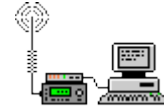




Packet Radio and Netrom Primer



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Packet Radio is a digital form of communications.

All you need to start in packet radio is a 2 meter FM radio which you probably already have. A computer, even an old XT running MS-Dos will work just fine and a TNC (terminal node controller).

The TNC is like a modem that encodes and decodes packets of data using what is called AX.25 protocol. This same data protocol is also used in commercial applications.

General Packet Primer

A packet radio station consists of a 2 meter radio, a terminal node controller (TNC), basically a modem for your radio, a computer running some type of communications software be it written for packet or as simple as a old telephone modem program like Telex, and connecting cables.

In the amateur radio community the most common use of packet radio is information obtained through a local bulletin board system (BBS). We use packet locally during the [Bloomsday Run](#) to connect our aid stations with a database to keep track of injured runners. It is also used in emergency communications. You can connect directly to another station or work through a node. A node is a TNC and radio on a hill top running what is called netrom. Netrom keeps track of other nodes in the area and calls that have been heard. When packet started you would have to digipeat through a node before netrom. Now we connect to the node then connect to another station even if it is several nodes (hops) away. See information on netrom commands at the end of this primer.

Packet Radio uses just what it states, Packets of information to communicate between stations. The AX.25 protocol is error correcting and will retry if the acknowledgment it receives from the receiving station (checksum) is not correct. It will continue to retry to send the information until it gets the confirmation the data was received correctly by the receiving TNC. If data is not received correctly your retry count will time out and you will get an indication to this on your terminal screen. Retry counts are usually set to 10 by default. If everything goes well a keyboard conversation can go on between several people if you connect through a conference bridge on your local BBS, keyboard to each other through your local node or reading messages on your local BBS.

There are several parameters you will need to set before getting on the air with your TNC. One of the most important is your callsign. Most TNC's have a NOCALL by default in the rom.

These settings should be used for the VHF Club F6FBB Packet BBS System.

MYCALL KA7FVV (please use your callsign)

RETRY 10 (should be default)

FRACK 12 (set between 8 and 12, this tells the TNC not to retry to send data if it does not get an acknowledgment right away).

PACLEN 230 (I like to have a larger paclen for larger packets)

MAXFRAME 4 (if you have heavy traffic or a poor path bump this down to 1)

TXDELAY 30 (this should be default)

PPERSIST 63

DWAIT 30

MONITOR ON or MONITOR 1-6 (depending on your brand of TNC will depend on what monitor command you have. Paccomm tnc's use on or off and AEA use 1-6. If monitor is off you will not receive any data on your screen if there is traffic on the channel. The monitor levels 1-6 just designate what you will see. A monitor of 1 will only give you unconnected packets such as the beacon from your local bbs indicating who has messages. A monitor of 6 will give you all of the traffic on the channel.

Now that you are all setup you are ready to try to connect to your local node and BBS. I will use our local system as an example.

Tune the radio to 145.090. We first need to check the volume setting of your radio. If the volume is to low or to high the TNC will not be able to decode received packets. Volume settings between the radio/TNC and path problems are the two most frustrating problems in packet radio. To do this open the squelch on the radio. Turn the volume up until you see the DCD light on the TNC come on or flicker. Continue to turn the volume slightly past this point and stop. Close the squelch. The audio should be set just right. The procedure has always worked fine for me.

Probably a good idea to monitor the frequency to see if you are decoding any packets. Also if you have another radio or scanner and listen to the frequency when the packets are sent.

Now that we are set, type the connect command on your communications software.

145.010 - WR7VHF-3 packet node South
145.090 - WR7VHF-4 packet node North

C WR7VHF-3 or C WR7VHF-4 (depending on which node you choose)

If everything is working as it should you will see this:

***Connected to WR7VHF-#

Type another connect command and the callsign of your local BBS.

C 2 WR7VHF

You should see this now:

***Connected to WR7VHF

You will now start to see the BBS menu. If you have not been on the BBS before it will ask for some information like your QTH and home BBS. It should be your local bbs. A packet address is going to look something like this:

ka7fvv@wr7vhf.#ewa.wa.usa.noam

General BBS Commands

L - Lists all of the messages since you last did the list command. If it is a busy bbs you may get a very long list.

