Katy Amateur Radio Society

Introduction

to

Automatic Packet Reporting System (APRS)

Michael Deaver KG5JBJ-9

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APRS

• 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

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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

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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 <u>http://aprs.fi/</u> 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)

APRS Hardware & Software

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- Equipment
 - Radio (2m)
 - > Terminal Node Controller (TNC)
 - GPS receiver
 - Cell phone
- APRS Software
 - > APRSDroid
 - > APRSPoint
 - > APRSPro
 - > APRS-TW (Telemetry Watcher)

EQUIPMENT

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

EQUIPMENT





Yaesu FTM-400XDR built in GPS & APRS TNC

FTM-400XDR Displays

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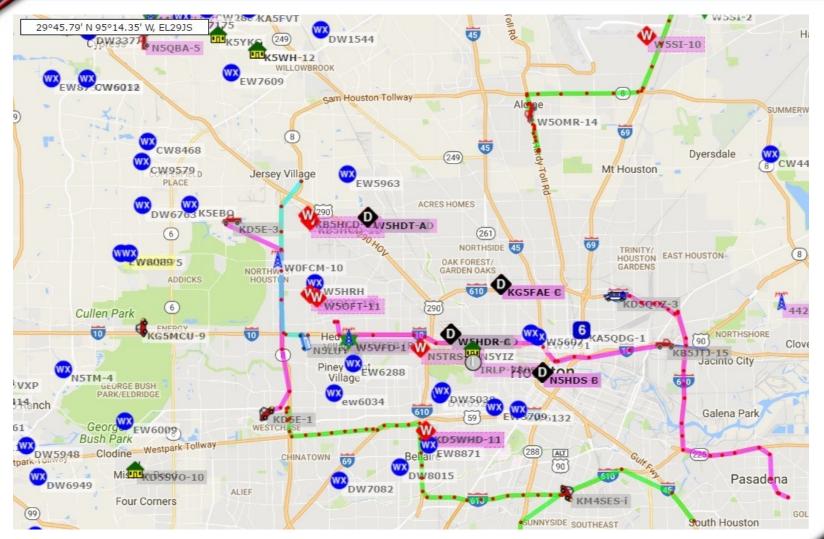


Moving Vehicle

Weather Station

APRS INTERNET SERVICE

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APRS-IS via APRS.fi website

APRS-IS SSID SYMBOLS



- -0 Dot
- -2 Bus
- -4 Bike
- -6 HELO
- -8 Ships (power)
- -10 Motorcycle
- -12 Jeep
- -14 Truck

Example - KG5JBJ-9

- -1 Ambulance
- -3 Fire Truck
- -5 Yacht (sail)
- -7 Aircraft
- -9 Car
- -11 Balloons
- -13 Rv
- -15 Van

APRS-IS ICONS



= STAR (digipeaters)

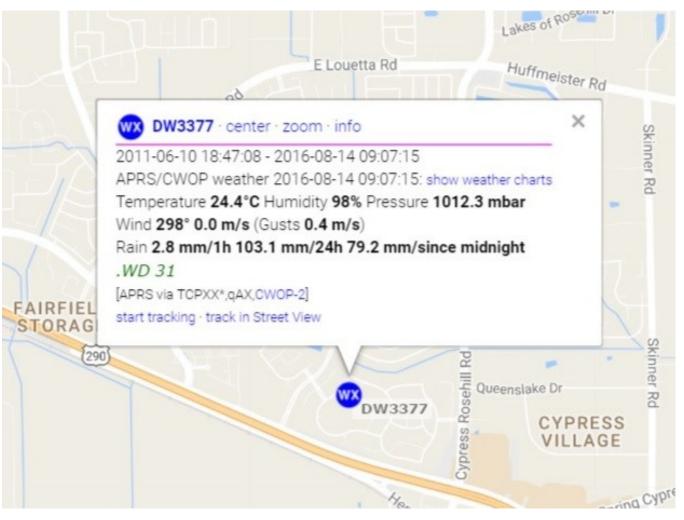
& = DIAMOND (gates)

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

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

APRS-IS Weather Station Info

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APRS Weather Station

APRS-IS APRSlink / Winlink Station Info

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APRS Winlink Station

APRS-fi Search

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3 hours	5 V			
KG5JB	-9 🚓			×≡
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Position	: 29°55.2	2019	°41.99' ₩	
2017		2019		
2017 Other S	2018	2019 G5JBJ	°41.99' Ŵ	
2017 Other S	2018 SSIDs: K	2019 G5JBJ	°41.99' Ŵ	
2017 Other S Wx: 96°F	2018 SIDs: K 56% 1012 m	2019 G5JBJ	°41.99' Ŵ	
2017 Other S Wx: 96°F Other v • Statio	2018 SIDs: K 56% 1012 m	2019 G5JBJ	°41.99' Ŵ	
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2017 Other S Wx: 96°F Other V • Statio • Raw • Statu • APRS • Mess • Prefix • Goog	2018 SIDs: K 56% 1012 m riews: on info packets is packets s packets s cwop w ages - Bu	2019 G5JBJ bar 2.2 MP s - Beaco reather - lletin boa g (ML ?	P41.99' W → → → → + s → on packets Telemetry	

