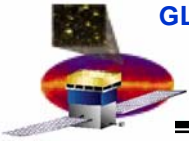


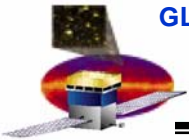
Mechanical Systems Mechanical / Thermal Hardware November 2004 Status

Marc Campell, Subsystem Manager



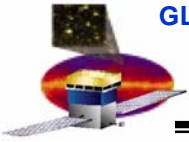
Accomplishments

- **Accomplishments during December.**
 - Pathfinder for the handling of Flight hardware in B/33.
 - 4 of 5 Top Flange Heat Pipes were bonded into Grid.
 - Tracker mounting hardware installed into Grid.
 - LM completed bonding doublers onto Radiator panels
 - X-LAT Plate fab is complete less Nickel plating.



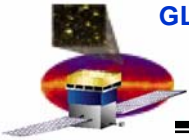
3 Month Milestones Dec - Feb

Milestone Description	Original Date	Current Date	Major Reqmnts to Achieve Milestone	Notes
Complete Grid Box Base Assy ops	07/22/04	12/23/04	All parts + MGSE in house	<i>Complete</i>
			Procedures in place	<i>complete</i>
			Hold MRR	<i>complete</i>
Grid Heat Pipe bond process Qual	02/24/04	11/15/04	write test report	<i>ECD 12/10/2004</i>
Design Heater Control Box	08/19/04	11/12/04	release drawings	<i>in release cycle</i>
Fabricate Heater Control Box	10/28/04	12/17/04	procurement cycle	
Test Heater Control Box	12/13/04	02/18/05		
Order TCS electronics components	01/30/04	12/17/04	release drawings of using assemblies	<i>activity started</i>
Order TCS flight hardware Heaters, thermostats & thermistors	12/19/03	11/30/04	LM procured TCS components	<i>parts on order</i>
			Grid thermostats	<i>Qual test complete report in review at GSFC</i>
Receive Grid #2, EMI skirts, details	11/15/04	03/22/05	EMI skirts & details	<i>complete</i>
			Grid final machining & inspection	<i>ECD 2/2/05</i>
			Grid plating	<i>ECD 2/25/05</i>
			grid box machining & hardware installation	<i>ECD 3/18/05</i>
Grid #2 Static Load Qual Test	12/16/04	02/28/04	Load case analysis	<i>prelim eval complete</i>
			in-house vs out-house analysis	<i>ECD 12/17</i>
			SOW, RFP & vendor selection	<i>Dec</i>
			MGSE & test fixture design	<i>Jan</i>
			MGSE & test fixture fab	<i>Feb</i>
			Test Readiness Review	<i>Mar</i>
Receive X-LAT plate	12/09/04	02/14/05	Complete X-LAT heat pipe fab	<i>Complete</i>
			Complete X-LAT plate assy	<i>Jan</i>
			Complete Thermal Vac testing	<i>Feb</i>



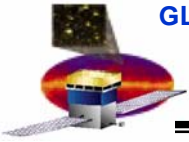
Drawing Release Plan

- **57 of 81 (70%) drawings released**
 - **18 MLI drawings have been added to MECH drawing list**
 - **4 unreleased parts not needed until I&T operations**
 - **In check**
- **Known drawing revisions**
 - **Jan – 2 planned**
 - **X-LAT (in release cycle) & Radiator IDD's**



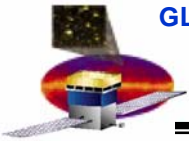
Concerns

- **Lockheed Martin - X-LAT plate & Radiator delivery schedule**
 - **LM's estimated cost at completion is \$8.49M**
 - Exceeds available budget of \$7.5M
 - Approval for additional funding will require DOE Chicago office approval (est. 3 months)
 - LM directed to work on Flight hardware only
 - Suspend test planning, design and other preparations
 - Suspend MGSE design and fab
 - **Manufacturing progress is slower than expected**
 - **Each step of the way there have been problems typical for a first article build**
 - **Need to reduce the time it takes to resolve these problems from weeks to days**



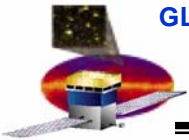
Concerns (cont)

- Grid to I&T delivery date – schedule continues to compress.
- Grid thermal control components & Downspout Heat Pipe to Grid thermal joint are not verified until LAT T/Vac test.
 - Difficult to access these components at this level (remove Radiators & ACD).



