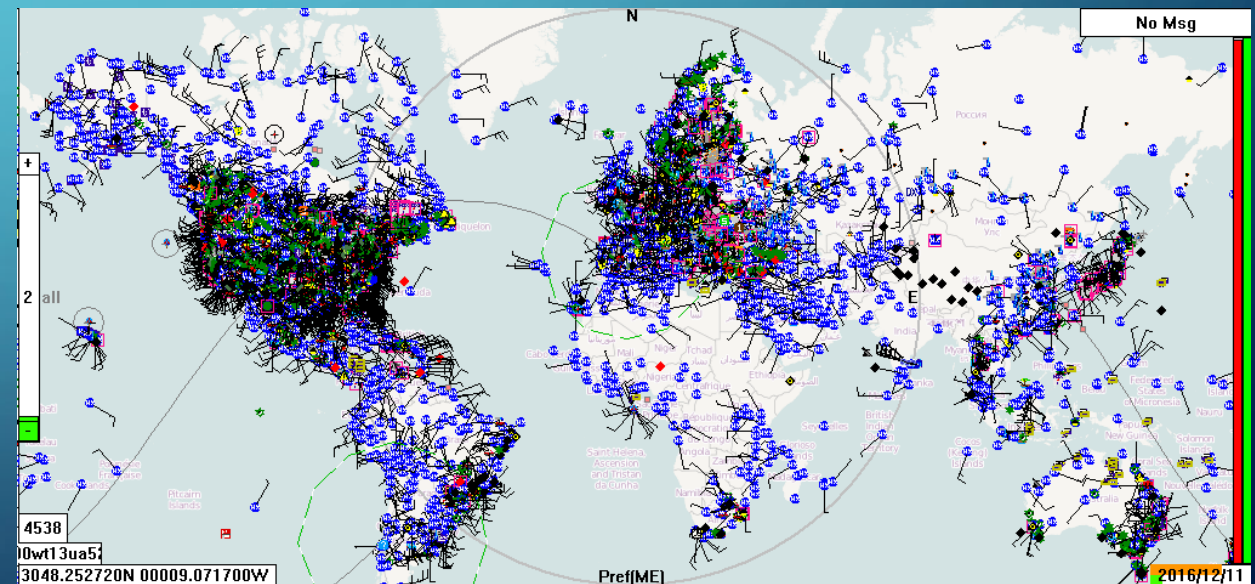
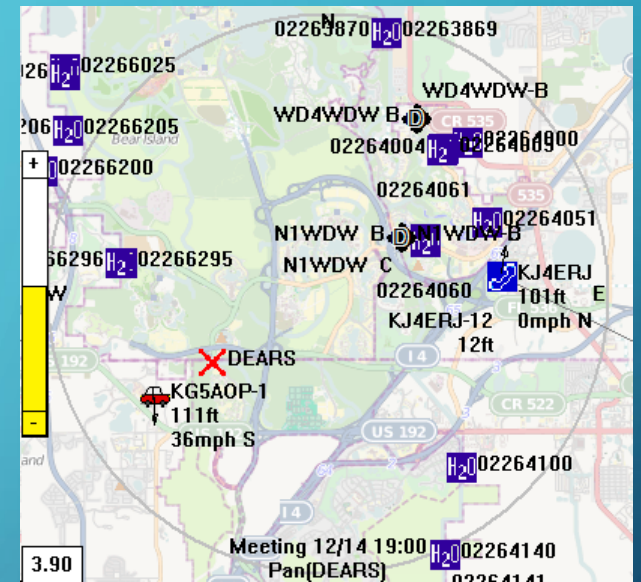


APRS* FROM A TO Z

*APRS is a registered trademark of Bob Bruninga, WB4APR

AX.25 TO APZXXX

BUT NOT EVERYTHING IN BETWEEN!



APRS FROM A TO Z

- AX.25 Packet Format (WAY under the covers)
 - APRS Packet Format
 - APRS Infrastructure
 - APRS Paths & Aliases
 - APRS Hardware
 - APRS Uses
- BUT FIRST!
 - WHAT IS IT?
 - WHO IS KJ4ERJ?

APRS – WHAT IS IT?

- A tactical, real-time **information sharing system** using standard protocols
- Developed by Bob Bruninga around 1992
- Supported by several major radio manufacturers (Kenwood, Yaesu, Alinco)
- Useful for both emergency operations and standard day-to-day operations
- An example of highly successful integration of RF and Internet technologies

KJ4ERJ – WHO IS HE?

- From the APRSISCE Wiki: <http://aprsisce.wikidot.com/kj4erj-story>
 - Magazine article in the (19)70s – Likely AX.25
 - Licensed in 2008 Thanks to KJ4DXK, W4WCQ, W4SGC
 - Fun with GPS, GeoCaching, and Digital Speedometer (from KJ4DXK)
 - APRSISCE on Windows Mobile – August/September 2008
 - APRSIS32 on Windows Desktops w/OpenStreetMaps – August 2009
 - APRSISMO on Android – August 2013

And now, ready to dive
straight into the deep end?

AX.25 PACKET FORMAT

- What is AX.25? – conforms to HDLC
<https://www.tapr.org/pdf/AX25.2.2.pdf>
- Connected Packet vs UI – TCP vs UDP
- Station IDs – Callsign-SSID (Secondary Station Identifier)
 - 6 Character callsign, 4 bit –SSID (-0 through -15)
- Checksum, not Error Correcting – all or nothing
- Address: Destination, Source, Repeaters – aka Path

OVER-THE-AIR FORMAT

- AFSK – 1200 Baud on 2m – 1200hz 2200hz tones
- FSK – 300 Baud on HF – 200hz separation
- PSK63 – http://www.crosscountrywireless.net/aprs_messenger.htm
- WSPR - <http://hojoham.blogspot.com/2016/05/wisp1-telemetry-revisited.html>
- Still no Error Correction, mostly just Checksums...
 - **ALL** of a packet must be received **PERFECTLY** before **ANYTHING** will be recovered from it.
- <http://robust-packet.net/> - SCS Tracker / DSP TNC

APRS PACKET FORMAT

Flag	Address	Control	PID	Info	FCS	Flag
01111110	112/224 Bits	8/16 Bits	8 Bits	N*8 Bits	16 Bits	01111110

Figure 3.1b. Information frame construction.

- Humanly Readable
 - TNC2 Packet Format
- SrcCall>DstCall,Path:Payload
- Payloads include:

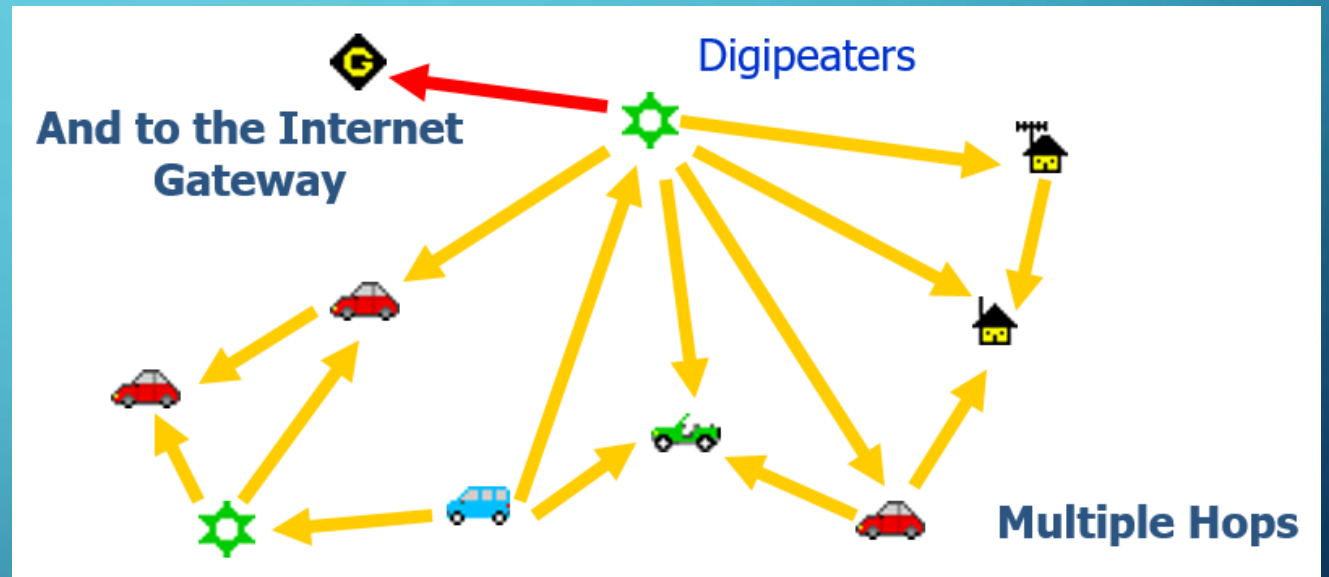
- Position reports, including Objects
- Telemetry & Definitions
- Messages (& acks)
- Weather
- Capabilities & Status
- Queries

