RTTY Starter

by Don Cassel, VE3XD

Introduction

While some contesters find the fast pace of a major CW or Phone contest exhilarating, others may find it to be a rather intimidating experience. This is especially true for beginners to contesting who have not yet mastered the details of fast exchanges and big pileups. An alternative to getting started is with RTTY contesting which is generally a much slower paced contest when compared to the other modes. Or maybe you are just looking for a different type of contesting mode and RTTY can be just the ticket for a new and satisfying experience. Either way take a look at RTTY and see if you don't find it to be as much fun as the main modes of contesting.

There are 20 or more significant RTTY contests that run during the year. While only six of these are eligible for club contesting there is plenty of opportunity to get your feet wet with any number of these contests. They range from the widely attended CQ/RJ WW RTTY which has a large contingent of operators world wide, as you might expect, to the North American QSO Party RTTY contest which has mainly U.S. and Canadian participants. If you are looking to fill in the gap of missing DXCC countries for RTTY then in addition to the CQ/RJ WW RTTY try one or more of CQ/RJ WPX RTTY, ARRL RTTY Round Up, or JARTS WW RTTY contests. All of these are well attended and will likely help you to net a few more countries in your log.

In this article we will look at how to get your station set up for RTTY, what software to use, and some techniques for making the most of your operating experience. As we are mainly addressing the beginner to RTTY contesting little or no experience will be assumed in the following.

Station Setup

Getting set up for RTTY is a little more involved than phone or CW but with today's computer hardware it's not really that difficult. With phone or CW it is possible to get on the air and do some contesting with only a mike or key. You probably need to do more than that to get serious with contesting, such as install some logging software, but some guys just jump in with a paper log and little else. On the other hand to get started with RTTY you will need some additional hardware and software added to your station to operate effectively.

Hardware

When I first began using RTTY in the early 90's the way to go was with a TNC and some matching software. In general the TNC plugged into your computer's serial port and also into the RTTY connector on your radio. Software then interfaced the two and you were in operation. You could transmit using either FSK (Frequency Shift Keying) or AFSK (Audio Frequency Shift Keying) depending on your configuration. A capable TNC was a significant investment unless you could pick one up at a hamfest but with it you also had access to other digital modes. At the time I played with RTTY, AMTOR, PACTOR, GTOR and HF Packet. The only one of these that is heard much on HF anymore is RTTY and a newer mode, PSK-31 has become popular, but that's another story.

More recently software has been developed to take advantage of the sound card that resides in virtually all of today's computers. So you can get set up to operate RTTY and other digital modes without a TNC. There is an ongoing argument whether it is better to use FSK or AFSK for RTTY. Suffice it to say that I have only used AFSK and have been very satisfied with the results. So that being my first hand experience the following discussion will centre on getting AFSK and the soundboard to work.

Receive Interface

To begin, you need a receive interface between the sound card and the radio as shown in Figure 1. The isolation transformer can be a Radio Shack 273-1374 or equivalent. The transformer is used to block any DC hum that might be present in the line. I found that one computer, a desktop, required the isolation while another, a laptop, did not. Shielded audio cables with appropriate connectors for your rig and soundboard should be used for the wiring.
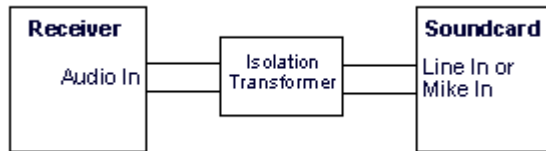

Figure 1. Connecting the receive audio to the sound card.

You could stop right there and check to see if you are receiving RTTY signals okay by running your software. That will at least confirm that one half of your system is working okay. You can't work them if you can't hear them. Right?

Transmit Interface

A similar setup is used to connect the soundboard to the mike on your transmitter (see Figure 2). I've used at different times, the actual microphone connector, the phone patch connector and the Packet connector. The advantage of the phone patch connector is that you don't have to unplug the mike to use RTTY. The Packet connector on the Mark V let's you use extra filtering that is not available in LSB mode which is the mode generally used for RTTY operation.
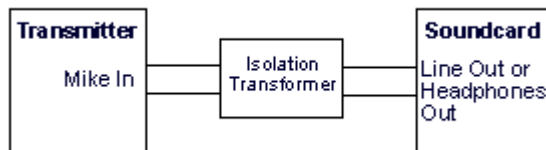

Figure 2. Connecting the transmit audio to the sound card.

Whether you use the Line In or Mike In for receive or Line Out or Headphones for transmit is a matter of sound levels in your card. I use the Mike In and Line Out on my sound card and that seems to work best for me. You may have to experiment a little to get the right combination.

Other Alternatives

In the past year I have replaced the above circuits with a Rigblaster Plus. This allowed me to integrate my rig, digital and CW connections all into one unit. West Mountain Radio have a number of units, one of which will likely satisfy your needs if you are so inclined to bypass the homebrew approach. MFJ also has some similar units. If you are handy with home brewing then that is a very inexpensive way to get started.

RTTY Software

The next link in the RTTY chain is software that will not only receive the RTTY audio and convert it to text on the screen but also interface with your radio to send RTTY. There are any number of programs out there that are suitable as any Google search will show. Some are free and other cost a small amount or much more depending on features and their purpose. Space is limited here so only three will be mentioned.

MMTTY

The first is MMTTY as shown in Figure 3. MMTTY was developed by Makoto Mori (JE3HHT) who has also written a very popular SSTV program called MMSSTV.

Figure 3. MMTTY by JE3HHT

One of the best features of MMTTY is that it is free. But don't let that fool you. It is one of the best RTTY programs around. So much so that many Writelog users also download a plug-in so that MMTTY can be run directly within Writelog. MMTTY is a fully featured program that includes the ability to pre-program buffers for stored messages and also a built-in logbook. One of the many exceptional features is the ability to copy fluttered or multi-path signals. When you encounter one of these hard to copy signals just click the option and settings are changed to optimize signal deciphering. MMTTY is also good at copying weak signals. Often I have been about to transmit CQ after not hearing a response only to see a station coming back to me on the screen. No S-meter movement and no obvious audio unless you listen very carefully and yet MTTY heard it. If you just want to play with RTTY this is a great way to start at no cost to you.

I personally use MMTTY as a plug-in to Writelog and find it to be very effective. MMTTY is available for downloading at www.qsl.net/mmhamsoft/.

MixW

MixW was developed by Nick Fedoseev (UT2UZ) and Denis Nechitailov (UU9JDR) and is shown in Figure 4. Like MMTTY it has its following of users and is highly regarded as a program for many of the digital modes. In addition to RTTY, modes such as CW, PSK, Pactor, Packet, SSTV and others are included in a single program.

Figure 4. MixW by UT2UZ and UU9JDR.

MixW also includes logging capabilities and macros that can be recorded for frequently used exchanges. Unfortunately in its current configuration it cannot be integrated with Writelog so I have been unable to give it a decent test. As a standalone program is appears to work very well. You can download MixW from http://www.mixw.net/ and use it for a test period of 15 days. After that it will cost you $50.00 U.S. to register it.

Both the MMTTY and MixW websites have far more information about these products than can be presented here so it's best to spend some time there comparing features. Then download them both and give them a test run.

Write*log*

Writelog is really much more than just a RTTY program. It is a fully featured contesting program that supports all major contests and many others. It includes Phone, CW, RTTY and PSK modes. Writelog (Figure 5) was developed by Wayne Wright (W5XD) who continues to support it with regular updates.

Figure 5. Writelog with one of its many possible window setups.

In addition to providing all the features for operating RTTY, Writelog gives the support you need to contest effectively. On the fly you can do dup checking, check for partial calls, check on what bands you have worked the caller, tell where to point your beam and so on. Writelog also gives a running summary of how you are doing in the contest. At the end of the contest just a few clicks will prepare your log and/or summary to be sent to the contest sponsors, 3830 or CCO.

If you are a packet user it has built-in spot capability. You can connect either to a packet station or to one of many Internet spotting servers. With the spot feature you can easily identify new multipliers and/or stations that you have not worked. Stations you have already worked are not displayed to minimize the clutter. Spotted stations can also be displayed on a bandmap which is a useful tool for search and pounce operating to see at a glance where new stations are located on the band. Remember not all contests permit the use of spotting clusters for all modes of operation.

You can find Writelog at http://www.writelog.com/. At $30.00 U.S. it's a bargain.

I'm sure if you talk to a few hams who run RTTY you will discover other software that they like. You may hear about RTTY by WF1B which is also a highly regarded program among contesters. DXLabs also has a following. It covers many aspects of operating beyond contesting and is a huge suite of programs. If you have lots of time for a large learning curve this may be worth checking out. Whatever you do, get started.

Trial Run

Now that you've decided on some software and have the soundcard connected at least spend a little time previewing the help files that come with your software. In particular at this time check into the settings you will need for the configuration you are using. In my case with Writelog I needed to tell it that my rig was on COM1, that I'm using soundcard AFSK and that LSB is really FSK. Each program will have to be told what you are using so don't leave this to the last minute as sometimes what seems obvious, isn't. For example, the setting "LSB is really FSK" in Writelog is rather obscure and is easily missed but without it RTTY simply doesn't work.

Next you will want to get on the air and make a few RTTY contacts. Not only will this help you to become familiar with your software but you will also get comfortable with tuning a RTTY signal, sending and receiving messages and how to deal with fading signals, QRM and the like. Much of the time you can find someone operating RTTY on 20 meters between 14.080 and 14.090. Remember to set your rig at 50% or less of full power as RTTY is a full duty cycle mode and you don't want to fry the finals. Therefore a 100 watt radio should be set to transmit at 50 watts or less.

Message Buffers

When you are contesting in RTTY you will want to set up all of your exchange information in buffers or memory so you can minimize any typing needed during the contest. This is a good idea also for general communication so that you can setup a CQ message, signal report, or W5ABC de VE3XD BTU type of message. In a contest you should aim to do no typing and setup your messages accordingly.

Each program will have a different scheme for storing messages and some require special codes to begin and end transmission or to include data such as a callsign, or serial number in the exchange. You may prefer a different arrangement than me and can make your own personalized set of messages. Another suggestion is to make up a paper template for the function keys with the purpose for each key written above the key position. That way you can see at a glance which key does what. Table 1 shows the Writelog function key messages I used in the CQ/RJ WW RTTY contest in 2003.

Key	Buffer Contents	Example of Sent Message
F2	%C de ve3xd ve3xd %R%E	GU0SUP DE VE3XD VE3XD
F3	%C hi %h 599 04 on on ve3xd %R%E	GU0SUP HI PHIL 599 04 ON ON VE3XD
F4	agn agn bk %R%E	AGN AGN BK
F5	cq test de ve3xd ve3xd cq %R%E	CQ TEST DE VE3XD VE3XD CQ
F6	%C hi %h 599 04 on on %c %R%E	JH4UYB HI MASA 599 04 ON ON JH4UYB
F7	%C qsl tu de ve3xd qrz? %R%E	JH4UYB QSL TU DE VE3XD QRZ?
F8	on on on on on on qsl?%R%E	ON ON ON ON ON ON QSL?
F9	de ve3xd%R%E	DE VE3XD
F10	State? bk%R%E	STATE? BK

Table 1. CQ/RJ WW RTTY Writelog buffers.

