

WSJT / FT8 / FT4

- FT8 protocol
- Computer / Radio Setup
- Program Setup
- Live Demo
- TX Audio Harmonics
- Contact Hints
- Fox and Hound

FT8 / FT4 Protocol

- FT8 15 sec. TX & RX cycle / 8 tones MFSK
- FT4 7.5 sec. TX & RX cycle / 4 tones MFSK
- 77 bit data payload + FEC sent twice
- Standard call signs are compressed to 28 bits
- 13 characters of free text
- Non-standard calls are sent as characters and are “hashed” e.g. Show up as <P500ABCD>
- See WSJT-X 2.1.0 Users guide

The PC

- Some what newer PC with Windows 7 or newer. Multicore processor is better.
- May also use Linux or MacOS
- Need sound card & serial port(s) or USB port(s)
- Install from
<https://physics.princeton.edu/pulsar/k1jt/wsjsx.html>
- RTFM

PC Time

- FT8 \pm 2 sec (FT4 \pm 1 sec)
- Decodes better at \pm 1 sec (FT4 \pm 0.5 sec)
- Use browser & check PC time @ www.time.is
- Set Windows time manually vs. WWV or
- Install Dimension4 or Meinberg ntp
- Observe DT column in WSJT-X

PC-Radio Interface

- RX and TX Audio
- PTT
- Radio Control (CAT)

PC-Radio - Audio

- Depending on radio and PC configuration
 - PC sound card to/from radio
 - Transformer isolated TX & RX
 - Commercial interface (Rigblaster, etc.)
 - Turn off PC sounds if using default PC sound card
 - Turn off PC sound card processing
 - External USB sound card (Signalink, etc.)
 - USB to sound card in the radio
 - SDR – Digital audio via VAC/DAX

PC-Radio – PTT

- Depending on radio and PC configuration
 - PTT via RS-232 port DTR/RTS to PTT port on radio with DC level translation (RigBlaster)
 - PTT via VOX (if supported by radio or Signalink)
 - PTT via CAT (if supported by radio)

PC-Radio – Control (CAT)

- RS-232 serial COM port
 - May need USB to Serial converter
 - USE FTDI
 - Need cable with correct connectors
 - Need to match baud rate, data format
- USB to COM port in radio
- SDR use VSP
- Flex use TCP

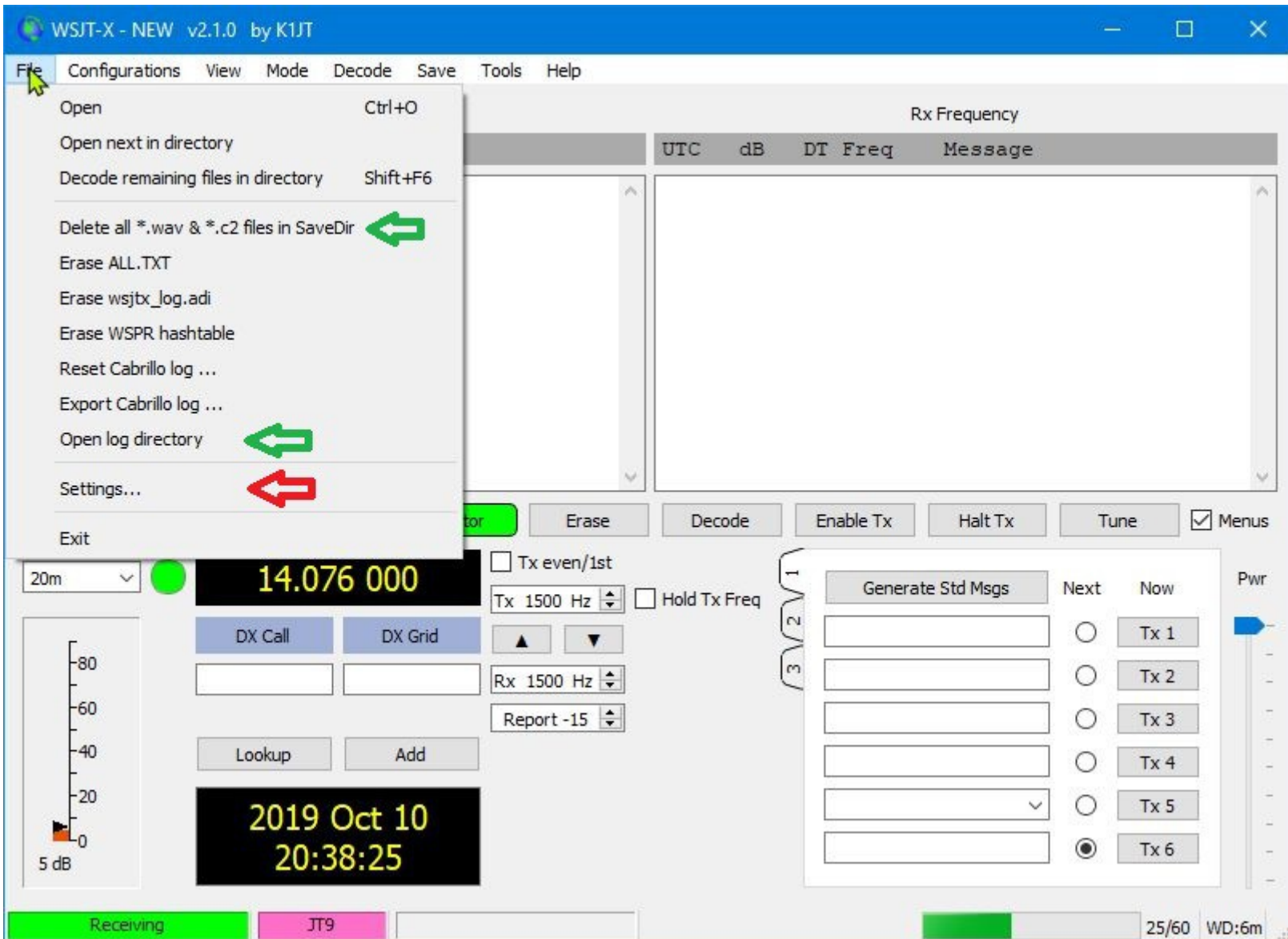
The Radio - Tx

- Use Digital mode if available else USB
- No Tx signal processing or Tx EQ
- Do not overdrive TX audio stages
- No or little ALC indication
- Control RF output with audio/WSJT level controls
- May need to set the SC playback audio level in the PC

The Radio – Rx

- Use reduced RF gain
- Some may wish to turn AGC off
- Adjust radio audio/RF for green in WSJT
 - 20-30 with quiet channel noise
 - Less than red with strong signals
 - May need to set PC Recording SC gain
 - May need to Configure Windows 10 to allow apps to access Mic inputs

WSJT File



WSJT Settings General

The screenshot shows the 'Settings' dialog box for WSJT, with the 'General' tab selected. The dialog has a blue title bar with a question mark icon and a close button. The tabs at the top are: General, Radio, Audio, Tx Macros, Reporting, Frequencies, Colors, and Advanced. The 'Station Detail' section contains: 'My Call:' (a pink text box with a red arrow pointing to it), 'My Grid:' (a pink text box with a red arrow pointing to it), an 'AutoGrid' checkbox, 'IARU Region:' (a dropdown menu showing 'All' with a red arrow pointing to it), and 'Message generation for type 2 compound callsign holders:' (a dropdown menu showing 'Full call in Tx3'). The 'Display' section contains: 'Start new period decodes at top' (checkbox), 'Blank line between decoding periods' (checkbox), 'Display distance in miles' (checkbox), 'Tx messages to Rx frequency window' (checked checkbox), 'Show DXCC, grid, and worked-before status' (checkbox with a green arrow pointing to it), 'Show principal prefix instead of country name' (checkbox), a 'Font...' button, and a 'Decoded Text Font...' button. The 'Behavior' section contains: 'Monitor off at startup' (checkbox), 'Monitor returns to last used frequency' (checkbox), 'Double-click on call sets Tx enable' (checkbox), 'Disable Tx after sending 73' (checkbox), 'Calling CQ forces Call 1st' (checkbox), 'Alternate F1-F6 bindings' (checkbox), 'CW ID after 73' (checkbox), 'Enable VHF/UHF/Microwave features' (checkbox), 'Allow Tx frequency changes while transmitting' (checkbox), 'Single decode' (checkbox), 'Decode after EME delay' (checkbox), 'Tx watchdog:' (a spinner box set to '6 minutes'), and 'Periodic CW ID Interval:' (a spinner box set to '0'). At the bottom are 'OK' and 'Cancel' buttons.

