



Katy Amateur Radio Society

Introduction to **Automatic Packet Reporting System** (APRS)

Michael Deaver
KG5JBJ-9
Nov 2016

◆ History

- In 1982, Bob Bruninga (WB4APR), a senior research engineer at the United States Naval Academy, implemented the earliest ancestor of APRS on an Apple II computer
- Bob Bruninga describes APRS in this way:
"APRS provides situational awareness to all operators of everything that is going on in his or her local area, whether it be weather reporting, traveler info, direction finding, objects pointing to ECHOLink and IRLP, or traffic reporting and emergency response."

- ◆ APRS is
 - a two-way tactical real-time digital communications system
 - digital communications information channel for Ham radio.
 - a single national channel
(United States & Canada: 144.390 MHz)
 - announcements, bulletins, messages, alerts, weather

◆ APRS is

- a frequency to monitor at any time to capture what is happening in ham radio in the local surrounding area
- a map of all this activity including objects, frequencies, satellites, nets, meetings, Hamfests, etc.
- real time positioning can be monitored on the <http://aprs.fi/> website by call sign, location, etc.

◆ APRS Technology

- uses Global Positioning System (GPS)
- operates entirely in an unconnected broadcast fashion, using unnumbered AX.25 protocol at 1200 bit/s
- packet repeaters, called digipeaters, form the backbone of the APRS system
- Internet gateway stations (IGates) connect the on-air APRS network to the **APRS Internet System** (APRS-IS)

- ◆ Equipment

- Radio (2m)
- Terminal Node Controller (TNC)
- GPS receiver
- Cell phone

- ◆ APRS Software

- APRSDroid
- APRSPoint
- APRSPro
- APRS-TW (Telemetry Watcher)



