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Problems

Computer to microcontroller connections were a main concern. The original project called for a 9-pin serial connection and a serial to USB cable. While this was easy to construct, it failed to connect. The next attempt was an FDTI chip, using jumper cables to connect it to the ATMega. This also did not work. The third and final attempt was an Arduino Nano, which was successful. This was the major roadblock.

There was also a disparity in the original source information. The provided schematic and the breadboard built by the originator differed greatly, leading to confusion and possible shorts. Having to add more components to secure the connection didn't help matters, however once the schematic and breadboard were broken down section by section, it was fairly simple to solve.

The final problem was with the code. It was impossible to program in the evaluation version of AVR Codevision, but it also wasn't transferable to another compiler such as Atmel' AVRStudio. Using AVRDude with the compiled files seemed to work once a bootloader was burned to the microcontroller. Codevision also had to be run as an administrator or it would refuse to build the project.

The future problem that I think would be most prevalent is the code. There were problems modifying it for the ATMega1284P, as opposed to the original 324P, and I can foresee this continuing if one was to try to use a different chip or add Flash memory. There may also be problems transferring off the breadboard to a smaller circuit board.

Future Work

There are many possibilities for modification. The first, and most obvious, is attaching more memory so that the GPS can store more data points. Another relates to size: the breadboard isn't very big, but it's possible that the project could be made smaller and lighter in order to serve as an indiscreet tracking device. There could also be code modifications so that there's a two-way connection between the computer and GPS to add more features. Finally, there are cosmetic changes, for example fitting the board into a box.

Citations

Original project information, schematic, and source code by Lucid Science:

Lucid Science. "Build the GPS Tracking Device." Lucid Science. 16 Apr. 2011. Web. 5 Aug. 2011. <http://lucidscience.com/pro-gps%20tracking%20device-1.aspx>