

# **Manual**

## **Micro-Trak RTG (Ready-To-Go)**

The Micro-Trak RTG is a single channel transmitter operating on the North American APRS channel, 144.390 MHZ. The transmitter was designed with the goal of producing a low cost, easy to implement APRS tracker with virtually no technical knowledge prerequisites.

The MT-RTG is designed to operate from automotive, unregulated power sources, and the device has built in power regulation and filtering. A special cable is included with your Micro-Trak that allows you to plug it into a cigarette lighter output in your vehicle, boat, aircraft, etc. A fuse is contained in the tip of the cigarette lighter plug, which is easily replaced by unscrewing the tip and removing the burnt out fuse. If your installation requires removing the cigarette lighter plug and directly wiring your unit into your vehicles' power, use great care to connect the device correctly, with the red wire as 12 Volt Positive, and the Black wire as vehicle ground. Do not use the device with the magnetically mounted antenna or any antenna connected to ground on vehicles with positive ground. Reversing polarity, even briefly, is very likely to destroy the transmitter, and will not be repaired under warranty.

The cable assembly also has a male, DB-9 serial plug, which allows the use of the Byonics GPS 2 magnetic mount "hockey puck" GPS module. Power for the GPS is provided through the DB-9 Cable. Virtually any GPS that can provide 4800 Baud, NMEA standard data is compatible with the MT-RTG.

Please note that the wiring of the DB-9 connector is set up for use with a GPS. The unit may be reprogrammed by downloading the free Byonics configuration software from the Byonics website. ([www.byonics.com](http://www.byonics.com)) In order to program the device, the transmitting and receiving serial lines must be inverted in respect to the GPS wiring scheme. Byonics offers a low cost null modem adapter for user programming. Ordinarily, the device will be programmed to your specifications prior to shipping.

## Operation

**WARNING: Do not plug the cigarette lighter plug into your vehicle or apply power to the unit until the system is fully assembled. Operating the MT-RTG without an antenna or dummy load attached may destroy or damage the power amplifier in the unit, which will not be covered under warranty.**

Assuming you ordered your Byonics MT-RTG pre-programmed, all that is required is simple plug and play operations. Connect the 6 pin mini din plug on the “dongle” cable into the mating receptacle on the MT-RTG, Note that the fit is quite snug, which will prevent unintentional removal. Note that the plug is keyed, and only fits in one way, so make sure you are properly aligning the plug and jack before applying any significant degree of pressure.

Connect the SMA antenna connector to the mating SMA connector on the MT-RTG. Place the magnetically mounted antenna as close to the center of the vehicle roof as possible. Non-metallic roofs may require metal foil or other improvised ground planes. In the event that you choose to utilize an antenna other than the one utilizing an SMA connector, use the appropriate adapter and a 2 meter antenna capable of handling at least 10 Watts. The antenna should be a vehicular or ground plane antenna designed for two meter operation. Rubber duck or short whip antennas may cause the unit to become “swamped” with RF power, causing continuous resetting of the MT-RTG. This can be observed by watching the Bi-Color LED next to the 6 pin mini-DIN connector. Ordinarily, the red/green LED will flash briefly on startup, indicating normal operation. If the MT-RTG goes into continuous reset, the LED will flash continuously. Unplug the unit and trouble shoot the installation before attempting to re-power the device.

Plug the GPS 2 or other GPS device into the MT-RTG, and place it in a position to give it the best possible line of sight view of the sky.

After all connections are made, plug the cigarette lighter plug into the vehicles jack, and switch the vehicle to whichever position allows the cigarette lighter jack to provide power.

The MT-RTG LED will flash both colors indicating that it is starting properly. The green LED section should begin to flash at a rate of about once per second. This indicates that the unit is receiving serial data from the GPS, but the GPS is not “locked” onto the satellites. When the GPS is providing “good” data, the green LED will stay lit continuously.

