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Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Common Geolocation and Spacecraft Orientation

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Goddard Space Flight Center Greenbelt, Maryland

Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Common Geolocation and Spacecraft Orientation

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Preface

This document is under JPSS Ground Segment 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:

JPSS Configuration Management Office
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Change History Log

Revision	Effective Date	Description of Changes (Reference the CCR & CCB/ERB Approve Date)	Sections Affected
0200-	Aug. 29, 2013	This version incorporates 474-CCR-13-1193 which was approved by JPSS Ground ERB on the effective date shown.	All
0200A	Jan 30, 2014	This version incorporates 474-CCR-13-1403 which was approved by JPSS Ground ERB on the effective date shown.	All
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0200B1	Sep 04, 2015	This version incorporates 474-CCR-15-2605 which was approved by the JPSS Ground ERB for C014 on the effective date shown.	All
0200C	Jul 28, 2015	This version incorporates 474-CCR-14-2288 and 474-CCR-15-2506 which was approved by the JPSS Ground ERB on the effective date shown.	All
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0200E	Jun 07, 2016	This version incorporates 474-CCR-16-2939 which was approved by the JPSS Ground ERB on the effective date shown.	All
0200F	Aug 03, 2017	This version incorporates 474-CCR-17-3459 which was approved by the JPSS Ground ERB on the effective date shown.	All
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Revision	Effective Date	Description of Changes (Reference the CCR & CCB/ERB Approve Date)	Sections Affected
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K	Mar 31, 2022	This version incorporates 474-CCR-22-5844 which was approved by the JPSS Ground ERB on Mar 22, 2022 and by the JPSS Ground Segment CCB on the effective date shown.	All
L	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

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1 INTRODUCTION

1.1 Scope

The Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Common Geolocation and Spacecraft Orientation contains the specification for the format of the Spacecraft Raw Data Records (RDRs) that are used to determine geolocation and spacecraft orientation information. 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 Raw Data Records (RDRs) associated with this algorithm grouping.
Section 5	Provides a description of the contents of each JPSS Temperature Data Records (TDRs) associated with this algorithm grouping.
Section 6	Provides a description of the Sensor Data Records (SDRs).
Section 7	Provides a description of relevant Look-Up Tables (LUTs) and Processing Coefficient Tables (PCTs) associated with this algorithm grouping.
Section 8	Provides a description of the contents of each JPSS Intermediate Products (IPs) associated with this algorithm grouping.
Appendix A	Provides the Data Mnemonic to Interface Mapping for the data products in this volume.
Appendix B	Provides the list of Common RDR Static Header Values.
Appendix C	Provides the 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	Acronyms/Glossary. Reference 470-00041, JPSS Program Lexicon
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
474-00448-01-08	JPSS Algorithm Specification Volume I: Software Requirements Specification (SRS) for the Common Geolocation and Spacecraft Orientation

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 (1 .. n)). A granule is a general term used to describe the minimum quanta of data collected per processing period, generally on the order of tens 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.

