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Volume 2a - ATLID L0 Products Definitions

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2	04.12.2009	-	All	Document restructured as described in EC.MN.ASD.SY.00233
3	10.06.2010	6.0	All	Modified after ECGP Pre-TEB
4	21.10.2010	6.1	All	Updated for ECGP KO
5	12.03.2012	6.1	All	Implementing changes requested in ESA CR-0005
6	11.12.2014	4.0 (changed by ASF)	All	• CR12/CCN223 implementation • Instrument evolutions

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2.1 Atmospheric LIDAR - Level 0

This specification arises in the frame of the ESSS and ECGP. The purpose of this document is to specify the format and content of the Instrument Source Packets as well as of the L0 products for the ATLID Instrument.

The current ISP format version is 4.0. Note that the numbering scheme has been changed by ASF.

TBDs/TBCs/TBWs mark specifications that are yet to be completed. Currently, this document includes no TBDs/TBCs/TBWs.

The ATLID Instrument generates the following L0 products.

Table 2.1-1: Products Summary Table

Instrument Mode	Product Id	Description	Record Size (Byte)	Granularity	Product Size	Coverage
Operational	ATL_NOM_0_	Level-0 product.	1786 (co-adding factor = 1) (worst case)	51 s^{-1}	~63 MB	1/8 orbit
			1860 (co-adding factor = 2) (nominal case)	25.5 s^{-1}	~33 MB	

2.1.1 General Data Structures

These are the common data structures for the ATLID L0 Products.

2.1.1.1 CAScoordinates

#	Field name	Description	Units	NetCDF C-Types	Size of each element	Number of elements	Total size	Value
1	Xvalue	X value	unitless	NC_FLOAT	4	1	4	
2	Yvalue	Y value	unitless	NC_FLOAT	4	1	4	
TOTAL:							8	

2.1.1.2 ATLIDAncHRData

This data structure is repeated in the ISP for every laser shot depending on the co-adding factor. A co-adding factor of N would result in N repetitions of this data structure in the ISP. See also the description in the ISP definitions below.

#	Field name	Description	Units	NetCDF C-Types	Size of each element	Number of elements	Total size	Value
1	Nacc_Cycle_Pos	Laser shot ID inside the DRD accumulation loop	unitless	NC_USHORT	2	1	2	
2	Laser_Shot_Date	Timestamp of the laser shot	unitless	ISPTime	7	1	7	

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3	Spare0	Due to ACDM FPGA design	unitless	NC_CHAR	1	1	1	
4	RLH_Frequency	TXA reference infrared frequency	BU	NC_USHORT	2	1	2	501
5	TXA_Status	Bit vector indicating laser healthiness	unitless	NC_USHORT	2	1	2	0
6	PD_En_UV	UV energy at output of harmonic section. Transfer function of IRDB shall be applied to get mJ	BU	NC_USHORT	2	1	2	2457
7	TLE_Status	Bit vector indicating TLE module healthiness	unitless	NC_USHORT	2	1	2	0
8	RLH_Status	Laser frequency locking status (word = 0xFFFF if tuned, word = 0xBFFF if not tuned)	unitless	NC_USHORT	2	1	2	65535
9	PD_En_Amp	IR energy measurement at amplifier level	BU	NC_USHORT	2	1	2	0
10	PD_CL_CL_Max	PD_CL_CL_Max	unitless	NC_USHORT	2	1	2	0
11	PD_En_MO	IR energy measurement at Master Oscillator level	BU	NC_USHORT	2	1	2	0
12	Multimode_Ratio	Proportion of longitudinal useless mode in the laser emission	BU	NC_USHORT	2	1	2	0
13	MO_I_sampled	Master Oscillator drive current	BU	NC_USHORT	2	1	2	0
14	Amp_1_Isampled	Amplifier 1 drive current	BU	NC_USHORT	2	1	2	0
15	Amp_2_Isampled	Amplifier 2 drive current	BU	NC_USHORT	2	1	2	0
16	Command_Rejection_Status_Word	TxA command acknowledge return	unitless	NC_USHORT	2	1	2	0
17	Failure_Status_Word_1	TxA failure description message (LSW)	unitless	NC_USHORT	2	1	2	0
18	Failure_Status_Word_2	TxA failure description message (MSW)	unitless	NC_USHORT	2	1	2	0
19	LCLK_Counter	Laser PRF count ID	unitless	NC_USHORT	2	1	2	0
20	delay_dt0	ACDM/TxA PRF delay in TMC(ACDM)	BU	NC_UINT	4	1	4	0
21	delay_dt3_Fixed	TLE/IDE delay offset in TMC(ACDM)	BU	NC_UINT	4	1	4	13000
22	delay_dt3_Variable	TLE/IDE delay altitude adjustment in TMC(ACDM)	BU	NC_UINT	4	1	4	15000
23	delay_dt5	OGSE synchronisation delay wrt IDE counter start in TMC(ACDM)	BU	NC_UINT	4	1	4	0
24	delay_dt6	OGSE synchronisation delay wrt ACDM PRF active edge in TMC(ACDM)	BU	NC_UINT	4	1	4	0
25	Synchro_Enable	Bit vector indicating instrument synchronisation status	unitless	NC_USHORT	2	1	2	0
26	AUTOCOL	Autocol	unitless	NC_USHORT	2	1	2	0
27	Spare1	Provision	unitless	NC_USHORT	2	1	2	0
28	Spare2	Provision	unitless	NC_USHORT	2	1	2	0
29	Spare3	Provision	unitless	NC_USHORT	2	1	2	0
30	Spare4	Provision	unitless	NC_USHORT	2	1	2	0
TOTAL:							**74**	

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2.1.1.3 ATLIDAncLRData

Instrument Ancillary Data (Low Rate).

