**First Design Report**

**Section 5:**

**1. Wiring Diagram (PDF)**



**2.Please describe all your arming switches: Mechanical, Magnetic, Bluetooth**

The arming is done with two pull pin switches (Omron SS-5G). PullPin 1 (Containing two limit switches) activities the main SRAD flight computer and RRC3. While Pull-pin 2 arms the Telemetry module (initialisation begins), Cameras (recording starts) and sends power to the Load side of the MOSFETS, completely arming the system.

**3.Please describe the redundancy built into your recovery electronics.**

Both the SRAD Flight Computer and the COTS altimeter (RRC3 Sport) are powered and wired separately (They are completely isolated). The primary batter powers the SRAD FC while the Secondary battery powers the RRC3.

There are two black powder charges each for the main and drogue parachutes, which are ignited via:

1. MOSFET switch in the SRAD FC
2. Main and Auxiliary ignition channels on the RRC3

**4.Please describe your arming sequence once the rocket is vertical on the pad.**

Once the rocket is vertical on the pad. The only arming left will be to pull the pull pin switches. The first pull pin switch is removed, we will wait for two queues:

1. The long beep off the RRC3 to indicate that its turned on and ready for launch
2. We will also be monitoring the logs menu on the plotter interface, to check for the initialisation of the all the components of the SRAD FC.

Next the second pull pin switch is removed, after which we just wait for the initialisation of the telemetry module (which can be checked via the log monitor as well as the stabilisation of the LED on the receiver telemetry module).

After which the rocket is completely armed and we can head back…

**Section 8:**

**1.Enter the manufacturer and model of your COTS altimeter.**

RRC3 "SPORT" DUAL DEPLOYMENT ALTIMETER

**2.Enter the manufacturer and model of your COTS altimeter or enter SRAD for a student-built flight altimeter and provide detailed information in the Recovery Narrative below.**

SRAD

**3.Please help us to help you, by filling this box out as completely as possible. Identify every independently recovered part of the launch vehicle and its recovery scheme. As appropriate, identify its associated recovery events, means of event triggering (e.g. barometric, magnetometer, other...), the redundancy of those event triggers,**

**and the altitude those events should occur at. The more information we have the better we can help you.**

The main components involved in the detection of apogee are the two barometric pressure sensors. They are LPS22HB (Low G, High resolution) and MS5607(High G, Low Resolution). The data from these sensors will be used to measure the change in pressure of the rocket environment. When the pressure stops decreasing and starts to increase, apogee is flagged. The ejection charge is sent to the drogue parachute. The main parachute is fired after a set delay. This delay is calculated by taking in mind the rockets descent rate and optimal recovery circle area…

**Section 9:**

**1. If SRAD tracker is used, add details in the GPS Narrative field. If Multiple Trackers are used, add details in the GPS Narrative field.**

Featherweight GPS Tracker (915MHz)

**2.Please help us to help you, by filling this box out as completely as possible. For SRAD GPS Solutions provide a narrative around your solution. The ability to easily change frequency, utilize APRS, and extensive testing of the solution should be included. The more information we have the better we can help you.**

The Featherweight GPS serves as the primary GPS tracker for the rocket. It will provide us with updates over the phone app. The GPS module (Mikroe GNSS 7 Click) will also capture location data and send it via the common telemetry link (915Mhz) to the ground station plotter interface. This data is being used to validate our plotter and sensing performance. However, the main tracking work will be done by the COTS GPS.