

GLAST

**Gamma-ray Large
Area Space
Telescope**



GLAST Large Area Telescope

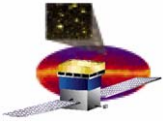
Monthly Mission Review

LAT DAQ and Flight Software Status

August 24, 2006

Jana Thayer

Stanford Linear Accelerator Center



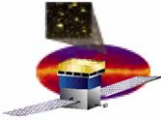
Topics

- **Hardware Completion**
- **Outcome of August FSW Delta FQT-A**
- **Flight Software Completion**



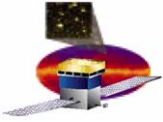
Status of DAQ Hardware

- **Status of Spare LCB**
 - Testing in progress
 - This board is the 3rd spare; no critical path is affected
- **Follow-up from last month's redundant GASU FPGA failure**
 - ACTEL's final report received
 - Discussed with GSFC
 - Close NCR
- **Spare Flight GASU**
 - GASU box with replaced ACTEL FPGA arrived at SLAC
 - Safe-to-mate, thermal cycle, vibe tests complete (passed)
 - Followed by thermal-vac, EMI tests



Flight Software Status

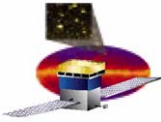
- **LAT Operation at NRL Continues using Build 0.6.9**
- **Baselined 0.6.11: 173 of 183 requirements**
 - **Completed delta FQT-A on August 14, 2006**
 - **6 new qualification tests run for the record**
 - Diagnostic configurations and filters (12 requirements)
 - GRB-related modes (5 requirements)
 - GRB messages to the LAT (3 requirements)
 - GRB messages from the LAT (4 requirements)



FSW Development Priorities

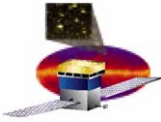
- **Priorities**
 - Continue I&T support; critical bug fixes
 - Complete science data compression
 - Implement GRB algorithm
 - Repairing bugs and defects *without impacting schedule for Observatory I&T*

- **Features driving FSW completion:**
 - Compression (B0.7.0)
 - GRB Detection (B1.0.0)



FSW B0.7.0

- **B0.7.0 driver: Data compression**
- **Available around 9/14/06**
- **Defects to be addressed in B0.7.0:**
 - **7/21 FSW CCB meeting held with all interested parties**
 - **Pruned a list of 58 items down to ~20 items tracked in JIRA**
 - **ISOC: correcting deficiencies in telecommand and telemetry interface and command confirmation functionality**
 - **SE: provide access to and control over hardware registers; provide indication of EPU boot state in telemetry**
 - **FSW configuration files: onboard traceability**
 - **Will be worked based on priority**
 - **Updates done by developers not on critical path**
 - **Schedule driven by data compression so improvements will not impact overall schedule**
 - **Items that do not get implemented in time will be deferred to B1.0.0 or indefinitely**
- **From overall mission perspective, more benefit and less risk to do now rather than later**



FSW B1.0.0

- **Build 1.0.0 driver: GRB algorithm**
 - **Includes GRB algorithm**
 - **5.3.10.2.1 GRB Location Accuracy**
 - **5.3.10.2.2 Modification of GRB criteria**
 - **5.3.11.3.3 Process Attitude Data**
 - **5.3.11.6 GRB Alert Message Latency**
 - **5.3.11.7 LAT GRB Repoint Request Message to SC**
 - **Sells off FSW Standards**
 - **5.4.1 System of Units (metric system)**
 - **5.4.2.x Coordinate Systems (3 requirements)**
 - **5.4.3 Resource Margin**
- **Available around 11/1/06 (was 10/16/06)**
 - **Schedule risk: need closure on detection algorithm from collaboration**
- **Delta-FQT-B (11/16/06)**
 - **Complete 183 of 183 requirements**
- **Install on LAT prior to Observatory Environmental Test**



Risk Mitigation

- **For scheduled FSW builds:**
 - Roll build well in advance of upload to LAT
 - Run full FSW regression test
 - Coordinate with I&T to regress test changes to LICOS, scripts, and CPT on Testbed
 - Install on LAT early to ensure that any bugs not caught by regression testing can be corrected without impact to schedule
- **Rolling back to B0.6.9 (or any previous build, down to B0.6.6)**
 - Upload a single configuration file to all CPUs (~1 hour)
 - Re-initialize LAT to run B0.6.9
 - FMX tracks LAT configuration: always know current FSW build in use



