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DOCUMENT

Earth Observation Mission Software File Format Specification

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APPROVAL

Title	Earth Observation Mission Software File Format Specification	
Issue 1	Revision 1	
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CHANGE LOG

Reason for change	Issue	Revision	Date
First Issue	1	0	16/2/2017
Updated Orbit Scenario File Format and Version; Clarification about File Format Version; Added Compliance to legacy File Format Standards; Minor changes in examples.	1	1	21/3/2017

CHANGE RECORD

Issue 1	Revision 1		
Reason for change	Date	Pages	Paragraph(s)
First Issue	16/2/2017	All	All
Updated Orbit Scenario File Format and Version; Clarification about File Format Version; Added Compliance to legacy File Format Standards Minor changes in examples.	21/3/2017	- - - -	1, 3.2 1 2 3.11

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1 INTRODUCTION

This document describes the format of some of the files used within Earth Observation Ground Segment Facilities. Formats are described for the file types listed in Table 1. These files are compliant with Earth Observation Ground Segment File Format Standard (FFS), see [RD01].

The "Format Version" is a number keeping track of format modifications. The formats defined by the Format Versions mentioned in Table 1 are compliant with FFS v3.0.

File Type	Content	Format Version
Orbit State Vector File	List of Orbit State Vectors (i.e. position and velocity at given times)	3.0
Orbit Scenario File	Set of parameters describing an orbit, e.g. repeat cycle, cycle length, MLST	3.1
Satellite Configuration File	Set of parameters describing an orbit, e.g. keplerian elements	3.0
Attitude Quaternion File	List of quaternions at given times	3.0
Attitude Roll Pitch Yaw File	List of roll pitch yaw angles at given times	3.0
Swath Definition File	Set of parameters defining an instrument swath	4.0
Swath Template File	One or more lists of latitude, longitude points defining a swath footprint	4.0
Zone Database File	One or more lists of latitude, longitude points defining zones (e.g. polygons)	3.0
Station Database File	One or more set of parameters defining Ground Stations	3.0
Attitude Definition File	Set of data or models defining satellite attitude	3.0
Field of View Configuration File	Set of parameters (e.g. list of azimuth, elevation) defining a field of view	3.0

Table 1 – list of Earth Observation Ground Segment Files

References

Id	Title
[RD01]	Earth Observation Ground Segment File Format Standard (version 3.0), http://eop-cfi.esa.int/Repo/PUBLIC/DOCUMENTATION/SYSTEM_SUPPORT_DOCS/PE-TN-ESA-GS-0001%20EO%20GS%20File%20Format%20Standard%203.0.pdf
[RD02]	Handbook for EO XML and Binary Schemas (version 1.7.1), http://eop-cfi.esa.int/Repo/PUBLIC/DOCUMENTATION/SYSTEM_SUPPORT_DOCS/PE-TN-ESA-GS-121%20%20Handbook%20for%20EO%20XML%20and%20Binary%20Schemas%201.7.1.pdf
[RD03]	Earth Observation Ground Segment File Format Standard (version 2.0), http://eop-cfi.esa.int/Repo/PUBLIC/DOCUMENTATION/SYSTEM_SUPPORT_DOCS/PE-TN-ESA-GS-0001%20EO%20GS%20File%20Format%20Standard%202.0.pdf

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2 COMPLIANCE WITH FILE FORMAT STANDARD

The File Format Standard (FFS) defines a structure common to all files used within the Earth Observation Ground Segment. More details can be found in [RD01].

Figure 1 shows the skeleton of a file compliant with FFS v3.0. The file shall be written according to XML syntax and shall follow certain conventions for file naming. It shall be composed by a Fixed Header (enclosed within **Fixed_Header** tags), a Variable Header (enclosed within **Variable_Header** tags),and a Data Block (enclosed within **Data_Block** tags). Only Variable Header and Data Block content depends on the file type. The file shall reference to an XML schema for validation via dedicated attributes in the **Earth_Observation_File** element as described in section 7.3 of [RD02]. Such attributes are:

- **xsi:schemaLocation** : the validating schema URL
- **schemaVersion** : the validating schema version

The validating schema version is encoded in the schema filename (e.g. version 1.5 is encoded as 0105 in EO_OPER_MPL_ORBRES_**0105**.XSD).
The validating schema version is identical to the File Format Version (e.g. the validating schema for Orbit Scenario File Format version 3.1 is named EO_OPER_MPL_ORBSCT_0301.XSD).

```xml
<?xml version="1.0" encoding="UTF-8"?>
<Earth_Observation_File xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="…"
schemaVersion="…" xmlns="http://eop-cfi.esa.int/CFI">
    <Earth_Observation_Header>
        <Fixed_Header>
            <File_Name>…</File_Name>
            <File_Description>…</File_Description>
            <Notes> …  </Notes>
            <Mission>…</Mission>
            <File_Class>…</File_Class>
            <File_Type>…</File_Type>
            <Validity_Period>
                <Validity_Start>…</Validity_Start>
                <Validity_Stop>…</Validity_Stop>
            </Validity_Period>
            <File_Version>…</File_Version>
            <EOFFS_Version>…</EOFFS_Version>
            <Source>
                <System>…</System>
                <Creator>…</Creator>
                <Creator_Version>…</Creator_Version>
                <Creation_Date>…</Creation_Date>
            </Source>
        </Fixed_Header>
        <Variable_Header>
            ...
        </Variable_Header>
    </Earth_Observation_Header>
    <Data_Block type="xml">
        ...
    </Data_Block>
</Earth_Observation_File>
```

Figure 1 – Skeleton of file compliant with FFS

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Figure 2 shows the skeleton of a file compliant with FFS v2.0 (see [RD03]) and v1.0.
The main difference between FFS v3.0 and previous versions v2.0 and v1.0 is the use of the **Earth_Explorer_File** and **Earth_Explorer_Header** elements. The **EOFFS_Version** element is used only in FFS v3.0.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<Earth_Explorer_File xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="…"
schemaVersion="…" xmlns="http://eop-cfi.esa.int/CFI">
    <Earth_Explorer_Header>
        <Fixed_Header>
            <File_Name>…</File_Name>
            <File_Description>…</File_Description>
            <Notes> …  </Notes>
            <Mission>…</Mission>
            <File_Class>…</File_Class>
            <File_Type>…</File_Type>
            <Validity_Period>
                <Validity_Start>…</Validity_Start>
                <Validity_Stop>…</Validity_Stop>
            </Validity_Period>
            <File_Version>…</File_Version>
            <Source>
                <System>…</System>
                <Creator>…</Creator>
                <Creator_Version>…</Creator_Version>
                <Creation_Date>…</Creation_Date>
            </Source>
        </Fixed_Header>
        <Variable_Header>
            ...
        </Variable_Header>
    </Earth_Explorer_Header>
    <Data_Block type="xml">
        ...
    </Data_Block>
</Earth_Explorer_File>
```

Figure 2 – Skeleton of file compliant with FFS legacy versions

The main difference between FFS v2.0 and FFS v1.0 is in file naming.
In FFS v3.0 and v2.0, the mission identifier is composed by three letters and the file extension is EOF
(e.g. **S1A**_TEST_AUX_ORBRES_20200401T040000_20200401T041000_0001.**EOF**)

In FFS v1.0, the mission identifier is composed by two letters and the file extension is EEF
(e.g. **CS**_TEST_AUX_ORBRES_20200401T040000_20200401T041000_0001.**EEF**）

Table 2 provides, for each File Type and File Format Standard Version, the latest File Format Version and the relevant validating schema. Validating schemas can be found at: http://eop-cfi.esa.int/CFI

File Type	FFS Version	File Format Version	Validating schema
Orbit State Vector File	1.0	1.5	EO_OPER_MPL_ORBRES_0105.XSD
	2.0	2.3	EO_OPER_MPL_ORBRES_0203.XSD
	3.0	3.0	EO_OPER_MPL_ORBRES_0300.XSD
Orbit Scenario File	1.0	1.5	EO_OPER_MPL_ORBSCT_0105.XSD
	2.0	2.4	EO_OPER_MPL_ORBSCT_0204.XSD
	3.0	3.1	EO_OPER_MPL_ORBSCT_0301.XSD
Satellite Configuration File	1.0	1.3	EO_OPER_INT_SATCFG_0103.XSD
	2.0	2.2	EO_OPER_INT_SATCFG_0202.XSD
	3.0	3.0	EO_OPER_INT_SATCFG_0300.XSD
Attitude Quaternion File Attitude Roll Pitch Yaw File	1.0	1.3	EO_OPER_INT_ATTREF_0103.XSD
	2.0	2.3	EO_OPER_INT_ATTREF_0203.XSD
	3.0	3.0	EO_OPER_INT_ATTREF_0300.XSD
Swath Definition File	1.0	2.3	EO_OPER_MPL_SW_DEF_0203.XSD
	2.0	3.3	EO_OPER_MPL_SW_DEF_0303.XSD
	3.0	4.0	EO_OPER_MPL_SW_DEF_0400.XSD
Swath Template File	1.0	2.3	EO_OPER_MPL_SWTREF_0203.XSD
	2.0	3.3	EO_OPER_MPL_ SWTREF _0303.XSD
	3.0	4.0	EO_OPER_MPL_ SWTREF _0400.XSD
Zone Database File	1.0	1.3	EO_OPER_MPL_ZON_DB_0103.XSD
	2.0	2.2	EO_OPER_MPL_ZON_DB_0202.XSD
	3.0	3.0	EO_OPER_MPL_ZON_DB_0300.XSD
Station Database File	1.0	1.5	EO_OPER_MPL_GND_DB_0105.XSD
	2.0	2.2	EO_OPER_MPL_GND_DB_0202.XSD
	3.0	3.0	EO_OPER_MPL_GND_DB_0300.XSD
Attitude Definition File	1.0	1.1	EO_OPER_INT_ATTDEF_0101.XSD
	2.0	2.2	EO_OPER_INT_ATTDEF_0202.XSD
	3.0	3.0	EO_OPER_INT_ATTDEF_3000.XSD
Field of View Configuration File	1.0	1.0	EO_OPER_INT_FOVCFG_0100.XSD
	2.0	2.0	EO_OPER_INT_FOVCFG_0200.XSD
	3.0	3.0	EO_OPER_INT_FOVCFG_0300.XSD

Table 2 – Mapping between File Types, FFS Version, File Format Version and validating schemas

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3   FILE FORMAT SPECIFICATION

The following sections describe, for each file type:
- the content of the Variable Header;
- the content of the Data Block;
- the reference to the validating schema for FFS v3.0 (shortly named "Schema Reference").

3.1   Orbit State Vector File

3.1.1   Variable Header

The Variable Header content is a sequence of XML elements described in Table 3.

XML Tag name	Type	Attributes	C Format	Description
Ref_Frame	string	-	%s	Orbit State Vector (see Table 5) co-ordinate system reference frame, it can be one of the following values: GEO_MEAN_2000 MEAN_DATE TRUE_DATE EARTH_FIXED
Time_Reference	string	-	%s	Time reference used when, due to an inconsistency with other time correlations, times associated to the state vector have to be recomputed. It can be one of the following values: TAI UTC UT1

Table 3 – Variable Header content

Example:

```
<Variable_Header>
    <Ref_Frame>EARTH_FIXED</Ref_Frame>
    <Time_Reference>UTC</Time_Reference>
</Variable_Header>
```

3.1.2   Data Block

The Data Block content is a sequence of XML elements described in Table 4.

XML Tag name	Type	Attributes	C Format	Description
List_of_OSVs	XML element	count="N" where n is the number of elements in the list	-	List of **OSV** elements (see Table 5).

Table 4 – Data Block content

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XML Tag name	Type	Attributes	C Format	Description
TAI	string	-	-	TAI date and time of OSV, in ASCII standard time format, including time reference and microseconds: TAI=yyyy-mm-ddThh:mm:ss.ssssss
UTC	string	-	-	UTC date and time of OSV, in ASCII standard time format, including time reference and microseconds: UTC=yyyy-mm-ddThh:mm:ss.ssssss
UT1	string	-	-	UT1 date and time of OSV, in ASCII standard time format, including time reference and microseconds: UT1=yyyy-mm-ddThh:mm:ss.ssssss
Absolute_Orbit	integer	-	%+06ld	Absolute Orbit Number of the OSV
X	real	unit="m"	%+012.3lf	X component of the OSV position vector in m with a precision of 1e-3.
Y	real	unit="m"	%+012.3lf	Y component of the OSV position vector in m with a precision of 1e-3.
Z	real	unit="m"	%+012.3lf	Z component of the OSV position vector in m with a precision of 1e-3.
VX	real	unit="m/s"	%+012.6lf	X component of the OSV velocity vector in m/s with a precision of 1e-6.
VY	real	unit="m/s"	%+012.6lf	Y component of the OSV velocity vector in m/s with a precision of 1e-6.
VZ	real	unit="m/s"	%+012.6lf	Z component of the OSV velocity vector in m/s with a precision of 1e-6.
Quality	string	-	%13s	This parameter is added to keep format compatibility with legacy formats. Default ("not used") value is "0000000000000"

Table 5 – OSV element content

Example (only the first and last OSVs are shown):

```xml
<Data_Block type="xml">
    <List_of_OSVs count="243">
        <OSV>
            <TAI>TAI=2021-06-10T04:57:17.817060</TAI>
            <UTC>UTC=2021-06-10T04:57:52.817060</UTC>
            <UT1>UT1=2021-06-10T04:57:53.117059</UT1>
            <Absolute_Orbit>+00999</Absolute_Orbit>
            <X unit="m">-1606749.988</X>
            <Y unit="m">-5677008.966</Y>
            <Z unit="m">-4135675.595</Z>
            <VX unit="m/s">-2876.652288</VX>
            <VY unit="m/s">-3541.028256</VY>
            <VZ unit="m/s">+5985.303441</VZ>
            <Quality>0000000000000</Quality>
        </OSV>
    [...]
        <OSV>
            <TAI>TAI=2021-06-10T06:58:17.817060</TAI>
            <UTC>UTC=2021-06-10T06:58:52.817060</UTC>
            <UT1>UT1=2021-06-10T06:58:53.117059</UT1>
            <Absolute_Orbit>+01001</Absolute_Orbit>
            <X unit="m">-5075578.371</X>
            <Y unit="m">-3158584.535</Y>
            <Z unit="m">+4005164.344</Z>
            <VX unit="m/s">+2519.609604</VX>
            <VY unit="m/s">+3677.868542</VY>
            <VZ unit="m/s">+6075.683811</VZ>
            <Quality>0000000000000</Quality>
        </OSV>
    </List_of_OSVs>
</Data_Block>
```

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3.1.3 Schema Reference

An example of validating XML schema for this file type is located at:

`http://eop-cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_AUX_ORBRES_0300.XSD`

This schema is compliant to [RD02] and includes format and range checks to ensure compliance to this specification and to the File Format Standard [RD01]. The schema file is named according to section 6.1.1 in [RD02] and is applicable to files named `MMM_`**`OPER_AUX_ORBRES_`**`<instance_id>.EOF`.

The following is the content of the Earth_Observation_File required to reference the above schema.

```
<Earth_Observation_File xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://eop-cfi.esa.int/CFI http://eop-
cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_AUX_ORBRES_0300.XSD" schemaVersion="3.0" xmlns="http://eop-
cfi.esa.int/CFI">
```

3.2 Orbit Scenario File

3.2.1 Variable Header

The Variable Header content is a sequence of XML elements described in Table 6.

XML Tag name	Type	Attributes	C Format	Description
Time_Reference	string	-	%s	Time reference used when, due to an inconsistency with other time correlations, times associated to the state vector have to be recomputed. It can be one of the following values: UT1

Table 6 – Variable Header content

Example:

```
<Variable_Header>
    <Time_Reference>UTC</Time_Reference>
</Variable_Header>
```

3.2.2 Data Block

The Data Block content is a sequence of XML elements described in Table 7.

XML Tag name	Type	Attributes	C Format	Description
List_of_Orbit_Changes	XML element	count="N" where n is the number of elements in the list	-	List of **Orbit_Change** elements (see Table 8).

Table 7 – Data Block content

XML Tag name	Type	Attributes	C Format	Description
Orbit	XML element	-	-	Orbit information (see Table 9).
Cycle	XML element	-	-	Cycle information (see Table 10).
Time_of_ANX	XML element	-	-	Ascending node time (see Table 12).

Table 8 – Orbit_Change element content

XML Tag name	Type	Attributes	C Format	Description
Absolute_Orbit	integer	-	%ld	absolute orbit number
Relative_Orbit	integer	-	%ld	relative orbit number
Cycle_Number	integer	-	%ld	cycle number
Phase_Number	integer	-	%ld	phase number

Table 9 – Orbit element content

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XML Tag name	Type	Attributes	C Format	Description
Repeat_Cycle	integer	-	%ld	Repeat Cycle
Cycle_Length	integer		%ld	Cycle Length
ANX_Longitude	real	unit="deg"	%.6lf	longitude of ascending node crossing (ANX) in degrees with a resolution of 1e-6 degrees
ANX_Longitude_Drift	XML element	-	-	drift of ANX Longitude, see Table 11
MLST	time	-	%s	mean local solar time at ANX of relative orbit 1 expressed as hours, minutes, seconds and microseconds HH:MM:SS.ssssss
MLST_Drift	real	unit="s/day"	%.6lf	drift of mean local solar time in s/day with a resolution of 1e-6
MLST_Nonlinear_Drift	XML element	-	-	Non linear MLST data, see Table 12

Table 10 – Cycle element content

XML Tag name	Type	Attributes	C Format	Description
Offset	real	unit="deg"	%.6lf	ANX Longitude drift initial value in deg with a resolution of 1e-6
Linear_Term	real	unit="deg/day"	%.6lf	ANX Longitude drift linear term in deg/day with a resolution of 1-6

Table 11 – ANX_Longitude_Drift element content

XML Tag name	Type	Attributes	C Format	Description
Linear_Approx_Validity	integer	unit="orbits"	%d	Number of orbits in which linear approximation is valid.
Quadratic_Term	real	unit="s/day^2"	%.6lf	MLST Quadratic term in s/day^2 with a resolution of 1e-6s/day^2.
Harmonics_Terms	XML element	num="N" where N is the number of harmonics (between 0 and 2)	-	List of **Harmonics_Term** elements (see Table 13). The **Harmonics_Term** element has a seq="i" attribute, where I denotes the identifier in the sequence starting from 1.

Table 12 – MLST_Nonlinear_Drift element content

XML Tag name	Type	Attributes	C Format	Description
Reference_Time	string	time_ref="UT1"	%s	UT1 Reference time of harmonic, in ASCII standard time format, including microseconds: yyyy-mm-ddThh:mm:ss.ssssss
Period	real	unit="days"	%6.2lf	Period of the harmonic in days with a resolution of 1e-2 days.
Amplitude_Sin	real	unit="sec"	%5.3lf	Amplitude of sine in seconds with a resolution of 1e-3 seconds
Amplitude_Cos	real	unit="sec"	%5.3lf	Amplitude of cosine in seconds with a resolution of 1e-3 seconds

Table 13 – Harmonics_Term element content

XML Tag name	Type	Attributes	C Format	Description
TAI	string	-	%s	TAI date and time of ANX, in ASCII standard time format, including time reference and microseconds: TAI=yyyy-mm-ddThh:mm:ss.ssssss
UTC	string	-	%s	UTC date and time of ANX, in ASCII standard time format, including time reference and microseconds: UTC=yyyy-mm-ddThh:mm:ss.ssssss
UT1	string	-	%s	UT1 date and time of ANX, in ASCII standard time format, including time reference and microseconds: UT1=yyyy-mm-ddThh:mm:ss.ssssss
TAI	string	-	%s	TAI date and time of ANX, in ASCII standard time format, including time reference and microseconds: TAI=yyyy-mm-ddThh:mm:ss.ssssss

Table 14 – Time_of_ANX element content

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Example:

```xml
<Data_Block type="xml">
    <List_of_Orbit_Changes count="1">
        <Orbit_Change>
            <Orbit>
                <Absolute_Orbit>1</Absolute_Orbit>
                <Relative_Orbit>11417</Relative_Orbit>
                <Cycle_Number>1</Cycle_Number>
                <Phase_Number>1</Phase_Number>
            </Orbit>
            <Cycle>
                <Repeat_Cycle unit="day">838</Repeat_Cycle>
                <Cycle_Length unit="orbit">11945</Cycle_Length>
                <ANX_Longitude unit="deg">40.300000</ANX_Longitude>
                <ANX_Longitude_Drift>
                    <Offset unit="deg">0.010000</Offset>
                    <Linear_Term unit="deg/day">0.000001</Linear_Term>
                </ANX_Longitude_Drift>
                <MLST>21:59:55.572000</MLST>
                <MLST_Drift unit="s/day">-0.270000</MLST_Drift>
                <MLST_Nonlinear_Drift>
                    <Linear_Approx_Validity unit="orbit">99999</Linear_Approx_Validity>
                    <Quadratic_Term unit="s/day^2">0.000000</Quadratic_Term>
                    <Harmonics_Terms num="1">
                        <Harmonic_Term seq="1">
                            <Reference_Time time_ref="UT1">2016-02-17T00:00:00.000000</Reference_Time>
                            <Period unit="days">10.00</Period>
                            <Amplitude_Sin unit="sec">0.001</Amplitude_Sin>
                            <Amplitude_Cos unit="sec">0.001</Amplitude_Cos>
                        </Harmonic_Term>
                    </Harmonics_Terms>
                </MLST_Nonlinear_Drift>
            </Cycle>
            <Time_of_ANX>
                <TAI>TAI=2016-02-16T19:19:20.844398</TAI>
                <UTC>UTC=2016-02-16T19:18:44.844398</UTC>
                <UT1>UT1=2016-02-16T19:18:44.844398</UT1>
            </Time_of_ANX>
        </Orbit_Change>
    </List_of_Orbit_Changes>
</Data_Block>
```

3.2.3   Schema Reference

An example of validating XML schema for this file type is located at:

`http://eop-cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_MPL_ORBSCT_0301.XSD`

This schema is compliant to [RD02] and includes format and range checks to ensure compliance to this specification and to the File Format Standard [RD01]. The schema file is named according to section 6.1.1 in [RD02] and is applicable to files named MMM_**OPER_MPL_ORBSCT_**<instance_id>.EOF.

The following is the content of the Earth_Observation_File required to reference the above schema.

```xml
<Earth_Observation_File xmlns:xsi=http://www.w3.org/2001/XMLSchema-instance
 xsi:schemaLocation="http://eop-cfi.esa.int/CFI
 http://eop-cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_MPL_ORBSCT_0301.XSD"
 schemaVersion="3.1"
 xmlns="http://eop-cfi.esa.int/CFI">
```

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3.3 Satellite Configuration File

3.3.1 Variable Header

The Variable Header is empty for this type of file.

3.3.2 Data Block

The Data Block content is a sequence of XML elements described in Table 15.

XML Tag name	Type	Attributes	C Format	Description
Satellite_Name	string	-	%s	Satellite Name
NORAD_Data	XML element	-	-	NORAD Satellite data, see Table 16
Lib_Init	XML element	-	-	Low and tight tolerances for orbital parameters, see Table 17.
Orbit_Init	XML element	-	-	Default Orbital parameters, see Table 18

Table 15 – Data Block content

XML Tag name	Type	Attributes	C Format	Description
Satellite_Number	integer	-	%ld	NORAD Satellite number
NORAD_Sat_Name	string	-	%s	NORAD Satellite name
Int_Designator	string	-	%s	NORAD international designator

Table 16 – NORAD_Data element content

XML Tag name	Type	Attributes	C Format	Description
Low_Tolerances	string	-	%s	Low tolerances for orbital parameters, see Table 19
Tight_Tolerances	XML element	-	-	Tight tolerances for orbital parameters, see Table 19

Table 17 – Lib_Init element content

XML Tag name	Type	Attributes	C Format	Description
Min_Semi_Major_Axis	real	-	%lf	Minimum semi-major axis (meters)
Nom_Semi_Major_Axis	real	-	%lf	Nominal semi-major axis (meters)
Max_Semi_Major_Axis	real	-	%lf	Maximum semi-major axis (meters)
Min_Inclination	real	-	%lf	Minimum inclination (degrees)
Nom_Inclination	real	-	%lf	Nominal inclination (degrees)
Max_Inclination	real	-	%lf	Maximum inclination (degrees)
Nom_Eccentricity	real	-	%lf	Nominal Eccentricity
Nom_Arg_Perigee	real	-	%lf	Nominal Argument of perigee (degrees)

Table 18 – Orbit_Init element content

XML Tag name	Type	Attributes	C Format	Description
Min_Semi_Major_Axis	real	-	%lf	Minimum semi-major axis (meters)
Max_Semi_Major_Axis	real	-	%lf	Maximum semi-major axis (meters)
Min_Inclination	real	-	%lf	Minimum inclination (degrees)
Max_Inclination	real	-	%lf	Maximum inclination (degrees)
Min_Eccentricity	real	-	%lf	Minimum Eccentricity
Max_Eccentricity	real	-	%lf	Maximum Eccentricity
Min_Semi_Major_Axis	real	-	%lf	Minimum semi-major axis (meters)
Max_Semi_Major_Axis	real	-	%lf	Maximum semi-major axis (meters)

Table 19 – Low_ and Tight_Tolerances element content

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Example:

```xml
<Data_Block type="xml">
    <Satellite_Name>NEW_SATELLITE</Satellite_Name>
    <NORAD_Data>
        <Satellite_Number>1</Satellite_Number>
        <NORAD_Sat_Name>TBD</NORAD_Sat_Name>
        <Int_Designator>00000AAA</Int_Designator>
    </NORAD_Data>
    <Lib_Init>
        <Low_Tolerances>
            <Min_Semi_Major_Axis>7140000.000000</Min_Semi_Major_Axis>
            <Max_Semi_Major_Axis>7240000.000000</Max_Semi_Major_Axis>
            <Min_Inclination>98.290000</Min_Inclination>
            <Max_Inclination>99.110000</Max_Inclination>
            <Min_Eccentricity>0.0</Min_Eccentricity>
            <Max_Eccentricity>0.5</Max_Eccentricity>
        </Low_Tolerances>
        <Tight_Tolerances>
            <Min_Semi_Major_Axis>7150000.000000</Min_Semi_Major_Axis>
            <Max_Semi_Major_Axis>7230000.000000</Max_Semi_Major_Axis>
            <Min_Inclination>98.390000</Min_Inclination>
            <Max_Inclination>99.010000</Max_Inclination>
            <Min_Eccentricity>0.0</Min_Eccentricity>
            <Max_Eccentricity>0.007</Max_Eccentricity>
        </Tight_Tolerances>
    </Lib_Init>
    <Orbit_Init>
        <Min_Semi_Major_Axis>7186000.000000</Min_Semi_Major_Axis>
        <Nom_Semi_Major_Axis>7195605.347274</Nom_Semi_Major_Axis>
        <Max_Semi_Major_Axis>7209000.000000</Max_Semi_Major_Axis>
        <Min_Inclination>98.690000</Min_Inclination>
        <Nom_Inclination>98.702197</Nom_Inclination>
        <Max_Inclination>98.710000</Max_Inclination>
        <Nom_Eccentricity>0.001141</Nom_Eccentricity>
        <Nom_Arg_Perigee>90.0</Nom_Arg_Perigee>
    </Orbit_Init>
</Data_Block>
```

3.3.3 Schema Reference

An example of validating XML schema for this file type is located at:

`http://eop-cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_INT_SATCFG_0300.XSD`

This schema is compliant to [RD02] and includes format and range checks to ensure compliance to this specification and to the File Format Standard [RD01]. The schema file is named according to section 6.1.1 in [RD02] and is applicable to files named `MMM_OPER_INT_SATCFG_<instance_id>.EOF`.

The following is the content of the Earth_Observation_File required to reference the above schema.

```xml
<Earth_Observation_File xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://eop-cfi.esa.int/CFI http://eop-cfi.esa.int/CFI/EE_CFI_SCHEMAS/
EO_OPER_INT_SATCFG_0300.XSD" schemaVersion="3.0" xmlns="http://eop-cfi.esa.int/CFI">
```

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3.4 Attitude Quaternion File

3.4.1 Variable Header

The Variable Header is empty for this type of file.

3.4.2 Data Block

The Attitude quaternion file contains a list of quaternion sets and associated times. Each quaternion set represent the transformation between a given Reference Frame to a given Satellite Based frame.
The Data Block content is a sequence of XML elements described in Table 20.

XML Tag name	Type	Attributes	C Format	Description
Attitude_File_Type	string	-	%s	It defines the Satellite Based Frame. It can be one of the following values: Sat_Nominal_Attitude Sat_Attitude Instr_Attitude
Attitude_Data_Type	string	-	%s	It defines the type of attitude data. It can be only the following value: Quaternions
Max_Gap	real	unit="s"	%.6f	Maximum gap between two consecutive set of quaternions
Quaternions_Data	XML element	-	-	See Table 21.

Table 20 – Data Block content

XML Tag name	Type	Attributes	C Format	Description
Reference_Frame	string	-	%s	Reference frame. It could be one of the following: BM2000 HM2000 GM2000 MEAN_DATE TRUE_DATE QUASI_MEAN_DATE PSEUDO_TRUE_DATE EARTH_FIXED
List_of_Quaternions	XML element	count="N" where n is the number of elements in the list	-	List of **Quaternions** elements (see Table 22).

Table 21 – Quaternions_Data element content

XML Tag name	Type	Attributes	C Format	Description
Time	string	ref="RRR" where RRR is one of the following: TAI UTC UT1 GPS	%s	Date for the quaternions. The date format is CCSDS-A with reference and microseconds (RRR=yyyy-mm-ddThh:nn:ss.ssssss)
Q1	real	-	%.9lf	First coordinate of quaternion vector. Adimensional number with precision of 1e-9
Q2	real	-	%.9lf	Second coordinate of quaternion vector. Adimensional number with precision of 1e-9
Q3	real	-	%.9lf	Third coordinate of quaternion vector. Adimensional number with precision of 1e-9
Q4	real	-	%.9lf	Scalar part of quaternion. Adimensional number with precision of 1e-9

Table 22 – Quaternions element content

Example (only first and last item are shown):

```xml
<Data_Block type="xml">
    <Attitude_File_Type>Sat_Attitude</Attitude_File_Type>
    <Attitude_Data_Type>Quaternions</Attitude_Data_Type>
    <Max_Gap unit="s">11.000000</Max_Gap>
    <Quaternion_Data>
        <Reference_Frame>GM2000</Reference_Frame>
        <List_of_Quaternions count="1442">
            <Quaternions>
                <Time ref="UTC">UTC=2020-04-01T04:00:00.000000</Time>
                <Q1>0.487124882</Q1>
                <Q2>0.165975309</Q2>
                <Q3>0.579456084</Q3>
                <Q4>0.631974836</Q4>
            </Quaternions>
            [...]
            <Quaternions>
                <Time ref="UTC">UTC=2020-04-01T08:00:10.000000</Time>
                <Q1>0.690492661</Q1>
                <Q2>0.408245532</Q2>
                <Q3>0.468027160</Q3>
                <Q4>0.370818080</Q4>
            </Quaternions>
        </List_of_Quaternions>
    </Quaternion_Data>
</Data_Block>
```

3.4.3   Schema Reference

An example of validating XML schema for this file type is located at:

http://eop-cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_INT_ATTREF_0300.XSD

This schema is compliant to [RD02] and includes format and range checks to ensure compliance to this specification and to the File Format Standard [RD01]. The schema file is named according to section 6.1.1 in [RD02] and is applicable to files named MMM_**OPER_INT_ATTREF**_<instance_id>.EOF.

The following is the content of the Earth_Observation_File required to reference the above schema.

```
<Earth_Observation_File xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://eop-cfi.esa.int/CFI http://eop-cfi.esa.int/CFI/EE_CFI_SCHEMAS/
EO_OPER_INT_ATTREF_0300.XSD" schemaVersion="3.0" xmlns="http://eop-cfi.esa.int/CFI">
```

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3.5 Attitude Roll Pitch Yaw File

3.5.1 Variable Header

The Variable Header is empty for this type of file.

3.5.2 Data Block

The Attitude Roll Pitch Yaw file contains a list of Roll Pitch Yaw sets and associated times. Each set represent the transformation between one reference Satellite Based Frame to another one.
The Data Block content is a sequence of XML elements described in Table 23.

XML Tag name	Type	Attributes	C Format	Description
Attitude_File_Type	string	-	%s	It defines the reference Satellite Based Frame. It can be one of the following values: Sat_Nominal_Attitude Sat_Attitude Instr_Attitude
Attitude_Data_Type	string	-	%s	It defines the type of attitude data. It can be only the following value: Attitude_Angles
Max_Gap	real	unit="s"	%.6f	Maximum gap between two consecutive set of quaternions
Attitude_Angles_Data	XML element	-	-	See Table 24.

Table 23 – Data Block content

XML Tag name	Type	Attributes	C Format	Description
List_of_Attitude_Angles	XML element	count="N" where n is the number of elements in the list	-	List of **Attitude_Angles** elements (see Table 25).

Table 24 – Attitude_Angles_Data element content

XML Tag name	Type	Attributes	C Format	Description
Time	string	ref="RRR" where RRR is one of the following: TAI UTC UT1 GPS	%s	Date for the quaternions. The date format is CCSDS-A with reference and microseconds (RRR=yyyy-mm-ddThh:nn:ss.ssssss)
Pitch	real	unit="deg"	%.6lf	Pitch angle in degrees with a precision of 1e-6.
Roll	real	unit="deg"	%.6lf	Roll angle in degrees with a precision of 1e-6.
Yaw	real	unit="deg"	%.6lf	Yaw angle in degrees with a precision of 1e-6.

Table 25 – Attitude_Angles element content

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Example (only first and last items are shown):

```
<Data_Block type="xml">
    <Attitude_File_Type>Sat_Attitude</Attitude_File_Type>
    <Attitude_Data_Type>Attitude_Angles</Attitude_Data_Type>
    <Max_Gap unit="s">11.000000</Max_Gap>
    <Attitude_Angles_Data>
        <List_of_Attitude_Angles count="1442">
            <Attitude_Angles>
                <Time ref="UTC">UTC=2020-04-01T04:00:00.000000</Time>
                <Pitch unit="deg">0.000001</Pitch>
                <Roll unit="deg">0.000002</Roll>
                <Yaw unit="deg">0.000003</Yaw>
            </Attitude_Angles>
  [...]
            <Attitude_Angles>
                <Time ref="UTC">UTC=2020-04-01T08:00:10.000000</Time>
                <Pitch unit="deg">0.000004</Pitch>
                <Roll unit="deg">0.000005</Roll>
                <Yaw unit="deg">0.000006</Yaw>
            </Attitude_Angles>
        </List_of_Attitude_Angles>
    </Attitude_Angles_Data>
</Data_Block>
```

3.5.3 Schema Reference

An example of validating XML schema for this file type is located at:

`http://eop-cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_INT_ATTREF_0300.XSD`

This schema is compliant to [RD02] and includes format and range checks to ensure compliance to this specification and to the File Format Standard [RD01]. The schema file is named according to section 6.1.1 in [RD02] and is applicable to files named `MMM_OPER_INT_ATTREF_<instance_id>.EOF`.

The following is the content of the Earth_Observation_File required to reference the above schema.

```
<Earth_Observation_File xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://eop-cfi.esa.int/CFI http://eop-cfi.esa.int/CFI/EE_CFI_SCHEMAS/
EO_OPER_INT_ATTREF_0300.XSD" schemaVersion="3.0" xmlns="http://eop-cfi.esa.int/CFI">
```

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3.6 Swath Definition File

3.6.1 Variable Header

The Variable Header is empty for this type of file.

3.6.2 Data Block

The Data Block content is a sequence of XML elements described in Table 26.

XML Tag name	Type	Attributes	C Format	Description
Swath	XML element	-	-	**Swath** data structure see Table 27.

Table 26 – Data Block content

XML Tag name	Type	Attributes	C Format	Description
Output_File_Description	string	-	%s	File Description for the output swath template file
Output_File_Type	string	-	%s	File type for the output swath template file. It should have the fixed value "MPL_SWTREF"
Swath_Type	string	-	%s	Swath type. It can have one of the following values: • point • line • inertial
Num_Swath_Records	integer	-	%d	Number of points in the swath template file (>0)
Refraction	XML element	-	-	Refraction model structure, see Table 28
Either **List_of_Swath_Points** *Or* **Asar_Geomtery**	XML element	**List_of_Swath_Points** count="n" number of points in the instantaneous swath **Asar_Geomtery** No attributes	-	**List_of_Swath_Points**: List of **Swath_Point** elements. Each element contains the geometry data for the calculation of each point in the instantaneous swath. See Table 29 **Asar_Geomtery**: ASAR geomery, see Table 29
Sat_Nominal_Att	XML element	-	-	Satellite Nominal Attitude initialization data, see Table 36.
Sat_Att	XML element	-	-	Satellite Attitude initialization data, see Table 37.
Instr_Att	XML element	-	-	Instrument Attitude initialization data, see Table 37.

Table 27 – Swath element content

XML Tag name	Type	Attributes	C Format	Description
Model	string	-	%s	Atmospheric refraction model. It can be one of: • NO_REF • STD_REF • USER_REF • PRED_REF
Freq	real	unit="MHz"	%lf	Signal Frequency in MHz (≥ 0)

Table 28 – Refraction element content

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XML Tag name	Type	Attributes	C Format	Description
One of the following **Pointing_Geometry** **Distance_Geometry** **Limb_Geometry** **Inertial_Geomtery** **Sub_Satellite_Geomtery**	XML element	-	%s	It Contains the geometry data for the calculation of each point in the instantaneous swath. **Pointing_Geometry:** see Table 30 **Distance_Geometry:** see Table 32 **Limb_Geometry:** see Table 31 **Inertial_Geomtery:** see Table 31 **Sub_Satellite_Geomtery:** empty

Table 29 – Swath_Point element content

XML Tag name	Type	Attributes	C Format	Description
Azimuth	real	unit="deg"	%lf	Swath azimuth in deg (-360,360)
Elevation	real	unit="deg"	%lf	Swath elevation in deg (-90,90)
Altitude	real	unit="m"	%lf	Swath altitude in m (>= 0)

Table 30 – Pointing_Geometry element content

XML Tag name	Type	Attributes	C Format	Description
Azimuth	real	unit="deg"	%lf	Swath azimuth in deg (-360,360)
Altitude	real	unit="m"	%lf	Swath altitude in m (>= 0)

Table 31 – Limb_ and Inertial_Geometry element content

XML Tag name	Type	Attributes	C Format	Description
Azimuth	real	unit="deg"	%lf	Swath azimuth in deg (-360,360)
Elevation	real	unit="deg"	%lf	Swath elevation in deg (-90,90)
Altitude	real	unit="m"	%lf	Swath altitude in m (>= 0)
Distance	real	unit="m"	%lf	distance in m (>= 0)

Table 32 – Distance_Geometry element content

XML Tag name	Type	Attributes	C Format	Description
Left_Pt	XML elelemt	-	-	It Contains the geometry data for the calculation of the left point in the instantaneous swath. It has the same content of **Pointing_Geometry**: see Table 30
Mid_Pt	XML elelemt	-	-	It Contains the geometry data for the calculation of the mid point in the instantaneous swath. It has the same content of **Pointing_Geometry**: see Table 30
Right_Pt	XML elelemt	-	-	It Contains the geometry data for the calculation of the right point in the instantaneous swath. It has the same content of **Pointing_Geometry**: see Table 30
Either **Narrow_Asar** Or **Wide_Asar**	XML elelemt	-	-	Slant range extension parameters. **Narrow_Asar:** see Table 34 **Wide_Asar:** see Table 35

Table 33 – Asar_Geometry element content

XML Tag name	Type	Attributes	C Format	Description
Slant_Range_Left	real	unit="10e-6s"	%lf	Slant Range Extension parameter for left point in microseconds.

Table 34 – Narrow_Asar element content

XML Tag name	Type	Attributes	C Format	Description
Slant_Range_Left	real	unit="10e-6s"	%lf	Slant Range Extension parameter for left point in microseconds.
Slant_Range_Right	real	unit="10e-6s"	%lf	Slant Range Extension parameter for right point in microseconds.

Table 35 – Wide_Asar element content

XML Tag name	Type	Attributes	C Format	Description
One of the following **None** **AOCS_Model** **Parameter_Model** **Harmonic_Model** **File_Model**	**AOCS_Model** integer **Parameter_Model** **Harmonic_Model** **File_Model** XML element **None** XML element (empty)	-	**AOCS_Model** %ld	Satellite Nominal Attitude initialization data **AOCS_Model** One of the following values 0: Geocentric Pointing 1: Local Normal Pointing 2: Yaw Steering 3: Zero Doppler **Parameter_Model**: see Table 38 **Harmonic_Model**: see Table 39 **File_Model**: see Table 40

Table 36 – Sat_Nominal_Att element content

XML Tag name	Type	Attributes	C Format	Description
One of the following **None** **Angle_Model** **Matrix_Model** **Harmonic_Model** **File_Model**	XML element **None** XML element (empty)	-	-	Satellite Attitude initialization data **Angle_Model**: see Table 41 **Matrix_Model**: see Table 42 **Harmonic_Model**: see Table 39 **File_Model**: see Table 40

Table 37 – Sat_ and Instrument_Att element content

XML Tag name	Type	Attributes	C Format	Description
Model	integer	-	%ld	Attitude Model Identifier
List_of_Parameters	XML element	count="n" where n is the number of elements in the list	-	List of **Parameter** elements. See Table 43.

Table 38 – Parameter_Model element content

XML Tag name	Type	Attributes	C Format	Description
Angle_Type	integer	-	%ld	Angle Type
List_of_Harmonic_Pitch	XML element	count="n" where n is the number of elements in the list	-	List of **Harmonic** elements for Pitch, see Table 44.
List_of_Harmonic_Roll	XML element	count="n" where n is the number of elements in the list	-	List of **Harmonic** elements for Roll see Table 44.
List_of_Harmonic_Yaw	XML element	count="n" where n is the number of elements in the list	-	List of **Harmonic** elements for Yaw see Table 44.
Offsets (present only in Instr_Att)	XML element	-	-	See Table 45.

Table 39 – Harmonic_Model element content

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XML Tag name	Type	Attributes	C Format	Description
List_of_Files	XML element	count="n" where n is the number of elements in the list	%ld	List of **File** elements, see Table 46.
Auxiliary_File (present only in Sat_Att)	string	-	%s	Attitude auxiliary file name
Time_Selection	XML element	-	-	It indicates the time window to be read from the attitude files. See Table 47.

<p align="center">**Table 40 – File_Model element content**</p>

XML Tag name	Type	Attributes	C Format	Description
Angle_1	real	unit="deg"	%lf	Pitch Mispointing Angle
Angle_2	real	unit="deg"	%lf	Roll Mispointing Angle
Angle_3	real	unit="deg"	%lf	Yaw Mispointing Angle
Offsets (present only in Instr_Att)	XML element	-	-	See Table 45.

<p align="center">**Table 41 – Angle_Model element content**</p>

XML Tag name	Type	Attributes	C Format	Description
Row_1	real	unit="deg"	%lf	Mispointing matrix first row
Row_2	real	unit="deg"	%lf	Mispointing matrix second row
Row_3	real	unit="deg"	%lf	Mispointing matrix third row
Offsets (present only in Instr_Att)	XML element	-	-	See Table 45.

<p align="center">**Table 42 – Matrix_Model element content**</p>

XML Tag name	Type	Attributes	C Format	Description
Parameter	string	-	%s	Parameter

<p align="center">**Table 43 – Parameter element content**</p>

XML Tag name	Type	Attributes	C Format	Description
Harmonic_Type	integer	-	%ld	Harmonic Type
Harmonic_Coefficient	real	-	%lf	Harmonic Coefficient

<p align="center">**Table 44 – Harmonic element content**</p>

XML Tag name	Type	Attributes	C Format	Description
Offset_X	real	unit="m"	%lf	X offset
Offset_Y	real	unit="m"	%lf	Y offset
Offset_Z	real	unit="m"	%lf	Z offset

<p align="center">**Table 45 – Offsets element content**</p>

XML Tag name	Type	Attributes	C Format	Description
File	string	-	%s	Attitude filename (full path)

<p align="center">**Table 46 – File element content**</p>

XML Tag name	Type	Attributes	C Format	Description
Either **Select_File** Or **Time_Window**	XML element	**Time_Window** time_ref="REF" being REF one of the following: UTC UT1 TAI GPS	-	**Select_File:** the whole files to be read (the tag has an empty value) **Time_Window:** indicates which part of the files has to be read. See Table 48.

<p align="center">**Table 47 – Time_Selection element content**</p>

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XML Tag name	Type	Attributes	C Format	Description
Time_0	real	-	%lf	Start time in MJD2000
Time_1	real	-	%lf	Stop time in MJD2000

Table 48 – Time_Window element content

XML Tag name	Type	Attributes	C Format	Description
Column_1	real	-	%lf	Element in the first column
Column_2	real	-	%lf	Element in the second column
Column_3	real	-	%lf	Element in the third column

Table 49 – Row element content

Example:

```xml
<Data_Block type="xml">
    <Swath>
        <Output_File_Description>OLCI</Output_File_Description>
        <Output_File_Type>MPL_SWTREF</Output_File_Type>
        <Swath_Type>open</Swath_Type>
        <Num_Swath_Records>1200</Num_Swath_Records>
        <Refraction>
            <Model>NO_REF</Model>
            <Freq unit="MHz">0.0</Freq>
        </Refraction>
        <List_of_Swath_Points count="3">
            <Swath_Point>
                <Pointing_Geometry>
                    <Azimuth unit="deg">+270.000000</Azimuth>
                    <Elevation unit="deg">+068.295000</Elevation>
                    <Altitude unit="m">+000000.000</Altitude>
                </Pointing_Geometry>
            </Swath_Point>
            <Swath_Point>
                <Pointing_Geometry>
                    <Azimuth unit="deg">+090.000000</Azimuth>
                    <Elevation unit="deg">+090.000000</Elevation>
                    <Altitude unit="m">+000000.000</Altitude>
                </Pointing_Geometry>
            </Swath_Point>
            <Swath_Point>
                <Pointing_Geometry>
                    <Azimuth unit="deg">+090.000000</Azimuth>
                    <Elevation unit="deg">+043.135000</Elevation>
                    <Altitude unit="m">+000000.000</Altitude>
                </Pointing_Geometry>
            </Swath_Point>
        </List_of_Swath_Points>
        <Sat_Nominal_Att>
            <AOCS_Model>2</AOCS_Model>
        </Sat_Nominal_Att>
        <Sat_Att>
            <None></None>
        </Sat_Att>
        <Instr_Att>
            <None></None>
        </Instr_Att>
    </Swath>
</Data_Block>
```

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3.6.3 *Schema Reference*

An example of validating XML schema for this file type is located at:

`http://eop-cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_MPL_SW_DEF_0400.XSD`

This schema is compliant to [RD02] and includes format and range checks to ensure compliance to this specification and to the File Format Standard [RD01]. The schema file is named according to section 6.1.1 in [RD02] and is applicable to files named `MMM_`**`OPER_MPL_SW_DEF_`**`<instance_id>`.`EOF.`

The following is the content of the Earth_Observation_File required to reference the above schema.

```
<Earth_Observation_File xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://eop-cfi.esa.int/CFI http://eop-
cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_MPL_SW_DEF_0400.XSD"
    xmlns="http://eop-cfi.esa.int/CFI" schemaVersion="4.0">
```

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3.7 Swath Template File

3.7.1 Variable Header

The Variable Header content is a sequence of XML elements described in Table 50.

XML Tag name	Type	Attributes	C Format	Description
Reference_OSF	string	-	%s	Orbit Scenario File used for generating the file
Reference_SDF	string	-	%s	Swath definition file used for generating the file
Absolute_Orbit	integer	-	%ld	Orbit for which the STF has been generated
Start_Validity_Orbit	integer	-	%ld	First orbit for which the STF is valid
Stop_Validity_Orbit	integer	-	%ld	Last orbit for which the STF is valid
Swath_Type	string. one of the following values: • open • closed	-	%s	Swath type
Swath_Point_Type	string. one of the following values: • geodetic • inertial	-	%s	Describes the type of swath points: inertial (RA and Declination) or geodetic (longitude and latitude)
One of the following: **Orbit_Geometry Orbit_State_Vector**	XML element	-	-	**Orbit_Geometry: see** Table 52. **Orbit_State_Vector: see** Table 53.
Time_Step	real	unit="s"	%f	Seconds between two swath points
List_of_STF_Altitudes	XML element	count="n" where n is the number of elements in the list	-	List of **STF_Altitude** elements, see Table 51
Refraction	XML element	-	-	Refraction model structure, see Table 28

Table 50 – Variable Header content

XML Tag name	Type	Attributes	C Format	Description
STF_Altitude	real	unit="m"	%f	Altitude for a swath point in m

Table 51 – STF_Altitude element content

XML Tag name	Type	Attributes	C Format	Description
Repeat_Cycle	real	unit="day"	%f	Repeat cycle in days
Cycle_Length	real	unit="orbit"	%f	Cycle length in orbits
MLST_Drift	real	unit="s/day"	%f	Mean local solar time drift

Table 52 – Orbit_Geometry element content

XML Tag name	Type	Attributes	C Format	Description
Absolute_Orbit	integer	-	%d	Orbit number for the swath template file.
Pos_X	real	unit="m"	%f	Position in X coordinate (meters)
Pos_Y	real	unit="m"	%f	Position in Y coordinate (meters)
Pos_Z	real	unit="m"	%f	Position in Z coordinate (meters)
Vel_X	real	unit="m/s"	%f	Velocity in X coordinate (m/s)
Vel_Y	real	unit="m/s"	%f	Velocity in Y coordinate (m/s)
Vel_Z	real	unit="m/s"	%f	Velocity in Z coordinate (m/s)

Table 53 – Orbit_State_Vector element content

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Example:

```
<Variable_Header>
    <Reference_OSF>MMM_OPER_MPL_ORBSCT_20200401T040000_20200401T080010_0001.EOF</Reference_OSF>
    <Reference_SDF>MMM_OPER_MPL_SW_DEF_20200101T000000_20300101T000000_0001.EOF</Reference_SDF>
    <Absolute_Orbit>2000</Absolute_Orbit>
    <Start_Validity_Orbit>1990</Start_Validity_Orbit>
    <Stop_Validity_Orbit>2010</Stop_Validity_Orbit>
    <Swath_Type>open</Swath_Type>
    <Swath_Point_Type>geodetic</Swath_Point_Type>
    <Orbit_Geometry>
        <Repeat_Cycle unit="day">35</Repeat_Cycle>
        <Cycle_Length unit="orbit">501</Cycle_Length>
        <MLST_Drift unit="s/day">+000.000000</MLST_Drift>
    </Orbit_Geometry>
    <Time_Step unit="s">5.029940120</Time_Step>
    <List_of_STF_Altitudes count="4">
        <STF_Altitude unit="m">+000000.000</STF_Altitude>
        <STF_Altitude unit="m">+000000.000</STF_Altitude>
        <STF_Altitude unit="m">+000000.000</STF_Altitude>
        <STF_Altitude unit="m">+000000.000</STF_Altitude>
    </List_of_STF_Altitudes>
    <Refraction>
        <Model>NO_REF</Model>
        <Freq unit="MHz">0.0</Freq>
    </Refraction>
</Variable_Header>
```

3.7.2   Data Block

The Data Block content is a sequence of XML elements described in Table 54.

XML Tag name	Type	Attributes	C Format	Description
List_of_STF_Pts	XML element	count="n" where n is the number of elements in the list	-	List of **STF_Pt** elements, see Table 55.

Table 54 – Data Block content

XML Tag name	Type	Attributes	C Format	Description
One of the following List_of_Geodetic_Pts List_of_Inertial_Pts	XML element	count="n" where n is the number of elements in the list	-	**List_of_Geodetic_Pts:** List of **Geodetic_Pt** elements, see Table 56. **List_of_Inertial_Pts:** List of **Inertial_Pt** elements, see Table 57.

Table 55 – STF_Pt element content

XML Tag name	Type	Attributes	C Format	Description
Long	real	unit="deg"	%f	Longitude of the point in deg
Lat	real	unit="deg"	%f	Latitude of the point in deg

Table 56 – Geodetic_Pt element content

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XML Tag name	Type	Attributes	C Format	Description
Ra	real	unit="deg"	%f	Right Ascension in deg
Dec	real	unit="deg"	%f	Declination in deg

Table 57 – Inertial_Pt element content

Example (only few points are shown):

```xml
<Data_Block type="xml">
    <List_of_STF_Pts count="1200">
        <STF_Pt>
            <List_of_Geodetic_Pts count="4">
                <Geodetic_Pt>
                    <Long unit="deg">-000.000000</Long>
                    <Lat unit="deg">-000.000000</Lat>
                </Geodetic_Pt>
                <Geodetic_Pt>
                    <Long unit="deg">-000.000000</Long>
                    <Lat unit="deg">-010.000000</Lat>
                </Geodetic_Pt>
                <Geodetic_Pt>
                    <Long unit="deg">-010.000000</Long>
                    <Lat unit="deg">-010.000000</Lat>
                </Geodetic_Pt>
                <Geodetic_Pt>
                    <Long unit="deg">-010.000000</Long>
                    <Lat unit="deg">-000.000000</Lat>
                </Geodetic_Pt>
            </List_of_Geodetic_Pts count="4">
        </STF_Pt>

 [...]

