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On the Air Live: APRS

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ARRL
The National Association for
Amateur Radio®

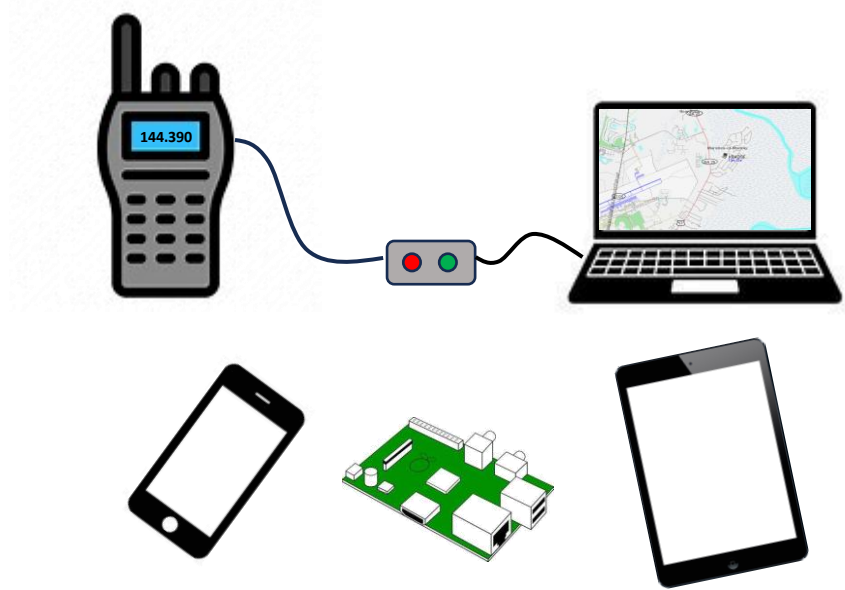


- What is APRS
- APRS Paths
- Digipeaters
- iGates
 - APRS-IS
 - Extended capabilities



Data Modes with the HT

- Computing Device
- Soundcard or TNC
- Efficient communication
- Fast, accurate data transfer
- Transfer files
- Text communication
- Pass location information
 - GPS
 - Lat/Long
 - What Three Words



Soundcards and TNCs

- Transmitted data is converted to audio via a soundcard or a Terminal Node Controller
- Soundcards can operate any data mode including packet radio and APRS
 - Can also be used for SSTV
- Terminal Node Controllers are specific to packet radio to include APRS
 - Hardware and software TNCs



```

Status Report, Tony Trach
Local Value 147.2484 Pa, 77.9

#sigmeter NOAAmeasr level = 180218(15) .....|.....|
#e 51 NOAAmeasr=NOA11, NOAAmeasr_ID=131116 600/60128 50000/600000=city 578
#location, normal, car [side view], for Hytune AT-070701 A895 vehicle
#12 10.5800, W 002 28.5500, 0 km/h (0 MPH), course 90, alt 0 m (0 Ft)
#city 578

#sigmeter NOAAmeasr level = 180218(15) .....|.....|
#e 31 M09P0=1500000, M09M0=5.5, NOAAmeasr_ID=131116 600/60128 50000/600000=CHMC Turner County GA
#location with time, Generic digimeter, 5000Pa [m/sqrtair.com]
#1 21.5800, W 003 00 m000
#CHMC Turner County GA

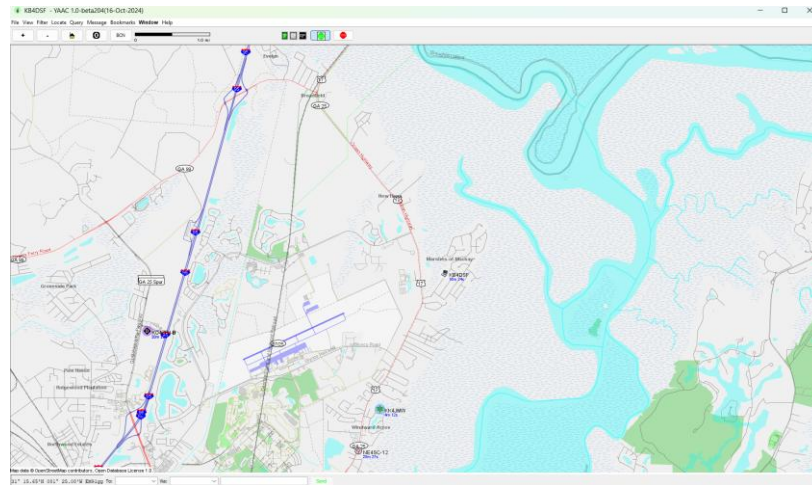
#sigmeter NOAAmeasr level = 71218(70) .....|.....|
#e 1 NOAAmeasr=NOA111, NOAAmeasr_ID=131116 600/60128 50000/600000=city 578
#location, car [side view], for Hytune AT-070701 A895 vehicle
#1 10.5800, W 001 28.5500, 0 km/h (0 MPH), course 90, alt 0 m (0 Ft)
#city 578
#(K) NOAAmeasr_ID=131116 280125.8707A0BL on the Air Live, on report, March 25 8pm easternstd+0

#sigmeter NOAAmeasr level = 5523(8) .....|.....|
#e 1 NICE1=1404PM12, NICE2=1-13, NOAAmeasr_ID=19151212010 180000.9726 73_323
#Status Report, W070701 Station 5111, SQL1E [http://aircannet.com.pl/]
#12 10.5800, W 002 28.5500
#location, station, digimeter, gust 6, temperature 60, rain 0.00 in last hour, rain 0.00 in last 24 hours, rain 0.00 since
#10, humidity 100, barometer 98.66, "G12"

