

Automatic Packet Reporting System (APRS)

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What is APRS?

- An Amateur Radio-based system for real time tactical digital communications of information of immediate value in the local area.
- Data can include:
 - An object's GPS coordinates;
 - Weather station telemetry;
 - Text messages, announcements and queries; and
 - Other telemetry.

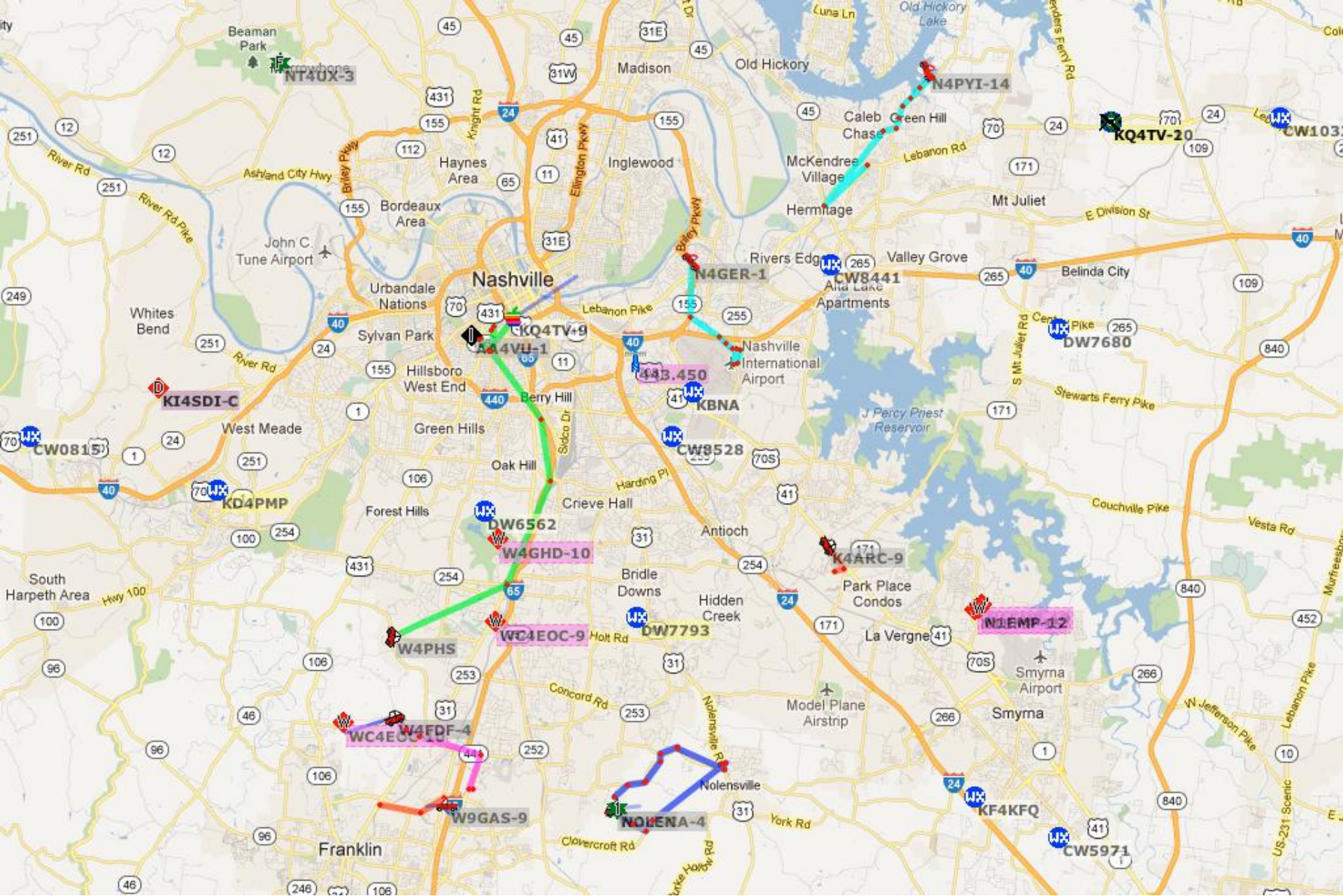
History of APRS

- 1982 - Bob Bruninga, USN engineer, developed earliest version of APRS on Apple II computer.
- 1984 - More advanced version on a Commodore VIC-20 for 160 km horse race
- 1986 - Tested in FEMA disaster exercises.
- 1990s – Widespread GPS use. System evolved to report more than just position.