Yaesu FT-8800 with Bluetooth TNC-X
GPS from cell phone running APRSDroid

EQUIPMENT

KARS



Yaesu FTM-400XDR
built in GPS & APRS TNC

FTM-400XDR Displays

KARS

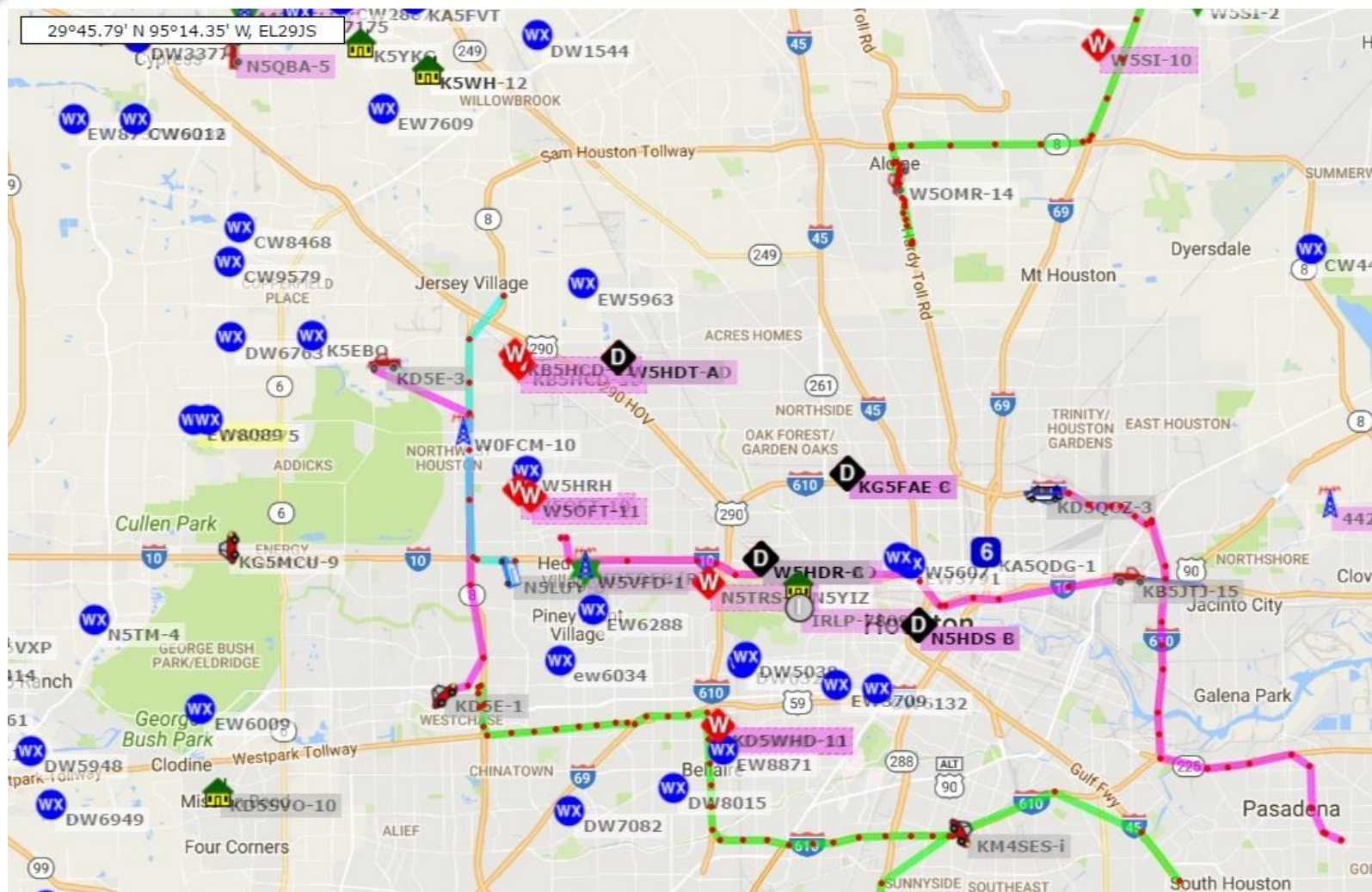
Moving Vehicle



Weather Station

APRS INTERNET SERVICE

KARS



APRS-IS via APRS.fi website

-0	Dot	-1	Ambulance
-2	Bus	-3	Fire Truck