```

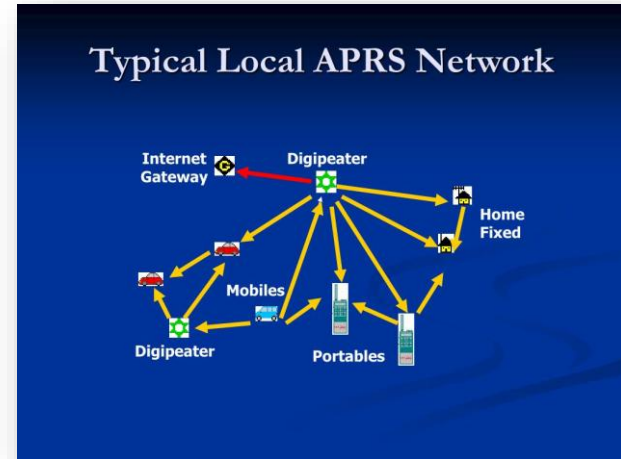
Software

- YAAC
 - Yet Another APRS Client
- Direwolf
 - Software TNC
- APRS-IS Passcode
 - n5dux.com/ham/aprs-passcode/
- Pinpoint APRS: pinpointaprs.com
 - Windows
- Xastir APRS: xastir.org
 - Linux
- Soundmodem: uz7.ho.ua/packetradio.htm
 - Software TNC
- AGWPE: Soundpacket.org/2agwget.aspx
 - Software TNC

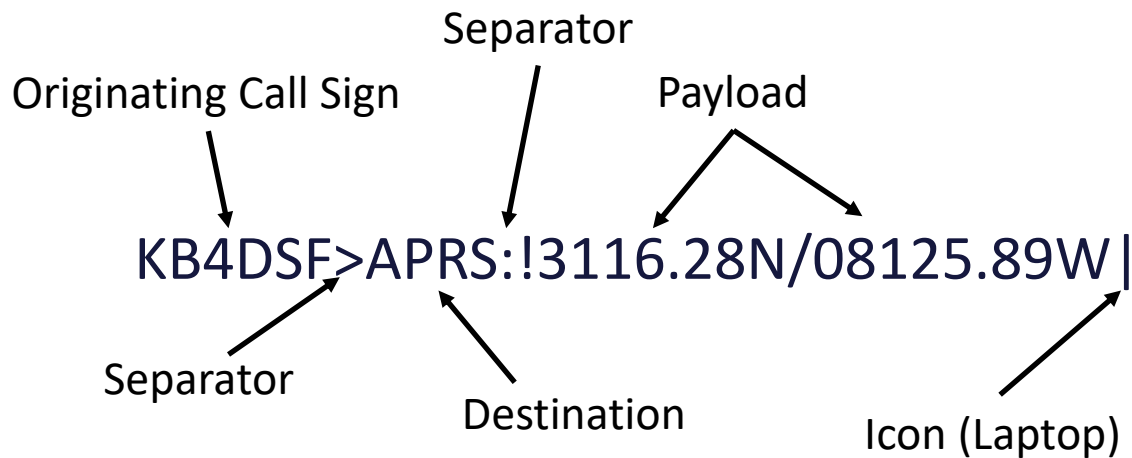


Automatic Packet Reporting System

- APRS: two-way, tactical, real-time digital communications system: 144.390 MHz
- Decentralized, local, information sharing network, no need for internet*
- Network can be as simple as two APRS devices operating in simplex
- Can be substantial consisting of multiple user devices, digipeaters*, and iGates
- Data can include:
 - GPS location
 - Text messages
 - Telemetry and weather data
 - Objects
 - Field Day location, emergency shelters, etc
 - Bulletins



APRS Message Format



Simplex APRS Message Format

KB4DSF>KO4ADN:On my way

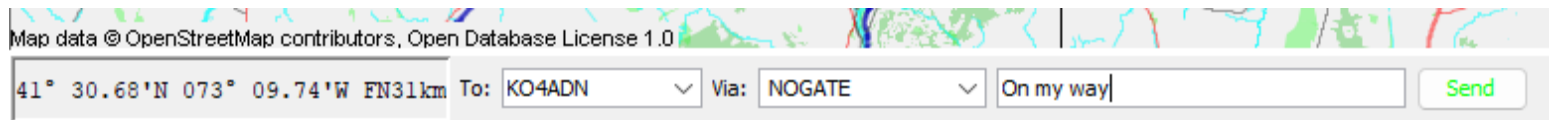
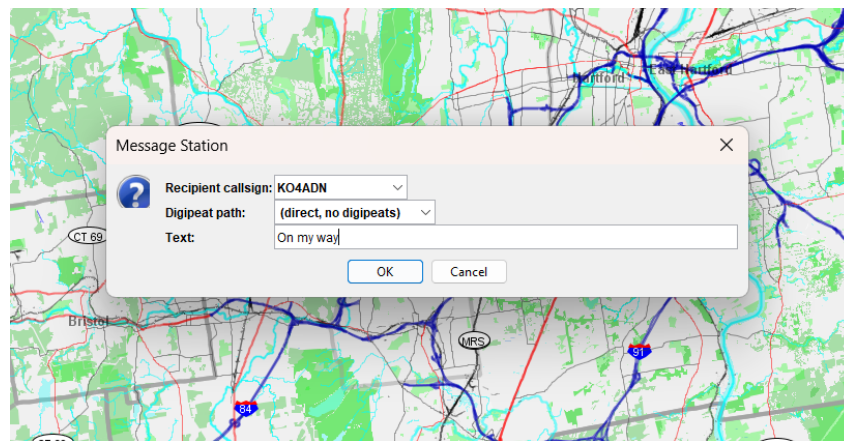
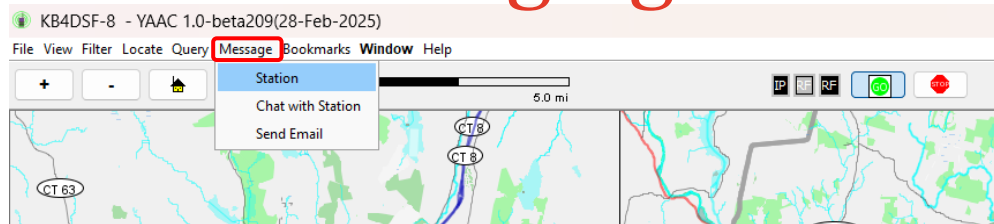
- Simplex
- No digipeaters but can be gated to the internet