- SQ3GOK-9>UR0P90,WIDE1-1,qAR,SP3KWA-4:`.+!S>>/"5j}Ania Antos Robert ZIMOTKI 2016_#
- HS5NFP>APESPG,TCPIP*,qAC,T2THAI:!1954.25N/09948.55E&PHG3260F/Chiangrai APRS Group
- F1BIV-1>APU25N,TCPIP*,qAC,T2SWEDEN:=4849.61N\00219.73Eo/PHG2130 - Qth:Paris 14e - VHF&IP {UIV32N}
- JH1HWT>API31,DSTAR*,qAR,JP1YDS-A:!3555.76N/14036.56E[/
- K1CKK-2>APN383,qAR,N1RCW-2:!4145.79NS06959.43W# W2,MAAn APRS DIGI ORLEANS MA
- TG9AOS-9>Q4SW0R,WIDE1-1,WIDE2-1,qAR,TG9AFX-3:`v>jlq k/"EB}_%
- W3GXT-1>APOT30,WIDE2-1,qAR,N3GXH-1:>
- N2MH>TQ0Q6W,K2PUT-15*,WIDE2-1,qAR,WB2ZII-15:`f*Tng6u`"4g}442.600MHz C141 +500_%
- WA5ETK-9>APT311,AMA39*,WIDE3-2,qAR,KE5KUL:!3514.16N/10149.88W>179/052/A=003575/Gene - Chevy Aveo Mobile
- CA2DMR-7>APRS,DMR*,qAS,Xe3ra-10:=2954.91S/07114.02W[000/000/A=000440DMR ID: 7302003
- EA5AHQ-10>APDW12,WIDE1-1,WIDE2-1,qAR,EA5IIE-10:!3925.89N\00036.40WSPHG1260APRS RX 144.800 + APRS SAT 145.825 ISS Estacion Espacial Internacional
- DB0FBG>APND13,WIDE2-2,qAR,DG1JLA-3;;439.025- *111111z5055.75N/01320.91Er1750 R30k DB0FBG Freiberg/Sa.

APRS INFRASTRUCTURE – The RF Side

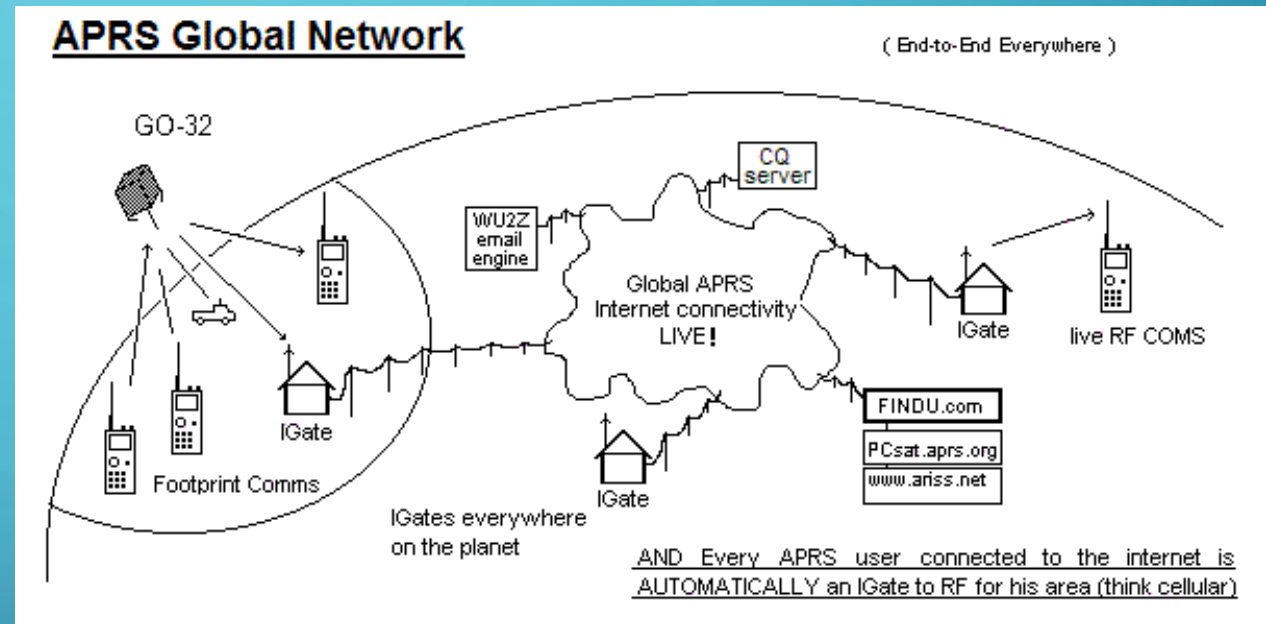
- Digipeaters – Digital Repeater
- Fixed & Mobile Stations
- Simplex range ~1/2 FM voice
- Digipeat Duplicate Detect
- UIFLOOD vs UITRACE

- `W4MCA>R8RX1T,W4PEM-14,WIDE1*,WIDE2-1,qAO,KJ4ERJ-12:`m.Yn{j>/`"43}_%
W2XYZ-9>R7PU5S,NI4CE-10,WIDE1,W4PEM-10,W4PEM-14,WIDE2*,qAO,KJ4ERJ-12:'n2[1 -/]CALLSIGN@ARRL.NET=`



APRS-IS INFRASTRUCTURE – The Internet Side

- RF meets the Internet
- IGates feed APRS-IS Servers
- Servers distribute globally
- Not “smart”, just a packet relay
- Realtime, no buffering, no storage
- Duplicate Suppression – Cannot use APRS-IS to evaluate RF coverage!
- Messages & “Courtesy” Posits gate back to RF – And sometimes more!



APRS HARDWARE

- APRS-capable Integrated Radios
- Integrated Trackers
- Terminal Node Controllers – TNCs
- Soundcard Modems

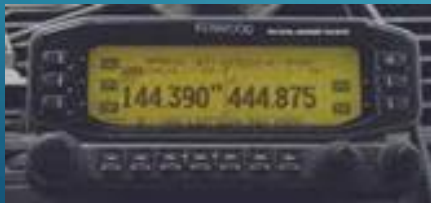


APRS INTEGRATED RADIOS

KENWOOD

D7/D72/D74
(Now with BlueTooth!)

