

Some More Thoughts on the New FT8 Mode

Weak Signal digital modes have been around for a while now. However, the new FT8 mode seems to be taking the HF bands by storm. These digital modes were first developed for transmissions in conditions where signals are weak and very intermittent. Some examples are meteor scatter, moon bounce and ionospheric scatter. It was also noted that these weak signals could be decoded and understood in the HF bands when even CW couldn't be decoded. The FT8 mode was developed just for this purpose.

You may already be using this mode or you have heard about it and haven't taken the dive into this digital mode yet. Then again maybe this is the first time you are learning these modes even exist. This article is just a brief overview of FT8. Details about these digital modes can be found online. A good place to start is the WSJT Web Page: <http://www.physics.princeton.edu/pulsar/K1JT/>. There you will learn about how and why the modes were developed and details on how it all works. The January 2018 QST also has two articles on FT8 mode.

This article's purpose is to give you enough information to get started as well as how you can use the FT8 mode for 10-10 contacts.

THE BASICS

You will need a PC that is connected to your HF rig. You at least must have two-way audio transfer between your rig and the computer and a PTT connection. The PC decodes the digital signals from the audio stream. On transmit, it encodes the signals onto the transmit audio. Because these signals are encoded and decoded based on time, your PC must have a fairly accurate and stable clock. The clock must be within 1 sec of UTC. There are many free programs that you can download and run to keep your PC's clock synced. I use NetTime.

It doesn't take a lot of RF power to communicate using these digital modes. 20 watts is considered QRO. You can make good solid QSOs with these digital modes using only 5 to 10 watts. In fact, if you keep your rig at 100 watts, you may actually cause QRM to adjoining stations. I have worked DX stations who are running 2 watts into a dipole antenna mounted inside their house on 20 meters. Almost any antenna will work.

You will also need the Weak Signal communications software. It is Free. You can download it from the same WSJT link given earlier in this article. After downloading and installing the software, you will launch WSJT and the main screen shown in Figure 1 will show on your monitor.

