PolySat

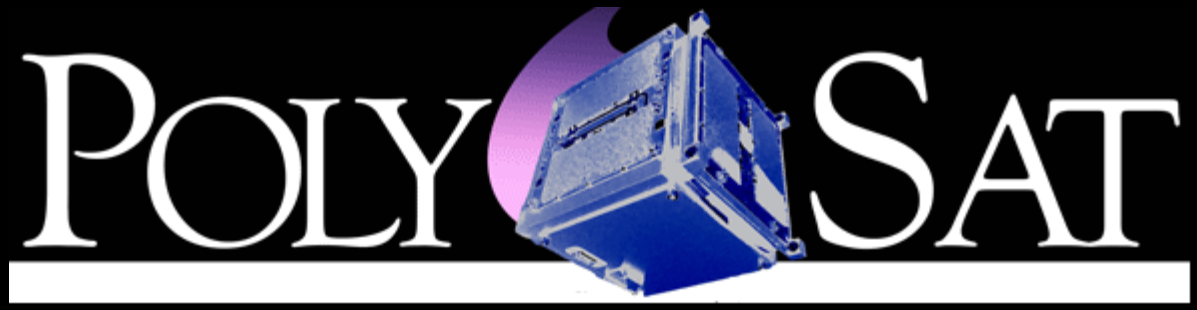
Project Update and Intern Program

CubeSat Developers' Workshop
Logan, Utah
9 August 2009

CAL POLY

PolySat

- Objective: Engineering Education
- Objective: Provide a reliable bus system to allow for flight qualification of a wide variety of small sensors and attitude control devices.



Current Projects

	Mission	Status	Future Developments
CP3/4	Test bed for custom structure, EPS, CDH, and attitude determination experiments.	Comms and EPS still functioning, C&DH (CP3) still functioning.	Continue data collection.
CP5	De-orbiting experiment	Design and Testing	Flight Model
CP6	CP3 re-fly with improved receive (LNA), bus software, and an NRL Payload	In orbit, comm. and C&DH operating successfully, collecting sensor data	Compare with CP3 sensor data, Initiate NRL payload at end of life cycle
CP7	Characterization of particle dampers in orbit	Flown on NASA Zero-G flight, data being analyzed	Flight model with hardware/software revisions
EPS	Provide a low-cost, reliable power system solution.	Final revisions for mass production have been completed	Ready by Q4 2009
Beacon	A hardware and software beacon solution for NPS.	Prototype development completed	Testing and integrating with NPS C&DH

