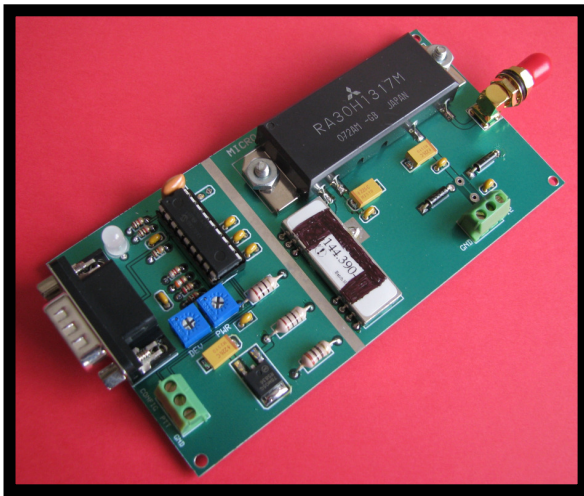


MICRO-TRAK BFT MANUAL

This manual covers Version 1.0 of the Micro-Trak BFT tracking transmitter. The MT-BFT is a single channel, crystal-controlled APRS transmitter controlled by a standard Tiny-Trak 3 encoder PIC. For more complete information on the TT3 encoder and its associated configuration software, please download the TT3 manual and configuration program from the Byonics website. The MT-BFT is only available on the North American APRS frequency, 144.390 MHZ. The unit is sold fully assembled and tested.

The MT-BFT requires as much as 9 Amperes of supply current to operate at full power. Do not exceed an operating voltage of 13.5 Volts.



