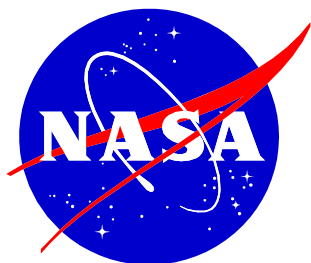


**Gamma-Ray Large Area
Space Telescope
(GLAST)
Ground System (GS)
Project**

***Database and Mnemonic
Naming Convention***

Baseline

October 28, 2004



**GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND**

Gamma-Ray Large Area
Space Telescope
(GLAST)
Ground System (GS)
Project

Database and Mnemonic Naming
Convention

October 28, 2004

Gamma-Ray Large Area Space Telescope (GLAST) Project Mnemonic Naming Convention

Prepared by:

Original signed _____

October 19, 2004 _____

John Nagy

Mission Operations Systems Lead

Date _____

Concurrence:

Original signed _____

October 28, 2004 _____

Wendell Burke

Date _____

Spectrum Astro Operations Interface

Original signed _____

October 28, 2004 _____

Rob Cameron

Date _____

LAT ISOC Subsystem Manager

Original signed _____

October 28, 2004 _____

William Paciesas

GBM Ground System Lead

Date _____

Original signed _____

October 28, 2004 _____

Erik Andrews

Flight Software

Date _____

Original signed _____

October 28, 2004 _____

Jay Norris

GSSC Lead

Date _____

Approved by:

Original signed _____

October 28, 2004 _____

Ken Lehtonen

GLAST Ground System/Ops Manager

Date _____

CHANGE RECORD PAGE

DOCUMENT TITLE: GLAST Ground System Data Base and Mnemonic Naming Convention			
DOCUMENT DATE: October 28, 2004			
ISSUE	DATE	PAGES AFFECTED	DESCRIPTION
Original Baseline	10/28/04	All	Baseline. CCR 492-0005

Table of Contents

1.0	Introduction	6
1.1	Purpose	6
1.2	Scope.....	6
1.3	Applicable Documents	6
2.0	General Guidelines	7
2.1	General Mnemonic Naming Convention	7
2.1.1	Element/System Assignment (mandatory)	7
2.1.2	Subsystem Assignment (optional)	7
2.1.3	Remaining Character Assignment.....	8
2.1.4	Keyword Abbreviations (optional).....	8
2.2	Telemetry Packet Header Telemetry Points (mandatory)	9
2.3	Command Sub-mnemonics	10
2.4	Discrete Telemetered Values (mandatory)	10
3.0	Database Exchange Files	11
3.1	Database Filename and Directory Structure	11
3.1.1	Database Exchange File Filename Examples.....	11

Table of Tables

Table	2-1 Element Single-Character Assignment	7
Table	2-2 Subsystem Character(s) Assignment	7
Table	2-4 Common Keywords and Abbreviations.....	8
Table	2-3 Telemetry Packet Header Telemetry Points	10

1.0 Introduction

1.1 Purpose

This document contains a set of guidelines describing the GLAST Project naming conventions for the telecommand, telemetry, discretes, analogs, limits, and flight parameter mnemonics used in the Project Database. Because the GLAST program has multiple teams contributing to the GLAST Project Database, it is important that a naming convention be used to avoid conflicts and establish consistency.

1.2 Scope

These are the recommended guidelines for all teams contributing to the GLAST Project Database. The section headings within this document clearly denote whether the guideline is mandatory or optional.

1.3 Applicable Documents

Unless otherwise specified, the following documents in their current issue form a part of this document to the extent specified herein.

- <http://itos.gsfc.nasa.gov/> Integrated Test and Operations System (ITOS)
- GLAST Database Format Control Document

2.0 General Guidelines

2.1 General Mnemonic Naming Convention

In general, mnemonics have a maximum length of 16 characters (this is the limit imposed by the ITOS ground system). Because of the 16-character limitation for naming mnemonics, the use of underscores to delimit names is not required or advised.

All mnemonics are upper case. Use letters (e.g., A, B, C ...) to distinguish between identical components whenever possible. Use numbers only when there are a “large” (more than 8) number of identical components to distinguish between.

No special characters are allowed such as “~!@#\$%^&*()+=-:;,”’?/><., including spaces. The only special character allowed is the underscore “_”. A plus sign (+) will be designated by a “P”, and a negative sign (-) will be designated by an “N”.

2.1.1 Element/System Assignment (mandatory)

In general, all telemetry and telecommand entries in the Project Data Base will belong to one of five categories. The first letter of the parameter designates which Element submitted the mnemonic. The exceptions to this rule are the Telemetry Packet Header telemetry points shown in Table 2-3.

Table 2-1 Element Single-Character Assignment

Prefix	Element
G	GLAST Burst Monitor
H	Packet header field
L	Large Area Telescope
S	Spacecraft
X	Ground System

2.1.2 Subsystem Assignment (optional)

The next 1-3 characters of each parameter will designate the subsystem or function to which the mnemonic belongs. There are a few repeats of letters in the subsystems but since they are from different elements this should not be confusing.

