

A General Overview of the APRS System

Updated Jan 2006

APRS is a registered trademark Bob Bruninga, WB4APR



General Topics

- APRS Definition & History
- Typical Equipment Setup
- Mapping/Tracking Programs
- Weather Reporting
- Public Events
- The Future
- Question & Demonstration



What is APRS?

- **APRS** stands for Automatic Packet Reporting System (although it is frequently also called Automatic *Position* Reporting System.)
- **APRS** was developed in the early 1990's by Bob Bruninga, WB4APR, for digital communications and tracking mobile **GPS equipped** stations utilizing Amateur two-way radio.



Bob Bruninga – “Father of APRS”



- His first connectionless protocol was run on a VIC-20 program in 1984 to report the position and status of horses in a cross country endurance run for AMRAD
- One of his first applications for APRS while an Instructor at the Naval Academy in Annapolis, MD. was to assist in tracking Academy boats on summer cruises up and down the Atlantic coast.



Bob Bruninga – “Father of APRS”



- The predecessor to the current “APRS” protocol was named APLS and released in 1991.
- He is still very active today, and continues to provide support and set standards.
- In the 13 years since its introduction, he has helped APRS to grow to the extent that it now encompasses just about every aspect of Amateur Radio.



What is APRS all about?

- The APRS System was developed to provide immediate local digital and graphical information exchange between all participants in an event. This includes not only tracking and monitoring position data, but also status, messaging, bulletins all without having to maintain packet connections. Typical data:
 - Positions of all stations and objects
 - Status of all stations
 - Messages, Bulletins and Announcements
 - Weather data and telemetry
 - DF bearings and signal strengths for quick transmitter hunting
- Typical applications are:
 - Marathons, races, events and public service
 - Search and rescue
 - Family communications and tracking and one-line emails
 - Mobile-to-mobile global messaging
 - Weather data exchange and display



More "About APRS"....

- APRS consists of a very large land based wireless network. Almost 30,000 users around the world.
- This network works via RELAYS every 20-30 miles called "digipeaters." And Globally via IGates to the internet.
- APRS is also used via some of the Amateur Satellites.
- It is also used to monitor telemetry values of weather stations for the National Weather Service (NWS)
- APRS has the capability to quickly relay telemetry values to research centers without the Internet.



Different than Regular Packet

- It uses graphical maps and other data displays.
- All communications use a “one-to-many protocol” so everyone is updated in real time.
- Uses Generic digipeating so knowledge of the network isn't required.
- APRS turns packet radio into a real-time tactical communications and display system for emergencies and public service applications.



What Equipment is required?

- APRS was developed to use existing packet radio hardware, so it only needs three pieces of hardware.
 - a transmitter/receiver (Transceiver),
 - a packet terminal node controller (TNC).
 - An optional Global Positioning System (GPS),



Basic Equipment - Radio



- A VHF Amateur Radio Transceiver operating on 144.390 Mhz. (USA).
- Should be a “transceiver” as APRS uses a collision detection system to know when to send data.
- Range of coverage depends on the power of the transmitter and terrain.



Basic Equipment - GPS



- A standard GPS (Global Positioning System) unit.
- Uses 24 orbiting satellites to pinpoint anyone's specific geographic location.
- GPS also provides ground speed and altitude measurements.
- Current accuracy ranges from 10-60 feet.



Basic Equipment - TNC

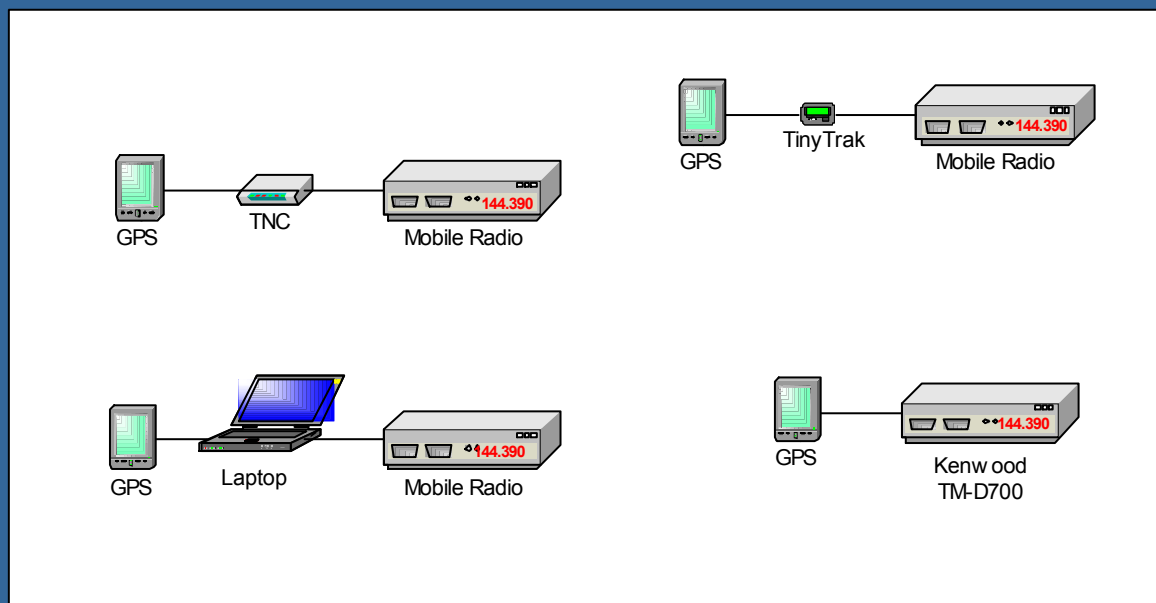


- A TNC which is basically a radio (or “RF”) modem.
- The TNC connects the transceiver to a GPS converting it’s data into AX.25 Packet protocol.
- “TinyTracs” are simple “Transmit Only” stand alone APRS TNCs



Various Mobile Setups

Mobile Tracking Installations utilize a GPS connected to the radio through the TNC interface,

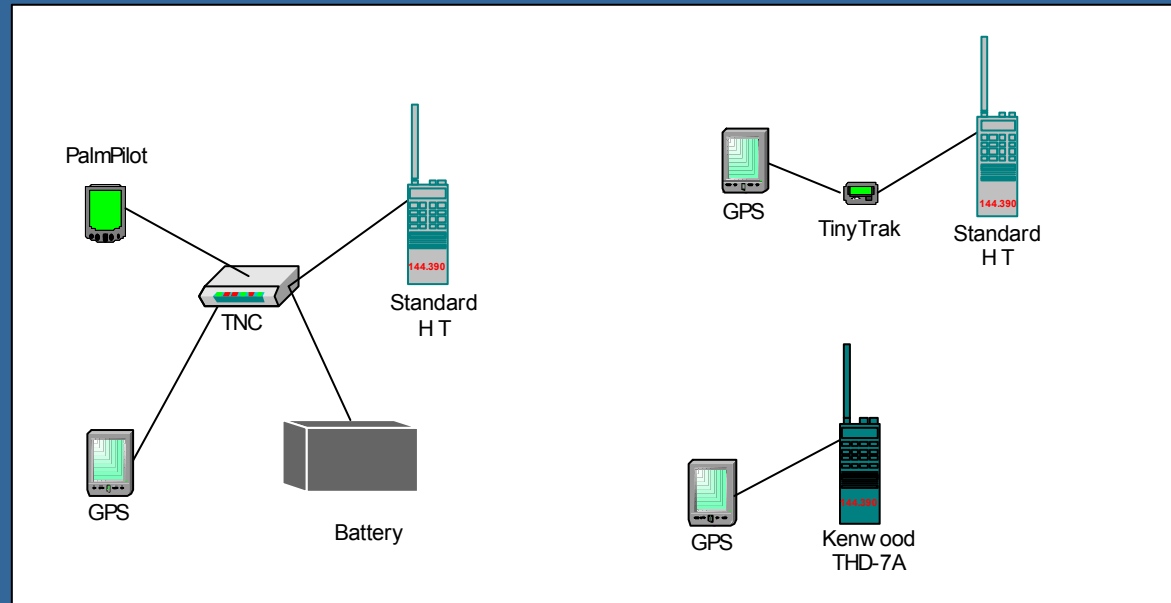


The new "APRS Ready" transceivers like Kenwood's TM-D700 have their own built in TNC.



Various Portable Setups

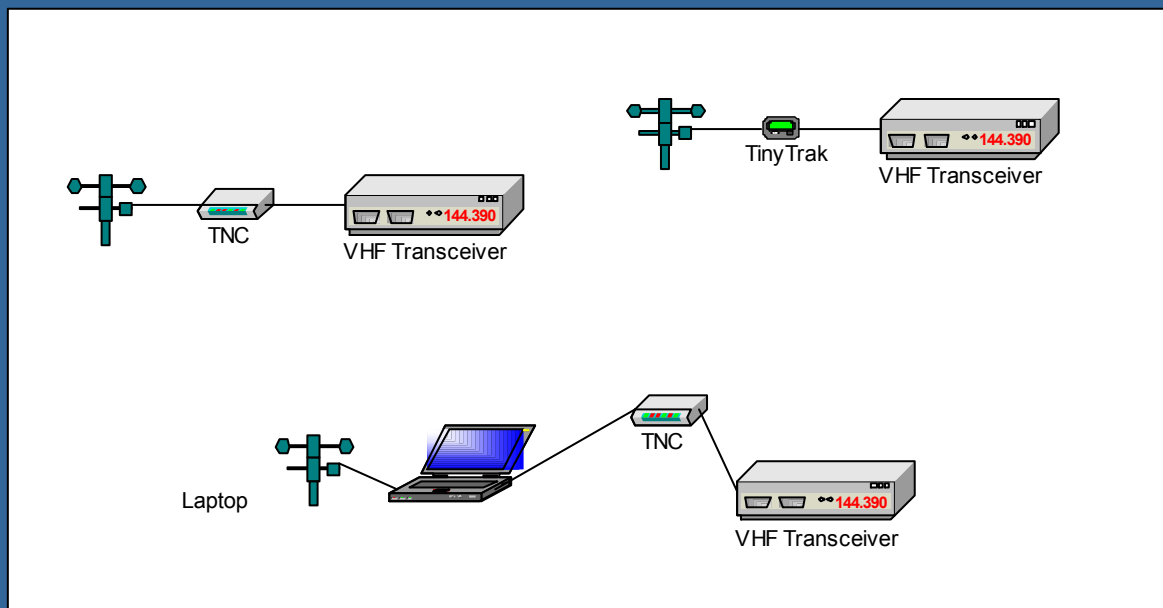
A Portable Tracker is usually low powered and may need a nearby digipeater.



These units work well with bike-a-thons, parades and other community events, along with search & rescue operations and weather nets.

Weather Station Setups

Weather station setups with APRS are similar to the normal setups,



However, the GPS unit is usually replaced by outside Weather Monitoring Equipment.



Built-in TNC Function Radios

- These radios are specifically designed to support APRS functions in a single package. Just add a basic GPS unit and it is ready!
 - Kenwood TM-D700A (includes front panel display)
 - Kenwood TH-D7A (includes front panel display)
 - Alinco DR-135T MKII with EJ-41U TNC



Kenwood TM-D700A

- A Dual band 144/440 MHz 50/35 Watts
- Built-in 1200/9600 bps TNC including a "digipeater".
- Built-in screen display of other APRS stations and front-panel send/receive messaging.
- Add a GPS, and the proper cable, or simply key in your position coordinates.
- Other APRS station locations are sent to the attached GPS map for display.



Kenwood TH-D7A(G)

- Built-in APRS functions and displays.
- Dual band 144/440 MHz.
- Built-in TNC at 1200/9600 bps.
- On screen text monitoring & messaging
- Plug in a GPS or key in coordinates
- Attached GPS map displays all other APRS station locations



Alinco DR-135T/EJ-41U

- Basic 2 M Radio with optional TNC.
- Allows direct input from any standard GPS.
- Basic 1200/9600 bps TNC
- Unlike the Kenwood radios, it requires a PC to set it up, and there is no APRS display directly on the radio.



PC Soundcard Method...