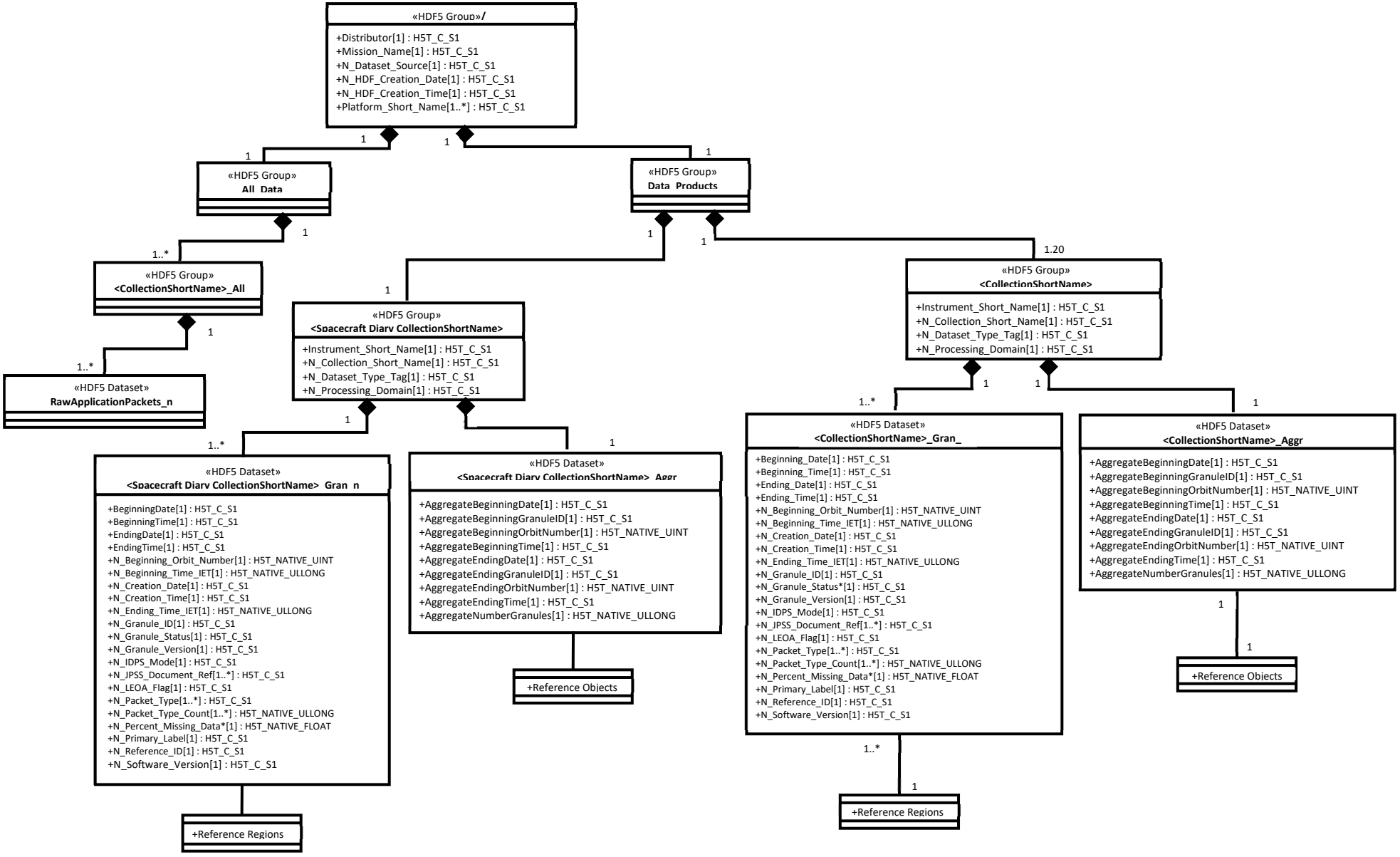

Figure: 3.1-1 Science and Diagnostic RDR Generalized UML Diagram

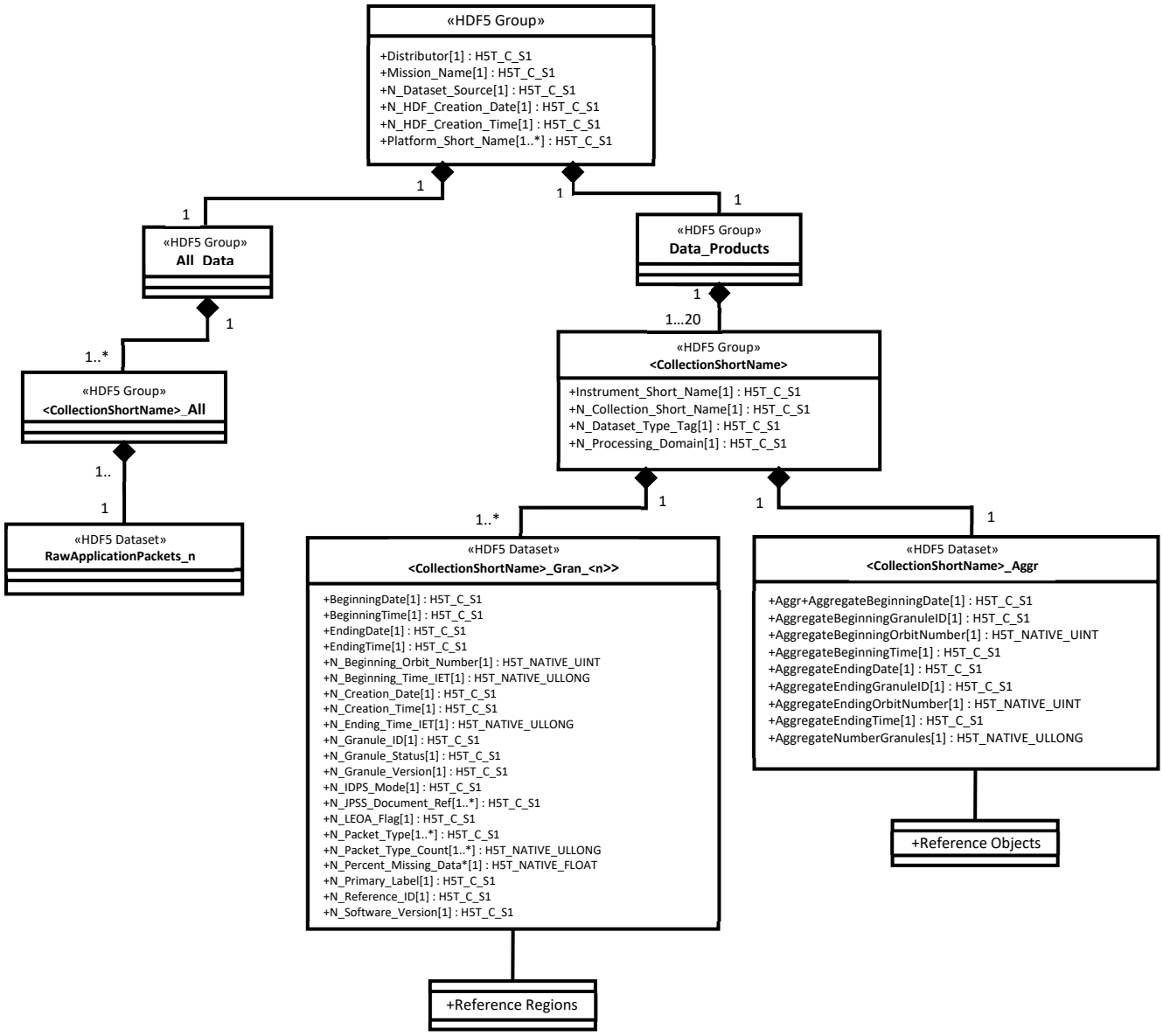

Figure: 3.1-2 Dwell, Dump, Telemetry, and Spacecraft Diary (when requested separately) RDR Generalized UML Diagram

3.2 RDR Spacecraft Ephemeris and Attitude Data

Figure 3.2-1, Science and Diagnostic HDF5 RDR files contain Spacecraft Ephemeris and Attitude application packets (AP) that occur for the same period of time as the requested datasets included in the file. This data is contained in the Spacecraft Diary Group (CollectionShortName) of the HDF5 file.

The period of the Spacecraft Ephemeris and Attitude granules is not likely to coincide with the period of the RDR product dataset granules. However, the aggregation of Spacecraft Ephemeris

and Attitude granules contains all of the APs collected during the aggregation period of the RDR product dataset. If the collection frequency for a given RDR product granule is less than the collection frequency for the Spacecraft Ephemeris and Attitude granule, then the co-temporal Spacecraft Ephemeris and Attitude granules are included in the HDF5 file in order to ensure overlapping time coverage. The time span of Ephemeris and Attitude granules is always greater than or equal to the time span of the RDR data. For example, Figure 3.1-1, Spacecraft Ephemeris and Attitude Delivery Timeline, shows a general example where a sensor granule timespan is much greater than the associated Spacecraft Ephemeris and Attitude granules. In this example, if Sensor granule *X* was requested for delivery, the resulting HDF5 file would include Spacecraft Ephemeris and Attitude granules *a*, *b*, *c*, and *d*. Likewise, Sensor granule *Y* would be accompanied by Spacecraft Ephemeris and Attitude granules *d*, *e*, *f*, and *g*.

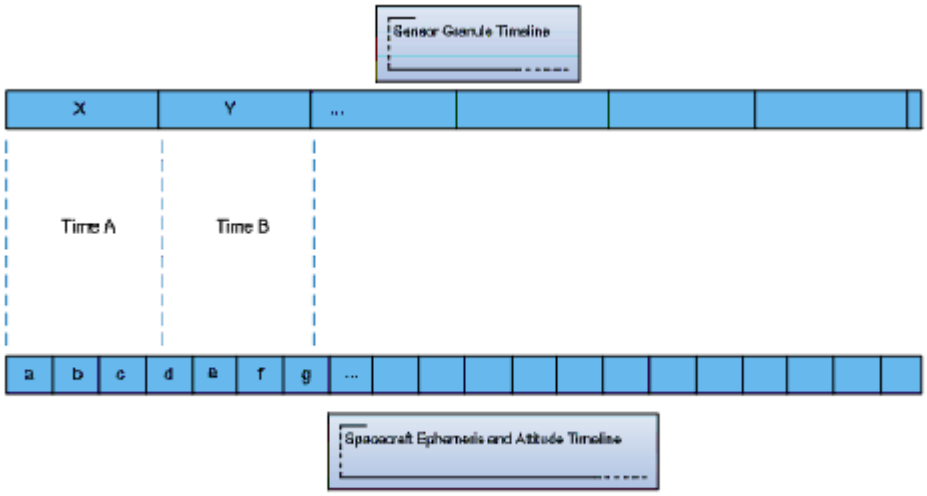

Figure: 3.2-1 Spacecraft Ephemeris and Attitude Delivery Timeline

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.

In addition, to the common "structured" RDR format detailed below, RDRs for some missions are identified as "unstructured". This means that each binary RDR only contains a buffer of APs (effectively the AP Storage Area only from structured RDRs). These RDRs will contain the standard RDR metadata and will follow the HDF format for Dump, Dwell and Telemetry. RDRs in this volume are "structured" except where specifically noted otherwise.

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 472-00717 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 Structures

Field Name	Description
Static Header	Static header describing the RDR
APID List	Array of structures that contain 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

