



Gamma-ray Large
Area Space
Telescope



GLAST Large Area Telescope

LAT Flight Software
TRR

Current Status

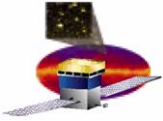
Sergio Maldonado
FSW Test Team Lead

Stanford Linear Accelerator Center



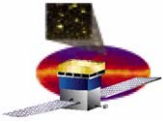
Current Status

- **RFAs**
- **Requirements status**
- **Development status**
- **Open JIRA Items**
- **Test Environment**
- **Procedure/Script Status (dry runs)**



RFA Status

- **6 Flight Unit Peer Review RFAs**
 - **All RFAs Closed**



Requirements Status

- **Current status**
 - Potential requirement update for GRB detection driven by science community, led by Steve Ritz
 - Change would effect Δ -FQT, but not main FQT
- **Action plan**
 - Finalize and incorporate any change into FSW Specification by 1 May 2006



Development Status

- **Current status**
 - **Known liens for FQT**
 - **Bug-fixes required for LAT commissioning (details from JIRA presented later)**
 - **Known liens for Δ -FQT**
 - **CNO, alignment filters**
 - **GRB detection algorithm and response**
 - **Compression**
- **Action plan**
 - **FQT target build V0-6-7 (7 Apr) will address relevant known bugs**
 - **Δ -FQT target build V1-0-0 (1 June) will provide all remaining functions**



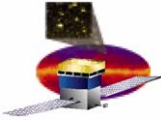
FSW (Flight Code) in FQT Build

Basic Services	ATT	FBS	MDB	RAD750
	CCSDS	FILE	MEM	SBC
	CDM	IMM	MON	SIB
	CMX	LATC	MSG	THS
	EBC	LDT	PBC	VXW
	EFC	LEM	PBS/PBI	ZFS
	EMP	LSF	PIG	ZLIB
Driver	CTDB	LCBD		
Services	CTS	ITC		
	EDS	LCS		
Applications	LCI	LHK	LPA	LSEP
	LCM	LIM	LSE	LSM
	LFS	LMC	LSEC	LTC
Software Config Files (CDM)	CAL_DB	FILE_DB	LEM_DB	MON_DB
	CGB_DB	GEO_DB	LHK_DB	MPP_DB
	CPU_DB	GFC_DB	LIM_DB	MSG_DB
	CTS_DB	GGF_DB	LPA_DB	PBC_DB
	EDS_DB	LCI_DB	LSM_DB	PBS_DB
	EFC_DB	LCM_DB	LTC_DB	PFC_DB
	EMP_DB	LCS_DB	MEM_DB	PIG_DB



Open JIRA Items Affecting Current FQT (Critical and Major as of March 28, Targeted for 0-6-7)

Key	Summary	Issue Type	Status	Priority	Fix Version/s	Component/s	Description
FSW-582	Capture of layer splits in LATC does not consider the FE mode registers	Bug	Open	Major	B0-6-7	LATC	<p>The logical concept of a layer split affects the TRC CSR register and the TFE MODE registers. When LATC captures the current LAT state, the TRC CSR register is read, but the TFE MODE register is not checked for consistency. This should be added, with the upper bits of the split "register" being used to hold information about any inconsistencies.</p> <p>This is non-trivial and will require some time to do correctly.</p>
FSW-576	Bug in CAL data compression algorithm	Bug	Open	Major	B0-6-7	LSEC	Being tracked via COM-19
FSW-561	Add LATC Verify To LPASTOP Activities	Improvement	Open	Major	B0-6-7	LPA	<p>At the end of a run, LATC_capture followed by LATC_verify should be executed. This will report as to whether or not the hardware configuration changed from the start of the run. If the verify fails, then LATC_consign will be called, forcing out a dump of the LATC register cache. This feature is requested by Gunther as a result of I&T clean room activities.</p>



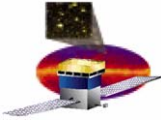
Open JIRA Items Affecting Current FQT (2)

FSW-538	There is no way to ignore the AEM when the LATC_verify operation is performed.	Bug	Open	Major	B0-6-7	LATC	<p>The ACD is treated by PIG as something of a seventeenth tower. The AEM is added to the C/R fabric when the ACD is powered on, just like a TEM and its tower.</p> <p>During testing the ACD is sometimes <code>_not_</code> powered on, so the AEM is not part of the C/R fabric and <code>LATC_capture</code> will not read back its registers. Subsequent <code>LATC_verify</code> operations will fail, since captured and cached in-memory models differ.</p> <p>The AEM needs to be added to the list of ignorable components.</p> <p>Without this fix, when I&T wish to run test involving LPA without the ACD they must insert the AEM into the C/R fabric by hand.</p>
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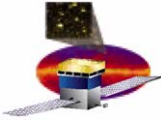
Open JIRA Items Affecting Δ FQT (Critical and Major as of March 28, Targeted for 1-0-0)