- Use a PC sound card to transmit and receive signals from radio – No TNC required
- AGWPE is an excellent Sound card interface for Packet Radio available free on the Internet.
- Simple interface circuitry (The same as PSK31).
- Requires a modest computer to operate



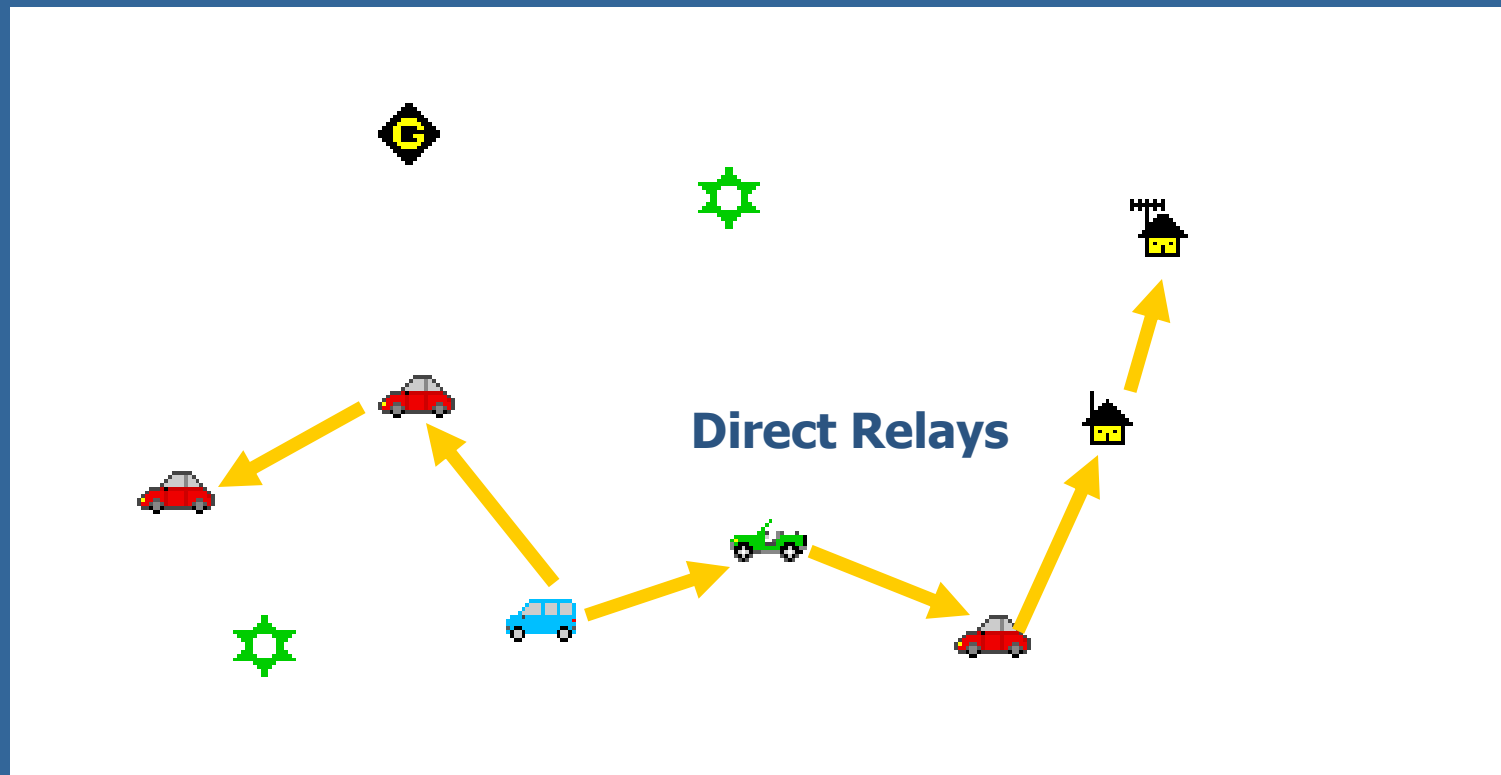
APRS Voice Alert



- Voice Alert is effectively 3rd Radio channel for the D7 and D700 APRS radios
- By setting the Band A for APRS to PL-100, but keeping the volume turned up:
 - You won't hear any packets on 144.39 *
 - But you will hear a voice call using PL-100 on 144.39
 - And you will hear* an occasional Ping packet if another D700 comes in line-of-site to you, like a proximity radar alerting you to local presence.
- Great for long haul traveling and meeting other APRS users.



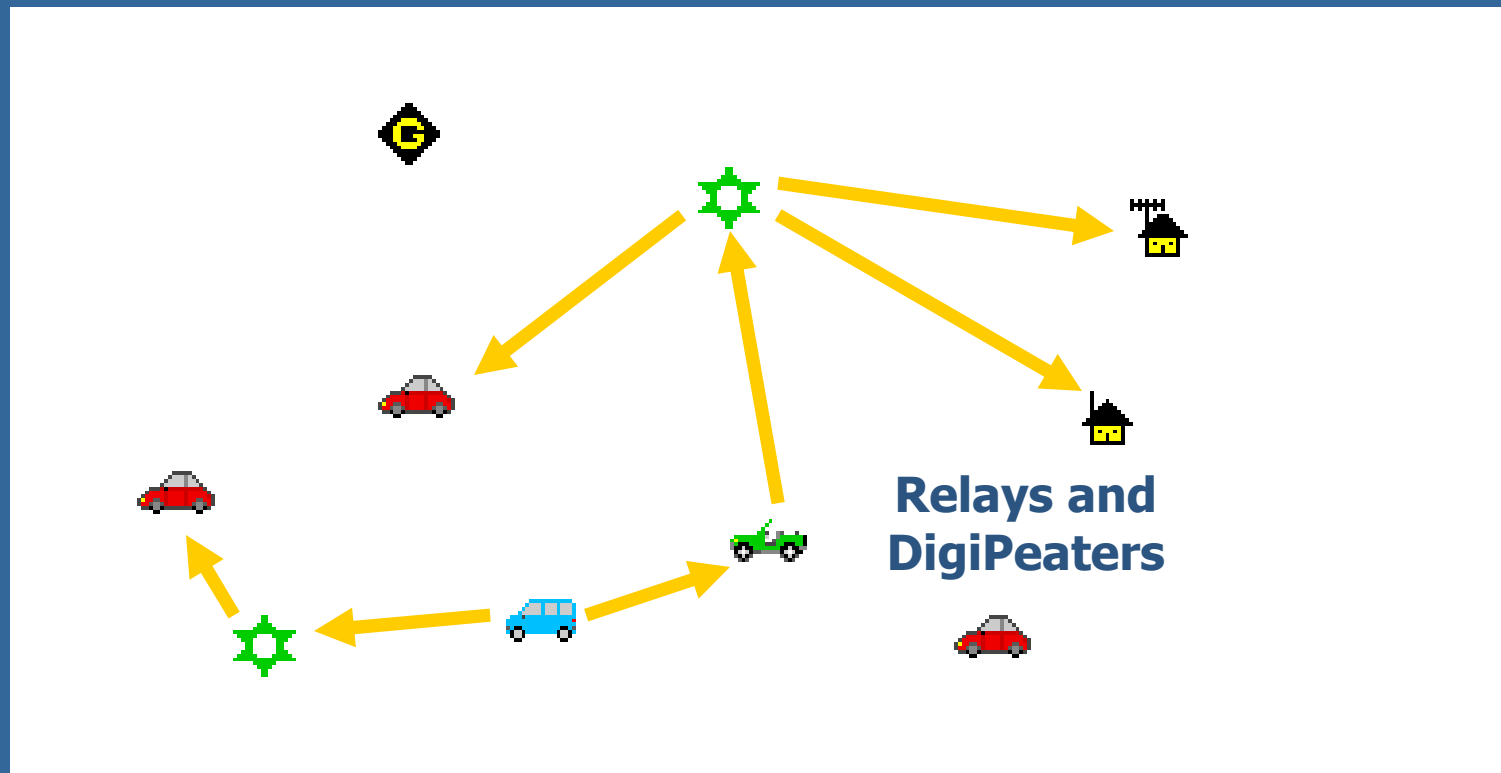
How does the Signal Travel?



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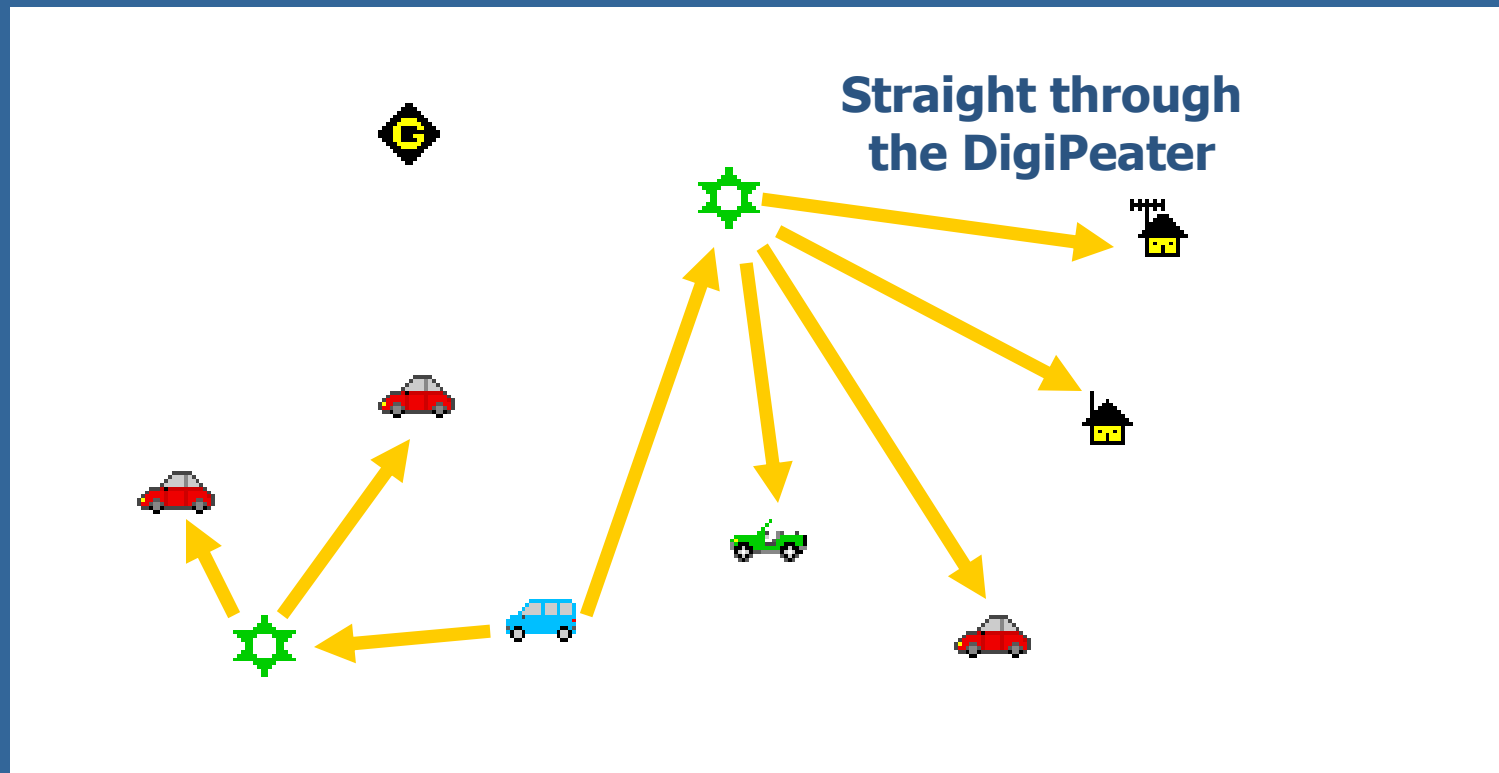
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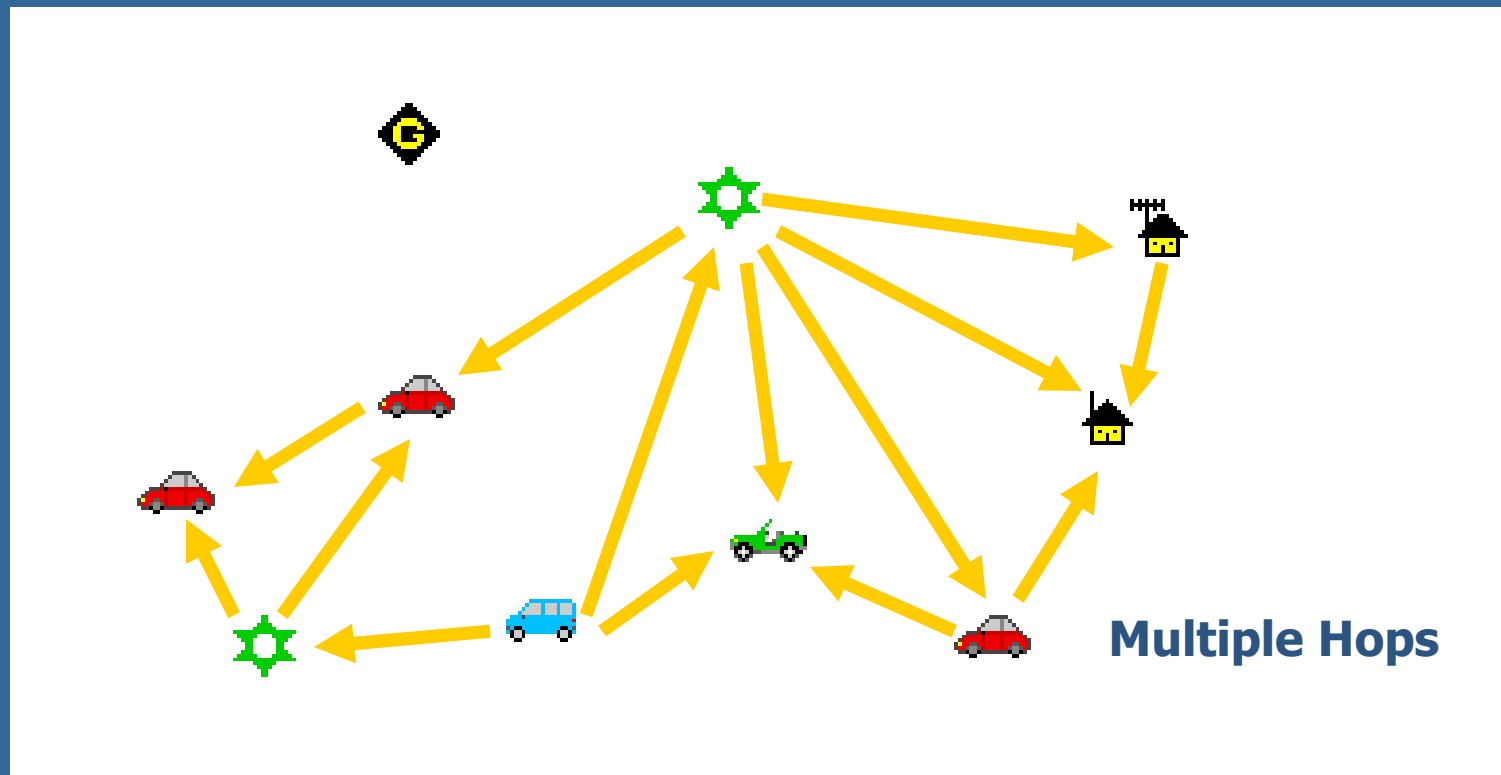
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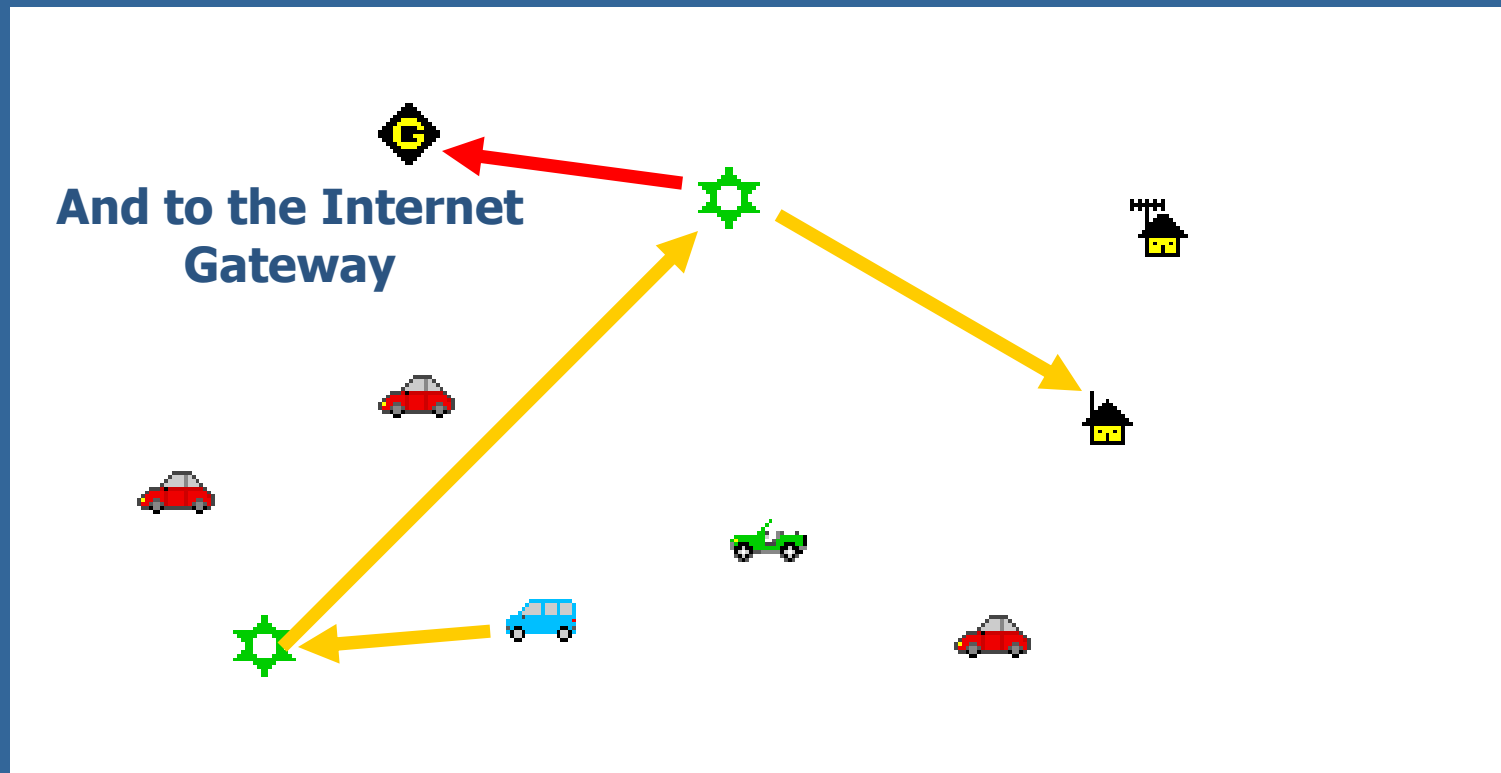
How does the Signal Travel?



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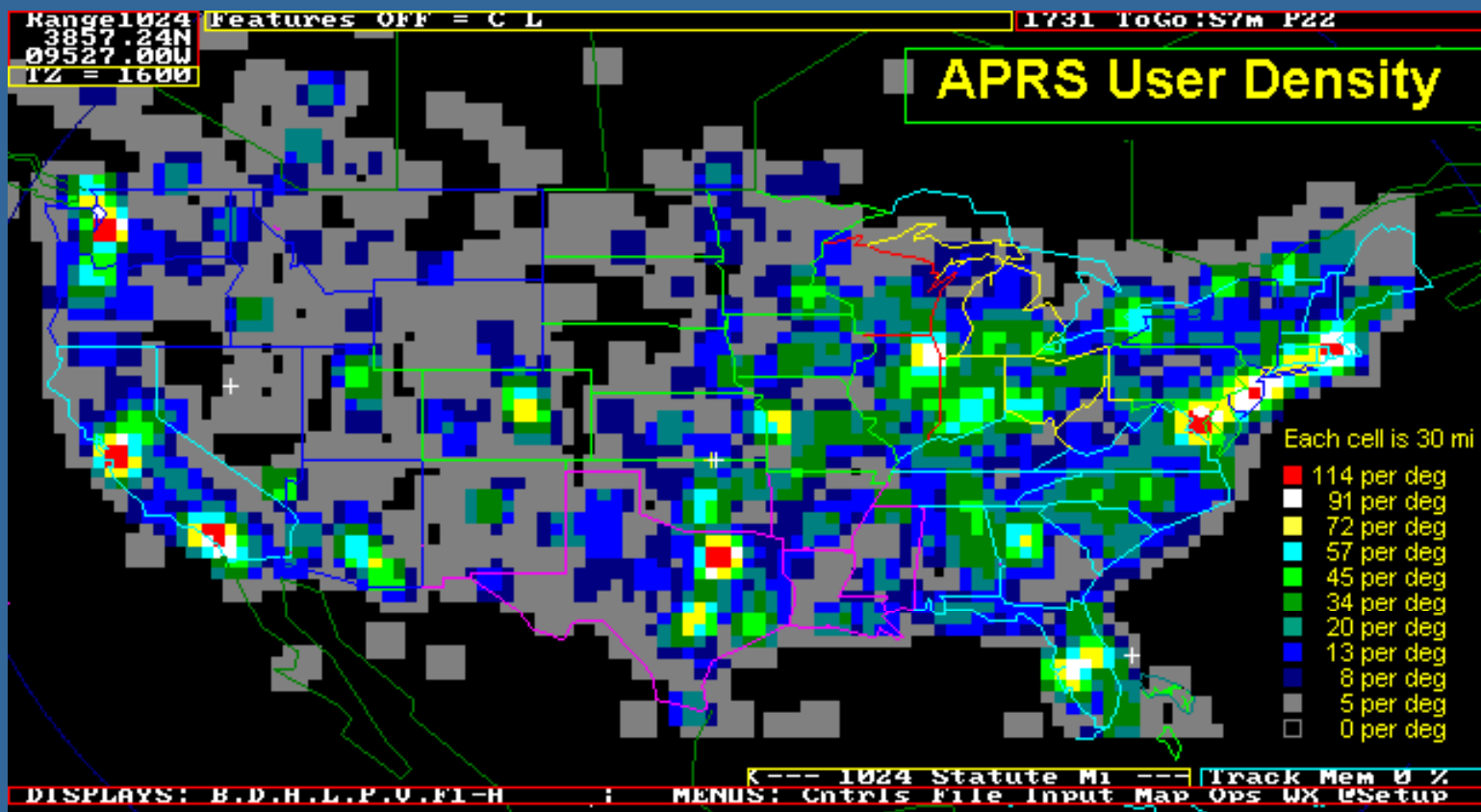
How does the Signal Travel?



The New-N Paradigm 2005

- ❑ APRS Generic Paths evolved over 13 years and the presence of many old legacy formats and procedures were really bogging down the network making it saturated and unreliable in busy areas.
- ❑ In 2005 all old paths were declared obsolete (RELAY & WIDE) and the entire APRS system in the US was then focused only on the WIDEn-N type of generic paths with small values of N.
- ❑ A WIDEn-N path goes N hops outward in all directions.
- ❑ N=2 in most areas colored on next slide





This data is plotted from Steve's FINDU data for 10 days and plotted on APRSdos shows the user density in the USA in Feb 05. Although it appears that most of the USA is low density, remember that a WIDE5-5 launched anywhere in the remotest area will still get to the closer cities and add to the QRM there. And there are 100 times more low density users surrounding these cities hitting them from all sides that really adds up to heavy QRM. We recommend WIDE2-2 in ■ ■ ■ ■ and surrounding areas

The grid size is 30 miles and each is averaged with all 8 of its surrounding adjacent grids.. The file is over 11,000 stations.

But the great news is that the New n-N Paradigm is the right approach. It encourages WIDEn-N everywhere while letting the high density areas trap large values of N to prevent overload in their areas only. WB4APR



Mapping/Tracking Programs

- APRSdos
- WinAPRS
- MacAprs
- APRS+SA
- UI-View
- Xastir
- XAPRS
- PocketAPRS

Bob Bruninga
Mark Sproul
Keith Sproul
Brent Hildebrand
Roger Barker
Open Source
Sproul Brothers
Mike Musick

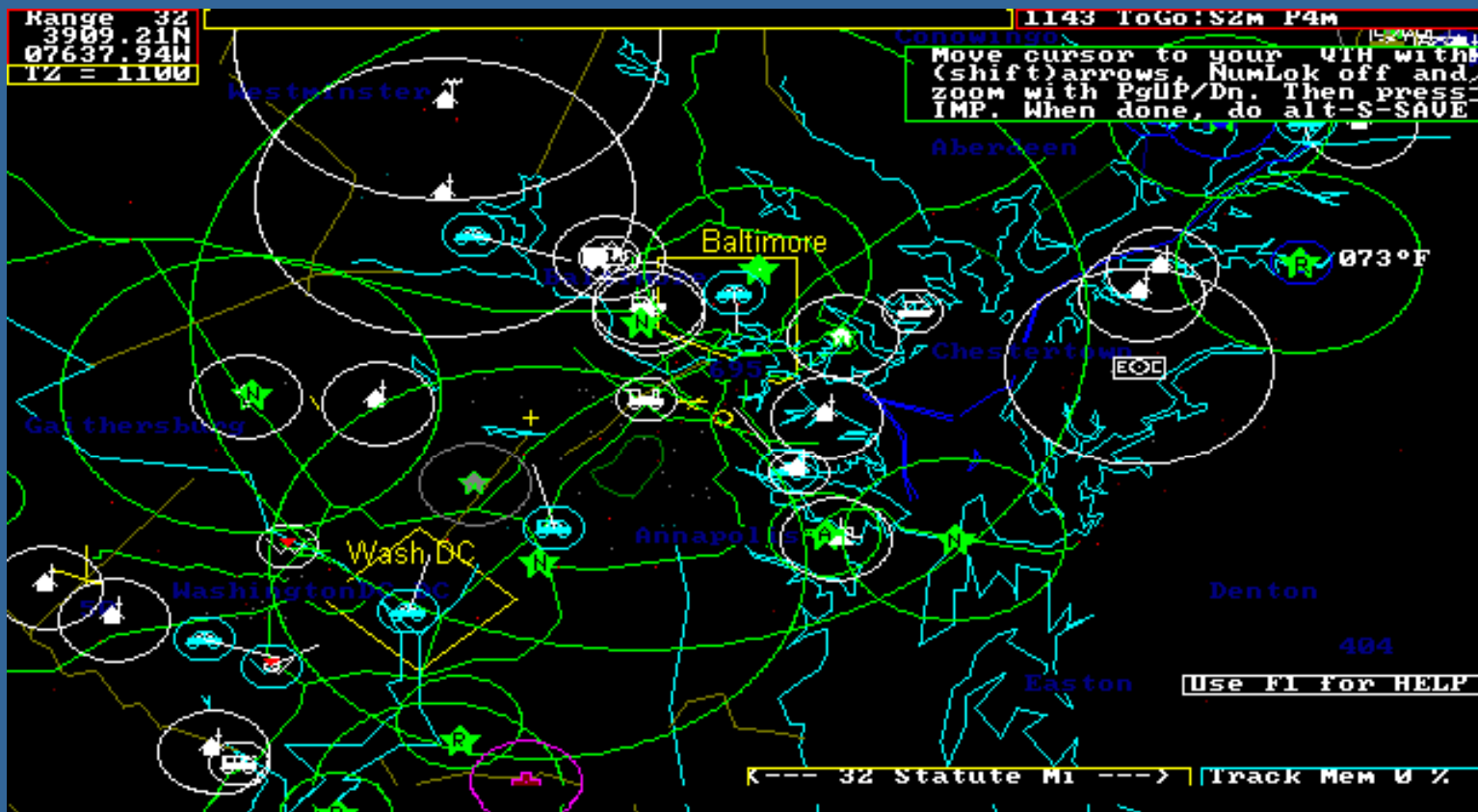


APRSdos

- The original, runs on any PC. Even a 386 or 486 & 1 floppy.
- Its focus is on the network, the RF channel, and local communications and display. Has crude maps.
- Only program with all APRS features built in
- Only APRS that fully supports all DFing modes
- Has lots of tools for assessing and displaying the local network, station ranges and RF connectivity.