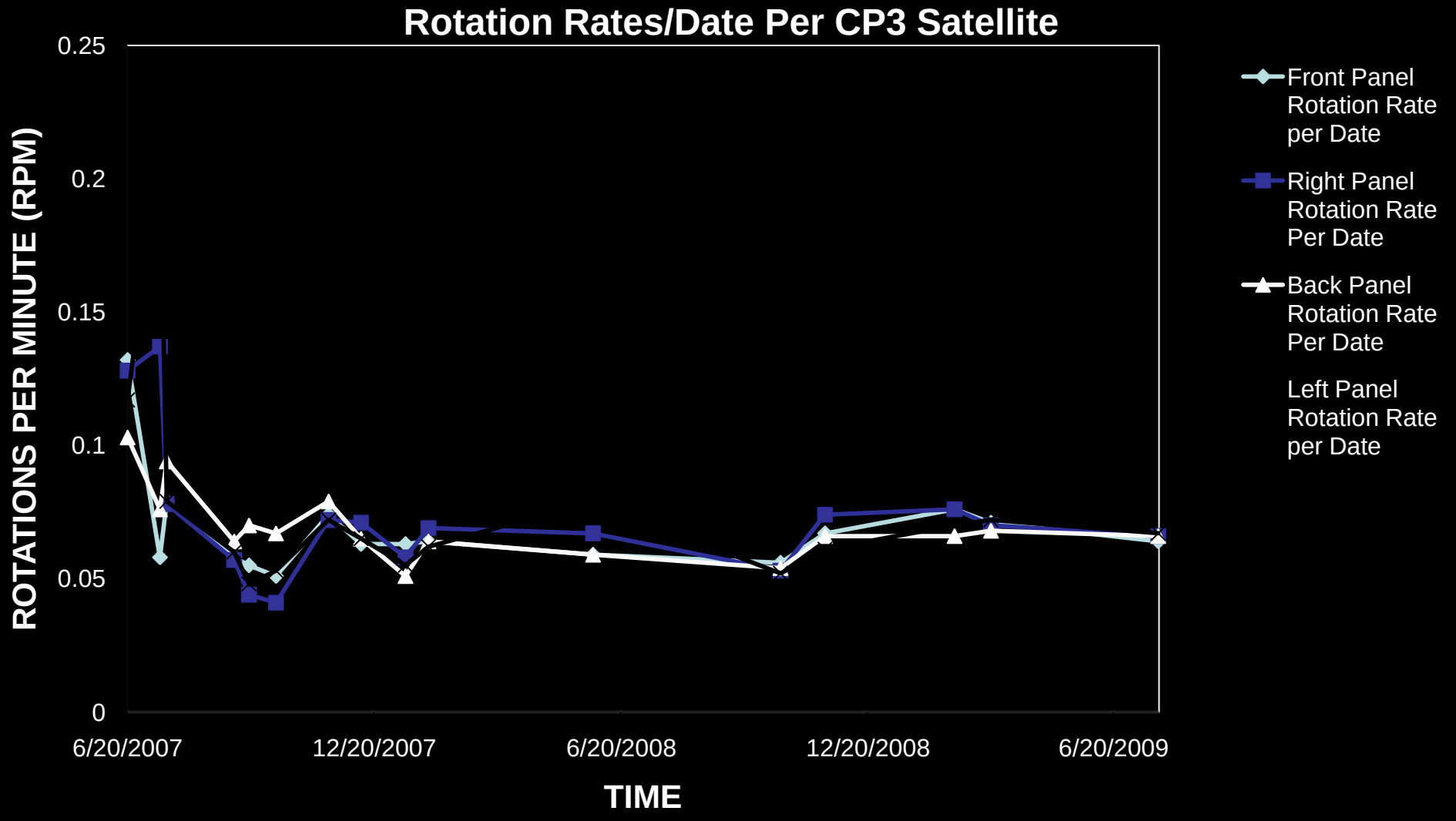
High School Interns

- Community outreach through a high school internship program
- Local students invited to the lab for the summer

Intern Work

- Analyzed over 2 years of sensor snapshot data from CP3
- Various characterizations:
  - satellite spin rates
  - solar cell degradation
  - energy generation

