

**APRS**

**Packet**

**Winlink**

**By**

**KM4MLS & KK4IB**

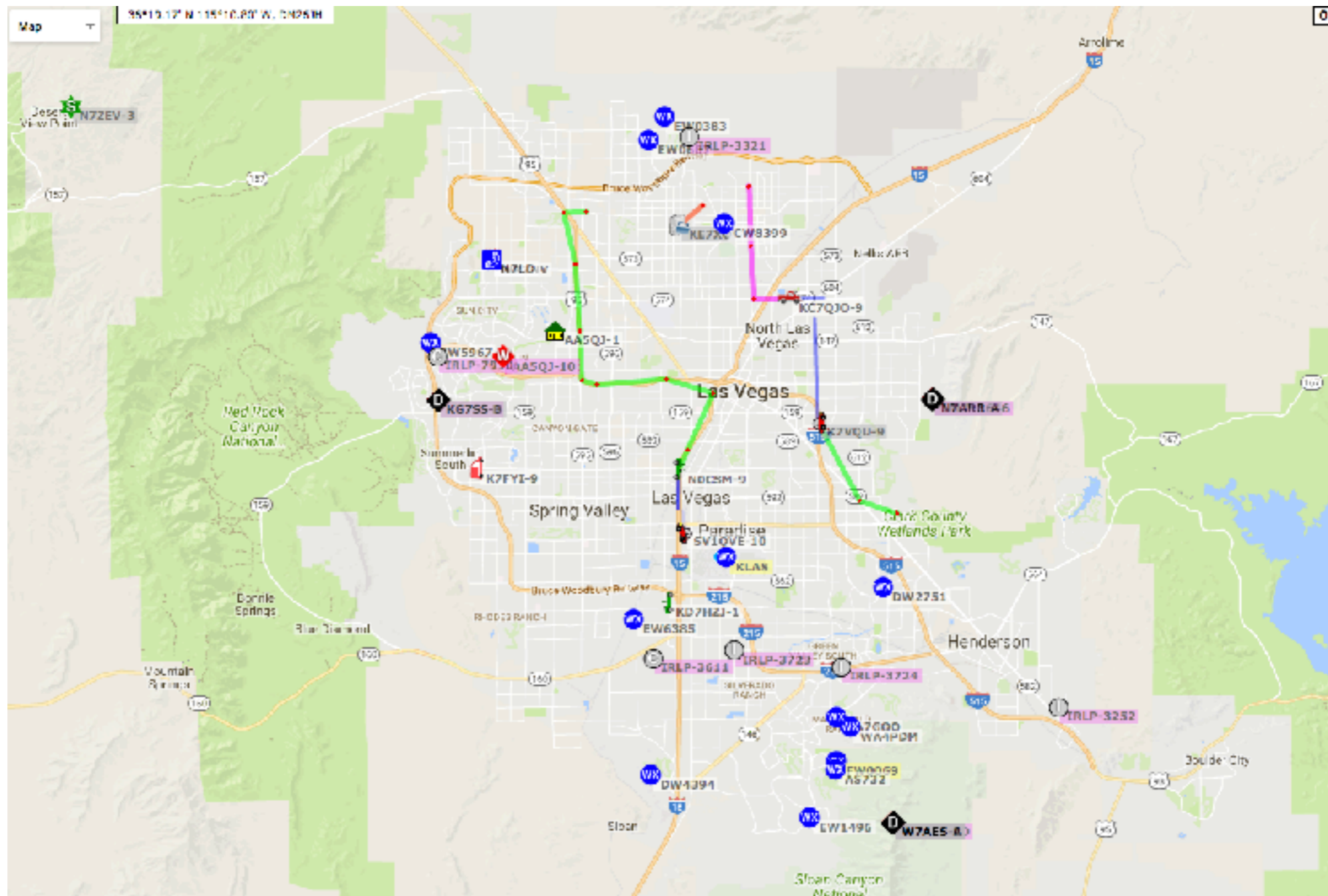
**Brian & Gene**



# APRS: What is it?

## Why is it?

## How to do ... hands on!

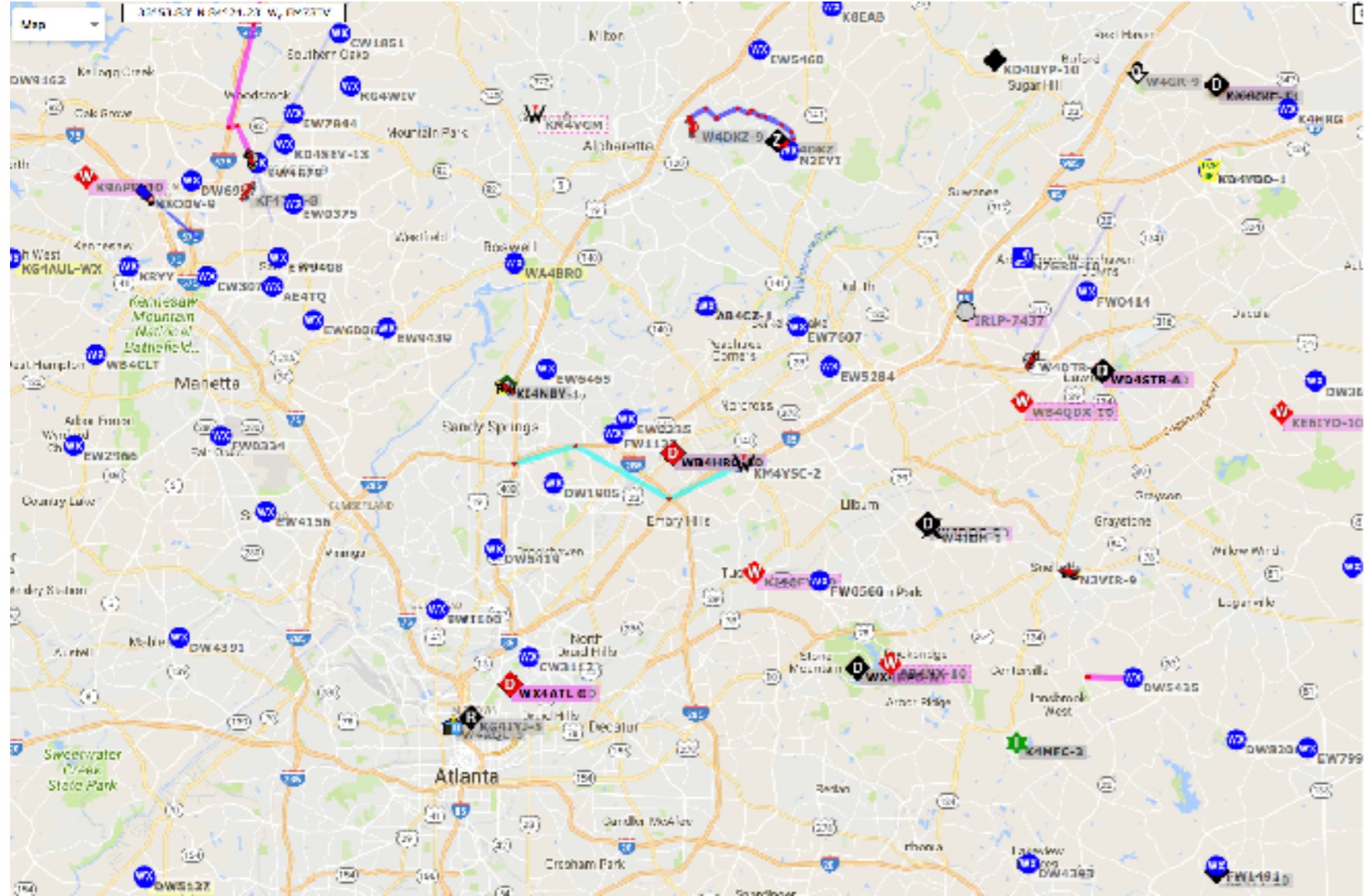


# Mobile APRS Block Diagram

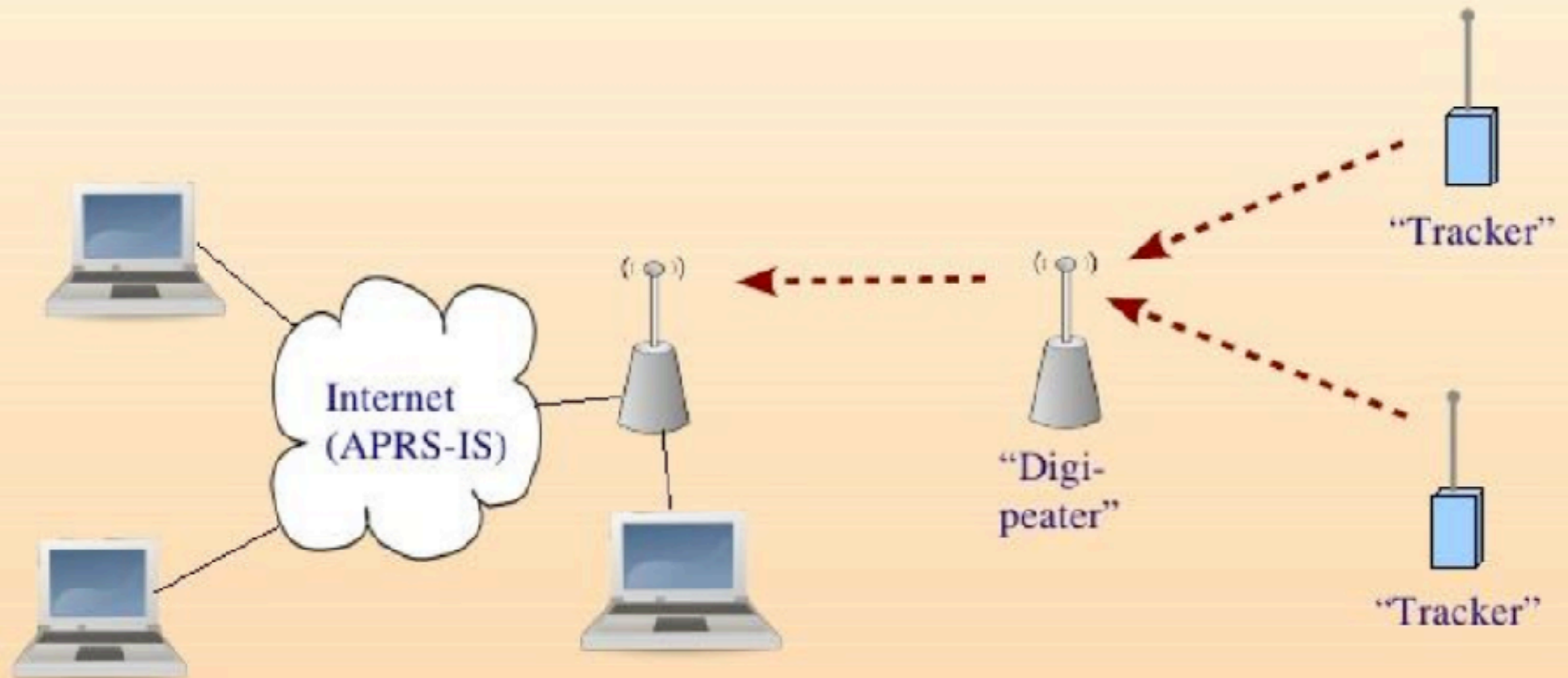
GPS RX

Packet Formatter

2 Meter Radio  
144.390 MHz



# Internet Gateway



<http://avarc.ca/download/balloon-project/Automatic-Packet-Reporting-System-PDF.pdf>

## How APRS and its Network Operate

- APRS uses the UI (connectionless/beacon) Frames of the AX.25 protocol (packet radio).
- APRS protocol is layered above AX.25. The AX.25 specification is available at <http://www.tapr.org/tapr/pdf/AX25.2.2.pdf>
- The APRS protocol specification is available at <ftp://ftp.tapr.org/aprssig/aprsspec/spec/aprs101/APRS101.zip>
- APRS does not use connected packets (eg. like a BBS or direct keyboard to keyboard)
- Uses 2 Meter AFSK at 1200 baud, on 144.390 MHz
- When a station wants to transmit a packet it listens and when the frequency is clear transmits the packet.  
(similar to how Ethernet works)
- Uses “generic digipeating” to route packets from the APRS beacon to an internet entry point

from: [http://home.townisp.com/~k1kwp/aprs\\_K1KWP.mini.pdf](http://home.townisp.com/~k1kwp/aprs_K1KWP.mini.pdf)