APRSdos (Range Circles)

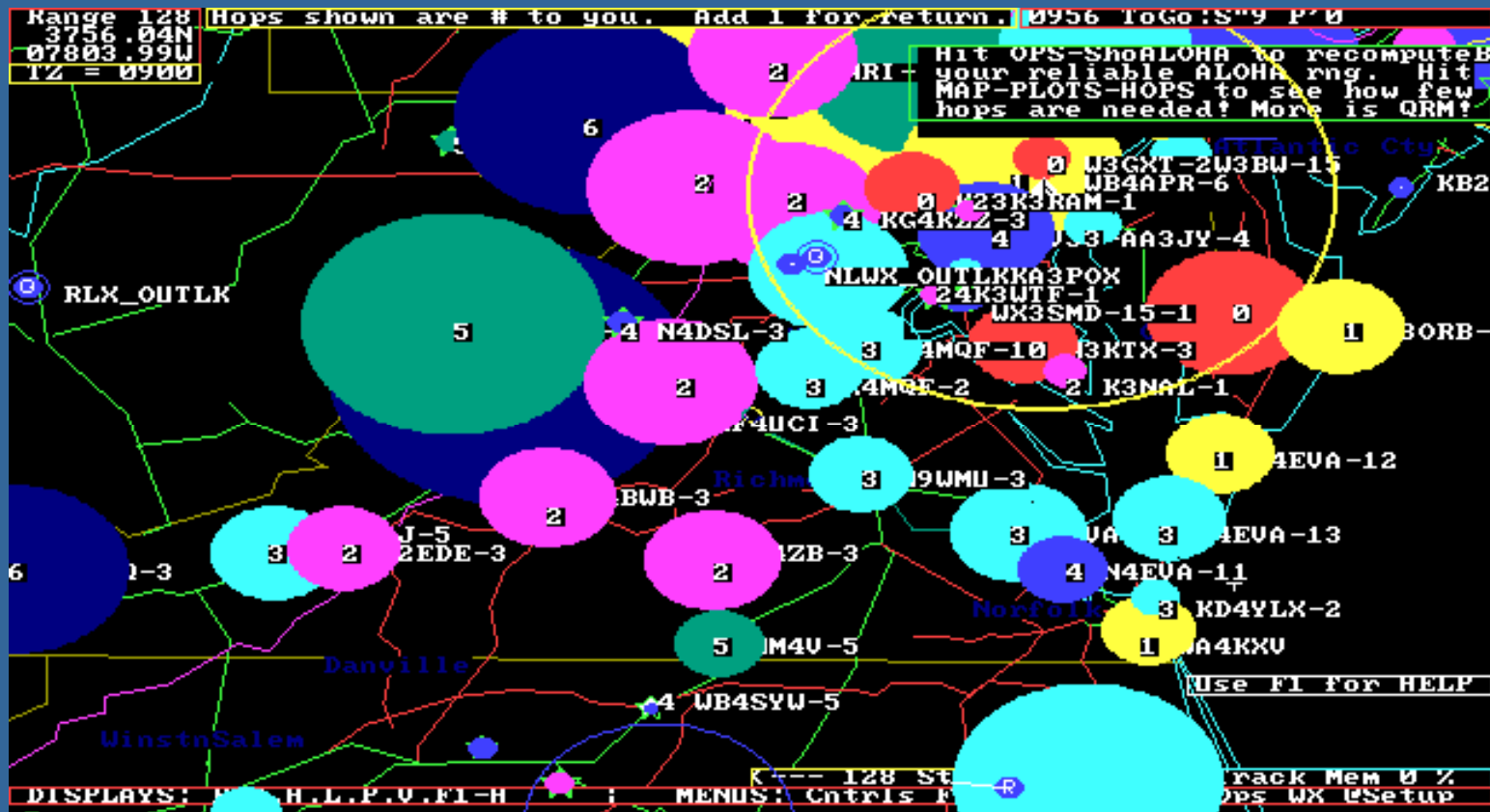


APRSdos map with PHG circles displayed and calls, roads, and rivers turned off to reduce clutter. The green interstates remain and you can see WashDC in the lower left and Baltimore in the upper center. Notice the three WIDEn-N digis cover the area though there are more than 15 digis around. Two stations in the upper center live on hills... 2 hops covers everywhere.



APRSdos (ALOHA circle and digipeater hops)

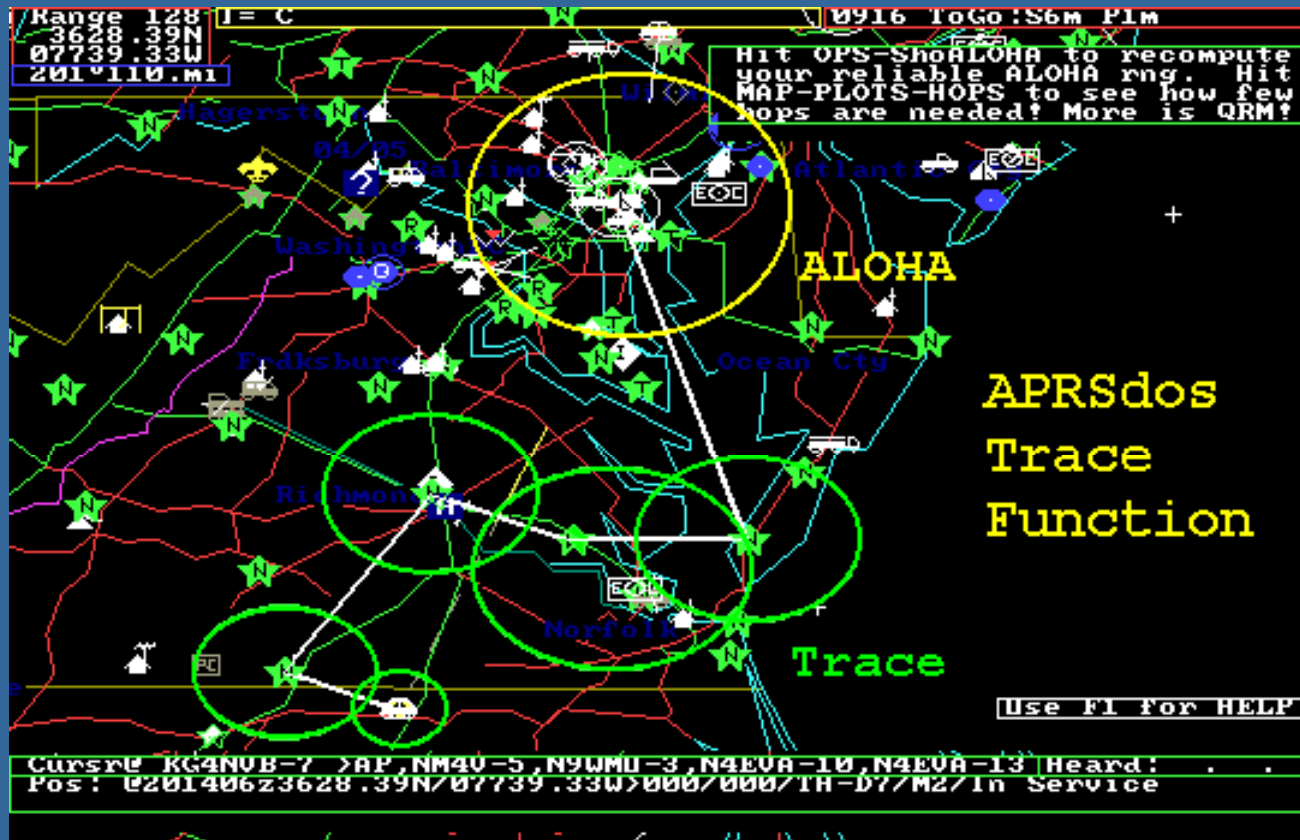
[Your ALOHA circle is your 100% saturated channel range]



MAPS-PLOT-HOPS display shows snapshot of number of hops from each digipeater to my station in Baltimore (at center of my ALOHA circle). Data is plotted from last-packet-received, so needs to be observed several times to average out circuitous packets and lucky shots.



APRSdos Range circles and Path tracing



APRSdos
Trace
Function

The TRACE function shows the path through the digipeaters it took to get to your station. This is a 5 hop mobile well outside of my ALOHA circle that got a lucky hop over water up the Bay from Norfolk to Baltimore. The fixed PHG RF range of each digi is also shown



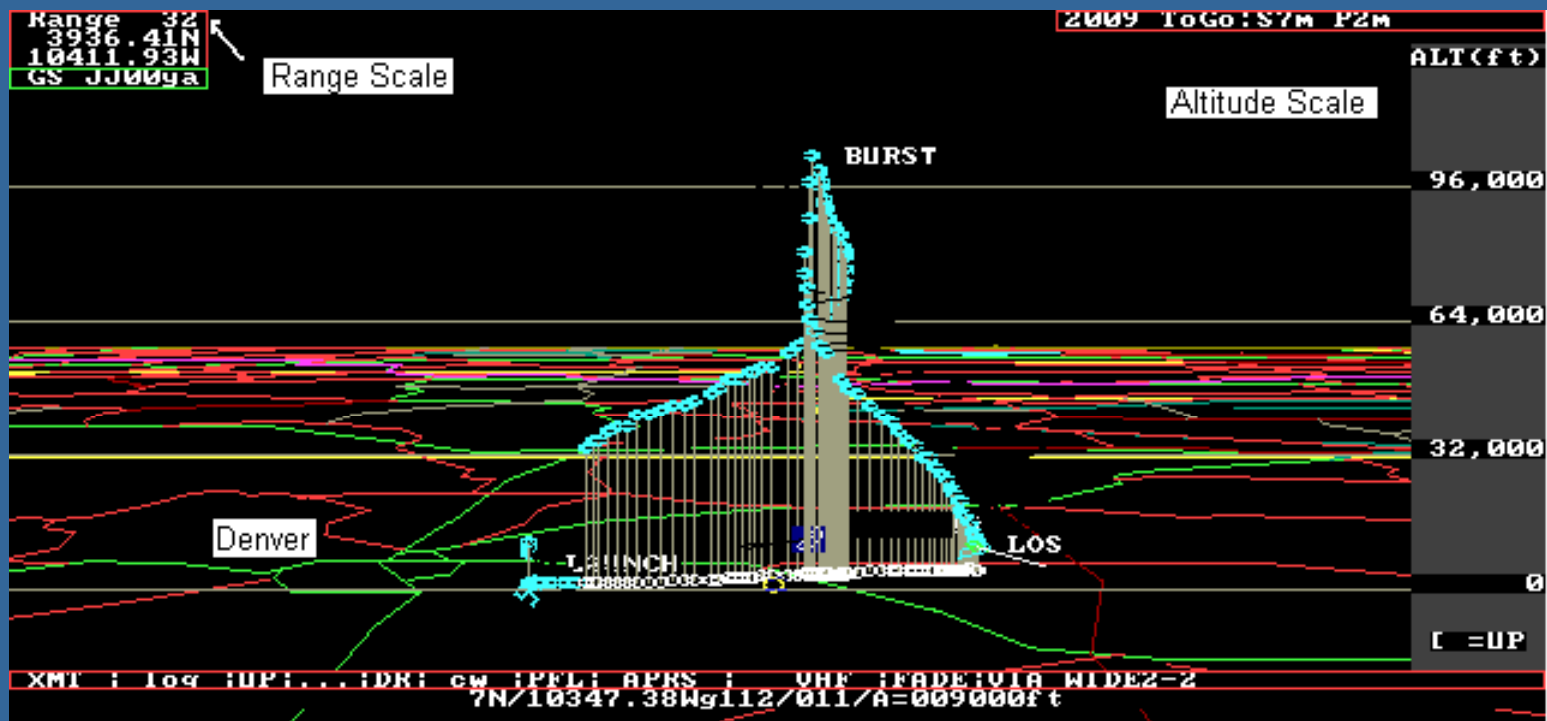
APRSdos (DFing by signal strength)



MAPS-PLOTS-DF-OMNI display of overlapping signal strength contours. All of these "voice" signal reports were entered rapidly on APRS as objects, and everyone can see that the FOX was found near the intersection of the colored circles. Notice how VALUABLE the "no-signal" reports were. They show you almost immediately where the fox is NOT. Great info!