KB4DSF>KO4ADN,NOGATE:On my way

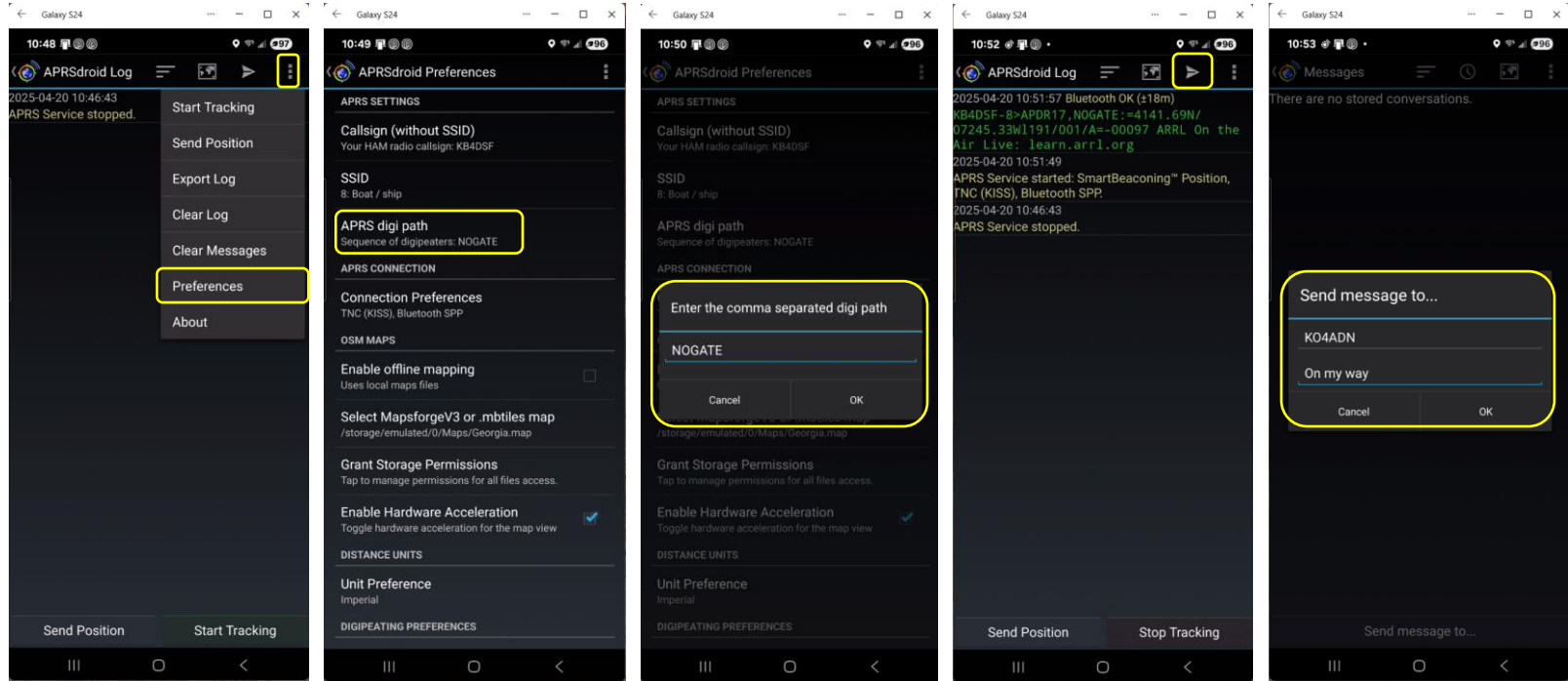
- Simplex
- No repeaters, no iGates
 - NOGATE, RFONLY, or both