#	Field name	Description	Units	NetCDF C-Types	Size of each element	Number of elements	Total size	Value
1	SID_ID	Source ID	unitless	NC_CHAR	1	1	1	0
2	OBT	Datation of the LR ancillary data update	unitless	ISPTime	7	1	7	
3	TXA_Mode	Laser mode (EMISSION, WARM-UP, OFFSET_CHECK, INIT, STAND-BY, OFF)	unitless	NC_USHORT	2	1	2	0
4	IDE_Mode	IDE mode (LIDAR, RONC, IMAGING, UP-DATA, STAND-BY, OFF)	unitless	NC_USHORT	2	1	2	0
5	INS_Mode	Instrument mode (INS_OPE, INS_IDL, INS_IDR, INS_DEC, INS_SBY, INS_SBR, INS_INI, INS_LAU, INS_OFF)	unitless	NC_USHORT	2	1	2	0
6	Atlid_Mode	ATLID mode (MEAS, SHTG_CAL, OCKA, LWU, DEC, RDY, HWU, IDLE_R, ST_BY, ST_BY_R, INIT, OFF)	unitless	NC_USHORT	2	1	2	0
7	BSA_Mode	BSA mode (OP-LOOP, CL-LOOP, COMPENS, STAND-BY, OFF)	unitless	NC_USHORT	2	1	2	0
8	Valid1	ACDM Instrument configuration gives the redundancy (1 for B (Redundant), 0 for A (Nominal)): bit0 - PpsStaOkity - PPS Status Validity bit1 - SrcOkity - PPS Source Validity bit2 - InstConf - Instrument Configuration bit3 - ResRegOkity - Reset Register Validity bit4 - AcdmRedSel - ACDM Redundancy Selection bit5 - TleRedSel - TLE Redundancy Selection bit6 - IdeRedSel - IDE Redundancy Selection bit7 - EqSolCtrl - EQ SOL Control	unitless	NC_CHAR	1	1	1	0
9	spare0	Provision	unitless	NC_CHAR	1	1	1	0
10	ModeTranSta	mode transition status: 0 - In_transition 1 - Stabilising 2 - Steady	unitless	NC_CHAR	1	1	1	0
11	Status	Bit vector : ACDM Instrument HW check-up	unitless	NC_USHORT	2	1	2	0
12	Current_Procedure	ATLID sub-mode (NOCAL, DCC, RNC, OCK, BEC, EDC, COC, CSC, FSC, LDT, IMG, UPD)	unitless	NC_USHORT	2	1	2	0
13	Calibration_Step	Frequency step ID inside the calibration scan	unitless	NC_CHAR	1	1	1	0
14	Calibration_Setpoint_1	Setpoint first data of the step (COC-X, EDC-EBEX, CSC, FSC, …)	BU	NC_USHORT	2	1	2	0
15	Calibration_Setpoint_2	Setpoint secundary data of the step (COC-Y, EDC-baffle)	BU	NC_USHORT	2	1	2	0
16	Last_Event_ID	Software failure description message	unitless	NC_USHORT	2	1	2	0

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17	spare1	ACDM PRF count ID	unitless	NC_USHORT	2	1	2	0
18	M1_Mirror_Temp	Primary mirror temperature	BU	NC_USHORT	2	1	2	0
19	BKGE_Temp	Background etalon temperature	BU	NC_USHORT	2	1	2	0
20	E_BEX_A_Temp	Beam expander A temperature	BU	NC_USHORT	2	1	2	0
21	E_BEX_B_Temp	Beam expander B temperature	BU	NC_USHORT	2	1	2	0
22	BSM_Command_X	Beam steering actuator (X axis)	BU	NC_USHORT	2	1	2	0
23	BSM_Command_Y	Beam steering actuator (Y axis)	BU	NC_USHORT	2	1	2	0
24	spare2	Provision	BU	NC_USHORT	2	1	2	0
25	spare3	Provision	BU	NC_USHORT	2	1	2	0
26	Centroid	Laser footprint position in CAS FOV (in µrad)	unitless	CAScoordinates	8	1	8	
27	Image_SNR_Estimator_Status	CAS averaged image availability	unitless	NC_CHAR	1	1	1	0
28	Estimated_SNR	Estimated SNR from centroid function	unitless	NC_FLOAT	4	1	4	0
29	Control_Error_Norm	Control error distance to CAS target in CAS FOV (in µrad)	unitless	NC_FLOAT	4	1	4	0
30	Image_Quality_Status	Correlation quality flag based on SNR from centroid function	unitless	NC_CHAR	1	1	1	0
31	Duration_Out_Status	Flag to detect a long duration without any correlation computation	unitless	NC_CHAR	1	1	1	0
32	Control_Error_Out_Status	Flag to detect erroneous or too important control error	unitless	NC_CHAR	1	1	1	0
33	Control_Error_Spec_Status	Current flag to detect when the pointing fulfils the specification	unitless	NC_CHAR	1	1	1	0
34	Frequency_Compensation	RLH frequency bias applied when S/C in YS mode	unitless	NC_SHORT	2	1	2	0
35	PPS_fine_time	LOBT fine time at PPS arrival	unitless	NC_CHAR	1	3	3	
36	F_cmd	working laser frequency f1	unitless	NC_USHORT	2	1	2	0
37	SpareArray	Provision	unitless	NC_CHAR	1	16	16	
38	DRD_Reception_Date	Date of DRD packet Reception	unitless	ISPTime	7	1	7	
39	DRD_Packet_Counter	DRD packet counter	unitless	NC_CHAR	1	3	3	
TOTAL:							**104**	

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2.1.2 ATL_NOM_0_

2.1.2.1 Description

This is the nominal ATLID L0 product.

2.1.2.2 Input Data

The ATLID Level-0 data is a reorganisation and collation of the ISPs specified in section 2.1.2.4.4. Quality flags are computed as needed and stored in the L0 Products Header.

2.1.2.3 Auxiliary Data

No auxiliary data is needed apart from time correlation information in the case of invalid time stamps in the ISPs.

2.1.2.4 Product Structure

Table 2.1-2: Product Overview

Fixed Product Header
ATLIDNOM_L0_MainProductHeader
L0 Specific Product Header
Instrument Source Packets

2.1.2.4.1 Fixed Product Header

See Products Definitions Volume 1.

2.1.2.4.2 ATLIDNOM_L0_MainProductHeader

This is the Main Product Header for the ATLID L0 Products. It is identical to the Main Product Header in Vol. 1 but has some predefined values specific to the ATLID L0 product.

#	Field name	Units	NetCDF C-Types	Size of each element	Number of elements	Total size	Value
1	productName	unitless	NC_BYTE	60	1	60	
2	originalProductName	unitless	NC_BYTE	60	1	60	
3	missionID	unitless	NC_BYTE	3	1	3	ECA
4	fileClass	unitless	NC_BYTE	4	1	4	
5	fileCategory	unitless	NC_BYTE	4	1	4	ATL_
6	productType	unitless	NC_BYTE	3	1	3	
7	productLevel	unitless	NC_BYTE	2	1	2	0_
8	sensingStartTime	unitless	NC_BYTE	23	1	23	
9	sensingStopTime	unitless	NC_BYTE	23	1	23	
10	degradedProductQualityFlag	unitless	ECBool	1	1	1	
11	description	unitless	NC_BYTE	2000	1	2000	
12	processorName	unitless	NC_BYTE	2000	1	2000	
13	processorMajorVersion	unitless	NC_SHORT	2	1	2	
14	processorMinorVersion	unitless	NC_SHORT	2	1	2	
15	executableMajorVersion	unitless	NC_SHORT	2	1	2	

