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XMM SSC to SOC Interface Control Document for SSC Data Products

Revision History

Issue Number	Issue Date	Author(s)	Comments
Draft 1.0	6-1-97	Julian Osborne (Editor)	Initial draft to SOC & SSC
Draft 2.0	7-4-97	Julian Osborne (Editor)	2 nd draft following SOC/SSC comments
Issue 1.0	15-7-97	Julian Osborne (Editor)	First formal release
Issue 1.1	27-10-97	Julian Osborne (Editor)	Revisions for Logica contract start
Issue 2.0	15-02-00	Julian Osborne	Interface moved to product group level
Issue 2.1	31-03-00	Julian Osborne	In response to comments on issue 2.0

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1 Acronym list

AMS	Archive Management Subsystem
ASCII	American Standard Code for Information Interchange
CCD	Charge Coupled Device
CD-ROM	Compact Disk - Read-Only Memory
DEC	Declination
EPIC	European Photon Imaging Camera
FITS	Flexible Image Transport System
FOV	Field Of View
FTS	File Transfer System
GNU	Gnu's Not Unix
HTML	Hyper-Text Markup Language
ICD	Interface Control Document
ID	IDentifier
ISO	International Organisation for Standardization
MOS	Metal Oxide Semiconductor
ODF	Observation Data File
OM	Optical Monitor
OSW	OM Science Window
PN	Positive-Negative
PNG	Portable Network Graphics
PS	PostScript
PPS	Pipeline Processing System
RA	Right Ascension
RGS	Reflection Grating Spectrometer
SAS	Science Analysis System
SDF	Slew Data File
SOC	Science Operation Centre
SSC	Survey Science Centre
URL	Uniform Resource Locator
XID	X-ray IDentification programme
XMM	X-ray Multi-Mirror

2 Applicable and reference documents

2.1 Applicable documents

- A-1** XMM-SOC-ICD-0007-DPD XMM Interface Control Document Top Level File Transfer System (FTS) - Issue A6, 1999 Jan 27
- A-2** XMM-SOC-ICD-0023-GC Keyword Specification for File Ingestion into AMS ICD - issue 1.2, 1999 Nov 5 (to be modified)

2.2 Reference documents

- R-1** XMM-SOC-ICD-0004-SSD Interface Control Document: Observation and Slew Data Files - Issue 2.4, 1999 Dec 15
- R-2** NOST 100-2.0 Definition of the Flexible Image Transport System (FITS), March 29, 1999 (<http://fits.gsfc.nasa.gov/>)
- R-3** SSC-LUX-SP-0004 Specifications for Individual SSC Data Products, to be circulated

3 Introduction

One of the main roles of the SSC within the XMM project is the creation of a variety of data products, both from the XMM observations and from the SSC follow-up/identification programme. This document specifies the form in which they will be delivered.

There are 3 major classes of SSC data product:

- PPS products
- XID products
- The XMM catalogue

The PPS products are the results of pipeline processing of individual observation and collections of slew data filesets (ODFs and SDFs). They include summary information, calibrated cleaned event lists, the positions and brightnesses of detected sources, high-level data products (e.g. images and spectra), catalogue cross-correlation information, quality information and a log file.

The XID products are the result of the SSC's task of identification of newly detected serendipitous X-ray sources. They will consist of a variety of data products (primarily ground-based optical imaging and spectroscopy) related to the follow-up/identification programme.

The XMM catalogue will list the primary characteristics of all sources detected by XMM. It will be re-issued at intervals to account for the continuously increasing sky area covered by XMM in orbit. Non-proprietary data, as processed by PPS tools (and subsequently screened by the SSC), will be used to create the XMM catalogue.

Files relating to the XMM catalogue will be presented in a future issue of this ICD.

SSC data products are delivered to the SOC as product group files which contain the individual product files for all pipeline-processed exposures of an observation. The group files, and other files sent to the SOC, are described in this ICD. However, only one of the constituent files of the product groups is controlled by this ICD. That file serves the sole purpose of linking together the constituent files of the group, it is not a scientific product. Configuration control of the other constituent files is provided by the SAS and SSC configuration control boards. These files are described in [R-3]

PPS products will be made available to the SOC within 30 working days of SSC receipt of the necessary ODFs and SDFs in normal circumstances. XID data and the XMM catalogue will be made available to the SOC when they are ready.

This document also specifies the SSC-specific aspects relating to the file transfer system operating between the SSC and the SOC, as covered by the FTS ICD [A-1].