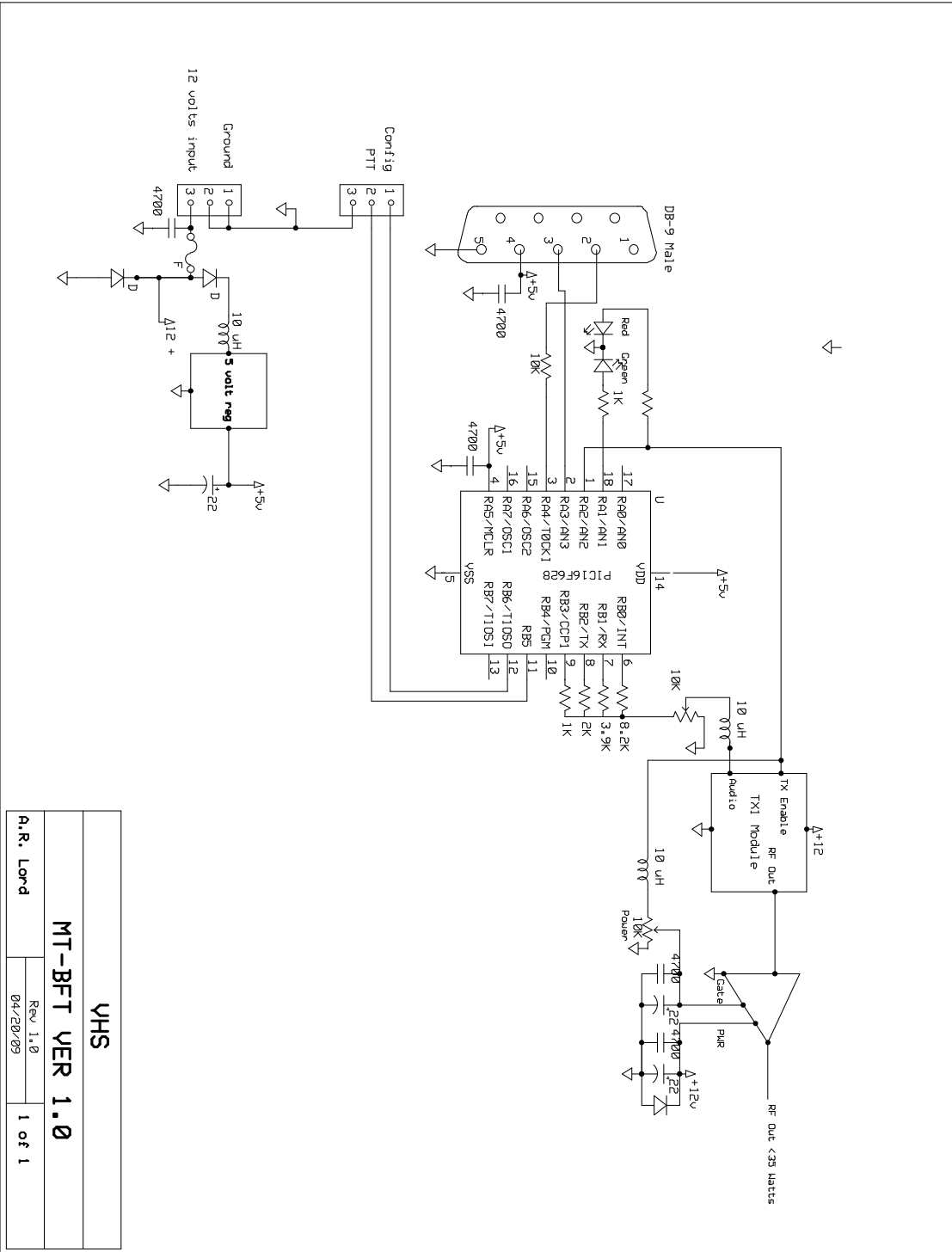
Programming

Programming the MT-BFT is accomplished in the same manner as programming a Tiny-Trak3. The MT-BFT is connected to the serial port of a computer port running the Byonics TT3 configuration software via a serial cable and Null-modem adaptor. The adaptor is required to switch the serial receive and transmit connectors in respect to that of a GPS receiver, which we anticipate will be the normal operating mode for your transmitter. Like most

Micro-Trak and TinyTrak products, the DB-9 connector on the PC board has a 5 volt output for powering a GPS. The DB-9 is plug and play compatible with the Byonics GPS 2 and many other 5 volt powered GPS receivers.

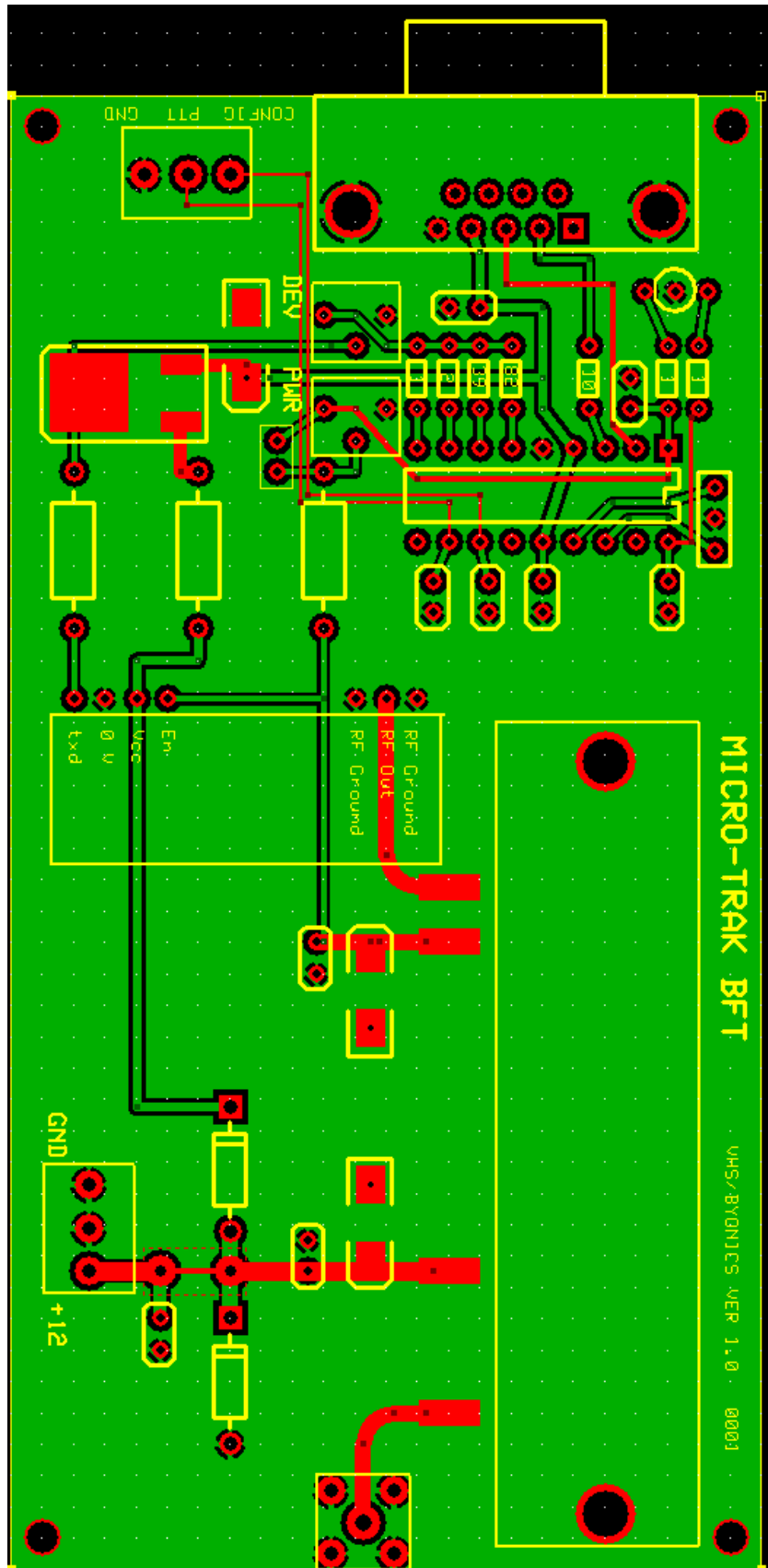
When transmitting, the MT-BFT creates an enormous radio frequency energy field that can wreak havoc with your computer while you are attempting programming. There are two user adjustable trimmer potentiometers on the printed circuit board. The one marked "PWR" sets the bias for the amplifiers turn-on gate. It should be noted that all of the valuable adjustment of this trimmer is in the last few degrees of rotation, and power levels other than fully rotated are best carried out with an RF power meter while transmitting into a dummy load. During programming, turn the PWR control all the way Counter-Clockwise to minimize RF fields and prevent overwhelming your computer. (You should connect the output to a dummy load or antenna any time you carry out any programming, operation, or testing !) With the power turned down, you may power the transmitter with a nine volt battery or other low current power supply. You must apply power to the unit to program the TT3 chip. Do not program the transmitter to send position reports more than once per minute, as it could cause the device to overheat.

