TITLE: ENVISAT-1 PRODUCTS SPECIFICATIONS

VOLUME 16: AUXILIARY DATA FILES

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SUMMARY: This document specifies the ENVISAT-1 products.

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CHANGE RECORD

ISSUE	REVISION	DATE	CHANGE STATUS	ORIGIN
1	A	12/01/96	Issue 1	
1	B	16/02/96	SCR #16, CR #16 Issue 1, Revision B Reason for Change: Updated to reflect information in PO-TN-ESA-GS-0381 and to address RIDs of Feb. 2/96 pertaining to the Level 0 structure. MPH, SPH, DSD, and DSR structures modified. Table added showing generalized Level 0 product structure. RIDs Addressed: ESA/0001: FEP header defined ESA/0002: PF-Host time stamp clarified ESA/0004: Processing PCD added ESA/0006: AF PCD ADS and DSD added ESA/0007: page A-3 updated ESA/0008: page B-3 updated ESA/0009: Table 8.1.1 modified ESA/0011: TBD changed to Range/ Doppler ESA/0013: FEP header defined ESA/0014: Table 8.4.7.4-2 corrected	

			CSF/1: filename in MPH corrected CSF/2: page A-3 updated	
			CSF/3: MPH PCD information updated CSF/5: DSD added to Level 0 SPH CSF/6: Section on AATSR updated and re-issued CSF/8: AATSR_O Summary Sheet updated	
1	C	04/04/96	SCR #38, CR #38 Issue 1, Revision C Reason for Change: Updated Sections 1-6, 17 and Annex A to reflect changes discussed at the Products Review Meeting #1, March 5-8, 1996, as per action item “AI MDA 6 April 96” from PO-MN-ESA-00416, Pg. 35.	Products Review Meeting #1
2	A	20/05/96	SCR #71, CR #71 Issue 2 Reason for Change: Separate volume created. Naming scheme updated.	
2	B	10/02/97	SCR #102, CR #102 Issue 2, Revision B	

			Reason for Change: Updated list of Auxiliary Data. Defined ECMWF file handling and format. Changes to orbit vectors and time parameters Data Set formats as per fax DPD/JMJ/ENV, 0280/97.	
3	A	09/02/98	SCR #169, CR #169 Issue 3 Reason for Change: AUX_ATT_AX is defined as per PO-FX-ESR-GS-1010. AUX_DEM_AX and AUX_LSM_AX are defined as per NWP/SD/4335. ECMWF files are defined as per PO-RP-ESA-GS-0622. All other changes are defined as per fax DPMO/JMJ/ENV,0368/98.	
3	B	16/10/98	SCR #218 , CR #218 Issue 3, revision B Reason for Change: Updated to reflect current status of ENVISAT Auxiliary data files. Updated for SPR-42000-0220-CSF. Minor edits as indicated by change bars Also updated according to the decisions of the ENVISAT PDS Progress Meeting #14 (PO-MN-CSF-GS-2653)	
3	C	23/5/2000	Issue 3, revision C	PDS V3

			Reason for change: Updated to reflect current status of ENVISAT Auxiliary data files. Updated for SPR-42000-0284-CSF. Minor edits as indicated by change bars	
		20/9/2000	#16.3.5 attitude file: use by L2 RA2	
3	D	20/11/00	Issue 3, Revision D	Products Review
3	E	15/6/2001	minor typos.	
3	F	15/6/2005	Added AUX_FRA file definition, series of typos correction, see change bars.	
3	G	20/11/2007	Issue 3, Revision G Reason for Change: Taking into account Change Request DM-241-CN introducing “DORIS orbit quality flag definition“ with impacts on both DORIS Processor Configuration data file (DOR_CON) and DORIS Instrument Characterization File (DOR_INS)	DM-241-CN

REGISTER OF CHANGES

Affected pages:

Par. 16.3.2 updated size of DOR_POR_AX
Par. 16.3.2.1 updated format of DOR_POR_AX
Par. 16.3.2.2 new paragraph on Orbit Quality Flag for DORIS preliminary orbit
Par. 16.3.3 updated size of DOR_VOR_AX
Par. 16.3.3.1 updated format of DOR_VOR_AX
Par. 16.3.3.2 new paragraph on Orbit Quality Flag for the DORIS precise orbit

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16 AUXILIARY DATA FILES

Auxiliary data files are all other data files used to produce a product other than the direct measurements of the instrument. This may include calibration data that was measured on-board but is not part of the main measurement data of the instrument. It may also include external calibration files from sources other than the satellite, processor configuration files, and any other files needed by instrument processors.

16.1 NAMING STRATEGY

The naming strategy for auxiliary data will be similar to the product naming conventions.

The first 10 characters will be the auxiliary data ID, and will follow the following format:

WWW_XXX_YZ

WWW is the same instrument codes used for specifying product IDs. The instrument ID for auxiliary data indicates the instrument the data is intended for. Auxiliary data intended for several instruments will use the code AUX.

XXX is used to identify the type of auxiliary data.

YZ is always set to the letters AX for auxiliary data.

For auxiliary data, the file name structure contains:

- The Auxiliary Data ID as described above (10 characters).
- The Processing Stage flag which is used to indicate the quality level of the auxiliary data, using the same method as for the core products with N for preliminary quality up to V for highest quality (1 character).
- The Originator ID indicates the source of the auxiliary data (3 characters). If not relevant, set to XXX.
- The date and time of the auxiliary data creation (YYYYMMDD_hhmmss) (15 characters).
- Underscore character (1 character).
- The date and time when the auxiliary data becomes valid in the PDS

(YYYYMMDD_hhmmss) (15 characters).
- Underscore character (1 character).
- The date and time when the auxiliary data ceases to be valid in the PDS (YYYYMMDD_hhmmss) (15 characters).

Note: The filename format above is 61 characters long. When the filename is written to field 1 of the MPH (which is 62 characters long) a blank space character is added at the end of the filename in order to fill the field.

Table 16.1-1 provides a list of the auxiliary data files used in the ENVISAT PDS. The purpose of this list is to provide an overview of the ENVISAT auxiliary data files. The auxiliary data files defined outside of Volume 16 are mentioned for information purposes only. Their applicable definitions are found in the volumes in which they are defined.