-4	Bike	-5	Yacht (sail)
-6	HELO	-7	Aircraft
-8	Ships (power)	-9	Car
-10	Motorcycle	-11	Balloons
-12	Jeep	-13	Rv
-14	Truck	-15	Van

Example – **KG5JBJ-9**

SSID = service set identifier

= STAR (digipeaters)

& = DIAMOND (gates)

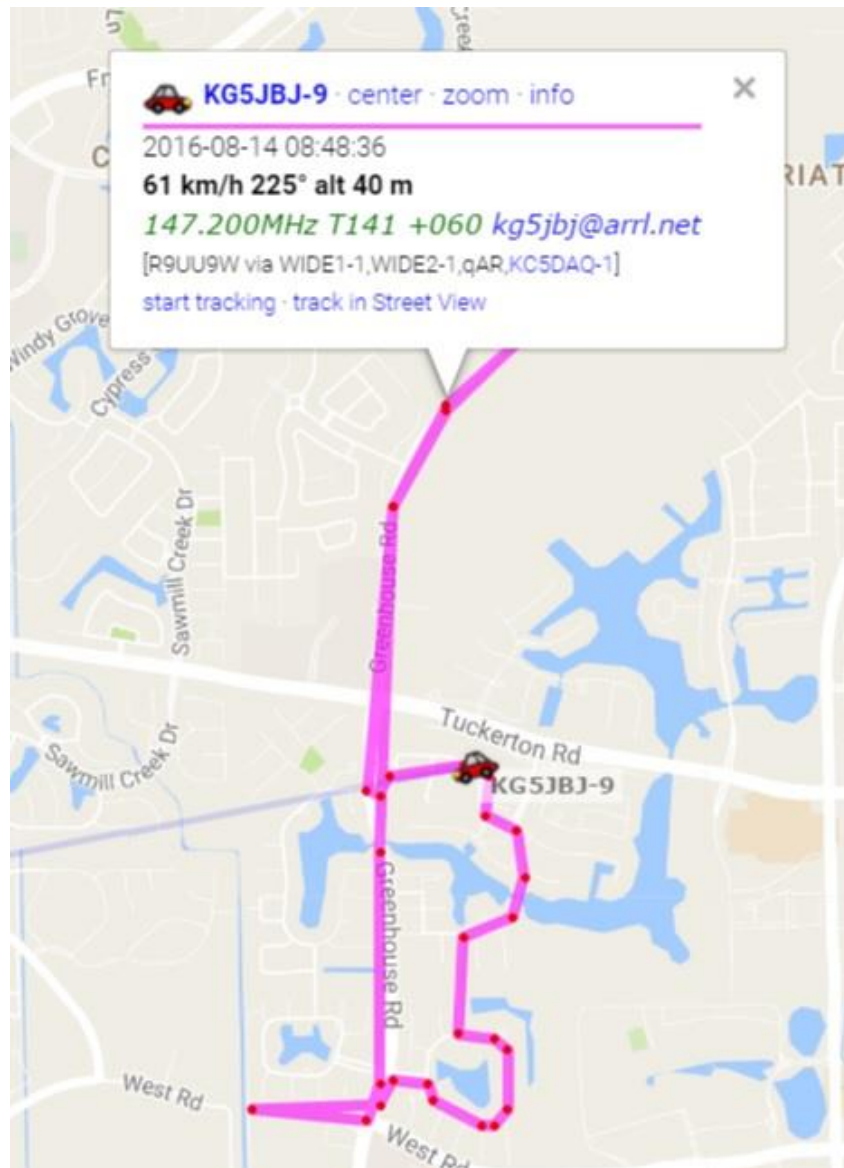
_ = WEATHER Station (blue), WX and W-R DIGI (green)

