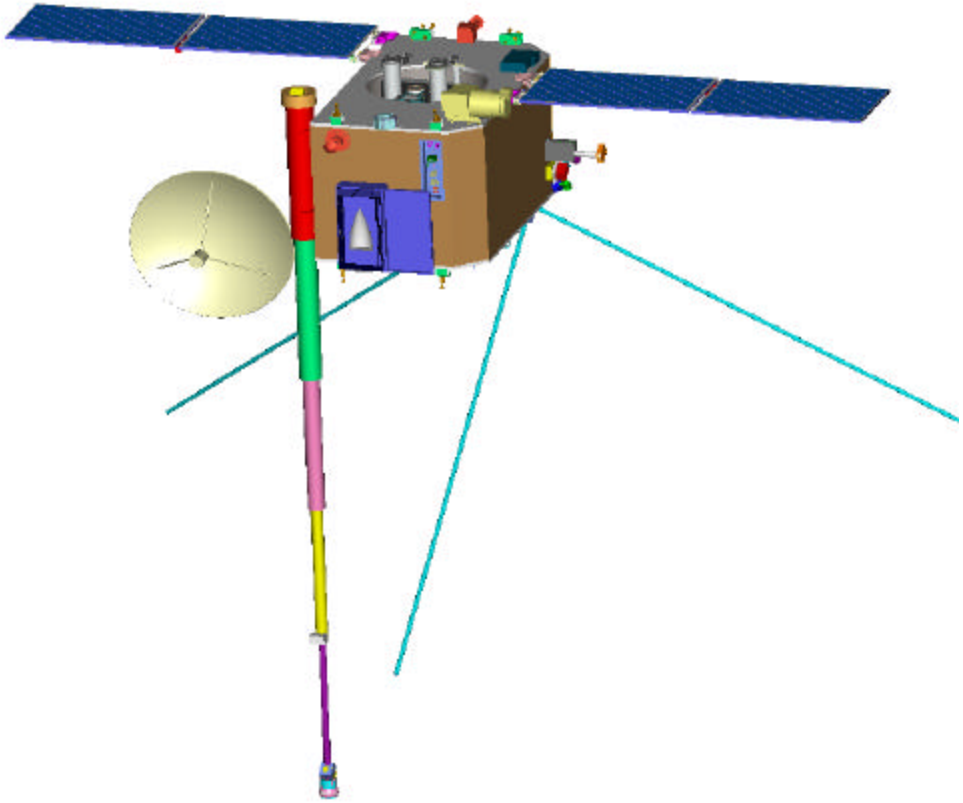
IMPACT Protoflight Boom Status Meeting



Agenda

9:00 – 11:30	Protoflight Build Status/Assessment
11:30 – 12:00	Schedule
12:00 – 1:00	Lunch
1:00 – 2:00	Boom Verification Plan
2:00 – 3:00	Review of Test Procedures - TB/TV/Vibe
3:00 – 4:00	Boom Deployment

Protoflight Build Status

- **Design goals and implementations since ETU**
  - **Improve concentricity and clocking stability during deployment, eliminate possibility of rollers jumping out of tracks**
    - **Increased to three tracks in tubes**
    - **Added travel limiting pins**
  - **Improve latchup – eliminate deadband**
    - **Reworked pin offsets, corrected machining errors**
  - **Assure adequate force margins throughout deployment**
    - **Increased Stacer force to provide adequate margin**
      - **Switched to 6 mil, 5” strip Elgiloy Stacer for more force (11-7lbs thrust)**
    - **Sequenced 50mm tube deployment using force latch to make higher-force mag harness deployment occur during highest-force portion of Stacer stroke**
      - **Force latch set to kick-off spring force plus 1/3 stacer force**
    - **Redesigned pinpuller and stowing preload to handle higher launch loads due to increased instrument mass**
      - **700lb pinpuller designed, built, and qualified (in process TiNi Aerospace) to hold 365lb preload to meet 30g design requirement**

Protoflight Build Status(cont.)

- Implement Mag harness deployment scheme
  - Shielded harness on outside of 50mm tube from SWEA to Mag
  - Stowed between 50mm and 90mm tubes in troughs

- Improve durability of rollers
  - Switched to hard BeCu from Aluminum
    - Now no wear on rollers or tracks

- Add removable SWEA mount
  - Added to allow boom tube disassembly, facilitate testing

- Improve thermal performance
  - Added closeout rings to tube anti-sunward end
  - Added window in blankets on sunward end to warm boom internals
  - Black anodized interior surfaces at sunward end for improved heat distribution
  - Resulted in 50C (now –20C) improvement in ring temps during deployment

Protoflight Build Status(cont.)

- Improve Tube fabrication
  - Eliminated wrinkling during layup
  - Added three tracks
  - Provided smooth track surfaces for low friction

- Improve ring alignment system for gluing
  - Added nesting flanges to rings
  - Added clocking alignment pins
  - Built alignment fixtures to insure squareness

Deployment testing

- 3 successful deployments to date
  - verified correct latchup, no deadband
  - Verified Stacer can push boom out
    - Pullout tests w/o Stacer and Stacer push force vs. stroke tests confirm margin ratio >3 during full deployment stroke
  - Verified Mag harness deployment occurs as predicted
    - Added drag overcome by higher force of Stacer at beginning of stroke
    - Mag harness deploying first guaranteed by force latch
    - Verified force latch activation force <1/3 Stacer force adaquate to maintain margin ratio and deploy mag harness first
  - Verified SWEA harness deploys correctly

Work to be done on Protoflight unit

- Redesign and refab Lower Mounting Ring to allow disassembly after gluing
- Glue tubes
- Rework flyweight brake to provide gear protection
- Test pinpuller and preloading, verify margin
- Improve tube track angular precision (mandrels)
- Build additional GSE to improve safety and ease of stowing

Schedule

- Tube delivery 5 weeks late
- UCB purchasing approvals delayed Stacer purchase 3 months
- Machined parts delivered 3 weeks late
- Despite these delays, Boom testing is currently only 12 days behind schedule
- Final parts for TV chamber due in two weeks, will push schedule to 3 weeks late
- TV chamber delay provides adequate time to implement additional work required