ICESat (GLAS) Science Processing Software Document Series
Volume
GLAS Standard Data Products Specification - Level 1
Version 8.0

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Foreword

This preliminary document defines the Level One GLAS standard data products. This Standard Data Products Specification is developed under the structure of the NASA STD-2100-91, a NASA standard defining a four-volume set of documents to cover an entire software life cycle. Under this standard a section of any volume may, if necessary, be rolled out to its own separate document. This document is a roll out of the GLAS ESDIS Software Detailed Design Specification under the Product Specification Volume.

The GEOSCIENCE LASER ALTIMETER SYSTEM (GLAS) is a part of the EOS program. This laser altimetry mission will be carried on the spacecraft designated EOS ICESat (Ice, Cloud and Land Elevation Satellite). The GLAS laser is a frequency-doubled, cavity-pumped, solid state Nd:YAG laser.

This document addresses the data flow, interfaces, record and data formats associated with the GLAS Level 1 standard data products. GLAS Level 1 standard data products are composed of Level 1A and Level 1B data products. The term “standard data products” refers to those EOS instrument data products listed in the Earth Science Data and Information System (ESDIS) Project data base that are routinely generated within the EOSDIS Distributed Active Archive Center (DAAC) or Science Computing Facilities (SCFs). Each data product has a unique Product Identification code assigned by the EOS Senior Project Scientist.

Level 1A and Level 1B Data Products are composed from those Level 0 data that have been reformatted or reversibly transformed to corrected and calibrated data in physical units at the full instrument rate and resolution.

This document was prepared by the Cryospheric Sciences Branch at NASA GSFC / WFF, Wallops Island, VA, in support of B. E. Schutz, GLAS Science Team Leader for the GLAS Investigation. This work was performed under the direction of David W. Hancock, III, who may be contacted at (757) 824-1238, David.W.Hancock@nasa.gov (e-mail), or (757) 824-1036 (FAX).

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Section 1

Introduction

1.1 Identification of Document

This document is identified as the GLAS Level 1 Standard Data Products Specification. The unique document identification number within the GLAS Standard Data Software documentation numbering scheme is GLAS-DPS-2621. Progressive editions of this document will be uniquely identified by the cover and page date marks.

1.2 Scope of Document

This document addresses the purpose, usage, and description of the GLAS Level 1 Standard Data Products. The intended audience for this document is the GLAS Science and Instrument Teams, the ESDIS Project and related focus teams, the community of EOS data users and investigators, and the GLAS Standard Data Software Development Team. This document does not provide details of the archive and distribution processes at the DAAC.

1.3 Purpose and Objectives of Document

The purpose of the GLAS Level 1 Standard Data Products Specification is to provide a high-level descriptive document for the data products. This document describes the purpose, usage, content, and format of the GLAS Level 1 Data Products. It describes the structure, physical storage, organization, and access characteristics of the GLAS Level 1 Data Products. The document additionally describes file transfer methods to support product access, the data flow associated with the data products, and the data storage and generation characteristics of the data products.

1.4 Document Organization

This document's outline is assembled in a form similar to those presented in the NASA Software Engineering Program [Information Document 2.3a].

1.5 Document Status and Schedule

This document will be updated and released as required.

1.5.1 Document Change History

Document Name: GLAS Standard Data Products Specification - Level 1		
Version Number	**Date**	**Nature of Change**
Preliminary	December 31, 1995	Original Version
Version 1.2	March 1998	Text, Figures, and Tables updated for Level 1 data updates, for the change to GLAS standard data product generation being performed at the GLAS SCF, and change of the spacecraft name to ICESAT.
Version 2.0	January 1999	Updates to Data Product Contents
Version 3.0	November 2000	Updated Data Product Contents coincident with the GLAS Science Algorithm Software V1 release.
Version 4.0	November 2001	Updated Data Product Contents coincident with the GLAS Science Algorithm Software V2 release.
Version5.0	July 2002	Updated Data Product Contents coincident with the GLAS Science Algorithm Software V2.2 release.
Version 6.0	October 2002	Revised for Version 3.0 software.
Version 7.0	August 2004	Revised for Version 4.0 software.
Version 8.0	November 2005	Revised for Version 5.0 software.

Section 2

Related Documentation

2.1 Parent Documents

The GLAS Level 1 Standard Data Products Specification is considered a “roll-out” from the Product Specification as the parent document or volume. Specific topics pertaining to data descriptions are located in the External Interface section under the Detailed Design document template.

This document is subordinate to any top-level mission or instrument management plan documents, and as such, recognizes these documents as external parent documents in lineage. The recognized external EOSDIS and GLAS parent documents superior to the GLAS Level 1 Standard Data Products Specification are listed below.

a) *NASA Earth Observing System Geoscience Laser Altimeter System GLAS Science Requirements Document,* Version 2.01, October 1997, Center for Space Research, University of Texas at Austin.

b) *GLAS Science Software Management Plan*, NASA / TM-1999-208641 / Version 3 / Volume 1, August 1998, NASA / GSFC Wallops Flight Facility.

2.2 Applicable Documents

The following documents are related to, or contain policies or references pertinent to the contents of the GLAS Level 1 Standard Data Products Specification.

a) *Data Production Software, Data Management, and Flight Operations Working Agreement for GLAS*, TBD, NASA Goddard Space Flight Center.

b) *Atmospheric Delay Correction to GLAS Laser Altimeter Ranges,* Algorithm Theoretical Basis Document, March 2001, Massachusetts Institute of Technology.

c) *Algorithm Theoretical Basis Document for the GLAS Atmospheric Channel Observations*, Version 0 (Preliminary), December 1995, Goddard Space Flight Center.

d) *Geoscience Laser Altimeter System: Surface Roughness of Ice Sheets,* Algorithm Theoretical Basis Document, Version 0.3, December 1996, University of Wisconsin.

e) *Determination of Sea Ice Surface Roughness from Laser Altimeter Waveform*, Algorithm Theoretical Basis Document, Version 0 (Preliminary), December 1995, The Ohio State University.

f) *Laser Footprint Location and Surface Profiles*, Algorithm Theoretical Basis Document, Version 3.0, October 2002, Center for Space Research, The University of Texas at Austin.

g) *Precision Orbit Determination (POD),* Algorithm Theoretical Basis Document, Version 2.2, October 2002, Center for Space Research, The University of Texas at Austin.

h) *Precision Attitude Determination (PAD)*, Algorithm Theoretical Basis Document, Version 2.2, October 2002, Center for Space Research, The University of Texas at Austin.

i) *The Algorithm Theoretical Basis Document for Level 1A Processing*, Version 1.6, June 2005, NASA / GSFC Wallops Flight Facility.

j) *GLAS Atmospheric Data Products*, Algorithm Theoretical Basis Document, Version 4.2, June 2001, Goddard Space Flight Center.

2.3 Information Documents

The following documents are provided as sources of information that provide background or supplemental information that may clarify or amplify material in the GLAS Level 1 Standard Data Products Specification.

a) *NASA Software Documentation Standard Software Engineering Program*, NASA-STD-21000-91, July 29, 1991, NASA.

b) *The Geoscience Laser Altimetry/Ranging System*, IEEE Transactions on Geoscience and Remote Sensing, Vol. GE-25, No. 5, September 1987.

c) *EOS Altimetry/GLAS Phase-A Study,* November 1995, NASA Goddard Space Flight Center.

d) *Memorandum: GLAS Data Products, Center for Space Research*, December 23, 1993, University of Texas at Austin.

e) *GLAS Science Computing Facility (SCF) Plan*, October 1997, NASA / GSFC Wallops Flight Facility.

Section 3

Purpose and Description of the Data Products

3.1 Purpose of the Data Products

The purpose of the GLAS Level 1 Standard Data Products is to provide the initial reduced GLAS instrument data to the GLAS Science Team and to provide input to the Level 2 data product generation. The GLAS Level 1 Data Products are monitored for data quality and instrument performance. The GLAS Level 1 Data Products are available to the EOS data user community for analysis purposes from the EOSDIS DAAC product storage facility.

3.2 Description of the Data Products

Table 3-1 identifies the Level 1 Data Products. The data products are integer-binary format files containing fixed-length records. Each data record consists of several data elements. An element is either an Item or an Array of Items. The elements are measurements and associated correction values obtained from specific GLAS science algorithm sets. The data products will be formatted in scaled integer binary format with both attached and unattached metadata containing identification, processing history, and data descriptive information.

Table 3-1 GLAS Level 1 Standard Data Products

Product ID (Identification)	Product Name	Product Level
GLA01	Altimetry Data File	1A
GLA02	Atmosphere Data File	1A
GLA03	Engineering Data File	1A
GLA04-01	LPA Data File	1A
GLA04-02	LRS Data File	1A
GLA04-03	GYRO Data File	1A
GLA04-04	IST Data File	1A
GLA04-05	BST Data File	1A
GLA04-06	SCPA Data File	1A
GLA05	Waveform-based Elevation Corrections File	1B
GLA06	Elevation File	1B
GLA07	Backscatter File	1B

Figure 3-1 illustrates the source Level 0 data being processed to generate the Level 1 Data Products on the I-SIPS (ICESAT Science Investigator-led Processing System). The GLAS science data processing software transforms the instrument data into the appropriate time-ordered, along-track 1064 nanometer and 532 nanometer Level 1A and Level 1B data parameters and elements. Additional Level 1A science processing algorithms retrieve the GPS receiver data and stellar reference system data and include in the Level 1A product file records. Instrument engineering monitor data along with derived calibration data items are recorded. The Level 1 Data Products are recorded with sufficient detail so as to allow the recovery of the original input elements. In support of the GLAS Science Team, the GLAS Operations Team performs quality assurance at the I-SIPS and returns data quality and descriptive metadata to EOSDIS for incorporation in the EOS data base system.

The specific details of the data product structure, content, format, and data element details will be presented in Section 6. Data sizing, storage burden, and physical media details are provided in Section 5.

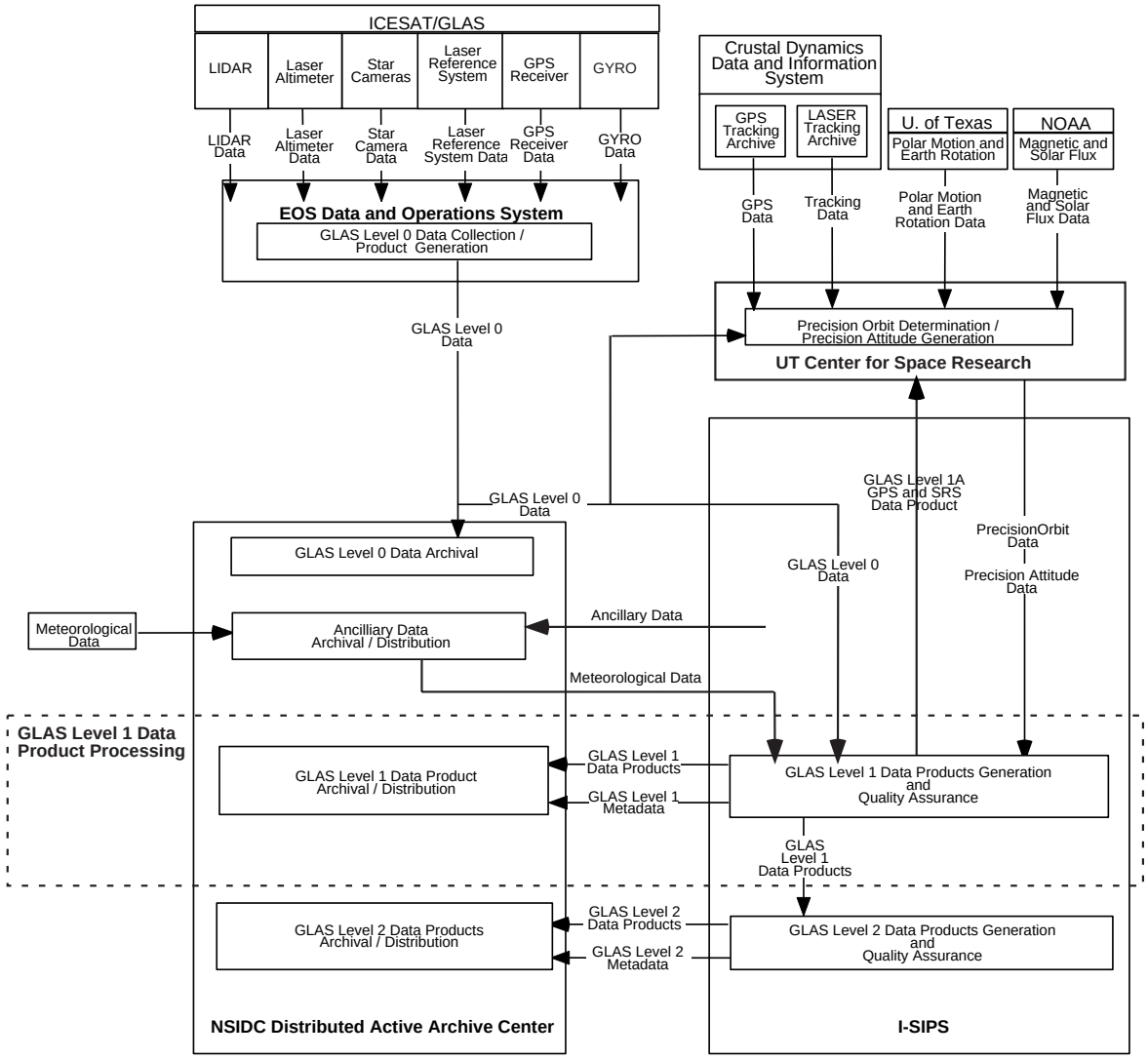

Figure 3-1 Level 1 Data Products Within the Processing Hierarchy

Section 4

Environment

4.1 Hardware Characteristics and Limitations

The required input to the software that creates the Level 1 Data Products is the GLAS Level 0 instrument and spacecraft telemetry data. The Level 0 data is available from EDOS in Production or Expedited Data Sets. The GLAS Level 1A and Level 1B Standard Data Products will be generated on the I-SIPS.

The I-SIPS consists of distributed UNIX operating system-based computers operating under the standard UNIX environment that support the GLAS Science Team operations including the standard data product generation and quality assurance monitoring. The GLAS Level 1A and Level 1B Data Products and their metadata (including QA data) are archived at the DAAC. The Level 1A and Level 1B associated data description and support information are included in the EOSDIS data base to facilitate EOS client inquiry and retrieval activities. The distribution management function of the DAAC allows clients to perform direct search and access of the Level 1A and Level 1B data or to request preparation of Level 1 Data Products.

4.2 Data Products Medium and Characteristics

The Level 1 Data Products will be delivered to the DAAC and archived under the Earth Sciences data collection within the DAAC's data storage and archival subsystem. The storage system will contain not only the Level 1 Data Products, but will also contain data descriptions and data advertisements (i.e., textual descriptive and abstract information, also called metadata).

The Earth Science data are implemented in the current-EOSDIS system through a hierarchical storage manager interface. Physical media supported by the storage system interface will include the disk storage subsystems, magnetic or optical media subsystems, and tiered archive robotics storage subsystems. EOSDIS clients can directly access the GLAS Level 1A and Level 1B data from the DAAC and can copy the data products to their host processors.

The Level 1 Data Products will be available to the GLAS Science Team through the ICESat SCF. See Information Document 2.3e for a detailed description of the ICESat SCF.

4.3 Protocol and Conventions

Protocols and conventions specific to the GLAS SCF will be developed by the GLAS Science Team and documented in the SCF Plan [Information Document 2.3e]. When interfacing to the DAAC, the I-SIPS will comply with procedures, conventions, and protocols as defined by the EOSDIS.

Data definition terminology specific to the GLAS Level 1 Data Products is presented in the Glossary at the end of this document. Figure 4-1 “Data Representation” depicts a schematic of the standard data representations used in the GLAS Level 1 Data Products. These data structures will be used in the Section 6.0 generic data description and in the Appendix C detailed data description of the GLAS Level 1 Data Products.

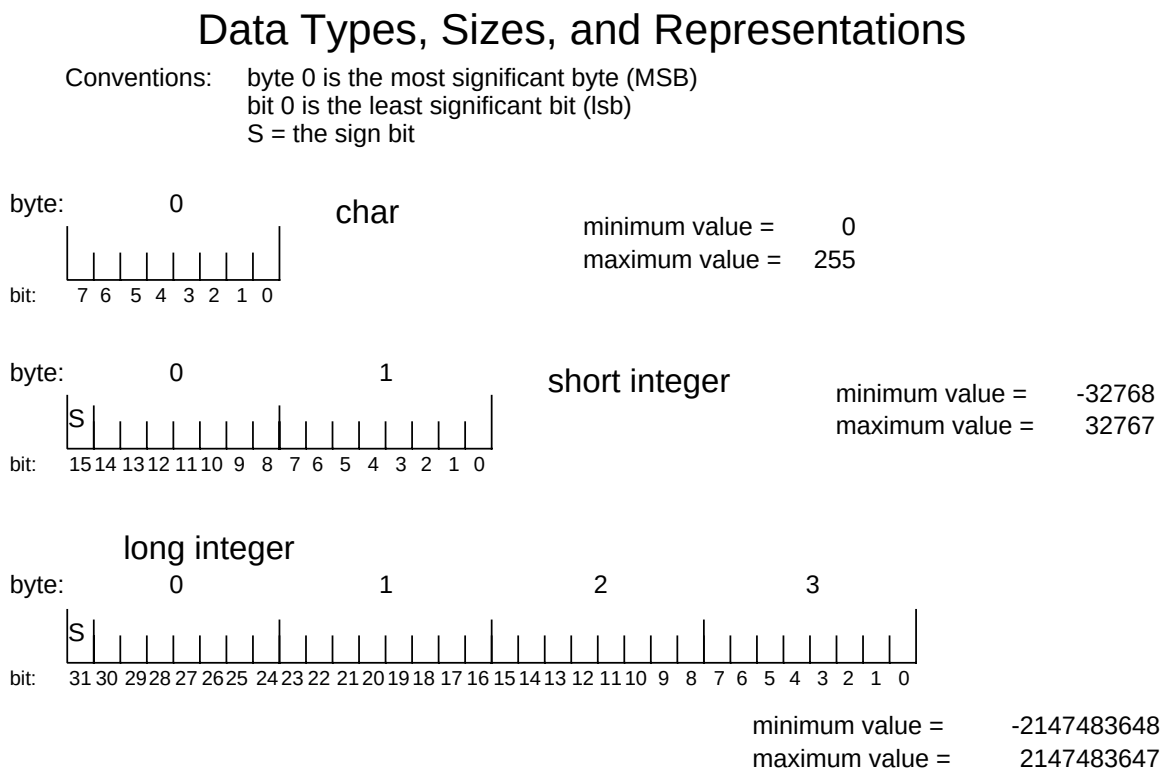

Figure 4-1 Data Representation

4.4 Failure Protection, Detection, and Recovery Features

The team supporting operations at the I-SIPS will be responsible for failure protection, detection, and recovery of the GLAS Level 1A and Level 1B Data Products stored on the I-SIPS. Initial GLAS Level 1A and Level 1B Data Products error detection is performed during product generation as part of the product and processing quality assurance activity. The GLAS Level 1A and Level 1B Data Products will be “backed up” under the routine operational functions performed at the I-SIPS. In the event of failure or error detection in the active working or archive storage, recovery would be performed from backup media or from the EOSDIS DAAC archive.

The EOSDIS will be responsible for failure protection, detection, and recovery of the GLAS Level 1A and Level 1B Data Products archived at the DAAC.

Section 5

Data Flow Characteristics

5.1 Volume, Size, and Frequency Estimates

The expected daily data storage burdens for the GLAS Level 1A and Level 1B Standard Data Products are listed in Table B-3. This estimate is based on the following EOS ICESat operational assumptions. The spacecraft will orbit the Earth at an inclination of 94 degrees and a nominal altitude of 600 kilometers in a circular orbit. The orbit (groundtrack) repeat cycle is approximately 91 days based on a frozen orbit. The EOS ICESat orbit period is approximately 100 minutes resulting in just under 15 orbits per day.

5.2 Data Transfer and Transmission

The GLAS Data Products and associated descriptive metadata will be delivered to the EOSDIS DAAC archival facility through the EOS Science Network access arrangement or off-line via storage media. The GLAS Level 1A and Level 1B Data Products delivered to the DAAC processing subsystem will be designated for fail-safe functions. The GLAS Science Team will have access to the GLAS Level 1 Data Products through the GLAS SCF using TCP/IP and standard UNIX command operations.

Data access procedures to retrieve the GLAS Level 1A and Level 1B Standard Data Products from the EOSDIS DAAC will be provided by the EOSDIS DAAC.

5.3 Timing and Sequencing Characteristics

The GLAS Level 1A and Level 1B Standard Data Products are generated as product files consisting of processed Level 0 data. The basic aggregation of the GLAS Level 1 Data Products is the descriptive information in the header records and GLAS Data Elements in the data records. Records consists of one-second of reduced GLAS instrument, GPS receiver and stellar reference system data, and location data. The exception is the Engineering Data File (GLA03) with records that span 16 seconds. The data parameters and elements contained within the records are groups of forty hertz, five hertz, and one hertz rate data.

All data records within the GLAS Level 1 Data Product files will be in ascending time order based on the first pulse time tag or the first sample time tag. All parameters and elements contained within the records are synchronous at either forty hertz, five hertz, or one hertz. The GLAS instrument and the EOS ICESat spacecraft are expected to operate continuously for at least three years with a goal of five years.

5.4 Recipients and Utilization

The GLAS Science Team and the EOSDIS DAAC are the initial recipients of the Level 1 Data Products. At the I-SIPS, the Level 1 Data Products will be used to generate the Level 1 metadata and the Level 2 Data Products. The metadata (delivered to the EOSDIS DAAC) will include data quality evaluation and statistical reporting on the GLAS Level 1 Data Products to quantify and qualify the products for EOS community usage. The GLAS Science Team will use the Level 1 Data Products for research and analysis.

The subsequent audience for the GLAS Level 1 Data Products is the scientific, governmental, and educational community sectors who will obtain the products from the EOSDIS DAAC.

5.5 Access

The GLAS Level 1 Data Products will be available to the GLAS Science Team from the GLAS SCF. Access to the GLAS SCF is controlled by the GLAS Science Team.

While EOS is intended to be a globally available and utilized mission program, access to the data is still operated under a security and integrity program to protect the data and data system resources from unauthorized or destructive use. Procedures for data access are defined by the EOSDIS DAAC.

Section 6

Data Product Definitions

6.1 Data Product Structure

The GLAS Level 1 Data Products will be generated as scaled integer binary files. Each file will contain appropriate header, labelling, and metadata information and a collection of one-second records of GLAS instrument, sensor, and time data. The exception is the GLA03 product which contains 16-second records.

6.2 Labeling and Identification

Each of the GLAS Level 1 Data Products is uniquely identified by a GLAS standard file name. The form of this file name is

GLAxx_mmm_prkk_ccc_tttt_s_nn_ffff.eee

Specific elements within the file name are described in Table 6-1.

Table 6-1 GLAS File Naming Keys

Key	Description
xx	The GLAS Product ID (01-15)
mmm	release number for process that created the produce (CCB assigned-combination of software and data)
p	repeat ground track phase
r	reference orbit number
kk	instance # incremented every time GLAS enters a different reference orbit
ccc	cycle of reference orbit for this phase
tttt	track within reference orbit
s	segment of orbit. This is 0 on files that contain multiple segments (GLA02, GLA03, GLA04,GLA07-GLA15) and 1,2,3,or 4 on GLA01, GLA05, and GLA06.
nn	granule version number (the number of times this granule is created for a specific release)
ffff	file type (numerical,CCB assigned for multiple files as needed for data of same time period for a specific ANCxx or GLAxx,.i.e. multi-file granule)

The structure and contents of the GLAS Level 1 Data Product headers and labels are contained in Appendix A.

6.3 Data Product Substructure Descriptions

Full data product descriptions are provided in Appendix B and online in a hyper-linked format at the WFF GLAS website. The URL for product descriptions is:

http://wffglas.wff.nasa.gov/v50_products/

Table 6-2 lists the fields shown in each data product description entry.

Table 6-2 GLAS Data Product Description Fields

Field	Description
Product ID	GLAS File ID (GLA01, GLA02, etc).
Name	Descriptive name.
Product Level	Product Level (L0,L1A,L1B,L2,L3).
Science Discipline	Primary associated science discipline.
Investigator	Primary investigator.
Archive Site	Location at which this file will be permanently archived.
Source	A flag giving source data system of this file.

Table 6-3 lists the data coverage description fields.

Table 6-3 GLAS Data Coverage Description Fields

Field	Description
Product ID	GLAS File ID (GLA01, GLA02, etc).
Temporal Resolution	Nominal time span, in seconds, of each record of data within a file.
Temporal Coverage	Nominal time span, in minutes, of data contained within a file.
Horiz Res Coverage	Horizontal coverage, in meters, over Earth's surface for each instrument measurement.
Vert Res Coverage	Vertical coverage, in meters, over the Earth's surface for each instrument measurement.
Root/External Flag	A flag signifying whether this file is: **0**: neither of the following. **1**: the head-of-chain (Level 0 data) of an instrument's data stream. **2**: a file from an external source.

Table 6-4 lists the data volume description fields.

Table 6-4 GLAS Data Volume Description of Fields

Field	Description
Product ID	GLAS File ID (GLA01, GLA02, etc).
Frequency (per day)	Number of times processing PGE is executed.
Files per Granule	Number of physical files per each granule.
CPU (min)	Number of processing minutes required to produce a granule of this data.
MB per Day	Estimated amount of this data processed each data.
Record Size (bytes, 0=variable)	Size, in bytes, of a single record of data. 0 indicates a variable sized record.
Granule Size (MB)	Size, in megabytes, of a granule.
Granules per Day	Number of granules normally processed per day.
Revs per Granule	Number of earth revolutions contained in one granule.

6.4 Detailed Data Descriptions

Full detailed data descriptions are available in Appendix C. These descriptions provide details for each value within a product file. Table 6-5 lists the fields shown in each detailed data description entry.

Table 6-5 GLAS Detailed Data Description Fields

Field	Description
Product Var Name	Unique identifying name of the product variable.
Offset (bytes)	Offset in bytes from start of data record (start=0).
Prod Data Type	Product (Unscaled) Variable Type and dimensions (in parens). **i1b** = Integer, 1 byte **i2b** = Integer, 2 bytes **i4b** = Integer, 4 bytes **r4b** = Real, 4 bytes **r8b** = Real, 8 bytes etc...
Total Bytes	Total number of bytes used by variable.
Is Unsigned?	Flag indicating if variable should be treated as unsigned.
Invalid Value/Flag	Indicates what identifies the filed as being invalid. **None** = variable cannot be invalid. **gd_invalid_*xxx*** = datatype-specific value which indicates the variable is not valid. ***[variable name]*** = name of the flag to check in order to determine validity of the variable.

6.5 GLAS Data Dictionary

Detailed variable descriptions are provided in Appendix D. These descriptions provide details for each variable within a product file. Table 6-6 lists the fields shown in each detailed data dictionary entry.

Table 6-6 GLAS Data Dictionary

Field	Description
Product Var Name	Unique identifying name of the product variable.
Is element of:	Corresponding record where variable is located.
Short Description	Descriptive name of the product variable.
Prod Data Type	Product (Unscaled) Variable Type and dimensions (in parens). **i1b** = Integer, 1 byte **i2b** = Integer, 2 bytes **i4b** = Integer, 4 bytes **r4b** = Real, 4 bytes **r8b** = Real, 8 bytes etc...
Total Bytes	Total number of bytes used by variable.
Product Units	Units in which variable is stored on product file.
Total Bytes	Total number of bytes used by variable.
Product Units	Units in which variable is stored on product file.
Invalid Value/Flag	Indicates what identifies the filed as being invalid. **None** = variable cannot be invalid. **gd_invalid_*xxx*** = datatype-specific value which indicates the variable is not valid. ***[variable name]*** = name of the flag to check in order to determine validity of the variable.
Is Correction Flag	Flag indicating if the variable is a correction flag.
Is Unsigned?	Flag indicating if variable should be treated as unsigned.
Product Minimum	Minimum value supported in product variable.
Product Maximum	Maximum value supported in product variable.
Description	Text description.
Comments	Text comments.

6.6 GLAS Flag Description

A detailed description of the flags is available in Appendix E.

Appendix A
Level 1 Data Products - Standard Label Contents & Description

GLAS Products begin with ASCII header records containing information regarding the processing which created the Product and the data contained within. These header records are exactly the same size as a Product data record and contain ASCII information in a slightly modified KEYWORD=VALUE format. In order to conserve space on the product, the header records contain multiple KEYWORD=VALUE entries and entries are delimited by a semi-colon (;) and linefeed (ASCII 10).

By design, the first two header entries are the record length and number of header records. This allows product readers to verify the record length and jump directly to the first data record, if necessary. Most of the remaining information within the headers is directly applicable to the generation of metadata files for EOS ingest.

The following fields are defined for GLAS Product Headers:

Table A-1 Product Header Elements

Keyword	Content Description
Additional_Attribute	Product-specific additional attributes.
AutomaticQualityFlagExplan	Automatic Quality flag explanation (per parameter).
Cycle	A count of the number of exact repeats of this reference orbit.
EquatorCrossingDate	Date of the equator crossing.
EquatorCrossingLong	Longitude of equator crossing.
EquatorCrossingTime	Time of the equator crossing.
glas_osc_rate	Value that indicates the accuracy rate of the GLAS oscillator.
glas_osc_rate_date	Valid date of the GLAS oscillator rate. (yyyy-mm-dd)
glas_osc_rate_time	Valid time of the GLAS oscillator rate. (hh:mm:ss)
InputPointer	Name of each input product file used to created this product (one instances of this keyword appears in the product header record for each input product file used in creation of this product).
internal_range_delay	Internal range delay for digitizer in meters (from anc33).
internal_range_delay_date	Valid date of corresponding internal range delay. (yyyy-mm-dd)
internal_range_delay_time	Valid time of corresponding internal range delay. (hh:mm:ss)
internal_time_delay	Time delay for digitizer in seconds (from anc33).
internal_time_delay_date	Valid date of internal time delay. (yyyy-mm-dd)
internal_time_delay_time	Valid time of internal time delay. (hh:mm:ss)

Table A-1 Product Header Elements (Continued)

Keyword	Content Description
Instance	The number of times that a specific reference orbit has been returned to during flight.
instrument_short_name	Short name of instrument (GLAS).
Instrument_State	Flag word that indicates which redundant units (laser, detector, oscillator) of the GLAS instrument are in operation.
Instrument_State_Date	The date that corresponds to the Instrument_State. There are a maximum of two per granule.
Instrument_State_Time	The time that corresponds to the Instrument_State. There are a maximum of two per granule.
LocalGranuleID	Filename of the granule.
LocalVersionID	Granule version number (auto-incrementing, nn in filenaming convention).
Numhead	Number of header records preceeding product data records.
OperationalQualityFlagExpl	Operational Quality flag explanation (per parameter).
Orbit Number	Orbit number
OrbitQuality	Status word that states what type of orbit was used during processing of the data for the granule. It specifies the models used in the orbit determination program. This provides an indication of the quality of the orbits being applied to the data.
ParameterName	Name of product specific parameters for which additional information follows.
PercentFullRate	Percent of data for this granule that atmospheric parameters are provided at 40 Hz data rate.
PercentGroundHit	Percent of data for this granule that had a detected ground return of the transmitted laser pulse.
PercentHighRate	Percent of data for this granule that atmospheric parameters are provided at 5 Hz data rate.
PercentLowRate	Percent of data for this granule that atmospheric parameters are provided at 0.25 Hz data rate.
PercentMediumRate	Percent of data for this granule that atmospheric parameters are provided at 1 Hz data rate.
Percent1064to532	Percent atmospheric profiles that use the 1064 nm profile data to provide estimated values for the saturated 532nm profiles.
PGEVersion	Version number of the GSAS software that generated this granule.
platform_short_name	Short name of spacecraft (Icesat).
ProductionDateTime	Creation time of granule.
QAPercentMissingData	Percent of missing data (per parameter)

Table A-1 Product Header Elements (Continued)

Keyword	Content Description
QAPercentOutofBounds	Percent of out-of-bounds data (per parameter)
RangeBeginningDate	Start date of data on the granule.
RangeEndingDate	End data of data on the granule.
RangeBeginningTime	Start time of day for data on this granule.
Range_Bias	The additive calibration correction in millimeters to apply to range based on the science team cal/val activities.
Range_Bias_Date	The date that corresponds to the first valid Range_Bias. There are a maximum of two per granule.
Range_Bias_Time	The time that corresponds to the first valid Range_Bias. There are a maximum of two per granule.
RangeEndingTime	End time of day for data on this granule.
Recl	Record length in bytes.
ReferenceOrbit	Assigned number for which exact orbital elements describe the exact repeat orbit pattern.
ReprocessingPlanned	Planned reprocessing status.
ReprocessingActual	Actual reprocessing status.
sc_osc_rate	Value that indicates the accuracy of the spacecraft oscillator.
sc_osc_rate_date	Valid date of the spacecraft oscillator measurement. (yyyy-mm-dd)
sc_osc_rate_time	Valid time of the spacecraft oscillator measurement. (hh:mm:ss)
sensor_short_name	Short name of sensor (LaserALT).
ScienceQualityFlagExplana	Science Quality flag explanation (per parameter).
ShortName	GSAS Filetype.
size_mb_ecs_data_granule	Size (in MB) of the granule.
SP_ICE_GLAS_EndBlock	Integer SPICE block number within GLAS coverage scheme in which granule data ends.
SP_ICE_PATH_NO	Number which represents the GLAS SPICE path number.
SP_ICE_GLAS_StartBlock	Integer SPICE block number within GLAS coverage scheme in which granule data starts.
time_between_contiguous_records	Time between contiguous data records (in seconds).
Timing_Bias	The time tag error determined by the calibration team that was added to the time tags to compute the true time of data as provided on the granule.
Timing_Bias_Date	The date that corresponds to the Timing_Bias. There are a maximum of two per granule.

Table A-1 Product Header Elements (Continued)

Keyword	Content Description
Timing_Bias_Time	The time of day that corresponds to the Timing_Bias. There are a maximum of two per granule.
Timing_Drift	This is the ratio of the true time for a one second oscillator tick to nominal one.
Timing_Drift_Date	The date that corresponds to the Timing_Drift. There are a maximum of two per granule.
Timing_Drift_Time	The time of day that corresponds to the Timing_Drift. There are a maximum of two per granule.
Track	The unique number assigned for each repeat ground track (one orbit) of the reference orbit.
Track_Segment	Number assigned for the specific latitude segment (1 = +50 to +50, 2 = +50 to -50, 3 = -50 to -50, 4 = -50 to +50) of the track for the data.
VersionID	The ESDT version number that is to be used with this product.
Additional product specific information	(see Table A-2)

In addition to the common information contained in its headers, each product may also contain information specific to the type of data it contains. This type of information is called a product-specific attribute (PSA). The PSAs mostly contain information related to product data quality. The PSAs and their attributes are listed in Table A-2.

Table A-2 Product Specific Elements

Product	Parameter Name	Attribute Name	Attribute
GLA01	Range	AutomaticQualityFlag	Flag will fail if percent no range > N% or percent missing > M% or percent out of bounds > B% where N, M, B are TBD.
		QAPercentMissingData	Percent Missing is the number of either (APID 12+13) or (APID 19).
		QAPercentOutofBounds	Percent Out of Bounds is percent of time EchoPeakLoc = 0 for shots w/ APID 19 AND (12 or 13) present.
GLA02	PC_Profile	AutomaticQualityFlag	Flag will fail if PCProfile_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is percent missing either (APID 15) or(APID 19).

Table A-2 Product Specific Elements (Continued)

Product	Parameter Name	Attribute Name	Attribute
GLA02	CD_Profile	AutomaticQualityFlag	Flag will fail if CDProfile_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is missing either (APID 17) or (APID 19).
GLA03	Data	AutomaticQualityFlag	Flag will fail if Data_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is percent missing 16 second frames using requested granule times.
GLA03	Temperature	AutomaticQualityFlag	Flag will fail if any temperature is out of bounds.
		QAPercentOutofBounds	Percent Out of Bounds is % of temperature parameters that are out of bounds. Use Red LImits.
GLA03	Voltage	AutomaticQualityFlag	Flag will fail if any voltage is out of bounds.
		QAPercentOutofBounds	Percent Out of Bounds is percent of voltage parameters that are out of bounds. Use Red LImits.
GLA04	prap	AutomaticQualityFlag	Flag will fail if PRAP_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is % missing APID 1984.
GLA04	Gyro	AutomaticQualityFlag	Flag will fail if Gyro_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is % missing in appropriate APID.
GLA04	Laser Reference System	AutomaticQualityFlag	Flag will fail if LRS_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is % missing in appropriate APID.
GLA04	Star Tracker	AutomaticQualityFlag	Flag will fail if BST_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is % missing in appropriate APID.

Table A-2 Product Specific Elements (Continued)

Product	Parameter Name	Attribute Name	Attribute
GLA04	Laser Pulse Array	AutomaticQualityFlag	Flag will fail if LPA_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is % missing APID 26.
GLA04	Instrument Star Tracker	AutomaticQualityFlag	Flag will fail if IST_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is % missing in appropriate APID.
GLA05	Range	AutomaticQualityFlag	Flag will fail if % no range > 25% or percent missing > 5% or percent out of bounds > 15%. Percent no range = percent missing + percent out of bounds - percent out of bounds * percent missing / 100.
		QAPercentMissingData	Percent Missing is (Expected - Received) / Expected. Expected from start/stop times on INPUT_FILE line.
		QAPercentOutofBounds	Percent Out of Bounds is percent of received with entire signal below threshold.
GLA06	Surface Elevation	AutomaticQualityFlag	Flag will fail if percent no elevation > 25% or percent missing > 5% or percent out of bounds > 15%. Percent no elevation = percent missing + percent out of bounds - percent out of bounds * percent missing / 100.
		QAPercentMissingData	Percent Missing is (Expected - Received) / Expected.
		QAPercentOutofBounds	Percent Out of Bounds is number of invalid / number of shots received.

Table A-2 Product Specific Elements (Continued)

Product	Parameter Name	Attribute Name	Attribute
GLA06	Surface Roughness	AutomaticQualityFlag	Flag will fail if SurfRoughness_PctOOB > 5%.
		QAPercentOutofBounds	Percent Out of Bounds is number of Invalid / number of shots received.
GLA06	Surface Reflectance	AutomaticQualityFlag	Flag will fail if SurfReflectance_PctOOB > 5%.
		QAPercentOutofBounds	Percent Out of Bounds is number of invalid / number of shots received.
GLA06	Surface Slope	AutomaticQualityFlag	Flag will fail if SurfSlope_PctOOB > 5%.
		QAPercentOutofBounds	Percent Out of Bounds is number of invalid / number of shots received.
GLA07	532nm Attenuated Back-scatter	TBD	TBD
GLA07	1064nm Attenuated Back-scatter	TBD	TBD

Appendix B
Level 1 Data Products Description

B.1 Data Product Description

Table B-1 Data Product Description

Product ID	Name	Level	Science Discipline	Investigator	Archive Site	Source
GLA01	Altimetry Data	1A	Altimetry	B. Minster	NSIDC	ICESAT SCF
GLA02	Atmosphere Data	1A	LIDAR	J. Spinhirne	NSIDC	ICESat SCF
GLA03	Engineering Data	1A	Engineering	N/A	NSIDC	ICESat SCF
GLA04-01	GLA04 LPA	1A	Location	B. Schutz	Icesat SCF	ICESat SCF
GLA04-02	GLA04 LRS	1A	Location	B. Schutz	Icesat SCF	Icesat SCF
GLA04-03	GLA04 GYRO	1A	Location	B. Schutz	Icesat SCF	ICESat SCF
GLA04-04	GLA04 IST	1A	Location	B. Schutz	Icesat SCF	ICESat SCF
GLA04-05	GLA04 BST	1A	Location	B. Schutz	Icesat SCF	ICESat SCF
GLA04-06	GLA04-SCPA	1A	Location	N/A	Icesat SCF	ICESat SCF
GLA05	Waveform-based elevation	1B	Altimeter Waveform	B. Minster	Icesat SCF	ICESat SCF
GLA06	Elevation	1B	Altimetry	B. Minster	Icesat SCF	ICESat SCF
GLA07	Backscatter	1B	Atmosphere	J. Spinhirne	Icesat SCF	ICESat SCF

B.2 Data Coverage

Table B-2 Data Coverage

Product ID	Temporal Resolution (sec)	Temporal Coverage (min)	Horiz Res Coverage (m)	Vert Rez Coverage (m)	Root/ External Flag
GLA01	1	23	170	0	0
GLA02	1	190	0	76.8	0
GLA03	16	190	76.8	170	0
GLA04-01	1	190	0	0	0
GLA04-02	1	190	0	0	0
GLA04-03	1	190	0	0	0
GLA04-04	1	190	0	0	0
GLA04-05	1	190	0	0	0
GLA04-06	1	190	0	0	0
GLA05	1	190	170	0	0
GLA06	1	190	170	0	0
GLA07	1	190	170	76.8	0

B.3 Data Volume

Table B-3 Data Volume

Product ID	Freq.(per day)	Files per Gran.	CPU (min)	MB per Day	Record Size (0=variable)	Granule Size (MB)	Gran. per Day	Revs per Gran.
GLA01	4	1	45.4	1497.491455	4660	26.74091884	56	0.25
GLA02	4	1	159.03	4701.269531	57056	671.609933	7	2
GLA03	4	1	10.72	136.1412048	26436	19.44874355	7	2
GLA04-01	4	1	1	1545.117188	18752	386.2792969	7	2
GLA04-02	4	1	1	525.3662109	6376	131.3415527	7	2
GLA04-03	4	1	1	28.67431641	348	7.168579102	7	2
GLA04-04	4	1	1	133.4838867	1620	33.37097168	7	2
GLA04-05	4	1	1	180.9448242	2196	45.23620605	7	2
GLA04-06	4	1	1	8.404541016	102	2.101135254	7	2
GLA05	4	1	199.36	1433.71582	17400	25.60206822	7	2
GLA06	4	1	118.84	566.8945313	6880	10.12311663	7	2
GLA07	1	1	157.4	5805.395508	70456	829.3422154	7	2

Appendix C
Level 1 Data Product Formats

C.1 Record Formats

C.1.1 Guidelines

The GLAS Data Product record formats were developed under the following guidelines:

1) Record size a multiple of 4.
2) Start elements on a 4 byte boundary; where not possible use pads or group smaller elements together to get to 4 byte boundary. Pad and move elements so that arrays start on 4 byte boundaries.
3) The output structures to build files should be grouped in descending size order, therefore group elements on file logically and in descending size order.
4) Data that occurs occasionally in the file should be put in the header. Specifically, data that are changing at a much lower rate than the record rate on the files, will be put in the header. These elements will not be shown in the record format.
5) Add spares.

C.1.2 GLA01

Fixed length, variable format records. For each second of data there is a main record and a varying number of long or short waveform records each denoted by the GLA01 record type field (i_gla01_rectype). Record type "0" is a main record, record type "1" is a long waveform record, and record type "2" is a short waveform. The main record contains all of the altimetry waveform information except that which is directly associated with the return waveform. Succeeding records in sets of either 2 for ocean or 5 for land, as determined by the on-board surface type mask, contain the return waveforms. Long, or land waveform records contain eight 544 sample returns and data. Short, or ocean records contain twenty 200 sample waveforms and associated data.

Table C-1 GLA01 Record Format

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
Record Type:GLA01_MAIN; % of Granule: 100; Record Duration (seconds):1; Repeats: 1						
Latest : Last Modified : Wed Apr 20 12:35:37 GMT-0400 (EDT) 2005						
i_rec_ndx	0	i4b	4	N/A	No	no
i_UTCTime	4	i4b (2)	8	seconds, microseconds	No	no
i_gla01_rectype	12	i2b	2	n/a	No	no

Table C-1 GLA01 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
i_spare1	14	i2b	2	n/a	No	no
i_dShotTime	16	i4b (39)	156	microseconds	No	No
i1_pred_lat	172	i4b	4	microdegrees	No	gi_invalid_i4b
i1_pred_lon	176	i4b	4	microdegrees	No	gi_invalid_i4b
i_RespEndTime	180	i4b (40)	160	nanoseconds	No	i_APID_AvFlg
i_LastThrXingT	340	i4b (40)	160	ns	No	i_APID_AvFlg
i_NextThrXing	500	i4b (40)	160	ns	No	i_APID_AvFlg
i_EchoPeakLoc	660	i4b (40)	160	nanoseconds	No	i_APID_AvFlg
i_EchoPeakVal	820	i2b (40)	80	counts	No	i_APID_AvFlg
i_wt_fact_filt	900	i4b (6, 40)	960	unitless	No	i_APID_AvFlg
i_filtr_thresh	1860	i2b (40)	80	counts	No	i_APID_AvFlg
i_time_txWfPk	1940	i4b (40)	160	ns	No	i_APID_AvFlg
i_TxWfStart	2100	i4b (40)	160	ns	No	i_APID_AvFlg
i_TxNrg_EU	2260	i4b	4	microjoules	No	i_APID_AvFlg
i_RecNrgAll_EU	2264	i4b (40)	160	attojoules	No	i_APID_AvFlg
i_RecNrgLast_EU	2424	i4b (40)	160	attojoules	No	i_APID_AvFlg
i_txWfPk_Flag	2584	i1b (40)	40	n/a	No	i_APID_AvFlg
i_InstState	2624	i4b	4	n/a	No	no
i_APID_AvFlg	2628	i1b (8)	8	n/a	No	No
i_FiltNumMask	2636	i4b	4	n/a	No	i_APID_AvFlg
i_HOff	2640	i4b (2)	8	Millimeters	No	i_APID_AvFlg
i_ADBias	2648	i4b (2)	8	Meters	No	i_APID_AvFlg
i_RminRmax	2656	i4b (2)	8	Meters	No	i_APID_AvFlg
i_WMinMax	2664	i4b (2)	8	Meters	No	i_APID_AvFlg
i_ObSCHt	2672	i4b	4	Millimeters	No	i_APID_AvFlg
i_engineering	2676	i2b (12)	24	various	No	i_APID_AvFlg
i_compRatio	2700	i2b (2)	4	counts	No	i_APID_AvFlg
i_N_val	2704	i2b	2	counts	No	i_APID_AvFlg
i_r_val	2706	i2b	2	counts	No	i_APID_AvFlg
i_ADdetOutGn	2708	i2b	2	counts	No	N/A
i_DEMmin	2710	i2b	2	meters	No	i_APID_AvFlg
i_DEMmax	2712	i2b	2	meters	No	i_APID_AvFlg
i_tx_wf	2714	i1b (48, 40)	1920	counts	Yes	i_APID_AvFlg
i_OrbFlg	4634	i1b (2)	2	NA	No	no
i_EchoLandType	4636	i1b	1	unitless	No	i_APID_AvFlg

Table C-1 GLA01 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
i_RngSrc_Flag	4637	i1b	1	n/a	No	i_APID_AvFlg
i_timecorflg	4638	i2b	2	N/A	No	No
i_TxFlg	4640	i1b (5)	5	N/A	No	No
i_GainShiftFlg	4645	i1b (5)	5	N/A	No	No
i_spare2	4650	i1b (10)	10	null	No	no
Total Bytes	4660					
Record Type:GLA01_LONG; % of Granule: 30; Record Duration (seconds):0.2; Repeats: 5						
Latest : Last Modified : Wed Aug 27 06:25:45 GMT-0400 (EDT) 2003						
i_rec_ndx	0	i4b	4	N/A	No	no
i_UTCTime	4	i4b (2)	8	seconds, microseconds	No	no
i_gla01_rectype	12	i2b	2	n/a	No	no
i_spare1	14	i2b	2	n/a	No	no
i_filtnum	16	i1b (8)	8	n/a	No	i_APID_AvFlg
i_shot_ctr	24	i2b (8)	16	counts	No	i_APID_AvFlg
i_statflags	40	i4b (8)	32	n/a	No	i_APID_AvFlg
i_gainSet1064	72	i2b (8)	16	counts	No	i_APID_AvFlg
i_4nsPeakVal	88	i2b (8)	16	counts	No	i_APID_AvFlg
i_8nsPeakVal	104	i2b (8)	16	counts	No	i_APID_AvFlg
i_4nsBgMean	120	i2b (8)	16	.01 counts	Yes	i_APID_AvFlg
i_4nsBgSDEV	136	i2b (8)	16	.01 counts	Yes	i_APID_AvFlg
i_samp_pad	152	i2b (8)	16	counts	No	i_APID_AvFlg
i_comp_type	168	i1b (8)	8	n/a	No	i_APID_AvFlg
i_rng_wf	176	i1b (544, 8)	4352	counts	Yes	i_APID_AvFlg
i_gainStatus	4528	i1b (8)	8	n/a	Yes	i_APID_AvFlg
i_NumCoinc	4536	i1b (8)	8	n/a	Yes	i_APID_AvFlg
i_rawPkHt	4544	i1b (8)	8	n/a	Yes	i_APID_AvFlg
i_spare2	4552	i1b (108)	108	n/a	No	no
Total Bytes	4660					
Record Type:GLA01_SHORT; % of Granule: 70; Record Duration (seconds):0.5; Repeats: 2						
Latest : Last Modified : Wed Aug 27 06:42:11 GMT-0400 (EDT) 2003						
i_rec_ndx	0	i4b	4	N/A	No	no

Table C-1 GLA01 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
i_UTCTime	4	i4b (2)	8	seconds, microseconds	No	no
i_gla01_rectype	12	i2b	2	null	No	no
i_spare1	14	i2b	2	null	No	no
i_filtnum	16	i1b (20)	20	n/a	No	i_APID_AvFlg
i_shot_ctr	36	i2b (20)	40	counts	No	i_APID_AvFlg
i_statflags	76	i4b (20)	80	n/a	No	i_APID_AvFlg
i_gainSet1064	156	i2b (20)	40	unitless	NA	i_APID_AvFlg
i_4nsPeakVal	196	i2b (20)	40	counts	No	i_APID_AvFlg
i_8nsPeakVal	236	i2b (20)	40	counts	No	i_APID_AvFlg
i_4nsBgMean	276	i2b (20)	40	.01 counts	Yes	i_APID_AvFlg
i_4nsBgSDEV	316	i2b (20)	40	.01 counts	Yes	i_APID_AvFlg
i_samp_pad	356	i2b (20)	40	counts	No	i_APID_AvFlg
i_comp_type	396	i1b (20)	20	n/a	No	i_APID_AvFlg
i_rng_wf	416	i1b (200, 20)	4000	counts	Yes	i_APID_AvFlg
i_gainStatus	4416	i1b (20)	20	n/a	NA	i_APID_AvFlg
i_NumCoinc	4436	i1b (20)	20	n/a	Yes	i_APID_AvFlg
i_rawPkHt	4456	i1b (20)	20	n/a	Yes	i_APID_AvFlg
i_spare2	4476	i1b (184)	184	n/a	No	no
Total Bytes	4660					

C.1.3 GLA02

Records are fixed length and format and occur once per second.

Table C-2 GLA02 Record Format

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
Record Type:GLA02_MAIN; % of Granule: 100; Record Duration (seconds):1; Repeats: 1						
Latest : Last Modified : Thu May 05 09:47:43 GMT-0400 (EDT) 2005						
i_rec_ndx	0	i4b	4	N/A	No	no
i_UTCTime	4	i4b (2)	8	seconds, microseconds	No	no
i1_pred_lat	12	i4b	4	microdegrees	No	gi_invalid_i4b
i1_pred_lon	16	i4b	4	microdegrees	No	gi_invalid_i4b
i_DEMmin	20	i2b	2	meters	No	i_APID_AvFlg
i_DEMmax	22	i2b	2	meters	No	i_APID_AvFlg
i_g_lid_qf	24	i1b (12)	12	n/a	Yes	no
i40_g_lid	36	i4b (148, 40)	23680	((pe/bin)KM^2)/J)/1000	No	i4b
i5_g_lid	23716	i4b (132, 5)	2640	((pe/bin)KM^2)/J)/1000	No	i4b
i1_g_lid	26356	i4b (268)	1072	((pe/bin)KM^2)/J)/1000	No	i4b
i40_g_sat_f	27428	i1b (740)	740	n/a	Yes	no
i5_g_sat_f	28168	i1b (84)	84	n/a	Yes	no
i1_g_sat_f	28252	i1b (36)	36	n/a	Yes	no
i40_g_TxNrg_EU	28288	i4b (40)	160	Joules * 1.0d5	No	i_APID_AvFlg
i5_g_TxNrg_EU	28448	i4b (5)	20	Joules * 1.0d5	No	i_APID_AvFlg
i1_g_TxNrg_EU	28468	i4b	4	Joules * 1.0d5	No	i_APID_AvFlg
i_g_IntRet	28472	i4b	4	photons*100	No	i_APID_AvFlg
i_Rng2PCProf	28476	i4b	4	centimeters	No	i_APID_AvFlg
i_Rng_PkRt	28480	i4b	4	centimeters	No	gi_invalid_i4b
i40_g_bg	28484	i4b (4, 40)	640	photons/bin * 100	No	i_APID_AvFlg
i5_g_bg	29124	i4b (4, 5)	80	photons/bin * 100	No	i_APID_AvFlg
i1_g_bg	29204	i4b (4)	16	photons/bin * 100	No	i_APID_AvFlg
i_gPredCldTop	29220	i2b (5)	10	meters	No	i_APID_AvFlg
i_g_shot_ctr	29230	i2b	2	n/a	No	i_APID_AvFlg
i_SpcmBg2Del	29232	i2b	2	nanoseconds	Yes	i_APID_AvFlg
i_SpcmRngDel	29234	i2b	2	nanoseconds	Yes	i_APID_AvFlg
i_SpcmGateDel	29236	i2b	2	nanoseconds	Yes	i_APID_AvFlg
i_SpcmBg1Del	29238	i2b	2	nanoseconds	Yes	i_APID_AvFlg
i_spcm_stat	29240	i2b	2	n/a	Yes	i_APID_AvFlg
i_g_TxNrg_Cts	29242	i1b (40)	40	counts	Yes	i_APID_AvFlg

Table C-2 GLA02 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
i_g_TxNrg_qf	29282	i1b (10)	10	n/a	Yes	no
i_g_IntRet_qf	29292	i1b	1	n/a	Yes	no
i_spare2	29293	i1b	1	NA	Yes	no
i_ir_lid_qf	29294	i1b (12)	12	n/a	Yes	no
i_ir_shot_ctr	29306	i2b	2	n/a	No	i_APID_AvFlg
i_spcm_cts	29308	i1b (8)	8	n/a	Yes	i_APID_AvFlg
i_pc_rbias	29316	i4b	4	n/a	No	i_APID_AvFlg
i40_ir_TxNrgEU	29320	i4b (40)	160	Joules * 1.0d5	No	i_APID_AvFlg
i5_ir_TxNrgEU	29480	i4b (5)	20	Joules * 1.0d5	No	i_APID_AvFlg
i_rng2CDProf	29500	i4b	4	centimeters	No	i_APID_AvFlg
i40_ir_bg	29504	i4b (4, 40)	640	W*1.0d17	No	i_APID_AvFlg
i5_ir_bg	30144	i4b (4, 5)	80	W*1.0d17	No	i_APID_AvFlg
i40_ir_lid	30224	i4b (148, 40)	23680	(W*KM^2)/J)*1.0d8	No	i4b
i5_ir_lid	53904	i4b (132, 5)	2640	(W*KM^2)/J)*10^8	No	i4b
i_CdBg2_Del	56544	i2b	2	counts	Yes	i_APID_AvFlg
i_RngGate_Del	56546	i2b	2	counts	Yes	i_APID_AvFlg
i_cd_bg1_del	56548	i2b	2	counts	Yes	i_APID_AvFlg
i_cd_det_stat	56550	i2b	2	n/a	Yes	i_APID_AvFlg
i_cd_rbias	56552	i4b	4	n/a	No	i_APID_AvFlg
i_cd_ad_out	56556	i1b	1	n/a	Yes	i_APID_AvFlg
i_cd_att_set	56557	i1b	1	n/a	Yes	i_APID_AvFlg
i_CldPkSig	56558	i1b (5)	5	photons / bin	No	i_APID_AvFlg
i_gndret_pksig	56563	i1b (5)	5	photons / bin	No	i_APID_AvFlg
i_gnd_ret_loc	56568	i1b (5)	5	bin number	No	i_APID_AvFlg
i_et_cal_mode	56573	i1b	1	n/a	No	i_APID_AvFlg
i_ir_TxNrg_qf	56574	i1b (10)	10	n/a	Yes	no
i_EtHtrC37j_c	56584	i2b	2	Amps X 100	No	i_APID_AvFlg
i_EtC37d_t	56586	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_ETsettleTime	56588	i2b	2	seconds	Yes	i_APID_AvFlg
i_et_Flags	56590	i1b	1	n/a	Yes	No
i_et_update_ctr	56591	i1b	1	n/a	No	i_APID_AvFlg
i_et_StartTemp	56592	i1b	1	Celsius	No	i_APID_AvFlg
i_et_StopTemp	56593	i1b	1	Celsius	No	i_APID_AvFlg
i_et_TempStep	56594	i1b	1	Celsius	No	i_APID_AvFlg
i_et_spare	56595	i1b (3)	3	NA	No	NA

Table C-2 GLA02 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
i_et_acqavg_tm	56598	i1b	1	seconds	No	No
i_spare6	56599	i1b	1	NA	Yes	no
i_et_temperr	56600	i4b	4	n/a	No	i_APID_AvFlg
i_ET_state	56604	i1b	1	N/A	No	i_APID_AvFlg
i_spare3	56605	i1b	1	NA	Yes	no
i_et_acqset_tm	56606	i2b	2	seconds	Yes	i_APID_AvFlg
i_et_onax_xmit	56608	i4b	4	n/a	No	i_APID_AvFlg
i_et_offax_xmit	56612	i4b	4	n/a	No	i_APID_AvFlg
i_et_trkfltout	56616	i4b	4	n/a	No	i_APID_AvFlg
i_et_trkfltavg	56620	i4b	4	n/a	No	i_APID_AvFlg
i_APID_AvFlg	56624	i1b (8)	8	n/a	No	No
i_OrbFlg	56632	i1b (2)	2	NA	No	no
i_HoffMin	56634	i2b	2	meters	No	i_APID_AvFlg
i_Hsat	56636	i4b	4	centimeters	No	i_APID_AvFlg
i_4nsBgMean	56640	i4b (40)	160	counts	No	i_APID_AvFlg
i_4nsBgSDev	56800	i4b (40)	160	counts	No	i_APID_AvFlg
i_DualPinA	56960	i1b (40)	40	counts	Yes	i_APID_AvFlg
i_DualPinB	57000	i1b (40)	40	counts	Yes	i_APID_AvFlg
i_spare4	57040	i1b	1	NA	Yes	no
i_DitheringEnabled Flag	57041	i1b	1	N/A	NA	i_APID_AvFlg
i_timecorflg	57042	i2b	2	N/A	No	No
spare5	57044	i1b (12)	12	n/a	NA	n/a
Total Bytes	57056					

C.1.4 GLA03

Records occur at once per 16 second rate and are fixed format.

Table C-3 GLA03 Record Format

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
Record Type:GLA03_MAIN; % of Granule: 100; Record Duration (seconds):16; Repeats: 1						
Latest : Last Modified : Thu Jul 29 07:34:27 GMT-0400 (EDT) 2004						
i_rec_ndx	0	i4b	4	N/A	No	no
i_UTCTime	4	i4b (2)	8	seconds, microseconds	No	no

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
i_phdr_20	12	i1b (6, 4)	24	N/A	No	i_APID_AvFlg
i_shdr_20	36	i1b (8, 4)	32	N/A	No	i_APID_AvFlg
i_g_nrg	68	i2b (4)	8	Percent X 100	No	i_APID_AvFlg
i_Lsr1Osc_t	76	i2b (4)	8	Celsius X 100	No	i_APID_AvFlg
i_Lsr1Dblr_t	84	i2b (4)	8	Celsius X 100	No	i_APID_AvFlg
i_LMB1Ref_t	92	i2b (4)	8	Celsius X 100	No	i_APID_AvFlg
i_L1Elec_t	100	i2b (4)	8	Celsius X 100	No	i_APID_AvFlg
i_LsrOsc_c	108	i2b (4)	8	Amps	No	i_APID_AvFlg
i_LsrAmp_c	116	i2b (4)	8	Amps	No	i_APID_AvFlg
i_LsrDr_pw	124	i2b (4)	8	pw in microsec	No	i_APID_AvFlg
i_Lsr2Osc_t	132	i2b (4)	8	Celsius X 100	No	i_APID_AvFlg
i_Lsr2Dblr_t	140	i2b (4)	8	Celsius X 100	No	i_APID_AvFlg
i_LMB2Ref_t	148	i2b (4)	8	Celsius X 100	No	i_APID_AvFlg
i_L2Elect_t	156	i2b (4)	8	Celsius X 100	No	i_APID_AvFlg
i_Lsr3Osc_t	164	i2b (4)	8	Celsius X 100	No	i_APID_AvFlg
i_Lsr3Dblr_t	172	i2b (4)	8	Celsius X 100	No	i_APID_AvFlg
i_LMB3Ref_t	180	i2b (4)	8	Celsius X 100	No	i_APID_AvFlg
i_L3Elect_t	188	i2b (4)	8	Celsius X 100	No	i_APID_AvFlg
i_PrimAD550v	196	i4b (4)	16	Volts X 100	No	i_APID_AvFlg
i_SecAD550v	212	i4b (4)	16	Volts X 100	No	i_APID_AvFlg
i_spcm1_550v	228	i4b (4)	16	Volts X 100	No	i_APID_AvFlg
i_spcm2_550v	244	i4b (4)	16	Volts X 100	No	i_APID_AvFlg
i_spcm3_550v	260	i4b (4)	16	Volts X 100	No	i_APID_AvFlg
i_spcm4_550v	276	i4b (4)	16	Volts X 100	No	i_APID_AvFlg
i_spcm5_550v	292	i4b (4)	16	Volts X 100	No	i_APID_AvFlg
i_spcm6_550v	308	i4b (4)	16	Volts X 100	No	i_APID_AvFlg
i_spcm7_550v	324	i4b (4)	16	Volts X 100	No	i_APID_AvFlg
i_spcm8_550v	340	i4b (4)	16	Volts X 100	No	i_APID_AvFlg
i_Int1_t	356	i2b (4)	8	Celsius	No	i_APID_AvFlg
i_ct_prail_v	364	i2b (4)	8	Volts X 100	No	i_APID_AvFlg
i_Int3_t	372	i2b (4)	8	Celsius	No	i_APID_AvFlg
i_VCXmtr_c	380	i2b (4)	8	milliAmps	No	i_APID_AvFlg
i_VCYmtr_c	388	i2b (4)	8	milliAmps	No	i_APID_AvFlg
i_Xpos	396	i2b (4)	8	Volts	No	i_APID_AvFlg
i_Ypos	404	i2b (4)	8	Volts	No	i_APID_AvFlg

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
i_ADdetOutGn	412	i2b (4)	8	counts	No	i_APID_AvFlg
i_ADdetRetGn	420	i2b (4)	8	counts	No	i_APID_AvFlg
i_DPinA	428	i2b (4)	8	Percent X 100	No	i_APID_AvFlg
i_DPinB	436	i2b (4)	8	Percent X 100	No	i_APID_AvFlg
i_Laser1_stat	444	i1b (4)	4	N/A	No	i_APID_AvFlg
i_Laser2_stat	448	i1b (4)	4	N/A	No	i_APID_AvFlg
i_Laser3_stat	452	i1b (4)	4	N/A	No	i_APID_AvFlg
i_OTS_stat	456	i1b (4)	4	N/A	No	i_APID_AvFlg
i_phdr_21	460	i1b (6, 4)	24	N/A	No	i_APID_AvFlg
i_shdr_21	484	i1b (8, 4)	32	N/A	No	i_APID_AvFlg
i_BusAInst_28v	516	i2b (4)	8	Volts X 100	No	i_APID_AvFlg
i_HBSupp_c	524	i4b (4)	16	Amps X 100	No	i_APID_AvFlg
i_HVPSDetSup_c	540	i4b (4)	16	Amps X 100	No	i_APID_AvFlg
i_OpHtr_c	556	i4b (4)	16	Amps X 100	No	i_APID_AvFlg
i_MechSys_c	572	i4b (4)	16	Amps X 100	No	i_APID_AvFlg
i_BusBL1_v	588	i2b (4)	8	Volts X 100	No	i_APID_AvFlg
i_BusBL1_c	596	i4b (4)	16	Amps X 100	No	i_APID_AvFlg
i_BusCL2_v	612	i2b (4)	8	Volts X 100	No	i_APID_AvFlg
i_BusCL2_c	620	i4b (4)	16	Amps X 100	No	i_APID_AvFlg
i_BusDL3_v	636	i2b (4)	8	Volts X 100	No	i_APID_AvFlg
i_BusDL3_c	644	i4b (4)	16	Amps X 100	No	i_APID_AvFlg
i_5VHb1_v	660	i2b (4)	8	Volts X 100	No	i_APID_AvFlg
i_5VHb1_c	668	i4b (4)	16	Amps X 100	No	i_APID_AvFlg
i_12VHb2_v	684	i2b (4)	8	Volts X 100	No	i_APID_AvFlg
i_12VHb2_c	692	i4b (4)	16	Amps X 100	No	i_APID_AvFlg
i_n12VHb3_v	708	i2b (4)	8	Volts X 100	No	i_APID_AvFlg
i_n12VHb3_c	716	i4b (4)	16	Amps X 100	No	i_APID_AvFlg
i_5VHb4_v	732	i2b (4)	8	Volts X 100	No	i_APID_AvFlg
i_5VHb4_c	740	i4b (4)	16	Amps X 100	No	i_APID_AvFlg
i_n5VHb5_v	756	i2b (4)	8	Volts X 100	No	i_APID_AvFlg
i_n5VHb5_c	764	i4b (4)	16	Amps X 100	No	i_APID_AvFlg
i_n5VHb6_v	780	i2b (4)	8	Volts X 100	No	i_APID_AvFlg
i_n5VHb6_c	788	i4b (4)	16	Amps X 100	No	i_APID_AvFlg
i_15VBPR_v	804	i2b (4)	8	Volts X 100	No	i_APID_AvFlg
i_n15VBPR_v	812	i2b (4)	8	Volts X 100	No	i_APID_AvFlg

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
i_12VPOscTC_c	820	i4b (4)	16	Amps X 100	No	i_APID_AvFlg
i_12VSOscTC_c	836	i4b (4)	16	Amps X 100	No	i_APID_AvFlg
i_n2VDV_v	852	i2b (4)	8	Volts X 100	No	i_APID_AvFlg
i_HbHS_t	860	i2b (4)	8	Celsius X 100	No	i_APID_AvFlg
i_FETSbHS_t	868	i2b (4)	8	Celsius X 100	No	i_APID_AvFlg
i_PrimOsc_Stat	876	i1b (4)	4	N/A	No	i_APID_AvFlg
i_SecOsc_Stat	880	i1b (4)	4	N/A	No	i_APID_AvFlg
i_PrimAD_Stat	884	i1b (4)	4	N/A	No	i_APID_AvFlg
i_SecAD_Stat	888	i1b (4)	4	N/A	No	i_APID_AvFlg
i_0VHVPSRef_v	892	i2b (4)	8	Volts X 100	No	i_APID_AvFlg
i_5VHVPSRef_v	900	i2b (4)	8	Volts X 100	No	i_APID_AvFlg
i_OptSensSt	908	i2b (4)	8	N/A	No	i_APID_AvFlg
i_CmdTlmStat	916	i2b (4)	8	N/A	No	i_APID_AvFlg
i_PDUPMonCal1	924	i1b (4)	4	N/A	No	i_APID_AvFlg
i_PDUPMonCal2	928	i1b (4)	4	N/A	No	i_APID_AvFlg
i_PDUSMonCal1	932	i1b (4)	4	N/A	No	i_APID_AvFlg
i_PDUSMonCal2	936	i1b (4)	4	N/A	No	i_APID_AvFlg
i_ctrinfo	940	i1b (4)	4	Counts	No	i_APID_AvFlg
i_phdr_22	944	i1b (6)	6	N/A	No	i_APID_AvFlg
i_shdr_22	950	i1b (8)	8	N/A	No	i_APID_AvFlg
i_HkBdC0_t	958	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_IPSBdC1_t	960	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_PCBdC2_t	962	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_CDFTBdC3_t	964	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_AD1DSPC4_t	966	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_AD2DSPC5_t	968	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_DCHBdC6_t	970	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_LMBdC7_t	972	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_TCMBdC8_t	974	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_OXCO1BdC9_t	976	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_OXCO2BdC10_t	978	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_OscBdC11_t	980	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_OTSBdC12_t	982	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_LPAC13_t1	984	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_LPAC14_t2	986	i2b	2	Celsius X 100	No	i_APID_AvFlg

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
i_AD1eclaC15_t	988	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_AD2eclaC16_t	990	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_AD1eclbC17_t	992	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_AD2eclbC18_t	994	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_AD1ADCC19_t	996	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_AD2ADCC20_t	998	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_lid_box_t	1000	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_PRTtelmtC22t	1002	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_PRTtelbfC23t	1004	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_PRTad1C24_t	1006	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_PRTad2C25_t	1008	i2b	2	Celsius X 100	No	i_APID_AvFlg
iF1LTRSRSC26_t	1010	i2b	2	Celsius X 100	No	i_APID_AvFlg
iF2LTRSRSC27_t	1012	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_srs_ff_optio_t	1014	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_PRTfboxC29_t	1016	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_F1fabC30_t	1018	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_F2fabC31_t	1020	i2b	2	Celsius X 100	No	i_APID_AvFlg
iF1LTRCRSC32_t	1022	i2b	2	Celsius X 100	No	i_APID_AvFlg
iF2LTRCRSC33_t	1024	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_SRSparC34_t	1026	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_PRTCalLC35_t	1028	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_PRTCalHC36_t	1030	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_PDBiasC38_v	1032	i2b	2	Volt X 100	No	i_APID_AvFlg
iAD1HSRamC39_t	1034	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_spare22_1	1036	i1b (12)	12	N/A	No	No
i_phdr_23	1048	i1b (6)	6	N/A	No	i_APID_AvFlg
i_shdr_23	1054	i1b (8)	8	N/A	No	i_APID_AvFlg
i_tlm_spare1	1062	i1b (2)	2	n/a	No	No
i_lsm1_t	1064	i4b	4	Celsius X 100	No	i_APID_AvFlg
i_lsm2_t	1068	i4b	4	Celsius X 100	No	i_APID_AvFlg
i_adsm_t	1072	i4b	4	Celsius X 100	No	i_APID_AvFlg
i_lbsme_t	1076	i4b	4	Celsius X 100	No	i_APID_AvFlg
i_lbsmm_t	1080	i4b	4	Celsius X 100	No	i_APID_AvFlg
i_HOP1ActH1_c	1084	i4b	4	Amps X 100	No	i_APID_AvFlg
i_HOP1ActH2_c	1088	i4b	4	Amps X 100	No	i_APID_AvFlg

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
i_HOP2ActH1_c	1092	i4b	4	Amps X 100	No	i_APID_AvFlg
i_HOP2ActH2_c	1096	i4b	4	Amps X 100	No	i_APID_AvFlg
i_HOP3ActH1_c	1100	i4b	4	Amps X 100	No	i_APID_AvFlg
i_HOP3ActH2_c	1104	i4b	4	Amps X 100	No	i_APID_AvFlg
iTsPMirHtrStPt	1108	i2b	2	Celsius X 100	No	i_APID_AvFlg
iTsTwrHtrStPt	1110	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_EtHtr_StPt	1112	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_LHP1_StPt	1114	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_LHP2_StPt	1116	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_TsPMirHtr_St	1118	i1b	1	N/A	Yes	i_APID_AvFlg
i_TsTwrHtr_St	1119	i1b	1	N/A	Yes	i_APID_AvFlg
i_EtHtr_St	1120	i1b	1	N/A	Yes	i_APID_AvFlg
i_LHP1_St	1121	i1b	1	N/A	Yes	i_APID_AvFlg
i_LHP2_St	1122	i1b	1	N/A	Yes	i_APID_AvFlg
i_TsPMir_sTh	1123	i1b	1	N/A	Yes	i_APID_AvFlg
i_TsSecSS_sTh	1124	i1b	1	N/A	Yes	i_APID_AvFlg
i_TsSMir_sTh	1125	i1b	1	N/A	Yes	i_APID_AvFlg
i_LHP1_sTh	1126	i1b	1	N/A	Yes	i_APID_AvFlg
i_LHP2_sTh	1127	i1b	1	N/A	Yes	i_APID_AvFlg
i_Et_sTh	1128	i1b	1	N/A	Yes	i_APID_AvFlg
i_tlm_spare2	1129	i1b	1	N/A	No	No
i_LHtP12_St	1130	i1b	1	N/A	No	i_APID_AvFlg
i_spare23_1	1131	i1b	1	n/a	No	No
i_phdr_50	1132	i1b (6)	6	N/A	No	i_APID_AvFlg
i_shdr_50	1138	i1b (8)	8	N/A	No	i_APID_AvFlg
i_TsPMir_t	1146	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_TsSMir_t	1148	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_TsTwr_t	1150	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_EtC37d_t	1152	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_LHP1C37e_t	1154	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_LHP2C37f_t	1156	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_TsPMirHDr_c	1158	i2b	2	Amps X 100	No	i_APID_AvFlg
i_TsTwrHDr_c	1160	i2b	2	Amps X 100	No	i_APID_AvFlg
i_EtHtrC37j_c	1162	i2b	2	Amps X 100	No	i_APID_AvFlg
i_DlyLineAll_t	1164	i2b	2	Celsius X 100	No	i_APID_AvFlg

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
i_DlyLineMid_t	1166	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_DlyLineHi_t	1168	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_OTSL1_rb	1170	i1b	1	Counts	No	i_APID_AvFlg
i_OTSL2_rb	1171	i1b	1	Counts	No	i_APID_AvFlg
i_OTSL3_rb	1172	i1b	1	Counts	No	i_APID_AvFlg
i_OTSL4_rb	1173	i1b	1	Counts	No	i_APID_AvFlg
i_OTS_tc1	1174	i2b	2	Counts	No	i_APID_AvFlg
i_OTS_tc2	1176	i2b	2	Counts	No	i_APID_AvFlg
i_tlm_spare501	1178	i1b	1	n/a	No	No
i_spare50	1179	i1b (21)	21	N/A	No	No
i_phdr_24	1200	i1b (6, 4)	24	N/A	No	i_APID_AvFlg
i_shdr_24	1224	i1b (8, 4)	32	N/A	No	i_APID_AvFlg
iHS_CmdProc	1256	i1b (4)	4	counts	Yes	i_APID_AvFlg
iHS_CmdRej	1260	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCS_CmdProc	1264	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCS_CmdRej	1268	i1b (4)	4	counts	Yes	i_APID_AvFlg
iTC_CmdProc	1272	i1b (4)	4	counts	Yes	i_APID_AvFlg
iTC_CmdRej	1276	i1b (4)	4	counts	Yes	i_APID_AvFlg
iSB_CmdProc	1280	i1b (4)	4	counts	Yes	i_APID_AvFlg
iSB_CmdRej	1284	i1b (4)	4	counts	Yes	i_APID_AvFlg
iSM_CmdProc	1288	i1b (4)	4	counts	Yes	i_APID_AvFlg
iSM_CmdRej	1292	i1b (4)	4	counts	Yes	i_APID_AvFlg
iRT_CmdProc	1296	i1b (4)	4	counts	Yes	i_APID_AvFlg
iRT_CmdRej	1300	i1b (4)	4	counts	Yes	i_APID_AvFlg
iRT_RCH3CmdRcv	1304	i1b (4)	4	counts	Yes	i_APID_AvFlg
iRT_RCH3CmdRej	1308	i1b (4)	4	counts	Yes	i_APID_AvFlg
iMD_CmdProc	1312	i1b (4)	4	counts	Yes	i_APID_AvFlg
iMD_CmdRej	1316	i1b (4)	4	counts	Yes	i_APID_AvFlg
iAD_CmdProc	1320	i1b (4)	4	counts	Yes	i_APID_AvFlg
iAD_CmdRej	1324	i1b (4)	4	counts	Yes	i_APID_AvFlg
iAD_StatFlag	1328	i1b (4)	4	n/a	Yes	i_APID_AvFlg
i_tlm_spare24	1332	i1b (3, 4)	12	n/a	No	No
iCD_CCDProc	1344	i1b (4)	4	counts	No	i_APID_AvFlg
iCD_CCDRej	1348	i1b (4)	4	counts	No	i_APID_AvFlg
iCD_StatusFlag	1352	i1b (2, 4)	8	n/a	No	i_APID_AvFlg