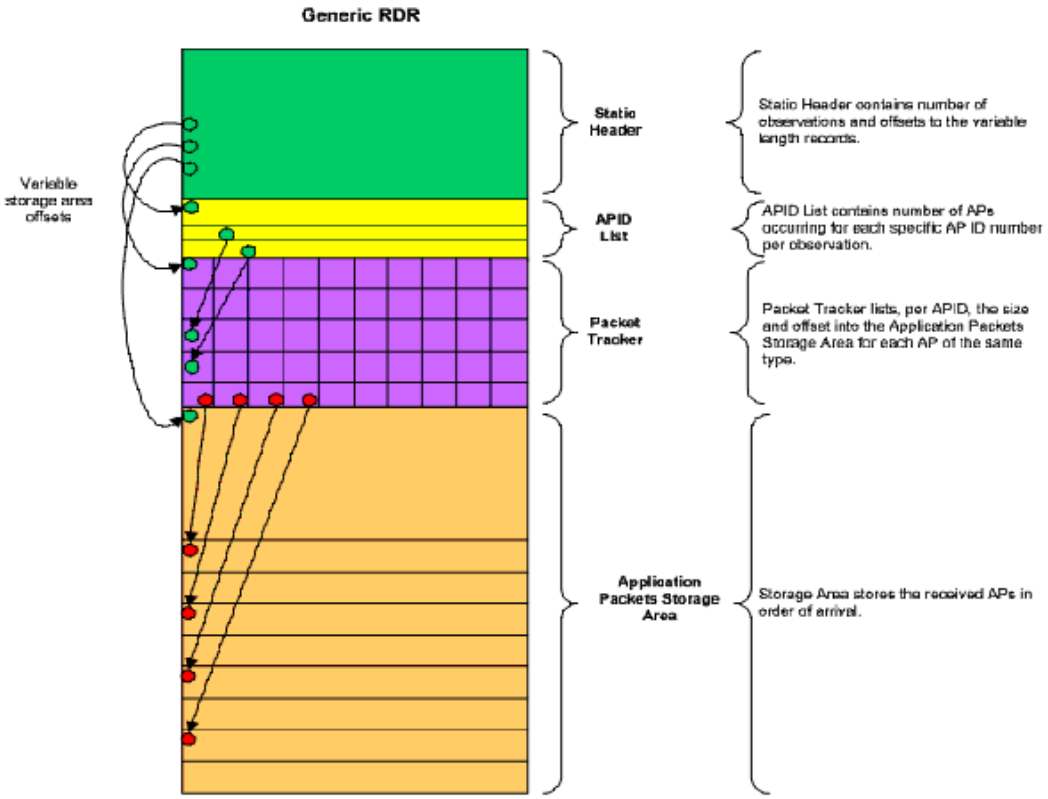

Figure: 4-1 Common RDR Layout

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	Each RDR has a single RDR Static Header and a dynamic Application Packet content area with three major entries: 1) APID List, 2) Packet Tracker List, and 3) Application Packet Storage Area.

	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. Tables 4.1-2, 4.1-3, and 4.1-4 define the Dynamic Application Packet content area. Table 4.1-2, RDR Packet Tracker provides information about individual APs. Table 4.1-3, Application Packet Storage Area, describes the storage area containing the APs. Table 4.1-4, Application Packet Tables, provides explanations of the fields given for each RDR described in the following sections.

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	DataType	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 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

Field Name	DataType	Description
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 Packet Tracker provides information about individual APs.

Table: 4.1-2 RDR Packet Tracker

Field Name	DataType	Description
obsTime	int64	The IET observation time of the AP as derived from the CCSDS Secondary Header of the AP or associated with the segmented group of the APID.
sequenceNumber	int32	The 14 bit sequence number extracted from the Primary Header's Packet Sequence Control word of the AP. This is used to track segmented packets and their location.
size	int32	The AP size in bytes as received
offset	int32	The AP begins at this offset from the beginning of the AP Storage Area. From the beginning of the RDR, the AP is at "offset" + apStorageOffset. (offset = -1 for packets not received).
fillPercent	int32	Percentage of fill data included in the AP. Based on the received and expected bytes per AP with valid values being 0-100% reported to the nearest %. Any AP with fill data (even one byte) will be reported with at least 1% fill data. Under normal conditions the value is 0. If the primary AP header indicates a secondary AP header is present, and the time code of the secondary AP header is fill, the AP is not made available. In the event that an AP is repaired, resulting in less fillPercent, a repaired RDR granule may be produced. See JPSS CDFCB-X, Vol. 1, Section 3.5.7 for more information on Repair Granules.

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

Table: 4.1-3 Application Packet Storage Area

Field Name	DataType	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.

Table: 4.1-4 Application Packet Tables

APID Short Name	Description
Short name of this Application Packet as an upper-case string	Brief description of this application packet

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
  - Find desired AP type using name field
  - Get pktTrackerStartIndex
  - Get pktsReserved
- Loop over the elements in Packet Tracker array starting at pktTrackerStartIndex
  - Get offset (if -1 stop processing no packet received)
  - Get size
  - Access the AP by adding the offset to the apStorageOffset value found in the Static Header
  - Extract size (the AP size in bytes) from the AP Storage Area
  - 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.

4.1.1 Geolocation and Spacecraft Orientation RDR Overview

The JPSS-1 RDR is an accumulation of binary data generated by sensors on board the S-NPP and JPSS-1 spacecraft and assembled into groups called application packets (APs). Unique Application Packet Identifier (APID) numbers represent each discrete AP type. The JPSS-1 ground software collects one or more groups of related APs together into granules which are then assembled into common RDR structures and combined with metadata to create the delivered HDF5 file. The APs are accumulated per discrete period and a granule refers to the data accumulated and organized for that discrete period. The APs are logically grouped into science,

diagnostic, dwell, dump, and telemetry RDRs. A science RDR data product generally contains all the necessary APs to construct a Sensor Data Record (SDR). Diagnostic, dwell, and dump RDRs generally contain APs that are only generated while the sensor is in diagnostic mode. Telemetry RDRs generally contain APs that describe the health and status of the sensor or spacecraft. This document shows the structure of the collection of APs that compose individual RDRs and the HDF5 structure for RDRs. Figure 4.1.1-1, RDR HDF5 File Model, shows the reference hierarchy for RDR contents.