## **APRS transmissions from a balloon beacon via amateur radio.**

First is Balloon status message

Second is location with altitude

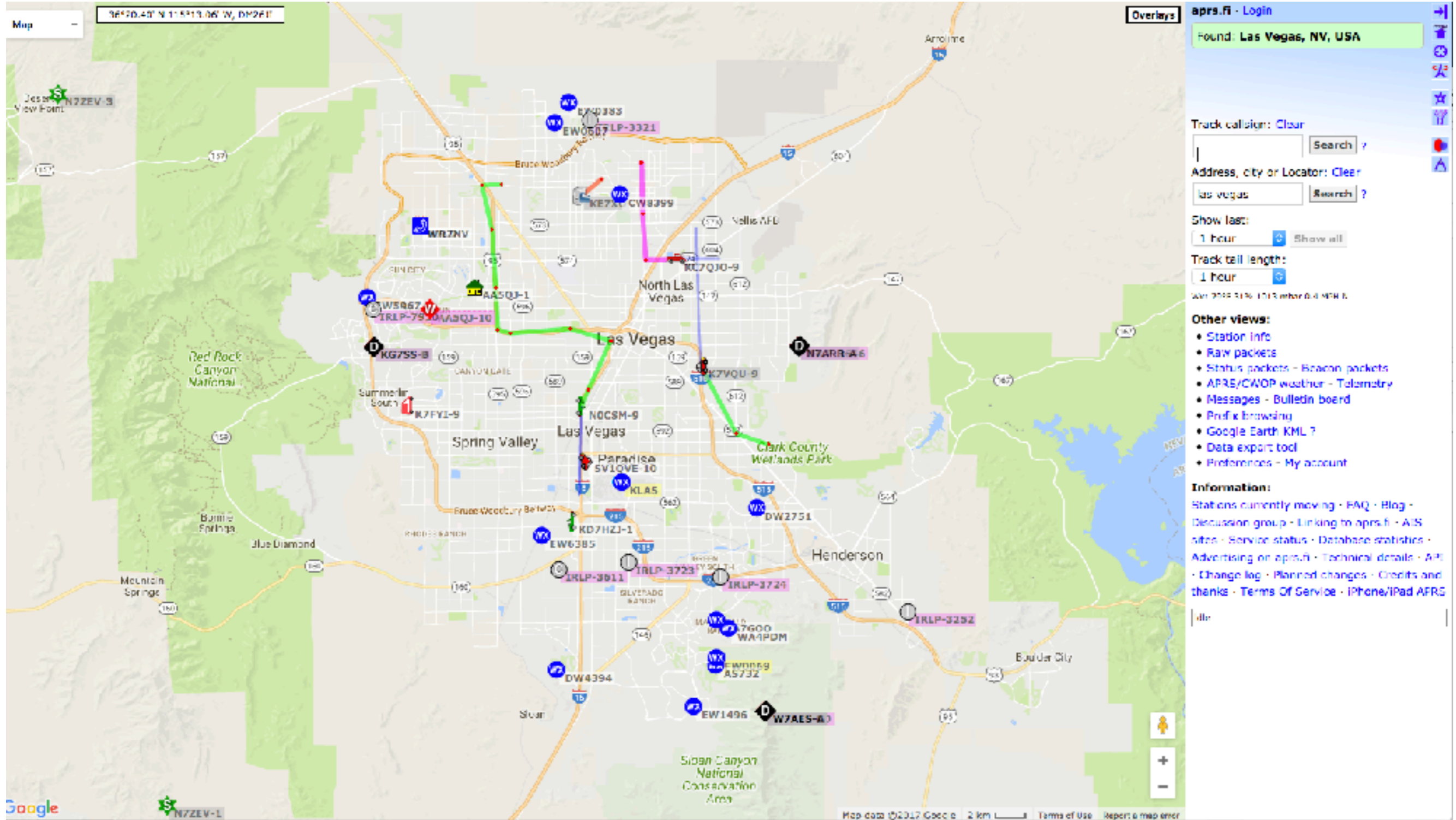
Third is location with course and heading

```
>Balloon 05:53:30 30090' 101520'pk 0.7dop 12trk 82degF 33% 12pump www.kd7lmo.net
```

```
$GPGGA,170656.00,3303.9792,N,11159.9748,W,1,09,0.9,4703.3,M,,M,,*59
```

```
$GPRMC,170658,A,3303.9725,N,11159.7845,W,24.8,88.9,151103,,*03
```

# APRS Map at [www.aprs.fi](http://www.aprs.fi)



# APRS Mobile Position Reporting Station

from: <http://aprs.qrz.ru/hard/other/qx9hall.pdf>

Fig 2—Views of the project. A is an outside view of the Pocket APRS Transmitter with antenna and GPS receiver. B shows a side view with the GPS port jack. C is an internal view of the Pocket APRS Transmitter.