Key	Summary	Component/s	Description
FSW-292	Implement GRB detection algorithm	LPA	
FSW-272	Additional filters for CNO, alignment ...	EFC	
FSW-305	Summary/statistics telemetry stream needs to be created for on-board event processors	LPA	<p>Event handlers come in two varieties, roughly divided by their output characteristics. Filters have the power to output two streams of information, the event itself and summary statistics. Event monitors only accumulate summary statistics. While there is a nice general model for filters to output events, there is no such model for summary statistic stream. Without such a model, each event handler contributor must conjure up an ad-hoc solution.</p> <p>This is mainly a design issue, the implementation should be a straightforward manner of stitching together existing utilities. The main issue to address is what are the various configuration parameters that define the stream and where does the specification of these reside. For example, some such as those that affect the overall rate, should be kept at the top configuration level (LPA) so that the person laying out all the event handlers can assess what the overall impact on the bandwidth will be, while others, such buffering sizes, are parameters that belong with the configuration of the handler itself.</p> <p>This project touches both LPA and the individual event handlers.</p>



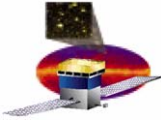
Open JIRA Items Affecting Δ FQT (2)

FSW-456	EMP and LCM do zlib compress with malloc/free, should use MBA_alloc/free	EMP LCM	<p>EMP and LCM do zlib compress with malloc/free, should use MBA_alloc/free (???)</p> <p>This means that zlib for SSR compression is using the VxWorks system memory partition instead of the larger MBA memory partition. If the malloc (i.e. VxWorks system) partition should fill, compression would fail.</p> <p>However, straight usage of MBA_alloc might fragment the MBA partition.(it might also fragment VxWorks partition it is currently using).</p> <p>Better solution might be some sort of pre-allocation scheme. THis would depend on some knowledgr of how zlib allocates memory.</p> <p>I have seen a case where deflateInIt() threw an exception in the sLCM task on the SIU.</p> <p>Unfortunately, there was no info from the zlib library, only that is where it was.</p> <p>From examination of parameters and code, I saw two possibilities:</p> <ol style="list-style-type: none">1) The VxWOorks partition was near full due to use of Tornado (I think) so it might have been a failed alloc (although I would think that the zlib lib would handle this case better than this).2) the stream.total_in parameter was 4713744. THis is used to count the number of bytes processed. This may or maynot mean something since the compress had not started. I could set this parameter to zero before the call (although the documentation does not say it is required).
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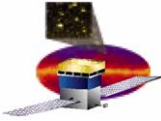
Open JIRA Items Affecting Δ FQT (3)

<u>FSW-455</u>	LATC datagram 'Q' package is needed	LATC	<p>There needs to be a 'Q' package that interprets the datagrams produced by the LATC package. These datagrams are sent to the SSR via the SDI, and they contain snapshots (in-memory models) of the LAT instrument registers.</p> <p>Since this is an enhancement and does not change existing functionality, there should be no negative impact to other packages nor a delay in the testing/release of FSW.</p>
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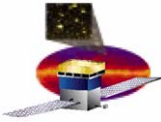
Open JIRA Items Affecting Δ FQT (4)

FSW-413	The definitions of SIU primary and SIU redundant are going to cause confusion.	LCS LEM PIG	<p>This is to raise the priority of a discussion that petered out in a Snitz posting.</p> <p>The problem is essentially one of labelling. In the current test-bed setup, people powering on an SIU send the power to the SIU labelled "redundant". They then go on to to use a LAT main feed on command, which identifies the powered SIU as "primary". The simple solution would be to swap the power cables coming out of the back of the BPU. Unfortunately that's not viable (in the end Spectrum Astro own those labels).</p> <p>The remaining solution is to find all associations in FSW between an SIU label (primary or redundant) and ensure that these are correctly mapped to EBM hardware addresses (0x23 and 0x22 respectively). I know there's one such association in package LCS. I believe there might be other such associations in packages PIG and/or LEM.</p> <p>This is also an opportunity to reduce the number of associations in the code to just one (and avoid this pain ever again).</p>
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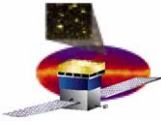
Open JIRA Items Affecting Δ FQT (5)

