

LAT Monthly Status Review

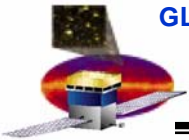
26 April 2005

Design Integration and Analysis

Martin Nordby

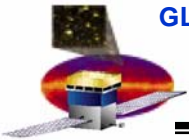
John Ku

Jack Goodman



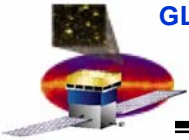
Design Support Status

- **Flight/fly-away hardware design (all remaining hardware listed)**
 - ✓ **X-Side Blanket Bar and mount brackets: drawings in release cycle**
 - ✓ **X-Side Connector Panels: drawings in release cycle**
 - ✓ **Y-Side Connector Panel: drawings in final check**
 - ✓ **Internal cables: drawings complete and released**
 - **External cables: revisions of ACD cable length in final check**
 - **Accelerometer mount brackets: design complete, drawings in first check**
 - **MLI blankets: working design and interface details in prep for SASS meeting in mid-May**
 - **External fly-away instrumentation cables: in queue after above work is finished**
- **LAT-DS-02560-01 LAT Tower Assembly**
 - **Released this past month**
- **LAT-DS-05210-01 Cable Installation Kit**
 - **First-round check print ECD 4/29**
- **LAT-DS-02561-01 LAT Tower and Electronics Assembly**
 - **Second-round check print out for broad review**
 - **Release ECD 5/6**
- **LAT-DS-02563-01 LAT Instrument Assembly**
 - **Modeling largely complete**
 - **Drafting awaiting completion of flight hardware detailing**
- **LAT-DS-00309-04 ACD-LAT IDD**
 - **Drawing completed this month, and out for review**
 - **Release waiting on telecon review of changes**



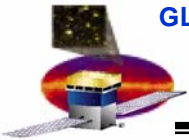
Integration Planning

- **LAT Integration Sequence (LAT-MD-00676-03)**
 - **Complete**
 - **Revision not yet started to address post-tower integration sequence updates**
- **Configuration drawings**
 - **LAT Tower Configuration Assembly**
 - **Drawing complete and released**
 - **All ancillary MGSE fixturing design complete, released, and hardware built**
 - **LAT Instrument Configuration Assembly**
 - **Drawing in-work (ECD: 5/13)**
 - **Associated miscellaneous MGSE hardware in-work now (ECD: 5/6)**
- **Integration MGSE (all remaining integration MGSE listed)**
 - **Test Interface Plate: check print complete; analysis and final check in-process (ECD: 5/13; need date: ~7/15)**
 - **Chill Bars: design complete; getting quotes on fab (ECD: ~5/16; need date: ~5/16)**
 - **Chiller: on-order (ECD: not confirmed with supplier; need date: ~5/16)**
 - **Auxiliary cooling plumbing: in-work; tubing will likely be tall poll**
 - **Heat Pipe locating jig: conceptual design complete (ECD: 6/1; need date: ~8/1)**
 - **Heat Pipe mount plates: conceptual design complete (ECD: 6/1; need date: ~8/1)**
 - **ACD Lift Frame: conceptual design and analysis in-work (ECD: 6/15; need date: ~9/1)**



Environmental Test Planning

- **Environmental Test planning**
 - **Planning and Design review planned for May 3-4 at NRL**
 - **Drafts of all Test Plans are in-work and will be available for review by this review**
- **High-level issues being worked**
 - **T-Vac test cabling**
 - **Agreed on a cabling concept for T-Vac → starting to work on implementation**
 - **Test support MGSE**
 - **Conceptual design of support structure complete**
 - **Test Interface Plate design is complete: analysis in-work; drawings in check**
 - **Test Stand design is nearly complete: analysis not yet started; drawings in check**



Structural Analysis: Accomplishments

- **LAT System Level**

- **T** Continued LAT Static test plan development

- Support of MGSE designs (MGSE identified and almost complete)
 - Load configurations and cases defined, but final analysis still in-work

- **I****T** Continued LAT Environmental test planning

- Dynamics test plan is very mature with a draft release this week
 - All outstanding action items have defined closure paths and will be tracked on a weekly basis

- **I****T** Completed miscellaneous MGSE analyses

- TIP (Test Interface Plate) for LAT environmental testing

- **I****T** Integrated the test-correlated ACD model into LATv10.09 FEA model

- **D** MLI Support bar analysis completed

- **LAT Subsystem Level**

- **T** TKR Subsystem

- Continued support of TKR testing at Alenia
 - Reviewed all TKR vibration test reports from INFN/Bari

