



Automatic Packet Reporting System

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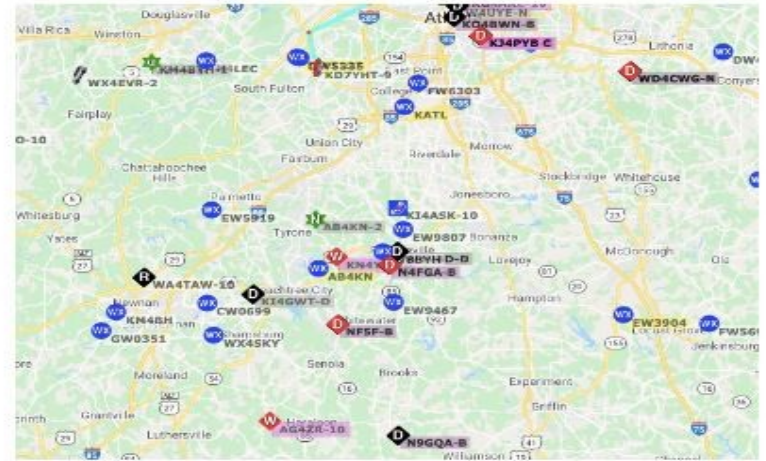
APRS – what is it?

Ham Radio Text Messaging

The Automatic Packet Reporting System is an amateur radio-based system for real time tactical digital communications of information of immediate value in the local area.

APRS data is typically broadcast on a single shared frequency to be repeated locally by area relay stations and digipeaters for widespread local consumption.

In addition, all such data is typically ingested into the APRS Internet System (APRS-IS) via an internet connected receiver (igate) and distributed globally. Shared information contains global coordinates, altitude, speed, heading, text messages, alerts, announcements, and bulletins.



What is APRS (Amateur Packet Reporting System)?

Automatic Packet Reporting System (APRS) is an amateur radio-based system for real time digital communications of information of immediate value in the local area.[1] Data can include object Global Positioning System (GPS) coordinates, weather station telemetry, text messages, announcements, queries, and other telemetry. APRS data can be displayed on a map, which can show stations, objects, tracks of moving objects, weather stations, search and rescue data, and direction finding data.

APRS data is typically transmitted on a single shared frequency (depending on country) to be repeated locally by area relay stations (digipeaters) for widespread local consumption. In addition, all such data are typically ingested into the APRS Internet System (APRS-IS) via an Internet-connected receiver (IGate) and distributed globally for ubiquitous and immediate access.[2] Data shared via radio or Internet are collected by all users and can be combined with external map data to build a shared live view.

APRS was developed from the late 1980s forward by Bob Bruninga, call sign WB4APR, a senior research engineer at the United States Naval Academy. He maintained the main APRS Web site until his death in 2022.[3][4] The initialism "APRS" was derived from his call sign.

Father of APRS

CDR Bob Bruninga, WB4APR, SK

- Commander Robert Bruninga, P.E. (US Navy, 1970-1990) invented what became APRS in 1982 on an Apple II computer
- Georgia Tech, 1970, BS EE
- Naval Postgraduate School, 1971, MS EE
- Originally used to map Navy position reports
- Later ported to VIC-20 computer and then IBM PC
- Originally called Connectionless Emergency Traffic System (CETS)
- FEMA used the technology in the 1990's and it became Automatic Position Reporting System
- With the prevalence of civilian GPS technology, additional uses were found for APRS and it became known as Automatic Packet Reporting System
- APRS began to decline in popularity in the early 2000's, but became popular again over the last 10 years as it has become integrated with the Internet (although it works without the Internet)
- Bob Bruninga became a SK last month on 2/7/2022



Why do you need aprs

YOU DON'T

Why I want you to have APRS



During an extreme weather event net control and the weather service radio operator can see exactly where you are if you are beaconing-

Where are you if you report your position as “I am in Moore Station next to the high school”?

What APRS is

- ✓ Software
- ✓ Hardware
- ✓ Protocols
- ✓ Systems
- ✓ Computers
- ✓ Networks
- ✓ People

What APRS is NOT?

- ✓ Magic
- ✓ Lifeless
- ✓ Only for Gurus
- ✓ Only for people with lots of money
- ✓ Only for people with GPS receivers

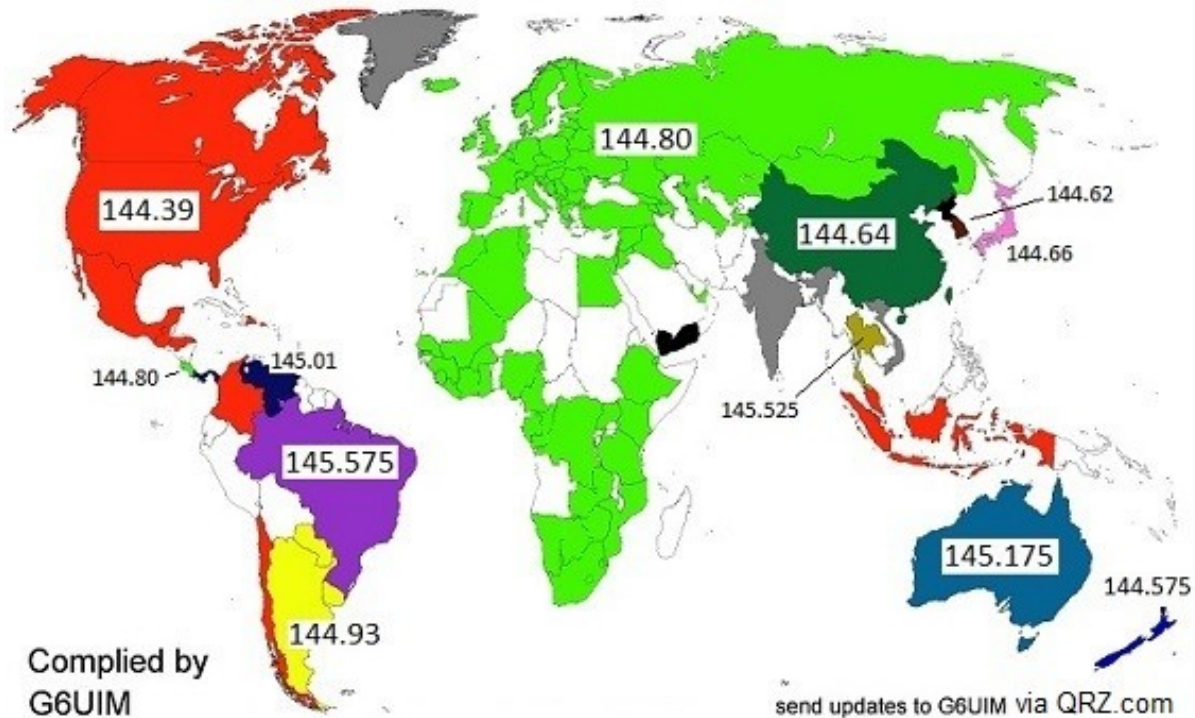
Advantages

- No cell service – no wifi – no problem
- When traveling – you can be tracked by loved ones
- You can track people – planes- balloons – etc
- You can get weather info on demand
- It's text messaging for hams