D700/D710/D710G



YAESU

VX8/FT1DR/FT2DR

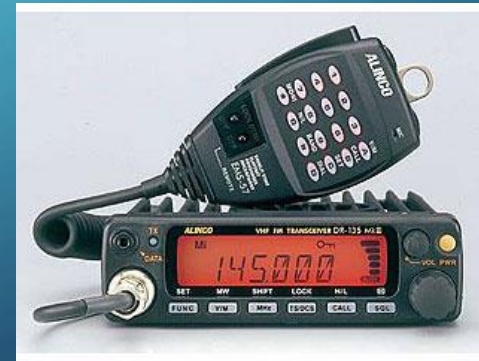
FTM-100/350R/400DR



ALINCO

DR-135 w/Internal TNC

EJ-41U Or better T3-135



INTEGRATED TRACKERS/IGATES

SAINSONIC

AP510 – 1 Watt Tracker



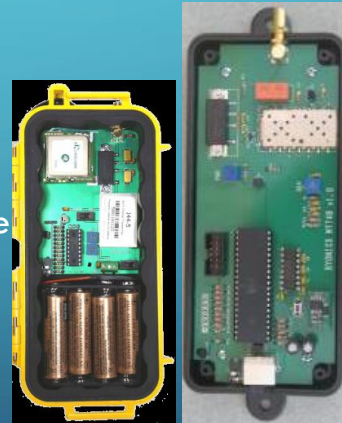
BYONICS

MicroTrak Ready To Go (10 watt)



MicroTrak All In One
10 watt Tracker

MTT4B/BT
8 watt Transceiver!



MICROSAT

WX3IN1+/Mini

Fully Functional IGate!



AX.25 MODEMS (Modulator/Demodulator)

(not true TNCs)

MOBILINKD

Direct BlueTooth-linked



BYONICS

TinyTrak 3 (Deaf Tracker)



TinyTrak 4
(w/TT4BT)



ARGENT DATA SYSTEMS

OpenTracker+/USB



Tracker 3 Family



TERMINAL NODE CONTROLLERS (TNCS)

KANTRONICS

(Venerable) KPC-3+ & More



Standalone Operations

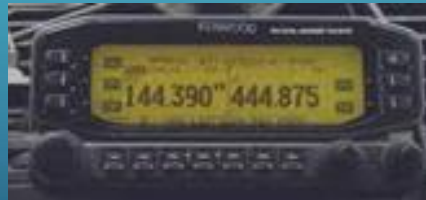
Provides Connected Packet & BBS too!
(NMEA-only Tracking, I think)

KENWOOD

D7/D72

Not the new D74!

D700/D710/D710G

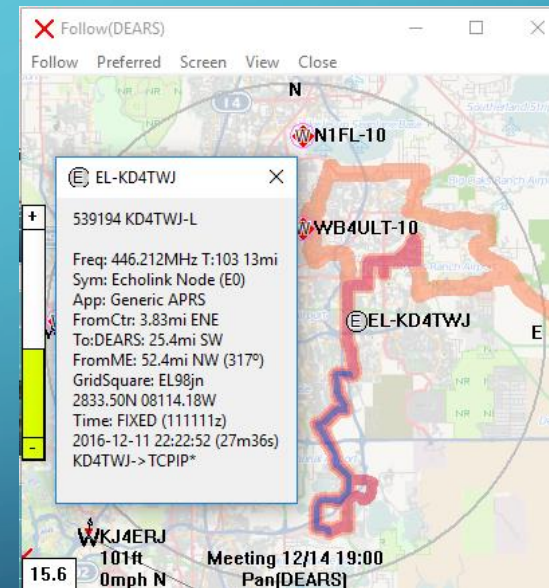


OTHERS?



APRS USES

- Tracking – Reduce voice traffic in public service events
 - Provide remote direction assistance
 - Off-roading in compound
 - Road-tripping to Dayton
 - Meet spouse for dinner!
- Local Information Initiative
 - <http://www.aprs.org/localinfo.html>



APRS USES

- Text Messaging
- Information Services
 - WHO-IS/WHO-15
 - SATSRV - <http://aprsisce.wikidot.com/doc:satsrv>
- Satellite Tracking – ISS & PSAT objects w/footprints!

APRS USES

- Contact/Announcement Services
 - CQSRVR/ANSRVR
 - <http://www.aprs-is.net/cqsrvr.aspx>
 - <http://aprsisce.wikidot.com/doc:ansrvr>
 - EMAIL-2 - <http://www.aprs-is.net/email.aspx>
- National Weather Service alerts & locations

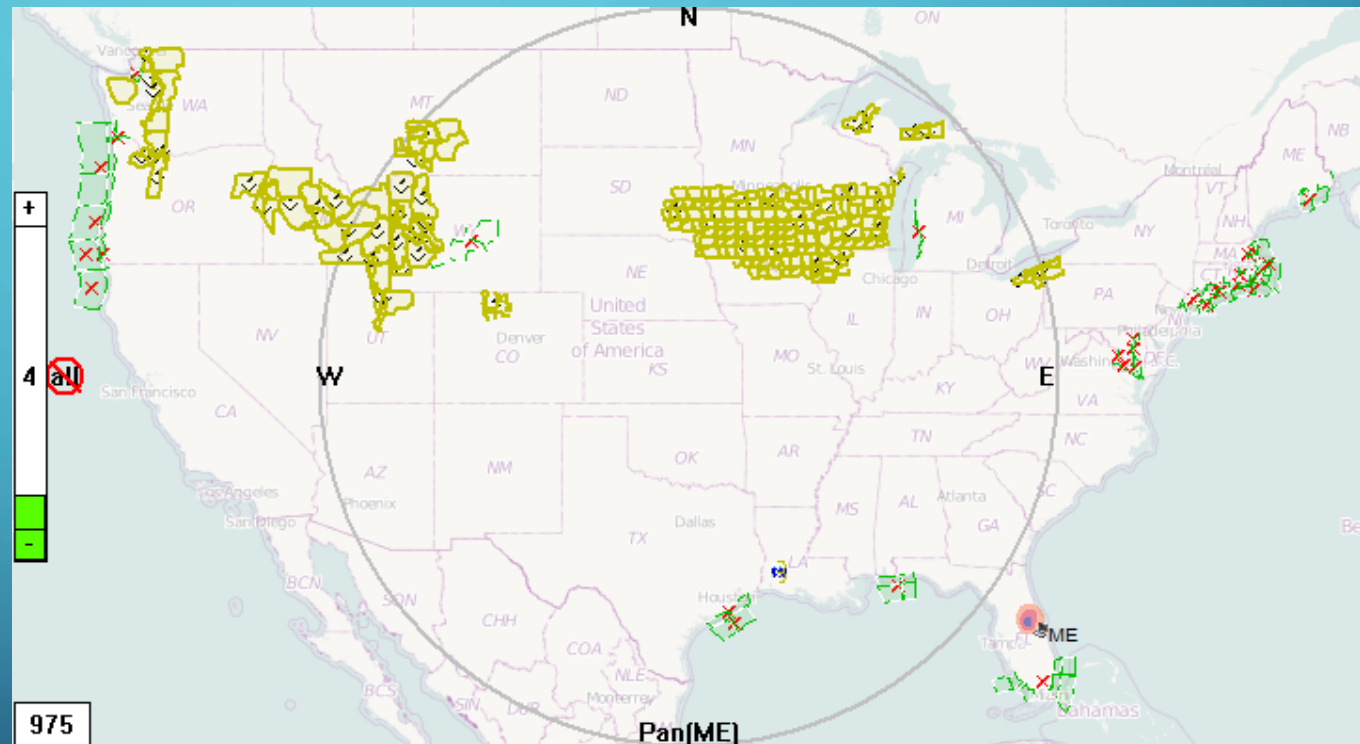
NWS WEATHER ALERTS

- Weather on 12/9/2016

BOUWSWa8u via WE7U-WX

NWS-WARN WINTER_WEATHER
Winter Storm Warning
Multi: 32/3464 Points 2 Parts
Source: COZ31-33
Issued: 09 16:53z
Expire: 10 00:00z (5h27m)
Duration: 7h07m

Sym: Snow Shwr (\G)
App: Generic APRS
FromCtr: 522mi WNW
FromME: 1690mi NW (307°)
GridSquare: DN60un92ap
4033.1665N 10615.4908W
2016-12-09 16:53:30 (1h39m)
BOUWSW->



975

NWS WARNINGS (POTENTIALLY LIFE THREATENING)

From http://wa8lmf.net/aprs/get_nws_shapefiles.htm

- As of mid-July 2009, the original **WXSVR** that injected the NWS alerts into the APRS Internet System to make the NWS shape file feature work shut down. A replacement server, **AE5PL-WX**, is now online providing this service. Shapes and symbols for severe weather **WARNINGS** should appear on maps just as before, however the operator of the new weather server has opted to vastly reduce the volume of traffic inserted into the APRS Internet System. This is to reduce the local radio channel congestion when these bulletins are retransmitted on RF. AE5PL-WX only transmits **WARNINGS** (severe weather actually in progress) but not the **ALERTS** and **WATCHES** sent by the old server.
- As a result, you will never see the yellow **ALERT** areas and orange **WATCH** areas that formerly appeared on UI-View maps. Only the far less numerous red **WARNING** shapes will appear, and for shorter periods of time.

