APRS
(Automatic Packet Reporting System)

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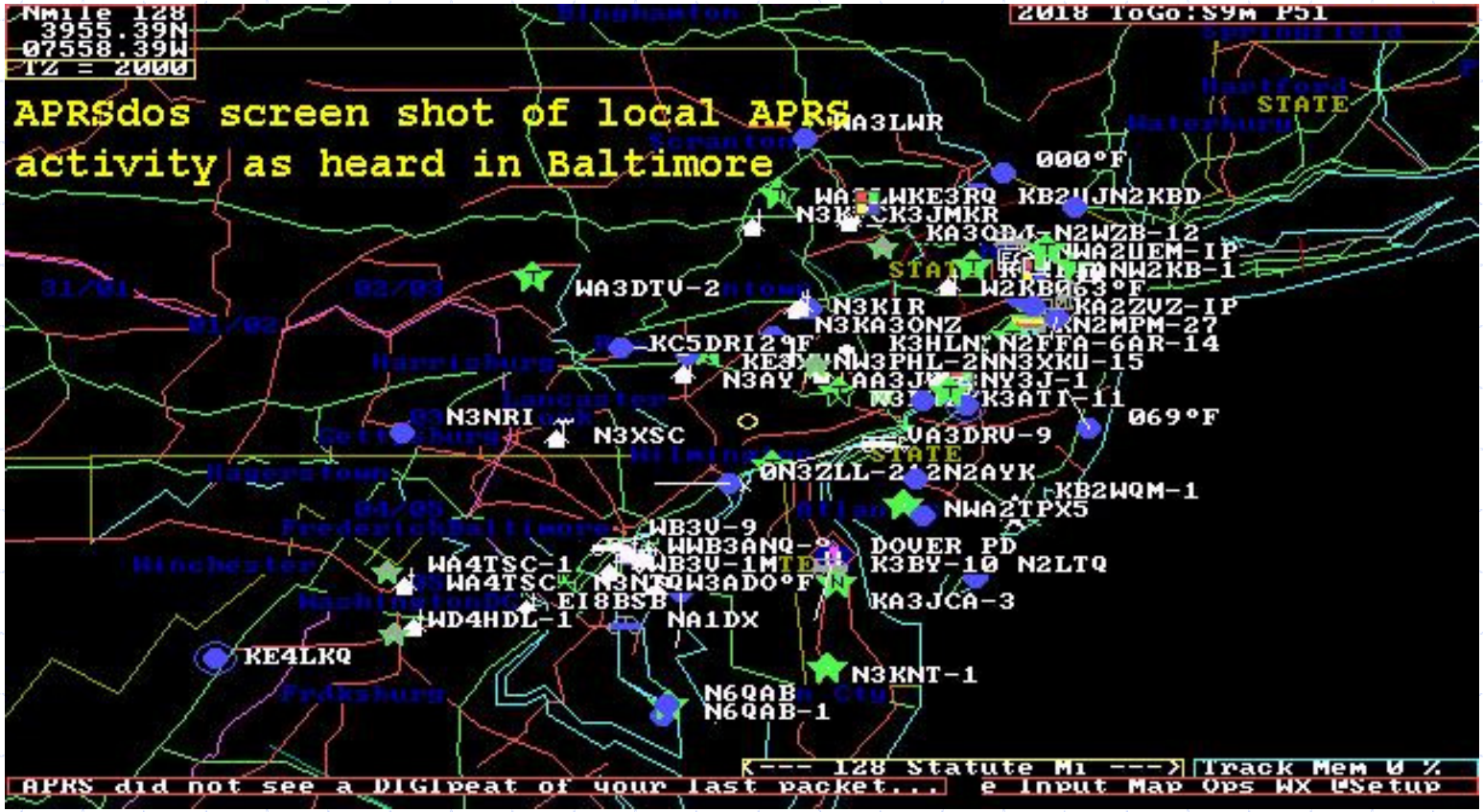
- A local real-time digital network where all-see-all
- Uses all conventional AX.25 1200 baud packet
- Shared simplex channel for simplicity and growth
- Since 1997, integrated with Internet for global view

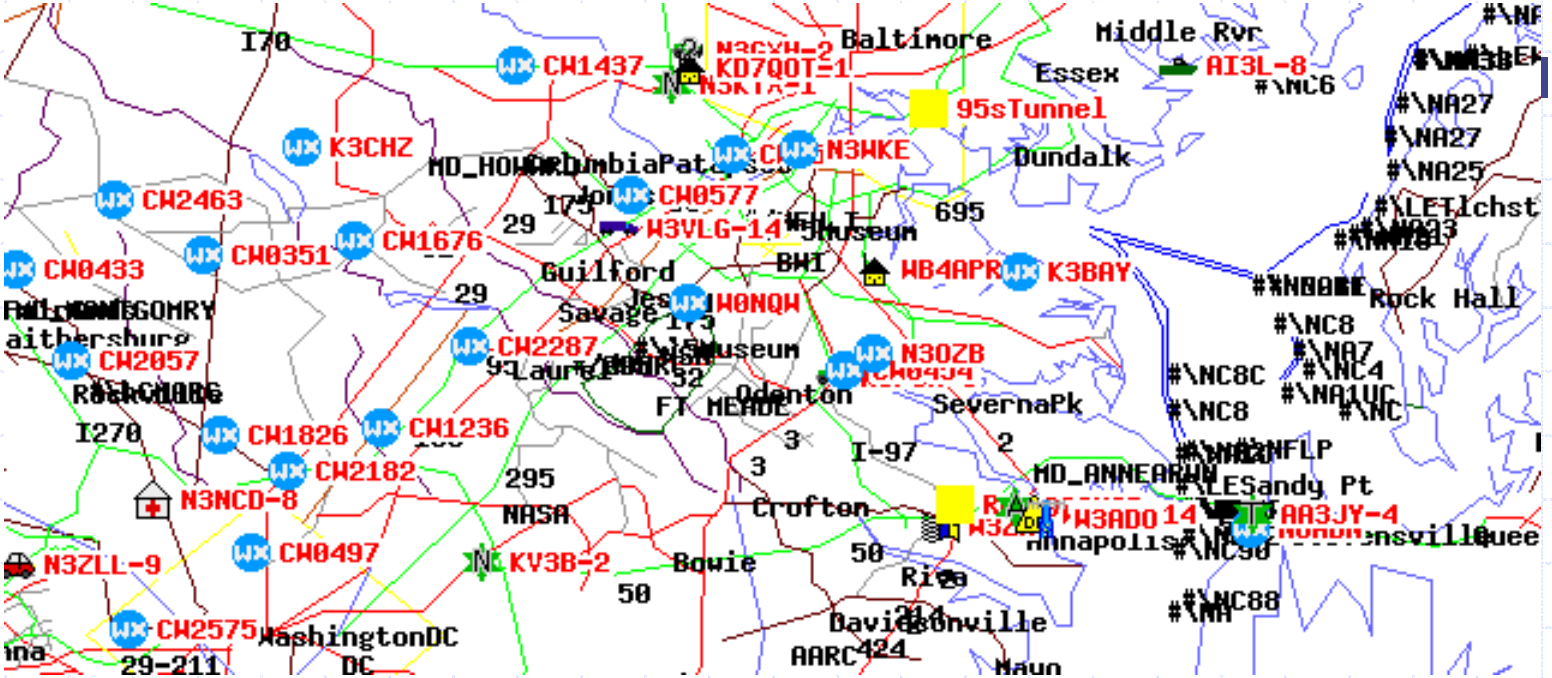
http://www.ew.usna.edu/~bruninga/aprs.html

APRSdos in 1992



128 mi

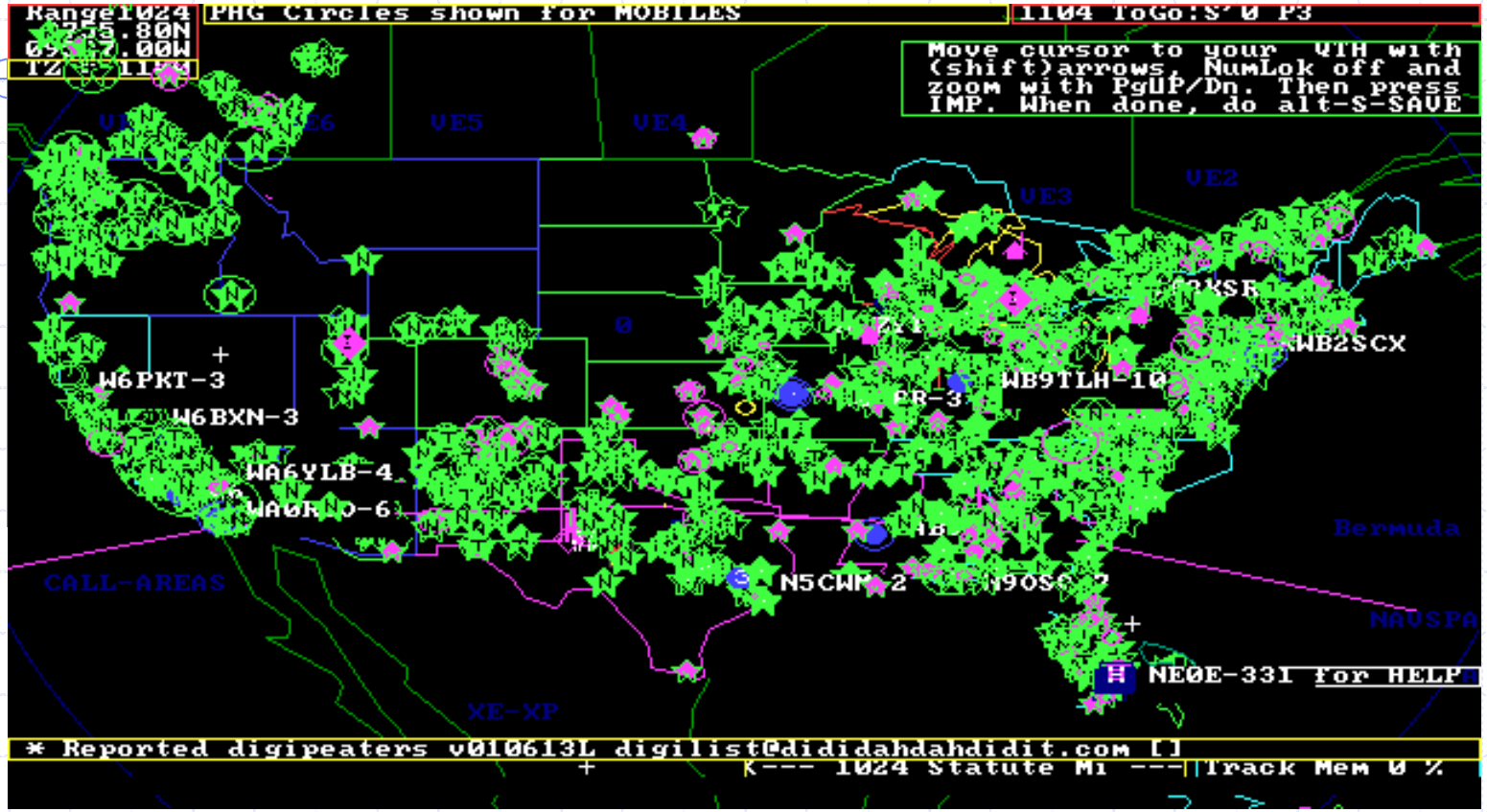
APRS Now (internet view)



