

AIRWAVES



APRS Tiny Tracker 3 Plus Build

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Special points of interest:

We need people to present a topic at our club meetings

The Next Tech Class is Nov 5-6. We need instructors

Come to Field Day June 25 to 26 at the Audie Murphy American Cotton Museum!

Submitted by Michael Ketchum K5MDK-
This summer, I decided to try a second attempt to build a small portable APRS telemetry tracker. APRS stands for **A**utomatic **P**acket **R**eporting **S**ystem. About four years ago, I ordered the Argent Data Open Tracker USB and had continual problems with a power diode in the tracker as well as the radio interface cable being poorly constructed. So, given the gumption to try it again four years later, I ordered the Tiny Tracker 3 Plus kit from Byonics (www.byonics.com). I also ordered a radio interface cable for my Yaesu FT-7900R VHF/UHF transceiver. I did not order a GPS receiver because I had one from the attempt four years earlier.

The Byonics kit arrived quickly with all parts needed and was soldered up in a couple of hours. After performing the test steps suggested by the manufacturer, as well as a smoke test with the PIC processor installed, I was set to integrate the radio interface cable with my Yaesu FT-7900R. The Tiny Tracker 3 Plus comes with software that talks through your RS-232 null modem cable. From the software, you can send commands to send test tones, thus confirming whether your radio interface cable is working correctly or not. You can also calibrate your incoming or outgoing audio on the tracker before sealing it up.

Next up for integration was the GPS Serial Receiver I had purchased four years earlier. Although the GPS receiver indicated power, I was not getting any GPS VALID indicator LED on the tracker. Looking at the specs for the GPS, I realize it is setup for 9600 baud NMEA instead of 4800 baud, as expected. No problem here, the Byonics Tiny Tracker 3 Plus can be setup to receive 9600 Baud data as well as TTL level adjustment, if needed. Furthermore, I double checked the specifications of the GPS to be sure it was RS-232 level and not TTL. This was confirmed.

However, I continued to have troubles with the GPS. After talking with Dave Hunter – KC7CEX over lunch, he suggested I allow the internal super capacitor to charge while sitting

under open sky. The thinking was the super cap was drained and needed to be recharged before storing satellite data. So, I connected the GPS it to a PUTTYTEL session on my laptop outdoors, which powers the GSP and is connected just fine via RS-232. However, I was only able to get one burst stream of NMEA after a few minutes of waiting. I must belong in a hospital, because I felt as though I should have been a bit more patient. After 30 minutes of waiting, I was only able to get that one single burse of NMEA data.

Fearing neighbor scrutiny, I brought the GPS receiver inside and started to troubleshoot the old interface cable I had purchased four years ago for connecting the old Argent Open Tracker USB to an HT radio. I had no access to the DB9 connector, as it was plastic sealed. So I made small incision through the insulation of the power cable to determine where the "open" might be located. Turns out, the entire Anderson power pole connector was not crimped correctly. To resolve the issue, I cut the connector off and started a new with a fresh soldered Anderson power pole connector. Voila! I now had my new Tiny Tracker 3 Plus controlling an HT. (Beware, some models of HT require R8 PTT control resistor be cut before using. Read the manual for more information.) Meanwhile, I let the GPS module operate at the window for over an hour.

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May Club Meeting Minutes

Stephen Denison – President, opened the meeting at 11:45.

Announcements made by club President:

- Field Day – approval received for using space in front of American Cotton Museum –June 24 -25.
 - o If no other location (Hospital or Sports Park) becomes available, this will be the location for field day.
 - o N1MM logging software will be used at Field Day.
- Repeater moving from L3 Fire Station to MSTF.
 - o Work day scheduled for 7/19 to finish the move.

Presentation by Scott Davis: RTTY Presentation.

- o A copy of the power point presentation is available on the MFARC website (www.wd5gsl.net).

Adjournment at 12:20

APRS

Continued from page 1.

I thought I would check the serial data one more time and voila again! NMEA strings were being sent on a regular basis.

Time to install. I simply put the new Tiny Tracker 3 Plus in the glove box with the GPS module mounted where the dash meets the windshield in the center. The wire for the GPS easily slid out of sight between the glass and the dash. The radio connections were made via the mic input (RJ-11) on the radio head and the speaker connection, also relocated under the seat. Once everything was connected, I took it for a test drive down the street and back. Without hesitation, I got in the house and checked for my results to see if they were on display using aprs.fi.

