GLAST Large Area Telescope
Monthly Mission Review

LAT Flight Software Status

July 12, 2007

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Stanford Linear Accelerator Center
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

Stanford Linear Accelerator Center
## B1-0-1 leftovers

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