Preferences - My account

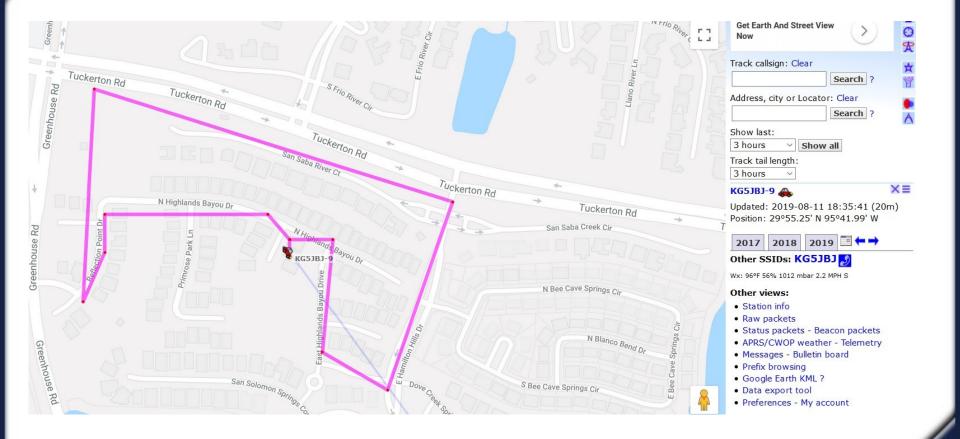
APRS-IS Vehicle Info Map

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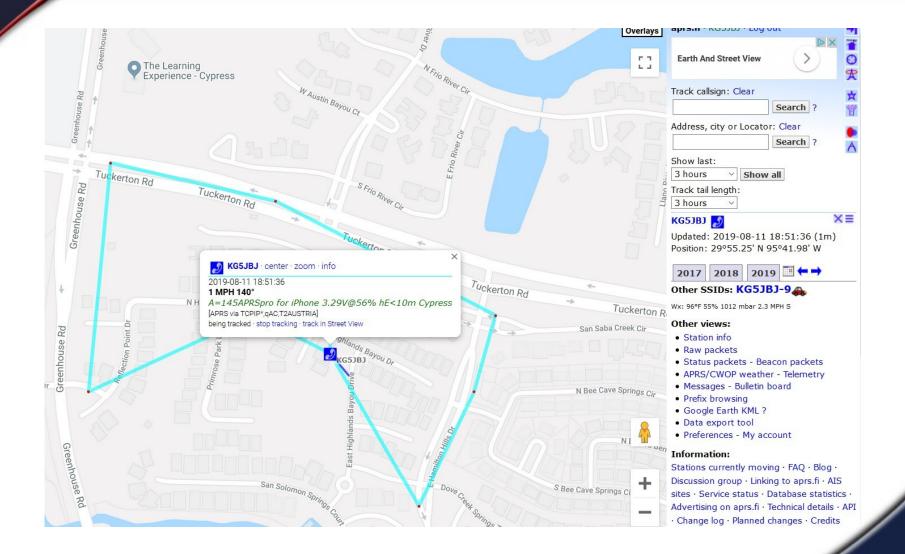
× KG5JBJ-9 · center · zoom · info 2016-08-14 08:48:36 TAIS 61 km/h 225° alt 40 m 147.200MHz T141 +060 kg5jbj@arrl.net [R9UU9W via WIDE1-1, WIDE2-1, qAR, KC5DAQ-1] start tracking · track in Street View ndy Groke Vehicle Information at that point Tuckerton Rd 5JBJ-9 West Rd est P

