

# Gannon University HARD payload

Status Report #6

6/29/2012

## 1. Achievements

- Integration test of most subsystems successfully completed
  - Scintillator and photodiodes were properly assembled for integration test in real situation of receiving cosmic rays in the lab.
  - Detector module including photodiodes, SSPM amplifier, and OP-AMP based comparator successfully detected cosmic rays in the lab and produced pulses with peak amplitudes greater than 2.4 V that is the threshold for logic High and Low for the microcontroller.
  - GPS module was successfully integrated; the microcontroller extracts the strings from our GPS in the same format as the one from HASP GPS (\$GGA string)
  - A new servo was purchased that can rotate 360 degrees in one direction (previous one had 180 degrees) and successfully tested and integrated.
  - An electronic compass was purchased, unit-tested, and successfully integrated with the microcontroller and the servo. Its integration test was successful.
  - Power module design is completed (but needs revision to avoid using resistors to down-convert 30 V to 10 V that will drive the microcontroller to produce 5 VDC output). As the photodiodes require 29 V for operation, an additional 5V (portable) battery will be used for the dual-power OP-AMP (comparator).
- A few payloads are ready for gluing and overall assembly with electronic & mechanical parts.
- Aluminum plate was purchased for thermal treatment as a heat sink to transfer internal heat to the mounting plate.
- Final PSIP submitted (and got brief feedback on the use of resistors intended as a voltage divider)

## 2. Issues

- (Minor) SD card for store data needs more attention since (as of now) it is not writing as frequent as it is instructed.

## 3. Next Steps

- Complete assembly of a payload with all electronic/mechanical components
- Complete a test plan to validate “plug-and-play” operation of the payload

## 4. Current team members and leader

Nichole McGuire, Electrical Engineering (Team Lead)

Aaron Neiman, Computer Engineering

Joe Veneri, Electrical Engineering

Dr. Wookwon Lee, ECE Faculty Advisor

Dr. Nicholas Conklin, Physics Faculty Advisor