GLAST Large Area Telescope

Monthly Mission Review

LAT Flight Software Status

March 6, 2007

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Stanford Linear Accelerator Center

FSW - Overall Status

- **Currently operating LAT with B0-9-0:**
  - **Uploaded to LAT 2/22/07**
  - **~50 hours of regression testing with this build**
  - **Compression bug fixes (error rate < 1 in 80 x 10^6 muon events)**
  - **Resolution for watchdog reboots (~100 hours since last reboot)**

- **B1-0-0: GRB algorithm (In progress)**
  - **GRB detection algorithm: B1-0-0**
    - **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 (verified as part of B1-0-0 after GRB detection algorithm is implemented)**
    - **5.4.1 System of Units (metric system)**
    - **5.4.2.x Coordinate Systems (3 requirements)**
    - **5.4.3 Resource Margin**

Plan forward

- **Internal FSW build: B0-10-0**
  - **Available on Testbed 3/14/07**
  - **Will allow FSW, FSW test, and I&T to begin developing/testing LAT-GBM interface and mode tests**
    - **Can we upload to the LAT?**
  - **Includes**
    - **FSW-893: LAT-GBM interface modifications to allow for testing**
    - **FSW-843: Modify LIM behavior to favor ARR over TOO and to always obey LPASTART and LPASTOP**
    - **FSW-808: Allow periodic triggers to run with event filters**
    - **FSW-747: LPA sweep event**
- **Build plan for B1-0-0 (for details, see next two slides)**
  - **Build contents:**
    - **FSW-292: GRB detection algorithm**
    - **Other JIRAs approved for B1-0-0**
  - **Target build date: 4/23/07**
  - **Target Delta-FQT-B: 4/30/07**
  - **Upload to LAT: ~5/1/07 (1 month prior to Observatory TVAC)**

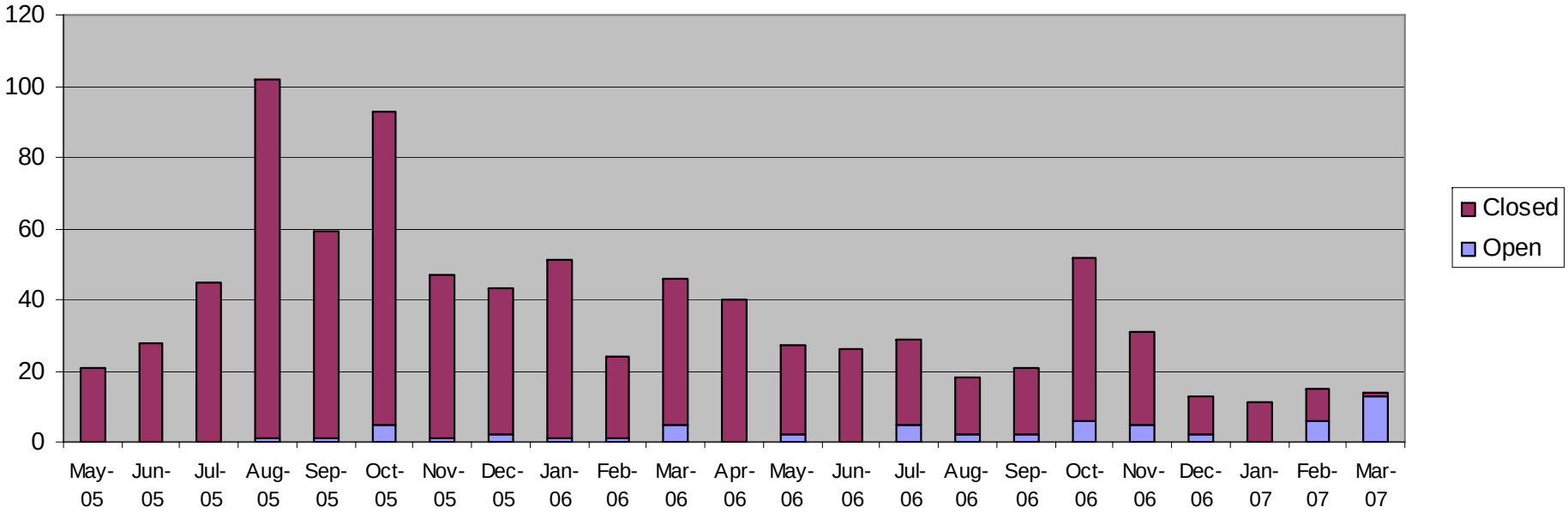
Implementing GRB algorithm (1/2)

