EADS astrium

Test Report

Herschel

Title: HERSCHEL S/C Level EMC RE and AutoComp. Test Report

CI-No: 100000

Prepared by:	EMC Test Team, M. Hopfgarten	Date:	4. 6. 08
Checked by:	J. Kroeker		6. June 2008
Product Assurance:	R. Stritter		04.06.08
Configuration Control:	W. Wietbrock		06/06/08
Project Management:	W. Fricke		06/06/2008

Distribution: See Distribution List (last page)

Issue	Date	Sheet	Description of Change	Release
1	2.6.08	All	Initial Issue	

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Annex 8 Analysis Of Tm Generation Compatibility With MGA Transmission

Annex 9 NCR 4207

List of Tables

1 Scope

This test report summarises the results of the EMC RE and Auto-Compatibility tests performed on the Herschel S/C in the Maxwell anechoic chamber at ETS in Noordwijk. The tests were performed by ETS in accordance with the TAS-F test specification, [AD1], applying the ASED Test Procedure, [AD2]. The applicable test configuration was established with [AD3].

1.1 Document Overview

In Annex 1 the ASED master AS-RUN Test Procedure can be found.

Annex 2 shows a time record of all test events during RE and Auto-Compatibility Test.

Annex 3 shows a step by step log of the RE test with reference to the relevant plots and including all procedure variations with justification for the variation.

In Annex 4 is the RE test report from ETS. This report lists all the test results, measurement accuracies and plots and gives explanations to the test results.

Annex 5 lists the Auto- Compatibility results.

Annex 6 with the Functional AIT 'AS-RUN' procedures shows with which scripts the SVM and the instruments were set to the requested modes. Also the As Run for the Auto-Compatibility test is included in this annex.

Annex 7 shows the SCOE and Flight skin connector configuration.

Annex 8 gives a Session data re-patriation.

Annex 9 shows NCR 4207 which was written to the safety loop

2 Documents

2.1 Applicable documents

The following documents of the latest issue in effect or as defined herein form a part of this document to the extent specified herein.

AD1	H-P-2-ASP-TS-0819	HERSCHEL FM EMC Test Requirements Specification
AD2	HP-2-ASED-TP-0180	HERSCHEL FM SAT RE / AutoComp EMC Test Procedure
AD3	HP-2-ASED-PR-0116	Herschel EGSE, Satellite & Instrument Procedure for EMC Radiated Test
AD4	HP-2-ASED-TP-0134	Leading Procedure for Herschel Integrated Satellite Test
AD5	H-P-TASF-MN-10371	RE EMC Pre TRR Checkpoint
AD6	H-P-TASF-MN-10xxx	EMC debug checkpoint
AD7	HP-2-ASED-MN-1546	PTR for SC EMC RE and Auto-Compatibility Test

3 Non-Conformances and Procedure Variations

3.1 Summary of NCR's

NCR 4207 was created after the safety loop triggered when switching back on transponder. See Annex 9

3.2 Summary of Procedure Variations

Page / Step numbers refer to AD 2

- Page 10: The Cryo SCOE was not connected. This allowed closing the MLI at the Cryo skin connectors. According to cryo engineering, control by the Cryo SCOE was not required to operate the instruments according sect. 3.1.2 of AD2 during the Re / AutoComp test.
- Page 11: After a Safety Loop of the BS SCOE Vbat was increased to 25.4 V and OVP to 28,4 V.
- Page 14: The S/C was turned by 90° counter clockwise in order to shorten the length of power cables in the chamber. This also allowed skipping sniff test in step 1.4.
- Step 1.5: Antenna location for ambient test changed from P2 (SPIRE) to P1 (PACS). This was assumed to be the worst case location due to EGSE cable rooting and resulted from the previous procedure variation.
- Steps 2.4.5 / 7: Notch Measurement was not performed as no S/C antennas are on the PACS side.
- Steps 3.4.1 to 3: In two antenna positions P2 (extra height) tested. Due to the present of the SVM shield this extra position has been requested by TAS-F in order to measure the levels on the top side of this shield but limited to 200 MHZ.
- Steps 4.4.1/4/7: Steps repeated with TX+TWTA ON in order to see the impact of the transmitting chain on RE results and particularly in the HIFI notch.
- Steps 4.4.4/7: Steps repeated with HIFI+TX+TWTA OFF. With this test it was shown that the spikes in the HIFI notch during the first run of steps 4.4.4/7 were caused by HIFI itself and not by the S/C or other instruments.

More details to procedure variations of AD 2 can be found in Annex 3, RE Test Log.

4 Test result overview

4.1 RE Test result summary

Table 4-1 provides an overview of the RE test results. The negative results of plot 18, 21, 22, and 23 are in the HIFI notch and were caused by HIFI itself what was demonstrated with plot 25 and 26 where HIFI was OFF. All acquired test results are presented in Annex 4.

Plot n°	Freq range	Polar	Antenna pos	S/C status	Notable Results	Comments
1	10k-1G	V	PACS	OFF	Max noise level : 42 dBuV/m at 2.5 MHz	OK
2	30M-1G	H	PACS	OFF	Max noise level : < 35 dBuV/m	OK
3	10k-1G	V	PACS	SPIRE noisy	Max noise level : 57 dBuV/m at 3 MHz	OK
4	30M-1G	H	PACS	SPIRE noisy	Max noise level : 37 dBuV/m at 40 MHz	OK
5	1G-18G	V	PACS	SPIRE noisy	Only one notable Emission due to TX at 8.467G	OK
6	1G-18G	H	PACS	SPIRE noisy	Only one notable Emission due to TX at 8.467G	OK
7	10k-200M	V	SPIRE_extra	SPIRE noisy	Max noise level : 62 dBuV/m at 3 MHz	OK
8	30M-200M	H	SPIRE_extra	SPIRE noisy	Max noise level < 30 dBuV/m	OK
9	10k-1G	V	SPIRE_nom	SPIRE noisy	Max noise level : 60 dBuV/m at 3 MHz	OK
10	30M-1G	H	SPIRE_nom	SPIRE noisy	Max noise level < 35 dBuV/m	OK
11	TC notch	V	SPIRE_nom	SPIRE noisy	No notable emission	OK
12	1G-18G	V	SPIRE_nom	SPIRE noisy	Only one notable Emission due to TX at 8.467G	OK
13	TC notch	H	SPIRE_nom	SPIRE noisy	No notable emission	OK
14	1G-18G	H	SPIRE_nom	SPIRE noisy	Only one notable Emission due to TX at 8.467G	OK
16	10k-1G	V	HIFI	HIFI noisy	Max noise level : 54 dBuV/m at 2 MHz	OK
17	30M-1G	H	HIFI	HIFI noisy	Max noise level < 36 dBuV/m	OK
18	HIFI notch	V	HIFI	HIFI noisy	4 exceeding emissions 23dBuV/m at 2.5G, 24/3.7G, 28/5G, 21/6.6G	NOK but in excess of < 8dBuV/m, XPND OFF
19	TC notch	V	HIFI	HIFI noisy	No notable emission	OK, XPND OFF

Plot n°	Freq range	Polar	Antenna pos	S/C status	Notable Results	Comments
20	TC notch	H	HIFI	HIFI noisy	No notable emission	OK, XPND OFF
21	HIFI notch	H	HIFI	HIFI noisy	3 exceeding emissions 27 dBuV/m at 2.5G, 26/3.7G, 21/5G	NOK but in excess of < 7dBuV/m, XPND OFF
22	HIFI notch	V	HIFI	HIFI noisy	5 exceeding emissions : 25dBuV/m at 2.5G, 24/3.7G, 24/5G, 24/6.2G, 93/8.469 (TX emission)	NOK but in excess of < 5dBuV/m for unwanted emissions, XPND ON
23	HIFI notch	H	HIFI	HIFI noisy	3 exceeding emissions 27 dBuV/m at 2.5G, 27/3.7G, and 88/8.469G (TX emission)	NOK but in excess of < 7dBuV/m for unwanted emissions, XPND ON
24	10k-30M	V	HIFI	HIFI noisy	Max noise level : 54 dBuV/m at 2 MHz	OK, XPND ON
25	HIFI notch	V	HIFI	HIFI OFF	No notable emission	Demonstration the origin of emissions recorded in plot22 is due to HIFI, XPND OFF
26	HIFI notch	H	HIFI	HIFI OFF	No notable emission	Demonstration the origin of emissions recorded in plot23 is due to HIFI, XPND OFF

Table 4-1: **RE Test result summary**

4.2 Auto-Compatibility Test result summary

All values found are below the thresholds for both chain-1 and chain-2.

No big issue except the AGC of XPND-1 that provides a value much lower than the fed Uplink Power. On top of this, the AGC is not linear, i.e. the gap read-ideal for values well above the threshold is much higher than the one when Uplink Power is close to threshold (for -140 dBm we have -180 dBm as read-out).
Note: this 'problem' was already seen during ESOC NDIU via X-band test and it's not directly related to EMC!

AGC of XPND-2 is much better even if suffering of the same problem: read-out < real-value > Calibration-curve to be updated?

RNG Group delay was performed. The measured values are in the same order of magnitude as the S/S tests. There are no other means to evaluate it.

All acquired test results are presented in Annex 5.

5 Conclusions

The test was performed successfully, i.e.

- the specified test requirements, conditions and input values were met
- all measurement results were well within the limits as judged by the customer TAS-F.
- all required data were measured and stored.
- the measured data have adequate quality and are suitable for further analysis if this would become necessary.
- no non-conformance affecting the test results was raised
- all required results have been provided

Annex 1

'AS-RUN' Master Test Procedure

Content:

Filled-in master procedure 'HERSCHEL FM SAT RE / AutoComp EMC Test Procedure'; HP-2-ASED-TP-0180, Issue 1

53 pages

As Run

Title: **HERSCHEL FM SAT RE / AutoComp EMC Test Procedure**

CI-No: 100 000

Prepared by:	Michael Hopfgarten	Date:	30.04.08
Checked by:	Jürgen Kroeker		30.4.08
Product Assurance:	i.V. René Stritter		30.04.08.
Configuration Control:	Walter Wietbrock		30.04.08
Project Management:	Wolfgang Fricke		30/04/2008
Approved by TAS-F:	D. Montet i.A. H. Burlas		05/05/2008
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1	30.04.08	All	Initial issue. RS test separated from doc (see HP-2-ASED-TP-0222); RE and AutoComp. test updated	

Table of Content

1 Scope

1.1 Objective

This procedure describes the activities to be carried out for the HERSCHEL Radiated Emission (RE) and AutoCompatibility tests in order to confirm the compatibility of the satellite itself.

1.2 Flow

The test flow is shown in figure 1.2-1.

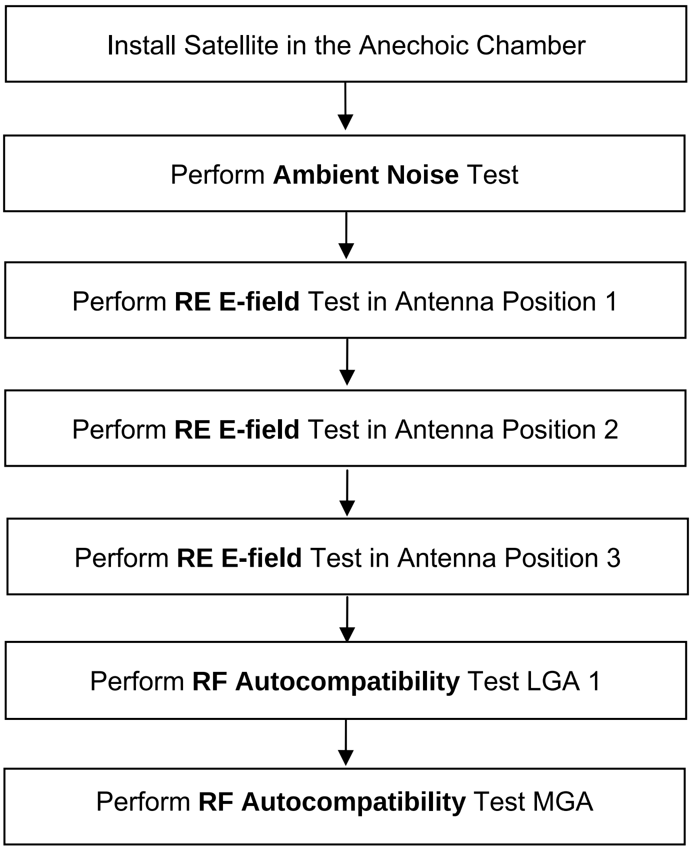

Figure 1.2-1: HERSCHEL FM Radiated EMC Test Flow

1.3 Test Specimen

The test specimen is the integrated HERSCHEL FM satellite.

1.4 Test objectives

The object of this test is to provide confirmation that the integrated spacecraft radiated emissions in operational mode are within acceptable limits measured at several positions around the spacecraft and that telecommands at lowest level are not disturbed by the S/C own radiation.

This information will be used in determining the system level RE/RS compatibility margins.

2 Documents/Drawings

The following documents in their latest issue are applicable to this procedure:

2.1 Applicable Documents

AD1	HP-2-ASED-PL-00007	Herschel PA Plan
AD2	HP-2-ASED-PL-0023	Herschel Contamination Control Plan
AD3	H-P-2-ASP-SP-0939	HERSCHEL IST Specification
AD4	H-P-1-ASPI-PL-0038	HERSCHEL/PLANCK EMC/ESD Control Plan
AD5	HP-2-ASED-PR-116	Herschel EGSE, Satellite & Instrument Procedure for EMC Radiated Test
AD6	H-P-1-ASPI-SP-0037	EMC Specification
AD7	H-P-2-ASP-TS-0819	HERSCHEL FM EMC Test Requirements Specification
AD8	HP-2-ASED-PL-0013	PLM EMC Control and Verification Plan
AD9	HP-2-ASED-PL-0037	Herschel EMC Test Plan

2.2 Reference Documents

In this section all documents are given which either

- could serve as reference for the radiated tests, or
- may be referred in the test report for clarification/justification of an outcome (result) of the test.

RD1	PACS-ME-TP-032	PACS EMC Procedures
RD2	SPIRE-RAL-PRC-003068	SPIRE RE Most Emissive Mode EMC Test Procedures for IST
RD3	SRON-G/HIFI/PR/2007-022	HIFI radiated emissivity procedures for IST tests
RD4	HP-2-ASED-PR-0123	Helium Refilling
RD5	HP-2-ASED-TP-0134	Herschel IST leading Procedure

3 Configuration

3.1 HERSCHEL Satellite FM Mechanical / Electrical Configuration

For the EMC RE test the Herschel satellite is mounted on the adapter ring. Both are than positioned on a wooden air pallet provided by the facility in order to be compliant with the floor load requirements of the Maxwell EMC chamber. The satellite is connected with the SCOE's via 30 m long cables. The setup is shown in sect. 3.5.

A hose for venting the cryostat has to be routed from the cryostat to the outside of the EMC chamber.

3.1.1 Cooling

HIFI shall be cooled whenever it is in a higher mode than STB. This is performed with a mobile AirCon placed in the Rosetta cleanroom. The cold air is than ducted in a hose through the chamber wall close to the HIFI panel where it increases the convection.

3.1.2 Cryo conditions

There is no constraint for He-I conditions from any FPU if temperatures are in the following range:

- Level 0 temperature (HTT upper bulkhead, T107): 4.2 - 6.5 K (4.2 - 7K at L0 I/F)
- Level 1 temperature (vent line, T231 - 237): 4.2 - 15 K
- Level 2 temperature (OBP, T254 T207): 5 - 30 K
- Level 3 temperature (Spire J-FET, T246 T247): 5 - 50 K
- No constraint on thermal shield and CVV
- Cryo cover temperature: 220 -260 K
- Temperatures might drift in the above given range during test.
- S/C is in vertical position and no movement during test.

3.1.3 Shielding and Grounding

The SCOE cables shall be shielded with aluminum foil from the satellite to the point where they go into the holes for the tunnels to the Rosetta clean room respectively the wall of the EMC chamber, as applicable.

The facility clean ground shall be connected to the PCDU panel. This is a single point ground which also grounds the adapter ring. The ground strap shall be routed in parallel to the SCOE cabling. Figure 3.2-1 gives an overview of the grounding during the test.

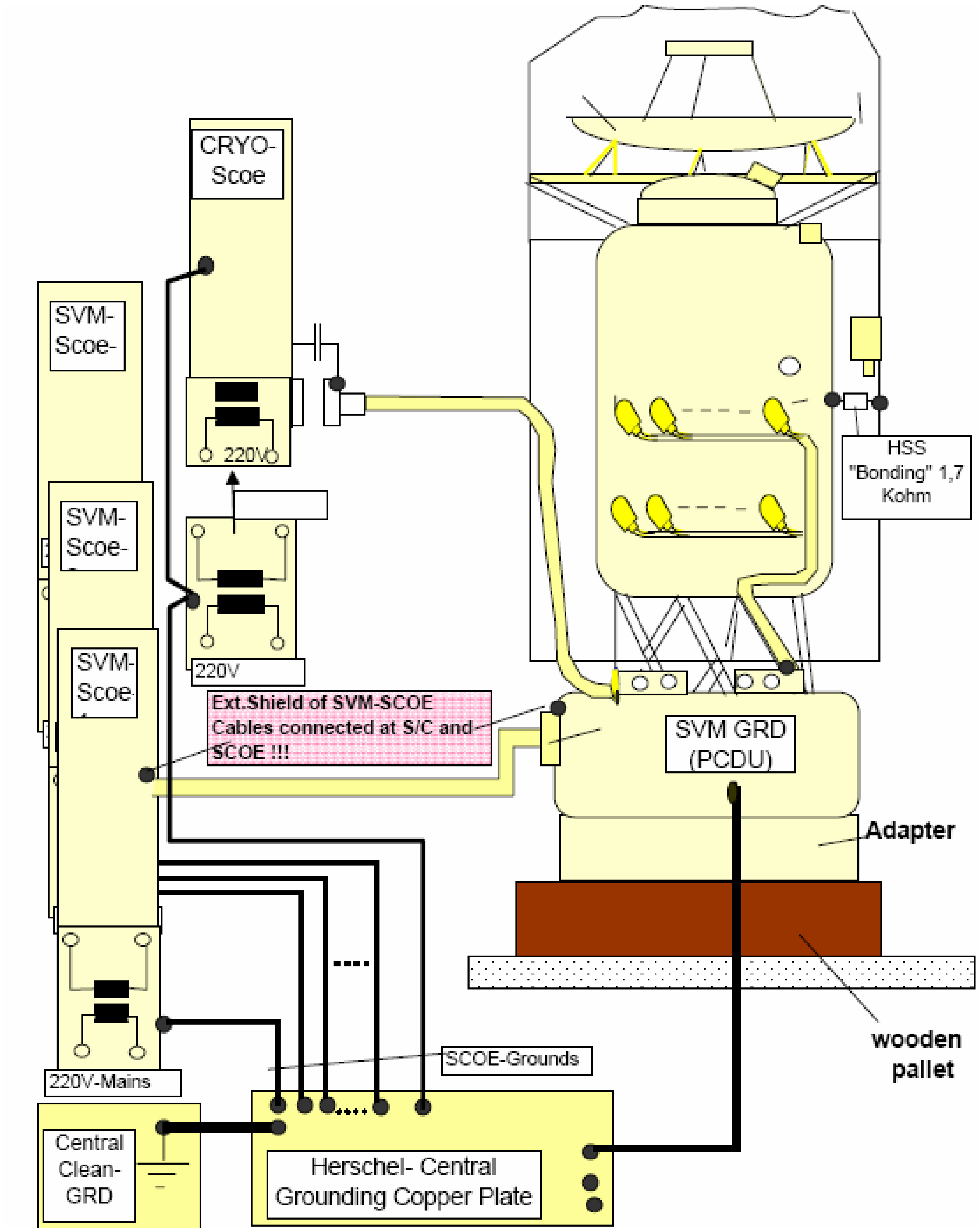

Figure 3.2-1: Grounding in EMC chamber

3.2 EGSE Configuration

The following SCOE's have to be located close to the S/C outside the EMC chamber (cable length 30m):

Table 3-1 shows the configuration for the SCOE's.

Subsystem	Electrical Configuration	Mechanical Configuration
SAS SCOE	• Online • Voc = 43 V • Isc = 2.0 A • Rs = 0.1 • N = 100 • Vprot = 45 V • Iprot (FPCS) less than 3.3 A • AIT BDR 1 and BDR 2 = ON • Separation Straps 1 to 8 = separated • SA Temp simulation set to 110 °C Battery Simulator Nominal Set:	3 racks + PC
BS SCOE	• Online • Vbat = 24 V • Icharge = 10 A • Idisch = 16 A • OVP = 27 V • OCP = ON	1 rack + PC
TT&C SCOE	All instruments ON and RF cables connected to TT&C subsystem in order to provide • RF downlink signal spectrum monitoring	1 rack + PC
TM/TC DFE	• Online • TM Chain A • TC Chain A • Archiving ON	1 rack + PC
Cryo SCOE	• Data Acquisition	1 rack + PC

Table 3.2-1: EGSE Configuration

3.3 HERSCHEL Satellite FM Operational Configurations

Table 3.3-1 shows the SVM Operational Configurations and Table 3.3-2 the Instrument Configurations in RE and AutoComp for the used modes. The communication with the S/C shall be made via the umbilical.

	Mode 1	Mode 2	Mode 3
Power Panel			
CDMU	ON, NOM	ON, NOM	ON, NOM
ACC	ON, Standby	ON, Standby	ON, Standby
PCDU	ON	ON	ON
Battery	Not connected	Not connected	Not connected
TTC Panel			
EPC1	ON	ON	ON
TWT1	ON	ON	ON
EPC2	OFF	OFF	OFF
TWT2	OFF	OFF	OFF
XPND1	ON, RX + TX	ON, RX + TX	ON, RX + TX
XPND2	ON, but only RX	ON, but only RX	ON, but only RX
RFDN	/	/	/
AOCS sensors			
STR1	ON	ON	ON
STR2	OFF	OFF	OFF
CRS1	ON	ON	ON
CRS2	ON	ON	ON
RWL-1	ON *)	ON *)	ON *)
RWL-2	ON *)	ON *)	ON *)
RWL-3	ON *)	ON *)	ON *)
RWL-4	ON *)	ON *)	ON *)
GYRO A	ON	ON	ON
GYRO B	OFF	OFF	OFF
SAS	/	/	/
AAD	/	/	/
Propulsion			
PT	ON	ON	ON
20N thrusters cat bed	OFF	OFF	OFF
Latch valve	OFF	OFF	OFF
Miscellaneous			
SREM	ON	ON	ON
VMC	ON	ON	ON

*): Reaction wheels are ON but not rotating

Table 3.3-1: SVM Operational Configurations in RE / AutoComp.

	Mode 1	Mode 2	Mode 3
PACS	Safe Mode	Safe Mode	Safe Mode
SPIRE	Most Emissive Mode	Stand By	Stand By
HIFI	Stand By	Most Noisy Mode	Stand By
PACS FPU	OFF	OFF	OFF
PACS Panel			
FPSPU N	ON	ON	ON
FPSPU R	OFF	OFF	OFF
FPDPU N	ON	ON	ON
FPDPU R	OFF	OFF	OFF
FPDEC/MEC1	ON	ON	ON
FPDEC/MEC2	OFF	OFF	OFF
FPBOLC N	ON	ON	ON
FPBOLC R	OFF	OFF	OFF
SPIRE FPU	ON	OFF	OFF
SPIRE Panel			
HSDPU N	ON	ON	ON
HSDPU R	OFF	OFF	OFF
HSFCU N	ON	ON	ON
HSFCU R	OFF	OFF	OFF
HSDCU N	ON	ON	ON
HSDCU R	OFF	OFF	OFF
CCU A	ON	ON	ON
CCU B	ON	ON	ON
HIFI LOU	OFF	ON / warm	ON / warm
HIFI FPU	ON	ON / cold	ON / cold
HIFI Panels			
FHWEH	ON	ON	ON
FHWEV	ON	ON	ON
FHLCU N	ON	ON	ON
FHLCU R	OFF	OFF	OFF
FHHRH	ON	ON	ON
FHHRV	ON	ON	ON
FHICU N	ON	ON	ON
FHICU R	OFF	OFF	OFF
FHFCU N	ON	ON	ON
FHFCU R	OFF	OFF	OFF

Table 3.3-2: Instrument Mode Configurations in RE / AutoComp.

3.4 GSE Calibration Status

All test hardware shall be calibrated and shall be within the calibration period during the test time. The test equipment list Table 3.4-1 shall be completed during the test and included in the test report.

Test Equipment List					
Item	**Manuf.**	**Model No.**	**SN No.**	**Invent No.**	**Next Calib.**
See Annex 4 RE Test Report from ETS page 9					

Table 3.4-1: Test Equipment List

3.5 Set-Up in Facility

The activities as detailed in this procedure shall be carried out in the Maxwell anechoic chamber of ESA/ ESTEC in Noordwijk, Netherland.

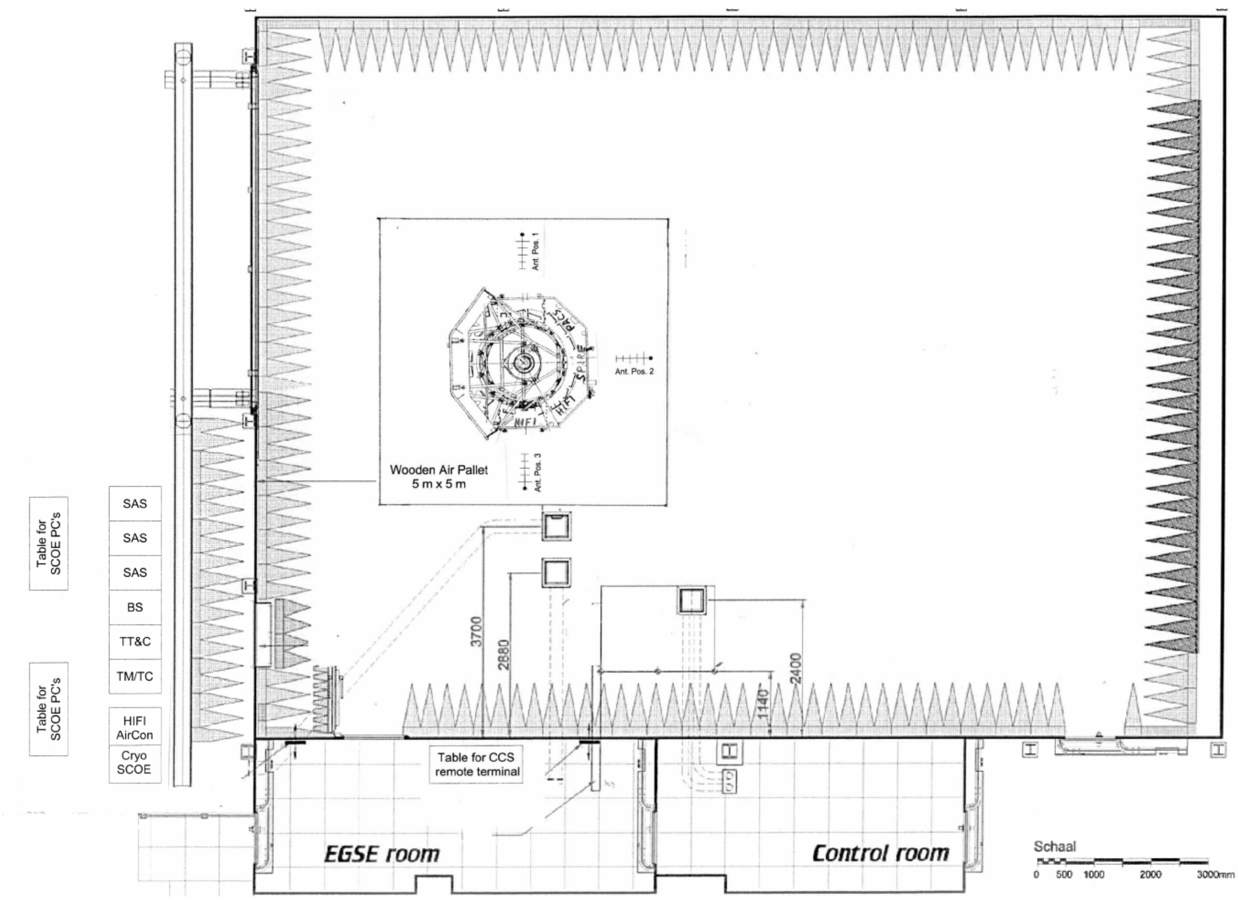

Figure 3.5-1 Arrangement of the EGSE and S/C in facility

3.6 General Requirements

- The handling of the test set-up shall be in accordance with controlled procedure only
- Handling, mechanical and electrical, has to be done only by qualified personnel

3.7 Environmental Conditions

All activities specified in the procedure have to be performed in the anechoic chamber, clean room class 100 000 environment.

Temperature: 22°C +/- 3°C

Relative Humidity: 40% to 55%

The cleanliness requirements will be observed throughout the activities, and the overall contamination control requirements identified in the Herschel Contamination Control Plan, AD2, will be observed.

3.8 Measurement Accuracies

3.8.1 Receiver Accuracies

Table 4.3.1-1 gives a guideline for receiver measuring bandwidths. The actual bandwidth of the test equipment shall be provided by the facility personnel during the EMC tests.

Actual values see Annex 4 RE Test Report from ETS sect 8.2

Frequency Range	**Proposed 6 dB BW**	**Actual**	**Comment**
30 Hz - 1 kHz	10 Hz		
1 kHz - 10 kHz	100 Hz		
10 kHz - 150 kHz	1 kHz		
150 kHz – 30 MHz	10 kHz		
30 MHz - 1 GHz	100 kHz		
Above 1 GHz	1 MHz		Except notches *)
Frequency Accuracy	± 2 %		
Amplitude Accuracy	± 2 dB		

*) The resolution bandwidth shall be selected so that the noise floor of the test equipment is 4 to 6 dB below the notch limit.

Table 3.8-1: Receiver Measurement Bandwidth

3.9 General Precautions and Safety

3.9.1 General Safety Requirements

Except of radiation during the AutoComp test no special hazards are expected. The application of the standard technical rules for mechanical and electrical integration and test activities is sufficient.

Lower level procedures called up by this procedure may define their own safety requirement in the relevant chapters which must be respected accordingly

3.9.2 Radiation

When test caps are not mounted and the S/C the is transmitting, the EMC chamber doors have to be closed and no persons are allowed in the EMC chamber.

3.9.3 ESD constraints

In order to prevent ESD sensitive H/W from any possible damages by accidental electrostatic discharges an ESD protected area must be defined during ESD sensitive activities:

- Floor and test bench of the ESD protected area has to be covered with anti-static mats
- During all handling activities (as transport, mounting, mating/de-mating of connectors, measurements with individual measurement devices, etc.) the operator has to work on anti static mats with correct clothing and personal grounding-straps
- Adequate ESD clothing is required:
  - Anti static coat
  - Anti static gloves
  - Anti static boots

3.10 Activities Management

3.10.1 Pre-Test Activities

At least the following tasks have to be successfully completed before start of integration and test activities according this procedure:

- This procedure released and accepted
- Formal release to start given by the board following review of relevant test procedures and test configurations.

3.10.2 Procedure Variation

Major activities deviating from the approved test procedure require the agreement of Project, AIV and PA responsible, and shall be documented via Activity Control Sheets (ACS). All ACS's generated in the frame of the execution of this procedure shall be listed in the ACS Summary Sheet in section 9.1 of this procedure.

3.10.3 Criteria for Failure

If the results of any test performed using this procedure or a lower level procedure which this procedure refers to yields a value which lies outside the specified limits, it shall be considered as a non-conformance. Initial analysis of the result will be applied to establish whether the result is due to measurement error or incorrect specification limits. A NCR will then be raised to report the non-conformance. Depending on the magnitude of the non-conformance, and its impact, either a minor or a major NCR will be raised. In case of major NCR the test shall be continued only upon written or verbal authorisation of Customer (TAS-F and ESA). All NCR's raised in the frame of the execution of this procedure shall be listed in the NCR Summary Sheet in section 7.3 of this procedure.

The NCR process is described in the Herschel PA Plan, AD1.

3.10.4 Test Completion and Post-Test Activities

All data that has been recorded during the test activities specified in this procedure shall be collected and retained in a centralised reference volume, and will include:

- PFM logbook
- Relevant CCS logs
- Photographs and plots
- Filled out test procedure
- Activity Control Sheets (ACS), if any
- Copies of NCR's, if any

All these test data shall be available for presentation at the Test Review Board (TRB) which will finally conclude on the test.

A test report shall be produced, whose contents shall be as follows:

- Brief summary of the test results
- PLM and instrument build standard summary
- "As-run" test procedure as an annex (this includes housekeeping data, temperature curves, etc.).

- List of NCR's raised
- List of ACS's generated.
- Relevant meeting minutes (e. g. TRR, TRB)
- Filled out Sign-off Sheet (see section 7.4 of this procedure).
- Evaluation of test results (might be in separate document)

3.11 PA Requirements

Quality Assurance shall monitor all operations (handling, transportation, disassembly, installation and test) as necessary to assure compliance with this procedure and the applicable requirements of the Herschel PA Plan, AD1.

In the course of this procedure PA shall pay particular attention to:

- the application of adequate protections to critical surfaces
- the records in the log-sheet
- the recording of the serial number of the test equipment used
- ensure that the test equipment used is within actual calibration cycle

PA has to make sure that NCR’s are raised when applicable and treated by NRB procedure as defined in the Herschel PA Plan, AD1.

After the conclusion that an activity is successfully completed, this activity has to be signed by the responsible AIT- and PA engineer in the step by step procedure. Also relevant log sheets have to be filled out and signed.

3.12 Personnel

Title	Function	Name
Test Director	Overall responsible	Martin Priestley
Test Conductor	EMC Test Coordinator	Michael Hopfgarten
EGSE Expert (ASED)	EMC Test Responsibility	Klaus Tigges
EGSE Expert (TAS-F)	EMC Test result processing	Marc Burlas
EGSE Operator	Operate EGSE (CCS, PLM SCOE, CDMU DFE, Cryo SCOE)	Pietro Modesto
EGSE Expert (TAS-I)	Support EGSE operator and EMC set-up	Pietro Modesto Alessio Di Capua
EMC Test Performance (~~ESTEC~~)	Responsible for the EMC facility and operations	Jaap van der Meulen ETS
Mech. Operator(s)	All mech. Integration activities	T. Bayer
Cryo Operators	Operate the cryostat during testing and maintain the required temperatures	J. Huber
ESA Support	Support and supervision of test activities	Filippo Marliani Bernhard Jackson
HIFI Engineers	Support test activities	-
PACS Engineers	Support test activities	-
SPIRE Engineers	Support test activities	-
PA Representative	To ensure PA requirements	R. Langenstein

Table 3.12-1: Personnel

4 Test Requirements

4.1 Radiated Emission (RE) E-field

The set-up and the performance of the test shall be similar to MIL Std 461E, RE 102.

- The satellite shall be set into the applicable operational configuration. See Table 3.3-1 and 3.3-2. The on board equipment shall be set to the most noisiest mode
- The on board LGA / MGA antennas shall be covered with test caps in order to limit the spurious emissions at TX frequency. The test caps shall be capable to handle the TX power without constraints.
- Each test antenna position shall coincide with the position of the harness of the respective instrument under test.
- Any test harness between satellite and EGSE shall be properly shielded before the test in order not to influence the test result.
- The Test chamber shall be free of other equipment and cabling than used during RE tests.
- The test antennas shall be placed at 1 metre distance to the satellite at predefined positions.

Before starting RE Test a kind of ambient /sniff tests will be performed with a portable spectrum analyser around the EGSE harness or any other critical item. An ambient test shall then be performed from 14kHz up to 1GHz in one polarisation (horizontal up from 30MHz) reduced to antenna position 2.

The selection of the RE test antennas shall be in accordance to Table 4.1-1.

Frequency Range	Polarization	Antenna Type	Comment
14 kHz – 30 MHz	V	Rod	Groundplane connected to S/C structure if feasible
30 MHz – 1 GHz	V and H	Biconical+logper	May be combined; Absorbers beneath A. and S/C on the floor
1 GHz – 18 GHz	V and H	Broadband horn	LNA is required for notches

Table 4.1-1: Selection of RE Test Antennas

4.1.1 RE E-field in Operational Modes

The operational satellite shall not exceed the E-field in the frequency range from

14 kHz to 18 GHz

Figure 4.1-1, Table 4.1-2 and Figure 4.1-2 show the limit and the TC notch for PACS and SPIRE, antenna positions 1 and 2.

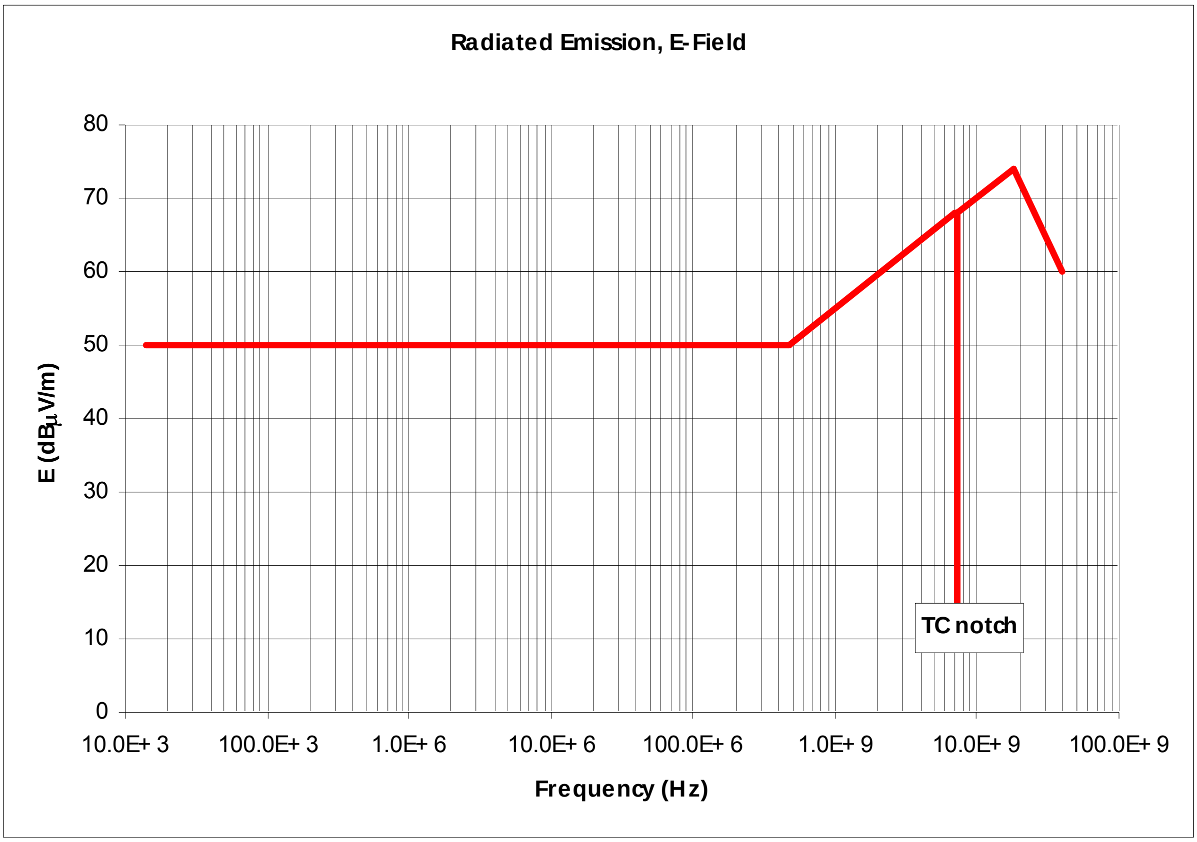

Figure 4.1-1: PACS and SPIRE RE E-Field General Limit

Frequency (MHz)	Level (dBuV/m)
7133	68
7186	45
7191 - 7213	15
7218	45
7271	68

Table 4.1-2: PACS and SPIRE TC Notch Limit Frequencies

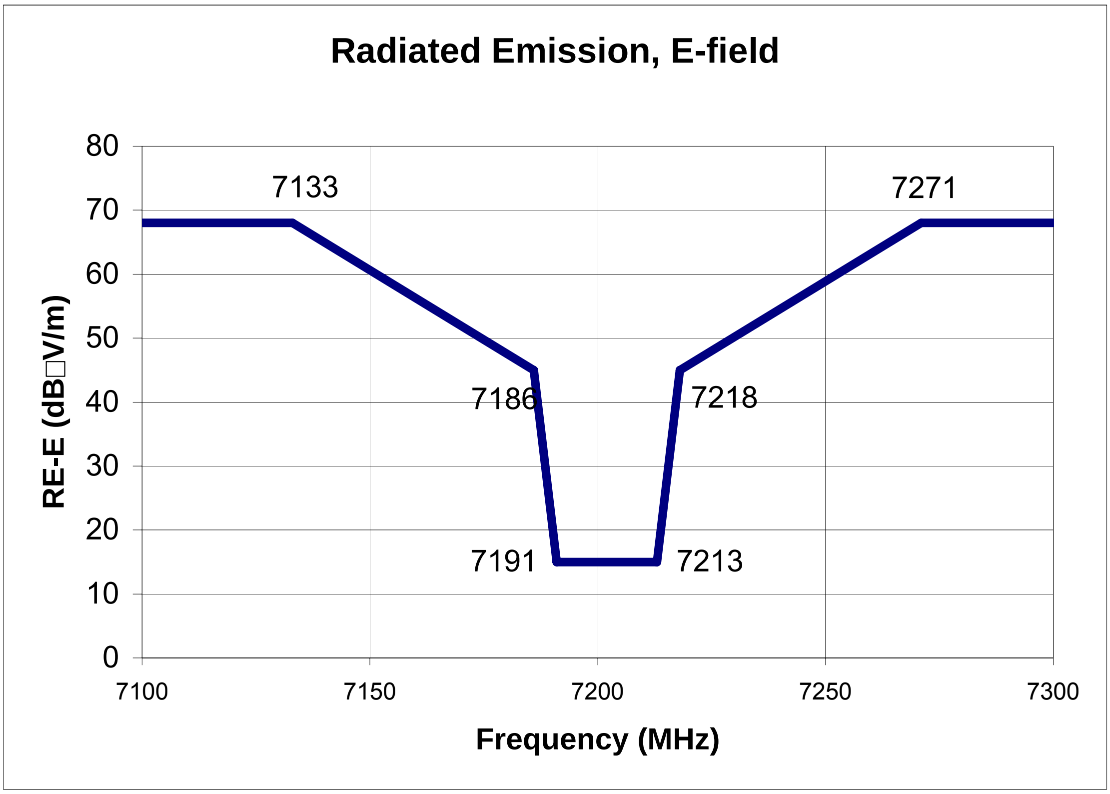

Figure 4.1-2: PACS and SPIRE RE E-Field TC Notch Limit

Figure 4.1-3, Table 4.1-3 and Figure 4.1-4 show the limit and the TC notch for HIFI, antenna position 3.

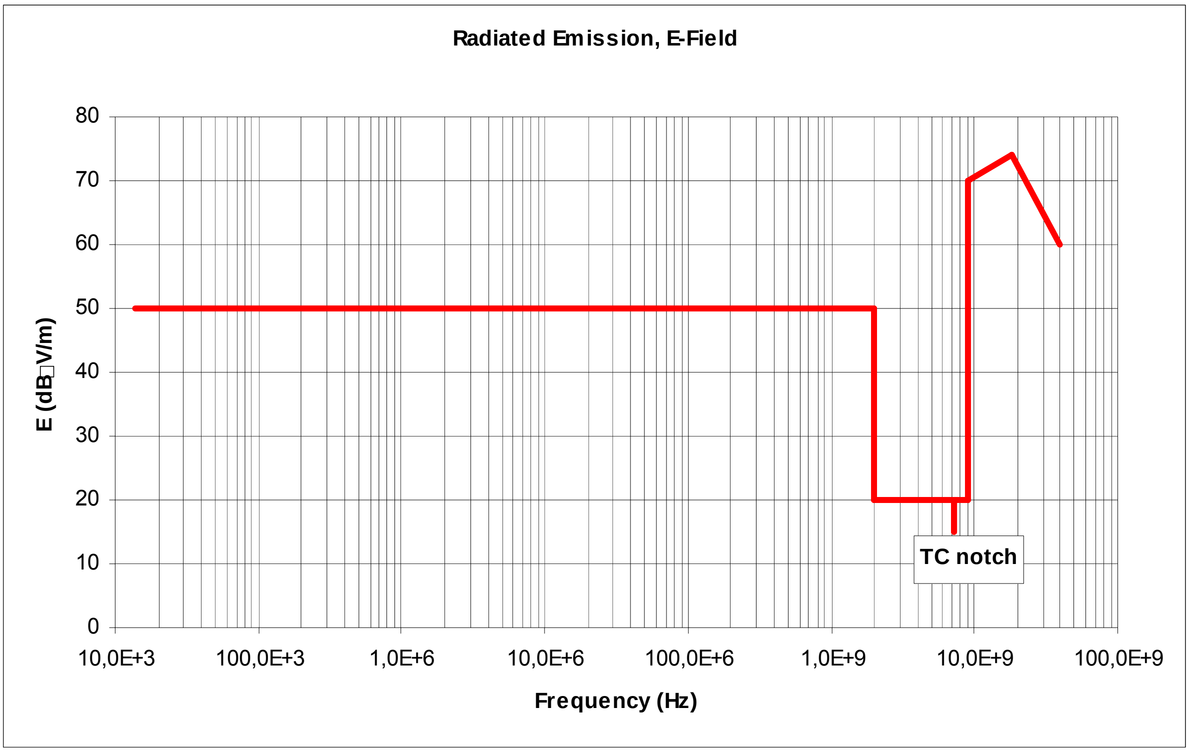

Figure 4.1-3: HIFI RE E-Field General Limit

Frequency (MHz)	Level (dBuV/m)
< 2000	50
2000 - 7186	20
7191-7213	15
7218 - 9000	20

Table 4.1-3: HIFI TC Notch Limit Frequencies

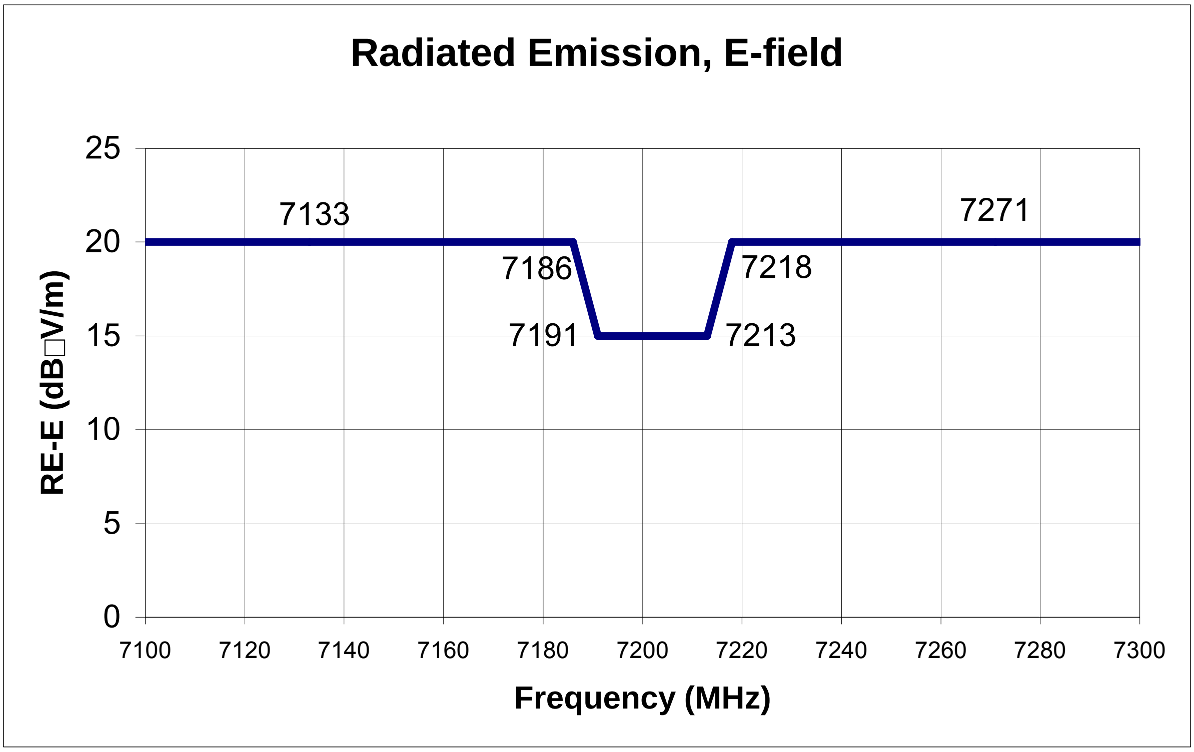

Figure 4.1-4: HIFI RE E-Field TC Notch Limit

Note:
The test equipment shall be capable to measure a level 6 dB below the defined limit.

- The measurement shall be taken for vertical (V) and horizontal (H) polarisations (below 30MHz only vert).
- The applicable spacecraft configurations are shown in Table 4.3-1
- In Figure 4.1-5 to 4.1-7 the three antenna positions are shown. The antennas are oriented to the harness of the measured instrument. See also floor plan Figure 3.5-1.

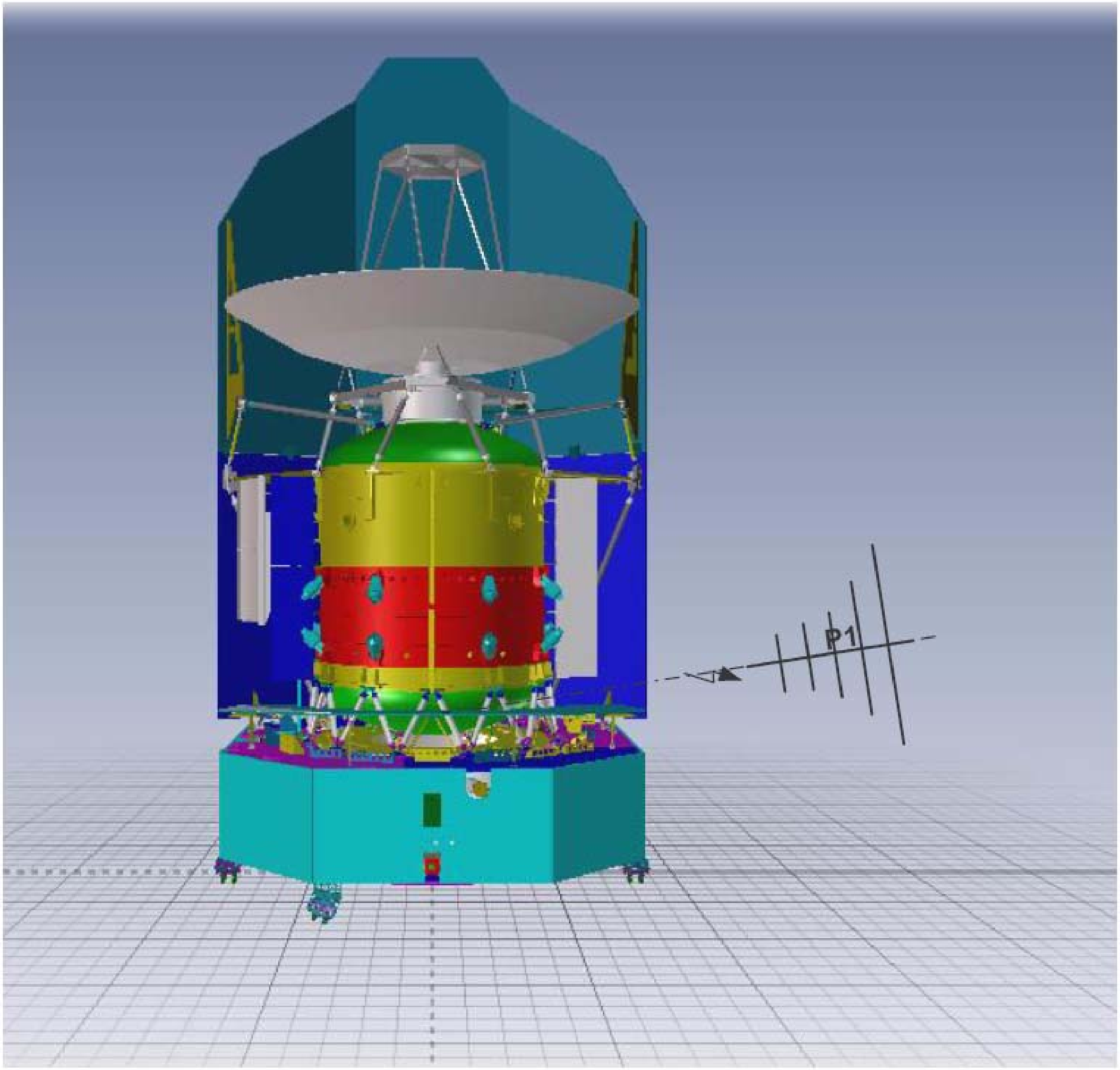

Figure 4.1-5: Antenna position P1 towards PACS

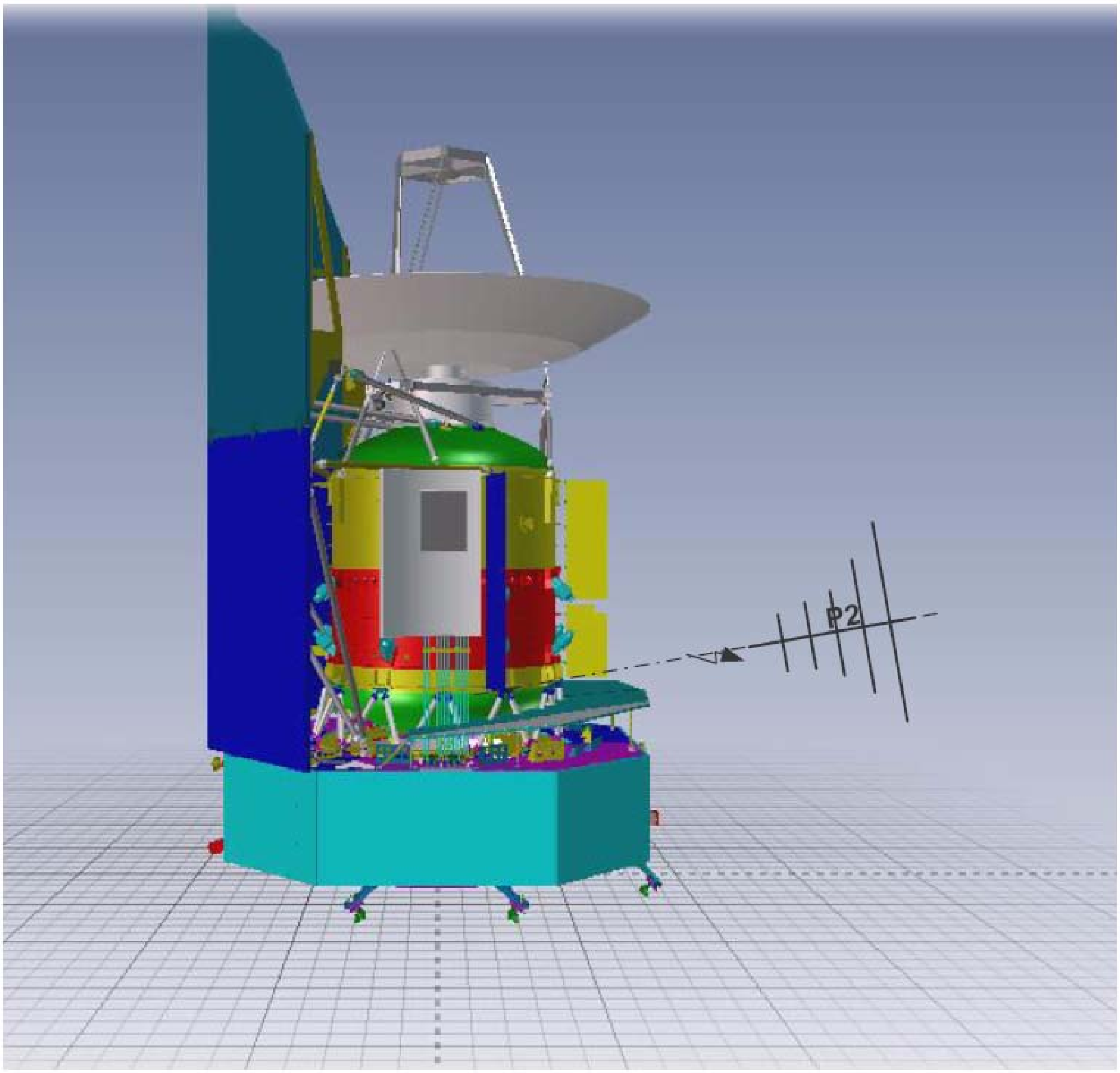

Figure 4.1-6: Antenna position P2 towards SPIRE

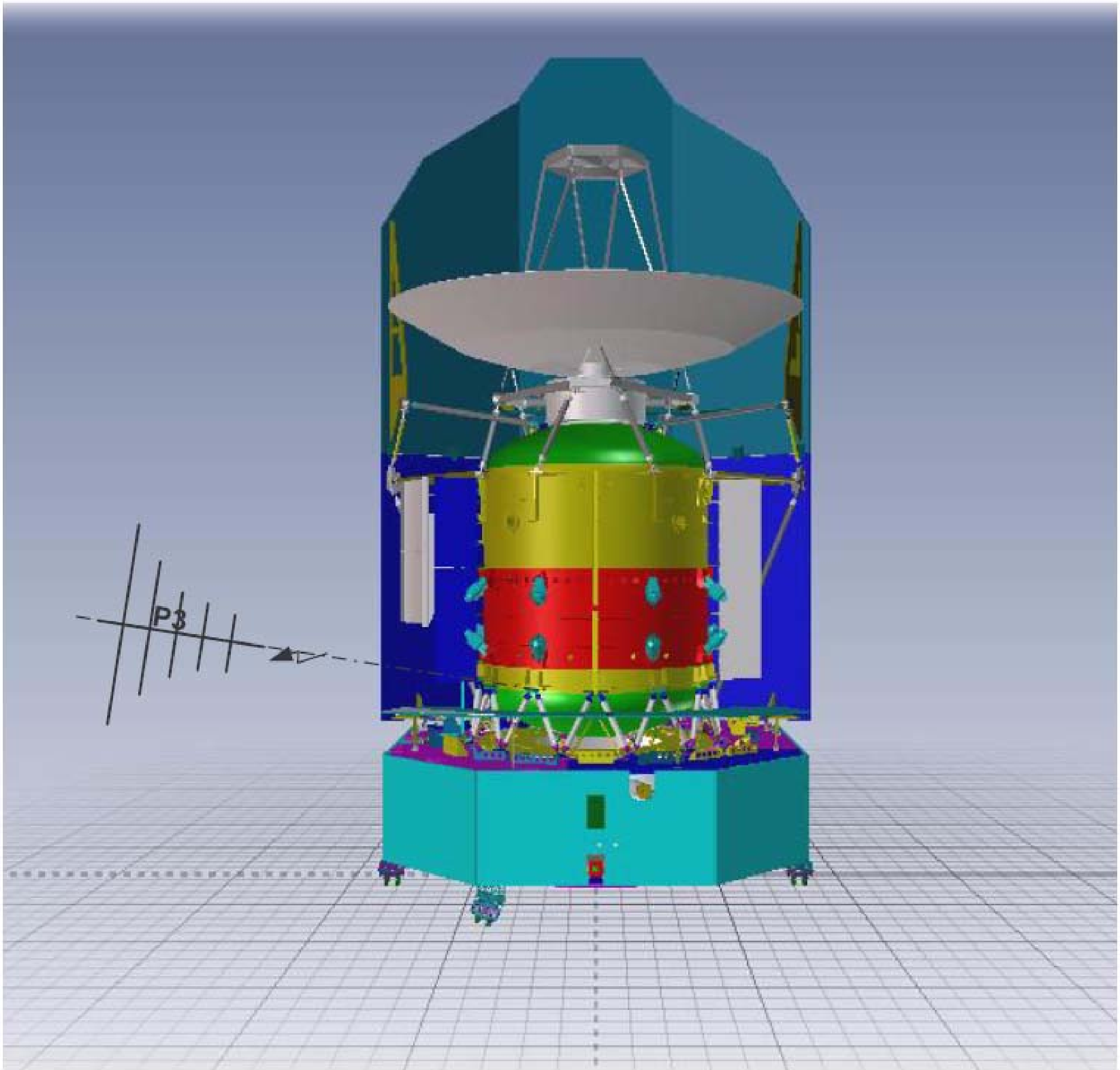

Figure 4.1-7: Antenna position P3 towards HIFI

4.2 Spacecraft RF Auto-Compatibility

The object of this test is to demonstrate that with a fully equipped and integrated spacecraft, with communications made through flight test couplers / umbilical, and free radiating antennas as shown in Figure 4.2-1, the following performances are satisfied:

1. When all equipment is operational and in most emissive mode, the X-band subsystem is capable to

- Receive telecommands at the lowest level which shall be experienced at L2
- Support low bit rate telecommand acquisition under 125 Hz Doppler effect at required level
- Receive and transmit ranging signal which can be properly measured. It will be verified that with delay results are compatible with the ranging calibrations gathered at transponder subsystem level.

and

2. While transmitting telemetry through the antennas all other equipment of the satellite is working properly.

The following points have to be considered for the test:

- The spacecraft shall be supplied (powered) by the SAS.
- Any test harness between satellite and EGSE shall be properly shielded before the test in order not to influence the test result. Other test equipment shall not be located in the anechoic chamber.
- The applicable spacecraft configuration is Mode 2. If AutoComp with HIFI implies a TC reception problem a test with Mode 3 is anticipated.

The EGSE connection between RF-EGSE and TTC Subsystem is shown in Figure 4.2-1.

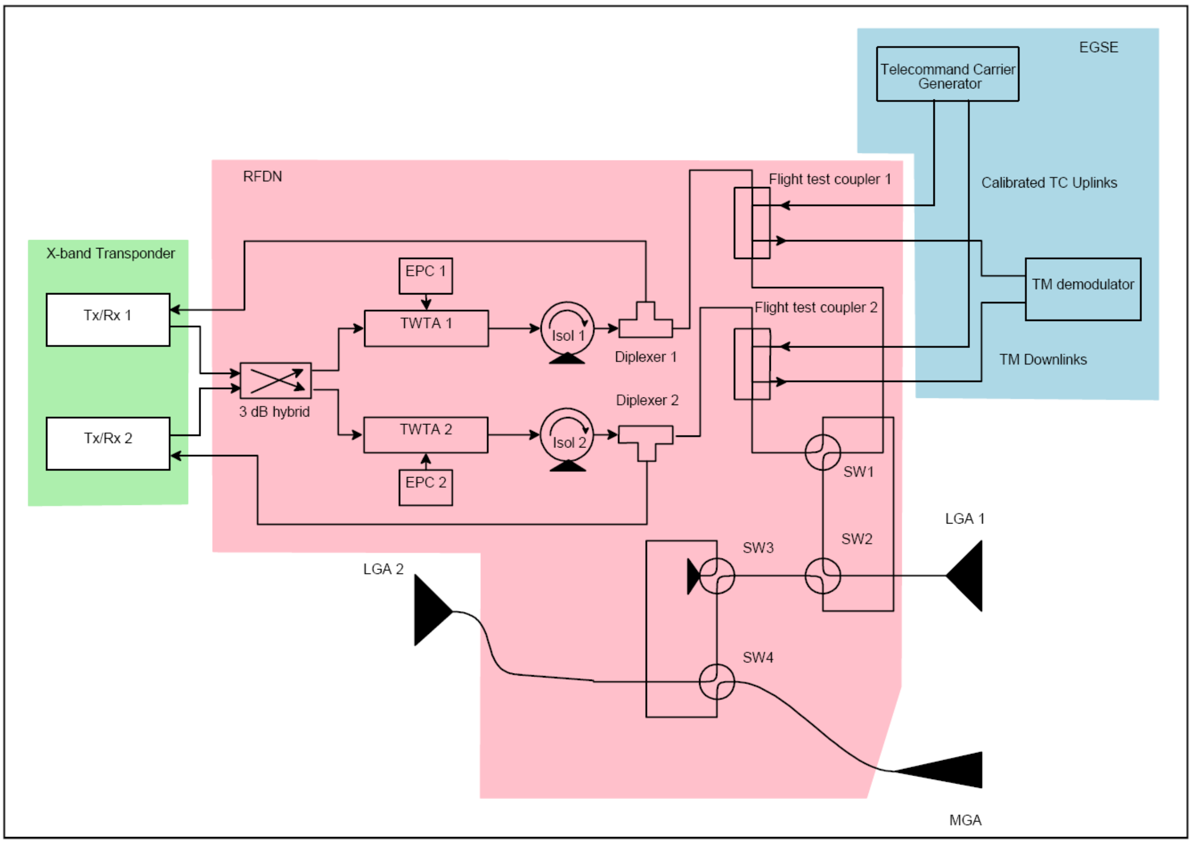

Figure 4.2-1: RF-EGSE and TTC Subsystem interconnection

4.3 Test overview

The following tables give an overview of the activities described in this procedure. The sections are test modules. Their sequence is not decisive i.e. it can be changed if required by test circumstances.

5.1. Ambient, Antenna Position P2 (towards SPIRE)

Step	Mode	**Antenna** (1 m distance)
1.1	SVM & Instruments OFF	Portable Spectrum Analyzer; sniff test
1.2	SVM & Instruments OFF	P2, Vertical; 14kHz to 30MHz
1.3	SVM & Instruments OFF	P2, Horizontal; 30MHz to 1GHz

5.2. Antenna Position P1 (towards PACS)

Step	Mode (see table 4.3-1)	**Antenna** (1 m distance)
2.1	1	Vertical; 14kHz to 30MHz
2.2	1	Horizontal; 30MHz to 1GHz
2.3	1	Vertical; 30MHz to 1GHz
2.4	1	Horizontal; 1GHz to 18 GHz
2.5	1	Horizontal; 7133 MHz to 7271 MHz, Notch
2.6	1	Vertical; 1GHz to 18 GHz
2.7	1	Vertical; 7133 MHz to 7271 MHz, Notch

5.3. Antenna Position P2 (towards SPIRE)

Step	Mode (see table 4.3-1)	**Antenna** (1 m distance)
3.1	1	Vertical; 14kHz to 30MHz
3.2	1	Horizontal; 30MHz to 1GHz
3.3	1	Vertical; 30MHz to 1GHz
3.4	1	Horizontal; 1GHz to 18 GHz
3.5	1	Horizontal; 7133 MHz to 7271 MHz, Notch
3.6	1	Vertical; 1GHz to 18 GHz
3.7	1	Vertical; 7133 MHz to 7271 MHz, Notch

5.4. Antenna Position P3 (towards HIFI)

Step	Mode (see table 4.3-1)	**Antenna** (1 m distance)
4.1	2	Vertical; 14kHz to 30MHz
4.2	2	Horizontal; 30MHz to 1GHz
4.3	2	Vertical; 30MHz to 1GHz
4.4	2	Horizontal; 1GHz to 18 GHz
4.5	2	Horizontal; 2 GHz to 9 GHz, Notch
4.6	2	Vertical; 1GHz to 18 GHz
4.7	2	Vertical; 2 GHz to 9 GHz, Notch

6.Autocompatibility Test

Step	Mode (see table 4.3-1)	Test item
1.1	2	Perturbation LGA1
1.2	2	Perturbation MGA

Next step performed **only** if AutoComp with HIFI implies a TC reception problem:

1.3	3	AutoComp. Perturbation LGA1

Mode	PACS	SPIRE	HIFI
1	Save mode	Most Noisy Mode	Stand By
2	Save mode	Stand By	Most Noisy Mode
3	Save mode	Stand By	Stand By

Table 4.3-1: Instrument Modes

5 Step by Step Procedure RE Test

5.1 Ambient, Antenna Position P2 (towards SPIRE)

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
1.1	Install the calibrated EMC Instrumentation.						✓	
1.2	Switch ON EGSE according AD5						✓	
1.3	Confirm with operator that the spacecraft is switched OFF and all EGSE is active.						✓	
1.4	Perform sniff test with portable spectrum analyzer along the S/C to SCOE harness.					Not performed.		
1.5	Position P~~2~~1. Antennas in 1 m distance from the SPIRE panel, directed to SPIRE harness. Perform the following measurements:					Position changed to P1 because the harness is on this side	✓	
1.5.1	Measure the ambient noise in the range from 14 kHz to 30 MHz for vertical polarisation.		Figure 4.1-1		See Plot	Plot 1 vert. *) Plot 2 horizontal	✓	
1.5.2	Measure the ambient noise in the range from 30 MHz to 1 GHz for vertical polarisation.		Figure 4.1-1		See Plot	Plot 1 vertical *) Plot 2 horizontal	✓	

*) Ant. hight is 2,70 m, Distance: 1m

1.6	Collect excel frequency to amplitude sheet from facility. Store the result of the measurement and compare it with the requirements limit. The measured result shall be 6 dB below the measurement limit.					See file: "RE data ambient measurements"			

Test location:	Operator	Product-Assurance:	Date:
ETS	7-05-08	07/05/08	7.5.08

5.2 Antenna Position P1 (towards PACS)

8.5.08

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N	
2.1	Install the calibrated EMC Instrumentation. Verify that the on board LGA / MGA antennas are covered with test caps.						✓		
2.2	Set S/C into Mode 1 according tables 3.3-1 and 3.3-2								
2.2.1	Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP				POWER SCOE IN Battery MODE INSTEAD OF S3R MODE			
2.2.2	Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5.	OP							
2.2.3	Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5.	OP							
2.2.4	Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5.	OP				RE Test was started with PACS, SPIRE and HIFI in STB			16:15
2.2.5	Switch SPIRE from STB into SPIRE Noisiest Mode. Execute test steps sect. of 8.1.3.2 of AD5.	OP					✓		16:20
2.3	Verify correct Mode 1 with EGSE operator.	OP					✓		16:20
2.4.	Position P1. Antennas in 1 m distance from the PACS panel, directed to PACS harness. Perform the following measurements:					Antenna high is 2,20m	✓		
2.4.1	Measure emissions in the range from 14 kHz to 30 MHz for vertical polarisation.		Figure 4.1-1		See Plot	Plot 3	✓		

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
2.4.2	Measure emissions in the range from 30 MHz to 1 GHz for horizontal polarisation.		Figure 4.1-1		See Plot	Plot 4	✓	
2.4.3	Measure emissions in the range from 30 MHz to 1 GHz for vertical polarisation.		Figure 4.1-1		See Plot	Plot 3	✓	17:50
2.4.4	Measure emissions in the range from 1 GHz to 18 GHz for horizontal polarisation.		Figure 4.1-1		See Plot	Going on with EXTRA-STEP 3.4.8	Plot 6	✓
2.4.5	~~Measure emissions in the range from 7133 MHz to 7271 MHz for horizontal polarisation, notch.~~		Figure 4.1-2		See Plot	Step not performed No S/C antennas on PACS side		
2.4.6	Measure emissions in the range from 1 GHz to 18 GHz for vertical polarisation.		Figure 4.1-1		See Plot	Plot 5	✓	
2.4.7	~~Measure emissions in the range from 7133 MHz to 7271~~ MHz ~~for horizontal polarisation, notch.~~		Figure 4.1-2		See Plot	Step not performed No S/C antennas on PACS side		
2.5	Collect excel frequency to amplitude sheet from facility. Store the result of the measurement and compare it with the requirements limit. The measured result shall be 6 dB below the measurement limit.							
	Perform following steps 2.6.x only if test will not be continued with another RE or AutoComp test. Depending on which test will follow the test conductor has to decide which steps will be executed and which not.							
2.6	Switch S/C and instruments OFF					Steps 2.6–2.7 not performed since test will be continued with sect. 5.3.		

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
2.6.1	Switch SPIRE from SPIRE Noisiest Mode into STB. Execute test steps sect. 8.1.3.3 of AD5.	OP				N/A		
2.6.2	Switch SPIRE from STB into OFF. Execute test steps sect. 8.1.3.4 of AD5.	OP				N/A		
2.6.3	Switch PACS from Safe Mode into OFF. Execute test steps of sect. 8.1.2.4 of AD5.	OP				N/A		
2.6.4	Switch HIFI from STB into OFF. Execute test steps sect. 8.1.4.4 of AD5.	OP				N/A		
2.6.5	Switch OFF EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP				N/A		
2.7	Verify that S/C is OFF with EGSE operator.	OP				N/A		

Test location:	Operator	Product-Assurance:	Date:
ETS	08-05-08	8.5.08	8.5.08

5.3 Antenna Position P2 (towards SPIRE)

08.08.08

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
3.1	Install the calibrated EMC Instrumentation. Verify that the on board LGA / MGA antennas are covered with test caps.					3.1- 3.3 not performed, Mode already switched ON		
3.2	Set S/C into Mode 1 according tables 3.3-1 and 3.3-2. Depending on current mode the test conductor has to decide which steps will be executed and which not.	OP				POWER SCOE IN Battery MODE INSTEAD OF SSR MODE		
3.2.1	Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP						
3.2.2	Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5.	OP						
3.2.3	Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5.	OP						
3.2.4	Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5.	OP				~~see 2.2.4~~	✓	
3.2.5	Switch SPIRE from STB into SPIRE Noisiest Mode. Execute test steps sect. of 8.1.3.2 of AD5.	OP					✓	
3.3	Verify correct Mode 1 with EGSE operator.	OP					✓	
3.4.	Position P2. Antennas in 1 m distance from the SPIRE panel, directed to SPIRE harness. Perform the following measurements:					Antenna hight 2,60 m	✓	

Extra 3.4.8	Position P2-a Antenna in 1m dist. from SVM, Hight: 3,2m	04	
3.4.9	Measure emissions in the range from 14 kHz - 30 MHz, vertical	Plot 7	✓
3.4.10	Measure emissions in the range ~~of~~ to 200 MHz, horizontal and vertical	Plot 8	✓

Go on with step 3.4.1

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
3.4.1	Measure emissions in the range from 14 kHz to 30 MHz for vertical polarisation.		Figure 4.1-1		See Plot	Plot 9	✓	
3.4.2	Measure emissions in the range from 30 MHz to 1 GHz for horizontal polarisation.		Figure 4.1-1		See Plot	Plot 10	✓	
3.4.3	Measure emissions in the range from 30 MHz to 1 GHz for vertical polarisation.		Figure 4.1-1		See Plot	Plot 9	✓	
3.4.4	Measure emissions in the range from 1 GHz to 18 GHz for horizontal polarisation.		Figure 4.1-1		See Plot	Plot 14	✓	
3.4.5	Measure emissions in the range from 7133 MHz to 7271 MHz for horizontal polarisation, notch.		Figure 4.1-2		See Plot	Plot 13	✓	
3.4.6	Measure emissions in the range from 1 GHz to 18 GHz for vertical polarisation.		Figure 4.1-1		See Plot	Plot 12 Plot 15	✓	
3.4.7	Measure emissions in the range from 7133 MHz to 7271 MHz for ~~horizontal~~ vertical polarisation, notch.		Figure 4.1-2		See Plot	Plot 11	✓	
3.5	Collect excel frequency to amplitude sheet from facility. Store the result of the measurement and compare it with the requirements limit. The measured result shall be 6 dB below the measurement limit.							
	Perform following steps 3.6.x only if test will not be continued with another RE or AutoComp test. Depending on which test will follow the test conductor has to decide which steps will be executed and which not.							

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
3.6	Switch S/C and instruments OFF							
3.6.1	Switch SPIRE from SPIRE Noisiest Mode into STB. Execute test steps sect. 8.1.3.3 of AD5.	OP					✓	20:05
3.6.2	Switch SPIRE from STB into OFF. Execute test steps sect. 8.1.3.4 of AD5.	OP				~~Note~~ Steps 3.6.2 to 3.7 not executed because		
3.6.3	Switch PACS from Safe Mode into OFF. Execute test steps of sect. 8.1.2.4 of AD5.	OP				Test continues with sect. 6.1		
3.6.4	Switch HIFI from STB into OFF. Execute test steps sect. 8.1.4.4 of AD5.	OP						
3.6.5	Switch OFF EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP						
3.7	Verify that S/C is OFF with EGSE operator.	OP						

Test location:	Operator	Product-Assurance:	Date:
ETS	08-05-08	8.5.08	8.5.08

5.4 Antenna Position P3 (towards HIFI)

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
4.1	Install the calibrated EMC Instrumentation. Verify that the on board LGA / MGA antennas are covered with test caps.						✓	
4.2	Set S/C into Mode 2 according tables 3.3-1 and 3.3-2. Depending on current mode the test conductor has to decide which steps will be executed and which not.						✓	
4.2.1	Set S/C into Mode 2 according tables 3.3-1 and 3.3-2						✓	
4.2.2	Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP				EGSE is ON already.	✓	
4.2.3	Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5.	OP				TWT's are not ON!!	✓	
4.2.4	Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5.	OP				On request of ESA and	✓	
4.2.5	Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5.	OP				agreed by TAS-F	✓	
4.2	Switch HIFI from STB into HIFI Noisiest Mode. Execute test steps sect. of 8.1.4.2 of AD5.	OP					✓	
4.3	Verify correct Mode 2 with EGSE operator.	OP					✓	

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
4.4.	Position P3. Antennas in 1 m distance from the HIFI panel, directed to HIFI harness. Perform the following measurements:					Ant. Hight: 2,24m	✓	
4.4.1	Measure emissions in the range from 14 kHz to 30 MHz for vertical polarisation.		Figure 4.1-3		See Plot	Plot 16	✓	
4.4.2	Measure emissions in the range from 30 MHz to 1 GHz for horizontal polarisation.		Figure 4.1-3		See Plot	Plot 17	✓	
4.4.3	Measure emissions in the range from 30 MHz to 1 GHz for vertical polarisation.		Figure 4.1-3		See Plot	Plot 16	✓	
4.4.4	Measure emissions in the range from 1 GHz to 18 GHz for horizontal polarisation.		Figure 4.1-3		See Plot	Plot 21	✓	
4.4.5	Measure emissions in the range from 2 GHz to 9 GHz for horizontal polarisation, notch.		Figure 4.1-4		See Plot	Plot 20+21	✓	
4.4.6	Measure emissions in the range from 1 GHz to 18 GHz for vertical polarisation.		Figure 4.1-3		See Plot	Plot 18	✓	
4.4.7	Measure emissions in the range from 2 GHz to 9 GHz for vertical polarisation, notch.		Figure 4.1-4		See Plot	Plot 18+19	✓	→ *)
4.5	Collect excel frequency to amplitude sheet from facility. Store the result of the measurement and compare it with the requirements limit. The measured result shall be 6 dB below the measurement limit.							

→ *) extra measurement. Same as 4.4.4–4.4.7 with TX+TWTA "ON" → Plot 22+23 ✓
// Same as 4.4.1 // // → Plot 24 ✓
// Same as 4.4.4–4.4.7 // TX+TWTA+HIFI "off" →

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
	Perform following steps 4.6.x only if test will not be continued with another RE or AutoComp test. Depending on which test will follow the test conductor has to decide which steps will be executed and which not.							
4.6	Switch S/C and instruments OFF							
4.6.1	Switch SPIRE from STB into OFF. Execute test steps sect. 8.1.3.4 of AD5.	OP				See PVS 8 of Functional Procedure 116		
4.6.2	Switch PACS from Safe Mode into OFF. Execute test steps of sect. 8.1.2.4 of AD5.	OP						
4.6.3	Switch HIFI from Noisiest Mode into STB. Execute test steps of sect. 8.1.2.3 of AD5.	OP						
4.6.4	Switch HIFI from STB into OFF. Execute test steps sect. 8.1.4.4 of AD5.	OP						
4.6.5	Switch OFF EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP						
4.7	Verify that S/C is OFF with EGSE operator.	OP						

Test location:	Operator	Product-Assurance:	Date:
ETS		9.5.08	9.5.08

6 Step by Step Procedure Auto-Compatibility Test

6.1 Nominal AutoComp Test

8.5.08

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
1.1	Remove test caps from on board LGA / MGA antennas.					Tx and EPC 1 switched OFF for	✓	
	Set S/C into Mode 2 according tables 3.3-1 and 3.3-2. Depending on current mode the test conductor has to decide which steps will be executed and which not.					removing test caps		
1.2	Set S/C into Mode 2 according tables 3.3-1 and 3.3-2							
1.2.1	Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP				Steps 1.2.1 – 1.2.4 continued from sect.		
1.2.2	Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5.	OP				5.3		
1.2.3	Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5.	OP						
1.2.4	Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5.	OP						
1.2.5	Switch HIFI from STB into HIFI Noisiest Mode. Execute test steps sect. of 8.1.4.2 of AD5.	OP					✓	
1.3	Verify correct Mode 2 with EGSE operator.	OP						
1.2.5	Switch ON Tx and EPC 1	OP				BS safety Loop		✓

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
1.4	Perform AutoComp test according sect. of 8.1.7 of AD5.							
1.5	Switch S/C and instruments OFF					Switch OFF by Safety Loop		
1.5.1	Switch SPIRE from STB into OFF. Execute test steps sect. 8.1.3.4 of AD5.	OP						
1.5.2	Switch PACS from Safe Mode into OFF. Execute test steps of sect. 8.1.2.4 of AD5.	OP						
1.5.3	Switch HIFI from Noisiest Mode into STB. Execute test steps of sect. 8.1.2.3 of AD5.	OP						
1.5.4	Switch HIFI from STB into OFF. Execute test steps sect. 8.1.4.4 of AD5.	OP						
1.5.5	Switch OFF EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP						
1.6	Verify that S/C is OFF with EGSE operator.	OP						

Test location:	Operator	Product-Assurance:	Date:
ETS	8.5.08 M. [signature]		8.5.08

6 Step by Step Procedure Auto-Compatibility Test

6.1 Nominal AutoComp Test

9.5.08

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
1.1	Remove test caps from on board LGA / MGA antennas.					Tx and EPC 1 switched OFF for removing test caps		
	Set S/C into Mode 2 according tables 3.3-1 and 3.3-2. Depending on current mode the test conductor has to decide which steps will be executed and which not.							
1.2	Set S/C into Mode 2 according tables 3.3-1 and 3.3-2							
1.2.1	Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP				Steps 1.2.1 – 1.2.3 continued from sect. 5.4		
1.2.2	Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5.	OP						
1.2.3	Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5.	OP						
1.2.~~5~~4	Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5.	OP					✓	
1.2.~~4~~5	Switch HIFI from STB into HIFI Noisiest Mode. Execute test steps sect. of 8.1.4.2 of AD5.	OP					✓	
1.3	Verify correct Mode 2 with EGSE operator.	OP					✓	

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
1.4	Perform AutoComp test according sect. of 8.1.7 of AD5.						✓	
1.5	Switch S/C and instruments OFF							
1.5.1	Switch SPIRE from STB into OFF. Execute test steps sect. 8.1.3.4 of AD5.	OP					✓	
1.5.2	Switch PACS from Safe Mode into OFF. Execute test steps of sect. 8.1.2.4 of AD5.	OP					✓	
1.5.3	Switch HIFI from Noisiest Mode into STB. Execute test steps of sect. 8.1.2.3 of AD5.	OP					✓	
1.5.4	Switch HIFI from STB into OFF. Execute test steps sect. 8.1.4.4 of AD5.	OP					✓	
1.5.5	Switch OFF EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP					✓	
1.6	Verify that S/C is OFF with EGSE operator.	OP					✓	

Test location:	Operator	Product-Assurance:	Date:
ETS	10.5.08 [signature]		10.5.08

6.2 Optional AutoComp Test

Not performed since results of sect. 6.1 are in spec.

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
2.1	Remove test caps from on board LGA / MGA antennas.							
	Set S/C into Mode 3 according tables 3.3-1 and 3.3-2. Depending on current mode the test conductor has to decide which steps will be executed and which not.							
2.2	Set S/C into Mode 3 according tables 3.3-1 and 3.3-2							
2.2.1	Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP						
2.2.2	Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5.	OP						
2.2.3	Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5.	OP						
2.2.4	Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5.	OP						
2.3	Verify correct Mode 3 with EGSE operator.	OP						
2.4	Perform AutoComp test according sect. of 8.1.7 of AD5.							
2.5	Switch S/C and instruments OFF							
2.5.1	Switch SPIRE from STB into OFF. Execute test steps sect. 8.1.3.4 of AD5.	OP						

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
2.5.2	Switch PACS from Safe Mode into OFF. Execute test steps of sect. 8.1.2.4 of AD5.	OP						
2.5.3	Switch HIFI from STB into OFF. Execute test steps sect. 8.1.4.4 of AD5.	OP						
2.5.4	Switch OFF EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP						
2.6	Verify that S/C is OFF with EGSE operator.	OP						

Test location:	Operator	Product-Assurance:	Date:

7 Facility Report

7.1 Calibration Data

Nr	manufacturer	equipment	Date	due
1				
2				
3				
4				
5				
6				
7				
8				
9				
10	**See Annex 4**	**RE Test Report from ETS page 9**		
11				
12				
13				
14				
15				

To be included if applicable

Summary Sheets

7.2 Procedure Variation Summary

See sect.3.2 of main test report and Annex 3 RE Test Log

	Test Change	Curr. No.: Date: Page 1 of 1	
Test designation Herschel EMC Test	Test Procedure	Issue 1, dated	Rev.
Test step changed	Reason for Change		
Test step changed	Reason for Change		
Test step changed	Reason for Change		
Test step changed	Reason for Change		
Prepared by:	Resp. Test Leader	Project Engineer	
PA/QA	Prime	Customer	

Table 7.2-1: Procedure Variation Sheet

7.3 Non Conformance Report (NCR) Summary

NCR - No.	NCR - Title	Date	Open Closed	PA sig.
	No NCR were generated			

Table 7.3-1: Non-Conformance Record Sheet

7.4 Sign-off Sheet

	Date	Signature
Test Director		
Test Conductor	10.5.08	M. [illegible]
EMC Expert		
PA Responsible		
ESA Representative		

After the conclusion that an activity is successfully completed, this activity has to be signed by the responsible AIT- and PA engineer in the step by step procedure. Also relevant log sheets have to be filled out and signed.

	Name	Dep./Comp.		Name	Dep./Comp.
	Baldock Richard	FAE12	x	Sonn Nico	ASG51
x	Barlage Bernhard	AED13		Steininger Eric	AED32
x	Bayer Thomas	ASA42	x	Stritter Rene	AED11
	Brune Holger	ASA45		Suess Rudi	OTN/ASA44
	Chen Bing	HE Space		Theunissen Martijn	DSSA
	Edelhoff Dirk	AED2		Vascotto Riccardo	HE Space
	Fehringer Alexander	ASG13	x	Tigges Klaus	AED32
X	Fricke Wolfgang Dr.	AED 65		Wagner Klaus	ASG23
	Geiger Hermann	ASA42	x	Wietbrock Walter	AET12
	Grasl Andreas	OTN/ASA44		Wöhler Hans	ASG23
	Grasshoff Brigitte	AET12		Wössner Ulrich	ASE252
x	Hamer Simon	Terma		Zumstein Armin	ASQ42
	Hanka, Erhard	FI552			
	Hendrikse Jeffrey	HE Space			
x	Hendry David	Terma			
	Hengstler Reinhold	ASA42			
	Hinger Jürgen	ASG23			
x	Hohn Rüdiger	AED65			
	Hofmann Rolf	ASE252			
x	Hopfgarten Michael	AED32			
x	Huber Johann	ASA42			
	Hund Walter	ASE252			
x	Idler Siegmund	AED312			
	Ivády von András	FAE12			
	Jahn Gerd Dr.	ASG23			
	Jolk Matthias	AET1	X	ESA/ESTEC	ESA
	Klenke Uwe	ASG72	X	Thales Alenia Space Cannes	TAS-F
x	Koelle Markus	ASA43	X	Thales Alenia Space Torino	TAS-I
x	Koppe Axel	AED312			
x	Kroeker Jürgen	AED65		**Instruments:**	
	La Gioia Valentina	Terma	x	MPE (PACS)	MPE
	Lang Jürgen	ASE252	x	RAL (SPIRE)	RAL
	Langenstein Rolf	AED15	x	SRON (HIFI)	SRON
x	Langfermann Michael	ASA41			
	Liberatore Danilo	Rhea			
	Martin Olivier	ASA43		**Subcontractors:**	
	Maukisch Jan	ASA43		Austrian Aerospace	AAE
	Much Christoph	ASA43		Austrian Aerospace	AAEM
x	Müller Martin	ASA43		BOC Edwards	BOCE
	Pietroboni Karin	AED65		Dutch Space Solar Arrays	DSSA
	Platzer Wilhelm	AED2		EADS Astrium Sub-Subsyst. & Equipment	ASSE
x	Reichle Konrad	ASA42		EADS CASA Espacio	CASA
	Runge Axel	OTN/ASA44		EADS CASA Espacio	ECAS
	Sauer Maximilian Dr.	AED65	x	European Test Services	ETS
	Schink Dietmar	AED32		Patria New Technologies Oy	PANT
	Schmidt Thomas	AED15		SENER Ingenieria SA	SEN
	Schweickert Gunn	ASG23		Thales Alenia Space, Antwerp	TAS-ETCA

Annex 2

Test Diary

Content:

Time record of all test events during RE and Auto-Compatibility Test.

5 pages

05-05-2008

EMC -test log Herschel SC RE test

Unit : SC
Model : FM
Serial number : N.A.

Experimenter :

05-05-2008

Preparation of facility
Correction factors for LNA amplifiers.
Removal of test table and PIPE
Removal of absorbers

06-05-2008

EGSE and SC moved into Rosetta clean room.
All EGSE bonded to the facility ground
NO CONNECTION BETWEEN FACILITY GROUND AND BUILDING EARTH.

07-05-2008

12:00 Preparation to move spacecraft to air pallet
15:15 Spacecraft moved in to the Maxwell facility.
Start connecting interfacing cables and wrapping all interface cables
19:00 Cable wrapping completed
19:20 Start zero run measurements in Pacs position (in front of pacs harness)
vertical polarization Antenna high is 280 above the floor level
Plot 1 Filename : Herschel RE1
19:53 Start zero run measurements in Pacs position (in front of pacs harness)
Horizontal polarization Antenna high is 280 above the floor level
Plot 2 Filename : Herschel RE2

20:30 Ends of Day

08-05-2008

16:20 Start RE in pacs position SC in spire noisiest mode.
vertical polarization Antenna high is 270 above the floor level
Plot 3 Filename : Herschel RE3
16:45 Start RE in pacs position SC in spire noisiest mode.

horizontal polarization Antenna high is 270 above the floor level
Plot 4 Filename : Herschel RE4

17:25 Start RE in pacs position SC in spire noisiest mode. (1 to 18 GHz)
vertical polarization Antenna high is 270 above the floor level
Plot 5 Filename : Herschel RE5

17:41 Start RE in pacs position SC in spire noisiest mode. (1 to 18 GHz)
horizontal polarization Antenna high is 270 above the floor level
Plot 6 Filename : Herschel RE6

17:43 Start RE in Spire position SC in spire noisiest mode.
vertical polarization Antenna height is 3.20 meter above the floor level
above spire screen 10 kHz to 200 MHz (extra measurement)
Antenna 1 meter from cable harness
Plot 7 Filename : Herschel RE7

17:57 Start RE in Spire position SC in spire noisiest mode.
horizontal polarization Antenna height is 3.20 meter above the floor level
above spire screen 30 MHz to 200 MHz (extra measurement)
Antenna 1 meter from cable harness
Plot 8 Filename : Herschel RE8

18:03 Start RE in Spire position SC in spire noisiest mode.
vertical polarization Antenna height is 2.60 meter above the floor level
above spire screen 10 kHz to 1 GHz (nominal measurement)
Antenna 1 meter from SVM
Plot 9 Filename : Herschel RE9

18:20 Start RE in Spire position SC in spire noisiest mode.
Horizontal polarization Antenna height is 2.60 meter above the floor level
above spire screen 30 MHz to 1 GHz (nominal measurement)
Antenna 1 meter from SVM
Plot 10 Filename : Herschel RE10

18:30 Start RE in spire position SC in spire noisiest mode. (Spire notch)
vertical polarization Antenna high is 260 above the floor level
Plot 11 Filename : Herschel RE11 (analyzer mode)

18:42 Start RE in spire position SC in spire noisiest mode. (1 to 18 GHz)
vertical polarization Antenna high is 260 above the floor level
Plot 12 Filename : Herschel RE12

18:58 Start RE in spire position SC in spire noisiest mode. (Spire notch)
Horizontal polarization Antenna high is 260 above the floor level
Plot 13 Filename : Herschel RE13 (analyzer mode)

19:01 Start RE in spire position SC in spire noisiest mode. (1 to 18 GHz)
horizontal polarization Antenna high is 260 above the floor level
Plot 14 Filename : Herschel RE14

19:15 Verification of last part of plot 12
Plot 15 Filename : Herschel RE15

20:15 end of test day

09-05-2008

9:00 preparation for HIFI measurement location
Pictures taken for pacs and spire location due to data loss of initial pictures.

10:30 Start RE in HIFI position SC in HIFI noisiest mode. (transponder OFF)
vertical polarization Antenna height is 2.65 meter above the floor level
10 kHz to 1 GHz Antenna 1 meter from SVM
Plot 16 Filename : Herschel RE16

10:50 Start RE in HIFI position SC in HIFI noisiest mode. (transponder OFF)
horizontal polarization Antenna height is 2.65 meter above the floor level
30 MHz to 1 GHz Antenna 1 meter from SVM
Plot 17Filename : Herschel RE17

11:07 Start RE in HIFI position SC in HIFI noisiest mode. (transponder OFF)
vertical polarization Antenna height is 2.65 meter above the floor level
1 GHz to 18 GHz Antenna 1 meter from SVM
Plot 18 Filename : Herschel RE18
Measured frequencies : 2.49899 GHz at 23.0 dBuV/m
3.7434 GHz at 24.0 dBuV/m
4.9969 GHz at 27.7 dBuV/m
6.5661 GHz at 20.9 dBuV/m

11:47 Start RE in HIFI position SC in HIFI noisiest mode. (Hifi notch)
vertical polarization Antenna high is 265 above the floor level
Plot 19 Filename : Herschel RE19 (analyzer mode)

11:52 Start RE in HIFI position SC in HIFI noisiest mode. (Hifi notch)
horizontal polarization Antenna high is 265 above the floor level
Plot 20 filename : Herschel RE20 (analyzer mode)

11:55 Start RE in HIFI position SC in HIFI noisiest mode. (transponder OFF)
horizontal polarization Antenna height is 2.65 meter above the floor level
1 GHz to 18 GHz Antenna 1 meter from SVM
Plot 21 Filename : Herschel RE21
Measured frequencies : 2.49899 GHz at 26.4 dBuV/m
3.7434 GHz at 26.0 dBuV/m
4.9969 GHz at 20.1 dBuV/m
6.5661 GHz at 20.0 dBuV/m

12:30 lunch

Prep for additional measurements HIFI noisy mode TWTA on

13:44 Start RE in HIFI position SC in HIFI noisiest mode. (TWTA 1 on)
vertical polarization Antenna height is 2.65 meter above the floor level
1 GHz to 18 GHz Antenna 1 meter from SVM
Plot 22 Filename : Herschel RE22
Measured frequencies : 2.49899 GHz at 24.3 dBuV/m
3.7434 GHz at 23.6 dBuV/m
4.9969 GHz at 23.6 dBuV/m
6.2505 GHz at 23.5 dBuV/m
8.4689 GHz at 76.6 dBuV/meter (wrong due to analyzer setting)
16.9358 GHz at 61.6 dBuV/m

14:20 manual verification of 8.5 GHz carrier amplitude analyzer reading is 92.4 dBuV this corrected for cable loss , LNA gain and antenna factor gives an absolute value of 90 dBuV/meter

14:24 Start RE in HIFI position SC in HIFI noisiest mode. (TWTA 1 on)
horizontal polarization Antenna height is 2.65 meter above the floor level
1 GHz to 18 GHz Antenna 1 meter from SVM
Plot 23 Filename : Herschel RE23
Measured frequencies : 2.49899 GHz at 27.0 dBuV/m
3.7434 GHz at 26.9 dBuV/m
4.9969 GHz at 17.4 dBuV/m
6.2505 GHz at Noise
8.4689 GHz at 76.6 dBuV/meter (wrong due to analyzer setting)
16.9358 GHz at 61.6 dBuV/m

14:57 manual verification of 8.5 GHz carrier amplitude analyzer reading is 87.1 dBuV this corrected for cable loss , LNA gain and antenna factor gives an absolute value of 84.6 dBuV/meter

15:03 Start RE in HIFI position SC in HIFI noisiest mode. (TWTA 1 on)
vertical polarization Antenna height is 2.65 meter above the floor level
10 kHz to 30 MHz Antenna 1 meter from SVM
Plot 24 Filename : Herschel RE24

15:34 Start RE in HIFI position SC in HIFI Off. (transponder off)
vertical polarization Antenna height is 2.65 meter above the floor level
1 GHz to 18 GHz Antenna 1 meter from SVM
Plot 25 Filename : Herschel RE25
No emissions measured

16:06 Start RE in HIFI position SC in HIFI Off. (transponder off)

horizontal polarization Antenna height is 2.65 meter above the floor level
1 GHz to 18 GHz Antenna 1 meter from SVM
Plot 26 Filename : Herschel RE26
No emissions measured

17:00 End of RE test

18:00 Start of Auto-Compatibility Test

10-05-2008

02:00 End of Auto-Compatibility Test

Annex 3

RE Test Log

Content:

Step by step log of the RE test with reference to the relevant plots and including all procedure variations with justification for the variation.

