Msgs ON Sound ON Help'.



JTAlert ~ Building Alert dB

Manually Building your dB

The screenshot shows the JTAlert software interface. On the left, a tree view lists various alert categories. The 'Alerts' category is circled in black, with an arrow pointing to the 'Wanted US State' option, which is also circled. Below this, a 'Rebuild your Wanted Alert requirements' dialog box is open, with the 'Wanted US State' option circled and labeled 'Not Enabled'. The 'Enable this Rebuild' checkbox is unchecked. In the center, a 'Wanted US State' dialog box is shown, with the 'Individual Bands' option circled. Below this, a 'Band Enable and Select' dialog box is open, with the 'By Individual Band' option circled. The 'Band 6m' dialog box is also visible, with the 'Check All' button circled and the text 'Click on them' next to it. The 'Band 6m' dialog box shows a grid of checkboxes for states, with 'AK' and 'HI' checked. The 'Band Enable and Select' dialog box shows a grid of checkboxes for bands, with all checked.



INDEXA

JTAlert ~ Some Additional Stuff

Alert Types Summary Window Setting colors

Alert Types

- Own Call**
- CQ**
- Directed CQ**
- Wanted Callsigns #1**
- Wanted Callsigns #2**
- Wanted Callsigns #3**
- Wanted Prefix**
- Wanted Grid**
- Wanted US State**
- Wanted VE Province**
- Wanted DXCC**
- Wanted CQ Zone**
- Wanted ITU Zone**
- Wanted Continent**
- Wanted DX Marathon**
- Ignored Callsign**
- Decode Keywords**
- Worked B4**
- No Alert**

Setting Badges and Borders

Badges & Borders

Top Right Badge position

Standard CQ

Show border

Show badge

CQ Text Back

73

Show border

Show badge

73 Text Back

Directed CQ

Show border

Show badge

DX Text Back

POTA

Show border

Show badge

PO Text Back

SOTA

Show border

Show badge

SO Text Back

Some Callsign Options

Callsign Options

Callsign section

- B4/State
- Lotw
- SNR dB
- Eqsl
- Online

Country section

- Country section
- SNR dB
- State
- B4 date replaces Country
- Grid replaces Country for VHF

Visual display

- Allow ATNO blinking effect



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: main@WSJTX.groups.io

JTAlert: Support@HamApps.groups.io

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

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



Thank you!

www.qsl.net/w1dyj



Appendix

- ***Presentation Abstract / W1DYJ Bio***
- ***More on using SPLIT & Some Random Info***
- ***W1DYJ***
 - ***Who Am I?***
 - ***What I have Logged as of February 2025***
 - ***Log Stats – 2017 vs. 2025***



Abstract / Bio

FT8 and JTAlert

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.



Using 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."



Some 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.



W1DYJ ~ Who Am I?

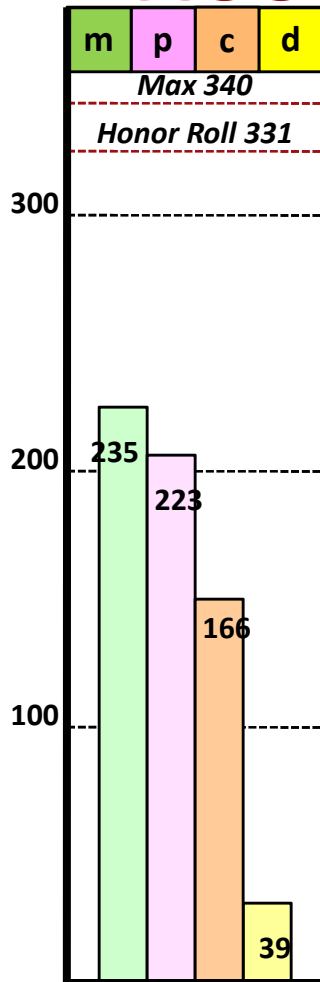
- Mom was a high School cafeteria worker. Dad was an electrician and had a dual workshop: woodworking and electronics (my two continuing favorite hobbies). They both highly valued education.
- As a kid: I “played” in his workshop, had an erector set, and read all the **Tom Swift** books...
- Built a **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**



