



APRS

Automatic Packet Reporting System

Presented by N4VIP

APRS SFARES Outline

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- APRS Network
- APRS Digipeters & IGates
- APRS Data Type
- APRS Components
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 - SARTrack – APRS-IS
 - SARTrack – Local reception

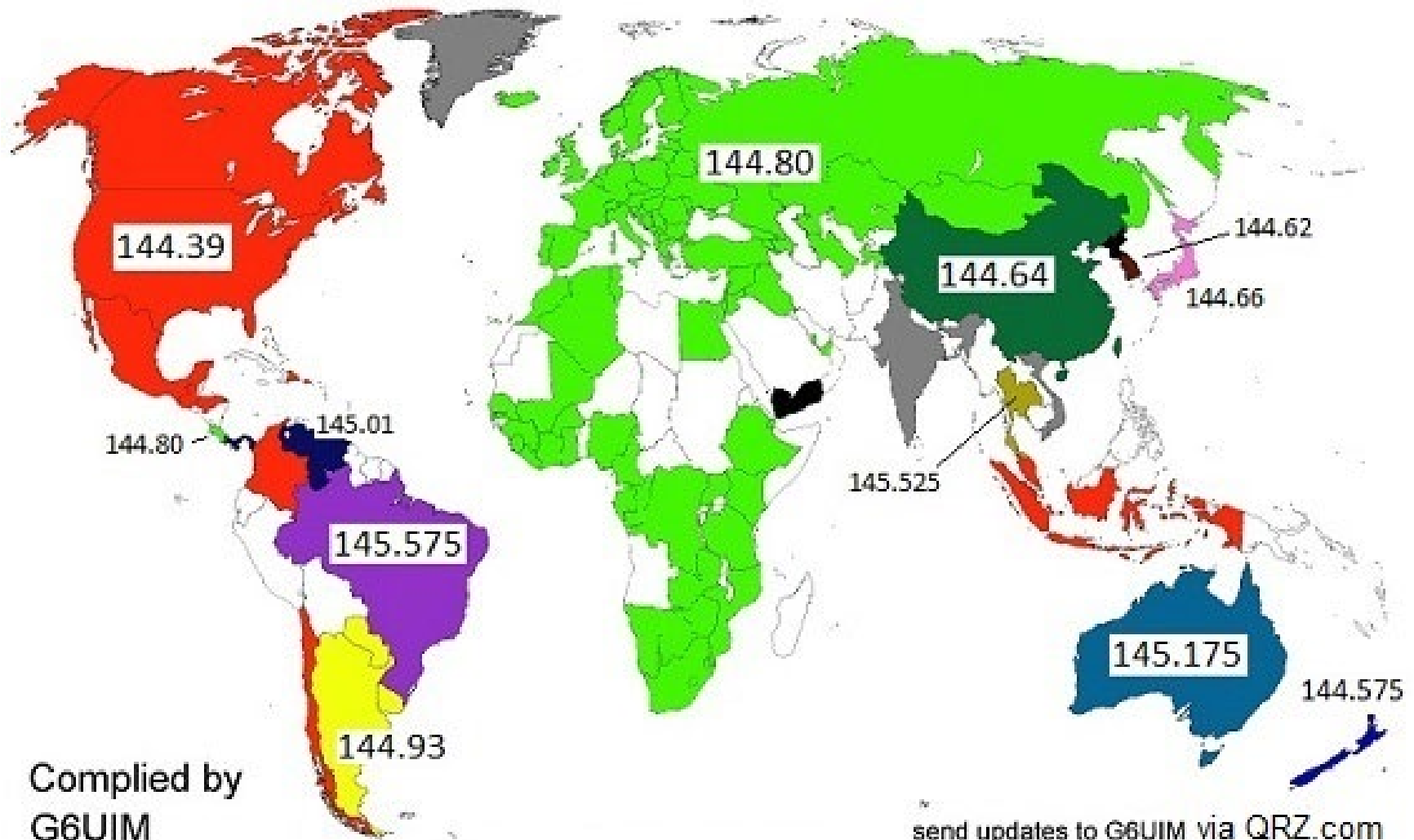
APRS History

- APRS developed 1980's by Bob Bruninga, WA4APR, a senior research engineer at the USNA
- As GPS technology became more widely available, 'Position' was replaced with 'Packet'