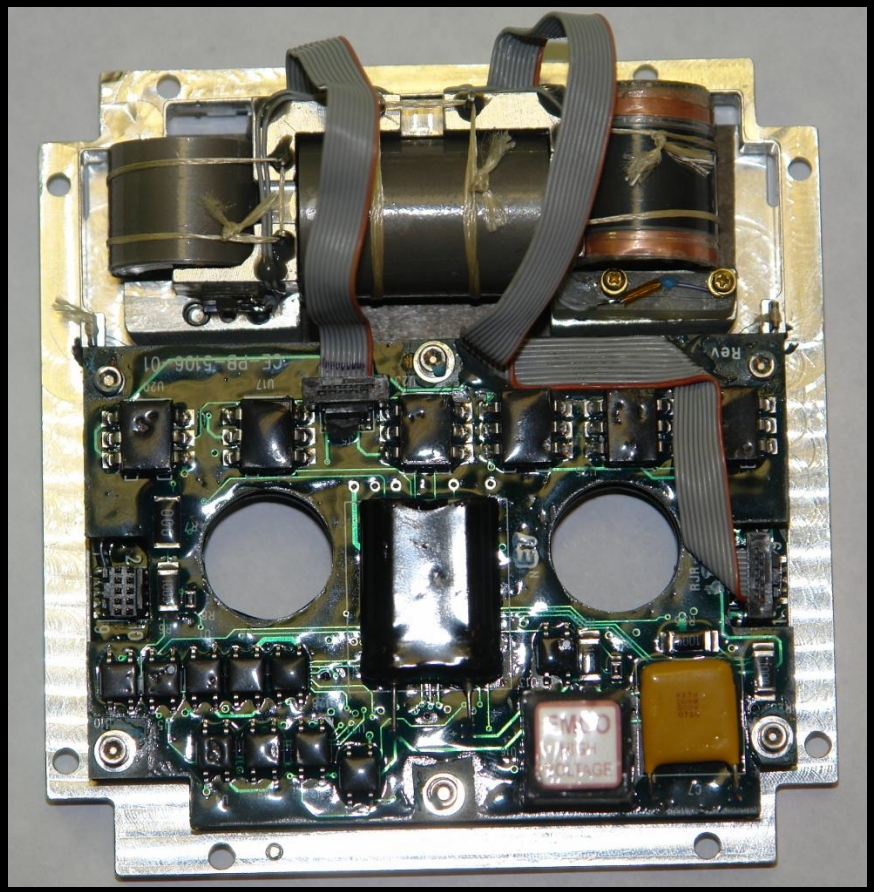
Intern Data Results Sample

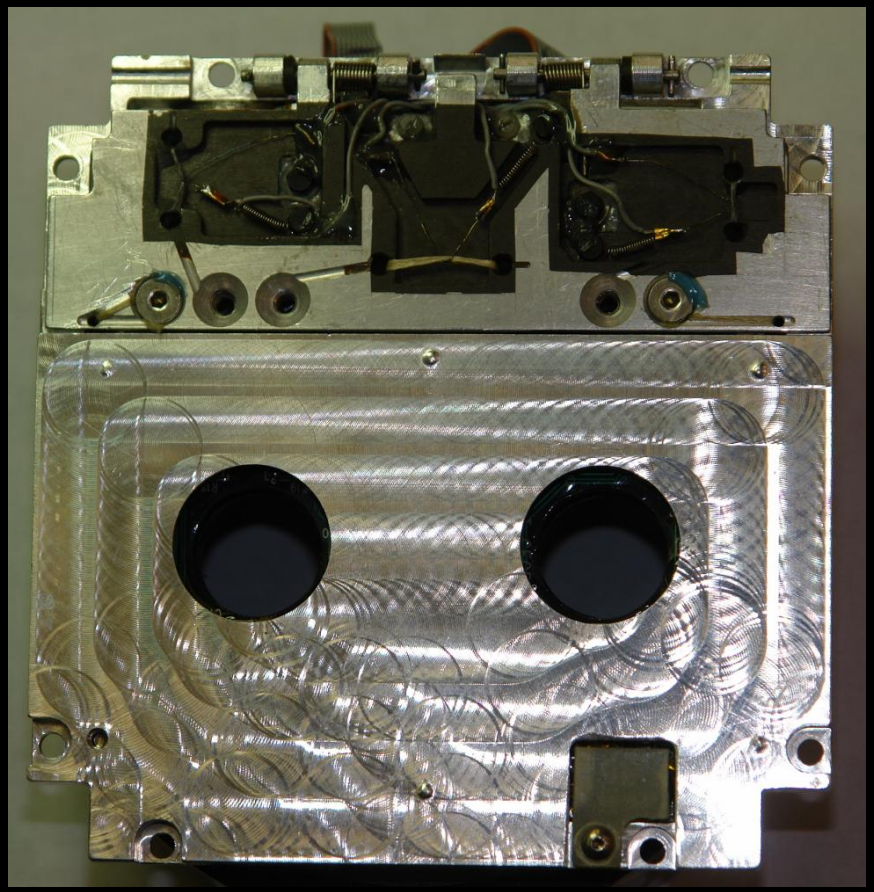


CP6 Overview

- Bus Improvements:
  - Low Noise Amplifier
  - Software stability
- Naval Research Laboratories Payload
  - Electron emitter and collection experiment
  - Two collectors, one emitter
  - Precursor to full electro-dynamic tether experiment