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
iDC_CmdProc	1360	i1b (4)	4	counts	Yes	i_APID_AvFlg
iDC_CmdRej	1364	i1b (4)	4	counts	Yes	i_APID_AvFlg
iDC_StatFlag	1368	i1b (2, 4)	8	n/a	No	i_APID_AvFlg
iGP_CmdProc	1376	i1b (4)	4	counts	Yes	i_APID_AvFlg
iGP_CmdRej	1380	i1b (4)	4	counts	Yes	i_APID_AvFlg
iGP_StatFlag	1384	i1b (2, 4)	8	n/a	No	i_APID_AvFlg
iPC_CmdProc	1392	i1b (4)	4	counts	Yes	i_APID_AvFlg
iPC_CmdRej	1396	i1b (4)	4	counts	Yes	i_APID_AvFlg
iPC_StatFlag	1400	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iCT_CmdProc	1408	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCT_CmdRej	1412	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCT_Mode	1416	i2b (4)	8	n/a	Yes	i_APID_AvFlg
i_phdr_25	1424	i1b (6, 4)	24	n/a	No	i_APID_AvFlg
i_shdr_25	1448	i1b (8, 4)	32	n/a	No	i_APID_AvFlg
i_HS_PrevMode	1480	i1b (4)	4	n/a	No	i_APID_AvFlg
i_HS_CurMode	1484	i1b (4)	4	n/a	No	i_APID_AvFlg
i_SubSysPres	1488	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iHS_WarmRCt	1496	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_ColdRCt	1504	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_MxWarmRCt	1512	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_ColdWarmF	1520	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iHS_OSResetF	1528	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iHS_OSTickCt	1536	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_HSExecCt	1544	i4b (4)	16	counts	No	i_APID_AvFlg
iHS_CSExecCt	1560	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_TCExecCt	1568	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_SBExecCt	1576	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_SMExecCt	1584	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_RTExecCt	1592	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_MDExecCt	1600	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_ADExecCt	1608	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_CDExecCt	1616	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_DCExecCt	1624	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_GPExecCt	1632	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_PCExecCt	1640	i2b (4)	8	counts	Yes	i_APID_AvFlg

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
iHS_CTExecCt	1648	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHSFPU_Uflw_Ct	1656	i4b (4)	16	counts	No	i_APID_AvFlg
iHS_spare1	1672	i4b (4)	16	n/a	No	No
iHS_spare2	1688	i2b (4)	8	n/a	No	No
iHSTCfireISRCt	1696	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_RTISRCtLo	1704	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_spare3	1712	i2b (4)	8	n/a	Yes	No
iHS_CTISRCt	1720	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_spare4	1728	i2b (4)	8	n/a	Yes	No
iHS_spare5	1736	i2b (4)	8	n/a	Yes	No
iHS_ppsISRCt	1744	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_DC_ISRCt	1752	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_PC_ISRCt	1760	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_CD_ISRCt	1768	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_AD_ISRCt	1776	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_spare6	1784	i2b (4)	8	n/a	Yes	No
iHS_OSEventSeq	1792	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iHS_PeakCPU	1800	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iHS_LastCPU	1804	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iHSPCI_Bus_st	1808	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iHSOS_Plog_st	1812	i1b (4)	4	n/a	No	i_APID_AvFlg
iHSOS_Plog_ct	1816	i2b (4)	8	counts	Yes	i_APID_AvFlg
iHS_Plog_stAdd	1824	i4b (4)	16	n/a	No	i_APID_AvFlg
iHS_Plog_mask	1840	i4b (4)	16	n/a	No	i_APID_AvFlg
i_spare25_2	1856	i1b (6, 4)	24	n/a	No	No
iCS_StatFlag	1880	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iCS_codeErr_ct	1884	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCSEPROMerr_ct	1888	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCSTblRamerr_ct	1892	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCS_codeErr_ID	1896	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iCSEPROMerr_ID	1904	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iCSTblRamErrID	1912	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iCS_code_mstrcs	1920	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iCSRam_mstrcs	1928	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iCSEPROMmstrcs	1936	i2b (4)	8	n/a	Yes	i_APID_AvFlg

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
iEPROM_bmem_cs	1944	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iEPROM_mem_cs	1952	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iPROM_mem_cs	1960	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iCS_spare	1968	i1b (18, 4)	72	n/a	No	No
iTC_MET_u2	2040	i1b (2, 4)	8	n/a	No	i_APID_AvFlg
iTC_MET_l4	2048	i1b (4, 4)	16	n/a	No	i_APID_AvFlg
iTC_FcmdInc_u2	2064	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iTC_FcmdInc_l4	2072	i4b (4)	16	n/a	No	i_APID_AvFlg
iTCworkMET_sec	2088	i4b (4)	16	seconds	No	i_APID_AvFlg
iTCworkMET_us	2104	i4b (4)	16	microseconds	No	i_APID_AvFlg
i_spare25_3	2120	i1b (18, 4)	72	n/a	No	No
i_SB_SndErrCnt	2192	i1b (4)	4	counts	Yes	i_APID_AvFlg
i_SB_RcvErrCnt	2196	i1b (4)	4	counts	Yes	i_APID_AvFlg
i_SB_OSErrCnt	2200	i1b (4)	4	counts	Yes	i_APID_AvFlg
iSB_QFullErrCt	2204	i1b (4)	4	counts	Yes	i_APID_AvFlg
iSB_BOverErrCt	2208	i2b (4)	8	counts	Yes	i_APID_AvFlg
i_SB_LBO_Strm	2216	i2b (4)	8	n/a	Yes	i_APID_AvFlg
i_SB_LBO_Pipe	2224	i2b (4)	8	n/a	Yes	i_APID_AvFlg
i_SB_LBO_Task	2232	i2b (4)	8	n/a	Yes	i_APID_AvFlg
i_SB_LQF_Strm	2240	i2b (4)	8	n/a	Yes	i_APID_AvFlg
i_SB_LQF_Pipe	2248	i2b (4)	8	n/a	Yes	i_APID_AvFlg
i_SB_LQF_Task	2256	i2b (4)	8	n/a	Yes	i_APID_AvFlg
i_SB_Spare	2264	i1b (8, 4)	32	n/a	No	No
iSMRemDumpCopy	2296	i1b (4)	4	counts	Yes	i_APID_AvFlg
iSM_Dump_flag	2300	i1b (4)	4	n/a	No	i_APID_AvFlg
iSM_TblOps_fg	2304	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iSM_TOp_ImgTyp	2308	i1b (4)	4	n/a	No	i_APID_AvFlg
iSM_TblID_sel	2312	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iSM_TblSize	2320	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iSM_TblCksum	2328	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iSM_success_ct	2336	i1b (4)	4	counts	Yes	i_APID_AvFlg
iSM_fail_ct	2340	i1b (4)	4	counts	Yes	i_APID_AvFlg
iSM_TblWdLd_ct	2344	i2b (4)	8	counts	Yes	i_APID_AvFlg
iSM_FSW_BldNum	2352	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iSM_FSW_VerNum	2356	i1b (4)	4	n/a	Yes	i_APID_AvFlg

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
iSM_Spares	2360	i1b (10, 4)	40	n/a	No	No
iBCRT_CntrlRWd	2400	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iBCRT_StatReg	2408	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iBCRT_IntStReg	2416	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iRT_MsgErr	2424	i2b (4)	8	counts	Yes	i_APID_AvFlg
iRT_RtryCt	2432	i2b (4)	8	counts	Yes	i_APID_AvFlg
iRT_InvCmd	2440	i1b (4)	4	counts	Yes	i_APID_AvFlg
iRT_InvBCCmd	2444	i1b (4)	4	counts	Yes	i_APID_AvFlg
iRT_ModeCodeCt	2448	i1b (4)	4	counts	Yes	i_APID_AvFlg
i_spare25_4	2452	i1b (4)	4	n/a	No	No
iRT_RcvRCH1_ct	2456	i2b (4)	8	counts	Yes	i_APID_AvFlg
iRT_RejRCH1_ct	2464	i2b (4)	8	counts	Yes	i_APID_AvFlg
iRT_SentXCH1ct	2472	i2b (4)	8	counts	Yes	i_APID_AvFlg
iRT_SentXCH2ct	2480	i2b (4)	8	counts	Yes	i_APID_AvFlg
iRT_CmdHist_ct	2488	i2b (4)	8	counts	Yes	i_APID_AvFlg
iRT_cksum_st	2496	i2b (4)	8	n/a	Yes	i_APID_AvFlg
i_spare25_5	2504	i1b (8, 4)	32	n/a	No	No
iMD_Tbl_flg	2536	i1b (4)	4	n/a	Yes	No
iMD_spare	2540	i1b (4)	4	n/a	No	No
iMD_T1addct	2544	i2b (4)	8	Counts	Yes	No
iMD_T2addct	2552	i2b (4)	8	n/a	Yes	No
iMD_T1rate	2560	i2b (4)	8	Counts	Yes	No
iMD_T2rate	2568	i2b (4)	8	n/a	Yes	No
iMD_spare2	2576	i1b (12, 4)	48	n/a	No	No
i_phdr_55	2624	i1b (6, 4)	24	n/a	No	i_APID_AvFlg
i_shdr_55	2648	i1b (8, 4)	32	n/a	No	i_APID_AvFlg
iAD_SWErr_ct	2680	i2b (4)	8	counts	Yes	i_APID_AvFlg
iAD_HWErr_ct	2688	i2b (4)	8	counts	Yes	i_APID_AvFlg
iAD_Shot_ct	2696	i1b (4)	4	counts	Yes	i_APID_AvFlg
iAD_ShotCtSkip	2700	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iAD_Sync_flag	2704	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iAD_spare1	2708	i1b (5, 4)	20	n/a	No	No
iAD_DSPfire_ct	2728	i2b (4)	8	counts	Yes	i_APID_AvFlg
iADDSPalive_ct	2736	i2b (4)	8	counts	Yes	i_APID_AvFlg
iAD_AncPkt_ct	2744	i2b (4)	8	counts	Yes	i_APID_AvFlg

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
iAD_EngPkt_ct	2752	i2b (4)	8	counts	Yes	i_APID_AvFlg
iAD_SmSci_ct	2760	i2b (4)	8	counts	Yes	i_APID_AvFlg
iAD_LgSci_ct	2768	i2b (4)	8	counts	Yes	i_APID_AvFlg
iDSPLoadProcCt	2776	i2b (4)	8	counts	Yes	i_APID_AvFlg
iDSPMDump_ct	2784	i2b (4)	8	counts	Yes	i_APID_AvFlg
iADMLoadCmdErr	2792	i2b (4)	8	counts	Yes	i_APID_AvFlg
iADMDumpCmdErr	2800	i2b (4)	8	counts	Yes	i_APID_AvFlg
iDSPcksumRate	2808	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iDSPcksumSW_st	2816	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iDSP_cksum_ct	2824	i2b (4)	8	counts	Yes	i_APID_AvFlg
iDSP_BScksum_l	2832	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iDSPEPROMcs_l	2840	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iDSPRAMcksum_l	2848	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iDSP_BScksum_u	2856	i4b (4)	16	n/a	No	i_APID_AvFlg
iDSPEPROMcs_u	2872	i4b (4)	16	n/a	No	i_APID_AvFlg
iDSPRAMcksum_u	2888	i4b (4)	16	n/a	No	i_APID_AvFlg
iAD_DSPsw_bnum	2904	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iAD_DSPsw_vnum	2908	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iAD_GPSrwin_ct	2912	i2b (4)	8	counts	Yes	i_APID_AvFlg
iDSP_Pcksuml	2920	i2b (4)	8	n/a	Yes	No
iDSP_Pcksumu	2928	i4b (4)	16	n/a	No	No
iDSP_autoreset	2944	i1b (4)	4	n/a	Yes	No
iAD_SWenable	2948	i1b (4)	4	n/a	Yes	No
iAD_DSPtroub	2952	i1b (2, 4)	8	n/a	No	No
iADmemTLoaderr	2960	i1b (4)	4	n/a	No	No
iAD_FixGain	2964	i1b (4)	4	n/a	Yes	No
iAD_spare2	2968	i1b (4)	4	n/a	No	No
iCD_Swerr_ct	2972	i2b (4)	8	counts	Yes	i_APID_AvFlg
iCD_shot_ct	2980	i2b (4)	8	counts	Yes	i_APID_AvFlg
iCD_SciPkt_ct	2988	i2b (4)	8	counts	Yes	i_APID_AvFlg
iCD_EngPkt_ct	2996	i2b (4)	8	counts	Yes	i_APID_AvFlg
iCD_AncPkt_ct	3004	i2b (4)	8	counts	Yes	i_APID_AvFlg
iCDRGateRcv_ct	3012	i2b (4)	8	counts	Yes	i_APID_AvFlg
iCD40ctrPkt_ct	3020	i2b (4)	8	counts	Yes	i_APID_AvFlg
i_spare55_1	3028	i2b (4)	8	n/a	No	No

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
iCD_BG1delay	3036	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iCD_BG2delay	3044	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iCD_Rgatedelay	3052	i2b (4)	8	n/a	Yes	i_APID_AvFlg
i_spare55_2	3060	i1b (2, 4)	8	n/a	No	No
iCD_rawADout	3068	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iCD_GPSLch_32l	3076	i4b (4)	16	n/a	No	i_APID_AvFlg
iCDfackLch_32l	3092	i4b (4)	16	n/a	No	i_APID_AvFlg
iCDfcmdLch_32l	3108	i4b (4)	16	n/a	No	i_APID_AvFlg
i_spare55_3	3124	i1b (4)	4	n/a	No	No
iCDfcmdLch_8m	3128	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iCDfackLch_8m	3132	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iCD_GPSLch_8m	3136	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iCD_dataRdyCtr	3140	i4b (4)	16	n/a	No	i_APID_AvFlg
iCD_intsrc	3156	i4b (4)	16	n/a	No	No
iCD_PWaccum	3172	i4b (4)	16	counts	Yes	No
iCD_PWLong	3188	i1b (4)	4	counts	Yes	No
iCD_PWshort	3192	i1b (4)	4	counts	Yes	No
iCD_PWmsb	3196	i1b (4)	4	counts	Yes	No
i_spare55_4	3200	i1b (4)	4	n/a	No	No
iDC_swFailct	3204	i2b (4)	8	Counts	Yes	No
iDC_shot_ct	3212	i2b (4)	8	counts	Yes	i_APID_AvFlg
iDC_Xpos	3220	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iDC_Ypos	3224	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iDC_LPApkt_ct	3228	i2b (4)	8	counts	Yes	i_APID_AvFlg
iDC_tmode_rate	3236	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iDC_pkt_ct	3244	i2b (4)	8	counts	Yes	i_APID_AvFlg
iDC_byte_ct	3252	i4b (4)	16	counts	No	i_APID_AvFlg
iDC_outbitrate	3268	i4b (4)	16	n/a	No	i_APID_AvFlg
iDC_IntReg	3284	i4b (4)	16	n/a	No	i_APID_AvFlg
iDC_CtlLchReg	3300	i4b (4)	16	n/a	No	i_APID_AvFlg
iDC_intMaskReg	3316	i4b (4)	16	n/a	No	i_APID_AvFlg
iDC_FIFO_reg	3332	i4b (4)	16	n/a	No	i_APID_AvFlg
IDC_LPAgainReg	3348	i4b (4)	16	n/a	No	i_APID_AvFlg
iDC_LPACt_reg	3364	i4b (4)	16	n/a	No	i_APID_AvFlg
iDC_spares	3380	i1b (8, 4)	32	n/a	No	No

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
iGPS10secIntCt	3412	i2b (4)	8	counts	Yes	i_APID_AvFlg
iGPPosPktRcvCt	3420	i2b (4)	8	counts	Yes	i_APID_AvFlg
iGP_HskPkt_ct	3428	i2b (4)	8	counts	Yes	i_APID_AvFlg
iGP_AncPkt_ct	3436	i2b (4)	8	counts	Yes	i_APID_AvFlg
iGPS40bitReqCt	3444	i2b (4)	8	counts	Yes	i_APID_AvFlg
iGPS40bitRcvCt	3452	i2b (4)	8	counts	Yes	i_APID_AvFlg
iGP_BadXYZ_cnt	3460	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iGP_TolXYZ_cnt	3468	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iGP_PktsSent	3476	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iGP_spares	3484	i1b (22, 4)	88	n/a	No	No
iPC_swerrct	3572	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iPC_shot_ct	3580	i2b (4)	8	counts	Yes	i_APID_AvFlg
iPC_SciPkt_ct	3588	i2b (4)	8	counts	Yes	i_APID_AvFlg
iPC_EngPkt_ct	3596	i2b (4)	8	counts	Yes	i_APID_AvFlg
iPC_AncPkt_ct	3604	i2b (4)	8	counts	Yes	i_APID_AvFlg
iPC_RDlyRcv_ct	3612	i2b (4)	8	counts	Yes	i_APID_AvFlg
iPC_SPCMDly	3620	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iPC_BG1Dly	3628	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iPC_BG2Dly	3636	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iPC_RGateDly	3644	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iPC_HW_stat	3652	i4b (4)	16	n/a	No	i_APID_AvFlg
IPC_SPCM_st	3668	i4b (4)	16	n/a	No	i_APID_AvFlg
iPC_DatRdyCtr	3684	i4b (4)	16	n/a	No	i_APID_AvFlg
iPCSPCMraw_1_4	3700	i4b (4)	16	counts	No	i_APID_AvFlg
iPCSPCMraw_5_8	3716	i4b (4)	16	counts	No	i_APID_AvFlg
iPCSPCM_DCycle	3732	i4b (4)	16	n/a	No	i_APID_AvFlg
iPC_spare1	3748	i1b (2, 4)	8	n/a	No	No
iC_BSCalXstart	3756	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iC_BSCalYstart	3764	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iF_BSCalXstart	3772	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iF_BSCalYstart	3780	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iC_BSCalXinc	3788	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iC_BSCalYinc	3796	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iF_BSCalXinc	3804	i2b (4)	8	n/a	Yes	i_APID_AvFlg
iF_BSCalYinc	3812	i2b (4)	8	n/a	Yes	i_APID_AvFlg

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
iC_BSCalIntSec	3820	i2b (4)	8	seconds	Yes	i_APID_AvFlg
iF_BSCalIntSec	3828	i2b (4)	8	seconds	Yes	i_APID_AvFlg
i_BSCalXbest	3836	i2b (4)	8	n/a	Yes	i_APID_AvFlg
i_BSCalYbest	3844	i2b (4)	8	n/a	Yes	i_APID_AvFlg
i_BSCal_remSec	3852	i2b (4)	8	seconds	Yes	i_APID_AvFlg
i_spare55_5	3860	i1b (10, 4)	40	n/a	No	No
iCT_state	3900	i1b (4)	4	n/a	No	i_APID_AvFlg
iCTCmdEchoErrCt	3904	i1b (4)	4	counts	Yes	i_APID_AvFlg
i_LMBCmdRcvCt	3908	i1b (4)	4	counts	Yes	i_APID_AvFlg
i_TMBCmdRcvCt	3912	i1b (4)	4	counts	Yes	i_APID_AvFlg
i_MCBCmdRcvCt	3916	i1b (4)	4	counts	Yes	i_APID_AvFlg
i_HKBCmdRcvCt	3920	i1b (4)	4	counts	Yes	i_APID_AvFlg
i_HVPSCmdRcvCt	3924	i1b (4)	4	counts	Yes	i_APID_AvFlg
i_PDUCmdRcvCt	3928	i1b (4)	4	counts	Yes	i_APID_AvFlg
i_HWtlm1Pkt_ct	3932	i1b (4)	4	counts	Yes	i_APID_AvFlg
i_HWtlm2Pkt_ct	3936	i1b (4)	4	counts	Yes	i_APID_AvFlg
i_HWtlm3Pkt_ct	3940	i1b (4)	4	counts	Yes	i_APID_AvFlg
i_HWtlm4Pkt_ct	3944	i1b (4)	4	counts	Yes	i_APID_AvFlg
i_HWtlm5Pkt_ct	3948	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCtdwellPkt_ct	3952	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCT_AncPkt_ct	3956	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCT_timeout_ct	3960	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCT_int_ct	3964	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCT_ShotCtErr	3968	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCT_dwell_mode	3972	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iCT_dwell_chnl	3976	i1b (4)	4	n/a	Yes	i_APID_AvFlg
iCTLMBmuxErrCt	3980	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCTHKBmuxErrCt	3984	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCTHKBsmxErrCt	3988	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCTTCBmuxErrCt	3992	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCTMCBmuxErrCt	3996	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCTHVPSmuxErrCt	4000	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCTPDUmuxErrCt	4004	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCT_CEchoSucCt	4008	i1b (4)	4	counts	Yes	i_APID_AvFlg
iCT_SupErrflag	4012	i2b (4)	8	n/a	Yes	No

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
iCT_LHP1tcstat	4020	i1b (4)	4	n/a	Yes	No
iCT_LHP2tcstat	4024	i1b (4)	4	n/a	Yes	No
iCT_LHP1tsp	4028	i1b (4)	4	n/a	Yes	No
iCT_LHP2tsp	4032	i1b (4)	4	n/a	Yes	No
iCT_LHP1tcctr	4036	i1b (4)	4	n/a	Yes	No
iCT_LHP2tcctr	4040	i1b (4)	4	n/a	Yes	No
iCT_LHP1_Tmin	4044	i1b (4)	4	n/a	Yes	No
iCT_LHP2_Tmin	4048	i1b (4)	4	n/a	Yes	No
iCT_LHP1_Tdelta	4052	i1b (4)	4	n/a	Yes	No
iCT_LHP2_Tdelta	4056	i1b (4)	4	n/a	Yes	No
iCT_LHP1_Tcyct	4060	i1b (4)	4	n/a	Yes	No
iCT_LHP2_Tcyct	4064	i1b (4)	4	n/a	Yes	No
iCT_miscFlag	4068	i1b (4)	4	n/a	Yes	No
ICT_spares	4072	i1b (11, 4)	44	n/a	No	No
i_phdr_ad	4116	i1b (6, 64)	384	n/a	No	i_APID_AvFlg
i_shdr_ad	4500	i1b (8, 64)	512	n/a	No	i_APID_AvFlg
i_phdr_15	5012	i1b (6, 16)	96	n/a	No	i_APID_AvFlg
i_shdr_15	5108	i1b (8, 16)	128	n/a	No	i_APID_AvFlg
i_phdr_17	5236	i1b (6, 16)	96	n/a	No	i_APID_AvFlg
i_shdr_17	5332	i1b (8, 16)	128	n/a	No	i_APID_AvFlg
i_phdr_19	5460	i1b (6, 16)	96	n/a	No	i_APID_AvFlg
i_shdr_19	5556	i1b (8, 16)	128	n/a	No	i_APID_AvFlg
i_sctr_19	5684	i2b (16)	32	counts	Yes	i_APID_AvFlg
i_chin_flag	5716	i1b (16)	16	n/a	No	i_APID_AvFlg
i_RMS_loc	5732	i4b (16)	64	ns	No	i_APID_AvFlg
i_sctrPDlyWF	5796	i4b (16)	64	counts	No	i_APID_AvFlg
i_dlaywf_start	5860	i4b (16)	64	ns	No	i_APID_AvFlg
i_PDlyWf	5924	i1b (32, 16)	512	counts	Yes	i_APID_AvFlg
i_otswf_start	6436	i4b (16)	64	ns	No	i_APID_AvFlg
i_sctrOTSWf	6500	i4b (4, 16)	256	counts	No	i_APID_AvFlg
i_OTSPWf	6756	i1b (128, 16)	2048	counts	Yes	i_APID_AvFlg
i_cTx_win_loc	8804	i4b (16)	64	ns	No	i_APID_AvFlg
i_cNumNoTxing	8868	i4b (16)	64	counts	No	i_APID_AvFlg
i_spare19_1	8932	i1b (16)	16	n/a	No	No
i_cTxThresh	8948	i2b (16)	32	counts	No	i_APID_AvFlg

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
i_cRwinSf	8980	i4b (24, 16)	1536	n/a	No	i_APID_AvFlg
i_cBgCoeff	10516	i4b (18, 16)	1152	n/a	No	i_APID_AvFlg
i_spare19_2	11668	i1b (16)	16	n/a	No	No
i_cEnAGC	11684	i1b (16)	16	n/a	No	i_APID_AvFlg
i_cEnAGC_4	11700	i1b (16)	16	n/a	No	i_APID_AvFlg
i_cRetGn	11716	i1b (16)	16	n/a	Yes	i_APID_AvFlg
i_cAGC_A	11732	i4b (4, 16)	256	n/a	No	i_APID_AvFlg
i_cAGC_B	11988	i4b (4, 16)	256	n/a	No	i_APID_AvFlg
i_cAGC_C	12244	i4b (2, 16)	128	n/a	No	i_APID_AvFlg
i_cAGC_Gmax	12372	i1b (16)	16	n/a	Yes	i_APID_AvFlg
i_cAGC_Gmin	12388	i1b (16)	16	n/a	Yes	i_APID_AvFlg
i_cAGC_Ginit	12404	i1b (16)	16	n/a	Yes	i_APID_AvFlg
i_cAGC_Zmax	12420	i4b (16)	64	n/a	No	i_APID_AvFlg
i_cAGC_Zmin	12484	i4b (16)	64	n/a	No	i_APID_AvFlg
i_cAGC_Vref	12548	i4b (16)	64	n/a	No	i_APID_AvFlg
i_cAGC_Vmin	12612	i1b (16)	16	n/a	Yes	i_APID_AvFlg
i_cFiltCTol	12628	i4b (16)	64	n/a	No	i_APID_AvFlg
i_cRwinDOff	12692	i4b (6, 16)	384	counts	No	i_APID_AvFlg
i_cRetFThr	13076	i1b (6, 16)	96	n/a	Yes	i_APID_AvFlg
i_spare_tlm21	13172	i1b (2, 16)	32	n/a	No	No
i_cFIRCoeff	13204	i1b (8, 16)	128	n/a	Yes	i_APID_AvFlg
i_FWminStDev	13332	i4b (16)	64	n/a	No	i_APID_AvFlg
i_FNzMinThr	13396	i4b (6, 16)	384	n/a	No	i_APID_AvFlg
i_FRejMskLead	13780	i4b (16)	64	n/a	No	No
i_FRejMskTrail	13844	i4b (16)	64	n/a	No	No
i_spare19_3	13908	i1b (22, 16)	352	n/a	No	No
i_shotctr_40	14260	i2b (40, 16)	1280	n/a	Yes	No
i_fack_time	15540	i1b (200, 16)	3200	n/a	Yes	No
i_fcmd_time	18740	i1b (200, 16)	3200	n/a	Yes	No
i_calcSClat	21940	i2b (16)	32	Degrees	No	i_APID_AvFlg
i_calcSClon	21972	i2b (16)	32	Degrees	No	i_APID_AvFlg
i_Hsat	22004	i4b (16)	64	meters	No	i_APID_AvFlg
i_Rsat	22068	i4b (16)	64	meters	No	i_APID_AvFlg
i_Rmin	22132	i4b (16)	64	meters	No	i_APID_AvFlg
i_Rmax	22196	i4b (16)	64	meters	No	i_APID_AvFlg

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
i_Wmin	22260	i4b (16)	64	meters	No	i_APID_AvFlg
i_Wmax	22324	i4b (16)	64	meters	No	i_APID_AvFlg
i_Hoffmin	22388	i4b (16)	64	meters	No	i_APID_AvFlg
i_Hoffmax	22452	i4b (16)	64	meters	No	i_APID_AvFlg
i_Rbmin	22516	i4b (16)	64	meters	No	i_APID_AvFlg
i_Rbmax	22580	i4b (16)	64	meters	No	i_APID_AvFlg
i_ObSurfType	22644	i1b (16)	16	n/a	No	i_APID_AvFlg
i_PosDatFlg	22660	i1b (16)	16	n/a	Yes	i_APID_AvFlg
i_SCPosPkt	22676	i1b (40, 16)	640	n/a	Yes	i_APID_AvFlg
i_SCPosPktShot	23316	i2b (16)	32	n/a	No	i_APID_AvFlg
i_SCPosPktGMET	23348	i1b (6, 16)	96	n/a	Yes	i_APID_AvFlg
i_DEMmin	23444	i1b (16)	16	meters	Yes	i_APID_AvFlg
i_DEMmax	23460	i1b (16)	16	meters	Yes	i_APID_AvFlg
i_RngDatSrc	23476	i1b (16)	16	n/a	Yes	i_APID_AvFlg
i_FTLatch	23492	i1b (5, 16)	80	counts	No	i_APID_AvFlg
i_GPSppsGMET	23572	i1b (6, 16)	96	counts	No	i_APID_AvFlg
i_spare19_4	23668	i1b (8, 16)	128	n/a	No	No
i_et_cal_mode	23796	i1b (16)	16	n/a	No	i_APID_AvFlg
i_ET_state	23812	i1b (16)	16	n/a	No	i_APID_AvFlg
i_ETsettleTime	23828	i1b (16)	16	seconds	Yes	i_APID_AvFlg
i_ET_Flags	23844	i1b (16)	16	n/a	Yes	No
i_et_onax_xmit	23860	i4b (16)	64	n/a	No	i_APID_AvFlg
i_et_offax_xmit	23924	i4b (16)	64	n/a	No	i_APID_AvFlg
i_et_temperr	23988	i4b (16)	64	n/a	No	i_APID_AvFlg
i_et_trkfltout	24052	i4b (16)	64	n/a	No	i_APID_AvFlg
i_et_trkfltavg	24116	i4b (16)	64	n/a	No	i_APID_AvFlg
i_et_StartTemp	24180	i1b (16)	16	celsius	No	i_APID_AvFlg
i_et_StopTemp	24196	i1b (16)	16	celsius	No	i_APID_AvFlg
i_et_TempStep	24212	i1b (16)	16	celsius	No	i_APID_AvFlg
i_et_acqavg_tm	24228	i1b (16)	16	seconds	No	No
i_et_acqset_tm	24244	i2b (16)	32	seconds	No	i_APID_AvFlg
i_et_update_ctr	24276	i1b (16)	16	n/a	No	i_APID_AvFlg
i_et_spare	24292	i1b (16)	16	n/a	No	No
i_DualPinA	24308	i1b (40, 16)	640	counts	Yes	i_APID_AvFlg
i_DualPinB	24948	i1b (40, 16)	640	counts	Yes	i_APID_AvFlg

Table C-3 GLA03 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Valule/Flag
i_532nrg	25588	i1b (40, 16)	640	n/a	Yes	i_APID_AvFlg
i_APID_AvFlg	26228	i1b (8, 16)	128	n/a	No	No
i_timecorflg	26356	i2b	2	N/A	No	No
i_spare4	26358	i1b (78)	78	n/a	No	No
Total Bytes	26436					

C.1.5 GLA04-01

Records occur at once per second and are fixed format.

Table C-4 GLA04-01 Record Format

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
Record Type:GLA04_LPA_MAIN; % of Granule: 100; Record Duration (seconds):1; Repeats: null						
Latest : Last Modified : Thu Sep 09 14:00:56 GMT-0400 (EDT) 2004						
i_rec_ndx	0	i4b	4	N/A	No	no
i_UTCTime	4	i4b (2)	8	seconds, microseconds	No	no
i_dShotTime	12	i4b (39)	156	microseconds	No	No
i_shot_cntr	168	i2b (40)	80	counts	Yes	i_APID_AvFlg
i_GPSLatch	248	i4b (2)	8	seconds, microseconds	Yes	i_APID_AvFlg
i_boxX	256	i1b (40)	40	counts	No	i_APID_AvFlg
i_boxY	296	i1b (40)	40	counts	No	i_APID_AvFlg
i_PixInt	336	i1b (400, 40)	16000	counts	Yes	i_APID_AvFlg
i_tx_wf	16336	i1b (48, 40)	1920	counts	Yes	i_APID_AvFlg
i_time_txWfPk	18256	i4b (40)	160	ns	No	i_APID_AvFlg
i_TxWfStart	18416	i4b (40)	160	ns	No	i_APID_AvFlg
i_txWfPk_Flag	18576	i1b (40)	40	n/a	No	i_APID_AvFlg
i_lpa_spare0	18616	i1b (120)	120	n/a	No	no
i_APID_AvFlg	18736	i1b (8)	8	n/a	No	No
i_timecorflg	18744	i2b	2	N/A	No	No
i_lpa_spare1	18746	i1b (6)	6	n/a	No	no
Total Bytes	18752					

C.1.6 GLA04-02

Records are fixed length and format and occur once per second.

Table C-5 GLA04-02

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
Record Type:GLA04_LRS_MAIN; % of Granule: 100; Record Duration (seconds):1; Repeats: null						
Latest : Last Modified : Thu Sep 09 14:30:56 GMT-0400 (EDT) 2004						
i_rec_ndx	0	i4b	4	N/A	No	no
i_UTCTime	4	i4b (2)	8	seconds, microseconds	No	no
i_samp_time	12	i4b (2, 10)	80	seconds,microseconds	No	No
i_shot_time	92	i4b (2, 10)	80	seconds microseconds	No	no
i_shot_ctr	172	i4b (10)	40	counts	Yes	no
i_lrs_vtcw	212	i4b (2, 10)	80	seconds, microseconds	No	i_APID_AvFlg
i_lrs_timetag	292	i4b (10)	40	Microseconds	No	i_APID_AvFlg
i_lrs_msginc	332	i1b (10)	10	N/A	No	i_APID_AvFlg
i_lrs_flag	342	i1b (10)	10	N/A	No	no
i_lrs_TkrMode	352	i1b (10)	10	N/A	No	i_APID_AvFlg
i_lrs_tspare2	362	i1b (10)	10	N/A	Yes	no
i_lrs_DiagStat	372	i1b (10)	10	N/A	No	i_APID_AvFlg
i_lrs_LastPCmd	382	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_lrs_RollCt	392	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_lrs_tspare3	402	i1b (10)	10	N/A	Yes	no
i_lrs_VTkrSt	412	i1b (3, 10)	30	N/A	Yes	i_APID_AvFlg
i_lrs_stat	442	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_lrs_TimeMark	452	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_lrs_CamID	462	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_lrs_swVID	472	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_LPAC13_t1	482	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_Vtstarvalid	484	i1b (3, 10)	30	N/A	No	i_APID_AvFlg
i_lrs_tspare4	514	i1b (30)	30	N/A	No	no
i_VTEEnergy	544	i2b (3, 10)	60	N/A	No	i_APID_AvFlg
i_VTBgBias	604	i2b (3, 10)	60	N/A	No	i_APID_AvFlg
i_VTCentR	664	i4b (3, 10)	120	Arc-seconds*1.0d6	Yes	i_APID_AvFlg
i_VTCentC	784	i4b (3, 10)	120	Arc-seconds*1.0d6	Yes	i_APID_AvFlg
i_lrsTimCofInt	904	i4b (10)	40	Microseconds	No	i_APID_AvFlg
i_lrs_RawRow	944	i2b (3, 10)	60	pixels	Yes	i_APID_AvFlg
i_lrs_RawCol	1004	i2b (3, 10)	60	pixels	Yes	i_APID_AvFlg

Table C-5 GLA04-02 (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
i_lrs_TrkThr	1064	i1b (3, 10)	30	N/A	Yes	i_APID_AvFlg
i_lrs_AcqThr	1094	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_lrs_FOVEdge	1104	i1b (10)	10	N/A	Yes	i_APID_AvFlg
iF1LTRSRSC26_t	1114	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_lrs_IntTime	1116	i2b (10)	20	milliseconds	Yes	i_APID_AvFlg
i_lrs_FrmCtr	1136	i2b (10)	20	N/A	Yes	i_APID_AvFlg
i_lrs_tspare7	1156	i1b (4, 10)	40	N/A	Yes	no
i_lrs_ccdtemp	1196	i2b	2	Celsius*100	No	i_APID_AvFlg
i_lrslenscellt	1198	i2b	2	Celsius*100	No	i_APID_AvFlg
i_trkr_subject	1200	i1b	1	null	Yes	null
i_spare	1201	i1b (3)	3	null	Yes	null
i_T0_shot_no	1204	i4b	4	NA	Yes	No
i_T0_frame	1208	i2b (5)	10	n/a	Yes	gi_invalid_i4b
i_T0_SA	1218	i2b (256, 5)	2560	null	Yes	null
i_lrs_spare2	3778	i1b (2)	2	NA	NA	NA
i_T1_shot_no	3780	i4b	4	counts	Yes	No
i_T1_frame	3784	i2b (4)	8	counts	Yes	gi_invalid_i2b
i_T1_SA	3792	i2b (256, 4)	2048	null	Yes	null
i_T2_shot_no	5840	i4b	4	null	Yes	null
i_T2_frame	5844	i2b	2	counts	Yes	gi_invalid_i4b
i_T2_SA	5846	i2b (256)	512	null	Yes	null
i_APID_AvFlg	6358	i1b (8)	8	n/a	No	No
i_timecorflg	6366	i2b	2	N/A	No	No
iF2LTRSRSC27_t	6368	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_TsPMir_t	6370	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_TsSMir_t	6372	i2b	2	Celsius X 100	No	i_APID_AvFlg
i_srs_ff_optio_t	6374	i2b	2	Celsius X 100	No	i_APID_AvFlg
Total Bytes	6376					

C.1.7 GLA04-03

Records are fixed length and format and occur once per second.

Table C-6 GLA04-03 Record Format

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
Record Type:GLA04_GYR_MAIN; % of Granule: 100; Record Duration (seconds):1; Repeats: null						
Latest : Last Modified : Thu Apr 03 12:26:31 GMT-0500 (EST) 2003						
i_rec_ndx	0	i4b	4	N/A	No	no
i_UTCTime	4	i4b (2)	8	seconds, microseconds	No	no
i_samp_time	12	i4b (2, 10)	80	seconds,microseconds	No	gd_invalid_i4b
i_siru_vtcw	92	i4b (2, 10)	80	seconds, microseconds	No	i_APID_AvFlg
i_siru_valdata	172	i2b (10)	20	n/a	Yes	i_APID_AvFlg
i_siru_AIA	192	i2b (10)	20	Arc-Seconds*20	Yes	i_APID_AvFlg
i_siru_BIA	212	i2b (10)	20	Arc-Seconds*20	Yes	i_APID_AvFlg
i_siru_CIA	232	i2b (10)	20	Arc-Seconds*20	Yes	i_APID_AvFlg
i_siru_DIA	252	i2b (10)	20	Arc-Seconds*20	Yes	i_APID_AvFlg
i_siru_ttag	272	i4b (10)	40	Microseconds	No	i_APID_AvFlg
i_siru_config	312	i2b (10)	20	n/a	Yes	i_APID_AvFlg
i_APID_AvFlg	332	i1b (8)	8	n/a	No	No
i_timecorflg	340	i2b	2	N/A	No	No
i_gyro_spare1	342	i1b (6)	6	n/a	Yes	no
Total Bytes	348					

C.1.8 GLA04-04

Records are fixed length and format and occur once per second.

Table C-7 GLA04-04 Record Format

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
Record Type:GLA04_IST_MAIN; % of Granule: 100; Record Duration (seconds):1; Repeats: null						
Latest : Last Modified : Wed Apr 02 15:24:15 GMT-0500 (EST) 2003						
i_rec_ndx	0	i4b	4	N/A	No	no
i_UTCTime	4	i4b (2)	8	seconds, microseconds	No	no
i_samp_time	12	i4b (2, 10)	80	seconds,microseconds	No	gd_invalid_i4b
i_shot_time	92	i4b (2, 10)	80	seconds microseconds	Yes	no
i_shot_ctr	172	i4b (10)	40	counts	Yes	no

Table C-7 GLA04-04 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
i_ist_vtcw	212	i4b (2, 10)	80	seconds microseconds	No	i_APID_AvFlg
i_ist_timetag	292	i4b (10)	40	Microseconds	No	i_APID_AvFlg
i_ist_msginc	332	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_ist_RollCt	342	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_ist_TkrMode	352	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_ist_tspare1	362	i1b (10)	10	N/A	Yes	no
i_ist_DiagStat	372	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_ist_LastPCmd	382	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_ist_VTkrSt	392	i1b (6, 10)	60	N/A	Yes	i_APID_AvFlg
i_ist_stat	452	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_ist_TimeMark	462	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_ist_CamID	472	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_ist_swVID	482	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_ist_flag	492	i1b (10)	10	N/A	No	no
I_ist_spare1	502	i1b (2)	2	N/A	Yes	no
i_Vtstarvalid	504	i1b (6, 10)	60	N/A	Yes	i_APID_AvFlg
i_VTEEnergy	564	i2b (6, 10)	120	N/A	No	i_APID_AvFlg
i_VTBgBias	684	i2b (6, 10)	120	N/A	No	i_APID_AvFlg
i_VTStarMag	804	i2b (6, 10)	120	star magnitude*10	No	i_APID_AvFlg
i_VTBoreH	924	i4b (6, 10)	240	Arc-seconds*100	No	i_APID_AvFlg
i_VTBoreV	1164	i4b (6, 10)	240	Arc-seconds*100	No	i_APID_AvFlg
i_ist_FocLngth	1404	i4b (10)	40	Microns * 100	No	i_APID_AvFlg
i_istTimCofInt	1444	i4b (10)	40	Microseconds	No	i_APID_AvFlg
i_ist_BoreCol	1484	i4b (10)	40	N/A	No	i_APID_AvFlg
i_ist_BoreRow	1524	i4b (10)	40	N/A	No	i_APID_AvFlg
i_ist_CCDTemp	1564	i2b (10)	20	Celsius*100	No	i_APID_AvFlg
i_istLensCellT	1584	i2b (10)	20	Celsius*100	No	i_APID_AvFlg
i_APID_AvFlg	1604	i1b (8)	8	n/a	No	No
i_timecorflg	1612	i2b	2	N/A	No	No
i_ist_spare2	1614	i1b (6)	6	n/a	Yes	no
Total Bytes	1620					

C.1.9 GLA04-05

Records are fixed length and format and occur once per second.

Table C-8 GLA04-05 Record Format

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
Record Type:GLA04_BST_MAIN; % of Granule: 100; Record Duration (seconds):1; Repeats: null						
Latest : Last Modified : Wed Jul 02 08:42:37 GMT-0400 (EDT) 2003						
i_rec_ndx	0	i4b	4	N/A	No	no
i_UTCTime	4	i4b (2)	8	seconds, microseconds	No	no
i_bst1_samp_time	12	i4b (2, 10)	80	seconds,microseconds	No	no
i_bst1_vtcw	92	i4b (2, 10)	80	Microseconds	No	i_APID_AvFlg
i_bst1_pchstat	172	i2b (10)	20	N/A	Yes	i_APID_AvFlg
i_bst1_datlat	192	i4b (10)	40	Microseconds	No	i_APID_AvFlg
i_bst1_sw1	232	i2b (10)	20	N/A	Yes	i_APID_AvFlg
i_bst1_sw2	252	i2b (10)	20	N/A	Yes	i_APID_AvFlg
i_bst1_mctr	272	i2b (10)	20	N/A	Yes	i_APID_AvFlg
i_bst1_recctr	292	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_bst1_rejctr	302	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_bst1_starX	312	i4b (5, 10)	200	Arc-SecondsX100	No	i_APID_AvFlg
i_bst1_starY	512	i4b (5, 10)	200	Arc-SecondsX100	No	i_APID_AvFlg
i_bst1_starInt	712	i4b (5, 10)	200	Magnitude*100	No	i_APID_AvFlg
i_bst1_ccdtemp	912	i2b (10)	20	Celsius* 100	No	i_APID_AvFlg
i_bst1_bptemp	932	i2b (10)	20	Celsius* 100	No	i_APID_AvFlg
i_bst1_lenstmp	952	i2b (10)	20	Celsius* 100	No	i_APID_AvFlg
i_bst1_8V	972	i1b (10)	10	Volt * 10	No	i_APID_AvFlg
i_bst1_n9V	982	i1b (10)	10	Volt * 10	No	i_APID_AvFlg
i_bst1_4V	992	i1b (10)	10	Volt * 10	No	i_APID_AvFlg
i_bst1_n5V	1002	i1b (10)	10	Volt * 10	No	i_APID_AvFlg
i_bst1_BG	1012	i2b (10)	20	N/A	No	i_APID_AvFlg
i_bst1_srchct	1032	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_bst1_Fact	1042	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_bst1_sernum	1052	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_bst1_swver	1062	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_bst1_cancode	1072	i2b (10)	20	N/A	Yes	i_APID_AvFlg
i_bst_spare1	1092	i1b (8)	8	n/a	Yes	no
i_bst2_samp_time	1100	i4b (2, 10)	80	seconds, microseconds	Yes	no
i_bst2_vtcw	1180	i4b (2, 10)	80	Microseconds	No	i_APID_AvFlg

Table C-8 GLA04-05 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
i_bst2_pchstat	1260	i2b (10)	20	N/A	Yes	i_APID_AvFlg
i_bst2_datlat	1280	i4b (10)	40	Microseconds	No	i_APID_AvFlg
i_bst2_sw1	1320	i2b (10)	20	N/A	Yes	i_APID_AvFlg
i_bst2_sw2	1340	i2b (10)	20	N/A	Yes	i_APID_AvFlg
i_bst2_mctr	1360	i2b (10)	20	N/A	Yes	i_APID_AvFlg
i_bst2_recctr	1380	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_bst2_rejctr	1390	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_bst2_starX	1400	i4b (5, 10)	200	Arc-Seconds*100	No	i_APID_AvFlg
i_bst2_starY	1600	i4b (5, 10)	200	Arc-Seconds*100	No	i_APID_AvFlg
i_bst2_starInt	1800	i4b (5, 10)	200	Magnitude*100	No	i_APID_AvFlg
i_bst2_ccdtemp	2000	i2b (10)	20	Celsius* 100	No	i_APID_AvFlg
i_bst2_bptemp	2020	i2b (10)	20	Celsius* 100	No	i_APID_AvFlg
i_bst2_lenstmp	2040	i2b (10)	20	Celsius* 100	No	i_APID_AvFlg
i_bst2_8V	2060	i1b (10)	10	Volt * 10	No	i_APID_AvFlg
i_bst2_n9V	2070	i1b (10)	10	Volt * 10	No	i_APID_AvFlg
i_bst2_4V	2080	i1b (10)	10	Volt * 10	No	i_APID_AvFlg
i_bst2_n5V	2090	i1b (10)	10	Volt * 10	No	i_APID_AvFlg
i_bst2_BG	2100	i2b (10)	20	N/A	No	i_APID_AvFlg
i_bst2_srchct	2120	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_bst2_Fact	2130	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_bst2_sernum	2140	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_bst2_swver	2150	i1b (10)	10	N/A	Yes	i_APID_AvFlg
i_bst2_cancode	2160	i2b (10)	20	N/A	Yes	i_APID_AvFlg
i_APID_AvFlg	2180	i1b (8)	8	n/a	No	No
i_timecorflg	2188	i2b	2	N/A	No	No
i_bst_spare2	2190	i1b (6)	6	n/a	Yes	no
Total Bytes	2196					

C.1.10 GLA04-06

Records are fixed length and format and occur once per second.

Table C-9 GLA04-06 Record Format

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
Record Type:GLA04_SCP_MAIN; % of Granule: 100; Record Duration (seconds):1; Repeats: null						
Latest : Last Modified : Wed Apr 02 15:24:15 GMT-0500 (EST) 2003						
i_rec_ndx	0	i4b	4	N/A	No	no
i_UTCTime	4	i4b (2)	8	seconds, microseconds	No	no
i_samp_time	12	i4b (2)	8	seconds microseconds	NA	no
i_scpa_vtcw	20	i4b (2)	8	seconds, microseconds	No	i_APID_AvFlg
i_CFA_Q1	28	i4b	4	N/A	No	i_APID_AvFlg
i_CFA_Q2	32	i4b	4	N/A	No	i_APID_AvFlg
i_CFA_Q3	36	i4b	4	N/A	No	i_APID_AvFlg
i_CFA_Q4	40	i4b	4	N/A	No	i_APID_AvFlg
i_ECIOrb_PosX	44	i4b	4	meters	No	i_APID_AvFlg
i_ECIOrb_PosY	48	i4b	4	meters	No	i_APID_AvFlg
i_ECIOrb_PosZ	52	i4b	4	meters	No	i_APID_AvFlg
i_ECIOrb_VelX	56	i4b	4	cm/sec	No	i_APID_AvFlg
i_ECIOrb_VelY	60	i4b	4	cm/sec	No	i_APID_AvFlg
i_ECIOrb_VelZ	64	i4b	4	cm/sec	No	i_APID_AvFlg
i_SA_Pos1	68	i4b	4	radians*1.0E+6	No	i_APID_AvFlg
i_SA_Pos2	72	i4b	4	radians*1.0E+6	No	i_APID_AvFlg
i_gps_latch	76	i2b (3)	6	microseconds	Yes	null
i_gps_time	82	i4b	4	seconds	Yes	null
i_SA_CntrFlg1	86	i1b	1	n/a	Yes	no
i_SA_CntrFlg2	87	i1b	1	n/a	Yes	no
i_APID_AvFlg	88	i1b (8)	8	n/a	No	No
i_timecorflg	96	i2b	2	N/A	No	No
i_scpa_spare1	98	i1b (4)	4	n/a	Yes	no
Total Bytes	102					

C.1.11 GLA05

Records are fixed length and format and occur once per second.

Table C-10 GLA05 Record Format

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
Record Type:GLA05_MAIN; % of Granule: 100; Record Duration (seconds):1; Repeats: 1						
Latest : Last Modified : Thu Sep 15 10:23:25 GMT-0400 (EDT) 2005						
i_rec_ndx	0	i4b	4	N/A	No	no
i_UTCTime	4	i4b (2)	8	seconds, microseconds	No	no
i_transtime	12	i2b	2	microseconds	No	i2b
i_spare1	14	i1b (2)	2	NA	No	no
i_deltagpstmcor	16	i4b	4	nanoseconds	No	gi_invalid_i4b
i_dShotTime	20	i4b (39)	156	microseconds	No	No
i_lat	176	i4b (40)	160	Microdegrees	No	i4b
i_lon	336	i4b (40)	160	Microdegrees	No	i4b
i_elev	496	i4b (40)	160	mm	No	i4b
i_PADPoint	656	i4b (6, 40)	960	Unitless*1000000	No	i4b
i_PODFixedPos	1616	i4b (6, 40)	960	3 * (m, mm)	No	i4b
i_sigmaatt	2576	i2b (40)	80	Unitless	No	i2b
i_gval_rcv	2656	i2b (40)	80	counts	No	i2b
i_wfnoiseOb1	2736	i2b (40)	80	0.0001 volts	No	i2b
i_wfnoiseOb2	2816	i2b (40)	80	0.0001 volts	No	i2b
i_sDevNsOb1	2896	i2b (40)	80	0.0001 volts	No	i2b
i_sDevNsOb2	2976	i2b (40)	80	0.0001 volts	No	i2b
i_refRng	3056	i4b (40)	160	.01 ns	No	i4b
i_thRtkRngOff1	3216	i4b (40)	160	0.01 ns	No	i4b
i_thRtkRngOff2	3376	i4b (40)	160	0.01 ns	No	i4b
i_minRngOff1	3536	i4b (40)	160	0.01 ns	No	i4b
i_minRngOff2	3696	i4b (40)	160	0.01 ns	No	i4b
i_preRngOff1	3856	i4b (40)	160	0.01 ns	No	i4b
i_preRngOff2	4016	i4b (40)	160	0.01 ns	No	i4b
i_centroid1	4176	i4b (40)	160	0.01 ns	No	i4b
i_centroid2	4336	i4b (40)	160	0.01 ns	No	i4b
i_centroidInstr	4496	i4b (40)	160	0.01 ns	No	gi_invalid_i4b
i_areaRecWF1	4656	i2b (40)	80	0.01 volts * ns	No	i2b
i_areaRecWF2	4736	i2b (40)	80	0.01 volts * ns	No	i2b
i_maxRecAmp	4816	i2b (40)	80	Tenth of millivolts	No	i2b

Table C-10 GLA05 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
i_maxSmAmp	4896	i2b (40)	80	Tenth of millivolts	No	No
i_reflctUncorr	4976	i4b (40)	160	Unitless*1E06	No	i4b
i_reflctuncmxpk	5136	i4b (40)	160	unitless x1.E06	No	gi_invalid_i4b
i_tpCentX	5296	i2b (40)	80	arcsec*10	No	gi_invalid_i2b
i_tpCentY	5376	i2b (40)	80	arcsec*10	No	gi_invalid_i2b
i_nPeaks1	5456	i1b (40)	40	NA	No	no
i_nPeaks2	5496	i1b (40)	40	NA	No	no
i_parm1	5536	i4b (19, 40)	3040	0.0001 volts, 6 * (0.0001 volts, 0.01 ns, 0.01 ns)	No	i4b
i_parm2	8576	i4b (19, 40)	3040	0.0001 volts, 6 * (0.0001 volts, 0.01 ns, 0.01 ns)	No	i4b
i_solnSigmas1	11616	i2b (19, 40)	1520	0.0001 volts, 6 * (0.0001 volts, 0.001 ns, 0.001 ns)	No	i2b
i_solnSigmas2	13136	i2b (19, 40)	1520	0.0001 volts, 6 * (0.0001 volts, 0.0001 ns, 0.0001 ns)	No	i2b
i_wfFitSDev_1	14656	i2b (40)	80	millivolts	No	i2b
i_wfFitSDev_2	14736	i2b (40)	80	millivolts	No	i2b
i_tpintensity	14816	i4b (40)	160	counts	No	gi_invalid_i4b
i_tpazimuth	14976	i2b (40)	80	deg*10	No	gi_invalid_i2b
i_tpeccentricity	15056	i2b (40)	80	e*1000	No	gi_invalid_i2b
i_tpmajoraxis	15136	i2b (40)	80	cm	No	gi_invalid_i2b
i_skew1	15216	i2b (40)	80	unitless * 100	No	i2b
i_kurt1	15296	i2b (40)	80	unitless * 100	No	i2b
i_skew2	15376	i2b (40)	80	unitless * 100	No	i2b
i_kurt2	15456	i2b (40)	80	unitless * 100	No	i2b
i_WFqual	15536	i4b (40)	160	NA	No	no
i_areaTrWF	15696	i2b (40)	80	0.01 volts * ns	No	i4b
i_tpOrX	15776	i2b (40)	80	degrees*10	No	gi_invalid_i2b
i_locTr	15856	i4b (40)	160	0.01 ns	No	i4b
i_parmTr	16016	i4b (4, 40)	640	millivolts, millivolts, 0.01 ns, 0.01 ns	No	i4b
i_sDevFitTr	16656	i2b (40)	80	millivolts	No	i2b
i_skewTr	16736	i4b (40)	160	NA	No	i4b
i_maxTrAmp	16896	i2b (40)	80	0.1 millivolts	No	i2b
i_gval_tx	16976	i2b	2	counts	No	i2b
i_compRatio	16978	i2b (2)	4	counts	No	i_APID_AvFlg
i_N_val	16982	i2b	2	counts	No	i_APID_AvFlg
i_r_val	16984	i2b	2	counts	No	i_APID_AvFlg

Table C-10 GLA05 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
i_ElvuseFlg	16986	i1b (5)	5	N/A	No	No
i_spare3	16991	i1b	1	NA	No	no
i_ElvFlg	16992	i1b (40)	40	N/A	No	No
i_atmQF	17032	i1b (10)	10	N/A	No	No
i_timecorflg	17042	i2b	2	N/A	No	No
i_APID_AvFlg	17044	i1b (8)	8	n/a	No	No
i_AttFlg2	17052	i1b (20)	20	NA	No	no
i_spare4	17072	i1b	1	NA	No	NA
i_FrameQF	17073	i1b	1	N/A	No	No
i_OrbFlg	17074	i1b (2)	2	NA	No	no
i_rngCorrFlg	17076	i1b (2)	2	N/A	No	No
i_spare5	17078	i1b (2)	2	NA	No	NA
i_beam_coelev	17080	i4b	4	degrees*100	No	i4b
i_beam_azimuth	17084	i4b	4	degrees*100	No	i4b
i_AttFlg1	17088	i2b	2	N/A	No	No
i_RMSpulseWd	17090	i2b (40)	80	100 ns	No	i2b
i_satNdx	17170	i1b (40)	40	ns	Yes	i1b
i_RecNrgAll	17210	i2b (40)	80	0.01 fJoules	No	i_APID_AvFlg
i_spare6	17290	i1b (110)	110	NA	No	NA
Total Bytes	17400					

C.1.12 GLA06

Records are fixed length and format and occur once per second.

Table C-11 GLA06 Record Format

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
Record Type:GLA06_MAIN; % of Granule: 100; Record Duration (seconds):1; Repeats: 1						
Latest : Last Modified : Mon Sep 19 09:22:56 GMT-0400 (EDT) 2005						
i_rec_ndx	0	i4b	4	N/A	No	no
i_UTCTime	4	i4b (2)	8	seconds, microseconds	No	no
i_transtime	12	i2b	2	microseconds	No	i2b
i_Spare1	14	i1b (2)	2	N/A	No	N/A
i_deltagpstmcor	16	i4b	4	nanoseconds	No	gi_invalid_i4b

Table C-11 GLA06 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
i_dShotTime	20	i4b (39)	156	microseconds	No	No
i_lat	176	i4b (40)	160	microdeg	No	i4b
i_lon	336	i4b (40)	160	microdeg	No	i4b
i_elev	496	i4b (40)	160	mm	No	i4b
i_PADPoint	656	i4b (6, 40)	960	Unitless*1000000	No	i4b
i_PODFixedPos	1616	i4b (6, 40)	960	3 * (m, mm)	No	i4b
i_sigmaatt	2576	i2b (40)	80	Unitless	No	i2b
i_Azimuth	2656	i4b	4	millideg	No	i4b
i_SolAng	2660	i4b	4	microdeg	No	i4b
i_tpintensity_avg	2664	i4b	4	counts	No	i4b
i_tpazimuth_avg	2668	i2b	2	degrees*10	No	i2b
i_tpeccentricity_avg	2670	i2b	2	Unitless*1000	No	i2b
i_tpmajoraxis_avg	2672	i2b	2	cm	No	i2b
i_Spare2	2674	i1b (2)	2	null	No	null
i_gdHt	2676	i2b (2)	4	cm	No	i2b
i_erElv	2680	i2b (2)	4	mm	No	i2b
i_spElv	2684	i2b (4)	8	mm	No	i2b
i_ldElv	2692	i2b (4)	8	mm	No	i2b
i_ocElv	2700	i2b (2)	4	mm	No	i2b
i_wTrop	2704	i2b (2)	4	mm	No	i2b
i_dTrop	2708	i2b (40)	80	mm	No	i2b
i_surfType	2788	i1b	1	N/A	No	No
i_Spare3	2789	i1b (3)	3	N/A	No	null
i_DEM_elv	2792	i4b (40)	160	cm	No	i4b
i_refRng	2952	i4b (40)	160	mm	No	i4b
i_TrshRngOff	3112	i4b (40)	160	mm	No	i4b
i_SigBegOff	3272	i4b (40)	160	mm	No	i4b
i_SigEndOff	3432	i4b (40)	160	mm	No	i4b
i_cntRngOff	3592	i4b (40)	160	mm	No	i4b
i_reflctUncorr	3752	i4b (40)	160	Unitless*1E06	No	i4b
i_reflCor_atm	3912	i4b	4	Unitless*1E06	No	i4b
i_maxSmAmp	3916	i2b (40)	80	Tenth of millivolts	No	No
i_SigmaElv	3996	i2b (40)	80	mm	No	i2b
i_numPk	4076	i1b (40)	40	N/A	No	No
i_kurt2	4116	i2b (40)	80	unitless * 100	No	i2b

Table C-11 GLA06 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
i_skew2	4196	i2b (40)	80	unitless * 100	No	i2b
i_srf_ruf	4276	i2b (40)	80	cm	No	i2b
i_srf_slope	4356	i2b (40)	80	millideg	No	i2b
i_isRngOff	4436	i4b (40)	160	mm	No	i4b
i_siRngOff	4596	i4b (40)	160	mm	No	i4b
i_ldRngOff	4756	i4b (40)	160	mm	No	i4b
i_ocRngOff	4916	i4b (40)	160	mm	No	i4b
i_nPeaks1	5076	i1b (40)	40	NA	No	no
i_ElvuseFlg	5116	i1b (5)	5	N/A	No	No
i_atm_avail	5121	i1b	1	NA	No	No
i_erd	5122	i2b	2	Millimeters	No	i2b
i_rdu	5124	i2b	2	Millimeters	No	i2b
i_cld1_mswf	5126	i1b	1	NA	No	No
i_MRC_af	5127	i1b	1	NA	No	No
i_SurfRuf_slpQF	5128	i1b (40)	40	N/A	No	No
i_ElvFlg	5168	i1b (40)	40	N/A	No	No
i_rng_UQF	5208	i2b (40)	80	N/A	No	No
i_atmQF	5288	i1b (10)	10	N/A	No	No
i_timecorflg	5298	i2b	2	N/A	No	No
i_APID_AvFlg	5300	i1b (8)	8	n/a	No	No
i_AttFlg2	5308	i1b (20)	20	NA	No	no
i_spare5	5328	i1b	1	NA	No	NA
i_FrameQF	5329	i1b	1	N/A	No	No
i_OrbFlg	5330	i1b (2)	2	NA	No	no
i_rngCorrFlg	5332	i1b (2)	2	N/A	No	No
i_CorrStatFlg	5334	i1b (2)	2	NA	No	no
i_beam_coelev	5336	i4b	4	degrees*100	No	i4b
i_beam_azimuth	5340	i4b	4	degrees*100	No	i4b
i_AttFlg1	5344	i2b	2	N/A	No	No
i_Spare6	5346	i1b (2)	2	N/A	No	null
i_DEM_hires_src	5348	i1b (40)	40	NA	No	No
i_DEM_hires_elv	5388	i2b (40)	80	meters	No	i2b
i_satNdx	5468	i1b (40)	40	ns	Yes	i1b
i_satRngCorr	5508	i2b (40)	80	mm	No	i2b
i_satCorrFlg	5588	i1b (40)	40	NA	NA	No

Table C-11 GLA06 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
i_satNrgCorr	5628	i2b (40)	80	mm	No	i2b
i_satPwdCorr	5708	i2b (40)	80	mm	No	i2b
i_gval_rcv	5788	i2b (40)	80	counts	No	i2b
i_RecNrgAll	5868	i2b (40)	80	0.01 fJoules	No	i_APID_AvFlg
i_FRir_cldtop	5948	i2b (40)	80	deka-meters	No	i2b
i_FRir_qaFlag	6028	i1b (40)	40	NA	No	No
i_FRir_ODflg	6068	i1b (40)	40	NA	No	No
i_FRir_intsig	6108	i2b (40)	80	e7/(m-sr)	No	i2b
i_msRngCorr	6188	i2b (40)	80	Unknown	No	i2b
i_msCorrFlg	6268	i1b (40)	40	Unknown	No	No
i_Surface_temp	6308	i2b	2	degrees Celsius * 100	No	i2b
i_Surface_pres	6310	i2b	2	millibars of mercury * 10	No	i2b
i_Surface_relh	6312	i2b	2	percentage * 100	No	i2b
i_Spare7	6314	i1b (566)	566	NA	No	null
Total Bytes	6880					

C.1.13 GLA07

Records are fixed length and format and occur once per second.

Table C-12 GLA07 Record Format

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
Record Type:GLA07_MAIN; % of Granule: 100; Record Duration (seconds):1; Repeats: 1						
Latest : Last Modified : Tue Sep 13 09:05:15 GMT-0400 (EDT) 2005						
i_rec_ndx	0	i4b	4	N/A	No	no
i_UTCTime	4	i4b (2)	8	seconds, microseconds	No	no
i_beam_coelev	12	i4b	4	degrees*100	No	i4b
i_beam_azimuth	16	i4b	4	degrees*100	No	i4b
i_spare0	20	i1b (16)	16	null	No	No
i_lat	36	i4b	4	microdegrees	No	i4b
i_lon	40	i4b	4	microdegrees	No	i4b
i_APID_AvFlg	44	i1b (8)	8	n/a	No	No
i_OrbFlg	52	i1b (2)	2	NA	No	no
i_LidarQF	54	i2b	2	NA	Yes	no

Table C-12 GLA07 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
i_AttFlg1	56	i2b	2	N/A	No	No
i_surfType	58	i1b	1	N/A	No	No
i_Spare1	59	i1b	1	NA	No	NA
i_SolAng	60	i4b	4	microdegrees	No	i4b
i_pad_angle	64	i4b	4	microdegrees	No	i4b
i_rng_geoid	68	i4b	4	meters	No	no
i_topo_elev	72	i4b	4	meters	No	i4b
i_Rng2PCProf_Cor	76	i4b	4	centimeters	No	i_APID_AvFlg
i_Rng2CDProf_Cor	80	i4b	4	meters	No	i_APID_AvFlg
i1_g_bg	84	i4b (4)	16	photons/bin * 100	No	i_APID_AvFlg
i5_g_bg	100	i4b (4, 5)	80	photons/bin * 100	No	i_APID_AvFlg
i40_g_bg	180	i4b (4, 40)	640	photons/bin * 100	No	i_APID_AvFlg
i5_ir_bg	820	i4b (4, 5)	80	W*1.0d17	No	i_APID_AvFlg
i40_ir_bg	900	i4b (4, 40)	640	W*1.0d17	No	i_APID_AvFlg
i5_g_TxNrg_EU	1540	i4b (5)	20	Joules * 1.0d5	No	i_APID_AvFlg
i40_g_TxNrg_EU	1560	i4b (40)	160	Joules * 1.0d5	No	i_APID_AvFlg
i5_ir_TxNrgEU	1720	i4b (5)	20	Joules * 1.0d5	No	i_APID_AvFlg
i40_ir_TxNrgEU	1740	i4b (40)	160	Joules * 1.0d5	No	i_APID_AvFlg
i_g_TxNrg_qf	1900	i1b (10)	10	n/a	Yes	no
i_ir_TxNrg_qf	1910	i1b (10)	10	n/a	Yes	no
i_atm_dem	1920	i4b	4	meters	No	i4b
i_metFlg	1924	i1b	1	NA	No	no
i_ir_bin_shift	1925	i1b	1	bins	No	no
i_Spare2	1926	i1b (6)	6	NA	No	NA
i_g_cal_cof	1932	i4b (3)	12	1d-6*(Photons/bin)(km^3/J)sr	No	no
i_ir_cal_cof	1944	i4b (2)	8	1d4*(Watts)(km^3/J)sr	No	no
i5_g_bscs	1952	i4b (548, 5)	10960	e11/(m-sr)	No	i4b
i40_g_bscs	12912	i4b (148, 40)	23680	e11/(m-sr)	No	i4b
i5_ir_bscs	36592	i4b (280, 5)	5600	e11/(m-sr)	No	i4b
i40_ir_bscs	42192	i4b (148, 40)	23680	e11/(m-sr)	No	i4b
i_g_mbscs	65872	i4b (548)	2192	e11/(m-sr)	No	no
i_ir_mbscs	68064	i4b (280)	1120	e11/(m-sr)	No	no
i1_int_ret	69184	i4b	4	e11/(m-sr)	No	i4b
i40_g_sat_prof	69188	i1b (740)	740	NA	No	no
i5_g_sat_prof	69928	i1b (343)	343	NA	No	no

Table C-12 GLA07 Record Format (Continued)

Product Var Name	Offset (Bytes)	Product Data Type	Total Bytes	Product Units	Is Unsigned?	Invalid Value/Flag
i_spare3	70271	i1b (5)	5	NA	No	NA
i_532AttBS_Flag	70276	i1b (18)	18	NA	No	no
i_1064AttBS_Flag	70294	i1b (18)	18	NA	No	no
i_AttFlg3	70312	i1b	1	NA	No	No
i_DitheringEnabled Flag	70313	i1b	1	N/A	NA	i_APID_AvFlg
i_timecorflg	70314	i2b	2	N/A	No	No
i_Surface_temp	70316	i2b	2	degrees Celsius * 100	No	i2b
i_Surface_pres	70318	i2b	2	millibars of mercury * 10	No	i2b
i_Surface_relh	70320	i2b	2	percentage * 100	No	i2b
i_Surface_wind	70322	i2b	2	meters/second * 100	No	i2b
i_Surface_wdir	70324	i2b	2	degrees * 10	No	i2b
i_spare4	70326	i1b (130)	130	NA	No	NA
Total Bytes	70456					

Appendix D
Data Dictionary

D.1 Data Dictionary

D.1.1 GLA01-Main Record

Product Var Name: i_rec_ndx
Is element of: GLA01 Long Waveform Record, GLA01 Main Record , GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: GLAS Record Index
Product Data Type: i4b
Total Bytes: 4
Product Units: N/A
Invalid Value/Flag: no
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.
Comments:

Product Var Name: i_UTCTime
Is element of: GLA01 Long Waveform Record, GLA01 Main Record , GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Transmit Time of First Shot in frame in J2000
Product Data Type: i4b (2)
Total Bytes: 8
Product Units: seconds, microseconds
Invalid Value/Flag: no
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: The transmit time in UTC of the 1st shot in the 1 second frame referenced to noon on Jan 1, 2000. The first item is the whole number of seconds ; the second item is the fractional part in microseconds.
Comments: This is not the ground bounce time, but the transmit time.