Simplex APRS Messaging with YAAC

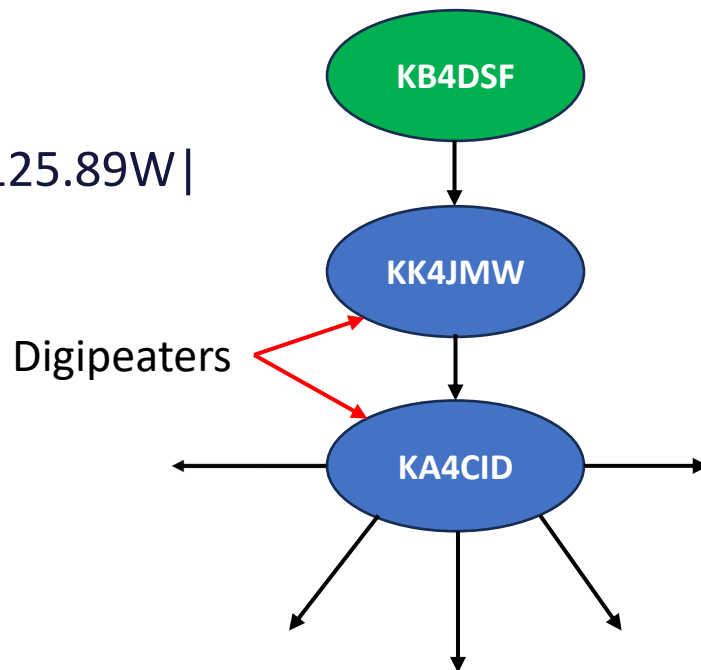


Simplex APRS Messaging with APRSdroid



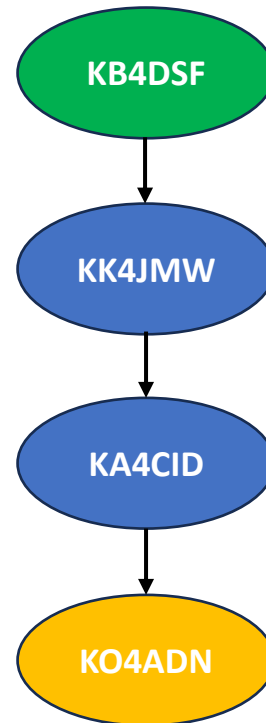
APRS Directed Path

- KB4DSF>KK4JMW,KA4CID:!3116.28N/08125.89W|

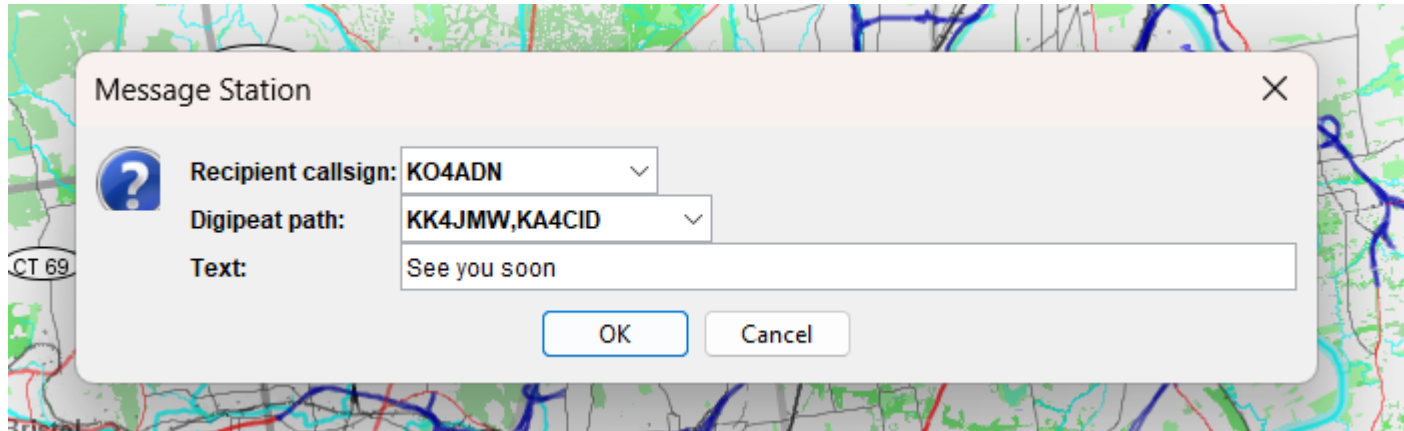


APRS Directed Path

- KB4DSF>KK4JMW,KA4CID,KO4ADN:See you soon



APRS Directed Path



A screenshot of a software interface for sending APRS messages. The background is a map showing roads and terrain. Overlaid on the map is a dialog box titled "Message Station" with a close button (X) in the top right corner. Inside the dialog box, there is a blue question mark icon. To the right of the icon are three input fields: "Recipient callsign:" with a dropdown menu showing "KO4ADN", "Digipeat path:" with a dropdown menu showing "KK4JMW,KA4CID", and "Text:" with a text input field containing "See you soon". At the bottom of the dialog box are two buttons: "OK" and "Cancel".

Message Station

Recipient callsign: KO4ADN

Digipeat path: KK4JMW,KA4CID

Text: See you soon

OK Cancel



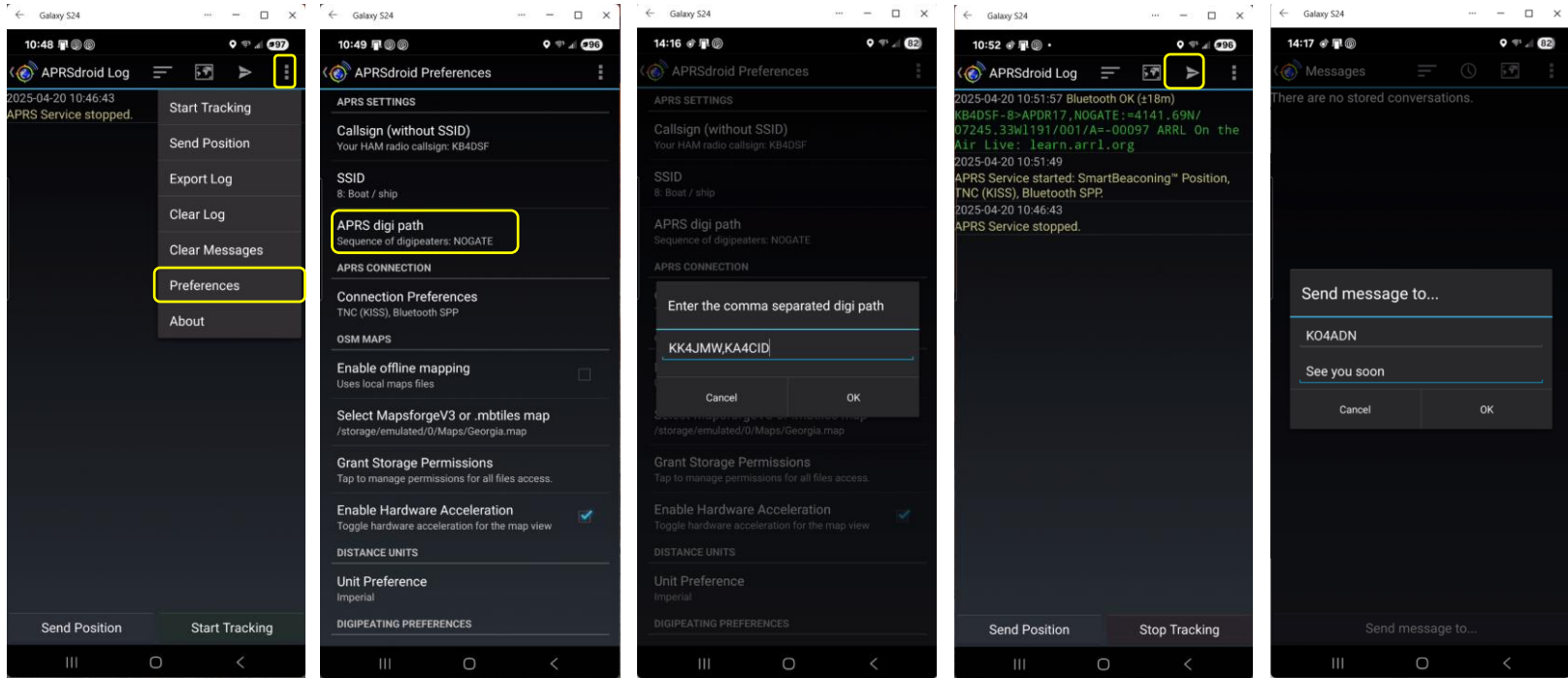
A screenshot of the bottom status bar of the APRS software. It shows map data information: "Map data © OpenStreetMap contributors, Open Database License 1.0". Below this is a row of fields: a text field containing "41° 38.15'N 073° 08.93'W FN31kq", a "To:" label followed by a dropdown menu showing "KO4ADN", a "Via:" label followed by a dropdown menu showing "KK4JMW,KA4CID", a text input field containing "See you soon", and a green "Send" button.