15 pages

K. Tigges/10.05.08

Note: In addition see ETS "Test log" – file
ETS EMC Test Operator: Jaap van der Meulen, Tel.: 53875 (at ESTEC)

To Para 5.1: Ambient, Antenna Position P2 (towards SPIRE)

07.05.08

Starting Test Run (First day of testing)

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
1.1	Install the calibrated EMC Instrumentation.						✔	
1.2	Switch ON EGSE according AD5						✔	
1.3	Confirm with operator that the spacecraft is switched OFF and all EGSE is active.						✔	
1.4	**Perform sniff test with portable spectrum analyzer along the S/C to SCOE harness.**					→ **Procedure Variation (see 1.5):** Setup for RE Measurements in P1 (PACS) used. In order to save time on given that the satellite position has been changed by 90° in the chamber. So the length of the EGSE harness has been notably shortened. Therefore it has been considered not necessary to perform the sniff test.	✔	

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
1.5	**Position P2. Antennas in 1 m distance from the SPIRE panel, directed to SPIRE harness. Perform the following measurements:**					**→ Procedure Variation:** Antenna location changed from P2 (SPIRE) to P1 (PACS). Assumed to be worst case location due to EGSE cable rooting. The P2 position was chosen without knowing exactly the disposition of the EGSE harness in the chamber. Antenna high is 2,70 m.	✔	
1.5.1	**Measure the ambient noise in the range from 14 kHz to 30 MHz for vertical polarisation.**		**Error! Reference source not found.**		See Plot	Plot 1: Ambient in PACS location (vertical) Plot 1a – 1e: Zoomed f- axis (1 plot per decade) Note: Emissions about 3 MHz at 40 dBµV/m. All other frequencies are well below 40 dBµV/m. Plot 2: Ambient in PACS location (horizontal) Plot 2a – 1b: Zoomed f- axis (1 plot per decade) Note: All emissions are well below 40 dBµV/m.	✔	
1.5.2	**Measure the ambient noise in the range from 30 MHz to 1 GHz for vertical polarisation.**		**Error! Reference source not found.**		See Plot	See 1.5.1	✔	

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
1.6	**Collect excel frequency to amplitude sheet from facility. Store the result of the measurement and compare it with the requirements limit. The measured result shall be 6 dB below the measurement limit.**					See data file "RE data ambient measurements"	✔	
						Photos taken (see folder "Pictures")	✔	

To Para 5.2: Antenna Position P1 (towards PACS)

08.05.08

Second day of testing

→ **Note:** Only Notch limit is relevant

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
2.1	Install the calibrated EMC Instrumentation. Verify that the on board LGA / MGA antennas are covered with test caps.						✔	
2.2	Set S/C into Mode 1 according tables 3.3-1 and 3.3-2							
2.2.1	Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP				Power SCOE in Battery mode instead of S3R mode.		
2.2.2	Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5.	OP						
2.2.3	Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5.	OP						
2.2.4	Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5.	OP				RE test was started with PACS, SPIRE and HIFI in STB.-mode	✔	

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
2.2.5	Switch SPIRE from STB into SPIRE Noisiest Mode. Execute test steps sect. of 8.1.3.2 of AD5.	OP					✔	
2.3	Verify correct Mode 1 with EGSE operator.	OP					✔	
2.4.	**Position P1. Antennas in 1 m distance from the PACS panel, directed to PACS harness. Perform the following measurements:**					Antenna high is 2,70 m	✔	
2.4.1	**Measure emissions in the range from 14 kHz to 30 MHz for vertical polarisation.**		**Error! Reference source not found.**		See Plot	Plot 3: SPIRE noisy mode in PACS location (vertical)	✔	
2.4.2	**Measure emissions in the range from 30 MHz to 1 GHz for horizontal polarisation.**		**Error! Reference source not found.**		See Plot	Plot 4: SPIRE noisy mode in PACS location (horizontal)	✔	
2.4.3	**Measure emissions in the range from 30 MHz to 1 GHz for vertical polarisation.**		**Error! Reference source not found.**		See Plot	Plot 3: SPIRE noisy mode in PACS location (vertical)	✔	

→ **Going on with step EXTRA-3.4.8**

→ Coming from Step 3.4.7

2.4.4	**Measure emissions in the range from 1 GHz to 18 GHz for horizontal polarisation.**		**Error! Reference source not found.**		See Plot	Plot 6: SPIRE noisy mode in PACS location (horizontal)	✔	
2.4.5	**Measure emissions in the range from 7133 MHz to 7271 MHz for horizontal polarisation, notch.**		Figure 4.1-2		See Plot	→ **Procedure Variation:** Notch Measurement not performed. No SC antennas on PACS side.		
2.4.6	**Measure emissions in the range from 1 GHz to 18 GHz for vertical polarisation.**		**Error! Reference source not found.**		See Plot	Plot 5: SPIRE noisy mode in PACS location (vertical)	✔	
2.4.7	**Measure emissions in the range from 7133 MHz to 7271 MHz for horizontal polarisation, notch.**		Figure 4.1-2		See Plot	→ **Procedure Variation:** Notch Measurement not performed. No SC antennas on PACS side.		
2.5	**Collect excel frequency to amplitude sheet from facility. Store the result of the measurement and compare it with the requirements limit. The measured result shall be 6 dB below the measurement limit.**					0pen → ETS will send to Astrium on 13.05.08		
	Perform following steps 2.6.x only if test will not be continued with another RE or AutoComp test. Depending on which test will follow the test conductor has to decide which steps will be executed and which not.					Steps 2.6 – 2.7 not performed since test will be continued with section 5.3.		
2.6	Switch S/C and instruments OFF							

2.6.1	Switch SPIRE from SPIRE Noisiest Mode into STB. Execute test steps sect. 8.1.3.3 of AD5.	OP						
2.6.2	Switch SPIRE from STB into OFF. Execute test steps sect. 8.1.3.4 of AD5.	OP						
2.6.3	Switch PACS from Safe Mode into OFF. Execute test steps of sect. 8.1.2.4 of AD5.	OP						
2.6.4	Switch HIFI from STB into OFF. Execute test steps sect. 8.1.4.4 of AD5.	OP						
2.6.5	Switch OFF EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP						
2.7	Verify that S/C is OFF with EGSE operator.	OP						

→ Going on with Stepp 3.6

To Para 5.3: Antenna Position P2 (towards SPIRE)

08.05.08

Second day of testing

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
3.1	Install the calibrated EMC Instrumentation. Verify that the on board LGA / MGA antennas are covered with test caps.					3.1 – 3.3 not performed. Test Mode already switched ON Power SCOE in Battery mode instead of S3R mode.	✔	
3.2	Set S/C into Mode 1 according tables 3.3-1 and 3.3-2. Depending on current mode the test conductor has to decide which steps will be executed and which not.	OP						

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
3.2.1	Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP						
3.2.2	Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5.	OP						
3.2.3	Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5.	OP						
3.2.4	Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5.	OP						
3.2.5	Switch SPIRE from STB into SPIRE Noisiest Mode. Execute test steps sect. of 8.1.3.2 of AD5.	OP						
3.3	Verify correct Mode 1 with EGSE operator.	OP						

→ Coming from Step EXTRA- 3.4.11

3.4.	**Position P2. Antennas in 1 m distance from the SPIRE panel, directed to SPIRE harness. Perform the following measurements:**					**Position P2: Initial position** Antenna height: 2.60 m	✔	
3.4.1	**Measure emissions in the range from 14 kHz to 30 MHz for vertical polarisation.**		**Error! Reference source not found.**		See Plot	Plot 9: SPIRE noisy mode in SPIRE nominal location (vertical)	✔	

3.4.2	**Measure emissions in the range from 30 MHz to 1 GHz for horizontal polarisation.**		**Error! Reference source not found.**		See Plot	Plot 10: SPIRE noisy mode in SPIRE nominal location (horizontal)	✔	
3.4.3	**Measure emissions in the range from 30 MHz to 1 GHz for vertical polarisation.**		**Error! Reference source not found.**		See Plot	Plot 9: SPIRE noisy mode in SPIRE nominal location (vertical)	✔	
3.4.4	**Measure emissions in the range from 1 GHz to 18 GHz for horizontal polarisation.**		**Error! Reference source not found.**		See Plot	Plot 14: SPIRE noisy mode in SPIRE nominal location (horizontal)	✔	
3.4.5	**Measure emissions in the range from 7133 MHz to 7271 MHz for horizontal polarisation, notch.**		Figure 4.1-2		See Plot	Plot 13: SPIRE noisy mode in SPIRE nominal location (horizontal)	✔	
3.4.6	**Measure emissions in the range from 1 GHz to 18 GHz for vertical polarisation.**		**Error! Reference source not found.**		See Plot	Plot 12: SPIRE noisy mode in SPIRE nominal location (vertical) Additional Plot 15: 17-18 GHz, to check results in this f-range.	✔	
3.4.7	**Measure emissions in the range from 7133 MHz to 7271 MHz for vertical polarisation, notch.**		Figure 4.1-2		See Plot	Plot 11: SPIRE noisy mode in SPIRE nominal location (vertical)	✔	

→ Going on with 2.4.4

→ Coming from step 2.4.3

<u>Extra antenna position:</u>
Position P2: Initial position
Position P2-a: (extra height): due to the present of the SWM shield this extra position has been requested in order to measure the levels on the top side of this shield. But limited to 200 MHZ. CF NC on spire radiated susceptibility.

<u>Extra</u> 3.4.8	**Position P2-a. Antennas in 1 m distance from the SVM. Perform the following measurements:**					Height: 3,20 m	✔	
<u>Extra</u> 3.4.9	**Measure emissions in the range from 14 kHz to 30 MHz for vertical polarisation.**					Plot 7: SPIRE noisy mode in SPIRE extra location (vertical)	✔	
Extra 3.4.10	**Measure emissions in the range from 30 MHz to 200 MHz for vertical and horizontal polarisation.**					Plot 7: SPIRE noisy mode in SPIRE extra location (vertical) Plot 8: SPIRE noisy mode in SPIRE extra location (horiz.)	✔	
<u>Extra</u> 3.4.11	**Collect excel frequency to amplitude sheet from facility.**					0pen → ETS will send to Astrium on 13.05.08		

3.5	**Collect excel frequency to amplitude sheet from facility. Store the result of the measurement and compare it with the requirements limit. The measured result shall be 6 dB below the measurement limit.**					0pen → ETS will send to Astrium on 13.05.08		

→ Going on with step 3.4.1

→ Coming from step 2.7

	Perform following steps 3.6.x only if test will not be continued with another RE or AutoComp test. Depending on which test will follow the test conductor has to decide which steps will be executed and which not.							
3.6	Switch S/C and instruments OFF							
3.6.1	Switch SPIRE from SPIRE Noisiest Mode into STB. Execute test steps sect. 8.1.3.3 of AD5.	OP				20:05	✔	
3.6.2	Switch SPIRE from STB into OFF. Execute test steps sect. 8.1.3.4 of AD5.	OP				**Step 3.6.2 to 3.7 not executed because test contin. With step 6.1 auto compatibility.**		
3.6.3	Switch PACS from Safe Mode into OFF. Execute test steps of sect. 8.1.2.4 of AD5.	OP						
3.6.4	Switch HIFI from STB into OFF. Execute test steps sect. 8.1.4.4 of AD5.	OP						
3.6.5	Switch OFF EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP						
3.7	Verify that S/C is OFF with EGSE operator.	OP						

To Para 5.4: Antenna Position P3 (towards HIFI)

→ **Note:** Only the notch limit is relevant.

09.05.08

Third day of testing

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
4.1	Install the calibrated EMC Instrumentation. Verify that the on board LGA / MGA antennas are covered with test caps.						✔	
4.2	Set S/C into Mode 2 according tables 3.3-1 and 3.3-2. Depending on current mode the test conductor has to decide which steps will be executed and which not.						✔	
4.2.1	Set S/C into Mode 2 according tables 3.3-1 and 3.3-2						✔	
4.2.2	Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP				EGSE is ON already.	✔	
4.2.3	Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5.	OP				TWT's are not ON!!! On request of ESA and agreed by TAS-F.	✔	
4.2.4	Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5.	OP					✔	
4.2.5	Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5.	OP					✔	
4.2	Switch HIFI from STB into HIFI Noisiest Mode. Execute test steps sect. of 8.1.4.2 of AD5.	OP					✔	
4.3	Verify correct Mode 2 with EGSE operator.	OP					✔	
4.4.	**Position P3. Antennas in 1 m distance from the HIFI panel, directed to HIFI harness. Perform the following measurements:**					Antenna Hight: 2,75 m	✔	
4.4.1	**Measure emissions in the range from 14 kHz to 30 MHz for vertical polarisation.**		Figure 4.1-3		See Plot	Plot 16: HIFI noisy mode in HIFI location (vertical)	✔	

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
4.4.2	**Measure emissions in the range from 30 MHz to 1 GHz for horizontal polarisation.**		Figure 4.1-3		See Plot	Plot 17: HIFI noisy mode in HIFI location (horizontal))	✔	
4.4.3	**Measure emissions in the range from 30 MHz to 1 GHz for vertical polarisation.**		Figure 4.1-3		See Plot	Plot 16: HIFI noisy mode in HIFI location (vertical)	✔	
4.4.4	**Measure emissions in the range from 1 GHz to 18 GHz for horizontal polarisation.**		Figure 4.1-3		See Plot	Plot 21: HIFI noisy mode in HIFI location (horizontal)	✔	
4.4.5	**Measure emissions in the range from 2 GHz to 9 GHz for horizontal polarisation, notch.**		Figure 4.1-4		See Plot	Plot 20/21: HIFI noisy mode in HIFI location (horizontal) Some spikes over limit (e.g. at 2,499 GHz)→ caused by HIFI (see EXTRA 4.4.10)	✔	
4.4.6	**Measure emissions in the range from 1 GHz to 18 GHz for vertical polarisation.**		Figure 4.1-3		See Plot	Plot 18: HIFI noisy mode in HIFI location (vertical)	✔	
4.4.7	**Measure emissions in the range from 2 GHz to 9 GHz for vertical polarisation, notch.**		Figure 4.1-4		See Plot	Plot 18/19: HIFI noisy mode in HIFI location (vertical) Some spikes over limit (e.g. at 2,499 GHz) → caused by HIFI (see EXTRA 4.4.10)	✔	

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
Extra 4.4.8	**Same measurement as for step 4.4.4 – 4.4.7 with TX+TWTA "ON". Horizontal and vertical antenna position.**					As initially foreseen in the test procedure. **→ In order to see the impact of the transmitting chain in the HIFI notch.** Plot 22: HIFI noisy mode in HIFI location twt on (vertical) Plot 23: HIFI noisy mode in HIFI location twt on (horizontal) Some spikes over limit (e.g. at 2,499 GHz) in the 2-9 GHz notch → caused by HIFI (see EXTRA 4.4.10) Note: TX frequency (8.46 GHz) emission amplitude is not correctly shown within the plot because it exceeds the analyser reference line! For the exact value an extra measurement was made, see "ETS-test-log".	✔	
Extra 4.4.9	**Same measurement as for step 4.4.1 with TX+TWTA "ON"**					As initially foreseen in the test procedure. **→ In order to see the impact of the EPC of the TWTA for RE.** Plot 24: HIFI noisy mode in HIFI location twt on (vertical)	✔	

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
Extra 4.4.10	**Same measurement as for step 4.4.4 – 4.4.7 with HIFI+TX+TWTA “OFF”. Horizontal and vertical antenna position.**					As initially foreseen in the test procedure. → **In order to see the impact of the HIFI for RE.** Plot 25: HIFY OFF in HIFI location transp. OFF (vertical) Plot 26: HIFY OFF in HIFI location transp. OFF (horizontal) No spikes (over limit) in the 2-9 GHz notch! See 4.4.5/4.4.7/4.4.8.		
4.5	**Collect excel frequency to amplitude sheet from facility. Store the result of the measurement and compare it with the requirements limit. The measured result shall be 6 dB below the measurement limit.**					0pen → ETS will send to Astrium on 13.05.08		
	Perform following steps 4.6.x only if test will not be continued with another RE or AutoComp test. Depending on which test will follow the test conductor has to decide which steps will be executed and which not.							
4.6	Switch S/C and instruments OFF							
4.6.1	Switch SPIRE from STB into OFF. Execute test steps sect. 8.1.3.4 of AD5.	OP						
4.6.2	Switch PACS from Safe Mode into OFF. Execute test steps of sect. 8.1.2.4 of AD5.	OP						
4.6.3	Switch HIFI from Noisiest Mode into STB. Execute test steps of sect. 8.1.2.3 of AD5.	OP						
4.6.4	Switch HIFI from STB into OFF. Execute test steps sect. 8.1.4.4 of AD5.	OP						

Step-No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	P	N
4.6.5	Switch OFF EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP						
4.7	Verify that S/C is OFF with EGSE operator.	OP						

Annex 4

RE Test Report from ETS

Content:

This report lists all test results, the measurement accuracies and plots and gives explanations to the test results.

120 pages

environmental tests for sensitive devices
large · world · class · test · facilities
HYDRA · Multishaker · LEAF · Large Space Simulator · MAXWELL

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Your access to the ESA/ESTEC Test Centre

Herschel FM SC RE EMC Test

ETS Facility Data report

Project : Herschel

ETS/REP/EMC/2416

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Contents

1. Scope

This report presents the results of the radiated emission tests performed on the Herschel spacecraft.
All measurements have been performed from 07-05 to 09-05-2008 in the ESTEC EMC test facility Maxwell.
The purpose of this facility data report is to describe:

- the facility configuration,
- the test set-ups,
- the test results.

2. Documents

2.1 Applicable Documents

The documents mentioned in this chapter are mandatory for the preparation of this document.

AD 1 Herschel FM SAT RE / AutoComp EMC Test procedure [HP-2-ASED-TP-0180]
Issue 1, Date 30-04-2008

AD 2 ETS QA Manual; [ETS/PLAN/QA/100]

AD 3 Safety and Security Manual; [AOS/4167/ESTEC]

AD 4 QA and Safety Plan for the ESTEC Test Centre; [ETS/PLAN/QA/003]

AD 5 Environmental Testing Product Assurance Manual; [QP/M/ALL/0001/C]

2.2 Reference Documents

The reference documents mentioned in this chapter are used to prepare this document and are therefore referred to.

RD 1 Declaration of facility readiness [ETS/REP/EMC/2392].

RD 2 Facility Readiness Review [ETS/REP/MOM/2391]

RD 3 Electromagnetic Requirements for the Control of EMI [MIL-STD-461-C/D]

RD 4 Electromagnetic Interference Characteristics [MIL-STD-462-C/D]

3. Abbreviations

AM	Amplitude Modulation
BOB	Break Out Box
CW	Continuous Wave
Diff.M.	Differential Mode
EP	Electro Propulsion
ESD	Electro Static Discharge
E.Field	Electric Field
EGSE	Electrical Ground Support Equipment
EM	Engineering Model
EMC	Electro Magnetic Compatibility
EMI	Electro Magnetic Interference
EUT	Equipment Under Test
FSS	Fine Sun Sensor
FM	Flight Model - or - Frequency Modulation
LNA	Low Noise Amplifier
MIL-STD	Military Standard
NB	Narrow Band
pp	peak to peak
RE	Radiated Emission
RFC	Radio Frequency Compatibility
RS	Radiated Susceptibility
SAR	Search And Rescue
w.r.t.	with respect to

4. Introduction

4.1 General Information

Order Number:	340610
Quality Assurance:	European Test Services B.V. complies with the ISO 9001:2000 Quality Management standard and is certified by TÜV CERT (Reg.N° 12.100.15987)
Location:	ESA ESTEC Test Centre, Noordwijk, The Netherlands
Activity:	EMC test
Test Dates:	07-10 April 2008
Facilities:	Maxwell LEMC
Test Adapters:	N.A.-

4.2 Test Item Information

Customer:	Astrium
Project:	Hershel
Test item Name:	Herschel SC
Model:	FM

4.3 Objective

The objective of the Radiated emission measurements on the Herschel spacecraft is to establish a reference baseline for the radiated susceptibility.

5. Test Setup

5.1 Facility Configuration

The Herschel spacecraft is tested in the ESTEC EMC facility (Maxwell).
The EMC facility is used in its configuration for system level tests.
The test table and 'pipe' are removed from the facility.
No floor absorbers are used
All EMC test equipment is located in the EMC control rooms.
All measurement coaxial cables are routed through a dedicated duct and connected to ground reference point at the feed through to ensure minimum noise contribution from the EMC instrumentation.

5.2 Specimen configuration

The spacecraft is positioned on the air pallet using an adaptor ring which is clamped on the air pallet using the 4 circular holes in the pallet.
Interface cabling to the spacecraft is routed through the feed through panel towards the FR cleanroom using the shortest way possible. All cables have been over shielded using aluminium foil.
All EGSE equipment is located in the FR clean room.
A cooling unit is positioned in the EGSE control room and two flexible cooling ducts are routed through a feed though from the EGSE room to the test area. At the point of entry of the test area the metallic spiral in the two cooling hoses has been cut to reduce transmission of RF noise via these conduits.

5.3 Instrumentation

Instrument	Type No	ESA Inv No
Receiver (R&S)	ESIB 40	107339
Antenna (ARA)	SAS 1/D	No Nbr
Antenna Biconical (EMCO)	EMCO 3108	No Nbr
Antenna LogPer (R&S)	HL 223	No Nbr
Antenna Ridge Guide Horn (EMCO)	3115	No Nbr
Low Noise Amplifier (Miteq)	AMF-40-001080-18-13P	107471
Low Noise Amplifier (Miteq)	JS42-08001800-16-8P-B1	No Nbr
Coaxial cable BNC (Control room)	1.5 mtr	No Nbr
Coaxial cable BNC (Ferrite Cladded)	10 mtr	No Nbr
Microwave cable (Suhner)	1.5 mtr	No Nbr
Microwave cable (Gore)	10 mtr	No Nbr

All test equipment is calibrated on a yearly basis with the calibration performed in January 2008. Therefore all Cal due dates are in January 2009.

6. Test Description

6.1 Responsibilities

Responsibilities of ETS	Responsibilities of Customer
Preparation of the test facility. Facility operation. Acquisition and processing of EMC measurement data.	Specimen handling. Specimen mounting on the test adapter. Specimen functional checks. Acquisition and processing of specimen data.

6.2 Test Sequence

The Radiated emission EMC test on the Herschel FM spacecraft is performed from 06-05 to 10-05-2008

07-05-2008 Arrival of satellite in the facility.
Installation in facility
Installation of interface cables
Shielding interface cables
Zero Run measurements

08-05-2008 Radiated Emissions for Pacs and Spire configuration

09-05-2008 Radiated Emissions for Hifi configuration.
Additional investigation due to emissions in the Hifi Notch

10-05-2008 Auto compatibility tests (not part of this report).

13-05-2008 Removal of satellite from facility.

7. Test Execution

7.1 Personnel

Test Engineer: J van der Meulen
Operator: J van der Meulen

7.2 Test Anomalies and Procedure Deviations

No procedure variation sheets were filled with respect to data acquisition or facility operation.

7.3 Environmental Parameters

Class 100.000 cleanliness conditions were required.

Temperature >18°C and <23°C
Relative humidity >40% and <60%

7.4 Summary of Test Activities and "as run" test procedures

Below is a listing of the tests performed on the Hershel FM spacecraft.
All test set up drawings and test set up photos can be found in the applicable annexes.

TEST PERFORMED		
TEST	**Annex. No**	**Plot No**
Radiated Emission	B	1 to 37 57 to 64

8. Facility Data Results

All required test data has been recorded.
The customer has monitored specimen performance.
Reporting on the measurement results will be done in the order listed in the table in paragraph 7.4

8.1 Grounding .

The Herschel spacecraft has been grounded to the facility ground using the grounding point available in one of the pits in the test area.
All EGSE has been grounded to the facility ground using the available ground bar in the FR clean room.

8.2 Radiated Emission

Radiated emission electric-field narrowband measurements have been performed from 10 kHz to 18 GHz in vertical polarization.
Measurements in horizontal polarization have been performed from 30 MHz to 18 GHz.
The notches above 1 GHz have been measured in both polarities.

Ambient measurements are made in 'worst case' condition (the Pacs location) This is the location closest to the cable bundles to the EGSE .
The tests in the Pacs and Spire locations are carried out with identical satellite configuration (spire in most noisy mode)
The test in the Hifi location has been carried out with the Hifi unit in its noisiest mode.

Most measurements have been performed using the ESI40 in receiver mode.
The Notch around 7 GHz and the measurement from 1 to 18 GHz in the Hifi location have been performed in spectrum analyzer mode. (In this mode the sweep time is significant faster but no pre-selection is available)
The used bandwidth and measuring times can be found in the table below.

Start Frequency	Stop Frequency	Step Width	Bandwidth	Measurement time	Detector	Transducer
Narrowband E-Field Receiver mode						
10 kHz	100 kHz	60 Hz	100 Hz	10 msec	Max peak	SAS 1/D low
100 kHz	1 MHz	600 Hz	1 kHz	10 msec	Max peak	SAS 1/D low
1 MHz	30 MHz	6 kHz	10 kHz	10 msec	Max peak	SAS 1/D low
30 MHz	200 MHz	60 KHz	100 kHz	10 msec	Max peak	EMCO 3108
200 MHz	1 GHz	60 KHz	100 kHz	10 msec	Max peak	HL223
1 GHz	18 GHz	600 kHz	1 MHz	15 msec	Max peak	EMCO 3115

Narrowband E-Field Spectrum analyzer mode 7 GHz notch						
7133 MHz	7186 MHz	N.A.	5 kHz	Coupled	Max peak	EMCO 3115
7186 MHz	7218 MHz	N.A.	1 kHz	Coupled	Max peak	EMCO 3115
7218 MHz	7271 MHz	N.A.	5 kHz	Coupled	Max peak	EMCO 3115
Narrowband E-Field Spectrum analyzer mode 1 to 18 GHz Hifi						
1 GHz	2 GHz	N.A.	1 MHz	Coupled	Max peak	EMCO 3115
2 GHz	3.5 GHz	N.A.	10 kHz	Coupled	Max peak	EMCO 3115
3.5 GHz	8 GHz	N.A.	3 kHz	Coupled	Max peak	EMCO 3115
8 GHz	9 GHz	N.A.	3MHz	Coupled	Max peak	EMCO 3115
9 GHz	18 GHz	N.A.	1 MHz	Coupled	Max peak	EMCO 3115

A summary of the results is listed in the table below. Pictures and drawings of the test set-up and all measurement data can be found in Annex B.

PLOT	MEASUREMENT	REMARKS
1 +1a to 1e	**E-Field Vertical polarization** **10 kHz to 1 GHz** File name : Herschel RE 1 Zero Run Antenna at Pac location 270 cm above floor 1 meter from SVM	Maximum ambient level measured is 40 dB µV/m around 2.8 MHz Plot 1a to 1e are decade prints of the same measurement results
2 +2a and 2b	**E-Field Horizontal polarization** **30 MHz to 1 GHz** File name : Herschel RE2 Zero Run Antenna at Pac location 270 cm above floor 1 meter from SVM	No significant emissions above the noise floor. Plot 2a and 2b are decade prints of the same measurement results
3 +3a to 3e	**E-Field Vertical polarization** **10 kHz to 1 GHz** File name : Herschel RE 3 Spire in noisiest mode Antenna at Pac location 270 cm above floor 1 meter from SVM	Maximum emissions level measured around 2.8 MHz at 58 dBµV/m Plot 3a to 3e are decade prints of the same measurement results
4 +4a and 4b	**E-Field Horizontal polarization** **30 MHz to 1 GHz** File name : Herschel RE 4 Spire in noisiest mode Antenna at Pac location 270 cm above floor 1 meter from SVM	Maximum emissions level measured around 39 MHz at 35 dBµV/m Plot 4a and 4b are decade prints of the same measurement results
5	**E-Field Vertical polarization** **1 GHz to 18 GHz** File name : Herschel RE 5 Spire in noisiest mode Antenna at Pac location 270 cm above floor 1 meter from SVM	Emission measured at 8.4686 GHz level 86.3 dBµV/m and its first harmonic.
6	**E-Field Horizontal polarization** **1 GHz to 18 GHz** File name : Herschel RE 6 Spire in noisiest mode Antenna at Pac location 270 cm above floor 1 meter from SVM	Emission measured at 8.4686 GHz level 93.2 dBµV/m and its first harmonic

PLOT	MEASUREMENT	REMARKS
7 + 7a to 7e	**E-Field Vertical polarization** **10 kHz to 200 MHz** File name : Herschel RE 7 Spire in noisiest mode Antenna at Spire extra location 320 cm above floor at 1 meter from the cable harness	Maximum emissions level measured around 3.8 MHz at 62 dBµV/m Plot 7a to 7e are decade prints of the same measurement results
8 + 8a and 8b	**E-Field Horizontal polarization** **30 MHz to 200 MHz** File name : Herschel RE 8 Spire in noisiest mode Antenna at Spire extra location 320 cm above floor at 1 meter from the cable harness	Maximum emissions level measured is 29 dBµV/m Plot 8a and 8b are decade prints of the same measurement results
9 + 9a to 9e	**E-Field Vertical polarization** **10 kHz to 1 GHz** File name : Herschel RE 9 Spire in noisiest mode Antenna at Spire nominal location 260 cm above floor at 1 meter SVM	Maximum emissions level measured around 3.8 MHz at 62 dBµV/m Plot 9a to 9e are decade prints of the same measurement results
10 + 10a to 10b	**E-Field Vertical polarization** **10 kHz to 1 GHz** File name : Herschel RE 9 Spire in noisiest mode Antenna at Spire nominal location 260 cm above floor at 1 meter SVM	Maximum emissions level measured is 28 dBµV/m Plot 10a and 10b are decade prints of the same measurement results
11	**E-Field Vertical polarization** **7 GHz Notch** File name : Herschel RE 11 Spire in noisiest mode Antenna at Spire nominal location 260 cm above floor at 1 meter SVM	No emissions measured
12	**E-Field Vertical polarization** **1 GHz to 18 GHz** File name : Herschel RE 12 Spire in noisiest mode Antenna at Spire nominal location 260 cm above floor at 1 meter SVM	At 8.486 GHz 89.6 dBµV/m is measured. The first harmonic of this signal is 28.6 dB lower.
13	**E-Field Horizontal polarization** **7 GHz Notch** File name : Herschel RE 13 Spire in noisiest mode Antenna at Spire nominal location 260 cm above floor at 1 meter SVM	No emissions measured
14	**E-Field Horizontal polarization** **1 GHz to 18 GHz** File name : Herschel RE 14 Spire in noisiest mode Antenna at Spire nominal location 260 cm above floor at 1 meter SVM	At 8.486 GHz 71.6 dBµV/m is measured. The first harmonic of this signal is in the noise.
15	**E-Field Vertical polarization** **16 GHz to 18 GHz** File name : Herschel RE 15 Spire in noisiest mode Antenna at Spire nominal location 260 cm above floor at 1 meter SVM	Verification of the increase of measured level at the end of the sweep in plot 12. The increase in the level is not explained but is not originating from the Spacecraft.

PLOT	MEASUREMENT	REMARKS
16 + 16a to 16e	**E-Field Vertical polarization** **10 kHz to 1 GHz** File name : Herschel RE 16 Hifi in noisiest mode Antenna at Hifi location 265 cm above floor at 1 meter SVM	Maximum emissions level measured is 53 dBµV/m at 2 MHz Plot 16a to 16e are decade prints of the same measurement results
17 +17a and 17b	**E-Field Horizontal polarization** **30 MHz to 1 GHz** File name : Herschel RE 17 Hifi in noisiest mode Antenna at Hifi location 265 cm above floor at 1 meter SVM	Maximum emissions level measured is 32 dBµV/m Plot 17a and 17b are decade prints of the same measurement results
18	**E-Field Vertical polarization** **1 GHz to 18 GHz** File name : Herschel RE 18 Hifi in noisiest mode Antenna at Hifi nominal location 265 cm above floor at 1 meter SVM	In the Hifi slot signals are measured at 2.4989 GHz - 23.0 dBµV/m. 3.7434 GHz - 24.0 dBµV/m 4.9969 GHz – 27.7 dBµV/m 6.5661 GHz – 20.9 dBµV/m
19	**E-Field vertical polarization** **7 GHz Notch** File name : Herschel RE 19 Hifi in noisiest mode Antenna at Hifi nominal location 265 cm above floor at 1 meter SVM	No emissions measured
20	**E-Field Horizontal polarization** **7 GHz Notch** File name : Herschel RE 20 Hifi in noisiest mode Antenna at Hifi nominal location 265 cm above floor at 1 meter SVM	No emissions measured
21	**E-Field Horizontal polarization** **1 GHz to 18 GHz** File name : Herschel RE 21 Hifi in noisiest mode Antenna at Hifi nominal location 265 cm above floor at 1 meter SVM	In the Hifi slot signals are measured at 2.49899 GHz – 26.4 dBµV/m. 3.7434 GHz - 26.0 dBµV/m 4.9969 GHz – 20.1 dBµV/m 6.5661 GHz – 20.0 dBµV/m
22	**E-Field Vertical polarization** **1 GHz to 18 GHz** File name : Herschel RE 22 Hifi in noisiest mode **TWT ON** Antenna at Hifi nominal location 265 cm above floor at 1 meter SVM	In the Hifi slot signals are measured at 2.4989 GHz – 24.3 dBµV/m. 3.7434 GHz – 23.6 dBµV/m 4.9969 GHz – 23.6 dBµV/m 6.2505 GHz – 2.3.5 dBµV/m 8.4689 GHz – 90.0 dBµV/m * 16.935 GHz – 61.6 dBµV/m
23	**E-Field Horizontal polarization** **1 GHz to 18 GHz** File name : Herschel RE 23 Hifi in noisiest mode **TWT ON** Antenna at Hifi nominal location 265 cm above floor at 1 meter SVM	In the Hifi slot signals are measured at 2.4989 GHz – 27.0 dBµV/m. 3.7434 GHz – 26.9 dBµV/m 4.9969 GHz – 17.4 dBµV/m 6.2505 GHz – At noise level 8.4689 GHz – 84.6 dBµV/m * 16.935 GHz – 61.6 dBµV/m
		***Note :** The amplitude of the carrier at 8.468 GHz is not correctly displayed in plot 22 and 23. This is due to the setting of the analyzer. The levels given in the table are manually verified and correct.

PLOT	MEASUREMENT	REMARKS
24 + 24a to 24d	**E-Field Vertical polarization** **10 kHz to 200 MHz** File name : Herschel RE 24 Hifi in noisiest mode **TWT ON** Antenna at Hifi location 265 cm above floor at 1 meter SVM	Maximum emissions level measured is 53 dBµV/m at 2 MHz Plot 24a to 24d are decade prints of the same measurement results
25	**E-Field Vertical polarization** **1 GHz to 18 GHz** File name : Herschel RE 25 Hifi Off Transponder Off Antenna at Hifi nominal location 265 cm above floor at 1 meter SVM	No emissions measured.
26	**E-Field Horizontal polarization** **1 GHz to 18 GHz** File name : Herschel RE 26 Hifi Off Transponder Off Antenna at Hifi nominal location 265 cm above floor at 1 meter SVM	No emissions measured.

Note : The increase measured in receiver mode at the end of plot 12 and re-measured at plot 15 have been investigated after the test has been completed.
These increases in the level seem to be due to the software used to drive the receiver, and are not actual increases in noise or signal levels.
The increase occurs at the end of the band only. As an experiment the upper frequency of the measurement has been increased to 18.2 GHz and the increase of the level occurred from 18.16 GHz up wards. This proves the issue to be software related.

9. Facility Success Criteria

The test with respect to the measurement phase can be considered as successful as far as each above criterion has been reached:

- ☒ The specified test requirements, conditions and input levels were met satisfactorily,
- ☒ All required data were measured and recorded,
- ☒ The data have adequate quality and are suitable for exploitation,
- ☒ The results of the on-site evaluation and checks are satisfactory,
- ☒ No non-conformance affecting the results is open,
- ☒ No more than 10% of the measurements have been lost.

10. Conclusions

All tests have been successfully completed.

During the radiated emission electric field measurements, maximum emissions are detected around 2 and 4 MHz in all positions and all configurations with a maximum measured level in this frequency area is 61 dBµV/m measured at the Spire extra location (3.20 meter above floor level) in vertical polarization
In addition emissions have been detected in the Hifi slot from 2 to 9 GHz. Investigation showed that Hifi itself was the source of these emissions

Detailed information on the mode of operation and the behavior of the Herschel spacecraft during the tests should be obtained from the experimenter.

Annexes

Annex A : Declaration of Facility Test Readiness.

Annex B : Radiated Emission

Annex A. Facility Test Readiness

ETS/REP/EMC/2392 Issue: 1 Date : 05 May 2008	**DECLARATION OF FACILITY TEST READINESS**	ets

FACILITY: EMC	ACTIVITY: Radiated emission EMC test	
PROJECT: HERSCHEL	ITEM:	MODEL: FM

- Declaration -

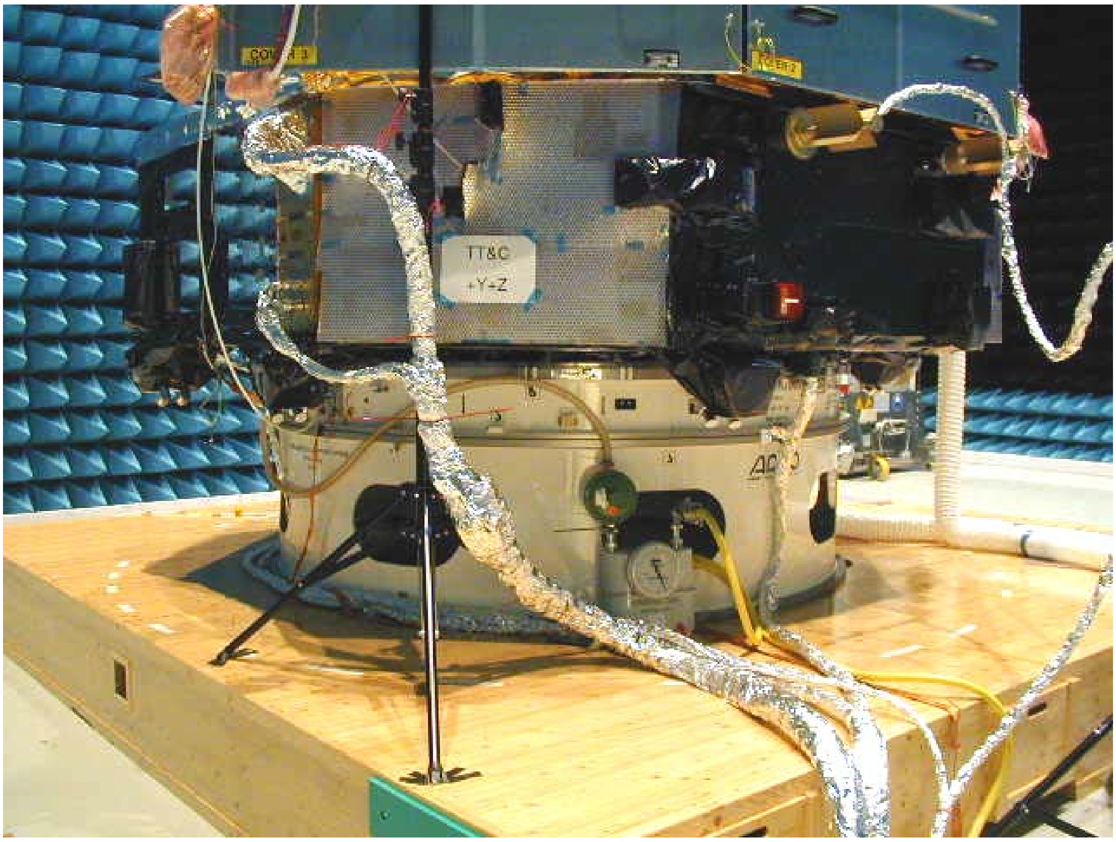
1. The above-mentioned test facility and associated measuring facilities are in nominal condition, conform to their specifications; they have been serviced, checked and calibrated.
2. The necessary test preparation, specific to this test has been properly performed and checked.
3. The necessary or required pre-test runs and/or measurements have been properly executed. The results have been evaluated and documented.
4. Special test devices or test installations - as far as these are required or necessary - have been properly prepared, qualified and documented.
5. The four above mentioned points are addressed in the Facility Readiness Review minutes of meeting Ref: ETS/MOM/EMC/2391 and the attached action item list has been successfully completed.

VISA	NAME	FUNCTION	DATE/SIGNATURE
Reviewed by :	Cees v Zijtveld	ETS-TM	05.05.2008
Approved by :	Jaap vd Meulen	ETS-TE	05-05-08
Authorized by:	JL Le Carreres	ETS-QAM	05-05-08

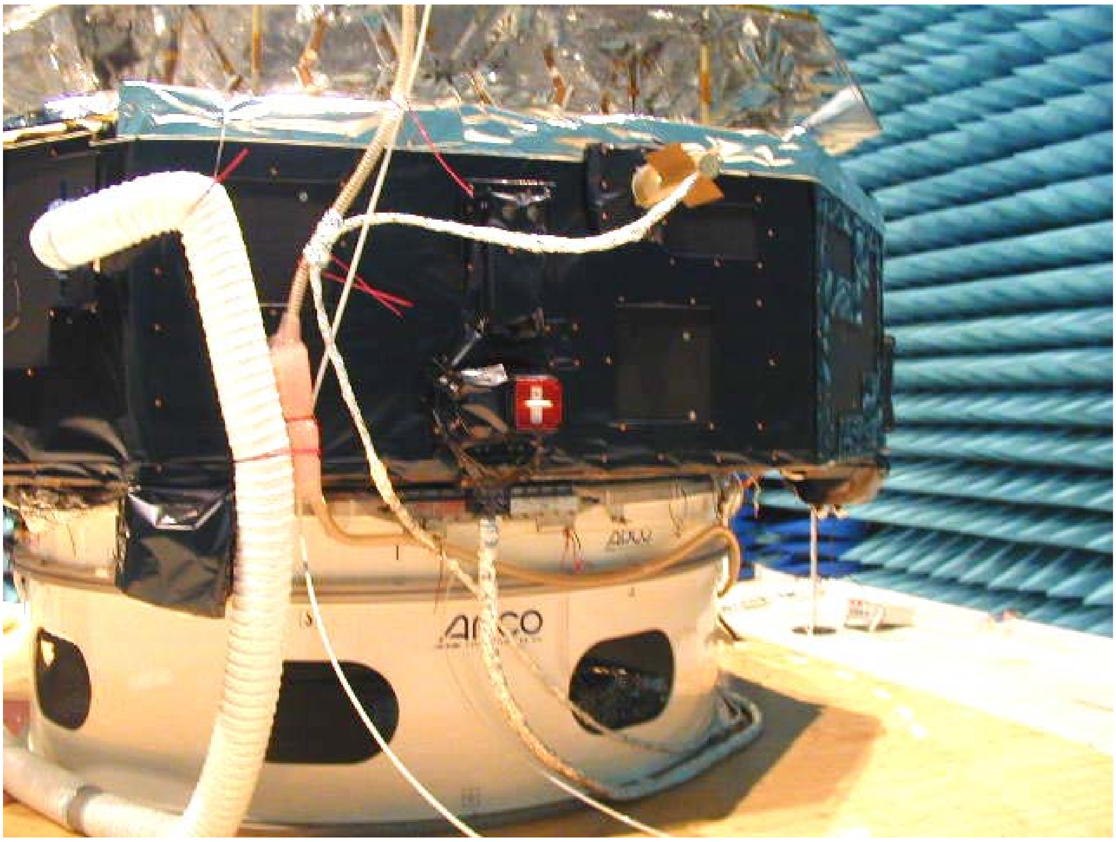
ETST036

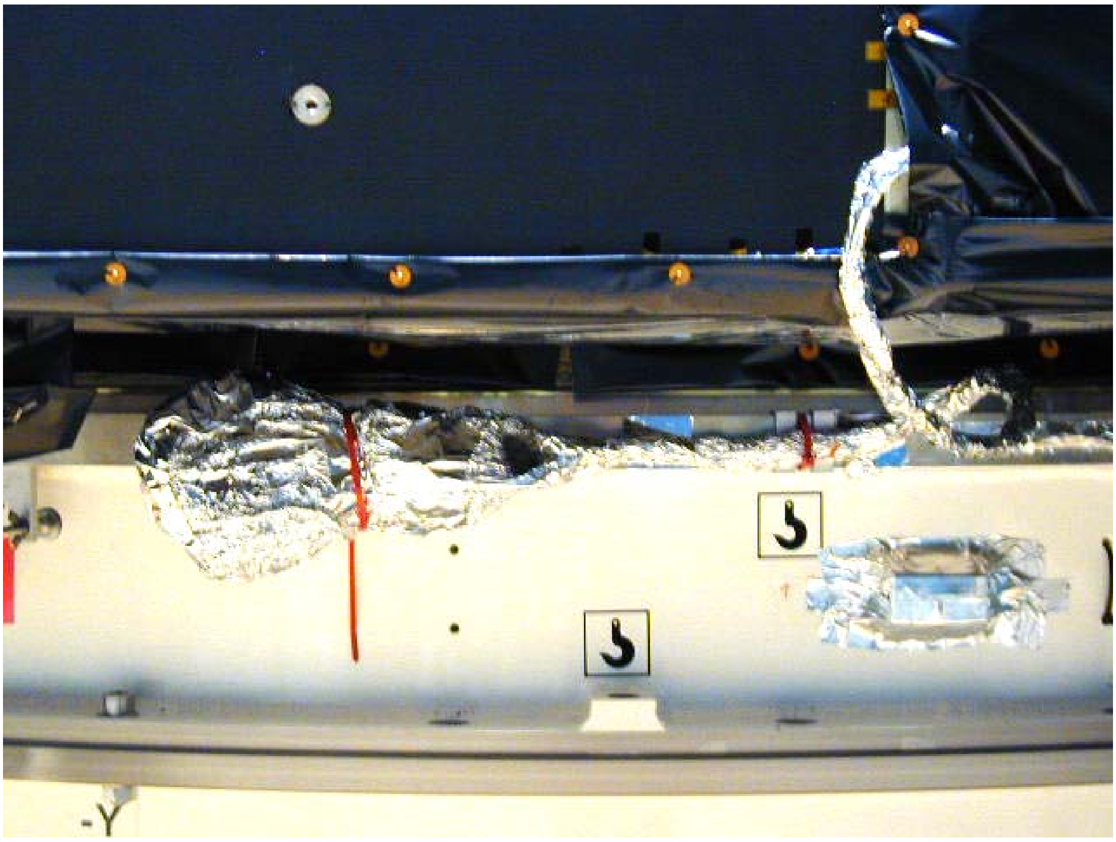
Annex B. Radiated Emission

Herschel in final position in Maxwell.

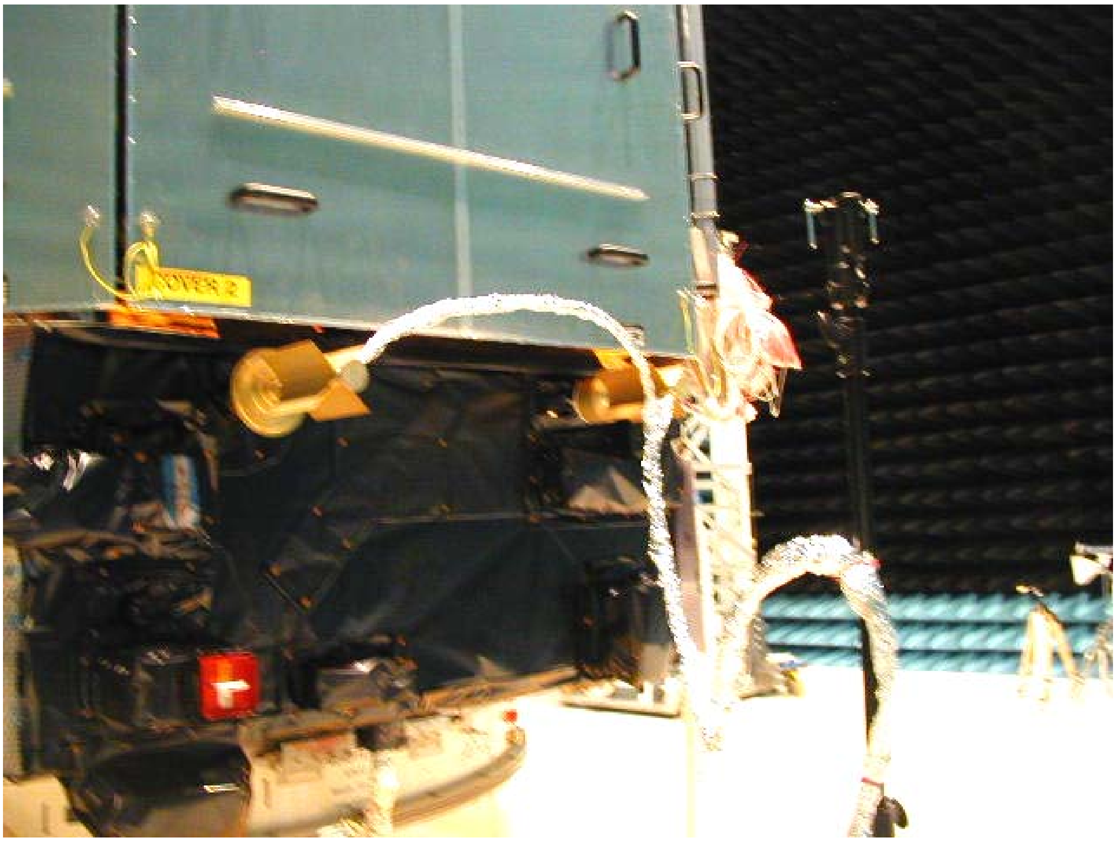


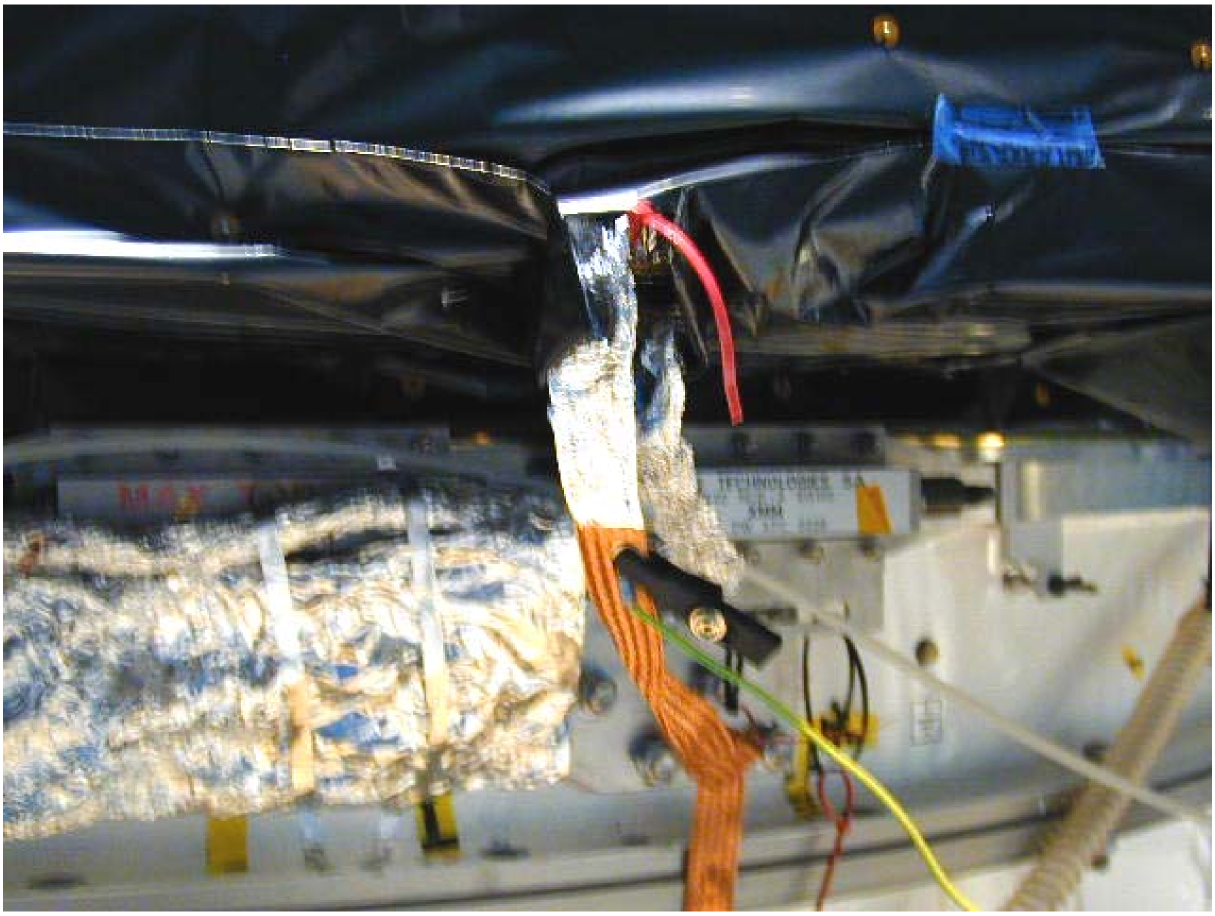
Cable harnesses wrapped in Aluminium over shield


Cable harnesses and RF cable wrapped in Aluminium over shield

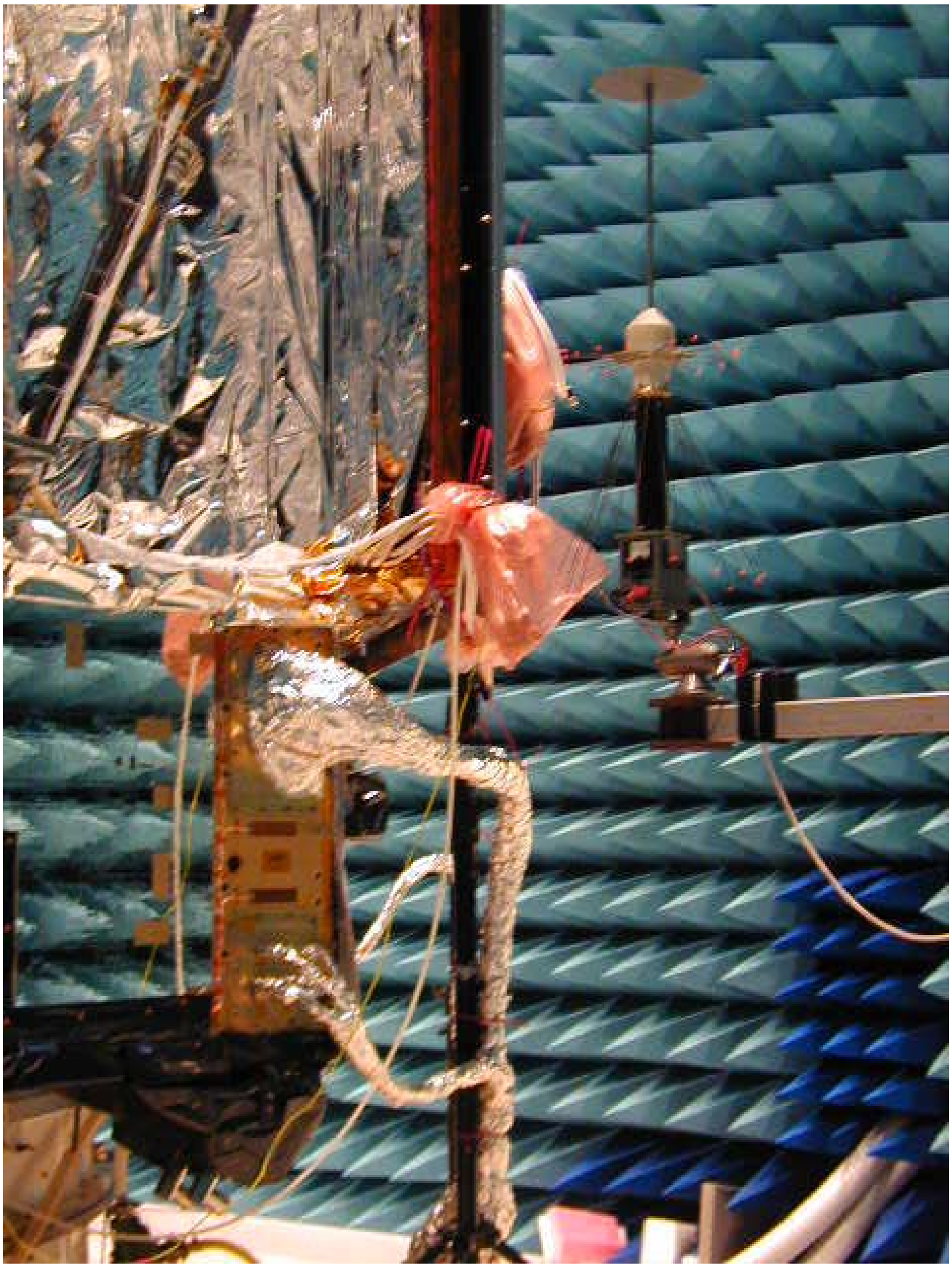


Cable harnesses wrapped in Aluminium over shield

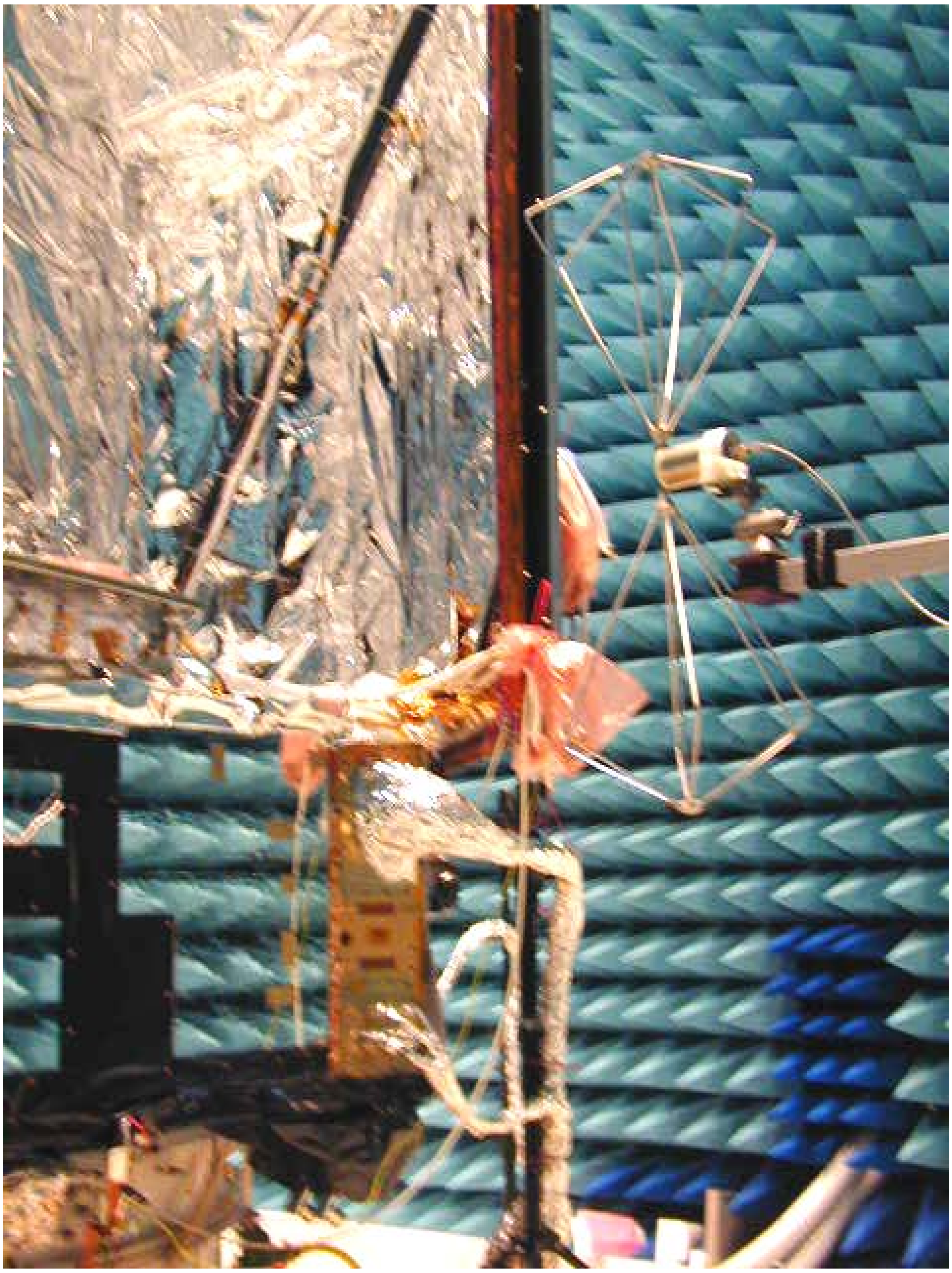

Cable harnesses and RF cable wrapped in Aluminium over shield

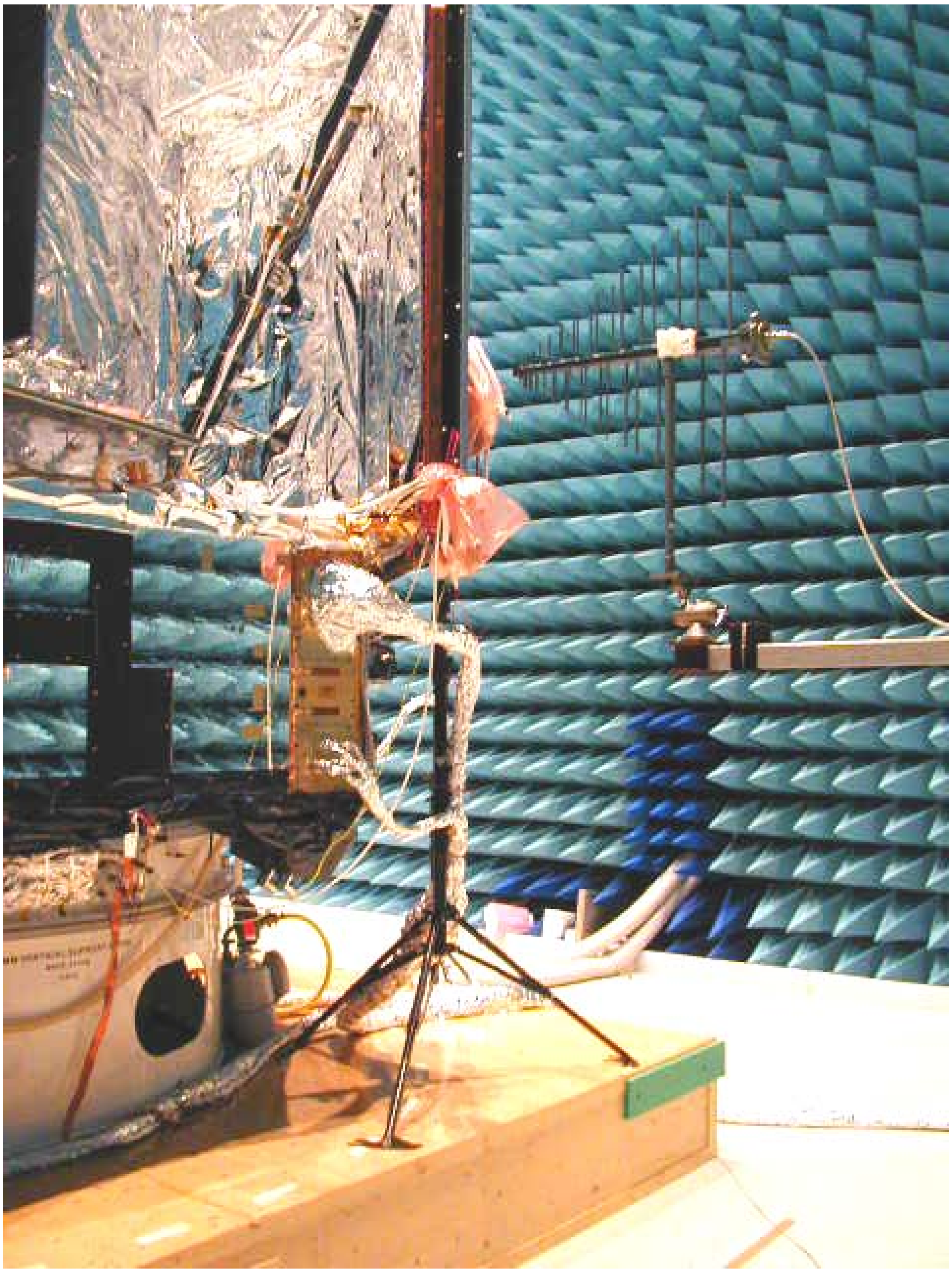


Satellite grounding point

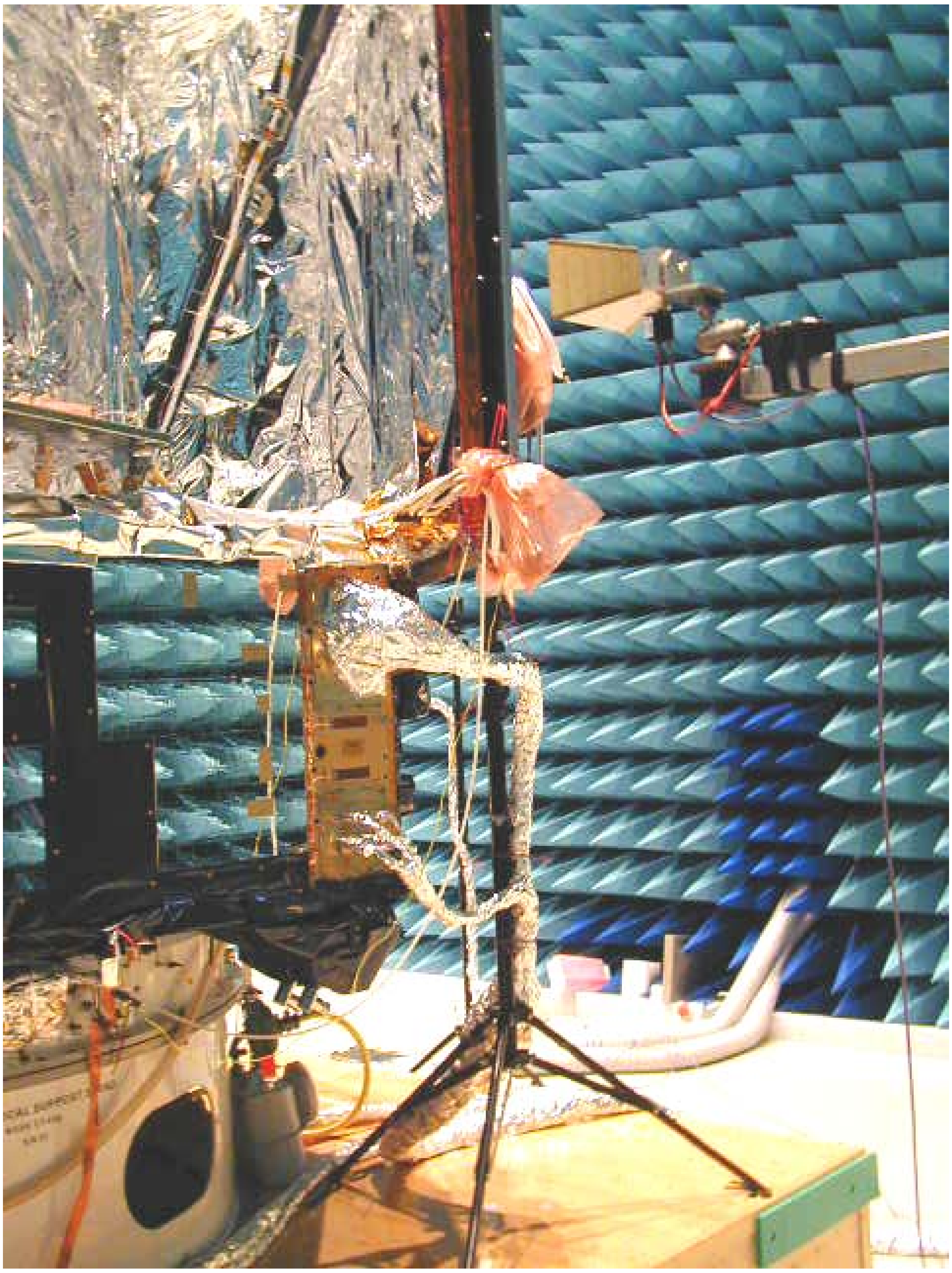


10 kHz to 30 MHz vertical polarisation in Pacs and Ambient location.

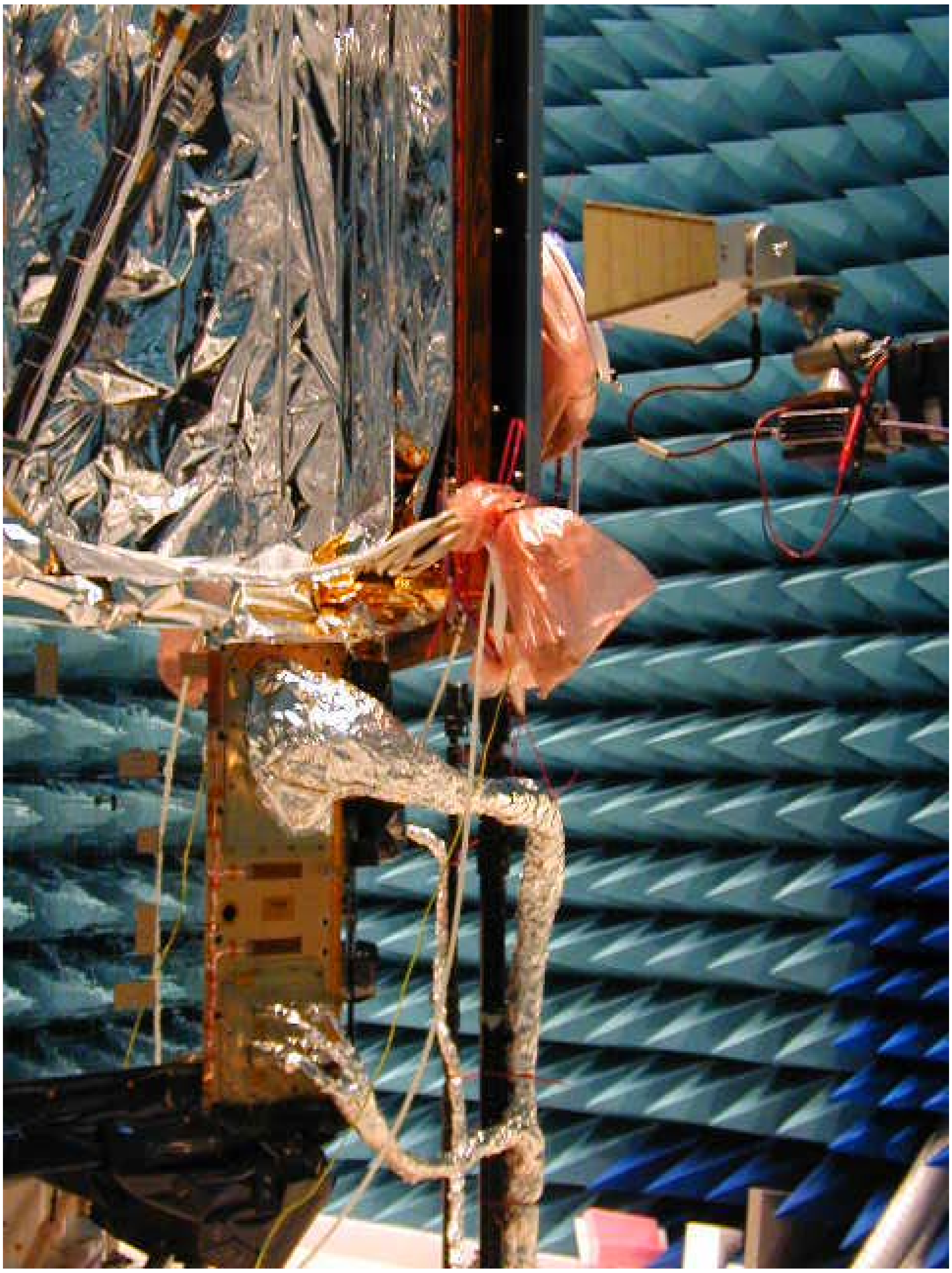

30 MHz to 200 MHz vertical polarisation in Pacs and Ambient location.



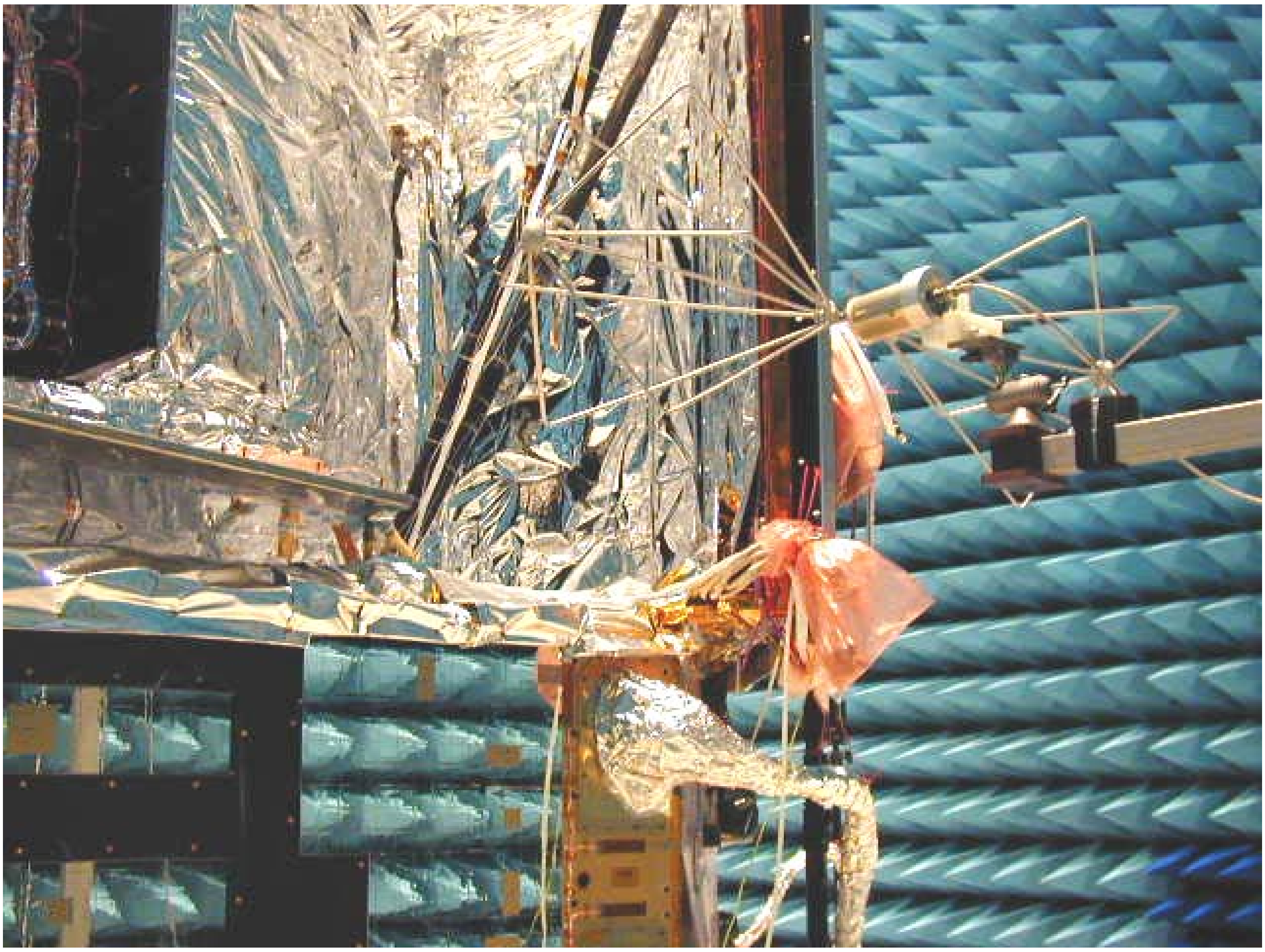
200 MHz to 1 GHz vertical polarisation in Pacs and Ambient location.



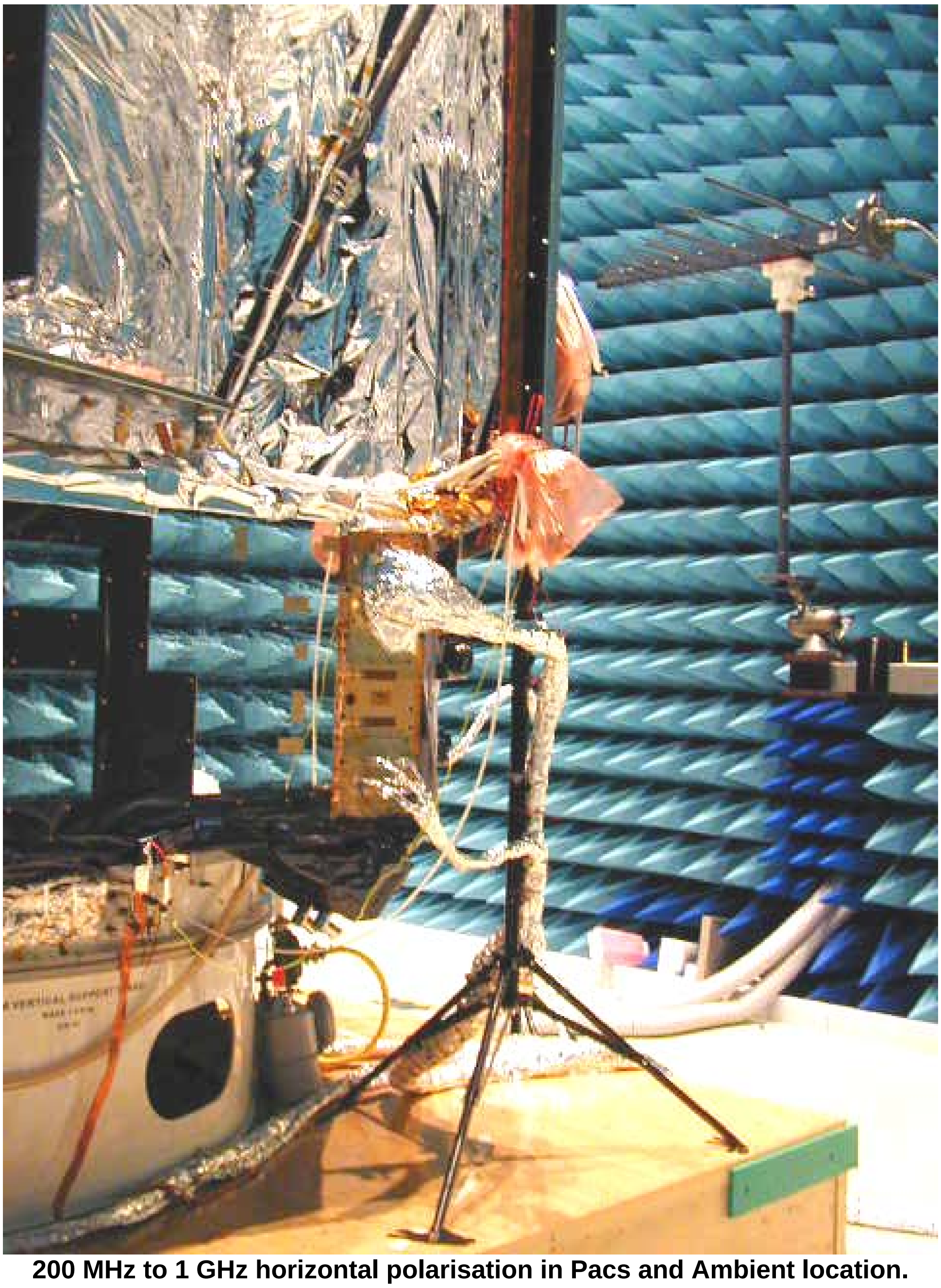
1 GHz to 8 GHz vertical polarisation in Pacs and Ambient location.

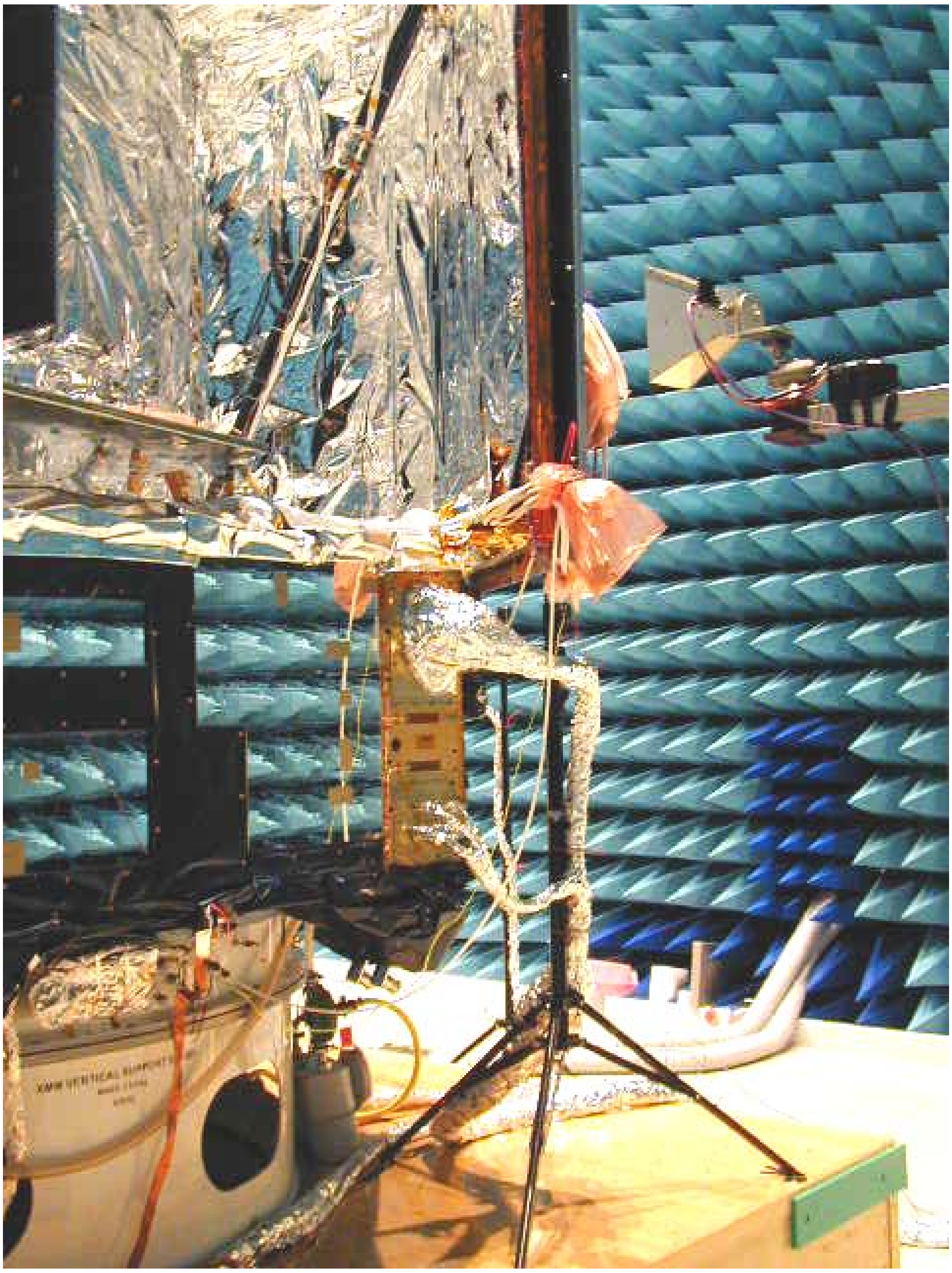


8 GHz to 18 GHz vertical polarisation in Pacs and Ambient location.

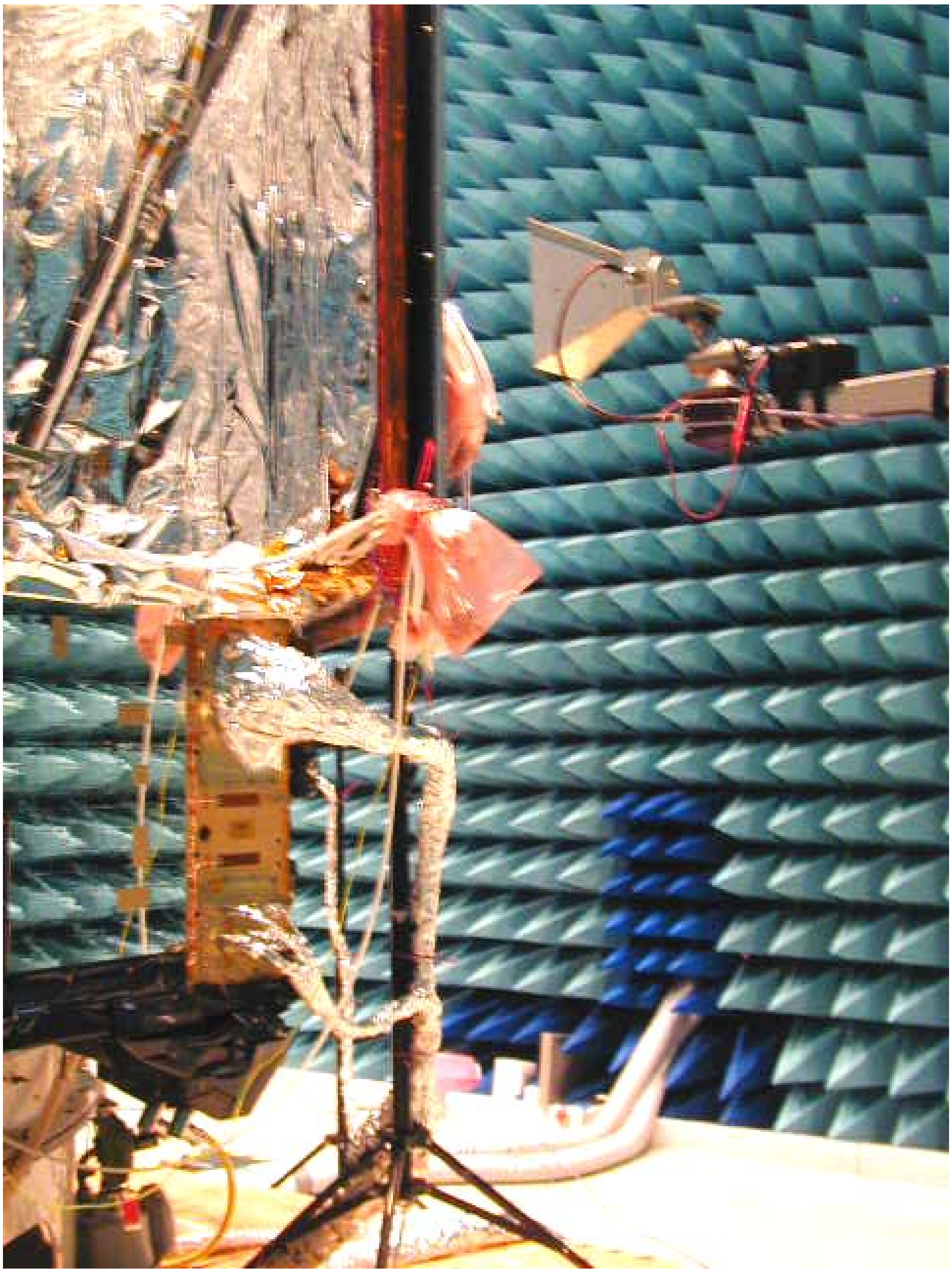


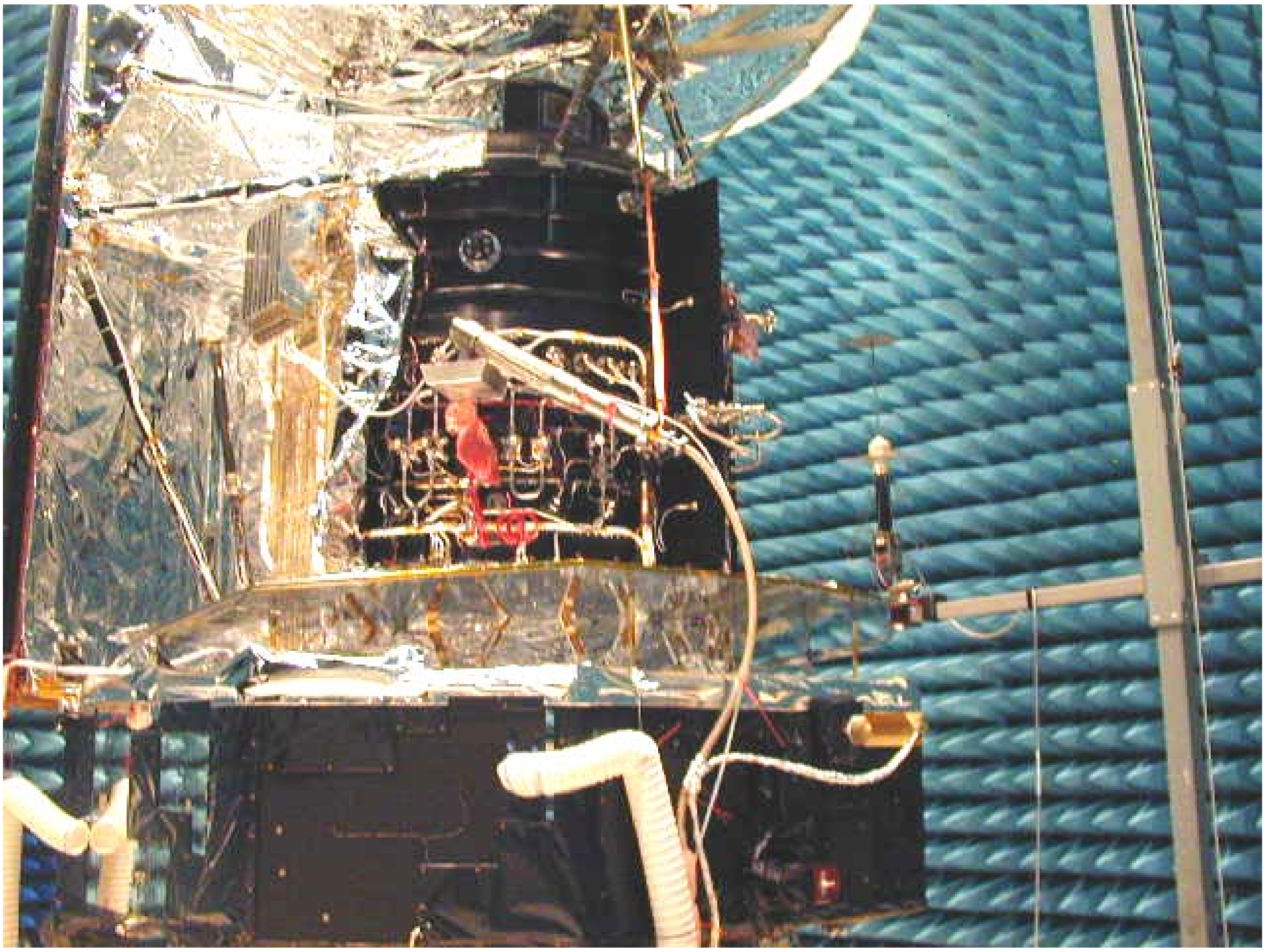
30 MHz to 200 MHz horizontal polarisation in Pacs and Ambient location.


200 MHz to 1 GHz horizontal polarisation in Pacs and Ambient location.

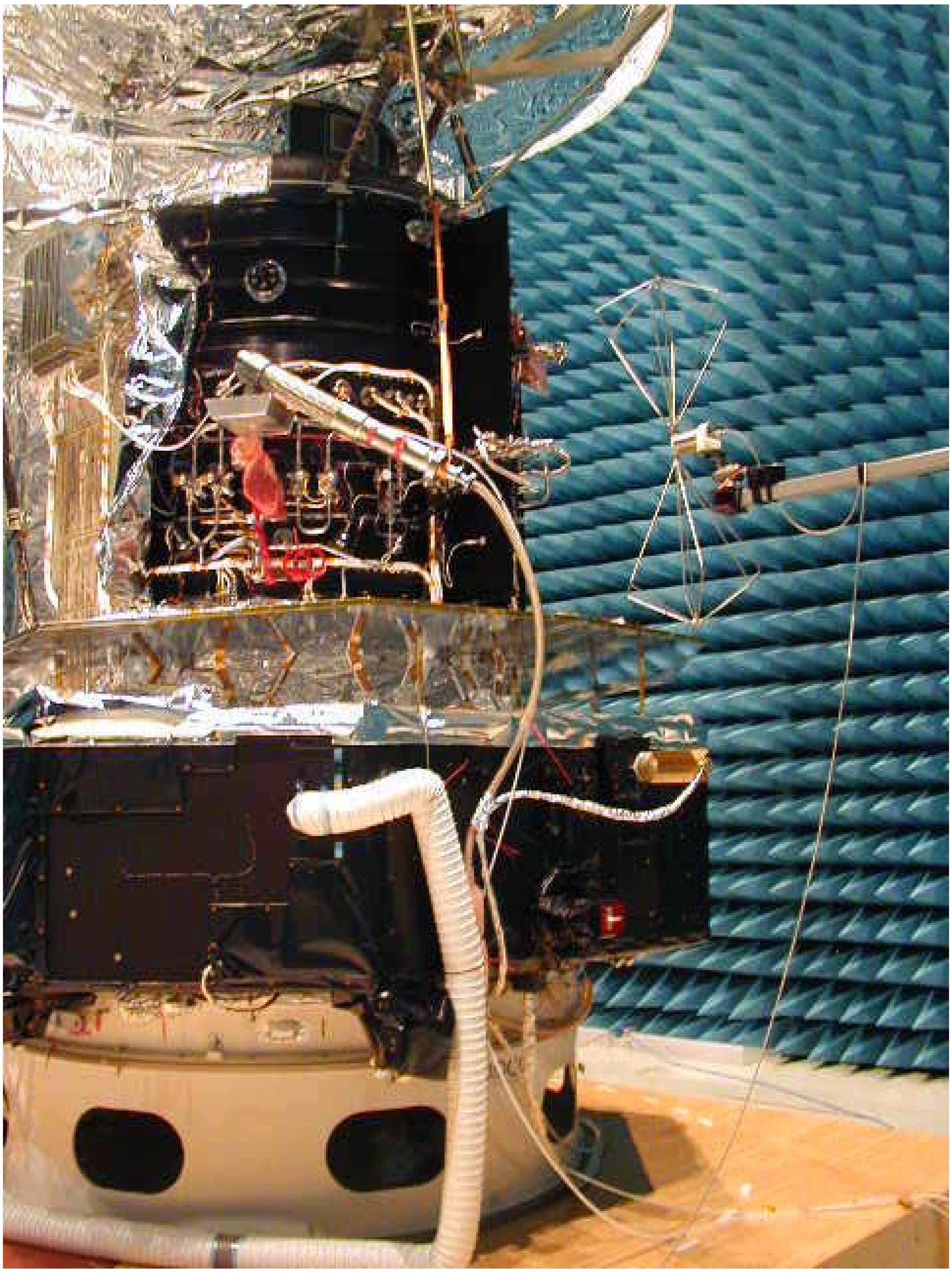


1 GHz to 8 GHz horizontal polarisation in Pacs and Ambient location.

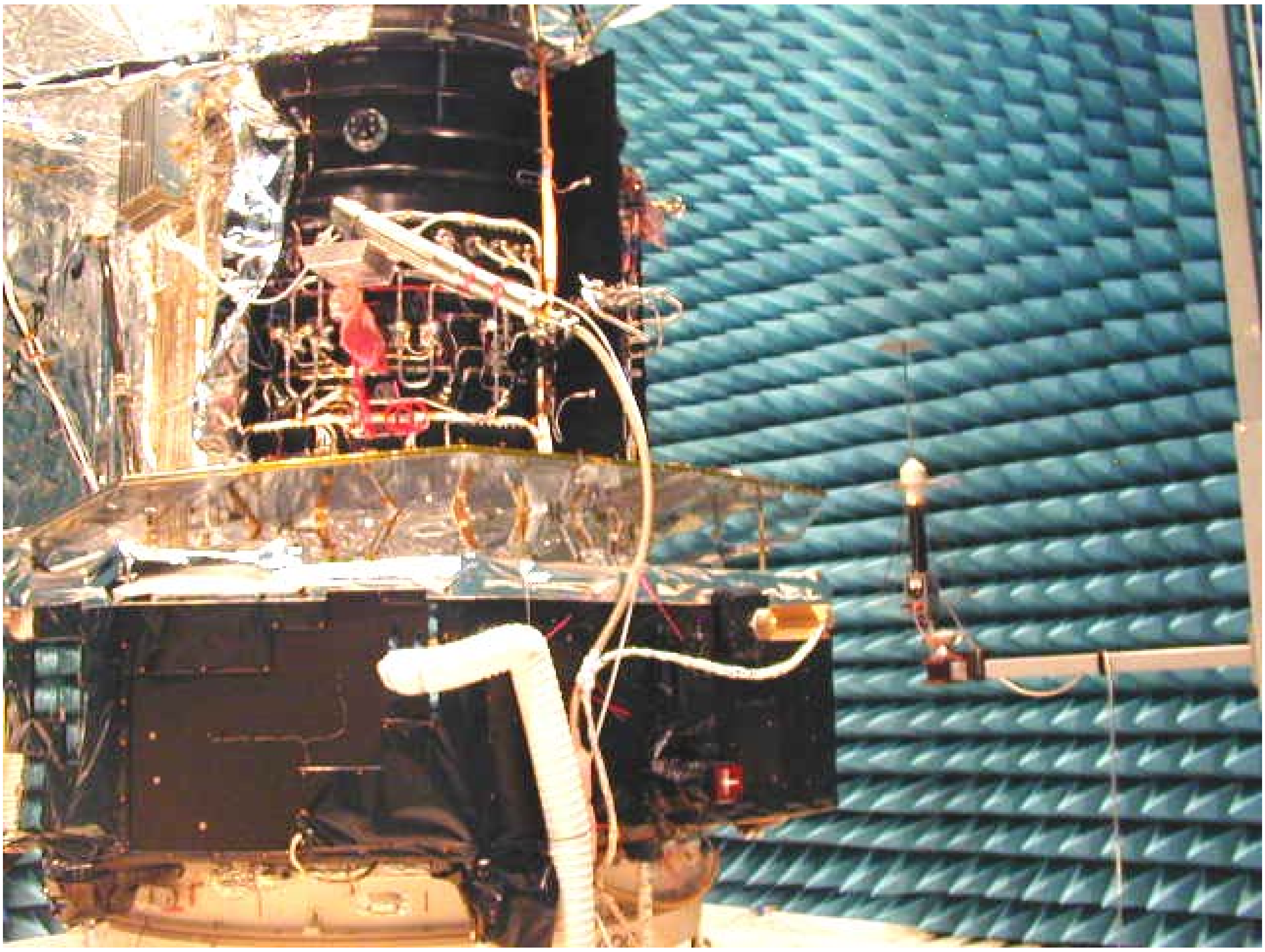

8 GHz to 18 GHz horizontal polarisation in Pacs and Ambient location.



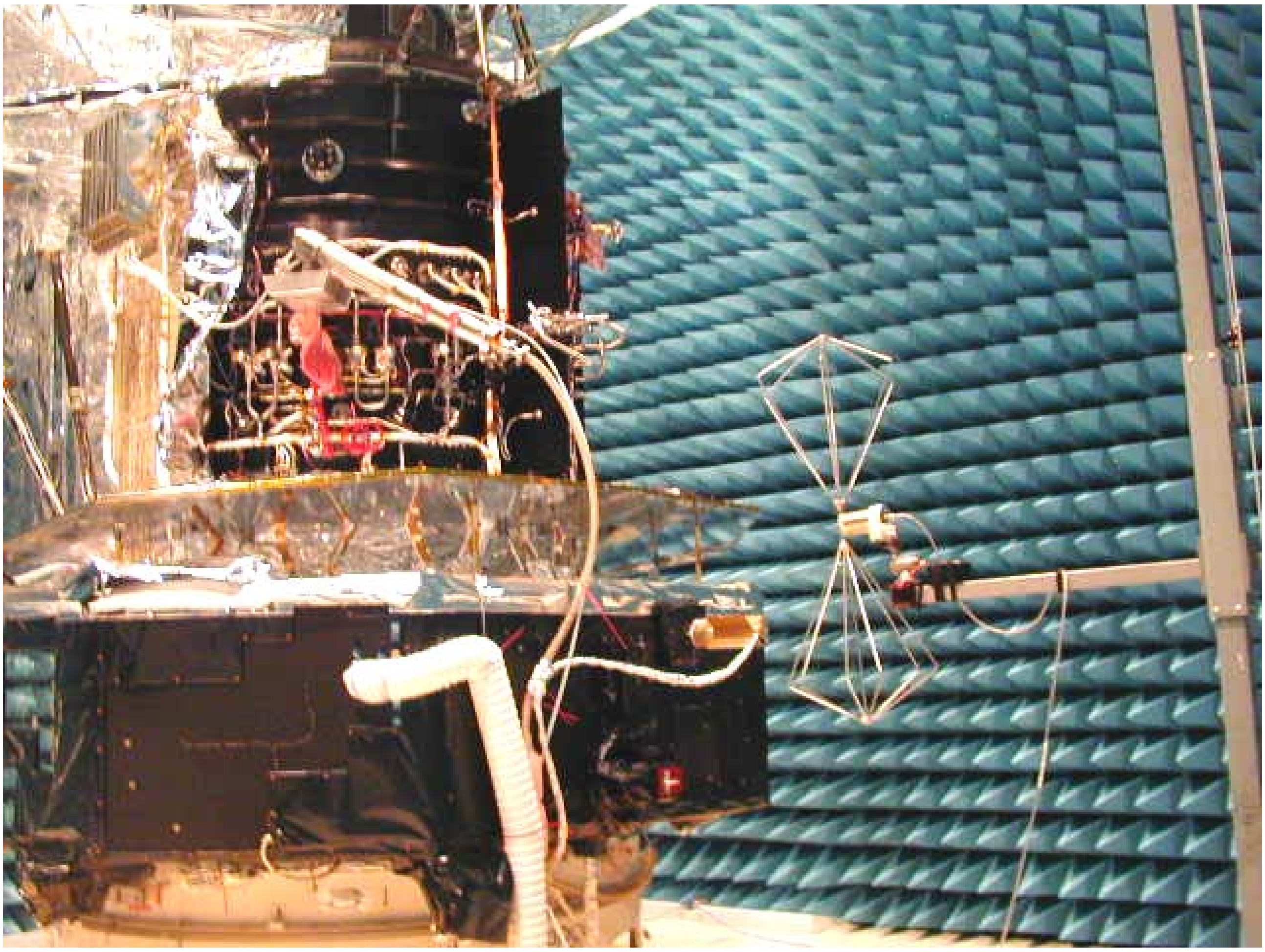
10 kHz to 30 MHz vertical polarisation in Spire additional (high) location.



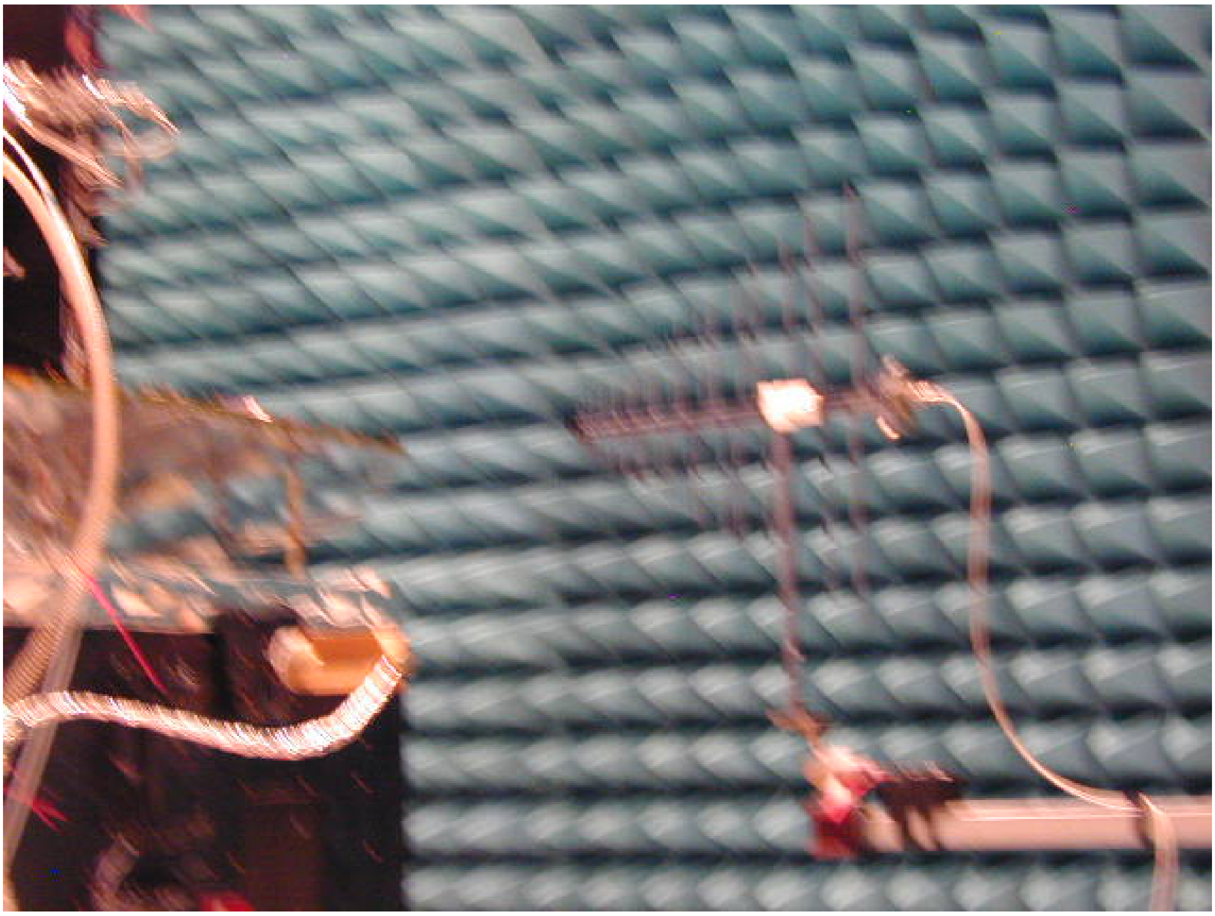
30 MHz to 200 MHz vertical polarisation in Spire additional (high) location.