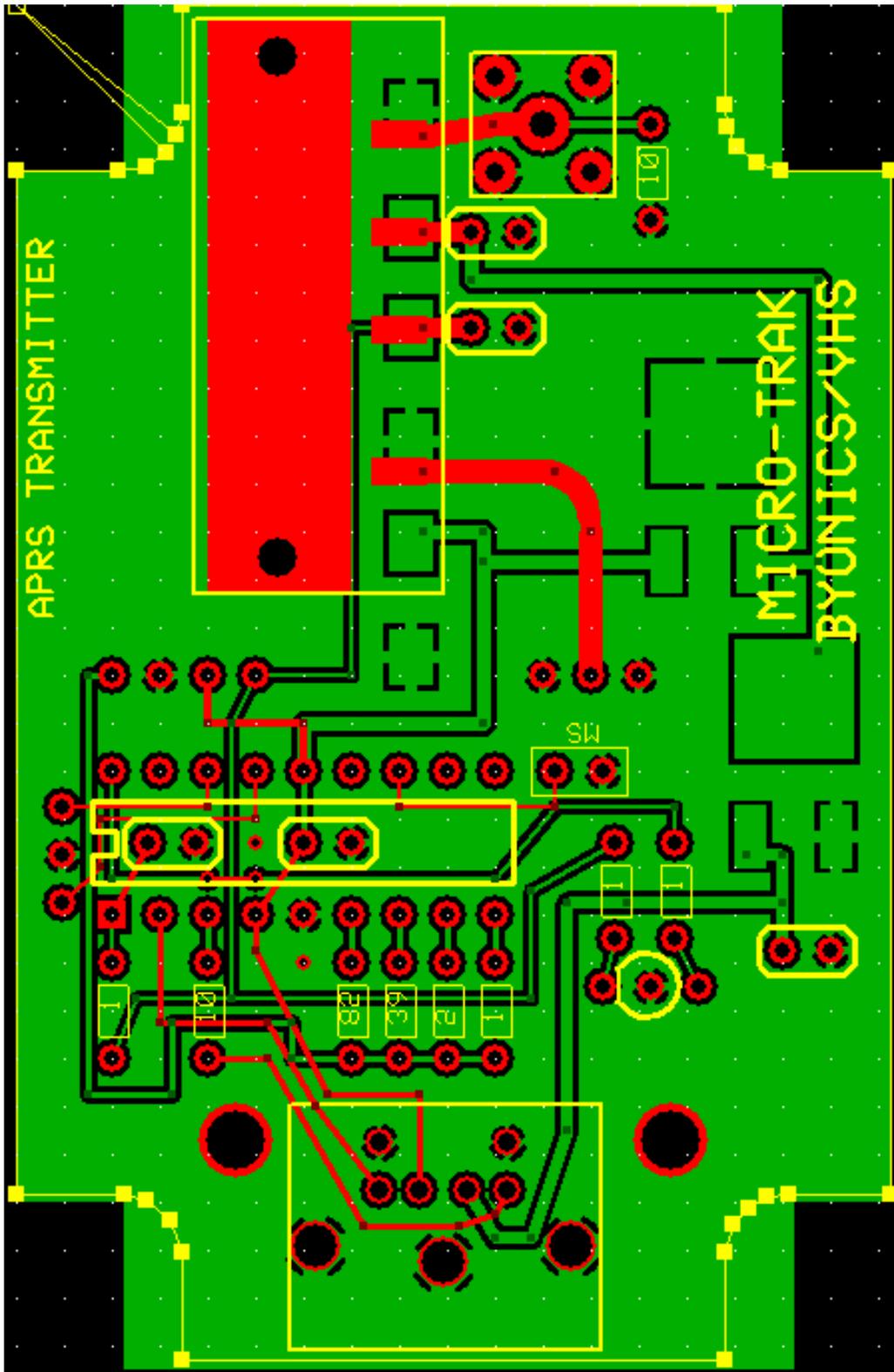
The red section of the LED will flash briefly indicating a transmission is taking place. APRS transmissions are very short, and may last from about 1/3 of a second to a second, depending on the units’ programming.

The MT-RTG is a transmitter only. The unit will occasionally send position reports coincidentally with other transmitters. The APRS network is unlike the cellular network, in that the nationwide network of digipeaters may not cover every area of the Country. Since the system is entirely operated by volunteer hams, there is no guarantee that every position report you send will make it to a digipeater or onto the APRS-IS (sites like openaprs.net or aprs.fi) Although the MT-RTG is much more powerful than handheld radios, it is still relatively low power in comparison to mobile users running potentially hundreds of Watts of power, and we occasionally have to struggle to get a word in edge wise. We have found 8-10 Watts of power to provide very good coverage in areas with working digipeaters.

