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Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the CERES RDR



**Goddard Space Flight
Center Greenbelt, Maryland**

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Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the CERES RDR

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Preface

This document is under JPSS Ground ERB configuration control. Once this document is approved, JPSS approved changes are handled in accordance with Class I and Class II change control requirements as described in the JPSS Configuration Management Procedures, and changes to this document shall be made by complete revision.

Any questions should be addressed to:

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Change History Log

Revision	Effective Date	Description of Changes (Reference the CCR & CCB/ERB Approve Date)	Sections Affected
0200-	August 22, 2013	This version incorporates 474-CCR-13-1172 which was approved by JPSS Ground ERB on the effective date shown.	All
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0200A1	Oct 23, 2014	This version incorporates 474-CCR-14-2091 which was approved by the JPSS Ground ERB for CO10 on the effective date shown.	All
0200B	Oct 07, 2014	This version incorporates 474-CCR-14-2011 which was approved by JPSS Ground ERB on the effective date shown.	All
0200C	Feb 26, 2015	This version incorporates 474-CCR-14-2168, 474-CCR-14-2288, and 474-CCR-14-2290 which was approved by JPSS Ground ERB on the effective date shown.	All
0200D	Jul 28, 2015	This version incorporates 474-CCR-14-2506 which was approved by JPSS Ground ERB on the effective date shown.	All
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G	Aug 30, 2023	This version incorporates 474-CCR-23-6541 which was approved by the JPSS Ground ERB on Aug 21, 2023 and by the JPSS Ground Segment CCB on the effective date shown.	All

Table of TBDs/TBRs/TBSs

TBx	Type	ID	Text	Action
1	TBD	SRS.02.09_36	<p>The following paragraphs describe the structure and contents of the RDR granules formed by the JPSS ground processing software. The ground processing software generates several RDRs for each sensor by accumulating one or more specific APs into a single collection. The accumulated APs are not byte-aligned or otherwise altered. They are merely collected and placed into storage in the order that they are received. The following paragraphs describe the binary packaging structure for these accumulated APs. Table 4-1, Common RDR Structure, shows the common JPSS RDR Structure. All JPSS RDRs are based on the same generic granule storage framework and is illustrated conceptually in Figure 4-1 Common RDR Layout. The detailed structure and contents of the APs are documented in the Mission Data Format Control Book (MDFCB) for each mission, GSFC 429-05-02-42 for S-NPP, 472-00251 for JPSS-1, and 472-TBD2 for JPSS-2. For more information on AP formatting, see the Recommendations for Advanced Orbiting Systems, Networks and Data Links, CCSDS 701.0-B-2, Section 3.3.3.</p> <p>Note: All multi-byte structures are in Big Endian.</p>	Define Document Number for JPSS-2

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1 INTRODUCTION

1.1 Scope

The Joint Polar Satellite System (JPSS) Algorithm Specification for CERES RDR - Volume II: Data Dictionary contains the specifications for the format of the Raw Data Records (RDRs), Sensor Data Records (SDRs), and Temperature Data Records (TDRs). This specification includes the format of the Hierarchical Data Format Release 5 (HDF5) files, as well as the product definitions. These formats are available to external users of the JPSS. For an overview of the data product formats, see 474-00001-01, JPSS CDFCB-X Vol I. For an overview of the metadata formats for data products, see 474-00448-02-01, JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms.

1.2 Organization

Section	Contents
Section 1	Provides information regarding the scope and organization of this document, as reference material only.
Section 2	Lists parent documents and related documents that were used as sources of information for this document or that provide additional background information to aid understanding of the interface implementations.
Section 3	Provides an overview of the HDF5 UML for the data product types
Section 4	Provides a description of the contents of each JPSS RDR.
Section 5	Provides a description of the contents of each JPSS TDR. (if applicable)
Section 6	Provides a description of the contents of each JPSS SDR.
Section 7	Provides a description of relevant Look-Up Tables (LUTs) and Processing Coefficient Tables (PCTs).
Section 8	Provides a description of each Intermediate Product if applicable.
Appendix A	Provides the Data Mnemonic to Interface Mapping for the data products in this volume.
Appendix B	Provides common RDR static header values in this volume.
Appendix C	Provides a mapping of the quality flags by sensor and product that are reportable to the associated data product quality flag Test ID used in the processing environment.
Appendix D	Provides reference to acronyms and glossary of terms found within the JPSS Program Lexicon (470-00041).
Attachment A	Provides the list of applicable xml files for this Data Dictionary.

2 RELATED DOCUMENTATION

The latest JPSS documents can be obtained from URL: https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm. JPSS Project documents have a document number starting with 470, 472 or 474 indicating the governing Configuration Control Board (CCB) (Program, Flight, or Ground) that has the control authority of the document.

2.1 Parent Documents

The following reference document(s) is (are) the Parent Document(s) from which this document has been derived. Any modification to a Parent Document will be reviewed to identify the impact upon this document. In the event of a conflict between a Parent Document and the content of this document, the JPSS Program Configuration Change Board has the final authority for conflict resolution.

Document Number	Title
474-00448-01-09	Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirement Specification (SRS) for the CERES RDR

2.2 Applicable Documents

The following document(s) is (are) the Applicable Document(s) from which this document has been derived. Any modification to an Applicable Document will be reviewed to identify the impact upon this document. In the event of conflict between an Applicable Document and the content of this document, the JPSS Program Configuration Change Board has the final authority for conflict resolution.

Document Number	Title
None	

3 UML FOR HDF5 PRODUCTS

3.1 RDR HDF5 Details

Figure 3.1-1, Science and Diagnostic RDR Generalized UML Diagram, depicts the HDF5 RDR file organization as a Unified Modeling Language (UML) class diagram for Science and Diagnostic RDRs. This also describes the science calibration RDRs generated by OMPS. Figure 3.1-2, Dwell, Dump, and Telemetry RDR Generalized UML Diagram, depicts the HDF5 RDR file organization as a UML Class Diagram for Dwell, Dump and Telemetry RDRs.