Table 16.1-1 ENVISAT PDS Auxiliary Data Files

Aux_Data_ID	Approx. Size (MB)	Estimated Update Rate	Used by	Used for	Comments
AUX_TIM_AX	0.0017	1 Orbit	PF-HS	L0	UTC time reference and conversion table
AUX_FPO_AX	0.013	1 Day	PF-HS	L0, L1B, L2	Predicted orbit state vector
AUX_FRO_AX	0.195	1 Day	ALL	L0, L1B, L2	Restituted orbit state vector
AUX_FRA_AX	7.000	1Day	ALL	L0, L1B, L2	Restituted attitude file
DOR_POR_AX	0.203	1 Day	All	L0, L1B, L2	DORIS Preliminary Orbit State Vevtors
DOR_VOR_AX	0.203	1 Day	All	L0, L1B, L2	DORIS Precise Orbit State Vevtors
AUX_ATT_AX	0.1	Infrequent	ALL	L1B, L2	ENVISAT attitude data
AUX_ECA_AX	8.7	6 hours	MERIS, MIPAS, GOMOS, SCIAMACHY, RA2/MWR	L1B, L2	ECMWF Analysis data file

Table 16.1-1 ENVISAT PDS Auxiliary Data Files

Aux_Data_ID	Approx. Size (MB)	Estimated Update Rate	Used by	Used for	Comments
AUX_ECF_AX	8.7	6 hours	MERIS, MIPAS, GOMOS, SCIAMACHY, RA2/MWR	L1B, L2	ECMWF Forecast data file
AUX_CN0_AX	0.002	Infrequent	ALL	L0	Level 0 Processor configuration file
AUX_DEM_AX	37.327	Infrequent	RA2, MERIS, AATSR	L1B, L2	Digital Elevation Model file
AUX_LSM_AX	12.325	Infrequent	AATSR, MERIS	L1B, L2	Land/Sea Mask data file
ASA_CON_AX	0.003	Infrequent	ASAR	L1B	ASAR Processor Configuration file
ASA_INS_AX	0.163	Infrequent	ASAR	L1B	Instrument characterization file
ASA_XCA_AX	0.010	6 Months	ASAR	L1B	ASAR External calibration data
ASA_XCH_AX	0.003	6 Months	ASAR	L1B	ASAR External characterization data
ATS_INS_AX	0.205	Infrequent	AATSR	L1B, L2	AATSR Instrument characterization file
ATS_PC1_AX	0.002	Infrequent	AATSR	L1B	AATSR Level 1B Processing Configuration file
ATS_VC1_AX	0.002	Infrequent	AATSR	L1B	Visible Calibration Data file
ATS_GC1_AX	0.269	Infrequent	AATSR	L1B	General Calibration data file
ATS_CH1_AX	0.002	Infrequent	AATSR	L1B	Level 1B Characterization file
ATS_CL1_AX	0.015	Infrequent	AATSR	L1B	Cloud LUT Data file
ATS_BRW_AX	0.002	Infrequent	AATSR	Browse	Browse LUT Data file

Table 16.1-1 ENVISAT PDS Auxiliary Data Files

Aux_Data_ID	Approx. Size (MB)	Estimated Update Rate	Used by	Used for	Comments
ATS_PC2_AX	0.002	Infrequent	AATSR	L2	AATSR Level 2 Processor Configuration file
ATS_SST_AX	0.022	Infrequent	AATSR	L2	SST Retrieval Coeff. Data file
ATS_LST_AX	14.00	Infrequent	AATSR	L2	LST Retrieval Coeff. Data file
DOR_CON_AX	TBD	Infrequent	DORIS	L1B	DORIS Processor Configuration file
DOR_INS_AX	0.002	Infrequent	DORIS	L1B	DORIS Instrument Characterization file
GOM_CAL_AX	7.240	Infrequent	GOMOS	L1B	Calibration database
GOM_CAT_AX	0.426	Infrequent	GOMOS	L1B	Star catalogue
GOM_CRS_AX	12.000	Infrequent	GOMOS	L2	Cross section file
GOM_INS_AX	0.010	Infrequent	GOMOS	L1B, L2	Instrument physical characteristics data
GOM_PR1_AX	0.002	Infrequent	GOMOS	L1B, L2	Level 1B processing configuration file
GOM_PR2_AX	0.124	Infrequent	GOMOS	L2	Level 2 processing configuration file
GOM_STS_AX	11.268	Infrequent	GOMOS	L1B	Stellar Spectra
MER_AER_AX	1.236	Infrequent	MERIS	L2	Aerosol Climatology data
MER_ATP_AX	1.137	1 Year	MERIS	L2	Atmospheric parameters data
MER_CMP_AX	5.418	1 Year	MERIS	L2	Cloud measurement parameters data
MER_CP1_AX	0.019	Infrequent	MERIS	L1B	Level-1B control parameters data

Table 16.1-1 ENVISAT PDS Auxiliary Data Files

Aux_Data_ID	Approx. Size (MB)	Estimated Update Rate	Used by	Used for	Comments
MER_CP2_AX	0.015	1 Year	MERIS	L2	Level-2 control parameters data
MER_DRM_AX	37.300	Infrequent	MERIS	L1B	Digital Roughness Model data
MER_INS_AX	2.940	Infrequent	MERIS	L1B, L2	Instrument data file
MER_LAP_AX	2.207	1 Year	MERIS	L2	Land aerosols parameters data
MER_LVI_AX	0.002	1 Year	MERIS	L2	Land vegetation index parameters data
MER_OAP_AX	47.539	1 Year	MERIS	L2	Ocean aerosols parameters data
MER_OC1_AX	2.637	1 Year	MERIS	L2	Ocean I parameters data
MER_OC2_AX	19.730	1 Year	MERIS	L2	Ocean II parameters data
MER_RAC_AX	2.169	2 Weeks	MERIS	L1B	Radiometric calibration data
MER_WVP_AX	33.440	1 Year	MERIS	L2	Water Vapour Parameters
MER_SCM_AX	7.610	Infrequent	MERIS	L2	Surface Confidence Map
MIP_CA1_AX	0.014	3 Months	MIPAS	L1B	Instrument characterization data
MIP_CG1_AX	0.947	1 Week	MIPAS	L1B	Gain calibration
MIP_CL1_AX	0.003	1 Month	MIPAS	L1B	Line of sight calibration
MIP_CO1_AX	0.130	1 Month	MIPAS	L1B	Offset Validation
MIP_CS1_AX	0.003	5 Days	MIPAS	L1B	ILS and spectral calibration data
MIP_MW1_AX	0.010	Infrequent	MIPAS	L1B	Level 1B Microwindow dictionary

Table 16.1-1 ENVISAT PDS Auxiliary Data Files

Aux_Data_ID	Approx. Size (MB)	Estimated Update Rate	Used by	Used for	Comments
MIP_PS1_AX	0.069	Infrequent	MIPAS	L1B	Level 1B Processing Parameters
MIP_PS2_AX	0.010	1 Month	MIPAS	L2	Level 2 Processing Parameters
MIP_MW2_AX	1.585	Several Months	MIPAS	L2	Level 2 Microwindows data
MIP_SP2_AX	205.672	Several Months	MIPAS	L2	Spectroscopic data file
MIP_IG2_AX	3.186	Several Months	MIPAS	L2	Initial Guess Profile
MIP_FM2_AX	94.162	Several Months	MIPAS	L2	Forward calculation results file
MIP_OM2_AX	25.452	Several Months	MIPAS	L2	Microwindows occupation matrices file
MIP_CS2_AX	465.336	Several Months	MIPAS	L2	Cross section lookup tables file
MIP_PI2_AX	0.166	Several Months	MIPAS	L2	A priori pointing information file
MWR_CHD_AX	0.006	Infrequent	RA2/MWR	L1B, L2	MWR Instrument Characterization data
MWR_CON_AX	0.002	Infrequent	RA2/MWR	L1B, L2	MWR processor configuration file
MWR_SLT_AX	0.002	Infrequent	RA2/MWR	L1B	Secondary Lobe Temperature file
MWR_LSF_AX	12.325	Infrequent	RA2/MWR	L1B, L2	Land/Sea Mask data file
RA2_CON_AX	0.002	Infrequent	RA2/MWR	L1B	RA2 processor configuration file
RA2_CHD_AX	0.004	Infrequent	RA2/MWR	L1B, L2	RA2 instrument characterization data

