Minutes of Meeting

HERSCHEL

Date:	01.09 05		
Doc.-No.:	HP-2-ASED-MN-1050		
Meeting place:	Astrium Ottobrunn	Chairman:	
Date/Time:	01/09/05 / 9:00	Secretary	
Agenda dated:		Close of Meeting:	

Subject: SPIRE and PACS RS Test Working Meetings

Participants:	Guy Doubrovik André Luc Bernard Jackson Filippo Marlinani Bernard Collaudin Siegmund Idler Doug Griffin Helmut Feuchtgruber Albrecht Poglitsch Clemens Kalde	Additional Distribution:

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☐ Brief-Minutes (except following sheets) ☐ Summary of Results of Sheets till

Signatures under the minutes of meetings *; see page 3

1. Sept. 2005

SPIRE EMC RS Test Working Meeting

PLM EQM EMC Test

1. Introduction

- Objective is to fix the EMC procedure HP-2-ASED-PR-0033, issue 1 04.06.05

- Presentation by SPIRE:
  - PSU non flight equipment must not violate the PLM grounding scheme
    - AI1 ASED ← to be checked by ASED
    - Grounding scheme to be added into
    - AI2 SPIRE ← the SPIRE test procedure
  - Cooler recycle will be performed in the evening. Every morning a 10 min health check is sufficient Health check procedure and automatic
    - AI3 SPIRE ← TCL to be defined by SPIRE
  - Script file Observation ID for SPOT is named in accordance to the Spot frequency but the script content is the same.
  - Data stored with reference to the „Observation Step"

The frequency table in the procedure must have columns indicating the SCRIPT name and the Observation ID (performance data)

AI4 SPIRE ← Spire to provide a SCRIPT file for single frequency.
Flexibility to stop the SCRIPT every time without impact on Reference testing and data acquisition.

- For the step-wise sweep this shall be performed according to the law $f_2 = 1,15 \times f_1$ (TBC SPIRE)

AI5 SPIRE ← DWELL time : 10sec. SPIRE to confirm

- Data Packets and Handshake between EMC and OP will be synchronised to the CCS time which shall be noted as sweep and stop time by EMC and OP

AI6 ASED ← Facility measurements as per presentation annex to be included into the EMC test procedure.

AI9 ASPI ← ASPI to provide a list of tested frequencies (in case of sweep measurements w.o. susceptibility).

Baseline :

- 30 SPOT FREquencies
- H-field 1 antenna position
  1 antenna polarisation
- E-field 2 antenna position and
  2 polarisation

2. EMC Test Procedure

to be updated with inputs given by SPIRE Presentation annex 1

AIB SPIRE Procedures and names check values will be provided by SPIRE 16.9.05

3. EMC test times

dito

4. Risc Factors etc.

See annex 1 (Spire presentation)
Starting 1st Cooler recycle planned on Monday Morning. ASED to check whether this activity can be done on Sunday

AI 7 ASED

All AI's to be answered 16.09.04

1/9/05 1.09.05

1. Sept. 2005

PACS EMC RS Test Working

1. Introduction

detail Procedure in HP-2-ASED-PR-0033, 04.06.05

file: _21_07_05

2 Test Procedure

- Start + Stop times must be noted for each step
- Total frequency application time will be 90 sec. (~50sec + Rest for Storage)

(1). Threshold measurement on defined H-field frequencies in Photometer mode. Frequencies to be defined (~30)

AT10 ← PSPI

- Reduction of Antenna Position E-field from 3 to 2 Antenna positions for each mode
- Reduction of Antenna Position H-field from 3 to 2 for Spectrometer mode only

(1) The additional Threshold tests are considered to take 1 day

- Cooler recycle shall be done in the evening instead of in the morning

- The antenna position will be defined by ESA / ASPI before test start

ATII ESA ←

- The tests shall start with Photometer mode H-field.
  For spectrometer mode no cooler recycle is necessary

- Test Sequence:

1	Photometer	H-field
2	Spectrometer	H-field
3	Photometer	E-field
4	Spectrometer	E-field

- Cover flushing necessary at the morning.

5. Test Times

To be updated according to the informations given.

4. Misc.

- BOLC external Power Supply

AI12 MPP ← MPP to send the Grounding Scheme of the BOLC.

All AIs to be answered until 16.9.05.

