BYONICS TinyTrak4 Quick-Start Guide

Version 0.7 – July 23, 2017

Introduction

This Quick-Start Guide is intended to help new users get up and running with a Byonics TinyTrak4.

What is needed?

Most users will need the following items to setup and operate the TinyTrak4. The first 4 are available from www.byonics.com.

- **TinyTrak4** – Either the TinyTrak4 Built and Tested unit, or a TinyTrak4 Kit. See the TinyTrak4 Hardware Manual for information on building the kit version.
- **Radio/Power Interface Cable** – This cable is needed to connect the TT4 to a power supply, and to the radio's mic and speaker connections. These can be purchased at www.byonics.com or built from the wiring diagrams at that site.
- **TT USB cable** – This is a custom USB to serial adapter that can connect directly to the TinyTrak4 serial port (J2) and also power the TT4. Another option is a normal USB to serial adapter, and a female to female null modem adapter, though it will not power the TinyTrak4.
- **Serial GPS** – If TinyTrak4 will be used as an APRS™ position tracker, a serial GPS sending NMEA sentences is needed. A USB only GPS cannot be used. The TinyTrak4 can be configured to power a 5V GPS, such as the Byonics GPS5.
- **Radio** – 2-meter amateur radio, along with radio power and antenna. Either a mobile radio or a handheld (HT) will work, as long as it has a microphone jack and an earphone/speaker jack.
- **Computer with Terminal Emulation software** – TeraTerm Pro for Windows and CoolTerm for Mac are recommended, but any terminal software should work. If the TT4 will only be used as a tracker, the computer is only needed during initial configuration.
- **TinyTrak4 Power Supply** – A 6V-15V power supply is needed to configure and operate the TinyTrak4. Most users will use a 12V battery, or vehicle cigarette lighter plug. When using the TT USB cable, do not use an additional power source.

Set the TinyTrak4 Jumpers

The TinyTrak4 has two user jumpers on the circuit board. JP8 is used to set the Radio PTT type, and JP6 is used to set the GPS power. To access, remove the screw on the back center of the TT4 case.

JP8 is located on the left side, near the DB-9 connector J1. When using a radio without a separate PTT line (Yaesu or Icom HTs, with cables HT1, HT2, or HT4), this jumper should be installed across both pins, shorting them together. For radios with a separate PTT line (Kenwood, Baofeng, Wouxun, and most all mobiles), this jumper should be removed, or stored on only 1 pin. A built TinyTrak4 normally has the jumper installed. If this jumper is installed when it shouldn't be, mobile radios may constantly transmit. If the jumper is not installed when it should be, radios will not transmit.

JP6 is located on the top of the PCB, near the right DB-9 connector J2. It has 3 posts. If a jumper is installed on the left two posts, 5V will be sent to the GPS/Computer port J2 pin 4 to power the GPS, such as the Byonics GPS5. If a jumper is installed on the right two posts, the supply voltage (usually 12V) will be sent to the J2 port. If the jumper is left off, or just stored on a single post, no power will be sent to the J2 port. A built TinyTrak4 normally has the jumper installed on the left 2 posts, providing 5V to J2. **Warning:** Sending 12V to a 5V GPS, such as the Byonics GPS5, will destroy the GPS.

Make the connections

Connecting all the above elements together is fairly simple. Connect the TT USB to the computer USB port, and install the drivers if needed. Connect the other end to the TinyTrak4 J2 Male DB-9 connector, marked "GPS/Computer". Then connect the Radio/Power Interface cable to the TinyTrak4

J1 Female DB-9 connector, marked "Radio/Power". Connect the other end of that cable to the radio mic and speaker/ear jack, but not to a power supply yet. This should allow you to configure the TinyTrak4 settings. After that, disconnect the TT USB from the TinyTrak4, connect the GPS, and connect the Radio/power cable to 12V to start operation.