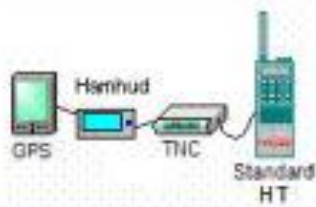
Why is APRS Special?

- APRS data can be displayed on a map which can show stations, objects, tracks of moving objects, weather stations, search and rescue data, and direction finding data etc.





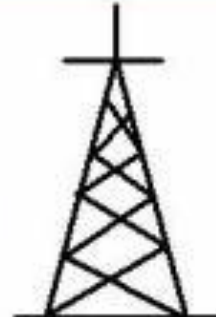
APRS



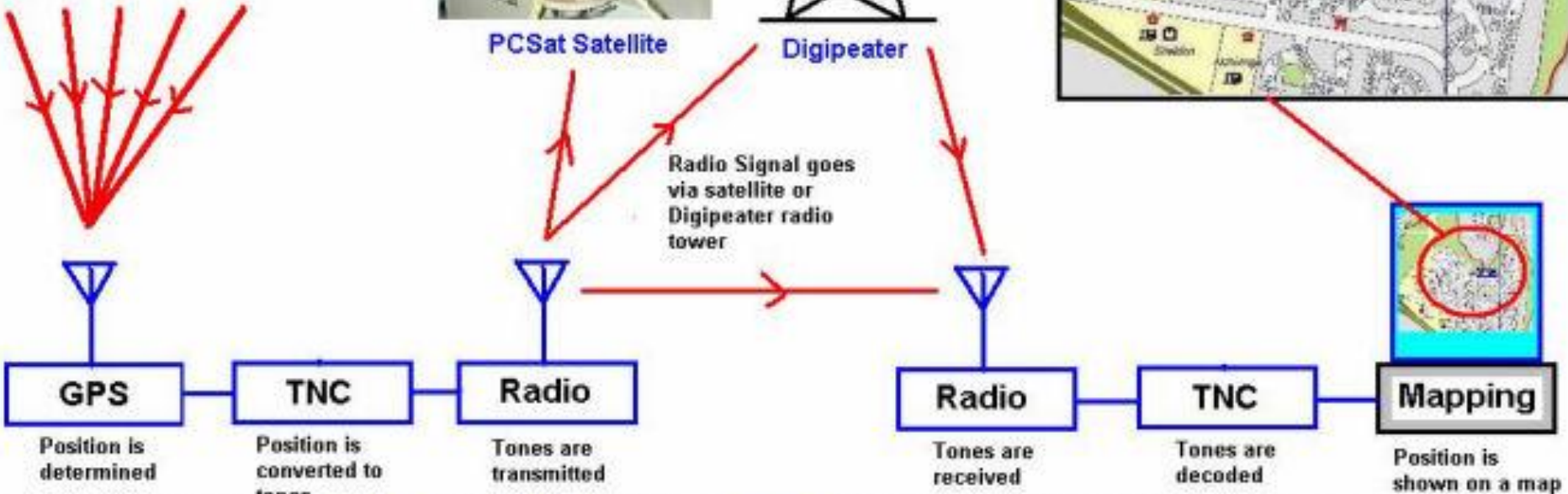
GPS Satellite



PCSat Satellite



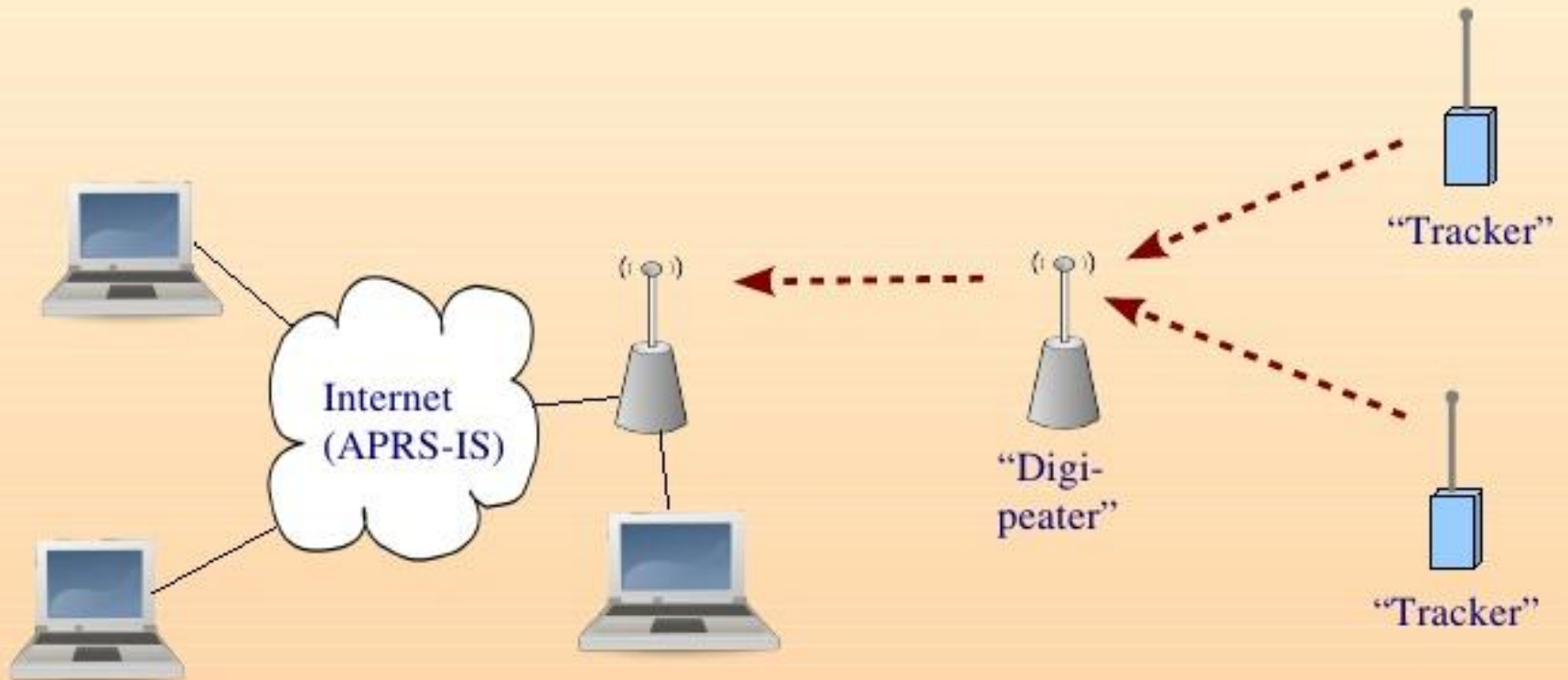
Digipeater



2010-10-12 15:59:50 UTC: [WD4HDL-1](#)>[APN383_KV3B-1](#),WIDE2*,qAR,[KB3RRL-3](#):13844.05N507750.15W#PHG5632/W3,VA n Viewtree Mtn Warrenton,VA



Internet Gateway



APRS and High Altitude Balloons

- Yes – APRS is used in High Altitude Balloons!
- Enables real-time tracking up to and possibly after landing.
- Some systems include altitude information.
- Some offer extra telemetry information.
- Use 144.390 MHz to take advantage of existing digipeaters and Internet gateways.