Settings

General Radio Audio Tx Macros Reporting Frequencies Colors Advanced

Station Detail

My Call: My Grid: ☐ 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

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/UHF/Microwave features ☐ Allow Tx frequency changes while transmitting ☐ Single decode ☐ Decode after EME delay

Tx watchdog: 6 minutes
Periodic CW ID Interval: 0

OK Cancel

WSJT Settings Radio

The screenshot shows the 'Radio' tab of the WSJT Settings window. Red arrows point to the 'Rig' dropdown (set to 'None'), the 'CAT Control' section, and the 'PTT Method' section (where 'VOX' is selected). A green arrow points from the 'Handshake' section to the 'Split Operation' section. Below 'Split Operation', green arrows point down to the 'Test CAT' and 'Test PTT' buttons.

Settings

General Radio Audio Tx Macros Reporting Frequencies Colors Advanced

Rig: None 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

Handshake

☒ Default ☐ None ☐ XON/XOFF ☐ Hardware

Force Control Lines

DTR: RTS:

PTT Method

☒ VOX ☐ DTR ☐ CAT ☐ RTS

Port: COM5

Transmit Audio Source

☐ Rear/Data ☒ Front/Mic

Mode

☒ None ☐ USB ☐ Data/Pkt

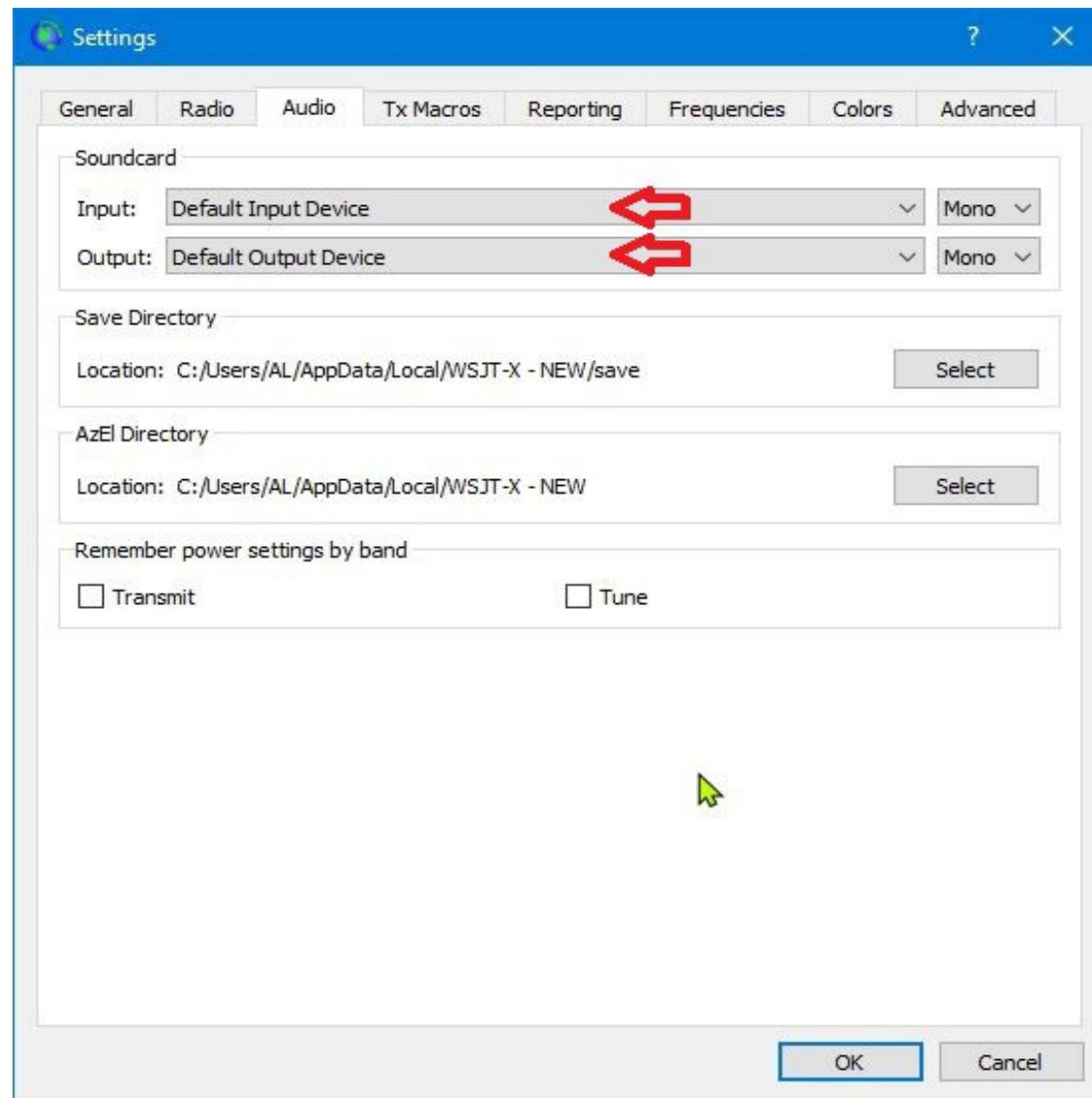
Split Operation

☒ None ☐ Rig ☐ Fake It

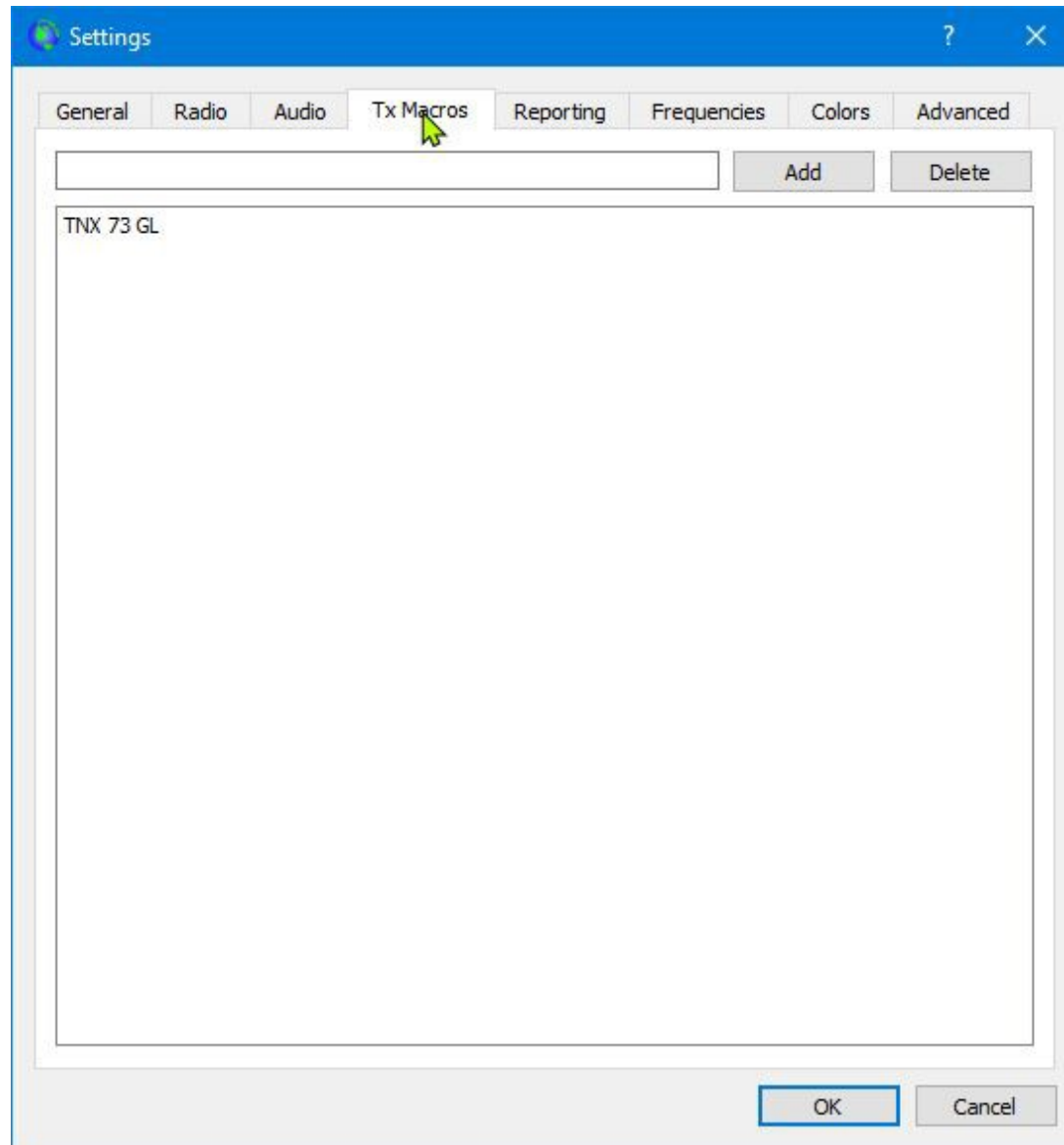
Test CAT Test PTT

OK Cancel

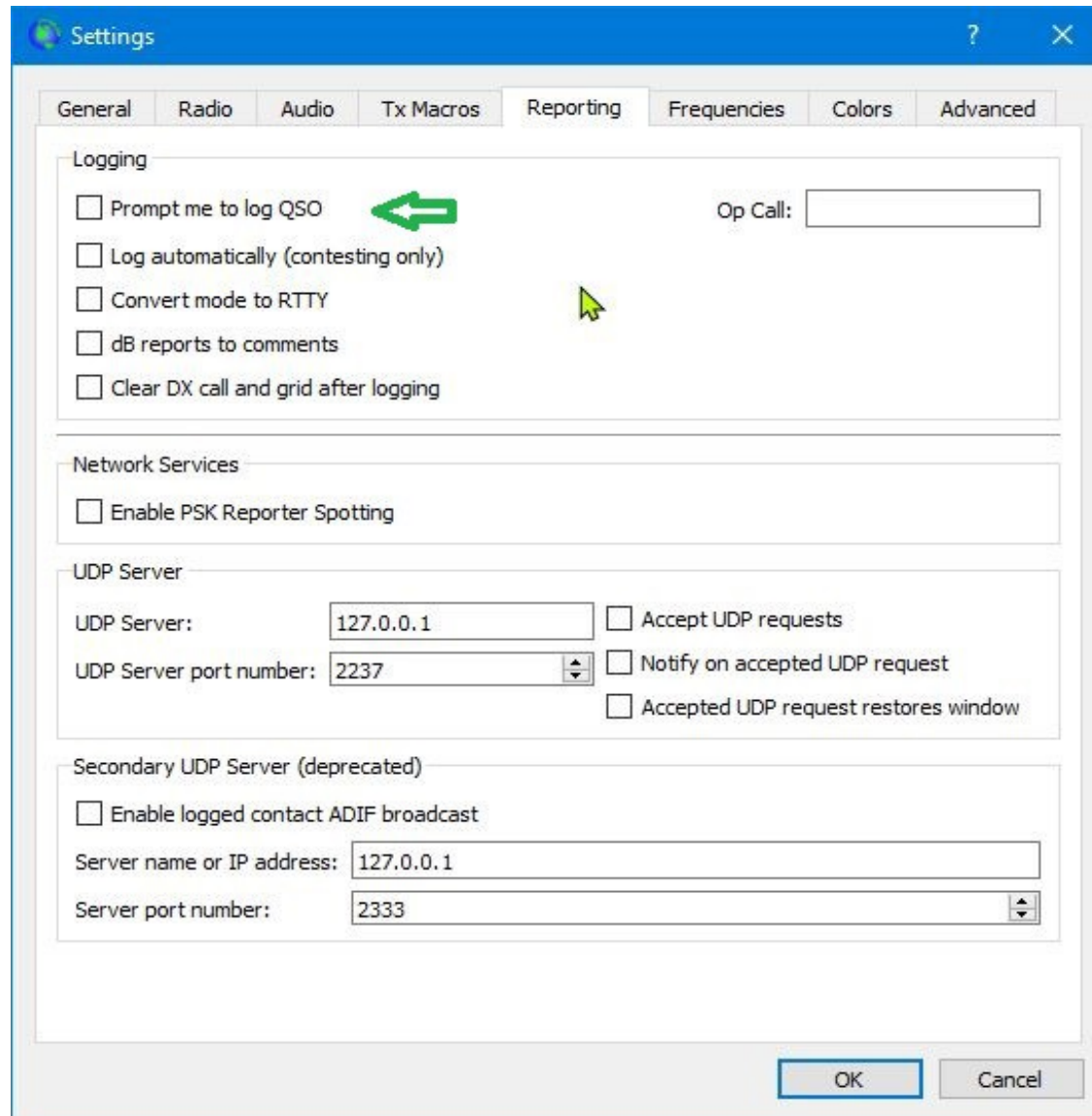
WSJT Settings Audio



WSJT Settings TX Macros



WSJT Settings Reporting





The screenshot shows the 'Reporting' tab of the WSJT Settings window. A green arrow points to the 'Prompt me to log QSO' checkbox, and a mouse cursor points to the 'Log automatically (contesting only)' checkbox. The 'Op Call' field is empty. The 'UDP Server' section shows '127.0.0.1' and '2237' with checkboxes for 'Accept UDP requests', 'Notify on accepted UDP request', and 'Accepted UDP request restores window'. The 'Secondary UDP Server (deprecated)' section shows '127.0.0.1' and '2333' with the 'Enable logged contact ADIF broadcast' checkbox.