NWS WATCHES

From http://wa8lmf.net/aprs/get_nws_shapefiles.htm

- **UPDATE AS OF SPRING 2011:** Another source of the NWS alerts, that duplicates the full feed of the original WXSVR is now available. "FireNet" is a separate server system operating in parallel with the standard APRS-IS. It provides the full APRS-IS feed, plus hundreds of other objects of interest to SAR groups, disaster incident commanders, EOC managers and others. FireNet includes earthquake epicenters, forest fires, stream and river water gauges, and the full NWS weather feed.

Just insert **firenet.us** port **14580** into your APRS software server login setup, instead of a "normal" APRS server. In Ulview, this would be added to the APRS server list in the "APRS Server Setup" dialog by using the keyboard "Ins" (Insert) key and entering **firenet.us:14580** and then checking the box to enable the new entry.. The standard port 14580 **user-defined filter commands** work on FireNet . More details on FireNet are here: <http://info.aprs.net/index.php/FireNet>

- **Ed Note:** firenet.us should **NOT** be used on an IGate as the primary APRS-IS connection!

GETTING STARTED

- CALLSIGN-SSID
- SSID Recommendations
- Path Recommendations

STATION IDS – CALLSIGN-SSID

- Up to 6 Character CALLSIGN
- 2 Alphanumeric –SSID
 - -00 is normally expressed as just CALLSIGN
 - -00 through -15 inclusive required for RF usage
 - -XX or Anything goes on the APRS-IS
 - Yaesu APRS Radios cannot message with non-AX.25 –SSIDs
- Each concurrently operating “thing” needs a unique –SSID!
 - No matter if hardware or software

-SSID RECOMMENDATIONS

-0	Your primary station usually fixed and message capable
-1	Generic additional station, digi, mobile, wx, etc
-2	Generic additional station, digi, mobile, wx, etc
-3	Generic additional station, digi, mobile, wx, etc
-4	Generic additional station, digi, mobile, wx, etc
-5	Other networks (Dstar, Iphones, Androids, Blackberry's etc)
-6	Special activity, Satellite ops, camping or 6 meters, etc
-7	Walkie talkies, HT's or other human portable

-8	Boats, sailboats, RV's or second main mobile
-9	Primary Mobile (usually message capable)
-10	Internet, I gates, echolink, winlink, AVRS, APRN, etc
-11	Balloons, aircraft, spacecraft, etc
-12	APRS ^{tt} , DTMF, RFID, devices, one-way trackers*, etc
-13	Weather stations
-14	Truckers or generally full time drivers
-15	Generic additional station, digi, mobile, wx, etc

ADDITIONAL -SSIDS

- INTERNET-ONLY Recommendations
- Some APRS-IS Servers don't pass -SSIDs > 2 characters
 - javAPRSSrvr per spec ???

-63	PSK63 HF stations
-tt	APRS TouchTone users (DTMF)
-ID	RFID
- A- Z	D-Star (That's <space>A through <space>Z)

KJ4ERJ-*

- AX.25 Compatible

- -0 TH-D74 + APRSISCE/32 Monitor
- -1 APRSIS32 IGate (w/-7)
- -7 OT2m w/HT
- -11 D700 Mobile
- -12 APRSISMO on Cell Phone
- -14 APRSISMO IGate (w/TH-D74)
- -15 APRSIS32 ANSRVR/SATSRVR
ISS/PSAT Object injector

- APRS-IS Stations

- -AP APRSIS32 Usage Monitor
- -AL APRSIS32 Full Feed
- -TS APRSISMO Test Instance
- -LS Lightning Strike Object injector
- -TD The Energy Detective
- -F1 APRSISMO on FreedomPop
- -E1/E2/E3/E4 ESP8266 IoT Instances
- S1 ESP8266 Server Remote Reset
- -HW/MB HotWater/MasterBath!

PATHS AND ALIASES

- Service request for digipeaters
- Between Src>Dst and :Payload
- Can be empty for simplex only!
- NOGATE, RONLY
- TCPIP*, TCPXX* (obsolete)
- RELAY,WIDE – Obsolete
- WIDEn-N
 - WIDE1-1,WIDE2-1
 - WIDE1-1,WIDE2-2
 - WIDE2-1
- SSn-N
- HOP7-7
- Explicit CALLSIGN-SSID

KJ4ERJ-AUTHORED APRS CLIENTS

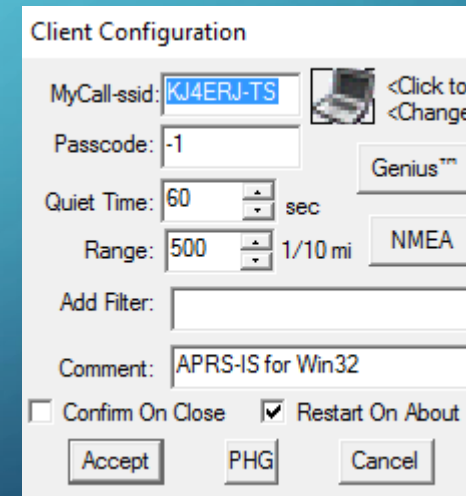
- APRSISCE/32 – Windows and Windows Mobile Client (APWWxx APWMxx)
- APRSISMO – Android MOAI Client (APWAxx)
- ESP8266 NodeMCU/lua (APZESP)
- When all you have is a hammer...

APRS EXPERIMENTAL – APZXXX

- APZTED – The Energy Detective – KJ4ERJ-TD
- APZLUA – ESP8266 – KJ4ERJ-E*, KJ4ERJ-S1, KJ4ERJ-HP
- APZMOW – KJ4ERJ-RB

GETTING STARTED WITH APRSISCE/32

- APRSIS32.ZIP
 - Not an installer! Just unzip into a newly created empty directory.
 - But NOT in a Windows Protected one (not Program Files...)
- First activation prompts for Client Configuration
 - Only needs MyCall-ssid
- When the world map appears, zoom and pan
 - Click Transmit when desired QTH is found – DONE!



