PinPoint APRS v2.3 Quick Start Guide

Written by Frank Watervoort, AB0WV. Last updated November 10, 2026.

Please note that this is not an APRS tutorial. To understand the purpose and capabilities behind APRS and learn more about its usefulness, please visit http://www.aprs.org or do a search on "APRS Introduction" using any major search engine on the web. There are quite a few videos on the topic on YouTube as well. I recorded a video on APRS during a monthly meeting of our ARES group a while back. The link to that video is as follows: https://www.youtube.com/watch?v=g6bAKpZWWKo.

This guide is only meant as a Quick Start Guide for the PinPoint APRS application and gives a quick feature overview.

Additional information can be found on the Frequently Asked Questions (FAQ) page at https://pinpointaprs.com/faq.html. If you have a good addition for the FAQ page, please send it to ab0wv at arrl.net. Thank you!

License

PinPoint APRS ("the software") is free for use by individuals. No warranty is expressed or implied. By using the software, you agree to the fact that the author can in no way be held liable for any kind of damages resulting from direct or indirect use of the software. By using the software, you also agree to the fact that you are using this software at your own risk and you understand that it should not be used in cases where a human's life depends on it or loss of property is at stake. Please refer to the **Credits, Copyrights and License** menu item under the View menu for the entire license agreement or scroll to the bottom of this document. You're not allowed to use PinPoint APRS unless you agree to the license agreement. I'm sure you understand why this precaution is necessary. Anyway, on to more fun stuff.

Active Development

PinPoint APRS is a labor of love by Frank Watervoort, AB0WV and is still under active development, so all the bugs may not have been worked out. If you have a great idea for a feature or are running into problems (after you have exhausted the enclosed Quick Start guide and the FAQ on the website), feel free to send an email to ab0wv at arrl.net. If enough people suggest the feature you have in mind, it may be added to the product roadmap for PinPoint APRS.

If you are sending a Bug Report, please take a look at the instructions on the download page at https://pinpointaprs.com/download.html#bugs first to ensure you're sending the details I need to be able to troubleshoot. The most important thing to keep in mind is to send me everything I need to reproduce the issue(s) you are experiencing, so I can fix it. Thanks for your support!

System Requirements

- PinPoint APRS has been shown to run on computers with very minimal memory and processor capabilities, but I'd like to recommend at least 4GB of memory for stability, but 8GB is definitely better. If your computer runs slowly with the PinPoint APRS workload, please look into upgrading your hardware.
- Microsoft .NET framework 4.7.2 (can be downloaded from https://support.microsoft.com/en-us/topic/microsoft-net-framework-4-7-2-offline-installer-for-windows-05a72734-2127-a15d-50cf-daf56d5faec2 if needed).
- A screen resolution of 1024x768 or higher. Multiple display setups are supported.
- If you're using a serial port TNC, you will need at least one COM port for your TNC and GPS (if your TNC is capable of passing GPS data through), or two COM ports if connecting the GPS and the TNC directly to your machine. Most USB to COM converters will work just fine and so do Bluetooth based serial ports, most of the time. A radio, GPS or TNC is not required for use. Using a KISS TNC over a network connection is also supported. If your station is in a fixed position, a GPS is not required.
- PinPoint APRS has been actively tested on Windows 7, Windows 10 and Windows 11, but should run fine on Windows Vista and Windows 8 as well. PinPoint APRS is not supported to run on Windows XP or earlier, which is a function of the .Net version in use.
- While PinPoint APRS does not require an Internet connection, you will need one to initially cache maps (automatic) or to use the APRS-IS servers. The weather related features (NexRad Weather Radar, Weather Alerts, Wildfires) require Internet access as well. More information on that below.

Download

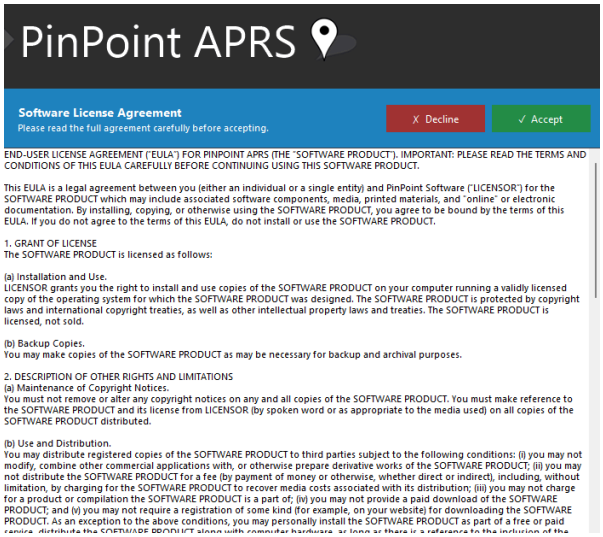
PinPoint APRS is free to download for individuals. The latest version can be downloaded at http://www.pinpointaprs.com#latest. If you are adventurous and want to help test a beta release of Pinpoint APRS, take a look at http://www.pinpointaprs.com#beta. PinPoint APRS will automatically check if there is an update, but only if you are connected to the Internet. This feature can be disabled under Tools > Options > Misc. If PinPoint APRS found a new update, you will see it displayed at the bottom of the map screen (it shows "New Version Available!". Click the link to open a browser and navigate to the download page to download the new version. Double click the downloaded version in your DOwnloads directory to upgrade).

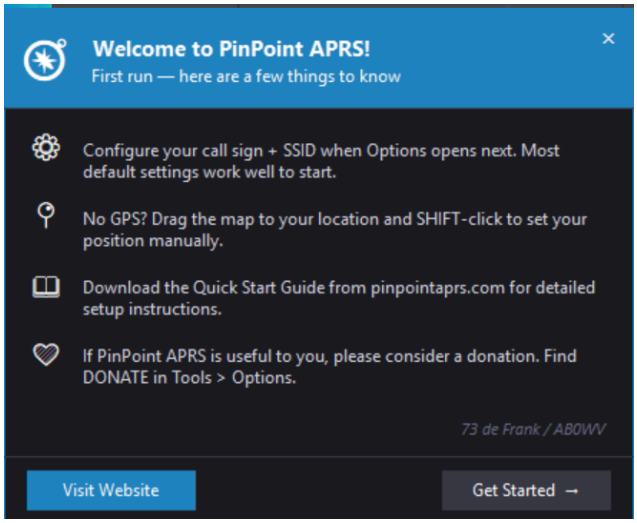
Installation

Download the file from the Download page at https://pinpointaprs.com/download.html#latest, find the downloaded file in your Downloads directory, double click it and follow the prompts. If you have a previous version of PinPoint APRS installed, it will automatically be uninstalled first. No changes are necessary during installation. The default installation options will install PinPoint in the c:\Program Files (x86)\PinPoint APRS directory and diagnostic/log files will be placed in your Documents folder.

Starting PinPoint For The First Time

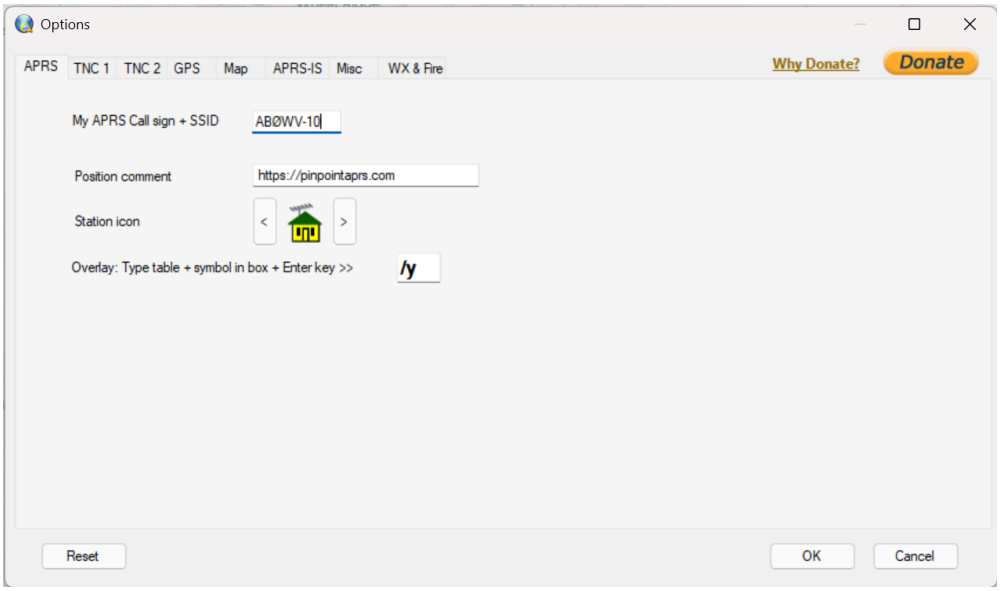
When you run PinPoint APRS for the first time, the first window that will pop-up is the License Agreement. If you read it and accept it, the next screen will make a few suggestions to get started, which we will cover below. Please read the license agreement carefully. Once you click 'Accept', you will be presented with the Welcome to PinPoint APRS screen with a few tips. Once you click Get Started, the Options screen shows up, which is accessible from the main menu by selecting Tools > Options, or pressing the F2 function key.





The Options Menu - Configuring PinPoint APRS

The Options menu is used to configure all features within Pinpoint and looks as follows when you first open it. There are multiple tabs at the top that configure the various areas of PinPoint APRS.



On the APRS tab, please enter your own call sign in the APRS Call sign box and optionally add an SSID (Secondary Station ID) from 1-15 (example AB0WV or AB0WV-9). Extended SSID's are allowed (numbers above 15 or letters, e.g. AB0WV-45 or AB0WV-B) for connections that support it (LoRa and APRS-IS).

Classic/older TNC's that use the AX.25 protocol (including all KISS TNC's) don't support SSID's outside the 1-15 range, so please bear this in mind.

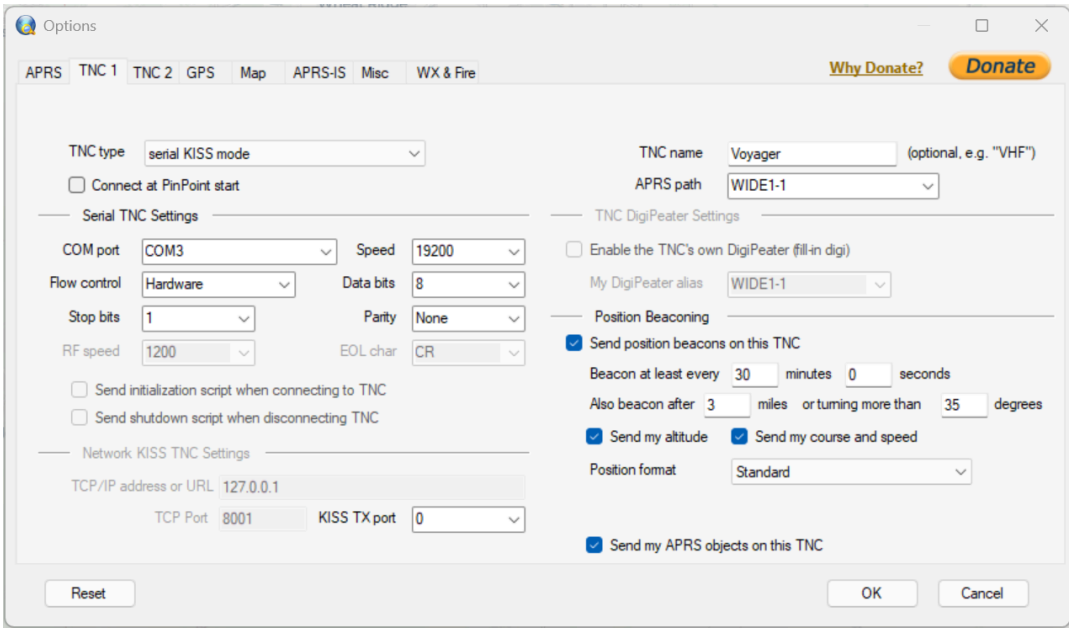
The Position comment is optional and could be used to identify a special event you're supporting with amateur radio, voice frequency you're monitoring, your email address, etc.

Using the left and right arrows in the Station icon section, you can select the APRS symbol you would like to use for your own station. Overlay symbols (secondary symbol table icons with an alphanumeric character placed on top) are fully supported, but should be entered directly in the text box to the right of the icon. Press Enter for it to take effect. An example of an overlay is **I&**, which is a black diamond shape with the capital letter 'I' superimposed, representing an iGate symbol.

An overview of the APRS symbols used in PinPoint and how to use overlays can be found here: https://aprs-tools.temporarilyoffline.com/get-symbol.html.

Tools > Options > TNC 1

While a TNC is not required, it will allow you to receive locally broadcast APRS packets via radio and will also allow you to function as an iGate, sending your received packets on to the APRS-IS servers for processing. If you are not using a TNC, you don't have to change any of the settings. If you only have one COM port on your system, PinPoint APRS will assume that that's the one you want to use for a TNC. If you have multiple COM ports available, please select the appropriate port below. PinPoint APRS supports the use of two TNCs at once, so you could have one connected to the primary VHF APRS frequency and one on the LoRa frequency or maybe HF for instance using VARA.



PinPoint APRS currently supports the following TNC types and radios that have built-in TNC's from the dropdown menu:

- Kenwood TH-D7 (use this for TH-D72 as well since they both use the TNC2 protocol)
- Kenwood TM-D700 and TM-D710 (in TNC2 protocol mode)
- Kenwood TS-2000 (in TNC2 protocol mode)
- Kantronics KPC-3+ (in TNC2 protocol mode)
- Kantronics KAM-XL (in TNC2 protocol mode)
- Byonics TinyTrak 4
- Serial KISS mode. Use this for Kenwood TH-D74 and TH-D75 and any other KISS TNCs. **Make sure your TNC is already in KISS mode. PinPoint APRS does not send data to put the TNC into KISS mode.** If you're using any of the Kenwoods or Kantronics units above in KISS mode, you would select this option.
- Network KISS mode (like DireWolf, SoundModem, VARA). **Make sure you check the IP address and the Port. Some ports use 8001 (PinPoint default), others use 8100, so please make sure to double check. Leave the KISS TX port alone if you don't specifically need support for multiple networked KISS TNC's.**
- Yaesu FTM-400. **This is only capable of reading/receiving data from the radio, no transmission is possible from PinPoint APSR to the radio. This is a shortcoming of the radio, not PinPoint APRS.** Use this TNC type for other Yaesu APRS capable radios as well.
- LoRa APRS TNC2, uses TNC2 protocol over a serial port with support for SSID's outside of the normal 0-15 range.

Support for the Yaesu FTM-400 and other Yaesu APRS capable radios is read-only, since the radio will not listen to any commands sent by PinPoint APRS, which is as it was designed by Yaesu. The Yaesu FTM-400

uses a non-standard APRS protocol. By selecting this as your TNC, you will be able to visualize and interpret all APRS packets received by your Yaesu APRS capable radio. Obviously make sure your Yaesu has APRS mode enabled.

PinPoint APRS will be able to connect to your selected TNC at startup by selecting the “Connect at PinPoint start” option in this screen.

Do not select the ‘Send startup script…” and “Send shutdown script…” if you are using a non TNC2 based TNC, so please disable it when using any serial or networked KISS TNC, LoRa TNC, or the Yaesu FTM-400 or other Yaesu radios, which are all read-only since the built-in TNC won’t accept external commands. These scripts can be found in the TNC subdirectory in the location where Pinpoint APRS is installed, and contain the commands sent to the TNC when connecting (startup) and when disconnecting (shutdown) and can be modified and customized if needed. Make sure to keep a copy, since every upgrade of PinPoint APRS will overwrite those files. If you’re using the TNC2 capable TNCs, it makes sense to leave these enabled so that things like call sign, path and other parameters are set up when connecting.