Each HDF5 RDR file contains an HDF5 Root Group, '/', a Data_Products Group, one or more Product Groups (CollectionShortName), and an All_Data Group containing one or more (CollectionShortName)_All groups. The latter group contains the Dataset_Array which holds the common RDR structures of Consultative Committee for Space Data Systems (CCSDS) structured APs. For Science and Diagnostic RDRs a Spacecraft Diary Group is also included in the Data_Products group. The Product Groups and Spacecraft Diary Group both contain datasets - an Aggregation Dataset (CollectionShortName_Aggr) and Granule Datasets (CollectionShortName_Gran_n - where n indicates the nth granule in a temporal aggregation of granules (0 .. n-1)). A granule is a general term used to describe the minimum quanta of data collected per processing period, generally on the order of seconds. For the definition and organization of the metadata attributes contained in the HDF5 files, see 474-00448-02-01, JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms. Attributes that are specific to a particular RDR are listed with the specific RDR's data format definition. Note: In the UML diagrams, an '*' following the name of an attribute indicates an element with exceptions; see the JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms, for the details of the exception.

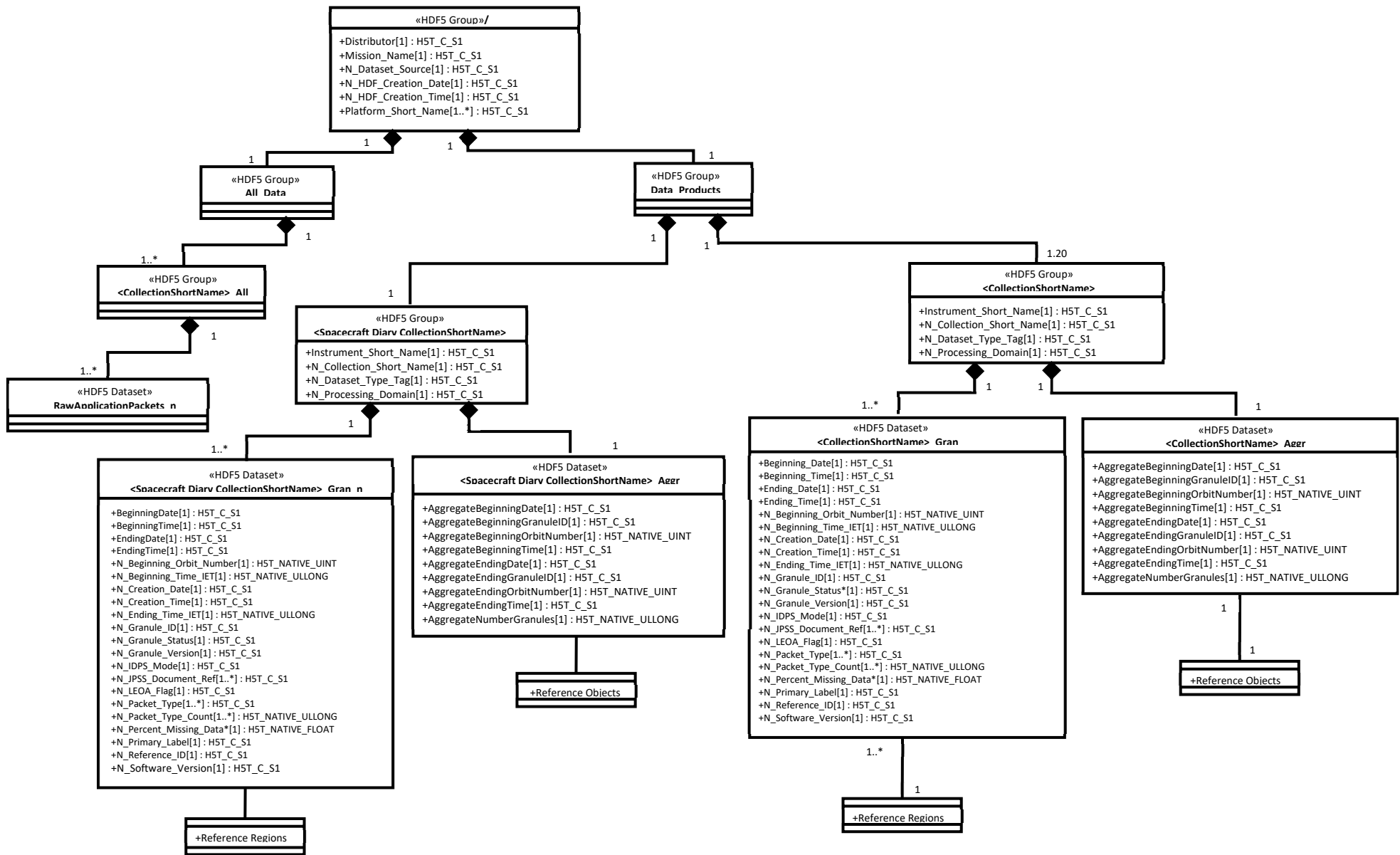


Figure: 3.1-1 Science and Diagnostic RDR Generalized UML Diagram