APRS Network

- APRS packets transmitted for all other stations to hear and use
- Packet repeaters, called digipeaters, form backbone of the APRS system
- Use store and forward technology to retransmit packets
- All stations operate on the same radio frequency (144.390 MHz, FM) for local reception
- Packets move from digipeater to digipeater, propagating outward from their point of origin

APRS around the world



APRS Digipeters & IGate

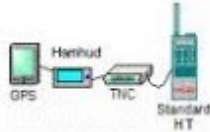
- Digipeaters keep track of the packets they forward
- Eventually most packets heard by an APRS Internet Gateway, called an IGate,
- Those packets routed to Internet APRS backbone (APRS-IS) for Internet reception
- All APRS-IS data available for local use, e.g. SARTRAK or on a website designed for the purpose, e.g. <http://aprs.fi>

APRS Data Types

- APRS packet types include:
 - Position/object/item,
 - Status,
 - Messages,
 - Queries,
 - Weather reports and
 - Telemetry
- Position/object/item packets contain lat/long, and display symbol and have optional fields (altitude, course, speed, etc.)
- Positions of fixed stations are configured in the APRS software
- Moving stations (portable or mobile) automatically derive their position information from a GPS receiver connected to the APRS equipment

APRS Components

APRS



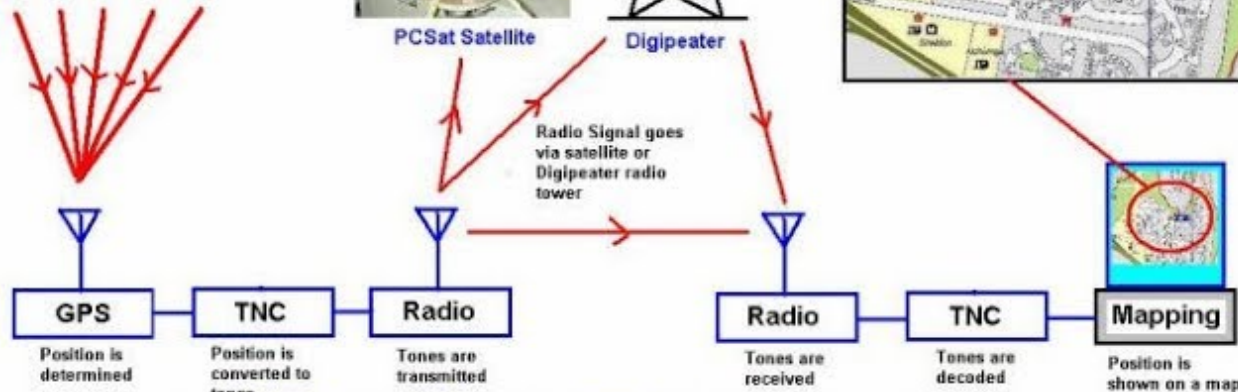
GPS Satellite



PCSat Satellite



Digipeater



2010-10-12 15:59:50 UTC: `WD4HDL-1>APN383,KV38-1,WIDE2*,qAR,K83RRL-3:13844.05N507750.15W#PHG5632/W3,VA,Viewtree Mtn Warrenton,VA`

