

FT8 + GridTracker

A brief introduction

FT8/FT4

- FT8/FT4 are digital weak signal modes created by Joe Taylor (K1JT) and Steve Franke (K9AN) (*Joe Taylor is also an astrophysicist and Nobel Prize winner for his discovery of a new type of pulsar.*)
- These modes use your computer to listen and pick out signals that are so weak that they are below the noise floor.
- While a weak signal mode, it is not a low power mode.
- It does allow many people with simple stations to make contacts with stations that would not be possible with SSB or even CW.

How does it work?

- FT8 uses audio from your computer to modulate a SSB signal.
- A separate sound card or “audio codec” is highly recommended to pass this audio in and out of the computer so levels can be controlled separately and computer system sounds don’t go over the air.
- WSJT, the base software used to do this and many other modes is “Open Source”, meaning the computer code is openly available, and comes in several forms.

Forms of FT8 software

- WSJT-X – The official K1JT release is the most common and the most current form
- WSJT-X Improved – published by DG2YCB takes the original WSJT-x release and adds some extra features
- WSJT-Z – Another version known for its ability to run fully automatically and unattended. (Unattended operation is illegal in the US and many other countries)
- MSHV – Another version by LZ2HV commonly used by DXpeditions.
- JTDX – Another “enhanced feature” version
- Which program you use is a “personal preference” thing.

WSJT-X setup

- It is an audio modulated USB signal (USB all bands)
- The wiring between radio and pc is hardware specific. You need a way to key PTT and get the sound in and out.
- Older radios require you to plug in to an ACC port where these signals are available, and connect them to computer sound card and a USB or serial port to get PTT.
- Newer radios have built in sound cards and more through a USB cable with their drivers that will create “Audio CODECs” that function as a separate sound card.

- There are too many possible combinations of radios and software to get into how to set each up. Here are a few YouTube videos for some combinations.
- HRD
- <https://www.youtube.com/watch?v=yIQHuloYv6o>
- Log4OM
- <https://www.youtube.com/watch?v=YElr9-oGqIY>
- N3FJP
- https://www.youtube.com/watch?v=17Wdn_9ZRMc

- You most likely already have that set up if you are using any form of logging software.
- The major problem with this comes from both pieces of software wanting to control the radio and a conflict happens.
- With HRD as my logging software, it is really easy to fix this by choosing Ham Radio Deluxe as the Radio
- I use Ham Radio Deluxe so I launch that, first. It establishes a connection to the radio for CIV/Rig Control and is already set up to get the frequency of the radio.
- With other logging software, you may have to start WSJT-X, first, then GridTracker and lastly your logging software. Cancel the error message since you are using WSJT-X to control the radio.

Radio Settings

- Your radio should be in USB DATA mode if available on your radio. What DATA mode does is make the radio look for its audio from the USB sound card or rear ACC jack instead of the microphone jack.
- Set the filter on your radio as wide as possible (3Khz or greater). FT8 uses that bandwidth to squeeze in and decode many simultaneous signals.

WSJT Settings

- Hold Tx Freq should always be checked. Try to find an empty spot in the waterfall, hold shift key on keyboard and click with your mouse on the left side of that empty spot. If this is not checked, your transmit signal will move to the same as the station you are answering and you may be transmitting on the same as the last guy that didn't check the box.
- Check Auto Seq – That lets the software automatically go through the contact steps.
- If your transmit frequency overlaps the signal you are trying to answer, you will stop transmitting after the first try.

- Make sure Monitor is lit up
- In settings, set TX Watchdog to no more than 5 minutes. This is how long you will call CQ or try to respond to a station before it gives up.
- Double click on a station you want to reach. They do not have to be calling CQ as they will continue to decode everyone and your call will be highlighted for them to answer when they finish, if they choose.
- If you want to call CQ, select Tx6 and then Enable Tx. Tradition is that if you are looking for stations to the east of you, leave the Tx even/1st unchecked. Check it if looking toward the west. This is not official, but common practice and helps you get the replies you want.
- The numbers you see -24 through +24 indicate signal strength with 0 being at noise level.