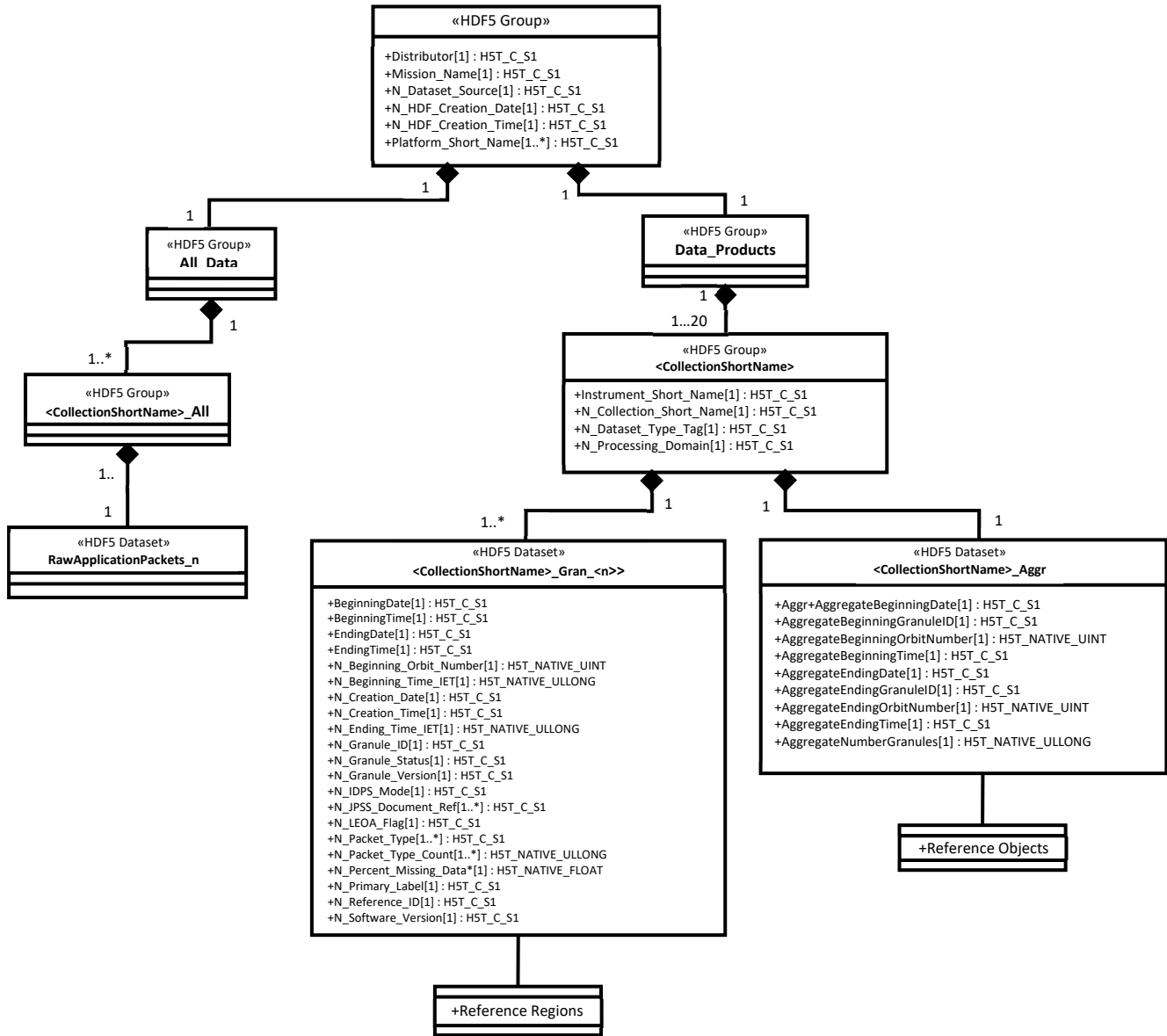


Figure: 3.1-1 Dwell, Dump, Telemetry, and Spacecraft Diary (when requested separately) RDR Generalized UML Diagram TDR/SDR HDF5 Details

Figure 3.2-1, Generalized UML Diagram for HDF5 SDR/TDR Files, depicts the HDF5 SDR/TDR organization as a Unified Modeling Language (UML) class diagram. Each HDF5 SDR/TDR file contains an HDF5 Root Group, '/', a Data Products Group, Product Groups (Collection Short Name), an optional Geolocation Group (depending upon packaging option, see the JPSS CDFCB-X Vol. I for a description of the geolocation packaging), and an All Data Group (dataset arrays). The Product Groups and Geolocation Group both contain datasets - an Aggregation Dataset (Collection Short Name_Aggr) and Granule Datasets (Collection Short Name_Gran_n) - where n indicates the nth granule in a temporal aggregation of granules (0 .. n-

1). A granule is a general term used to describe the minimum quanta of data collected per processing period, generally on the order of seconds. For the definition and organization of the metadata attributes contained in the HDF5 files, see 474-00448-02-01, JPSS Algorithm Specification Volume II: Data Dictionary for the Common Algorithms. Attributes that are specific to a particular SDR/TDR are listed with the specific SDR/TDR's data format definition. For the generalized formats and packaging options for the Geolocation data, see the JPSS CDFCB-X Vol. I.