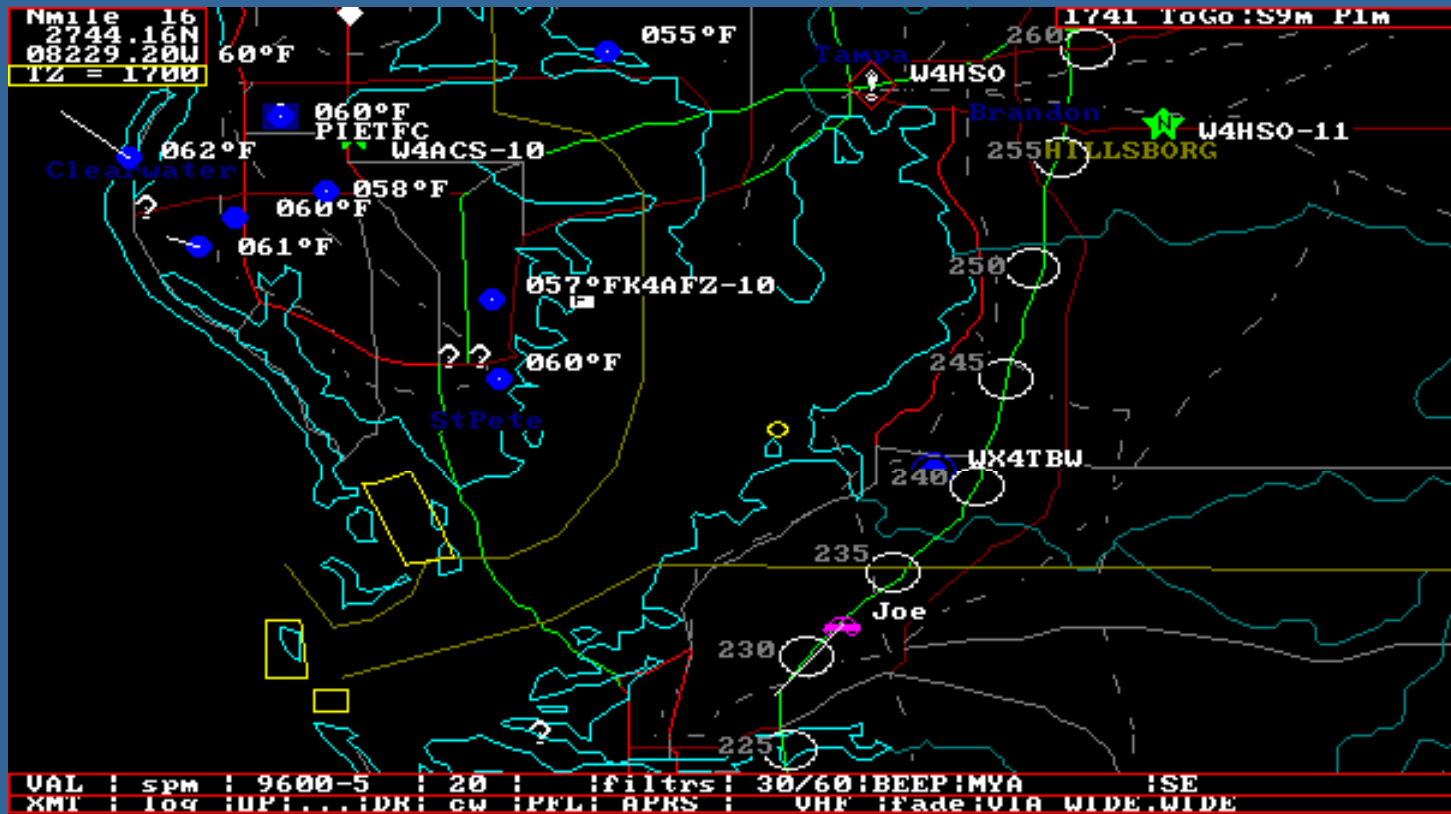
APRSdos 3D views for Balloon tracking



APRSdos has a 3D map display mode. The vertical scale can be separately set from the normal Range Scale depending on the altitude of objects. This is a typical APRS balloon track.



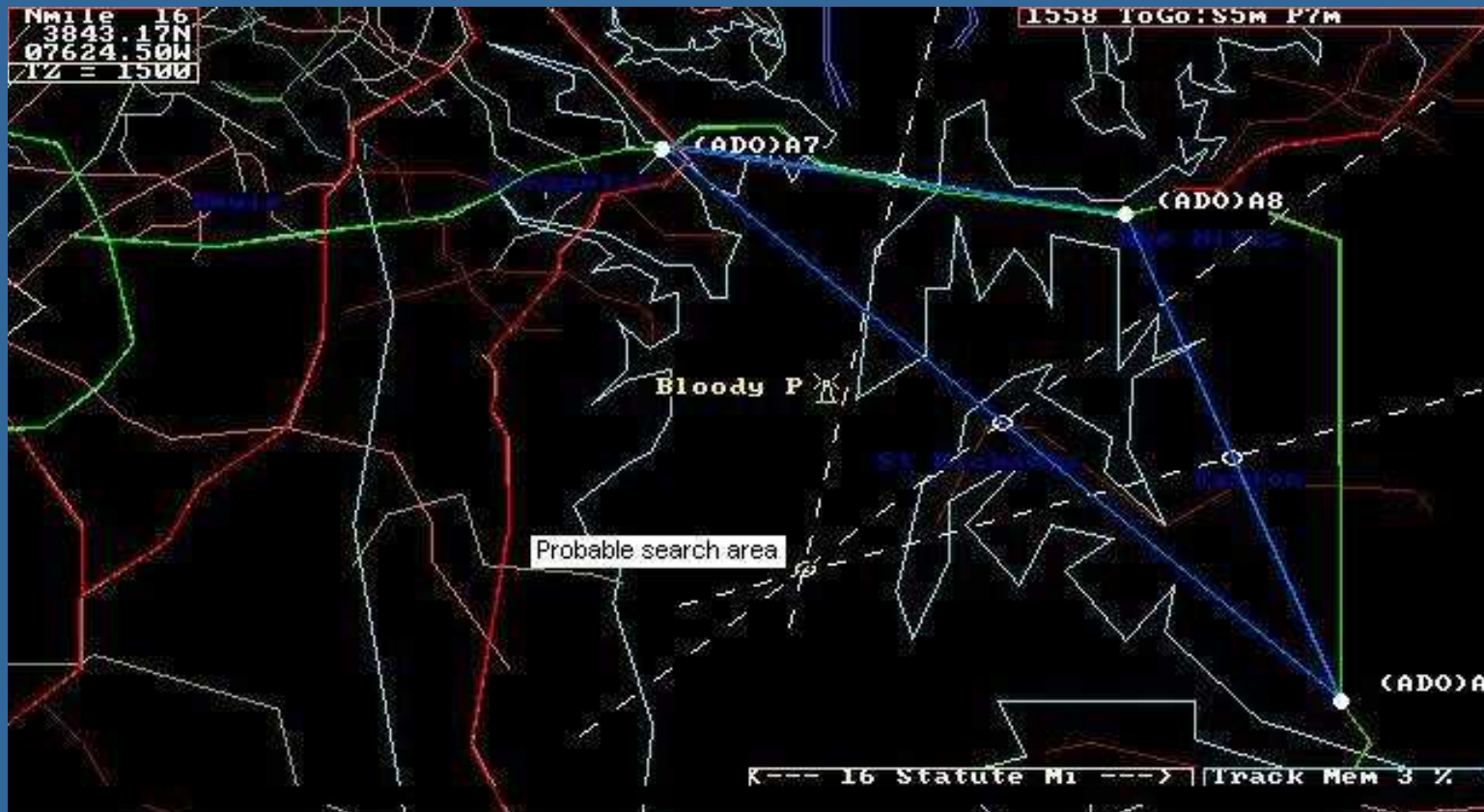
APRSdos Tracking with Milemarks



This APRSdos map of Tampa shows how Mile Marks can be overlaid on the map with the "MM" keys. Notice how I have placed the non-APRS mobile "Joe" on the interstate at mile mark 232 headed south west. Since APRSdos deadreckons all objects, Joe will continue to move on my map without update. This is very handy going to Dayton with many folks on the road. You can keep an eye on all the other non-APRS travelers that are in QSO range even though they have no APRS capability.



APRSdos (Solo DF Fade Circle Technique)



MAPS-PLOTS-DF-FADEcircle - This technique allows a single individual to locate the approximate source of a signal. Just Drive until the signal fades out. Hit F5 key. Turn around, drive the other way to the fade. Hit F5 key. Go a third direction until it fades again. Hit the F5 key. Then hit MAPS-PLOTS-DF-FADE and APRS will compute the approximate location of the signal. Then drive to the indicated area and do it again! This time mark equal points of signal level X. Do it again. Go to the center, do it again... and again! You WLL find the signal as long as you have enough gas...



WinAPRS and MacAPRS

- Separate Windows and Mac programs
- Precision Mapping and Tiger Maps
- Supports GPS and weather station input
- Supports all standard Packet Radio TNCs
- Supports all standard callbook CD-ROMs for lookup of call signs



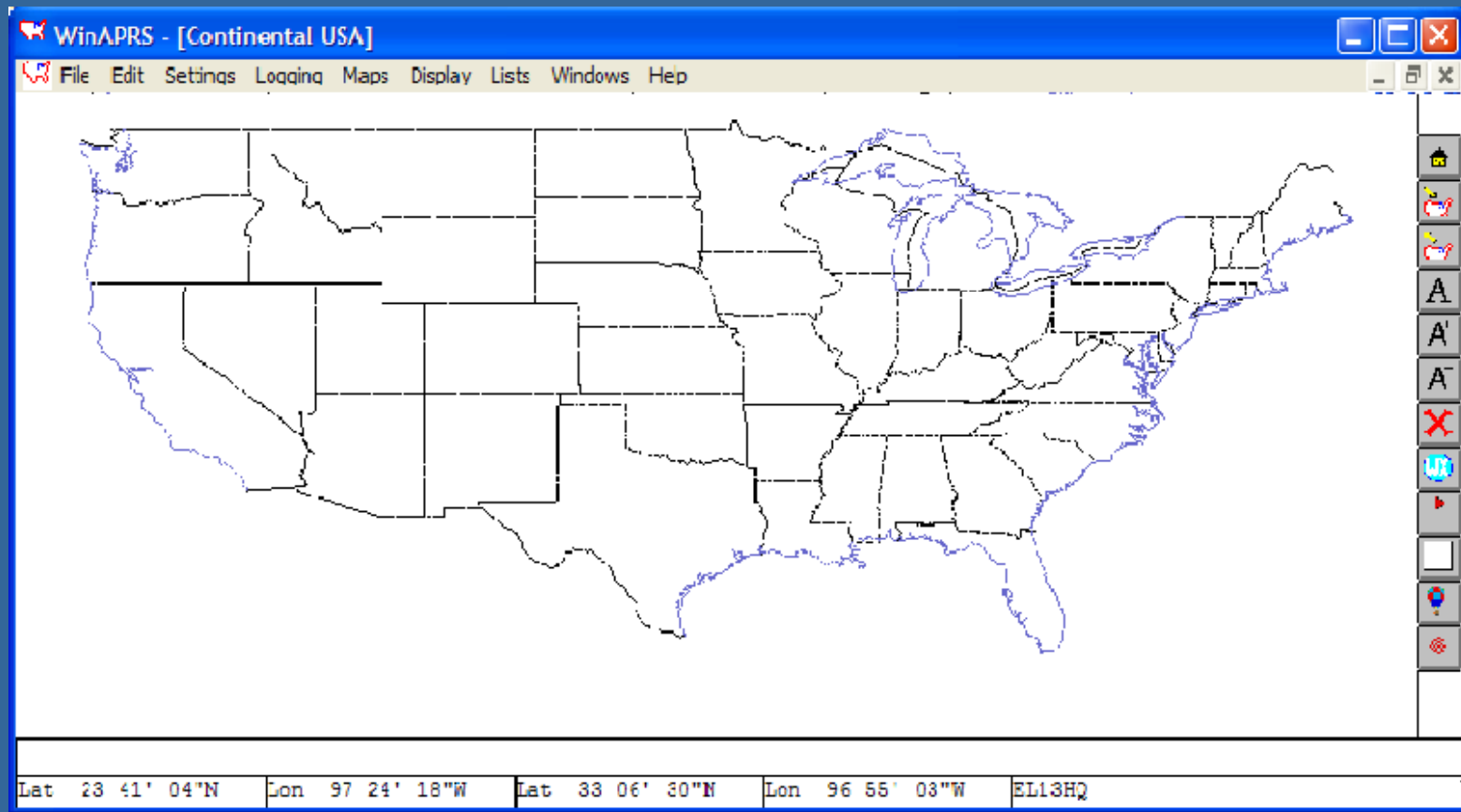
WinAPRS (TigerMaps)



