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1. INTRODUCTION

The FM2 MOS Calibration was carried out on 21 May - 13 June and 30 June - 2 July 1998 at the IAS - Station D'Etalonnage, Campus D'Orsay in France. An overall description of the calibration set up is given in [7].

The data produced by the PN instrument was archived by the EST EGSE, together with the housekeeping data of the calibration facility and other derived data.

The Raw Archive were processed by the EST Science Console in order to produce a data set written in the EGSE Reduced Data Format to be analysed by the EPIC Data Analysis Team (CDAT).

This lead to populate an Erdf (Epic Reduced Data Files) Archive containing a set of HK and Science data files for each *exposure* (i.e. for each period among two consecutive idle status of the instrument) and a set of HK data files for each *idle* period.

Each exposure was identified by a *Run ID* number and the related files have been archived in the Erdf/Science/ and Erdf/HK subdirectories, grouped by decade of runs.

A summary of the data taking is given in Annex 2.

1.1. Purpose and scope

The aim of the present document is to describe the test configuration set up and the content of the Erdf DAT Tapes containing all the Erdf data produced during the campaign.

The Erdf DAT tapes content list is given in Annex 1.

1.2. Reference documents

- [1] L. Chiappetti, Basic requirements for processing of EPIC science telemetry, EPIC-EST-SP-005, Issue 1
- [2] EPCS Electrical I/F Specification, EPIC-EST-SP-002, Issue 4, April 1998.
- [3] Format of the EPIC GSE Reduced Data Files, EPIC-EST-SP-004, Issue 1.4, February 1997
- [4] GSE Basic I/F and Operational Requirements for the EPIC Calibration at Orsay, EPIC-EST-SP-010, Issue 1.4, 22.08.97
- [5] CCOE Man Machine I/F Requirements for the EPIC Calibration at Orsay, EPIC-EST-SP-011, Issue 1.2, 16.09.97
- [6] MOV-COE synchronisation requirements update, EPIC-EST-TN-003, Issue 2.0, October 1997.
- [7] M.Trifoglio *et al*, Ground Calibration GSE for the XMM-EPIC instrument at the Orsay Synchrotron facility, presented at the SPIE's Annual Meeting, 19-24 July 1998, San Diego, California USA.

1.3. Change Record

- 1.0 First issue accompanying the Erdf DAT Tapes, Version 1.

1.4. Definition, acronyms and abbreviations

AIV Assembly, Integration and Verification

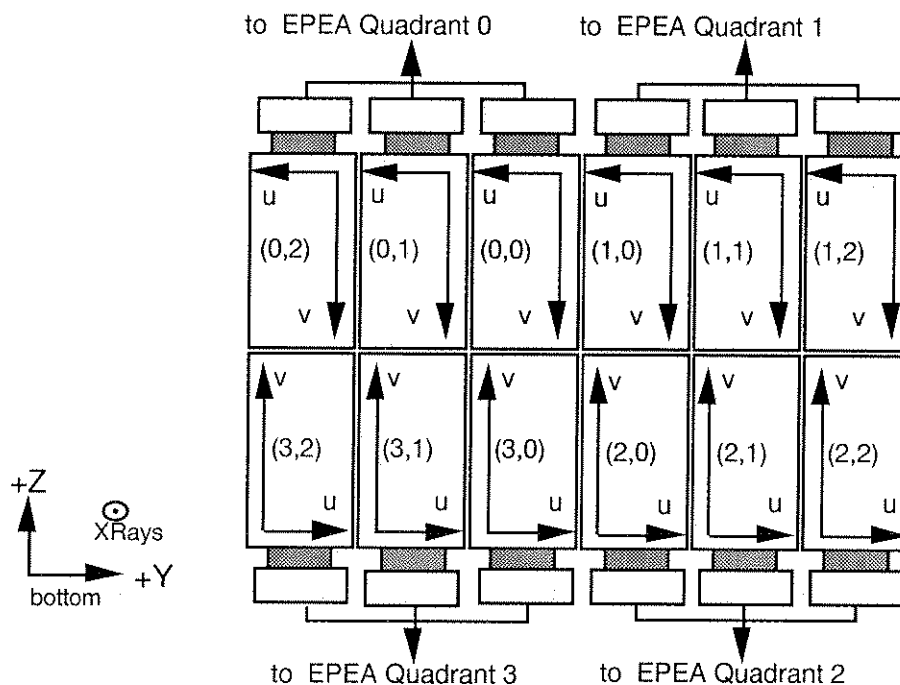
APID	Application Process Identifier
CAL-COE	Calibration Check-Out Equipment
CCOE	Central Check-Out Equipment
CDAT	Calibration and Data Team
EMCS	Epic Mos Camera System
EPCS	Epic Pn Camera System
EPIC	European Photon Imaging Camera
ERDF	EGSE Reduced Data Files
ERMS	Epic Radiation Monitor System
ESA/CCS	European Space Agency Central Check-out System
ETE-COE	End-to-End Check Out Equipment
ETOL	European Test Operation Language
EXP-COE	Experimental Check Out Equipment
FDHS EC	Fast Data Handling Simulator Engineering Console
FDHS LU	Fast Data Handling Simulator Local Unit
FITS	Flexible Image Transport System
FTP	File Transfer Protocol
FWHM	Full Width at Half Maximum
HEW	Half Energy Width
HK	Housekeeping
ISU	Interface Simulator Unit
LAN	Local Area Network
NFS	Network File System
OLA	On-Line Analysis
OOL	Out of Limit
MOVCOE	Movement Checkout Equipment
PCF	Primary Calibration File
QLA	Quick Look Analysis
SID	Structure Identifier
SQL	Structured Query Language
TBD	To Be Defined
TBV	To Be Verified
TBW	To Be Written
TM	Telemetry
XDR	eXternal Data Representation format
XMM	X-ray Multi Mirror

2. TEST SET UP

2.1. PN Camera Head Configuration

The FM1 PN under test consisted of 4 quadrant, each containing 3 CCDs, of 200x64 pixels. CCD#1 of quadrant was not functioning properly and has been deactivated since RUNID 3440.

The view from behind the CCD surface is sketched below.

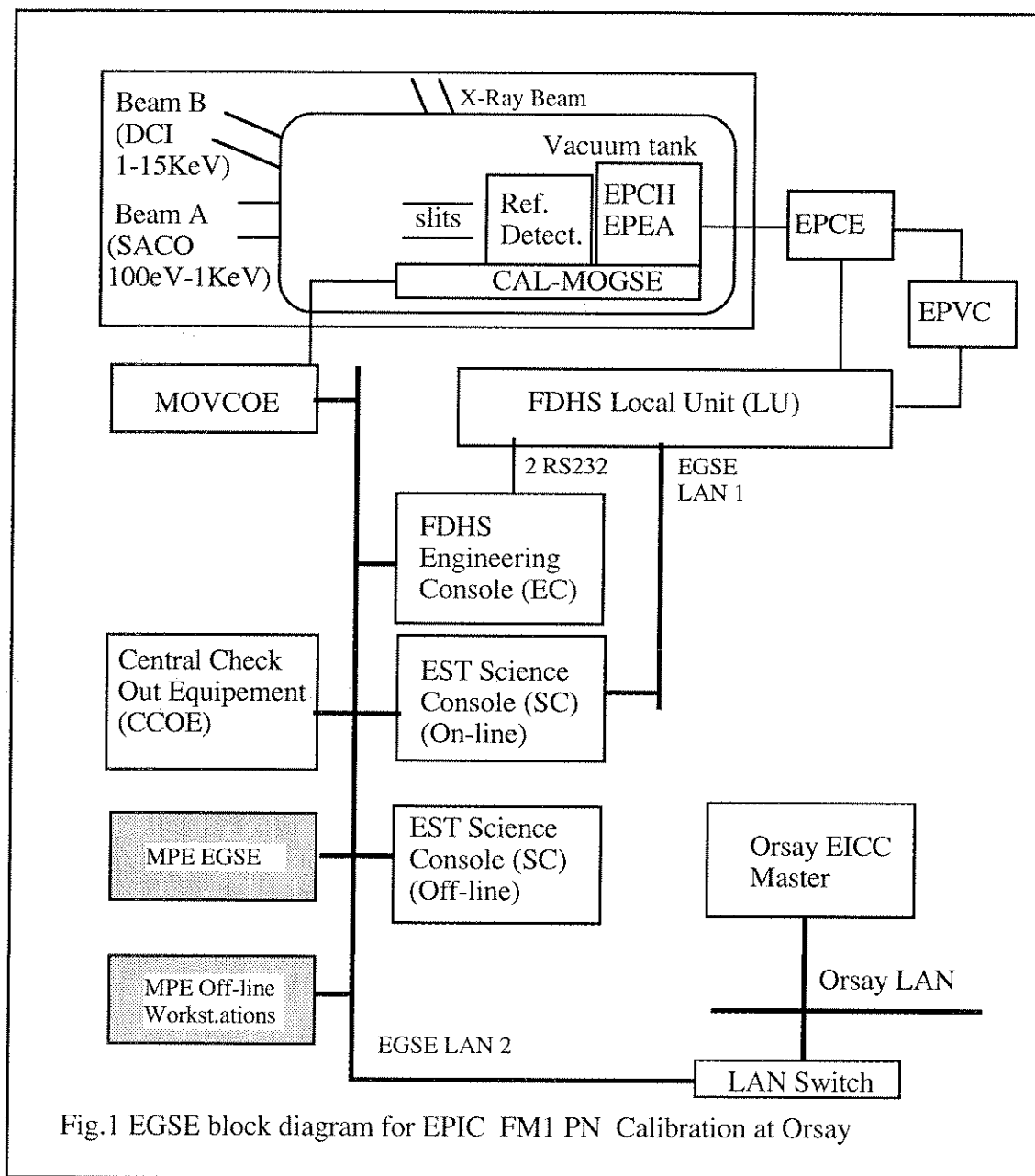


The u_i, v_i chip detector coordinates are in pixel. The u coordinate ranges 0 to 63 and the v coordinate ranges 0 to 199.

The camera has been attached to a Mechanical Optical Ground Support Equipment (MOGSE) able to provide the translation motion needed for scanning the camera along the Z axes at constant speed through the beam.