Direct support for soundcard TNC’s is usually accomplished through Network KISS mode. The Kenwood, Kantronics and Byonics TNC’s are supported in TNC2 (or TEXT) mode. When selecting a Kenwood, Kantronics or Byonics TNC, please make sure the TNC itself is not in KISS mode, which they are capable of. If your TNC is in KISS mode, please select the KISS mode option in PinPoint APRS.

The Modem RF Speed parameter will allow you to select the speed the modem will use over RF, not the local serial communication speed. This parameter is only supported for TNC2 type TNC’s (like the Kantronics TNC’s and Kenwood radios with built-in TNC), not KISS TNC’s, since it sends a command to the TNC as part of the startup file.

Some TNCs require hardware handshaking over the serial port (Kantronics) and others don’t, so you may need to experiment with the Flow control parameter to support your TNC.

If you have a TNC2 mode based TNC that is not listed, you could select the Custom option from the TNC type drop down and modify the custom startup and shutdown files with the correct commands for your TNC. This file can be found in the PinPoint APRS application directory, under the TNC subdirectory. Make sure to keep a copy of your customized files, since every upgrade of PinPoint APRS will overwrite those files.

One note on Bluetooth based serial ports: When you pair a Bluetooth based serial device to your computer (like a TNC that supports Bluetooth like the Kenwood D75, Mobilinkd TNC or Microsat Voyager), Windows creates two COM ports for it by default. This is because the Bluetooth Serial Port Profile supports two roles: one for your PC connecting out to the device, and one for the device connecting in to your PC, and Windows sets up a COM port for each, even though only one is normally used. PinPoint APRS will try to identify the one you should and shouldn't use and will show them in the

COM port dropdown with their associated name, and shows 'do not use' for the one you should not use, but if one port doesn't work, try the other associated with the same Bluetooth device.

If you have a network based TNC using the KISS protocol, please make sure your network device is not beaconing by itself if beaconing in PinPoint APRS is enabled as well. You may configure the TCP/IP address and the UDP port number in the lower section.

If you wish to use KISS mode, please ensure your TNC hardware is already in KISS mode and keep in mind that you cannot use the DigiPeater option since that's only supported for TNC2 capable TNC's. It will not work, even if selected. DigiPeating using KISS TNC's is slated for a future release.

The KISS protocol has the option for using a port number from 0 to 15 that defaults to 0 (zero) to address specific devices or clients. PinPoint APRS listens to all port numbers (0-15) while in KISS mode, but can transmit using a specific port number, which is shown below under **KISS TX port**, which is only used when using a TNC that handles multiple clients. **Note: Leave it at 0 (zero) if you don't need this functionality.**

The TNC name is a simple text field that will allow you to keep the two TNCs apart, since the name will show up in the APRS Messages field, the Last Heard Window, the status bar of the Map screen, etc. You can use the name of the TNC (e.g. Voyager) and/or frequency used.

Select the correct APRS Path for your purposes. For mobile applications, the default should be fine. You can select a path from the drop-down list or you can override the dropdown list and type in your own. Use path WIDE1-1, NOGATE if you don't want your packets to get iGated to APRS-IS (will disable the ability to beacon on APRS-IS) or set the path to TCPIP if you'd like to send your APRS packets only to APRS-IS and keep them off the radio (will disable the ability to beacon via RF) which also makes sure that other stations also don't iGate them to RF. You can also select path ARISS for sending APRS to the International Space Station (see the FAQ on the website for steps on how to do that). You can also type your own path in the box.

If you'd like your station to function as a fill-in Digi, you can enable the APRS DigiPeater option. Fill-in Digis only respond to first hop packets from stations that use WIDE1-1 first in their path, often to help relay the packet out of an area where there isn't a lot of APRS activity so that other Digis can pick it up and repeat it. **Please note that this function is only supported for specific non-KISS TNC's (like the Kenwood radios with built-in TNC and the Kantronics TNC's) on the TNC tab in the Option screen**. The Kenwood and Kantronics TNC's have internal software that will Digipeat packets, where KISS TNC's don't have that logic built-in. The 'LoRa APRS TNC2' type TNC doesn't support this function either.

Please do not enable Beaconing until you have set your own position on the map. To set your own position on the map: Drag the map to your location using the mouse (you can zoom out first and zoom back in using the mousewheel), then, use SHIFT-Click (hold the SHIFT key while clicking on your location) on the Map and select "Set As My Position" from the menu that comes up, otherwise PinPoint APRS

starts beaconing the default initial position (and/or pull stations from APRS-IS) which is in Castle Rock, Colorado, USA (near my home). Then, enter your altitude when prompted for it, or leave it zero if you're not sure. Once you set your own position, PinPoint APRS will remember it. Of course, the easiest way to set your own position on the map is by connecting an NMEA compatible GPS receiver on one of the COM ports on the system.

The Position Beacon option will send your current position on the map via the currently connected TNC and/or to the connected APRS-IS server by default, **unless you disable Beacon using RF (which means beacon via radio) or Beacon using APRS-IS** in this screen. The self-explanatory default settings should work well, but can be tweaked if necessary. You can send a manual position beacon under the Tools > Send Position Beacon menu option (or press the F1 key). Make sure a TNC or APRS-IS server is connected when you do.

The Position format dropdown allows you to select either Standard, Compact (LoRa) or Mic-E encoding. Standard encoding sends a bit longer position packet that is fully human readable. Compact uses Base-91 compression and is the standard for LoRa beacons. Mic-E is another compressed position format that shortens the sent APRS packets, therefore needing less time to send the same information on air. When selecting Mic-E, you will also get to select the status that is sent out along with the position information. "En Route" is the default status. Don't set your Mic-E status to "Emergency" unless there is a real emergency at hand, since a number of APRS clients will set off alarms if someone is broadcasting that as their status.

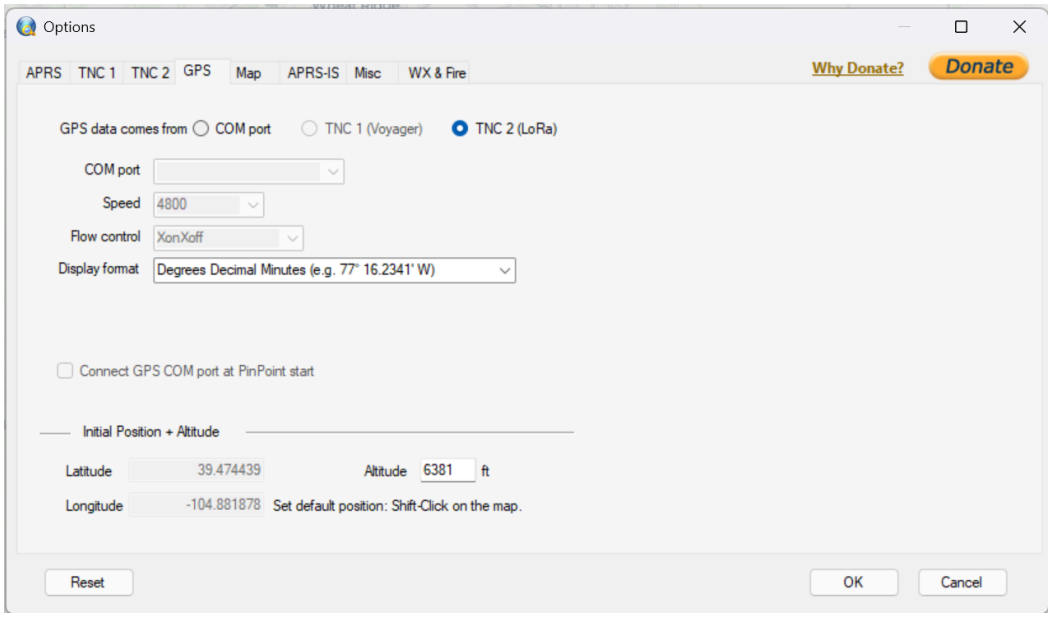
The "Send my APRS objects on this TNC" checkbox gives you control over where APRS Objects should be sent. They can be sent via TNC 1, TNC 2 and/or APRS-IS. Received APRS objects always show up, regardless of this setting.

The TNC 2 tab is disabled by default. Click on it and enable it first to be able to configure it. The options available in the TNC 2 tab are identical to the options in the TNC 1 tab.

Tools > Options > GPS

If you plan to be mobile and want others to be able to keep track of your position, you can add a GPS to PinPoint APRS that will keep your position current. Any NMEA compatible serial GPS will work just fine. PinPoint APRS recognizes the following NMEA sentences: $GPGGA, $GLGGA, $GNGGA, $GPRMC, $GLRMC, $GNRMC, $GPGSA, $GLGSA, $GNGSA and $PGRME (Garmin® proprietary).

If your radio has a built-in GPS (like a Kenwood TM-D710 with an **external** GPS) that sends GPS data over the same line as the serial TNC, you can select the 'Use GPS data coming from TNC' option. The Kenwood TM-D710G (with built-in GPS) will still need an external GPS on its serial GPS port in the control head to make this work. The older Kenwood TM-D710 with external GPS will work just fine. (This was a design decision by Kenwood not to allow the TM-D710G with internal GPS to put out NMEA sentences on the serial line from the radio, unless you use an external GPS).



Select the “GPS data comes from” parameter. If you have an external GPS, select COM port, and configure the serial port parameters underneath. If you have a Kenwood TM-D710, select the TNC you are using for the Kenwood TNC (TNC 1 or TNC 2). Some LoRa boards with onboard GPS modules that are running firmware from Ricardo Guzman are also capable of sending GPS data together with the TNC data over the same serial port (has to be enabled in the LoRa firmware first).

The Display format allows you to select the desired display format for GPS coordinates all over the app.

If you’re using an external GPS and you would like it to connect when PinPoint APRS starts, you can enable the “Connect GPS COM port at PinPoint start” option.

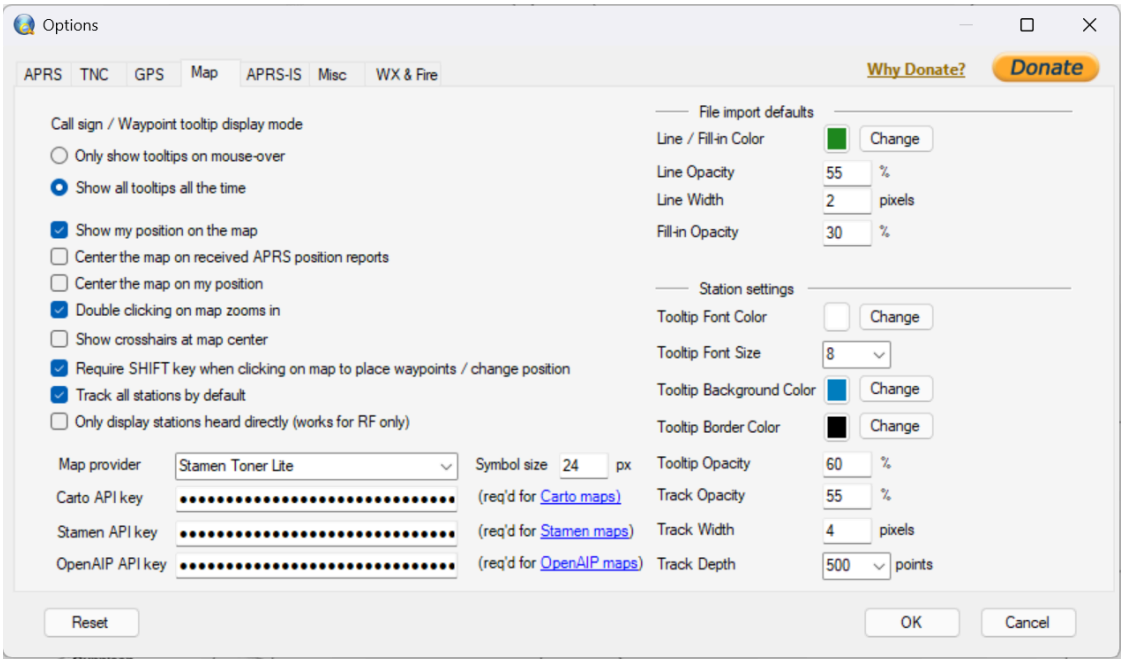
To set your own initial position it’s easiest to drag the map to your desired start position and click on the appropriate position on the map while holding down the SHIFT key and selecting ‘Set As My Position’ from the pop-up menu and then enter your altitude. The initial position will be your start position when you start PinPoint APRS. As soon as you connect a GPS, the coordinates sent by the GPS will update your position.

Tools > Options > Map

The Call sign tooltip display mode controls how APRS symbol call signs and other data on the map are made visible. The default is to show all tooltips (which contains the call sign and sometimes a tactical call or other data) all the time. To declutter the map, you can select to only show those tooltips when you mouse over the APRS symbol. There used to be a simple way of filtering call signs in this section, which

has been revamped into its own feature. For more information about Including/Excluding various stations on the map, see the **Using the Packet Filter** section further below.

When using tactical call signs instead of amateur radio call signs, make sure to always put the FCC call sign in the Position Comment and ensure that the tactical call sign does not exceed 6 characters + optional SSID from 1-15. You can also assign your own tactical calls to stations on the map that are only visible to you. You can find more about that below, under “Clicking on a Station on the Map”.



The option for ‘Show my position on the map’ shows or hides the station icon indicating your position on the map. Option ‘Center the map on received APRS position reports’ will center the map on every APRS position report received. The ‘Require SHIFT key…’ option is better left enabled, since just requiring a click to place waypoints or set your own position can sometimes interfere with clicking on symbols or dragging the map, but this can be useful when using a tablet.

The Map provider drop down box will allow you to select from a large number of map providers and map types, including topographic, satellite and hybrid maps. The Stamen maps from Stadia Maps require an API key. Sign up at https://client.stadiamaps.com/signup/, create a free API key and paste it in the *Stamen API key* field under Tools > Options > Map.

Carto maps also require an API key, which can be obtained at https://carto.com/basemaps/apikey/ for free. Paste the API key it into the Carto API key field under Tools > Options > Map.

If you are an aviation enthusiast and you would like an aviation map, you can sign up for a free API key from OpenAIP. Sign up at https://www.openaip.net/ , create an API key and paste it in the *OpenAIP API key* field. Then select the *OpenAIP + World Topo Map* from the dropdown.

Note: If you selected a map provider that requires an API key, but you didn't have an API key in the appropriate Tools > Options > Map API key field initially, you may see map tiles that say something like "API key required" printed on top of the tiles. Those map tiles are now cached on disk, so when you do add your own API key later, those tiles will still show "API key required" since they're coming from the map cache on your local machine. To clear the map cache, go to Tools > Options > Misc and click the Purge button to delete the map cache and force Pinpoint APRS to grab the map tiles from the remote map tile server.

The other maps don't require an API key. There are many different kinds available.

Maps are cached automatically in the background and are usable even when you are not connected to the Internet. To cache maps for offline use, make sure that you **drag the type of map you wish to use (Google Maps, OpenStreetMap, etc) around at all the various zoom levels and areas you need later while offline**, while connected to the Internet (if you anticipate being offline later). Maps are only cached for the Map provider you have selected (e.g. Google Maps, or OpenStreetMaps). When maps are being rendered on your screen while online, these maps will be stored in a cache database stored on your local computer. PinPoint APRS will first look for maps in the local cache before trying to download them.

The symbol size is the size of the APRS symbols shown on the map. The default setting is 24 pixels, which is a good size.

You can import and export your own waypoints and tracks on top of the map using one of the File import and export functions, which will read GPS Exchange Format (GPX) files, KML/KMZ files or GeoJson files and export to GPX or KML format. The File import settings allow you to customize the defaults for these imports, how they look on your map. Some of these files have their own settings. **The settings in this menu are only used if the imported file doesn't have its own color set, line width, etc, so it acts like a fallback. At the time of import, you can customize the track/route color, width and opacity if the file you're importing doesn't have these parameters set.**

Under station settings, you can customize how a tooltip with a call sign shows up on the map.