32 mi

- View with Browser (no two way or messaging)
- Connect via client (Same as local RF, but global)

APRS digipeaters in 1996



1000 USA digis (with 10,000 user stations)

???? World digis (total of 27,000 user stations)

Vehicle Tracking

Google Search on APRS trackers

Roof top version

Under seat version

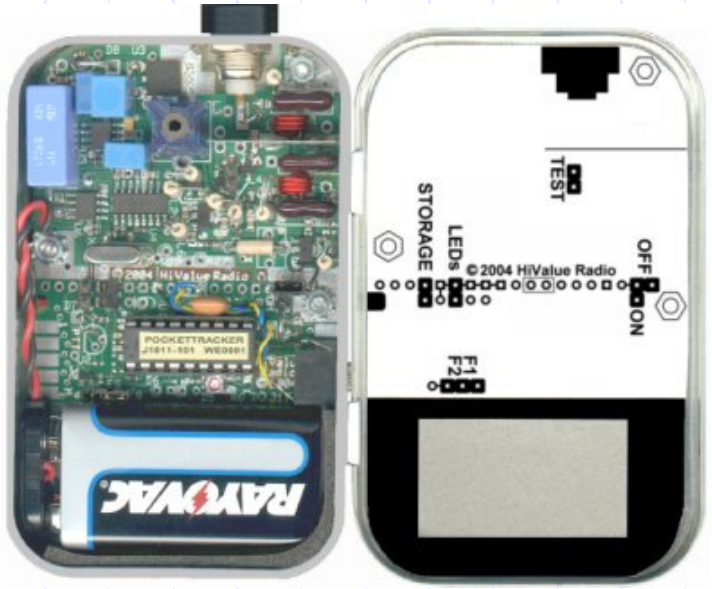
Toolbox version

Carrying case

All-in-one-radio

Personal Tracking

Google: APRS pocket tracker



Pocket Tracker $89 kit:

Runs for 10 Hrs on 9v battery

Includes low power (0.25W) TX on 144.39 144.99

All-In-One APRS Radios

(GPS needed if moving)

Integrated Radio APRS

Dual Band Radio with built-in APRS

- Band A on APRS *&* (PL100 Voice Alert)
- Band B on your favorite repeater (2m or 70cm)

TM-D700 Mobile

TH-D7 HT

GPS & User Map Display

Radio Display:

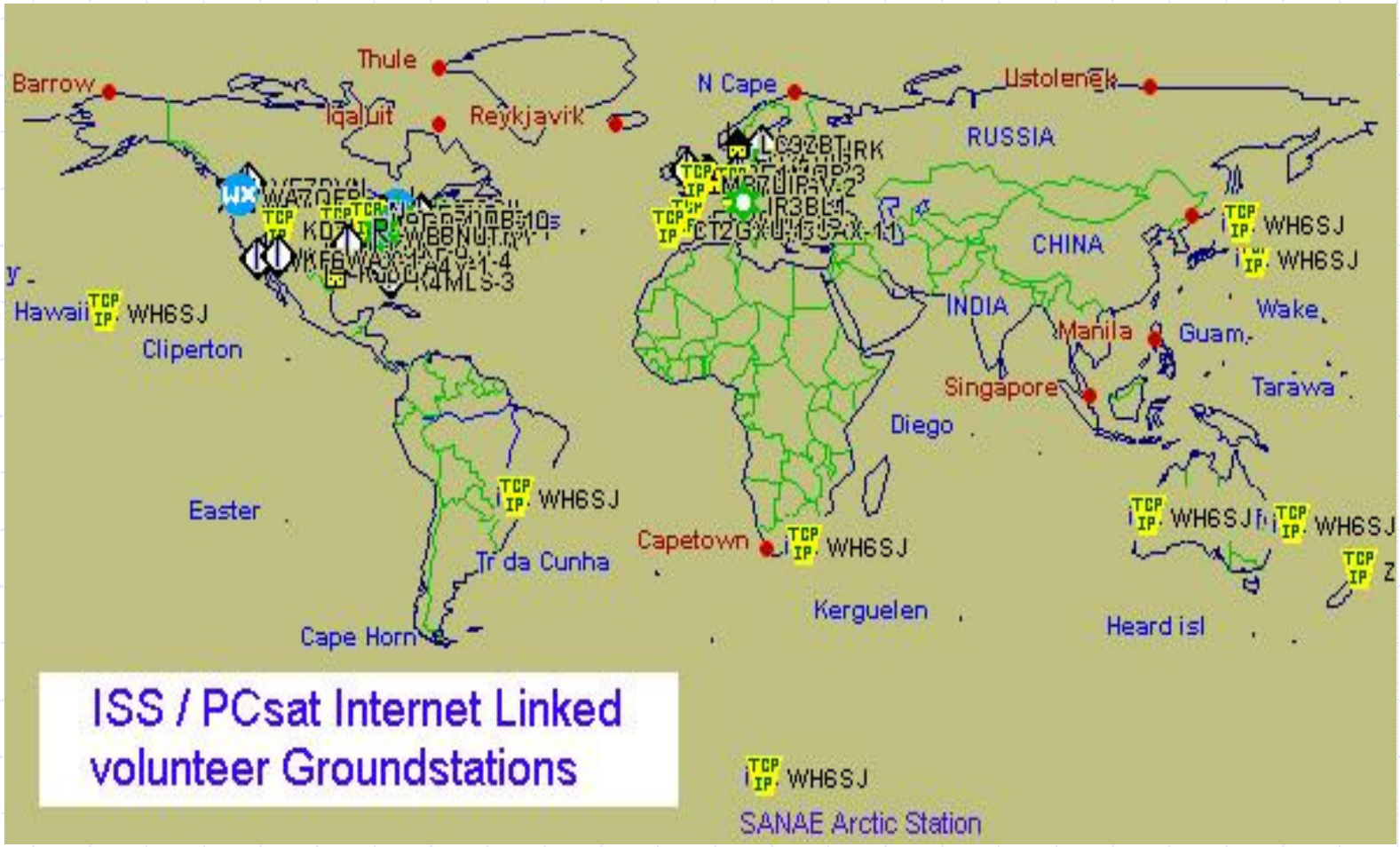
- Stations, Objects, Calls, Icons
- Course/Speed Distance/Bearing
- WX: wind, temp, temp, rain
- Stn: Power, Ant height and gain
- Messages, Bulletins, Announcements
- *Traffic, Satellites in view, Storms

