

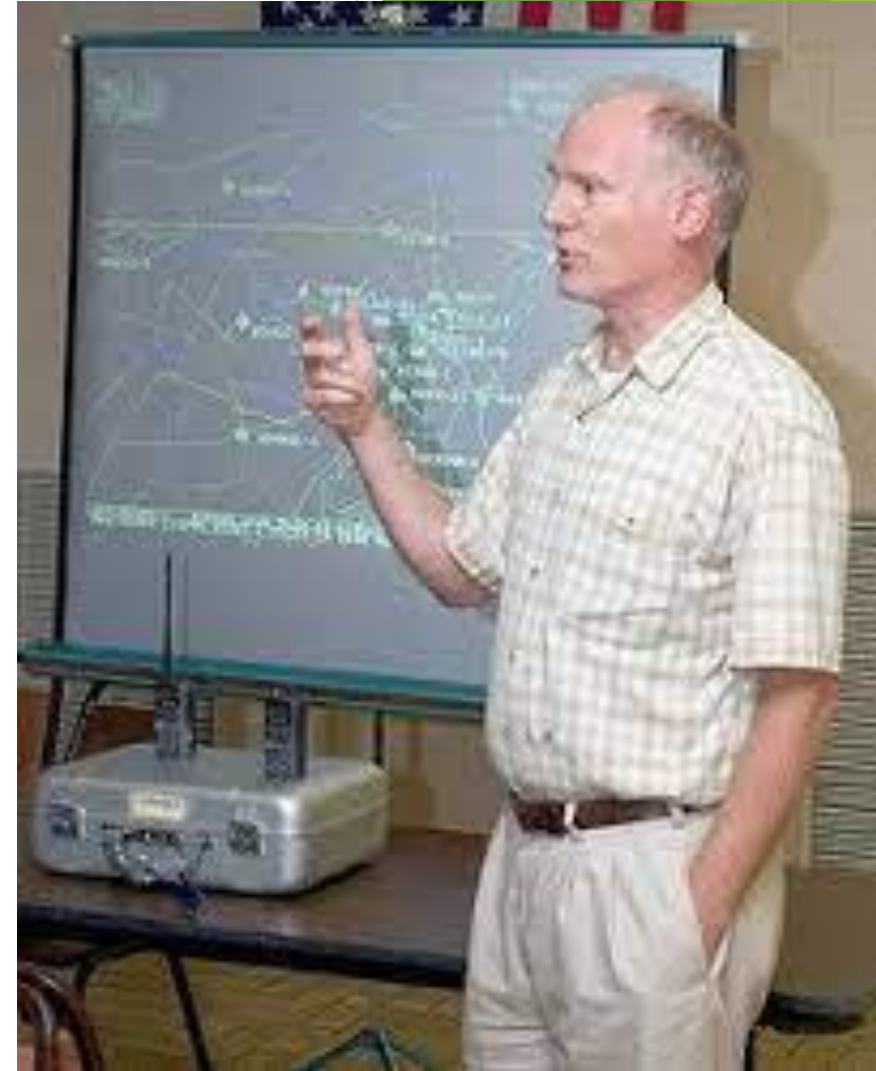
APRS Gateways and Services

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What is APRS Again?

- ▶ We talked about APRS before:
<https://www.murrayarc.org/2020/05/15/training-class-aprs/>
- ▶ Recap
 - ▶ APRS - Automatic Packet Reporting System
 - ▶ Developed by Bob Bruninga (WB4APR/SK) in the early 1990s
 - ▶ Automatic - operates without the control operator doing anything
 - ▶ Packet - based on Packet Radio technology
 - ▶ Reporting - used for disseminating information
 - ▶ System - not stand alone, multiple radios, computers, etc.



What's it Do?

- ▶ Previous presentation in 2020 talked about what APRS is, how it works, including the underlying protocols
- ▶ This presentation is about what you can actually do with it
 - ▶ including some less common uses
- ▶ APRS is a *Tactical Real Time Information Distribution System*

What's it Do?