Map data © OpenStreetMap contributors, Open Database License 1.0

41° 38.15'N 073° 08.93'W FN31kq To: KO4ADN Via: KK4JMW,KA4CID See you soon Send

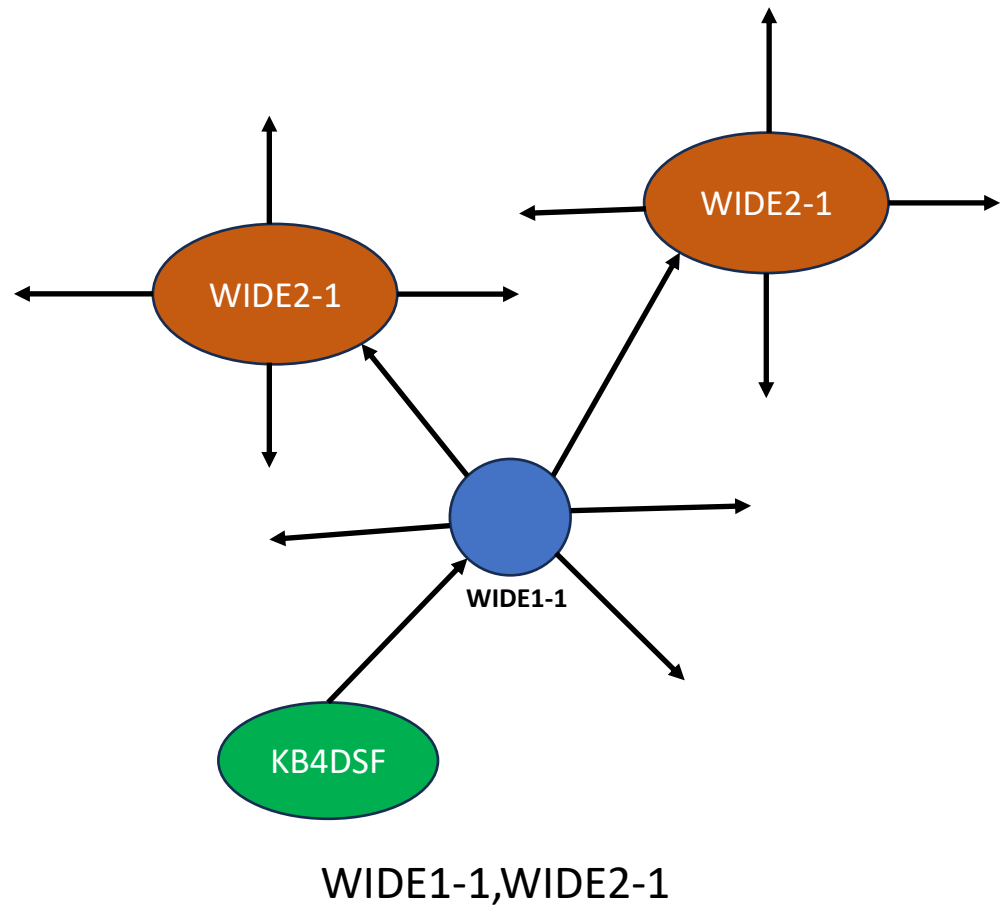


APRS Directed Path



Digipeaters

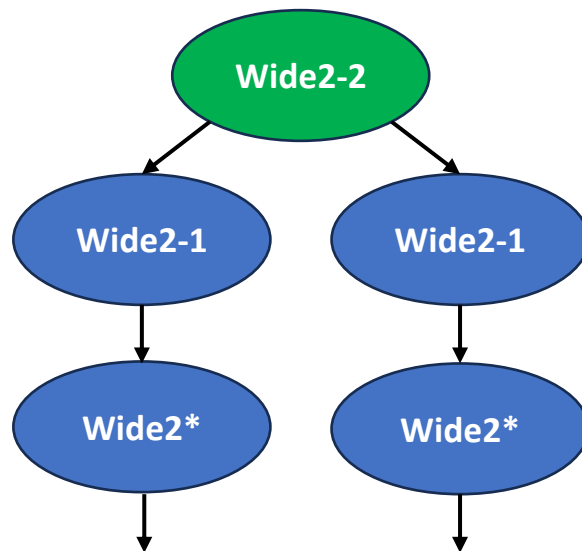
- Provides for wider coverage
- Two types
 - Fill-in (WIDE1-1)
 - Higher Level (WIDE2-1, WIDE2-2, WIDE3-3)



APRS Paths

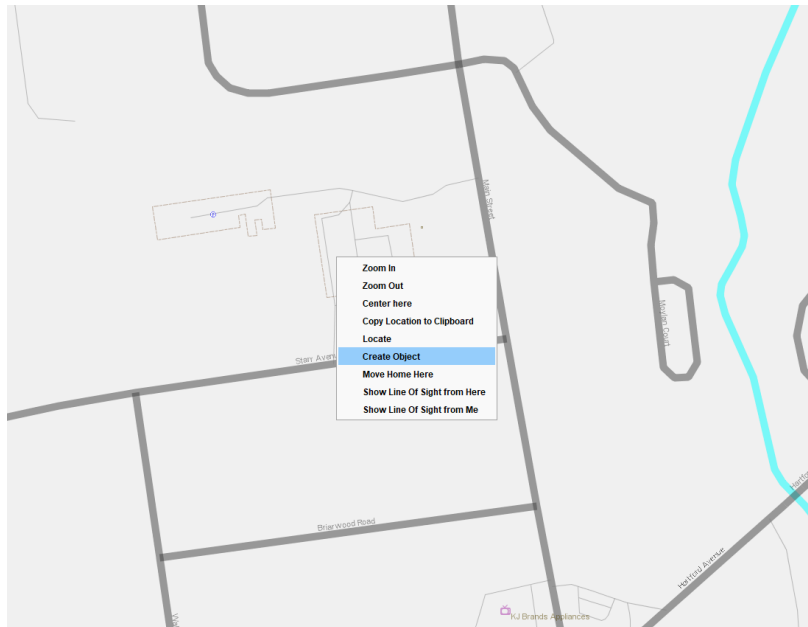
- Digipeater hops
 - Wide1-1 = Fill in
 - Wide2-1 = 2 hops w/ 1 remaining*
 - Wide2-2 = 2 hops w/ 2 remaining
 - Wide3-3 = 3 hops w/ 3 remaining
- Most common path settings
 - Wide1-1, Wide2-1
 - Wide1-1, Wide2-2
- Can request up to 7, but don't
 - Some digipeaters do not accept anything over 2
 - Anything over 3 is likely to fail