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WinAPRS



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WinAPRS



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APRS + SA

- 32-bit Windows-based
- Delorme Street Atlas 4.0 through 9.0
- TNC-2 or AGWPE for RF operation
- Standard NEMA GPS and Weather station support
- IGate to Internet
- Email send and receive
- Web Server



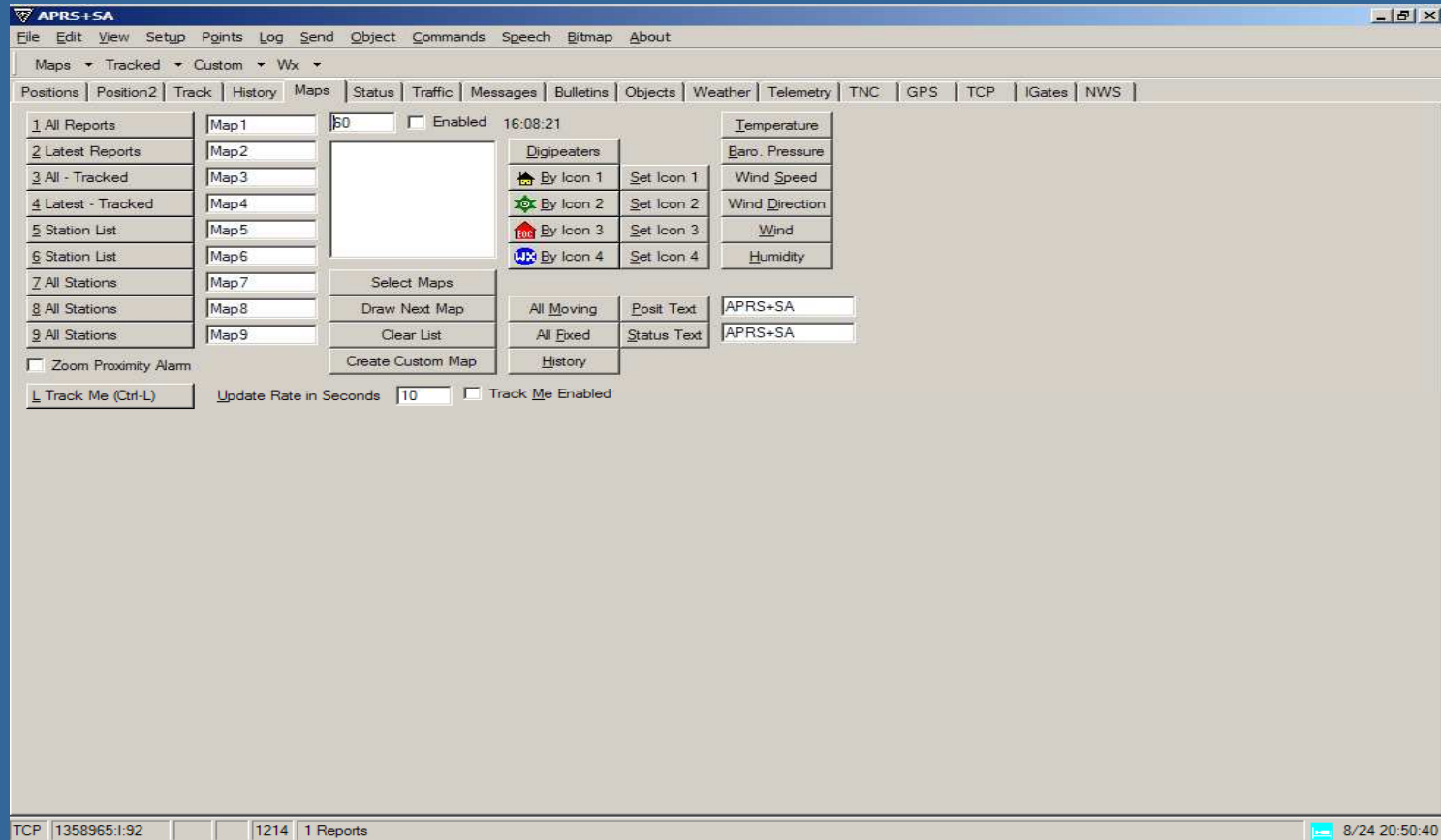
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APRS + SA

The screenshot shows the APRS-SA software interface. The window title is "APRS-SA". The menu bar includes File, Edit, View, Setup, Points, Log, Send, Object, Commands, Speech, Bitmap, and About. The status bar at the bottom shows "TCP 1345051:1:171", "1213", and the date/time "8/24 20:49:04".

The interface is divided into several sections:

- Stationary:** A list of 1061 stations. Visible entries include WD9HAE, EA1DAX-3, N8WAQ-15, DG1LJP, PA3ATR, VE7EQU-13, KD5CFM, HB9DQU-12, VE7WAT, KD7GIZ-10, M3LOX, K5MBH-1, WA1IRK, KB6OOC-2, KG4SCS, KB3JAU, VE7CIM-15, IK1SLD, INFOKIOSK1..., 147.15.K0TMU, ZL1AMW-12, KC2IXE, KC2IXE-1, KG4RAW, PD5RHV, IK1NAF, K5QQ-1, N8AMX, EA8AKW, Stkv.EOC:AC..., Okt.Co.:AC5MR, DO2WO, IW4BMA-4, KE6AFE-11, KA0MR-15, CT4DK, VE1UHF-1, VE1AIC-3, PE5YES, DK2YCT, VA3CWB-3, and F1SEY-2.
- Moving:** A table with 11 stations. The table has columns for Callsign and Count.

Callsign	Count
OX3HI	13
KE6AFE	28
K3GJ	13
KF6KMY	3
ISS-NONE...	8
OE6CUD-9	63
KK6RW-8	15
VE6GC	2
KG4UWA	2
DO9FS	3
KE4IAM-14	2
- Tracking List:** A list of 0 stations.
- Options:** A panel on the right with checkboxes for "ENABLE TRACKING" (checked), "Auto Map Update", "Zoom to Most Recent", and "Track Any Moving Station". Below these are buttons for "Clear", "Add All Moving", "Map All Reports", "Map Most Recent", "Map Fixed List", and "Map Moving List".

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APRS + SA

APRS+SA

File Edit View Setup Points Log Send Object Commands Speech Bitmap About

Maps Tracked Custom Wx

Positions Position2 Track History Maps Status Traffic Messages Bulletins Objects Weather Telemetry TNC GPS TCP IGates NWS

Callsign	Latitude	Longitude	Text	Date/Time Heard	#	Path
EB5CCF-14	N37°43.100'	W0°51.800'	/= aprsdMUEA EB5CCF Linux APRS Server ...	2003/08/24 20:45:57		I:APD214,TCPI...
IW7EAS-4	N41°03.030'	E16°53.010'	-/=Marco -http://iw7eas.homeip.net/ {UIV32N}	2003/08/24 20:45:57		I:APU24V,TCPI...
W5HJS-10	N30°00.320'	W90°10.130'	-/=New Orleans Area I-Gate {UIV32N}	2003/08/24 20:45:56		I:APU25E,TCPI...
Ten-Tec:W...	N35°51.780'	W83°31.760'	h*291817z000/000/Ten-Tec Mfg. and Sales...	2003/08/24 20:45:56		I:APS221,TCPI...
K4NUT	N28°18.500'	W82°40.470'	./@242044z275/006g010t090r000p000P000...	2003/08/24 20:45:55		I:APRS,TCPIP*...
N5ZXD	N33°33.520'	W101°55.000'	x/=PHG2140XASTIR-Linux Lubbock, Tx	2003/08/24 20:45:55		I:APX121,TCPI...
Windrock:W...	N36°07.260'	W84°18.900'	/*291817z000/000/Windrock Mountain Rep...	2003/08/24 20:45:53		I:APS221,TCPI...
WM4Q	N35°56.680'	W86°21.180'	-/=PHG5018/WinAPRS 2.7.2 -TNRUTMURF...	2003/08/24 20:45:52		I:APW272,TCPI...
MB7UIK	N51°10.090'	E0°37.440'	./@241942z057/003g004t069r000p004P000...	2003/08/24 20:45:51		I:APU256,TCPI...
N4BSA	N27°56.610'	W82°45.560'	./@242045z249/002g004t088r000p000b101...	2003/08/24 20:45:46		I:APU25E,TCPI...
LA3WAA	N63°25.870'	E10°36.410'	/=APRS test fra Hundhamaren, JP53HK {UIV...	2003/08/24 20:45:45		I:APU24P,TCPI...
MB7UFF	N51°46.260'	E0°07.330'	&l=Harlow IGate {UIV32}	2003/08/24 20:45:44		I:APU25E,TCPI...
MUGM	N19°54.000'	W75°08.000'	./@242010z230/008g000t081r000p000h78b...	2003/08/24 20:45:44		I:APRS,TCPIP*...
WX6SGX	N33°01.310'	W117°04.960'	W/=NWS San Diego Skywam IGate/Probe E...	2003/08/24 20:45:44		I:APU25E,TCPI...
WA6OFT-1	N34°08.620'	W114°17.490'	&l=Parker, AZ IGate, DIGI (Relay) {UIV32N}	2003/08/24 20:45:43		I:APU25F,TCPI...
K1DWW-8	N40°51.930'	W73°01.230'	&l= aprsd Linux APRS Server	2003/08/24 20:45:43		I:APD215,TCPI...
IT9DLN-12	N37°36.200'	E12°57.930'	/= Menfi Linux Server	2003/08/24 20:45:43		I:APD225,TCPI...
MMMX	N19°26.000'	W99°06.000'	./@241945z040/006g000t073r000p000h50b...	2003/08/24 20:45:42		I:APRS,TCPIP*...
MMUN	N21°02.000'	W86°52.000'	./@241945z090/015g000t093r000p000h63b...	2003/08/24 20:45:41		I:APRS,TCPIP*...
N7TTE-10	N36°08.710'	W115°04.550'	/=PHG2270/WinAPRS 2.4.8 -NVCLALAS VE...	2003/08/24 20:45:41		I:APW248,TCPI...
MUHA	N22°59.000'	W82°24.000'	./@241952z040/010g000t090r000p000h62b...	2003/08/24 20:45:40		I:APRS,TCPIP*...
UIBB	N56°22.250'	E101°41.920'	./@242000z040/006g000t052r000p000h81b...	2003/08/24 20:45:38		I:APRS,TCPIP*...
UHMA	N64°47.000'	E177°34.000'	./@242000z070/031g042t046r000p000h00b...	2003/08/24 20:45:36		I:APRS,TCPIP*...
IRLP-5700:...	N35°41.650'	W83°37.250'	L/*291817z000/000/IRLP Node #5700 443.3...	2003/08/24 20:45:36		I:APS221,TCPI...
K6TVI	N33°44.650'	W118°06.080'	./=PHG5250/Seal Bch WX-k6tvi@cal-net.or...	2003/08/24 20:45:34		I:APW261,TCPI...
GCLP	N27°56.000'	W15°23.000'	./@242000z020/023g000t073r000p000h73b...	2003/08/24 20:45:33		I:APRS,TCPIP*...
FACT	S33°59.000'	E18°36.000'	./@242000z330/010g000t054r000p000h87b...	2003/08/24 20:45:32		I:APRS,TCPIP*...
AYPY	S9°26.000'	E147°13.000'	./@242000z000/002g000t073r000p000h00b...	2003/08/24 20:45:30		I:APRS,TCPIP*...
SV1CPO-10	N38°38.290'	E21°23.970'	/= LinuxAPRS IP=213.5.193.22 sv1cpo@sv1...	2003/08/24 20:45:30		I:APD214,TCPI...
YBBN	S27°23.000'	E153°06.000'	./@242000z270/006g000t050r000p000h81b...	2003/08/24 20:45:28		I:APRS,TCPIP*...
YPDN	S12°24.000'	E130°52.000'	./@242000z230/002g000t068r000p000h88b...	2003/08/24 20:45:27		I:APRS,TCPIP*...
KG4ZY-10	N28°16.970'	W82°42.700'	#l=PHG7580 R-W-T DIGI & IGate Pasco Co, FI	2003/08/24 20:45:27		I:APU25F,TCPI...
K1XVM	N44°49.910'	W68°46.440'	&l=PHG7560[K1XVM@amsat.org] IGate XA...	2003/08/24 20:45:27		I:APX121,TCPI...
WIII	S6°07.000'	E106°39.000'	./@241900z210/003g000t077r000p000h78b...	2003/08/24 20:45:25		I:APRS,TCPIP*...
VE3BLX	N46°09.000'	E83°31.800'	./=APRS+SA Hilton Beach Ontario	2003/08/24 20:45:25		I:APS215,TCPI...
CHEB-OK1...	N50°03.860'	E12°24.060'	./@242000z360/013g000t055Xweb20.00z 13...	2003/08/24 20:45:25		I:APW010,TCPI...

