Autonomous Glider for Radiosonde Recovery

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The purpose of this project is to design and construct a lightweight glider that would house the atmospheric sensor payload of a radiosonde weather balloon and be carried to 100,000 feet where the glider would then autonomously gain stability and guide the payload to a waypoint for recovery. The glider would ensure convenient recovery of the valuable radiosonde payload. For this experiment, the glider will be constructed of foamboard and include a custom-built programmable flight controller to assure flight stability, redundancy manual control override, and GPS and compass navigation to guide autonomously to a pre-defined landing point. Many prototypes of the radiosonde recovery glider were built and tested, resulting in a final prototype with a dual boom, lightweight airframe. The flight controller, while it failed at first, has been revised to incorporate quaternions which are an ordered set of four numbers to accurately describe three-dimensional rotation of the glider to maintain glider stability and achieve navigation. The flight controller also works simultaneously with the radiosonde to provide accurate destination navigation and reliability.

Awards Won: