INTRODUCTION TO FT8

PART 2

TOPICS FOR PART 2

- FT4
- Frequencies
- Fox and Hound
- Logging
- Setting up colors within WSJT-X
- JT Alert
- Best S+P feature

WHAT IS FT4?

- Designed in 2019, originally intended for contesting.
- Like FT8 it uses:
  - Fixed-length transmissions (77 bits)
  - Structured messages
  - Strong forward error correction
- T/R sequences are 6 seconds long (FT8’s are 15 seconds)
- Transmissions last for 4.48 seconds (FT8’s are 12.64 seconds)
- Uses 4-tone frequency-shift keying (FSK); FT8 uses 8-tone FSK.
- FT4 is 3.5 dB less sensitive than FT8 and requires twice the bandwidth.

FREQUENCIES FOR FT4 AND FT8

- Specific frequencies on each band are used by agreement for FT8 and FT4. You don't have to tune up and down the band to find stations to work.

FT8	FT4
1.840	
3.573	3.575
7.074	7.047.5
10.136	10.140
14.074	14.080
18.100	18.104
21.074	21.140
24.915	24.919
28.074	28.180
50.313	50.318
50.323	
70.154	
144.174	144.170

EXAMPLE OF A CONTACT WITH FT4

SAME AS WITH FT8 BUT IN HALF THE TIME

- CQ K2DM EL88
- K2DM N0SMX EL98
- N0SMX K2DM -03
- K2DM N0SMX R+02
- N0SMX K2DM RR73
- K2DM N0SMX 73

- The entire sequence took 45 seconds!

- ➢K2DM sends CQ during the first 7.5-sec period
- ➢N0SMX answers during the next period
- ➢K2DM sends a signal report to N0SMX
- ➢N0SMX rogers and sends a report back
- ➢K2DM rogers and says 73
- ➢N0SMX sends 73

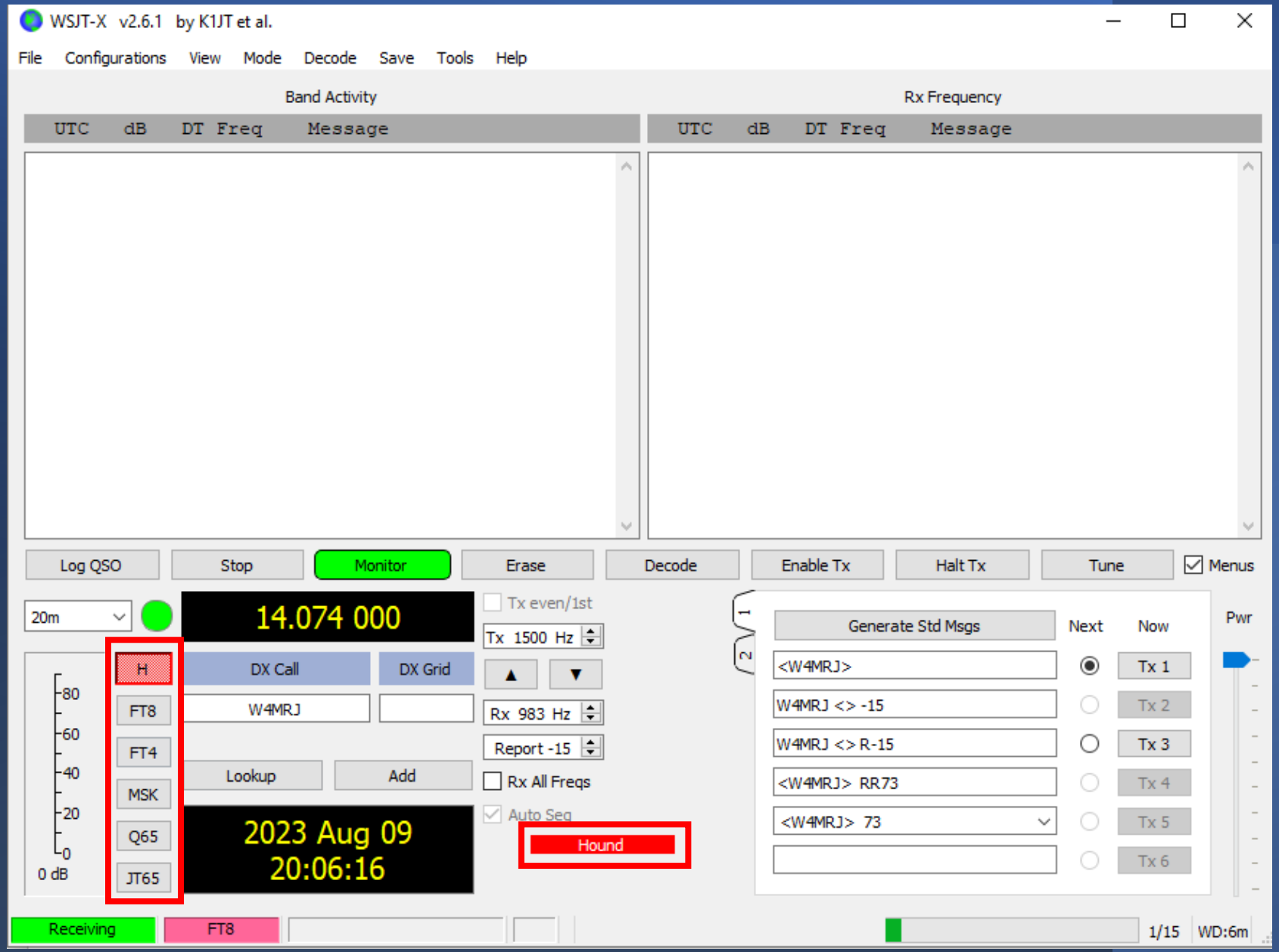
FOX AND HOUND MODE IN FT8 AKA “DXPEDITION MODE”