YAESU FTM-400XDR sends main band freq. information

APRS Track from FTM-400XDR

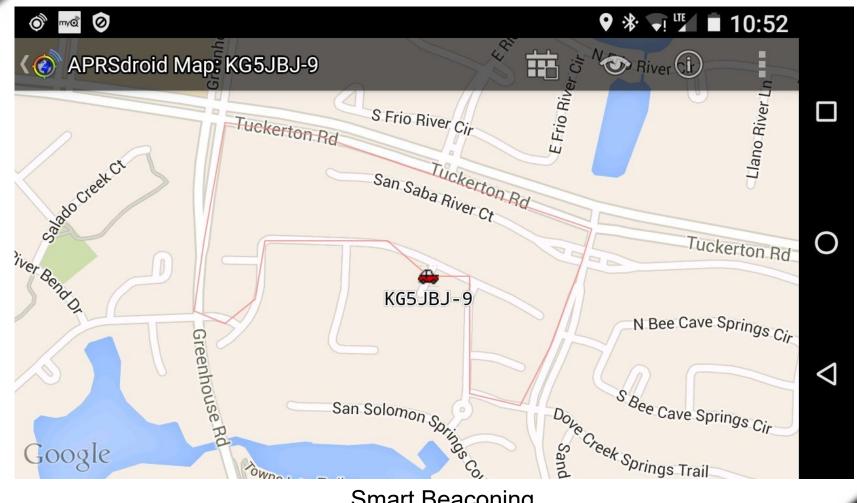


APRS Track from APRSPro for iPhone



APRSDroid Map

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Smart Beaconing APRSDroid map display

APRSDroid



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APRSdroid Hub					
👹 KG5JBJ	0.0 km N 11:14 AM				
/A=000052 kg5jbj@ar	rl.net				
🎂 KD5QCZ-3	3.3 km SE 11:16 AM				
281/029/A=000183!wI	11				
📣 KC5DAQ-8	6.3 km W 11:16 AM				
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👆 KF6KYD	6.9 km E 11:15 AM				
APRS-IS for Win32					
💀 KF6KYD-2	7.0 km E 11:16 AM				
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♣KD5E-3	12.0 km SE 11:05 AM				
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👆 K5₩H-12	12.5 km NE 11:16 AM				
PHG5170/AllStar 282					
💀 KA5FVT	13.5 km NE 11:14 AM				
346/001g004t077r002p237h96b10159.wvi					
SINGLE SHOT	STOP TRACKING				

APRSDroid Station List

APRSDroid Station Info

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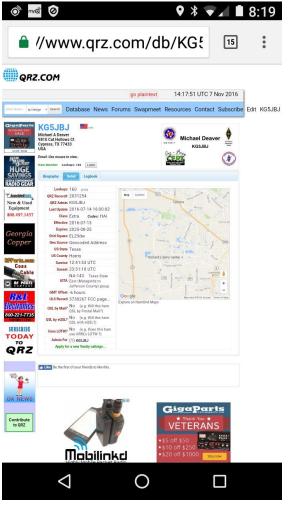
 Image: Image: Im					
← Station Info KG5JBJ-9 ► 🗺 :					
Station SSIDs					
KG5JBJ-9 0.0 km N /A=000019 KG5JBJ@ARRL.NET					
Station History K65JBJ-9≫APDR13,WIDE1-1:=2955.26N/ 09542.00W≥201/011/A=0000013 K65JBJQARRL.NET					
2016-03-15 10:52:02 Bluetooth OK (±4m) KG5JBJ-9≫APDR13,WIDE1-1:=2955.26N/ 09541.96W≥316/011/A=000006 KG5JBJ@ARRL.NET					
2016-03-15 10:51:55 received KG5JBJ-9>APDR13,N5LUY-2*:=2955.23N/ 09541.96W>001/023/A=-00013					
MAP APRS.FI QRZ.COM					

MAP - APRS.FI - QRZ.COM

APRSDroid - aprs.fi & qrz.com

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apre	s.fi				
	· info · static map · telemetry · weather · raw · status ·				
	messages · bulletins · browse · moving				
Calleign e	hip name or locator:				
KG5JBJ-9					
KG00D0-	Search [clear]				
APRS statio	on KG5JBJ-9 🚓 - show graphs				
	KG5JBJ@ARRL.NET				
Location:	29°55.26' N 95°42.00' W - locator EL29DW61AA - show ma				
	- 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				
Last	County, Texas, United States 2016-03-15 15:53:20 UTC (3s ago)				
position:	2016-03-15 10:53:20 CDT local time at Cypress, United				
position.	States [?]				
Altitude:	6 m				
Device:	Open Source: APRSdroid (app, Android)				
Last path:					
	Good path!				
Positions	22				
stored:					
Packet rate	:187 seconds between packets on average during 3554				
	seconds.				
Other SSIDs:	KG5JBJ 🚓 KG5JBJ-10 🔊 KG5JBJ-5 💋 KG5JBJ-7 💋				
Stations ne	ar current position of KG5JBJ-9 - show more				
callsign	distance last heard - UTC				



APRSDroid screen capture

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

<u>Commands:</u>

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

APRSlink Commands

- **P** Playback message
- <u>SMS</u> Send short message
 Syntax: SMS <email address, call sign, or alias> <message>

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- <u>A</u> Create an alias for an e-mail address
 Example: A sam=sammy.miller@somelongdomainname.net
- <u>F#</u> Forward message number # to address or call sign following
- <u>K#</u> Kill (mark as deleted) message number
- <u>G#</u> Return information about closest active RMS Packet Gateway
- I Return Information about APRSlink