SCHEMATIC



YHS	
MT-BFT VER 1.0	
Rev 1.0	1 of 1
04/20/09	
A.R. Lord	

PCB LAYOUT



OPERATION

Safe Operation

The Micro-Trak BFT utilizes a very high power amplifier module, and this means that the device will require substantial amounts of current to operate, approximately 8 Amperes at 12 volts is to be expected during transmission cycles. Failure to operate the transmitter into a properly matched antenna or dummy load can result in damage or destruction to the amplifier module, and blown out modules will not be covered under warranty. The MT-BFT should not have more than 13.6 volts applied to its input.

Fusible Trace

The PCB utilizes a fusible trace, which if all goes according to plan, will never be used except as a conductor. In the even that you apply reversed polarity voltage to the unit, the trace will burn out. Pads have been made available to add a 5 ampere slow-blow fuse in this event.

Trimmer Controls

There are two trimmer potentiometers on the PC board. One can be used to set the devices' deviation level (ordinarily, this will be set to about 90% rotation) and not require any adjustment. See the above section on programming for adjustment of the PWER (power) control trimmer for low use during programming.

Note that there are two holes just below the PWR trimmer control. These provide a connection point that bypasses the trimmer control. This will allow you to set the lower power output of the Micro-Trak using the trimmer, but add an external switch or jumper to switch back to full power (Hi/Lo switch)

Auxiliary Inputs

A three screw terminal connector adjacent to the DB-9 connector is used for two functions. The input marked "Config" is used to switch the MT to its secondary configuration when brought to ground. Please note that this is not used in any way during programming!

The second function, marked PTT, allows you to force-send a transmission. Please remember this input is only used with a momentary, normally open switch. As long as the switch is held down, the MT-BFT will continue to send a dead carrier, followed by a position report when un-keyed. Do not hold this connection to ground for more time than is required (just about as fast as you can push it) as it can melt your transmitter down. Please refer to the TT3 manual for full details on how the PTT function is configured, as it can be set to "time out" and disallow force sent position to be sent to frequently.

You may note that there are places for capacitors which are not present on the board. These are for use in the event that excessive lengths of remote control wire on the PTT and Config inputs cause noise or processor reset problems.

Problems

The most common problems with these types of devices are encountered during programming. Please consult the TT3 manual for instructions on programming. The Yahoo TinyTrak 3 users Group can also provide great information, as can the Micro-Trak Yahoo Users group. You can E-mail Micro-Trak tech support at Microtrak@Byonics.com.

Another common problem arising from the use of devices utilizing the TT3 chips is continuing system reset, characterized by continually flashing LEDs. This is generally caused by low voltage/current power supplies, poor antenna matches (A good antenna is CRITICAL with a high power transmitter!) or routing power wires too close to the RF transmission path.