Product Var Name: i_gla01_rectype
Is element of: GLA01 Main Record
Short Description: GLA01 Record Type
Product Data Type: i2b
Total Bytes: 2
Product Units: n/a
Invalid Value/Flag: no
Is Correction Flag?: NA
Is Unsigned?: No

```
Product Minimum:      0
Product Maximum:      2
Description:          Record type indicating whether this record is a main=1, long=2, or
short=3 waveform record.
Comments:

Product Var Name:     i_spare1
Is element of:        GLA01 Main Record
Short Description:    Spares
Product Data Type:    i2b
Total Bytes:          2
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spares
Comments:

Product Var Name:     i_dShotTime
Is element of:        GLA01 Main Record , GLA04 LPA Main Record, GLA05 record, GLA06
record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    Laser Shot Time Deltas (shots 2-40)
Product Data Type:    i4b (39)
Total Bytes:          156
Product Units:        microseconds
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1200000
Description:          The time deltas of pulses 2 through 40 to i_UTCTime, the UTC time
tag of the first pulse in the 1-second data frame. Adding the deltas to i_UTCTime will
give the user the time of each individual shot in the frame.
Comments:             To calculate the time for shots 2-40, add these deltas to the time
of the first shot.

Product Var Name:     i1_pred_lat
Is element of:        GLA01 Main Record , GLA02 Record
Short Description:    Predicted geodetic Latitude of the laser footprint
Product Data Type:    i4b
Total Bytes:          4
Product Units:        microdegrees
Invalid Value/Flag:   gi_invalid_i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -90000000
Product Maximum:      90000000
Description:          The geodetic Latitude of the laser footprint; obtained from the
predicted orbit; assuming the laser is nadir pointing.
Comments:

Product Var Name:     i1_pred_lon
Is element of:        GLA01 Main Record , GLA02 Record
Short Description:    Predicted geodetic Longitude of the laser footprint
Product Data Type:    i4b
Total Bytes:          4
Product Units:        microdegrees
```

```
Invalid Value/Flag:   gi_invalid_i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      360000000
Description:          The geodetic Longitude of the laser footprint; obtained from the
predicted orbit; assuming the laser is nadir pointing.
Comments:

Product Var Name:     i_RespEndTime
Is element of:        GLA01 Main Record
Short Description:    Ending Address of Range Reponse
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        nanoseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      5100000
Description:          Address (in digitizer counts) of the 2000-byte surface echo data
dump (as measured from the start of Acquisition Memory, i.e. Start of digitization).
Last in time. From APID12/13 offset 80.
Comments:

Product Var Name:     i_LastThrXingT
Is element of:        GLA01 Main Record
Short Description:    Last Threshold Crossing Location for Selected Filter
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        ns
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      5100000
Description:          Address, in digitizer counts, of the detected last (i.e. last in
time) threshold crossing (as measured from the start of Acquisition Memory, i.e. Start
of digitization).  Also called the trailing edge.  Set to 0 if threshold crossing was
NOT detected. From APID12/13, Offset 84.
Comments:              null

Product Var Name:     i_NextThrXing
Is element of:        GLA01 Main Record
Short Description:    Next to Last Threshold Crossing Location for Selected Filter
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        ns
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      5100000
Description:          Address (in dititizer counts) of the detected next to last thresh-
old crossing (as measured from the start of Acquisition Memory, i.e. Start of digitiza-
tion. Also called the leading edge.  Set to 0 if a threshold crossing was NOT detected.
From APID12/13 offset 88.
Comments:
```

```
Product Var Name:     i_EchoPeakLoc
Is element of:        GLA01 Main Record
Short Description:    Echo Peak Location
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        nanoseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      5100000
Description:          Address (in digitizer counts) of the detected peak value (as mea-
sured from the start of Acquisition Memory, i.e. Start of digitization).  Set to 0 if a
threshold crossing was NOT detected. From APID12/13 offset 100.
Comments:

Product Var Name:     i_EchoPeakVal
Is element of:        GLA01 Main Record
Short Description:    Echo Peak Value
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Peak value for the selected filter returned by the FIR filter en-
gine.  Set to 0 if a threshold crossing was not detected. From APID12/13 offset 96.
Comments:

Product Var Name:     i_wt_fact_filt
Is element of:        GLA01 Main Record
Short Description:    Filter Weight Factors
Product Data Type:    i4b (6, 40)
Total Bytes:          960
Product Units:        unitless
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2000000000
Description:          Results of weight formulas for all FIR filters. There are a total
of 6 filters. From APID12/13, offset 124.
Comments:

Product Var Name:     i_filtr_thresh
Is element of:        GLA01 Main Record
Short Description:    Selected Filter Threshold Value
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Threshold values used to find the last and next to last threshold
crossings for the selected filter. From APID12/13, Offset 108.
```

```
Comments:

Product Var Name:     i_time_txWfPk
Is element of:        GLA01 Main Record , GLA04 LPA Main Record
Short Description:    Transmit Pulse Peak Location
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        ns
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      500000
Description:          Address in digitizer counts of the Transmit Pulse Peak as measured
from the start of Acquisition Memory, i.e. start of digitization. From APID12/13, Offset
68.
Comments:             The range measurement starts from this time. To accurately time
stamp the transmit pulse, it is necessary to add the delay to start of digitizer.

Product Var Name:     i_TxWfStart
Is element of:        GLA01 Main Record , GLA04 LPA Main Record
Short Description:    Starting Address of Transmit Pulse Sample
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        ns
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      500000
Description:          Starting Address in digitizer counts of the Transmit Pulse sample
relative to the start of digitization. From APID12/13, Offset 76.
Comments:

Product Var Name:     i_TxNrg_EU
Is element of:        GLA01 Main Record
Short Description:    1064 nm Laser Transmit Energy
Product Data Type:    i4b
Total Bytes:          4
Product Units:        microjoules
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      90000
Description:          The 1064 nm  laser pulse transmitted energy in energy units, com-
puted from the digitized outgoing pulse, the transmit gain, and the detector temperature.
Comments:

Product Var Name:     i_RecNrgAll_EU
Is element of:        GLA01 Main Record
Short Description:    1064 Laser received Energy from all signal above threshold
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        attojoules
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
```

```
Product Maximum:      200000
Description:          This is calculated by taking the area under the received waveform
from all responses greater than the threshold and converting it to energy units.
Comments:

Product Var Name:     i_RecNrgLast_EU
Is element of:        GLA01 Main Record
Short Description:    1064 nm Laser Received Energy (max pk)
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        attojoules
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200000
Description:          This is the energy in the 1064 nm laser pulse between the threshold
crossings before and after the maximum amplitude in energy units.
Comments:

Product Var Name:     i_txWfPk_Flag
Is element of:        GLA01 Main Record , GLA04 LPA Main Record
Short Description:    Transmit Waveform Peak Status Flag
Product Data Type:    i1b ( 40)
Total Bytes:          40
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      8
Description:          Transmit_Status. Status Word:Bit 0:  If bit is set, then internal
software failure.  Bit 1:  If bit is set, then peak is below threshold. Bit 2: If bit
is set, peak was never found (latch).
From APID12/13, Offset 72.

Please see <a href='flags/i_txWfPk_Flag.pdf'> the PDF flag description</a> for more de-
tails.

Comments:

Product Var Name:     i_InstState
Is element of:        GLA01 Main Record
Short Description:    Instrument State
Product Data Type:    i4b
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      524288
Description:          Flag defining current configuration of the GLAS instrument.  This
is a common flag.
Please see <a href='flags/i_InstState.pdf'> the PDF flag description</a> for more de-
tails.Comments:

Product Var Name:     i_APID_AvFlg
Is element of:        GLA01 Main Record , GLA02 Record, GLA04 BST Main Record, GLA04 GYRO
```

```
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record,
GLA14 Record, GLA15 Record
Short Description:    APID Data Availability Flag
Product Data Type:    i1b (8)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          Flag indicating which packets (APIDs) for each second are available
missing, or filled.  APID 19 is broken down further into Altimeter Digitizer, Photon
Counter, Cloud Digitizer, GPS/DEM, and C&T sections.
Please see <a href='flags/i_APID_AvFlg.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_FiltNumMask
Is element of:        GLA01 Main Record
Short Description:    Filter Selection Mask
Product Data Type:    i4b
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      64
Description:          The low order 6 bits, bits 0 through 5, indicate which filters were
selectable for a shot.  The definition of complete failure of the filters has been changed
to mean the complete failure of all SELECTABLE filters.  Bit 0: 4 nsec filter, bit 1: 8
nsec filter, bit 2: 16 nsec filter, bit 3: 32 nsec filter, bit 4: 64 nsec filter, bit
5: 128 nsec filter.  In case of the complete failure of all the filters, the result of
the last 'good' shot shall be used, even if this mask proscribes the filter choice.  A
bit value = 1 =selectable; bit value = 0 = not selectable. From APID19, Offset 30.
Please see <a href='flags/i_FiltNumMask.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_HOff
Is element of:        GLA01 Main Record
Short Description:    DEM Offset
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        Millimeters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1.0D9
Product Maximum:      1.0D9
Description:          Offsets associated with the minimum and maximum height uploaded in
the DEM used to define the range window.  1st item:  minimum height offset = DEM uncer-
tainty + bias; default is 1.125 km. 2nd item:  maximum height offset = DEM uncertainty
- bias; default is -0.875 km. From APID19, Offset 1116.
Comments:

Product Var Name:     i_ADBias
```

```
Is element of:        GLA01 Main Record
Short Description:    Altimeter Digitizer Bias
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        Meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000000
Product Maximum:      1000000
Description:          Altimeter Digitizer  bias values added to minimum and maximum
range: 1st item is bias for minimum range (Rbmin) - default  = 0; 2nd item is bias for
maximum range (Rbmax) - default  = 0.  Used when necessary to correct for off-nadir
pointing angles greater than 1 degree. From APID19, Offset 1124.
Comments:

Product Var Name:     i_RminRmax
Is element of:        GLA01 Main Record
Short Description:    Range Window Start and Stop
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        Meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1000000
Description:          Range window start and stop in kilometers. From APID19, Offset
1100.
Comments:

Product Var Name:     i_WMinMax
Is element of:        GLA01 Main Record
Short Description:    Window Size
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        Meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1000000
Description:          Range window minimum and maximum size.  1st item is minimum - de-
fault is 2 km; 2nd item is maximum - default is 11 km. From APID19, Offset 1108.
Comments:

Product Var Name:     i_ObSCHt
Is element of:        GLA01 Main Record
Short Description:    On-board Height of S/C
Product Data Type:    i4b
Total Bytes:          4
Product Units:        Millimeters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1.0D9
Product Maximum:      1.0D9
Description:          Geodetic altitude of S/C above earth surface (Hsat). From APID19,
Offset 1092.
```

```
Comments:

Product Var Name:     i_engineering
Is element of:        GLA01 Main Record
Short Description:    Engineering Data
Product Data Type:    i2b (12)
Total Bytes:          24
Product Units:        various
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -3000
Product Maximum:      5000
Description:          The following is from /glas/vob/src/l1a_lib/L_EngCorr_mod.f90
which is called by L1AMgr:
d_engineering(1) = active detector temperature [T_detID
if detector=1, T_detID = GLA00_prod%CTHW3_hk(1)%i_PRTad1C24_t
if detector=2, T_detID = GLA00_prod%CTHW3_hk(1)%i_PRTad2C25_t]
d_engineering(2) = active digitizer temperature [T_digID
if digitizer=1, T_digID = GLA00_prod%CTHW3_hk(1)%i_AD1ADCC19_t
if digitizer=2, T_digID = GLA00_prod%CTHW3_hk(1)%i_AD2ADCC20_t]
d_engineering(3) = oscillator board temperature
[T_relay = GLA00_prod%CTHW3_hk(1)%i_OscBdC11_t]
d_engineering(4) = Fiber Box temperature
[T_fb = GLA00_prod%CTHW3_hk(1)%i_PRTfboxC29_t]
d_engineering(5) thru d_engineering(12)  TBD. All temperatures are in Celsius X 100.
Comments:             Engineering data (temperatures, voltages, currents) affecting the
altimetry data.  Array of 12 values.

Product Var Name:     i_compRatio
Is element of:        GLA01 Main Record , GLA05 record
Short Description:    Compression Ratios
Product Data Type:    i2b (2)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      1
Product Maximum:      5
Description:          Averaging values p and q for frame. First item is p; second is q.
From APID19, Offset 232. First N downlink samples are generated by averaging p raw dig-
itized elements and the rest of the allocated samples in the waveform by averaging q
elements.
Comments:             Not valid if APID19 is missing.

Product Var Name:     i_N_val
Is element of:        GLA01 Main Record , GLA05 record
Short Description:    Value of N
Product Data Type:    i2b
Total Bytes:          2
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      544
Description:          Value of N used for waveform compression for the frame. From
APID19, Offset 236.
```

```
Comments:            Not valid if APID19 is missing.

Product Var Name:    i_r_val
Is element of:       GLA01 Main Record , GLA05 record
Short Description:   Value of r
Product Data Type:   i2b
Total Bytes:         2
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     8
Description:         Value of r used for waveform compression for frame. From APID19,
Offset 238. Not valid if APID19 is missing.
Comments:            After M shots with no valid return, the ‘p’ and ‘q’ averaging of
the normal downlinked waveform compression type will be overridden and instead the tele-
metered received echo will consist of average samples averaged over ‘r’ raw samples.

Product Var Name:    i_ADdetOutGn
Is element of:       GLA01 Main Record
Short Description:   Transmitted Gain
Product Data Type:   i2b
Total Bytes:         2
Product Units:       counts
Invalid Value/Flag:  N/A
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     255
Description:
Comments:            This is only updated every 4 seconds.

Product Var Name:    i_DEMmin
Is element of:       GLA01 Main Record
Short Description:   DEM minimum
Product Data Type:   i2b
Total Bytes:         2
Product Units:       meters
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     -1000
Product Maximum:     12000
Description:         Onboard spacecraft DEM minimum elevation used to calculate hmin.
From APID19, Offset 1192.
Comments:

Product Var Name:    i_DEMmax
Is element of:       GLA01 Main Record
Short Description:   DEM maximum
Product Data Type:   i2b
Total Bytes:         2
Product Units:       meters
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     -1000
Product Maximum:     12000
```

```
Description:          Onboard spacecraft DEM maximum elevation used to calculate hmax.
From APID19, Offset 1193.
Comments:

Product Var Name:     i_tx_wf
Is element of:        GLA01 Main Record , GLA04 LPA Main Record
Short Description:    Sampled Transmit Pulse Waveform
Product Data Type:    i1b (48, 40)
Total Bytes:          1920
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Transmit Pulse; 48 bytes of raw data samples.
Comments:

Product Var Name:     i_OrbFlg
Is element of:        GLA01 Main Record , GLA02 Record, GLA05 record, GLA06 record, GLA07
Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    POD flag (Orbit Flag)
Product Data Type:    i1b (2)
Total Bytes:          2
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      128
Description:          Denotes quality of orbit, whether predicted or precision, loss of
GPS data, maneuver-degraded, etc.
Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name:     i_EchoLandType
Is element of:        GLA01 Main Record
Short Description:    Echo Land Type
Product Data Type:    i1b
Total Bytes:          1
Product Units:        unitless
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3
Description:          Surface Echo Land Type for Compression. 0=sea, 1=land, 2=sea/ice,
3=land/ice. From APID19, Offset 231.
Comments:             The values of 'p', 'q', and 'N' are surface echo land type depen-
dent, but can only change once per frame (1sec).

Product Var Name:     i_RngSrc_Flag
Is element of:        GLA01 Main Record
Short Description:    Range Data Source
Product Data Type:    i1b
Total Bytes:          1
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
```

Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2
Description: Source of Range data: 0 = s/c time and position packet; 1 = uplinked DEM bytes; 2 = uplinked Rmin/Rmax. Please see <a href='flags/i_RngSrc_Flag.pdf'> the PDF flag description</a> for more details. From APID19, Offset 1194.
Comments:

Product Var Name: i_timecorflg
Is element of: GLA01 Main Record , GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: time correction flag
Product Data Type: i2b
Total Bytes: 2
Product Units: N/A
Invalid Value/Flag: No
Is Correction Flag?: No
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 32767
Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name: i_TxFlg
Is element of: GLA01 Main Record
Short Description: Transmit Pulse Flag
Product Data Type: i1b (5)
Total Bytes: 5
Product Units: N/A
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -127
Product Maximum: 127
Description: Flag indicating whether the transmit pulse is telemetered (valid) or not telemetered (invalid) in this record (1 bit set/shot). See the <a href='flags/i_TxFlg.pdf'>PDF file</A> for more information.
Comments:

Product Var Name: i_GainShiftFlg
Is element of: GLA01 Main Record
Short Description: Gain Shift Flag
Product Data Type: i1b (5)
Total Bytes: 5
Product Units: N/A
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -127
Product Maximum: 127
Description: Flag indicates if the gain has been shifted for the corresponding measurement. 0=Gain has been shifted (valid) or 1=Gain has not been shifted (potentially invalid) in this record (1 bit set/shot). See the <a href='flags/i_GainShiftFlg.pdf'>PDF file</A> for more information.

Comments:

Product Var Name: i_spare2
Is element of: GLA01 Main Record
Short Description: Spares
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: null
Invalid Value/Flag: no
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description:
Comments:

D.1.2 GLA01-Long Waveform Record

Product Var Name: i_rec_ndx
Is element of: GLA01 Long Waveform Record, GLA01 Main Record , GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: GLAS Record Index
Product Data Type: i4b
Total Bytes: 4
Product Units: N/A
Invalid Value/Flag: no
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.
Comments:

Product Var Name: i_UTCTime
Is element of: GLA01 Long Waveform Record, GLA01 Main Record , GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Transmit Time of First Shot in frame in J2000
Product Data Type: i4b (2)
Total Bytes: 8
Product Units: seconds, microseconds
Invalid Value/Flag: no
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: The transmit time in UTC of the 1st shot in the 1 second frame referenced to noon on Jan 1, 2000. The first item is the whole number of seconds ; the second item is the fractional part in microseconds.
Comments: This is not the ground bounce time, but the transmit time.

Product Var Name: i_gla01_rectype
Is element of: GLA01 Long Waveform Record

```
Short Description:    GLA01 Record Type
Product Data Type:    i2b
Total Bytes:          2
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2
Description:          Record type indicating whether this record is a main=1, long=2, or
short=3 waveform record.
Comments:

Product Var Name:     i_spare1
Is element of:        GLA01 Long Waveform Record
Short Description:    Spares
Product Data Type:    i2b
Total Bytes:          2
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spares
Comments:

Product Var Name:     i_filtnum
Is element of:        GLA01 Long Waveform Record
Short Description:    Filter Number
Product Data Type:    i1b ( 8)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      5
Description:          Filter with the highest weight (0 for 4 nsec filter; 1 for 8 nsec
filter; 2 for 16 nsec filter; 3 for 32 nsec filter; 4 for 64 nsec filter; 5 for 128 nsec
filter).  May or may not be selectable!  If no selectable filter can be chosen, then the
last successful filter, selectable or NOT is chosen. From APID12/13, Offset 104.
Comments:

Product Var Name:     i_shot_ctr
Is element of:        GLA01 Long Waveform Record
Short Description:    Shot Counter
Product Data Type:    i2b ( 8)
Total Bytes:          16
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200
Description:          The shot number for each of the 40 shots in this record.  The shot
count rolls over after reaching 200. From APID12/13, Offset 16.
Comments:
```

```
Product Var Name:     i_statflags
Is element of:        GLA01 Long Waveform Record
Short Description:    Range Window Status Word
Product Data Type:    i4b ( 8)
Total Bytes:          32
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      262144
Description:           Range Window Status word: Bit 0:  No first crossing found on 4-
nsec filter Bit 1:  No first crossing found on 8-nsec filter Bit 2:  No first crossing
found on 16-nsec filter Bit 3:  No first crossing found on 32-nsec filter Bit 4:  No
first crossing found on 64-nsec filter Bit 5:  No first crossing found on 128-nsec filter
Bit 6:  No second crossing found on 4-nsec filter Bit 7:  No second crossing found on
8-nsec filter Bit 8:  No second crossing found on 6-nsec filter Bit 9:  No second crossing
found on 32-nsec filter Bit 10: No second crossing found on 64-nsec filter Bit 11: No
second crossing found on 128-nsec filter Bit 12: First sample in range greater than or
equal to threshold  for 4 nsec filter Bit 13: First sample in range >= to threshold for
8 nsec filter Bit 14: First sample in range >= threshold for 16 nsec filter Bit 15: First
sample in range >= threshold  for 32 nsec filter Bit 16: First sample in range >= thresh-
old for 64 nsec filter Bit 17: First sample in range >= threshold for 128 nsec filter
Bit 18: All filters were rejected flag.  0 = FALSE, 1 = TRUE.  This flag will be set to
true (1) if bits 0 through 5 in Range_Status are set. Bits 19-31 are unused spares.
Please see <a href='flags/i_statflags.pdf'> the PDF flag description</a> for more de-
tails. From APID12/13, Offset 120.
Comments:

Product Var Name:     i_gainSet1064
Is element of:        GLA01 Long Waveform Record
Short Description:    AD Gain Setting
Product Data Type:    i2b ( 8)
Total Bytes:          16
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          The receiver gain; results of the gain algorithm. From APID12/13,
Offset 148.
Comments:

Product Var Name:     i_4nsPeakVal
Is element of:        GLA01 Long Waveform Record
Short Description:    4ns Filter Peak value
Product Data Type:    i2b ( 8)
Total Bytes:          16
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Received pulse Peak value for the 4ns filter; returned by the FIR
engine. From APID12/13, Offset 92.
Comments:
```

```
Product Var Name:     i_8nsPeakVal
Is element of:        GLA01 Long Waveform Record
Short Description:    8ns Filter Peak value
Product Data Type:    i2b ( 8)
Total Bytes:          16
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Received pulse Peak value for the 8ns filter; returned by the FIR
engine. From APID12/13, Offset 94.
Comments:

Product Var Name:     i_4nsBgMean
Is element of:        GLA01 Long Waveform Record
Short Description:    Background Mean Value
Product Data Type:    i2b ( 8)
Total Bytes:          16
Product Units:        .01 counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      51200
Description:          Background Noise Mean Value for the 4 ns filter. From APID12/13,
Offset 112.
Comments:

Product Var Name:     i_4nsBgSDEV
Is element of:        GLA01 Long Waveform Record
Short Description:    Background Standard Deviation
Product Data Type:    i2b ( 8)
Total Bytes:          16
Product Units:        .01 counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      51200
Description:          The standard deviation of the background noise for the 4 ns filter.
From APID12/13, Offset 116.
Comments:

Product Var Name:     i_samp_pad
Is element of:        GLA01 Long Waveform Record
Short Description:    Echo Sample Padding
Product Data Type:    i2b ( 8)
Total Bytes:          16
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      544
Description:          Surface echo sample padding.  Number of zero bytes used to pad the
surface echo data samples after averaging. From APID12/13, Offset 152.
Comments:
```

```
Product Var Name:     i_comp_type
Is element of:        GLA01 Long Waveform Record
Short Description:    Echo Compression Type
Product Data Type:    i1b ( 8)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          Surface echo compression type.  Indicates the type of compression
performed.  0 = N, p, and q; 1 = r. From APID12/13, Offset 154.
Comments:

Product Var Name:     i_rng_wf
Is element of:        GLA01 Long Waveform Record
Short Description:    1064 nm Range Waveform
Product Data Type:    i1b (544, 8)
Total Bytes:          4352
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          The 1064 nm echo waveform digitizer sample output, at 544 samples
per shot over land and ice sheet and 200 samples per shot over sea ice and ocean.  The
surface type is determined by the instrument from the on-board DEM.  The digitized data
was averaged according to the waveform compression parameters (M,N) and the compression
ratio (p, q, and r).
Comments:             This has no calibration applied. The calibration is applied inter-
nally during ground science algorithm processing. The calibration constants are avail-
able on ANC07 file.

Product Var Name:     i_gainStatus
Is element of:        GLA01 Long Waveform Record
Short Description:    Gain Status Bits
Product Data Type:    i1b ( 8)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Note that these bits are always set to 0 on the first shot of a
science run and when auto gain is disabled.
bit 0x1:  0 if the gain loop was run for this shot;
             1 if the gain loop was bypassed for this shot;
bit 0x2:  0 if the gain loop did not time out;
             1 if the gain loop timed out and was reset;Comments:

Product Var Name:     i_NumCoinc
Is element of:        GLA01 Long Waveform Record
Short Description:    Number of Coincidences for Selected Filter
Product Data Type:    i1b ( 8)
Total Bytes:          8
```

```
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          The number of coincidences between the selected filter and all oth-
er filters (including itself). This is one of the terms used to calculate the weight of
the selected filter. If no filter is selected, this value is 0.Comments:

Product Var Name:     i_rawPkHt
Is element of:        GLA01 Long Waveform Record
Short Description:    Height of Peak in Raw Waveform
Product Data Type:    i1b ( 8)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          The maximum raw value in a specified range at the end of the return
waveform. This value is used as the input to the gain control loop in place of the 8ns
peak height.Comments:

Product Var Name:     i_spare2
Is element of:        GLA01 Long Waveform Record
Short Description:    Spares
Product Data Type:    i1b (108)
Total Bytes:          108
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spares
Comments:
```

D.1.3 GLA01-Short Record

```
Product Var Name:     i_rec_ndx
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    GLAS Record Index
Product Data Type:    i4b
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Unique index that relates this record to the corresponding
record(s) in each GLAS data product.
Comments:
```

```
Product Var Name:     i_UTCTime
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    Transmit Time of First Shot in frame in J2000
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        seconds, microseconds
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          The transmit time in UTC of the 1st shot in the 1 second frame
referenced to noon on Jan 1, 2000.   The first item is the whole number of seconds ; the
second item is the fractional part in microseconds.
Comments:             This is not the ground bounce time, but the transmit time.

Product Var Name:     i_gla01_rectype
Is element of:        GLA01_Short_Record
Short Description:    GLA01 Record Type
Product Data Type:    i2b
Total Bytes:          2
Product Units:        null
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2
Description:          Record type indicating whether this record is a main=1, long=2, or
short=3 waveform record.
Comments:

Product Var Name:     i_spare1
Is element of:        GLA01_Short_Record
Short Description:    Spares
Product Data Type:    i2b
Total Bytes:          2
Product Units:        null
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spares
Comments:

Product Var Name:     i_filtnum
Is element of:        GLA01_Short_Record
Short Description:    Filter Number
Product Data Type:    i1b ( 20)
Total Bytes:          20
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
```

```
Product Minimum:      0
Product Maximum:      5
Description:          Filter with the highest weight (0 for 4 nsec filter; 1 for 8 nsec
filter; 2 for 16 nsec filter; 3 for 32 nsec filter; 4 for 64 nsec filter; 5 for 128 nsec
filter). May or may not be selectable! If no selectable filter can be chosen, then the
last successful filter, selectable or NOT is chosen. From APID12/13, Offset 104.
Comments:

Product Var Name:     i_shot_ctr
Is element of:        GLA01_Short_Record
Short Description:    Shot Counter
Product Data Type:    i2b ( 20)
Total Bytes:          40
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200
Description:          The shot number for each of the 40 shots in this record. The shot
count rolls over after reaching 200. From APID12/13, Offset 16.
Comments:

Product Var Name:     i_statflags
Is element of:        GLA01_Short_Record
Short Description:    Range Window Status Word
Product Data Type:    i4b ( 20)
Total Bytes:          80
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      262144
Description:           Range Window Status word: Bit 0:  No first crossing found on 4-
nsec filter Bit 1:  No first crossing found on 8-nsec filter Bit 2:  No first crossing
found on 16-nsec filter Bit 3:  No first crossing found on 32-nsec filter Bit 4:  No
first crossing found on 64-nsec filter Bit 5:  No first crossing found on 128-nsec filter
Bit 6:  No second crossing found on 4-nsec filter Bit 7:  No second crossing found on
8-nsec filter Bit 8:  No second crossing found on 6-nsec filter Bit 9:  No second crossing
found on 32-nsec filter Bit 10: No second crossing found on 64-nsec filter Bit 11: No
second crossing found on 128-nsec filter Bit 12: First sample in range greater than or
equal to threshold  for 4 nsec filter Bit 13: First sample in range >= to threshold for
8 nsec filter Bit 14: First sample in range >= threshold for 16 nsec filter Bit 15: First
sample in range >= threshold  for 32 nsec filter Bit 16: First sample in range >= thresh-
old for 64 nsec filter Bit 17: First sample in range >= threshold for 128 nsec filter
Bit 18: All filters were rejected flag.  0 = FALSE, 1 = TRUE.  This flag will be set to
true (1) if bits 0 through 5 in Range_Status are set. Bits 19-31 are unused spares.
Please see <a href='flags/i_statflags.pdf'> the PDF flag description</a> for more de-
tails. From APID12/13, Offset 120.
Comments:

Product Var Name:     i_gainSet1064
Is element of:        GLA01_Short_Record
Short Description:    AD Gain Setting
Product Data Type:    i2b ( 20)
Total Bytes:          40
Product Units:        unitless
Invalid Value/Flag:   i_APID_AvFlg
```

```
Is Correction Flag?:  No
Is Unsigned?:         NA
Product Minimum:      0
Product Maximum:      255
Description:          The receiver gain; results of the gain algorithm. From APID12/13,
Offset 148.
Comments:             This number has calibrations applied so will differ from the value
on the APID12/13.

Product Var Name:     i_4nsPeakVal
Is element of:        GLA01_Short_Record
Short Description:    4ns Filter Peak Value
Product Data Type:    i2b ( 20)
Total Bytes:          40
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Received pulse Peak value for the 4ns filter; returned by the FIR
engine. From APID12/13, Offset 92.
Comments:

Product Var Name:     i_8nsPeakVal
Is element of:        GLA01_Short_Record
Short Description:    8ns Filter Peak Value
Product Data Type:    i2b ( 20)
Total Bytes:          40
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Received pulse Peak value for the 8ns filter; returned by the FIR
engine. From APID12/13, Offset 94.
Comments:

Product Var Name:     i_4nsBgMean
Is element of:        GLA01_Short_Record
Short Description:    Background Mean Value
Product Data Type:    i2b ( 20)
Total Bytes:          40
Product Units:        .01 counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      51200
Description:          Background Noise Mean Value for the 4 ns filter. From APID12/13,
Offset 112.
Comments:

Product Var Name:     i_4nsBgSDEV
Is element of:        GLA01_Short_Record
Short Description:    Background Standard Deviation
Product Data Type:    i2b ( 20)
Total Bytes:          40
```

```
Product Units:        .01 counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      51200
Description:          The standard deviation of the background noise for the 4 ns filter.
From APID12/13, Offset 116
Comments:

Product Var Name:     i_samp_pad
Is element of:        GLA01_Short_Record
Short Description:    Echo Sample Padding
Product Data Type:    i2b ( 20)
Total Bytes:          40
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      544
Description:          Surface echo sample padding. Number of zero bytes used to pad the
surface echo data samples after averaging. From APID12/13, Offset 152.
Comments:

Product Var Name:     i_comp_type
Is element of:        GLA01_Short_Record
Short Description:    Echo Compression Type
Product Data Type:    i1b ( 20)
Total Bytes:          20
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          Surface echo compression type. Indicates the type of compression
performed. 0 = N, p, and q; 1 = r. From APID12/13, Offset 154.
Comments:

Product Var Name:     i_rng_wf
Is element of:        GLA01_Short_Record
Short Description:    1064 nm Range Waveform
Product Data Type:    i1b (200, 20)
Total Bytes:          4000
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          The 1064 nm echo waveform digitizer sample output, at 544 samples
per shot over land and ice sheet and 200 samples per shot over sea ice and ocean.  The
surface type is determined by the instrument from the on-board DEM.  The digitized data
was averaged according to the waveform compression parameters (M,N) and the compression
ratio (p, q, and r).
Comments:             This has no calibration applied. The calibration is applied inter-
nally during ground science algorithm processing. The calibration constants are avail-
able on ANC07 file.
```

```
Product Var Name:     i_gainStatus
Is element of:        GLA01_Short_Record
Short Description:    Gain Status Bits
Product Data Type:    i1b ( 20)
Total Bytes:          20
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         NA
Product Minimum:      0
Product Maximum:      255
Description:          Note that these bits are always set to 0 on the first shot of a
science run and when auto gain is disabled.
bit 0x1:  0 if the gain loop was run for this shot;
              1 if the gain loop was bypassed for this shot;
bit 0x2:  0 if the gain loop did not time out;
              1 if the gain loop timed out and was reset;Comments:

Product Var Name:     i_NumCoinc
Is element of:        GLA01_Short_Record
Short Description:    Number of Coincidences for Selected Filter
Product Data Type:    i1b ( 20)
Total Bytes:          20
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          The number of coincidences between the selected filter and all oth-
er filters (including itself). This is one of the terms used to calculate the weight of
the selected filter. If no filter is selected, this value is 0.Comments:

Product Var Name:     i_rawPkHt
Is element of:        GLA01_Short_Record
Short Description:    Height of Peak in Raw Waveform
Product Data Type:    i1b ( 20)
Total Bytes:          20
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          The maximum raw value in a specified range at the end of the return
waveform. This value is used as the input to the gain control loop in place of the 8ns
peak height.Comments:

Product Var Name:     i_spare2
Is element of:        GLA01_Short_Record
Short Description:    Spares
Product Data Type:    i1b (184)
Total Bytes:          184
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
```

```
Product Maximum:      0
Description:          Spares
Comments:
```

D.1.4 GLA02 Record

```
Product Var Name:     i_rec_ndx
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    GLAS Record Index
Product Data Type:    i4b
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Unique index that relates this record to the corresponding
record(s) in each GLAS data product.
Comments:

Product Var Name:     i_UTCTime
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    Transmit Time of First Shot in frame in J2000
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        seconds, microseconds
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          The transmit time in UTC of the 1st shot in the 1 second frame
referenced to noon on Jan 1, 2000.   The first item is the whole number of seconds ; the
second item is the fractional part in microseconds.
Comments:             This is not the ground bounce time, but the transmit time.

Product Var Name:     i1_pred_lat
Is element of:        GLA01 Main Record , GLA02 Record
Short Description:    Predicted geodetic Latitude of the laser footprint
Product Data Type:    i4b
Total Bytes:          4
Product Units:        microdegrees
Invalid Value/Flag:   gi_invalid_i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -90000000
Product Maximum:      90000000
Description:          The geodetic Latitude of the laser footprint; obtained from the
predicted orbit; assuming the laser is nadir pointing.
Comments:
```

```
Product Var Name:     i1_pred_lon
Is element of:        GLA01 Main Record , GLA02 Record
Short Description:    Predicted geodetic Longitude of the laser footprint
Product Data Type:    i4b
Total Bytes:          4
Product Units:        microdegrees
Invalid Value/Flag:   gi_invalid_i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      360000000
Description:          The geodetic Longitude of the laser footprint; obtained from the
predicted orbit; assuming the laser is nadir pointing.
Comments:

Product Var Name:     i_DEMmin
Is element of:        GLA02 Record
Short Description:    DEM minimum
Product Data Type:    i2b
Total Bytes:          2
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      12000
Description:          Onbroard spacecraft DEM minimum elevation used to calculate hmin.
From APID19, Offset 1192.Comments:

Product Var Name:     i_DEMmax
Is element of:        GLA02 Record
Short Description:    DEM maximum
Product Data Type:    i2b
Total Bytes:          2
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      12000
Description:          Onboard spacecraft DEM maximum elevation used to calculate hmax.
From APID19, Offset 1193.Comments:

Product Var Name:     i_g_lid_qf
Is element of:        GLA02 Record
Short Description:    532 nm LIDAR Data Quality Flag
Product Data Type:    i1b (12)
Total Bytes:          12
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      3
Description:          532 nm lidar data quality flag. 2 bits per shot for the 40 HZ pro-
file; 2 bits per sum for the 5 Hz profile, 2 bits for the 1 Hz profile for a total of
92 bits.  There are 4 spare bits.  A value of 3 indicates the background data is out of
bounds (0-100).
```

Please see <a href='flags/i_g_lid_qf.pdf'> the PDF flag description</a> for more details.Comments:

Product Var Name: i40_g_lid
Is element of: GLA02 Record
Short Description: 532 nm LIDAR Data from 10 KM to -1 KM
Product Data Type: i4b (148, 40)
Total Bytes: 23680
Product Units: ((pe/bin)KM^2)/J)/1000
Invalid Value/Flag: i4b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 100000000
Description: The normalized lidar signal from the 532 nm photon counting channel for the 10 KM to -1 segment of the atmosphere. Background subtraction, range squared, and dead time correction is applied. NOTES: pe = photons; J = Joules.Comments:

Product Var Name: i5_g_lid
Is element of: GLA02 Record
Short Description: 532 nm LIDAR Data from 20 KM to 10 KM
Product Data Type: i4b (132, 5)
Total Bytes: 2640
Product Units: ((pe/bin)KM^2)/J)/1000
Invalid Value/Flag: i4b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 100000000
Description: The normalized lidar signal from the 532 nm photon counting channel for the 20 KM to 10 KM segment of the atmosphere. Background subtraction, range squared, and dead time correction is applied. Sums of 8 samples.Comments:

Product Var Name: i1_g_lid
Is element of: GLA02 Record
Short Description: 532 nm LIDAR Data from 40 KM to 20 KM
Product Data Type: i4b (268)
Total Bytes: 1072
Product Units: ((pe/bin)KM^2)/J)/1000
Invalid Value/Flag: i4b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 100000000
Description: The normalized lidar signal from the 532 nm photon counting channel for the 40 KM to 20 KM segment of the atmosphere. Background subtraction, range squared, and dead time correction is applied.Comments:

Product Var Name: i40_g_sat_f
Is element of: GLA02 Record
Short Description: 532 nm Saturation Flag for 10 to -1 KM Segment
Product Data Type: i1b (740)
Total Bytes: 740
Product Units: n/a
Invalid Value/Flag: no
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 1

```
Description:          Bit flag indicating whether the 532 nm signal is saturated or not
for the 10 to -1 KM profile.  0 = not saturated, 1 = saturated.  1 bit flag per each bin
in the profile.  There are 148 bins in the profile and the profiles occur at 40 per
second for a total of 5920 flags (148 * 40) per second.  Bits 0-147 are the flags for
shot 1, Bits 148-295 are the flags for shot 2, etc.
Please see <a href='flags/i40_g_sat_f.pdf'> the PDF flag description</a> for more de-
tails.Comments:

Product Var Name:     i5_g_sat_f
Is element of:        GLA02 Record
Short Description:    532 nm Saturation Flag for 20 to 10 KM Segment
Product Data Type:    i1b (84)
Total Bytes:          84
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      1
Description:          Bit flag indicating whether the 532 nm signal is saturated or not
for the 20 to 10 KM Profile.  0 = not saturated, 1 = saturated. There is one flag per
each bin in the profile.  There are 132 bins in a profile and the profiles are summed
over 8 shots for a total of 660 flags (132 * 5) per second.  Bits 0-131 are the flags
for shots 1-8, Bits 132-263 are the flags for shots 9-16, etc.  The upper 12 bits are
spares.
Please see <a href='flags/i5_g_sat_f.pdf'> the PDF flag description</a> for more de-
tails.Comments:

Product Var Name:     i1_g_sat_f
Is element of:        GLA02 Record
Short Description:    532 nm Saturation Flag for 40 to 20 KM Segment
Product Data Type:    i1b (36)
Total Bytes:          36
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      1
Description:          Bit flag indicating whether the 532 nm signal is saturated or not
for the 40 to 20 KM Segment.  0 = not saturated, 1 = saturated.   There is one flag per
each bin in the profile.  There are 268 bins in a profile and the profile is summed over
the 40 shots in a second for a total of 268 flags (268 * 1) per second.   The upper 20
bits are spares.
Please see <a href='flags/i1_g_sat_f.pdf'> the PDF flag description</a> for more de-
tails.Comments:

Product Var Name:     i40_g_TxNrg_EU
Is element of:        GLA02 Record, GLA07 Record
Short Description:    532 nm Laser Transmit Energy at 40 Hz
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        Joules * 1.0d5
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      4500
Description:          The 532 nm transmitted pulse energy in energy units, converted from
```

```
the counts from the transmitted energy monitor.Comments: Not valid if APID19 is miss-
ing.

Product Var Name:     i5_g_TxNrg_EU
Is element of:        GLA02 Record, GLA07 Record
Short Description:    532 nm Laser Transmit Energy at 5 Hz
Product Data Type:    i4b ( 5)
Total Bytes:          20
Product Units:        Joules * 1.0d5
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      4500
Description:          The 532 nm transmitted pulse energy in energy units, converted from
the counts from the transmitted energy monitor.  Averaged over 8 shots.Comments: Not
valid if APID19 is missing.

Product Var Name:     i1_g_TxNrg_EU
Is element of:        GLA02 Record
Short Description:    532 nm Laser Transmit Energy at 1 Hz
Product Data Type:    i4b
Total Bytes:          4
Product Units:        Joules * 1.0d5
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      4500
Description:          The 532 nm transmitted pulse energy in energy units, converted from
the counts from the transmitted energy monitor.  Averaged over 40 shots.Comments:

Product Var Name:     i_g_IntRet
Is element of:        GLA02 Record
Short Description:    532 nm Integrated Return, 40 to 20 KM
Product Data Type:    i4b
Total Bytes:          4
Product Units:        photons*100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      500000
Description:          Sum of raw photon counts (after background is subtracted) over the
20 to 40 km bins.Comments:

Product Var Name:     i_Rng2PCProf
Is element of:        GLA02 Record
Short Description:    Start Range of 532 nm Backscatter Profile
Product Data Type:    i4b
Total Bytes:          4
Product Units:        centimeters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      50000000
Product Maximum:      70000000
Description:          The range from the spacecraft to the start of the 532 nm backscat-
ter profile - the start of the 40 KM segment of Lidar Data.Comments: Not valid if
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APID19 is missing.

Product Var Name:     i_Rng_PkRt
Is element of:        GLA02 Record
Short Description:    Range from spacecraft to peak of return
Product Data Type:    i4b
Total Bytes:          4
Product Units:        centimeters
Invalid Value/Flag:   gi_invalid_i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      50000000
Product Maximum:      70000000
Description:          Range calculated from the spacecraft to the location of the peak
as returned in the telemetry (ground).
Comments:

Product Var Name:     i40_g_bg
Is element of:        GLA02 Record, GLA07 Record
Short Description:    532 nm Background at 40 Hz
Product Data Type:    i4b (4, 40)
Total Bytes:          640
Product Units:        photons/bin * 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      100000
Description:          The normalized 532 nm background counts from upper (1) and lower
(2) integration intervals.(3) is background used to compute NRB.Comments: Not valid if
APID15 is missing.

Product Var Name:     i5_g_bg
Is element of:        GLA02 Record, GLA07 Record
Short Description:    532 nm Background at 5 Hz
Product Data Type:    i4b (4, 5)
Total Bytes:          80
Product Units:        photons/bin * 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      100000
Description:          The normalized 532 nm background counts from upper (1) and lower
(2) integration intervals.(3) is background used to compute NRB. Averaged over 8
shots.Comments:       Not valid if APID15 is missing.

Product Var Name:     i1_g_bg
Is element of:        GLA02 Record, GLA07 Record
Short Description:    532 nm Background at 1 Hz
Product Data Type:    i4b (4)
Total Bytes:          16
Product Units:        photons/bin * 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      100000
Description:          The normalized 532 nm background counts from upper (1) and lower
```

```
(2) integration intervals.(3) is background used to compute NRB. Averaged over 40
shots.Comments:       Not valid if APID15 is missing.

Product Var Name:     i_gPredCldTop
Is element of:        GLA02 Record
Short Description:    532 nm Predicted Cloud Top Height at 5Hz
Product Data Type:    i2b ( 5)
Total Bytes:          10
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      30000
Description:          The predicted height of the first cloud above local ground, pre-
dicted from the 532 nm lidar signal.Comments:

Product Var Name:     i_g_shot_ctr
Is element of:        GLA02 Record
Short Description:    532 nm LIDAR Data Shot Counter
Product Data Type:    i2b
Total Bytes:          2
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200
Description:          Corresponds to first value of the 40 -1 km to 10 km aerosol science
data. From APID15, Offset 14.
Comments:

Product Var Name:     i_SpcmBg2Del
Is element of:        GLA02 Record
Short Description:    SPCM Background 2 Delay
Product Data Type:    i2b
Total Bytes:          2
Product Units:        nanoseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          The delay for the background #2 as read from the photon counter
board. From APID19, Offset 586.
Comments:

Product Var Name:     i_SpcmRngDel
Is element of:        GLA02 Record
Short Description:    SPCM Range Delay
Product Data Type:    i2b
Total Bytes:          2
Product Units:        nanoseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          The delay for the range gate as read from the photon counter board.
```

This is the delay from the fire acknowledge to the start of data collection for the 40 KM profile.Comments:

Product Var Name: i_SpcmGateDel
Is element of: GLA02 Record
Short Description: SPCM Gate Delay
Product Data Type: i2b
Total Bytes: 2
Product Units: nanoseconds
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 65535
Description: The SPCM Gate Delay from the photon counter board. This is the delay from the fire acknowledge prior to to enabling the SPCMs.Comments:

Product Var Name: i_SpcmBg1Del
Is element of: GLA02 Record
Short Description: SPCM Background 1 Delay
Product Data Type: i2b
Total Bytes: 2
Product Units: nanoseconds
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 65535
Description: The Background #1 Delay from the photon counter board.Comments:

Product Var Name: i_spcm_stat
Is element of: GLA02 Record
Short Description: SPCM Status
Product Data Type: i2b
Total Bytes: 2
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 65280
Description: The status of the SPCM as read from the photon counter board. The Photon Counter Bd address 0xXX800004.
Comments:

Product Var Name: i_g_TxNrg_Cts
Is element of: GLA02 Record
Short Description: 532 nm Laser Transmit Energy, counts
Product Data Type: i1b (40)
Total Bytes: 40
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: The 532 nm transmitted pulse energy, in raw counts from the transmitted pulse energy monitor.Comments:

```
Product Var Name:     i_g_TxNrg_qf
Is element of:        GLA02 Record, GLA07 Record
Short Description:    532 nm Laser Transmit Energy Quality Flag
Product Data Type:    i1b (10)
Total Bytes:          10
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      3
Description:          Evaluation of the 532 nm laser transmit energy which is an indi-
cation of the laser health; 2 bits per shot for 40 shots; 1 = full laser energy, 2 =
marginal laser energy, 3 = deficient laser energy, 0 = not used.
Please see <a href='flags/i_g_TxNrg_qf.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_g_IntRet_qf
Is element of:        GLA02 Record
Short Description:    Integrated Return Quality Flag
Product Data Type:    i1b
Total Bytes:          1
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      5
Description:          Assessment of the integrated return value; indicator of boresight
accuracy and signal strength. 0 = unused, 1 = excellent, 2 = good, 3 = marginal, 4 =
poor, 5 = bad data.
Please see <a href='flags/i_g_IntRet_qf.pdf'> the PDF flag description</a> for more de-
tails.Comments:

Product Var Name:     i_spare2
Is element of:        GLA02 Record
Short Description:    Spares
Product Data Type:    i1b
Total Bytes:          1
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
Description:          Not used
Comments:

Product Var Name:     i_ir_lid_qf
Is element of:        GLA02 Record
Short Description:    1064 nm LIDAR Data Quality Flag
Product Data Type:    i1b (12)
Total Bytes:          12
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
```

```
Product Maximum:     3
Description:         1064 nm lidar data quality flag. 2 bits per shot for the 40 HZ
profile; 2 bits per sum for the 5 Hz profile for a total of 90 bits.  The upper 6 bits
are spares. A value of 3 indicates the background data is out of bounds (0-255).
Please see <a href='flags/i_ir_lid_qf.pdf'> the PDF flag description</a> for more de-
tails.Comments:

Product Var Name:    i_ir_shot_ctr
Is element of:       GLA02 Record
Short Description:   1064 nm Cloud Digitizer Shot Counter
Product Data Type:   i2b
Total Bytes:         2
Product Units:       n/a
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     200
Description:         Shot number corresponding to first value of the 40 -1 km to 10 km
cloud digitizer data.
Comments:

Product Var Name:    i_spcm_cts
Is element of:       GLA02 Record
Short Description:   SPCM Raw Counts
Product Data Type:   i1b (8)
Total Bytes:         8
Product Units:       n/a
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     255
Description:         The raw counts for each photon counter (1-8) from the S? Photon
Counter Module.Comments:

Product Var Name:    i_pc_rbias
Is element of:       GLA02 Record
Short Description:   Photon Counter Range Bias
Product Data Type:   i4b
Total Bytes:         4
Product Units:       n/a
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     -1000000
Product Maximum:     1000000
Description:         The range bias of the photon counter; always positive.
Comments:

Product Var Name:    i40_ir_TxNrgEU
Is element of:       GLA02 Record, GLA07 Record
Short Description:   1064 nm Laser Transmit Energy at 40 Hz
Product Data Type:   i4b ( 40)
Total Bytes:         160
Product Units:       Joules * 1.0d5
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
```

```
Product Minimum:      0
Product Maximum:      9000
Description:          The 1064 nm laser pulse energy, computed from the digitized out-
going pulse and the detector temperature.Comments: Not valid if APID19 and APID12 or
APID13 are missing.

Product Var Name:     i5_ir_TxNrgEU
Is element of:        GLA02 Record, GLA07 Record
Short Description:    1064 nm Laser Transmit Energy at 5 Hz
Product Data Type:    i4b ( 5)
Total Bytes:          20
Product Units:        Joules * 1.0d5
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      9000
Description:          The 1064 nm laser pulse energy, computed from the digitized out-
going pulse and the detector temperature. Averaged over 8 shots.Comments: Not valid if
APID19 and APID12 or APID13 are missing.

Product Var Name:     i_rng2CDProf
Is element of:        GLA02 Record
Short Description:    Start Range of the 1064 nm Backscatter Profile
Product Data Type:    i4b
Total Bytes:          4
Product Units:        centimeters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      50000000
Product Maximum:      70000000
Description:          The range from the spacecraft to the start of the 1064 nm back-
scatter profile - the start of the 20 KM segment of Lidar Data.Comments:

Product Var Name:     i40_ir_bg
Is element of:        GLA02 Record, GLA07 Record
Short Description:    1064 nm Background at 40 Hz
Product Data Type:    i4b (4, 40)
Total Bytes:          640
Product Units:        W*1.0d17
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -100000000
Product Maximum:      100000000
Description:          The normalized 1064 nm background counts from upper (1) and lower
(2) integration intervals.(3) is background used to compute NRB.
Comments:             Not valid if APID17 is missing.

Product Var Name:     i5_ir_bg
Is element of:        GLA02 Record, GLA07 Record
Short Description:    1064 nm Background at 5 Hz
Product Data Type:    i4b (4, 5)
Total Bytes:          80
Product Units:        W*1.0d17
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
```

```
Product Minimum:      -100000000
Product Maximum:      100000000
Description:          The normalized 1064 nm background counts from upper (1) and lower
(2) integration intervals.(3) is background used to compute NRB. Averaged over 8 shots.
Comments:             Not valid if APID15 is missing.

Product Var Name:     i40_ir_lid
Is element of:        GLA02 Record
Short Description:    1064 nm LIDAR Data from 10 KM to -1 KM
Product Data Type:    i4b (148, 40)
Total Bytes:          23680
Product Units:        (W*KM^2)/J)*1.0d8
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000000000
Product Maximum:      1000000000
Description:          The normalized lidar signal from the 1064 nm cloud digitizer data
for the 10 KM to -1 KM atmospheric segment. Background subtraction, and range squared
correction is applied.
Comments:

Product Var Name:     i5_ir_lid
Is element of:        GLA02 Record
Short Description:    1064 nm LIDAR Data from 20 KM to 10 KM
Product Data Type:    i4b (132, 5)
Total Bytes:          2640
Product Units:        (W*KM^2)/J)*10^8
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000000000
Product Maximum:      1000000000
Description:          The normalized lidar signal from the 1064 nm cloud digitizer data
for the 20 KM to 10 KM atmospheric segment. Background subtraction, and range squared
correction is applied.
Comments:

Product Var Name:     i_CdBg2_Del
Is element of:        GLA02 Record
Short Description:    Cloud Digitizer Background 2 Delay
Product Data Type:    i2b
Total Bytes:          2
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          The delays for background #2 and the range gate from the cloud dig-
itizer board.Comments:

Product Var Name:     i_RngGate_Del
Is element of:        GLA02 Record
Short Description:    Cloud Digitizer Range Gate Delay
Product Data Type:    i2b
Total Bytes:          2
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
```

```
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          The delays for background #2 and the range gate from the cloud dig-
itizer board.Comments:

Product Var Name:     i_cd_bg1_del
Is element of:        GLA02 Record
Short Description:    Cloud Digitizer Background 1 Delay
Product Data Type:    i2b
Total Bytes:          2
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          The delay for background #1 from the cloud digitizer board.Com-
ments:

Product Var Name:     i_cd_det_stat
Is element of:        GLA02 Record
Short Description:    Cloud Digitizer Detector Status
Product Data Type:    i2b
Total Bytes:          2
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          Status of the detector from the cloud digitizer board.Comments:

Product Var Name:     i_cd_rbias
Is element of:        GLA02 Record
Short Description:    Cloud Digitizer Range Bias
Product Data Type:    i4b
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000000
Product Maximum:      1000000
Description:          The range bias from the cloud digitizer; always positive.
Comments:

Product Var Name:     i_cd_ad_out
Is element of:        GLA02 Record
Short Description:    A/D Output
Product Data Type:    i1b
Total Bytes:          1
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
```

```
Description:          The output from the A/D converter; from the cloud digitizer board.
Used for to diagnose problems with the analog path.Comments:

Product Var Name:     i_cd_att_set
Is element of:        GLA02 Record
Short Description:    Attentuation Setting
Product Data Type:    i1b
Total Bytes:          1
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          The attentuation setting from the cloud digitizer board. Comments:

Product Var Name:     i_CldPkSig
Is element of:        GLA02 Record
Short Description:    Cloud Return Peak Signal
Product Data Type:    i1b ( 5)
Total Bytes:          5
Product Units:        photons / bin
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32
Description:          Peak photon count in the 532 nm backscatter data within the range
for cloud returns; at the 5 Hz rate.Comments:

Product Var Name:     i_gndret_pksig
Is element of:        GLA02 Record
Short Description:    Ground Return Peak Signal
Product Data Type:    i1b ( 5)
Total Bytes:          5
Product Units:        photons / bin
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32
Description:          Peak photon count in the 532 nm backscatter data.  It is assumed
that a ground return causes the maximum signal; at the 5 Hz rate.Comments:

Product Var Name:     i_gnd_ret_loc
Is element of:        GLA02 Record
Short Description:    Ground Return Location
Product Data Type:    i1b ( 5)
Total Bytes:          5
Product Units:        bin number
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32
Description:          Bin number (from the end of the profile) of the estimated ground
return peak signal; at the 5 Hz rate.Comments:

Product Var Name:     i_et_cal_mode
```

```
Is element of:        GLA02 Record
Short Description:    Etalon Calibration  - Current mode
Product Data Type:    i1b
Total Bytes:          1
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3
Description:          Current mode of Etalon calibration: 0 = Off, 1 = Acquire, 2 = Track-
ing, 3 = Invalid.
Comments:

Product Var Name:     i_ir_TxNrg_qf
Is element of:        GLA02 Record, GLA07 Record
Short Description:    1064 nm Laser Transmit Energy Quality Flag
Product Data Type:    i1b (10)
Total Bytes:          10
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      3
Description:          Evaluation of the 1064 nm laser transmit energy which is an indi-
cation of the laser health; 2 bits per shot for 40 shots; 1 = full laser energy, 2 =
marginal laser energy, 3 = deficient laser energy, 0 = not used.
Please see <a href='flags/i_ir_TxNrg_qf.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_EtHtrC37j_c
Is element of:        GLA02 Record, GLA03 Main Record
Short Description:    Etalon Heater Current, Ch 37j
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2500
Description:          Etalon Heater Current, Ch 37j
Comments:

Product Var Name:     i_EtC37d_t
Is element of:        GLA02 Record, GLA03 Main Record
Short Description:    Etalon Temperature, Ch 37d
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      3000
Description:          Etalon Temperature, Ch 37dComments:
```

```
Product Var Name:     i_ETsettleTime
Is element of:        GLA02 Record
Short Description:    Etalon Temperature Settle Time
Product Data Type:    i2b
Total Bytes:          2
Product Units:        seconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          The commanded time the software will wait after a temperature set-
point is sent to the etalon heater. Integer units in seconds. Applies only to tracking
mode.
Comments:

Product Var Name:     i_et_Flags
Is element of:        GLA02 Record
Short Description:    Etalon Flags
Product Data Type:    i1b
Total Bytes:          1
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Etalon Flags.
Comments:

Product Var Name:     i_et_update_ctr
Is element of:        GLA02 Record
Short Description:    Etalon Averaging Update Counter
Product Data Type:    i1b
Total Bytes:          1
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Etalon averaging update counter.Comments:

Product Var Name:     i_et_StartTemp
Is element of:        GLA02 Record
Short Description:    Start Temperature
Product Data Type:    i1b
Total Bytes:          1
Product Units:        Celsius
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Start TemperatureComments:

Product Var Name:     i_et_StopTemp
Is element of:        GLA02 Record
Short Description:    Stop Temperature
```

```
Product Data Type:    i1b
Total Bytes:          1
Product Units:        Celsius
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Stop Temperature.Comments:

Product Var Name:     i_et_TempStep
Is element of:        GLA02 Record
Short Description:    Temperature Step
Product Data Type:    i1b
Total Bytes:          1
Product Units:        Celsius
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Temperature StepComments:

Product Var Name:     i_et_spare
Is element of:        GLA02 Record
Short Description:    Spares
Product Data Type:    i1b ( 3)
Total Bytes:          3
Product Units:        NA
Invalid Value/Flag:   NA
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:
Comments:

Product Var Name:     i_et_acqavg_tm
Is element of:        GLA02 Record
Short Description:    Etalon Averaging time for acquire command
Product Data Type:    i1b
Total Bytes:          1
Product Units:        seconds
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Etalon Averaging Time for Acquire Command.Comments:

Product Var Name:     i_spare6
Is element of:        GLA02 Record
Short Description:    Spare
Product Data Type:    i1b
Total Bytes:          1
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
```

```
Product Minimum:      0
Product Maximum:      0
Description:
Comments:

Product Var Name:     i_et_temperr
Is element of:        GLA02 Record
Short Description:    Etalon Temperature Error
Product Data Type:    i4b
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Etalon Temperature Error.
Comments:

Product Var Name:     i_ET_state
Is element of:        GLA02 Record
Short Description:    Etalon State
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3
Description:          State of the etalon: 0 = Init, 1 = Set Temp, 2 = Wait, 3 = Average
Comments:

Product Var Name:     i_spare3
Is element of:        GLA02 Record
Short Description:    Spares
Product Data Type:    i1b
Total Bytes:          1
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
Description:          Not used
Comments:

Product Var Name:     i_et_acqset_tm
Is element of:        GLA02 Record
Short Description:    Etalon Temperature Settle time for acquire cmd
Product Data Type:    i2b
Total Bytes:          2
Product Units:        seconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32767
Description:          Etalon Temperature Settle Time for acquire cmd.
```

```
Comments:

Product Var Name:     i_et_onax_xmit
Is element of:        GLA02 Record
Short Description:    Etalon Averaged on-axis Transmission
Product Data Type:    i4b
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Etalon Averaged on-axis Transmission.
Comments:

Product Var Name:     i_et_offax_xmit
Is element of:        GLA02 Record
Short Description:    Etalon Averaged off-axis Transmission
Product Data Type:    i4b
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Etalon Averaged off-axis Transmission.
Comments:

Product Var Name:     i_et_trkfltout
Is element of:        GLA02 Record
Short Description:    Etalon Tracking Loop Filter output
Product Data Type:    i4b
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Etalon Tracking Loop Filter output.Comments:

Product Var Name:     i_et_trkfltavg
Is element of:        GLA02 Record
Short Description:    Etalon Tracking Failure Average
Product Data Type:    i4b
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Etalon Tracking Failure Average
Comments:

Product Var Name:     i_APID_AvFlg
Is element of:        GLA01 Main Record , GLA02 Record, GLA04 BST Main Record, GLA04 GYRO
```

```
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record,
GLA14 Record, GLA15 Record
Short Description:    APID Data Availability Flag
Product Data Type:    i1b (8)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          Flag indicating which packets (APIDs) for each second are available
missing, or filled.  APID 19 is broken down further into Altimeter Digitizer, Photon
Counter, Cloud Digitizer, GPS/DEM, and C&T sections.
Please see <a href='flags/i_APID_AvFlg.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_OrbFlg
Is element of:        GLA01 Main Record , GLA02 Record, GLA05 record, GLA06 record, GLA07
Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    POD flag (Orbit Flag)
Product Data Type:    i1b (2)
Total Bytes:          2
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      128
Description:          Denotes quality of orbit, whether predicted or precision, loss of
GPS data, maneuver-degraded, etc.
Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name:     i_HoffMin
Is element of:        GLA02 Record
Short Description:    Offset to minimum DEM height
Product Data Type:    i2b
Total Bytes:          2
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      12000
Description:          Offset to minimum DEM height used in flight algorithm
Comments:

Product Var Name:     i_Hsat
Is element of:        GLA02 Record
Short Description:    Geodetic altitude of satellite above earth
Product Data Type:    i4b
Total Bytes:          4
Product Units:        centimeters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
```

```
Product Minimum:      50000000
Product Maximum:      70000000
Description:          Geodetic altitude of satellite above earth’s surface computed in
real time by the GLAS flight algorithm.
Comments:

Product Var Name:     i_4nsBgMean
Is element of:        GLA02 Record
Short Description:    4ns Background Mean Value
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      65536
Description:          4ns Filter Background mean
Comments:

Product Var Name:     i_4nsBgSDev
Is element of:        GLA02 Record
Short Description:    4ns Background Standard Deviation
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      65536
Description:          4ns filter background standard deviation.
Comments:

Product Var Name:     i_DualPinA
Is element of:        GLA02 Record
Short Description:    Dual Pin A data
Product Data Type:    i1b ( 40)
Total Bytes:          40
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  No
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Dual Pin A data (from APID19, offset 1248)Comments:

Product Var Name:     i_DualPinB
Is element of:        GLA02 Record
Short Description:    Dual Pin B Data
Product Data Type:    i1b ( 40)
Total Bytes:          40
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  No
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Dual Pin B data from APID19, Offset 1288
```

```
Comments:

Product Var Name:     i_spare4
Is element of:        GLA02 Record
Short Description:    Spares
Product Data Type:    i1b
Total Bytes:          1
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
Description:          Not used
Comments:

Product Var Name:     i_DitheringEnabledFlag
Is element of:        GLA02 Record, GLA07 Record
Short Description:    Dithering Enabled Flag
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  Yes
Is Unsigned?:         NA
Product Minimum:      0
Product Maximum:      1
Description:          0=FALSE, 1=TRUEComments: Not valid if APID15 is missing.

Product Var Name:     i_timecorflg
Is element of:        GLA01 Main Record , GLA02 Record, GLA03 Main Record, GLA04 BST Main
Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS
Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08
Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    time correction flag
Product Data Type:    i2b
Total Bytes:          2
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32767
Description:          Indicates what instrument or bias corrections were applied to the
times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag descrip-
tion</a> for more details.
Comments:

Product Var Name:     spare5
Is element of:        GLA02 Record
Short Description:    Spare 5
Product Data Type:    i1b (12)
Total Bytes:          12
Product Units:        n/a
Invalid Value/Flag:   n/a
Is Correction Flag?:  NA
Is Unsigned?:         NA
Product Minimum:      n/a
```

```
Product Maximum:      n/a
Description:
Comments:
```

D.1.5 GLA03 Main Record

```
Product Var Name:     i_rec_ndx
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    GLAS Record Index
Product Data Type:    i4b
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Unique index that relates this record to the corresponding
record(s) in each GLAS data product.
Comments:

Product Var Name:     i_UTCTime
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    Transmit Time of First Shot in frame in J2000
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        seconds, microseconds
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          The transmit time in UTC of the 1st shot in the 1 second frame
referenced to noon on Jan 1, 2000.   The first item is the whole number of seconds ; the
second item is the fractional part in microseconds.
Comments:             This is not the ground bounce time, but the transmit time.

Product Var Name:     i_phdr_20
Is element of:        GLA03 Main Record
Short Description:    Primary Header  APID 20
Product Data Type:    i1b (6, 4)
Total Bytes:          24
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Primary Header  APID 20Comments:

Product Var Name:     i_shdr_20
```

```
Is element of:        GLA03 Main Record
Short Description:    Secondary Header APID 20 (time stamp)
Product Data Type:    i1b (8, 4)
Total Bytes:          32
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Secondary Header APID 20 (time stamp)Comments:

Product Var Name:     i_g_nrg
Is element of:        GLA03 Main Record
Short Description:    532 Energy Throughput
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Percent X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      100
Description:          532 Energy
Comments:

Product Var Name:     i_Lsr1Osc_t
Is element of:        GLA03 Main Record
Short Description:    Laser Oscillator Temperature
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3000
Description:          Laser Oscillator Temperature
Comments:

Product Var Name:     i_Lsr1Dblr_t
Is element of:        GLA03 Main Record
Short Description:    Laser Doubler Temperature
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3000
Description:          Laser Doubler Temperature
Comments:

Product Var Name:     i_LMB1Ref_t
Is element of:        GLA03 Main Record
Short Description:    LMB Reference Temperature
Product Data Type:    i2b ( 4)
Total Bytes:          8
```

```
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3000
Description:          Laser Monitor Board (LMB) Reference Temperature
Comments:

Product Var Name:     i_L1Elec_t
Is element of:        GLA03 Main Record
Short Description:    Electronics Temperature
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3000
Description:          Electronics Temperature (MEU)
Comments:

Product Var Name:     i_LsrOsc_c
Is element of:        GLA03 Main Record
Short Description:    Laser Oscillator Current
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Amps
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      105
Product Maximum:      145
Description:          Laser Osc Current
Comments:

Product Var Name:     i_LsrAmp_c
Is element of:        GLA03 Main Record
Short Description:    Laser Amplifier Current
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Amps
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      105
Product Maximum:      145
Description:          Laser Amp Current
Comments:

Product Var Name:     i_LsrDr_pw
Is element of:        GLA03 Main Record
Short Description:    Laser Drive Pulse Width
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        pw in microsec
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
```

```
Is Unsigned?:         No
Product Minimum:      105
Product Maximum:      145
Description:          Laser Dr Pulse Width
Comments:

Product Var Name:     i_Lsr2Osc_t
Is element of:        GLA03 Main Record
Short Description:    Oscillator Temperature
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3000
Description:
Comments:

Product Var Name:     i_Lsr2Dblr_t
Is element of:        GLA03 Main Record
Short Description:    Laser Doubler Temperature
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3000
Description:
Comments:

Product Var Name:     i_LMB2Ref_t
Is element of:        GLA03 Main Record
Short Description:    LMB Reference Temperature
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3000
Description:
Comments:

Product Var Name:     i_L2Elect_t
Is element of:        GLA03 Main Record
Short Description:    Electronics Temperature
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3000
```

```
Description:
Comments:

Product Var Name:     i_Lsr3Osc_t
Is element of:        GLA03 Main Record
Short Description:    Oscillator Temperature
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3000
Description:
Comments:

Product Var Name:     i_Lsr3Dblr_t
Is element of:        GLA03 Main Record
Short Description:    Laser Doubler Temperature
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3000
Description:
Comments:

Product Var Name:     i_LMB3Ref_t
Is element of:        GLA03 Main Record
Short Description:    LMB Reference Temperature
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3000
Description:
Comments:

Product Var Name:     i_L3Elect_t
Is element of:        GLA03 Main Record
Short Description:    Electronics Temperature
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3000
Description:
Comments:
```

```
Product Var Name:     i_PrimAD550v
Is element of:        GLA03 Main Record
Short Description:    Primary Altimeter Detector 550V Voltage
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      53500
Product Maximum:      56500
Description:          Primary Altimeter Detector 550 V
Comments:

Product Var Name:     i_SecAD550v
Is element of:        GLA03 Main Record
Short Description:    Secondary Altimeter Detector 550V Voltage
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      53500
Product Maximum:      56500
Description:          Secondary Altimeter Detector 550 V
Comments:

Product Var Name:     i_spcm1_550v
Is element of:        GLA03 Main Record
Short Description:    SPCM Detector #1 550V Voltage
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      53500
Product Maximum:      56500
Description:          SPCM Detector #1 550 V
Comments:

Product Var Name:     i_spcm2_550v
Is element of:        GLA03 Main Record
Short Description:    SPCM Detector #2 550V Voltage
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      53500
Product Maximum:      56500
Description:          SPCM Detector #2 550 V
Comments:

Product Var Name:     i_spcm3_550v
Is element of:        GLA03 Main Record
Short Description:    SPCM Detector #3 550V Voltage
```

```
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      53500
Product Maximum:      56500
Description:          SPCM Detector #3 550 V
Comments:

Product Var Name:     i_spcm4_550v
Is element of:        GLA03 Main Record
Short Description:    SPCM Detector #4 550V Voltage
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      53500
Product Maximum:      56500
Description:          SPCM Detector #4 550 V
Comments:

Product Var Name:     i_spcm5_550v
Is element of:        GLA03 Main Record
Short Description:    SPCM Detector #5 550V Voltage
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      53500
Product Maximum:      56500
Description:          SPCM Detector #5 550 V
Comments:

Product Var Name:     i_spcm6_550v
Is element of:        GLA03 Main Record
Short Description:    SPCM Detector #6 550V Voltage
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      53500
Product Maximum:      56500
Description:          SPCM Detector #6 550 V
Comments:

Product Var Name:     i_spcm7_550v
Is element of:        GLA03 Main Record
Short Description:    SPCM Detector #7 550V Voltage
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Volts X 100
```

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      53500
Product Maximum:      56500
Description:          SPCM Detector #7 550 V
Comments:

Product Var Name:     i_spcm8_550v
Is element of:        GLA03 Main Record
Short Description:    SPCM Detector #8 550V Voltage
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      53500
Product Maximum:      56500
Description:          SPCM Detector #8 550 V
Comments:

Product Var Name:     i_Int1_t
Is element of:        GLA03 Main Record
Short Description:    Internal Temperature #1
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Celsius
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      105
Product Maximum:      145
Description:          Internal Temp #1
Comments:

Product Var Name:     i_ct_prail_v
Is element of:        GLA03 Main Record
Short Description:    C & T Positive Rail
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -10000
Product Maximum:      20000
Description:
Comments:

Product Var Name:     i_Int3_t
Is element of:        GLA03 Main Record
Short Description:    Internal Temperature #3
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Celsius
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
```

```
Product Minimum:      105
Product Maximum:      145
Description:          Internal Temp #3
Comments:

Product Var Name:     i_VCXmtr_c
Is element of:        GLA03 Main Record
Short Description:    VC X Motor Current
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        milliAmps
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      150
Product Maximum:      200
Description:          VC X Motor Current
Comments:

Product Var Name:     i_VCYmtr_c
Is element of:        GLA03 Main Record
Short Description:    VC Y Motor Current
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        milliAmps
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      150
Product Maximum:      200
Description:          VC Y Motor Current
Comments:

Product Var Name:     i_Xpos
Is element of:        GLA03 Main Record
Short Description:    X Position
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3600
Description:          X Position
Comments:

Product Var Name:     i_Ypos
Is element of:        GLA03 Main Record
Short Description:    Y Position
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3600
Description:          Y Position
```

```
Comments:

Product Var Name:     i_ADdetOutGn
Is element of:        GLA03 Main Record
Short Description:    Transmitted Gain
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          The transmitted gain value.  The AD Detector Outgoing Gain read-
back.  Commanded value ; repeats for 4 seconds. From APID 20, Offset 29.
Comments:

Product Var Name:     i_ADdetRetGn
Is element of:        GLA03 Main Record
Short Description:    AD Detector Return Gain readback
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          AD Detector Return Gain readback
Comments:

Product Var Name:     i_DPinA
Is element of:        GLA03 Main Record
Short Description:    Dual Pin -A Throughput
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Percent X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      10000
Description:          Dual Pin -A
Comments:

Product Var Name:     i_DPinB
Is element of:        GLA03 Main Record
Short Description:    Dual Pin -B Throughput
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Percent X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      10000
Description:          Dual Pin -B
Comments:
```

```
Product Var Name:     i_Laser1_stat
Is element of:        GLA03 Main Record
Short Description:    Laser 1 Status
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          Indicates whether Laser 1 is enabled or disabled.  Value of 0 =
enabled; 1 = disabled.Comments:

Product Var Name:     i_Laser2_stat
Is element of:        GLA03 Main Record
Short Description:    Laser 2 Status
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          Indicates whether Laser 2 is enabled or disabled.  Value of 0 =
enabled; 1 = disabled.Comments:

Product Var Name:     i_Laser3_stat
Is element of:        GLA03 Main Record
Short Description:    Laser 3 Status
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          Indicates whether Laser 3 is enabled or disabled.  Value of 0 =
enabled; 1 = disabled.Comments:

Product Var Name:     i_OTS_stat
Is element of:        GLA03 Main Record
Short Description:    OTS Enable Status
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          Indicates whether OTS is enabled or disabled.  Value of 0 = en-
abled; 1 = disabled.Comments:

Product Var Name:     i_phdr_21
Is element of:        GLA03 Main Record
Short Description:    Primary Header APID 21
```

```
Product Data Type:    i1b (6, 4)
Total Bytes:          24
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Primary Header APID 21Comments:

Product Var Name:     i_shdr_21
Is element of:        GLA03 Main Record
Short Description:    Secondary Header APID 21 (time stamp)
Product Data Type:    i1b (8, 4)
Total Bytes:          32
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Secondary Header APID 21 (time stamp)Comments:

Product Var Name:     i_BusAInst_28v
Is element of:        GLA03 Main Record
Short Description:    +28V Bus A Instrument Voltage
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      2400
Product Maximum:      3200
Description:          +28V Bus A   Instrument
Comments:

Product Var Name:     i_HBSupp_c
Is element of:        GLA03 Main Record
Short Description:    Hybrid Supplies Current
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      1200
Product Maximum:      1500
Description:          Hybrid Supplies
Comments:

Product Var Name:     i_HVPSDetSup_c
Is element of:        GLA03 Main Record
Short Description:    HVPS Detector Supplies Current
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
```

```
Is Unsigned?:         No
Product Minimum:      2200
Product Maximum:      2800
Description:          HVPS Detector Supplies
Comments:

Product Var Name:     i_OpHtr_c
Is element of:        GLA03 Main Record
Short Description:    Operational Heaters Current
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      400
Product Maximum:      600
Description:          Operational Heaters
Comments:

Product Var Name:     i_MechSys_c
Is element of:        GLA03 Main Record
Short Description:    Mechanical System Current
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      800
Product Maximum:      1200
Description:          Mechanical System
Comments:

Product Var Name:     i_BusBL1_v
Is element of:        GLA03 Main Record
Short Description:    +28V Bus B   Laser 1 Voltage
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      2400
Product Maximum:      3200
Description:          +28V Bus B   Laser 1
Comments:

Product Var Name:     i_BusBL1_c
Is element of:        GLA03 Main Record
Short Description:    +28V Bus B   Laser 1 Current
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      800
Product Maximum:      1200
```

```
Description:          +28V Bus B   Laser 1
Comments:

Product Var Name:     i_BusCL2_v
Is element of:        GLA03 Main Record
Short Description:    +28V Bus C   Laser 2 Voltage
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      2400
Product Maximum:      3200
Description:          +28V Bus C   Laser 2
Comments:

Product Var Name:     i_BusCL2_c
Is element of:        GLA03 Main Record
Short Description:    +28V Bus C   Laser 2 Current
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      800
Product Maximum:      1200
Description:          +28V Bus C   Laser 2
Comments:

Product Var Name:     i_BusDL3_v
Is element of:        GLA03 Main Record
Short Description:    +28V Bus D   Laser 3 Voltage
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      2400
Product Maximum:      3200
Description:          +28V Bus D   Laser 3
Comments:

Product Var Name:     i_BusDL3_c
Is element of:        GLA03 Main Record
Short Description:    +28V Bus D   Laser 3 Voltage
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      800
Product Maximum:      1200
Description:          +28V Bus D   Laser 3
Comments:
```

```
Product Var Name:     i_5VHb1_v
Is element of:        GLA03 Main Record
Short Description:    + 5 V Hybrid # 1 Voltage
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      400
Product Maximum:      600
Description:          + 5 V Hybrid # 1
Comments:

Product Var Name:     i_5VHb1_c
Is element of:        GLA03 Main Record
Short Description:    + 5 V Hybrid # 1 Current
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      50
Product Maximum:      150
Description:          + 5 V Hybrid # 1
Comments:

Product Var Name:     i_12VHb2_v
Is element of:        GLA03 Main Record
Short Description:    +12 V Hybrid # 2 Voltage
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      1100
Product Maximum:      1300
Description:          +12 V Hybrid # 2
Comments:

Product Var Name:     i_12VHb2_c
Is element of:        GLA03 Main Record
Short Description:    + 12 V Hybrid # 2 Current
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      150
Product Maximum:      250
Description:          + 12 V Hybrid # 2
Comments:

Product Var Name:     i_n12VHb3_v
Is element of:        GLA03 Main Record
Short Description:    - 12 V Hybrid # 3 Voltage
```

```
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1300
Product Maximum:      -1100
Description:          - 12 V Hybrid # 3
Comments:

Product Var Name:     i_n12VHb3_c
Is element of:        GLA03 Main Record
Short Description:    - 12 V Hybrid # 3 Current
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      250
Description:          - 12 V Hybrid # 3
Comments:

Product Var Name:     i_5VHb4_v
Is element of:        GLA03 Main Record
Short Description:    + 5 V Hybrid # 4 Voltage
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      400
Product Maximum:      600
Description:          + 5 V Hybrid # 4
Comments:

Product Var Name:     i_5VHb4_c
Is element of:        GLA03 Main Record
Short Description:    + 5 V Hybrid # 4 Current
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      50
Product Maximum:      150
Description:          + 5 V Hybrid # 4
Comments:

Product Var Name:     i_n5VHb5_v
Is element of:        GLA03 Main Record
Short Description:    - 5 V Hybrid # 5 Voltage
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts X 100
```

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -600
Product Maximum:      -400
Description:          - 5 V Hybrid # 5
Comments:

Product Var Name:     i_n5VHb5_c
Is element of:        GLA03 Main Record
Short Description:    - 5 V Hybrid # 5 Current
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      150
Description:          - 5 V Hybrid # 5
Comments:

Product Var Name:     i_n5VHb6_v
Is element of:        GLA03 Main Record
Short Description:    - 5 V Hybrid # 6 Voltage
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -600
Product Maximum:      -400
Description:          - 5 V Hybrid # 6
Comments:

Product Var Name:     i_n5VHb6_c
Is element of:        GLA03 Main Record
Short Description:    - 5 V Hybrid # 6 Current
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      150
Description:          - 5 V Hybrid # 6
Comments:

Product Var Name:     i_15VBPR_v
Is element of:        GLA03 Main Record
Short Description:    + 15 V Boost Post Register Voltage
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
```

```
Product Minimum:      1400
Product Maximum:      1600
Description:          + 15 V Boost Post Reg
Comments:

Product Var Name:     i_n15VBPR_v
Is element of:        GLA03 Main Record
Short Description:    - 15 V Boost Post Register Current
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1600
Product Maximum:      -1400
Description:          - 15 V Boost Post Reg
Comments:

Product Var Name:     i_12VPOscTC_c
Is element of:        GLA03 Main Record
Short Description:    12V Prim Osc Thermal Control
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      150
Product Maximum:      250
Description:          +12 V Prim Osc Thermal ControlComments:

Product Var Name:     i_12VSOscTC_c
Is element of:        GLA03 Main Record
Short Description:    12V Sec Osc Thermal Control
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      150
Product Maximum:      250
Description:          +12 V Sec Osc Thermal ControlComments:

Product Var Name:     i_n2VDV_v
Is element of:        GLA03 Main Record
Short Description:    -2 V Discrete Voltage
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -300
Product Maximum:      -100
Description:          -2 V Discrete Voltage
Comments:
```

```
Product Var Name:     i_HbHS_t
Is element of:        GLA03 Main Record
Short Description:    Hybrid Heatsink Temperature
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3000
Description:          Hybrid Heatsink
Comments:

Product Var Name:     i_FETSbHS_t
Is element of:        GLA03 Main Record
Short Description:    FET Switch Bank Heatsink Temperature
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3000
Description:          FET Switch Bank Heatsink
Comments:

Product Var Name:     i_PrimOsc_Stat
Is element of:        GLA03 Main Record
Short Description:    Primary Oscillator Status
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          Status of Primary Oscillator from FET switch bank status.  Value
of 0 indicates off; value of 1 indicates on.
Comments:

Product Var Name:     i_SecOsc_Stat
Is element of:        GLA03 Main Record
Short Description:    Secondary Oscillator Status
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          Status of secondary Oscillator from FET switch bank status.  Value
of 0 indicates off; value of 1 indicates on.Comments:

Product Var Name:     i_PrimAD_Stat
Is element of:        GLA03 Main Record
```

```
Short Description:    Primary Altimeter Digitizer Status
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          Status of Primary altimeter digitizer from FET switch bank status.
Value of 0 indicates off; value of 1 indicates on.Comments:

Product Var Name:     i_SecAD_Stat
Is element of:        GLA03 Main Record
Short Description:    Secondary Altimeter Digitizer Status
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          Status of secondary altimeter digitizer from FET switch bank sta-
tus.  Value of 0 indicates off; value of 1 indicates on.Comments:

Product Var Name:     i_0VHVPSRef_v
Is element of:        GLA03 Main Record
Short Description:    HVPS +0 Volts Reference Voltage
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -500
Product Maximum:      500
Description:          HVPS +0 Volts Reference
Comments:

Product Var Name:     i_5VHVPSRef_v
Is element of:        GLA03 Main Record
Short Description:    HVPS +5 V Reference Voltage
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Volts X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1000
Description:          HVPS +5 V Reference
Comments:

Product Var Name:     i_OptSensSt
Is element of:        GLA03 Main Record
Short Description:    Optical Sensor Status
Product Data Type:    i2b ( 4)
Total Bytes:          8
```

```
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      4095
Description:          Indicates status of primary and secondary laser select mechanisms
and altimeter digitizer detectors.Comments:

Product Var Name:     i_CmdTlmStat
Is element of:        GLA03 Main Record
Short Description:    Command Telemetry Status
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      65535
Description:          Status of MCS board commandable telemetry.Comments:

Product Var Name:     i_PDUPMonCal1
Is element of:        GLA03 Main Record
Short Description:    Primary Monitor Calibration
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Primary Monitor CalibrationComments:

Product Var Name:     i_PDUPMonCal2
Is element of:        GLA03 Main Record
Short Description:    Primary Monitor Calibration
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Primary Monitor CalibrationComments:

Product Var Name:     i_PDUSMonCal1
Is element of:        GLA03 Main Record
Short Description:    Secondary Monitor Calibration
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
```

```
Description:          Secondary Monitor CalibrationComments:

Product Var Name:     i_PDUSMonCal2
Is element of:        GLA03 Main Record
Short Description:    Secondary Monitor Calibration
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Secondary Monitor CalibrationComments:

Product Var Name:     i_ctrinfo
Is element of:        GLA03 Main Record
Short Description:    Counter info
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        Counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      15
Description:          MCS MUX Counter (only uses 4 lower bits).
Comments:

Product Var Name:     i_phdr_22
Is element of:        GLA03 Main Record
Short Description:    Primary Header APID 22
Product Data Type:    i1b (6)
Total Bytes:          6
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Primary Header APID 22Comments:

Product Var Name:     i_shdr_22
Is element of:        GLA03 Main Record
Short Description:    Secondary Header APID 22 (time stamp)
Product Data Type:    i1b (8)
Total Bytes:          8
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Secondary Header APID 22 (time stamp)Comments:

Product Var Name:     i_HkBdC0_t
Is element of:        GLA03 Main Record
Short Description:    Housekeeping Board Temperature, Ch 0
Product Data Type:    i2b
```

```
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Housekeeping Board Temperature, Ch 0
Comments:

Product Var Name:     i_IPSBdC1_t
Is element of:        GLA03 Main Record
Short Description:    Instrument Processor System Board Temperature, Ch 1
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Instrument Processor System Board Temperature, Ch 1
Comments:

Product Var Name:     i_PCBdC2_t
Is element of:        GLA03 Main Record
Short Description:    Photon Counter Board Temperature, Ch 2
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Photon Counter Board Temperature, Ch 2
Comments:

Product Var Name:     i_CDFTBdC3_t
Is element of:        GLA03 Main Record
Short Description:    Cloud Digitizer/Frequency & Time Board Temperature, Ch 3
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Cloud Digitizer/Frequency & Time Board Temperature, Ch 3
Comments:

Product Var Name:     i_AD1DSPC4_t
Is element of:        GLA03 Main Record
Short Description:    Altimeter Digitizer 1 DSP Temperature, Ch 4
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
```

```
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Altimeter Digitizer 1 Board Temperature, Ch 4
Comments:

Product Var Name:     i_AD2DSPC5_t
Is element of:        GLA03 Main Record
Short Description:    Altimeter Digitizer 2 DSP Temperature, Ch 5
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Altimeter Digitizer 2 Board Temperature, Ch 5
Comments:

Product Var Name:     i_DCHBdC6_t
Is element of:        GLA03 Main Record
Short Description:    Data Collection & Handling Board Temperature, Ch6
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Altimeter Digitizer 2 Board Temperature 1, Ch 6
Comments:

Product Var Name:     i_LMBdC7_t
Is element of:        GLA03 Main Record
Short Description:    Laser Monitor Board Temperature, Ch 7
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Altimeter Digitizer 2 Board Temperature 2, Ch 7
Comments:

Product Var Name:     i_TCMBdC8_t
Is element of:        GLA03 Main Record
Short Description:    Temperature Controller Monitor Board Temperature, Ch 8
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
```

```
Product Maximum:      4000
Description:          Data Collection & Handling Board Temperature, Ch 8
Comments:

Product Var Name:     i_OXCO1BdC9_t
Is element of:        GLA03 Main Record
Short Description:    Oven-crystal-controlled Oscillator(OXCO) 1 Board Temperature, Ch 9
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Laser Monitor Board Temperature, Ch 9
Comments:

Product Var Name:     i_OXCO2BdC10_t
Is element of:        GLA03 Main Record
Short Description:    Oven-crystal-controlled Oscillator(OXCO) 2 Board Temperature, Ch
10
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Temperature Controller Monitor Board Temperature, Ch 10
Comments:

Product Var Name:     i_OscBdC11_t
Is element of:        GLA03 Main Record
Short Description:    Oscillator Board Temperature, Ch 11
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Oven-crystal-controlled Oscillator(OXCO) 1 Board Temperature, Ch
11
Comments:

Product Var Name:     i_OTSBdC12_t
Is element of:        GLA03 Main Record
Short Description:    Optical Test Source (OTS) Board Temperature, Ch 12
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
```

```
Description:          Oven-crystal-controlled Oscillator(OXCO) 2 Board Temperature, Ch
12
Comments:

Product Var Name:     i_LPAC13_t1
Is element of:        GLA03 Main Record, GLA04 LRS Main Record
Short Description:    Laser Profiler Array (LPA) Temperature 1, Ch 13
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Oscillator Board Temperature, Ch 13
Comments:

Product Var Name:     i_LPAC14_t2
Is element of:        GLA03 Main Record
Short Description:    Laser Profiler Array (LPA) Temperature 2, Ch 14
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Optical Test Source (OTS) Board Temperature, Ch 14
Comments:

Product Var Name:     i_AD1eclaC15_t
Is element of:        GLA03 Main Record
Short Description:    Altimeter Digitizer 1 ECLA Temperature, Ch 15
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Laser Profiler Array (LPA) Temperature 1, Ch 15
Comments:

Product Var Name:     i_AD2eclaC16_t
Is element of:        GLA03 Main Record
Short Description:    Altimeter Digitizer 2 ECLA Temperature, Ch 16
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Laser Profiler Array (LPA) Temperature 2, Ch 16
Comments:
```

```
Product Var Name:     i_AD1eclbC17_t
Is element of:        GLA03 Main Record
Short Description:    Altimeter Digitizer 1 ECLB Temperature, Ch 17
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Altimeter Digitizer 1 Board Temperature 3, Ch 17
Comments:

Product Var Name:     i_AD2eclbC18_t
Is element of:        GLA03 Main Record
Short Description:    Altimeter Digitizer 2 ECLB Temperature, Ch 18
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Altimeter Digitizer 2 Board Temperature 3, Ch 18
Comments:

Product Var Name:     i_AD1ADCC19_t
Is element of:        GLA03 Main Record
Short Description:    Altimeter Digitizer 1 ADC Temperature, Ch 19
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Altimeter Digitizer 1 Board Temperature 4, Ch 19
Comments:

Product Var Name:     i_AD2ADCC20_t
Is element of:        GLA03 Main Record
Short Description:    Altimeter Digitizer 2 ADC Temperature, Ch 20
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Altimeter Digitizer 2 Board Temperature 4, Ch 20
Comments:

Product Var Name:     i_lid_box_t
Is element of:        GLA03 Main Record
```

```
Short Description:    Lidar Box Temperature
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Lidar Box Temperature
Comments:

Product Var Name:     i_PRTtelmtC22t
Is element of:        GLA03 Main Record
Short Description:    PRT, Telescope Mount Temperature, Ch 22
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Altimeter Digitizer 2 Board Temperature 5, Ch 22
Comments:

Product Var Name:     i_PRTtelbfC23t
Is element of:        GLA03 Main Record
Short Description:    PRT, Telescope Baffle Temperature, Ch 23
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          HK Tlm Channel 23- Spare
Comments:

Product Var Name:     i_PRTad1C24_t
Is element of:        GLA03 Main Record
Short Description:    PRT, Altimeter Detector 1 Temperature, Ch 24
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      5000
Description:          PRT, Gyro Temperature, Ch 24
Comments:

Product Var Name:     i_PRTad2C25_t
Is element of:        GLA03 Main Record
Short Description:    PRT, Altimeter Detector 2 Temperature, Ch 25
Product Data Type:    i2b
Total Bytes:          2
```

```
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      5000
Description:          PRT, Star Camera Temperature, Ch 25
Comments:

Product Var Name:     iF1LTRSRSC26_t
Is element of:        GLA03 Main Record, GLA04 LRS Main Record
Short Description:    PRT, Face 1 LTR to SRS Temperature, Ch26
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      5000
Description:          PRT, Stellar Reference System (SRS) Temperature, Ch 26
Comments:

Product Var Name:     iF2LTRSRSC27_t
Is element of:        GLA03 Main Record, GLA04 LRS Main Record
Short Description:    PRT, Face 2 LTR to SRS Temperature, Ch27
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      5000
Description:          PRT, Lidar Detector Pkg? Temperature, Ch 27
Comments:

Product Var Name:     i_srs_ff_optio_t
Is element of:        GLA03 Main Record, GLA04 LRS Main Record
Short Description:    SRS First Fold Optics Temperature
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      5000
Description:          SRS First Fold Optics TemperatureComments:

Product Var Name:     i_PRTfboxC29_t
Is element of:        GLA03 Main Record
Short Description:    PRT, Fiber Box Temperature, Ch 29
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
```

```
Product Minimum:     0
Product Maximum:     5000
Description:         PRT, Altimeter Detector 2 Temperature, Ch 29Comments:

Product Var Name:    i_F1fabC30_t
Is element of:       GLA03 Main Record
Short Description:   PRT, Face 1 Fold Around Bench Temperature, Ch 30
Product Data Type:   i2b
Total Bytes:         2
Product Units:       Celsius X 100
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     5000
Description:         PRT, Spacecraft Interface Temperature, Ch 30
Comments:

Product Var Name:    i_F2fabC31_t
Is element of:       GLA03 Main Record
Short Description:   PRT, Face 2 Fold Around Bench Temperature, Ch 31
Product Data Type:   i2b
Total Bytes:         2
Product Units:       Celsius X 100
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     5000
Description:         PRT, Telescope Mount Temperature, Ch 31
Comments:

Product Var Name:    iF1LTRCRSC32_t
Is element of:       GLA03 Main Record
Short Description:   PRT, Face 1 LTR CRS Temperature, Ch 32
Product Data Type:   i2b
Total Bytes:         2
Product Units:       Celsius X 100
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     5000
Description:         PRT, Telescope Baffle Temperature, Ch 32
Comments:

Product Var Name:    iF2LTRCRSC33_t
Is element of:       GLA03 Main Record
Short Description:   PRT, Face 2 LTR CRS Temperature, Ch 33
Product Data Type:   i2b
Total Bytes:         2
Product Units:       Celsius X 100
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     5000
Description:         PRT Temperature Region 10, Ch 33, Spare
Comments:
```

```
Product Var Name:     i_SRSparC34_t
Is element of:        GLA03 Main Record
Short Description:    PRT, Stellar Reference System (SRS) Parabola Temperature, Ch 34
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      5000
Description:          PRT Temperature Region 11, Ch 34, Spare
Comments:

Product Var Name:     i_PRTCalLC35_t
Is element of:        GLA03 Main Record
Short Description:    PRT Cal Low Temperature, Ch 35
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      5000
Description:          PRT Cal Low Temperature, Ch 35
Comments:

Product Var Name:     i_PRTCalHC36_t
Is element of:        GLA03 Main Record
Short Description:    PRT Cal High Temperature, Ch 36
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      5000
Description:          PRT Cal High Temperature, Ch 36
Comments:

Product Var Name:     i_PDBiasC38_v
Is element of:        GLA03 Main Record
Short Description:    Pin Diode Bias Voltage, Ch 38
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Volt X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1200
Description:          Pin Diode Bias Voltage, Ch 38
Comments:

Product Var Name:     iAD1HSRamC39_t
Is element of:        GLA03 Main Record
```

```
Short Description:    AD1 High Speed Ram Temperature, Ch 39
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1200
Description:          AD1 High Speed Ram Temperature, Ch 39
Comments:

Product Var Name:     i_spare22_1
Is element of:        GLA03 Main Record
Short Description:    Spare
Product Data Type:    i1b ( 12)
Total Bytes:          12
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spares in telemetry packet. 3 1-byte spares: GHKSPARE1-GHKSPARE5.
Comments:

Product Var Name:     i_phdr_23
Is element of:        GLA03 Main Record
Short Description:    Primary Header APID 23
Product Data Type:    i1b (6)
Total Bytes:          6
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Primary Header APID 23Comments:

Product Var Name:     i_shdr_23
Is element of:        GLA03 Main Record
Short Description:    Secondary Header APID 23 (time stamp)
Product Data Type:    i1b (8)
Total Bytes:          8
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Secondary Header APID 23 (time stamp)Comments:

Product Var Name:     i_tlm_spare1
Is element of:        GLA03 Main Record
Short Description:    Spares
Product Data Type:    i1b ( 2)
Total Bytes:          2
Product Units:        n/a
Invalid Value/Flag:   No
```

```
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:
Comments:

Product Var Name:     i_lsm1_t
Is element of:        GLA03 Main Record
Short Description:    Laser Select Mechanism #1 Temperature
Product Data Type:    i4b
Total Bytes:          4
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      2000
Product Maximum:      6000
Description:          Laser Select Mechanism #1 TemperatureComments:

Product Var Name:     i_lsm2_t
Is element of:        GLA03 Main Record
Short Description:    Laser Select Mechanism #2 Temperature
Product Data Type:    i4b
Total Bytes:          4
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      2000
Product Maximum:      6000
Description:          Laser Select Mechanism #2 Temperature
Comments:

Product Var Name:     i_adsm_t
Is element of:        GLA03 Main Record
Short Description:    Altimeter Detector Select Mechanism  Temperature
Product Data Type:    i4b
Total Bytes:          4
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      2000
Product Maximum:      6000
Description:          Altimeter Detector Select Mechanism TemperatureComments:

Product Var Name:     i_lbsme_t
Is element of:        GLA03 Main Record
Short Description:    Laser Beam Select Mech Electronics Temperature
Product Data Type:    i4b
Total Bytes:          4
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      2000
Product Maximum:      6000
Description:          Laser Beam Select Mech Electronics Temperature
```

```
Comments:

Product Var Name:     i_lbsmm_t
Is element of:        GLA03 Main Record
Short Description:    Laser Beam Select Mechanism Mirror Temperature
Product Data Type:    i4b
Total Bytes:          4
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      2000
Product Maximum:      6000
Description:          Laser Beam Select Mechanism Mirror Temperature
Comments:

Product Var Name:     i_HOP1ActH1_c
Is element of:        GLA03 Main Record
Short Description:    HOP 1 Actuator Current - Heater 1
Product Data Type:    i4b
Total Bytes:          4
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      800
Product Maximum:      1000
Description:          HOP 1 Actuator Current - Heater 1
Comments:

Product Var Name:     i_HOP1ActH2_c
Is element of:        GLA03 Main Record
Short Description:    HOP 1 Actuator Current - Heater 2
Product Data Type:    i4b
Total Bytes:          4
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      800
Product Maximum:      1000
Description:          HOP 1 Actuator Current - Heater 2
Comments:

Product Var Name:     i_HOP2ActH1_c
Is element of:        GLA03 Main Record
Short Description:    HOP 2 Actuator Current - Heater 1
Product Data Type:    i4b
Total Bytes:          4
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      800
Product Maximum:      1000
Description:          HOP 2 Actuator Current - Heater 1
Comments:

Product Var Name:     i_HOP2ActH2_c
```

```
Is element of:        GLA03 Main Record
Short Description:    HOP 2 Actuator Current - Heater 2
Product Data Type:    i4b
Total Bytes:          4
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      800
Product Maximum:      1000
Description:          HOP 2 Actuator Current - Heater 2
Comments:

Product Var Name:     i_HOP3ActH1_c
Is element of:        GLA03 Main Record
Short Description:    HOP 3 Actuator Current - Heater 1
Product Data Type:    i4b
Total Bytes:          4
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      800
Product Maximum:      1000
Description:          HOP 3 Actuator Current - Heater 1
Comments:

Product Var Name:     i_HOP3ActH2_c
Is element of:        GLA03 Main Record
Short Description:    HOP 3 Actuator Current - Heater 2
Product Data Type:    i4b
Total Bytes:          4
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      800
Product Maximum:      1000
Description:          HOP 3 Actuator Current - Heater 2
Comments:

Product Var Name:     iTsPMirHtrStPt
Is element of:        GLA03 Main Record
Short Description:    Telescope Primary Mirror Heater Temperature Setpoint
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      5000
Description:          Telescope Primary Mirror Heater Temp Setpoint Readback
Comments:

Product Var Name:     iTsTwrHtrStPt
Is element of:        GLA03 Main Record
Short Description:    Telescope Tower Heater Temperature Setpoint
Product Data Type:    i2b
```

```
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      5000
Description:          Telescope Tower Heater Temperature Setpoint Readback
Comments:

Product Var Name:     i_EtHtr_StPt
Is element of:        GLA03 Main Record
Short Description:    Etalon Heater Temperature Setpoint
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      5000
Description:          Etalon Heater Temperature Setpoint Readback
Comments:

Product Var Name:     i_LHP1_StPt
Is element of:        GLA03 Main Record
Short Description:    Loop Heat Pipe 1 Temperature Setpoint
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      5000
Description:          Loop Heat Pipe 1 Temperature Setpoint Readback
Comments:

Product Var Name:     i_LHP2_StPt
Is element of:        GLA03 Main Record
Short Description:    Loop Heat Pipe 2 Temperature Setpoint
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      5000
Description:          Loop Heat Pipe 2 Temperature Setpoint Readback
Comments:

Product Var Name:     i_TsPMirHtr_St
Is element of:        GLA03 Main Record
Short Description:    Telescope Primary Mirror Heater Status
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
```

```
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Telescope Primary Mirror Heater Enable Readback.  0 = Disabled;
0xFF = Enabled.Comments:

Product Var Name:     i_TsTwrHtr_St
Is element of:        GLA03 Main Record
Short Description:    Telescope Tower Heater Status
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Telescope Tower Heater Enable Readback.   0 = Disabled; 0xFF = En-
abled.Comments:

Product Var Name:     i_EtHtr_St
Is element of:        GLA03 Main Record
Short Description:    Etalon Heater Status
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Etalon Heater Enable Readback.  0 = Disabled; 0xFF = Enabled.Com-
ments:

Product Var Name:     i_LHP1_St
Is element of:        GLA03 Main Record
Short Description:    Loop Heat Pipe 1 Status
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Loop Heat Pipe 1 Enable Readback.  0 = Disabled; 0xFF = En-
abled.Comments:

Product Var Name:     i_LHP2_St
Is element of:        GLA03 Main Record
Short Description:    Loop Heat Pipe 2 Status
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
```

```
Product Maximum:      255
Description:          Loop Heat Pipe 2 Enable Readback.  0 = Disabled; 0xFF = En-
abled.Comments:

Product Var Name:     i_TsPMir_sTh
Is element of:        GLA03 Main Record
Short Description:    Telescope Primary Mirror Selected Thermister
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Thermister Select - Telescope Primary Mirror - Status Readback.  0
= Thermistor 1; 0xFF = Thermistor 2.Comments:

Product Var Name:     i_TsSecSS_sTh
Is element of:        GLA03 Main Record
Short Description:    Telescope Secondary Support Structure Selected Thermister
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Thermister Select Telescope Secondary Support Structure Status
Readback.  0 = Thermistor 1; 0xFF = Thermistor 2.Comments:

Product Var Name:     i_TsSMir_sTh
Is element of:        GLA03 Main Record
Short Description:    Telescope Secondary Mirror Selected Thermister
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Thermister Select - Telescope Secondary Mirror - Status Readback.
0 = Thermistor 1; 0xFF = Thermistor 2.Comments:

Product Var Name:     i_LHP1_sTh
Is element of:        GLA03 Main Record
Short Description:    LHP1 Selected Thermister
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Thermister Select LHP1 (lasers) Status Readback.  0 = Thermistor
1; 0xFF = Thermistor 2.Comments:
```

```
Product Var Name:     i_LHP2_sTh
Is element of:        GLA03 Main Record
Short Description:    LHP2 Selected Thermister
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Thermister Select LHP2 (rest of instrument) Status Readback.  0 =
Thermistor 1; 0xFF = Thermistor 2.Comments:

Product Var Name:     i_Et_sTh
Is element of:        GLA03 Main Record
Short Description:    Etalon Selected Thermister
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Thermister Select Etalon Status Readback.  0 = Thermistor 1; 0xFF
= Thermistor 2.Comments:

Product Var Name:     i_tlm_spare2
Is element of:        GLA03 Main Record
Short Description:    Spare
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          spares added for byte alignment.
Comments:

Product Var Name:     i_LHtP12_St
Is element of:        GLA03 Main Record
Short Description:    Loop Heat Pipe 1 & 2 Heater Status
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3
Description:          Loop Heat Pipe 1 & 2 Heater Status; Pipe 1 -> Bit 0, LSB,  Pipe 2
-> Bit 1; 0=OFF, 1=ON; spares -> Bits 2-7Comments:

Product Var Name:     i_spare23_1
Is element of:        GLA03 Main Record
```

```
Short Description:    Spares
Product Data Type:    i1b
Total Bytes:          1
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:
Comments:

Product Var Name:     i_phdr_50
Is element of:        GLA03 Main Record
Short Description:    Primary Header APID 50
Product Data Type:    i1b ( 6)
Total Bytes:          6
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Primary Header APID 50
Comments:

Product Var Name:     i_shdr_50
Is element of:        GLA03 Main Record
Short Description:    Secondary Header APID 50 (time stamp)
Product Data Type:    i1b ( 8)
Total Bytes:          8
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Secondary Header APID 50 (time stamp)
Comments:

Product Var Name:     i_TsPMir_t
Is element of:        GLA03 Main Record, GLA04 LRS Main Record
Short Description:    Telescope Region 0 Primary Mirror Temperature
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      3000
Description:          Telescope Region 0 Primary Mirror
Comments:

Product Var Name:     i_TsSMir_t
Is element of:        GLA03 Main Record, GLA04 LRS Main Record
Short Description:    Telescope Region 1 Secondary Mirror Temperature
Product Data Type:    i2b
Total Bytes:          2
```

```
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      3000
Description:          Telescope Region 1 Secondary Mirror
Comments:

Product Var Name:     i_TsTwr_t
Is element of:        GLA03 Main Record
Short Description:    Telescope Region 2 Tower Temperature
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      3000
Description:          Telescope Region 2 Tower
Comments:

Product Var Name:     i_EtC37d_t
Is element of:        GLA02 Record, GLA03 Main Record
Short Description:    Etalon Temperature, Ch 37d
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      3000
Description:          Etalon Temperature, Ch 37dComments:

Product Var Name:     i_LHP1C37e_t
Is element of:        GLA03 Main Record
Short Description:    Loop Heat Pipe 1 Temperature, Ch 37e
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      3000
Description:          Loop Heat Pipe 1 Temperature, Ch 37e
Comments:

Product Var Name:     i_LHP2C37f_t
Is element of:        GLA03 Main Record
Short Description:    Loop Heat Pipe 2 Temperature, Ch 37f
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
```

```
Product Minimum:      -1000
Product Maximum:      3000
Description:          Loop Heat Pipe 2 Temperature, Ch 37f
Comments:

Product Var Name:     i_TsPMirHDr_c
Is element of:        GLA03 Main Record
Short Description:    Telescope Primary Mirror Heater drive current
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2500
Description:          Telescope Primary Mirror Heater drive current
Comments:

Product Var Name:     i_TsTwrHDr_c
Is element of:        GLA03 Main Record
Short Description:    Telescope Tower Heater drive current
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2500
Description:          Telescope Tower Heater drive current
Comments:

Product Var Name:     i_EtHtrC37j_c
Is element of:        GLA02 Record, GLA03 Main Record
Short Description:    Etalon Heater Current, Ch 37j
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Amps X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2500
Description:          Etalon Heater Current, Ch 37j
Comments:

Product Var Name:     i_DlyLineAll_t
Is element of:        GLA03 Main Record
Short Description:    Delay Line All Temperature
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      3000
Description:          Delay Line All Temperature from Laser Monitor Board.
```

```
Comments:

Product Var Name:     i_DlyLineMid_t
Is element of:        GLA03 Main Record
Short Description:    Delay Line Mid Temperature
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      3000
Description:          Delay Line Mid Temperature from Laser Monitor Board.
Comments:

Product Var Name:     i_DlyLineHi_t
Is element of:        GLA03 Main Record
Short Description:    Delay Line Hi Temperature
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      3000
Description:          Delay Line Hi Temperature from Laser Monitor Board.
Comments:

Product Var Name:     i_OTSL1_rb
Is element of:        GLA03 Main Record
Short Description:    OTS Level1 readback
Product Data Type:    i1b
Total Bytes:          1
Product Units:        Counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      100
Description:
Comments:

Product Var Name:     i_OTSL2_rb
Is element of:        GLA03 Main Record
Short Description:    OTS Level 2 readback
Product Data Type:    i1b
Total Bytes:          1
Product Units:        Counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      100
Description:
Comments:

Product Var Name:     i_OTSL3_rb
```

```
Is element of:        GLA03 Main Record
Short Description:    OTS Level 3 readback
Product Data Type:    i1b
Total Bytes:          1
Product Units:        Counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      100
Description:
Comments:

Product Var Name:     i_OTSL4_rb
Is element of:        GLA03 Main Record
Short Description:    OTS Level 4 readback
Product Data Type:    i1b
Total Bytes:          1
Product Units:        Counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      100
Description:
Comments:

Product Var Name:     i_OTS_tc1
Is element of:        GLA03 Main Record
Short Description:    OTS Trigger Count 1  readback
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      10000
Description:
Comments:

Product Var Name:     i_OTS_tc2
Is element of:        GLA03 Main Record
Short Description:    OTS Trigger Count 2 readback
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      10000
Description:
Comments:

Product Var Name:     i_tlm_spare501
Is element of:        GLA03 Main Record
Short Description:    Spares
Product Data Type:    i1b
```

```
Total Bytes:          1
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:
Comments:

Product Var Name:     i_spare50
Is element of:        GLA03 Main Record
Short Description:    Spares in telemetry
Product Data Type:    i1b ( 21)
Total Bytes:          21
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spares in telemetry packet. 29 1-byte spares: GHW5SPR[29].
Comments:

Product Var Name:     i_phdr_24
Is element of:        GLA03 Main Record
Short Description:    Primary Header APID 24
Product Data Type:    i1b (6, 4)
Total Bytes:          24
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Primary Header APID 23Comments:

Product Var Name:     i_shdr_24
Is element of:        GLA03 Main Record
Short Description:    Secondary Header APID 24 (time stamp)
Product Data Type:    i1b (8, 4)
Total Bytes:          32
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Secondary Header APID 23 (time stamp)Comments:

Product Var Name:     iHS_CmdProc
Is element of:        GLA03 Main Record
Short Description:    HS Task Cmd Processed Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
```

```
Product Minimum:     0
Product Maximum:     128
Description:         HS Task Cmd Processed CounterComments:

Product Var Name:    iHS_CmdRej
Is element of:       GLA03 Main Record
Short Description:   HS Task Cmd Rejected(or Error) Counter
Product Data Type:   i1b ( 4)
Total Bytes:         4
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     128
Description:         HS Task Cmd Rejected(or Error) CounterComments:

Product Var Name:    iCS_CmdProc
Is element of:       GLA03 Main Record
Short Description:   CS Task Cmd Processed Counter
Product Data Type:   i1b ( 4)
Total Bytes:         4
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     128
Description:         CS Task Cmd Processed CounterComments:

Product Var Name:    iCS_CmdRej
Is element of:       GLA03 Main Record
Short Description:   CS Task Cmd Rejected(or Error) Counter
Product Data Type:   i1b ( 4)
Total Bytes:         4
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     128
Description:         CS Task Cmd Rejected(or Error) CounterComments:

Product Var Name:    iTC_CmdProc
Is element of:       GLA03 Main Record
Short Description:   TC Task Cmd Processed Counter
Product Data Type:   i1b ( 4)
Total Bytes:         4
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     128
Description:         TC Task Cmd Processed CounterComments:

Product Var Name:    iTC_CmdRej
Is element of:       GLA03 Main Record
Short Description:   TC Task Cmd Rejected(or Error) Counter
```

```
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          TC Task Cmd Rejected(or Error) CounterComments:

Product Var Name:     iSB_CmdProc
Is element of:        GLA03 Main Record
Short Description:    SB Task Cmd Processed Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          SB Task Cmd Processed CounterComments:

Product Var Name:     iSB_CmdRej
Is element of:        GLA03 Main Record
Short Description:    SB Task Cmd Rejected(or Error) Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          SB Task Cmd Rejected(or Error) CounterComments:

Product Var Name:     iSM_CmdProc
Is element of:        GLA03 Main Record
Short Description:    SM Task Cmd Processed Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          SM Task Cmd Processed CounterComments:

Product Var Name:     iSM_CmdRej
Is element of:        GLA03 Main Record
Short Description:    SM Task Cmd Rejected(or Error) Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
```

```
Product Maximum:     128
Description:         SM Task Cmd Rejected(or Error) CounterComments:

Product Var Name:    iRT_CmdProc
Is element of:       GLA03 Main Record
Short Description:   RT Task Cmd Processed Counter
Product Data Type:   i1b ( 4)
Total Bytes:         4
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     128
Description:         RT Task Cmd Processed CounterComments:

Product Var Name:    iRT_CmdRej
Is element of:       GLA03 Main Record
Short Description:   RT Task Cmd Rejected(or Error) Counter
Product Data Type:   i1b ( 4)
Total Bytes:         4
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     128
Description:         RT Task Cmd Rejected(or Error) CounterComments:

Product Var Name:    iRT_RCH3CmdRcv
Is element of:       GLA03 Main Record
Short Description:   RT Task RCH3 Commands Received
Product Data Type:   i1b ( 4)
Total Bytes:         4
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     128
Description:         RT Task RCH3 (SA22-25, CSA 26) Commands Received.  Does not count
spacecraft position and command packet.Comments:

Product Var Name:    iRT_RCH3CmdRej
Is element of:       GLA03 Main Record
Short Description:   RT Task RCH3 Commands Rejected
Product Data Type:   i1b ( 4)
Total Bytes:         4
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     128
Description:         RT Task RCH3 (SA22-25, CSA 26) Commands Rejected. Commands are re-
jected for checksum problems.Comments:

Product Var Name:    iMD_CmdProc
Is element of:       GLA03 Main Record
```

```
Short Description:    MD Task Cmd Processed Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          MD Task Cmd Processed CounterComments:

Product Var Name:     iMD_CmdRej
Is element of:        GLA03 Main Record
Short Description:    MD Task Cmd Rejected(or Error) Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          MD Task Cmd Rejected(or Error) CounterComments:

Product Var Name:     iAD_CmdProc
Is element of:        GLA03 Main Record
Short Description:    AD Task Cmd Processed Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          AD Task Cmd Processed CounterComments:

Product Var Name:     iAD_CmdRej
Is element of:        GLA03 Main Record
Short Description:    AD Task Cmd Rejected(or Error) Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          AD Task Cmd Rejected(or Error) CounterComments:

Product Var Name:     iAD_StatFlag
Is element of:        GLA03 Main Record
Short Description:    AD Target Status and Mode Flags
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
```

```
Product Minimum:      0
Product Maximum:      1
Description:          AD Target Status and Mode Flags. 0 = Not present; 1 = Present.
Comments:

Product Var Name:     i_tlm_spare24
Is element of:        GLA03 Main Record
Short Description:    Spares
Product Data Type:    i1b (3, 4)
Total Bytes:          12
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:
Comments:

Product Var Name:     iCD_CCDProc
Is element of:        GLA03 Main Record
Short Description:    CD Task CCD Processed Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      128
Description:          CD Task CCD Processed CounterComments:

Product Var Name:     iCD_CCDRej
Is element of:        GLA03 Main Record
Short Description:    CD Task CCD Rejected(or Error) Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      128
Description:          CD Task CCD Rejected(or Error) CounterComments:

Product Var Name:     iCD_StatusFlag
Is element of:        GLA03 Main Record
Short Description:    CD Status Flags
Product Data Type:    i1b (2, 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          CD Status Flags.   Bits 0-2 indicate CD Mode; 1 = Idle, 2=Engi-
neering, 4=Science, Other values invalid.  Bits 3 indicates CD Data Ready Interrupt;
0=Enabled, 1=Disabled. Bits 4 - 5 indicate CD Idle Mode Interrupt Source; 0=Clear Mem,
```

```
1=Fire Cmd, 2=Fire Ack, Other values invalid. Bit 6 indicates CD Range Gate Offset
Source; 0=Fire Ack, 1= Fire Cmd.  Bit 7 is spare.
Comments:

Product Var Name:     iDC_CmdProc
Is element of:        GLA03 Main Record
Short Description:    DC Task Cmd Processed Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          DC Task Cmd Processed CounterComments:

Product Var Name:     iDC_CmdRej
Is element of:        GLA03 Main Record
Short Description:    DC Task Cmd Rejected(or Error) Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          DC Task Cmd Rejected(or Error) CounterComments:

Product Var Name:     iDC_StatFlag
Is element of:        GLA03 Main Record
Short Description:    DC Status Flags
Product Data Type:    i1b (2, 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32768
Description:          DC Status Flags
Comments:

Product Var Name:     iGP_CmdProc
Is element of:        GLA03 Main Record
Short Description:    GP Task Cmd Processed Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          GP Task Cmd Processed CounterComments:

Product Var Name:     iGP_CmdRej
Is element of:        GLA03 Main Record
```

```
Short Description:    GP Task Cmd Rejected(or Error) Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          GP Task Cmd Rejected(or Error) CounterComments:

Product Var Name:     iGP_StatFlag
Is element of:        GLA03 Main Record
Short Description:    GP Status Flags
Product Data Type:    i1b (2, 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32768
Description:          GP Status Flags
Comments:

Product Var Name:     iPC_CmdProc
Is element of:        GLA03 Main Record
Short Description:    PC Task Cmd Processed Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          PC Task Cmd Processed CounterComments:

Product Var Name:     iPC_CmdRej
Is element of:        GLA03 Main Record
Short Description:    PC Task Cmd Rejected(or Error) Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          PC Task Cmd Rejected(or Error) CounterComments:

Product Var Name:     iPC_StatFlag
Is element of:        GLA03 Main Record
Short Description:    PC Status Flags
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
```

```
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          PC Status Flags
Comments:

Product Var Name:     iCT_CmdProc
Is element of:        GLA03 Main Record
Short Description:    CT Task Cmd Processed Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT Task Cmd Processed CounterComments:

Product Var Name:     iCT_CmdRej
Is element of:        GLA03 Main Record
Short Description:    CT Task Cmd Rejected(or Error) Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT Task Cmd Rejected(or Error) CounterComments:

Product Var Name:     iCT_Mode
Is element of:        GLA03 Main Record
Short Description:    CT Task Mode
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          CT Task mode.  Bit 0 indicates CT Task Software Mode; 0=Manual,
1=Auto.  Bit 1 indicates CT Task C&T Control Hardware Mode, Register bit; 0=Manual, 1=Au-
to. Bit 2 indicates CT Task Startup Mode, Discrete cmd; 0=Manual, 1=Auto Power Up Osc/
AD. Bit 3 indicates CT Task Startup AD/OSC, Discrete cmd; 0=Primary, 1= Secondary. Bits
4 - 5 indicate CT Etalon Tracking Mode; 0=Off, 1=Acquire, 2=Tracking, 3=Invalid.  Bits
6 - 7 are spares.
Comments:

Product Var Name:     i_phdr_25
Is element of:        GLA03 Main Record
Short Description:    Primary Header APID 25
Product Data Type:    i1b (6, 4)
Total Bytes:          24
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
```

```
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Primary Header APID 25Comments:

Product Var Name:     i_shdr_25
Is element of:        GLA03 Main Record
Short Description:    Secondary Header APID 25 (time stamp)
Product Data Type:    i1b (8, 4)
Total Bytes:          32
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Secondary Header APID 25 (time stamp)Comments:

Product Var Name:     i_HS_PrevMode
Is element of:        GLA03 Main Record
Short Description:    HS Processor Previous Mode
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3
Description:          HS Processor Previous Mode; 0=Unknown, 2=PROM, 3=EEPROMComments:

Product Var Name:     i_HS_CurMode
Is element of:        GLA03 Main Record
Short Description:    HS Processor Current Mode
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3
Description:          HS Processor Current Mode; 0=Unknown, 2=PROM, 3=EEPROMComments:

Product Var Name:     i_SubSysPres
Is element of:        GLA03 Main Record
Short Description:    Subsystem Present Flags
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          Subsystem Present Bit Flags.  Value of 0 = subsystem not present;
value of 1 = subsystem present in small and large telemetry packets.  Bit 0 = HS; Bit 1
= CS; Bit 2 = TC; Bit 3 = SB; Bit 4 = SM; Bit 5 = RT; Bit 6 = AD; Bit 7 = MD; Bit 8 =
CD; Bit 9 = DC; Bit 10 = GP; Bit 11 = PC; Bit 12 = CT.  Bits 13-15 are spares.Comments:
```

```
Product Var Name:     iHS_WarmRCt
Is element of:        GLA03 Main Record
Short Description:    HS Warm Restart Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS Warm Restart CountComments:

Product Var Name:     iHS_ColdRCt
Is element of:        GLA03 Main Record
Short Description:    HS Cold Restart Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS Cold Restart CountComments:

Product Var Name:     iHS_MxWarmRCt
Is element of:        GLA03 Main Record
Short Description:    HS Max Warm Restart Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS Max Warm Restart CountComments:

Product Var Name:     iHS_ColdWarmF
Is element of:        GLA03 Main Record
Short Description:    HS Cold-Warm Flag
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          HS Cold-Warm FlagComments:

Product Var Name:     iHS_OSResetF
Is element of:        GLA03 Main Record
Short Description:    HS OS Caused Reset Flag
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
```

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          HS OS Caused Reset FlagComments:

Product Var Name:     iHS_OSTickCt
Is element of:        GLA03 Main Record
Short Description:    HS OS Tick Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS OS Tick Count
Comments:

Product Var Name:     iHS_HSExecCt
Is element of:        GLA03 Main Record
Short Description:    HS HS Exec Count
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          HS HS Exec CountComments:

Product Var Name:     iHS_CSExecCt
Is element of:        GLA03 Main Record
Short Description:    HS CS Exec Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS CS Exec CountComments:

Product Var Name:     iHS_TCExecCt
Is element of:        GLA03 Main Record
Short Description:    HS TC Exec Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS TC Exec CountComments:
```

```
Product Var Name:     iHS_SBExecCt
Is element of:        GLA03 Main Record
Short Description:    HS SB Exec Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS SB Exec CountComments:

Product Var Name:     iHS_SMExecCt
Is element of:        GLA03 Main Record
Short Description:    HS SM Exec Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS SM Exec CountComments:

Product Var Name:     iHS_RTExecCt
Is element of:        GLA03 Main Record
Short Description:    HS RT Exec Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS RT Exec CountComments:

Product Var Name:     iHS_MDExecCt
Is element of:        GLA03 Main Record
Short Description:    HS MD Exec Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS MD Exec CountComments:

Product Var Name:     iHS_ADExecCt
Is element of:        GLA03 Main Record
Short Description:    HS AD Exec Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
```

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS AD Exec CountComments:

Product Var Name:     iHS_CDExecCt
Is element of:        GLA03 Main Record
Short Description:    HS CD Exec Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS CD Exec CountComments:

Product Var Name:     iHS_DCExecCt
Is element of:        GLA03 Main Record
Short Description:    HS DC Exec Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS DC Exec CountComments:

Product Var Name:     iHS_GPExecCt
Is element of:        GLA03 Main Record
Short Description:    HS GP Exec Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS GP Exec CountComments:

Product Var Name:     iHS_PCExecCt
Is element of:        GLA03 Main Record
Short Description:    HS PC Exec Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS PC Exec CountComments:
```

```
Product Var Name:     iHS_CTExecCt
Is element of:        GLA03 Main Record
Short Description:    HS CT Exec Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS CT Exec CountComments:

Product Var Name:     iHSFPU_Uflw_Ct
Is element of:        GLA03 Main Record
Short Description:    HS FPU Underflow Count
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          HS FPU Underflow CountComments:

Product Var Name:     iHS_spare1
Is element of:        GLA03 Main Record
Short Description:    HS spares
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          HS Spares
Comments:

Product Var Name:     iHS_spare2
Is element of:        GLA03 Main Record
Short Description:    HS Spares
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          HS Spares
Comments:

Product Var Name:     iHSTCfireISRCt
Is element of:        GLA03 Main Record
Short Description:    HS TC Fire Cmd ISR Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
```

```
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS TC Fire Cmd ISR CountComments:

Product Var Name:     iHS_RTISRCtLo
Is element of:        GLA03 Main Record
Short Description:    HS RT ISR Count - Low Priority
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS RT ISR Count - Low PriorityComments:

Product Var Name:     iHS_spare3
Is element of:        GLA03 Main Record
Short Description:    HS Spares
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
Description:          HS Spares
Comments:

Product Var Name:     iHS_CTISRCt
Is element of:        GLA03 Main Record
Short Description:    HS CT ISR Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS CT ISR CountComments:

Product Var Name:     iHS_spare4
Is element of:        GLA03 Main Record
Short Description:    HS Spares
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
```

```
Description:          HS Spares
Comments:

Product Var Name:     iHS_spare5
Is element of:        GLA03 Main Record
Short Description:    HS Spares
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
Description:          HS Spares
Comments:

Product Var Name:     iHS_ppsISRCt
Is element of:        GLA03 Main Record
Short Description:    HS GPS 10 Sec ISR Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS GPS 10 Sec ISR CountComments:

Product Var Name:     iHS_DC_ISRCt
Is element of:        GLA03 Main Record
Short Description:    HS DC ISR Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS DC ISR CountComments:

Product Var Name:     iHS_PC_ISRCt
Is element of:        GLA03 Main Record
Short Description:    HS PC ISR Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS PC ISR CountComments:

Product Var Name:     iHS_CD_ISRCt
Is element of:        GLA03 Main Record
Short Description:    HS CD ISR Count
```

```
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS CD ISR CountComments:

Product Var Name:     iHS_AD_ISRCt
Is element of:        GLA03 Main Record
Short Description:    HS AD ISR Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS AD ISR CountComments:

Product Var Name:     iHS_spare6
Is element of:        GLA03 Main Record
Short Description:    Spares
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
Description:
Comments:

Product Var Name:     iHS_OSEventSeq
Is element of:        GLA03 Main Record
Short Description:    HS OS Event Seq Number
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          HS OS Event Seq NumberComments:

Product Var Name:     iHS_PeakCPU
Is element of:        GLA03 Main Record
Short Description:    HS Peak CPU Utilization
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
```

```
Product Minimum:      0
Product Maximum:      128
Description:          HS Peak CPU Utilization
Comments:

Product Var Name:     iHS_LastCPU
Is element of:        GLA03 Main Record
Short Description:    HS Last CPU Utililzation
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          HS Last CPU UtililzationComments:

Product Var Name:     iHSPCI_Bus_st
Is element of:        GLA03 Main Record
Short Description:    HS OS PCI Bus Target Enable and Interrupt status
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          HS OS PCI Bus Target Enable and Interrupt statusComments:

Product Var Name:     iHSOS_Plog_st
Is element of:        GLA03 Main Record
Short Description:    HS OS Performance Log Enable Flag
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          HS OS Performance Log Enable Flag
Comments:

Product Var Name:     iHSOS_Plog_ct
Is element of:        GLA03 Main Record
Short Description:    HS OS Performance Log Item Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          HS OS Performance Log Item Count
Comments:
```

```
Product Var Name:     iHS_Plog_stAdd
Is element of:        GLA03 Main Record
Short Description:    HS OS Performance Log Filter Start Address
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32000
Description:          HS OS Performance Log Filter Start Address
Comments:

Product Var Name:     iHS_Plog_mask
Is element of:        GLA03 Main Record
Short Description:    HS OS Performance Log Filter Mask
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32000
Description:          HS OS Performance Log Filter MaskComments:

Product Var Name:     i_spare25_2
Is element of:        GLA03 Main Record
Short Description:    Spares
Product Data Type:    i1b (6, 4)
Total Bytes:          24
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spares
Comments:

Product Var Name:     iCS_StatFlag
Is element of:        GLA03 Main Record
Short Description:    CS Status Flags
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          CS Status Flags.  Bits 0-1 indicate CS Enable/Disabled Status; val-
ue of 0=Disabled, 1=Enabled.  Bits 2-3 indicate CS Code Memory Checksum Status; value
of 0=Disabled, 1=Enabled, 2=Disabled and Recomputing, 3=Enabled and Recomputing.  Bits
4-5 indicate CS Table Memory Checksum Status; value of 0=Disabled, 1=Enabled, 2=Disabled
and Recomputing, 3=Enabled and Recomputing.  Bits 6-7 indicate CS EEPROM Checksum status;
value of 0=Disabled, 1=Enabled, 2=Disabled and Recomputing, 3=Enabled and Recomput-
ing.Comments:
```

```
Product Var Name:     iCS_codeErr_ct
Is element of:        GLA03 Main Record
Short Description:    CS Code Segment Error Count
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CS Code Segment Error CountComments:

Product Var Name:     iCSEPROMerr_ct
Is element of:        GLA03 Main Record
Short Description:    CS EEPROM Segment Error Count
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CS EEPROM Segment Error CountComments:

Product Var Name:     iCSTblRamerr_ct
Is element of:        GLA03 Main Record
Short Description:    CS Table Ram Segment Error Count
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CS Table Ram Segment Error CountComments:

Product Var Name:     iCS_codeErr_ID
Is element of:        GLA03 Main Record
Short Description:    CS Table ID of last Code Error
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          CS Table ID of last Code ErrorComments:

Product Var Name:     iCSEPROMerr_ID
Is element of:        GLA03 Main Record
Short Description:    CS Table ID of last EEPROM Error
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
```

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          CS Table ID of last EEPROM ErrorComments:

Product Var Name:     iCSTblRamErrID
Is element of:        GLA03 Main Record
Short Description:    CS Table ID of last Table RAM Error
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          CS Table ID of last Table RAM ErrorComments:

Product Var Name:     iCS_code_mstrcs
Is element of:        GLA03 Main Record
Short Description:    CS Code Segment Master Checksum
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          CS Code Segment Master ChecksumComments:

Product Var Name:     iCSRam_mstrcs
Is element of:        GLA03 Main Record
Short Description:    CS Table RAM Master Checksum
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          CS Table RAM Master ChecksumComments:

Product Var Name:     iCSEPROMmstrcs
Is element of:        GLA03 Main Record
Short Description:    CS EEPROM Master Checksum
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          CS EEPROM Master ChecksumComments:
```

```
Product Var Name:     iEPROM_bmem_cs
Is element of:        GLA03 Main Record
Short Description:    CS Checksum of EEPROM Boot Memory
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          CS Checksum of EEPROM Boot MemoryComments:

Product Var Name:     iEPROM_mem_cs
Is element of:        GLA03 Main Record
Short Description:    CS Checksum of EEPROM Memory
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          CS Checksum of EEPROM MemoryComments:

Product Var Name:     iPROM_mem_cs
Is element of:        GLA03 Main Record
Short Description:    CS Checksum of PROM Memory
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          CS Checksum of PROM MemoryComments:

Product Var Name:     iCS_spare
Is element of:        GLA03 Main Record
Short Description:    CS Spare
Product Data Type:    i1b (18, 4)
Total Bytes:          72
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          CS Spare - 18 bytes.
Comments:

Product Var Name:     iTC_MET_u2
Is element of:        GLA03 Main Record
Short Description:    TC GLAS MET Upper 2 bytes
Product Data Type:    i1b (2, 4)
Total Bytes:          8
Product Units:        n/a
```

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          TC GLAS MET Upper 2 bytes
Comments:

Product Var Name:     iTC_MET_l4
Is element of:        GLA03 Main Record
Short Description:    TC GLAS MET Lower 4 bytes
Product Data Type:    i1b (4, 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          TC GLAS MET Lower 4 bytes
Comments:

Product Var Name:     iTC_FcmdInc_u2
Is element of:        GLA03 Main Record
Short Description:    TC Fire Command Time Increment Upper 2 bytes
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          TC Fire Command Time Increment Upper 2 bytes
Comments:

Product Var Name:     iTC_FcmdInc_l4
Is element of:        GLA03 Main Record
Short Description:    TC Fire Command Time Increment Lower 4 bytes
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      157680000
Description:          TC Fire Command Time Increment Lower 4 bytesComments:

Product Var Name:     iTCworkMET_sec
Is element of:        GLA03 Main Record
Short Description:    TC GLAS MET Working Time seconds
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        seconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
```

```
Product Maximum:      157680000
Description:          TC GLAS MET Working Time secondsComments:

Product Var Name:     iTCworkMET_us
Is element of:        GLA03 Main Record
Short Description:    TC GLAS MET Working Time microseconds
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        microseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1000000
Description:          TC GLAS MET Working Time micro-secondsComments:

Product Var Name:     i_spare25_3
Is element of:        GLA03 Main Record
Short Description:    Spare
Product Data Type:    i1b (18, 4)
Total Bytes:          72
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spare in telemetry
Comments:

Product Var Name:     i_SB_SndErrCnt
Is element of:        GLA03 Main Record
Short Description:    SB Send Error Count
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          SB Send Error CountComments:

Product Var Name:     i_SB_RcvErrCnt
Is element of:        GLA03 Main Record
Short Description:    SB Receive Error Count
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          SB Receive Error CountComments:

Product Var Name:     i_SB_OSErrCnt
Is element of:        GLA03 Main Record
Short Description:    SB OS Error Count
```

```
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          SB OS Error CountComments:

Product Var Name:     iSB_QFullErrCt
Is element of:        GLA03 Main Record
Short Description:    SB Queue Full Error Count
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          SB Queue Full Error CountComments:

Product Var Name:     iSB_BOverErrCt
Is element of:        GLA03 Main Record
Short Description:    SB Buffer overrun Error Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          SB Buffer overrun Error CountComments:

Product Var Name:     i_SB_LBO_Strm
Is element of:        GLA03 Main Record
Short Description:    SB last buffer overrun - Stream Id
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          SB last buffer overrun - Stream IdComments:

Product Var Name:     i_SB_LBO_Pipe
Is element of:        GLA03 Main Record
Short Description:    SB last buffer overrun - Pipeline Id
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
```

```
Product Maximum:      32768
Description:          SB last buffer overrun - Pipeline IdComments:

Product Var Name:     i_SB_LBO_Task
Is element of:        GLA03 Main Record
Short Description:    SB last buffer overrun - Sender Task ID
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          SB last buffer overrun - Sender Task IDComments:

Product Var Name:     i_SB_LQF_Strm
Is element of:        GLA03 Main Record
Short Description:    SB last queue full - Stream Id
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          SB last queue full - Stream IdComments:

Product Var Name:     i_SB_LQF_Pipe
Is element of:        GLA03 Main Record
Short Description:    SB last queue full - Pipeline Id
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          SB last queue full - Pipeline IdComments:

Product Var Name:     i_SB_LQF_Task
Is element of:        GLA03 Main Record
Short Description:    SB last queue full - Sender Task ID
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          SB last queue full - Sender Task IDComments:

Product Var Name:     i_SB_Spare
Is element of:        GLA03 Main Record
Short Description:    SB Spare
Product Data Type:    i1b (8, 4)
```

```
Total Bytes:          32
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          SB Spare
Comments:

Product Var Name:     iSMRemDumpCopy
Is element of:        GLA03 Main Record
Short Description:    SM num of remaining copies to be dumped
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          SM num of remaining copies to be dumped
Comments:

Product Var Name:     iSM_Dump_flag
Is element of:        GLA03 Main Record
Short Description:    SM dump in progress flag
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          SM tbl/mem dump in progress flag.  Value of 0 = false, 1 = true.
Comments:

Product Var Name:     iSM_TblOps_fg
Is element of:        GLA03 Main Record
Short Description:    SM table operations flag
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          SM table operations flag.  Bits 0 - 5 indcate SM Table Session
Type; value of 0=None, 5=DUMP_ONLY, 6=REP_EEPROM, 7=REP_RAM, 8=APPD_ACTV. Bit 6 indi-
cates table operations; value of 0 = Inactive, 1 = Active.  Bit 7 is spare.Comments:

Product Var Name:     iSM_TOp_ImgTyp
Is element of:        GLA03 Main Record
Short Description:    SM table operations from image type
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
```

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3
Description:          SM table operations from image type. Value of 0=None, 1=EEPROM,
2=RAM, 3=NULL.
Comments:

Product Var Name:     iSM_TblID_sel
Is element of:        GLA03 Main Record
Short Description:    SM table id selected
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          SM table id selected
Comments:

Product Var Name:     iSM_TblSize
Is element of:        GLA03 Main Record
Short Description:    SM currently selected table size in words
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          SM currently selected tbl size in words
Comments:

Product Var Name:     iSM_TblCksum
Is element of:        GLA03 Main Record
Short Description:    SM currently selected table checksum
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          SM currently selected table checksumComments:

Product Var Name:     iSM_success_ct
Is element of:        GLA03 Main Record
Short Description:    SM table commit success count
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
```

```
Product Minimum:     0
Product Maximum:     128
Description:         SM table commit success countComments:

Product Var Name:    iSM_fail_ct
Is element of:       GLA03 Main Record
Short Description:   SM table commit failure count
Product Data Type:   i1b ( 4)
Total Bytes:         4
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     128
Description:         SM table commit failure countComments:

Product Var Name:    iSM_TblWdLd_ct
Is element of:       GLA03 Main Record
Short Description:   SM table num. of words loaded
Product Data Type:   i2b ( 4)
Total Bytes:         8
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     32768
Description:         SM table num. of words loadedComments:

Product Var Name:    iSM_FSW_BldNum
Is element of:       GLA03 Main Record
Short Description:   SM FSW build number
Product Data Type:   i1b ( 4)
Total Bytes:         4
Product Units:       n/a
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     128
Description:         SM FSW build numberComments:

Product Var Name:    iSM_FSW_VerNum
Is element of:       GLA03 Main Record
Short Description:   SM FSW version number
Product Data Type:   i1b ( 4)
Total Bytes:         4
Product Units:       n/a
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     128
Description:         SM FSW version numberComments:

Product Var Name:    iSM_Spares
Is element of:       GLA03 Main Record
Short Description:   SM spares
```

```
Product Data Type:    i1b (10, 4)
Total Bytes:          40
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          SM spares
Comments:

Product Var Name:     iBCRT_CntrlRWd
Is element of:        GLA03 Main Record
Short Description:    BCRT CONTROL REGISTER WORD
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      384
Description:          BCRT CONTROL REGISTER WORD. Bit 7 indicates RT Channel A Select;
value of 0 = off, 1 = on.  Bit 8 indicates RT Channel B Select; value of 0 = off, 1 =
on.  All other bits are unused.Comments:

Product Var Name:     iBCRT_StatReg
Is element of:        GLA03 Main Record
Short Description:    BCRT Status Register
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      1
Description:          BCRT Status Register.  Bit 0 indicates RT Status, RT Mode Enabled
Flag; value of 0 = Disabled, 1 = Enabled.  All other bits are unsed.Comments:

Product Var Name:     iBCRT_IntStReg
Is element of:        GLA03 Main Record
Short Description:    BCRT INTERRUPT STATUS REGISTER
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          BCRT INTERRUPT STATUS REGISTERComments:

Product Var Name:     iRT_MsgErr
Is element of:        GLA03 Main Record
Short Description:    RT 1553 MESSAGE ERRORS
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
```

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          RT 1553 MESSAGE ERRORSComments:

Product Var Name:     iRT_RtryCt
Is element of:        GLA03 Main Record
Short Description:    RT 1553 RETRY COUNT
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          RT 1553 RETRY COUNTComments:

Product Var Name:     iRT_InvCmd
Is element of:        GLA03 Main Record
Short Description:    RT 1553 INVALID COMMANDS
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          RT 1553 INVALID COMMANDSComments:

Product Var Name:     iRT_InvBCCmd
Is element of:        GLA03 Main Record
Short Description:    RT 1553 INVALID BROADCAST CMDS
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          RT 1553 INVALID BROADCAST CMDSComments:

Product Var Name:     iRT_ModeCodeCt
Is element of:        GLA03 Main Record
Short Description:    RT MODE CODES RECEIVED
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          RT MODE CODES RECEIVEDComments:
```

```
Product Var Name:     i_spare25_4
Is element of:        GLA03 Main Record
Short Description:    SPARE
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          SPARE
Comments:

Product Var Name:     iRT_RcvRCH1_ct
Is element of:        GLA03 Main Record
Short Description:    RT PACKETS RECEIVED ON RCH1
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          RT PACKETS RECEIVED ON RCH1Comments:

Product Var Name:     iRT_RejRCH1_ct
Is element of:        GLA03 Main Record
Short Description:    RT PACKETS Rejected ON RCH1
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          RT PACKETS Rejected ON RCH1Comments:

Product Var Name:     iRT_SentXCH1ct
Is element of:        GLA03 Main Record
Short Description:    RT PACKETS SENT ON XCH1
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          RT PACKETS SENT ON XCH1; HK channel.Comments:

Product Var Name:     iRT_SentXCH2ct
Is element of:        GLA03 Main Record
Short Description:    RT PACKETS SENT ON XCH2
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
```

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          RT PACKETS SENT ON XCH2; Diagnostic channel.Comments:

Product Var Name:     iRT_CmdHist_ct
Is element of:        GLA03 Main Record
Short Description:    RT Number of Command History Packets Sent
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          RT Number of Command History Packets SentComments:

Product Var Name:     iRT_cksum_st
Is element of:        GLA03 Main Record
Short Description:    RT Checksum Status
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      1
Description:          RT Checksum Status.  Value of 0 = CMD Checksum Disabled; 1 = CMD
Checksum enabled.Comments:

Product Var Name:     i_spare25_5
Is element of:        GLA03 Main Record
Short Description:    Spares
Product Data Type:    i1b (8, 4)
Total Bytes:          32
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spares
Comments:

Product Var Name:     iMD_Tbl_flg
Is element of:        GLA03 Main Record
Short Description:    MD Table Enable Flag
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
```

```
Description:
Comments:

Product Var Name:     iMD_spare
Is element of:        GLA03 Main Record
Short Description:    MD spare
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          MD spare
Comments:

Product Var Name:     iMD_T1addct
Is element of:        GLA03 Main Record
Short Description:    MD Table #1 Address Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Counts
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:
Comments:

Product Var Name:     iMD_T2addct
Is element of:        GLA03 Main Record
Short Description:    MD Table #2 Address Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:
Comments:

Product Var Name:     iMD_T1rate
Is element of:        GLA03 Main Record
Short Description:    MD Table #1 Rate
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Counts
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:
Comments:
```

```
Product Var Name:     iMD_T2rate
Is element of:        GLA03 Main Record
Short Description:    MD Table #2 Rate
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:
Comments:

Product Var Name:     iMD_spare2
Is element of:        GLA03 Main Record
Short Description:    MD Spares
Product Data Type:    i1b (12, 4)
Total Bytes:          48
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:
Comments:

Product Var Name:     i_phdr_55
Is element of:        GLA03 Main Record
Short Description:    Primary Header APID 55
Product Data Type:    i1b (6, 4)
Total Bytes:          24
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Primary Header APID 55
Comments:

Product Var Name:     i_shdr_55
Is element of:        GLA03 Main Record
Short Description:    Secondary Header 55 (time stamp)
Product Data Type:    i1b (8, 4)
Total Bytes:          32
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Secondary Header for APID 55 (time stamp)
Comments:

Product Var Name:     iAD_SWErr_ct
Is element of:        GLA03 Main Record
Short Description:    AD Software Error Count
```

```
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD Software Error Count.  Number of software errors detected.
Comments:

Product Var Name:     iAD_HWErr_ct
Is element of:        GLA03 Main Record
Short Description:    AD Hardware Error Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD Hardware Error Count.  Number of hardware errors detected.
Comments:

Product Var Name:     iAD_Shot_ct
Is element of:        GLA03 Main Record
Short Description:    AD Shot Count Value
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          AD Shot Count Value
Comments:

Product Var Name:     iAD_ShotCtSkip
Is element of:        GLA03 Main Record
Short Description:    AD Shot Count Skip Detected
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      1
Description:          AD Shot Count Skip Detected flag; 0 = no skip, 1 = skip.Comments:

Product Var Name:     iAD_Sync_flag
Is element of:        GLA03 Main Record
Short Description:    AD Synchronized Flag
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
```

```
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      1
Description:          AD Synchronized Flag; 0 = not in sync, 1 = in sync.Comments:

Product Var Name:     iAD_spare1
Is element of:        GLA03 Main Record
Short Description:    AD Spares
Product Data Type:    i1b (5, 4)
Total Bytes:          20
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:
Comments:

Product Var Name:     iAD_DSPfire_ct
Is element of:        GLA03 Main Record
Short Description:    AD DSP Laser Fire Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD DSP Laser Fire Count.  Indicates the number of laser fire com-
mands detected.Comments:

Product Var Name:     iADDSPalive_ct
Is element of:        GLA03 Main Record
Short Description:    AD DSP Alive Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD DSP Alive Count. Increments once every 75ms when laser fire com-
mand fails.Comments:

Product Var Name:     iAD_AncPkt_ct
Is element of:        GLA03 Main Record
Short Description:    AD Ancillary Packets Sent
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
```

```
Description:          AD Ancillary Packets SentComments:

Product Var Name:     iAD_EngPkt_ct
Is element of:        GLA03 Main Record
Short Description:    AD Engineering Packets Sent
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD Engineering Packets SentComments:

Product Var Name:     iAD_SmSci_ct
Is element of:        GLA03 Main Record
Short Description:    AD Science Small Packets Sent
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD Science Small Packets SentComments:

Product Var Name:     iAD_LgSci_ct
Is element of:        GLA03 Main Record
Short Description:    AD Science Large Packets Sent
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD Science Large Packets SentComments:

Product Var Name:     iDSPLoadProcCt
Is element of:        GLA03 Main Record
Short Description:    AD DSP Load Packets Processed Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD DSP Load Packets Processed CountComments:

Product Var Name:     iDSPMDump_ct
Is element of:        GLA03 Main Record
Short Description:    AD DSP Memory Dump Packets Sent
Product Data Type:    i2b ( 4)
Total Bytes:          8
```

```
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD DSP Memory Dump Packets SentComments:

Product Var Name:     iADMLoadCmdErr
Is element of:        GLA03 Main Record
Short Description:    AD Memory Load Command Errors
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD Memory Load Command ErrorsComments:

Product Var Name:     iADMDumpCmdErr
Is element of:        GLA03 Main Record
Short Description:    AD Memory Dump Command Errors
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD Memory Dump Command ErrorsComments:

Product Var Name:     iDSPcksumRate
Is element of:        GLA03 Main Record
Short Description:    AD DSP Checkum Rate
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD DSP Checkum Rate.  Number of 48-bit words checked in each of 3
memory types of DSP memory each shot (40 Hz).Comments:

Product Var Name:     iDSPcksumSW_st
Is element of:        GLA03 Main Record
Short Description:    AD DSP Checksum S/W Enable Status
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      1
```

```
Description:          AD DSP Checksum S/W Enable Status; 0 = Disable, 1 = Enable.Com-
ments:

Product Var Name:     iDSP_cksum_ct
Is element of:        GLA03 Main Record
Short Description:    AD DSP # of times all of memory has been checksumed
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD DSP # of times all of memory has been checksumedComments:

Product Var Name:     iDSP_BScksum_l
Is element of:        GLA03 Main Record
Short Description:    AD DSP Bootstrap Checksum Lower 16 bits
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD DSP Bootstrap Checksum Lower 16 bitsComments:

Product Var Name:     iDSPEPROMcs_l
Is element of:        GLA03 Main Record
Short Description:    AD DSP EPROM Checksum Lower 16 bits
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD DSP EPROM Checksum Lower 16 bitsComments:

Product Var Name:     iDSPRAMcksum_l
Is element of:        GLA03 Main Record
Short Description:    AD DSP RAM Checksum Lower 16 bits
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD DSP RAM Checksum Lower 16 bitsComments:

Product Var Name:     iDSP_BScksum_u
Is element of:        GLA03 Main Record
Short Description:    AD DSP Bootstrap Checksum Upper 32 bits
Product Data Type:    i4b ( 4)
```

```
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          AD DSP Bootstrap Checksum Upper 32 bitsComments:

Product Var Name:     iDSPEPROMcs_u
Is element of:        GLA03 Main Record
Short Description:    AD DSP EPROM Checksum Upper 32 bits
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          AD DSP EPROM Checksum Upper 32 bitsComments:

Product Var Name:     iDSPRAMcksum_u
Is element of:        GLA03 Main Record
Short Description:    AD DSP RAM Checksum Upper 32 bits
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          AD DSP RAM Checksum Upper 32 bitsComments:

Product Var Name:     iAD_DSPsw_bnum
Is element of:        GLA03 Main Record
Short Description:    AD DSP S/W Build Number
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          AD DSP S/W Build NumberComments:

Product Var Name:     iAD_DSPsw_vnum
Is element of:        GLA03 Main Record
Short Description:    AD DSP S/W Version Number
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
```

```
Description:          AD DSP S/W Version NumberComments:

Product Var Name:     iAD_GPSrwin_ct
Is element of:        GLA03 Main Record
Short Description:    AD GPS Range Window Packets received
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          AD GPS Range Window Packets received
Comments:

Product Var Name:     iDSP_Pcksuml
Is element of:        GLA03 Main Record
Short Description:    AS DSP Patch Checksum Bits 15..0
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:
Comments:

Product Var Name:     iDSP_Pcksumu
Is element of:        GLA03 Main Record
Short Description:    AS DSP Patch Checksum bits 47..16
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:
Comments:

Product Var Name:     iDSP_autoreset
Is element of:        GLA03 Main Record
Short Description:    AD Auto Reset DSP Flag
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:
Comments:

Product Var Name:     iAD_SWenable
```

```
Is element of:        GLA03 Main Record
Short Description:    AD Software Enable Flags
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:
Comments:

Product Var Name:     iAD_DSPtroub
Is element of:        GLA03 Main Record
Short Description:    AD DSP Trouble Indicator Status Word
Product Data Type:    i1b (2, 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:
Comments:

Product Var Name:     iADmemTLoaderr
Is element of:        GLA03 Main Record
Short Description:    AD DSP Memory Table Load Error Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:
Comments:

Product Var Name:     iAD_FixGain
Is element of:        GLA03 Main Record
Short Description:    AD Fixed Return Gain Setting
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:
Comments:

Product Var Name:     iAD_spare2
Is element of:        GLA03 Main Record
Short Description:    AD Spares
Product Data Type:    i1b ( 4)
```

```
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          AD Spares
Comments:

Product Var Name:     iCD_Swerr_ct
Is element of:        GLA03 Main Record
Short Description:    CD Software Error Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          CD Software Error CountComments:

Product Var Name:     iCD_shot_ct
Is element of:        GLA03 Main Record
Short Description:    CD Shot Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          CD Shot CountComments:

Product Var Name:     iCD_SciPkt_ct
Is element of:        GLA03 Main Record
Short Description:    CD Science Mode Packets Sent
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          CD Science Mode Packets SentComments:

Product Var Name:     iCD_EngPkt_ct
Is element of:        GLA03 Main Record
Short Description:    CD Engineering Mode Packets Sent
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
```

```
Product Maximum:     32768
Description:         CD Engineering Mode Packets SentComments:

Product Var Name:    iCD_AncPkt_ct
Is element of:       GLA03 Main Record
Short Description:   CD Ancillary Packet Sent
Product Data Type:   i2b ( 4)
Total Bytes:         8
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     32768
Description:         CD Ancillary Packet SentComments:

Product Var Name:    iCDRGateRcv_ct
Is element of:       GLA03 Main Record
Short Description:   CD Range Gate Pkts Received
Product Data Type:   i2b ( 4)
Total Bytes:         8
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     32768
Description:         CD Range Gate Pkts ReceivedComments:

Product Var Name:    iCD40ctrPkt_ct
Is element of:       GLA03 Main Record
Short Description:   CD 40-bit Counter Packets Sent
Product Data Type:   i2b ( 4)
Total Bytes:         8
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     32768
Description:         CD 40-bit Counter Packets SentComments:

Product Var Name:    i_spare55_1
Is element of:       GLA03 Main Record
Short Description:   Spare
Product Data Type:   i2b ( 4)
Total Bytes:         8
Product Units:       n/a
Invalid Value/Flag:  No
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     0
Description:         Spare in telemetry
Comments:

Product Var Name:    iCD_BG1delay
Is element of:       GLA03 Main Record
Short Description:   CD Background #1 Delay
```

```
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          CD Background #1 Delay
Comments:

Product Var Name:     iCD_BG2delay
Is element of:        GLA03 Main Record
Short Description:    CD Background #2 Delay
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          CD Background #2 Delay
Comments:

Product Var Name:     iCD_Rgatedelay
Is element of:        GLA03 Main Record
Short Description:    CD Range Gate Delay
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          CD Range Gate Delay
Comments:

Product Var Name:     i_spare55_2
Is element of:        GLA03 Main Record
Short Description:    Spare
Product Data Type:    i1b (2, 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spare in telemetry
Comments:

Product Var Name:     iCD_rawADout
Is element of:        GLA03 Main Record
Short Description:    CD Raw A/D Output Data Structure
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
```

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          CD Raw A/D Output Data Structure.  Bits 0 - 7 are the raw Cloud
digitizer A/D output data.  Bit 8 is the CD Raw A/D Overflow Flag.  Bits 9 - 13 indicate
the CD Attenuation Setting; value of 1=1/1, 2=1/1.77, 4=1/3.16, 8=1/5.6, 16=1/10.  All
other bits are unused.Comments:

Product Var Name:     iCD_GPSLch_32l
Is element of:        GLA03 Main Record
Short Description:    CD GPS 40 bit Latch Value 32 lsb
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          CD GPS 40 bit Latch Value 32 lsbComments:

Product Var Name:     iCDfackLch_32l
Is element of:        GLA03 Main Record
Short Description:    CD Fire Acknowledge 40 bit Latch Value 32 lsb
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          CD Fire Acknowledge 40 bit Latch Value 32 lsbComments:

Product Var Name:     iCDfcmdLch_32l
Is element of:        GLA03 Main Record
Short Description:    CD Fire Cmd 40 bit Latch Value 32 lsb
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          CD Fire Cmd 40 bit Latch Value 32 lsbComments:

Product Var Name:     i_spare55_3
Is element of:        GLA03 Main Record
Short Description:    Spare
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
```

```
Product Maximum:     0
Description:         Spare in telemetry
Comments:

Product Var Name:    iCDfcmdLch_8m
Is element of:       GLA03 Main Record
Short Description:   CD Fire Cmd 40 bit Latch Value 8 msb
Product Data Type:   i1b ( 4)
Total Bytes:         4
Product Units:       n/a
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     128
Description:         CD Fire Cmd 40 bit Latch Value 8 msb
Comments:

Product Var Name:    iCDfackLch_8m
Is element of:       GLA03 Main Record
Short Description:   CD Fire Acknowledge 40 bit Latch Value 8 msb
Product Data Type:   i1b ( 4)
Total Bytes:         4
Product Units:       n/a
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     128
Description:         CD Fire Acknowledge 40 bit Latch Value 8 msb
Comments:

Product Var Name:    iCD_GPSLch_8m
Is element of:       GLA03 Main Record
Short Description:   CD GPS 40 bit Latch Value 8 msb
Product Data Type:   i1b ( 4)
Total Bytes:         4
Product Units:       n/a
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     128
Description:         CD GPS 40 bit Latch Value 8 msb
Comments:

Product Var Name:    iCD_dataRdyCtr
Is element of:       GLA03 Main Record
Short Description:   CD Data Ready Counter
Product Data Type:   i4b ( 4)
Total Bytes:         16
Product Units:       n/a
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     65280
Description:         CD Data Ready Counter.  Bits 8 - 15 are the CD FIRE ACKNOWLEDGE
COUNTER.
```

```
Comments:

Product Var Name:     iCD_intsrc
Is element of:        GLA03 Main Record
Short Description:    CD Software Mode Flag
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:
Comments:

Product Var Name:     iCD_PWaccum
Is element of:        GLA03 Main Record
Short Description:    CD PW Limit Violation Counter
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        counts
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      2147483647
Description:
Comments:

Product Var Name:     iCD_PWLong
Is element of:        GLA03 Main Record
Short Description:    CD Long PW Violation Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      127
Description:
Comments:

Product Var Name:     iCD_PWshort
Is element of:        GLA03 Main Record
Short Description:    CD Short PW Violation Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      127
Description:
Comments:

Product Var Name:     iCD_PWmsb
```

```
Is element of:        GLA03 Main Record
Short Description:    CD Short PW MSB
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      127
Description:
Comments:

Product Var Name:     i_spare55_4
Is element of:        GLA03 Main Record
Short Description:    Spare
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spare in telemetry
Comments:

Product Var Name:     iDC_swFailct
Is element of:        GLA03 Main Record
Short Description:    DC Software Fail Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        Counts
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:
Comments:

Product Var Name:     iDC_shot_ct
Is element of:        GLA03 Main Record
Short Description:    DC Shot Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          DC Shot CountComments:

Product Var Name:     iDC_Xpos
Is element of:        GLA03 Main Record
Short Description:    DC X Position
Product Data Type:    i1b ( 4)
Total Bytes:          4
```

```
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          DC X PositionComments:

Product Var Name:     iDC_Ypos
Is element of:        GLA03 Main Record
Short Description:    DC Y Position
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          DC Y PositionComments:

Product Var Name:     iDC_LPApkt_ct
Is element of:        GLA03 Main Record
Short Description:    DC LPA Packets Sent
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          DC LPA Packets SentComments:

Product Var Name:     iDC_tmode_rate
Is element of:        GLA03 Main Record
Short Description:    DC Test Mode Rate
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          DC Test Mode RateComments:

Product Var Name:     iDC_pkt_ct
Is element of:        GLA03 Main Record
Short Description:    DC Packets Sent
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          DC Packets SentComments:
```

```
Product Var Name:     iDC_byte_ct
Is element of:        GLA03 Main Record
Short Description:    DC Bytes Sent
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          DC Bytes SentComments:

Product Var Name:     iDC_outbitrate
Is element of:        GLA03 Main Record
Short Description:    DC Output bit rate in BPS
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          DC Output bit rate in BPSComments:

Product Var Name:     iDC_IntReg
Is element of:        GLA03 Main Record
Short Description:    DC Interrupt register
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          DC Interrupt registerComments:

Product Var Name:     iDC_CtlLchReg
Is element of:        GLA03 Main Record
Short Description:    DC Control latch register
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          DC Control latch registerComments:

Product Var Name:     iDC_intMaskReg
Is element of:        GLA03 Main Record
Short Description:    DC Interrupt Mask Register
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
```