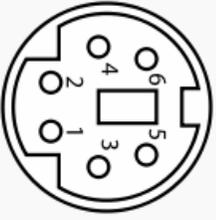
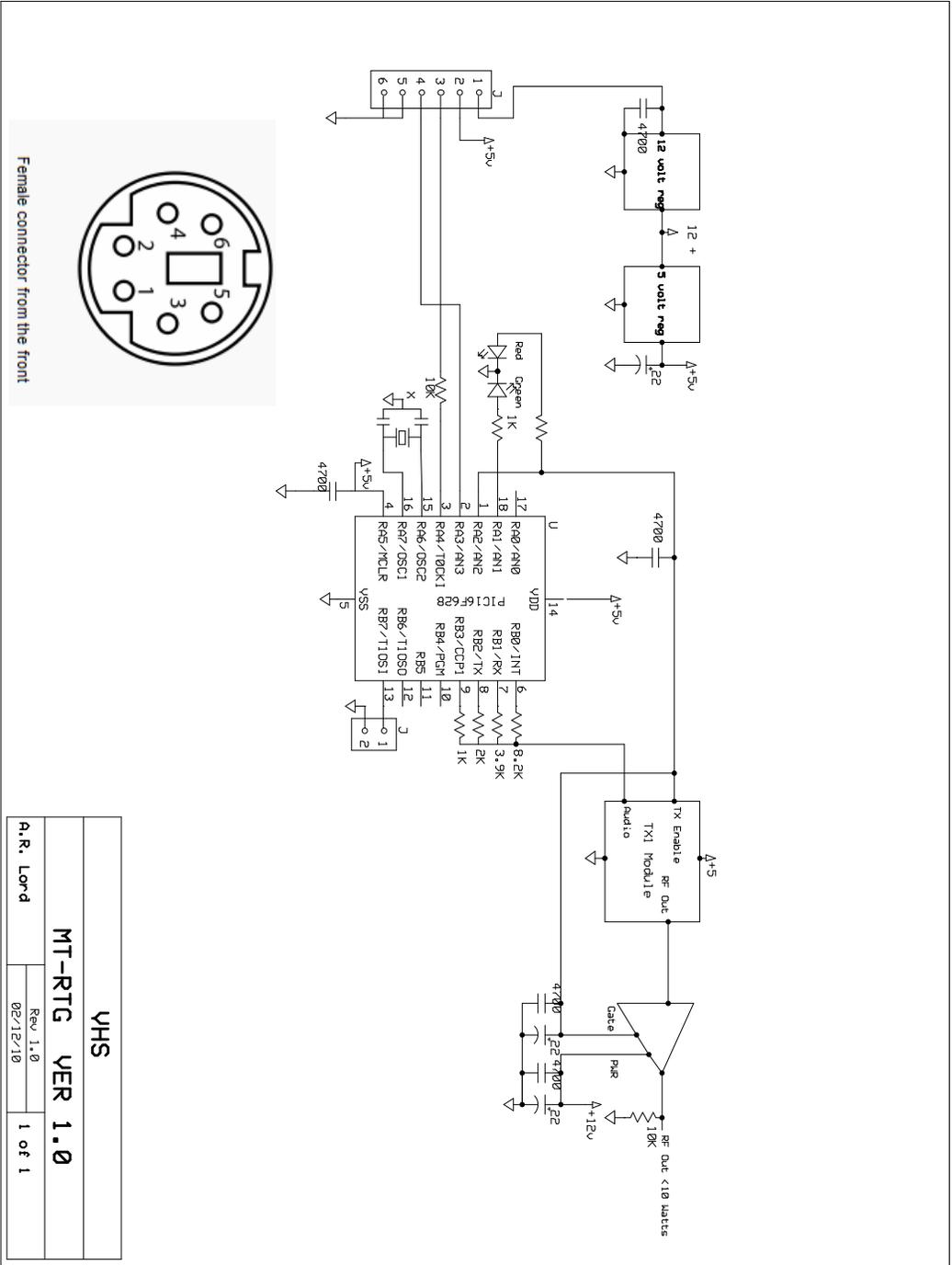
The MT-RTG has no user adjustments or controls. (Not even an ON/OFF switch) The power and deviation levels are set and fixed at optimal levels for the device. The MT-RTG uses a standard Byonics TT3 chip, and you can download the TT3 manual to explore all the possible ways the unit may be specially programmed for your application. The default values included when your unit was shipped are generally optimal.

Because the TT3 chip is capable of storing two entirely separate configurations (containing your FCC call sign, APRS Icon, tactical call sign, digipath, Smart Beacons, and other data modes) A pair of holes on the printed circuit board marked “SW” (Switch) have been provided for those hams with the skills to add an external switch. Most hams will generally only run one configuration, but as these units may be used in a car one day, and in a boat the next, the option to select multiple configurations creates a degree of flexibility.