Today, I can track my vehicle's location using one of many different web sites available. There is aprs.fi, k6ib.com, or findu.com. Each of these sites provide a means of adding the call sign – SSID to the URL in order to see the vehicle on a map at the same time, without having to enter information.

<http://aprs.fi/#!call=a%2FK5MDK-2&timerange=3600&tail=3600>

<http://k6ib.com/cgi-bin/aprs/tracker?view=A&call=K5MDK-2&icon=4>

<http://www.findu.com/cgi-bin/track.cgi?call=K5MDK-2>

The lessons learned from this build are twofold: (a) never put your trust in the wiring of pre-made cables - it is better to build them yourself and save the heart ache later, and (b) allow your GPS receiver to charge up under open sky if it has been unplugged for a long time. I'm very happy with Byonics Tiny Tracker 3 Plus, as a very affordable kit. I was very disappointed with my experience four years ago with the Argent Data Open Tracker USB. But I prefer to end this article on a happy note in the key of CW. --- --.

May Meeting Presentation– RTTY

Radio Teletype (RTTY) has been around since 1849 when a landline was installed between Philadelphia and New York. French Engineer Emile Baudot is credited with developing the system and the Baudot code (which RTTY uses), as well as the term "baud rate" are named in his honor. The system was used extensively to transmit data by commercial and military users during the 1920's and 30's.

Amateur Radio Operators obtained surplus commercial and military teletype equipment after World War 2, and the first Amateur RTTY transmission took place on May 1946 using the 2 meter band. On February 20, 1953 the FCC granted a petition to allow RTTY transmissions on the 80, 40, and 20 meter bands. Today there are multiple RTTY organizations and a plethora of events and contests throughout the year that make use of RTTY.

RTTY equipment originally consisted of mechanical printers that would receive the signal and print the message on paper. In the 1980's computers running teleprinter emulator software could replace the printer and instead displayed the message on a computer screen. Today all you need to use RTTY is a radio, a computer with a soundcard, an interface between the computer and radio, and one of the many software packages to decode and encode the Baudot code that makes up a RTTY signal.

A standard RTTY transmission consists of two tones at 2125 Hz and 2295 Hz called the Mark and Space (or one and zero if you are binary minded). These can be generated using a single sideband transceiver with Audio Frequency Shift Keying, or by varying the transmitted frequency of a carrier wave, called Direct Frequency Shift Keying. There are many common operating frequencies on the ham bands (frequencies in kHz):

- 80m: 3580-3650
- 40m: 7020-7040 (DX) 7080-7100 (US)
- 30m: 10130-10145
- 20m: 14080-14099
- 17m: 18100-18110
- 15m: 21080-21100
- 12m: 24920-24925
- 10m: 28070-28150

RTTY is widely used in DX'ing and Contesting. The most popular RTTY contest is CQWW RTTY which is held in the final weekend of September every year.

For more RTTY information, see:

<http://www.aa5au.com/rtty/>

<http://www.iw5edi.com/ham-radio/26/a-rtty-tutorial-for-beginners>

<http://www.dxzone.com/catalog/Software/RTTY/>

<https://en.wikipedia.org/wiki/Radioteletype>

RFI Hunting

Submitted by David Rogers KG5KPU- Chasing an RFI issue can be tedious, frustrating, and often turn into a never-ending endeavor. It can often feel like chasing ghosts or herding cats. In my case, chasing down an elusive RFI problem may have saved my house from burning to the ground.

Since replacing a multi-band dipole that was hung over the back fence, 25ft away from the house, with a HEX beam mounted on a mast that was anchored to the peak of the house, the 10m and 15m bands have been bombarded with a persistent and pronounced flutter. The RFI was destroying any chance of making a contact on the 10m band, which is a fickle band this time of year without any interference. My first thought was that the sensitivity of the beam was "picking up" interference that the dipole wasn't able to detect. This theory was backed up by the fact that the RFI was worse when the beam was pointed South, and dissipated (but did not disappear) when the beam was pointed North.

