

APRS Equipment Options

There are several options for getting on the air quickly and easily with APRS.

Several pieces of equipment required by APRS installations:

1. Radio – A HT is usually suitable for vehicles.
2. Appropriate antenna
3. TNC – Terminal Node Controller to interface the radio to the GPS and computer
4. GPS receiver – A receive-only unit without display is sufficient for position reporting
5. Connecting cables for radio, TNC, power.

Configuration 1 – Byonics TinyTrak3 (transmit only APRS tracker):

This configuration is recommended for simple, inexpensive systems whose purpose is to report the positions. This system does *not* function as a digipeater, and it should not be chosen where you want to display vehicle positions on a locally-connected computer or other display. The TinyTrak3 is small, rugged, easy to configure, and it uses very little power.

1. TinyTrak3 TNC by Byonics (<http://www.byonics.com/tinytrak/>) -- \$33/\$42
2. Byonics GPS2 (<http://www.byonics.com/tinytrak/gps.php>) -- \$69
3. TNC-radio cable (http://www.byonics.com/cables/tinytrak3_ht.php) -- \$19

You can purchase an assembled TinyTrak3 TNC, GPS2, and cable from Byonics for a total cost of about \$126. If you are willing to build your own cable and assemble a TinyTrak3 kit, you can get the total cost down to \$98 (not including radio and antenna).

Configuration 2 – Argent Data Systems Tracker2 (transmit/receive APRS):

The Tracker2 TNC by Argent Systems (<http://www.argentdata.com/products/tracker2.html>) is more sophisticated than the TinyTrak3. The Tracker2 can function as a digipeater; that is, it can retransmit APRS packets that it receives from other units. This allows it to function as a “fill in” digipeater in areas not serviced by wide-area digipeaters. The Tracker2 also can pass decoded packets to a local computer for immediate position display. And, the Tracker2 can directly drive a Garmin Nuvi 350 GPS unit for in-vehicle display of nearby APRS-equipped vehicles. Short two-way text messages can be exchanged with the addition of a computer or other suitable data entry/display device such as the Nuvi 350.

The Tracker2 has a 30 amp relay built in that can automatically power up a radio just before an APRS packet is sent and then power it down to save power until the next packet needs to be transmitted. This is especially useful for telemetry applications like weather stations that transmit infrequently and run off solar power.

The Tracker2 is slightly larger and more expensive than the TinyTrak3, and it is more complex to configure because of the digipeating capability. Fortunately, the same GPS receivers and connecting cables can be used with the TinyTrak3 and the Tracker2.

1. Tracker2 OT2m by Argent – (<http://www.argentdata.com/products/tracker2.html>) -- \$95
2. Byonics GPS2 GPS2 (<http://www.byonics.com/tinytrak/gps.php>) -- \$69
3. TNC-radio cable (http://www.byonics.com/cables/tinytrak3_ht.php) -- \$19

Optional equipment for the Argent Tracker2:

1. Y-splitter serial cable to allow a computer and GPS display to both be connected:
http://www.argentdata.com/catalog/product_info.php?cPath=21&products_id=93 -- \$7.50
2. Garmin Nuvi 350 refurbished GPS display
(<http://www.radioshack.com/product/index.jsp?productId=3480192&CAWELAID=308067378>) -- \$110

Configuration 3 – Byonics TinyTrak4 (transmit/receive APRS):

Byonics also makes a TinyTrak4 which is a direct competitor to the Argent Tracker2. See <http://www.byonics.com/tinytrak4/> for detailed information about the TinyTrak4. The TinyTrak4 does digipeating like the Tracker2, and it is widely used with good success. The TinyTrak4 is less expensive than the Tracker2 costing \$65 in kit form and \$75 for an assembled unit versus \$95 for an assembled Tracker2. The TinyTrak4 does not yet have the capability of directly driving a Gamin Nuvi 350 display like the Tracker2. Also, the documentation for the Tracker2 is better than the TinyTrak4, and the Tracker2 has a nice Windows configuration utility program where as the TinyTrak4 requires you to type commands through a serial terminal emulator.

Configuring the TNCs

You will need a null modem cable to connect your TNC to a computer for setting the configuration. You can purchase one from Byonics for \$8 (<http://www.byonics.com/cables/null.php>). If you have a new computer that doesn't have a serial port, then you will need a serial-to-USB adapter such as <http://www.byonics.com/cables/usb.php> for \$16.