APRS Features

- ✓ Maps
- ✓ Weather Station Reporting
- ✓ DX Cluster Reporting
- ✓ Internet Access
- ✓ Messages
- ✓ Bulletins and Announcements
- ✓ Traffic
- ✓ All-Packet Log
- ✓ Heard Log
- ✓ Digipeater List
- ✓ Fixed Station Tracking
- ✓ Objects
- ✓ ACARS - Aircraft

APRS Frequencies



VHF 144.39 MHz

HF 10.151 MHz LSB

Experimental work is being done on other frequencies.

APRS

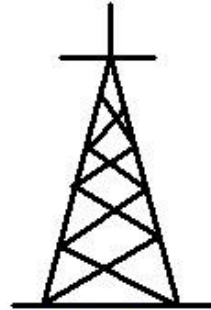
Automatic Position Reporting System



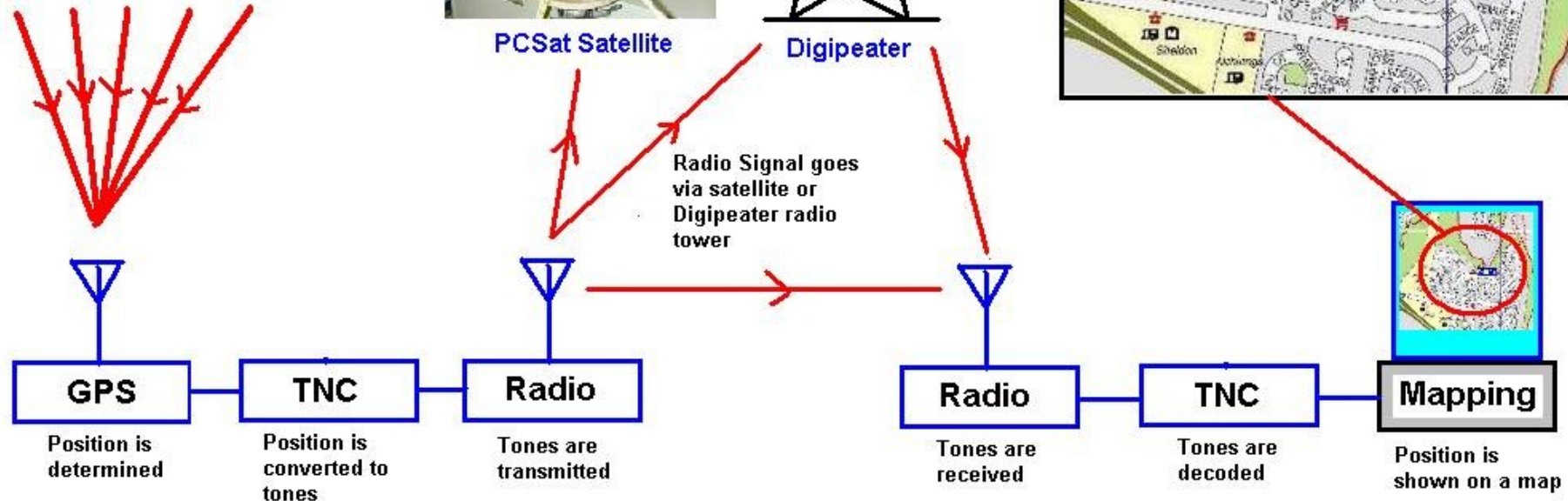
GPS Satellite



PCSat Satellite

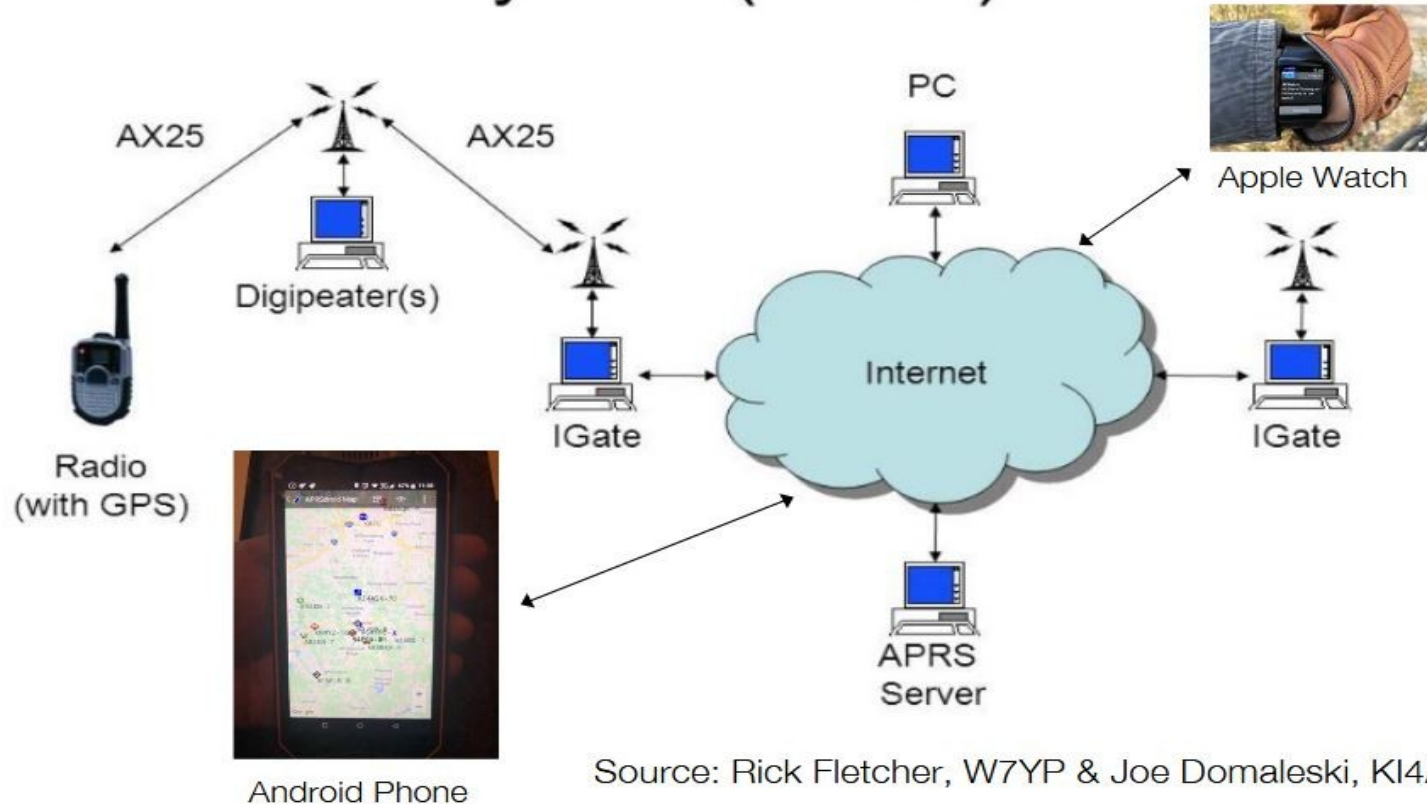


Digipeater



How does APRS work?

Automatic Packet Reporting System (APRS)



Source: Rick Fletcher, W7YP & Joe Domaleski, KI4ASK

WIDE DIGIPEATERS versus RELAYS

- ✓ RELAY's are mostly home stations
- ✓ They are used to fill in areas with no WIDE coverage
- ✓ WIDE's are permanent Digis
- ✓ They have good coverage

Relays are used to fill in the gaps. Wides do most of the work.

PATHS – WIDE1:1,WIDE2:1

APRS pathing defines the route your packet takes through the network of digipeaters. It tells digipeaters who should repeat your packet and how far it should go. Think of it like addressing a letter: the path is your routing instruction.