FT8: An Update ~ W1DYJ Stats – 2017



DXCC



DXCC

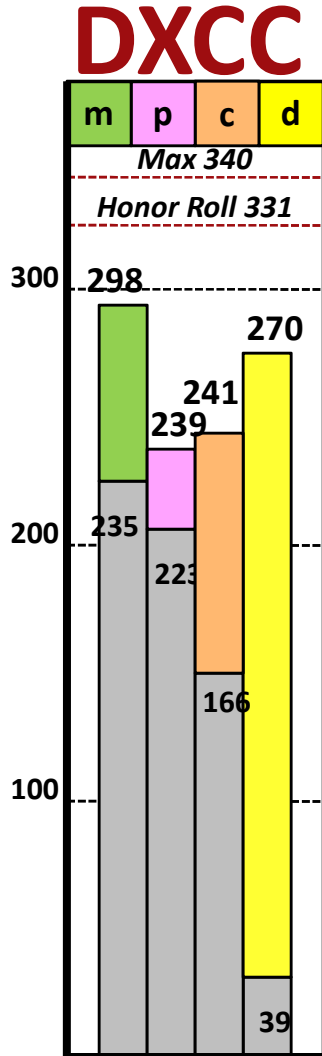
Count of overall Entities

Minimum = 100

Endorsements by band and mode



FT8: An Update ~ W1DYJ Stats – 9/2025



DXCC

Count of overall Entities

Minimum = 100

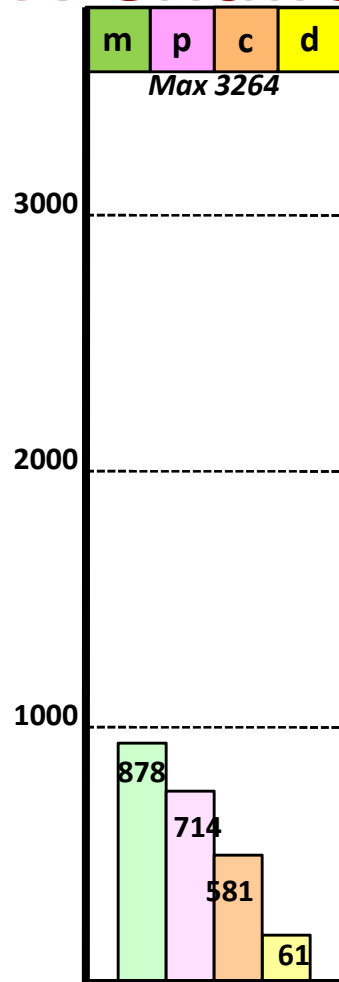
Endorsements by band and mode



FT8: An Update ~ W1DYJ Stats – 2017

mixed phone cw digital

DX Challenge



DX Challenge
Count of overall Band-Entities

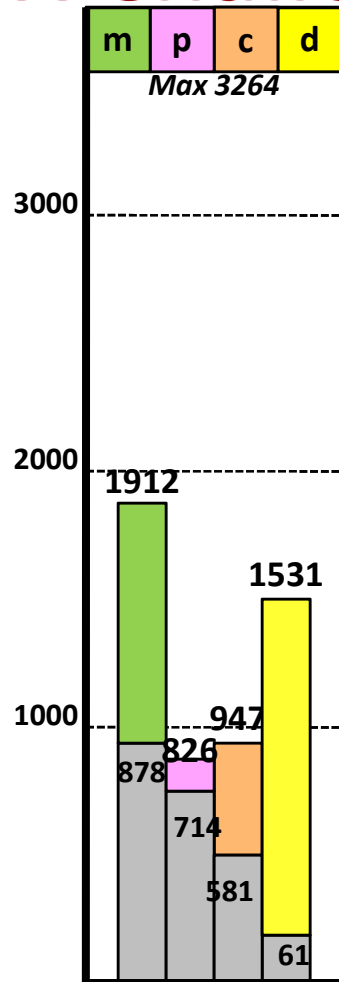
Minimum = 1000



FT8: An Update ~ W1DYJ Stats – 9/2025



DX Challenge



DX Challenge

Count of overall Band-Entities

Minimum = 1000



FT8: An Update ~ W1DYJ Stats – 2017

mixed
phone
cw
digital

DXCC by Band

DXCC by Band

Mixed – 4 bands
Phone – 4 bands
CW – 3 bands
Digital – no bands

		m	p	c	d		m	p	c	d
2017	160					17				
2017	80					15				
2017	60					12				
2017	40					10				
2017	30		na			6				
2017	20									



