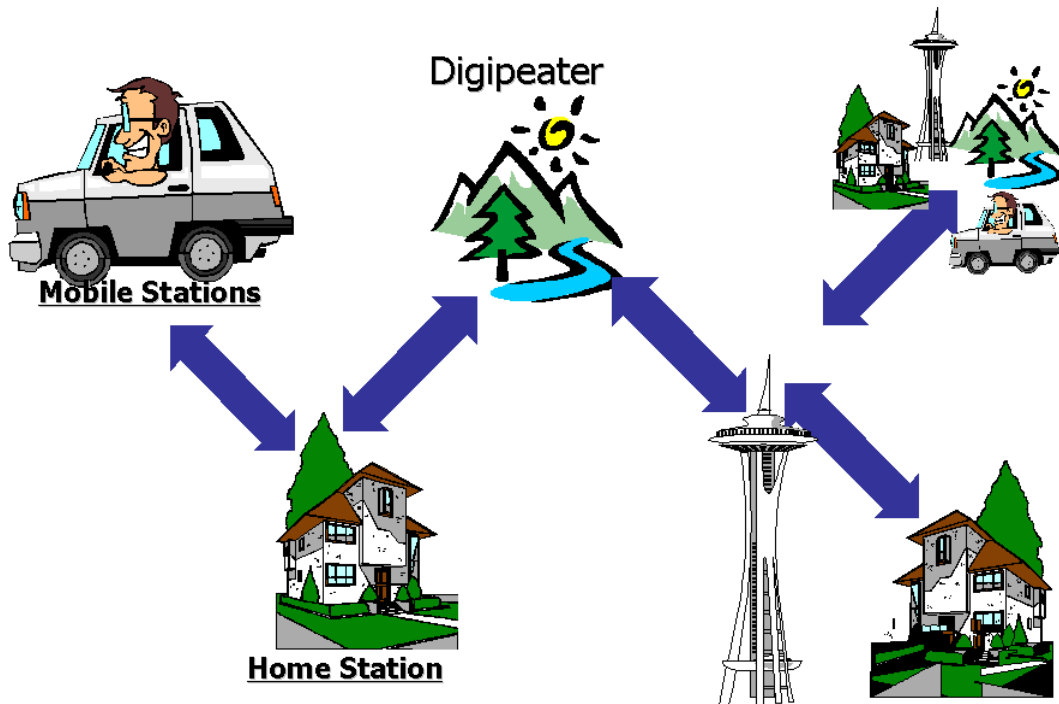


What Is APRS

Surrey Amateur Radio Club

Presentation & Demonstration

February 10, 2007



What is APRS?

Originally taken from <http://webpages.charter.net/n4wyk/>

To me APRS was a saving grace for packet radio. Packet radio has great potential for passing large pieces of message traffic from one station to another. However, with the Internet growing by leaps and bounds a lot of folks, including myself, seem to become disenchanted with packet.

Then we discovered APRS! (Of course some of us discovered APRS before then but I digress...). It was always difficult to apply packet to real time events. Especially since these events seem to always be short lived. APRS can avoid this problem. It is not limited to a connected network or its complexity.

APRS permits any number of stations to exchange data just like voice users do on a voice net. Any user can send information to all stations or receive it. Secondly, APRS recognized one of the greatest real-time needs of any special event or emergency. That is tracking of key assets!

For instance... Where is the event leader? Where are the emergency vehicles? What is the weather at various points in the county? Where is the end of the parade? Where are the power lines down? Where is the mobile ATV Camera? Where is the hurricane? WHERE IS THE DX? Where is your son in your car???

To answer these questions, APRS is a full featured automatic vehicle location and status reporting system too. It can be used over any 2-way radio system including HAM, CB, Marine Band, and Cellular Phone.

WinAPRS™ is a version of MacAPRS™ for the Windows operating system. WinAPRS™ implements the APRS™ protocol for Automatic Position Reporting System originally developed by Bob Brunigar. APRS™ is trademarked by Bob Brunigar, MacAPRS™ and WinAPRS™ are trademarked by Mark and Keith Sproul.

General APRS Information Protocols & Paths

Fixed or Home stations:

TNC: Just about any TNC you have will work for APRS.

Settings: **Unproto:** wide2-1 **Alias:** wide1-1

Radio: 3-5 watts will do as the “wide’s” look after the larger coverage area.

Sound Card: Use an interface to isolate the radio from the computer.

<http://patmedia.net/ralphmilnes/soundcardpacket/>
<http://www.elcom.gr/sv2agw/index.html>

Computer: anything from a dos 286 on up works. More memory = better results.