Table 16.1-1 ENVISAT PDS Auxiliary Data Files

Aux_Data_ID	Approx. Size (MB)	Estimated Update Rate	Used by	Used for	Comments
RA2_IFF_AX	0.002	periodic	RA2/MWR	L1B	RA2 IF Mask from in-flight measurements
RA2_IFA_AX	0.002	Infrequent	RA2/MWR	L1B	RA2 IF Mask from on-ground measurements for chain A
RA2_IFB_AX	0.002	Infrequent	RA2/MWR	L1B	RA2 IF Mask from on-ground measurements for chain B
RA2_IOC_AX	0.186	1 Year	RA2/MWR	L2	Ionospheric corrections
RA2_MSS_AX	59.744	1 Year	RA2/MWR	L2	Mean sea surface
RA2_USO_AX	0.002	Infrequent	RA2/MWR	L1B	USO frequency measured on ground
RA2_SOL_AX	0.002	1 Month	RA2/MWR	L2	Solar Activity Data file
RA2_POL_AX	0.074	2-3 per week	RA2/MWR	L2	Pole Location Data file
RA2_PLA_AX	0.100	TBD	RA2/MWR	L2	Platform Data file
RA2_SOI_AX	0.014	Infrequent	RA2/MWR	L2	Ocean/Ice2 Configuration (System) file
RA2_CST_AX	0.002	Infrequent	RA2/MWR	L2	RA2 Constants data file
RA2_ICT_AX	0.002	Infrequent	RA2/MWR	L2	Ice1/Sea Ice Configuration (System) file
RA2_SSB_AX	0.039	Infrequent	RA2/MWR	L2	Sea State Bias Table file
RA2_DIP_AX	0.062	Infrequent	RA2/MWR	L2	Modified Dip Map file
RA2_SET_AX	0.011	Infrequent	RA2/MWR	L2	Cartwright Amplitudes file
RA2_OT1_AX	12.478	Infrequent	RA2/MWR	L2	Ocean Tide Solution 1 Map file

Table 16.1-1 ENVISAT PDS Auxiliary Data Files

Aux_Data_ID	Approx. Size (MB)	Estimated Update Rate	Used by	Used for	Comments
RA2_OT2_AX	16.637	Infrequent	RA2/MWR	L2	Ocean Tide Solution 2 Map file
RA2_TLG_AX	8.319	Infrequent	RA2/MWR	L2	Tidal Loading Coefficients Map file Solution1
RA2_TLD_AX	8.319	Infrequent	RA2/MWR	L2	Tidal Loading Coefficients Map file Solution2
RA2_GEO_AX	3.924	Infrequent	RA2/MWR	L2	Geoid Height file
RA2_SL1_AX	48.002	Infrequent	RA2/MWR	L2	Slope Model for Greenland Data file
RA2_SL2_AX	355.913	Infrequent	RA2/MWR	L2	Slope Model for Antarctica Data file
RA2_MET_AX	0.131	Infrequent	RA2/MWR	L2	Altitude of Meteorological Grid Points file
SCI_LK1_AX	0.256	1 week	SCIAMACHY	L1B	Leakage Current Parameters file
SCI_PE1_AX	0.141	1 week	SCIAMACHY	L1B	PPG/Etalon Parameters file
SCI_SP1_AX	0.035	1 week	SCIAMACHY	L1B	Spectral Calibration Parameters file
SCI_SU1_AX	0.166	1 day	SCIAMACHY	L1B	Sun Reference Spectrum file
SCI_KD1_AX	12.000	Infrequent	SCIAMACHY	L1B	Key Data file (Instrument Characterization file)
SCI_MF1_AX	1.000	Monthly	SCIAMACHY	L1B	m-Factor file
SCI_LI1_AX	0.150	Infrequent	SCIAMACHY	L1B	Level 1B Initialization file
SCI_LI2_AX	0.008	Infrequent	SCIAMACHY	L2	Level 2 Initialization file
SCI_PR2_AX	0.118	Infrequent	SCIAMACHY	L2	Atmospheric Climatologies Data file
SCI_CL2_AX	0.541	Infrequent	SCIAMACHY	L2	Cloud Parameters Data file

Table 16.1-1 ENVISAT PDS Auxiliary Data Files

Aux_Data_ID	Approx. Size (MB)	Estimated Update Rate	Used by	Used for	Comments
SCI_SF2_AX	1.307	Infrequent	SCIAMACHY	L2	Surface data base file
SCI_CS2_AX	0.818	Infrequent	SCIAMACHY	L2	Literature Cross-Sections Data Base file
SCI_FM2_AX	1.229	Infrequent	SCIAMACHY	L2	Flight-Model Reference Cross Spectra Data file
SCI_UC2_AX	0.3446	Infrequent	SCIAMACHY	L2	Undersampling correction spectra
SCI_CC2_AX	3.0	Infrequent	SCIAMACHY	L2	PMD minimum reflectance library
SCI_MF2_AX	2.623	Infrequent	SCIAMACHY	L2	Air Mass Factor Look-Up-Table file
SCI_PF2_AX	0.003	Infrequent	SCIAMACHY	L2	BIAS slant path factor lookup table
SCI_RC2_AX	0.044	Infrequent	SCIAMACHY	L2	AAIA Rayleigh scattering correction look-up table
SCI_BL2_AX	0.976	Infrequent	SCIAMACHY	L2	Line by line Absorption Cross-Sections file
SCI_IN__AX	0.07	Infrequent	SCIAMACHY	L2 (Offline)	Offline Initialization file

16.2 AUXILIARY DATA STRUCTURE

Auxiliary data files follow the same format guidelines as the PDS products. Every Auxiliary Data file will consist of an MPH, an SPH and one or more data sets.

Auxiliary data which originates outside the PDS will be “wrapped” in an MPH and SPH upon entry to the PDS. The actual contents of the foreign file will become those of a GADS, without modification.

16.2.1 Auxiliary Data MPH

The MPH used for auxiliary data is the same as that used for products. For auxiliary data which originates from the satellite, most of the MPH fields will be relevant. For auxiliary data which does not originate from the satellite, many sections of the MPH will not be relevant, and MPH fields not pertinent will be blanked or set to zero (depending on the field type) as shown in Volume 5.