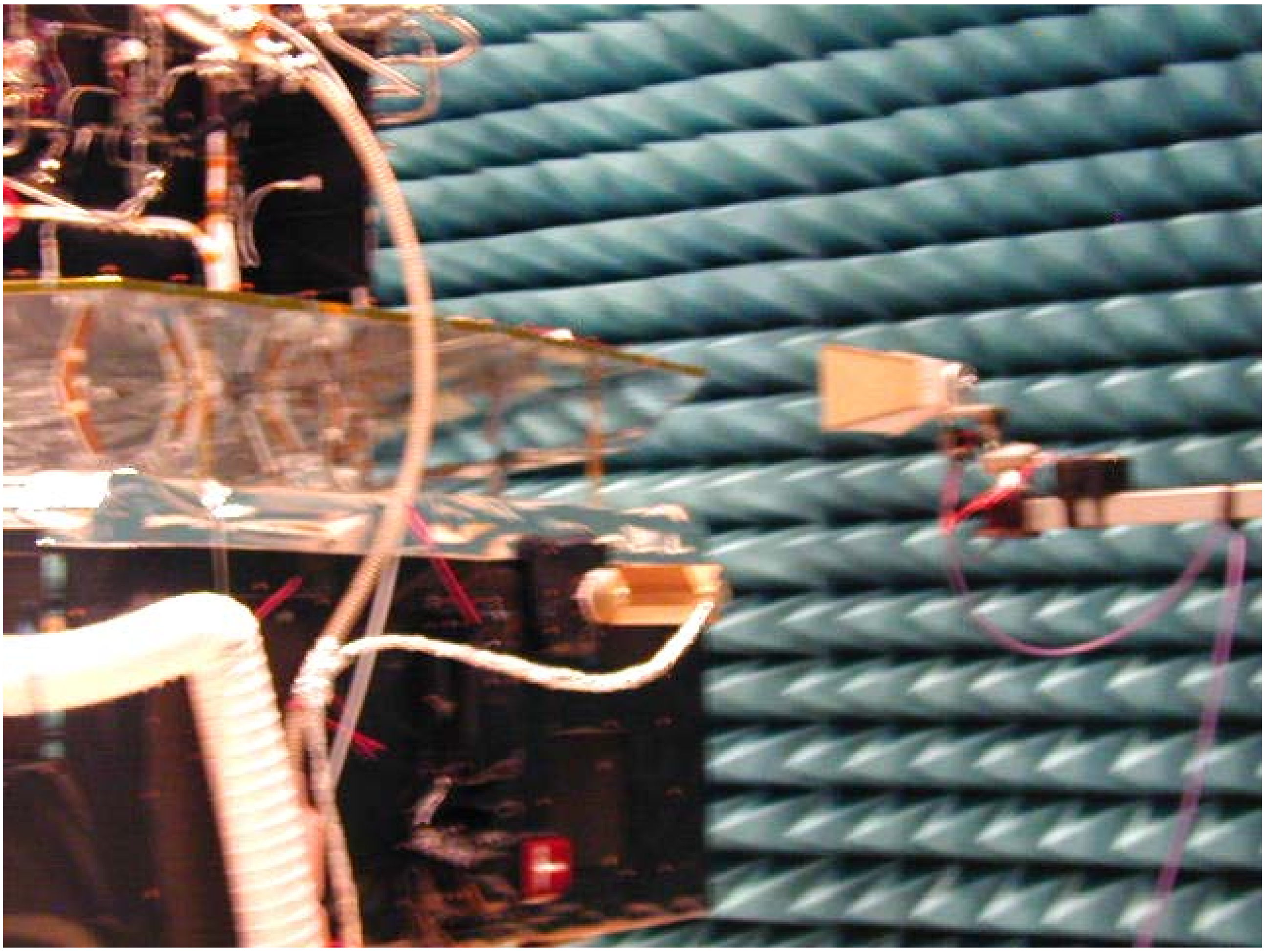
10 kHz to 30 MHz vertical polarisation in Spire nominal location.



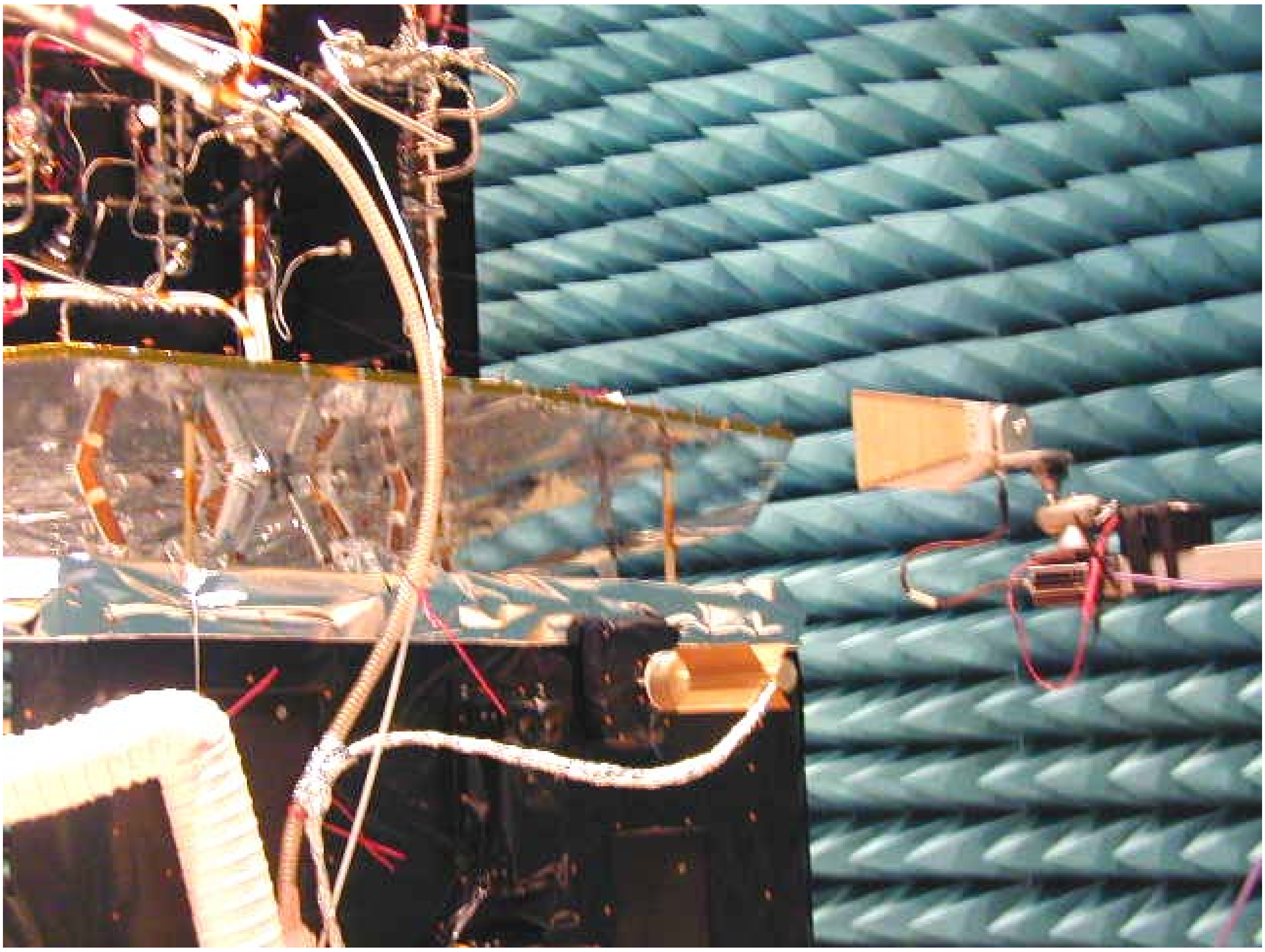
10 kHz to 30 MHz vertical polarisation in Spire nominal location.



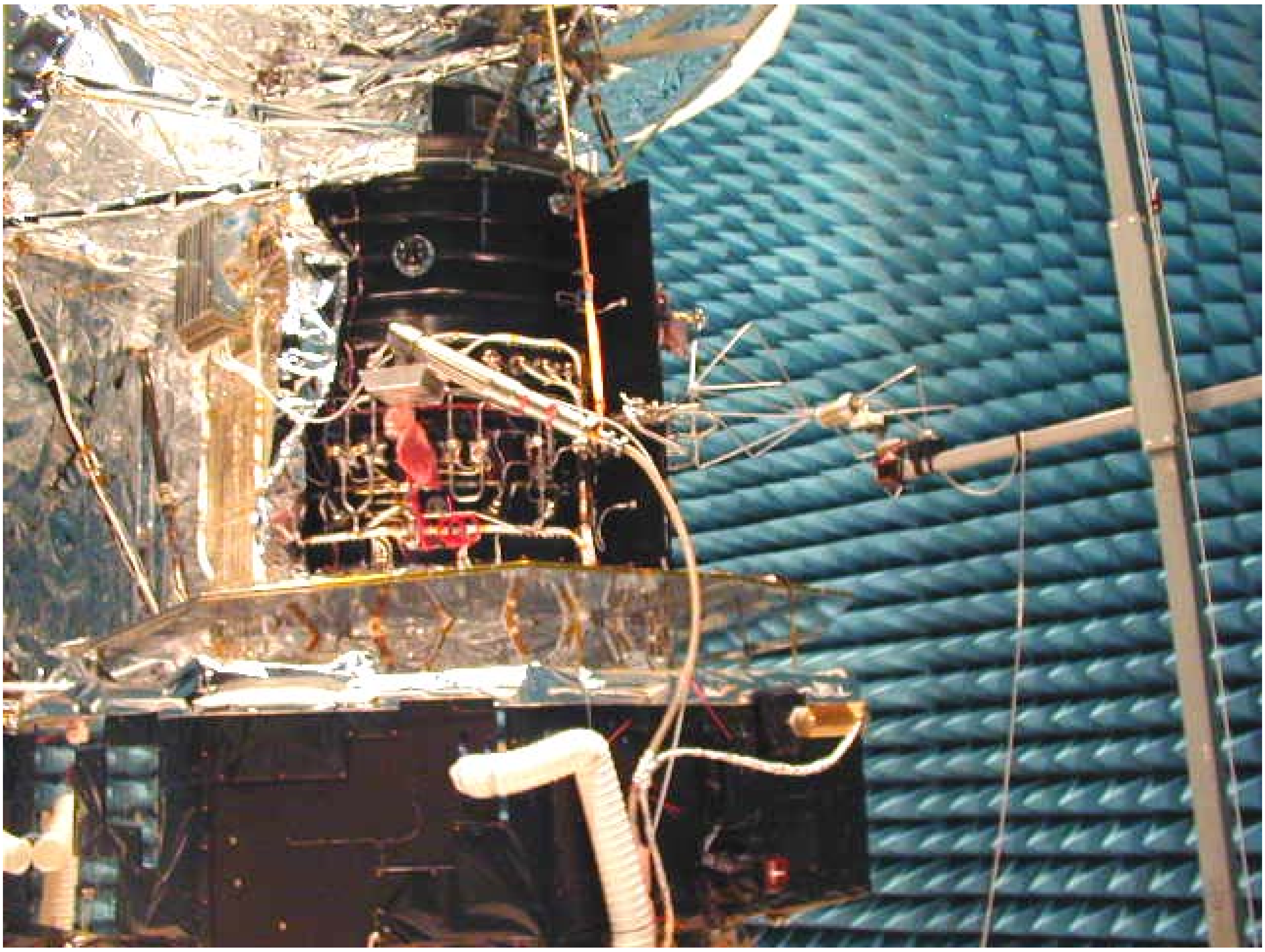
200 MHz to 1 GHz vertical polarisation in Spire nominal location.
(camera autofocus had problems)



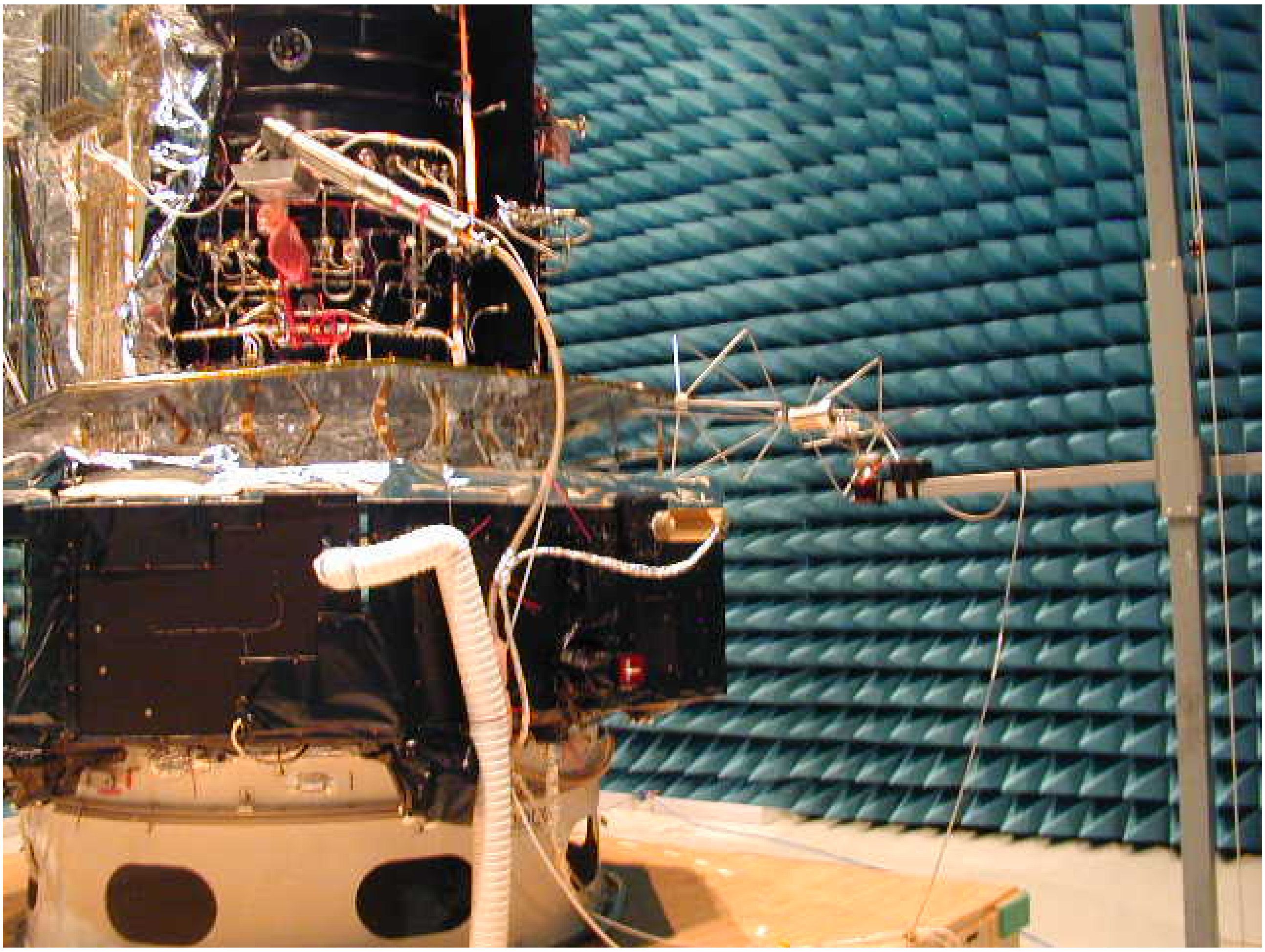
1 GHz to 8 GHz vertical polarisation in Spire nominal location.
(camera autofocus had problems)



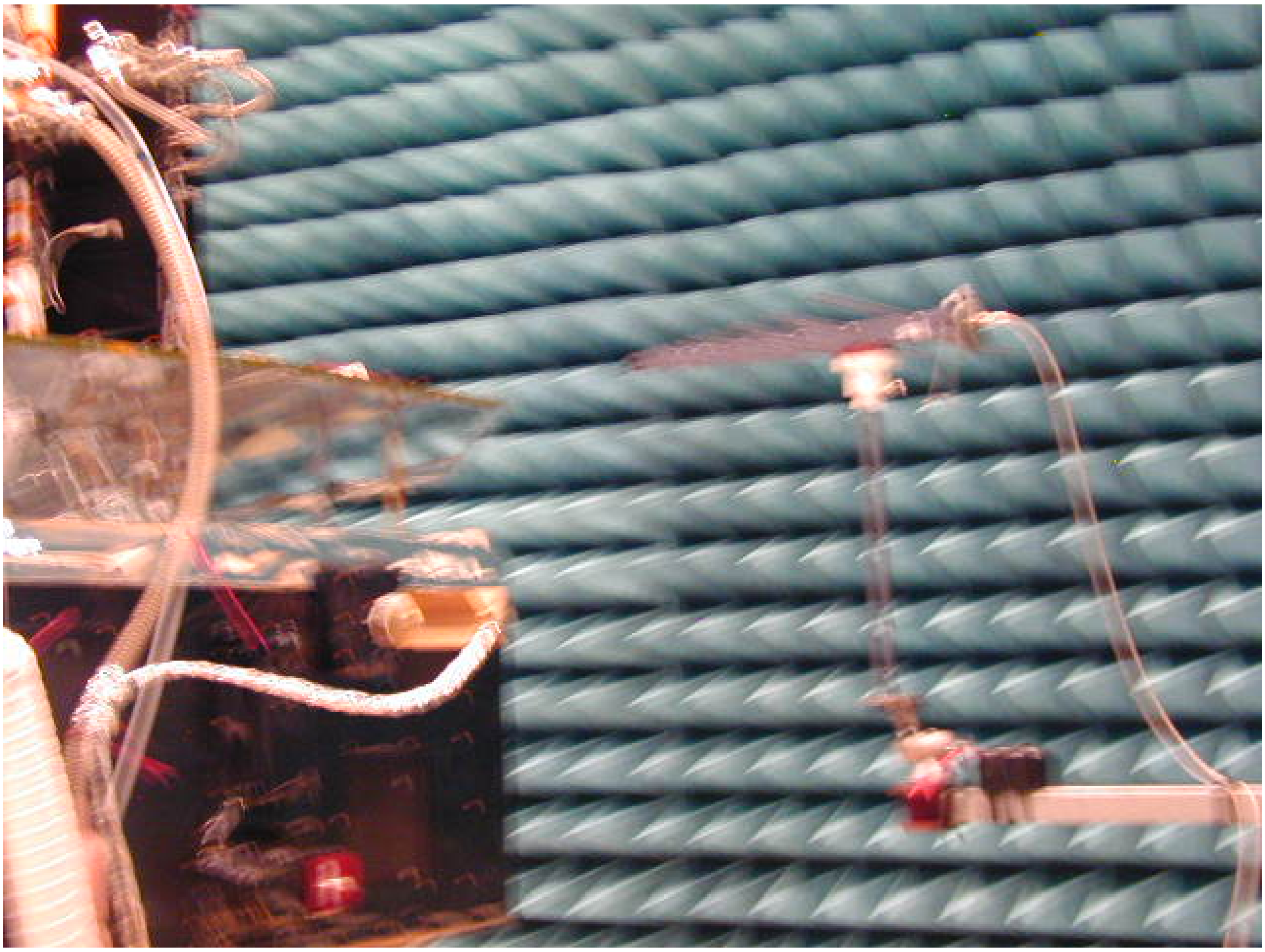
8 GHz to 18 GHz vertical polarisation in Spire nominal location.



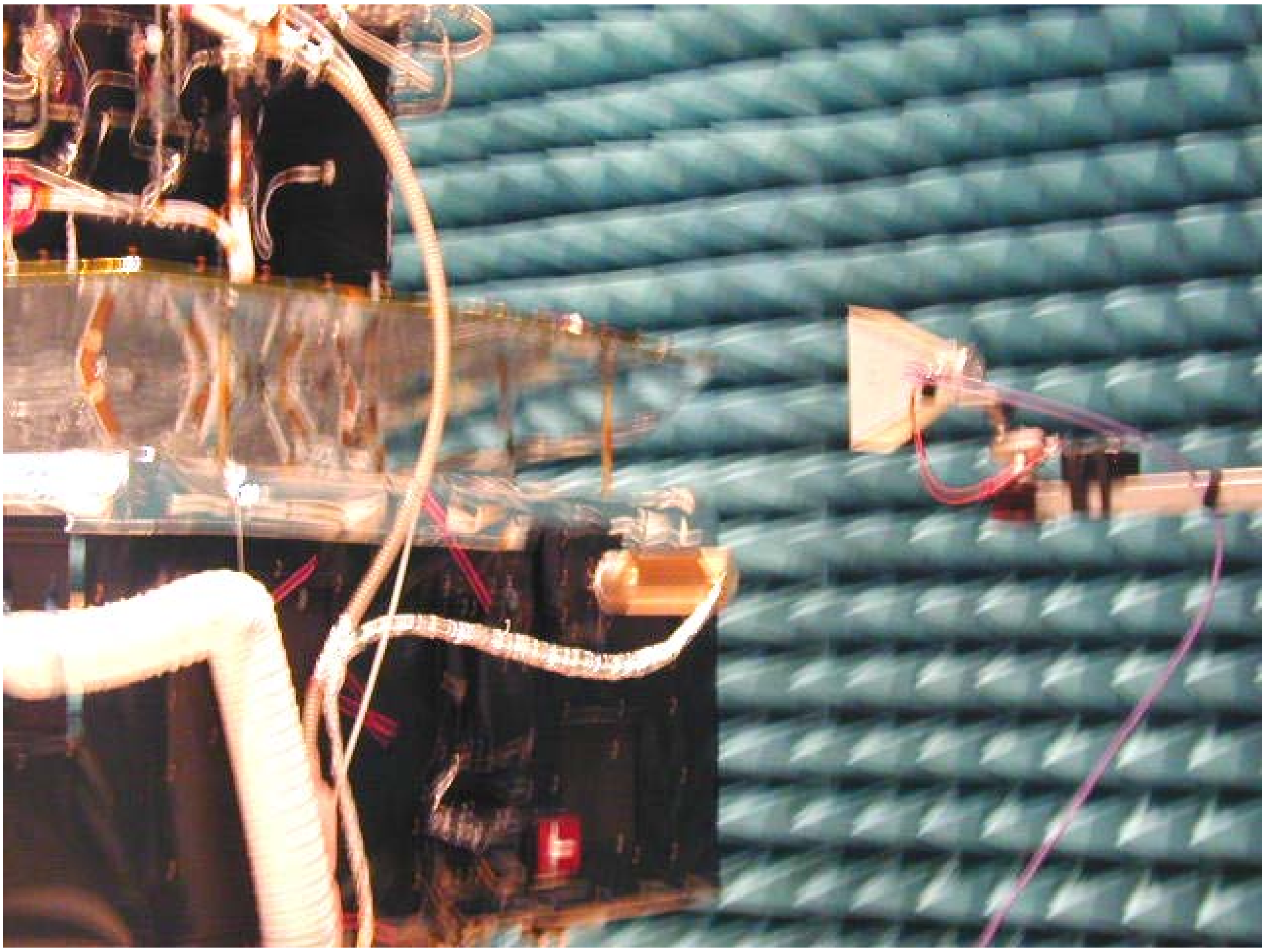
30 MHz to 200 MHz horizontal polarisation in Spire additional (high) location.



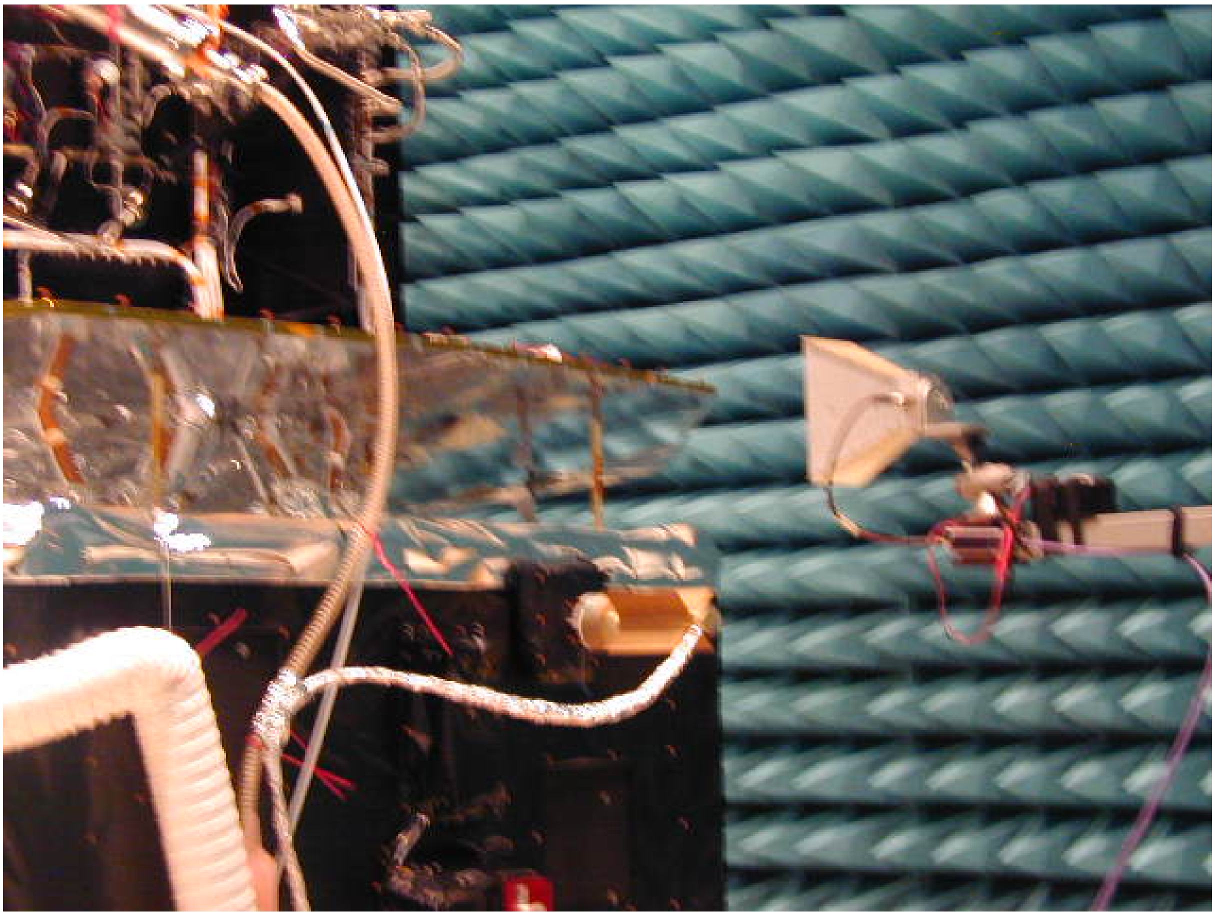
30 MHz to 200 MHz horizontal polarisation in Spire nominal location.



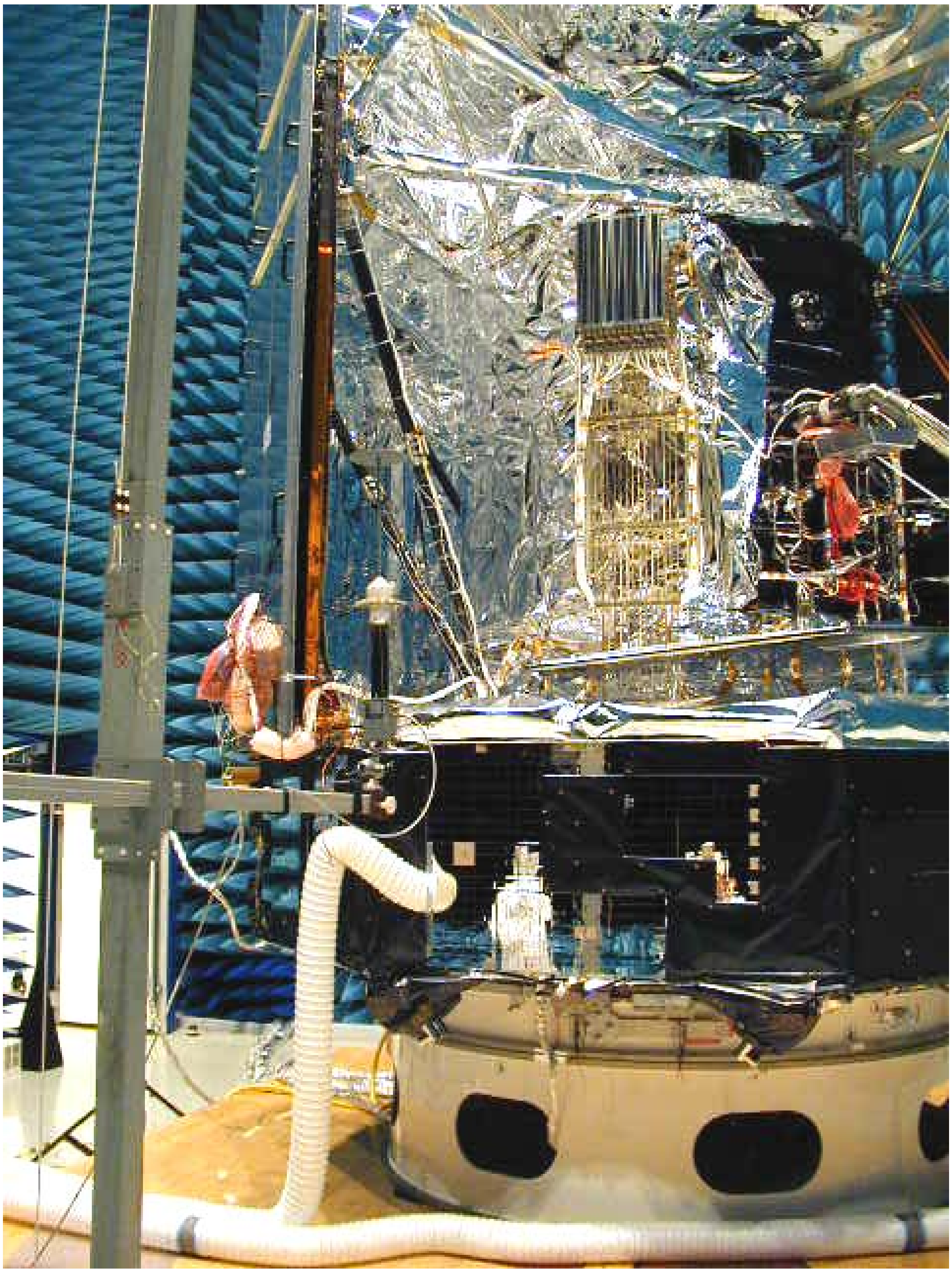
200 MHz to 1 GHz horizontal polarisation in Spire nominal location.
(camera autofocus had problems)



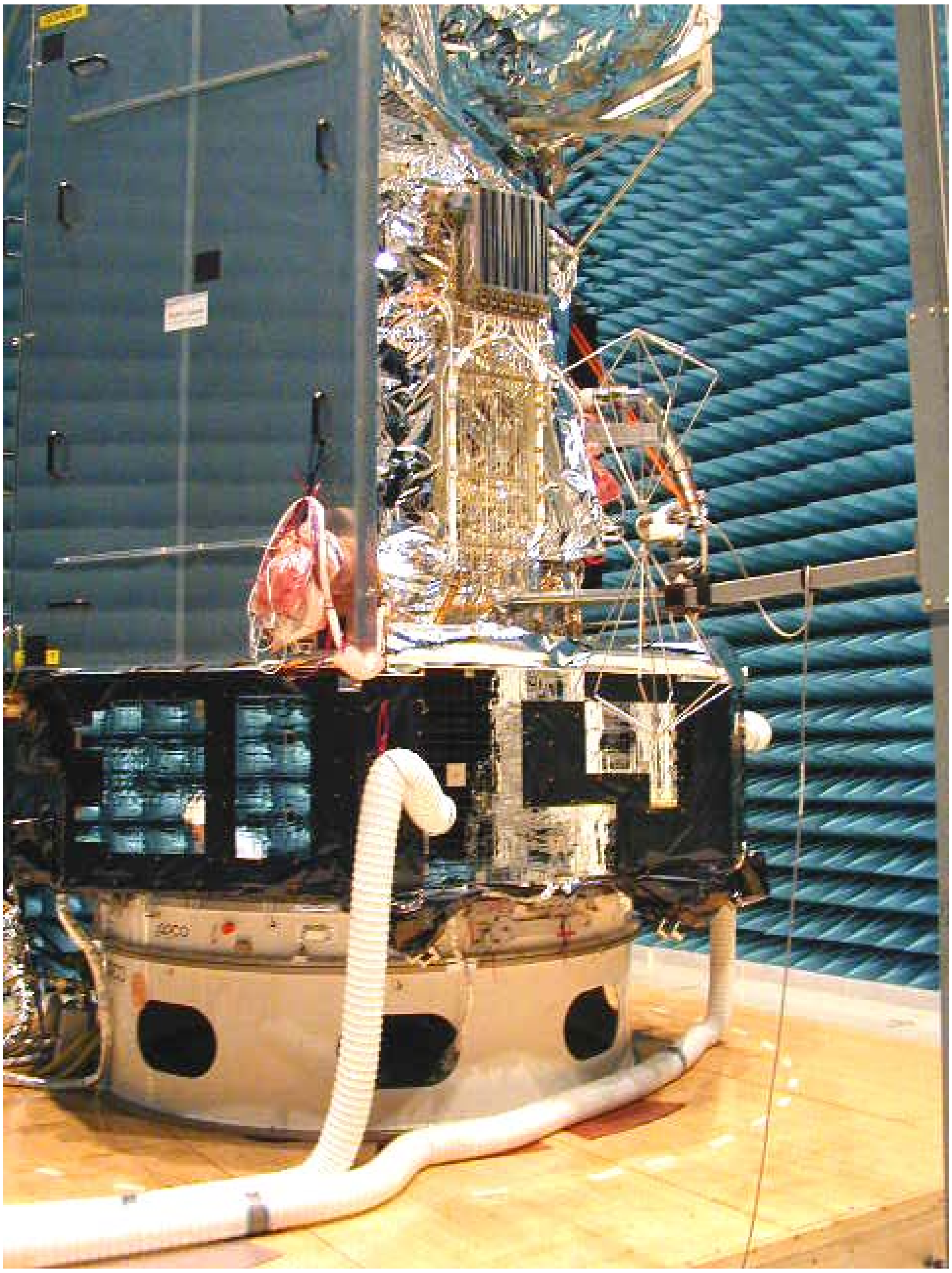
1 GHz to 8 GHz horizontal polarisation in Spire nominal location.
(camera autofocus had problems)



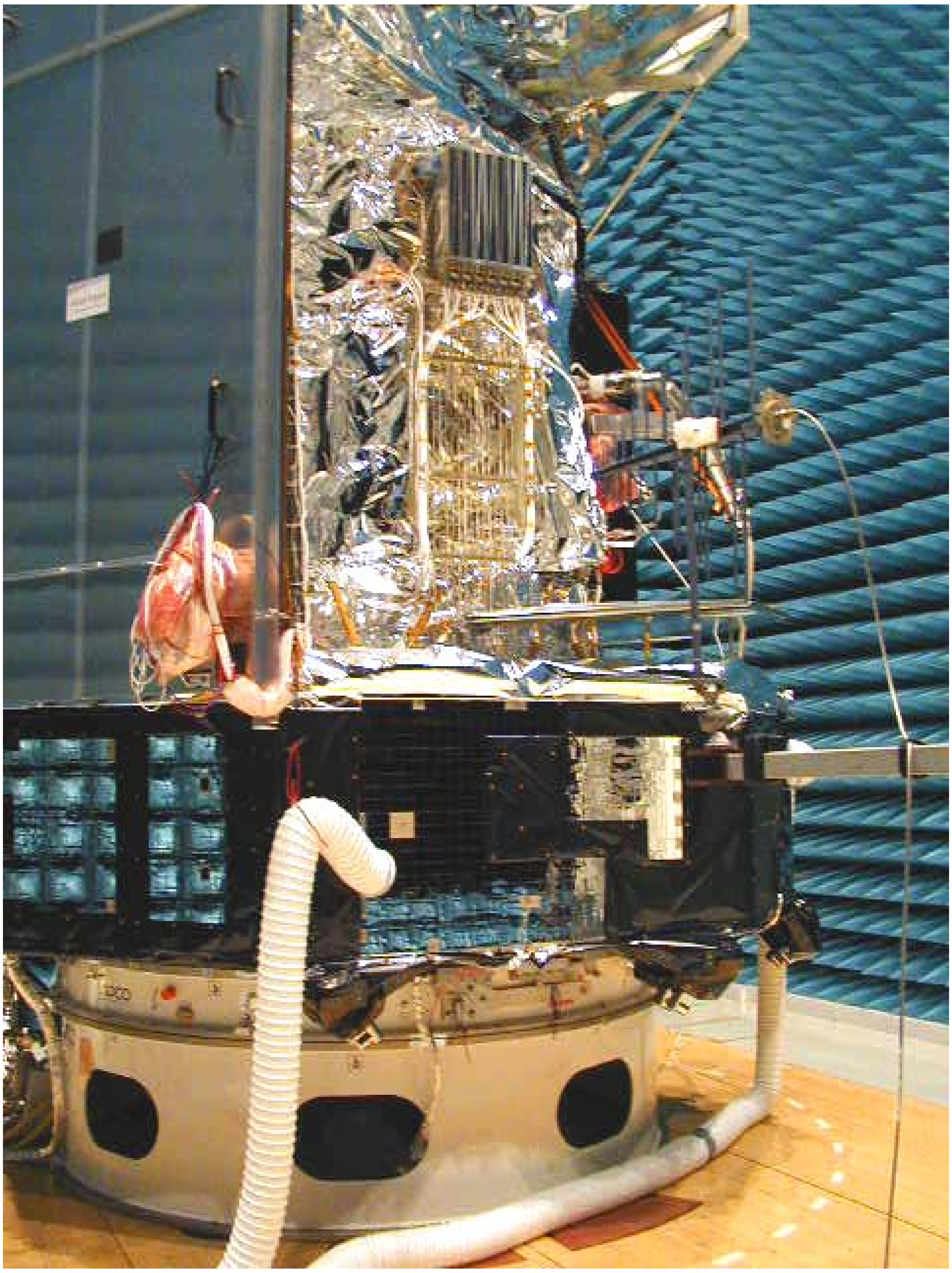
8 GHz to 18 GHz horizontal polarisation in Spire nominal location.
(camera autofocus had problems)

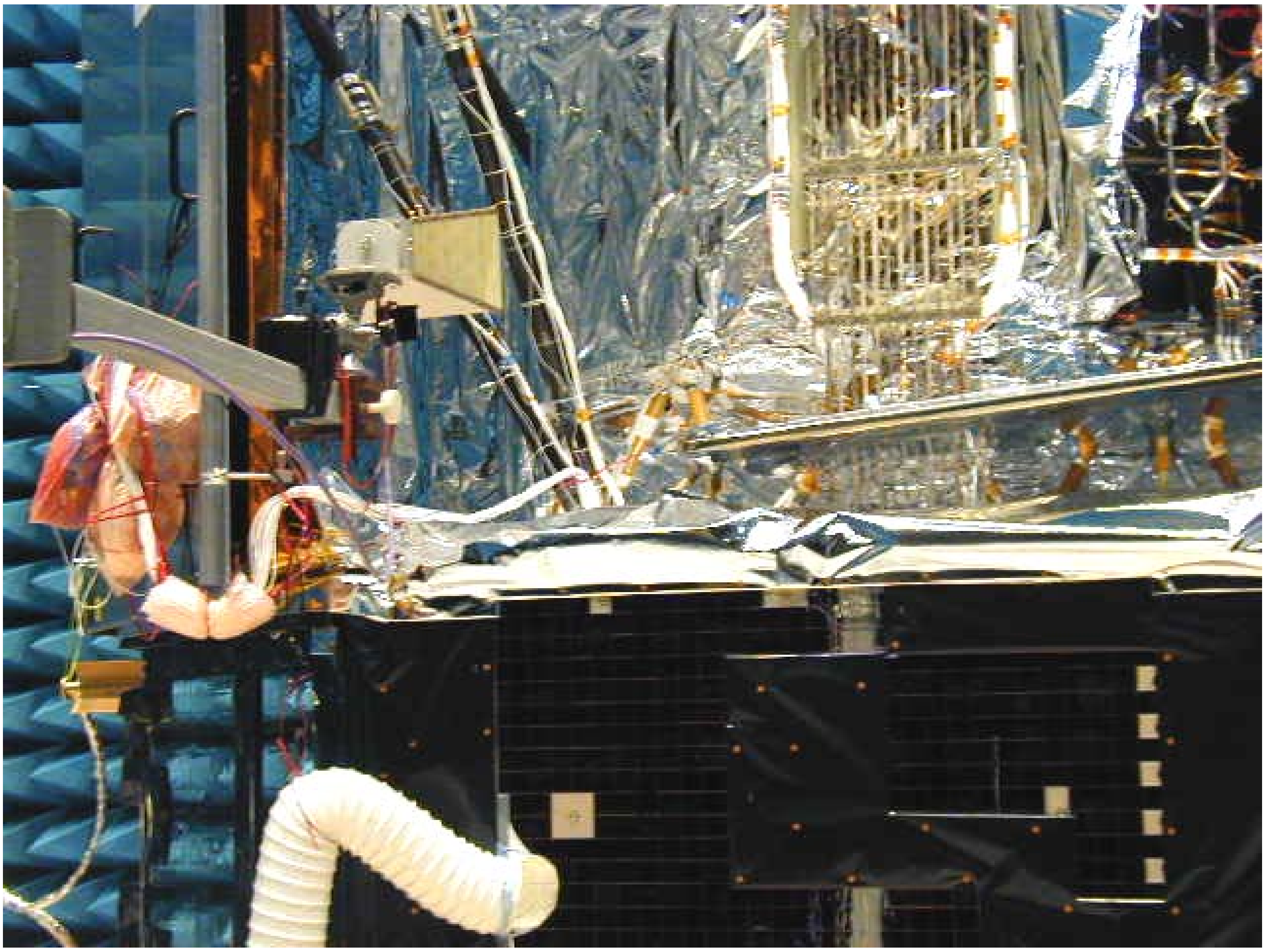


10 kHz to 30 MHz vertical polarisation in Hifi location.

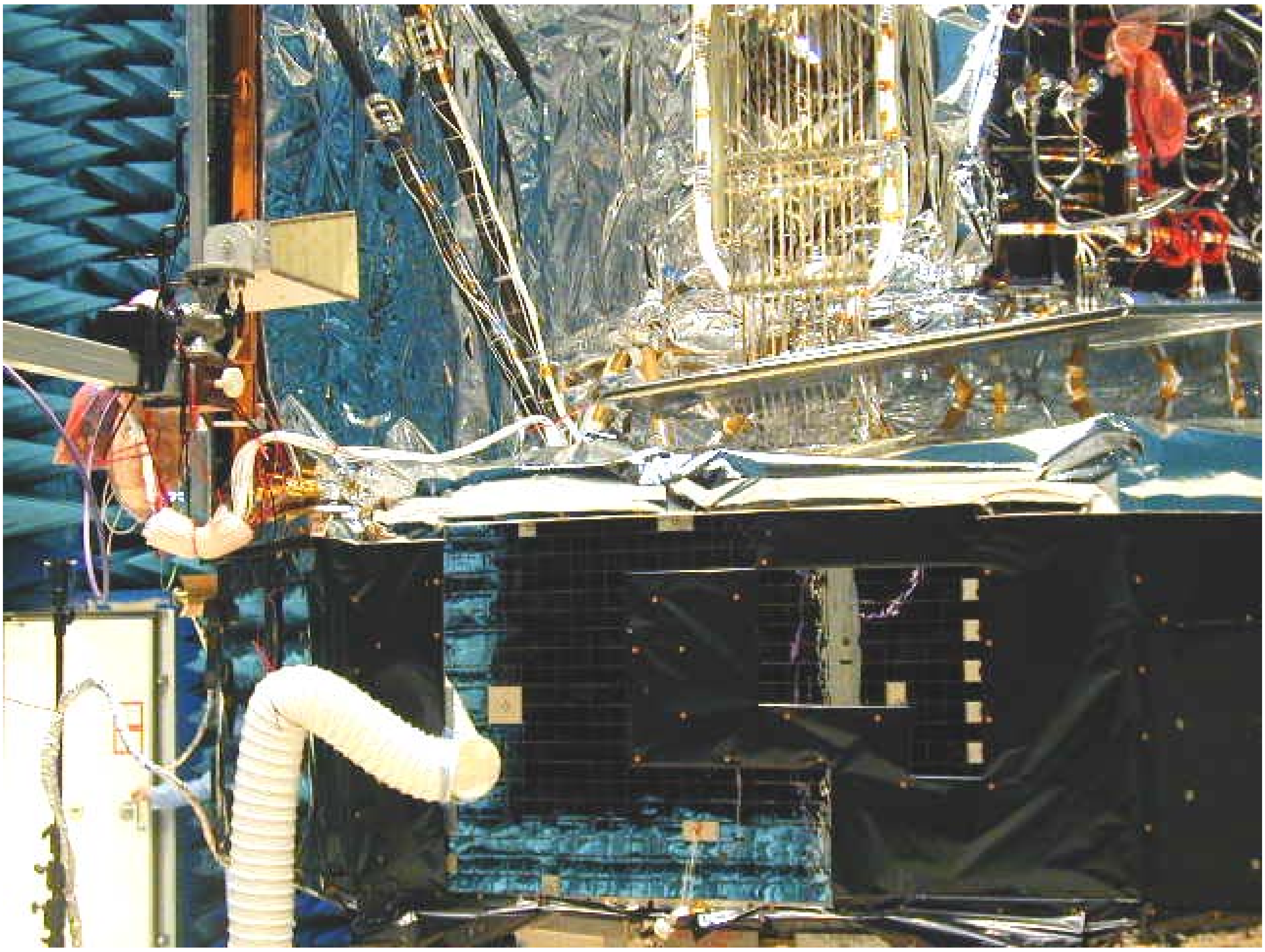


30 MHz to 200 MHz vertical polarisation in Hifi location.

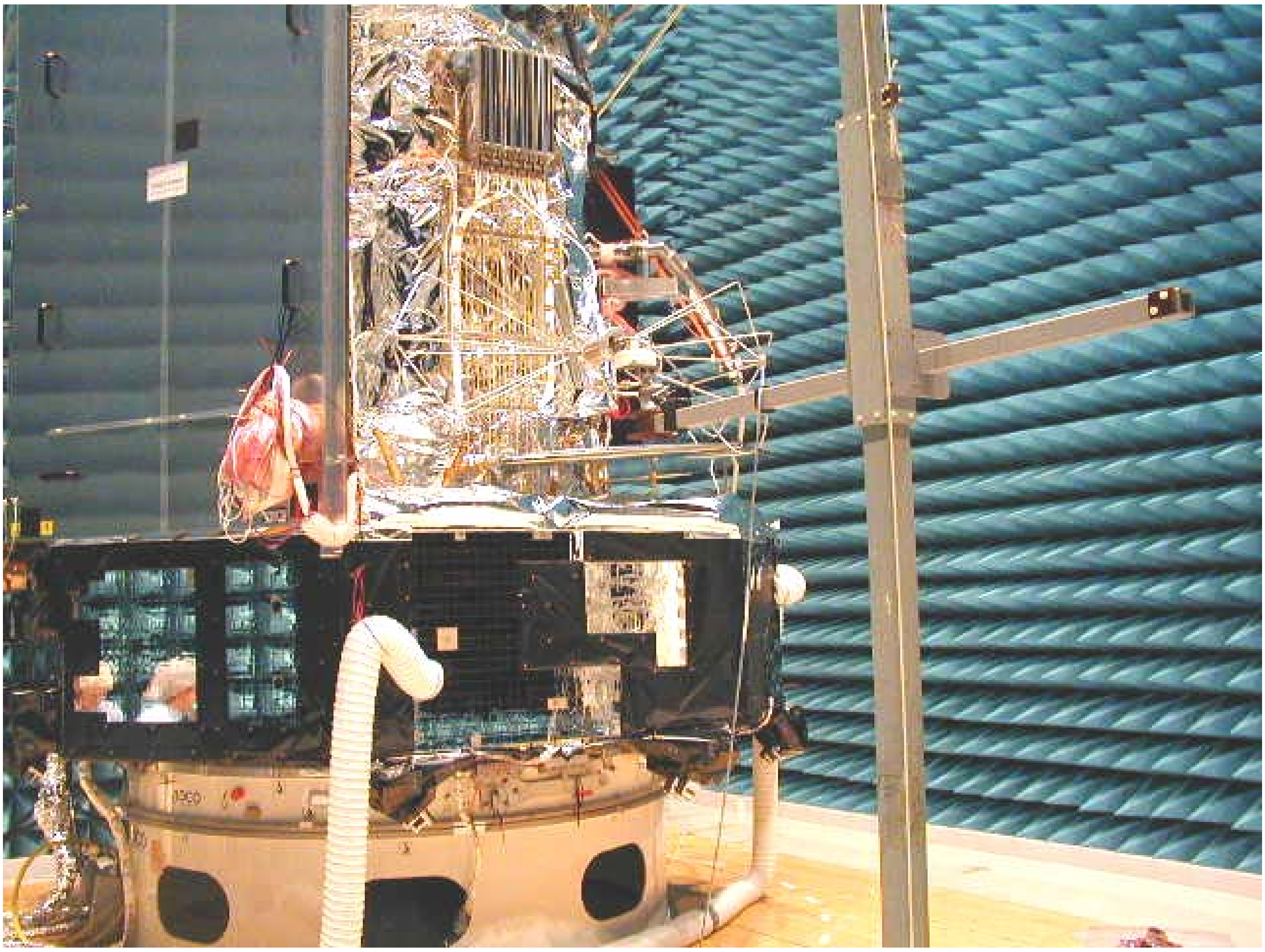

200 MHz to 1 GHz vertical polarisation in Hifi nominal location.

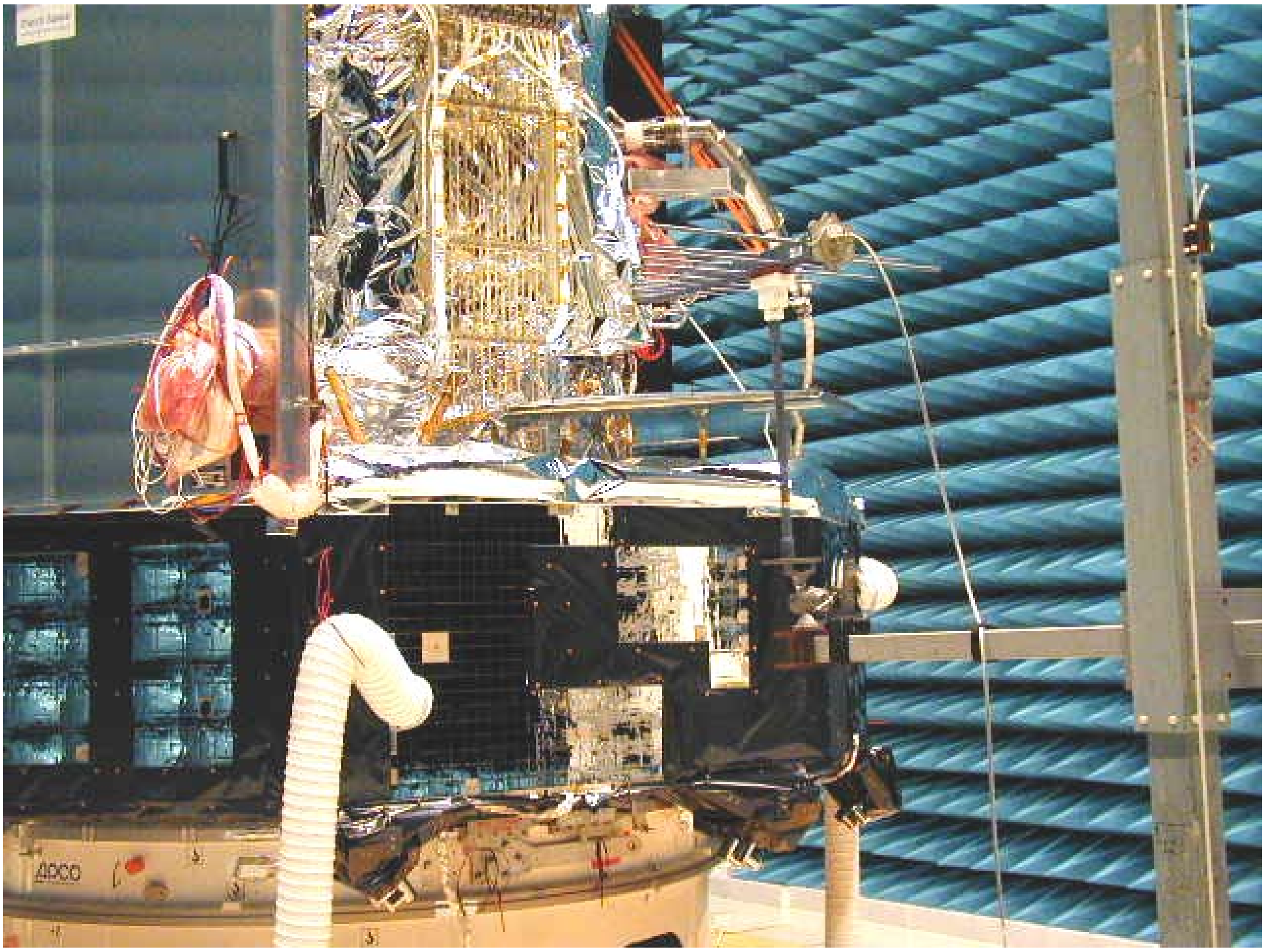


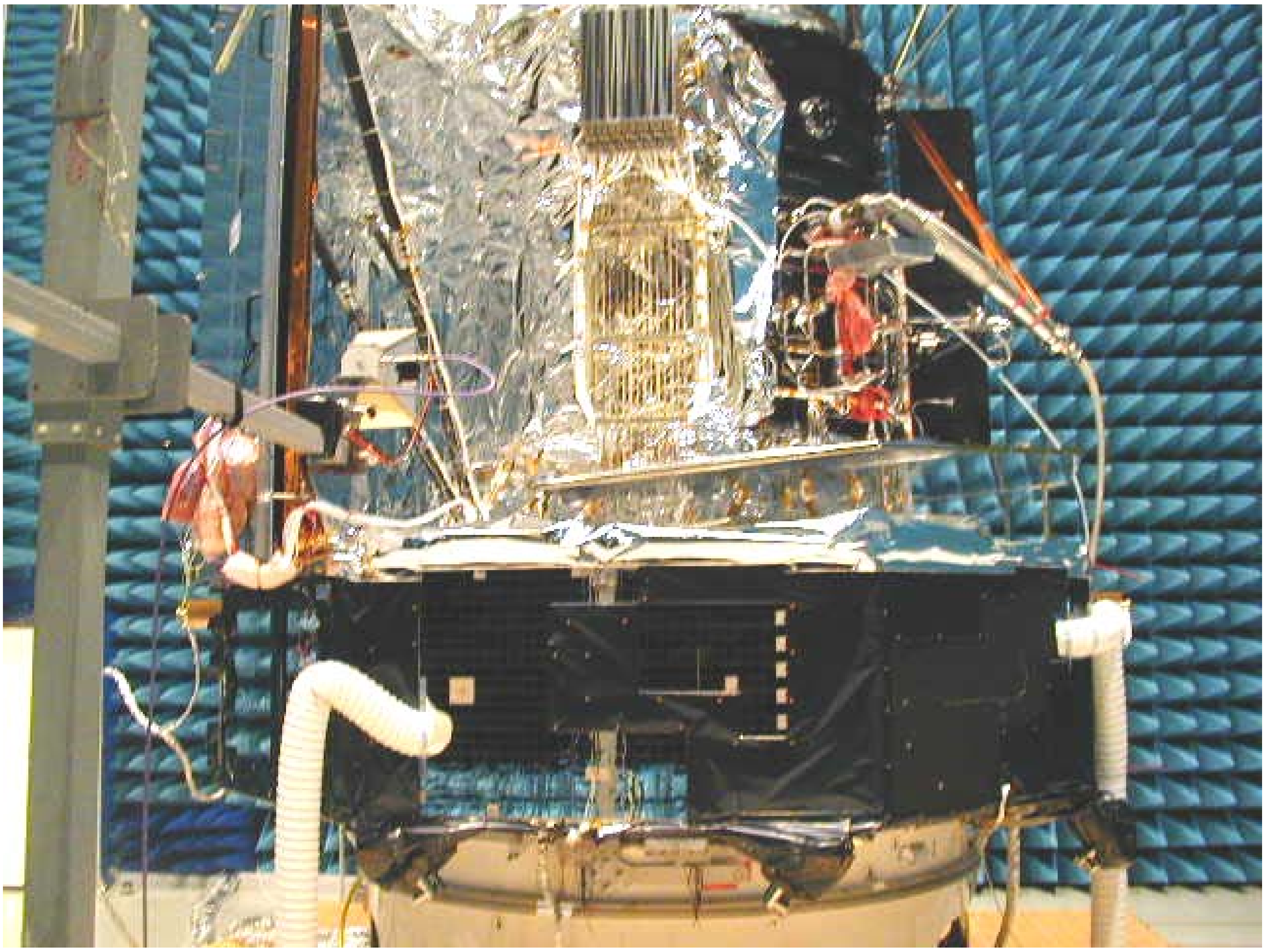
1 GHz to 8 GHz vertical polarisation in Hifi nominal location.



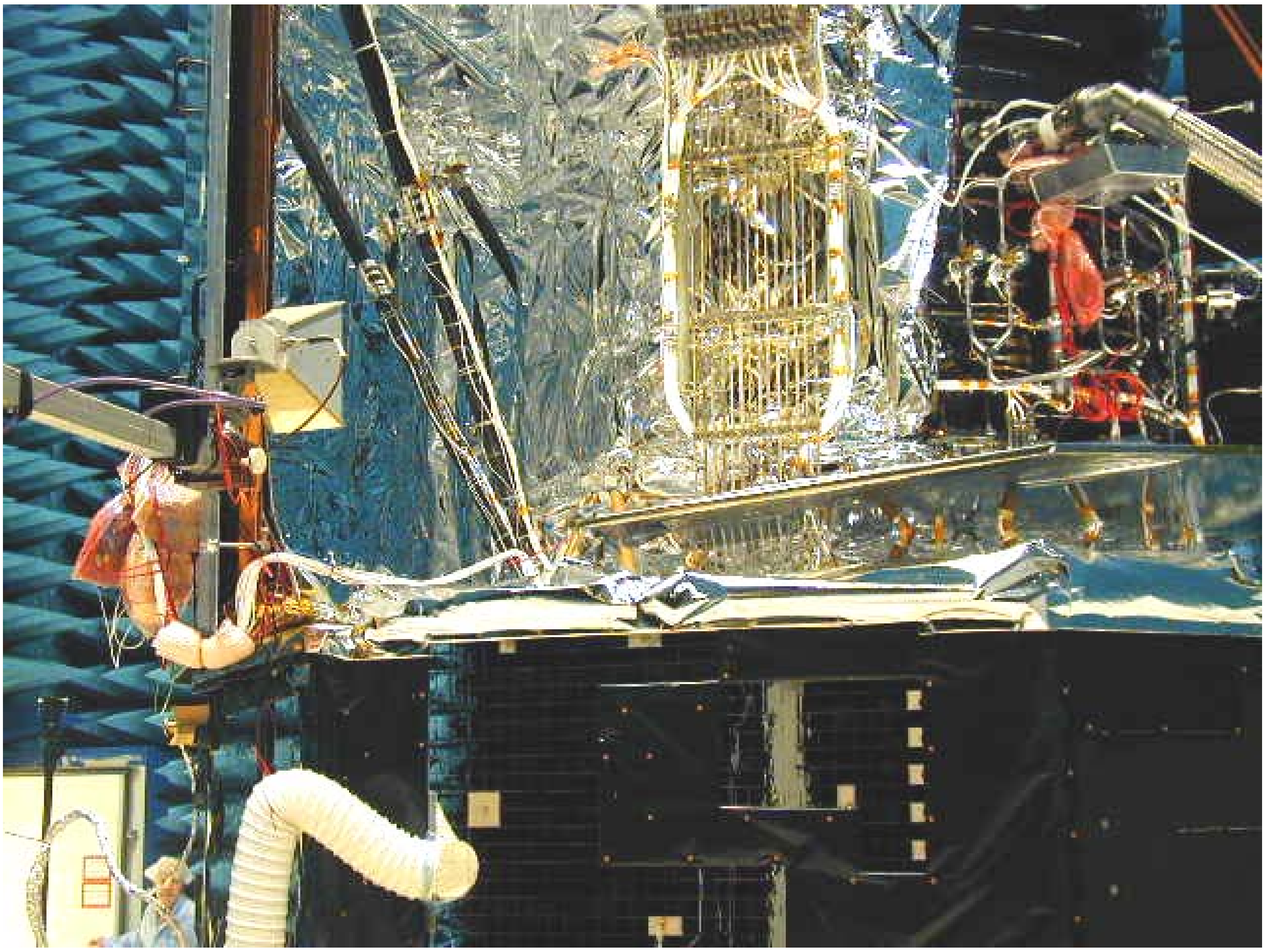
8 GHz to 18 GHz vertical polarisation in Hifi nominal location.


30 MHz to 200 MHz horizontal polarisation in Hifi nominal location.


200 MHz to 1 GHz horizontal polarisation in Hifi nominal location.

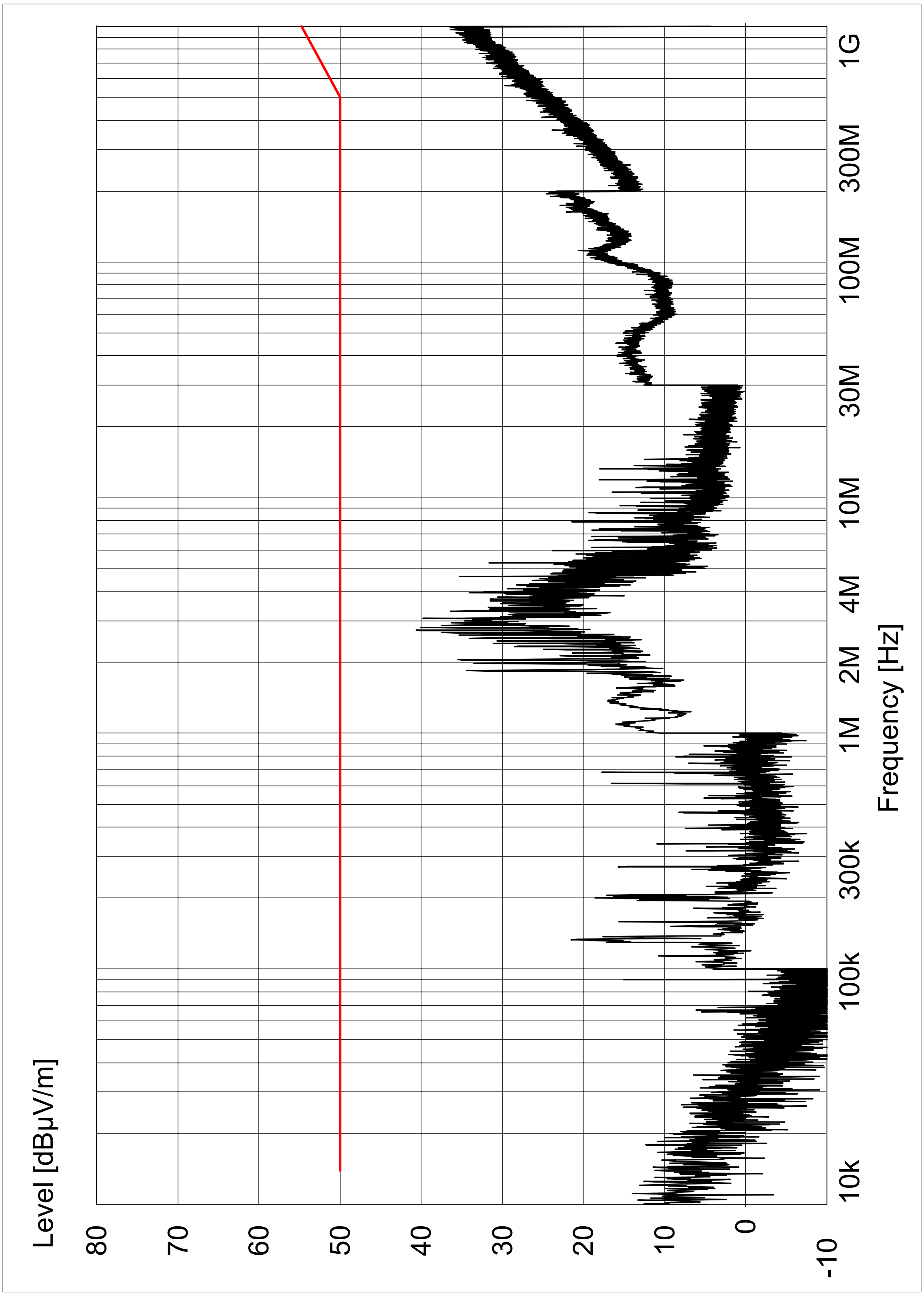


1 GHz to 8 GHz horizontal polarisation in Hifi nominal location.

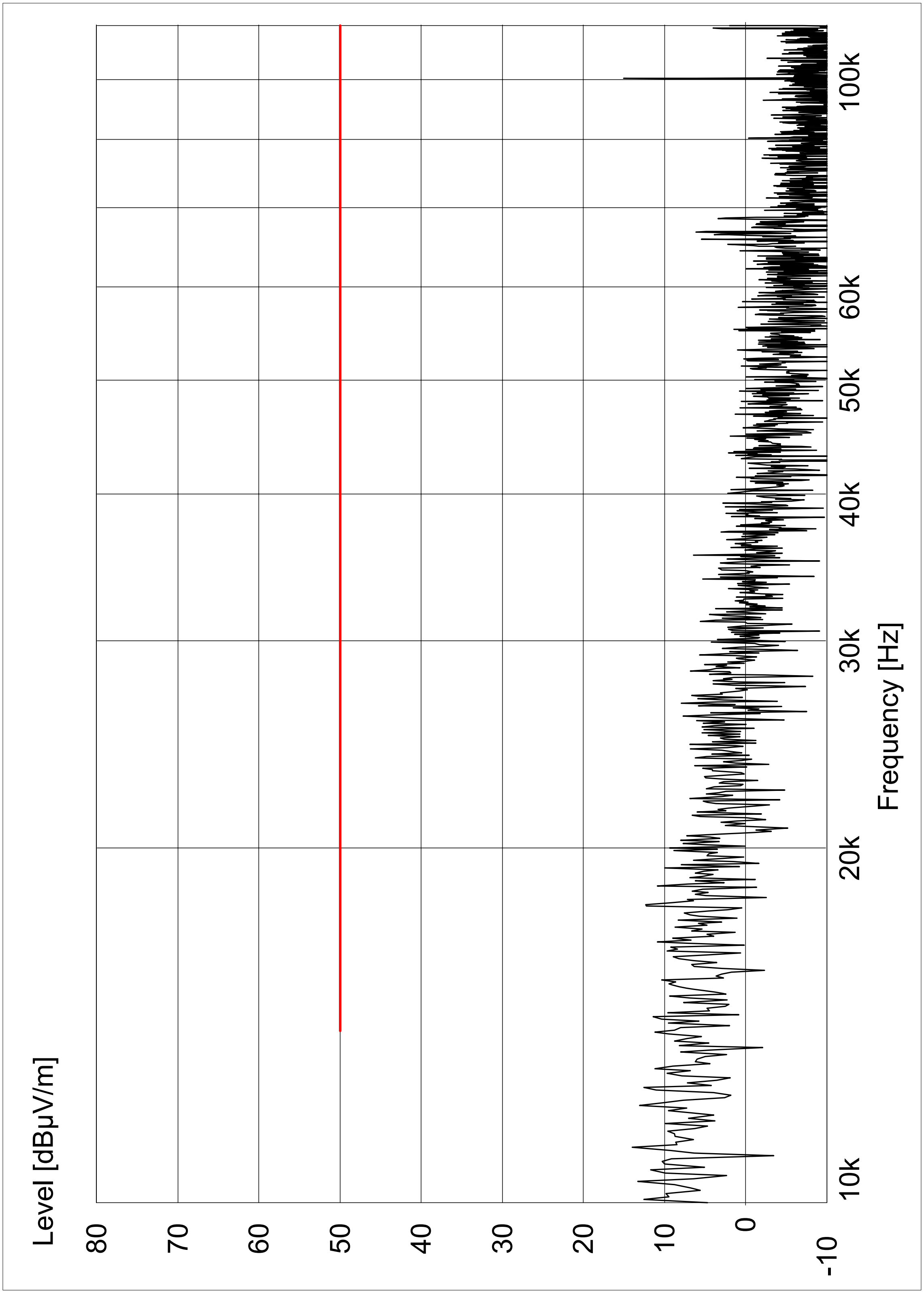


8 GHz to 18 GHz horizontal polarisation in Hifi nominal location.

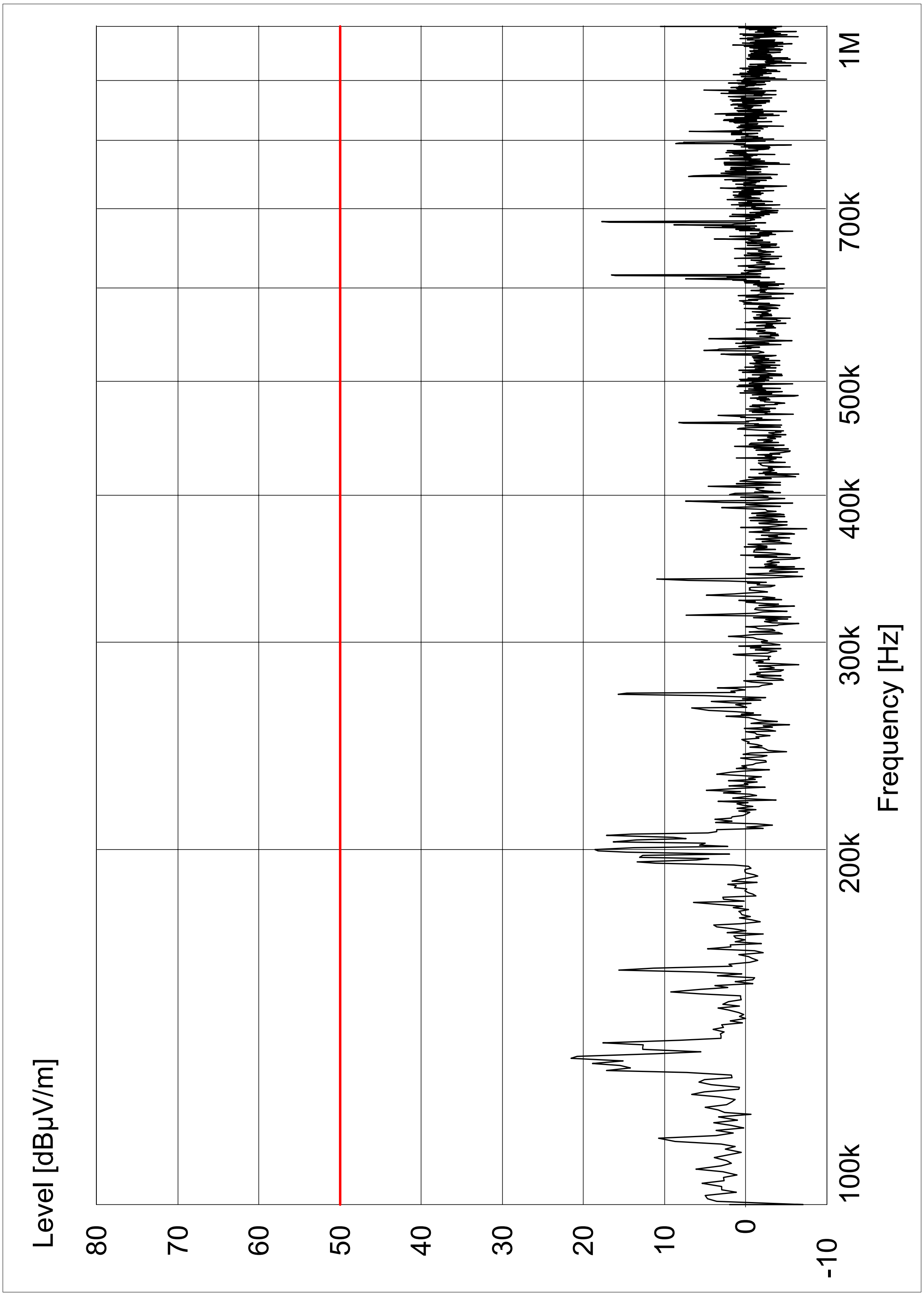
07-05-2008 19:47
Plot 1 Ambient in pacs location VP



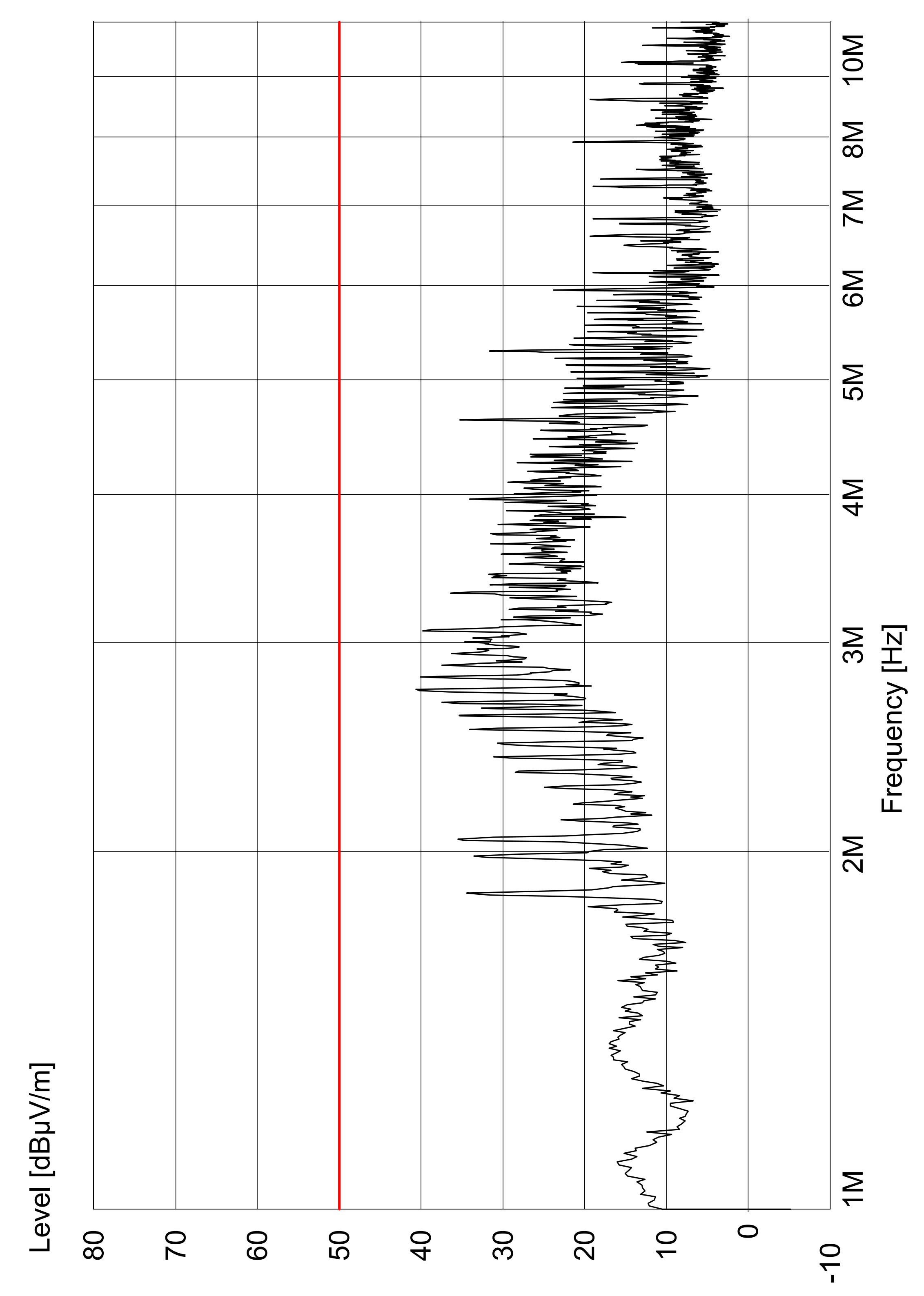
07-05-2008 19:47
Plot 1a Ambient in pacs location VP



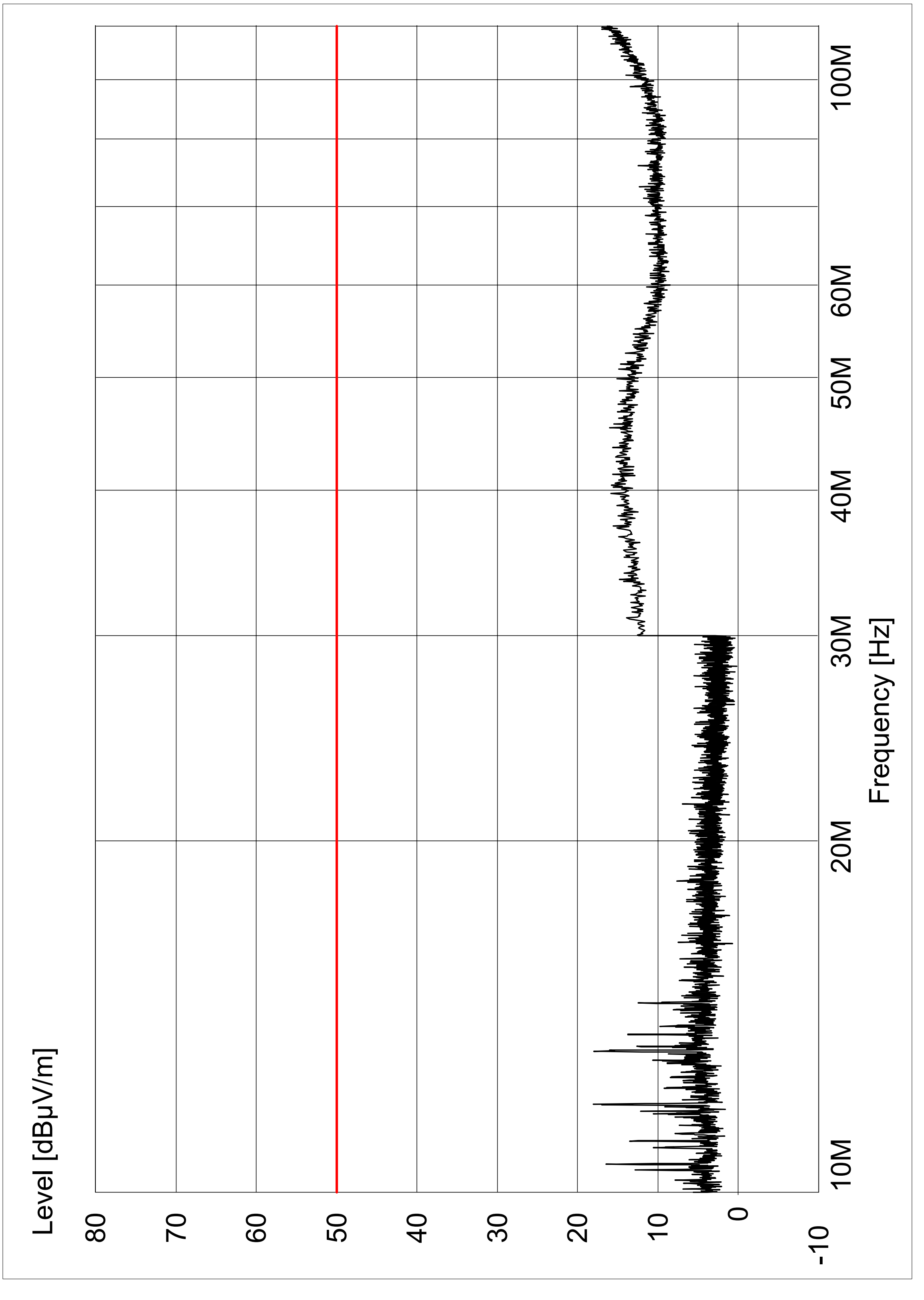
07-05-2008 19:47
Plot 1b Ambient in pacs location VP



07-05-2008 19:47
Plot 1c Ambient in pacs location VP



07-05-2008 19:47
Plot 1d Ambient in pacs location VP



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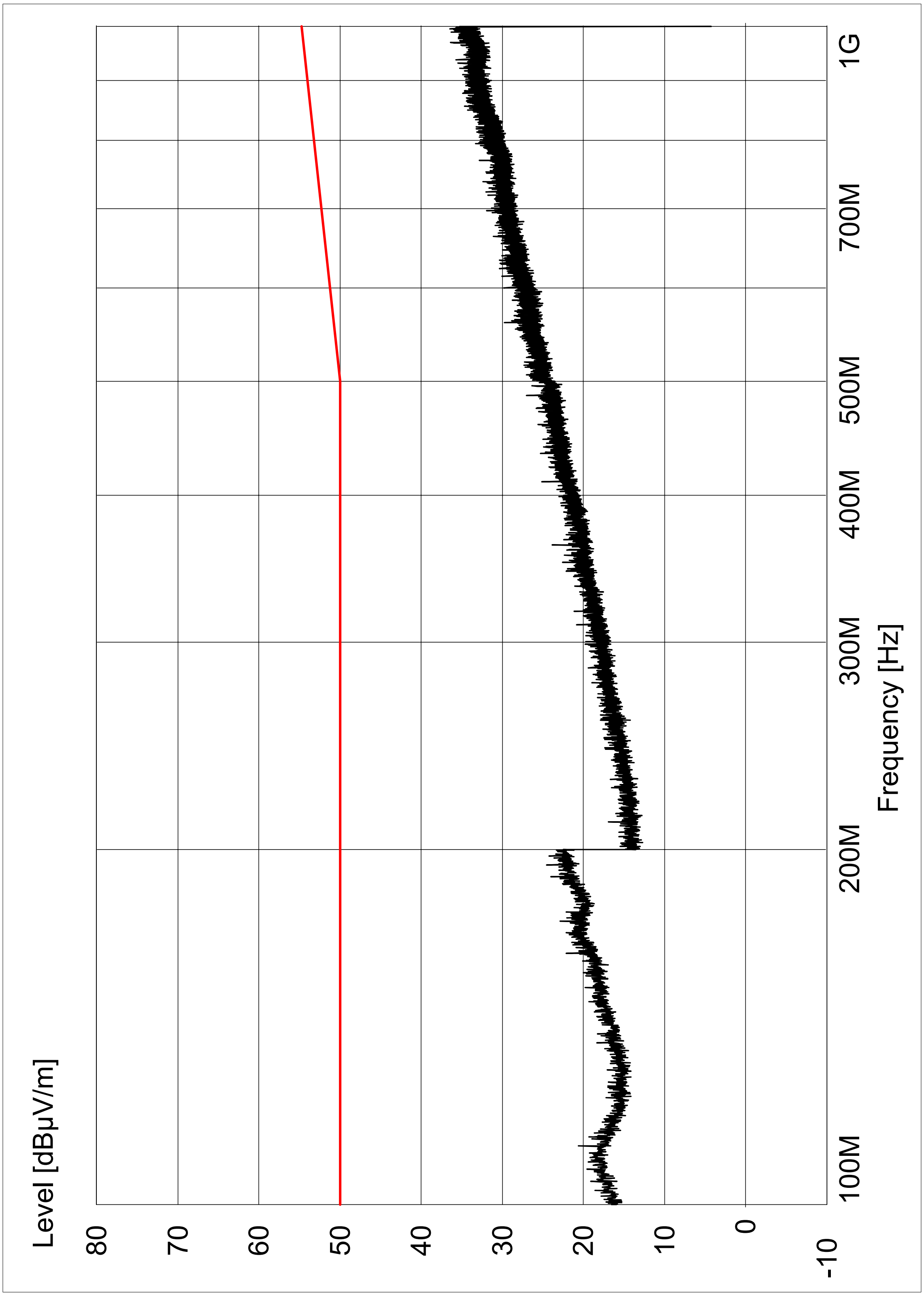
Plot 1e Ambient in pacs location VP



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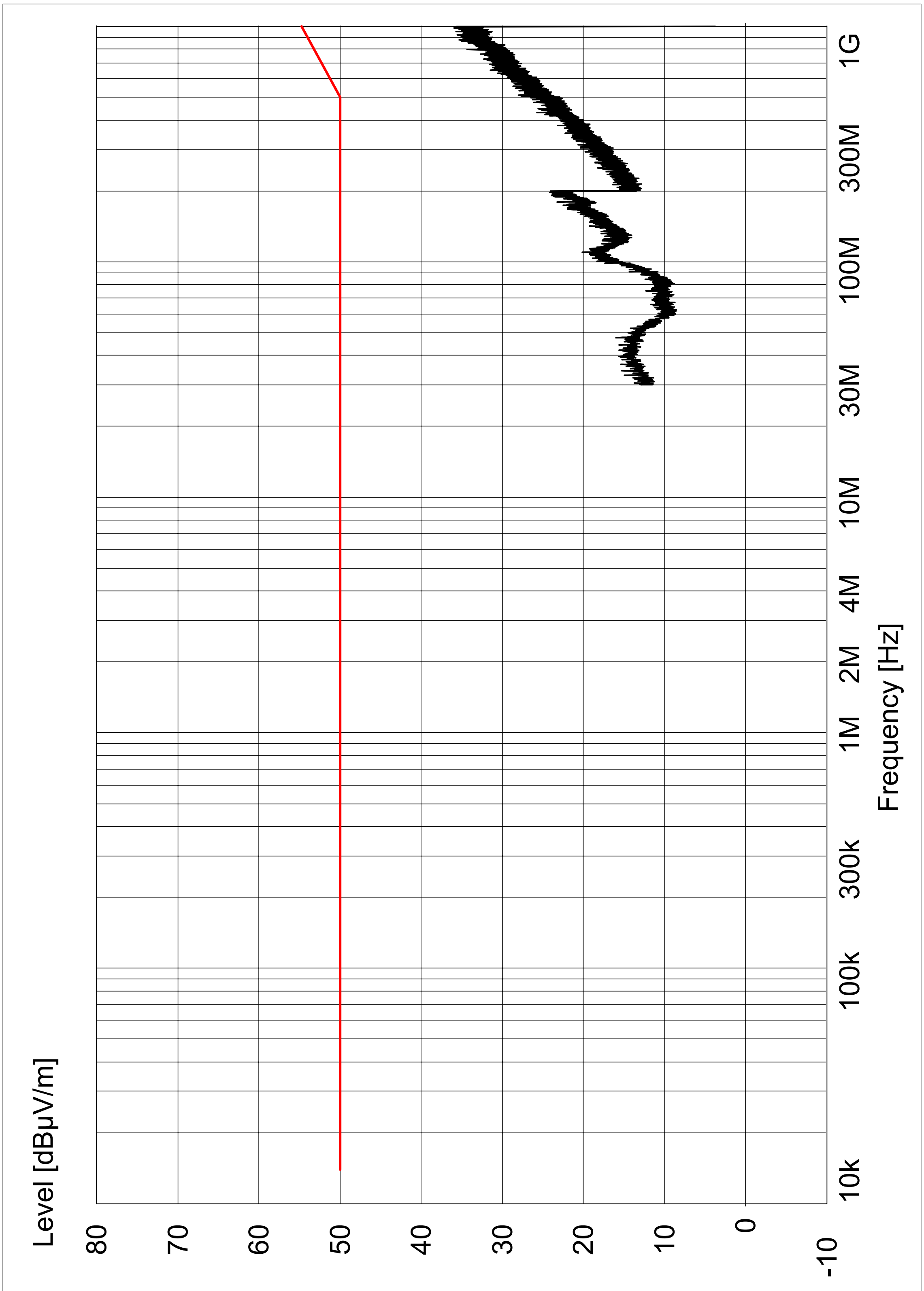
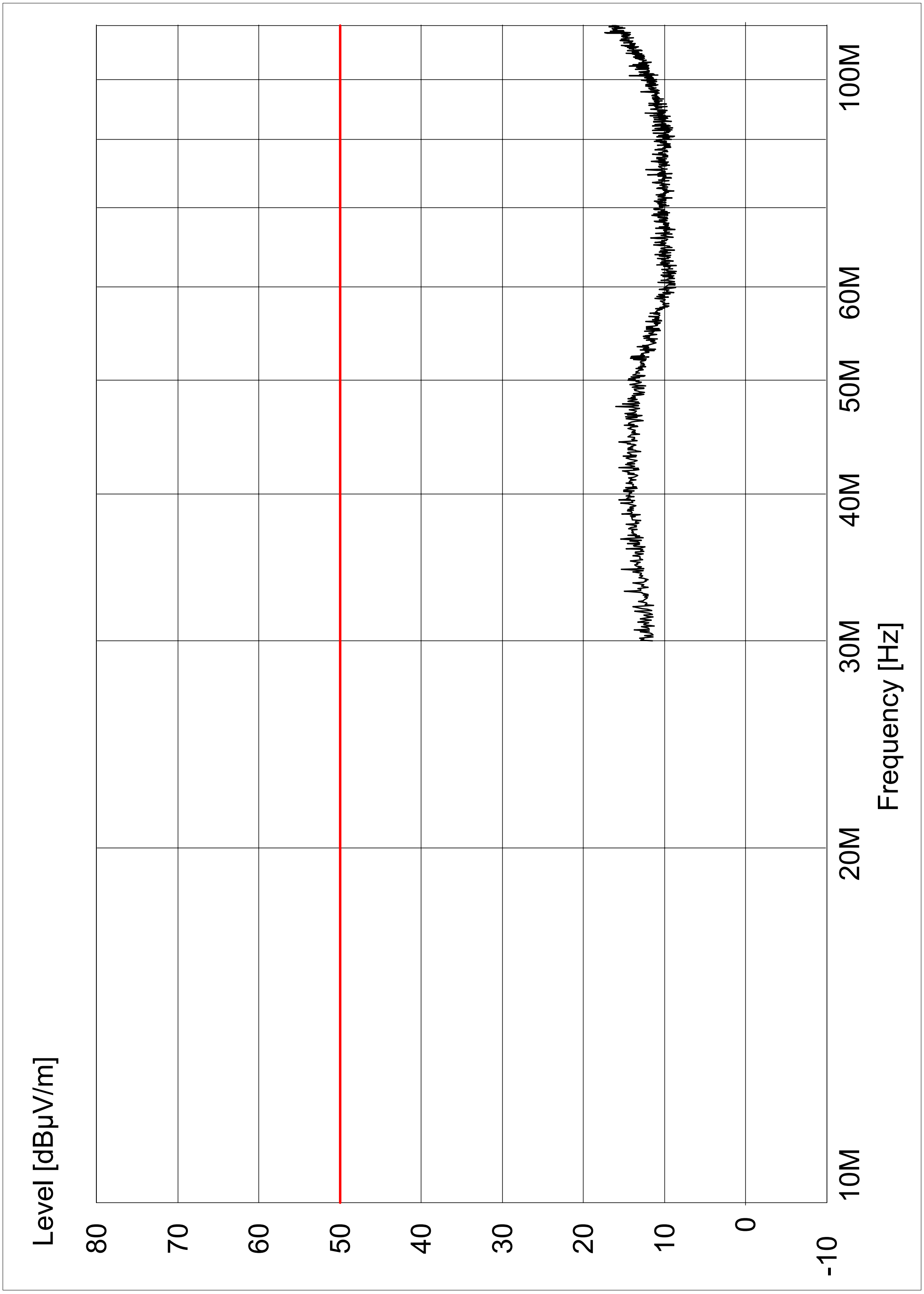
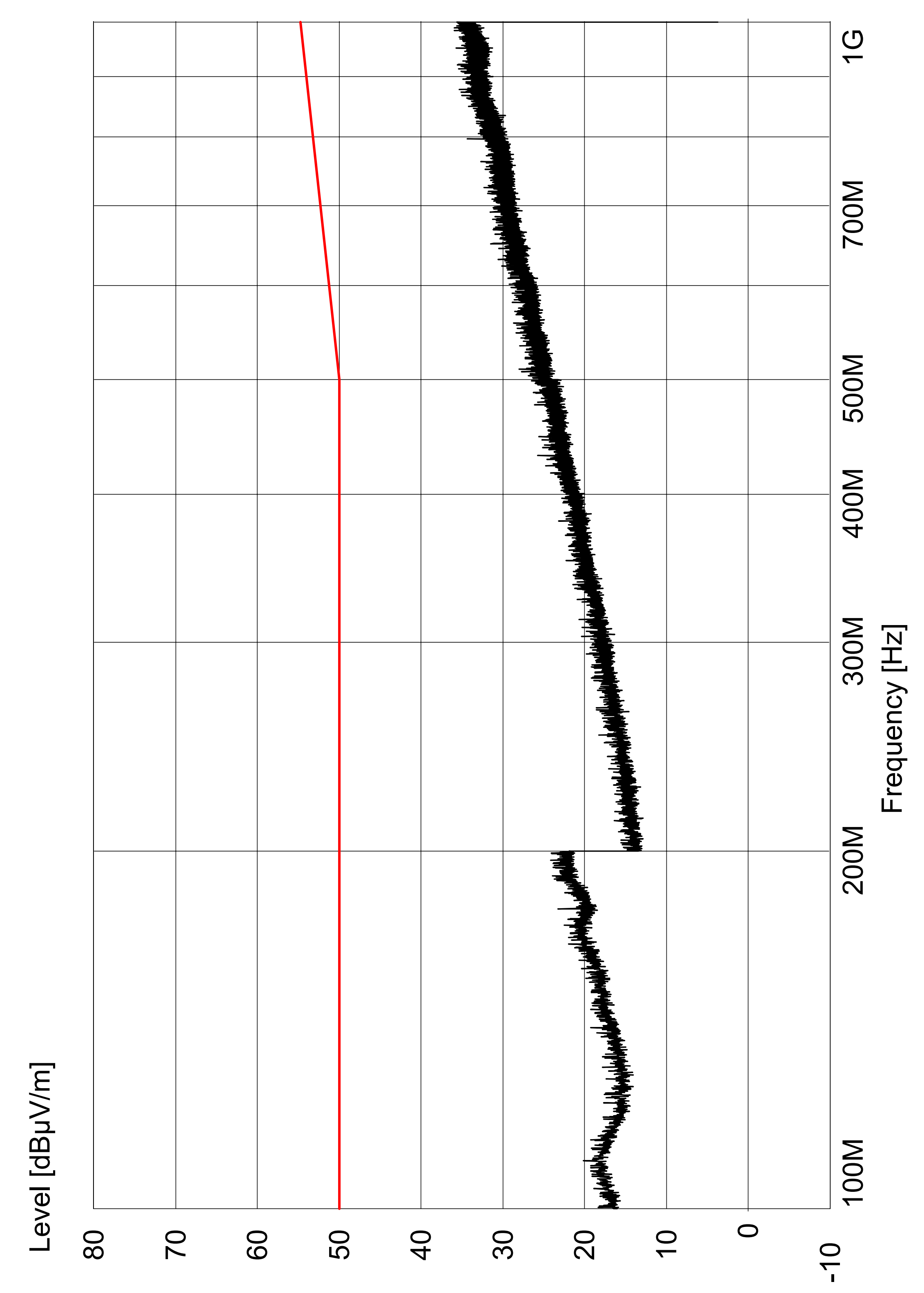
07-05-2008 20:04
Plot 2 Ambient in pacs location HP



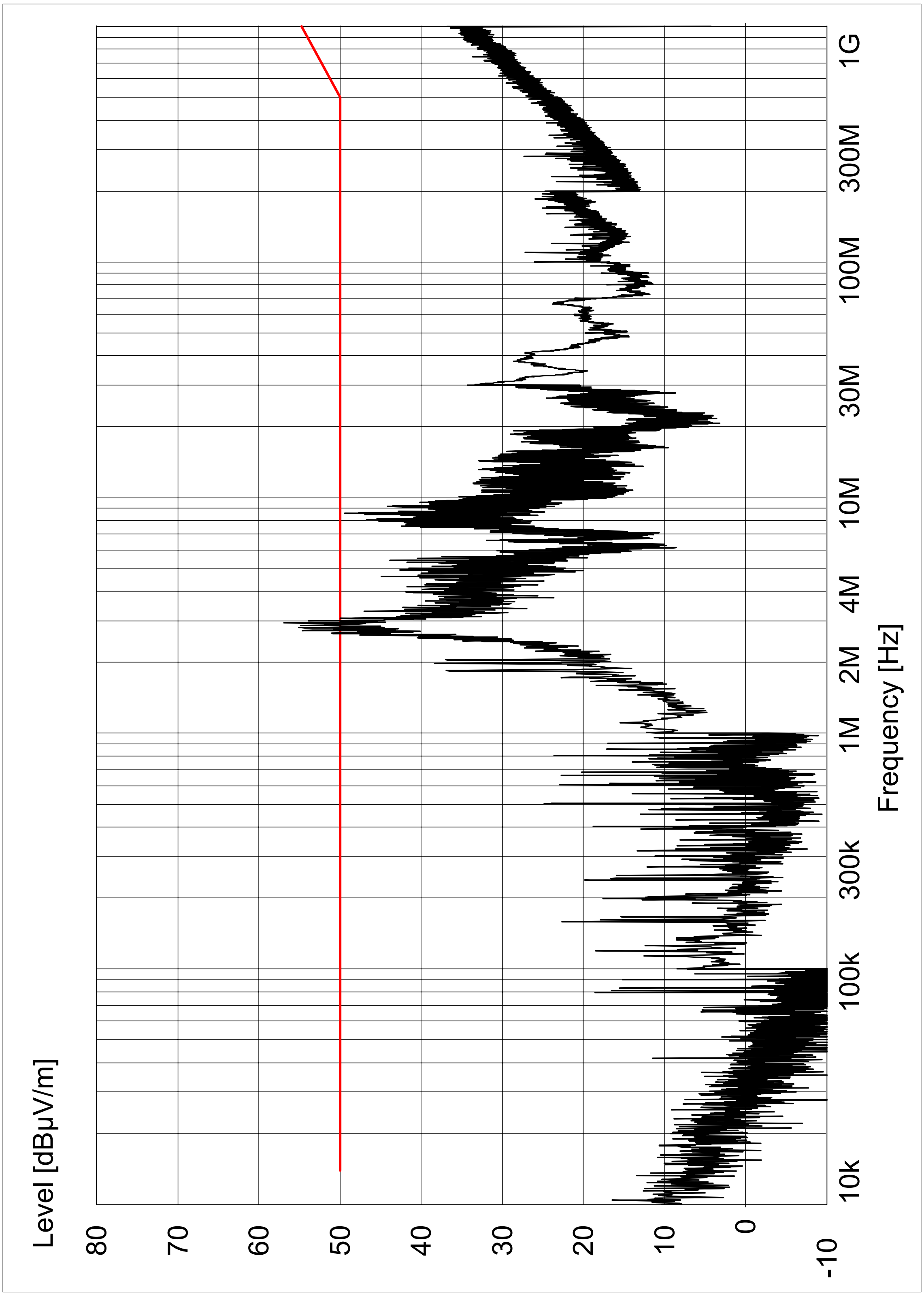
07-05-2008 20:04
Plot 2a Ambient in pacs location HP