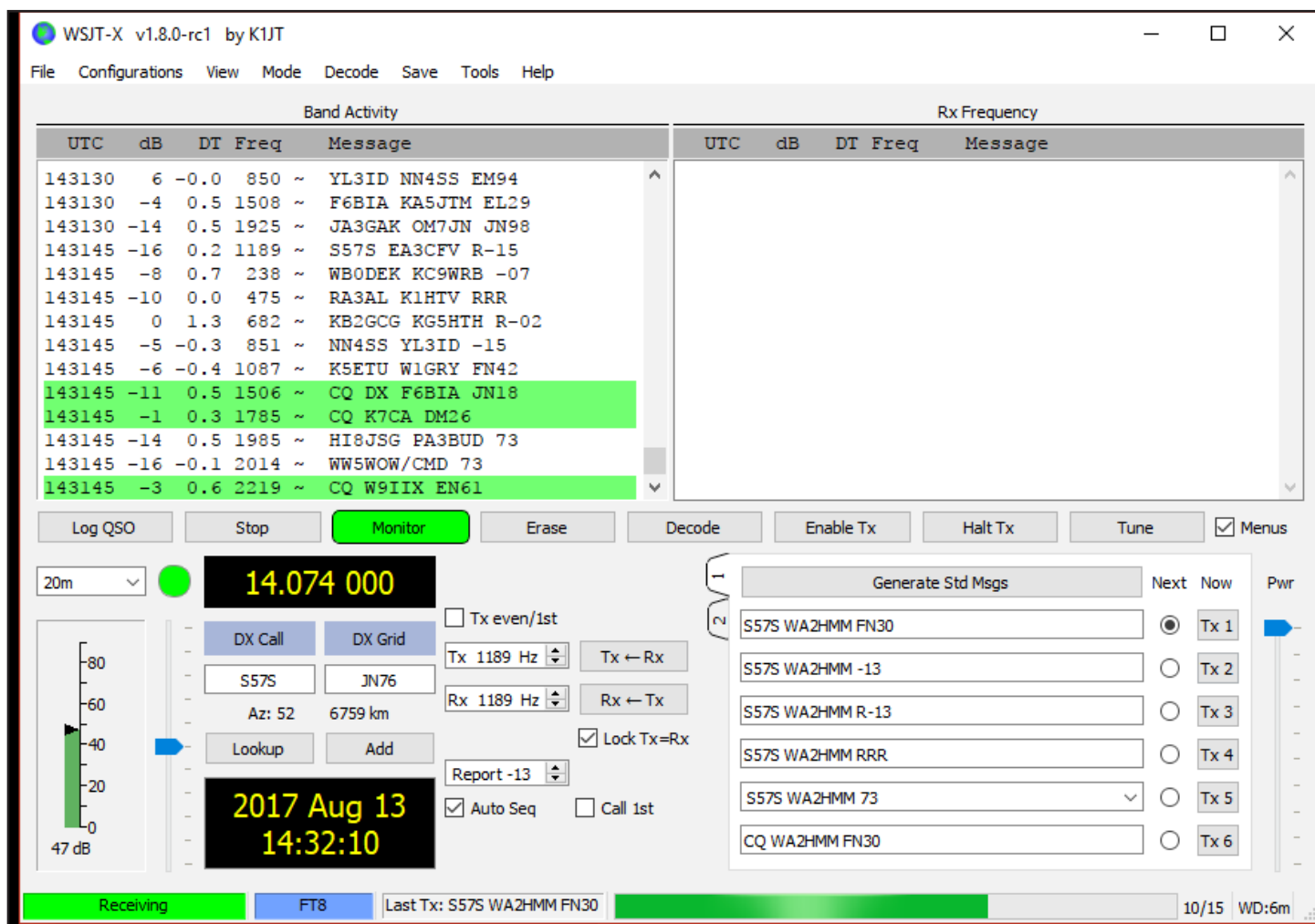


Figure 1. WSJT-X Main Window

The online User Guide will walk you through making the connections between the software and your HF rig. There is also an online “Basic Operating Tutorial” to help you get started. If the User Guide and tutorial doesn’t do it for you, then there is a user group where you can post your

questions and get the answers you need.

To help navigate around the WSJT signals in the band, a waterfall display can be activated. A sample of the waterfall display is shown in Figure 2.