Configure the Alpha firmware

The final step is to configure the TinyTrak4 with your desired options. Start the terminal emulation software, set for the proper COM port, set the baud rate to 19200 and turn off flow control. Then cycle power to the TT4 by disconnecting and reconnecting the TT USB from the TinyTrak4 J2 port, and the terminal should display:

`?`

`Press ESC 3 times to enter TT4 Options Menu`

When you see this, press the ESC key 3 times quickly within about one second, and you should see:

`Byonics TinyTrak4 Alpha v0.72 (1284)`

`Options Menu`

`:`

at which point you are in the Alpha config menu, and you can configure the TinyTrak4. You can type text commands such as

- `HELP` – to display a list of all commands and descriptions
- `DISPLAY` – to display all currently set options
- `RESTORE` – to restore all settings to factory defaults
- `QUIT` – to quit the config menu, and allow the TT4 to start operating

Typing any command without a parameter will display its current setting. Refer to the Alpha Firmware Manual for details on all the commands, and the section below for recommended settings. Once configured, disconnect the TT USB and connect the GPS, and connect power to the radio interface cable to begin TT4 Alpha operation.

Setting Alpha audio levels

The TT4 needs to have the outgoing and incoming audio levels set to work with the particular radio you will be connecting to it.

To set the outgoing audio level, you will need a second radio to listen to your transmitted audio. Use the menu `CALIBRATE` command to make the radio to transmit test audio. Press B to send both the high and low tones, and while listening on the receiver, press the 1 and 2 keys to adjust the transmit audio level. You should start the level high, and then bring it down until you hear a noticeable level drop on the receiver. You can also use the R1 pot on the TT4 PCB to adjust the transmit audio level.

To set the incoming audio level you will use the `MONITOR` and `RXAMP` command. The radio volume should usually be set low, around 10%, if connected to the speaker jack. The `MONITOR` command will cause the TT4 to display the received audio level to the terminal. The value displayed when a packet is received should be between 50 and 80. The value displayed when a packet is not received should be between 2 or less if using squelch, and greater than 80 with open squelch. If it is not, press any key to quit the `MONITOR` command, and use the `RXAMP` command to adjust the incoming audio gain and then re-check the level with the `MONITOR` command. If needed, adjust the radio volume, but be sure the volume is left in the position found suitable for the selected `RXAMP` setting. To confirm decoding, set AMODE TEXT and ABAUD 19200 and then QUIT the config menu, don't press ESC when prompted, and see if decoded packets appear on the terminal screen.

Recommended Alpha configuration

Below are some recommendations for basic settings. These assume you begin with all parameters at their default settings (as set with the `RESTORE` command.)

Tracker configuration with GPS connected directly to the TT4

- **`MYCALL <your callsign>`** – set your callsign, i.e.: `MYCALL N6BG-1`
- **`PPERIOD 120`** – set the position report rate to 2 minutes (120 seconds)

KISS TNC configuration

- **`AMODE KISS`** – set to KISS protocol
- **`ABAUD 19200`** – or whatever is desired

Digipeater configuration

- **`ALIAS1 WIDE1`** – set the Digipeater call to repeat

Transmit Digipeater details for fixed location configuration

- **`TSYMC #`** – set the digipeater symbol
- **`PPERIOD 3600`** – set the digipeater position report rate to 1 hour (3600 seconds)
- **`LOCATION <your location>`** – format be DDMM.mmmmH DDDMM.mmmmH
- **`TOSV FALSE`** – to send location without GPS
- **`PATH1 WIDE2-1`** – set outgoing path
- **`PATH2 %`** – set outgoing path by clearing PATH2

Telemetry configuration

- **`TPERIOD 300`** – set the telemetry report rate to 5 minutes (300 seconds)

Additional Resources

Hopefully, this guide has helped to get you started using the Byonics TinyTrak4. If you need additional assistance, here are some resources:

- www.byonics.com/tinytrak4 – The TinyTrak4 website contains all Byonics TinyTrak4 documentation, firmware, and software available.
- groups.yahoo.com/group/tinytrak4 – This TinyTrak4 user mailing list is a great place to ask questions, and read how others are using the TinyTrak4. There are many experienced TinyTrak4 users here.
- support@byonics.com – You can email any TinyTrak4 questions to Byonics.