- ▶ Lots of people get hung up on "position reports"
- ▶ APRS can be used to track you/show people where you are
- ▶ APRS can also be used for MANY MANY other things
 - ▶ Local Information (what repeaters are commonly used, when are the nets)
 - ▶ Objects on a Map (where are the race leaders and tail end Charlie's)
 - ▶ Text Messaging (sending short messages from operator to operator)
 - ▶ Other Messaging (routing messages to/from non-amateur operators)
 - ▶ Delivering Telemetry (fixed and moving stations: sensors, high altitude balloons, satellites, etc.)

Let's Talk Tactical

- ▶ APRS concentrates on LOCAL information
- ▶ Yes, it has the capability to send data over a wide area, but the primary purpose is for LOCAL information for TACTICAL purposes
- ▶ Turn on your radio, wait 30 minutes, and you'll have all the info you need

- ▶ Uses a "flood fill" algorithm for routing packets
 - ▶ Packet radio is connection oriented: every packet has a source and destination
 - ▶ APRS packets have a source, but go to everyone who is listening
 - ▶ The destination field in the packet is used to identify the sending equipment

"New" WIDEn-N Routing

- ▶ "New" was implemented in 2004
- ▶ All APRS packets include a "path"
- ▶ Example path: WIDE2-2 - packets should travel through two digipeaters
- ▶ Each digipeater that processes a packet decrements the hop number
- ▶ Each digipeater also adds its own identifier to show where the message went
 - ▶ We'll look at a few of these in the demo portion of the presentation
- ▶ You might use a geographically limited path: UT2-2 - packets will flood out two hops, but not leave the state of Utah
- ▶ You CAN use e.g. WIDE3-3, if you're in a very rural area with very limited digipeater access

Routing Special Cases

- ▶ ARISS - route via a station in SPACE (the ISS, PCSAT, other satellites as available)
- ▶ TEMPn-N - temporary, event specific routing
 - ▶ Adhoc digipeater on a mobile to provide coverage for low power handhelds
 - ▶ Specific attempts to deliver a packet over a large area
 - ▶ APRS "Golden Packet" attempts on the Appalachian "Mountains"
- ▶ WIDE1-1,WIDE2-2 - route through a "fill in" digipeater first
- ▶ NO PATH AT ALL - aerial stations (balloons, airplanes) should run with NO path set at all as they can already be seen over a wide area
- ▶ HF APRS stations should never digipeat (they can gateway packets to/from the internet, though)

Internet Gateways?

- ▶ There is a whole backbone on the Internet for carrying APRS traffic
- ▶ Used so that people interested in watching the traffic can do it without a radio
- ▶ IGates gateway APRS packets to/from RF and the Internet
- ▶ People have written software that listens to this traffic and does stuff based on what it hears...
- ▶ We're going to talk about some of these next

SMSGTE

- ▶ SMS (cell phone text messages) Gateway
- ▶ <https://smsgte.org/>
- ▶ Allows bi-directional APRS <-> SMS
 - ▶ Yes, not only can you send a message to someone's phone, they can reply!
- ▶ Pre-registration is not required, but if you do, you get access to additional features (like aliases, so you don't have to send people's phone numbers out over the air all the time)
- ▶ Currently this is a FREE service
- ▶ Works in seven countries, including the USA
- ▶ Example: send message to SMSGTE
message body: @18015551212 test message

SMSGTE

▶ DEMO TIME

EMAIL and EMAIL-2

- ▶ Send/receive (short) e-mail messages via APRS
- ▶ <https://www.aprs-is.net/Email.aspx>
- ▶ Like SMSGTE, but sends messages via e-mail
- ▶ Original gateway, EMAIL, has been shut down as of 2019 and replaced with a new implementation called EMAIL-2
- ▶ Example: send message to EMAIL-2
message body: `user@mail.server message text`
- ▶ Also supports defining shortcuts, which further allows BIDIRECTIONAL e-mail traffic from the defined shortcut addresses

EMAIL and EMAIL-2

- ▶ Setting up a shortcut: send message to EMAIL-2
message body: `myshortcut user@mail.server`
- ▶ Setting up a shortcut for myself: send message to EMAIL-2
message body: `me my@email.address`
- ▶ Sending an e-mail to a shortcut: send message to EMAIL-2
message body: `myshortcut message text goes here`
- ▶ Finding out what shortcuts you have: send message to EMAIL-2
message body: `me L`
- ▶ Deleting a shortcut: send message to EMAIL-2
message body: `myshortcut R`

