

APRS and GPS ON A BUDGET

1/25/06

Have you been thinking about putting together an APRS Tracker, or APRS monitor station in your shack, or a GPS navigator in your car? Then you checked out the prices at the local Ham candy store. You found the current price for a Kantronics TNC is pushing \$200 out the door, or \$450 for a Kenwood TM-D700 combo radio/TNC, a top of the line Garmin GPS is \$700 plus, and another fifty bucks for prefabricated radio interface cables. And WinAPRS software is in the neighborhood of \$60. There are some GPS receivers only (no display) in the \$80-100 range. Using these prices one could spend anywhere from \$300 to almost a grand for a Tracker depending on the type of GPS and TNC used, and this does not include the cost of a radio. An in shack monitor setup can easily add up to around \$350 when you include interface cables, again not including a radio.

By now you are probably saying "no way" am I willing to put out that kind of money. Well, there are DIY alternatives that get the cost under \$75 for a tracker if you have an old HT or 2 meter mobile collecting dust in the shack. If you have an old laptop lying around, how about \$50 for an in vehicle talking navigation system. Or, using the internet you can follow trackers and get weather info for about \$20 using APRS Plus and a used copy of Street Atlas.

Okay, so how do we get APRS and GPS on a budget? Well, there are surplus new in box OEM twelve channel GPS receivers modules available for under twenty dollars, GPS antennas with a built in amplifier for \$4, and a special purpose APRS encoder for \$27 in lieu of a full blown \$200 TNC. For a Tracker you will need a GPS and a TNC, a basic tracker can be built for under \$75. Using a surplus GPS module, a \$27 Byonics Tiny Trak encoder, and twenty bucks to connect it all up and package it in a nice little project box. Pick up a used copy of Street Atlas for under \$5 on Ebay, twenty four bucks for a surplus GPS module and antenna, throw in another fifteen or so for wire and a project box, and you have an in car navigator for around fifty dollars.

For a full up APRS monitor station in your shack you will need a full blown TNC, APRS software, and a two meter radio. There are several versions of APRS software out there, but if you are cost conscious it is hard to beat APRS Plus (also referred to as APRS + SA) and a used copy of Street Atlas. APRS Plus registration is only \$15, and a few dollars for a used copy SA keeps the software cost around twenty dollars. An alternate to a \$200 dollar Kantronics TNC is the Elcom micro TNC for under \$130, and it is USB compatible. With a TNC/MIC switch you can multi task one radio for APRS and normal communications.

Want to see the actual 'on a budget' hardware up and running – join us at the February meeting for a live demonstration. If you have a Tracker or GPS hardware please bring it to the meeting and share your experience. If you are new to APRS, I have likely created more questions than I have answered. I found the www.byonics.com and www.elcom.gr web sites very informative. CVARC will sponsor a workshop or group purchase if interest merits.

Hugh, KF6HHS

3/07/06 Hugh, KF6HHS

The tracker kits are ready and will be available at the March meeting. The kit includes the 12 channel GPS receiver, TinyTrak III, project box, connectors, DB9 hood, voltage regulator, reverse polarity diode, spacers, screws - washers - nuts, and a few other misc. parts. In addition, Dave KR6WRG has homebrewed a nice little PC board that will take the agony out of wiring the little 2mm GPS interface connector.

CVARC on a Budget Tracker and Navigator Log

The price of the kit is \$70, and I think we should all throw a dollar or two at Dave to cover the cost of his materials for the 2mm PC board. The GPS interface PC board is not in the kit, Dave is bringing them to the meeting.

The only items you will need to complete a full up tracker is a connect that mates with your radio of choice, a 12 volt power connector - again personal choice, and some 24 ga. hook up wire.

Remember the tracker will also function as a navigation system using a laptop in you car, all you need is a DB9 serial cable. We demonstrated the tracker will drive a 25 foot cable which should be adequate for most installations. I purchased the 25 footer at Fry's for 9.99, as I recall 6, 9, and 12 footers were about \$4.99.

Neil, KG6QEL will be posting the documentation (schematic, pis's, and some do's and don'ts) on the CVARC web site as I make them presentable.

You may want to get a head start and down load the TT III manual and configuration software from the Byonics web site -
<http://www.byonics.com>.

And, info on the Axiom Sandpiper GPS 12 channel receiver at -
<http://www.allsurplus.net/Axiom>

The following APRS sites I came across in the process of designing the CVARC tracker were interesting (at least to this APRS newbie) -
<http://www.martechsys.com/kb9vbr/aprs.htm>
<http://www.tapr.org/~kh2z/aprsplus>
<http://www.n5oom.org>
<http://www.washcoares.org/aprs.html>
<http://www.kf6fir.net/APRS/index.html>

3/13/06 KF6HHS

Uploaded a picture board of Dave's GPS PC Board and details on the voltage regulator and 12 volt power wiring.

The GPS and 12 volt details.pdf file should complete the tracker Documentation.

Dave's GPS PC board is fantastic, the GPS mating connector fits like a glove, easy to solder the I/O wires, and really adds a professional touch to the project.

Also covered is the mounting of C1 and C2 on the 7805 voltage regulator, and a "how to" for D1 the polarity protection diode.

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