XMM Optical Monitor

MULLARD SPACE SCIENCE LABORATORY
UNIVERSITY COLLEGE LONDON Author: Nigel Bray

MSSL ^{XMM}OM System Level EMC Test Plan

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Issue	Date	Changes
01	28-Mar-95	New document for EIDR
02	see cover	Expanded test matrix

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1. Introduction

This document defines how the Optical Monitor is to be set-up, operated and monitored during the EMC testing as specified in the EID-A and described in the XMM EMC Control Plan.

It is the top level document that defines the EMC testing of the Optical Monitor as a system with its own EGSE.

It is intended that this document does not repeat specifications or information belonging in the applicable documents.

2. Applicable Documents

XMM Experiment Interface Document, Part A, RS-PX-0016, Issue 4, 3-Oct-94

XMM EMC Control Plan (not currently issued)

XMM-OM System Acceptance Test Procedure (not currently issued)

3. Requirements

TBD.

4. Test Matrix

The table below identifies the test groups to be applied to the various models:

	Models			
Units	QM	EM	FM	FS
OM1	Q	-	A	-
OM2	Q	-	A	A
OM3	-	-	-	-

Note: The QM OM2 is manufacturered with FS DPU, FS DEM-PSU and QM ICU component units. It is delivered following qualification tests for the S/C to use as an EM. It is to be returned for refurbishment to become the FS. See XMM-OM Model Philosophy And Test Plan XMM-OM/MSSL/SP/0054.01 28Mar95. (http://mssls7.mssl.ucl.ac.uk/docs.html#mssl_sp_0054)

The individual tests and the test groups to which they belong are listed below together with the applicable specifications and procedures.

Category Test	Specification EID-A Issue 4	Procedure	Test Groups
Isolation			
MNPWR/Structure	5.9.3.1	1	QA
MNPWR/Secondary			
TMPSU	5.9.3.1	2	QA
DEM-PSU	5.9.3.1	3	QA
Bonding			
TM	5.9.3.2	4	QA
DEM	5.9.3.2	5	QA
Modes Evaluation	-	12	Q
Conducted Emission			
Power	5.9.4.1.1	6	Q
Signal	5.9.4.1.2	7	Q
Conducted Susceptibility			
Power	5.9.4.2.1	8	Q
Signal	5.9.4.2.2	9	Q
Radiated Emission			
H Field	5.9.4.3.1	10	Q
E Field	5.9.4.3.2	10	Q
Radiated Susceptibility			
H Field	5.9.4.4.1	11	Q
E Field	5.9.4.4.2	11	Q
Electrostatic Discharge	5.9.4.5	8	Q

5. Detail Procedures

1 MNPWR/Structure Isolation

Test Configuration: A

Connections used: TM-J01a/b, DEM1/2-J01 and grounding stud on TM and each DEM

Interfaces: Not connected

Stimulation: none

Operating condition: OFF

Measurement, Resistance and Capacitance:

TM-J01a:PriPWR_goA → TM Grounding Stud
TM-J01a:PriPWR_retA → TM Grounding Stud
TM-J01b:RdtPWR_goA → TM Grounding Stud
TM-J01b:RdtPWR_retA → TM Grounding Stud
DEM1-J01:PriPWR_go → DEM Grounding Stud
DEM1-J01:PriPWR_ret → DEM Grounding Stud
DEM2-J01:RdtPWR_go → DEM Grounding Stud
DEM2-J01:RdtPWR_ret → DEM Grounding Stud

2 TMPSU, MNPWR/Secondary Isolation

The following test must have been performed as part of the equipment Acceptance test as it requires access to internal signals within the unit. Refer to the approproiate section of the Acceptance Test Results report or log-book.