1.9.05
C. Klein
Helmut Feuerstein

Meeting: HP-2-ASED-MM-105

Action Item List

Herschel

Title: Working meeting

Date: 01.09.05

No.:	Description:	Due Date	Originator Comp./Pers.	Actionee Comp./Pers.	Source	Completion
1	check PSU grounding	16.9.	D. Griffin	Idler		
2	Add grounding scheme to test proc	16.9	Kalde	Griffin		
3	TCL to be defined	16.9	Idler	Griffin		
4	Provide script file for single frequency	16.9	Idler	Griffin		
5	Spire to define step-wise sweeps	-"-	Kalde	Griffin		
6	Include facility measurements	-"-	Griffin	Kalde		
7	ASED to check cooler recycle on Sunday	-"-	Griffin	Idler		
8	Proc names to be provided	-"-	Kalde	Griffin		
9	Provide frequency list	-"-	Kalde	A. Luc		
10	Define frequencies	-"-	Kalde	A. Luc		
11	Antenna positions to be defined	-"-	Kalde	A. Luc		
12	Send Bolc Grounding scheme	-"-	Kalde	H. Feuchtgruber		

VPr

Herschel/SPIRE
EQM EMC Test Planning Meeting

Doug Griffin

EUT Review (1)

- The configuration of the instrument is as per the SPIRE CQM EIDP ABCL
- Summary:
  - Detectors: Flight like PLW BDA, remaining STM
  - Detector Harnesses: Flight like
  - JFET Modules: Flight like for PLW, remaining STM. Un-used connectors closed by makeshift EMI covers
  - Cooler: Flight like with degraded hold time and heat switch
  - FPU: Flight like with unused connectors closed by makeshift EMI covers
  - Cryogenic grounding scheme: Flight like
  - Cryoharness: Flight like for PLW. Not present for un-used subsystems
  - DCU: Non flight grade components. No-redundancy. PLW LIA cards present. Un-used connectors sealed with Kapton and EMI tape. Non flight mechanical I/F. Sealed with EMI tape
  - FCU: Non flight grade components. No redundancy. Un-used connectors sealed with Kapton and EMI tape. Non flight mechanical I/F. Sealed with EMI tape
  - DPU: Non flight grade components. No-redundancy. Un-used connectors sealed with Kapton and EMI tape. Flight like mechanical I/F
  - PSU: Non-flight bench power supply

EUT Review (2)

- EUT
  - PLW detector subsystem
    - Detector arrays
    - Cryoharness
    - Grounding / shielding scheme
    - DRCU
  - No RS tests on the susceptibility limits of other sub-systems

Test conditions

- As per IID-A and HP-2-ASED-PR-0033

Cooler recycling

- SPIRE-RAL-NOT-002493, Overnight operation of SPIRE, Issue 2.0 has been re-issued
- Summary
  - The SPIRE instrument requires stable temperatures for various observing modes (including EMC testing)
    - < 10mK dT/dt
  - During cooler recycle, the heaters within the cooler generate thermal disturbances to the cooler and the instrument
  - These transients require up to 6-8 hours to decay
  - Practically, the stringent thermal stability requirement has been achieved during ILT by recycling the cooler in the evening and leaving the transients to die out over night
  - If the cooler is recycled and the instrument shut down over night, then the cooler heat switches will open and the evaporator will heat up and the He-3 will evaporate
  - The cooler is currently recycled using an interactive TCL script
    - A revised automated TCL script is to be written before the EQM SFT
    - This automated script will be tested during the PFM-2 ILT
    - The dynamics of the recycle of the CQM cooler in the EQM cryostat will require interactive recycle for the first few recycles
    - After this, the automated script can be implemented for the remaining EQM tests

Cooler recycling

- Summary (cont.)
  - SPIRE will provide a short script which will carry out an instrument health check
  - It will be very similar to the P-Cal flash script and will take a few minutes to execute
  - This script is to be run at the start of the day to establish that the instrument is in a nominal condition
  - A limited set of conservatively set hard and soft limits are in the MIB. These can be also used to establish the health of the instrument
  - SPIRE accepts liability for any damage to the instrument arising from unattended overnight operation

Test Scripts

- Two families of tcl test scripts will be provided by 23-Sep-05
  - SPIRE_EMC_SPOTxxxx.tcl
  - SPIRE_EMC_SWEEPxxxx.tcl
- These replace many of the scripts noted in HP-2-ASED-PR-0033
- The scripts perform the following activities:
  - Sets the JFET Vdd to ON (+2.5V) and Vss to -2.5V
  - Sets the Detector AC bias frequency to 70Hz
  - Sets the Detector AC bias amplitude to 16.47mVrms
  - Sets the Detector sampling rate to 26.7Hz
  - Executes the automatic detector offset generation
  - Sets the Observation Identification (ObsID) to the pre-determined value
    - The "xxxx" in the filename corresponds to the ObsID set for the test
    - The ObsID links the data to the test and must be carefully recorded
  - Controls the setting of the Observation Step
    - This provide the link between the SPIRE data to the EMC test configuration
    - Some of the steps are manual and some are automatic