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16	executableMinorVersion	unitless	NC_SHORT	2	1	2	
17	formatMajorVersion	unitless	NC_SHORT	2	1	2	
18	formatMinorVersion	unitless	NC_SHORT	2	1	2	
19	subsettedProduct	unitless	ECBool	1	1	1	
20	dataBlockSize	unitless	NC_UINT64	8	1	8	
21	acquisitionStation	unitless	NC_BYTE	10	1	10	
22	processingCentre	unitless	NC_BYTE	10	1	10	
23	processingStartTime	unitless	NC_BYTE	23	1	23	
24	processingStopTime	unitless	NC_BYTE	23	1	23	
25	orbitNumber	unitless	NC_USHORT	2	1	2	
26	frameID	unitless	NC_BYTE	1	1	1	
27	ANXTime	unitless	NC_BYTE	26	1	26	
28	ANXLongitude	unitless	NC_DOUBLE	8	1	8	
29	stateVectorSource	unitless	NC_BYTE	15	1	15	
30	stateVectorTime	unitless	NC_BYTE	26	1	26	
31	xPosition	unitless	NC_DOUBLE	8	1	8	
32	yPosition	unitless	NC_DOUBLE	8	1	8	
33	zPosition	unitless	NC_DOUBLE	8	1	8	
34	xVelocity	unitless	NC_DOUBLE	8	1	8	
35	yVelocity	unitless	NC_DOUBLE	8	1	8	
36	zVelocity	unitless	NC_DOUBLE	8	1	8	
37	orbitSemiMajorAxis	unitless	NC_DOUBLE	8	1	8	
38	orbitEccentricity	unitless	NC_DOUBLE	8	1	8	
39	orbitInclination	unitless	NC_DOUBLE	8	1	8	
40	perigeeArgument	unitless	NC_DOUBLE	8	1	8	
41	rightAscension	unitless	NC_DOUBLE	8	1	8	
42	meanAnomaly	unitless	NC_DOUBLE	8	1	8	
43	frameStartCoordinates	unitless	GeographicCoordinates	8	1	8	
44	frameStopCoordinates	unitless	GeographicCoordinates	8	1	8	
45	frameStartTime	unitless	NC_BYTE	23	1	23	
46	frameStopTime	unitless	NC_BYTE	23	1	23	
47	frameStartMargin	unitless	NC_DOUBLE	8	1	8	
48	frameStopMargin	unitless	NC_DOUBLE	8	1	8	
TOTAL:						**Size depends on XML format**	

2.1.2.4.3 L0 Specific Product Header

See Products Definitions Volume 1.

2.1.2.4.4 Instrument Source Packets

ATLID operates in a number of modes. Some of the modes do not generate ISPs at all; some generate ISPs for special purposes (e.g. calibration measurements). For the ESSS some of them generate only dummy ISPs (that is ISPs in the right format with dummy values). The ATLID instrument modes are summarised in Table 2.1-3.

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Table 2.1-3: ATLID Instrument Modes

ATLID Mode name	Mode	Submode	Acronym	Science Packet 225	CAS Packet 226	HK Packet 226
OFF (used for Launch)	INS_LAU	OFF	OFF	-	-	-
OFF	INS_OFF	OFF	OFF	-	-	-
INIT	INS_INI	INIT	INI	-	-	-
Standby	INS_SBY	STAND_BY	SBY	-	-	-
Standby-refuse	INS_SBR	STAND_BY_R	SBR	-	-	-
Heater Warm-up	INS_IDL	HWU	HWU	-	-	-
Ready	INS_IDL	RDY	RDY	-	-	-
Idle-refuse	INS_IDR	IDLE_R	IDR	-	-	-
Decontamination	INS_DEC	DECONTAM	DEC	-	-	-
Laser Warm-up	INS_OPE	LWU	LWU	-	-	-
Dark Current Calibration	INS_OPE	LWU	DCC	x	x	x
Read-out noise calibration	INS_OPE	LWU	RNC	x	x	x
Measurement	INS_OPE	MEAS	MES	x	x	x
Offset Check calibration (laser)	INS_OPE	OCKA	OCK	-	-	-
Background Etalon Spectral calibration	INS_OPE	SHOOTING_CAL	BEC	x	x	x
Emission Defocus calibration	INS_OPE	SHOOTING_CAL	EDC	x	x	x
Coarse Co-alignment calibration	INS_OPE	SHOOTING_CAL	COC	x	x	x
Coarse Spectral calibration	INS_OPE	SHOOTING_CAL	CSC	x	x	x
Fine Spectral calibration	INS_OPE	SHOOTING_CAL	FSC	x	x	x
Imaging	INS_OPE	SHOOTING_CAL	IMG	x	x	x
Un-processed data	INS_OPE	SHOOTING_CAL	UPD	x	x	x

The following subsections define the generated ISPs.

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2.1.2.4.4.1 ATLID_LIDAR_PacketHeader Bit Vector Table

These are the actual values of the Packet Header for the ATLID LIDAR ISP.

Parameter	MSB	Description	Value
Version_Number	b0 - b2	CCSDS Version Number	000b
Type	b3	Packet type	0b
Data_Field_Header_Flag	b4	Indicates the presence of a secondary (data field) header (when set to 1).	0x01
Application_Process_ID__PID	b5 - b11	Process ID (part of the APID)	0x40
Application_Process_ID__PCAT	b12 - b15	Packet category	12
Segmentation_Flags	b16 - b17	Indicates the grouping (segmentation) of TM source packets.	11b
Source_Sequence_Count	b18 - b31	Wrap around counter used to count each TM packet. For the ESSS in contrast to the PUS, only one counter for all APIDs is maintained.	source packet count value modulo 2^14 (0 - 16383)
Packet_Length	b32 - b47	Number of bytes contained in the packet data field minus 1.	number of octets in packed data field - 1

2.1.2.4.4.2 ATLID_LIDAR_PUSDataFieldHeader Bit Vector Table

These are the actual values of the PUS Data Field Header described in Vol. 1 for the ATLID LIDAR ISP.

Parameter	MSB	Description	Value
Spare_1	b0	Not used.	Must be set to 0 for all TM source packets.
TM_Source_Packet_PUS_Version_Number	b1 - b3	Not used.	(0 was used for ESA PUS version) 1 for ECSS PUS
Spare_2	b4 - b7	Filler to complete the byte.	Must be set to 0 for all TM source packets
Service_Type	b8 - b15	Indicates the service to which the packet relates.	225
Service_Subtype	b16 - b23	Indicates the service subtype to which the packet relates.	1
Destination_ID	b24 - b31	Indicates the destination of the packet (May be omitted if only one destination exists).	0
Time	b32 - b87	Onboard time (OBT).	Coarse time: LSB = 1 sec Fine time: LSB = 1/16777215 sec
Time_Quality	b88 - b95	This shall give the status of the time reporting	Bit3 (Time type): 0 = Elapsed Time (ET); 1 = OBT

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		sub-service, i.e. current PPS source and whether synchronization is enabled.	Bit 4 (Sync. Source): 0 = internal; 1 = external Bit 5 (Ext. Sync. Source Detail): 0 = 1Hz Pulse; 1 = MIL-BUS Bit 6 (Sync. Status): 0 = NoSync; 1 = InSync Bit 7 (Sync. Enabled/Disabled): 0 = Disabled; 1 = Enabled

