

AVHRR 3 Level 1 Product Format Specification

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1 INTRODUCTION

1.1 Purpose and Scope

This document is the Advanced Very High Resolution Radiometer (AVHRR/3) Level 1 Product Format Specification.

The generic product format specification used by this document is defined in the EPS Generic Product Format Specification [AD-1] .

1.2 Structure of the Document

The document is organised in three sections, including the introduction:

Section 1	Describes the purpose of the document and the document structure.
Section 2	Details the product formats for Level 1a and 1b products.
Sections 3-4	Describe the instrument and level-specific records for Level 1a and 1b products.
Sections 6	Provides a history of version numbers for records defined within the document.
Appendix A	Provides links to detailed tables describing the record formats.

1.3 Applicable Documents

AD-1	EPS Generic Product Format Specification	EPS.GGS.SPE.96167
AD-2	EPS Ground Segment AVHRR/3 Level 1 Product Generation Specification	EPS.EPS.SYS.SPE.990004

1.4 Acronyms and Abbreviations Used in this Document

<i>Acronym</i>	<i>Meaning</i>
AMSU-A	Advanced Microwave Sounding Unit-A
AVHRR	Advanced Very High Resolution Radiometer
GAC	Global Area Coverage
GEADR	Global External Auxiliary Data Record
GIADR	Global Internal Auxiliary Data Record
MDR	Measurement Data Record
NEdT	Noise Equivalent Delta Temperature
VEADR	Variable External Auxiliary Data Records
VIADR	Variable Internal Auxiliary Data Records

2 FORMAT OF AVHRR/3 LEVEL 1 PRODUCTS

2.1 Overview

The product format for both AVHRR Level 1a and 1b products is based on the generic product format as described in [AD-1]. This document details the instrument- and level-specific additions required for AVHRR Level 1 products.

2.2 Generic Record Header Fields

All generic record header fields of the instrument/level specific records defined in this document shall have an INSTRUMENT_GROUP value of AVHRR [AD-1].

3 LEVEL 1A RECORDS

3.1 Secondary Product Header Record

The Level 1a SPHR is detailed in the Annex (0) to this document. It has a subclass ID value of 0.

3.1.1 SPHR Fields

3.1.1.1 SRC_DATA_QUAL

SRC_data_qual is a bit(16) that specifies which combination of auxiliary data is used for the scenes analysis. The following abbreviations are used in the specification:

- AMSU-A TCWV (AVHRR_L1_PGS_DAT_AMSUBT)
- NWP TCWV (AVHRR_L1_PGS_DAT_FORCWV)
- NWP T2M (AVHRR_L1_PGS_DAT_FORT2M)

The bits are set as follows:

<i>Bit</i>	<i>Meaning</i>
15 – 10	Not used
9	Availability of NWP T2M is changing during the dump
8	Availability of NWP TCWV is changing during the dump
7	Availability of AMSU-A TCWV is changing during the dump
6	NWP TCWV is missing
5	AMSU-A TCWV and NWP T2M are missing
4	AMSU-A TCWV and NWP TCWV are missing
3	AMSU-A TCWV is missing
2	NWP T2M is missing
1	NWP TCWV and NWP T2M are missing
0	AMSU-A TCWV, NWP TCWV, and NWP T2M are missing

Table 1: SRC_DATA_QUAL bit definitions

3.2 Global External Auxiliary Data Record

The global datasets that are used by the Level 1 PGF (described in [AD-2]) but not written into the product are referenced by GEADRs, as specified in [AD-1].

3.2.1 Record Subclasses

The following subclasses of GEADR are present for the AVHRR Level 1a product.

<i>Subclass</i>	<i>Description</i>	<i>Subclass ID</i>
AVHR_CAL	Calibration and configuration parameters	1

Table 2: GEADR Level 1a subclasses

3.3 Global Internal Auxiliary Data Record

There are two subclasses of GIADR for the Level 1a Product. These are detailed in the Annex (0) to this document.

3.3.1 Record Subclasses

Record subclass determines the type of auxiliary data referenced.

<i>Subclass</i>	<i>Description</i>	<i>Subclass ID</i>
GIADR-RADIANCE	PRT Temperature conversion factors, intercept, slope, and central wave number for the band correction for channels 3b, 4, and 5	1
GIADR-ANALOG	Analogue to digital conversion coefficients	2

Table 3: GIADR subclasses

3.3.2 GIADR Fields

3.3.2.1 RAMP_CALIBRATION_COEFFICIENT

<i>Bit</i>	<i>Meaning</i>
15 – 6	Not Used
5	Ramp non-linearity for GAC & Full Resolution ch 5
4	Ramp non-linearity for GAC and Full Resolution ch 4
3	Ramp non-linearity for GAC and Full Resolution ch 3b
2	Ramp non-linearity for GAC and Full Resolution ch 3a
1	Ramp non-linearity for GAC and Full Resolution ch 2
0	Ramp non-linearity for GAC and Full Resolution ch 1

Table 4: RAMP_CALIBRATION_COEFFICIENT bit definitions

3.3.2.2 PRIMARY_CALIBRATION_ALGORITHM_OPTION

<i>Bit</i>	<i>Meaning</i>
15	Not Used
14	Ch 5 resolution (0 = high; 1 = low)
13	Ch 5 substitution coefficients (0 = no; 1 = yes)
12-10	Not used
9	Ch 4 resolution (0 = high; 1 = low)
8	Ch 4 substitution coefficients (0 = no; 1 = yes)
7-5	Not used
4	Ch 3b resolution (0 = high; 1 = low)
3	Ch 3b substitution coefficients (0 = no; 1 = yes)
2-0	Not used

Table 5: PRIMARY_CALIBRATION_ALGORITHM_OPTION bit definitions

3.3.2.2.1 SECONDARY_CALIBRATION_ALGORITHM_OPTION

<i>Bit</i>	<i>Meaning</i>
15	Not Used
14	Ch 5 resolution (0 = high; 1 = low)
13	Ch 5 substitution coefficients (0 = no; 1 = yes)
12-10	Not used
9	Ch 4 resolution (0 = high; 1 = low)
8	Ch 4 substitution coefficients (0 = no; 1 = yes)
7-5	Not used
4	Ch 3b resolution (0 = high; 1 = low)
3	Ch 3b substitution coefficients (0 = no; 1 = yes)
2-0	Not used

Table 6: SECONDARY_CALIBRATION_ALGORITHM_OPTION bit definitions

3.4 Variable External Auxiliary Data Record

There are no VEADRs defined for the Level 1a product.

3.5 Variable Internal Auxiliary Data Record

There are no VIADRs defined for the Level 1a product.

3.6 Measurement Data Record

The MDRs for AVHRR Level 1 products contain data for either full resolution or GAC mode, dependent upon the product type. The MDR contains, per scan line, scene counts, calibration counts from cold space and warm target views, and other associated information such as frame synchronisation, frame ID, time code, counts of the ramp calibration, three PRT measurements, identification of invalid words and Digital B data as well as analogue housekeeping data.

The subclasses of MDR are detailed in the Annex (0) to this document.

3.6.1 Record Subclasses

<i>Subclass</i>	<i>Description</i>	<i>Subclass ID</i>
MDR-1A	Level 1a MDR	1
MDR-1B	Level 1b MDR	2

Table 7: MDR subclasses

3.6.2 MDR Fields

3.6.2.1 FRAME_INDICATOR

Bits which are not applicable to Metop data will be left unset.

<i>Bit</i>	<i>Meaning</i>
	WORD 1
15 -10	Not Used
9	0 = internal sysn 1 = AVHRR sync
8 – 7	DEFAULT TO ZERO 0 = Not an HRPT frame but a GAC frame 1 = minor frame 1 2 = minor frame 2 3 =minor frame 3
6 – 3	Spacecraft addresses
2	0 = frame stable; 1 = frame resync occurred
1	0 = pseudonoise AVHRR input; 1 = normal AVHRR input
0	AVHRR Input: 0 = AVHRR channel 3b 1 = AVHRR channel 3a
	WORD 2
15 – 10	Not used
9 – 0	Undefined

Table 8: FRAME_INDICATOR bit string definitions

3.6.2.2 TIME_CODE

<i>Bit</i>	<i>Meaning</i>
	WORD 1
15 – 10	Not used
9 – 1	Binary day count
0	0
	WORD 2
15 – 10	Not used
9	1
8	0
7	1
6 – 0	Most significant part of binary millisecond of day count
	WORD 3
15 – 10	Not used
9 – 0	Middle part of binary millisecond of day count
	WORD 4
15-10	Not used
9-0	Least significant part of binary millisecond of day count

Table 9: TIME_CODE bit string definitions

3.6.2.3 INSTRUMENT_INVALID_WORD_FLAG

If bit = 1, associated telemetry bit was not updated during most recent minor frame cycle - possibly due to lost frame.

<i>Bit</i>	<i>Meaning</i>
15	Motor/telemetry
14	Electronics/telemetry
13	Channel 1 status
12	Channel 2 status
11	Channel 3a status
10	Channel 3b status
9	Channel 4 status
8	Channel 5 status
7	Channel 3a/3b select status
6	Voltage calibrate status
5	Cooler heat
4	Scan motor
3	Telemetry lock
2	Earth shield
1	Patch control
0	Not used

Table 10: INSTRUMENT_INVALID_WORD_FLAG bit definitions

3.6.2.4 DIGITAL_B_DATA

These data are extracted from the instrument telemetry.

<i>Bit</i>	<i>Meaning</i>
15	Motor/telemetry (0=off, 1 =on)
14	Electronics/telemetry (0 = off; 1 = on)
13	Channel 1 status (0 = disable; 1 = enable)
12	Channel 2 status (0 = disable; 1 = enable)
11	Channel 3a status (0 = disable; 1 = enable)
10	Channel 3b status (0 = disable; 1 = enable)
9	Channel 4 status (0 = disable; 1 = enable)
8	Channel 5 status (0 = disable; 1 = enable)
7	Channel 3a/3b select status (0 = 3b; 1 = 3a)
6	Voltage calibrate status (0 = off; 1 = on)
5	Cooler heat (0 = off; 1 = on)
4	Scan motor (0 = low; 1 = high)
3	Telemetry lock (0 = off; 1 = lock)
2	Earth shield (0 = disable; 1 = deploy)
1	Patch control (0 = off; 1 = on)
0	Not used

Table 11: DIGITAL_B_DATA bit definitions

3.6.2.5 INSTRUMENT_INVALID_ANALOG_WORD_FLAG

If bit =1, associated telemetry word was not updated during the most recent minor frame cycle - possibly due to lost frame.