Software: Free off the Internet from a number of locations, these are just a few:

<http://www.winaprs.org>
<ftp://ftp.tapr.org/aprssig/macstuff/>
<ftp://ftp.tapr.org/aprssig/winstuff/>
<ftp://ftp.tapr.org/aprssig/dosstuff/>
<ftp://ftp.tapr.org/aprssig/linux/>



Local Maps: <http://www.burnabyradio.com/aprs/index.html>

Mobile Stations:

GPS receiver: Anything with a NEMA 183 output. Options are many, portable, engines with external antennas, etc. Aeronautical GPS' do not work with APRS.

TNC: Just about any recent TNC will do the job. Options are TT3's, Open Tracker and Pico Packets. Beacon, **set transmit rate to over 2 minutes.**

Unproto: wide1-1,wide2-1

Radio: Any portable radio that is data capable will work. That includes just about any radio that was built after the 1970's. Physical size may be your limitation but power shouldn't be more than 5 watts. That is why there are home fill-in stations, wides and I-gates.

Interesting APRS Sites:

www.aprs.net
www.byonics.com/tinytrak4
www.amsat.org/amsat-new
www.aprsworld.net
www.findu.com/cgi-bin/find.cgi?call=ve7sfu-10
www.aprs-is.net
www.dxzone.com
<http://info.aprs.net/wikka.php?wakka=APRS>



Your local APRS group is the South Westminster Amateur Radio Group Society (SWARGS) is non profit and monitors 147.040 (+600) VE7RCH. SWARGS business meetings are held in the VE7IDH hobby room the 1st Tuesday each month at 7PM, and last about ½ hour. Tech/Social nights are the 3rd Tuesday each month and project, questions and inquiries are always welcome.

General APRS Information Protocols & Paths

NORTHWEST APRS FAQ SHEET

- **Q. What area is covered by the NWAPRS system?**
 - The NWAPRS group covers Washington, Idaho, Oregon, Montana, Alberta, and British Columbia. We have members in all major cities within the region.
 - There is regional, yet sometimes sporadic coverage along I-5 starting from Vancouver, BC, and heading south thru Edmonds, Bellevue, Seattle, Tacoma, Olympia, Centralia, Kelso/Longview, WA, and Vancouver, Portland, Salem, Corvallis and down through Medford and the CA state line, OR. I-90 is well covered from Seattle east to Glendive, MT.
 - I-15 coming up from SLC, UT through Pocatello, Idaho Falls, and Dillon, then Butte, Helena, and Great Falls up to the Canadian border and north.
 - East of Portland thru the gorge to the Tri-Cities is well covered, but is more sporadic down towards Boise, Idaho.
 - Hwy 101 along the Pacific coast has sporadic coverage near Newport, and Astoria, OR, and South Bend to Aberdeen, WA.
 - Alberta has great coverage throughout Edmonton and Calgary, and near the national Parks around Banff and Lake Louise. This should be reason enough to head north of the border and take in some of the natural beauty that surrounds Alberta!
 - British Columbia has increasingly good coverage along the major east west Hwy 3. Vancouver Island coverage is oriented more toward the southern part of the island, with plans to expand northward primarily in support of the annual Vancouver Island Challenge boat race between the Canadian Coast Guard, U.S. Coast Guard, and British Coast Guard Auxiliaries.
- **Q. What frequency is the NWAPRS group operating on?**
 - The NWAPRS group operates on the national APRS frequency of 144.390 mhz.
 - The NWAPRS group also operates HF on 10.151 LSB (Tune 10147.5 MHz for USB only radios) and on 10M (28.120 USB). We are looking into a 6m freq, 50.15???
- **Q. I have a tracker in my car, what outgoing path should I be using?**
 - We recommend using WIDE1-1,WIDE2-1 for all mobile trackers. This will get your signal out throughout a large region.
 - Please do NOT transmit more than once per minute for mobile stations. Doing so adds a lot of QRM to the frequency.
 - Please shut off trackers when the vehicle is NOT in use.
- **Q. What is the right outgoing path for my home station?**
 - The latest recommendation is WIDE2-1 for all fixed stations. If you cannot reach a WIDEn-n digipeater, then try the aid of a near by fill-in digi or other home station by using WIDE1-1,WIDE2-1.
- **Q. How often should my station transmit its position or status report?**
 - Check for the latest settings on the [Station Settings](#) web page.