Show Moving Stations Only Single Screen Only Local RF Only

TCP 1319912:1:279 1211 8/24 20:46:02

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UI-View

- UI-View uses bitmap images for its maps. Also, the 32 bit version supports Precision Mapping.
- It supports TNCs in KISS mode and AGWPE host mode in addition to terminal mode - and host mode allows up to 16 RF ports.
- UI-View has a full-featured intelligent digipeater.
- UI-View has full support for connecting to APRS servers on the internet.
- UI-View is open architecture. A number of other software developers have written add-on applications providing additional functionality.



UI-view

- Whether it is used just for WX, or display only, or full TX /RX/internet. UI-View is more than capable.
- It can be configured as a digipeater to relay packets.
- With plug-ins, UI-View can receive NWS warnings and plot them on the map.
- UI-View can really shine in the emergency or event communications role.

The screenshot shows the UI-View32 V1.94 software interface. The main window displays a map of the Fort Worth, Texas area with various weather stations marked. A detailed weather data panel is visible for station KD5DMG, showing the following information:

Speed	Gust	W'chill	Time	Humidity
0.9	1.3	39.5	15:14	23 %
m/sec	N	m/sec		
Direction		Pressure	Temperature	
115 degrees		1012.6 hPa	29.90 in	
Speed S		Gust	Dew-point	
2.0		3.0	15.4 C	
mph		mph	60 F	
W'chill		Rain Today		
103 F		0.0 mm		
		0.00 in		

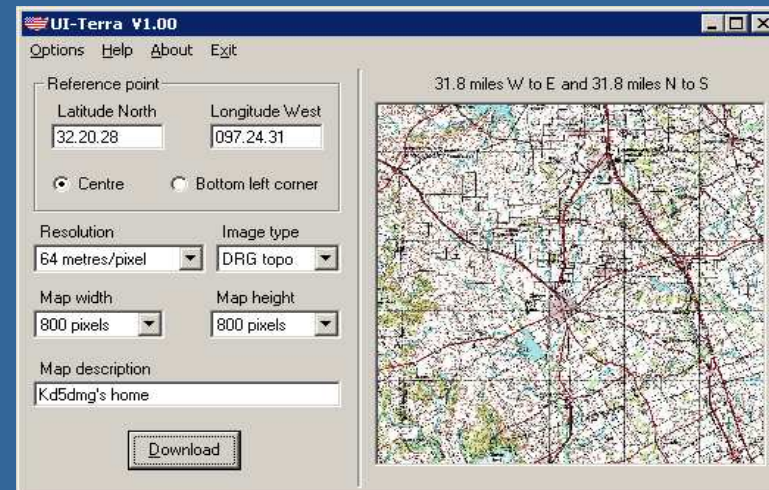
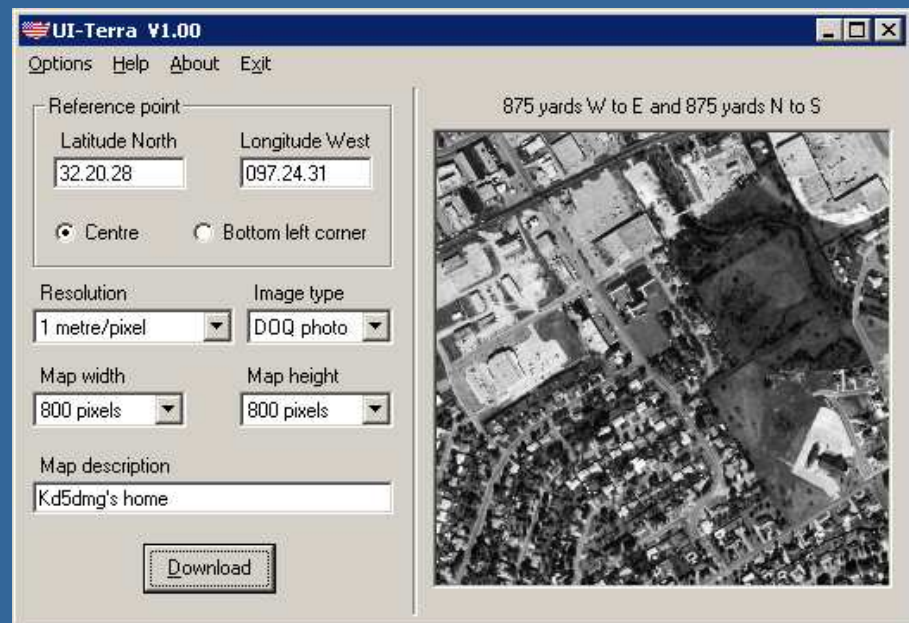
Below the weather data panel, there are fields for Beacon comment, Status text, Name, Effective digi path, and Frame. The Frame field contains the following text:

```
KD5DMG>APRS,TCPIP:qAC,KD5DMG:
@072013z3220.29N09724.32W_115/002g003t105r000P000h23b101
```



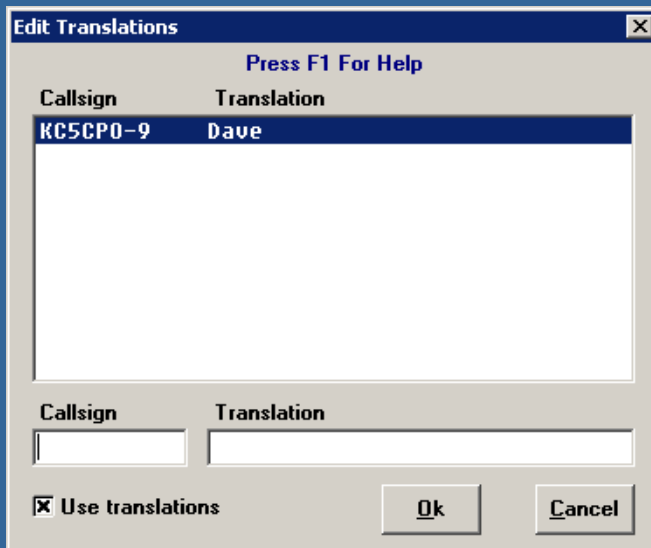
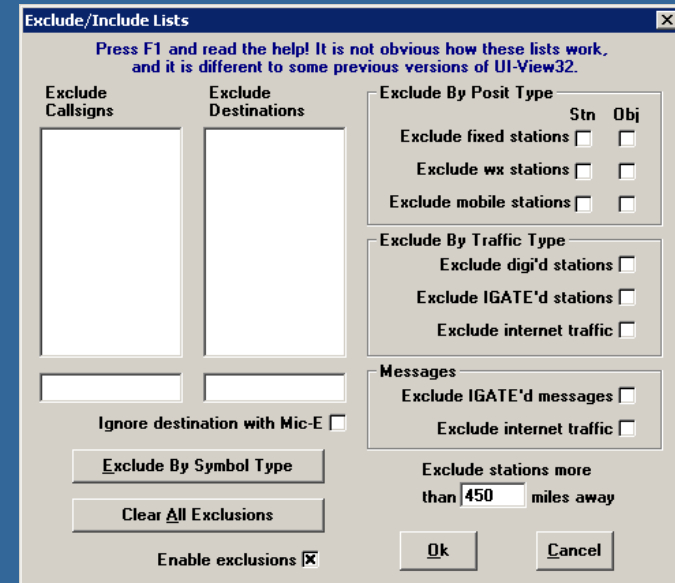
UI-view Maps

- Full support for Precision mapping, plus you can “capture” many other mapping programs.
- SA virtual map. It makes it very easy to grab maps from Street Atlas V4, V5, V6, V7, V8 and V9
- UI-Terra add-on allows you to make maps from Terraserver.



UI-View Events Operation

- Exclude/include lists. Here you can choose to exclude everything except mobile stations.



- Tactical calls -- you can assign labels to call signs.
- With a plug-in, you can draw an object on the map and transmit it over APRS. This is great for a race route.



Xastir

- Development is a collaborative effort of programmers from around the world.
- Xastir supports many map formats and is highly customizable.
- Xastir runs on Windows, MacOSX, Linux, FreeBSD, Solaris, and Lindows, with many more possible .
- On Unix-like operating systems, you can run your weather station or GPS on a separate computer as well, which is good for those hams who are already short on serial ports.
- Xastir is FREE! under the GPL license and comes with all source code.



The APRS Internet Interface

- Allows you to see more than just local RF.
- Utilize facilities available only on the Internet.
- Low cost backbone between RF networks.
- World-wide availability.
- Can run stand-alone without a Radio Interface.



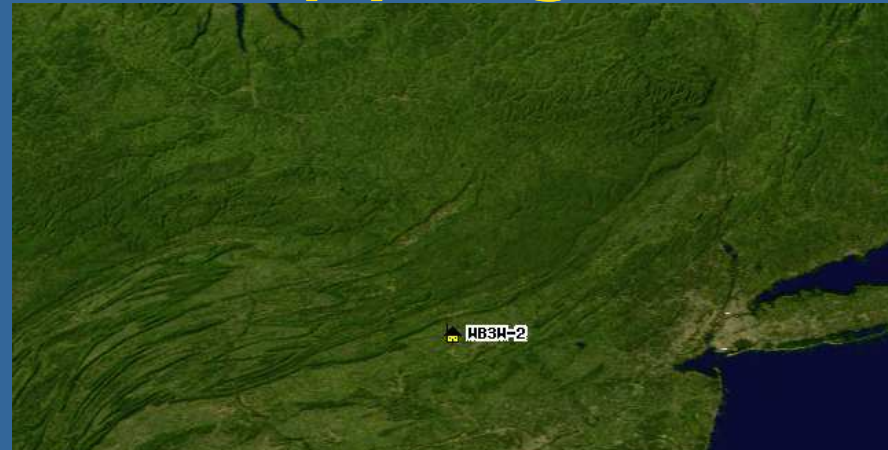
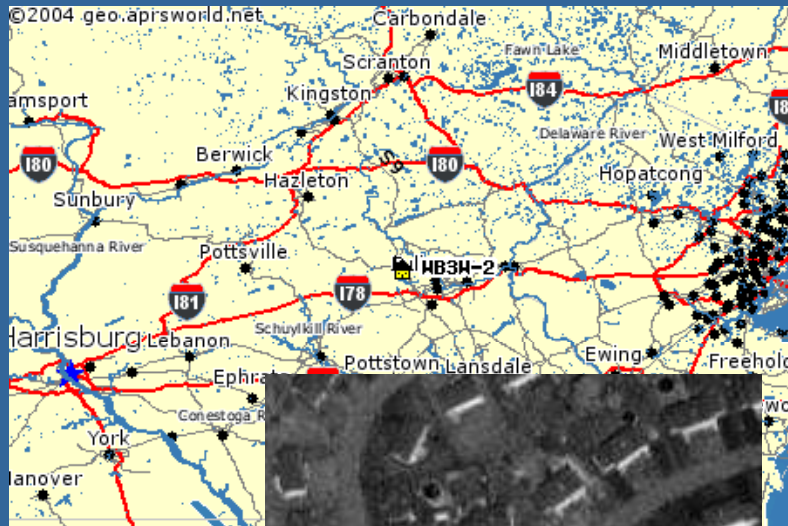
APRS IGates

- An IGATE is a local APRS station that utilizes the APRS-Internet network to pass all packets heard on their local RF back to the Internet.
- It can also act as a gateway to pass messages addressed to local RF stations from Internet only stations.