On top of the RFI issue, there was also a problem with a circuit breaker in the main panel that would blow every time the microwave oven was used. Some troubleshooting revealed that the breaker, which was probably 30 years old, was failing. In order to replace the breaker, all power to the house would need to be shut off.

Thanks to suggestions from some helpful hams, the two issues were dealt with simultaneously. With the radio hooked up to an external battery, power to the house was shut off. The RFI problem disappeared. Gone. One by one, each breaker was re-energized. When the breaker to the back bedroom was engaged, the RFI returned. Viola...problem isolated. Sort of. The area of the problem had been identified, but not the source.

At this point, each appliance in the bedroom was unplugged. When the TV was unplugged, the RFI went away. To make sure it wasn't a bad outlet, the TV was plugged into another outlet. RFI returned. Bingo!!! The source had been identified. The TV in question was a 15 year old CRT relic that cost a whopping \$79. Considering the age and cost of the set, it probably wasn't manufactured to the highest of standards. It may be important to note that the TV was directly under the antenna.

Just how did chasing this RFI issue possibly save the house? During the troubleshooting process, it was discovered that the breakers above and below the breaker that was blowing every time the microwave was used were loose. They were pushing on the suspect breaker, creating a situation where it wasn't making full contact with the bus bar. After properly securing the two loose breakers and realigning the suspect breaker, the microwave works without a hitch.

There is now peace and harmony in the world. 10m is usable (propagation willing) and popcorn snacks are, once again, readily available.

Presentations Wanted

We are looking for presenters to present a short topic on Ham Radio at our monthly club meetings. Presentations may include, but are not limited to:

- Building or Modifying Station Equipment
- Different types of Digital Operation
- Software used for Ham Radios
- Emergency Radio Equipment
- Ham Radio Activities, such as contests or events

If you would like more information on a particular topic, and would like someone to do a presentation on it, you may suggest it as a topic. Please email Stephen Denison or Michael Ketchum to present a topic or to suggest a topic for presentation.

Upcoming Classes and Test Sessions

The Majors Field Amateur Radio Club is planning on having classes on the following Days:

November 4, 5 Technician Class, Test on November 5

If anyone is interested in taking a class, teaching a class, or becoming a volunteer examiner to administer the test, please email classes@wd5gsl.org.

Field Day

The Majors Field Amateur Radio Club will be participating in the ARRL Field day from the Audie Murphy/ American Cotton Museum located at 600 I-30 Frontage Rd in Greenville. The objective of this exercise is to set up an amateur station in less than ideal conditions and contact as many other stations as possible in a 24 hour period.

We will have two or three stations set up on multiple HF bands. Everyone is invited to come out and get on the air, whether you can be there for the entire time, or just an hour.

For more information about Field Day, see the [ARRL website](#).

**MAJORS FIELD
AMATEUR RADIO
CLUB**

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**We're on the
Web!**

See us at:

www.wd5gsl.org

Your article submissions
are welcomed. Please
submit to Stephen
Denison

Majors Field
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Club Station

Club Station: TBD
VHF Repeater: WD5GSL/R
147.160 MHz (+) PL 100.0 Hz
Friday Morning Talk-In Net
UHF Repeater: WD5GSL/R
444.625 MHz (+) PL 151.4 Hz
Temporary Antenna Position Limits Range Currently

June

16 SVARA Meeting at 7:00pm at Greenville Hospital
23 MFARC Meeting PD North Conference Room at 11:45am
25-26 Field Day

REGULAR ACTIVITIES

Daily DFW Early Traffic Net (NTS) at 6:30pm 146.88 – PL 110.9Hz
Daily DFW Late Traffic Net (NTS) at 8:30pm 146.72 – PL 110.9Hz
Daily DFW CW Traffic Net (NTS) at 7:00pm and at 10pm on 3541 KHz www.k6jt.com
Thurs Sabine Valley Amateur Radio Association Net Every Thursday night at 7:00pm on the
K5GVL/R 146.780 MHz (+) PL 114.8Hz

FridayMajors Field Amateur Radio Club Talk-In Net Every Friday morning on your way in
to work on the WD5GSL/R 147.160 MHz (+) PL 100.0Hz

Contest Calendar: <http://www.hornucopia.com/contestcal/weeklycont.php>