FSW Plan Forward

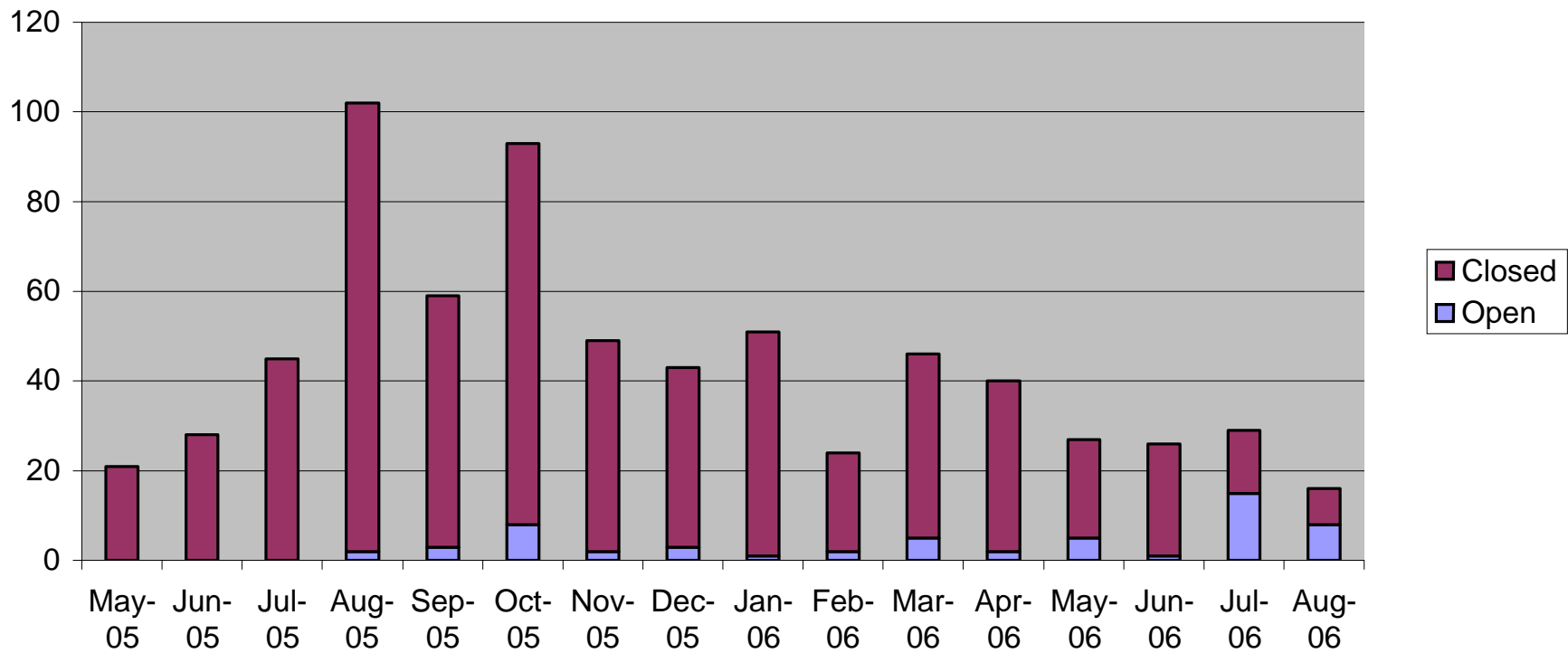
- **B0.6.9: Maintain FSW thru LAT environmental test**
- **B0.7.0 put on LAT ~ Sept. 24***
 - Arrive at SASS
 - CPT to verify LAT survived the trip with existing software
 - Install B0.7.0 on LAT
 - Perform any required regression testing
 - Run CPT prior to handover to GSFC
- **B1.0.0: available mid-October***
 - Critical updates only through L&EO
- **d-FQT- B –November**
 - 183 of 183 requirements – GRB algorithm
- **B1.0.0 installed on LAT prior to observatory test**
- **Builds after L&EO**
 - GLAST CCB approval for updates impacting interface with other systems
 - ISOC CCB approval for updates not affecting interface