EMAIL and EMAIL-2

- ▶ How about that bi-directional e-mail to APRS?
- ▶ You can't just "reply" to an e-mail you received
- ▶ Send an e-mail to the address you received gated email from in my case, it is "KD7Z WV-1 <aprsemail2@ae5pl.net>"
- ▶ Set the subject of the message to the station callsign (with SSID), a colon, and the message text: KD7Z WV-1: this is the response message
- ▶ In the body of the message, you must include the shortcut used to send mail to you, in the format "userid:myshortcut:"
- ▶ It's weird, so we'll try it out in the demo
- ▶ If the receiving station isn't online, the server will hold on to it for 24 hours
- ▶ Pick up held messages by sending the message "get" to EMAIL-2

EMAIL and EMAIL-2

▶ DEMO TIME

WHO-IS and WHO-15

- ▶ You're no doubt familiar with QRZ.com and have used it to look up a callsign that you heard on the air
- ▶ What if you're not online/near a computer/with internet access?
- ▶ Send a message to WHO-IS with the message body being the call sign
- ▶ Get back a message with the license class, name, state, and country
- ▶ WHO-15? some igates and/or software doesn't support non-numeric SSIDs (i.e. the IS after the dash), the WHO-IS server also responds to calls to WHO-15 to evade this problem
- ▶ Prefix the callsign with "f" to get the "full" output for a given callsign (full output includes the address [not just state/country] if known)

WHO-IS and WHO-15

▶ DEMO TIME

CQSRVR and ANSRVR

- ▶ CQ Server lets you register with a particular "topic"
- ▶ Anything sent to that topic will get sent to you
- ▶ You can then start up station-to-station messaging
- ▶ Send a message to CQSRVR
message body: CQ groupname your message
example: CQ APRS testing aprs services
- ▶ Unsubscribe by sending "U groupname"
- ▶ Other things to send:
"?" Lists all groups
"? Groupname" shows you how many people are in the group
"L" shows groups you are currently monitoring
- ▶ Not sending anything for 12 hours automatically unsubscribes you
- ▶ Can only send one message per group per 30 minutes (avoid congestion)

CQSRVR and ANSRVR

- ▶ ANSRVR - Announcement Server
- ▶ ANSRVR was developed to overcome some deficiencies of CQSRVR
 - ▶ CQSRVR doesn't work with tactical calls
 - ▶ CQSRVR requires you to send a message when you join a group
- ▶ Additional ANSRVR commands:
 - "D" show groups with descriptions, also sending D <group> description text, will supply a description of the group to the server
 - "L" List groups you are a member of (with member count including self)
 - "J group" Join group quietly
 - "K group1 group2 group3 ..." Quietly Keepalive multiple groups (be careful of APRS message length limits)

CQSRVR and ANSRVR

- ▶ I checked and as of Monday night there were 438 groups on ANSRVR
- ▶ Here are some interesting/popular sounding ones:
 - AMSAT - info on aprs sattelites
 - APRSDROID - ANDROID APRS PLATFORM
 - BALLOON - high altitude balloon alerts
 - ISS - ISS APRS Schedule
 - JOTA - Jamboree on the Air
 - SKYTEST - test messages for SKYWARN
 - SOTA - summits on the air
- ▶ And a bunch more with currently only one member of the group, so take a look and strike up a conversation!