2.1.2.4.4.3 ATLIDLIDARISP

#	Field name	Description	Units	NetCDF C-Types	Size of each element	Number of elements	Total size	Value
1	stateVectorQuality	Contains details about the S/C state vector quality information as received from the S/C	unitless	NC_UINT	4	1	4	
2	ISPFormatVersion	Stores the version number of the ICD where the ISP format definition is specified. The most significant byte shall store the major version and the least significant byte shall store the minor version.	unitless	NC_USHORT	2	1	2	
3	AncDataSetsCount	Nanc (=Nacc nominally) : nb of sets of high rate ancillary per DRD / nb of laser shots per DRD if less or equal 10	unitless	NC_USHORT	2	1	2	
4	ancHRDataSets	This data structure is repeated in the ISP for every laser shot depending on the co-adding factor. A co-adding factor of N would result in N repetitions of this data structure in the ISP. See also the description in the ISP definitions below.	unitless	ATLIDAncHRData	74	1 - 10	74 - 740	
5	AncLRData		unitless	ATLIDAncLRData	104	1	104	
6	Packet_Header	Packet Counter (16 bit)	unitless	NC_USHORT	2	1	2	1
7	IDE_Mode_Selection	IDE mode (LIDAR, RONC, IMAGING or UP-DATA) : here LIDAR	unitless	NC_USHORT	2	1	2	1
8	N_PRF_IDE_Parameter	Nacc : nb of laser shots per DRD	unitless	NC_USHORT	2	1	2	2
9	IDE_PRF_Number	PRF counter (8Bit)	unitless	NC_USHORT	2	1	2	0
10	Pixel_Index_UPD	Pixel ID when in UPD mode; not applicable when on LIDAR sub-mode	unitless	NC_USHORT	2	1	2	1
11	ACDM_Validity_Status	Bit vector indicating the ACDM status concerning the quality of the acquisition (copy of ACDM TC content)	unitless	NC_USHORT	2	1	2	0
12	CAS_Data_Indicator	CAS image counter in case of type2 DRD	unitless	NC_USHORT	2	1	2	0
13	Background_Saturation_Status	Bit vector for channels background saturation	unitless	NC_USHORT	2	1	2	0

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		indicator						
14	Detection_Saturation_Status	Bit vector for channels signal saturation indicator	unitless	NC_USHORT	2	1	2	0
15	Background_Integration_Time	Adjustment parameter for background samples integration time	unitless	NC_USHORT	2	1	2	0
16	DataArray_MieCopolar	Contains 256 laser return samples [1..256], 4 offset evaluation samples [257..260] (transition sample at #255)	BU	NC_USHORT	2	260	520	
17	DataArray_MieCrosspolar	Contains 256 laser return samples [1..256], 4 offset evaluation samples [257..260] (transition sample at #255)	BU	NC_USHORT	2	260	520	
18	DataArray_Rayleigh	Contains 256 laser return samples [1..256], 4 offset evaluation samples [257..260] (transition sample at #255)	BU	NC_USHORT	2	260	520	
19	AppendedCRC			AppendedCRC	2	1	2	
TOTAL:							**1768 - 2434**	

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2.1.2.4.4.4 ATLID_RONC_PacketHeader Bit Vector Table

These are the actual values of the Packet Header for the ATLID RONC ISP.

Parameter	MSB	Description	Value
Version_Number	b0 - b2	CCSDS Version Number	000b
Type	b3	Packet type	0b
Data_Field_Header_Flag	b4	Indicates the presence of a secondary (data field) header (when set to 1).	0x01
Application_Process_ID__PID	b5 - b11	Process ID (part of the APID)	0x40
Application_Process_ID__PCAT	b12 - b15	Packet category	12
Segmentation_Flags	b16 - b17	Indicates the grouping (segmentation) of TM source packets.	11b
Source_Sequence_Count	b18 - b31	Wrap around counter used to count each TM packet. For the ESSS in contrast to the PUS, only one counter for all APIDs is maintained.	source packet count value modulo 2^14 (0 - 16383)
Packet_Length	b32 - b47	Number of bytes contained in the packet data field minus 1.	number of octets in packed data field - 1

2.1.2.4.4.5 ATLID_RONC_PUSDataFieldHeader Bit Vector Table

These are the actual values of the PUS Data Field Header described in Vol. 1 for the ATLID RONC ISP.

Parameter	MSB	Description	Value
Spare_1	b0	Not used.	Must be set to 0 for all TM source packets.
TM_Source_Packet_PUS_Version_Number	b1 - b3	Not used.	(0 was used for ESA PUS version) 1 for ECSS PUS
Spare_2	b4 - b7	Filler to complete the byte.	Must be set to 0 for all TM source packets
Service_Type	b8 - b15	Indicates the service to which the packet relates.	225
Service_Subtype	b16 - b23	Indicates the service subtype to which the packet relates.	2
Destination_ID	b24 - b31	Indicates the destination of the packet (May be omitted if only one destination exists).	0
Time	b32 - b87	Onboard time (OBT).	Coarse time: LSB = 1 sec Fine time: LSB = 1/16777215 sec
Time_Quality	b88 - b95	This shall give the status of the time reporting	Bit3 (Time type): 0 = Elapsed Time (ET); 1 = OBT

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		sub-service, i.e. current PPS source and whether synchronization is enabled.	Bit 4 (Sync. Source): 0 = internal; 1 = external Bit 5 (Ext. Sync. Source Detail): 0 = 1Hz Pulse; 1 = MIL-BUS Bit 6 (Sync. Status): 0 = NoSync; 1 = InSync Bit 7 (Sync. Enabled/Disabled): 0 = Disabled; 1 = Enabled

2.1.2.4.4.6 ATLIDRONCISP

#	Field name	Description	Units	NetCDF C-Types	Size of each element	Number of elements	Total size	Value
1	stateVectorQuality	Contains details about the S/C state vector quality information as received from the S/C	unitless	NC_UINT	4	1	4	
2	ISPFormatVersion	Stores the version number of the ICD where the ISP format definition is specified. The most significant byte shall store the major version and the least significant byte shall store the minor version.	unitless	NC_USHORT	2	1	2	
3	AncDataSetsCount	Nanc (=Nacc nominally) : nb of sets of high rate ancillary per DRD / nb of laser shots per DRD if less or equal 10	unitless	NC_USHORT	2	1	2	
4	ancHRDataSets	This data structure is repeated in the ISP for every laser shot depending on the co-adding factor. A co-adding factor of N would result in N repetitions of this data structure in the ISP. See also the description in the ISP definitions below.	unitless	ATLIDAncHRData	74	1 - 10	74 - 740	
5	AncLRData		unitless	ATLIDAncLRData	104	1	104	
6	Packet_Header	Packet Counter (16bit)	unitless	NC_USHORT	2	1	2	1
7	IDE_Mode_Selection	IDE mode (LIDAR, RONC, IMAGING or UP-DATA) : here RONC	unitless	NC_USHORT	2	1	2	2
8	N_PRF_IDE_Parameter	Nacc : nb of laser shots per DRD	unitless	NC_USHORT	2	1	2	1
9	IDE_PRF_Number	PRF counter (8 bit)	unitless	NC_USHORT	2	1	2	
10	Pixel_Index_UPD	Pixel ID when in UPD mode; not applicable when on RONC sub-mode	unitless	NC_USHORT	2	1	2	1
11	ACDM_Validity_Status	Bit vector indicating the ACDM status concerning the quality of the acquisition (copy of ACDM TC content)	unitless	NC_USHORT	2	1	2	
12	CAS_Data_Indicator	CAS image counter in case of type2 DRD	unitless	NC_USHORT	2	1	2	