The screenshot shows the 'Client Configuration' dialog box. It contains the following fields and controls:

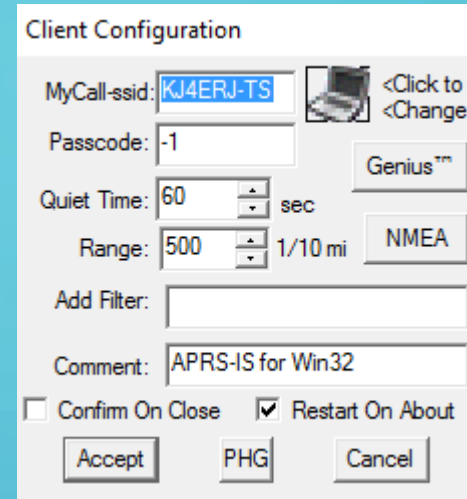
- MyCall-ssid:** A text box containing 'KJ4ERJ-TS' with a '<Click to <Change' button to its right.
- Passcode:** A text box containing '-1' with a '<Click to <Change' button to its right.
- Quiet Time:** A spin box set to '60' with 'sec' to its right.
- Range:** A spin box set to '500' with '1/10 mi' to its right and an 'NMEA' button.
- Add Filter:** An empty text box.
- Comment:** A text box containing 'APRS-IS for Win32'.
- Confirm On Close:** An unchecked checkbox.
- Restart On About:** A checked checkbox.
- Buttons:** 'Accept', 'PHG', and 'Cancel' buttons at the bottom.

AUTHENTICATED APRS – PASSCODES

- From <http://www.aprs-is.net/Connecting.aspx> (Emphasis their's)
 - **It is the responsibility of each software author to provide the proper passcode to their individual users on a request basis.** This is to aid in keeping APRS-IS restricted to amateur radio use only.
- From <http://aprsisce.wikidot.com/doc:passcode>
 - If you are new to APRS or do not remember your APRS-IS passcode, please send an e-mail to aprsisce-owner@yahoo.com for a passcode. Make sure you include your name, callsign, and the fact that you need a passcode for **APRSISCE/32**
- **Please do not use or promote web-based APRS-IS passcode generators!**

CONFIGURE/GENERAL

- MyCall-ssid & Passcode
- Range – See more stations!
- Add Filter – Advanced topic, see <http://www.aprs-is.net/javaprfilter.aspx>
- Comment – Visible to the world
- Checkboxes
 - Confirm On Close
 - Restart On About

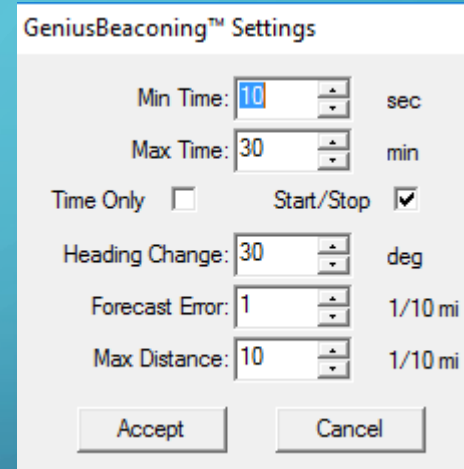


The screenshot shows a 'Client Configuration' dialog box with the following fields and options:

- MyCall-ssid:** KJ4ERJ-TS (with a laptop icon and '<Click to <Change' text)
- Passcode:** -1
- Quiet Time:** 60 sec (with a spinner box)
- Range:** 500 1/10 mi (with a spinner box and an 'NMEA' button)
- Add Filter:** (empty text box)
- Comment:** APRS-IS for Win32
- Confirm On Close
- Restart On About
- Buttons: Accept, PHG, Cancel

Configure / GeniusBeaconing™

- <http://aprsisce.wikidot.com/en-geniusbeaconing>
 - Compare actual GPS position to forecasted last beacon
 - Beacon if error exceeds threshold
 - Also allows distance & time-based beacons
- Hear also: <http://tinyurl.com/Guidance-mp3>



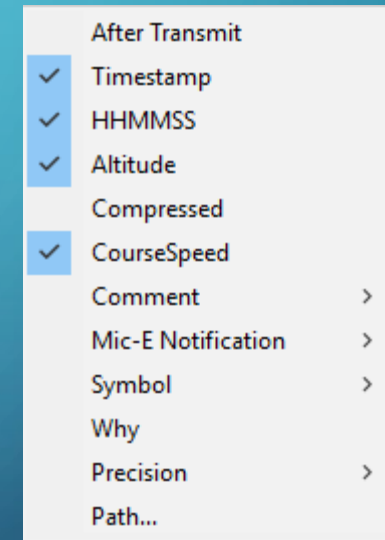
The screenshot shows a dialog box titled "GeniusBeaconing™ Settings". It contains several configuration options:

- Min Time: 10 sec
- Max Time: 30 min
- Time Only:
- Start/Stop:
- Heading Change: 30 deg
- Forecast Error: 1 1/10 mi
- Max Distance: 10 1/10 mi

At the bottom of the dialog are two buttons: "Accept" and "Cancel".

CONFIGURE / BEACON

- Selects components to include in position beacons
- Also where you specify path for RF ports
- Why is handy for debugging!
- After Transmit is good for mobile, non-GPS stations
 - Like a laptop instance on a road trip!
- Have we mentioned symbols yet?



CONFIGURE / NWS-SHAPES

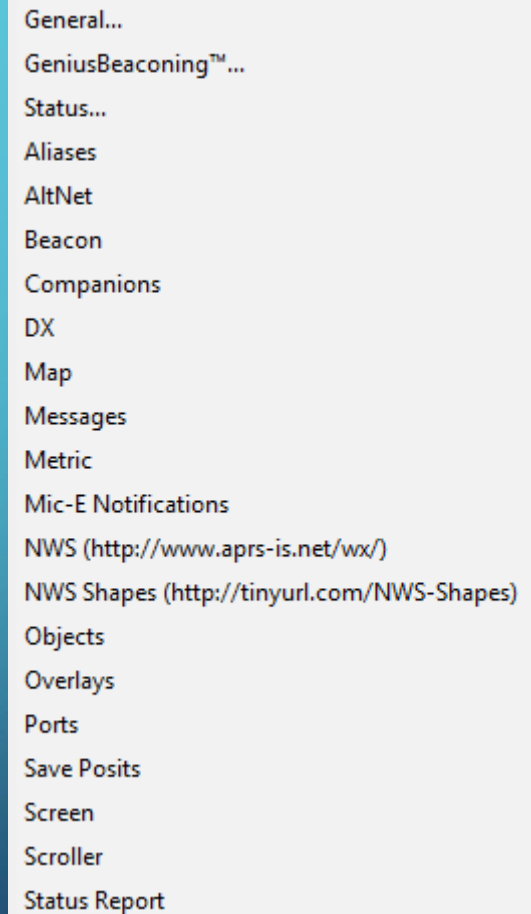
- Supports NWS alerts highlighting portions of the map (t/n)
- Shapefiles sometimes change, get the latest from...
- http://wa8lmf.net/aprs/get_nws_shapefiles.htm
 - <http://www.nws.noaa.gov/geodata/catalog/county/html/county.htm>
 - <http://www.nws.noaa.gov/geodata/catalog/wsom/html/pubzone.htm>
 - <http://www.nws.noaa.gov/geodata/catalog/wsom/html/marinezones.htm>
- firenet.us carries them all

CONFIGURE NWS / NEW OFFICE...