The data products described here will be stored in the XMM science archive located at the SOC. Access to these data products will be via the AMS for both XMM principal guest observers, and, after the proprietary period has elapsed, archival researchers from the whole scientific community. The AMS catalogue contents can be browsed using a web browser, allowing SSC product group files (and possibly individual product files) to be downloaded via the internet or delivered on CD-ROM.

Changebars are shown where this issue of the ICD differs from the previous issue.

4 File Types

This ICD describes files of various types. They, and their relationships, are summarized here.

4.1 FTS file

This is the file which wraps up all the files for an FTS transmission from the SSC to the SOC. It is a GNU `tar` file. It contains the deliverable files, and a transaction details file.

4.2 Transaction details file

Contained in the FTS file, it includes keyword – value pairs to identify the FTS file and to populate the AMS database tables with information relating to the deliverable files.

4.3 Deliverable files

These are the files which are the direct concern of this ICD. They are contained in the FTS file. There are two types of deliverable file: product group files and the PPS run message file.

4.3.1 Product group files

These are GNU `tar` files in which the individual data product files, and the index file, are collected together. They may contain either PPS product or XID product files, but not both.

4.3.2 PPS run message file

This is a plain ASCII file, designed to be sent to the Guest Observer as part of the notification that their XMM data is ready. It will be the last constituent file of the FTS `tar` file. This file is only present when the product group files contain PPS product files.

4.4 Index file

There is at least one file present in all product group files, this is the index file. It is in HTML format, and includes links to all the other files in the product group file in which it sits.

4.5 Data product files

These are the individual results files of the SSC processing, which are contained in the deliverable `tar` files. They may be in a variety of scientific, graphical, or text formats, and are described in [R-3]. Many files will be compressed with GNU `gzip`, but not those for which this would cause browser problems. Some may contain external or internal URLs; external URLs will be limited to reference data, not bulk XMM data, and internal URLs will assume all targets are in the same directory. These files are not described in this ICD, configuration control being provided by the SAS and SSC configuration control boards. There are two categories of data product file: PPS product files and XID products files.

5 SSC to SOC product transport

The transport of the SSC products to the SOC is defined by the FTS ICD [A-1]. The system implemented by the SSC, and described here, aims to be consistent with that document.

The FTS ICD requires that transferred files be contained in a ‘wrapper’ file (called here the FTS file), with GNU `tar` being the wrapping mechanism. Each FTS file must contain, in addition to the files to be transferred, a single ‘transaction details’ file. This file contains information relating to the particular instance of file transfer, and it contains a list of keyword – value pairs for each of the constituent files. In the case of the SSC deliverable files, these keywords are the AMS keywords through which users will query the AMS to retrieve the products. The format of the transaction details file is specified in the FTS ICD, and is described below; it allows the description of an arbitrary number of files.

SSC-generated files will be delivered to the SOC via the FTS as FTS `tar` files containing the deliverable files (in general themselves `tar` files), and the associated transaction details file.

An FTS transmission of PPS products will consist of the complete set of available deliverable files for a single XMM observation. Should it be necessary to transmit a new set of files of an observation (e.g. following re-processing), the entire set of files will again be transmitted. XID product transmissions will be sent via FTS in XID observation product sets.

5.1 The filename of the transported file

The FTS `tar` file containing the deliverable files and transaction details file has a file name of the form:

ffff_sordes_txxxxxxxxxxxxxxxx_vvvvv.XMM

In the case of the SSC transmissions to the SOC, the file name fields have the following values:

Field	Meaning	Value or <i>format</i>	Note
ffff	File type ID	PIPE or XID_	1
sor	Originating FTS node	SSC	
des	Destination FTS node	XSS	
t	Data type ID	D	
xxxxxxxxxxxxxxxx	File-specific (not used by FTS)	__xxxxxxxx__	2
vvvvv	Version number	00000	3
XMM	Project name	XMM	

Notes:

- 1 Depending on whether file contains pipeline products or XID products
- 2 `xxxxxxxx` will take the value of the observation number `PPPPPOOLL` defined in [R-1] for pipeline products, and the value of the XID observation number for XID products.
- 3 The SSC does not intend to make use of this version number scheme, the value will thus be fixed.

5.2 The Transaction Details File

The transaction details file contained in the FTS file has the same file name as the FTS file, but with the extension `.TDF`, rather than `.XMM`. It is an ASCII file of up to 133 characters per record (including record terminator).

There is one transaction details file in the FTS file, it contains one transaction block for each file in the FTS file (excluding itself of course). As shown below, each transaction block has an arbitrary number of header-type records in the source details block, followed by an arbitrary number of catalogue records in the catalogue details block. For FTS transmissions that include PPS products the last transaction block will relate to the PPS run message file.

