

## Week X Report

**Advisor(s):** Gary Tuttle

**Client:** NASA Marshall Space Flight Center

**Members (Roles):** **Isaac Johns**-Team Communicator, **Ryan Bissett**-Team Communicator, **Tom Henry**-Webmaster, **Luke Dahlman**-Team Leader, **Anh Ho**-Key Concept Holder, **Dustin Pierce**-Key Concept Holder, **Antjuan Buffett**

**Project Title:** Remote Deployment Circuit and Mechanism for Lightweight CubeSat Solar Panels

### Weekly Summary

This week we started to redesign our boom to fit within our new specifications. Instead of having a cubic foot to contain 4 to 9 square feet of solar panel as we originally thought, or 1U (10cm x 10cm x 10cm) to store 1 square foot of solar panel as we were told next, we now have 1U to store 4 to 9 square feet of solar panel. As before these panels still have to be retractable. This proved a difficult problem, but one we feel we've overcome with a new design. We've sent sketches of this design to John Carr and are awaiting his approval or denial of it.

### Meeting Notes

From our weekly meetings:

- Our previous design is unfeasible, even if we scale it down immensely
- We cannot use many typical types of solar panel designs due to the requirement of making the solar cells retractable
- A rolled design, supported by flexible metal bands similar to measuring tape, is our next best idea
  - This design allows 4 to 9 square feet of solar panel to be deployed and retracted from only 1U
- Our second version of our Project Plan has been made and edited

### 11/05/2014 Group Meeting to Decide Course of Action and Create New Design

**Duration:** 1hr      **Members Present:** Isaac Johns, Tom Henry, Luke Dahlman, Anh Ho, Dustin Pierce, Antjuan Buffet

### Purpose and Goals:

This group meeting was meant to create a new design for the boom. Given the new requirements our old design was inadequate and a new one was needed. A design using the same principle that allows a flexible metal tape measure to extend out extremely far compared to its thickness will be used to support the solar panels as they go out over 10 feet from the satellite, while only being

10cm across to fit within the constraints. The panels will be rolled up when not in use inside the satellite.

## **11/09/2014 Group Meeting to ReWrite Project Plan**

**Duration:** 1hr                    **Members Present:** Ryan Bissett, Luke Dahlman, Isaac Johns

### **Purpose and Goals:**

The point of this meeting was to finish our revision of our project plan. The final version is due on Wednesday 11/10/14, and we needed to work on it beforehand so we would all have time to edit it. We weren't all able to make it to the meeting, but all individuals will edit it before submission.

### **Achievements**

This week our most important achievement was to come up with an alternate design for our project that will work with the new, more challenging requirements.

### **Pending Issues**

- Need to get John Carr's approval of our design. It is expected he will allow us to experiment with it, but we want to know if he sees any problems with it that will stop our progress that we haven't thought about. We also need to know if our current design violates any design parameters we are unaware of.

### **Plans for Next Week**

- As a group, we will talk to John Carr and see his reaction to our idea. If he is ok with it, we will proceed with our design, and if not we will have to redesign our idea again.

### **Individual Contributions This Week**

- Luke: Writing/compiling project plan version 2, design the new boom to meet new requirements, conducting group meetings.
- Isaac: meeting on new boom design, meeting about project plan version 2, meeting about new direction & email John Carr, looking into electrical relays.
- Ryan: Wrote weekly report, attended meetings, helped write project plan version 2.
- Tom: Revised project plan, made powerpoint for Mani, updating website, meetings, starting to develop new boom.
- Dustin: meetings and design.
- Anh: spent around a bit of time on inventor research "sheet metal on roller" and sort of start on the new design drawing.
- Antjuan: Research of tape measure extension without gravity.

## **Total Contributions for this Project**

### **1 – 1 hour meetings**

- Luke: 6 hrs
- Isaac: 7.5 hrs
- Ryan: 5 hrs
- Tom: 8 hrs
- Dustin: 4 hrs
- Anh: 3 hrs
- Antjuan: 0.3 hrs