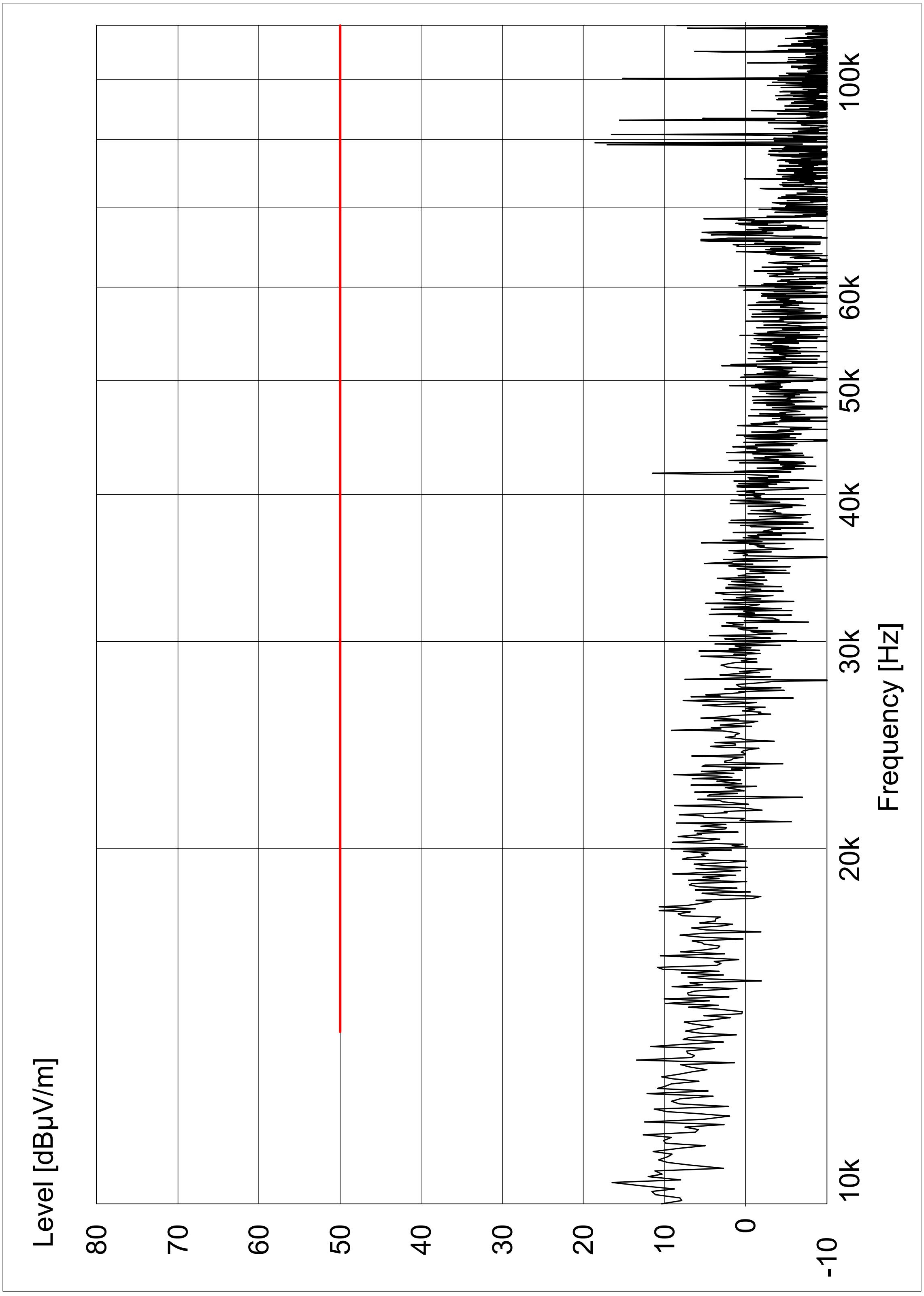
07-05-2008 20:04
Plot 2b Ambient in pacs location HP



08-05-2008 16:43
Plot 3 Spire noisy mode in pacs location VP



08-05-2008 16:43
Plot 3a Spire noisy mode in pacs location VP



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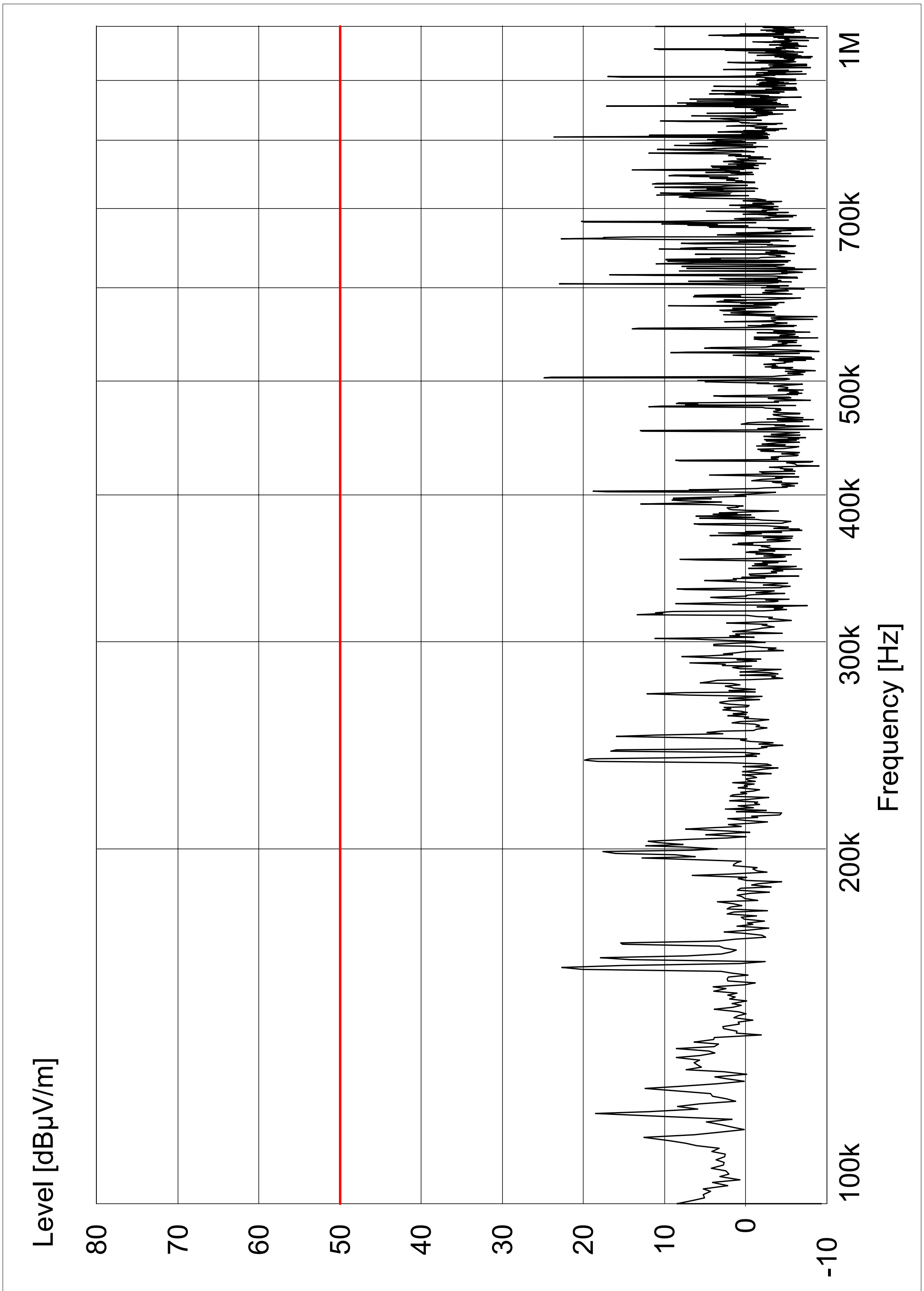
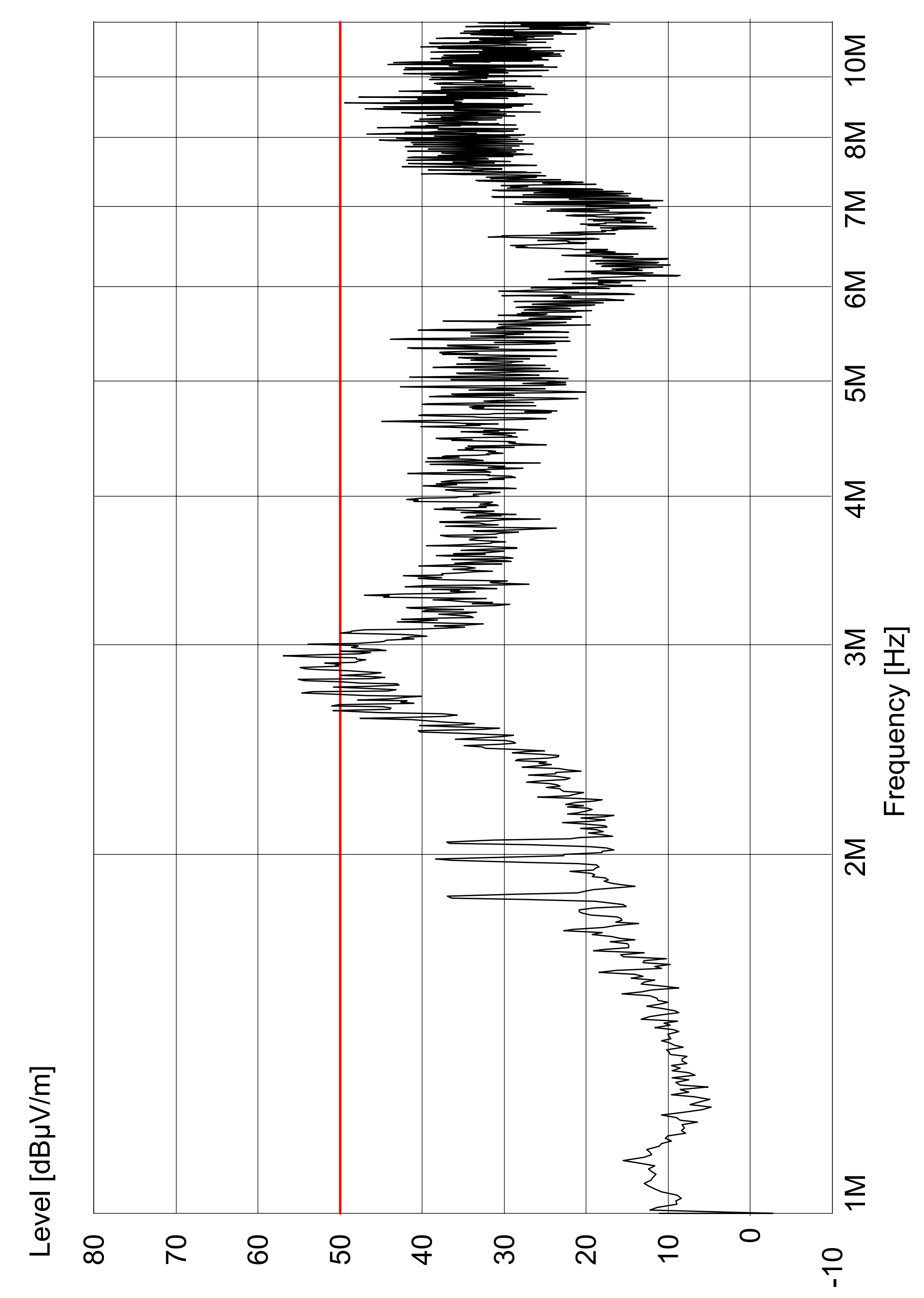
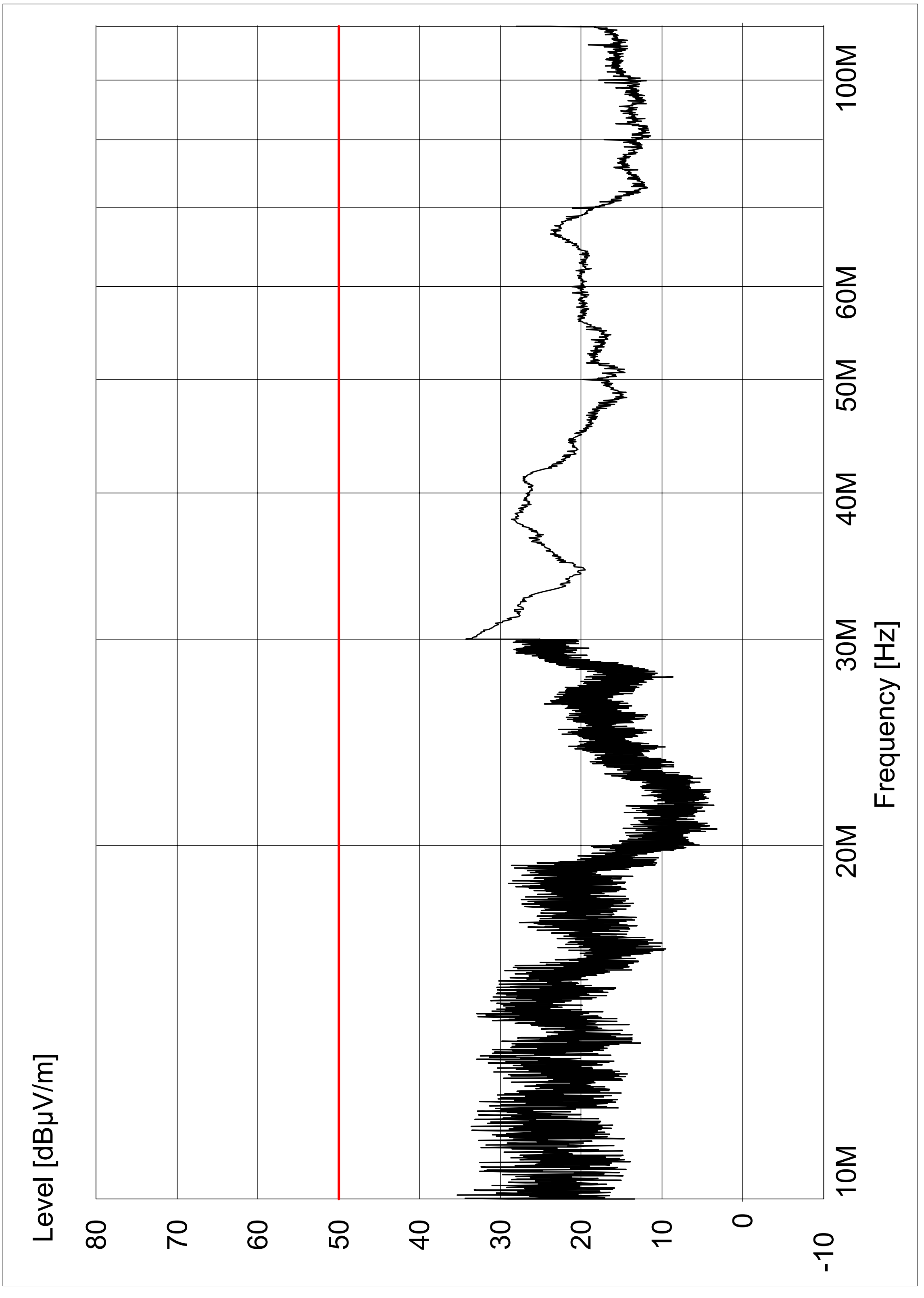
Plot 3b Spire noisy mode in pacs location VP



08-05-2008 16:43
Plot 3c Spire noisy mode in pacs location VP



08-05-2008 16:43
Plot 3d Spire noisy mode in pacs location VP



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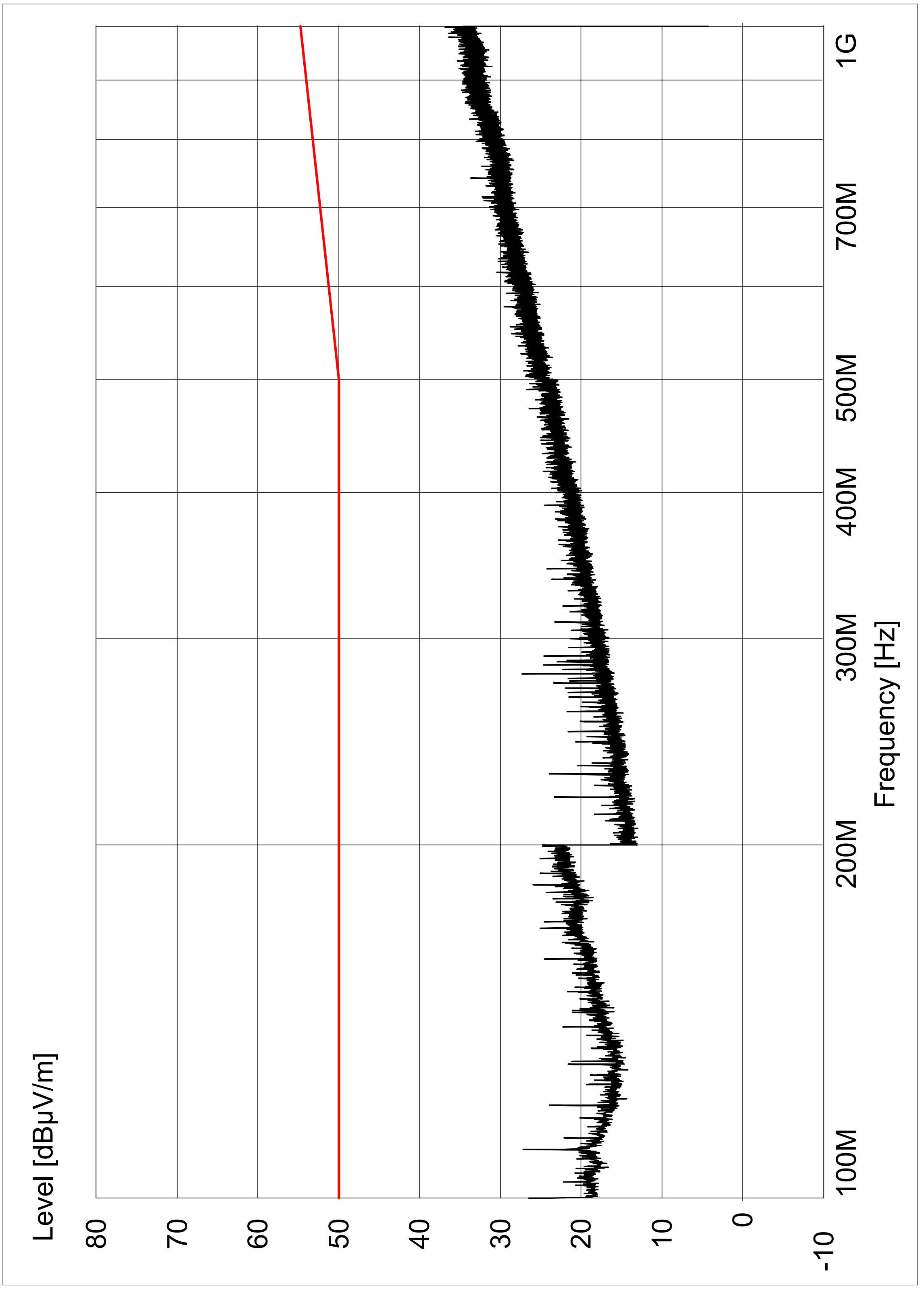
08-05-2008 16:43
Plot 3e Spire noisy mode in pacs location VP



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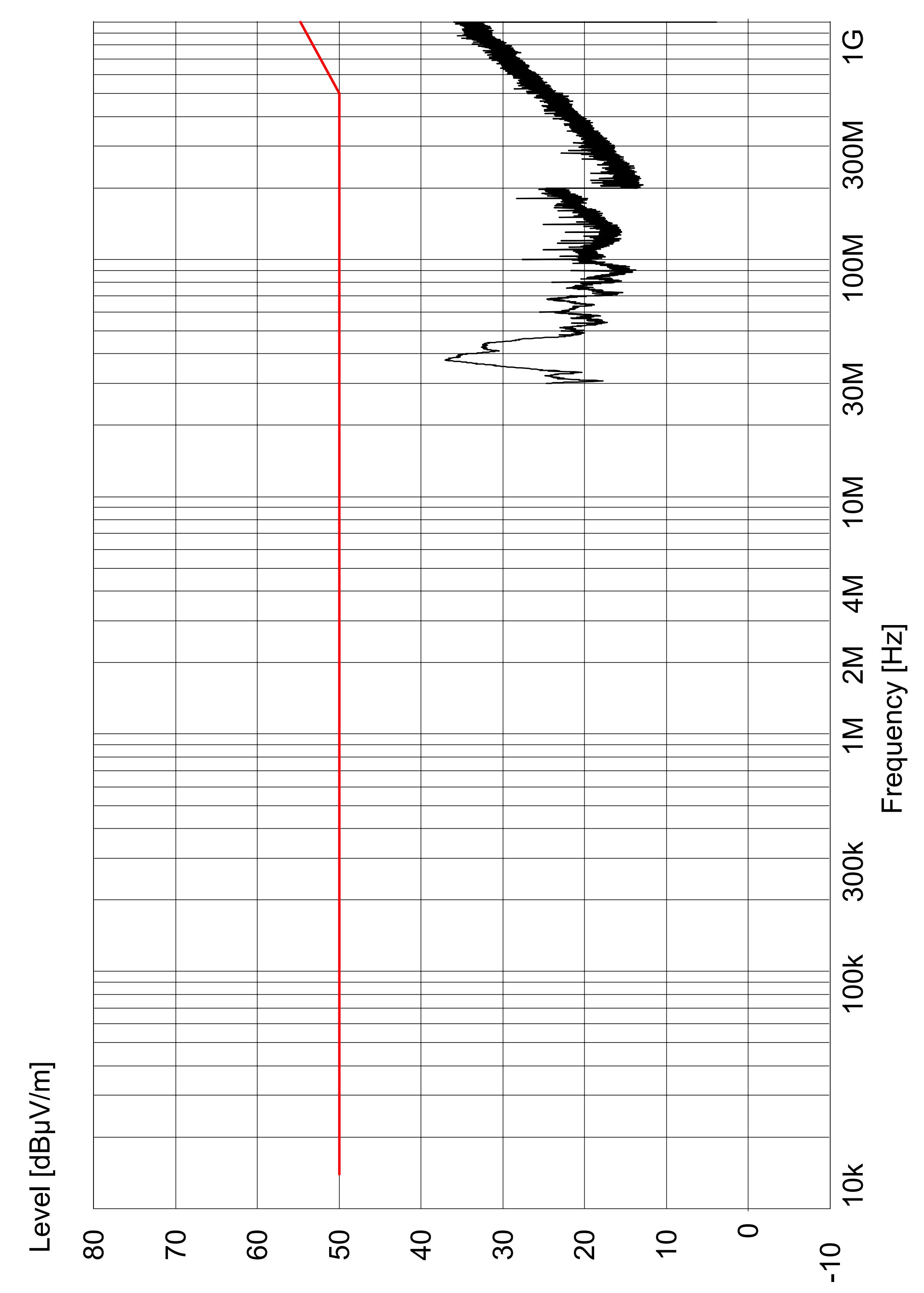
Plot 4 Spire noisy mode in pacs location HP



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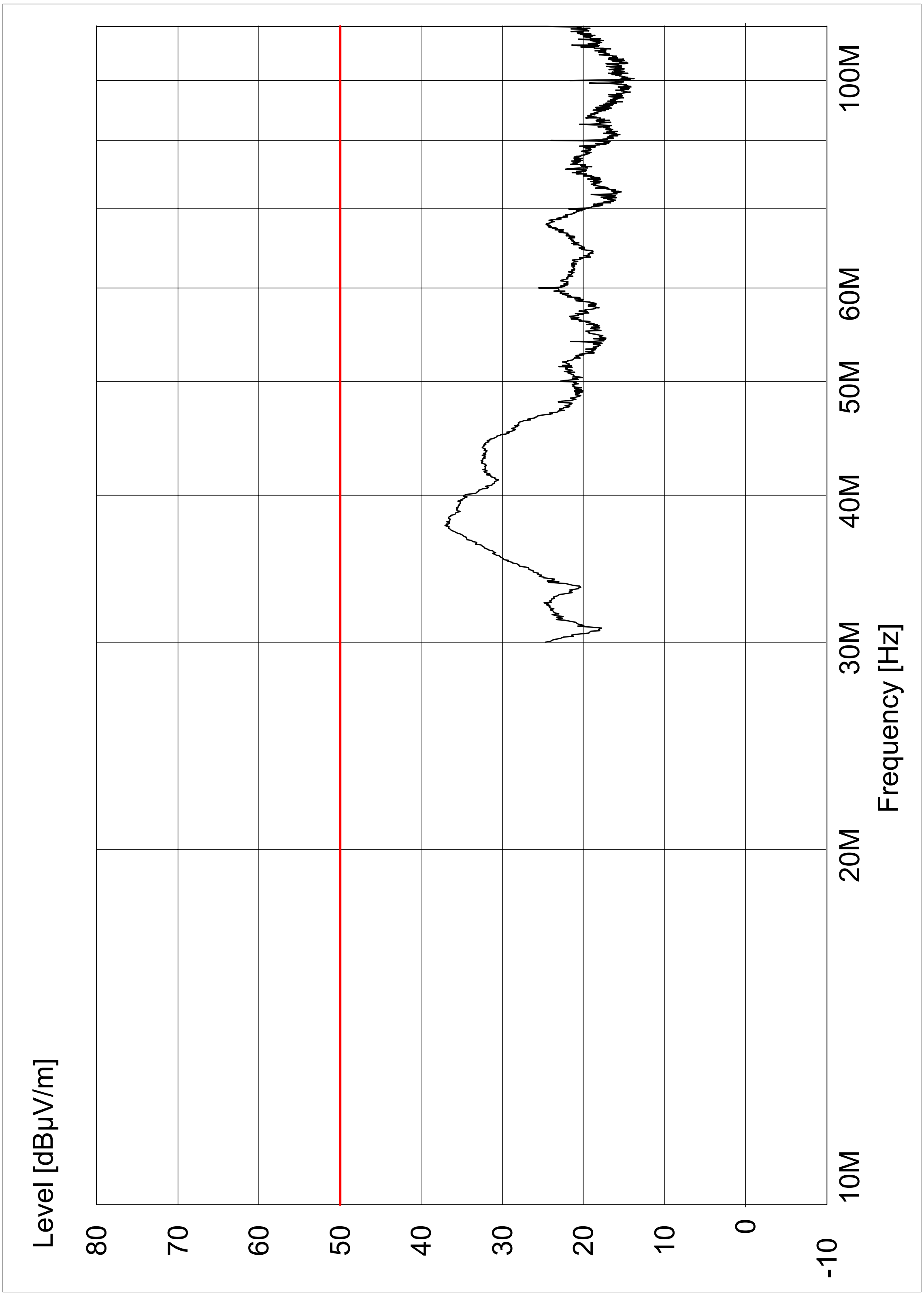
Plot 4a Spire noisy mode in pacs location HP



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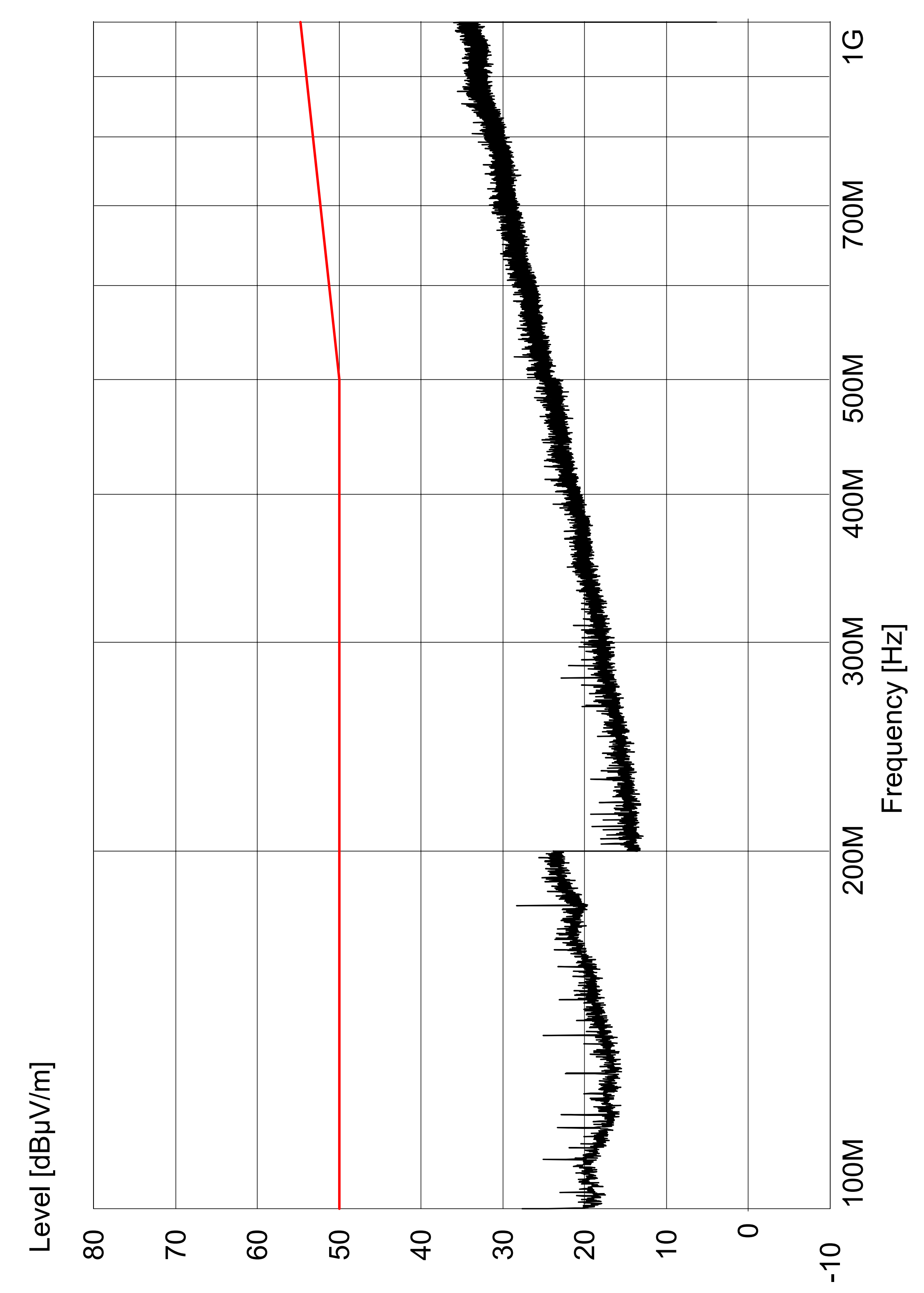
Plot 4b Spire noisy mode in pacs location HP



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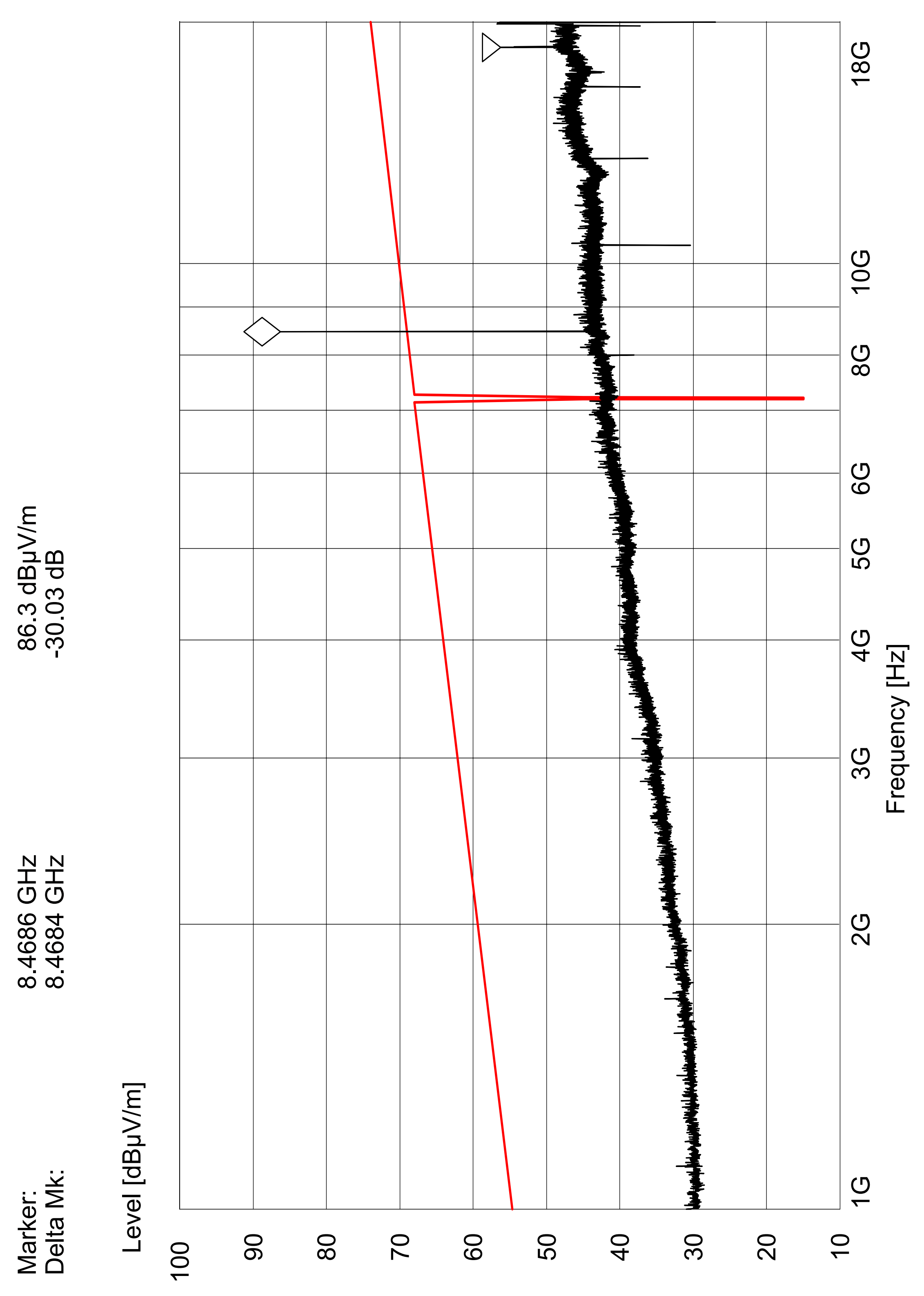
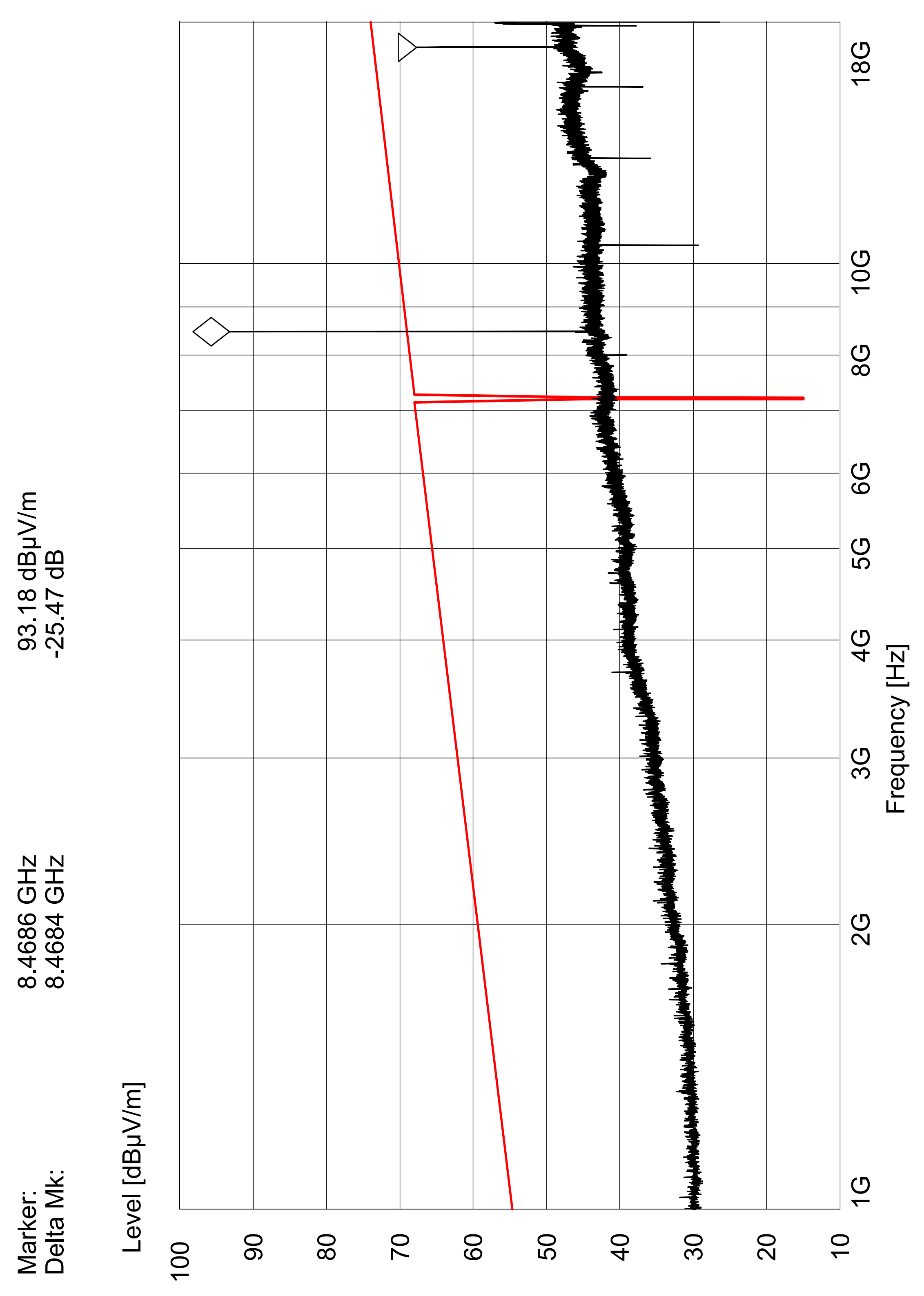
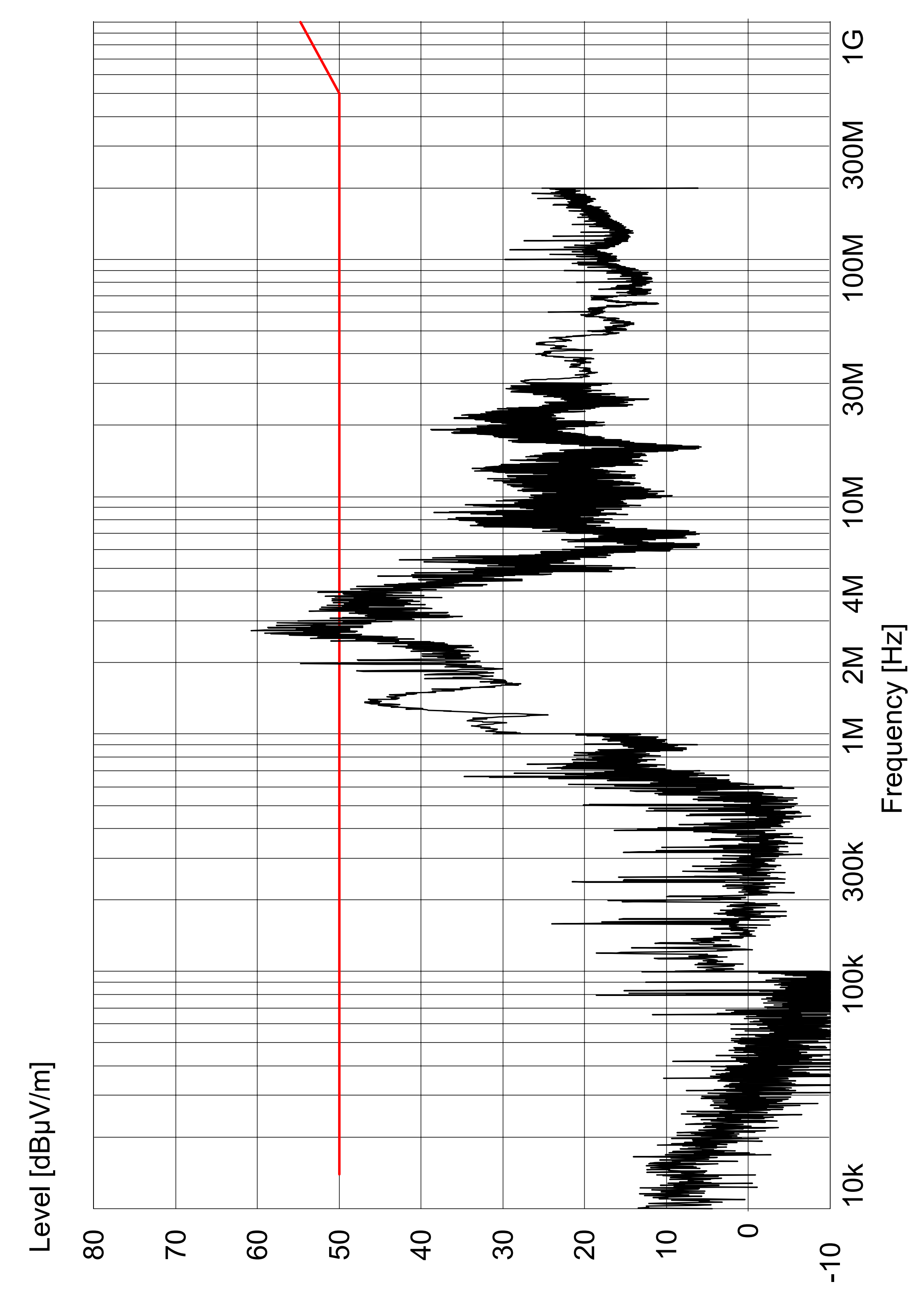
Plot 5 Spire noisy mode in pacs location VP



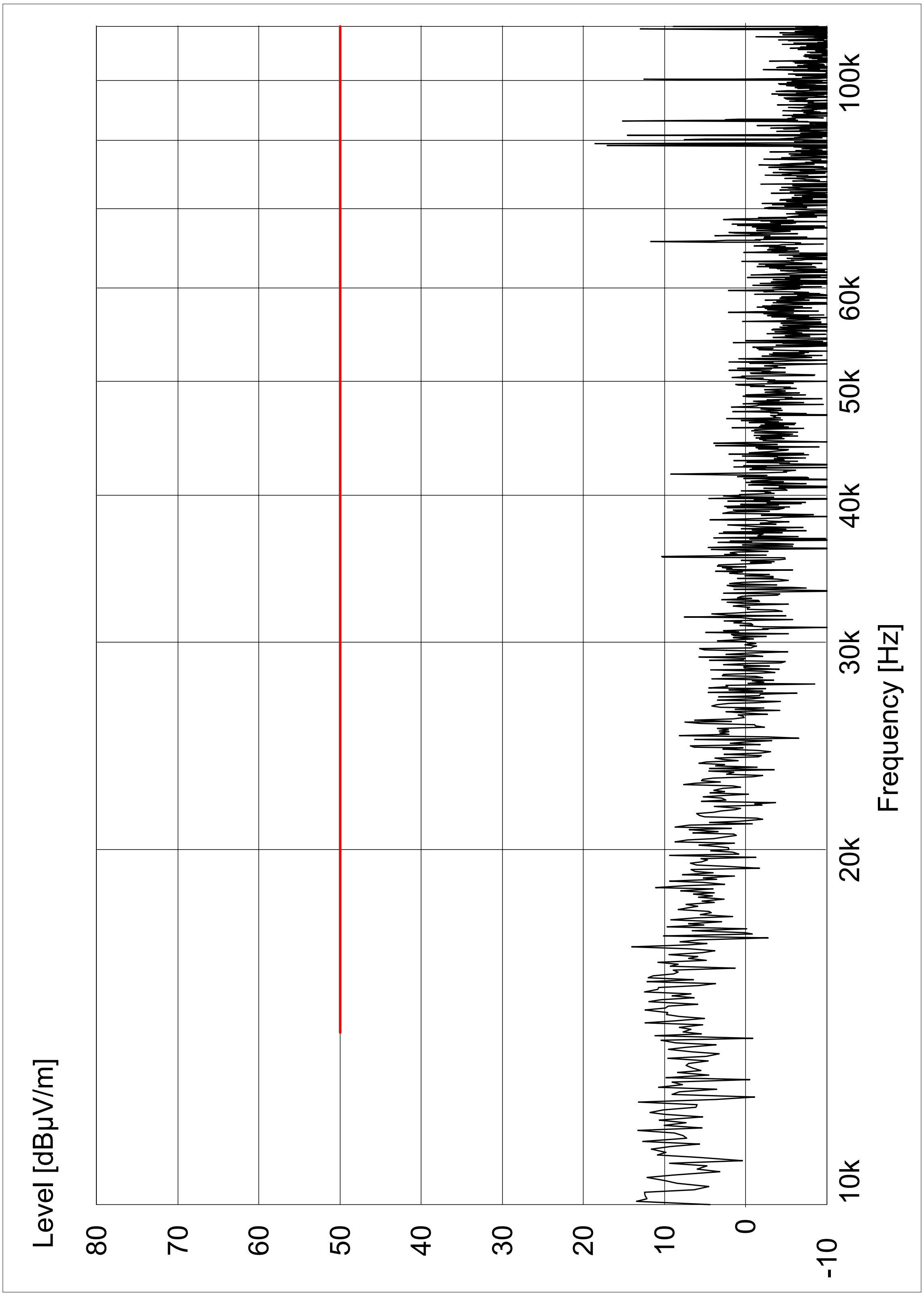
08-05-2008 20:03
Plot 6 Spire noisy mode in pacs location HP



08-05-2008 17:57
Plot 7 Spire noisy mode in spire extra location VP



08-05-2008 17:57
Plot 7a Spire noisy mode in spire extra location VP



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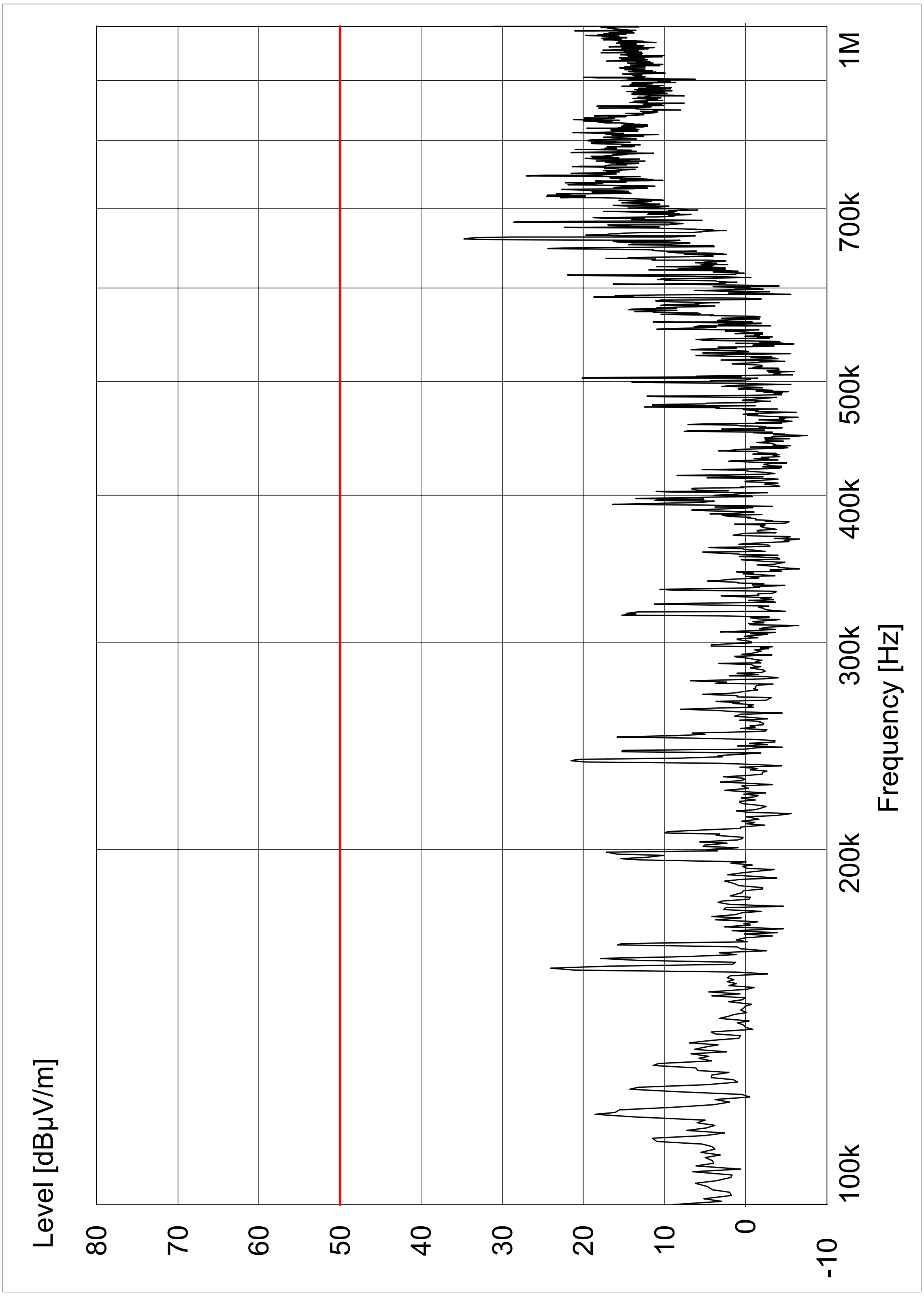
Plot 7b Spire noisy mode in spire extra location VP



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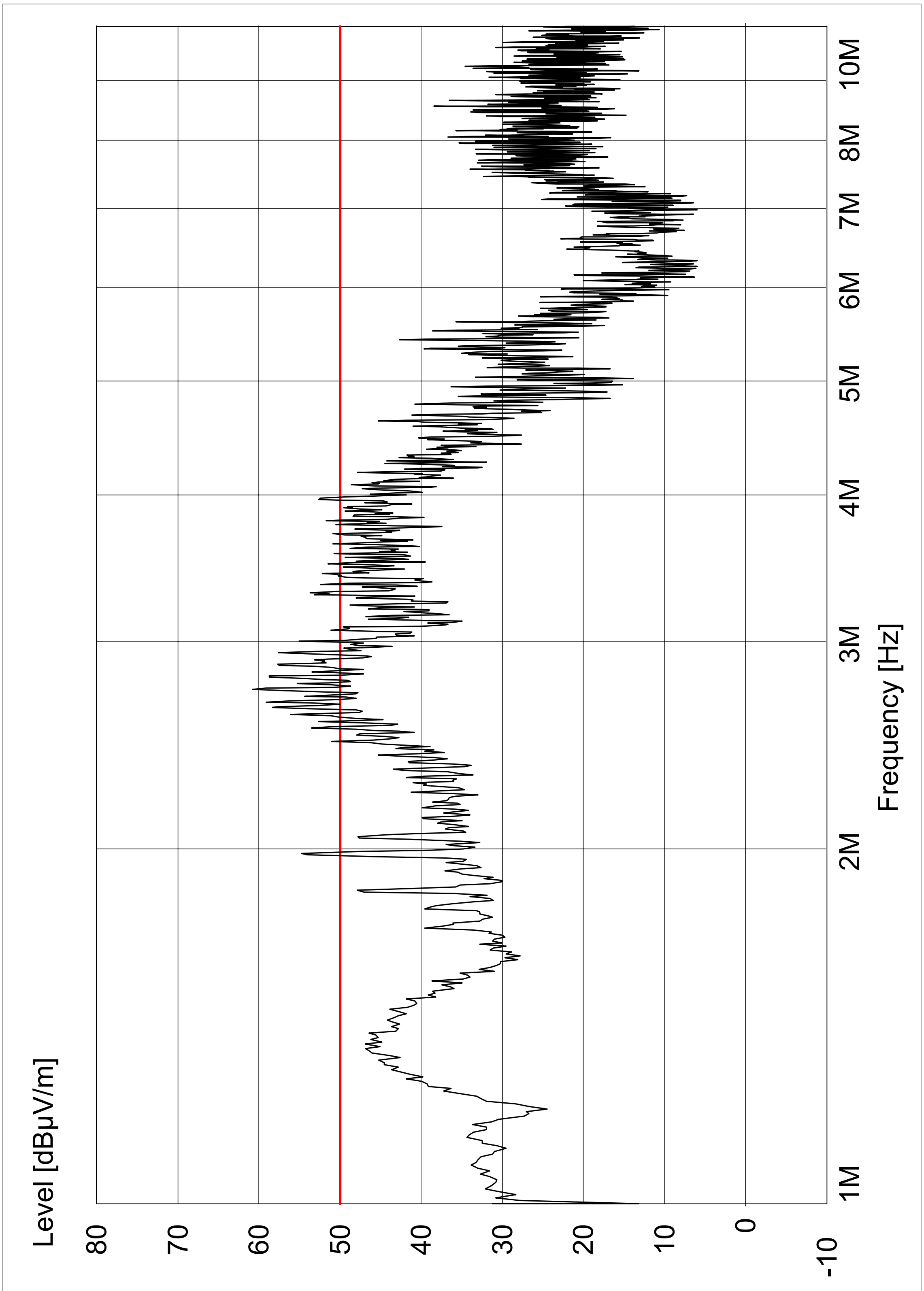
Plot 7c Spire noisy mode in spire extra location VP



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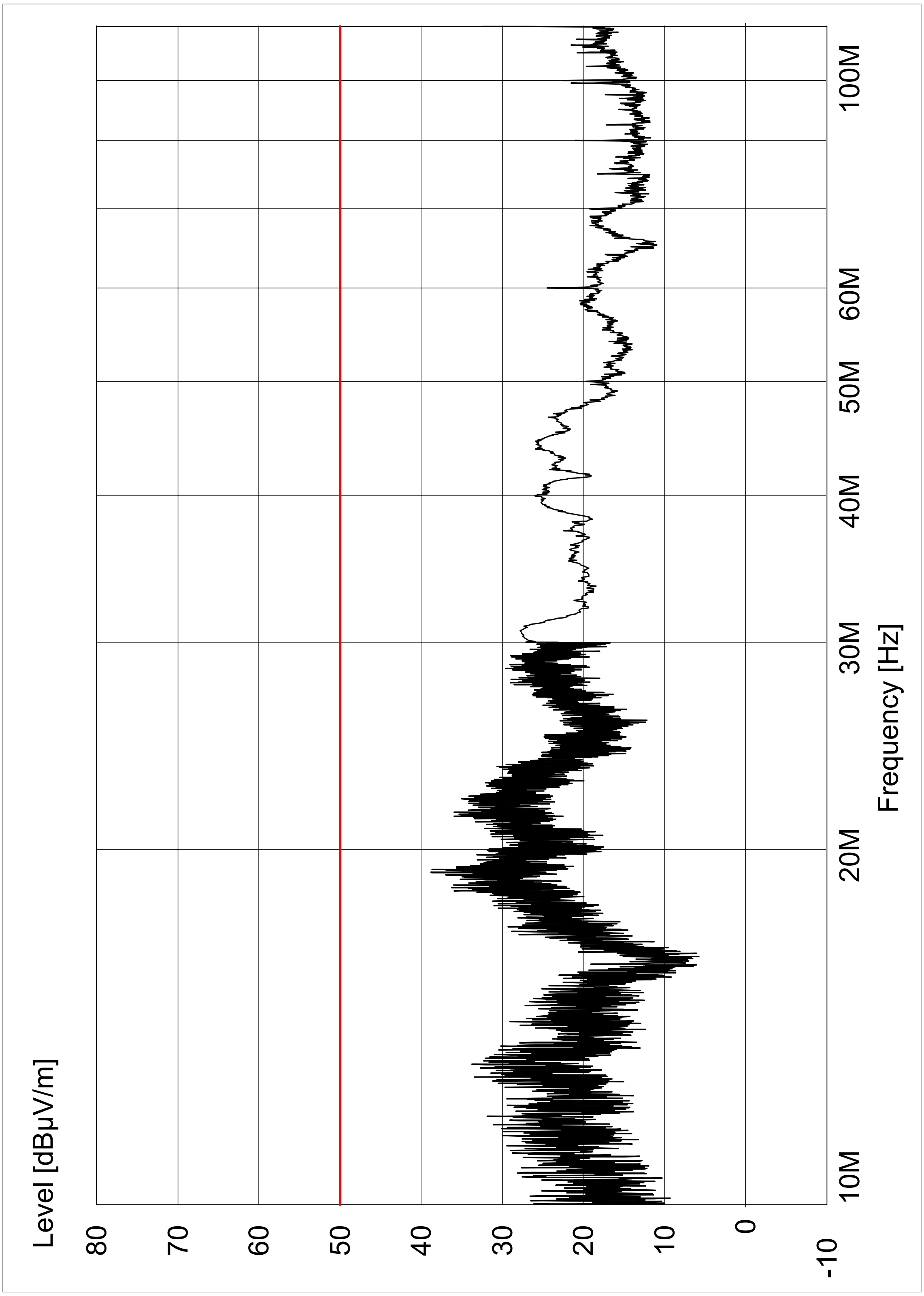
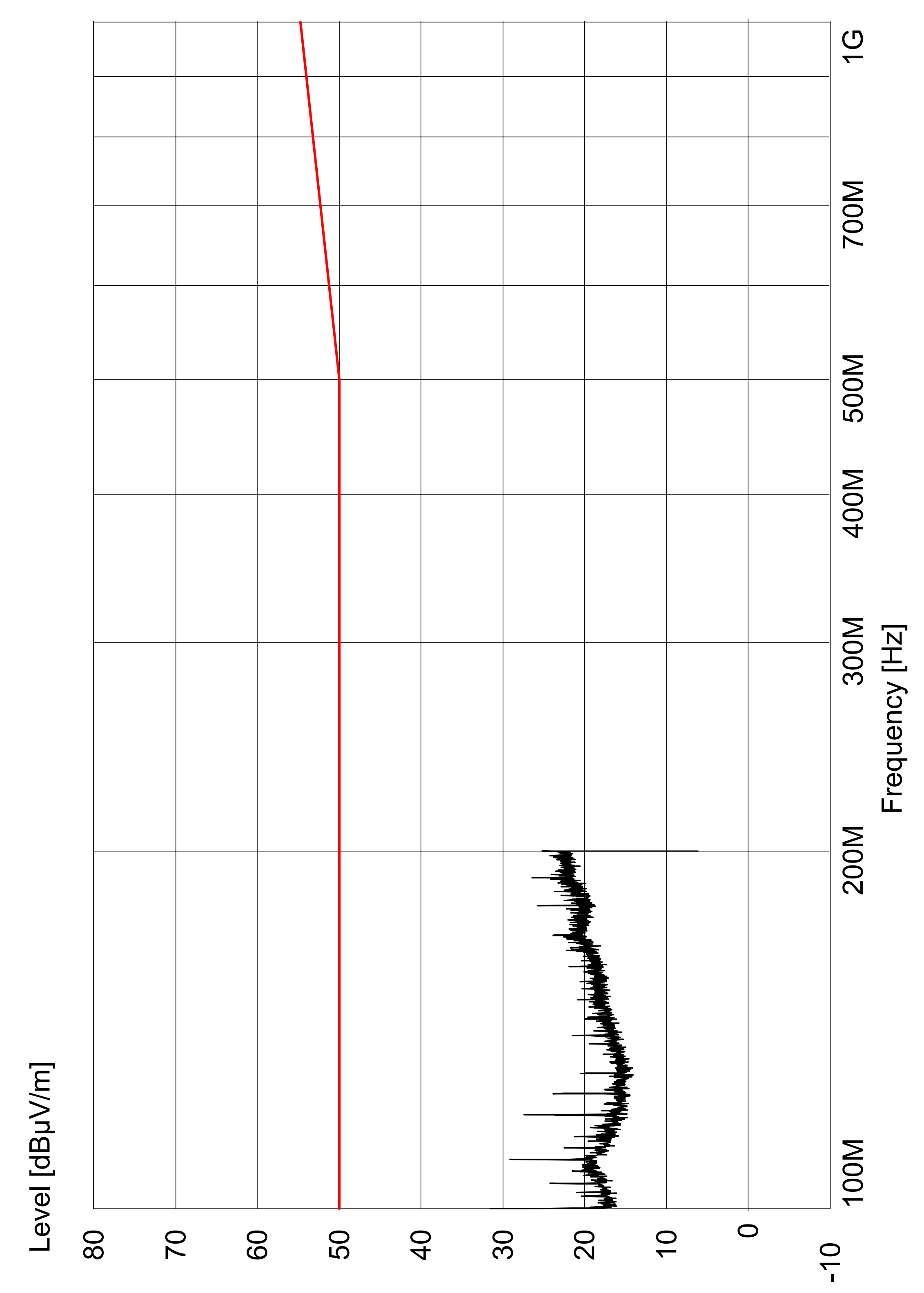
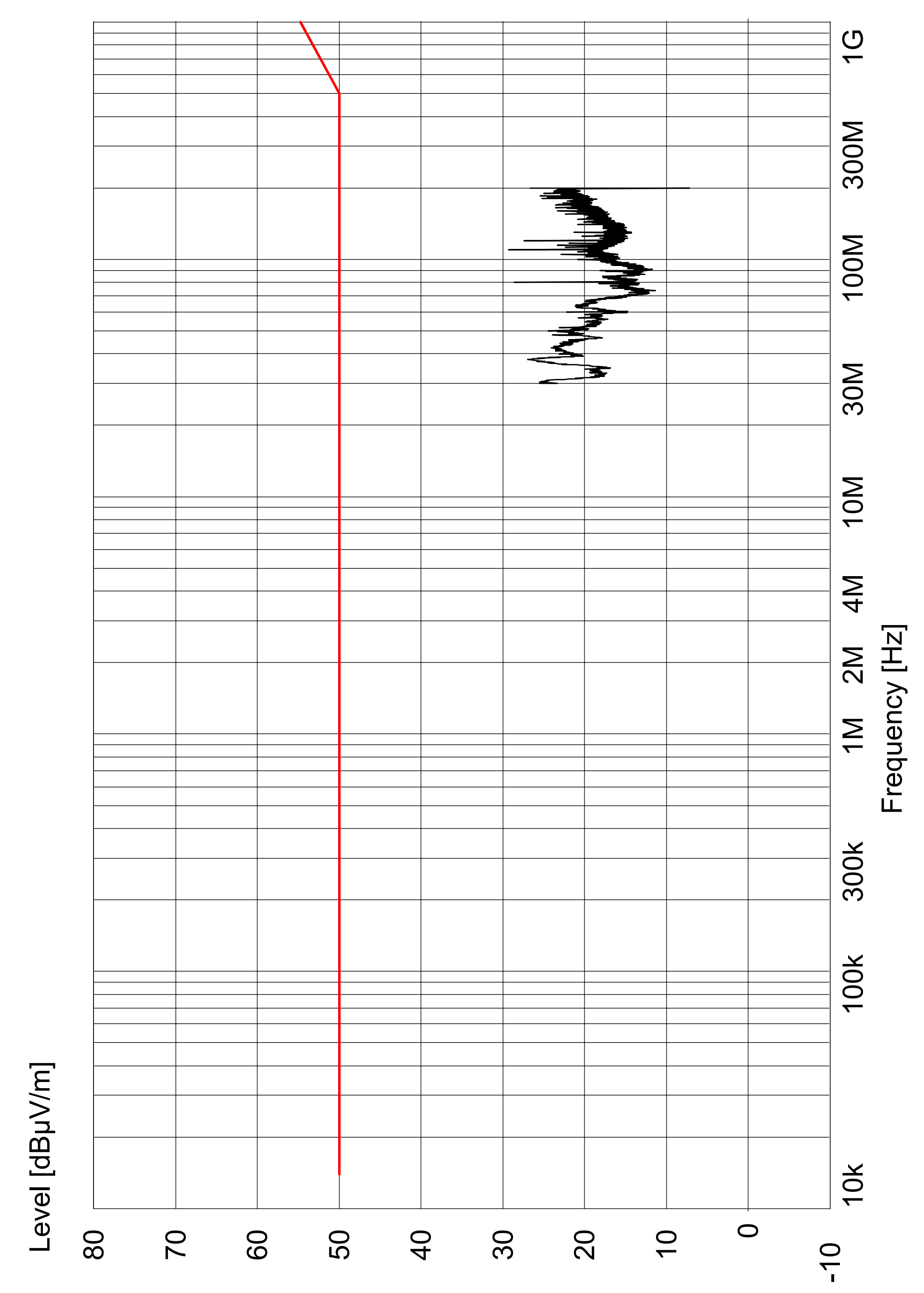
Plot 7d Spire noisy mode in spire extra location VP



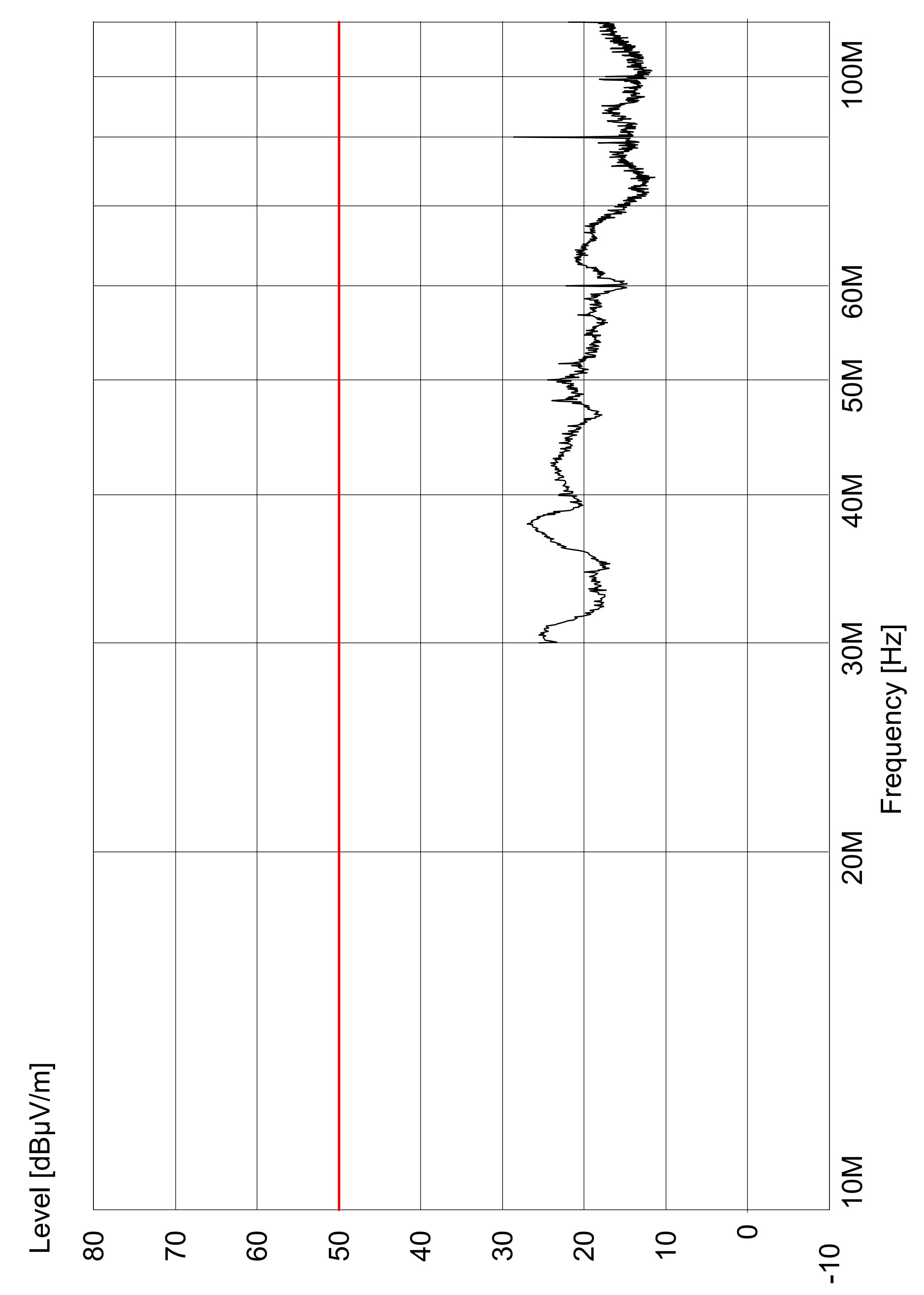
08-05-2008 17:57
Plot 7e Spire noisy mode in spire extra location VP



08-05-2008 18:01
Plot 8 Spire noisy mode in spire extra location HP



08-05-2008 18:01
Plot 8a Spire noisy mode in spire extra location HP



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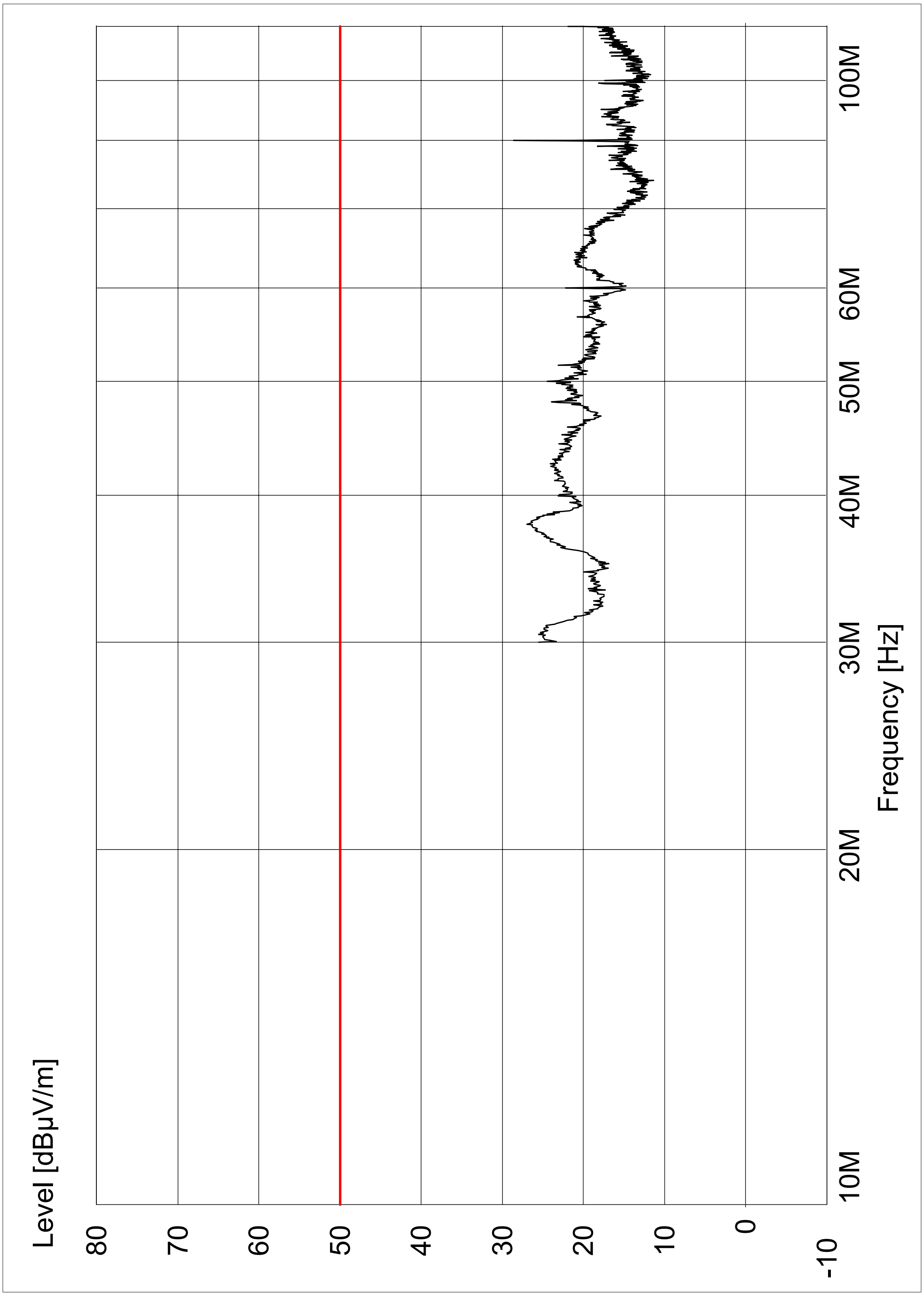
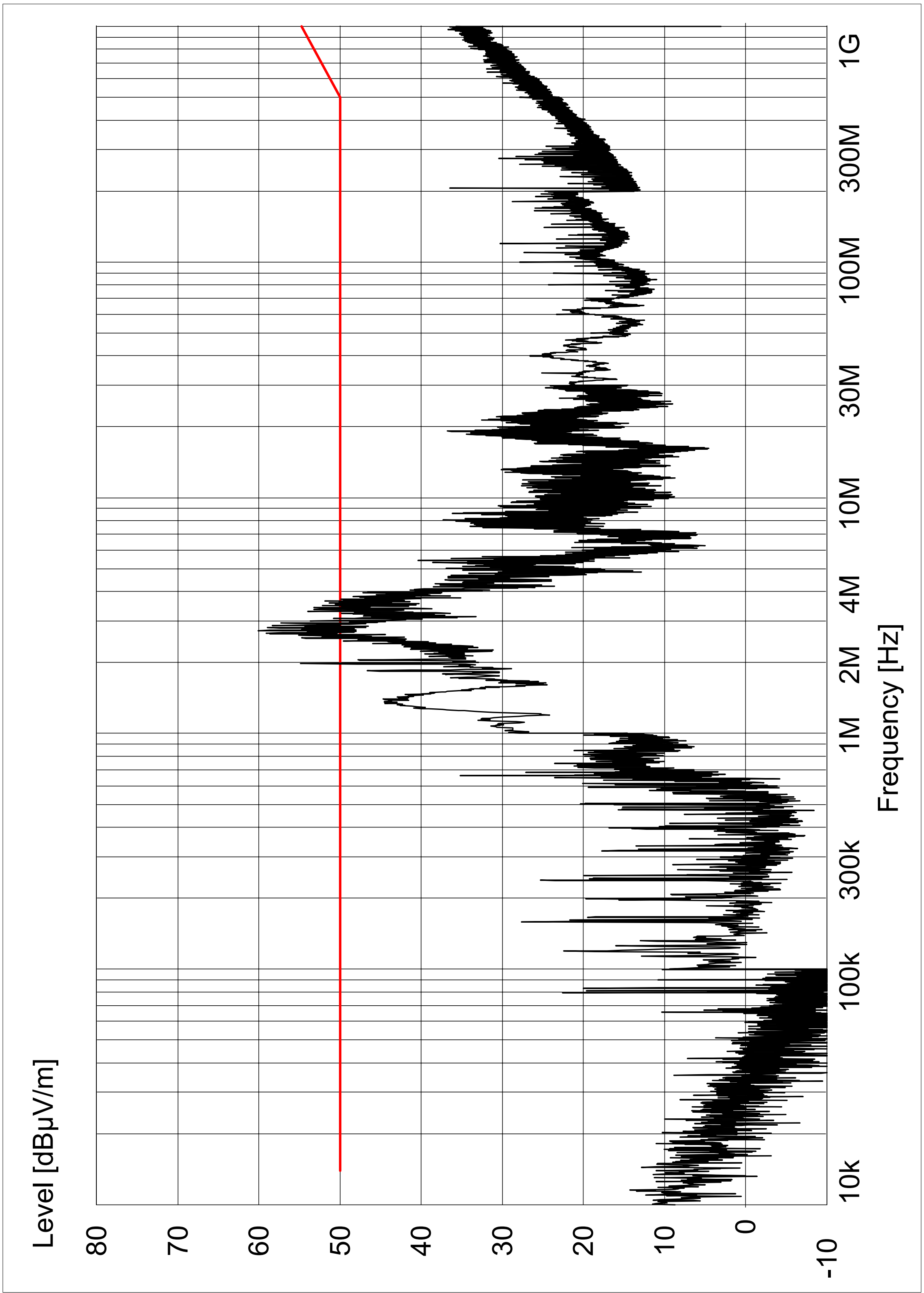
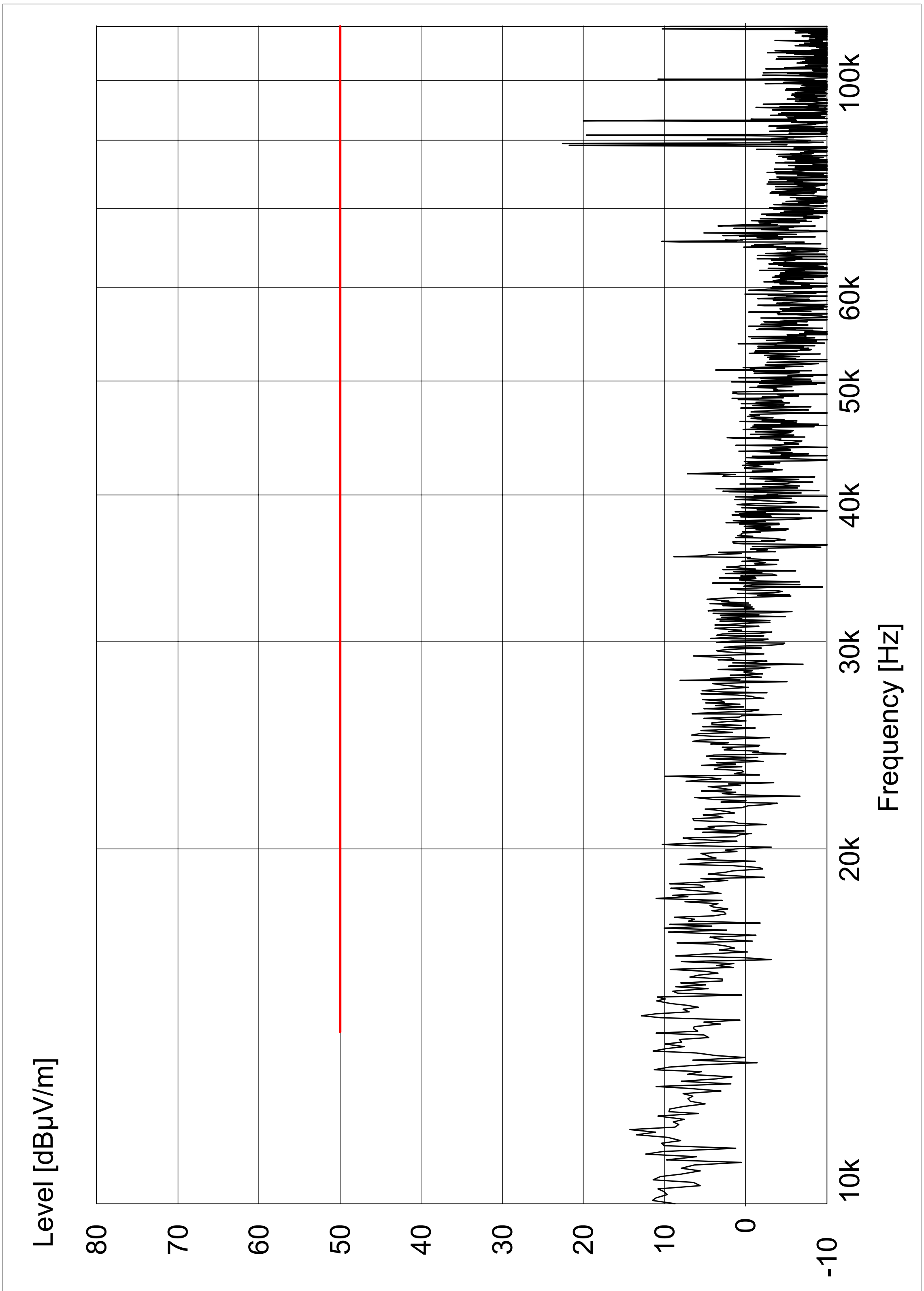
08-05-2008 18:01
Plot 8b Spire noisy mode in spire extra location HP



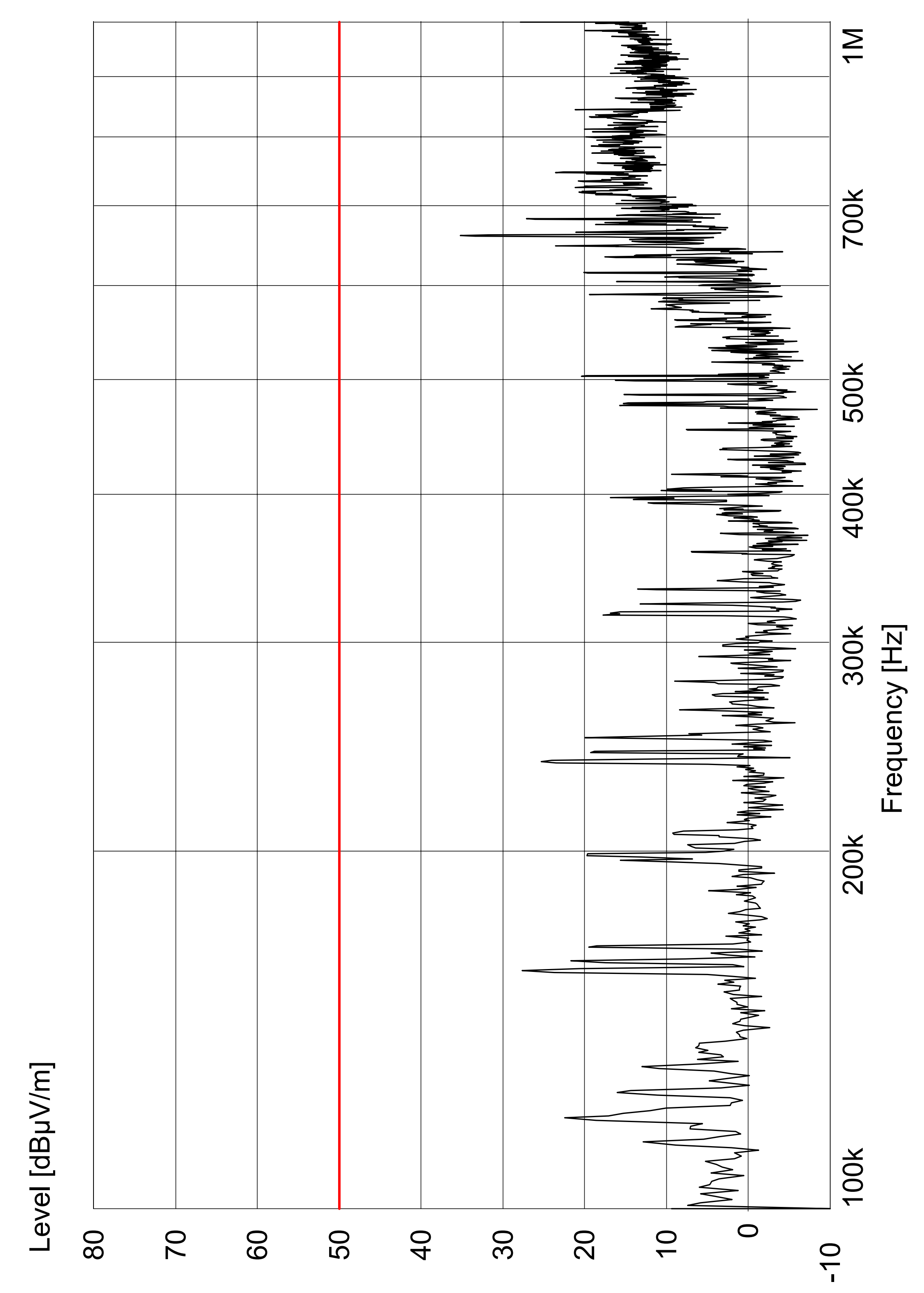
08-05-2008 18:21
Plot 9 Spire noisy mode in spire nominal loc VP



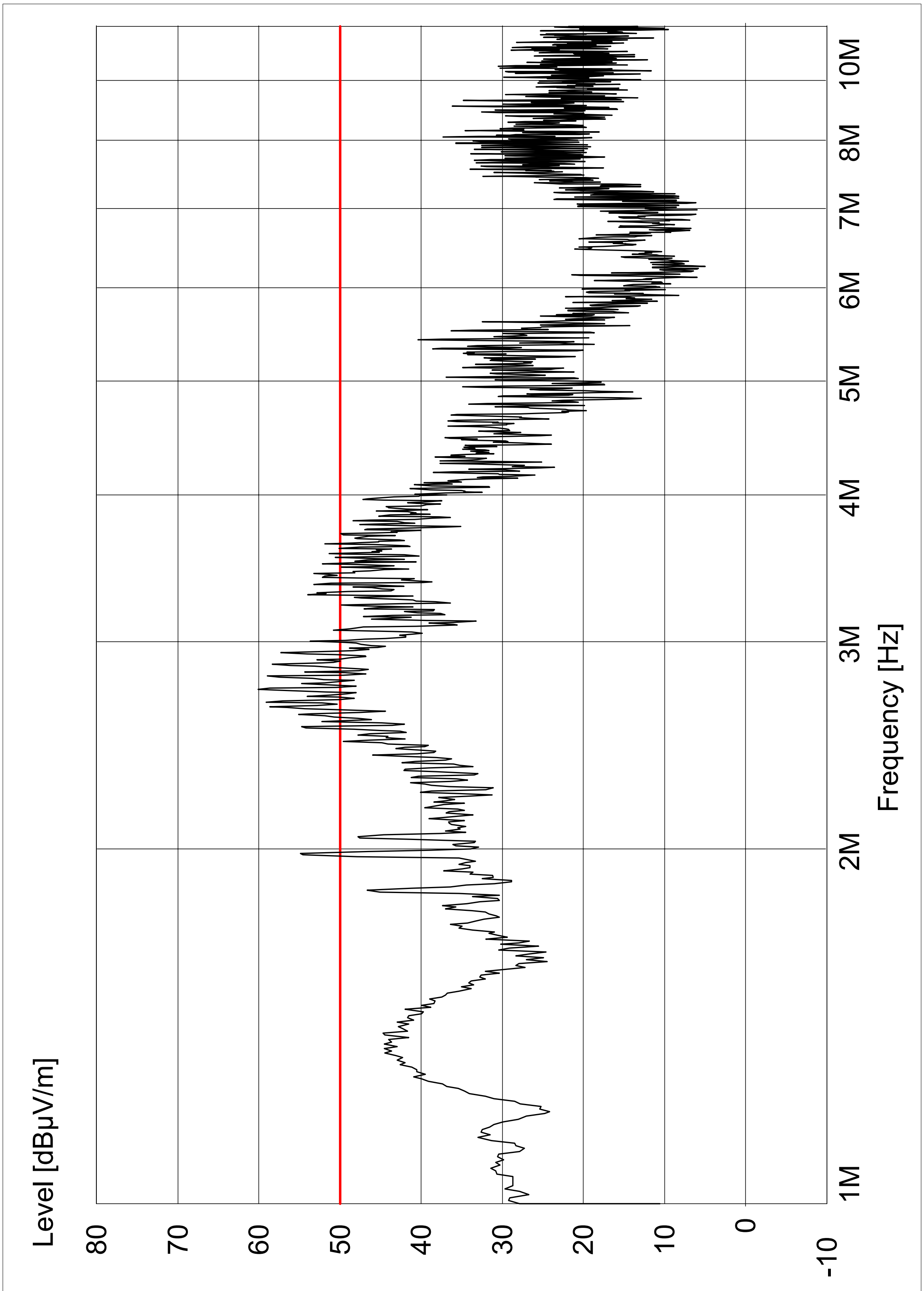
08-05-2008 18:21
Plot 9a Spire noisy mode in spire nominal loc VP



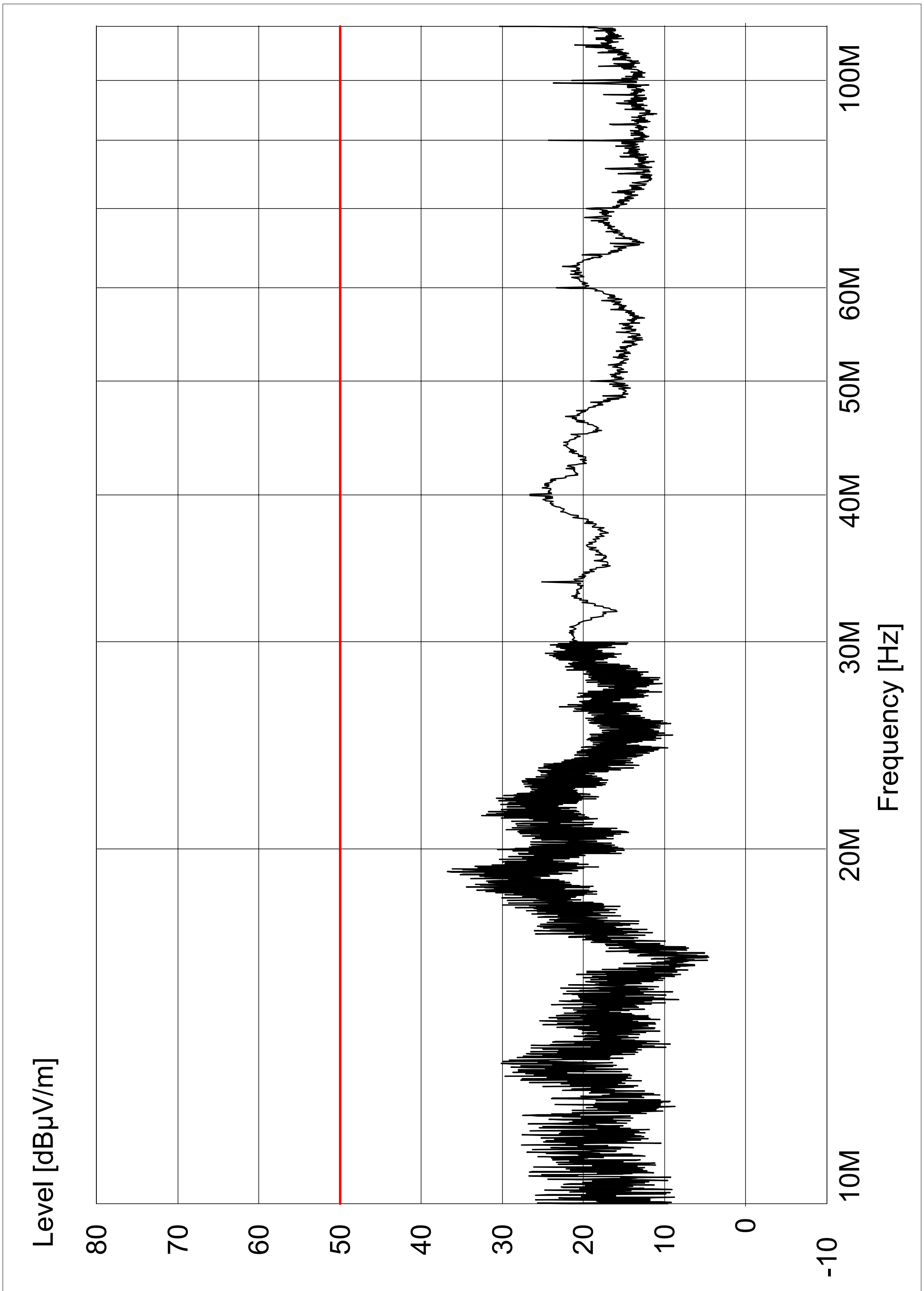
08-05-2008 18:21
Plot 9b Spire noisy mode in spire nominal loc VP



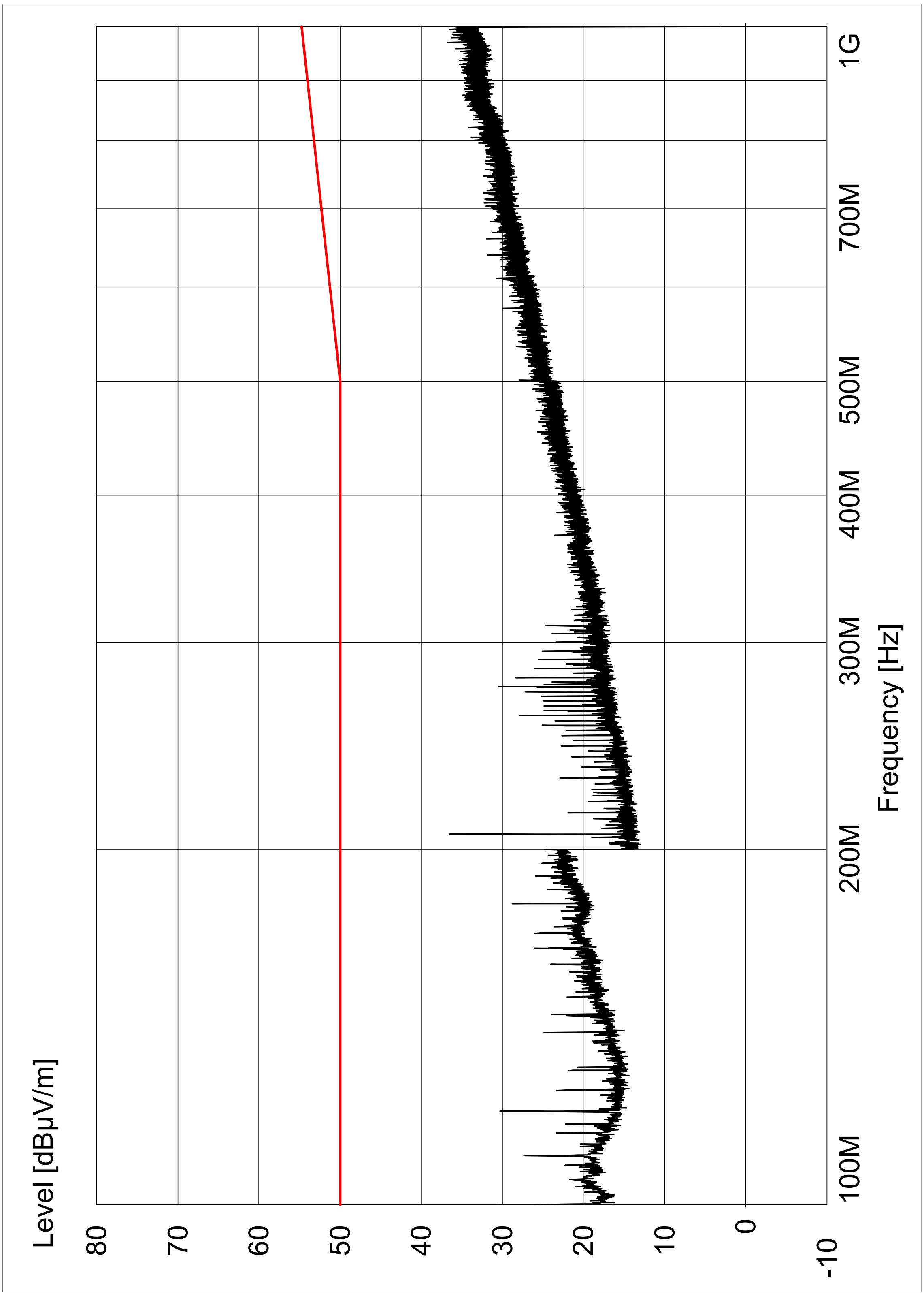
08-05-2008 18:21
Plot 9c Spire noisy mode in spire nominal loc VP



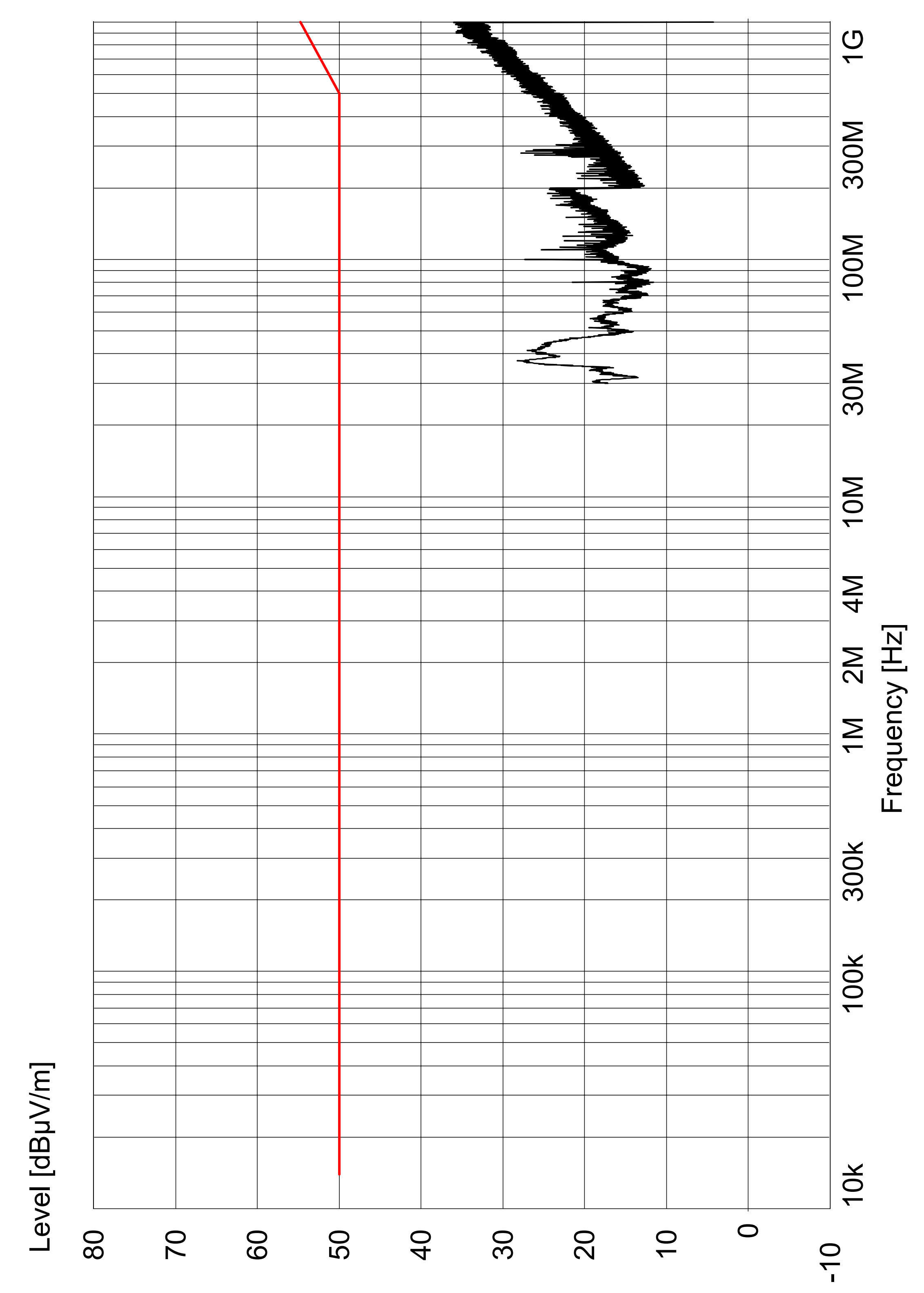
08-05-2008 18:21
Plot 9d Spire noisy mode in spire nominal loc VP



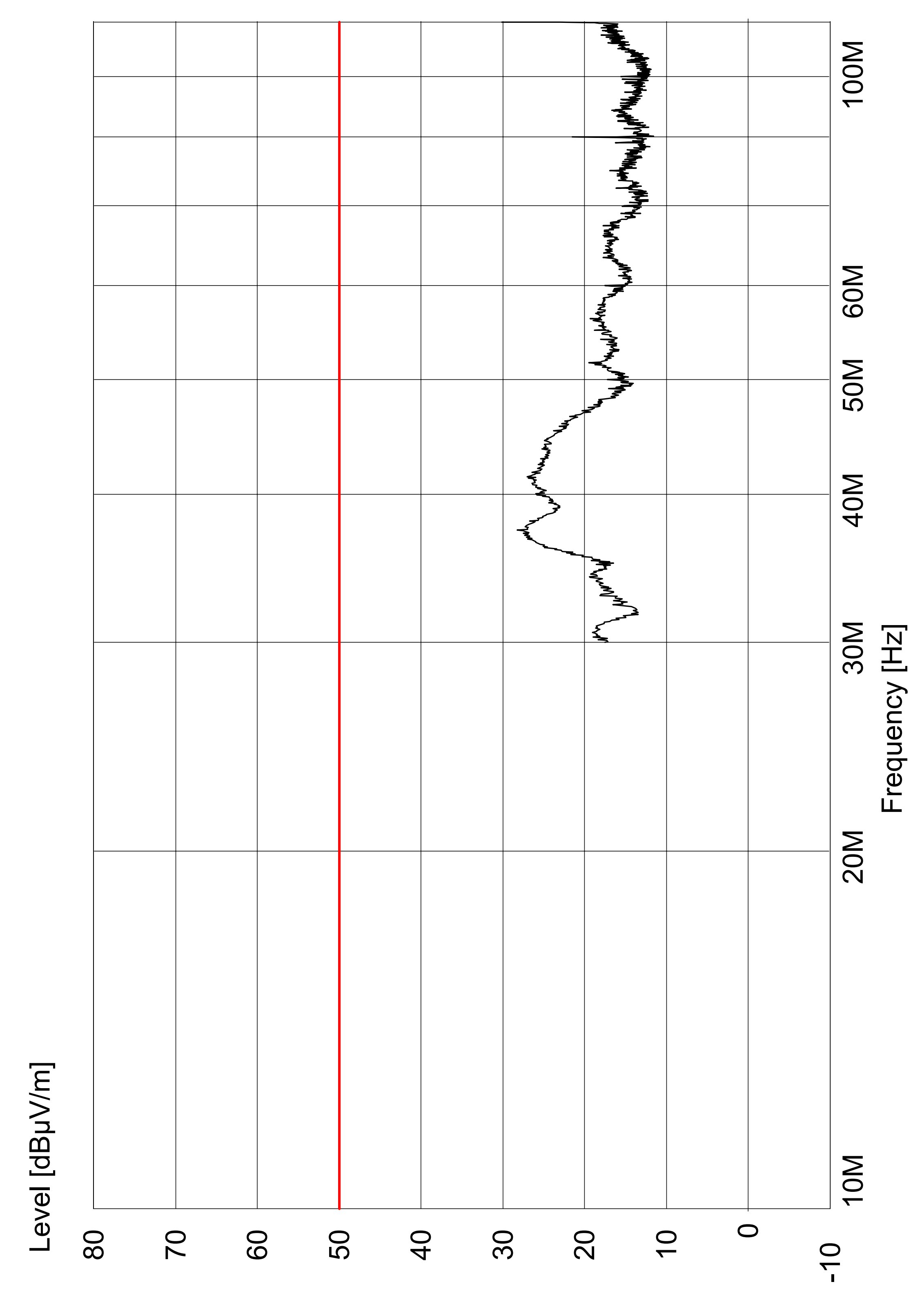
08-05-2008 18:21
Plot 9e Spire noisy mode in spire nominal loc VP