APRS in Utah

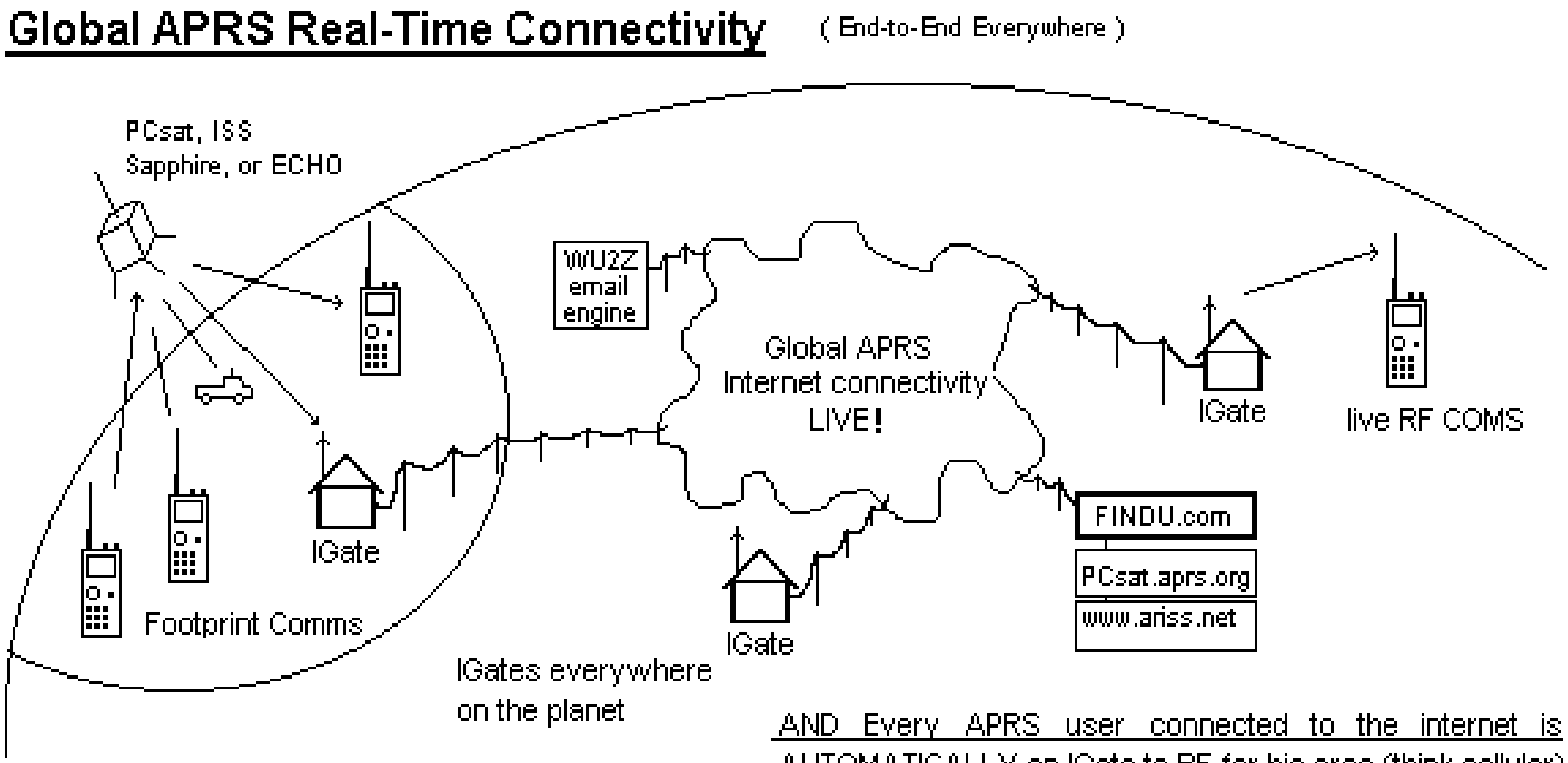
Jfindu.aprs-is.net

- 27 users in S.L.C

APRS around the world



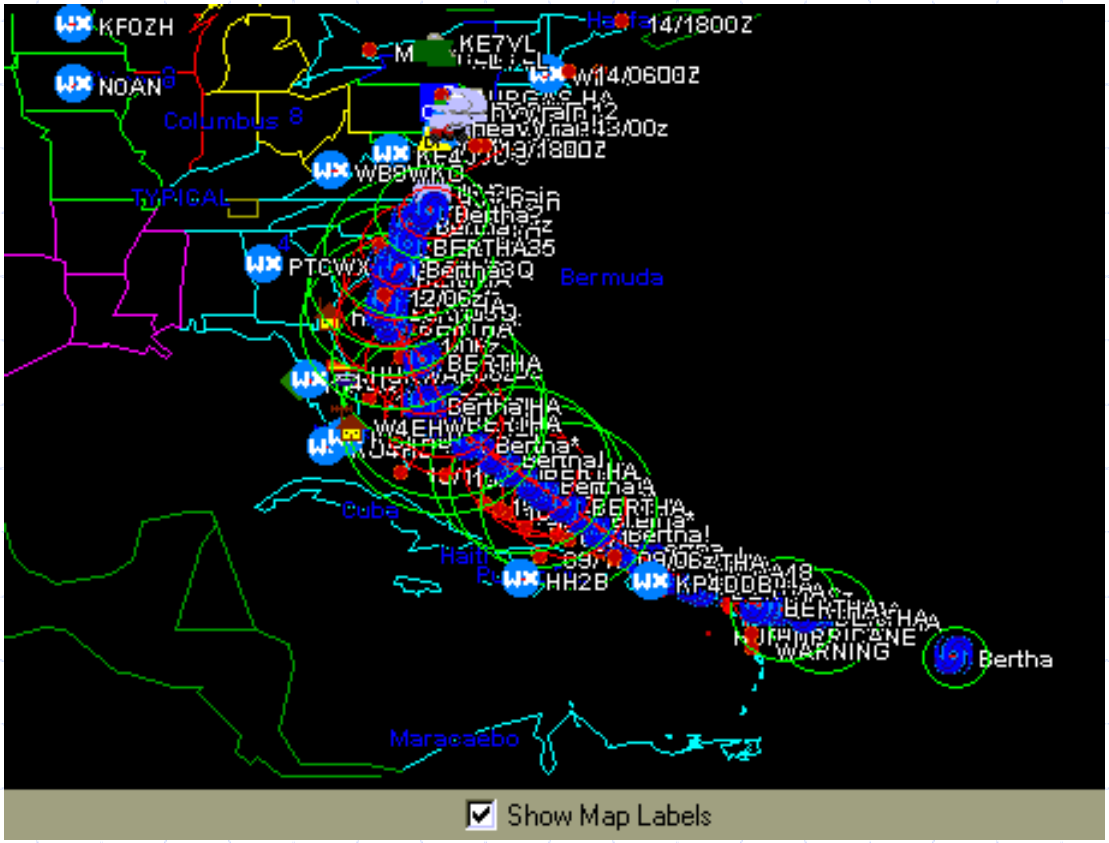
APRS around the world



Special Events

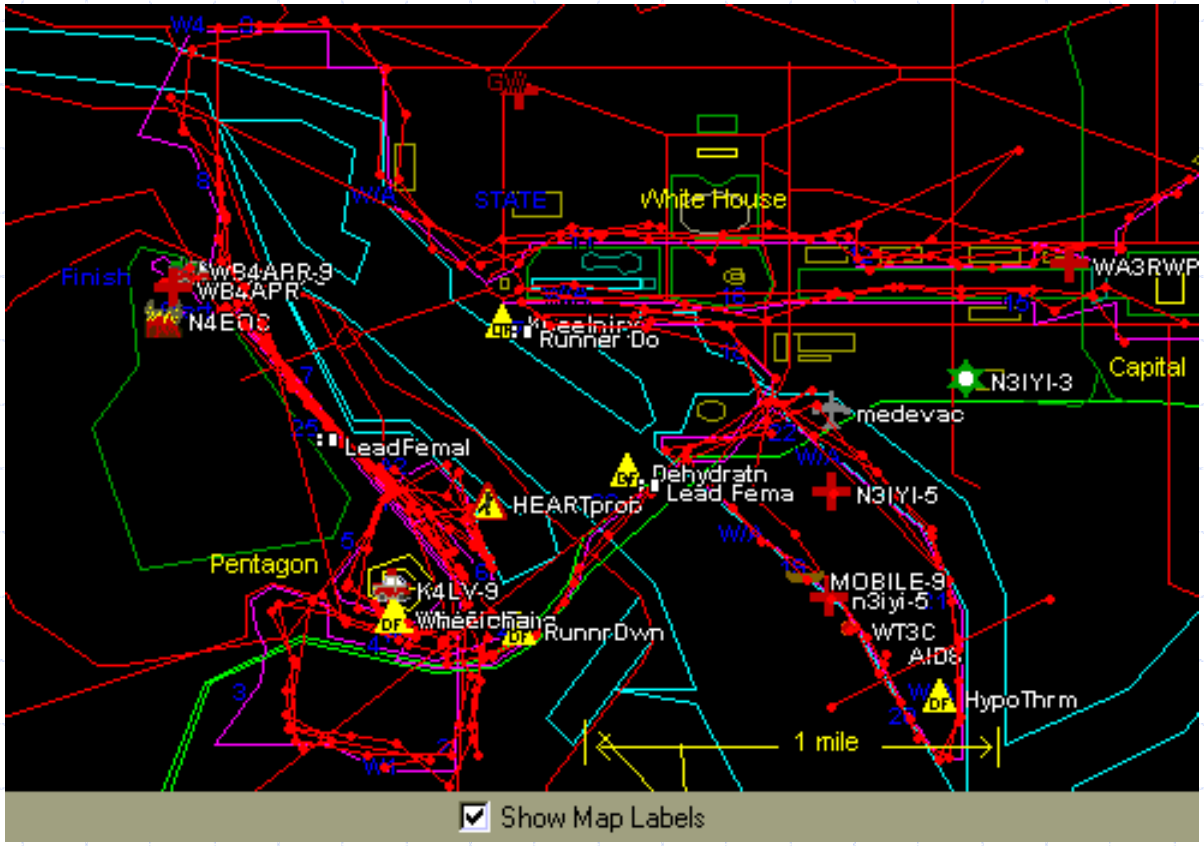
- Stations
- Locations
- Objects
- Tracks
- Areas
- Weather
- Assets
- And Keyboard Messaging