## References

<http://www.arrl.org/position-reporting-with-aprs>

<http://www.aprs.org/>

<http://www.w4vld.com/aprs-build-your-station/>

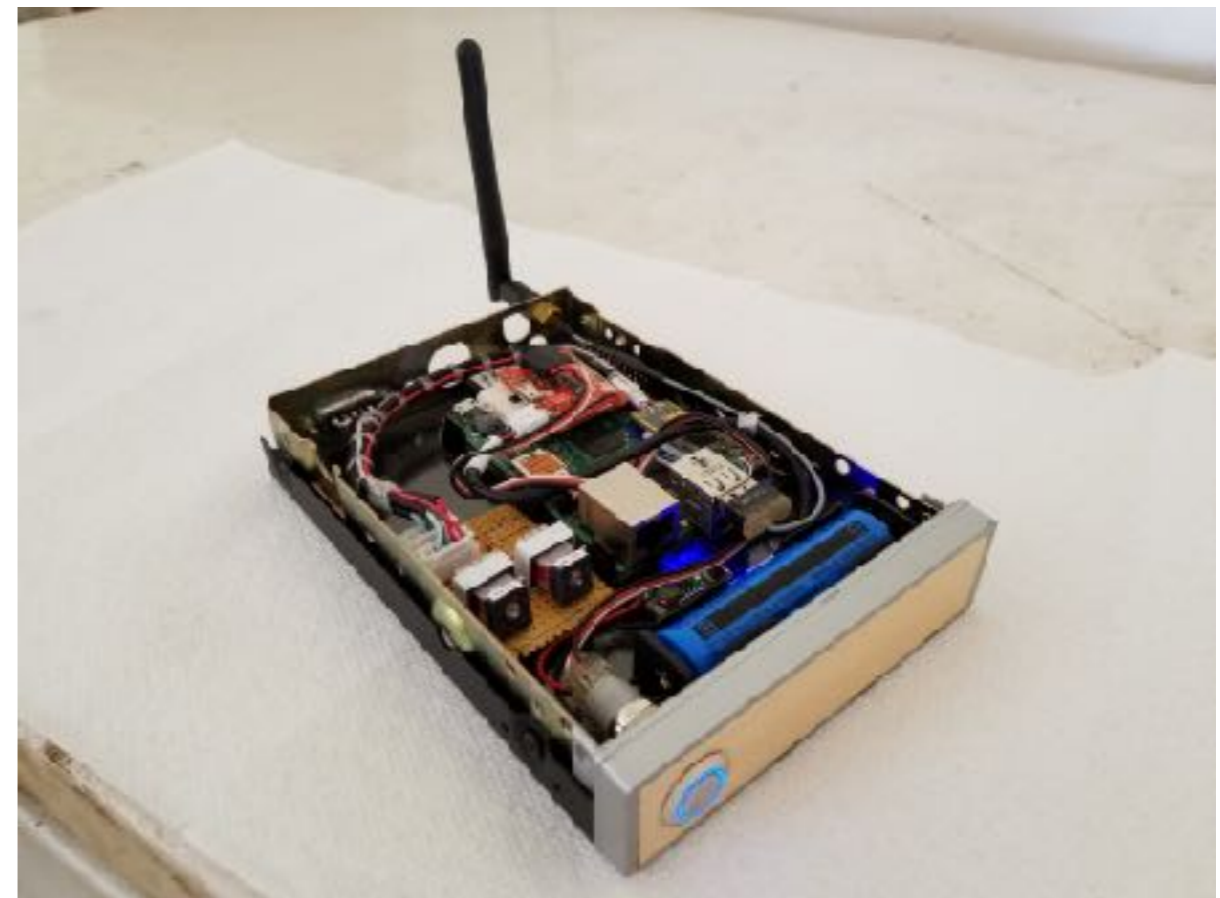
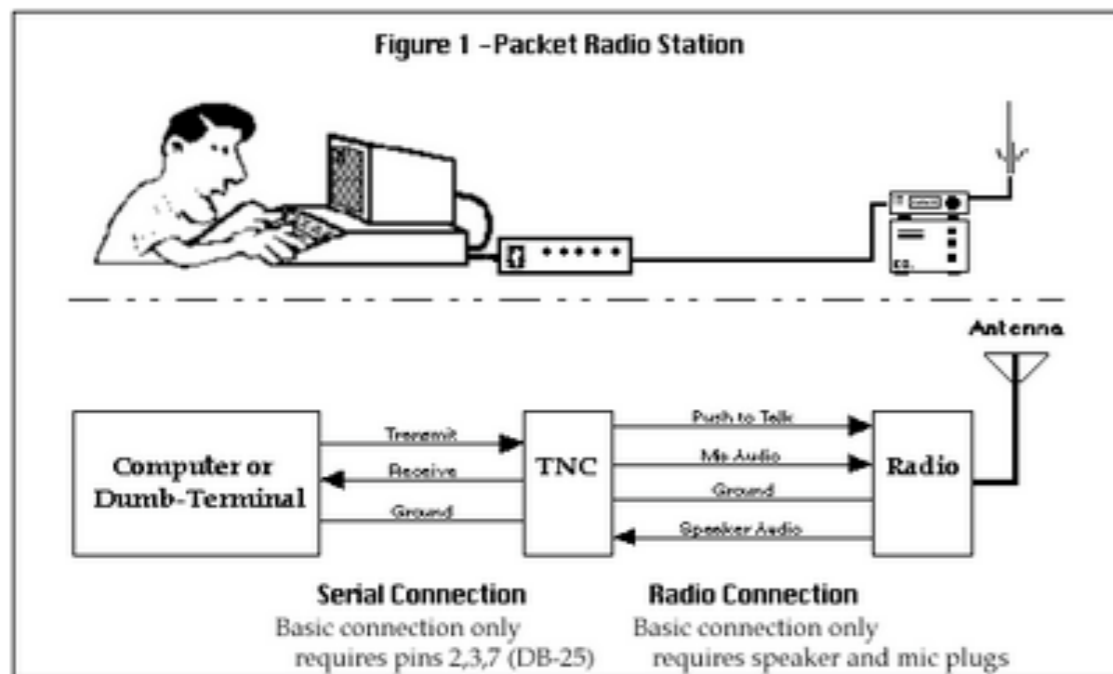
**APRS transmits over packet radio ... packet radio? What's that?**



