Developing a Low-Cost UAV Avionics Package

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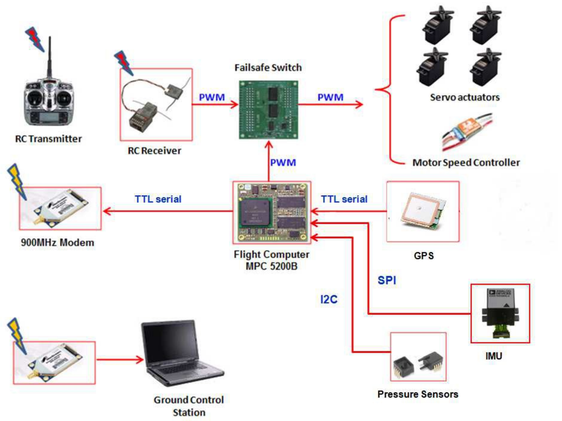
Motivation

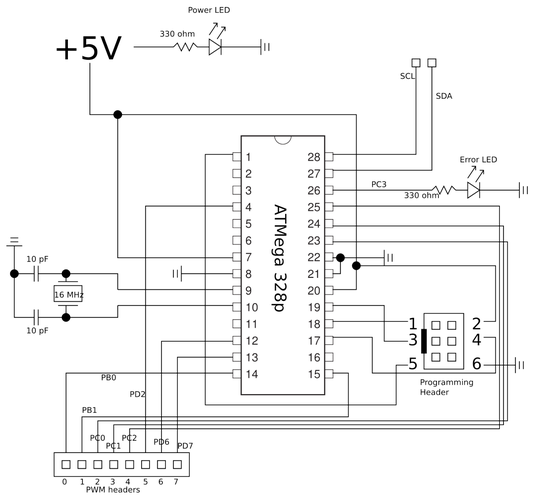
- UAVs have wide-ranging applications, but are costly
- The UAV Reserach Group at the U is working to develop low-cost UAVs with commercial off-the-shelf (COTS) components
- Side effect: lower-cost parts are generally less feature-rich than more-expensive counterparts
- Solution: Develop add-on modules as needed to bridge gap between required features and those available



Hardware overview

Completed Work

- One limiting factor is number of pulse-width modulation (PWM) inputs/outputs, used for interacting with servos, among other things
- On-board computer has inter-integrated circuit (I2C) support, which allows for up to 127 devices to be used
- Converting PWM lines to I2C alleviates some of the IO problems



PWM-I2C Converter Schematic

Future Research

- Other work can be delegated from main computer, leaving more processing power for other tasks
- The board designed is completely separate from the main daughterboard; integrating the two may be practical

FASER, one of the UAVs

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