TITLE: ENVISAT-1 PRODUCTS SPECIFICATIONS

VOLUME 13: MWR PRODUCTS SPECIFICATIONS

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THOMSON-CSF APPROVAL:

SUMMARY: This document specifies the ENVISAT-1 products.

DRL 3-3 of contract 27/11/95-761.

Company internal reference: 50-7316 Proposition:

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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	

ISSUE	REVISION	DATE	CHANGE STATUS	ORIGIN
			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 Separate volume created. Updated with new product information from Document A-3.	
2	B	17/03/97	SCR #145, CR #145 Issue 2, Revision B Reason for Change: Minor updates, see change bars.	

REGISTER OF CHANGES

Affected pages:

13-5 to 13-7

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13 MWR PRODUCTS SPECIFICATIONS

13.1 INSTRUMENT OVERVIEW

The Microwave Radiometer is a nadir-viewing, 2-channel passive microwave sensor which provides radiometric measurements at 23.8 and 36.5 GHz. The signals received can be related to surface temperature, but more importantly they provide an estimate of the total water vapour content in the atmosphere. This data is necessary to correct the Radar Altimeter-2 data for atmospheric effects.

Table 13.1-1 MWR Characteristics

GEOMETRIC:	Characteristics vary according to the antenna frequency: 23.8 GHz: 21.2 km x 21.2 km footprint 36.5 GHz: 22.5 km (along) x 19.1 km (cross) footprint
RADIOMETRIC:	0.5 degree K resolution
SPECTRAL:	Measured gain: 23.8 GHz: 40.62 dB 36.5 GHz: 42.0 dB

13.2 PRODUCTS OVERVIEW

The Microwave Radiometer products consist of only of a Level 0 product. MWR data processed to a higher level is included as auxiliary data in RA-2 products. The MWR products are summarized in Table 13.2-1, and the Product Tree of Figure 13.2-1.

Table 13.2-1 MWR Products

Instrument / mode	Product ID	Description
MWR	MWR_NL__0P	MWR Level 0
	MWR Level 1B	The MWR Level 1B data is included in the Level 1B RA-2 Product. It is not a stand-alone product itself.
	MWR Level 2	The MWR Level 2 data is included in the Level 2 RA-2 Products. It is not a stand-alone product itself.

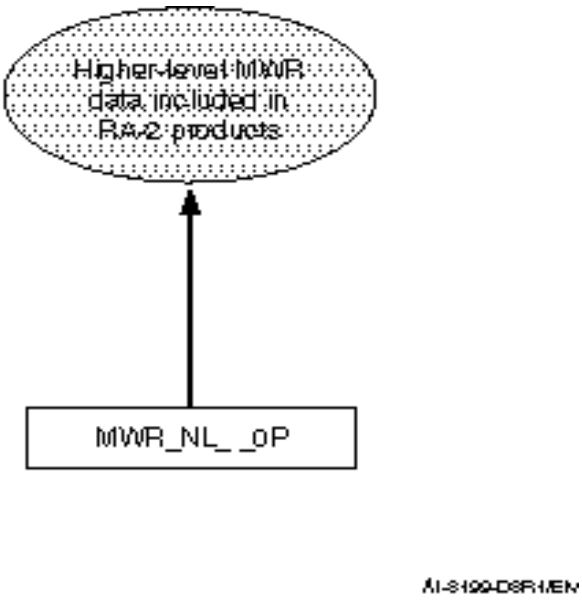

Figure 13.2-1 MWR Product Tree

13.3 LEVEL 0 PRODUCTS

There is one MWR Level 0 Product.

13.3.1 MWR Level 0 Product

This product contains level 0 data from the Microwave Radiometer. Measurements are obtained from a 2-channel antenna which can be converted into brightness temperature measurements. The Level 0 product consists of time ordered, annotated Instrument Source Packets, and is intended for archive and as the basis of higher order products.

13.3.2 Input Data

Annotated ISPs as received from the Front End Processor (FEP) plus auxiliary data.

13.3.3 Auxiliary Data Used

The Level 0 product requires the following auxiliary information (refer to Volume 6):

- Phase, cycle and orbit number data,
- ID of the systems and subsystem that collect and process the data,
- ENVISAT orbital state vectors,
- Processor Configuration file, which includes PCD error codes and threshold values, and
- SBT to UTC conversion data.

13.3.4 Processing Performed

Determination of the satellite position and conversion of Satellite Binary Time (SBT) to Universal Time Co-ordinates (UTC) is accomplished using ESA software.

13.3.5 Product Structure

As defined in Volume 6. The detailed structure of Instrument Source Packets is described in Document A-1.

13.4 LEVEL 1B PRODUCTS

The Level 0 MWR is processed to determine MWR Microwave Brightness Temperature. This data is included as auxiliary data in the Level 1B RA-2 product. It is not a product in itself.

13.4.1 MWR Microwave Brightness Temperature

This is level 1B data from the Microwave Radiometer. It consists of geolocated, radiometrically and geometrically corrected brightness temperature measurements at each of the two antenna frequencies. This data is the basis of the derivation (via higher level processing) of integrated liquid water and water vapour content values.

Refer to Volume 14 for details.

13.5 LEVEL 2 PRODUCTS

The Level 1B MWR data is processed to determine the MWR Vapour and Liquid Water Content. This data is included as auxiliary data in the RA-2 Level 2 products. It is not a PDS product in itself.

13.5.1 MWR Vapour and Liquid Water Content

This is level 2 data from the Microwave Radiometer which consists of water vapour and liquid water content measurements. The main application of this data is for the correction of tropospheric delay for the radar altimeter instrument.

Refer to Volume 14 for details.

13.6 AUXILIARY DATA FILES

The format and contents of the auxiliary data files used for MWR processing is described in Volume 14.

13.7 PRODUCT SUMMARY SHEETS

The data on the following pages is extracted from the product summary information contained in the DDT data base.

Only information for the Level 0 product is provided since the higher leverl products are not stand-alone products, but are instead included in the RA-2 products described in Volume 14.

Microwave Radiometer Level 0

Date of change:	0304/98	Reason of the change:	first issue
		Description of the change:	first issue

PRODUCT ID	MWR_NL__0P
PRODUCT NAME	Microwave Radiometer Level 0
DESCRIPTION	This product contains level 0 data from the Microwave Radiometer. Measurements are obtained from a 2-channel antenna which can be converted into brightness temperature measurements.
APPLICATIONS	Archived product forming basis for all higher level processing
DELIVERY TIME	Product available from PDHS within 3 hours from data take. It is available from PAC starting 2 weeks after.
COVERAGE	full orbit
THROUGHPUT	1 product per orbit
PRODUCT SIZE	400000 records * 16 bytes/record * 2 channels = 1.28 MBytes + packet header (29 bytes/record = 1.16 MB) = 2.44 MB/orbit.
GEOMETRIC SAMPLING	Measurement every 1km
GEOMETRIC RESOLUTION	N/A
GEOMETRIC ACCURACY	N/A
RADIOMETRIC RESOLUTION	Information not available
RADIOMETRIC ACCURACY	Information not available
AUXILIARY DATA INCLUDED	Orbit state vectors; Time correlation parameters.
INTERNAL CALIBRATION	None
ALGORITHMS USED	Satellite positioning; time correlation.

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