LAT Monthly Status Review

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Design Integration and Analysis

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Design Support Status

- Flight/fly-away hardware design (all remaining hardware listed)
  - √ X-Side Blanket Bar and mount brackets: drawings released
  - √ X-Side Connector Panels: drawings released
  - √ Y-Side Connector Panel: drawings released
  - √ External cables: ACD cables revisions released
  - – Accelerometer mount brackets: drawings in release cycle
  - – Temp Sensor Brackets: drawings complete; analysis ECD is 5/25
  - – MLI blankets: design/interfaces finalized at Spectrum meeting last week; dwg's in work
  - – External fly-away instrumentation cables: in queue after above work is finished
  - – TKR accel mount bracket: concept complete; drawing not started (ECD: 6/24)
- LAT-DS-05210-01 Cable Installation Kit
  - – Final checks out for review now; out for release by 5/27
- LAT-DS-02561-01 LAT Tower and Electronics Assembly
  - – In release cycle now
- LAT-DS-02563-01 LAT Instrument Assembly
  - – Modeling largely complete
  - – Drafting awaiting completion of flight hardware detailing
- LAT-DS-00309-04 ACD-LAT IDD
  - – Release waiting on telecon review of changes

Integration and Test Planning

- LAT Integration Sequence (LAT-MD-00676-03)
  - Revision not yet started to address post-tower integration sequence updates
- Configuration drawings
  - LAT Instrument Configuration Assembly
    - Heat pipe locating/support MGSE drawings in release cycle
    - ACD lift fixture in analysis
    - Drawing on hold pending completion of ACD lift fixture (ECD: 6/15))
- Integration MGSE (all remaining integration MGSE listed)
  - Chill Bars: parts complete; assembly to be done this week (need: 6/8)
  - Chiller: due last Friday
  - Auxiliary cooling plumbing: order in-work; expect delivery next week (need: 6/8)
- Environmental Test planning
  - Planning and Design review May 3-4 at NRL was successful in baselining EMI, Dynamics test plans
  - T-Vac test planning is behind → we have a follow-on meeting tomorrow to finalize in-chamber heating/cooling plans, which is the biggest issue

Structural Analysis: Accomplishments

- LAT System Level
  - (T) Continued LAT Static test plan development
    - Support of MGSE designs
    - Final analysis, and TRR slide preparation in-work
  - (I)(T) Continued LAT Environmental test planning
    - Supported Environmental Test PDR @ NRL
      - Presented Dynamics Test Plan – No major actions
      - Identified details that need to be closed and are in-work
  - (I)(T) Completed TIP assembly analysis – minor design modification, final report pending
- LAT Subsystem Level
  - (T) TKR Subsystem
    - Continued support of TKR testing at Alenia
    - Continued to review all TKR vibration test reports from INFN/Bari
  - (T) Mechanical Subsystem
    - Supported RAD test plan discussions
  - (T) EBOX Subsystem
    - Supported TEM/TPS Acceptance testing

(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 handling procedures and test environments – ECD = 6/3/05
    - Shipping Container Analysis Report – ECD = 6/3/05
- 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 = 7/5/05
    - Support RAD and XLAT issues, as needed
  - (D)(I)(T) EBOX Subsystem
    - Complete TEM/TPS Vibration test report
    - Analyze cable support tray analysis

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Thermal Engineering Activities – Completed

- Design Engineering and Support
  - Supported LAT level TVAC MGSE design
  - Presentation at LAT Environmental TIM on May 3-5
- 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; Base case chosen to be LAT powered on with overdriving thermal sink plates to -150C
  - LAT TVAC concept thermal design set-up finished
  - LAT TVAC Test Plan document finished
- Subsystem Support and Oversight
  - Completed TKR 1 and TKR 3 TVAC Acceptance Test; first time for dual test
- LAT Thermal Control System
- Lockheed Thermal Control System Hardware
  - Radiator Protoqual Test Plan, finished
  - Held review with LM Mission Success Group and NASA to re-scope X-LAT Plate acceptance test
    - Thermal test with atmospheric hot and cold GN2 rather than at vacuum
    - Increase cycles from 4 to 12
    - Change from thermographic to ultrasonic test of heat pipe bond joint
  - X-LAT Plate Protoqual Test Plan finished

Thermal Engineering Activities – Current

- Design Engineering and Support
  - Environmental Specification – change Tracker Acceptance Level Tests (35oC to 45oC)
  - Review between SLAC, LM and Spectrum to agree on MLI blanket outer surface finish.
- 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 - after radiator/TCS acceptance tests
  - TVAC Test Procedures document started
- Subsystem Support and Oversight
  - Continued support for TKR TVAC Acceptance Testing; TKR 4 and 5 in test this week
  - Continued support of TVAC tests for eboxes
  - Support of ACD TVAC test
- LAT Thermal Control System
  - Set-up for test to measure thermal conductance of VCHP triple joint using mold release material in progress; test will proceed when time is available in TVAC chamber
- Lockheed Thermal Control System Hardware
  - Radiator/TCS Protoqual Test planned for June 2005
  - X-LAT Plate undergoing ultrasonic testing May 23-24; Protoqual Test TRR scheduled for May 25; Thermal cycling planned to be finished May 27.
  - X-LAT Plate TVAC Protoqual Test Procedures, finished and in review

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
  - 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
  - Support TVAC tests of TKR 6 -16
  - Support ACD TVAC test
- LAT Thermal Control System
  - Preliminary verification during LM Radiator Protoqual Tests
  - TCS verified in LAT TVAC tests at NRL
- Lockheed Thermal Control System Hardware
  - Radiator TVAC Protoqual Test Procedures, writing to begin within days