Presentation Outline

• Section 1: Mission Overview
• Section 2: Integrated Subsystem Testing Status
• Section 3: Full Mission Simulation Results
• Section 4: Project Management Update
1.0 Mission Overview

Steven Hard
Mission Overview

• Capture NIR Earth images from space, measure magnetic field of Earth, gather redundant flight dynamics data, & detect ionized particles
  – Need access to optics port

• Benefits SmallSat community – COTS orientation estimation
Concept of Operations

- **Launch**: 
  - $H = 0$ km ($T = 0$)
  - Begin data acquisition

- **End of Orion Burn**: 
  - $H = 52$ km ($T = 0.6$ min)
  - Boom extension triggered

- **Apogee**: 
  - $H = 115$ km ($T = 2.8$ min)

- **Chute deploys**: 
  - $H = 10.5$ km ($T = 5.5$ min)
  - Chute deploys

- **Boom retraction triggered**: 
  - $H = 11$ km ($T = 5.3$ min)

- **Splashdown**: 
  - $H = 0$ km ($T = 15$ min)

- **All systems on**: 
  - $H = 0$ km ($T = -3$ min)
2.0 Integrated Subsystem Testing Status

Steven Hard
Integrated Subsystem Testing Status:

- HAB flight test – 5/23 (integration in progress)
  - SPACE-4X operation and data analysis
  - WVU-CAM operation and data analysis (no boom)
  - PDS voltage regulators and activation switch
- Mechanical integration and fit check – 5/26
  - SSP verification
  - WVU-CAM boom operation
- ATK vibration test – 6/1
  - SSP performance validation
  - Full mission simulation
Integrated Subsystem Testing Status:

1.0 HAB Flight Test

This will verify that all systems (except WVU-CAM Boom) are functioning properly in flight conditions over extended operations

Test will be performed on 5/23

Payload integration started on 5/15 and will conclude on 5/22
1.0 Mechanical integration and fit check

This will provide verification that all subsystems fit with volume constraints and are support/positioned properly

Test will be performed on 5/26

Additional tests on WVU-CAM Boom will be performed to verify operational limits are satisfied
Integrated Subsystem Testing Status:

1.0 ATK vibration test

This will verify that the SSP subsystem adequately supports all other subsystems and that all electronics are operations through/after testing

Test will be performed on 6/1

Additional tests will be conducted at Wallops Island on 6/21

Include pictures and/or screen shots of data or test

USE this slide for each integrated subsystem
3.0 Full Mission Simulation Results

Steven Hard
Full Mission Simulation Results

- Give overview of test
  - Who, what, where, when, how long, how many times (if you’ve had multiple mission sims accounting for previously discovered issues, please discuss in the upcoming slides)
  - Explain if anything wasn’t in flight configuration (not fully integrated in canister, some PCB missing, etc) and **WHY**
  - Show pictures of your test setup
  - Discuss plans for follow up testing
Full Mission Simulation Results

• What action items do you have left between now and LRR?
  – ATK vibration test
  – Action items in preparation are summarized in project summary
4.0 Project Management Update

Steven Hard
Action Item Summary

- WVU-CAM 3D printed parts 5/19-5/22
- HAB payload integration 5/22
- WVU-CAM full integration 5/25
- SPACE-4X full integration 5/26
## User Guide Compliance

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Status/Reason (if needed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center of gravity in 1&quot; mid-can?</td>
<td>With 1’</td>
</tr>
<tr>
<td>Contained in can</td>
<td></td>
</tr>
<tr>
<td>Connected to can by 4/5 bulkheads on top and bottom only</td>
<td></td>
</tr>
<tr>
<td>Mass at 10±0.2lbs (half can)</td>
<td>Currently 10 lbs with ballast for 0.2lb tolerance</td>
</tr>
<tr>
<td>Shared canister clearance</td>
<td>1” separation between payloads – needs verified</td>
</tr>
<tr>
<td>No voltage on the can</td>
<td>No opportunity to check yet</td>
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<tr>
<td>Activation wires at least 4 ft</td>
<td></td>
</tr>
<tr>
<td>Activation wire at least 24 gauge</td>
<td>22 gauge</td>
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<tr>
<td>Early Activation: current &lt; 1 A</td>
<td>No opportunity to check fully integrated current draw yet</td>
</tr>
<tr>
<td>T-0 Activation: current &lt; .1 A</td>
<td>Not using</td>
</tr>
<tr>
<td>Battery Type</td>
<td>Ni-mh (will not charge at Wallops)</td>
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</table>
Biggest Worries

• WVUTech-SPACE software woes
  • May have to off-ramp SPI comm (IMU)
• WVU-CAM software analysis
  • Not much effort put into data analysis yet
• HAB launch recovery
  • Risky business if payload is non-recoverable
Conclusions

• Somewhat behind schedule but have plan in place to mitigate risk if worse-case scenarios occur
• Non-US citizen attending launch

• Discuss Check-In Procedure – you don’t have to put anything here, this is just an FYI that we will be talking about this (I will be quizzing you on it so be familiar!)
• Discuss Presentation to RockOn! 2015
• Discuss Final Report
• Discuss extra launch attendees