FT8: An Update ~ W1DYJ Stats – 9/2025

mixed
phone
cw
digital

DXCC by Band

DXCC by Band

Mixed – 9 bands
Phone – 4 bands
CW – 4 bands
Digital – 9 bands

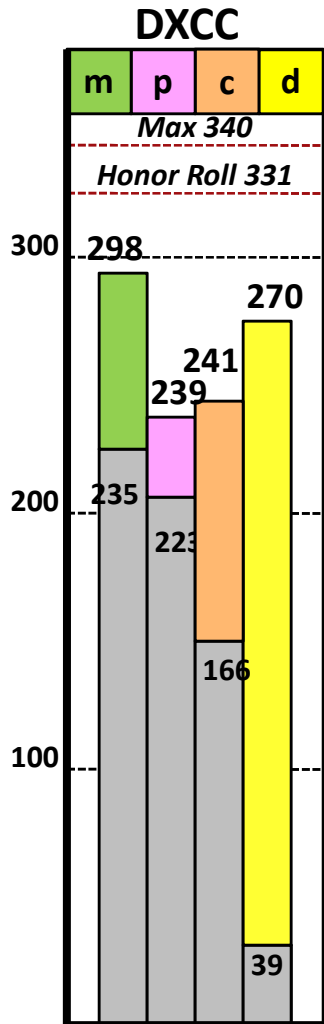
		m	p	c	d		m	p	c	d
2017	160					17				
2025	160	93	7	60	69	17	93	52	38	69
2017	80					15	93	52	38	
2025	80	93	75	96	69	15	93	75	96	69
2017	60					12				
2025	60	93	0	0	69	12	93	26	33	69
2017	40	93	52	38		10	93	52		
2025	40	93	75	96	69	10	93	75	96	69
2017	30		na			6				
2025	30	93	na	90	69	6	94	27	13	87
2017	20	93	52	38						
2025	20	93	75	96	69					



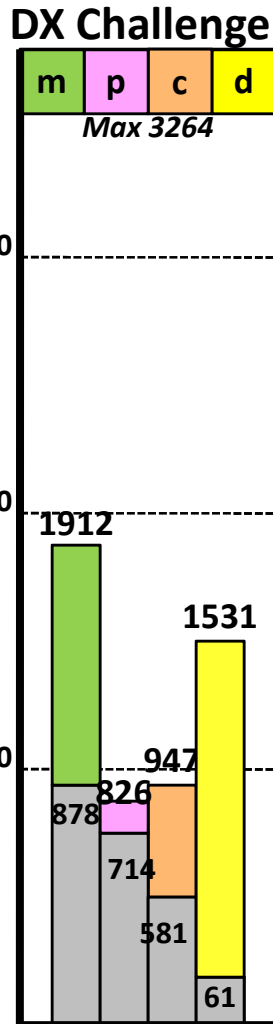
FT8:

W1DYJ Stats – 2017 → 9/2025

mixed phone cw digital



2017



DXCC by Band

Year	Band	mixed	phone	cw	digital
2017	170				
	160	93	7	60	69
2025	17	228	52	38	191
	17				
2017	80				
	80	143	75	96	110
2025	15	248	155	156	187
	15				
2017	60				
	60	106	0	0	106
2025	12	216	26	33	173
	12				
2017	40				
	40	196	120	148	145
2025	10	230	177	140	132
	10				
2017	30				
	30	202	na	90	166
2025	6	94	27	13	87
	6				
2017	20				
	20	263	187	172	164

