

Monthly Status Report - September 2013

ASTRO Team - MIT - Payload 06

27 September 2013

Team Information:

Updates: Upon recovery, payload was fully intact since the HASP payload landed relatively upright. Worm gears were still engaged, and cannisters were in closed position, as anticipated.

- We monitored temperature sensors and current draws from the ground via custom app. Both motors turned at appropriate altitudes. Heaters functioned, as did the High Voltage source (UMHV). However, one UMHV malfunctioned during flight and had to be manually turned off because it was drawing too much current. However, this occurred already at peak altitude, and functioned during ascent. Therefore, we were still able to collect our integral atmospheric sample before the UMHV malfunction. Noticed upon inspection of payload corrosion of UMHV in addition to a detached grounding wire running from the malfunctioning UMHV to the ESD film surrounding the payload.
- Made schematic and experimental procedure for sample analysis

Issues Encountered:

- Corrosion of one UMHV and therefore cut power supply to UMHV upon malfunction.

Milestones:

- Successful flight in early September leaving from Fort Sumner, NM. ASTRO team recovered payload and sampled in field following sampling protocol.
- For each cannister, 5 flocked swab samples were collected and preserved in RNAShield. Each sample was then stored in a thermos, placed on ice, and shipped back to Massachusetts General Hospital the day of recovery (arrival in MGH date: September 4, stored at -20 degrees Celsius).

Plans for sample analysis *(To be performed by Jessica Sandoval)*

- Order more 16S and 18S rRNA Amplification Kits and desired primers
- Currently have supplies for cell lysis and gDNA purification.
- Plan for sample processing:

Isolate gDNA from flocked swab samples, amplify genetic material using 16S and 18S protocols, run amplicon using electrophoresis (retrieve sample), quantify amount of genetic material in gel column, sequence using MiSeq Personal Sequencer.

Members and Roles

Jessica Sandoval (Biological Engineering, 2015) - Team leader, Mechanical Build/Design, Recovery Team member, Biotic analysis of samples

Ethan DiNinno (Aeronautical and Astronautical Engineering, 2016) - Electrical Design

Rodrigo Gomes (Computer Science, 2015) - Programming/Website Development, Recovery Team member

Jeremy Kaplan (Computer Science, 2015) - Programming/Website Development

Christopher Carr - Research advisor for ASTRO team