FOX AND HOUND MODE

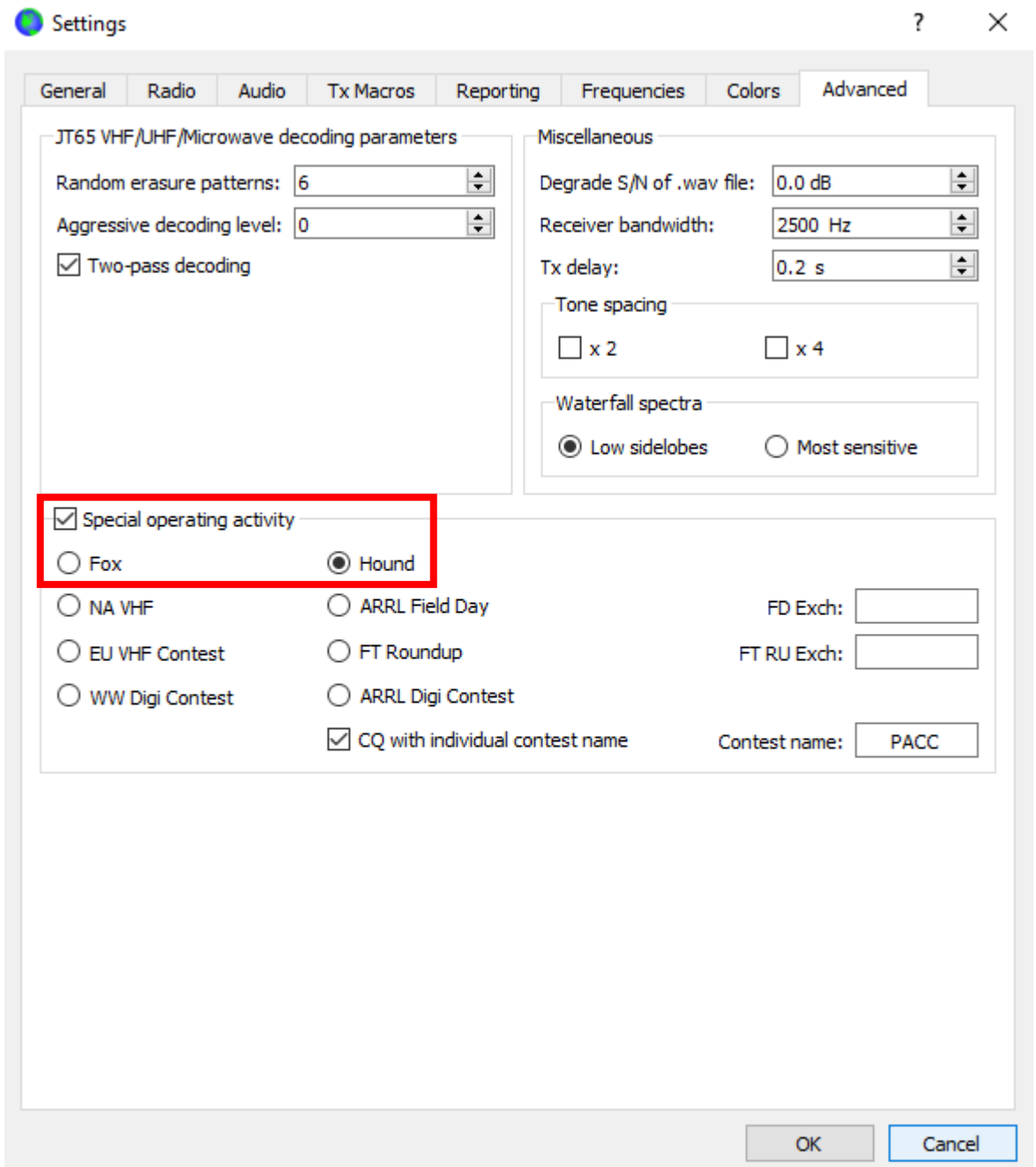
- Is intended for use by rare-entity DXpeditions and other circumstances where rates well over 100/hour are expected.
- Enables DXpeditions to make FT8 QSOs at very high rates.
  - Does not work in FT4.
- The DXpedition station is the FOX, and the calling stations are the HOUNDS.
- QSOs can be completed with as little as one FOX transmission per QSO.
- Authorized FOX stations can transmit up to five signals simultaneously!