FSW-341	LPA Mode Change/Flush Behavior is Incorrect	LPA	<p>A) The current sequence of actions occurring for a mode change is incorrect. The actions should be:</p> <ol style="list-style-type: none">1 disconnect event handlers2 flush active event handlers and datagram3 select new mode for all handlers and datagram4 change active event handlers5 reconnect event handlers <p>Currently, the mode change behavior only executes step 3, but the datagram mode change is not called. This means that event data will not always reflect the actual mode in which it was collected. Also, the handlers associated with a given mode may not be enabled as expected</p> <p>B) Additionally, in order to ensure this occurs in an interlocked fashion, some of the above steps need to be executed in the context of the event processing task, rather than LPA. In order to do this, LCBD must expose a FORK que.</p> <p>A fix is already in dev for A) but B) requires an update to LCDB and possibly EDS.</p>
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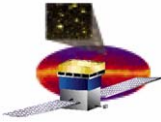
Open JIRA Items Affecting Δ FQT (6)

<u>FSW-369</u>	MSG needs to disable reports from within the MSG task	MSG	<p>There is a potential livelock problem with the MSG output task. This occurs when one of the MSG output callback functions calls another function which generates a MSG report. The instance I encountered with this was in having the CTDB MSG output callback attempt to forward a telemetry packet to the SIU, but could not due to an LCS/LCB software error. This error generated a MSG report which was put back on the MSG output queue, only to hit the same error again when attempting to send the second error report. This creates an infinite loop of continuous MSG reports and needs to be avoided.</p> <p>The proposed solution is to disable MSG reports from within the context of the MSG task.</p>
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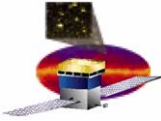
Test Environment Status

- **Current status**
 - **Known lien: VSC support for LAT GRB commands**
 - **Impacts Δ -FQT, but not main FQT**
- **Action plan**
 - **Incorporate capability to support Δ -FQT**



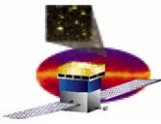
Procedure/Script Status

- **FQT Tests**
 - All test procedure documents baselined, with updates approved by FSW CCB
 - All tests have been formally dry run
- **Δ-FQT Tests**
 - Δ-FQT procedures and scripts are under development, pending related development and EGSE liens



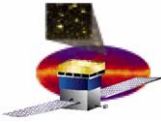
Script Status (2)

Test Script (in priority and planned execution order)	Test Procedure Document (LAT-TD)	Formal Dry Run Against Specified Release
FSW Initialization		
FSWINI_001: SIU primary boot	7132	0-6-1
FSWINI_002: Boot self-test	7133	0-6-1
FSWINI_003: Multiple boot images	7134	0-6-1
FSWINI_004: SIU hardware reboot in response to signal on the discrete lines	7135	0-6-1
FSWINI_005: EPU primary boot	7136	0-6-1
FSWINI_006: Reset source	7137	0-6-1
FSWINI_007: Storage and retrieval of system errors during SIU primary boot	7138	0-6-1
FSWINI_008: Storage and retrieval of system errors during EPU primary boot	7139	0-6-1
FSWINI_009: SIU boot status on discrete lines and SIU boot housekeeping telemetry	7140	0-6-6
FSWINI_010: SIU and EPU secondary boot	7141	0-6-1
FSWINI_011: SIU and EPU secondary boot error mitigation	7142	0-6-1
FSWINI_012: SEU protection	7143	0-6-1
FSWINI_013: Memory scrubbing	7144	0-6-1
FSWINI_014: Watchdog management during boot	7145	0-6-1



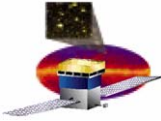
Script Status (3)

Test Script (in priority and planned execution order)	Test Procedure Document (LAT-TD)	Formal Dry Run Against Specified Release
Command Functional		
CMDFNC_001: Soft reset	6995	0-6-1
CMDFNC_003: 1553 interface and command functional verification	7164	0-6-1
Narrowband Telemetry Verification		
NBTLMV_001: Housekeeping and low-rate science	7129	0-6-1
NBTLMV_002: Diagnostic telemetry	7130	0-6-1
NBTLMV_003: ACD HSK anomaly response and alert telemetry	7160	0-6-1
Configuration (nominal)		
SIUCFG_001: LAT subsystem data collection	7051	0-6-1
SIUCFG_002: LAT subsystem configuration	7052	0-6-1
File Management		
FILMGT_001: File management	7158	0-6-1



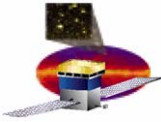
Script Status (4)