<i>Bit</i>	<i>Meaning</i>
31-23	Unused
22	Motor current
21	Electronics current
20	Black body temperature, channel 5
19	Detector #5 bias voltage
18	Black body temperature, channel 4
17	Black body temperature, channel 3b
16	A/D converter temperature
15	Black body temperature 4
14	Black body temperature 3
13	Black body temperature 2

<i>Bit</i>	<i>Meaning</i>
12	Black body temperature 1
11	Motor housing temperature
10	Baseplate temperature
9	Electronics temperature
8	Cooler housing temperature
7	Radiator temperature
6	Patch temperature
5	Earth shield position
4	Patch temperature extended
3	Detector #4 bias voltage
2	Reference voltage
1	Patch power
0	Unused

Table 12: *INSTRUMENT_INVALID_ANALOG_WORD_FLAG* bit definitions

3.6.2.6 NAVIGATION_STATUS

<i>Bit</i>	<i>Meaning</i>
31 – 17	Not used
16	Earth location corrected for Euler angles
15 – 12	Earth location indicator 0 = earth location available 1 = user ephemeris files older than 24 hours 2 = no earth location available
11 – 8	Spacecraft attitude control 0 = operating in YGC or NOMINAL mode 1 = operating in another mode 2 = attitude exceeds nominal tolerance
7 – 4	Attitude SMODE 0 = NOMINAL mode 1 = rate nulling mode 2 = YGC mode 3 = search mode 4 = coast mode
3 – 0	Attitude mode 0 = NOMINAL mode/no test 1 = yaw axis test in progress 2 = roll axis test in progress 3 = pitch axis test in progress

Table 13: *NAVIGATION_STATUS* bit string definitions

3.6.2.7 QUALITY_INDICATOR

<i>Bit</i>	<i>Meaning</i>
31	Do not use scan for product generation
30	Time sequence error detected with this scan (see below)
29	Data gap precedes this scan
28	Insufficient data for calibration (see below)
27	Earth location data not available (see below)
26	First good time following a clock update (nominally 0)
25	Instrument status changed with this scan
24	Sync lock dropped during this frame – DEFAULT TO ZERO
23	Frame sync word error greater than zero– DEFAULT TO ZERO
22	Frame sync previously dropped lock– DEFAULT TO ZERO
21	Flywheeling detected during this frame– DEFAULT TO ZERO
20	Bit slippage detected during this frame– DEFAULT TO ZERO
19 - 9	Not used
8	TIP parity error detected– DEFAULT TO ZERO
7-6	Reflected sunlight detected ch 3b (0 = no anomaly; 1 = anomaly; 3 = unsure)
5 - 4	Reflected sunlight detected ch 4 (0 = no anomaly; 1 = anomaly; 3 = unsure)
3 - 2	Reflected sunlight detected ch 5 (0 = no anomaly; 1 = anomaly; 3 = unsure)
1	Resync occurred on this frame– DEFAULT TO ZERO
0	Pseudo noise occurred on this frame

Table 14: *QUALITY_INDICATOR bit string definitions*

3.6.2.8 SCAN_LINE_QUALITY

<i>Bit</i>	<i>Meaning</i>
	Time Problem Code (all bits off implies the scan time is as expected)
31 - 24	Not used
23	Time field is bad but can probably be inferred from the previous good time
22	Time field is bad and can't be inferred from the previous good time
21	This record starts a sequence that is inconsistent with previous times (i.e., there is a time discontinuity). This may or may not be associated with a spacecraft clock update (See bit 26 in QUALITY_INDICATOR Field)
20	Start of a sequence that apparently repeats scan times that have been previously accepted
19 – 16	Not used
	Calibration Code Problem Note: these bits complement the channel indicators; normal calibration is all bits set to 0.
15	Scan line was not calibrated because of bad time
14	Scan line was calibrated using fewer than the preferred number of scan lines because of proximity to start or end of data set or to a data gap
13	Scan line was not calibrated because of bad or insufficient PRT data
12	Scan line was calibrated but with marginal PRT data
11	Some uncalibrated channels on this scan. (See channel indicators.)
10	Uncalibrated due to instrument mode
9	Questionable calibration because of antenna position error of space view
8	Questionable calibration because of antenna position error of black body
	Earth Location Problem Code (all bits off indicates the Earth location was normal)
7	Not earth located because of bad time; earth location fields zero filled
6	Earth location questionable because of questionable time code. (See time problem flags above.)
5	Earth location questionable – only marginal agreement with reasonableness check.
4	Earth location questionable – fails reasonableness check
3	Earth location questionable because of antenna position check
2 – 0	Not used

Table 15: SCAN_LINE_QUALITY bit definitions

3.6.2.9 DATA_CALIBRATION

This is a compound data type. For each IR channel, it contains information about the actual value of the NEdT and the calibration quality:

<i>Field</i>	<i>Description</i>	<i>SF</i>	<i>Dimension</i>	<i>Type</i>	<i>Type Size</i>	<i>Field Size</i>
NEDT_VALUE	Value of the noise equivalent temperature	2	1, 1, 1	u-byte	1	1
CALIBRATION_QUALITY	Channel Quality Flags	0	1, 1, 1	bitst(8)	1	1

Table 16: Structure of compound data type DATA_CALIBRATION

The content of the individual fields is defined below:

3.6.2.9.1 NEDT_VALUE

Type	u-byte						
Description	Repeated for channels 3B, 4, and 5. Channel dependent value of NEdT with a scaling factor of 2; values corresponding to NEdTs larger than 2.55 K will be set to 255.						
Specifications	<table border="1"> <tbody> <tr> <td>Channel 3B</td> <td>0.12 K</td> </tr> <tr> <td>Channel 4</td> <td>0.12 K</td> </tr> <tr> <td>Channel 5</td> <td>0.12 K</td> </tr> </tbody> </table>	Channel 3B	0.12 K	Channel 4	0.12 K	Channel 5	0.12 K
Channel 3B	0.12 K						
Channel 4	0.12 K						
Channel 5	0.12 K						

Table 17: NeDT Value: Each word contains the actual channel-dependent value of NeDT.

3.6.2.9.2 CALIBRATION_QUALITY

There is one word for each channel 3B, 4 and 5 in order. The meaning for one channel is listed below in Table 16. Type: bits (8). All bits off implies a good calibration.

<i>Bit</i>	<i>Meaning</i>
7	This channel is not calibrated
6	This channel is calibrated but questionable
5	All bad black body counts for scan line
4	All bad space view counts for scan line
3	Actual NEdT value exceeds specification
2	Marginal black body view counts for this line
1	Marginal space view counts for this line
0	Not used

Table 18: CALIBRATION_QUALITY bit definitions

3.6.2.10 INTERNAL_TARGET_TEMPERATURE

Three readings from one of the four platinum resistance thermometers (PRT). A different PRT is sampled for each scan; every fifth scan will contain a reference value of 0 in place of each reading.

4 LEVEL 1B RECORDS

4.1 Secondary Product Header Record

The Level 1b SPHR is identical to the Level 1a SPHR.

4.2 Global External Auxiliary Data Record

The global datasets that are used by the Level 1 PGF (described in [AD-1]) but not written into the product are referenced by GEADRs, as specified in [AD-1].

4.2.1 Record Subclasses

The following subclasses of GEADR are present for the AVHRR Level 1b product.

<i>Subclass</i>	<i>Description</i>	<i>Subclass ID</i>
AVHR_CAL	Calibration and configuration parameters	1
AVHR_THR	Processing parameters for scenes analysis and landmarks database	2
xxxx_LSM	Geographic atlas for land/sea/coast distribution	3
xxxx_CST	Atlas of monthly mean surface temperatures	4
AVHR_ALB	Land surface albedo atlas	5
xxxx_CWV	Atlas of monthly mean global total column water vapour distribution	6
xxxx_DEM	Digital elevation model	7

Table 19: GEADR Level 1b subclasses

4.3 Global Internal Auxiliary Data Record

There are two subclasses of GIADR for the Level 1b Product, which are identical to those of the Level 1a Product.

4.4 Variable External Auxiliary Data Record

The variable auxiliary datasets that are used by the Level 1 PGF [AD-1] but not written into the product are referenced by VEADRs, as specified in [AD-1].

4.4.1 Record Subclasses

The following subclasses of VEADR are present for the AVHRR Level 1b product.

<i>Subclass</i>	<i>Description</i>	<i>Subclass ID</i>
ATIA_FCT	Global forecasts of AIT temperatures and total column water vapour content	1

Table 20: VEADR Level 1b subclasses

4.5 Variable Internal Auxiliary Data Record

There are no VIADRs defined for the Level 1b product.

4.6 Measurement Data Record

4.6.1 Record Subclasses

Details of MDR subclasses for Level 1b are included in Table 7 under the Level 1a description.

4.6.2 MDR Fields

The structures of these fields are the same as for the Level 1a MDR:

- FRAME_INDICATOR,
- TIME_CODE,
- INSTRUMENT_INVALID_WORD_FLAG,
- DIGITAL_B_DATA,
- INSTRUMENT_INVALID_ANALOG_WORD_FLAG,
- NAVIGATION_STATUS,
- QUALITY_INDICATOR,
- SCAN_LINE_QUALITY,
- CALIBRATION_QUALITY

In addition, the cloud information is included in the Level 1b MDR.