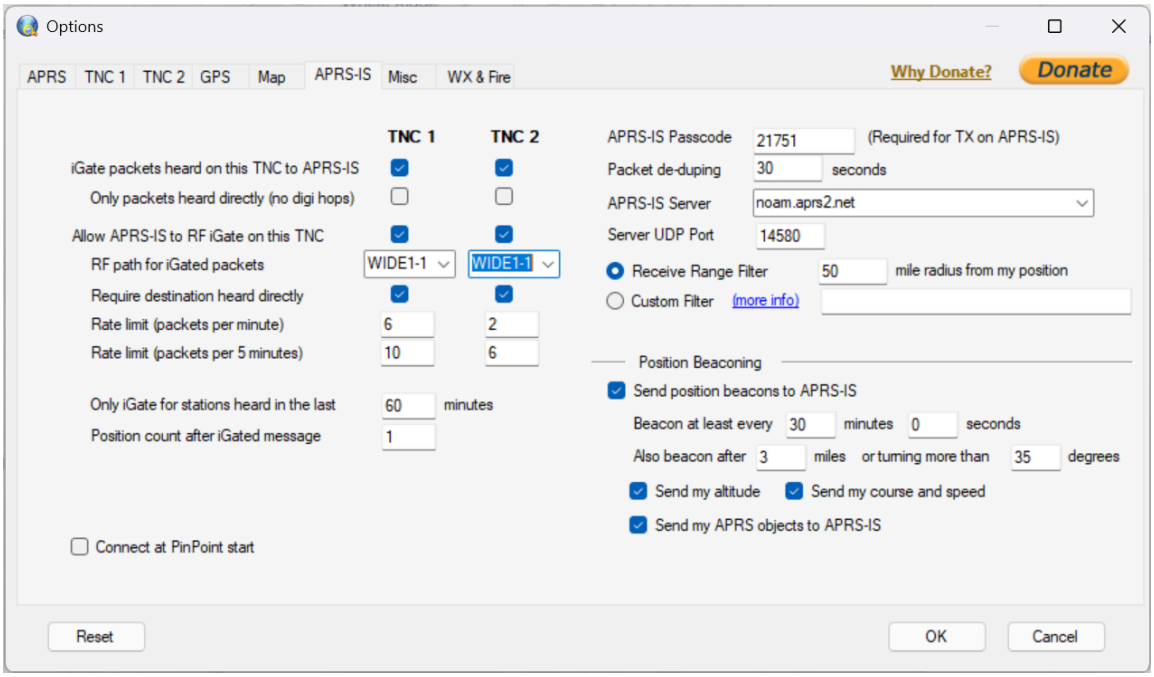
You can track a station on the map by clicking on a station on the map and enabling the 'Tracking' option in the menu that pops-up. Every time the station moves, a line from the old position will be drawn to the new position, allowing you to track the station's path. The Station tracking settings will allow you to customize how the tracking lines show on the map, and how many lines it should draw before cleaning up old tracks.

You can also enable "Track all stations by default", which means that all stations will show a track when moving around on the map. You can override this, by disabling tracking for individual stations, right clicking on the station icon and disabling Tracking, which will also remove the current track, if there is

one. The depth of the track ((or maximum track length in terms of how many location updates it tracks) is controlled by Track Depth in the Tools > Options > Map menu.

Tools > Options > APRS-IS

APRS-IS (Automatic Packet Reporting System-Internet Service) is the common name given to the Internet-based network which inter-connects various APRS radio networks throughout the world (and even space). APRS-IS is maintained and operated by volunteer Amateur Radio operators to provide world-wide capabilities to the Amateur Radio APRS RF networks and to promote the Amateur Radio service.



The APRS-IS servers take in APRS data from iGate applications all over the world. These iGates are receiving local data via radio and sending it on to the APRS-IS servers for processing and distribution. PinPoint APRS acts as a two-way iGate (from RF/radio to APRS-IS and from APRS-IS to RF/radio) and can also receive APRS data from the APRS-IS servers for display on the map, so you don't need a TNC, radio or GPS to see local APRS data by using the APRS-IS servers. **The default settings are sufficient to receive APRS data.** You do not need an APRS-IS Passcode to receive data via APRS-IS. The passcode shown above is specific to my callsign, and won't work with yours.

To enable the iGate RF to APRS-IS mode for a specific TNC, enable the checkbox (iGate packets heard on this TNC to APRS-IS) for each TNC that you want to iGate and enter the APRS-IS passcode on the right. You can add a restriction to only iGate packets to APRS-IS that your station heard directly, so without using a Digipeater, to help cut down on duplicates being sent to APRS-IS in a very busy area.

To obtain an APRS-IS passcode, you can send an email to ab0wv at arrl.net or use online resources. The password is needed to **send** data to the APRS-IS servers (iGate, beacon, messages, etc). You don't need a passcode if you just want to **receive** data from the APRS-IS servers. The passcode is a requirement from the APRS-IS stewards in order to **send** data to APRS-IS. Its purpose is to ensure only licensed radio amateurs can write to their servers. Please ensure you use a valid amateur radio callsign to generate the passcode. Only include your callsign, not the SSID, when requesting an APRS-IS passcode. The SSID doesn't matter for the passcode, so if you have multiple stations with your own call sign and use various SSID's, use the same passcode for all those stations. The passcode is not a function of PinPoint APRS, but it merely passes it on to the APRS-IS servers when requesting a connection to log in.

The RF to APRS-IS iGate ("Allow APRS-IS to RF iGate on this TNC" option) has the following options:

- RF path for iGated packets : What path should PinPoint APRS use on RF to send out the iGated message?
- Require destination hard directly : Only iGate messages on RF if you can hear the destination station directly, so without a digipeater. This helps with cutting down on duplicate traffic in busy areas.
- Rate limit (default 6 packets per minute): This setting limits the number of iGated packets to the shown value per minute to prevent flooding the RF channel. Only modify if you have a specific need.
- Rate limit (default 10 packets per 5 minutes) : This setting limits the number of iGated packets to the shown value for a 5 minute timespan to prevent flooding the RF channel. Only modify if you have a specific need.
- Only iGate for stations heard in the last 60 minutes. This will make sure that PinPoint APRS will only iGate messages from APRS-IS to RF if the destination station has been heard in the last hour. Only modify if you have a specific need.
- Position count after iGated message. If PinPoint APRS iGates an APRS message to RF, PinPoint APRS will also send a position beacon the next time the originating station send a beacon, so the recipient of the APRS message can also see the location of the station that sent the message, but this setting limits the number of beacons to the set value. Only modify if you have a specific need.

On the right side of the screen, there are a few additional options besides the APRS Passcode field, which we already discussed.

The packet deduping function removes any identical packets received via radio as a result of other Digi's repeating the same packets you already received in an earlier transmission. This helps reduce strain on the APRS-IS servers and should be left at the default setting of 30 seconds.

APRS-IS servers receive a lot of duplicate packets from various iGates in the same area and must spend compute cycles getting rid of duplicate data. In an area that has many iGates, you can help cut down even further on duplicate data by enabling the option that only iGates packets that your TNC heard directly, without a digipeater.

In the drop down, select the APRS-IS server that is most appropriate for where you live. If you live in North America (noam), then the default is fine. You can select an option from the drop down or type in your own. The available APRS-IS servers in the dropdown are:

Worldwide: rotate.aprs2.net
North America: noam.aprs2.net
South America: soam.aprs2.net
Europe/Africa: euro.aprs2.net
Asia: asia.aprs2.net
Oceania: aunz.aprs2.net

The default Server UDP port should work just fine and should only be changed in cases where you need to use an alternate port.

The Receive range filter will limit the APRS-IS server to only send APRS data for stations that fall in the entered radius from your current position. If you do not wish to see APRS-IS data on your map, but still want to iGate and use the radio's TNC data to show stations on the map, you can set the radius to zero. **If you enter a very large radius (say, more than 100 miles or 160 km), there's a chance your computer will get overwhelmed with APRS data from the APRS-IS servers and won't be able to keep up and run very slowly.** A good value is somewhere between 10 to 60 miles, or 16 to 100 km. The more you ask PinPoint APRS to do, the more capable computer you will need.

You can also create a custom filter for the data that the APRS-IS server sends to PinPoint APRS. Click on the more info link to open a webpage that explains the options available for creating custom filters within APRS-IS. This website is provided by the APRS-IS stewards. The custom filter must start with the word 'filter' and is then followed by the parameters in the document, example: *filter m/100 b/AB** = Range filter for 100 KM around my last beaconed position for all call signs that start with AB.

Enable the 'Connect at PinPoint start' option if you want to connect to APRS-IS at application start.

Position beaconing via APRS-IS can be configured separately from the TNCs, including whether or not you want to send APRS objects to APRS-IS or not. Try not to beacon on multiple channels (TNC 1 / TNC 2 / APRS-IS) unless you have a specific need, to cut down on unnecessary traffic.

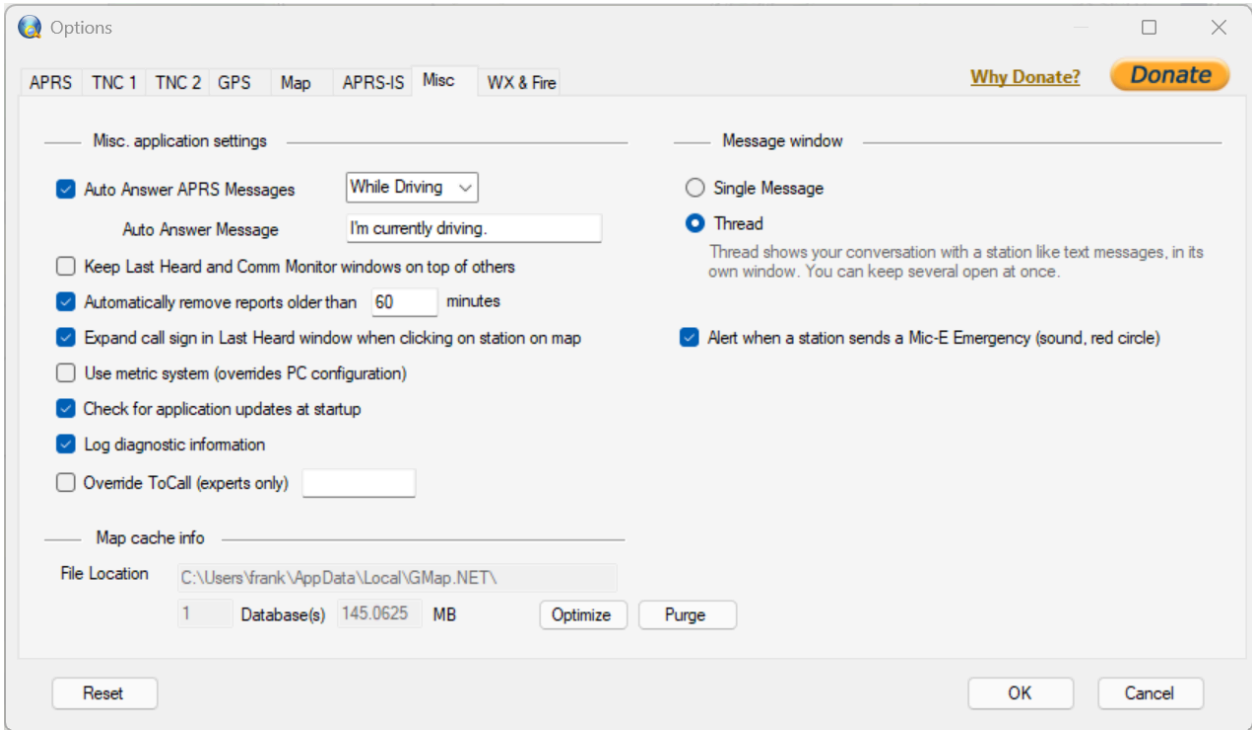
PinPoint APRS monitors your connection to APRS-IS and network TNC continuously. If your Internet or local network connection is interrupted, the app will detect the disconnection and keep watching for the network to come back. Once connectivity is restored, PinPoint APRS will automatically reconnect to APRS-IS and/or your network TNC without any action on your part.

What you will see during an outage:
- The connection status indicator will show that the connection has been lost.

- PinPoint APRS will continue attempting to reconnect in the background.
- When the network comes back, the status will return to “connected” and traffic will resume automatically.

Tools > Options > Misc

PinPoint APRS supports sending and receiving messages via APRS. If you are driving while someone sends you a message, PinPoint APRS can automatically send a reply if needed.



Some people like to keep the Last Heard and Communications Monitor on top of the map screen. The corresponding option in the Miscellaneous menu allows you to keep those windows on top, even if you click on the map window.

PinPoint APRS has the ability to clean up old position reports. PinPoint APRS will remove the symbol from the map and remove the call sign from the Last Heard window if a station hasn’t been heard from in the number of minutes defined under this option.

If you click on a station on the map, PinPoint APRS will expand the details in the Last Heard window for that station by default. That behavior can be turned off on the Miscellaneous tab.

PinPoint APRS will switch to metric mode if it detects that your PC runs in metric mode, but you can force it to use metric mode regardless of your PC setting by enabling the ‘Use metric system’ option. If you disable this option, it will run in whatever mode your PC uses.

By default, and when an Internet connection is available, PinPoint APRS, at application startup and every 3 hours after that, will check if there is an update available. If an update is available, you have the option to download it by clicking the link at the bottom of the map screen (or just go to https://pinpointaprs.com/download.html#latest to download it). If you don't wish PinPoint to check for an update every time it starts, disable the option in this screen. If you have downloaded a new version of PinPoint APRS and you want to update your current version, just exit Pinpoint APRS first, find the downloaded file in your Downloads directory, double click it and follow the prompts to upgrade.

You can turn logging of diagnostic information off if you run low on disk space.

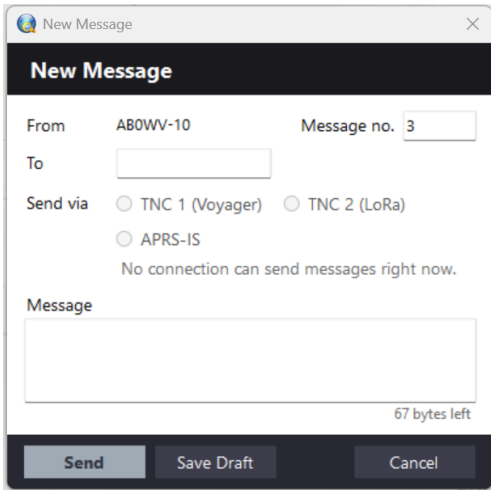
The Override ToCall option is for APRS experts who want to replace the standard APINxx ToCall (which is a piece of information that identifies the software that was being used to send the APRS packet) with something custom. For normal operation, please don't change this.

The map cache info section shows some information about the location and size of your map cache database. You can share this database with someone else in the field if they don't have Internet access available, and they will immediately have access to your cached maps. Just find the cache database called Data.gmdb in one of the subdirectories (usually C:\Users\{username}\AppData\Local\GMap.NET\TileDBv5\en) onto a thumb drive or external hard drive, move it to the other computer and use the File > Import Map Cache to import Data.gmdb onto the other computer.