Here are the most common path aliases you'll encounter:

Alias	Meaning
WIDE1-1	Used for fill-in digipeaters (low-level, local coverage)
WIDE2-1	Used for high-level digipeaters (wide-area coverage)
WIDE2-2	Two hops via high-level digis
WIDE1-1,WIDE2-1	One hop via fill-in, then one via high-level digi (very common)

Let's say your path is WIDE1-1,WIDE2-1:

- Your radio sends a packet with a WIDE1-1,WIDE2-1 path.
 - A fill-in digipeater hears it and replaces WIDE1-1 with its own call (e.g., KG5EUX*) and marks it used.
 - A high-level digipeater hears the remaining WIDE2-1, repeats it, and marks it used.
 - The packet is now KG5EUX*,WIDE2-1* and won't be repeated again.
- This prevents infinite loops and keeps the network efficient.

Best Practices

- Mobile/HT Use: WIDE1-1,WIDE2-1 — ensures local fill-in and wide coverage.
- Base Station: WIDE2-1 or WIDE2-2 — skip fill-ins to reduce congestion.
- Digipeaters: Should not use paths at all — they beacon with no path or direct.

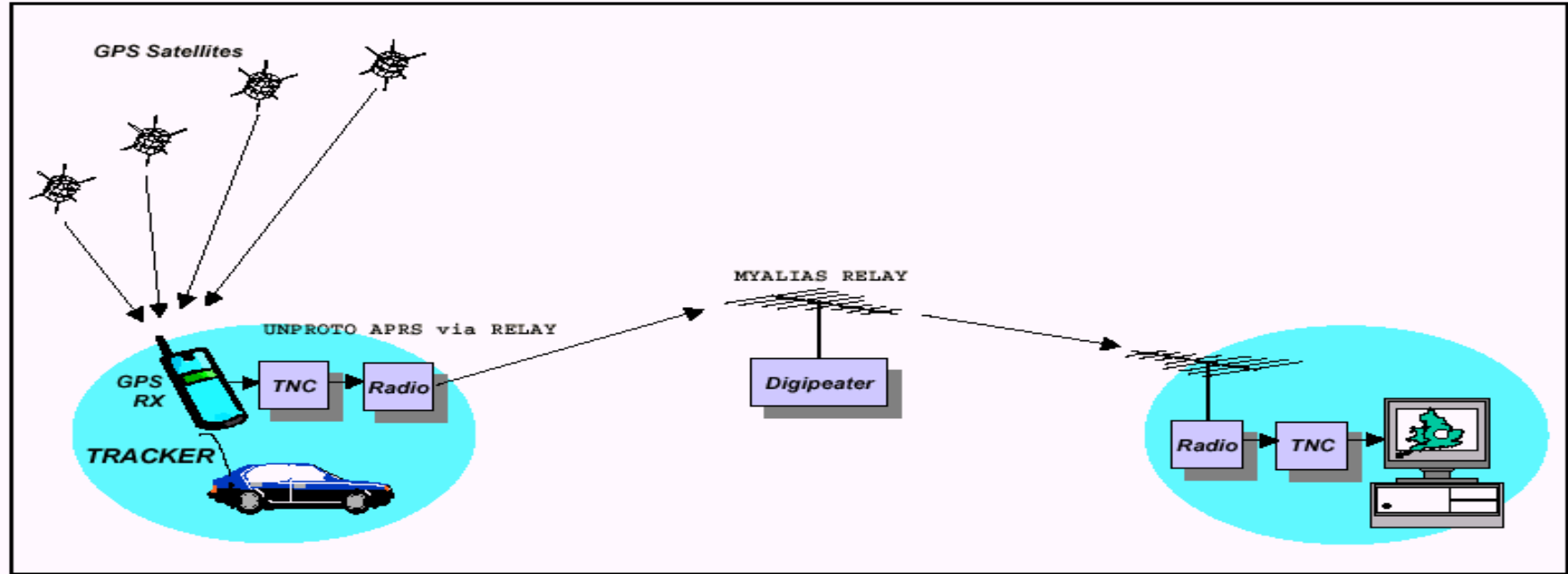
What to Avoid

- Over-pathing: Using WIDE2-2,WIDE2-3 or more causes unnecessary traffic.
- Obsolete paths: RELAY, TRACE, and WIDE (without numbers) are deprecated.