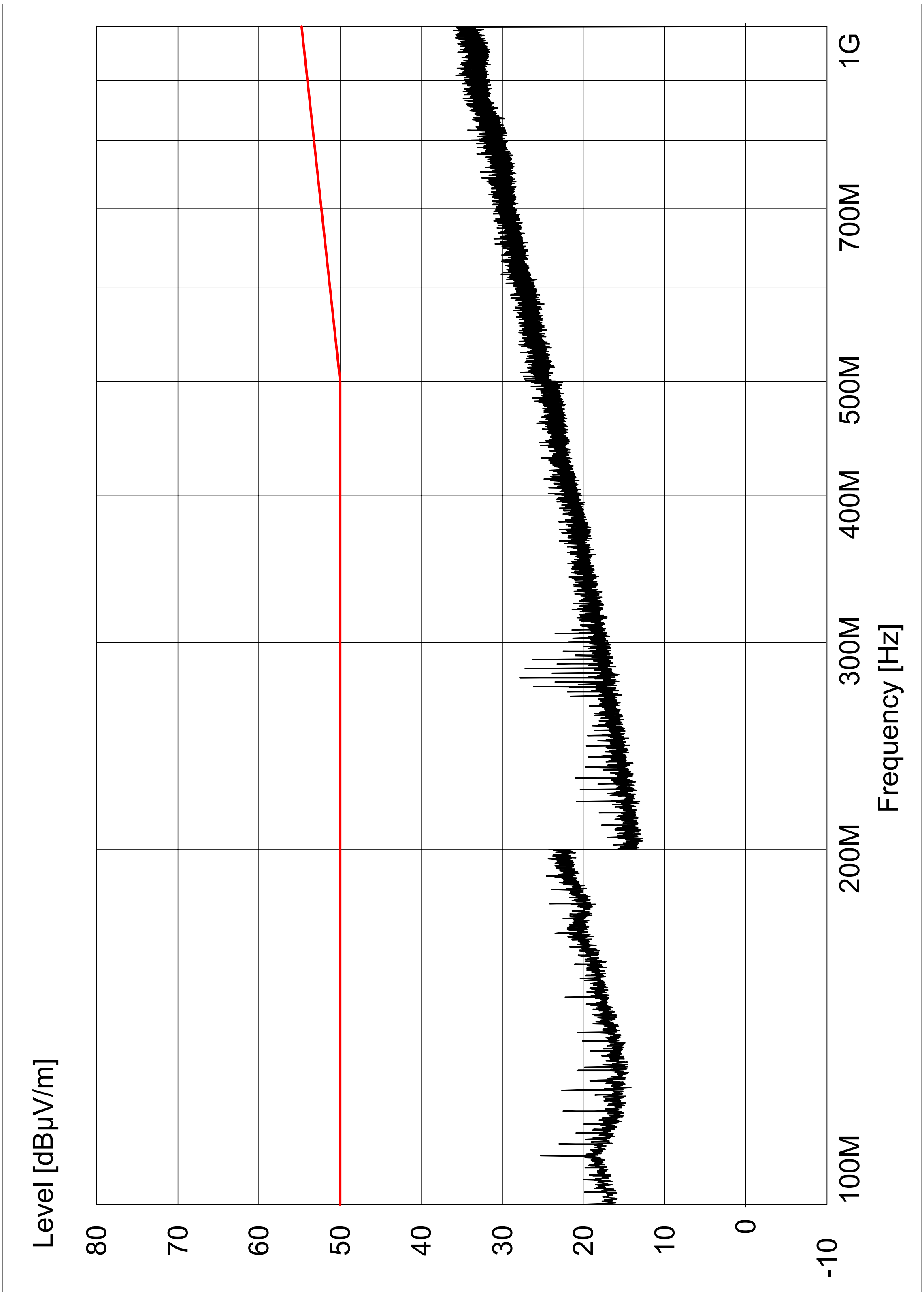
08-05-2008 18:31
Plot 10 Spire noisy mode in spire nominal loc HP



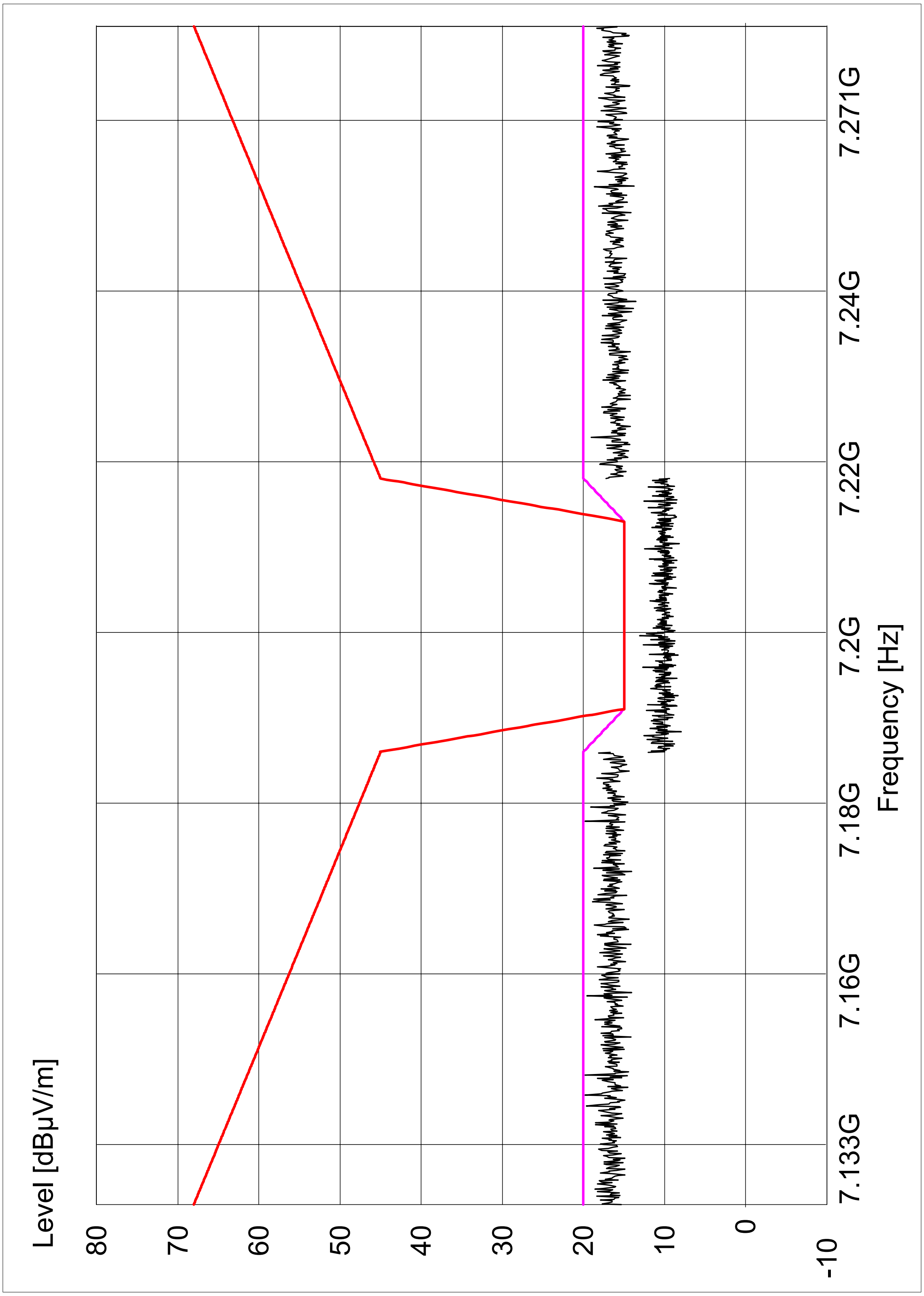
08-05-2008 18:31
Plot 10a Spire noisy mode in spire nominal loc HP



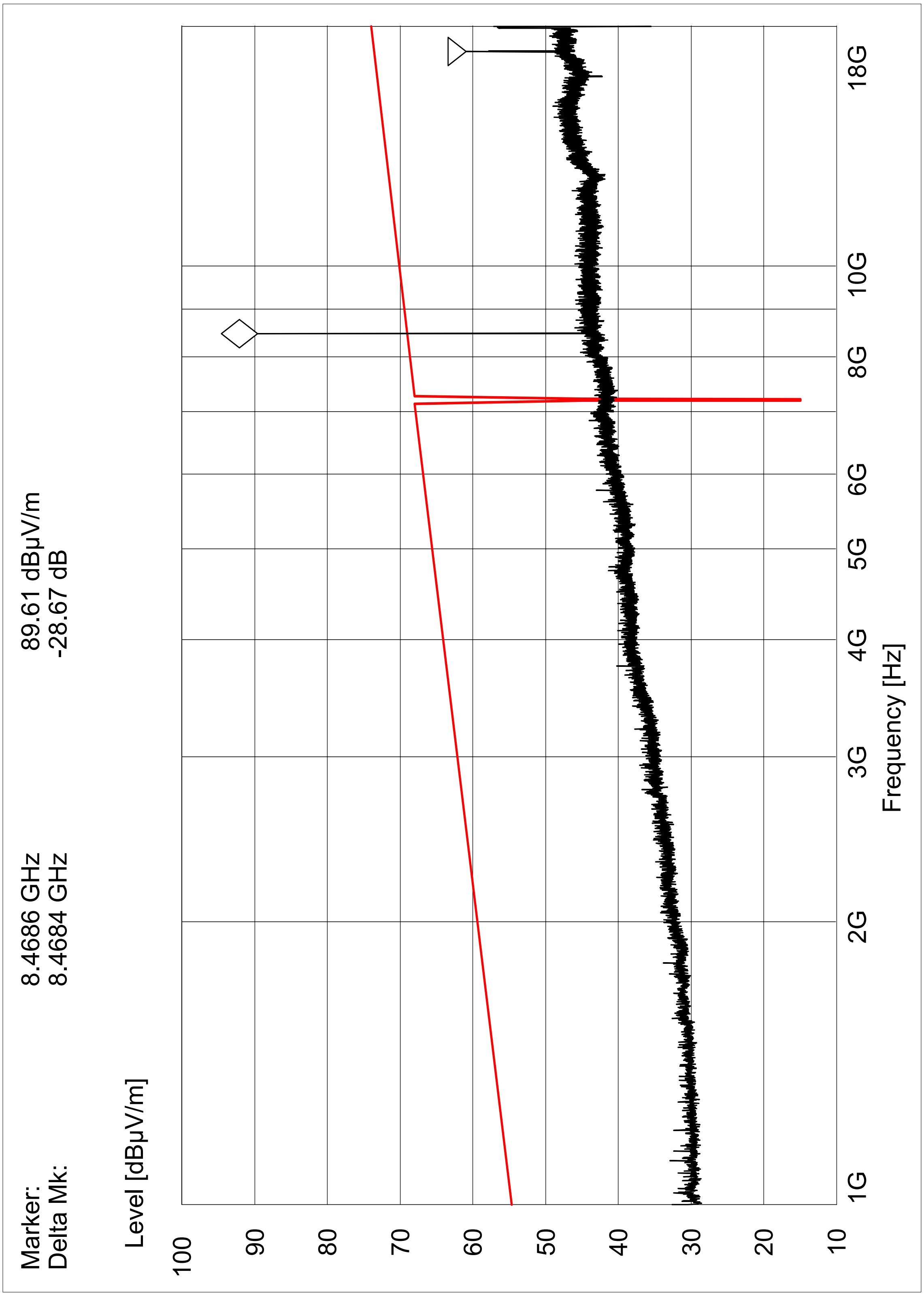
08-05-2008 18:31
Plot 10b Spire noisy mode in spire nominal loc HP



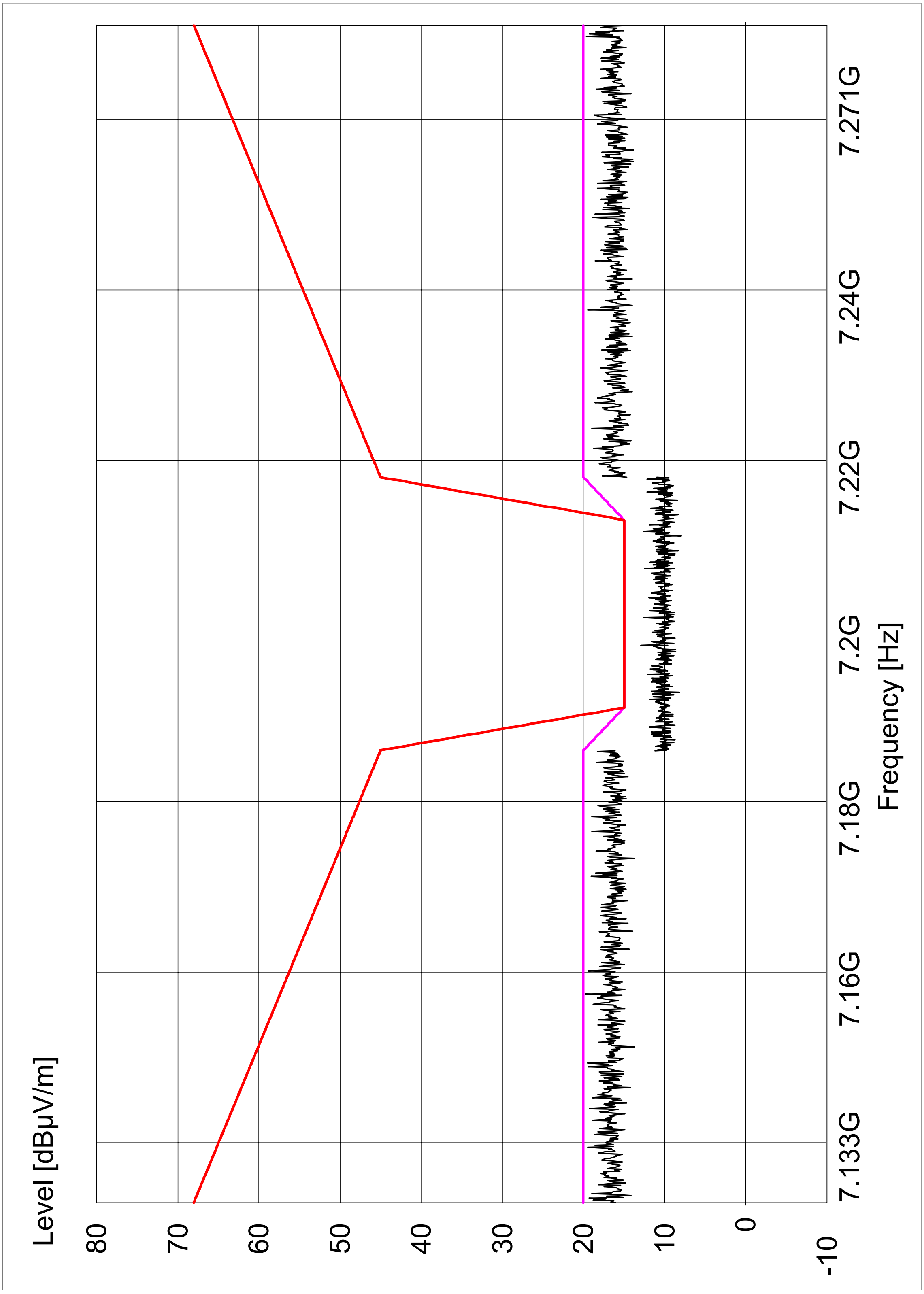
08-05-2008 18:43
Plot 11 Spire noisy mode in spire nominal loc VP



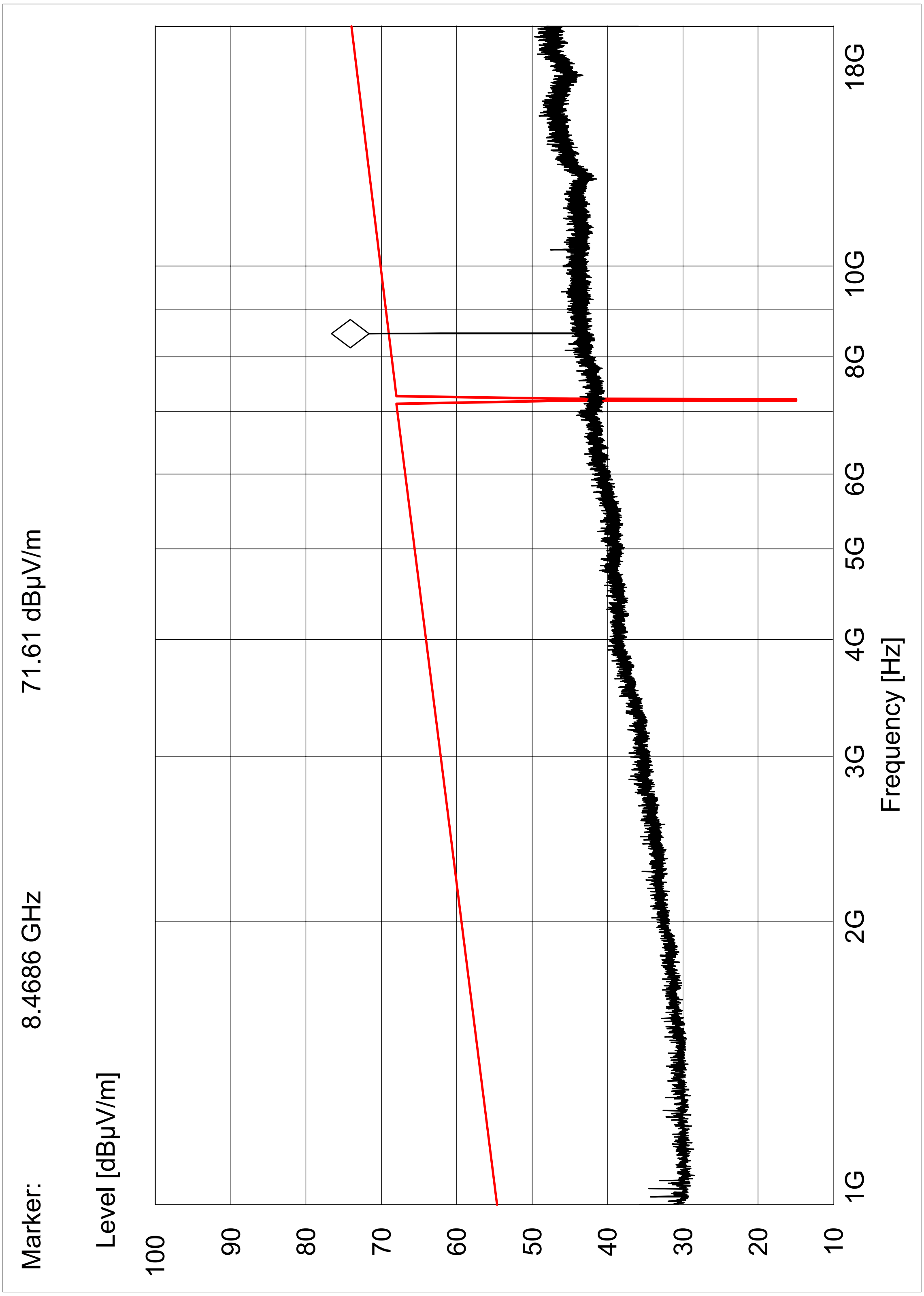
08-05-2008 18:58
Plot 12 Spire noisy mode in spire location VP



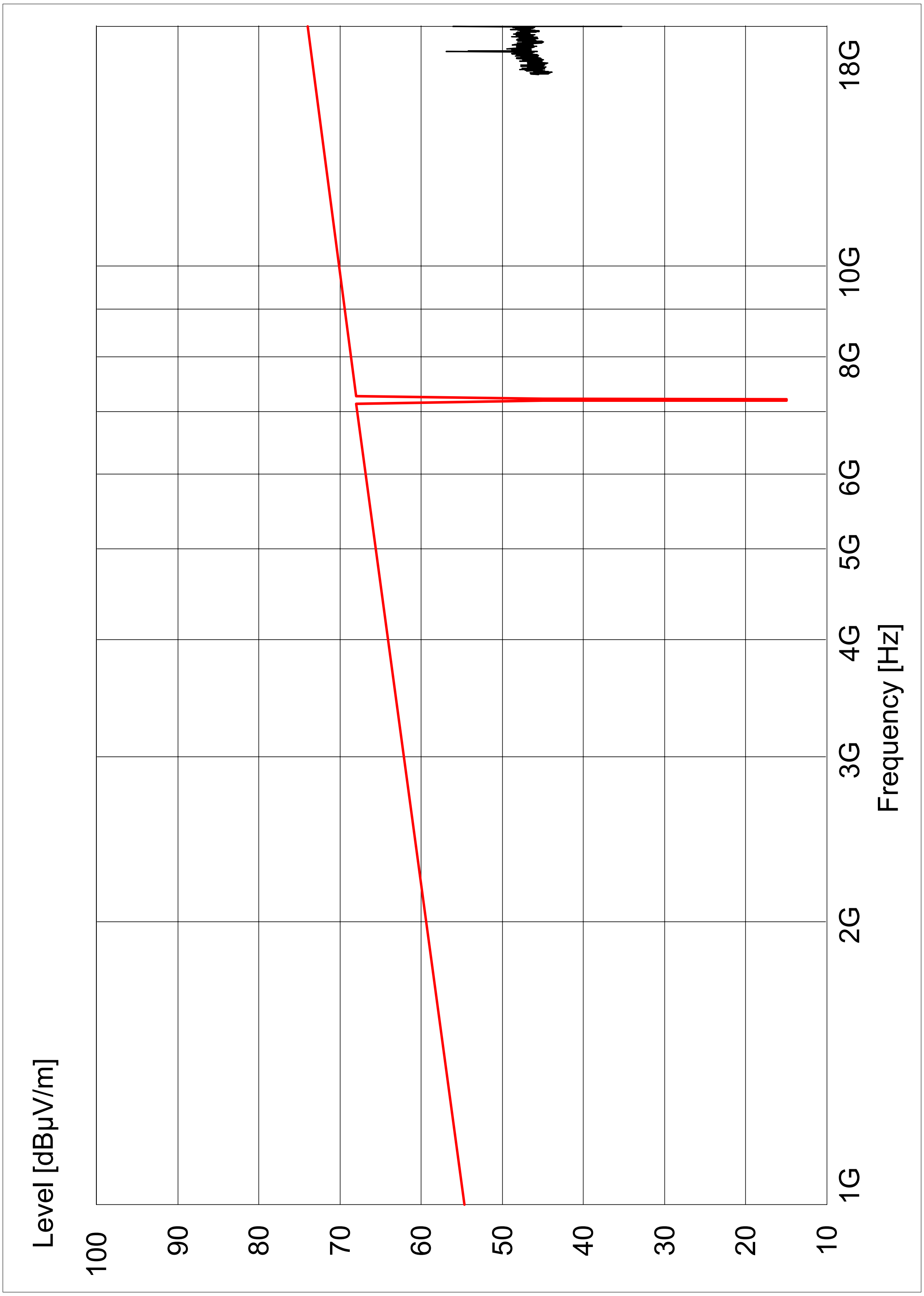
08-05-2008 19:04
Plot 13 Spire noisy mode in spire nominal loc HP



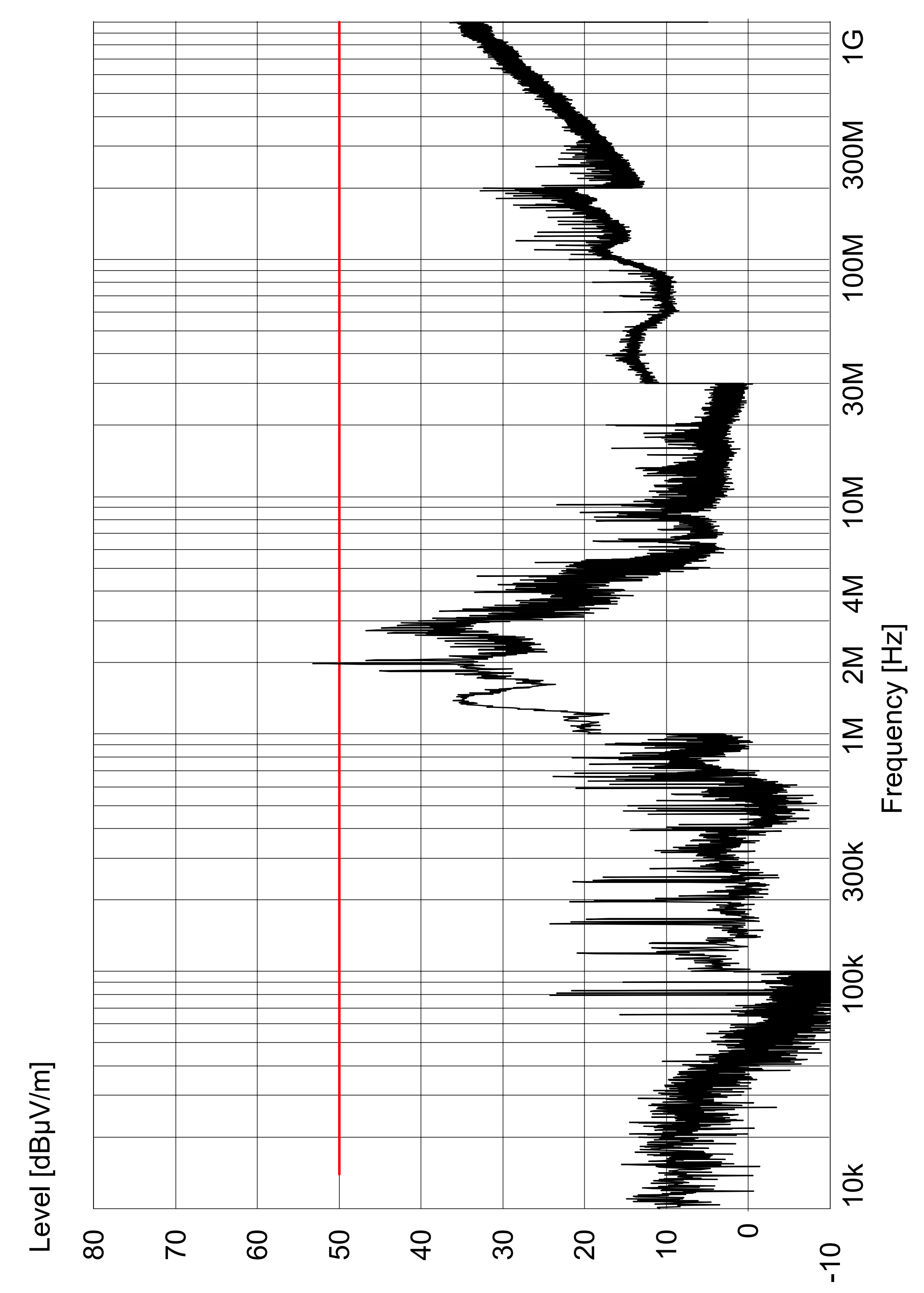
08-05-2008 19:16
Plot 14 Spire noisy mode in spire location HP



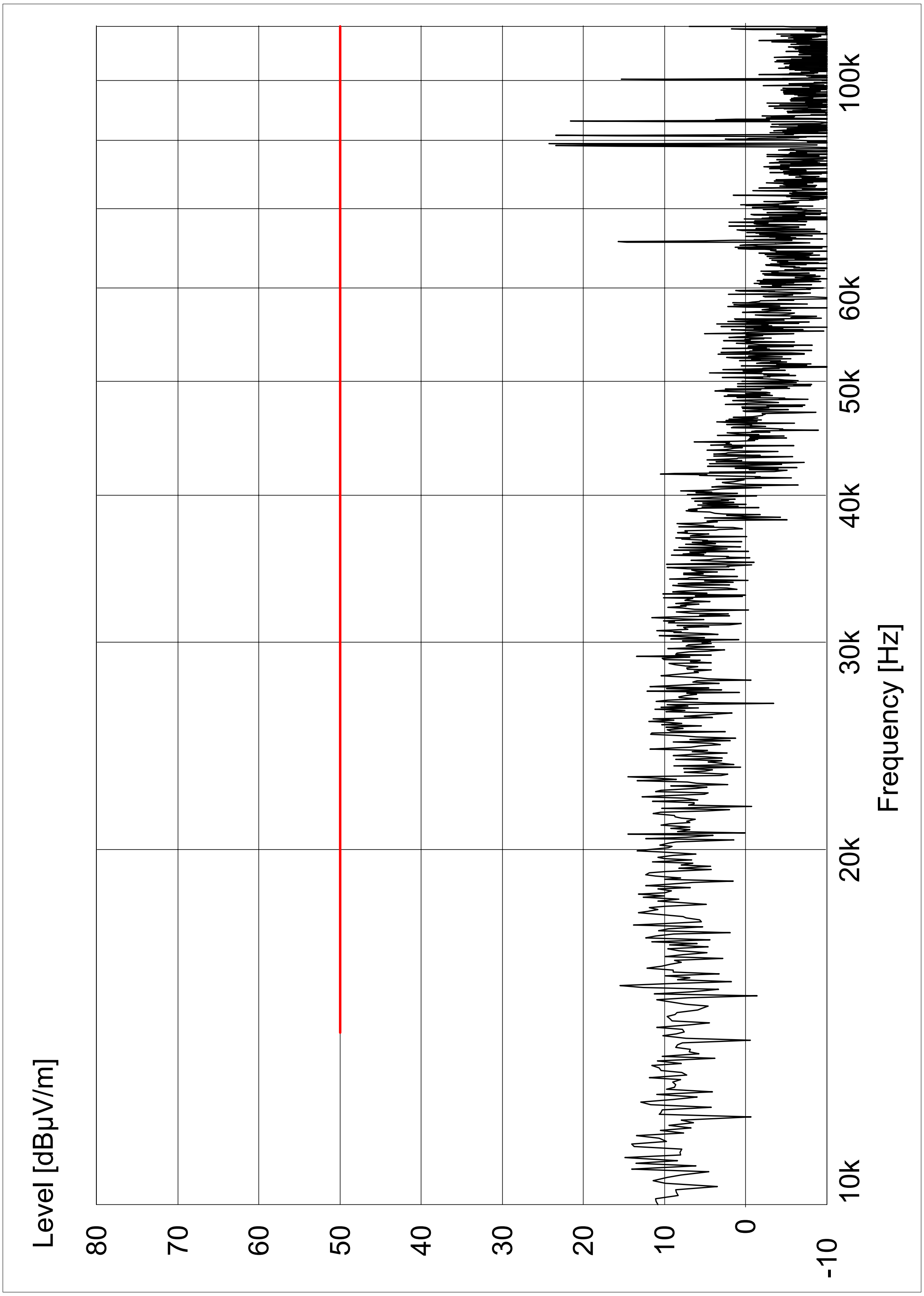
08-05-2008 19:24
Plot 15 Spire noisy mode in spire location VP



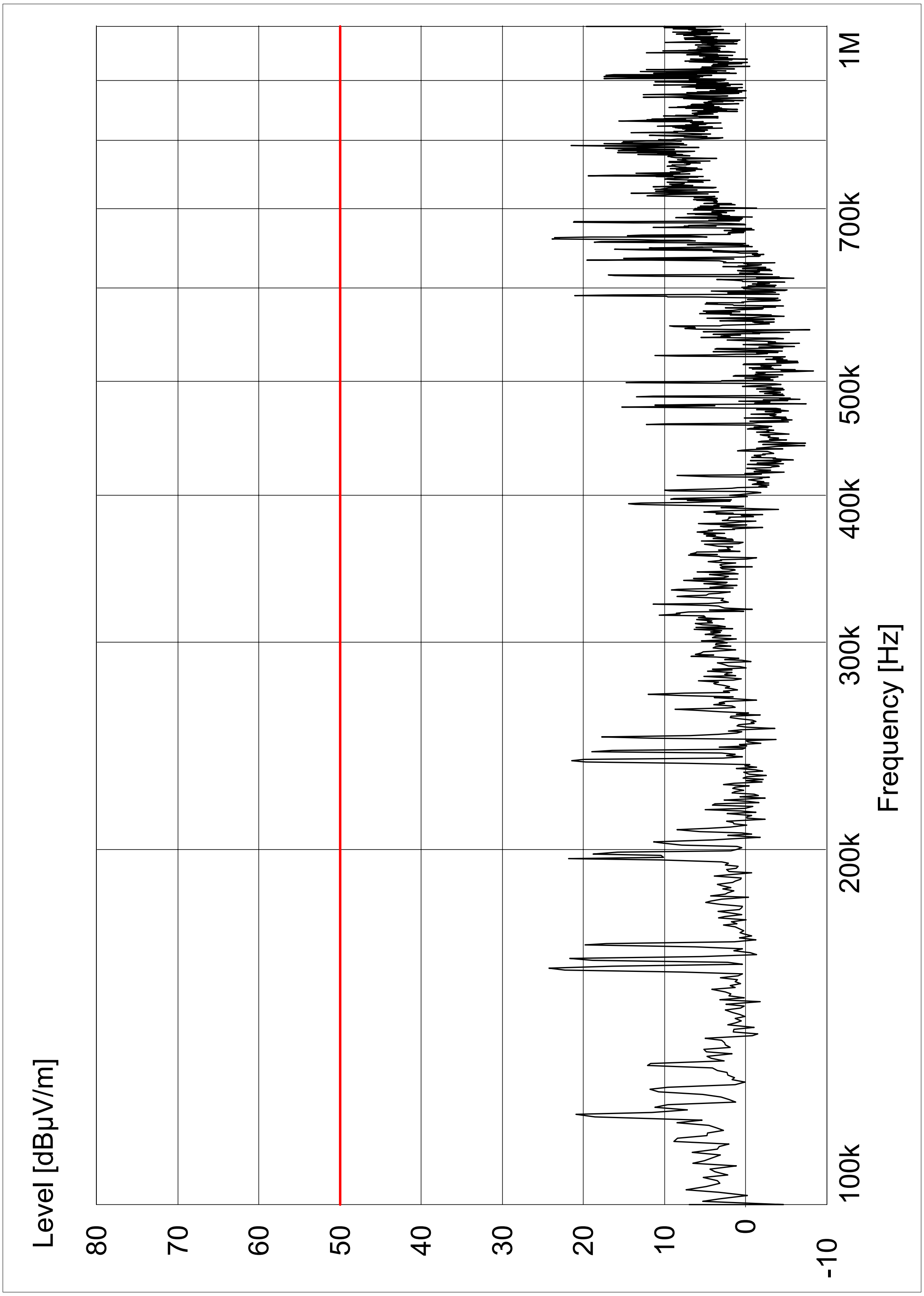
09-05-2008 10:48
Plot 16 Hifi noisy mode in Hifi location VP



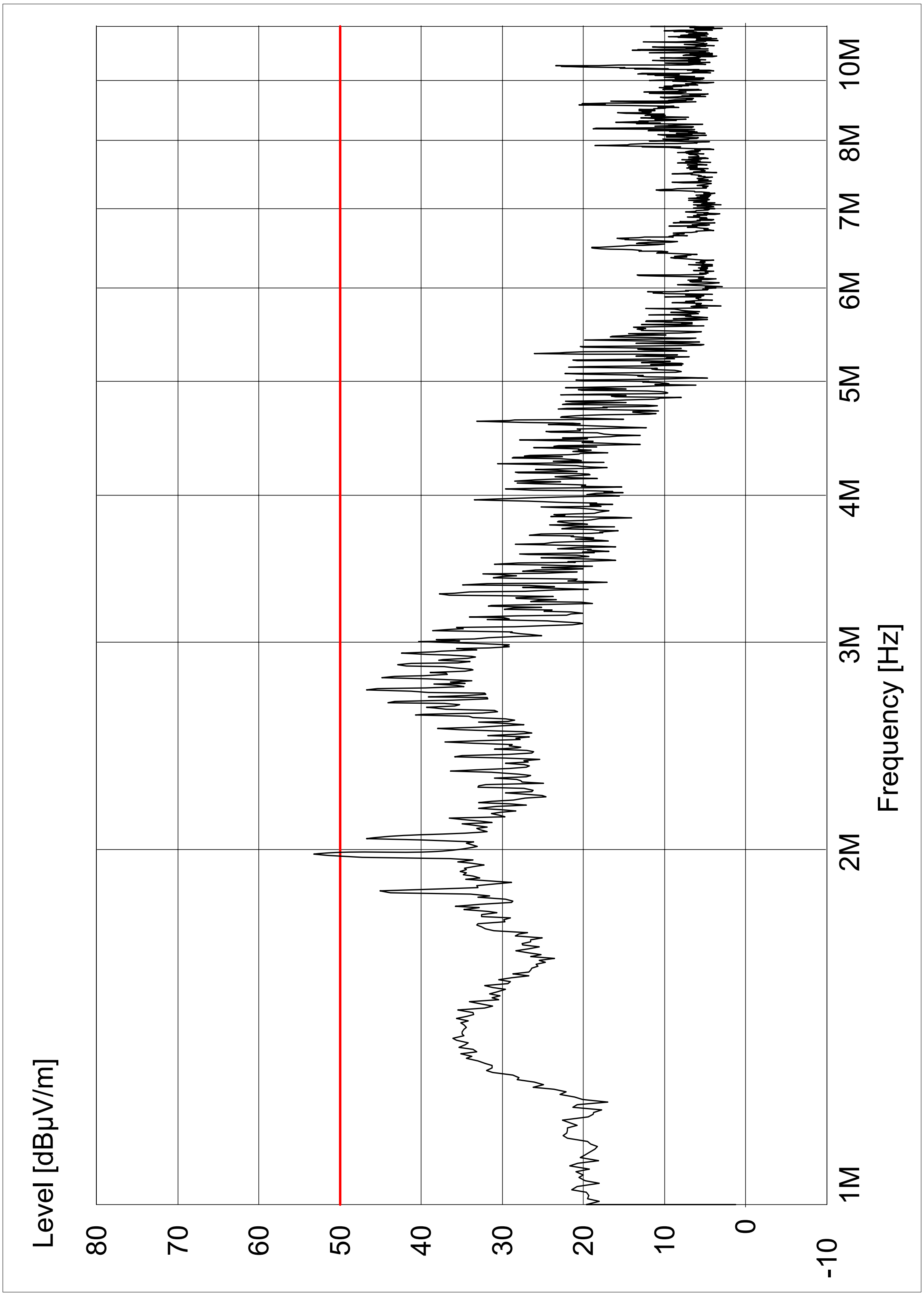
09-05-2008 10:48
Plot 16a Hifi noisy mode in Hifi location VP



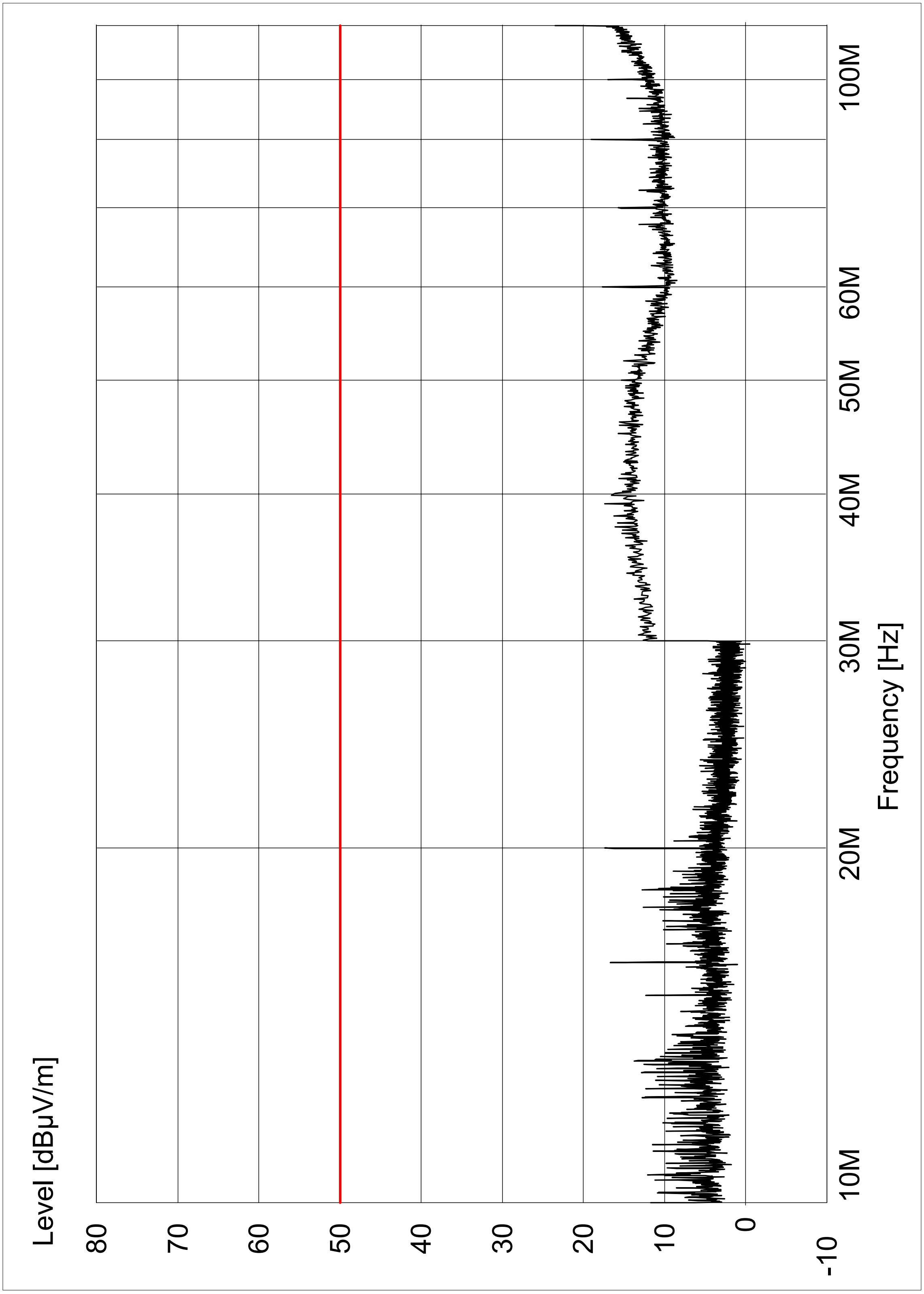
09-05-2008 10:48
Plot 16b Hifi noisy mode in Hifi location VP



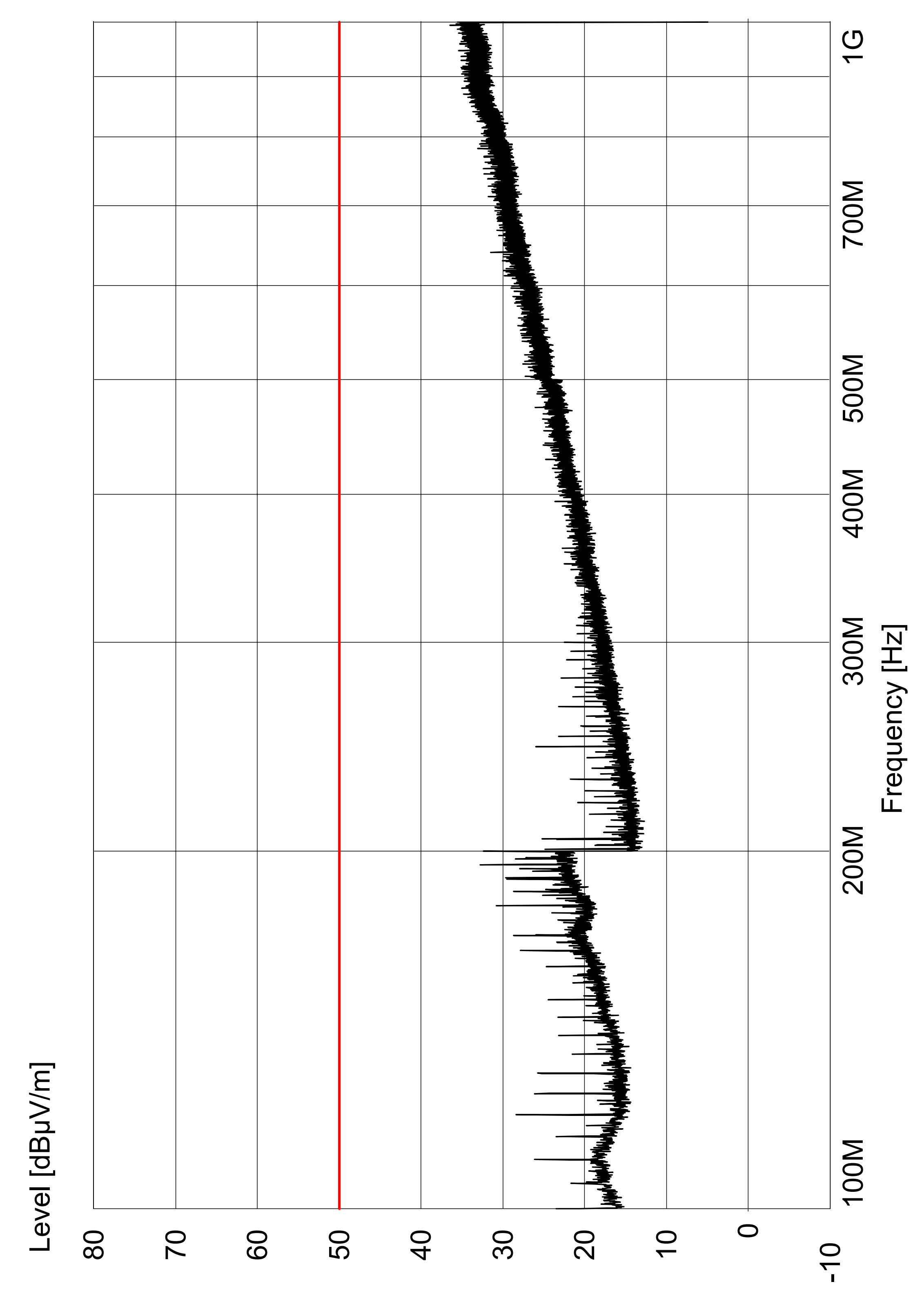
09-05-2008 10:48
Plot 16c Hifi noisy mode in Hifi location VP



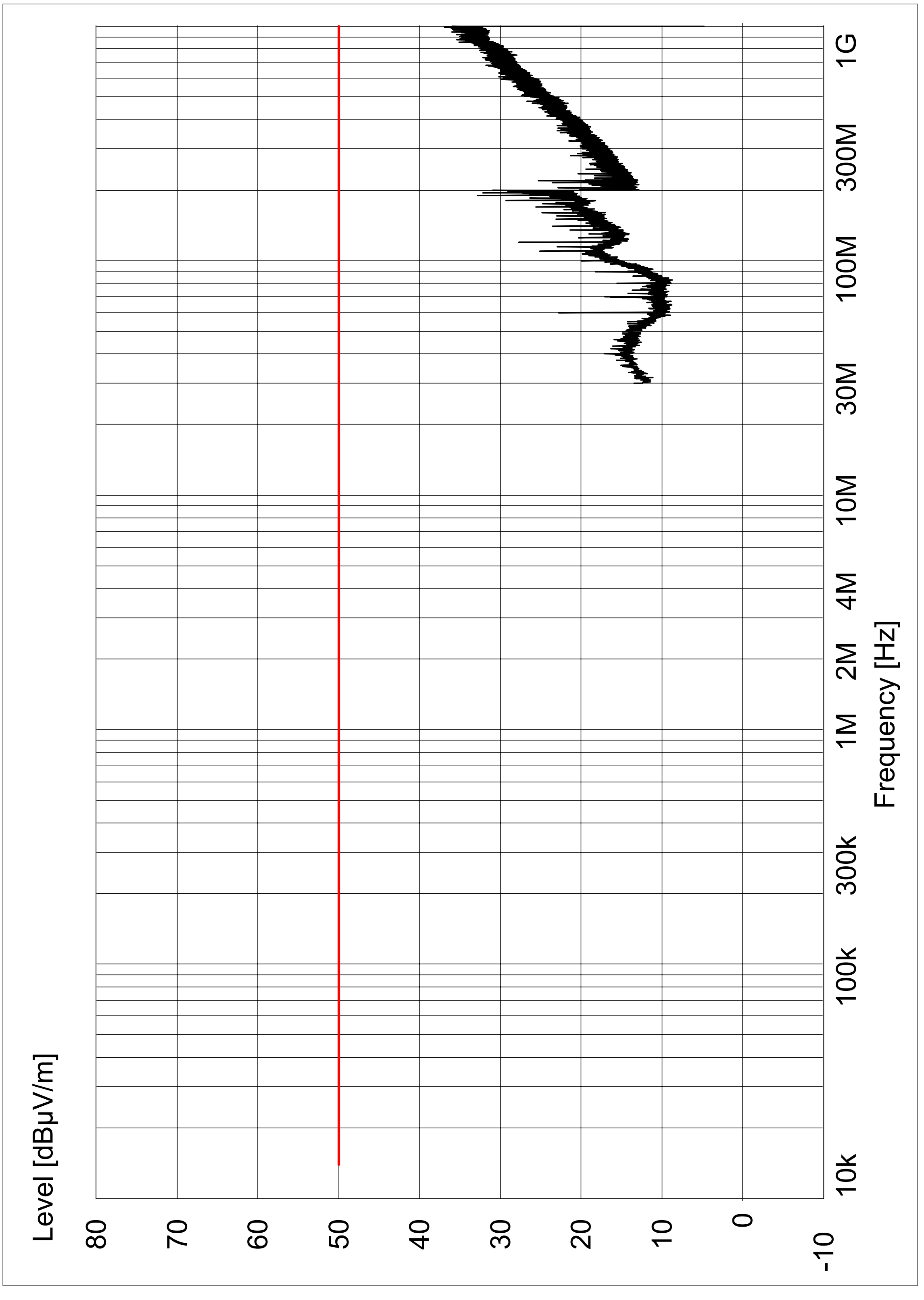
09-05-2008 10:48
Plot 16d Hifi noisy mode in Hifi location VP



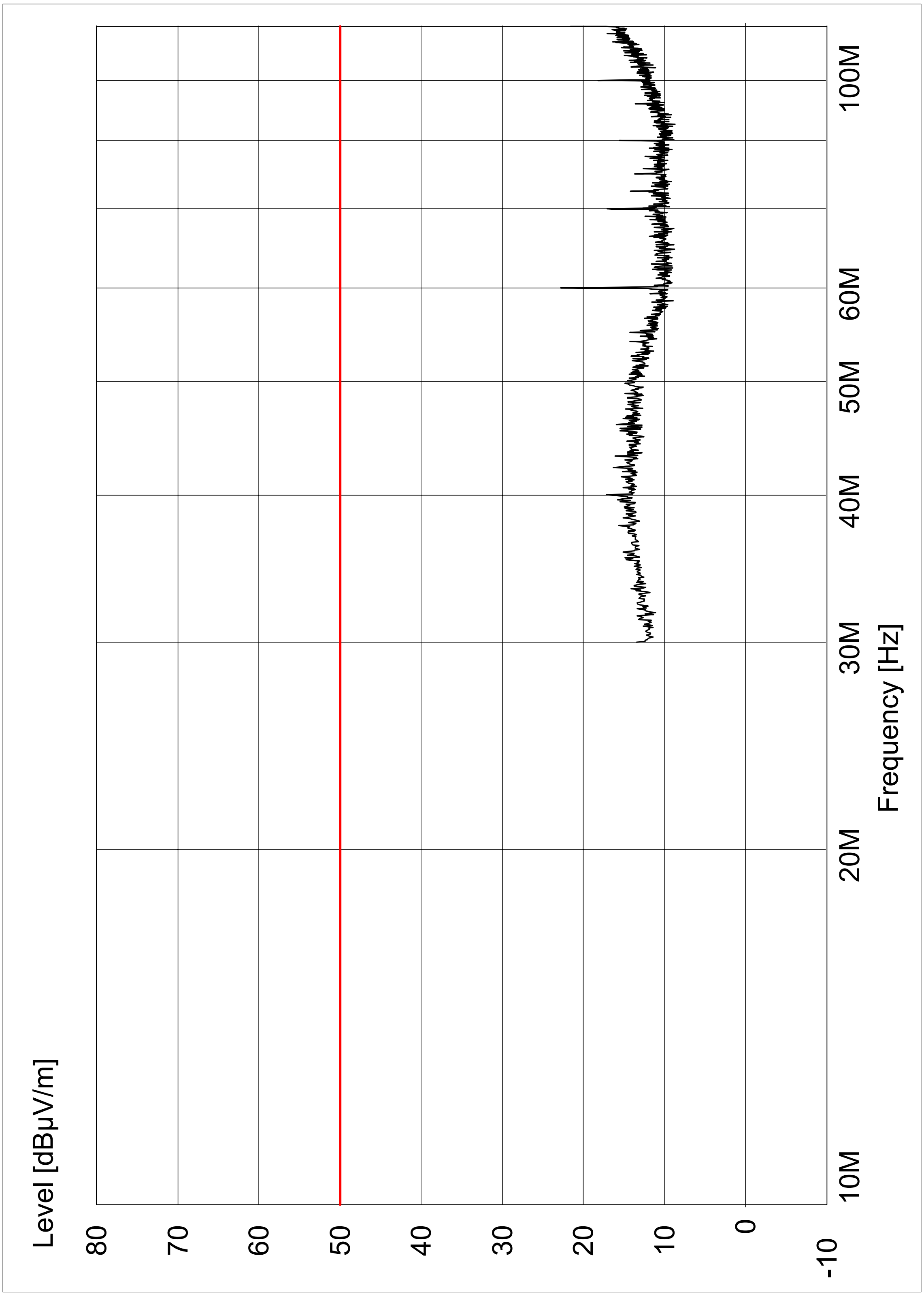
09-05-2008 10:48
Plot 16e Hifi noisy mode in Hifi location VP



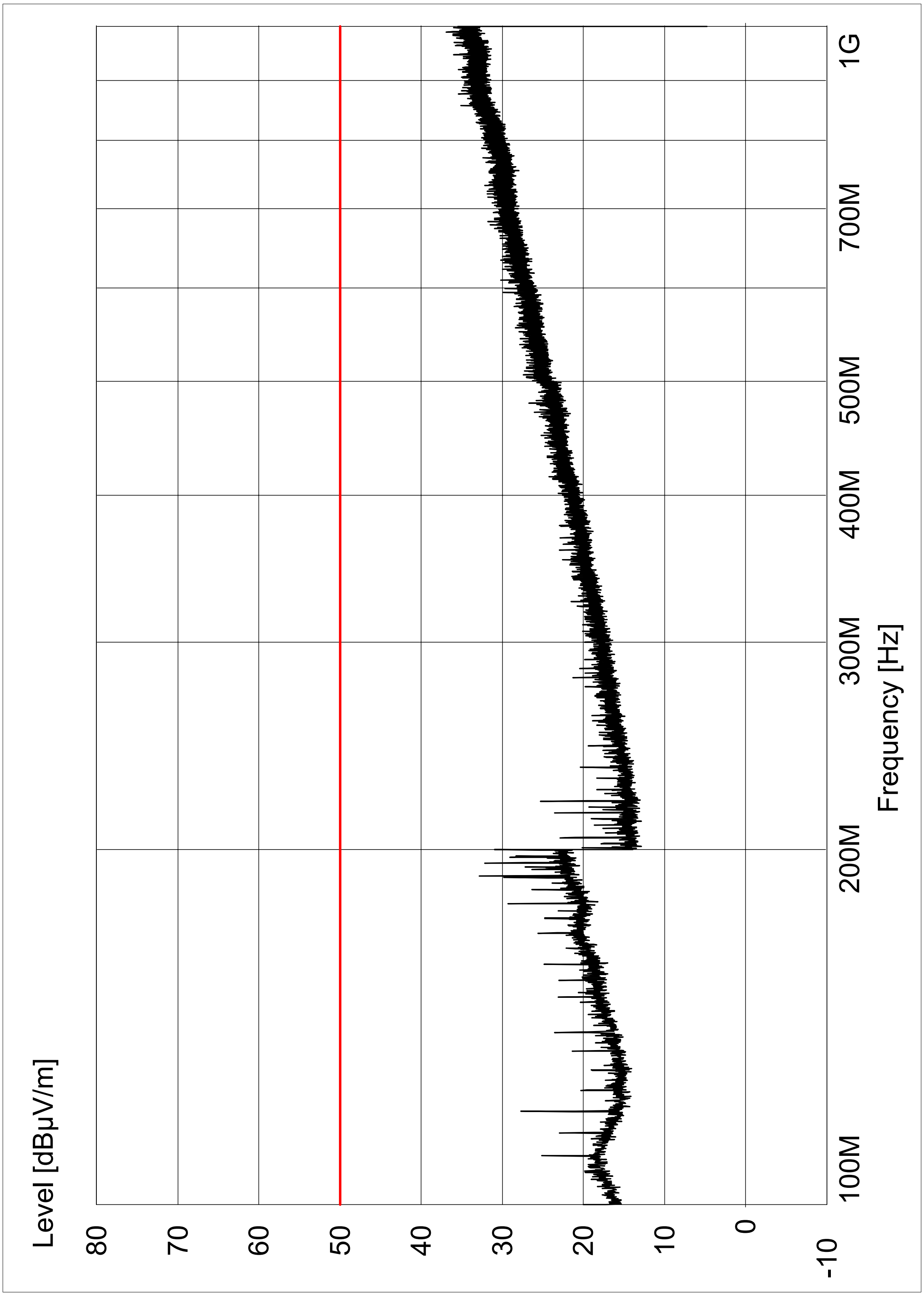
09-05-2008 11:02
Plot 17 Hifi noisy mode in Hifi location HP



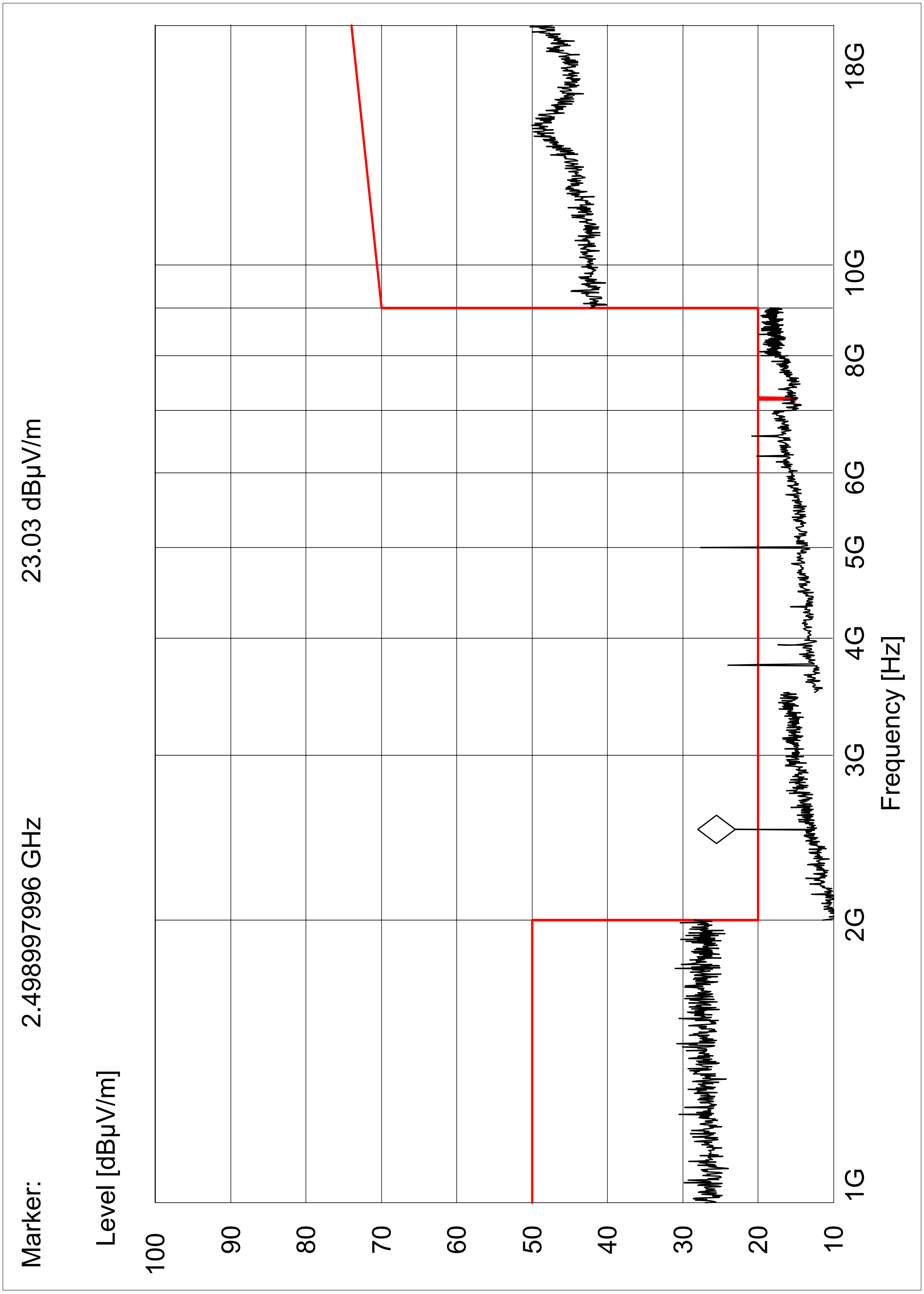
09-05-2008 11:02
Plot 17a Hifi noisy mode in Hifi location HP



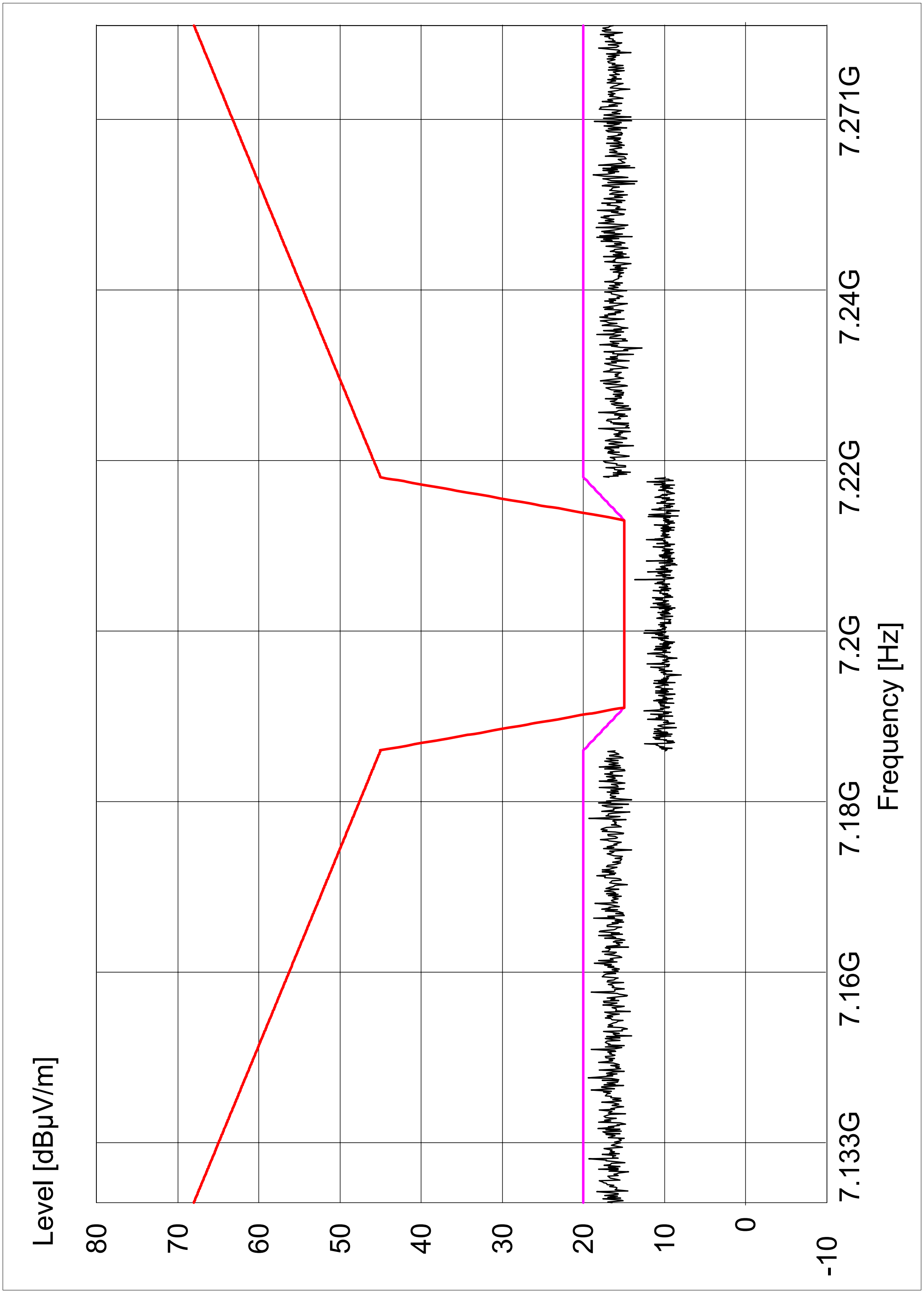
09-05-2008 11:02
Plot 17b Hifi noisy mode in Hifi location HP



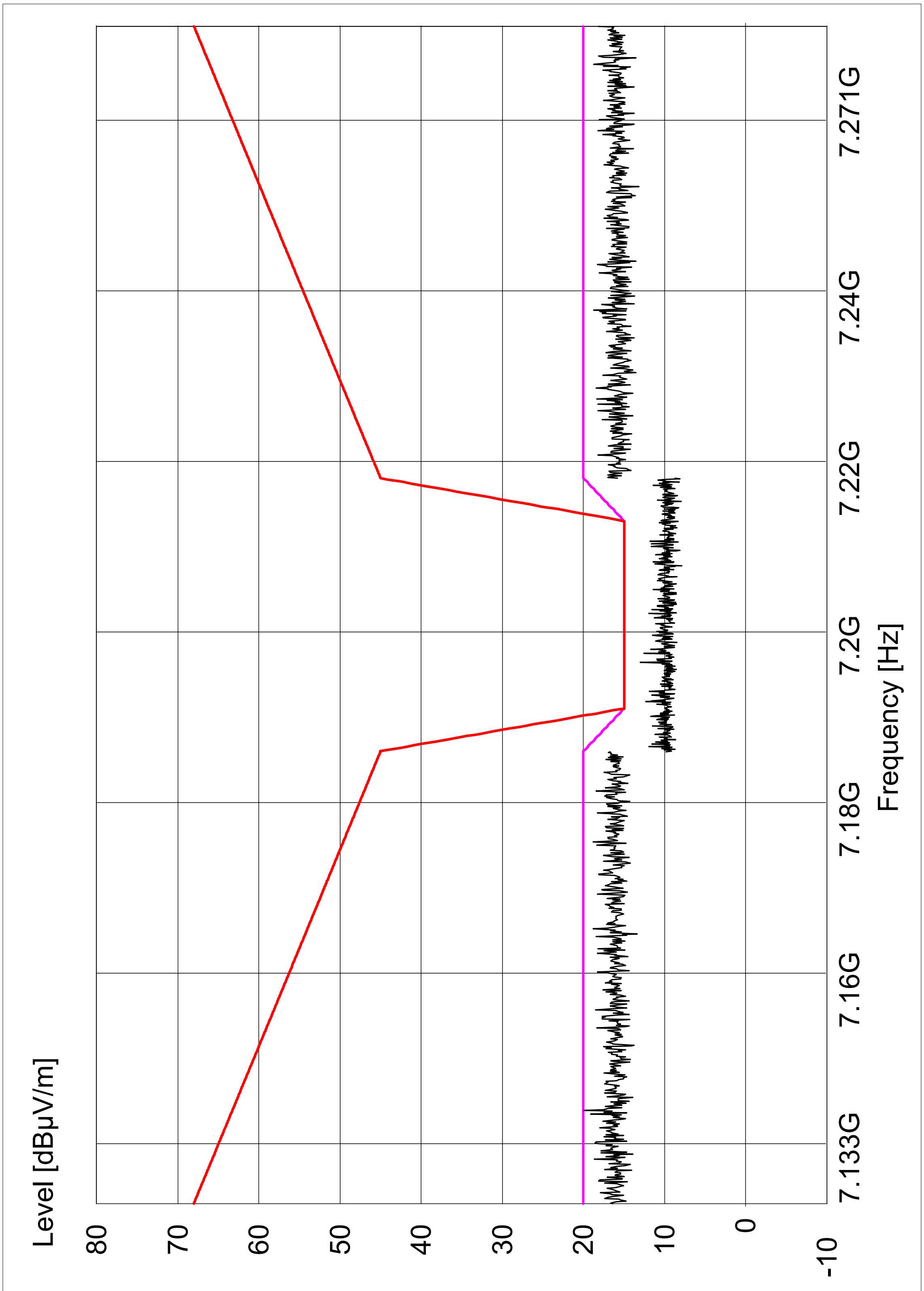
09-05-2008 11:42
Plot 18 Hifi noisy mode in Hifi location VP



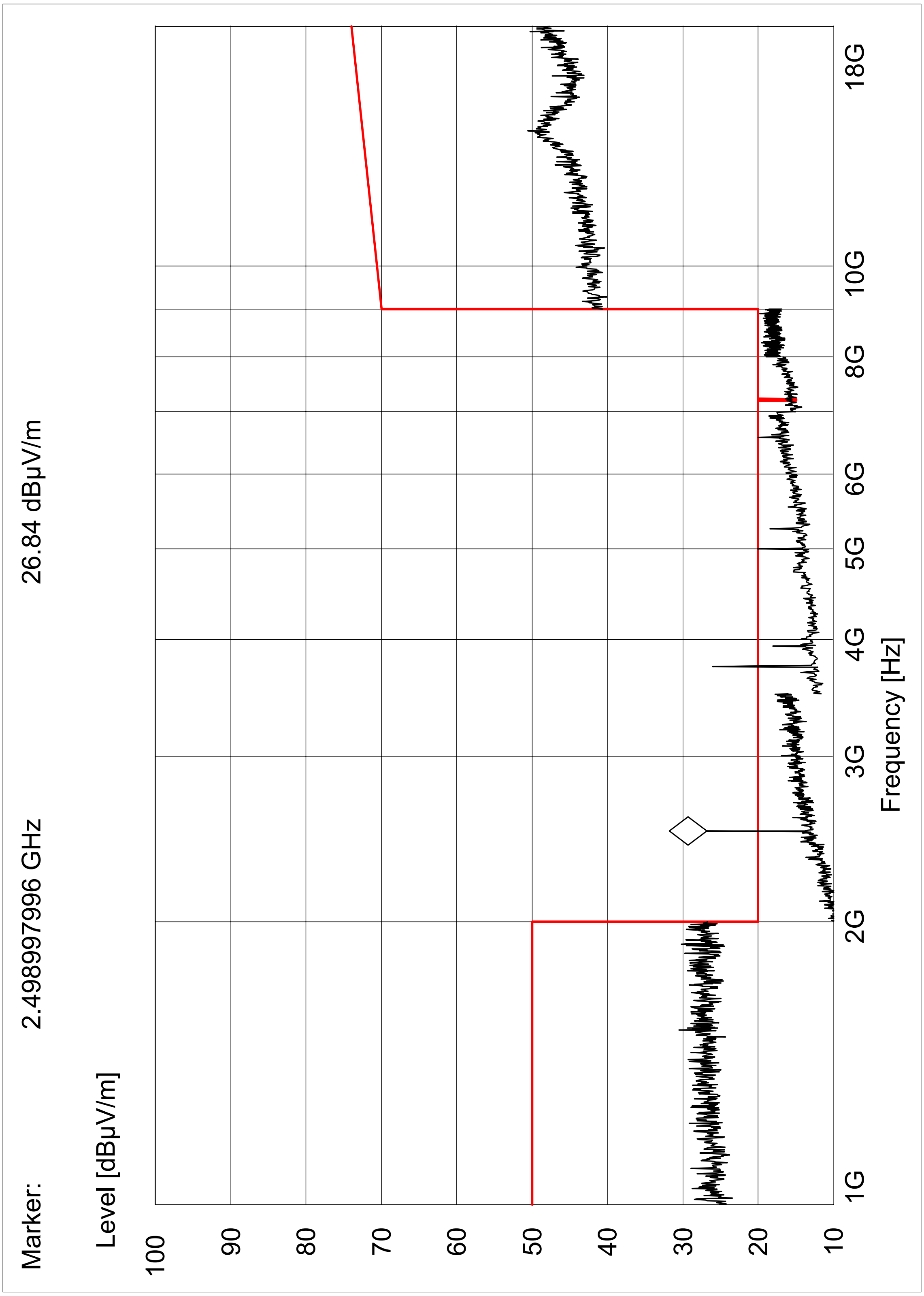
09-05-2008 11:53
Plot 19 Hifi noisy mode in Hifi location VP



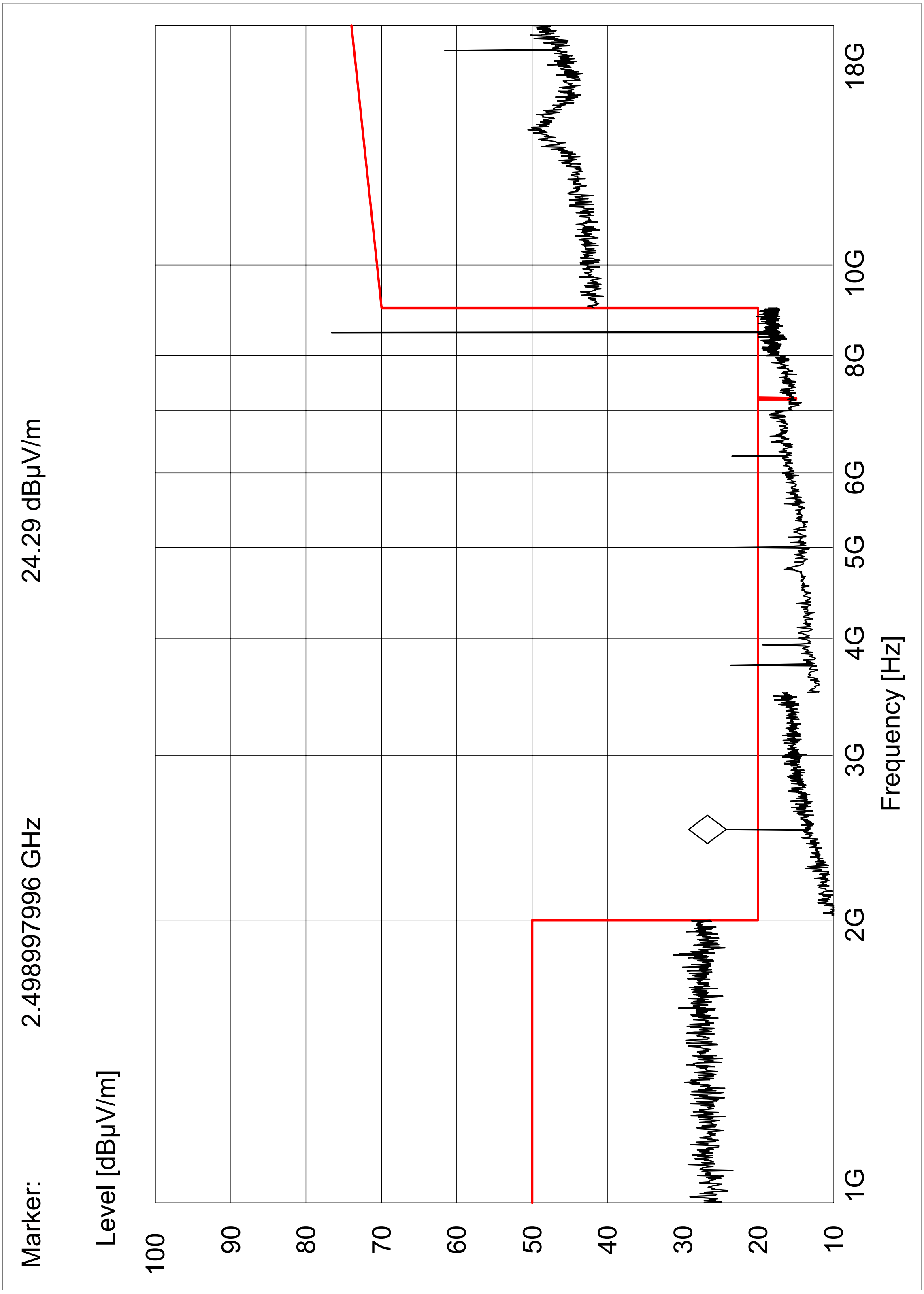
09-05-2008 11:58
Plot 20 Hifi noisy mode in Hifi location HP



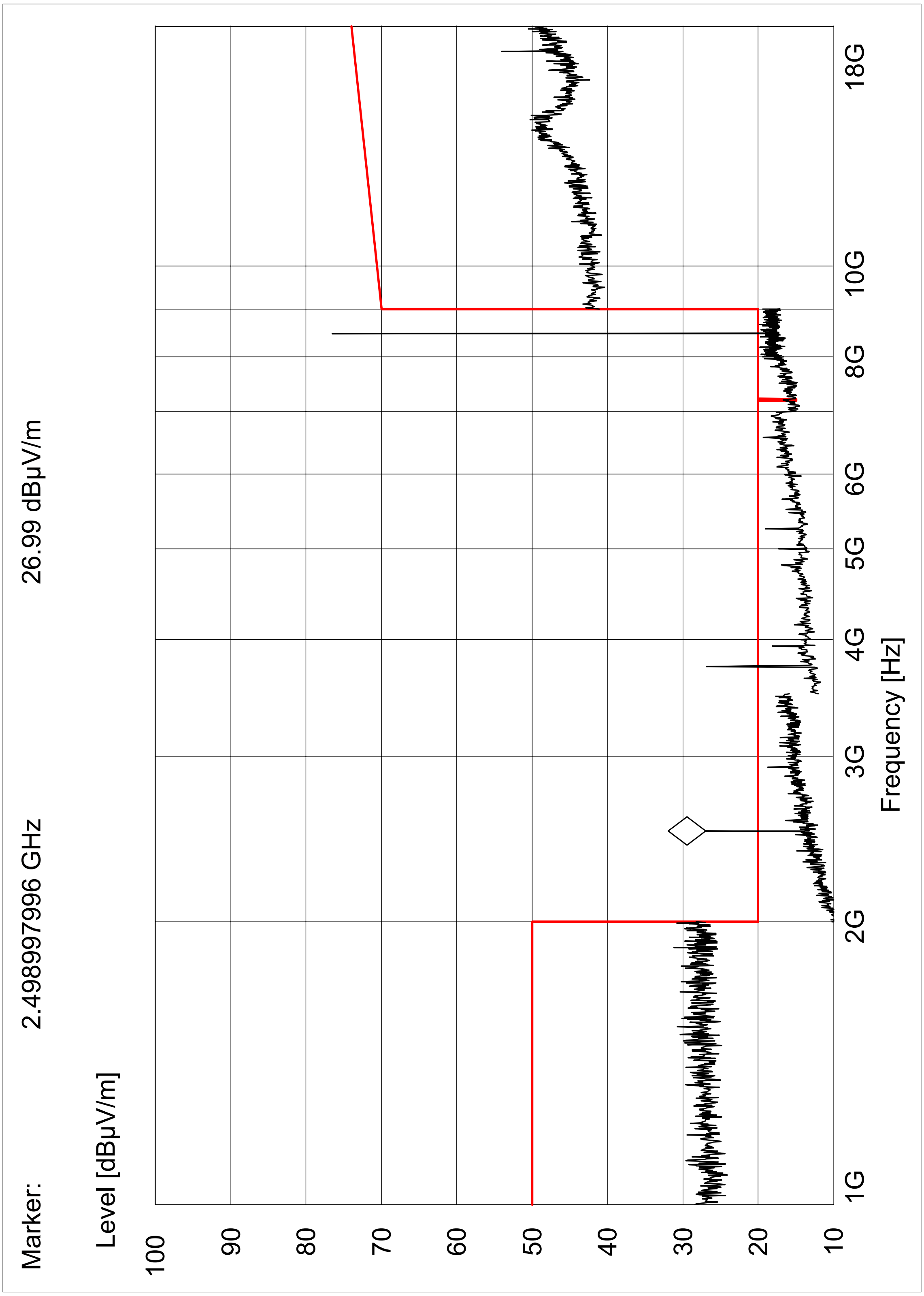
09-05-2008 12:34
Plot 21 Hifi noisy mode in Hifi location HP



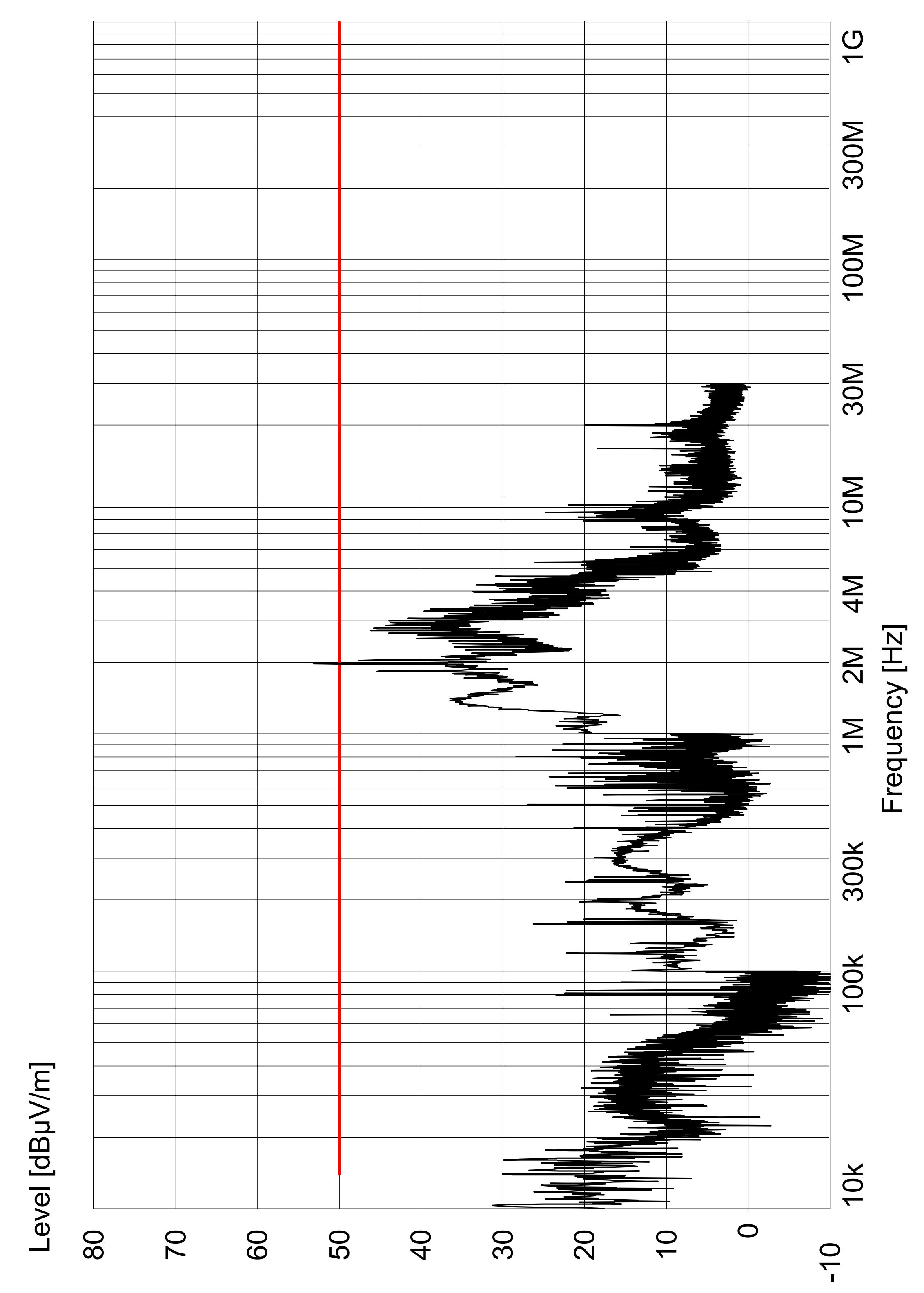
09-05-2008 15:00
Plot 22 Hifi noisy mode in Hifi location twt on VP



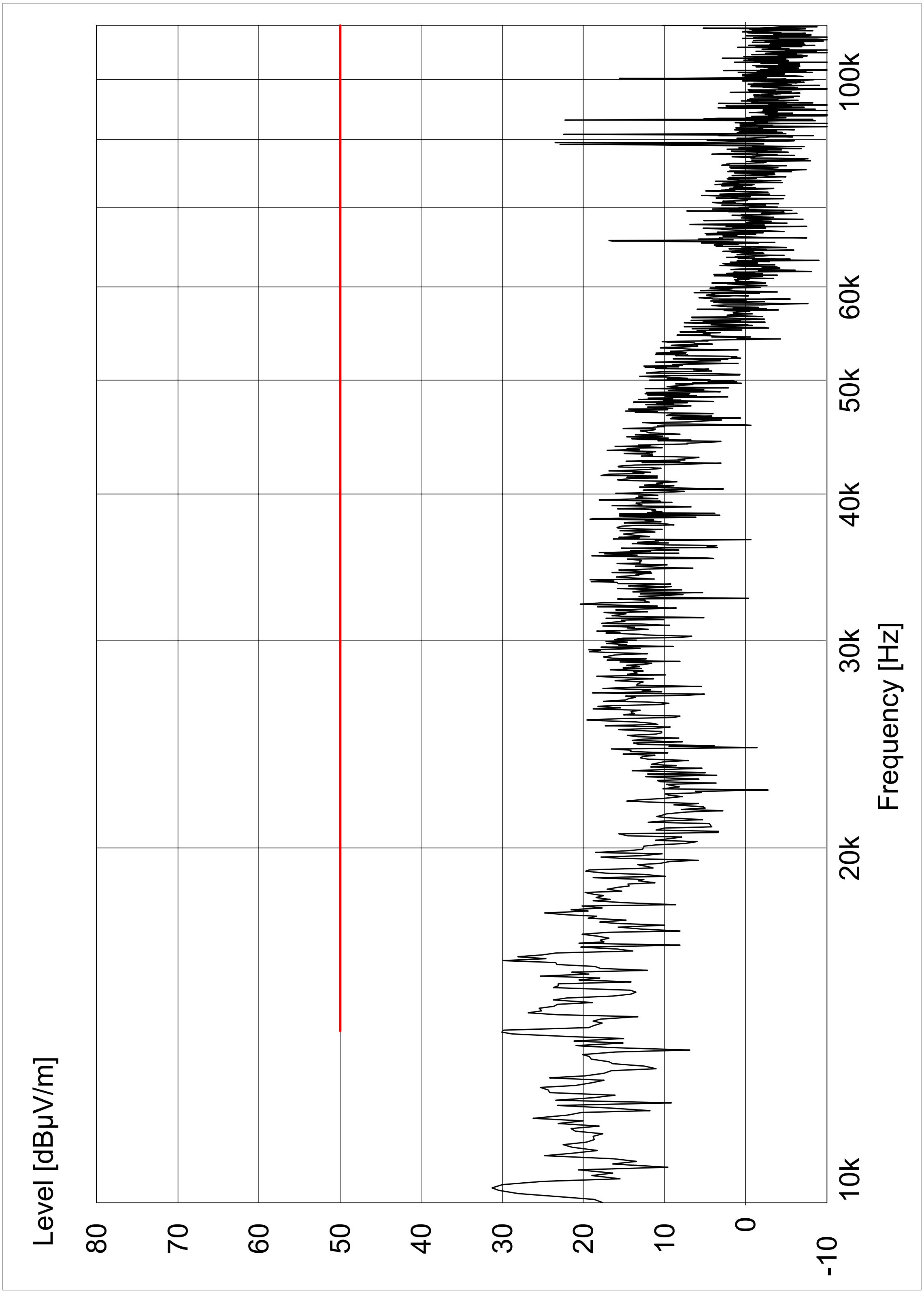
09-05-2008 14:59
Plot 23 Hifi noisy mode in Hifi location twt on HP



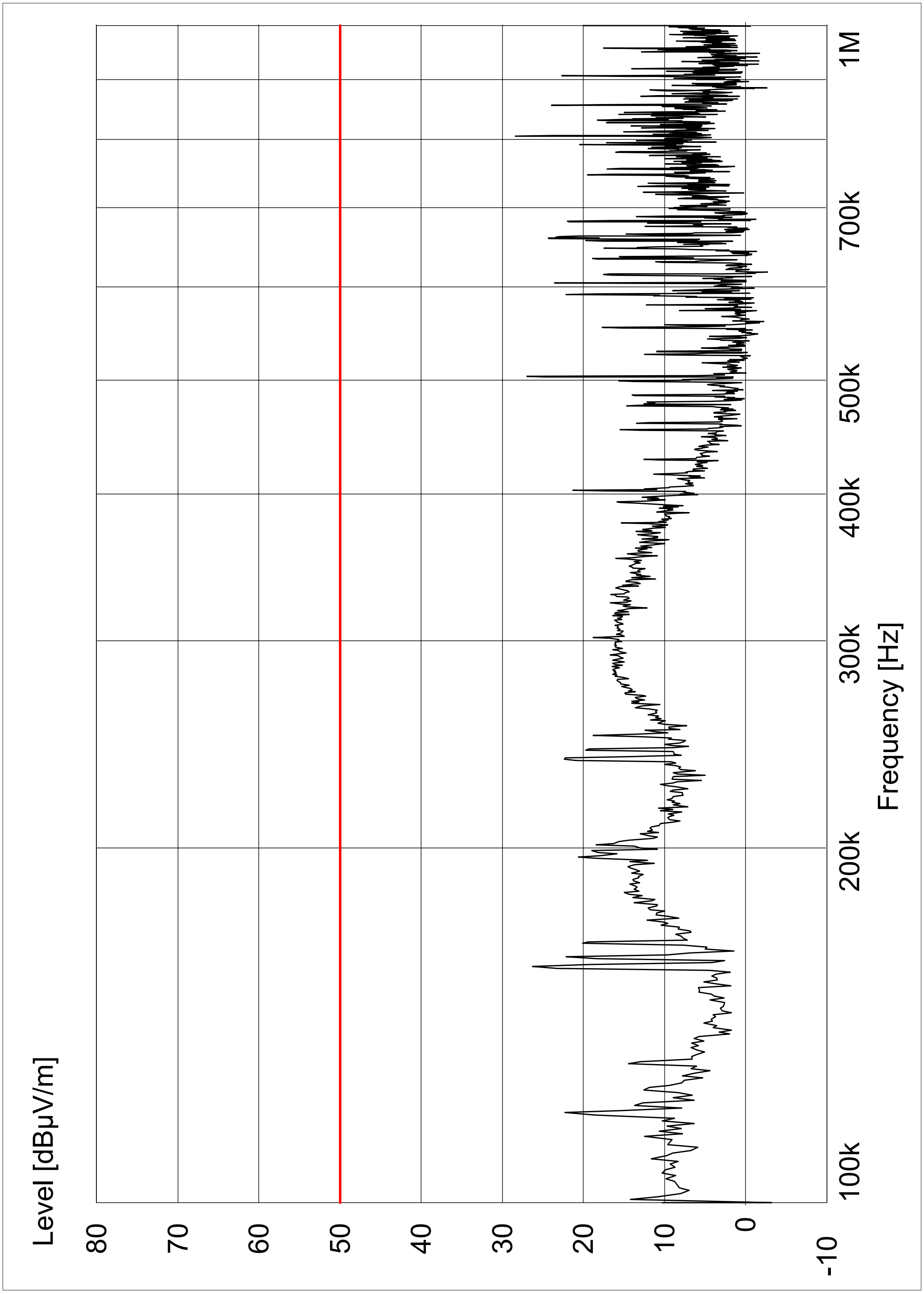
09-05-2008 15:13
Plot 24 Hifi noisy mode in Hifi location TWT on VP



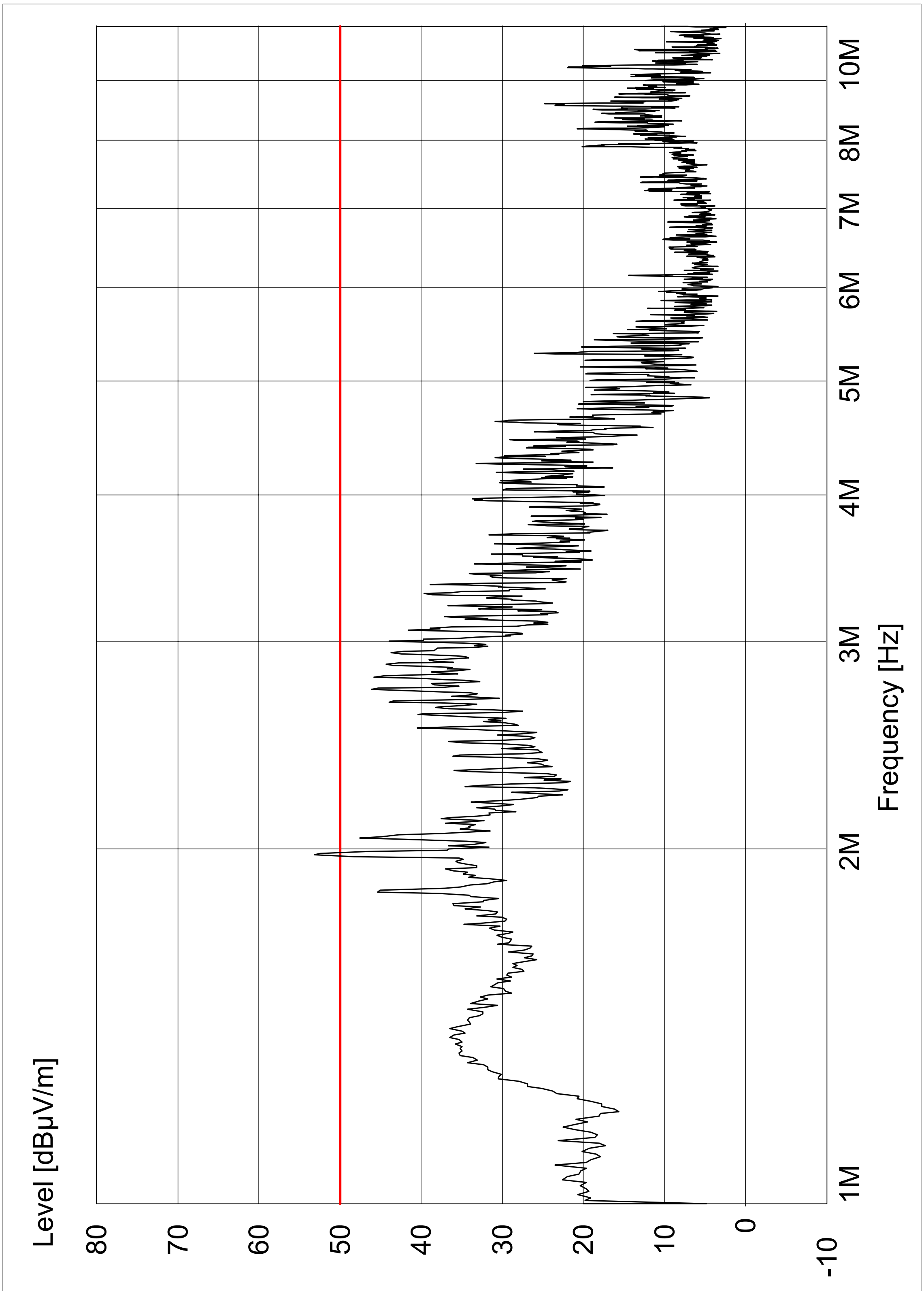
09-05-2008 15:13
Plot 24a Hifi noisy mode in Hifi location TWT on VP



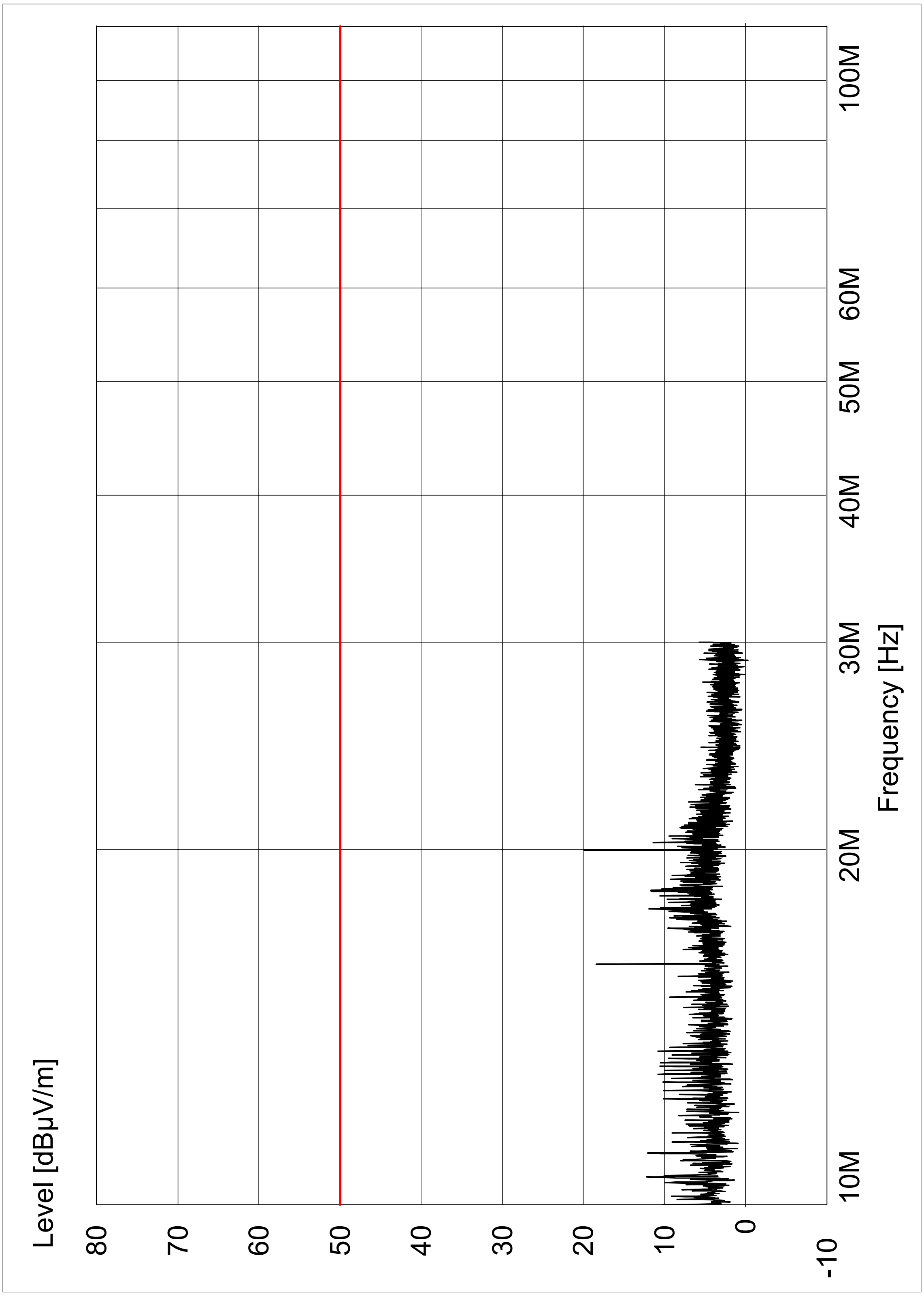
09-05-2008 15:13
Plot 24b Hifi noisy mode in Hifi location TWT on VP



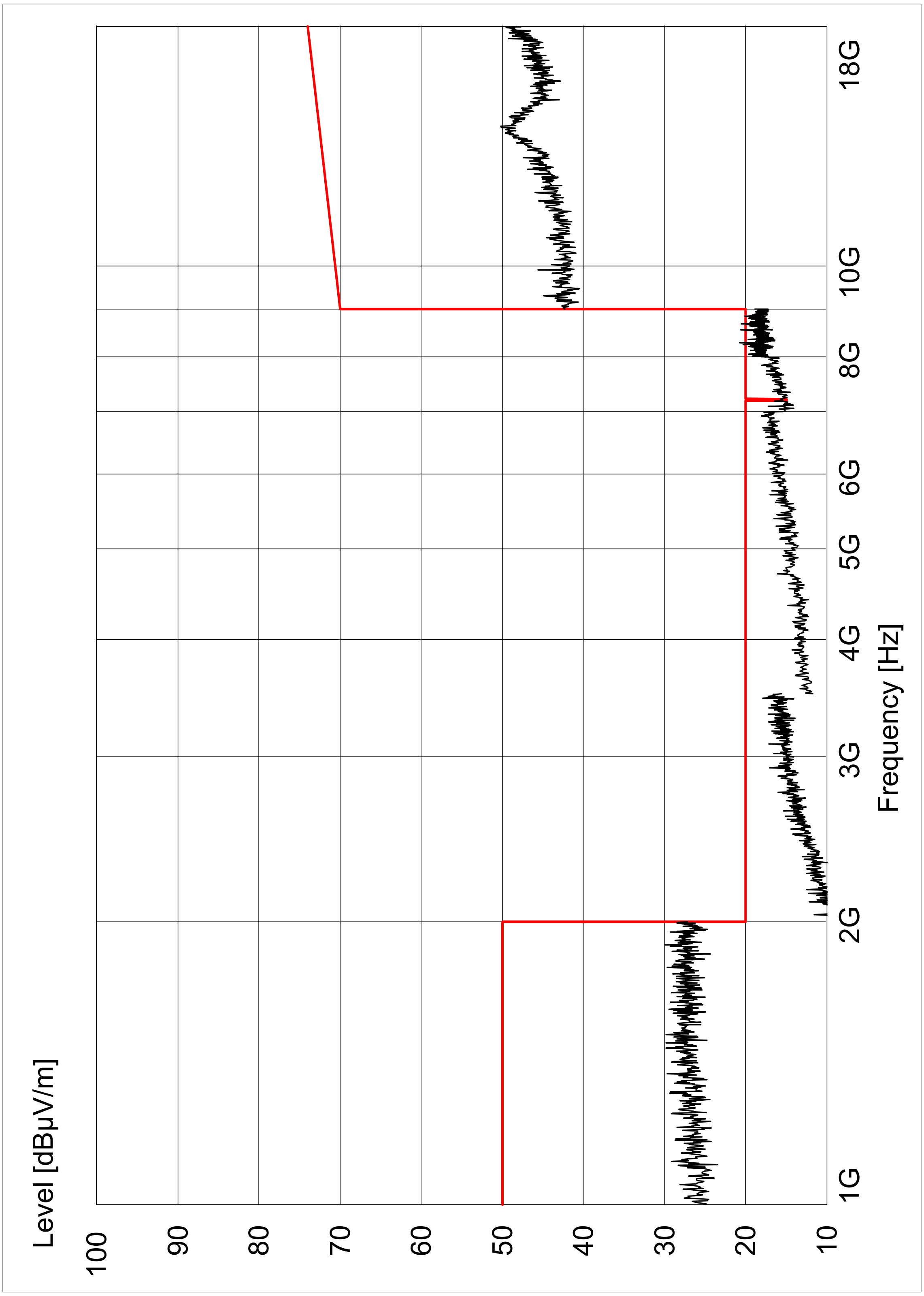
09-05-2008 15:13
Plot 24c Hifi noisy mode in Hifi location TWT on VP