General APRS Information Protocols & Paths

- **Q. How do I program my TNC settings for the new tracker?**
 - It's important that you use a regular packet program, not APRS or PaKet, to initially program your TNC with tracker settings. The reason is that APRS and PaKet have a start-up and shut-down configuration file that changes settings in the TNC when you quit the program. If you use PacTerm or some simple comms tool, then you can make all the necessary changes and not worry about the program configuration file changing the settings again at shutdown.
- **Q. Where can I get more information about the NWAPRS network?**
 - Try the NWAPRS Group home page at <http://www.nwaprs.org>
- **Q. I see some station icons with a Blue Circle and a line coming out of it, moving around. What kind of station is this?**
 - This is an integrated weather station, and the line signifies the direction at which the wind is originating. The longer the line, the higher the wind speed.
 - If using APRSdos, hit the N key to find out details being reported by that weather station. Look at the top of the screen to find this out.
 - These stations are using either Peet Brothers or Davis weather stations. Typically the cable from these stations connects to the second serial port of the computer. In some cases a remote WX station may not have a computer connected. In that case, the WX station is connected to the TNC much like a GPS would be connected.
- **Q. There's a line coming out of the little car symbol on the map. What's that mean?**
 - This line represents the vehicle's heading. It is derived from the GPRMC line of data. The longer the line, the indication of greater speed. The shorter the line, then a slower speed.
- **Q. What are those green stars I see on the map display?**
 - Those represent remoted WIDEn-N area digipeaters, and are typically atop a mountain somewhere and offer long range digipeating of APRS signals.
 - While you can send APRS one liners to a regular APRS station, these digipeaters are typically not manned. They consist of a TNC and radio only. One liners to a digipeater will not normally be acknowledged.
- **Q. I want to put up a WIDE area digipeater, what equipment do I need?**
 - We'll assume first you have authorized access to a site, and have already gained permission to put up a digipeater. If not, please take care of this business first.
 - The basic necessities of an APRS WIDEn-N digipeater site include a mobile-type radio, a Kantronics KPC-3+ digipeater (w/8.2 or greater eproms), an antenna capable of surviving harsh winter conditions (wind and ice), good coax, power supply (or also UPS), and cavities or filters.
 - TNC programming notes can be found on the nwaprs home pages.
 - NWAPRS WIDEn-N digipeaters are typically named with a geographical reference, like KOPEAK, BALDY, etc. When a station callsign is used, the standard SSID is -10.

General APRS Information Protocols & Paths

- **Q. I want to put a tracker in my car, what equipment do I need?**
 - This is one of the more fun applications of APRS; vehicle tracking.
 - There are several ways to easily implement a tracker in your vehicle. If you already have a 2M mobile then all you need is a TNC and GPS.
 - The TNC can be a Kantronics KPC-3+ (8.2 or greater preferred), PacComm Tiny-2, Pico, or Handi-Packet, or AEA PK-12. Most operators here in the NWAPRS group use the Kantronics KPC-3+. On the other hand, you can use a TX-only TNC like the TinyTracker III, or TigerTrak modules, which are great.
 - The GPS needs to output NMEA data, and there are a host of models available from Garmin, Magellan, Delorme, and others.
 - Many operators will have a second radio, like the RS HTX-202 handy talkie dedicated for a vehicle tracker. This is a good radio for APRS ops.
 - Assembly instructions (e.g. cabling ideas) can be found on the NWAPRS web pages.
- **Q. What kind of computer do I need to operate APRS?**
 - There are versions of APRS for dos, Windows, Macintosh, Unix, and the Palm III. Practically any computer will work. Of course a newer computer will work fastest, but an older 486 beefed up with Windows 95 or Unix (Linux, FreeBSD, ?), or Macintosh 68040 with extra RAM will work just fine.
- **Q. Where do I get the software, and how much does it cost?**
 - Nearly all versions of APRS software are shareware, and can be found on the www.tapr.org web site. Additionally you may want to try the aprs.rutgers.edu web site for some good stuff. One Unix version, Xastir, is freeware.
 - The enclosed read-me files that come with your APRS software will tell you how much it costs to get a validation number. For APRSdos it's about \$30, for Mac and WinAPRS about \$50. UI-View32 is freeware now, since the passing of it's author in 2004. These small fees pay the developer for his time and efforts, and help keep him interested in improving the software. Once you pay, you're AOK for new versions which are always coming out.
- **Q. What if I don't want to validate my APRS software. Will it still work?**
 - APRS will work just fine with most versions even without a validation number. By inserting a validation number APRS allows you to SAVE a configuration file that includes your callsign, location, and station information. Otherwise, you'll have to re-input the information each time you start the software.
- **Q. I've heard there's an HT with a TNC built in. What's the scoop?**
 - You're referring to the new Kenwood TH-D7A, with packet and APRS capabilities built directly into the radio. Check the ham radio magazines for details. These radios go for about \$500.