Z = W in Red Diamond (APRSlink, part of Winlink)

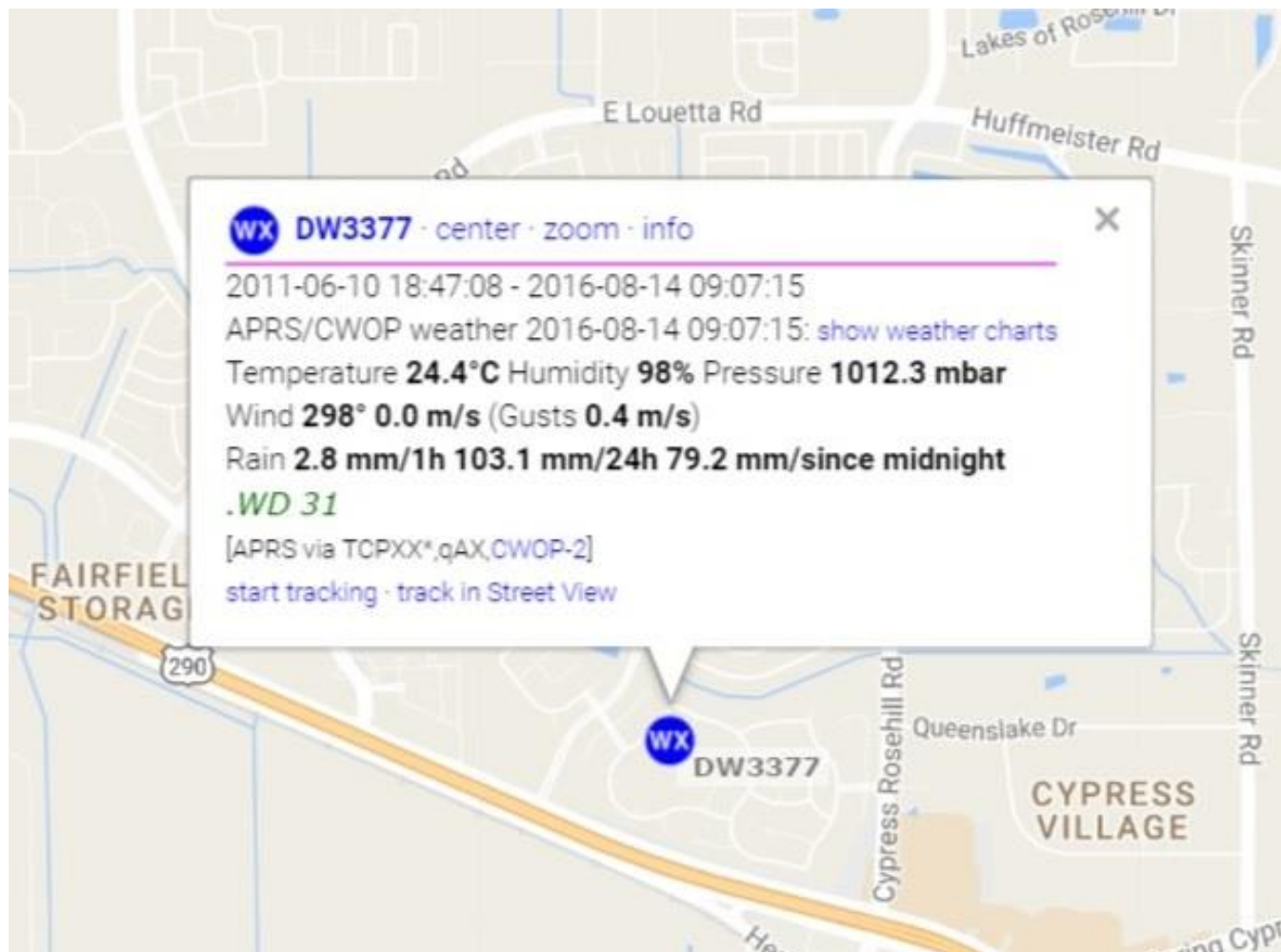
APRS-IS Vehicle Info Map

KARS

FTM-400XDR
sends main band
freq. information



Vehicle Information
at that point

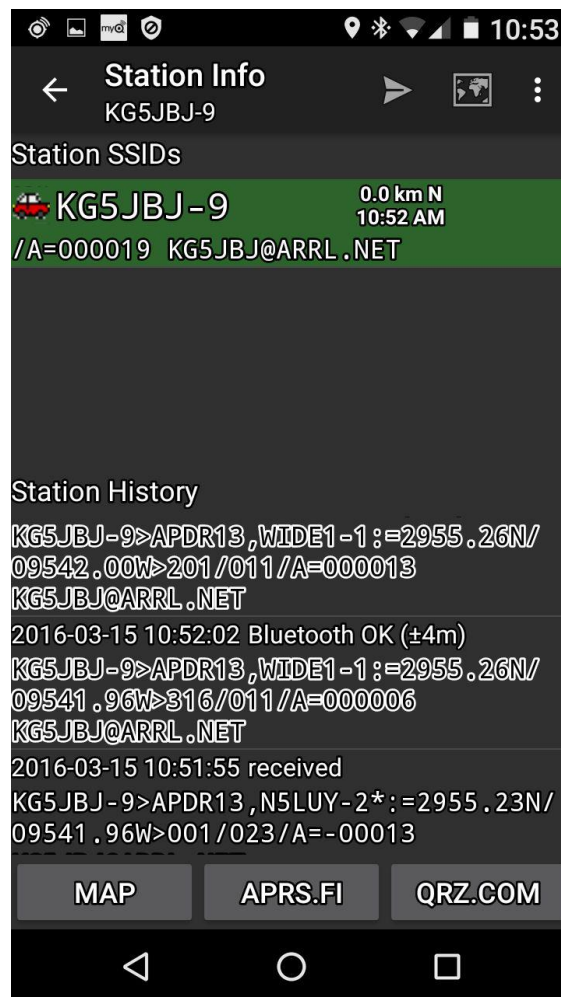


APRS Weather Station

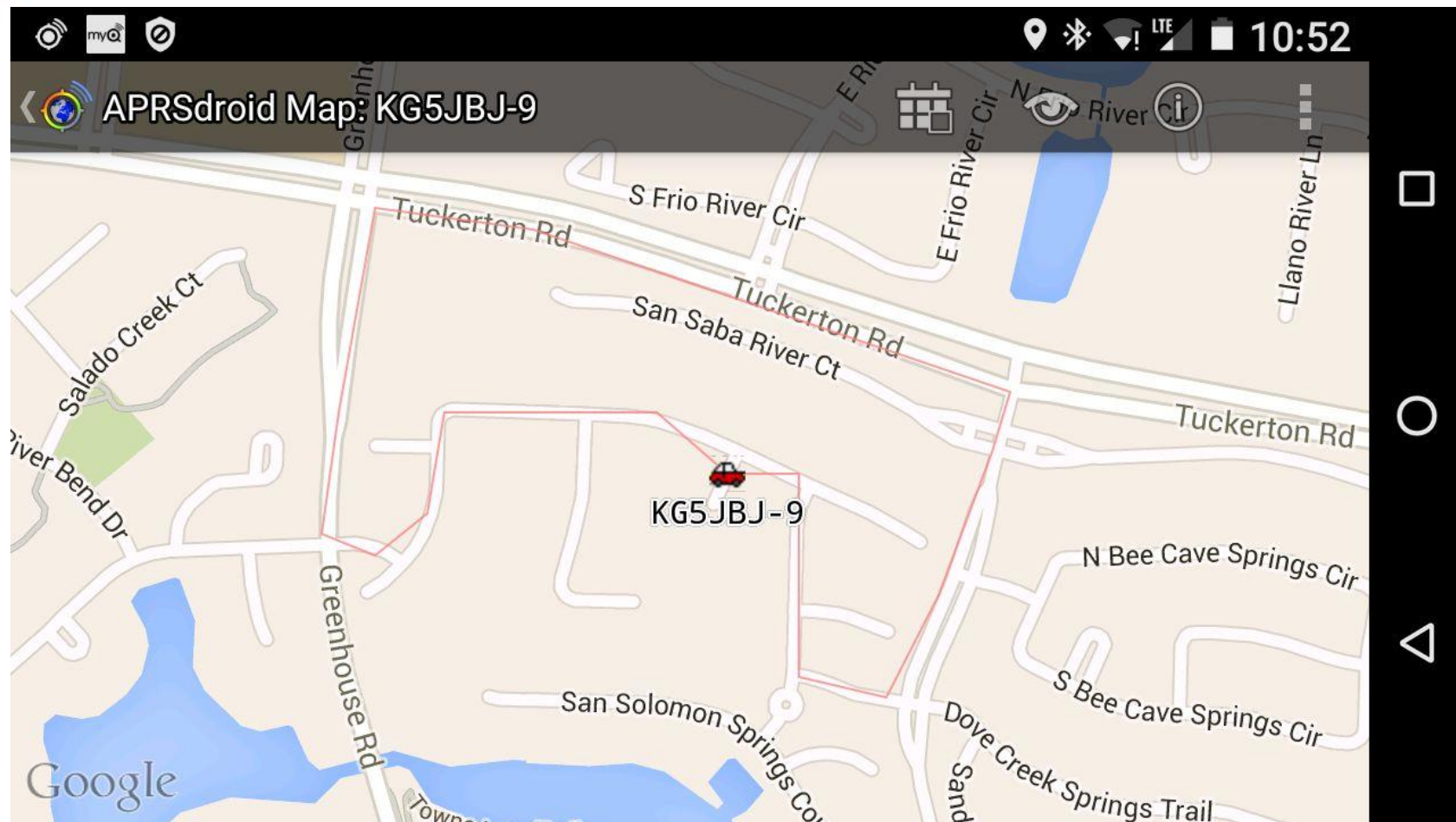


APRS Winlink Station

APRSDroid
Station List



MAP – APRS.FI – QRZ.COM



Smart Beaconing
APRSDroid map display

APRSDroid - aprs.fi & qrz.com

KARS

APRSDroid interface showing the aprs.fi website. The status bar at the top shows signal strength, location, and time 10:53.

Search bar:

Navigation links: [map view](#) · [info](#) · [static map](#) · [telemetry](#) · [weather](#) · [raw](#) · [status](#) · [beacons](#) · [messages](#) · [bulletins](#) · [browse](#) · [moving](#)

Callsign, ship name or locator:

APRS station **KG5JBJ-9** - show graphs

Comment: [KG5JBJ@ARRL.NET](#)

Location: 29°55.26' N 95°42.00' W - locator **EL29DW61AA** - show map - static map

5.4 km South bearing 183° from Cypress, Harris County, Texas, United States [?]
 7.1 km West bearing 265° from Oak Cliff Place, Harris County, Texas, United States
 36.9 km Northwest bearing 298° from Houston, Harris County, Texas, United States
 53.8 km Northwest bearing 298° from Pasadena, Harris County, Texas, United States

Last position: 2016-03-15 15:53:20 UTC (3s ago)
 2016-03-15 10:53:20 CDT local time at Cypress, United States [?]