Test Script (in priority and planned execution order)	Test Procedure Document (LAT-TD)	Formal Dry Run Against Specified Release
Operational Modes		
OPMODE_001: Mode control	7161	0-6-1
Front-End Calibration (Charge Injection)		
FECALB_001: TOT measurements	7152	0-6-6
FECALB_002: TKR Threshold and charge scans	7153	0-6-6
FECALB_003: TKR Trigger check	7154	0-6-6
FECALB_004: ACD CI	7155	0-6-6
FECALB_005: CAL CI	7156	0-6-6
Event Performance Monitoring		
EVTPMO_001: Deadtime	7054	0-6-6
EVTPMO_002: VETO rates from GEM	7055	0-6-6
EVTPMO_003: L1 Trigger Rates	7056	0-6-6
EVTPMO_004: Monitor CNO Rates	7057	0-6-6
Filter		
EVTFIL_001: Interface from the Event Builder	7112	0-6-1+
EVTFIL_002: Rates and capacity	7113	0-6-1+
EVTFIL_003: Reprogramming	7114	0-6-1+
EVTFIL_004: Filter bypass	7115	0-6-1+



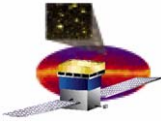
Script Status (5)

Test Script (in priority and planned execution order)	Test Procedure Document (LAT-TD)	Formal Dry Run Against Specified Release
Wideband Telemetry Verification		
WBTLMV_001: Science data format and volume	7157	0-6-6
Memory Management		
MEMMGT_001: Memory managment	6994	0-6-1
MEMMGT_002: Memory load data	7159	0-6-6
Time Processing		
TIMPRC_001: Time Services	7053	0-6-1




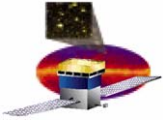
Script Status (6)

Test Script (in priority and planned execution order)	Test Procedure Document (LAT-TD)	Formal Dry Run Against Specified Release
Interface formats		
IPCFNC_001: Inter-processor communications	7050	0-6-1
VSGIFV_001: Discrete Signal interfaces	7163	0-6-6
Thermal		
THRMCS_001(2): Thermal control system	7162	0-6-6
THRMCS_002(1): Thermal control system - Heater Algorithm		0-6-6





Script Status (7)

Test Script (in priority and planned execution order)	Test Procedure Document (LAT-TD)	Formal Dry Run Against Specified Release
Diagnostic functions		
DCMODE_001: ACD Diagnostics and Calibration	7126	
DCMODE_002: CAL Diagnostics and Calibration	7127	
DCMODE_003: TKR Diagnostics and Calibration	7128	0-6-6
DCMODE_004:	7128	
GRB		
GRBPRC_001: delta		
GRBPRC_002		
GRBREQ_001		
GRBREQ_003		
GRBREQ_004		
GRBREQ_005		
FSW Standards		
FSWSTD_001: Units		
FSWSTD_002: Coordinate Systems		
FSWSTD_003: Resource Margin		



**Gamma-ray Large
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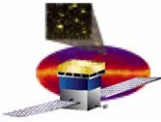
A vertical banner on the left side of the slide. At the top is the GLAST logo, which consists of the word 'GLAST' in a stylized, metallic font with a satellite-like structure behind it. Below the logo is the text 'Gamma-ray Large Area Space Telescope' in blue. The main part of the banner is a colorful image of the cosmic microwave background, showing a bright yellow and orange band across the center, surrounded by a blue and purple field of smaller, distant galaxies. At the bottom of the banner is a row of flags representing the participating countries: France, Germany, Italy, Japan, Sweden, and the United States, followed by the European Space Agency and NASA logos.

GLAST Large Area Telescope

LAT Flight Software
TRR

Backup

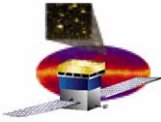
Stanford Linear Accelerator Center



Open JIRA Items

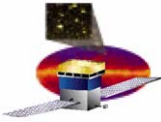
(Minor and Trivial Severity as of March 28)

JIRA							
FSW-575	CRC DAC load stall is not long enough....	Bug	Open	Minor	B0-6-7	LEM_DB	<p>As noted in FSW-563, the stall time for loading the CRC DAC register should be 64 (is currently 50.)</p> <p>To Quote James:</p> <p>LEM_DB provides both an interface and a set of databases containing the stall and timeout values. The interface has a very fine granularity (individual LAT registers) but the current database has a granularity of components (so all CRC registers receive the same stall time). Without changing any code outside of the LEM_DB package the database schema can be extended to give the CRC DAC register their own parameter, loaded with the appropriate stall time. With no code changes all CRC loads can be given a stall time of 64 ticks.</p> <p>The former change would require CCB approval for the schema to be modified and a new version of LEM_DB released.</p> <p>The latter change is restricted to the contents of the database and would just required the Powers That Be to work out once and for all how they want to handle these configuration files</p>
FSW-559	TCC reset stomps on TCC event timeout value from PIG_DB	Bug	Open	Minor	B0-7-0	PIG	<p>There is a TCC reset that is issued when we power the TKR. (This was done at their request.) Currently, the TCC event timeout register is set when the TEM is powered, it then gets erased by the TCC reset.</p>