4.6.2.1 CLOUD_INFORMATION

<i>Bit</i>	<i>Meaning</i>
15	Uniformity test (0 = 'test failed' or 'clear'; 1 = 'cloudy')
14	Uniformity test (0 = 'test failed' or 'cloudy', 1 = 'clear')
13	T3-T5 test (0 = 'test failed' or 'clear'; 1 = 'cloudy')
12	T3-T5 test (0 = 'test failed' or 'cloudy', 1 = 'clear')
11	T4-T3 test (0 = 'test failed' or 'clear'; 1 = 'cloudy')
10	T4-T3 test (0 = 'test failed' or 'cloudy', 1 = 'clear')
9	T4-T5 test (0 = 'test failed' or 'clear'; 1 = 'cloudy')
8	T4-T5 test (0 = 'test failed' or 'cloudy', 1 = 'clear')
7	Albedo test (0 = 'test failed' or 'clear'; 1 = 'cloudy' or 'snow/ice covered')
6	Albedo test (0 = 'test failed' or 'cloudy', 1 = 'clear' or 'snow/ice covered')
5	T4 test (0 = 'test failed' or 'clear'; 1 = 'cloudy' or 'snow/ice covered')
4	T4 test (0 = 'test failed' or 'cloudy', 1 = 'clear' or 'snow/ice covered')
3-0	Number of the test situation (11 different test situations)

Table 21: CLOUD_INFORMATION bit string definitions

5 OCCURRENCE INFORMATION

5.1 Level 1a

5.1.1 Full

<i>Record</i>	<i>Occurrence</i>
MPHR	Once per product
SPHR	Once per product
GIADR (all subclasses)	Once per product
GEADR (all subclasses)	Once per product
MDR-1A	Once per scan

5.1.2 GAC

<i>Record</i>	<i>Occurrence</i>
MPHR	Once per product
SPHR	Once per product
GIADR (all subclasses)	Once per product
GEADR (all subclasses)	Once per product
MDR-1A	Once every 3 scans

5.2 Level 1b

5.2.1 Full

<i>Record</i>	<i>Occurrence</i>
MPHR	Once per product
SPHR	Once per product
GIADR (all subclasses)	Once per product
GEADR (all subclasses)	Once per product
VEADR	At least once per product
MDR-1B	Once per scan

5.2.2 GAC

<i>Record</i>	<i>Occurrence</i>
MPHR	Once per product
SPHR	Once per product
GIADR (all subclasses)	Once per product
GEADR (all subclasses)	Once per product
VEADR	At least once per product
MDR-1B	Once every 3 scans

6 RECORD FORMAT VERSION CONTROL

This section provides version numbers for the records defined within this document.

<i>Record Subclass</i>	<i>Format Version Number</i>	<i>Issue Defined</i>
SPHR	3	6.3
	2	6.2
	1	6.1 (CDR)
GIADR-RADIANCE	3	6.3
	2	6.2
	1	6.1 (CDR)
GIADR-ANALOG	2	6.2
	1	6.1 (CDR)
MDR-1A-FULL	<i>REPLACED BY MDR-1A</i>	6.3
	2	6.2
	1	6.1 (CDR)
MDR-1A-GAC	<i>REPLACED BY MDR-1A</i>	6.3
	2	6.2
	1	6.1 (CDR)
MDR-1B-FULL	<i>REPLACED BY MDR-1B</i>	6.3
	2	6.2
	1	6.1 (CDR)
MDR-1B-GAC	<i>REPLACED BY MDR-1B</i>	6.3
	2	6.2
	1	6.1 (CDR)
MDR-1A	5	7D
	4	6.5
	3	6.3
MDR-1B	5	7D
	4	6.5
	3	6.3

Table 22: Record Format Version Numbers

APPENDIX A: DETAILED SPECIFICATION OF AVHRR/3 LEVEL 1 DATA RECORDS

In the following Annex, detailed format specifications for all the Variable Internal and Measurement Data Records in AVHRR/3 Level 1 products are included:

- SPHR
- GIADR-RADIANCE
- GIADR-ANALOG
- MDR-1A
- MDR-1B

The Annex is accessible under DM Tool: `EPS.MIS.SPE.97231.ANX`

This complete annex is also attached to this document.

This Document	
Title	AVHRR/3 LEVEL 1 PRODUCT FORMAT SPECIFICATION TABLES
Reference Number	EPS/MIS/SPE/97231

Revisions	
Issue 4 Draft B	AVHRR/3 LEVEL 1 PRODUCT FORMAT SPECIFICATION TABLES
	Rev 2: Cosmetic changes to field names in VIADR-1A
Issue 4 Draft B	Converted SPHR to ASCII format
Issue 5 Revision 0	Issue for CGS PDR
Issue 5 Revision 1	Revised Issue for CGS PDR
Issue 5 Revision 2	Moved fields from all ADRs into relevant MDRs
Issue 6 Revision 0	Removed ADRs. ADR contents moved into relevant MDR
	Added two generic quality flags at the start of each MDR
	VIADR-MINOR FRAME-INFO deleted. Content moved to MDR as this is at scanline rate
	VIADR-DIGITAL-TM deleted. Content moved to MDR as this is at scanline rate
	VIADR-ANALOG-HK deleted. Content moved to MDR as this is at scanline rate
	SPHR.RECORD_STATUS_CHANGE - Deleted. Info is in MDR
	SPHR.INSTRUMENT_STATUS_FLAG - Deleted. Info is in MDR
Issue 6 Rev 1	Update of main text
	Corrected array size of CALIBRATION_QUALITY field in MDR-1A-GAC, MDR-1B-GAC
Issue 6 Rev 2	Removed SPHR.CDA_STATUS
	Removed SPHR.TIP_CODE
	Add NAV_SAMPLING_RATE to the SPHR
	Add NUM_NAVIGATION_POINTS to MDR
	Add EARTH_VIEWS_PER_SCANLINE to SPHR
	Add EARTH_VIEWS_PER_SCANLINE to MDR
	Update MDR-1A and MDR-1B to have variable size fields dependent upon sampling rate and earth view count. Amalgamate Full and GAC versions into one MDR.
	MDR: Added EARTH_LOCATION_FIRST and EARTH_LOCATION_LAST field
	MDR: Added ANGULAR_RELATION_FIRST and ANGULAR_RELATION_LAST field
	MDR-1B: Combine SCENE_RADIANCE and IN-BAND_RADIANCES fields into one - SCENE_RADIANCES - and make an array of 5 channels, rather than 3+3 channels. Accounts for the fact that one channel is always 3a OR 3b.
	SPHR.SRC_DATA_TYPE deleted
	GIADR_RADIANCE:

	INSTRUMENT_STATUS_FLAG removed from MDRs.
	YEAR_RECENT_CALIBRATION made unsigned integer
	DAY_RECENT_CALIBRATION made unsigned integer
	PRIMARY_CALIBRATION_ALGORITHM_ID made unsigned integer
	SECONDARY_CALIBRATION_ALGORITHM_ID made unsigned integer
	MDR:
	COUNT_FRAM_ERROR made unsigned integer
	DIGITAL_A_TM.RAMP_CALIB made unsigned integer
	INTERAL_TARGET_TEMP_CNT made unsigned integer
	TIME_ATTITUDE made unsigned integer
	SPACECRAFT_ALTITUDE made unsigned integer
	Change EULER_ANGLE data type to integer2 compatible with NOAA and other ATOVS PFSs
Issue 6.3	EUM.EPS.SYS.DCR.03.039
	SPHR: Changed SRC_DATA_QUAL to a bits(16) field. Updated required field size.
	MDR1a/1b - Corrected array ordering of fields EARTH_VIEW_COUNTS, COLD_CALIBRATION_COUNTS, WARM_CALIBRATION_COUNTS, ANGULAR_RELATIONS, EARTH_LOCATIONS
	MDR-1A/1B: Clarified description for fields FRAME_SYNCHRONISATION, FRAME_INDICATOR, TIME_CODE for Metop data
	MDR-1A/1B: Corrected description for field EARTH_LOCATION_FIRST
	MDR-1B: Field CLOUD_INFORMATION made variable-sized in line with other fields in the record
	MDR-1A/1B. Field FRAME_SYNCHRONISATION array size increased from 1 to 6 in in line with the size of the data to be stored..
Issue 6.4	EUM.EPS.SYS.DCR.03.076
	MDR-1B.SCENE_RADIANCES. Description text amended to reflect correct units for channels 3b, 4 and 5.
Issue 6.5	EUM.EPS.SYS.DCR.04.012
	Parameters: Change size of parameter NP from 102 to 103
	MDR-1A/1B: Marked effect of change to parameter NP
	MDR-1A/1B: Changed scaling factor of CH3B45_SECOND_TERM to 9 from 6
	MDR-1A/1B: Changed scaling factor of CH3B_TEST_SECOND_TERM to 9 from 6

	MDR-1A/1B: Update description of COUNT_ERROR_FRAME
	MDR-1B: Changed scaling factor for SCENE_RADIANCES channel 3a/3b from 2 to 4
	MDR-1A/1B: Changed order of array for field ANGULAR_RELATIONS from NP x 4 to 4 x NP
	MDR-1A/1B: Changed order of array for field EARTH_LOCATIONS from NP x 2 to 2 x NP
	GIADR_RADIANCE: Corrected name for field PRIMARY_CALIBRATION_ALGORITHM_OPTION from PRIMARY_CALIBRATION_ALGORITHM-OPTION
Version 7A 03/07/08	Migrated into Hummingbird. Contents identical with issue 6.5.
Version 7B 25/08/08	EPS_AB_DCR_EUM_72
	MDR-1A/1B: Enhanced descriptions of ANGULAR_RELATIONS and EARTH_LOCATIONS
Version 7C 29/09/09	ODT_DCR_80
	(Updates specified in ODT_DCR_80 only affect Word document, not annex.)
	MDR-1B.SCENE_RADIANCES. Description text corrected for error in units: cm --> cm ⁻¹ .
Version 7D 22/02/11	ODT_DCR_237
	MDR-1A & MDR-1B, field ANGULAR_RELATIONS: Added Description note on azimuth angle range.
	TBD
	New worksheet to describe compound data type DATA_CALQUAL. Also added to Types sheet. MDR-1A & MDR-1B: Field CALIBRATION_QUALITY replaced by DATA_CALIBRATION.

