

HASP Monthly Status Report - June 2014

Balloons over Volcanoes Team

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1 Synopsis

- Completed acoustic array
- Developed and tested logger powering system
- Mounted acoustic array on flag pole and tested microphone performance
- Submitted PSIP revisions

2 Activity Summary

We made modifications to the power system to isolate the data logger from the microphones. The performance of the DC DC voltage step down was evaluated during stress tests designed to ensure correct operation of the data logger over the full range of voltages supplied by HASP. We found that the step down operated correctly at 24 volts and 37 volts, demonstrating that the logger power system will function over the 28-32 volt range provided by HASP. The acoustic array wiring was completed and each of the three microphones was mounted in a black insulated lunch box. The array acquired data during a field-scale experiment consisting of chemical explosions designed to mimic steam blasts at volcanoes. The instrumentation and wiring was mounted on a 25 foot tall flag pole to provide vertical control at the experiment. The array continued to operate in gusty winds, brief periods of light rain, and gravel impacts from the explosions. A Ref Tek 130 data logger instead of the Data Cube was used due to the high frequency content of the acoustic signals from the blasts.

3 Issues Encountered

Channel 2 (the middle microphone) lost acquisition for several hours during the second day of blasting. We will investigate the cause of this but it is likely due to a loose connection. During prototyping of the power system, we noticed that the DC DC step down was warm to the touch. However, this was not observed during further testing.

4 Milestones Achieved

The acoustic array is complete and operated successfully during adverse field conditions.

5 Team

The student team consists of Daniel C. Bowman and Rebecca Rodd (University of North Carolina at Chapel Hill), Jacob F. Anderson (Boise State University), Aaron Curtis (New Mexico Tech), and Tierney Larson (Yale University). Jonathan M. Lees (UNC Chapel Hill) serves as Faculty Advisor. Paul Norman and Kyle Jones are outside advisors.



Figure 1: The HASP acoustic array records an explosion during an experimental volcanology initiative in Buffalo, New York.