FT-8

The newest fun weak signal digital mode.

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What is FT8?

- The latest weak signal mode from K1JT
- Joseph Taylor, K1JT
  - Nobel Prize winning Astrophysicist
  - Created WSPR, JT65, JT9 and many other Weak signal modes
- WSJT (Weak Signal/Joseph Taylor)
  - WSJT, WSJT-X, WSPR, SimJT
  - https://physics.princeton.edu/pulsar/k1jt/
- I've made 1000+ contacts since Jan 2018
  - Completed my WAS on 20m

What is FT8?

- First showed up in August 2017
  - As of Dec 31st ClubLog reported that 60% of all contacts logged on their service were done with FT8
- Can only be found in WSJT-X and some other free software packages.
- Time Dependency
  - Synchronized time is critical to this mode working properly
- 15 Second Transmission Intervals
  - Even (0 Second/30 Second)
  - Odd (15 Second/45 Second)
- 13 Character Limit
- Can decode down to audio levels of -24 dB

What is FT8?

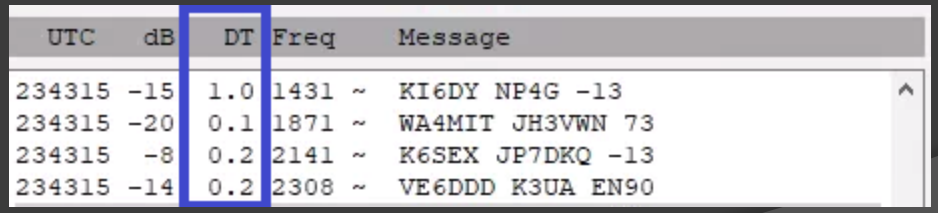
- “[FT8 is] designed for making reliable, error-free contacts using very weak signals — in particular, signals that may be too weak for the more traditional modes to be usable, or even too weak to hear.” -Joseph Taylor, K1JT

What is needed?

- Computer
- Audio Interface to Radio
  - SignaLink
  - West Mountain Radio RigBlaster
  - Timewave Navigator
  - Homebrew
    - WSJT-X requires an audio card that does 48000hz sample rate
- Time Synchronization Software
  - Dimension 4 - http://www.thinkman.com/dimension4/
  - Meinberg NTP - http://www.satsignal.eu/ntp/setup.html
- WSJT-X
  - https://physics.princeton.edu/pulsar/k1jt/wsjtx.html

Time Synchronization

- Why?
  - Computer clocks don’t keep time very well
  - They lose 10ths of a second very quickly
- FT8 is highly time sensitive
  - Decodes will fail starting at a DT difference of just 0.5 seconds.
  - Ideally you are within 0.1 seconds.



UTC	dB	DT	Freq	Message
234315	-15	1.0	1431	~ KI6DY NP4G -13
234315	-20	0.1	1871	~ WA4MIT JH3VWN 73
234315	-8	0.2	2141	~ K6SEX JP7DKQ -13
234315	-14	0.2	2308	~ VE6DDD K3UA EN90