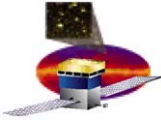
Open JIRA Items (Minor and Trivial) (2)

FSW-304	LTC package documentation out of date	Improvement	In Progress	Minor	B0-7-0	LTC	The LTC package documentation has not been kept up to date with the latest changes over the past couple of months. It is mainly details that need to be updated, as the overall design and implementation have not changed too much. The "doc" directory contains a design description by J.Russell (also entered as a LATdoc official document) and a user's manual by S.Mazzoni.
FSW-292	Implement GRB detection algorithm	New Feature	Open	Minor	B0-8-0	LPA	
FSW-522	Large file uploads sometimes fail when M7 enabled	Bug	Open	Minor	B0-7-0	FILE THS	Entered on behalf of Jim Panetta: When uploading large files (>15-20KB) in application mode, with M7 enabled, the upload sometimes fails. Receive error message ~"could not allocate buffer for packet". Problem does not occur with M7 disabled.
FSW-247	Some fragment of LATC needs to migrate to a new package QLATC.	Improvement	In Progress	Minor	B0-7-0	LATC	Structures and functions required for interpreting the LATC data must be split off into a new package QPIG to isolate the FSW interface from internal implementation details.
FSW-434	LCI test code is out of date.	Improvement	Open	Minor	B0-7-0	LCI	The rapid development/depolymt cycle of LCI has resulted in incomplete test coverage of LCI.



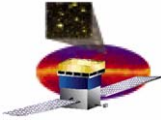
Open JIRA Items (Minor and Trivial) (3)

FSW-419	If LSEC cannot encode an event, nothing is placed into the datagram.	Improvement	Open	Minor	B0-7-0	LSEC	<p>It may be that events arrive on the LCB that are corrupted and LSEC cannot navigate through the event. Under these circumstances the attempt to encode fails and the consignment of data stops, possibly with a MSG emitted.</p> <p>The behaviour should be modified so that the first corrupted event in a cycle is written out as it arrived on the LCB, uncompressed, and subsequent corrupted events cause an error record to be emitted.</p> <p>This will assist with the postmortem and record keeping.</p>
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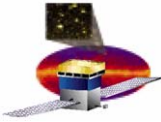
Open JIRA Items (Minor and Trivial) (4)

FSW-490	EPU State Monitoring Required by LHK and THS	Task	Open	Minor	B0-7-0	LCM LHK LIM THS	<p>Both LHK and THS master tasks running on the SIU need to communicate with the EPUs when running in application mode. Currently, there is no way for these tasks to know if the EPUs are in application mode. They need an EPU state table that contains the current running mode of the EPUs. With this information, these master tasks can determine whether or not it is safe to send messages to the EPUS. This is the optimal solution over always sending them (dangerous) or by manually reconfiguration (cumbersome).</p> <p>The SIU will have to run EPU state monitoring based on:</p> <ol style="list-style-type: none">1) Spying commands to EPU (e.g. power on/off, secondary boot).2) Spying EPU telemetry (e.g. primary boot telemetry, some sort of ping). <p>LIM is probably the best candidate to maintain this information.</p>
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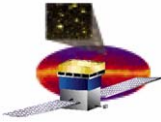
Open JIRA Items (Minor and Trivial) (5)

FSW-271	Logical/physical descriptions	Improvement	Open	Minor	B0-7-0	CPU_DB	<p>Some CPU properties are logical (list of tasks to be run on an EPU). Some CPU properties are physical (the RAD750 in the EPU2 slot had developed a memory failure). Current FSW code configures down to the logical level (is this an SIU or an EPU), but not down to the physical level.</p> <p>Hard to estimate how long this would take because the first problem is how to present the information. Current best guess: use spare memory locations in SUROM (on RAD750s) and NVRAM (on COTS boards) to plant what amounts to a serial number. The serial number can then be used as a key in other applications.</p>
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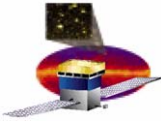
Open JIRA Items (Minor and Trivial) (6)

FSW-414	Add internal resources to PIG and eliminate the LEM_micr argument present in most function prototypes/	Improvement	Open	Minor	B0-7-0	LIM PIG	<p>Many of the PIG functions take a pointer to a LEM_micr as an argument. This is, obviously, a LEM multi-item command/response list and is used to construct the register load and read operations. When PIG was originally designed it was imagined that a pool of LEM_micr could be shared by multiple packages, at the very least by LPA, LCI and LIM. However, it has transpired that each package requiring a LEM_micr is creating one as part of the internal resources used by that package (LATC, for example creates a maximally sized LEM_micr during initialisation).</p> <p>Currently LIM allocates this resource, that is never used directly by LIM itself, simply to pass a pointer into every PIG function.</p> <p>I would like to propose that internal resources be added to PIG, starting with a maximally sized LEM_micr. This would add PIG_initialise and PIG_teardown functions, and remove the LEM_micr argument that is present in most PIG function prototypes.</p> <p>At the very least this change would lead to improved modularity (LIM would no longer directly use LEM), but I have an ulterior motive for proposing this change.</p>
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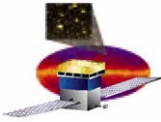
Open JIRA Items (Minor and Trivial) (7)