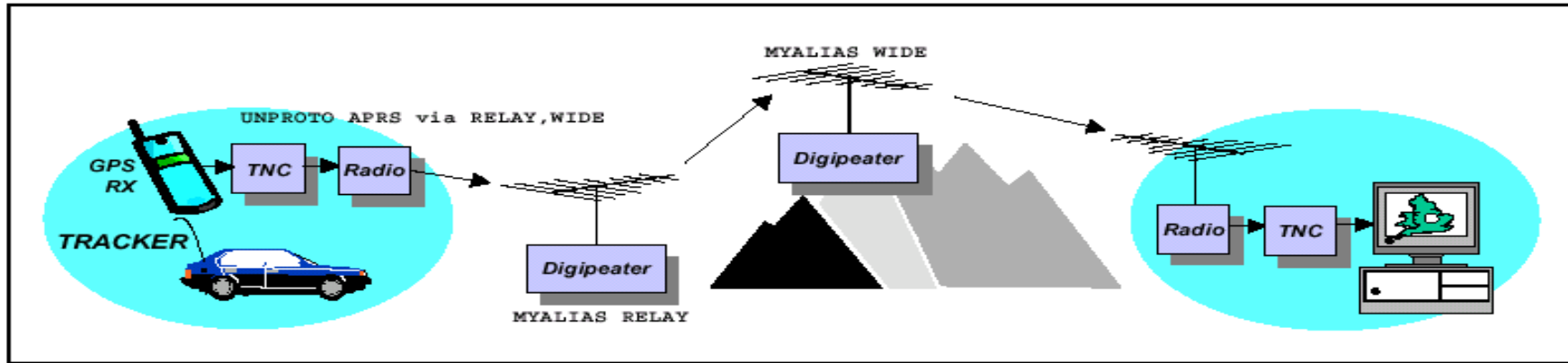
iGates should beacon direct only.

If an APRS packet does not include WIDE1-1, it can still be digipeated, but only by true WIDEn-n digipeaters — not fill-in digipeaters that are configured to respond to WIDE1-1.