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          DC Interrupt Mask Register; indicates which interrupts are en-
abled/disabled.  Bit 0 is the DC Interrupt 1; value of 0 = Disabled, 1 = Enabled.  Bit
1 is the DC LPA Interrupt; value of 0 = Disabled, 1 = Enabled.  Bit 2 is the DC Output
FIFO Empty Interrupt; value of 0 = Disabled, 1 = Enabled.  Bit 3 is the DC Output FIFO
Full Interrupt;  value of 0 = Disabled, 1 = Enabled.  Bit 4 is the DC RAM Busy Interrupt;
;  value of 0 = Disabled, 1 = Enabled.  Bit 5 is the DC Interrupt 6;  value of 0 =
Disabled, 1 = Enabled.  All other bits are unused.Comments:

Product Var Name:     iDC_FIFO_reg
Is element of:        GLA03 Main Record
Short Description:    DC fifo flags register
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          DC FIFO flags register.  Bit 0 is the DC FIFO Fill flag; value of
0 = True, 1 = false.  Bit 1 is the DC FIFO almost empty flag; value 0f 0 = True, 1 =
false.  Bit 2 is the DC FIFO almost full flag; value 0f 0 = True, 1 = false.    Bit 3
is the DC FIFO empty flag; value 0f 0 = True, 1 = false.  All other bits are unused.Com-
ments:

Product Var Name:     IDC_LPAgainReg
Is element of:        GLA03 Main Record
Short Description:    DC LPA gain register
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          DC LPA gain register.  Bits 0-2 are the LPA gain.  Bit 3 is the
LPA reset flag; value of 0 = In reset, 1 = not in reset.Comments:

Product Var Name:     iDC_LPACt_reg
Is element of:        GLA03 Main Record
Short Description:    DC LPA packet count register
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          DC LPA packet count register.  Bits 0 - 13 are the LPA frame byte
count.  Bits 16 - 23 are the LPA packet (frame) count.Comments:

Product Var Name:     iDC_spares
```

```
Is element of:       GLA03 Main Record
Short Description:   DC Spares
Product Data Type:   i1b (8, 4)
Total Bytes:         32
Product Units:       n/a
Invalid Value/Flag:  No
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     0
Description:         DC Spares
Comments:

Product Var Name:    iGPS10secIntCt
Is element of:       GLA03 Main Record
Short Description:   GP GPS  10 second Interrupt Count
Product Data Type:   i2b ( 4)
Total Bytes:         8
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     32768
Description:         GP GPS  10 second Interrupt Count Comments:

Product Var Name:    iGPPosPktRcvCt
Is element of:       GLA03 Main Record
Short Description:   GP Number of Position Packets received
Product Data Type:   i2b ( 4)
Total Bytes:         8
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     32768
Description:         GP Number of Position Packets receivedComments:

Product Var Name:    iGP_HskPkt_ct
Is element of:       GLA03 Main Record
Short Description:   GP Number of Housekeeping packets sent
Product Data Type:   i2b ( 4)
Total Bytes:         8
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        Yes
Product Minimum:     0
Product Maximum:     32768
Description:         GP Number of Housekeeping packets sentComments:

Product Var Name:    iGP_AncPkt_ct
Is element of:       GLA03 Main Record
Short Description:   GP Number of Ancillary Packets sent
Product Data Type:   i2b ( 4)
Total Bytes:         8
Product Units:       counts
Invalid Value/Flag:  i_APID_AvFlg
```

```
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          GP Number of Ancillary Packets sentComments:

Product Var Name:     iGPS40bitReqCt
Is element of:        GLA03 Main Record
Short Description:    GP GPS 10 sec Pulse 40-Bit Counter Requests sent
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          GP GPS 10 sec Pulse 40-Bit Counter Requests sentComments:

Product Var Name:     iGPS40bitRcvCt
Is element of:        GLA03 Main Record
Short Description:    GP GPS 10 sec Pulse 40-Bit Counter Packets Received
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          GP GPS 10 sec Pulse 40-Bit Counter Packets ReceivedComments:

Product Var Name:     iGP_BadXYZ_cnt
Is element of:        GLA03 Main Record
Short Description:    GP Packets with bad X,Y,Z Position Data
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      -32768
Product Maximum:      32768
Description:          GP Packets with bad X,Y,Z Position Data
Comments:

Product Var Name:     iGP_TolXYZ_cnt
Is element of:        GLA03 Main Record
Short Description:    GP Packets with X,Y,Z data below Tolerance
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          GP Packets with X,Y,Z Position Data Below ToleranceComments:
```

```
Product Var Name:     iGP_PktsSent
Is element of:        GLA03 Main Record
Short Description:    GP Number of Range Packets Sent
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          GP Number of Range Packets SentComments:

Product Var Name:     iGP_spares
Is element of:        GLA03 Main Record
Short Description:    GP Spares
Product Data Type:    i1b (22, 4)
Total Bytes:          88
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          GP Spares
Comments:

Product Var Name:     iPC_swerrct
Is element of:        GLA03 Main Record
Short Description:    PC Software Error Count
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC Software Error CountComments:

Product Var Name:     iPC_shot_ct
Is element of:        GLA03 Main Record
Short Description:    PC Shot Counter
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          Photon counter (PC) Shot CounterComments:

Product Var Name:     iPC_SciPkt_ct
Is element of:        GLA03 Main Record
Short Description:    PC SCIENCE MODE PACKETS SENT
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
```

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC SCIENCE MODE PACKETS SENTComments:

Product Var Name:     iPC_EngPkt_ct
Is element of:        GLA03 Main Record
Short Description:    PC ENGINEERING MODE PACKETS SENT
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC ENGINEERING MODE PACKETS SENTComments:

Product Var Name:     iPC_AncPkt_ct
Is element of:        GLA03 Main Record
Short Description:    PC ANCILLARY MODE PACKETS SENT
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC ANCILLARY MODE PACKETS SENTComments:

Product Var Name:     iPC_RDlyRcv_ct
Is element of:        GLA03 Main Record
Short Description:    PC RANGE GATE DELAY PACKETS RECEIVED
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC RANGE GATE DELAY PACKETS RECEIVEDComments:

Product Var Name:     iPC_SPCMDly
Is element of:        GLA03 Main Record
Short Description:    PC SPCM Gate Delay
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC SPCM Gate DelayComments:
```

```
Product Var Name:     iPC_BG1Dly
Is element of:        GLA03 Main Record
Short Description:    PC Background 1 Delay
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC Background 1 DelayComments:

Product Var Name:     iPC_BG2Dly
Is element of:        GLA03 Main Record
Short Description:    PC Background 2 Delay
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC Background 2 DelayComments:

Product Var Name:     iPC_RGateDly
Is element of:        GLA03 Main Record
Short Description:    PC Range Gate Delay
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC Range Gate DelayComments:

Product Var Name:     iPC_HW_stat
Is element of:        GLA03 Main Record
Short Description:    PC Hardware Mode Status Word
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          PC Hardware Mode Status Word.  Bits 0 -2 indicate the PC board
hardware mode; a value of 1=Idle, 2=Engineering, 4=Science. Bits 12 - 13 in dicate the
PC interuppt source; a value of 1=Fire Command, 2=Fire Acknowledge.  Bit 14 is the PC
measurement source; a value of 0=Fire Command, 1=Fire Acknowledge.  All other bits are
unused.
Comments:

Product Var Name:     IPC_SPCM_st
Is element of:        GLA03 Main Record
```

```
Short Description:    PC SPCM STATUS
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          PC SPCM (Single photon counting module) Status.  Indicates which
of the eight SPCMs are enable/disabled.  A value of 0 = enabled, 1 = disabled.  Bit 8
corresponds to SPCM 1.  Bit 9 corresponds to SPCM 2.  Bit 10 corresponds to SPCM 3.  Bit
11 corresponds to SPCM 4.  Bit 12 corresponds to SPCM 5.  Bit 13 corresponds to SPCM 6.
Bit 14 corresponds to SPCM 7.  Bit 15 corresponds to SPCM 8.  All other bits are unused.
Comments:

Product Var Name:     iPC_DatRdyCtr
Is element of:        GLA03 Main Record
Short Description:    PC Data Ready Counter
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      65535
Description:          PC Data Ready Counter.  Bits 8 - 15 are the PC FIRE ACKNOWLEDGE
COUNTER.Comments:

Product Var Name:     iPCSPCMraw_1_4
Is element of:        GLA03 Main Record
Short Description:    PC SPCM 1 THROUGH 4 RAW COUNTS
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          The raw counts for SPCM 1, 2, 3 ,4.  Bits 0-7 correspond to SPCM
1; bits 8 - 15 correspond to SPCM 2; bits 16 - 23 correspond to SPCM 3; bits 24 - 31
correspond to SPCM 4.
Comments:

Product Var Name:     iPCSPCMraw_5_8
Is element of:        GLA03 Main Record
Short Description:    PC SPCM 5 THROUGH 8 RAW COUNTS
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          The raw counts for SPCM 5, 6, 7, 8.  Bits 0-7 correspond to SPCM
5; bits 8 - 15 correspond to SPCM 6; bits 16 - 23 correspond to SPCM 7; bits 24 - 31
```

```
correspond to SPCM 8.
Comments:

Product Var Name:     iPCSPCM_DCycle
Is element of:        GLA03 Main Record
Short Description:    PC SPCM Duty Cycle
Product Data Type:    i4b ( 4)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          PC SPCM Duty CycleComments:

Product Var Name:     iPC_spare1
Is element of:        GLA03 Main Record
Short Description:    PC Spares
Product Data Type:    i1b (2, 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          PC Spares.
Comments:

Product Var Name:     iC_BSCalXstart
Is element of:        GLA03 Main Record
Short Description:    PC Coarse Boresite Calibration X Start Pos
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC Coarse Boresite Calibration X Start PosComments:

Product Var Name:     iC_BSCalYstart
Is element of:        GLA03 Main Record
Short Description:    PC Coarse Boresite Calibration Y Start Pos
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC Coarse Boresite Calibration Y Start PosComments:

Product Var Name:     iF_BSCalXstart
Is element of:        GLA03 Main Record
Short Description:    PC Fine Boresite Calibration X Start Pos
```

```
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC Fine Boresite Calibration X Start PosComments:

Product Var Name:     iF_BSCalYstart
Is element of:        GLA03 Main Record
Short Description:    PC Fine Boresite Calibration Y Start Pos
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC Fine Boresite Calibration Y Start PosComments:

Product Var Name:     iC_BSCalXinc
Is element of:        GLA03 Main Record
Short Description:    PC Coarse Boresite Calibration X Increment
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC Coarse Boresite Calibration X IncrementComments:

Product Var Name:     iC_BSCalYinc
Is element of:        GLA03 Main Record
Short Description:    PC Coarse Boresite Calibration Y Increment
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC Coarse Boresite Calibration Y IncrementComments:

Product Var Name:     iF_BSCalXinc
Is element of:        GLA03 Main Record
Short Description:    PC Fine Boresite Calibration X Increment
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
```

```
Product Maximum:      32768
Description:          PC Fine Boresite Calibration X IncrementComments:

Product Var Name:     iF_BSCalYinc
Is element of:        GLA03 Main Record
Short Description:    PC Fine Boresite Calibration Y Increment
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC Fine Boresite Calibration Y IncrementComments:

Product Var Name:     iC_BSCalIntSec
Is element of:        GLA03 Main Record
Short Description:    PC Coarse Boresite Cal Integration Seconds
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        seconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC Coarse Boresite Cal Integration SecondsComments:

Product Var Name:     iF_BSCalIntSec
Is element of:        GLA03 Main Record
Short Description:    PC Fine Boresite Cal Integration Seconds
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        seconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC Fine Boresite Cal Integration SecondsComments:

Product Var Name:     i_BSCalXbest
Is element of:        GLA03 Main Record
Short Description:    PC Boresite Calibration Best X Position
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC Boresite Calibration Best X PositionComments:

Product Var Name:     i_BSCalYbest
Is element of:        GLA03 Main Record
Short Description:    PC Boresite Calibration Best Y Position
Product Data Type:    i2b ( 4)
```

```
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC Boresite Calibration Best Y PositionComments:

Product Var Name:     i_BSCal_remSec
Is element of:        GLA03 Main Record
Short Description:    PC Boresite Cal Seconds Remaining
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        seconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          PC Boresite Cal Seconds RemainingComments:

Product Var Name:     i_spare55_5
Is element of:        GLA03 Main Record
Short Description:    Spares
Product Data Type:    i1b (10, 4)
Total Bytes:          40
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spares in telemetry
Comments:

Product Var Name:     iCT_state
Is element of:        GLA03 Main Record
Short Description:    CT State Machine Current State
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      6
Description:          CT State Machine Current StateComments:

Product Var Name:     iCTCmdEchoErrCt
Is element of:        GLA03 Main Record
Short Description:    CT COMMAND ECHO ERRORS
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
```

```
Product Maximum:      128
Description:          CT COMMAND ECHO ERRORSComments:

Product Var Name:     i_LMBCmdRcvCt
Is element of:        GLA03 Main Record
Short Description:    CT LM BOARD CMDS RECEIVED
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT LM BOARD CMDS RECEIVEDComments:

Product Var Name:     i_TMBCmdRcvCt
Is element of:        GLA03 Main Record
Short Description:    CT TM BOARD CMDS RECEIVED
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT TM BOARD CMDS RECEIVEDComments:

Product Var Name:     i_MCBCmdRcvCt
Is element of:        GLA03 Main Record
Short Description:    CT MC BOARD CMDS RECEIVED
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT MC BOARD CMDS RECEIVEDComments:

Product Var Name:     i_HKBCmdRcvCt
Is element of:        GLA03 Main Record
Short Description:    CT HK BOARD CMDS RECEIVED
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT HK BOARD CMDS RECEIVEDComments:

Product Var Name:     i_HVPSCmdRcvCt
Is element of:        GLA03 Main Record
Short Description:    CT HVPS Cmds Received
Product Data Type:    i1b ( 4)
```

```
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT HVPS Cmds ReceivedComments:

Product Var Name:     i_PDUCmdRcvCt
Is element of:        GLA03 Main Record
Short Description:    CT PDU Cmds Received
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT PDU Cmds ReceivedComments:

Product Var Name:     i_HWtlm1Pkt_ct
Is element of:        GLA03 Main Record
Short Description:    CT HW TLM 1 PACKETS SENT
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT HW TLM 1 PACKETS SENTComments:

Product Var Name:     i_HWtlm2Pkt_ct
Is element of:        GLA03 Main Record
Short Description:    CT HW TLM 2 PACKETS SENT
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT HW TLM 2 PACKETS SENTComments:

Product Var Name:     i_HWtlm3Pkt_ct
Is element of:        GLA03 Main Record
Short Description:    CT HW TLM 3 PACKETS SENT
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
```

```
Description:          CT HW TLM 3 PACKETS SENTComments:

Product Var Name:     i_HWtlm4Pkt_ct
Is element of:        GLA03 Main Record
Short Description:    CT HW TLM 4 PACKETS SENT
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT HW TLM 4 PACKETS SENTComments:

Product Var Name:     i_HWtlm5Pkt_ct
Is element of:        GLA03 Main Record
Short Description:    CT HW TLM 5 PACKETS SENT
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT HW TLM 5 PACKETS SENTComments:

Product Var Name:     iCtdwellPkt_ct
Is element of:        GLA03 Main Record
Short Description:    CT DWELL PACKETS SENT
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT DWELL PACKETS SENTComments:

Product Var Name:     iCT_AncPkt_ct
Is element of:        GLA03 Main Record
Short Description:    CT ANCILLARY PACKETS SENT
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT ANCILLARY PACKETS SENTComments:

Product Var Name:     iCT_timeout_ct
Is element of:        GLA03 Main Record
Short Description:    CT TIMEOUT COUNT
Product Data Type:    i1b ( 4)
Total Bytes:          4
```

```
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT TIMEOUT COUNTComments:

Product Var Name:     iCT_int_ct
Is element of:        GLA03 Main Record
Short Description:    CT INTERRUPT COUNT
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT INTERRUPT COUNTComments:

Product Var Name:     iCT_ShotCtErr
Is element of:        GLA03 Main Record
Short Description:    CT Shot Counter Errors
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT Shot Counter ErrorsComments:

Product Var Name:     iCT_dwell_mode
Is element of:        GLA03 Main Record
Short Description:    CT Dwell Mode
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32
Description:          CT Dwell ModeComments:

Product Var Name:     iCT_dwell_chnl
Is element of:        GLA03 Main Record
Short Description:    CT Dwell Channel
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT Dwell ChannelComments:
```

```
Product Var Name:     iCTLMBmuxErrCt
Is element of:        GLA03 Main Record
Short Description:    CT Laser Monitor Board Mux Error Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT Laser Monitor Board Mux Error CounterComments:

Product Var Name:     iCTHKBmuxErrCt
Is element of:        GLA03 Main Record
Short Description:    CT Housekeeping Board Mux Error Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT Housekeeping Board Mux Error CounterComments:

Product Var Name:     iCTHKBsmxErrCt
Is element of:        GLA03 Main Record
Short Description:    CT Housekeeping Board Submux Error Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT Housekeeping Board Submux Error CounterComments:

Product Var Name:     iCTTCBmuxErrCt
Is element of:        GLA03 Main Record
Short Description:    CT Temperature Controller Board Mux Error Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT Temperature Controller Board Mux Error CounterComments:

Product Var Name:     iCTMCBmuxErrCt
Is element of:        GLA03 Main Record
Short Description:    CT Mechanism Controller Board Mux Error Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
```

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT Mechanism Controller Board Mux Error CounterComments:

Product Var Name:     iCTHVPSmuxErrCt
Is element of:        GLA03 Main Record
Short Description:    CT High Voltage Power Supply Mux Error Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT High Voltage Power Supply Mux Error CounterComments:

Product Var Name:     iCTPDUmuxErrCt
Is element of:        GLA03 Main Record
Short Description:    CT Power Distribution Unit Mux Error Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT Power Distribution Unit Mux Error CounterComments:

Product Var Name:     iCT_CEchoSucCt
Is element of:        GLA03 Main Record
Short Description:    CT Command Echo Success Count
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          CT Command Echo Success CountComments:

Product Var Name:     iCT_SupErrflag
Is element of:        GLA03 Main Record
Short Description:    CT Suppressed Event Message Error Flags
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:
Comments:
```

```
Product Var Name:     iCT_LHP1tcstat
Is element of:        GLA03 Main Record
Short Description:    CT LHP1 Temperature Control State
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:
Comments:

Product Var Name:     iCT_LHP2tcstat
Is element of:        GLA03 Main Record
Short Description:    CT LHP2 Temperature Control State
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:
Comments:

Product Var Name:     iCT_LHP1tsp
Is element of:        GLA03 Main Record
Short Description:    CT LHP1 Temperature Setpoint
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:
Comments:

Product Var Name:     iCT_LHP2tsp
Is element of:        GLA03 Main Record
Short Description:    CT LHP2 Temperature Setpoint
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:
Comments:

Product Var Name:     iCT_LHP1tcctr
Is element of:        GLA03 Main Record
```

```
Short Description:    CT LHP1 Temperature Control Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:
Comments:

Product Var Name:     iCT_LHP2tcctr
Is element of:        GLA03 Main Record
Short Description:    CT LHP2 Temperature Control Counter
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:
Comments:

Product Var Name:     iCT_LHP1_Tmin
Is element of:        GLA03 Main Record
Short Description:    CT LHP1 Minimum Temperature
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:
Comments:

Product Var Name:     iCT_LHP2_Tmin
Is element of:        GLA03 Main Record
Short Description:    CT LHP2 Minimum Temperature
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:
Comments:

Product Var Name:     iCT_LHP1_Tdelta
Is element of:        GLA03 Main Record
Short Description:    CT LHP1 Temperature Change
Product Data Type:    i1b ( 4)
Total Bytes:          4
```

```
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:
Comments:

Product Var Name:     iCT_LHP2_Tdelta
Is element of:        GLA03 Main Record
Short Description:    CT LHP2 Temperature Change
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:
Comments:

Product Var Name:     iCT_LHP1_Tcyct
Is element of:        GLA03 Main Record
Short Description:    CT LHP1 Temperature Control Cycle Time
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:
Comments:

Product Var Name:     iCT_LHP2_Tcyct
Is element of:        GLA03 Main Record
Short Description:    CT LHP2 Temperature Control Cycle Time
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:
Comments:

Product Var Name:     iCT_miscFlag
Is element of:        GLA03 Main Record
Short Description:    CT Misc Status Flags
Product Data Type:    i1b ( 4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
```

```
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:
Comments:

Product Var Name:     ICT_spares
Is element of:        GLA03 Main Record
Short Description:    CT Spares
Product Data Type:    i1b (11, 4)
Total Bytes:          44
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          CT Spares
Comments:

Product Var Name:     i_phdr_ad
Is element of:        GLA03 Main Record
Short Description:    Primary Header APID 12 or 13
Product Data Type:    i1b (6, 64)
Total Bytes:          384
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Primary Header APID 12 or 13Comments:

Product Var Name:     i_shdr_ad
Is element of:        GLA03 Main Record
Short Description:    Secondary Header 12 or 13 (time stamp)
Product Data Type:    i1b (8, 64)
Total Bytes:          512
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Secondary Header 12 or 13 (time stamp)Comments:

Product Var Name:     i_phdr_15
Is element of:        GLA03 Main Record
Short Description:    Primary Header APID 15
Product Data Type:    i1b (6, 16)
Total Bytes:          96
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Primary Header APID 15Comments:
```

```
Product Var Name:     i_shdr_15
Is element of:        GLA03 Main Record
Short Description:    Secondary Header APID 15 (time stamp)
Product Data Type:    i1b (8, 16)
Total Bytes:          128
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Secondary Header APID 15 (time stamp)Comments:

Product Var Name:     i_phdr_17
Is element of:        GLA03 Main Record
Short Description:    Primary Header APID 17
Product Data Type:    i1b (6, 16)
Total Bytes:          96
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Primary Header APID 17Comments:

Product Var Name:     i_shdr_17
Is element of:        GLA03 Main Record
Short Description:    Secondary Header APID 17 (time stamp)
Product Data Type:    i1b (8, 16)
Total Bytes:          128
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Secondary Header APID 17 (time stamp)Comments:

Product Var Name:     i_phdr_19
Is element of:        GLA03 Main Record
Short Description:    Primary Header APID 19
Product Data Type:    i1b (6, 16)
Total Bytes:          96
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Primary Header APID 19Comments:

Product Var Name:     i_shdr_19
Is element of:        GLA03 Main Record
Short Description:    Secondary Header APID 19 (time stamp)
Product Data Type:    i1b (8, 16)
Total Bytes:          128
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
```

```
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          Secondary Header APID 19 (time stamp)Comments:

Product Var Name:     i_sctr_19
Is element of:        GLA03 Main Record
Short Description:    Shot Counter APID 19
Product Data Type:    i2b ( 16)
Total Bytes:          32
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          Shot Counter APID 19
Comments:

Product Var Name:     i_chin_flag
Is element of:        GLA03 Main Record
Short Description:    Check-In Flags, Mask 0x1F
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          The Check-in Flag indicates what telemetry tasks are represented
in the current ancillary science packet: AD Task, Mask = 0x01; PC Task, Mask = 0x02;  CD
Task, Mask = 0x04; GP Task, Mask = 0x08; CT Task, Mask = 0x10; Bit value of 1=task tlm
in ancillary pkt, 0=task tlm NOT in ancillary pkt.  Dimensioned to 16 because occurs
once per second.Comments:

Product Var Name:     i_RMS_loc
Is element of:        GLA03 Main Record
Short Description:    RMS Noise Calculation Location
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        ns
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Location of RMS noise calculation: starting digitizer element num-
ber. RMS location start time. DSP tlm. Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name:     i_sctrPDlyWF
Is element of:        GLA03 Main Record
Short Description:    Shot Counter for Post Delay WF
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
```

```
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Shot counter for the Post delay pulse waveform.   Dimensioned to
16 because occurs once per second.
Comments:

Product Var Name:     i_dlaywf_start
Is element of:        GLA03 Main Record
Short Description:    Post Delay Pulse Waveform Start Address
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        ns
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Start address of the Post delay laser pulse waveform in nanosecond
resolution relative to the first sample of the waveform.  Dimensioned to 16 because oc-
curs once per second.
Comments:

Product Var Name:     i_PDlyWf
Is element of:        GLA03 Main Record
Short Description:    Sampled Post Delay Pulse Waveform
Product Data Type:    i1b (32, 16)
Total Bytes:          512
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Sampled post delay pulse waveform.  Note: offset for this data is
from the transmit pulse peak.  Dimensioned to 32 by 16 because 32 samples occur once per
second.
Comments:

Product Var Name:     i_otswf_start
Is element of:        GLA03 Main Record
Short Description:    OTS Pulse Waveform Start Address
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        ns
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Start address of the following four Optical Test System (OTS) laser
pulse waveforms in nanosecond resolution relative to the first sample of the waveform.
Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name:     i_sctrOTSWf
Is element of:        GLA03 Main Record
Short Description:    Shot Counter for OTS WF
```

```
Product Data Type:    i4b (4, 16)
Total Bytes:          256
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      65535
Description:          Shot counters for the OTS pulse waveforms.   Dimensioned to 4 by
16 because 4 OTS waveforms occur each second.
Comments:

Product Var Name:     i_OTSPWf
Is element of:        GLA03 Main Record
Short Description:    Sampled OTS Pulse Waveform
Product Data Type:    i1b (128, 16)
Total Bytes:          2048
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Sampled OTS pulse waveform.  Note: offset for this data is from
the laser fire.  Dimensioned to 32 by 64 because 32 samples occur 4 times per second.
Comments:

Product Var Name:     i_cTx_win_loc
Is element of:        GLA03 Main Record
Short Description:    Commanded Location of Transmit Pulse Search Window
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        ns
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Reflects commanded value. Dimensioned to 16 because occurs once
per second.
Comments:

Product Var Name:     i_cNumNoTxing
Is element of:        GLA03 Main Record
Short Description:    Commanded Number of No Threshold Crossings
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Number of no threshold crossing shots for error condition.  Re-
flects commanded value. Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name:     i_spare19_1
Is element of:        GLA03 Main Record
```

```
Short Description:    Spare APID 19
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spare byte from telemetry packet. Dimensioned to 16 because occurs
once per second.
Comments:

Product Var Name:     i_cTxThresh
Is element of:        GLA03 Main Record
Short Description:    Commanded Transmit Pulse Threshold Value
Product Data Type:    i2b ( 16)
Total Bytes:          32
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200
Description:          Reflects commanded value. Dimensioned to 16 because occurs once
per second.
Comments:

Product Var Name:     i_cRwinSf
Is element of:        GLA03 Main Record
Short Description:    Commanded Range Window Weighting Scale Factors
Product Data Type:    i4b (24, 16)
Total Bytes:          1536
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200
Description:          Reflects commanded value. Dimensioned to 24 by 16 because 4 scale
factors per each filter (6) occurs each second.
Comments:

Product Var Name:     i_cBgCoeff
Is element of:        GLA03 Main Record
Short Description:    Commanded Background Coefficients
Product Data Type:    i4b (18, 16)
Total Bytes:          1152
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200
Description:          Reflects commanded value. Background noise coefficients A1, A2, A3
for the 4ns, 8ns, 16ns, 32ns, 64ns, and 128ns filter. Dimensioned 3 by 6 by 16 because
3 coefficients occur for the filter per second.
Comments:
```

```
Product Var Name:     i_spare19_2
Is element of:        GLA03 Main Record
Short Description:    Spare APID 19
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spares in the telemetry. Dimensioned to 16 because occurs once per
second.
Comments:

Product Var Name:     i_cEnAGC
Is element of:        GLA03 Main Record
Short Description:    Commanded Enable/Disable AGC
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          Enable/Disable Auto Gain Calculation.  Reflects commanded value.
Dimensioned to 16 because occurs once per second.Comments:

Product Var Name:     i_cEnAGC_4
Is element of:        GLA03 Main Record
Short Description:    Commanded Enable/Disable Use 4ns Filter for AGC
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          Enable/Disable Use 4ns Filter for AGC.  Reflects commanded value.
Dimensioned to 16 because occurs once per second.Comments:

Product Var Name:     i_cRetGn
Is element of:        GLA03 Main Record
Short Description:    Commanded Return Gain Value
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      200
Description:          Return Gain Value.  Reflects commanded value. Dimensioned to 16
because occurs once per second.
Comments:

Product Var Name:     i_cAGC_A
```

```
Is element of:        GLA03 Main Record
Short Description:    Commanded AGC A Parameter
Product Data Type:    i4b (4, 16)
Total Bytes:          256
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200
Description:          AGC A Parameters.  Reflects commanded value.  Dimensioned to 4 by
16 because 4 parameters occur per second.
Comments:

Product Var Name:     i_cAGC_B
Is element of:        GLA03 Main Record
Short Description:    Commanded AGC B Parameter
Product Data Type:    i4b (4, 16)
Total Bytes:          256
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200
Description:          AGC B Parameters.  Reflects commanded value.  Dimensioned to 4 by
16 because 4 parameters occur per second.
Comments:

Product Var Name:     i_cAGC_C
Is element of:        GLA03 Main Record
Short Description:    Commanded AGC C Parameter
Product Data Type:    i4b (2, 16)
Total Bytes:          128
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200
Description:          AGC C0 and C1 Parameters.  Reflects commanded value.  Dimensioned
to 2 by 16 because 2 parameters occur per second.
Comments:

Product Var Name:     i_cAGC_Gmax
Is element of:        GLA03 Main Record
Short Description:    Commanded AGC Gmax Parameter
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      100
Description:          AGC Gmax Parameter.  Reflects commanded value. Dimensioned to 16
because occurs once per second.
Comments:
```

```
Product Var Name:     i_cAGC_Gmin
Is element of:        GLA03 Main Record
Short Description:    Commanded AGC Gmin Parameter
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      100
Description:          AGC Gmin Parameter.  Reflects commanded value. Dimensioned to 16
because occurs once per second.
Comments:

Product Var Name:     i_cAGC_Ginit
Is element of:        GLA03 Main Record
Short Description:    Commanded AGC Ginit Parameter
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      100
Description:          AGC Ginit Parameter.  Reflects commanded value. Dimensioned to 16
because occurs once per second.
Comments:

Product Var Name:     i_cAGC_Zmax
Is element of:        GLA03 Main Record
Short Description:    Commanded AGC Zmax Parameter
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200
Description:          AGC Zmax Parameter.  Reflects commanded value.  Dimensioned to 16
because occurs once per second.
Comments:

Product Var Name:     i_cAGC_Zmin
Is element of:        GLA03 Main Record
Short Description:    Commanded AGC Zmin Parameter
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200
Description:          AGC Zmin Parameter.  Reflects commanded value.  Dimensioned to 16
because occurs once per second.
Comments:
```

```
Product Var Name:     i_cAGC_Vref
Is element of:        GLA03 Main Record
Short Description:    Commanded AGC Vref Parameter
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200
Description:          AGC Vref Parameter.  Reflects commanded value.  Dimensioned to 16
because occurs once per second.
Comments:

Product Var Name:     i_cAGC_Vmin
Is element of:        GLA03 Main Record
Short Description:    Commanded AGC Vmin Parameter
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      200
Description:          AGC Vmin Parameter.  Reflects commanded value.  Dimensioned to 16
because occurs once per second.
Comments:

Product Var Name:     i_cFiltCTol
Is element of:        GLA03 Main Record
Short Description:    Commanded Filter Coincidence Tolerance
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200
Description:          Tolerance for coincidence of all filters.  Reflects commanded val-
ue.  Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name:     i_cRwinDOff
Is element of:        GLA03 Main Record
Short Description:    Commanded Range Window Dump Offsets
Product Data Type:    i4b (6, 16)
Total Bytes:          384
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200
Description:          Range Window Dump Offsets.  Offsets applied to trailing edge of
range pulse for the selection of the 1000 sample region to be downlinked.  Each filter
```

is given a separate offset. Index 0 => 4 nanosecond filter, Index 1 => 8 nanosecond filter, Index 2 => 16 nanosecond filter, Index 3 => 32 nanosecond filter, Index 4 => 64 nanosecond filter and Index 5 => 128 nanosecond filter. Reflects commanded value. Dimensioned to 6 by 16 because offset occurs for each filter (6) per second.
Comments:

Product Var Name: i_cRetFThr
Is element of: GLA03 Main Record
Short Description: Commanded Return Pulse Filter Threshold Values
Product Data Type: i1b (6, 16)
Total Bytes: 96
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 200
Description: Reflects commanded value. The return pulse threshold values for all filters. Dimensioned to 6 by 16 because occurs for each filter (6) per second.
Comments:

Product Var Name: i_spare_tlm21
Is element of: GLA03 Main Record
Short Description: Spares
Product Data Type: i1b (2, 16)
Total Bytes: 32
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description:
Comments:

Product Var Name: i_cFIRCoeff
Is element of: GLA03 Main Record
Short Description: Commanded FIR Coefficients
Product Data Type: i1b (8, 16)
Total Bytes: 128
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 200
Description: FIR COEFFICIENTS ? aabb ccdd xxyy zzww; set of eight 8-bit coefficients used by the FIR Filter engine for all filtering conditions. Aabb ccdd ? First set of coefficients. Xxyy zzww? Second set of coefficients. Reflects commanded value. Dimensioned to 8 by 16 because 8 coefficients occur per second.
Comments:

Product Var Name: i_FWminStDev
Is element of: GLA03 Main Record
Short Description: Filter Weight Minimum Standard Deviation
Product Data Type: i4b (16)
Total Bytes: 64
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg

```
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Filter weight minimum standard deviation.
Comments:

Product Var Name:     i_FNzMinThr
Is element of:        GLA03 Main Record
Short Description:    Filter Noise Minimum Thresholds for each Filter
Product Data Type:    i4b (6, 16)
Total Bytes:          384
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Filter Noise Minimum Thresholds for each Filter (4ns, 8ns, 16 ns,
32 ns, 64 ns, 128ns).
Comments:

Product Var Name:     i_FRejMskLead
Is element of:        GLA03 Main Record
Short Description:    Filter reject mask for leading edge
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:
Comments:

Product Var Name:     i_FRejMskTrail
Is element of:        GLA03 Main Record
Short Description:    Filter reject mask for trailing edge
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:
Comments:

Product Var Name:     i_spare19_3
Is element of:        GLA03 Main Record
Short Description:    Spare APID 19
Product Data Type:    i1b (22, 16)
Total Bytes:          352
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
```

```
Product Minimum:      0
Product Maximum:      0
Description:          Spares in the telemetry.  Dimensioned to 22 by 16 because 22 bytes
occur per second.
Comments:

Product Var Name:     i_shotctr_40
Is element of:        GLA03 Main Record
Short Description:    Shot Counter
Product Data Type:    i2b (40, 16)
Total Bytes:          1280
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      1
Product Maximum:      200
Description:
Comments:

Product Var Name:     i_fack_time
Is element of:        GLA03 Main Record
Short Description:    Fire Acknowledge Time
Product Data Type:    i1b (200, 16)
Total Bytes:          3200
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          Fire Acknowledge Time (from Freq and Time Bd). Freq & Time Board
Tlm, 40 bit counter. Dimensioned (5,40,16).Comments:

Product Var Name:     i_fcmd_time
Is element of:        GLA03 Main Record
Short Description:    Fire Command Time
Product Data Type:    i1b (200, 16)
Total Bytes:          3200
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      128
Description:          Fire Command Time (from Freq and Time Bd). Freq & Time Board Tlm,
40 bit counter. Dimensioned (5,40,16).Comments:

Product Var Name:     i_calcSClat
Is element of:        GLA03 Main Record
Short Description:    Latitude
Product Data Type:    i2b ( 16)
Total Bytes:          32
Product Units:        Degrees
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -90
Product Maximum:      90
```

```
Description:          S/C latitude calculated from s/c position data in degrees.  Dimen-
sioned to 16 because occurs once per second.
Comments:

Product Var Name:     i_calcSClon
Is element of:        GLA03 Main Record
Short Description:    Longitude
Product Data Type:    i2b ( 16)
Total Bytes:          32
Product Units:        Degrees
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      360
Description:          S/C longitude calculated from s/c position data in degrees.  Di-
mensioned to 16 because occurs once per second.
Comments:

Product Var Name:     i_Hsat
Is element of:        GLA03 Main Record
Short Description:    Height (Hsat)
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      800000
Description:          S/C geodetic altitude of s/c above earth’s surface in kilometers.
Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name:     i_Rsat
Is element of:        GLA03 Main Record
Short Description:    Rsat
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      800000
Description:          Distance from s/c to center of earth in kilometers.  Dimensioned
to 16 because occurs once per second.
Comments:

Product Var Name:     i_Rmin
Is element of:        GLA03 Main Record
Short Description:    Rmin
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
```

```
Product Maximum:      800000
Description:          Range window start in kilometers.  Dimensioned to 16 because occurs
once per second.
Comments:

Product Var Name:     i_Rmax
Is element of:        GLA03 Main Record
Short Description:    Rmax
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      800000
Description:          Range window stop in kilometers.  Dimensioned to 16 because occurs
once per second.
Comments:

Product Var Name:     i_Wmin
Is element of:        GLA03 Main Record
Short Description:    Wmin
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      100000
Description:          Minimum window size. Default is 2km.  Dimensioned to 16 because
occurs once per second.
Comments:

Product Var Name:     i_Wmax
Is element of:        GLA03 Main Record
Short Description:    Wmax
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      100000
Description:          Maximum window size. Default is 11km.  Dimensioned to 16 because
occurs once per second.
Comments:

Product Var Name:     i_Hoffmin
Is element of:        GLA03 Main Record
Short Description:    Hoffmin (DEM uncertainty + bias)
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
```

```
Product Minimum:      -1000
Product Maximum:      10000
Description:          Offset associated with the minimum height. Default is 1.125km.  Di-
mensioned to 16 because occurs once per second.
Comments:

Product Var Name:     i_Hoffmax
Is element of:        GLA03 Main Record
Short Description:    Hoffmax (DEM uncertainty - bias)
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -2000
Product Maximum:      10000
Description:          Offset associated with the maximum height. Default is negative
0.875km.  Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name:     i_Rbmin
Is element of:        GLA03 Main Record
Short Description:    Rbmin
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      10000
Description:          Bias added to the mimimum range for Altimeter Digitizer (in kilo-
meters). Default is 0..  Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name:     i_Rbmax
Is element of:        GLA03 Main Record
Short Description:    Rbmax
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -2000
Product Maximum:      10000
Description:          Bias added to the maximum range for Altimeter Digitizer (in kilo-
meters). Default is 0.  Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name:     i_ObSurfType
Is element of:        GLA03 Main Record
Short Description:    Surface Type
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
```

```
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3
Description:          Surface type from telemetry data:  0=ocean & no ice; 1=land & no
ice; 2=ocean & ice; 3=land & ice.  Dimensioned to 16 because occurs once per second.Com-
ments:

Product Var Name:     i_PosDatFlg
Is element of:        GLA03 Main Record
Short Description:    Position data valid flag
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Set to zero(0) if no errors detected during position data process-
ing, otherwise non-zero.  Dimensioned to 16 because occurs once per second.Comments:

Product Var Name:     i_SCPosPkt
Is element of:        GLA03 Main Record
Short Description:    Spacecraft Time and Position Packet
Product Data Type:    i1b (40, 16)
Total Bytes:          640
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Spacecraft position and GPS Time command packet received over 1553
bus minus 8 byte CCSDS command header. Format is defined in spacecraft ICD.
Comments:

Product Var Name:     i_SCPosPktShot
Is element of:        GLA03 Main Record
Short Description:    Shot Count for 1553 Spacecraft Time and Position Packet
Product Data Type:    i2b ( 16)
Total Bytes:          32
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Shot count captured by RT task when it receives spacecraft position
and command packet. Only lower 8 bits valid
Comments:

Product Var Name:     i_SCPosPktGMET
Is element of:        GLA03 Main Record
Short Description:    GLAS MET for 1553 Spacecraft Time and Position Packet
Product Data Type:    i1b (6, 16)
Total Bytes:          96
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
```

```
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          GLAS MET captured by RT task when it receives spacecraft position
and command packet.
Comments:

Product Var Name:     i_DEMmin
Is element of:        GLA03 Main Record
Short Description:    DEM minimum byte
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          DEM miminum elevation byte used to calculate hmin.  Dimensioned to
16 because occurs once per second.
Comments:

Product Var Name:     i_DEMmax
Is element of:        GLA03 Main Record
Short Description:    DEM maximum byte
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          DEM maximum elevation byte used to calculate hmax.  Dimensioned to
16 because occurs once per second.
Comments:

Product Var Name:     i_RngDatSrc
Is element of:        GLA03 Main Record
Short Description:    Range data source
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      2
Description:          Source of range data: 0=s/c time & pos pkt; 1=uplinked DEM bytes;
2=uplinked Rmin/Rmax.  Dimensioned to 16 because occurs once per second.       Comments:

Product Var Name:     i_FTLatch
Is element of:        GLA03 Main Record
Short Description:    GPS 10 Sec Pulse 40 bit count value
Product Data Type:    i1b (5, 16)
Total Bytes:          80
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
```

```
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Last 40-bit count value from frequency & time board. Corresponds
to the last GPS 10 second pulse.  Dimensioned to 16 because the latch time occurs once
per second. 2 4-byte items because the latch value is 40 bits.  The upper 24 bits are
not used.
Comments:

Product Var Name:     i_GPSppsGMET
Is element of:        GLA03 Main Record
Short Description:    GLAS MET for GPS 0.1 Hz Pulse
Product Data Type:    i1b (6, 16)
Total Bytes:          96
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          GLAS MET at time of last GPS 10 sec pulse (in VTCW format)
Comments:

Product Var Name:     i_spare19_4
Is element of:        GLA03 Main Record
Short Description:    Spare APID 19
Product Data Type:    i1b (8, 16)
Total Bytes:          128
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spares in the telemetry.  Dimensioned to 8 by 16 because 8 bytes
occur per second.
Comments:

Product Var Name:     i_et_cal_mode
Is element of:        GLA03 Main Record
Short Description:    Etalon Calibration  - Current mode
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3
Description:          Current mode of Etalon calibration: OFF=0, Acquire=1, Tracking=2
or Invalid=3.  Dimensioned to 16 because occurs once per second.Comments:

Product Var Name:     i_ET_state
Is element of:        GLA03 Main Record
Short Description:    Etalon State
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
```

```
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      4
Description:          The state of the etalon: Init=0, Set Temp=1, Wait=2, Average=3.
Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name:     i_ETsettleTime
Is element of:        GLA03 Main Record
Short Description:    Etalon Temperature Settle Time
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        seconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Etalon Temperature Settle Time.  Dimensioned to 16 because occurs
once per second.
Comments:

Product Var Name:     i_ET_Flags
Is element of:        GLA03 Main Record
Short Description:    Etalon Flags
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Etalon Flags.  Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name:     i_et_onax_xmit
Is element of:        GLA03 Main Record
Short Description:    Etalon Averaged on-axis transmission
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Etalon Averaged on-axis transmission.  Dimensioned to 16 because
occurs once per second.
Comments:

Product Var Name:     i_et_offax_xmit
Is element of:        GLA03 Main Record
Short Description:    Etalon Averaged off-axis transission
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
```

```
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Etalon Averaged off-axis transmission.  Dimensioned to 16 because
occurs once per second.
Comments:

Product Var Name:     i_et_temperr
Is element of:        GLA03 Main Record
Short Description:    Etalon Temperature Error
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Etalon Temperature Error.  Dimensioned to 16 because occurs once
per second.
Comments:

Product Var Name:     i_et_trkfltout
Is element of:        GLA03 Main Record
Short Description:    Etalon Tracking Loop Filter output
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Etalon Tracking Loop Filter output.  Dimensioned to 16 because oc-
curs once per second.
Comments:

Product Var Name:     i_et_trkfltavg
Is element of:        GLA03 Main Record
Short Description:    Etalon Tracking Failure Average
Product Data Type:    i4b ( 16)
Total Bytes:          64
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Etalon Tracking Failure Average.  Dimensioned to 16 because occurs
once per second.
Comments:

Product Var Name:     i_et_StartTemp
Is element of:        GLA03 Main Record
Short Description:    Start Temperature
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        celsius
```

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Start Temperature.  Dimensioned to 16 because occurs once per sec-
ond.
Comments:

Product Var Name:     i_et_StopTemp
Is element of:        GLA03 Main Record
Short Description:    Stop Temperature
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        celsius
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Stop Temperature.  Dimensioned to 16 because occurs once per sec-
ond.
Comments:

Product Var Name:     i_et_TempStep
Is element of:        GLA03 Main Record
Short Description:    Temperature Step
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        celsius
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Temperature Step.  Dimensioned to 16 because occurs once per sec-
ond.
Comments:

Product Var Name:     i_et_acqavg_tm
Is element of:        GLA03 Main Record
Short Description:    Etalon Averaging time for acquire command
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        seconds
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Etalon averaging time for acquire command.  Dimensioned to 16 be-
cause occurs once per second.
Comments:

Product Var Name:     i_et_acqset_tm
Is element of:        GLA03 Main Record
Short Description:    Etalon Temperature setle time for acquire cmd
Product Data Type:    i2b ( 16)
Total Bytes:          32
```

```
Product Units:        seconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32767
Description:          Etalon Temperature setle time for acquire cmd.   Dimensioned to 16
because occurs once per second.
Comments:

Product Var Name:     i_et_update_ctr
Is element of:        GLA03 Main Record
Short Description:    Etalon averaging update counter
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Etalon averaging update counter.  Dimensioned to 16 because occurs
once per second.
Comments:

Product Var Name:     i_et_spare
Is element of:        GLA03 Main Record
Short Description:    Spare Etalon Bytes
Product Data Type:    i1b ( 16)
Total Bytes:          16
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spare Bytes.   Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name:     i_DualPinA
Is element of:        GLA03 Main Record
Short Description:    Dual Pin A
Product Data Type:    i1b (40, 16)
Total Bytes:          640
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          From Laser Monitor Board.  Each corresponds to one of the 40 shots.
Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name:     i_DualPinB
Is element of:        GLA03 Main Record
Short Description:    Dual Pin B
Product Data Type:    i1b (40, 16)
Total Bytes:          640
```

```
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          From Laser Monitor Board.  Each corresponds to one of the 40 shots.
Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name:     i_532nrg
Is element of:        GLA03 Main Record
Short Description:    Etalon 532 Energy
Product Data Type:    i1b (40, 16)
Total Bytes:          640
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      32768
Description:          Etalon 532 Energy.
Comments:

Product Var Name:     i_APID_AvFlg
Is element of:        GLA03 Main Record
Short Description:    Availability Flag
Product Data Type:    i1b (8, 16)
Total Bytes:          128
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:
Comments:

Product Var Name:     i_timecorflg
Is element of:        GLA01 Main Record , GLA02 Record, GLA03 Main Record, GLA04 BST Main
Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS
Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08
Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    time correction flag
Product Data Type:    i2b
Total Bytes:          2
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32767
Description:          Indicates what instrument or bias corrections were applied to the
times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag descrip-
tion</a> for more details.
Comments:

Product Var Name:     i_spare4
```

```
Is element of:        GLA03 Main Record
Short Description:    Spares
Product Data Type:    i1b ( 78)
Total Bytes:          78
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Additional spares
Comments:
```

D.1.6 GLA04 LPA Main Record

```
Product Var Name:     i_rec_ndx
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    GLAS Record Index
Product Data Type:    i4b
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Unique index that relates this record to the corresponding
record(s) in each GLAS data product.
Comments:

Product Var Name:     i_UTCTime
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    Transmit Time of First Shot in frame in J2000
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        seconds, microseconds
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          The transmit time in UTC of the 1st shot in the 1 second frame
referenced to noon on Jan 1, 2000.   The first item is the whole number of seconds ; the
second item is the fractional part in microseconds.
Comments:             This is not the ground bounce time, but the transmit time.

Product Var Name:     i_dShotTime
Is element of:        GLA01 Main Record , GLA04 LPA Main Record, GLA05 record, GLA06
record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    Laser Shot Time Deltas (shots 2-40)
Product Data Type:    i4b (39)
```

```
Total Bytes:          156
Product Units:        microseconds
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1200000
Description:          The time deltas of pulses 2 through 40 to i_UTCTime, the UTC time
tag of the first pulse in the 1-second data frame. Adding the deltas to i_UTCTime will
give the user the time of each individual shot in the frame.
Comments:             To calculate the time for shots 2-40, add these deltas to the time
of the first shot.

Product Var Name:     i_shot_cntr
Is element of:        GLA04 LPA Main Record
Short Description:    Shot Counter
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      200
Description:          The forty Shot Counters corresponding to LPA Data. These match the
corresponding waveform records on the GLA01 product.
Comments:

Product Var Name:     i_GPSLatch
Is element of:        GLA04 LPA Main Record
Short Description:    GPS Latch Time
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        seconds, microseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      null
Product Maximum:      null
Description:          The GPS time that was used to convert the frequency board time to
J2000 for the lasers shot times in this record.  The GPS time is normally updated ap-
proximately every 10 seconds; the previoius latch time will repeat until a new one is
received.
Comments:

Product Var Name:     i_boxX
Is element of:        GLA04 LPA Main Record
Short Description:    X Position of Box
Product Data Type:    i1b ( 40)
Total Bytes:          40
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      79
Description:          X Coordinate for the top left corner of the 20 by 20 LPA image
data, 0 to 79. To map the LPA image into the LRS image the LPA image needs to be rotated
90 degrees clockwide. So the LPA rotated to LRS (column) upper left X  corner is 79 minus
```

```
i_boxY minus 19.Comments:

Product Var Name:     i_boxY
Is element of:        GLA04 LPA Main Record
Short Description:    Y Position of Box
Product Data Type:    i1b ( 40)
Total Bytes:          40
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      79
Description:          Y Coordinate for the top left corner of the 20 by 20 LPA image
data, 0 to 79. To map the LPA image into the LRS image the LPA image needs to be rotated
90 degrees clockwide. So the LPA rotated to LRS (row) upper left Y  corner is i_boxX.Com-
ments:

Product Var Name:     i_PixInt
Is element of:        GLA04 LPA Main Record
Short Description:    LPA Data
Product Data Type:    i1b (400, 40)
Total Bytes:          16000
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          The forty per second images of the laser pulse. 20x20 box of LPA
pixel intensity data. Row 1 column 1 to 20 first, then row 2 to 20. Row is Y and column
is X. To map the LPA image into the LRS image the LPA image needs to be rotated 90 degrees
clockwise. Comments:

Product Var Name:     i_tx_wf
Is element of:        GLA01 Main Record , GLA04 LPA Main Record
Short Description:    Sampled Transmit Pulse Waveform
Product Data Type:    i1b (48, 40)
Total Bytes:          1920
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          Transmit Pulse; 48 bytes of raw data samples.
Comments:

Product Var Name:     i_time_txWfPk
Is element of:        GLA01 Main Record , GLA04 LPA Main Record
Short Description:    Transmit Pulse Peak Location
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        ns
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      500000
```

Description: Address in digitizer counts of the Transmit Pulse Peak as measured from the start of Acquisition Memory, i.e. start of digitization. From APID12/13, Offset 68.
Comments: The range measurement starts from this time. To accurately time stamp the transmit pulse, it is necessary to add the delay to start of digitizer.

Product Var Name: i_TxWfStart
Is element of: GLA01 Main Record , GLA04 LPA Main Record
Short Description: Starting Address of Transmit Pulse Sample
Product Data Type: i4b (40)
Total Bytes: 160
Product Units: ns
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 500000
Description: Starting Address in digitizer counts of the Transmit Pulse sample relative to the start of digitization. From APID12/13, Offset 76.
Comments:

Product Var Name: i_txWfPk_Flag
Is element of: GLA01 Main Record , GLA04 LPA Main Record
Short Description: Transmit Waveform Peak Status Flag
Product Data Type: i1b (40)
Total Bytes: 40
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: No
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 8
Description: Transmit_Status. Status Word:Bit 0: If bit is set, then internal software failure. Bit 1: If bit is set, then peak is below threshold. Bit 2: If bit is set, peak was never found (latch).
From APID12/13, Offset 72.
Please see <a href='flags/i_txWfPk_Flag.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name: i_lpa_spare0
Is element of: GLA04 LPA Main Record
Short Description: Spares
Product Data Type: i1b (120)
Total Bytes: 120
Product Units: n/a
Invalid Value/Flag: no
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description: Spares used for padding.
Comments:

Product Var Name: i_APID_AvFlg
Is element of: GLA01 Main Record , GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

```
Short Description:    APID Data Availability Flag
Product Data Type:    i1b (8)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          Flag indicating which packets (APIDs) for each second are available
missing, or filled.  APID 19 is broken down further into Altimeter Digitizer, Photon
Counter, Cloud Digitizer, GPS/DEM, and C&T sections.
Please see <a href='flags/i_APID_AvFlg.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_timecorflg
Is element of:        GLA01 Main Record , GLA02 Record, GLA03 Main Record, GLA04 BST Main
Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS
Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08
Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    time correction flag
Product Data Type:    i2b
Total Bytes:          2
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32767
Description:          Indicates what instrument or bias corrections were applied to the
times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag descrip-
tion</a> for more details.
Comments:

Product Var Name:     i_lpa_spare1
Is element of:        GLA04 LPA Main Record
Short Description:    Spares
Product Data Type:    i1b (6)
Total Bytes:          6
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spares added for padding.
Comments:
```

D.1.7 GLA04 LRS Main Record

```
Product Var Name:     i_rec_ndx
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    GLAS Record Index
```

```
Product Data Type:    i4b
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Unique index that relates this record to the corresponding
record(s) in each GLAS data product.
Comments:

Product Var Name:     i_UTCTime
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    Transmit Time of First Shot in frame in J2000
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        seconds, microseconds
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          The transmit time in UTC of the 1st shot in the 1 second frame
referenced to noon on Jan 1, 2000.   The first item is the whole number of seconds ; the
second item is the fractional part in microseconds.
Comments:             This is not the ground bounce time, but the transmit time.

Product Var Name:     i_samp_time
Is element of:        GLA04 LRS Main Record
Short Description:    Sample Time
Product Data Type:    i4b (2, 10)
Total Bytes:          80
Product Units:        seconds,microseconds
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          The 10 times of the LRS data as computed from the VTCW converted
by using GPS if available and time offsets to the GLAS laser 10 hertz signal (every
fourth fire cmd). The first item is the whole number of seconds since J2000; the second
item is the fractional part in microseconds. (In UTC J2000 time).
Comments:

Product Var Name:     i_shot_time
Is element of:        GLA04 LRS Main Record
Short Description:    Shot time
Product Data Type:    i4b (2, 10)
Total Bytes:          80
Product Units:        seconds microseconds
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
```

```
Product Maximum:      2147483647
Description:          The time for each of the 10 laser shots based on alignment to GLA01
using GPS time if available. The first item is the whole number of seconds since J2000;
the second item is the fractional part in microseconds. (In UTC J2000 time)
Comments:

Product Var Name:     i_shot_ctr
Is element of:        GLA04 LRS Main Record
Short Description:    shot numbers
Product Data Type:    i4b ( 10)
Total Bytes:          40
Product Units:        counts
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      1
Product Maximum:      200
Description:          Shot numbers for the 10 laser fire commands associated with the
LRS data.
Comments:

Product Var Name:     i_lrs_vtcw
Is element of:        GLA04 LRS Main Record
Short Description:    LRS VTCW Time Tag
Product Data Type:    i4b (2, 10)
Total Bytes:          80
Product Units:        seconds, microseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Raw VTCW counts converted to seconds.
Comments:

Product Var Name:     i_lrs_timetag
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Time Tag
Product Data Type:    i4b ( 10)
Total Bytes:          40
Product Units:        Microseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1000000
Description:          LRS SA-2 Time Tag, Sample 1-10.  The time increment to GLAS 10 Hz
pulse.
Comments:

Product Var Name:     i_lrs_msginc
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Message Incomplete Flag
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
```

```
Product Minimum:      0
Product Maximum:      1
Description:          LRS SA-2 Message Incomplete Flag, Sample 1-10Comments:

Product Var Name:     i_lrs_flag
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Flag
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          LRS Flag Byte. Please see <a href='flags/i_lrs_flag.pdf'> the PDF
flag description</a> for more details.
Comments:

Product Var Name:     i_lrs_TkrMode
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Tracker Mode Status
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      7
Description:          LRS SA-2 Tracker Mode Status, Sample 1-10Comments:

Product Var Name:     i_lrs_tspare2
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Spare 2
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
Description:          LRS SA-2 Spare 1, Sample 1-10
Comments:

Product Var Name:     i_lrs_DiagStat
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Diagnostic Sub-Mode Status
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          LRS SA-2 Diagnostic Sub-Mode Status, Sample 1-10Comments:
```

```
Product Var Name:     i_lrs_LastPCmd
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Last Processed Command ID
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          LRS SA-2 Last Processed Command ID, Sample 1-10Comments:

Product Var Name:     i_lrs_RollCt
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Time Tag Rollover Count
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          LRS SA-2 Time Tag Rollover Count, Samples 1-10Comments:

Product Var Name:     i_lrs_tspare3
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Spare 3
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
Description:          LRS SA-2 Spare 1, Sample 1-10
Comments:

Product Var Name:     i_lrs_VTkrSt
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Virtual Trackers State
Product Data Type:    i1b (3, 10)
Total Bytes:          30
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          State of IST SA-8 Virtual Trackers 0-2 for Samples 1-10. For each
tracker byte value indicates the state.  Values are 0=Offline, 1=Standby, 2=Acq1, 3=Acq2,
4=RedAcq1, 5=RedAcq2, 6=Handoff1, 7=Handoff2, 8=Handoff3, 9=Handoff4, 10=Handoff5,
11=Track, 12=U12 bad, 13=U13 bad, 14=U14 bad, 15=AwaitAcq.  Tracker 0 starts at byte
1.Comments:

Product Var Name:     i_lrs_stat
Is element of:        GLA04 LRS Main Record
```

```
Short Description:    LRS SA-2 Status
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          IST SA-8 Bit Flags. Bit 7 = Fault Detection Summary (0/Clear  1/
Set);  Bit 6 = Cold Boot Indicator (0/Clear  1/Set);  Bit 5 = Time Mark Received (0/
Clear  1/Set);  Bit 4 = Software Reset Event (0/Clear  1/Set);  Bit 3 = Sync Mode (0/
External  1/Internal);  Bit 2 = Invalid Command (0/Clear  1/Set);  Bit 1 = TEC Enbl/Dsbl
Status (0/Dsbl  1/Enbl);  Bit 0 = Command Ignored Flag (0/Clear  1/Set)Comments:

Product Var Name:     i_lrs_TimeMark
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Time Mark ID
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          LRS SA-2 Time Mark ID, Sample 1-10Comments:

Product Var Name:     i_lrs_CamID
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Camera ID
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          LRS SA-2 Camera ID, Sample 1-10Comments:

Product Var Name:     i_lrs_swVID
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Software Version ID
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          LRS SA-2 Software Version ID, Sample 1-10Comments:

Product Var Name:     i_LPAC13_t1
Is element of:        GLA03 Main Record, GLA04 LRS Main Record
Short Description:    Laser Profiler Array (LPA) Temperature 1, Ch 13
Product Data Type:    i2b
Total Bytes:          2
```

```
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      4000
Description:          Oscillator Board Temperature, Ch 13
Comments:

Product Var Name:     i_Vtstarvalid
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Virtual Tracker Star Valid
Product Data Type:    i1b (3, 10)
Total Bytes:          30
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          Star Valid Flag for LRS SA-2 Virtual Trackers 0 - 2, Samples 1-
10Comments:

Product Var Name:     i_lrs_tspare4
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Spare4
Product Data Type:    i1b (30)
Total Bytes:          30
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          Spares 4, 5, 6 from LRS SA-2 trackers 0-2, samples 1-10.
Comments:

Product Var Name:     i_VTEEnergy
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Virtual Tracker Encircled Energy
Product Data Type:    i2b (3, 10)
Total Bytes:          60
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32767
Description:          Encircled Energy for LRS SA-2 Virtual Trackers 0 - 2, Samples 1-10
Comments:

Product Var Name:     i_VTBgBias
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Virtual Tracker Bckgrnd Bias
Product Data Type:    i2b (3, 10)
Total Bytes:          60
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
```

```
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1023
Description:           Backgrnd Bias for LRS SA-2 Virtual Trackers 0 - 2, Samples 1-10
Comments:

Product Var Name:     i_VTCentR
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Virtual Tracker Centroid Row
Product Data Type:    i4b (3, 10)
Total Bytes:          120
Product Units:        Arc-seconds*1.0d6
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      1800000000
Description:          Centroid Row from LRS SA-2 Virtual Trackers 0 - 2, Samples 1-10.
Row is Y. The row (0 to 15) within the image data (i_T0_SA) is i_VTCentR minus
i_lrs_RawRow.
Comments:

Product Var Name:     i_VTCentC
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Virtual Tracker Centroid Column
Product Data Type:    i4b (3, 10)
Total Bytes:          120
Product Units:        Arc-seconds*1.0d6
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      1800000000
Description:          Centroid Column from LRS SA-2 Virtual Trackers 0 - 2, Samples 1-
10. Column is X. The column (0 to 15) within the image data (i_T0_SA) is i_VTCentC minus
i_lrs_RawCol.
Comments:

Product Var Name:     i_lrsTimCofInt
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Time to Center of Integration
Product Data Type:    i4b ( 10)
Total Bytes:          40
Product Units:        Microseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      131070000
Description:          LRS SA-29 Time to Center of Integration, Samples 1-10
Comments:

Product Var Name:     i_lrs_RawRow
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Virtual Tracker Raw Row
Product Data Type:    i2b (3, 10)
Total Bytes:          60
Product Units:        pixels
Invalid Value/Flag:   i_APID_AvFlg
```

```
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      495
Description:          Raw row data from LRS SA-2 trackers 0-2, Samples 1-10. Raw Row (Y
axis) is the upper left hand corner Y position of the LRS 16x16 image array (i_T0_SA).
Comments:

Product Var Name:     i_lrs_RawCol
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Virtual Tracker Raw Column
Product Data Type:    i2b (3, 10)
Total Bytes:          60
Product Units:        pixels
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      495
Description:          Raw column data from LRS SA-2 trackers 0-2, Samples 1-10. Raw col-
umn (X axis) is the upper left hand corner X position of the LRS 16x16 image array
(i_T0_SA).Comments:

Product Var Name:     i_lrs_TrkThr
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Virtual Tracker Track Threshold
Product Data Type:    i1b (3, 10)
Total Bytes:          30
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      2
Product Maximum:      255
Description:          Threshold from LRS SA-2 trackers 0-2, Samples 1-10
Comments:

Product Var Name:     i_lrs_AcqThr
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Acquisition Threshold
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      2
Product Maximum:      255
Description:          LRS SA-2 Acquisition Threshold, Samples 1-10
Comments:

Product Var Name:     i_lrs_FOVEdge
Is element of:        GLA04 LRS Main Record
Short Description:    LRS FOV Entrance Edge
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
```

```
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      3
Description:          LRS SA-2 FOV Entrance Edge, Samples 1-10
Comments:

Product Var Name:     iF1LTRSRSC26_t
Is element of:        GLA03 Main Record, GLA04 LRS Main Record
Short Description:    PRT, Face 1 LTR to SRS Temperature, Ch26
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      5000
Description:          PRT, Stellar Reference System (SRS) Temperature, Ch 26
Comments:

Product Var Name:     i_lrs_IntTime
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Integration Time
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        milliseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      40
Description:          LRS SA-2 Integration Time, Samples 1-10
Comments:

Product Var Name:     i_lrs_FrmCtr
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Frame Counter
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          LRS SA-2 Frame Counter, Samples 1-10Comments:

Product Var Name:     i_lrs_tspare7
Is element of:        GLA04 LRS Main Record
Short Description:    LRS Spare 7
Product Data Type:    i1b (4, 10)
Total Bytes:          40
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
Description:          LRS SA-2 Spare 7, Samples 1-10
```

```
Comments:

Product Var Name:     i_lrs_ccdtemp
Is element of:        GLA04 LRS Main Record
Short Description:    LRS SA-5 CCD Temperature
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius*100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -27316
Product Maximum:      23880
Description:          Counts to degree C value in deg C = Counts/128 -273.16  The 273
changes K to C degrees  Scale it by 100 on product output to keep .01 degrees
Comments:

Product Var Name:     i_lrslenscellt
Is element of:        GLA04 LRS Main Record
Short Description:    LRS SA-5 Lens Cell Temperature
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius*100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -27316
Product Maximum:      23880
Description:
Comments:

Product Var Name:     i_trkr_subject
Is element of:        GLA04 LRS Main Record
Short Description:    Tracker Subject
Product Data Type:    i1b
Total Bytes:          1
Product Units:        null
Invalid Value/Flag:   null
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      63
Description:          Tells what the tracker is tracking:  0=> Star Data,  1=> Laser
Data, 2=> Collimated Data.  The one byte looks like  | 0 0  | T 2 | T 1 | T 0 | where
T0 = Tracker 0, T 1 is tracker 1 and T2 is tracker 2.  The MSB will be set to 00.
Comments:

Product Var Name:     i_spare
Is element of:        GLA04 LRS Main Record
Short Description:    Spare
Product Data Type:    i1b (3)
Total Bytes:          3
Product Units:        null
Invalid Value/Flag:   null
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      null
Description:
```

Comments:

Product Var Name: i_T0_shot_no
Is element of: GLA04 LRS Main Record
Short Description: shot number
Product Data Type: i4b
Total Bytes: 4
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 200
Description: Shot number of the first frame.
Comments:

Product Var Name: i_T0_frame
Is element of: GLA04 LRS Main Record
Short Description: T0 Frame number
Product Data Type: i2b (5)
Total Bytes: 10
Product Units: n/a
Invalid Value/Flag: gi_invalid_i4b
Is Correction Flag?: No
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 65535
Description: Two byte word describing the frame.
Comments:

Product Var Name: i_T0_SA
Is element of: GLA04 LRS Main Record
Short Description: LRS SA Virtual Tracker 0 Data
Product Data Type: i2b (256, 5)
Total Bytes: 2560
Product Units: null
Invalid Value/Flag: null
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: null
Product Maximum: null
Description: The image will be a 16 X 16 pixel image. The first word (2byte) in the PRAP data contains the frame number. It has been set to the same value as the second pixel so that automatic scaling in plots can work. Order of the data is: row 1 column 1 to 16; row2 column 1 to 16; ....; row 16 column 1 to 16. Column is X and Row is Y.
Comments:

Product Var Name: i_lrs_spare2
Is element of: GLA04 LRS Main Record
Short Description: Spare
Product Data Type: i1b (2)
Total Bytes: 2
Product Units: NA
Invalid Value/Flag: NA
Is Correction Flag?: NA
Is Unsigned?: NA
Product Minimum: NA
Product Maximum: NA
Description:

```
Comments:

Product Var Name:     i_T1_shot_no
Is element of:        GLA04 LRS Main Record
Short Description:    shot number
Product Data Type:    i4b
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   No
Is Correction Flag?:  No
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      200
Description:          Shot number of the first frame.
Comments:

Product Var Name:     i_T1_frame
Is element of:        GLA04 LRS Main Record
Short Description:    Tracker 1 Frame Number
Product Data Type:    i2b (4)
Total Bytes:          8
Product Units:        counts
Invalid Value/Flag:   gi_invalid_i2b
Is Correction Flag?:  No
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          Two byte word describing the frame
Comments:

Product Var Name:     i_T1_SA
Is element of:        GLA04 LRS Main Record
Short Description:    LRS SA Virtual Tracker 1 Data
Product Data Type:    i2b (256, 4)
Total Bytes:          2048
Product Units:        null
Invalid Value/Flag:   null
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      null
Product Maximum:      null
Description:          The image will be a 16 X 16 pixel image.  The first word(2byte) in
the PRAP data contains the frame number.  It has been set to the same value as the second
pixel so no automatic scaling will take place.
Comments:

Product Var Name:     i_T2_shot_no
Is element of:        GLA04 LRS Main Record
Short Description:    shot numbers
Product Data Type:    i4b
Total Bytes:          4
Product Units:        null
Invalid Value/Flag:   null
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      null
Product Maximum:      null
Description:
Comments:
```

```
Product Var Name:     i_T2_frame
Is element of:        GLA04 LRS Main Record
Short Description:    Tracker2 Frame Number
Product Data Type:    i2b
Total Bytes:          2
Product Units:        counts
Invalid Value/Flag:   gi_invalid_i4b
Is Correction Flag?:  No
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          Two byte word describing the frame
Comments:

Product Var Name:     i_T2_SA
Is element of:        GLA04 LRS Main Record
Short Description:    LRS SA Virtual Tracker 2 Data
Product Data Type:    i2b (256)
Total Bytes:          512
Product Units:        null
Invalid Value/Flag:   null
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      null
Product Maximum:      null
Description:          The image will be a 16 X 16 pixel image.  The first word(2byte) in
the PRAP data contains the frame number.  It has been set to the same value as the second
pixel so no automatic scaling will take place.
Comments:

Product Var Name:     i_APID_AvFlg
Is element of:        GLA01 Main Record , GLA02 Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record,
GLA14 Record, GLA15 Record
Short Description:    APID Data Availability Flag
Product Data Type:    i1b (8)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          Flag indicating which packets (APIDs) for each second are available
missing, or filled.  APID 19 is broken down further into Altimeter Digitizer, Photon
Counter, Cloud Digitizer, GPS/DEM, and C&T sections.
Please see <a href='flags/i_APID_AvFlg.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_timecorflg
Is element of:        GLA01 Main Record , GLA02 Record, GLA03 Main Record, GLA04 BST Main
Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS
Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08
Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    time correction flag
```

```
Product Data Type:    i2b
Total Bytes:          2
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32767
Description:          Indicates what instrument or bias corrections were applied to the
times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag descrip-
tion</a> for more details.
Comments:

Product Var Name:     iF2LTRSRSC27_t
Is element of:        GLA03 Main Record, GLA04 LRS Main Record
Short Description:    PRT, Face 2 LTR to SRS Temperature, Ch27
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      5000
Description:          PRT, Lidar Detector Pkg? Temperature, Ch 27
Comments:

Product Var Name:     i_TsPMir_t
Is element of:        GLA03 Main Record, GLA04 LRS Main Record
Short Description:    Telescope Region 0 Primary Mirror Temperature
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      3000
Description:          Telescope Region 0 Primary Mirror
Comments:

Product Var Name:     i_TsSMir_t
Is element of:        GLA03 Main Record, GLA04 LRS Main Record
Short Description:    Telescope Region 1 Secondary Mirror Temperature
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      3000
Description:          Telescope Region 1 Secondary Mirror
Comments:

Product Var Name:     i_srs_ff_optio_t
Is element of:        GLA03 Main Record, GLA04 LRS Main Record
Short Description:    SRS First Fold Optics Temperature
Product Data Type:    i2b
```

```
Total Bytes:          2
Product Units:        Celsius X 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      5000
Description:          SRS First Fold Optics TemperatureComments:
```

D.1.8 GLA04 GYRO Main Record

```
Product Var Name:     i_rec_ndx
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    GLAS Record Index
Product Data Type:    i4b
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Unique index that relates this record to the corresponding
record(s) in each GLAS data product.
Comments:

Product Var Name:     i_UTCTime
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    Transmit Time of First Shot in frame in J2000
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        seconds, microseconds
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          The transmit time in UTC of the 1st shot in the 1 second frame
referenced to noon on Jan 1, 2000.   The first item is the whole number of seconds ; the
second item is the fractional part in microseconds.
Comments:             This is not the ground bounce time, but the transmit time.

Product Var Name:     i_samp_time
Is element of:        GLA04 GYRO Main Record
Short Description:    Sample Time
Product Data Type:    i4b (2, 10)
Total Bytes:          80
Product Units:        seconds,microseconds
Invalid Value/Flag:   gd_invalid_i4b
Is Correction Flag?:  No
Is Unsigned?:         No
```

```
Product Minimum:      0
Product Maximum:      2147483647
Description:          The 10 times associated with the gyro data samples in the packet.
Time in UTC seconds computed from corresponding VTCW converted by using GPS if avail-
able.The first item is the whole number of seconds since J2000; the second item is the
fractional part in microseconds. (In UTC J2000 time)
Comments:

Product Var Name:     i_siru_vtcw
Is element of:        GLA04 GYRO Main Record
Short Description:    SIRU VTCW
Product Data Type:    i4b (2, 10)
Total Bytes:          80
Product Units:        seconds, microseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Raw VTCW counts converted to seconds.
Comments:

Product Var Name:     i_siru_valdata
Is element of:        GLA04 GYRO Main Record
Short Description:    SIRU Data Valid Word
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          The SIRU Data Valid Word is composed of bit flags : Mode Valid (1/
Valid, 0/Invalid); Gyro Scale Factor (1/High, 0/Low); Gyro A Angle Valid (1/Valid, 0/
Invalid); Gyro B Angle Valid (1/Valid, 0/Invalid); Gyro C Angle Valid (1/Valid, 0/In-
valid); Gyro D Angle Valid (1/Valid, 0/Invalid); Spare 1 (4 bits unused); Gyro A Rate
Saturation (1/Saturated, 0/Normal); Gyro B Rate Saturation (1/Saturated, 0/Normal); Gyro
C Rate Saturation (1/Saturated, 0/Normal); Gyro D Rate Saturation (1/Saturated, 0/Nor-
mal); Heater Power Status (1/Off or Error, 0/Normal); Spare 2 (1 bit unused).  One flag
word per sample; 10 samples per second.
Please see <a href='flags/i_siru_valdata.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_siru_AIA
Is element of:        GLA04 GYRO Main Record
Short Description:    SIRU Gyro A Integrated Angle
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        Arc-Seconds*20
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      3600
Description:          10 samples per second.
Comments:
```

```
Product Var Name:     i_siru_BIA
Is element of:        GLA04 GYRO Main Record
Short Description:    SIRU Gyro B Integrated Angle
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        Arc-Seconds*20
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      3600
Description:          10 samples per second.
Comments:

Product Var Name:     i_siru_CIA
Is element of:        GLA04 GYRO Main Record
Short Description:    SIRU Gyro C Integrated Angle
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        Arc-Seconds*20
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      3600
Description:          10 samples per second.
Comments:

Product Var Name:     i_siru_DIA
Is element of:        GLA04 GYRO Main Record
Short Description:    SIRU Gyro D Integrated Angle
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        Arc-Seconds*20
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      3600
Description:          10 samples per second.
Comments:

Product Var Name:     i_siru_ttag
Is element of:        GLA04 GYRO Main Record
Short Description:    SIRU Time Tag (free-run bin clock)
Product Data Type:    i4b ( 10)
Total Bytes:          40
Product Units:        Microseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      4194240
Description:          10 samples per second.
Comments:

Product Var Name:     i_siru_config
Is element of:        GLA04 GYRO Main Record
Short Description:    SIRU Configuration Word, Sample 1
```

```
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        n/a
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          The SIRU Configuration Word is composed of bit flags: Gyro A Status
(1/Active, 0/Inactive); Gyro B Status (1/Active, 0/Inactive); Gyro C Status (1/Active,
0/Inactive); Gyro D Status (1/Active, 0/Inactive); CPU/HCM Channel 1 Status (1/Active,
0/Inactive); CPU/HCM Channel 2 Status (1/Active, 0/Inactive); Power Supply 1 Status (1/
Active, 0/Inactive); Power Supply 2 Status (1/Active, 0/Inactive); Reserved (4 bits);
Spare 3 (4 bits unused).   One flag word per sample; 10 samples per second.
Please see <a href='flags/i_siru_config.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_APID_AvFlg
Is element of:        GLA01 Main Record , GLA02 Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record,
GLA14 Record, GLA15 Record
Short Description:    APID Data Availability Flag
Product Data Type:    i1b (8)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          Flag indicating which packets (APIDs) for each second are available
missing, or filled.  APID 19 is broken down further into Altimeter Digitizer, Photon
Counter, Cloud Digitizer, GPS/DEM, and C&T sections.
Please see <a href='flags/i_APID_AvFlg.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_timecorflg
Is element of:        GLA01 Main Record , GLA02 Record, GLA03 Main Record, GLA04 BST Main
Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS
Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08
Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    time correction flag
Product Data Type:    i2b
Total Bytes:          2
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32767
Description:          Indicates what instrument or bias corrections were applied to the
times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag descrip-
tion</a> for more details.
Comments:
```

```
Product Var Name:     i_gyro_spare1
Is element of:        GLA04 GYRO Main Record
Short Description:    Spares
Product Data Type:    i1b (6)
Total Bytes:          6
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
Description:          Spares added for future use.
Comments:
```