DATA_CALQUAL

FIELD	DESCRIPTION	SF	UNITS	DIM1	DIM2	DIM3	TYPE	TYPE SIZE	FIELD SIZE
NEDT_VALUE	Value of the noise equivalent temperature	2	K	1	1	1	u-byte	1	1
CALIBRATION_QUALITY	Channel Quality Flags	0	N/A	1	1	1	bitst(8)	1	1
								SIZE	2

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 Worksheet: GIADR-RADIANCE

FIELD	DESCRIPTION	SF	UNITS	DIM1	DIM2	DIM3	TYPE	TYPE SIZE	FIELD SIZE	OFFSET
RECORD_HEADER	Generic Record Header	0		1	1	1	REC_HEAD	20	20	0
RADIANCE CONVERSION										
RAMP_CALIBRATION_COEFFICIENT	Ramp/Auto Calibration Indicators Bit Field			1	1	1	bitst(16)	2	2	20
YEAR_RECENT_CALIBRATION	Year of Most Recent Solar Channel Calibration (e.g. 1999)		yr	1	1	1	u-integer2	2	2	22
DAY_RECENT_CALIBRATION	Day of Year of Most Recent Solar Channel Calibration (e.g. 365)		day	1	1	1	u-integer2	2	2	24
PRIMARY_CALIBRATION_ALGORITHM_ID	Primary Calibration Algorithm ID			1	1	1	u-integer2	2	2	26
PRIMARY_CALIBRATION_ALGORITHM_OPTION	Primary Calibration Algorithm Selected Options			1	1	1	bitst(16)	2	2	28
SECONDARY_CALIBRATION_ALGORITHM_ID	Secondary Calibration Algorithm ID			1	1	1	u-integer2	2	2	30
SECONDARY_CALIBRATION_ALGORITHM_OPTION	Secondary Calibration Algorithm Selected Options			1	1	1	bitst(16)	2	2	32
IR_TEMPERATURE1_COEFFICIENT1	IR Target Temp 1 Conversion Coefficient 1	2	K	1	1	1	integer2	2	2	34
IR_TEMPERATURE1_COEFFICIENT2	IR Target Temp 1 Conversion Coefficient 2	5	K/cnt	1	1	1	integer2	2	2	36
IR_TEMPERATURE1_COEFFICIENT3	IR Target Temp 1 Conversion Coefficient 3	8	K/cnt ²	1	1	1	integer2	2	2	38
IR_TEMPERATURE1_COEFFICIENT4	IR Target Temp 1 Conversion Coefficient 4	11	K/cnt ³	1	1	1	integer2	2	2	40
IR_TEMPERATURE1_COEFFICIENT5	IR Target Temp 1 Conversion Coefficient 5	14	K/cnt ⁴	1	1	1	integer2	2	2	42
IR_TEMPERATURE1_COEFFICIENT6	IR Target Temp 1 Conversion Coefficient 6	17	K/cnt ⁵	1	1	1	integer2	2	2	44
IR_TEMPERATURE2_COEFFICIENT1	IR Target Temp 2 Conversion Coefficient 1	2	K	1	1	1	integer2	2	2	46
IR_TEMPERATURE2_COEFFICIENT2	IR Target Temp 2 Conversion Coefficient 2	5	K/cnt	1	1	1	integer2	2	2	48
IR_TEMPERATURE2_COEFFICIENT3	IR Target Temp 2 Conversion Coefficient 3	8	K/cnt ²	1	1	1	integer2	2	2	50
IR_TEMPERATURE2_COEFFICIENT4	IR Target Temp 2 Conversion Coefficient 4	11	K/cnt ³	1	1	1	integer2	2	2	52
IR_TEMPERATURE2_COEFFICIENT5	IR Target Temp 2 Conversion Coefficient 5	14	K/cnt ⁴	1	1	1	integer2	2	2	54
IR_TEMPERATURE2_COEFFICIENT6	IR Target Temp 2 Conversion Coefficient 6	17	K/cnt ⁵	1	1	1	integer2	2	2	56

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IR_TEMPERATURE3_COEFFICIENT1	IR Target Temp 3 Conversion Coefficient 1	2	K	1	1	1	integer2	2	2	58
IR_TEMPERATURE3_COEFFICIENT2	IR Target Temp 3 Conversion Coefficient 2	5	K/cnt	1	1	1	integer2	2	2	60
IR_TEMPERATURE3_COEFFICIENT3	IR Target Temp 3 Conversion Coefficient 3	8	$^{\circ}\text{K}/\text{cnt}^2$	1	1	1	integer2	2	2	62
IR_TEMPERATURE3_COEFFICIENT4	IR Target Temp 3 Conversion Coefficient 4	11	K/cnt^3	1	1	1	integer2	2	2	64
IR_TEMPERATURE3_COEFFICIENT5	IR Target Temp 3 Conversion Coefficient 5	14	K/cnt^4	1	1	1	integer2	2	2	66
IR_TEMPERATURE3_COEFFICIENT6	IR Target Temp 3 Conversion Coefficient 6	17	K/cnt^5	1	1	1	integer2	2	2	68
IR_TEMPERATURE4_COEFFICIENT1	IR Target Temp 4 Conversion Coefficient 1	2	K	1	1	1	integer2	2	2	70
IR_TEMPERATURE4_COEFFICIENT2	IR Target Temp 4 Conversion Coefficient 2	5	K/cnt	1	1	1	integer2	2	2	72
IR_TEMPERATURE4_COEFFICIENT3	IR Target Temp 4 Conversion Coefficient 3	8	K/cnt^2	1	1	1	integer2	2	2	74
IR_TEMPERATURE4_COEFFICIENT4	IR Target Temp 4 Conversion Coefficient 4	11	K/cnt^3	1	1	1	integer2	2	2	76
IR_TEMPERATURE4_COEFFICIENT5	IR Target Temp 4 Conversion Coefficient 5	14	K/cnt^4	1	1	1	integer2	2	2	78
IR_TEMPERATURE4_COEFFICIENT6	IR Target Temp 4 Conversion Coefficient 6	17	K/cnt^5	1	1	1	integer2	2	2	80
CH1_SOLAR_FILTERED_IRRADIANCE	Ch 1 Solar Filtered Irradiance in Wavelength	1	W/m^2	1	1	1	integer2	2	2	82
CH1_EQUIVALENT_FILTER_WIDTH	Ch 1 Equivalent Filter Width in Wavelength	3	μm	1	1	1	integer2	2	2	84
CH2_SOLAR_FILTERED_IRRADIANCE	Ch 2 Solar Filtered Irradiance in Wavelength	1	W/m^2	1	1	1	integer2	2	2	86
CH2_EQUIVALENT_FILTER_WIDTH	Ch 2 Equivalent Filter Width in Wavelength	3	μm	1	1	1	integer2	2	2	88
CH3A_SOLAR_FILTERED_IRRADIANCE	Ch 3a Solar Filtered Irradiance in Wavelength	1	W/m^2	1	1	1	integer2	2	2	90
CH3A_EQUIVALENT_FILTER_WIDTH	Ch 3a Equivalent Filter Width in Wavelength	3	μm	1	1	1	integer2	2	2	92
CH3B_CENTRAL_WAVENUMBER	Ch 3b Central Wavenumber	2	cm^{-1}	1	1	1	integer4	4	4	94
CH3B_CONSTANT1	Ch 3b Constant 1 for band correction	5	K	1	1	1	integer4	4	4	98

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CH3B_CONSTANT2_SLOPE	Ch 3b Constant 2 slope for band correction	6	K/ K	1	1	1	integer4	4	4	102
CH4_CENTRAL_WAVENUMBER	Ch 4 Central Wavenumber	3	cm-1	1	1	1	integer4	4	4	106
CH4_CONSTANT1	Ch 4 Constant 1 for band correction	5	K	1	1	1	integer4	4	4	110
CH4_CONSTANT2_SLOPE	Ch 4 Constant 2 slope for band correction	6	K/ K	1	1	1	integer4	4	4	114
CH5_CENTRAL_WAVENUMBER	Ch 5 Central Wavenumber	3	cm-1	1	1	1	integer4	4	4	118
CH5_CONSTANT1	Ch 5 Constant 1 for band correction	5	K	1	1	1	integer4	4	4	122
CH5_CONSTANT2_SLOPE	Ch 5 Constant 2 slope for band correction	6	K/ K	1	1	1	integer4	4	4	126
SIZE OF THE GIADR										130

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FIELD	DESCRIPTION	SF	UNITS	DIM1	DIM2	DIM3	TYPE	TYPE SIZE	FIELD SIZE	OFFSET
RECORD_HEADER	Generic Record Header	0		1	1	1	REC_HEAD	20	20	0
A/D CONVERSION										
PATCH_TEMPERATURE_COEFFICIENT1	Patch Temperature Conversion Coefficient	2	K	1	1	1	integer2	2	2	20
PATCH_TEMPERATURE_COEFFICIENT2	Patch Temperature Conversion Coefficient	4	K/cnt	1	1	1	integer2	2	2	22
PATCH_TEMPERATURE_COEFFICIENT3	Patch Temperature Conversion Coefficient	6	K/cnt ²	1	1	1	integer2	2	2	24
PATCH_TEMPERATURE_COEFFICIENT4	Patch Temperature Conversion Coefficient	8	K/cnt ³	1	1	1	integer2	2	2	26
PATCH_TEMPERATURE_COEFFICIENT5	Patch Temperature Conversion Coefficient	10	K/cnt ⁴	1	1	1	integer2	2	2	28
PATCH_TEMPERATURE_EXTENDED_COEFFICIENT1	Patch Temperature Extended Conversion Coefficient	2	K	1	1	1	integer2	2	2	30
PATCH_TEMPERATURE_EXTENDED_COEFFICIENT2	Patch Temperature Extended Conversion Coefficient	4	K/cnt	1	1	1	integer2	2	2	32
PATCH_TEMPERATURE_EXTENDED_COEFFICIENT3	Patch Temperature Extended Conversion Coefficient	6	K/cnt ²	1	1	1	integer2	2	2	34
PATCH_TEMPERATURE_EXTENDED_COEFFICIENT4	Patch Temperature Extended Conversion Coefficient	8	K/cnt ³	1	1	1	integer2	2	2	36
PATCH_TEMPERATURE_EXTENDED_COEFFICIENT5	Patch Temperature Extended Conversion Coefficient	10	K/cnt ⁴	1	1	1	integer2	2	2	38
PATCH_POWER_COEFFICIENT1	Patch Power Conversion Coefficient	2	mW	1	1	1	integer2	2	2	40
PATCH_POWER_COEFFICIENT2	Patch Power Conversion Coefficient	4	mW/cnt	1	1	1	integer2	2	2	42
PATCH_POWER_COEFFICIENT3	Patch Power Conversion Coefficient	6	mW/cnt ²	1	1	1	integer2	2	2	44
PATCH_POWER_COEFFICIENT4	Patch Power Conversion Coefficient	8	mW/cnt ³	1	1	1	integer2	2	2	46
PATCH_POWER_COEFFICIENT5	Patch Power Conversion Coefficient	10	mW/cnt ⁴	1	1	1	integer2	2	2	48
RADIATOR_TEMPERATURE_COEFFICIENT1	Radiator Temperature Conversion Coefficient	2	K	1	1	1	integer2	2	2	50
RADIATOR_TEMPERATURE_COEFFICIENT2	Radiator Temperature Conversion Coefficient	4	K/cnt	1	1	1	integer2	2	2	52
RADIATOR_TEMPERATURE_COEFFICIENT3	Radiator Temperature Conversion Coefficient	6	K/cnt ²	1	1	1	integer2	2	2	54
RADIATOR_TEMPERATURE_COEFFICIENT4	Radiator Temperature Conversion Coefficient	8	K/cnt ³	1	1	1	integer2	2	2	56
RADIATOR_TEMPERATURE_COEFFICIENT5	Radiator Temperature Conversion Coefficient	10	K/cnt ⁴	1	1	1	integer2	2	2	58