General APRS Information Protocols & Paths

- **Q. I've heard there's a new mobile with a TNC built in. What's the scoop?**
 - This would be the new Kenwood TM-D700. Like the TH-D7A mentioned above, the D700 has the components of a TNC built-in. Many of our users have the new D700 installed. You will NOT be sorry about buying this radio!
- **Q. What is a Mic-E, or Mic-Encoder?**
 - The Mic-E(ncoder) is a partial-kit from TAPR for about \$130 that connects between your microphone and mobile radio. There are automatic and manual adjustments which allow you to transmit GPS data over a repeater (or the APRS freq), to be received elsewhere and displayed on-screen.
 - A GPS connects to the Mic-E and feeds position information to the radio.
 - Several repeater groups have authorized Mic-E ops over their repeaters. The Queen Anne Hill repeater (W7VHY) on 146.xx and the WWRA repeater on 442.65 (t103.5) both allow Mic-E ops. The WWRA 146.62 repeater should be Mic-E capable soon. Those signals are passed from the repeater freq to the APRS freq.
 - A related question: What is a Pic-Encoder? The Pic-E(ncoder) is also available from TAPR and is cheaper than a Mic-E but has different features. It can be used in place of a Mic-E, but can be used for other tasks as well. Check the TAPR web site for further info.
- **Q. Why should I leave my home station TNC and radio on all the time, even when APRS is not running?**
 - Your own TNC has an ALIAS setting of WIDE1-1 (if you have changed it from the old RELAY setting). If you leave your radio and TNC on, it will automatically digipeat packets using an outgoing path of WIDE1-1,WIDEn-N, which is a standard setting for mobile ops.
 - This helps the overall system, as many portable or mobile trackers use low power, which may not be able to reach the nearest WIDE digi on the mountain. Your station digipeatss these packets to the nearest WIDE.
- **Q. How do I know what path setting to use for my home QTH, so my location is distributed thru the nwaprs?**
 - You enter the path station in the UNPROTO field of your TNC, from within the APRS software. To get there from APRSdos, you hit the U key. From WinAPRS, use the SETTINGS, TNC menus.
 - Enter WIDE3-3 and watch for "a receive" after your station transmits a position report. You may even force transmit additional location packets for experimentation. To confirm your signal got out, try looking yourself up on the findu.com site.
- **Q. How do the NWAPRS signals get onto the Internet?**
 - There are many locations throughout the NWAPRS were the radio/TNC signal is fed, via computer, to an internet gateway. All signals that are received at those locations are transmitted via the internet to the national APRS server via "secondary" servers, several of which are located in the NWAPRS.. It is estimated that these gateways receive 90% of all the NWAPRS signals.

General APRS Information Protocols & Paths

- **Q. What's the scoop on the TOP 200 Heard Stations linked from the nwaprs.org web pages?**
 - The Top 200 is a web page that lists the "most heard" stations in the nwaprs region. It's a useful tool when trying to determine if your tracker or home station is transmitting too much.
 - Your station should not normally appear in the top 3-5 stations listed. If it is, it generally means you have your station set to transmit too often. If your tracker is at home or work, turn it off. Only trackers on the road should be transmitting periodic position reports.
 - Everyone should routinely check the TOP 200 list to help optimize their station settings.
- **Q. I'm traveling. How does someone back home see my location via the internet? They may or may not be a ham.**
 - First, they need to know the exact callsign, with SSID, that you are using.
 - Next, have them log onto the internet and go to the URL <http://map.findu.com/callsign-ssid> and replace the callsign-ssid with your own information. If your station has been heard recently, it will give course and speed information, how long ago the last update was received, and three maps (close-up, nearby, regional).
 - You can actually do this routine with any APRS resource (WIDE digi, WX station, home station, etc, to check to see when it was last heard via one of the iGates).
- **Q. What kind of TNC do I need for a mobile tracker?**
 - If you plan on taking your laptop along, you will want to get a KPC-3+.
 - If you just want a transmit only, rather portable setup, you have several options:
 - TigerTronics TigerTrak TM-1/TM-1+, has multi functions, VHF/HF tracker.
 - Byonics TinyTrak III, may be bought in kit form, has great features for a VHF tracker
 - Others are out there, but these are the best two.
- **Q. How much does it cost to be a member in the NWAPRS?**
 - Annual dues are \$500, payable to Dave/K7GPS. <OR>
 - Make a donation of one bag of groceries to your local food bank. <OR>
 - Make a donation of toys to Toys for Tots or other organization at Christmas.
 - Don't get me wrong here. I'd love to get rich off of all this fun, but you must have better use of your funds, like donating some to the needy. Do that first, and if there's anything leftover, mail it to me earmarked for my new RV fund.
- **Q. I have a gazillion more questions, how do I get them all answered?**
 - First, read the read-me documents that come with APRS.
 - Next, find an APRS guru who lives nearby and solicit his help.
 - Be patient, as there is a learning curve to becoming familiar with APRS.
 - Sign up for the NWAPRS sig mailing list!

Original May 2005, modified Jan. 2007, Feb 2007.