Test Configuration: TM Acceptance Test

Connections used: TM-J01a/b, TMPSU1/2/3-J02

Measurement, Resistance and Capacitance:

TM-J01a:PriPWR_goA → TMPSU1-J02:***_go/ret
TM-J01a:PriPWR_retA → TMPSU1-J02:***_go/ret
TM-J01b:RdtPWR_goA → TMPSU1-J02:***_go/ret
TM-J01b:RdtPWR_retA → TMPSU1-J02:***_go/ret

TM-J01a:PriPWR_goA → TMPSU2-J02:***_go/ret
TM-J01a:PriPWR_retA → TMPSU2-J02:***_go/ret
TM-J01b:RdtPWR_goA → TMPSU2-J02:***_go/ret
TM-J01b:RdtPWR_retA → TMPSU2-J02:***_go/ret

TM-J01a:PriPWR_goA → TMPSU3-J02:***_go/ret
TM-J01a:PriPWR_retA → TMPSU3-J02:***_go/ret
TM-J01b:RdtPWR_goA → TMPSU3-J02:***_go/ret
TM-J01b:RdtPWR_retA → TMPSU3-J02:***_go/ret

*** = pos25, pos15, pos11, pos5.3, neg5.3, neg15

3 DEM-PSU, MNPWR/Secondary Isolation

The following test must have been performed as part of the equipment Acceptance test as it requires access to internal signals within the unit. Refer to the approproiate section of the Acceptance Test Results report or log-book.

Test Configuration: DEM Acceptance Test

Connections used: DEM1/2-J01, DEM1/2-Backplane.

Measurement, Resistance and Capacitance:

DEM1-J01:PriPWR_go → Backplane:***
DEM1-J01:PriPWR_ret → Backplane:***

DEM2-J01:RdtPWR_go → Backplane:***
DEM2-J01:RdtPWR_ret → Backplane:***

*** = DPU_5.2V, DPU_3.3V, ICU_5.2V, ICU_3.3V, ICU_6V, DEM_GND.

4 TM Bonding

Test Configuration: A

Connections used: TM Grounding Stud, TM-J01/2/3a/b

Interfaces: Not connected

Stimulation: none

Operating condition: OFF

Measurement: Resistance (milli-Ohmeter @ 100mA)

TM Grounding Stud to TM-J01/2/3a/b connector shells
TM-J01/2/3a/b all screen pins
Structure points

5 DEM Bonding

Test Configuration: A

Connections used: DEM Grounding Stud, DEM1/2-J01

Interfaces: Not connected

Stimulation: none

Operating condition: OFF

Measurement: Resistance (milli-Ohmeter @ 100mA)

DEM Grounding Stud to DEM1/2-J01 connector shells
DEM1/2-J01 all screen pins
Structure points

6 Power line Conducted Emission

Test Configuration: A

Connections used: TM-J01a/b, DEM1/2-J01 and grounding stud on TM

Interfaces: PSU2 and Signal Generator ON
RTU-no action
DBI active prior to instrument switch-on

Stimulation: Detector source off.
EGSE operating.

Operating condition: EMISSIONS

Measurement: Provide graphs from receiving equipment according to tests laid down in EID-A and the XMM EMC Control Plan

7 Signal line Conducted Emission

Test Configuration: A

Connections used: TM-J01a/b, DEM1/2-J04

Interfaces: PSU2 and Signal Generator ON
RTU-no action
DBI active prior to instrument switch-on

Stimulation:	Detector source off. EGSE operating.
Operating condition:	EMISSIONS
Measurement:	Provide graphs from receiving equipment according to tests laid down in EID-A and the XMM EMC Control Plan

8 Power line Conducted Susceptibility

Test Configuration:	A
Connections used:	TM-J01a/b, DEM1/2-J01 and grounding stud on TM
Interfaces:	PSU2 and Signal Generator ON RTU-no action DBI active prior to instrument switch-on
Stimulation:	Detector source on. EGSE operating. Perform stimulation with signal generator equipment according to tests laid down in EID-A and the XMM EMC Control Plan
Operating condition:	SUSCEPTIBILITY
Measurement:	Provide graphs from generator equipment of the levels of susceptibility and report from EGSE the nature of the effect.