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BLACKBODY_TEMPERATURE1_COEFFICIENT1	Blackbody Temperature 1 Conversion Coefficient	2 °C	1	1	1	integer2	2	2	60
BLACKBODY_TEMPERATURE1_COEFFICIENT2	Blackbody Temperature 1 Conversion Coefficient	4 °C/cnt	1	1	1	integer2	2	2	62
BLACKBODY_TEMPERATURE1_COEFFICIENT3	Blackbody Temperature 1 Conversion Coefficient	6 °C/cnt ²	1	1	1	integer2	2	2	64
BLACKBODY_TEMPERATURE1_COEFFICIENT4	Blackbody Temperature 1 Conversion Coefficient	8 °C/cnt ³	1	1	1	integer2	2	2	66
BLACKBODY_TEMPERATURE1_COEFFICIENT5	Blackbody Temperature 1 Conversion Coefficient	10 °C/cnt ⁴	1	1	1	integer2	2	2	68
BLACKBODY_TEMPERATURE2_COEFFICIENT1	Blackbody Temperature 2 Conversion Coefficient	2 °C	1	1	1	integer2	2	2	70
BLACKBODY_TEMPERATURE2_COEFFICIENT2	Blackbody Temperature 2 Conversion Coefficient	4 °C/cnt	1	1	1	integer2	2	2	72
BLACKBODY_TEMPERATURE2_COEFFICIENT3	Blackbody Temperature 2 Conversion Coefficient	6 °C/cnt ²	1	1	1	integer2	2	2	74
BLACKBODY_TEMPERATURE2_COEFFICIENT4	Blackbody Temperature 2 Conversion Coefficient	8 °C/cnt ³	1	1	1	integer2	2	2	76
BLACKBODY_TEMPERATURE2_COEFFICIENT5	Blackbody Temperature 2 Conversion Coefficient	10 °C/cnt ⁴	1	1	1	integer2	2	2	78
BLACKBODY_TEMPERATURE3_COEFFICIENT1	Blackbody Temperature 3 Conversion Coefficient	2 °C	1	1	1	integer2	2	2	80
BLACKBODY_TEMPERATURE3_COEFFICIENT2	Blackbody Temperature 3 Conversion Coefficient	4 °C/cnt	1	1	1	integer2	2	2	82
BLACKBODY_TEMPERATURE3_COEFFICIENT3	Blackbody Temperature 3 Conversion Coefficient	6 °C/cnt ²	1	1	1	integer2	2	2	84
BLACKBODY_TEMPERATURE3_COEFFICIENT4	Blackbody Temperature 3 Conversion Coefficient	8 °C/cnt ³	1	1	1	integer2	2	2	86
BLACKBODY_TEMPERATURE3_COEFFICIENT5	Blackbody Temperature 3 Conversion Coefficient	10 °C/cnt ⁴	1	1	1	integer2	2	2	88
BLACKBODY_TEMPERATURE4_COEFFICIENT1	Blackbody Temperature 4 Conversion Coefficient	2 °C	1	1	1	integer2	2	2	90
BLACKBODY_TEMPERATURE4_COEFFICIENT2	Blackbody Temperature 4 Conversion Coefficient	4 °C/cnt	1	1	1	integer2	2	2	92
BLACKBODY_TEMPERATURE4_COEFFICIENT3	Blackbody Temperature 4 Conversion Coefficient	6 °C/cnt ²	1	1	1	integer2	2	2	94
BLACKBODY_TEMPERATURE4_COEFFICIENT4	Blackbody Temperature 4 Conversion Coefficient	8 °C/cnt ³	1	1	1	integer2	2	2	96
BLACKBODY_TEMPERATURE4_COEFFICIENT5	Blackbody Temperature 4 Conversion Coefficient	10 °C/cnt ⁴	1	1	1	integer2	2	2	98

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ELECTRONIC_CURRENT_COEFFICIENT1	Electronics Current Conversion Coefficient	2	mA	1	1	1	integer2	2	2	100
ELECTRONIC_CURRENT_COEFFICIENT2	Electronics Current Conversion Coefficient	4	mA/cnt	1	1	1	integer2	2	2	102
ELECTRONIC_CURRENT_COEFFICIENT3	Electronics Current Conversion Coefficient	6	mA/cnt ²	1	1	1	integer2	2	2	104
ELECTRONIC_CURRENT_COEFFICIENT4	Electronics Current Conversion Coefficient	8	mA/cnt ³	1	1	1	integer2	2	2	106
ELECTRONIC_CURRENT_COEFFICIENT5	Electronics Current Conversion Coefficient	10	mA/cnt ⁴	1	1	1	integer2	2	2	108
MOTOR_CURRENT_COEFFICIENT1	Motor Current Conversion Coefficient	2	mA	1	1	1	integer2	2	2	110
MOTOR_CURRENT_COEFFICIENT2	Motor Current Conversion Coefficient	4	mA/cnt	1	1	1	integer2	2	2	112
MOTOR_CURRENT_COEFFICIENT3	Motor Current Conversion Coefficient	6	mA/cnt ²	1	1	1	integer2	2	2	114
MOTOR_CURRENT_COEFFICIENT4	Motor Current Conversion Coefficient	8	mA/cnt ³	1	1	1	integer2	2	2	116
MOTOR_CURRENT_COEFFICIENT5	Motor Current Conversion Coefficient	10	mA/cnt ⁴	1	1	1	integer2	2	2	118
EARTH_SHIELD_POSITION_COEFFICIENT1	Earth Shield Position Conversion Coefficient	2	V	1	1	1	integer2	2	2	120
EARTH_SHIELD_POSITION_COEFFICIENT2	Earth Shield Position Conversion Coefficient	4	V/cnt	1	1	1	integer2	2	2	122
EARTH_SHIELD_POSITION_COEFFICIENT3	Earth Shield Position Conversion Coefficient	6	V/cnt ²	1	1	1	integer2	2	2	124
EARTH_SHIELD_POSITION_COEFFICIENT4	Earth Shield Position Conversion Coefficient	8	V/cnt ³	1	1	1	integer2	2	2	126
EARTH_SHIELD_POSITION_COEFFICIENT5	Earth Shield Position Conversion Coefficient	10	V/cnt ⁴	1	1	1	integer2	2	2	128
ELECTRONIC_TEMPERATURE_COEFFICIENT1	Electronics Temperature Conversion Coefficient	2	°C	1	1	1	integer2	2	2	130
ELECTRONIC_TEMPERATURE_COEFFICIENT2	Electronics Temperature Conversion Coefficient	4	°C/cnt	1	1	1	integer2	2	2	132
ELECTRONIC_TEMPERATURE_COEFFICIENT3	Electronics Temperature Conversion Coefficient	6	°C/cnt ²	1	1	1	integer2	2	2	134
ELECTRONIC_TEMPERATURE_COEFFICIENT4	Electronics Temperature Conversion Coefficient	8	°C/cnt ³	1	1	1	integer2	2	2	136
ELECTRONIC_TEMPERATURE_COEFFICIENT5	Electronics Temperature Conversion Coefficient	10	°C/cnt ⁴	1	1	1	integer2	2	2	138
COOLER_HOUSING_TEMPERATURE_COEFFICIENT1	Cooler Housing Temperature Conversion Coefficient	2	°C	1	1	1	integer2	2	2	140
COOLER_HOUSING_TEMPERATURE_COEFFICIENT2	Cooler Housing Temperature Conversion Coefficient	4	°C/cnt	1	1	1	integer2	2	2	142

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COOLER_HOUSING_TEMPERATURE_COEFFICIENT3	Cooler Housing Temperature Conversion Coefficient	6	°C/cnt ²	1	1	1	integer2	2	2	144
COOLER_HOUSING_TEMPERATURE_COEFFICIENT4	Cooler Housing Temperature Conversion Coefficient	8	°C/cnt ³	1	1	1	integer2	2	2	146
COOLER_HOUSING_TEMPERATURE_COEFFICIENT5	Cooler Housing Temperature Conversion Coefficient	10	°C/cnt ⁴	1	1	1	integer2	2	2	148
BASEPLATE_TEMPERATURE_COEFFICIENT1	Baseplate Temperature Conversion Coefficient	2	°C	1	1	1	integer2	2	2	150
BASEPLATE_TEMPERATURE_COEFFICIENT2	Baseplate Temperature Conversion Coefficient	4	°C/cnt	1	1	1	integer2	2	2	152
BASEPLATE_TEMPERATURE_COEFFICIENT3	Baseplate Temperature Conversion Coefficient	6	°C/cnt ²	1	1	1	integer2	2	2	154
BASEPLATE_TEMPERATURE_COEFFICIENT4	Baseplate Temperature Conversion Coefficient	8	°C/cnt ³	1	1	1	integer2	2	2	156
BASEPLATE_TEMPERATURE_COEFFICIENT5	Baseplate Temperature Conversion Coefficient	10	°C/cnt ⁴	1	1	1	integer2	2	2	158
MOTOR_HOUSING_TEMPERATURE_COEFFICIENT1	Motor Housing Temperature Conversion Coefficient	2	°C	1	1	1	integer2	2	2	160
MOTOR_HOUSING_TEMPERATURE_COEFFICIENT2	Motor Housing Temperature Conversion Coefficient	4	°C/cnt	1	1	1	integer2	2	2	162
MOTOR_HOUSING_TEMPERATURE_COEFFICIENT3	Motor Housing Temperature Conversion Coefficient	6	°C/cnt ²	1	1	1	integer2	2	2	164
MOTOR_HOUSING_TEMPERATURE_COEFFICIENT4	Motor Housing Temperature Conversion Coefficient	8	°C/cnt ³	1	1	1	integer2	2	2	166
MOTOR_HOUSING_TEMPERATURE_COEFFICIENT5	Motor Housing Temperature Conversion Coefficient	10	°C/cnt ⁴	1	1	1	integer2	2	2	168
AD_CONVERTER_TEMPERATURE_COEFFICIENT1	A/D Converter Temperature Conversion Coefficient	2	°C	1	1	1	integer2	2	2	170
AD_CONVERTER_TEMPERATURE_COEFFICIENT2	A/D Converter Temperature Conversion Coefficient	4	°C/cnt	1	1	1	integer2	2	2	172
AD_CONVERTER_TEMPERATURE_COEFFICIENT3	A/D Converter Temperature Conversion Coefficient	6	°C/cnt ²	1	1	1	integer2	2	2	174
AD_CONVERTER_TEMPERATURE_COEFFICIENT4	A/D Converter Temperature Conversion Coefficient	8	°C/cnt ³	1	1	1	integer2	2	2	176
AD_CONVERTER_TEMPERATURE_COEFFICIENT5	A/D Converter Temperature Conversion Coefficient	10	°C/cnt ⁴	1	1	1	integer2	2	2	178
DETECTOR4_BIAS_VOLTAGE_COEFFICIENT1	Detector #4 Bias Voltage Conversion Coefficient	2	V	1	1	1	integer2	2	2	180
DETECTOR4_BIAS_VOLTAGE_COEFFICIENT2	Detector #4 Bias Voltage Conversion Coefficient	4	V/cnt	1	1	1	integer2	2	2	182