Altitude: 6 m
 Device: Open Source: APRSDroid (app, Android)
 Last path: KG5JBJ-9>APDR13 via N5LUY-2*,qAR,KC5DAQ-1

Good path!

Positions stored: 22

Packet rate: 187 seconds between packets on average during 3554 seconds.

Other SSIDs: [KG5JBJ](#) [KG5JBJ-10](#) [KG5JBJ-5](#) [KG5JBJ-7](#)

Stations near current position of KG5JBJ-9 - show more

callsign distance last heard - UTC

APRSDroid interface showing the qrz.com website. The status bar at the top shows signal strength, location, and time 8:19.

Search bar:

QRZ.COM

go plaintext 14:17:51 UTC 7 Nov 2016

Database News Forums Swapmeet Resources Contact Subscribe Edit KG5JBJ

KG5JBJ
 Michael A Deaver
 9810 Cat Hollows Ct
 Cypress, TX 77433
 USA

Email: Use mouse to view.

Ham Member Lookups: 180

Biography Social Logbook

Lookups: 160 (qrz)
 QRZ Record: 2031254
 QRZ Address: KG5JBJ
 Last Update: 2016-07-14 16:00:02
 Class: Extra Codes: HAI
 Effective: 2016-07-13
 Expires: 2025-08-25
 Grid Square: EL29dw
 Geo Source: Geocoded Address
 US State: Texas
 US County: Harris
 Sunrise: 12:41:53 UTC
 Sunset: 23:31:10 UTC
 NA:143 Texas State
 NOTA East (Managers to Jefferson County) group
 GMT Offset: -6 hours
 USL Record: 3730267 FCC page...
 No (e.g. Will this ham
 QSL by Mail? No (e.g. Will this ham
 QSL by eQSL? No (e.g. Will this ham
 QSL with eQSL?)
 Uses LOTW? No (e.g. Does this ham
 use ARRL's LOTW?)
 Admin For: (1) KG5JBJ
 Apply for a new Vanity callsign...

Be the first of your friends to like this.

DX NEWS

Contribute to QRZ

Mobilinkd

GigaParts
 Thank You VETERANS
 \$5 off \$50
 \$10 off \$250
 \$20 off \$1000
 Shop Now

APRSDroid screen capture

APRSlink is a part of Winlink System which allows you to send messages, text, and emails