CP6 Payload





NRL payload before integration

CP6 Data Collection

- CPX Data Decoder / More dBs
  - More dBs is written in Ruby
  - Designed to collect data from the TNC and display it in parsed form
  - CPX Data Decoder is written in MySQL/ Python
  - http://moredbs.atl.calpoly.edu

CP6 Contributor Locations

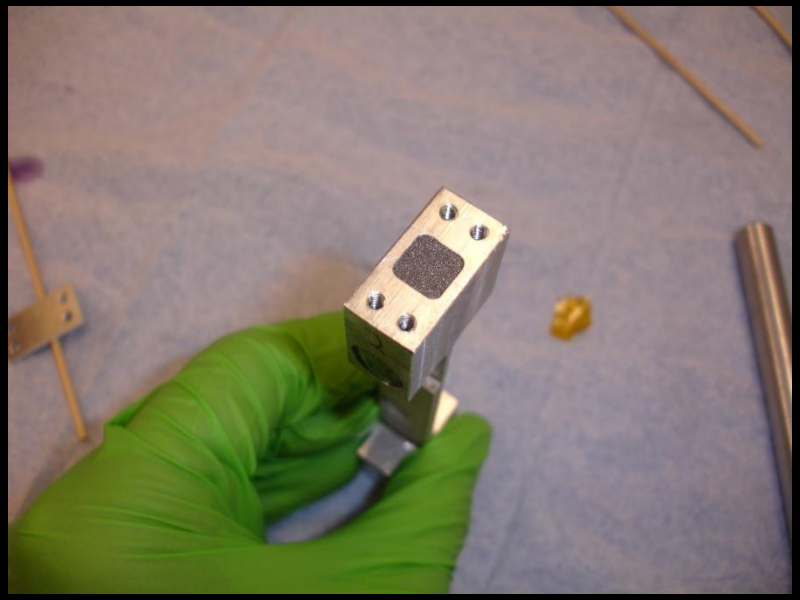
Thank you!

CP6 Contribution Statistics

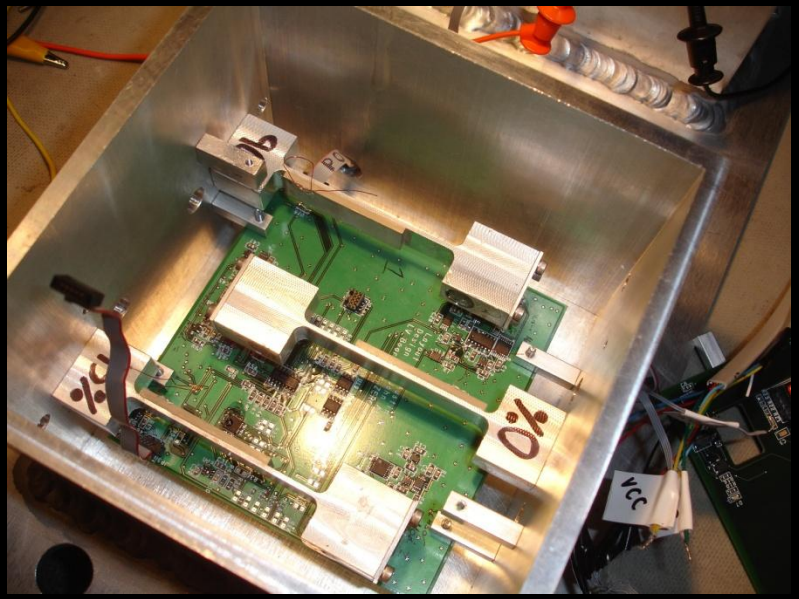
- Operators
  - Total Number: 66
  - Cal Poly: 14
  - 3rd-Party: 52
- Packets Down-linked
  - Total: 46805
  - Cal Poly: 18090
  - 3rd-Party: 28715
- Bytes Downloaded
  - Total: 3714234 (3.54 MB)
  - Cal Poly: 1163671 (1.11 MB)
  - 3rd-Party: 2550563 (2.43 MB)