Findu.com mapping

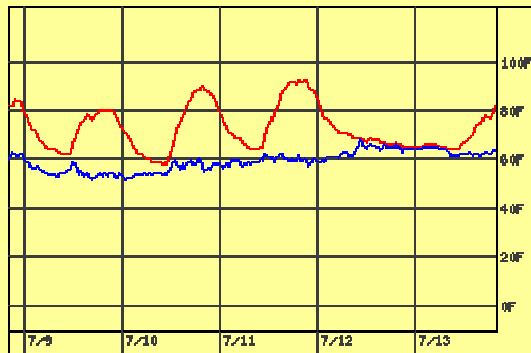
Internet tracking developed by
Steve Demise – K4HG



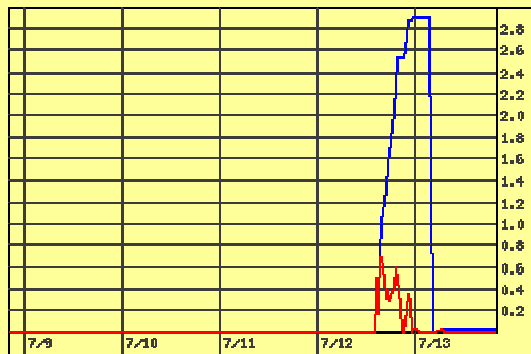
APRS is a registered trademark Bob Bruninga, WB4APR



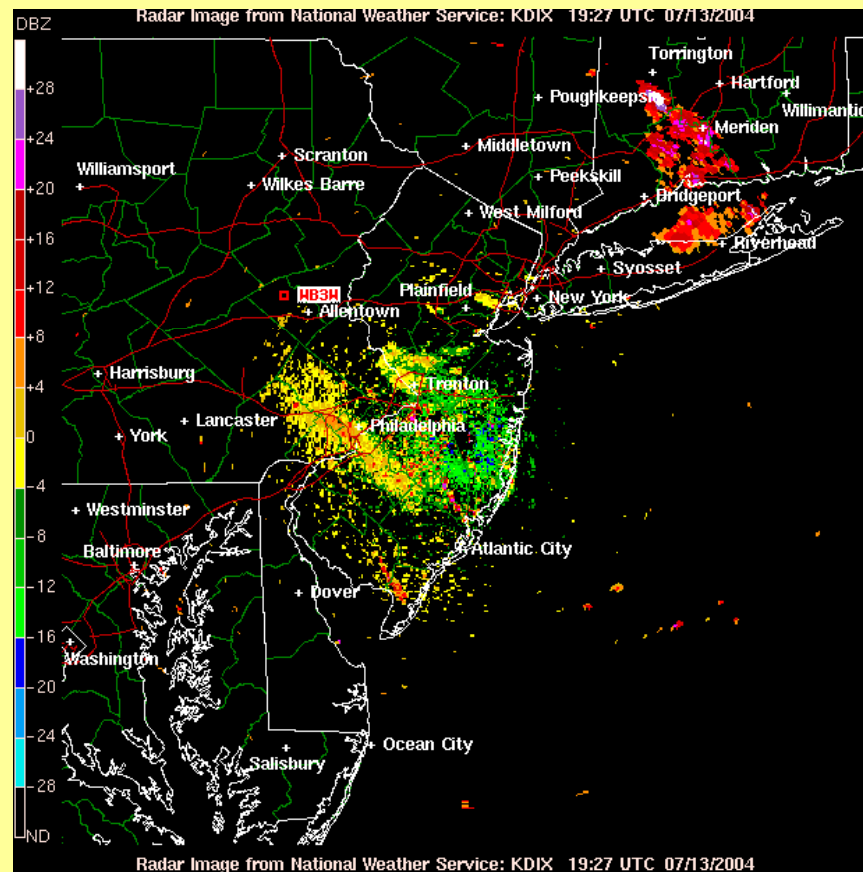
Findu.com Weather Tables



Temperature & Dew Point

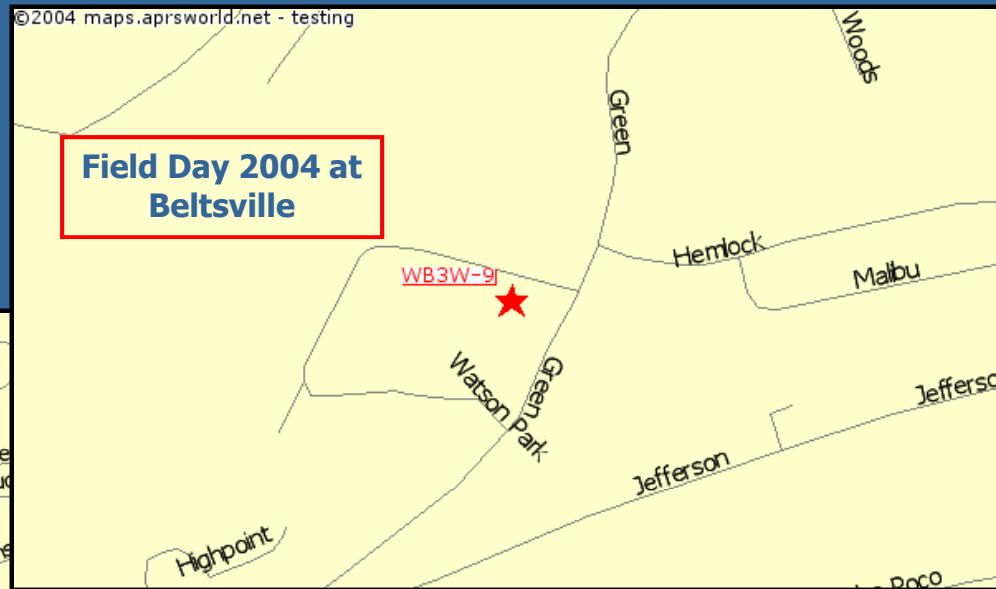
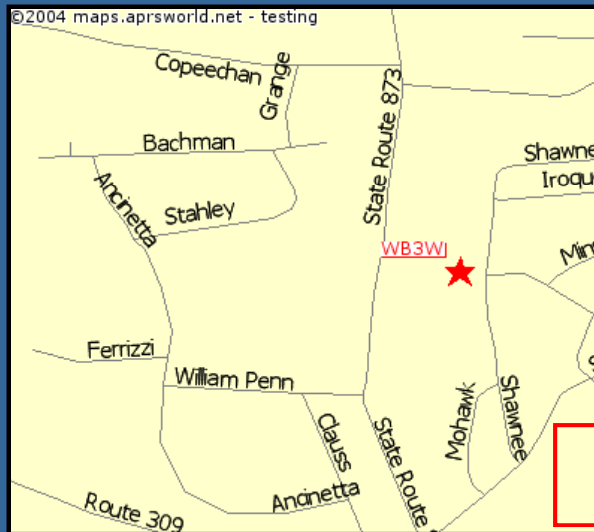


Rainfall Rates



Aprsworld.com

Developed by James
Jarvis – KB0THN



Home Weather
Station



Allows simultaneous tracking
mapping of the various SSID's
used by a station

APRS is a registered trademark Bob Bruninga, WB4APR



Citizens Weather Corps



The Citizens Weather Observer Program (CWOP) has become an interesting adjunct to the APRS Internet reporting system.



WXNET and CWOP Purpose

- Allows non-Amateurs to utilize the APRS network to collect and report on local weather conditions.
- Does not require any kind of Radio Interface
- This data is available as a public service for any non-commercial use.
- Provides feedback and guidance to weather station operators to help them improve.

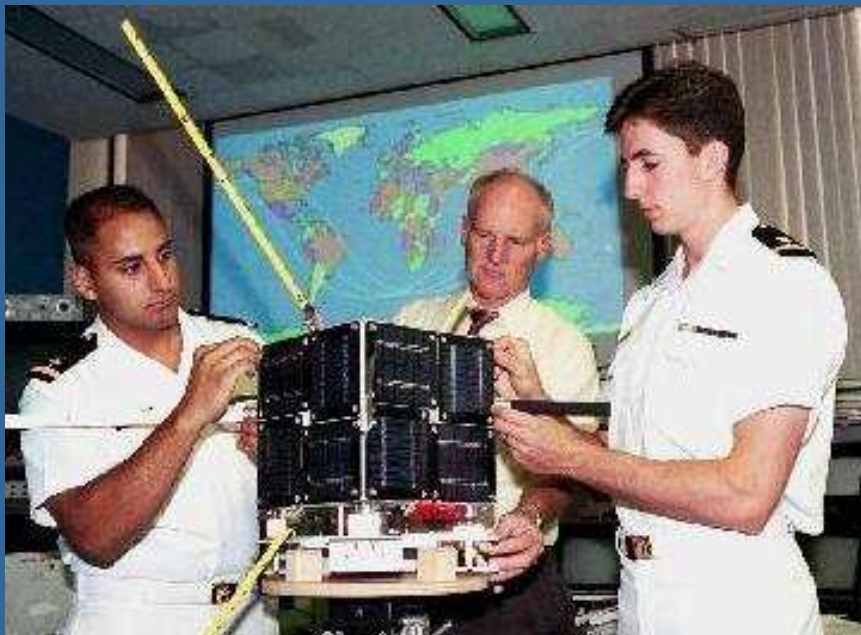


APRS for Special Uses

- Bicycle rallies, races
- Walk-a-thons, Parades
- Skywarn
- Weather Nets
- Crime prevention patrols
- Damage assessment
- Direction Finding – Foxhunts
- Voice for communications, APRS for visual mapping
- Now integrating into APRN (Automatic Picture Relay Network)



Into Space..PCSAT

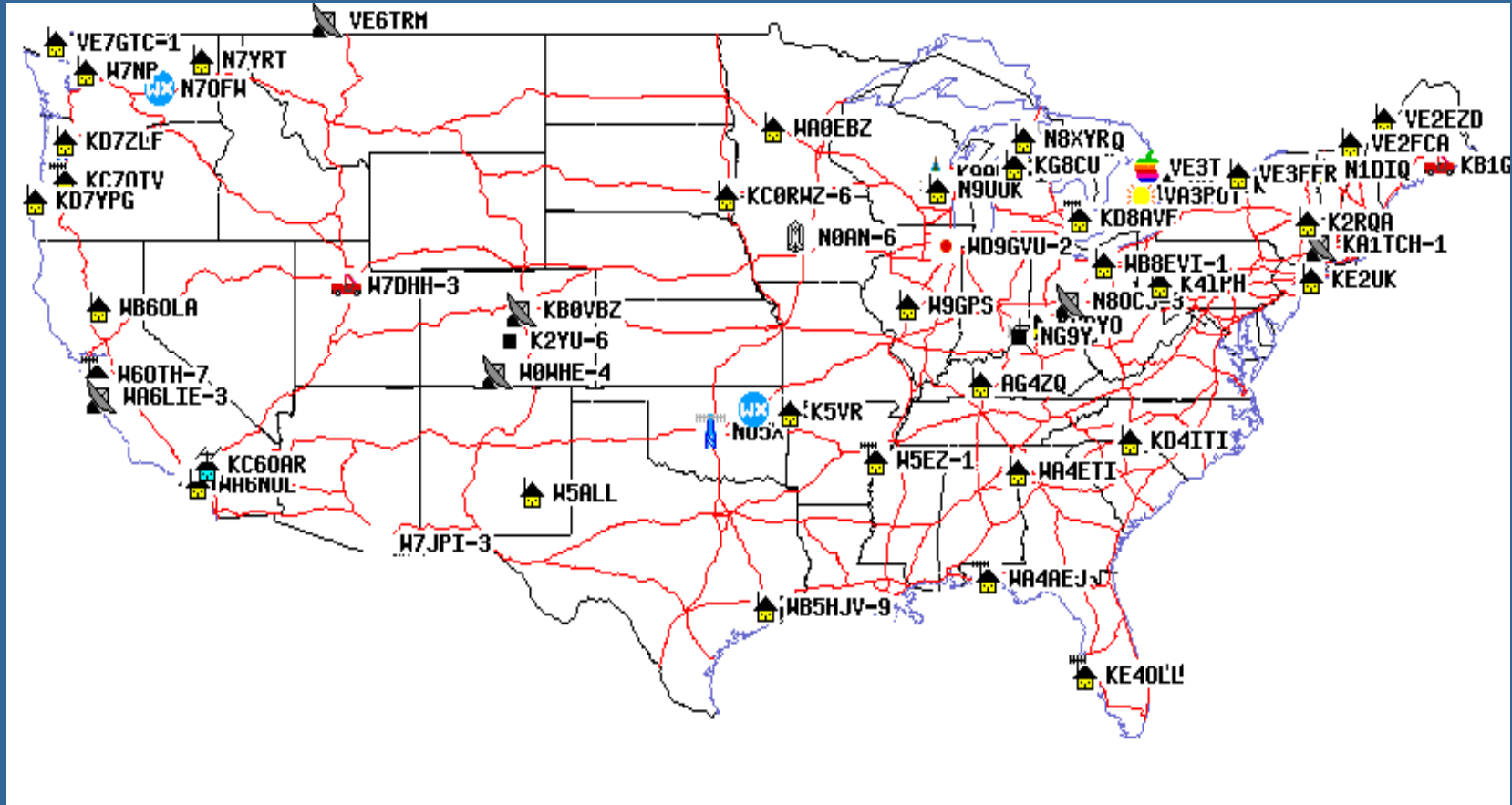


- The Prototype Communications Satellite, is a US Naval Academy Aerospace student project.
- It was designed to give students real hands on experience in satellite design and operations

■ APRS space frequency is published as 145.825



APRS via Space



APRS is a registered trademark Bob Bruninga, WB4APR



PCSAT Satellite



See live downlink on <http://pcsat.aprs.org>

- PCSAT, Launched in September 2001 from Kodiak Alaska Launch Complex.
- The first APRS satellite, and has since been joined by 3 other such satellites
- It still works during mid-day sunny passes.



PCSAT Enhancements

- PCsat includes a special store-and-forward Priority Communications feature.



- This can capture Emergency and Priority messages from the Kenwood THD7 and D700 radios anywhere on the globe and retransmit these signals on the USA VHF 144.39 APRS frequency.



International Space Station



See live downlink on www.ariss.net

- International Space Station (ISS) also supports APRS on its 145.80/145.99 packet system.
- Use digipeater path VIA ARISS.
- Also has been used by the crew to send messages to friends, family, and amateur radio operators



PCSAT2



- PCSAT2, is the second APRS digipeater satellite.
- Use digipeater path VIA ARISS.
- It was attached to the outside of the ISS in July 2005
- Uplink is 145.825
downlink is 435.275

See www.ew.usna.edu/~bruninga/pec/pc2ops.html



Credits

- Thanks to the following for earlier research and presentations on APRS.....

John Beadles

N500M

Tony Campbell

W5ADC

Pete Loveall

AE5PL

Bob Bruninga

WB4APR

(updated Jan 2006)

