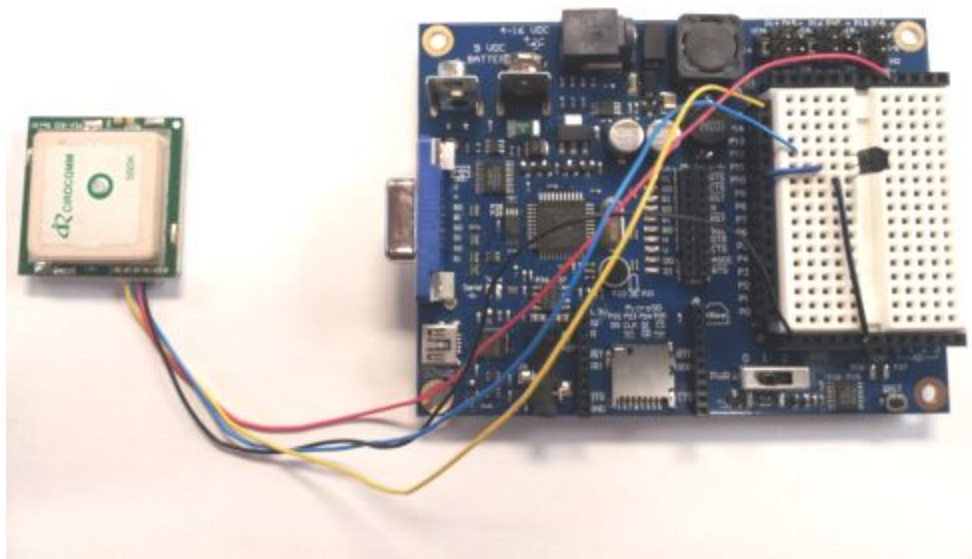


Spin Project: Constant Navigation with GPS

Level: Beginner

Skills Required: Wiring, Basic Programming

Hours to Complete: 0.5



With the increasing number of GPS units being used in mass transit and consumer vehicles, the manufacturing companies have changed the output of the GPS modules to what is referred to as “Static Navigation”. With this output, the vehicle has to be moving at a predetermined speed for the GPS to update its Lat/Lon data. What this does is it prevents your GPS from uttering the infamous “rerouting” every five seconds while sitting at a stop light. While this mode is good for vehicles, it is not so good for a DIY ground-based robot that moves at a mere 3 mph.

Fortunately for us, the GPS Modules also have a mode called “Constant Navigation”. This mode has the GPS-output updated Lat/Lon data every second, which is the refresh rate of the modules themselves. This means that you can power on the module at your desk, and watch the data change ever so slightly, without ever taking a step. Now, even the smallest robot moving at 0.5 mph can have on-board GPS navigation!

What's Needed

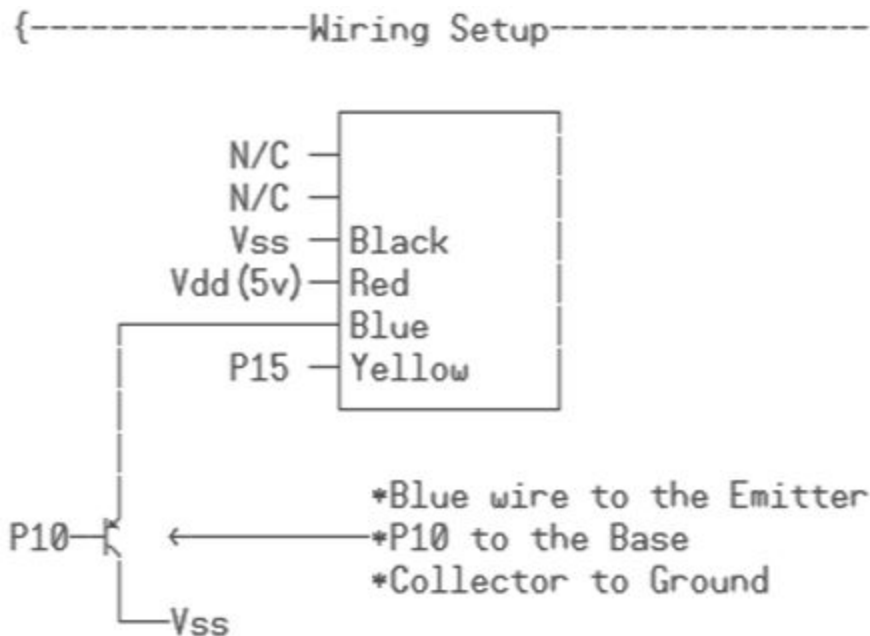
In order to complete this project, the following parts are required:

- (1) PMB-648 (#28500, discontinued) or PMB-688 (#28501, discontinued) GPS
- (1) Propeller Board of Education (#32900, discontinued)
- (1) 2N3906 PNP Transistor (#500-00003, discontinued)
- misc jumper wires