9 Signal line Conducted Susceptibility

Test Configuration:	A
Connections used:	TM-J01a/b, DEM1/2-J04
Interfaces:	PSU2 and Signal Generator ON RTU-no action DBI active prior to instrument switch-on
Stimulation:	Detector source on. EGSE operating. Perform stimulation with signal generator equipment according to tests laid down in EID-A and the XMM EMC Control Plan
Operating condition:	SUSCEPTIBILITY
Measurement:	Provide graphs from generator equipment of the levels of susceptibility and report from EGSE the nature of the effect.

10 Radiated Emission

Test Configuration:	A
Connections used:	antenna
Interfaces:	PSU2 and Signal Generator ON RTU-no action DBI active prior to instrument switch-on
Stimulation:	Detector source off. EGSE operating.
Operating condition:	EMISSIONS
Measurement:	Provide graphs from receiving equipment according to tests laid down in EID-A and the XMM EMC Control Plan

11 Radiated Susceptibility

Test Configuration:	A
Connections used:	antenna
Interfaces:	PSU2 and Signal Generator ON RTU-no action DBI active prior to instrument switch-on
Stimulation:	Detector source on. EGSE operating. Perform stimulation with signal generator equipment according to tests laid down in EID-A and the XMM EMC Control Plan
Operating condition:	SUSCEPTIBILITY
Measurement:	Provide graphs from generator equipment of the levels of susceptibility and report from EGSE the nature of the effect.

12 Modes Evaluation

Test Configuration:	A
Connections used:	antenna
Interfaces:	PSU2 and Signal Generator ON RTU-no action DBI active prior to instrument switch-on
Stimulation:	Detector source off. EGSE operating.
Operating condition:	MODES
Measurement:	Perform a basic scan of radiated E field emissions and plot graphs in each of the various instrument modes.

6. General Procedures

A Acceptance test

Refer to the XMM-OM System Acceptance Test Procedure.

B Start of day

TBD.

C End of day

TBD.

