

HASP Monthly Status Report - May 2014

Balloons over Volcanoes Team

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1 Synopsis

- Successfully negotiated array design with CSBF
- Tested instrumentation and logger
- Completed inter array and array to logger signal cabling
- Obtained ground infrasound array data from Sandia National Labs
- Began analyzing ground infrasound data

2 Activity Summary

We tested the infrasound microphones that we plan to fly, and found several problems. Thus, we had to switch out one microphone model (gray screw-on plastic case) for another (clamshell Pelican case) on Channel 1. Channels 2 and 3 remain the gray screw-on plastic case models, although channel 2 has a fragile power connection and may be switched out as well if needed. During testing, we determined that powering the data logger and the microphones from the same source caused unacceptably high electronic noise. Therefore, each microphone will have its own battery pack. After working through these problems, we successfully tested the array for over twelve hours (see Figure 1).

The Columbia Scientific Balloon Facility (CSBF) and our team determined that each microphone will be attached to a rung on the ladder between the HASP payload and the parachute. Microphones and their battery packs will be installed inside insulated lunch boxes. The array will be attached to our logger on the payload plate via a 50' cable. We plan on ordering the lunch boxes within the next few days. The microphone packages will be tested during an experimental volcanology initiative in mid June, in which they will be installed on a 25' flag pole above small chemical explosions.

Team member Tierney Larson has received data from a ground infrasound array near Socorro, New Mexico, and she is currently cataloging the events in that data set. This will assist us in anticipating and interpreting signals recorded during the flight.

Goals for June include setting up and testing the voltage step down for data logger powering, constructing the 50' logger to array cable, and installing the payload box.

3 Issues Encountered

The electronic noise induced by the logger required us to redesign our power system. Testing also revealed faulty microphones and fragile power connections.

4 Milestones Achieved

We have successfully logged infrasound data in the laboratory and we have begun quantifying the signals we expect to see this August.

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). Rebecca is an incoming Ph. D. student working with Jonathan Lees; she is assisting in array construction and testing. Jonathan M. Lees (UNC Chapel Hill) serves as Faculty Advisor. Paul Norman and Kyle Jones are outside advisors.

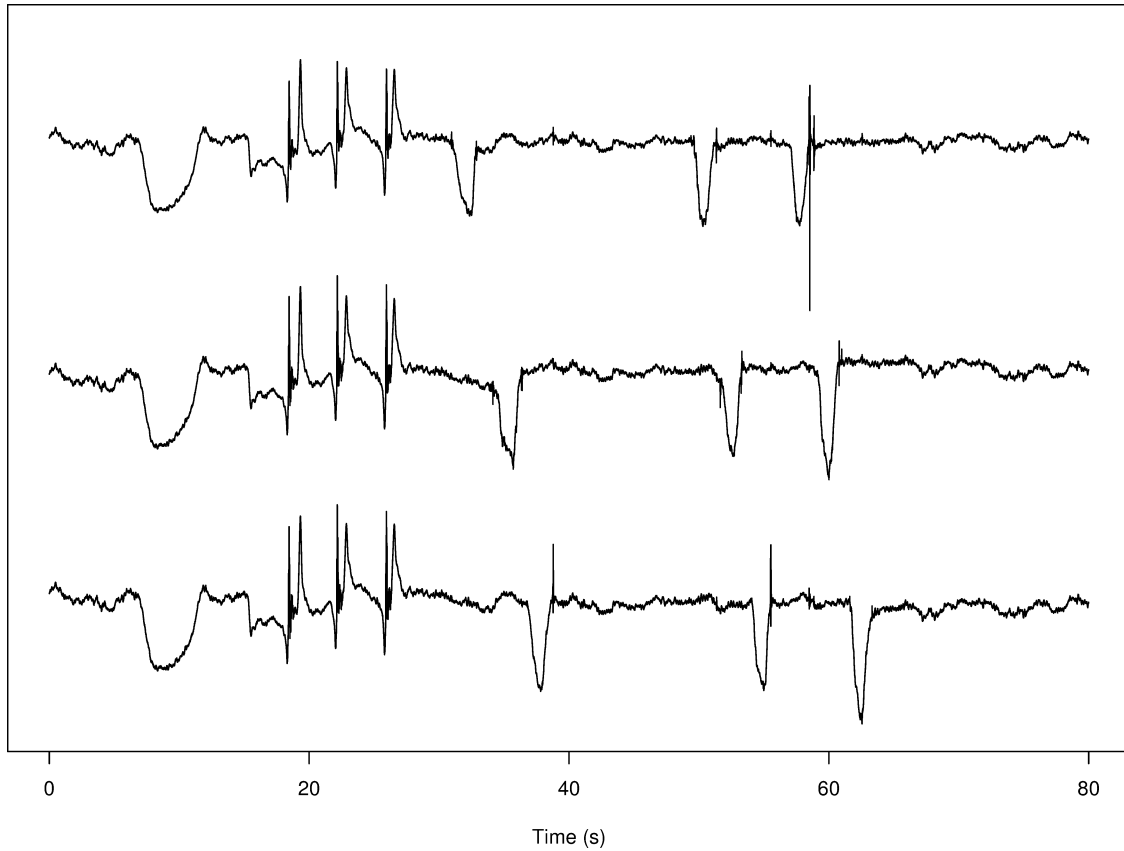


Figure 1: Testing the NASA HASP infrasound array at 400 samples per second. The first signal, at about 10 seconds, is probably the HVAC in the building turning on or off. A set of three impulsive signals at 20 seconds was created by repeatedly slamming the laboratory door. The final set of three signals (from about 30 seconds on) were created by lifting each microphone in succession; hence the slight delay between each trace.