CQSRVR and ANSRVR

▶ DEMO TIME

WXBOT and WXYO

- ▶ Weather Bot gives you current or future conditions
- ▶ You can ask about "where", "when", or "what"
- ▶ Where: city,state; callsign; aprs object; lat/long (decimal degrees, negative for south or west); gridsquare (four or six character); CWOP; airport (four character ICAO or three character IATA) responds with METAR; or zipcode
- ▶ When: today, tonight, tomorrow, tomorrow night, day of week (i.e. Saturday, three letter abbreviations accepted)
- ▶ What: brief (default), full, current, metar, or cwop
- ▶ NOTE: only works for areas covered by US National Weather Service (and airports, which will be reported with a METAR string)

WXBOT and WXYO

- ▶ Like WXBOT, but based in Romania
- ▶ Can look up non-US callsigns
- ▶ You can ask for a report with a numeric number of hours from now (not just e.g. tomorrow or tonight)

WXBOT and WXYO

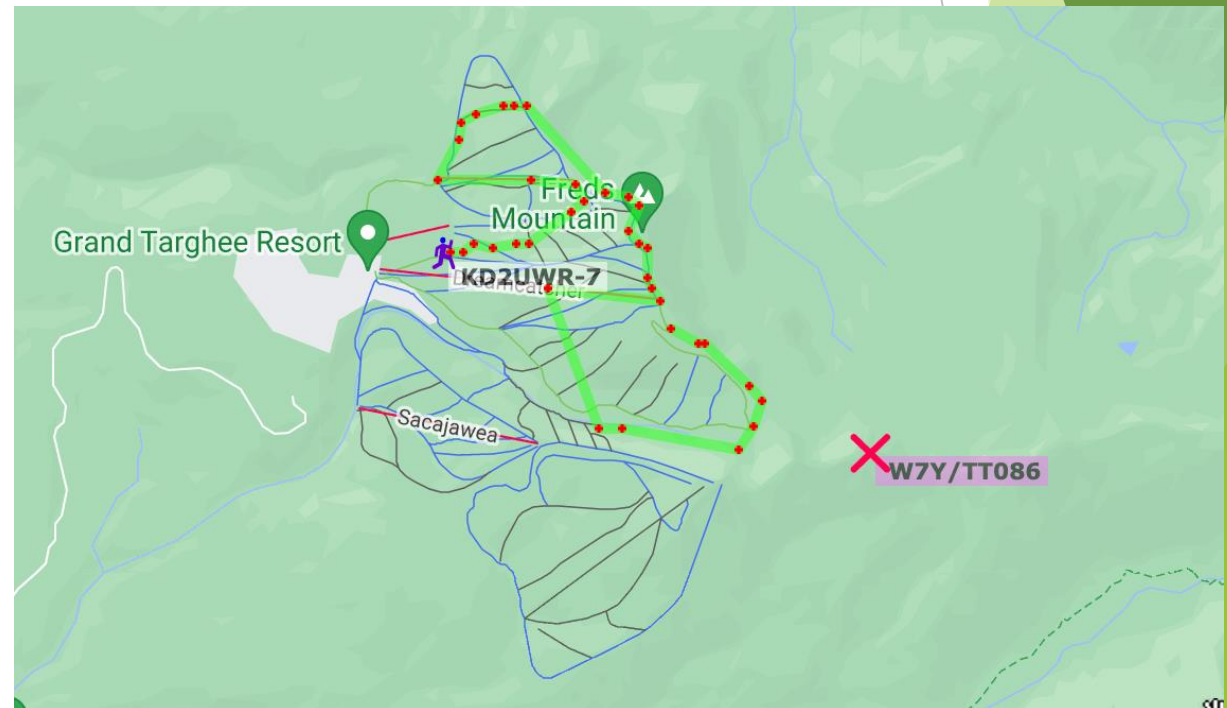
▶ DEMO TIME

SOTA

- ▶ Summits on the Air
- ▶ Using the SOTA gateway, you can "spot" yourself (report that you are activating a summit)
- ▶ Send a message to: SOTA
message body must contain Ass/Ref Frequency Mode and optionally callsign
- ▶ Example: W7U/UT-043 146.54 FM AE4KR
"View Benchmark" (a.k.a. Alien Tower on Traverse Ridge), our own Paul operating on 146.54 MHz FM simplex last October

Other SOTA Integrations

- ▶ There is also a system called SOTA2APRS
- ▶ Watches APRS traffic
- ▶ Detects when an APRS station is getting close to a SOTA site
- ▶ Can "automatically" spot a SOTA activator
- ▶ Publishes this information to APRS
- ▶ Best place to visualize this is on aprs.fi



Q&A