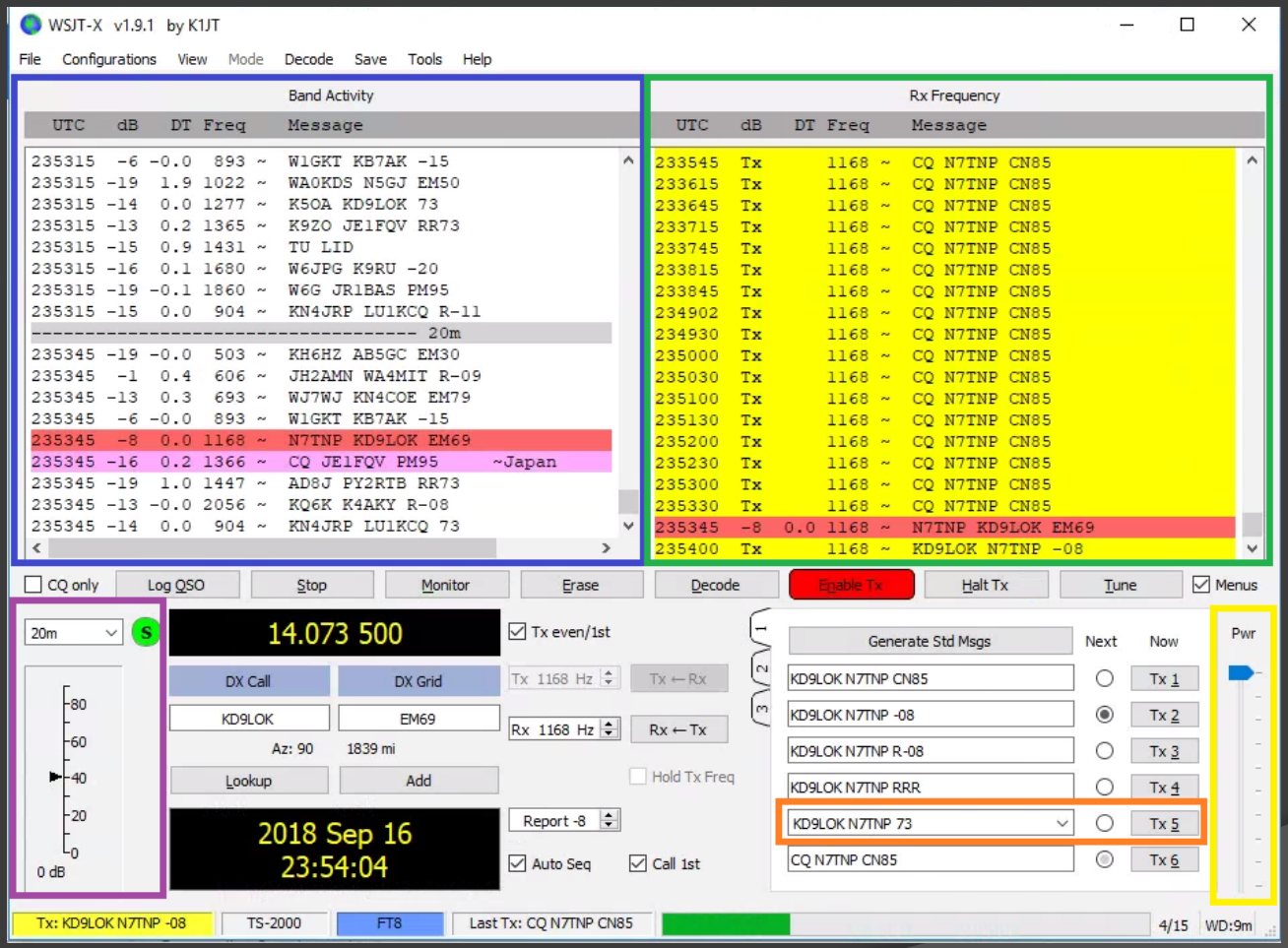
How to make an FT8 QSO

- 15 second cycles
  - 4 Per Minute
  - 2 Listen
  - 2 Transmit
  - 13 seconds on the air
  - 2 seconds for decoding and preparing for the next cycle
- Similar to JT65 and JT9
  - FASTER!

How an FT8 QSO Operates

- CQ — CQ N7TNP CN85
  - CQ [CALL] [Grid Sq]
- Response to CQ — W7Q N7TNP CN85
  - [Call] [Your Call] [Grid Sq]
- Response to Caller — W7Q N7TNP -12
  - [Caller] [Your Call] [RSSI]
- Response to Signal Report — W7Q N7TNP R-12
  - [Caller] [Your Call] R[RSSI]
  - R is to acknowledge that you received the signal report.
- Roger Roger Roger — W7Q N7TNP RRR
  - [Caller] [Your Call] RRR
- 73 — W7Q N7TNP 73
  - [Caller] [Your Call] 73
- *RR73* — *W7Q N7TNP RR73*
  - *[Caller] [Your Call] RR73*