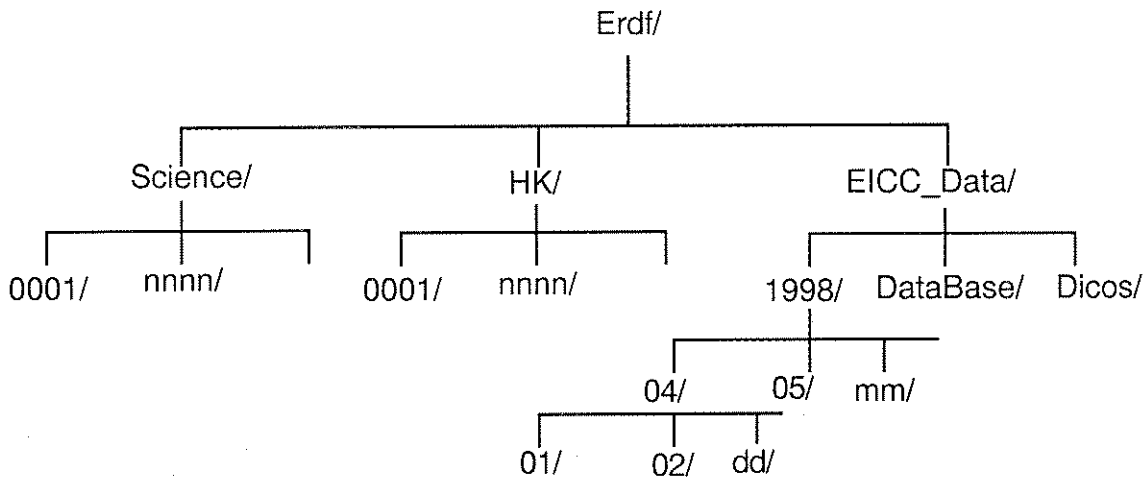
2.2. EGSE configuration and data archiving

The data taking was conducted using the EGSE configuration depicted in fig.1 below.



The tests have been conducted from the Central Cechout Equipment (CCOE) which sequenced the operations by means of automated test sequences, implemented as specified in [4] and [5].

The EGSE Reduced Data Files to be included in the DAT tape were stored under the following Erdf directory tree:



Science and HK subtrees

These subtrees were devoted, as usual, to the data acquired in near real time from the instrument and from the Orsay facility (On-line Data), namely:

Science: Egse Reduced Science Data Files, as derived in near-realtime from the Instrument Raw TLM Science data.

HK: Instrument Raw TLM HK data files related to an exposure, copied from the Instrument Raw HK data

Facility Raw HK data files related to an exposure, copied from the Facility Raw HK data files.

The Science and HK files are grouped under subdirectories containing the files related to the Run Id of a given decade, e.g.: 0001/ contains all the files related to Run Id 1,2,3, ...,9,10.

The bulk of the data contained in the Science subdirectory were the FITS files with the photon lists and the auxiliary information produced for each CCD when operated in imaging mode.

The Science subdirectory was available via NFS to the Off-Line Analysis Workstations as soon as the exposure was completed.

The Instrument Raw TLM HK data include all the HK Packets received from the FDHS Eng. Console. The desired class of packet can be extracted on the basis of the Packet Type and the Packet Subtype information contained in the Data Field Header.

At the Orsay FM1 PN Calibration, at least the following class of HK packets were present:

	Packet Type	Packet Subtype
Housekeeping Telemetry	[1]	[2]

EICC_Data subtree

In order to calibrate the beam flux, a SiLi detector and a Proportional Counter detector (for very low energies) have been used. In addition a SiLi Diode was located in front of the beam in order to monitor the beam current during the CCD observation.

The spectra and HK data relevant to these detectors have been collected by the EICC Facility computer system, and, at the end of the campaign, have been transferred to the Science Console, where have been stored in the EICC_Data directory tree shown above, grouped by date under the 1998/ subdirectory .

The *Dicos/* and the *Database/* subtrees contains s/w (IDL code) and data which have been used in the EICC computer to browse the archive (for any detail please refer to *Hochedez Jean Francois* <hochedez@ias.fr>) .

The whole tree have been included in the Erdf Tape #7.

2.3. File Naming

Science and HK subtrees

The following file naming was used under the Science/HK/ tree for the HK data produced during the exposure having Run id nnnnn:

ORSnnnnn_YYMMDD_HHMMSS.hk6	for the PN Instrument HK produced every 8 s.
ORSnnnnn_YYMMDD_HHMMSS.hk8	for the PN Instrument HK produced every 64 s.
ORSnnnnn_YYMMDD_HHMMSS.omh	for the Orsay (Facility) HK

where nnnnn is the Run ID and YYMMDD and HHMMSS are the time and the date of creation, respectively.

The HK data (either PN Instrument HK or Orsay Facility HK) produced before exposure n was started (IDLE period among n-1 and n) were identified by adding an "_" in their file name. A double "_" in the name, identified the first IDLE period of a measurement session (i.e. started just after the connection with the FDHS).

The file naming under the Erdf/Science tree is described in [3].

EICC_Data subtree

There are two kind of Spectra of the Beam (SiLi or Prop. counter):

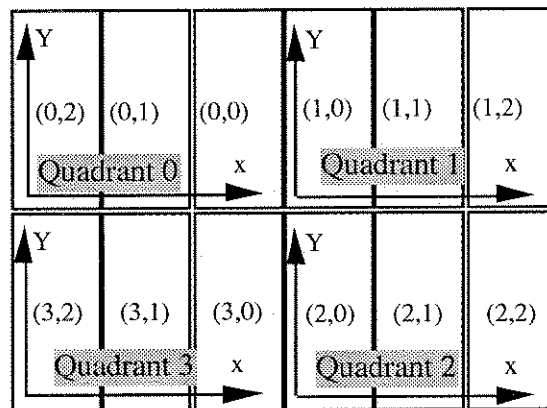
- 1) spectra which have been manually recorded; they have a short format naming, e.g.: 98040127.mce;
- 2) spectra which have been created automatically by the EICC scripts during profiles or stability phases; they have a long format naming, e.g.: Eicc19980426173126.mce.

In addition, there are Data files from EICC in ascii format (header + data), they have .fits extension in the file name, e.g.: Eicc19980401095651.fits

2.4. Data Format

Science and HK subtrees

The Erdf/Science files have been produced following the FITS format given in [3]. It is noted that in these files all the pixel coordinates have been converted to the *pn camera oriented quadrant detector coordinate system*, where the x coordinate ranges 0 to 191 and the y coordinate ranges 0 to 199, represented below:



pn camera oriented quadrant detector coordinates

Due to a camera system malfunctioning, sometimes the TM event data words were padded with all 1's. It was decided to save them anyhow in the photon list files. They can be identified as they are associated to quadrant #3,ccd #3 (being both the quadrant ID and the CCD ID field padded with all 1's).

The instrument HK are in the TLM format specified in [2].

The Orsay Facility HK consists of:

- 1) The data acquired from the EICC during the Beam Calibration phase, which corresponds to the IDLE period of the camera;
The aim of these data is to provide the parameters which characterise the configuration of the Beam and the result of the Beam Calibration performed with the Si(Li) detector before starting the data taking with the EPIC camera.
- 2) The data acquired from the EICC during the EPIC exposure; they provide the HK related to the beam functioning

In both cases, each message received from the EICC is filed in a ASCII file as a single row, after having added the Science Console time stamp.

In Annex 3 is given a sample of the different set of information archived by the Science Console.

2.5. Time correlation

Starting from RUNID 3445, some keywords have been added in the header of the FITS files (relf and asf) in order to correlate the On Board Time (OBT) counter kept by the EPDH (and having a recycle period of about 8-9 hours) with the Science Console CPU time. As the latter is synchronised,

using the Network Time Protocol (NTP) service with the other GSE computers, this will allow to correlate the CCD data with the beam data.

To this purpose, it was considered that each time a Observation command is sent to the EPEA, the EPEA time is reset and the OBT (just the seconds) at which this reset is performed, is sent in the HK TLM Packet, together with the current value of the current OBT.

Hence, the following solution has been adopted:

- these time counters are read by the Science Console from the second HK TLM packet received since the observation started: the former is saved into the RESETPEAT FITS Header keyword. The current OBT (just the seconds) is saved in the OBTEGSET FITS Header keyword.
- the Science Console CPU time (hh:mm:ss) at which this HK packet has been received is saved into the RESETEGSET FITS Header keyword.
- the Science Console CPU time at which the Erdf file is opened is saved in the TIME-OBS FITS Header keyword.

Example:

TIME-OBS: 16:26:48

RESETEGSET = 16:27:00

RESETPEAT = 22974

OBTEGSET = 22987

i.e:

the packet containing the OBT = 22987 seconds was received by the Science Console @ 16:27:00 and provided the information that 13 seconds before (i.e. 16.26.47) the EPEA time has been reset. The FITS file was opened just 1 seconds after this reset

3. THE ERDF DAT TAPES

A procedure has been used in order to produce the Erdf DAT Tape containing the Erdf/ subdirectories related to a given set of decades.

As detailed in the following sections, the procedure analyses all the files contained in the selected decades in order to produce the related summary and log files and to create a tape directory which will be saved in the DAT as the first tar file which summaries the content of the tape itself.

The usual procedure has been customised for the Orsay Campaign in order to include the EICC_Data directory tree, if any, as the second tar file in the tape.

3.1. The summary and log files

As a first step, the procedure takes care of adding into each decade subdirectory of the Erdf/Science and Erdf/HK, the summary and log decade files, namely:

Science/nnnn/instr_sc.sum, Science/nnnn/dec_rep.sum; Science/nnnn/instr_sc.log

HK/nnnn/instr_hk.sum; HK/nnnn/instr_hk.log

HK/nnnn/facil_hk.sum; HK/nnnn/facil_hk.log.

The *.sum are tabular ASCII files containing summary data separated by Tabs. The *.log contains the list of the files which have been removed, together with the reason of the removal.

The instr_sc.sum file

The procedure searches in the decade subdirectory for all the files related to a given exposure. Hence, from the files pertaining to a given Quadrant, the procedure extracts and writes in this file the values of the following FITS keywords:

FILENAME, DATATYPE DATE-OBS, TIME-OBS, DATE-END, TIME-END, FILTER, CCD0MODE, CCD1MODE, CCD2MODE, NFRAME, NEVENT

where:

FILENAME = base file name (e.g. 03243_980521_132464.p0*)

NFRAME = number of frame as given by the NAXIS2 keyword of the *asf file

NEVENT = number of event as given by the NAXIS2 keyword of the *elf file

For the meaning of the remaining keyword refer to [3].