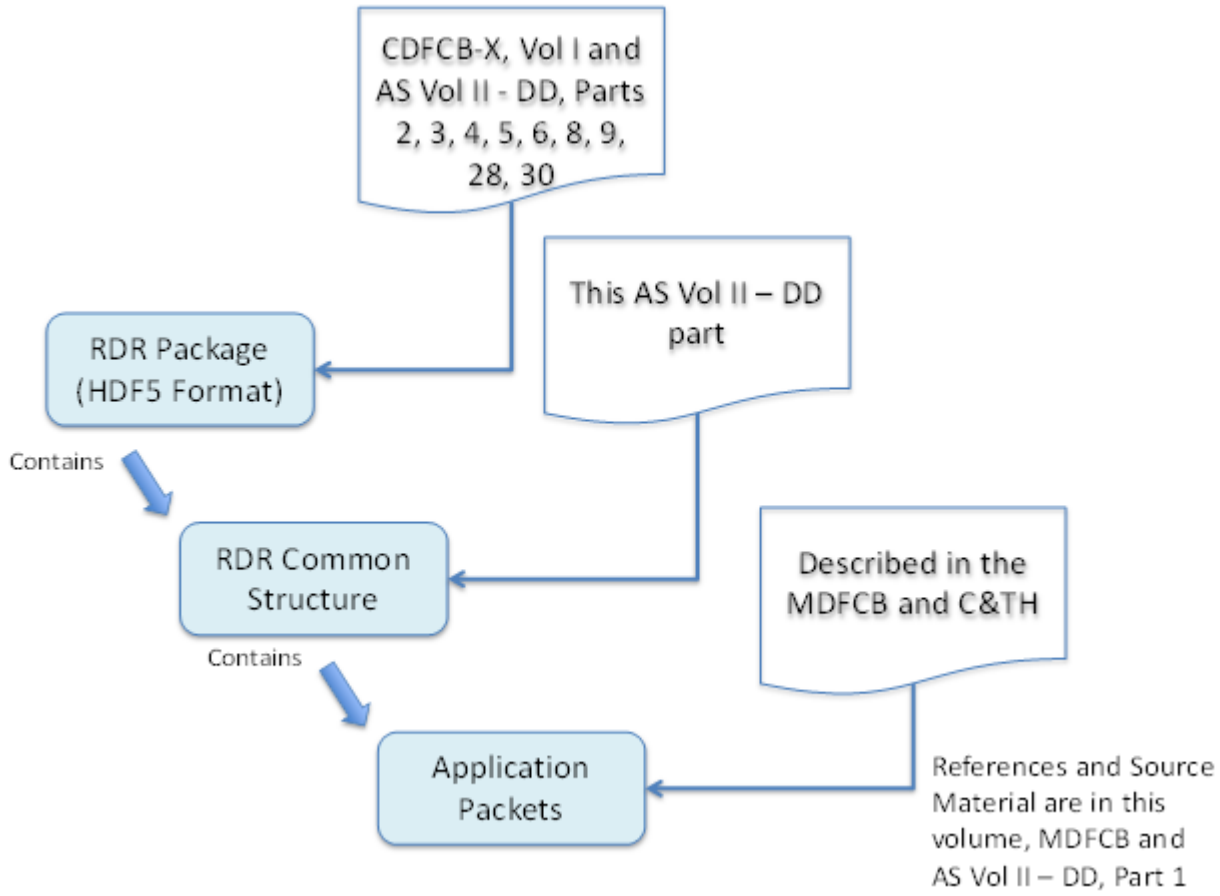

Figure: 4.1.1-1 RDR HDF5 File Model

4.2 S-NPP Spacecraft RDRs

Data Mnemonic	Telemetry: RDRE-SCTP-C0031 Attitude/Ephemeris: RDRE-SCAE-C0030
Description/ Purpose	The S-NPP Spacecraft produces several application packets on VCID 0 which are related to spacecraft health and status. These Application packets are grouped into the S-NPP Spacecraft Telemetry RDR. The S-NPP Spacecraft produces several application packets on VCID 0 which are related to spacecraft Ephemeris and Attitude. These Application packets are grouped into the S-NPP Ephemeris and Attitude RDR.

File-Naming Construct	See the JPSS CDFCB-X Vol. I, Section 3.0 for details
File Size	Telemetry: See Table 4.2.1.2-2 S-NPP Spacecraft Telemetry RDR for size Attitude/Ephemeris: See Table: 4.2.3-2 S-NPP RDR Spacecraft Ephemeris and Attitude RDR Structure for size
File Format Type	HDF5
Data Content and Data Format	Section 4.2.1 describes the S-NPP Spacecraft Telemetry RDR Section 4.2.2 describes the S-NPP Attitude/Ephemeris RDR

4.2.1 S-NPP Spacecraft Telemetry RDR

4.2.1.1 S-NPP Spacecraft Telemetry RDR HDF5 Files

The S-NPP Spacecraft Telemetry RDR HDF5 files are described in Section 3.0, Raw Data Records HDF5 Details.

4.2.1.2 S-NPP Spacecraft Telemetry RDR Data Content Summary

Table 4.2.1.2-1, S-NPP Spacecraft Telemetry RDR Application Packets, lists the APs accumulated for the S-NPP Spacecraft Telemetry RDR. In the event of a discrepancy in APIDs listed here, see the S-NPP C&TH, BATC Drawing 568423. Note: Spacecraft generated APIDs are in the range 0 to 99, however, only the APIDs that are currently described in the C&TH are included here. Additional APIDs may be added with subsequent revisions of the S-NPP C&TH.

Table: 4.2.1.2-1 S-NPP Spacecraft Telemetry RDR Application Packets

APID Short Name	Description	Value $APID_{10}$
BUS_HR	Bus High Rate, 1 Hz	1
BUS_LR	Bus Low Rate, 1/16 Hz	2
BUS_DTU	Bus DTU	3
BUS_T	Bus Thermal	4
SSR	SSR 1553 Data	5
PUMA	PUMA 1553 Data	6
DSEP	DSEP 1553 Data - no Therm	7
ADCS_HKL	ADCS HSK - low rate	9
TOD	Time of Day Message	10
ADCS_DIA	ADCS Diagnostic	12
FSW_HKF	Bus FSW HSK - Fast	13
FSW_HKS	Bus FSW HSK - Slow	14
ST_HR	High Rate Star Tracker	16
FSW_DIA	FSW Diagnostic, #1	17
FSW_DIA2	FSW Diagnostic, #2	18
FW_DIA	1394 Diagnostic	19
ADCSDIAF	ADCS Diagnostic, Fast	20
ADCSDIAS	ADCS Diagnostic, Slow	21
FSW_DIA3	FSW Diagnostic	22

APID Short Name	Description	Value $APID_{10}$
FSW_DIA4	FSW Diagnostic	23
FSW_DIA5	FSW Diagnostic	24
PD_LR	PUMA and DSEP, Low Rate	25
DMP_SCCS	SCC FSW Short Table Dump	26
SMP_CDPS	CDP FSW Short Table Dump	27
DUMP_SCC	SCC Table Dump Packet	28
DUMP_CDP	CDP Table Dump Packet	29
SCC_SU	SCC FSW Startup and Kernel Frames	30
GYRO_HR	High Rate Gyro Data	65
FW_HK	1394 Housekeeping	70

Table 4.2.1.2-2, S-NPP Spacecraft Telemetry RDR Structure, shows the layout and static contents of the S-NPP Spacecraft Telemetry RDR.

Table: 4.2.1.2-2 S-NPP Spacecraft Telemetry RDR Structure

	Byte	Field	Type	Value
Static Header	0	satellite	char[4]	NPP
	4	sensor	char[16]	SPACECRAFT
	20	typeID	char[16]	TELEMETRY
	36	numAPIDs	Uint32	29
	40	apidListOffset	Uint32	72
	44	pktTrackerOffset	Uint32	1000
	48	apStorageOffset	Uint32	424864
	52	nextPktPos	Uint32	varies
	56	startBoundary	int64	varies
	64	endBoundary	int64	varies
Dynamic	72	APID List	IngSmdCommon_ApidDetailType [29]	varies
	1000	Pkt Tracker List	IngSmdCommon_PktTrackerType [17661]	varies
	424864	AP storage area	Uint8[5119369]	varies
File Size	5,552,644 Bytes			

4.2.2 S-NPP Spacecraft Ephemeris and Attitude RDR

4.2.2.1 S-NPP Spacecraft Ephemeris and Attitude RDR HDF5 Files

The S-NPP Spacecraft Ephemeris and Attitude RDR HDF5 files are described in Section 3.0, Raw Data Records HDF5 Details.

4.2.2.2 S-NPP Spacecraft Ephemeris and Attitude Data Content Summary

Table 4.2.3-1, S-NPP RDR Spacecraft Ephemeris and Attitude Application Packets, lists the APs accumulated for the Spacecraft Diary group; the APID assignment listed in this table applies

only to S-NPP. In the event of a discrepancy in the APIDs listed here, see the S-NPP C&TH, BATC Drawing 568423.

4.2.3 S-NPP RDR Spacecraft Ephemeris and Attitude Application Packets

Table: 4.2.3-1 S-NPP RDR Spacecraft Ephemeris and Attitude Application Packets

APID Short Name	Description	Value $APID_{10}$
CRITICAL	Bus Critical Telemetry	0
ADCS_HKH	ADCS Housekeeping Telemetry High Rate	8
DIARY	Diary (Ephemeris and Attitude)	11

The sampling frequencies of the S-NPP Ephemeris and Attitude data contained in the Spacecraft Ephemeris and Attitude granules are both 1.0 Hz. For more information, see SER-SW062, FSW Table Description, CDP Table 20.

Table 4.2.3-2, S-NPP RDR Spacecraft Ephemeris and Attitude RDR Structure, shows the layout and static contents of the S-NPP Spacecraft Ephemeris and Attitude RDR.