- Widen-N
 - n = requested number of hops
 - N = remaining hops





Objects



Create New Object

Name: ARRL HQ ☒ Object active (not "killed")

Latitude: 41° 42.88' N Local

Longitude: 72° 43.67' W ☐ Permanent Item

Symbol: // Dot Overlay:

Speed (knots): 0 Course (degrees N): 0

Comment: 225 Main St

Object Digipeating:

Standard Digipeat Paths:

Selected Digipeat Paths in Proportional Path Order:

- 1 WIDE1-1
- 2 WIDE1-1, WIDE2-1

Enter User-Defined Digipeat Path:

Initial repeat rate (sec): 60

Retransmission decay ratio: 2

Stable slow repeat rate (sec): 1,800

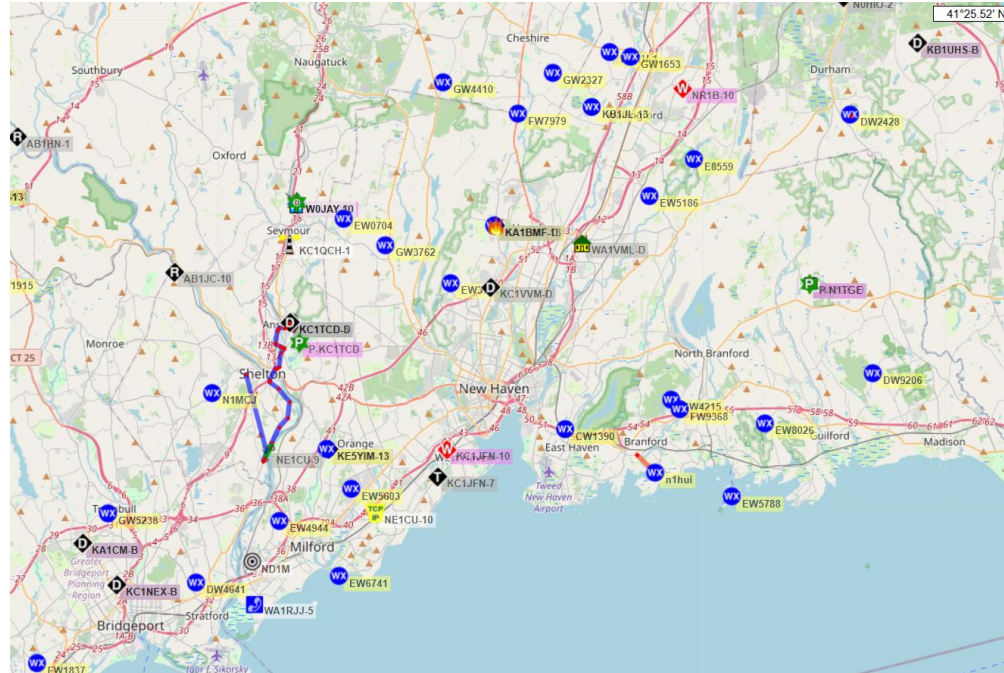
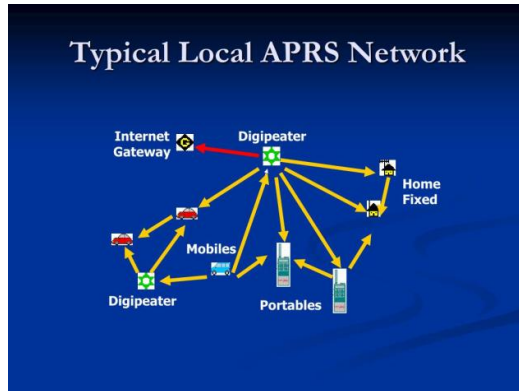
GRU group (blank for no group):

Objects



iGates

- Internet Gateway
- APRS.FI
- APRS-IS
- [N5DUX APRS Passcode Generator](#)

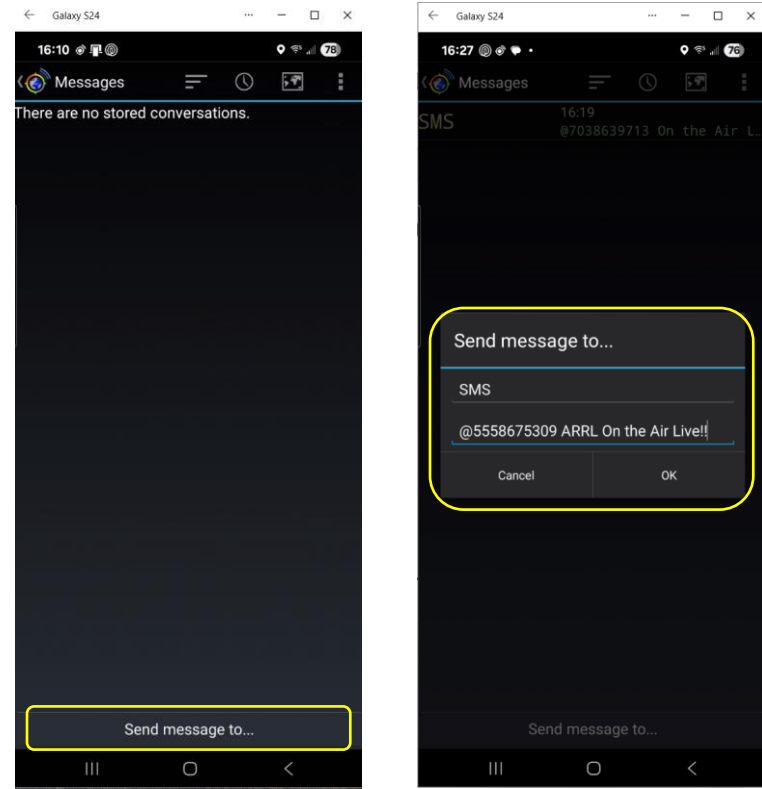


Extended Capabilities via APRS-IS

- SMS to a cell phone
- Opt in at <https://aprs.wiki/>
- Send message to SMS
- Format