The dec_rep.sum file

This file contains a subset of the keywords contained in the instr_sc_sum files which are used to populate the description of runs given in Annex 2.

The instr_sc.log files

In case one of the following values is found:

NFRAME = 0 in *asf

NEVENT = 0 in *elf

the related files are removed and an entry is written in this file.

The instr_hk.sum and facil_hk.sum files

These files list the name and the size (in bytes) of each HK file contained in the decade related to the instrument and to the calibration facility, respectively.

The instr_hk.log and facil_hk.log files

These files list the names of the HK files which have been removed as they were empty.

3.2. The tape directory

As second step, the procedure creates the Tapes/Tape.nnn directory, where nnn is the number assigned to the Erdf tape to be produced.

At the time tape production, this directory will be stored in the first tar file of the Erdf DAT Tape in order to allow the user to have a summary on the tape content without having to inspect all the tape.

In this subdirectory, the procedure creates the following files.

The tape_id file

This file contains the ASCII string "TAPEID = nnn" identifying the tape, e.g.:

TAPEID = 001

The tape_files file

The procedure writes into this file one entry for each Erdf subdirectory. Each entry, gives the id of the tape to be created and the sequential number of the tar file where the subdirectory will be saved. E.g.:

TAPEID	FILE #	Tar Dir
001	001	Tapes/Tape.001/
001	002	HK/0040/
001	002	Science/0040/
001	003	HK/0041/
001	003	Science/0041/
001	004	HK/0042/
001	004	Science/0042/
...	...	...

The summary and log files

All the summary and log files contained in each decade are merged and stored in the Tapes/Tape.nnn directory in a file having the same name, i.e.:

instr_sc.sum; dec_rep.sum; instr_sc.log

instr_hk.sum; instr_hk.log

facil_hk.sum; facil_hk.log

contain the information related to the whole tape.

4. DATA DISTRIBUTION

Seven Erdf DAT tapes have been produced in order to contain all the data saved in the Erdf/ data tree during the Orsay FM1 PN Calibration.

The file location of each decade is given Annex 1, were the content of the tape_files files, mentioned in 3 above, is presented.

4.1. How to inspect the Erdf DAT tape and restore the files

The tape can be positioned to the desired tar file using the "mt" command and the subdirectory can be extracted using the "tar" command.

Some examples (on an DEC OSF Platform) follow (note: the "no-rewind" device is specified).

- 1) skip the first three End Of File marks :

```
> mt -f/dev/nrmt0m fsf 3
```

- 2) list the content of the next tar file (file # 4 in the DAT Tape):

```
> tar tvf/dev/nrmt0m
```

```
drwxr-xr-x 203/650 0 Dec 23 17:52:29 1996 12/
-rwxr-x--- 203/650 28800 Dec 4 13:12:34 1996 12/00111_041296_131157.m1imalelf
-rwxr-x--- 203/650 11520 Dec 23 12:06:01 1996 12/00111_041296_131157.m1imaasf
-rwxr-x--- 203/650 11520 Dec 4 13:12:41 1996 12/00111_041296_131157.m3imalelf
-rwxr-x--- 203/650 11520 Dec 4 13:12:41 1996 12/00111_041296_131157.m3imaasf
-rwxr-x--- 203/650 8640 Dec 4 13:11:57 1996 12/00111_041296_131157.m6imalelf
-rwxr-x--- 203/650 8640 Dec 4 13:11:57 1996 12/00111_041296_131157.m6imaasf
.....
```

- 3) skip the End Of File mark of the current file (the file just listed above) and one more End Of File mark in order to position the tape at the beginning of the tar file # 6:

```
> mt -f/dev/nrmt0m fsf 2
```

- 4) list the content of the next tar file (file # 4 in the DAT Tape):

```
> tar tvf/dev/nrmt0m
```

```
drwxr-xr-x 203/650 0 Dec 23 18:06:04 1996 14/
-rwxr-xr-x 203/650 31680 Dec 4 17:03:46 1996 14/00131_041296_165727.m6imalelf
-rwxr-xr-x 203/650 11520 Dec 4 17:03:46 1996 14/00131_041296_165727.m6imaasf
-rwxr-xr-x 203/650 192960 Dec 4 17:03:41 1996 14/00131_041296_165727.m1imalelf
```

```
-rwxr-xr-x 203/650 11520 Dec 4 17:03:41 1996 14/00131_041296_165727.m1imaasf
-rwxr-xr-x 203/650 40320 Dec 4 17:03:51 1996 14/00131_041296_165727.m3ima1elf
-rwxr-xr-x 203/650 14400 Dec 4 17:03:51 1996 14/00131_041296_165727.m3imaasf
-rwxr-xr-x 203/650 40320 Dec 4 17:11:06 1996 14/00131_041296_171028.m3ima1elf
.....
```

- 5) skip the End Of File mark of the current file (the file just listed above) in order to position the tape at the beginning of the tar file # 7:

```
> mt -f/dev/nrmt0m fsf
```

- 6) extract the content of the next tar file (file # 7 in the DAT Tape) restoring all the files in the current directory (i.e. creating the subdirectory 15/):

```
tar xvf/dev/nrmt0m
```

```
tar: blocksize = 20
```

```
x 15/
```

```
x 15/00141_051296_091856.m1ima1elf, 8640 bytes, 17 tape blocks
x 15/00141_051296_091856.m1imaasf, 8640 bytes, 17 tape blocks
x 15/00141_051296_091856.m3ima1elf, 8640 bytes, 17 tape blocks
x 15/00141_051296_091856.m3imaasf, 8640 bytes, 17 tape blocks
x 15/00141_051296_091857.m6ima1elf, 8640 bytes, 17 tape blocks
x 15/00141_051296_091857.m6imaasf, 8640 bytes, 17 tape blocks
x 15/00142_051296_094544.m3ima1elf, 9993600 bytes, 19519 tape blocks
x 15/00142_051296_094544.m3imaasf, 72000 bytes, 141 tape blocks
.....
```

ANNEX 1 Erdf DAT TAPE Content List

TAPEID	FILE #	Tar Dir
001	001	Tapes/Tape.001/
001	002	HK/0325/
001	002	Science/0325/
001	003	HK/0326/
001	003	Science/0326/
001	004	HK/0327/
001	004	Science/0327/
001	005	HK/0328/
001	005	Science/0328/
001	006	HK/0329/
001	006	Science/0329/
001	007	HK/0330/
001	007	Science/0330/
001	008	HK/0331/
001	008	Science/0331/
001	009	HK/0332/
001	009	Science/0332/
001	010	HK/0333/
001	010	Science/0333/
001	011	HK/0334/
001	011	Science/0334/
001	012	HK/0335/
001	012	Science/0335/
002	001	Tapes/Tape.002/
002	002	HK/0335/
002	002	Science/0335/
002	003	HK/0336/
002	003	Science/0336/
002	004	HK/0337/
002	004	Science/0337/
002	005	HK/0338/
002	005	Science/0338/
002	006	HK/0339/
002	006	Science/0339/
002	007	HK/0340/
002	007	Science/0340/
002	008	HK/0341/
002	008	Science/0341/
002	009	HK/0342/
002	009	Science/0342/
002	010	HK/0343/
002	010	Science/0343/
003	001	Tapes/Tape.003/
003	002	HK/0344/
003	002	Science/0344/
003	003	HK/0345/
003	003	Science/0345/

003	004	HK/0346/
003	004	Science/0346/
003	005	HK/0347/
003	005	Science/0347/
003	006	HK/0348/
003	006	Science/0348/
003	007	HK/0349/
003	007	Science/0349/
004	001	Tapes/Tape.004/
004	002	HK/0349/
004	002	Science/0349/
004	003	HK/0350/
004	003	Science/0350/
004	004	HK/0351/
004	004	Science/0351/
004	005	HK/0352/
004	005	Science/0352/
004	006	HK/0353/
004	006	Science/0353/
005	001	Tapes/Tape.005/
005	002	HK/0353/
005	002	Science/0353/
005	003	HK/0354/
005	003	Science/0354/
005	004	HK/0355/
005	004	Science/0355/
005	005	HK/0356/
005	005	Science/0356/
005	006	HK/0357/
005	006	Science/0357/
005	007	HK/0358/
005	007	Science/0358/
005	008	HK/0359/
005	008	Science/0359/
005	009	HK/0360/
005	009	Science/0360/
005	010	HK/0361/
005	010	Science/0361/
006	001	Tapes/Tape.006/
006	002	HK/0361/
006	002	Science/0361/
006	003	HK/0362/
006	003	Science/0362/
006	004	HK/0363/
006	004	Science/0363/
006	005	HK/0364/
006	005	Science/0364/
006	006	HK/0365/
006	006	Science/0365/
006	007	HK/0366/
006	007	Science/0366/

006	008	HK/0367/
006	008	Science/0367/
006	009	HK/0368/
006	009	Science/0368/
006	010	HK/0369/
006	010	Science/0369/
006	011	HK/0370/
006	011	Science/0370/
006	012	HK/0371/
006	012	Science/0371/
006	013	HK/0372/
006	013	Science/0372/
006	014	HK/0373/
006	014	Science/0373/
006	015	HK/0374/
006	015	Science/0374/
006	016	HK/0375/
006	016	Science/0375/
006	017	HK/0376/
006	017	Science/0376/
006	018	HK/0377/
006	018	Science/0377/
006	019	HK/0378/
006	019	Science/0378/
006	020	HK/0379/
006	020	Science/0379/
006	021	HK/0380/
006	021	Science/0380/
006	022	HK/0381/
006	022	Science/0381/
007	001	Tapes/Tape.007/
007	002	EICC_Data/
007	003	HK/0382/
007	003	Science/0382/
007	004	HK/0383/
007	004	Science/0383/
007	005	HK/0384/
007	005	Science/0384/

