

Contesting

I've been taking part in RTTY contests for a few years now and I hope this article will inspire you to enter your first RTTY contest or perhaps to improve your contest experience.

RTTY is a digital modulation mode using a 5-bit code with start and stop bits. It uses two frequencies to represent mark and space. For amateur use the standard rate is 45.5 baud and the tone spacing (shift) is 170Hz.

There are two methods of generating RTTY – FSK and AFSK. If using a radio with a built-in soundcard, it's very easy to get set up and start using the mode. If you are already set up for FT8 or FT4, then RTTY will be easy to configure.

FSK (Frequency Shift Keying) switches the transmitter between two frequencies. There is no requirement for audio level adjustment or to ensure the speech processor is turned off. Modern radios will likely accommodate FSK.

AFSK (Audio Frequency Shift Keying) uses keyed audio tones into an SSB transmitter via either the mic input or an auxiliary audio input eg line in. AFSK requires you to ensure any speech processor is off and the audio levels for receive and transmit are set correctly so that the rig is not overdriven. If the audio level is too high your RF signal will be distorted. AFSK can achieve the same results on air as FSK. Good quality AFSK can be achieved with any SSB radio, allowing older legacy models to be used.

One benefit of using AFSK is that you can switch from RTTY to PSK without changing software. This is useful when taking part in dual-mode contests such as the RSGB 80m Club Championships and Autumn Series.

Macros

Using Macros to populate the messages you send during the contest simplifies operation a lot. Before you take part in a contest, check what the default messages are in your logging software (Figure 1). They may be roughly correct but, in a lot of cases, will be better if optimised. Test all of your messages in their expected sequence before a contest starts.

Below are some basic rules which will help you have quicker exchanges and keep other operators happy

Do:

- Send your callsign twice or more when answering a CQ call
- Use leading zeros in your sent serial numbers – '001 001' instead of just '1, 1'. This will be a setting in your logging software
- If asked for a repeat, just send what you are asked for. For example, if you are asked 'NR?'

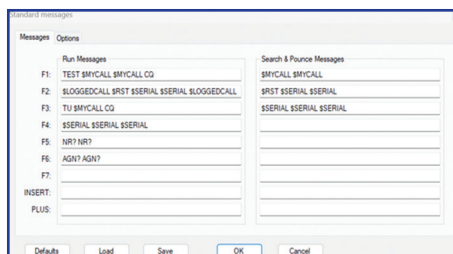


FIGURE 1: An example of macros set up in DX Log.

NR?' Just send '001 001 001'

- Add 'CQ' to the end of your CQ or TU message, this helps people know you are inviting callers when they only catch the tail-end of your transmission. 'TEST G6XX G6XX CQ' or 'TU G6XX CQ' is good
- Add the person's callsign you are replying to for the first time only at the start and end of your message eg 'M5RIC 599 145 145 M5RIC'. You don't need to include their callsign on subsequent messages
- Use a carriage return ('CR' or '%CR') at the start of each message you send. This will ensure your new message is not joined on to a load of random characters produced from noise eg (without carriage return) 'XMNDHWYTUDMHKQLPG6XX 599 001 001 G6XX'
- If using RIT, reset this back to 0 after the QSO is complete or you send a CQ message N1MM uses {CLEARRIT} and for DXLog it's \$CLEARRIT

Do not:

- Send your exchange before you receive one when you are using 'search & pounce'
- Send the callsign of the person calling CQ
- Send the RST more than once, eg 599 001 001 is fine – on HF this is 599

Example of an efficient QSO

Op 1: TEST G6XX G6XX CQ
 Op 2: M5RIC M5RIC
 Op 1: M5RIC 599 001 001 M5RIC
 Op 2: 599 123 123
 Op 1: TU G6XX CQ

Some stations send far too much information both on the replies and when asked for a repeat. Cut the messages down as much as possible and only send what is needed.