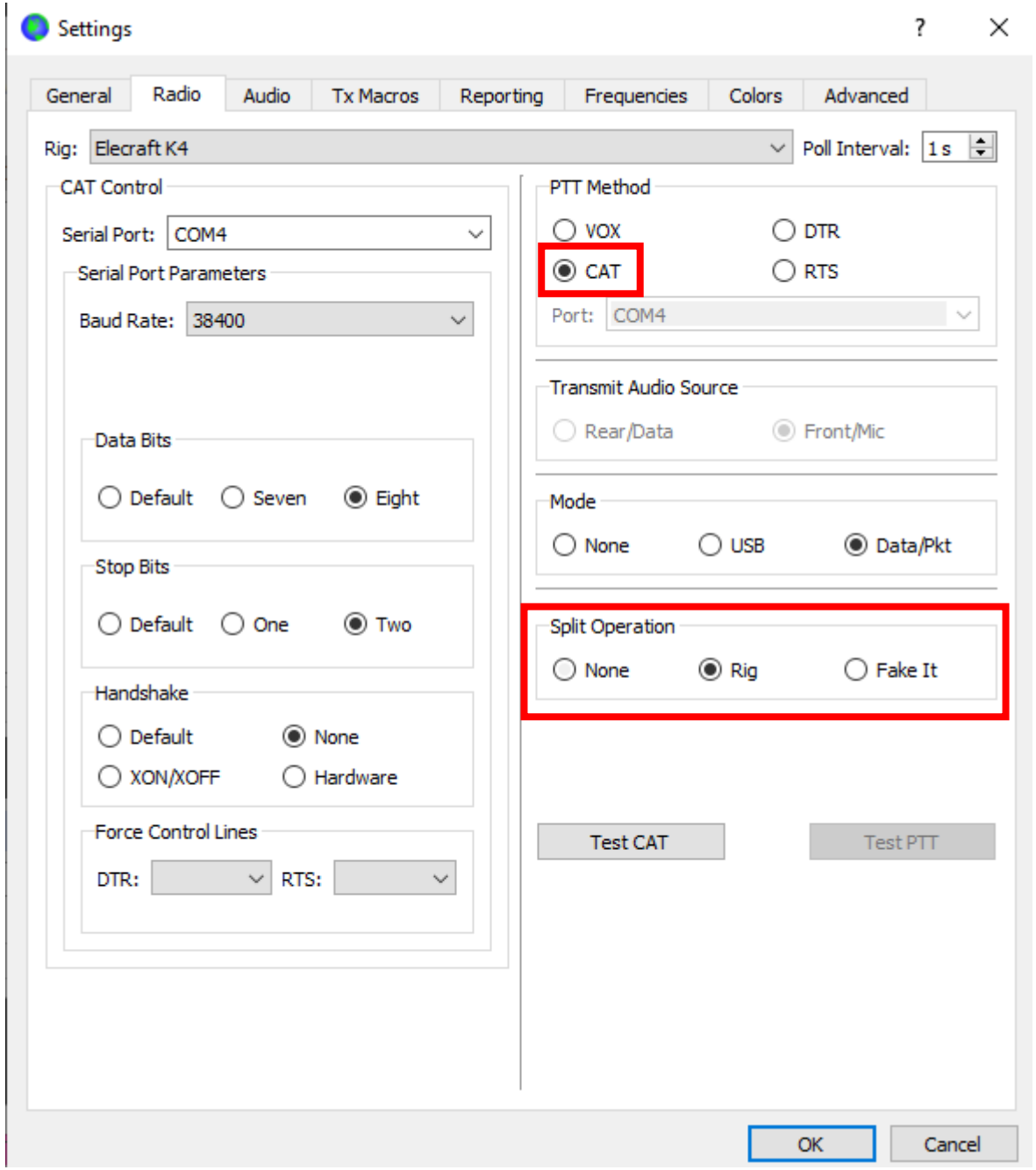
FOX AND HOUND MODE
RESTRICTIONS AND PREREQUISITES

- The multi-signal capability should only be used if sustained QSO rates are expected to be well above 100 per hour.
- Do NOT use DXpedition mode on the conventional FT8 frequencies.
  - Find a suitable dial frequency and publicize it for the Hounds.
- WSJT-X release 1.9.0 or later is required, but release 2.6.0 makes HOUND mode easier to use.
  - Release 2.6.0 added a button to select the HOUND mode.


WSJT-X v2.6.1 by K1JT et al.
File Configurations View Mode Decode Save Tools Help
Band Activity
UTC dB DT Freq Message
Rx Frequency
UTC dB DT Freq Message
Log QSO
Stop
Monitor
Erase
Decode
Enable Tx
Halt Tx
Tune
Menus
20m
14.074 000
Tx even/1st
Tx 1500 Hz
H
FT8
FT4
MSK
Q65
JT65
DX Call
DX Grid
W4MRJ
Rx 983 Hz
Report -15
Lookup
Add
Rx All Freqs
Auto Seq
Hound
2023 Aug 09
20:06:16
80
60
40
20
0
0 dB
Generate Std Msgs
Next
Now
Pwr
<W4MRJ>
W4MRJ <> -15
W4MRJ <> R-15
<W4MRJ> RR73
<W4MRJ> 73
Tx 1
Tx 2
Tx 3
Tx 4
Tx 5
Tx 6
Receiving
FT8
1/15
WD:6m

Selecting the HOUND button puts WSJT-X into the HOUND special operating activity on the **Settings|Advanced** tab.



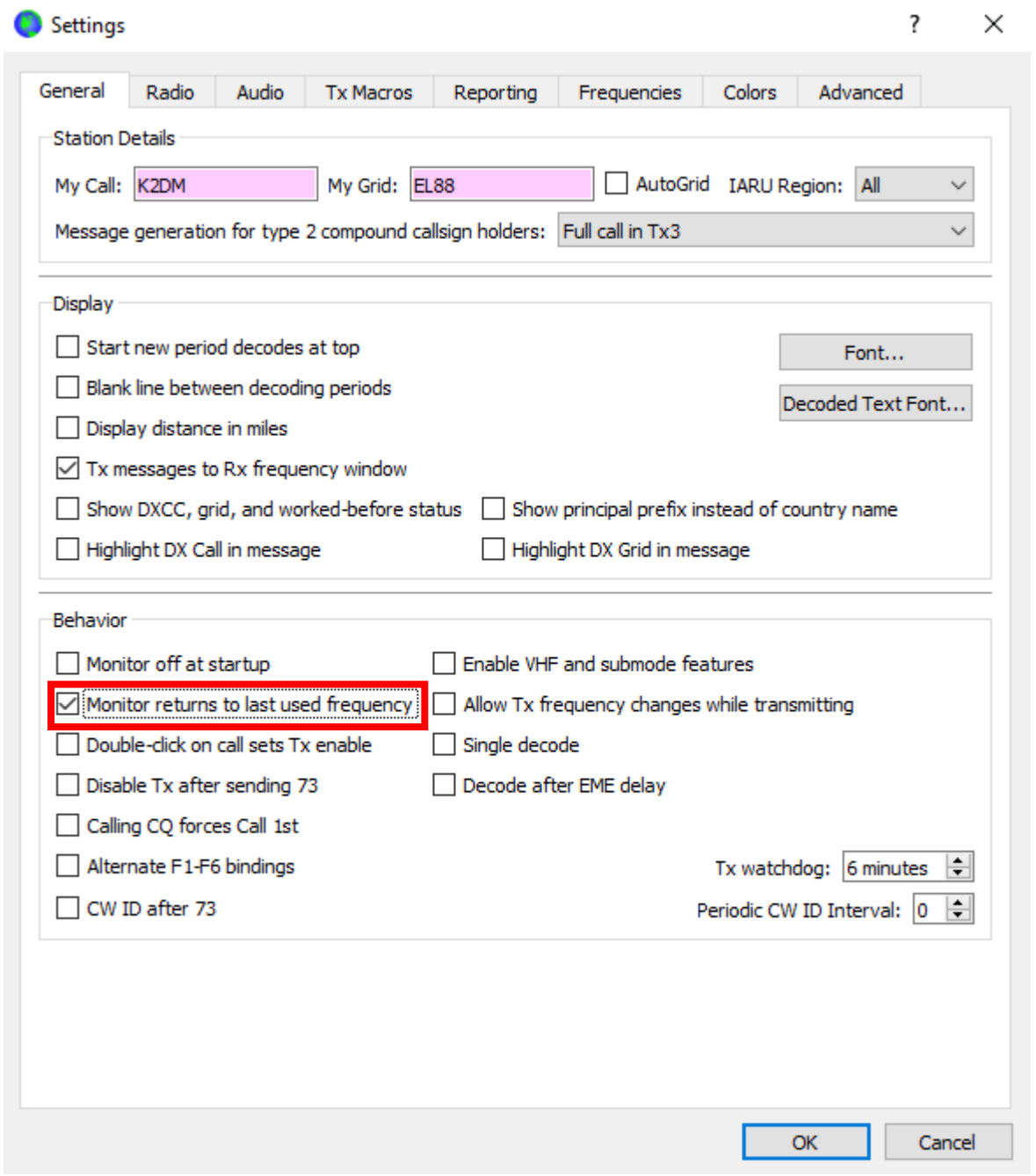


FOX AND HOUND MODE
MORE RESTRICTIONS AND PREREQUISITES

Everyone should use **CAT** control with **Split Operation** (either **Rig** or **Fake It**) on the **Settings|Radio** tab.

