

Advanced APRS System

SBARA Holiday Raffle 2009

SBARA 2009

Umesh Ghodke (K6VUG) & Al Rendon (WT6K)

APRS Basics

- Automatic Position Reporting System
- Broadcast your location & information
- Display information about other stations
- Based on amateur radio packet channels
- Useful for:
 - Community: friends, group activity, fox hunts
 - Tracking & Telemetry: vehicles, payloads
 - Search & Rescue: personnel, mapping, etc.

APRS Data

APRS Data Elements (NMEA Format)

- Your Call Sign
- Routing Call Signs (Path)
- Latitude, Longitude, Icon, Speed, Direction & Altitude
- Short Text Comment

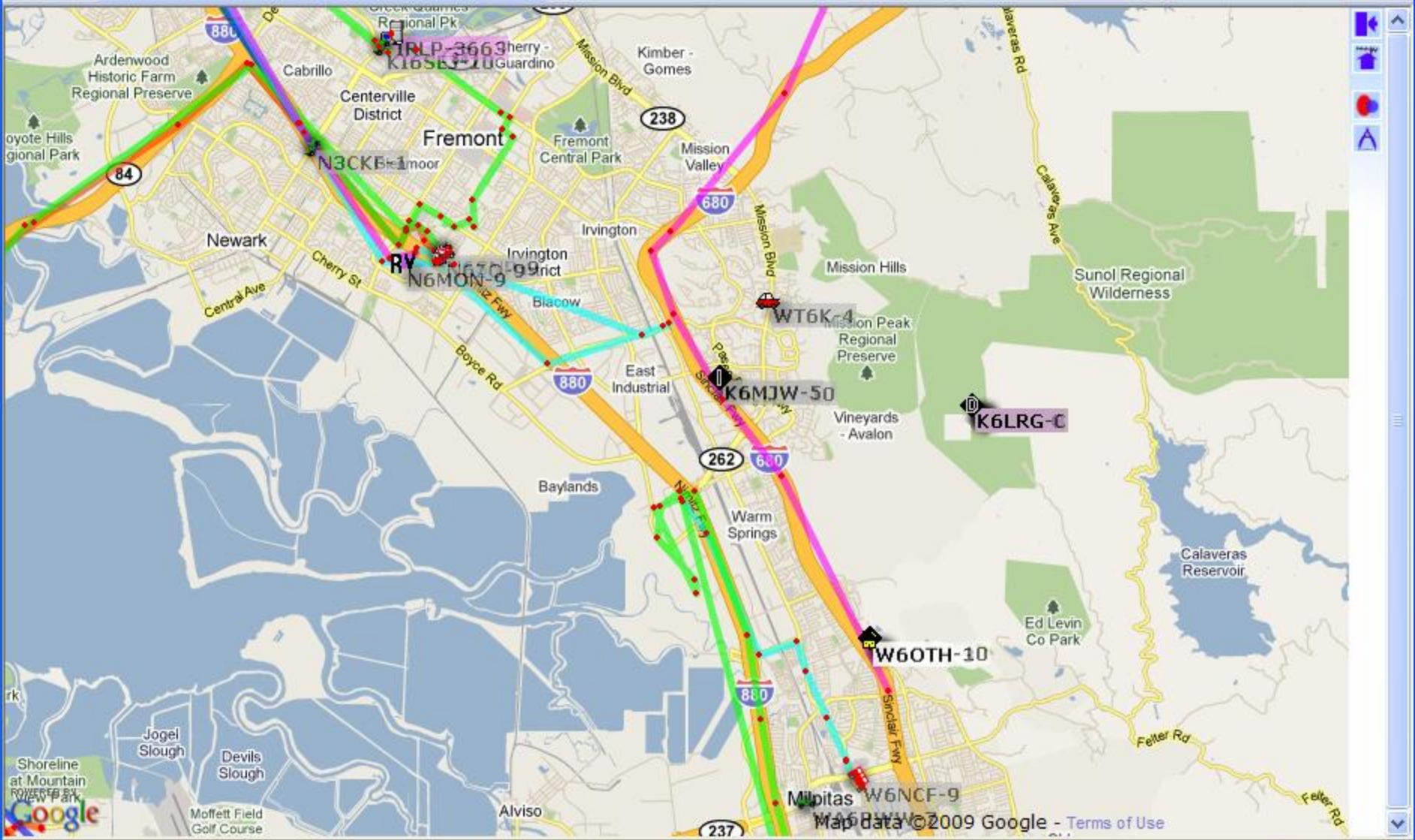
Example:

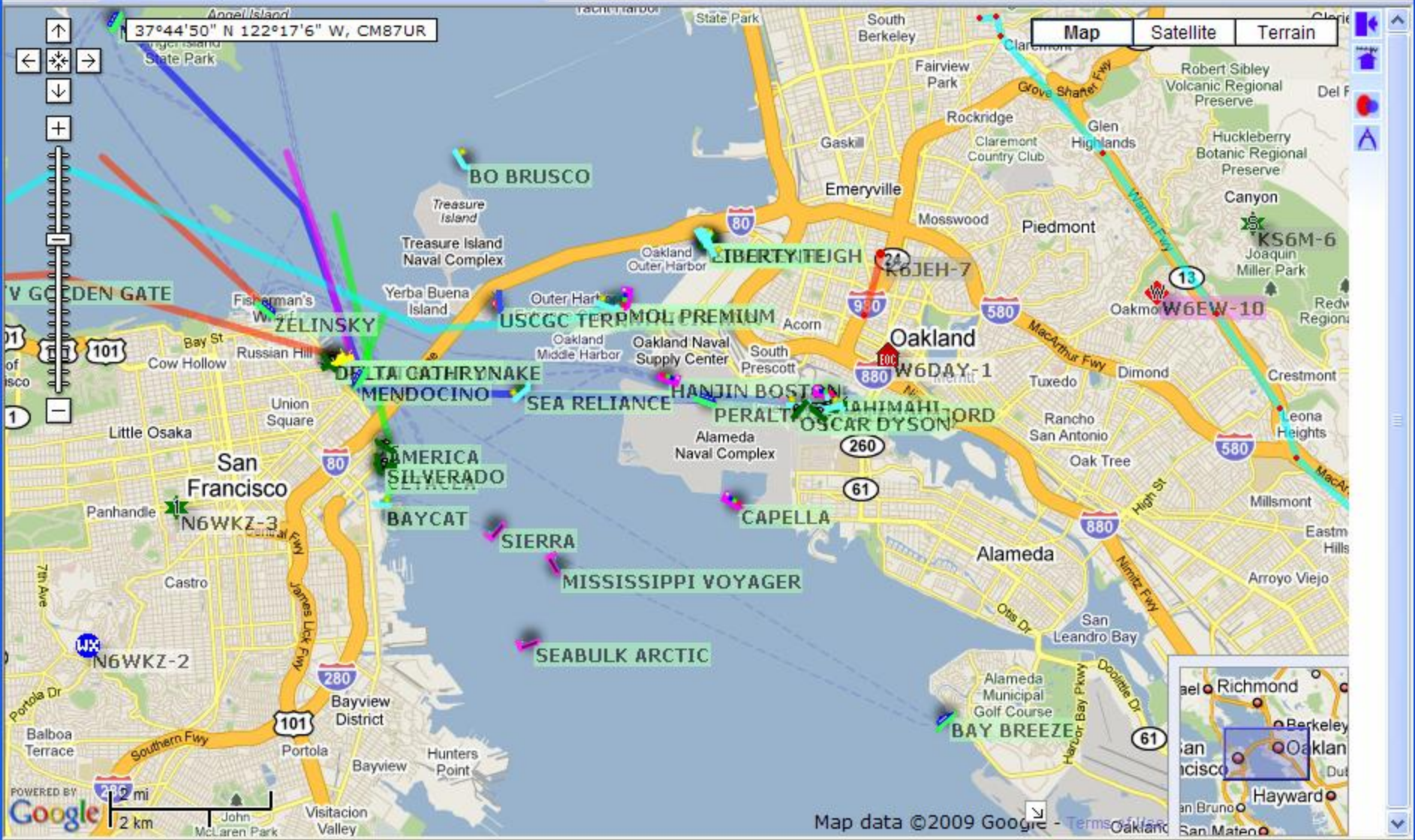
WT6K-4>

WIDE1-1,WIDE2-1:

!3731.12N/12155.13W>000/000/A=000347

SBARA Raffle Tracker





APRS Systems

- Basic APRS Mobile
 - Transmits your position
- Advanced (2-Way) APRS Mobile
 - Transmits your position
 - Displays positions of nearby stations heard over-the-air

Basic APRS System

1. GPS receiver - tracks your position
2. TNC - encodes position, information into APRS packets
3. TRANSCEIVER - broadcasts APRS packets

Advanced APRS System

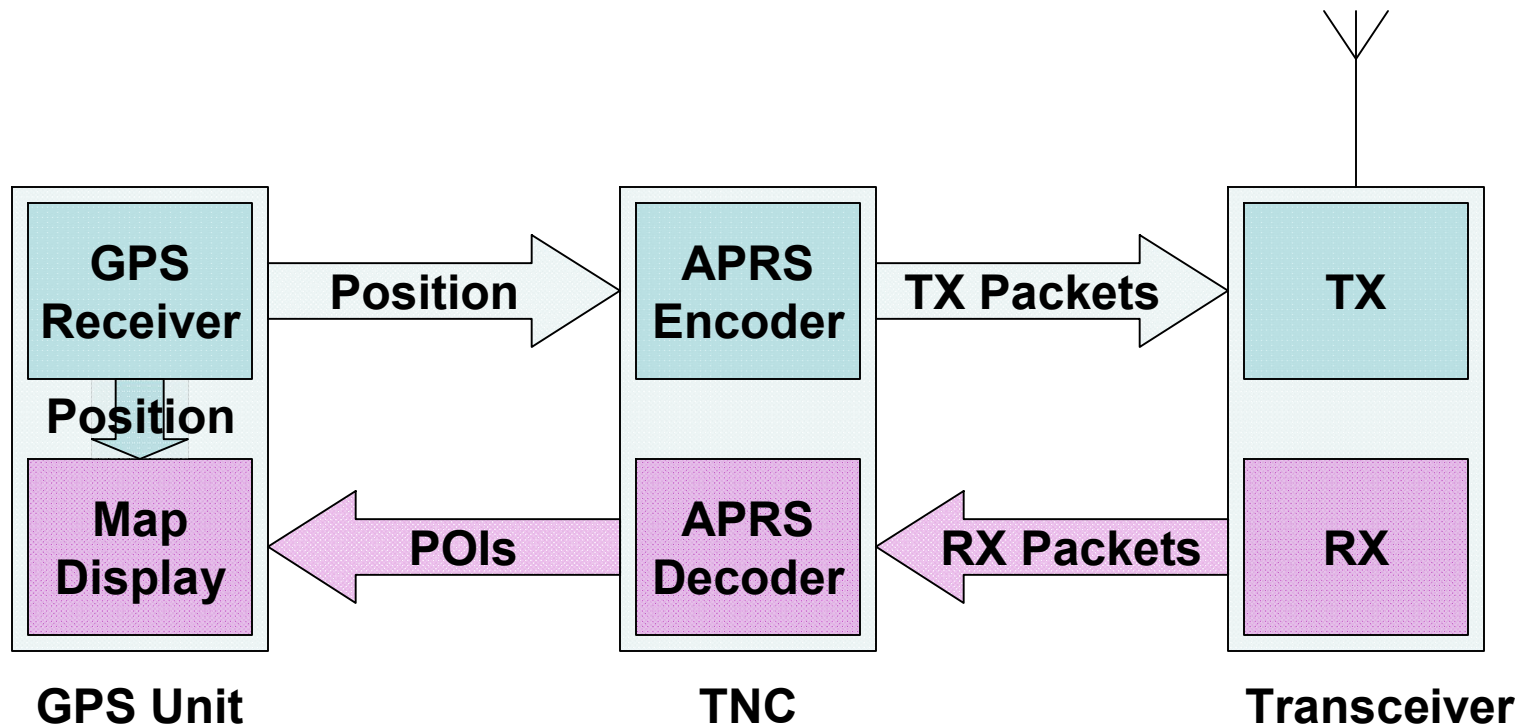
A

- GPS receiver - tracks your position
- TNC - encodes position, information into APRS packets
- TRANSMITTER - broadcasts APRS packets

B

- RECEIVER - receives other APRS packets
- TNC - decodes APRS packets into position, information
- DISPLAY - shows nearby APRS objects on a local map

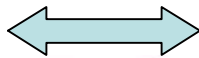
2-Way APRS, Internals



APRS System Configuration



**Garmin
nuvi350**



**Garmin
to NMEA
Translat
or Cable**



**Open
Tracker+**



**TNC-
Radio &
Power
Cable**



**Radio
Transceiver**

Garmin nuvi350



- Navigation, 2-D or 3-D maps and turn-by-turn voice directions & street names
- POIs - hotels, restaurants, fuel, ATMs, etc.
- Displays Custom POIs*
- MP3 Music & Audio Book Player (2GB)
- JPEG Picture Viewer, World Clock with Time Zones, Currency Converter, Measurement Converter, Calculator, etc.

Garmin NMEA Translator

- APRS requires NMEA data formats
- Translates Garmin USB Data to NMEA Serial Data
- Includes a Microchip



OpenTracker+



- Encodes GPS position data into APRS data packets (TX)
- Decodes APRS data packets (RX) into GPS Points Of Interest (POIs)