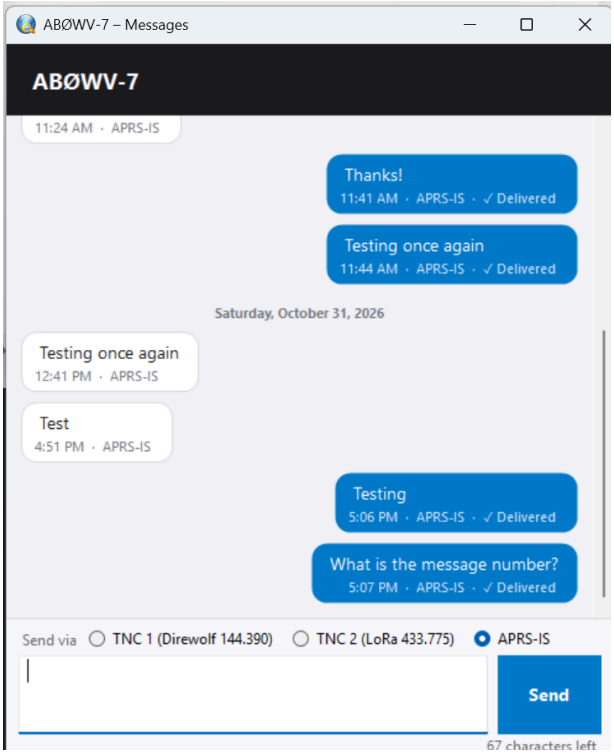
The Optimize button will optimize your local map cache database, so it cleans out unused data and shrinks the file down, if possible.

The Purge button deletes the map cache in case your cached maps are getting stale and should be re-fetched from the tile servers.

On the right side, you can select in what mode APRS Messaging is shown. If you use Single Message, you will see the APRS Message screen that displays one message at a time, as shown below.



In Thread mode, you will see messages between your station and the destination station in a text messaging-like threaded view, example below. You can have multiple threaded windows open between yourself and various stations. To open a message in a thread view, just double click on one of the messages in the APRS Message window (View > Messages (F10)).



The “Alert when stations sends a Mic-E Emergency” option will determine whether PinPoint APRS will show a red circle around the station beaconing the Emergency status available in Mic-E encoding. You will also hear an alert sound when the app isn’t muted. The Events list will show a notice about this

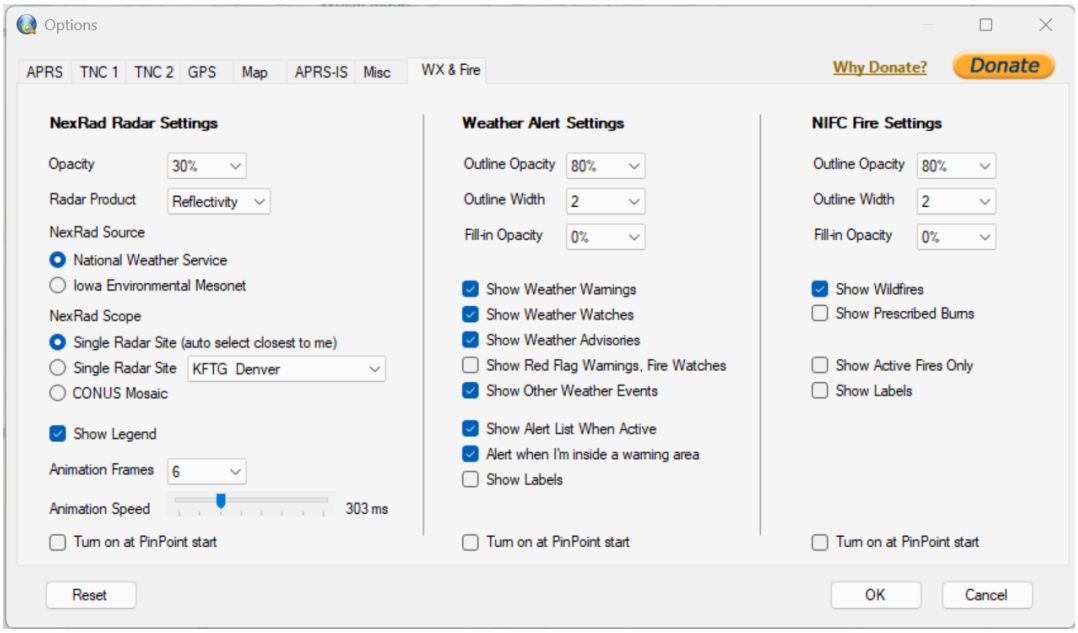
station sending an Emergency status, "Emergency" is shown in Last Heard details and station details when clicked on the station icon.

Tools > Options > WX & Fire

This screen provides for configuration of situational awareness tools, like NexRad Weather Radar, Weather Alerts and Wildfire related information, which can be overlaid on the map screen.

These weather & wildfire related features are currently only available in or near the USA, since only USA based sources were being used for rendering weather data on the map, which means your APRS Position must be in or near the USA for you to be able to use these features.

NexRad Radar Settings
NexRad Weather Radar is enabled & disabled through the Map menu on the main screen. These are the available settings. If you're not as familiar with weather radar, just leave the default settings and everything should work just fine.



Opacity is the opacity of the NexRad weather radar data that is overlaid on top of the map. 30% is the default, which works quite well, but you can customize as needed. 0% is fully transparent, so you won't actually see any radar tiles. 100% is fully opaque, so nothing will be visible underneath the radar tiles (like the map, APRS stations, etc).

Radar Product: Reflectivity measures the strength of the radar signal returned from precipitation, indicating its intensity and type, while Velocity shows the speed and direction of moving objects, like wind, by detecting changes in the radar signal's frequency due to the Doppler effect, useful for spotting a rotating mass of air or tornado's.

The **NexRad source** determines which weather source PinPoint APRS will connect to. If you're not sure about the difference, leave it at the default setting.

The **NexRad scope** has three options:

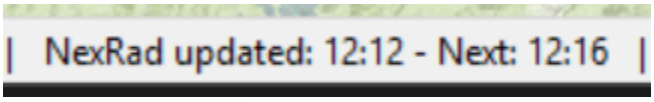
- Single Radar Site (auto select closest to me) will automatically select the NexRad radar that is closest to your position on the map, which is usually fine.
- Single Radar Site with a dropdown selection for manually selecting the NexRad radar site you would like to connect to.
- CONUS Mosaic shows weather for the entire USA, which is stitched together from all the radar sites in the USA. Only useful for when you're tracking weather over a very large area.

Show Legend will show the color scale on the map bottom right in dBz for NexRad weather radar, for reference purposes only.

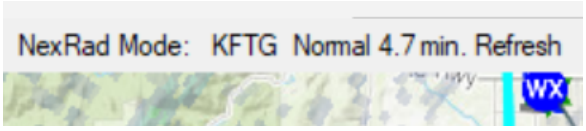
Animation Frames determine how many weather updates max it will keep in memory to use for the weather radar animation when enabled.

Animation Speed determines the timing between animation frames. The default is half a second (500 ms) between frames, but you can customize it to your liking. If your computer can't keep up, back off the animation speed.

When NexRad weather radar is active, you can see the last update and next update at the bottom of the Map window, as shown below:

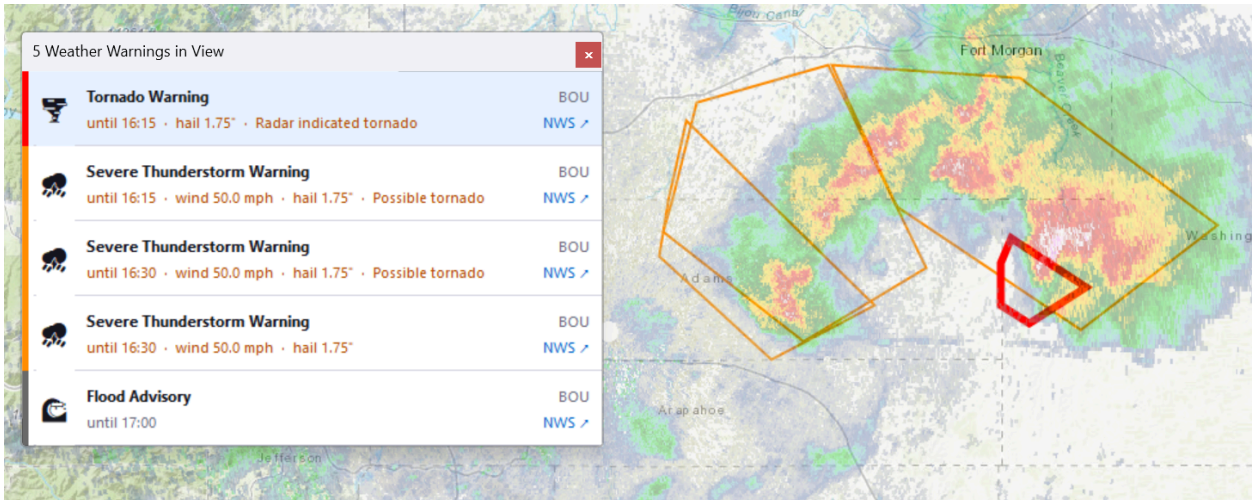


At the top of the Map window you will see the current mode of the NexRad radar and radar site in use:

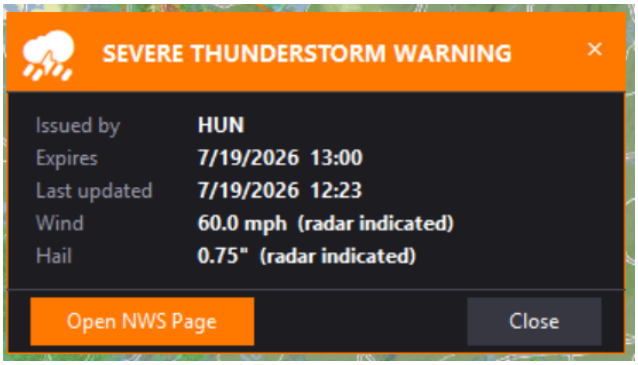


Weather Alert Settings

This feature shows polygons on the map indicating various weather & fire warnings, watches, etc, across the entire USA. This feature is enabled & disabled using the Map menu on the main screen. Below is an example of Weather Alerts on the map, with the Weather Alerts detail list shown to the left.



Any weather alerts on the map are sorted by priority in the Weather Alerts list. When you mouse-over an item in the list, the associated weather warning will be highlighted on the map. Only Weather Alerts in view are shown in the list. Weather Alerts listed with gray detail text are within 15 minutes of expiring and are sorted newest first. Clicking on a Weather Alert polygon or clicking on a Weather Alert in the list provides more detail about the weather event and a link to the webpage that provides even more detail. Example shown below:



Below you will find the settings in the Options > WX & Fire tab associated with Weather Alerts.

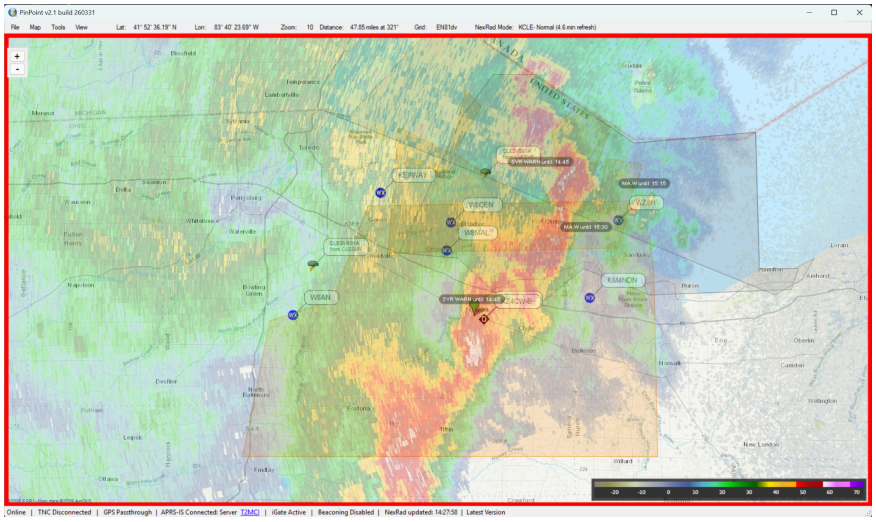
Outline Opacity controls the opacity of the perimeter of the weather alert, while **Outline Width** determines how many pixels wide the perimeter is drawn.

Fill-in Opacity controls the opacity of the area inside the perimeter of the weather alert. 0% shows no fill-in, whereas 100% is completely opaque.

The next section allows you to control what kind of warnings, watches, etc, to show on the map. Just enable & disable what you would like to see.

Show Alert List When Active enables (or disables) the weather warning list to pop-up when activating the weather alerts on the map.

Alert when I'm inside a warning area, when enabled, will draw a red border around the map if you move into a weather warning area or a weather warning is declared at your position. An example is shown below. The red border will clear if the warning is called off, or you move outside of the warning area.



Show Labels controls whether or not a label with the type of alerts and expiration time is shown for the alert area. You can also click on any alert area and get more information about the alert itself.

NIFC Fire Settings

NIFC is the National Interagency Fire Center (NIFC) and serves as the U.S. support center for wildland firefighting, coordinating resources and efforts among multiple federal and state agencies. You can display current wildfires on the map using the corresponding feature under the Map menu on the main screen. Wildfires that have a known area or polygon will show the area of the fire on the map, otherwise a circle is drawn corresponding to the size of the fire. Fires that are 100% contained are shown in gray, whereas fires that are not yet 100% contained (or unknown containment) are shown in red.

Outline Opacity controls the opacity of the perimeter of the fire area, while **Outline Width** determines how many pixels wide the fire perimeter is drawn.

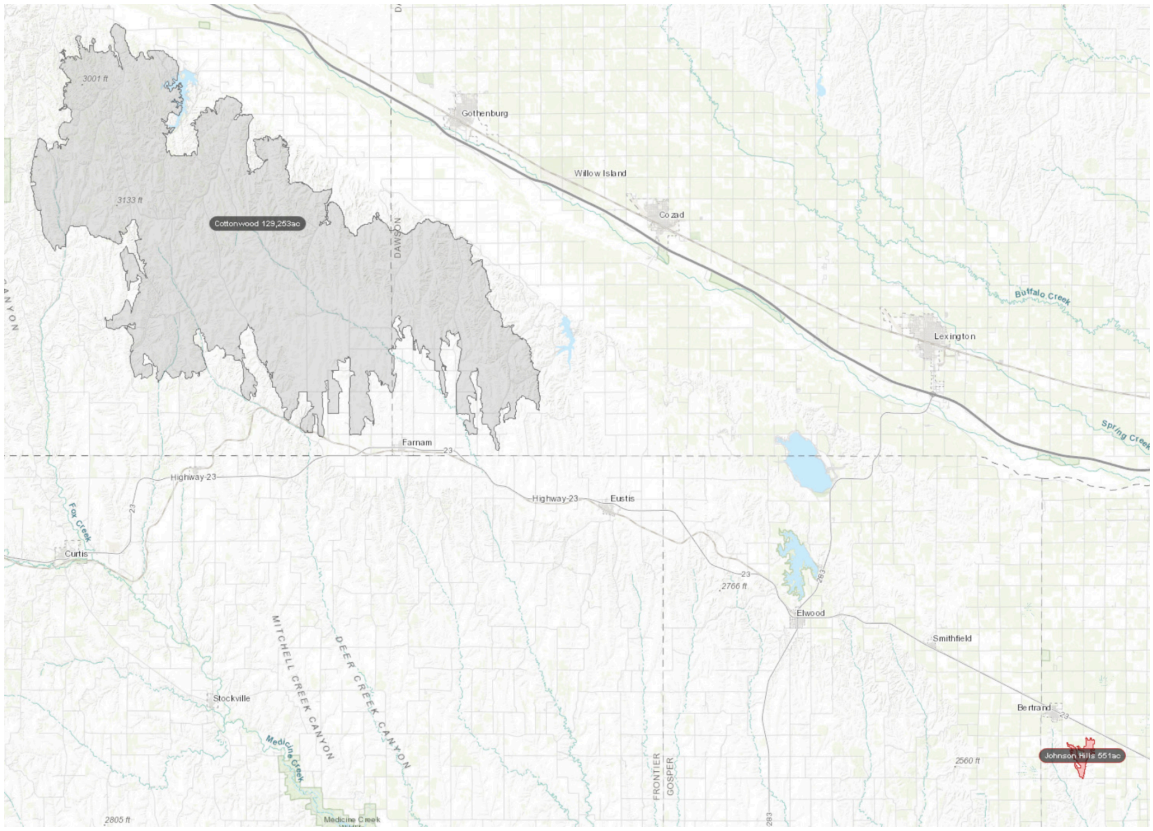
Fill-in Opacity controls the opacity of the area inside the perimeter of the wildfire. 0% shows no fill-in, whereas 100% is completely opaque.

