

# Gannon University HARD payload

Status Report #3

3/29/2013

## 1. Achievements/Work in Progress

- Search for, and design of, a new ‘digital’ comparator is ongoing; during this reporting period, the team acquired new comparator chips that deemed appropriate for the purpose, but recent lab testing revealed that its processing delay from the input to the output of the chip was excessive. Placed new orders for better Comparator units. Until those chips arrive and prove to be useful, our Option B of using last year’s analog comparator chips will be in effect.
- Finished testing of photomultiplier (PM) and its multiplier boards using a light source based on an in-house LED driver circuit. This test was conducted to hand-pick the best four photomultipliers for the payload operating with the 30 Vdc HASP power supply. The team finalized 4 sets of PMs and amplifier boards to proceed to subsystem integration.
- DC-DC step-up (from 30 Vdc HASP to 40 Vdc) converters are needed for those four PMs/amplifier boards as PMs’ inherent, operating voltages lie between 30 and 40 Vdc. Two DC-DC converters of 20 Vdc in series will be used to get 40 Vdc (only to supply power to PMs) as lab testing with 2.5 V DC-DC power converters showed desired functionality.
- Fully tested and revised code for SD card, E-compass and Servo.
- Physical construction of a payload is in progress with most hardware parts in.

## 2. Issues

- No major issues.

## 3. Next Steps

- To finish integration of Comparator unit with Photomultiplier and its amplifier board (4 sets)
- To integrate PMs, amplifiers, and scintillators, and finish lab testing & verification.
- To finalize all software implementation for microcontroller to interact with all other subsystems.
- To continue and finish work on construction of HASP 2013 payload framework.

## 4. Current team members and leader

Aaron Neiman, Computer Engineering (HASP 2013 Team Lead)

Bennett, Joseph, Electrical Engineering

Codi Wasser, Computer Engineering

Kelvin Joefield, Electrical Engineering

Yousef Samkari, Electrical Engineering

Dr. Wookwon Lee, ECE Faculty Advisor

Dr. Nicholas Conklin, Physics Faculty co-advisor

Prof. Donald MacKellar, ECE Faculty co-advisor