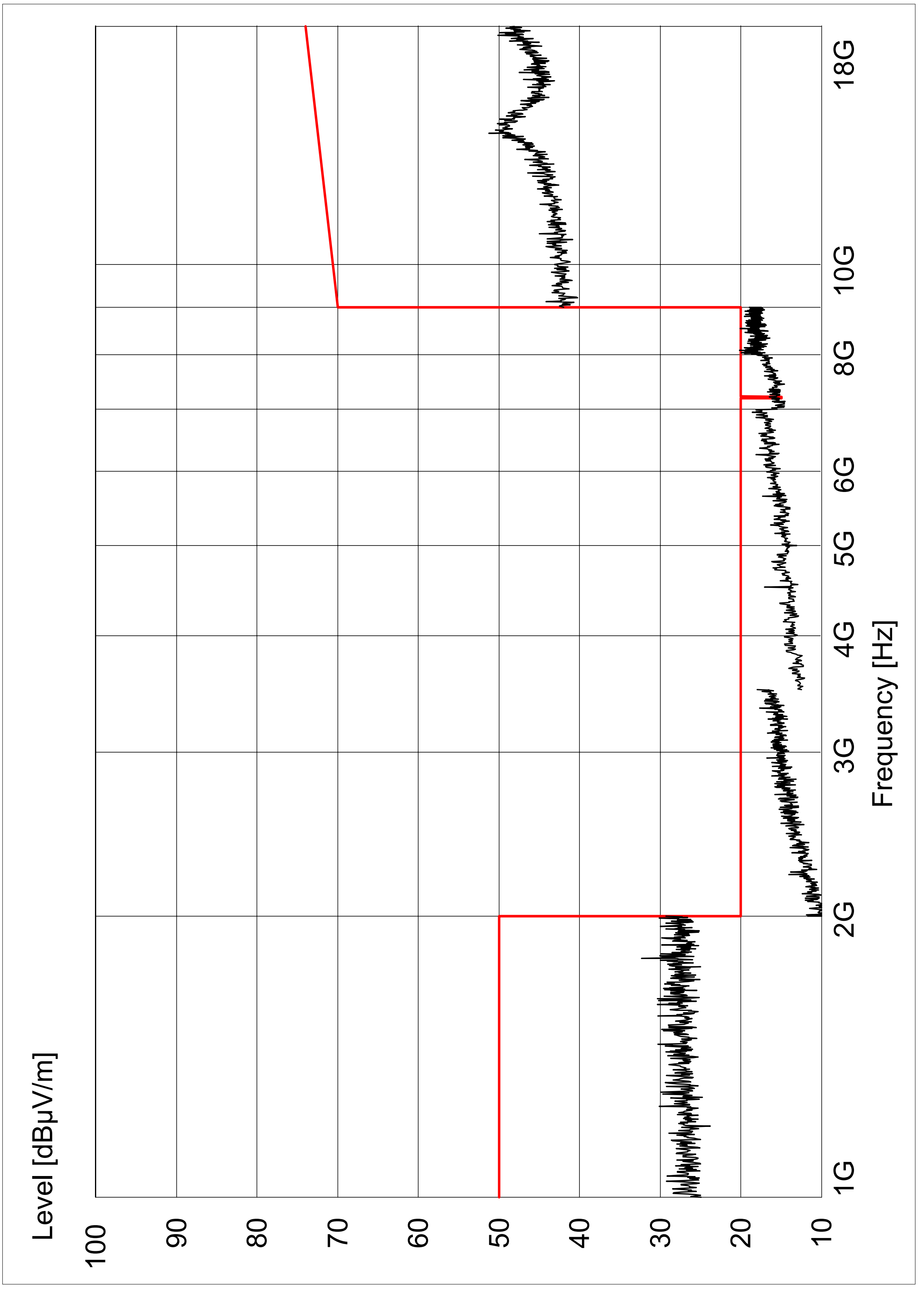
09-05-2008 15:13
Plot 24d Hifi noisy mode in Hifi location TWT on VP



09-05-2008 16:07
Plot 25 Hifi Off in Hifi location transp OFF VP



09-05-2008 16:40
Plot 26 Hifi Off in Hifi location transp OFF HP



Annex 5

Results of Auto-Compatibility Test

5 pages

Issued by A. Di Capua, 09/05/08

Autocomp Summary Table

Note:

IL Loss chain-1: 31.06 dB - to be subtracted from 'TTC SCOE LEVEL' in order to have RX-1 Input Level
IL Loss chain-2: 30.92 dB - to be subtracted from 'TTC SCOE LEVEL' in order to have RX-2 Input Level

Xpnd-1 Lock Acquisition:

Signal Strength (TTC SCOE LEVEL) [dBm]	Locked/NoLocked	AGC RMB20442 [dBm] / RAW	AGC RMB09442 [dBm] / RAW
-105.0	Locked	-152 / 28	-180.5 / 448
-105.3	Locked	-152 / 28	- 180.75 / 447
-105.6	Locked	-152 / 28	-181.75 / 445
-105.9	Locked	-152 / 28	-182 / 442
-106.2	Locked	-152 / 28	-182.25 / 441
-106.5	Locked	-152 / 28	-182.75 / 439
-106.8	Locked	-153 / 27	-183.25 / 437
-107.1	Locked	-153 / 27	-183.5 / 436
-107.4	Locked	-153 / 27	-184.25 / 433
-107.7	Locked	-153 / 27	-184.75 / 431
-108.0	Locked	-153 / 27	-185.25 / 429
-108.3	Locked	-153 / 27	-185.5 / 428
-108.6	Locked	-153 / 27	-186 / 426
-108.9	Locked	-153 / 27	-186.25 / 425
-109.2	Locked	-153 / 27	-186.5 / 424
-109.5	Locked	-153 / 27	-187 / 422
-109.8	Locked	-154 / 26	-187.25 / 421
-110.1	NO LOCKED	-155 / 25	-193.75 / 39

Xpnd-1 Lock Acquisition + Doppler Shift (+65 KHz):

Signal Strength (TTC SCOE LEVEL) [dBm]	Locked/NoLocked	AGC RMB20442 [dBm] / RAW	AGC RMB09442 [dBm] / RAW
-105.0	Locked	-151 / 29	-181 / 446
-105.3	Locked	-152 / 28	-181.5 / 444
-105.6	Locked	-152 / 28	-181.75 / 443
-105.9	Locked	-152 / 28	-182.25 / 441
-106.2	Locked	-153 / 27	-183 / 438
-106.5	Locked	-153 / 27	-183.25 / 437

-106.8	Locked	-153 / 27	-184 / 434
-107.1	Locked	-153 / 27	-184.25 / 433
-107.4	Locked	-153 / 27	-184.75 / 431
-107.7	Locked	-153 / 27	-185.25 / 429
-108.0	Locked	-153 / 27	-185.5 / 428
-108.3	Locked	-153 / 27	-185.75 / 427
-108.6	Locked	-153 / 27	-186.25 / 425
-108.9	Locked	-153 / 27	-186.5 / 424
-109.2	Locked	-154 / 26	-187 / 422
-109.5	NO LOCKED	-156 / 24	-194 / 394

Xpnd-1 TC Acquisition

Signal Strength (TTC SCOE LEVEL) [dBm]	Locked/NoLocked	Squelch	AGC RMB20442 [dBm] / RAW	AGC RMB09442 [dBm] / RAW	100 TCs accepted (Y / N)
-86	Locked	ON	-124.5 / 55	-124.62 / 834	Y
-86.3	Locked	ON	-125 / 54	-125.1 / 817	Y
-86.6	Locked	ON	-125.5 / 53	-125.53 / 805	Y
-86.9	Locked	ON	-126 / 52	-126.09 / 789	Y
-87.2	Locked	ON	-126.5 / 51	-126.72 / 775	Y
-87.5	Locked	ON	-127 / 50	-126.29 / 761	Y
-87.8	Locked	ON	-128 / 49	-127.74 / 749	Y
-88.1	Locked	ON	-128 / 49	-128.2 / 738	Y
-88.4	Locked	ON	-129 / 48	-128.95 / 723	Y
-88.7	Locked	ON	-130 / 47	-129.62 / 712	Y
-89.0	Locked	ON	-130.5 / 46	-130.38 / 701	Y
-89.3	Locked	ON	-131 /45	-131.2 / 690	Y
-89.6	Locked	ON	-132 /44	-132.6 / 669	Y
-89.9	Locked	ON	-132 /44	-132.6 / 669	N (99%)
-90.2	Locked	ON	-133 /43	-133.5 / 659	N (98%)

Xpnd-1 TC Acquisition + Doppler Shift (-65 KHz)

Signal Strength (TTC SCOE LEVEL) [dBm]	Locked/NoLocked	Squelch	AGC RMB20442 [dBm] / RAW	AGC RMB09442 [dBm] / RAW	100 TCs accepted (Y / N)
-88.0	Locked	ON	-128 / 49	-128.1 / 740	Y
-88.1	Locked	ON	-128 / 49	-128.1 / 738	Y
-88.4	Locked	ON	-129 / 48	-128.85 / 725	Y
-88.7	Locked	ON	-130 / 47	-129.5 / 714	Y
-89.0	Locked	ON	-130.5 / 46	-130.38 / 701	Y
-89.3	Locked	ON	-131 /45	-131.0 / 693	Y
-89.6	Locked	ON	-132 /44	-131.73 / 682	Y
-89.9	Locked	ON	-132 /44	-132.46 / 671	Y
-90.2	Locked	ON	-133 /43	-133.5 / 659	Y
-90.5	Locked	ON	-135 /42	-134.45 / 650	N (99%)
-90.8	Locked	ON	-137 /41	-135.5 / 640	N (96%)

XPND-1 RNG Group Delay:
5153 [ns]; Max Variation: 382.67 [ns]

XPND-1 TM Check: OK

XPND-2 Summary Table:

Xpnd-2 Lock Acquisition:

Signal Strength (TTC SCOE LEVEL) [dBm]	Locked / NoLocked	AGC RMB41442 [dBm] / RAW	AGC RMB10442 [dBm] / RAW
-106.0	Locked	-140 / 36	-141.5 / 565
-108.0	Locked	-140 / 36	-145.5 / 557
-108.3	Locked	-140 / 36	-146.5 / 555
-108.6	Locked	-140 / 36	-146.5 / 555
-108.9	Locked	-142 / 35	-147 / 554
-109.2	Locked	-142 / 35	-147.5 / 553
-109.5	Locked	-142 / 35	-148 / 552
-109.8	Locked	-142 / 35	-148.5 / 551
-110.1	No Locked	-144 / 34	-158 / 532

Xpnd-2 Lock Acquisition + Doppler Shift (+65 KHz):

Signal Strength (TTC SCOE LEVEL) [dBm]	Locked/NoLocked	AGC RMB41442 [dBm] / RAW	AGC RMB10442 [dBm] / RAW
-108.0	Locked	-140 / 36	-145.5 / 557
-108.3	Locked	-140 / 36	-146 / 556
-108.6	Locked	-140 / 36	-147 / 554
-108.9	Locked	-142 / 35	-147.5 / 553
-109.2	Locked	-142 / 35	-147.5 / 553
-109.5	Locked	-142 / 35	-148 / 552
-109.8	Locked	-142 / 35	-148.5 / 551
-110.1	No Locked	-144 / 34	-158.5 / 531

Xpnd-2 TC Acquisition

Signal Strength (TTC SCOE LEVEL) [dBm]	Locked/NoLocked	Squelch	AGC RMB41442 [dBm] / RAW	AGC RMB10442 [dBm] / RAW	100 TCs accepted (Y / N)
-89.0	Locked	ON	-123 / 49	-123.4 / 744	Y
-89.3	Locked	ON	-124 /48	-123.75 / 735	Y
-89.6	Locked	ON	-124 /48	-124.1 / 728	Y
-89.9	Locked	ON	-124.5 /47	-124.47 / 721	Y
-90.2	Locked	ON	-124.5 /47	-124.8 / 715	Y
-90.5	Locked	ON	-125 /46	-125.18 / 707	N (98%)

Xpnd-2 TC Acquisition + Doppler Shift (-65 KHz)

Signal Strength (TTC SCOE LEVEL) [dBm]	Locked/NoLocked	Squelch	AGC RMB41442 [dBm] / RAW	AGC RMB10442 [dBm] / RAW	100 TCs accepted (Y / N)
-89.0	Locked	ON	-123 / 49	-123.45 / 743	Y
-89.3	Locked	ON	-124 /48	-123.8 / 735	Y
-89.6	Locked	ON	-124.5 /47	-124.15 / 727	Y
-89.9	Locked	ON	-124.5 /47	-124.52 / 720	Y
-90.2	Locked	ON	-125 /46	-124.84 / 714	Y
-90.5	Locked	ON	-125 /46	-125.23 / 706	Y
-90.8	Locked	ON	-126 /45	-125.5 / 700	Y
-91.1	Locked	ON	-126 /45	-125.5 / 700	N (97%)

XPND-2 RNG Group Delay:

5176.91 [ns]; Max Variation: 382.45 [ns]

XPND-2 TM Check: OK

Annex 6

Functional AIT 'AS-RUN' Procedures

Content:

1. Filled-in 'Herschel EGSE, Satellite & Instrument Procedure for EMC Radiated Test '; HP-2-ASED-PR-0116, Issue 1, Start of formal run

90 pages

2. Filled-in 'Herschel EGSE, Satellite & Instrument Procedure for EMC Radiated Test '; HP-2-ASED-PR-0116, Issue 1, Continuation of formal run

96 pages

3. Filled-in 'Leading Procedure for Herschel integrated Satellite Test '; HP-2-ASED-TP-0134, Issue 1, Switch-ON prior to Try Runs

129 pages

4. Filled-in 'Leading Procedure for Herschel integrated Satellite Test '; HP-2-ASED-TP-0134, Issue 1, Switch-ON after Safety Loop and Switch-OFF after RE test

129 pages

START OF FORMAL RUN

1

EADS astrium

Procedure

Herschel

AS RUN SVM/INSTRUMENT HANDLING + AUTOCOMP PROCEDURE FOR EMC RE/AUTOCOMP TESTING

08 May ~~2008~~

RE With SPIRE NOISY + antenna TOWARDS SPIRE

Title: **Herschel EGSE, Satellite & Instrument Procedure for the EMC Radiated Emission and RF AutoCompTests**

CI-No: 100000

2008_05_08_04_12_....EMC_RE

Prepared by:	A Di Capua	A. Di Capua	07/05/08
	P Modesto		Date: 07/05/08
Checked by:	M Koelle	M. Koelle	07/05/08
AIT:	R. Hohn		07/05/08
Engineering:	D Priestley		07/05/08
Product Assurance:	R. Stritter	pp.	8/5/08.
Configuration Control:	W. Wietbrock		
Project Management:	Dr. W. Fricke		08/05/08
Approved by TAS-F:	D Montet		08/05/08

Distribution: See Distribution List (last page)

Issue	Date	Sheet	Description of Change	Release
1	06.05.2008		Initial Version (HIPT and ESA comments incorporated)	0

Table of Content

1 Scope

1.1 Objective

This Procedure details the EGSE and Satellite activities to be performed during the Herschel S/C level Conducted EMC Radiated Emission and RF Auto-compatibility tests.

1.2 Operational Flow

Chapter 8 provides the detailed step-by-step test procedure.

2 Documents/Drawings

This document incorporates, by dated or undated references, provisions from other publications. These normative references are cited at appropriate places in the text and publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these apply to this document only when incorporated into it by amendment or revision. For undated references, the latest edition of the publication referred to apply.

2.1 Applicable Documents

AD-1	Herschel radiated FM Sat EMC Test Procedure	H-P-2-ASED-TP-0180
AD-2	Herschel SAT Emergency Switch Off Procedure	H-P-2-ASED-PR-071
AD-3	Procedure for setup and operation of the HIFI cooling system	HP-2-ASED-PR-125
AD-4	Herschel IST Leading Procedure (Issue 4)	HP-2-ASED-TP-0134

2.2 Reference Documents

RD-1	Herschel PCDU & CDMS nominal switch on / off procedure	HP-2-ASED-PR-0070
RD-2	PACS EMC Test Procedure on Integrated System Level, Issue 1.5	PACS-ME-TP-032
RD-3	HIFI conducted emissivity procedures for IST tests, Issue 1.5.3	SRON-G/HIFI/PR/2007-019
RD-4	SPIRE Warm Units EMC Conductive Emissions Procedures for IST, Issue 1.1 Redlined	SPIRE-RAL-PRC-002946
RD-5	PACS I-EGSE User Manual, Issue 1, 19-Jul-2007	PICC-ME-MN-010
RD-6	HIFI IEGSE setup procedure	SRON-U/HIFI/PR/2007-005
RD-7	SPIRE I-EGSE Set-Up, Issue 2.2	SPIRE-RAL-DOC-002841
RD-8	FIRST/PLANCK Instrument Interface Document part A	PT-IID-A-04624
RD-9	FIRST/PLANCK Instrument Interface Document part B (HIFI)	PT-IIDB/HIFI-02125
RD-10	FIRST/PLANCK Instrument Interface Document part B (PACS)	PT-IIDB/PACS-02126
RD-11	FIRST/PLANCK Instrument Interface Document part B (SPIRE)	PT-IIDB/SPIRE-02124
RD12	LO SFT Procedure using LO Dummy, Issue 1.01	MPIfR/HIFI/PR/2006-565
RD13	HIFI switch on procedure	SRON-G/HIFI/PR/200707-1.5.3
RD-14	Herschel FM Spacecraft EMC Test Requirements Specification (Issue 4)	H-P-2-ASP-TS-0819
RD-15	Test Readiness Review: Herschel FM S/C Radiated Emissions / Auto-Compatibility Test	H-P-TASF-MN-10395

2.3 Acronyms

TBS To Be Supplied

3 Requirements to be verified

As set out in requirements document RD-14 and with redline clarification in minutes RD-15.

4 Configuration

4.1 Herschel S/C Configuration

4.1.1 Hardware Configuration

See Herschel IST Procedure Leading Procedure HP-2-ASED-TP-0134

4.1.2 Software Configuration

The EGSE, SVM & Instruments switch on / off will be run with the following on-board software configuration:

1. CDMS OBSW: 3.4
2. ACMS OBSW:3.7

4.1.3 Test Configuration

4.1.3.1 SVM

See Herschel IST Procedure Leading Procedure HP-2-ASED-TP-0134

4.1.3.2 HIFI

N/A

4.1.3.3 PACS

N/A

4.1.3.4 SPIRE

N/A

4.1.4 Simulated Equipments

N/A

5 Conditions

5.1 Personnel

See AD-1 chapter 4.7

5.2 Environmental

See AD-1 chapter 4.2

5.3 General Precautions and Safety

5.3.1 General Safety Requirements, Precautions

- For HIFI, Handling precautions according to RD-8 and RD-9 are applicable.
- For PACS, Handling precautions according to RD-8 and RD-10 are applicable.
- For SPIRE, Handling precautions according to RD-8 and RD-11 are applicable.

5.3.2 Special condition and hazards

The following Operational restrictions shall be carefully taken into account:

- In case of any failure, the activities shall be stopped until troubleshooting plan is generated and approved.

A general constraint for all instrument DPUs (or ICU in the case of HIFI), there shall be a 5 minute wait between switching off a DPU/ICU and switching it back on again.

5.3.2.1 HIFI

None when powering on/off HIFI ICU only as per sections XXX.
When operating HIFI using the full configuration, ref. sections XXX the following applies:

1. Connection/Disconnection with the HIFI I-EGSE is required as per section XXX.
2. The following Cryo temperature limits shall be observed when operating HIFI:

S/C Environmental	Limits	Actual
Cryostat Connection (Valves)	N/A	
Cryostat Status (HeI/HeII)	N/A	
Cryostat Level 0 Temp (T107 - CCUB)	<20K	
Cryostat Level 1 Temp (T231-T237 - CCUB)	<20K	
Cryostat Level 2 Temp (T207 read from CryoSCOE)	<=40K	
Cryostat Level 3 Temp	N/A	

The following shall be observed if HIFI is commanded to "Standby1" mode or above:

If switched on the WBS laser temperature (HM023193 HWH_Laser_T and HWV_Laser_T) may rise above a red limit (30degC) in the MIB. If this occurs the test can continue, but the time of occurrence should be logged. If the temperature rises to 35degC the lasers will be automatically switched off by the instrument. It is recommended to start active cooling of the HIFI panel see AD-2 before the WBS laser temperatures reach 30degC to avoid "HIGH HIGH" alarms being reported repeatedly and unnecessarily by the HPCCS. NB: If temperature trend is rising during the test then Cooling on HIFI panel may need to be adjusted (ref. AD-2).

5.3.2.2 PACS

Prior to switching ON PACS, PACS specific OBCPs & EATs shall be loaded and enabled on the CDMU. Note: the PACS power on scripts will prompt for confirmation of this before allowing the operator to continue with power on of the instrument.
CDMU must be in AFO mode for the duration of PACS operations. Note this maybe extended to all instruments in the future.
Note during power off of PACS FDIR may be triggered due to expected (5,2) events being reported from PACS DPU. To avoid this PACS specific OBCPs are disabled for the duration of the power down sequence, and then re-enabled.

5.3.2.3 SPIRE

None

5.3.3 ESD constraints

Normal clean-room conditions.

5.4 Special QA Requirements

No special requirements.

5.5 GSE

The spacecraft is mounted on an adaptor sitting on an EMC wooden palette.

5.5.1 MGSE

N/A

5.5.2 CVSE

N/A

5.5.3 EGSE

5.5.3.1 EGSE Hardware Configuration

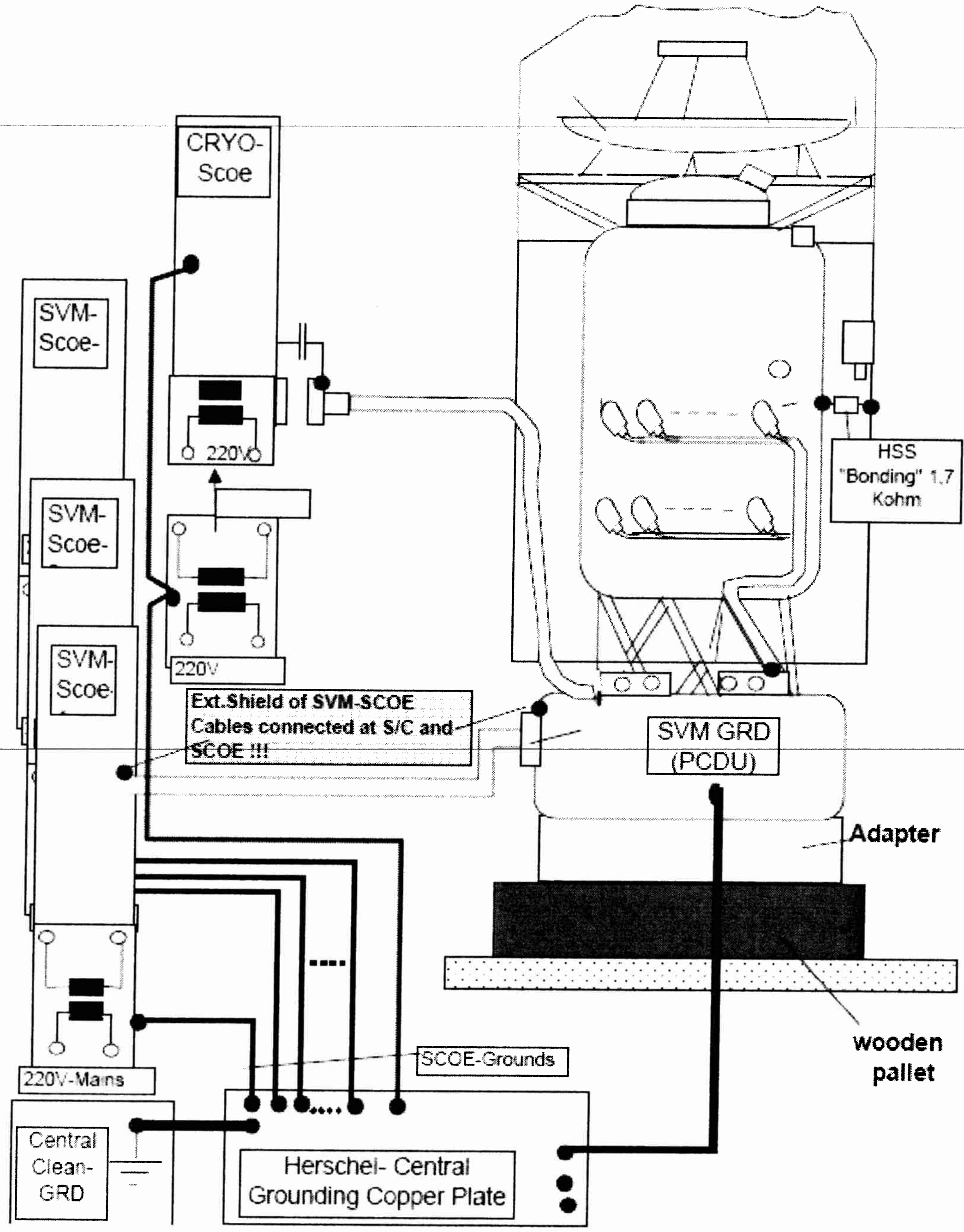
S/S	Unit	Configuration			SCOE simulated eqpts	Remarks
		Herschel				
EGSE	CCS	1				
	TM/TC DFE	1				
	POWER SCOE	1				

See RD-15 for full list.

5.5.3.2 EGSE User Software

Item	Version
CCS	HPCCS 2.0-1166.
HPSDB	*HPSDB v 3.3.1.24* File: R_TM_HERSCH_FM9_711071940 with patches

5.5.3.3 Grounding Configuration



5.5.3.4 Test Equipment

Special test equipment is supplied by ETS.

5.5.3.5 Data Acquisition System

N/A

5.5.4 OGSE

N/A

5.5.5 Special Equipment

N/A

6 Verification Requirements and Test Criteria

PASS/FAIL CRITERIA

At each test stage completion, the test success is determined comparing the results obtained against the expected values.
If the compliance between obtained and expected values has been met, and authorization to proceed with the next stage of the test is given, then the actual test stage must be considered satisfactory completed.

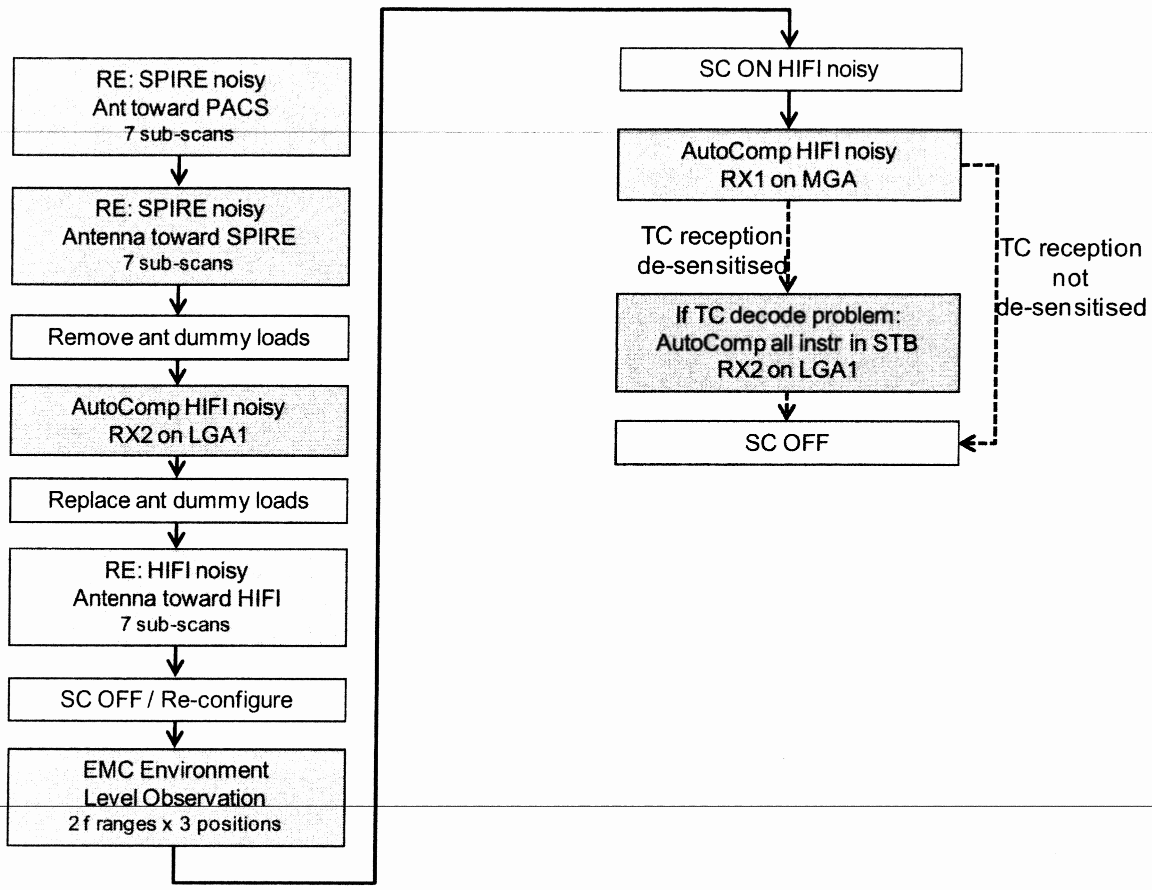
The success of the overall testing activities is determined from the satisfactory completion of all test stages.

Successful criteria to be satisfied in each test stage shall be:

See AD-1 chapter 4.5.3

Verification that the TM(5,2), TM(5,4) and TM(1,8) received event reports are only those ones expected to fulfill the pass test criteria.

7 General Test Flow



8 Test Execution Step-by-Step Procedure

8.1 Radiated FM SAT EMC

8.1.1 A.1 Switch satellite EGSE into the REFERENCE mode Configuration according to the AD-1 configuration table in chapter 3.2 & 3.3

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
10	Check that Skin Configuration is the one reported in ANNEX 2 of this procedure						
20	Switch on scoe to allow EMC team to perform the ambient noise (SC OFF)						
30	Perform Herschel IST Leading Procedure HP-2-ASED-PR-0134 From the test conductor : Write Callasync Z010999MCVT003_IST_START EMC				In the Chapter 7.2.4.2(ACMS ON) Perform only the steps: 1,2(IST_EMC),3,4,8,9,10		
40	OPERATOR WARNING In the Chapter 7.2.4.2(ACMS ON) Perform only the steps: 1,2(IST_EMC),3,4,8,9,10						
50	Perform test script D102159SCVT226_EMC_SETUP						

NOTE THAT WHETHER ANNEX 2 IS USED (FOR RE) OR ANNEX 3 (FOR 'AUTOCOMP') IS UNDER THE CONTROL OF THE TEST CONDUCTOR, TEST DIRECTOR OR EMC EXPERT (M. BURLAS)

Test location:		Operator:		QA:		Date/Time:	

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
60	D102159SCVT226_EMC_SETUP Click “End TS “ to continue						
70	OPERETOR INFO Communicate to the EMC TEAM that the SC is switched on and ready to start EMC						
80	Z010999MCVT200_EMC The EGSE and SVM are now set Click in window the button "OK" to proceed						

Test location:		Operator:		QA:		Date/Time:	

8.1.2 *PACS Instrument Procedures*

8.1.2.1 PACS OFF to Standby (SAFE)

The following will switch ON and configure PACS Prime instrument in SAFE mode in any satellite configuration (i.e. warm, or Cold HeI/HeII). HKTM packets will be generated on APIDs 1152 dec and 1154 decimal (these can be observed using TMPH with corresponding filter – note however a limited number of TMPHs should be running at any one time).

Step-No.	*Test-Step-Description*	*Nominal Value*	*Actual Value*	*Remarks*	*P*	*N*
1.	On HPCCS start Packet History displays for the following APIDs: 1152, 1154	OK				
2.	*From the HPCCS test conductor console start the test script to power PACS Prime to SAFE:* ***Z102999SCVT010_ASDGEN_PACSPWRON_P***					
3.	On HPCCS when prompted: `"FM PACS Switch ON in Warm or Cold conditions, FPU connected - Select NO to abort TS if not correct"`	YES				

Test location:		Operator:		QA:		Date/Time:	

Step-No.	*Test-Step-Description*	*Nominal Value*	*Actual Value*	*Remarks*	*P*	*N*
4.	On HPCCS when prompted: `" PACS FDIR OBCPs/EATs loaded and enabled? - If not select NO to abort TS"`	YES				
	If in any doubt about the script being executed **NO** should be selected to abort the script. Before restarting consult the relevant instrument support engineer to confirm the correct script to be used for the test in question.					
	If **YES** is selected the test script will go on to automatically power on all PACS warm units, force boot the DPU ASW and configure the instrument to SAFE (Standby mode)					
5.	*If AFO mode not already selected for CDMU the script **P102999SCVT905_ASDISTPACS_PWR_ON_N** will prompt that AFO will be commanded next.* *Click **OK** to continue the script if the prompt appears.*	OK				

Test location:		Operator:		QA:		Date/Time:	

Step-No.	*Test-Step-Description*	*Nominal Value*	*Actual Value*	*Remarks*	*P*	*N*
6.	On HPCCS when all autonomous actions have been completed by the power on script **P102999SCVT905_ASDISTPACS_PWR_ON_N** it will prompt: "`Set Bus Profile Back to Original Setting?`" Select **YES** if it is likely that other non-PACS instrument related activities are to be performed, otherwise select **NO**.	NO				
7.	If **YES** selected the original Bus Profile will be restored. However note that if the original Bus Profile was 0 (launch) the script will automatically leave the Bus Profile unchanged as this profile is not compatible with instruments being powered in Standby, in which case the following prompt will appear: "`Bus Profile left unchanged, as original setting 0 (Launch)`" If prompted select **OK** to continue	OK				

Test location:		Operator:		QA:		Date/Time:	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
8.	If **NO** selected then at the prompt: `"Bus Profile left unchanged"` Select **OK** to continue	OK				
9.	*The script will automatically terminate*	OK				
10.	*Verify HK TM packets are being received on APIDs 1152 & 1154*	OK				
11.	*Either using the ANDs indicated verify the correct status of the following PACS specific TM parameters or if the IEGSE is connected request IEGSE Operator to confirm that PACS is in SAFE mode:* **DM_BOL_REC_PAC (PM038420)** is incrementing	Incrementing		AND: PA019420		
12.	***PACS in SAFE mode.*** ***Return to calling Procedure***	OK				

Test location:		Operator:		QA:		Date/Time:	

8.1.2.2 Transition from Standby to PACS Noisiest Mode

N/A

8.1.2.3 Transition from PACS Noisiest Mode to Standby

N/A

Test location:		Operator:		QA:		Date/Time:	

8.1.2.4 PACS Standby (SAFE) to OFF

The following procedure will switch PACS Prime from SAFE to OFF.

Step-No.	***Test-Step-Description***	***Nominal Value***	***Actual Value***	***Remarks***	***P***	***N***
1.	From the HPCCS test conductor console start the test script to power OFF PACS Prime from SAFE: **Z102999SCVT011_ASDGEN_PACSPWROFF_P**					
2.	On HPCCS when prompted: `"FM PACS Switch OFF in Warm or Cold conditions, FPU connected - Select NO to abort TS if not correct"`	YES				
	If in any doubt about the script being executed **NO** should be selected to abort the script. Before restarting consult the relevant instrument support engineer to confirm the correct script to be used for the test in question.					
	If **YES** is selected the test script will go on to automatically power off all PACS warm units.					
3.	Note: During switch off of PACS (5,2) TM event packets are expected	(5,2) events observed				

Test location:		Operator:		QA:		Date/Time:	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
4.	On HPCCS when all autonomous actions have been completed by the power on script **P102999SCVT906_ASDISTPACS_PWR_OFF_N** it will prompt: "Set Bus Profile Back to Original Setting?"	NO				
5.	Select **YES** if it is likely that other non-PACS instrument related activities are to be performed. However note that if the original Bus Profile was 0 (launch) the script will automatically leave the Bus Profile unchanged as this profile is not compatible with instruments being powered in Standby: "Bus Profile left unchanged, as original setting 0 (Launch)"	OK				
6.	If **NO** selected then at the prompt: "Bus Profile left unchanged" Select OK to continue	OK				

Test location:		Operator:		QA:		Date/Time:	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
7.	On HPCCS stop Packet History displays for the following APIDs:1152,1154	OK				
8.	PACS OFF. Return to calling Procedure	OK				

Test location:		Operator:		QA:		Date/Time:	

8.1.3 SPIRE Instrument Procedures

8.1.3.1 SPIRE OFF to Standby (REDY)

The following will switch ON and configure SPIRE Prime instrument in REDY (Standby) mode. HKTM packets will be generated on APIDs 1280 dec and 1282 decimal (these can be observed using TMPH with corresponding filter – note however a limited number of TMPHs should be running at one time).
During power on of SPIRE a number of soft/hard OOLs are reported due to the sequential switch on of the units. This is expected and will clear when SPIRE is in REDY mode. When in REDY mode one parameter remains OOL (soft) namely SMD2V505 this is also expected.

Step-No.	*Test-Step-Description*	*Nominal Value*	*Actual Value*	*Remarks*	*P*	*N*
1.	On HPCCS start Packet History displays for the following APIDs:1280,1282	OK				
2.	*From the HPCCS test conductor console start the test script to power SPIRE Prime to REDY:* ***Z102999SCVT004_ASDGEN_SPIREPWRON_P***					
3.	On HPCCS when prompted: `“SPIRE Switch ON for IST activities in any conditions - Select NO to abort TS if not correct”`	YES				

Test location:		Operator:		QA:		Date/Time:	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
4.	If in any doubt about the script being executed **NO** should be selected to abort the script. Before restarting consult the relevant instrument support engineer to confirm the correct script to be used for the test in question.					
5.	If **YES** is selected the test script will go on to automatically power on all SPIRE warm units, force boot the DPU ASW and configure the instrument to REDY (Standby mode).					
6.	*On HPCCS when all autonomous actions have been completed by the power on script* ***S102999SCVT017_ASDGENSPIR_PWR_ON_P*** *it will prompt:* `“Set Bus Profile Back to Original Setting?”`	NO				

Test location:		Operator:		QA:		Date/Time:	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
7.	Select **YES** if it is likely that other non-SPIRE instrument related activities are to be performed. *However note that if the original Bus Profile was 0 (launch) the script will automatically leave the Bus Profile unchanged as this profile is not compatible with instruments being powered in Standby:* `"Bus Profile left unchanged, as original setting 0 (Launch)"`	OK				
8.	If **NO** selected then at the prompt: `"Bus Profile left unchanged"` Select OK to continue	OK				
9.	*Verify HK TM packets are being received on APIDs 1280 & 1282*					
10.	Either using the ANDs indicated verify the correct status of the following SPIRE specific TM parameters or if the IEGSE is connected request IEGSE Operator to confirm that: THSK (SM00T500) parameter refreshing @ 0.25 Hz	OK		**AND: SA_1_559**		

Test location:		Operator:		QA:		Date/Time:	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	TM1N and TM2N parameters are incrementing as indicated: TM1N (SMT0N500) by 2 every 4 secs TM2N (SMT1N500) by 1 every 4 secs MODE parameter is set to "REDY" mode (RAW value 0x0200)	OK SM00M500 = 0x0200 (REDY)				
11.	***SPIRE powered and in REDY mode*** ***Return to calling Procedure***					

Test location:		Operator:		QA:		Date/Time:	

8.1.3.2 Transition from Standby to SPIRE Noisiest Mode

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
1.	If SPIRE Prime Bus Profile not selected then send the following command from manual command stack: **DC819160** **DH049160=3**	**AND: ZAD07999** **DEF5F160=3**			ok
2.	Execute TCL script SPIRE-IST-EMC-RE-STBY2PHOTOPS.tcl – Issue 1.1	—	—	—	ok
3.	Check that THSK parameter is refreshing every second	THSK	Refreshing @ 1Hz	— 1 sec	ok
4.	Check that TM1N and TM2N parameters are incrementing as indicated	TM1N TM2N	@ 0.5Hz @ 1Hz	— 2 sec — 1 sec	ok
5.	Check that the Photometer LIAs have switched on	PLIABITSTAT	0/1	1	ok
6.	Check that the BSM sensors have switched on	CHOPSENSPWR JIGGSENSPWR	0/1 0/1	1 1	ok
7.	Check that the SMEC sensors are switched on	SMECENCPWR SMECLVDTPWR	0/1 0/1	1 1	ok
8.	Check that TM3N is incrementing as indicated	TM3N	~18-20 Hz	— ≃ 20Hz	ok

Test location:	ESTEC	Operator:		QA:		Date/Time:	08/05/08 14:20

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
9.	Check that TM5N is incrementing as indicated	TM5N	Incrementing by ~4-5 every 2 seconds	— 5	ok
10.	Check that DCUFRAMECNT and MCUFRAMECNT on the FUNCTIONAL TEST PARAMETERS AND are incrementing as indicated	DCUFRAMECNT MCUFRAMECNT	~18-20 Hz Incrementing by ~96-100 every 2 seconds	— 18 Hz — 97	ok
11.	Check that the MODE parameter is set to RAW value 0xFFCD for the "PHOTOPS" mode *Note that "PHOTOPS" is a dummy value for the EMC RE activities – no converted value is defined.*	MODE	REDY (0x200) / 0xFFCD = 65485	=> ok	ok
12.	***Notify EMC Test Conductor SPIRE in noisest mode. Return to calling procedure***	OK	ok	ok	ok

Test location:	EstEC	Operator:	[signature]	QA:	[signature]	Date/Time:	8/05/08 14:21

8.1.3.3 Transition from SPIRE Noisiest Mode to Standby

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
1.	Execute TCL script SPIRE-IST-EMC-RE-PHOTOPS2STBY.tcl – Issue 1.0	—	—	—	OK
2.	Check that the THSK parameter is refreshing every 4 seconds	THSK	Refreshing @ 0.25Hz	—	OK
3.	Check that TM1N and TM2N parameters are incrementing as indicated	TM1N	Incrementing by 2 every 4 seconds	—	OK
		TM2N	Incrementing by one every 4 seconds		OK
4.	Check that TM3N and TM5N have stopped incrementing	TM3N	—	—	OK
		TM5N	—	—	OK
5.	Check that DCUFRAMECNT and MCUFRAMECNT on the FUNCTIONAL TEST PARAMETERS AND have stopped incrementing	DCUFRAMECNT	—	—	OK
		MCUFRAMECNT	—	—	OK

Test location:	ESTEC EMC	Operator:	[signature]	QA:	[signature]	Date/Time:	8/5/08 18:03

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
6.	Check that SPIRE is in REDY mode (RAW 0x200)	MODE	0xFFCD/0x200 (REDY)	REDY	OK
7.	Check that the Photometer LIAs are switched off	PLIABITSTAT	1/0	0	OK
8.	Check that the BSM sensors have switched off	CHOPSENSPWR JIGGSENSPWR	1/0 1/0	0 0	OK OK
9.	Check that the SMEC sensors are switched off	SMECENCPWR SMECLVDTPWR	1/0 1/0	0 0	OK OK
10.	***Notify EMC Test Conductor SPIRE in Standby (REDY) mode. Return to calling procedure***	OK		OK	OK

* PERFORM PVS #1 - REMOVE CAPS IN PARRALLEL PERFORM ACS 333
* THEN ON COMPLETION OF ACS 333 START AUTO COMP PERFORM PVS #2

SC SAFETY LOOP TRIGGERED NCR 4207

Test location:	ESTEC EMC	Operator:	[signature]	QA:	BHOBB	Date/Time:	08/05/08 18:04

* PVS 3 - SAFETY LOOP RECOVERY OF SC

8.1.3.4 SPIRE Standby (REDY) to OFF

The following procedure will switch SPIRE Prime from REDY to OFF.

Step-No.	*Test-Step-Description*	*Nominal Value*	*Actual Value*	*Remarks*	*P*	*N*
1.	From the HPCCS test conductor console start the test script to power OFF SPIRE Prime from REDY: **Z102999SCVT005_ASDGEN_SPIREPWROFF_P**	OK				
2.	On HPCCS when prompted: `“SPIRE Switch OFF for IST activities in any conditions - Select NO to abort TS if not correct”`	YES				
3.	If in any doubt about the script being executed **NO** should be selected to abort the script. Before restarting consult the relevant instrument support engineer to confirm the correct script to be used for the test in question.					
4.	If **YES** is selected the test script will go on to automatically power off all SPIRE warm units.					

Test location:		Operator:		QA:		Date/Time:	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
5.	During Switch OFF of SPIRE the following (5,1) and (5,4) event messages on APID 1280 are expected and do not indicate a problem: a) EVID 1313 No_MCU_Response_Error b) EVID 21773 ALARM_LSMCU_DEAD					
6.	*On HPCCS when all autonomous actions have been completed by the power on script* ***S102999SCVT019_ASDGENSPIR_PWR_OFF_P*** *it will prompt:* "`Set Bus Profile Back to Original Setting?`"	NO				
7.	Select **YES** if it is likely that other non-SPIRE instrument related activities are to be performed. *However note that if the original Bus Profile was 0 (launch) the script will automatically leave the Bus Profile unchanged as this profile is not compatible with instruments being powered in Standby:* "`Bus Profile left unchanged, as original setting 0 (Launch)`"	OK				

Test location:		Operator:		QA:		Date/Time:	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
8.	If **NO** selected then at the prompt: `"Bus Profile left unchanged"` Select OK to continue	OK				
9.	On HPCCS stop Packet History displays for the following APIDs:1280,1282	OK				
10.	***SPIRE OFF.*** ***Return to calling Procedure***					

Test location:		Operator:		QA:		Date/Time:	

8.1.4 *HIFI Instrument Procedures*

8.1.4.1 HIFI OFF to Standby

The following will switch ON and configure HIFI Nominal instrument in Standby1 mode. HKTM packets will be generated on APIDs 1024 dec and 1026 decimal (these can be observed using TMPH with corresponding filter – note however a limited number of TMPHs should be running at one time).
During power on of HIFI a number of soft/hard OOLs are reported due to the sequential switch on of the units. Some of these are to be expected when in Hel conditions and the others are expected because the unit is typically cold at switch ON.

Parameters OOL when in Hel:
HM248191 – HF_AP_2K_IF_CT
HM243191 – HF_APR_SCCS_CT
HM244191 – HF_APR_S10K_CT
HM250191 – HF_AP_4K_END_CT

Parameters OOL expected to come back in limits when units warmed up:
HM187192 – HRV_ACS_1_T
HM188192 – HRV_AVS_2_T
HM062192 – HRH_ACS_1_T
HM063192 – HRH_AVS_2_T

Parameter OOL until HIFI powered in Standby1
HD247194 – HL_ptv_checksum
HM258194 – HL_MODE_S
HM259194 – HL_error_word_S

Test location:		Operator:		QA:		Date/Time:	

Some additional parameters may exhibit OOL during the test:

Parameter OOL expected during test but which should be monitored for duration of test (should be kept below 30degC to avoid HIGH-HIGHs being reported):
HM062193 – HWV_Laser_T
HM023193 – HWH_Laser_T

Parameter OOL expected during test but which need not be monitored:
HM022193 – HWH_CCD_T
HM061193 – HWV_CCD_T

Step-No.	*Test-Step-Description*	*Nominal Value*	*Actual Value*	*Remarks*	*P*	*N*
1.	If not already on, Switch on & configure HIFI I-EGSE i.a.w. **RD-6**, and configure for nominal and FPU cold and LOU warm without attenuators	OK				
2.	From HPCCS Test Conductor console issue command to connect to HIFI I-EGSE **connect HHIFIEGSE**	YZS27940 = CONNECTED		**AND SYS_PARS**		
	Perform the following two steps if command parameter exchange is required between the IEGSE and HPCCS for the test concerned.					

Test location:		Operator:		QA:		Date/Time:	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
3.	If not already running from the HPCCS test conductor console execute the test script: **ALL_SubscribeParams**					
4.	Verify HPCCS-IEGSE connection by sending the following test command from manual command stack (repeater value 0) and verify received OK on IEGSE: **YC00X962**	OK				
5.	Patch HIFI synthetic parameters for warm conditions by executing the following scripts: **HIFIST_ASED_PatchPtvChecksum** **HIFIST_ASED_PatchTempLimits** Note these scripts replace HIFIST_CCS_conf_ptv_checksum_warm due to NCR-3652	OK				
8.	On HPCCS start Packet History displays for the following APIDs:1024,1026	OK				

Test location:		Operator:		QA:		Date/Time:	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
9.	From the HPCCS test conductor console start the test script: **Z102999SCVT014_ASDGEN_HIFIPWRON_P**	OK		ANDs HA000289 HA004289		
10.	On HPCCS when prompted: "FM HIFI Switch ON for IST or SFT in Hel/Hell conditions with warm LOU - Select NO to abort TS if not correct"	YES				
	The test script will go on to automatically power on all HIFI warm units, force boot the DPU ASW and configure the instrument to Standby.					
11.	At prompt to record OBS_ID_per_hk during subsequent table readback commanding (which starts when OK is pressed); record value of HM003190 (typical reading = 9000xxxx hex), Note: at start & end value is 90000000 hex "Select OK to continue" Select OK	OK				

Test location:		Operator:		QA:		Date/Time:	

Step-No.	***Test-Step-Description***	***Nominal Value***	***Actual Value***	***Remarks***	***P***	***N***
12.	Value of OBS_ID during table read commanding. Give both Hex and Dec values: : **HM003190**		Hex <OBSID>= Dec <OBSID>=	AND: HA000289		
13.	Request the nominated I-EGSE operator to run the command 'verifyreadback <OBSID>' from a terminal window (opened from the terminal icon " >_ " at bottom left of HIFIEGSE workstation screen) using the **Dec <OBSID>** value retrieved in the previous step. If the word **PASS** does not appear on the screen at the end of the verifyreadback, this is a nogo on this test procedure. If OK respond to prompt accordingly, otherwise contact SRON to investigate and resolve before continuing.	OK				

Test location:		Operator:		QA:		Date/Time:	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
14.	*On HPCCS when all autonomous actions have been completed by the power on script H102999SCVT015_ASDISTHIFI_PWR_ON_P it will prompt:* *"Set Bus Profile Back to Original Setting?"*	NO				
15.	*Select YES if it is likely that other non-HIFI instrument related activities are to be performed.* *However note that if the original Bus Profile was 0 (launch) the script will automatically leave the Bus Profile unchanged as this profile is not compatible with instruments being powered in Standby:* *"Bus Profile left unchanged, as original setting 0 (Launch)"* *Select OK to continue*	OK				

Test location:		Operator:		QA:		Date/Time:	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
16.	If NO selected then at the prompt: "Bus Profile left unchanged" Select OK to continue	OK				
17.	Verify HK TM packets are being received on APIDs 1024 & 1026	OK				
18.	Start HIFI Panel Active Cooling as per procedure AD-3	OK				
19.	**HIFI Nominal powered and ready mode** **Return to calling procedure**	OK				

Test location:		Operator:		QA:		Date/Time:	

8.1.4.2 Transition from Standby to HIFI Noisiest Mode

Running the following procedure will configure HIFI from STANDBY to Noisest mode for EMC RE

Step-No.	***Test-Step-Description***	***Nominal Value***	***Tolerance***	***Actual Value***	***Remarks***	***P***	***N***
1.	Confirm HIFI nominal is powered on and in PRIMARY mode	OK			AND: HA003289		
2.	*If HIFI Prime Bus Profile not selected then send the following command from manual command stack:* **DC819160** **DH049160=2**	OK			AND: ZAD07999 PAR: DEF5F160		
3.	*Execute test script:* *HIFIST_nom_IST_Init_6b_key_warm*	OK			Testmode_Init band 6b lo_freq 1584.0		
4.	*Execute test script:* *HIFIST_nom_IST_LO_on_6b_warm*	OK			Testmode_LCU_switchon band 6b		
5.	*Execute test script:* *HIFIST_nom_IST_LOtune_6b_key_warm*	OK			Testmode_LO_tuning band 6b lo_freq 1584.0		

Test location:		Operator:		QA:		Date/Time:	

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
6.	Execute test script (runs for approximately 20mins): HIFIST_nom_EMC_emis_20_warm	OK			Testmode_stability _internal_load band 6b hrs_mode_h wb8 hrs_mode_v wb8 integ_time 4 n 150 backend both		
7.	**Notify EMC Test Conductor that HIFI is configured in its noisest mode for test** **Return to calling procedure**	OK					

Test location:		Operator:		QA:		Date/Time:	

8.1.4.3 Transition from HIFI Noisiest Mode to Standby

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	Configure HIFI for power OFF					
1.	Execute test script: HIFIST_nom_SFT_LCU_switch_off_warm	OK		Testmode_LCU_switchoff		
2.	Execute test script: HIFIST_nom_SFT_Nominal_off_warm	OK		Testmode_HIFI_Nominal laser_H Lasers_off laser_V Lasers_off chop_loop OPEN		
3.	**HIFI in Standby** **Return to calling procedure**	OK				

Test location:		Operator:		QA:		Date/Time:	

8.1.4.4 HIFI Standby to OFF

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
1.	Stop HIFI Panel Active Cooling as per procedure AD-3	OK				
2.	From the HPCCS test conductor console start the test script: **Z102999SCVT015_ASDGEN_HIFIPWROFF_P**	OK				
3.	On HPCCS when prompted: `“FM HIFI Switch OFF for IST or SFT in Hel/Hell conditions with warm LOU - Select NO to abort TS if not correct”`	YES				
	If in any doubt about the script being executed **NO** should be selected to abort the script. Before restarting consult the relevant instrument support engineer to confirm the correct script to be used for the test in question.					

Test location:		Operator:		QA:		Date/Time:	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	The test script will go on to automatically power off all HIFI warm units.					
4.	On HPCCS when all autonomous actions have been completed by the power on script **H102999SCVT016_ASDISTHIFI_PWR_OFF_P** it will prompt: "`Set Bus Profile Back to Original Setting?`"	NO				
5.	Select **YES** if it is likely that other non-HIFI instrument related activities are to be performed. However note that if the original Bus Profile was 0 (launch) the script will automatically leave the Bus Profile unchanged as this profile is not compatible with instruments being powered in Standby: "`Bus Profile left unchanged, as original setting 0 (Launch)`"	OK				

Test location:		Operator:		QA:		Date/Time:	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
6.	If **NO** selected then at the prompt: `"Bus Profile left unchanged"` Select OK to continue	OK				
7.	On HPCCS stop Packet History displays for the following APIDs:1024,1026	OK				
8.	From HPCCS Test Conductor console issue command to disconnect PACS I-EGSE **disconnect HHIFIEGSE**	DISCONNECTED		**AND: SYS_PARS**		
9.	*If no longer required for other instrument activities, from the HPCCS test conductor console terminate the test script:* ***ALL_SubscribeParams***					
10.	***HIFI OFF*** ***Return to calling Procedure***	OK				

Test location:		Operator:		QA:		Date/Time:	

8.1.5 RWLs 1-4 in noisiest mode for ca. 20 minutes

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
1	Using A102109SPVT206_ACMS_RWL_EMC_SETUP						
2	Select from the menu: 45 (Apply torque commands clockwise to all RWLs)						

NOTE: Wheels will spin down to zero (with friction) after TBD minutes

Test location:		Operator:		QA:		Date/Time:	

8.1.6 Switch STR 1 to dumping mode (CCD)

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
1	Execute **A…_STR1_DUMPING**						
2	During **A…_STR1_DUMPING** **Select from menu: 13 (STR1 CCD Dump)** This puts STR1 in dump mode which takes ca. 1 ½ h						
3	**Stop CCD Dumping**						

Test location:		Operator:		QA:		Date/Time:	

8.1.7 Autocompatibility TTC part

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
TTC check during AutoCompatibility				
10	From Test Conductor Console, execute script: R102479SPVT124_TTC_Autocomp.tcl	OK		
20	The following Menu shall appear: TTC COMMISSIONING ============================ 1. 100 TCs 2. TM X-Check on chain-1 3. RNG Group delay chain-1 4. TM X-Check on chain-2 5. RNG Group delay chain-2 99. Set back TTC to initial setting *Select Option 1*	OK		
Chain-1 Lock Acquisition				

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
30	TTC SCOE is set to perform 1 triangular sweep @ -137 dBm at RX level (Herschel operational frequency)	OK		Power level @ TTC SCOE is set to -105 dBm to take into account IL path (See [AD 1])
40	Script Y102989ECVT018_TTC_TC_OP_METHOD shall pop-up. When Script is over, from TTC synoptic check that XPND-1 is Locked	OK		
50	Put TTC SCOE in Local Mode	OK		
60	From TTC SCOE, change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK		
70	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET	OK		
80	Check from TTC synoptic that XPND is locked	OK		
90	Repeat steps 50-70 until XPND gets unlocked	OK		At the end of the 'loop' record the final Uplink Power Value
Chain-1 Lock Acquisition with Doppler Shift				

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
100	From TTC SCOE in Local Mode, change operational frequency from 'Herschel Nominal (7207.8483 MHz)' to 'Herschel Nom + 65 KHz': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.9133 MHz And then SAVE	OK		Power level @ TTC SCOE is set to -105 dBm to take into account IL path (See [AD 1])
110	From TTC SCOE, change the Uplink Power at -105 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK		Power level @ TTC SCOE is set to -105 dBm to take into account IL path (See [AD 1]). RX level is -137 dBm
120	TTC SCOE is set to perform 1 triangular sweep @ -137 dBm at RX level (Herschel operational frequency + 65 KHz)	OK		
130	Perform a triangular sweep with above settings by: Windows -> Test Commands -> Op modes -> TC Operation And then ONLINE	OK		
140	Wait for sweep to be completed. On TTC SCOE, a window shall pop-up asking if XPND is locked. Check on TTC synoptic that XPND-1 is locked and click OK	OK		
150	From TTC SCOE, change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK		

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
160	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET	OK		
170	Check from TTC synoptic that XPND is locked	OK		
180	Repeat steps 150-170 until XPND gets unlocked	OK		At the end of the 'loop' record the final Uplink Power Value
Chain-1 TC Threshold				
190	From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal (7207.8483 MHz)': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.8483 MHz And then SAVE	OK		
200	From TTC SCOE, change the Uplink Power at -86 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK		Power level @ TTC SCOE is set to -86 dBm to take into account IL path (See [AD 1]). RX level is -118 dBm

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
210	At TTC SCOE level, apply modulation by selecting: Windows -> SCOE Config -> Uplink -> Tc Mod Index: Type: 1.0 And then SAVE			
220	Perform a triangular sweep with above settings by: Windows -> Test Commands -> Op modes -> TC Operation And then ONLINE	OK		
230	Wait for sweep to be completed. On TTC SCOE, a window shall pop-up asking if XPND is locked and SQUELCH is ON. Check on TTC synoptic that XPND-1 is locked and click OK	OK		
240	From Main Script Menu, select option '100 TCs'	OK		
250	100 TCs (Connection Test Type) are sent via RF. At script completion, check from CMD History that all TCs have been accepted and completed (TM (1,1) and (1,7) received for each TC).	OK		During the execution of the script, if any of the TC is not 'completed' script can be terminated. Main Menu will appear again.
260	At the end of above script, go to TTC SCOE and change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK		

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
270	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET	OK		
280	From TTC Synoptic, check if XPND is locked and SQUELCH is ON. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired.	OK		At the end of the 'loop' record the final Uplink Power Value
Chain-1 TC Threshold with Doppler Shift				
290	From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal with Doppler (7207.8483 MHz - 65 KHz)': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.7833 MHz And then SAVE	OK		@ TTC SCOE level: -88 dBm
300	From TTC SCOE, change the Uplink Power at -86 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK		**Power level @ TTC SCOE is set to -86 dBm to take into account IL path (See [AD 1]). RX level is -118 dBm**

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
310	At TTC SCOE level, apply modulation by selecting: Windows -> SCOE Config -> Uplink -> Tc Mod Index: Type: 1.0 And then SAVE			
320	**Perform a triangular sweep with above settings by:** Windows -> Test Commands -> Op modes -> TC Operation **And then ONLINE**	OK		
330	Wait for sweep to be completed. On TTC SCOE, a window shall pop-up asking if XPND is locked and SQUELCH is ON. Check on TTC synoptic that XPND-1 is locked and click OK	OK		
340	From Main Script Menu, select option '100 TCs'	OK		
350	100 TCs (Connection Test Type) are sent via RF. At script completion, check from CMD History that all TCs have been accepted and completed (TM (1,1) and (1,7) received for each TC).	OK		During the execution of the script, if any of the TC is not 'completed' script can be terminated. Main Menu will appear again.
360	At the end of above script, go to TTC SCOE and change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK		

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
370	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET	OK		
380	From TTC Synoptic, check if XPND is locked and SQUELCH is ON. Repeat Steps 340-380 until XPND 100 TCs are not correctly acquired.	OK		At the end of the 'loop' record the final Uplink Power Value
390	**From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal with Doppler (7207.8483 MHz - 65 KHz)':** Windows -> SCOE Config -> Uplink -> Uplink Frequency: **Type: 7207.7833 MHz** And then SAVE	OK		
Chain-1 RNG Group Delay				
400	Ensure that TTC SCOE is in remote mode	OK		
410	From Main Menu, select Option 3	OK		
420	TTC SCOE is set in order to deliver an Uplink Power at XPND-RX level of -105 dBm	OK		TTC SCOE is set to -73 dBm
430	Script TTC_OP_METHOD is called to lock XPND-1	OK		

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
440	At Script completion check from TTC synoptic that TTC is locked	OK		
450	Routine to measure RNG group delay is called. At the end of script, record the value	OK		Result Directory on TTC SCOE: ~/Spool/[current session day]
TM Chain-1 check				
460	From Main Menu, select option 2	OK		
470	TM is routed via RF	OK		
480	At Prompt: 'Check TM flowing' Open a TM Packet History and check that TM with APID 16 is correctly flowing down Then, click OK to continue	OK		
490	TM is routed back via Umbilical	OK		
500	Chain-1 is switched-off and Chain-2 is switched-on	OK		This step is performed via **Umbilical**
510	From SAT synoptic, check that the above configuration is reached.	OK		
Chain-2 Lock Acquisition				
520	TTC SCOE is set to perform 1 triangular sweep @ -137 dBm at RX level (Herschel operational frequency)	OK		Power level @ TTC SCOE is set to -106 dBm to take into account IL path (See [AD 1])

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
530	Script Y102989ECVT018_TTC_TC_OP_METHOD shall pop-up. When Script is over, from TTC synoptic check that XPND-1 is Locked	OK		
540	Put TTC SCOE in Local Mode	OK		
550	From TTC SCOE, change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK		
560	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET	OK		
570	Check from TTC synoptic that XPND is locked	OK		
580	Repeat steps 550-570 until XPND gets unlocked	OK		At the end of the 'loop' record the final Uplink Power Value
Chain-2 Lock Acquisition with Doppler Shift				

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
590	From TTC SCOE in Local Mode, change operational frequency from 'Herschel Nominal (7207.8483 MHz)' to 'Herschel Nom + 65 KHz': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.9133 MHz And then SAVE	OK		Power level @ TTC SCOE is set to -106 dBm to take into account IL path (See [AD 1])
600	From TTC SCOE, change the Uplink Power at -106 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK		**Power level @ TTC SCOE is set to -106 dBm to take into account IL path (See [AD 1]). RX level is -137 dBm**
610	**TTC SCOE is set to perform 1 triangular sweep @ -137 dBm at RX level (Herschel operational frequency + 65 KHz)**	OK		
620	**Perform a triangular sweep with above settings by:** Windows -> Test Commands -> Op modes -> TC Operation **And then ONLINE**	OK		
630	Wait for sweep to be completed. On TTC SCOE, a window shall pop-up asking if XPND is locked. Check on TTC synoptic that XPND-1 is locked and click OK	OK		

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
640	From TTC SCOE, change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK		
650	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET	OK		
660	Check from TTC synoptic that XPND is locked	OK		
670	Repeat steps 640-670 until XPND gets unlocked	OK		**At the end of the 'loop' record the final Uplink Power Value**
Chain-2 TC Threshold				
680	From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal (7207.8483 MHz)': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.8483 MHz And then SAVE	OK		
690	From TTC SCOE, change the Uplink Power at -87 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK		Power level @ TTC SCOE is set to -87 dBm to take into account IL path (See [AD 1]). RX level is -118 dBm

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
700	At TTC SCOE level, apply modulation by selecting: Windows -> SCOE Config -> Uplink -> Tc Mod Index: Type: 1.0 And then SAVE			
710	Perform a triangular sweep with above settings by: Windows -> Test Commands -> Op modes -> TC Operation And then ONLINE	OK		
720	Wait for sweep to be completed. On TTC SCOE, a window shall pop-up asking if XPND is locked and SQUELCH is ON. Check on TTC synoptic that XPND-1 is locked and click OK	OK		
730	From Main Script Menu, select option '100 TCs'	OK		
740	100 TCs (Connection Test Type) are sent via RF. At script completion, check from CMD History that all TCs have been accepted and completed (TM (1,1) and (1,7) received for each TC).	OK		During the execution of the script, if any of the TC is not 'completed' script can be terminated. Main Menu will appear again.
750	At the end of above script, go to TTC SCOE and change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK		

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
760	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET	OK		
770	From TTC Synoptic, check if XPND is locked and SQUELCH is ON. Repeat Steps 730-770 until XPND 100 TCs are not correctly acquired.	OK		At the end of the 'loop' record the final Uplink Power Value
Chain-2 TC Threshold with Doppler Shift				
780	From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal with Doppler (7207.8483 MHz - 65 KHz)': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.7833 MHz And then SAVE	OK		@ TTC SCOE level: -88 dBm

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
790	From TTC SCOE, change the Uplink Power at -87 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK		Power level @ TTC SCOE is set to -86 dBm to take into account IL path (See [AD 1]). RX level is -118 dBm
800	At TTC SCOE level, apply modulation by selecting: Windows -> SCOE Config -> Uplink -> Tc Mod Index: Type: 1.0 And then SAVE			
810	Perform a triangular sweep with above settings by: Windows -> Test Commands -> Op modes -> TC Operation And then ONLINE	OK		
820	Wait for sweep to be completed. On TTC SCOE, a window shall pop-up asking if XPND is locked and SQUELCH is ON. Check on TTC synoptic that XPND-1 is locked and click OK	OK		
830	From Main Script Menu, select option '100 TCs'	OK		
840	100 TCs (Connection Test Type) are sent via RF. At script completion, check from CMD History that all TCs have been accepted and completed (TM (1,1) and (1,7) received for each TC).	OK		During the execution of the script, if any of the TC is not 'completed' script can be terminated. Main Menu will appear again.

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
850	At the end of above script, go to TTC SCOE and change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK		
860	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET	OK		
870	From TTC Synoptic, check if XPND is locked and SQUELCH is ON. Repeat Steps 340-380 until XPND 100 TCs are not correctly acquired.	OK		At the end of the 'loop' record the final Uplink Power Value
880	**From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal with Doppler (7207.8483 MHz - 65 KHz)':** Windows -> SCOE Config -> Uplink -> Uplink Frequency: **Type: 7207.7833 MHz** And then SAVE	OK		

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
890	From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal with Doppler (7207.8483 MHz - 65 KHz)': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.7833 MHz And then SAVE	OK		@ TTC SCOE level: -88 dBm
Chain-2 RNG Group Delay				
900	Ensure that TTC SCOE is in remote mode	OK		
910	From Main Menu, select Option 3	OK		
920	TTC SCOE is set in order to deliver an Uplink Power at XPND-RX level of -105 dBm	OK		TTC SCOE is set to -73 dBm
930	Script TTC_OP_METHOD is called to lock XPND-1	OK		
940	At Script completion check from TTC synoptic that TTC is locked	OK		
950	Routine to measure RNG group delay is called. At the end of script, record the value	OK		Result Directory on TTC SCOE: ~/Spool/[current session day]
TM Chain-2 check				
960	From Main Menu, select option 2	OK		
970	TM is routed via RF	OK		

Test location:		Operator:		QA:		Date/Time:	

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
980	At Prompt: 'Check TM flowing' Open a TM Packet History and check that TM with APID 16 is correctly flowing down Then, click OK to continue	OK		
990	TM is routed back via Umbilical	OK		
1000	Chain-1 is switched-off and Chain-2 is switched-on	OK		This step is performed via **Umbilical**
1010	From SAT synoptic, check that the above configuration is reached.	OK		
Reset starting conditions				
1020	From Main Menu, select option 99	OK		
1030	TTC Chain-2 is switched-off while chain-1 is set ON	OK		
1040	From TTC Synoptic check that above conditions are met	OK		

Test location:		Operator:		QA:		Date/Time:	

8.2 D Off mode

8.2.1 D.4 Satellite OFF

8.2.1.1 D.4.1 Follow procedure for the satellite and for the CCU

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
1	Perform Herschel IST Leading Procedure HP-2-ASED-PR-0134 To switch off use the sequence IST END						

8.2.1.2 D.4.2 Confirm that all satellite equipment is OFF (unpowered)

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
1	Verify SCOE amber lamp (indicating if S/C powered) is OFF	OK					
2	Verify no TM except system packet (SCOE TM)	OK					

Test location:		Operator:		QA:		Date/Time:	

8.2.2 D.5 Switch all EGSE OFF

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
1	Verify no TM packet from SCOE TM	OK					

Test location:		Operator:		QA:		Date/Time:	

9 Summary Sheets

Procedure Variation Summary

	Test Change	Curr. No.: 1 Date ~~04~~ 08-05-2008 Page 1 of 1	
Test designation EMC RE Autocomp (dry-run)	Test Procedure PR-0116	Issue 1.0	Rev. -
Test step changed	Reason for Change See below.		

To disconnect Antenna Cable and connect to the FTC Test Points.

Send tc. 08/05/08 18:07.

XPND 1 OFF => DCN80170 OK

TWTA OFF => DC06E170 OK.

Verify on TM TT&C HP that:

EPC 1 IS OFF OK

TWTA 1 IS OFF OK

XPND 1 IS OFF OK

LCL 23 IS OPEN OK

LCL 49 IS OPEN OK

Now the Mechanical Team can change the Antenna.

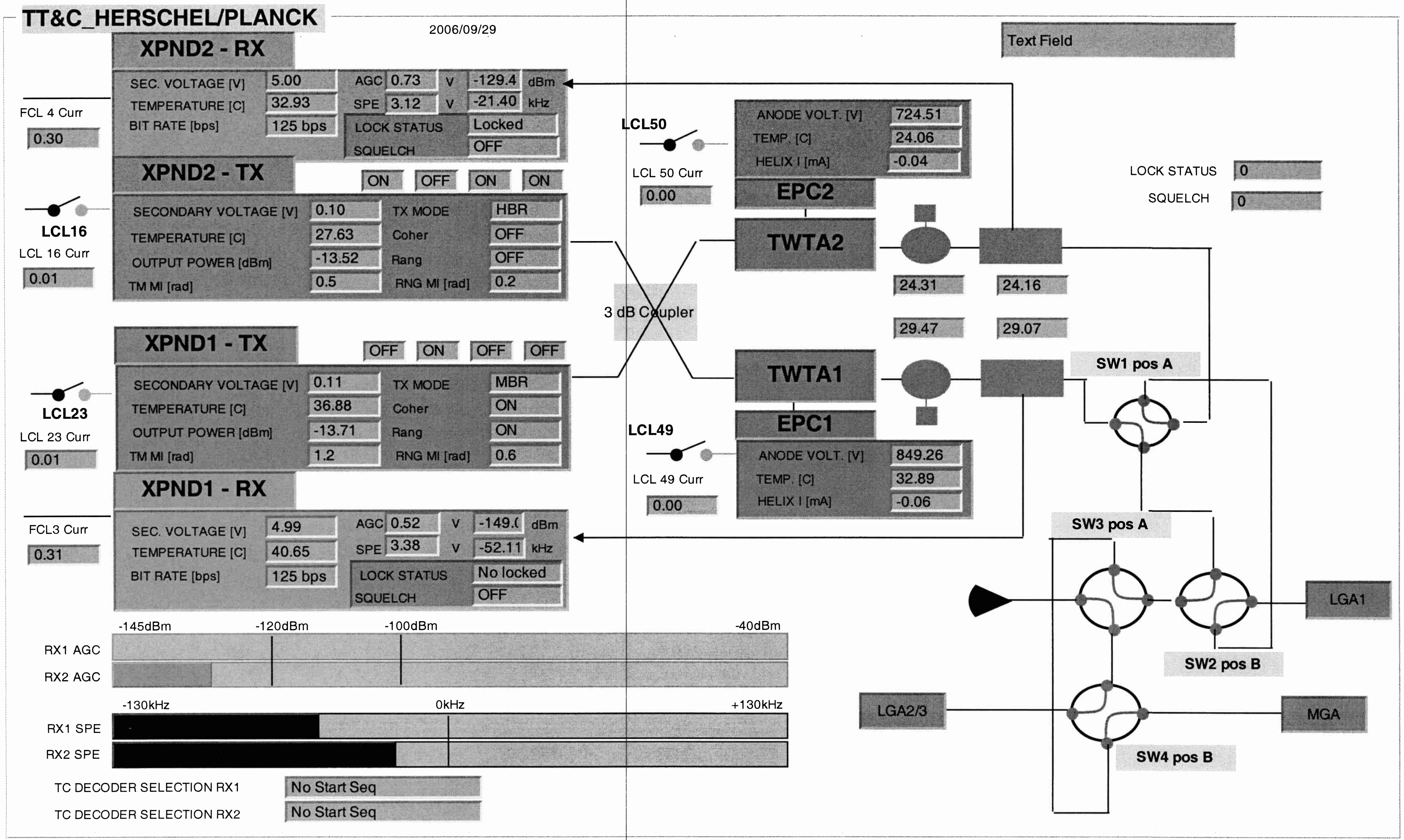
~~One time that the Activity is ended Sent the two tc~~

~~XPND 1 ON => DCN83170~~

~~TWTA 1 ON => DC16E170~~

Prepared by:	Resp. Test Leader	Project Engineer
PA/QA B.HOGG	Prime	Customer

DS: 65535 ID: TT&C_H Title: MIMICS DISPLAY Sample Time: 2008.129.18.13.57.295 Workstation: hpws24



8.1 Procedure Variation Summary

	Test Change	Curr. No.: #2 Date 8/5/08 Page 1 of 1	
Test designation EMC RE AUTO COMP	Test Procedure PR-0116	Issue	Rev.
Test step changed	Reason for Change SWON TWTA-1 + XPND-1		

TWTA-1 + XPND-1 WERE SWITCHED OFF
BY PUSH 1 TO REMOVE THE CAPS.
IN ORDER TO CONTINUE THE AUTO COMP
TEST THEY NEED TO BE TURNED ON.
USE THESE TCS:

DC16E170 (TWTA1-ON)
WAIT 5 MINS: CHECK TWTA-1 TM
DCN83170 (XPND1-ON)
*
THEN THE SAFETY LOOP TRIGGERED !

Prepared by: [signature]	Resp. Test Leader	Project Engineer
PA/QA [signature]	Prime	Customer

Table 8.1-1: Procedure Variation Sheet

8.1 Procedure Variation Summary

	Test Change	Curr. No.: #3 Date 9/5/08 Page 1 of 1	
Test designation EMC RE Auto Comp	Test Procedure PR-0116	Issue	Rev.
Test step changed RECOVERY ACTION	Reason for Change SAFETY LOOP TRIGGERED		

1. On the command stack load the following:
[Set mopId = 0] YC043946 (YP430946 = 0);
DCA11170 [RM-A DISABLE]
DCA12170 [RM-B DISABLE]
Repeat 5 Times

2. Run the Short Power On Script:
Z010999MCUT001_POWER-ON

3. As soon as Orange Power SC Bus lamp is lit on SAS Scoe send the Prepared commands as quickly as possible

4. When the Power On Script has finished Run the Power Off Script:
Z010999MCUT002_POWER-OFF

Prepared by: WJDAVIS.	Resp. Test Leader	Project Engineer
PA/QA [signature]	Prime	Customer

Table 8.1-1: Procedure Variation Sheet

9.2 Non Conformance Report (NCR) Summary

NCR - No.	NCR - Title	Date	Open Closed	PA sig.
NCR 4207	SAFETY LOOP TRIGGERED DURING AUTOCOMP	09/05/08	open	[illegible]

Table 9.2-1: Non-Conformance Record Sheet

9.3 Sign-off Sheet

	Date	Signature
Test Manager		
Operator		
PA Responsible	9/5/08	[signature]
ESA Representative		

10 ANNEX 1: Procedure Hierarchy

The top level procedure (H-P-2-ASED-TP-0180) calls this procedure, which in turn calls the IST Leading Procedure (HP-2-ASED-TP-0134).

11 ANNEX 2: SCOE Cable Connection Requirement (RE Tests)

SCOE CABLES CONNECTION to HERSCHEL S/C					
SKIN-01	PWR Panel (PCDU)				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
	BS Nom Power	SK01BJ09	PCDU	BS SCOE Cable Plugged	
	BS Red Power	SK01BJ10	PCDU	BS SCOE Cable Plugged	
	BDR1 AIT	SK01BJ11	PCDU	LPS SCOE Cable Plugged	
	BDR2 AIT	SK01BJ12	PCDU	LPS SCOE Cable Plugged	
	SA Nom Power	SK01AJ01	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ02	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ03	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ04	PCDU	Connector Cover	
	SA Red Power	SK01AJ05	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ06	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ07	PCDU	POWER SCOE Cable Plugged	
SKIN-02	PWR Panel (ACC, CDMU, RCS, 1553 & Thruster)				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
SKIN-02	DMS 1553 Bus_A	J01	CDMU		Flight Plug SK02P01 Plugged
SKIN-02	DMS 1553 Bus_B	J02	CDMU		Flight Plug SK02P02 Plugged
SKIN-02	ACMS 1553 Bus_A	J03	ACC		Flight Plug SK02P03 Plugged
SKIN-02	ACMS 1553 Bus_B	J04	ACC		Flight Plug SK02P04 Plugged
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	Copper Tape	
SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	Copper Tape	
SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH		Flight Plug SK02P07 Plugged
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS		Flight Plug

					SK02P08 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J09	ACC/CDMU		Flight Cap SK02P09 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J10	ACC/CDMU		Flight Cap SK02P10 Plugged
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS		Flight Plug SK02P11 Plugged
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	Copper Tape	
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH	Copper Tape	
SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		ACMS Flight Plug SK02P14 Plugged
SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		ACMS Flight Plug SK02P15 Plugged
SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		ACMS Flight Plug SK02P16 Plugged
SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		ACMS Flight Plug SK02P17 Plugged
SKIN-03	TTC Panel				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
SKIN-03	Test point TC + protection jumper EPC1	SK03J01	XPND1/EPC1	Copper Tape	
SKIN-03	Test point TC + protection jumper EPC2	SK03J02	XPND2/EPC2	Copper Tape	
	RF LINK				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
	RF link for antenna LGA1	N/A	LGA1		LGA1 Anechoic Cap + termination
	RF link for antenna LGA2	N/A	LGA2		LGA2 Anechoic Cap + termination
	RF link for antenna MGA	N/A	MGA		MGA Anechoic Cap + termination
	TTC Panel Test point J 15			MGA	
	TTC Panel Test point J 60			LGA1	
SKIN-04	ACMS Panel (RWE)				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
SKIN-04	RWL1 Sgn	J01	ACC/RWL-1		ACMS Flight Plug SK04P01 Plugged
SKIN-04	RWL2 Sgn	J02	ACC/RWL-2		ACMS Flight Plug SK04P02 Plugged
SKIN-04	RWL3 Sgn	J03	ACC/RWL-3		ACMS Flight Plug SK04P03 Plugged
SKIN-04	RWL4 Sgn	J04	ACC/RWL-4		ACMS Flight Plug SK04P04 Plugged
SKIN-05	GYR/QRS Panel				

	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-05	CRS1 AOCS Sgn	J01	CRS-1/ACC		ACMS Flight plug
SKIN-05	CRS2 AOCS Sgn	J02	CRS-2/ACC		ACMS Flight plug
SKIN-05	GYRO RS422 / Test	J03	GYRO		ACMS Flight Cap
SKIN-05	CRS 1/2 Stimuli	J04	CRS-1,2		ACMS Flight Cap
SKIN-05	AAD Sgn M	J05	AAD/ACC		ACMS Flight Plug
SKIN-05	SAS1/2 Sgn M	J06	SAS/ACC		ACMS Flight Plug
SKIN-05	SAS1/2 Sgn R	J07	SAS/ACC		ACMS Flight Plug
SKIN-05	AAD Sgn R	J08	AAD/ACC		ACMS Flight Plug
SKIN-06	STR Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-06	STR1 Stimuli	J01	STR1		ACMS Flight Plug
SKIN-06	STR2 Stimuli	J02	STR2		ACMS Flight Plug
	UMBILICAL				
	Connector Function	Connector	S/C unit	SCOE CABLE	
	Power/Data	HU1 J01	SYSTEM	SCOEs cable Plugged	
	Power/Data	HU2 J01	SYSTEM	SCOEs cable Plugged	

12 ANNEX 3: SCOE Cable Connection Requirement (AUTO-COMP Tests)

SCOE CABLES CONNECTION to HERSCHEL S/C

SKIN-01 PWR Panel (PCDU)

	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	BS Nom Power	SK01BJ09	PCDU	BS SCOE Cable Plugged	
	BS Red Power	SK01BJ10	PCDU	BS SCOE Cable Plugged	
	BDR1 AIT	SK01BJ11	PCDU	LPS SCOE Cable Plugged	
	BDR2 AIT	SK01BJ12	PCDU	LPS SCOE Cable Plugged	
	SA Nom Power	SK01AJ01	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ02	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ03	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ04	PCDU	Connector Cover	
	SA Red Power	SK01AJ05	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ06	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ07	PCDU	POWER SCOE Cable Plugged	

SKIN-02 PWR Panel (ACC, CDMU, RCS, 1553 & Thruster)

	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-02	DMS 1553 Bus_A	J01	CDMU		Flight Plug SK02P01 Plugged
SKIN-02	DMS 1553 Bus_B	J02	CDMU		Flight Plug SK02P02 Plugged
SKIN-02	ACMS 1553 Bus_A	J03	ACC		Flight Plug SK02P03 Plugged
SKIN-02	ACMS 1553 Bus_B	J04	ACC		Flight Plug SK02P04 Plugged
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	Copper Tape	
SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	Copper Tape	
SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH		Flight Plug SK02P07 Plugged
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS		Flight Plug

					SK02P08 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J09	ACC/CDMU		Flight Cap SK02P09 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J10	ACC/CDMU		Flight Cap SK02P10 Plugged
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS		Flight Plug SK02P11 Plugged
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	Copper Tape	
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH	Copper Tape	
SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		ACMS Flight Plug SK02P14 Plugged
SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		ACMS Flight Plug SK02P15 Plugged
SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		ACMS Flight Plug SK02P16 Plugged
SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		ACMS Flight Plug SK02P17 Plugged
SKIN-03	TTC Panel				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
SKIN-03	Test point TC + protection jumper EPC1	SK03J01	XPND1/EPC1	Copper Tape	
SKIN-03	Test point TC + protection jumper EPC2	SK03J02	XPND2/EPC2	Copper Tape	
	RF LINK				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
	RF link for antenna LGA1	N/A	LGA1		
	RF link for antenna LGA2	N/A	LGA2		
	RF link for antenna MGA	N/A	MGA		
	TTC Panel Test point J 15			MGA	
	TTC Panel Test point J 60			LGA1	
SKIN-04	ACMS Panel (RWE)				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
SKIN-04	RWL1 Sgn	J01	ACC/RWL-1		ACMS Flight Plug SK04P01 Plugged
SKIN-04	RWL2 Sgn	J02	ACC/RWL-2		ACMS Flight Plug SK04P02 Plugged
SKIN-04	RWL3 Sgn	J03	ACC/RWL-3		ACMS Flight Plug SK04P03 Plugged
SKIN-04	RWL4 Sgn	J04	ACC/RWL-4		ACMS Flight Plug SK04P04 Plugged
SKIN-05	GYR/QRS Panel				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
SKIN-05	CRS1 AOCS Sgn	J01	CRS-1/ACC		ACMS Flight plug

SKIN-05	CRS2 AOCS Sgn	J02	CRS-2/ACC		ACMS Flight plug
SKIN-05	GYRO RS422 / Test	J03	GYRO		ACMS Flight Cap
SKIN-05	CRS 1/2 Stimuli	J04	CRS-1,2		ACMS Flight Cap
SKIN-05	AAD Sgn M	J05	AAD/ACC		ACMS Flight Plug
SKIN-05	SAS1/2 Sgn M	J06	SAS/ACC		ACMS Flight Plug
SKIN-05	SAS1/2 Sgn R	J07	SAS/ACC		ACMS Flight Plug
SKIN-05	AAD Sgn R	J08	AAD/ACC		ACMS Flight Plug
SKIN-06	STR Panel				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
SKIN-06	STR1 Stimuli	J01	STR1		ACMS Flight Plug
SKIN-06	STR2 Stimuli	J02	STR2		ACMS Flight Plug
	UMBILICAL				
	Connector Function	**Connector**	**S/C unit**	**SCOE CABLE**	
	Power/Data	HU1 J01	SYSTEM	SCOEs cable Plugged	
	Power/Data	HU2 J01	SYSTEM	SCOEs cable Plugged	

13 Distribution List

See next page.

	Name	Dep./Comp.
	Baldock Richard	FAE12
	Barlage Bernhard	AED13
	Bayer Thomas	ASA42
	Brune Holger	ASA45
	Chen Bing	HE Space
	Edelhoff Dirk	AED2
	Fehringer Alexander	ASG13
X	Fricke Wolfgang Dr.	AED 65
	Geiger Hermann	ASA42
	Grasl Andreas	OTN/ASA44
	Grasshoff Brigitte	AET12
X	Hamer Simon	Terma
	Hanka, Erhard	FI552
X	Hendrikse Jeffrey	HE Space
X	Hendry David	Terma
	Hengstler Reinhold	ASA42
	Hinger Jürgen	ASG23
X	Hohn Rüdiger	AED65
	Hofmann Rolf	ASE252
X	Hopfgarten Michael	AED32
	Huber Johann	ASA42
	Hund Walter	ASE252
X	Idler Siegmund	AED312
	Ivády von András	FAE12
	Jahn Gerd Dr.	ASG23
	Jolk Matthias	AET1
	Klenke Uwe	ASG72
X	Koelle Markus	ASA43
	Koppe Axel	AED312
X	Kroeker Jürgen	AED65
	La Gioia Valentina	Terma
	Lang Jürgen	ASE252
	Langenstein Rolf	AED15
	Langfermann Michael	ASA41
	Liberatore Danilo	Rhea
	Martin Olivier	ASA43
	Maukisch Jan	ASA43
X	Much Christoph	ASA43
X	Müller Martin	ASA43
	Pietroboni Karin	AED65
	Platzer Wilhelm	AED2
	Reichle Konrad	ASA42
	Runge Axel	OTN/ASA44
	Sauer Maximilian Dr.	AED65
	Schink Dietmar	AED32
	Schmidt Thomas	AED15
	Schweickert Gunn	ASG23

	Name	Dep./Comp.
X	Sonn Nico	ASG51
	Steininger Eric	AED32
	Stiehle Hubert	AET32
X	Stritter Rene	AED11
	Suess Rudi	OTN/ASA44
	Theunissen Martijn	DSSA
	Vascotto Riccardo	HE Space
	Wagner Klaus	ASG23
X	Wietbrock Walter	AET12
	Wöhler Hans	ASG23
	Wössner Ulrich	ASE252
	Zumstein Armin	ASQ42
X	ESA/ESTEC	ESA
X	Thales Alenia Space Cannes	TAS-F
	Thales Alenia Space Torino	TAS-I
	Instruments:	
	MPE (PACS)	MPE
	RAL (SPIRE)	RAL
	SRON (HIFI)	SRON
	Subcontractors:	
	Austrian Aerospace	AAE
	Austrian Aerospace	AAEM
	BOC Edwards	BOCE
	Dutch Space Solar Arrays	DSSA
	EADS Astrium Sub-Subsyst. & Equipment	ASSE
	EADS CASA Espacio	CASA
	EADS CASA Espacio	ECAS
	European Test Services	ETS
	Patria New Technologies Oy	PANT
	SENER Ingenieria SA	SEN
	Thales Alenia Space, Antwerp	TAS-ETCA

CONT OF FORMAL RUN (2)

EADS astrium

Procedure

Herschel

AS RUN 09/05/08

following NCR "4207" 'Safety Loop during Autocomp'

2008_05_08_04_12_hercdmu_hpws22_REALTIME_EMC_RE

Title: **Herschel EGSE, Satellite & Instrument Procedure for the EMC Radiated Emission and RF AutoCompTests**

CI-No: 100000

Prepared by:	A Di Capua	A. Di Capua	07/05/08
	P Modesto		Date: 07/05/08
Checked by:	M Koelle	M. Kölle	07/05/08
AIT:	R. Hohn		07/05/08
Engineering:	D Priestley		07/05/08
Product Assurance:	R. Stritter	pp.	8/5/08.
Configuration Control:	W. Wietbrock		
Project Management:	Dr. W. Fricke		08/05/08
Approved by TAS-F:	D Montet		08/05/08

Distribution: See Distribution List (last page)

EADS astrium | **Procedure** | **Herschel**

AS RUN 09/05/08

following NCR "4207" 'Safety Loop during AutoComp'

Title: **Herschel EGSE, Satellite & Instrument Procedure for the EMC Radiated Emission and RF AutoCompTests**

CI-No: 100000

Prepared by:	A Di Capua		07/05/08
	P Modesto	Date:	07/05/08
Checked by:	M Koelle		07/05/08
AIT:	R. Hohn		07/05/08
Engineering:	D Priestley		07/05/08
Product Assurance:	R. Stritter	pp.	8/5/08.
Configuration Control:	W. Wietbrock		
Project Management:	Dr. W. Fricke		08/05/08
Approved by TAS-F:	D Montet		08/05/08

Distribution: See Distribution List (last page)

Issue	Date	Sheet	Description of Change	Release
1	06.05.2008		Initial Version (HIPT and ESA comments incorporated)	0

Table of Content

1 Scope

1.1 Objective

This Procedure details the EGSE and Satellite activities to be performed during the Herschel S/C level Conducted EMC Radiated Emission and RF Auto-compatibility tests.

1.2 Operational Flow

Chapter 8 provides the detailed step-by-step test procedure.

2 Documents/Drawings

This document incorporates, by dated or undated references, provisions from other publications. These normative references are cited at appropriate places in the text and publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these apply to this document only when incorporated into it by amendment or revision. For undated references, the latest edition of the publication referred to apply.

2.1 Applicable Documents

AD-1	Herschel radiated FM Sat EMC Test Procedure	H-P-2-ASED-TP-0180
AD-2	Herschel SAT Emergency Switch Off Procedure	H-P-2-ASED-PR-071
AD-3	Procedure for setup and operation of the HIFI cooling system	HP-2-ASED-PR-125
AD-4	Herschel IST Leading Procedure (Issue 4)	HP-2-ASED-TP-0134

2.2 Reference Documents

RD-1	Herschel PCDU & CDMS nominal switch on / off procedure	HP-2-ASED-PR-0070
RD-2	PACS EMC Test Procedure on Integrated System Level, Issue 1.5	PACS-ME-TP-032
RD-3	HIFI conducted emissivity procedures for IST tests, Issue 1.5.3	SRON-G/HIFI/PR/2007-019
RD-4	SPIRE Warm Units EMC Conductive Emissions Procedures for IST, Issue 1.1 Redlined	SPIRE-RAL-PRC-002946
RD-5	PACS I-EGSE User Manual, Issue 1, 19-Jul-2007	PICC-ME-MN-010
RD-6	HIFI IEGSE setup procedure	SRON-U/HIFI/PR/2007-005
RD-7	SPIRE I-EGSE Set-Up, Issue 2.2	SPIRE-RAL-DOC-002841
RD-8	FIRST/PLANCK Instrument Interface Document part A	PT-IID-A-04624
RD-9	FIRST/PLANCK Instrument Interface Document part B (HIFI)	PT-IIDB/HIFI-02125
RD-10	FIRST/PLANCK Instrument Interface Document part B (PACS)	PT-IIDB/PACS-02126
RD-11	FIRST/PLANCK Instrument Interface Document part B (SPIRE)	PT-IIDB/SPIRE-02124
RD12	LO SFT Procedure using LO Dummy, Issue 1.01	MPIfR/HIFI/PR/2006-565
RD13	HIFI switch on procedure	SRON-G/HIFI/PR/200707-1.5.3
RD-14	Herschel FM Spacecraft EMC Test Requirements Specification (Issue 4)	H-P-2-ASP-TS-0819
RD-15	Test Readiness Review: Herschel FM S/C Radiated Emissions / Auto-Compatibility Test	H-P-TASF-MN-10395

2.3 Acronyms

TBS To Be Supplied

3 Requirements to be verified

As set out in requirements document RD-14 and with redline clarification in minutes RD-15.

4 Configuration

4.1 Herschel S/C Configuration

4.1.1 Hardware Configuration

See Herschel IST Procedure Leading Procedure HP-2-ASED-TP-0134

4.1.2 Software Configuration

The EGSE, SVM & Instruments switch on / off will be run with the following on-board software configuration:

1. CDMS OBSW: 3.4
2. ACMS OBSW:3.7

4.1.3 Test Configuration

4.1.3.1 SVM

See Herschel IST Procedure Leading Procedure HP-2-ASED-TP-0134

4.1.3.2 HIFI

N/A

4.1.3.3 PACS

N/A

4.1.3.4 SPIRE

N/A

4.1.4 Simulated Equipments

N/A

5 Conditions

5.1 Personnel

See AD-1 chapter 4.7

5.2 Environmental

See AD-1 chapter 4.2

5.3 General Precautions and Safety

5.3.1 General Safety Requirements, Precautions

- For HIFI, Handling precautions according to RD-8 and RD-9 are applicable.
- For PACS, Handling precautions according to RD-8 and RD-10 are applicable.
- For SPIRE, Handling precautions according to RD-8 and RD-11 are applicable.

5.3.2 Special condition and hazards

The following Operational restrictions shall be carefully taken into account:

- In case of any failure, the activities shall be stopped until troubleshooting plan is generated and approved.

A general constraint for all instrument DPUs (or ICU in the case of HIFI), there shall be a 5 minute wait between switching off a DPU/ICU and switching it back on again.

5.3.2.1 HIFI

None when powering on/off HIFI ICU only as per sections XXX.
When operating HIFI using the full configuration, ref. sections XXX the following applies:

1. Connection/Disconnection with the HIFI I-EGSE is required as per section XXX.
2. The following Cryo temperature limits shall be observed when operating HIFI:

S/C Environmental	Limits	Actual
Cryostat Connection (Valves)	N/A	
Cryostat Status (HeI/HeII)	N/A	
Cryostat Level 0 Temp (T107 - CCUB)	<20K	
Cryostat Level 1 Temp (T231-T237 - CCUB)	<20K	
Cryostat Level 2 Temp (T207 read from CryoSCOE)	<=40K	
Cryostat Level 3 Temp	N/A	

The following shall be observed if HIFI is commanded to "Standby1" mode or above:

If switched on the WBS laser temperature (HM023193 HWH_Laser_T and HWV_Laser_T) may rise above a red limit (30degC) in the MIB. If this occurs the test can continue, but the time of occurrence should be logged. If the temperature rises to 35degC the lasers will be automatically switched off by the instrument.
It is recommended to start active cooling of the HIFI panel see AD-2 before the WBS laser temperatures reach 30degC to avoid "HIGH HIGH" alarms being reported repeatedly and unnecessarily by the HPCCS.
NB: If temperature trend is rising during the test then Cooling on HIFI panel may need to be adjusted (ref. AD-2).

5.3.2.2 PACS

Prior to switching ON PACS, PACS specific OBCPs & EATs shall be loaded and enabled on the CDMU. Note: the PACS power on scripts will prompt for confirmation of this before allowing the operator to continue with power on of the instrument.
CDMU must be in AFO mode for the duration of PACS operations. Note this maybe extended to all instruments in the future.
Note during power off of PACS FDIR may be triggered due to expected (5,2) events being reported from PACS DPU. To avoid this PACS specific OBCPs are disabled for the duration of the power down sequence, and then re-enabled.

5.3.2.3 SPIRE

None

5.3.3 ESD constraints

Normal clean-room conditions.

5.4 Special QA Requirements

No special requirements.

5.5 GSE

The spacecraft is mounted on an adaptor sitting on an EMC wooden palette.

5.5.1 MGSE

N/A

5.5.2 CVSE

N/A

5.5.3 EGSE

5.5.3.1 EGSE Hardware Configuration

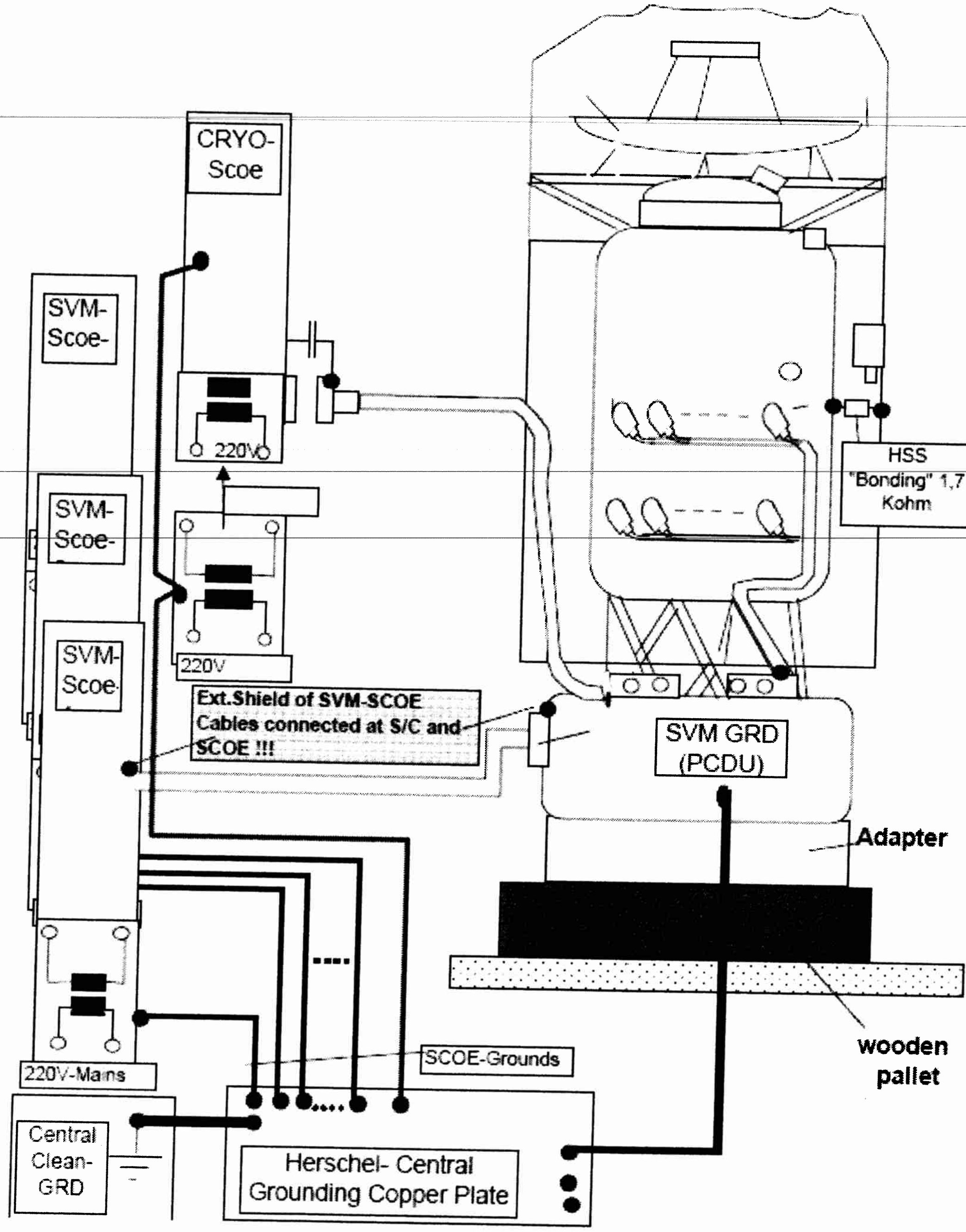
S/S	Unit	Configuration			SCOE simulated eqpts	Remarks
		Herschel				
EGSE	CCS	1				
	TM/TC DFE	1				
	POWER SCOE	1				

See RD-15 for full list.

5.5.3.2 EGSE User Software

Item	Version
CCS	HPCCS 2.0-1166.
HPSDB	*HPSDB v 3.3.1.24* File: R_TM_HERSCH_FM9_711071940 with patches

5.5.3.3 Grounding Configuration



5.5.3.4 Test Equipment

Special test equipment is supplied by ETS.

5.5.3.5 Data Acquisition System

N/A

5.5.4 OGSE

N/A

5.5.5 Special Equipment

N/A

6 Verification Requirements and Test Criteria

PASS/FAIL CRITERIA

At each test stage completion, the test success is determined comparing the results obtained against the expected values.
If the compliance between obtained and expected values has been met, and authorization to proceed with the next stage of the test is given, then the actual test stage must be considered satisfactory completed.