To: SMS

@5558675309 Jenny, I've got your number



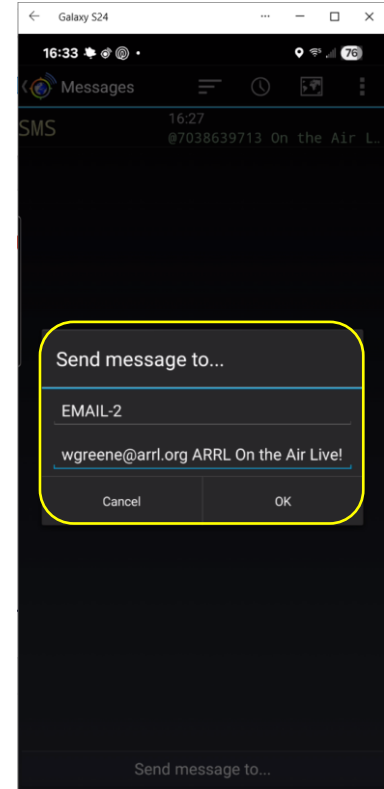
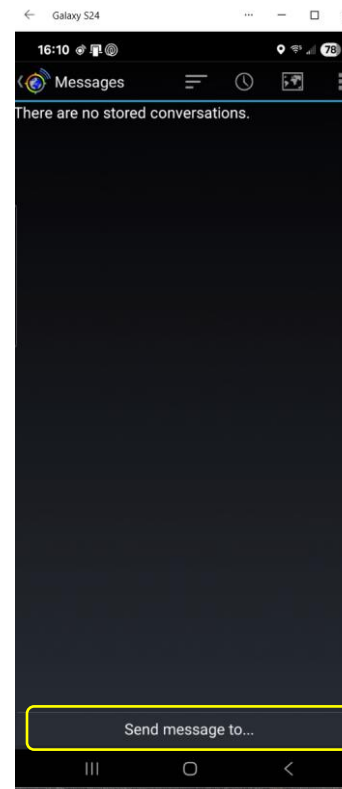
Extended Capabilities via APRS-IS

- Email via APRS

To: EMAIL-2

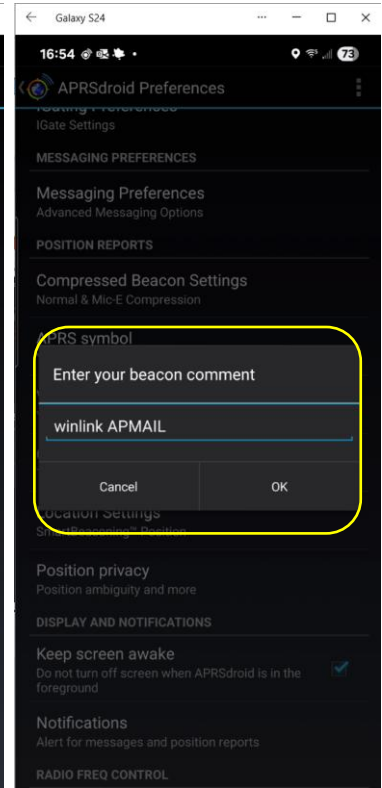
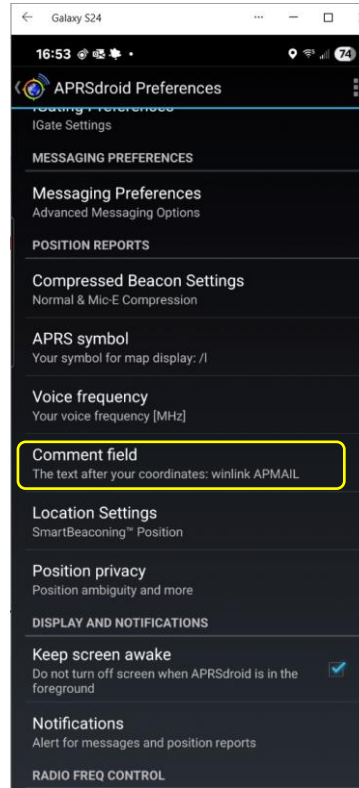
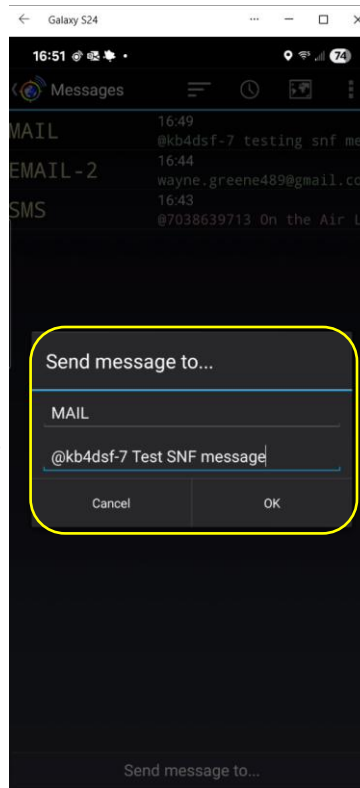
email@emailaddress.com Message