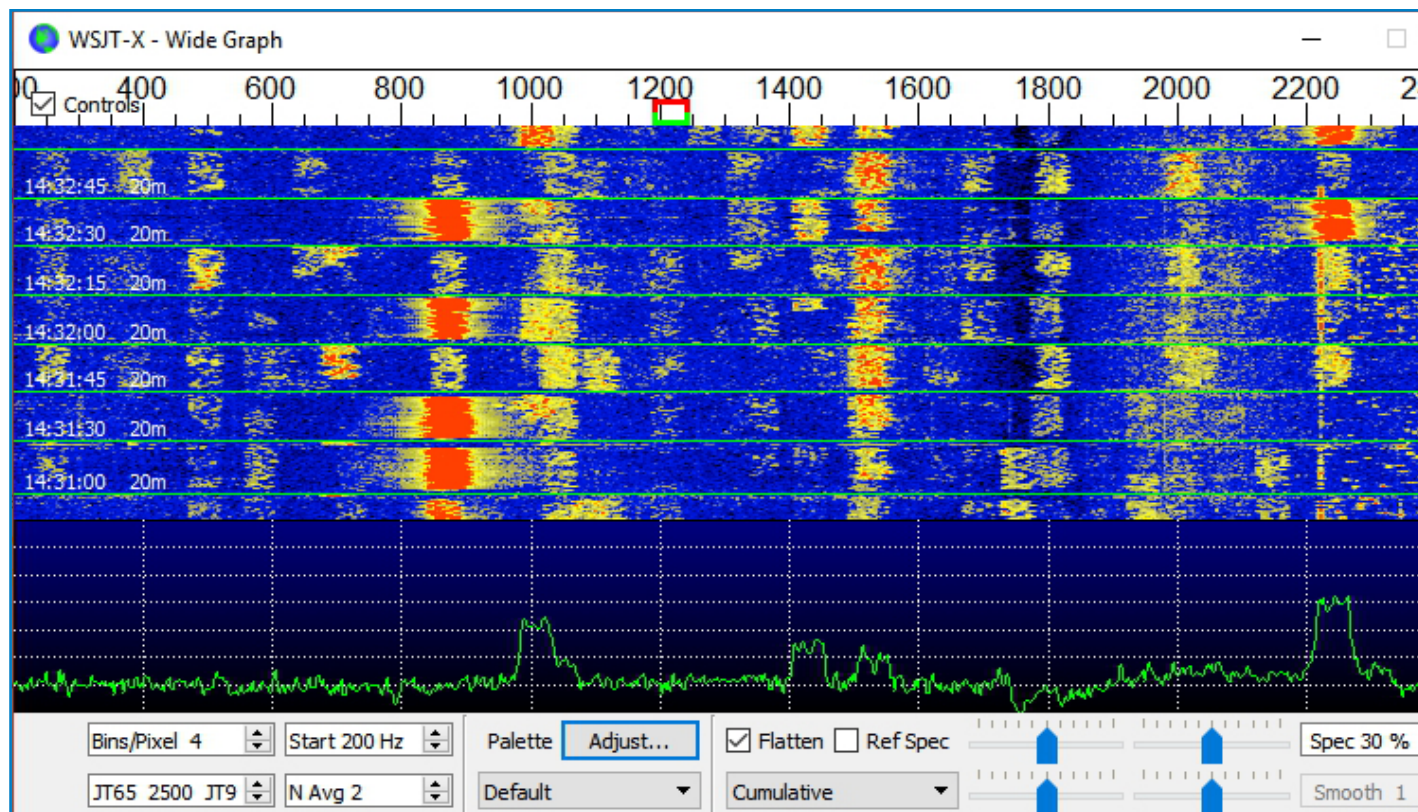


Figure 2. WSJT-X Waterfall Display

As you will quickly determine, FT8 is not a mode where you can carry on the usual rag-chew session. The transactions are very quick and very limited in verbiage. Each transmission has a limit of 13 characters. You might think this limitation would preclude us from using this mode for 10-10 QSO Parties. Well, as it turns out, the WSJT software gives just enough flexibility to accomplish the typical 10-10 exchange.

According to the rules, a 10-10 exchange consists of your call, Name, 10-10 number, and QTH (State, Province or County). Even though WSJT has automated the typical FT8 QSO exchange, there are ways to do a little freelance communications. The transmission of the call sign is already automatically sent by the WSJT software. After you install the software, you enter your call sign in the Settings window during the configuration and setup. This allows the software to include it in all the automatic transmissions. With the call sign taken care of, you will need to transmit the 10-10 number, your name, and your QTH using “Text Messages.”

FT8 text messages are limited to 13 characters, including the spaces. If you can pack those three pieces of information into one 13 or less character string, then you’re set. For example, “BILL 12345 CT” would work. If you can’t make it fit into 13 characters, then you will need to

break it down into two messages. I use “CHARLIE NY” as one message and then “10X 40510”. I also have another text message of my VP number for those times when a VP number is appropriate.

There are a number of ways the software allows you to transmit a text message. The Message Control Panel where messages sent from your station are composed, is in the lower-right corner of the Main Screen. See Figure 3 for a closer view of the Message Control Panel.

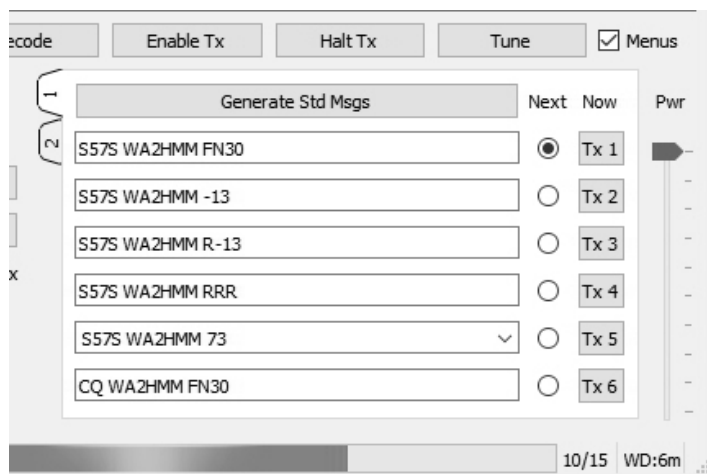


Figure 3. Message Control Panel - Tab 1

Figure 3 shows six text fields where text can be entered for transmission through your rig. These fields show only when tab “1” (see upper-left of the text area) is enabled. Text can be entered into any of these fields and selected for transmitting. The one feature tab 1 provides is the automatic progression through these text messages when the “Auto Seq” (Auto Sequence) checkbox is checked. When you click on the “Enable Tx” button, the software will progress automatically through all six of these messages depending on what is decoded from the messages sent by your QSO partner. While the progression is going, you may jump ahead or back by clicking on the option button next to the text you want sent next. You can force immediate transmission of a text string by clicking on one of the Text buttons under the “Now” label.

Note: You may notice that all six of the text messages shown in Figure 3 are longer than 13 characters. The software has special rules built-in to compress call signs so they take up less bits of data and therefore allow a few more characters to be sent. Explanation of these rules is beyond the scope of this article and left up to you to research them in the User Guide found at the link provided earlier.

