What is APRS?   By Russell Hall, N8RSH

APRS stands for Automatic Packet Reporting System, which was developed and is copyrighted by Bob Bruninga WB4APR. It is used to exchange real time information automatically across a digital packet network. The first miss conception I have discovered is that APRS is not just a tracking system. APRS will give your GPS coordinates in a beacon packet, however, there is so much more information you can transmit and receive. These include but not limited to: announcements, bulletins, messages, alerts, weather, net times, meeting times, hamfest, voice repeater configuration and satellite info. Tracking model rockets with GPS coordinates is the primary application that got me started reaching APRS.

Here is how it works, first, you format the packet with the information you want to share with other hams, as pointed out above. Next, you transmit that packet on to a simplex frequency (some places do split) at a baud rate within that frequency plan, with hopes someone can hear and decode your message. There is some hope on repeating your information along its way with the use of Digipeaters and a Path.

A Digipeater is not like the voice repeaters which I have grown to love, with real time talk on a split frequency. It will do digital repeating by storing the packet that comes into the station, editing the path in the packet and then retransmitting it on the same frequency. A Gateway is a Digipeater working on multiple frequencies. The path in the packet determines the number of hops and which network to repeat to.

Path networks started out simple with just WIDE,RELAY,TRACE. However, there was no control of how many hops the packet would travel before decaying off the network. Now with a WIDEn-N format path has a provision to decay. Here are the following path settings with the number of hops the packet can travel before decaying off network. WIDE1-1 is one hop, WIDE1-1,WIDE2-1 is two hops, WIDE1-1,WIDE2-2 is three hops. So with a WIDE1-1 path, a Digipeater will take the path string before it repeats and takes the one off at the end and puts a * in to symbolize that a hop has been removed. The Digipeater will also add your call sign to the packet with a * at the end, example N8RSH*. So the path will look like N8RSH*,WIDE1-*. By doing this you can tell where the packet traffic came from.

Here are the recommend settings from aprs.net for North America VHF Fixed station: simplex 144.390MHz 1200 baud, path WIDE2-1, CTCSS Tone 100Hz. The recommend Mobile stations settings are: simplex 144.390MHz 1200 baud, path WIDE1-1, WIDE2-1 CTCSS Tone 100Hz. However, you can change your path to add an extra hop to it by using WIDE1-1,WIDE2-2 in a mobile rig. The International Space Station Digipeater station is on: simplex frequency 145.825MHz 1200 baud, path ARISS, WIDE2-1. With the CTCSS Tone 100Hz set on, you will not hear the APRS data noise, but voice traffic will pass through to the speaker. I personally would only use voice on APRS frequencies in an emergency situation, and would leave the frequency clear for packet traffic.

With the Internet becoming as huge as it is now, they have developed APRS-IS which stands for Automatic Packet Reporting System-Internet Service. APRS-IS is design to connect RF networks together through an IGate station to other IGates stations. An IGate Station is a RF unit connected to a TNC to a computer with software and an Internet connection. Currently, I am using APRSISCE/32 software to

function as an IGate and a Digipeater at my house and I have a MFJ TNC and a Motorola GM300 connected to my home brewed j-pole.

One quick side note, SMSGTE is a SMS/APRS gateway. It allows connective between cell phone users and APRS. I have looked at it, but I haven't jump in to setup a sms gateway and to take on the cost of a project like that.

If you are looking for unit with TNC, GPS, AX.25 decoder built-in for APRS function, I would recommend Kenwood TM-D710GA for a mobile rig or a TH-D72a handheld. I have a soft spot for Kenwood radios because they are easy to program in the field. There are other companies that make units with the same functions. However, I have enjoyed using Kenwood products and they work great for what I need.

In conclusion, APRS has a ton advantages and some disadvantages to the ham community. The huge disadvantage is depends on the number of hams using the network. If no one uses it, then there is no information to share. However, if too many ham use the network, information will collide. Without error detection parts, some or all of your information will not make it to its attended destination. One of the huge advantages I see with APRS is being able to share information with other hams in the network without the dependence of a wired network. This is a great and powerful tool for emergency responders when working in an emergency situation.

Here are some links I found useful while researching APRS.
http://www.aprs.org/ APRS written by Bob Bruninga, WB4APR
http://info.aprs.net/ history and info on APRS
http://aprs.fi/ online google map tracking site
http://aprsisce.wikidot.com/ is a software client used to connect to APRS-IS and RF
http://www.apritch.myby.co.uk/uiview_software.htm another software client
http://users.belgacom.net/hamradio/uiss.htm windows packet program designed for ISS & PCSat
http://www.issfanclub.com/ tracking and reports from the International Space Station
http://gpredict.oz9aec.net/ real-time satellite tracking software

73 till next time, N8RSH