Settings

General Radio Audio Tx Macros Reporting Frequencies Colors Advanced

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

Op Call:

Network Services

☐ Enable PSK Reporter Spotting

UDP Server

UDP Server: ☐ Accept UDP requests

UDP Server port number: ☐ Notify on accepted UDP request

☐ Accepted UDP request restores window

Secondary UDP Server (deprecated)

☐ Enable logged contact ADIF broadcast

Server name or IP address:

Server port number:

OK Cancel

WSJT Settings Frequencies

Settings

General Radio Audio Tx Macros Reporting Frequencies Colors Advanced

Frequency Calibration

Slope: 0.0000 ppm Intercept: 0.00 Hz

Working Frequencies

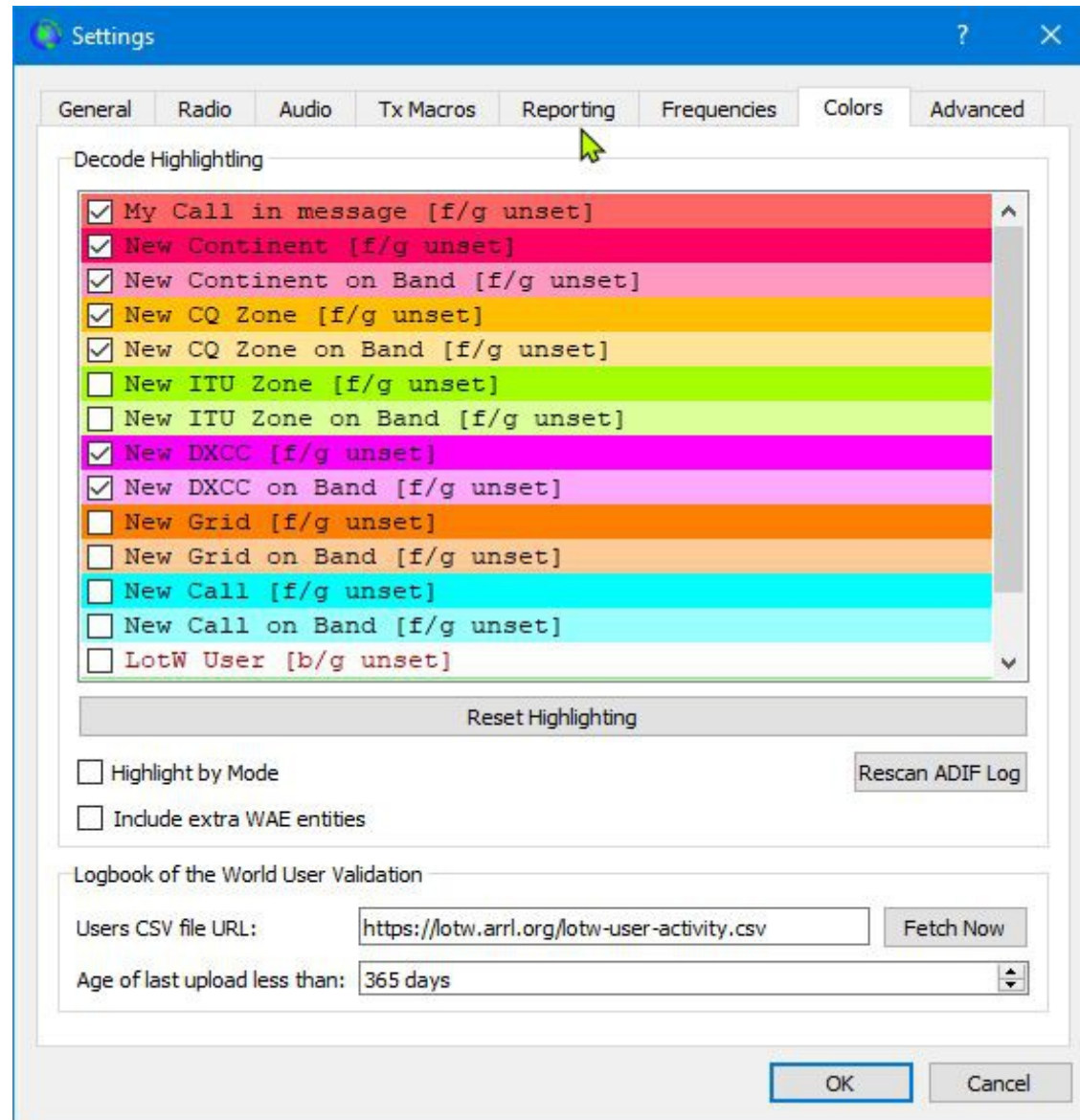
IARU Region	Mode	Frequency
All	JT9	10.140 000 MHz (30m)
All	FT4	10.140 000 MHz (30m)
All	FT8	14.074 000 MHz (20m)
All	JT65	14.076 000 MHz (20m)
All	JT9	14.078 000 MHz (20m)
All	FT4	14.080 000 MHz (20m)
All	WSPR	14.095 600 MHz (20m)

Station Information

Band	Offset	Antenna Description
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OK Cancel

WSJT Settings Colors



WSJT Settings Advanced

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 SN 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

☐ Special operating activity: Generation of FT4, FT8, and MSK144 messages

☐ Fox ☒ Hound

☒ NA VHF Contest ☐ ARRL Field Day

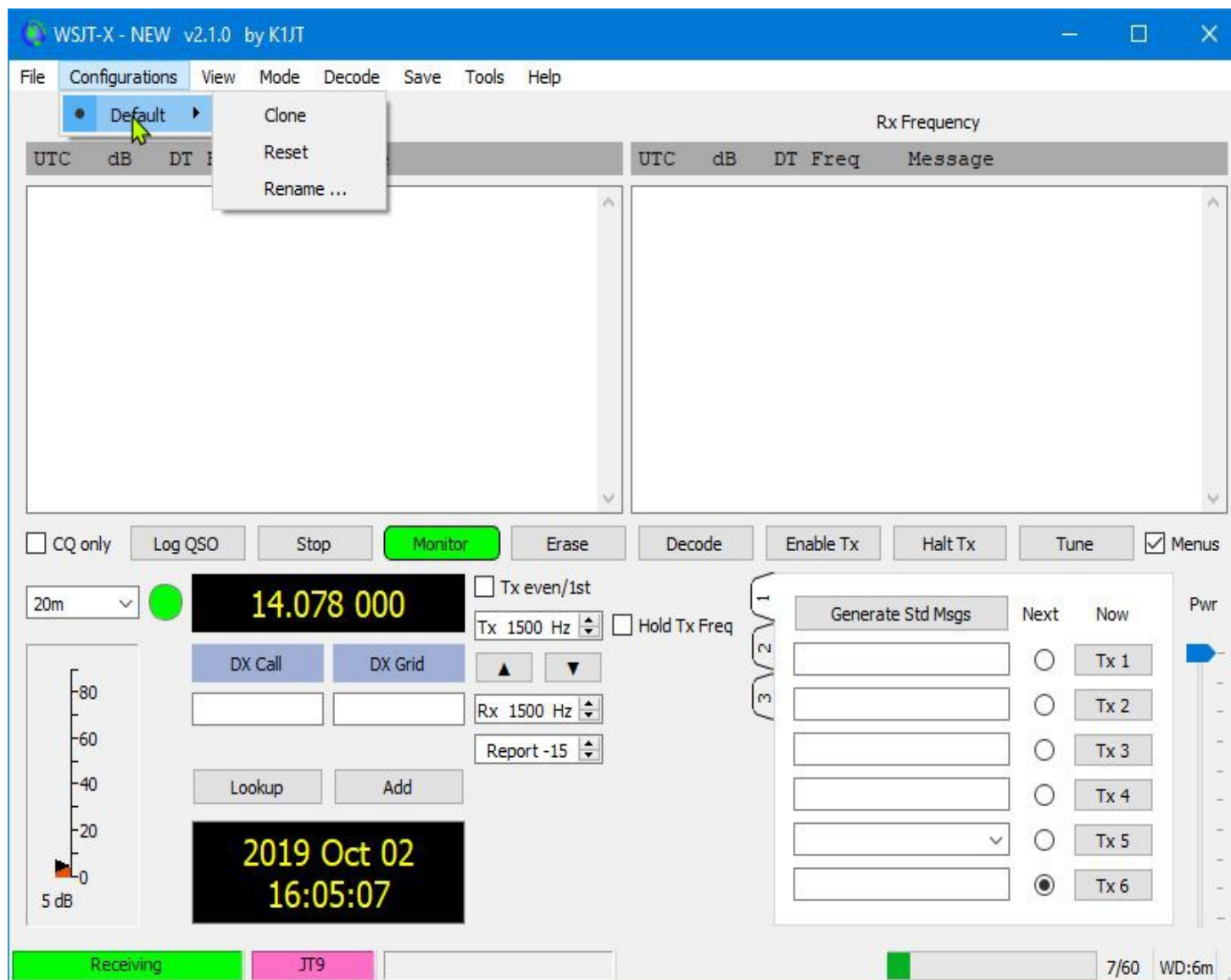
☐ EU VHF Contest ☐ RTTY Roundup messages