Field #1 (named "PRODUCT") of the MPH contains the name of the auxiliary data file using the auxiliary data naming strategy described in Section 16.1 above. Thus field 1 will be constructed as:

Table 16.2.1-1 Auxiliary data MPH Field #1

Table 16.2.1-1 Auxiliary data MPH Field #1

1	**PRODUCT=**	keyword	8	8*uc
	quotation mark (")		1	uc
	Auxiliary Data File Name (the following fields describe the contents of the auxiliary data filename)		62	
	10 characters file ID	-	10	10*uc
	Processing stage flag (see field 2 below)	-	1	uc
	Originator ID (if not relevant, set to XXX)	-	3	3*uc
	creation_day (YYYYMMDD UTC creation day of the auxiliary file)	-	8	8*uc
	underscore character	-	1	uc
	creation_time (HHMMSS UTC creation time of the auxiliary file)	-	6	6*uc
	underscore character	-	1	uc

Table 16.2.1-1 Auxiliary data MPH Field #1

1	**PRODUCT=**	keyword	8	8*uc
	valid_day (YYYYMMDD UTC day the auxiliary file becomes valid)	--------	8	8*uc
	underscore character		1	uc
	valid_time (HHMMSS UTC time the auxiliary file becomes valid)		6	6*uc
	underscore character		1	uc
	invalid_day (YYYYMMDD UTC day the auxiliary file becomes invalid)		8	8*uc
	underscore character		1	uc
	invalid_time (HHMMSS UTC time the auxiliary file becomes invalid)		6	6*uc
	blank space character		1	uc
	quotation mark (“)	-	1	uc
	newline character	terminator	1	uc

Field #10 (named “SENSING_START”) of the Auxiliary data MPH contains the start time of validity of the auxiliary data, which correspond to the “valid_day” and “valid_time” in above table.

Field #11 (named “SENSING_STOP”) of the Auxiliary data MPH contains the stop time of validity of the auxiliary data, which correspond to the “invalid_day” and “invalid_time” in above table.

16.2.2 Auxiliary Data SPH Structure

In order to maintain a degree of conformity across the Auxiliary Data files, the SPH contains only the SPH Descriptor and a spare field, other than the DSDs. The number of DSDs in the SPH may vary.

The Auxiliary Data file SPH is defined below. Refer to Volume 5 regarding the ASCII conventions used in the SPH.

Table 16.2.2-1 Auxiliary Data SPH

N	Description	Units	Byte Length	Data Type	Dim.
1	**SPH_DESCRIPTOR=**	keyword	15	uc	15
	quotation mark (“)	-	1	uc	1
	SPH Descriptor ASCII string describing the file.	-	28	uc	28
	quotation mark (“)	-	1	uc	1
	newline character	terminator	1	uc	1
2	**Spare (blanks)**	-	51	uc	51
	newline character	terminator	1	uc	1
3	**DSDs** As defined in Volume 5.	-	variable	dsd	variable
TOTAL		-	variable		

16.2.3 Auxiliary Data File Data Sets

The Data Sets may be of any of the types described for PDS Products, and follow identical format rules. Any exceptions are noted in the individual file descriptions.

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16.3 COMMON AUXILIARY DATA FILES

The following subsections describe auxiliary data files used by several instrument processors.

16.3.1 FOS Orbit State Vectors

The instrument ground processing software uses the CFI orbit propagator software module and an orbit state vector as input to calculate the satellite position all along the orbit. The following describes the product structure of the FOS predicted and restituted orbit state vector files.

FILE_ID: FOS Predicted: AUX_FPO_AX

FOS Restituted: AUX_FRO_AX

USE: Used during ground processing

UPDATED: Once per day

SIZE:

AUX_FPO_AX: one MDSR per orbit, file covers 6 days (86 MDSRs). Size = 1247 (MPH) + 378 (SPH) + 129 * 86 MDSRs = 12719 bytes.

AUX_FRO_AX: one MDSR per minute, file covers 1 day, with 60 minute overlap (1500 MDSRs). Size = 1247 (MPH) + 378 (SPH) + 129 * 1500 = 195125 bytes.

16.3.1.1 Format

The MPH and SPH of these files will follow the standard MPH, SPH structure of all ENVISAT auxiliary data.The SPH contains a single DSD of type “M.” pointing to the MDS. The file will consist of a single MDS containing several MDSRs. Each MDSR is of the format shown below.

NOTE THAT ORBIT STATE VECTOR MDSRs DO NOT FOLLOW STANDARD ENVISAT-PDS FORMAT. The MDSR is in ASCII format.

Table 16.3.1.1-1 Format of MDSR for Orbit State Vectors

N	MDSR Contents	Units	Byte Length	Data Type	Dim.
1	**UTC of Orbit State Vector**	UTC	27	uc	27
2	**ASCII blank space character**	-	1	uc	1
3	**Delta UT1 = UT1-UTC**	s	8	Ado06	1
4	**ASCII blank space character**	-	1	uc	1
5	**Absolute Orbit number**	-	6	As	1
6	**ASCII blank space character**	-	1	uc	1
7	**X position in Earth fixed reference frame**	m	12	Ado73	1
8	**ASCII blank space character**	-	1	uc	1
9	**Y position in Earth fixed reference frame**	m	12	Ado73	1
10	**ASCII blank space character**	-	1	uc	1
11	**Z position in Earth fixed reference frame**	m	12	Ado73	1
12	**ASCII blank space character**	-	1	uc	1
13	**X velocity relative to Earth fixed reference frame**	m/s	12	Ado46	1
14	**ASCII blank space character**	-	1	uc	1
15	**Y velocity relative to Earth fixed reference frame**	m/s	12	Ado46	1
16	**ASCII blank space character**	-	1	uc	1
17	**Z velocity relative to Earth fixed reference frame**	m/s	12	Ado46	1
18	**ASCII blank space character**	-	1	uc	1
19	**Quality Flags** taking the following values:	-	6	uc	6

N	MDSR Contents	Units	Byte Length	Data Type	Dim.
	" 3" : ajusted, " 4" : estimated during a maneuver period, " 5" : interpolated over a tracking data gap, " 6" : extrapolated for a duration less than 1 day, " 7" : extrapolated for a duration that ranges from 1 day to 2 days " 8" : extrapolated for a duration larger than 2 days, or extrapolated just after a maneuver.				
20	**ASCII newline character**	terminator	1	uc	1
	TOTAL		129		

16.3.2 DORIS Preliminary Orbit State Vectors

The preliminary orbit reconstruction is the first orbit estimate produced from the DORIS Doppler shift data. It is produced off-line systematically for all DORIS data received, and is intended as an orbit estimate of higher quality than that of the Navigator product.

FILE_ID: DOR_POR_AX

USE: Used during ground processing

UPDATED: Once per day

SIZE: MPH(1247 bytes) + SPH(378 bytes) + MDS (204981 bytes) = 206606 bytes

16.3.2.1 Format

The format is identical to that described in Section 16.3.1.1.

Each file covers 26 hours (from 10 PM the day before to midnight – 1 min) + 29 minutes (for orbit interpolation, 5 orbit vectors at the beginning of the file and 24 orbit vectors at the end are added), with 1 MDSR per minute. Therefore, there are 1589 MDSRs in the MDS.

16.3.2.2 Orbit quality flag

The POD orbit quality flag for DORIS preliminary orbit has the 6 following values :

- " 3" : for an ajusted preliminary orbit,
- " 4" : for a preliminary orbit estimated during a maneuver period,
- " 5" : for a preliminary orbit interpolated over a tracking data gap,
- " 6" : for a preliminary orbit extrapolated for a duration less than 1 day,
- " 7" : for a preliminary orbit extrapolated for a duration that ranges from 1 day to 2 days
- " 8" : for a preliminary orbit extrapolated for a duration larger than 2 days, or extrapolated just after a maneuver.

16.3.3 DORIS Precise Orbit State Vectors

The precise orbit reconstruction is the most accurate orbit estimate produced from the DORIS data. It is produced off-line systematically for all DORIS data received, and is intended as an orbit estimate of the highest quality achievable using DORIS.