FSW-526	NCR 794, problem 6: Add debugging code to LCBD code to trace intermittent failure	Bug	Open	Minor	B0-7-0	LCBD	<p>During TV Test for PDU, RunControl software occasionally crashed. Behavior in this scenario is a complete lockup of the software on the VxWorks side. Power cycling or hard reset of the VME crate is the only way to resolve this crash. In all observed cases of this problem, there is an exception at current instruction address 0x0 in the "dLCBDrst" task. Eric Siskind suspects that some software routine is deficient in interpreting a legal but unusual error code from the LCB.</p> <p>Need to add debugging code to driver code be able to trace problem.</p>
FSW-287	Anti-flooding for MSG	Improvement	Open	Minor	B0-8-0	MSG	<p>Under certain circumstances (usually things like broken/missing/uninitialized hardware), MSG can enter a cyclic reporting mode, spewing hundreds of repetitive and uninformative messages. This has two downsides. The messages can exhaust MSG resources, so other more important messages get dropped (even if MSG's resources don't get exhausted, finding the important message can get to be finding a needle in a haystack). The messages also chew up storage/bandwidth.</p> <p>This fix would limit the rate at which any given message can be issued. Once the rate is exceeded, a repeating message would be suppressed until its average rate fell back below the average rate allowed.</p>
FSW-273	Statistics telemetry (SSR and 1553)	New Feature	Open	Minor	B0-8-0	EFC	



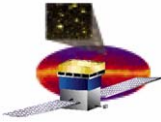
Open JIRA Items (Minor and Trivial) (8)

FSW-280	CAL and ACD bias voltage settings	Improvement	Open	Minor	B0-8-0	LEM	<p>In addition to commands that set the bias voltage, commands to turn on and turn off the bias voltages have been requested. These commands would require the software to save a copy of the current bias voltage settings before turning them off so it could be restored when it was turned on. So the software would have to maintain a table of the bias voltages.</p> <p>PIG (the likely candidate for providing this functionality) does not currently maintain internal storage, which would therefore have to be added.</p>
FSW-445	QLFS should include support for DFI parsing of file dump datagrams sent to the SSR.	New Feature	Open	Minor	B0-7-0	QLFS	<p>The DFI package contains a datagram parser base class from which datagram-specific parsers can be derived. The QLFS package should contain such a derived class that parses file dump datagrams sent to the SSR.</p> <p>Since this is an enhancement to the QLFS package, and does not change existing functionality, there should be no negative impact to other packages nor a delay in the testing/release of FSW.</p>



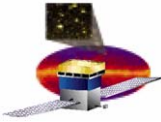
Open JIRA Items (Minor and Trivial) (9)

FSW-444	Memory dump SSR packet sequences should not contain multiple datagrams	Improvement	Open	Minor	B0-7-0	MEM	<p>When memory dump data is sent to the SSR, multiple datagrams are used to send the data, each with no more than ~2K bytes of data. To provide a hint that these datagrams are related, the CCSDS sequence flags are set so that the first datagram has the 'FIRST' bit set, the last datagram has the 'LAST' bit set, and any intermediate datagrams have no sequence flag bits set. There is also a transaction ID value within the datagrams that can be used to determine that they are related to each other.</p> <p>Unfortunately, the DFIP datagram assembler assumes that a CCSDS packet sequence contains at most one datagram. To be compatible with this assembler, the MEM code should be changed to set the sequence flags so that only one datagram is included in a packet sequence.</p> <p>This change should be trivial, and testing it should not take very long. Since I don't believe that anyone has yet done any work with memory dump datagrams sent to the SSR, this change should not negatively impact other packages nor delay FSW testing or the release of FSW to I&T.</p>
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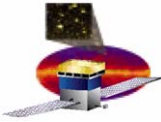
Open JIRA Items (Minor and Trivial) (10)