# Printed Circuit Board



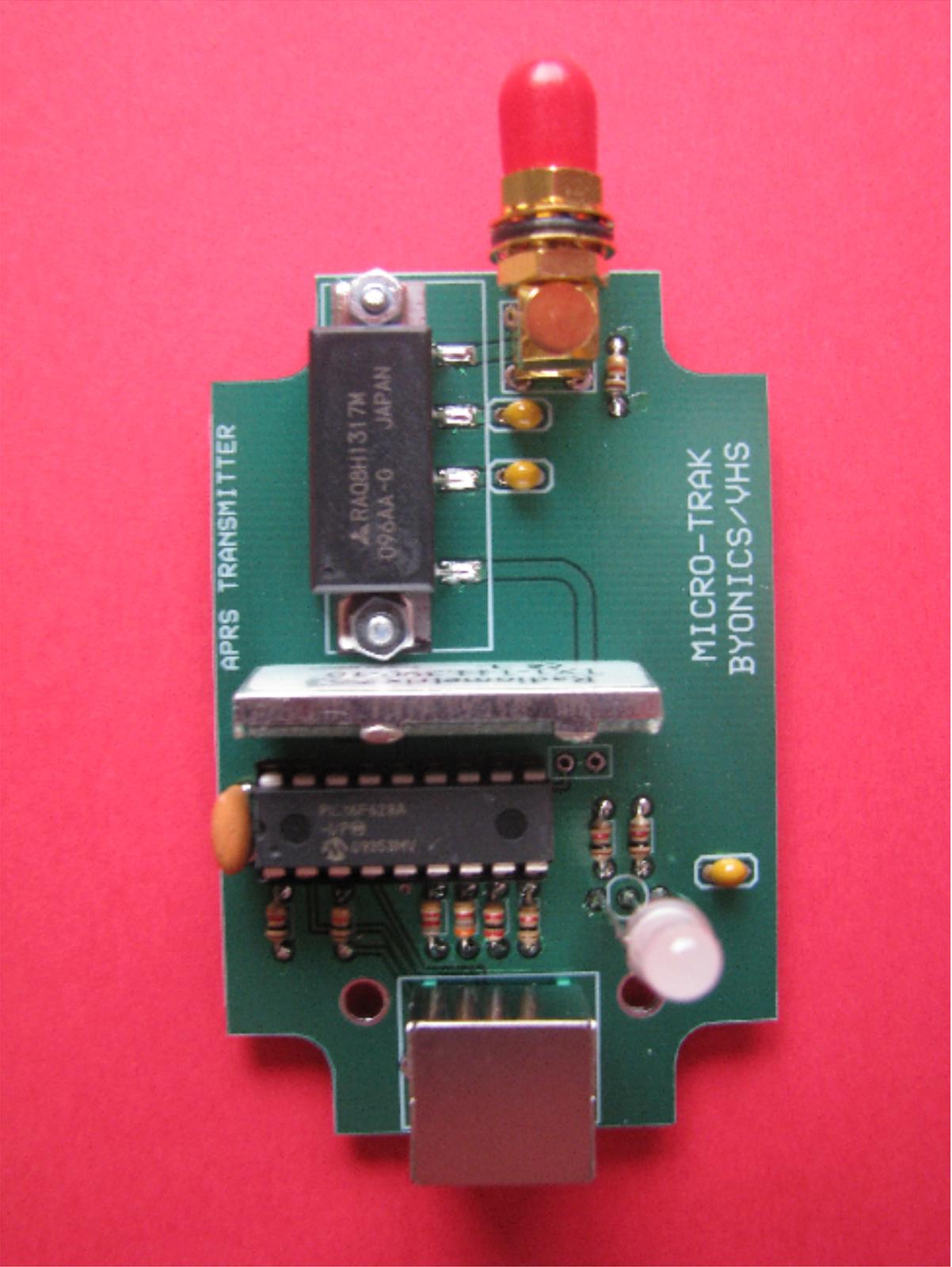
# Schematic

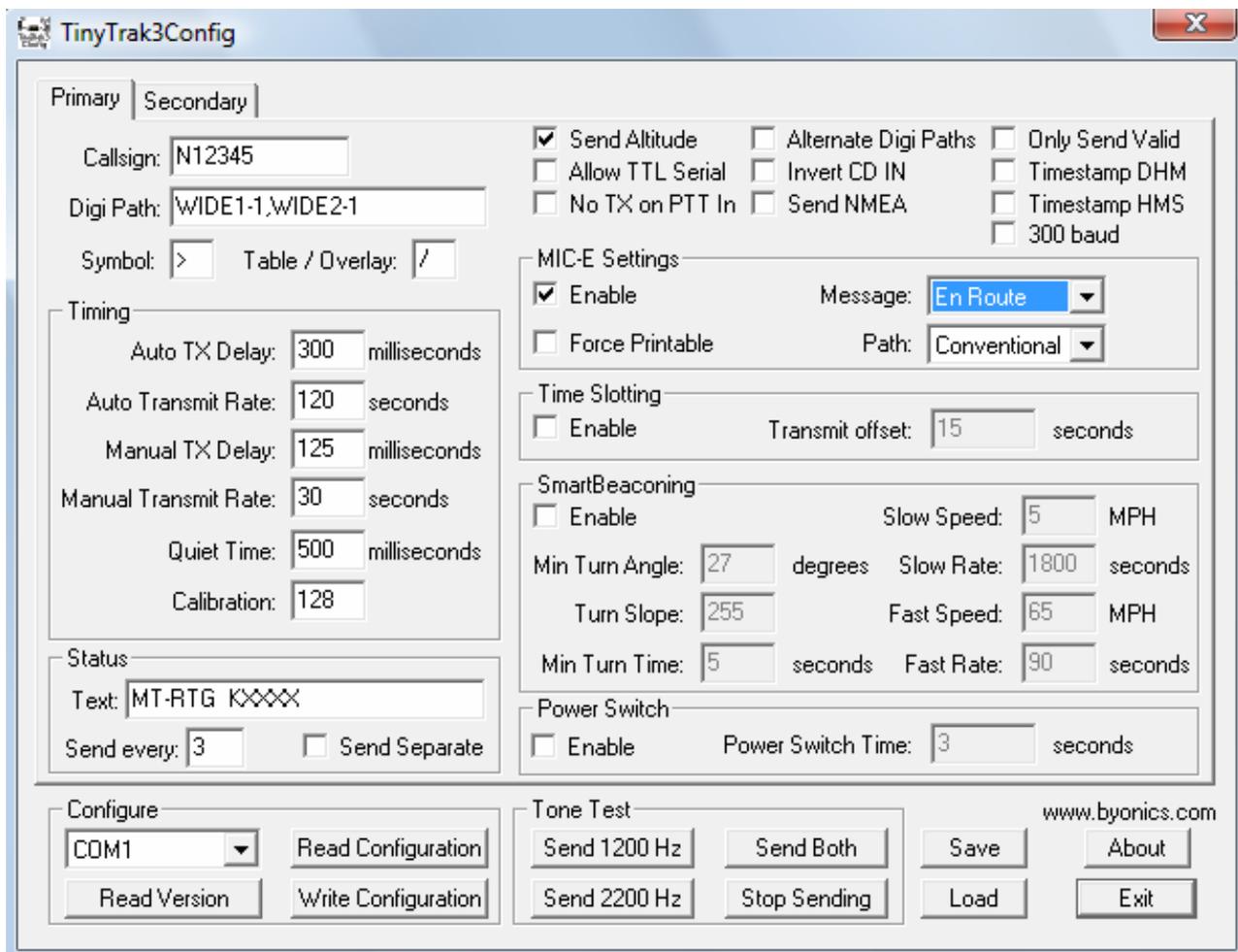


Female connector from the front

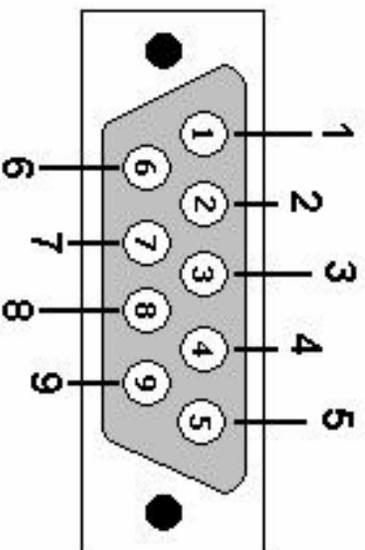
<b>YHS</b>	
<b>MT-RTG VER 1.0</b>	
Rev 1.0	1 of 1
A.R. Lord	
02/12/10	







This is a screen shot of the programming software. The call sign entered in the top left hand field is modeled after an aircraft call sign. You do not need to use your FCC call sign in this field, as long as you enter your actual FCC assigned call sign in the Status Text field. Download the TT3 manual for more complete information on the functions of each of the programmable features. When you place your order, Byonics will need your desired call sign or tactical call sign( which may be your actual call sign plus a secondary id number in case you use multiple trackers, i.e AF6OF-6) the APRS Icon you want ( Car, plane, horse, etc) and whether you want to use Smart Beaconsing or conventional 2 minute transmission periods. (More on Smart Beaconsing in the TT3 manual.)



**DB9: View looking into male connector**

Pin No.	Dir	Notes/Description
1	-	No Connection
2	IN	Serial Input - From GPS RS-232 TX or PC
3	OUT	Serial Output - (Only used during programming)
4	OUT	+5 volts output to power GPS
5	OUT	Ground