FILE_ID: DOR_VOR_AX

USE: Used during ground processing

UPDATED: Once per day

SIZE: MPH(1247 bytes) + SPH(378 bytes) + MDS (204981 bytes) = 206606 byte

16.3.3.1 Format

The format is identical to that described in Section 16.3.1.1.

Each file covers 26 hours (from 10 PM the day before to midnight – 1 min) + 29 minutes (for orbit interpolation, 5 orbit vectors at the beginning of the file and 24 orbit vectors at the end are added), with 1 MDSR per minute. Therefore, there are 1589 MDSRs in the MDS.

16.3.3.2 16.3.3.2 Orbit quality flag

The POD orbit quality flag for the DORIS precise orbit has the 6 following values :

- " 3" : for an ajusted precise orbit,
- " 4" : for a precise orbit estimated during a maneuver period,

- " 5" : for a precise orbit interpolated over a tracking data gap,
- " 6" : for a precise orbit extrapolated for a duration less than 1 day,
- " 7" : for a precise orbit extrapolated for a duration that ranges from 1 day to 2 days
- " 8" : for a precise orbit extrapolated for a duration larger than 2 days, or extrapolated just after a maneuver.

16.3.4 UTC/SBT Time Conversion File

The instrument ground processing software uses the CFI time conversion software module and this file to convert from satellite binary time to UTC time.

FILE_ID: AUX_TIM_AX

USE: Used during ground processing, annotated into MPH.

UPDATED: once per orbit

SIZE: MPH(1247 bytes) + SPH (378 bytes) + GADS (52 bytes) = 1677 bytes

16.3.4.1 Format

The MPH and SPH of these files will follow the standard MPH, SPH structure of all ENVISAT auxiliary data. The SPH contains a single DSD of type "G" pointing to the GADS. The format of the GADS is shown below:

Table 16.3.4.1-1 Format of GADS for SBT/UTC Time Conversion File

N	Description	Units	Byte Length	Data Type	Dim.
1	**Reference UTC time corresponding to SBT time below** (currently defined to be given at the time of the ascending node state vector)	UTC	27	uc	27
2	**ASCII blank space character**	-	1	uc	1
3	**Reference Satellite Binary Time**	-	11	Al	1
4	**ASCII blank space character**	-	1	uc	1

N	Description	Units	Byte Length	Data Type	Dim.
5	**SBT clock step in picoseconds**	ps	11	Al	1
6	**ASCII newline character**	-	1	uc	1
	TOTAL		52		

16.3.5 ENVISAT-1 Attitude Data File

This file contains the parameters used by the ESA CFI Target software. It contains the instrument attitude information for the ENVISAT instruments.

FILE ID: AUX_ATT_AX

TYPE: Auxiliary

USE: Level 1B processing or L2 processing (RA2)

UPDATED: Infrequently

SIZE: MPH(1247 bytes) + SPH(2338 bytes) + DSs(approx. 100 kbytes) = approx. 100 kbytes

16.3.5.1 Format

The file structure is shown in the table below:

MPH

Auxiliary Data SPH with 8 DSD: *DSD pointing to the AOCS Parameters GADS* *DSD pointing to the RA2 Attitude Perturbation GADS* *DSD pointing to the MERIS Attitude Perturbation GADS* *DSD pointing to the AATSR Attitude Perturbation GADS* *DSD pointing to the MIPAS Attitude Perturbation GADS* *DSD pointing to the SCIAMACHY Attitude Perturbation GADS* *DSD pointing to the GOMOS Attitude Perturbation GADS* *DSD pointing to the ASAR Attitude Perturbation GADS*
AOCS Parameters GADS
RA2 Attitude Perturbation GADS
MERIS Attitude Perturbation GADS
AATSR Attitude Perturbation GADS
MIPAS Attitude Perturbation GADS
SCIAMACHY Attitude Perturbation GADS
GOMOS Attitude Perturbation ADS
ASAR Attitude Perturbation GADS

16.3.5.1.1 OCS Parameters GADS

The AOCS Parameters GADS contains the 3 AOCS parameters (Cx, Cy, Cz). The format of the GADS is shown below.

Table 16.3.5.1.1-1 Parameters GADS Format

N	Description	Units	Byte Size	Data Type	Dim.
1	**AOCS Cx parameter (pitch)**	10^{-6} degrees	4	sl	1
2	**AOCS Cy parameter (roll)**	10^{-6} degrees	4	sl	1
3	**AOCS Cz parameter (yaw)**	10^{-6} degrees	4	sl	1

N	Description	Units	Byte Size	Data Type	Dim.
TOTAL			12		

16.3.5.1.2 RA2 Attitude Perturbation GADS

The RA2 Attitude Perturbation GADS contains several GADSR. The format of the GADSR is shown below.

Table 16.3.5.1.2-1 RA2 Attitude Perturbation GADSR Format

N	Description	Units	Byte Size	Data Type	Dim.
1	**Time from ANX**	10-6 seconds	8	sd	1
2	**Pitch mispointing angle**	10-6 degrees	4	sl	1
3	**Roll mispointing angle**	10-6 degrees	4	sl	1
4	**Yaw mispointing angle**	10-6 degrees	4	sl	1
TOTAL			20		

16.3.5.1.3 Other Instrument Attitude Perturbation GADS

The Attitude Perturbation GADS format described in Section 16.3.5.1.2 is repeated for MERIS, AATSR, MIPAS, SCIAMACHY, GOMOS and ASAR. Each instrument has a separate GADS, containing several GADSR of the format shown in Table 16.3.5.1.2-1. The number of GADSR varies from one instrument to another.

16.3.6 FOS Restituted Attitude Data File

This file contains the ENVISAT attitude information as expressed as the difference between the on-board attitude estimates available in HK TM plus the guiding frame computed using orbital parameters uplinked from ground and the guiding frame computed using a ground determined

orbit file. A number of harmonic coefficients to reconstruct a best fit of the attitude is contained as well.

It is produced and generated off-line with a delay of 2-3days and it has an overall duration of

one day.

FILE ID: AUX_FRA_AX

TYPE: Auxiliary

USE: Used during ground processing.

UPDATED: Once per day

SIZE: MPH(1247 bytes) + SPH(378 bytes) + DSs(approx. 7Mbytes) = approx. 7 Mbytes

16.3.6.1 Format

The file is received from the FOS and converted to the Envisat Format just adding MPH+SPH and filling the relevant fields, the remaining part of the file is kept as received, no additions or modifications are made from the original format to that part.

The file structure is shown in the table below:

MPH
Auxiliary Data SPH with 1 DSD:
DSD pointing to the Restituted Attitude GADS
Restituted Attitude GADS *(DS name is: Restituted Attitude Params)*

16.3.6.1.1 Restituted Attitude GADS

This GADS contains the ENVISAT attitude information expressed as the difference between the on-board attitude estimates available in HK TM plus the guiding frame computed using orbital parameters uplinked from ground and the guiding frame computed using a ground determined orbit file.

A number of harmonic coefficients to reconstruct a best fit of the reconstructed attitude are contained as well.

The format of this GADS is in ASCII, the description of the contents of the GADS are in the tables below.

