GLAST Large Area Telescope

Monthly Mission Review

LAT Flight Software Status

July 12, 2007

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FSW - Overall Status

- **FQTB completed**
- **B1-0-1 upload/regression in progress…**

FQTB completed

- All remaining FSW requirements sold off
  - FQTB: 7/09/07 – 7/10/07
  - GRB detection 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
  - FSW Standards
    - 5.4.1 System of Units (metric system)
    - 5.4.2.x Coordinate Systems (3 requirements)
    - 5.4.3 Resource Margin

B1-0-1 has arrived!

- **Build contents relative to B0-9-0*:**
  - **GRB algorithm and updates to LAT-GBM interface**
  - **LCI bug correction**
  - **Updates to LIM, LATC, event filter, compression**
  - **Additional monitoring of LAT configuration and CPU performance through housekeeping**
- **Regression testing of B1-0-1 on Testbed is complete**
  - **Standard FSW regression test suite was successful**
  - **Tested portions of LAT CPT using LICOS in dataflow lab**
    - **Calibration runs**
    - **Physics data acquisition runs**

*** Full list of changes available in JIRA**

B1-0-1 upload/regression: 7/11/07 11:48 PM

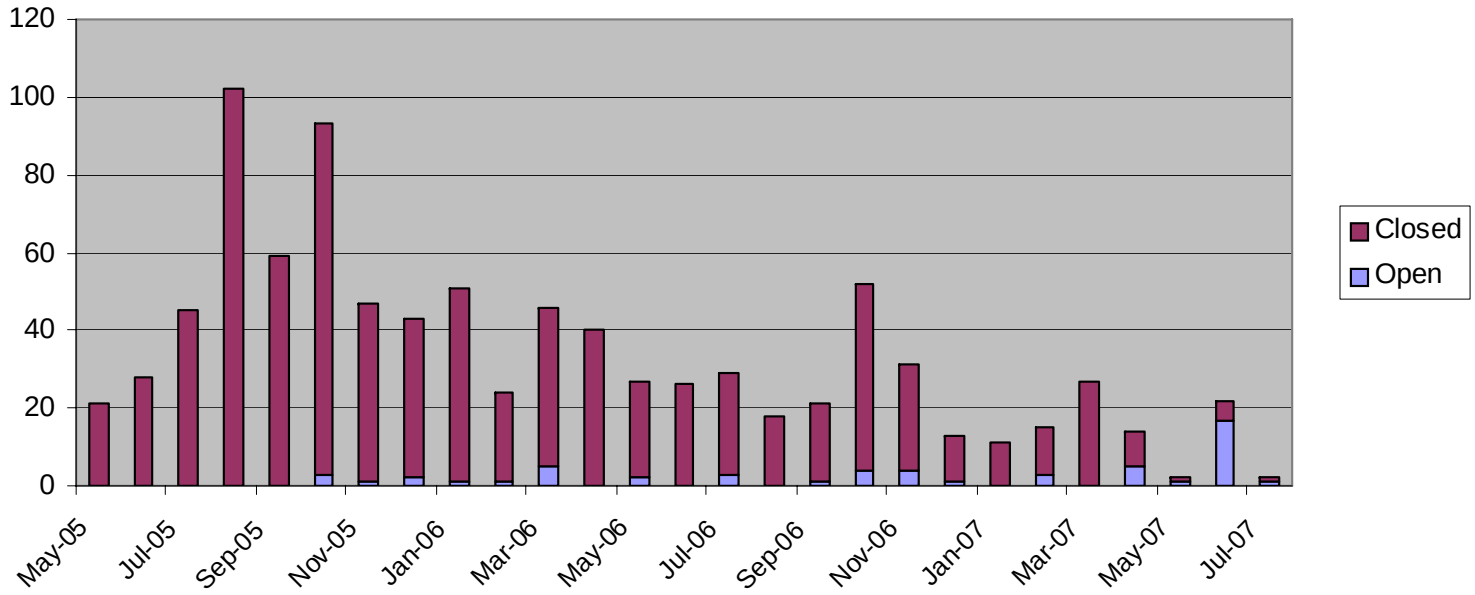
- **B1-0-1 upload started at 5 PM MST on Wednesday, 7-11-07**
  - **In progress**
  - **SIU1 and EPU0 completed**

- **No regression tests performed on the LAT yet…**

Write-back vs. write-through modes

- LAT responds to a flag in the secondary boot command to boot in either write-back or write-through mode
  - Write-back mode
    - Nominal mode for on-orbit operations
  - Write-through
    - Ensures cache coherency to capture non-stale information after a watchdog reboot
      - Only useful for watchdog reboots not exception or panic reboots
    - CPU usage is not optimized for running in this mode
      - Approximate factor of 3 hit in CPU performance
- Why are we operating in write-through mode in the first place?
  - When EMI began, LAT had only 200 reboot-free hours since fix was installed
  - Watchdog reboots represented majority of spontaneous reboots
  - Write-through mode leaves breadcrumbs in case of a watchdog reboot, but comes with a penalty in CPU performance
- Switch to write-back (nominal) mode for CPT and all future tests
  - 400+ reboot-free hours since reboot fix was installed
  - “Clean break”:
    - EMI is complete
    - CPT next week is an opportunity to get a new baseline in the nominal running mode
  - Since mode is commandable, it requires no effort to switch to write-back

JIRA Metrics as of 11 July 2007



- **Open issues are divided as follows**
  - **22 items approved for B1-0-1 that were not complete in time for the build**
    - **16 items associated with a single housekeeping JIRA; split into 16 for tracking purposes**
    - **2 JIRAs dealing with configurations and/or ground software changes**
    - **Of the 4 remaining, only one is crucial – addition of event summary statistics**
  - **16 planned for B2-0-0 (post L+60)**
  - **13 deferred indefinitely**
  - **2 being investigated**
  - **3 on FSW CCB agenda**

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Backup

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Configuration file changes Addition to housekeeping – tracked as individual JIRAs

B1-0-1 leftovers

Key	Summary
FSW-305	Summary/statistics telemetry stream needs to be created for on-board event processors
FSW-806	Revisit rate counter implementation
FSW-789	LCI event data is inconsistent if TEM errors or diagnostics present
FSW-582	Capture of layer splits in LATC does not consider the FE mode registers
FSW-938	LMC Delta timestamp telemetry field description is incorrect
FSW-917	Implement the filter parameters described in TD-08805-01
FSW-948	Add LPA_DB instance ID to housekeeping
FSW-946	Add LATC info to housekeeping telemetry
FSW-950	Add GRB GBM and EPU states in housekeeping
FSW-949	Add default values of LATC, LPA_DB and LATC ignore files for physics acquisitions to housekeeping
FSW-947	Add LCI program file ID to housekeeping
FSW-945	Add PDU/GASU power and CRU Configuration register info to housekeeping
FSW-944	Add LHK configuration files in use to housekeeping
FSW-943	Put LRA in charge of tracking GEM sent, prescaled, discarded, livetime, deadzone for housekeeping
FSW-942	Add simulating/not simulating info for THS time tone and time hack to housekeeping
FSW-941	Add memory scrub info to housekeeping
FSW-918	Include Run ID in housekeeping
FSW-934	Add telemetry to report on LAT power state and state/configuration of physics data acquisition
FSW-951	Add "dirty" flag in housekeeping to indicate non-nominal configuration change
FSW-939	Add LTC configuration file ID to housekeeping