APRSlink Messages

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← Messages F ● + Messages WLNK-1 ● I There are no stored conversations. 2016-08-15 12:33:39 KBSUBJ List 2016-08-15 12:33:40 WLNK-1 1 2016-08-15 12:33:43 APRS MSG TEST 1 Send message to WLNK-1 1) 08/15/2016 17:33:43 APRS MSG TEST 1 WLNK-1 1) 08/15/2016 17:33:43 //WL2K Packet 2 00 08/15/2016 17:33:43 //WL2K Packet 2 2016-08-15 12:34:19 KBSUBJ 1 2016-08-15 12:34:20 WLNK-1 2 1 2 2016-08-15 12:34:49 KBSUBJ 2 1 1 1 1 1 1 1 1 1 1 2 08/15/2016 17:33:43 1 2 2016-08-15 12:34:19 KBSUBJ 1 1 1 1 0 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ð Ø	♥ * ▼⊿ ■ 1:27	i 🔊 💿 🗖	♥ 🕸 🐨 🖌 🛢 12:34
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Send message to 2) 08/15/2016 17:33:43 //WL2K Packet 2 WLNK-1 Est via Telnet 969 bytes 2 U 2016-08-15 12:34:19 K065JBJ R1 CANCEL OK OK 2016-08-15 12:34:24 WLNK-1 R1 SEND MESSAGE TO MESSAGE TO OK 0K	conversations.		1) 08/15/2016 17:33	
WLNK-1 2016-08-15 12:34:19 K@GJBJ R1 U 2016-08-15 12:34:22 WLNK-1 APRS MSG TEST Fm: SMTP: kg5jbj@g-mail.com Msg: This is a msg test. R1 CANCEL OK 2016-08-15 12:34:24 WLNK-1 Michael Deaver KG5JBJ File SEND MESSAGE TO OK OK OK	Send messag	ge to	2) 08/15/2016 17:33	:43 //WL2K Packet
L2016-08-15 12:34:22 WLNK-1APRS MSG TEST Fm: SMTP: kg5jbj@g- mail.com Msg: This is a msg test. 73CANCEL OKCANCEL OK2016-08-15 12:34:24 WLNK-1 Michael Deaver KG5JBJ 713-201-4495 2016-08-15 12:34:45 KG5JBJ Digg 	WLNK-1		2016-08-15 12:34:19 🕅 🗟 🕅	BJ P1
CANCEL OK2016-08-15 12:34:24 WLNK-1 Michael Deaver KG5JBJ 713-201-4495Iog off2016-08-15 12:34:45 KG65JBJ 	<u>ц</u>		APRS MSG TEST Fm:SM mail.com Msg:This i	K-1 ITP:kg5jbj@g-
2016-08-15 12:34:45 K@SJBJ log by@ 2016-08-15 12:34:46 WLNK-1 Log off successful OK	C/	ANCEL OK	2016-08-15 12:34:24 WLN Michael Deaver	
2016-08-15 12:34:46 WLNK-1 Log off successful OK			2016-08-15 12:34:45 🕅 🕄	10g
			2016-08-15 12:34:46 WLN	K-1 Off
	SEND MESS	AGE TO	<u> </u>	ок
	0			

Email via APRSlink

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.

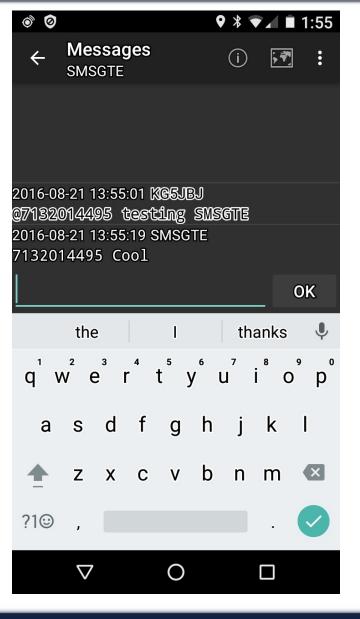
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SMS 7135551234 call me asap

SMSGTE SMS texting

KARS

SMSGTE @5551234567 <Your short message here>



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- Sources and Links
 - https://en.wikipedia.org/wiki/Automatic_Packet_Reporting_System
 - http://aprs.fi/
 - http://www.aprs.org/
 - http://www.openaprs.net/
 - https://aprsdroid.org/ Android app
 - http://aprspro.com/v1/ iPhone app
 - http://www.aprs-is.net/
 - http://www.winlink.org/APRSLink
 - Emails and Texts with APRS by K7DCC (PPT)
 - http://smsgte.wixsite.com/smsgte

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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!

KG5JBJ@GMAIL.COM