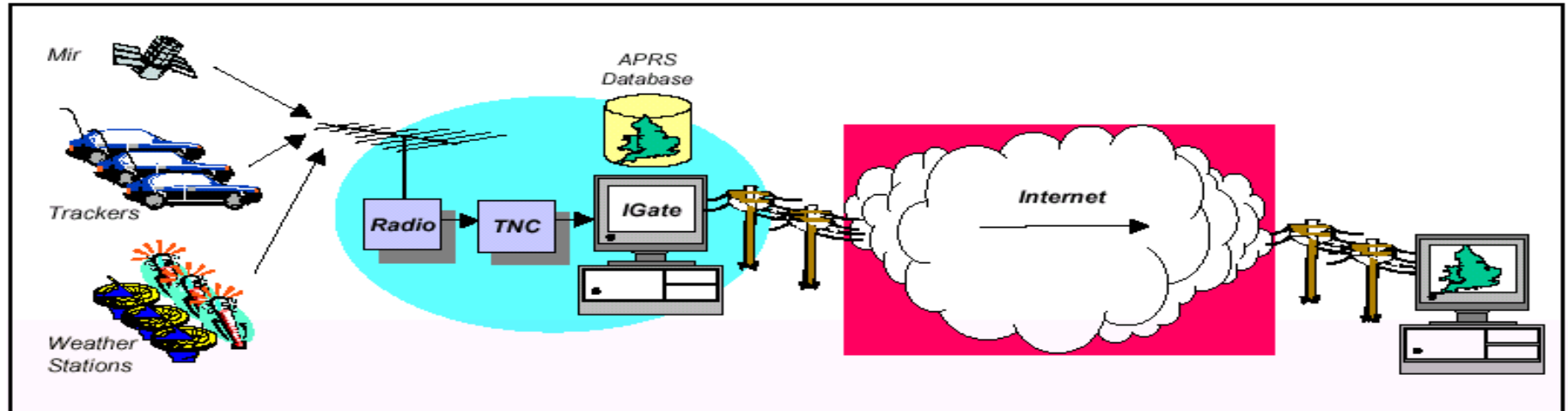
RELAY Digipeater



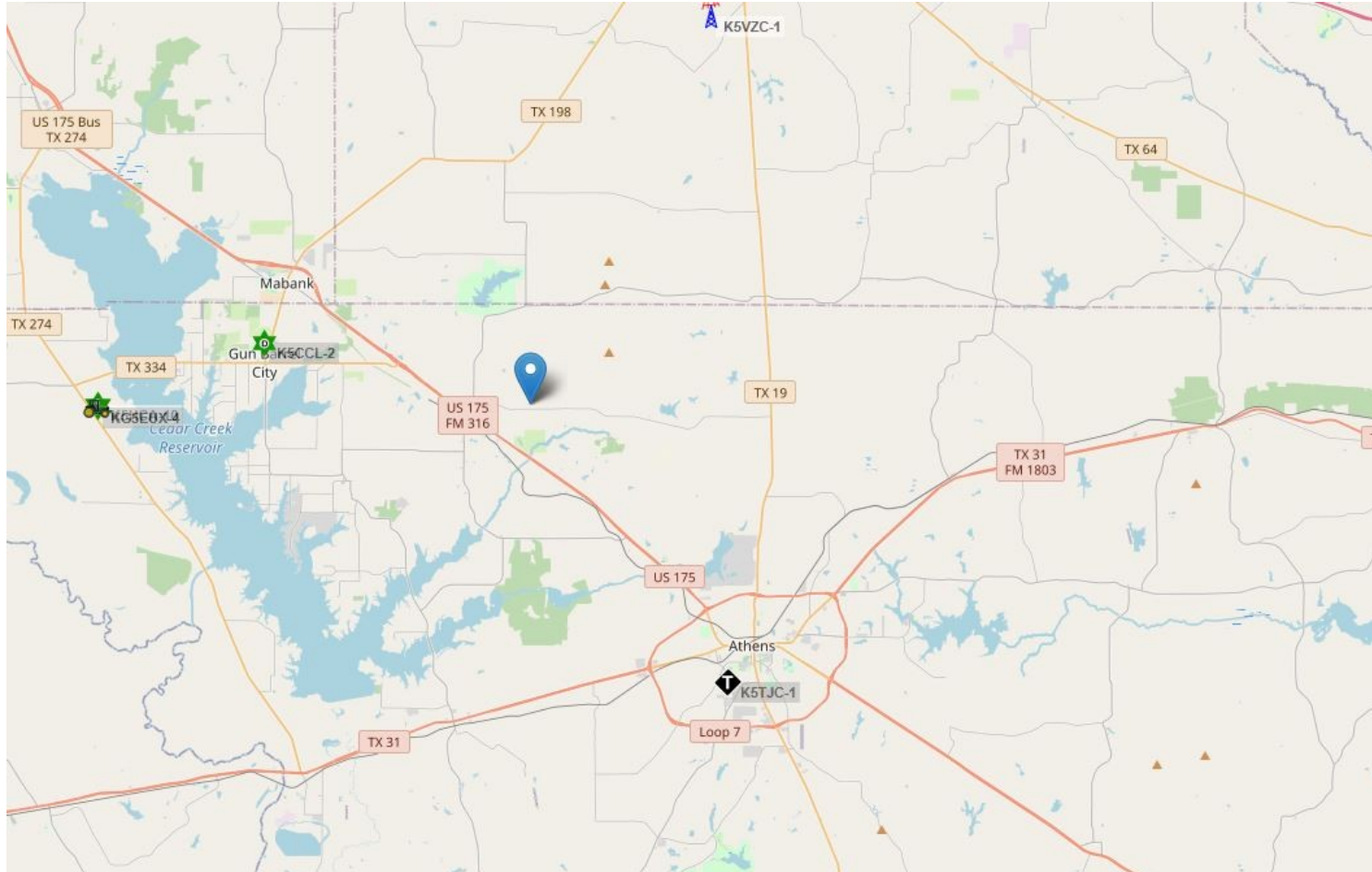
WIDE area Digipeaters



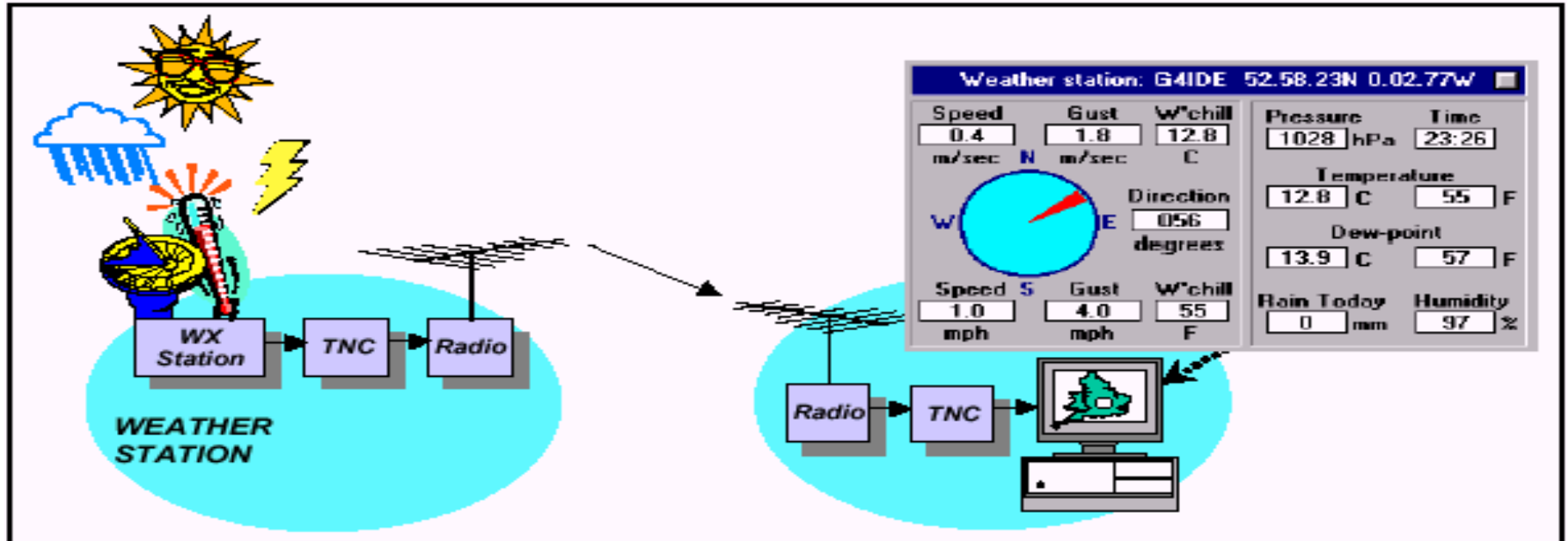
Internet Gateways - IGATES



Digipeaters and Igates in our area

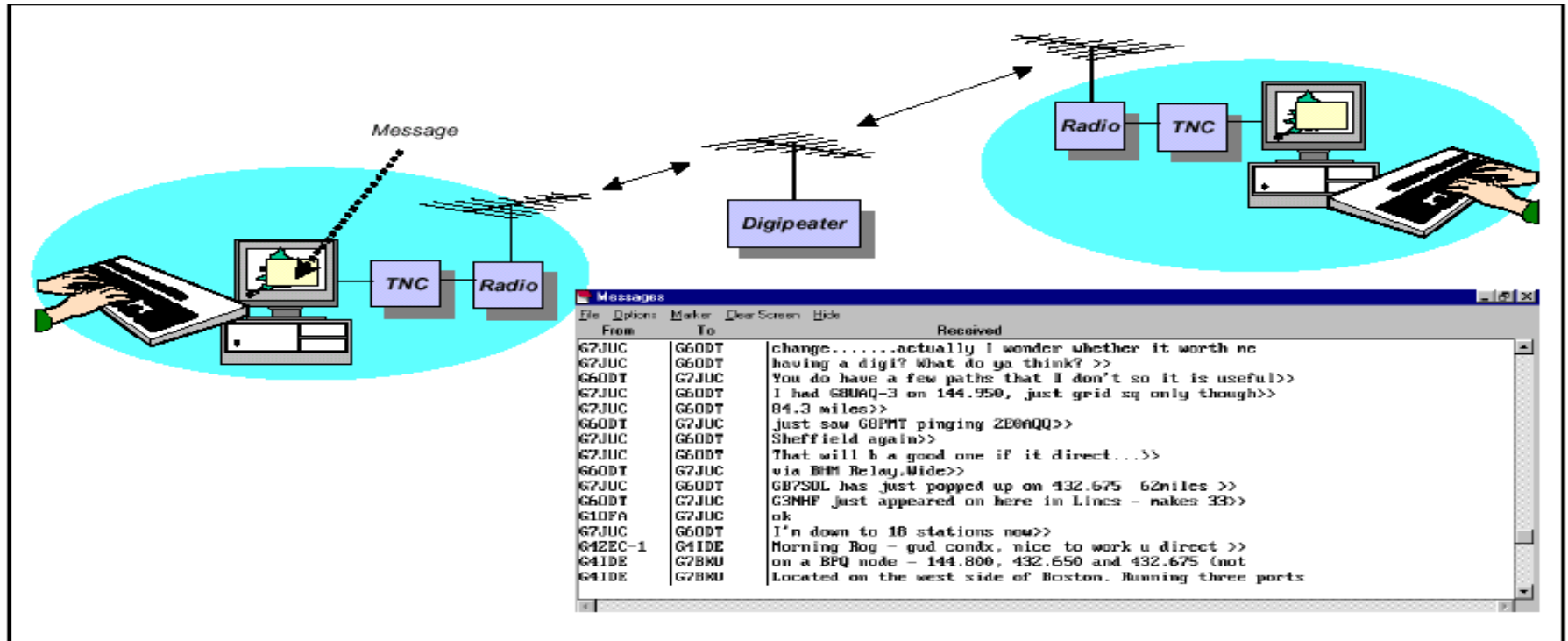


Weather Stations

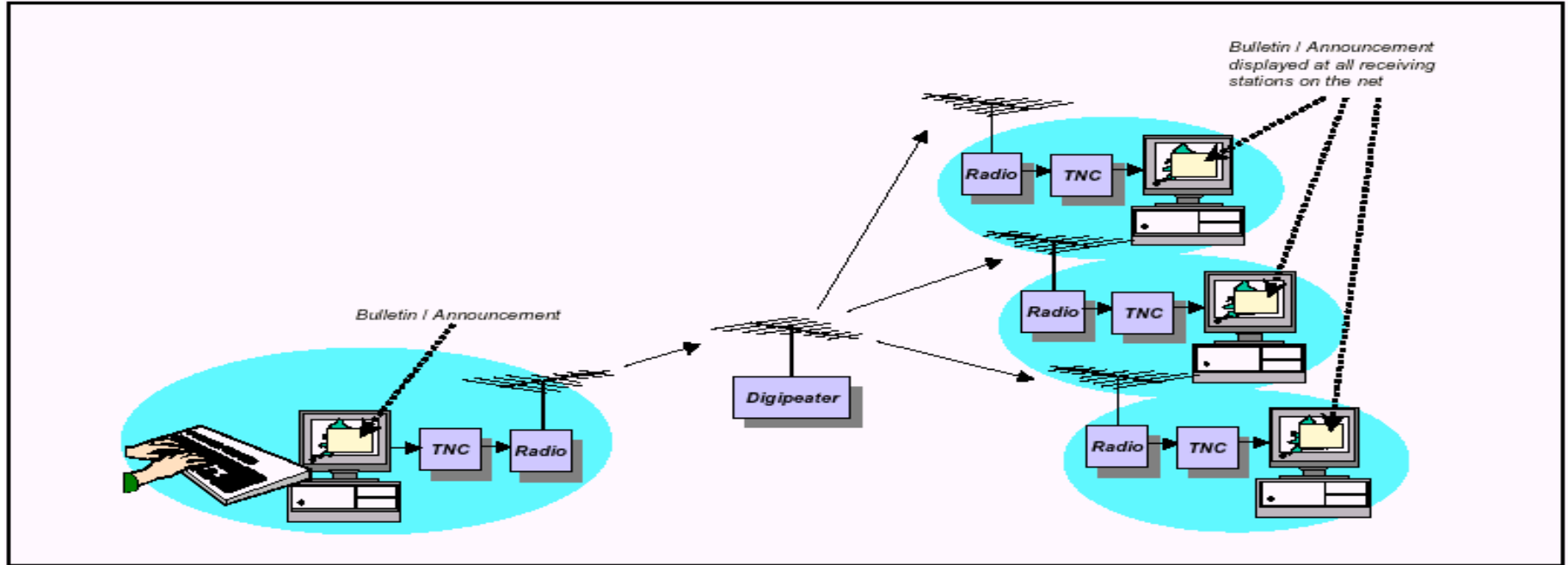


Weather Stations may also be placed onto the APRS network allowing automated weather reporting

APRS Messaging - Person to Person



APRS Announcements and Bulletins



SMS: APRS to SMS Gateway

SMS bridges the gap between APRS and SMS messaging. With this bot, you can send text messages to mobile phones directly from your APRS device.

What Happened to SMSGTE?

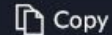
- **SMSGTE shut down** due to increasing spam and regulatory requirements in the U.S., Canada, and other regions. ¹
- The original service allowed APRS users to send SMS messages using a simple format like `@CALLSIGN message`, but abuse and compliance issues forced its closure.

The Replacement: NA7Q's APRS SMS Gateway

- **New gateway launched in late 2023** by NA7Q to fill the gap left by SMSGTE. ² ³
- **Opt-in required:** Recipients must register their phone numbers before they can receive APRS messages.
- **Same basic format:** APRS users can still send messages using the familiar `@CALLSIGN message` syntax.
- **Hosted at:** theconnectdesk.com/SMS

How to Use the New Gateway

1. **Opt-in your phone number** via the form on the website.
2. **Send APRS message** from your radio or APRS client using:



To: SMS
Message: @1234567890 Hello from KG5EUX!

sms

In order to use the service, simply compose an APRS message To: SMS in the following format:

To: SMS
@<phonenumber> message

E.g.:

To: SMSGTE
@9038806320 No cell svc, use this number to txt me via radio.

