Mission Overview

*Mission:* Design a functional Balloon Sat that will collect data on the intensity of light in the visible spectrum, particularly in regards to redshifted and blueshifted light, during the flight up to 30 kilometers on November 7th, 2015.

Light intensity increases with altitude
Red and blue light is less intense

During flight, expect to see increased altitude, increased intensity, and less “redshift” or “blueshift”

Observations on redshift and blueshift will help develop future techniques of minimizing the adverse effect of high light intensity

*Figure 1: Light Intensity by Wavelength*
Design: Concept of Operations

- Present your Concept of Operations diagram.
- Should explain how you expected your mission to operate and highlight briefly if it did.
- Include a recap of how your BalloonSat flight went.
Design: Concept of Operations

**Flight**
- Temperature, pressure, humidity and accelerometer collect data throughout entire flight
- Spectrophotometer collects data every kilometer until "burst"
- Camera takes pictures periodically

**Launch**
- BalloonSat is secured to launch vehicle
- Balloon is released carrying the team's payload

**Pre-launch**
- All systems tested
- Turn on power and verify all systems are functioning
- Seal BalloonSat

**Drop**
- BalloonSat is tracked and recovered
- Power turned off to BalloonSat

**Data Recovery**
- Data transferred to team's computers and analyzed
Recap of flight

Burst at around 95,000 feet
Launched in Deer Trail, CO and recovered in Hugo, CO
Failure Analysis

• RGB Sensors did not record to the SD card. When the Balloon Sat was recovered, the SD card was not in all the way.
• We did an 8 hour test to verify that the RGB sensors would record to the SD card.
Results and Analysis

Present actual flight data

If you did not get flight data, you cannot skip this slide

Include a picture of Matt Damon or George Clooney dying in space for extra credit
Launch!

Temperature decreases as altitude increases

Launch Pressure decreases as altitude increases

Burst Pressure increases as altitude decreases

Landing
To prove that it was merely a SD card / human error, the Arduino powering the six RGB light sensors was left running for 8 hours inside the Balloon Sat.

Successfully recorded data.

For the first four hours (1 pm to 5 pm, including sunset), the Balloon Sat was placed in a window with one side facing the sun and the other sides facing into a dark room.

For the next four hours, the Balloon Sat was left in a dark room.

The data from the broken (maxed out) sensor was omitted.

After-flight RGB Data

- Max intensity was 2500 lux.
- The declining line was from 1 pm to 5 pm, including sunset.
- Max at 3500 lux.
- This little drop in the trendline was clouds moving in front of the sun.
- Max intensity was 2500 lux.
- 5 pm to 9 pm, in a dark room.
What’s Your Plan?

Contacting EOSS about relaunch
Goal: relaunch on December 12
Testing BalloonSat to make sure SD card is secure
Prepare material for the ITLL Design Expo
Complete DD Rev D
Prepare for community service presentation
Create team video
Prepare for final presentation