AOCS Parameters

The AOCS Parameters section contains the three coefficients (Cx, Cy, Cz) used for the Local Normal Pointing guiding reference.

Orbital and Daily Harmonics

The reconstructed attitude is fitted by a first order harmonic function whose coefficients can be up to 15 at the orbital frequency and up to 30 at the daily frequency.

The harmonic function is the best fit to a mispointing due to the difference between the on-board orbit propagator and the ground-determined orbit.

The on-board attitude estimates are not included in this processing.

Table 16.3.6.1.1-1 Orbital and Daily Harmonics

Description	Units
UTC Start	dd-mmm-yyyy hh:mm:ss.ssssss
UTC End	dd-mmm-yyyy hh:mm:ss.ssssss
Cumulated TM Gap Duration	s
Pitch	
A0 Coefficient	deg
A1 Coefficient	deg/day
A2 Coefficient	deg/day^2

Table 16.3.6.1.1-1 Orbital and Daily Harmonics

Description	Units
Orbital Pulsation	deg/day
Number of Harmonics	NA
1st Harmonic (Amplitude, Phase)	deg
2nd Harmonic (Amplitude, Phase)	deg
…	deg
15th Harmonic (Amplitude, Phase)	deg
Daily Pulsation	deg/day
Number of Harmonics	NA
1st Harmonic (Amplitude, Phase)	deg
2nd Harmonic (Amplitude, Phase)	deg
…	deg
30th Harmonic (Amplitude, Phase)	deg
Roll	
A0 Coefficient	deg
A1 Coefficient	deg/day
A2 Coefficient	deg/day^2
Orbital Pulsation	deg/day
Number of HarmonicsNA	NA
1st Harmonic (Amplitude, Phase)	deg
2nd Harmonic (Amplitude, Phase)	deg
…	deg
15th Harmonic (Amplitude, Phase)	deg
Daily Pulsation	deg/day

Table 16.3.6.1.1-1 Orbital and Daily Harmonics

Description	Units
Number of Harmonics	NA
1st Harmonic (Amplitude, Phase)	deg
2nd Harmonic (Amplitude, Phase)	deg
…	deg
30th Harmonic (Amplitude, Phase)	deg
Yaw	
A0 Coefficient	deg
A1 Coefficient	deg/day
A2 Coefficient	deg/day^2
Orbital Pulsation	deg/day
Number of Harmonics	NA
1st Harmonic (Amplitude, Phase)	deg
2nd Harmonic (Amplitude, Phase)	deg
…	deg
15th Harmonic (Amplitude, Phase)	deg
Daily Pulsation	deg/day
Number of Harmonics	NA
1st Harmonic (Amplitude, Phase)	deg
2nd Harmonic (Amplitude, Phase)	deg
…	deg
30th Harmonic (Amplitude, Phase)	deg

Attitude Mode Changes

The number of platform attitude mode changes, their respective starting time and the platform

modes (i.e. SYSM, YSM, FPM, etc..) for the interval under analysis, are reported within this section of the file.

Table 16.3.6.1.1-2 Attitude Mode Changes

Description	Units
Number of Mode Changes	NA
UTC Start MODE #1	dd-mmm-yyyy hh:mm:ss.ssssss
MODE #1	TEXT
UTC Start MODE #2	dd-mmm-yyyy hh:mm:ss.ssssss
MODE #2	TEXT
…	…
UTC Start MODE #n	dd-mmm-yyyy hh:mm:ss.ssssss
MODE #n	TEXT

Attitude Estimator Output

The attitude is expressed in terms of pitch, roll and yaw mispointing with respect to the controlled reference frame as retrieved from HK TM. Excluding possible TM gaps, the data are given at 1 Hz frequency.

Table 16.3.6.1.1-3 Attitude Estimator Output

Description	Units
UTC Start	dd-mmm-yyyy hh:mm:ss.ssssss
Pitch	deg
Roll	deg
Yaw	deg

16.3.7 ECMWF Data Files

ECMWF data files contain Meteo information. The are ingested into the PDS ground segment on a regular basis and are used by various instrument processors during the generation of products.

There are two kinds of ECMWF data: *Forecast data* and *Analysis data*. Forecast data is used in NRT processing, while Analysis data is used during OFL product generation. Both Forecast data and Analysis data files have the same format.

FILE ID: AUX_ECF_AX -- ECMWF Forecast data

AUX_ECA_AX -- ECMWF Analysis data

TYPE: Auxiliary

USE: Level 1B processing, L2 processing

UPDATED: ECMWF files enter the PDS every 6 hours. There are 4 Analysis files and 4 Forecast files, each valid for a 12 hour time period.

SIZE: MPH(1247 bytes) + SPH(378 bytes) + DSs(approx. 8.7 MB) = approx. 8.7MB

16.3.7.1 Format

The high level breakdown of the file is shown below.

Table 16.3.7.1-1 Schematic Structure of ECMWF Files

MPH
SPH - standard Auxiliary Data SPH with 1 DSDs: *DSD for the ECMWF GADS*
ECMWF GADS

ECMWF data files entering the PDS are encoded in PB-IO format. Upon entry to the PDS, the file is modified to fit the standard ENVISAT PDS file format. This is done by completing the following steps:

- Place the PB-IO file (without modifying its structure) into a GADS (the ECMWF GADS);
- Add an Auxiliary Data SPH (with one DSD for the GADS);
- Add an MPH (fields not relevant set to zero or filled with ASCII blank space characters as per Volume 5);
- Assign a PDS filename as per the auxiliary data naming convention described earlier in this volume.

16.3.7.1.1 GADS

The GADS contains information encoded in PB-IO format. No additions or modifications are made from the original format.

16.3.8 Digital Elevation Model File

This file contains a world Digital Elevation Model (DEM). The GADS of this file contains the elevation values on a regular grid. The coverage of the grid is from 180+1/24 W to 180 - 1/24 E degrees in longitude and from -90 + 1/24 to 90 -1/24 degrees in latitude. The resolution of the grid is 1/12 degree in longitude and 1/12 degree in latitude. One value is recorded at each grid point.

FILE ID: AUX_DEM_AX

TYPE: Auxiliary

USE: Level 2 processing

UPDATED: infrequently

SIZE: MPH(1247 bytes) + SPH(658 bytes) + DSs(37325059 bytes) = 37 326 964 bytes

16.3.8.1 Format

The high level breakdown of the file is shown below.

Table 16.3.8.1-1 Schematic Structure of the DEM File

MPH
SPH - standard Auxiliary Data SPH with 2 DSDs: *DSD for the General GADS* *DSD for the DEM GADS*
General GADS DEM GADS

16.3.8.1.1 General GADS

The GADS contains information describing the whole file. The format of the GADS is shown below.