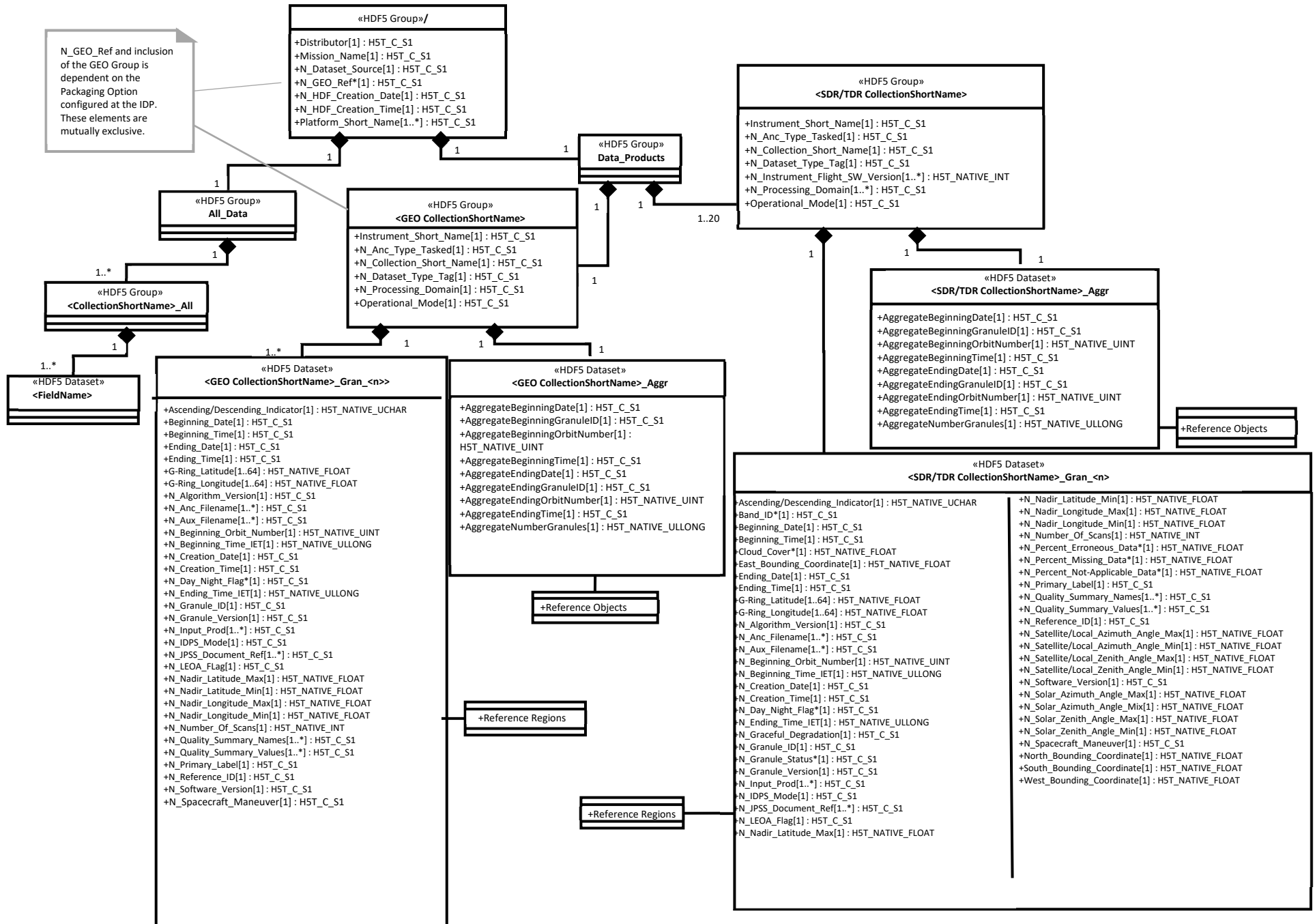


Figure: 3.1-2 Generalized UML Diagram for HDF5 SDR/TDR Files

4 JPSS RAW DATA RECORDS (RDRS)

The following paragraphs describe the structure and contents of the RDR granules formed by the JPSS ground processing software. The ground processing software generates several RDRs for each sensor by accumulating one or more specific APs into a single collection. The accumulated APs are not byte-aligned or otherwise altered. They are merely collected and placed into storage in the order that they are received. The following paragraphs describe the binary packaging structure for these accumulated APs. Table 4-1, Common RDR Structure, shows the common JPSS RDR Structure. All JPSS RDRs are based on the same generic granule storage framework and is illustrated conceptually in Figure 4-1 Common RDR Layout.

The detailed structure and contents of the APs are documented in the Mission Data Format Control Book (MDFCB) for each mission, GSFC 429-05-02-42 for S-NPP, 472-00251 for JPSS-1, and 472-TBD2 for JPSS-2. For more information on AP formatting, see the Recommendations for Advanced Orbiting Systems, Networks and Data Links, CCSDS 701.0-B-2, Section 3.3.3.

Table: 4-1 Common RDR Structure

Field Name	Description
Static Header	Static header describing the RDR
APID List	Array of structures that contains information about each APID that is collected in the RDR
Packet Tracker	Array of structures that contains information about each AP that is in the RDR
AP Storage area	General buffer where the APs are stored back-to-back in the order that they are received