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13	Background_Saturation_Status	Bit vector for channels background saturation indicator	unitless	NC_USHORT	2	1	2	
14	Detection_Saturation_Status	Bit vector for channels signal saturation indicator	unitless	NC_USHORT	2	1	2	
15	Background_Integration_Time	Adjustment parameter for background samples integration time	unitless	NC_USHORT	2	1	2	
16	DataArray_MieCopolar	Contains 256 laser return samples [1..256], 4 offset evaluation samples [257..260] (transition sample at #255)	BU	NC_USHORT	2	260	520	
17	DataArray_MieCrosspolar	Contains 256 laser return samples [1..256], 4 offset evaluation samples [257..260] (transition sample at #255)	BU	NC_USHORT	2	260	520	
18	DataArray_Rayleigh	Contains 256 laser return samples [1..256], 4 offset evaluation samples [257..260] (transition sample at #255)	BU	NC_USHORT	2	260	520	
19	AppendedCRC			AppendedCRC	2	1	2	
TOTAL:							**1768 - 2434**	

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2.1.2.4.4.7 ATLID_IMAGING_PacketHeader Bit Vector Table

These are the actual values of the Packet Header for the ATLID IMAGING ISP.

Parameter	MSB	Description	Value
Version_Number	b0 - b2	CCSDS Version Number	000b
Type	b3	Packet type	0b
Data_Field_Header_Flag	b4	Indicates the presence of a secondary (data field) header (when set to 1).	0x01
Application_Process_ID__PID	b5 - b11	Process ID (part of the APID)	0x40
Application_Process_ID__PCAT	b12 - b15	Packet category	12
Segmentation_Flags	b16 - b17	Indicates the grouping (segmentation) of TM source packets.	11b
Source_Sequence_Count	b18 - b31	Wrap around counter used to count each TM packet. For the ESSS in contrast to the PUS, only one counter for all APIDs is maintained.	source packet count value modulo 2^14 (0 - 16383)
Packet_Length	b32 - b47	Number of bytes contained in the packet data field minus 1.	number of octets in packed data field - 1

2.1.2.4.4.8 ATLID_IMAGING_PUSDataFieldHeader Bit Vector Table

These are the actual values of the PUS Data Field Header described in Vol. 1 for the ATLID IMAGING ISP.

Parameter	MSB	Description	Value
Spare_1	b0	Not used.	Must be set to 0 for all TM source packets.
TM_Source_Packet_PUS_Version_Number	b1 - b3	Not used.	(0 was used for ESA PUS version) 1 for ECSS PUS
Spare_2	b4 - b7	Filler to complete the byte.	Must be set to 0 for all TM source packets
Service_Type	b8 - b15	Indicates the service to which the packet relates.	225
Service_Subtype	b16 - b23	Indicates the service subtype to which the packet relates.	3
Destination_ID	b24 - b31	Indicates the destination of the packet (May be omitted if only one destination exists).	0
Time	b32 - b87	Onboard time (OBT).	Coarse time: LSB = 1 sec Fine time: LSB = 1/16777215 sec
Time_Quality	b88 - b95	This shall give the status of the time reporting	Bit3 (Time type): 0 = Elapsed Time (ET); 1 = OBT

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		sub-service, i.e. current PPS source and whether synchronization is enabled.	Bit 4 (Sync. Source): 0 = internal; 1 = external Bit 5 (Ext. Sync. Source Detail): 0 = 1Hz Pulse; 1 = MIL-BUS Bit 6 (Sync. Status): 0 = NoSync; 1 = InSync Bit 7 (Sync. Enabled/Disabled): 0 = Disabled; 1 = Enabled

2.1.2.4.4.9 ATLIDIMAGINGISP

#	Field name	Description	Units	NetCDF C-Types	Size of each element	Number of elements	Total size	Value
1	stateVectorQuality	Contains details about the S/C state vector quality information as received from the S/C	unitless	NC_UINT	4	1	4	
2	ISPFormatVersion	Stores the version number of the ICD where the ISP format definition is specified. The most significant byte shall store the major version and the least significant byte shall store the minor version.	unitless	NC_USHORT	2	1	2	
3	AncDataSetsCount	Nanc (=Nacc nominally): nb of sets of high rate ancillary per DRD / nb of laser shots per DRD if less or equal 10	unitless	NC_USHORT	2	1	2	
4	ancHRDataSets	This data structure is repeated in the ISP for every laser shot depending on the co-adding factor. A co-adding factor of N would result in N repetitions of this data structure in the ISP. See also the description in the ISP definitions	unitless	ATLIDAncHRData	74	1 - 10	74 - 740	

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		below.						
5	AncLRData		unitless	ATLIDAncLRData	104	1	104	
6	Packet_Header	Packet Counter (16bit)	unitless	NC_USHORT	2	1	2	1
7	IDE_Mode_Selection	IDE mode (LIDAR, RONC, IMAGING or UP-DATA); here IMAGING	unitless	NC_USHORT	2	1	2	3
8	N_PRF_IDE_Parameter	Nacc : nb of laser shots per DRD	unitless	NC_USHORT	2	1	2	1
9	IDE_PRF_Number	PRF counter (8 bit)	unitless	NC_USHORT	2	1	2	
10	Pixel_Index_UPD	Pixel ID when in UPD mode; not applicable when on IMAGING sub-mode	unitless	NC_USHORT	2	1	2	1
11	ACDM_Validity_Status	Bit vector indicating the ACDM status concerning the quality of the acquisition (copy of ACDM TC content)	unitless	NC_USHORT	2	1	2	
12	CAS_Data_Indicator	CAS image counter in case of type2 DRD	unitless	NC_USHORT	2	1	2	
13	Background_Saturation_Status	Bit vector for channels background saturation indicator	unitless	NC_USHORT	2	1	2	
14	Detection_Saturation_Status	Bit vector for channels signal saturation indicator	unitless	NC_USHORT	2	1	2	
15	Background_Integration_Time	Adjustment parameter for background samples integration time	unitless	NC_USHORT	2	1	2	
16	DataArray_BKG_MIE_Copolar	Mie detector background map	unitless	NC_USHORT	2	48	96	
17	DataArray_SMP_MIE_Copolar	Mie detector signal map	unitless	NC_USHORT	2	48	96	
18	DataArray_OFS_MIE_Copolar	Mie detector offset data	unitless	NC_USHORT	2	4	8	
19	DataArray_BKG_MIE_Crosspolar	Cross-polar detector background map	unitless	NC_USHORT	2	48	96	
20	DataArray_SMP_MIE_Crosspolar	Cross-polar detector signal map	unitless	NC_USHORT	2	48	96	
21	DataArray_OFS_MIE_Crosspolar	Cross-polar detector	unitless	NC_USHORT	2	4	8	