Table 16.3.8.1.1-1 AUX_DEM_AX General GADS Format

N	Description	Units	Byte Length	Data Type	Dim.
1	**LAT_GRID_SIZE=**	keyword	14	uc	14
	Resolution of the grid in latitude (dφ)	minutes	15	Afl	1
	<min>	units	5	uc	5
	newline character	terminator	1	uc	1
2	**LAT_FIRST=**	keyword	10	uc	10
	Latitude of first point on the grid (φf)	minutes	15	Afl	1
	<min>	units	5	uc	5
	newline character	terminator	1	uc	1

N	Description	Units	Byte Length	Data Type	Dim.
3	**LAT_LAST=**	keyword	9	uc	9
	Latitude of last point on the grid (φl)	minutes	15	Afl	1
	<min>	units	5	uc	5
	newline character	terminator	1	uc	1
4	**LON_GRID_SIZE=**	keyword	14	uc	14
	Resolution of the grid in longitude (dμ)	minutes	15	Afl	1
	<min>	units	5	uc	5
	newline character	terminator	1	uc	1
5	**LON_FIRST=**	keyword	10	uc	10
	Longitude of first point on the grid (μf)	minutes	15	Afl	1
	<min>	units	5	uc	5
	newline character	terminator	1	uc	1
6	**LON_LAST=**	keyword	9	uc	9
	Longitude of last point on the grid (μl)	minutes	15	Afl	1
	<min>	units	5	uc	5
	newline character	terminator	1	uc	1
7	**DEF=**	keyword	4	uc	4
	Default value of the grid values(def)	-	11	Al	1
	newline character	terminator	1	uc	1
8	**Spare (blank characters)**	-	50	uc	50
	newline character	terminator	1	uc	1
TOTAL			**259**		

16.3.8.1.2 DEM GADS

This GADS contains the values of the ocean depth or land elevation. Each GADSR corresponds to a longitude value. The first record corresponds to the first

value of the longitude, and the last record is relative to the last value of the longitude. The format of each GADS record is defined in the table below.

Table 16.3.8.1.2-1 DEM GADS Record

N	Description	Units	Byte Length	Data Type	Dim.
1	**Ocean depth / land elevation, ordered as:** Ocean depth / land elevation at φ_f Ocean depth / land elevation at $\varphi_f + d\varphi$ ..... Ocean depth / land elevation at φ_l	mm	8640	fl	2160
Size			**8640**		

where φ_f, φ_l, and $d\varphi$ are the latitude of the first point, the latitude of the last point, and the grid resolution in latitude, respectively.

16.3.9 Land/Sea Mask File

The Land/Sea Mask file classifies points on the Earth surface as Land/Sea or Coastline.

FILE ID: AUX_LSM_AX

TYPE: Auxiliary

USE: Level 1B processing

UPDATED: Infrequently.

SIZE: MPH(1247 bytes) + SPH(1778 bytes) + DSs(12322596 bytes) = 12 325 621 bytes

16.3.9.1 Format

The high level breakdown of the file is shown below.

Table 16.3.9.1-1 Structure of the Land-Sea Mask File

MPH
SPH - standard Auxiliary Data SPH with 6 DSDs: *DSD for the 1 Degree Resolution Surface GADS* *DSD for the 0.1 Degree Resolution Surface GADS* *DSD for the 0.01 Degree Resolution Surface GADS* *DSD for the 1 Degree Resolution Coastline GADS* *DSD for the 0.1 Degree Resolution Coastline GADS* *DSD for the 0.01 Degree Resolution Coastline GADS*
1 Degree Resolution Surface GADS
0.1 Degree Resolution Surface GADS
0.01 Degree Resolution Surface GADS
1 Degree Resolution Coastline GADS
0.1 Degree Resolution Coastline GADS
0.01 Degree Resolution Coastline GADS

16.3.9.1.1 1 Degree Resolution Surface GADS

The size of the GADS is summarized in the table below:

Table 16.3.9.1.1-1 1 Degree Resolution Surface GADS

GADSR	Description	Byte Length
0	**GADSR associated with latitude 1 (90 deg. S to 89 deg. S)**	720
....	**.....**	.....
179	**GADSR associated with latitude 180 (89 deg. N to 90 deg. N)**	720
Size		**129600**

There are 180 records in this GADS, each record being associated with a 1 degree

latitude line. Each record contains 360 values. The format of each GADS record is defined in the table below.

Table 16.3.9.1.1-2 1 Degree Resolution Surface GADS Record

N	Description	Units	Byte Length	Data Type	Dim.
1	**Surface flag, 1 degree resolution** Values: -2 = cell is covered by land -1 = cell is fully covered by sea N > 0 = cell is not fully land or fully sea: a description of higher resolution of this cell may be found in the record number N (1+GADSR number) of the 0.1 Degree Surface GADS.	-	720	ss	360
Size			**720**		

In each record (i.e. each latitude line) cells are ordered with longitude going from 180 deg. W to 179 deg. E: the first cell corresponds to a region within 180 deg. W - 179 deg. W, the last cell corresponds to a region within 179 deg. E - 180 deg. E.

16.3.9.1.2 0.1 Degree Surface GADS

The size of the GADS is summarized in the table below:

Table 16.3.9.1.2-1 0.1 Degree Resolution Surface GADS

GADSR	Description	Byte Length
0	**GADSR associated with 1 degree cell 1**	400
....	**.....**	.....
9542	**GADSR associated with 1 degree cell 9543**	400
Size		**3817200**

The cells are ordered with longitude (going Eastward) varying more rapidly than latitude (going Northward). This GADS contains 9543 GADS Records. The

format of each GADSR is shown in the table below.

Table 16.3.9.1.2-2 0.1 Degree Resolution Surface GADS Record

N	Description	Units	Byte Length	Data Type	Dim.
1	**Surface flag - 0.1 degree resolution** Values: -2 = cell is covered by land -1 = cell is fully covered by sea N > 0 = cell is not fully land or fully sea: a description of higher resolution of this cell may be found in the record number N (1+GADSR number) of the 0.01 Degree Surface GADS.	-	400	sl	100
Size			**400**		

16.3.9.1.3 0.01 Degree Surface GADS

The size of the GADS is summarized in the table below:

Table 16.3.9.1.3-1 0.01 Degree Resolution Surface GADS

GADSR	Description	Byte Length
0	**GADSR associated with 0.1 degree cell 1**	14
....	**.....**	.....
146008	**GADSR associated with 0.1 region number 146009**	14
Size		**2044126**

The cells are ordered with longitude (going Eastward) varying more rapidly than latitude (going Northward). The format of each GADSR is shown in the table below.

Table 16.3.9.1.3-2 0.01 Degree Resolution Surface GADS Record

N	Description	Units	Byte Length	Data Type	Dim.

1	**Surface Flag - 0.01 Degree resolution** 14 bytes holding 112 bits. Each one of the first 100 bits is related to a 0.01 by 0.01 degree cell. The bit value has the following meaning: 1 = TRUE = land 0 = FALSE = sea	flags	14	uc	14
Size			**14**		

16.3.9.1.4 1 Degree Resolution Coastline GADS

The size of the GADS is summarized in the table below:

Table 16.3.9.1.4-1 1 Degree Resolution Coastline GADS

GADSR	Description	Byte Length
0	**GADSR associated with latitude 1 (90 deg. S to 89 deg. S)**	720
....	**.....**	.....
179	**GADSR associated with latitude 180 (89 deg. N to 90 deg. N)**	720
Size		**129600**

There are 180 records in this GADS, each record being associated with a 1 degree latitude line. Each record contains 360 values. The format of each GADS record is defined in the table below.

Table 16.3.9.1.4-1 1 Degree Resolution Coastline GADS Record

N	Description	Units	Byte Length	Data Type	Dim.

