LRR Balloon Launch

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Basics

- PMS
- Payload 1 Accelerometer
- Payload 2 GPS Tracker
• Used the PMS from the last launch this was the plan
• Integrated with the new payloads
• Accelerometer

• At first was the ADXL345 but interfacing with that and getting decent data was complicated

• Used ADXL335 because it gave analog output at 3 analog pins

• Used the same number of pins

• Better data

• Better power consuptions
Payload 2

• Gas sensors
  • Started with 4 of them
  • Heated
  • 5 V and 33 Ohms over the heaters gives ~ 150 mA which is too much! For the arduino
• Since this is too much we ran external battery through a voltage regulator, easy to power the arduino externally now

• But wait!
Heater

• It’s a heater and the gas sensor like a constant temperature

• How in the world do you control the heater with an output from the Arduino at 150 mA?
PID control

- This means we PID controlled the output through a digital pin and bumped the current with a transistor. Due to the wanky heater wiring had to use a P-controlled FET transistor.
It Works

• The heater is PID controlled and it works
Testing

- Tested by putting in a fridge, PID control responded appropriately.

- Due to the P-type transistor it is unreasonable to get the heater to the temperature that we really want, the voltage out will just be 255 through the digital (1023 or ~4.3 volts to the heater (not enough fix later part of what we are testing))
• Everything then got tested together.
• Able to watch voltage, current, temp, to payload 1 and 2 all going to one SD card
• GPS and Accel writing to another SD card
• Heater temp, voltage, output, and PID control info is going to a third SD card
Testing cont.

• Not tested in a vaccum but voltage are relatively low so the chances of anything happening are really low

• GPS and Accel was tested for 2 hours with solid data

• Gas Sensor was run for 17 hours with great data
Questions?