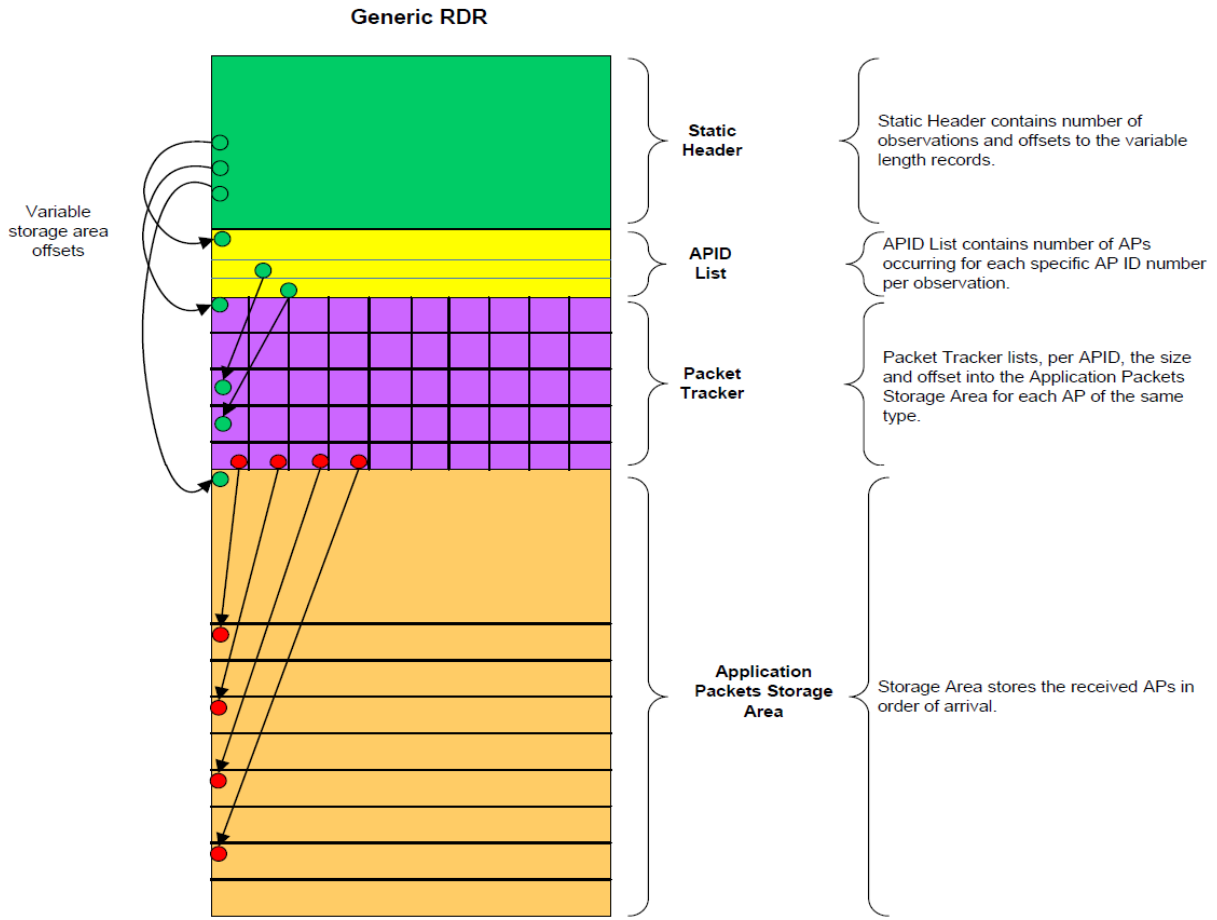


Figure: 4-1 Common RDR Layout

4.1 Common RDR Structures

The following section defines these structures and provides methods for determining the variable length RDR components.

Description/ Purpose	The following tables describe the four structures found in the common RDR Structure. The common RDR Structure granules are referenced by the HDF5 Object and Reference Region pointers in the CollectionShortName_Aggr and CollectionShortName_Gran_# datasets, respectively.
File-Naming Construct	See the JPSS CDFCB-X Vol. I-Overview, Section 3.0 for details.
File Size	Nominally specified per RDR
File Format Type	Big Endian Binary (structure stored within HDF5)
Production Frequency	Common structure created for each RDR granule Granule durations specified per RDR

Data Content and Data Format	<p>Each RDR has a single RDR Static Header and a dynamic Application Packet content area with three major entries:</p> <ol style="list-style-type: none"> 1) APID List, 2) Packet Tracker List, and 3) Application Packet Storage Area. <p>Table 4.1-1, RDR Static Header, details the spacecraft and sensor that the RDR data originated from, the type of data the RDR contains, and the start and end boundary times of the RDR granule. It also provides byte offset information needed to access individual APs and the number of AP types that are contained in the RDR.</p> <p>Tables 4.1-2, 4.1-3, and 4.1-4 define the Dynamic Application Packet content area.</p> <p>Table 4.1-2, RDR APID List, defines the structure used to identify the AP data type and it provides information necessary for accessing the RDR Packet Tracker. The APID List has details for each APID including number expected and received.</p> <p>Table 4.1-3, RDR Packet Tracker provides information about individual APs.</p> <p>Table 4.1-4, Application Packet Storage Area, describes the storage area containing the APs.</p>
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Table 4.1-1, RDR Static Header, details the spacecraft and sensor that the data originated from, the type of the data the RDR contains, and the start and end boundary times of the RDR granule. The RDR contains APs that have observation times which are greater than or equal to the start boundary and less than the end boundary time. The total size of the RDR Static Header is 72 bytes.

Table: 4.1-1 RDR Static Header

Field Name	Data Type	Description
satellite	char[4]	Source satellite name as found in JPSS CDFCB-X Vol. I, Table 3.4.1-1, Spacecraft ID.
Sensor	char[16]	The RDR sensor name in a case-sensitive string (Example: “VIIRS”, “ATMS”, “CrIS”, etc. See Appendix B, Common Static Header Values, for specific values.)
typeID	char[16]	The RDR type in an upper case string (Example: “SCIENCE”, “DIAGNOSTIC”, “TELEMETRY”, “MEMORY DUMP”, “DWELL”. See Appendix B, Common Static Header Values, for specific values.)
numAPIDs	UInt32	The number of different types of expected APIDs that make the RDR. (numAPIDs is specific for each type of RDR, see Appendix B, Common Static Header Values, for specific values.)
apidListOffset	UInt32	Byte offset of the APID List (this is equivalent to the size of the static header: 72). The APID List starts immediately after the Generic RDR Static Header. Note: Always use this value to find the APID address.
pktTrackerOffset	UInt32	Byte offset from the beginning of the Common RDR to the Packet Tracker list

Field Name	Data Type	Description
		Note: Always use this value to find the Packet Tracker list.
apStorageOffset	UInt32	Byte offset from the beginning of the Common RDR to the AP Storage Note: Always use this value to find the AP Storage.
nextPktPos	UInt32	Byte offset from the beginning of the Application Packet Storage Area (apStorageOffset) to the end of valid data within the Application Packet Storage Area
startBoundary	int64	All APs occur at or after this time in IDPS Epoch Time (IET) format. Note IET begins January 1, 1958 and is measured in microseconds. For more information on IET see JPSS CDFCB-X Vol. I, Section 3.3.1.
endBoundary	int64	The RDR non-inclusive boundary time in IET format. All APs occur before this time.

Table 4.1-2, RDR APID List, details the APIDs that are in the RDR. The number of elements in the list is equal to the numAPIDs field in the RDR Static Header. The size of a single RDR APID list element is 32 bytes.