Several WCARES members already own null modem cables and serial-USB adapters, so you are welcome to contact them for help in getting your APRS unit configured and ready to run.

APRS Radios

Any 2 meter radio can be used to send APRS position reports. For most applications, a 5 Watt HT will be sufficient. If you have an old but functional HT in your junk box then you are in business. Otherwise, you can hope to get lucky at a hamfest or by checking eBay or Craigslist.

Another choice for an inexpensive, new HT is the Puxing PX-777. Argent Data Systems (the same company that makes the Tracker2) sells the PX-777 for \$87 https://www.argentdata.com/catalog/product_info.php?products_id=74. The PX-777 is frequently used with APRS units, and it has a 4.2/5 rating on eHam.net (see <http://www.eham.net/reviews/detail/6221>). You may be able to buy the PX-777 at a lower price at other sites.

Radios with built-in APRS TNCs:

There are a few HT and mobile radios currently on the market that have APRS TNC functions built into the hardware, reducing the number of cables required to set up a system.

Yaesu VX-8R: This \$380 beauty is the current top-of-the-line Yaesu HT. In addition to providing 50/144/222/430 MHz radio service, it has an APRS TNC built into it. An optional \$80 Yaesu GPS unit (FGPS-2) can be attached to complete the APRS capabilities.

Kenwood TH-D7 portable: This 2M/80cm mobile radio was discontinued in 2007. However, some units still show up on eBay occasionally. The radio has separate connections for a GPS and computer. It can be used as a portable tracker or provide connectivity for PC-based APRS client software.

Kenwood TM-D700/710: This 2M/70cm mobile radio has a large display for APRS information and can act as a mobile digipeater. An external GPS is required for APRS operation. There are also products on the market that interface directly with this radio to support mapping, and there are full size keyboards for easy message entry.

Alinco DR-135TP: This 2M mobile radio has an optional TNC board for packet radio. A drop in Tracker2 board from Argent Data Systems makes for a very clean APRS installation. See <http://alinco.com/Products/DR-135/>

Yaesu FTM-350: Yaesu has announced this mobile radio which is similar to the Kenwood D710. At this time it is available only in Japan (see <http://onjapan.net/2009/hamfair/standard.html>).

APRS Internet Sites

Once you get set up, you're probably going to want to check your track to make sure you are successfully transmitting. There are a number of Internet sites that display the current positions and tracks of APRS units. One of the best is <http://aprs.fi/> Just enter your call sign in the "Track Callsign" field on the right.

Other popular APRS tracking sites include:

<http://www.openaprs.net>

<http://www.aprsworld.net>

<http://www.db0anf.de/app/aprs>

<http://www.wulfden.org/APRSQuery.shtml>

APRS Display on a Local Computer

In addition to viewing APRS tracks through the Internet, you can feed the output of the Tracker2 and TinyTrak4 TNCs into a computer for direct decoding and display. This allows APRS displays to function in remote locations or emergency situations where Internet access is not available.

Several Windows programs are available for APRS packet decoding and display. The most popular APRS program is UI-View (<http://www.ui-view.org/>). UI-View is a fabulous program written by G4IDE who died a few years ago. UI-View is free, but you must register to get a key, and donations are encouraged. The same cable used to connect the TNC to the computer for configuring it can be used to communicate with UI-View.

For detailed, street level mapping with UI-View, you must purchase the Precision Mapping software from UnderTow Software (see <http://www.undertowsoftware.com/PMSAT/PMSAT.htm>). Precision Mapping software costs \$50 plus shipping.

Yahoo and WCARES Support Groups

There are several Yahoo support groups related to APRS:

- TinyTrak3/4 – <http://groups.yahoo.com/group/TinyTrak/>
- Tracker2 – <http://groups.yahoo.com/group/tracker2/>
- UI-View – <http://groups.yahoo.com/group/ui-view/>
- APRS in Tennessee – <http://groups.yahoo.com/group/EastTNAPRS/>

See <http://www.aprs.org/> for general information about APRS.

See <http://www.winlink.org/aprslink> for information about sending Winlink messages via APRS.

In addition to these Yahoo groups, a number of WCARES members have experience configuring and using the TinyTrak3 and Tracker2 units. Contact W4PHS, Phil Sherrod at PhilSherrod@comcast.net or KI4LMR, Randy Armour at Randy.Armour@nashville.gov for help getting started with APRS.