Table: 4.2.3-2 S-NPP Spacecraft Ephemeris and Attitude RDR Structure

	Byte	Field	Type	Value
Static Header	0	satellite	char[4]	NPP
	4	sensor	char[16]	SPACECRAFT
	20	typeID	char[16]	DIARY
	36	numAPIDs	Uint32	3
	40	apidListOffset	Uint32	72
	44	pktTrackerOffset	Uint32	168
	48	apStorageOffset	Uint32	1680
	52	nextPktPos	Uint32	varies
	56	startBoundary	int64	varies
	64	endBoundary	int64	varies
Dynamic	72	APID List	IngSmdCommon_ApidDetailType[3]	varies
	168	Pkt Tracker List	IngSmdCommon_PktTrackerType[63]	varies
	1680	AP storage area	Uint8[13293]	varies
File Size	14,973 Bytes			

4.3 JPSS-1 Spacecraft RDRs

Data Mnemonic	Telemetry: RDRE-SCTN-C0040 Attitude/Ephemeris: RDRE-SCAE-C0040
Description/ Purpose	The JPSS-1 Spacecraft produce several application packets which are related to spacecraft health and status. These Application packets are grouped into the JPSS-1 Spacecraft Telemetry RDR.

	The JPSS-1 Spacecraft produces several application packets which are related to Ephemeris and Attitude. These Application packets are grouped into the JPSS-1 Ephemeris and Attitude RDR.
File-Naming Construct	See the JPSS CDFCB-X Vol. I, Section 3.0 for details
File Size	Telemetry: See Table 4.3.1.2-2 JPSS-1 Spacecraft Telemetry RDR Data Content Summary for size Attitude/Ephemeris: See Table 4.3.2.2-2 JPSS-1 Spacecraft Ephemeris and Attitude RDR for size
File Format Type	HDF5
Data Content and Data Format	Section 4.3.1 describes the JPSS-1 Spacecraft Telemetry RDR Section 4.3.2 describes the JPSS-1 Attitude/Ephemeris RDR

4.3.1 JPSS-1 Spacecraft Telemetry RDR

4.3.1.1 JPSS-1 Spacecraft Telemetry RDR HDF5 Files

The JPSS-1 Spacecraft Telemetry RDR HDF5 files are described in Section 3.0, Raw Data Records HDF5 Details.

4.3.1.2 JPSS-1 Spacecraft Telemetry RDR Data Content Summary

Table 4.3.1.2-1, JPSS-1 Spacecraft Telemetry RDR Data Content Summary, lists the APs accumulated for the JPSS-1 Spacecraft Telemetry RDR. The APID assignment listed in Table 4.3.2.2-1, JPSS-1 Spacecraft Telemetry RDR Application Packets, applies to JPSS-1 only. In the event of a discrepancy in APIDs listed here, see the JPSS Mission Data Format Control Book (MDFCB) - JPSS-1 (472-00251).

Table: 4.3.1.2-1 JPSS-1 Spacecraft Telemetry RDR Data Content Summary

APID Short Name	Description	Value $APID_{10}$
BUS_HR	Critical - Fast	1
BUS_LR	Critical - Slow	2
BUS_DTU	Remaining DTU (no ADCS)	3
BUS_T	Thermal	4
SSR	SSR Telemetry	5
PCDU1	PCDU Overcurrent Limits	6
PCDU2	PCDU Telemetry (except OC Limits)	7
ADCS_HKL	ADCS Housekeeping, Slow	9
TOD	Time of Day (TOD) Message	10
BUS_4K	Critical - 4K Packet	12
FSW_HKF	Bus FSW HSK - Fast	13
FSW_HKS	Bus FSW HSK - Slow	14
ST_L	1 Sample of Star Tracker Data	15
ST_HR	10 Hz Star Tracker Data	16
ADCSDIAF	ADCS Diagnostic, Fast	20

APID Short Name	Description	Value $APID_{10}$
FSW_DIA3	FSW Diagnostic	22
DMP_SCPS	SCP FSW Short Table Dump	26
DMP_CDPS	CDP FSW Short Table Dump	27
DUMP_SCP	SCP Long Table Dump Packet	28
DUMP_CDP	CDP Long Table Dump Packet	29
IRCGC	Instrument Received Counts and Gap Counts	51
SPW	Spacewire Telemetry	52
PWR	Power Telemetry	55
GYRO_HR	50Hz Gyro Data	65
FQT	FQT Packet	87
LP_F	Launch Packet - Fast	88
LP_S	Launch Packet - Slow	89
DD_MGNG	Duplicate Data - Maneuver Go/No-Go	98

Table: 4.3.1.2-2 JPSS-1 Spacecraft Telemetry RDR Structure

	Byte	Field	Type	Value
Static Header	0	satellite	char[4]	J01
	4	sensor	char[16]	SPACECRAFT
	20	typeID	char[16]	TELEMETRY
	36	numAPIDs	Uint32	28
	40	apidListOffset	Uint32	72
	44	pktTrackerOffset	Uint32	968
	48	apStorageOffset	Uint32	410216
	52	nextPktPos	Uint32	varies
	56	startBoundary	int64	varies
	64	endBoundary	int64	varies
Dynamic	72	APID List	IngSmdCommon_ApidDetailType[28]	varies
	968	Pkt Tracker List	IngSmdCommon_PktTrackerType[17052]	varies
	410216	AP storage area	Uint8[6660633]	varies
File Size	7,070,849 Bytes			

4.3.2 JPSS-1 Spacecraft Ephemeris and Attitude RDR

4.3.2.1 JPSS-1 Spacecraft Ephemeris and Attitude RDR HDF5 Files

The JPSS-1 Spacecraft Ephemeris and Attitude RDR HDF5 files are described in Section 3.0, Raw Data Records HDF5 Details.

4.3.2.2 JPSS-1 Spacecraft Ephemeris and Attitude Data Content Summary

Table 4.3.2.2-1, JPSS-1 RDR Spacecraft Ephemeris and Attitude Application Packets, lists the APs accumulated for the Spacecraft Diary group for JPSS-1. In the event of a discrepancy see the JPSS-1 MDFCB, 472-00251.

Table: 4.3.2.2-1 JPSS-1 RDR Spacecraft Ephemeris and Attitude Application Packets

APID Short Name	Description	Value $APID_{10}$
CRITICAL	Critical Telemetry	0
ADCS_HKH	ADCS Housekeeping, Fast	8
DIARY	Attitude/Ephemeris Message	11

The sampling frequencies of the JPSS-1 Ephemeris and Attitude data contained in the Spacecraft Ephemeris and Attitude granules are both 1.0 Hz; refer to the JPSS-1 MDFCB, 472-00251, for further details.

Table: 4.3.2.2-2 JPSS-1 Spacecraft Ephemeris and Attitude RDR Structure

	Byte	Field	Type	Value
Static Header	0	satellite	char[4]	J01
	4	sensor	char[16]	SPACECRAFT
	20	typeID	char[16]	DIARY
	36	numAPIDs	Uint32	3
	40	apidListOffset	Uint32	72
	44	pktTrackerOffset	Uint32	168
	48	apStorageOffset	Uint32	1680
	52	nextPktPos	Uint32	varies
	56	startBoundary	int64	varies
	64	endBoundary	int64	varies
Dynamic	72	APID List	IngSmdCommon_ApidDetailType[3]	varies
	168	Pkt Tracker List	IngSmdCommon_PktTrackerType[63]	varies
	1680	AP storage area	Uint8[13587]	varies
File Size	15,267 Bytes			

4.4 JPSS-2 Spacecraft RDRs

Data Mnemonic	Telemetry: RDRE-SCTN- C0050 Ephemeris and Attitude: RDRE-SCAE-C0050
Description/ Purpose	The JPSS-2 Spacecraft produce several application packets which are related to spacecraft health and status. These Application packets are grouped into the JPSS-2 Spacecraft Telemetry RDR. The JPSS-2 Spacecraft produces several application packets which are related to Ephemeris and Attitude. These Application packets are grouped into the JPSS-2 Ephemeris and Attitude RDR.