        <STF_Pt>
            <List_of_Geodetic_Pts count="4">
                <Geodetic_Pt>
                    <Long unit="deg">010.000000</Long>
                    <Lat unit="deg">350.000000</Lat>
                </Geodetic_Pt>
                <Geodetic_Pt>
                    <Long unit="deg">010.000000</Long>
                    <Lat unit="deg">000.000000</Lat>
                </Geodetic_Pt>
                <Geodetic_Pt>
                    <Long unit="deg">020.000000</Long>
                    <Lat unit="deg">-010.000000</Lat>
                </Geodetic_Pt>
                <Geodetic_Pt>
                    <Long unit="deg">020.000000</Long>
                    <Lat unit="deg">350.000000</Lat>
                </Geodetic_Pt>
            </List_of_Geodetic_Pts>
        </STF_Pt>
    </List_of_STF_Pts>
</Data_Block>
```

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3.7.3   Schema Reference

An example of validating XML schema for this file type is located at:

`http://eop-cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_MPL_SWTREF_0400.XSD`

This schema is compliant to [RD02] and includes format and range checks to ensure compliance to this specification and to the File Format Standard [RD01]. The schema file is named according to section 6.1.1 in [RD02] and is applicable to files named `MMM_`**`OPER_MPL_SWTREF_`**`<instance_id>.EOF`.

The following is the content of the Earth_Observation_File required to reference the above schema.

```
<Earth_Observation_File xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://eop-cfi.esa.int/CFI http://eop-
cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_MPL_SWTREF_0400.XSD"
    xmlns="http://eop-cfi.esa.int/CFI" schemaVersion="4.0">
```

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3.8 Zone Database File

3.8.1 Variable Header

The Variable Header is empty for this type of file.

3.8.2 Data Block

The Data Block content is a sequence of XML elements described in Table 58.

XML Tag name	Type	Attributes	C Format	Description
List_of_Zones	XML element	count="n" where n is the number of elements in the list	-	List of **Zone** elements. See Table 59

Table 58 – Data Block content

XML Tag name	Type	Attributes	C Format	Description
Zone_Id	string	-	%s	Zone name
Zone_Description	string	-	%s	Zone description
Surface	string	-	%s	Type of surface
Projection	string	-	%s	Projection
Creator	string	-	%s	Cretator name
List_of_Polygon_Pts	XML element	count="n" where n is the number of ele-ments in the list	-	List of **Polygon_Pt** elements, points defining the zone. See Table 60.
Diameter	real	unit="m"	%f	Diameter of the zone if the list of polygon points is empty.

Table 59 – Zone element content

XML Tag name	Type	Attributes	C Format	Description
Long	real	unit="deg"	%f	longitude of the point in deg (-360, 360)
Lat	real	unit="deg"	%f	latitude of the point in deg (-90, 90)

Table 60 – Polygon_Pt element content

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Example:

```xml
<Data_Block type="xml">
    <List_of_Zones count="1">
        <Zone>
            <Zone_Id>RECT_ZONE</Zone_Id>
            <Zone_Description></Zone_Description>
            <Surface></Surface>
            <Projection>RECTANGULAR</Projection>
            <Creator>TEST DATA</Creator>
            <List_of_Polygon_Pts count="4">
                <Polygon_Pt>
                    <Long unit="deg">-030.000000</Long>
                    <Lat unit="deg">-020.000000</Lat>
                </Polygon_Pt>
                <Polygon_Pt>
                    <Long unit="deg">-030.000000</Long>
                    <Lat unit="deg">-010.000000</Lat>
                </Polygon_Pt>
                <Polygon_Pt>
                    <Long unit="deg">-011.000000</Long>
                    <Lat unit="deg">-010.000000</Lat>
                </Polygon_Pt>
                <Polygon_Pt>
                    <Long unit="deg">-011.000000</Long>
                    <Lat unit="deg">-020.000000</Lat>
                </Polygon_Pt>
            </List_of_Polygon_Pts>
            <Diameter unit="m">+000.000000</Diameter>
        </Zone>
    </List_of_Zones>
</Data_Block>
```

3.8.3 Schema Reference

An example of validating XML schema for this file type is located at:

`http://eop-cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_MPL_ZON_DB_0300.XSD`

This schema is compliant to [RD02] and includes format and range checks to ensure compliance to this specification and to the File Format Standard [RD01]. The schema file is named according to section 6.1.1 in [RD02] and is applicable to files named MMM**_OPER_MPL_ZON_DB_**<instance_id>.EOF.

The following is the content of the Earth_Observation_File required to reference the above schema.

```xml
<Earth_Observation_File
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://eop-cfi.esa.int/CFI http://eop-
cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_MPL_ZON_DB_0300.XSD" xmlns="http://eop-cfi.esa.int/CFI"
schemaVersion="3.0">
```

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3.9 Station Database File

3.9.1 Variable Header

The Variable Header is empty for this type of file.

3.9.2 Data Block

The Data Block content is a sequence of XML elements described in Table 61.

XML Tag name	Type	Attributes	C Format	Description
List_of_Ground_Stations	XML element	count="n" where n is the number of elements in the list	-	List of **Ground_Station** elements. See Table 59

Table 61 – Data Block content

XML Tag name	Type	Attributes	C Format	Description
Station_Id	string	-	%s	Station name
Descriptor	string	-	%s	Station description
Antenna	string	-	%s	Antenna band
Frequency (optional)	real	unit="Hz"	%f	Frequency in Hz
Purpose	string	-	%s	Purpose
Type	string	-	%s	Station Type
Location	XML element	-	-	Station location. See Location element, Table 63.
List_of_Spacecrafts	XML element	count="n" where n is the number of elements in the list		Spacecraft dependant mask type parameters. List of Spacecraft elements, see Table 64.
Default_El	real	unit="deg"	%f	Default elevation in deg.
List_of_Mask_Points	XML element	count="n" where n is the number of elements in the list	-	List of **Mask_Point** elements, see Table 65.

Table 62 – Ground_Station element content

XML Tag name	Type	Attributes	C Format	Description
Long	real	unit="deg"	%f	Longitude in deg
Lat	real	unit="deg"	%f	Latitude in deg
Alt	real	unit="deg"	%f	Altitude in deg

Table 63 – Location element content

XML Tag name	Type	Attributes	C Format	Description
Name	string	-	%s	Spacecraft name
Aos_El	real	unit="deg"	%f	Acquisition of signal elevation
Los_El	real	unit="deg"	%f	Loss of signal elevation
Mask	string	-	%s	Mask type. Possible values: AOS_LOS_WITH_MASK AOS_LOS MASK_ONLY

Table 64 – Spacecraft element content

XML Tag name	Type	Attributes	C Format	Description
Az	real	unit="deg"	%f	Azimuth
El	real	unit="deg"	%f	Elevation

Table 65 – Mask_Point element content

Example (only few Mask Points are shown):

```xml
<Data_Block type="xml">
  <List_of_Ground_Stations count="1">
    <Ground_Station>
      <Station_id>GSVLBRHX</Station_id>
      <Descriptor>Svalbard (PLATABERGET)</Descriptor>
      <Antenna>X-BAND </Antenna>
      <Purpose>GLOBAL + REGIONAL </Purpose>
      <Type> </Type>
      <Location>
        <Long unit="deg">+015.400000</Long>
        <Lat unit="deg">+078.130000</Lat>
        <Alt unit="m">+0470.000</Alt>
      </Location>
      <List_of_Spacecrafts count="1">
        <Spacecraft>
          <Name>SMOS</Name>
          <Aos_El unit="deg">+005.000000</Aos_El>
          <Los_El unit="deg">+005.000000</Los_El>
          <Mask>AOS_LOS_WITH_MASK</Mask>
        </Spacecraft>
      </List_of_Spacecrafts>
      <Default_El unit="deg">+0000.000</Default_El>
      <List_of_Mask_Points count="22">
        <Mask_Point>
          <Az unit="deg">+000.000000</Az>
          <El unit="deg">+000.400000</El>
        </Mask_Point>
        <Mask_Point>
          <Az unit="deg">+032.000000</Az>
          <El unit="deg">+000.400000</El>
        </Mask_Point>
[...]
        <Mask_Point>
          <Az unit="deg">+272.000000</Az>
          <El unit="deg">+000.400000</El>
        </Mask_Point>
        <Mask_Point>
          <Az unit="deg">+360.000000</Az>
          <El unit="deg">+000.400000</El>
        </Mask_Point>
      </List_of_Mask_Points>
    </Ground_Station> >
  </List_of_Ground_Stations>
</Data_Block>
```

3.9.3   Schema Reference

An example of validating XML schema for this file type is located at:

http://eop-cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_MPL_GND_DB_0300.XSD

This schema is compliant to [RD02] and includes format and range checks to ensure compliance to this specification and to the File Format Standard [RD01]. The schema file is named according to section 6.1.1 in [RD02] and is applicable to files named MMM_**OPER_MPL_GND_DB**_<instance_id>.EOF.

The following is the content of the Earth_Observation_File required to reference the above schema.

```
<Earth_Observation_File
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://eop-cfi.esa.int/CFI http://eop-
cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_MPL_GND_DB_0300.XSD"  xmlns="http://eop-cfi.esa.int/CFI"
schemaVersion="3.0">
```

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3.10 Attitude Definition File

3.10.1 Variable Header

The Variable Header is empty for this type of file.

3.10.2 Data Block

The Data Block content is a sequence of XML elements described in Table 66.

XML Tag name	Type	Attributes	C Format	Description
Attitude_Definition	XML element	-	-	Attitude_Definition data structure see

Table 66 – Data Block content

XML Tag name	Type	Attributes	C Format	Description
Sat_Nominal_Att	XML element	-	-	Satellite Nominal Attitude initialization data, see Table 68
Sat_Att	XML element	-	-	Satellite Attitude initialization data, see Table 69.
Instr_Att	XML element	-	-	Instrument Attitude initialization data, see Table 69.

Table 67 – Swath element content

XML Tag name	Type	Attributes	C Format	Description
One of the following **None** **AOCS_Model** **Parameter_Model** **Harmonic_Model** **File_Model**	**AOCS_Model** integer **Parameter_Model** **Harmonic_Model** **File_Model** XML element **None** XML element (empty)	-	**AOCS_Model** %ld	Satellite Nominal Attitude initialization data **AOCS_Model** AOCS model. It can contain the name of the AOCS model or the corresponding number, both are allowed. The allowed values are the following (the equivalent number is shown between parenthesis): GEOCENTRIC_POINTING (0) LOCAL_NORMAL_POINTING (1) YAW_STEERING_MODE (2) ZERO_DOPPLER_YSM (3) **Parameter_Model:** see Table 38 **Harmonic_Model:** see Table 39 **File_Model:** see Table 40

Table 68 – Sat_Nominal_Att element content

XML Tag name	Type	Attributes	C Format	Description
One of the following **None** **Angle_Model** **Matrix_Model** **Harmonic_Model** **File_Model** Only in Sat_Att **Quaternion_Plus_Angle** **Quaternion_Plus_Matrix**	XML element **None** XML element (empty)	-	-	Satellite Attitude initialization data **Angle_Model:** see Table 41 **Matrix_Model:** see Table 42 **Harmonic_Model:** see Table 39 **File_Model:** see Table 40 **Quaternion_Plus_Angle** **Quaternion_Plus_Matrix**

Table 69 – Sat_ and Instrument_Att element content

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XML Tag name	Type	Attributes	C Format	Description
Model	integer	-	%ld	Attitude Model Identifier It can contain the name of the model or the corresponding number, both are allowed. The allowed values are the following (the equivalent number is shown between parenthesis): GENERIC (0) ENVISAT (1) CRYOSAT (2) ADM (3) SENTINEL1 (4) SENTINEL2 (5) GEO (6)
List_of_Parameters	XML element	count="n" where n is the number of elements in the list	-	List of **Parameter** elements. See Table 43.

Table 70 – Parameter_Model element content

XML Tag name	Type	Attributes	C Format	Description
Angle_Type	integer	-	%ld	It can contain the name of the angle type or the corresponding number, both are allowed. The allowed values are the following (the equivalent number is shown between parenthesis): TRUE_LAT_TOD (0) MEAN_LAT_TOD (1)
List_of_Harmonic_Pitch	XML element	count="n" where n is the number of elements in the list	-	List of **Harmonic** elements for Pitch see Table 44.
List_of_Harmonic_Roll	XML element	count="n" where n is the number of elements in the list	-	List of **Harmonic** elements for Roll see Table 44.
List_of_Harmonic_Yaw	XML element	count="n" where n is the number of elements in the list	-	List of **Harmonic** elements for Yaw see Table 44.
Offsets (present only in Instr_Att)	XML element	-	-	See Table 45.

Table 71 – Harmonic_Model element content

XML Tag name	Type	Attributes	C Format	Description
Angle_Model	Structure (see Table 249)	-	-	Angles see Table 41
Quaternion_File	string	-	%s	Name of the file containing the list of quaternions.

Table 72 – Quaternion_Plus_Angle element content

XML Tag name	Type	Attributes	C Format	Description
Matrix_Model	Structure (see Table 250)	-	-	Matrix see Table 42
Quaternion_File	string	-	%s	Name of file containing the list of quaternions.

Table 73 – Quaternion_Plus_Matrix element content

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Example:

```xml
<Data_Block type="xml">
    <Attitude_Definition>

        <Sat_Nominal_Att>
            <AOCS_Model>YAW_STEERING_MODE</AOCS_Model>
        </Sat_Nominal_Att>

        <Sat_Att>
            <File_Model>
                <List_of_Files count="1">
                    <File>MA1_TEST_AUX_ATTRES_20210408T050853_20210408T101753_0001.EOF</File>
                </List_of_Files>
                <Auxiliary_File/>
                <Time_Selection>
                    <Select_File/>
                </Time_Selection>
            </File_Model>
        </Sat_Att>

        <Instr_Att>
            <Angle_Model>
                <Angle_1 unit="deg">0.0</Angle_1>
                <Angle_2 unit="deg">0.0</Angle_2>
                <Angle_3 unit="deg">0.0</Angle_3>
                <Offset_X unit="m">0.0</Offset_X>
                <Offset_Y unit="m">0.0</Offset_Y>
                <Offset_Z unit="m">0.0</Offset_Z>
            </Angle_Model>
        </Instr_Att>

    </Attitude_Definition>
</Data_Block>
```

3.10.3 Schema Reference

An example of validating XML schema for this file type is located at:
`http://eop-cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_INT_ATTDEF_0300.XSD`

This schema is compliant to [RD02] and includes format and range checks to ensure compliance to this specification and to the File Format Standard [RD01]. The schema file is named according to section 6.1.1 in [RD02] and is applicable to files named `MMM_OPER_INT_ATTDEF_<instance_id>.EOF`.

The following is the content of the Earth_Observation_File required to reference the above schema.

```xml
<Earth_Observation_File
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://eop-cfi.esa.int/CFI http://eop-cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_INT_ATTDEF_0300.XSD" xmlns="http://eop-cfi.esa.int/CFI"
schemaVersion="3.0">
```

3.11 Field of View Configuration File

3.11.1 *Variable Header*

The Variable Header is empty for this type of file.

3.11.2 *Data Block*

The Data Block content is a sequence of XML elements described in Table 74.

XML Tag name	Type	Attributes	C Format	Description
FOV_Constraints	XML element	type="mode" being mode one of the following values: Link_to_Spacecraft	-	It defines Field of View constraints, see Table 75.

Table 74 – Data Block content

XML Tag name	Type	Attributes	C Format	Description
List_of_Masks	XML element	count="n" being n the number of elements in the list	-	List of **Mask** elements, see Table 76
Miscellaneous_Parameters	XML element	-	-	Additional parameters, see Table 79.

Table 75 – FOV_Constraints element content

XML Tag name	Type	Attributes	C Format	Description
Mask	XML element	type="mask_type" being mask_type one of the following values: inclusive exclusive	-	It defines a mask in terms of mask points, see Table 77

Table 76 – Mask element

XML Tag name	Type	Attributes	C Format	Description
Status	string	-	%s	Mask status. Allowed values: ENABLED DISABLED
List_of_Mask_Points	XML element	count="n" being n the number of elements in the list	-	List of **Mask_Point** elements, see Table 78.

Table 77 – Mask element content

XML Tag name	Type	Attributes	C Format	Description
Azimuth	real	unit="deg"	-	Azimuth of the point in deg
Elevation	real	unit="deg"	-	Elevation of the point in deg

Table 78 – Mask_Point element content

XML Tag name	Type	Attributes	C Format	Description
Min_Tg_Height	real	unit="m"	-	Minimum tangent height allowed in m

Table 79 – Miscellaneous_Parameters element content

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Example (only few mask points are shown):

```xml
<Data_Block type="xml">
    <FOV_Constraints type="Link_to_Spacecraft">
        <List_of_Masks count="2">
            <Mask type="inclusive">
                <Status>ENABLED</Status>
                <List_of_Mask_Points count="4">
                    <Mask_Point>
                        <Azimuth unit="deg">0.0</Azimuth>
                        <Elevation unit="deg">10.0</Elevation>
                    </Mask_Point>
[…]
                    <Mask_Point>
                        <Azimuth unit="deg">0.0</Azimuth>
                        <Elevation unit="deg">-90.0</Elevation>
                    </Mask_Point>
                </List_of_Mask_Points>
            </Mask>
            <Mask type="exclusive">
                <Status>ENABLED</Status>
                <List_of_Mask_Points count="8">
                    <Mask_Point>
                        <Azimuth unit="deg">0.0</Azimuth>
                        <Elevation unit="deg">-85.0</Elevation>
                    </Mask_Point>
[…]
                    <Mask_Point>
                        <Azimuth unit="deg">0.0</Azimuth>
                        <Elevation unit="deg">-90.0</Elevation>
                    </Mask_Point>
                </List_of_Mask_Points>
            </Mask>
        </List_of_Masks>
        <Miscellaneous_Parameters>
            <Min_Tg_Height unit="m">19000.0</Min_Tg_Height>
        </Miscellaneous_Parameters>
    </FOV_Constraints>
</Data_Block>
```

3.11.3 Schema Reference

An example of validating XML schema for this file type is located at:

http://eop-cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_INT_FOVCFG_0300.XSD

This schema is compliant to [RD02] and includes format and range checks to ensure compliance to this specification and to the File Format Standard [RD01]. The schema file is named according to section 6.1.1 in [RD02] and is applicable to files named MMM_**OPER_INT_FOVCFG**_<instance_id>.EOF.

The following is the content of the Earth_Observation_File required to reference the above schema.

```xml
<Earth_Observation_File
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://eop-cfi.esa.int/CFI http://eop-
cfi.esa.int/CFI/EE_CFI_SCHEMAS/EO_OPER_INT_FOVCFG_0300.XSD" xmlns="http://eop-cfi.esa.int/CFI"
schemaVersion="3.0">
```

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