# Packet Radio

Transmits text, over radio. Can include multiple packet station “hops” from one end to the other, worldwide! Live keyboard conversation, or send files from one station to another with multiple hops.

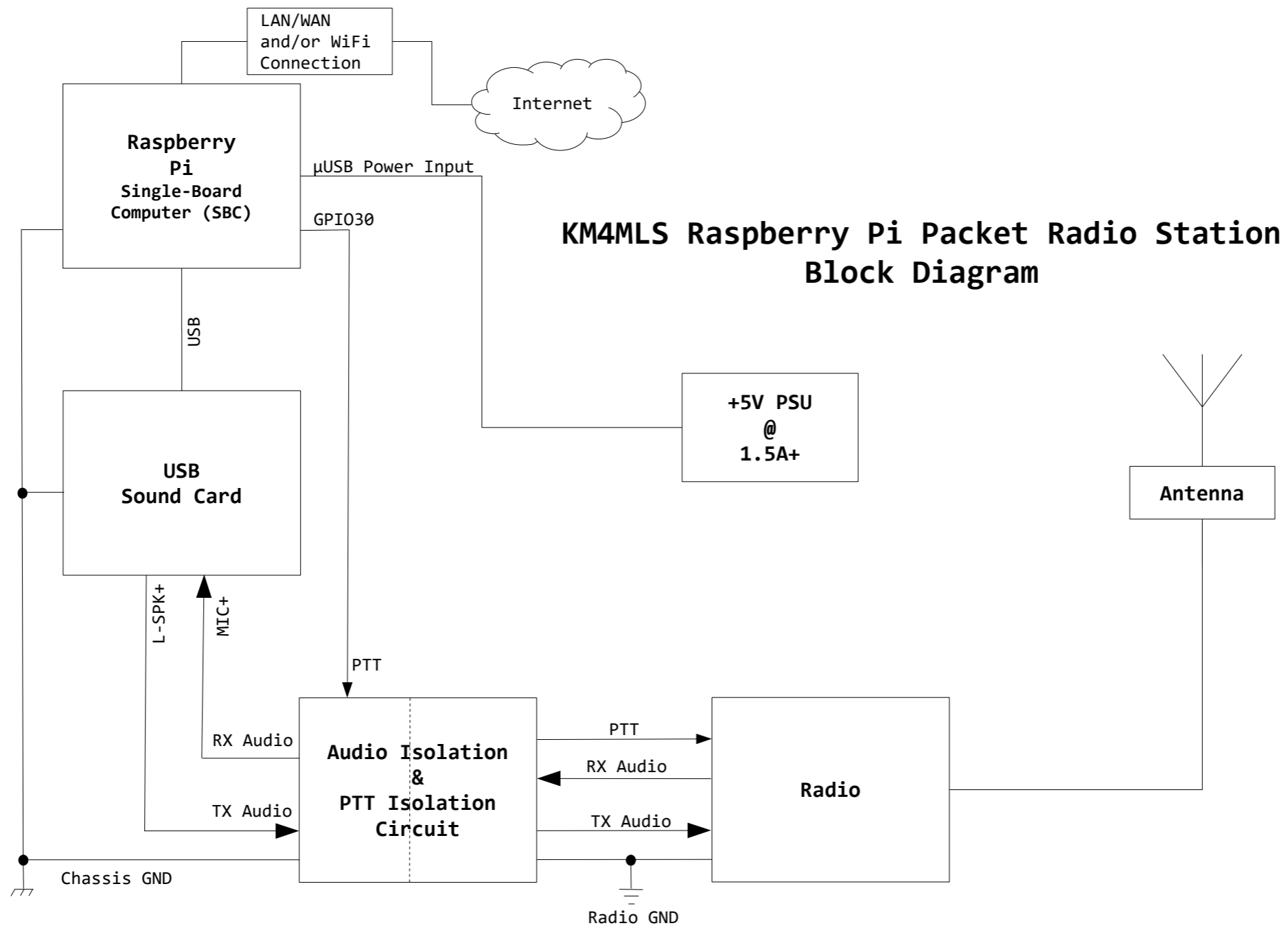
Example: send list of folks at shelter to central disaster EMC.