FOX AND HOUND MODE
MORE RESTRICTIONS AND PREREQUISITES

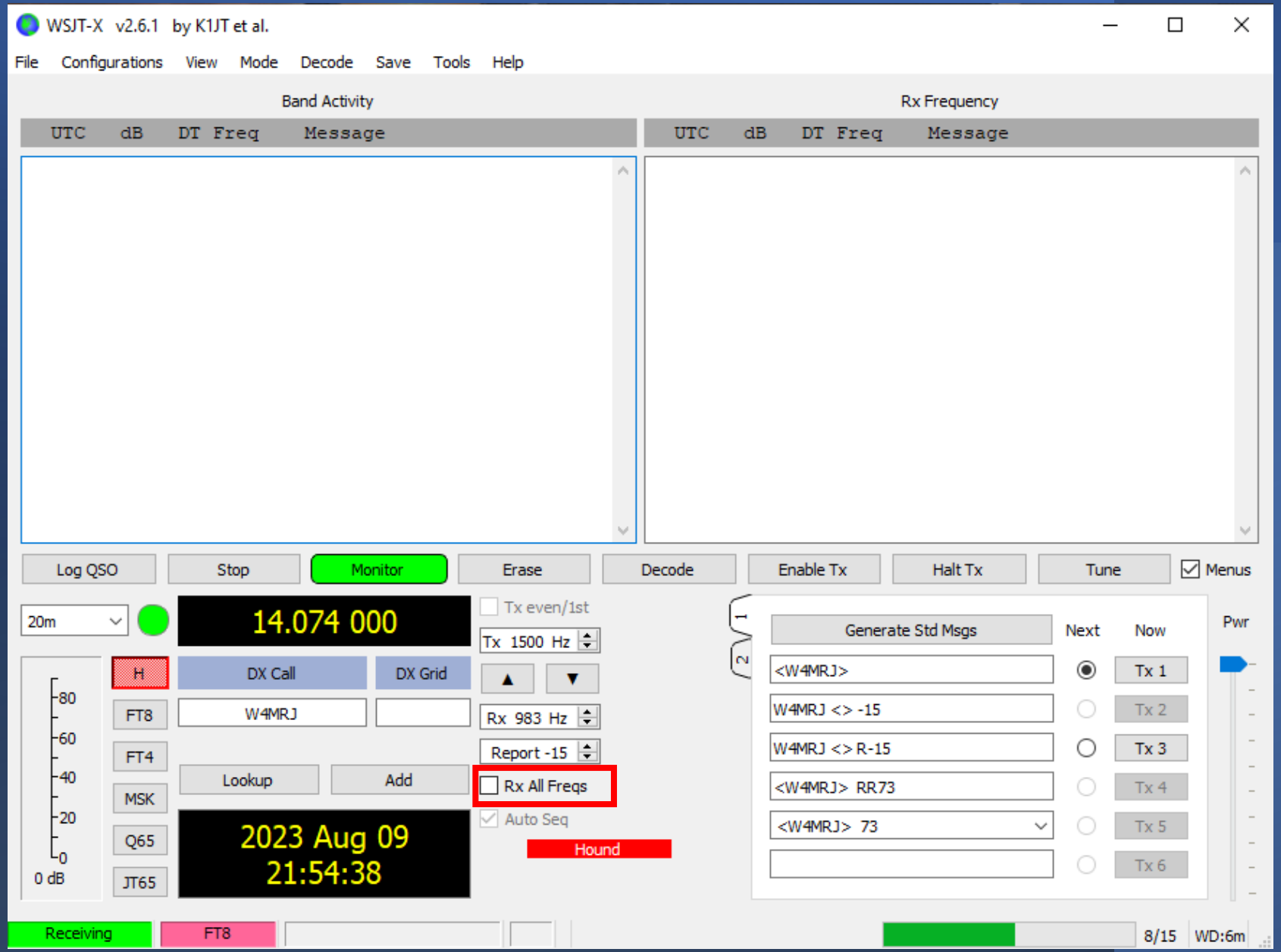
Everyone should check **Monitor returns to last used frequency** on the **Settings|General** tab.



FOX AND HOUND MODE

BASIC OPERATION

- The FOX transmits at audio frequencies between 300 and 900 Hz.
  - If the FOX is transmitting multiple simultaneous signals, the signals are spaced at 60 Hz intervals.
  - Each of these signals is called a stream.
- HOUNDS make initial calls anywhere between 1000 – 4000 Hz.
  - FOX will NOT respond to HOUNDS who make their initial calls below 1000 Hz.
- When the FOX (finally!) calls you (the HOUND) and gives you a report, your report back to the FOX is automatically sent at the same frequency that the FOX called you on (his stream frequency)!!!
  - This moves your signal out of all the QRM above 1000 Hz and down to the clear area where only the FOX is supposed to transmit.
- If your waterfall display does not show ANY other HOUND stations calling the FOX, click the **Rx All Freqs** box on the main WSJT-X screen.
  - This allows you to find a clear spot to use for calling the FOX.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Band Activity
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Log QSO
Stop
Monitor
Erase
Decode
Enable Tx
Halt Tx
Tune
Menus
20m
14.074 000
Tx even/1st
Tx 1500 Hz
H
DX Call
DX Grid
W4MRJ
Rx 983 Hz
Report -15
FT8
FT4
MSK
Q65
JT65
Lookup
Add
Rx All Freqs
Auto Seq
Hound
2023 Aug 09
21:54:38
80
60
40
20
0
0 dB
Generate Std Msgs
Next
Now
Pwr
<W4MRJ>
W4MRJ <> -15
W4MRJ <> R-15
<W4MRJ> RR73
<W4MRJ> 73
Tx 1
Tx 2
Tx 3
Tx 4
Tx 5
Tx 6
Receiving
FT8
8/15
WD:6m

FOX AND HOUND MODE

EXAMPLE OF A F/H CONTACT OR TWO

1. FOX, transmitting on 540 Hz: CQ VP2MDM
2. Multiple HOUNDS, transmitting at various frequencies above 1000 Hz: VP2MDM K4ZDM EL88, VP2MDM N0SMX EL 92, VP2MDM W4MRJ EL88
3. FOX, transmitting on 540 Hz: K4ZDM VP2MDM -13
4. HOUND, transmitting on 540 Hz: VP2MDM K4ZDM R-11
5. FOX, transmitting on 540 Hz: K4ZDM RR73; N0SMX <VP2MDM> -11
6. HOUND, transmitting on 540 Hz: VP2MDM N0SMX R-16
7. FOX, transmitting on 540 Hz: N0SMX RR73; W4MRJ <VP2MDM> -09
8. NOTE: When the FOX sends RR73 to one station, he can also send a signal report to ONE additional station, which will pull THAT station down to the FOX's stream frequency.
   - The result of all this is that only one station at a time can be talking to the FOX on the FOX's stream frequency.
   - The station to whom the FOX sent RR73 is returned to their original frequency above 1000 Hz!

WHEN DOES A FOX ABORT A QSO?