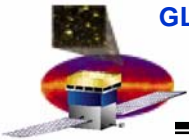
- **T** Mechanical Subsystem

- Supported RAD test plan discussions

- **T** EBOX Subsystem

- Special Box Test procedure completed, in signature cycle
 - TEM/TPS Test procedure completed
 - TEM/TPS Shipping container drop test report

D = Flight Design
I = Integration Prep
T = LAT/SS Test Prep



Structural Analysis: Near-term Milestones and Status

- **LAT System Level**

- **T** LAT Static Testing: complete pre-test analysis and review with mechanical branch

- **I** **T** LAT Dynamics Testing

- Finalize external accelerometer locations and cable routing – ECD = 6/1/05
 - Update LAT vibration test predictions – ECD = 9/1/05
 - Continue planning with I&T and NRL for LAT environmental testing – ECD=ongoing through test

- **I** **MGSE for I&T: augment MGSE analysis with additional I&T needs, as required**

- LAT Test Stand MGSE and associated test environments – ECD = 5/15/05
 - Shipping Container Analysis needs to be redone for new handling configuration – ECD = 5/15/05

- **LAT Subsystem Level**

- **T** TKR Subsystem

- Continue to support testing in Italy (help from GSFC is lined up)

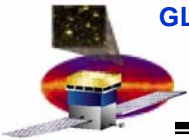
- **T** Mechanical Subsystem

- Proof Test Spectrum provided flexures TRR – ECD = 6/10/05
 - Shear plate qualification test report – ECD = 6/17/05
 - Grid Static Load Test procedures, STE, TRR – ECD = 6/17/05
 - Support RAD and XLAT issues, as needed

- **D** **I** **T** EBOX Subsystem

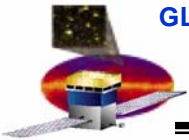
- Complete TEM/TPS Vibration test report – (Need to get data from Wyle)
 - Analyze cable support tray analysis

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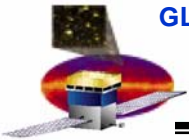
Thermal Engineering Activities – Completed (from last month)

- **Design Engineering and Support**
 - Supported LAT level TVAC MGSE conceptual design
- **LAT Level Thermal Analysis and Tests**
 - Completed evaluation of concepts to reduce transient times between thermal cycling
 - Auxiliary HEX is the best, but added complexity → planning review to close this out
- **Subsystem Support and Oversight**
 - Completed TKR 1 and TKR 2 TVAC Acceptance Test successfully
 - Supported TVAC test for TEM/TPS qual unit
- **LAT Thermal Control System**
 - Completed: LAT-TD-05956-01, GLAST LAT Radiator VCHP Reservoir Heater Control Algorithm
- **Lockheed Thermal Control System Hardware**
 - Identified alternate vacuum chamber for TVAC radiator tests; evaluated reduction in TVAC test scope for X-LAT plate – no decision yet.



Thermal Engineering Activities – Current (from last month)

- **Design Engineering and Support**
 - Environmental Specification – change Tracker Acceptance Level Tests (35oC to 45oC)
- **LAT Level Thermal Analysis and Tests**
 - Thermal math model for LAT TVAC Test almost complete; awaiting final design of LAT support GSE.
 - Evaluating TVAC set-up thermal design
 - Finishing T-Vac Test Plan document—spec'ing test requirements on MGSE, EGSE, facility → clean draft out Apr 8
- **Subsystem Support and Oversight**
 - TKR 1 and TKR 3 double TVAC test—test planned for 11 April '05.
 - Continued support of TVAC tests for eboxes
 - Support of ACD TVAC test
- **LAT Thermal Control System**
 - Planning for test to measure thermal conductance of VCHP triple joint using mold release material proceeding
 - Evaluating test simulation set-up for TCS verification
- **Lockheed Thermal Control System Hardware**
 - One radiator complete except for attachment of wiring harness
 - Second radiator few weeks behind first



Thermal Engineering Activities – Planned (from last month)

- **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
 - Document analysis of LAT transition from Survival to Operating Mode
 - LAT Thermal Vacuum Test Plan – finalize
 - LAT Thermal Vacuum Test Procedure – begin
 - 200 Node Launch Vehicle Thermal Math Model
- **Subsystem Support and Oversight**
 - Support TVAC tests of all eboxes
 - Support TVAC tests of TKR 3 -16
 - Support ACD TVAC test
- **LAT Thermal Control System**
 - Preliminary verification in LM Radiator Acceptance Tests
 - Finalize definition of LM TVAC tests for TCS
 - TCS verified in LAT TVAC tests at NRL
- **Lockheed Thermal Control System Hardware**
 - X-LAT Plate TVAC Test Procedures, begin writing
 - Radiator Acceptance Test Plan, finalize
 - Radiator TVAC Acceptance Test Procedures, begin writing