On Display

[https://www.tapr.org/pr\\_whypacketradio.html](https://www.tapr.org/pr_whypacketradio.html)

[https://www.tapr.org/pr\\_intro.html](https://www.tapr.org/pr_intro.html)



**KM4MLS Raspberry Pi Packet Radio Station  
Block Diagram**

# Terminal Node Controller TNC



# Packet - Pactor - Winlink

<https://en.wikipedia.org/wiki/PACTOR>

<https://en.wikipedia.org/wiki/Winlink>

Internet

Router



**Emails using Winlink can be routed over internet or HF or VHF!  
We even have email form just for radio, and matches IC-213.**

## GENERAL MESSAGE (ICS 213)

1. Incident Name (Optional):	<input type="text"/>		
2. To (Name and Position):	<input type="text"/>	To Email:	<input type="text"/>
3. From (Name and Position):	<input type="text"/>	From Email:	W4PHS
4. Subject:	<input type="text"/>	5. Date:	6. Time:
		2015-04-23	11:55:22
7. Message:			
<div style="border: 1px solid #ccc; height: 200px; width: 100%;"></div>			
8. Approved by: Name:		<input type="text"/>	Position/Title: <input type="text"/>
ICS 213		HTML Template Version # 1.00 by OE3XEC	

Submit

Use this form within your Winlink Express Application.

[http://www.philsherrod.com/Winlink/RMS Express HTML Forms.pdf](http://www.philsherrod.com/Winlink/RMS_Express_HTML_Forms.pdf)

<http://www.arrl.org/news/rms-express-with-winmor-now-available-for-winlink-2000>

<http://uz7.ho.ua/packetradio.htm>

## From Wikipedia

### Supported radio technologies [ edit ]

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- 802.11 "WiFi"
- ALE (Automatic Link Establishment)
- APRS (Automatic Packet Reporting System)
- AX.25 Packet Radio
- D-Star
- PACTOR
- PACTOR-II
- PACTOR-III
- PACTOR-IV
- WINMOR
- TCP/IP (Telnet and other Wireless Technologies)

