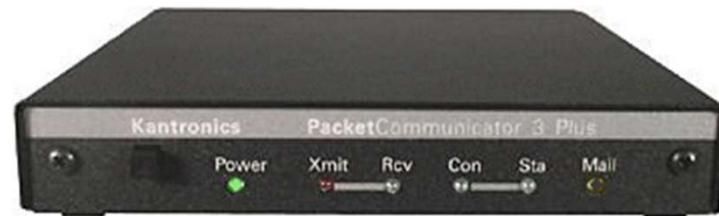# Introduction to Packet Radio

By Matt Mitchell
KB8UVN

Who am I?

- Matt Mitchell, KB8UVN
- Licensed since 1994
- Active on Packet Radio since 1995
- TCP/IP Coordinator for Ohio AMPR Net (44.x.x.x)
- Trustee of the Central Ohio Packet Association

What do I do?

- Operate 8 Packet switches throughout Ohio
- Operate 6 APRS Digipeaters including 3 I-Gates and HF Gateway (30m)
- Packet Mail forwarding hub for Central Ohio
- Operate a Winlink RMS Gateway
- Operate a DX Cluster spotting system
- Work with surrounding clubs and individuals to help grow packet radio interest and infrastructure

What is Packet Radio?

- An effective, error free way to transfer information both manually and automatically
- A framework which other applications can be built upon (will cover more later)
- An additional service we can provide to fellow hams, similarly to running a repeater system
- A great way to meet hams in neighboring areas

What Packet Radio is not?

- A competitor to broadband Internet Access (speeds typically range from 1200 to 19200 Baud from 50 Mhz through 450 Mhz)

How to get started

- Most packet stations consist of 3 components
  - Radio
  - Computer (with associated software)
  - TNC (or other interface)

Radio

- Most packet operations take place on 2m. The unofficial "calling" frequency for 2m, 1200 baud packet is 145.010 MHz

- APRS in North America can be found on 144.390 MHz

- 6m, 1¼m and 70cm are also usable but less popular

Computer

- Just about any computer will work, some better than others and the newer the system, the newer the software can be usable (mainly in the Windows world)

- It's possible to run packet on a dumb terminal, but it requires the use of a TNC. Most of us likely have a computer in our shack that can be put into packet service already.

TNC

- TNC stands for "Terminal Node Controller"
- Similar to a telephone modem, but with circuitry to handle the PTT line on radios
- Usually interfaces via serial line to a computer
- Some or all capability is retained while disconnected from the computer (to host a digipeater for example)

TNC Types

- There are 4 major vendors of TNCs
  - Kantronics
    - Mostly popular with the KPC-3, also offering a KPC-9612 and KAM for Multimode operation on HF
  - MFJ
    - Manufacturer of the widely developed TNC2 clone (from TAPR) with their 1270b, 1270c and recently released 1270x models
  - AEA/Timewave
    - Offers TNC units that can be used to build networks with the PK-12 and PK-96.
  - Paccomm
    - Offers several flavors of TNC, for awhile the only TNC2 clone available. Several different options available

Soundcard Interfaces

- West Mountain Radio
  - Several Rigblaster models which cover packet and other modes

- Tigertronics
  - Offer Signalink USB interface which does not require an existing soundcard

- Other
  - Several other options are available. It is possible to home brew your own interface and run cables directly to the soundcard already in your computer

Packet Software

- Available for DOS, Linux and Windows

- Most is tailored for a specific application which is built on top of packet.

- In it's simplest form, when using a TNC, it is possible to use basic terminal software such as Hyperterminal on Windows or Minicom on Linux

DOS Software

- Paket
  - Freeware available for download from TAPR's website

- KaGold/PkGold
  - Commercial software, very versitile but only works with Kantronics or AEA/Timewave TNCs

- G8BPQ Net/Rom software

- F6FBB BBS software

- TNOS & JNOS TCP/IP software

Linux Software

- Linux natively supports packet radio in the kernel!
  - This equates to extensive support for many hardware types which may or may not be supported by DOS or Windows (DRSI Boards, USB Interfaces, etc)
- F6FBB BBS can also be run on Linux
- TNOS and JNOS can both be run on Linux
- DX Spider Spotting system

Windows Software

- PuTTY
  - Versatile terminal program that can support Serial connections as well as Telnet and Secure Shell (SSH)
- Winpack
  - Basic terminal interface with scriptable connections
- MixW
  - Handles many modes as well as packet
- AGWPE
  - Can be an underlying interface to many TNC/interfaces including soundcards
- G8BPQ 32 Bit
  - Utilized for Net/Rom packet switches and BBS/Chat systems
- F6FBB 32 Bit
  - Used for store and forward packet BBS systems

Popular Packet Applications

- Packet Bulletin Boards (BBS)
- Chat systems
- DX Spotting (DX Cluster)
- TCP/IP gateway/support
- Automatic Packet Reporting System (APRS)
- Winlink
- Net/Rom packet networking

BBS

- Used to store and forward both personal and public messages.

- Can be used to route NTS traffic as well as general discussion, for sale items, etc

- More advanced systems require the use of a computer to store large amounts of messages

- Can be a repository for file uploads and downloads

Chat Systems

- Can provide a round table of multiple stations
- Can be linked via RF or Internet for world wide conversations
- Can support multiple channels to allow many parallel conversations across the same network
- Excellent way to meet like minded packeteers!

DX Cluster

- Used to send and receive DX spotting information

- Linked together to other DX Cluster systems over RF and the Internet to produce a wide area network of DX spot systems

- Can be accessed via packet (RF) or over the Internet (telnet)

TCP/IP Gateway

- Can encapsulate TCP/IP that is used on the Internet into Packet Radio, which allows support for protocols like FTP, SMTP/POP3 (email) and other applications

- Can create AX.25 over IP (axip) wormholes and link different packet systems together over high speed IP links and/or the Internet

APRS

- Used for the reporting of many types of information, including position of mobile stations, weather information, local services (such a Repeaters, Echolink/IRLP systems, etc)
- Useful for spotting VHF propagation distances and conditions
- Can be used for Instant Message type communications

Winlink

- Used to send and receive email over both VHF/UHF packet as well as many HF packet modes

- Can be used in emergency situations to correspond with hams and non-hams alike

- Several clients available which have a similar to email feel

Net/Rom

- Net/Rom is a dynamic routing protocol which is at the foundation of most packet networks

- It allows routing information to be exchanged between neighboring node systems to automatically spread reachable systems

- When configured properly, it will allow for fault tolerance to reroute traffic based on available systems

Any questions?

Links of Interest

- Tucson Amateur Packet Radio (TAPR)
  - http://www.tapr.org
- US Packet
  - http://www.uspacket.org
- APRS
  - http://www.aprs.org
- Yahoo Groups
  - http://groups.yahoo.com (several exist)
- Ohio Packet
  - http://ohiopacket.org (wiki)

Contact me

- Please feel free to contact me with questions about anything covered here or related to packet radio
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