APRS Beacon Transmitter with GPS Receiver



Radios – HTs, Mobile, Base Stations

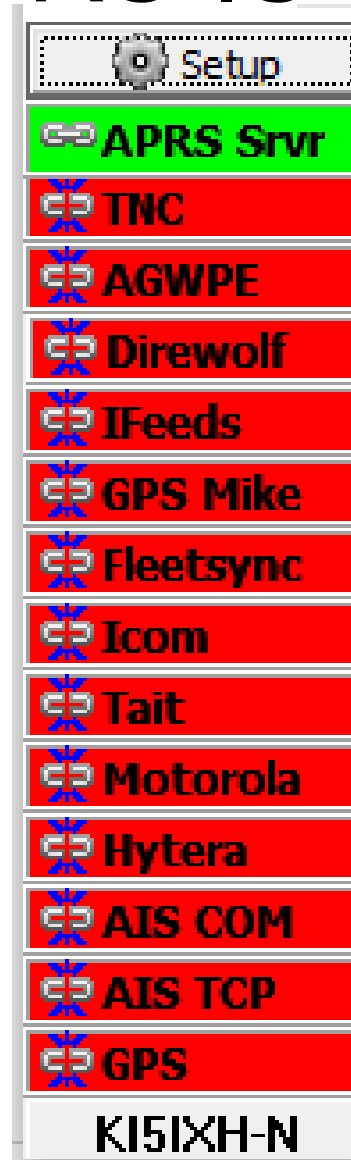
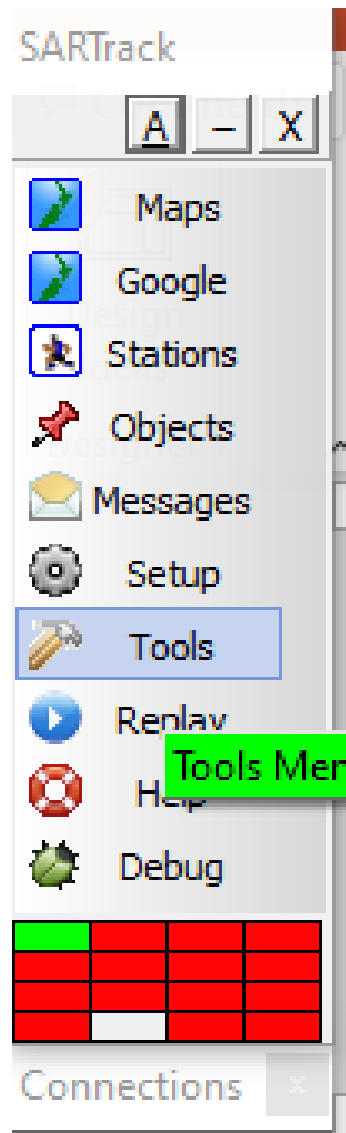


SFARES APRS Usage during an activation

- APRS-IS using SARTrack and internet server
- Local reception using SARTrack and VHF/Direwolf
- Several Food Depot trucks have APRS