Transaction Details File Structure
TRANSACTION_START
SOURCEDETAILS
KEYWORD=value
...
ENDSOURCEDETAILS
CATALOGUEDETAILS
KEYWORD=value
...
ENDCATALOGUEDETAILS
TRANSACTION_END
TRANSACTION_START
...
...
TRANSACTION_END

Notes on all records are provided in [A-1]. The keyword values in the source details block for pipeline products are mostly defined in [A-2], and are reported in the table below.

Keyword	Meaning	Value or <i>format</i>	Note
SUBSYSTEM	subsystem_name	PPS	1
ROLE	user role	SSC	
USERNAME	user name		2
ACTION	action	INSERT	
DIT	data item type	PIPEPROD or XIDPROD	1
TOOLNAME	task name	<i>10 chars max.</i>	
VERSION	task version number	<i>s.rrr.mmm.nnn</i>	3
DATEPRODUCED	date produced (UTC)	<i>yyyy-mm-ddThh:mm:ssZ</i>	4
REMARK	comment	<i>"comment"</i>	

Notes:

- 1 Independent of whether file contains pipeline products or XID products
- 2 Not given for security reasons
- 3 See [A-1]
- 4 Keyword value is terminated by the character 'Z', unlike the FITS standard [R-2]

Each catalogue details block will contain AMS keyword – value pairs for a single deliverable file. The first keyword – value pair in any such section will identify the deliverable file to which the later keywords in that section relate. The keyword names `PIPEPROD_FP` and `XIDPROD_FP` will be used for this purpose, the value being delimited by single quote marks. The filenames of the deliverable files are specified in section 6.4, they are unique, and so may be used as primary keywords to index the relevant AMS database table. The catalogue details (i.e. AMS) keyword names are specified in section 8.

6 File names

6.1 File name conventions

SSC filenames will comply with ISO 9660 level 2, and are subject to additional constraints also.

- Filenames will be up to 27 characters, followed by a dot, followed by 3 characters.
- All filename characters are upper case.
- Where a fixed number of digits are specified, leading zeros will be present if the field would not otherwise be filled.
- Allowed characters include only A-Z, 0-9 and the underscore character (_).
- Each file made by the SSC has a unique filename, unless the contents of the file are to replace a previous edition of that file.

6.2 FTS file

The filename construction of the FTS file is described in section 5.1.

6.3 Transaction details file

The filename construction of the transaction details file is described in section 5.2.

6.4 Deliverable and index files

The deliverable files (and the index files) have filenames of the form:

iioooooooooottttttxxx_v.fff

Field	Meaning	Value	Note
ii	File type identifier	PP or XI	1
oooooooooooo	Observation number		2
ttttt	Deliverable file type		3
xxx	Source number	000 – 999	4
v	File version	0 – 9	
fff	File format	TAR or ASC or HTM	5

Notes:

- 1 Depending on whether the file is PPS-related (PPS product group, PPS run message or PPS index file) or XID-related (XID product group or XID index file)
- 2 The XMM observation number P P P P P P O O L L in [R-1] (section 5.3.1.1) for PPS files, the XID observation number for XID files
- 3 Allowed values are shown in the following table
- 4 Real source numbers start with 001, xxx = 000 for non-source-specific files
- 5 TAR for product group files, ASC for PPS run message files, HTM for index files

tttttt field value	File description
EEVLIS	EPIC event lists group
ESKYIM	EPIC sky images group
EANCIL	EPIC ancillary group
ESRLIS	EPIC source lists group
ESOURC	EPIC source-specific group
OIMAGE	OM images group
OMSLIS	OM source lists group
OMSRTS	OM timeseries group
REVLIS	RGS event lists group
REXPIM	RGS exposure images group
RIMAGE	RGS images group
RSPECT	RGS spectrum group
CRSCOR	Cross-correlation group
PPSDAT	PPS data group
PPSGRA	PPS graphics group
PPSMMSG	PPS run message file
PPSIND	PPS index file
XIDFLD	XID field data group
XIDSOU	XID source-specific group
XIDGRA	XID field graphics group
XIDIND	XID index file

6.5 Data product files

The forms of the filenames of the two categories of data product files are given in Appendix 1.

These are provided for information only. They are subject to SAS configuration control, but not to ICD configuration control.

7 Deliverable Files

The deliverable files are the product group files which result from the SSC's pipeline processing of XMM data and X-ray source identification programmes, and the PPS run message file.

The file names of the deliverable files are described in section 6.4.

7.1 Pipeline product group files

The pipeline product group files are GNU **tar** files which contain, between them, all the individual files that are the results of the SAS pipeline processing of a single XMM observation. No directory information is present in these **tar** files, all constituent files will thus **untar** into the same directory.