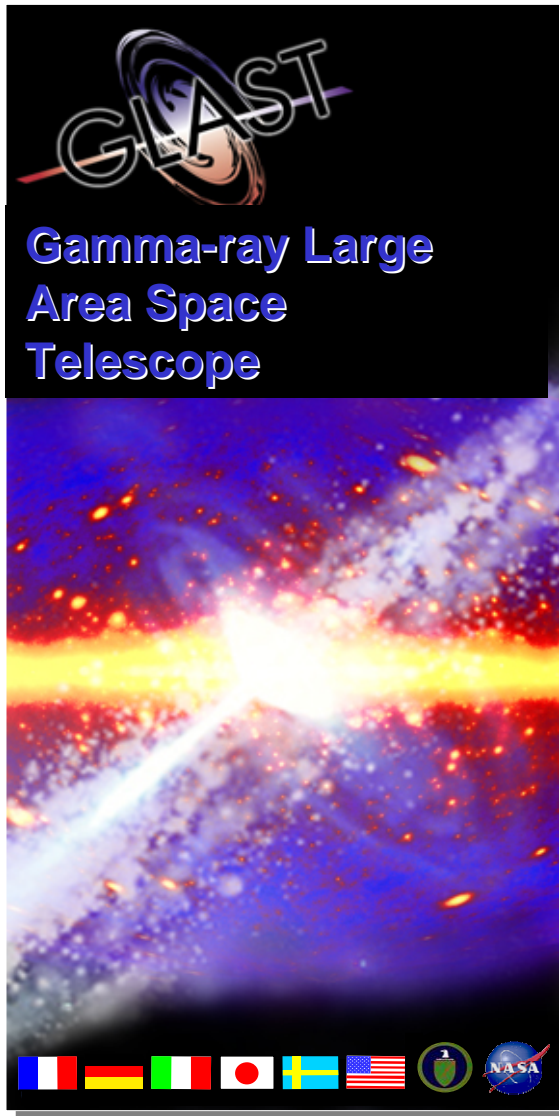
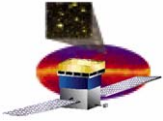
* Target FSW build dates.



JIRA Metrics

JIRA Metrics as of 22 August 2006



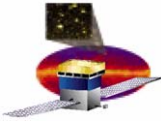


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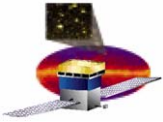
Backup

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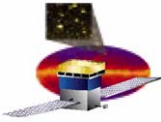
Top FSW JIRAs (Critical or Major Severity)

Priority	Key	Summary	Issue Type
Critical	FSW-716	Implement science data compression	Improvement
Critical	FSW-292	Implement GRB detection algorithm	New Feature
Major	FSW-684	There need to be general no-op commands for each task.	New Feature
Major	FSW-680	Swap LHKPnxHP3DSIT and LHKPnxHP5DSIT to address miswiring of thermal sensor	Bug
Major	FSW-718	Expose LookAtMe in telecommands	Improvement
Major	FSW-717	Expose LAT reset command to Telecommand	Improvement
Major	FSW-456	EMP and LCM do zlib compress with malloc/free, should use MBA_alloc/free	Improvement
Major	FSW-305	Summary/statistics telemetry stream needs to be created for on-board event processors	Improvement
Major	FSW-369	MSG needs to disable reports from within the MSG task	Bug
Major	FSW-576	Bug in CAL data compression algorithm	Bug
Major	FSW-623	CLONE -Documentation for several apids needs to be added to standard webpage	Improvement



Top FSW JIRAs (Critical or Major Severity)

Priority	Key	Summary	Issue Type
Major	FSW-703	Ensure all registers are set	Improvement
Major	FSW-704	Read, report and clear flag registers	Improvement
Major	FSW-701	Add flexibility to MSG level output based on destination	Improvement
Major	FSW-699	Create report to identify configuration files in use	Improvement
Major	FSW-698	Separate LTC master config files into fof, data	Improvement
Major	FSW-270	mnemonics in telemetry packet 720/0x2D0 do not begin with ?L?	Improvement
Major	FSW-562	Make sure that PIG's power sequence is still correct	Improvement



B0.7.0 JIRAs

- Existing JIRA items address requirements, bug fixes, and open NCRs:
 - FSW-164, 167, 270, 419, 526, 538, 562, 636, 690-2, 695-7, 703-4, 716-8
 - Example: Data compression, LAT reset
- Correct deficiencies in current functionality
 - FSW - 287, 369, 582, 682, 698-9, 707
 - Example: Anti-flooding for MSG, LTC Configuration files traceable with FMX, MOOT/MOOD
- Needed for operations visibility
 - FSW-684, 693
 - Example: No-op commands, command confirmation and task messaging configuration report