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		offset data						
22	DataArray_BKG_MIE_Rayleigh	Rayleigh detector background map	unitless	NC_USHORT	2	48	96	
23	DataArray_SMP_MIE_Rayleigh	Rayleigh detector signal map	unitless	NC_USHORT	2	48	96	
24	DataArray_OFS_MIE_Rayleigh	Rayleigh detector offset data	unitless	NC_USHORT	2	4	8	
25	SpareArray	Provision	unitless	NC_USHORT	2	480	960	
26	AppendedCRC			AppendedCRC	2	1	2	
TOTAL:							**1768 - 2434**	

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2.1.2.4.4.10 ATLID_UPDATA_PacketHeader Bit Vector Table

These are the actual values of the Packet Header for the ATLID UPDATA ISP.

Parameter	MSB	Description	Value
Version_Number	b0 - b2	CCSDS Version Number	000b
Type	b3	Packet type	0b
Data_Field_Header_Flag	b4	Indicates the presence of a secondary (data field) header (when set to 1).	0x01
Application_Process_ID__PID	b5 - b11	Process ID (part of the APID)	0x40
Application_Process_ID__PCAT	b12 - b15	Packet category	12
Segmentation_Flags	b16 - b17	Indicates the grouping (segmentation) of TM source packets.	11b
Source_Sequence_Count	b18 - b31	Wrap around counter used to count each TM packet. For the ESSS in contrast to the PUS, only one counter for all APIDs is maintained.	source packet count value modulo 2^14 (0 - 16383)
Packet_Length	b32 - b47	Number of bytes contained in the packet data field minus 1.	number of octets in packed data field - 1

2.1.2.4.4.11 ATLID_UPDATA_PUSDataFieldHeader Bit Vector Table

These are the actual values of the PUS Data Field Header described in Vol. 1 for the ATLID UPDATA ISP.

Parameter	MSB	Description	Value
Spare_1	b0	Not used.	Must be set to 0 for all TM source packets.
TM_Source_Packet_PUS_Version_Number	b1 - b3	Not used.	(0 was used for ESA PUS version) 1 for ECSS PUS
Spare_2	b4 - b7	Filler to complete the byte.	Must be set to 0 for all TM source packets
Service_Type	b8 - b15	Indicates the service to which the packet relates.	225
Service_Subtype	b16 - b23	Indicates the service subtype to which the packet relates.	4
Destination_ID	b24 - b31	Indicates the destination of the packet (May be omitted if only one destination exists).	0
Time	b32 - b87	Onboard time (OBT).	Coarse time: LSB = 1 sec Fine time: LSB = 1/16777215 sec
Time_Quality	b88 - b95	This shall give the status of the time reporting	Bit3 (Time type): 0 = Elapsed Time (ET); 1 = OBT

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		sub-service, i.e. current PPS source and whether synchronization is enabled.	Bit 4 (Sync. Source): 0 = internal; 1 = external Bit 5 (Ext. Sync. Source Detail): 0 = 1Hz Pulse; 1 = MIL-BUS Bit 6 (Sync. Status): 0 = NoSync; 1 = InSync Bit 7 (Sync. Enabled/Disabled): 0 = Disabled; 1 = Enabled

2.1.2.4.4.12 ATLIDUPDATAISP

#	Field name	Description	Units	NetCDF C-Types	Size of each element	Number of elements	Total size	Value
1	stateVectorQuality	Contains details about the S/C state vector quality information as received from the S/C	unitless	NC_UINT	4	1	4	
2	ISPFormatVersion	Stores the version number of the ICD where the ISP format definition is specified. The most significant byte shall store the major version and the least significant byte shall store the minor version.	unitless	NC_USHORT	2	1	2	
3	AncDataSetsCount	Nanc (=Nacc nominally) : nb of sets of high rate ancillary per DRD / nb of laser shots per DRD if less or equal 10	unitless	NC_USHORT	2	1	2	
4	ancHRDataSets	This data structure is repeated in the ISP for every laser shot depending on the co-adding factor. A co-adding factor of N would result in N repetitions of this data structure in the ISP. See also the description in the ISP definitions below.	unitless	ATLIDAncHRData	74	1 - 10	74 - 740	
5	AncLRData		unitless	ATLIDAncLRData	104	1	104	
6	Packet_Header	Packet Counter (16bit)	unitless	NC_USHORT	2	1	2	1
7	IDE_Mode_Selection	IDE mode (LIDAR, RONC, IMAGING or UP-DATA) : here UP-DATA	unitless	NC_USHORT	2	1	2	4
8	N_PRF_IDE_Parameter	Nacc : nb of laser shots per DRD	unitless	NC_USHORT	2	1	2	1
9	IDE_PRF_Number	PRF counter (8 bit)	unitless	NC_USHORT	2	1	2	
10	Pixel_Index_UPD	Pixel ID (p) of the first pixel where UPD mode is applied	unitless	NC_USHORT	2	1	2	1
11	ACDM_Validity_Status	Bit vector indicating the ACDM status concerning the quality of the acquisition (copy of ACDM TC content)	unitless	NC_USHORT	2	1	2	
12	CAS_Data_Indicator	CAS image counter in case of type2 DRD	unitless	NC_USHORT	2	1	2	
13	Background_Saturation_Status	Bit vector for channels background saturation	unitless	NC_USHORT	2	1	2	

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		indicator						
14	Detection_Saturation_Status	Bit vector for channels signal saturation indicator	unitless	NC_USHORT	2	1	2	
15	Background_Integration_Time	Adjustment parameter for background samples integration time	unitless	NC_USHORT	2	1	2	
16	DataArray_MIE_Copolar_p	Pixel p of Mie detector video signal sampling	BU	NC_USHORT	2	130	260	
17	DataArray_MIE_Copolar_p1	Pixel p+1 of Mie detector video signal sampling	BU	NC_USHORT	2	130	260	
18	DataArray_MIE_Crosspolar_p	Pixel p of cross-polar detector video signal sampling	BU	NC_USHORT	2	130	260	
19	DataArray_MIE_Crosspolar_p1	Pixel p+1 of cross-polar detector video signal sampling	BU	NC_USHORT	2	130	260	
20	DataArray_MIE_Rayleigh_p	Pixel p of Rayleigh detector video signal sampling	BU	NC_USHORT	2	130	260	
21	DataArray_MIE_Rayleigh_p1	Pixel p+1 of Rayleigh detector video signal sampling	BU	NC_USHORT	2	130	260	
22	AppendedCRC			AppendedCRC	2	1	2	
TOTAL:							**1768 - 2434**	

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2.1.2.4.4.13 ATLIDCoalignmentPacketHeader Bit Vector Table

These are the actual values of the Packet Header for the ATLID Coalignment ISP.

