Unchanged since CDR

- Documentation
  - Use of Redmine for issue tracking and hardware tracking

- Outgassing
  - All materials below TML<1.0% and CVCM<0.1%

- Magnetic Cleanliness
  - Minimize current loops, opposite batteries, twisted harnessing

- Parts Selection / Screening
  - Select for flight experience and radiation testing

- EEE Review
  - Schematic review, layout review, AIDS and Kits

- Facilities
  - Class 1000 flow bench (ISO class 6), nitrogen purged dry locker, TVAC chamber, mu metal house, and Haas CNC
New since CDR
Production Issues and Outsourcing

• Tight Fall quarter schedule
  • 51 tight tolerance aluminum and PEEK parts machined in house
  • 10 parts outsourced to Race Concepts
  • 6 parts outsourced to GeoSpencer
  • 24 parts (lower tolerance) to Protolabs
  • Outsourced some hand soldering (next slide)

• EPD wave washer springs from SeaStrom
  • Quality issues, looked at various vendors

• Tunacan kicksprings from Century Spring

• In house alodine, anodize by Barry Avenue Plating

• PCBs fabricated by Advanced Circuits
• Again, driven by tight Fall Quarter schedule

• Needed to complete qty 3-5 of each with only 2 technicians:
  • BETC, SIPS, IDPU, D1, D2, EFE, Preamp, -X/+X, all solar panels

• Had to outsource hand soldering to ACME PCB Assembly
  • SIPS, IDPU, D1, D2
  • Lowering quality solder job, mistakes, alignment
  • Some boards, we ended up redoing most of the solder joints anyways during QA process
  • All of D1 was done with unleaded solder, even though leaded specified
  • Saved time was worth higher cost
Improved digital AIDS

- Digitized in PowerPoint format
- Gets several rounds of review
- Unambiguous, ensures all boards are populated equally
- Issues usually traced back to error in AIDS

IC REG LIN POS ADJ 100MA 8WSON G367/657   LP2951CSD-3.0/NOPB

Exposed pad, needs reflow (Orientation Matters)

Resistor 0.0 OHM JUMPER 1/8W 3-Pad Select, 0603 G277   MCT06030Z0000ZP500

This resistor configures the MAX668 for either Bootstrap or non-Bootstrap mode. All BETC EM rev 4 units should be configured for Bootstrap.

Close these two pads
Stake EEE Components

- Staked large components with 2216 epoxy, layered when necessary
Conformal Coat

- Concoat due to concerns over conductive debris
- Kapton tape over mezzanine pins
- Arathane 5750 A/B thinned with Ultralane #1, used by Aerospace Corporation
  - Mixing ratio of 4.5/25/25g (A/B/t) by weight
  - Brush apply
  - Applied under strong UV light
  - Wicks up/thru connectors
Haywires

• Flying 9 haywires on ELFIN
  • WD, LETC1, LETC2, -X, IDPU (x2), +Z, D1 (x2)
• Staked with 2216 epoxy
• Given ample radius for strain relief
Programmatic Schedule up to Launch

PSR June 7th

Internal FOR June 12th

Delivery July 30th

ORR Mid-August

Launch!!! Sept 12th, 2018

Completed MOC Late June

Range 3 Late June

Complete ESN Upgrades Late July

Wallops Compatibility Test Early August

Spacecraft Operator Training for Flight up until Launch!

Mission Ops Software Development

Ru-106 Delivery Late June

Final Source Tests Mid July

Flight MSP Load Late July

Stable Release

Stable Release

IDPU MSP Software Development

IDPU MSP Software Development into flight

Mission Milestones

Software Development Efforts

Nonflight Hardware Milestones

Tests on Flight Hardware

LEGEND

Mission Assurance 10
Thank you to all of our sponsors, stakeholders, and contributors!

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