If you don't have a macro set up, send your message manually. Pressing Alt and K in DXLog [3] or Ctrl and K in N1MM will activate the keyboard where you can send free text messages.

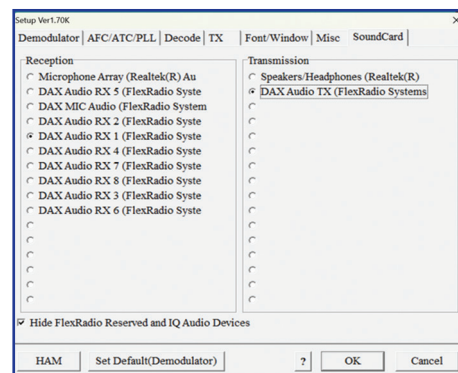


FIGURE 2: Soundcard setting for Flex radio.

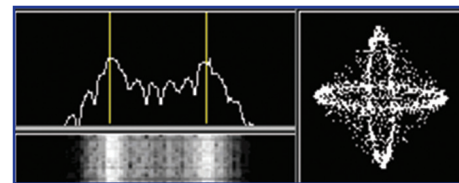


FIGURE 3: The picture above shows the signal aligned perfectly.

What software is needed?

Like any software, the best is often the one with which you feel comfortable, and which meets your needs.

When contesting, RTTY decoders are used in conjunction with contest logging software. Developers have integrated the two together. The RTTY software will decode what is being received and, based on the information in the logger entry window, send a response.

Common logging software that has RTTY integration (which you might already be using) includes N1MM [4], DXLog and WinTest. If you've not tried it, DXLog is very similar to WinTest (and is free) but has been developed over the past number of years, has a growing number of users that contribute to enhancements and is in use by some of the top single operator contesters in the world. N1MM and DXLog come with MMVARI already installed. Using this will get you on the air quickly and can be used for multiple data modes including PSK, not just RTTY.

Other decoders are available. The logging software will let you change the default to something else. These need to be downloaded and installed separately from the contest logger.

Two popular free choices of decoder for contesting are mentioned below.

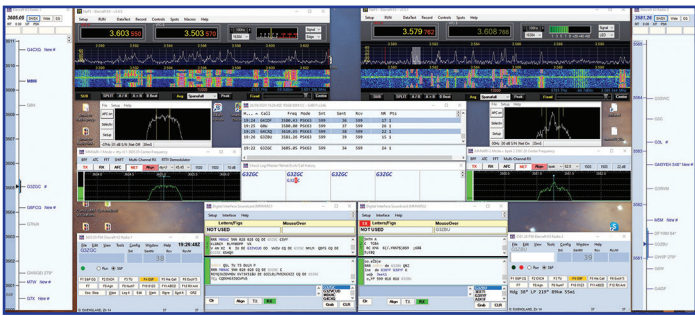


FIGURE 4: Roger, G4BVY's screen setup using N1MM and multiple decoders.

MMTTY

MMTTY [1] was created by JE3HHT and widely used for nearly 25 years throughout the RTTY community. Whilst there are lots of settings in the menus, once configured you won't need to touch any of these. So don't be put off.

2Tone

Introduced in 2012 by David, G3YYD, it has a much cleaner and simpler interface than MTTY. In many cases, 2Tone [2] will outperform MMTTY or other decoders but, by using multiple decoders, you will be able to see which has the best decode.

Decoding/ transmitting: NET/AFC

Receiving and transmitting on the correct frequency is essential for operating RTTY. Ensuring that AFC (Automatic Frequency Control) and NET are set correctly will help with this. If you are unsure, leave them both switched off.

For receiving stations who are calling you off frequency, use RIT on the radio instead. Just ensure this is set back to 0 after each QSO is logged or you start calling CQ. See note in Macros about doing this automatically.

Selecting soundcard input/output

Once you have a RTTY decoder installed, eg MMTTY (Options-Set-up-Soundcard), you need to set the input and output channels to use. Figure 2 shows an example for Flex radio but you will have something similar where you have one for reception and another for transmission. If you don't see any signals on the decoder or can't transmit, check the settings here. You will also need to configure the Tx tab with how you are going to control the PTT.

