MICRO-TRAK 300 MANUAL VER 1.5

The Micro-Trak 300 Version 1.5 is a miniature APRS (Automatic Position Reporting System) transmitter operating on the North American APRS frequency standard of 144.390 MHz and is also available on the European standard frequency of 144.800 MHz. The transmitter accepts a TinyTrak3 DIP PIC. The entire assembly is only 1 X 3.3 inches, and weighs less than one ounce! The Micro-Trak 300 is a creation of VHS Products, and is distributed exclusively by Byonics. The MT-300 Version 1.5 has many significant improvements over Version 1.4, including a user adjustable deviation control, and a screw terminal input for power and a configuration switch.

Because of its small size and light weight, the MT-300 Version 1.5 is ideal for portable and airborne operations. Small size notwithstanding, the Micro-Trak 300 has a power output in the range of 300 mW, and is capable of operating at extremely long ranges. An on-board 5 volt regulator provides an optional 200 mA, power output for your GPS receiver. (Many applications, including the use of the device with handheld GPS units, will not require the 5 volt output of the Micro-Track.) The entire system runs well on 9-15 volts DC, and draws only about 10 milliamps in standby, and increases to 180 milliamps during transmissions (which last approximately 1/3 of a second using MIC-E)

This provides for a very efficient battery-powered package. The transmitter will typically run for about 25 hours on a nine-volt battery with 2 minute check-ins. No case or package is provided with the Micro-Trak 300, allowing the user to package the device according to their unique needs. The design philosophy called for as small, light and basic a package as possible. The programming and GPS input connection is set up to use a DB9 Male connector (The same as a standard TinyTrak 3) by simply sliding the connector over the board-edge tabs and soldering. The Micro-Trak can connect to a standard GPS receiver directly through the DB9 connector, but it is important to remember that computer programming and communication uses a reversed connection, meaning you will need a female to female Null modem cable, or a null modem adaptor and a gender-changer connector for programming your Micro-Trak. These cables and/or connectors are available from Byonics. For an explanation of programming, please see the TinyTrak 3 Manual.

More information about TinyTrak and the Micro-Trak 300, Version 1.5 as well as configuration software may be found at: http://www.byonics.com/microtrak300. E-Mail information requests about the Micro-Trak 300 can be addressed to: microtrak300@byonics.com
Micro-Trak 300 Serial Connections

Pin 1  No connection
Pin 2  Serial Data In (GPS and programming)
Pin 3  Serial Data Out
Pin 4  + 5 Regulated output (optional for GPS power)
Pin 5  Ground
Programming

The Micro-Trak may be connected to a computer for programming to the DB-9 connector soldered to the card edge connections. Note that you will require a Null Modem and gender changer adaptor to program your Micro-Trak. Consult the TinyTrak 3 manual for instructions on using the Byonics configuration software to program the TT3 PIC on-board the Micro-Trak. Be aware that the Micro-Trak is a transmit-only device, and will transmit over other stations. It is not a good practice to send position reports too frequently, since this can jam other stations, and will use Micro-Trak battery power too quickly. 120 second checks-ins are recommended.

Power/Switch Input

The MT-300 Version 1.5 has utilizes a three-screw input terminal for power, ground, and configuration switch inputs. (See image, left) Note that the input marked ‘SW’ is an input that is used to change the between the primary and alternate configurations by switching to ground, and has nothing to do with programming the unit.

Antenna Connection

The Micro-Trak is provided with an SMA connector for an RF output. Care should be taken not to over-stress the connector with long chains of RF adaptors or converters. The SMA connector is long barreled, and includes washers and an O-ring to help create a water resistant enclosure.

Deviation Control

A user adjustable deviation control has been added to this version of the Micro-Trak 300. The blue trimmer potentiometer has been set fully clockwise on shipping. You can set the deviation control to accommodate narrower systems by adjusting the control counter-clockwise. Do not use excessive force to adjust this point.

Status LEDs

The MT-300 has red and green LED’s for status indicators. On powering the unit, the lights will blink briefly, indicating a system reset. The red LED indicates the device is transmitting. The green LED indicates the status of the GPS: Blinking means the GPS has not found “lock” and a solid green LED indicates the GPS is “synched up” with the sky and sending valid data. If the LED’s in the unit flash continually, the unit probably has low batteries or has been “swamped” with RF from a nearby transmitter or power amplifier. Discontinue operation until you have corrected the problem.
Technical Summary

- Transmit power: 300mW (24.7dBm) nominal
- Operating frequency: 144.390 MHZ, or 144.800 MHZ
- Supply range: 9-15 VDC
- Current consumption: 180mA nominal transmit
- Data rate: 300, 1200 Baud AFSK
- PCB Dimensions 1 X 3.3 Inches
- Weight < 1 ounce

Performance specifications

Absolute maximum ratings

Operating temperature: -10°C to +60°C
Storage temperature: -30°C to +70°C

Electronic Characteristics

DC supply 9-15 VDC
TX Supply current 180 mA
RF Power Output +25.7 dBm (max)
Spurious emissions -40 dBm
FM Deviation 3.5 kHz (Peak)
RF Center Frequency 144.390 /144.800 MHZ
Modulation bandwidth @ -3dB 3 KHz
TX select to full RF <5 ms