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DETECTOR4_BIAS_VOLTAGE_COEFFICIENT3	Detector #4 Bias Voltage Conversion Coefficient	6	V/cnt ²	1	1	1	integer2	2	2	184
DETECTOR4_BIAS_VOLTAGE_COEFFICIENT4	Detector #4 Bias Voltage Conversion Coefficient	8	V/cnt ³	1	1	1	integer2	2	2	186
DETECTOR4_BIAS_VOLTAGE_COEFFICIENT5	Detector #4 Bias Voltage Conversion Coefficient	10	V/cnt ⁴	1	1	1	integer2	2	2	188
DETECTOR5_BIAS_VOLTAGE_COEFFICIENT1	Detector #5 Bias Voltage Conversion Coefficient	2	V	1	1	1	integer2	2	2	190
DETECTOR5_BIAS_VOLTAGE_COEFFICIENT2	Detector #5 Bias Voltage Conversion Coefficient	4	V/cnt	1	1	1	integer2	2	2	192
DETECTOR5_BIAS_VOLTAGE_COEFFICIENT3	Detector #5 Bias Voltage Conversion Coefficient	6	V/cnt ²	1	1	1	integer2	2	2	194
DETECTOR5_BIAS_VOLTAGE_COEFFICIENT4	Detector #5 Bias Voltage Conversion Coefficient	8	V/cnt ³	1	1	1	integer2	2	2	196
DETECTOR5_BIAS_VOLTAGE_COEFFICIENT5	Detector #5 Bias Voltage Conversion Coefficient	10	V/cnt ⁴	1	1	1	integer2	2	2	198
CH3B_BLACKBODY_VIEW_COEFFICIENT1	Channel 3b Blackbody View Conversion Coefficient	2	°C	1	1	1	integer2	2	2	200
CH3B_BLACKBODY_VIEW_COEFFICIENT2	Channel 3b Blackbody View Conversion Coefficient	4	°C/cnt	1	1	1	integer2	2	2	202
CH3B_BLACKBODY_VIEW_COEFFICIENT3	Channel 3b Blackbody View Conversion Coefficient	6	°C/cnt ²	1	1	1	integer2	2	2	204
CH3B_BLACKBODY_VIEW_COEFFICIENT4	Channel 3b Blackbody View Conversion Coefficient	8	°C/cnt ³	1	1	1	integer2	2	2	206
CH3B_BLACKBODY_VIEW_COEFFICIENT5	Channel 3b Blackbody View Conversion Coefficient	10	°C/cnt ⁴	1	1	1	integer2	2	2	208
CH4_BLACKBODY_VIEW_COEFFICIENT1	Channel 4 Blackbody View Conversion Coefficient	2	°C	1	1	1	integer2	2	2	210
CH4_BLACKBODY_VIEW_COEFFICIENT2	Channel 4 Blackbody View Conversion Coefficient	4	°C/cnt	1	1	1	integer2	2	2	212
CH4_BLACKBODY_VIEW_COEFFICIENT3	Channel 4 Blackbody View Conversion Coefficient	6	°C/cnt ²	1	1	1	integer2	2	2	214
CH4_BLACKBODY_VIEW_COEFFICIENT4	Channel 4 Blackbody View Conversion Coefficient	8	°C/cnt ³	1	1	1	integer2	2	2	216
CH4_BLACKBODY_VIEW_COEFFICIENT5	Channel 4 Blackbody View Conversion Coefficient	10	°C/cnt ⁴	1	1	1	integer2	2	2	218
CH5_BLACKBODY_VIEW_COEFFICIENT1	Channel 5 Blackbody View Conversion Coefficient	2	°C	1	1	1	integer2	2	2	220
CH5_BLACKBODY_VIEW_COEFFICIENT2	Channel 5 Blackbody View Conversion Coefficient	4	°C/cnt	1	1	1	integer2	2	2	222

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CH5_BLACKBODY_VIEW_COEFFICIENT3	Channel 5 Blackbody View Conversion Coefficient	6	°C/cnt ²	1	1	1	integer2	2	2	224
CH5_BLACKBODY_VIEW_COEFFICIENT4	Channel 5 Blackbody View Conversion Coefficient	8	°C/cnt ³	1	1	1	integer2	2	2	226
CH5_BLACKBODY_VIEW_COEFFICIENT5	Channel 5 Blackbody View Conversion Coefficient	10	°C/cnt ⁴	1	1	1	integer2	2	2	228
REFERENCE_VOLTAGE_COEFFICIENT1	Reference Voltage Conversion Coefficient	2	V	1	1	1	integer2	2	2	230
REFERENCE_VOLTAGE_COEFFICIENT2	Reference Voltage Conversion Coefficient	4	V/cnt	1	1	1	integer2	2	2	232
REFERENCE_VOLTAGE_COEFFICIENT3	Reference Voltage Conversion Coefficient	6	V/cnt ²	1	1	1	integer2	2	2	234
REFERENCE_VOLTAGE_COEFFICIENT4	Reference Voltage Conversion Coefficient	8	V/cnt ³	1	1	1	integer2	2	2	236
REFERENCE_VOLTAGE_COEFFICIENT5	Reference Voltage Conversion Coefficient	10	V/cnt ⁴	1	1	1	integer2	2	2	238
SIZE OF THE GIADR										240

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FIELD	DESCRIPTION	SF	UNITS	DIM1	DIM2	DIM3	TYPE	TYPE SIZE	FIELD SIZE	OFFSET
RECORD_HEADER	Generic Record Header	0		1	1	1	REC_HEAD	20	20	0
	GENERIC QUALITY INDICATORS									
DEGRADED_INST_MDR	Quality of MDR has been degraded from nominal due to an instrument degradation	NA	NA	1	1	1	boolean	1	1	20
DEGRADED_PROC_MDR	Quality of MDR has been degraded from nominal due to a processing degradation	NA	NA	1	1	1	boolean	1	1	21
MEASUREMENT DATA										
EARTH_VIEWS_PER_SCANLINE	Earth views per scanline, NE	0	cnt	1	1	1	integer2	2	2	22
EARTH_VIEW_COUNTS	Earth view counts, (ch. 1-5) (Field of View 1-2048)	0	cnt	NE		1	integer2	2	20480	24
COLD_CALIBRATION_COUNTS	Cold space view calibration counts (ch. 1-5)(View 1-10)	0	cnt	10	5	1	integer2	2	100	20504
WARM_CALIBRATION_COUNTS	Warm target view calibration counts(ch. 3b,4,5) (View 1-10)	0	cnt	10	3	1	integer2	2	60	20604
NAVIGATION DATA AT SCAN LINE										
TIME_ATTITUDE	Time Associated with Attitude Angles	0	s	1	1	1	u-integer4	4	4	20664
EULER_ANGLE	Euler Angles: Roll, Pitch, Yaw	3	deg	3	1	1	integer2	2	6	20668
NAVIGATION_STATUS	Navigation Status Bit Field	0	N/A	1	1	1	bits(32)	4	4	20674
SPACECRAFT_ALTITUDE	Spacecraft Altitude Above Reference Geoid (MSL)	1	km	1	1	1	u-integer4	4	4	20678
ANGULAR_RELATIONS_FIRST	Angular relationship for the first earth view in scanline	2	deg	4	1	1	integer2	2	8	20682
ANGULAR_RELATIONS_LAST	Angular relationship for the last earth view in scanline	2	deg	4	1	1	integer2	2	8	20690
EARTH_LOCATION_FIRST	Earth location for the first earth view in scanline	4	deg	2	1	1	integer4	4	8	20698
EARTH_LOCATION_LAST	Earth location for the last earth view in scanline	4	deg	2	1	1	integer4	4	8	20706
NUM_NAVIGATION_POINTS	Number of navigation points in angular_relations and earth_locations arrays, NP			1	1	1	integer2	2	2	20714

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ANGULAR_RELATIONS	Angular relationships: solar zenith angle, satellite zenith angle, solar azimuth angle, satellite azimuth angle (each 40th point, points 25 to 2025; possible reduction to every 20th point, points 5 to 2045).	2	deg	4	NP	1	integer2	2	824	20716
EARTH_LOCATIONS	Earth Location: latitude, longitude (each 40th point, points 25 to 2025; possible reduction to every 20th point, points 5 to 2045)	4	deg	2	NP	1	integer4	4	824	21540
QUALITY_INDICATOR	Quality Indicator Bit Field	0	N/A	1	1	1	bitst(32)	4	4	22364
SCAN_LINE_QUALITY	Scan Line Quality Flags	0	N/A	1	1	1	bitst(32)	4	4	22368
DATA_CALIBRATION	Noise-Equivalent Delta T and Channel Quality Flags	0	N/A	3	1	1	DATA_CALQUAL	2	6	22372
COUNT_ERROR_FRAME	Count of Bit Errors in Frame Sync. This field is applicable only to NOAA data. For Metop data it should be defaulted to zero.	0	cnt	1	1	1	u-integer2	2	2	22378
Calibration Coefficients										
CH123A_CURVE_SLOPE1	Visible Operational calibration curve slope 1 (ch. 1,2,3a)	7	%reflect ance /cnt	3	1	1	integer4	4	12	22380
CH123A_CURVE_INTERCEPT1	Visible Operational calibration curve intercept 1 (ch. 1,2,3a)	6	%reflect ance	3	1	1	integer4	4	12	22392
CH123A_CURVE_SLOPE2	Visible Operational calibration curve slope 2 (ch. 1,2,3a)	7	%reflect ance /cnt	3	1	1	integer4	4	12	22404
CH123A_CURVE_INTERCEPT2	Visible Operational calibration curve intercept 2 (ch. 1,2,3a)	6	%reflect ance	3	1	1	integer4	4	12	22416
CH123A_CURVE_INTERCEPTION	Visible Operational calibration intersection (ch. 1,2,3a)	0	cnt	3	1	1	integer4	4	12	22428
CH123A_TEST_CURVE_SLOPE1	Visible Test calibration curve slope 1 (ch. 1,2,3a)	7	%reflect ance /cnt	3	1	1	integer4	4	12	22440
CH123A_TEST_CURVE_INTERCEPT1	Visible Test calibration curve intercept 1 (ch. 1,2,3a)	6	%reflect ance	3	1	1	integer4	4	12	22452