File-Naming Construct	See the JPSS CDFCB-X Vol. I, Section 3.0 for details.
File Size	Telemetry: See Table 4.4.1.2-2 JPSS-2 Spacecraft Telemetry RDR structure for size Attitude/Ephemeris: See Table 4.4.2.2-2 JPSS-2 Spacecraft Ephemeris and Attitude RDR structure for size
File Format Type	HDF5
Data Content and Data Format	See Section 4.4.1 JPSS-2 Spacecraft Telemetry RDR See Section 4.4.2 JPSS-2 Spacecraft Ephemeris and Attitude RDR

4.4.1 JPSS-2 Spacecraft Telemetry RDR

4.4.1.1 JPSS-2 Spacecraft Telemetry RDR HDF5 Files

The JPSS-2 Spacecraft Telemetry RDR HDF5 files are described in Section 3.0, Raw Data Records HDF5 Details.

4.4.1.2 JPSS-2 Spacecraft Telemetry RDR Data Content Summary

Table 4.4.1.2-1, JPSS-2 Spacecraft Telemetry RDR Application Packets, lists the APs accumulated for the JPSS-2 Spacecraft Telemetry RDR. The APID assignment listed in Table 4.4.1.2-1, JPSS-2 Spacecraft Telemetry RDR Application Packets, applies to JPSS-2 only. In the event of a discrepancy in APIDs listed here, see the JPSS-2 MDFCB, 472-00717.

Table: 4.4.1.2-1 JPSS-2 Spacecraft Telemetry RDR Application Packets

APID Short Name	Description	Value $APID_{10}$
FSW_10	FSW_HW_10HZ	23
FSW_2	FSW_HW_2HZ	24
FSW_1	FSW_HW_1HZ	25
FSW_1ST	FSW_HW_1HZFT_10HZST	26
ACS_1	ACS_1_HZ_SOH_01	31
ACS_2	ACS_1_HZ_SOH_02	32
ACS_3	ACS_1_HZ_SOH_03	33
ACS_4	ACS_1_HZ_SOH_04	34
ACS_5	ACS_1_HZ_SOH_05	35
ACS_6	ACS_1_HZ_SOH_06	36
ACS_8	ACS_1_HZ_SOH_08	38
ACS_9	ACS_1_HZ_SOH_09	39
ACS_10	ACS_1_HZ_SOH_10	40
FSW_RT1	FSW Real-Time Telemetry Subcom 1	50
FSW_RT2	FSW Real-Time Telemetry Subcom 2	51
FSW_RT3	FSW Real-Time Telemetry Subcom 3	52
FSW_RT4	FSW Real-Time Telemetry Subcom 4	53
FSW_RT5	FSW Real-Time Telemetry Subcom 5	54
FSW_RT6	FSW Real-Time Telemetry Subcom 6	55

APID Short Name	Description	Value $APID_{10}$
FSW_RT7	FSW Real-Time Telemetry Subcom 7	56
FSW_RT8	FSW Real-Time Telemetry Subcom 8	57
FSW_RT9	FSW Real-Time Telemetry Subcom 9	58
FSW_RT10	FSW Real-Time Telemetry Subcom 10	59
STE1_10	STE1_10HZ_HK	133
STE1_1	STE1_1HZ_HK	134
STE2_10	STE2_10HZ_HK	144
STE2_1	STE2_1HZ_HK	145
GPSA_PVT3	GPSA_GTM_NAV_PVT_DATA_3T	1688
GPSA_PVT4	GPSA_GTM_NAV_PVT_DATA_4T	1689
GPSB_PVT3	GPSB_GTM_NAV_PVT_DATA_3T	1888
GPSB_PVT4	GPSB_GTM_NAV_PVT_DATA_4T	1889

Table: 4.4.1.2-2 JPSS-2 Spacecraft Telemetry RDR Structure

	Byte	Field	Type	Value
Static Header	0	satellite	char[4]	J02
	4	sensor	char[16]	SPACECRAFT
	20	typeID	char[16]	TELEMETRY
	36	numAPIDs	Uint32	31
	40	apidListOffset	Uint32	72
	44	pktTrackerOffset	Uint32	1064
	48	apStorageOffset	Uint32	1,258,040
	52	nextPktPos	Uint32	Varies
	56	startBoundary	int64	Varies
	64	endBoundary	int64	Varies
Dynamic	72	APID List	IngSmdCommon_ApidDetailType [31]	Varies
	1064	Pkt Tracker List	IngSmdCommon_PktTrackerType [52,374]	Varies
	1,258,040	AP storage area	Uint8[12,231,156]	Varies
File Size	13,489,196 Bytes			

4.4.2 JPSS-2 Spacecraft Ephemeris and Attitude RDR

4.4.2.1 JPSS-2 Spacecraft Ephemeris and Attitude RDR HDF5 Files

The JPSS-2 Spacecraft Ephemeris and Attitude RDR HDF5 files are described in Section 3.0, Raw Data Records HDF5 Details.

4.4.2.2 JPSS-2 Spacecraft Ephemeris and Attitude Data Content Summary

Table 4.4.2.2-1, JPSS-2 RDR Spacecraft Ephemeris and Attitude Application Packets, lists the APs accumulated for the Spacecraft Diary group for JPSS-2. In the event of a discrepancy, see the JPSS-2 MDFCB, 472-00717.

Table: 4.4.2.2-1 JPSS-2 RDR Spacecraft Ephemeris and Attitude Application Packets

APID Short Name	Description	Value $APID_{10}$
CRITICAL	Critical Telemetry	30
ADCS_HKH	ADCS Housekeeping, Fast	37
DIARY	Attitude/Ephemeris Message	11

The sampling frequencies of the JPSS-2 Ephemeris and Attitude data contained in the Spacecraft Ephemeris and Attitude granules are both 10 Hz; refer to the JPSS-2 MDFCB, 472-00717, for further details.

Table: 4.4.2.2-2 JPSS-2 Spacecraft Ephemeris and Attitude RDR Structure

	Byte	Field	Type	Value
Static Header	0	satellite	char[4]	J02
	4	sensor	char[16]	SPACECRAFT
	20	typeID	char[16]	DIARY
	36	numAPIDs	Uint32	3
	40	apidListOffset	Uint32	72
	44	pktTrackerOffset	Uint32	168
	48	apStorageOffset	Uint32	10,752
	52	nextPktPos	Uint32	Varies
	56	startBoundary	int64	Varies
	64	endBoundary	int64	Varies
Dynamic	72	APID List	IngSmdCommon_ApidDetailType[3]	Varies
	168	Pkt Tracker List	IngSmdCommon_PktTrackerType[441]	Varies
	10,752	AP storage area	Uint8[122,892]	Varies
File Size	133,644 Bytes			

4.5 GCOM-W1 Spacecraft RDRs

Data Mnemonic (JPSS-1 Only)	System Telemetry: RDRE-SCGW-C0033 Real-time PCD: RDRE-SCGW-C0034 Attitude and Orbit: RDRE-SCGW-C0035
Description/ Purpose	The GCOM-W1 Spacecraft produces application packets related to spacecraft health and status. The three packet types are System Telemetry, Real-time PCD data, and Attitude and Orbit data. These are each received as contact files that are stored into individual unstructured RDRs.
File-Naming Construct	See the JPSS CDFCB-X Vol. I, Section 3.0 for details.
File Size	Variables due to contact periods
File Format Type	HDF5

Data Content and Data Format	Section 4.5.3 describes the GCOM-W1 System Telemetry RDR Section 4.5.4 describes the GCOM-W1 Real-time PCD RDR Section 4.5.5 describes the GCOM-W1 Attitude and Orbit RDR

4.5.1 DELETED

4.5.2 DELETED

4.5.3 GCOM-W1 System Telemetry RDR

4.5.3.1 GCOM-W1 System Telemetry RDR HDF5 Files

The GCOM-W1 System Telemetry RDR HDF5 files are described in Section 3.0, Raw Data Records HDF5 Details.