ANNEX 2 DESCRIPTION OF RUNS IN ORSAY

DATE-OBS	TIME-OBS	TIME-END	RUN_ID	ENERGY (ev)	FILTER	NOTES
21/05/98	13:24:13	13:24:26	03243		OPEN	test
22/05/98	14:33:31	14:59:29	03245		unknown	test
22/05/98	15:13:27	17:18:20	03246		OPEN	test
22/05/98	17:31:32	17:36:39	03247		A THIN	test
22/05/98	17:38:44	17:43:49	03248		B THIN	test
Test with DCI (BEAM_OPEN.CFG)						
22/05/98	18:02:29	18:07:32	03249	2000	OPEN	
22/05/98	18:14:26	18:19:31	03250	"	OPEN	
Test with DCI (BEAM_FULL_1.CFG)						
22/05/98	18:30:38	18:35:45	03251	2000	OPEN	
22/05/98	18:48:40	18:53:47	03252		A THIN	
22/05/98	18:55:10	19:00:16	03253		B THIN	
22/05/98	19:01:40	19:06:46	03254		C MEDIUM	
22/05/98	19:08:09	19:13:16	03255		D THICK	
22/05/98	19:14:38	19:19:44	03256		OPEN	
22/05/98	19:37:45	20:33:41	03257		OPEN	
25/05/98	11:58:10	12:31:39	03258		OPEN	
25/05/98	12:34:18	13:43:26	03259		CLOSED	
25/05/98	13:45:48	16:01:30	03260		unknown	
25/05/98	16:08:47	19:21:58	03261		OPEN	
25/05/98	19:39:15	19:44:52	03262		OPEN	
25/05/98	19:51:21	21:00:11	03263		OPEN	
SiLi Edge with DCI (BEAM_OPEN.CFG)						
25/05/98	21:14:38	21:19:42	03264	1830	OPEN	
25/05/98	21:50:54	21:55:59	03265	"	OPEN	
25/05/98	22:06:47	22:11:53	03266	1838	OPEN	
25/05/98	22:47:06	22:52:12	03267	"	OPEN	
25/05/98	23:32:08	23:37:21	03268	1842	OPEN	
25/05/98	23:59:14	00:04:21	03269	"	OPEN	
26/05/98	00:09:54	00:15:07	03270	1846	OPEN	
26/05/98	00:36:51	00:42:04	03271	"	OPEN	
26/05/98	00:55:01	01:00:06	03272	1850	OPEN	
26/05/98	01:23:27	01:28:33	03273	"	OPEN	
26/05/98	01:57:56	02:03:01	03274	1865	OPEN	
26/05/98	02:28:13	02:33:17	03275	"	OPEN	
26/05/98	02:40:03	02:45:09	03276	1870	OPEN	
26/05/98	03:12:24	03:17:28	03277	"	OPEN	
26/05/98	03:23:23	03:28:28	03278	1865	OPEN	
26/05/98	03:53:33	03:58:38	03279	"	OPEN	
26/05/98	04:06:47	04:11:52	03280	1853	OPEN	
26/05/98	04:33:15	04:38:21	03281	"	OPEN	
26/05/98	04:54:02	04:59:12	03282	?	OPEN	energy not set correctly
26/05/98	05:19:17	05:24:22	03283	1847	OPEN	
26/05/98	05:47:56	05:53:01	03284	"	OPEN	
26/05/98	06:00:27	06:05:32	03285	1843	OPEN	
26/05/98	06:36:06	06:41:12	03286	"	OPEN	
26/05/98	07:42:17	07:47:22	03287	1835	OPEN	
26/05/98	08:10:11	08:15:21	03288	"	OPEN	
26/05/98	10:09:07	10:11:36	03289	-	CLOSED	test
26/05/98	10:21:51	10:26:56	03290	1835	OPEN	
26/05/98	10:59:43	11:04:47	03291	"	OPEN	
26/05/98	11:11:15	11:16:20	03292	1836	OPEN	no EICC HK received

26/05/98	11:41:36	11:46:41	03293	'	OPEN	
26/05/98	11:53:34	11:58:47	03294	1839	OPEN	
26/05/98	12:46:29	12:51:33	03295	"	OPEN	
26/05/98	13:04:36	13:09:46	03296	1840	OPEN	
26/05/98	13:15:01	13:20:05	03297	1840	OPEN	
26/05/98	13:42:44	13:47:51	03298	"	OPEN	
26/05/98	13:55:46	14:00:57	03299	1844	OPEN	
26/05/98	14:25:09	14:30:14	03300	"	OPEN	
26/05/98	14:39:26	14:44:31	03301	1848	OPEN	
26/05/98	15:10:27	15:15:31	03302	"	OPEN	
26/05/98	15:45:28	16:50:13	03303		OPEN	problemswith the beam
26/05/98	16:53:14	17:46:05	03304		OPEN	CCD1 bad
26/05/98	17:47:17	18:27:36	03305		OPEN	
26/05/98	19:26:21	19:31:27	03306		CLOSED	test
26/05/98	19:55:42	20:00:48	03307	1856	OPEN	p=20
26/05/98	20:09:43	20:14:49	03308	1856	OPEN	p=10
26/05/98	20:39:03	20:44:12	03309	"	OPEN	
26/05/98	20:59:19	21:04:26	03310		OPEN	no good
26/05/98	21:09:26	21:14:40	03311	1865	OPEN	
26/05/98	21:39:47	21:44:53	03312	"	OPEN	
26/05/98	21:54:16	21:59:21	03313	1875	OPEN	
26/05/98	22:23:10	22:28:17	03314	"	OPEN	
26/05/98	22:40:29	22:45:35	03315	1880	OPEN	
26/05/98	23:29:23	23:34:29	03316	"	OPEN	
26/05/98	23:40:04	23:45:09	03317	"	OPEN	p=10 (error: last energy repeated)
27/05/98	00:06:28	00:11:35	03318	1865	OPEN	
27/05/98	00:36:51	00:42:04	03319	"	OPEN	
27/05/98	01:08:22	01:13:28	03320	1860	OPEN	
27/05/98	01:35:56	01:41:06	03321	"	OPEN	
27/05/98	01:43:49	01:48:55	03322	1849	OPEN	
27/05/98	02:10:14	02:15:19	03323	"	OPEN	
27/05/98	02:19:23	02:24:30	03324	1845	OPEN	
27/05/98	02:47:26	02:52:33	03325	"	OPEN	
27/05/98	02:55:48	03:00:54	03326	1841	OPEN	
27/05/98	03:28:50	03:33:57	03327	"	OPEN	
27/05/98	03:39:39	03:44:45	03328	1837	OPEN	
27/05/98	04:08:06	04:13:13	03329	"	OPEN	
27/05/98	04:17:16	04:22:23	03330	1830	OPEN	
27/05/98	04:46:08	04:51:14	03331	"	OPEN	
27/05/98	04:57:52	05:03:06	03332	1837	OPEN	
27/05/98	05:25:31	06:15:34	03333	"	OPEN	
27/05/98	06:27:20	06:32:27	03334	1839	OPEN	
27/05/98	07:29:23	07:34:30	03335	"	OPEN	
27/05/98	07:38:34	07:43:40	03336	1865	OPEN	
27/05/98	08:05:29	09:04:14	03337	"	OPEN	
27/05/98	09:04:54	09:05:42	03338		OPEN	test
27/05/98	09:06:15	09:08:06	03339		OPEN	test
27/05/98	09:10:17	09:13:39	03340		OPEN	test
27/05/98	09:16:23	09:21:55	03341		OPEN	test
27/05/98	09:56:14	10:01:20	03342		OPEN	test
27/05/98	10:08:47	10:16:15	03343	1836	OPEN	no scan
27/05/98	10:40:00	10:45:07	03344	"	OPEN	
27/05/98	11:03:25	11:08:31	03345	1836	OPEN	
27/05/98	11:48:06	11:53:13	03346	"	OPEN	
27/05/98	12:38:10	13:28:14	03347	1865	OPEN	
Low energy continuum with SACO (BEAM_OPEN.CFG)						
28/05/98	04:10:28	04:18:33	03358	500	OPEN	
28/05/98	04:47:26	04:55:35	03359	"	OPEN	
28/05/98	05:21:12	05:29:22	03360	450	OPEN	
28/05/98	05:59:57	06:08:06	03361	"	OPEN	

X-Tube					
28/05/98	06:42:50	11:02:57	03362		OPEN
Low energy continuum with SACO (BEAM_OPEN.CFG)					
28/05/98	12:00:37	12:08:53	03363	420	OPEN
28/05/98	12:44:15	12:52:24	03364	"	OPEN
High energy continuum with DCI (BEAM_FULL_1.CFG)					
28/05/98	18:28:25	18:33:32	03369	2800	OPEN
28/05/98	18:58:55	19:04:00	03370	"	A THIN
28/05/98	19:05:31	19:10:46	03371	"	B THIN
28/05/98	19:12:09	19:17:14	03372	"	C MEDIUM
28/05/98	19:18:45	19:23:52	03373	"	D THICK
28/05/98	19:25:15	19:30:21	03374	"	OPEN
28/05/98	19:48:36	19:53:42	03375	2600	OPEN
28/05/98	20:27:48	20:32:54	03376	"	A THIN
28/05/98	20:34:17	20:39:24	03377	"	B THIN
28/05/98	20:40:47	20:45:54	03378	"	C MEDIUM
28/05/98	20:47:17	20:52:23	03379	"	D THICK
28/05/98	20:53:53	20:59:00	03380	"	OPEN
28/05/98	21:13:31	21:18:35	03381	2400	OPEN
28/05/98	21:50:12	21:55:18	03382	"	A THIN
28/05/98	21:57:04	22:02:12	03383	"	B THIN
28/05/98	22:03:33	22:08:41	03384	"	C MEDIUM
28/05/98	22:10:06	22:15:12	03385	"	D THICK
28/05/98	22:16:34	22:21:40	03386	"	OPEN
28/05/98	22:30:36	22:35:41	03387	2200	OPEN
28/05/98	22:59:01	23:04:07	03388	"	A THIN
28/05/98	23:05:38	23:10:44	03389	"	B THIN
28/05/98	23:12:07	23:17:12	03390	"	C MEDIUM
28/05/98	23:18:43	23:23:49	03391	"	D THICK
28/05/98	23:26:40	00:16:47	03392	"	OPEN
29/05/98	00:19:44	01:07:49	03393	"	OPEN
29/05/98	02:01:16	02:06:21	03394	2000	OPEN
29/05/98	02:29:47	02:34:52	03395	"	A THIN
29/05/98	02:36:14	02:41:20	03396	"	B THIN
29/05/98	02:42:42	02:47:49	03397	"	C MEDIUM
29/05/98	02:49:13	02:54:18	03398	"	D THICK
29/05/98	02:55:48	03:01:02	03399	"	OPEN
29/05/98	03:07:02	03:16:56	03400	-	OPEN
29/05/98	04:07:18	04:12:23	03401	1900	OPEN
29/05/98	04:37:59	04:43:05	03402	"	A THIN
29/05/98	04:44:35	04:49:49	03403	"	B THIN
29/05/98	04:51:12	04:56:18	03404	"	C MEDIUM
29/05/98	04:57:49	05:02:54	03405	"	D THICK
29/05/98	05:04:17	05:09:23	03406	"	OPEN
29/05/98	05:14:23	05:19:29	03407	1800	OPEN
29/05/98	05:48:29	05:53:34	03408	"	A THIN
29/05/98	05:54:58	06:00:02	03409	"	B THIN
29/05/98	06:01:25	06:06:31	03410	"	C MEDIUM
29/05/98	06:08:02	06:13:07	03411	"	D THICK
29/05/98	06:14:37	06:19:43	03412	"	OPEN
29/05/98	06:32:33	06:37:38	03413	1750	OPEN
29/05/98	07:03:30	07:08:36	03414	"	A THIN
29/05/98	07:09:57	07:15:04	03415	"	B THIN
29/05/98	07:16:26	07:21:32	03416	"	C MEDIUM
29/05/98	07:22:54	07:28:00	03417	"	D THICK
29/05/98	07:29:30	08:36:16	03418	"	OPEN
29/05/98	08:45:18	08:50:23	03419	2200	OPEN
29/05/98	09:13:50	09:18:56	03420	"	A THIN
29/05/98	09:20:26	09:25:41	03421	"	B THIN
29/05/98	09:27:03	09:32:09	03422	"	C MEDIUM
29/05/98	09:33:40	09:38:46	03423	"	D THICK