APRS for Weather Tracking



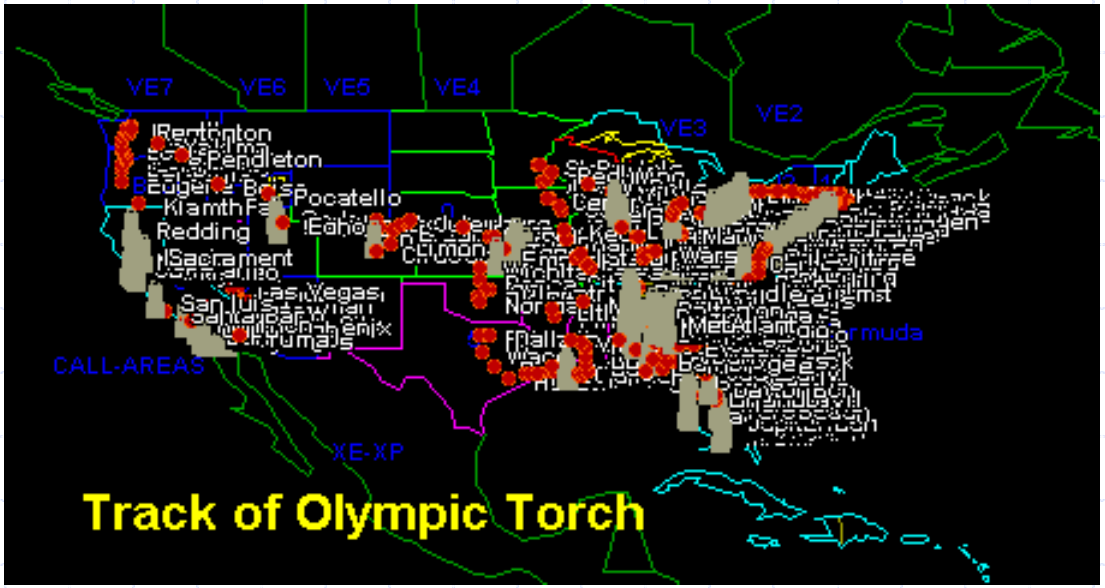
- **WX Reports**
- **Objects**
- **Movement**
- **Predictions**
- **Warnings**
- **Areas**

APRS for Marathons



- Assets
- Lead, Tail
- VIP's
- Comms
- Downed runners
- Ambulances

Tracking Olympic Torch



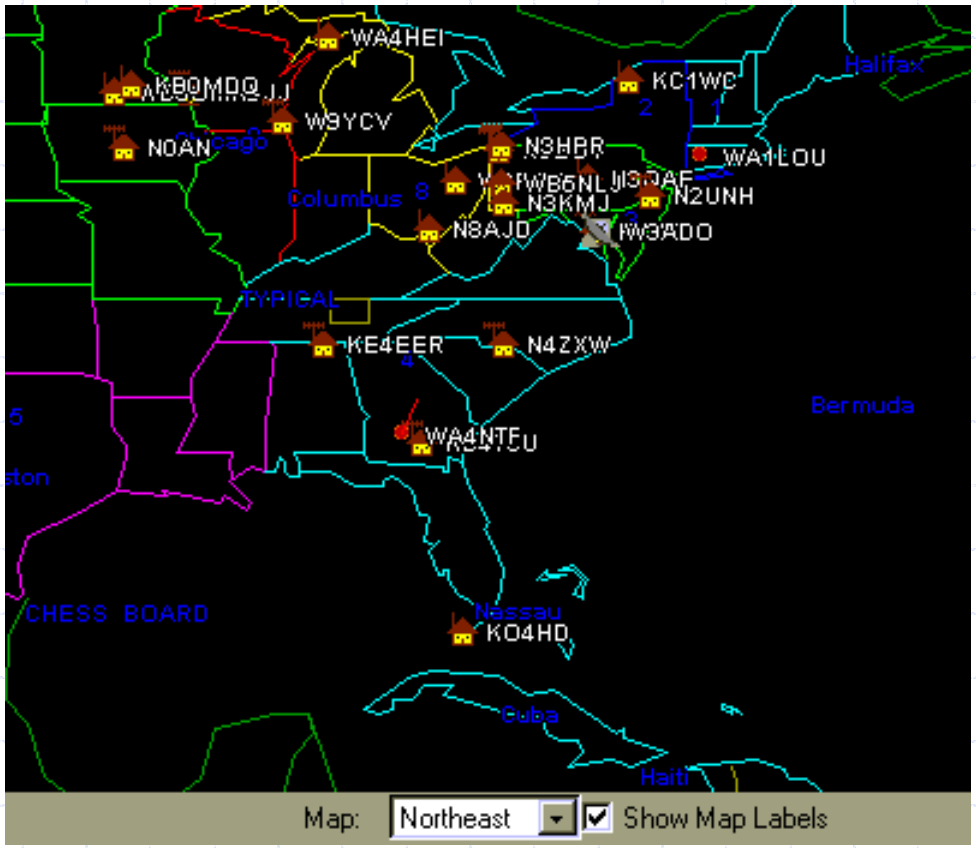
Anywhere in country via HF gates or

These days via Internet Gateways

APRS Perfect for Balloons

- Easy track and recovery
- Typically one every 2 weeks somewhere in the USA
- RF ranges nearly 400 miles

APRS for Meteor Scatter

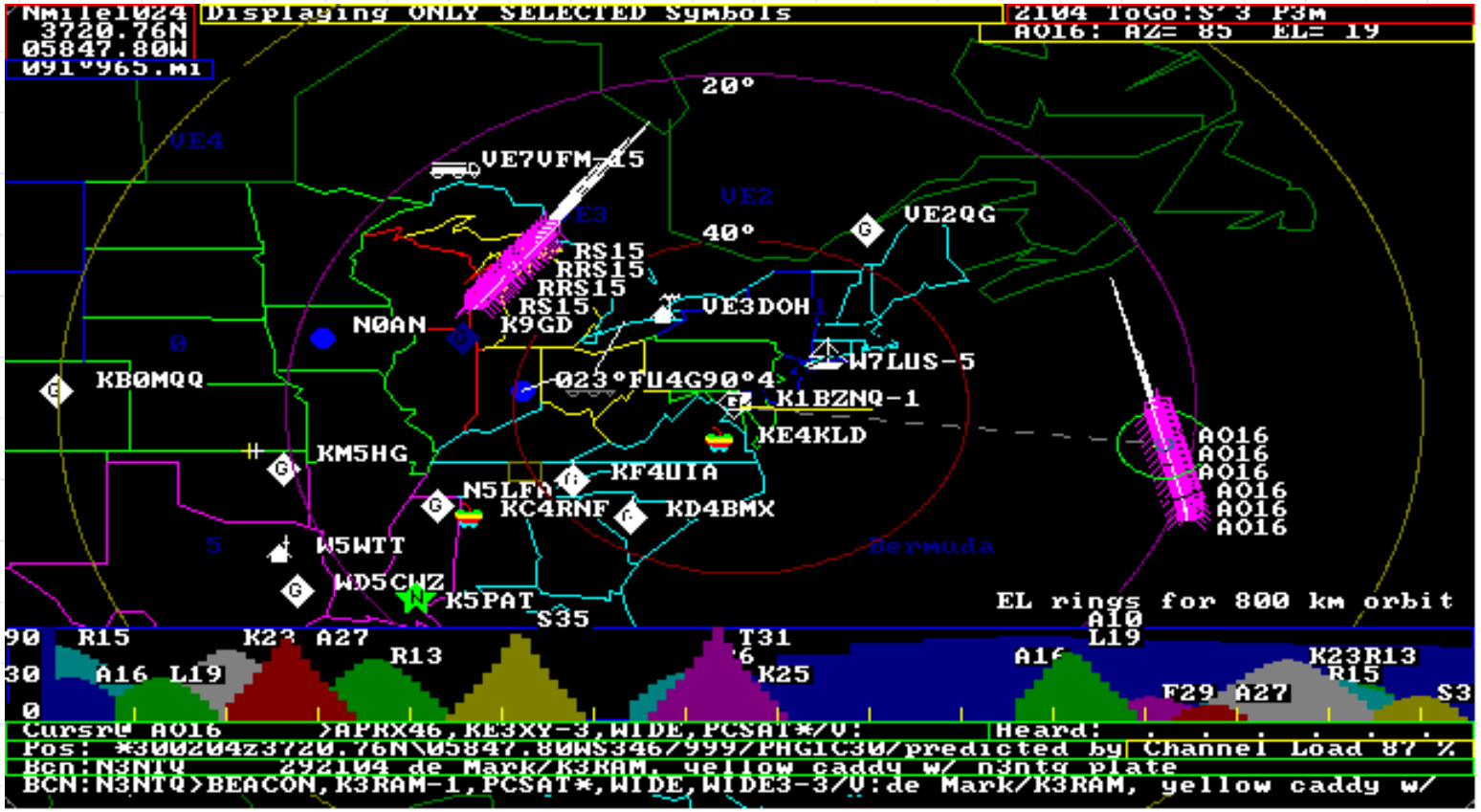


- Everyone TX's
- Short 0.3s packets
- By quadrant for 15s
- Next morning see what you got

APRS Satellites

Shuttle, ISS, Sunsat, PCsat
PCSAT2, ANDE, RAFT, Echo?