There are 15 pipeline product group types. Each one contains related files, generally from one of the three major XMM instruments (i.e. EPIC, RGS or OM). An FTS transmission of pipeline product group files may not include instances of all types. The pipeline product group file types are listed below:

Deliverable file description
EPIC event lists group
EPIC sky images group
EPIC ancillary group
EPIC source lists group
EPIC source-specific group
OM images group
OM source lists group
OM timeseries group
RGS event lists group
RGS exposure images group
RGS images group
RGS spectra group
Cross-correlation group
PPS data group
PPS graphics group

Although the constituent files of the product group types are not covered by this ICD, there is one file which all product group files will contain. This is the index file, an html file containing links only to all the other files in the product group. It also contains brief descriptions of the files which are the targets of these links.

One of the pipeline product group types (the **PPS graphics group**) contains only display file types (e.g. png, pdf, html) as opposed to the FITS files which dominate the other groups. This is provided to allow on-line browsing of the graphical products of the pipeline processing (starting from the index file), assuming that the products group will be **untared** at the AMS user-interface server. The other product groups may be similarly **untared** to allow individual product files to be downloaded.

All pipeline product group types except one occur at most once in an FTS **tar** file. The exception is the **EPIC source-specific group**, which occurs once per selected EPIC-detected celestial

X-ray source. The number of **EPIC source-specific group** files in an FTS file is thus not fixed (although there will typically be a few tens of such files).

7.2 PPS run message file

The PPS run message file is an ASCII file of an arbitrary number of 80-character lines which is present whenever an FTS transmission does not consist solely of XID product group files. The file is designed to be part of the message to the guest observer which announces that their data is now processed. The contents of the file is not further defined here, but the file will never be empty.

Deliverable file description
PPS run message file

7.3 XID product group files

The XID product group files are GNU **tar** files which contain, between them, all the individual files that are the results of the processing of a single XID observation. No directory information is present in these **tar** files, all constituent files will thus **untar** into the same directory.

There are 3 XID product group types. Each one contains related files. An FTS transmission of XID product group files may not include instances of all types. The XID product group file types are listed below.

Deliverable file description
XID field data group
XID source-specific group
XID field graphics group

Although the constituent files of the product group types are not covered by this ICD, there is one file which all product group files will contain. This is the index file, an html file containing links only to all the other files in the product group. It also contains brief descriptions of the files which are the targets of these links.

One of the XID product group types (the **XID field graphics group**) contains only display file types (e.g. png, pdf, html) as opposed to the FITS files which dominate the other groups. This is provided to allow on-line browsing of the graphical products of the pipeline processing (starting from the index file), assuming that the products group will be **untared** at the AMS user-interface server. The other product groups may be similarly **untared** to allow individual product files to be downloaded.

All XID product group types except one occur at most once in an FTS **tar** file. The exception is the **XID source-specific group**, which occurs once per selected XID source. The number of **XID source-specific group** files in an FTS file is thus not fixed (there may be between 0 and ~250 such files).

8 Deliverable file keywords

The AMS gives access to files on the basis of their AMS keyword values. Keyword – value pairs are provided for the deliverable files in the catalogue details block of the transaction details file (see section 5), they are coded as ASCII. These keywords are defined in this section, where a brief description of each keyword is given. Full explanations of the values of the keywords will be provided in [R-3].

A keyword is required to link a catalogue details block with a deliverable file. This keyword is `PIPEPROD_FP` for PPS product group and PPS run message files, and is `XIDPROD_FP` for XID product groups files. One or the other is present in all catalogue details blocks. The keyword value (i.e. the filename of the deliverable file) is enclosed in single quotes. The file naming convention for deliverable files is described in section 6.4. Filenames are unique, so this file-pointer keyword may be used as the primary keyword to index the relevant AMS database table.

Section 8.1 defines the keywords that are associated with the PPS product group and PPS run message files. Section 8.1.1 defines the additional keywords specific to the PPS product group file `EPIC source-specific group`. Section 8.2 defines the keywords associated with the XID product group files. Section 8.2.1 similarly defines the additional keywords specific to the XID product group file `XID source-specific group`.

The format of the keywords is described in [A-2]. Allowed keyword types are:

String	Denoted "An", where n is the maximum number of characters. The keyword value is enclosed in single quotes.
Integer	Denoted "In", where n is the maximum number of digits (excluding any sign character).
Real	Denoted "Rn.m", where n is the maximum total number of digits (excluding sign and decimal point characters), and m is the maximum number of digits after the decimal point.
Date	Here denoted "D", the format is yyyy-mm-ddThh:mm:ssZ.

8.1 Keywords associated with all PPS files

The following table defines keywords that are associated with PPS product group and PPS run message files. All FTS TDF catalogue details blocks relating to PPS deliverable files will contain all of these keywords (with values).

Keyword	Format	Description
<code>PIPEPROD_FP</code>	A28	Name of file to which keywords relate
<code>INSTRUMENT</code>	A18	Instruments contributing to product group
<code>OBS_ID</code>	A10	XMM observation ID
<code>TYPE</code>	A22	Deliverable file description
<code>TARGET</code>	A20	Name of observation target
<code>RA_POINT</code>	R7.4	RA of XMM pointing (J2000.0, deg)
<code>DEC_POINT</code>	R6.4	Declination of XMM pointing (J2000.0, deg)
<code>PA_POINT</code>	R4.1	Position angle of XMM (CCW from North, deg)
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Keyword	Format	Description
DURATION	I6	Observation duration (sec)
DATE_OBS	D	Date of start of observation
LII_POINT	R5.2	Galactic longitude of XMM pointing (deg)
BII_POINT	R4.2	Galactic latitude of XMM pointing (deg)
OBSERVER	A41	Name of guest observer
OM_MODES	A54	OM modes used in observation
EPIC_PN_MODES	A39	EPIC pn modes used in observation
EPIC_MOS1_MODES	A37	EPIC MOS1 modes used in observation
EPIC_MOS2_MODES	A37	EPIC MOS2 modes used in observation
RGS1_MODES	A74	RGS1 modes used in observation
RGS2_MODES	A74	RGS2 modes used in observation
OM_FILTERS	A34	OM filter wheel positions used in observation
EPIC_PN_FILTERS	A47	EPIC pn filters used in observation
EPIC_MOS1_FILTERS	A47	EPIC MOS1 filters used in observation
EPIC_MOS2_FILTERS	A47	EPIC MOS2 filters used in observation
OBS_MODE	A8	Observation mode
OM_DET	A9	OM detector name
VVFLAGS	A12	Validation & verification flags
PROCREVISION	A8	Processing revision
PROCDATE	D	Processing date
SASVERSION	A20	SAS version identifier
PPSVERSION	A24	PPS configuration version identifier

Some string keywords take values that are concatenations of a limited set of substrings. Example values of the substrings of some keywords are provided in Appendix 2. The values of the TYPE keyword are also provided there.

8.1.1 Additional keywords associated with the EPIC source-specific group file

In addition to the keywords specified in the previous table, the PPS product group file **EPIC source-specific group** has the following extra keywords associated with it. All FTS TDF catalogue details blocks relating to the EPIC source-specific group will contain all of these keywords (with values).

Keyword	Format	Description
SRC_NUM	I4	Source number in observation
RA_OBJ	R7.4	RA of EPIC object (J2000, deg)
DEC_OBJ	R6.4	DEC of EPIC object (J2000, deg)
RATE	R7.3	Source count rate (c/s)
RATE_ERR	R5.3	Source count rate error
LII_OBJ	R7.4	Galactic longitude of EPIC object (deg)
BII_OBJ	R6.4	Galactic latitude of EPIC object (deg)
HR1	R3.2	Hardness ratio 1
HR1_ERR	R3.2	Hardness ratio 1 error

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Keyword	Format	Description
HR2	R3.2	Hardness ratio 2
HR2_ERR	R3.2	Hardness ratio 2 error
HR3	R3.2	Hardness ratio 3
HR3_ERR	R3.2	Hardness ratio 3 error
LOGVARPROB	R4.2	Log(10) K-S variability probability (%)
RADEC_ERR	R4.1	X-ray source position uncertainty (arcsec)
FLUX	R6.2	X-ray source flux in XID band (1.e-14 erg/cm ² /s)
FLUX_ERR	R5.2	X-ray source flux uncertainty
OFFAXIS_ANG	R3.1	X-ray source off-axis angle (arcmin)
RGSSPECTRUM	A1	Was an RGS spectrum made by the pipeline?

8.2 Keywords associated with XID product group files

The keywords associated with all XID product group files are defined in the following table. XID product group keywords are to be considered independent of PPS product group keywords. All FTS TDF catalogue details blocks relating to XID deliverable files will contain all of these keywords (with values).

Keyword	Format	Description
XIDPROD_FP	A28	Name of file to which keywords relate
TYPE	A24	Deliverable file description
XIDXOBS	I4	XID X-ray observation number
OBS_ID	A10	XMM observation ID
DATE_OBS	D	Date of start of XMM observation
RA_POINT	R7.4	RA of XMM pointing (J2000.0, deg)
DEC_POINT	R6.4	Dec. of XMM pointing (J2000.0, deg)
LII_POINT	R5.2	Galactic longitude of XMM pointing (deg)
BII_POINT	R4.2	Galactic latitude of XMM pointing (deg)
VVFLAGS	A12	Validation & verification flags
PROCREV	A8	Processing revision
PROCDATE	D	Processing date

The value of the TYPE keyword is provided in Appendix 2.

8.2.1 Additional keywords associated with the XID source-specific group file

In addition to the keywords specified in the previous table, the XID product group file **XID source-specific group** has the following extra keywords associated with it. All FTS TDF catalogue details blocks relating to the XID source-specific group will contain all of these keywords (with values).

Keyword	Format	Description
SRC_NUM	I4	XMM source number
XIDOSOU	I3	XID source number
(continued on next page)		

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Keyword	Format	Description
RA_OBJ	R7.4	RA of X-ray source (J2000.0, deg)
DEC_OBJ	R6.4	DEC of X-ray source (J2000.0, deg)
RADEC_ERR	R4.1	X-ray source position uncertainty (arcsec)
FLUX	R6.2	X-ray source flux in XID band (1.e-14 erg/cm ² /s)
FLUX_ERR	R5.2	X-ray source flux uncertainty
OFFAXIS_ANG	R3.1	X-ray source off-axis angle (arcmin)
RATE	R7.3	EPIC source count rate (c/s)
RATE_ERR	R5.3	EPIC source count rate error
HR1	R3.2	EPIC Hardness ratio 1
HR1_ERR	R3.2	EPIC Hardness ratio 1 error
HR2	R3.2	EPIC Hardness ratio 2
HR2_ERR	R3.2	EPIC Hardness ratio 2 error
HR3	R3.2	EPIC Hardness ratio 3
HR3_ERR	R3.2	EPIC Hardness ratio 3 error
LOGVARPROB	R4.2	Log(10) EPIC K-S variability probability (%)
RGSSPECTRUM	A1	Was an RGS spectrum made by the pipeline?
RA_XID	R7.4	RA of XID source (J2000.0, deg)
DEC_XID	R6.4	DEC of XID source (J2000.0, deg)
LII_OBJ	R7.4	Galactic longitude of X-ray source (deg)
BII_OBJ	R6.4	Galactic latitude of X-ray source (deg)
CLASS	A5	Classification of XID source
SUBCLASS	A5	Sub-class of XID source
REDSHIFT	R4.3	XID source redshift
IDENTIFIED	A1	Is the X-ray source identified?
XID_MAG	R5.3	Magnitude of XID source
XID_MAG_ERR	R4.3	Uncertainty in magnitude of XID source
XID_MAG_FILT	A3	Filter used for magnitude value
XID_DIST	R4.1	Distance between X-ray and XID source (arcsec)
XID_DIST_SIG	R4.2	Significance of XID_DIST

9 Appendix 1

9.1 Data product file name

The form of the filenames of the two categories of data product files are shown in the following subsections.

These are provided for information only. They are subject to SAS configuration control, but not to ICD configuration control.

The filename fields are further described in [R-3].

9.1.1 PPS product file names

PPS data product filenames take the 27.3 character form:

Pooooooooooddueetttttsxxx.fff

Field	Meaning	Value
P	File type identifier	P
oooooooooo	Observation identifier	
dd	Data source identifier	
u	Exposure flag	
eee	Exposure number within the observation	
ttttt	Product type	
s	Data subset number	
xxx	Source number	
fff	File format	

9.1.2 XID product file names

XID product file names take the 27.3 character form:

X_ttttt_xxxx_eee_ooo_llln.fff

Field	Meaning	Value
X	File type identifier	X
ttttt	Product type	
xxxx	XID X-ray observation number	
eee	XID X-ray source number	
ooooo	XID source number	
lll	XID filter used	
nn	Data subset number	
fff	File format	

10 Appendix 2

10.1 Allowed values of the TYPE keyword

All deliverable files have an associated keyword TYPE (section 8). The values of the TYPE keyword for each type of deliverable file are given in the table below.

Deliverable file type	Allowed TYPE keyword values
Pipeline product group files	EPIC EVENT LISTS EPIC SKY IMAGES EPIC ANCILLARY EPIC SOURCE LISTS EPIC SOURCE-SPECIFIC OM IMAGES OM SOURCE LISTS OM TIMESERIES RGS EVENT LISTS RGS EXPOSURE IMAGES RGS IMAGES RGS SPECTRA CROSS-CORRELATION PPS DATA PPS GRAPHICS
PPS run message file	PPS RUN MESSAGE
XID product group files	XID FIELD DATA XID SOURCE-SPECIFIC XID FIELD GRAPHICS

10.2 Example PPS product group keyword substring values

Some PPS product group string keywords may only be made up of specific character sub-strings (with blanks as delimiters), examples are given in the following table. (These keywords are designed to allow AMS users to find deliverable files made from data when XMM instruments were in specific states by using a *keyword contains ...* search function.)

The values presented in the table are presumed to be represented in some form in the ODF.

These are provided for information only. They are subject to SAS configuration control, but not to ICD configuration control.

Keyword	Allowed Values	Description
INSTRUMENT	E1	EPIC MOS 1
	E2	EPIC MOS 2
	E3	EPIC pn
	OM	OM
	R1	RGS 1
(continued on next page)		

(continued from previous page)		
Keyword substring	Allowed Values	Meaning
	R2	RGS 2
OM_MODES	USR E1I E1F E2I E2F E3I E3F R1I R1F R2I R2F IMG IMF FF	SCI USER DEF E1 IMG E1 IMG FST E2 IMG E2 IMG FST E3 IMG E3 IMG FST R1 IMG R1 IMG FST R2 IMG R2 IMG FST IMAGE IMAGE FAST FLAT FIELD
EPIC_PN_MODES	IMG LWN SWN FAT FAB LOF NOI DIA FOF OFF	PRI FULL PN PRI LGE WIN PRI SML WIN FAST TIMING FAST BURST LARGE OFFSET NOISE DIAG FULL OFFSET OFFSET
EPIC_MOS1_MODES & EPIC_MOS2_MODES	IMG RFS W2 W3 W4 W5 W6 FAS FAC OV DIA	PRI FULL MOS PRI PART RFS PRI PART W2 PRI PART W3 PRI PART W4 PRI PART W5 PRI PART W6 FAST UNCOMP FAST COMP OFF/VAR CCD DIAG
RGS1_MODES & RGS2_MODES	D35 DIA Q1 Q2 Q3 Q4 Q5	DIAG 3 4 5 DIAG TEST RGS QDUMP1 RGS QDUMP2 RGS QDUMP3 RGS QDUMP4 RGS QDUMP5
(continued on next page)		

(continued from previous page)		
Keyword substring	Allowed Values	Meaning
	Q6 Q7 Q8 Q9 SPC SPQ HER HSS HSR HTS D11 D22 TST HTR	RGS QDUMP6 RGS QDUMP7 RGS QDUMP8 RGS QDUMP9 SPECTROSCOPY SPECTR + Q HER HER + SES HER + SER HTR B SINGLE DIAG 1X1 DIAG 2X2 SPECTR TEST HTR MULTIPLE
OM_FILTERS	BL VB MA UB BB WL OG W1 M2 W2 UG BU	Blocked V-band Magnifier U-band B-band White light Optical grism UVW1 UVM2 UVW2 UV grism Barred U
EPIC_PN_FILTERS & EPIC_MOS1_FILTERS & EPIC_MOS2_FILTERS	CLS OPN TN1 TN2 MED THK CLC CLO CT1 CT2 CMD CTK	CLOSED OPEN - NO FILTER THIN FILTER 1 THIN FILTER 2 MEDIUM FILTER THICK FILTER CAL. CLOSED CAL. OPEN - NO FILTER CAL. THIN FILTER CAL. THIN FILTER 2 CAL. MEDIUM FILTER CAL. THICK FILTER
OBS_MODE or	POINTING SLEW	Pointing Slew
OM_DET or	PRIME REDUNDANT	Prime Redundant

11 Appendix 3

11.1 Constituents of the pipeline product group files

The data product files which are included in the pipeline product group files are listed here. The format and the expected number of file instances in the group are also given, in some cases this number is quite uncertain. FITS format files will be individually compressed with GNU `gzip`.

The following table is provided for information only. It is subject to SSC configuration control, but not to ICD configuration control.

