

**Monthly Status Report - June 2013**  
**ASTRO Team - MIT - Payload 06**  
**28 June 2013**

**Mechanical Build**

**Jessica Sandoval** (Biological Engineering, 2015) - Team leader

Updates: We are continuing construction of our final payload. Currently, we have the rotating canisters, end caps, motor mounts, mount platforms, spacers, and most supports machined out. However, we will have to re-water jet and laser cut two side supports due to a design modification of three holes. Upon recreating these parts, we will have all custom parts fabricated and only have to worry about minor modifications and finishing the assembly of our payload.

Issues Encountered: Inter-rotating canisters initially difficult to turn due to need for deburring. Also, water jet services went offline for a week due to system error. Now, water jet is back up and available for use.

Milestones: We have machined the major components of our payload and now must turn our attention to finishing the design of the thermal insulation layers. Note: we have the majority of the design for the thermal insulation finished.

We have also raised \$1,350 from the MIT Department of Electrical Engineering and Computer Science, which is will be used to fund our travels to Texas for Integration (in addition to a Massachusetts Space Grant that is offering 2:1 matching for travel costs).

**Electrical Design**

**Ethan DiNinno** (Aeronautical and Astronautical Engineering, 2016)

Updates: See below. Next step: order PCB for flight hardware to consolidate all electronics onto one neat board. Measured current draw will be provided when tests are complete.

Issues Encountered: New driver board may be necessary because the current draw of the motors is close enough to the design limits that additional current at low temperatures may destroy the ports. 32.768kHz crystal not yet known to work because the part was damaged during soldering. RS-232 serial converter now broken but was verified to produce correct voltages.

Milestones: Breadboarded all electronic components except thermal management. Outputs and power supply verified working.

**Programming/Website Development**

**Rodrigo Gomes** (Computer Science, 2015)

**Jeremy Kaplan** (Computer Science, 2015)

Updates: Have a code base for most hardware components (only missing thermistor

readings); tested MSP430 serial communication and stepper motors; capable of parsing GPS data and ground commands. Sends data back in the correct format.

Issues Encountered: Testing the stepper motors was hard because at first the code wasn't working properly and a delay happened when we didn't immediately realized that one of the driver boards wasn't working.

Milestones: Basic hardware control nearly complete: need to finish programming thermistor readings and test everything as a system; Next milestones: document the whole system, design and code the logic behind the system (at what altitudes are we taking samples? When to turn on heater and for how long? What to do with GPS data, handling reboots - ground commands might be needed, ...)

**Christopher Carr** - Research advisor for ASTRO team