WSJT-X


WSJT-X v1.9.1 by K1JT
File Configurations View Mode Decode Save Tools Help
Band Activity
UTC dB DT Freq Message
235315 -6 -0.0 893 ~ W1GKT KB7AK -15
235315 -19 1.9 1022 ~ WA0KDS N5GJ EM50
235315 -14 0.0 1277 ~ K5OA KD9LOK 73
235315 -13 0.2 1365 ~ K9ZO JE1FQV RR73
235315 -15 0.9 1431 ~ TU LID
235315 -16 0.1 1680 ~ W6JPG K9RU -20
235315 -19 -0.1 1860 ~ W6G JR1BAS PM95
235315 -15 0.0 904 ~ KN4JRP LU1KCQ R-11
---------- 20m
235345 -19 -0.0 503 ~ KH6HZ AB5GC EM30
235345 -1 0.4 606 ~ JH2AMN WA4MIT R-09
235345 -13 0.3 693 ~ WJ7WJ KN4COE EM79
235345 -6 -0.0 893 ~ W1GKT KB7AK -15
235345 -8 0.0 1168 ~ N7TNP KD9LOK EM69
235345 -16 0.2 1366 ~ CQ JE1FQV PM95 ~Japan
235345 -19 1.0 1447 ~ AD8J PY2RTB RR73
235345 -13 -0.0 2056 ~ KQ6K K4AKY R-08
235345 -14 0.0 904 ~ KN4JRP LU1KCQ 73
Rx Frequency
UTC dB DT Freq Message
233545 Tx 1168 ~ CQ N7TNP CN85
233615 Tx 1168 ~ CQ N7TNP CN85
233645 Tx 1168 ~ CQ N7TNP CN85
233715 Tx 1168 ~ CQ N7TNP CN85
233745 Tx 1168 ~ CQ N7TNP CN85
233815 Tx 1168 ~ CQ N7TNP CN85
233845 Tx 1168 ~ CQ N7TNP CN85
234902 Tx 1168 ~ CQ N7TNP CN85
234930 Tx 1168 ~ CQ N7TNP CN85
235000 Tx 1168 ~ CQ N7TNP CN85
235030 Tx 1168 ~ CQ N7TNP CN85
235100 Tx 1168 ~ CQ N7TNP CN85
235130 Tx 1168 ~ CQ N7TNP CN85
235200 Tx 1168 ~ CQ N7TNP CN85
235230 Tx 1168 ~ CQ N7TNP CN85
235300 Tx 1168 ~ CQ N7TNP CN85
235330 Tx 1168 ~ CQ N7TNP CN85
235345 -8 0.0 1168 ~ N7TNP KD9LOK EM69
235400 Tx 1168 ~ KD9LOK N7TNP -08
CQ only
Log QSO
Stop
Monitor
Erase
Decode
Enable Tx
Halt Tx
Tune
Menus
20m
S
80
60
40
20
0
0 dB
14.073 500
Tx even/1st
DX Call
DX Grid
Tx 1168 Hz
Tx ← Rx
KD9LOK
EM69
Rx 1168 Hz
Rx ← Tx
Az: 90
1839 mi
Lookup
Add
Hold Tx Freq
2018 Sep 16
23:54:04
Report -8
Auto Seq
Call 1st
Generate Std Msgs
Next
Now
KD9LOK N7TNP CN85
Tx 1
KD9LOK N7TNP -08
Tx 2
KD9LOK N7TNP R-08
Tx 3
KD9LOK N7TNP RRR
Tx 4
KD9LOK N7TNP 73
Tx 5
CQ N7TNP CN85
Tx 6
Pwr
Tx: KD9LOK N7TNP -08
TS-2000
FT8
Last Tx: CQ N7TNP CN85
4/15
WD:9m