The next section allows you to control what you would like to see on the map, wildfires and/or prescribed burns.

The **Show Active Fires Only** checkbox allows you to control whether or not to display fires that have 100% containment.

Show Labels controls whether or not a label with the wildfire name and the number of acres is shown for each fire that is greater than 100 acres. Fires that are less than 100 acres in size do not show a label by default, but you can click on any wildfire or prescribed burn and get more information about the event.

Below is an example of what the wildfire map could look like with a very large, but 100% contained wildfire on the left and a smaller but active wildfire on the right.



Clicking on the wildfire polygon or label will give you more information about the wildfire, as shown below



The “Turn on at PinPoint start” for each section controls whether or not this feature is enabled by default when PinPoint APRS starts.

The Main Application

PinPoint APRS uses four separate windows to interact with the user, that can be placed anywhere on the screen or across multiple displays. PinPoint APRS will remember the placement of the windows for next time you start the application.

The first thing you should do after setting up the Options menu for the first time with your call sign, etc, is to set your own position on the map: Drag the map to your location using the mouse (you can zoom out first and zoom back in), then, use SHIFT-Click (hold the SHIFT key while clicking on your location) on the Map and select “Set As My Position” from the menu that comes up and then enter your altitude (or leave at zero if you don’t know).

Map

The map in the main window shows all position reports, tracks, direction of travel for vehicle APRS symbols and controls the other windows via the menus along the top.

- The latitude and longitude displayed at the top of the Map window is the position of the mouse on the map.
- The Zoom indicator shows the current Zoom level.
- The Distance shown is the distance and heading from your current position on the map to the position of the mouse cursor on the map.
- The Grid is the ham radio grid square, also known as a Maidenhead Locator. It’s a system used by amateur radio operators to describe their geographic location using a combination of letters and numbers. Each grid square typically measures 1° of latitude by 2° of longitude, allowing operators to easily communicate their location during radio transmissions.
- When NexRad Weather Radar is enabled, NexRad Mode shows the current mode the active weather radar is in, which usually dictates how fast the weather radar is updated on screen. This

is only updated for NexRad radar systems that support this feature from the National Weather Service (NWS). You will notice that the NexRad radar will start to update more frequently when there is severe weather nearby.

Along the top you will find the following menu items and subitems:

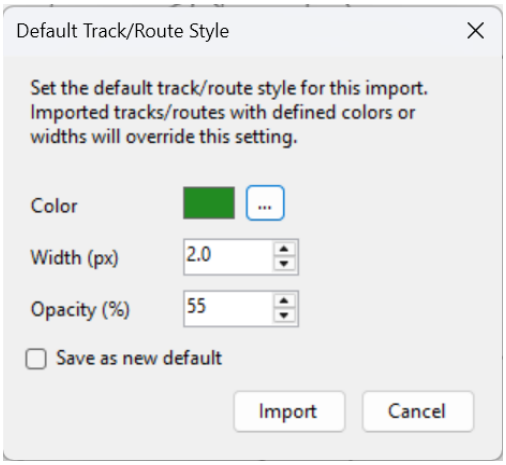
- **File**
  - **Import GPX File** - Draws tracks and waypoints from a GPX formatted file (GPS Exchange Format) on your map. You can edit GPX files before loading using an external application like MapSource from Garmin or add some waypoints and tracks inside of PinPoint APRS. You can do some minor edits (like editing and adding waypoints) inside of PinPoint APRS (SHIFT click on the map to add a waypoint or tracks. Click on a waypoint to edit or remove it). If the GPX file has track or route colors in it (using the <color> element), it will override the default GPX import color under Tools > Options > Map > File import defaults. Example of the use of the line width and color extension inside a GPX file for a track:

```
<trk>
  <name>Drawn Track 1</name>
  <extensions>
    <color>800040</color>
    <width>4</width>
  </extensions>
  <trkseg>
    <trkpt lat="39.47594726" lon="-104.8813462" />
    <trkpt lat="39.47648555" lon="-104.8814106" />
    <trkpt lat="39.47676712" lon="-104.8815715" />
    <trkpt lat="39.47696588" lon="-104.8819149" />
    <trkpt lat="39.47706525" lon="-104.8824191" />
    <trkpt lat="39.47709838" lon="-104.8829985" />
    <trkpt lat="39.47710666" lon="-104.8834062" />
    <trkpt lat="39.47712322" lon="-104.8839641" />
    <trkpt lat="39.47711494" lon="-104.8843288" />
    <trkpt lat="39.47666775" lon="-104.8842537" />
    <trkpt lat="39.47620398" lon="-104.8841679" />
    <trkpt lat="39.47575678" lon="-104.884243" />
    <trkpt lat="39.47530958" lon="-104.8843718" />
    <trkpt lat="39.47448142" lon="-104.8845971" />
    <trkpt lat="39.47298242" lon="-104.8850262" />
  </trkseg>
</trk>
```

GPX import also supports APRS symbol imports using the <sym> element where the first character between <sym> and </sym> is the APRS symbol table and the second character is the APRS symbol code. Example of a waypoint called Tower1 with a Tower APRS symbol, which is represented by **/r**

```
<wpt lat="39.47612117" lon="-104.8830307">
  <name>Tower1</name>
  <sym>/r</sym>
</wpt>
```

At the time of import, you can customize the track/route color, width and opacity. If the file you're importing doesn't have these parameters set already, the following dialog box pops-up after the import file selection. If this dialog doesn't pop-up, it means that the GPX file has its own parameters set already:



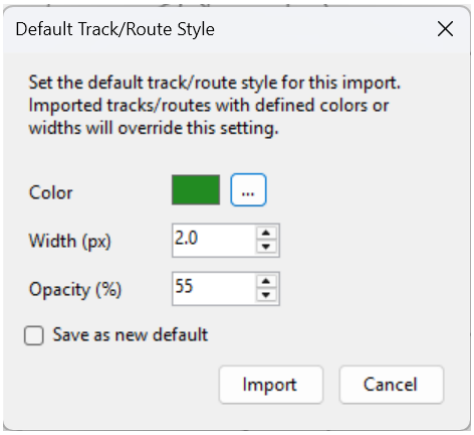
- **Import KMZ/KML File** - Draws tracks and waypoints from a KMZ or KML formatted file on your map, like used in the Google Earth application. The KML import also supports track colors using the <color> element, line width using the <width> element and APRS symbols using the <ExtendedData> element. Here's an example of APRS symbol support:

```
<Document>
  <name>PinPoint Export</name>
  <Placemark>
    <name>Test1</name>
    <ExtendedData>
      <Data name="aprs-symbol-table">
        <value>/</value>
      </Data>
      <Data name="aprs-symbol-code">
        <value>r</value>
      </Data>
    </ExtendedData>
    <Point>
      <coordinates>-104.8830307,39.47612117,0</coordinates>
    </Point>
  </Placemark>
```

Here is an example of track color and line width support inside a KML file:

```
<Style id="line_0">
  <LineStyle>
    <color>8C404080</color>
    <width>4</width>
  </LineStyle>
</Style>
<Placemark>
  <name>Drawn Track 1</name>
  <styleUrl>#line_0</styleUrl>
  <LineString>
    <tessellate>1</tessellate>
    <coordinates>-104.8813462,39.47594726,0 -104.8814106,39.47648555,0
    -104.8815715,39.47676712,0 -104.8819149,39.47696588,0
    -104.8824191,39.47706525,0 -104.8829985,39.47709838,0
    -104.8834062,39.47710666,0 -104.8839641,39.47712322,0
    -104.8843288,39.47711494,0 -104.8842537,39.47666775,0
    -104.8841679,39.47620398,0 -104.884243,39.47575678,0
    -104.8843718,39.47530958,0 -104.8845971,39.47448142,0
    -104.8850262,39.47298242,0</coordinates>
  </LineString>
</Placemark>
```

At the time of import, you can customize the track/route color, width and opacity. If the file you're importing doesn't have these parameters set already, the following dialog box pops-up after the import file selection. If this dialog doesn't pop-up, it means that the KMZ/KML file has its own parameters set already:



- **Import GeoJSON File** - Imports GeoJSON data. GeoJSON is an open standard format designed for representing simple geographical features and their non-spatial attributes, based on the JSON format. It supports various geometry types, including Point, LineString, and Polygon, and is commonly used for encoding geographic data structures.
- **Export Tracks and Waypoints** will allow you to export any tracks and waypoints currently on the map into a single GPX or KML file. You can import one or more GPX, KML, KMZ and GeoJson files with tracks and waypoints, add your own tracks and waypoints and export everything to a single GPX or KML file this way. Select between GPX or KML export by selecting the appropriate file type under 'Save as type' in the file dialog. APRS symbols, track colors and widths will all be saved into the new GPX file.

- **Import Map Cache** - If you find yourself in the field without Internet access and you didn't get a chance to cache the maps you need using your Internet connection at home, you can import someone else's map cache. Copy the map cache file from the other person onto a memory stick and import it. The location of the Data.gmdb file can be found at the bottom of the Options screen under Tools > Options > Misc. and is usually something like C:\Users\{username}\AppData\Local\GMap.NET\TileDBv5\en
- **Load Simulation** - Allows you to simulate receiving APRS packets through TNC or APRS-IS by playing back APRS packets contained in a text file. Very useful for testing purposes.
- **Save Current Map as Image** - Allows you to save a copy of the current map view as a graphic image, for instance for sharing and annotation purposes.

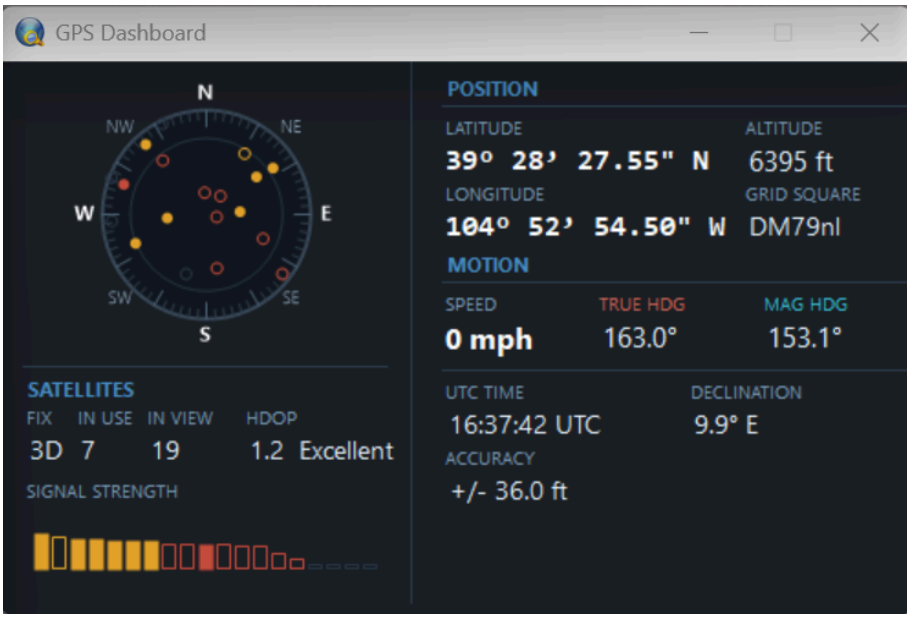
- **Map**
  - **Clear Tracks and Waypoints** - Removes all imported and placed waypoints and tracks from the map.
  - **Clear Stations** - Remove all received position reports from the map.
  - **Remove My APRS Objects** - Removes all your own APRS Objects from the map, and sends out 'kill' packets for every removed APRS Object so they are removed from other APRS clients as well.
  - **Center Map on My Position** - Center the map on your last reported position. Sometimes useful when you've been slewing/panning the map a lot and lost your own position on the map.
  - **Select Weather Radar Site** - This menu option becomes active when the Weather Radar is active and it is in Single Radar Site mode. By clicking this, weather radar data is removed from the map and all radar sites in the USA will be shown on the map as small rectangles with their identifiers. Clicking any of the shown radar sites will make that radar site active (and remembered for next time) and weather radar will be redrawn from the new radar's perspective. If you select a radar site that is inactive, PinPoint APRS will warn you. Press ESC while in this mode to go back to your previously selected radar site.
  - **NexRad Weather Radar** - Overlays the NexRad weather radar data as configured in Tools > Options > WX & Fire settings. The radar will update automatically when this is enabled. Default update frequency is 5 minutes. When using NWS as the source and using a Single Radar Site mode (not the CONUS Mosaic setting), the update frequency will update automatically based on what the NexRad radar in question is doing (frequency usually increases when severe weather starts popping up). **Tip:** Adding weather radar to an otherwise already colorful map can make it hard to interpret. There are a few maps available that are more plain with less color, making them more suited for this purpose. Try the following maps: ArcGIS_World_Topo_Map, Carto Voyager map, Carto Positron map or Carto DarkMatter map. Additionally Stamen Toner, Stamen Toner Lite, Stamen Toner Blacklite. The Stamen maps from Stadia Maps require an API key and so do Carto and OpenAPI.

- **Note:** If you click **Weather Radar** and nothing shows up on the map where you expect to see it, or it's showing outdated radar imagery, it's likely that the selected radar site is offline. If the radar imagery is more than 45 minutes old, you will receive a pop-up message indicating that the selected radar site is offline, possibly for maintenance and to select a different radar site.
- **Weather Alerts** - This feature shows polygons on the map indicating various weather & fire warnings, watches, etc, across the entire USA. Clicking on an alert area shows more information about the weather event. The Weather Alerts list also shows up listing weather events in order of priority. Mouse-over an item in the list to highlight the associated alert polygon on the map. Clicking a weather polygon or clicking an item in the Weather Alert list shows the detail page with a link to an external web page with more information about the weather event. Labels show the type of weather alert and the time the warning expires. Weather alerts are updated every 5 minutes by default, except if NexRad weather radar goes into SAILS mode, when the weather alerts update frequency increases to every 2 minutes.
- **Wildfires** - Shows all wildfires currently reported by NIFC on the map for the entire USA. Wildfires that have a known area (or polygon) will show the actual area of the fire on the map, otherwise a circle is drawn corresponding to the size of the fire. Fires that are 100% contained are shown in gray, whereas fires that are not yet 100% contained (or unknown containment) are shown in red. Clicking on a wildfire label or polygon/circle will show more information about the fire in question. The label indicates the fire name and the last reported size in acres. Wildfires are updated every 5 minutes with the latest information from NIFC. Some wildfires are only updated every few days, some more often. This is a function of NIFC.
- **Address Search** will let you find an address, worldwide, on the map. You need Internet access for Address Search to work. If a match doesn't come up at first when clicking Search, type in more of the address and click Search again. Once an address in the Results box looks good, click it and click either **Preview on Map** or **Go To Address**. **Go To Address** will place a green marker on the map, which you can remove by clicking on it. You can place as many green markers on the maps as you like.
- The **Packet Filter** is a way to filter out the stations you don't want to see, or create a list of the only stations you would like to see based on various parameters. See the dedicated Packet Filter chapter to see how to use it.

- **Tools**
  - **Connect TNC** - Connects to the serial or network TNC you defined in the Tools > Options > TNC 1 menu. When only using one TNC (TNC 1) and TNC 2 is disabled, this menu connects and disconnects TNC 1. When both TNCs are enabled, this menu splits up in connecting/disconnecting TNC 1 and TNC 2.
  - **Connect APRS-IS** - Connects to the APRS-IS server with the parameters you defined in the Tools > Options > APRS-IS menu. If you don't want to receive APRS-IS packets and

want to use your local TNC to receive APRS packets while iGate-ing to the APRS-IS servers, set the receive range radius to zero. Once you are connected to APRS-IS, you will see the actual server you're connected to at the bottom of the Map screen, underlined in blue. You can click on this link, which opens a browser window to that server's status screen where you can see your iGate statistics.