FSW-361	More precise naming of variables that measure time in system clock ticks to reduce confusion	Improvement	Open	Minor	B0-7-0	EDS	<p>In many places, variables that measure time in elapsed system clock ticks have incorporated the string 'time' . This has caused confusion, since in most other places time is expressed in units of nano-seconds, not system clock ticks.</p> <p>Wish to change the naming convention of time -> ticks in order to make the distinction.</p> <p>This will affect EDS (mainly EBF_gem) and its usage in the LSE package (mainly the files LSE_ctx.h.c and LSE_dgm.h.c)</p>
FSW-562	Make sure that PIG's power sequence is still correct	Task	Open	Trivial	Deferred	PIG	<p>When working on the LICOS power on script, I noticed that the tower sequence at power on the Systems Engineering had Selim implement was different than the default sequence in PIG. (Which was specified by Systems Engineering long ago.) It is trivial to change PIG, but we should define what is currently correct. I don't think anyone will care until TVAC at the earliest.)</p>
FSW-567	Add DEAD_ZONED counter to HSK	Improvement	Open	Trivial	Deferred	LHK	<p>Entered on behalf of Bryson Lee & Eric Grove: The DEAD_ZONED counter (register address 12) in the GEM trigger statistics register block is not currently sampled and telemetered in the low-rate science HSK telemetry packet (APID 551). The value of this counter should be included in the low-rate science telemetry.</p>



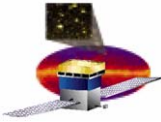
Open JIRA Items (Minor and Trivial) (11)

FSW-540	Addition of AEM/EBM memory relocation register control	New Feature	Open	Trivial	Deferred	PIG PIG_DB	The AEM and EBM have memory relocation registers which allow the use of different areas of memory in the event of a failure. Currently these registers are not accessible except by LEM. One possible place to support these registers are in PIG/PIG_DB as they would be one-time-write registers. That said, PIG may not be the place for them, but we should support their use somewhere. It should also be noted that this functionality has not been tested on the flight GASU. (Apropos of nothing.)
FSW-248	PIG documentation needs to be updated	Improvement	Open	Trivial	B0-7-0	PIG	
FSW-524	NCR 794 problem 5: FSW needs to expose command for LATP hard reset to the PDU	New Feature	Open	Trivial	Deferred		Power up noise when a GASU is turned on causes the PDU FSM to enter an unrecoverable illegal state. The PDU behavior in this case is complete unresponsiveness until a LAT reset is sent. The mitigation strategy for this problem is to augment the power-up sequence for the GASU with a LAT reset (specifically to reset the PDU). FSW should expose this command so that power on scripts can branch to execute it if telemetry indicates this condition has been encountered. Dataless command resets will not work since the PDU FSM is in an unrecoverable illegal state. The root-cause of this particular problem is a shortcoming in the synthesis tool for the PDU FPGA which did not properly protect against illegal states. See NCR 794 for additional details.
FSW-288	MEM should protect against writing to TFFS space	Improvement	Open	Trivial	Deferred	MEM PBC	Deferred indefinitely by FSW CCB.



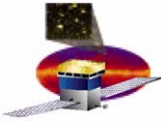
Open JIRA Items (Minor and Trivial) (12)

FSW-207	Alternate Run Control	Improvement	Open	Trivial	B0-8-0	LIM	Neil Johnson proposed an alternate run control methodology at the 8/25/05 Ops Planning Meeting. See the attached PPT for details (or access at http://confluence.slac.stanford.edu/download/attachments/5010/FSW+-ISOC+Issues+050823.ppt?version=1).
FSW-426	Implement ability to write and read an individual register via ground command	New Feature	Open	Trivial	B0-7-1		This ability is needed as a tool for troubleshooting and for test support. It's use would be operationally prohibited on-orbit during normal operations.
FSW-167	LTC telemetry packets contain one 16-bit word that contains both the status and the raw value instead of two words	Bug	Open	Trivial	B0-7-0	LTC	On behalf of ISOC: LTC telemetry packets contain one 16-bit word that contains both the status and the raw value instead of two words (4-bit status and 12-bit raw).



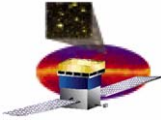
Open JIRA Items (Minor and Trivial) (13)