NOTE: It is formatted as an unstructured RDR.

4.5.3.2 GCOM-W1 System Telemetry RDR Data Content Summary

Table 4.5.3.2-1, GCOM-W1 System Telemetry RDR Application Packets, lists the APs accumulated for the GCOM-W1 System Telemetry RDR. The APID assignment listed in Table 4.5.3.2-1, GCOM-W1 System Telemetry RDR Application Packets, applies to GCOM-W only. In the event of a discrepancy in APIDs listed here or for details of the AP content, see the GCOM-W1 Mission Operations Interface Specification (MOIS), 474-REF-00145 (JAXA #: SGC-070078) and the JPSS GS Technical Exchange with JAXA for GCOM-W1, 474-REF-00111. In addition, for details about GPS data refer to the Global Positioning System Wing Systems Engineering & Integration Interface Specification, IS-GPS-200.

Table: 4.5.3.2-1 GCOM-W1 System Telemetry RDR Application Packets

APID Short Name	Description	Value $APID_{10}$
SYS_TELEMETRY	Housekeeping Telemetry	1281

4.5.4 GCOM-W1 Real-time PCD RDR

4.5.4.1 GCOM-W1 Real-time PCD RDR HDF5 Files

The GCOM-W1 Real-time PCD RDR HDF5 files are described in Section 3.0, Raw Data Records HDF5 Details.

NOTE: It is formatted as an unstructured RDR.

4.5.4.2 GCOM-W1 Real-time PCD RDR Data Content Summary

Table 4.5.4.2-1, GCOM-W1 Real-time PCD RDR Application Packets, lists the APs accumulated for the GCOM-W1 Real-time PCD RDR. The APID assignment listed in Table 4.5.4.2-1, GCOM-W1 Real-time PCD RDR Application Packets, applies to GCOM-W only. In the event of a discrepancy in APIDs listed here or for details of the AP content, see the GCOM-W1 Mission Operations Interface Specification (MOIS), 474-REF-00145 (JAXA #: SGC-070078) and the JPSS GS Technical Exchange with JAXA for GCOM-W1, 474-REF-00111. In

addition, for details about GPS data refer to the Global Positioning System Wing Systems Engineering & Integration Interface Specification, IS-GPS-200.

Table: 4.5.4.2-1 GCOM-W1 Real-time PCD RDR Application Packets

APID Short Name	Description	Value $APID_{10}$
RT_PCD_SUPP	Support Data	1550

4.5.5 GCOM-W1 Attitude/Orbit RDR

4.5.5.1 GCOM-W1 Attitude/Orbit RDR HDF5 Files

The GCOM-W1 Attitude/Orbit RDR HDF5 files are described in Section 3.0, Raw Data Records HDF5 Details.

NOTE: It is formatted as an unstructured RDR.

4.5.5.2 GCOM-W1 Attitude/Orbit RDR Data Content Summary

Table 4.5.5.2-1, GCOM-W1 Attitude/Orbit RDR Application Packets, lists the APs accumulated for the GCOM-W1 Attitude/Orbit RDR. The APID assignment listed in Table 4.5.5.2-1, GCOM-W1 Attitude/Orbit RDR Application Packets, applies to GCOM-W only. In the event of a discrepancy in APIDs listed here or for details of the AP content, see the GCOM-W1 Mission Operations Interface Specification (MOIS), 474-REF-00145 (JAXA #: SGC-070078) and the JPSS GS Technical Exchange with JAXA for GCOM-W1, 474-REF-00111. In addition, for details about GPS data refer to the Global Positioning System Wing Systems Engineering & Integration Interface Specification, IS-GPS-200.

Table: 4.5.5.2-1 GCOM-W1 Attitude/Orbit RDR Application Packets

APID Short Name	Description	Value $APID_{10}$
ATT_ORBIT	Orbit Data (Spacecraft Diary)	1549

4.6 GOSAT-GW Spacecraft RDRs

Data Mnemonic (GOSAT-GW Only)	System Telemetry: RDRE-SCGG-C0036 Attitude and Orbit: RDRE-SCGG-C0037
Description/ Purpose	The GOSAT-GW Spacecraft produces application packets related to spacecraft health and status. The three packet types are System Telemetry and Attitude and Orbit data. These are each received as contact files that are stored into individual unstructured RDRs.
File-Naming Construct	See the JPSS CDFCB-X Vol. I, Section 3.0 for details.
File Size	Variables due to contact periods
File Format Type	HDF5
Data Content and Data Format	Section 4.6.1 describes the GOSAT-GW System Telemetry RDR Section 4.6.2 describes the GOSAT-GW Attitude and Orbit RDR

4.6.1 GOSAT-GW System Telemetry RDR

4.6.1.1 GOSAT-GW System Telemetry RDR HDF5 Files

The GOSAT-GW System Telemetry RDR HDF5 files are described in Section 3.0, Raw Data Records HDF5 Details.

NOTE: It is formatted as an unstructured RDR.

4.6.1.2 GOSAT-GW System Telemetry RDR Data Content Summary

Table 4.6.1.2-1, GOSAT-GW System Telemetry RDR Application Packets, lists the APs accumulated for the GOSAT-GW System Telemetry RDR. The APID assignment listed in Table 4.6.1.2-1, GOSAT-GW System Telemetry RDR Application Packets, applies to GOSAT-GW only. In the event of a discrepancy in APIDs listed here or for details of the AP content, see the GOSAT-GW Mission Operations Interface Specification (MOIS), 474-REF-01794 (JAXA #: FTZ-190050. In addition, for details about GPS data refer to the Global Positioning System Wing Systems Engineering & Integration Interface Specification, IS-GPS-200.

Table: 4.6.1.2-1 GOSAT-GW System Telemetry RDR Application Packets

APID Short Name	Description	Value $APID_{10}$
OC_HK	Orbit Control Housekeeping	32
MDP_HK	Mission Data Processing Housekeeping	48
DM_HK	Data Management Housekeeping	128
AOCE_HK	Attitude Orbit Control Electronics Housekeeping	151
RIM_HK	Remote Interface Module Housekeeping	160
CDMS_HK	Cmd Data Management System Housekeeping	208

4.6.2 GOSAT-GW Attitude/Orbit RDR

4.6.2.1 GOSAT-GW Attitude/Orbit RDR HDF5 Files

The GOSAT- Attitude/Orbit RDR HDF5 files are described in Section 3.0, Raw Data Records HDF5 Details.

NOTE: It is formatted as an unstructured RDR.

4.6.2.2 GOSAT-GW Attitude/Orbit RDR Data Content Summary

Table 4.6.2.2-1, GOSAT-GW Attitude/Orbit RDR Application Packets, lists the APs accumulated for the GOSAT-GW Attitude/Orbit RDR. The APID assignment listed in Table 4.6.2.2-1, GOSAT-GW Attitude/Orbit RDR Application Packets, applies to GOSAT-GW only. In the event of a discrepancy in APIDs listed here or for details of the AP content, see the GOSAT-GW Mission Operations Interface Specification (MOIS), 474-REF-01794 (JAXA #: FTZ-190050). In addition, for details about GPS data refer to the Global Positioning System Wing Systems Engineering & Integration Interface Specification, IS-GPS-200.