To get back to the 10-10 exchange, you could insert the one or two text messages into any one of the six text fields. As the software progresses through the six fields, your text message or messages would be transmitted. Although possible, this is not the recommended method. However, if you take a closer look at text field 5 you will notice a drop-down arrow at the right end of the field. When you click on the drop-down arrow, a list of text messages will appear below the text field. The list of text messages are the Tx Macros that have been entered under the Settings Screen as shown in Figure 4.

As shown in Figure 4, the three text messages I created with my 10-10 information are listed as text macros. Having

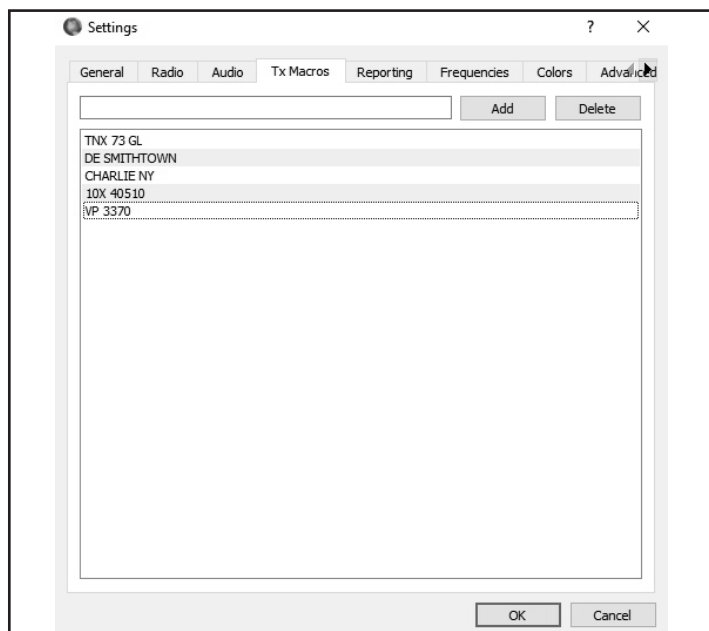


Figure 4. Tx Macros in Settings Window

the text stored in this way allows for the quick insertion of the text in a transmission sequence.

In the text 5 field of the Message Control Panel, click on the drop-down arrow and click on the first text macro to send. After the first text message is sent, the next text macro can be selected through the drop-down box and then transmitted during the next transmit cycle.

The second method for transmitting 10-10 information is done through Tab 2 of the Message Control Panel. See Figure 5 for a closer view of Message Control Panel with Tab 2 selected.

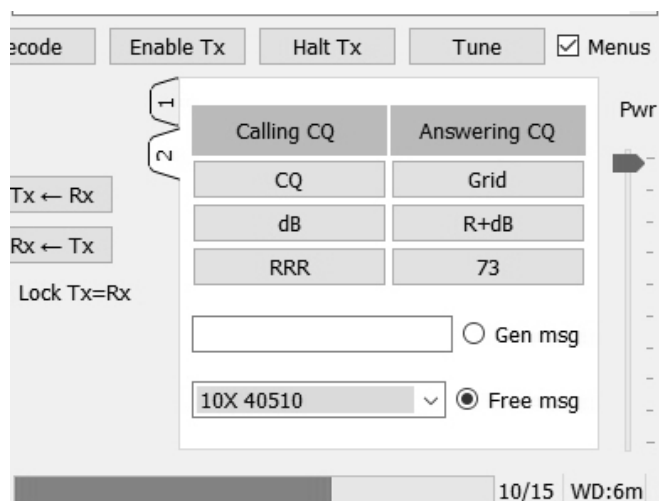


Figure 5. Message Control Panel - Tab 2

In the Tab 2 screen, you have more manual control over the messages you want sent at any time. Clicking on the buttons (CQ, Grid, dB, etc.) will insert the appropriate text in the field labeled “Gen msg”. As you progress through the QSO with your QSO partner, you click on the appropriate button. When you want to transmit a message that is not generated by the software, you enter the text in the field labeled “Free msg” and click on the option button to the right of the field. Whatever is in the Free msg field is transmitted at the next transmit cycle.

Note the drop-down arrow at the right edge of the Free msg field. Yes that’s right, the text macros are shown so you can select one by clicking on it. Thereby sending your QSO partner the 10-10 information they need from you to make a valid 10-10 contact.

So there you have it. A brief overview of how to use the WSJT FT8 mode to transmit your 10-10 information to a QSO partner. For more information on Weak Signal modes, go the link provided earlier. I hope to catch you on 10 meters (28.074 MHz for this mode) for an FT8 QSO.

73 Charlie, WA2HMM #40510