FSW-180	ISOC request for additional status info in housekeeping	Improvement	Reopened	Trivial	B0-7-0	LHK	<p>ISOC would like to have the following status information included in HK data:</p> <ol style="list-style-type: none"> 1) Current Operating Mode (from LIM) (1 byte) [previously requested in JIRA FSW-168] 2) Current States of LCI, LDF and LPA (from LIM) (3 * 1 byte = 3 bytes) 3) compound run identifier from each EPU (3 EPUs * 12 bytes/run ID) = 36 bytes (this refers to the 96-bit run identifier composed of 24-bit Ground ID, 3-bit Mode ID, 5-bit Config ID, etc. which JJ is currently adding to FSW) 4) 32-bit key/name of the Configuration Master File (4 bytes) 5) elapsed on-time (32-bit seconds) for each CPU since boot (4 CPUs * 4 bytes = 16 bytes) <p>Items 6-9 below are for ground-initiated commands only; i.e. not including S/C or GBM commands (it should be possible to differentiate these by AppID and Fn Code).</p> <p>6) next event command and its response and the time</p>
FSW-249	LATC documentation needs to be updated	Improvement	Open	Trivial	B0-7-0	LATC	
FSW-270	mnemonics in telemetry packet 720/0x2D0 do not begin with ?L?	Bug	Open	Trivial	B0-7-0	ITC	<p>The mnemonics in telemetry packet 720/0x2D0 ?Response to command from spacecraft? do not begin with ?L? ? they begin with ?ITC?</p>



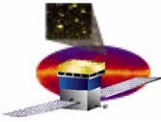
Open JIRA Items (Minor and Trivial) (14)

FSW-168	Add LIM mode status to regular housekeeping packet	New Feature	Open	Trivial	B0-7-0	LHK	On behalf of ISOC: The packet with LIM data (783/0x30F) is a diagnostic packet, however ISOC needs to know the operating mode (currently LIMTOPMODE) in order to reconcile the state of the instrument with the expected commanded state, for realtime ops. This information needs to be in a regular housekeeping packet.
FSW-474	Sharpen the definition of the extended counters so that completely accurate bookkeeping can be done even when there are dropped datagrams	Improvement	Open	Trivial	B0-8-0	LSE QSE	<p>This is an item spawned from FSW-472. It was deemed okay to defer this work, so it was split off into a separate (this Jira item) Jira.</p> <p>The time ascribed to the start of a new datagram is the time of the first event. In order to properly account for the time between datagrams, (note that the definition of the start time of a datagram is somewhat arbitrary), the start time should be the time of the last event of the previous datagram. As long as one has all the datagrams, this information can be recovered. If, however, a datagram is dropped, this information is lost. To meet the design goal of making each datagram stand by itself, and, therefore, effectively protect against dropped datagrams, the information from the last event of the previous datagram must be duplicated in the datagram. (Note that while the word 'time' is used here, in fact, this argument applies to all then extended counters.)</p> <p>One might also wish to explore changing the code so that the update of these counters occurs on every event rather than every accepted event. The natural place to do this would be in EDS and provide an acces</p>



Open JIRA Items (Minor and Trivial) (15)

FSW-401	The EPU EBC image size could be reduced by breaking a PIG-LEM dependency.	Improvement	Open	Trivial	Deferred	PIG	<p>Tony added a comment to FSW-396 that indicated there may be "a small rearrangement of PIG that will sever the connection between EBC and LEM". By making this rearrangement, the EPU EBC image size could be reduced by eliminating the LEM package modules that it currently includes. Reducing the size of an EBC image is a 'good thing', since the current plan is to upload these images to the instrument each time they are used.</p> <p>The resolution of FSW-396 did not include this rearrangement, so this new issue is being created to remind Tony to investigate the possibility of rearranging PIG for this purpose (in his copious free time of course :-).</p>
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Open JIRA Items (Minor and Trivial) (16)

FSW-352	Event Path can livelock the system, freezing out the update of the watchdog timer.	Bug	Open	Trivial	Deferred	EDS EFC LCBD	<p>Under heavy event loads, the task or tasks servicing event traffic can soak up all the available CPU. This will lock out the low priority task that updates the RAD750's watchdog timer. If this live-lock persists long enough, the watchdog timer will eventually expire, unnecessarily crashing the system.</p> <p>A number of solutions have been proposed, but nothing aesthetically pleasing that truly addresses the heart of the problem. Any solution will involve some entity in the event path artificially ticking the watchdog timer. The trick is finding an appropriate set of circumstances that does the job without unnecessarily updating the watchdog timer. In the components section I have select those components where an eventual solution may be implemented.</p> <p>CONTEXT NOTE: This fix is crucial to high rate running in a test environment, but such conditions are unlikely to happen on orbit. However, clean living says this problem should be addressed. As a touchstone, high-rate for the GAMMA filter without doing any output is around 7-8KHz into one CPU of ALL GAMMAs. With a</p>
FSW-164	Add LATC Telecommand Interface to LIM	New Feature	Reopened	Trivial	Deferred	LIM	The LIM application must provide a telecommand interface to the LATC utility package in order to enable dynamic configuration by file, read back telemetry dumps, and configuration verification.
FSW-239	vxw_flight RTOS constituent still has the serial console device enabled	Improvement	Open	Trivial	Deferred	VXW	vxw_flight RTOS constituent still has the serial console device enabled. This issue created in response FSW CCB action based on Dan's comment in FSW-188.