Table: 4.1-2 RDR APID List

Field Name	Data Type	Description
name	char[16]	Short name describing the data type (Example: M01 for VIIRS. See individual RDR sections for specific values.)
value	UInt32	This field stores an APID that is in the RDR.
pktTrackerStartIndex	UInt32	The first index in the pktTracker array that will contain an AP of this APID. This index is zero based.
pktsReserved	UInt32	This field stores the number of APs reserved for this APID in this RDR. This value accounts for the worst case expected for the temporal granule period. Due to variability in scan rates, the actual number of packets received can be less than the "reserved" and still be 100% complete as shown in the metadata.
pktsReceived	UInt32	The number of APs of this APID that have been received for this RDR

Table 4.1-3 Application Packet Storage Area describes the AP storage area.

Table: 4.1-3 Application Packet Storage Area

Field Name	Data Type	Description
apStorage	Array of unsigned int8	Storage area where application packets are stored as they arrive in consecutive order

Table 4.1-4, Application Packet Tables, provides explanations of the fields given for each RDR described in the following sections. APIDs are listed in the JPSS Alg. Spec. for CERES RDR Volume IV: SRSPF (474-00448-04-09).

Table: 4.1-4 Application Packet Tables

APID Short Name	Description	Value APID ₁₀
Short name of this Application Packet as an upper-case string	Brief description of this application packet	Numerical Application Packet ID, in base 10. For instruments on both S-NPP and JPSS-1, there will be separate APID Value columns for each mission.

Note: Grouped or segmented packets contain mission data exceeding the size of a single CCSDS packet.

Accessing APs can be achieved in two fashions; Random Access or Sequential Access.

To access APs in random order by AP type:

- Get the range for a specific type of data from the APID List
 - o Find desired AP type using name field
 - o Get pktTrackerStartIndex
 - o Get pktsReserved
- Loop over the elements in Packet Tracker array starting at pktTrackerStartIndex
 - o Get offset (if -1 stop processing no packet received)
 - o Get size
 - o Access the AP by adding the offset to the apStorageOffset value found in the Static Header
 - o Extract size (the AP size in bytes) from the AP Storage Area
 - o Repeat above for pktsReserved

To access APs in sequential order:

- Get the apStorageOffset from the Static Header to determine memory location for start of APs in AP Storage Area
- Get the nextPktPos from the Static Header (The nextPktPos value indicates the end of valid RDR data within the AP Storage Area)
- Parse AP's manually by reading the primary header, accessing the size of the packet, and accessing the user data section in the CCSDS packet

Repeat until nextPktPos equals current position.

4.2 CERES RDR Overview

Data Mnemonic	Science: RDRE-CERS-C0030 Diagnostic: RDRE-CERS-C0032 Telemetry: RDRE-CERS-C0031
Description/	The CERES instrument provides radiometric measurements of the earth using three thermistor bolometer detector units. The short-wave detector measures

Purpose	<p>earth-reflected solar radiation in the wavelength region of 0.3 μm to 5 μm; the window detector measures earth-emitted long-wave radiation in the wavelength region of 8.2 μm to 11.8 μm; and the total detector measures radiation in the range of 0.3 to 100 μm.</p> <p>CERES is configured to scan in a plane perpendicular to the orbit track, with each complete scan taking 6.6 seconds. Science and Housekeeping (Telemetry) packets are nominally generated every scan, except during calibration sequences when the calibration packet is generated rather than the science packet. Either calibration or science packets are stored in the Science RDR.</p> <p>The CERES RDRs are delivered without being used in the production of any other JPSS Data Product.</p>
File-Naming Construct	See the JPSS CDFCB-X Vol. I, Section 3.0 for details.
File Size	<p>Science: See Table: 4.3.2-3 S-NPP CERES Science RDR Structure See Table: 4.3.2-4 JPSS-1 CERES Science RDR Structure</p> <p>Diagnostic: See Table: 4.4.2-3 S-NPP CERES Diagnostic RDR Structure See Table: 4.4.2-4 JPSS-1 CERES Diagnostic RDR Structure</p> <p>Telemetry: See Table: 4.5.2-3 S-NPP CERES Telemetry RDR Structure See Table: 4.5.2-4 JPSS-1 CERES Telemetry RDR Structure</p> <p>All sizes are per granule. Sizes do not include HDF5 overhead. For each RDR, the size represents the maximum internal buffer size required to support IDPS.</p> <p>For Science RDRs, since concurrent receipt of both APIDs is not expected, the size of the delivered HDF5 file may be much smaller (~50%) since the internal storage space will be truncated upon delivery to match the actual data received.</p>
File Format Type	HDF5
Data Content and Data Format	<p>Section 4.3 describes the CERES Science RDR</p> <p>Section 4.4 describes the CERES Diagnostic RDR</p> <p>Section 4.5 describes the CERES Telemetry RDR</p>

4.3 CERES Science RDR

4.3.1 CERES Science RDR HDF5 Files

The CERES Science RDR HDF5 files are described in Section 3.1, Raw Data Records HDF5 Details.

4.3.2 CERES Science RDR Data Content Summary

Table 4.3.2.-1, S-NPP CERES Science RDR Application Packets, lists the APs accumulated for the S-NPP CERES Science RDR. Table 4.3.2-2, JPSS-1 CERES Science RDR Application Packets, lists the APs accumulated for the JPSS-1 CERES Science RDR. In the event of a discrepancy in APIDs listed here, see the MDFCB, GSFC 429-05-02-42 for S-NPP or 472-00251 for JPSS-1.