QLA routines

- Two QLA routines will have to be generated for the Spot and Swept frequency tests
- These routines will be tested during the PFM ILT tests in September 2005
- The routines will generate an ASCII file which contains a table containing 97 columns
  - 1 Column containing the step number
  - 46 columns containing the mean detector output during the reference case / test case
    - This data is used to determine if there is Ohmic heating of the detectors due to EMI at the particular test frequency
  - 46 columns containing the standard deviation of the detector output during the particulaar reference / test case
    - This data is used to determine if there is excess noise on the detectors due to EMI at the particular test frequency
- The ASCII file will be imported into excel in quasi-real time to give a quick assessment of the instrument susceptibility

8/17

Spot Frequency Test Sequence

Sequence	Time Start	Duration	Event	Observation Step after Event	QLA
A	00:00:00	00:03:00	CCS Operator executes SPIRE_EMC_SPOT_xxxx.tcl Detector automatic offset generated	0xFFFF	
B	00:03:00	00:00:10	CCS Operator signals EMC test engineer that script has been executed	0xFFFF	
C	00:03:10	00:00:10	EMC Test Engineer Signals that Reference Case can start	0xFFFF	
D	00:03:20	00:03:00	CCS Operator increments step and data for reference case generated	0x0001	
E	00:06:20	00:00:10	Reference case finishes and CCS Operator signals EMC engineer to set frequency to f_1	0xFFFF	PLW reference data written to ascii file
F	00:06:30	00:00:10	EMC Engineer sets frequency to f_1 and signals CCS operator when amplitude and frequency OK	0xFFFF	
G	00:06:40	00:03:00	CCS Operator increments step and data for case f_1 generated	0x0002	
H	00:09:40	00:00:10	Case f_1 finishes and CCS operator signals EMC Engineer to set frequency to f_2	0xFFFF	PLW case f_1 data written to ascii file
I	00:09:50	00:00:10	EMC Engineer sets frequency to f_2 and signals CCS operator when amplitude and frequency OK	0xFFFF	
J	00:10:00	00:03:00	CCS Operator increments step and data for case f_2 generated	0x0002	
K	00:13:00	00:00:10	Case f_2 finishes and CCS operator signals EMC Engineer to set frequency to f_3	0xFFFF	PLW case f_2 data written to ascii file
L	00:13:10	00:26:40	Next 8 frequency steps	0x0011	PLW case $f_{3\text{-}11}$ data written to ascii file
M	00:39:50	00:03:20	Reference case	0x0012	PLW reference data written to ascii file

Each spot frequency takes: 00:03:20

The ratio of test frequency tests to reference tests is 10:1

Frequency Sweep Test Sequence

Sequence	Time Start	Duration	Event	Observation Step after Event	QLA
A	00:00:00	00:03:00	CCS Operator executes SPIRE_EMC_SWEEP_xxxx.tcl Detector automatic offset generated	0xFFFF	
B	00:03:00	00:00:10	CCS Operator signals EMC test engineer that script has been executed	0xFFFF	
C	00:03:10	00:00:10	EMC Test Engineer Signals that Reference Case can start	0xFFFF	
D	00:03:20	00:03:00	CCS Operator increments step and data for reference case generated	0x0001	
E	00:06:20	00:00:10	Reference case finishes and CCS Operator signals EMC engineer to set up for test case 1	0xFFFF	PLW reference data written to ascii file
F	00:06:30	00:00:10	EMC Engineer sets start frequency to f_1, end frequency to f_2 and the sweep speed to X_1 Hz/s and signals CCS operator that the test step is ready to commence	0xFFFF	
	00:06:40	00:00:10	CCS Operator increments step and signals EMC Engineer to start sweep ***exactly*** 10 seconds later	0x0002	
G	00:06:40	00:03:00	EMC engineer starts sweep and data for test case 1 generated	0xFFFF	PLW case 1 data written to ascii file
H	00:09:40	00:00:10	EMC Engineer sets start frequency to f_2, end frequency to f_3 and the sweep speed to X_2 Hz/s and signals CCS operator that the test step is ready to commence	0xFFFF	
I	00:09:50	00:00:10	CCS Operator increments step and signals EMC Engineer to start sweep ***exactly*** 10 seconds later	0x0003	
J	00:10:00	00:03:00	EMC engineer starts sweep and data for test case 2 generated	0xFFFF	PLW case 2 data written to ascii file
K	00:13:00	00:26:40	Next 8 frequency steps	0x0011	PLW case $f_{3\text{-}11}$ data written to ascii file
L	00:39:40	00:03:20	Reference case	0x0012	PLW reference data written to ascii file

Each frequency sweep bin takes: 00:03:20

The ratio of tests cases to reference tests is 10:1

Pre-test activities

- Set the mass flow rate of He to the CVV lid
  - The flow-rate temperature relation will be determined during SPIRE SFT/SPT
- Photograph the EMC test configuration
- Set up the EMC equipment in the correct test configuration
- Assumption: Calibration of the fields to be carried out prior to testing