started manually from EC

background

29/05/98	09:40:08	09:45:14	03424	"	OPEN	
29/05/98	11:18:26	12:00:53	03425	-	OPEN	Calibration source
29/05/98	12:04:35	14:00:58	03426		OPEN	SACO setting
Nitrogen Edge with SACO (BEAM_OPEN_2.CFG)						
29/05/98	15:10:12	15:18:17	03427	390	OPEN	
29/05/98	15:42:53	15:50:59	03428	"	OPEN	
29/05/98	16:05:11	16:13:24	03429	350	OPEN	
29/05/98	16:35:01	16:43:06	03430	"	OPEN	
29/05/98	17:04:20	21:57:54	03431	-	OPEN	background
29/05/98	22:04:39	22:19:48	03432	325	OPEN	
29/05/98	22:42:39	22:57:40	03433	"	OPEN	
29/05/98	23:27:51	23:45:06	03434	-	OPEN	background
30/05/98	00:02:41	00:17:48	03435	500	OPEN	
30/05/98	00:41:06	01:31:08	03436	"	OPEN	
30/05/98	01:41:08	01:51:22	03437	420	OPEN	
30/05/98	02:24:13	09:06:57	03438	-	OPEN	background
X-Tube						
02/06/98	11:46:04	11:48:18	03439		OPEN	
02/06/98	11:52:14	12:10:18	03440		OPEN	since 3440, CCD#1 Q#0 set as bad, background
02/06/98	12:23:41	13:58:50	03441	1.5 keV	OPEN	
02/06/98	13:59:38	14:08:42	03442		OPEN	
02/06/98	14:09:06	15:23:23	03443		OPEN	
02/06/98	16:14:33	16:15:57	03444		OPEN	
02/06/98	16:26:48	16:27:35	03445		OPEN	since 3445 , added FITS keywords: RESEGSET, RESEPEAT, OBTEGSET
02/06/98	17:53:41	18:56:05	03446		OPEN	
Al edge scan with DCI (BEAM_FULL_1.CFG)						
02/06/98	23:23:11	23:31:27	03453	1700	OPEN	
03/06/98	00:00:17	00:08:26	03454	"	A THIN	
03/06/98	00:09:49	00:17:51	03455	"	B THIN	
03/06/98	00:19:20	00:27:24	03456	"	C MEDIUM	
03/06/98	00:29:11	00:39:15	03457	"	D THICK	
03/06/98	00:40:46	00:48:52	03458	"	OPEN	
03/06/98	00:59:01	01:07:05	03459	1650	OPEN	
03/06/98	01:29:02	01:37:08	03460	"	A THIN	
03/06/98	01:38:47	01:46:53	03461	"	B THIN	
03/06/98	01:48:32	01:56:38	03462	"	C MEDIUM	
03/06/98	01:58:16	02:08:18	03463	"	D THICK	
03/06/98	02:09:48	02:17:55	03464	"	OPEN	
03/06/98	02:27:32	02:35:36	03465	1600	OPEN	
03/06/98	03:00:43	03:08:52	03466	"	A THIN	
03/06/98	03:10:15	03:18:23	03467	"	B THIN	
03/06/98	03:19:46	03:27:54	03468	"	C MEDIUM	
03/06/98	03:29:32	03:39:35	03469		D THICK	
03/06/98	03:41:05	03:49:12	03470	"	OPEN	
03/06/98	03:58:28	04:06:34	03471	1570	OPEN	
03/06/98	04:28:29	04:36:45	03472	"	A THIN	
03/06/98	04:38:08	04:46:14	03473	"	B THIN	
03/06/98	04:47:37	04:55:44	03474	"	C MEDIUM	
03/06/98	04:57:22	05:07:26	03475	"	D THICK	
03/06/98	05:08:52	05:16:59	03476	"	OPEN	
03/06/98	05:23:05	05:33:13	03477	1550	OPEN	
03/06/98	05:59:48	06:09:57	03478	"	A THIN	
03/06/98	06:11:20	06:21:22	03479	"	B THIN	
03/06/98	06:22:56	06:33:00	03480	"	C MEDIUM	
03/06/98	06:34:30	06:49:33	03481	"	D THICK	
03/06/98	06:50:57	07:01:04	03482	"	OPEN	
03/06/98	08:26:13	08:36:19	03483	1570	OPEN	

03/06/98	09:06:59	09:17:07	03484	"	A THIN	
03/06/98	09:18:30	09:28:36	03485	"	B THIN	
03/06/98	09:30:04	09:40:05	03486	"	C MEDIUM	
03/06/98	09:41:36	09:56:42	03487	"	D THICK	
03/06/98	09:58:09	10:58:08	03488	"	OPEN	SACO reinjection
Low energy continuum with SACO (BEAM_OPEN_2.CFG)						
03/06/98	14:13:25	14:18:33	03490	270	OPEN	
03/06/98	14:56:15	15:06:25	03491	"	C MEDIUM	wrong filter,started again
03/06/98	15:24:53	15:32:57	03492	"	A THIN	
03/06/98	15:35:49	15:43:53	03493	"	B THIN	
03/06/98	15:45:21	15:57:24	03494	"	C MEDIUM	
03/06/98	15:58:55	16:14:01	03495	"	D THICK	
03/06/98	16:15:40	16:23:45	03496	"	OPEN	
03/06/98	16:56:51	17:06:58	03497	250	OPEN	
03/06/98	17:39:40	17:49:46	03498	"	OPEN	
03/06/98	18:36:15	18:41:30	03499	200	OPEN	SACOREINJECTION
Low energy continuum with SACO (BEAM_FULL_4.CFG)						
03/06/98	21:55:48	22:34:22	03500	200	OPEN	camera alignment
03/06/98	22:34:48	23:02:18	03501	"	OPEN	"
03/06/98	23:25:23	23:30:29	03502	200	OPEN	
04/06/98	00:00:09	00:10:16	03503	"	A THIN	
04/06/98	00:11:39	00:21:47	03504	"	B THIN	
04/06/98	00:23:09	00:38:13	03505	"	C MEDIUM	
04/06/98	00:39:49	00:59:51	03506	"	D THICK	
04/06/98	01:01:25	01:06:28	03507	"	OPEN	
04/06/98	01:28:10	01:33:17	03508	150	OPEN	
04/06/98	02:14:09	02:24:17	03509	"	A THIN	
04/06/98	02:25:57	02:35:58	03510	"	B THIN	
04/06/98	02:37:27	02:52:34	03511	"	C MEDIUM	
04/06/98	02:54:04	03:14:11	03512	"	D THICK	
04/06/98	03:15:38	03:20:40	03513	"	OPEN	
04/06/98	03:40:08	03:45:14	03514	150	OPEN	BEAM_FULL_2.CFG
04/06/98	04:12:00	04:42:05	03515	"	OPEN	
04/06/98	05:11:15	05:16:21	03516	175	OPEN	
04/06/98	06:03:05	06:08:11	03517	"	OPEN	
X-Tube						
04/06/98	06:16:27	09:40:52	03518		OPEN	
High energy continuum with DCI (BEAM_OPEN.CFG)						
04/06/98	14:03:00	15:50:54	03521		OPEN	beam setup
04/06/98	16:27:18	16:37:23	03522	3000	OPEN	filter missed in the beam
04/06/98	16:38:30	16:48:36	03523	3000	OPEN	p=10 again
04/06/98	17:22:38	17:32:41	03524	"	OPEN	
04/06/98	17:56:08	18:04:13	03525	3500	OPEN	
04/06/98	18:28:25	19:48:30	03526	"	OPEN	
04/06/98	19:59:26	20:00:32	03527	3500	OPEN	@ the bottom of camera
04/06/98	20:03:28	20:29:49	03528	"	OPEN	nobeam
04/06/98	20:30:18	20:37:52	03529	"	OPEN	positioning of the camera
04/06/98	20:38:20	20:57:56	03530	"	OPEN	@ the top of the camera
04/06/98	21:18:13	21:26:18	03531	4000	OPEN	
04/06/98	21:48:10	21:56:14	03532	"	OPEN	
04/06/98	22:02:17	22:12:23	03533	4500	OPEN	
04/06/98	22:36:38	22:46:46	03534	"	OPEN	
04/06/98	23:13:23	23:23:30	03535	5000	OPEN	
04/06/98	23:53:24	00:53:34	03536	"	OPEN	
05/06/98	00:55:47	01:19:42	03537	-	OPEN	background
05/06/98	01:32:35	01:42:43	03538	5500	OPEN	
05/06/98	02:05:44	02:15:49	03539	"	OPEN	
05/06/98	02:35:19	02:45:27	03540	6000	OPEN	
05/06/98	03:18:21	03:28:24	03541	"	OPEN	
05/06/98	03:33:06	03:43:14	03542	6500	OPEN	
05/06/98	04:07:27	04:17:35	03543	"	OPEN	