- Specify your local NWS office for alerts (p/)
 - * (literally a splat or asterisk) for all offices
- See <http://aprs-is.net/wx/> for more details
- MLB Covers the following Florida counties:
 - Brevard, Indian River, Lake, Martin
 - Okeechobee, Orange, Osceola
 - Seminole, St. Lucie, Volusia

OTHER CONFIG OPTIONS

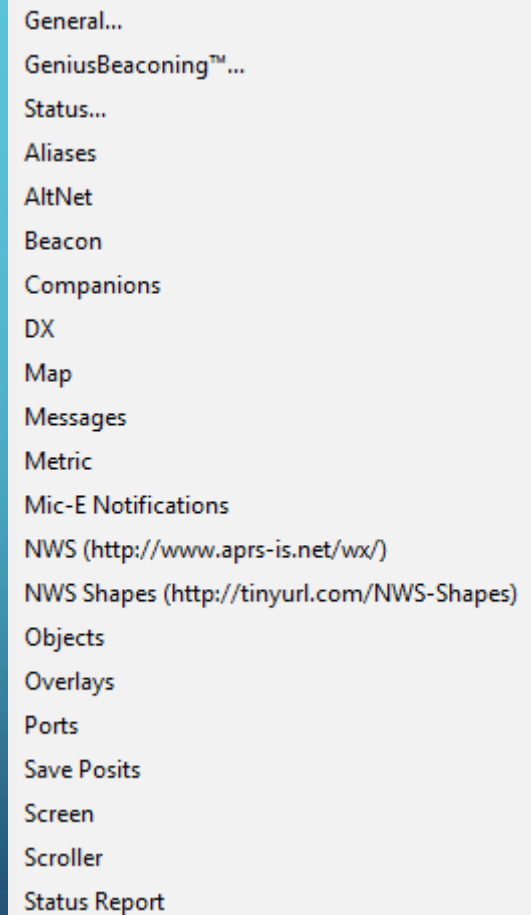
- Status - Optional Status Reports
- Aliases – Advanced Path detection
- AltNet – Selective ToCall Reception (u/)
- Companions
- DX – Distance Reception Triggers
- Map – Select an OSM-compatible tile source
- Messages – Allow reception of other station's messages

A screenshot of a configuration menu with a white background and black text. The menu items are listed vertically, separated by small gaps. The items are: General..., GeniusBeaconing™..., Status..., Aliases, AltNet, Beacon, Companions, DX, Map, Messages, Metric, Mic-E Notifications, NWS (http://www.aprs-is.net/wx/), NWS Shapes (http://tinyurl.com/NWS-Shapes), Objects, Overlays, Ports, Save Posits, Screen, Scroller, and Status Report.

General...
GeniusBeaconing™...
Status...
Aliases
AltNet
Beacon
Companions
DX
Map
Messages
Metric
Mic-E Notifications
NWS (<http://www.aprs-is.net/wx/>)
NWS Shapes (<http://tinyurl.com/NWS-Shapes>)
Objects
Overlays
Ports
Save Posits
Screen
Scroller
Status Report

OTHER CONFIG OPTIONS

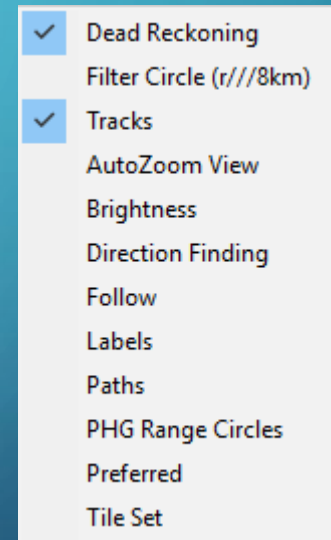
- Metric – For non-Imperial units users
- Mic-E Notifications - <http://aprs.org/aprs12/EmergencyCode.txt>
- Objects – Add additional information to the global or local APRS map
- Overlays – Add routes and lines to the local map
- Ports – Configure additional Ports
- Save Posits – Restart with known station information
- Screen – (De)Select various screen components
- Scroller – Control the packet scroller contents

A screenshot of a configuration menu with a white background and black text. The menu items are listed vertically, separated by small gaps. The items are: General..., GeniusBeaconing™..., Status..., Aliases, AltNet, Beacon, Companions, DX, Map, Messages, Metric, Mic-E Notifications, NWS (http://www.aprs-is.net/wx/), NWS Shapes (http://tinyurl.com/NWS-Shapes), Objects, Overlays, Ports, Save Posits, Screen, Scroller, and Status Report.

General...
GeniusBeaconing™...
Status...
Aliases
AltNet
Beacon
Companions
DX
Map
Messages
Metric
Mic-E Notifications
NWS (<http://www.aprs-is.net/wx/>)
NWS Shapes (<http://tinyurl.com/NWS-Shapes>)
Objects
Overlays
Ports
Save Posits
Screen
Scroller
Status Report

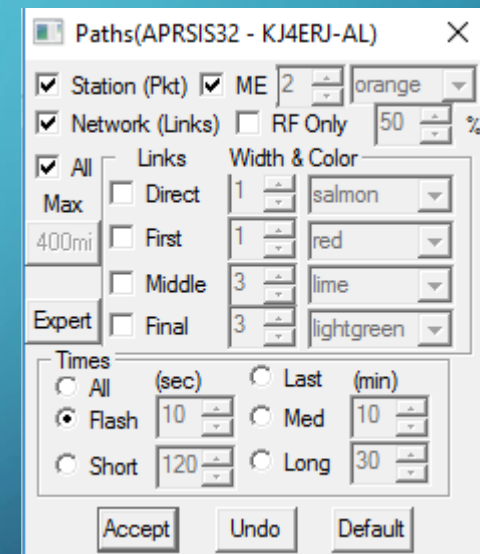
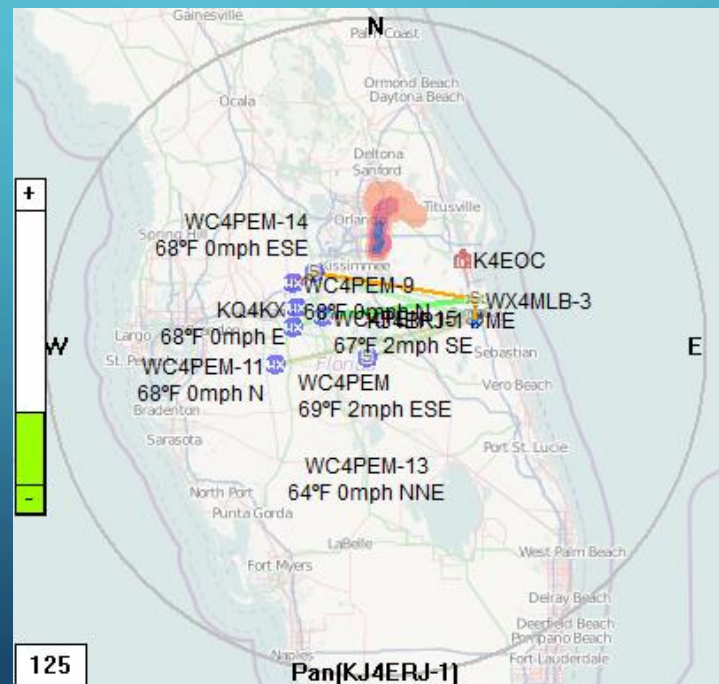
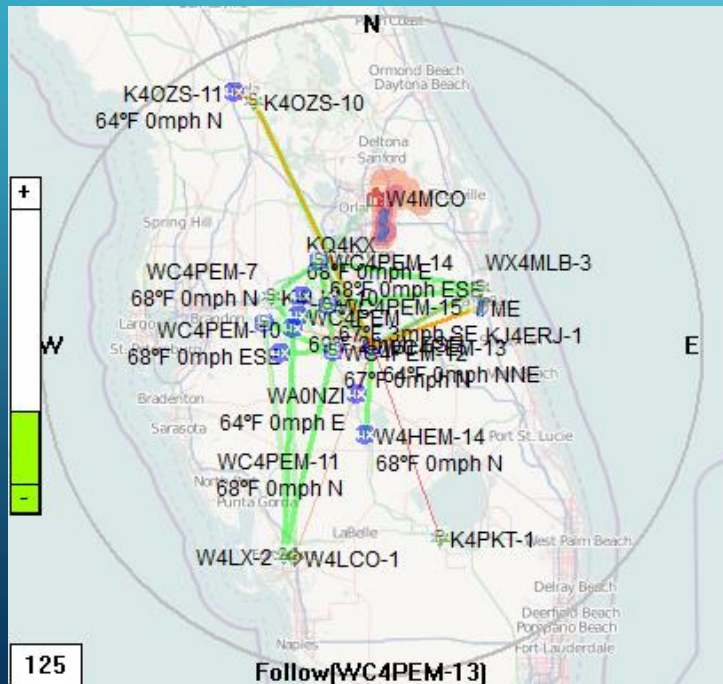
SCREEN MENU OPTIONS

- Dead Reckoning – Forecast mobile station position
- Filter Circle – Dangerous at low zoom levels!
- Tracks – Where they've been vs where they're going
- AutoZoom View – In/Out/All
- Brightness – Bright or Dim, No effect 100% opacity!
 - Left/Right Arrows control map opacity
- Direction Finding – Yes, APRS can be used to plot fox hunts!



