SSA Balloon (SSA) Mission



Goals of the Project

Overall: Launch a weather balloon to take photos and data, and improve upon past student projects

Specifically: To use the technology and resources we had available to us at the CHS SIGMA Lab

Building the Box

We went through numerous versions of the box, working to balance size, weight, and strength, while allowing us to achieve each goal we had.

The two things we struggled with most were the size of the box and the material.

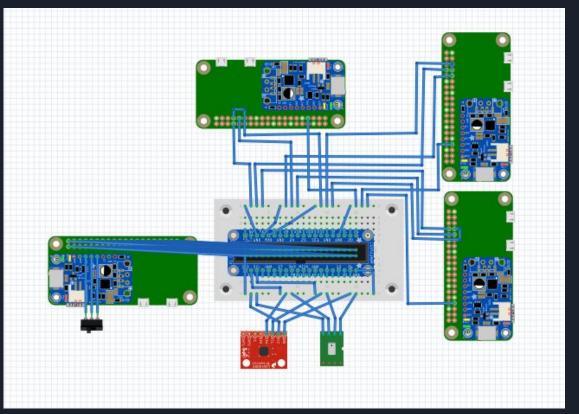
We eventually decided to make the box roughly a foot cubed and to make it out of a plywood called Luan. We decided on luan because it was lightweight yet still solid and if it broke upon the impact of landing it would splinter instead of shatter, protecting the electronics inside.

Coding and Sensors

We used Raspberry Pi Zeros to run sensors and three small cameras

Our goal was to gather a wide range of data and photos

To do this, we adapted numerous sensors to the Pi's, and added cameras to gain multiple perspectives



Actual Launch

Using a Latex High Altitude Balloon, 290 cubic feet of helium, and a home made helium filler, we launched the ballon around 9:00 from Charlottesville High and immediately set on the chase.



How We Used HAM Radio

Once the balloon was in the air, HAM radio was our only method to track it.

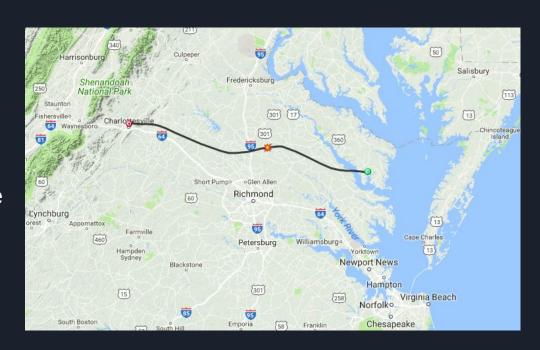
Our system receive GPS data, then transmitted the coordinates over radio

The antenna we used to transmit was built from scratch by students years ago

Moving forward, we hope to improve on our ability to launch weather balloons so that future students can do similar things easily. One aspect we hope to improve in the antenna.

Challenges

- Weather: we wanted a launch time with fair weather and minimal cloud cover
- The balloon passed through the jet stream, which varied in strength
- Group communication between different aspects of the project



Questions?