SFARES Display capabilities

SARTrack – APRS-IS

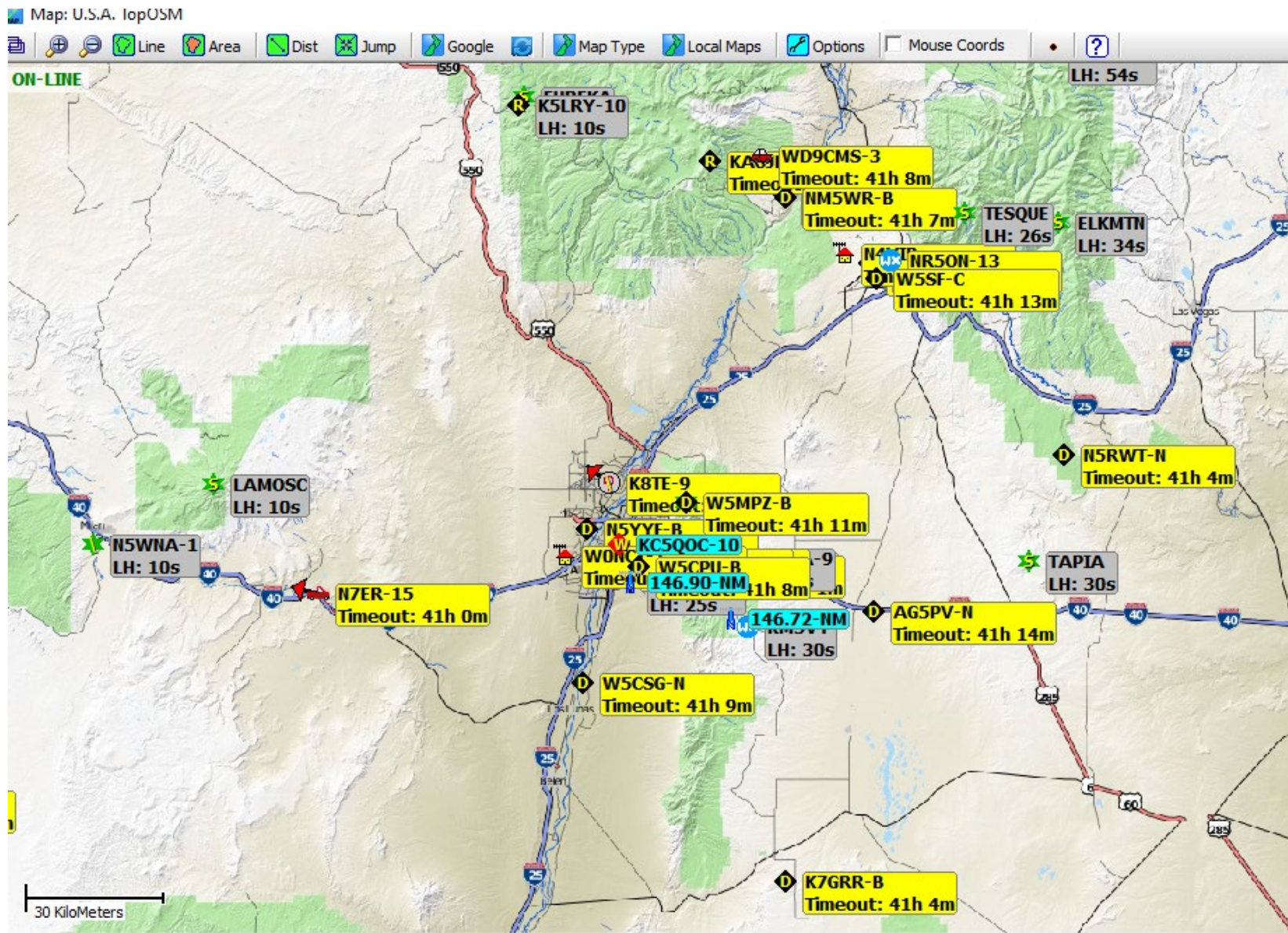


SFARES Display capabilities

SARTrack – APRS-IS

- Every Central Site has the SARTrack program installed that access APRS-IS data stream from the Texas APRS Server
- Data are filtered to be within 200 miles of Santa Fe

SARTrack – APRS-IS data



SARTrack Stations and Objects

1. Stations – move
2. Objects – stationary

To clear screen

1. Stations – Options and clear Stations Database
2. Objects – Delete All

The screenshot displays the SARTrack software interface. The main window shows a map of the Las Vegas area with several stations and objects overlaid. The stations are represented by call signs and their respective LH (Link Health) and Timeout values. The objects are represented by call signs and their respective Timeout values. The interface includes a menu on the right side with options such as Maps, Google, Stations, Objects, Messages, Setup, Tools, Replay, Help, and Debug. Below the menu is a grid of connections, including APRS Svr, TNC, AGWPE, Direwolf, IFeeds, GPS Mike, Fleetsync, Icom, Tait, Motorola, Hytera, AIS COM, AIS TCP, GPS, and KC0NUK-B. The status bar at the bottom shows the current position, priority, active object, and tracker object. The status bar also displays the zoom level (9), the number of queued and failed objects (0), and the local map name (No Map).

CALL SIGN	LH	TIMEOUT
KSLRY-10	4s	
WD9CMS-3		41h 9m
AD5RB-E	22s	
TESQUE	1m 26s	
LKMTN	1m 34s	
NR5ON-13		41h 8m
W5SF-C		41h 14m
N5RWT-N		41h 5m
KC6UQT-B	46s	
W5MPZ-B		41h 12m
N5YYE-R		41h 12m
KC5QOC-10		
W5CPU-B	146.90-NMh	6m 34s
W5CSG-N		41h 10m
KM5VY-10	51s	
AG5PV-N		41h 15m
TAPIA	1m 30s	
K7GRR-B		41h 5m

APRS Symbols

 House	 Fire Station	 Weather Station
 Car	 EOC	 Digipeater
 Truck	 Hospital	 IGate
 Jeep	 Shelter	 Helicopter
 Ambulance	 Runner	 Fixed Wing
 Fire Truck	 Water Station	 Space Shuttle
 Police Car	 Animal Shelter	 Sail Boat

APRS sites

- Digital W5SF – B



- Wx – Weather – NR5ON



- Digipeater - APRS

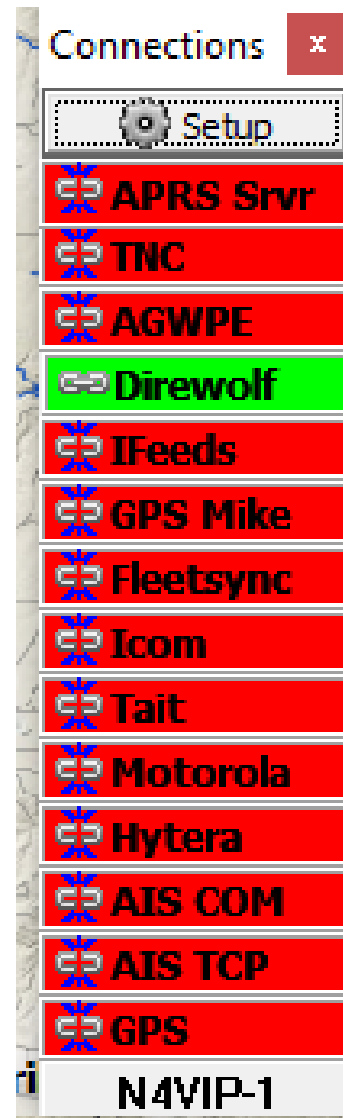
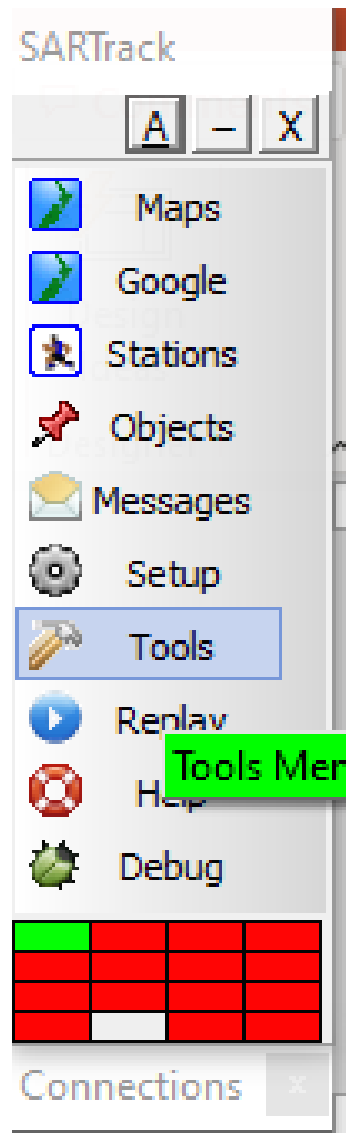