- Keep the message as short as possible



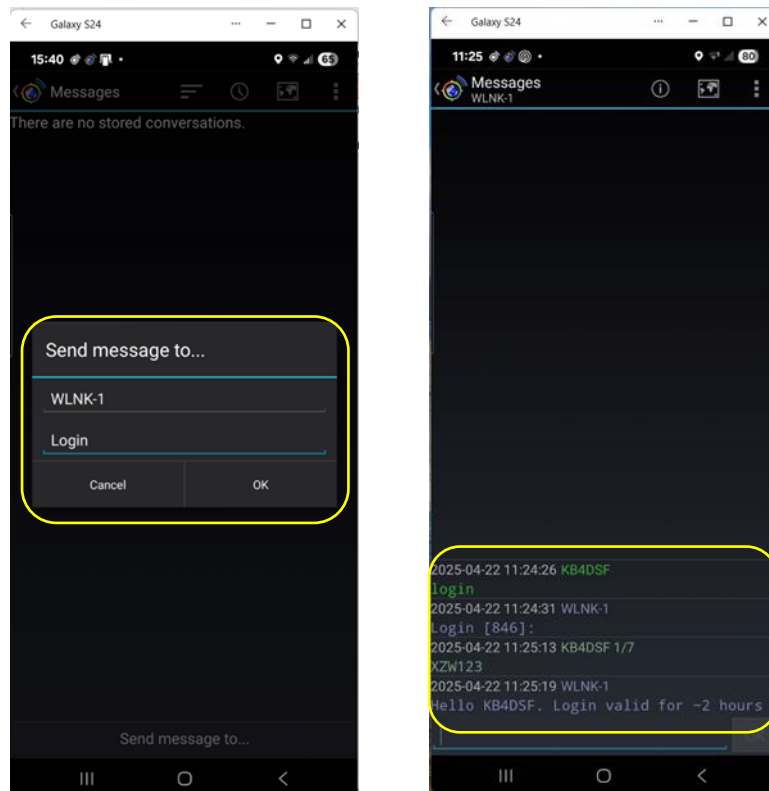
Extended Capabilities via APRS-IS

- Store-and-forward messaging
- Messages will wait in a queue awaiting for recipient to beacon APRS
- Stored in the Queue for 7 days
- To retrieve
 - Manually: send aprsm to MAIL
 - Automatically: add APMAIL to your APRS status message



Extended Capabilities via APRS-IS

- APRSLink
- Receive and Send winlink email
- Send message to WLNK-1 to login
- Challenge will consist of 3 numbers
 - Correspond to the character positions of your password
 - Follow up with three random characters
 - EX: your password is P@\$WORD
 - Challenge is 351
 - Response: \$WP123
 - Login will be good for 2 hours



Extended Capabilities via APRS-IS

- APRSLink
- L = list of messages
- R# = read message #
- Y# = replay to message #
- All APRSlink commands are found here:

<https://winlink.org/APRSLink>

- SP = write a message
 - Line by line
 - First line is the Subject
 - Write each line
 - Last line = /EX

SP wgreene@arrl.org Winlink Message

First line of message.

Second line of message

/EX



Extended Capabilities via APRS-IS

Send message to...

WLNK-1

login

Cancel OK

07:39

WLNK-1

You have 4 Winlink mail...

12:22

Messages

WLNK-1

2025-04-24 12:20:21 KB4DSF
Login

2025-04-24 12:20:22 WLNK-1
Login [152]:

2025-04-24 12:20:49 KB4DSF
I@Q123

2025-04-24 12:20:50 WLNK-1
Hello KB4DSF. Login valid for ~2 hours

2025-04-24 12:22:09 KB4DSF
L

2025-04-24 12:22:10 WLNK-1
1) 04/24/2025 16:22:09 Test APRSLINK 361 bytes

2025-04-24 12:22:10 WLNK-1
2) 04/24/2025 16:22:09 Wayne, FL WL NET 04-22-25 New Callsigns AJ

2025-04-24 12:22:11 WLNK-1
4AR Clifton I;KF0TTM Alexander;N5VY 2087 bytes

2025-04-24 12:22:12 WLNK-1
3) 04/24/2025 16:22:09 Re: FL WL NET, Wayne, Newington, CT, VHF FM P

12:22

Messages

WLNK-1

2025-04-24 12:20:21 KB4DSF
Login

2025-04-24 12:20:22 WLNK-1
Login [152]:

2025-04-24 12:20:49 KB4DSF
I@Q123

2025-04-24 12:20:50 WLNK-1
Hello KB4DSF. Login valid for ~2 hours

2025-04-24 12:22:09 KB4DSF
L

2025-04-24 12:22:10 WLNK-1
1) 04/24/2025 16:22:09 Test APRSLINK 361 bytes

2025-04-24 12:22:10 WLNK-1
2) 04/24/2025 16:22:09 Wayne, FL WL NET 04-22-25 New Callsigns AJ

2025-04-24 12:22:11 WLNK-1
4AR Clifton I;KF0TTM Alexander;N5VY 2087 bytes

2025-04-24 12:22:12 WLNK-1
3) 04/24/2025 16:22:09 Re: FL WL NET, Wayne, Newington, CT, VHF FM P

R1

OK

Login

Challenge and Response

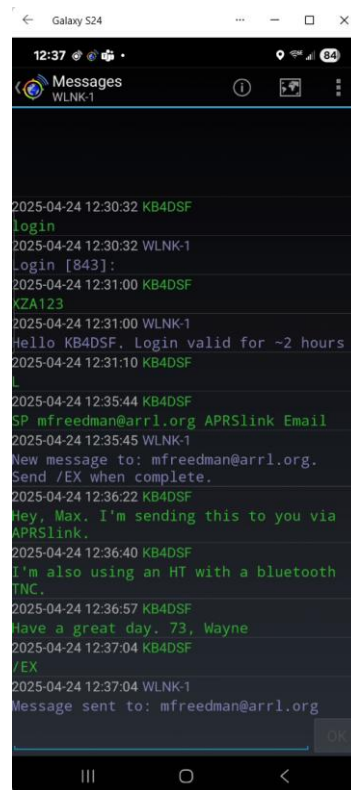
List command to list Winlink messages

Read command to read message #1



Extended Capabilities via APRS-IS

Email via APRSlink



Thank You!



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