- WSJT-X maintains several queues in a manner that allows difficult QSOs to be completed while keeping the overall QSO rate high.
- We use a “3 strikes and you’re out” rule.
- Fox will call a specific Hound up to 3 times, waiting for an “R+rpt” response. If no response is received – abort.
- If a Hound repeatedly sends an “R+rpt” message, Fox will send RR73 up to 3 times, then abort.
- Finally, the total timespan of an attempted QSO is limited to 3 minutes, the QSO is aborted.

FOX AND HOUND MODE

HOW TO TELL IF A STATION IS A FOX

- The FOX announces their operation ahead of time.
- The FOX is operating on a dial frequency that is not a standard FT8 frequency.
- The FOX station is transmitting below 900 Hz.
- The station transmits messages to more than one other station at a time, e.g.: K4ZDM RR73; N0SMX <VP2MDM> -11
- The FOX station only transmits during the EVEN transmit/receive periods.

MSHV
Let's Take a Side Trip to Bulgaria

- WSJT-X has a competitor called MSHV, which was developed by LZ2HV.
- I am not going to say much about MSHV now except as it pertains to FOX/HOUND operation.
- Some FOXes use MSHV. If you call them using WSJT-X in HOUND mode, you may not be able to work them.

MSHV IN MULTISTREAM MODE
ADVANTAGES RE: FOX/HOUND

- Callers do not have to make any configuration changes or have any knowledge beyond knowing how to use the standard FT8 mode.
- It can be used not only for true DX expeditions, but also for other smaller events, such as special events, activations, etc.
- Callers can use any frequency to call the DX, so more bandwidth is allowed.

MSHV IN MULTISTREAM MODE
DISADVANTAGES RE: FOX/HOUND

- The program can be configured for a maximum of 5 simultaneous frames, but since each frame will only contain one message, the maximum number of simultaneous QSO is only 5.
- The DX operator can choose whether to transmit in odd or even periods, which can lead to confusion for the most inexperienced callers who sometimes end up transmitting in the same period of the DX.
- Callers can use any frequency to call the DX, even frequencies already being used for the ongoing contacts of the DX, causing him trouble to complete the contacts.

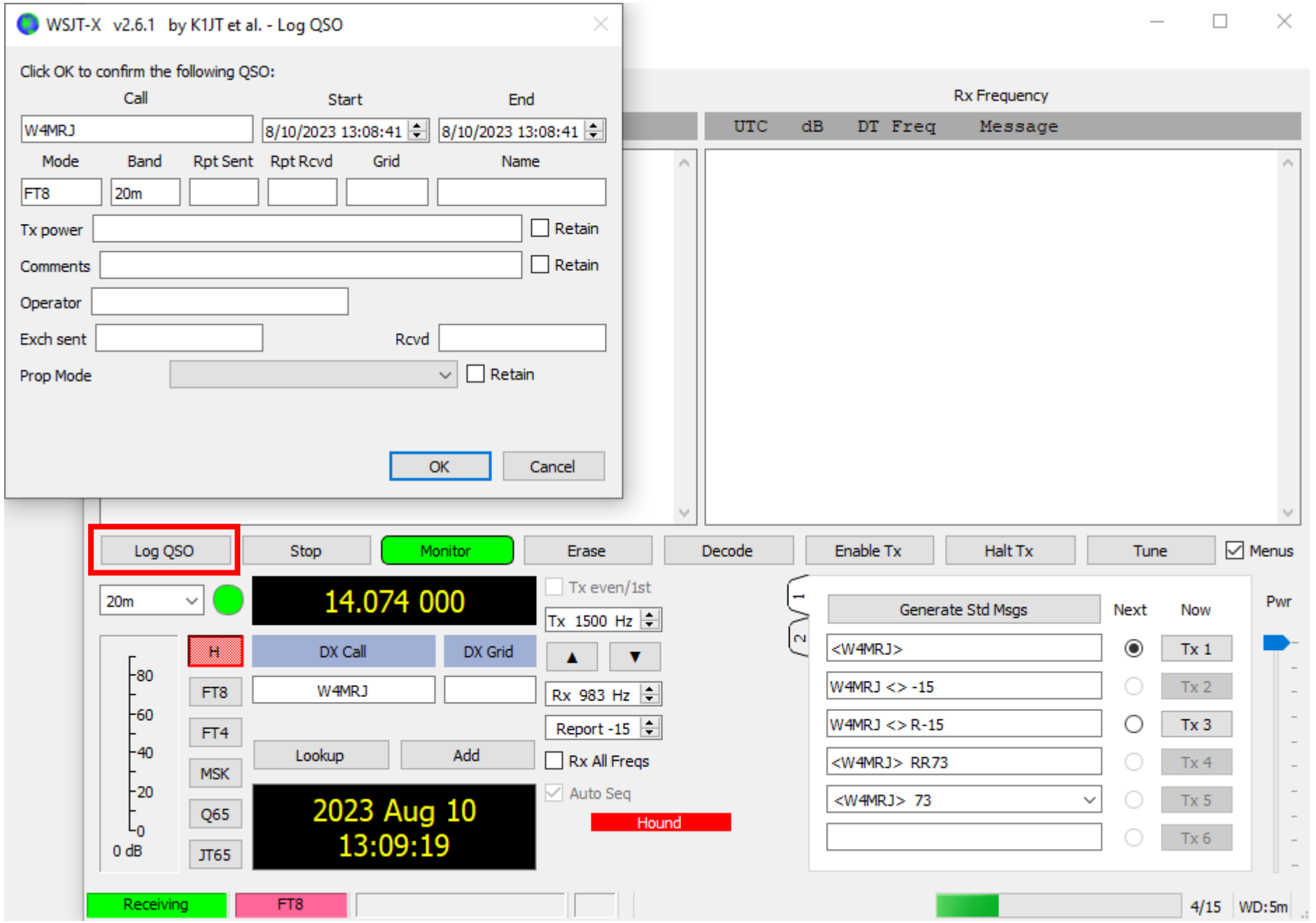
IMPORTANT: In no case, under any circumstances, should the FT8 standard frequencies be used, neither for Fox/Hound, nor for multistream.

