GLAST Large Area Telescope

Monthly Mission Review

LAT Flight Software Status

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FSW Status

- **B1-0-5 upload and regression completed 11/16/07**
  - **Some issues discovered (see later slides for details)**
  - **B1-0-6 planned to correct these problems**

- **B1-0-6 schedule:**
  - **Approximate schedule for B1-0-6:**
    - **Roll build: 12/14**
    - **Testbed: 12/14 - 12/21 (2-3 days of work, 7 days scheduled)**
    - **Ready for upload by 12/21**

B1-0-6 details

- Summary of JIRAs approved for B1-0-6:
  - Reboot and reboot handling: EFC, VXW
  - Handling of repoints/GRB mode changes: GRBP, LIM, LPA
  - Miscellaneous bug fixes: EFC, XFC, LSEP
- JIRAs by the numbers
  - 17 JIRAs approved since B1-0-5, including 3 today
    - 13 changes to flight packages (most changes trivial)
      - 10 approved in previous CCBs
        - » 9/10 have already been implemented, have passed unit testing, and have been released to the test group for system level tests
      - 3 approved today
        - » Estimate 3 days to implement and unit test these changes
        - » No risk or change to the schedule
    - 4 changes to ground packages

FSW Issues (GRB Handling test/DITL)

- **GRB Handling test script (Flag 1)**
  - **Symptom: LAT went into ARR (LAT-detected burst) prior to any actions taken by the script. LAT was expected to remain in PHYSICS mode. This behavior was also noticed during the DITL.**
  - **Root cause: Using the flight parameters for the GRB algorithm on the ground with certain trigger configurations can cause "legitimate" LAT-detected bursts.**
  - **Solution: FSW-1016, FSW-1021, FSW-1028.**
    - **In order to run the test on the ground, disable LAT burst detection by the real GRB algorithm while still allowing the simulation to function.**
    - **Maintain ability to forward GBM repoint requests and respond to GBM triggers and closeouts**

FSW Issues (DITL, part 1)

- **DITL (Flag 6, part 1)**
  - **Symptom: "Didn't forward GBM repoint"**
  - **Root cause: GBM repoint recommendation command has been implemented as 0=do not recommend repoint, 1 = recommend repoint. The ICD specifies the opposite meaning, which is what FSW expected.**
  - **Solution: FSW-1018, LAT FSW will change the interpretation of 0 and 1 to match GBM implementation**
- **DITL (Flag 6, part 2)**
  - **Symptom: When a negative repoint recommendation is received by LIM, LIM/LPA remain stuck in ARR mode.**
  - **Root cause: LIM does not forward negative repoint recommendations to LPA and in the event of a negative repoint recommendation, the GRB logic ignores the subsequent closeout sent by the GBM. As a result, LIM/LPA are never given the directive to exit ARR mode**
  - **Solution: FSW-1017, LIM/LPA will honor the closeout**

FSW Issues (DITL, part 2)

- **DITL (Flag 4):**
  - **Symptom: "LAT caused an ARR to end early. Expected duration of 5 hours, saw 10 minutes"**
  - **Root cause: The problem is not in FSW, but in the expectation. The change in duration was for GBM-detected bursts, not LAT-detected bursts. The 10 minute timescale is correct for a LAT-detected burst without a repoint request in which burst is suspected but never confirmed.**
  - **Action: None. Modify expectations.**
- **DITL (Flag 5):**
  - **Symptom: Failure of the LAT to simulate the GRB**
  - **Root cause: The LPASETGRB command issued to initiate simulation mode was incorrect due to operator error resulting in repeated triggers.**
  - **Solution: Use correct LPASETGRB arguments in future tests**

FSW Issues (B1-0-5 regression)

- **Reboot due to FSW bug in heavy-ion particle (HIP) filter code**
  - **Symptom: One of the late-stage vetoes of the HIP filter causes a data exception when an event with 4-range readout is encountered**
  - **Root cause: A 16-bit mask is being treated as though it were 32-bits causing the HIP filter to access nonexistent TEM towers for events when the CAL is in 4-range readout mode**
  - **Solution: FSW-1012, Fix the 16-bit mask**
- **Reboot diagnostic information not reported in boot telemetry**
  - **Symptom: Boot type is reported as 1 (COLD boot) rather than 4 (EXCEPTION) and boot diagnostics are empty**
  - **Root cause: The user-provided exception panic handler was inadvertently unhooked when the serial console device was disabled in VXW**
  - **Solution: FSW-239, provide and verify code path to FSW exception panic handler under all circumstances**

FSW Issues (misc)

- **Miscellaneous bugs in GRB or handling of bursts by LIM/LPA (which may not have had a direct impact on DITL):**
  - **FSW-1013: EFC improperly sets a mask, causing all filters, to post their passed events to the GRB processing algorithm**
  - **FSW-1011: LIM should check repoint timer prior to transitioning out of QUIESCENT mode. If timer is active, mode is ARR, if inactive, PHYSICS.**
  - **FSW-1020, 1022: Mis-dimensioned arrays**

Outstanding FSW Issues

- **CPU serial number mismatch (Aliveness testing)**
  - **Symptom: An error was reported by housekeeping indicating that the CPU identifier reported by EPU2 disagreed with the expected CPU identifier.**
    - **The error occurs when "diff"ing two records containing CPU performance information delivered by EPU2 to the SIU. The "diff" is paranoid and insists that the records carry the same CPU identifier.**
    - **Somehow the CPU identifier information, probably on the EPU, was overwritten, but the overwrite appeared to have no other effect**
    - **It has never been seen in testing (> 100 hours of testing if you include the Testbed) and we have not yet been able to duplicate it**
  - **Root cause: Unknown at this time**
  - **Action: Further progress is hard unless this reproduces on the Testbed.**
    - **If we see the error again on the LAT, we are prepared to do some memory dumps to try and isolate the problem.**
    - **We will continue to try and reproduce this on the Testbed**
  - **Impact: None, except for the appearance of this error message. There is no other perceptible effect on operations**
- **What to do if SC does not reject new repoint requests if it is already in a pointed observation?**
  - **Based on the ICD, the LAT team has assumed that the SC will reject repoint requests if it is already in a pointed observation. Consequently, the LAT doesn't worry about sending multiple repoint requests, assuming the SC will handle it**
  - **Based on new information, if SC is in ARR, it does not reject subsequent repoint requests.**
  - **We are still gathering information.**