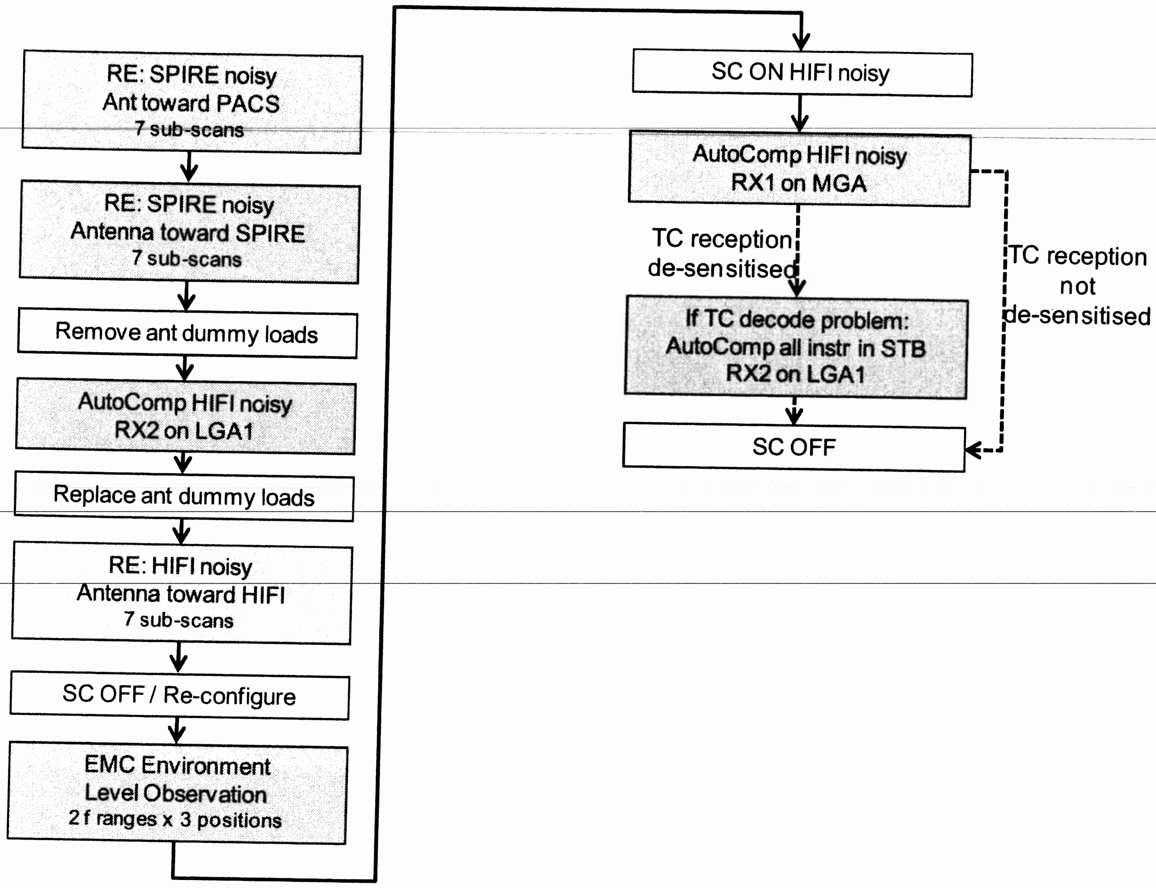
The success of the overall testing activities is determined from the satisfactory completion of all test stages.

Successful criteria to be satisfied in each test stage shall be:

See AD-1 chapter 4.5.3

Verification that the TM(5,2), TM(5,4) and TM(1,8) received event reports are only those ones expected to fulfill the pass test criteria.

7 General Test Flow



8 Test Execution Step-by-Step Procedure

8.1 Radiated FM SAT EMC

8.1.1 *A.1 Switch satellite EGSE into the REFERENCE mode Configuration according to the AD-1 configuration table in chapter 3.2 & 3.3*

Step-No.	***Test-Step-Description***	***Nominal Value***	***Tolerance***	***Actual Value***	***Remarks***	***P***	***N***
10	Check that Skin Configuration is the one reported in ANNEX 2 of this procedure				Already performed in previous session	✓	
20	Switch on scoe to allow EMC team to perform the ambient noise (SC OFF)					✓	
30	Perform Herschel IST Leading Procedure HP-2-ASED-PR-0134 From the test conductor : Write Callasync Z010999MCVT003_IST_START EMC				In the Chapter 7.2.4.2(ACMS ON) Perform only the steps: 1,2(IST_EMC),3,4,8,9,10	✓	
40	OPERATOR WARNING In the Chapter 7.2.4.2(ACMS ON) Perform only the steps: 1,2(IST_EMC),3,4,8,9,10						
50	Perform test script D102159SCVT226_EMC_SETUP			02:37			

Test location:	ESTEC	Operator:	ADe	QA:	B. Hogg	Date/Time:	09/05/08 00.41 UTC

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
60	D102159SCVT226_EMC_SETUP Click "End TS " to continue			02:55			
70	OPERETOR INFO Communicate to the EMC TEAM that the SC is switched on and ready to start EMC						
80	Z010999MCVT200_EMC The EGSE and SVM are now set Click in window the button "OK" to proceed						

PUS#1
PUS #4
PUS#5

Test location:	ESTEC	Operator:	[illegible]	QA:	B. HOGG	Date/Time:	9/5/08

8.1.2 *PACS Instrument Procedures*

8.1.2.1 PACS OFF to Standby (SAFE)

The following will switch ON and configure PACS Prime instrument in SAFE mode in any satellite configuration (i.e. warm, or Cold HeI/HeII). HKTM packets will be generated on APIDs 1152 dec and 1154 decimal (these can be observed using TMPH with corresponding filter – note however a limited number of TMPHs should be running at any one time).

Step-No.	*Test-Step-Description*	*Nominal Value*	*Actual Value*	*Remarks*	*P*	*N*
1.	On HPCCS start Packet History displays for the following APIDs: 1152, 1154	OK	OK		✓	
2.	*From the HPCCS test conductor console start the test script to power PACS Prime to SAFE:* ***Z102999SCVT010_ASDGEN_PACSPWRON_P***	OK	OK		✓	
3.	On HPCCS when prompted: `"FM PACS Switch ON in Warm or Cold conditions, FPU connected - Select NO to abort TS if not correct"`	YES	YES		✓	

Test location:	ESTEC ESA	Operator:	[signature]	QA:	[signature]	Date/Time:	09/05/08 4:50

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
4.	On HPCCS when prompted: `" PACS FDIR OBCPs/EATs loaded and enabled? - If not select NO to abort TS"`	YES	YES		✓	
	If in any doubt about the script being executed **NO** should be selected to abort the script. Before restarting consult the relevant instrument support engineer to confirm the correct script to be used for the test in question.					
	If **YES** is selected the test script will go on to automatically power on all PACS warm units, force boot the DPU ASW and configure the instrument to SAFE (Standby mode)					
5.	*If AFO mode not already selected for CDMU the script* ***P102999SCVT905_ASDISTPACS_PWR_ON_N*** *will prompt that AFO will be commanded next.* *Click* ***OK*** *to continue the script if the prompt appears.*	OK	OK		✓	

Test location:	ESTEC EMC	Operator:	[signature]	QA:	[signature]	Date/Time:	09/05/08

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
6.	On HPCCS when all autonomous actions have been completed by the power on script **P102999SCVT905_ASDISTPACS_PWR_ON_N** it will prompt: `“Set Bus Profile Back to Original Setting?”` Select **YES** if it is likely that other non-PACS instrument related activities are to be performed, otherwise select **NO**.	NO	NO		✓	
7.	If **YES** selected the original Bus Profile will be restored. However note that if the original Bus Profile was 0 (launch) the script will automatically leave the Bus Profile unchanged as this profile is not compatible with instruments being powered in Standby, in which case the following prompt will appear: `“Bus Profile left unchanged, as original setting 0 (Launch)”` If prompted select **OK** to continue	OK	N/A		✓	

Test location:	ESTEC ESA	Operator:	[signature]	QA:	[signature]	Date/Time:	09/05/08 04:57

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
8.	If **NO** selected then at the prompt: `"Bus Profile left unchanged"` Select **OK** to continue	OK	OK		✓	
9.	*The script will automatically terminate*	OK	OK.		✓	
10.	*Verify HK TM packets are being received on APIDs 1152 & 1154*	OK	OK		✓	
11.	*Either using the ANDs indicated verify the correct status of the following PACS specific TM parameters or if the IEGSE is connected request IEGSE Operator to confirm that PACS is in SAFE mode:* **DM_BOL_REC_PAC (PM038420)** is incrementing	Incrementing	Incrementing	AND: PA019420	✓	
12.	***PACS in SAFE mode.*** ***Return to calling Procedure***	OK	OK		✓	

Test location: ESTEC GMC	Operator: [signature]	QA: [signature]	Date/Time: 09/05/08 05:50

8.1.2.2 Transition from Standby to PACS Noisiest Mode

N/A

8.1.2.3 Transition from PACS Noisiest Mode to Standby

N/A

Test location:		Operator:		QA:		Date/Time:	

8.1.2.4 PACS Standby (SAFE) to OFF

The following procedure will switch PACS Prime from SAFE to OFF.

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
1.	From the HPCCS test conductor console start the test script to power OFF PACS Prime from SAFE: **Z102999SCVT011_ASDGEN_PACSPWROFF_P**	ok	ok		✓	
2.	On HPCCS when prompted: `"FM PACS Switch OFF in Warm or Cold conditions, FPU connected - Select NO to abort TS if not correct"`	YES	YES		✓	
	If in any doubt about the script being executed **NO** should be selected to abort the script. Before restarting consult the relevant instrument support engineer to confirm the correct script to be used for the test in question.		'	N/A		
	If **YES** is selected the test script will go on to automatically power off all PACS warm units.	ok	ok		✓	
3.	Note: During switch off of PACS (5,2) TM event packets are expected	(5,2) events observed	ok		✓	

Test location:	ESTEC	Operator:	ADE	QA:	BHOCE	Date/Time:	10/05

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
4.	On HPCCS when all autonomous actions have been completed by the power on script **P102999SCVT906_ASDISTPACS_PWR_OFF_N** it will prompt: `"Set Bus Profile Back to Original Setting?"`	NO	NO		✓	
5.	Select **YES** if it is likely that other non-PACS instrument related activities are to be performed. However note that if the original Bus Profile was 0 (launch) the script will automatically leave the Bus Profile unchanged as this profile is not compatible with instruments being powered in Standby: `"Bus Profile left unchanged, as original setting 0 (Launch)"`	OK	N/A			
6.	If **NO** selected then at the prompt: `"Bus Profile left unchanged"` Select OK to continue	OK	Ok		✓	

Test location: ESTEC	Operator: [signature]	QA: [signature]	Date/Time: 10/05

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
7.	On HPCCS stop Packet History displays for the following APIDs:1152,1154	OK	ok		✓	
8.	PACS OFF. Return to calling Procedure	OK	ok		✓	

Test location:	EsTeC	Operator:	ADe	QA:	[illegible]	Date/Time:	10/08

8.1.3 SPIRE Instrument Procedures

8.1.3.1 SPIRE OFF to Standby (REDY)

The following will switch ON and configure SPIRE Prime instrument in REDY (Standby) mode. HKTM packets will be generated on APIDs 1280 dec and 1282 decimal (these can be observed using TMPH with corresponding filter – note however a limited number of TMPHs should be running at one time).
During power on of SPIRE a number of soft/hard OOLs are reported due to the sequential switch on of the units. This is expected and will clear when SPIRE is in REDY mode. When in REDY mode one parameter remains OOL (soft) namely SMD2V505 this is also expected.

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
1.	On HPCCS start Packet History displays for the following APIDs:1280,1282	OK	OK		✓	
2.	*From the HPCCS test conductor console start the test script to power SPIRE Prime to REDY:* ***Z102999SCVT004_ASDGEN_SPIREPWRON_P***	OK	OK		✓	
3.	On HPCCS when prompted: `"SPIRE Switch ON for IST activities in any conditions - Select NO to abort TS if not correct"`	YES	YES		✓	

Test location:	ESTEC EMC	Operator:		QA:		Date/Time:	09/05/08 05:59

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
4.	If in any doubt about the script being executed **NO** should be selected to abort the script. Before restarting consult the relevant instrument support engineer to confirm the correct script to be used for the test in question.	OK	N/A		✓	
5.	If **YES** is selected the test script will go on to automatically power on all SPIRE warm units, force boot the DPU ASW and configure the instrument to REDY (Standby mode).	OK	N/A		✓	
6.	*On HPCCS when all autonomous actions have been completed by the power on script* ***S102999SCVT017_ASDGENSPIR_PWR_ON_P*** *it will prompt:* `“Set Bus Profile Back to Original Setting?”`	NO	NO		✓	

Test location: ESTEC EMC	Operator:	QA:	Date/Time: 09/05/08 06:07

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
7.	Select **YES** if it is likely that other non-SPIRE instrument related activities are to be performed. *However note that if the original Bus Profile was 0 (launch) the script will automatically leave the Bus Profile unchanged as this profile is not compatible with instruments being powered in Standby:* `"Bus Profile left unchanged, as original setting 0 (Launch)"`	OK	N/A		✓	
8.	If **NO** selected then at the prompt: `"Bus Profile left unchanged"` Select OK to continue	OK	OK		✓	
9.	*Verify HK TM packets are being received on APIDs 1280 & 1282*					
10.	Either using the ANDs indicated verify the correct status of the following SPIRE specific TM parameters or if the IEGSE is connected request IEGSE Operator to confirm that: THSK (SM00T500) parameter refreshing @ 0.25 Hz	OK	OK	**AND: SA_1_559**	✓	

Test location:	ESTEC EMC	Operator:	[signature]	QA:	[signature]	Date/Time:	09/05/08 06:09

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	TM1N and TM2N parameters are incrementing as indicated: TM1N (SMT0N500) by 2 every 4 secs TM2N (SMT1N500) by 1 every 4 secs	OK	OK		✓	
	MODE parameter is set to "REDY" mode (RAW value 0x0200)	SM00M500 = 0x0200 (REDY)	REDY		✓	
11.	***SPIRE powered and in REDY mode*** ***Return to calling Procedure***	OK	OK		✓	

Test location:	ESTEC EMC	Operator:		QA:		Date/Time:	09/05/08 .06:11

8.1.3.2 Transition from Standby to SPIRE Noisiest Mode

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
1.	If SPIRE Prime Bus Profile not selected then send the following command from manual command stack: **DC819160** **DH049160=3**	**AND: ZAD07999** **DEF5F160=3**			
2.	Execute TCL script SPIRE-IST-EMC-RE-STBY2PHOTOPS.tcl – Issue 1.1	—	—	—	
3.	Check that THSK parameter is refreshing every second	THSK	Refreshing @ 1Hz	—	
4.	Check that TM1N and TM2N parameters are incrementing as indicated	TM1N TM2N	@ 0.5Hz @ 1Hz	—	
5.	Check that the Photometer LIAs have switched on	PLIABITSTAT	0/1		
6.	Check that the BSM sensors have switched on	CHOPSENSPWR JIGGSENSPWR	0/1 0/1		
7.	Check that the SMEC sensors are switched on	SMECENCPWR SMECLVDTPWR	0/1 0/1		
8.	Check that TM3N is incrementing as indicated	TM3N	~18-20 Hz	—	

Test location:		Operator:		QA:		Date/Time:	

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
9.	Check that TM5N is incrementing as indicated	TM5N	Incrementing by ~4-5 every 2 seconds	—	
10.	Check that DCUFRAMECNT and MCUFRAMECNT on the FUNCTIONAL TEST PARAMETERS AND are incrementing as indicated	DCUFRAMECNT	~18-20 Hz	—	
		MCUFRAMECNT	Incrementing by ~96-100 every 2 seconds	—	
11.	Check that the MODE parameter is set to RAW value 0xFFCD for the “PHOTOPS” mode *Note that “PHOTOPS” is a dummy value for the EMC RE activities – no converted value is defined.*	MODE	REDY (0x200) / 0xFFCD		
12.	***Notify EMC Test Conductor SPIRE in noisest mode.*** ***Return to calling procedure***	OK			

Test location:		Operator:		QA:		Date/Time:	

8.1.3.3 Transition from SPIRE Noisiest Mode to Standby

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
1.	Execute TCL script SPIRE-IST-EMC-RE-PHOTOPS2STBY.tcl – Issue 1.0	—	—	—	
2.	Check that the THSK parameter is refreshing every 4 seconds	THSK	Refreshing @ 0.25Hz	—	
3.	Check that TM1N and TM2N parameters are incrementing as indicated	TM1N TM2N	Incrementing by 2 every 4 seconds Incrementing by one every 4 seconds	—	
4.	Check that TM3N and TM5N have stopped incrementing	TM3N TM5N	— —	— —	
5.	Check that DCUFRAMECNT and MCUFRAMECNT on the FUNCTIONAL TEST PARAMETERS AND have stopped incrementing	DCUFRAMECNT MCUFRAMECNT	— —	— —	

Test location:		Operator:		QA:		Date/Time:	

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
6.	Check that SPIRE is in REDY mode (RAW 0x200)	MODE	0xFFCD/0x200 (REDY)		
7.	Check that the Photometer LIAs are switched off	PLIABITSTAT	1/0		
8.	Check that the BSM sensors have switched off	CHOPSENSPWR JIGGSENSPWR	1/0 1/0		
9.	Check that the SMEC sensors are switched off	SMECENCPWR SMECLVDTPWR	1/0 1/0		
10.	***Notify EMC Test Conductor SPIRE in Standby (REDY) mode. Return to calling procedure***	OK			

Test location:		Operator:		QA:		Date/Time:	

8.1.3.4 SPIRE Standby (REDY) to OFF

The following procedure will switch SPIRE Prime from REDY to OFF.

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
1.	From the HPCCS test conductor console start the test script to power OFF SPIRE Prime from REDY: **Z102999SCVT005_ASDGEN_SPIREPWROFF_P**	OK	ok		✓	
2.	On HPCCS when prompted: `"SPIRE Switch OFF for IST activities in any conditions - Select NO to abort TS if not correct"`	YES	YES		✓	
3.	If in any doubt about the script being executed **NO** should be selected to abort the script. Before restarting consult the relevant instrument support engineer to confirm the correct script to be used for the test in question.			N/A		
4.	If **YES** is selected the test script will go on to automatically power off all SPIRE warm units.					

Test location:	ESTEC	Operator:	ADe	QA:	[signature]	Date/Time:	10/09

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
5.	During Switch OFF of SPIRE the following (5,1) and (5,4) event messages on APID 1280 are expected and do not indicate a problem: a) EVID 1313 No_MCU_Response_Error b) EVID 21773 ALARM_LSMCU_DEAD	ok	ok		✓	
6.	*On HPCCS when all autonomous actions have been completed by the power on script* ***S102999SCVT019_ASDGENSPIR_PWR_OFF_P*** *it will prompt:* `“Set Bus Profile Back to Original Setting?”`	NO	NO			
7.	Select **YES** if it is likely that other non-SPIRE instrument related activities are to be performed. *However note that if the original Bus Profile was 0 (launch) the script will automatically leave the Bus Profile unchanged as this profile is not compatible with instruments being powered in Standby:* `“Bus Profile left unchanged, as original setting 0 (Launch)”`	OK		(N/A)		

Test location:	OSTZe	Operator:	Ade	QA:	[illegible]	Date/Time:	10/05

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
8.	If **NO** selected then at the prompt: `"Bus Profile left unchanged"` Select OK to continue	OK	ok		✓	
9.	On HPCCS stop Packet History displays for the following APIDs:1280,1282	OK	ok		✓	
10.	***SPIRE OFF.*** ***Return to calling Procedure***					

Test location:	Bsize	Operator:	Ade	QA:	[signature]	Date/Time:	10/05

8.1.4 *HIFI Instrument Procedures*

8.1.4.1 HIFI OFF to Standby

The following will switch ON and configure HIFI Nominal instrument in Standby1 mode. HKTM packets will be generated on APIDs 1024 dec and 1026 decimal (these can be observed using TMPH with corresponding filter – note however a limited number of TMPHs should be running at one time).
During power on of HIFI a number of soft/hard OOLs are reported due to the sequential switch on of the units. Some of these are to be expected when in Hel conditions and the others are expected because the unit is typically cold at switch ON.

Parameters OOL when in Hel:
HM248191 – HF_AP_2K_IF_CT
HM243191 – HF_APR_SCCS_CT
HM244191 – HF_APR_S10K_CT
HM250191 – HF_AP_4K_END_CT

Parameters OOL expected to come back in limits when units warmed up:
HM187192 – HRV_ACS_1_T
HM188192 – HRV_AVS_2_T
HM062192 – HRH_ACS_1_T
HM063192 – HRH_AVS_2_T

Parameter OOL until HIFI powered in Standby1
HD247194 – HL_ptv_checksum
HM258194 – HL_MODE_S
HM259194 – HL_error_word_S

Test location:		Operator:		QA:		Date/Time:	

Some additional parameters may exhibit OOL during the test:

Parameter OOL expected during test but which should be monitored for duration of test (should be kept below 30degC to avoid HIGH-HIGHs being reported):
HM062193 – HWV_Laser_T
HM023193 – HWH_Laser_T

Parameter OOL expected during test but which need not be monitored:
HM022193 – HWH_CCD_T
HM061193 – HWV_CCD_T

Step-No.	***Test-Step-Description***	***Nominal Value***	***Actual Value***	***Remarks***	***P***	***N***
1.	If not already on, Switch on & configure HIFI I-EGSE i.a.w. **RD-6**, and configure for nominal and FPU cold and LOU warm without attenuators	OK	OK		✓	
2.	From HPCCS Test Conductor console issue command to connect to HIFI I-EGSE **connect HHIFIEGSE**	YZS27940 = CONNECTED	Already connected	**AND SYS_PARS**	✓	
	Perform the following two steps if command parameter exchange is required between the IEGSE and HPCCS for the test concerned.					

Test location:	ESTEC EMC	Operator:	[signature]	QA:	[signature]	Date/Time:	09/05/08 05:04

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
3.	If not already running from the HPCCS test conductor console execute the test script: **ALL_SubscribeParams**	OK	OK		✓	
4.	Verify HPCCS-IEGSE connection by sending the following test command from manual command stack (repeater value 0) and verify received OK on IEGSE: **YC00X962**	OK	OK		✓	
5.	Patch HIFI synthetic parameters for warm conditions by executing the following scripts: **HIFIST_ASED_PatchPtvChecksum** **HIFIST_ASED_PatchTempLimits** Note these scripts replace HIFIST_CCS_conf_ptv_checksum_warm due to NCR-3652	OK	OK		✓	
8.	On HPCCS start Packet History displays for the following APIDs:1024,1026	OK	OK		✓	

Test location:	ESTEC ETC	Operator:	[signature]	QA:	[signature]	Date/Time:	09/05/08

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
9.	From the HPCCS test conductor console start the test script: **Z102999SCVT014_ASDGEN_HIFIPWRON_P**	OK	OK	ANDs HA000289 HA004289	✓	
10.	On HPCCS when prompted: "FM HIFI Switch ON for IST or SFT in HeI/HeII conditions with warm LOU - Select NO to abort TS if not correct"	YES	YES		✓	
	The test script will go on to automatically power on all HIFI warm units, force boot the DPU ASW and configure the instrument to Standby.					
11.	At prompt to record OBS_ID_per_hk during subsequent table readback commanding (which starts when OK is pressed); record value of HM003190 (typical reading = 9000xxxx hex), Note: at start & end value is 90000000 hex "Select OK to continue" Select OK	OK	OK		✓	

Test location:	ESTEC EMC	Operator:	[illegible]	QA:	[illegible]	Date/Time:	09/05/08 05:30

Step-No.	*Test-Step-Description*	*Nominal Value*	*Actual Value*	*Remarks*	*P*	*N*
12.	Value of OBS_ID during table read commanding. Give both Hex and Dec values: : **HM003190**		Hex <OBSID>= 90004044 Dec <OBSID>= 2415935556	AND: HA000289	✓	
13.	Request the nominated I-EGSE operator to run the command 'verifyreadback <OBSID>' from a terminal window (opened from the terminal icon " >_ " at bottom left of HIFIEGSE workstation screen) using the **Dec <OBSID>** value retrieved in the previous step. If the word **PASS** does not appear on the screen at the end of the verifyreadback, this is a nogo on this test procedure. If OK respond to prompt accordingly, otherwise contact SRON to investigate and resolve before continuing.	OK	OK		✓	

Test location: ESTEC EMC	Operator:	QA:	Date/Time: 09/05/08 05:55

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
14.	*On HPCCS when all autonomous actions have been completed by the power on script H102999SCVT015_ASDISTHIFI_PWR_ON_P it will prompt:* *"Set Bus Profile Back to Original Setting?"*	NO			✓	
15.	*Select YES if it is likely that other non-HIFI instrument related activities are to be performed.* *However note that if the original Bus Profile was 0 (launch) the script will automatically leave the Bus Profile unchanged as this profile is not compatible with instruments being powered in Standby:* *"Bus Profile left unchanged, as original setting 0 (Launch)"* *Select OK to continue*	OK		NA	✓	

Test location:	ESTEC EMC	Operator:		QA:		Date/Time:	09/05/08 08:55

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
16.	If NO selected then at the prompt: "Bus Profile left unchanged" Select OK to continue	OK	OK		✓	
17.	Verify HK TM packets are being received on APIDs 1024 & 1026	OK	OK		✓	
18.	Start HIFI Panel Active Cooling as per procedure AD-3	OK	OK		✓	
19.	**HIFI Nominal powered and ready mode Return to calling procedure**	OK	OK		✓	

Test location:	ESTEC ETC	Operator:		QA:		Date/Time:	09/05/08. 05:56

8.1.4.2 Transition from Standby to HIFI Noisiest Mode

Running the following procedure will configure HIFI from STANDBY to Noisest mode for EMC RE

Step-No.	*Test-Step-Description*	*Nominal Value*	*Tolerance*	*Actual Value*	*Remarks*	*P*	*N*
1.	Confirm HIFI nominal is powered on and in PRIMARY mode	OK		OK	AND: HA003289	✓	
2.	*If HIFI Prime Bus Profile not selected then send the following command from manual command stack:* **DC819160** **DH049160=2**	OK		OK	AND: ZAD07999 PAR: DEF5F160	✓	
3.	*Execute test script:* *HIFIST_nom_IST_Init_6b_key_warm*	OK		OK	Testmode_Init band 6b lo_freq 1584.0	✓	
4.	*Execute test script:* *HIFIST_nom_IST_LO_on_6b_warm*	OK		OK	Testmode_LCU_switchon band 6b	✓	
5.	*Execute test script:* *HIFIST_nom_IST_LOtune_6b_key_warm*	OK		OK	Testmode_LO_tuning band 6b lo_freq 1584.0	✓	

Test location:	ESTEC EMC	Operator:		QA:		Date/Time:	09/05/08 06:32

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
6.	Execute test script (runs for approximately 20mins): HIFIST_nom_EMC_emis_20_warm	OK		N/R PVS 1	Testmode_stability_internal_load band 6b hrs_mode_h wb8 hrs_mode_v wb8 integ_time 4 n 150 backend both	✓	
7.	**Notify EMC Test Conductor that HIFI is configured in its noisest mode for test** **Return to calling procedure**	OK		OK		✓	

Test location:	ESTEC EMC	Operator:	[signature]	QA:	[signature]	Date/Time:	09/05/08 06:33

8.1.4.3 Transition from HIFI Noisiest Mode to Standby

Step-No.	***Test-Step-Description***	***Nominal Value***	***Actual Value***	***Remarks***	***P***	***N***
	Configure HIFI for power OFF					
1.	Execute test script: HIFIST_nom_SFT_LCU_switch_off_warm	OK	Ok	Testmode_LCU _switchoff	✓	
2.	Execute test script: HIFIST_nom_SFT_Nominal_off_warm	OK	Ok	Testmode_HIFI _Nominal laser_H Lasers_off laser_V Lasers_off chop_loop OPEN	✓	
3.	**HIFI in Standby** **Return to calling procedure**	OK	Ok		✓	

Test location:	EStre	Operator:	[signature]	QA:	[signature]	Date/Time:	10/05/08

8.1.4.4 HIFI Standby to OFF

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
1.	Stop HIFI Panel Active Cooling as per procedure AD-3	OK	Ok		✓	
2.	From the HPCCS test conductor console start the test script: **Z102999SCVT015_ASDGEN_HIFIPWROFF_P**	OK	Ok		✓	
3.	On HPCCS when prompted: `“FM HIFI Switch OFF for IST or SFT in Hel/Hell conditions with warm LOU - Select NO to abort TS if not correct”`	YES	Yes		✓	
	If in any doubt about the script being executed **NO** should be selected to abort the script. Before restarting consult the relevant instrument support engineer to confirm the correct script to be used for the test in question.					

Test location:	ESTEC	Operator:	ADe	QA:	[signature]	Date/Time:	10/03

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	The test script will go on to automatically power off all HIFI warm units.					
4.	On HPCCS when all autonomous actions have been completed by the power on script **H102999SCVT016_ASDISTHIFI_PWR_OFF_P** it will prompt: `“Set Bus Profile Back to Original Setting?”`	NO	Yes		✓	
5.	Select **YES** if it is likely that other non-HIFI instrument related activities are to be performed. However note that if the original Bus Profile was 0 (launch) the script will automatically leave the Bus Profile unchanged as this profile is not compatible with instruments being powered in Standby: `“Bus Profile left unchanged, as original setting 0 (Launch)”`	OK	ok		✓	

Test location:	FSZ0e	Operator:	ADe	QA:	[illegible]	Date/Time:	10/05

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
6.	If **NO** selected then at the prompt: `"Bus Profile left unchanged"` Select OK to continue	OK		N/A	✓	
7.	On HPCCS stop Packet History displays for the following APIDs:1024,1026	OK	ok		✓	
8.	From HPCCS Test Conductor console issue command to disconnect ~~PACS~~ HIFI I-EGSE **disconnect HHIFIEGSE**	DISCONNECTED	ok	**AND: SYS_PARS**	✓	
9.	*If no longer required for other instrument activities, from the HPCCS test conductor console terminate the test script:* ***ALL_SubscribeParams***			post-poned N/A	✓	
10.	***HIFI OFF*** ***Return to calling Procedure***	OK	ok		✓	

Test location:	ESTEC	Operator:	ADe	QA:	[signature]	Date/Time:	10/05

8.1.5 RWLs 1-4 in noisiest mode for ca. 20 minutes

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
1	Using A102109SPVT206_ACMS_RWL_EMC_SETUP						
2	Select from the menu: 45 (Apply torque commands clockwise to all RWLs)						

NOTE: Wheels will spin down to zero (with friction) after TBD minutes

Test location:		Operator:		QA:		Date/Time:	

8.1.6 Switch STR 1 to dumping mode (CCD)

Step-No.	*Test-Step-Description*	*Nominal Value*	*Tolerance*	*Actual Value*	*Remarks*	*P*	*N*
1	Execute **A…_STR1_DUMPING**						
2	During **A…_STR1_DUMPING** **Select from menu: 13 (STR1 CCD Dump)** This puts STR1 in dump mode which takes ca. 1 ½ h						
3	**Stop CCD Dumping**						

Test location:		Operator:		QA:		Date/Time:	

8.1.7 *Autocompatibility TTC part*

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
TTC check during AutoCompatibility				
10	From Test Conductor Console, execute script: R102479SPVT124_TTC_Autocomp.tcl	OK	ok	
20	The following Menu shall appear: TTC COMMISSIONING ========================== 1. 100 TCs 2. TM X-Check on chain-1 3. RNG Group delay chain-1 4. TM X-Check on chain-2 5. RNG Group delay chain-2 99. Set back TTC to initial setting ~~Select Option 1~~ 09/05/08	OK	ok	
Chain-1 Lock Acquisition				

Test location:	ESTEC	Operator:	AOE	QA:		Date/Time:	09/05/08 ; 16:02 UTC

*RIS#1 – 4207

Step	Operations	Results: Required Value	Results: Actual Value	Remarks and Record
30	SET TTC SCOE ~~is set~~ to perform 1 triangular sweep @ -137 dBm at RX level (Herschel operational frequency)	OK		Power level @ TTC SCOE is set to -105 dBm to take into account IL path (See [AD 1])
START SWEEP 40	Script Y102989ECVT018_TTC_TC_OP_METHOD shall ~~pop-up~~. When Script is over, from TTC synoptic check that XPND-1 is Locked	OK	OK XPND1 LOCKED ARE NOT AS EXPECTED	SCOE SET MANUALLY SWEEP RANGE 130KHZ SWEEP RATE 0.5KHz/sec
~~50~~	~~Put TTC SCOE in Local Mode~~	OK	OK SEE ANNEX 1	
60	From TTC SCOE, change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK	OK	
70	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET, EXECUTE	OK	OK	
80	Check from TTC synoptic that XPND is locked	OK	OK	
90	Repeat steps 50-70 until XPND gets unlocked	OK	LAST VALUE -110.1 @ TTC SCOE LEVEL	At the end of the 'loop' record the final Uplink Power Value

Chain-1 Lock Acquisition with Doppler Shift

*RIS#1 – 4207

Test location:	ESTEC	Operator:	ADC	QA:	[signature]	Date/Time:	09/05/08

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
100	From TTC SCOE in Local Mode, change operational frequency from 'Herschel Nominal (7207.8483 MHz)' to 'Herschel Nom + 65 KHz': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.9133 MHz (OR Apply doppler shift of 0.065 MHz) And then SAVE	OK	Ok	Power level @ TTC SCOE is set to -105 dBm to take into account IL path (See [AD 1])
110	From TTC SCOE, change the Uplink Power at -105 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK	Ok	Power level @ TTC SCOE is set to -105 dBm to take into account IL path (See [AD 1]). RX level is -137 dBm
120	TTC SCOE is set to perform 1 triangular sweep @ -137 dBm at RX level (Herschel operational frequency + 65 KHz)	OK	Ok	
130	Perform a triangular sweep with above settings by: Windows -> Test Commands -> Op modes -> TC Operation And then ~~ONLINE~~, "Execute"	OK	Ok	
140	Wait for sweep to be completed. On TTC SCOE, a window shall pop-up asking if XPND is locked. Check on TTC synoptic that XPND-1 is locked and click OK	OK	OK	Manually locked @ end the moved to +65 kHz frequency
150	From TTC SCOE, change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK	Ok	

Test location:	CSG	Operator:	[signature]	QA:	[signature]	Date/Time:	07/05/08

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
160	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET	OK	ok	
170	Check from TTC synoptic that XPND is locked	OK	ok	
180	Repeat steps 150-170 until XPND gets unlocked	OK	ok	FINAL VALUE ? -109.5 @ TTC SCOE LEVEL At the end of the 'loop' record the final Uplink Power Value
Chain-1 TC Threshold				
190	From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal (7207.8483 MHz)': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.8483 MHz And then SAVE	OK	ok	
200	From TTC SCOE, change the Uplink Power at -86 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK	ok	Power level @ TTC SCOE is set to -86 dBm to take into account IL path (See [AD 1]). RX level is -118 dBm

Test location:	Operator:	QA:	Date/Time:
ETC	[signature]	[signature]	5/1/08

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
210	At TTC SCOE level, apply modulation by selecting: Windows -> SCOE Config -> Uplink -> Tc Mod Index: Type: 1.0 And then SAVE	ok	ok	
220	Perform a triangular sweep with above settings by: Windows -> Test Commands -> Op modes -> TC Operation And then ONLINE , EXECUTE	OK	ok	
RNS#2 -4207 230	Wait for sweep to be completed. On TTC SCOE, a window shall pop-up asking if XPND is locked and SQUELCH is ON. Check on TTC synoptic that XPND-1 is locked and click OK	OK	ok	
240	From Main Script Menu, select option '100 TCs'	OK	ok	
250	100 TCs (Connection Test Type) are sent via RF. At script completion, check from CMD History that all TCs have been accepted and completed (TM (1,1) and (1,7) received for each TC).	OK	ok	During the execution of the script, if any of the TC is not 'completed' script can be terminated. Main Menu will appear again.
260	At the end of above script, go to TTC SCOE and change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK	ok	

Test location:	ESTEC	Operator:	ADe	QA:	[illegible]	Date/Time:	04/08/05

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
270	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET	OK	ok	
280	From TTC Synoptic, check if XPND is locked and SQUELCH is ON. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired.	OK	OK	(100% TCs) FINAL VALUE: 89.6 (1) At the end of the 'loop' record the final Uplink Power Value TTC Scoe level
Chain-1 TC Threshold with Doppler Shift				
290	From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal with Doppler (7207.8483 MHz - 65 KHz)': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.7833 MHz And then SAVE	OK	ok	@ TTC SCOE level: -88 dBm
300	From TTC SCOE, change the Uplink Power at -86 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK	ok	**Power level @ TTC SCOE is set to -86 dBm to take into account IL path (See [AD 1]). RX level is -118 dBm**

Test location:	Operator:	QA:	Date/Time:

Step	Operations	Results: Required Value	Results: Actual Value	Remarks and Record
310	At TTC SCOE level, apply modulation by selecting: Windows -> SCOE Config -> Uplink -> Tc Mod Index: Type: 1.0 And then SAVE	Ok	Ok	
320	**Perform a triangular sweep with above settings by:** Windows -> Test Commands -> Op modes -> TC Operation **And then ONLINE**	OK Ok	ok	Rondly locked
330	Wait for sweep to be completed. On TTC SCOE, a window shall pop-up asking if XPND is locked and SQUELCH is ON. Check on TTC synoptic that XPND-1 is locked and click OK	OK	ok	
340	From Main Script Menu, select option '100 TCs'	OK	ok	
350	100 TCs (Connection Test Type) are sent via RF. At script completion, check from CMD History that all TCs have been accepted and completed (TM (1,1) and (1,7) received for each TC).	OK	ok	During the execution of the script, if any of the TC is not 'completed' script can be terminated. Main Menu will appear again.
360	At the end of above script, go to TTC SCOE and change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK	ok	

Test location:	ESTEC	Operator:	ADe	QA:	[illegible]	Date/Time:	8/08

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
370	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET	OK	ok	
380	From TTC Synoptic, check if XPND is locked and SQUELCH is ON. Repeat Steps 340-380 until XPND 100 TCs are not correctly acquired.	OK	ok	At the end of the 'loop' record the final Uplink Power Value -90.2 @ TTC
390	**From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal ~~with Doppler (7207.8483 MHz - 65 KHz)~~':** Windows -> SCOE Config -> Uplink -> Uplink Frequency: **Type: ~~7207.7833~~ MHz** 7207.8483 And then SAVE	OK	ok	
Chain-1 RNG Group Delay				
400	Ensure that TTC SCOE is in remote mode	OK	ok	
410	From Main Menu, select Option 3	OK		
420	TTC SCOE is set in order to deliver an Uplink Power at XPND-RX level of -105 dBm	OK	ok	TTC SCOE is set to -73 dBm
430	Script TTC_OP_METHOD is called to lock XPND-1	OK		

PKS #3-4207

Test location:	ESTEC	Operator:	ADC	QA:	[signature]	Date/Time:	10/05/08

RS#4-4207

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
440	At Script completion check from TTC synoptic that TTC is locked	OK		XPND LOCKED BY RNG ROUTINE
450	Routine to measure RNG group delay is called. At the end of script, record the value	OK	ok	Result Directory on TTC SCOE: ~/Spool/[current session day]
TM Chain-1 check			RNG DELAY 5153 nS, MAX VARI 382.67nS	
460	From Main Menu, select option 2	OK	ok	
470	TM is routed via RF	OK	ok	
480	At Prompt: 'Check TM flowing' Open a TM Packet History and check that TM with APID 16 is correctly flowing down Then, click OK to continue	OK	ok	
490	TM is routed back via Umbilical	OK	ok	MANUALLY DONE WITH TMTC
500	Chain-1 is switched-off and Chain-2 is switched-on	OK	ok	This step is performed via **Umbilical**
510	From SAT synoptic, check that the above configuration is reached.	OK	ok	
Chain-2 Lock Acquisition				
520	TTC SCOE is set to perform 1 triangular sweep @ -137 dBm at RX level (Herschel operational frequency)	OK		Power level @ TTC SCOE is set to -106 dBm to take into account IL path (See [AD 1])

Test location:	ESTEC	Operator:	ADe	QA:	B Moore	Date/Time:	10/05/08

Step	Operations	Results: Required Value	Results: Actual Value	Remarks and Record
530	Script Y102989ECVT018_TTC_TC_OP_METHOD shall pop-up. When Script is over, from TTC synoptic check that XPND-1 is Locked	OK		SCOE set Manually; 1 sweep, LGA-1
540	Put TTC SCOE in Local Mode	OK	Ok	
550	From TTC SCOE, change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK	Ok	
560	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET	OK	Ok	
570	Check from TTC synoptic that XPND is locked	OK	Ok	
580	Repeat steps 550-570 until XPND gets unlocked	OK	Ok	At the end of the 'loop' record the final Uplink Power Value 8 - 109.8 @ TTC
Chain-2 Lock Acquisition with Doppler Shift				

Test location:	ESTEC	Operator:	ADe	QA:	[signature]	Date/Time:	10/05

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
590	From TTC SCOE in Local Mode, change operational frequency from 'Herschel Nominal (7207.8483 MHz)' to 'Herschel Nom + 65 KHz': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.9133 MHz And then SAVE	OK	Ok	-108.1 dBm Power level @ TTC SCOE is set to ~~-106~~ dBm to take into account IL path (See [AD 1])
600	From TTC SCOE, change the Uplink Power at ~~-106~~ -108.1 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK	ok	**Power level @ TTC SCOE is set to -106.1 dBm to take into account IL path (See [AD 1]). RX level is -137 dBm**
610	**TTC SCOE is set to perform 1 triangular sweep @ -137 dBm at RX level (Herschel operational frequency + 65 KHz)**	OK	ok	
620	**Perform a triangular sweep with above settings by:** Windows -> Test Commands -> Op modes -> TC Operation **And then ONLINE**	OK	ok	
630	Wait for sweep to be completed. On TTC SCOE, a window shall pop-up asking if XPND is locked. Check on TTC synoptic that XPND-1 is locked and click OK	OK	ok	

Test location:	ESTEC	Operator:	ADe	QA:	[signature]	Date/Time:	10/05

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
640	From TTC SCOE, change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK	ok	
650	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET	OK	ok	
660	Check from TTC synoptic that XPND is locked	OK	ok	
670	Repeat steps 640-670 until XPND gets unlocked	OK	ok	**At the end of the 'loop' record the final Uplink Power Value** - 109.8 ① TTE
Chain-2 TC Threshold				
680	From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal (7207.8483 MHz)': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.8483 MHz And then SAVE	OK	ok	
690	From TTC SCOE, change the Uplink Power at ~~-87~~ -89 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK		Power level @ TTC SCOE is set to ~~-87~~ -89 dBm to take into account IL path (See [AD 1]). RX level is -1~~18~~ dBm

Test location:	ESTEC	Operator:	ADe	QA:	[signature]	Date/Time:	10/05

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
700	At TTC SCOE level, apply modulation by selecting: Windows -> SCOE Config -> Uplink -> Tc Mod Index: Type: 1.0 And then SAVE		OK	
710	Perform a triangular sweep with above settings by: Windows -> Test Commands -> Op modes -> TC Operation And then ONLINE	OK	ok	
720	Wait for sweep to be completed. On TTC SCOE, a window shall pop-up asking if XPND is locked and SQUELCH is ON. Check on TTC synoptic that XPND-1 is locked and click OK	OK	ok	
730	From Main Script Menu, select option '100 TCs'	OK	ok	
740	100 TCs (Connection Test Type) are sent via RF. At script completion, check from CMD History that all TCs have been accepted and completed (TM (1,1) and (1,7) received for each TC).	OK	ok	During the execution of the script, if any of the TC is not 'completed' script can be terminated. Main Menu will appear again.
750	At the end of above script, go to TTC SCOE and change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK	ok	

RVS#2-4207 ->*

Test location:	ESTEC	Operator:	ADe	QA:	[illegible]	Date/Time:	10/05/08

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
760	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET	OK	Ok	
770	From TTC Synoptic, check if XPND is locked and SQUELCH is ON. Repeat Steps 730-770 until XPND 100 TCs are not correctly acquired.	OK	OK	-90.2 @TTC Scoe At the end of the 'loop' record the final Uplink Power Value
Chain-2 TC Threshold with Doppler Shift				
780	From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal with Doppler (7207.8483 MHz - 65 KHz)': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.7833 MHz And then SAVE	OK	OK	@ TTC SCOE level: -88 dBm

Test location:	ESTEC	Operator:	ADe	QA:	[signature]	Date/Time:	10/05

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
790	From TTC SCOE, change the Uplink Power at -87 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK	ok	Power level @ TTC SCOE is set to -86 dBm to take into account IL path (See [AD 1]). RX level is -118 dBm
800	At TTC SCOE level, apply modulation by selecting: Windows -> SCOE Config -> Uplink -> Tc Mod Index: Type: 1.0 And then SAVE	ok	✓	
810	Perform a triangular sweep with above settings by: Windows -> Test Commands -> Op modes -> TC Operation And then ONLINE	OK	✓	
820	Wait for sweep to be completed. On TTC SCOE, a window shall pop-up asking if XPND is locked and SQUELCH is ON. Check on TTC synoptic that XPND-1 is locked and click OK	OK	ok	Manually locked
830	From Main Script Menu, select option '100 TCs'	OK	ok	
840	100 TCs (Connection Test Type) are sent via RF. At script completion, check from CMD History that all TCs have been accepted and completed (TM (1,1) and (1,7) received for each TC).	OK	ok	During the execution of the script, if any of the TC is not 'completed' script can be terminated. Main Menu will appear again.

Test location:	Operator:	QA:	Date/Time:
[illegible]	ADC	[illegible]	10/05

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
850	At the end of above script, go to TTC SCOE and change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	OK	ok	
860	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET	OK	ok	
870	From TTC Synoptic, check if XPND is locked and SQUELCH is ON. Repeat Steps 340-380 until XPND 100 TCs are not correctly acquired.	OK	ok	At the end of the 'loop' record the final Uplink Power Value -90.8 @ TTC
880	**From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal ~~with Doppler~~ (7207.8483 ~~MHz – 65 KHz)~~':** Windows -> SCOE Config -> Uplink -> Uplink Frequency: **~~Type: 7207.7833 MHz~~** And then SAVE	OK	ok	

Test location:	ESTEC	Operator:	ADE	QA:	[illegible]	Date/Time:	10/05

RVS #3 BUT WITH LGA 1

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
890	~~From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal with Doppler (7207.8483 MHz - 65 KHz)': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.7833 MHz~~ ~~And then SAVE~~	OK	N/A	@ TTC SCOE level: -88 dBm
Chain-2 RNG Group Delay				
900	Ensure that TTC SCOE is in remote mode	OK	OK	
910	~~From Main Menu, select Option 3~~ TTC SCOE CALL RNG GROUP DELAY ROUTINE	OK	OK	
920	TTC SCOE is set in order to deliver an Uplink Power at XPND-RX level of -105 dBm	OK	OK	TTC SCOE is set to -73 dBm
930	~~Script TTC_OP_METHOD is called to lock XPND-1~~	OK		NOT NEEDED
940	At Script completion check from TTC synoptic that TTC is locked	OK	OK	
950	Routine to measure RNG group delay is called. At the end of script, record the value	OK	OK	Result Directory on TTC SCOE: ~/Spool/[current session day] 5176.91nS MAX VARI 382.45nS
TM Chain-2 check				
960	From Main Menu, select option 2	OK	OK	
970	TM is routed via RF	OK	OK	

Test location:	ESTEC	Operator:	[signature]	QA:	[signature]	Date/Time:	10/05/08

Step	Operations	Results		Remarks and Record
		Required Value	Actual Value	
980	At Prompt: 'Check TM flowing' Open a TM Packet History and check that TM with APID 16 is correctly flowing down Then, click OK to continue	OK	ok	
990	TM is routed back via Umbilical	OK	ok	
1000	~~Chain-1 is switched-off and~~ Chain-2 is switched-~~on~~ off	OK	ok	This step is performed via **Umbilical**
1010	From SAT synoptic, check that the above configuration is reached.	OK	ok	
Reset starting conditions				
1020	From Main Menu, select option 99	OK	N/A	
1030	TTC Chain-2 is switched-off while chain-1 is set ON	OK		
1040	From TTC Synoptic check that above conditions are met	OK		

Test location:	ESTEC	Operator:		QA:		Date/Time:	10/05

8.2 D Off mode

8.2.1 D.4 Satellite OFF

8.2.1.1 D.4.1 Follow procedure for the satellite and for the CCU

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
1	Perform Herschel IST Leading Procedure HP-2-ASED-PR-0134 To switch off use the sequence IST END	ok		ok		✓	

8.2.1.2 D.4.2 Confirm that all satellite equipment is OFF (unpowered)

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
1	Verify SCOE amber lamp (indicating if S/C powered) is OFF	OK		ok		✓	
2	Verify no TM except system packet (SCOE TM)	OK		ok		✓	

Test location:	ESTEC	Operator:	Ade	QA:	[signature]	Date/Time:	10/09

8.2.2 D.5 Switch all EGSE OFF

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
1	Verify no TM packet from SCOE TM	OK					

Test location:		Operator:		QA:		Date/Time:	

9 Summary Sheets

9.1 Procedure Variation Summary

<table>
<tr><td></td><td>Test Change</td><td colspan="2">Curr. No.: #1 - 4207
Date 10th/05/2008
Page 1 of 1</td></tr>
<tr><td colspan="2">Test designation
EMC RE / AUTO COMP</td><td>Test Procedure
PR - 0116</td><td>Issue
1</td><td>Rev.
0</td></tr>
<tr><td colspan="2">Test step changed
8.1.7 Step 50</td><td colspan="3">Reason for Change
MOVE STEP</td></tr>
<tr><td colspan="5">REMOVE STEP 50 TO IN BETWEEN STEP 20 & STEP 30.
PERFORM MANUALE ADJUSTMENT TO SCOE</td></tr>
<tr><td>Prepared by: B.HOGG</td><td>Resp. Test Leader A. Di Capo</td><td colspan="3">Project Engineer</td></tr>
<tr><td>PA/QA</td><td>Prime</td><td colspan="3">Customer</td></tr>
</table>

Table 9.1-1: Procedure Variation Sheet

9.1 Procedure Variation Summary

	Test Change	Curr. No.: #2-4207 Date 10/05/2008 Page 1 of 1	
Test designation EMC RE / AUTO COMP	Test Procedure PR-0116	Issue 1	Rev. 0
Test step changed 8.1.7. 235	Reason for Change ADDITIONAL STEP		

INSERT STEP.

TMTC TO BE SET SUCH THAT TC CMD'S ARE SENT VIA TTC SCOE.

Prepared by: B. HOGG	Resp. Test Leader ADe	Project Engineer
PA/QA [signature]	Prime	Customer

Table 9.1-1: Procedure Variation Sheet

9.1 Procedure Variation Summary

	Test Change	Curr. No.: #3-4207 Date 10/05/08 Page 1 of 1	
Test designation EMC RE /AUTO COMP	Test Procedure PR-0116	Issue 1	Rev. 0
Test step changed 8.1.7. STEPS 400 TO 430	Reason for Change MANUAL SET UP OF SCOE		

STEP 400 – PUT TTC SCOE INTO LOCAL ok

STEP 410 – NOT REQUIRED ✓

STEP 420 – PERFORM AS PROCEDURE ok

INSERT STEP 425 – SET XPND 1 MOD INDEX 0:0 ok

STEP 430 – CALL FROM TTC SCOE ROUTINE FOR RNG GROUP DELAY (ANTENNA MGA) ok

Prepared by: B.HOGG	Resp. Test Leader [signature]	Project Engineer
PA/QA [signature]	Prime	Customer

Table 9.1-1: Procedure Variation Sheet

9.1 Procedure Variation Summary

	Test Change	Curr. No.: # 4-4207 Date 10/05/08 Page 1 of 1	
Test designation EMC RE / AUTO COMP	Test Procedure PR-0116	Issue 1	Rev. 0
Test step changed 8.1.7. 455	Reason for Change ADDITIONAL STEP		
RE ENABLE MOD INDEX 1:2 @ XPND LEVEL			
Prepared by: B. HOGG	Resp. Test Leader ADe	Project Engineer	
PA/QA	Prime	Customer	

Table 9.1-1: Procedure Variation Sheet

9.2 Non Conformance Report (NCR) Summary

NCR - No.	NCR - Title	Date	Open Closed	PA sig.

Table 9.2-1: Non-Conformance Record Sheet

9.3 Sign-off Sheet

	Date	Signature
Test Manager		
Operator		
PA Responsible	10/05/08	[signature]
ESA Representative		

10 ANNEX 1: Procedure Hierarchy

The top level procedure (H-P-2-ASED-TP-0180) calls this procedure, which in turn calls the IST Leading Procedure (HP-2-ASED-TP-0134).

11.1 ANNEX 2: SCOE Cable Connection Requirement (RE tests)

SCOE CABLES CONNECTION to HERSCHEL S/C

SKIN-01 PWR Panel (PCDU)

Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
BS Nom Power	SK01BJ09	PCDU	BS SCOE Cable Plugged	
BS Red Power	SK01BJ10	PCDU	BS SCOE Cable Plugged	
BDR1 AIT	SK01BJ11	PCDU	LPS SCOE Cable Plugged	
BDR2 AIT	SK01BJ12	PCDU	LPS SCOE Cable Plugged	
SA Nom Power	SK01AJ01	PCDU	POWER SCOE Cable Plugged	
SA Nom Power	SK01AJ02	PCDU	POWER SCOE Cable Plugged	
SA Nom Power	SK01AJ03	PCDU	POWER SCOE Cable Plugged	
SA Red Power	SK01AJ04	PCDU	Connector Cover	
SA Red Power	SK01AJ05	PCDU	POWER SCOE Cable Plugged	
SA Red Power	SK01AJ06	PCDU	POWER SCOE Cable Plugged	
SA Red Power	SK01AJ07	PCDU	POWER SCOE Cable Plugged	

SKIN-02 PWR Panel (ACC, CDMU, RCS, 1553 & Thruster)

	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-02	DMS 1553 Bus_A	J01	CDMU		Flight Plug SK02P01 Plugged
SKIN-02	DMS 1553 Bus_B	J02	CDMU		Flight Plug SK02P02 Plugged
SKIN-02	ACMS 1553 Bus_A	J03	ACC		Flight Plug SK02P03 Plugged
SKIN-02	ACMS 1553 Bus_B	J04	ACC		Flight Plug SK02P04 Plugged
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	Copper Tape	
SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	Copper Tape	
SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH		Flight Plug SK02P07 Plugged
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS		Flight Plug

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07:45

					SK02P08 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J09	ACC/CDMU		Flight Cap SK02P09 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J10	ACC/CDMU		Flight Cap SK02P10 Plugged
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS		Flight Plug SK02P11 Plugged
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	Copper Tape	
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH	Copper Tape	
SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		ACMS Flight Plug SK02P14 Plugged
SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		ACMS Flight Plug SK02P15 Plugged
SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		ACMS Flight Plug SK02P16 Plugged
SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		ACMS Flight Plug SK02P17 Plugged
SKIN-03	TTC Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-03	Test point TC + protection jumper EPC1	SK03J01	XPND1/EPC1	Copper Tape	
SKIN-03	Test point TC + protection jumper EPC2	SK03J02	XPND2/EPC2	Copper Tape	
	RF LINK				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	RF link for antenna LGA1	N/A	LGA1	Cable conn.	LGA1 Anechoic Cap ~~+ termination~~
	RF link for antenna LGA2	N/A	LGA2	Cable conn.	LGA2 Anechoic Cap ~~+ termination~~
	RF link for antenna MGA	N/A	MGA	Cable conn.	MGA Anechoic Cap ~~+ termination~~
	TTC Panel Test point J 15			~~MGA~~ 50Ω	Terminator
	TTC Panel Test point J 60			~~LGA1~~ 50Ω	Terminator
SKIN-04	ACMS Panel (RWE)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-04	RWL1 Sgn	J01	ACC/RWL-1		ACMS Flight Plug SK04P01 Plugged
SKIN-04	RWL2 Sgn	J02	ACC/RWL-2		ACMS Flight Plug SK04P02 Plugged
SKIN-04	RWL3 Sgn	J03	ACC/RWL-3		ACMS Flight Plug SK04P03 Plugged
SKIN-04	RWL4 Sgn	J04	ACC/RWL-4		ACMS Flight Plug SK04P04 Plugged
SKIN-05	GYR/QRS Panel				

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09.05.08 07:4[illegible]

	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-05	CRS1 AOCS Sgn	J01	CRS-1/ACC		ACMS Flight plug √
SKIN-05	CRS2 AOCS Sgn	J02	CRS-2/ACC		ACMS Flight plug √
SKIN-05	GYRO RS422 / Test	J03	GYRO		ACMS Flight Cap √
SKIN-05	CRS 1/2 Stimuli	J04	CRS-1,2		ACMS Flight Cap √
SKIN-05	AAD Sgn M	J05	AAD/ACC		ACMS Flight Plug √
SKIN-05	SAS1/2 Sgn M	J06	SAS/ACC		ACMS Flight Plug √
SKIN-05	SAS1/2 Sgn R	J07	SAS/ACC		ACMS Flight Plug √
SKIN-05	AAD Sgn R	J08	AAD/ACC		ACMS Flight Plug √
SKIN-06	STR Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-06	STR1 Stimuli	J01	STR1		ACMS Flight Plug √
SKIN-06	STR2 Stimuli	J02	STR2		ACMS Flight Plug √
	UMBILICAL				
	Connector Function	Connector	S/C unit	SCOE CABLE	
	Power/Data	HU1 J01	SYSTEM	SCOEs cable Plugged √	
	Power/Data	HU2 J01	SYSTEM	SCOEs cable Plugged √	

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09.05.07 07:45

11 ANNEX 2: SCOE Cable Connection Requirement (RE Tests)

SCOE CABLES CONNECTION to HERSCHEL S/C					
SKIN-01	PWR Panel (PCDU)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	BS Nom Power	SK01BJ09	PCDU	BS SCOE Cable Plugged	
	BS Red Power	SK01BJ10	PCDU	BS SCOE Cable Plugged	
	BDR1 AIT	SK01BJ11	PCDU	LPS SCOE Cable Plugged	
	BDR2 AIT	SK01BJ12	PCDU	LPS SCOE Cable Plugged	
	SA Nom Power	SK01AJ01	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ02	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ03	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ04	PCDU	Connector Cover	
	SA Red Power	SK01AJ05	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ06	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ07	PCDU	POWER SCOE Cable Plugged	
SKIN-02	PWR Panel (ACC, CDMU, RCS, 1553 & Thruster)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-02	DMS 1553 Bus_A	J01	CDMU		Flight Plug SK02P01 Plugged
SKIN-02	DMS 1553 Bus_B	J02	CDMU		Flight Plug SK02P02 Plugged
SKIN-02	ACMS 1553 Bus_A	J03	ACC		Flight Plug SK02P03 Plugged
SKIN-02	ACMS 1553 Bus_B	J04	ACC		Flight Plug SK02P04 Plugged
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	Copper Tape	
SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	Copper Tape	
SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH		Flight Plug SK02P07 Plugged
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS		Flight Plug

					SK02P08 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J09	ACC/CDMU		Flight Cap SK02P09 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J10	ACC/CDMU		Flight Cap SK02P10 Plugged
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS		Flight Plug SK02P11 Plugged
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	Copper Tape	
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH	Copper Tape	
SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		ACMS Flight Plug SK02P14 Plugged
SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		ACMS Flight Plug SK02P15 Plugged
SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		ACMS Flight Plug SK02P16 Plugged
SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		ACMS Flight Plug SK02P17 Plugged
SKIN-03	TTC Panel				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
SKIN-03	Test point TC + protection jumper EPC1	SK03J01	XPND1/EPC1	Copper Tape	
SKIN-03	Test point TC + protection jumper EPC2	SK03J02	XPND2/EPC2	Copper Tape	
	RF LINK				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
	RF link for antenna LGA1	N/A	LGA1		LGA1 Anechoic Cap + termination
	RF link for antenna LGA2	N/A	LGA2		LGA2 Anechoic Cap + termination
	RF link for antenna MGA	N/A	MGA		MGA Anechoic Cap + termination
	TTC Panel Test point J 15			MGA	
	TTC Panel Test point J 60			LGA1	
SKIN-04	ACMS Panel (RWE)				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
SKIN-04	RWL1 Sgn	J01	ACC/RWL-1		ACMS Flight Plug SK04P01 Plugged
SKIN-04	RWL2 Sgn	J02	ACC/RWL-2		ACMS Flight Plug SK04P02 Plugged
SKIN-04	RWL3 Sgn	J03	ACC/RWL-3		ACMS Flight Plug SK04P03 Plugged
SKIN-04	RWL4 Sgn	J04	ACC/RWL-4		ACMS Flight Plug SK04P04 Plugged
SKIN-05	GYR/QRS Panel				

	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-05	CRS1 AOCS Sgn	J01	CRS-1/ACC		ACMS Flight plug
SKIN-05	CRS2 AOCS Sgn	J02	CRS-2/ACC		ACMS Flight plug
SKIN-05	GYRO RS422 / Test	J03	GYRO		ACMS Flight Cap
SKIN-05	CRS 1/2 Stimuli	J04	CRS-1,2		ACMS Flight Cap
SKIN-05	AAD Sgn M	J05	AAD/ACC		ACMS Flight Plug
SKIN-05	SAS1/2 Sgn M	J06	SAS/ACC		ACMS Flight Plug
SKIN-05	SAS1/2 Sgn R	J07	SAS/ACC		ACMS Flight Plug
SKIN-05	AAD Sgn R	J08	AAD/ACC		ACMS Flight Plug
SKIN-06	STR Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-06	STR1 Stimuli	J01	STR1		ACMS Flight Plug
SKIN-06	STR2 Stimuli	J02	STR2		ACMS Flight Plug
	UMBILICAL				
	Connector Function	Connector	S/C unit	SCOE CABLE	
	Power/Data	HU1 J01	SYSTEM	SCOEs cable Plugged	
	Power/Data	HU2 J01	SYSTEM	SCOEs cable Plugged	

11.2 ANNEX 3: SCOE Cable Connection Requirement (AUTO-COMP tests)

SCOE CABLES CONNECTION to HERSCHEL S/C					
SKIN-01	PWR Panel (PCDU)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	BS Nom Power	SK01BJ09	PCDU	BS SCOE Cable Plugged	
	BS Red Power	SK01BJ10	PCDU	BS SCOE Cable Plugged	
	BDR1 AIT	SK01BJ11	PCDU	LPS SCOE Cable Plugged	
	BDR2 AIT	SK01BJ12	PCDU	LPS SCOE Cable Plugged	
	SA Nom Power	SK01AJ01	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ02	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ03	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ04	PCDU	Connector Cover	
	SA Red Power	SK01AJ05	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ06	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ07	PCDU	POWER SCOE Cable Plugged	
SKIN-02	PWR Panel (ACC, CDMU, RCS, 1553 & Thruster)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-02	DMS 1553 Bus_A	J01	CDMU		Flight Plug SK02P01 Plugged
SKIN-02	DMS 1553 Bus_B	J02	CDMU		Flight Plug SK02P02 Plugged
SKIN-02	ACMS 1553 Bus_A	J03	ACC		Flight Plug SK02P03 Plugged
SKIN-02	ACMS 1553 Bus_B	J04	ACC		Flight Plug SK02P04 Plugged
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	Copper Tape	
SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	Copper Tape	
SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH		Flight Plug SK02P07 Plugged
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS		Flight Plug

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Am 08.05.08 20:35

					SK02P08 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J09	ACC/CDMU		Flight Cap SK02P09 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J10	ACC/CDMU		Flight Cap SK02P10 Plugged
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS		Flight Plug SK02P11 Plugged
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	Copper Tape	
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH	Copper Tape	
SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		ACMS Flight Plug SK02P14 Plugged
SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		ACMS Flight Plug SK02P15 Plugged
SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		ACMS Flight Plug SK02P16 Plugged
SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		ACMS Flight Plug SK02P17 Plugged
SKIN-03	TTC Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-03	Test point TC + protection jumper EPC1	SK03J01	XPND1/EPC1	Copper Tape	
SKIN-03	Test point TC + protection jumper EPC2	SK03J02	XPND2/EPC2	Copper Tape	
	RF LINK				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	RF link for antenna LGA1	N/A	LGA1		
	RF link for antenna LGA2	N/A	LGA2		
	RF link for antenna MGA	N/A	MGA		
	TTC Panel Test point J 15			MGA	
	TTC Panel Test point J 60			LGA1	
SKIN-04	ACMS Panel (RWE)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-04	RWL1 Sgn	J01	ACC/RWL-1		ACMS Flight Plug SK04P01 Plugged
SKIN-04	RWL2 Sgn	J02	ACC/RWL-2		ACMS Flight Plug SK04P02 Plugged
SKIN-04	RWL3 Sgn	J03	ACC/RWL-3		ACMS Flight Plug SK04P03 Plugged
SKIN-04	RWL4 Sgn	J04	ACC/RWL-4		ACMS Flight Plug SK04P04 Plugged
SKIN-05	GYR/QRS Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-05	CRS1 AOCS Sgn	J01	CRS-1/ACC		ACMS Flight plug

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SKIN-05	CRS2 AOCS Sgn	J02	CRS-2/ACC		ACMS Flight plug √
SKIN-05	GYRO RS422 / Test	J03	GYRO		ACMS Flight Cap √
SKIN-05	CRS 1/2 Stimuli	J04	CRS-1,2		ACMS Flight Cap √
SKIN-05	AAD Sgn M	J05	AAD/ACC		ACMS Flight Plug √
SKIN-05	SAS1/2 Sgn M	J06	SAS/ACC		ACMS Flight Plug √
SKIN-05	SAS1/2 Sgn R	J07	SAS/ACC		ACMS Flight Plug √
SKIN-05	AAD Sgn R	J08	AAD/ACC		ACMS Flight Plug √
SKIN-06	STR Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-06	STR1 Stimuli	J01	STR1		ACMS Flight Plug √
SKIN-06	STR2 Stimuli	J02	STR2		ACMS Flight Plug √
	UMBILICAL				
	Connector Function	Connector	S/C unit	SCOE CABLE	
	Power/Data	HU1 J01	SYSTEM	SCOEs cable Plugged √	
	Power/Data	HU2 J01	SYSTEM	SCOEs cable Plugged √	

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12 ANNEX 3: SCOE Cable Connection Requirement (AUTO-COMP Tests)

SCOE CABLES CONNECTION to HERSCHEL S/C

	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-01	PWR Panel (PCDU)				
	BS Nom Power	SK01BJ09	PCDU	BS SCOE Cable Plugged	
	BS Red Power	SK01BJ10	PCDU	BS SCOE Cable Plugged	
	BDR1 AIT	SK01BJ11	PCDU	LPS SCOE Cable Plugged	
	BDR2 AIT	SK01BJ12	PCDU	LPS SCOE Cable Plugged	
	SA Nom Power	SK01AJ01	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ02	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ03	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ04	PCDU	Connector Cover	
	SA Red Power	SK01AJ05	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ06	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ07	PCDU	POWER SCOE Cable Plugged	
SKIN-02	PWR Panel (ACC, CDMU, RCS, 1553 & Thruster)				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
SKIN-02	DMS 1553 Bus_A	J01	CDMU		Flight Plug SK02P01 Plugged
SKIN-02	DMS 1553 Bus_B	J02	CDMU		Flight Plug SK02P02 Plugged
SKIN-02	ACMS 1553 Bus_A	J03	ACC		Flight Plug SK02P03 Plugged
SKIN-02	ACMS 1553 Bus_B	J04	ACC		Flight Plug SK02P04 Plugged
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	Copper Tape	
SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	Copper Tape	
SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH		Flight Plug SK02P07 Plugged
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS		Flight Plug

					SK02P08 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J09	ACC/CDMU		Flight Cap SK02P09 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J10	ACC/CDMU		Flight Cap SK02P10 Plugged
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS		Flight Plug SK02P11 Plugged
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	Copper Tape	
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH	Copper Tape	
SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		ACMS Flight Plug SK02P14 Plugged
SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		ACMS Flight Plug SK02P15 Plugged
SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		ACMS Flight Plug SK02P16 Plugged
SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		ACMS Flight Plug SK02P17 Plugged
SKIN-03	TTC Panel				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
SKIN-03	Test point TC + protection jumper EPC1	SK03J01	XPND1/EPC1	Copper Tape	
SKIN-03	Test point TC + protection jumper EPC2	SK03J02	XPND2/EPC2	Copper Tape	
	RF LINK				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
	RF link for antenna LGA1	N/A	LGA1		
	RF link for antenna LGA2	N/A	LGA2		
	RF link for antenna MGA	N/A	MGA		
	TTC Panel Test point J 15			MGA	
	TTC Panel Test point J 60			LGA1	
SKIN-04	ACMS Panel (RWE)				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
SKIN-04	RWL1 Sgn	J01	ACC/RWL-1		ACMS Flight Plug SK04P01 Plugged
SKIN-04	RWL2 Sgn	J02	ACC/RWL-2		ACMS Flight Plug SK04P02 Plugged
SKIN-04	RWL3 Sgn	J03	ACC/RWL-3		ACMS Flight Plug SK04P03 Plugged
SKIN-04	RWL4 Sgn	J04	ACC/RWL-4		ACMS Flight Plug SK04P04 Plugged
SKIN-05	GYR/QRS Panel				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
SKIN-05	CRS1 AOCS Sgn	J01	CRS-1/ACC		ACMS Flight plug

SKIN-05	CRS2 AOCS Sgn	J02	CRS-2/ACC		ACMS Flight plug
SKIN-05	GYRO RS422 / Test	J03	GYRO		ACMS Flight Cap
SKIN-05	CRS 1/2 Stimuli	J04	CRS-1,2		ACMS Flight Cap
SKIN-05	AAD Sgn M	J05	AAD/ACC		ACMS Flight Plug
SKIN-05	SAS1/2 Sgn M	J06	SAS/ACC		ACMS Flight Plug
SKIN-05	SAS1/2 Sgn R	J07	SAS/ACC		ACMS Flight Plug
SKIN-05	AAD Sgn R	J08	AAD/ACC		ACMS Flight Plug
SKIN-06	STR Panel				
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**
SKIN-06	STR1 Stimuli	J01	STR1		ACMS Flight Plug
SKIN-06	STR2 Stimuli	J02	STR2		ACMS Flight Plug
	UMBILICAL				
	Connector Function	**Connector**	**S/C unit**	**SCOE CABLE**	
	Power/Data	HU1 J01	SYSTEM	SCOEs cable Plugged	
	Power/Data	HU2 J01	SYSTEM	SCOEs cable Plugged	

13 Distribution List

See next page.

	Name	Dep./Comp.		Name	Dep./Comp.
	Baldock Richard	FAE12	X	Sonn Nico	ASG51
	Barlage Bernhard	AED13		Steininger Eric	AED32
	Bayer Thomas	ASA42		Stiehle Hubert	AET32
	Brune Holger	ASA45	X	Stritter Rene	AED11
	Chen Bing	HE Space		Suess Rudi	OTN/ASA44
	Edelhoff Dirk	AED2		Theunissen Martijn	DSSA
	Fehringer Alexander	ASG13		Vascotto Riccardo	HE Space
X	Fricke Wolfgang Dr.	AED 65		Wagner Klaus	ASG23
	Geiger Hermann	ASA42	X	Wietbrock Walter	AET12
	Grasl Andreas	OTN/ASA44		Wöhler Hans	ASG23
	Grasshoff Brigitte	AET12		Wössner Ulrich	ASE252
X	Hamer Simon	Terma		Zumstein Armin	ASQ42
	Hanka, Erhard	FI552			
X	Hendrikse Jeffrey	HE Space			
X	Hendry David	Terma			
	Hengstler Reinhold	ASA42			
	Hinger Jürgen	ASG23			
X	Hohn Rüdiger	AED65			
	Hofmann Rolf	ASE252			
X	Hopfgarten Michael	AED32			
	Huber Johann	ASA42			
	Hund Walter	ASE252			
X	Idler Siegmund	AED312			
	Ivády von András	FAE12			
	Jahn Gerd Dr.	ASG23			
	Jolk Matthias	AET1	X	ESA/ESTEC	ESA
	Klenke Uwe	ASG72	X	Thales Alenia Space Cannes	TAS-F
X	Koelle Markus	ASA43		Thales Alenia Space Torino	TAS-I
	Koppe Axel	AED312			
X	Kroeker Jürgen	AED65		**Instruments:**	
	La Gioia Valentina	Terma		MPE (PACS)	MPE
	Lang Jürgen	ASE252		RAL (SPIRE)	RAL
	Langenstein Rolf	AED15		SRON (HIFI)	SRON
	Langfermann Michael	ASA41			
	Liberatore Danilo	Rhea			
	Martin Olivier	ASA43		**Subcontractors:**	
	Maukisch Jan	ASA43		Austrian Aerospace	AAE
X	Much Christoph	ASA43		Austrian Aerospace	AAEM
X	Müller Martin	ASA43		BOC Edwards	BOCE
	Pietroboni Karin	AED65		Dutch Space Solar Arrays	DSSA
	Platzer Wilhelm	AED2		EADS Astrium Sub-Subsyst. & Equipment	ASSE
	Reichle Konrad	ASA42		EADS CASA Espacio	CASA
	Runge Axel	OTN/ASA44		EADS CASA Espacio	ECAS
	Sauer Maximilian Dr.	AED65		European Test Services	ETS
	Schink Dietmar	AED32		Patria New Technologies Oy	PANT
	Schmidt Thomas	AED15		SENER Ingenieria SA	SEN
	Schweickert Gunn	ASG23		Thales Alenia Space, Antwerp	TAS-ETCA

SWITCH ON SC FOR EMC
08/05/08

1

Herschel Integrated Satellite Test
Procedure: Leading Procedure

Herschel

EADS astrium

SWITCH ON PRIOR EMC-RE DRY RUN

Title: **Leading Procedure for Herschel Integrated Satellite Test**

AS RUN.

CI-No: 2008_05_08_04-12-hercdmu-hpws22-REALTIME-EMC-RE

Prepared by:	Functional Team	Date:
Checked by:	C. Much	25/4/2008
Product Assurance:	J. Hall	25/4/2008.
Configuration Control:	W. Wietbrock	
TASF Engineering	G. Beaufils p.o.	25 APR 08
TASF Test Director	S. Mooney	25/4/2008.
Project Management:	Dr. W. Fricke ~~AGREED AS NOT MANDATORY SIGNATURE FOR START OF TEST~~	29/04/08
Project Management	Denis Montet	28/4/08

Distribution: See Distribution List (last page)

Change Record:

Issue	Date	Sheet	Description of Change	Release
1	11.01.2008		Initial version	1
1.1	04.02.2008		- see change bar	
1.2	27.02.2008		Update IST START step description according to AS RUN procedures, Add Operator note in Annex D, Add IST_GUI pictures, Update Hierarchy Script	
2.0	11.03.2008		5.4.3.1 Add CCS Light in EGSE Hardware Configuration 7.1.2 change all RFDN SM values from BBBB to ABBB (See procedure variations) 7.1.2 change value of "Bat.SCOE in table for launch clean run 7.1.2 change value of "TTR in SM" in table for "FDIR" and "Nom mode Robustness" 7.1.2 Correct SSMM configuration for ACMS commissioning 7.1.3 Step 1 add script name 7.1.3 Step 2 describe how to open window 7.1.3 Step 4 additional remark N/A for "Launch Clean Run" 7.1.3 Step 5 additional remark N/A for "Launch Clean Run" 7.1.3 Step 7 additional remark N/A for "Launch Clean Run" 7.1.3 Move Step 7b as 9b 7.1.3 Step 8-9 appears always (not only for launch cases)	
			7.1.3 step 20 add Operator Note 11 reference 7.1.3 step 22 deleted 7.1.3 step 23 added "Satellite state displayed" 7.1.3 step 29 remark deleted 7.1.3 step 33-34 Remark moved from step 34 to step 33 7.1.3 step 39 additional remark 7.1.4.1 step 9 add SPR 282 7.1.4.2 step 4 correct script name 7.1.4.2 step 5-6-7 clarify N/A 7.1.4.2 step 8 move remark to step 10 7.1.4.2 step 10 add SPR and NCR and expected TM(5,1) 7.1.4.2 step 13 add PM_reset TC Not Acknowledged 7.3 step 2 change YES to Confirm	

			7.3 step 2 add "RWL ON" condition 7.3 step 5 correct typo 7.3 step 7 add out of limit comment 7.3 add step 12a 7.3 remove step24 7.3 move step21 after WRITE_CROME step 23 7.3.1 4th Step 31 Add event TM(5,1) expected during ACC OFF Annex D add Operator Note 11 Rename Chapter 7 as IST Test Create new subchapters 7.1 HPCCS configuration for IST Test 7.1.1 Apply Tag on test files	
3	17.04.08		Update IST START procedure according to the AS RUN procedure for Nominal Mode Robstness (minor changes), 4.3.1 & 4.3.2 to include SCOE Sk01J04 and to correct hcu connector ident Typo's 7.2.1 Insert IST Start overview test flow diagram 7.2.2 update table 5.8.12 Nom Mode Robustness table to be i.a.w. the IST Specification	
4	24.04.08		Update IST START procedure according to the AS RUN procedure for minor updates, Include step 21 in Section 7.2.4 - start a CCU log file to monitor temperature TLM's	

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1 Scope

This Test Procedure contains the overall IST start-up and shutdown procedures for the satellite covering all the defined test cases as well as being the entry point for calling the appropriate test configuration.

It also contains the supporting definition of the relevant supporting infrastructure and pre test conditions required for the IST tests to be performed correctly.

All pre-requisites for the Helium II procedures shall be incorporated into a future issue of this document.

1.1 Objective

This document is the entry point for the Integrated Satellite Test - IST - test cases to be executed as part of the overall IST campaign for the Herschel project.

This document shall act as the leading procedure, to become 'as run' procedure for each IST test case that is executed, and shall be identified on the front sheet in 'Red' before start of test. A new 'as run' copy of the procedure shall be used for each test run, and will become a accurate history of the test performed. All activities will be recorded, with results obtained. Any anomalies found will be noted in the step by step section as they arise, and where applicable an SPR (Software Problem reports) will be raised.

The identification of hazardous conditions associated with the test article and the operations, which might damage equipment, cause injury or invalidate test data, will be herein provided. Precautions to be observed, with correlation to the specific areas of applicability, will be provided as well in the descriptions of the test set-up to be adopted.

1.2 Flow

The test flow is divided into two main areas: IST1 pre-environmental testing and IST2 which will be performed post environmental testing. For IST1 the tests will be grouped into 3 main test groups: Warm Case, He I, and He II condition. (See list below). For IST2 all testing shall be performed in He II condition.

IST 1

- **Warm case**
  - Launch clean run
  - Launch phase, separation and post separation
  - Satellite Commissioning warm case
  - ACMS commissioning
  - Launch sequence robustness
  - Mode transitions Warm case

- **He I**
  - Mode transitions He I or He II
  - S/C reconfiguration
  - NOM mode robustness
  - Test of Instrument FDIR OBCP

- **He II**
  - Instruments commissioning and performance verification
  - CDMS management
  - DTCP worst case scenario
  - Satellite/ CCU Commissioning He II only
  - Reference Mission Scenario

IST 2

All tests will be performed in He II

Tests may be run in any order

2 Documents

2.1 Applicable Documents

This section contains the list of documents originator of the test procedure, the list of documents filled with the requirement applicable to the activities explained in this procedure, the list of documents used to define the activities on the items (like design reports)

AD 2.1.1 Herschel Integrated Satellite Test Specification H-P-2-ASP-0939

2.2 Reference Documents

This section contains a list of documents filled with statements necessary to organise and to detail the operative execution of the test activities

RD 2.2.1.a.	Herschel/Planck Reference Mission Scenario	SCI-PT-12759
RD 2.2.1.b.	H/P ACMS S/S AVM SIT Specification	H-P-SP-AI-0059
RD 2.2.1.c.	H CDMS SIT Specification	H-P-SP-AI-0065
RD 2.2.1.d.	H TT&C SIT Specification	H-P-SP-AI-0078
RD 2.2.1.e.	H PCS SIT Specification	H-P-SP-AI-0079
RD 2.2.1.f.	Packet Store Usage on H/P	PT-CMOC-OPS-TN-6603
RD 2.2.1.g.	Software user's Manual	P-HPL-NOT-0029-SE
RD 2.2.1.h.	CDMU ASW Requirement Specification	H-P-SP-AI-0031
RD 2.2.1.l.	Basic Software Requirement Specification	H-P-SP-AI-0006
RD 2.2.1.m.	H/P ACMS Requirement Specification	H-P-SP-AI-0011
RD 2.2.1.n.	SVM FDIR Design Specification	H-P-TN-AI-0024
RD 2.2.1.o.	Herschel Planck PSICD	SCI-PT-ICD-07527
RD 2.2.1.p.	H-P-CDMU ASW User Manual	H-P-4-SSF-MA-0001
RD 2.2.1.q.	H-P ACMS Design Report	H-P-4-DS-TN-0011
RD 2.2.1.r.	H-P ACMS TC Definition	H-P-4-DS-TN-0024
RD 2.2.1.s.	ACMS FDIR Analysis Report	H-P-4-DS-TN-0010
RD 2.2.1.t.	CDMU HW User Manual	P-HPL-NOT-0009

2.3 Other Documents

Additional to the IST Leading procedure there are the Step by Step IST procedure for each test case and a separate Instrument Power ON/OFF Switching procedure (see the table below).

IST Step by Step Test Procedures	HP-2-ASED-	Test to be performed
Herschel IST Test Case 'Launch Phase, Separation and Post Separation'	TP-0185	
Herschel IST Test Case 'Satellite Commissioning'	TP-0186	
Herschel IST Test Case 'ACMS Commissioning'	TP-0187	
Herschel IST Test Case 'Instruments Commissioning and Performance Verification'	TP-0188	
Herschel IST Test Case 'Mode Transitions'	TP-0189	
Herschel IST Test Case 'S/C Reconfiguration'	TP-0190	
Herschel IST Test Case 'CDMS Management'	TP-0191	
Herschel IST Test Case 'DTCP Worst Case Scenario'	TP-0192	
Herschel IST Test Case 'REFERENCE Mission Scenario'	TP-0193	
Herschel IST Test Case 'Launch Clean Run'	TP-0194	
Herschel IST Test Case 'Launch Sequence Robustness'	TP-0195	
Herschel IST Test Case 'NOM Mode Robustness'	TP-0196	
Herschel IST Test Case 'Test of Instrument FDIR OBCP'	TP-0197	
Herschel Instrument Power On/Off and Mode Switching Procedure for Functional Testing	TP-0206	

3 Requirements to be verified

See AD 2.1.1 "Herschel Integrated Satellite Test Specification" section 9

4 Configuration

4.1 Hardware Configuration

The activities described in this test procedure require the complete system configuration according to the hardware matrix here below reported.

S/S	Unit	Configuration	SCOE simulated equipments	Remarks
		Herschel		
EGSE	CCS	1		
	CCS lite	1		
	TM/TC DFE	1		
	CDMU SCOE	1		
	ACMS SCOE	1		
	TT&C SCOE	1		
	POWER SCOE	1		
	CCU SCOE			
IGSE	**HIFI IGSE**	1		
	PACS IGSE	1		
	SPIRE IGSE	1		
PCS	PCDU	1+1		
	Battery	1 Installed. Only	1	Battery Simulation for other tests
		connected for Launch clean run		
	Solar Array	30 nom sections not required for IST	1	Power SCOE
CDMS	CDMU	1+1		
ACMS	ACC	1+1		
	RWA	3+1		
	GYRO	3+1		
	STR	2		
	CRS	2		
	AAD	1+1 internal red		
	SAS	2+2 internal red		
TT&C	XPND	2		
	TWT	2		
	EPC	2		
	LGA	2 (not used during the IST)		

S/S	Unit	Configuration	SCOE simulated equipments	Remarks
	MGA	1 (not used during the IST)		
RCS		1+1 (not used during the IST)		ACMS SCOE
TCS		1 (partially installed)		
VMC		1		
SREM		1		
HIFI		1		
PACS		1		
SPIRE		1		
Telescope		1		
HSS		1		

Table 1: Satellite configuration required for IST

4.2 SW Configuration

The Satellite IST will be run with the on-board software configuration as detailed in the IST TRR.

The actual configuration of the software should be noted here to ensure correct system status

- CDMS OBSW: ____________________
- ACMS OBSW: ____________________
- STR PROM SW: ____________________
- STR EEPROM SW: ____________________
- PACS DPU SW: ____________________
- PACS SPU SW: ____________________
- PACS DMC SW: ____________________
- HIFI ICU SW: ____________________
- SPIRE DPU SW: ____________________

4.3 SCOE Cables Connection

For the IST there are four different SCOE cables configuration.

- Configuration 1 for ”Nominal Launch” and “RMS” see 4.3.1
- Configuration 2 for ” Instrument Commissioning”, “Mode Transitions”, “S/C Reconfiguration”, “Launch Mode Robustness”, “CDMS management”, “ACMS Commissioning”, “Satellite commissioning” and “DTCP Worst Case Scenario” ” NOM Mode Robustness” 4.3.2
- Configuration 3 for ” Launch Clean Run” 4.3.3

4.3.1 SCOE cable connection for "RMS"

SCOE CABLES CONNECTION to HERSCHEL S/C					
SKIN-01	PWR Panel (PCDU)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	BS Nom Power	SK01BJ09	PCDU		PCDU Flight Plug SK01BP09 Plugged
	BS Red Power	SK01BJ10	PCDU		PCDU Flight Plug SK01BP09 Plugged
	BDR1 AIT	SK01BJ11	PCDU	LPS SCOE Cable Plugged	
	BDR2 AIT	SK01BJ12	PCDU	LPS SCOE Cable Plugged	
	SA Nom Power	SK01AJ01	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ02	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ03	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ04	PCDU	Connector Cover	
	SA Red Power	SK01AJ05	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ06	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ07	PCDU	POWER SCOE Cable Plugged	
SKIN-02	PWR Panel (ACC, CDMU, RCS, 1553 & Thruster)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-02	DMS 1553 Bus_A	J01	CDMU	Bus Monitor Cable Plugged	
SKIN-02	DMS 1553 Bus_B	J02	CDMU	Bus Monitor Cable Plugged	
SKIN-02	ACMS 1553 Bus_A	J03	ACC	ACMS SCOE Cable Plugged	
SKIN-02	ACMS 1553 Bus_B	J04	ACC	ACMS SCOE Cable Plugged	
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	ACMS SCOE Cable Plugged	
SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	ACMS SCOE Cable Plugged	

SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH	ACMS SCOE Cable Plugged	
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS	ACMS SCOE Cable Plugged	
SKIN-02	CDMU and ACC EEPROM reprogramming input	J09	ACC/CDMU		Flight Cap SK02P09 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J10	ACC/CDMU		Flight Cap SK02P10 Plugged
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS	ACMS SCOE Cable Plugged	
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	ACMS SCOE Cable Plugged	
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH	ACMS SCOE Cable Plugged	
SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		ACMS Flight Cap SK02P14 Plugged
SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		ACMS Flight Cap SK02P15 Plugged
SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		ACMS Flight Cap SK02P16 Plugged
SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		ACMS Flight Cap SK02P17 Plugged
SKIN-03	TTC Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-03	Test point TC + protection jumper EPC1	SK03J01	XPND1/EPC1		Plastic cap (See note1)
SKIN-03	Test point TC + protection jumper EPC2	SK03J02	XPND2/EPC2		Plastic cap (See note1)
	RF LINK				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	RF link for antenna LGA1	N/A	LGA1	RF SCOE LGA1 Plugged	LGA1 Anechoic Cap
	RF link for antenna LGA2	N/A	LGA2	RF SCOE LGA2 Plugged	LGA2 Anechoic Cap
	RF link for antenna MGA	N/A	MGA	RF SCOE MGA Plugged	MGA Anechoic Cap
SKIN-04	ACMS Panel (RWE)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-04	RWL1 Sgn	J01	ACC/RWL-1		ACMS Flight Cap SK04P01 Plugged
SKIN-04	RWL2 Sgn	J02	ACC/RWL-2		ACMS Flight Cap SK04P02 Plugged
SKIN-04	RWL3 Sgn	J03	ACC/RWL-3		ACMS Flight Cap SK04P03 Plugged

SKIN-04	RWL4 Sgn	J04	ACC/RWL-4		ACMS Flight Cap SK04P04 Plugged
SKIN-05	GYR/QRS Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-05	CRS1 AOCS Sgn	J01	CRS-1/ACC		ACMS Flight Cap
SKIN-05	CRS2 AOCS Sgn	J02	CRS-2/ACC		ACMS Flight Cap
SKIN-05	GYRO RS422 / Test	J03	GYRO	ACMS SCOE Cable Plugged	
SKIN-05	CRS 1/2 Stimuli	J04	CRS-1,2	ACMS SCOE Cable Plugged	
SKIN-05	AAD Sgn M	J05	AAD/ACC	ACMS SCOE Cable Plugged	
SKIN-05	SAS1/2 Sgn M	J06	SAS/ACC	ACMS SCOE Cable Plugged	
SKIN-05	SAS1/2 Sgn R	J07	SAS/ACC	ACMS SCOE Cable Plugged	
SKIN-05	AAD Sgn R	J08	AAD/ACC	ACMS SCOE Cable Plugged	
SKIN-06	STR Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-06	STR1 Stimuli	J01	STR1	ACMS SCOE Cable Plugged	
SKIN-06	STR2 Stimuli	J02	STR2	ACMS SCOE Cable Plugged	
	UMBILICAL				
	Connector Function	Connector	S/C unit	SCOE CABLE	
	Power/Data	HU1 J01	SYSTEM	SCOEs cable Plugged	
	Power/Data	HU2 J01	SYSTEM	SCOEs cable Plugged	

CryoSCOE harness setup for ACS/PR/TP No.:

Annex No.:

315 100	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
	Temperature Sensors	315100-J01	T117, T118, T207, T211, T238, T239, T249,T251, T253, T255, T423, T443, T463, T851, T852, T853, T861	Cryo SCOE J07 & J15		no flight
	Temperature & pressure Sensors	315100-J03	T702, T872, P101, T103, T115, T116, T704, T802, T803, T805, T806, T871	Cryo SCOE J01 & J17		no flight
	Temperature Sensors	315100-J05	T331, T333, T335, T337, T339, T341 (Telescope)	Cryo SCOE J14		X
	Temperature Sensors	315100-J06	T332, T334, T336, T338, T340, T342 (Telescope)	Cryo SCOE J10		X
316 100	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
	Valve Sensor	316100-J01	VS501, VS504			X
	Valve Sensor	316100-J02	VS503, VS505			X
321 100	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
		321100-J01	L701, H701	Cryo SCOE J11		no flight
		321100-J02	LL702, H702	Cryo SCOE J03		no flight
		321100-J03	H502, H503	Cryo SCOE J06		no flight
		321100-J04	P501	Cryo SCOE J01		no flight

		321100-J05	H103, H701, L102, VT102, VT103, VT105, VT701, VH102, VH103, VH105, VH701, VS102, VS105, VS701	Cryo SCOE J11		no flight
		321100-J06	H104, H702, L101, VT104, VT106, VT702, VH104, VH106, VH702, VS104, VS702	Cryo SCOE J03		no flight
		321100-J07	H501	Cryo SCOE J06		no flight
		321100-J08	T502	Cryo SCOE J01		no flight
321 200	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
		321200-J01	T202, T212, T221, T223, T227, T228, T232, T234, T236, T242, T244, T246, T250, T254, T258, T424, T464	Cryo SCOE J08		X
		321200-J02	T102, T105, T106, T111, PR_P701, T421, T442, T461, H101	Cryo SCOE J04		X
		321200-J03	T321, T323, T501, T505, T651, T901, T903, T907, T911	Cryo SCOE J09		X
		321200-J04	T312, T314, T316, T905, T909, T931, T933, T935	Cryo SCOE J09		X
		321200-J05	VS103, H102	Cryo SCOE J04		X
321 300	on top of					
	Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected

		321300-J01	T208, T213, T222, T224, T225, T226, T231, T233, T235, T237, T247, T248, T252, T256, T862, T444	Cryo SCOE J02		X
		321300-J02	T101, T104, T107, T112, T703, T422, T441, T462, T701, H102	Cryo SCOE J04		X
		321300-J03	P502,T322, T324, T504, T506, T507, T652, T902, T908, T912	Cryo SCOE J18		X
		321300-J04	T311, T313, T315, T904, T906, T910, T932, T934	Cryo SCOE J14		X
		321300-J05	VS106, H102	Cryo SCOE J04		X
CVSE I/F	on top of					
	Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected
				Cryo SCOE J18		X

to be approved & released before start of ACS/PR/TP by Floor-Manager	Date:	Sign:

SAFE / ARM plug setup for ACS/PR/TP No.:						
Annex No.:						
314 200	on top of					
	Connector Function	Connector	S/C unit	SAFE	ARM	Sign
	SAFE / ARM plug	314 200-J03	NED (601)	X		
	SAFE / ARM plug	314 200-J04	NED (602)	X		
	SAFE / ARM plug	314 200-J05	SI 601	X		
	SAFE / ARM plug	314 200-J06	SI 602	X		
to be approved & released before start of ACS/PR/TP by Floor-Manager	Date:		Sign:			

4.3.2 SCOE cable connection for " Nominal Launch", " Satellite Commissioning",,"Instrument Commissioning "ACMS Commissioning", "Mode Transitions", S/C Reconfiguration", "CDMS management", DTCP Worst Case Scenario", "Launch Mode Robustness",."NOM Mode Robustness" and "Instrument FDIR"

SCOE CABLES CONNECTION to HERSCHEL S/C					
SKIN-01	PWR Panel (PCDU)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	BS Nom Power	SK01BJ09	PCDU	BS SCOE Cable Plugged	
	BS Red Power	SK01BJ10	PCDU	BS SCOE Cable Plugged	
	BDR1 AIT	SK01BJ11	PCDU	LPS SCOE Cable Plugged	
	BDR2 AIT	SK01BJ12	PCDU	LPS SCOE Cable Plugged	
	SA Nom Power	SK01AJ01	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ02	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ03	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ04	PCDU	Connector Cover	
	SA Red Power	SK01AJ05	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ06	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ07	PCDU	POWER SCOE Cable Plugged	
SKIN-02	PWR Panel (ACC, CDMU, RCS, 1553 & Thruster)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-02	DMS 1553 Bus_A	J01	CDMU	Bus Monitor Cable Plugged	
SKIN-02	DMS 1553 Bus_B	J02	CDMU	Bus Monitor Cable Plugged	
SKIN-02	ACMS 1553 Bus_A	J03	ACC	ACMS SCOE Cable Plugged	
SKIN-02	ACMS 1553 Bus_B	J04	ACC	ACMS SCOE Cable Plugged	
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	ACMS SCOE	

				Cable Plugged	
SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	ACMS SCOE Cable Plugged	
SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH	ACMS SCOE Cable Plugged	
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS	ACMS SCOE Cable Plugged	
SKIN-02	CDMU and ACC EEPROM reprogramming input	J09	ACC/CDMU		Flight Cap SK02P09 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J10	ACC/CDMU		Flight Cap SK02P10 Plugged
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS	ACMS SCOE Cable Plugged	
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	ACMS SCOE Cable Plugged	
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH	ACMS SCOE Cable Plugged	
SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		ACMS Flight Cap SK02P14 Plugged
SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		ACMS Flight Cap SK02P15 Plugged
SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		ACMS Flight Cap SK02P16 Plugged
SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		ACMS Flight Cap SK02P17 Plugged
SKIN-03	TTC Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-03	Test point TC + protection jumper EPC1	SK03J01	XPND1/EPC1		Plastic cap (See note1)
SKIN-03	Test point TC + protection jumper EPC2	SK03J02	XPND2/EPC2		Plastic cap (See note1)
	RF LINK				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	RF link for antenna LGA1	N/A	LGA1	RF SCOE LGA1 Plugged	LGA1 Anechoic Cap
	RF link for antenna LGA2	N/A	LGA2	RF SCOE LGA2 Plugged	LGA2 Anechoic Cap
	RF link for antenna MGA	N/A	MGA	RF SCOE MGA Plugged	MGA Anechoic Cap
SKIN-04	ACMS Panel (RWE)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-04	RWL1 Sgn	J01	ACC/RWL-1		ACMS Flight Cap SK04P01 Plugged
SKIN-04	RWL2 Sgn	J02	ACC/RWL-2		ACMS Flight Cap

					SK04P02 Plugged
SKIN-04	RWL3 Sgn	J03	ACC/RWL-3		ACMS Flight Cap SK04P03 Plugged
SKIN-04	RWL4 Sgn	J04	ACC/RWL-4		ACMS Flight Cap SK04P04 Plugged
SKIN-05	GYR/QRS Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-05	CRS1 AOCS Sgn	J01	CRS-1/ACC		ACMS Flight Cap
SKIN-05	CRS2 AOCS Sgn	J02	CRS-2/ACC		ACMS Flight Cap
SKIN-05	GYRO RS422 / Test	J03	GYRO	ACMS SCOE Cable Plugged	
SKIN-05	CRS 1/2 Stimuli	J04	CRS-1,2	ACMS SCOE Cable Plugged	
SKIN-05	AAD Sgn M	J05	AAD/ACC	ACMS SCOE Cable Plugged	
SKIN-05	SAS1/2 Sgn M	J06	SAS/ACC	ACMS SCOE Cable Plugged	
SKIN-05	SAS1/2 Sgn R	J07	SAS/ACC	ACMS SCOE Cable Plugged	
SKIN-05	AAD Sgn R	J08	AAD/ACC	ACMS SCOE Cable Plugged	
SKIN-06	STR Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-06	STR1 Stimuli	J01	STR1	ACMS SCOE Cable Plugged	
SKIN-06	STR2 Stimuli	J02	STR2	ACMS SCOE Cable Plugged	
	UMBILICAL				
	Connector Function	Connector	S/C unit	SCOE CABLE	
	Power/Data	HU1 J01	SYSTEM	SCOEs cable Plugged	
	Power/Data	HU2 J01	SYSTEM	SCOEs cable Plugged	

CryoSCOE harness setup for ACS/PR/TP No.:						
Annex No.:						
315 100	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
	Temperature Sensors	315100-J01	T117, T118, T207, T211, T238, T239, T249,T251, T253, T255, T423, T443, T463, T851, T852, T853, T861	Cryo SCOE J07 & J15		no flight
	Temperature & pressure Sensors	315100-J03	T702, T872, P101, T103, T115, T116, T704, T802, T803, T805, T806, T871	Cryo SCOE J01 & J17		no flight
	Temperature Sensors	315100-J05	T331, T333, T335, T337, T339, T341 (Telescope)	Cryo SCOE J14		X
	Temperature Sensors	315100-J06	T332, T334, T336, T338, T340, T342 (Telescope)	Cryo SCOE J10		X
316 100	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
	Valve Sensor	316100-J01	VS501, VS504			X
	Valve Sensor	316100-J02	VS503, VS505			X
321 100	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
		321100-J01	L701, H701	Cryo SCOE J11		no flight
		321100-J02	LL702, H702	Cryo SCOE J03		no flight
		321100-J03	H502, H503	Cryo SCOE J06		no flight

	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
		321100-J04	P501	Cryo SCOE J01		no flight
		321100-J05	H103, H701, L102, VT102, VT103, VT105, VT701, VH102, VH103, VH105, VH701, VS102, VS105, VS701	Cryo SCOE J11		no flight
		321100-J06	H104, H702, L101, VT104, VT106, VT702, VH104, VH106, VH702, VS104, VS702	Cryo SCOE J03		no flight
		321100-J07	H501	Cryo SCOE J06		no flight
		321100-J08	T502	Cryo SCOE J01		no flight
321 200	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
		321200-J01	T202, T212, T221, T223, T227, T228, T232, T234, T236, T242, T244, T246, T250, T254, T258, T424, T464	Cryo SCOE J08		X
		321200-J02	T102, T105, T106, T111, PR_P701, T421, T442, T461, H101	Cryo SCOE J04		X
		321200-J03	T321, T323, T501, T505, T651, T901, T903, T907, T911	Cryo SCOE J09		X
		321200-J04	T312, T314, T316, T905, T909, T931, T933, T935	Cryo SCOE J09		X
		321200-J05	VS103, H102	Cryo SCOE J04		X

321 300	on top of					
	Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected
		321300-J01	T208, T213, T222, T224, T225, T226, T231, T233, T235, T237, T247, T248, T252, T256, T862, T444	Cryo SCOE J02		X
		321300-J02	T101, T104, T107, T112, T703, T422, T441, T462, T701, H102	Cryo SCOE J04		X
		321300-J03	P502,T322, T324, T504, T506, T507, T652, T902, T908, T912	Cryo SCOE J18		X
		321300-J04	T311, T313, T315, T904, T906, T910, T932, T934	Cryo SCOE J14		X
		321300-J05	VS106, H102	Cryo SCOE J04		X
CVSE I/F	on top of					
	Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected
				Cryo SCOE J18		X

to be approved & released before start of ACS/PR/TP by Floor-Manager	Date:	Sign:

SAFE / ARM plug setup for ACS/PR/TP No.:						
Annex No.:						
314 200	on top of					
	Connector Function	Connector	S/C unit	SAFE	ARM	Sign
	SAFE / ARM plug	314 200-J03	NED (601)	X		
	SAFE / ARM plug	314 200-J04	NED (602)	X		
	SAFE / ARM plug	314 200-J05	SI 601	X		
	SAFE / ARM plug	314 200-J06	SI 602	X		
to be approved & released before start of ACS/PR/TP by Floor-Manager		Date:		Sign:		

4.3.3 SCOE cable connection for" Launch Clean Run"

SVM / EGSE harness setup for ACS/PR/TP No.:							
Annex No.:							
SKIN-01	PWR Panel (PCDU)						
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	SA Nom Power	SAS SCOE	PCDU	SK01A J/P01	disconnected		
	SA Nom Power	SAS SCOE	PCDU	SK01A J/P02	disconnected		
	SA Nom Power	SAS SCOE	PCDU	SK01A J/P03	disconnected		
			Battery	SK01A J/P04	EMC cover		
	SA Red Power	SAS SCOE	PCDU	SK01A J/P05	disconnected		
	SA Red Power	SAS SCOE	PCDU	SK01A J/P06	disconnected		
	SA Red Power	SAS SCOE	PCDU	SK01A J/P07	disconnected		
	BS Nom Power	BS SCOE	PCDU	SK01B J/P09	Flight		
	BS Red Power	BS SCOE	PCDU	SK01B J/P10	Flight		
	BDR1 AIT	SAS SCOE	PCDU	SK01B J/P11	LPS SCOE Cable Plugged		
	BDR2 AIT	SAS SCOE	PCDU	SK01B J/P12	LPS SCOE Cable Plugged		
SKIN-02	PWR Panel (ACC, CDMU, RCS, 1553 & Thruster)						
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	DMS 1553 Bus_A	CDMU SCOE	CDMU	SK02 J/P01	Flight		
	DMS 1553 Bus_B	CDMU SCOE	CDMU	SK02 J/P02	Flight		
	ACMS 1553 Bus_A	ACMS SCOE	ACC	SK02 J/P03	Flight		
	ACMS 1553 Bus_B	ACMS SCOE	ACC	SK02 J/P04	Flight		
	LV1/FCV 20N CMD S/A M	ACMS SCOE	ACC/RCS	SK02 J/P05	disconnected		
	LV2/FCV 20N CMD S/A R	ACMS SCOE	ACC/RCS	SK02 J/P06	disconnected		
	RCS Press/Tank Temp/PT Pwr	ACMS SCOE	ACC/PT&TH	SK02 J/P07	Flight		
	Thruster Temp M/LV1 Sts	ACMS SCOE	ACC/RCS	SK02 J/P08	Flight		

	Quick S/W load	grey ACMS	black CDMS	SK02 J/P09	disconnected		
	Quick S/W load	grey ACMS	black CDMS	SK02 J/P10	disconnected		
	Thruster Temp R/LV2 Sts	ACMS SCOE	ACC/RCS	SK02 J/P11	Flight		
	Thruster C/B Heaters M	ACMS SCOE	ACC/CBH	SK02 J/P12	disconnected		
	Thruster C/B Heaters R	ACMS SCOE	ACC/CBH	SK02 J/P13	disconnected		
	Str1/2 On/Off Cmd M/Str1 Sts	ACMS SCOE	ACC/STR-1	SK02 J/P14	Flight		
	Str1/2 On/Off Cmd R/Str2 Sts	ACMS SCOE	ACC/STR-2	SK02 J/P15	Flight		
	Gyro A On/Off Cmd		ACC/GYRO-E1	SK02 J/P16	Flight		
	Gyro B On/Off Cmd		ACC/GYRO-E2	SK02 J/P17	Flight		
SKIN-03	TTC Panel						
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	Test point TC + protection jumper EPC1	Plastic Cap	XPND1/EPC1	SK03 J/P01	Flight		
	Test point TC + protection jumper EPC2	Plastic Cap	XPND2/EPC2	SK03 J/P02	Flight		
	RF LINK						
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	RF link for antenna LGA1	TT&C SCOE	LGA1	LGA1 Anechoic Cap	RF-SCOE		
	RF link for antenna LGA2	TT&C SCOE	LGA2	LGA2 Anechoic Cap	RF-SCOE		
	RF link for antenna MGA	TT&C SCOE	MGA	MGA Anechoic Cap	RF-SCOE		
SKIN-04	ACMS Panel (RWE)						
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	RWL1 Sgn		ACC/RWL-1	SK04 J/P01	Flight		
	RWL2 Sgn		ACC/RWL-2	SK04 J/P02	Flight		
	RWL3 Sgn		ACC/RWL-3	SK04 J/P03	Flight		
	RWL4 Sgn		ACC/RWL-4	SK04 J/P04	Flight		

SKIN-05	GYR/QRS Panel						
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	CRS1 AOCS Sgn		CRS-1/ACC	SK05 J/P01	Flight		
	CRS2 AOCS Sgn		CRS-2/ACC	SK05 J/P02	Flight		
	GYRO RS422 / Test	ACMS SCOE	GYRO	SK05 J/P03	disconnected		
	CRS 1/2 Stimuli	ACMS SCOE	CRS-1,2	SK05 J/P04	disconnected		
	AAD Sgn M	ACMS SCOE	AAD/ACC	SK05 J/P05	Flight		
	SAS1/2 Sgn M	ACMS SCOE	SAS/ACC	SK05 J/P06	Flight		
	SAS1/2 Sgn R	ACMS SCOE	SAS/ACC	SK05 J/P07	Flight		
	AAD Sgn R	ACMS SCOE	AAD/ACC	SK05 J/P08	Flight		
SKIN-06	STR Panel						
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	STR1 Stimuli	STR1	STR1	SK06 J/P01	disconnected		
	STR2 Stimuli	STR2	STR2	SK06 J/P02	disconnected		
UMBILICAL							
	Connector Function	SCOE	S/C unit	Connector	Connection		Sign
	Power/Data	System	SYSTEM	HUJ01	SCOE		
	Power/Data	System	SYSTEM	HUJ02	SCOE		
approved SE		approved AIT		approved PA/Safety		approved Floor-Manger	
sign off:							

CryoSCOE harness setup for ACS/PR/TP No.:

Annex No.:

315 100 on top of

Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
Temperature Sensors	315100-J01	T117, T118, T207, T211, T238, T239, T249,T251, T253, T255, T423, T443, T463, T851, T852, T853, T861	Cryo SCOE J07 & J15		no flight
Temperature & pressure Sensors	315100-J03	T702, T872, P101, T103, T115, T116, T704, T802, T803, T805, T806, T871	Cryo SCOE J01 & J17		no flight
Temperature Sensors	315100-J05	T331, T333, T335, T337, T339, T341 (Telescope)	Cryo SCOE J14		X
Temperature Sensors	315100-J06	T332, T334, T336, T338, T340, T342 (Telescope)	Cryo SCOE J10		X

316 100 on top of

Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
Valve Sensor	316100-J01	VS501, VS504			X
Valve Sensor	316100-J02	VS503, VS505			X

321 100 on top of

Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
	321100-J01	L701, H701	Cryo SCOE J11		no flight
	321100-J02	LL702, H702	Cryo SCOE J03		no flight
	321100-J03	H502, H503	Cryo SCOE J06		no flight
	321100-J04	P501	Cryo SCOE J01		no flight

		321100-J05	H103, H701, L102, VT102, VT103, VT105, VT701, VH102, VH103, VH105, VH701, VS102, VS105, VS701	Cryo SCOE J11		no flight
		321100-J06	H104, H702, L101, VT104, VT106, VT702, VH104, VH106, VH702, VS104, VS702	Cryo SCOE J03		no flight
		321100-J07	H501	Cryo SCOE J06		no flight
		321100-J08	T502	Cryo SCOE J01		no flight
321 200	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
		321200-J01	T202, T212, T221, T223, T227, T228, T232, T234, T236, T242, T244, T246, T250, T254, T258, T424, T464	Cryo SCOE J08		X
		321200-J02	T102, T105, T106, T111, PR_P701, T421, T442, T461, H101	Cryo SCOE J04		X
		321200-J03	T321, T323, T501, T505, T651, T901, T903, T907, T911	Cryo SCOE J09		X
		321200-J04	T312, T314, T316, T905, T909, T931, T933, T935	Cryo SCOE J09		X
		321200-J05	VS103, H102	Cryo SCOE J04		X
321 300	on top of					
	Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected

		321300-J01	T208, T213, T222, T224, T225, T226, T231, T233, T235, T237, T247, T248, T252, T256, T862, T444	Cryo SCOE J02		X
		321300-J02	T101, T104, T107, T112, T703, T422, T441, T462, T701, H102	Cryo SCOE J04		X
		321300-J03	P502,T322, T324, T504, T506, T507, T652, T902, T908, T912	Cryo SCOE J18		X
		321300-J04	T311, T313, T315, T904, T906, T910, T932, T934	Cryo SCOE J14		X
		321300-J05	VS106, H102	Cryo SCOE J04		X
CVSE I/F	on top of					
	Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected
				Cryo SCOE J18		X
to be approved & released before start of ACS/PR/TP by Floor-Manager	Date:			Sign:		

SAFE / ARM plug setup for ACS/PR/TP No.:						
Annex No.:						
314 200	on top of					
	Connector Function	Connector	S/C unit	SAFE	ARM	Sign
	SAFE / ARM plug	314 200-J03	NED (601)	X		
	SAFE / ARM plug	314 200-J04	NED (602)	X		
	SAFE / ARM plug	314 200-J05	SI 601	X		
	SAFE / ARM plug	314 200-J06	SI 602	X		
to be approved & released before start of ACS/PR/TP by Floor-Manager	Date:		Sign:			

5 Conditions

5.1 Personnel

The following table shall be filled in detailing which personnel are required to be present for the test. The signature of the appropriate responsible is classified as agreement to start the test as stated in the TRR.