05/06/98	04:21:23	04:31:30	03544	7000	OPEN	
05/06/98	04:55:12	05:55:15	03545	"	OPEN	
05/06/98	06:14:20	06:24:27	03546	7500	OPEN	
05/06/98	06:49:53	06:59:54	03547	"	OPEN	
05/06/98	07:12:53	07:22:55	03548	8000	OPEN	
05/06/98	07:47:17	07:57:32	03549	"	OPEN	
05/06/98	09:11:55	09:18:22	03550	3920	OPEN	BEAM_FULL_2D.CFG filter missing in the beam flux too low
05/06/98	09:23:49	09:28:56	03551	3920	OPEN	"
05/06/98	09:31:56	09:37:04	03552	"	D THICK	"
05/06/98	09:38:35	09:43:42	03553	"	OPEN	"
05/06/98	09:45:13	09:48:02	03554	"	D THICK	"
Medium energy continuum with SACO						
05/06/98	10:21:23	12:00:50	03555		OPEN	beam setup
05/06/98	12:01:16	13:07:48	03556		OPEN	"
05/06/98	13:28:31	13:38:34	03557	1300	OPEN	
05/06/98	15:36:04	15:46:07	03558	1300	OPEN	beam calib.failed,started again p=10
05/06/98	16:11:37	17:11:43	03559	"	OPEN	p=20
05/06/98	17:19:30	17:40:16	03560		OPEN	SACO reinjection
05/06/98	18:31:05	20:13:11	03562	-	OPEN	background
05/06/98	20:28:50	20:29:57	03563		OPEN	test
05/06/98	21:29:52	21:31:15	03564		unknown	test
05/06/98	21:37:46	21:39:39	03565		unknown	calibration source
05/06/98	21:41:42	21:54:42	03566		OPEN	"
05/06/98	22:03:01	22:13:10	03567	1150	OPEN	
05/06/98	22:37:00	22:47:04	03568	"	OPEN	
05/06/98	22:57:57	23:08:06	03569	1050	OPEN	
05/06/98	23:32:06	23:42:15	03570	"	OPEN	
05/06/98	23:58:19	00:08:26	03571	950	OPEN	
06/06/98	00:32:22	00:42:31	03572	"	OPEN	
06/06/98	00:56:05	01:06:14	03573	850	OPEN	
High energy continuum with DCI						
08/06/98	15:12:25	16:47:14	03574		OPEN	DCI setup
08/06/98	16:47:31	17:17:28	03575		OPEN	"
08/06/98	17:28:42	17:38:49	03576	9000	OPEN	
08/06/98	18:00:42	18:10:46	03577	"	OPEN	
08/06/98	18:36:04	18:46:10	03578	11000	OPEN	
08/06/98	19:09:02	19:19:09	03579	"	OPEN	
08/06/98	19:30:22	19:40:29	03580	13000	OPEN	
08/06/98	20:04:10	20:14:17	03581	"	OPEN	
08/06/98	21:02:34	21:12:40	03582	15000	OPEN	
08/06/98	21:34:35	21:44:41	03583	"	OPEN	
08/06/98	22:31:35	22:41:39	03584	17000	OPEN	
08/06/98	23:04:25	23:14:30	03585	"	OPEN	
08/06/98	23:18:31	23:28:34	03586	16000	OPEN	
08/06/98	23:51:02	00:01:05	03587	"	OPEN	
09/06/98	00:35:10	00:45:16	03588	14000	OPEN	
09/06/98	01:08:28	01:18:38	03589	"	OPEN	
09/06/98	01:37:16	01:47:23	03590	12000	OPEN	
09/06/98	02:09:51	02:19:54	03591	"	OPEN	
09/06/98	02:41:15	02:51:22	03592	10000	OPEN	
09/06/98	03:14:48	03:24:53	03593	"	OPEN	
09/06/98	03:36:09	03:46:16	03594	9000	OPEN	
09/06/98	04:09:06	05:09:12	03595	"	OPEN	
09/06/98	05:23:20	05:41:48	03596		OPEN	test
09/06/98	05:42:37	05:55:52	03597		OPEN	beam setting
09/06/98	05:56:38	06:01:50	03598		OPEN	"
09/06/98	06:03:44	06:13:37	03599	9000	OPEN	test
09/06/98	06:34:37	06:44:44	03600	12000	OPEN	
09/06/98	07:07:14	08:07:18	03601	"	OPEN	

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09/06/98	08:39:59	09:26:47	03602		OPEN	test
09/06/98	09:40:54	09:51:02	03603	15000	OPEN	p=10
09/06/98	10:18:19	10:38:06	03604		OPEN	no good
09/06/98	10:55:20	11:55:23	03605	15000	OPEN	p=20
Al-K edge scan with DCI						
09/06/98	12:26:40	14:33:10	03607		OPEN	beam setting
09/06/98	14:41:18	15:51:29	03608		OPEN	"
09/06/98	15:51:43	17:14:18	03609		OPEN	"
09/06/98	17:36:36	17:46:38	03610	1500	OPEN	
09/06/98	18:10:40	18:20:57	03611	"	A THIN	
09/06/98	18:22:20	18:32:23	03612	"	B THIN	
09/06/98	18:33:59	18:49:08	03613	"	C MEDIUM	
09/06/98	18:50:30	19:10:35	03614	"	D THICK	
09/06/98	19:12:02	19:22:10	03615	"	OPEN	
09/06/98	19:36:46	19:46:55	03616	1525	OPEN	
09/06/98	20:14:40	20:24:48	03617	"	A THIN	
09/06/98	20:26:11	20:36:19	03618	"	B THIN	
09/06/98	20:37:42	20:52:44	03619	"	C MEDIUM	
09/06/98	20:55:25	21:10:26	03620	"	D THICK	
09/06/98	21:12:03	21:20:09	03621	"	OPEN	
09/06/98	21:49:54	21:57:55	03622	1559	OPEN	
09/06/98	22:21:52	22:32:07	03623	"	A THIN	
09/06/98	22:33:30	22:43:37	03624	"	B THIN	
09/06/98	22:45:05	22:55:11	03625	"	C MEDIUM	
09/06/98	22:56:38	23:11:45	03626	"	D THICK	
09/06/98	23:13:13	23:21:16	03627	"	OPEN	
09/06/98	23:31:49	23:39:54	03628	1561	OPEN	
10/06/98	00:09:32	00:19:40	03629	"	A THIN	
10/06/98	00:21:03	00:31:11	03630	"	B THIN	
10/06/98	00:32:33	00:42:41	03631	"	C MEDIUM	
10/06/98	00:44:09	00:59:21	03632	"	D THICK	
10/06/98	01:00:43	01:08:48	03633	"	OPEN	
10/06/98	01:47:47	01:55:53	03634	1580	OPEN	
10/06/98	02:20:00	02:30:03	03635	"	A THIN	
10/06/98	02:31:32	02:41:40	03636	"	B THIN	
10/06/98	02:43:19	02:53:28	03637	"	C MEDIUM	
10/06/98	02:54:52	03:09:55	03638	"	D THICK	
10/06/98	03:11:19	03:19:25	03639	"	OPEN	
10/06/98	07:47:46	09:10:53	03640		OPEN	test
10/06/98	09:11:28	10:48:28	03641		OPEN	background with scan
Medium energy continuum with SACO						
10/06/98	10:59:28	11:08:56	03642		OPEN	test
10/06/98	12:07:45	13:37:04	03643		OPEN	"
10/06/98	14:30:22	15:46:43	03644		OPEN	"
10/06/98	15:46:59	16:40:40	03645		OPEN	"
10/06/98	16:50:46	17:29:38	03646		OPEN	"
10/06/98	17:57:14	18:07:19	03647	850	OPEN	
10/06/98	18:31:37	18:41:43	03648	"	OPEN	
10/06/98	18:56:04	19:01:09	03649	850	OPEN	beam down
10/06/98	20:39:28	20:49:18	03650		OPEN	SACO setup
10/06/98	20:54:27	21:06:18	03651		OPEN	"
10/06/98	21:06:46	21:38:42	03652		OPEN	"
10/06/98	22:33:43	22:43:46	03653	750	OPEN	
10/06/98	23:07:32	23:17:38	03654	"	OPEN	
10/06/98	23:29:24	23:39:40	03655	700	OPEN	
11/06/98	00:03:26	00:13:30	03656	"	OPEN	
11/06/98	00:21:34	00:31:41	03657	800	OPEN	
11/06/98	00:55:16	01:05:24	03658	"	OPEN	
11/06/98	01:13:31	01:16:46	03659		OPEN	test
11/06/98	01:27:04	01:37:12	03660	900	OPEN	
11/06/98	02:01:02	02:11:18	03661	"	OPEN	