CP7 Concept

- Particle Dampers
- Characterize with cantilever beams
- Driven at various frequencies/amplitudes



Cantilever beam tip mass shown filled with a fine tungsten powder before being capped off with a lid



Mounted beams shown with data acquisition electronics

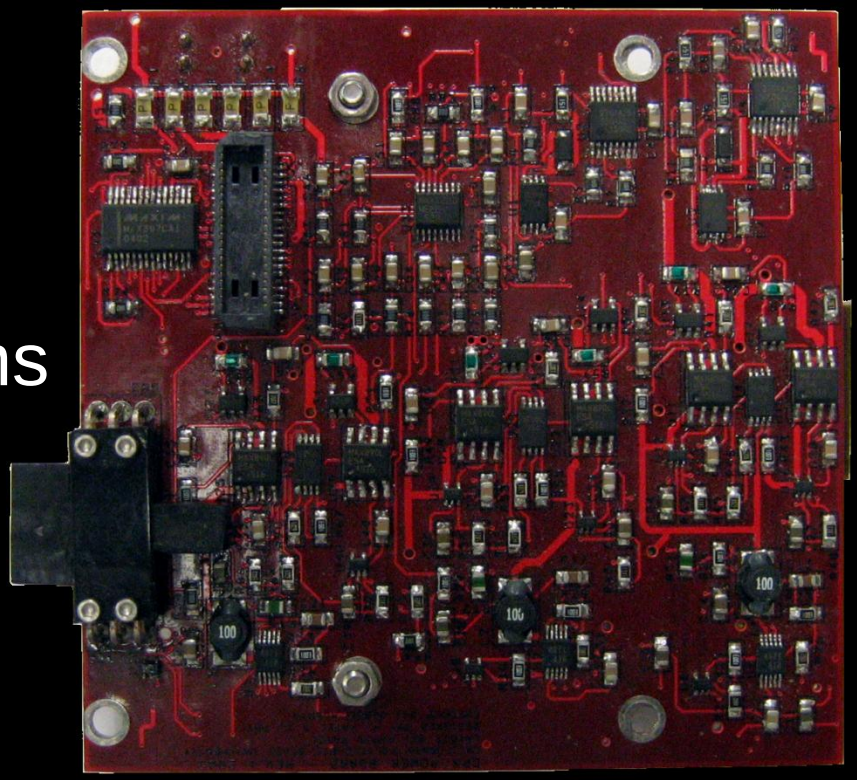
CP7 Parabolic Flight Testing

- Preliminary testing on parabolic flight
- All basic electronics and mechanical systems designed to CubeSat spec

CP7 test rig shown on parabolic flight with PolySat/CubeSat members (left to right): Austin Williams, John Abel, Alicia Johnstone, Stephanie Wong, Sean Fitzsimmons and Justin Foley

EPS - **Overview**

- Simple, low-cost 1U power supply for CubeSats
- Flight-proven system
- Aimed at University Programs
- See flyer outside at booth.



GENSO Contact info

- Genso Website : www.genso.org
- Genso Mailing List : genso-us@cubesat.org
- Any Questions about Genso please email Jason Anderson at anderson.l.jason@gmail.com

Spring Workshop 2010

- At Cal Poly, San Luis Obispo
- End of April 2010

Questions

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