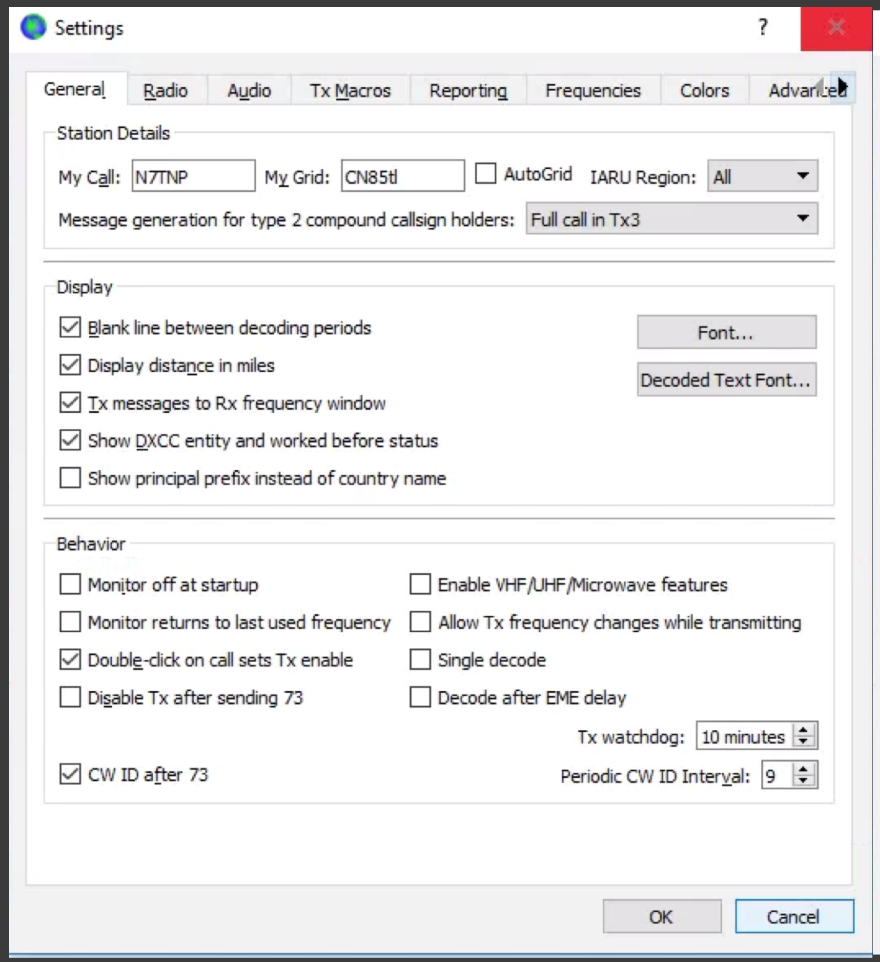
FT8 for Field Day and other Events

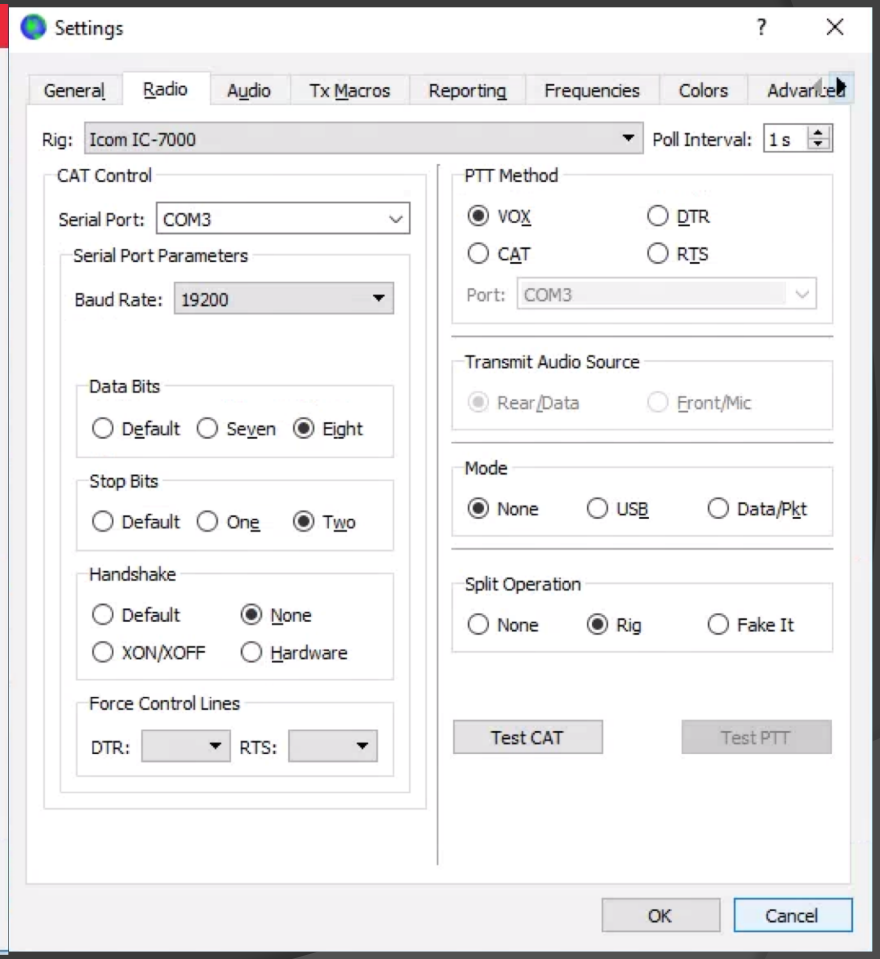
- We worked FT-8 for Field Day
- The challenge: Figuring out the most efficient way to send the FD exchange.
  - ‘3A OR’
  - We used the ‘TX Macro Configuration’
  - 3A OR 73 W7Q
  - {CAUTION} Limit of 13 characters

FT8 DXpedition Mode

- Allows a ‘Fox (DX)’ to work multiple stations at once
  - Really good for working DX stations
- ‘Hounds (Hunters)’
- You generally don’t see people running DXpedition mode on the known FT8 frequencies.

WSJT-X Settings





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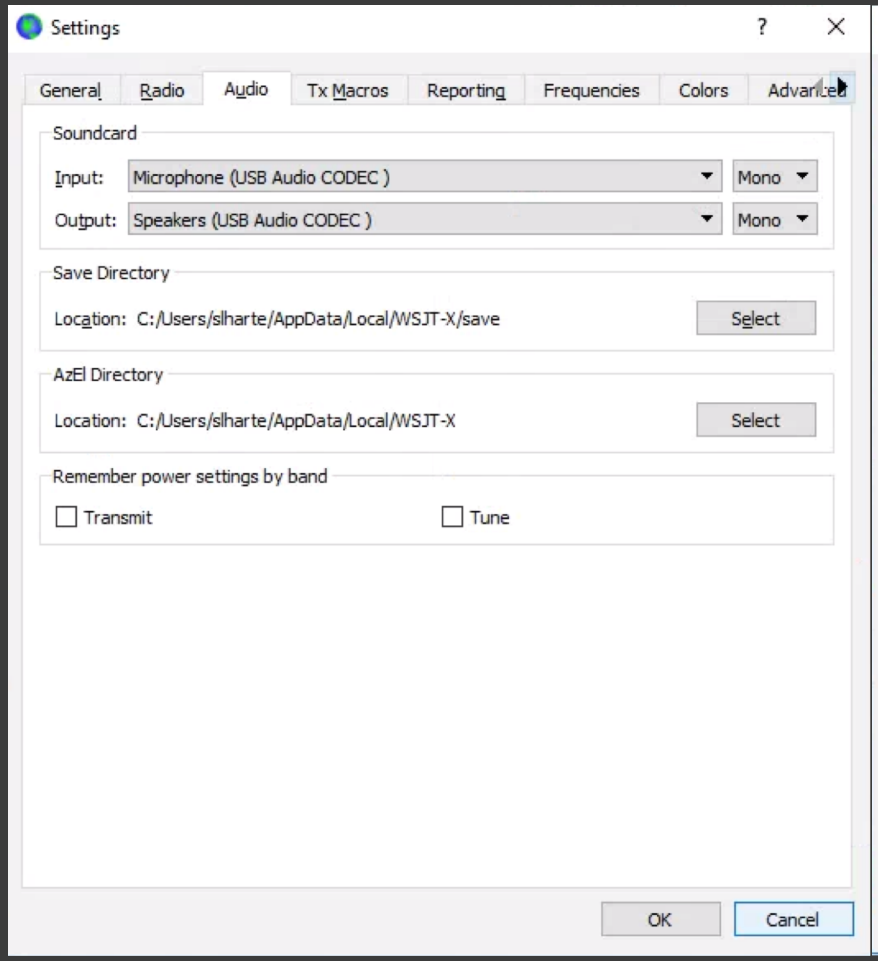