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CH123A_TEST_CURVE_SLOPE2	Visible Test calibration curve slope 2 (ch. 1,2,3a)	7	%reflectance /cnt	3	1	1	integer4	4	12	22464
CH123A_TEST_CURVE_INTERCEPT2	Visible Test calibration curve intercept 2 (ch. 1,2,3a)	6	%reflectance	3	1	1	integer4	4	12	22476
CH123A_TEST_CURVE_INTERCEPTION	Visible Test calibration intersection (ch. 1,2,3a)	0	cnt	3	1	1	integer4	4	12	22488
CH123A_PRELAUNCH_CURVE_SLOPE1	Visible Prelaunch calibration curve slope 1 (ch. 1,2,3a)	7	%reflectance /cnt	3	1	1	integer4	4	12	22500
CH123A_PRELAUNCH_CURVE_INTERCEPT1	Visible Prelaunch calibration curve intercept 1 (ch. 1,2,3a)	6	%reflectance	3	1	1	integer4	4	12	22512
CH123A_PRELAUNCH_CURVE_SLOPE2	Visible Prelaunch calibration curve slope 2 (ch. 1,2,3a)	7	%reflectance /cnt	3	1	1	integer4	4	12	22524
CH123A_PRELAUNCH_CURVE_INTERCEPT2	Visible Prelaunch calibration curve intercept 2 (ch. 1,2,3a)	6	%reflectance	3	1	1	integer4	4	12	22536
CH123A_PRELAUNCH_CURVE_INTERCEPTION	Visible Prelaunch calibration intersection (ch. 1,2,3a)	0	cnt	3	1	1	integer4	4	12	22548
CH3B45_SECOND_TERM	IR Operational Calibration Second Order Term (ch. 3b,4,5)	9	mW/(m ² sr cm ⁻¹)/cnt ²	3	1	1	integer4	4	12	22560
CH3B45_FIRST_TERM	IR Operational Calibration First Order Term (ch. 3b,4,5)	6	mW/(m ² sr cm ⁻¹)/cnt	3	1	1	integer4	4	12	22572
CH3B45_ZEROTH_TERM	IR Operational Calibration Zeroth Order Term (ch. 3b,4,5)	6	mW/(m ² sr cm ⁻¹)	3	1	1	integer4	4	12	22584
CH3B45_TEST_SECOND_TERM	IR Test Calibration Second Order Term (ch. 3b,4,5)	9	mW/(m ² sr cm ⁻¹)/cnt ²	3	1	1	integer4	4	12	22596
CH3B45_TEST_FIRST_TERM	IR Test Calibration First Order Term (ch. 3b,4,5)	6	mW/(m ² sr cm ⁻¹)/cnt	3	1	1	integer4	4	12	22608
CH3B45_TEST_ZEROTH_TERM	IR Test Calibration Zeroth Order Term (ch. 3b,4,5)	6	mW/(m ² sr cm ⁻¹)	3	1	1	integer4	4	12	22620
DIGITAL A Telemetry										

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FRAME_SYNCHRONISATION	Frame Sync.This field is applicable only to NOAA data. For Metop data the field will be zeroed.	0	N/A	6	1	1	u-integer2	2	12	22632
FRAME_INDICATOR	Frame ID.This field is applicable only to NOAA data. For Metop data the all bits will be unset.	0	N/A	2	1	1	bitst(16)	2	4	22644
TIME_CODE	Time Code.This field is applicable only to NOAA data. For Metop data the all bits will be unset.	0	N/A	4	1	1	bitst(16)	2	8	22648
RAMP_CALIB	Ramp Calibration (Ch 1-5)	0	cnt	5	1	1	u-integer2	2	10	22656
INTERNAL_TARGET_TEMPERATURE_COUNT	Internal Target Temperature Count Reading (1 - 3) - (Three readings from one of the four platinum resistance thermometers (PRT). A different PRT is sampled for each scan; every fifth scan will contain a reference value of 0 in place of each reading.)	0	cnt	3	1	1	u-integer2	2	6	22666
Digital B telemetry										
INSTRUMENT_INVALID_WORD_FLAG	Invalid Word Bit Flags	0	N/A	1	1	1	bitst(16)	2	2	22672
DIGITAL_B_DATA	AVHRR Digital B Data	0	N/A	1	1	1	bitst(16)	2	2	22674
Analog housekeeping data										
INSTRUMENT_INVALID_ANALOG_WORD_FLAG	Invalid Word Bit Flags	0	N/A	1	1	1	bitst(32)	4	4	22676
PATCH_TEMPERATURE	Word 1: Patch Temperature	0	-	1	1	1	u-integer2	2	2	22680
PATCH_EXTENDED_TEMPERATURE	Word 2: Patch Temperature Extended	0	-	1	1	1	u-integer2	2	2	22682
PATCH_POWER	Word 3: Patch Power	0	-	1	1	1	u-integer2	2	2	22684
RADIATOR_TEMPERATURE	Word 4: Radiator Temperature	0	-	1	1	1	u-integer2	2	2	22686
BLACKBODY_TEMPERATURE1	Word 5: Black Body Temperature 1	0	-	1	1	1	u-integer2	2	2	22688
BLACKBODY_TEMPERATURE2	Word 6: Black Body Temperature 2	0	-	1	1	1	u-integer2	2	2	22690
BLACKBODY_TEMPERATURE3	Word 7: Black Body Temperature 3	0	-	1	1	1	u-integer2	2	2	22692
BLACKBODY_TEMPERATURE4	Word 8: Black Body Temperature 4	0	-	1	1	1	u-integer2	2	2	22694
ELECTRONIC_CURRENT	Word 9: Electronics Current	0	-	1	1	1	u-integer2	2	2	22696
MOTOR_CURRENT	Word 10: Motor Current	0	-	1	1	1	u-integer2	2	2	22698

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EARTH_SHIELD_POSITION	Word 11: Earth Shield Position	0	-	1	1	1	u-integer2	2	2	22700
						1		2	2	22702
ELECTRONIC_TEMPERATURE	Word 12: Electronics Temperature	0	-	1	1	1	u-integer2	2	2	
COOLER_HOUSING_TEMPERATURE	Word 13: Cooler Housing Temperature	0	-	1	1	1	u-integer2	2	2	22704
BASEPLATE_TEMPERATURE	Word 14: Baseplate Temperature	0	-	1	1	1	u-integer2	2	2	22706
MOTOR_HOUSING_TEMPERATURE	Word 15: Motor Housing Temperature	0	-	1	1	1	u-integer2	2	2	22708
AD_CONVERTER_TEMPERATURE	Word 16: A/D Converter Temperature	0	-	1	1	1	u-integer2	2	2	22710
						1		2	2	22712
DETECTOR4_VOLTAGE	Word 17: Detector #4 Bias Voltage	0	-	1	1	1	u-integer2	2	2	22714
						1		2	2	22716
DETECTOR5_VOLTAGE	Word 18: Detector #5 Bias Voltage	0	-	1	1	1	u-integer2	2	2	22718
CH3_BLACKBODY_VIEW	Word 19: Channel 3b Blackbody View	0	-	1	1	1	u-integer2	2	2	22720
CH4_BLACKBODY_VIEW	Word 20: Channel 4 Blackbody View	0	-	1	1	1	u-integer2	2	2	22722
CH5_BLACKBODY_VIEW	Word 21: Channel 5 Blackbody View	0	-	1	1	1	u-integer2	2	2	22724
REFERENCE_VOLTAGE	Word 22: Reference Voltage	0	-	1	1	1	u-integer2	2	2	22726
SIZE OF RECORD										22724

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FIELD	DESCRIPTION	SF	UNITS	DIM1	DIM2	DIM3	TYPE	TYPE SIZE	FIELD SIZE	OFFSET
RECORD_HEADER	Generic Record Header	0		1	1	1	REC_HEAD	20	20	0
GENERIC QUALITY INDICATORS										
DEGRADED_INST_MDR	Quality of MDR has been degraded from nominal due to an instrument degradation	NA	NA	1	1	1	boolean	1	1	20
DEGRADED_PROC_MDR	Quality of MDR has been degraded from nominal due to a processing degradation	NA	NA	1	1	1	boolean	1	1	21
MEASUREMENT DATA										
EARTH_VIEWS_PER_SCANLINE	Earth views per scanline, NE	0	cnt	1	1	1	integer2	2	2	22
SCENE_RADIANCES	Scene radiance for channels 1, 2, 3a or 3b, 4 & 5. Channels 1, 2, 3a in units of W/(m ² .sr). Channels 3b, 4, 5 in units of mW/(m ² .sr.cm ⁻¹). Channels 1, 2, 4 & 5 with scale factor = 2. Channels 3a or 3b with scale factor = 4.	See Description	See Description	NE	5	1	integer2	2	20480	24
NAVIGATION DATA AT SCAN LINE										
TIME_ATTITUDE	Time Associated with Attitude Angles	0	s	1	1	1	u-integer4	4	4	20504
EULER_ANGLE	Euler Angles: Roll, Pitch, Yaw	3	deg	3	1	1	integer2	2	6	20508
NAVIGATION_STATUS	Navigation Status Bit Field	0	N/A	1	1	1	bitst(32)	4	4	20514
SPACECRAFT_ALTITUDE	Spacecraft Altitude Above Reference Geoid (MSL)	1	km	1	1	1	u-integer4	4	4	20518
ANGULAR_RELATIONS_FIRST	Angular relationship for the first earth view in scanline	2	deg	4	1	1	integer2	2	8	20522
ANGULAR_RELATIONS_LAST	Angular relationship for the last earth view in scanline	2	deg	4	1	1	integer2	2	8	20530
EARTH_LOCATION_FIRST	Earth location for the first earth view in scanline	4	deg	2	1	1	integer4	4	8	20538
EARTH_LOCATION_LAST	Earth location for the last earth view in scanline	4	deg	2	1	1	integer4	4	8	20546
NUM_NAVIGATION_POINTS	Number of navigation points in angular_relations and earth_locations arrays, NP			1	1	1	integer2	2	2	20554
ANGULAR_RELATIONS	Angular relationships: solar zenith angle, satellite zenith angle, solar azimuth angle, satellite azimuth angle (each 40th point, points 25 to 2025; possible reduction to every 20th point, points 5 to 2045).	2	deg	4	NP	1	integer2	2	824	20556