Table: 4.3.2-1 S-NPP CERES Science RDR Application Packets

Apid Short Name	Description	Value APID ₁₀
CAL	Calibration	147
SCI	Science	149

Table: 4.3.2-2 JPSS-1 CERES Science RDR Application Packets

Apid Short Name	Description	Value APID ₁₀
CAL	Calibration	147
SCI	Science	149

Table 4.3.2-3, S-NPP CERES Science RDR Structure, shows the layout and static contents of the S-NPP CERES Science RDR. Table 4.3.2-4, JPSS-1 CERES Science RDR Structure, shows the layout and static contents of the JPSS-1 CERES Science RDR.

Table: 4.3.2-3 S-NPP CERES Science RDR Structure

	Byte	Field	Type	Value
Static Header	0	satellite	char[4]	'NPP'
	4	sensor	char[16]	'CERES'
	20	typeID	char[16]	'SCIENCE'
	36	numAPIDs	UInt32	2
	40	apidListOffset	UInt32	72
	44	pktTrackerOffset	UInt32	136
	48	apStorageOffset	UInt32	4936
	52	nextPktPos	UInt32	Varies
	56	startBoundary	int64	Varies
64	endBoundary	int64	Varies	
Dynamic	72	APID List	IngSmdCommon_ApidDetailType [2]	Varies
	136	Pkt Tracker List	IngSmdCommon_PktTrackerType [200]	Varies
	4936	AP storage area	UInt8[1398800]	Varies
File Size	1,403,736 Bytes			

Table: 4.3.2-4 JPSS-1 CERES Science RDR Structure

	Byte	Field	Type	Value
Static Header	0	satellite	char[4]	'J01'
	4	sensor	char[16]	'CERES'
	20	typeID	char[16]	'SCIENCE'
	36	numAPIDs	UInt32	2
	40	apidListOffset	UInt32	72
	44	pktTrackerOffset	UInt32	136
	48	apStorageOffset	UInt32	4936
	52	nextPktPos	UInt32	Varies

	Byte	Field	Type	Value
	56	startBoundary	int64	Varies
	64	endBoundary	int64	Varies
Dynamic	72	APID List	IngSmdCommon_ApidDetailType [2]	Varies
	136	Pkt Tracker List	IngSmdCommon_PktTrackerType [200]	Varies
	4936	AP storage area	UInt8[1398800]	Varies
File Size	1,403,736 Bytes			

4.4 CERES Diagnostic RDR

4.4.1 CERES Diagnostic RDR HDF5 Files

The CERES Diagnostic RDR HDF5 files are described in Section 2.0, Raw Data Records HDF5 Details.

4.4.2 CERES Diagnostic RDR Data Content Summary

Table 4.4.2-1, S-NPP CERES Diagnostic RDR Application Packets, lists the APs accumulated for the S-NPP CERES Diagnostic RDR. Table 4.4.2-2, JPSS-1 CERES Diagnostic RDR Application Packets, lists the APs accumulated for the JPSS-1 CERES Diagnostic RDR. In the event of a discrepancy in APIDs listed here, see the MDFCB, GSFC 429-05-02-42 for S-NPP or 472-00251 for JPSS-1.

Table: 4.4.2-1 S-NPP CERES Diagnostic RDR Application Packets

APID Short Name	Description	Value APID ₁₀
DIA	Diagnostic	150

Table: 4.4.2-2 JPSS-1 CERES Diagnostic RDR Application Packets

APID Short Name	Description	Value APID ₁₀
DIA	Diagnostic	150

Table 4.4.2-3, S-NPP CERES Diagnostic RDR Structure, shows the layout and static contents of the S-NPP CERES Diagnostic RDR. Table 4.4.2-4, JPSS-1 CERES Diagnostic RDR Structure, shows the layout and static contents of the JPSS-1 CERES Diagnostic RDR.

Table: 4.4.2-3 S-NPP CERES Diagnostic RDR Structure

	Byte	Field	Type	Value
Static Header	0	satellite	char[4]	'NPP'
	4	sensor	char[16]	'CERES'
	20	typeID	char[16]	'DIAGNOSTIC'
	36	numAPIDs	UInt32	1
	40	apidListOffset	UInt32	72
	44	pktTrackerOffset	UInt32	104
	48	apStorageOffset	UInt32	2504

	Byte	Field	Type	Value
	52	nextPktPos	UInt32	Varies
	56	startBoundary	int64	Varies
	64	endBoundary	int64	Varies
Dynamic	72	APID List	IngSmdCommon_ApidDetailType[1]	Varies
	104	Pkt Tracker List	IngSmdCommon_PktTrackerType[100]	Varies
	2504	AP storage area	UInt8[699400]	Varies
File Size	701,904 Bytes			

Table: 4.4.2-4 JPSS-1 CERES Diagnostic RDR Structure

	Byte	Field	Type	Value
Static Header	0	satellite	char[4]	'J01'
	4	sensor	char[16]	'CERES'
	20	typeID	char[16]	'DIAGNOSTIC'
	36	numAPIDs	UInt32	1
	40	apidListOffset	UInt32	72
	44	pktTrackerOffset	UInt32	104
	48	apStorageOffset	UInt32	2504
	52	nextPktPos	UInt32	Varies
	56	startBoundary	int64	Varies
	64	endBoundary	int64	Varies
Dynamic	72	APID List	IngSmdCommon_ApidDetailType[1]	Varies
	104	Pkt Tracker List	IngSmdCommon_PktTrackerType[100]	Varies
	2504	AP storage area	UInt8[699400]	Varies
File Size	701,904 Bytes			

4.5 CERES Telemetry RDR

4.5.1 CERES Telemetry RDR HDF5 Files

The CERES Telemetry RDR HDF5 files are described in Section 3.1, Raw Data Records HDF5 Details.

4.5.2 CERES Telemetry RDR Data Content Summary

Table 4.5.2-1, S-NPP CERES Telemetry RDR Application Packets, lists the APs accumulated for the S-NPP CERES Telemetry RDR. Table 4.5.2-2, JPSS-1 CERES Telemetry RDR Application Packets, lists the APs accumulated for the JPSS-1 CERES Telemetry RDR. In the event of a discrepancy in APIDs listed here, see the MDFCB, GSFC 429-05-02-42 for S-NPP or 472-00251 for JPSS-1.