The recipient, if they are in a good cell location, will receive the text from SMS's unpublished number. The recipient can reply and you will receive an APRS message

EMAIL-2

EMAIL-2 is a service that allows users to send messages from the Automatic Packet Reporting System (APRS) to Internet email addresses. This feature is particularly useful for amateur radio operators who want to communicate via email while using APRS.

How EMAIL-2 Works

Sending Messages

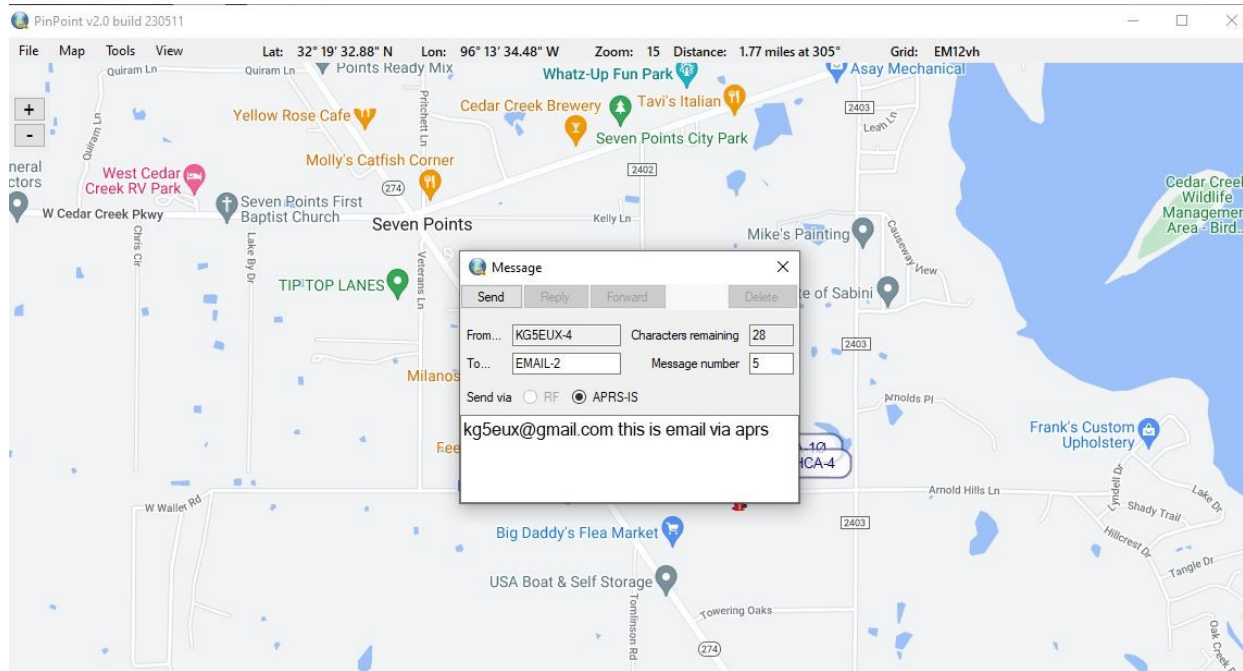
To send a message using EMAIL-2, you need to format your APRS message correctly.

The message should start with the command EMAIL-2, followed by the recipient's email address and the message content.

Example Format

Command: EMAIL-2 [email address] [message]

Example: EMAIL-2 youremail@gmail.com Hello, this is a test message.



K KG5EUX-4
aprsemail2@ae5pl.net

To undisclosed recipients

KG5EUX-4: this is email via aprs

From: KG5EUX-4
this is email via aprs

DO NOT REPLY

Find KG5EUX-4 at <https://aprs.fi/KG5EUX-4>

Received from KG5EUX-4 via APRS by EMAIL-2
More info at <https://www.aprs-is.net/email.aspx>

WLNK-1

APRSLink provides a set of commands that allow amateur radio operators to interact with the Winlink system directly from their APRS devices. By connecting to the “WLNK-1” callsign, you can use these commands to perform various tasks related to sending, reading, replying to, and managing emails.

Visit <https://winlink.org/aprslink> for commands

Winlink via APRS

Message

Send Reply Forward Delete

From... KG5EUX-4 Characters remaining 62

To... WLNK-1 Message number 11

Send via RF APRS-IS

LOGIN

Message

Send Reply Forward Delete

From... WLNK-1

To... KG5EUX-4 Message number 1881

Send via RF APRS-IS

Login [246]

Message

Send Reply Forward Delete

From... KG5EUX-4 Characters remaining 61

To... WLNK-1 Message number 9

Send via RF APRS-IS

0MKABC

Message

Send Reply Forward Delete

From... WLNK-1

To... KG5EUX-4 Message number 1886

Send via RF APRS-IS

Hello KG5EUX-4. Login valid for ~2 hours

Message

Send Reply Forward Delete

From... WLNK-1

To... KG5EUX-4 Message number 1887

Send via RF APRS-IS

11/10/2025 16:22:06 No messages

Top APRS Bots in the APRS Network: Enhance Your Ham Radio Experience

The Automatic Packet Reporting System (APRS) is a powerful tool for amateur radio operators, enabling real-time communication, tracking, and data sharing over radio waves. One of the most exciting features of APRS is the availability of bots—automated services that provide valuable information and functionality to users. Whether you're using APRS software or an APRS-enabled radio, these bots can significantly enhance your experience.

WXBot: Your Weather Forecast Companion

WXBot is a must-have for any ham radio operator who needs up-to-date weather information. By sending a query to WXBot with a location or grid square, you can receive detailed weather forecasts, including temperature, wind speed, humidity, and more. This bot is especially useful for outdoor activities like camping, hiking, or field operations.

<https://sites.google.com/site/ki6wjp/wxbot>

FIND: Locate Callsigns in the APRS Network

The FIND bot helps you locate a specific callsign within the APRS network. Whether you're trying to find a friend or track a station, this bot provides the last known position and status of the requested callsign.

How to use: Send a message to FIND with the callsign you're searching for (e.g., FIND N0CALL).