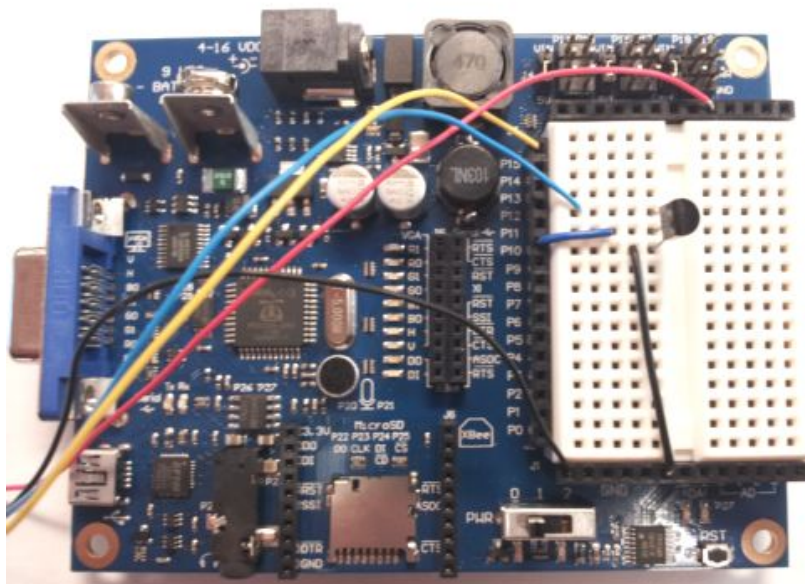
Note: Many of these parts are discontinued for sale or manufacture by Parallax, but may be found through other retailers, or have suitable replacements available through Parallax or other retailers.

Wire the Emitter-Follower Circuit

Using the diagram below, make the necessary connections and ensure that the transistor is installed correctly. The schematic can also be found in the comments section of the Constant_Nav_Mod.spin file.



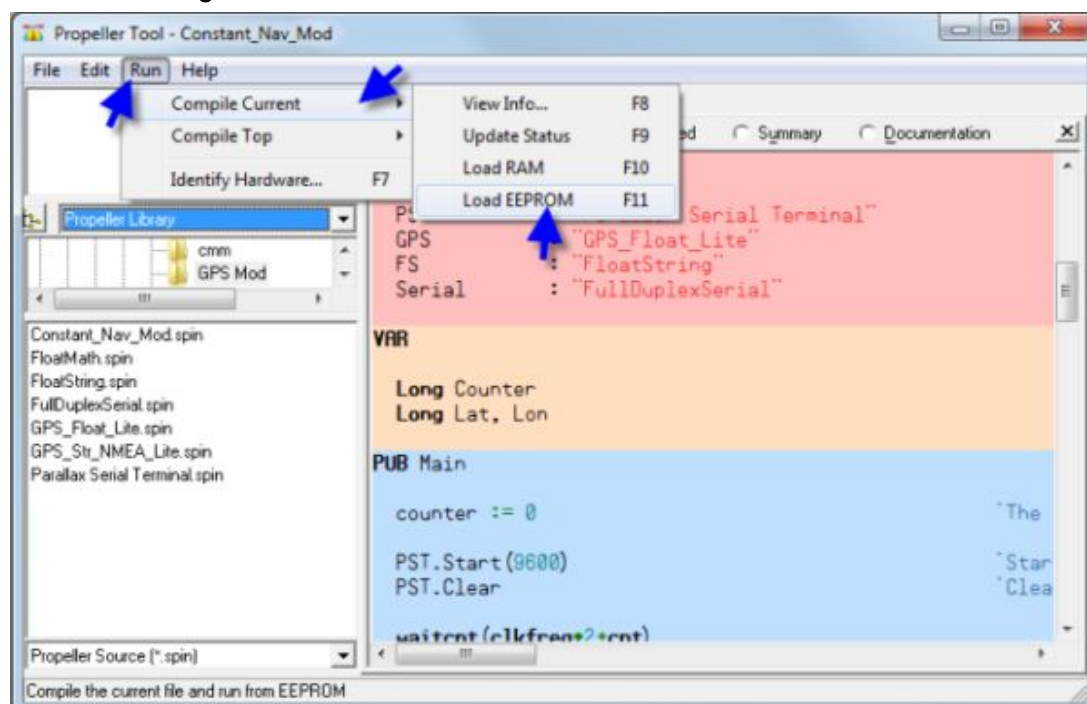
When wired, the board should look something like this:



Test Your Modified GPS

- ✓ Open Constant_Nav_Mod.spin from the code folder within the project download.
- ✓ Load the program onto your Propeller board by using the shortcut key F11, or by selecting Run...Compile Current...Load EEPROM from the drop down menu.

See below image:



- ✓ Once loaded, press F12, or select Run...Parallax Serial Terminal (PST).
- ✓ Ensure that you have selected the Comm Port that your board is on, and have the baud rate set to 9600.

The first thing the program does is gives the GPS a 10 second warm-up period, and will display a message in the PST. Then, it will go through the process of re-configuring the GPS to operate in Constant Navigation mode, and messages will be displayed in the PST to let you know where it is at in the process. Once complete, the PST will clear and your current Latitude and Longitude will be displayed.

Your positional data should change ever so slightly even when sitting on your desktop, and will update steadily when you move at a walking pace. If you do not see the updated data appear, and it seems like your data is frozen, ensure that you have good connections and that your transistor connections are correct. Double check the picture and schematic found in the code for help with connections.