Product group	Constituent files	Format	Typical number
EPIC event list group	EPIC MOS imaging mode event list	FITS	2
	EPIC PN imaging mode event list	FITS	1
	EPIC timing mode event list	FITS	0
	Index file	HTML	1
EPIC sky image group	EPIC image	FITS	15
	EPIC observation image	FITS	1
	Index file	HTML	1
EPIC ancillary group	EPIC exposure map	FITS	15
	EPIC sensitivity map	FITS	1
	EPIC exposure sensitivity map	FITS	3
	EPIC camera sensitivity map	FITS	0
	EPIC global background spectrum	FITS	3
	EPIC fluctuations spectrum	FITS	3
	Index file	HTML	1
EPIC source list group	EPIC exposure box-local source list	FITS	3
	EPIC exposure box-map source list	FITS	3
	EPIC exposure ml source list	FITS	3
	EPIC camera box-local source list	FITS	0
	EPIC camera box-map source list	FITS	0
	EPIC camera ml source list	FITS	0
	EPIC obs box-local source list	FITS	1
	EPIC obs box-map source list	FITS	1
	EPIC obs ml source list	FITS	1
	EPIC FITS summary source list	FITS	1
	Index file	HTML	1
EPIC source-specific group	EPIC FITS source timeseries	FITS	2
	EPIC source timeseries	PDF	2
	EPIC source FFT plot	PDF	2
	EPIC FITS source spectrum	FITS	3
	EPIC FITS source bkgground spectrum	FITS	3
	EPIC source spectrum plot	PDF	3
	Index file	HTML	1
OM images	OM OSW FITS image	FITS	48
	OM flatfield image	FITS	1
(continued on next page)			

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Product group	Constituent files	Format	Typical number
	Index file	HTML	1
OM source lists group	OM OSW source list	FITS	48
	OM observation source list	FITS	1
	Index file	HTML	1
OM timeseries group	OM OSW FITS source timeseries	FITS	16
	OM OSW source timeseries	PDF	16
	OM FITS tracking star timeseries	FITS	16
	Index file	HTML	1
RGS event list group	RGS event list	FITS	2
	Index file	HTML	1
RGS exposure group	RGS exposure map	FITS	2
	Index file	HTML	1
RGS image group	RGS FITS image	FITS	4
	Index file	HTML	1
RGS spectra group	RGS FITS source spectrum	FITS	4
	Index file	HTML	1
Cross-correlation group	FITS source cross-corr summary	FITS	1
	FITS source cross-corr results	FITS	100
	FITS FOV cross-corr summary	FITS	15
	FITS FOV cross-corr results	FITS	15
	FITS source raw posn cross-corr results	FITS	1
	Index file	HTML	1
PPS data group	PPS product index	FITS	1
	Calibration index file	FITS	1
	PPS script log	ASCII	1
	Index file	HTML	1
PPS graphics group	EPIC PNG image	PNG	15
	EPIC PNG observation image	PNG	1
	EPIC three-colour image	PNG	3
	EPIC variability image	PNG	3
	EPIC intensity histogram	PDF	3
	EPIC housekeeping summary	PDF	3
	EPIC global background timeseries	PDF	5
	EPIC HTML summary source list	HTML	1
	EPIC HTML summary page	HTML	1
	EPIC total graphics image	PNG	1
	OM tracking history plot	PNG	16
	OM tracking star timeseries	PDF	32
	OM housekeeping summary	PDF	1
	OM total graphics image	PNG	3
	OM HTML summary page	HTML	1
	RGS spatial image plot	PNG	2
	RGS energy image plot	PNG	2

(continued on next page)

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Product group	Constituent files	Format	Typical number
	RGS housekeeping summary	PDF	2
	RGS auxiliary data plot	PDF	2
	RGS HTML summary page	HTML	1
	RGS spectrum plot	PDF	4
	RGS trailed spectrum plot	PNG	4
	Cross-corr catalogue descriptions	HTML	100
	Cross-corr searched catalogues	HTML	1
	HTML source cross-corr summary	HTML	1
	HTML source cross-corr results	HTML	1
	HTML FOV cross-corr summary	HTML	15
	HTML FOV cross-corr results	HTML	15
	Cross-corr catalogue plot	PDF	1
	XMM-rosat image plot	PNG	1
	Finding chart plot	PDF	100
	Observation summary	HTML	1
	SSC logo1	PNG	1
	SSC logo2	PNG	1
	CDS logo1	PNG	1
	CDS logo2	PNG	1
	CDS logo3	PNG	1
	ESA logo1	PNG	1
	XMM logo1	PNG	1
	PPS summary	HTML	1
	Index file	HTML	1

11.2 Constituents of the XID product group files

The data product files which are included in the XID product group files are listed here. The format and the expected number of file instances in the group are also given, in some cases this number is quite uncertain. FITS format files will be individually compressed with GNU `gzip`.

The following table is provided for information only. It is subject to SSC configuration control, but not to ICD configuration control.

Product group	Constituent files	Format	Typical number
XID field data group	XID reduced FITS image	FITS	30
	XID magnitude table	FITS	1
	Index file	HTML	1
XID source-specific group	XID finding chart	PNG	1
	XID fluxed spectrum	PDF	2
	XID FITS spectrum	FITS	2
	Index file	HTML	1
XID field graphics group	XID observation summary	HTML	1
	XID reduced PNG image	PNG	30
	XID magnitude table	HTML	1
	Index file	HTML	1