- **Implementation of GRB algorithm can be split up into three pieces:**
  1. **Internal FSW infrastructure for handling a GRB (complete)**
  2. **Infrastructure for testing GBM/LAT interface (complete, needs tweaking)**
     - **Existing code needs some modification (FSW-893)**
       - **Ability to trigger algorithm indicating LAT detected GRB via telecommand to test messaging protocols**
  3. **GRB algorithm - detecting a burst (work in progress)**
     - **Algorithm has been defined by science groups**
     - **Porting the algorithm to an onboard environment has begun**
     - **FQT test to be written using testbed/FES**

Implementing GRB algorithm (2/2)

- **Timeline:**
  - **12/06: GRB detection algorithm received from science groups**
  - **1/06: Algorithm implemented in onboard computing environment**
    - **Complexity and scalability evaluated**
    - **Changes proposed to original algorithm to make it more suitable to online environment**
  - **2/06: Feedback passed to science groups**
  - **2/22/07: "Simplified" algorithm received**
  - **3/6/07: Proposed algorithm evaluated, partially implemented**
- **Status:**
  - **First iteration of the process is complete**
  - **Estimate two more iterations with 2 week timescales**
  - **Expected availability 5/1/07**
- **Testing:**
  - **GRB detection algorithm can only be tested on Testbed using Monte Carlo**
  - **Tests are already being defined and implemented using a "dummy" algorithm**

JIRA Metrics as of 5 March 2007



- **Open issues are divided as follows**
  - **19 planned for B1-0-0**
  - **13 planned for B2-0-0 (post L+60)**
  - **14 deferred indefinitely**
  - **14 unscheduled**
    - **10 being assessed by FSW team (new IVV code review)**
    - **4 awaiting Project CCB adjudication**

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Backup

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B1-0-0 JIRAs

- Major open issues
  - FSW-292 Implement GRB detection algorithm
  - FSW-305: Summary/statistics telemetry stream needs to be created for on-board event processors
  - FSW-893: Augment LPASETGRB telecommand to allow testing of messaging protocols
  - FSW-843: Modify LIM behavior to favor ARR over TOO and to always obey LPASTART and LPASTOP
  - FSW-808: Enabling periodic triggers with event filters
  - FSW-747: Correct two separate errors with the extended counters
- Other issues
  - FSW-811: Modify the sample parameters of the Gamma, MIP, and Heavy Ion filters
  - FSW-833: SIU exception occurs during LAT power down
  - 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-164: Add LATC Telecommand Interface to LIM
  - FSW-732: Task messaging configuration report
  - FSW-723: LATC (and RIM) XML contains duplicate tag names
  - FSW-693: Command confirmation configuration report
- Green indicates B0-10-0

B2-0-0 JIRAs

- FSW-872: Illegal memory reference in LCBD after request list fetch error
- FSW-838: PPC compiler is treating a char as an unsigned quantity rather than a signed (survey ongoing)
- FSW-799: Decide on desired level of command execution verification, ability to determine commanded configuration changes
- FSW-791: High and low splits are not separately ignorable
- FSW-790: Tracker calibration doesn't work correctly with uneven splits
- FSW-729: LATC verify error response
- FSW-703: Ensure all registers are set
- FSW-699: Create report to identify configuration files in use
- FSW-562: Make sure that PIG's power sequence is still correct
- FSW-538: There is no way to ignore the AEM when the LATC_verify operation is performed.
- FSW-419: If LSEC cannot encode an event, nothing is placed into the datagram.
- FSW-414: Add internal resources to PIG and eliminate the LEM_micr argument present in most function prototypes/
- FSW-287: Anti-flooding for MSG
- FSW-280: CAL and ACD bias voltage settings
- FSW-271: Logical/physical descriptions

Unscheduled

- **IVV: just received and pending FSW review**
  - **FSW-763: EFC IVV code issues**
  - **FSW-884: EMP package IVV2 code issues**
  - **FSW-882: LATC package IVV2 code issues**
  - **FSW-881: RIM package IVV2 code issues**
  - **FSW-890: ITC package IVV2 code issues**
  - **FSW-887: EDS package IVV2 code issues**
  - **FSW-886: LCM package IVV2 code issues**
  - **FSW-885: LCI package IVV2 code issues**
  - **FSW-889: LHK package IVV2 code issues**
  - **FSW-883: Remove error and status register information from LATC dumps**
- **Pending CCB review:**
  - **FSW-892: Improved speed and infrastructure of reboot trace information**
  - **FSW-891: Error and status register dump contains extraneous data**
  - **FSW-880: Add some configuration registers as parameters to LCI**
  - **FSW-879: Define the ACD hit map delay as an iterable in LCI**