D.1.9 GLA04 IST Main Record

```
Product Var Name:     i_rec_ndx
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    GLAS Record Index
Product Data Type:    i4b
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Unique index that relates this record to the corresponding
record(s) in each GLAS data product.
Comments:

Product Var Name:     i_UTCTime
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    Transmit Time of First Shot in frame in J2000
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        seconds, microseconds
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          The transmit time in UTC of the 1st shot in the 1 second frame
referenced to noon on Jan 1, 2000.   The first item is the whole number of seconds ; the
second item is the fractional part in microseconds.
Comments:             This is not the ground bounce time, but the transmit time.

Product Var Name:     i_samp_time
Is element of:        GLA04 IST Main Record
Short Description:    Sample Time
Product Data Type:    i4b (2, 10)
```

```
Total Bytes:          80
Product Units:        seconds,microseconds
Invalid Value/Flag:   gd_invalid_i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          The 10 times of the IST data as computed from the VTCW converted
by using GPS if available and time offsets to the GLAS laser 10 hertz signal (every
fourth fire cmd). The first item is the whole number of seconds since J2000; the second
item is the fractional part in microseconds. (In UTC J2000 time).
Comments:

Product Var Name:     i_shot_time
Is element of:        GLA04 IST Main Record
Short Description:    Shot times
Product Data Type:    i4b (2, 10)
Total Bytes:          80
Product Units:        seconds microseconds
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      null
Product Maximum:      null
Description:          The time for each of the 10 laser shots based on alignment with
GLA01 using the GPS time if available. The first item is the whole number of seconds
since J2000; the second item is the fractional part in microseconds. (In UTC J2000 time)
Comments:

Product Var Name:     i_shot_ctr
Is element of:        GLA04 IST Main Record
Short Description:    shot numbers
Product Data Type:    i4b ( 10)
Total Bytes:          40
Product Units:        counts
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      null
Product Maximum:      null
Description:          Shot numbers for the 10 laser fire commands associated with the
IST data.
Comments:

Product Var Name:     i_ist_vtcw
Is element of:        GLA04 IST Main Record
Short Description:    IST VTCW Time Tag
Product Data Type:    i4b (2, 10)
Total Bytes:          80
Product Units:        seconds microseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Raw VTCW counts converted to seconds.Comments:

Product Var Name:     i_ist_timetag
Is element of:        GLA04 IST Main Record
```

```
Short Description:    IST Time Tag
Product Data Type:    i4b ( 10)
Total Bytes:          40
Product Units:        Microseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          IST SA-8 Time Tag, Sample 1-10.  The time increment to GLAS 10 Hz
pulse.
Comments:

Product Var Name:     i_ist_msginc
Is element of:        GLA04 IST Main Record
Short Description:    IST Message Incomplete Flag
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      1
Description:          IST SA-8 Message Incomplete Flag, Sample 1-10Comments:

Product Var Name:     i_ist_RollCt
Is element of:        GLA04 IST Main Record
Short Description:    IST Time Tag Rollover Count
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      15
Description:          IST SA-8 Time Tag Rollover Count, Sample 1-10Comments:

Product Var Name:     i_ist_TkrMode
Is element of:        GLA04 IST Main Record
Short Description:    IST Tracker Mode Status
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      7
Description:          IST SA-8 Tracker Mode Status, Sample 1-10Comments:

Product Var Name:     i_ist_tspare1
Is element of:        GLA04 IST Main Record
Short Description:    IST Spare 1
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   no
```

```
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
Description:          IST SA-8 Spare 1, Sample 1-10
Comments:

Product Var Name:     i_ist_DiagStat
Is element of:        GLA04 IST Main Record
Short Description:    IST Diagnostic Sub-Mode Status
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      1
Description:          IST SA-8 Diagnostic Sub-Mode Status, Sample 1-10Comments:

Product Var Name:     i_ist_LastPCmd
Is element of:        GLA04 IST Main Record
Short Description:    IST Last Processed Command ID
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          IST SA-8 Last Processed Command ID, Sample 1-10Comments:

Product Var Name:     i_ist_VTkrSt
Is element of:        GLA04 IST Main Record
Short Description:    IST Virtual Trackers State
Product Data Type:    i1b (6, 10)
Total Bytes:          60
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          State of IST SA-8 Virtual Trackers 0-5 for Samples 1-10. For each
tracker byte value indicates the state.  Values are 0=Offline, 1=Standby, 2=Acq1, 3=Acq2,
4=RedAcq1, 5=RedAcq2, 6=Handoff1, 7=Handoff2, 8=Handoff3, 9=Handoff4, 10=Handoff5,
11=Track, 12=U12 bad, 13=U13 bad, 14=U14 bad, 15=AwaitAcq.  Tracker 0 starts at byte
1.Comments:

Product Var Name:     i_ist_stat
Is element of:        GLA04 IST Main Record
Short Description:    IST SA-8 Status
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
```

```
Product Minimum:      0
Product Maximum:      255
Description:          IST SA-8 Bit Flags. Bit 7 = Fault Detection Summary (0/Clear  1/
Set);  Bit 6 = Cold Boot Indicator (0/Clear  1/Set);  Bit 5 = Time Mark Received (0/
Clear  1/Set);  Bit 4 = Software Reset Event (0/Clear  1/Set);  Bit 3 = Bright Object
Event (0/External  1/Internal);  Bit 2 = Invalid Command (0/Clear  1/Set);  Bit 1 = TEC
Enbl/Dsbl Status (0/Dsbl  1/Enbl);  Bit 0 = Command Ignored Flag (0/Clear  1/Set)Com-
ments:

Product Var Name:     i_ist_TimeMark
Is element of:        GLA04 IST Main Record
Short Description:    IST Time Mark ID
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          IST SA-8 Time Mark ID, Sample 1-10Comments:

Product Var Name:     i_ist_CamID
Is element of:        GLA04 IST Main Record
Short Description:    IST Camera ID
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          IST SA-8 Camera ID, Sample 1-10Comments:

Product Var Name:     i_ist_swVID
Is element of:        GLA04 IST Main Record
Short Description:    IST Software Version ID
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          IST SA-8 Software Version ID, Sample 1-10Comments:

Product Var Name:     i_ist_flag
Is element of:        GLA04 IST Main Record
Short Description:    IST Flag
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
```

```
Description:          IST Flag Byte. Please see <a href='flags/i_ist_flag.pdf'> the PDF
flag description</a> for more details.
Comments:

Product Var Name:     I_ist_spare1
Is element of:        GLA04 IST Main Record
Short Description:    Spares
Product Data Type:    i1b (2)
Total Bytes:          2
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
Description:          Spares added for byte alignment.
Comments:

Product Var Name:     i_Vtstarvalid
Is element of:        GLA04 IST Main Record
Short Description:    IST Virtual Tracker Star Valid
Product Data Type:    i1b (6, 10)
Total Bytes:          60
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      1
Description:          Star Valid Flag for IST SA-8 Virtual Trackers 0 - 5, Samples 1-
10Comments:

Product Var Name:     i_VTEEnergy
Is element of:        GLA04 IST Main Record
Short Description:    IST Virtual Tracker Encircled Energy
Product Data Type:    i2b (6, 10)
Total Bytes:          120
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32678
Description:          Encircled Energy for IST SA-8 Virtual Trackers 0 - 5, Samples 1-
10Comments:

Product Var Name:     i_VTBgBias
Is element of:        GLA04 IST Main Record
Short Description:    IST Virtual Tracker Bckgrnd Bias
Product Data Type:    i2b (6, 10)
Total Bytes:          120
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1024
Description:           Backgrnd Bias for IST SA-8 Virtual Trackers 0 - 5, Samples 1-
10Comments:
```

```
Product Var Name:     i_VTStarMag
Is element of:        GLA04 IST Main Record
Short Description:    IST Virtual Tracker Star Magnitude
Product Data Type:    i2b (6, 10)
Total Bytes:          120
Product Units:        star magnitude*10
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      63
Description:          Star Magnitude from IST SA-8 Virtual Trackers 0 - 5, Samples 1-10
Comments:

Product Var Name:     i_VTBoreH
Is element of:        GLA04 IST Main Record
Short Description:    IST Virtual Tracker Boresight H
Product Data Type:    i4b (6, 10)
Total Bytes:          240
Product Units:        Arc-seconds*100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1700000
Product Maximum:      1700000
Description:          Boresight H from IST SA-8 Virtual Trackers 0 - 5, Samples 1-10
Comments:

Product Var Name:     i_VTBoreV
Is element of:        GLA04 IST Main Record
Short Description:    IST Virtual Tracker Boresight V
Product Data Type:    i4b (6, 10)
Total Bytes:          240
Product Units:        Arc-seconds*100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1700000
Product Maximum:      1700000
Description:          Boresight V from IST SA-8 Virtual Trackers 0 - 5, Samples 1-10
Comments:

Product Var Name:     i_ist_FocLngth
Is element of:        GLA04 IST Main Record
Short Description:    IST Effective Focal Length
Product Data Type:    i4b ( 10)
Total Bytes:          40
Product Units:        Microns * 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      6535500
Description:          IST SA-8 Effective Focal Length, Samples 1-10
Comments:

Product Var Name:     i_istTimCofInt
Is element of:        GLA04 IST Main Record
```

```
Short Description:    IST Time to Center of Integration
Product Data Type:    i4b ( 10)
Total Bytes:          40
Product Units:        Microseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      131070000
Description:          IST SA-29 Time to Center of Integration, Samples 1-10
Comments:

Product Var Name:     i_ist_BoreCol
Is element of:        GLA04 IST Main Record
Short Description:    IST Boresight Column
Product Data Type:    i4b ( 10)
Total Bytes:          40
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      390000
Description:          IST SA-29 Boresight Column, Samples 1-10Comments:

Product Var Name:     i_ist_BoreRow
Is element of:        GLA04 IST Main Record
Short Description:    IST Boresight Row
Product Data Type:    i4b ( 10)
Total Bytes:          40
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      390000
Description:          IST SA-29 Boresight Row, Samples 1-10Comments:

Product Var Name:     i_ist_CCDTemp
Is element of:        GLA04 IST Main Record
Short Description:    IST CCD Temperature
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        Celsius*100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -27316
Product Maximum:      23880
Description:          IST SA-29 CCD Temperature, Samples 1-10
Comments:

Product Var Name:     i_istLensCellT
Is element of:        GLA04 IST Main Record
Short Description:    IST Lens Cell Temperature
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        Celsius*100
Invalid Value/Flag:   i_APID_AvFlg
```

```
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -27316
Product Maximum:      23880
Description:          IST SA-29 Lens Cell Temperature, Samples 1-10
Comments:

Product Var Name:     i_APID_AvFlg
Is element of:        GLA01 Main Record , GLA02 Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record,
GLA14 Record, GLA15 Record
Short Description:    APID Data Availability Flag
Product Data Type:    i1b (8)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          Flag indicating which packets (APIDs) for each second are available
missing, or filled.  APID 19 is broken down further into Altimeter Digitizer, Photon
Counter, Cloud Digitizer, GPS/DEM, and C&T sections.
Please see <a href='flags/i_APID_AvFlg.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_timecorflg
Is element of:        GLA01 Main Record , GLA02 Record, GLA03 Main Record, GLA04 BST Main
Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS
Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08
Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    time correction flag
Product Data Type:    i2b
Total Bytes:          2
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32767
Description:          Indicates what instrument or bias corrections were applied to the
times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag descrip-
tion</a> for more details.
Comments:

Product Var Name:     i_ist_spare2
Is element of:        GLA04 IST Main Record
Short Description:    Spares
Product Data Type:    i1b (6)
Total Bytes:          6
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
```

Description: Spares added for future use.
Comments:

D.1.10 GLA04 BST Main Record

Product Var Name: i_rec_ndx
Is element of: GLA01 Long Waveform Record, GLA01 Main Record , GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: GLAS Record Index
Product Data Type: i4b
Total Bytes: 4
Product Units: N/A
Invalid Value/Flag: no
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.
Comments:

Product Var Name: i_UTCTime
Is element of: GLA01 Long Waveform Record, GLA01 Main Record , GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Transmit Time of First Shot in frame in J2000
Product Data Type: i4b (2)
Total Bytes: 8
Product Units: seconds, microseconds
Invalid Value/Flag: no
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: The transmit time in UTC of the 1st shot in the 1 second frame referenced to noon on Jan 1, 2000. The first item is the whole number of seconds ; the second item is the fractional part in microseconds.
Comments: This is not the ground bounce time, but the transmit time.

Product Var Name: i_bst1_samp_time
Is element of: GLA04 BST Main Record
Short Description: BST1 Sample Time
Product Data Type: i4b (2, 10)
Total Bytes: 80
Product Units: seconds,microseconds
Invalid Value/Flag: no
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: The time of the ten BST1 data. This time is computed using the VTCW counts and converted to seconds using GPS if available.
Comments:

```
Product Var Name:     i_bst1_vtcw
Is element of:        GLA04 BST Main Record
Short Description:    BST1 VTCW Time Tag
Product Data Type:    i4b (2, 10)
Total Bytes:          80
Product Units:        Microseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      null
Description:          BST1 VTCW counts converted to seconds.
Comments:

Product Var Name:     i_bst1_pchstat
Is element of:        GLA04 BST Main Record
Short Description:    BST1 Patch Execution Status
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
Description:          0 = No patches.  10 samples per second.Comments:

Product Var Name:     i_bst1_datlat
Is element of:        GLA04 BST Main Record
Short Description:    BST1 Data Latency
Product Data Type:    i4b ( 10)
Total Bytes:          40
Product Units:        Microseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      4194240
Description:          10 samples per second.
Comments:

Product Var Name:     i_bst1_sw1
Is element of:        GLA04 BST Main Record
Short Description:    BST1 Status Word 1
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          BST1 Status Word 1 is composed of bit flags: Position Uncalibrated
(0/CalEnbl, 1/CalDsbl); Intensity Uncalibrated (0/CalEnbl, 1/CalDsbl); BITE Star On (0/
NoBITE, 1/BITEOn); Background High (0/OK, 1/High); RAM Fail (0/OK, 1/Error); ROM Fail
(0/OK, 1/Error); Star 5 Invalid (0/OK, 1/Invalid); Star 4 Invalid (0/OK, 1/Invalid);
Star 3 Invalid (0/OK, 1/Invalid); Star 2 Invalid (0/OK, 1/Invalid); Star 1 Invalid (0/
OK, 1/Invalid); Star 5 Track (0/NoTrack, 1/Track); Star 4 Track (0/NoTrack, 1/Track);
Star 3 Track (0/NoTrack, 1/Track); Star 2 Track (0/NoTrack, 1/Track); Star 1 Track (0/
```

NoTrack, 1/Track). One status word per sample; 10 samples per second. Please see <a href='flags/i_bst_sw1.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name: i_bst1_sw2
Is element of: GLA04 BST Main Record
Short Description: BST1 Status Word 2
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 65535
Description: BST1 Status Word 2 is composed of bit flags: Star 5 Directed Search (0/NoSrch, 1/Search); Star 4 Directed Search (0/NoSrch, 1/Search); Star 3 Directed Search (0/NoSrch, 1/Search); Star 2 Directed Search (0/NoSrch, 1/Search); Star 1 Directed Search (0/NoSrch, 1/Search); Full Field Search (0/NoSrch, 1/Search); Calibration Override (0/NoOverride, 1/Override); Unsync (0/OK, 1/Unsync); Download (0/NoDnld, 1/Dnld); Stack Error (0/OK, 1/Error); Smoothed Raw Data (0/NoSmooth, 1/Smoothed); Watchdog Timeout (0/OK, 1/Timeout); Data Error (0/OK, 1/Error); Data Upset (0/OK, 1/Upset); RAM Execution (0/ROM, 1/RAM); Reset (0/Clear, 1/Reset). One status word per sample; 10 samples per second. Please see <a href='flags/i_bst_sw2.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name: i_bst1_mctr
Is element of: GLA04 BST Main Record
Short Description: BST1 Message Counter
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 65535
Description: 10 samples per second.Comments:

Product Var Name: i_bst1_recctr
Is element of: GLA04 BST Main Record
Short Description: BST1 Command Received Counter
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: 10 samples per second.Comments:

Product Var Name: i_bst1_rejctr
Is element of: GLA04 BST Main Record
Short Description: BST1 Command Rejected Counter
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          10 samples per second.Comments:

Product Var Name:     i_bst1_starX
Is element of:        GLA04 BST Main Record
Short Description:    BST1 Star Position X
Product Data Type:    i4b (5, 10)
Total Bytes:          200
Product Units:        Arc-SecondsX100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      360000
Description:          Position X of 5 stars at 10 samples per second.
Comments:

Product Var Name:     i_bst1_starY
Is element of:        GLA04 BST Main Record
Short Description:    BST1 Star Position Y
Product Data Type:    i4b (5, 10)
Total Bytes:          200
Product Units:        Arc-SecondsX100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      360000
Description:          Position Y of 5 stars at 10 samples per second.
Comments:

Product Var Name:     i_bst1_starInt
Is element of:        GLA04 BST Main Record
Short Description:    BST1 Star Intensity
Product Data Type:    i4b (5, 10)
Total Bytes:          200
Product Units:        Magnitude*100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -250000
Product Maximum:      250000
Description:          Instensity of 5 stars at 10 samples per second.
Comments:

Product Var Name:     i_bst1_ccdtemp
Is element of:        GLA04 BST Main Record
Short Description:    BST1 CCD Temperature
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        Celsius* 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -32677
```

```
Product Maximum:     32678
Description:         10 samples per second.
Comments:

Product Var Name:    i_bst1_bptemp
Is element of:       GLA04 BST Main Record
Short Description:   BST1 Baseplate Temperature
Product Data Type:   i2b ( 10)
Total Bytes:         20
Product Units:       Celsius* 100
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     -32677
Product Maximum:     32678
Description:         10 samples per second.
Comments:

Product Var Name:    i_bst1_lenstmp
Is element of:       GLA04 BST Main Record
Short Description:   BST1 Lens Temperature
Product Data Type:   i2b ( 10)
Total Bytes:         20
Product Units:       Celsius* 100
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     -32677
Product Maximum:     32678
Description:         10 samples per second.
Comments:

Product Var Name:    i_bst1_8V
Is element of:       GLA04 BST Main Record
Short Description:   BST1 +8 Volt Supply
Product Data Type:   i1b ( 10)
Total Bytes:         10
Product Units:       Volt * 10
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     -127
Product Maximum:     127
Description:         10 samples per second.
Comments:

Product Var Name:    i_bst1_n9V
Is element of:       GLA04 BST Main Record
Short Description:   BST1 -9 Volt Supply
Product Data Type:   i1b ( 10)
Total Bytes:         10
Product Units:       Volt * 10
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     -127
Product Maximum:     127
Description:         10 samples per second.
Comments:
```

```
Product Var Name:     i_bst1_4V
Is element of:        GLA04 BST Main Record
Short Description:    BST1 +4 Volt Supply
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        Volt * 10
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          10 samples per second.
Comments:

Product Var Name:     i_bst1_n5V
Is element of:        GLA04 BST Main Record
Short Description:    BST1 -5 Volt Supply
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        Volt * 10
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          10 samples per second.
Comments:

Product Var Name:     i_bst1_BG
Is element of:        GLA04 BST Main Record
Short Description:    BST1 Background Reading
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -32767
Product Maximum:      32767
Description:          10 samples per second.Comments: From Paul Woznick: The background
count should be treated as signed. A negative count means that the tracker has been light
saturated for a longer period of time and because the reference voltage is dynamic, can
result in a negative output.
Product Var Name:     i_bst1_srchct
Is element of:        GLA04 BST Main Record
Short Description:    BST1 Full Field Search Count
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          10 samples per second.Comments:

Product Var Name:     i_bst1_Fact
Is element of:        GLA04 BST Main Record
```

```
Short Description:    BST1 False Alarms Count
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          10 samples per second.Comments:

Product Var Name:     i_bst1_sernum
Is element of:        GLA04 BST Main Record
Short Description:    BST1 Serial Number
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          10 samples per second.Comments:

Product Var Name:     i_bst1_swver
Is element of:        GLA04 BST Main Record
Short Description:    BST1 Software Revision Code
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          One revision code  per sample; 10 samples per second.Comments:

Product Var Name:     i_bst1_cancode
Is element of:        GLA04 BST Main Record
Short Description:    BST1 Cancel Code Word
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          BST1 Cancel Code Word; 3 bits for each star (1-5); bit 15 is spare.
The flag values are: 0/NoTerm, 1/Overlap, 2/NoFOV, 3/TooDark,  4/HotPixel, 5/ColumnDe-
fect, 6/BreakTrack, 7/Dropped.  Star 1 flag starts at bit 0. One code word per sample;
10 samples per second.
Please see <a href='flags/i_bst_cancode.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_bst_spare1
Is element of:        GLA04 BST Main Record
Short Description:    Spares
```

```
Product Data Type:    i1b (8)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
Description:          Spares added for future use.
Comments:

Product Var Name:     i_bst2_samp_time
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Sample Time
Product Data Type:    i4b (2, 10)
Total Bytes:          80
Product Units:        seconds, microseconds
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      2147483647
Description:          The time of the ten BST2 data. This time is computed using the VTCW
counts and converted to seconds using GPS if available.
Comments:

Product Var Name:     i_bst2_vtcw
Is element of:        GLA04 BST Main Record
Short Description:    BST2 VTCW Time Tag
Product Data Type:    i4b (2, 10)
Total Bytes:          80
Product Units:        Microseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      null
Description:          BST2 raw VTCW converted to seconds.
Comments:

Product Var Name:     i_bst2_pchstat
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Patch Execution Status
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
Description:          0 = No patches.  10 samples per second.Comments:

Product Var Name:     i_bst2_datlat
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Data Latency
Product Data Type:    i4b ( 10)
Total Bytes:          40
Product Units:        Microseconds
```

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      4194240
Description:          10 samples per second.
Comments:

Product Var Name:     i_bst2_sw1
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Status Word 1
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          BST2 Status Word 1 is composed of bit flags: Position Uncalibrated
(0/CalEnbl, 1/CalDsbl); Intensity Uncalibrated (0/CalEnbl, 1/CalDsbl); BITE Star On (0/
NoBITE, 1/BITEOn); Back);ground High (0/OK, 1/High); RAM Fail (0/OK, 1/Error); ROM Fail
(0/OK, 1/Error); Star 5 Invalid (0/OK, 1/Invalid); Star 4 Invalid (0/OK, 1/Invalid);
Star 3 Invalid (0/OK, 1/Invalid); Star 2 Invalid (0/OK, 1/Invalid); Star 1 Invalid (0/
OK, 1/Invalid); Star 5 Track (0/NoTrack, 1/Track); Star 4 Track (0/NoTrack, 1/Track);
Star 3 Track (0/NoTrack, 1/Track); Star 2 Track (0/NoTrack, 1/Track); Star 1 Track (0/
NoTrack, 1/Track). One status word per sample; 10 samples per second. Please see <a
href='flags/i_bst_sw1.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name:     i_bst2_sw2
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Status Word 2
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          BST2 Status Word 2 is composed of bit flags: Star 5 Directed Search
(0/NoSrch, 1/Search); Star 4 Directed Search (0/NoSrch, 1/Search); Star 3 Directed Search
(0/NoSrch, 1/Search); Star 2 Directed Search (0/NoSrch, 1/Search); Star 1 Directed Search
(0/NoSrch, 1/Search); Full Field Search (0/NoSrch, 1/Search); Calibration Override (0/
NoOverride, 1/Override); Unsync (0/OK, 1/Unsync); Download (0/NoDnld, 1/Dnld); Stack Er-
ror (0/OK, 1/Error); Smoothed Raw Data (0/NoSmooth, 1/Smoothed); Watchdog Timeout (0/
OK, 1/Timeout); Data Error (0/OK, 1/Error); Data Upset (0/OK, 1/Upset); RAM Execution
(0/ROM, 1/RAM); Reset (0/Clear, 1/Reset). One status word per sample; 10 samples per
second. Please see <a href='flags/i_bst_sw2.pdf'> the PDF flag description</a> for more
details.
Comments:

Product Var Name:     i_bst2_mctr
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Message Counter
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        N/A
```

```
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          10 samples per second.Comments:

Product Var Name:     i_bst2_recctr
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Command Received Counter
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          10 samples per second.Comments:

Product Var Name:     i_bst2_rejctr
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Command Rejected Counter
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          10 samples per second.Comments:

Product Var Name:     i_bst2_starX
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Star Position X
Product Data Type:    i4b (5, 10)
Total Bytes:          200
Product Units:        Arc-Seconds*100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      360000
Description:          Position X of 5 stars at 10 samples per second.
Comments:

Product Var Name:     i_bst2_starY
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Star Position Y
Product Data Type:    i4b (5, 10)
Total Bytes:          200
Product Units:        Arc-Seconds*100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      360000
Description:          Position Y of 5 stars at 10 samples per second.
```

```
Comments:

Product Var Name:     i_bst2_starInt
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Star Intensity
Product Data Type:    i4b (5, 10)
Total Bytes:          200
Product Units:        Magnitude*100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -250000
Product Maximum:      250000
Description:          Instensity of 5 stars at 10 samples per second.
Comments:

Product Var Name:     i_bst2_ccdtemp
Is element of:        GLA04 BST Main Record
Short Description:    BST2 CCD Temperature
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        Celsius* 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -32677
Product Maximum:      32678
Description:          10 samples per second.
Comments:

Product Var Name:     i_bst2_bptemp
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Baseplate Temperature
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        Celsius* 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -32677
Product Maximum:      32678
Description:          10 samples per second.
Comments:

Product Var Name:     i_bst2_lenstmp
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Lens Temperature
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        Celsius* 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -32677
Product Maximum:      32678
Description:          10 samples per second.
Comments:

Product Var Name:     i_bst2_8V
```

```
Is element of:        GLA04 BST Main Record
Short Description:    BST2 +8 Volt Supply
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        Volt * 10
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          10 samples per second.
Comments:

Product Var Name:     i_bst2_n9V
Is element of:        GLA04 BST Main Record
Short Description:    BST2 -9 Volt Supply
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        Volt * 10
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          10 samples per second.
Comments:

Product Var Name:     i_bst2_4V
Is element of:        GLA04 BST Main Record
Short Description:    BST2 +4 Volt Supply
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        Volt * 10
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          10 samples per second.
Comments:

Product Var Name:     i_bst2_n5V
Is element of:        GLA04 BST Main Record
Short Description:    BST2 -5 Volt Supply
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        Volt * 10
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          10 samples per second.
Comments:

Product Var Name:     i_bst2_BG
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Background Reading
Product Data Type:    i2b ( 10)
```

```
Total Bytes:          20
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -32767
Product Maximum:      32767
Description:          10 samples per second.Comments: From Paul Woznick: The background
count should be treated as signed. A negative count means that the tracker has been light
saturated for a longer period of time and because the reference voltage is dynamic, can
result in a negative output.
Product Var Name:     i_bst2_srchct
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Full Field Search Count
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          10 samples per second.Comments:

Product Var Name:     i_bst2_Fact
Is element of:        GLA04 BST Main Record
Short Description:    BST2 False Alarms Count
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          10 samples per second.Comments:

Product Var Name:     i_bst2_sernum
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Serial Number
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          10 samples per second.Comments:

Product Var Name:     i_bst2_swver
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Software Revision Code
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
```

```
Product Minimum:      0
Product Maximum:      255
Description:          One revision code  per sample; 10 samples per second.Comments:

Product Var Name:     i_bst2_cancode
Is element of:        GLA04 BST Main Record
Short Description:    BST2 Cancel Code Word
Product Data Type:    i2b ( 10)
Total Bytes:          20
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      65535
Description:          BST2 Cancel Code Word; 3 bits for each star (1-5); bit 15 is spare.
The flag values are: 0/NoTerm, 1/Overlap, 2/NoFOV, 3/TooDark,  4/HotPixel, 5/ColumnDe-
fect, 6/BreakTrack, 7/Dropped.  Star 1 flag starts at bit 0. One code word per sample;
10 samples per second.
Please see <a href='flags/i_bst_cancode.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_APID_AvFlg
Is element of:        GLA01 Main Record , GLA02 Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record,
GLA14 Record, GLA15 Record
Short Description:    APID Data Availability Flag
Product Data Type:    i1b (8)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          Flag indicating which packets (APIDs) for each second are available
missing, or filled.  APID 19 is broken down further into Altimeter Digitizer, Photon
Counter, Cloud Digitizer, GPS/DEM, and C&T sections.
Please see <a href='flags/i_APID_AvFlg.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_timecorflg
Is element of:        GLA01 Main Record , GLA02 Record, GLA03 Main Record, GLA04 BST Main
Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS
Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08
Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    time correction flag
Product Data Type:    i2b
Total Bytes:          2
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32767
```

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name: i_bst_spare2
Is element of: GLA04 BST Main Record
Short Description: Spares
Product Data Type: i1b (6)
Total Bytes: 6
Product Units: n/a
Invalid Value/Flag: no
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 0
Description: Spares added for future use.
Comments:

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Product Var Name: i_rec_ndx
Is element of: GLA01 Long Waveform Record, GLA01 Main Record , GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: GLAS Record Index
Product Data Type: i4b
Total Bytes: 4
Product Units: N/A
Invalid Value/Flag: no
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.
Comments:

Product Var Name: i_UTCTime
Is element of: GLA01 Long Waveform Record, GLA01 Main Record , GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Transmit Time of First Shot in frame in J2000
Product Data Type: i4b (2)
Total Bytes: 8
Product Units: seconds, microseconds
Invalid Value/Flag: no
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: The transmit time in UTC of the 1st shot in the 1 second frame referenced to noon on Jan 1, 2000. The first item is the whole number of seconds ; the second item is the fractional part in microseconds.
Comments: This is not the ground bounce time, but the transmit time.

```
Product Var Name:     i_samp_time
Is element of:        GLA04 SCPA Main Record
Short Description:    Sample time
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        seconds microseconds
Invalid Value/Flag:   no
Is Correction Flag?:  No
Is Unsigned?:         NA
Product Minimum:      0
Product Maximum:      2147483647
Description:          The time for the s/c data based on the GPS time latched to VTCW .
The first item is the whole number of seconds since J2000; the second item is the frac-
tional part in microseconds. (In UTC J2000 time)
Comments:

Product Var Name:     i_scpa_vtcw
Is element of:        GLA04 SCPA Main Record
Short Description:    S/C Data VTCW Time Tag
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        seconds, microseconds
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Raw VTCW counts converted to seconds.Comments:

Product Var Name:     i_CFA_Q1
Is element of:        GLA04 SCPA Main Record
Short Description:    Control Frame Att Quaternion Q1
Product Data Type:    i4b
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1100000
Product Maximum:      1100000
Description:          The spacecraft control frame attitude quaternion 1 from the ADCS
Data.
Comments:

Product Var Name:     i_CFA_Q2
Is element of:        GLA04 SCPA Main Record
Short Description:    Control Frame Att Quaternion Q2
Product Data Type:    i4b
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1100000
Product Maximum:      1100000
Description:          The spacecraft control frame attitude quaternion 2 from the ADCS
Data.
Comments:
```

```
Product Var Name:     i_CFA_Q3
Is element of:        GLA04 SCPA Main Record
Short Description:    Control Frame Att Quaternion Q3
Product Data Type:    i4b
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1100000
Product Maximum:      1100000
Description:          The spacecraft control frame attitude quaternion 3 from the ADCS
Data.
Comments:

Product Var Name:     i_CFA_Q4
Is element of:        GLA04 SCPA Main Record
Short Description:    Control Frame Att Quaternion Q4
Product Data Type:    i4b
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1100000
Product Maximum:      1100000
Description:          The spacecraft control frame attitude quaternion 4  from the ADCS
Data.
Comments:

Product Var Name:     i_ECIOrb_PosX
Is element of:        GLA04 SCPA Main Record
Short Description:    Next ECI Orbital Position X
Product Data Type:    i4b
Total Bytes:          4
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -8169500
Product Maximum:      8169500
Description:          The spacecraft’s next ECI Orbital Position X from the ADCS Data.
Comments:

Product Var Name:     i_ECIOrb_PosY
Is element of:        GLA04 SCPA Main Record
Short Description:    Next ECI Orbital Position Y
Product Data Type:    i4b
Total Bytes:          4
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -8169500
Product Maximum:      8169500
Description:          The spacecraft’s next ECI Orbital Position Y from the ADCS Data.
Comments:
```

```
Product Var Name:     i_ECIOrb_PosZ
Is element of:        GLA04 SCPA Main Record
Short Description:    Next ECI Orbital Position Z
Product Data Type:    i4b
Total Bytes:          4
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -8169500
Product Maximum:      8169500
Description:          The spacecraft’s next ECI Orbital Position Z from the ADCS Data.
Comments:

Product Var Name:     i_ECIOrb_VelX
Is element of:        GLA04 SCPA Main Record
Short Description:    Next ECI Orbital Velocity X
Product Data Type:    i4b
Total Bytes:          4
Product Units:        cm/sec
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1045696
Product Maximum:      1045696
Description:          The spacecraft’s next ECI Orbital Velocity X from the ADCS Data.
Comments:

Product Var Name:     i_ECIOrb_VelY
Is element of:        GLA04 SCPA Main Record
Short Description:    Next ECI Orbital Velocity Y
Product Data Type:    i4b
Total Bytes:          4
Product Units:        cm/sec
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1045696
Product Maximum:      1045696
Description:          The spacecraft’s next ECI Orbital Velocity Y from the ADCS Data.
Comments:

Product Var Name:     i_ECIOrb_VelZ
Is element of:        GLA04 SCPA Main Record
Short Description:    Next ECI Orbital Velocity Z
Product Data Type:    i4b
Total Bytes:          4
Product Units:        cm/sec
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1045696
Product Maximum:      1045696
Description:          The spacecraft’s next ECI Orbital Velocity Z from the ADCS Data.
Comments:

Product Var Name:     i_SA_Pos1
Is element of:        GLA04 SCPA Main Record
Short Description:    Calculated SA 1 Position
```

```
Product Data Type:    i4b
Total Bytes:          4
Product Units:        radians*1.0E+6
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -65536
Product Maximum:      65536
Description:          The spacecraft calculated SA 1 Position from the ADCS Data.
Comments:

Product Var Name:     i_SA_Pos2
Is element of:        GLA04 SCPA Main Record
Short Description:    Calculated SA 2 Position
Product Data Type:    i4b
Total Bytes:          4
Product Units:        radians*1.0E+6
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -65536
Product Maximum:      65536
Description:          The spacecraft calculated SA 2 Position from the ADCS Data.
Comments:

Product Var Name:     i_gps_latch
Is element of:        GLA04 SCPA Main Record
Short Description:    GPS Latched VTCW
Product Data Type:    i2b (3)
Total Bytes:          6
Product Units:        microseconds
Invalid Value/Flag:   null
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      null
Product Maximum:      null
Description:
Comments:

Product Var Name:     i_gps_time
Is element of:        GLA04 SCPA Main Record
Short Description:    GPS Time of Current Solution
Product Data Type:    i4b
Total Bytes:          4
Product Units:        seconds
Invalid Value/Flag:   null
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      null
Product Maximum:      null
Description:
Comments:

Product Var Name:     i_SA_CntrFlg1
Is element of:        GLA04 SCPA Main Record
Short Description:    SA 1 Autonomous Control Flag
Product Data Type:    i1b
Total Bytes:          1
Product Units:        n/a
```

```
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      1
Description:          Points indicate whether or not solar array articulation is enabled
or inhibited.
Comments:

Product Var Name:     i_SA_CntrFlg2
Is element of:        GLA04 SCPA Main Record
Short Description:    SA 2 Autonomous Control Flag
Product Data Type:    i1b
Total Bytes:          1
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  No
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      1
Description:          Points indicate whether or not solar array articulation is enabled
or inhibited.
Comments:

Product Var Name:     i_APID_AvFlg
Is element of:        GLA01 Main Record , GLA02 Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record,
GLA14 Record, GLA15 Record
Short Description:    APID Data Availability Flag
Product Data Type:    i1b (8)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          Flag indicating which packets (APIDs) for each second are available
missing, or filled.  APID 19 is broken down further into Altimeter Digitizer, Photon
Counter, Cloud Digitizer, GPS/DEM, and C&T sections.
Please see <a href='flags/i_APID_AvFlg.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_timecorflg
Is element of:        GLA01 Main Record , GLA02 Record, GLA03 Main Record, GLA04 BST Main
Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS
Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08
Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    time correction flag
Product Data Type:    i2b
Total Bytes:          2
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
```

```
Product Maximum:      32767
Description:          Indicates what instrument or bias corrections were applied to the
times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag descrip-
tion</a> for more details.
Comments:

Product Var Name:     i_scpa_spare1
Is element of:        GLA04 SCPA Main Record
Short Description:    Spares
Product Data Type:    i1b (4)
Total Bytes:          4
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      0
Description:          Spares added for future values.
Comments:
```

D.1.12 GLA05 Record

```
Product Var Name:     i_rec_ndx
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    GLAS Record Index
Product Data Type:    i4b
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Unique index that relates this record to the corresponding
record(s) in each GLAS data product.
Comments:

Product Var Name:     i_UTCTime
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    Transmit Time of First Shot in frame in J2000
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        seconds, microseconds
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          The transmit time in UTC of the 1st shot in the 1 second frame
referenced to noon on Jan 1, 2000.   The first item is the whole number of seconds ; the
second item is the fractional part in microseconds.
```

```
Comments:            This is not the ground bounce time, but the transmit time.

Product Var Name:    i_transtime
Is element of:       GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:   One way transit time
Product Data Type:   i2b
Total Bytes:         2
Product Units:       microseconds
Invalid Value/Flag:  i2b
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     4000
Description:         One way transit time calculated using the preliminary range offset.
This is added to the UTC time tag to get the ground bounce times at which to calculate
the orbit
Comments:

Product Var Name:    i_spare1
Is element of:       GLA05 record
Short Description:   i_spare1
Product Data Type:   i1b (2)
Total Bytes:         2
Product Units:       NA
Invalid Value/Flag:  no
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     null
Product Maximum:     null
Description:
Comments:

Product Var Name:    i_deltagpstmcor
Is element of:       GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:   Delta GPS time correction
Product Data Type:   i4b
Total Bytes:         4
Product Units:       nanoseconds
Invalid Value/Flag:  gi_invalid_i4b
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     1000000
Description:         The high frequency delta GPS time correction calculated during the
precision orbit processing step.
Comments:

Product Var Name:    i_dShotTime
Is element of:       GLA01 Main Record , GLA04 LPA Main Record, GLA05 record, GLA06
record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:   Laser Shot Time Deltas (shots 2-40)
Product Data Type:   i4b (39)
Total Bytes:         156
Product Units:       microseconds
Invalid Value/Flag:  No
Is Correction Flag?: NA
Is Unsigned?:        No
```

```
Product Minimum:      0
Product Maximum:      1200000
Description:          The time deltas of pulses 2 through 40 to i_UTCTime, the UTC time
tag of the first pulse in the 1-second data frame. Adding the deltas to i_UTCTime will
give the user the time of each individual shot in the frame.
Comments:             To calculate the time for shots 2-40, add these deltas to the time
of the first shot.

Product Var Name:     i_lat
Is element of:        GLA05 record
Short Description:    Spot Coordinate Data - Latitude (Uncorrected)
Product Data Type:    i4b (40)
Total Bytes:          160
Product Units:        Microdegrees
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -90000000
Product Maximum:      90000000
Description:          The geodetic latitude of the forty laser spots in this record, com-
puted from the Precision orbit, precision attitude, and preliminary range.  The prelim-
inary range is used with no geodetic corrections applied.
Comments:             This latitude may differ from that on GLA06 and the level 2 ele-
vation products where a corrected range is used in the calculation

Product Var Name:     i_lon
Is element of:        GLA05 record
Short Description:    Spot Coordinate Data - Longitude (Uncorrected)
Product Data Type:    i4b (40)
Total Bytes:          160
Product Units:        Microdegrees
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      360000000
Description:          The longitude of the forty laser spots in this record, computed
from the Precision orbit,precision attitude, and preliminary range.  The preliminary
range is used with no geodetic corrections applied.
Comments:             This longitude may differ from that on GLA06 and the level 2 prod-
ucts where a corrected range is used in the calculation

Product Var Name:     i_elev
Is element of:        GLA05 record
Short Description:    Spot Surface Elevation with respect to ITRF ellipsoid (Uncorrect-
ed)
Product Data Type:    i4b (40)
Total Bytes:          160
Product Units:        mm
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -3300000
Product Maximum:      9000000
Description:          The surface elevation with respect to ellipsoid of the forty laser
spots in this record.  The elevation is calculated using the preliminary range, the pre-
cision orbit, and precision attitude with no geodetic corrections applied.
Comments:             This will differ from the elevation on the elevation products where
it is calculated from the range corrected for geodetic affects and measured to a region-
```

type dependent specific location on the received waveform.

Product Var Name: i_PADPoint
Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: PAD Pointing unit Vector in ICRF
Product Data Type: i4b (6, 40)
Total Bytes: 960
Product Units: Unitless*1000000
Invalid Value/Flag: i4b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000000
Product Maximum: 1000000
Description: Unit vectors giving the pointing direction of the laser with respect to the GLAS optical bench axes in the ICRF reference frame, one vector for each of the 40 shots, at the shot (transmit) time. Each component is composed of 2 4-byte items.
Comments:

Product Var Name: i_PODFixedPos
Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Position orbit vector in ICRF
Product Data Type: i4b (6, 40)
Total Bytes: 960
Product Units: 3 * (m, mm)
Invalid Value/Flag: i4b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -7.0E+10
Product Maximum: 7.0E+10
Description: Spacecraft position vectors in ICRF of the laser point of reference on the spacecraft, one vector for each of the 40 shots, at the bounce (transmit plus transit) time. Each element is composed of 2 4-byte items. The first is m and the second is millimeters.
Comments:

Product Var Name: i_sigmaatt
Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Attitude Quality Indicator
Product Data Type: i2b (40)
Total Bytes: 80
Product Units: Unitless
Invalid Value/Flag: i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 6000
Description: Attitude quality indicator. Values: 0=good; 50=warning; 100=bad.
Comments: This indicator currently has only 3 values: 0, 50, and 100, leaving open the opportunity to use numbers in between for further resolution of the degradation as our knowledge improves.

Product Var Name: i_gval_rcv
Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Gain Value used for Received Pulse

```
Product Data Type:    i2b (40)
Total Bytes:          80
Product Units:        counts
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200
Description:          Gain value used for received pulse - uncalibrated.
Comments:             This value is in counts and needs to be calibrated before calcu-
lating energy from it. Same as variable in GLA01_Long/i_gainSet1064.

Product Var Name:     i_wfnoiseOb1
Is element of:        GLA05 record
Short Description:    1064 nm Background noise, (alternate)
Product Data Type:    i2b (40)
Total Bytes:          80
Product Units:        0.0001 volts
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -300
Product Maximum:      30000
Description:          Either the background noise mean value measured by the instrument,
or the background noise calculated from the received echo using alternative parameters.
See local flag definition for l_WFqual - a flag is set if the background noise is cal-
culated.
Comments:             This is in units of counts and must be calibrated and converted to
voltage before using it - see conversion table in header record.

Product Var Name:     i_wfnoiseOb2
Is element of:        GLA05 record
Short Description:    1064 nm Background noise, (standard)
Product Data Type:    i2b (40)
Total Bytes:          80
Product Units:        0.0001 volts
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -300
Product Maximum:      30000
Description:          Either the background noise mean value measured by the instrument,
or the background noise calculated from the received echo using standard parameters.
See local flag definition for l_WFqual - a flag is set if the background noise is cal-
culated.
Comments:             This is in units of counts and must be calibrated and converted to
voltage before using it - see conversion table in header record.

Product Var Name:     i_sDevNsOb1
Is element of:        GLA05 record
Short Description:    Standard deviation of 1064 nm Background noise, (alternate)
Product Data Type:    i2b (40)
Total Bytes:          80
Product Units:        0.0001 volts
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      30000
```

```
Description:          The standard deviation of the background noise (alternative param-
eters).
Comments:

Product Var Name:     i_sDevNsOb2
Is element of:        GLA05 record
Short Description:    Standard deviation of 1064 nm Background noise, (standard)
Product Data Type:    i2b (40)
Total Bytes:          80
Product Units:        0.0001 volts
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      30000
Description:          The standard deviation of the background noise (standard parame-
ters).
Comments:

Product Var Name:     i_refRng
Is element of:        GLA05 record
Short Description:    Reference Range
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        .01 ns
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      400000000
Product Maximum:      1000000000
Description:          Two-way Reference range in time measured from the centroid of the
transmit pulse to the last received echo digitizer gate telemetered (farthest from the
spacecraft).
Comments:             This is not the range measurement, but a reference value from which
the offsets to calculate the range measurement are given. The range measurement will be
to a specific location on the received echo that represents the surface response.

Product Var Name:     i_thRtkRngOff1
Is element of:        GLA05 record
Short Description:    Threshold Retracker Range Offset (alternative)
Product Data Type:    i4b (40)
Total Bytes:          160
Product Units:        0.01 ns
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -100000
Product Maximum:      0
Description:          Offset to be added to i_refRng to give the two-way range in time
to the threshold retracker location on the received echo calculated using alternative
parameters.
Comments:             The position on the received echo for threshold retracking is cal-
culated as the first received gate where the voltage is > n*sigma (see ATBD). This is
calculated after converting the noise and waveform from counts to voltage.

Product Var Name:     i_thRtkRngOff2
Is element of:        GLA05 record
Short Description:    Threshold Retracker Range Offset (standard)
Product Data Type:    i4b (40)
```

```
Total Bytes:          160
Product Units:        0.01 ns
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -100000
Product Maximum:      0
Description:          Offset to be added to i_refRng to give the two-way range in time
to the threshold retracker location on the received echo using standard parameters.
Comments:             The position on the received echo for threshold retracking is cal-
culated as the first received gate where the voltage is > n*sigma (see ATBD). This is
calculated after converting the noise and waveform from counts to voltage.

Product Var Name:     i_minRngOff1
Is element of:        GLA05 record
Short Description:    Minimum Range Offset (alternative)
Product Data Type:    i4b (40)
Total Bytes:          160
Product Units:        0.01 ns
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -100000
Product Maximum:      0
Description:          Offset to be added to i_refRng to give the two-way range in time
to the location on the received echo calculated as the beginning of signal (closest to
the spacecraft) using alternate parameters.
Comments:             This is calculated after the received echo and noise values are
calibrated and converted from counts to voltage as the first received gate where the
voltage is > n*sigma (see ATBD). The value of n may be different than threshold retracker.

Product Var Name:     i_minRngOff2
Is element of:        GLA05 record
Short Description:    Minimum Range Offset (standard)
Product Data Type:    i4b (40)
Total Bytes:          160
Product Units:        0.01 ns
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -100000
Product Maximum:      0
Description:          Offset to be added to i_refRng to give the two-way range in time
to the location on the received echo calculated as the beginning of signal (closest to
the spacecraft) closest to the spacecraft using standard parameters.
Comments:             This is calculated after the received echo and noise values are
calibrated and converted from counts to voltage as the first received gate where the
voltage is > n*sigma (see ATBD). The value of n may be different than threshold retracker.

Product Var Name:     i_preRngOff1
Is element of:        GLA05 record
Short Description:    Preliminary Uncorrected Range Offset (alternative)
Product Data Type:    i4b (40)
Total Bytes:          160
Product Units:        0.01 ns
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -100000
```

```
Product Maximum:      0
Description:          Offset to be added to i_refRng to give the two-way range in time
to the location on the received echo calculated as the end of signal (farthest from the
spacecraft) using alternative parameters.
Comments:             This is calculated after the received echo and noise values are
calibrated and converted from counts to voltage (see ATBD).

Product Var Name:     i_preRngOff2
Is element of:        GLA05 record
Short Description:    Preliminary Uncorrected Range Offset (standard)
Product Data Type:    i4b (40)
Total Bytes:          160
Product Units:        0.01 ns
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -100000
Product Maximum:      0
Description:          Offset to be added to i_refRng to give the two-way range in time
to the location on the received echo calculated as the end of signal (farthest from the
spacecraft) using standard parameters.
Comments:             This is calculated after the received echo and noise values are
calibrated and converted from counts to voltage (see ATBD). This is the range used to
calulate the geodetic coordinates of the footprint and elevations on this record.

Product Var Name:     i_centroid1
Is element of:        GLA05 record
Short Description:    Centroid retracker offset (alternative)
Product Data Type:    i4b (40)
Total Bytes:          160
Product Units:        0.01 ns
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -100000
Product Maximum:      0
Description:          Offset to be added to i_refRng to give the two-way range in time
to the location of the centroid of the received echo from signal begin through signal
end defined by the alternative parameters.
Comments:             This is calculated after the received echo and noise values are
calibrated and converted from counts to voltage (see ATBD).

Product Var Name:     i_centroid2
Is element of:        GLA05 record
Short Description:    Centroid retracker offset (standard)
Product Data Type:    i4b (40)
Total Bytes:          160
Product Units:        0.01 ns
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -100000
Product Maximum:      0
Description:          Offset to be added to i_refRng to give the two-way range in time
to the location of the centroid of the received echo from signal begin through signal
end defined by the standard parameters.
Comments:             This is calculated after the received echo and noise values are
calibrated and converted from counts to voltage (see ATBD).
```

```
Product Var Name:     i_centroidInstr
Is element of:        GLA05 record
Short Description:    Centroid retracker offset using max peak
Product Data Type:    i4b (40)
Total Bytes:          160
Product Units:        0.01 ns
Invalid Value/Flag:   gi_invalid_i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -100000
Product Maximum:      0
Description:          Offset to be added to i_refRng to give the two-way range in time
to the location on the received echo of the centroid of the signal surrounding the maximum
amplitude peak.
Comments:             This is the definition used by the instrument team to check out
the on-board algorithms. See ATBD

Product Var Name:     i_areaRecWF1
Is element of:        GLA05 record
Short Description:    Area uder received echo (alternative)
Product Data Type:    i2b (40)
Total Bytes:          80
Product Units:        0.01 volts * ns
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32766
Description:          Area under the received echo from signal begin to signal end using
alternative parameters.
Comments:             This is calculated after converting the return to voltage.

Product Var Name:     i_areaRecWF2
Is element of:        GLA05 record
Short Description:    Area under received echo (standard)
Product Data Type:    i2b (40)
Total Bytes:          80
Product Units:        0.01 volts * ns
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32766
Description:          Area under the received echo from signal begin to signal end using
standard parameters.
Comments:             This is calculated after converting the return to voltage.

Product Var Name:     i_maxRecAmp
Is element of:        GLA05 record
Short Description:    Max Amplitude of Received Echo
Product Data Type:    i2b (40)
Total Bytes:          80
Product Units:        Tenth of millivolts
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -300
Product Maximum:      30000
Description:          Maximum Amplitude of the Received Echo.
```

```
Comments:            This is calculated after converting the return to voltage.

Product Var Name:    i_maxSmAmp
Is element of:       GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:   Peak Amplitude of Smoothed Received Echo
Product Data Type:   i2b ( 40)
Total Bytes:         80
Product Units:       Tenth of millivolts
Invalid Value/Flag:  No
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     -300
Product Maximum:     30000
Description:         The peak amplitude of the received echo after it has been smoothed
to remove high frequency noise (see ATBD).
Comments:            This is calculated after converting the return to voltage.

Product Var Name:    i_reflctUncorr
Is element of:       GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:   Reflectivity not corrected for Atmospheric Effects
Product Data Type:   i4b ( 40)
Total Bytes:         160
Product Units:       Unitless*1E06
Invalid Value/Flag:  i4b
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     1000000
Description:         The reflectance (not corrected for atmospheric effects) is calcu-
lated as the ratio of the received energy after it has been scaled for range, and the
transmitted energy.  The corrected reflectance may be calculated from this uncorrected
reflectance by dividing  by e^(-2(tc+ta+tm)), where tc is the cloud (column) integrated
optical depth, ta is the aerosol (column) integrated optical depth, and tm is the mo-
lecular optical depth.
Comments:            This uses all signal between signal begin and signal end.

Product Var Name:    i_reflctuncmxpk
Is element of:       GLA05 record
Short Description:   Reflectivity Not Corrected For Atmospheric Effects from max peak
Product Data Type:   i4b (40)
Total Bytes:         160
Product Units:       unitless x1.E06
Invalid Value/Flag:  gi_invalid_i4b
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     1000000
Description:         The reflectance (not corrected for atmospheric effects) is calcu-
lated as the ratio of the received energy after it has been scaled for range, and the
transmitted energy.  The corrected reflectance may be calculated from this uncorrected
reflectance by dividing  by e^(-2(tc+ta+tm)), where tc is the cloud (column) integrated
optical depth, ta is the aerosol (column) integrated optical depth, and tm is the mo-
lecular optical depth.
Comments:            This uses only the signal surrounding the maximum peak.

Product Var Name:    i_tpCentX
Is element of:       GLA05 record
```

```
Short Description:    LPA Centroid X
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        arcsec*10
Invalid Value/Flag:   gi_invalid_i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32766
Description:
Comments:

Product Var Name:     i_tpCentY
Is element of:        GLA05 record
Short Description:    LPA Centroid Y
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        arcsec*10
Invalid Value/Flag:   gi_invalid_i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32766
Description:
Comments:

Product Var Name:     i_nPeaks1
Is element of:        GLA05 record, GLA06 record, GLA14 Record
Short Description:    Initial Number of Peaks in received echo (alternate)
Product Data Type:    i1b (40)
Total Bytes:          40
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      50
Description:          The initial number of peaks of the received echo; determined from
the smoothed waveform, using alternative parameters
Comments:

Product Var Name:     i_nPeaks2
Is element of:        GLA05 record
Short Description:    Initial Number of Peaks in received echo (standard)
Product Data Type:    i1b (40)
Total Bytes:          40
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      50
Description:          The initial number of peaks found in the received echo; determined
from the smoothed waveform, using standard parameters
Comments:

Product Var Name:     i_parm1
Is element of:        GLA05 record
Short Description:    Parameters from the Gaussian fit to the received echo (alternative)
```

```
Product Data Type:    i4b (19, 40)
Total Bytes:          3040
Product Units:        0.0001 volts, 6 * (0.0001 volts, 0.01 ns, 0.01 ns)
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -30, 6 * (0, -100000, 0)
Product Maximum:      30000, 6 * (30000, 0, 32766)
Description:          Parameters (in physical units) determined from the fit of the re-
ceived echo using the alternative parameterization. In the order of: item1=noise (mil-
livolts), then 6 sets of three Gaussian parameters (subitem1=amplitude (millivolts),
subitem2=peak location (ns), and subitem3=sigma (ns)). Items 2-4 are the Gaussian pa-
rameters for the last (closest-to-the-ground or 1st) peak.  Items 5-7 are the Gaussian
parameters for the next-to-last (2nd) peak. ..Items 17-19 are the Gaussian parameters
for the closest-to-the-satellite peak.  If there are fewer than six peaks, the unused
parameters are set invalid. Adding the location to i_refRng gives the two-way range in
time to the center of that peak.
Comments:             The received echo was calibrated and converted from counts to volt-
age using table in header records before the fit was performed.

Product Var Name:     i_parm2
Is element of:        GLA05 record
Short Description:    Parameters from Gaussian fit to the received echo (standard)
Product Data Type:    i4b (19, 40)
Total Bytes:          3040
Product Units:        0.0001 volts, 6 * ( 0.0001 volts, 0.01 ns, 0.01 ns)
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -30, 6 * (0, -100000, 0)
Product Maximum:      30000, 6 * (30000, 0, 32766)
Description:          Parameters (in physical units) determined from the fit of the re-
ceived echo using the standard parameterization. In the order of : item1=noise (milli-
volts), then 6 sets of Gaussian parameters (subitem1=amplitude (millivolts),
subitem2=peak location (ns), and subitem3=sigma (ns)). Items 2-4 are the Gaussian pa-
rameters for the last (closest-to-the-ground or 1st) peak.  Items 5-7 are the Gaussian
parameters for the next-to-last (2nd) peak. ..Items 17-19 are the Gaussian parameters
for the closest-to-the-satellite peak.  If there are fewer than six peaks, the unused
parameters are set invalid. Adding the location to i_refRng gives the two-way range in
time to the center of that peak.
Comments:             The received echo was calibrated and converted from counts to volt-
age using table in header records before the fit was performed.

Product Var Name:     i_solnSigmas1
Is element of:        GLA05 record
Short Description:    Sigmas of fit parameters (alternative)
Product Data Type:    i2b (19, 40)
Total Bytes:          1520
Product Units:        0.0001 volts, 6 * (0.0001 volts, 0.001 ns, 0.001 ns)
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      30000, 6 * (30000, 3000, 3000)
Description:          Standard deviation of each fit parameter from diagonal of final
covariance matrix from alternative parameterization. In the order of: item1=noise (mil-
livolts), then 6 sets of three parameters (subitem1=amplitude (millivolts),
subitem2=peak location (ns), and subitem3=sigma (ns)). Items 2-4 are the parameters for
the last (closest-to-the-ground or 1st) peak.  Items 5-7 are the parameters for the next-
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to-last (2nd) peak. ..Items 17-19 are the parameters for the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set invalid.
Comments: Note that the received echo was calibrated and converted from counts to voltage using table in header records before the fit was performed.

Product Var Name: i_solnSigmas2
Is element of: GLA05 record
Short Description: Sigmas of fit parameters (standard)
Product Data Type: i2b (19, 40)
Total Bytes: 1520
Product Units: 0.0001 volts, 6 * (0.0001 volts, 0.0001 ns, 0.0001 ns)
Invalid Value/Flag: i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 30000, 6 * (30000, 3000, 3000)
Description: Standard deviation of each fit parameter from diagonal of final covariance matrix from standard parameterization. In the order of: item1=noise (millivolts), then 6 sets of three parameters (subitem1=amplitude (millivolts), subitem2=peak location (ns), and subitem3=sigma (ns)). Items 2-4 are the parameters for the last (closest-to-the-ground or 1st) peak. Items 5-7 are the parameters for the next-to-last (2nd) peak. ..Items 17-19 are the parameters for the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set invalid.Comments: Note that the received echo was calibrated and converted from counts to voltage using table in header records before the fit was performed.

Product Var Name: i_wfFitSDev_1
Is element of: GLA05 record
Short Description: The received echo fit standard deviation (alternative)
Product Data Type: i2b (40)
Total Bytes: 80
Product Units: millivolts
Invalid Value/Flag: i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 30000
Description: The standard deviation of the difference between the functional fit and the received echo using alternative parameters.
Comments: Note that the received echo was calibrated and converted from counts to voltage using table in header records before the fit was performed.

Product Var Name: i_wfFitSDev_2
Is element of: GLA05 record
Short Description: The received echo fit standard deviation (standard)
Product Data Type: i2b (40)
Total Bytes: 80
Product Units: millivolts
Invalid Value/Flag: i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 30000
Description: The standard deviation of the difference between the functional fit and the received echo using the standard parameters
Comments: Note that the received echo was calibrated and converted from counts to voltage using table in header records before the fit was performed.

Product Var Name: i_tpintensity

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Is element of:       GLA05 record
Short Description:   Transmit pulse intensity
Product Data Type:   i4b (40)
Total Bytes:         160
Product Units:       counts
Invalid Value/Flag:  gi_invalid_i4b
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     25500
Description:         Transmit pulse intensity as measured by the LPA.
Comments:

Product Var Name:    i_tpazimuth
Is element of:       GLA05 record
Short Description:   Transmit pulse azimuth
Product Data Type:   i2b (40)
Total Bytes:         80
Product Units:       deg*10
Invalid Value/Flag:  gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     3600
Description:         Transmit pulse azimuth
Comments:

Product Var Name:    i_tpeccentricity
Is element of:       GLA05 record
Short Description:   Transmit pulse eccentricity
Product Data Type:   i2b (40)
Total Bytes:         80
Product Units:       e*1000
Invalid Value/Flag:  gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     1000
Description:         Transmit pulse eccentricity as measured by the LPA.
Comments:

Product Var Name:    i_tpmajoraxis
Is element of:       GLA05 record
Short Description:   Transmit pulse major axis
Product Data Type:   i2b (40)
Total Bytes:         80
Product Units:       cm
Invalid Value/Flag:  gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     10000
Description:         Transmit pulse major axis as measured by the LPA.
Comments:

Product Var Name:    i_skew1
Is element of:       GLA05 record, GLA14 Record
Short Description:   Skewness of Received Echo (alternative)
Product Data Type:   i2b (40)
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Total Bytes:          80
Product Units:        unitless * 100
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -10000
Product Maximum:      10000
Description:          Skewness of the received echo from signal begin to signal end using
alternative parameters
Comments:             Note that the received echo was calibrated and converted to voltage
before calculation.

Product Var Name:     i_kurt1
Is element of:        GLA05 record, GLA14 Record
Short Description:    Kurtosis of Received Echo (alternative)
Product Data Type:    i2b (40)
Total Bytes:          80
Product Units:        unitless * 100
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      1000
Description:          Kurtosis of the received echo from signal begin to signal end using
alternative parameters
Comments:             Note that the received echo was calibrated and converted to voltage
before calculation.

Product Var Name:     i_skew2
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA15
Record
Short Description:    Skewness
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        unitless * 100
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -10000
Product Maximum:      10000
Description:          The skewness of the received echo from signal begin to signal end
using standard  parameters.
Comments:             Note that the received echo was calibrated and converted to voltage
before calculation.

Product Var Name:     i_kurt2
Is element of:        GLA05 record, GLA06 record, GLA12 Record
Short Description:    Kurtosis of the Received Echo (standard)
Product Data Type:    i2b (40)
Total Bytes:          80
Product Units:        unitless * 100
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      1000
Description:          Kurtosis of the received echo from signal begin to signal end using
standard parameters
Comments:             Note that the received echo was calibrated and converted to voltage
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before calculation.

Product Var Name:     i_WFqual
Is element of:        GLA05 record
Short Description:    Received Echo Quality Flag
Product Data Type:    i4b (40)
Total Bytes:          160
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Indicator of the quality of the received echo (waveform); deter-
mined during the received echo assessment process, and the functional fit.  Each 4 byte
integer represents 31 bits of flag information.  For definitions of each bit,
Please see <a href='flags/i_WFqual.pdf'> the PDF flag description</a>.
Comments:

Product Var Name:     i_areaTrWF
Is element of:        GLA05 record
Short Description:    Area Under Transmitted Pulse
Product Data Type:    i2b (40)
Total Bytes:          80
Product Units:        0.01 volts * ns
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      15840
Description:          Area under the transmitted pulse calculated from 48 gates teleme-
tered
Comments:             Note that the transmit pulse was calibrated and converted to volt-
age before calculation.

Product Var Name:     i_tpOrX
Is element of:        GLA05 record
Short Description:    Pulse Orientation
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        degrees*10
Invalid Value/Flag:   gi_invalid_i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3600
Description:          Pulse Orientation (Angle measured counter-clockwise from LPA X-ax-
is)Comments:

Product Var Name:     i_locTr
Is element of:        GLA05 record
Short Description:    Centroid of Transmitted Pulse in time relative to gate 1 of tr wf
Product Data Type:    i4b (40)
Total Bytes:          160
Product Units:        0.01 ns
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
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Product Maximum:      4800
Description:          Time from gate 1 of the transmitted pulse to the centroid of trans-
mitted pulse calculated from 48 gates telemetered
Comments:             Note that the pulse was calibrated and converted to voltage before
calculation.

Product Var Name:     i_parmTr
Is element of:        GLA05 record
Short Description:    Parameters of the Gaussian fit to the Transmitted Pulse
Product Data Type:    i4b (4, 40)
Total Bytes:          640
Product Units:        millivolts, millivolts, 0.01 ns,  0.01 ns
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -30, -30, 0, 0
Product Maximum:      30000, 30000, 4800, 32766
Description:          Parameters from the Gaussian fit to the transmitted pulse:
item1=noise (millivolts), item2=amplitude (millivolts), Item3=peak location (ns), and
item 4=sigma (ns). Peak location is relative to gate 1 of the transmit pulse.
Comments:             Note that the pulse was calibrated and converted to voltage before
calculation.

Product Var Name:     i_sDevFitTr
Is element of:        GLA05 record
Short Description:    Standard deviation of fit of transmitted pulse
Product Data Type:    i2b (40)
Total Bytes:          80
Product Units:        millivolts
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      30000
Description:          Standard deviation of fit of a gaussian model to the transmitted
pulse
Comments:             Note that the pulse was calibrated and converted to voltage before
calculation.

Product Var Name:     i_skewTr
Is element of:        GLA05 record
Short Description:    Skewness of Transmitted Pulse
Product Data Type:    i4b (40)
Total Bytes:          160
Product Units:        NA
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      1000
Description:          Skewness of transmitted pulse
Comments:             Note that the pulse was calibrated and converted to voltage before
calculation.

Product Var Name:     i_maxTrAmp
Is element of:        GLA05 record
Short Description:    Maximum Amp of Transmitted Pulse
Product Data Type:    i2b (40)
Total Bytes:          80
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Product Units:        0.1 millivolts
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -300
Product Maximum:      30000
Description:          Maximum amplitude of transmitted pulse calculated from all (48)
gates telemetered
Comments:             Note that the pulse was calibrated and converted to voltage before
calculation.

Product Var Name:     i_gval_tx
Is element of:        GLA05 record
Short Description:    Gain Value used for Transmitted Pulse - uncalibrated
Product Data Type:    i2b
Total Bytes:          2
Product Units:        counts
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      255
Description:          Gain value used for transmitted pulse - uncalibrated
Comments:             This value is in counts and needs to be calibrated before calcu-
lating energy from it. Same as variable in GLA01_Main/i_ADdetOutGn.

Product Var Name:     i_compRatio
Is element of:        GLA01 Main Record , GLA05 record
Short Description:    Compression Ratios
Product Data Type:    i2b (2)
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      1
Product Maximum:      5
Description:          Averaging values p and q for frame. First item is p; second is q.
From APID19, Offset 232. First N downlink samples are generated by averaging p raw dig-
itized elements and the rest of the allocated samples in the waveform by averaging q
elements.
Comments:             Not valid if APID19 is missing.

Product Var Name:     i_N_val
Is element of:        GLA01 Main Record , GLA05 record
Short Description:    Value of N
Product Data Type:    i2b
Total Bytes:          2
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      544
Description:          Value of N used for waveform compression for the frame. From
APID19, Offset 236.
Comments:             Not valid if APID19 is missing.

Product Var Name:     i_r_val
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```
Is element of:        GLA01 Main Record , GLA05 record
Short Description:    Value of r
Product Data Type:    i2b
Total Bytes:          2
Product Units:        counts
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      8
Description:          Value of r used for waveform compression for frame. From APID19,
Offset 238. Not valid if APID19 is missing.
Comments:             After M shots with no valid return, the ‘p’ and ‘q’ averaging of
the normal downlinked waveform compression type will be overridden and instead the tele-
metered received echo will consist of average samples averaged over ‘r’ raw samples.

Product Var Name:     i_ElvuseFlg
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Elevation use flag
Product Data Type:    i1b ( 5)
Total Bytes:          5
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          Flag indicating whether the elevations on this record should be
used or not (1 bit set/shot). See the <a href=’flags/i_ElvuseFlg.pdf’>PDF file</A> for
more information.
Comments:

Product Var Name:     i_spare3
Is element of:        GLA05 record
Short Description:    i_spare3
Product Data Type:    i1b
Total Bytes:          1
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:
Comments:

Product Var Name:     i_ElvFlg
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Elevation Definition Flag
Product Data Type:    i1b ( 40)
Total Bytes:          40
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      127
```

Description: Indicates which location on the received echo was used to calculate the elevation on the record.
Please see <a href='flags/i_ElvFlg.pdf'> the PDF flag description</a> for more details.
'For GLA06 and 12-15, bits are set to reflect Standard Fitting. For GLA14, bits are set to reflect Alternate Fitting. Although defined as a pass-thru, the values are different on GLA06/12-15 and GLA14.'
Comments:

Product Var Name: i_atmQF
Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Atmosphere Flag
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 1
Description: Indicates from LIDAR channel if conditions for forward scattering were favorable.
Please see <a href='flags/i_atmQF.pdf'> the PDF flag description</a> for more details.
Comments: If forward scattering occurs, it may map to an error in the elevation measurement. Users may want to delete data with forward scattering.

Product Var Name: i_timecorflg
Is element of: GLA01 Main Record , GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: time correction flag
Product Data Type: i2b
Total Bytes: 2
Product Units: N/A
Invalid Value/Flag: No
Is Correction Flag?: No
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 32767
Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name: i_APID_AvFlg
Is element of: GLA01 Main Record , GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: APID Data Availability Flag
Product Data Type: i1b (8)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -127

Product Maximum: 127
Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections.
Please see <a href='flags/i_APID_AvFlg.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name: i_AttFlg2
Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Attitude Flag 2
Product Data Type: i1b (20)
Total Bytes: 20
Product Units: NA
Invalid Value/Flag: no
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 15
Description: Denotes at 40/sec rate whether precision attitude was used to determine spot location, and if problems with LPA, etc.
Please see <a href='flags/i_AttFlg2.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name: i_spare4
Is element of: GLA05 record
Short Description: Spares
Product Data Type: i1b
Total Bytes: 1
Product Units: NA
Invalid Value/Flag: NA
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description:
Comments:

Product Var Name: i_FrameQF
Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Altimeter Frame Quality Flag
Product Data Type: i1b
Total Bytes: 1
Product Units: N/A
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 1
Description: Denotes all bad data (no signal in whole frame), or all data good and all science team recommended corrections applied
Please see <a href='flags/i_FrameQF.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name: i_OrbFlg
Is element of: GLA01 Main Record , GLA02 Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

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Short Description:    POD flag (Orbit Flag)
Product Data Type:    i1b (2)
Total Bytes:          2
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      128
Description:          Denotes quality of orbit, whether predicted or precision, loss of
GPS data, maneuver-degraded, etc.
Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name:     i_rngCorrFlg
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Range Correction Flag
Product Data Type:    i1b (2)
Total Bytes:          2
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32767
Description:          Denotes which geophysical or instrument corrections have been ap-
plied to the range in the calculation of the elevation on this record.
Please see <a href='flags/i_rngCorrFlg.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_spare5
Is element of:        GLA05 record
Short Description:    Spares
Product Data Type:    i1b ( 2)
Total Bytes:          2
Product Units:        NA
Invalid Value/Flag:   NA
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      NA
Product Maximum:      NA
Description:
Comments:

Product Var Name:     i_beam_coelev
Is element of:        GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13
Record, GLA14 Record, GLA15 Record
Short Description:    Co-elevation
Product Data Type:    i4b
Total Bytes:          4
Product Units:        degrees*100
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      36000
Description:          Co-elevation (CE) is direction from vertical of the laser beam as
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seen by an observer located at the laser ground spot.Comments:

Product Var Name: i_beam_azimuth
Is element of: GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Azimuth
Product Data Type: i4b
Total Bytes: 4
Product Units: degrees*100
Invalid Value/Flag: i4b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 36000
Description: Az is the direction clockwise from north of the laser beam vector as seen by an observer at the laser ground spot viewing toward the spacecraft (i.e., the vector from the ground to the spacecraft).Comments:

Product Var Name: i_AttFlg1
Is element of: GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Attitude Flag 1
Product Data Type: i2b
Total Bytes: 2
Product Units: N/A
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 32767
Description: At 1/sec denotes large off-nadir angle, ocn sweep, target of opportunity, steering to reference track.
Please see <a href='flags/i_AttFlg1.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name: i_RMSpulseWd
Is element of: GLA05 record
Short Description: RMS Pulse Width
Product Data Type: i2b (40)
Total Bytes: 80
Product Units: 100 ns
Invalid Value/Flag: i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 1000
Description: The RMS width of the entire waveform.Comments:

Product Var Name: i_satNdx
Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Saturation Index
Product Data Type: i1b (40)
Total Bytes: 40
Product Units: ns
Invalid Value/Flag: i1b
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0

```
Product Maximum:      255
Description:          The count of the number of gates in a waveform which have an am-
plitude greater than or equal to i_satNdxTh (set in anc07_0004). The value 255 means 255
or more gates are above the saturation index threshold (i_satNdxth).
Comments:

Product Var Name:     i_RecNrgAll
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Received Energy signal begin to signal end
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:         0.01 fJoules
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32000
Description:
Comments:

Product Var Name:     i_spare6
Is element of:        GLA05 record
Short Description:    Spare6
Product Data Type:    i1b (110)
Total Bytes:          110
Product Units:        NA
Invalid Value/Flag:   NA
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      NA
Product Maximum:      NA
Description:
Comments:
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D.1.13 GLA06 Record

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Product Var Name:     i_rec_ndx
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    GLAS Record Index
Product Data Type:    i4b
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Unique index that relates this record to the corresponding
record(s) in each GLAS data product.
Comments:

Product Var Name:     i_UTCTime
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
```

Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Transmit Time of First Shot in frame in J2000
Product Data Type: i4b (2)
Total Bytes: 8
Product Units: seconds, microseconds
Invalid Value/Flag: no
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: The transmit time in UTC of the 1st shot in the 1 second frame referenced to noon on Jan 1, 2000. The first item is the whole number of seconds ; the second item is the fractional part in microseconds.
Comments: This is not the ground bounce time, but the transmit time.