Table: 4.6.2.2-1 GOSAT-GW Attitude/Orbit RDR Application Packets

APID Short Name	Description	Value $APID_{10}$
AOCE_GPS_PRO	Attitude/Orbit GPS	921

APID Short Name	Description	Value $APID_{10}$
AOCE_STT_ORB_PRO	Attitude/Orbit detail data	923
OC_OBS_X	Orbit Control detail data	1312

5 TEMPERATURE DATA RECORDS (TDRS)

Not Applicable

6 SENSOR DATA RECORDS (SDRS)

Not Applicable

7 LOOK-UP TABLES AND PROCESSING COEFFICIENT TABLES

The template used for these formats in this document is described below.

Data Mnemonic: This is a unique identifier. JPSS CDFCB-X Vol. I, 474-00001-01 describes the data mnemonic definition methodology.

Description/Purpose: A brief description of the data format and its purpose.

Instrument: Identification of the Instrument associated with the table.

File-Naming Construct: A description of the file-naming constructs for those data units that apply. JPSS CDFCB-X Vol. I, 474-00001-01 defines file-naming conventions.

File Size: The size of the data file.

File Format Type: The format type of the data file.

Production Frequency: Production frequency is the interval of time for data generation. A production frequency equal to dynamic implies that it is only as requested or as needed.

Data Format/Structure: This defines the actual data format. The definitions provide information for every data element in the data unit.

The following rules apply to all tables:

1. All field names mandatory, unless specified otherwise.
2. Fill data is specified, where applicable.
3. Strings are left-aligned and integers are right-aligned, unless specified otherwise.
4. For information regarding Coordinated Universal Time (UTC) and IDPS Epoch Time (IET) conventions, see the JPSS CDFCB-X Vol. I, 474-00001-01.
5. For all references of the ASCII Standard, the corresponding International Standards Organization (ISO) standard is ISO/IEC 10646. The specific Unicode is UTF8, unless stated otherwise.
6. The fields are presented in order (either top - down or most significant first), unless stated otherwise.

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 Geolocation and Spacecraft Orientation LUTs

Geolocation and Spacecraft Orientation currently use 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 Geolocation and Spacecraft Orientation Automated PCs

The Geolocation and Spacecraft Orientation currently use 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 Geolocation and Spacecraft Orientation Initialization PCs

Data Mnemonic	NP_NU-LM0233-215: Common Geolocation PC
Description/ Purpose	The COMMON GEO PARAM PC contains coefficients used in the common geolocation algorithm. This file is used in the Common Geolocation algorithm.
File-Naming Construct	See the File-Naming Convention for Auxiliary Data Formats, JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4. The Collection Short Name used in the filename is based on the table - see the JPSS CDFCB-X Vol. I, 474-00001-01, for the applicable Collection Short Names.
File Size	See Table 7.2.2.1-1 Common Geolocation Parameters PC Data Format for size
File Format Type	Little Endian Binary
Production Frequency	As needed

Data Content and Data Format	For details see Table 7.2.2.1-1, Common Geolocation Parameters PC Data Format

Table: 7.2.2.1-1 Common Geolocation Parameters PC Data Format

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
ang_mom_limit	16	64-bit floating point	5.3E10 - 5.44E10	Meters2 per second	Angular momentum magnitude absolute limits. 1 Dimensional Array: ANC_MIN_MAX_DIM Size of Dimension(s): 2
ang_mom_z_limit	16	64-bit floating point	-8.5E10 - -7.5E9	Meters2 per second	Angular momentum Z component absolute limits. 1 Dimensional Array: ANC_MIN_MAX_DIM Size of Dimension(s): 2
orbit_consistency	8	64-bit floating point	≤ 1000 m	Meters	Orbit position/velocity consistency limit - used to verify that the S/C velocity data can be used to compute the absolute value of the shift in S/C position between two E&A data points to within the consistency limit. The same limit applies to all vector components.
position_abs_limit	16	64-bit floating point	-7.25E6 to 7.25E6	Meters	Orbit position absolute limits -used to check that the position vector components are within the valid range. 1 Dimensional Array: ANC_MIN_MAX_DIM Size of Dimension(s): 2
position_mag_limit	16	64-bit floating point	7.0E6 to 7.5E6	Meters	Orbit position magnitude limits -used to check that the magnitude of the position vector is within the valid range. 1 Dimensional Array: ANC_MIN_MAX_DIM Size of Dimension(s): 2
velocity_abs_limit	16	64-bit floating point	-7.55E3 to 7.55E3	Meters per second	Orbit velocity absolute limits -used to check that the velocity vector components are within the valid range. 1 Dimensional Array: ANC_MIN_MAX_DIM Size of Dimension(s): 2

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
velocity_mag_limit	16	64-bit floating point	7.35E3 to 7.55E3	Meters per second	Orbit velocity magnitude limits -used to check that the magnitude of the velocity vector is within the valid range. 1 Dimensional Array: ANC_MIN_MAX_DIM Size of Dimension(s): 2
attitude_abs_limit	16	64-bit floating point	-1800.0 to 1800.0	Arcseconds	Attitude angle absolute limits. 1 Dimensional Array: ANC_MIN_MAX_DIM Size of Dimension(s): 2
File Size	120 Bytes				

7.2.2.2 Geolocation and Spacecraft Orientation Ephemeral PCT

Data Mnemonic	DP_NU-LM2020-006
Description/ Purpose	The Common Geolocation SAA PC provides tunable processing coefficients for use by the algorithm during execution. The coefficients can be modified (tuned) through a configuration control process in response to algorithm, performance, inputs, sensitivity, etc. changes.
File-Naming Construct	See the File-Naming Convention for Auxiliary Data Formats, JPSS CDFCB-X Vol. I, 474-00001-01, Section 3.4. The Collection Short Name used in the filename is based on the table - see the JPSS CDFCB-X Vol. I, 474-00001-01, Table B-1 for the applicable Collection Short Names.
File Size	See Table 7.2.2.2-1 Common Geolocation SAA PC Data Format for size
File Format Type	Little Endian Binary
Production Frequency	As needed
Data Content and Data Format	For details see 7.2.2.2-1 Common Geolocation SAA PC Data Format

Table: 7.2.2.2-1 Common Geolocation SAA PC Data Format

Field Name	Length (Bytes)	Data Type	Range of Values	Units	Comments
centerLat	8	64-bit floating point	-pi/2 - pi/2	Radians	Latitude of the center of the SAA (in radians, positive north)
centerLon	8	64-bit floating point	-pi - pi	Radians	Longitude of the center of the SAA (in radians, positive East)
maxIndex	8	64-bit floating point	0 - 100	Percent	Maximum index value produced by the function
latHeight	8	64-bit floating point	0 - pi/2	Radians	Latitude height of the SAA (in radians) equal to 1 standard deviation of the Gaussian distribution model.
lonWidth	8	64-bit floating point	0 - pi	Radians	Longitude width of the SAA (in radians) equal to 1 standard deviation of the Gaussian distribution model.
File Size	40 Bytes				

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

Table: B-1 Common RDR Static Header Values lists pre-defined unique values for the fields from the static header for each of the RDRs defined.

RDR Name	Sensor	TypeID	numAPIDs
S-NPP Spacecraft Telemetry	SPACECRAFT	TELEMETRY	29
S-NPP Ephemeris and Attitude	SPACECRAFT	DIARY	3
JPSS-1 Spacecraft Telemetry	SPACECRAFT	TELEMETRY	28
JPSS-1 Ephemeris and Attitude	SPACECRAFT	DIARY	3
JPSS-2 Spacecraft Telemetry	SPACECRAFT	TELEMETRY	31
JPSS-2 Ephemeris and Attitude	SPACECRAFT	DIARY	3

Appendix C. DQTT Quality Flag Mapping

Not Applicable

Appendix D. Abbreviations and Acronyms

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

Attachment A. XML Formats for Related Products

Table: ATT-1 XML Formats for Related Products

File Number	XML Filename
N/A	