Achievements in Developing an Advanced Standard for CubeSats

10th Annual CubeSat Workshop

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25 April 2013

6U Canisterized Satellite Dispenser (CSD)

6U Payload
Advanced Standards are Important and Urgent

- **Gap in existing capabilities**
  - Commercial and government missions can benefit from larger CubeSats
- **Lots of advanced developers**
  - Designing or building 6U+ Payloads and CSDs
  - CubeSat integrators
  - Launch services for CubeSats
- **Standards maximize market opportunity**
  - Payloaders have best choices
Published Standards for Three New Sizes: 6U, 12U and 27U

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Standard for the Payloads....

Published Standards for Three New Sizes: 6U, 12U and 27U

Available at www.planetarysystemsCorp.com/#!__downloads

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Payload Features and Advancements

- Tabs – preempt a load path problem as CubeSats get bigger
  
  **PROBLEM:** Payload can rattle in dispenser
  
  **SOLUTION:** Preloaded tabs guarantee invariant load path

- Increased mass capabilities to 2kg per U

- Electrical interface to dispenser/LV
  - Payload adds an optional 15 pin in flight disconnect (Separation Connector)

- Allow dispenser constrained deployables
  - Payload designers no longer need release mechanisms for deployables
Upcoming Changes to the Payload Specification

**Known Changes**

- Aluminum tabs that interface with the CSD shall be hard anodized
  - Provides better surface than bare aluminum
  - Conductive path to CSD via optional 15-pin Separation Connector

**Potential Changes**

- Add increased height (+Y) to 3U and 6U
  - Allows conversion of current 3U hardware to tab design

- Conductive path to dispenser though – Z payload face

- Accommodating a non-singular tab design
  - Payloads can be modular
CSD Features

• **6 Mounting faces**
  – Eliminates the need for adapters
  – Eliminates blind interfaces
  – Ability to easily bolt-on features

• **Door and initiator does not protrude past mounting surface**
  – Can eliminate interference with LV surfaces or nearby payloads

• **15-pin separation electrical connector**

• **Automatically resets**
  – Motor driven, no consumables, truly test like you fly

• **Additional payload access via door and side panels**

• **Accommodates existing 3U CubeSats via adapter kit**
CSD Qualification Testing Summary

PSC has successfully completed qualification testing of 3U and 6U CSDs

- **Thermal Vacuum**
  - CSD operated successfully at initiation voltages extremes at high and low thermal limits.

- **Vibration**
  - Random excitation in all 3 axis and multiple mounting configurations.

- **Strength**
  - Performed as sine burst.

- **Shock**
  - High level excitation in all 3 axis and multiple mounting configurations.
What’s Next?

• Launch CSDs
  – Summer 2013: A 3U CSD will deploy the POPACS mission on a Falcon 9
  – Two 6U CSDs manifested on two DOD missions

• Potential updates to the Payload specification and CSD design
  – Increase 3U height by 3mm to accommodate tabs on existing CubeSats

• Complete qualification testing of the 12U CSD