

This device is designed to read the 4k8 baud RS232 NMEA GPRMC output from a GPS and output APRS compatible AX.25 tracking packets to a transmitter.

Build the circuit according to the freetrak_lite.PDF schematic.

The software is also compatible with the older trak_74z freetrak decoder provided input modifications are made to PORTB pins 6 & 7 for the message bit switches.

Program the 16F628A PIC with the TRK_202B.hex firmware.

This program is too large to fit in a PIC16F627 and will not work.

If the LED flashes rapidly without the option jumper, it means there is no valid configuration stored. This is normal after first programming.

Remove power, install jumper and do the following:

The user data is fully configurable and is stored in EPROM memory at the end. Configuration procedure is as follows:

1. Connect serial port to computer's serial port.
You will need to run a serial terminal program like Procomm or similar.
Data rate is 4800,8,N,1.
 - a. The 4 pin jumper block shown in schematic allows you to reverse data lines (null modem) by moving jumpers 90 degrees.
This allows serial communication with either a computer or GPS.
2. Install option jumper to pull input A:4 low.
This tells the tracker at power up that it's in configuration mode.
3. Turn on power to the FreeTrak.
 - a. If you don't see the sign on message, turn off power.
Turn the jumpers on the 4 pin block 90 degrees and turn on power again.

Configuration:

See the freetrak_cfg.jpg photo for a configuration screen shot.

You can backspace and edit any entry prior to entering it.

You should see this on your computer:

```
FreeTrak v2.02B (c)2007
Enter TOCALL
>
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This is the destination call sign. Enter the call sign and SSID (if any) using capital letters.

This is often set to APRS.

Press <ENTER>.

Next will be Enter MYCALL. Enter your call sign and desired SSID (if any) using capital letters. Example: N0QBH-9.

Press <ENTER>

Next are the DIGI entries (if any).

Enter each DIGI call sign using capital letters i.e. (RELAY or WIDE2-2, etc).

Press <ENTER> after each one.

There are up to three digipeater entries available.
These are optional and pressing <ENTER> without any data will skip ahead to the HOLDOFF entry.

The HOLDOFF is a timer which counts down the number of sentences from the GPS. When it reaches zero it transmits and resets itself to the value you enter here.
Most GPS send once per second so a number like 30 would equal 30 seconds.
The number must be between 1 and 99.

Next it will ask: Compressed Report Y/N?
If you want to transmit mic-e compressed format type Y else type N.
Press <ENTER>

* If you choose Y:
It will ask: Enter symbol code - <CR> for default car
Consult with the Mic-E specification for an entire list.
Some common ones are:

-	house
>	car (default)
<	motorcycle
Y	sailboat
b	bicycle
R	rec vehicle
O	balloon

Press <ENTER>

* Compressed mode requires the GPS send RMC type sentences configured to DDMM.mm
(minutes in hundredths) format.

You should now see; Successful Configuration, adjust busy detect now
At this time the busy detect circuit is active and it's trigger threshold can be set.

Connect the audio to a radio at normal listening volume and open squelch.
Adjust the BUSY DETECT pot until the LED comes on solidly and goes out when unsquelched.

This normally gives a reading at PIC pin B:4 of about 1.2 volts DC.

Remove OPTION jumper and power down.

The next time the unit is powered up without the option jumper, it will be in transmit mode, waiting for data.

Momentarily shorting the option jumper during normal operation will force a transmission.

Message bits are selected by either grounding(0) or applying +5v(1) to PORTB pins 6 and 7 in the following combinations.

pin 6	pin 7	
0	0	returning
0	1	in service
1	0	en route
1	1	off duty

Older versions of FreeTrak hardware must be modified to include pull up resistors and jumper switches on PORTB:6,7 to function with this version of software. Users may wish to bring these connections out to a switch which will allow changing status on the fly.

