EST	EPIC

DOCUMENT TYPE:	**TECHNICAL NOTE**
TITLE:	**TC/TM DATABASE FOR THE EPIC MOS CAMERA SYSTEM (EMCS)**
DOCUMENT No.:	**EPIC-EST-TN-008**
ISSUE No.:	**2**
DATE:	**October 1998**
PAGE:	**1 of IV, 4, A5, B10, C2, D1, E29, F75, G19, H7, I4, J1, K1, L142, M87**
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CHANGE - RECORD

Issue	Date	Page	Description of Change	Release
1	March, 1998	-	First Issue of the document	-
2	October, 1998		Updating for the FM chain	FM DRB

TABLE OF CONTENT

1. INTRODUCTION

1.1. Purpose

The purpose of this document is to provide a full description of the TC/TM Database provided to ESA for the Flight Model 2 (FM2) of **E**PIC **M**OS **C**amera **S**ystem (**EMCS**), in order to support possible users.

1.2. Acronyms

CCD	Charge Coupled Device
EMAE	EPIC MOS Analogue Electronics
EMCH	EPIC MOS Camera Head
EMCR	EPIC MOS Control Recognition Unit
EMCS	EPIC MOS Camera System
EMDH	EPIC MOS Data Handling
EMVC	EPIC MOS Voltage Converter
EPIC	European Photon Imaging Camera
EQM	Engineering and Qualification Model
EST	EPIC System Team
HK	Housekeeping
LAB	LABEN S.p.A.
MFN	Master Function Number
MMS	Matra Marconi Space
PREF	Parameter Reference
SAP	Service d'Astrophysique
TC	Telecommand packet
TM	Telemetry packet
TPN	Telemetry Packet Number
XMM	X-Ray Multi-Mirror Mission

1.3. Applicable Documents

All the documents listed in this Section shall be applicable to the extent agreed upon by ESA and the EPIC P.I.. In case of conflict between this document and the documents listed here below, precedence shall be given to the listed documents. When no issue number is specified, the latest issue published before the date of issuance of this document shall be considered.

RS-PX-0028	Issue 6.0	XMM Operations Interface Requirements Document, ESA
RS-PX-0032	Issue 5.4	Packet Structure Definition, ESA
EPIC-EST-SP-001	Issue 4	EMCS Electrical I/F Specification, EST
XM-TN-DOR-0111	Issue 2	XMM Satellite Database Users Manual, DORNIER

1.4. Reference Documents

All the documents listed in this Section shall be considered as a guideline to the extent established in this document. In case of conflict between this document and the documents listed here below, precedence shall be given to this document. When no issue number is specified, the latest issue published before the date of issuance of this document shall be considered.

EPIC-LAB-SR-002	Issue 4	Requirement Specification for the EPIC MOS Camera System (EMCS), EST
EPIC-MMS-IF-001	Issue 2	Command Address Allocation for the XMM EPIC EMAE, MMS
EPIC-SAP-SP-003	Issue 9	Software Requirement Document for the CTR EMCR Unit, SAP

2. DATABASE OVERVIEW

2.1. General Structure

The database of the EMCS is compiled according to the requirements specified in AD 1, which sets even the identification conventions for the TC/TM packets and parameters.
The format of the above items is specified in AD 2.
The database environment, which is realized with ACCESS 7.0 for Windows 95, is provided by Dornier: its data structure is fully described in AD 4.
Note that the content of the present database is the same for EMCS FM1: the only difference is in the first character of all the item code number (3 instead of 4 for TM packets, aliases, calibration curves and TM condition parameters; E instead of K for TC packets and both TC and TM parameters).

2.2. TC Data Package

2.2.1. TC packets

113 TC packets are defined for the EMCS, with Master Function Numbers ranging from K1 to K125 (12 numbers are not used).

2.2.2. TC parameters

236 TC parameters are defined for the EMCS, with Parameter Reference Numbers ranging from K1 to K257 (PREFs K7-12, 22, 101-103, 161-163, 177-178, 184-185, 191-192, 198-199, 222).
The TC parameter identified as “FIX” is used to identify all the fixed data (bit, byte, words, etc.) within a TC packet data field: its width can be set depending on the specific data and its value is constant (the data value). Several FIX parameters can be present within the same TC data field.

2.3. TM Data Package

2.3.1. TM packets

77 TM packets are defined for the EMCS, with Telemetry Packet Numbers ranging from 40001 to 42504: TPNs 40013, 40016 and 40028-40030 are not used. TPNs 40x03, with x = 0 - 9, identify the 10 Unsuccessful Command Acceptance packets; TPNs 4xx04, with x = 0 - 8/10 - 25, identify the 25 Unsuccessful Command Execution packets.

2.3.2. TM parameters

The EPCS database includes 675 TM parameters: 504 parameters are related to the periodic HK packet, whereas other 170 parameters are used in sporadic TM packets. The remaining parameter is the FIX one.

HK parameters

In the HK TM Packet (TPN 40001), with periodicity of 8 s, there are 504 parameters: their PREFs range are K1001-1482 and K1573-1628. PREFs K1063-1064, 1114-1115, 1202-1203, 1249-1250, 1259, 1303-1304, 1576-1585, 1591, 1597-1598, 1604-1605, 1611-1612, 1618-1623 are not used.

In the parameter name, the first character identifies the parameter origin, i.e. the system unit it is referred to. As general rule, parameters are numbered following their position order within the TM packet. Here below both the parameter sources and their PREF ranges are reported:

- D EMDH K1001-1043, 1045-1066, 1574-1575
- C EMCR K1044, 1067-1083, 1085-1086, 1088-1092, 1316-1482, 1592-1628
- V EMVC K1084, 1087
- E Eng. CCD K1093-1108, 1165-1196, 1209, 1211-1240, 1242, 1266-1297
- A EMAE K1109-1138, 1153-1164, 1197-1208, 1210, 1241, 1243-1252, 1260, 1263-1264, 1298-1307, 1309, 1311-1314, 1586-1590
- H EMCH K1139-1152, 1253-1258, 1261-1262, 1265, 1308, 1310, 1315
- G General K1008-1009

Aperiodic TM parameters

Parameters to be used in sporadic TM packets are identified by PREFs ranging from K1483 to 1572 and from 1633 to 1713. PREFs K1485 is not used.

FIX parameter

The TM parameter identified as “FIX” is used to identify all the fixed data (bit, byte, words, etc.) within a TM packet data field: its width can be set depending on the specific data and its value is constant.

2.4. Aliases

For the EMCS database 45 aliases have been defined, with reference numbers ranging from 4000 to 4048 (alias numbers 4004, 4022-4023 and 4028 are not used). They are used just in TC/TM parameters of Type Code PTC = 2; the parameters of this type which are not associated to any alias are counters.

2.5. Calibration Curves

For the EMCS database 31 calibration curves have been defined. They are used just in TC/TM parameters of Type Code PTC = 3 ; the parameters of this type which are not associated to any curve are counters.

2.6. Condition Parameters

7 Condition Parameters have been defined, with PREF ranging from X4000 to X4006: all of them are relevant to the system Operating Modes.