

LAT Monthly Status Review

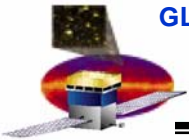
27 Sep 2005

Design Integration and Analysis

Martin Nordby

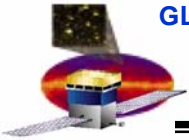
John Ku

Jack Goodman



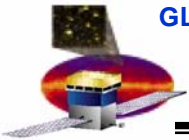
Design Support Status

- **Flight/fly-away hardware designs (all known remaining hardware listed)**
 - **MLI blankets: first check of drawings completed in October; drawings being updated (hardware need date: 2/06)**
 - **Radiator shims: collecting info**
 - **TKR accel mount bracket: drawings released in October; hardware being fabricated**
 - **Cable support brackets: drawings released in October; hardware being fabricated**
 - **Heat Pipe shims, spacers: drawings released in October; hardware being fabricated**
- **Assembly drawings (all remaining assembly drawings listed)**
 - **LAT-DS-06721 External Cable Installation Kit**
 - **Drawing completed in October and in release cycle**
 - **LAT-DS-02563-01 LAT Instrument Assembly**
 - **Completed and released in October**
 - **LAT-DS-01624-01 LAT Top Assembly**
 - **Work re-started on this (ECD: late Nov)**
- **Interface Drawings**
 - **All interface drawings released and up-to-date with no known liens**



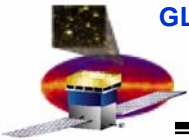
Integration Planning

- **Configuration drawings**
 - **LAT Instrument Configuration Assembly**
 - Completed and released in October
- **Integration MGSE (all remaining integration MGSE listed)**
 - **ACD Lift Fixture**
 - Drawings released in October
 - Hardware built, assembled, proof-tested, and ready for ACD integration



Structural Analysis: Accomplishments

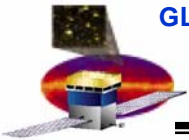
- **LAT System Level**
 - **Grid Static Load Test (GSLT)**
 - Completed Grid#2 shipping crate analysis
 - Supported GSLT TRR on 10/13/05
 - Supported GSLT Facility preparations
 - Completed most of pre-test analysis → delta-TRR packet v.2 out
 - **Continued LAT Environmental test planning**
 - Completed assessment of SC Top Deck simulator for Acoustic test
 - Completed assessment of Radiator strut mount stiffness requirement
 - Completed final review of accelerometer channels and parts list
 - Accelerometer functional and sensitivity checks partially complete
- **LAT Subsystem Level**
 - **MGSE**
 - Completed Test Stand critical weld assessment → none present
 - Supported resolution of lingering questions about ACD lift fixture
 - Completed assessment of SC Top Deck simulator for Acoustic test
 - Completed LAT Drawbar analysis
 - Supported LAT Transport Container analysis review, and loads definition
 - **Mechanical Subsystem**
 - X-LAT washer analysis complete
 - **EBOX Subsystem**
 - Supported EBOX SS testing (defining test levels for HCB)
 - Supported EBOX data package (PDU)



Structural Analysis: Near-term Milestones and Status

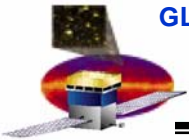
- **LAT System Level**
 - **Grid Static Load Test (GSLT)**
 - Complete Pre-test analysis: predictions; hold delta-TRR 11/04/05 @ NTS
 - Support testing; start 11/08/05; end 11/20/05
 - **LAT Dynamics Testing**
 - Update LAT vibration test predictions – ECD = Dec 2005
 - Work with GSFC on test levels
 - Support Pathfinder activities at NRL – ECD = ongoing through Jan 2006
 - Continue planning with I&T and NRL for LAT environmental testing – ECD=ongoing through test
 - **MGSE for I&T: augment MGSE analysis with additional I&T needs, as required**

- **LAT Subsystem Level**
 - **Mechanical Subsystem**
 - Develop strength test plan for radiators ECD=12/02/05
 - Support radiator static tests @ SLAC ECD=12/30/05



Thermal Engineering Activities – Completed

- Design Engineering and Support
 - N/A
- LAT Level Thermal Analysis and Tests
 - Simple analysis model completed to determine feasibility of using purge grooves for cooling the air space between Trackers and ACD during non-TVAC ground testing. Purge gas cooling appears feasible, but mixing of the cooling gas with the hot air layer above the trackers is uncertain.
- Subsystem Support and Oversight
 - Tracker thermal acceptance testing is complete.
- LAT Thermal Control System
 - Radiator Protoqual test completed.
- Lockheed Thermal Control System Hardware
 - Radiator Protoqual test completed.



Thermal Engineering Activities – Current

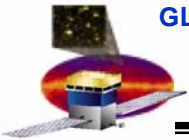
- **Design Engineering and Support**
 - Environmental Specification – change Tracker Acceptance Level Tests (35C to 45C).
 - Instrumentation Plan – update of detailed test thermal sensor list.
 - Supporting NRL regarding STE issues.
 - Supporting I&T with temperature sensor installation issues.

- **LAT Level Thermal Analysis and Tests**
 - Thermal math model for LAT TVAC Test almost complete; LAT support stand GSE will be incorporated into model when time becomes available.
 - Modification of orbit thermal model to predict ground operation temperatures with integrated ACD. Orbital model with ground cooling scheme predicts Tracker temperatures > 40 C.
 - Comparison of heat pipe subroutines – LM and C&R – in LAT thermal math model with intent to replace LM with C&R so model is not LM proprietary- in progress, waiting to hear from NASA/GSFC.

- **Subsystem Support and Oversight**
 - Reviewing ACD thermal vacuum test report.

- **LAT Thermal Control System**
 - Correlation of radiator Protoqual test data with LAT thermal math model, in progress.

- **Lockheed Thermal Control System Hardware**
 - Radiators shipped to SLAC.



Thermal Engineering Activities - Planned

- **Design Engineering and Support**
 - Complete detailed MLI design
 - Review, then fabricate MLI blankets; two sets, one set for tests and other for flight
- **LAT Level Thermal Analysis and Tests**
 - Thermal Math Model, Ver. 6.1, reduced node
 - Thermal Math Model, Ver. 6.2, LAT TVAC test configuration and test predictions.
 - Document analysis of LAT transition from Survival to Operating Mode
 - 200 Node Launch Vehicle Thermal Math Model
- **Subsystem Support and Oversight**
 - Support TVAC tests of all eboxes
- **LAT Thermal Control System**
 - TCS verified in LAT TVAC tests at NRL
- **Lockheed Thermal Control System Hardware**
 - N/A