11/06/98	02:23:37	02:33:44	03662	1000	OPEN	
11/06/98	02:57:08	03:57:18	03663	"	OPEN	
11/06/98	04:14:34	05:28:28	03664		OPEN	background
11/06/98	05:32:00	07:01:30	03665		CLOSED	background
Al-K edge scan with DCI						
11/06/98	09:27:47	10:02:06	03666		OPEN	beam setup
11/06/98	10:11:51	10:16:55	03667	1580	OPEN	
11/06/98	10:42:27	10:50:34	03668	"	A THIN	
11/06/98	10:52:04	11:00:11	03669	"	B THIN	
11/06/98	11:01:51	11:09:57	03670	"	C MEDIUM	
11/06/98	11:11:37	11:21:41	03671	"	D THICK	
11/06/98	11:23:08	11:28:16	03672	"	OPEN	
11/06/98	11:40:31	11:45:36	03673	1620	OPEN	
11/06/98	12:10:07	12:18:14	03674	"	A THIN	
11/06/98	12:19:53	12:28:00	03675	"	B THIN	
11/06/98	12:29:38	12:37:41	03676	"	C MEDIUM	
11/06/98	12:39:25	12:49:33	03677	"	D THICK	
11/06/98	12:50:56	12:56:04	03678	"	OPEN	
11/06/98	13:30:55	13:36:03	03679	1560	OPEN	to be started again
11/06/98	14:03:58	14:09:06	03680	"	OPEN	p=10
11/06/98	14:33:23	14:41:30	03681	"	A THIN	
11/06/98	14:42:58	14:51:07	03682	"	B THIN	
11/06/98	14:52:47	15:00:53	03683	"	C MEDIUM	
11/06/98	15:02:31	15:12:36	03684	"	D THICK	
11/06/98	15:14:03	15:19:12	03685	"	OPEN	
Sn-L edge scan with DCI						
11/06/98	15:25:36	17:27:45	03686	3920	OPEN	beam setup
11/06/98	18:27:44	18:32:51	03687	3920	OPEN	
11/06/98	18:34:30	18:39:38	03688	"	D THICK	
11/06/98	18:41:09	18:46:16	03689	"	OPEN	
11/06/98	18:48:04	18:53:12	03690	"	D THICK	
11/06/98	18:54:52	19:00:00	03691	"	OPEN	
11/06/98	19:32:20	19:37:28	03692	3930	OPEN	
11/06/98	19:39:04	19:44:07	03693	"	D THICK	
11/06/98	19:45:46	19:50:51	03694	"	OPEN	
11/06/98	19:52:27	19:57:36	03695	"	D THICK	
11/06/98	19:59:08	20:04:12	03696	"	OPEN	
11/06/98	20:15:19	20:20:28	03697	3935	OPEN	
11/06/98	20:21:59	20:27:07	03698	"	D THICK	
11/06/98	20:28:40	20:33:44	03699	"	OPEN	
11/06/98	20:35:20	20:40:28	03700	"	D THICK	
11/06/98	20:42:16	20:50:39	03701	"	OPEN	
11/06/98	21:05:52	21:11:00	03702	4000	OPEN	BEAM_FULL_3D
11/06/98	21:12:36	21:27:49	03703	"	D THICK	
11/06/98	21:12:36	21:27:49	03704	"	D THICK	
11/06/98	21:34:44	21:53:34	03705	"	OPEN	
unknown	unknown	unknown	03706	"	D THICK	
unknown	unknown	unknown	03707	"	OPEN	
11/06/98	22:21:41	22:26:46	03708	4150	OPEN	BEAM_FULL_2D
11/06/98	22:28:34	22:33:41	03709	"	D THICK	
11/06/98	22:35:21	22:40:28	03710	"	OPEN	
11/06/98	22:51:20	22:57:19	03711	"	D THICK	
11/06/98	23:05:27	23:10:36	03712	4150	OPEN	
11/06/98	23:12:15	23:17:24	03713	"	D THICK	
11/06/98	23:18:54	23:24:01	03714	"	OPEN	
11/06/98	23:25:32	23:30:40	03715	"	D THICK	
11/06/98	23:32:36	23:37:44	03716	"	OPEN	
11/06/98	23:42:05	23:47:13	03717	4155	OPEN	
11/06/98	23:48:50	23:53:53	03718	"	D THICK	
11/06/98	23:55:32	00:00:49	03719	"	OPEN	
12/06/98	00:02:20	00:07:28	03720	"	D THICK	

12/06/98	00:08:59	00:14:07	03721	"	OPEN	
12/06/98	00:26:23	00:31:27	03722	4160	OPEN	
12/06/98	00:33:05	00:38:13	03723	"	D THICK	
12/06/98	00:40:02	00:45:10	03724	"	OPEN	
12/06/98	00:46:50	00:51:59	03725	"	D THICK	
12/06/98	00:53:30	00:58:38	03726	"	OPEN	
12/06/98	01:18:22	01:23:31	03727	4460	OPEN	
12/06/98	01:55:44	02:00:51	03728	"	OPEN	
12/06/98	02:02:39	02:07:42	03729	"	D THICK	
12/06/98	02:09:27	02:14:35	03730	"	OPEN	
12/06/98	02:16:06	02:21:14	03731	"	D THICK	
12/06/98	02:22:44	02:27:52	03732	"	OPEN	
12/06/98	02:37:31	02:42:47	03733	4465	OPEN	
12/06/98	02:44:18	02:49:26	03734	"	D THICK	
12/06/98	02:50:57	02:56:03	03735	"	OPEN	
12/06/98	03:41:23	03:46:26	03736	4465	OPEN	restarted
12/06/98	03:48:07	03:53:10	03737	"	D THICK	
12/06/98	03:54:47	03:59:55	03738	"	OPEN	
12/06/98	04:08:53	04:14:01	03739	4470	OPEN	
12/06/98	04:15:32	04:20:39	03740	"	D THICK	
12/06/98	04:22:11	04:27:17	03741	"	OPEN	
12/06/98	04:29:14	04:34:21	03742	"	D THICK	
12/06/98	04:36:02	04:41:10	03743	"	OPEN	
12/06/98	04:54:38	04:59:45	03744	4350	OPEN	
12/06/98	05:01:25	05:06:32	03745	"	D THICK	
12/06/98	05:08:20	05:13:28	03746	"	OPEN	
12/06/98	05:15:08	05:20:16	03747	"	D THICK	
12/06/98	05:21:47	05:26:54	03748	"	OPEN	
12/06/98	05:38:41	05:43:45	03749	4600	OPEN	
12/06/98	05:45:22	05:50:38	03750	"	D THICK	
12/06/98	05:52:10	05:57:17	03751	"	OPEN	
12/06/98	05:58:49	06:03:56	03752	"	D THICK	
12/06/98	06:05:27	06:10:35	03753	"	OPEN	
12/06/98	06:54:24	06:59:31	03754	4155	OPEN	
12/06/98	07:01:07	07:07:00	03755	"	D THICK	
12/06/98	07:18:41	07:23:58	03756	4155	OPEN	restarted
12/06/98	07:25:29	07:30:37	03757	"	D THICK	
12/06/98	07:32:08	07:37:46	03758	"	OPEN	
12/06/98	09:12:16	09:17:19	03759	4155	OPEN	
12/06/98	09:18:57	09:24:11	03760	"	D THICK	
12/06/98	09:25:42	09:30:49	03761	"	OPEN	
12/06/98	09:32:28	09:37:35	03762	"	D THICK	
12/06/98	09:39:22	09:44:28	03763	"	OPEN	
12/06/98	10:15:03	10:20:07	03764	4155	OPEN	
12/06/98	10:21:44	10:26:59	03765	"	D THICK	
12/06/98	10:28:30	10:33:38	03766	"	OPEN	
12/06/98	10:35:09	10:40:16	03767	"	D THICK	
12/06/98	10:42:11	10:47:18	03768	"	OPEN	
12/06/98	10:48:59	11:36:46	03769		OPEN	background
Oxygen edge scan with SACO						
12/06/98	12:58:10	13:08:25	03770	540	OPEN	
12/06/98	13:33:06	13:43:14	03771	"	OPEN	
12/06/98	15:01:39	15:11:47	03772	530	OPEN	
12/06/98	15:37:49	15:47:58	03773	"	OPEN	
12/06/98	16:22:36	16:32:40	03774	550	OPEN	
12/06/98	16:57:53	17:08:03	03775	"	OPEN	beam down
12/06/98	20:48:14	21:06:48	03776		OPEN	test
12/06/98	21:17:49	21:27:56	03777	570	OPEN	
12/06/98	21:53:10	22:03:12	03778	"	OPEN	
12/06/98	22:29:43	22:37:50	03779	545	OPEN	
12/06/98	23:00:55	23:09:02	03780	"	OPEN	

12/06/98	23:28:02	23:36:11	03781	535	OPEN	
12/06/98	23:58:41	00:06:50	03782	"	OPEN	
13/06/98	00:32:54	00:41:03	03783	520	OPEN	
13/06/98	01:02:04	01:10:11	03784	"	OPEN	
13/06/98	01:23:56	01:32:02	03785	560	OPEN	
SiLi edge scan with DCI						
30/06/98	22:19:09	22:27:13	03790	1800	OPEN	test
30/06/98	22:38:14	22:43:16	03791	1800	OPEN	camera @ -110 °C
30/06/98	23:12:49	23:17:54	03792	"	OPEN	
30/06/98	23:26:17	23:31:23	03793	1825	OPEN	
01/07/98	00:00:47	00:05:53	03794	"	OPEN	
01/07/98	00:12:04	00:17:13	03795	1838	OPEN	
01/07/98	00:55:31	01:00:37	03796	"	OPEN	
01/07/98	01:05:47	01:10:52	03797	1840	OPEN	
01/07/98	01:40:01	01:45:07	03798	"	OPEN	
01/07/98	01:50:16	01:55:22	03799	1847	OPEN	
01/07/98	02:24:56	02:30:09	03800	"	OPEN	
01/07/98	02:35:01	02:40:07	03801	1851	OPEN	
01/07/98	03:09:19	03:14:24	03802	"	OPEN	
01/07/98	03:19:08	03:24:13	03803	1856	OPEN	
01/07/98	03:53:38	03:58:44	03804	"	OPEN	
01/07/98	04:03:58	04:09:07	03805	1865	OPEN	
01/07/98	04:38:42	04:43:55	03806	"	OPEN	
01/07/98	06:56:55	07:02:02	03807	1838	OPEN	camera @ -90 °C
01/07/98	07:31:35	07:36:42	03808	"	OPEN	
01/07/98	07:42:39	07:47:46	03809	1840	OPEN	
01/07/98	08:24:21	08:29:27	03810	"	OPEN	
01/07/98	08:35:32	08:40:38	03811	1865	OPEN	
01/07/98	09:10:27	10:05:33	03812	"	OPEN	
Low energy continuum with SACO						
01/07/98	17:17:29	17:27:33	03814	500	OPEN	
01/07/98	18:04:16	18:14:30	03817	"	A THIN	
01/07/98	21:55:57	22:06:03	03819	225	OPEN	
01/07/98	22:35:01	22:45:07	03820	420	OPEN	
01/07/98	23:15:18	23:25:23	03821	"	A THIN	
01/07/98	23:26:54	23:36:59	03822	"	B THIN	
01/07/98	23:38:38	23:48:44	03823	"	C MEDIUM	
01/07/98	23:50:31	00:00:37	03824	"	D THICK	
02/07/98	00:02:23	00:12:29	03825	"	OPEN	
02/07/98	01:29:23	01:39:28	03826	350	OPEN	
02/07/98	02:10:14	02:20:20	03827	"	A THIN	
02/07/98	02:21:50	02:31:56	03828	"	B THIN	
02/07/98	02:33:27	02:43:33	03829	"	C MEDIUM	
02/07/98	02:45:12	02:55:17	03830	"	D THICK	
02/07/98	02:57:04	03:07:10	03831	"	OPEN	
02/07/98	03:22:26	03:32:40	03832	325	OPEN	
02/07/98	03:40:34	04:38:35	03833	"	OPEN	test
02/07/98	04:47:33	04:57:37	03834	325	OPEN	
02/07/98	05:25:25	05:35:39	03835	"	A THIN	
02/07/98	05:37:02	05:47:07	03836	"	B THIN	
02/07/98	05:48:39	05:58:44	03837	"	C MEDIUM	
02/07/98	06:00:33	06:10:37	03838	"	D THICK	
02/07/98	06:12:24	06:22:30	03839	"	OPEN	

ANNEX 3 EICC HK Data Format

Legenda:

Energy = Required (eV)/CCOE

MOGSE positioning before starting the flux check using the CS (SiLI Detector) in front of the RD (resizing device):

RP-rZ: Rotation Angle to select the Beam

RD-Ty, RD-tZ: positioning of the Resizing Device

CS-tz, CS-tY: vertical and horizontal positioning of the Si(Li) detector

CH-tY, CH-tZ: vertical and horizontal positioning of the Camera Head.