Parameter	MSB	Description	Value
Version_Number	b0 - b2	CCSDS Version Number	000b
Type	b3	Packet type	0b
Data_Field_Header_Flag	b4	Indicates the presence of a secondary (data field) header (when set to 1).	0x01
Application_Process_ID__PID	b5 - b11	Process ID (part of the APID)	0x40
Application_Process_ID__PCAT	b12 - b15	Packet category	12
Segmentation_Flags	b16 - b17	Indicates the grouping (segmentation) of TM source packets.	11b
Source_Sequence_Count	b18 - b31	Wrap around counter used to count each TM packet. For the ESSS in contrast to the PUS, only one counter for all APIDs is maintained.	source packet count value modulo 2^14 (0 - 16383)
Packet_Length	b32 - b47	Number of bytes contained in the packet data field minus 1.	number of octets in packed data field - 1

2.1.2.4.4.14 ATLIDCoalignmentPUSDataFieldHeader Bit Vector Table

These are the actual values of the PUS Data Field Header described in Vol. 1 for the ATLID Coalignment ISP.

Parameter	MSB	Description	Value
Spare_1	b0	Not used.	Must be set to 0 for all TM source packets.
TM_Source_Packet_PUS_Version_Number	b1 - b3	Not used.	(0 was used for ESA PUS version) 1 for ECSS PUS
Spare_2	b4 - b7	Filler to complete the byte.	Must be set to 0 for all TM source packets
Service_Type	b8 - b15	Indicates the service to which the packet relates.	226
Service_Subtype	b16 - b23	Indicates the service subtype to which the packet relates.	1
Destination_ID	b24 - b31	Indicates the destination of the packet (May be omitted if only one destination exists).	0
Time	b32 - b87	Onboard time (OBT).	Coarse time: LSB = 1 sec Fine time: LSB = 1/16777215 sec
Time_Quality	b88 - b95	This shall give the status of the time reporting	Bit3 (Time type): 0 = Elapsed Time (ET); 1 = OBT

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		sub-service, i.e. current PPS source and whether synchronization is enabled.	Bit 4 (Sync. Source): 0 = internal; 1 = external Bit 5 (Ext. Sync. Source Detail): 0 = 1Hz Pulse; 1 = MIL-BUS Bit 6 (Sync. Status): 0 = NoSync; 1 = InSync Bit 7 (Sync. Enabled/Disabled): 0 = Disabled; 1 = Enabled

2.1.2.4.4.15 ATLIDCoalignmentISP

#	Field name	Description	Units	NetCDF C-Types	Size of each element	Number of elements	Total size	Value
1	stateVectorQuality	Contains details about the S/C state vector quality information as received from the S/C	unitless	NC_UINT	4	1	4	
2	ISPFormatVersion	Stores the version number of the ICD where the ISP format definition is specified. The most significant byte shall store the major version and the least significant byte shall store the minor version.	unitless	NC_USHORT	2	1	2	
3	SID	Packet ID	unitless	NC_CHAR	1	1	1	0
4	OBT	On Board Time for HK acquisition	unitless	ISPTime	7	1	7	
5	NumSummedImage	"CAS images counter [1..Mav] : The number of received CAS images which have been summed"	unitless	NC_CHAR	1	1	1	0
6	M_AV	Number of images which must be received from IDE to be averaged by ACDM before applying the centroiding algorithms	unitless	NC_CHAR	1	1	1	88
7	CAS_temp	Detector temperature Thermal Control Heater Temperature Monitor 25	unitless	NC_SHORT	2	1	2	0
8	Centroid_XY	Coordinate Estimation Laser echo centroid (sub-pixel) position	BU	CAScoordinates	8	1	8	
9	Bsmsetpcomndx	Calculated LOS X Saturated command to BSM (X axis)	BU	NC_USHORT	2	1	2	0
10	Bsmsetpcomndy	Calculated LOS Y Saturated command to BSM (Y axis)	unitless	NC_USHORT	2	1	2	0
11	Detection_Saturation_Status	Indication whether or not saturation has occurred in the echo images (for last received CAS image) 16-bit word	BU	NC_USHORT	2	1	2	0

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		output by CAS IDE. provides information of potential saturation of the data present in the following DRD packet, during their generation at IDE level. From Detection Auxiliary Data						
12	Background_Saturation_Status	Indication whether or not saturation has occurred in the background images (for last received CAS image) 16-bit word output by CAS IDE. provides information of potential saturation of the background data present in the following DRD packet, during their generation at IDE level. From Detection Auxiliary Data	BU	NC_USHORT	2	1	2	0
13	Image_Quality_Indicator	Image processing quality Indication whether or not enough images have been summed for averaging	BU	NC_CHAR	1	1	1	0
14	CentrdQualFail	CentrdQualFail centroid quality failure duration exceeded	BU	NC_CHAR	1	1	1	0
15	SNR_est	Estimated SNR Indication whether or not the image signal-to-noise ratio is high enough for centroiding	BU	NC_FLOAT	4	1	4	0
16	AtlConfCtrReg	ATLID Configuration Control Register : Allows to know the chosen BSM (bit 0) Flag that indicates which BSM mechanism is selected (i.e. 0 = redundant, 1 = nominal)	BU	NC_CHAR	1	1	1	0
17	Ctl_err_XY	Calculated control error	unitless	CAScoordinates	8	1	8	
18	Ctl_err_norm	Root sum square control error	unitless	NC_FLOAT	4	1	4	0
19	CtlErrQual	Control error threshold duration has been exceeded	unitless	NC_CHAR	1	1	1	0
20	CtlQualFail	Control error quality failure duration exceeded	unitless	NC_CHAR	1	1	1	0
21	TransBSMSetpoint_XY	Calculated BSM pointing Setpoint	unitless	CAScoordinates	8	1	8	
22	PosModeBsa	Current BSA Mode: copy of loaded mode	unitless	NC_USHORT	2	1	2	0
23	Accumulation_Threshold	summed image threshold (minimum average image number)	unitless	NC_USHORT	2	1	2	0
24	TrackingPointX	Copy of the Tracking point TC (X)	unitless	NC_USHORT	2	1	2	0
25	TrackingPointY	Copy of the Tracking point TC (Y)	unitless	NC_USHORT	2	1	2	0