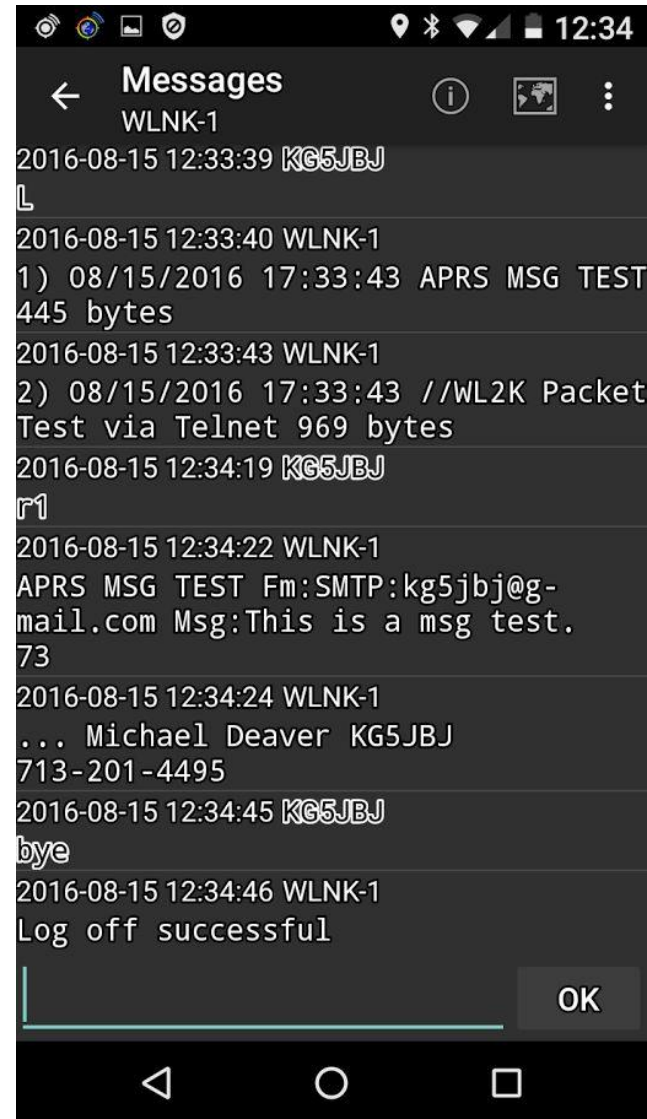
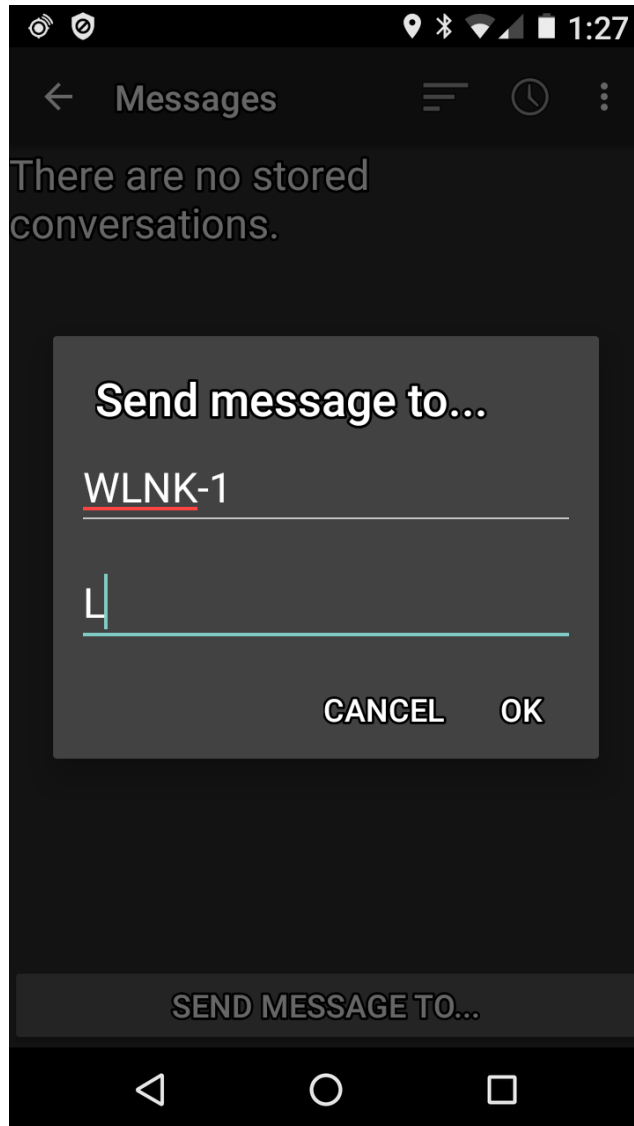
Commands:

- ♦ **WLNK-1** start login process LOGIN [123] – response 123xxx
- ♦ **H** or ? Return brief Help
- ♦ **L** List of messages
- ♦ **R#** Read message number #
- ♦ **Y#** reply to message #
- ♦ **SP** <email address – or- call sign –or- alias> <subject>
SP sam@iam.com Header Test Message
/EX Complete and send the composed

- ♦ P Playback message
- ♦ SMS Send short message
Syntax: SMS <email address, call sign, or alias> <message>
- ♦ A Create an alias for an e-mail address
Example: A sam=sammy.miller@somealongdomainname.net
- ♦ F# Forward message number # to address or call sign following
- ♦ K# Kill (mark as deleted) message number
- ♦ G# Return information about closest active RMS Packet Gateway
- ♦ ! Return Information about APRSlink

APRSlink Messages

KARS



List

1

2

R1

log
off

After WNLK-1 login

SP sam@iam.com Test Message (Msg Tx)