- Optionally, controls transmission rate with Smart Beacons

TNC to Radio Cable

- Basically, helps TNC drive the radio
- Interfaces TX and RX signals
- Provides PTT line from TNC to Radio
- Provides Squelch line from Radio to TNC



Advanced APRS, SBARA 200
Umesh (K6VUG) & AI (WT6K)

VHF Transceiver

- Transmits and Receives FM radio signals on APRS channel 144.390 MHz
- Fixed, Mobile or Handheld



Advanced APRS, SB
Umesh (K6VUG) & AI (WT6K)

2-Way APRS, Made Easy

- OpenTracker+:
 - Decodes received APRS data into POIs
- Garmin nuvi350:
 - Displays the POIs in Real-Time,
 - Excellent 2-D, 3-D maps
 - Replaces the PC

Showing Stations Received



Advanced APRS, SBARA 2009,
Umesh (K6VUG) & AI (WT6K)

Key Features

- ❖ Excellent GPS features & maps
- ❖ Very Compact, Low Profile
- ❖ Low Cost, Easy Setup
- ❖ Eliminates the need for a PC

Must See It to Believe It !

Cost Estimates

- Garmin nuvi350: \$100 to \$300
- OpenTracker+: \$50
- Garmin NMEA Translator Cable: \$50
- TNC to Radio Cable: \$25

Total cost excluding radio: \$250+ approx.

References

- APRS: <http://www.aprs.org/>
- Garmin nuvi350
 - <https://buy.garmin.com/shop/shop.do?pID=31655#nuvi350>
- OpenTracker+
 - <http://www.argentdata.com/products/otplus.html>
- Garmin Translator Cable
 - https://www.argentdata.com/catalog/product_info.php?products_id=114
- TNC-Radio Cables
 - http://www.buxcomm.com/catalog/index.php?main_page=index&cPath=4
 - <http://www.rpc-electronics.com/trackercables.php>

Thank You & Good Luck !

Merry Christmas, Happy Holidays,
&
A Happy New Year

