APRS

Automatic Packet Reporting System
APRS
What is it?

• a real-time tactical communications and display system (situational awareness)

• It was designed to be a resource for the local and traveling ham to show surrounding local information of immediate value.

• Is NOT primarily intended as a way to track cars on a map (although it will do that)
APRS

History

• Developed by Bob Bruninga WB4APR (thus the name)

• Introduced at the 1992 TAPR/Arrl Digital Communications Conference
APRS
How it works

• Uses packet radio

• Original packet radio is point-to-point with ‘connected’ stations

• APRS is point-to-many

• Packet radio, but unconnected packets (no “ack”)
APRS
How it works - direct - without the internet

• Uses radio, TNC (hardware or software), and (sometimes) a computer
• Simplex mode - Generally VHF FM on 144.39 MHz (North America)
• Sender’s radio transmits a packet.
• Packet can contain callsign, lat/long/altitude/speed/direction, a symbol, status message, telemetry, short messages directed to specific stations
• Multiple radios (in simplex range) can receive it.
• No ack returned (unless it is a “message”)
APRS

How it works - using digipeater(s) - without the internet

• Sender’s radio transmits a packet.
• Packet is received by a digipeater which temporarily stores and then retransmits the packet. Like voice repeaters, digipeaters are generally at a high elevation to cover a large area
• Packet can contain callsign, lat/long/altitude/speed/direction, a symbol, status message, telemetry, short messages directed to specific stations
• Multiple radios (in simplex range) can receive it.
• No ack returned (unless it is a “message”)
APRS
How it works - using digipeater(s) - combined with the internet

- Specialized stations called iGates, pass APRS packets traffic from RF to the internet and vice-versa (requires a radio, TNC, and a computer - often a Raspberry Pi)
- A server network (APRS-IS) manages the storing and routing of packets
- APRS-IS a common name given to the Internet-based network which interconnects various APRS radio networks throughout the world (and space)
- Other servers can exchange packets with APRS-IS and make them available via the web (aprs.fi, aprsdirect.com, etc.)
APRS
SSIDs are station designators appended to your callsign

- a station’s SSID gives you an idea of it’s purpose
- The common ones to know are
  - -0 for base stations
  - -7 for HTs
  - -9 for mobile
- Example: AD6QF-7

<table>
<thead>
<tr>
<th>SSID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0</td>
<td>Your primary station usually fixed and message capable</td>
</tr>
<tr>
<td>-1</td>
<td>generic additional station, digi, mobile, wx, etc</td>
</tr>
<tr>
<td>-2</td>
<td>generic additional station, digi, mobile, wx, etc</td>
</tr>
<tr>
<td>-3</td>
<td>generic additional station, digi, mobile, wx, etc</td>
</tr>
<tr>
<td>-4</td>
<td>generic additional station, digi, mobile, wx, etc</td>
</tr>
<tr>
<td>-5</td>
<td>Other networks (Dstar, Iphones, Androids, Blackberry’s etc)</td>
</tr>
<tr>
<td>-6</td>
<td>Special activity, Satellite ops, camping or 6 meters, etc</td>
</tr>
<tr>
<td>-7</td>
<td>walkie talkies, HT’s or other human portable</td>
</tr>
<tr>
<td>-8</td>
<td>boats, sailboats, RV’s or second main mobile</td>
</tr>
<tr>
<td>-9</td>
<td>Primary Mobile (usually message capable)</td>
</tr>
<tr>
<td>-10</td>
<td>internet, Igates, echolink, winlink, AVRS, APRN, etc</td>
</tr>
<tr>
<td>-11</td>
<td>balloons, aircraft, spacecraft, etc</td>
</tr>
<tr>
<td>-12</td>
<td>APRStt, DTMF, RFID, devices, one-way trackers*, etc</td>
</tr>
<tr>
<td>-13</td>
<td>Weather stations</td>
</tr>
<tr>
<td>-14</td>
<td>Truckers or generally full time drivers</td>
</tr>
<tr>
<td>-15</td>
<td>generic additional station, digi, mobile, wx, etc</td>
</tr>
</tbody>
</table>
APRS
What’s needed?

• To observe
  • aprs.fi
  • aprsdirect.com

• To participate
  • radio, TNC, computer or tablet
  • cellphone or tablet w/app
  • APRS capable radio
APRS
Beaconing vs. messages

• Beaconing is a broadcast
• Contains information of interest to the general recipient
• Location, beacon status text, wx information, telemetry
APRS
Beaconing vs. messages

• Messages are station-to-station

• But are not private (still packets)

• If station A has beached recently, it will be known to the APRS-IS network

• If station B sends a message to station A, the APRS-IS network will route the message to the last iGate that heard station B
APRS
APRS-capable radios

• Stand-alone (built-in TNC)
  • Kenwood TH-d7, d72, d74
  • Kenwood TM-700, 710G
  • Yaesu FT-8, FT1DR, FT2DR, FT3DR
  • Yaesu FTM-100, 300, 350, 400
• Icom has some DPRS radios that send APRS to the internet but do not use analog rf digis
• There are others
APRS
Other solutions

- Mobilinkd 2 ($65) + Computer w/ bluetooth or Android device + radio

- Moblinkd 3 ($120) + Computer or iOS device (or Android device) + radio

- Better than an APRS-capable HT due to detailed map on tablet, computer, or cellphone
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Non-rf solutions

• aprs.fi app for iOS ($7+)

• aprsDroid app for android ($5 Google play store or OpenSource supportware)
APRS
Mobile frequency beaconing

• This is a way for hams to “find each other” by announcing the frequency they are currently monitoring.

• The frequency of your VFO A is included in the status text of your beacon. Other hams can see this.

• When you receive a station with frequency info included in your beacon you press the TUNE button to switch to that frequency.
APRS
Future topics to explore

• What are paths?
• What does Wide 1-1 mean?
• How do I send an APRS message to somebody’s email address?
• How do I send and receive aprs messages to SMS?
• What is smart beaconing
Questions?
Where do we go from here?