- Moving truck – West at 94 km/hr



SFARES Display capabilities

SARTrack – Local reception

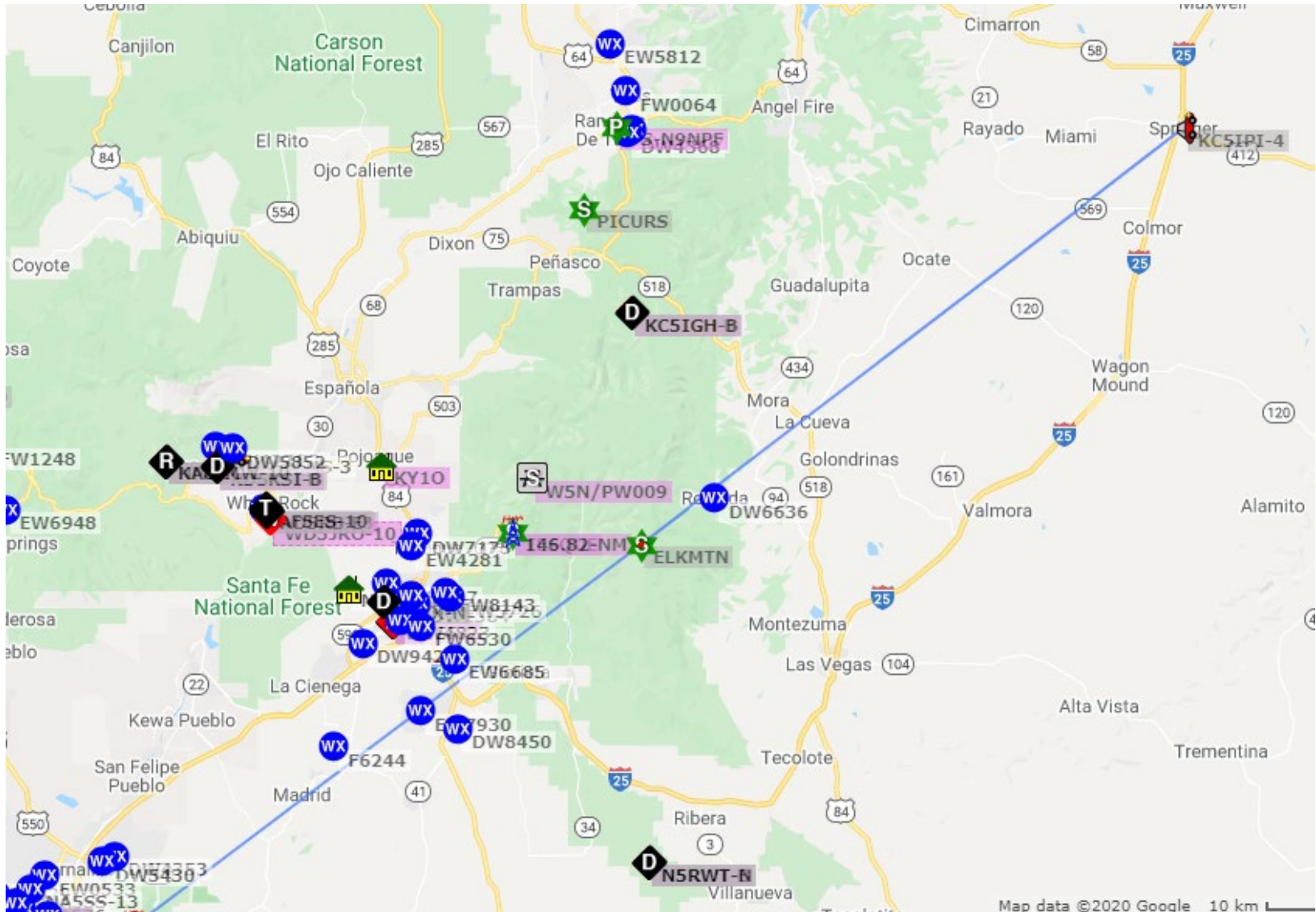


SFARES Display capabilities

SARTrack – Local reception

- Every Central Site has a dedicated VHF receiver with connectivity through the DireWolf interface to the SARTrack Program for reception of local APRS data

<http://APRS.FI>



Resources

- SARTrack – www.sartrack.co.nz (Windows)
- APRS.FI

SFARES ARRL SET 24 OCT

- All APRS equipped/mobile SFARES members should activate APRS
- All SFARES members at home QTH track all SFARES mobile units
- After SET completion, all units submit tracking log to identify where APRS data can be received and transmitted