

Denton County ARES Packet July 20th 2006

Packet radio has been around since the 1980s. Packet is a mode not limited to just VHF and UHF. It takes on different forms on different frequencies. To clarify, packet is a mode, nothing else. Packet currently uses the protocol [AX25 version 2](#). Packet radio as most commonly know is used on VHF frequencies with backbones on UHF. This is not a set scheme, just the way things have developed. The first thing that comes to peoples minds is that packet radio is slow. This mindset has occurred due to multiple reasons,

1. My dial up connection is faster than packet. This is true.
2. I have the internet and email. Ok this is also true but there is several ways to get email via packet radio.
3. I have a cell phone, ok, so do I but what is one of the first things that goes down in a disaster, phone service, particularly cell phones (because everyone has one).

Lets address issue number 1 first. Yes dialup connections to the internet are faster, but it ties the the PTSN. It can be overloaded to the point of failure, lines get ripped up by anyone with a shovel or power equipment, etc. You have to have the land line to dial up your ISP.

Why has packet not gotten any faster? People lost interest partially due to the internet, but that is not the sole reason. To get past 1200 baud, you had to have either a radio that was out of the box 9600k or faster capable or you had to modify an existing radio. The reason for the modification is where you get the audio. The faster you push a data rate, the wider the spectrum required to move the data is. Much past 1200 baud, you exceed the bandpass (bandwidth) of your audio amplifier. The same goes for the transmit audio. Note, the transmit audio on VHF will not cause your transmitter to exceed the bandwidth approved by the FCC, it just goes in to compression and is muffled. That is not good for an audio signal. A properly modified radio can run at 19.2k baud and stay in the bandwidth of the transmitter.

Expense and lack of available gear is probably the second highest reason. Not too much gear is out there for 9600 baud or faster. The market never took hold and volumes of sales were not, still are not high enough to sell equipment at prices Amateurs are willing to pay. Face it, an 802.11b access point can be bought for \$50, modified to use real antennas and amps if wanted. You achieve 11 megabits if you are within a certain distance.

Why use packet? Simple, we have it, the gear is out there, if you have APRS, are you already equiped, you can use a sound card on a Windows or Unix clone pc. Bare bones, you can put up a network, while slow in relative terms, is up in a short amount of time. But, you just said that I can get 802.11b gear and put up a network. Yea I did but think about this for a minute, microwave paths in the order of miles we are talking about are not trivial and very fragile. VHF and UHF and 1200 to 19.2K is not as fragile. 802.11 requires IP addresses, those are easy duplicate and adds to the fragility of the network. Packet uses your callsign.

Packet equipment can still be bought at Amateur radio stores and hamfests. Radios, such as the Kenwood D7A, D700, and the Alinco DR135 have TNCs built into them that are capable of 9600 baud. Most VHF and UHF transceivers have data jacks that take care of the audio issue at 9600 and faster for you. Given that why has packet not taken off, too many excuses.

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Why do I want to use packet radio? This one is actually simple to answer. Speed and accuracy. Yes I said speed. Even if you hold the distinct honor of being the fastest CW operator in the world, 1200 baud packet will still get the same amount of information there faster. I say that but let me quantify that statement. If you are sending say 10 names, by the time you got it typed in the keyboard, almost any other mode might beat it, if you have 20 names or more, no contest. There is also the accuracy issue. On CW, there is no realistic comparison since CW is a digital mode. Errors can still occur but not as likely as voice. Let me give you this example, my last name is Story. I know of the following ways it could be spelled, Story, Storey, Storie, Stori. My first name, Guy can be spelled Guy, Gi or Gy. Any one of those different spellings is a different person. It is possible that a region has two people that only a letter, common at that, could create confusion. Voice traffic is prone to the receiving end assuming a spelling is one way when it is another. Say the operator at the end asks for clarification, time is being spent on the clarification. The difference in a spelling could send someone to the wrong hospital, shelter, or processing center. In the case of hurricane Kartina, that location could be literally half way across the country.

With packet radio, you can open up a text editor, generate you list of names or what ever and send it knowing that the file will get there 100% correct. The sender is responsible for spelling. You can also format the file so it has column and rows. You still have to be very efficient though. Programs like Microsoft Word have a tendency to cause a file to be very large for no reason at all. Notepad in Windows, Edit in DOS, vi, pico or emacs in Unix variants create files that have the needed information and still reasonable in size. Fancy fonts, colors, formatting only increase bloat. That increases the time it takes to send a file to another station.

What do I need to setup packet? First and foremost a radio and a modem. The radio is very simple and the modem almost. Computer processing has gotten fast enough (since the mid 90s) that allows you to use the sound card as a modem. APRS has been using AGWPE for 10 years now. Linux has been but I can not tell you for how long. Easily 10 years. You interface the radio to the modem. You also need a terminal program. There are more than I can list here. You can use Hyperterminal in Windows or Minicom in Unix but they do not support the common file transfer protocol YAPP. YAPP uses compression to send files and is much faster than sending a text file. For example, a 1k text file using Hyperterminal takes as long as a 2k file using YAPP. There are shareware and commercial programs for packet use available.

Packet is a mode. AX25 and KISS are protocols. KISS lets the computer handle the overhead instead of the modem. With current PCs, this is not an issue and in certain circumstances is better. KISS though does not let you use the mail box features in your tnc. If you use a sound card for a tnc, this is a non-issue.

1200 baud is the simplest and most common but slowest, 9600 baud is much faster but not as common. You do have to know how to setup the network to a point. If you are in an area you are familiar with, setting up a network is easy. If you are in an area you are not familiar with, you may have to ask for local digipeaters that can be used, or in both cases just watch the traffic and your s meter. Try to keep digipeat paths to a minimum. Each digipeater cuts your speed in half and increases the chance of a collision. A digipeater is the digital form of a simplex repeater. Packet in most cases uses simplex frequencies.