Level III to Diagram: L0 Data Processing

Req ID	Requirement	Comments	Diagrams
3.3.1.1 Housekeeping Data Ingest			
TLM0150	The LAT ISOC shall be able to process Level 0 data of at least 30 hours of recorded science and 36 hours of recorded housekeeping data within 24 hours.	This ensures the ISOC can handle the largest size data dump from the observatory. The data is assumed to be continuously collected at orbit averaged rates.	L0 Data Processing, L1&2 Product Generation
3.3.1.2 Housekeeping Data Processing			
TLM0190	The LAT ISOC shall process all Level 0 data received from the MOC.	Processing includes providing data extraction, state conversions and Engineering Unit (EU) conversions.	L0 Data Processing, L1&2 Product Generation
TLM0200	The LAT ISOC shall automatically process recorded observatory HK data when received from the MOC.		L0 Data Processing, Trending
TLM0220	The LAT ISOC shall accept and accommodate variable CCSDS length packets for science, housekeeping, and alert data.		L0 File Ingest, L0 Data Processing
TLM0310	The LAT ISOC shall process recorded housekeeping data at a minimum of 10 times the real-time rate.	This provides the ability to replay previously recorded data through the real-time system.	L0 Data Processing, Trending
TLM0320	The LAT ISOC shall process retransmitted data within 24 hours of its arrival.	This is data resulting from a retransmission request sent by the LAT ISOC	L0 Data Processing, L1&2 Product Generation
TLM0330	The LAT ISOC shall process LAT instrument on-board diagnostic data.	This requirement applies to both RT and recorded data.	L0 Data Processing, Telemetry Monitoring

Req ID	Requirement	Comments	Diagrams
3.3.1.3 Housekeeping Data Extraction			
TLM0440	The LAT ISOC shall extract table and memory dump image information from diagnostic data.		L0 Data Processing
TLM0450	The LAT ISOC shall extract all data types as specified in the GLAST T&C Handbook.	The T&C Handbook will refer to other documents, as appropriate.	L0 Data Processing
3.3.1.5 Housekeeping Data Value Conversion			
TLM0640	The LAT ISOC shall provide discrete state conversions as specified in the T&C database.		L0 Data Processing, Telemetry Monitoring
TLM0650	The LAT ISOC shall provide conversion from downlinked raw values to Engineering Units (EUs), as identified in the T&C database and GLAST T&C Handbook.		L0 Data Processing, Telemetry Monitoring
3.3.2.1 Science Data Processing			
DCP0080	The LAT ISOC shall be able to process multiple level-0 files to generate level-1 products, i.e., events that span dumps.	Needed to produce events that span multiple SSR dumps.	L0 Data Processing
3.3.3 Data Archiving Requirements			
ARCH0070	The LAT ISOC shall archive the Level 0 data files for the life of the mission.	This provides the capability to retransmit the files to the GSSC or IOCs as necessary.	L0 Data Processing
3.3.4 Alert Telemetry Monitoring Requirements			
TDRS0010	The LAT ISOC shall be able to receive notification of alert telemetry (including real time alerts) from the MOC.		Telemetry Monitoring

Req ID	Requirement	Comments	Diagrams
3.3.5 User Interface Language Requirements			
UIL0030	The LAT ISOC user interface language shall be capable of providing telemetry monitoring.		LAT Configuration, Telemetry Monitoring, L0 Data Processing
UIL0050	The LAT ISOC user interface language shall allow procedure parameter passing.		LAT Configuration, Telemetry Monitoring, L0 Data Processing
UIL0060	The LAT ISOC user interface language shall provide local and global variables.		LAT Configuration, Telemetry Monitoring, L0 Data Processing
UIL0070	The LAT ISOC user interface language shall provide arithmetic capabilities using local and global variables, telemetry values, system variables, and constants.		LAT Configuration, Telemetry Monitoring, L0 Data Processing
UIL0090	The LAT ISOC user interface language shall provide comment capability.		LAT Configuration, Telemetry Monitoring, L0 Data Processing
UIL0100	The LAT ISOC user interface language shall provide access to current telemetry and system values, allowing observations of values in raw or converted form.		LAT Configuration, Telemetry Monitoring, L0 Data Processing
UIL0130	The LAT ISOC shall provide the capability to process user interface language directives as part of a procedure.		LAT Configuration, Telemetry Monitoring, L0 Data Processing

Req ID	Requirement	Comments	Diagrams
UIL0140	The LAT ISOC shall provide the capability to create procedures.		LAT Configuration, Telemetry Monitoring, L0 Data Processing
UIL0200	The LAT ISOC shall provide the capability to execute procedures.	For use during pre-launch test and for validation of procedures on the testbed	LAT Configuration, Telemetry Monitoring, L0 Data Processing
UIL0230	The LAT ISOC shall report both the acceptance and completion of the procedures to the user.	For use during pre-launch test and for validation of procedures on the testbed	LAT Configuration, Telemetry Monitoring, L0 Data Processing
3.4.11 Calibration & Performance Requirements			
C&P0080	The LAT ISOC shall process unfiltered data generated by the instrument hardware trigger.		L0 Data Processing, LAT Configuration
3.4.5 Memory Mapping & Maintenance Requirements			
MMM0030	The LAT ISOC shall provide the capability to compare dumped memory images downlinked from the observatory with the associated load images stored at the LAT ISOC.		LAT Configuration
3.4.6 Limit Monitoring Requirements			
LMIT0010	The LAT ISOC shall determine the limit states of telemetry mnemonics by comparing observatory housekeeping data with associated limit threshold values defined in the PDB.		Telemetry Monitoring, L0 Data Processing
LMIT0040	The LAT ISOC shall automatically determine the limit state for playback data.		L0 Data Processing