Table: 4.5.2-1 S-NPP CERES Telemetry RDR Application Packets

APID Short Name	Description	Value APID ₁₀
HK	Housekeeping Telemetry	146

Table: 4.5.2-2 JPSS-1 CERES Telemetry RDR Application Packets

APID Short Name	Description	Value APID ₁₀
HK	Housekeeping Telemetry	146

Table 4.5.2-3, S-NPP CERES Telemetry RDR Structure, shows the layout and static contents of the CERES Telemetry RDR. Table 4.5.2-4, JPSS-1 CERES Telemetry RDR Structure, shows the layout and static contents of the JPSS-1 CERES Telemetry RDR.

Table: 4.5.2-3 S-NPP CERES Telemetry RDR Structure

	Byte	Field	Type	Value
Static Header	0	satellite	char[4]	'NPP'
	4	sensor	char[16]	'CERES'
	20	typeID	char[16]	'TELEMETRY'
	36	numAPIDs	UInt32	1
	40	apidListOffset	UInt32	72
	44	pktTrackerOffset	UInt32	104
	48	apStorageOffset	UInt32	2504
	52	nextPktPos	UInt32	Varies
	56	startBoundary	int64	Varies
	64	endBoundary	int64	Varies
Dynamic	72	APID List	IngSmdCommon_ApidDetailType[1]	Varies
	104	Pkt Tracker List	IngSmdCommon_PktTrackerType[100]	Varies
	2504	AP storage area	UInt8[25600]	Varies
File Size	28,104 Bytes			

Table: 4.5.2-4 S-NPP CERES Telemetry RDR Structure

	Byte	Field	Type	Value
Static Header	0	satellite	char[4]	'J01'
	4	sensor	char[16]	'CERES'
	20	typeID	char[16]	'TELEMETRY'
	36	numAPIDs	UInt32	1
	40	apidListOffset	UInt32	72
	44	pktTrackerOffset	UInt32	104
	48	apStorageOffset	UInt32	2504
	52	nextPktPos	UInt32	Varies
	56	startBoundary	int64	Varies
	64	endBoundary	int64	Varies
Dynamic	72	APID List	IngSmdCommon_ApidDetailType[1]	Varies
	104	Pkt Tracker List	IngSmdCommon_PktTrackerType[100]	Varies

	Byte	Field	Type	Value
	2504	AP storage area	UInt8[25600]	Varies
File Size	28,104 Bytes			

5 TEMPERATURE DATA RECORDS (TDRS)

Not Applicable

6 SENSOR DATA RECORDS (SDRS)

Not Applicable

7 LOOK-UP TABLES AND PROCESSING COEFFICIENT TABLES

7.1 Look-Up Tables

Algorithm Look-up Table (LUT) files contain tables of pre-computed values used in lieu of real-time algorithm computations to reduce processing resource demands. Table values are typically the result of RTM executions and other environmental model simulations. These data generally cover broad, multi-dimensional parameter spaces which are unique to each algorithm.

7.1.1 CERES RDR LUTs

The CERES RDR currently uses no LUTs.

7.2 Processing Coefficient Tables

The S-NPP/JPSS-1 ground system data product generation subsystem uses Processing Coefficient Table (PCT) file parameters. PCT files can be either Automated or Manual coefficient tables. Within the Manual table type are two coefficient classes: Initial and Ephemeral. Sections below describe all three and any tables of that type for the product.

7.2.1 Automated Processing Coefficients

Automated Processing Coefficient (PC) files contain parameters updated and/or created during the processing of the S-NPP/JPSS Data Products by the processing algorithms. The processing environment subsequently uses these files without human review of their contents. Files can be used immediately after creation or in future processing such as the next granule in the production data stream processing.

7.2.1.1 CERES RDR Automated PCs

The CERES RDR currently uses no Automated PCs.

7.2.2 Manual Processing Coefficients

Manual Processing Coefficient (PC) files contain parameters used for S-NPP/JPSS Data Product generation which require human review prior to operational processing environment insertion. Manual Processing Coefficients have two classes:

- Initialization PCTs contain infrequently updated initial parameters sets S-NPP/JPSS uses for data product generation.
- Ephemeral PCTs contain frequently updated parameters sets S-NPP/JPSS uses for data product generation.

7.2.2.1 CERES RDR Initialization PCs

The CERES RDR currently uses no Initialization PCs.

7.2.2.2 CERES Ephemeral PCs

The CERES RDR currently uses no Ephemeral PCs.

8 INTERMEDIATE PRODUCTS (IPS)

Not Applicable

Appendix A. Data Mnemonic to Interface Mapping

For a complete list of Data Mnemonic to Interface Mapping, see 474-00001-01, JPSS CDFCB-X Vol I. The CDFCB contains Data Mnemonics, Identifiers, Collection Short Names, Interface Documents, and Collection Long Names for each JPSS Data Product and for Geolocation data.

Appendix B. Common RDR Static Header Values

Common RDR Static Header Values lists pre-defined unique values for the fields from the static header for each of the RDRs defined.

Table: B-11 Common RDR Static Header

RDR Name	Sensor	TypeID	NumAPIDs
CERES Science	CERES	SCIENCE	2
CERES Diagnostic	CERES	DIAGNOSTIC	1
CERES Telemetry	CERES	TELEMETRY	1

Appendix C. DQTT Quality Flag Mapping

Not Applicable

Appendix D. Abbreviations and Acronyms

See is 470-00041 JPSS Program Lexicon for abbreviations and acronyms.

Attachment A. XML Formats for Related Products

Table: ATT-1-1 XML Formats for Related Products

File Number	XML Filename
N/A	