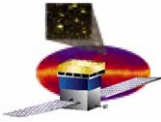**Gamma-ray Large Area Space Telescope**

GLAST Large Area Telescope

Instrument Flight Software
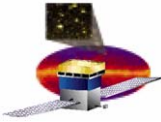
Monthly Status Review
June 30, 2004

Jeff / Terry
for FSW team

Stanford Linear Accelerator Center

- Added a new feature to the secondary boot code which allows users to selectively mount the EEPROM filesystem partitions. This should be useful in cases where it is known that one of the banks is corrupted.

- Released new and improved 1553 and SIB drivers.

- Revived the topic of the detailed settings of the bridge chip registers on the RAD750 boards. First on the error reports available from the memory controller and PCI host interface

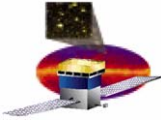- Continued work on the MEM usage package and associated test to verify the operation of the new memory map

June activities

- Started incorporating packages for code unique to ISIS in an ISIS project directory. Completed first cut at LAT command list for the ISIS software system and circulated for group review.

- Completed housekeeping telemetry structs and mnemonics in LCAT for TEM, PDU, and AEM environmental quantities and PDU power status registers (payload issue)

- Completed housekeeping limit checking code for environmental quantities
- Redrafted LAT-TD-02620 (instrument startup) in light of experience with the test-bed
- LCB driver updated to track hardware changes that fix a potential lock condition and developing a comprehensive test procedure for the LCB
- converting Monte Carlo data into the format needed by the FES. They have now produced a set of 32 files, one for each tracker and calorimeter detector, representing a single muon event   (almost ready to send data through the system and receive it)

- A lot of effort has gone into development of the intertask communication (ITC) which we are currently exercising (on schedule)
- Calorimetry calibration code being exercised on hardware (no real sensors) and in simulation
- Thermal Control System code has been taken about as far as it can be without actual hardware.
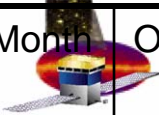
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FSW Test Script Development

- **FSW test scripts will be tracked as follows:**

  - Scripts will be written, and each will be executed in a dry run.

  - A count of the number of scripts that have had a dry-run will be reported monthly

  - A few scripts will be used in the monthly FSW demonstration

  - (To complete script development by the end of Flight Unit testing, roughly 28 scripts must be developed per month.)
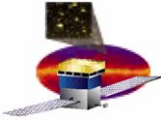
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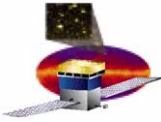
Monthly Demonstration Schedule

- The demonstration schedule has been reorganized to reflect current realities   especially the ISIS schedule.

- Jun   Telemetry
- July   ITC and full config   (moved Physics/filter later)
- Aug   holdovers and thermal control
  - ISIS FQT separate
- Sept   Boot centric
- Oct   physics items
- Nov   Ops and comprehensive 1553
- Dec   FU build load/run and diagnostics

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Month	Old schedule	New schedule
June	**ISIS formal testing**	**Alert and diagnostic telemetry** **(after PDU road show and test bed available=>12-th)**
July	*** Deadtime monitoring** *** Deadtime reporting** *** Thermal control command and telemetry**	*** Multi-tower, full configuration [hardware ?]** *** Inter-task communications (SIU only)**
Aug	*** All filter algorithms to meet data rate** *** Command, configure multiple towers/TLM** *** Configure prototype tower / TEM** *** Filter data from proto-flight hardware**	*** Set discretes on test command (using SDIS) -** *holdover* *** Discrete control/reporting in HSK telem -** *holdover* *** Generate ARR test command -** *holdover* *** Generate science data packet test command -** *holdover* *** Thermal control command and telemetry**
Sept	*** Boot EPU (with telemetry and control)** *** Code load to EPU** *** Produce simulated telemetry frame** *** Respond to commands / mode control**	*** Boot EPU (with telemetry and control)** *** Code lode to EPU** *** Boot commands -** *holdover* **•Inter-task communications (complete, SIU to EPU)** **•Time services**
Oct	*** Perform all instrument calibration with FES** *** Perform filter diagostics and report in TLM** *** OPS / high level commands**	*** Filter data from proto-flight hardware** *** Deadtime reporting** *** All filter algorithms to meet data rate** *** Perform filter diagostics and report in TLM** *** Filter performance** *** Respond to commands/mode control**