Facility measurements

- Photograph the EMC test configuration
- Cover temperature
- Boil of He mass flow rate
- Instrument S/C I/F temperatures
- EMC test equipment parameters (?)
  - Currents
  - Voltages

Detailed planning

- Assumptions:
  - Meeting from 8:15 to 09:00
  - 8 hours of test time available per day
  - Cooler recycled over night
- Missing information:
  - Antenna positions
  - Polarisations
  - Number of antenna reconfigurations for E and H fields
  - Time to reconfigure test equipment

Each frequency sweep bin takes: 00:03:20
The ratio of tests cases to reference tests is 10:1

Documentation

- The details agreed today will be incorporated into SPIRE-RAL-NOT-002402 and up-issued to 2.0
- SPIRE will produce a test report containing
  - Log of events
  - Test data
  - Summary of test conditions
  - Details of susceptibilities
- What is the Astrium plan for the test report and how do the scopes of the SPIRE and Astrium documents overlap?

Time table

- SPIRE proposes weekly update telecons to track progress of test preparation activities at 14:00UK/15:00CET
  - 9-September
  - 16-September
  - 23-September
- Current dates for testing ?

	Name	Dep./Comp.		Name	Dep./Comp.
	Alberti von Mathias Dr.	AOE22		Sonn Nico	AOE51
	Barlage Bernhard	AED11		Steininger Eric	AED44
	Bayer Thomas	AOA52	X	Stritter Rene	AED11
	Brune Holger	AOA55		Thörmer Klaus-Horst Dr.	OTN/AED65
	Fehringer Alexander	AOE13		Wagner Klaus	AOE22
X	Fricke Wolfgang Dr.	AED 65	X	Wietbrock Walter	AET12
	Geiger Hermann	AOA52		Wöhler Hans	AOE22
	Gerner Willi	AED11		Wössner Ulrich	ASE442
	Grasl Andreas	OTN/AOA54			
	Grasshoff Brigitte	AET12			
	Hauser Armin	AOE22			
X	Hendry David	Terma Resid.			
	Hengstler Reinhold	AOA 5			
	Hinger Jürgen	AOE22	X	Alcatel	ASP
	Hofmann Rolf	ASE442	X	ESA/ESTEC	ESA
	Hohn Rüdiger	AED65		**Instruments:**	
	Huber Johann	AOA52	X	MPE (PACS)	MPE
	Hund Walter	ASE442	X	RAL (SPIRE)	RAL
X	Idler Siegmund	AED432		SRON (HIFI)	SRON
	Ilsen Stijn	Terma Resid.		**Subcontractors:**	
	Iványi von András	FAE22		Air Liquide, Space Department	AIR
	Jahn Gerd Dr.	AOE22		Air Liquide, Space Department	AIRS
X	Kalde Clemens	APE3		Air Liquide, Orbital System	AIRT
	Kameter Rudolf	OTN/AOA54		Alcatel Bell Space	ABSP
	Kettner Bernhard	AET42		Astrium Sub-Subsyst. & Equipment	ASSE
X	Knoblauch August	AET32		Austrian Aerospace	AAE
	Koelle Markus	AOA53		Austrian Aerospace	AAEM
X	Kroeker Jürgen	AED65		APCO Technologies S. A.	APCO
	Kunz Oliver Dr.	AOE22		Bieri Engineering B. V.	BIER
	Lamprecht Ernst	OTN/ASI21		BOC Edwards	BOCE
	Lang Jürgen	ASE442		Dutch Space Solar Arrays	DSSA
	Langenstein Rolf	AED15		EADS CASA Espacio	CASA
	Langfermann Michael	AOA51		EADS CASA Espacio	ECAS
	Mack Paul	OTN/AOA54		EADS Space Transportation	ASIP
	Müller Jörg	AOA52		Eurocopter	ECD
	Müller Ralf	FAE22		European Test Services	ETS
	Peltz Heinz-Willi	AOE13		HTS AG Zürich	HTSZ
	Pietroboni Karin	AED65		Linde	LIND
	Platzer Wilhelm	AED22		Patria New Technologies Oy	PANT
	Reichle Konrad	AOA52		Phoenix, Volkmarsen	PHOE
	Reuß Friedhelm	AED62		Prototech AS	PROT
X	Rühe Wolfgang	AED65		QMC Instruments Ltd.	QMC
	Runge Axel	OTN/AOA54		Rembe, Brilon	REMB
	Sachsse Bernt	AED21		Rosemount Aerospace GmbH	ROSE
X	Schink Dietmar	AED44		RYMSA, Radiación y Microondas	RYM
X	Schlosser Christian	OTN/AOA54		SENER Ingenieria SA	SEN
	Schmidt Rudolf	FAE22		Stöhr, Königsbrunn	STOE
	Schweickert Gunn	AOE22		Terma A/S, Herlev	TER