

## Mudd III Preparation Checklist

- If you have not done so, model the flight of your rocket with your selected motor in Rocksim. Verify that the initial acceleration is 6 g or higher and record the predicted apogee in feet and the time to apogee on the flight card.
- Measure the voltage of both batteries with a meter. If a battery is below 8.5V replace it.

### R-DAS Programming Verification

- Power R-DAS. Don't over torque the switch screw. It is possible to break it off of the PC board and they are a pain to replace.
- Attach R-DAS to computer with USB cable.
- Get Config.
- Set/Verify G-Switch.
- Set/Verify Drogue at Apogee.
- Set/Verify Timed to Drogue at calculated time-to-apogee plus 2 seconds per 1000 feet past calculated apogee.
- Set/Verify Main at. Any altitude below apogee and above 0 is OK.
- Set/Verify SR to 200 Hz.
- Set/Verify all ADC channels are ON.
- Go to Downlink/OSD tab
- Set/Verify transmitter ON and correct channel (same as team number)
- Store Config.
- If there is any question, set volume to loudest.
  - Add terminal window to R-DAS interface.
  - Type " c buzz 3<return>" in window. It will not show what you type.
- Get Config again.
- Verify all settings.
- 2<sup>nd</sup> person verify g-switch, Drogue at Apogee, and timed Drogue.
- Power down R-DAS. It is not necessary to Store Config again.
- Disconnect computer from R-DAS.

### Sensor Selection

- Set the three sensor-selection switches to either
  - 1 – Vibration Sensors,
  - 2 – IMU and Pitot, or
  - 3 – Temperature and Pressure.
- For vibration sensors, choose which six of the sixteen sensors you want to use and set the patch bay accordingly.

- Record the vibration sensor/patch configuration on the flight card and in your notebook.
- Reassemble rocket.
  - Verify orientation of avionics board (either marked line or Video anchor tab) and slide into rocket.
  - Reconnect 20-pin connector. If possible guide connector and cable down into motor holder
  - Connect video power cable to camera pod.
  - Place and secure camera pod on rocket.
  - Verify orientation of recovery section, slide together, and attach anchor screws.

### Check Video

- Go to Video Telemetry station.
- Power on Video. Don't over torque the switch screw. It is possible to break it off of the PC board and they are a pain to replace.
- Verify video transmitter is working on correct channel.
- Power down video.

### Check Telemetry

- Go to Telemetry station.
- Power on R-DAS.
- Verify that the telemetry station is receiving the telemetry from the rocket.
- To the extent possible verify that the sensors are functioning correctly, e.g., shake and rotate the rocket for IMU, tap for vibration.
- Power down R-DAS.

### Parachute loading (Proctor Supervised)

- Remove nose cone and pull out shock cord and parachute.
- Inspect shock cord
- Visually inspect chute for hardware defects and security.
- Take one handful of un-clumped recovery wadding and loosely pack into chute section. **Warning:** Tightly packed and under-packed are both fatal to rockets.
- Fold/gather shock cord up to parachute and load into chute section.
- Fold chute; make sure lines are orderly; wrap shroud lines around chute. Be sure the proctor inspects your chute folding and wrapping procedure.
- Put chute into recovery section; make sure it slides freely.
- Load the rest of the shock cord into the section.
- Insert nosecone into end of rocket.

Fill out Flight Card. Include **ALL** requested information except Pad Number, RSO/LCO comments and RSO and LSO initials.

### **Motor Insertion (Proctor Supervised)**

- Put on safety glasses.
- Record information on motor model, etc.
- Insert and secure motor.
- Tape igniter to outside of rocket.

### **Recovery Charge Preparation (Done by Proctor)**

- Move rocket to recovery-charge loading area.
- Leave on safety glasses.
- Have proctor insert recovery-charge bolt and connect electric match.
- Carefully reassemble rocket and secure with screws.
- The rocket is now LIVE, *do not* permit nosecone to point at anyone.

### **Rocket Check-in**

- Take rocket, checklist and flight card to RSO to have rocket inspected.
- Take rocket to check-in table (or LCO) to turn in flight card and be assigned a launch pad.
- When given all clear, proceed to assigned launch pad.

### **At Launch Pad (Proctor Supervised)**

- Remove bottom pin from launch stand.
- Pivot launch rail to almost horizontal.
- Slide rocket onto rail and down to rail stop.
- Remove Pitot tube cap.
- Pivot rail to desired angle and replace pin.
- Insert igniter into motor. Be sure it is fully inserted.
- Secure with red cap. Push the cap all of the way on.
- Attach alligator clips to igniter leads. Verify that the leads are not touching each other or the launch pad.
- Check/test continuity at relay box.
- Power on R-DAS and Video.
- Verify that telemetry and video telemetry are functioning properly.
- Record GPS position of rocket and orientation of IMU.
- Return to safe area.

## Rocket Recovery

- Wait until all rockets on launch pads have been launched and you are given the all clear signal by the RSO or LCO.
- Proceed to your rocket.
- If GPS is available, record GPS position of rocket and if possible the IMU orientation.
- Immediately** turn off R-DAS and Video power. Don't wait to return to the prep area.
- Inspect for damage.
- Return to rocket prep area.

## Data Retrieval

- Power on R-DAS. **Always** power on the R-DAS **before** connecting the computer.
- Attach R-DAS to computer with USB cable.
- Download data from R-DAS. If it won't download, try Get Config and then download.
- Save the data file. The name should be in the following format:
  - Rocket size (M, L),
  - Rocket number (2, 3, 5, 6, or 7),
  - Flight type (IMU, TP, VIB),
  - Motor designation before the dash, e.g., G61W,
  - S followed by section number,
  - T followed by team number,
  - F followed by flight number (for your team),
  - Underscore then date in YYYYMMDD format.

The file should have the .rd extension. For example, if Team 2 of section 5 flew large rocket #6 with the sensors set to IMU for their third flight on a G339N-P on April 15, 2009, the file name would be L6IMUG339NS5T2F3\_20090415.rd .

- Export a Raw Data file with the same name as the flight data file, but with the .txt extension, e.g., L6IMUG339NS5T2F3\_20090415.txt .
- For data redundancy, take the rocket to another computer and repeat the download and export procedure.

## Post Flight Prep

- Do an inspection and report any visible damage.
- If there is dirt in the Pitot tube, invert the rocket and clean out the tube using a drill bit or similar implement.
- Replace Pitot tube cap.
- Remove motor casing and take it to used motor storage area.
- Take rocket to flight prep area for next team.