- **Connect GPS** - Connects to the separate external GPS you defined under Tools > Options > GPS. If your TNC has a built-in GPS or is passing GPS data through the TNC's serial connection to your computer, make sure to enable the correct source of where the GPS data is coming from under Tools > Options > GPS. Most TNC's are not capable of this. Below is what the GPS Dashboard looks like when you connect to a GPS. Depending on the GPS, not all fields may be populated. Some GPS' don't send certain data, so a field may stay blank.

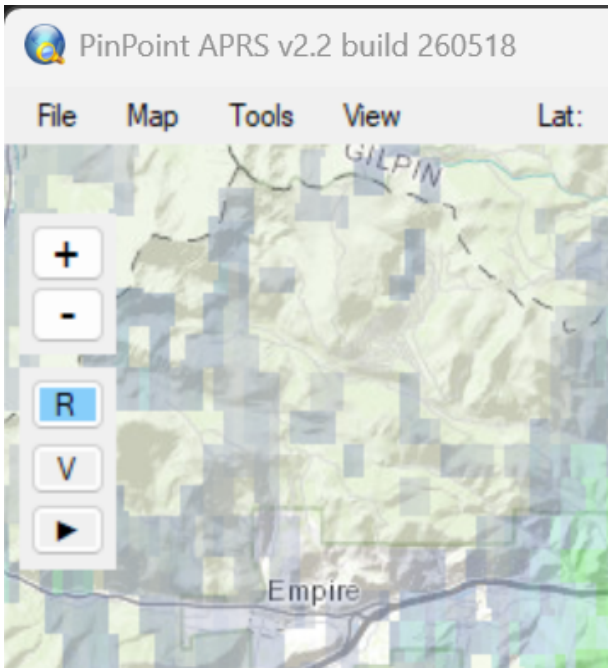


Send Position Beacon - Sends a manual APRS beacon to all your currently connected devices (TNC 1 / TNC 2 and/or APRS-IS) for which beaconing is enabled, based on your current position and settings under Tools > Options > TNC 1 / TNC 2 / APRS-IS. You can also press the F1 function key as a shortcut. Make sure your position on the map has been correctly set using either a connected GPS or SHIFT-Clicking on your position on the map, and selecting "Set As My Position" before you start beaconing.

- **Beacon All My APRS Objects** - Will immediately send out beacons for all your own APRS Objects to TNC 1 / TNC 2 and/or APRS-IS, depending on their individual settings, and will update the Last Beaconed value to the current time. Please be mindful using this, as this can send out a lot of packets in sequence, depending on how many APRS Objects you have defined.

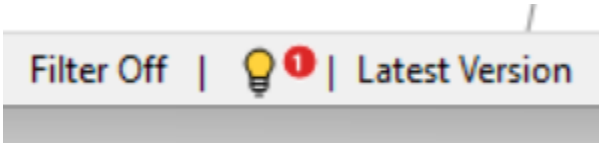
    - **Sending APRS messages** - See the section below on sending APRS messages for more detail.
    - **Mute / Unmute** - Mutes and Unmutes PinPoint's built in sounds. You can create your own sounds by replacing the *.wav files in the PinPoint application directory, under the Sounds subdirectory.
    - **Options** - Brings up the PinPoint configuration window. You can also use the F2 function key as a shortcut. Keep in mind if you have connected a TNC, GPS, APRS-IS under the Tools menu, or are showing Weather Radar, Weather Alerts or Wildfires under the Map menu, that any changes you make in Options, once you click OK, may not take immediate effect and may require you to disconnect and reconnect the TNC, GPS, APRS-IS under the Tools menu, or disable and re-enable the Weather Radar, Weather Alerts and Wildfires under the Map menu.
- **View**
    - **Last Heard, GPS and Comm Monitor Window** - Hide / Show the respective windows
    - **Events Window** - The events window is used for displaying events that happened while PinPoint APRS was running. Certain types of errors and other events are listed in the Events window so that the user is not required to click an OK button and block the entire PinPoint APRS application as a result. If there is an event, it will show in the lower status bar of the Map window. The Events window will pop-up if you click the orange x Events warning. You can filter on Informational, Warnings and Error.
    - **Messages (F10)** shows the APRS Messages screen, with an Inbox, Sent Items folder, Drafts folder and Deleted Items folder, very akin to an email client. See the chapter on APRS Messages below for more details.
    - **Notes from Frank** shows messages from the PinPoint APRS developer, Frank - AB0WV with news, updates, beta versions, etc.
    - **Map Scale** - Show / Hide the map scale. The map scale is shown in Miles by default, and in Kilometers when Windows is running in Metric mode (or you use the Metric override in Tools > Options > Misc > Use metric system.)
    - **Save Current Window Sized and Positions** - Saves the current window sizes and positions for the Map, Communications Monitor, GPS, Last Heard and APRS Messages windows. PinPoint also saves window sizes and positions automatically if the application is ended via File > Exit.
    - **Reset Window Sizes and Positions** - This option will reset the window positions and sizes to what they were the first time PinPoint APRS was started. If a window is no longer showing up (happens sometimes when switching from a multi-monitor setup to a single monitor setup, or unplugging an external monitor on a laptop), you can use this reset option to get back to normal.
    - **Credits, Copyright and License** - A list of credits and contributors, copyright notices and the license in effect for the PinPoint APRS application.
- **The +/- and R/V/▸ buttons top left on the map screen**

- The + and - buttons top left will zoom in and out of the map. You can also use your mouse wheel to zoom in and out of the position where your mouse pointer is on the map.
- The R and V buttons show up when you are in Single Radar Site mode and you have Show Weather Radar enabled on the map. You can use these buttons to switch between the Reflectivity and Velocity radar products, which can be useful when trying to spot a tornado, mesocyclone or otherwise rotating mass of air. The screenshot below shows what these buttons look like.
- The Play (▶) button is only enabled when there are at least two radar updates in memory that PinPoint APRS can use to animate the weather radar. It will keep adding frames until the Animation Frames setting under Tools > Options > WX & Fire has been reached. You can click the button when enabled and PinPoint APRS will start showing an animated weather radar to assist with showing progression and direction of weather events. During animation, the time of the weather update is shown at the bottom center of the Map window. **Keep in mind that when you pan around on the map or change the zoom level during weather radar animation, the ▶ button is disabled again until the next weather radar update.**

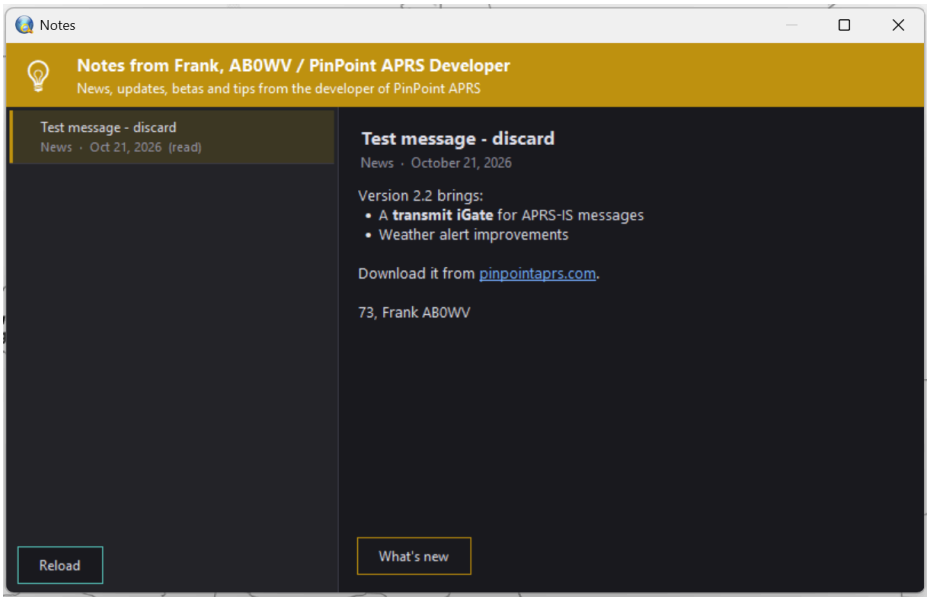


- Clicking on the items in the bottom status bar on the map window will activate/deactivate the feature. Example: Clicking on "TNC Disconnected" status will connect the TNC. Clicking on it when it shows "TNC Connected" will disconnect the TNC. Clicking on the NexRad status in the bottom bar will turn NexRad Weather Radar on and off, etc.

- **Notes from Frank, AB0WV** - In the status bar of the Map window you will find a lightbulb icon like the one shown below. The developer of PinPoint APRS, Frank, call sign AB0WV, located in Colorado in the USA, sometimes wants to share news, updates, new betas to test, tips, etc.
    - The lightbulb is 'on' (or lit up) when there is a new note from Frank and the red badge shows how many new notes there are to read.



    - Clicking the lightbulb will bring up the Notes window shown below, that shows news, updates, betas and tips. Important notes are shown in red at the top of the list. PinPoint APRS checks every few hours (while connected to the Internet) to see if there is a new note and also at application startup.
    - You can click the Reload button to check for new notes manually, should it be needed.
    - Once you have read all new notes, the red badge on the lightbulb disappears and the lightbulb turns off.



Last Heard

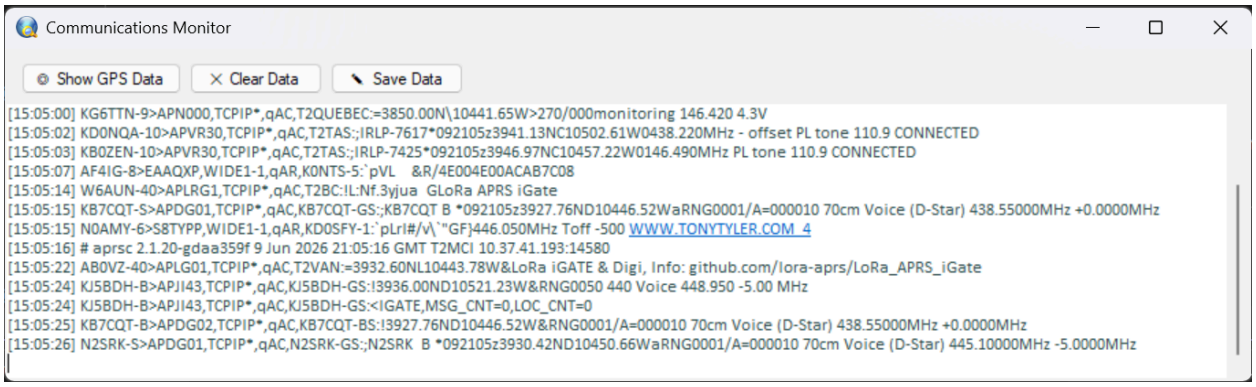
Provides the details for all position, weather and miscellaneous reports. Position reports received via Radio and APRS-IS are displayed in different sections. If you right click on the Position reports header, you can clear all stations, collapse the treeview, or sort everything alphabetically (this includes the treeview headers as well, so things may be a bit re-arranged when you do this).

- Clicking on a received station expands that tree node to show you all received detail.

- Right-clicking on a received station allows you to center the map on that station, start an APRS message to that station, do a QRZ call sign lookup (you need to be logged in to QRZ first), or sort alphabetically.

Communications Monitor

Shows raw data being sent to and received from the TNC or APRS-IS (GPS data also if using GPS pass through capabilities. If you click the *Show GPS Data* button, the received GPS data will also be displayed in the Communications Monitor window and can be helpful for troubleshooting purposes. The *Save Data* button will allow you to save the data in the window to a text file for later analysis.



The data shown in the Communications Monitor window is color coded as follows:

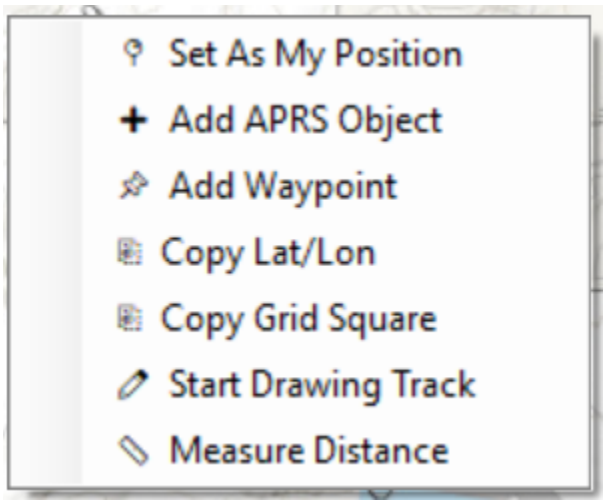
- Data received FROM APRS-IS is shown in dark gray.
- Data sent TO APRS-IS (beacon, iGate, etc) is shown in bright red.
- Data received FROM TNC 1 is shown in purple.
- Data sent TO TNC 1 is shown in dark red (brown-ish)
- Data received FROM TNC 2 is shown in blue.
- Data sent TO TNC 2 is shown as orange.
- Data received FROM your GPS (or TNC if using GPS Passthrough) is shown in dark green (if “Show GPS Data” is enabled)

GPS Dashboard

If you connect a GPS to PinPoint APRS, this window shows all the available details related to your position, speed, heading, etc. The compass rose (if your GPS supports it) shows where the GPS satellites are located in the sky overhead. If there is no data in a specific field, it means that your GPS does not send the data to PinPoint APRS. Not all GPS units send the same data.

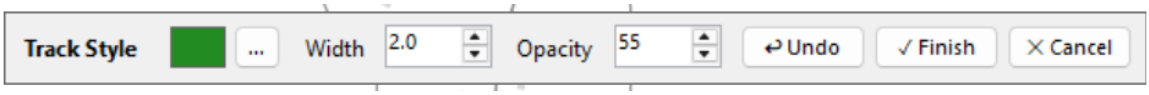
SHIFT-Click on the Map

When you hold down the Shift key while clicking on a desired location on the map, the following options appear:



- **Set As My Position** allows you to change your position without the need of a connected GPS. Just select your location on the map and select this option and then enter your altitude (or leave zero if you don't know it). If you are already connected to APRS-IS, while you change position, it will take until the next beacon to APRS-IS for the radius to move within which stations are displayed from APRS-IS.
- **Add APRS Object** adds an APRS Object to the map in the position where you clicked. APRS Objects are stations that are beaconed out via APRS-IS and/or Radio, just like your own position and they are associated with your call sign, even though they have their own Object Name. For more detail, see the chapter "Placing APRS Objects on the map" below.
- **Add Waypoint** will add a waypoint marker to your own map, which is only visible on your map since it doesn't get beaconed out. APRS symbols will be exported and imported using GPX or KML export and import features. You can modify or remove waypoints by clicking on them and selecting the appropriate options. If you click on **Move Waypoint**, you will be able to move the Waypoint around on the map, and click where you want to place the Waypoint next. You can zoom in and out with the mouse wheel while finding the right spot to place the Waypoint. Pressing the ESC key moves the Waypoint back to where it was before you clicked Move Waypoint and cancels the Move Waypoint action.
- **Copy Lat/Lon** copies the latitude and longitude of the position you clicked on the map into the Windows Paste buffer, so you can paste the current latitude and longitude into another application or document. When pasting, the text looks something like this: Latitude: 39° 46' 44.37" N, Longitude: 104° 59' 17.15" W
  The display format of the latitude and longitude (decimal degrees, etc) is controlled under Tools > Options > GPS > Display format.