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EARTH_LOCATIONS	Earth Location: latitude, longitude (each 40th point, points 25 to 2025; possible reduction to every 20th point, points 5 to 2045)	4	deg	2	NP	1	integer4	4	824	21380
QUALITY_INDICATOR	Quality Indicator Bit Field	0	N/A	1	1	1	bitst(32)	4	4	22204
SCAN_LINE_QUALITY	Scan Line Quality Flags	0	N/A	1	1	1	bitst(32)	4	4	22208
DATA_CALIBRATION	Noise-Equivalent Delta T and Channel Quality Flags	0	N/A	3	1	1	DATA_CALQUAL	2	6	22212
COUNT_ERROR_FRAME	Count of Bit Errors in Frame Sync. This field is applicable only to NOAA data. For Metop data it should be defaulted to zero.	0	cnt	1	1	1	u-integer2	2	2	22218
Calibration Coefficients										
CH123A_CURVE_SLOPE1	Visible Operational calibration curve slope 1 (ch. 1,2,3a)	7	%reflectance /cnt	3	1	1	integer4	4	12	22220
CH123A_CURVE_INTERCEPT1	Visible Operational calibration curve intercept 1 (ch. 1,2,3a)	6	%reflectance	3	1	1	integer4	4	12	22232
CH123A_CURVE_SLOPE2	Visible Operational calibration curve slope 2 (ch. 1,2,3a)	7	%reflectance /cnt	3	1	1	integer4	4	12	22244
CH123A_CURVE_INTERCEPT2	Visible Operational calibration curve intercept 2 (ch. 1,2,3a)	6	%reflectance	3	1	1	integer4	4	12	22256
CH123A_CURVE_INTERCEPTION	Visible Operational calibration intersection (ch. 1,2,3a)	0	cnt	3	1	1	integer4	4	12	22268
CH123A_TEST_CURVE_SLOPE1	Visible Test calibration curve slope 1 (ch. 1,2,3a)	7	%reflectance /cnt	3	1	1	integer4	4	12	22280
CH123A_TEST_CURVE_INTERCEPT1	Visible Test calibration curve intercept 1 (ch. 1,2,3a)	6	%reflectance	3	1	1	integer4	4	12	22292
CH123A_TEST_CURVE_SLOPE2	Visible Test calibration curve slope 2 (ch. 1,2,3a)	7	%reflectance /cnt	3	1	1	integer4	4	12	22304
CH123A_TEST_CURVE_INTERCEPT2	Visible Test calibration curve intercept 2 (ch. 1,2,3a)	6	%reflectance	3	1	1	integer4	4	12	22316
CH123A_TEST_CURVE_INTERCEPTION	Visible Test calibration intersection (ch. 1,2,3a)	0	cnt	3	1	1	integer4	4	12	22328
CH123A_PRELAUNCH_CURVE_SLOPE1	Visible Prelaunch calibration curve slope 1 (ch. 1,2,3a)	7	%reflectance /cnt	3	1	1	integer4	4	12	22340
CH123A_PRELAUNCH_CURVE_INTERCEPT1	Visible Prelaunch calibration curve intercept 1 (ch. 1,2,3a)	6	%reflectance	3	1	1	integer4	4	12	22352
CH123A_PRELAUNCH_CURVE_SLOPE2	Visible Prelaunch calibration curve slope 2 (ch. 1,2,3a)	7	%reflectance /cnt	3	1	1	integer4	4	12	22364
CH123A_PRELAUNCH_CURVE_INTERCEPT2	Visible Prelaunch calibration curve intercept 2 (ch. 1,2,3a)	6	%reflectance	3	1	1	integer4	4	12	22376

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CH123A_PRELAUNCH_CURVE_INTERCEPTION	Visible Prelaunch calibration intersection (ch. 1,2,3a)	0	cnt	3	1	1	integer4	4	12	22388
CH3B45_SECOND_TERM	IR Operational Calibration Second Order Term (ch. 3b,4,5)	9	mW/(m ² sr cm ⁻¹)/cnt ²	3	1	1	integer4	4	12	22400
CH3B45_FIRST_TERM	IR Operational Calibration First Order Term (ch. 3b,4,5)	6	mW/(m ² sr cm ⁻¹)/cnt	3	1	1	integer4	4	12	22412
CH3B45_ZEROTH_TERM	IR Operational Calibration Zeroth Order Term (ch. 3b,4,5)	6	mW/(m ² sr cm ⁻¹)	3	1	1	integer4	4	12	22424
CH3B45_TEST_SECOND_TERM	IR Test Calibration Second Order Term (ch. 3b,4,5)	9	mW/(m ² sr cm ⁻¹)/cnt ²	3	1	1	integer4	4	12	22436
CH3B45_TEST_FIRST_TERM	IR Test Calibration First Order Term (ch. 3b,4,5)	6	mW/(m ² sr cm ⁻¹)/cnt	3	1	1	integer4	4	12	22448
CH3B45_TEST_ZEROTH_TERM	IR Test Calibration Zeroth Order Term (ch. 3b,4,5)	6	mW/(m ² sr cm ⁻¹)	3	1	1	integer4	4	12	22460
CLOUD_INFORMATION	Cloud Information CCM (Clear/Cloudy/Mixed) Codes	0	N/A	NE	1	1	bitst(16)	2	4096	22472
DIGITAL A Telemetry										
FRAME_SYNCHRONISATION	Frame Sync. This field is applicable only to NOAA data. For Metop data the field will be zeroed.	0	N/A	6	1	1	u-integer2	2	12	26568
FRAME_INDICATOR	Frame ID. This field is applicable only to NOAA data. For Metop data the all bits will be unset.	0	N/A	2	1	1	bitst(16)	2	4	26580
TIME_CODE	Time Code. This field is applicable only to NOAA data. For Metop data the all bits will be unset.	0	N/A	4	1	1	bitst(16)	2	8	26584
RAMP_CALIB	Ramp Calibration (Ch 1-5)	0	cnt	5	1	1	u-integer2	2	10	26592
INTERNAL_TARGET_TEMPERATURE_COUNT	Internal Target Temperature Count Reading (1 - 3) - (Three readings from one of the four platinum resistance thermometers (PRT). A different PRT is sampled for each scan; every fifth scan will contain a reference value of 0 in place of each reading.)	0	cnt	3	1	1	u-integer2	2	6	26602
Digital B telemetry										
INSTRUMENT_INVALID_WORD_FLAG	Invalid Word Bit Flags	0	N/A	1	1	1	bitst(16)	2	2	26608
DIGITAL_B_DATA	AVHRR Digital B Data	0	N/A	1	1	1	bitst(16)	2	2	26610
Analog housekeeping data										
INSTRUMENT_INVALID_ANALOG_WORD_FLAG	Invalid Word Bit Flags	0	N/A	1	1	1	bitst(32)	4	4	26612

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PATCH_TEMPERATURE	Word 1: Patch Temperature	0-	1	1	1	u-integer2	2	2	26616
PATCH_EXTENDED_TEMPERATURE	Word 2: Patch Temperature Extended	0-	1	1	1	u-integer2	2	2	26618
PATCH_POWER	Word 3: Patch Power	0-	1	1	1	u-integer2	2	2	26620
RADIATOR_TEMPERATURE	Word 4: Radiator Temperature	0-	1	1	1	u-integer2	2	2	26622
BLACKBODY_TEMPERATURE1	Word 5: Black Body Temperature 1	0-	1	1	1	u-integer2	2	2	26624
BLACKBODY_TEMPERATURE2	Word 6: Black Body Temperature 2	0-	1	1	1	u-integer2	2	2	26626
BLACKBODY_TEMPERATURE3	Word 7: Black Body Temperature 3	0-	1	1	1	u-integer2	2	2	26628
BLACKBODY_TEMPERATURE4	Word 8: Black Body Temperature 4	0-	1	1	1	u-integer2	2	2	26630
ELECTRONIC_CURRENT	Word 9: Electronics Current	0-	1	1	1	u-integer2	2	2	26632
MOTOR_CURRENT	Word 10: Motor Current	0-	1	1	1	u-integer2	2	2	26634
EARTH_SHIELD_POSITION	Word 11: Earth Shield Position	0-	1	1	1	u-integer2	2	2	26636
ELECTRONIC_TEMPERATURE	Word 12: Electronics Temperature	0-	1	1	1	u-integer2	2	2	26638
COOLER_HOUSING_TEMPERATURE	Word 13: Cooler Housing Temperature	0-	1	1	1	u-integer2	2	2	26640
BASEPLATE_TEMPERATURE	Word 14: Baseplate Temperature	0-	1	1	1	u-integer2	2	2	26642
MOTOR_HOUSING_TEMPERATURE	Word 15: Motor Housing Temperature	0-	1	1	1	u-integer2	2	2	26644
AD_CONVERTER_TEMPERATURE	Word 16: A/D Converter Temperature	0-	1	1	1	u-integer2	2	2	26646
DETECTOR4_VOLTAGE	Word 17: Detector #4 Bias Voltage	0-	1	1	1	u-integer2	2	2	26648
DETECTOR5_VOLTAGE	Word 18: Detector #5 Bias Voltage	0-	1	1	1	u-integer2	2	2	26650
CH3_BLACKBODY_VIEW	Word 19: Channel 3b Blackbody View	0-	1	1	1	u-integer2	2	2	26652
CH4_BLACKBODY_VIEW	Word 20: Channel 4 Blackbody View	0-	1	1	1	u-integer2	2	2	26654
CH5_BLACKBODY_VIEW	Word 21: Channel 5 Blackbody View	0-	1	1	1	u-integer2	2	2	26656
REFERENCE_VOLTAGE	Word 22: Reference Voltage	0-	1	1	1	u-integer2	2	2	26658
SIZE OF THE MDR (FULL RESOLUTION)									26660

Field Type	Size in Bytes
bitst(16)	2
bitst(24)	3
bitst(32)	4
bitst(8)	1
boolean	1
byte	1
char(1)	1
char(2)	2
char(3)	3
char(4)	4
char(88)	88
DATA_CALQUAL	2
e-char(1)	1
e-char(2)	2
e-char(3)	3
enumerated	1
general time	15
integer2	2
integer4	4
integer8	8
long cds time	8
REC_HEAD	20
short cds time	6
u-byte	1
u-integer2	2
u-integer4	4
u-integer8	8

NOTE: Table must be sorted into ascending order

Parameter	Value	Description
NE	2048	Number of earth view per scanline for Full data (highest value)
NP	103	Number of navigation points at a sampling rate of 20 for a Full product (highest value)