Clock sync is VERY Important

- I use ***Dimension4*** software to automatically sync my computer's clock with the world.
- FT8 users start sending on exactly the same 15 second intervals (odd or even) so if your clock is wrong, you will miss part of the signal and may not decode anything.
- Some rare DX may not have access to the internet so their clocks may be off. If I see +/- .4 or above, I use another program called ***TimeFudge*** to adjust my clock to match theirs.

Fox/Hound

- Fox/hound is a special, FT8 mode used by Dxpeditions to allow them to contact more people, faster
- The FOX can transmit several signals, simultaneously, below 1000 hz while responding to those above 1000 hz.
- If you are in HOUND mode, once the Fox replies to your call, the software will temporarily move your transmit frequency to theirs and when QSO is done, move you back to where you started. The idea is that if everything works right, you should be on a clear frequency. You DO NOT have to be in hound mode to make a QSO in this mode, as they still hear and decode the whole bandwidth that they heard you on in the first place.

- When in hound mode, you transmit fewer times but with the new versions, it seems to start replying when they call on you, even if it has timed out on transmitting.

Super Fox/Hound

- This is a new mode in FT8 to also carry on more than one QSO at the same time.
- It will sound very different if they are using it. 
- You must have the latest versions of the program to receive this and you will notice that your messages go blank until you are responding to the fox.
- Supposed to be a more secure mode, with a digital key so you know the fox is real.
- Supposed to have stronger signal strength.

MSHV

- MSHV is another FT8 software, based on WSJT that allows Dxpeditions to make multiple QSO's at the same time.
- There is no shifting of your transmit frequency nor do you want to choose Hound mode.
- They will often finish with you while starting the QSO with the next station in the same transmission. Something like

“NR2C RR73; WA2DQL <VK9CU> +08”

Is a “RR73” required?

- There is a big dispute over whether you must receive a 73 reply to verify the QSO.
- Requirements for a complete QSO include a signal report and a confirmation that it was received on each end.
- If you or the other station reply with a “R+01” you are verifying you heard his signal report and technically, the QSO is valid and the “Log Call” window pops up.
- During times where you want maximum Q’s per hour, that will be the end of the QSO and you can log it, even though you haven’t gotten a 73.
- A grid square is not a requirement for a complete QSO.

Why use GridTracker2

- GridTracker adds many useful features that make FT8 more fun.
- Main MAP window – shows you the grids you have reached, heard, and confirmed.
- Call Roster window – can be set up to show and announce new countries, states, counties, and other things as well as letting you see if you have already contacted that station on that band. It also can let you know if they use LOTW, eQSL or other confirmation websites. You click on the top of the title to sort the stations by that field.
- You pick what you want to see. Many options.

- GridTracker can be set up to automatically log your FT8 contacts to your logging software, LOTW, eQSL, QRZ, ClubLog, and others.
- Callsign Lookup – This window will retrieve info from QRZ and show you their photo, location, Beam heading and distance from you and even the last time they uploaded to LOTW. Clicking on “Link” will open a browser to their QRZ page.

OHH, the map !!

- The map can show you much useful information. Like DX Maps, it will show you current contacts so you can see propagation.
- Every grid with activity, past or present, on that band will have a color associated with it. Mine are at defaults so a red grid means I have made at least one confirmed contact in that grid. A yellow grid means I have made a contact there but they have not confirmed. A green grid means that there is currently a station being decoded from that grid and I do not have the grid in my log.
- As you move your mouse over the map, in the top left corner, it will show you distance and beam heading to that spot.

Helpful links

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

GridTracker2 - <https://gridtracker.org/>

Dimension 4 - <http://www.thinkman.com/d4>

PSKReporter – Website that will show you where you are being heard!

<https://pskreporter.info/pskmap?callsign=nr2c&search=Find>

DX Maps - <https://www.dxmaps.com/spots/mapg.php?Lan=E>

ClubLog – The website for Dxpeditons <https://clublog.org/>

Conclusions/Questions

- Questions?
- A Google search with “your logging software,your radio model, WSJTx Gridtracker” will often lead to a very detailed set of instructions on YouTube.
- I can be reached by cell between 8am and 3pm, Monday-Friday for help. 518-593-0661. Leave me a message as my cell software often won't let me answer call that are not in my contact list.
- Remember, for best results in getting my help with your particular radio setup, please buy me one to test. 😊

Chuck NR2C