L> argument - You can narrow the list you see to what you want to see such as space, sale, keps.

(ex: L> space). There must be a space between the > and argument.

H - Help command

K - Kills messages

KM - Kills my messages

R - Read messages (EX: R 245 will read message 245)

S - Send messages (EX: S KA7FVV will send a message to KA7FVV. Then the bbs will ask for a title to the message. After this is sent it will ask you to enter the content of the message. When you are finished you can do one of two things to end the message. Ctrl Z and Enter or /ex and enter will end the message. I have found that sometimes the Ctrl Z does not work for some reason depending on the terminal software used.

B - Bye (disconnects you from the bbs and node)

Reading Packet (letters in parentheses after data)

C - Connect Request
D - Disconnect Request
DM - Disconnect Mode
UA - Unnumbered Acknowledgement
UI - Unconnected Information Frame
I(n) - Informaiton fram or Index packet (n=0-7)

What frames you see will depend on your monitor setting. Some TNC's only have a on or off monitor. On seems to be a setting of 4. If you have number choices a 1 will only decode unconnected frames like the hourly beacon from the bbs.

Common Packet Frequencies

144.91, .93, .95, .99 (144.93 is reserved for the nationwide APRS system)

145.01, .03, .05, .07, .09, .51, .53, .55, .57, .59, .61, .63, .65, .67, .69, .71, .73, .75, .77, .79

Netrom Commands

When packet first started operators used to put off the shelf TNC's on mountain tops. The packet stations would need to know what the callsign and/or alias was on each location between there home location and where they wanted to connect. An example of connecting from Spokane to Portland would be: C KA7PDX V WA7AAA, KA7BBB, WB7CCC. Netrom simplifies this process. Netrom keeps track of routes and mountain top stations it can hear. You still need to know where a callsign is located but instead of doing multiple connects down the line to Portland I can simply connect to the node locally and then C PDX and let the packet system do the rest. That is if there is an outside rf link via packet. When the VHF Club South Packet Stack is up and running we will have a rf path to the outside world once again. Here are some common commands for Netrom.

To start out you must connect to the node. In your TNC software type C callsign (what ever the node callsign is). In the case of the VHF Club on 145.09 it is WR7VHF-4 so use C WR7VHF-4.

B - Bye: Disconnect your station from the node. If you disconnect from the BBS, you are automatically disconnected from the node.

C - Connect: Must be followed by a callsign or alias. In case of the VHF Club to connect to the club BBS use C 2 WR7VHF. The 2 tells the

TNC to connect using port 2. In this case the UHF backbone. If you wish to connect to another station on the VHF port use C callsign.

CQ: Sends a CQ on the node frequency. Other stations must be on frequency to see the CQ.

H - Help: Brings up a list of commands in this list.

I - Info: Gives information about the node you are connected to.

L - Links: Shows status of links.

M - Mheard: List of stations heard by the node. Usually in a certain time period like the last 12 hours. Same as the Mheard command on your TNC.

N - Nodes: List of nodes the node you are connected to can hear. You should be able to connect to any of these nodes. You can also use N *. This will show all nodes even backbones indicated with a # in the callsign.

P - Ports: Lists ports available on this node.

R - Routes: List of routes. Should match nodes and lists strength or reliability. Larger the number the better.

S - Stats: Status of node with number of packet frames sent and received.

U - Users: List of current users connected to the node.

Sysop: Login for Sysops

I hope this primer is helpful to old and new packet users alike. It is just meant to be a starting point with general information for the packet user. A working knowledge will come with experience with the mode. Like everything in life there is a learning curve.

Here is a great source of packet information: [Packet Radio](#)

Here are some links to multiple packet software sites: Instant links to recommended programs.

[PacketWin2.1](#) [Pacfast \(DOS\)](#)

[Yapp \(DOS\)](#) [paKet 6.2 \(DOS\)](#)

[QRZ Software](#) [ON1DHT Page](#) (click on software)

[WinPack 6](#)

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