Completing a QSO

Once you have set up the correct input and output, when tuning across a RTTY signal you should see two peaks which will line up with the vertical lines in the decoder (Figure 3). Eventually you will be able to do this by ear and won't need to look at the decoder screen.

Once the lines are aligned, you should see the print on the screen decoding what the current station is sending. Using the decoder with a contest logger means it will integrate the SCP (Super Check Partial). As callsigns are decoded it will use different colours to highlight them eg new station and new multiplier is yellow, new station but not a multiplier is red, worked already (dupe) is pink etc. Setting your own colours means you can make it easier to spot the calls you want to work. This is useful when working in a search-and-pounce fashion and it helps to ensure you work new multipliers etc.

A left-click of the mouse on the callsign or exchange (serial number) in the decoder window will place it in the call/exchange field of the logger. You can manually edit this if required eg if the call you decoded was W1AAA but later you decode W1AA and wish to make an amendment.

You also have the option to use keyboard shortcuts to grab the callsign from the decoder window, not touching the mouse at all. See keyboard shortcuts of your logger/decoder on how to do this.

Sending messages: F keys

When configuring macros, you will set a message for each F key (F1, F2 etc). Starting with F1 to call CQ, you will then move through to F2, F3 to complete the QSO eg setting other F keys for repeats eg serial x 3 etc.

(F1) TEST G6XX G6XX CQ

M5RIC M5RIC

(Left Click M5RIC in decoder window – callsign field populated)

(F2) M5RIC 599 123 123 M5RIC

599 843 843

(Left Click 843 in decoder window (599 defaulted) 843 populated in exchange field)

(F3) TU G6XX CQ

(Press Enter to log the contact M5RIC 599 843)

You can operate a contest using just the F keys for all messages. Another option is to use ESM, the same as for CW.

Parallel decoding/ profiles

As you are relying on the software to decode the RTTY signal, maximising the possibility of a successful copy can be achieved by running multiple decoders of different types (MMTTY and 2Tone) using different profiles. To do this you will need to install each decoder multiple times in its own folder. Contest loggers often allow more than one decoder to be used simultaneously.

SO2V / SO2R / 2BSIQ

If you are interested in bettering your RTTY contest score, you could look at operating SO2V (Single Operator 2 VFO), SO2R (Single Operator 2 Radio) or 2BSIQ (2 Band Synchronised Interleaved QSO).

With either method, if you are assisted by receiving spots from the cluster including the RBN, your bandmap for either VFO/radio will be populated. Clicking on a spot will change the VFO/radio to that frequency and, if the spotted frequency is correct, you can start to decode and then call the station.

Take care here to ensure any offsets and mode settings on your radio are correct as you can click on a spot only to find the station isn't there and is actually above or below the spot.

SO2V means you are running on one VFO and using a second to search round on the same, or other, band for other stations. With good timing you can up your rate or get much-needed multipliers by interleaving QSOs between the main and sub VFOs.

Figure 4 shows Roger, G4BVY's screen setup using N1MM and multiple decoders. Running RTTY on the main VFO but also picking cluster/RBN spots off to work stations using PSK on the sub VFO.

SO2R and 2BSIQ methods can be used if you have the hardware and capability to use two radios on separate bands. This will be covered in a future article.

References

- [1] MMTTY: <https://hamsoft.ca/pages/mmtty.php>
- [2] 2Tone: <https://www.rttycontesting.com/downloads/2tone/>
- [3] DXLog: <https://dxlog.net/>
- [4] N1MM: <https://n1mmwp.hamdocs.com/>

Recommended reading

- 1. RTTY contest tips: <https://www.rttycontesting.com/>
- 2. Don, AA5AU: <https://www.aa5au.com/>
- 3. WPX RTTY: <https://cqwprrty.com/>

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