http://www.ew.usna.edu/~bruninga/astars.html



MAP display of APRS stations seen on-the-air

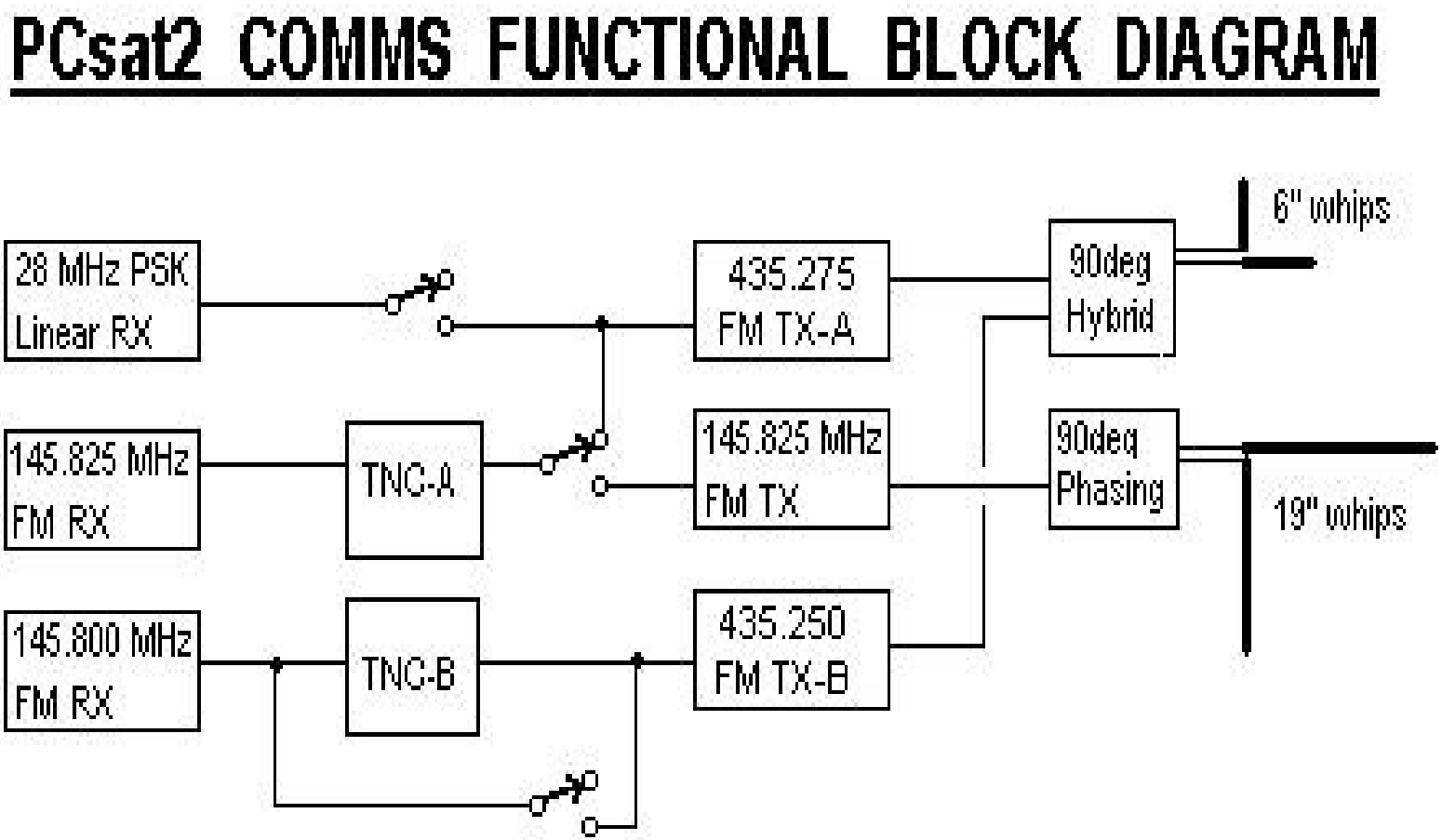
Map shows current position of all satellites

Rings show EL angle from own station

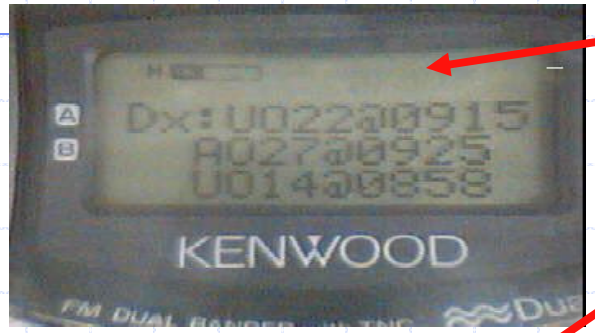
Next 2 hours of Passes. Shows max EL angle

All satellites are shown on the map as moving objects. Across the bottom of the screen the next 2.5 hours of satellite passes are shown in a graphic showing the maximum elevation of the pass.

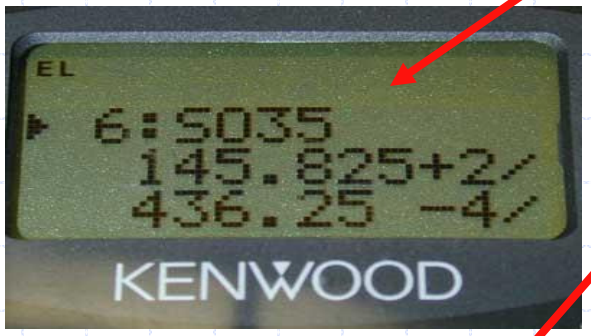
Amateur Satellite Transponders



AMSAT info on your D7-HT



Schedule of next 80 minutes is updated every 10 mins

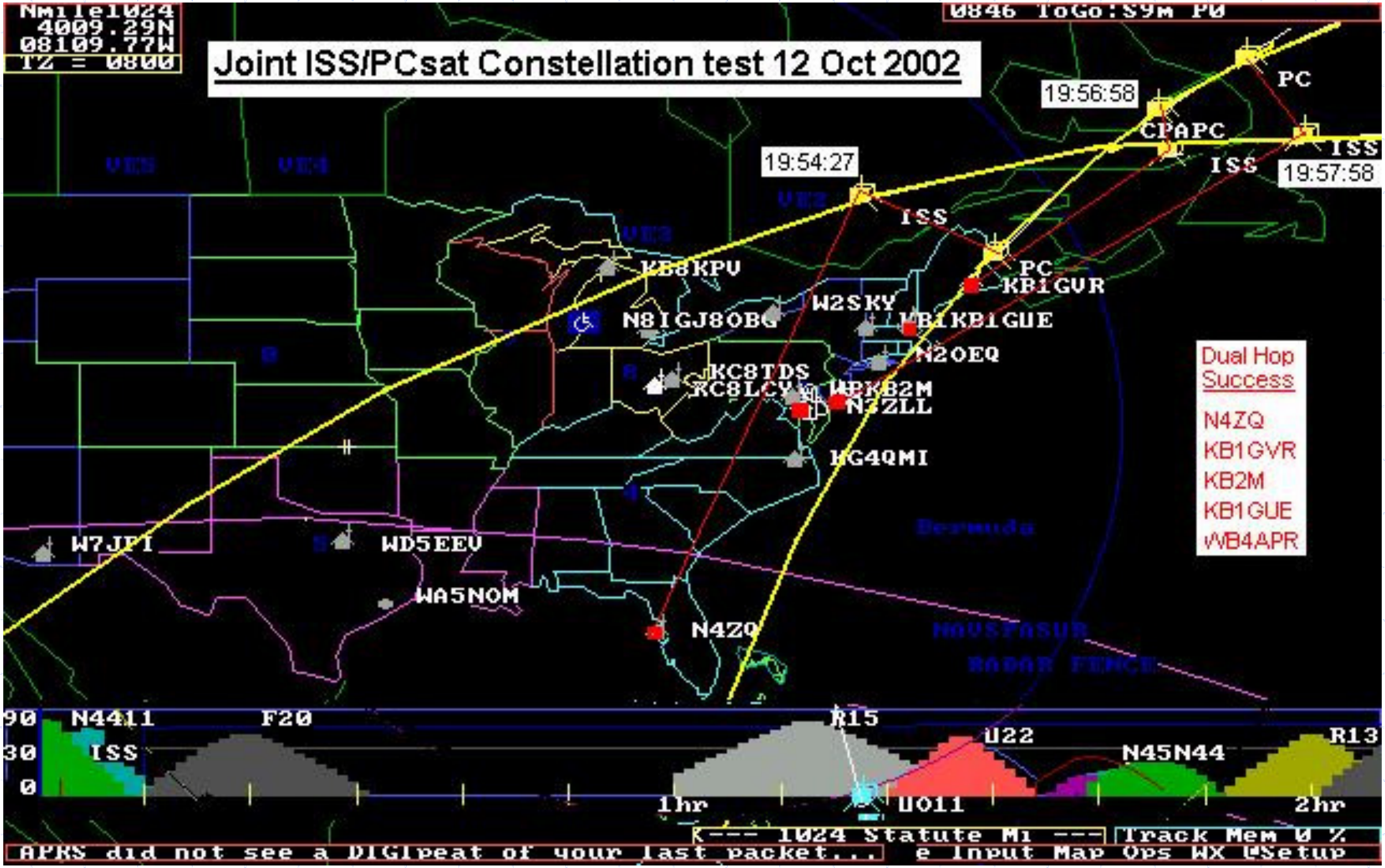


Object Text shows uplink freq, downlink freq & Doppler

Radio shows direction and range to satellite for handheld antenna pointing

Another display shows course and speed of satelite (not shown)