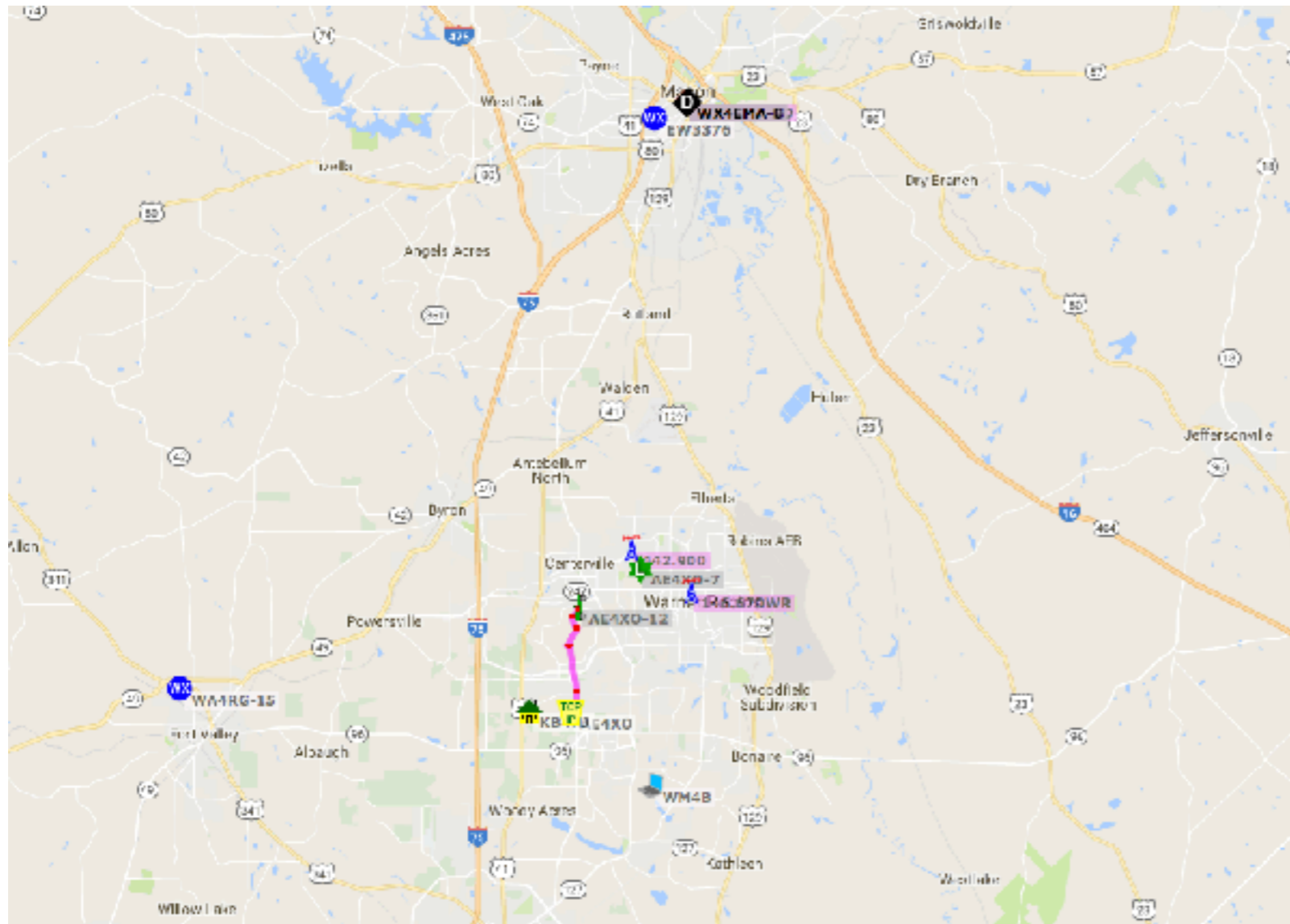
Generally, email communications over amateur radio in the 21st century is now considered normal and commonplace.<sup>[*citation needed*]</sup> Email via [High frequency](#) (HF) can be used nearly everywhere on the planet, and is made possible by connecting an HF [single sideband](#) (SSB) transceiver system to a computer, modem interface, and appropriate software. The HF modem technologies include [PACTOR](#), [Winmor](#), and [Automatic Link Establishment](#) (ALE).

PACTOR combines the [bandwidth](#) efficiency of [packet radio](#) with the [error-correction](#) (CRC) and automatic repeat request (ARQ) of [AMTOR](#). Amateur radio operators were instrumental in developing and implementing these digital modes.

# Demo and hands on #1

APRS burst display as seen on terminal

APRS as seen on Map



# Packet Between Two Stations