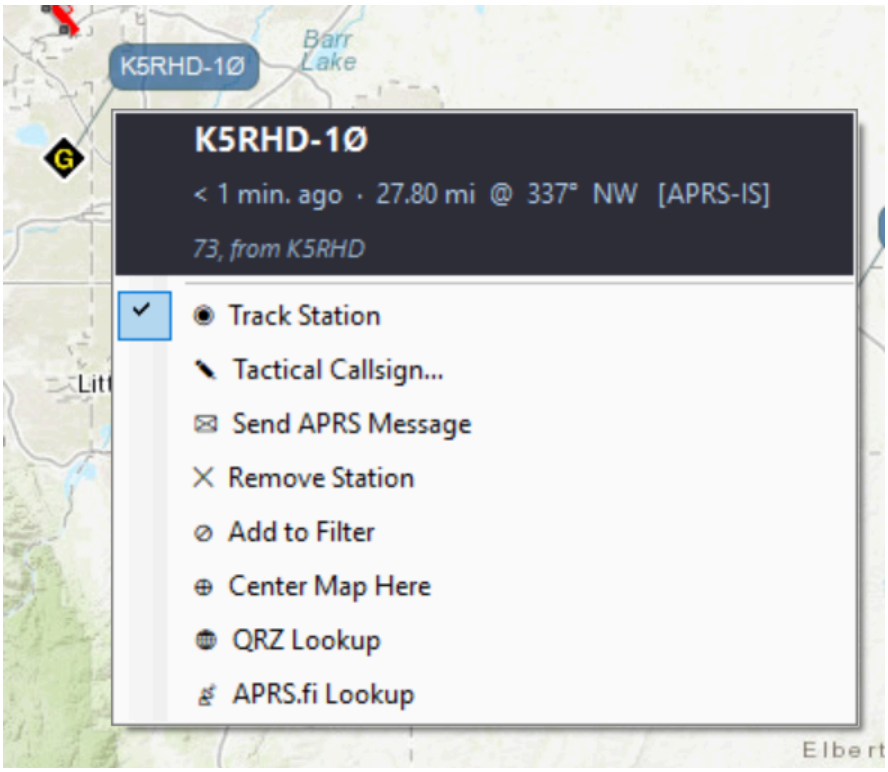
- **Copy Grid Square** does the same thing as Copy Lat/Lon, but for the current Grid Square and looks something like this when pasted: Grid Square: DM79mx
- **Start Drawing Track** will allow your own track on the map. Where you clicked to bring up the menu will be the start of the track. Move your mouse to the next point of the track and click, and continue this until done with the track. If you make a mistake, the backspace key will erase your last addition to the track. You can use the backspace key to keep going back further if needed. You can customize the track color, width and opacity by clicking the appropriate options in the box shown below that shows up near the top of the map while in drawing mode. The Undo button removes the last added track segment (same as backspace). The Finish button ends the drawing session (same as ESC). The Cancel button cancels the track drawing session entirely.



  A single track can only have one line color and width. If you'd like to add a track in a different color, end drawing the current track, and start a new drawing session where you can customize color and width again.
  When done, press the ESC key or click Finish to commit the track to the map. You can for instance import a KML or GPX file, add your own waypoints and tracks to it, and then export it back out to a GPX or KML file that you can use to distribute to others and/or import again at a later date. The default color and width are being used for the track, defined under Tools > Options > Map > File import defaults. You can draw one track in one color and/or width and another in a different color and width on the same map and the GPX/KML export will save those values, so that when you import it later, the colors and track width are preserved, alongside the APRS symbols used for waypoints. To delete a track, click on a track in question and select the Delete option.
- **Measure Distance** will allow you to measure the distance between two points on the map. Just SHIFT-Click on the map in the start position, select Measure Distance, and move the mouse to the other point on the map and you'll see the distance next to the line that is being drawn. Click or press ESC to exit the feature. The line and measurement disappear at that point.
- **Note**: Zooming in/out of the map is disabled while the Shift key is held down to try to eliminate unwanted zoom action when using Shift-Click actions on the map.

Clicking on a Station on the Map

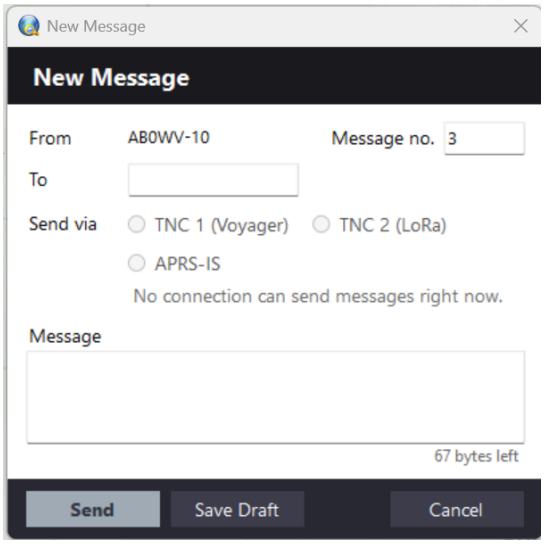
When you click on a station on the map, the following context menu pops up.



Mobile stations can be tracked by enabling the Tracking option. To turn Tracking off, click on the station again and click the Tracking option to turn it off.

Sometimes you want to keep track of a station by its Tactical Call (example: “Checkpoint 1”) and track them as such on the map. If you give a station a tactical call, the tactical call along with the call sign will be shown in the tooltip going forward. This tactical call will only be used internal to PinPoint APRS, so is not shared with anyone else.

The Send Message option allows you to send the station an APRS message. You can select whether you want the message to be transmitted via radio (TNC 1 or TNC 2) or APRS-IS. Make sure you are connected to a TNC or APRS-IS to send the message via the selected method first. See the section on Using APRS Messaging below for more information.



The Remove option removes the station from the map and from the Last Heard window.

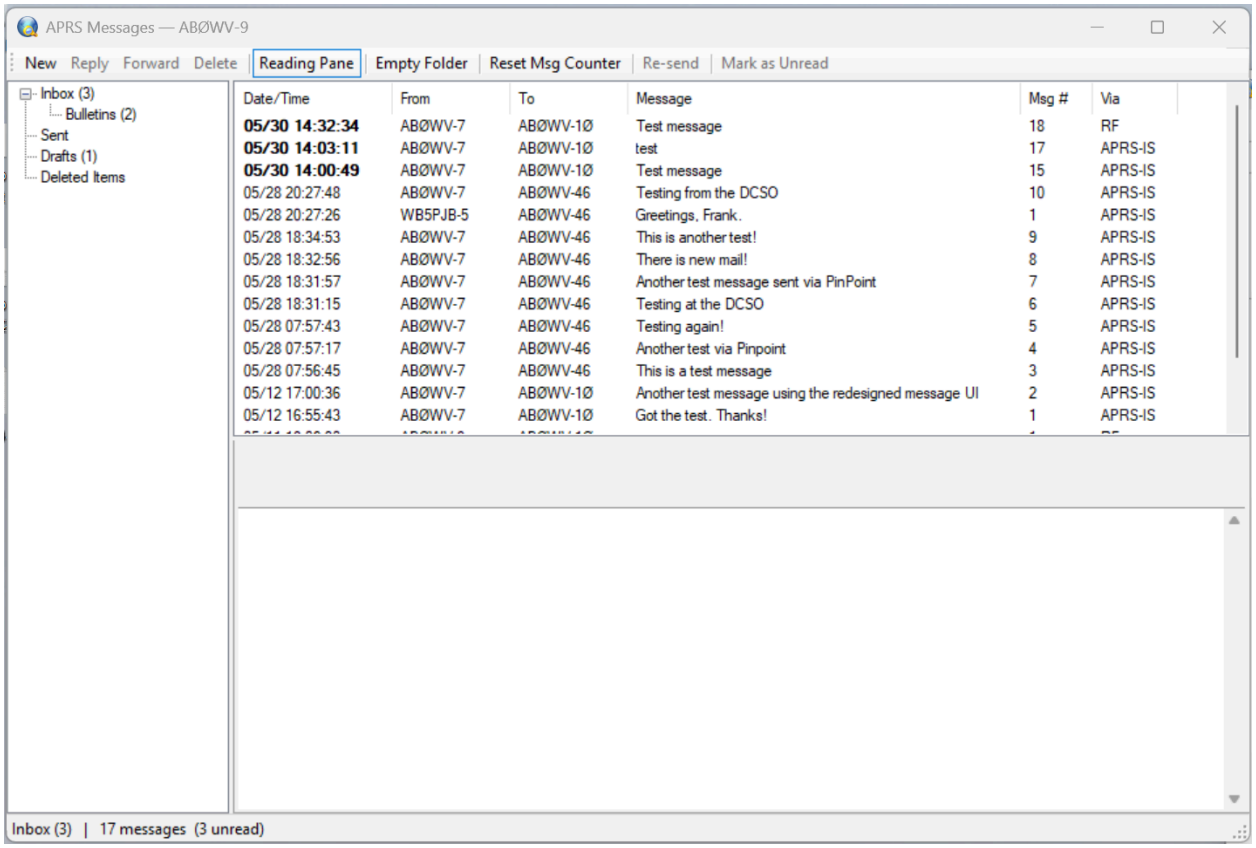
The “Add to Filter” option will add the currently selected station to the Packet Filter. See below for more info on the Packet Filter.

The “Center Map” option will center the map on the currently selected station.

The “QRZ Call Sign Lookup” option will open a web browser window and perform a lookup on the QRZ.com website to find the details associated with the currently selected station, including name, address, email address, etc. You will need a valid account on QRZ.com in order to use this function.

Using APRS Messages

PinPoint APRS includes a full APRS Messages manager, accessible from View → Messages or by pressing F10.



The Messaging Window is organized like an email client, with three panels:

- Left - Folders: Inbox, Sent, Drafts, and Deleted Items. The Inbox shows an unread count badge, Drafts shows a total count.
- The Inbox has a sub folder called Bulletins, where any received bulletins can be found. APRS Bulletins from callsigns that send Bulletins repeatedly (think repeaters that send capabilities every few hours) will just update the received date/time and content and not be shown as an additional Bulletin in the Bulletins folder. APRS Bulletins more than 48 hours old that have not received an update will be removed from the Bulletins folder.
- Center - Message list: Shows all messages in the selected folder, sorted newest-first by default. Click the From column header to sort alphabetically.
- Bottom - Reading pane: Displays the selected message. Toggle it on or off with the Reading Pane button in the toolbar.

The Messaging window and all panels are resizable, and those settings will be remembered by PinPoint.

Composing Messages

Click New to open the compose window, fill in the To callsign and message body (67-character APRS limit; a character counter shows how many remain), choose RF or APRS-IS, and click Send. Obviously, you must have connected to a TNC and/or APRS-IS to be able to send messages.

Use Save as Draft to save a message without sending. Double-click any draft in the Drafts folder to reopen it for editing, sending, or deletion.

If you enable the APRS Message Thread view under Tools > Options > Misc, you will see a different representation of the APRS Messages, namely a text message-like interface where you can quickly type messages back and forth with the recipient, like a chat application. Open a new thread by clicking New in the APRS Message window, and type the call sign, or double click on a message in the Inbox to open the view as a APRS Message Thread.

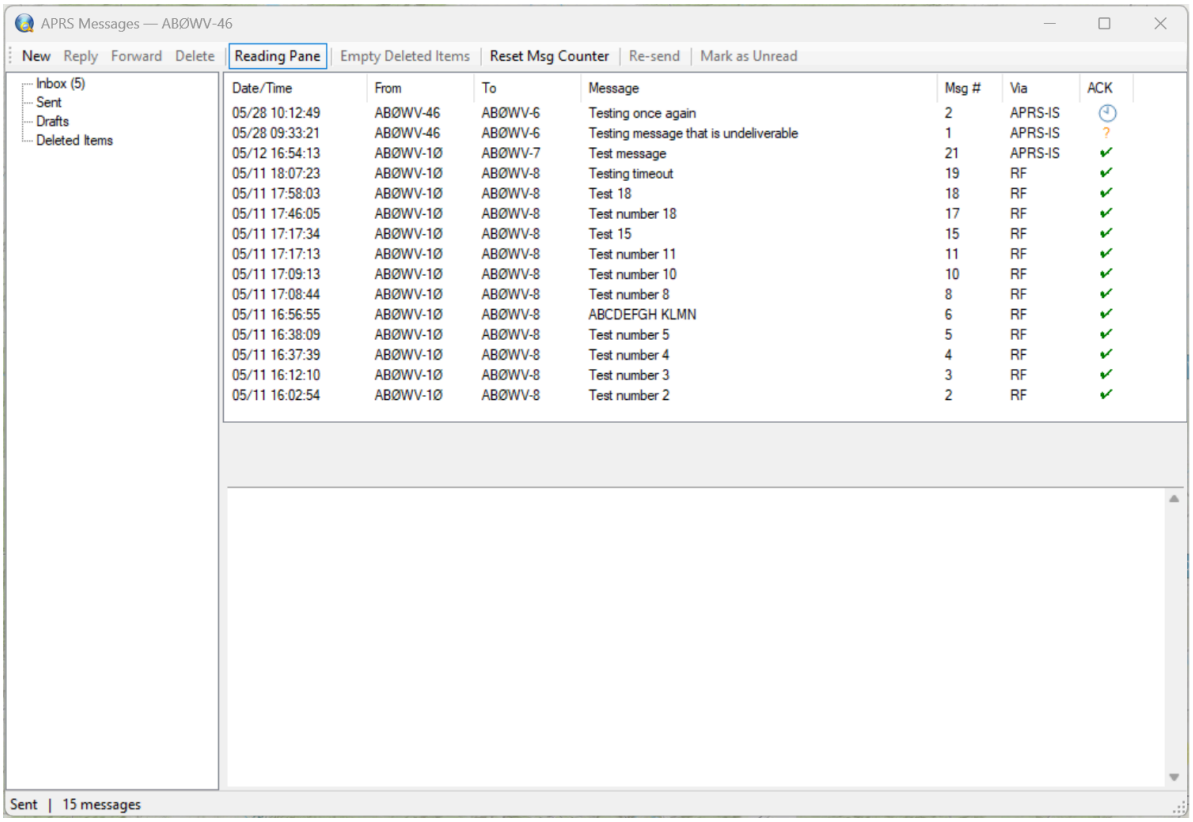
The Send Via selection for using TNC1, TNC 2 or APRS-IS as the message channel always shows the method that was last used (if connected and available), but you can override it if needed.

Delivery and ACK (receipt acknowledgement) Tracking

Every numbered outgoing message is tracked for acknowledgement. The ACK column in the Sent folder shows the current delivery state at a glance:

Icon	Meaning
🕘	Waiting for ACK — PinPoint APRS is still trying by re-sending a few times
✔	Acknowledged receipt by the remote station
✖	Rejected by the remote station
?	Timed out — no response received

PinPoint APRS automatically retransmits unacknowledged messages on an exponential backoff schedule (at 30 sec, 60 sec, 2 min, 4 min, and 4 min again) before giving up. No manual intervention is required. See the ACK column in the screenshot below. **Note: If you delete a message from the Sent folder that has not been ACK'ed yet, PinPoint APRS will stop retrying to send the message.**



Re-sending a Message

If a message has timed out or been rejected and you want to try again, select it in the Sent folder and click Re-send. PinPoint APRS will retransmit it immediately and restart the full send cycle.

Replying and Forwarding

Select any message and use Reply to open a new compose window pre-addressed to the sender, or Forward to open a compose window with the message body pre-filled.

Auto-Answer

When Auto-Answer is enabled in Options, PinPoint APRS automatically replies to incoming messages with a preset text (for example, while driving). Auto-replies are fire-and-forget per the APRS protocol — they carry no message number and require no acknowledgement. A record of each auto-reply sent appears in your Sent folder, labelled with an AA: prefix.

Message Counter

PinPoint APRS maintains a persistent outgoing message number counter across restarts. Use Reset Msg Counter in the toolbar if you ever need to reset the numbering back to 1.

Mark as Unread

You can mark a message in the Inbox as unread by selecting it and clicking the Mark as Unread button, which immediately updates the New Messages counter.