ISS: Track the International Space Station

If you're interested in satellite communication or just want to know where the International Space Station (ISS) is, the ISS bot has you covered. It provides the current location of the ISS, including its latitude, longitude, and altitude.

How to use: Send a message to ISS to get the latest position.

REPEAT: Find Amateur Radio Repeaters

The REPEAT bot is a handy tool for finding information about amateur radio repeaters. Simply provide a location or grid square, and REPEAT will return details like frequencies, tones, and offsets for nearby repeaters.

How to use: Send a message to REPEAT with your location or grid square (e.g., REPEAT EM12).

SATBOT: Satellite Pass Predictions

SATBOT is perfect for satellite enthusiasts. By entering a grid square and the name of a satellite, SATBOT will provide pass predictions, including the time, azimuth, and elevation of the next pass.

How to use: Send a message to SATBOT with your grid square and satellite name (e.g., SATBOT EM12 S0-50).

Active Satellites Supporting APRS

Satellite	Uplink Freq (MHz)	Downlink Freq (MHz)	Notes
ISS (ARISS)	145.825	145.825	Most reliable APRS digipeater; supports 1200 baud AFSK
NO-84 (PSAT)	145.825	145.825	1200 baud APRS digipeater; occasionally active
FalconSat-3	145.825	435.103	9600 baud; requires compatible TNC
NO-104 (PSAT2)	145.825	145.825	Experimental APRS digipeater; intermittent availability
ISS Crossband Repeater	437.800	145.990 uplink (FM voice)	Not APRS, but useful for voice contacts

Sources: APRS.org ASTARS page, APRS@groups.io, [UARC](http://UARC.org) 76ers APRS Satellite Guide

WHO-IS: Operator Information Lookup

The WHO-IS bot allows you to look up an operator's name and DXCC (DX Century Club) information based on their callsign. This is particularly useful for identifying unfamiliar stations or confirming contest participants.

How to use: Send a message to WHO - IS with the callsign (e.g., WHO - IS N0CALL).

APSPOT: WWFF, POTA and SOTA to APRS Spotting

If you're a WWFF, POTA and Summits on the Air (SOTA) enthusiast, APSPOT is your go-to bot. It converts SOTA spots into APRS messages, allowing you to share your activations with the APRS network.

WTSAPP: APRS to WhatsApp Gateway

WTSAPP is a relatively new bot that enables APRS-to-WhatsApp messaging. Similar to SMSGTE, this bot allows you to send messages to WhatsApp users directly from your APRS device.

<https://wtsapp.org>

MPAD – GOOGLE FOR APRS

Wx forecasts, position reporting, OSM category searches,
calculations, satellite passes & frequency data, DAPNET messaging,
METAR/TAF Data for airport locations
ICAO METAR / wx inquiries
IATA METAR / wx inquiries
WhereIs
Sunrise/Sunset and Moonset/Moonrise
CWOP (Customer Weather's Observer Program)
Satellite passes
Satellite frequencies
Repeater data
OpenStreetMap Nearby Category Searches
Send a message to DAPNET
Send a position report via email
Fortuneteller
Radiosonde landing prediction
repeater data lookups, CWOP reports, METAR and TAF reports, celestial

Bot web sites

WXBot: [https://sites.google.com/site/ki6wjp/...](https://sites.google.com/site/ki6wjp/)

APRSPH: <https://aprsph.net/>

REPEAT: <http://aprs-repeat.hemna.com/#help>

DAGA: <https://reflector.sota.org.uk/t/intro...>

SMS: <https://smsgte.org/>

MPAD: <https://github.com/projecthorus/sonde...>

NTSGTE: <https://nts2.arrl.org/ntsgte-an-aprs-...>

APSPOT: <https://apspot.radio/>

SOTA: <https://www.sotaspots.co.uk/>

WTSAPP: <https://wtsapp.org/>

MPAD <https://github.com/joergschultzelutter/mpad>

SONDEHUB <https://amateur.sondehub.org>

Best clients (in my opinion)

Windows: PINPOINT – APRSIS32- UI-VIEW

Unix: YACC, XASTER, DIREWOLF

IOS: APRS.FI

ANDROID: APRSDROID

Software Name (and link)	OS(es)	Description
APRSdos	MS-DOS	The original APRS application. Specialized versions are also available. While not directly APRS-IS capable, it sets the standard for APRS packets.
APRSDroid	Android	GUI app for Android
AFilter	Windows (32 bit)	Data stream filter application.
AGWTracker	Windows (32 bit)	GUI with multiple map types.
AGWTrackerPPC	Windows Mobile	GUI for Windows Mobile
ALogger	Windows (32 bit)	APRS-IS logging application.
APRSISCE/32	Windows Mobile, CE Windows 32 and 64 bit	GUI client for Windows Mobile and Windows 32 & 64 bit OSEs
APRS/CE	WindowsCE	GUI client for Windows CE
APRSPoint	Windows (32 bit)	GUI client. Uses MapPoint for maps.
Aprx	UNIXes, Linux, BSD, Sunos	APRS IGate and digipeater supports Linux AX.25 and serial interfaces.
APRS+SA	Windows (32 bit)	GUI client and IGate. Uses Street Atlas for maps.
javAPRS	Java Applet	GUI applet for web pages.
javAPRSSrvrIGate	Android	IGate/local server for Android
mAPRS	Java Midlet	Midlet for Mobile Devices.
QTH.app	MacOS	GUI client
MacAPRS	MacOS	GUI client and IGate
PinPoint APRS	Windows	GUI client/IGate
pocketAPRS	PalmOS	GUI client for Palm OS. NO LONGER AVAILABLE OR SUPPORTED (Please do not contact me regarding this software. I am not the author of this software)
SARTrack	Windows (32 bit)	GUI designed for Search and Rescue, Tactical callsigns, multi-colour tracks, Search Areas, Messaging, SAR Logging
SmartPalm	PalmOS	Text client.
UI-View	Windows (16 & 32 bit)	GUI client and IGate.
WinAPRS	Windows (16 & 32 bit)	GUI client and IGate
X-APRS	Linux	X-Windows GUI client and IGate
XASTIR	X-Window OSEs (Linux/Unix/MacOSX)	GUI client and IGate.
YAAC	Windows (32 & 64 bit) Mac OS X, Linux, FreeBSD	GUI client and IGate

Questions or Comments?

If you have questions or any comment not covered today contact me

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