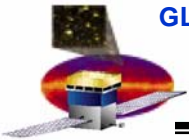
Open Flight Design Issues

- **Requirements for Grid survival heaters & thermostats being revised to raise minimum Tracker temperatures**
 - **Bonding operations on hold pending CCB**
- **TCS validation vs. LM modified Radiator Thermal Vacuum & Balance plans**
 - **TCS test requirements being developed with Tom McCarthy**
 - **~3 additional TCS cases proposed**
 - **Cost & schedule impacts will be evaluated**
 - **TCS risk assessment and Qual test plan requested by GSFC**
- **Define GBA Static Load test requirements & plans**
 - **Detailed load cases & STE being developed**
 - **1st draft complete – loads have gone down and many test cases will be deleted or combined**
 - **Stress to perform another iteration on the load cases, then**
 - **Test in-house vs out of house decision can be made**



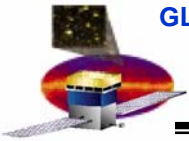
Open Flight Design Issues (cont)

- Radiator integration sequence
 - Coupon testing of repeated make & break of joint in process
 - Disassembly facilitated by use of mold release agent
- X-LAT MLI blanket billowing will violate stay clear
- Radiator MLI blanket and wiring violates stay clear
 - Working issue with LM & Spectrum Astro
 - S/C to LAT MLI design options in work with Spectrum Astro
 - Working group meeting planned for Jan
- Radiator vibration requirements
 - Current proposal is pre & post low level sine sweep, sine vibe and Acoustic testing
 - Working with GSFC & LM to minimize & finalize requirements
 - Preliminary design of vibration test fixture complete.
 - Design concepts for Acoustic test fixture are next
 - Effort on hold



MECH Qualification Program

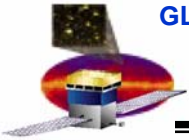
Qual Test	Status	ECD
Grid-Top Flange Heat Pipe bond process qual	Complete report in work.	Dec 04
Grid Box Assy Static Load test	Planning in work. Perform on Grid #2	Mar 05
X-LAT Plate Thermal Vac test	at LMMS	TBD*
Radiator Variable Conductance Heat Pipe new extrusion	Passed burst test, heat capacity test after charging	Comp
Radiator Acoustic	at LMMS	TBD*
Radiator Thermal Vacuum	at LMMS	TBD*
TCS-Radiator Thermal Balance	Scope is changing. Need to define requirements	TBD*
* LM test program on hold pending funding resolution		



PMCS

- **Mech Sys (SLAC only) current schedule variance +76K**
 - **Received Flight Grid #1 (late)**
- **Mech Sys (SLAC only) cum schedule variance -\$746K**
 - **Driven by late receipt of Grid #2, TCS hardware and Static Load Test did not start.**

- **Mech Sys (LM only) current cost variance -\$426K, and**
- **Mech Sys (LM only) cum cost variance -\$929K**
 - **LM is behind schedule and not on their headcount profile**
 - **LM has provided a spending profile for Jan – Mar to take them up to \$7.5M**
 - **Investigating other testing options for Radiator and X-LAT plate**



Program Threats

- **Top threats to maintaining schedule**
 - **Grid Box is a pathfinder for Flight hardware operations in B33**
 - **Highly compressed, success oriented schedule**
 - **LM X-LAT & Radiator delivery have no float and LM manufacturing is not maintaining their schedule**
- **Top threats to staying within cost**
 - **LM staying on schedule**
 - **LM maintaining headcount profile, esp. planned roll-off**
 - **SLAC staying on schedule**
 - **Interdependencies with DAQ for fab, assy & test of TCS**