LOGGING OPTIONS WITH WSJT-X

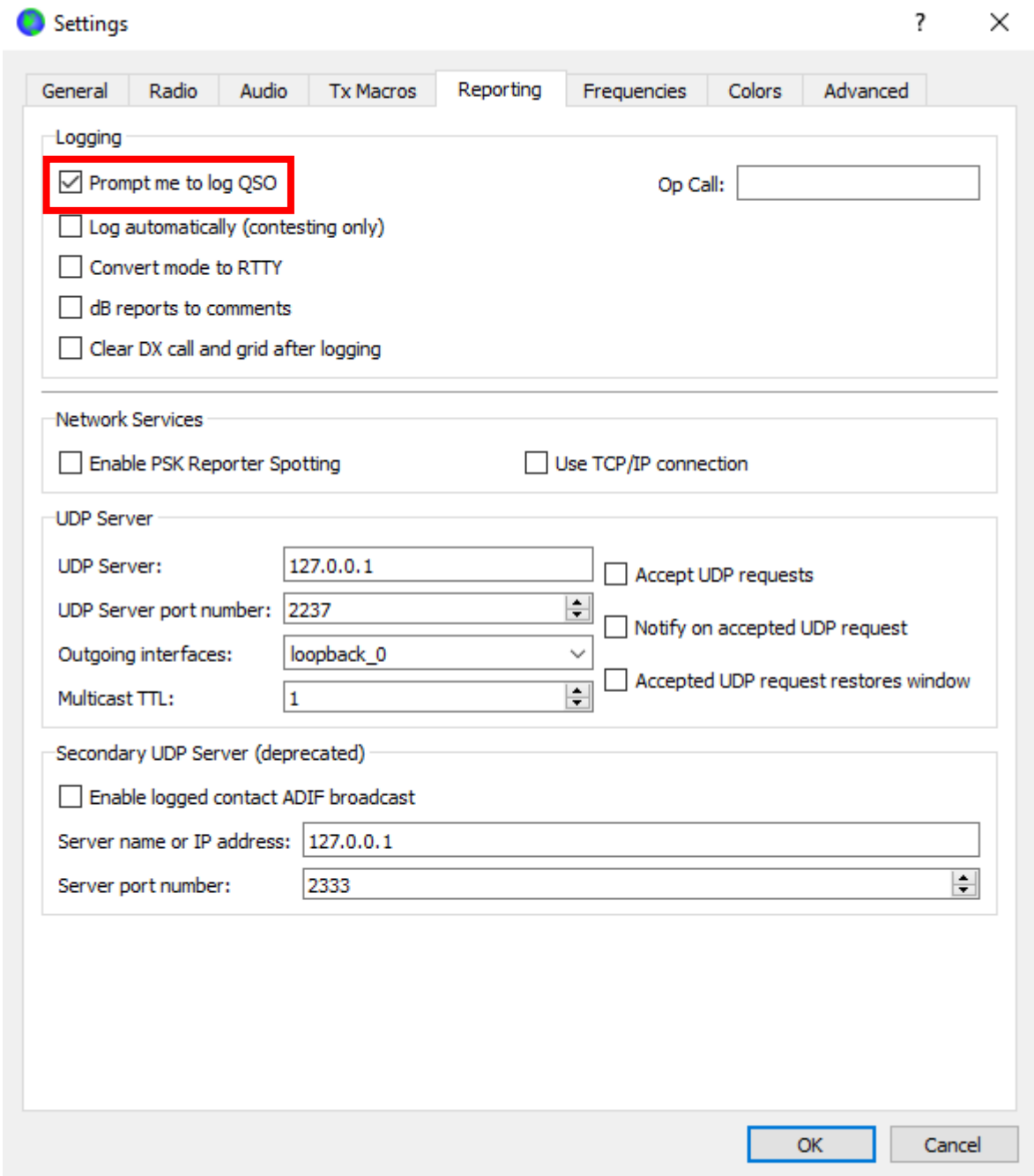
1. Log contacts directly to an adi file on your computer.
2. Send contact information to your logging program on your computer.

To log a QSO within WSJT-X, click **Log QSO** on the main screen. This will bring up a confirmation window on which you can click **OK** to confirm the QSO.

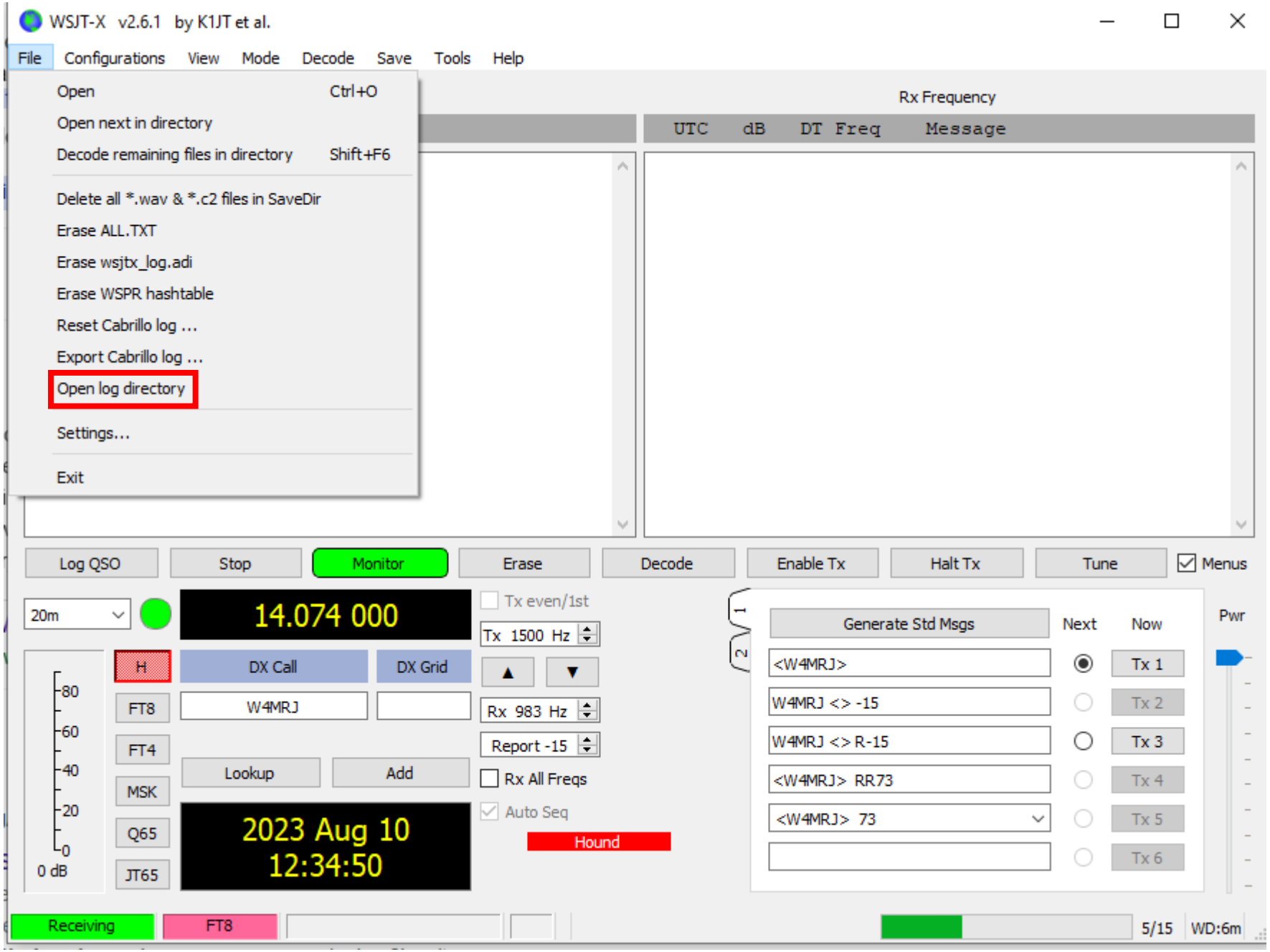
You can also administer WSJT-X so that the confirmation window pops up automatically at the end of a QSO.