FD Exch:

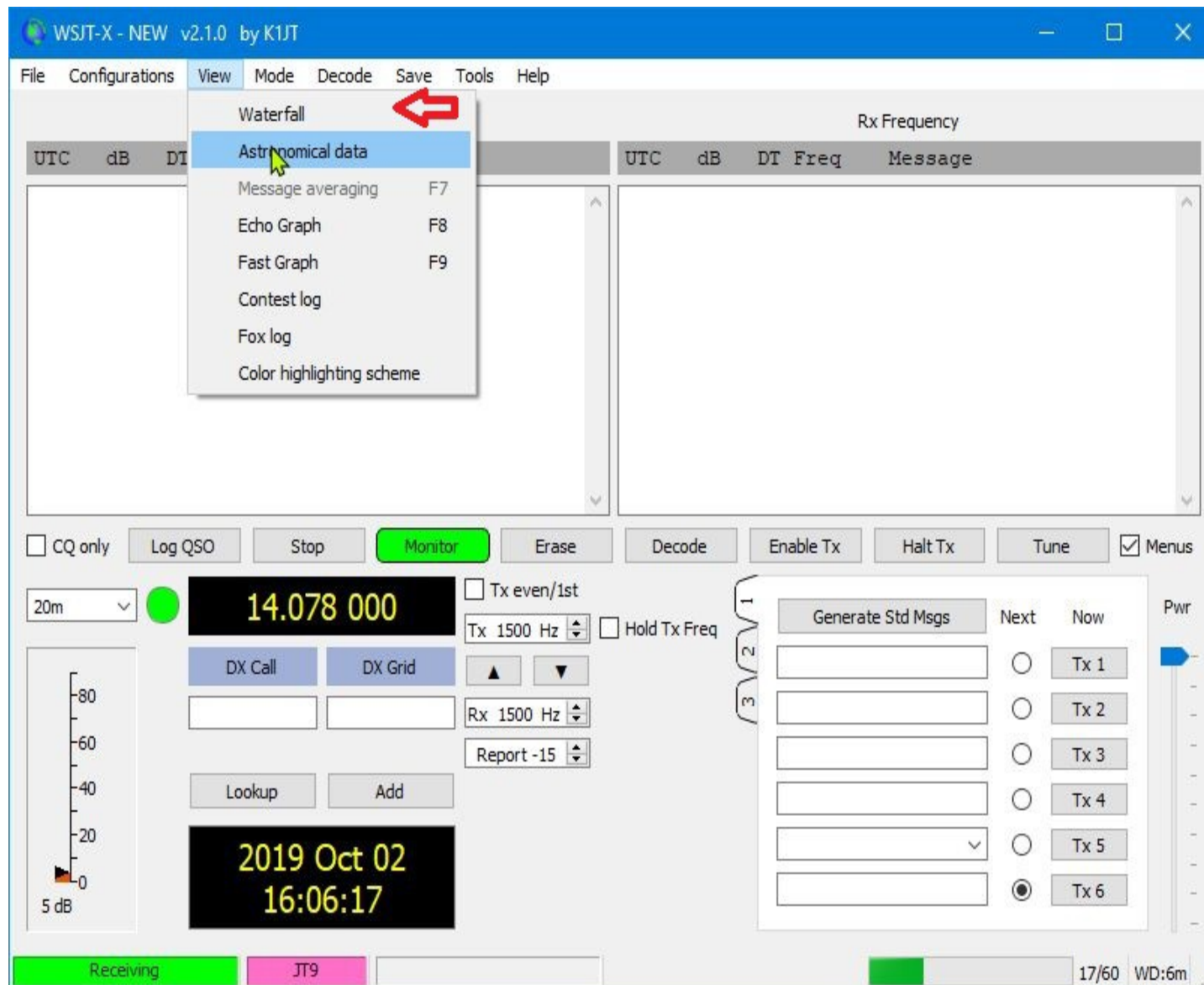
RTTY RU Exch:

OK Cancel

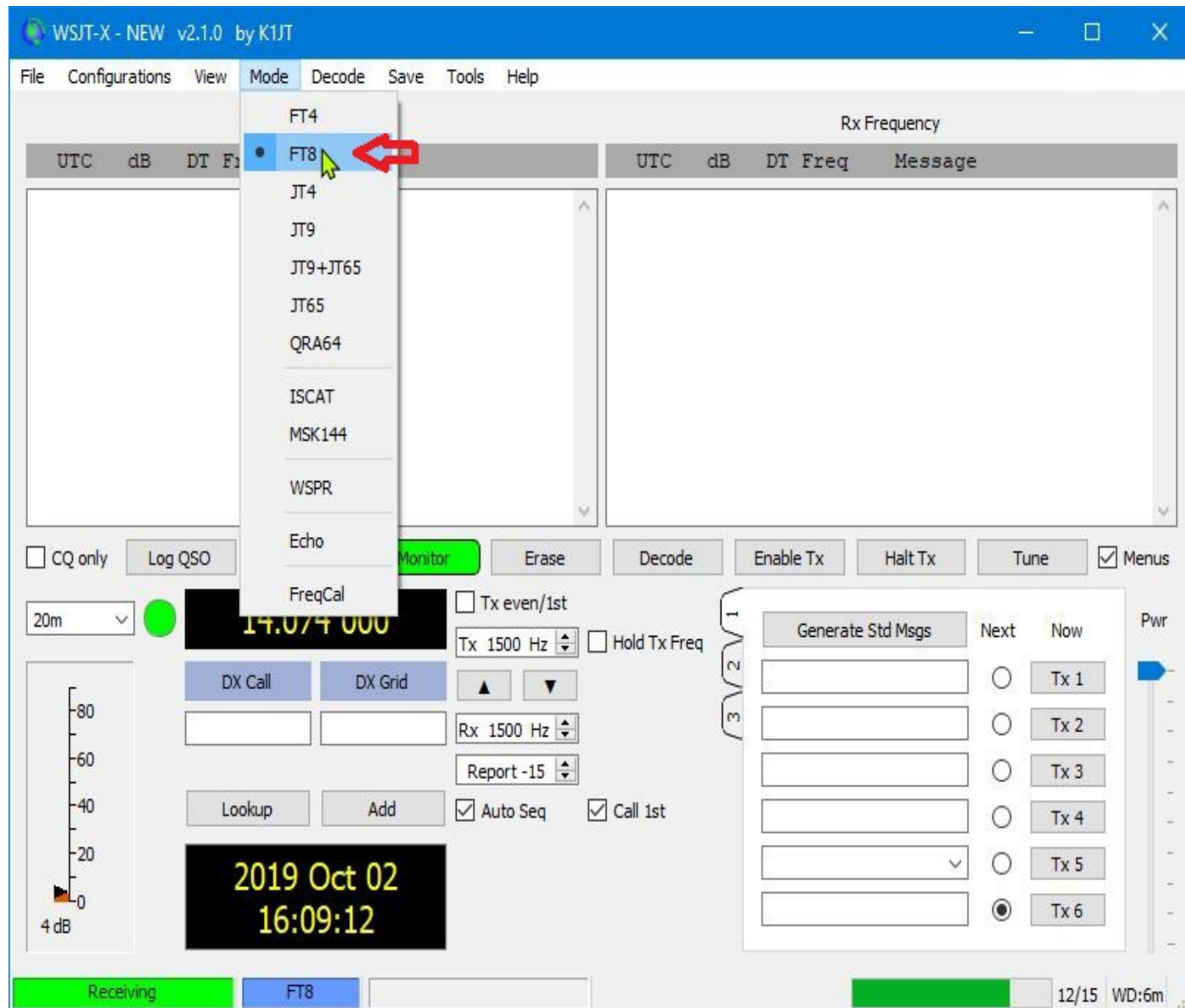
WSJT Configurations



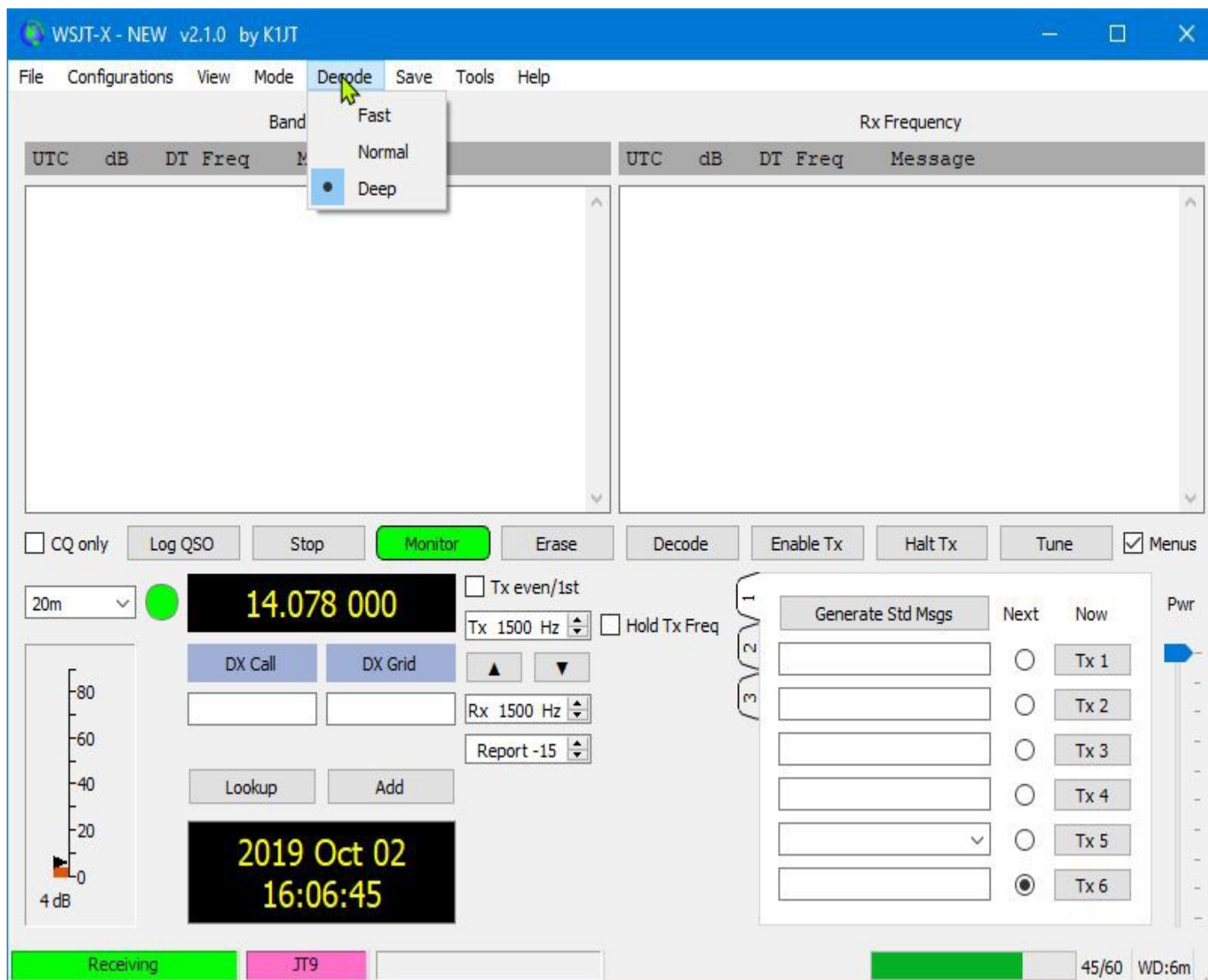
WSJT View



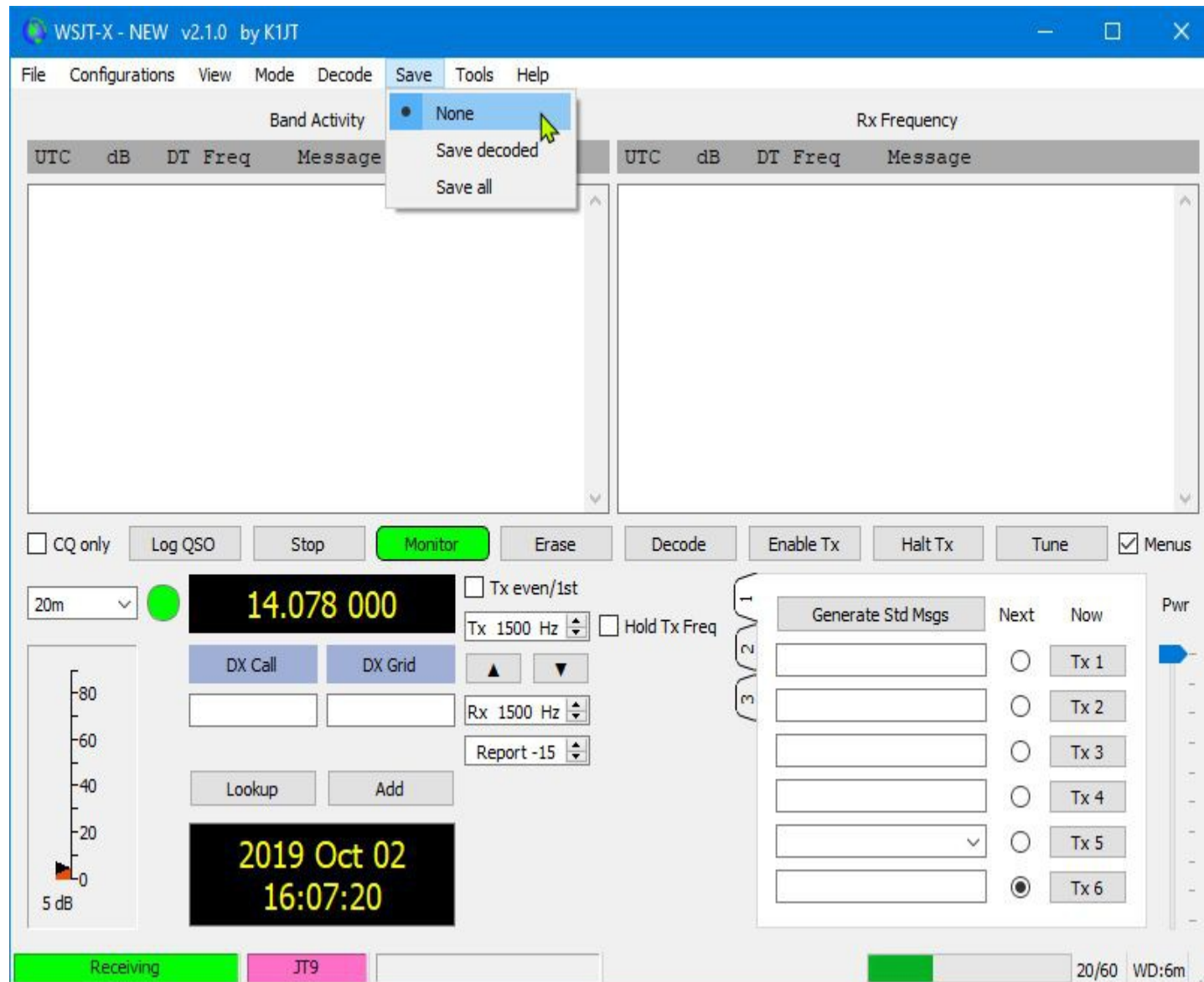
WSJT Mode



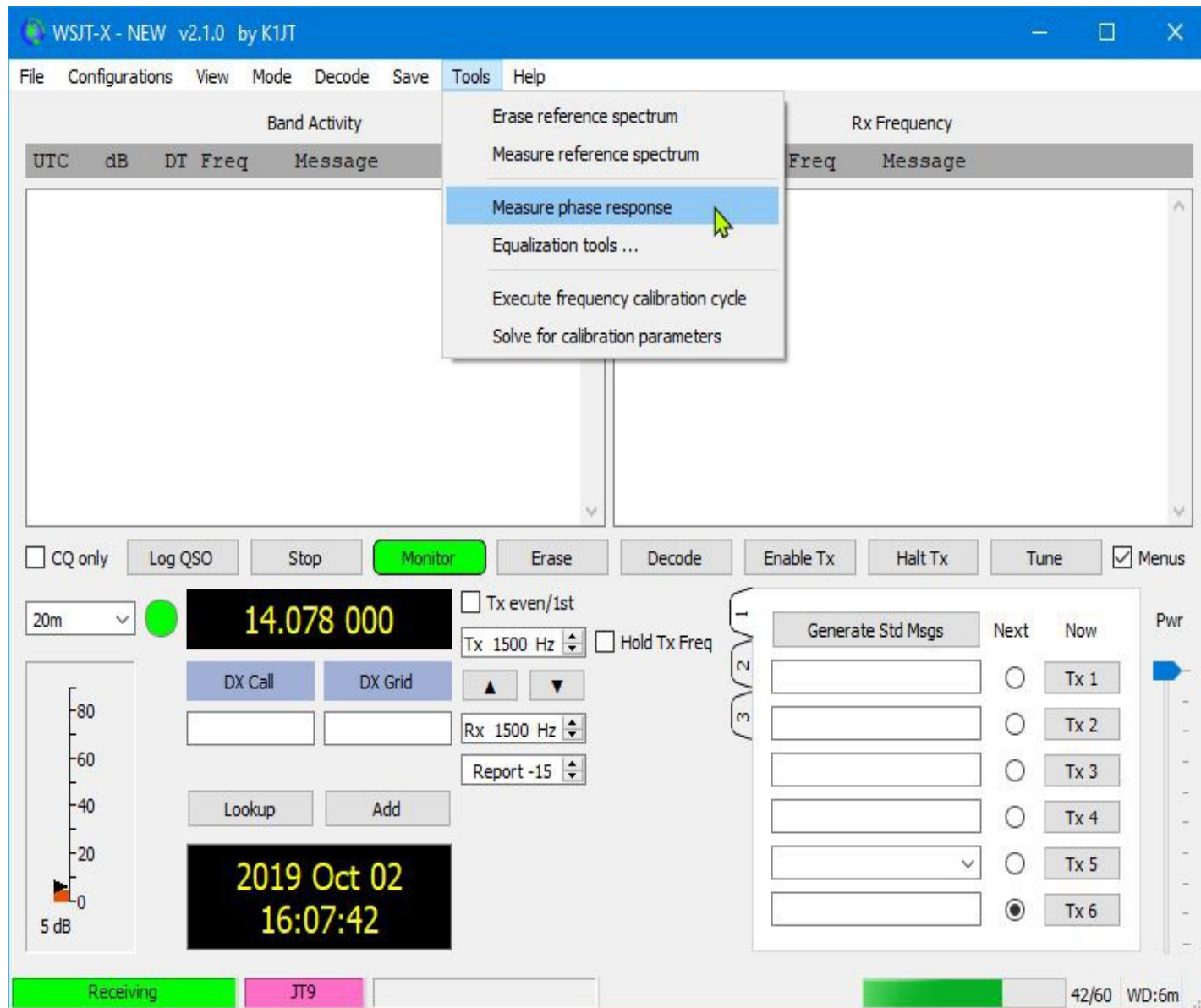
WSJT Decode



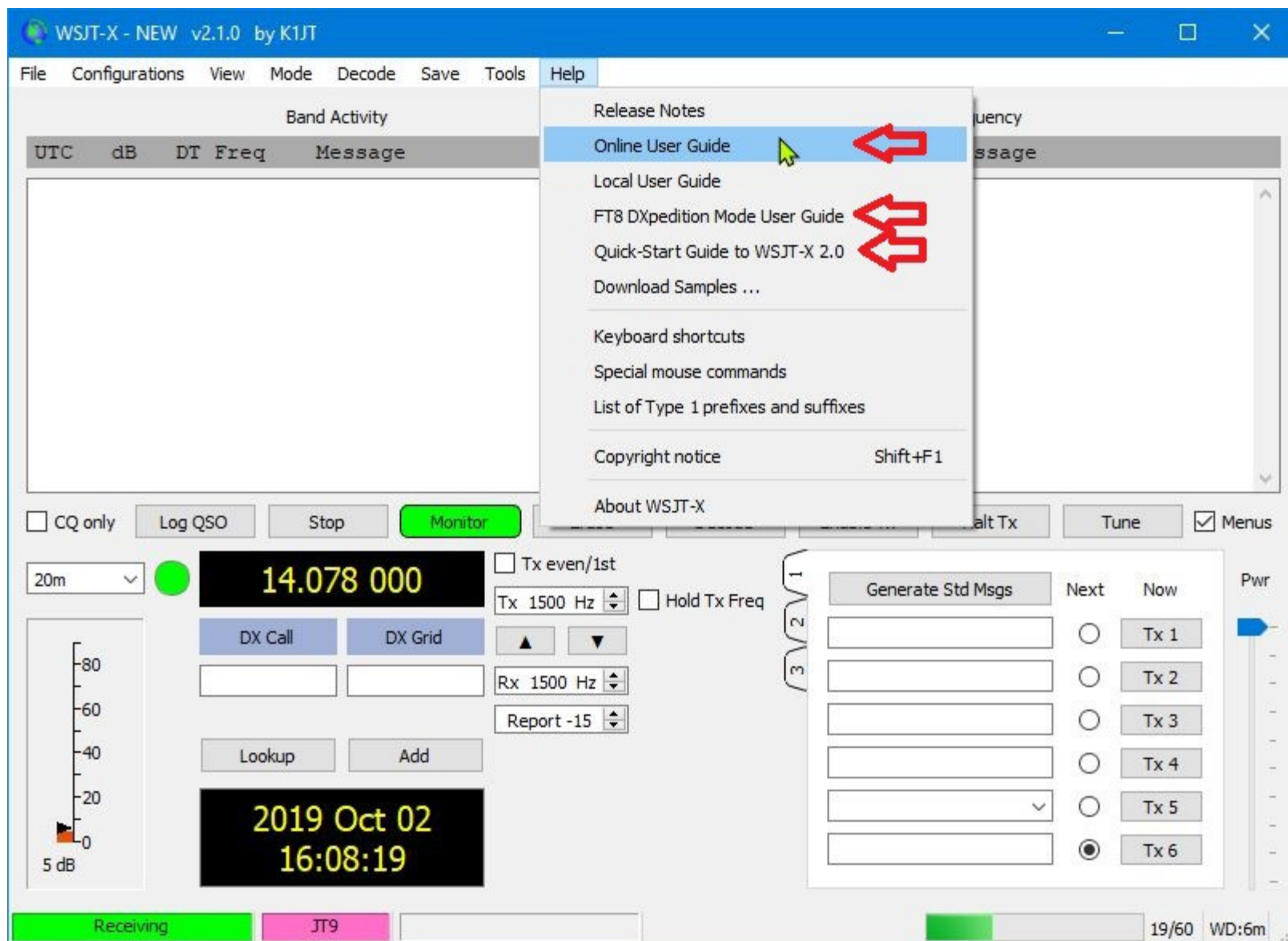
WSJT Save



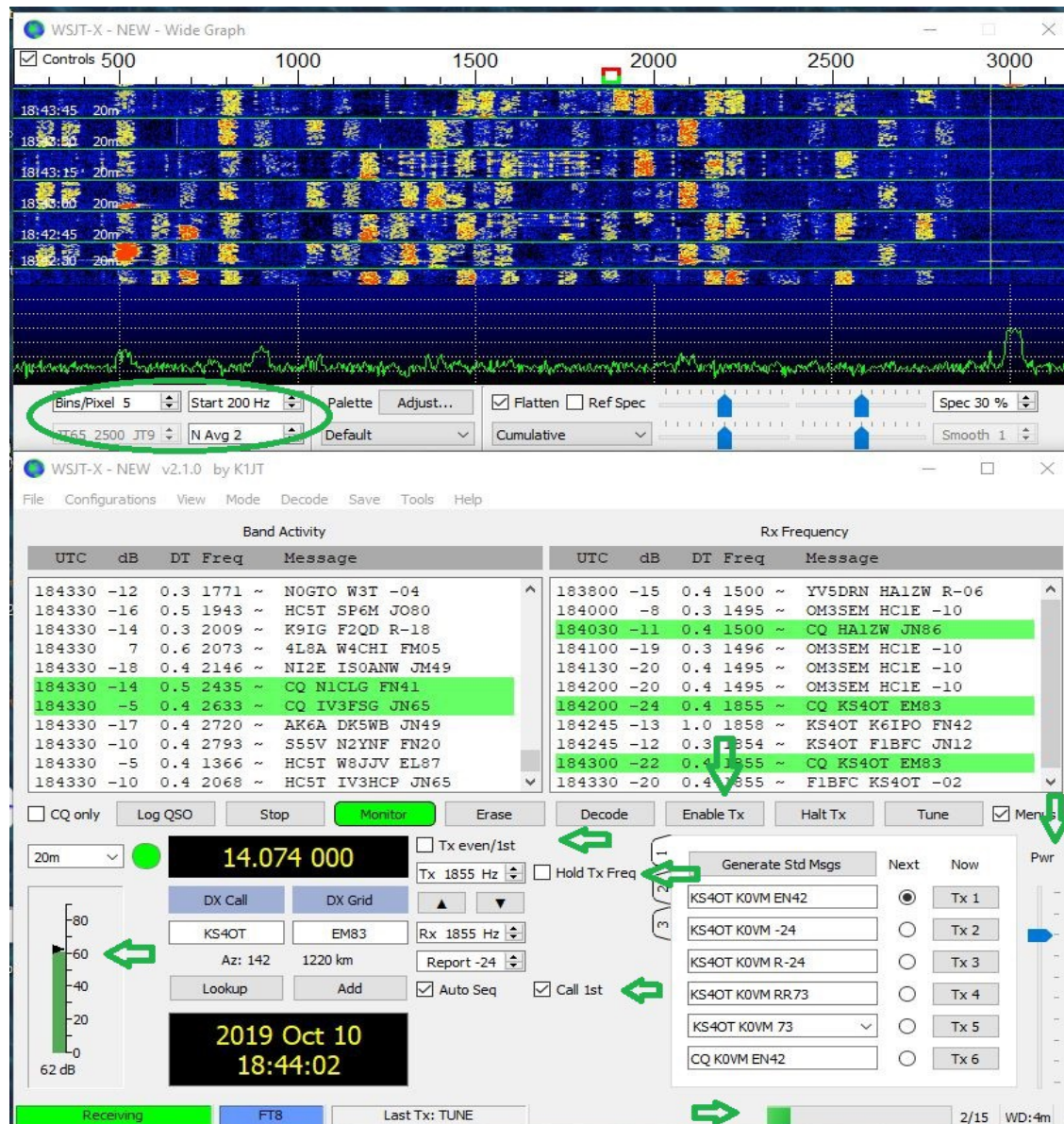
WSJT Tools



WSJT Help

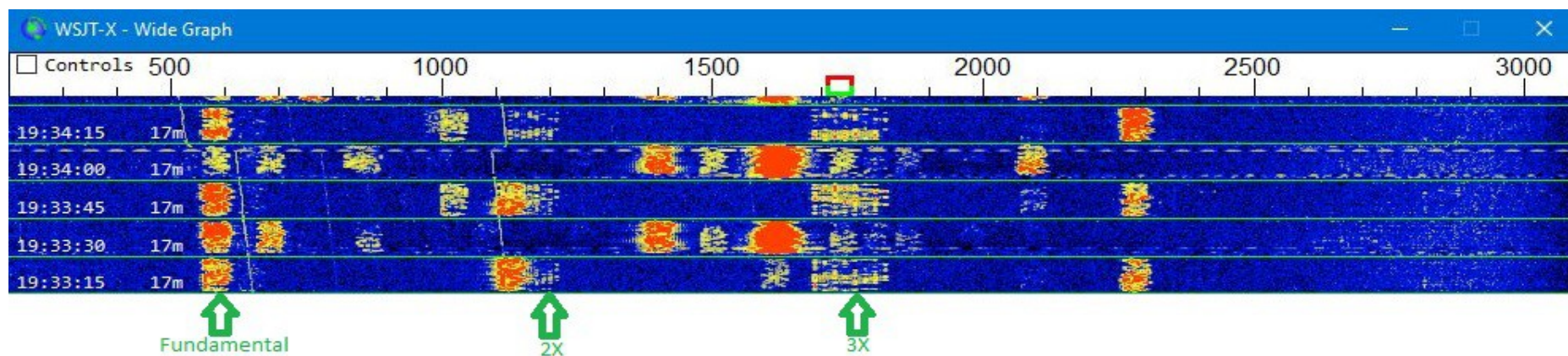


WSJT



Live Demo

TX Audio Harmonics



TX Audio Harmonic Control

- TX Audio Levels
- Tone vs TX passband
 - VFO A_B Switch on TX (Split op – RIG)
 - VFO Shift on TX (Split op - FAKE IT)

Contact hints

- TX / RX Frequency navigation
- TX Hold
- Odd/Even TX cycle
 - Fox/Hound
 - Pre arranged schedule / EME / MS
- Auto Sequence
- Call First
- TX4 - RRR vs RR73

Fox & Hound

- On DX-pedition pre-announced frequencies
- DX always Tx even/1st time slot
- DX may have more than one TX carrier below 600 hz
- DX may response to more than one hound at a time per carrier
- Hounds call above 1000 hz
- Hounds frequency will shift during a successful QSO
- Enforced TX time out when hound calling fox
- Read DX-pedition announcement
- Read WSJT-X DX mode user guide

Other Stuff

- Configurations
- Contesting
- False Decodes
- Other Logging options - Import .adi or Real time
- Time Check - DT
- Tool Tips