Table 2-2 Subsystem Character(s) Assignment

Prefix	Subsystem/Function
Spacecraft Subsystems	
C	COMMUNICATIONS subsystem
D	COMMAND & DATA HANDLING subsystem
E	ELECTRICAL POWER subsystem
F	FLIGHT SOFTWARE subsystem

G	GUIDANCE, NAVIGATION, & CONTROL subsystem
P	PROPULSION subsystem
S	STRUCTURES & MECHANISMS subsystem
T	THERMAL subsystem
LAT Subsystems	
ACD	Anti-coincidence Detector subsystem
CAL	Calorimeter subsystem
CI	Charge Injection (Calibration)
CM	Computer Manager
DAQ	Data Acquisition System subsystem
DF	Diagnostics Framework
FS	File System
HK	Housekeeping
IM	Instrument Manager
MCH	Mechanisms
PA	Physics Acquisition
SW	Software Watchdog
TC	Thermal Control
TKR	Tracker subsystem
GBM Subsystems	
CPU	Central Processing Unit
DAQ	Data Acquisition subsystem
DPU	Data Processing Unit subsystem
FSW	Flight Software
HK	Housekeeping
PHA	Pulse height Analysis
PSB	Power Supply Box subsystem
TST	Test (not used in normal operations)

2.1.3 Remaining Character Assignment

The remaining 12 characters are to be utilized (if necessary) to describe the individual parameters in a way that is easily understandable to the team.

2.1.4 Keyword Abbreviations (optional)

To assure consistency between subsystems the following telemetry and command keyword abbreviations should be used.

Table 2-4 Common Keywords and Abbreviations

Abbreviation	Keyword
ON	ON
OFF	OFF

ENA	ENABLE
DIS	DISABLE
INH	INHIBIT
OVR	OVERRIDE
ACT	ACTIVATE
SUS	SUSPEND
SET	SET
RST	RESET
SBY	STANDBY
SEL	SELECT
HI	HIGH
MED	MEDIUM
LO	LOW
I	CURRENT
LVL	LEVEL
MODE	MODE
P	PRESSURE
W	POWER
RATE	RATE
SPD	SPEED
S	STATUS, STATE
T	TEMPERATURE
V	VOLTAGE
TRQ	TORQUE
RNG	RANGE
COHO	COHERENCY
DEC	DECODER
ENC	ENCODER

In general, units are either on or off, their functions are either enabled or disabled and processes (software programs) are either activated or suspended. An “inhibit” is used for temporary prevention of an enabled function or activated process, and an override is used for temporary execution of a disabled function or suspended process.

2.2 Telemetry Packet Header Telemetry Points (mandatory)

An exception to the general naming convention is for telemetry packet header field mnemonics. These mnemonics are common to each packet and will be standardized with the format of the single character ‘H’, followed by a four decimal-digit telemetry

packet APID, followed by a field name. Table 2-3 contains the standardized fields for APID 123.

Table 2-3 Telemetry Packet Header Telemetry Points

Mnemonic	Start Byte	Start Bit	Length	Data Type	Description
H0123APID	0	0	11	U12	APID 123 Packet Application Process ID
H0123SHDRFLG	0	11	1	U12	APID 123 Packet Secondary Header Flag
H0123PKTTYPE	0	12	1	U12	APID 123 Packet Type
H0123PKTVNO	0	13	3	U12	APID 123 Packet Version Number
H0123SEQCNT	2	0	14	U12	APID 123 Packet Sequence Count Sequence
H0123SEGFLG	2	14	2	U12	APID 123 Packet Sequence Flags Segmentation
H0123PKTLEN	4	0	16	U12	APID 123 Packet Length
H0123TIME	6	0	48	STIME4 2	APID 123 S/C Clock time when packet data was collected
H0123SECONDS	6	0	32	U1234	APID 123 S/C Clock seconds value when packet data was collected
H0123SUBSECS	10	0	16	U12	APID 123 S/C Clock subseconds value when packet data was collected

2.3 Command Sub-mnemonics

Wherever possible, command sub-mnemonics will follow the conventions listed Table 2-4. Wherever the abbreviations listed in Table 2-4 are not adequate, any short yet descriptive text may be substituted. It is strongly encouraged that consistency be maintained within each element.

2.4 Discrete Telemetered Values (mandatory)

In all cases where discrete telemetry is used the following convention should be followed.

- A value of “1” in telemetry will be used to indicate when a parameter is “ON”, “TRUE”, and “ENABLE”.
- A value of “0” in telemetry will be used to indicate when a parameter is “OFF”, “FALSE”, and “DISABLE”.

It is very important that discrete telemetry be consistent across all elements of the observatory.

3.0 Database Exchange Files

3.1 Database Filename and Directory Structure

All of the files used to define database exchange records must have unique names. Filenames will consist of all lowercase characters. To avoid filename conflicts, each filename must start with a pre-assigned prefix. ITOS database exchange files will reside in the multiple team directories starting from the \$HOME/glast/dbx directory (i.e. \$HOME/glast/dbx/sc, \$HOME/glast/dbx/lat, etc.). Each team will locate their files in separate directories with the following name:

- a. sc – Spacecraft
- b. lat – LAT
- c. gbm – GBM
- d. ops – Operations

Each database exchange file filename must start with a pre-assigned prefix. Each database exchange file filename must have a '.dbx' suffix. It is also recommended that a version identifier be placed within the filename as well.

3.1.1 *Database Exchange File Filename Examples*

- a. LAT tracker telemetry
Filename: lat_tkr_tlm_v12.dbx
- b. LAT tracker commands
Filename: lat_tkr_cmd_v12.dbx
- c. GBM data processing unit telemetry
Filename: gbm_dpu_tlm_v34.dbx
- d. GBM data processing unit commands
Filename: gbm_dpu_cmd_v34.dbx
- e. Spacecraft C&DH telemetry
Filename: sc_cdh_tlm_v5.dbx
- f. Spacecraft C&DH commands
Filename: sc_cdh_cmd_v5.dbx