

## **Operating Instructions:**

To operate the board there are few steps required to bypass some issues we had with routing and pins. First, in order to get power to the touch screen, it is essential to make a connection between pin 1 of T1 and pin 1 of T2. T1 is mounted vertically so with the board facing forward (text reads from left to right and logo is upright) pin 1 is the bottom pin of the two. T2 is mounted horizontally so pin 1 is the left pin of the two. Next there needs to be a 6V power supply going into the barrel connector labeled P2 to power the 3.3V power plane. After that a 19.2V power supply needs to be connected to the barrel connector labeled P1 to power the backlight of the LCD. It is important to connect the 6V power supply before the 19.2V power supply to ensure the correct functionality. The last part of the project is the GPS receiver that needs to be attached. The GPS has 6 wires that are all color coated: ground (black), power (red), TTL RX (white), TTLTX (teal), RS-232TX (yellow) and RS-232 RX (blue). Only 3 of these are needed to get the GPS working properly: ground, power, RS-232 TX. There is a 4 pin connector labeled U6 on the board that is used for the GPS. Pin 1 is labeled on the left side and pin 4 is labeled on the right side so it is intuitive how the pin layout is. To connect the GPS properly connect the power (red) to pin 1 of U6, RS-232TX (yellow) to pin 2 of U6 and ground (black) to pin 4 of U6. Pin 3 of U6 is unused. Once those are all connected the board should be ready to go.

Our DIP switch that is mounted on the board was done incorrectly so we had to make an external switch to control the reset of the processor. Pin 1 is the boot loader pin and pin 2 is the reset pin on the switch. To enable boot loader mode to upload code to the board first flip pins 1 and 2 into the on position then flip pin 2 back into the off position. The board is now ready to load code. Once code is loaded put pin 1 into the off position and push pin 2 into the on position and then off position to reset the board and start it up.

Once the project is powered up the rest of the operation is done through the touch screen interface. The touch screen interface starts with an intro that says "TrackMate / Touch anywhere to begin." From there it takes you to the home screen that has buttons for the Music screen, GPS screen and Options screen. The Music screen has an interface for choosing songs, volume control and a return to the home screen. The GPS screen has a button to poll the GPS for coordinates, reset the distance calculation to 0, or return to the home screen. On the GPS screen polling the GPS once prints out coordinates in the Current coordinates section. Polling the GPS a second time prints out the first coordinates on the previous coordinates screen and new coordinates on the current coordinates side as well as doing a distance calculation between the two, finding approximate speed and showing the total distance travelled. The Options screen was more of an idea from a product perspective rather than something we actually implemented. Currently the options screen takes you to a black screen where a tap will return you to the home screen.