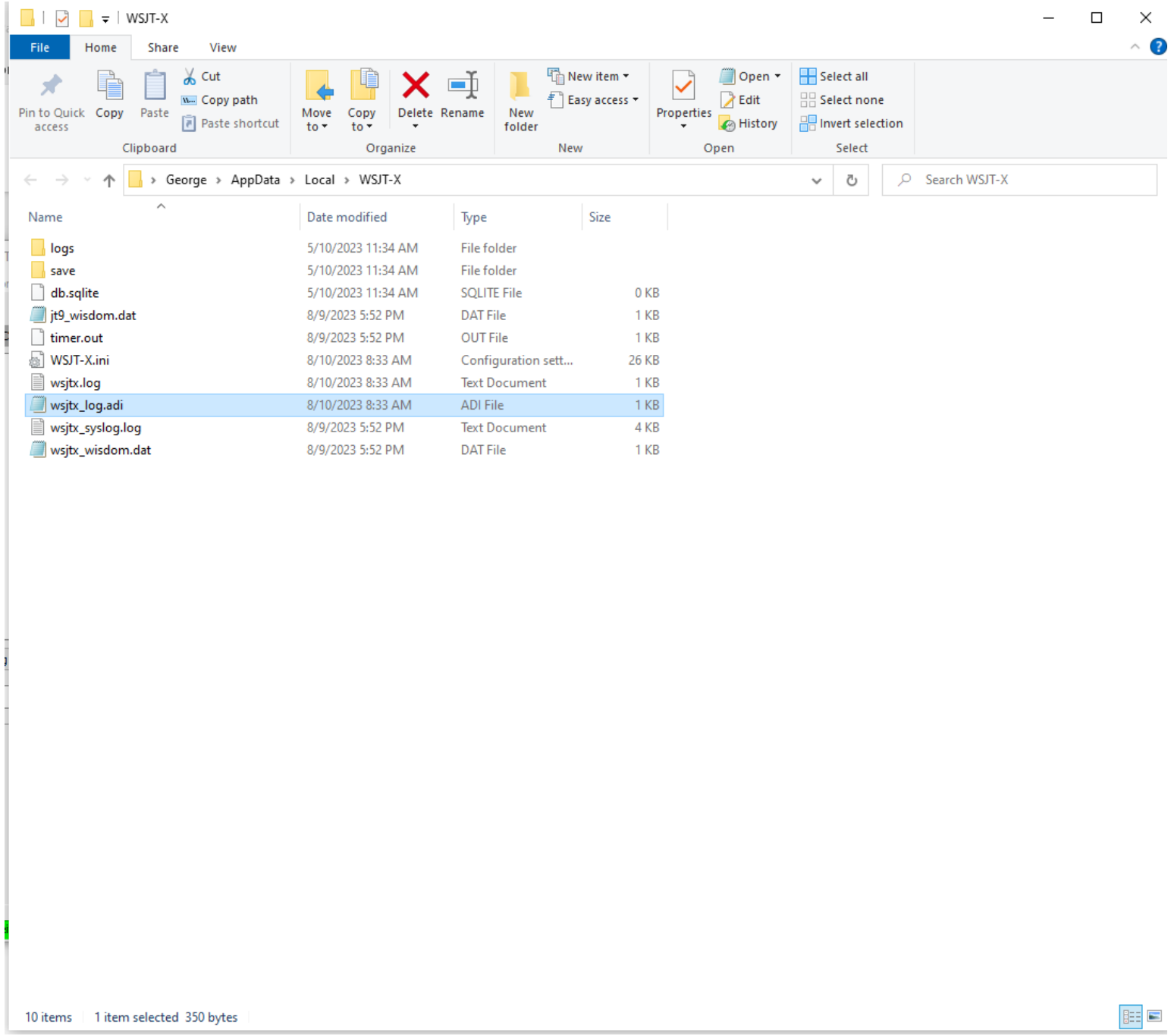
On the **Reporting** tab in **Settings**, check the box next to **Prompt me to log QSO**. The confirmation window will then come up automatically at the end of each QSO.



To see your WSJT-X log, first go to **File|Open log directory**. This will bring up a list of available WSJT-X logs, including performance logs.



Double-click on **wsjt-x_log.adi** to open your log in adi format.
Or double-click on **wsjt-x.log** to open your log in text format.

