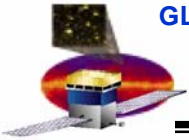


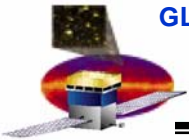
Mechanical Systems Mechanical / Thermal Hardware August 2004 Status

Marc Campell, Subsystem Manager

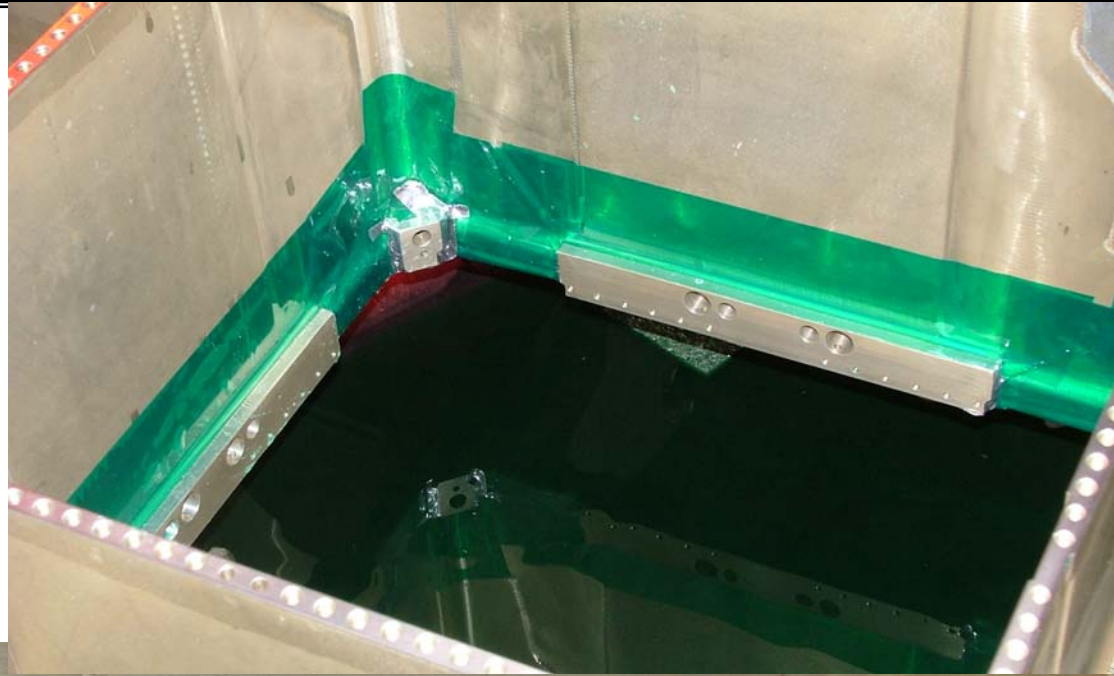


Accomplishments

- **Accomplishments during Sept.**
 - **Grid #1 Nickel plating complete**
 - **Grid #2 finish machining 80% complete**
 - **LM has delivered the Top Flange and Downspout heat pipes to B/33**
 - **They had been delivered in place at LM**
 - **Grid TCS instrumentation quantities & locations finalized**
 - **Received Grid Box tilt table for B/33 assembly work**



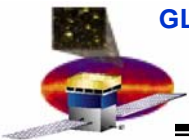
Grid #1 Brush Nickel Plating



Masked

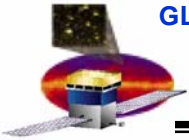
Plated





Grid #2 In Process



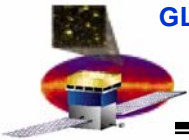


Tapemation Status

- All detail parts complete
- Final operations ready to start

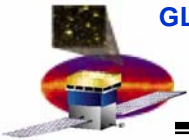
Milestones

- Plating complete 9/30 (took 5 weeks, 2 were planned)
- Grid Box Machining complete 10/12
- Final hardware installation 10/18
- Clean, inspect pre-ship review 10/20
- Package & Ship to SLAC 10/21



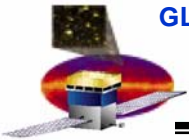
3 Month Milestones Sep - Nov

Milestone Description	Original Date	Current Date	Major Reqmnts to Achieve Milestone	Notes
Receive Grid #1, EMI skirts, details	03/30/04	10/21/04	Grid plating & grid box machining	
Complete Grid Box Base Assy ops	07/22/04	11/12/04	All parts + MGSE in house	Complete
			Procedures in place	in review
			Hold MRR	ECD 10/14/04
Release Grid Box Assy Procedures	04/15/04	10/16/04		<i>in work</i>
Procure Grid Assembly MGSE	05/17/04	09/14/04		<i>on order</i>
Grid Heat Pipe bond process Qual	02/24/04	10/15/04		<i>last sample in process</i>
Design Heater Control Box	08/19/04	10/19/04		<i>in work</i>
Fabricate Heater Control Box	10/28/04			
Test Heater Control Box	12/13/04			
Order TCS electronics components	01/30/04			<i>activity started</i>
Order TCS flight hardware Heaters, thermostats & thermistors	12/19/03	10/30/04	LM procured TCS components	parts on order
			Grid thermostats	parts in house now
				Qual test pending
Receive Grid #2, EMI skirts, details		11/15/04	Grid plating & grid box machining	
Receive X-LAT plate	12/09/04	01/15/05	Complete X-LAT heat pipe fab	50% complete
			Complete X-LAT plate assy	
			Complete Thermal Vac testing	