SCREEN / PATHS / APPEARANCE

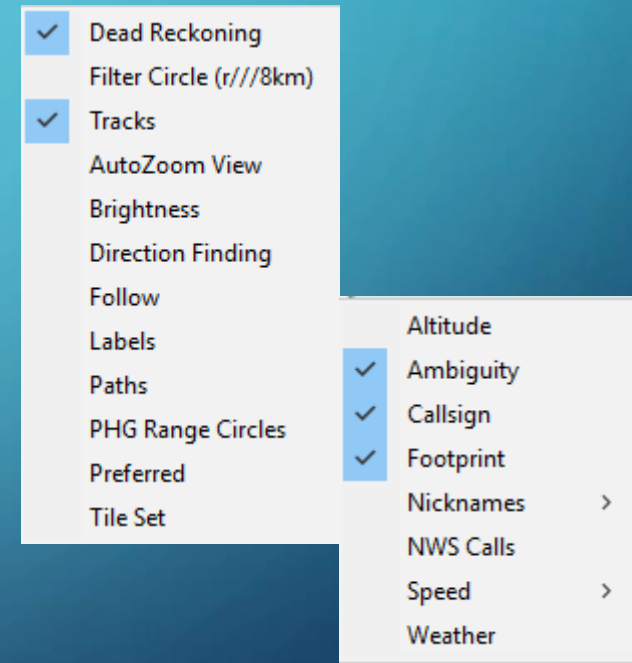
- Only valid for RF-fed stations
- Show RF hops to/from stations in near real-time



Works really nicely in conjunction with AutoZoom!

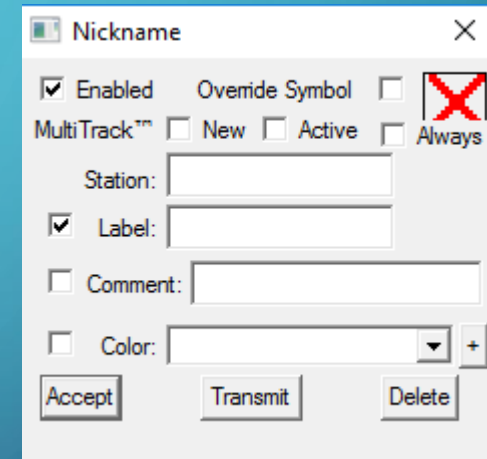
SCREEN MENU OPTIONS

- Follow / Find – One of my most-used options!
- Labels – Additional options!
 - Nicknames – Change the way you see stations
- PHG Range Circles – show repeater coverage
- Preferred – set/recall default screen size/center
- Tile Set – Select active map tile set



NICKNAMES

- Override what you see vs what was transmitted
 - Optionally override displayed symbol
 - Label replaces callsign-ssid
 - Even non-enabled Comment override can specify !Shriek!
 - Color is the track color
- Can automatically MultiTrack stations!
- Transmit will issue TACTICAL messages in a future release
 - See [http://www.xastir.org/wiki/Search_and_Rescue_\(SAR\)](http://www.xastir.org/wiki/Search_and_Rescue_(SAR)) in the Wayback Machine



!SHRIEK!s

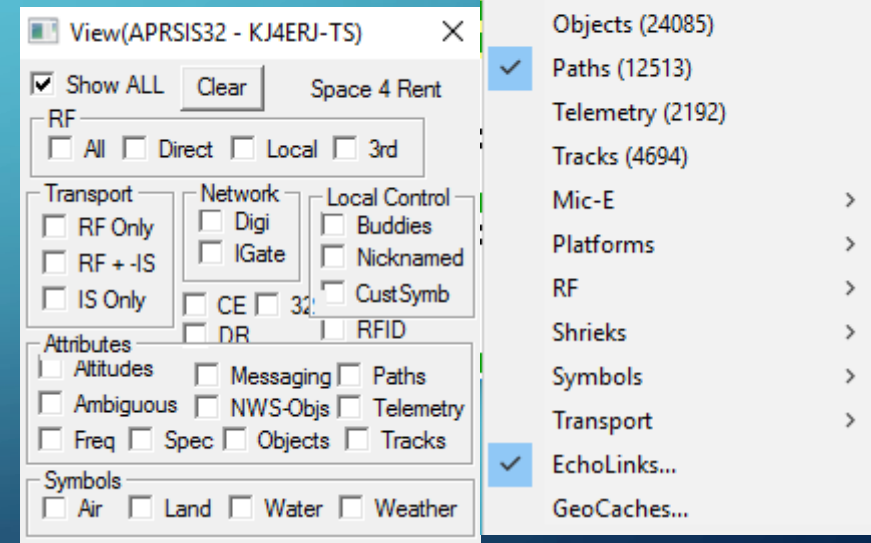
- !text! Included in comment (or nicknamed comment)
- Uniquely seen !shriek!s in View / Shrieks
- Filters the map for events
 - !R4R! – Ride for Ronald
 - !CTC! – Cycle the City
 - !SN! – Skywarn Network (origination of my idea)

	None (11/32)
	!SN! 78% (42)
	!H4OH! 5.6% (3)
	!K6ARC! 5.6% (3)
	!BIKEMS! 1.9% (1)
	!GO! 1.9% (1)
	!JCARES! 1.9% (1)
	!LOST! 1.9% (1)
<input checked="" type="checkbox"/>	!R4R! 1.9% (1)
	!SUNSHINE! 1.9% (1)
	!CQ! (0)
<input checked="" type="checkbox"/>	!GP! (0)

Segues nicely into View...

VIEW – Filter (and count) the map view

- ALL vs NONE
- Nicknamed – Another way to control visibility
- RF selects Direct, Local, 3rd Party
- Transport is RF vs IS and Digi/IGate
- EchoLinks – Fetches from their server
- GeoCaches – Loads a PocketQuery .GPX!
- b/ t/n o/ t/t t/u s/



VIEW / PLATFORMS

- Very Informative from a full feed!
- Determined from:
 - <http://www.aprs.org/aprs11/tocalls.txt>
 - <http://aprs.org/aprs12/mic-e-types.txt>
 - Other “hints”
- u/

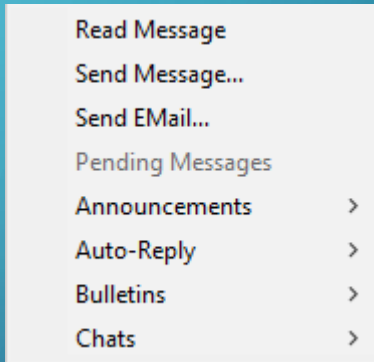
None (20531)
Other 21% (4303)
Generic 13% (2720)
UI-View 9.7% (1987)
Kenwood 7.0% (1443)
Yaesu 6.1% (1261)
aprx de OH2MQK 4.8% (978)
JAPRS IGATE 4.7% (974)
Kantronics 4.5% (916)
Unrecognized 4.1% (835)
ArgentData Tracker2 4.0% (828)
Byonics 3.7% (757)

APRSISCE/32 3.3% (684)
UIDIGI 3.3% (674)
Android 2.8% (573)
xastir 2.2% (455)
Experimental 1.3% (267)
APRS4R (123)
AGWTracker (111)
TNC-X (80)
AVRT Family (78)
DIXPRS (62)
DIGI_NED (59)
aprsd (58)