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26	Ctr_err_out_status	Control Error Status Flag to detect erroneous or too important control error	unitless	NC_CHAR	1	1	1	0
27	Ctr_err_spec_status	Control Error Spec Status Current flag to detect when the pointing shall fulfil the specification	unitless	NC_CHAR	1	1	1	0
28	CoAlignmentFunctionMode	Active co-alignment function mode	unitless	NC_USHORT	2	1	2	0
29	Spare_Array	Provision	unitless	NC_CHAR	1	31	31	
30	CAS_Image_Background1	CAS Averaged background image before echo	BU	NC_UINT	4	52	208	
31	CAS_Image_Echo	CAS Averaged signal image	BU	NC_UINT	4	52	208	
32	CAS_Image_Background2	CAS Averaged background image after echo	BU	NC_UINT	4	52	208	
33	CAS_Image_Min	CAS minimum signal map	BU	NC_UINT	4	52	208	
34	CAS_Image_Max	CAS maximum signal map	BU	NC_UINT	4	52	208	
35	CAS_Image_SD	CAS signal standard deviation map	BU	NC_UINT	4	52	208	
36	AppendedCRC			AppendedCRC	2	1	2	
TOTAL:							**1356**	

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2.1.2.4.4.16 ATLIDTelemetryPacketHeader Bit Vector Table

These are the actual values of the Packet Header for the ATLID Telementry ISP.

Parameter	MSB	Description	Value
Version_Number	b0 - b2	CCSDS Version Number	000b
Type	b3	Packet type	0b
Data_Field_Header_Flag	b4	Indicates the presence of a secondary (data field) header (when set to 1).	0x01
Application_Process_ID__PID	b5 - b11	Process ID (part of the APID)	0x40
Application_Process_ID__PCAT	b12 - b15	Packet category	12
Segmentation_Flags	b16 - b17	Indicates the grouping (segmentation) of TM source packets.	11b
Source_Sequence_Count	b18 - b31	Wrap around counter used to count each TM packet. For the ESSS in contrast to the PUS, only one counter for all APIDs is maintained.	source packet count value modulo 2^14 (0 - 16383)
Packet_Length	b32 - b47	Number of bytes contained in the packet data field minus 1.	number of octets in packed data field - 1

2.1.2.4.4.17 ATLIDTelemetryPUSDataFieldHeader Bit Vector Table

These are the actual values of the PUS Data Field Header described in Vol. 1 for the ATLID Telemetry ISP.

Parameter	MSB	Description	Value
Spare_1	b0	Not used.	Must be set to 0 for all TM source packets.
TM_Source_Packet_PUS_Version_Number	b1 - b3	Not used.	(0 was used for ESA PUS version) 1 for ECSS PUS
Spare_2	b4 - b7	Filler to complete the byte.	Must be set to 0 for all TM source packets
Service_Type	b8 - b15	Indicates the service to which the packet relates.	226
Service_Subtype	b16 - b23	Indicates the service subtype to which the packet relates.	2
Destination_ID	b24 - b31	Indicates the destination of the packet (May be omitted if only one destination exists).	0
Time	b32 - b87	Onboard time (OBT).	Coarse time: LSB = 1 sec Fine time: LSB = 1/16777215 sec
Time_Quality	b88 - b95	This shall give the status of the time reporting	Bit3 (Time type): 0 = Elapsed Time (ET); 1 = OBT

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		sub-service, i.e. current PPS source and whether synchronization is enabled.	Bit 4 (Sync. Source): 0 = internal; 1 = external Bit 5 (Ext. Sync. Source Detail): 0 = 1Hz Pulse; 1 = MIL-BUS Bit 6 (Sync. Status): 0 = NoSync; 1 = InSync Bit 7 (Sync. Enabled/Disabled): 0 = Disabled; 1 = Enabled

2.1.2.4.4.18 ATLIDTelemetryISP

#	Field name	Description	Units	NetCDF C-Types	Size of each element	Number of elements	Total size	Value
1	stateVectorQuality	Contains details about the S/C state vector quality information as received from the S/C	unitless	NC_UINT	4	1	4	
2	ISPFormatVersion	Stores the version number of the ICD where the ISP format definition is specified. The most significant byte shall store the major version and the least significant byte shall store the minor version.	unitless	NC_USHORT	2	1	2	
3	Timestamp	Packet Timestamp	unitless	ISPTime	7	1	7	
4	Attitude_Q1	ACDM considered PFM quaternion 1	BU	NC_SHORT	2	1	2	
5	Attitude_Q2	ACDM considered PFM quaternion 2	BU	NC_SHORT	2	1	2	
6	Attitude_Q3	ACDM considered PFM quaternion 3	BU	NC_SHORT	2	1	2	
7	Attitude_Q4	ACDM considered PFM quaternion 4	BU	NC_SHORT	2	1	2	
8	OrbitalPosition	ACDM considered orbital position	deg	NC_SHORT	2	1	2	
9	SolarAngle	ACDM considered sun zenithal angle	deg	NC_SHORT	2	1	2	
10	PacketCounter	Packet numerical ID	unitless	NC_SHORT	2	1	2	
11	ADCM_MCLK_Counter	ACDM MCLK (48 MHz) Counter	unitless	NC_BYTE	1	1	1	
12	DataFieldAndSpareArray	Mixed Data and Spare fields. For ATLID EEM test campaign with ASW V1.1, the packet will be defined dynamically if needed thanks to the PUS service 3. The following reflects what is proposed for the SW V2.0: BytePos Description 24 HK TM SID 31 : Block TM1 and Block TM2 TLE 197 HK TM SID 32 : Block TM1 and Block TM2 TLE 370 HK TM SID 61 : Default Acdm thermistor housekeeping	unitless	NC_SHORT	2	373	746	

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		584 HK TM SID 51 : Block TM BSM 671 TleNomTMon 673 PlhNomTMon 675 RlhNomTMon 677 TleNomVMon 679 TleNomIMon 681 TleRedTMon 683 PlhRedTMon 685 RlhRedTMon 687 TleRedVMon 689 TleRedIMon 691 BsmNomTMon 693 BsmeNomTMon 695 BsfeNomTMon 697 BsmNomVMon 699 BsmNomIMon 701 BsmRedTMon 703 BsmeRedTMon 705 BsfeRedTMon 707 BsmRedVMon 709 BsmRedIMon 711 CveNomTMon 713 CveNomVMon 715 CveNomIMon 717 CveRedTMon 719 CveRedVMon 721 CveRedIMon						
13	AppendedCRC			AppendedCRC	2	1	2	
TOTAL:							**776**	

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AIRBUS DEFENCE & SPACE

EarthCARE Routing Sheet

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