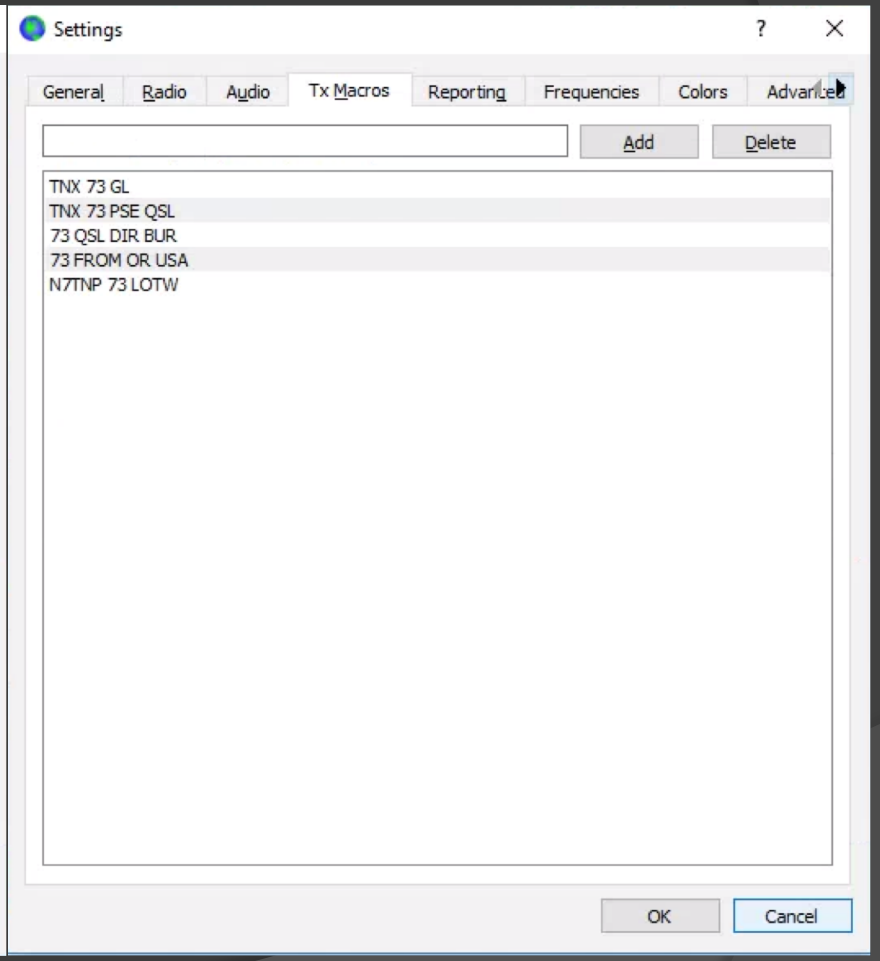

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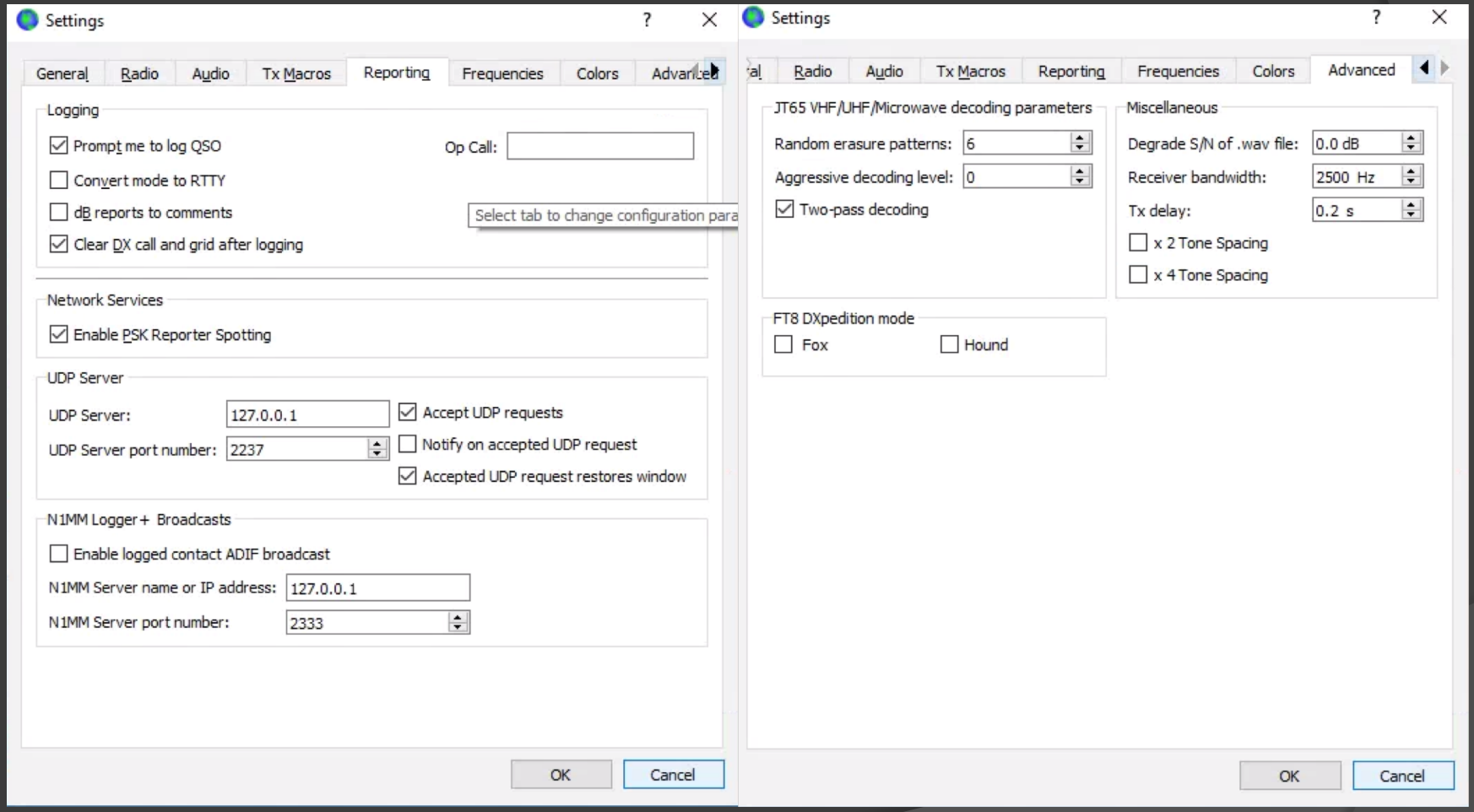

FT8 On The Go

- I use remote desktop applications to work FT8 away from the shack.
  - Chrome Remote Desktop
- Things to think about before remote hamming
  - Good Antenna System
  - Good Internet Connection
  - Security
- Things I need buy to enhance my remote station
  - Computer readable SWR meter
  - Remote capable antenna switch