APRS Space Experiments

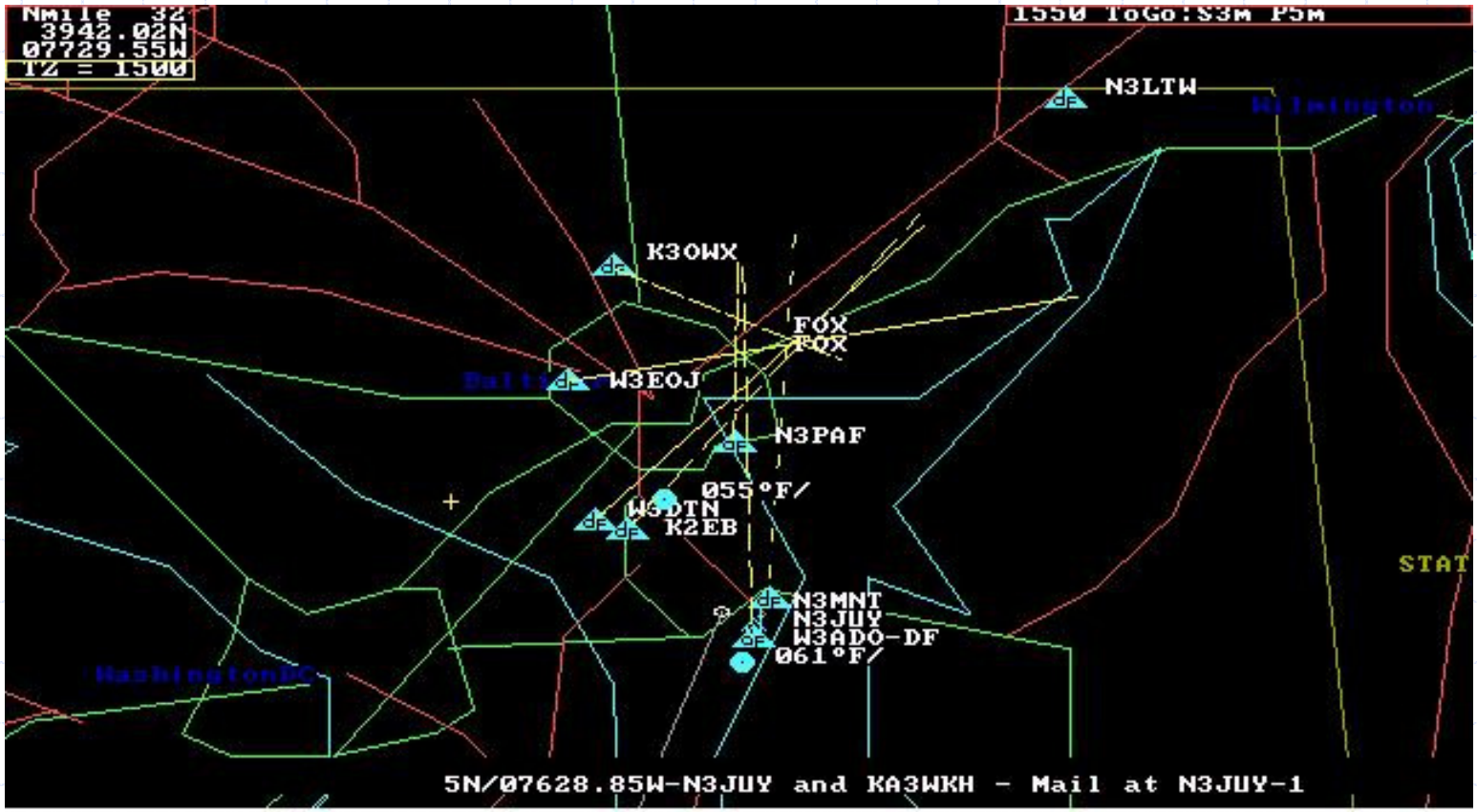


PCSAT2 on ISS next Spring

The preferred location for PCSAT2 is out on the ISS Solar array, beyond the alpha joint so that it gets full sun when ISS is in Sun. Our preferred location is shown with the arrow.

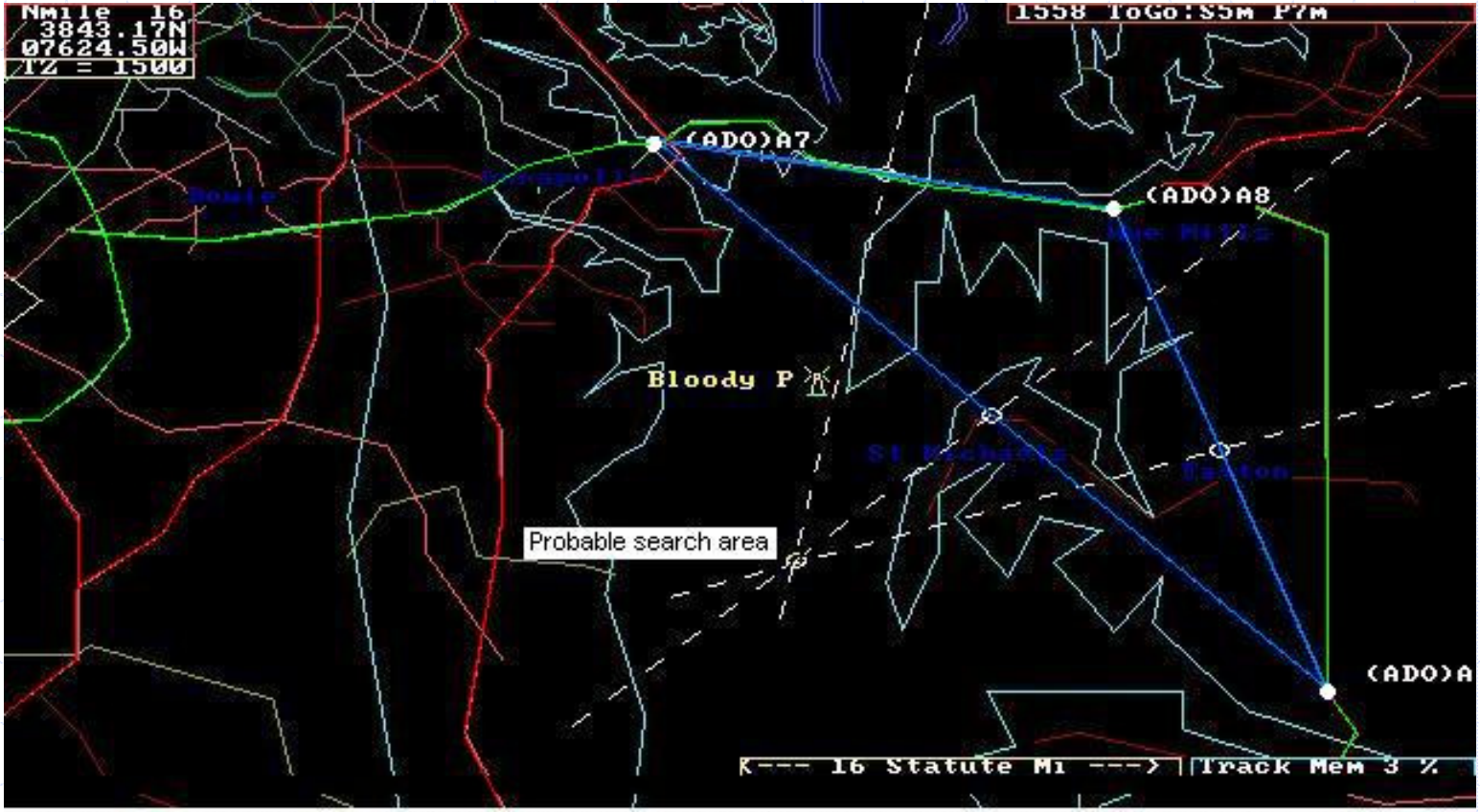
Direction Finding (Classic Beams)