Product Var Name: i_transtime
Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: One way transit time
Product Data Type: i2b
Total Bytes: 2
Product Units: microseconds
Invalid Value/Flag: i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 4000
Description: One way transit time calculated using the preliminary range offset. This is added to the UTC time tag to get the ground bounce times at which to calculate the orbit
Comments:

Product Var Name: i_Spare1
Is element of: GLA06 record
Short Description: 2 byte spare
Product Data Type: i1b (2)
Total Bytes: 2
Product Units: N/A
Invalid Value/Flag: N/A
Is Correction Flag?: No
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description:
Comments:

Product Var Name: i_deltagpstmcor
Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Delta GPS time correction
Product Data Type: i4b
Total Bytes: 4
Product Units: nanoseconds
Invalid Value/Flag: gi_invalid_i4b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0

```
Product Maximum:      1000000
Description:          The high frequency delta GPS time correction calculated during the
precision orbit processing step.
Comments:

Product Var Name:     i_dShotTime
Is element of:        GLA01 Main Record , GLA04 LPA Main Record, GLA05 record, GLA06
record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    Laser Shot Time Deltas (shots 2-40)
Product Data Type:    i4b (39)
Total Bytes:          156
Product Units:        microseconds
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1200000
Description:          The time deltas of pulses 2 through 40 to i_UTCTime, the UTC time
tag of the first pulse in the 1-second data frame. Adding the deltas to i_UTCTime will
give the user the time of each individual shot in the frame.
Comments:             To calculate the time for shots 2-40, add these deltas to the time
of the first shot.

Product Var Name:     i_lat
Is element of:        GLA06 record
Short Description:    Spot 1 Coordinate Data, Latitude Corrected
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        microdeg
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -90000000
Product Maximum:      90000000
Description:          The geodetic latitude of the 40 laser spots in the 1 second time
frame, computed from the Precision orbit, precision attitude, and ice-sheet specific
range after instrument corrections, atmospheric delays and tides have been applied. The
values are in degrees North.
Comments:

Product Var Name:     i_lon
Is element of:        GLA06 record
Short Description:    Spot 1 Coordinate Data, Longitude Corrected
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        microdeg
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      360000000
Description:          The longitude of the 40 laser spots in the 1 second time frame,
computed from the Precision orbit, precision attitude, and ice-sheet specific range after
instrument corrections, atmospheric delays and tides have been applied. The values are
in east longitude.
Comments:

Product Var Name:     i_elev
Is element of:        GLA06 record
```

```
Short Description:    Surface Elevation
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        mm
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -500000
Product Maximum:      10000000
Description:          Surface elevation with respect to the ellipsoid at the spot loca-
tion determined by the ice-sheet specific range after instrument corrections, atmospher-
ic delays and tides have been applied.
Comments:

Product Var Name:     i_PADPoint
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    PAD Pointing unit Vector in ICRF
Product Data Type:    i4b (6, 40)
Total Bytes:          960
Product Units:        Unitless*1000000
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000000
Product Maximum:      1000000
Description:          Unit vectors giving the pointing direction of the laser with re-
spect to the GLAS optical bench axes in the ICRF reference frame, one vector for each
of the 40 shots, at the shot (transmit) time. Each component is composed of 2 4-byte
items.
Comments:

Product Var Name:     i_PODFixedPos
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Position orbit vector in ICRF
Product Data Type:    i4b (6, 40)
Total Bytes:          960
Product Units:        3 * (m, mm)
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -7.0E+10
Product Maximum:      7.0E+10
Description:          Spacecraft position vectors in ICRF of the laser point of reference
on the spacecraft, one vector for each of the 40 shots, at the bounce (transmit plus
transit) time.  Each element is composed of 2 4-byte items. The first is m and the second
is millimeters.
Comments:

Product Var Name:     i_sigmaatt
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Attitude Quality Indicator
Product Data Type:    i2b (40)
Total Bytes:          80
Product Units:        Unitless
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
```

```
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      6000
Description:          Attitude quality indicator. Values: 0=good; 50=warning; 100=bad.
Comments:             This indicator currently has only 3 values: 0, 50, and 100, leaving
open the opportunity to use numbers in between for further resolution of the degradation
as our knowledge improves.

Product Var Name:     i_Azimuth
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Local Azimuth
Product Data Type:    i4b
Total Bytes:          4
Product Units:        millideg
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      360000
Description:          Azimuth of the footprint path.
Comments:

Product Var Name:     i_SolAng
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Solar Incidence Angle
Product Data Type:    i4b
Total Bytes:          4
Product Units:        microdeg
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -90000000
Product Maximum:      90000000
Description:          The solar incidence angle determined during Precision Orbit Deter-
mination processing; it provides the operational sun angle estimate.
Comments:

Product Var Name:     i_tpintensity_avg
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Transmit Pulse intensity - frame avg
Product Data Type:    i4b
Total Bytes:          4
Product Units:        counts
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      25500
Description:
Comments:

Product Var Name:     i_tpazimuth_avg
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Transmit Pulse azimuth - frame avg
Product Data Type:    i2b
```

```
Total Bytes:          2
Product Units:        degrees*10
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3600
Description:
Comments:

Product Var Name:     i_tpeccentricity_avg
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Transmit Pulse eccentricity - frame avg
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Unitless*1000
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1000
Description:
Comments:

Product Var Name:     i_tpmajoraxis_avg
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Tramsit Pulse major axis - frame avg
Product Data Type:    i2b
Total Bytes:          2
Product Units:        cm
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      10000
Description:
Comments:

Product Var Name:     i_Spare2
Is element of:        GLA06 record
Short Description:    spares
Product Data Type:    i1b (2)
Total Bytes:          2
Product Units:        null
Invalid Value/Flag:   null
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:
Comments:

Product Var Name:     i_gdHt
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Geoid
Product Data Type:    i2b ( 2)
```

```
Total Bytes:          4
Product Units:        cm
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -20000
Product Maximum:      20000
Description:          The height of the geoid above the ellipsoid for the first and last
shot in the record.
Comments:

Product Var Name:     i_erElv
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record
Short Description:    Solid Earth Tide Elevation (at first & last shot)
Product Data Type:    i2b ( 2)
Total Bytes:          4
Product Units:        mm
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -10000
Product Maximum:      10000
Description:          The solid earth tide elevation for the first & last shot in the
record.
Comments:

Product Var Name:     i_spElv
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Tide Elevations, Specific
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        mm
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -10000
Product Maximum:      10000
Description:          A tide elevation calculated from alternate tide models for specific
regions for shots 1, 11, 21, and 31.
Comments:

Product Var Name:     i_ldElv
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Load Tide Elevation
Product Data Type:    i2b ( 4)
Total Bytes:          8
Product Units:        mm
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -10000
Product Maximum:      10000
Description:          The load tide elevation applied to each shot. Elements 1-4 of the
load tide vector are applied to shots 1-10, 11-20, 21-30, and 31-40, respectively.Com-
ments:                The load tide is NOT NECESSARILY the load tide for shots
1,11,21,31. It is calculated for the first valid shot in each group of 10 and applied
to all valid shots in the group.
```

```
Product Var Name:     i_ocElv
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Ocean Tide Elevation (at first & last shot)
Product Data Type:    i2b ( 2)
Total Bytes:          4
Product Units:        mm
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -10000
Product Maximum:      10000
Description:          The ocean tide elevation at first & last shot
Comments:

Product Var Name:     i_wTrop
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Range Correction_Wet Troposphere
Product Data Type:    i2b ( 2)
Total Bytes:          4
Product Units:        mm
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      0
Description:          The range correction due to the wet troposphere at first & last
shot.
Comments:

Product Var Name:     i_dTrop
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record
Short Description:    Range Correction, Dry Troposphere
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        mm
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -2500
Product Maximum:      0
Description:          The range correction due to the dry troposphere; one correction
for each shot.
Comments:

Product Var Name:     i_surfType
Is element of:        GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Region Type
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      1
Product Maximum:      15
```

```
Description:          Describes the region type or types associated with each shot Ice
Sheet, ocean, sea ice, or Land.
Please see <a href='flags/i_surfType.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_Spare3
Is element of:        GLA06 record
Short Description:    spares
Product Data Type:    i1b (3)
Total Bytes:          3
Product Units:        N/A
Invalid Value/Flag:   null
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:
Comments:

Product Var Name:     i_DEM_elv
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    DEM Elevation
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        cm
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -50000
Product Maximum:      1000000
Description:          Elevation with respect to sea level as interpolated from a Digital
Elevation Map (DEM) at each footprint location.
Comments:

Product Var Name:     i_refRng
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record
Short Description:    Reference Range
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        mm
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      400000000
Product Maximum:      1000000000
Description:          Range in distance calculated from the time between the peak of the
transmit pulse and the farthest gate from the spacecraft of the received pulse. See the
rngcorrflg to determine any corrections that have been applied.
Comments:

Product Var Name:     i_TrshRngOff
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record
Short Description:    Threshold Retracker Range Offset
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        mm
Invalid Value/Flag:   i4b
```

```
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -150000
Product Maximum:      0
Description:          Offset to be added to i_refRng to give the range in distance to
the threshold retracker location on the received echo using standard parameters.
Comments:

Product Var Name:     i_SigBegOff
Is element of:        GLA06 record
Short Description:    Signal Begin Range Offset
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        mm
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -150000
Product Maximum:      0
Description:          Offset to be added to i_refRng to give the range in distance to
the location on the received echo calculated as the beginning of signal (closest to the
spacecraft) using standard parameters.
Comments:

Product Var Name:     i_SigEndOff
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record
Short Description:    Signal End Range Offset
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        mm
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -150000
Product Maximum:      0
Description:          Offset to be added to i_refRng to give the range in distance to
the location on the received echo calculated as the end of signal (farthest from the
spacecraft) using standard parameters.Comments:

Product Var Name:     i_cntRngOff
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record
Short Description:    Centroid Range Offset
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        mm
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -150000
Product Maximum:      0
Description:          Offset to be added to i_refRng to give the range in distance to
the location of the centroid of the received echo from signal begin through signal end
defined by the standard parameters.
Comments:

Product Var Name:     i_reflctUncorr
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Reflectivity not corrected for Atmospheric Effects
```

```
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        Unitless*1E06
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1000000
Description:          The reflectance (not corrected for atmospheric effects) is calcu-
lated as the ratio of the received energy after it has been scaled for range, and the
transmitted energy.  The corrected reflectance may be calculated from this uncorrected
reflectance by dividing  by e^(-2(tc+ta+tm)), where tc is the cloud (column) integrated
optical depth, ta is the aerosol (column) integrated optical depth, and tm is the mo-
lecular optical depth.
Comments:             This uses all signal between signal begin and signal end.

Product Var Name:     i_reflCor_atm
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Reflectivity Corrected Atmospheric Effects
Product Data Type:    i4b
Total Bytes:          4
Product Units:        Unitless*1E06
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1000000
Description:          This corrected reflectance is calculated from the uncorrected re-
flectance by dividing by e^(-2(tc+ta+tm)), where tc is the cloud (column) integrated
optical depth, ta is the aerosol (column) integrated optical depth, and tm is the mo-
lecular optical depth.
Comments:

Product Var Name:     i_maxSmAmp
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Peak Amplitude of Smoothed Received Echo
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        Tenth of millivolts
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -300
Product Maximum:      30000
Description:          The peak amplitude of the received echo after it has been smoothed
to remove high frequency noise (see ATBD).
Comments:             This is calculated after converting the return to voltage.

Product Var Name:     i_SigmaElv
Is element of:        GLA06 record, GLA12 Record
Short Description:    Sigma of Elevation
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        mm
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
```

```
Product Minimum:      0
Product Maximum:      32000
Description:          Elevation error estimates, the error from the Gaussian fit to the
received echo associated with the centroid of the last peak using standard parameters.
Comments:

Product Var Name:     i_numPk
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record
Short Description:    Number of Peaks found in the Return
Product Data Type:    i1b ( 40)
Total Bytes:          40
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      6
Description:          The number of peaks in the return echo found by the Gaussian fit-
ting procedure, using standard parameters.
Comments:

Product Var Name:     i_kurt2
Is element of:        GLA05 record, GLA06 record, GLA12 Record
Short Description:    Kurtosis of the Received Echo (standard)
Product Data Type:    i2b (40)
Total Bytes:          80
Product Units:        unitless * 100
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      1000
Description:          Kurtosis of the received echo from signal begin to signal end using
standard parameters
Comments:             Note that the received echo was calibrated and converted to voltage
before calculation.

Product Var Name:     i_skew2
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA15
Record
Short Description:    Skewness
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        unitless * 100
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -10000
Product Maximum:      10000
Description:          The skewness of the received echo from signal begin to signal end
using standard  parameters.
Comments:             Note that the received echo was calibrated and converted to voltage
before calculation.

Product Var Name:     i_srf_ruf
Is element of:        GLA06 record
Short Description:    Surface Roughness
Product Data Type:    i2b ( 40)
Total Bytes:          80
```

```
Product Units:        cm
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      12000
Description:          The surface roughness over the footprint calculated empirically
from the transmitted pulse and received echo assuming no slope and using the standard
parameterization.
Comments:

Product Var Name:     i_srf_slope
Is element of:        GLA06 record
Short Description:    Surface Slope
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        millideg
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32000
Description:          The surface slope over the footprint calculated empirically from
the transmitted pulse and received echo assuming no roughness and using standard param-
eterization.
Comments:

Product Var Name:     i_isRngOff
Is element of:        GLA06 record, GLA12 Record
Short Description:    Ice Sheet Range Offset
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        mm
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -150000
Product Maximum:      0
Description:          Range offset to be added to i_refRng to calculate the range using
the algorithm deemed appropriate for ice sheets.
Comments:

Product Var Name:     i_siRngOff
Is element of:        GLA06 record, GLA13 Record
Short Description:    Sea Ice Range Offset
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        mm
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -150000
Product Maximum:      0
Description:          Range offset to be added to i_refRng to calculate the range using
the algorithm deemed appropriate for sea ice.
Comments:

Product Var Name:     i_ldRngOff
Is element of:        GLA06 record, GLA14 Record
```

```
Short Description:    Land Range Offset
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        mm
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -150000
Product Maximum:      0
Description:          Range offset to be added to i_refRng to calculate the range using
the algorithm deemed appropriate for land.
Comments:

Product Var Name:     i_ocRngOff
Is element of:        GLA06 record, GLA15 Record
Short Description:    Ocean Range Offset
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        mm
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -150000
Product Maximum:      0
Description:          Range offset to be added to i_refRng to calculate the range using
the algorithm deemed appropriate for oceans.
Comments:

Product Var Name:     i_nPeaks1
Is element of:        GLA05 record, GLA06 record, GLA14 Record
Short Description:    Initial Number of Peaks in received echo (alternate)
Product Data Type:    i1b (40)
Total Bytes:          40
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      50
Description:          The initial number of peaks of the received echo; determined from
the smoothed waveform, using alternative parameters
Comments:

Product Var Name:     i_ElvuseFlg
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Elevation use flag
Product Data Type:    i1b ( 5)
Total Bytes:          5
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          Flag indicating whether the elevations on this record should be
used or not (1 bit set/shot). See the <a href='flags/i_ElvuseFlg.pdf'>PDF file</A> for
more information.
Comments:
```

```
Product Var Name:     i_atm_avail
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Atmosphere Availability Flag
Product Data Type:    i1b
Total Bytes:          1
Product Units:        NA
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      15
Description:          Please see <a href='flags/i_atm_avail.pdf'> the PDF flag descrip-
tion</a> for more details.
Comments:

Product Var Name:     i_erd
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Estimated Range Delay
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Millimeters
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1000
Description:
Comments:

Product Var Name:     i_rdu
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Range Delay Uncertainty
Product Data Type:    i2b
Total Bytes:          2
Product Units:        Millimeters
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      10000
Description:
Comments:

Product Var Name:     i_cld1_mswf
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Cloud Multiple Scattering Warning Flag
Product Data Type:    i1b
Total Bytes:          1
Product Units:        NA
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      15
```

Description: The multiple scattering warning flag (MSWF) is based on the total column optical depth (aerosol plus cloud) calculated in GLA11 using 532nm. It is intended as a way to quickly obtain information about the potential severity of multiple scattering with regards to the range-to-surface calculated by the altimetry processing software. It will be output on the GLA11 product for use by the altimetry group. The multiple scattering warning flag will have values ranging from 0-14, based on the total column optical depth as detailedin the PDF.
A warning flag value of 15 will signify ?invalid?. An invalid will be encoded if an optical depth in any of the layers in the 1-second column could not be calculated. This usually occurs in a very optically ?thick? cloud which extinguishes the signal. It could also occur if the extinction-to-backscatter ratio assignment is set too high, causing the transmission calculations in the lidar inversion to go out-of-range.Please see <a href='flags/i_cld1_mswf_elv.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name: i_MRC_af
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Medium Resolution Cloud Availability Flag
Product Data Type: i1b
Total Bytes: 1
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 15
Description: Please see <a href='flags/i_MRC_af.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name: i_SurfRuf_slpQF
Is element of: GLA06 record, GLA12 Record, GLA14 Record
Short Description: Surface Roughness & Slope Quality Flag
Product Data Type: i1b (40)
Total Bytes: 40
Product Units: N/A
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 127
Description: Per-shot data quality flags indicating quality of i_srf_slope and i_srf_ruf on this record.
Please see <a href='flags/i_SurfRuf_slpQF.pdf'> the PDF flag description</a> for more details. For GLA06 and 12-15, bits are set to reflect Standard Fitting.
For GLA14, bits are set to reflect Alternate Fitting. Although defined as a pass-thru, the values are different on GLA06/12-15 and GLA14.'
Comments:

Product Var Name: i_ElvFlg
Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Elevation Definition Flag
Product Data Type: i1b (40)
Total Bytes: 40
Product Units: N/A
Invalid Value/Flag: No
Is Correction Flag?: NA

```
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      127
Description:          Indicates which location on the received echo was used to calculate
the elevation on the record.
Please see <a href='flags/i_ElvFlg.pdf'> the PDF flag description</a> for more details.
'For GLA06 and 12-15, bits are set to reflect Standard Fitting. For GLA14, bits are set
to reflect Alternate Fitting. Although defined as a pass-thru, the values are different
on GLA06/12-15 and GLA14.'
Comments:

Product Var Name:     i_rng_UQF
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Range Offset Quality/Use Flag
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32767
Description:          Data quality flag for the range offsets on this record.
Please see <a href='flags/i_rng_UQF.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name:     i_atmQF
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Atmosphere Flag
Product Data Type:    i1b ( 10)
Total Bytes:          10
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          Indicates from LIDAR channel if conditions for forward scattering
were favorable.
Please see <a href='flags/i_atmQF.pdf'> the PDF flag description</a> for more details.
Comments:             If forward scattering occurs, it may map to an error in the ele-
vation measurement. Users may want to delete data with forward scattering.

Product Var Name:     i_timecorflg
Is element of:        GLA01 Main Record , GLA02 Record, GLA03 Main Record, GLA04 BST Main
Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS
Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08
Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    time correction flag
Product Data Type:    i2b
Total Bytes:          2
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
```

```
Product Maximum:      32767
Description:          Indicates what instrument or bias corrections were applied to the
times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag descrip-
tion</a> for more details.
Comments:

Product Var Name:     i_APID_AvFlg
Is element of:        GLA01 Main Record , GLA02 Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record,
GLA14 Record, GLA15 Record
Short Description:    APID Data Availability Flag
Product Data Type:    i1b (8)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          Flag indicating which packets (APIDs) for each second are available
missing, or filled.  APID 19 is broken down further into Altimeter Digitizer, Photon
Counter, Cloud Digitizer, GPS/DEM, and C&T sections.
Please see <a href='flags/i_APID_AvFlg.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_AttFlg2
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Attitude Flag 2
Product Data Type:    i1b (20)
Total Bytes:          20
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      15
Description:          Denotes at 40/sec rate whether precision attitude was used to de-
termine spot location, and if problems with LPA, etc.
Please see <a href='flags/i_AttFlg2.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name:     i_spare5
Is element of:        GLA06 record
Short Description:    Spares
Product Data Type:    i1b
Total Bytes:          1
Product Units:        NA
Invalid Value/Flag:   NA
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:
Comments:

Product Var Name:     i_FrameQF
```

```
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Altimeter Frame Quality Flag
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          Denotes all bad data (no signal in whole frame), or all data good
and all science team recommended corrections applied
Please see <a href='flags/i_FrameQF.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name:     i_OrbFlg
Is element of:        GLA01 Main Record , GLA02 Record, GLA05 record, GLA06 record, GLA07
Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    POD flag (Orbit Flag)
Product Data Type:    i1b (2)
Total Bytes:          2
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      128
Description:          Denotes quality of orbit, whether predicted or precision, loss of
GPS data, maneuver-degraded, etc.
Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name:     i_rngCorrFlg
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Range Correction Flag
Product Data Type:    i1b (2)
Total Bytes:          2
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32767
Description:          Denotes which geophysical or instrument corrections have been ap-
plied to the range in the calculation of the elevation on this record.
Please see <a href='flags/i_rngCorrFlg.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_CorrStatFlg
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Correction Status Flag
Product Data Type:    i1b (2)
Total Bytes:          2
Product Units:        NA
Invalid Value/Flag:   no
```

```
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32767
Description:          For each geophysical correction that has multiple values denotes
which algorithm or model was used.
Please see <a href='flags/i_CorrStatFlg.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_beam_coelev
Is element of:        GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13
Record, GLA14 Record, GLA15 Record
Short Description:    Co-elevation
Product Data Type:    i4b
Total Bytes:          4
Product Units:        degrees*100
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      36000
Description:          Co-elevation (CE) is direction from vertical of the laser beam as
seen by an observer located at the laser ground spot.Comments:

Product Var Name:     i_beam_azimuth
Is element of:        GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13
Record, GLA14 Record, GLA15 Record
Short Description:    Azimuth
Product Data Type:    i4b
Total Bytes:          4
Product Units:        degrees*100
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      36000
Description:          Az is the direction clockwise from north of the laser beam vector
as seen by an observer at the laser ground spot viewing toward the spacecraft (i.e., the
vector from the ground to the spacecraft).Comments:

Product Var Name:     i_AttFlg1
Is element of:        GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13
Record, GLA14 Record, GLA15 Record
Short Description:    Attitude Flag 1
Product Data Type:    i2b
Total Bytes:          2
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32767
Description:          At 1/sec denotes large off-nadir angle, ocn sweep, target of op-
portunity, steering to reference track.
Please see <a href='flags/i_AttFlg1.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name:     i_Spare6
```

```
Is element of:        GLA06 record
Short Description:    spares
Product Data Type:    i1b (2)
Total Bytes:          2
Product Units:        N/A
Invalid Value/Flag:   null
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:
Comments:

Product Var Name:     i_DEM_hires_src
Is element of:        GLA06 record, GLA12 Record, GLA13 Record
Short Description:    High Resolution Source Flag
Product Data Type:    i1b ( 40)
Total Bytes:          40
Product Units:        NA
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      128
Description:          Please see <a href='flags/i_DEM_hires_src.pdf'> the PDF flag de-
scription</a> for more details.
Comments:

Product Var Name:     i_DEM_hires_elv
Is element of:        GLA06 record, GLA12 Record, GLA13 Record
Short Description:    High Resolution Elevation
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        meters
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -500
Product Maximum:      13000
Description:
Comments:

Product Var Name:     i_satNdx
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Saturation Index
Product Data Type:    i1b (40)
Total Bytes:          40
Product Units:        ns
Invalid Value/Flag:   i1b
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      255
Description:          The count of the number of gates in a waveform which have an am-
plitude greater than or equal to i_satNdxTh (set in anc07_0004). The value 255 means 255
or more gates are above the saturation index threshold (i_satNdxth).
Comments:
```

```
Product Var Name:     i_satRngCorr
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Saturation Range Correction
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        mm
Invalid Value/Flag:   i2b
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      100
Description:
Comments:

Product Var Name:     i_satCorrFlg
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Saturation Correction Flag
Product Data Type:    i1b ( 40)
Total Bytes:          40
Product Units:        NA
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         NA
Product Minimum:      NA
Product Maximum:      NA
Description:          This is a flag for i_satRngCorr, i_satNrgCorr & i_satPwdCorr.
Comments:

Product Var Name:     i_satNrgCorr
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Saturation Energy Correction
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        mm
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      100
Description:
Comments:

Product Var Name:     i_satPwdCorr
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Saturation Pulse Width Correction
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        mm
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      100
Description:
Comments:
```

```
Product Var Name:     i_gval_rcv
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Gain Value used for Received Pulse
Product Data Type:    i2b (40)
Total Bytes:          80
Product Units:        counts
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      200
Description:          Gain value used for received pulse - uncalibrated.
Comments:             This value is in counts and needs to be calibrated before calcu-
lating energy from it. Same as variable in GLA01_Long/i_gainSet1064.

Product Var Name:     i_RecNrgAll
Is element of:        GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Received Energy signal begin to signal end
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:         0.01 fJoules
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32000
Description:
Comments:

Product Var Name:     i_FRir_cldtop
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Full Resolution 1064 Cloud Top
Product Data Type:    i2b ( 40)
Total Bytes:          80
Product Units:        deka-meters
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1030
Description:          Full resolution (40 Hz) cloud top height obtained from the 1064
atmospheric channel. This parameter is for a 1 second record. This parameter is in GLA09.
Comments:

Product Var Name:     i_FRir_qaFlag
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Full Resolution 1064 Quality Flag
Product Data Type:    i1b ( 40)
Total Bytes:          40
Product Units:        NA
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
```

```
Product Maximum:     15
Description:         Please see <a href='flags/i_FRir_qaFlag.pdf'> the PDF flag de-
scription</a> for more details.
Comments:

Product Var Name:    i_FRir_ODflg
Is element of:       GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:   Full Resolution 1064 Optical Depth Flag
Product Data Type:   i1b ( 40)
Total Bytes:         40
Product Units:       NA
Invalid Value/Flag:  No
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     0
Description:         This parameter is for a 1 second record. This parameter is also in
GLA11.Comments:

Product Var Name:    i_FRir_intsig
Is element of:       GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:   Full Resolution 1064 Integrated Signal
Product Data Type:   i2b ( 40)
Total Bytes:         80
Product Units:       e7/(m-sr)
Invalid Value/Flag:  i2b
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     10000
Description:         Though called 'integrated signal' this is actually an average of
all bins in the above-ground portion of the 1064 40 Hz profile with values above the
threshold of 1.0e-7 (1/(m-sr) units). This parameter is for a 1 second record. This pa-
rameter is also in GLA09.
Comments:

Product Var Name:    i_msRngCorr
Is element of:       GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:   Multi-Scatter Range Correction
Product Data Type:   i2b ( 40)
Total Bytes:         80
Product Units:       Unknown
Invalid Value/Flag:  i2b
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     0
Description:
Comments:

Product Var Name:    i_msCorrFlg
Is element of:       GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:   Multi-Scatter Range Correction
Product Data Type:   i1b ( 40)
Total Bytes:         40
```

```
Product Units:        Unknown
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:
Comments:

Product Var Name:     i_Surface_temp
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Surface Temperature
Product Data Type:    i2b
Total Bytes:          2
Product Units:        degrees Celsius * 100
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -10000
Product Maximum:      10000
Description:
Comments:

Product Var Name:     i_Surface_pres
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Surface Pressure
Product Data Type:    i2b
Total Bytes:          2
Product Units:        millibars of mercury * 10
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      20000
Description:
Comments:

Product Var Name:     i_Surface_relh
Is element of:        GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15
Record
Short Description:    Relative Humidity
Product Data Type:    i2b
Total Bytes:          2
Product Units:        percentage * 100
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      10000
Description:
Comments:

Product Var Name:     i_Spare7
Is element of:        GLA06 record
Short Description:    spares
Product Data Type:    i1b ( 566)
Total Bytes:          566
```

```
Product Units:        NA
Invalid Value/Flag:   null
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:
Comments:
```

D.1.14 GLA07 Record

```
Product Var Name:     i_rec_ndx
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    GLAS Record Index
Product Data Type:    i4b
Total Bytes:          4
Product Units:        N/A
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          Unique index that relates this record to the corresponding
record(s) in each GLAS data product.
Comments:

Product Var Name:     i_UTCTime
Is element of:        GLA01 Long Waveform Record, GLA01 Main Record ,
GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record,
GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    Transmit Time of First Shot in frame in J2000
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        seconds, microseconds
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      2147483647
Description:          The transmit time in UTC of the 1st shot in the 1 second frame
referenced to noon on Jan 1, 2000.   The first item is the whole number of seconds ; the
second item is the fractional part in microseconds.
Comments:             This is not the ground bounce time, but the transmit time.

Product Var Name:     i_beam_coelev
Is element of:        GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13
Record, GLA14 Record, GLA15 Record
Short Description:    Co-elevation
Product Data Type:    i4b
Total Bytes:          4
Product Units:        degrees*100
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
```

```
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      36000
Description:          Co-elevation (CE) is direction from vertical of the laser beam as
seen by an observer located at the laser ground spot.Comments:

Product Var Name:     i_beam_azimuth
Is element of:        GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13
Record, GLA14 Record, GLA15 Record
Short Description:    Azimuth
Product Data Type:    i4b
Total Bytes:          4
Product Units:        degrees*100
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      36000
Description:          Az is the direction clockwise from north of the laser beam vector
as seen by an observer at the laser ground spot viewing toward the spacecraft (i.e., the
vector from the ground to the spacecraft).Comments:

Product Var Name:     i_spare0
Is element of:        GLA07 Record
Short Description:    Spares
Product Data Type:    i1b (16)
Total Bytes:          16
Product Units:        null
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:
Comments:

Product Var Name:     i_lat
Is element of:        GLA07 Record
Short Description:    Profile Coordinate, Latitude
Product Data Type:    i4b
Total Bytes:          4
Product Units:        microdegrees
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -90000000
Product Maximum:      90000000
Description:          Profile coordinate in the IERS Terrestrial Reference Frame: east
longitude and latitude, at the 1 herz rate.Comments:

Product Var Name:     i_lon
Is element of:        GLA07 Record
Short Description:    Profile Coordinate, Longitude
Product Data Type:    i4b
Total Bytes:          4
Product Units:        microdegrees
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
```

```
Product Minimum:      0
Product Maximum:      360000000
Description:          Profile coordinate in the IERS Terrestrial Reference Frame: east
longitude and latitude, at the 1 herz rate.Comments:

Product Var Name:     i_APID_AvFlg
Is element of:        GLA01 Main Record , GLA02 Record, GLA04 BST Main Record, GLA04 GYRO
Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04
SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record,
GLA14 Record, GLA15 Record
Short Description:    APID Data Availability Flag
Product Data Type:    i1b (8)
Total Bytes:          8
Product Units:        n/a
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -127
Product Maximum:      127
Description:          Flag indicating which packets (APIDs) for each second are available
missing, or filled.  APID 19 is broken down further into Altimeter Digitizer, Photon
Counter, Cloud Digitizer, GPS/DEM, and C&T sections.
Please see <a href='flags/i_APID_AvFlg.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_OrbFlg
Is element of:        GLA01 Main Record , GLA02 Record, GLA05 record, GLA06 record, GLA07
Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description:    POD flag (Orbit Flag)
Product Data Type:    i1b (2)
Total Bytes:          2
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      128
Description:          Denotes quality of orbit, whether predicted or precision, loss of
GPS data, maneuver-degraded, etc.
Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name:     i_LidarQF
Is element of:        GLA07 Record
Short Description:    Lidar Frame quality flag
Product Data Type:    i2b
Total Bytes:          2
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      1
Description:          Composite Flag - see Common Flag Spreadsheet for details
Please see <a href='flags/i_LidarQF.pdf'> the PDF flag description</a> for more de-
tails.Comments:

Product Var Name:     i_AttFlg1
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Is element of:        GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13
Record, GLA14 Record, GLA15 Record
Short Description:    Attitude Flag 1
Product Data Type:    i2b
Total Bytes:          2
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32767
Description:          At 1/sec denotes large off-nadir angle, ocn sweep, target of op-
portunity, steering to reference track.
Please see <a href='flags/i_AttFlg1.pdf'> the PDF flag description</a> for more details.
Comments:

Product Var Name:     i_surfType
Is element of:        GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    Region Type
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      1
Product Maximum:      15
Description:          Describes the region type or types associated with each shot Ice
Sheet, ocean, sea ice, or Land.
Please see <a href='flags/i_surfType.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_Spare1
Is element of:        GLA07 Record
Short Description:    Spares
Product Data Type:    i1b
Total Bytes:          1
Product Units:        NA
Invalid Value/Flag:   NA
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      0
Description:          not used
Comments:

Product Var Name:     i_SolAng
Is element of:        GLA07 Record
Short Description:    Solar Incidence Angle
Product Data Type:    i4b
Total Bytes:          4
Product Units:        microdegrees
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -90000000
Product Maximum:      90000000
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Description:          The solar incidence angle determined during Precision Orbit Deter-
mination processing; it provides the operational sun angle estimate
Comments:

Product Var Name:     i_pad_angle
Is element of:        GLA07 Record
Short Description:    PAD Angle
Product Data Type:    i4b
Total Bytes:          4
Product Units:        microdegrees
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      360000000
Description:          Attitude angle calculated from PAD and POD.
Comments:

Product Var Name:     i_rng_geoid
Is element of:        GLA07 Record
Short Description:    Range of satellite above geoid
Product Data Type:    i4b
Total Bytes:          4
Product Units:        meters
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      60000000
Description:          Range of satellite above geoid based upon POD, PAD, and geoid
Comments:

Product Var Name:     i_topo_elev
Is element of:        GLA07 Record
Short Description:    Topographic elevation of surface above geoid
Product Data Type:    i4b
Total Bytes:          4
Product Units:        meters
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -2500
Product Maximum:      32000
Description:          Topographic elevation of surface above geoid based upon POD, PAD,
and geoid
Comments:

Product Var Name:     i_Rng2PCProf_Cor
Is element of:        GLA07 Record
Short Description:    Start Range of 532 nm Backscatter Profile
Product Data Type:    i4b
Total Bytes:          4
Product Units:        centimeters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      50000000
Product Maximum:      70000000
Description:          The range from the spacecraft to the start of the 532 nm backscat-
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ter profile - the start of the 40 KM segment of Lidar Data. This variable has  a slight
correction applied to it.Comments: Not valid if APID19 is missing.

Product Var Name:     i_Rng2CDProf_Cor
Is element of:        GLA07 Record
Short Description:    Start Range of 1064 nm  Backscatter Profile
Product Data Type:    i4b
Total Bytes:          4
Product Units:        meters
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      50000000
Product Maximum:      70000000
Description:          The range from the spacecraft to the start of the 1064 nm back-
scatter profile - the start of the 20 KM segment of Lidar Data. This variable has a
slight correction applied to it.
Comments:

Product Var Name:     i1_g_bg
Is element of:        GLA02 Record, GLA07 Record
Short Description:    532 nm Background at 1 Hz
Product Data Type:    i4b (4)
Total Bytes:          16
Product Units:        photons/bin * 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      100000
Description:          The normalized 532 nm background counts from upper (1) and lower
(2) integration intervals.(3) is background used to compute NRB. Averaged over 40
shots.Comments:       Not valid if APID15 is missing.

Product Var Name:     i5_g_bg
Is element of:        GLA02 Record, GLA07 Record
Short Description:    532 nm Background at 5 Hz
Product Data Type:    i4b (4, 5)
Total Bytes:          80
Product Units:        photons/bin * 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      100000
Description:          The normalized 532 nm background counts from upper (1) and lower
(2) integration intervals.(3) is background used to compute NRB. Averaged over 8
shots.Comments:       Not valid if APID15 is missing.

Product Var Name:     i40_g_bg
Is element of:        GLA02 Record, GLA07 Record
Short Description:    532 nm Background at 40 Hz
Product Data Type:    i4b (4, 40)
Total Bytes:          640
Product Units:        photons/bin * 100
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
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Product Maximum:     100000
Description:         The normalized 532 nm background counts from upper (1) and lower
(2) integration intervals.(3) is background used to compute NRB.Comments: Not valid if
APID15 is missing.

Product Var Name:    i5_ir_bg
Is element of:       GLA02 Record, GLA07 Record
Short Description:   1064 nm Background at 5 Hz
Product Data Type:   i4b (4, 5)
Total Bytes:         80
Product Units:       W*1.0d17
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     -100000000
Product Maximum:     100000000
Description:         The normalized 1064 nm background counts from upper (1) and lower
(2) integration intervals.(3) is background used to compute NRB. Averaged over 8 shots.
Comments:            Not valid if APID15 is missing.

Product Var Name:    i40_ir_bg
Is element of:       GLA02 Record, GLA07 Record
Short Description:   1064 nm Background at 40 Hz
Product Data Type:   i4b (4, 40)
Total Bytes:         640
Product Units:       W*1.0d17
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     -100000000
Product Maximum:     100000000
Description:         The normalized 1064 nm background counts from upper (1) and lower
(2) integration intervals.(3) is background used to compute NRB.
Comments:            Not valid if APID17 is missing.

Product Var Name:    i5_g_TxNrg_EU
Is element of:       GLA02 Record, GLA07 Record
Short Description:   532 nm Laser Transmit Energy at 5 Hz
Product Data Type:   i4b ( 5)
Total Bytes:         20
Product Units:       Joules * 1.0d5
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
Product Minimum:     0
Product Maximum:     4500
Description:         The 532 nm transmitted pulse energy in energy units, converted from
the counts from the transmitted energy monitor.  Averaged over 8 shots.Comments: Not
valid if APID19 is missing.

Product Var Name:    i40_g_TxNrg_EU
Is element of:       GLA02 Record, GLA07 Record
Short Description:   532 nm Laser Transmit Energy at 40 Hz
Product Data Type:   i4b ( 40)
Total Bytes:         160
Product Units:       Joules * 1.0d5
Invalid Value/Flag:  i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?:        No
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Product Minimum:      0
Product Maximum:      4500
Description:          The 532 nm transmitted pulse energy in energy units, converted from
the counts from the transmitted energy monitor.Comments: Not valid if APID19 is miss-
ing.

Product Var Name:     i5_ir_TxNrgEU
Is element of:        GLA02 Record, GLA07 Record
Short Description:    1064 nm Laser Transmit Energy at 5 Hz
Product Data Type:    i4b ( 5)
Total Bytes:          20
Product Units:        Joules * 1.0d5
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      9000
Description:          The 1064 nm laser pulse energy, computed from the digitized out-
going pulse and the detector temperature. Averaged over 8 shots.Comments: Not valid if
APID19 and APID12 or APID13 are missing.

Product Var Name:     i40_ir_TxNrgEU
Is element of:        GLA02 Record, GLA07 Record
Short Description:    1064 nm Laser Transmit Energy at 40 Hz
Product Data Type:    i4b ( 40)
Total Bytes:          160
Product Units:        Joules * 1.0d5
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      9000
Description:          The 1064 nm laser pulse energy, computed from the digitized out-
going pulse and the detector temperature.Comments: Not valid if APID19 and APID12 or
APID13 are missing.

Product Var Name:     i_g_TxNrg_qf
Is element of:        GLA02 Record, GLA07 Record
Short Description:    532 nm Laser Transmit Energy Quality Flag
Product Data Type:    i1b (10)
Total Bytes:          10
Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      3
Description:          Evaluation of the 532 nm laser transmit energy which is an indi-
cation of the laser health; 2 bits per shot for 40 shots; 1 = full laser energy, 2 =
marginal laser energy, 3 = deficient laser energy, 0 = not used.
Please see <a href='flags/i_g_TxNrg_qf.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_ir_TxNrg_qf
Is element of:        GLA02 Record, GLA07 Record
Short Description:    1064 nm Laser Transmit Energy Quality Flag
Product Data Type:    i1b (10)
Total Bytes:          10
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Product Units:        n/a
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         Yes
Product Minimum:      0
Product Maximum:      3
Description:          Evaluation of the 1064 nm laser transmit energy which is an indi-
cation of the laser health; 2 bits per shot for 40 shots; 1 = full laser energy, 2 =
marginal laser energy, 3 = deficient laser energy, 0 = not used.
Please see <a href='flags/i_ir_TxNrg_qf.pdf'> the PDF flag description</a> for more de-
tails.
Comments:

Product Var Name:     i_atm_dem
Is element of:        GLA07 Record
Short Description:    DEM value at current location from 1 km x 1 km grid
Product Data Type:    i4b
Total Bytes:          4
Product Units:        meters
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -32768
Product Maximum:      32768
Description:          Surface height value for current location from 1 km x 1 km grid
Comments:

Product Var Name:     i_metFlg
Is element of:        GLA07 Record
Short Description:    Met/std atm source/quality flag
Product Data Type:    i1b
Total Bytes:          1
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      15
Description:          Flag indicating if met data or standard atmosphere data are used
to fill met profiles. Flag is set to 1 if time of first file > 24 hrs, 2 if time of
second file > 24 hrs, 2+index of standard atmosphere file if time of both files > 24 hrs.
Please see <a href='flags/i_metFlg.pdf'> the PDF flag description</a> for more de-
tails.Comments:

Product Var Name:     i_ir_bin_shift
Is element of:        GLA07 Record
Short Description:    1064 vertical alignment offset
Product Data Type:    i1b
Total Bytes:          1
Product Units:        bins
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -10
Product Maximum:      10
Description:          Number of bins that 1064 nm surface return bin is shifted to align
with 532 nm surface return bin.Comments:

Product Var Name:     i_Spare2
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Is element of:        GLA07 Record
Short Description:    Spares
Product Data Type:    i1b (6)
Total Bytes:          6
Product Units:        NA
Invalid Value/Flag:   NA
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          not used
Comments:

Product Var Name:     i_g_cal_cof
Is element of:        GLA07 Record
Short Description:    532 nm Backscatter Calibration Coefficient
Product Data Type:    i4b (3)
Total Bytes:          12
Product Units:        1d-6*(Photons/bin)(km^3/J)sr
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      1.0d4
Product Maximum:      1.0d9
Description:          The calibration value applied to the 532 nm lidar data to get the
backscatter (1=high cal ht, 2=low cal ht, 3=used).
Comments:

Product Var Name:     i_ir_cal_cof
Is element of:        GLA07 Record
Short Description:    1064 nm Backscatter Calibration Coefficient
Product Data Type:    i4b (2)
Total Bytes:          8
Product Units:        1d4*(Watts)(km^3/J)sr
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      1.0d5
Product Maximum:      1.0d8
Description:          The calibration value applied to the 1064 nm lidar data to get the
backscatter (1=low cal ht, 2=used).
Comments:

Product Var Name:     i5_g_bscs
Is element of:        GLA07 Record
Short Description:    532 nm Merged Attenuated Backscatter Profile 40 to -1 km
Product Data Type:    i4b (548, 5)
Total Bytes:          10960
Product Units:        e11/(m-sr)
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -1000
Product Maximum:      1000000000
Description:          For the full vertical atmospheric profile (-1 to 41 km), the at-
mosphere 532 nm calibrated, attenuated backscatter  profile  at the rate of 5 per 1
second.  When the 532 nm data becomes saturated the 1064 nm data is converted and merged
into the data set. The Level 1A data that occurs at 40/second, every 8 shots are averaged
and stored in the profile and the 1/second is replicated to get the full 5 Hz rate on
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this product.
Comments:

Product Var Name: i40_g_bscs
Is element of: GLA07 Record
Short Description: 532 nm Merged Attenuated Backscatter Profile 10 to -1 km
Product Data Type: i4b (148, 40)
Total Bytes: 23680
Product Units: e11/(m-sr)
Invalid Value/Flag: i4b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 1000000000
Description: For the 10 KM to -1 KM vertical segment, the atmosphere 532 nm calibrated, attenuated backscatter profile at the 40 per 1 second rate. When the 532 nm data becomes saturated the 1064 nm data is converted to 532 data and merged into the data set.
Comments:

Product Var Name: i5_ir_bscs
Is element of: GLA07 Record
Short Description: 1064 nm Attenuated Backscatter Profile 20 to -1 km
Product Data Type: i4b (280, 5)
Total Bytes: 5600
Product Units: e11/(m-sr)
Invalid Value/Flag: i4b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 1000000000
Description: Atmosphere 1064 nm calibrated, attenuated backscatter profile (-1 to 20 km) at the rate of 5 per 1 second. Averages of 8 shots are used for the Level 1A data that occurs at 40/second rate.
Comments:

Product Var Name: i40_ir_bscs
Is element of: GLA07 Record
Short Description: 1064 nm Attenuated Backscatter Profile 10 to -1 km
Product Data Type: i4b (148, 40)
Total Bytes: 23680
Product Units: e11/(m-sr)
Invalid Value/Flag: i4b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 1000000000
Description: Atmosphere 1064 nm calibrated, attenuated backscatter profile (-1 to 10 km) at the rate of 40 per 1 second.
Comments:

Product Var Name: i_g_mbscs
Is element of: GLA07 Record
Short Description: 532 nm molecular backscatter cross section profile 40 to -1 km
Product Data Type: i4b (548)
Total Bytes: 2192
Product Units: e11/(m-sr)
Invalid Value/Flag: no
Is Correction Flag?: NA

```
Is Unsigned?:         No
Product Minimum:      1000
Product Maximum:      1000000
Description:          532 nm molecular backscatter profile computed from MET data inter-
polated in space and time to profile location.
Comments:

Product Var Name:     i_ir_mbscs
Is element of:        GLA07 Record
Short Description:    1064 nm molecular backscatter cross section profile 20 to -1 km
Product Data Type:    i4b (280)
Total Bytes:          1120
Product Units:        e11/(m-sr)
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      1000
Product Maximum:      1000000
Description:          1064 nm molecular backscatter profile computed from MET data in-
terpolated in space and time to profile location.
Comments:

Product Var Name:     i1_int_ret
Is element of:        GLA07 Record
Short Description:    532 nm integrated return from 40 to 20 km
Product Data Type:    i4b
Total Bytes:          4
Product Units:        e11/(m-sr)
Invalid Value/Flag:   i4b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      200000
Product Maximum:      100000000
Description:          The integrated or summed 532 attenuated backscatter profile from
40 to 20 km. When normalized by the sum of the molecular backscatter for the same in-
terval, gives an indication of data qualityComments:

Product Var Name:     i40_g_sat_prof
Is element of:        GLA07 Record
Short Description:    532 nm Saturation Flag Profile 10 to -1 km
Product Data Type:    i1b ( 740)
Total Bytes:          740
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          532 nm Saturation Flag Profile from 10 to -1 km. Indicates whether
the 532 data were saturated and therefore whether the value is converted from the 1064
data. 0 = not saturated, 1 = saturated.
Please see <a href='flags/i40_g_sat_prof.pdf'> the PDF flag description</a> for more de-
tails.Comments:

Product Var Name:     i5_g_sat_prof
Is element of:        GLA07 Record
Short Description:    532 nm Saturation Flag Profile 40 to -1 km
Product Data Type:    i1b ( 343)
Total Bytes:          343
```

```
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          532 nm Saturation Flag Profile from 41 to -1 km. Indicates whether
the 532 data were saturated and therefore whether the value is converted from the 1064
data. 0 = not saturated, 1 = saturated.
Please see <a href='flags/i5_g_sat_prof.pdf'> the PDF flag description</a> for more de-
tails.Comments:

Product Var Name:     i_spare3
Is element of:        GLA07 Record
Short Description:    Spares
Product Data Type:    i1b (5)
Total Bytes:          5
Product Units:        NA
Invalid Value/Flag:   NA
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          not used
Comments:

Product Var Name:     i_532AttBS_Flag
Is element of:        GLA07 Record
Short Description:    532 nm Attenuated Backscatter Vertical Profile Flag
Product Data Type:    i1b ( 18)
Total Bytes:          18
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3
Description:          Composite Flag - see Breakout for details
Please see <a href='flags/i_532AttBS_Flag.pdf'> the PDF flag description</a> for more
details.Comments:

Product Var Name:     i_1064AttBS_Flag
Is element of:        GLA07 Record
Short Description:    1064 nm Attenuated Backscatter Vertical Profile Flag
Product Data Type:    i1b ( 18)
Total Bytes:          18
Product Units:        NA
Invalid Value/Flag:   no
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3
Description:          Composite Flag - see Breakout for details
Please see <a href='flags/i_1064AttBS_Flag.pdf'> the PDF flag description</a> for more
details.Comments:

Product Var Name:     i_AttFlg3
Is element of:        GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11
Record
```

```
Short Description:    Attitude Flag 3
Product Data Type:    i1b
Total Bytes:          1
Product Units:        NA
Invalid Value/Flag:   No
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      1
Description:          Please see <a href='flags/i_AttFlg3.pdf'> the PDF flag descrip-
tion</a> for more details.
Comments:

Product Var Name:     i_DitheringEnabledFlag
Is element of:        GLA02 Record, GLA07 Record
Short Description:    Dithering Enabled Flag
Product Data Type:    i1b
Total Bytes:          1
Product Units:        N/A
Invalid Value/Flag:   i_APID_AvFlg
Is Correction Flag?:  Yes
Is Unsigned?:         NA
Product Minimum:      0
Product Maximum:      1
Description:          0=FALSE, 1=TRUEComments: Not valid if APID15 is missing.

Product Var Name:     i_timecorflg
Is element of:        GLA01 Main Record , GLA02 Record, GLA03 Main Record, GLA04 BST Main
Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS
Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08
Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14
Record, GLA15 Record
Short Description:    time correction flag
Product Data Type:    i2b
Total Bytes:          2
Product Units:        N/A
Invalid Value/Flag:   No
Is Correction Flag?:  No
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      32767
Description:          Indicates what instrument or bias corrections were applied to the
times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag descrip-
tion</a> for more details.
Comments:

Product Var Name:     i_Surface_temp
Is element of:        GLA07 Record
Short Description:    Surface Temperature
Product Data Type:    i2b
Total Bytes:          2
Product Units:        degrees Celsius * 100
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      -10000
Product Maximum:      10000
Description:
Comments:
```

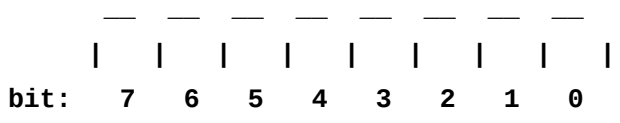
```
Product Var Name:     i_Surface_pres
Is element of:        GLA07 Record
Short Description:    Surface Pressure
Product Data Type:    i2b
Total Bytes:          2
Product Units:        millibars of mercury * 10
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      20000
Description:
Comments:

Product Var Name:     i_Surface_relh
Is element of:        GLA07 Record
Short Description:    Relative Humidity
Product Data Type:    i2b
Total Bytes:          2
Product Units:        percentage * 100
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      10000
Description:
Comments:

Product Var Name:     i_Surface_wind
Is element of:        GLA07 Record, GLA15 Record
Short Description:    Surface Wind Speed
Product Data Type:    i2b
Total Bytes:          2
Product Units:        meters/second * 100
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      20000
Description:
Comments:

Product Var Name:     i_Surface_wdir
Is element of:        GLA07 Record, GLA15 Record
Short Description:    Surface Wind Direction Azimuth from North
Product Data Type:    i2b
Total Bytes:          2
Product Units:        degrees * 10
Invalid Value/Flag:   i2b
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      0
Product Maximum:      3600
Description:
Comments:

Product Var Name:     i_spare4
Is element of:        GLA07 Record
```

```
Short Description:    Spares
Product Data Type:    i1b (130)
Total Bytes:          130
Product Units:        NA
Invalid Value/Flag:   NA
Is Correction Flag?:  NA
Is Unsigned?:         No
Product Minimum:      null
Product Maximum:      null
Description:          not used
Comments:
```

Appendix E
Flags

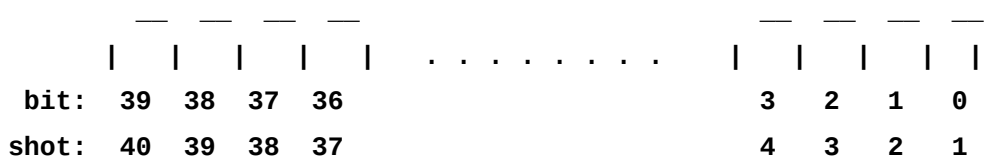
E.1 Design Philosophy

GSAS flag design is governed by a consistent philosophy. Per HP documentation, bits are numbered right to left starting at 0. E.g., a byte has the following bit numbers:

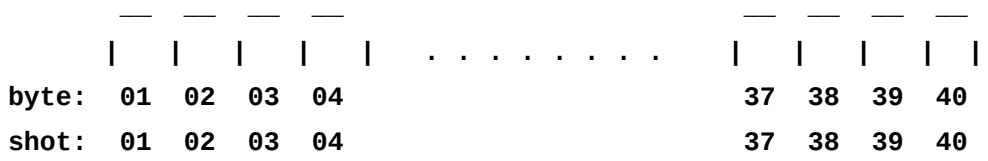


However, arrays of bytes are numbered left to right starting at 1. The direction from which shots are incremented depend if the flag is a byte flag or bit flag. Byte flags increment from left to right, bit flags increment from right to left. This follows the "natural" big endian ordering scheme. E.g.:

BIT flags increment from right to left:



BYTE flags increment from left to right:



The following section contains detailed descriptions of each flag found in the GSAS Level 2 products. The descriptions are ordered alphabetically.

E.2 Flag Descriptions

i_APID_AvFlg [1/sec for GLA01, 02, 04-07, 12-15], [1/16 sec for GLA03]: APID Data Availability Flag

Page 1 of 2

2 bit sets of values; 0= present, 1=filled at EDOS, 2=never received - ISIPS filled

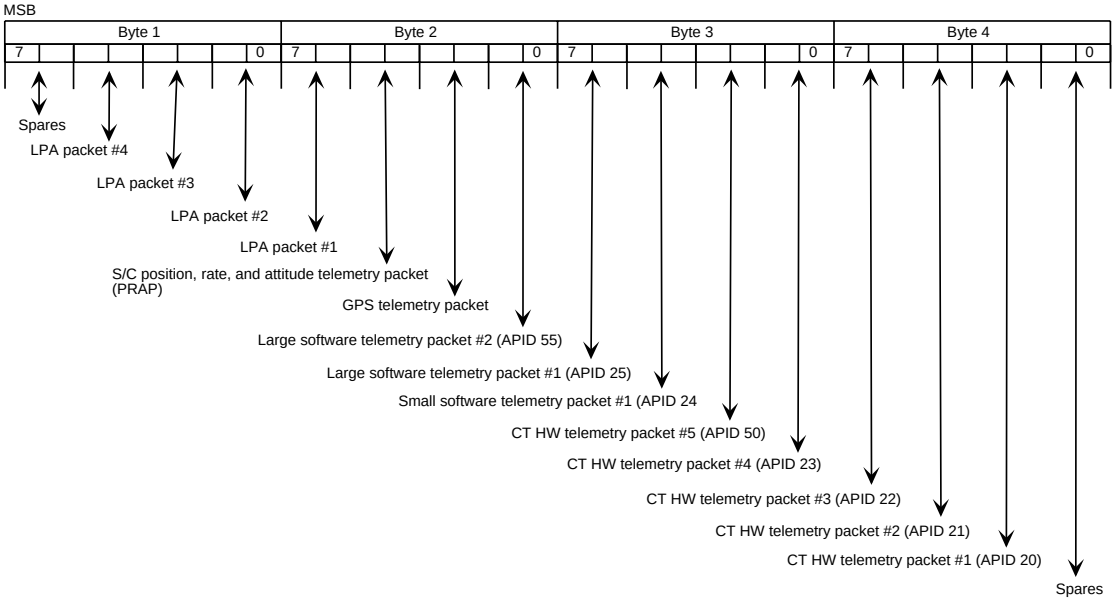


Figure E-1 APID Data Availability Flag

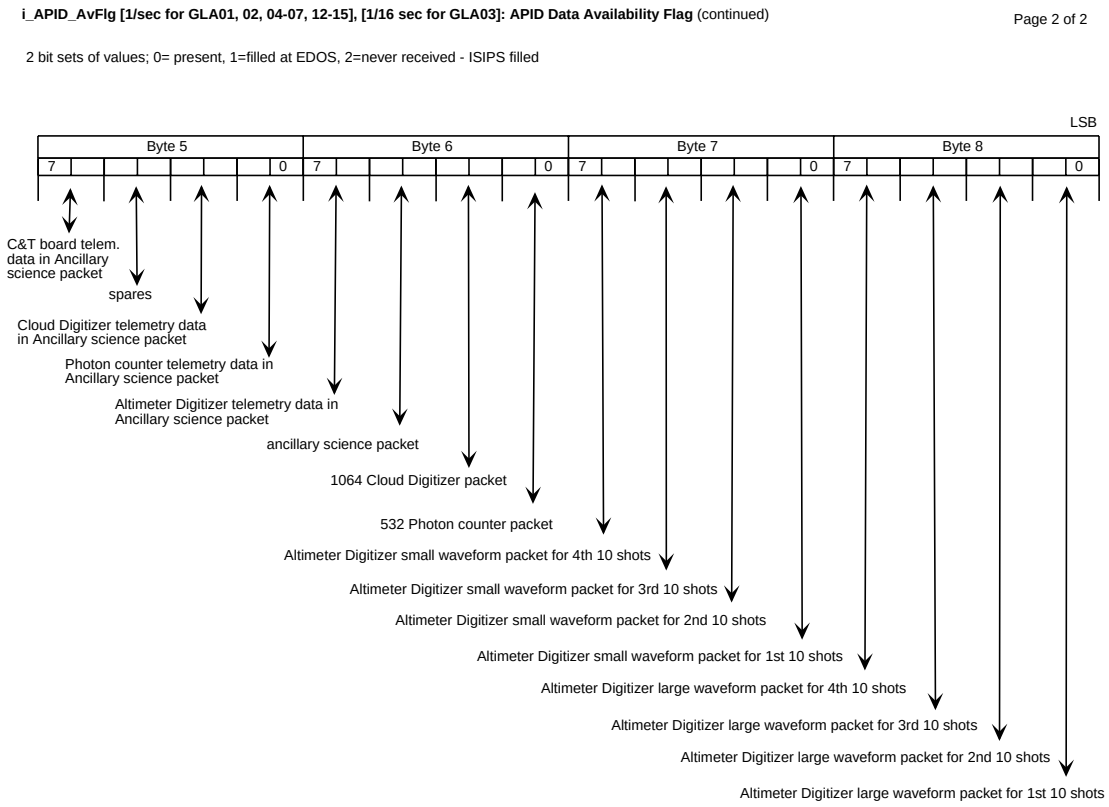


Figure E-1 APID Data Availability Flag (Continued)

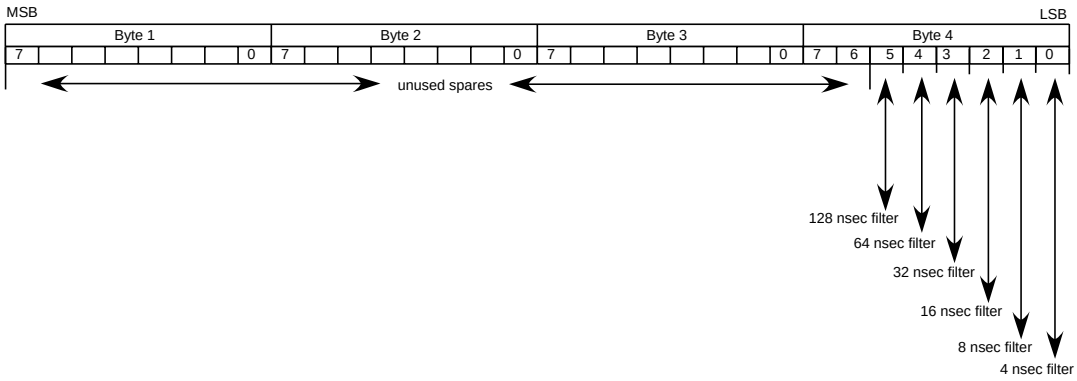


Figure E-2 Filter Section Mask

i_GainShiftFlg [1/sec for GLA01_main]: Gain Shift Flag; One flag per shot; indicates if the gain has been shifted for the corresponding measurement.
1-bit flags, 40/second.

0=Gain has been shifted (valid)
1=Gain has not been shifted (potentially invalid)

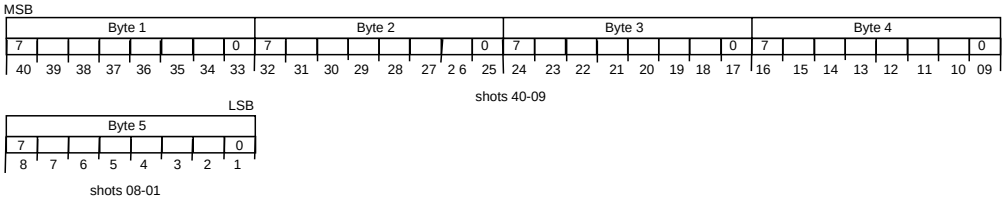


Figure E-3 Gain Shift Flag

i_InstState [GLA01_main]: Instrument State Flag

1 bit set of values: 0 = Disabled/Off, 1 = Enabled/On

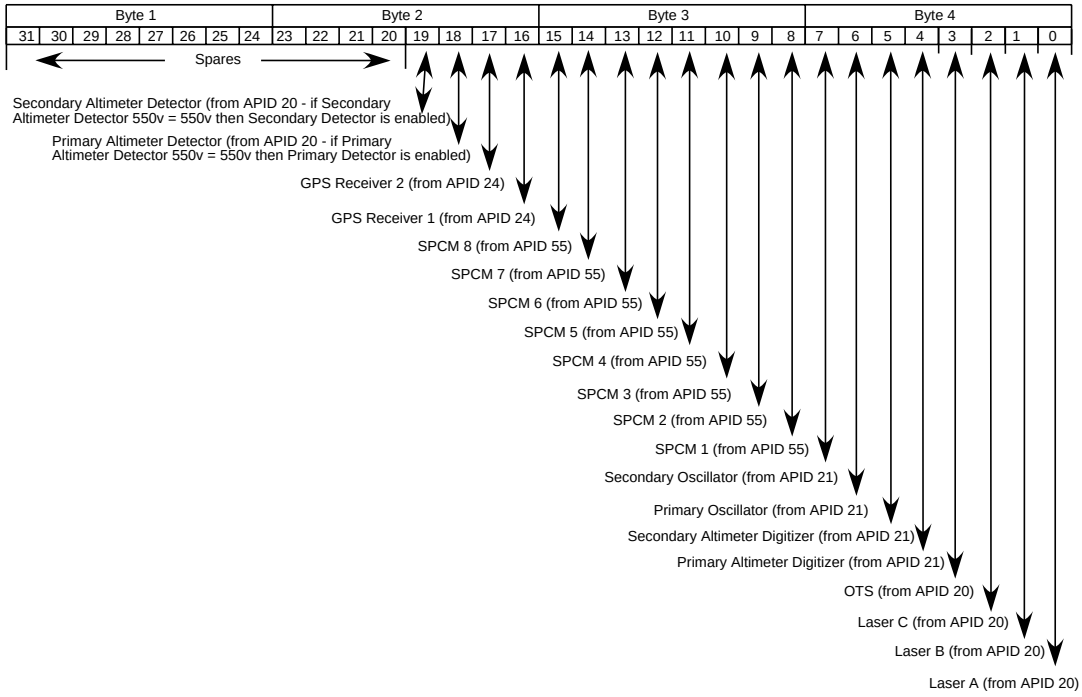


Figure E-4 Instrument State Flag

i_ObSurfType [GLA01]: Surface Type

1 byte set of values: 0 = ocean & no ice, 1 = land & no ice, 2 = ocean & ice, 3 = land & ice

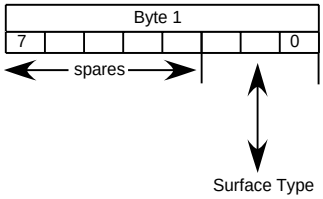


Figure E-5 Surface Type

i_OrbFlg [1/sec for GLA01, 02, 05-15]: Orbit Flag

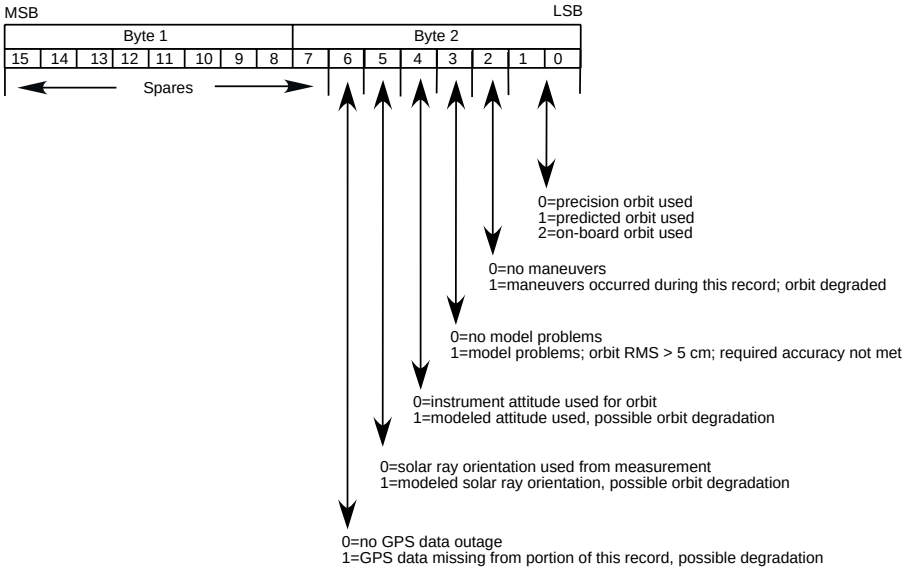


Figure E-6 Orbit Flag

i_RngSrc_Flag [GLA01_Main]:Range Data Source Flag

1 byte set of values: 0 = s/c time and position packet, 1 = uplinked DEM bytes, 2 = uplinked Rmin/Rmax

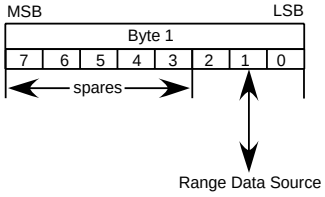


Figure E-7 Range Data Source Flag

i_statflags [GLA01_long, GLA01_short]: Range Window Status Word

Note: i_statflags is a 4 byte flag. Each 4 byte flag, corresponds to 1/40 of a second measurement. There are multiple types of subrecords in GLA01; GLA01_long and GLA01_short. Each type contains a specific number of subrecords; GLA01_long contains 5 records per second and GLA01_short contains 2 records per second. Therefore, i_statflags will be represented by 8, 4 byte flags, in GLA01_long for each of the 5 records (40 total flags) and represented by 20, 4 byte flags, in GLA01_short for each of the 2 records (40 total flags). The first 4 byte flag in the first subrecord corresponds to the first 1/40 second of data.

1 bit sets of values; 0=False, 1=True

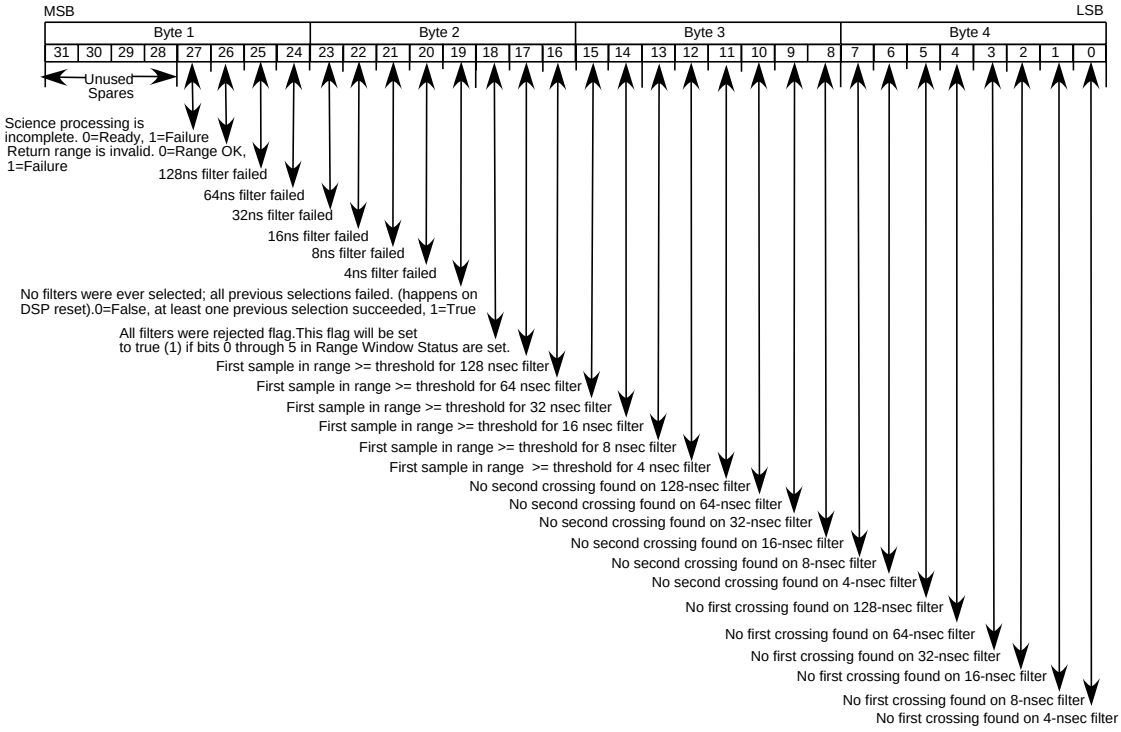


Figure E-8 Range Window Status Word

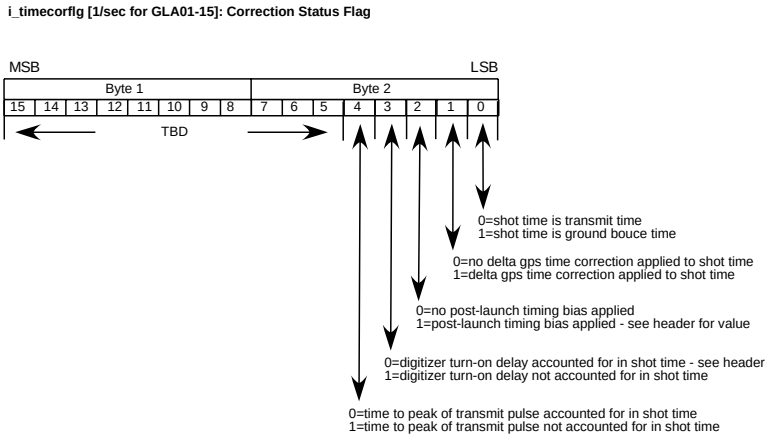


Figure E-9 Correction Status Flag

i_TxFlg [1/sec for GLA01_main]: Transmit Pulse Flag; One flag per shot; indicates quality to use based on valid or invalid criteria
1-bit flags, 40/second.

0=Transmit Pulse is telemetered (valid)
1=Transmit Pulse is not telemetered (invalid)

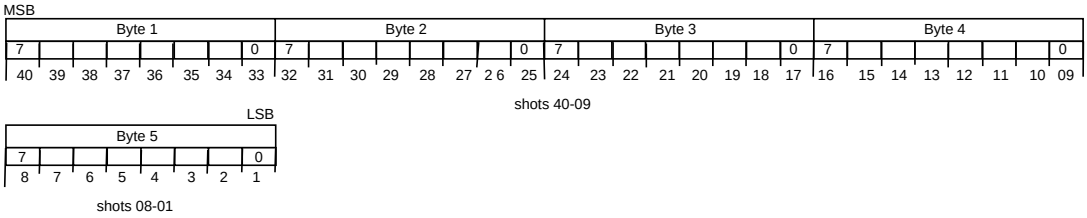


Figure E-10 Transmit Pulse Flag

i_txWfPk_Flag [GLA01_Main, GLA04-01(LPA)]: Transmit Waveform Peak Status Flag

Note: i_txWfPk_Flag is a 1 byte flag. One byte corresponds to 1/40 of a second.
The first byte flag corresponds to the first 1/40 second of data.

1 bit flags, 40 per second

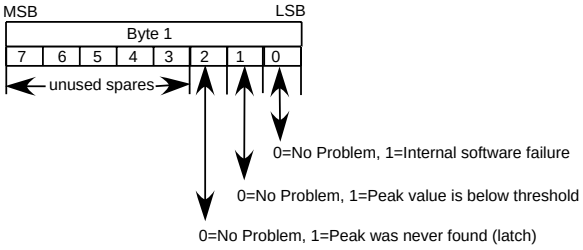


Figure E-11 Transmit Waveform Peak Status Flag

i_g_IntRet_qf [GLA02]: Integrated Return Quality Flag

4-bit set of values: 0 = unused, 1 = excellent, 2 = good, 3 = marginal, 5 = bad data

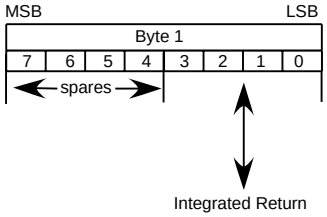


Figure E-12 Integrated Return Quality Flag

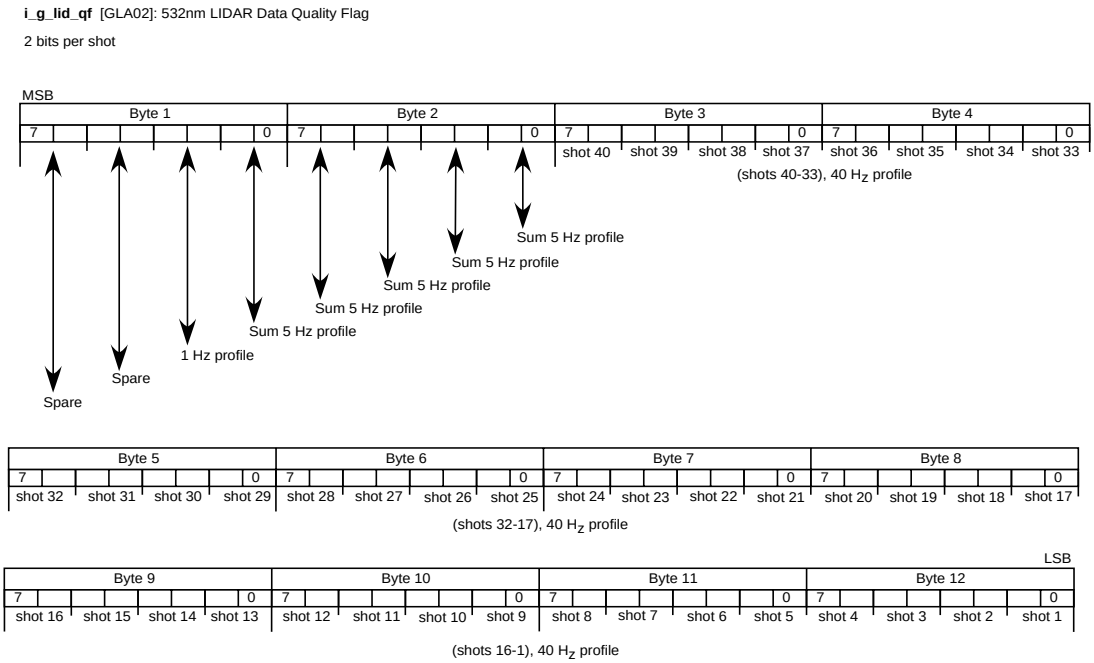


Figure E-13 532nm LIDAR Data Quality Flag

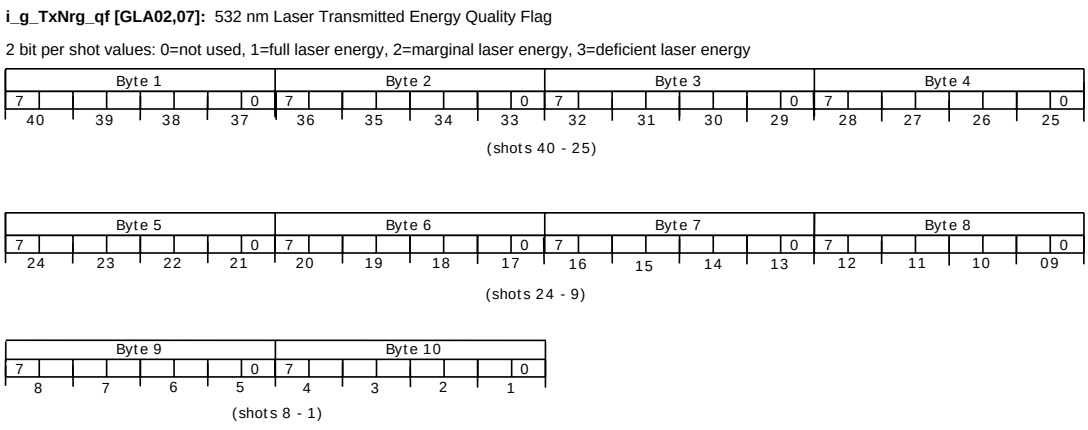


Figure E-14 532 nm Laser Transmitted Energy Quality Flag

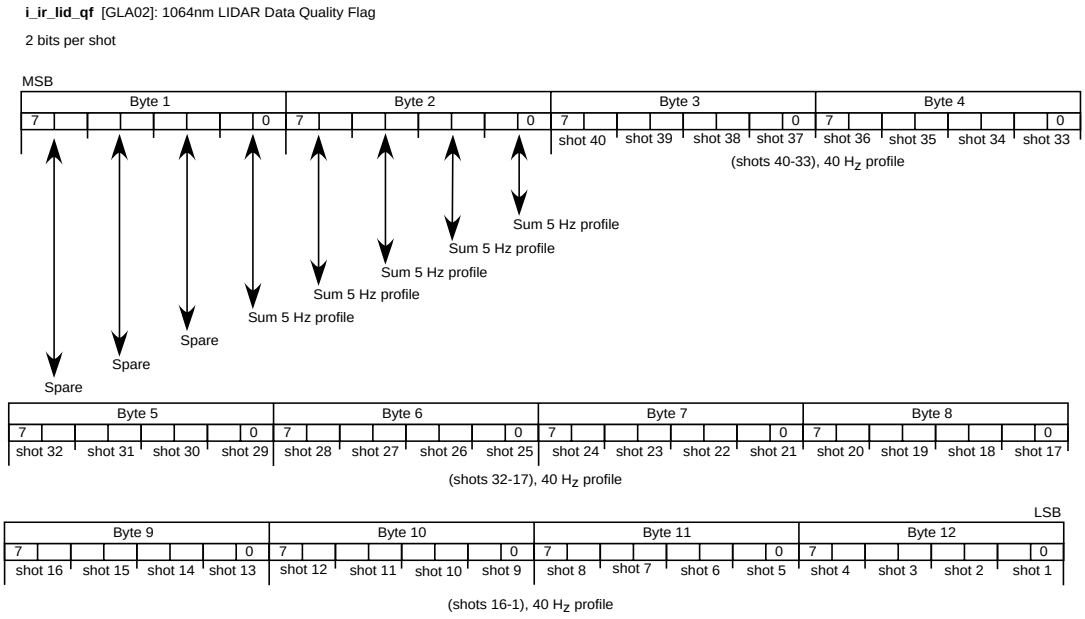


Figure E-15 1064nm LIDAR Data Quality Flag

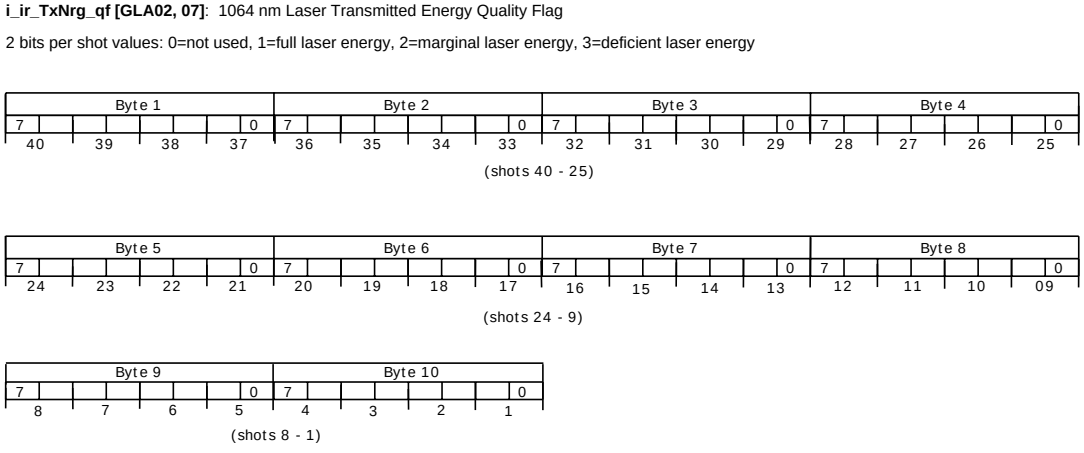


Figure E-16 1064 nm Laser Transmitted Energy Quality Flag

i1_g_sat_f [GLA02]: Bit flag indicating whether the 532 nm signal is saturated or not for the 40 to 20 KM Segment. 1 bit per each sum of 40 shots per bin (268); 0 = not saturated, 1 = saturated.

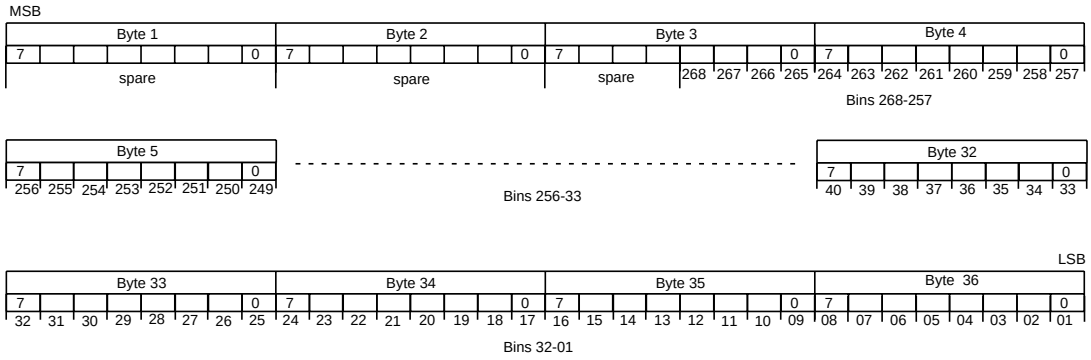


Figure E-17 Bit flag indicating whether the 532 nm signal is saturated or not for the 40 to 20 KM Segment

i5_g_sat_f [GLA02]: Bit flag indicating whether the 532 nm signal is saturated or not for the 20 to 10 KM Segment. 1 bit per each sum of 8 shot(40) per bin (132); 0 = not saturated, 1 = saturated.

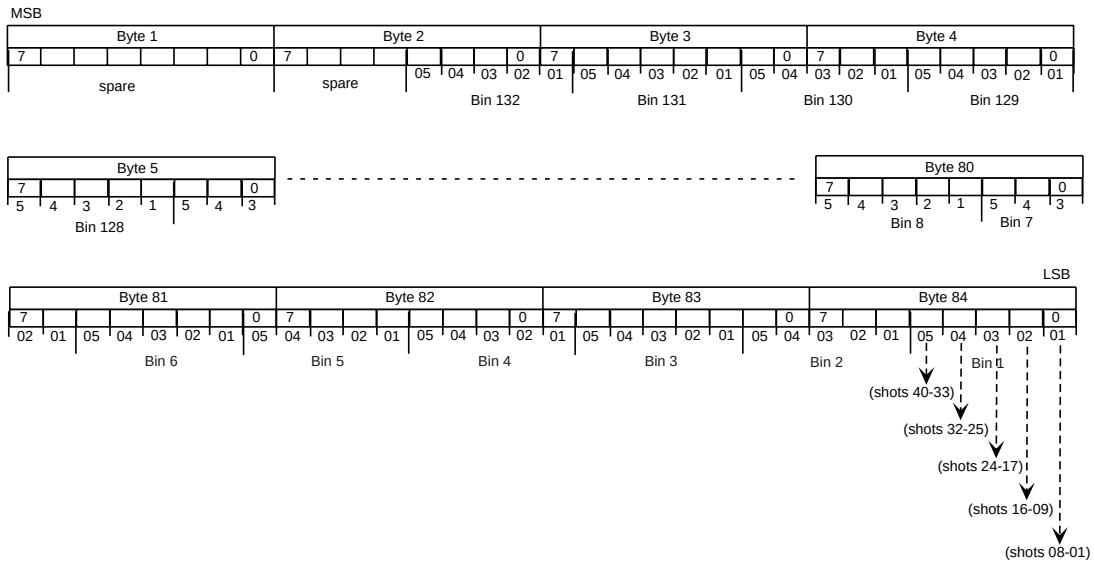


Figure E-18 Bit flag indicating whether the 532 nm signal is saturated or not for the 20 to 10 KM Segment

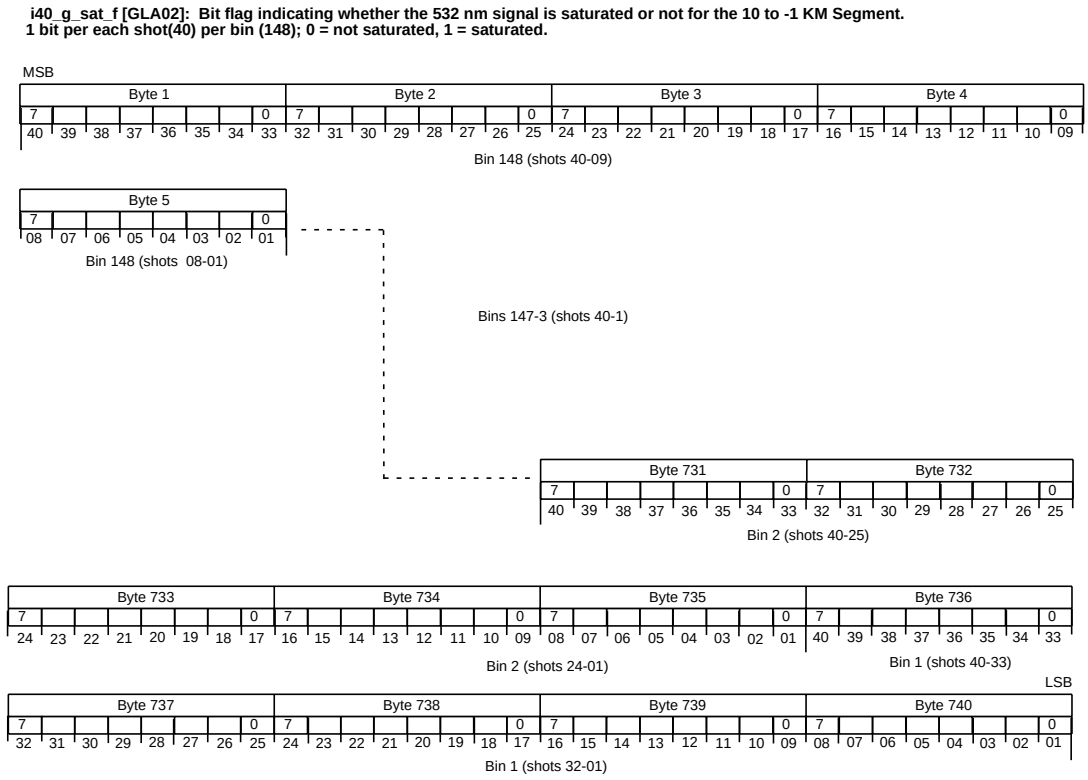


Figure E-19 Bit flag indicating whether the 532 nm signal is saturated or not for the 10 to -1 KM Segment

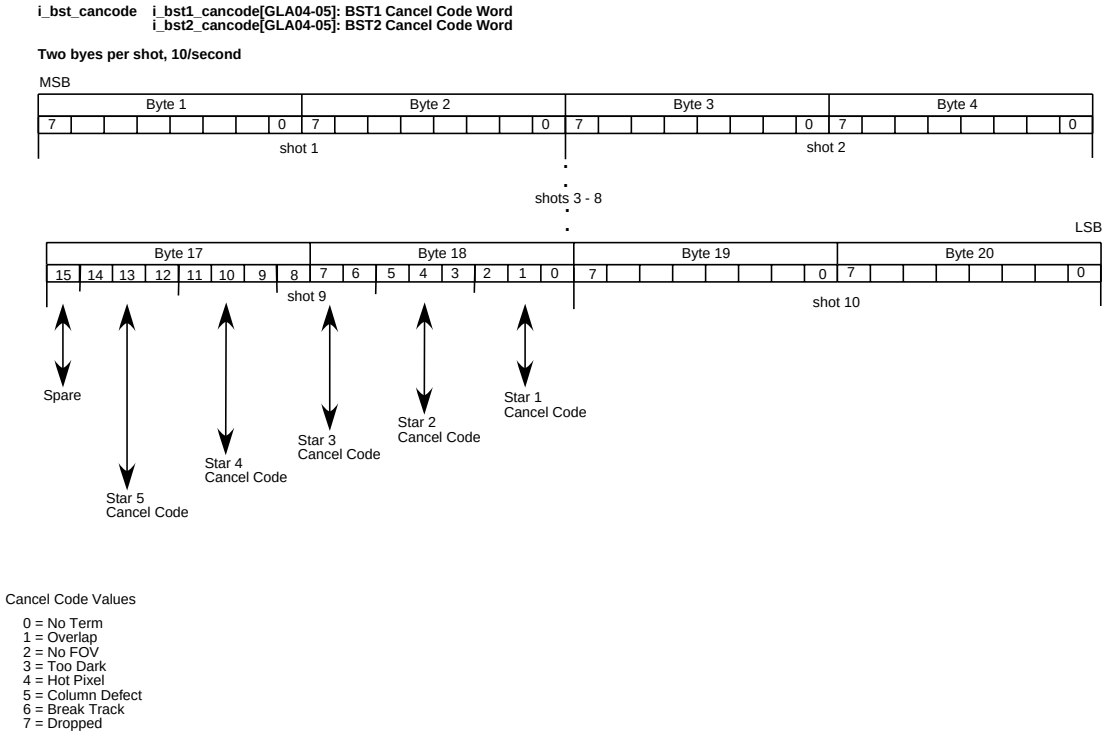


Figure E-20 BST1 Cancel Code Word
BST2 Cancel Code Word

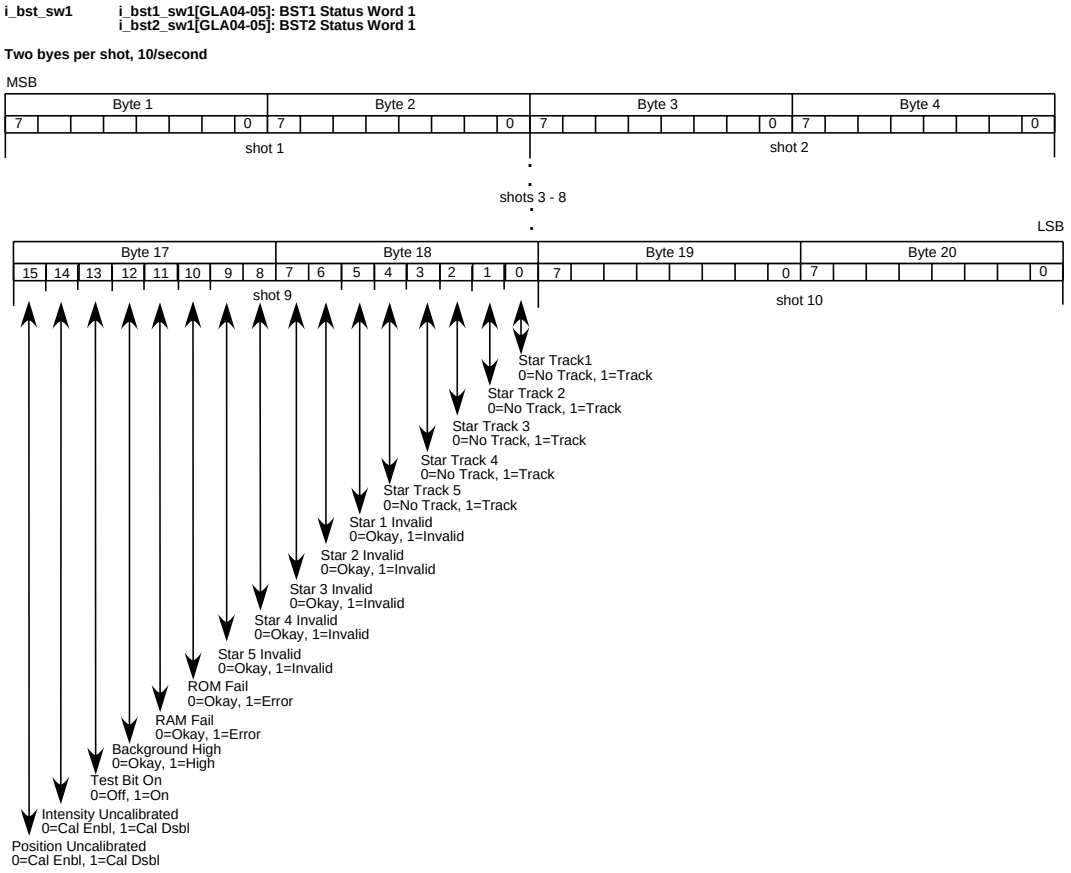


Figure E-21 BST1 Status Word
BST2 Status Word 1

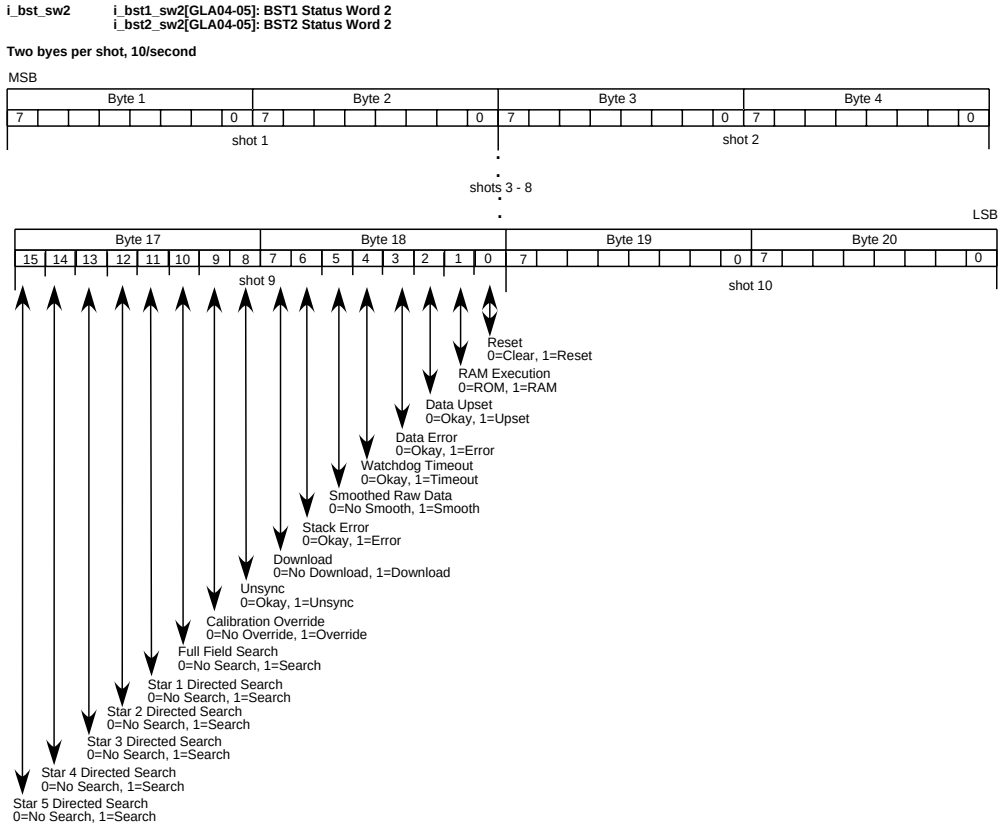


Figure E-22 BST1 Status Word 2
BST2 Status Word 2

i_ist_flag [GLA04-04]: IST Flag

1 byte flag, 10/second

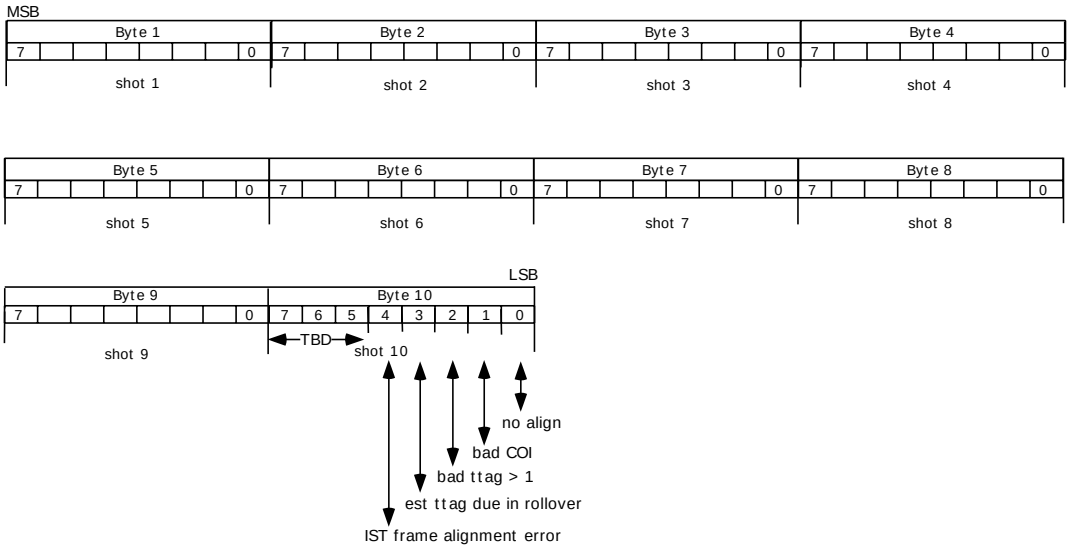


Figure E-23 IST Flag

i_lrs_flag [GLA04-02]: LRS Flag

1 byte flag, 10/second

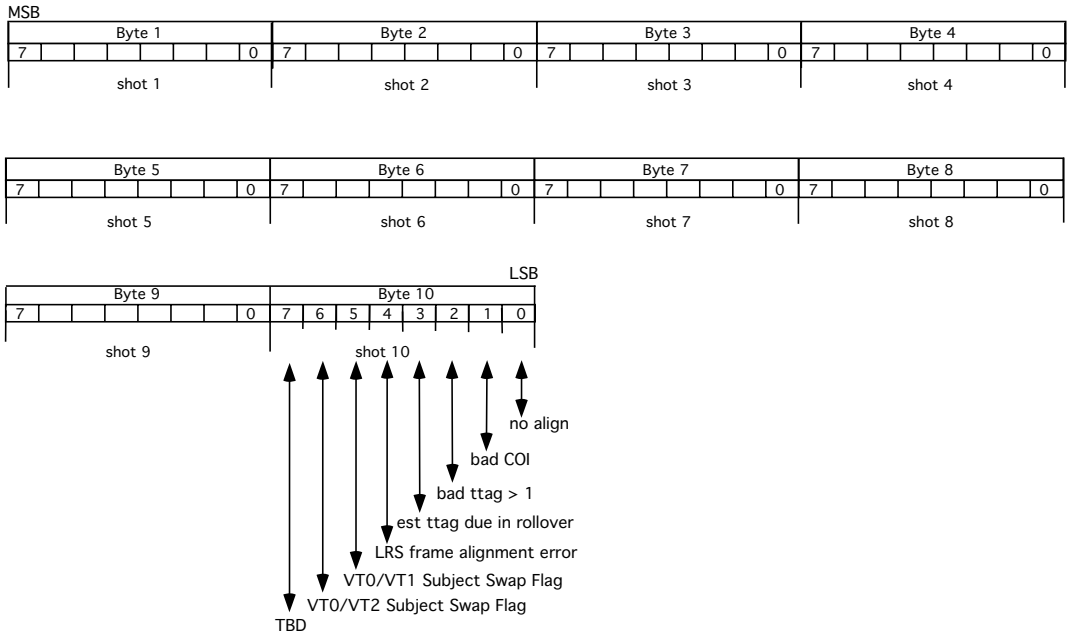


Figure E-24 LRS Flag

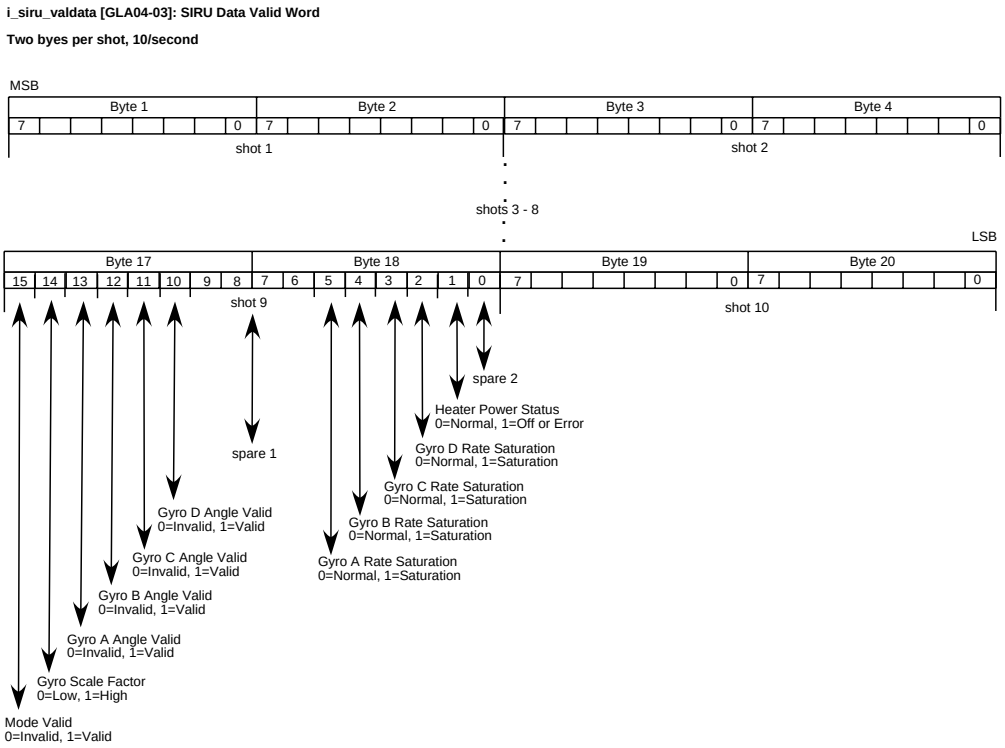


Figure E-25 SIRU Data Valid Word

i_atmQF [1/sec for GLA05, 06, 12-15]: Atmosphere Flag

2 bit flags, 40/second

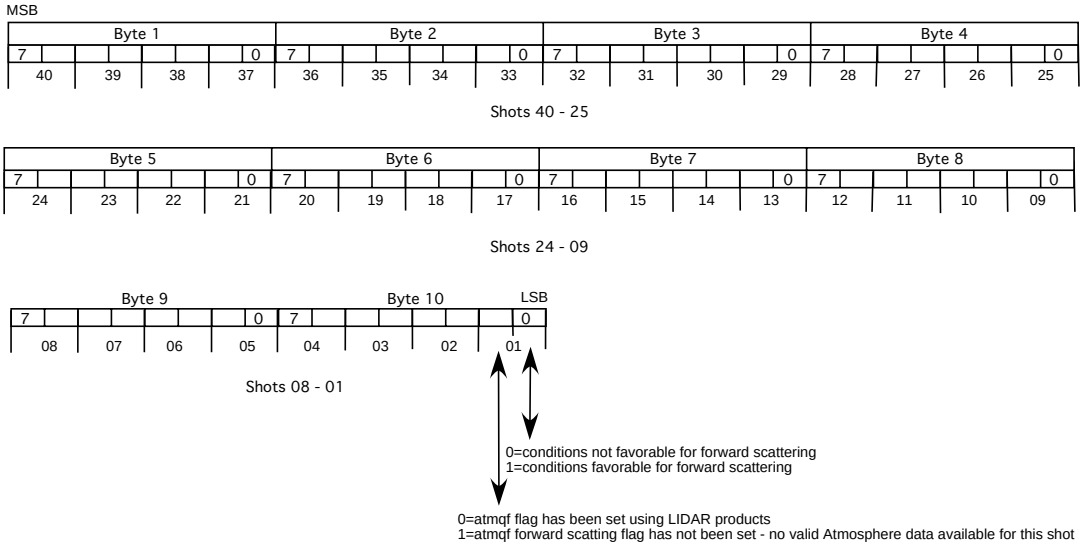


Figure E-26 Atmosphere Flag

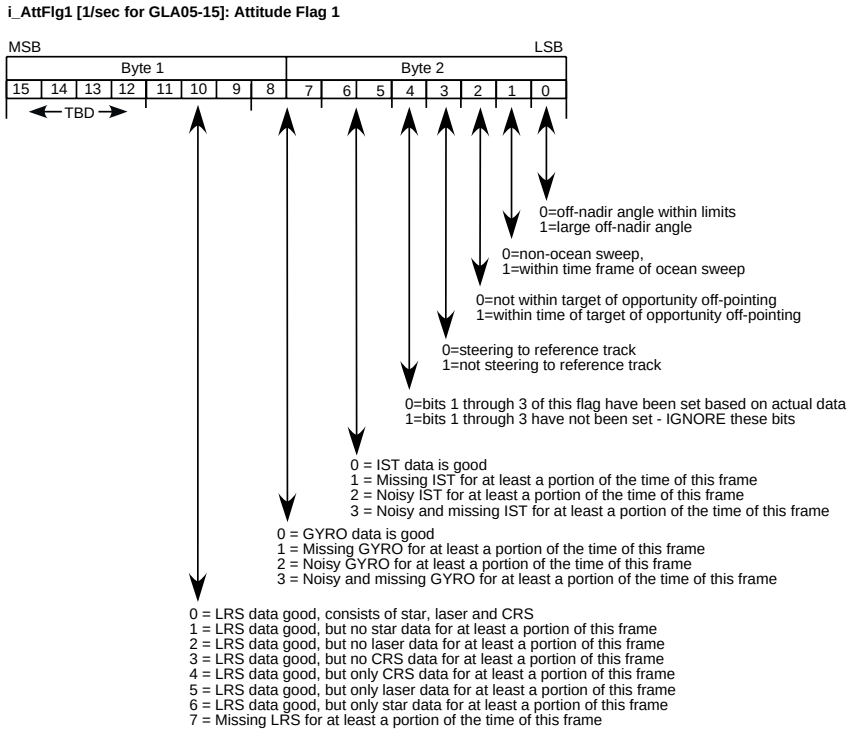


Figure E-27 Attitude Flag 1

i_AttFlg2 [1/sec for GLA05,06,12-15]: Attitude Flag 2

Bytes 1-5, PAD Use Flag: 1 bit/shot values; 0 = PAD used to determine spot location, 1 = PAD not used to determine spot location
Bytes 6-10, Calc PAD Use Flag: 1 bit/shot values; 0 = new PAD used to determine orbit, 1 = pass-thru PAD not used to determine orbit
Bytes 11-20, LPA Problem Flag: 2 bit/shot values; 0 = no problems with LPA, 1 = missing LPA, 2 = noisy LPA

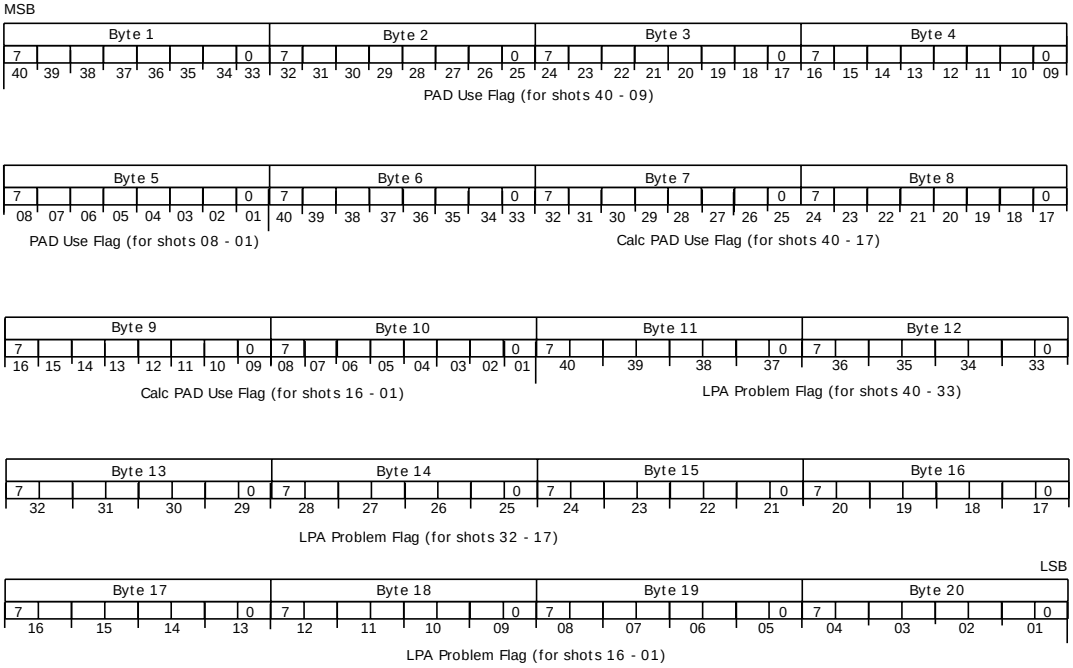


Figure E-28 Attitude Flag 2

i_AttFlg3 [1/sec for GLA07-11]: Attitude Flag 3

0=PAD used for geolocation
1=PAD not used for geolocation

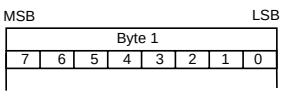


Figure E-29 Attitude Flag 3

i_ElvFlg [1/sec GLA05, 06, 12-15]: Elevation Definition Flag; Indicates which location on the received echo was used to calculate the elevation on the record.

1-byte flags, 40/second.

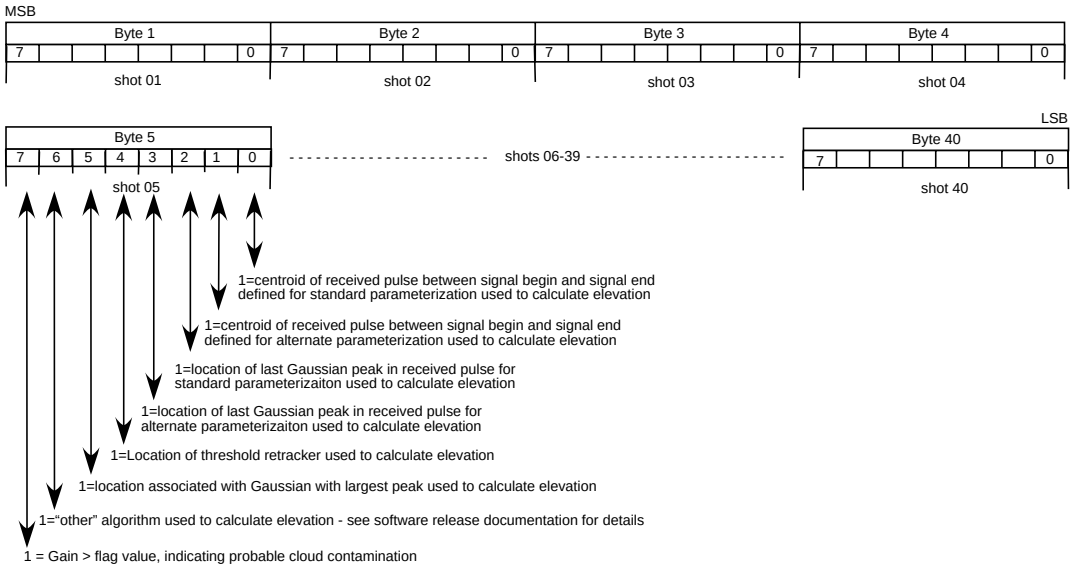


Figure E-30 Elevation Definition Flag

i_ElvuseFlg [1/sec for GLA05, 06, 12-15]: Elevation Use Flag; One flag per shot; indicates quality to use based on valid or invalid criteria

1-bit flags, 40/ second.

0=elevation is valid
1=elevation is invalid

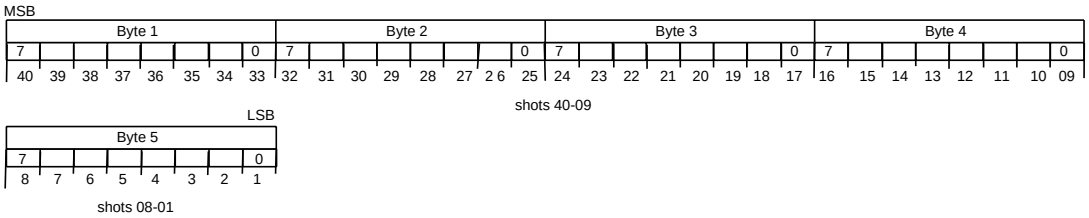


Figure E-31 Elevation Use Flag

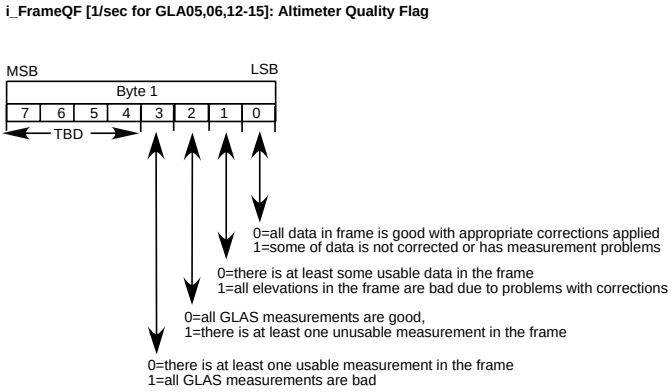


Figure E-32 Altimeter Quality Flag

i_rngCorrFlg [1/sec for GLA05, 06, 12-15]: Range Correction Flag

2 byte set of 1 bit values: 0=used, 1=not used

Note: This is a range correction flag. Some of the corrections are applied to the reference range, i_refrng on the data record, and some of them are used in the calculation of the elevation but are not applied to the reference range.

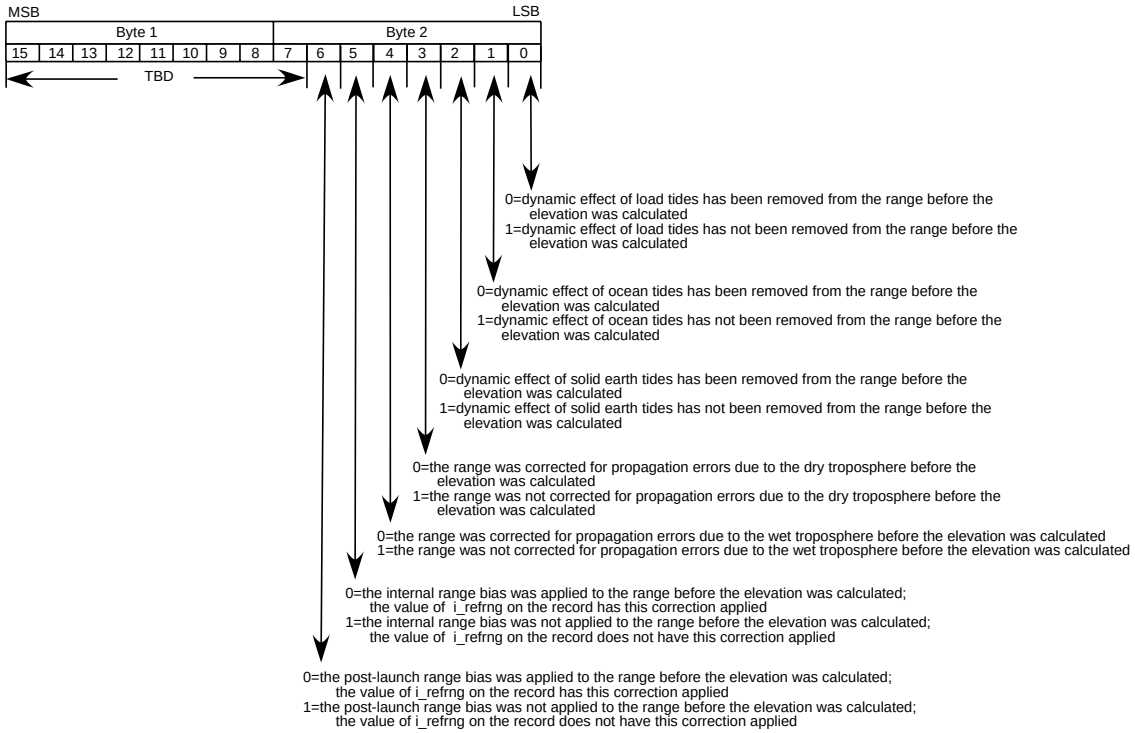


Figure E-33 Range Correction Flag

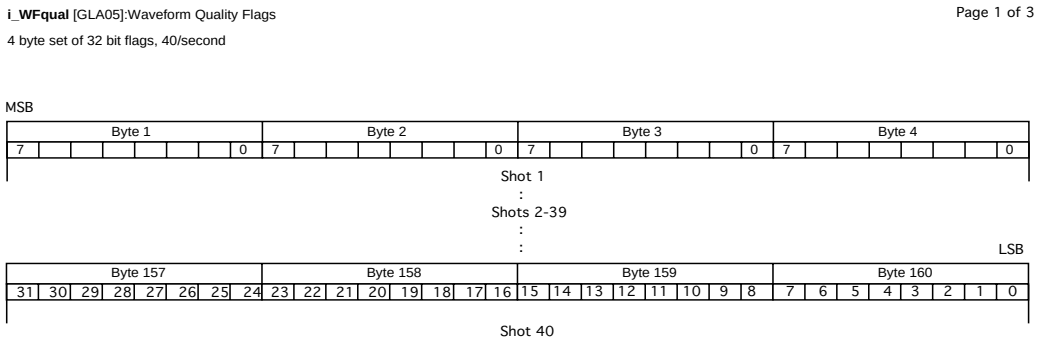


Figure E-34 Waveform Quality Flags

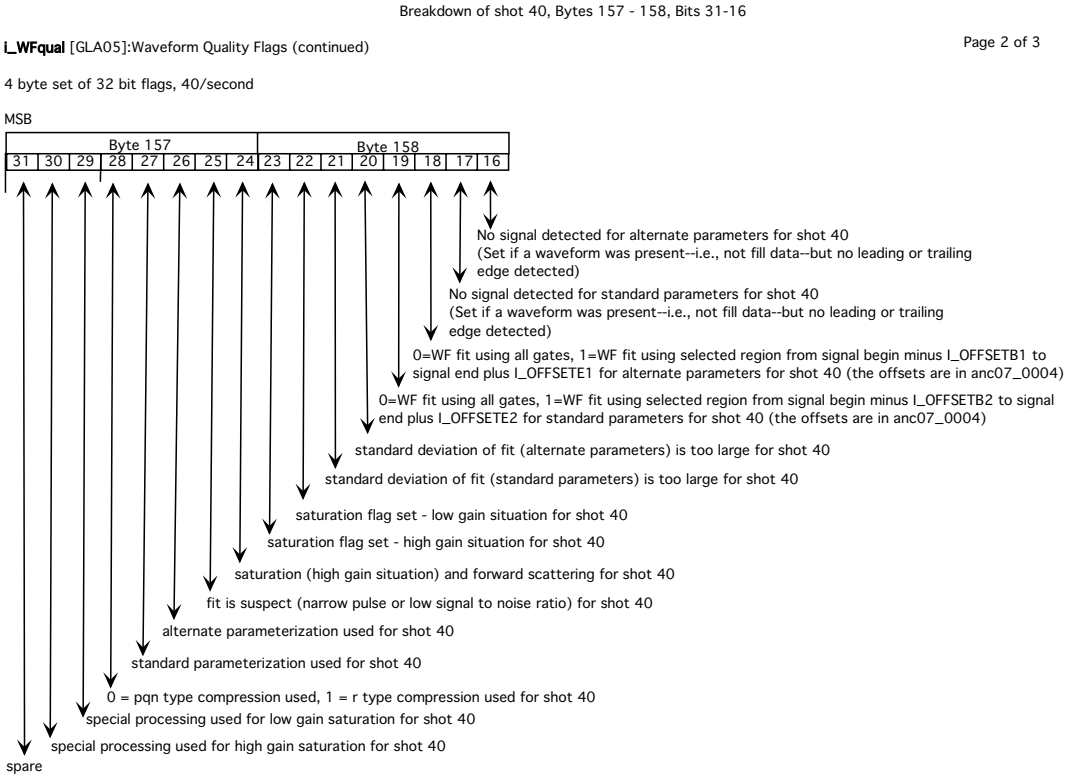


Figure E-34 Waveform Quality Flags (Continued)

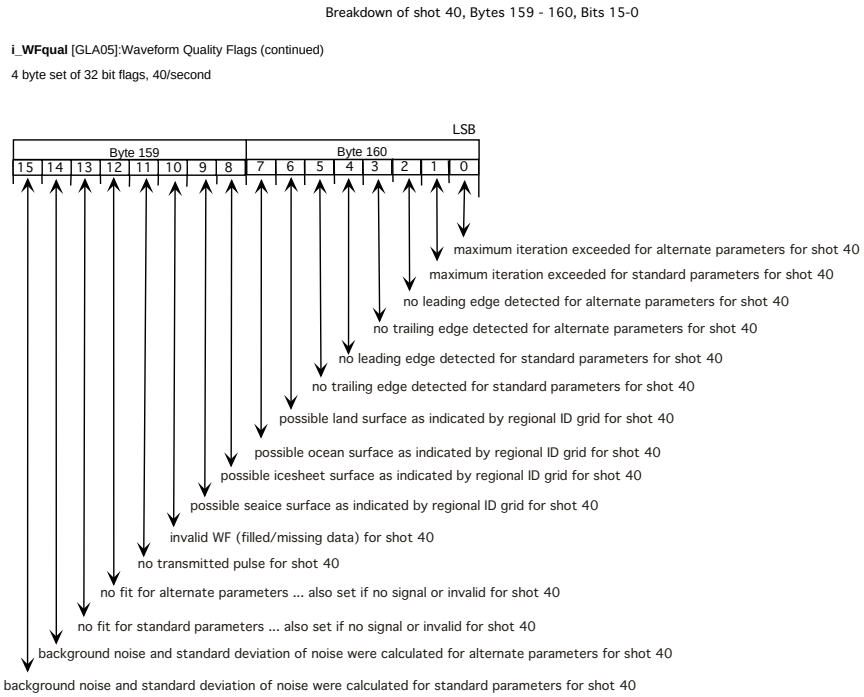


Figure E-34 Waveform Quality Flags (Continued)

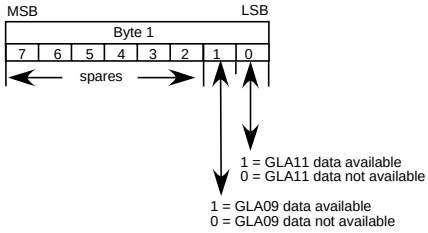
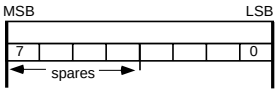


Figure E-35 Atmosphere Availability Flag

i_cld1_mswf [GLA06, 12-15]: Multiple Scattering Warning Flag

4 bit set of values;
0 = < 0.010
1 = 0.010 - 0.030
2 = 0.030 - 0.060
3 = 0.060 - 0.100
4 = 0.100 - 0.150
5 = 0.150 - 0.225
6 = 0.225 - 0.300
7 = 0.300 - 0.400
8 = 0.400 - 0.500
9 = 0.500 - 0.670
10 = 0.670 - 0.900
11 = 0.900 - 1.200
12 = 1.200 - 1.600
13 = 1.600 - 2.000
14 = > 2.000
15 = Invalid



Note: A warning flag value of 15 will be the default whenever no 532nm signal is available (as when the 532 laser energy is < 4 mJ during daytime). To distinguish this case from that of optically thick clouds, one must check the number of layers. If there were zero layers reported, but the MSWF is 15, then the cause is the lack of useable 532 data. If the number of layers is > 0 and the MSWF is 15, then the cause is total extinction of the lidar beam (this happens for clouds of optical depth > about 3).

A warning flag of '0' is a very good indicator of no layers or a layer so thin it won't cause any altimetry range delays.

Figure E-36 Multiple Scattering Warning Flag

i_CorrStatFlg [1/sec for GLA06, 12-15]: Correction Status Flag

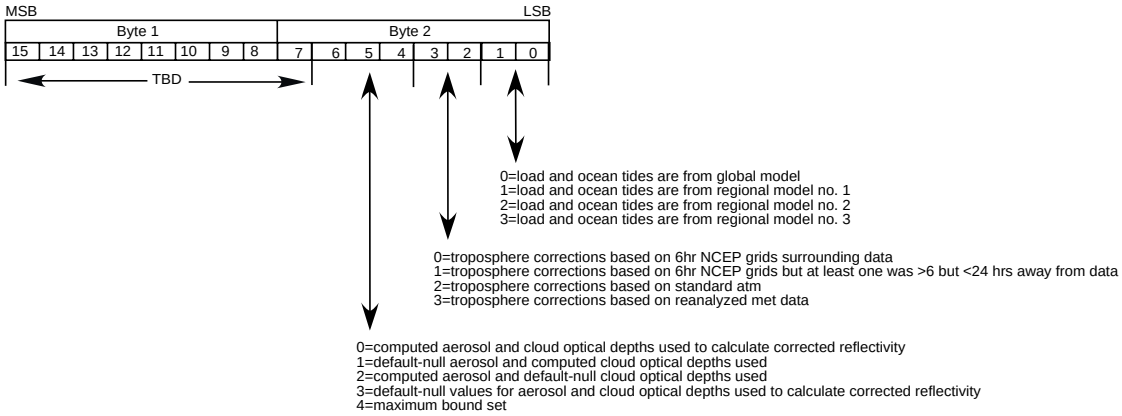
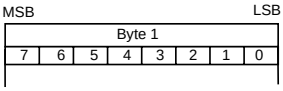


Figure E-37 Correction Status Flag

i_DEM_hires_src [1/sec for GLA06,14]: High Resolution Source Flag

1-byte flag, 40/second



Values:
0 = no high res source available
1 = "unfinished research" Shuttle Radar Topography Mission (SRTM) C-band 90 m DEM produced by JPL
2 = "finished" SRTM C-band 90 m DEM produced by NGA

Figure E-38 High Resolution Source Flag

i_MRC_af [GLA06, 12-15]: Medium Resolution Cloud Availability Flag

Tells how many cloud layers were found at this resolution. The total number of layers found is the sum of those found using the 532 channel and the 1064 channel (thus, this number will generally be larger than the actual number of layers present). value 15 = cloud layers were not searched for; value 0 = cloud layers were searched for, but not detected

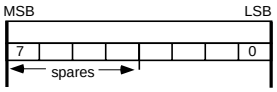


Figure E-39 Medium Resolution Cloud Availability Flag

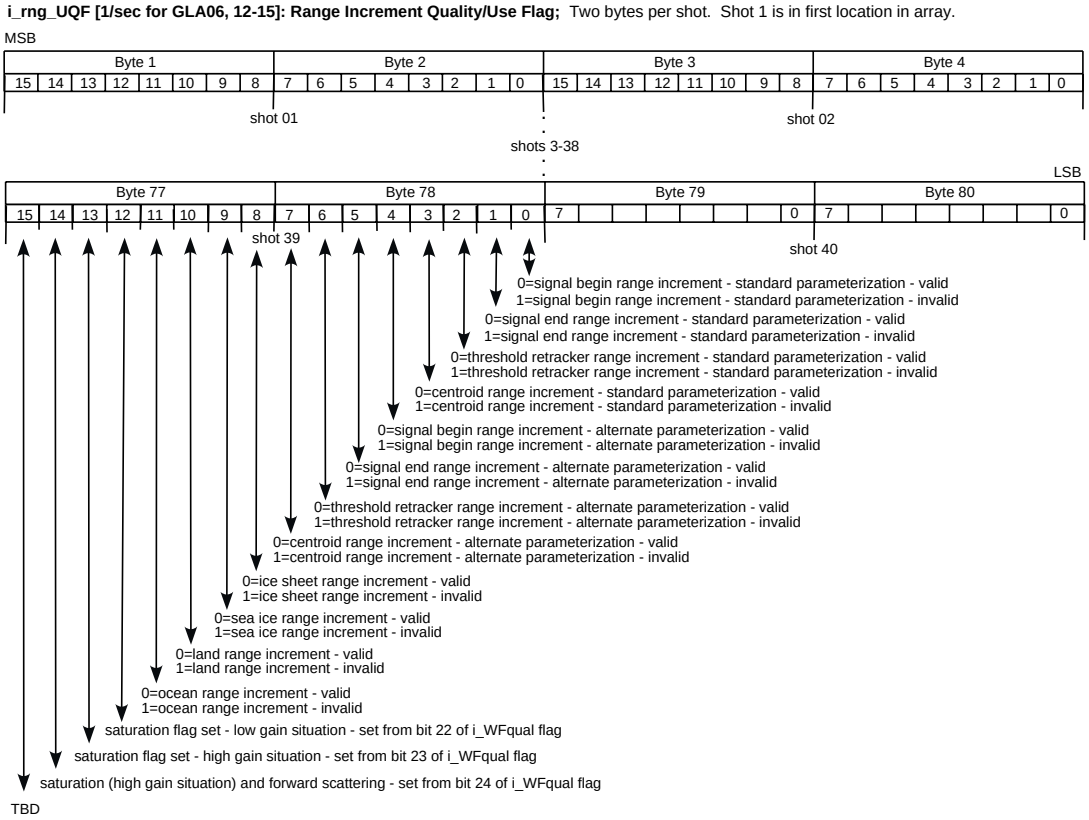


Figure E-40 Range Increment Quality/Use Flag

i_SurfRuf_slpQF [1/sec for GLA06, 12,14]: Surface Roughness and Slope Quality Flag; One byte per shot data quality flag.

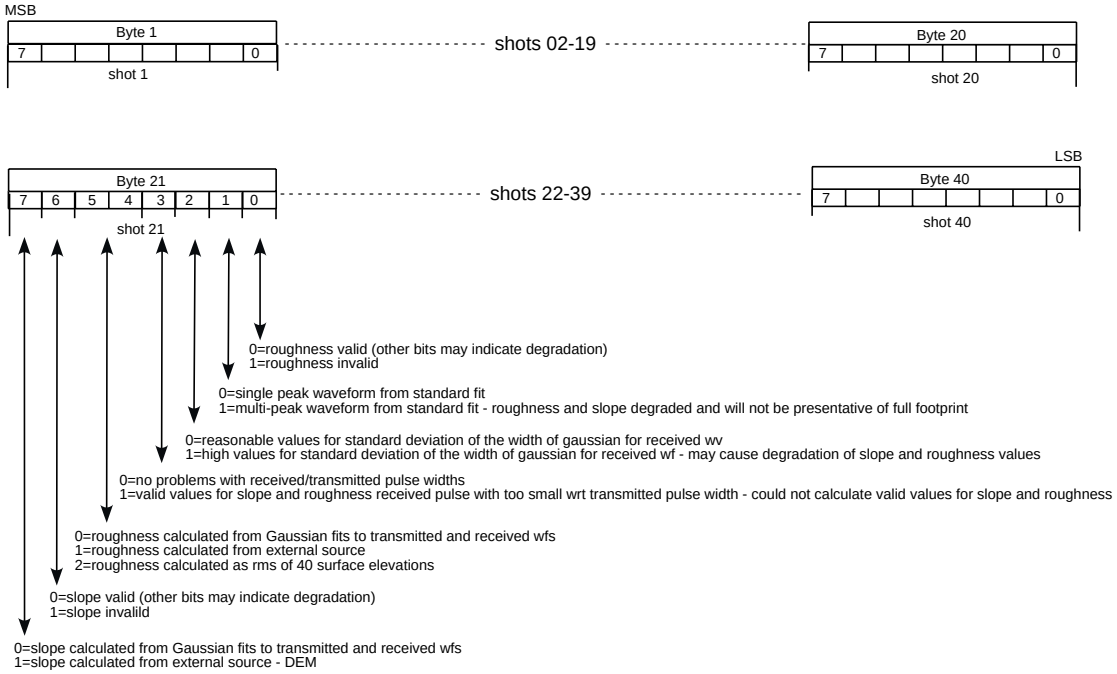


Figure E-41 Surface Roughness and Slope Quality Flag

i_surfType [GLA06, 12-15]: Region Type

1 byte of 1 bit values

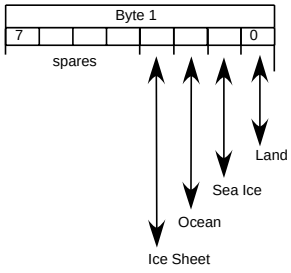


Figure E-42 Region Type

i_LidarQF [1/sec for GLA07], [1/4 sec for GLA08-11]: Lidar Frame Quality Flag

0=good data
1=data unsuitable for L2 processing due to weak 532 laser energy or high background
2=either SPCMs not turned on or bad background

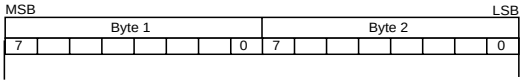


Figure E-43 Lidar Frame Quality Flag

i_532AttBS_Flag [GLA07]: 532 nm Attenuated Backscatter Vertical Profile Flag

i40_g_bscs_uf = use flag at 40Hz: value 0 = no, saturated bins were replaced; value 1 = yes, saturated bins were replaced

i40_g_bscs_qf = quality flag at 40Hz: value 0 = good data; value 1 = if 532 nm laser energy flag equals 3; value 2 = if 1064 nm quality flag equals 1 and 1064 nm backscatter value replaced 532 nm backscatter value

i5_g_bscs_uf = use flag at 5Hz: value 0 = no, saturated bins were replaced; value 1 = yes, saturated bins were replaced

i5_g_bscs_qf = quality flag at 5Hz: value 0 = good data; value 1 = if 532 nm laser energy flag equals 3; value 2 = if 1064 nm quality flag equals 1 and 1064 nm backscatter value replaced 532 nm backscatter value

il_g_bscs_qf = quality flag at 1 sec: value 0 = good quality; value 2 = 532 nm integrated return is bad; value 3 = ratio of integrated return to molecular integrated return is bad

i_g_cal_qf = quality flag: value 0 = good quality; value 2 = if no records left after elimination tests, value before elimination tests used instead

i_g_cal_dnf = day/night flag: value 0 = indeterminate; value 1 = night; value 2 = day

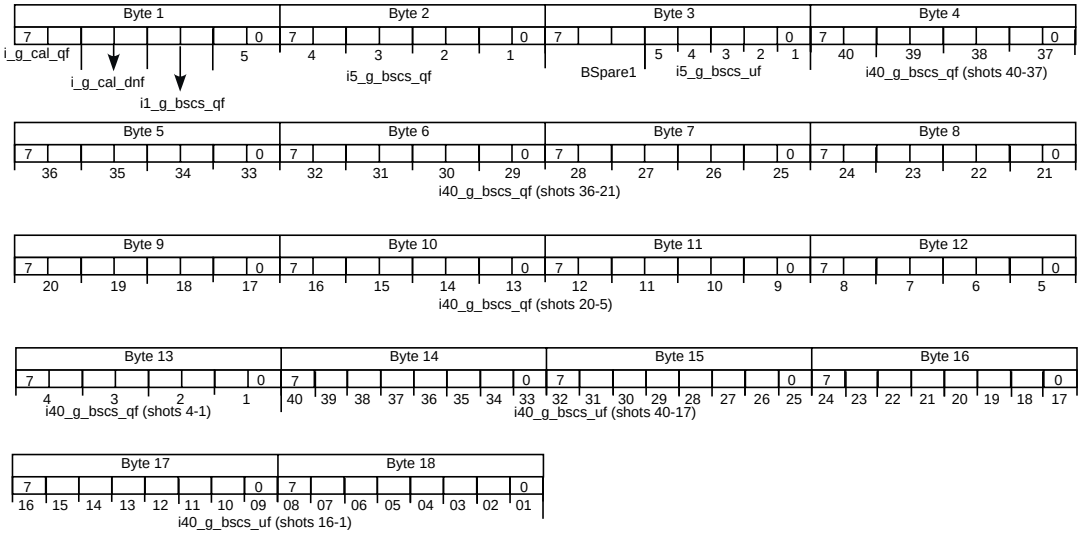


Figure E-44 532 nm Attenuated Backscatter Vertical Profile Flag

i_1064AttBS_Flag [GLA07]: 1064 nm Attenuated Backscatter Vertical Profile Flag

i40_ir_bscs_uf = use flag: not used

i40_ir_bscs_qf = quality flag at 40Hz: value 0 = good data; value 1 = if 1064 nm laser energy flag equals 3

i5_ir_bscs_uf = use flag: not used

i5_ir_bscs_qf = quality flag at 5Hz: value 0 = good data; value 1 = if 1064 nm laser energy flag equals 3

i1_ir_cal_qf = quality flag: value 0 = good quality; value 2 = if no records left after elimination tests, value before elimination tests used instead

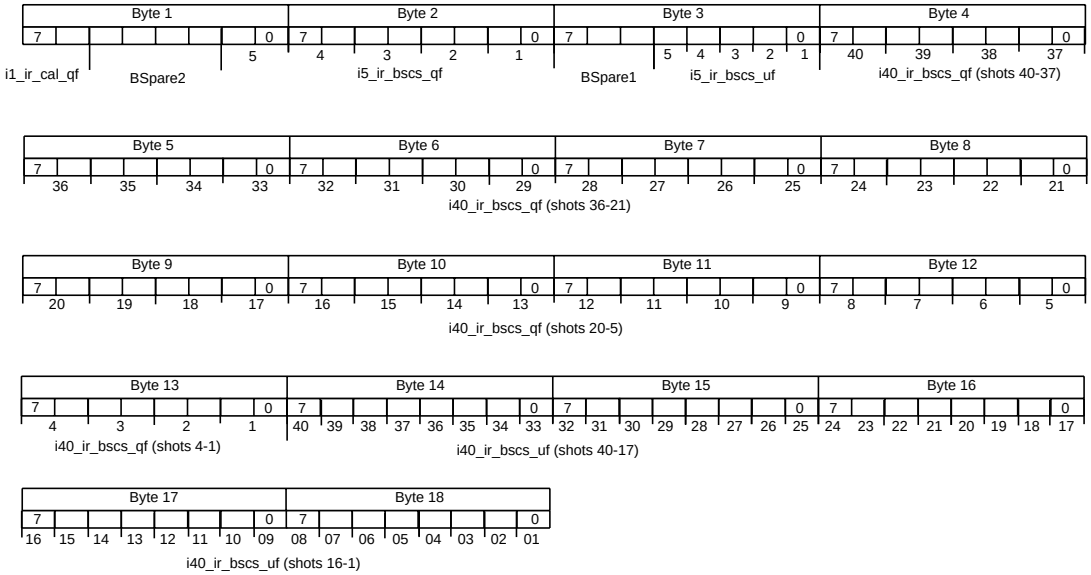


Figure E-45 1064 nm Attenuated Backscatter Vertical Profile Flag

i_metFlg [GLA07]: Meteorological/Standard Atmospheric Data Source/Quality Flag

Flag indicating if met data or standard atmosphere data are used to fill met profiles.
Flag is set to 0 if times of both met files are <=24 hrs apart, 1 if time of only first
file > 24 hrs, 2 if time of only second file > 24 hrs, 2+index of standard atmosphere file if time of both files >24 hours

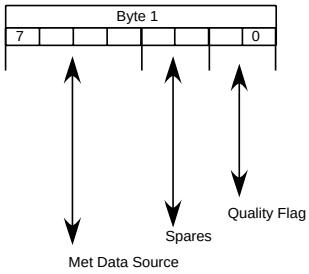


Figure E-46 Meteorological/Standard Atmospheric Data Source/Quality Flag

i5_g_sat_prof [GLA07]: 532 nm Saturation Flag Profile 40 to -1km. Indicates whether the 532 data were saturated and therefore whether the value is converted from the 1064 data.

1 bit per each shot(40) per bin (548); 0 = not saturated, 1 = saturated.

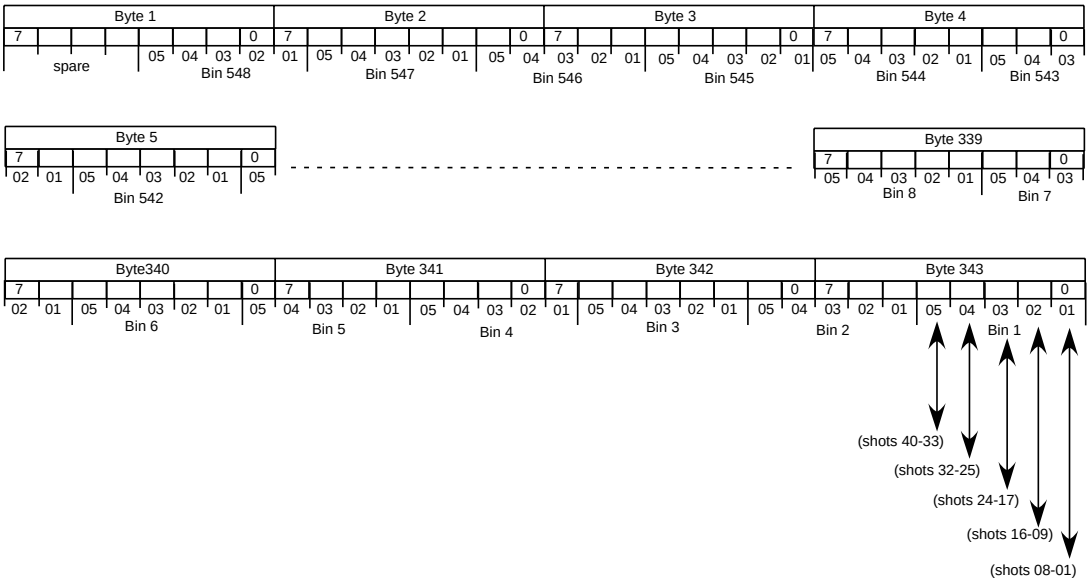


Figure E-47 532 nm Saturation Flag Profile 40 to -1km

i40_g_sat_prof [GLA07]: 532 nm Saturation Flag Profile 10 to -1km. Indicates whether the 532 data were saturated and therefore whether the value is converted from the 1064 data.

1 bit per each shot(40) per bin (148); 0 = not saturated, 1 = saturated.

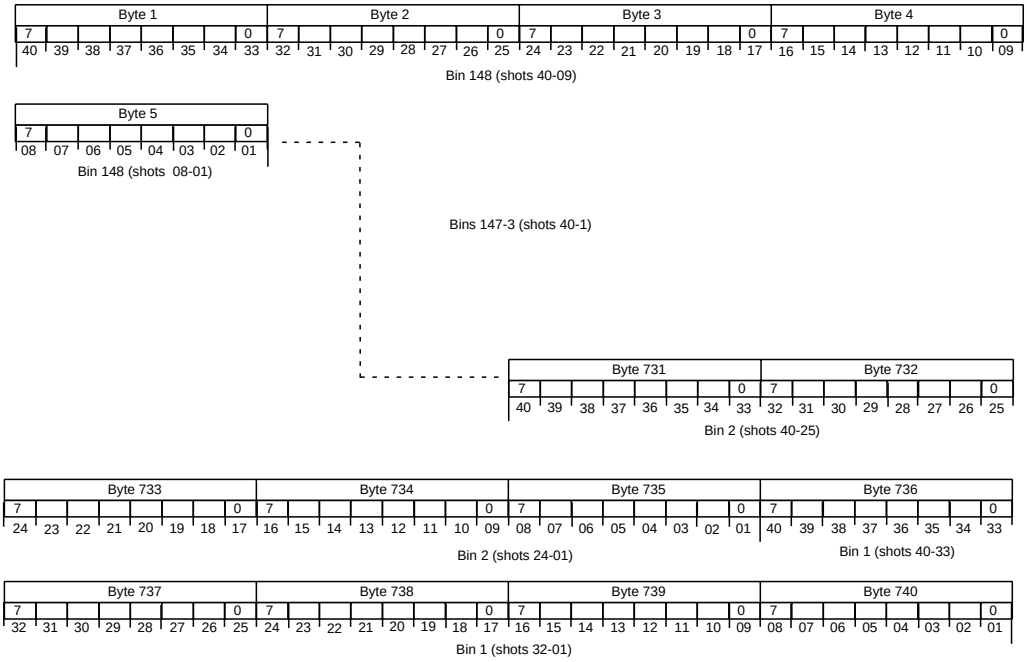


Figure E-48 532 nm Saturation Flag Profile 10 to -1km

Abbreviations & Acronyms

A2P	Algorithm-to-Product Conversion
ALT	Altimeter or Altimetry, also designation for the EOS-Altimeter spacecraft series
ANCxx	GLAS Ancillary Data Files
APID	GLAS Level-0 Data file
ATBD	Algorithm Theoretical Basis Document
ATM	Atmosphere
CCB	Change Control Board
ClearCase	GSAS version tracking software
CR	Change Request
DAAC	Distributed Active Archive Center
DEM	Digital Elevation Model
DFD	Data Flow Diagram
DLT	Digital Linear Tape
EDOS	EOS Data and Operations System
EDS	Expedited Data Set
ELEV	Elevation
EOC	EOS Operating Center
EOS	NASA Earth Observing System Mission Program
EOSDIS	Earth Observing System Data and Information System
GB	Gigabyte
GDS	GLAS Ground Data System
GLAS	Geoscience Laser Altimeter System instrument or investigation
GLAxx	GLAS Science Data Product Files
GLOP	GLAS Level-0 PGE (correctly called GLAS_L0proc)
TBD	to be determined, to be done, or to be developed

Glossary

aggregate	A collection, assemblage, or grouping of distinct data parts together to make a whole. It is generally used to indicate the grouping of GLAS data items, arrays, elements, and EOS parameters into a data record. For example, the collection of Level 1B EOS Data Parameters gathered to form a one-second Level 1B data record. It could be used to represent groupings of various GLAS data entities such as data items aggregated as an array, data items and arrays aggregated into a GLAS Data Element, GLAS Data Elements aggregated as an EOS Data Parameter, or EOS Data Parameters aggregated into a Data Product record.
array	An ordered arrangement of homogenous data items that may either be synchronous or asynchronous. An array of data items usually implies the ability to access individual data items or members of the array by an index. An array of GLAS data items might represent the three coordinates of a georeference location, a collection of values at a rate, or a collection of values describing an altimeter waveform.
file	A collection of data stored as records and terminated by a physical or logical end-of-file (EOF) marker. The term usually applies to the collection within a storage device or storage media such as a disk file or a tape file.
header	A text and/or binary label or information record, record set, or block, prefacing a data record, record set, or a file. A header usually contains identifying or descriptive information, and may sometimes be embedded within a record rather than attached as a prefix.
item	Specifically, a data item. A discrete, non-decomposable unit of data, usually a single word or value in a data record, or a single value from a data array. The representation of a single GLAS data value within a data array or a GLAS Data Element.
label	The text and/or binary information records, record set, block, header, or headers prefacing a data file or linked to a data file sufficient to form a labeled data product. A label may consist of a single header as well as multiple headers and markers depending on the defining authority.
Level 0	The level designation applied to an EOS data product that consists of raw instrument data, recorded at the original resolution, in time order, with any duplicate or redundant data packets removed.
Level 1A	The level designation applied to an EOS data product that consists of reconstructed, unprocessed Level 0 instrument data, recorded at the full resolution with time referenced data records, in time order. The data are annotated with ancillary information including radiometric and geometric calibration coefficients, and georeferencing parameter data (i.e., ephemeris data). The included, computed coefficients and parameter data have not however been applied to correct the Level 0 instrument data contents.
Level 1B	The level designation applied to an EOS data product that consists of Level 1A data that have been radiometrically corrected, processed from raw data into sensor data units, and have been geolocated according to applied georeferencing data.

Level 2	The level designation applied to an EOS data product that consists of derived geophysical data values, recorded at the same resolution, time order, and geo-reference location as the Level 1A or Level 1B data.
Level 3	The level designation applied to an EOS data product that consists of geophysical data values derived from Level 1 or Level 2 data, recorded at a temporally or spatially resampled resolution.
Level 4	The level designation applied to an EOS data product that consists of data from modeled output or resultant analysis of lower level data that are not directly derived by the GLAS instrument and supplemental sensors.
metadata	The textual information supplied as supplemental, descriptive information to a data product. It may consist of fixed or variable length records of ASCII data describing files, records, parameters, elements, items, formats, etc., that may serve as catalog, data base, keyword/value, header, or label data. This data may be parsable and searchable by some tool or utility program.
orbit revolution	The passage of time and spacecraft travel signifying a complete journey around a celestial or terrestrial body. For GLAS and the EOS ICESat spacecraft each orbit revolution count starts at the time when the spacecraft is on the equator traveling toward the North Pole, continues through the equator crossing as the spacecraft ground track moves toward the South Pole, and terminates when the spacecraft has reached the equator moving northward from the South Polar region.
parameter	Specifically, an EOS Data Parameter. This is a defining, controlling, or constraining data unit associated with a EOS science community approved algorithm. It is identified by an EOS Parameter Number and Parameter Name. An EOS Data Parameter within the GLAS Data Product is composed of one or more GLAS Data Elements.
pass	A sub-segment of an orbit, it may consist of the ascending or descending portion of an orbit (e.g., a descending pass would consist of the ground track segment beginning with the northernmost point of travel through the following southernmost point of travel), or the segment above or below the equator (e.g., either the northern or southern hemisphere portion of the ground track on any orbit).
product	Specifically, the Data Product or the EOS Data Product. This is implicitly the labeled data product or the data product as produced by software on the DAAC or SCF. A GLAS data product refers to the data file or record collection either prefaced with a product label or standard formatted data label or linked to a product label or standard formatted data label file. Loosely used, it may indicate the entire set of product files contained in a data repository.
record	A specific organization or aggregate of data items. It represents the collection of EOS Data Parameters within a given time interval, such as a one-second data record. It is the first level decomposition of a product file.
Standard Data Product	Specifically, a GLAS Standard Data Product. It represents an EOS ICESat/GLAS Data Product produced on the DAAC or on the SCF. It is routinely produced and is intended to be archived in the EOSDIS data repository for EOS user community-wide access and retrieval.
variable	Usually a reference in a computer program to a storage location.