

## Embedded Microcontroller Design Project

### Wireless eData

#### Mission Statement

The Wireless E Data team aims to reduce the size of last year's prototype by switching to the PIC microcontroller supported by a custom PCB design. The team also intends to implement a graphical user interface, "home base", powered by a Raspberry Pi. Ultimately, the team will create the first Wireless E Data network.

#### Synopsis

Once all team members were up to speed, the team ported a "lightweight" version of the Arduino software to the PIC platform. Simultaneously, the team designed, ordered, and tested its first PCB iteration late February. This was a tremendous success and morale booster for the team as the group did not have any prior experience in PIC software development or PCB design.

Next the team split into two subgroups, each with its own primary and secondary goals. One portion of the group focused on PCB design and software development; the other focused on mechanical design and document control. By mid-March the team had settled on their second PCB iteration and ordered a total of seven boards. At this time the team also began to 3D print enclosures for the devices, the mechanical design involved two iterations before settling on a working design. Lastly, the team completed and tested the Raspberry Pi "home base" software.

The team struggled with unexpected software and hardware complications. Features that performed without issue in a test environment did not perform as expected when tested in a "real-world" fashion. The PIC software did not always detect a fall, and our "home base" would lock up and become unresponsive at times. This forced the team to push additional revisions of both the PIC and Raspberry Pi software. It also became apparent that battery life was an issue. With too little time to redesign the circuit, the team switched to lithium batteries as a "quick fix" solution. With the help of great teamwork, cool heads, and three 12hr+ meetings, the team achieved their goal of creating the first Wireless E Data network.



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