In general function keys F2 to F4 are used when operating search and pounce. Keys F5 to F7 are for running. F1 is the Help key aka Windows. The others provide for other needs during the contest. In addition I have some Shift-function keys setup for other needs such as sending my call three times, asking for a repeat on the other station's callsign, asking for a province instead of a state. Planning ahead helps to virtually eliminate the need for typing messages during the contest. Although the messages are typed in lowercase they send in uppercase as RTTY has only uppercase letters and numbers.
In the case of Writelog, other programs will use different conventions, the entries beginning with % are special characters that substitute a value. The ones used in the Table 1 are:

%C   Substitutes the callsign currently in the QSO entry window. The call gets there either by clicking it in the RTTY window or by typing it into the QSO window.
%R   Is equivalent to pressing the Return key during transmission.
%E   Defines the end of message and returns Writelog to receive mode.

%H   Includes the name of the called station from a Friends file that matches call signs with first names.

This contest doesn't include a serial number exchange but if it did then a %3 could be included to provide a three-digit serial number from the log. Codes such as %C and %3 can also be used for CW contesting which generally has much shorter exchanges.

So now that the software is set up and you have been able to make a few contacts let's get on with RTTY contesting.

Search and Pounce

If you've never operated a RTTY contest before then starting with search and pounce is certainly easier and less nerve racking than running. I highly recommend getting started that way. In fact I began contesting with only a low mounted G5RV and then a vertical a few years later and for several years only used S&P. This is good experience as you wait and listen for a calling station and then jump in with your call sign (hit key F2) after his CQ. Then when you are recognized and have received his exchange, send your exchange by pressing F3 and you are in the log. Forget the pileups, especially early in the contest as you can waste a lot of time with little return for your efforts. Using search and pounce will help you get familiar with the different way operators work the contest and to get a feel for the rhythm of RTTY contesting.

Running

To run successfully in a RTTY contest you will need a reasonably competent station. One of the reasons I did not do much other than search and pounce with my G5RV was that my signal was not strong enough to be heard very well. A much better QSO rate for me could be had by using S&P. So if you have at least a small directional antenna or a fairly good vertical then you can give running a shot.

Begin by looking for a clear frequency. In the CQ/RJ WW RTTY this is easier said than done. Moving to either the low or high end of the RTTY frequencies can help. When ready hit the function key to send out your CQ. You will likely need to repeat this a few times before you get a response so keep trying. In my case I hit F5 and the CQ is sent. Writelog also has an auto-repeat CQ so you won't wear out your finger. Believe me, in a long contest this is a really nice feature.

When a station comes back to you enter the call into the logging window and send the exchange. Usually I would be able to click the call sign in the Writelog RTTY window and then press F6 to send the exchange. When you have received his exchange enter it in the log and press F7. You have completed the contact. If you missed anything then ask for a repeat by pressing the appropriate key to send the request.

Handling QRM in RTTY is not as easy as in CW or Phone. In those modes you can often pull out a character or two and ask for the XE1 or the DL station. In Rtty if two or more stations call together you normally only see garbage on the screen. Rather than ask for a repeat of the call, because if you do you will just get the same mess again, wait a few seconds. One of the stations is likely to recognize what happened and will send his call before any of the others and you will be able to read it. That is why I have my call recorded once in F9 to use in S&P for that very purpose. Now you can reply to that station and complete the exchange.

Don't expect to see high rates in RTTY. It is very unusual to have a rate of 100 per hour for very long in RTTY. Maybe for a few minutes you will see the rate meter hit that level. Over the course of an hour or more rates of 60 or less are more common. The reason of course is that the messages are long enough to take a some time to complete. Some of the messages can be made a little shorter to save time but unless you have a very competitive station that is unlikely to make much difference over the course of the contest.

Summary

RTTY contesting can be a lot of fun and a easy going mode of operating. You can even eat a sandwich and sip on a cup of java and keep contesting without interruption. Try that with phone. Once you have mastered

the basics and are look for new challenges you can even move to the single operator two radio approach. Use one radio for running and the other to look for new contacts and mults. Writelog supports this mode of operating and provides for two logging windows and two RTTY windows. Multitasking is not my style so a single radio works fine for me. So bottom line, why not give RTTY contesting a try?