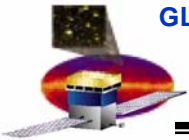
Drawing Release Plan

- **54 of 61 (90%) drawings released**
 - **Unreleased parts not needed until I&T operations**
 - **Start work on these in Oct**
- **Known drawing revisions**
 - **Sep – 2 planned**
 - **Grid as built - in sign off**
 - **Grid box machining – in sign off**
 - **Oct – 2 planned**
 - **X-LAT & Radiator IDD's,**



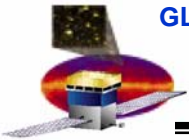
Concerns

- **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).**
- **X-LAT plate & Radiator delivery schedule**
 - **Ramp up in manufacturing progress is slower than expected**
 - **LM is reviewing their cost at completion**



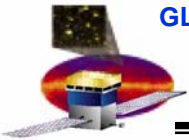
Open Flight Design Issues

- **TCS – location of Grid thermistors, fly away instrumentation and associated wiring needs to be finalized (top assembly drawing)**
 - **Locations determined – wire routing in work**
 - **Grid thermostats will operate at 35V & 1A; 42V failure mode**
 - **Qualification testing of parts underway**
 - **~15,000 of 30,000 cycles completed**
- **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 due 10/29**



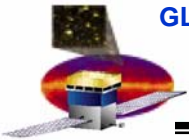
Open Flight Design Issues (cont)

- Radiator wiring nomenclature (new)
 - The temp sensors going to the Spacecraft are labeled #1 - 6 but they go to VCHPs #0 - 5.
 - Likewise the primary & redundant heater leads from the Heater Control Box to the reservoir heaters are labeled #1 - 6, but go to reservoirs #0 - 5.
 - This means that heater #1 & temp sensor #1 are on VCHP 0. This will surely cause confusion down the line.
- 2 options
 - fix the wiring nomenclature
 - Affects labeling on several harness drawing
 - May affect PDU & SIU connector labeling on drawings
 - Affects Spacecraft ICD & labeling on Spacecraft harness drawing
 - Affects Instrumentation plan
 - Or – change the VCHP numbering from 0 – 5 to 1 – 6 to match current drawing
 - Affects LAT numbering document and other
 - Affects Radiator IDD
 - May affect Flight Software
 - Will contradict with existing thermal analyses and models



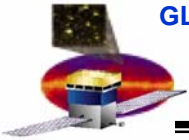
Open Flight Design Issues (cont)

- Radiator integration sequence
 - Coupon testing of repeated make & break of joint in process
 - Disassembly facilitated by use of mold release agent
- Radiator level EMI test was deleted
 - Engineering test of coupon started
 - Coupon passes up to ~80Mhz
 - LM will present results
- 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
- Radiator vibration requirements
 - Current proposal is pre & post low level sine sweep, sine vibs and Acoustic testing
 - Working with GSFC & LM to minimize & finalize requirements



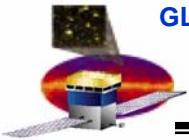
MECH Qualification Program

Qual Test	Status	ECD
Grid-Top Flange Heat Pipe bond process qual	In work	Sep 04
Grid Box Assy Static Load test	Planning in work. Perform on Grid #2	Feb 05
X-LAT Plate Thermal Vac test	at LMMS	Nov 04
Radiator Variable Conductance Heat Pipe new extrusion	Passed burst test, heat capacity test after charging	Comp
Radiator Acoustic	at LMMS	Mar 05
Radiator Thermal Vacuum	at LMMS	May 05
TCS-Radiator Thermal Balance	Scope is changing. Need to define requirements	May 05



PMCS

- **Mech Sys (SLAC only) current period schedule variance -\$104K**
 - **Procurement of TCS hardware**
 - **Delivery of Grid #2**
- **Mech Sys (SLAC only) cum schedule variance -\$504K**
 - **Driven by late receipt of Grid #1, Grid #2 and TCS hardware**
 - **Delivery of Grid #1 in Oct and Grid #2 in Dec will remove ~ half of this**



Program Threats

- **Top threats to maintaining schedule**
 - **Grid delivery from Tapemation**
 - **Highly compressed, success oriented schedule**
 - **LM X-LAT & Radiator delivery have no float and LM manufacturing not maintaining schedule**
 - **Grid Box will be pathfinder for Flight hardware operations in B33**
- **Top threats to staying within cost**
 - **Staying on schedule**
 - **LM staying on schedule**
 - **Interdependencies with DAQ for fab, assy & test of TCS**