The first time stamp is the EICC CPU time before sending the data and the second one is the Science Console CPU time at the receipt of the data.

SyncCurt = Synchrotron current (Amp.)

LifeTime = Lifetime positrons in ring

SyncDiod = monitoring diod current (relative current measurement after the monochrommator), SACO only.

Attenu = 0 without attenuator in the DCI or SACO

3 with attenuator in the DCI or SACO

NrjMin = Range of Int. begin (eV)

NrjMax = Range of Int.end, for Si(Li) slow (eV)

SACO BEAM

EPIC camera Idle period before OPEN 1, data received during the Beam Flux check - Protocol 10 (e.g.: file ORS01935_980416_154238_.omh)	
Run_ID = {E 9 Run_ID:Sunayev}@{I 9 Time} 15:46:24.096	
B_Line = SACO_Line@15:46:23.799	15:46:24.443
Energy = +349938844E-6@15:46:24.270	15:46:24.915
RP-rZ = +250000000E-9@15:46:24.731	15:46:25.376
RD-tY = +158000000E-6@15:46:25.212	15:46:25.857
RD-tZ = +545000000E-7@15:46:25.692	15:46:26.336
CS-tZ = +545000000E-7@15:46:29.147	15:46:29.790
CH-tY = +370000000E-7@15:46:29.618	15:46:30.261
CH-tZ = +639000000E-7@15:46:30.079	15:46:30.723
ACK: SACO_Line is ready@15:46:30.429	15:46:31.072
CS-tY = +190000000E-6@15:46:43.688	15:46:44.330

EPIC camera run period OPEN 1, data received during EPIC camera exposure (e.g.: file ORS01935_980416_155044.omh)	
Run_ID = +193500000E-5@15:50:44.429	15:50:45.159
SyncCurt = +24880E-2#1@15:50:45.340	15:50:46.068
LifeTime = +18490E-3#1@15:50:45.911	15:50:46.638
SyncDiod = +27157E-13#1@15:50:46.482	15:50:47.209
SyncCurt = +24840E-2#2@15:50:48.144	15:50:48.871
LifeTime = +18490E-3#2@15:50:48.745	15:50:49.472
SyncDiod = +29902E-13#2@15:50:49.316	15:50:50.042
...	...

EPIC camera Idle period before OPEN 2, data received during the Beam Calibration - Protocol 20 file ORS01936_980416_155604_.omh	
Attenu = +000000000E-9@15:57:07.867	15:57:08.727
NrjMin = +200000000E-6@15:57:08.337	15:57:09.196
NrjMax = +180000000E-4@15:57:08.898	15:57:09.757
ACK: End Of Absolute Scan@16:24:03.439	16:24:03.803
ACK: SetEnergy Completed AndMovCoeReady@16:25:58.732	16:25:59.134
16:25:59.927	

EPIC camera run period OPEN 2, data received during MOS camera exposure file ORS01936_980416_162702.omh	
Run_ID = +193600000E-5@16:27:01.917	16:27:02.330
SyncCurt = +24080E-2#1@16:27:02.938	16:27:03.352
LifeTime = +18790E-3#1@16:27:03.529	16:27:03.942
SyncDiod = +43130E-13#1@16:27:04.170	16:27:04.584
SyncCurt = +24060E-2#2@16:27:05.872	16:27:06.285
LifeTime = +18790E-3#2@16:27:06.463	16:27:06.879
SyncDiod = +43276E-13#2@16:27:07.034	16:27:07.448
SyncCurt = +24060E-2#3@16:27:08.766	16:27:09.179
LifeTime = +18790E-3#3@16:27:09.367	16:27:09.781
SyncDiod = +43276E-13#3@16:27:09.958	16:27:10.371
SyncCurt = +24060E-2#4@16:27:11.641	16:27:12.053
LifeTime = +18790E-3#4@16:27:12.221	16:27:12.634
SyncDiod = +42831E-13#4@16:27:12.802	16:27:13.217
SyncCurt = +24060E-2#5@16:27:14.435	16:27:14.848
LifeTime = +18790E-3#5@16:27:15.005	16:27:15.419
SyncDiod = +42831E-13#5@16:27:15.576	16:27:15.988
...	...

DCI BEAM (DCI_FULLL_2 procedure)

EPIC camera Idle period before OPEN 1, data received during the Beam Flux check - Protocol 10 file ORS01908_980416_060009_.omh	
Run_ID = +190800000E-5@06:01:08.930	06:01:09.986
B_Line = DCI_Line@06:01:09.300	06:01:10.349
Energy = +240001543E-5@06:01:09.901	06:01:10.953
RP-rZ = +217000000E-7@06:01:10.392	06:01:11.445
RD-tY = +163000000E-6@06:01:10.903	06:01:11.956
RD-tZ = +972000000E-7@06:01:11.413	06:01:12.467
CS-tZ = +966000000E-7@06:01:11.924	06:01:12.973
CH-tY = +410000000E-7@06:01:12.435	06:01:13.483
CH-tZ = +100000000E-6@06:01:12.926	06:01:13.974
ACK: DCI_Line is ready@06:01:13.276	06:01:14.325
CS-tY = +192500000E-6@06:01:24.256	06:01:25.359
Absolu = {E 9 TrueIntSiLi:Tenma}@{I 9 Time}	06:01:25.769
Synchr = +269400000E-6@06:01:25.167	06:01:26.265
ACK: Flux Checked@06:01:25.588	06:01:26.680
ACK: SetEnergy Completed AndMovCoeReady@06:06:10.692	06:06:11.864
06:06:12.723	

EPIC camera run period OPEN 1, data received during EPIC camera exposure file ORS01935_980416_155044.omh	
Run_ID = +190800000E-5@06:07:43.984	06:07:45.196
...	...
SyncCurt = +26920E-2#2@06:07:47.910	06:07:49.125
LifeTime = +23696E-2#2@06:07:48.480	06:07:49.696
SyncDiod = +12233E-11#2@06:07:49.111	06:07:50.330
SyncCurt = +26920E-2#3@06:07:50.784	06:07:51.999
LifeTime = +23696E-2#3@06:07:51.415	06:07:52.631
SyncDiod = +12233E-11#3@06:07:52.006	06:07:53.220

....

DCI BEAM (DCI_FULL procedure)

EPIC camera Idle period before OPEN 1, data received during the Beam Flux check - Protocol 10 file ORS01884_980416_010430_.omh	
Run_ID = +188400000E-5@01:05:27.911	01:05:28.061
B_Line = DCI_Line@01:05:28.261	01:05:28.410
Energy = +180000609E-5@01:05:28.892	01:05:29.040
RP-rZ = +217000000E-7@01:05:29.393	01:05:29.550
RD-tY = +163000000E-6@01:05:29.874	01:05:30.021
RD-tZ = +972000000E-7@01:05:30.334	01:05:30.482
CS-tZ = +966000000E-7@01:05:30.805	01:05:30.953
CH-tY = +410000000E-7@01:05:31.276	01:05:31.423
CH-tZ = +100000000E-6@01:05:31.736	01:05:31.884
ACK: DCI_Line is ready@01:05:32.087	01:05:32.235
CS-tY = +192500000E-6@01:09:54.479	01:09:54.706
Absolu = {E 9 TrueIntSiLi:Tenma}@ {I 9 Time}	01:09:55.097
Synchr = +275000000E-6@01:09:55.370	01:09:55.591
ACK: Flux Checked@01:09:55.721	01:09:55.938
ACK: SetEnergy Completed AndMovCoeReady@01:16:47.299	01:16:47.666
01:16:48.456	

EPIC camera run period OPEN 1, data received during EPIC camera exposure file ORS01884_980416_011821.omh	
Run_ID = +188400000E-5@01:18:21.071	01:18:21.482
SyncCurt = +27500E-2#1@01:18:21.962	01:18:22.373
LifeTime = +23516E-2#1@01:18:22.573	01:18:22.984
SyncDiod = +12466E-11#1@01:18:23.144	01:18:23.554
SyncCurt = +27480E-2#2@01:18:24.786	01:18:25.197
LifeTime = +23105E-2#2@01:18:25.367	01:18:25.777
SyncDiod = +12526E-11#2@01:18:25.938	01:18:26.348
SyncCurt = +27480E-2#3@01:18:27.590	01:18:28.000
LifeTime = +23105E-2#3@01:18:28.181	01:18:28.590
SyncDiod = +12526E-11#3@01:18:28.772	01:18:29.183
...	...

EPIC camera Idle period before OPEN 2, data received during the Beam Flux check - Protocol 10 file ORS01885_980416_012342_.omh	
Attenu = +000000000E-9@01:24:04.183	01:24:04.679
NrjMin = +200000000E-6@01:24:04.644	01:24:05.137
NrjMax = +180000000E-4@01:24:05.104	01:24:05.598
ACK: End Of Absolute Scan@01:51:17.004	01:51:17.199
ACK: SetEnergy Completed AndMovCoeReady@01:52:13.425	
01:52:13.611	
01:52:14.432	

EPIC camera run period OPEN 2, data received during EPIC camera exposure file ORS01885_980416_015352.omh	
Run_ID = +188500000E-5@01:53:52.265	01:53:52.502
SyncCurt = +27420E-2#1@01:53:53.056	01:53:53.294
LifeTime = +23761E-2#1@01:53:53.647	01:53:53.885
SyncDiod = +12707E-11#1@01:53:54.247	01:53:54.485
SyncCurt = +27420E-2#2@01:53:55.910	01:53:56.150
LifeTime = +23639E-2#2@01:53:56.481	01:53:56.718
SyncDiod = +12715E-11#2@01:53:57.051	01:53:57.291
...	...