The TNC by WB5YYQ

One of the things I love about ham radio are the many different modes of communication you can use. Beyond CW and voice, there are a multitude of digital modes: packet, Vara FM, Vara HF, APRS, slow scan television, FT-8, FT-4, Olivia, RTTY, and many, many more. However, all of these modes have one thing in common, a digital interface. This device is known as either a Terminal Node Controller (TNC) or a sound card modem, and connects your ham radio to a computer. Times have really changed since the early days. Back then, you had to send commands to the TNC thru a terminal program, since all functions took place on the external device, and you didn't have fancy software to do that for you. You had to press Control-C to get a command prompt, then enter various parameters to setup the device.

My first TNC was a MFJ model 1278 I purchased in the eighties. That was my first experience with packet, and there were a number of packet BBS stations in the Houston area back then. As you can imagine, operation was somewhat clunky (for lack of a more technical term).

Some popular device manufacturers include Tigertronics, MFJ, Kantronics, Master Communication, and West Mountain Radio. You can also put one together fairly easy with a Raspberry Pi, called DigiPi.

The TNC is connected to the computer via a serial cable. When plugged in, the computer should recognize the device and may load a device driver. The device parameters may need to be configured in whatever software program you are using. This is generally which com port and baud rate to use. For many years, the USB port has replaced the conventional 9 pin serial port.

The ham radio is connected to the TNC with only 4 conductors, which are the microphone, speaker, push to talk, and ground. Some radios may have dedicated data ports which simplifies things. Manufacturers sell cables designed for specific radios, or you can build your own without too much trouble. Make sure you have the right cable for your specific model radio. Microphone and data port wiring are not universal. If you plug in the wrong cable, you could short out your rig.

If you have access to those 4 conductors, almost any radio can be connected to a TNC, including old rigs you might have laying around or pick up cheap at a ham fest. I bought an old Kenwood TR-7930 at a hamfest for $30. It had 16 channels and 30 watts. I wanted to set this up as a dedicated digital station. I found the microphone pin out diagram on the internet and discovered that it had one unused pin, which I used to connect to the speaker. I then wired up a DB-9 connector to a 8-pin microphone connector, which gave me the 4 lines I needed. This old rig works very well on VaraFm with my Master Communications DRA-30 USB sound modem.

Thankfully, you generally don't have to do surgery on your rig to get to those 4 connections. If your rig does not have a data port, using the microphone jack and the speaker jack will usually work. However, some rigs might not provide the proper signal levels or may not be stable or fast enough to handle the digital modes.

The challenge using a rig not specifically designed for digital modes, is the software. You may have to get creative to trick the software in getting PTT working. There are many resources on the internet to address these issues.

Some rigs come with a data port which makes it easy to connect to a TNC, including Yaesu FT-7900,

Kenwood TM-V71, Icom IC-208H, among others.

The Icom 7300, 7100, and 9700, Yaesu FT-991A, and Kenwood TS-590SG, all have built-in sound modems, so all you need is a USB cable connected to a computer.

And some rigs have everything built-in. The Kenwood d710 mobile rig and the Kenwood TH-74 handheld can send & receive APRS messages, stand-alone without a computer.

Most of these TNC or sound modem devices can handle all of the digital modes available to hams. There are a host of software programs to utilize: fldigi, DireWolf, WSJT-X, UISS, JTDX, MSHV, JT8Call, MMSSTV, MMTTY, and many others.