http://www.ew.usna.edu/~bruninga/dfing.html



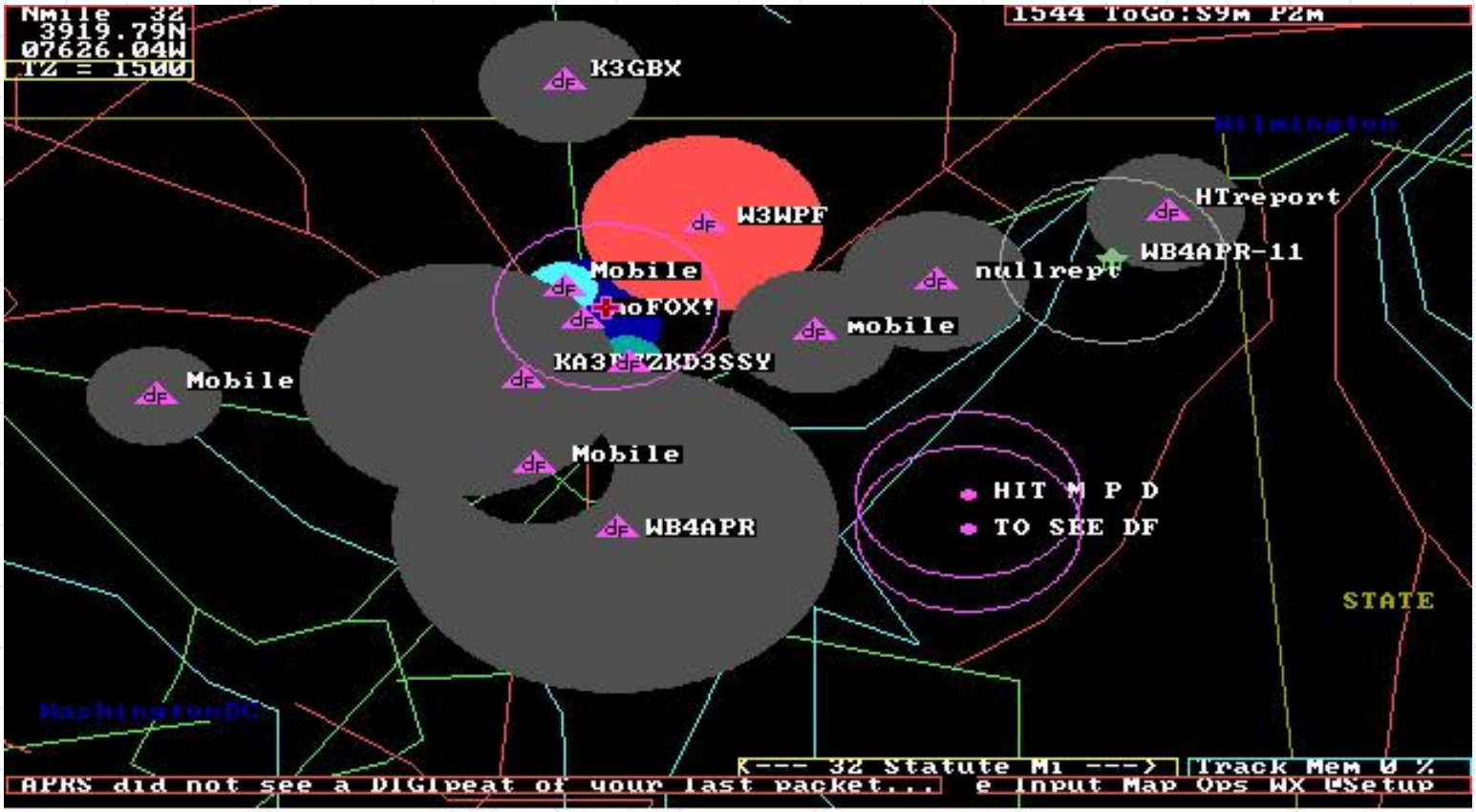
MAPS-PLOTS-DF - This is the classic APRS DF plot. But it takes DF stations that can provide DF bearings. In the real world, less than say 2% of ham operators on the air have BEAMS or can give you real-time -as-you-are DF bearings. Thus, forget being able to use this technique except when PLANNED. Instead, PRACTICE your OMNI-DF techniques. EVERYONE can provide data!

DF-ing by Fade-Circle-Technique



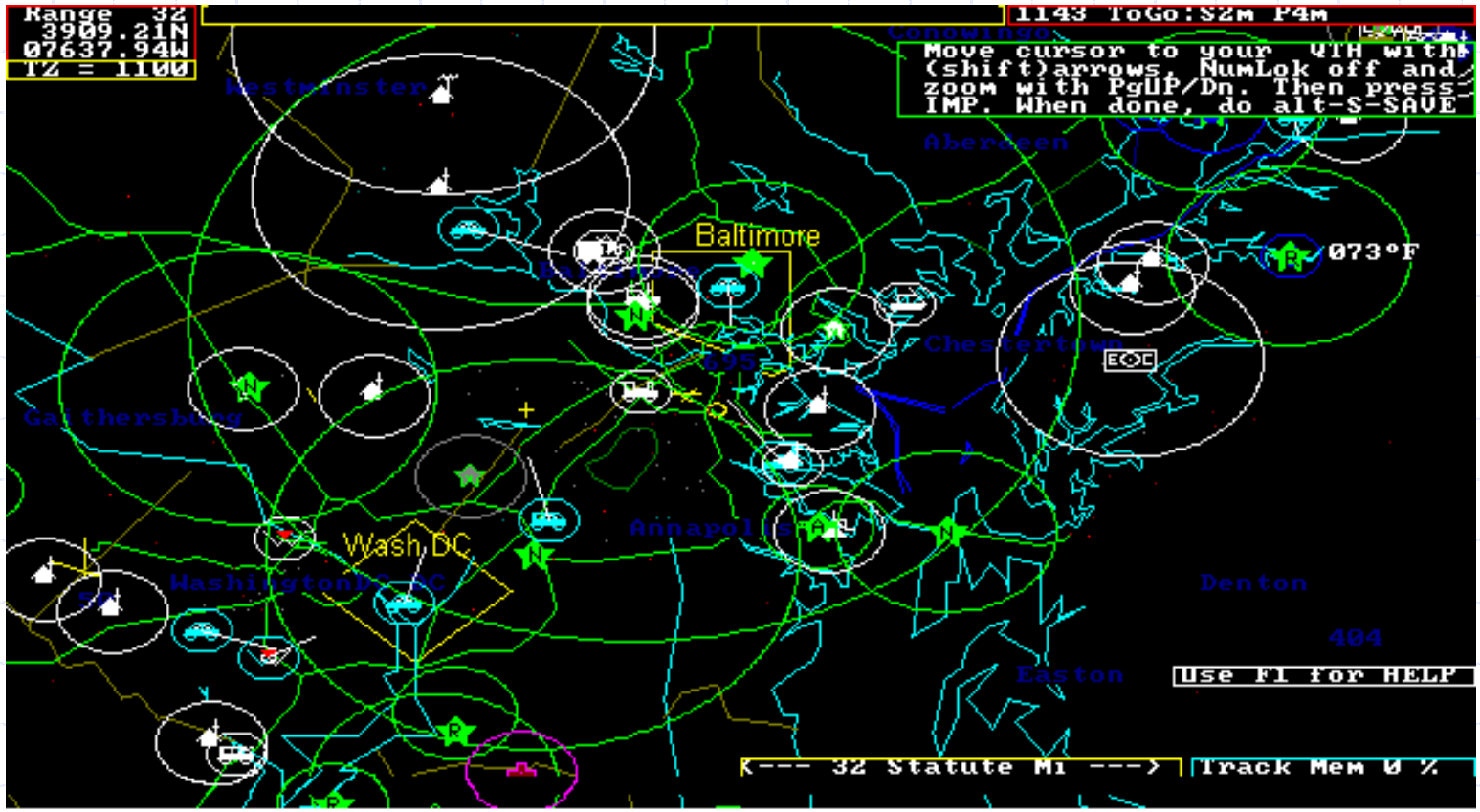
MAPS-PLOTS-DF-FADEcircle - This technique allows a single individual to locate the approximate source of a signal. Just Drive until the signal fades out. Hit F5 key. Turn around, drive the other way to the fade. Hit F5 key. Go a third direction until it fades again. Hit the F5 key. Then hit MAPS-PLOTS-DF-FADE 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 WILL find the signal as long as you have enough gas...

OMNI-Direction finding



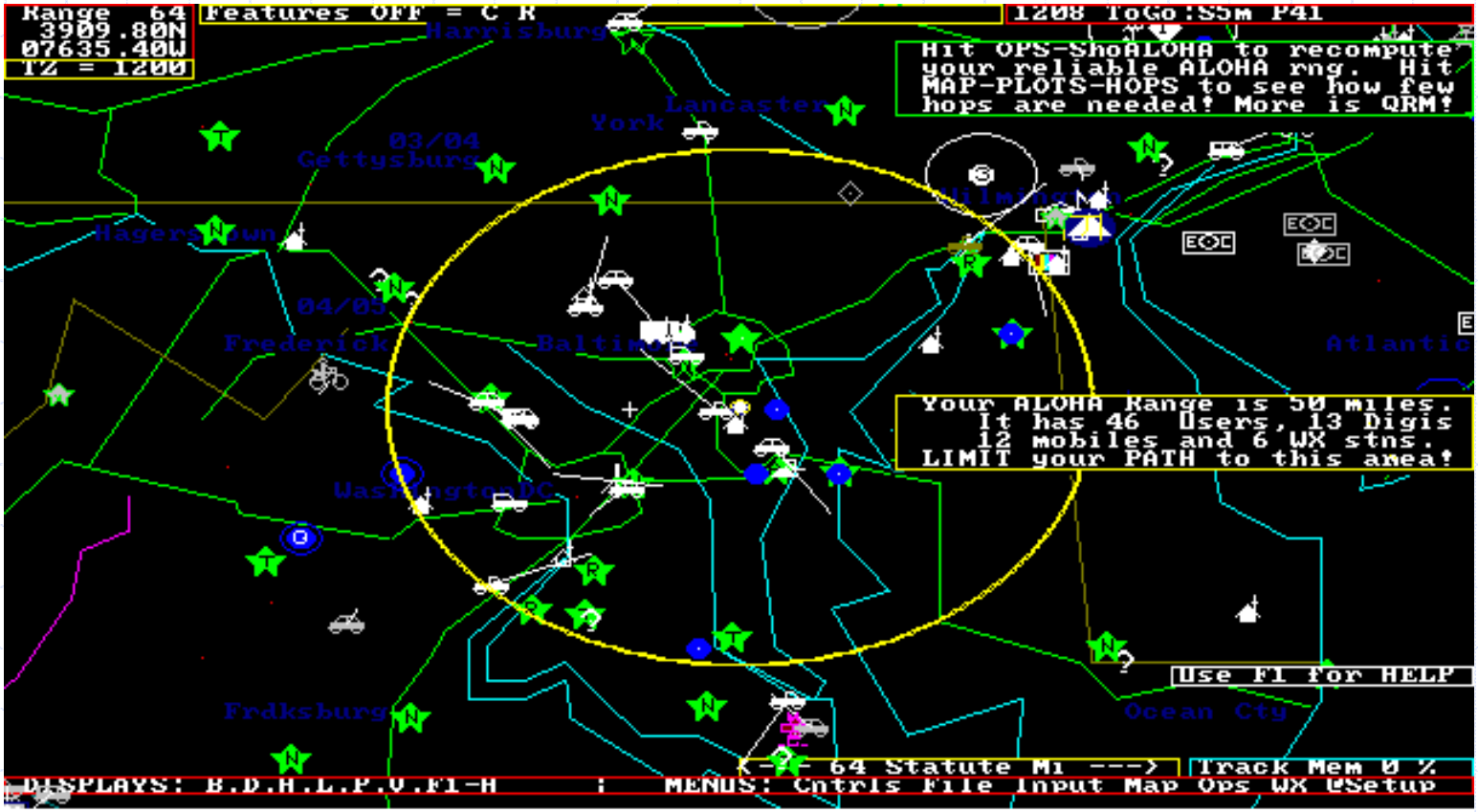
MAPS-PLOTS-DF-OMNI display of overlapping signal strength contours. All of these "voice" signal reports were entered rapidly on APRS as objects, and everone can see that the FOX was found near the intersection of the colored circles. Notice how VALUABLE the "no-signal" reports were. THey show you almost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

Station 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.

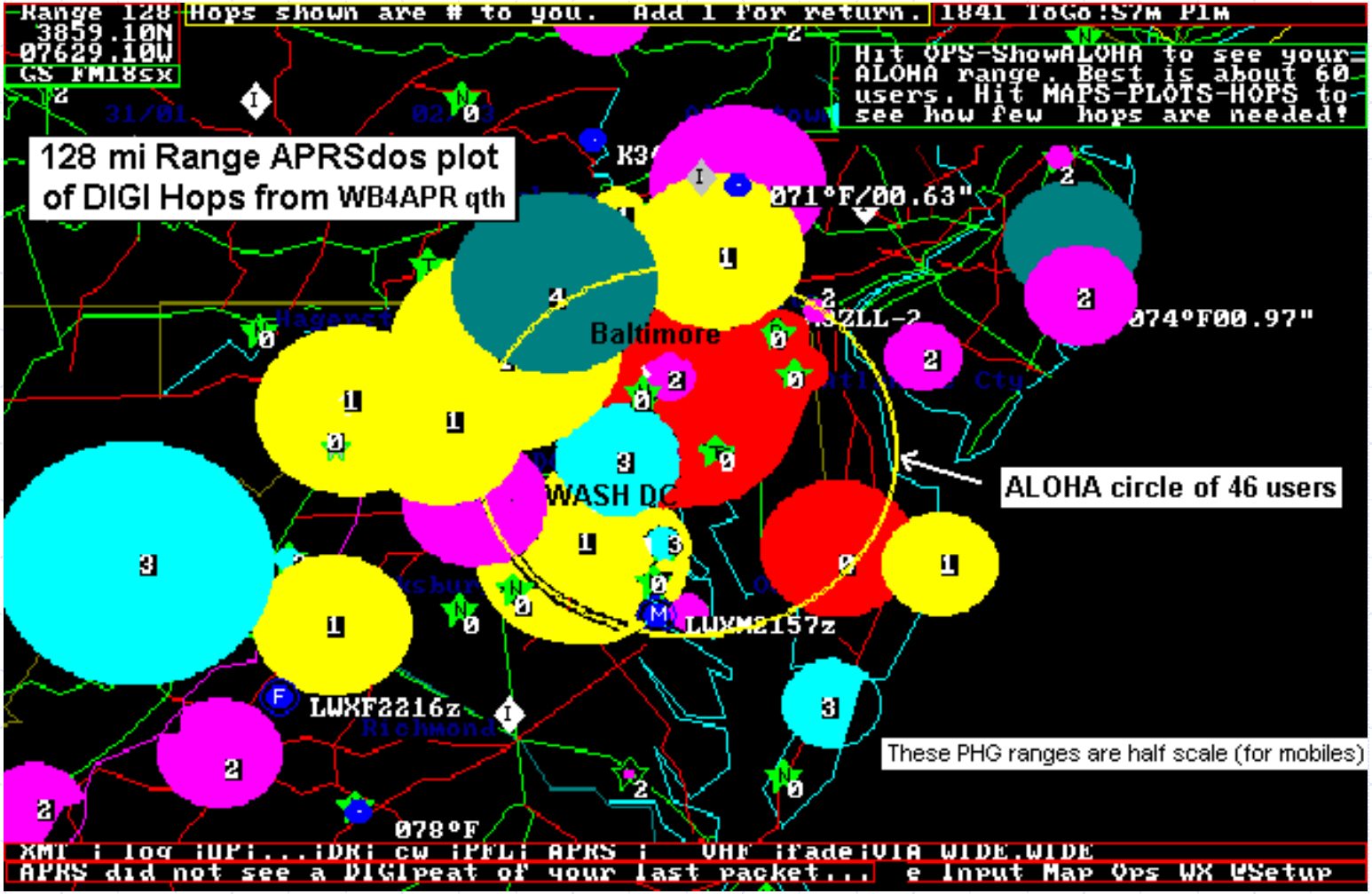
ALOHA Circle (channel capacity)



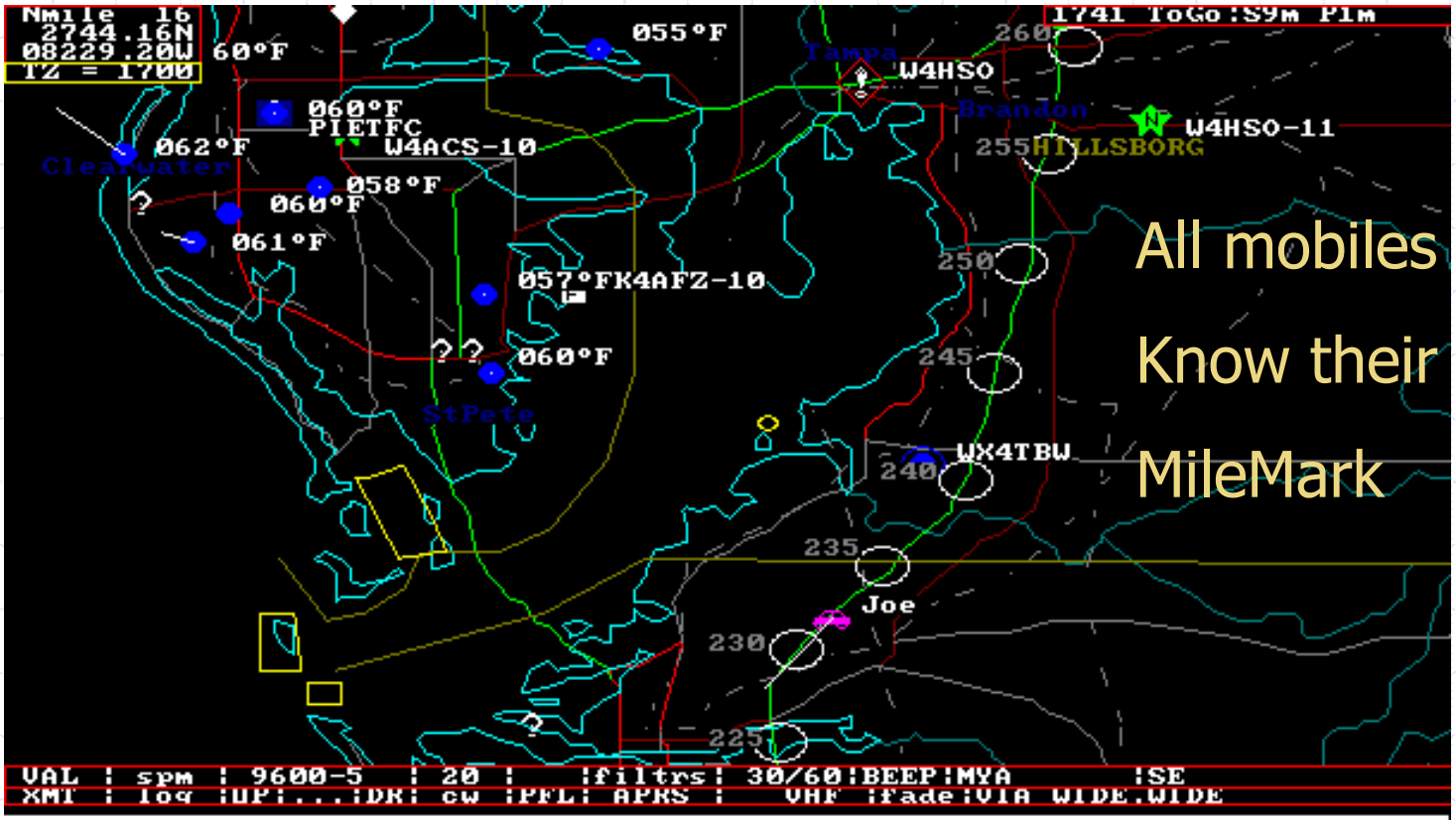
This APRSdos map has all roads and streams turned off to clearly show the ALOHA circle and users. It contains the number of users shown in the yellow box. Those 46 stations generate 1800 packets per 30 minute period (including an additional copy for each digi involved.) for a fully loaded channel. Any attempts to communicate beyond that circle are GUARANTEED QRM to others.

DIGIpeater Hops

1 or 2 hops covers 100 users!



Highway Mile Mark Reporting



This APRSdos map of Tampa shows how Mile Marks can be overlayed 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.

APRS is everywhere!

Digipeaters are trivial to put up

APRS can use ANY station as a digipeater

APRS network can be come-as-you are

APRS is not an end in itself. It is simply a digital channel for everyone to exchange info of every type to everyone on channel

You can voyer worldwide on the Internet

(or tune us in on 144.39 in USA)…