DIGI_NED (58)
SQ3FYK WX/Digi (52)
SARTrack (51)
OpenAPRS (43)
WinAPRS (37)
YAAC (37)
APRS+SA (25)
MacAPRS (21)
APRS Msngr (19)
APRStt (7)
UISS (4)
APRSdos (3)
BigRedBee (3)
HAMHUD (3)

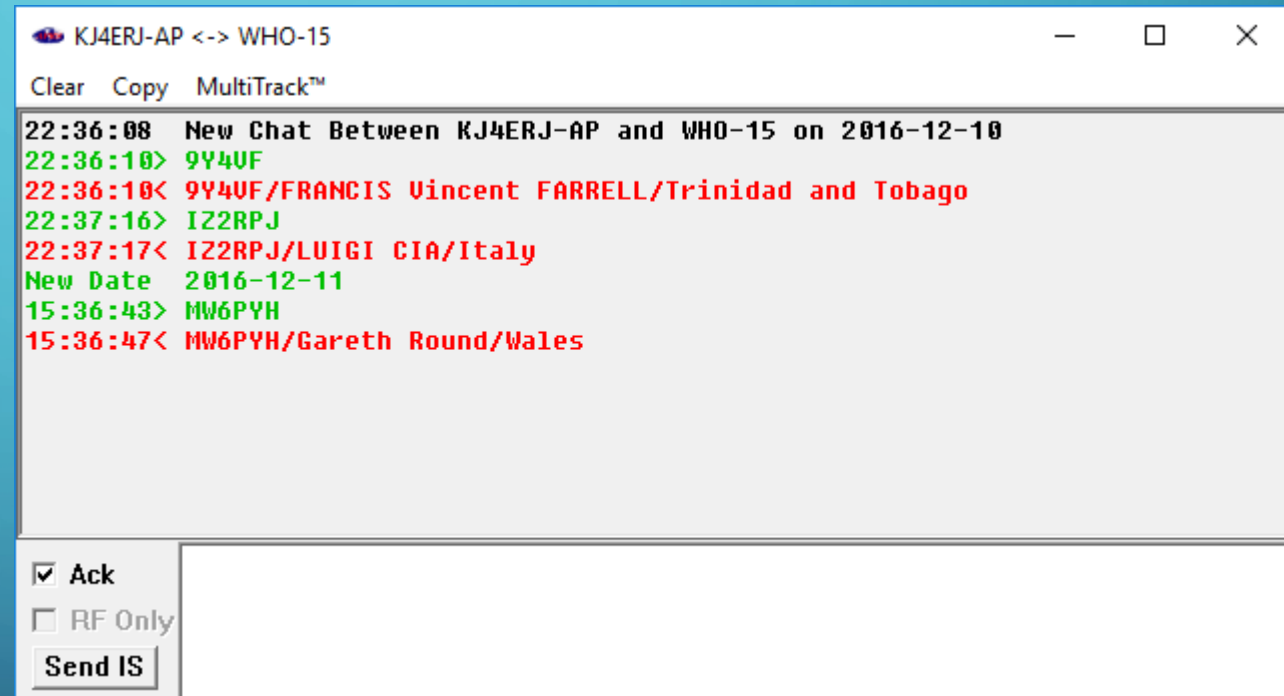
MESSAGES – THE POWER OF APRS!

- APRSISCE/32 makes messaging easy!
- EMail via the EMAIL-2 gateway
- Announcements supports CQSRVR and ANSRVR
- Auto-Reply – Not really recommended
- Bulletins!
 - W4MCO: :0 Ready for check ins for the OCARES Net



APRS MESSAGING CHAT

- Choice of IS, RF, or Best
- Optional Ack
- Uses Reply-Ack
- Decaying Interval Retry
- Multi-line auto-word wrap



KJ4ERJ-AP <-> WHO-15

Clear Copy MultiTrack™

22:36:08 New Chat Between KJ4ERJ-AP and WHO-15 on 2016-12-10

22:36:10> 9Y4UF

22:36:10< 9Y4UF/FRANCIS Vincent FARRELL/Trinidad and Tobago

22:37:16> I22RPJ

22:37:17< I22RPJ/LUIGI CIA/Italy

New Date 2016-12-11

15:36:43> MW6PYH

15:36:47< MW6PYH/Gareth Round/Wales

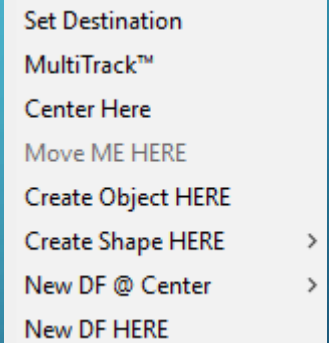
Ack

RF Only

Send IS

RIGHT CLICK COORDINATE MENU

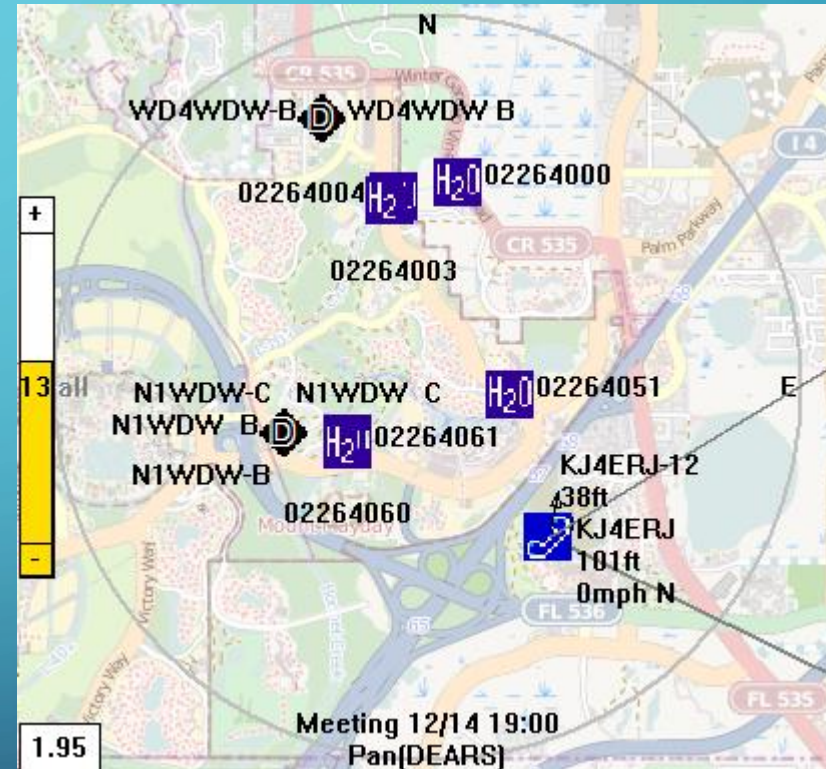
- Destination – soon to support:
 - Waypoint (destination) a RED dot showing intended destination. Uses special processing to draw a line from a mobile to his destination. This was proposed 5 Jan 2004
- Objects, and Shapes, and MultiTracks – Oh MY!



Set Destination
MultiTrack™
Center Here
Move ME HERE
Create Object HERE
Create Shape HERE >
New DF @ Center >
New DF HERE

Have I mentioned MultiTracks?

- Up to 15 Windows, realtime updated
- Great for watching High Altitude Balloons
- Close-Up Segments of an event
- Family driving around town
- Or just to fill up your screen!



AND MUCH MORE!

- RF Ports – Instant IGate if APRS-IS is also available
- Multiple APRS-IS feeds (CWOP Ports)
- NMEA GPS Ports
- NMEA Interleaved from TNC
- About version check and update
- Development version for late-breaking (and sometimes broken) features
- See <http://aprsisce.wikidot.com/> for more!

QUESTIONS?

- There's no such thing as a stupid question unless you've asked it before and are expecting a different answer.

THANK YOU!