| Month	Old schedule	New schedule
November	*** 1553 command / telemetry full test** *** Multi-tower full configuration** *** Diagnostics** *** Filter performance** *** Code load / run**	* Configure prototype tower/TEM (fits here)??? *** Perform all instrument calibration with prototype tower** *** OPS/high level commands** *** 1553 command/telemetry full test**
December	*** Flight unit BUILD (pre - FQT)**	*** Flight unit build (pre-FQT)** *** Code load/run** *** Diagnostics**
January	*** Flight unit BUILD (post - FQT)**	*** Flight unit build (post-FQT)**

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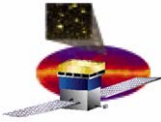
Tracking Progress on Demonstrations

- In the following table, requirements are rolled up into high-level functional categories.
  - A complete requirements to demonstrations matrix is posted on the FSW Monthly Demonstrations Web page:
  http://www.slac.stanford.edu/exp/glast/flight/web/FSW_demos.shtml

General Requirement Category	July Multi tower and ITC	Aug catch up and thermal	Sept BOOT and full ITC	Oct Physics	Nov OPS Full 1553	Dec FU build, diagnostics	Jan	Notes
5.2.1: LAT Internal Hardware Interfaces [7]		40%	60%	75%	85%			
5.2.2: Hardware Interfaces with Spacecraft [6]	50%				100%			
5.2.3: Hardware Interfaces with the GBM [1]	100%							
5.3.1: Boot Process [15]	50%		90%		100%			
5.3.2: Watchdog [1]	10%					100%		

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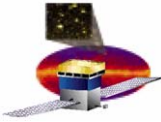
Tracking Progress on Demonstrations (cont'd)

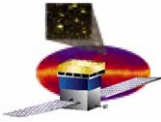| General Requirement Category	July Multi tower and ITC	Aug catch up and thermal	Sept BOOT and full ITC	Oct Physics	Nov OPS Full 1553	Dec FU build, diagnostics	Jan	Notes
5.3.3: Command Processing [10]			80%		100%			
5.3.4: Time Services [5]	20%		100%					
5.3.5: Telemetry [8]	15%				100%			
5.3.6: Deadtime Management [3]				100%				
5.3.7: File and Memory Management [20]	10%		100%					
5.3.8: Event Monitoring and Delivery [10]					10%	100%		
5.3.9: Event Filtering [3]				100%				
5.3.10: GRB Detection [6]					100%			

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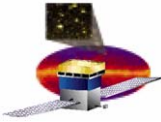
Tracking Progress on Demonstrations (cont'd)

General Requirement Category	July Multi tower and ITC	Aug catch up and thermal	Sept BOOT and full ITC	Oct Physics	Nov OPS Full 1553	Dec FU build, diagnostics	Jan	Notes
5.3.11: GRB Response [11]	10%			40%	90%			
5.3.12: Charge Injection Calibration [19]					100%			
5.3.13: Diagnostics [35]					5%	100%		
5.3.14: Ancillary Data from SC (at 1 Hz) [5]	100%							
5.3.15: Mode Control [1]				100%				
5.3.16: Safety [4]				100%				

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General Requirement Category	July Multi tower and ITC	Aug catch up and thermal	Sept BOOT and full ITC	Oct Physics	Nov OPS Full 1553	Dec FU build, diagnostics	Jan	Notes
5.3.17: Configuration [3]	100%							
5.3.18: SAA Transit [3]								
5.3.19: Thermal Control System [17]		100%						
5.4.1: System of Units [1]								
5.4.2: Coordinate Systems [3]								
5.4.3: Resource Margin [1]								

Next 3 Month's activities:

- ISIS Build and Test scripts & TRR & FQT & DELIVERY
- Last Major release for primary BOOT [has everything] in July

- understand Mode Control schedule

- Development of FU test scripts and a count of dry-runs
- Integration of selected FU test scripts into Demos
- Proposed daily(?) weekly(?) resource scheduling meeting
-
- FU designs leveraging off the EM work
- Mid sept => FU Peer Review

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