

# High Altitude Balloon Control System

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## Motivation

High altitude balloons offer a low cost solution for deploying RF and sensor packages. Traditionally, the flight time of an HAB is limited by the balloon bursting. The creation of an altitude control system will drastically improve the flight duration resulting in a larger variety of applications. The proposed control system will allow for prolonged deployment over a specific region.

## Design Requirements

- Overall payload must weigh  $\leq$  6 lb. to comply with FAA regulations
- Payload must be capable of controlling its buoyancy by venting helium and dispensing ballast
- Payload must have an automatic control algorithm
- Payload must maintain communication throughout the flight with commercial means (Iridium satellite communications)
  - Payload must allow for manual override via the satellite communications

## Objective

The goal of this project was to develop an altitude and location control system for a latex HAB to allow long duration flights over a general location. Algorithms take into account current pressure and temperature conditions when venting helium or dropping ballast to estimate altitude changes. Weather forecasts from the National Oceanic and Atmospheric Administration provide wind speeds at distinct pressure levels allowing for prediction of horizontal movement over time. Using this prediction along with altitude control, the balloon's position can be controlled.

## Launch Preparations



## Test Flight Stats