Beacon



Battery



Camera



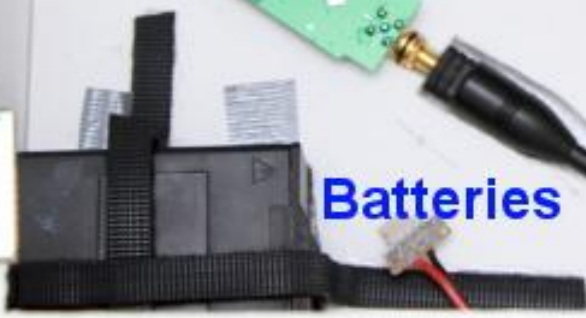
APRS



GPS

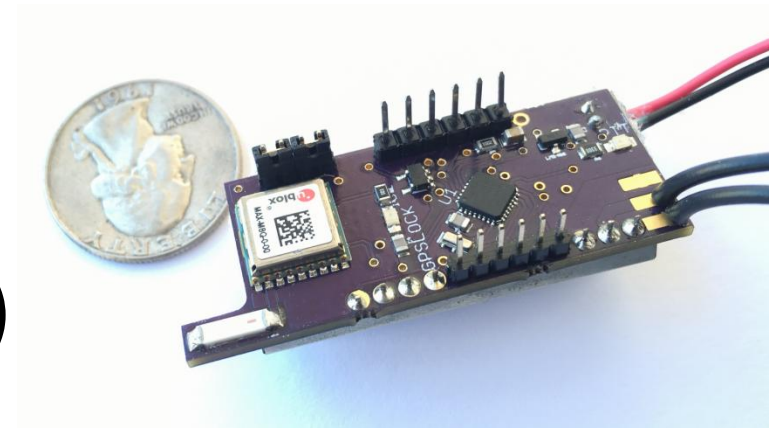


Batteries



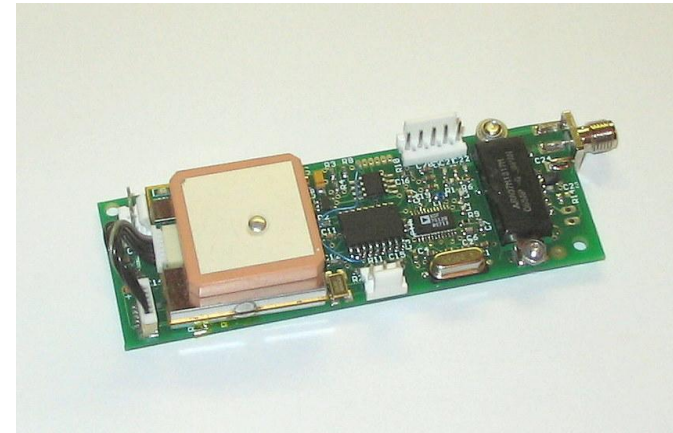
Tracksoar Tracker

- Reports location, altitude, temperature pressure and humidity
- Extra sensors can be added
- 45 grams (not inc. batteries)
- 300 mW on 144.390 MHz
- One data burst/minute for 12 hours with two AA batteries
- \$200.00 USD



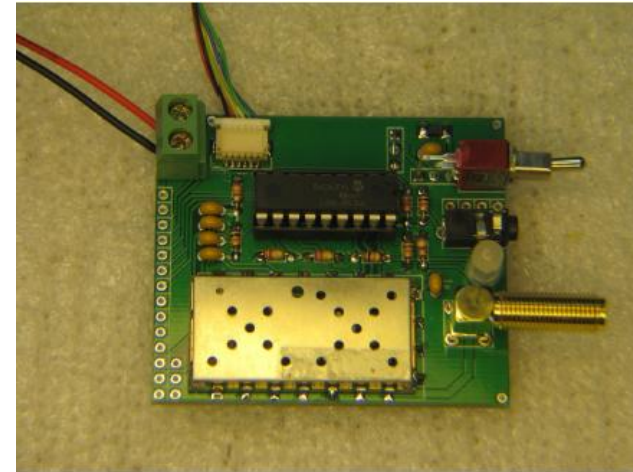
Big Red Bee BLGPS

- Reports location and altitude
- 136 grams (with five AA batteries)
- 1 – 5 watts depending on voltage (4 – 12 VDC)
- One data burst/minute for 48 hours
- \$265 USD



Byonics MicroTrak 1000

- Reports location (altitude?)
- 105 grams (includes antenna, but not three AA batteries)
- GPS guaranteed to 84 km ASL
- 1 watt output into supplied dipole antenna
- One data burst /2 minutes for no more than 3 days
- \$220.00 USD



High Altitude Science Radio Bug

- Reports location (altitude?)
- 25 grams (not inc batteries)
- 250 mW into supplied dipole antenna
- Not much documentation available online
- \$200.00 USD



Recommendations

- Several options available – will require research to select optimum tracker.
- We can build antenna – easy to do.
- Consider water landing – want antenna vertical.
- Once on ground, signal may not reach digipeater – may want to have a backup system to retrieve payload.

Questions?