1	**Coastline flag, 1 degree resolution** Values: -2 = coast cell -1 = not coast N > 0 = cell is partly covered by a coastline: a description of higher resolution of this cell may be found in the record number N (1+GADSR number) of the 0.1 Degree Coastline GADS.	-	720	ss	360
Size			**720**		

16.3.9.1.5 0.1 Degree Coastline GADS

The size of the GADS is summarized in the table below:

Table 16.3.9.1.5-1 0.1 Degree Resolution Coastline GADS

GADSR	Description	Byte Length
0	**GADSR associated with 1 degree cell 1**	400
....	**.....**	.....
9764	**GADSR associated with 1 degree cell 9765**	400
Size		**3906000**

The cells are ordered with longitude (going Eastward) varying more rapidly than latitude (going Northward). The format of each GADSR is shown in the table below.

Table 16.3.9.1.5-2 0.1 Degree Resolution Coastline GADS Record

N	Description	Units	Byte Length	Data Type	Dim.

1	**Coastline flag - 0.1 degree resolution** Values: -2 = coast -1 = not coast N > 0 = cell is partly covered by a coastline: a description of higher resolution of this cell may be found in the record number N (1+GADSR number) of the 0.01 Degree Coastline GADS.	-	400	sl	100
Size			**400**		

16.3.9.1.6 0.01 Degree Coastline GADS

The size of the GADS is summarized in the table below:

Table 16.3.9.1.6-1 0.01 Degree Resolution Coastline GADS

GADSR	Description	Byte Length
0	**GADSR associated with 0.1 degree cell 1**	14
....	**.....**	.....
164004	**GADSR associated with 0.1 region number 164005**	14
Size		**2296070**

The cells are ordered with longitude (going Eastward) varying more rapidly than latitude (going Northward). The format of each GADSR is shown in the table below.

Table 16.3.9.1.6-2 0.01 Degree Resolution Coastline GADS Record

N	Description	Units	Byte Length	Data Type	Dim.

1	**Coastline Flag - 0.01 Degree resolution** 14 bytes holding 112 bits. Each one of the first 100 bits is related to a 0.01 by 0.01 degree cell. The bit value has the following meaning: 1 = TRUE = coast 0 = FALSE = land or sea	flags	14	uc	14
Size			**14**		

16.3.10 Quality Checking File (Obsolete)

The PFHS uses this auxiliary data for each product on which quality checking shall be performed. According to this auxiliary data file, the PF-HS analyses a list of fields included in the Data Sets, and discards the product if the quality check test is not successful.

FILE_ID: AUX_QUA_AX

USE: Used by the PF-HS for Product Quality Checking, only for Level 1b, Level2, and Browse products.

UPDATED: As needed by the PQF

SIZE: MPH (1247 bytes) + SPH (14 098 bytes) + MDSs (80000 bytes) = 95345 bytes *

* : Size estimated with 50 MDSs and a mean number of 16 DSRs per MDS.

16.3.10.1 Format

The MPH and SPH of these files will follow the standard MPH, SPH structure of all ENVISAT auxiliary data. The SPH contains 50 DSDs. In each DSD the field DS_NAME (defined in Volume 5) contains only the product ID followed by blank space characters. For example: DS_NAME=”ASA_APP_1P ”. Those which are not used have a blank DS_NAME field and are set to the NOT USED condition described in Volume 5. The High level breakdown of the file is shown below.

Table 16.3.10.1-1 AUX_QUA_AX File Format

MPH
SPH with N= 50 DSDs: *DSD (M) for MDS for Product ID #1* *DSD (M) for MDS for Product ID #2* *....* *DSD (M) for MDS for Product ID #50*
MDS #1
MDS #2
.....
MDS #n

16.3.10.1.1 MDS Format

Each MDS consists of several MDSRs. There is one MDSR for each field that the PF-HS checks. According to this MDSR, the PF-HS checks the field in all DSRs of the product if the selected DS contains many DSRs. The format of each MDSR is the same and is described below.

Table 16.3.10.1.1-1 Format of the MDSR

N	Description	Units	Byte Length	Data Type	Dim.
1	**Creation date of the MDSR**	MJD	12	mjd	1
2	**Quality Indicator** always be set to zero	-	1	sc	1
3	**Number of the DSD to analyse in the Product** Gives the DSD in the product that shall be analysed to perform the PF-HS quality checking.	-	2	us	1
4	**Offset of the field to analyse in the DSR or in each DSR if the DS contains many DSR.** Gives the position of the first byte of the corresponding field in the DSR to analyse	bytes	4	ul	1
5	**Name of the field to analyse** Gives in a short string the type of the field to analyse in the DSR	-	50	uc	50

Table 16.3.10.1.1-1 Format of the MDSR

N	Description	Units	Byte Length	Data Type	Dim.
6	**Type of the field to analyse** Gives the type of the field to analyse. This type is one the following: 0 : type = sc 1 : type = uc 2 : type = ss 3 : type = us 4 : type = sl 5 : type = ul 6 : type = sd 7 : type = ud 8 : type = fl 9 : type = do	-	1	uc	1
7	**Type of the test to perform on the field** Gives the type of test to perform the quality checking of the field. An error is supposed to be detected on the field if the result of the test is true.The test order is <value to be tested><test operator><parameter of the test>. The type of test is one the following: 0 : inferior 1 : equal 2 : superior 3 : different	-	1	uc	1
8	**Parameter of the test to perform the analysis** Gives the value of the parameter. This value is used to construct the test, to compare with the value of the field included in the DSR.	-	8	do	1
9	**Identity Threshold** This threshold is only used for type of test 'equal' and 'different', on floating point values (fl, do). It is compared with the absolute value of the difference between value of field and test parameter. If the absolute value is higher than threshold, the value of field and the test parameters are deemed different. Default value if not used: 0	-	8	do	1
10	**Product assessment threshold** If the percentage of errors detected by the test (defined in field #7) exceeds this threshold, the product must be discarded.	%	2	us	1
10	**Spare**	-	13	uc	13
	TOTAL		**102**		

16.4 PAC Auxiliary Data

The following table provides a list of the auxiliary data files used in the Processing and Archiving Centers (PACs). The format of these data files are beyond the scope of this document.

Table 16.4-1

Table 16.4-1 PAC Auxiliary Data

Auxiliary Data ID	Approx. Size (MB)	Estimated Update Rate	Used in	Comments
SMM_DRY_AX	9.0	6 Hours	F-PAC	Tropospheric Correction Dry (Analysis data, grid 0.5 degree)
SMM_WET_AX	9.0	6 Hours	F-PAC	Tropospheric Correction Wet (Analysis data, grid 0.5 degree)
SMM_ERD_AX	9.0	6 Hours	F-PAC	Quality Indicator Tropospheric Dry data
SMM_ERW_AX	9.0	6 Hours	F-PAC	Quality Indicator Tropospheric Wet data
SMM_WIN_AX	9.0	6 Hours	F-PAC	Wind Data
SMM_ION_AX	TBD	1 Month (TBC)	F-PAC	Ionospheric Correction Grid data
SMM_DIO_AX	0.005	1 Day	F-PAC	Orbit Navigator Data

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