Deferred

- FSW-824: CLONE -Disable memory controller Maximum Bank Active Timeout
- FSW-832: CLONE -Need unique access to all cache lines of LCB I/O buffers during hardware operation
- FSW-626: LATC dumps have unexpected GTFE masks on LATC verify error dumps only
- FSW-875: IVV TIM 1635 - LAT FSW Boot Code (PBC): Duplication of APID definitions in header & source code files may lead to execution errors
- FSW-876: Include LATC ignore file used as part of the run configuration data
- FSW-239: vxw_flight RTOS constituent still has the serial console device enabled
- FSW-540: Addition of AEM/EBM memory relocation register control
- FSW-697: Set the range for all padded fields to 0-0
- FSW-474: Sharpen the definition of the extended counters so that completely accurate bookkeeping can be done even when there are dropped datagrams
- FSW-689: Split LFSFILEID into device, directory, and file name
- FSW-724: QSEC does not update the event-time fields in the standard context correctly
- FSW-526: NCR 794, problem 6: Add debugging code to LCBD code to trace intermittent failure
- FSW-636: NCR 882: CPU should apply a reset to the LCB after it powers the GASU and before it checks the LCB for data presence
- FSW-753: ACD calibration PHA threshold is not being iterated

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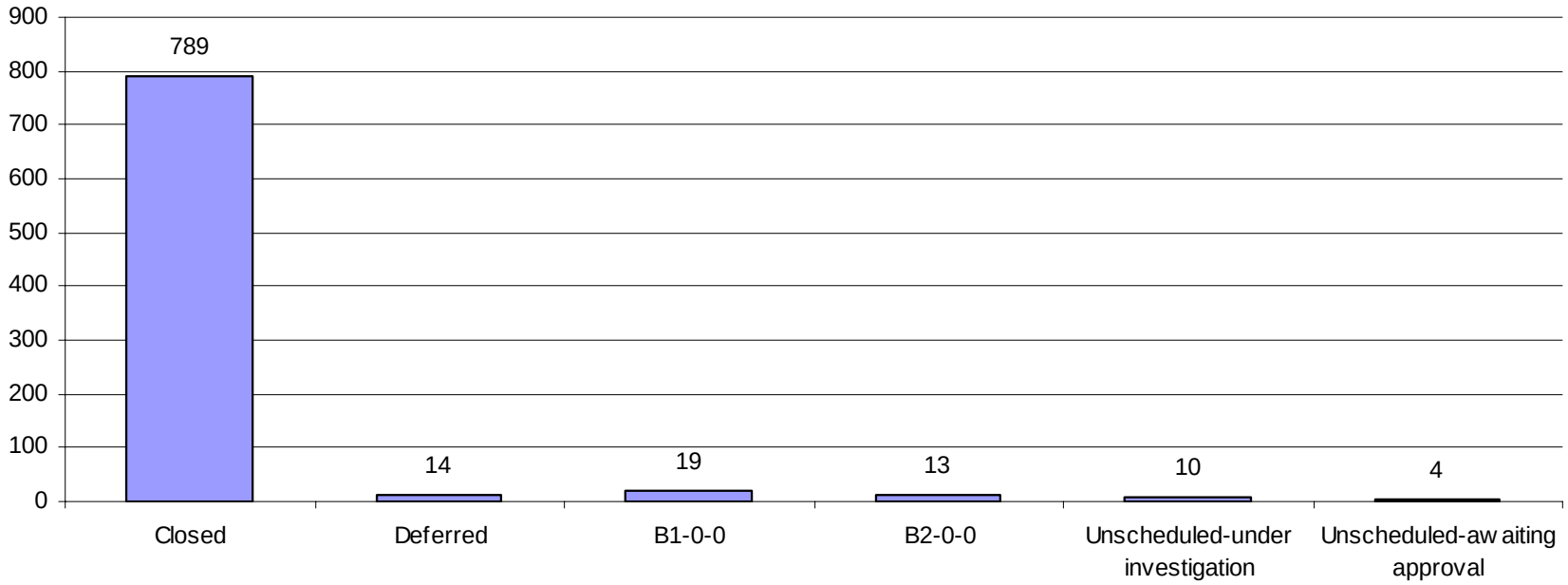

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