7. Test Configurations

A Full Instrument Configuration at Test-House

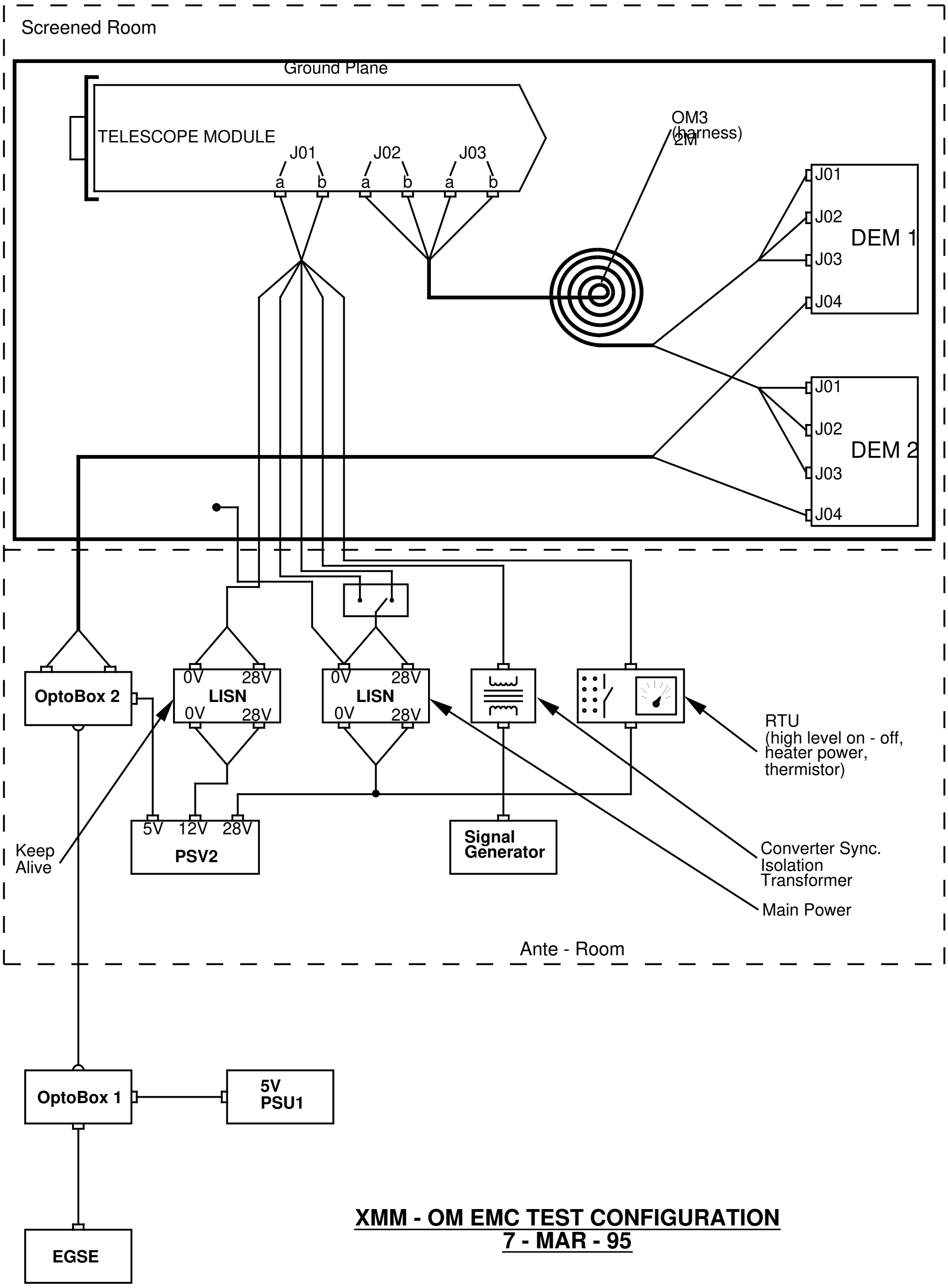

Figure 7.1: XMM-OM EMC Test Configuration

8. Operating Conditions

OFF

Ensure that PSU2 and then the signal generator are off.

INACTIVE

Ensure that main Power to the instrument is isolated by relay switches, or is not connected such that the instrument sees no voltage on its input and a high impedance.

If necessary, connect TM-J01a/b followed by the DEM1/2-J04.

Switch on the signal generator so that the synchronisation signals active.

Switch on PSU2 so that the keep-alive power is active.

Ensure instrument relays are driven to their Primary or Redundant configurations according to the test and the substitution heater is on.

The instrument is now in the INACTIVE condition.

To return to the OFF condition, switch off PSU2, then the signal generator.

EMISSIONS

Start from the INACTIVE condition. (Define/record the state of the instrument relays)

Ensure that PSU1 and the EGSE are on.

Switch on main power to the instrument. (Either primary or redundant according to the test)

Start the EGSE program or script provided for EMC emissions tests.

Description of user operations to be provided.

The instrument is now in the EMISSIONS condition.

To return to the INACTIVE condition switch off main power to the instrument.

SUSCEPTIBILITY

Start from the INACTIVE condition. (Define/record the state of the instrument relays)

Ensure that PSU1 and the EGSE are on.

Switch on main power to the instrument. (Either primary or redundant according to the test)

Start the EGSE program or script provided for EMC susceptibility tests.

Description of user operations to be provided.

The instrument is now in the SUSCEPTIBILITY condition. The EGSE operator must indicate to the EMC test engineer when the instrument is influenced by the EMC stimulation, and provide a code to identify the nature of the effect.

To return to the INACTIVE condition switch off main power to the instrument.