Deleted Items
Deleted Messages are moved to the Deleted Items folder using the Delete button. The Deleted Items folder can be emptied using the Empty Deleted Items button.

Deleting all Messages in a Folder
Select the folder you would like to empty, and click the Empty Folder button. The messages will all be put into the Deleted Items folder (which you can empty as well using the same method).

New Message Notifications
There is a New Messages notification in the status bar at the bottom of the map window and a windows notification that shows the message contents for 6 seconds. Clicking on the notification or status bar item brings up the Messages window. If your PinPoint APRS Sounds are Unmuted, the application will play a “You Have New Mail” notification upon receipt of a new message.

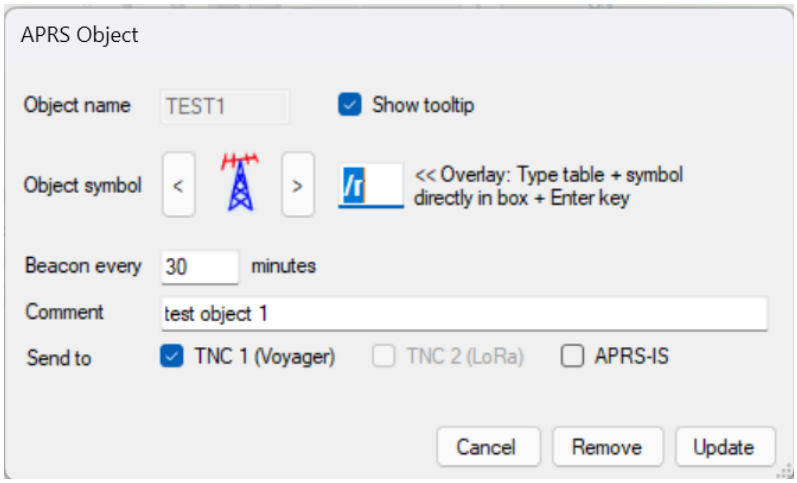
Message store
Messages are read from and stored in a json file in your Documents directory and called PinPointMessages.json. The file is read at startup and updated when things change (new message, etc).

Bulk Deleting Messages
To delete APRS messages in bulk from any of the folders, Ctrl+click, Shift+click and Shift+Up/Down now work to select messages. Ctrl+A selects every message in the folder. The Delete key deletes the selection. Right-clicking the list gives a menu with Delete and, in Deleted Items, Restore and Move to. The status bar shows "N selected" when in the process of selecting messages. Deleted messages go to Deleted Items and can be moved or restored to the folder they came from. Deleting unacknowledged APRS messages from Sent cancels pending retries.

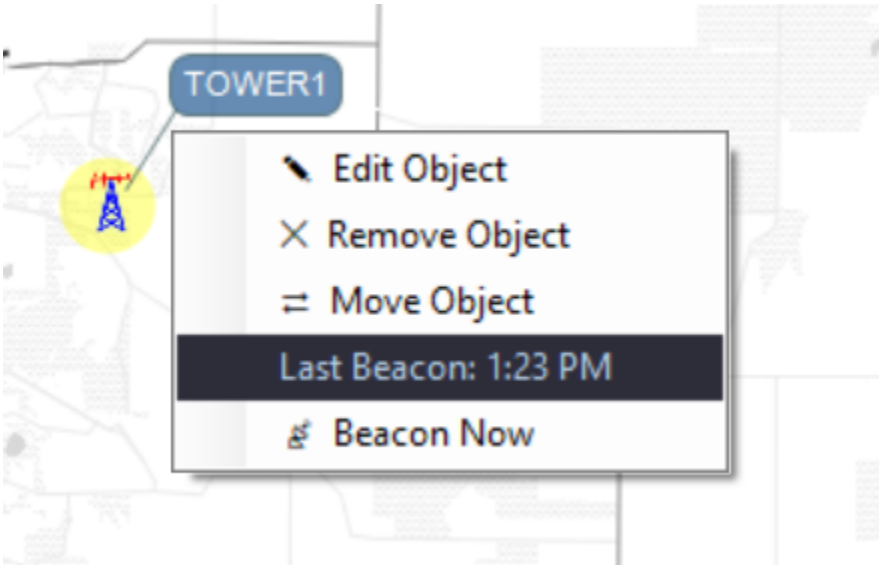
Placing APRS Objects on the map

You can add an APRS Object on the map by holding SHIFT while clicking on the map in the location where you would like to place the object. The menu that appears when SHIFT-Clicking on the map is shared by a few functions. Select **Add APRS Object**. In the window that pops up, add the Object Name (must be unique for your APRS Objects, so you can’t repeat the same object name yourself), the APRS Symbol you would like to use (you can use the left and right arrows to flip through them, or add the symbol table and symbol ID directly into the box next to it and press enter. For instance, /- is a house, /r is a tower, etc.). In the next box (Beacon Every) you can enter the number of minutes for the beacon interval. Keep in mind that for static APRS Objects, 30 minutes is usually plenty. Beaconing unnecessarily often just congest the limited bandwidth we have on APRS. In the Comment section you can add any comment you’d like. The Show Tooltip checkbox will add the symbol with or without a tooltip (without meaning that it only shows

on mouse-over). The Send to section allows you to select the channels to use when sending out the APRS Objects. Each of the channels (TNC 1, TNC 2 and APRS-IS) has its own setting whether sending our APRS Objects is allowed.



When you click Add, the symbol will be added to the map inside a yellow circle, which is to set it apart from all the other symbols on the map. The ones within the yellow circle are all yours. The first beacon (if you have a TNC or APRS-IS connected) will be sent within 1 minute from adding the Object and then subsequently at the interval you entered. You can manually beacon any time by clicking on the APRS Object in question and select the Beacon Now option.



Removing an APRS Object will immediately send an APRS packet indicating the APRS Object was removed, and it will be removed from your map and stop beaconing going forward.

If you click on **Move Object**, you will be able to move the object around on the map, and click where you want to place the APRS Object next. You can zoom in and out with the mouse wheel while finding the

right spot to place the APRS Object. Pressing the ESC key moves the APRS Object back to where it was before you clicked Move Object and cancels the Move Object action. When you click on the map to place the APRS Object, the APRS Object's new position will be beaconed out right away so everyone is able to see the new location of the APRS Object.

Under the Map menu, you will find the "**Remove My APRS Objects**" feature that will remove all your APRS Objects at once, and will send "kill" packets for every APRS Object that was removed.

Under the Tools menu, you will find "**Beacon All My APRS Objects"**, which will immediately send out beacons for all your own APRS Objects, and will update the Last Beacon value to the current time. Please be mindful using this, as this can send out a lot of packets in sequence, depending on how many APRS Objects you have defined.

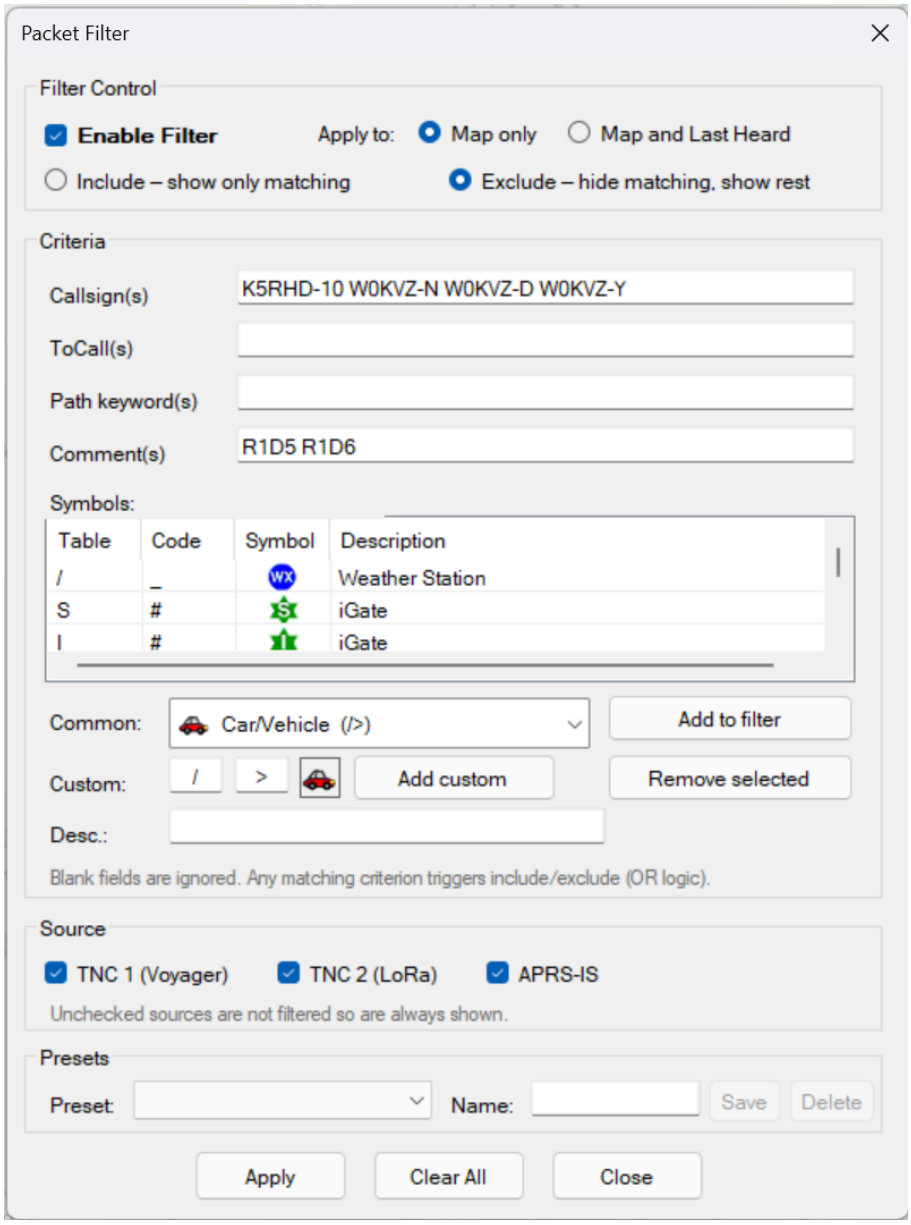
PinPoint APRS will remember the APRS Objects you have defined, so if you exit the app and restart it, your previously defined APRS Objects will still be there, and will start beaconing at the interval you defined, so make sure to actually remove APRS Objects you no longer need on the map.

APRS Object store
APRS Objects are read from and stored in a json file in your Documents directory and called PinPointAprsObjects.json. The file is read at startup and updated when things change (new object, deleted object, etc).

Using the Packet Filter

The Packet Filter lets you cut through the clutter by telling PinPoint APRS which stations to show on the map, or which ones to hide. Everything that gets filtered out still appears in the Last Heard list, so you're not losing data, just cleaning up the view.

Open it from Map > Packet Filter.



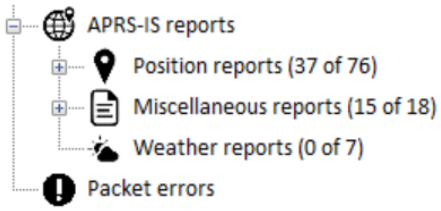
Enable Filter

When checked, this turns the Filter on after you click Apply. Clicking the **Filter Off / Filter Active** status on the lower status bar of the map window will also turn the Packet Filter on or off.

Apply to

- Map only - Only apply the filter to the stations shown on the map. Always show all stations in the Last Heard window.
- Map and Last Heard - Apply the filter to both the stations shown on the map and in the Last Heard window.

- When the filter is applied to Last Heard as well, the Last Heard window will show counts as shown below. The example shows (37 of 76) on the 'Position reports' line, meaning that a total of 76 position reports were actually received, but due to the applied filter settings, only 37 are shown in the list below it.



Include vs. Exclude

At the top you'll pick a mode:

- Include - only stations that match your criteria appear on the map. Everything else is hidden.
- Exclude - stations that match are hidden; everything else shows normally.

The filter has no effect until you check Enable Filter and click Apply. You can also enable/disable the filter by clicking on the Filter Off/Filter Active status at the bottom of the Map window.

Setting up your criteria

You can filter by any combination of the fields below. If a packet matches any of them, it counts as a match (this is called OR logic, one hit is enough).

Callsign(s)

Type one or more callsigns, separated by spaces. You can use wildcards:

- * matches any number of characters — W3* matches W3OO, W3ABC-9, and anything else starting with W3.
- ? matches exactly one character — KD9?? matches KD9AB, KD9XY, etc.

To match a specific station with all its SSIDs, use AB0WV* for instance. To match only the base callsign, just type the callsign without the SSID or wildcard, so like AB0WV.

ToCall

Every APRS packet includes a "to" address that identifies the software or device that sent it. This is called the ToCall (or destination field). It's not where the packet is going; it's more like a device fingerprint. For example, packets from Direwolf typically start with APDW, and APRSDroid uses APDR, PinPoint APRS uses APINxx where xx represents the version number. If you want to filter by device type rather than by callsign, this is the field to use. Wildcards work here too APIN* would match any version of PinPoint APRS. Some applications, including PinPoint APRS, allow you to override the ToCall parameter. You can add multiple ToCall keywords to filter on by using a space between each ToCall keyword.

Path keyword

Matches a word or fragment anywhere in the packet's path (the list of digipeaters it travelled through). For example, type WIDE2 to find packets that used wide-area digipeating, or a specific digipeater callsign to find stations heard through it. You can add multiple path keywords to filter on by using a space between each path keyword.

Comment keyword
Matches text in the packet's comment field; the free-text portion that stations often use for status messages, weather readings, or equipment info. Not case-sensitive. For instance everyone in your group can include something in their comment that you can use to filter on, for instance their ARES district, like R1D5 for Douglas County & Elbert County in Colorado. You can add multiple comment keywords to filter on by using a space between each comment keyword.

Symbols
Filter by the APRS icon a station is using. Pick from the Common dropdown (which shows the actual icon) and click Add to filter, or type a custom table/code pair in the Custom boxes. The icon preview updates as
you type so you can confirm you have the right symbol. You can add as many symbols as you like; a station matches if it uses any one of them.

Source
At the bottom you can choose whether the filter applies to RF packets from TNC 1 and/or TNC2 and/or APRS-IS packets (from the Internet feed). Unchecking a source means those packets always show up (bypass the filter), regardless of your current filter settings.

Quick filtering from the map
Right-click any station on the map or in the Last Heard list and choose Add To Filter to instantly add that callsign to your filter. The filter is enabled and applied on the spot; no need to open the filter dialog. The current Include/Exclude mode is left exactly as-is.

Presets
Using Presets at the bottom of the Packet Filter window will allow you to save, edit and recall a filter you have defined. By entering a name for the filter in the Name text box, and clicking Save, you have saved the current configuration of the Packet Filter. You can recall it from the Preset dropdown menu and click Apply to activate it (make sure the Packet Filter is enabled at the very top of the window). To make edits to an existing Preset, recall a filter using the dropdown, make some changes to the filter definition and Save it again. To delete a filter, recall it from the dropdown and click Delete.

Applying changes
When you make changes in the filter dialog, click Apply to put them into effect. PinPoint APRS will immediately re-evaluate all the stations currently on the map and update the display. The filter settings are saved automatically and will be restored the next time you open PinPoint, including whether the

filter is active or not. You can see if the filter is active by the orange Filter Active status at the bottom of the Map window.

Packet Filter store
Filters are read from and stored in a json file in your Documents directory and called PinPointFilters.json. Presents (= saved filter definitions) are stored in PinPointFilterPresets.json. The files are read at startup and updated when things change (new/removed filters, new preset, etc).

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A big Thank You to the Amateur Radio Emergency Services (ARES) group of Douglas and Elbert Counties in Colorado, USA, where several members helped me test PinPoint APRS extensively before releasing it to the world. You can read more about our group at http://www.aresdec.org.

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