Req ID	Requirement	Comments	Diagrams
LMIT0050	The LAT ISOC shall report limit state changes as event messages.	also driven by EVT0010	Telemetry Monitoring, L0 Data Processing
LMIT0080	The LAT ISOC shall provide the capability to reset the limit checking counter when telemetry processing is resumed.	The limit checking counter monitors the number of successive out-of-state occurrences.	Telemetry Monitoring, L0 Data Processing
LMIT0090	The LAT ISOC shall provide the capability to reset the limit checking counter when limit checking is enabled.	The limit checking counter monitors the number of successive out-of-state occurrences.	Telemetry Monitoring, L0 Data Processing
LMIT0100	The LAT ISOC shall provide the capability to enable limit checking of any and all parameters.		Telemetry Monitoring, L0 Data Processing
LMIT0110	The LAT ISOC shall provide the capability to disable limit checking of any and all parameters.		Telemetry Monitoring, L0 Data Processing
LMIT0120	The LAT ISOC shall provide the capability to override the limit threshold values defined in the PDB for any parameter.		Telemetry Monitoring, L0 Data Processing
LMIT0160	The LAT ISOC shall support up to two limit sets for each parameter.		Telemetry Monitoring, L0 Data Processing
LMIT0170	LAT ISOC shall check the value of the switch mnemonic to determine which limit set to use.	The switch mnemonic and the associated switch values are optionally defined for each telemetry parameter in the PDB.	Telemetry Monitoring, L0 Data Processing

3.4.7 Configuration Monitoring Requirements

CFG0015	The LAT ISOC shall provide the capability to define one or more Configuration monitor sets.		Telemetry Monitoring, L0 Data Processing

Req ID	Requirement	Comments	Diagrams
CFG0020	The configuration monitor sets shall consist of a list of telemetry parameters and associated expected values.		Telemetry Monitoring, L0 Data Processing
CFG0030	The LAT ISOC shall compare the configuration monitor sets to telemetered observatory data.		Telemetry Monitoring, L0 Data Processing
CFG0040	The LAT ISOC shall detect differences between the values of the parameters in the configuration monitor sets and the values of the associated parameters in the telemetered observatory data.		Telemetry Monitoring, L0 Data Processing
CFG0050	The LAT ISOC shall provide the capability to compare observatory data to a minimum of 10 configuration monitor sets, simultaneously.		Telemetry Monitoring, L0 Data Processing
CFG0060	The LAT ISOC shall provide the capability for automatic execution of configuration monitor sets.		Telemetry Monitoring, L0 Data Processing
CFG0070	The LAT ISOC shall reject questionable quality data in configuration files while making comparisons.	Questionable quality will be based on standards established in the Level 4 operations documents for the LAT ISOC.	Telemetry Monitoring, L0 Data Processing
CFG0080	The LAT ISOC shall provide the capability for the user to enable and disable the automatic execution of configuration monitor sets.		Telemetry Monitoring, L0 Data Processing

Req ID	Requirement	Comments	Diagrams
CFG0090	The LAT ISOC shall provide the capability to automatically execute a comparison whenever the values for all mnemonics in a configuration monitor set have been updated since the last comparison.		Telemetry Monitoring, L0 Data Processing
CFG0100	The LAT ISOC shall provide the capability to automatically initiate a comparison whenever the value of a single mnemonic in a configuration monitor set has been updated since the last comparison.		Telemetry Monitoring, L0 Data Processing
CFG0110	The LAT ISOC shall provide the capability to automatically execute a comparison whenever the value(s) of one or more mnemonics in a configuration monitor set have been updated since the last comparison.		Telemetry Monitoring, L0 Data Processing
CFG0120	The LAT ISOC shall provide the capability to automatically execute a comparison at a user-defined interval.		Telemetry Monitoring, L0 Data Processing
CFG0130	The LAT ISOC shall report the results of configuration monitor sets comparisons as event messages.		Telemetry Monitoring, L0 Data Processing
CFG0140	The LAT ISOC shall be capable of displaying the names of the configuration monitor sets actively being executed.		Telemetry Monitoring, L0 Data Processing
3.4.9 Anomaly Tracking and Notification Requirements			
ATNS0015	The LAT ISOC shall receive, process, and respond to LAT instrument alert messages.		L0 File Ingest, L0 Data Processing, Logging

Req ID	Requirement	Comments	Diagrams
ATNS0100	The LAT ISOC shall automatically receive notification of anomalous LAT events from the MOC.	Also supports GEN0050	L0 File Ingest, L0 Data Processing, Logging