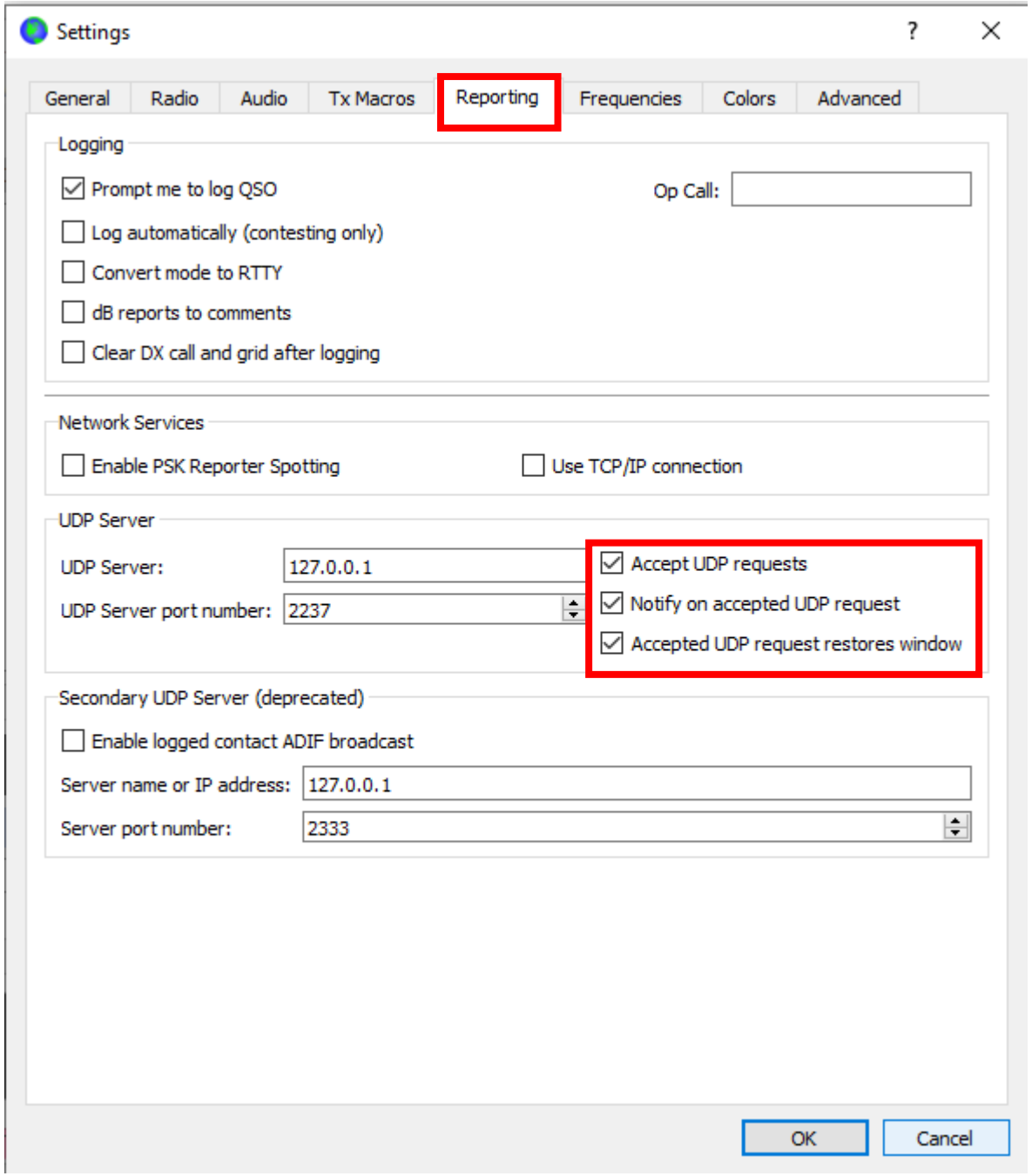


LOGGING TO AN EXTERNAL PROGRAM

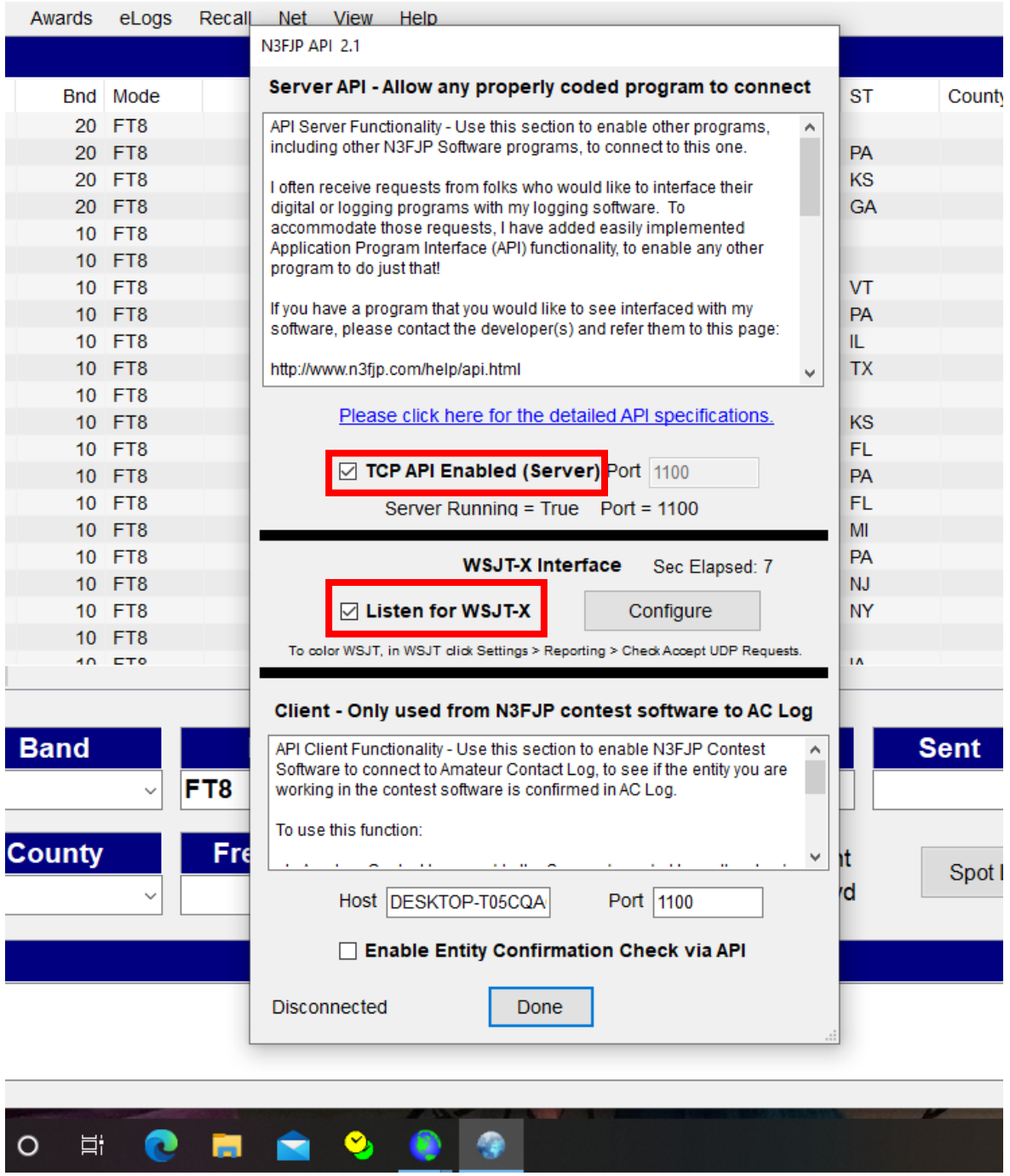
- Two steps:
  1. Enable UDP in WSJT-X
     - User Datagram Protocol is just a data communication protocol for time sensitive information.
  2. Tell your logging program about WSJT-X

STEP 1.

Remember the **Reporting** tab on the **Settings** screen in WSJT-X? This is where you activate the link to send your QSOs to your logging program. Check the three boxes in the **UDP Server** section.



STEP 2.

In your N3FJP logging program, go to **Settings|Application Program Interface (API)**

Check the box for **TCP API Enabled (Server)**, and check the box for **Listen for WSJT-X**.