Some text for the body of the message (Msg Tx)

Some more text for the message (Msg Tx)

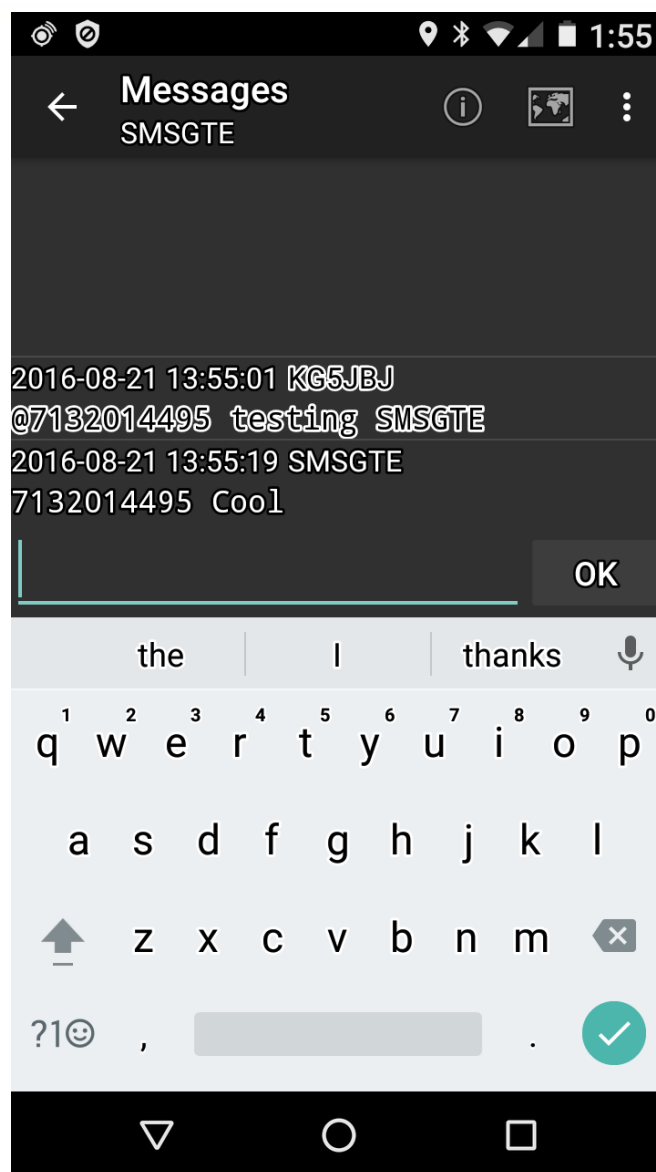
/EX (Msg Tx)

Each line is a separate APRS message, but the need for entering specific commands for each line/message has been removed. You type and send as much text as necessary and then send /EX as a separate APRS message to complete your email and send the composed message. You should receive a confirmation message.

SMS 7135551234 call me asap

SMSGTE SMS texting

SMSGTE @5551234567
<Your short message here>



◆ Sources and Links

- https://en.wikipedia.org/wiki/Automatic_Packet_Reporting_System
- <http://aprs.fi/#!addr=77433>
- <http://www.aprs.org/>
- <http://www.openaprs.net/>
- <https://aprsdroid.org/>
- <http://www.aprs-is.net/>
- <http://www.winlink.org/APRSLink>
- Emails and Texts with APRS by K7DCC (PPT)
- <http://smsgte.wixsite.com/smsgte>

◆ Sources and Links

- <http://www.dxzone.com/catalog/Software/APRS/>
- <http://aprsisce.wikidot.com/start>
- <http://www.aprs.net/>
- <https://en.wikipedia.org/wiki/AX.25>
- <http://www.dxzone.com/catalog/Software/APRS/>
- YouTube “APRS tutorial SMS messaging APRSDroid”
- <http://harriscountyares.org/training/DIG/DIG-105.pdf>
- <http://aprstw.blandranch.net/>
- <http://www.aprs.net/vm/DOS/SYMBOLS.HTM>
- <https://groups.yahoo.com/neo/groups/APRS/info>

Thank You!