Responsibility	Required for Test (Y/N)	Name / Organization	Signature
Floor Manager	Y		
Test Director	Y		
Test Conductor	Y		
EGSE Operator			
SVM Support Engineer			
Cryo Support Engineer			
HIFI Instrument Support Engineer			
PACS Instrument Support Engineer			
Spire Instrument Support Engineer			
PA Responsible	Y		
Customer Representative			

Table 2: List of IST test attendants

Persons, other than test personal as mentioned in the test team organization and participants of the TRR, are allowed to observe the test at the discretion of the Test Director and Test Conductor.

5.2 Environmental

During all the phases of the test the HERSCHEL Satellite shall be maintained in a controlled environment in order to prevent degradation or contamination of the satellite equipment and surface, which could result in operational failures.

ESTEC site clean room will be used.

Ambient conditions shall comply with ISO14644-1 for cleanliness requirement.

The characteristic shall be:

- Temperature = 22C ± 3C
- Relative Humidity = 50 % +/- 10%
- Delta Pressure = above 0.6 mm H_2O
- Clean Conditions = Class 100 000

The following table defines the S/C conditions for each IST test sequence with respect to Cryostat He I/He II status, tilting angle and usage of the real battery.

IST 1 Part 1 Warm preferred

Chapter of IST Spec Issue 4		Instr. Mode	Real Battery required	Satellite X-Axis tilting	Ambient or cool down (deviating from IST Spec !!!)	He I HTT venting >20mg/sec	He II HTT venting >20mg/sec
5.8.2	**Launch phase, separation and post separation**	3 shift	4 shift	5 shift	6 shift	7 shift	8 shift
5.8.2.3	Initial configuration	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.2	Satellite power ON	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.4	Configuration for launch	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.5	Launch	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.6	Separation	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.7	Post separation	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.8	Initial check out in SAM mode	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.9	CDMS transition to NOM mode	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.10	Orbit Control Manoeuvre	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.11	End of the sequence	OFF	Y	n.a	Preferred	alternative	alternative
5.8.3	**Satellite Commissioning**						
5.8.3.3	Test start configuration	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.4	TTC commissioning	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.5	CDMS commissioning	OFF	N	n.a	Preferred	alternative	alternative
	TCS commissioning	OFF	N	n.a.	Preferred	alternative	alternative
5.8.3.7	PCS commissioning	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.10	SREM commissioning	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.11	TCS commissioning	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.12	Telescope decontamination	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.13	Cryo Cover opening	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.14	Test end	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.9	**ACMS commissioning**						
5.8.3.9.1	AAD, SAS, CRS, STR, GYR, RCS unit check	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.9.2	RWLs health check	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.9.3	STR functional verification	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.9.4	ACC health check	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.9.5	ACMS dynamic verification	OFF	N	n.a	Preferred	alternative	alternative
5.8.5	**Mode transitions**						
5.8.5.3	Test start configuration	OFF	N	n.a	Preferred	alternative	alternative
5.8.5.4	Launch to Launch	OFF	N	n.a	Preferred	alternative	alternative
5.8.5.5	Launch to SAM	OFF	N	n.a	Preferred	alternative	alternative
5.8.5.6	SAM to SAM	OFF	N	n.a	Preferred	alternative	alternative
5.8.5.7	SAM to NOM	OFF	N	n.a	Preferred	alternative	alternative
5.8.10	**Launch clean run**						
		OFF	Y	n.a	Preferred	alternative	alternative
5.8.11	**Launch sequence robustness**						
5.8.11.3.2	Satellite power on	OFF	N	n.a	Preferred	alternative	alternative
5.8.11.3.4	Configuration for launch (status)	OFF	N	n.a	Preferred	alternative	alternative
5.8.11.3.5	Configuration for launch	OFF	N	n.a	Preferred	alternative	alternative
5.8.11.3.6	Separation	OFF	N	n.a	Preferred	alternative	alternative
5.8.11.3.7	S/C acquisition	OFF	N	n.a	Preferred	alternative	alternative
5.8.11.3.8	Initial checkout in SAM mode	OFF	N	n.a	Preferred	alternative	alternative
5.8.11.3.9	Transition to NOM mode	OFF	N	n.a	Preferred	alternative	alternative
5.8.11.3.10	Orbit control manoeuvre	OFF	N	n.a	Preferred	alternative	alternative

IST 1 Part 2 He I or He II

Chapter of IST Spec Issiue 4		Instr. Mode	Real Battery required	Satellite X-Axis tilting	Ambient or cool down (deviating from IST Spec !!!)	He I HTT venting >20mg/sec	He II HTT venting >20mg/sec
5.8.5	**Mode transitions**						
5.8.5.8	NOM to NOM	PACS spectro SPIRE STBY HIFI STBY	N	0-23		alternative	Preferred
5.8.5.9	NOM to EAM	PACS STBY SPIRE STBY HIFI STBY	N	0-23		alternative	Preferred
5.8.5.10	EAM to EAM	PACS STBY SPIRE STBY-> Photo->STBY HIFI STBY	N	0-23		alternative	Preferred
5.8.5.11	EAM to NOM	PACS STBY SPIRE STBY- >Photo	N	0-23		alternative	Preferred
5.8.5.12	NOM to SM	PACS STBY->OFF SPIRE Photo->OFF HIFI STBY->OFF	N	0-23		alternative	Preferred
5.8.5.13	SM to SM	OFF	N	0-23		alternative	Preferred
5.8.5.14	SM to SAM	OFF	N	0-23		alternative	Preferred
5.8.5.17	EAM to SAM (needs new SAM to NOM and NOM to EAM)	PACS STBY SPIRE STBY HIFI Science -> STBY	N	0-23		alternative	Preferred
5.8.5.18	NOM to SAM (needs new SAM to NOM)	PACS Burst- >STBY SPIRE STBY	N	0-23		alternative	Preferred
5.8.5.19	Test end	OFF	N	0-23		alternative	Preferred
5.8.6	**S/C reconfiguration**						
5.8.6.2	Test start configuration	PACS STBY SPIRE STBY HIFI STBY	N	0-23		alternative	Preferred
5.8.6.3	CDMS level 3a	PACS STBY SPIRE STBY HIFI Prime-	N	0-23		alternative	Preferred
5.8.6.4	CDMS level 3b	PACS STBY SPIRE STBY HIFI STBY	N	0-23		alternative	Preferred
5.8.6.5	ACMS level 4	PACS Prime->OFF SPIRE STBY->OFF HIFI STBY->OFF	N	0-23		alternative	Preferred
5.8.6.6	ACMS recovery from Survival Mode (ACMS SASM to SAM)	OFF	N	0-23		alternative	Preferred
5.8.6.7	CDMS level 4	PACS Prime->OFF SPIRE STBY->OFF HIFI STBY->OFF	N	0-23		alternative	Preferred
5.8.6.8	Test end	OFF	N	0-23		alternative	Preferred
5.8.12	**NOM mode robustness**						
5.8.12.3.1	Initial State	PACS STBY SPIRE Photo HIFI STBY	N	0-23		alternative	Preferred
5.8.12.3.2	CDMS PM 1553 BC failure simulation	PACS STBY SPIRE Photo- >STBY	N	0-23		alternative	Preferred
5.8.12.3.3	CDMS PM 1553 BC failure recovery	PACS Photo SPIRE STBY HIFI STBY	N	0-23		alternative	Preferred
5.8.12.3.4	Initial state second test	PACS Photo SPIRE STBY HIFI STBY	N	0-23		alternative	Preferred
5.8.12.3.5	ACMS 1553 RT failure simulation	PACS Photo - >STBY SPIRE STBY	N	0-23		alternative	Preferred
5.8.12.3.6	ACMS 1553 RT failure recovery	PACS STBY->OFF SPIRE STBY->OFF HIFI STBY->OFF	N	0-23		alternative	Preferred
5.8.13	**Test of Instrument FDIR OBCP**						
5.8.13.4	SPIRE FDIR OBCP	SPIRE	N	0-23		alternative	Preferred
5.8.13.5	PACS FDIR OBCP	PACS	N	0-23		alternative	Preferred
5.8.13.6	HIFI FDIR OBCP	HIFI	N	0-23		alternative	Preferred
5.9	**DEGRADED CASES**						
5.9.1	S/C ability to be operated in degraded modes					alternative	Preferred

IST 1 Part 3 He II only

Chapter of IST Spec Issiue 4		Instr. Mode	Real Battery required	Satellite X-Axis tilting	Ambient or cool down (deviating from IST Spec !!!)	He I HTT venting >20mg/sec	He II HTT venting >20mg/sec
5.8.3	**Satellite Commissioning**						
5.8.3.8	CCU (cryostat) commissioning	OFF	N	23			Required
5.8.4	**Instruments commissioning and performance verification**						
5.8.4.3	Test start (restart) configuration	OFF	N	23			Required
5.8.4.4							Required
5.8.4.5	SPIRE commissioning test	Spire	N	23 -> 90			Required
5.8.4.6	PACS commissioning test	PACS	N	23			Required
5.8.4.7	HIFI commissioning test	HIFI	N	0-23			Required
5.8.4.8	SPIRE and PACS parallel mode	SPIRE/PACS	N	23			Required
5.8.4.9	Test end or interruption	OFF	N				Required
5.8.7	**CDMS management**						
5.8.7.2.1	General Sequence (Integration with RMS DTCP number 2)	PACS Prime STBY -> Burst -> X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
5.8.7.2.2	MTL management	PACS Prime STBY -> Burst -> X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
5.8.7.2.3	OBCP management	PACS Prime STBY -> Burst -> X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
5.8.7.2.4	SSMM management	PACS Prime STBY -> Burst -> X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
5.8.7.2.5	FDIR level 1 & 2	PACS Prime STBY -> Burst -> X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
5.8.7.2.6	OBT management	PACS Prime STBY -> Burst -> X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
5.8.8	**DTCP worst case scenario**						
		PACS (Burst) SPIRE STBY HIFI Prime	N	0-23		*TBC*	Preferred
5.8.9	**REFERENCE Mission Scenario**						
5.8.9.2	Test start configuration		Y				Required
5.8.9.3	Test steps		Y				Required
5.8.9.4	HIFI OD	HIFI OD	Y	0-23			Required
5.8.9.5	PACS OD	PACS OD	Y	0-23			Required
5.8.9.6	SPIRE OD	SPIRE OD	Y	0-23			Required
5.8.9.7	Test end		Y				Required

Table 3: S/C conditions for each IST test sequence

5.3 General Precautions and Safety

5.3.1 General Safety Requirements, Precautions

Special condition and hazards

The following Operational restrictions shall be carefully taken into account:

1. Before any test article modification the relevant power sources shall be switched OFF
2. Protective caps shall be installed on each harness or unit connector when these are not linked to their equipment
3. All the test data shall be recorded
4. Before starting the test sequence, care must be taken in verifying that all hardware links are correctly connected.
5. to avoid possible damages, no signal shall be applied in no powered units, except where otherwise specified
6. During testing the step by step procedure shall be followed. Changes will be possible and will be managed by a Procedure Variation Sheet approved by the AIV and PA.
7. In case of any failure, the activities shall be stopped until troubleshooting plan is generated and approved.
8. In case of non-conformance, the procedure addressed in [AD 2.1.2.b] shall be applied.
9. The time of usage (ON/OFF cycles and ON duration) of each limited life equipment (FPGAs', etc?) shall be noted and recorded by the QA.
10. No stimulus has to be applied to any CRS switched-OFF
11. The EPC cannot be switched-ON for more than 5 minutes without any TWT turned-ON.
12. Care must be exercised when working around the S/C; in particular, if real IMU(s) or CRS rate sensors are involved, which may register any mechanical vibration affecting the responses of the ACC and/or invalidating the overall test results.
13. In case of AC failure, when the AC power will be again available, preliminary checks will be performed to verify that no damage has be caused to EGSE, SLE and S/L. The test conductor can decide to restart or to continue the test depending on the point where the failure happened.
14. Considering the SVM NCR affecting the XPND FM4, the transponder will be continuously flushed with Nitrogen during the tests.
15. Due to the use of liquid Helium during the Herschel mechanical test campaign, particular safety precautions need to be taken. The cryostat operations which require handling of liquid Helium are described in a dedicated procedure.
16. It shall be ensured that, for the beginning of each IST_START, the BDR's have been switched offi in order that skin plug reconfiguration can be carried out safely in presence of the flight battery. Note : During IST End the power down sequence, commands to turn the BDR's off (to isolate the battery)are issued via the CDMU. If it is suspected for any reason the battery has not been isolated by

switching the BDR's off then the stand alone procedure "BDR Isolation" from HP-2-ASED-TP-0215 shall be executed, startup from the power down state.

17. The maximum continuous battery discharge limit of 36 A shall be respected at all times.

5.3.1.1 Instrument specific safety requirements and precautions

HIFI

LOU being at ambient temperature, IMT objectives on HIFI will be limited. Specifically, the LO power should be limited and higher frequency channel should not used (IID-B). The bias range to the mixers and electromagnets should also be restricted

PACS

Whenever PACS FPU is at HEII conditions:

Prior to any PACS instrument switch-on within this procedure, the FDIR mechanisms as described in "PACS Failure Detection Isolation and Recovery"(PACS-ME-GP-002, Issue 1.2) must be in place and have to be up and running on the CDMU. This shall remain activate during all modes of the PACS instrument, except the off mode.

5.3.2 ESD constraints

- The spacecraft must be grounded
- All connectors have to be covered with ESD dust caps when not mated
- All AIT personnel have to wear antistatic shoes and clothes
- The clean room floor around and under the item under test shall be covered with an antistatic carpet, which is grounded to facility ground.

5.3.3 *Grounding Configuration*

A distributed single point grounding (DSPG) approach is used between the facility GSE and the satellite for electrical integration and performance tests.

Instrument signal ground isolation to the EGSE data processing electronics will be
ensured.

5.3.4 Test Equipment Calibration and Performances

All equipment used for test activities shall be within their normal calibration period performed and certified either by the Facility or equipment supplier. Certification and calibration labels shall be available for inspections before activity start. Calibration shall be performed by/with qualified personnel/procedures under PA/QA supervision and approval. All the instrumentation to be used for the test shall follow the relevant PA rules.

Item Name	Item Type	Serial Number	Calibration Status

5.3.5 Special QA Requirements

The QA/PA representative shall be present during all test activities.
All documentation shall be inspected and approved before start and end of each test activity. The responsible PA engineer shall ensure that all 'as run' procedures have all the relevant information correctly recorded.

5.4 GSE

Test Equipment List					
Item	**Manuf.**	**Model No.**	**SN No.**	**Invent No.**	**Next Calib.**

5.4.1 MGSE

No additional mechanical GSE is required to perform the test described in this test procedure.

5.4.2 CVSE

The set-up of the CVSE will be performed according to HP-2-ASED-0095

Helium operations will be performed according

The cool down and filling procedure: HP-2-ASED-PR-0082 for Helium I

The Helium II top-up procedure: HP-2-ASED-TP-0083 for Helium II

The cover cooling procedure: HP-2-ASED-PR-0048 for special instrument stimulation

A list of the CVSE hardware which might be used is given below.

Qty.	Designation/Manufacturer	Provided by	Drawing/Ident. NR:	Calibr. Date
2	LHe Service Vacuum Pumping Unit I	BOCE	CI No. 142 310-01	
2	LHe Service Vacuum Pumping Unit II	BOCE	CI No. 142 310-02	
1	Main High Vacuum Pumping Unit	BOCE	CI No. 142 310-03	
1	Mobile High Vacuum Pumping Unit	BOCE	CI No. 142 310-03	
3	Molecular Turbo pumps	BOCE	CI No. 142 310-03	
1	Laboratory Vacuum Pump in safety unit	BOCE	CI No. 142 310-04	
1	Laboratory Vacuum Pump in scaffolding	BOCE	CI No. 142 310-04	
1	Laboratory Vacuum Pump in scaffolding (Ex proof.)	BOCE	CI No. 142 310-05	
2	CVSE Monitoring Rack	BOCE	CI No. 142 310-06	
2	Leak Detector Spectron 5000	BOCE	CI No. 142 310-07	
3	He I transfer lines (Y0211/Y0221/Y0231)	DeMaCo	CI No. 142 310-08	
3	He II transfer lines (Y0201-1, -2, -3)	De MaCo	CI No. 142 310-08	
2	Dewar to dewar transfer lines (Y0241 - Y0242)	De MaCo	CI No. 142 310-08	
1	Cover flushing line inlet (L1 + L2, separable)	AAE	CI No. 155 210	
1	Cover flushing line outlet (L3 + L4, separable)	AAE	CI No. 155 210	
1	Heater unit for cover inlet line	DeMaCo		
3	Venting line (Y0601/Y0602/Y0601-3)	DeMaCo	CI No. 142 310-09	
2	Pumping lines (Y0611-1 / Y0611-2)	DeMaCo	CI No. 142 310-09	
Set	Bake out lines (Y0633)	ASED	CI No. 142 310-09	
Set	HiVac Pumping lines (Y0673)	ASED	CI No. 142 310-09	

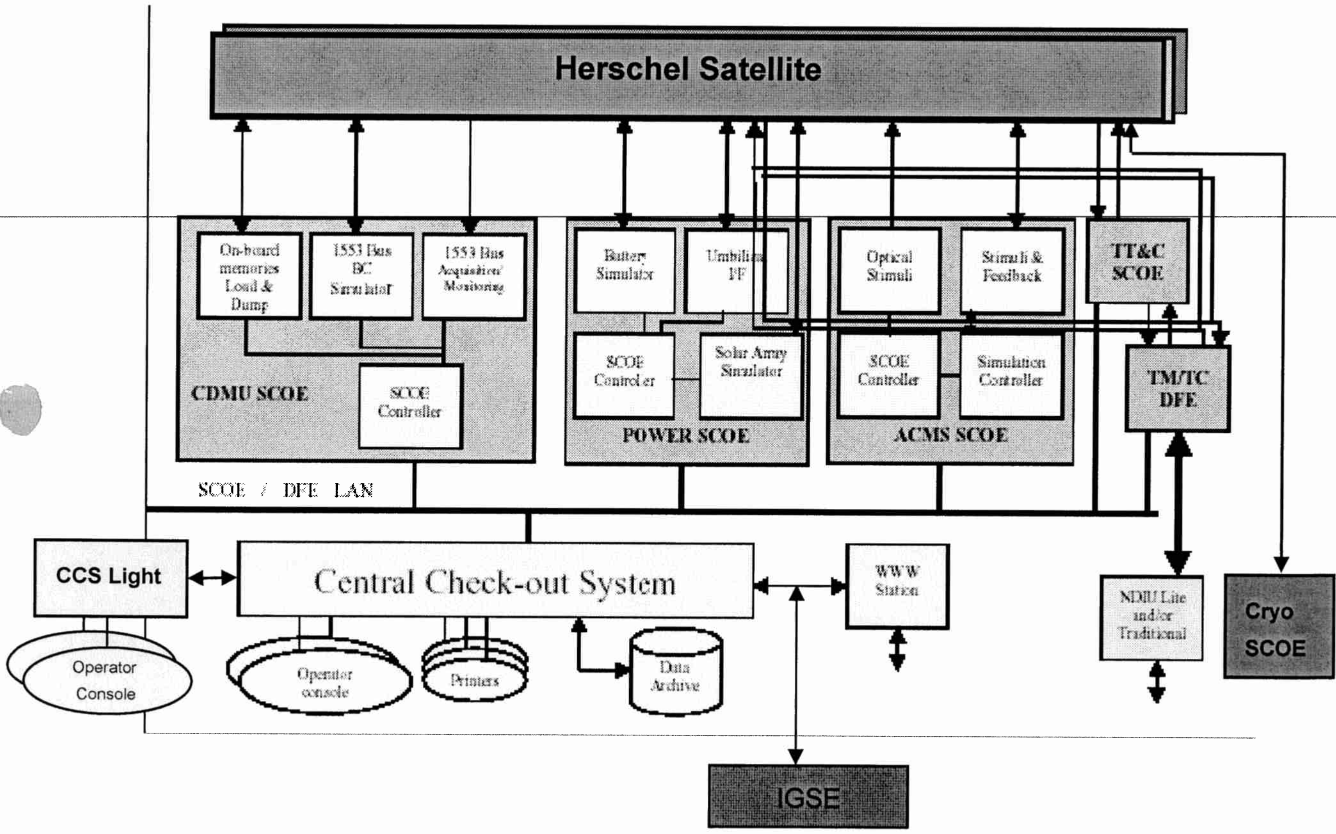
Qty.	Designation/Manufacturer	Provided by	Drawing/Ident. NR:	Calibr. Date
Set	Helium I lines (Y0612)	ASED	CI No. 142 310-09	
Set	Helium II Pumping lines (Y0602)	ASED	CI No. 142 310-09	
2	Scaffolding for He lines	ASED	CI No. 142 310-10	
10	450 l LHe Dewars type HDS 450 -EIPS	Linde		
1	Spiro pump DryTel 1025	ASED		
2	Liquid level sensor	ASED		
2	Helium depth indicator	ASED		
3	Pressure indicator (Keller)	ASED		
1	Laminar flow meter (0-10 mg/s / 0-70 mg/s)	ASED		
1	Standard flow meter (0-5 g/s)	ASED		
2	Gas flow counter	ASED		
Set	Vacuum houses	ASED		
Set	Miscellaneous vacuum seals	ASED		
Set	Vacuum parts	ASED		
Set	Special tools	ASED		
1	Scale	ASED		
1	Pressure Control unit (0-1500 mbar, Ziegler)	ASED		
Set	Plastic pipes (Diameter 20-40 mm, different length)	ASED		
1	HEXA He heating unit	CryoVac	S-21-7021	
Set	Stands	ASED		
Set	Trip tray	ASED		
Set	Special adapters	ASED		
1	Gate valve DN160	ASED		
1	He II bypass valve	ASED		

5.4.3 EGSE

5.4.3.1 EGSE Hardware Configuration

The EGSE configuration, when completed, is shown in the figure below

S/S	Unit	Configuration			SCOE simulated equipments	Remarks
		Herschel				
EGSE	CCS	1				
	CCS Light	1				
	TM/TC DFE	1				
	CDMU SCOE	1				
	ACMS SCOE	1				
	TT&C SCOE	1				
	POWER SCOE	1				
	Cryo SCOE					
	NDIU					



The Herschel/ EGSE will be built with the following equipment:

- Central Check Out System (CCS)

- Central Check Out System Light (CCS Lite)
- The Power Control Subsystem SCOE (Power SCOE)
- The Telemetry, Tracking and Command SCOE (TT&C SCOE)
- The Telemetry and Telecommand Data Front End Equipment (TM/TC DFE)
- The Attitude and Control Measurement Subsystem SCOE (ACMS SCOE)
- The Central Data Management Unit SCOE (CDMU SCOE)
- The Cryo SCOE which performs four general tasks
  - Control and monitoring the Cryostat Instrumentation either directly by the Cryo SCOE, i.e. locally or initiated by the CCS, i.e. remotely.
  - Substitution of the real CCU if the CCU is not available
  - Monitoring of several parameters of the Cryo Vacuum Support Equipment (CVSE).
  - Simulate the launcher interface by providing “dry loop commands” to be sent to the CCU.

All the above items are interconnected through an Ethernet Local Area Network (LAN) used to exchange both data and command & control information.

The CCS Lite will be used and configured in order to have a hot TM/TC backup in case of main CCS crashes.

~~The NDIU will be configured to put ESOC in listening mode.~~

5.4.3.2 EGSE User Software

Most of the Test Software will be developed on the CCS, based on SCOS 2k, and will interface the HPSDB. It will consists mainly of:

- Test Sequences
- Synoptic Displays
- Data Evaluation and Test Analysis Software
- Simulation Software Master sequences (mainly for ACMS S/S).

On the contrary, on the SCOE's/DFE only a very peculiar type of software will be developed; it will mainly consist of:

- Configuration/set-up files for SCOE's/DFE instrumentation
- Sequence of commands
- Simulation files for Dynamic control and ACMS Sensors simulation
- Telemetry Simulation file for Missing Unit (Experiments).

A complete list of EGSE SW version (particularly CCS and HPSDB) shall be provided before start of test and attached to this procedure.

5.4.4 OGSE

No OGSE is required to carry out the test activities of the IST.

5.4.5 Special Equipment

5.4.5.1 Cooling device

The HIFI units when equipped with MLI (WEV, WEH, HRV, HRH) exceed their maximum operating temperature, WEV 35,5°C vs30°C, HRV 40,1°C vs 40°C, WEH 35,3°C vs 30°C, HRH 41,9°C vs 40°C.

Therefore the implementation of a cooling system for the two HIFI panels (forced convection directed in these areas) is mandatory.

All the units stay in their operating temperature range with comfortable margins, except:

- GYRO baseplate 63,5°C vs 55°C, due to use of flight thermal control parameters, covered by RFD HP-300000-AI-RD-0011 issue 03.
- CRS1 and CRS2 around 50°C, due to use of flight thermal control parameters, covered by RFD H-P-300000-AI-RD-0014 issue03.

6 Verification Requirements and Test Criteria

PASS/FAIL CRITERIA

At each test stage completion, the test success is determined comparing the results obtained against the expected values.

If the compliance between obtained and expected values has been met, and authorisation to proceed with the next stage of the test is given, then the actual test stage must be considered satisfactory completed.

The success of the overall testing activities is determined from the satisfactory completion of all test stages.

Successful criteria to be satisfied in each test stage shall be:

- Test conditions according to specification requirement;
- Complete verification of the requirement aspects according to the test specifications
- Fulfilment of test results with respect to required data;
- Verification that all the TM parameters used to monitor the SAT do not exceed the limit thresholds loaded in the HPSDB (OOL display);
- Verification that the TM (5,2), TM (5,4) and TM (1,8) received event reports are only those ones expected to fulfil the pass test criteria.

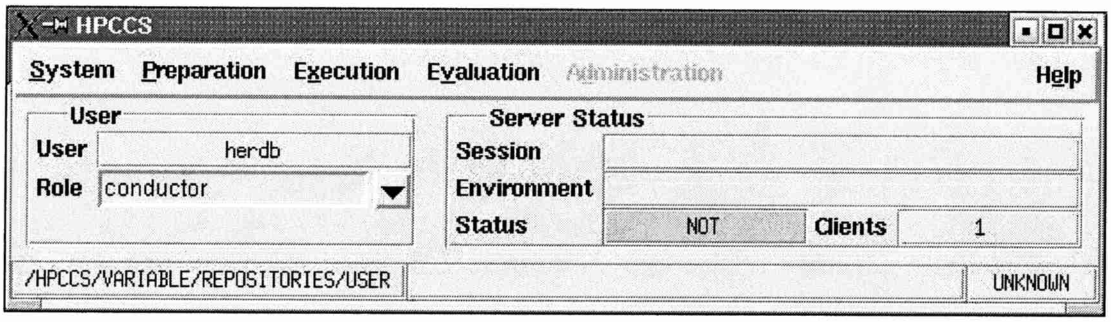
7 IST Test

7.1 HPCCS Configuration for IST Test

7.1.1 Apply Tag on test files

The **EGSE operator** has to perform the following steps **before starting IST test**:

1. On a Workstation login as **herdb** (password **hertest)**, being this user dedicated to DB operations for Herschel FM Checkout System, and open a shell (xterm).
2. Logged as herdb, run Startmmi and the following window will occur



3. Logged as herdb, in HPCCS window, select menu "**Preparation → Prepare**"
4. Logged as herdb, In **PREP** window, select menu "**Preparation→ Discard all**"
5. Logged as herdb, In **Confirm Discard** window, click the button **Discard**
6. Logged as herdb, in **PREP** window, select menu "**Preparation→ Update**"
7. Logged as herdb, in **Check out environment** window**,** click the button **Check out** and then **Close**
8. Logged as herdb, in **PREP** window**,** select menu "**Tag → Apply**"
9. Logged as herdb, in the window **Apply Tag →New Tag,** insert TAG name

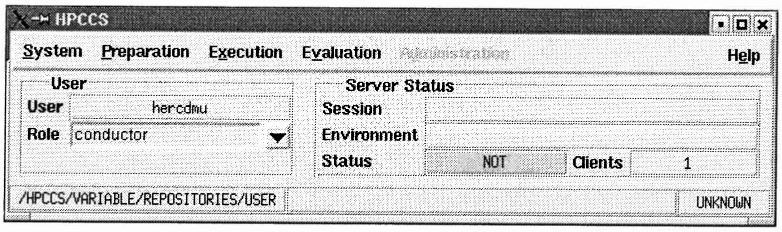
Currently, TAG name for IST has the format:

IST_x_PART_x_TP_xxxx_x_x_BEGIN_xxx

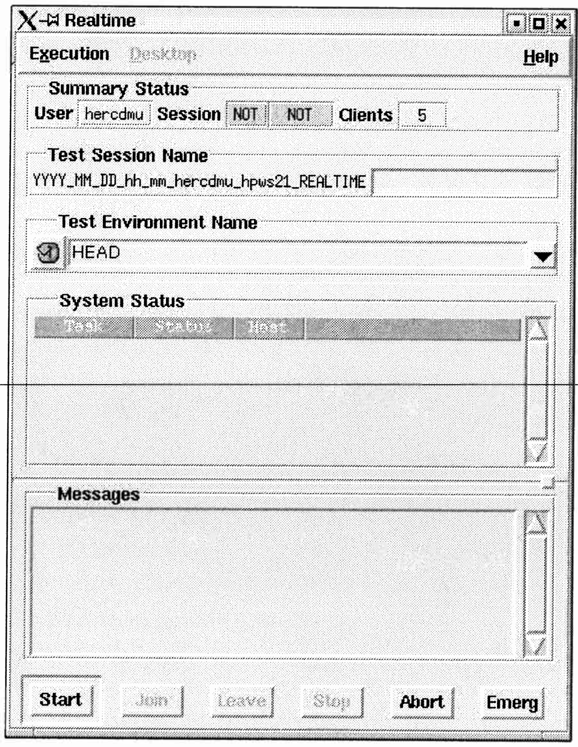
10. Logged as herdb, push **Apply → Apply**
11. Logged as herdb, confirm Tag Application Push Apply button
12. Logged as herdb, open a new **shell** window (xterm)
13. Logged as herdb, execute the command **update_tag**
14. Logged as herdb, insert the name of **TAG**
IST_x_PART_x_TP_xxxx_x_x_BEGIN_xxx
15. Logged as herdb, in **PREP** window, select menu "**Tag → Apply**"
16. Logged as herdb, in **Apply tag** window, select in the list the TAG
IST_x_PART_x_TP_xxxx_x_x_BEGIN_xxx
17. Logged as herdb, push **Copy selected tag**
18. Logged as herdb, modify the TAG name with **IST_x_PART_x_TP_xxxx_x_x_END_xxx**
19. Logged as herdb, push **Apply → Apply**
20. Logged as herdb, confirm Tag Application Push Apply button

7.1.2 Start test session on HPCCS

Logged as **hercdmu** or **heracms** run "startmmi"



On **HPCCS** window, select menu **"Execution → Start"** in order to open the following window. In the **"Test Session Name"** field, insert an abbreviation describing which IST test will be performed and click the button **"Start"** to proceed.



Once the real time session initialized, the button **"Join"** is enabled and shall be clicked. Then configure desktop of different CCS stations throught the menu "Desktop" and the following menus:

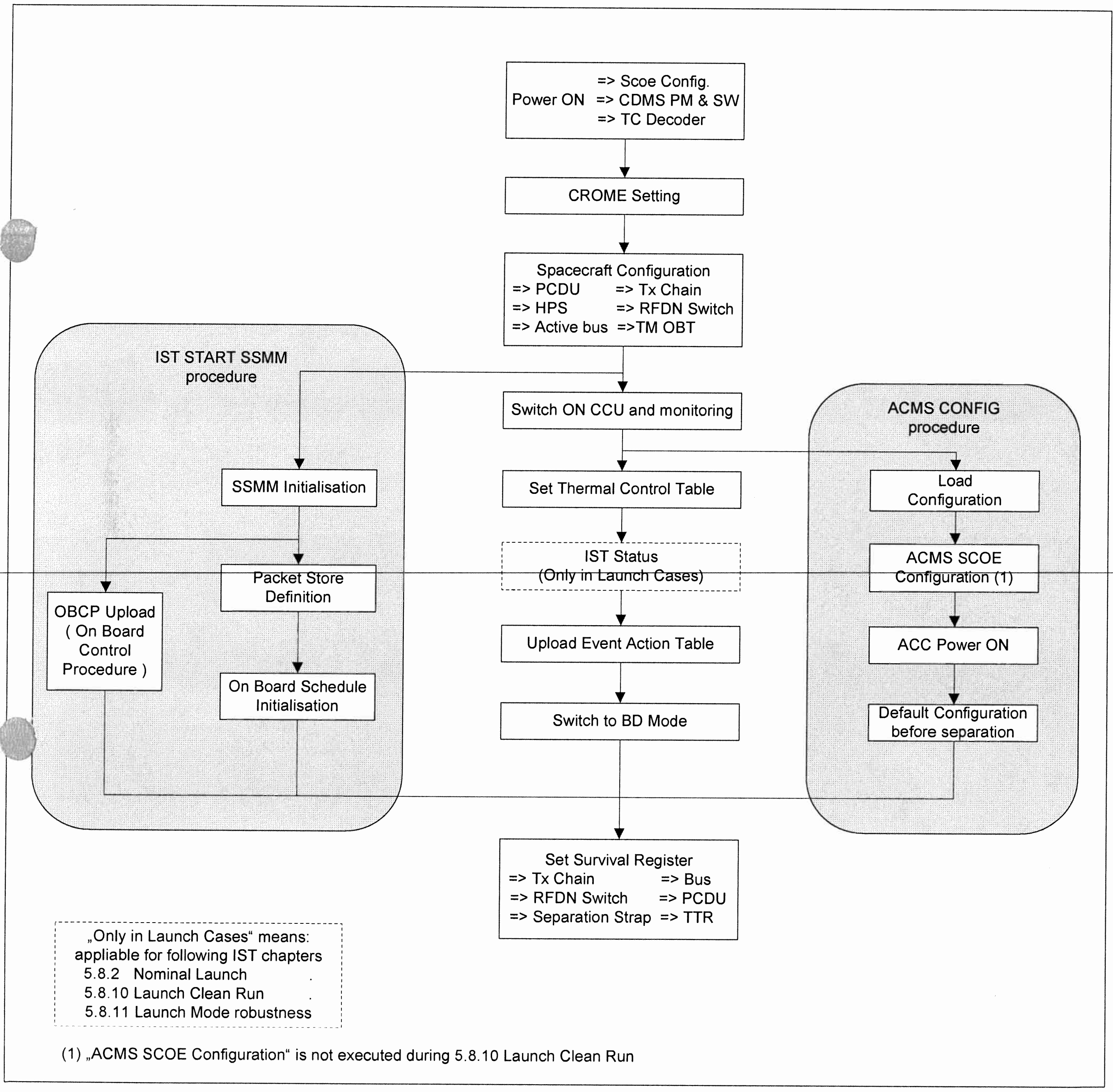
- Monitoring → Telemetry Desktop
- Monitoring → Telemetry Packet history
- Monitoring → Out of limit
- Monitoring → On Board Event History
- Test Sequences → Test Conductor Console
- Command → Telecommand History

7.2 IST START for Spacecraft configuration

7.2.1 Diagram Overview

The flow of the "IST START" sequence is depicted in the diagram below. To save time during the satellite power on, the SSMM initialising and the ACMS switch on is performed in parallel.

=



7.2.2 IST Configuration Table

The Herschel Satellite configuration for each IST test case is listed in the table below.

SASLPS SCOE	Bat. SCOE	Crome PAP/CCS	Sep. Strap SM	TTR SM	TM OBT	TC Dec.	PM SW	SSMM	Bus	Bus SM	PCDU	PCDU SM	HPS	TxChain	TxChain SM	RFDN	RFDN SM	CCU ON	CCU Mode	ACMS Config. File
5.8.2 NOMINAL LAUNCH																				
SAS	Sim. Charged + Launch	PM A Nominal	Not Separated	B	A	A	A1	A 0-1-2 B 0-1-2	A	B	A	B	A	A	B	1&3	ABBB	A&B	2	IST_FN
5.8.3a ACMS Commissioning																				
SAS	Sim. Charged	PM A Nominal	Separated	B	A	B	A1	A 0-1-2 B 0-1-2	A	B	A	B	A	A	B	1&3	ABBB	A&B	1	IST_SCA1
5.8.3b S/C Commissioning																				
SAS	Sim. Charged	PM A Nominal	Separated	B	A	A	A1	A 0-1-2 B 0-1-2	A	B	A	B	A	A	B	1&3	ABBB	A&B	1	IST_MOD
5.8.4.5.1 SPIRE Commissioning																				
SAS	Sim. Charged	PM A Nominal	Separated	B	A	A	A1	A 1 B 1	B	A	A	B	A	A	B	1&3	ABBB	A&B	1	
5.8.4.5.2 SPIRE Spectrometer Complementary Test																				
SAS	Sim. Charged	PM B Nominal	Separated	A	B	B	B1	A 3 B 3	B	A	B	A	B	B	A	2&4	AABB	A&B	1	

SASLPS SCOE	Bat. SCOE	Crome PAP/CCS	Sep. Strap SM	TTR SM	TM OBT	TC Dec.	PM SW	SSMM	Bus SM		PCDU SM		HPS	TxChain SM		RFDN SM		CCU ON	CCU Mode	ACMS Config. File
5.8.4.6 PACS Commissioning																				
SAS	Sim. Charged	PM A Nominal	Separated	A	A	B	A1	A 2 B 2	B	A	B	A	B	B	A	2&4	AABB	A&B	1	
5.8.4.7 HIFI Commissioning																				
SAS	Sim. Charged	PM B Nominal	Separated	B	A	A	B1	A 3 B 3	A	B	A	B	A	A	B	1&3	ABBB	A&B	1	
5.8.4.8 Parallel Mode Commissioning																				
SAS	Sim. Charged	PM B Nominal	Separated	A	B	B	B1	A 0 B 0	A	B	B	A	B	B	A	2&4	AABB	A&B	1	
5.8.5 Mode Transition																				
SAS	Sim. Charged	PM A Nominal	Separated	B	A	A	A1	A 1 B 1	A	B	A	B	A	A	B	1&3	ABBB	A&B	2	IST_MOD
5.8.6 SC Reconfiguration																				
SAS	Sim. Charged	PM A Nominal	Separated	A	B	B	A1	A 2 B 2	B	A	B	A	B	B	A	2&4	AABB	A&B	1	IST_FD_B
5.8.7 CDMS Management																				
SAS	Sim. Charged	PM A Nominal	Separated	B	A	A	A2	A 1 B 1	A	B	A	B	A	A	B	1&3	ABBB	A&B	2	IST_CDMS
5.8.8 DTCP Worst Case Scenario																				
SAS	Sim. Charged	PM B Nominal	Separated	A	B	B	B2	A 2 B 2	B	A	B	A	B	B	A	2&4	AABB	A&B	2	IST_WCS

SASL PS	Bat. SCOE	Crome PAP/CCS	Sep. Strap SM	TTR SM	TM OBT	TC Dec.	PM SW	SSMM	Bus SM		PCDU SM		HPS	TxChain SM		RFDN SM		CCU ON	CCU Mode	ACMS Config. File
5.8.9 RMS Reference Mission Scenario																				
SAS	Sim. Charged	PM A Nominal	Separated	B	A	A	A1	A 0-1-2 B 0	A	B	A	B	A	A	B	1&3	ABBB	A&B	1	IST_RMS
5.8.9 Launch Clean Run																				
LPS	REAL	PM A Nominal	Not Separated	B	A	A	A1	A 0-1-2 B 0-1-2	A	B	A	B	A	A	B	1&3	ABBB	A&B	2	IST_CLN
5.8.11 Launch Mode Robustness																				
SAS	Sim. Charged +Launch	PM A Nominal	Not Separated	B	A	A	A1	A 0 B 0	A	B	A	B	A	A	B	1&3	ABBB	A&B	2	IST_LSR
5.8.12 NOM Mode Robustness																				
SAS	Sim. Charged	PM A Nominal	Separated	A	B	B	A1	A 3 B 3	B	A	B	A	B	B	A	2&4	AABB	A&B	1	IST_NMR
5.8.13 Instrument FDIR																				
SAS	Sim. Charged	PM A Nominal	Separated	B	A	A	A2	A 1 B 1	A	B	A	B	A	A	B	1&3	ABBB	A&B	1	IST_CDMS

7.2.3 Initialisation

Step-No.	Initialisation-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	TT&C SCOE initialisation						
1	Verify that TT&C SCOE application SW is running Otherwise go on TTC SCOE or access remotely (command "startCMD ttcvnc" on shell window") and click "TTC SCOE Herschel" icon on TT&C SCOE desktop controller and wait for self test completion.					✓	
2	On TT& SCOE application, in window ":: CONF namespace" (that can be open by menu "windows/SCOE config"), select menu "Config/Load", load the file "Herschel.conf" then click "open" button.					✓	
	SPACECRAFT SKIN CONNECTORS CONFIGURATION						
3	**Verify that all the SCOE skin connectors cables are installed** • Goto chapter 4.3 • Choose according to the IST Test case the related skin configuration table • Check the list and sign off (together with PA and Floor Manager). 8/8	SKIN CONFIGURATION IS CHECKED BY ANNEX 1 OF THE CALLING ACS 0321					

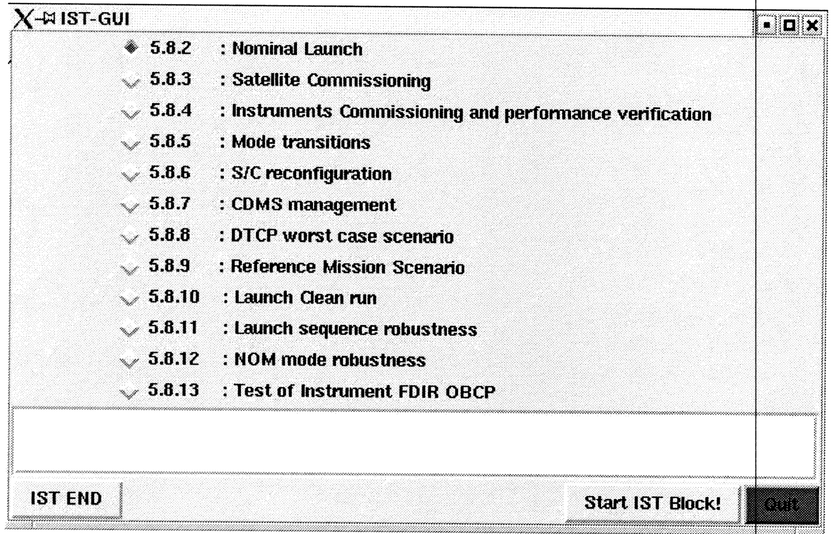
Test location:	Operator	Product-Assurance:	Date:	Time
Estec	[illegible]	R. [illegible]	8-5-2007	04:30

Step-No.	Initialisation-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	ACMS SCOE CHECK						
4 N/A for "Launch Clean Run"	Verify that the ACMS SCOE is ON and operational				SKIP		
5 N/A for "Launch Clean Run"	In the Clean Room, check on the ACMS SCOE that STR UCE Electrical Stimuli program on PC2 and PC3 are enabled (i.e. double click on "scroll lock" and check "01-02 & 01-03" that mouse pointer can be moved). Otherwise execute Annex D Operator Note 3				SKIP		

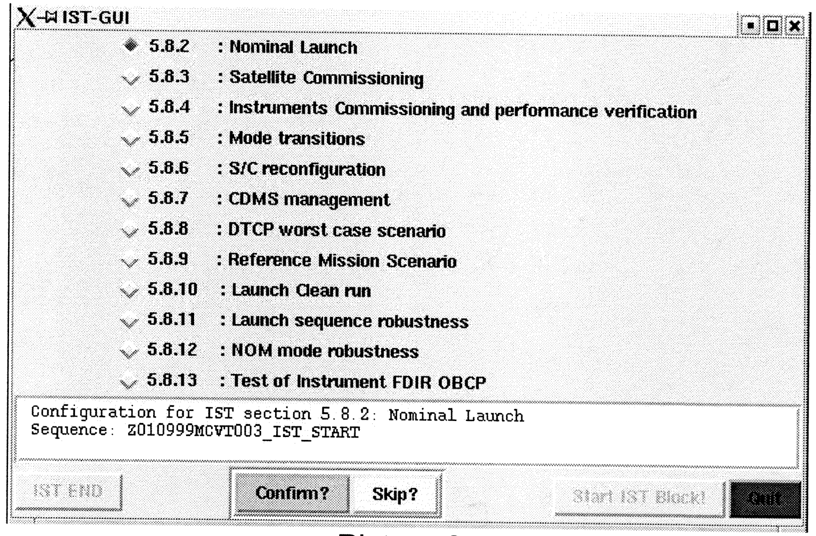
Test location: ESTEC	Operator	Product-Assurance:	Date: 8-8-2008	Time 04:30

7.2.4 IST Start Step by Step Procedure

At the CCS test sequence console call the sequence "Z010999MCVT201_IST_GUI " to start an IST test. When the Graphical User Interface (see Picture 1) occurs, select the appropriate test case (and note it down in this Test Procedure) followed by a click on the "Start IST Block".



Picture 1



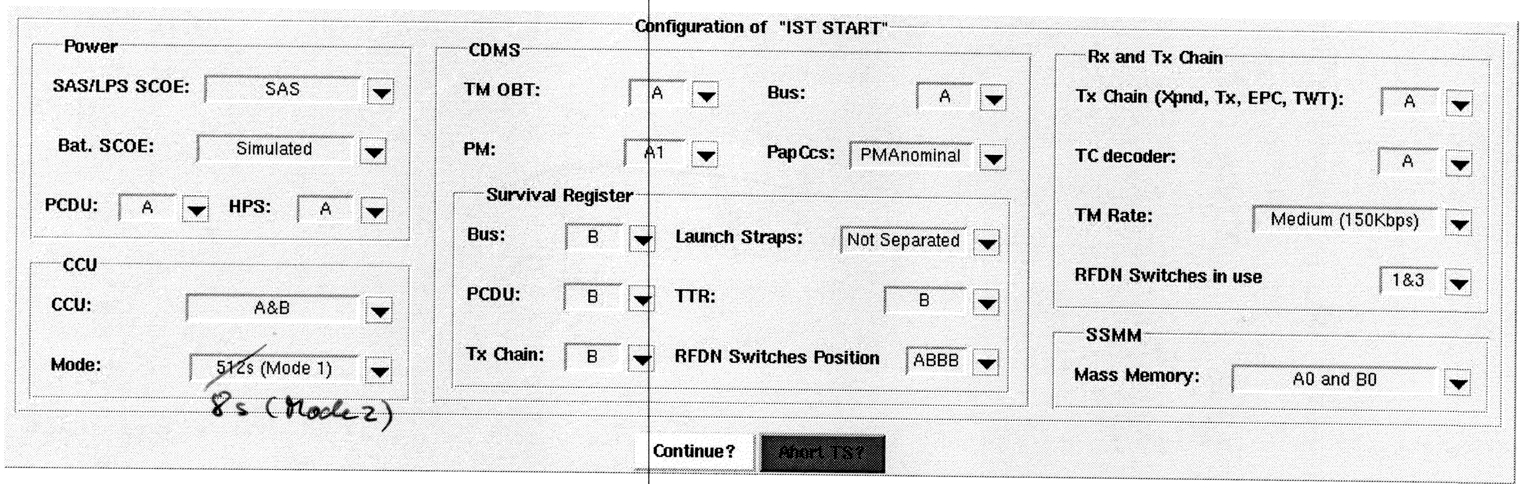
Picture 2

NA

Then configuring the spacecraft for the selected IST Test is proposed to be run or skipped (see Picture 2).
If the button "Confirm" has been clicked, continue with step 1 of the following IST START step description. Otherwise pressing the button "Skip" will lead to chapter 7.2

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	8-5-2008	04 : 20

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
1	**Z010999MCVT003_IST_START** At the bottom of the window, the IST_START configuration panel displays all parameters applied during the IST_START. ⇨ Click the button "Continue" to proceed	To Check in Config. Table (Page 73)			Using parameter EMC	V	



IST_START Configuration Panel

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	8-5-2008	04 :42

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
2	**Z010999MCVT003_IST_START** Note the execution diagram, resuming each configuration steps and check all parameters are set as previously (particularly if any modification has been done on configuration panel) **"START Satellite HERSCHEL "IST_START""** ⇨ Choose "Yes" or "No"	YES				✓	
3	**Z010999MCVT097_ASDGEN_CRIT_PARS_CHECK** This script will run during the whole session to monitor critical parameters. As soon as wrong value will be detected. A popup window will occur alerting the operator about incorrect TM checks ⇨ Minimise this window by clicking the corresponding button (on corner top right, first button from left)					✓	

Test location:	Operator	Product-Assurance:	Date:	Time
Kelbel	[illegible]	[illegible]	8-5-2008	4:44

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
4	**Z010999MCVT003_IST_START** Reply to the prompt: **"SPACECRAFT POWER_ON"** ⇨ Click the button "Confirm" to proceed					✓	
5	**Z010999MCVT001_POWER_ON_HER_IST** **Set Battery** [redacted] **Set TCDecoder to** [redacted] **Set PM_SW** [redacted] Do you want to continue with the upper configuration: If these parameter values are in accordance with the IST Configuration Table (Page 73), ⇨ click the button "OK" to proceed	To Check in Config. Table (Page 73) Bat.SCOE TCDec. PM/SW		SAS + Sim A A1	(24V)	✓ ✓ ✓ ✓	

Test location:	Operator	Product-Assurance:	Date:	Time
BETEC			8-5-2008	4:51

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
6	**Z010999MCVT001_POWER_ON_HER_IST** A Popup window occurs asking to verify data reception on TM/TC Data Front End workstation: In window "System Status", check following panels ➔ TM chain / TM Acquisition synchronised and locked Status expected ➔ View / TM Transfer Frame Monitor TM frame data should be received before few minutes ⇨ click the button "OK" to proceed					√	
7	**Z010999MCVT001_POWER_ON_HER_IST** A Popup Window occurs asking to start a new acquisition in Bus Monitor with name IST on the CDMU SCOE: - start a new acquisition by clicking "Menu Mode/Start new Acquisition" If an acquisition is already started, please stop and restart ⇨ click the button "OK" to proceed After few minutes Data transfer should be visible on the Bus Monitor.				N/A for "Launch Clean Run" as the cables for CDMU BUS monitor are disconnected N/A also for EMC	√	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	Köll	[signature]	8/5/08	5:10

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
8	**D102159SCVT001_GET_ALARM_STATUS** Check that both DOD ext1 and ext2 are "Not Asserted". Otherwise execute Annex D – Operator Note 8 ⇨ Click the button "End TS!" to proceed					✓	
9	**D102159SCVT001_GET_ALARM_STATUS** Check that both DOD ext1 and ext2 are "Not Asserted". Otherwise execute Annex D – Operator Note 8 ⇨ Click the button "End TS!" to proceed					✓	
9b when BCR OCP are detected ACTIVE	**Z010999MCVT001_POWER_ON_HER_IST** Temporary workaround until **SPR-107 / NCR-3312** are solved ⇨ click the button "YES" to proceed the workaround **See SPR 107 / NCR 3312**	YES			NCR **3492**: TTRMMemCorEr_A 1 := 0 SPR **244**: OutOfLimit for SA_Pan?_Temp_N/R (WMB0?569) SPR **284**: WARNING about missing TC SPR **285**: many TCs not acknowleged For launch clean run with real Battery fully charged, parameters BCR1, BCR2 are expected active.	✓	

5:14:52 (5,4) pckts "Cyclic Task Overrun"

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	Köhl	[signature]	8/5/08	5:15

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
10	**D102159SCVT032TIMESYNCRO** Wait until the synchronization between CDMS On-board Time and CCS is finished ⇨ Click the button "End TS!" to proceed				TM parameter ZE00999 out of limits and back in limits again at synchronisation to be expected.	✓	
11	**Z010999MCVT001_POWER_ON_HER_IST** ⇨ Click the button "End TS!" to proceed					✓	
12	**D102159SCVT001_GET_ALARM_STATUS** Check that both DOD ext1 and ext2 are "Not Asserted". Otherwise execute Annex D – Operator Note 8 ⇨ Click the button "End TS!" to proceed					✓	
13	**Z010999MCVT003_IST_START** Reply to the prompt: **"CDMS Configuration:"** **"CROME settings [redacted]"** If the CROME settings is in accordance with the CROME PAP/CCS of IST Configuration Table (Page73), ⇨ Click the button "Confirm" to proceed	To Check in Config. Table (Page 73) CROME PAP/CCS		PMA nominal		✓	

5:18

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	Kolle	R. Vasco Ko	8/5/08	5:20

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
14	**D102159SCVT176_WRITE_CROME** ⇨ Click the button "End TS!" to proceed					√	
15	**Z010999MCVT003_IST_START** Reply to the prompt: **"CDMS Configuration:"** **"Set configuration"** **"Bus ? PCDU ? HPS ? TxChain ? RFDN ???"** **"TM-OBT ? TMrate Medium (150Kbps)"** If all these parameter value are in accordance with the IST Configuration Table (Page 73), ⇨ Click the button "Confirm" to proceed	To Check in Config. Table (Page 73) BUS PCDU HPS TxCh. RFDN TM-Obt (TM rate	A A A A 1 & 3 A Medium)		Please note that the TMrate Medium (150 Kbps) is not specified in IST Config. Table on page 73.	√	
16 Only if Encoder B is req.	**D102159SCVT104_ENCODER_SELECT** ⇨ Click the button "End TS!" to proceed				SPR 286: TM check needs repeat	NA	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	Kl	R. Kasek	8/5/08	5 : 23

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
17	**D102159SCVT174_IST_REDUNDANT_CONF** ⇨ Click the button "End TS!" to proceed					✓	
18	**Z010999MCVT003_IST_START** Reply to the prompt: **"SSMM Configuration"** "[redacted]" ⇨ Click the button "Confirm" to proceed	To Check in Config. Table (Page 73) SSMM		A0+B0		✓ ✓	
19	**Z010999MCVT005_IST_START_SSMM** Start initialising with Steps 1-2 of IST START SSMM Procedure (see Page 96). Then continue with the next test step of IST_START. **NOTE:** After completion of Mass Memory initialisation (roughly 12 minutes per bank), i.e. when **ALL** affected mass memory banks are **ON**, continue with step 3 of IST START SSMM Procedure (see Page 96).				In Launch cases, IST_START_SSMM shall be completely performed before next step also for EMC ?	✓	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC			8/5/08	5:30

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
20	**Z010999MCVT003_IST_START** Reply to the prompt: **"SWITCH ON CCU [redacted] and"** **"START MONITORING in MODE [redacted]"** ⇨ Click the button "Confirm" to proceed In case that TM checks for CCU valves are failed, see Annex D Operator note 11 and perform actions if required.	To Check in Config. Table (Page 73) CCU On Mode		A & B 2 (8sec)	**NCR-3119:** Alarms for TMs o KM130300 o KM120300 o KM110300 fails status consistency check during CCU A on And for TMs o KM130301 o KM120301 o KM110301 fails status consistency check The following is expected until TC DCT53170 is sent: o Events 28417 CCU A monitoring discarded o Events 28418 CCU B monitoring discarded	✓	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	Köh	R. Vasvolz	8/5/08	06:07

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
21	**Z010999MCVT003_IST_START** Reply to the prompt: **"Record CCU Temp In Background"** ⇨ Click the button "Confirm" to proceed				**Minimise Log file after starting**	√	
22 applicable only in launch (IST spec. 5.8.2 5.8.10 5.8.11)	**Z010999MCVT003_IST_START** Reply to the prompt : **"STATUS SPACECRAFT and EGSE (Power ON)"** ⇨ Click the button "Confirm" to proceed Reply to the next prompt: **"Do you want to stop and notice each failure?"** ⇨ Choose "YES" to proceed				N/A		

6:18

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]		8/5/08	6 : 18

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
23 applicable only in launch (IST spec. 5.8.2 5.8.10 5.8.11)	**Z010999MCVT1533_IST_STATUS** Check the Satellite status displayed and ⇨ Click the button "OK" to proceed				NA		
24	**Z010999MCVT003_IST_START** Reply to the prompt: **ACMS SCOE Configuration – ACMS Power ON** ⇨ Click the button "Confirm" to proceed Execute ACMS CONFIG procedure (Page 100) in parallel to the IST_START master					✓	

Test location:	Operator	Product-Assurance:	Date:	Time
Estec	[illegible]		8-5-2008	6:18

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
25	**Z010999MCVT003_IST_START** Reply to the prompt: **"SET TCT Table for Ambient Temperature"** ⇨ Click the button “Confirm” to proceed					√	
26	**D102159SCVT032EnNomTCSLoops** ⇨ Click the button "End TS!" to proceed					√	
27	**D102159SCVT115_CHECK_HCS_OFF** ⇨ Click the button "End TS!" to proceed					√	
28	**Z010999MCVT003_IST_START** Reply to the prompt: **"EAT UPLOADING"** ⇨ Click the button “Confirm” to proceed”					√	

Test location: Estec	Operator [signature]	Product-Assurance: [signature]	Date: 8/5/08	Time 6:33

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
29	**D102159SCVT192_GET_EAT_REPORT** Check that every initial entries of the Event Action Table are successfully checked ⇨ Click the button "End TS!" to proceed					✓	
30	**D102159SCVT192_GET_EAT_REPORT** Check that every initial entries of the Event Action Table are correctly set ⇨ Click the button "End TS!" to proceed					✓	
31	**D102159SCVT192_IST_UPLOAD_EAT** ⇨ Click the button "End TS!" to proceed					✓	
32	**Z010999MCVT003_IST_START** Ckeck that ACC is running on TM Packet history with filter on APID 512 (set on Step 1 of ACMS Configuration Procedure 7.2.4.2 Page 100) and checking packets reception.					✓	

Test location:	Operator	Product-Assurance:	Date:	Time
Bchrec	[illegible]	R. [illegible]	8-5-2008	6:43

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
33	**Z010999MCVT003_IST_START** Do not perform before the completion of the procedures: - IST START SSMM and - ACMS Configuration Cannot be run in parallel with other "active" sequences or TCs send in parallel Reply to the prompt: **"CDMS CONFIGURATION:"** **"SURVIVAL REGISTER SETTING"** **"(Bus [redacted], PCDU [redacted], RFDN [redacted], TxChain [redacted], TTR [redacted], Sep Strap [redacted])"** ⇨ Click the button "Confirm" to proceed	To Check in Config. Table (Page 73) Bus PCDU RFDN TxCh. TTR Sep Strap				V	
34	**D102159SCVT175_SET_SURV_REG** ⇨ Click the button "End TS!" to proceed				SPR 289 No TM return for TM check	V	
35 (only in launch test cases)	**Z010999MCVT003_IST_START** Prompt: "Check CDMS Tables" ⇨ Click the button "Confirm" to proceed				NA		

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	Köhn	R. Vasella	8/5/08	6:44

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
36 (only in launch test cases	**D102159SCVT219_GET_BSW_HEALTH_UIU** ⇨ Click the button "End TS!" to proceed				NA		
37 (only in launch test cases)	**D102159SCVT204_GET_MOT** ⇨ Click the button "End TS!" to proceed				NA		
38 (only in launch test cases)	**D102159SCVT192_GET_EAT_REPORT** Check that every uploaded entries of the Event Action Table are correctly set ⇨ Click the button "End TS!" to proceed				NA		
39 (only in launch test cases)	**D102159SCVT205_SAT_COM_TCT** ⇨ Click the button "End TS!" to proceed				Expected that checks will fail as the uploaded TCT is for ambient but the checks are performed against the NA		

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	Kohler	R. Vasc...lk	8/5/08	6:44

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
40 (only in launch test cases)	**D102159SCVT207_SAT_COM_FCCT** ⇨ Click the button "End TS!" to proceed				NA		
41	**Z010999MCVT003_IST_START** Reply to the prompt: **"DOWNLINK SSMM PACKET STORE and CEL A&B"** ⇨ Click the button "Confirm" to proceed					√	
42	**D102159SCVT188_IST_DUMP_PKT_STORE** ⇨ Click the button " End TS!" to proceed				With parameters: 0 80 1 81 2 82 3 83 wrong implementation of SPR 509 & 510	√	
43	**D102159SCVT188_IST_DUMP_PKT_STORE** ⇨ Click the button " End TS!" to proceed				With parameters: CEL_A CEL_B **All events, warnings and alarms recorded before the dump, are re-occuring during this step**	√	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	Kolb	R. Vasiliu	8/5/08	6:45

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
44	**Z010999MCVT003_IST_START** ⇨ Click the button "End TS!" to proceed					√	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	8-5-2008	6:54

7.2.4.1 IST_START_SSMM Procedure

Step-No.	IST_START_SSMM-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
1	**Z010999MCVT005_IST_START_SSMM** Reply to the prompt: **"SSMM CONFIGURATION [redacted]"** ⇨ Click the button "Confirm" to proceed	To Check in Config. Table (Page 73) SSMM				✓	
2	**D102159SCVT186_IST_SSMM_ON** **Reply to the prompt "Do you want to continue" "with such configuration?"** Check the SSMM configuration and then ⇨ Click the button "Continue" to proceed				Mass Memory config. takes about 12 minutes per bank. Therefore, the next step in IST_START procedure can be executed.	✓	
3	**D102159SCVT186_IST_SSMM_ON** ⇨ Click the button "End TS!" to proceed					✓	

Test location:	Operator	Product-Assurance:	Date:	Time
BGTBC	[signature]	R. Vasecka	1-5-2008	5:52

Step-No.	IST_START_SSMM-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
4	**Z010999MCVT005_IST_START_SSMM** Reply to the prompt: **"OBCP UPLOADING"** ⇨ Click the button "Confirm" to proceed **Let run in parallel the sequence D102159SCVT193_IST_UPLOAD_OBCP** and continue with next step "Packet Store Definition"				occurrence of 2 BSW problems EvtID 30738 ✓ ✓	✓	
5	**Z010999MCVT005_IST_START_SSMM** Reply to the prompt: **"Definition of the Packet Store"** ⇨ Click the button "Confirm" to proceed					✓	
6	If only 1 Bank (bank 0, 1, 2 or 3) is initialised on each SSMM → **D102159SCVT185_IST_PACKET_STORE_DEF** If 3 banks (banks 0, 1 and 2) are initialised on each SSMM **D102159SCVT189_IST_PACKET_STORE_DEF2** If SSMM A banks 0, 1 and 2 and only SSMM B bank 0 are initialised **D102159SCVT178_RMS_PKT_STORE_DEF** When the requested SSMM bank are initialised ⇨ Click the button "Yes" to proceed					✓	

Test location:	Operator	Product-Assurance:	Date:	Time
BSTEC	Jelher	R. Vascolk	8-5-2008	5:58

Step-No.	IST_START_SSMM-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
7	If only 1 Bank is initialised on SSMM A & B **D102159SCVT185_IST_PACKET_STORE_DEF** If 3 banks are initialised on SSMM A & B **D102159SCVT189_IST_PACKET_STORE_DEF2** If 3 banks on SSMM A and only 1 on SSMM B are initialised **D102159SCVT178_RMS_PKT_STORE_DEF** ⇨ Click the button "End TS!" to proceed				**NCR-3492** occurs: (TTRRMMemCorEr_A 2 := 1)! ✓	✓	
8	**Z010999MCVT005_IST_START_SSMM** Reply to the prompt: **"Initialise MTL Service Buffers"** ⇨ Click the button "Confirm" to proceed				TM(5,4) alarms expected: o Evt_MTLBufADel (ID:26914) o Evt_MTLBufBDel (ID 26915)	✓	
9	**D102159SCVT209_START_ON_BOARD_SCHEDULE** ⇨ Click the button "End TS!" to proceed				SPR 282 TM failure: too quick check	✓	
10	**D102159SCVT193_IST_UPLOAD_OBCP** ⇨ Click the button "End TS!" to proceed					✓	

Test location:	Operator	Product-Assurance:	Date:	Time
Estec	Jellen	R. Vasoll	8-5-2008	6:18

Step-No.	IST_START_SSMM-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
11	**Z010999MCVT005_IST_START_SSMM** ⇨ Click the button "End TS!" to proceed					✓	

Test location:	Operator	Product-Assurance:	Date:	Time
Estec	Jellbay	R. Vascolli	1-5-2008	6:18

7.2.4.2 ACMS Configuration Procedure

Step-No.	ACMS_CONFIG-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
1	Open the ACMS_H_BLOC MIM Display to verify the telemetry status updating. Configure a "Telemetry Packet History" window set with filter APID = 512					√	
2	**A102109SPVT003_ACMS_CONFIG25** At the prompt "Enter your choice", insert **"1"** to select **"Select/Load ACMS_CONFIG Input File"** ⇨ Click the button "OK" to proceed	1		1 (= IST_EMC)	IST_EMC	√	
3	**A102109SPVT003_ACMS_CONFIG25** ⇨ Click the button "Continue" to proceed					√	
4	**A102109SPVT004_ACMS_LOADCONFIG1** At the prompt, **"Enter your choice:** ⇨ Click the button "OK" to proceed	To Check in Config. Table (Page 73) ACMS Config. File				√	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	Jellum	R. Vasco lb	8-5-2008	6:24

Step-No.	ACMS_CONFIG-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
5 N/A for "Launch Clean Run"	**A102109SPVT003_ACMS_CONFIG25** At the prompt "Enter your choice", insert **"6"** to select **"ACMS SCOE Configuration"** ⇨ Click the button "OK" to proceed	6			SKIP		
6 N/A for "Launch Clean Run"	**A102109SPVT003_ACMS_CONFIG25** ⇨ Click the button "Continue" to proceed				SKIP		
7 N/A for "Launch Clean Run"	**A102109SPVT003_ACMS_CONFIG25** Verify on AND YA001939 AMCS SCOE - AS_PSEUDO 1 of 1 the parameters YMACT939 (ACMS SCOE state) YMASE939 (Simulator stata) YMAMS939 (MILFE state) YMAUS939 (UIFE state)	executing executing executing executing		SKIP	Alarms are expected for TM with APID 2018 and EVID 4 when the parameters on the left have not reached the executing stage yet.		

Test location:	Operator	Product-Assurance:	Date:	Time 6 : 24

Step-No.	ACMS_CONFIG-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
8	**A102109SPVT003_ACMS_CONFIG25** At the prompt "Enter your choice", insert **"4"** to select **"ACMS Power ON (in Pre-Sep configuration)"** ⇨ click the button "OK" to proceed	4				✓	
9	**A102109SPVT003_ACMS_CONFIG25** ⇨ Click the button "CONTINUE" to proceed					✓	
10	**A102109SPVT011_ACMS_ON** During this sequence, following events are expected: - TM(5,4) Event Report and Reconfiguration Log - TM(5,2) APID:2018 (ACMS_SCOE) indicates ACMS "TestDataWord" needs to be switched ON. A few seconds later when the corresponding TC is sent, this TM(5,2) must disappear. - Multiple other events TM(5,1), such as "Fdir Task Overrun" or "Fdir Rm Parity Error"				Expected Out of Limit of AEYYY109 (synchronisation) ACC may become INVALID for a short time SPR **245** NCR **2862**: Out of Limit of HKA_ANTH?_Data SPR **334** OutOfLimit of Gyro Calib Curve in LCR	✓	

AFTER STEP 10 HAS COMPLETED SKIP ALL FURTHER ACMS STEPS IN THIS SECTION

Test location:	Operator	Product-Assurance:	Date:	Time
Estec	Jeffrey	R. Vascolk	8-5-2008	8:39

Step-No.	ACMS_CONFIG-Step-Description		Nominal Value	Tolerance	Actual Value		P	N
11	**A102109SPVT003_ACMS_CONFIG25** At the prompt "Enter your choice", Insert to select **"Modify ACC SGM/RM content"** ⇨ Click the button "OK" to proceed	**"5"**	5					
12	**A102109SPVT003_ACMS_CONFIG25** ⇨ Click the button "Continue" to proceed							
13	**A102109SPVT003_ACMS_CONFIG25** At the prompt "Enter your choice", Insert for **"Default configuration for separation"** ⇨ Click the button "OK" to proceed	**"20"**	20			Expected Out of Limit of AEYYY109 (synchronisation) ACC may become INVALID for a short time TC PM_Reset (ACY42109) not acknowledge expected		
14	**A102109SPVT003_ACMS_CONFIG25** ⇨ Click the button "Continue" to proceed							

Test location:	Operator	Product-Assurance:	Date:	Time :

Step-No.	ACMS_CONFIG-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
15	**A102109SPVT003_ACMS_CONFIG25** After about 10 min verify that ACMS Sequences are correctly terminated and ACMS CONFIG MAIN MENU 1.0 is available.						
16	**A102109SPVT003_ACMS_CONFIG25** At the prompt "Enter your choice", Insert **"99"** to select **"Return to Main Menu 1.0"** ⇨ Click the button "OK" to proceed	99					
17	**A102109SPVT003_ACMS_CONFIG25** ⇨ Click the button "Continue" to proceed						

Test location:	Operator	Product-Assurance:	Date:	Time :

7.3 IST Test Case

According to the actual IST Test Case, IST_GUI will prompt with following window(see Figure 1) to execute the relevant test sequence / procedure as listed below.

Click the button "Confirm" to call the appropriate sequence displayed in the message box.

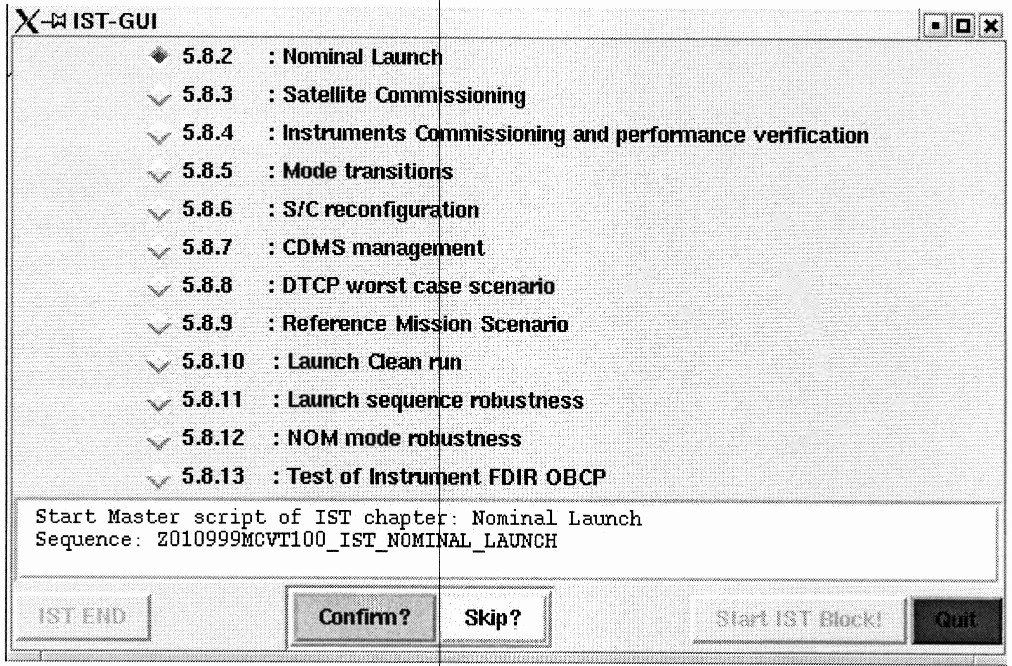


Figure 1: IST_GUI calling Master sequence, for instance "Nominal Launch"

Test location:	Operator	Product-Assurance:	Date:	Time :

Important Note: After execution of the IST Test Case, S/C has to be switched off with the “IST END” procedure as described in chapter 7.4.

Herschel IST Test Case 'Launch Phase, Separation and Post Separation':	HP-2-ASED-TP-0185
Herschel IST Test Case 'Satellite Commissioning':	HP-2-ASED-TP-0186
Herschel IST Test Case 'ACMS Commissioning':	HP-2-ASED-TP-0187
Herschel IST Test Case 'Instruments Commissioning and Performance Verification':	HP-2-ASED-TP-0188
Herschel IST Test Case 'Mode Transitions':	HP-2-ASED-TP-0189
Herschel IST Test Case 'S/C Reconfiguration':	HP-2-ASED-TP-0190
Herschel IST Test Case 'CDMS Management': ..	HP-2-ASED-TP-0191
Herschel IST Test Case 'DTCP Worst Case Scenario': ..	HP-2-ASED-TP-0192
Herschel IST Test Case 'REFERENCE Mission Scenario':	HP-2-ASED-TP-0193
Herschel IST Test Case 'Launch Clean Run':	HP-2-ASED-TP-0194
Herschel IST Test Case 'Launch Sequence Robustness':	HP-2-ASED-TP-0195
Herschel IST Test Case 'NOM Mode Robustness':	HP-2-ASED-TP-0196
Herschel IST Test Case 'Test of Instrument FDIR OBCP'	HP-2-ASED-TP-0197

Highlight the TEST Case to be performed in the above

Test location:	Operator	Product-Assurance:	Date:	Time
				:

7.4 IST END Procedure

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
1.	**IST_GUI** ⇨ Click the button "OK" and then ⇨ Click the button "IST_END" to proceed						
2.	**D102159SCVT188_IST_DUMP_PKT_STORE** ⇨ Click the button "Confirm" to proceed						
3.	**D102159SCVT188_IST_DUMP_PKT_STORE** ⇨ Click the button " End TS!" to proceed						

Test location:	Operator	Product-Assurance:	Date:	Time
				:

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
4. Only if PACS, SPIRE or HIFI is still ON	**Z010999MCVT004_IST_END** If one of the instruments is detected "ON" reply to the prompt: "Should the sequence" Z102999SCVT011_ASDGEN_PACSPWROFF_P Z102999SCVT005_ASDGEN_SPIREPWROFF_P Z102999SCVT015_ASDGEN_HIFIPWROFF_P "be called?" ⇨ Click the button "YES" to proceed						
5. Only if CCU A is ON	**Z010999MCVT004_IST_END** If CCU is detected "ON" reply to the prompt: Should the sequence "K102999ECVT001_ASDGENCCU_ABPWROFF be called ⇨ Click the button "YES" to proceed						

Test location:	Operator	Product-Assurance:	Date:	Time :

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
6. Only if RWL ON and ACMS is still in SCM	**Z010999MCVT004_IST_END** "Please ensure that ACMS is set in OCM mode, otherwise select the correct menu in the ACMS_CONFIG25" Perform chapter 7.4.1 then click OK						
7. Only if RWL are still spinning	**Z010999MCVT004_IST_END** Start the sequence A102109SPVT061_RWL_SPINDOWN? ⇨ Click the button "YES" to proceed				Out of Limits concerning RWL speed are expected during RWL spin down		
8. Only if ACMS is still ON	**Z010999MCVT004_IST_END** Start the sequence A102109SPVT012_ACMS_OFF ? ⇨ Click the button "YES" to proceed						

Test location:	Operator	Product-Assurance:	Date:	Time :

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
9. Only if ACMS is still ON	**A102109SPVT012_ACMS_OFF** During this sequence, following event are expected to occur: • TM(5,2) EvtID: 33 Event Report - ACB Rx Failed • TM(5,2) EvtID: 33 Event Report - ACB Rx Failed • TM(5,4) EvtId:16426 Mode SBSM Entry • Event Report - Boot Report and Reconfiguration Log • Event Report - SDB Unhealthy • Multiple "New Tm 251004939" • Multiple "New Tm 251001939" • Multiple "New Tm 251002939" This sequence needs time to be completely run, so let run in parallel with the following steps.						
10. Only if SREM is still ON	**Z102999SCVT002_SREM_OFF** ⇨ Click the button "End TS!" to proceed				SPR **35-290** NCR **3986** Wrong TM set in HPSDB		
11.	**D102159SCVT174_IST_REDUNDANT_CONF** ⇨ Click the button "Ens TS" to proceed						

Test location:	Operator	Product-Assurance:	Date:	Time
				:

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
12. Only if Survival Register set with separated flag	**Z010999MCVT004_IST_END** At the prompt "The survival register is set with the launch flag "separated". It must be set to "not separated" to avoid any reconfiguration during power off" ⇨ Click the button “Yes” to proceed						
13. Only if Survival Register set with separated flag	**D102159SCVT175_SET_SURV_REG** ⇨ Click the button “End TS!” to proceed						

Test location:	Operator	Product-Assurance:	Date:	Time :

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
14. Only if CROME wrongly set	**Z010999MCVT004_IST_END** Reply to the prompt "The CROME registers are not configured " "in PMA or PMB nominal " "Such configuration will block TM during Power OFF" ⇨ Click the button "YES" to proceed						
15. Only if CROME wrongly set	**D102159SCVT176_WRITE_CROME** ⇨ Click the button "End TS!" to proceed						
16. Only if SSMM is ON	**D102159SCVT188_IST_DUMP_PKT_STORE** ⇨ Click the button "End TS!" to proceed						
17. Only if SSMM is ON	**D102159SCVT181_Disable_PKT_STORE** ⇨ Click the button "End TS!" to proceed						

Test location:	Operator	Product-Assurance:	Date:	Time :

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
18. Only if SSMM is ON	**D102159SCVT187_IST_SSMM_OFF** During this sequence, the following events are expected: • TM(5,2) EvtId: 84 PM COCOS SPW C Reconnection • TM(5,4) EvtId: 88 MM A COCOS RT Failure • TM(5,4) EvtId: 148 MM SPW C address transfer error • TM(5,2) EvtId: 85 PM COCOS SPW C Reconnection • TM(5,4) EvtId: 89 MM A COCOS RT Failure • TM(5,4) EvtId: 149 MM SPW C address transfer error ⇨ Click the button "End TS!" to proceed						
19. Not for Launch Cases	**D102159SCVT001PM_SELECT** ⇨ Click the button "End TS!" to proceed						
20.	**Z010999MCVT002_POWER_OFF_HER_IST** ⇨ Click the button "End TS!" to proceed						

Test location:	Operator	Product-Assurance:	Date:	Time :

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
21 Only if TTC-SCOE is still ON	**Y102989ETVT020_TTC_SCOE_OFF** ⇨ Click the button "End TS!" to proceed						
21.	**Z010999MCVT004_IST_END** ⇨ Click the button "End TS!" to proceed						
22.	**IST_GUI** ⇨ Click the button "Quit" to terminate the test sequence						
23.	**Update CVS Tag** 1. Open a **shell** (xterm) 2. Execute the command **update_tag** Insert the name of **TAG →** **IST_x_PART_x_TP_xxxx_x_x_END_xxx**						

Test location:	Operator	Product-Assurance:	Date:	Time :

7.4.1 ACMS SCM to OCM transition for power off

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
24.	**A102109SPVT003_ACMS_CONFIG25** At the prompt "Enter your choice", insert **"2"** to select **"Transition SCM to OCM"** ⇨ Click the button "OK" to proceed, then "Continue"	2					
25.	**A102109SPVT003_ACMS_CONFIG25** At the prompt Menu 7 "Enter your choice", insert **"5"** to select **"Reaction wheels spin down"** Click the button "OK" to proceed, then "Continue"	5					
26.	**A102109SPVT003_ACMS_CONFIG25** At the prompt Menu 9 "Enter your choice", insert **"1"** to select **"Switch off ACMS"** Click the button "OK" to proceed, then "Continue"	1					

Test location:	Operator	Product-Assurance:	Date:	Time
				:

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
27.	**A102109SPVT012_ACMS_OFF** During this sequence, following event are expected to occur: • TM(5,4) EvtId:16426 Mode SBSM Entry • Event Report - Boot Report and Reconfiguration Log • Event Report - SDB Unhealthy • TM(5,2) EvtID: 33 Event Report - ACB Rx Failed • TM(5,2) EvtID: 33 Event Report - ACB Rx Failed • Multiple "New Tm 251004939" • Multiple "New Tm 251001939" • Multiple "New Tm 251002939" • Multiple TM(5,1) such as "FDir Task Overrun", etc…						
28.	**A102109SPVT003_ACMS_CONFIG25** At the prompt "Enter your choice", insert **"99"** to select **"Terminate ACMS_CONFIG25"** Click the button "OK" to proceed, then "Confirm" and continue in parallel with the next step.	99					

Test location:	Operator	Product-Assurance:	Date:	Time
				:

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
29.	**A102109SPVT017_ACMS_CRS_BACKGROUND** ⇨ Terminate the sequence.						

Test location:	Operator	Product-Assurance:	Date:	Time :

8 Summary Sheets

8.1 Procedure Variation Summary

	Test Change	Curr. No.: Date Page of	
Test designation	Test Procedure	Issue	Rev.
Test step changed	Reason for Change		
Prepared by:	Resp. Test Leader	Project Engineer	
PA/QA	Prime	Customer	

Table 8.1-1: Procedure Variation Sheet

8.2 Non Conformance Report (NCR) and SPR Summary

The status of all NCRs/SPRs generated during the test shall be given in the table below:

NCR/SPR - No.	Title	Date	Open/ Closed	PA sig.

Table 8.2-2: NCR/SPR Record Sheet

8.3 Sign-off Sheet

To finalise the test campaign, all responsible personnel shall sign off the filled-in procedure in the following table:

	Date	Signature
Test Director		
Test Conductor		
PA Responsible	10/05/08	

Annex B: Script Hierarchy

```
============ IST START ================

>Z010999MCVT001_POWER_ON_HER_IST $PM $tcDec $batScoe
 |-----> Y102989EPVT007_IST_PWR_SCOE_ON $configBS
 |-----|-----> Z010999MMXX002UNITS_CHECK
 |-----> async referby timeSynchronisation D102159SCVT032TIMESYNCRO
 |-----> D102159SCVT210_GET_ALARM_STATUS
 |-----> D102159SCVT210_GET_ALARM_STATUS
 |-----> W102584EPVT007_IST_CHECK_PCDU
 |-----> Z010999MMXX002UNITS_CHECK
 |-----> R102479ECVT009_UNITS_SELECTION
> Z010999MCVT001_POWER_ON_HER_IST $PM $tcDec $batScoe
 |-----> Y102989EPVT007_IST_PWR_SCOE_ON $configBS
 |-----|-----> Z010999MMXX002UNITS_CHECK
 |-----> async referby timeSynchronisation D102159SCVT032TIMESYNCRO
 |-----> D102159SCVT210_GET_ALARM_STATUS
 |-----> D102159SCVT210_GET_ALARM_STATUS
 |-----> W102584EPVT007_IST_CHECK_PCDU
 |-----> Z010999MMXX002UNITS_CHECK
 |-----> R102479ECVT009_UNITS_SELECTION
> D102159SCVT210_GET_ALARM_STATUS
> D102159SCVT176_WRITE_CROME $papCcs 1
> D102159SCVT174_IST_REDUNDANT_CONF $bus $pcduTmTc $hps $txChain $rfdn $tmObt
$tmRate
 |-----> D102159SCVT104_ENCODER_SELECT $tmObt $tm_Enc_Config
> async referby istStartSSMM Z010999MCVT005_IST_START_SSMM $ssmm]
> K102999ECVT001_ASDGENCCU_ABPWRON
 |-----> K102999ECVT001_ASDGENCCU_MnDisDLC
 |-----> K102999ECVT001_ASDGENCCUA_POWERON
 |-----|-----> Z010999MMXX002UNITS_CHECK
 |-----> K102999ECVT001_ASDGENCCUA_ChkEssTM
 |-----> K102999ECVT001_ASDGENCCUB_POWERON
 |-----|-----> Z010999MMXX002UNITS_CHECK
 |-----> K102999ECVT001_ASDGENCCUB_ChkEssTM
> K102999ECVT001_ASDGENCCU_MnEBOTH2
> K102999ECVT001_ASDGENCCU_MnEBOTH1
> K102999ECVT001_ASDGENCCUA_POWERON
 |-----> Z010999MMXX002UNITS_CHECK
> K102999ECVT001_ASDGENCCUA_MnEnaMd2
> K102999ECVT001_ASDGENCCUA_MnEnaMd1
> K102999ECVT001_ASDGENCCUB_POWERON
 |-----> Z010999MMXX002UNITS_CHECK
> K102999ECVT001_ASDGENCCUB_MnEnaMd2
> K102999ECVT001_ASDGENCCUB_MnEnaMd1
> Z010999MCVT153_IST_STATUS 5.8.2.4.2
 |-----> ACMS_get_RM_status RMA
 |-----> ACMS_get_RM_status RMB
> async A102109SPVT003_ACMS_CONFIG25
|-----> A102109SPVT004_ACMS_LOADCONFIG1
|-----> A102109SPVT010_ACMS_SCOE_CONFIG1
|-----|-----> async A102109SPVT017_ACMS_CRS_BACKGROUND
|-----> A102109SPVT011_ACMS_ON
|-----|-----> Z010999MMXX002UNITS_CHECK
|-----|-----> ACMS_get_RM_status RMA
```

```
|-----|-----> ACMS_get_RM_status RMB
|-----> A102109SPVT021_ACMS_ACC_SEPARA
> D102159SCVT032EnNomTCSLoops ist_herschel_tcs_config
> D102159SCVT115_CHECK_HCS_OFF
> D102159SCVT192_IST_UPLOAD_EAT
 |-----> D102159SCVT192_GET_EAT_REPORT
 |-----> D102159SCVT192_GET_EAT_REPORT 1
> D102159SCVT175_SET_SURV_REG $busSM $pcduSM $rfdnSM $txChainSM $ttrSM $sepStsSM
> D102159SCVT219_GET_BSW_HEALTH_UIU 1
> D102159SCVT204_GET_MOT 1
> D102159SCVT192_GET_EAT_REPORT 1
> D102159SCVT205_SAT_COM_TCT 1
> D102159SCVT207_SAT_COM_FCCT 1
> D102159SCVT188_IST_DUMP_PKT_STORE 0 80 1 81 2 82 3 83
> async referby celDownlink D102159SCVT188_IST_DUMP_PKT_STORE CEL_A CEL_B


============  IST END ================

 > $swOFFsequence
 > A102109SPVT061_RWL_SPINDOWN
 > async referby acmsOff A102109SPVT012_ACMS_OFF
 > Z102999SCVT002_SREM_OFF
 > D102159SCVT174_IST_REDUNDANT_CONF A A 0 0  0 0 0
 |-----> D102159SCVT104_ENCODER_SELECT $tmObt $tm_Enc_Config
 > D102159SCVT175_SET_SURV_REG B B ABBB B B not
 > D102159SCVT176_WRITE_CROME AB 1
 > D102159SCVT181_DISABLE_PKT_STORE
 > D102159SCVT187_IST_SSMM_OFF
 > Y102989ETVT020_TTC_SCOE_OFF
 |-----> Y102989ECVT018_TTC_TC_OP_METHOD OFFLINE
 |-----|-----> Y102989ETVT017_TTC_CHECK_ROUTINE
 |-----|-----> Y102989ETVT019_TTC_SCOE_ACTIVITY
 > W102584SPVT101_PCDU_TRANSITION_FDIR 5
 > Z010999MCVT002_POWER_OFF
 |-----> D102159SCVT028SSMM_OFF
 |-----> D102159SCVT001PM_SELECT B
 |-----|-----> D102159SCVT003DISTHERMALCONTROL
 |-----|-----> Z010999MMXX002UNITS_CHECK
 |-----> D102159SCVT001PM_SELECT A
 |-----|-----> D102159SCVT003DISTHERMALCONTROL
 |-----|-----> Z010999MMXX002UNITS_CHECK
 |-----> R102479SMXX001_XPND_HUM_TXT
 |-----> Y102989EPVT002_PWR_SCOE_OFF
 |-----|-----> Z010999MMXX003UNITS_CHECK_PWR_OFF
 |-----|-----> Z010999MMXX003UNITS_CHECK_PWR_OFF
 |-----|-----> Z010999MMXX003UNITS_CHECK_PWR_OFF
 |-----> Z010999MMXX003UNITS_CHECK_PWR_OFF
```

Annex C: Session Record

Test Description	
Session ID	
Start Time:	
End Time	
CVS Tag for Test	
Applicable IST Specification	
Test conductor	
QA Approval	

Test Description	
Session ID	
Start Time:	
End Time	
CVS Tag for Test	
Applicable IST Specification	
Test conductor	
QA Approval	

Test Description	
Session ID	
Start Time:	
End Time	
CVS Tag for Test	
Applicable IST Specification	
Test conductor	
QA Approval	

Annex D: Operation Notes

Operation Note 3

Title: ACMS SCOE does not boot	Date: 06/02/08
Observation: The ACMS SCOE does not boot. Reason: One of the STR UCE (Unit Checkout Equipment) electrical stimuli programs hangs.	
Operator Action: Until NCR / SPR is solved the following workaround is proposed (by Martijn): During powering the Power SCOE in the cleanroom: 1) Go to the STR UCE (in cleanroom) and select electrica stimuli PC on the KVM switch, press 2 time 'scroll lock' and select PC#2. 2) Kill the running application, by pressing the cross in the upper right corner. 3) Start the UCE application by double clicking the icon 'SMI', an application 'Star Mapper Analogue Chain Simulation' should start up. 4) Press 2 time 'scroll lock' and select PC#3 and repeat step 3.	

Operation Note 8

Title: DOD Alarm	Date: 14/02/08

Observation:

During each Power on within the "IST_START" there is a check of the DOD flag. Directly after the "D102159SVT32TIMESYNCRO" the dump of the RM LOG and the DOD Flag check is performed by the "D102159SCVT210_Get_ALARM_STATUS".

If the DOD alarm is present it has to be reset , otherwise the S/C will enter Save Mode directly after separation.

Operator Action:

For resetting the DOD alarm decrease the Vbat under the DoD threshold and then increasing the Vbat upper the DoD threshold therefore perform the following steps:
Open a shell window -> startCMD bsvnc
On the window "H-P BS SCOE" switch to local
On the window "BS SCOE Config" change the Battery Voltage from 25,4 to 19
The push the button save&update
On the window "BS SCOE Config" change the Battery Voltage from 19 to 25,4
The push the button save&update
On the window "H-P BS SCOE" switch to remote

Execute the script: D102159SCVT210_Get_ALARM_STATUS
to dump the RM Log to check DOD Flag Check if DOD alarm is still present

Operation Note 11

Title: Failure in TM Check of CCU Valves	Date: 14/02/08

Observation:

If CCU Valves sensing lines are connected to CRYO SCOE instead of CCU the valves status check fails at CCU Power ON

Operator Action:

1) On Test conductor Console, perform “connect PFM_CRYO”

2) Thanks Telemetry Query Display (TQD) check following TMs
   - YM648958 (VLV_STATUS_V103) instead of KM269302 = “CLOSED”
   - YM649958 (VLV_STATUS_V106) instead of KM269303 = “CLOSED”
   - YM640958 (VLV_STATUS_V501) instead of KM270302 = “CLOSED”
   - YM641958 (VLV_STATUS_V503) instead of KM270303 = “CLOSED”
   - YM643 958 (VLV_STATUS_V505) instead of KM271303 = “OPEN”

3) On Test conductor Console, perform “disconnect PFM_CRYO”

END OF DOCUMENT

Insert actual distribution list

SWITCH ON SC FOR EMC AFTER NCR 4207
09/05/08

SWITCH OFF SC AFTER EMC 10/05/08

(2)

EADS astrium

Herschel Integrated Satellite Test
Procedure: Leading Procedure

Herschel

AS RUN LEADING PROCEDURE FOR EMC / AUTOCOMP TESTS

Title: **Leading Procedure for Herschel Integrated Satellite Test**

8th May to 10th May 2008

CI-No: IST-END 9 May 10th; ADe

Prepared by:	Functional Team	Date:
Checked by:	C. Much	25/4/2008
Product Assurance:	J. Hall	25/4/2008.
Configuration Control:	W. Wietbrock	
TASF Engineering	G. Beaufils p.o.	25 APR 08
TASF Test Director	S. Mooney	25/4/2008.
Project Management:	Dr. W. Fricke ~~AGREED AS DOC VALIDATOR + SIGNATURE FOR START OF TEST +~~	29/04/08
Project Management	Denis Montet	28/4/08

Distribution: See Distribution List (last page)

PROCEDURE USED AFTER SAFETY LOOP TRIGGERED
SWITCH ON FOR FORMAL RUN OF
HIFI RE TEST AND AUTOCOMP.
INCLUDES SWITCH OFF OF SC AFTER EMC.

Change Record:

Issue	Date	Sheet	Description of Change	Release
1	11.01.2008		Initial version	1
1.1	04.02.2008		- see change bar	
1.2	27.02.2008		Update IST START step description according to AS RUN procedures, Add Operator note in Annex D, Add IST_GUI pictures, Update Hierarchy Script	
2.0	11.03.2008		5.4.3.1 Add CCS Light in EGSE Hardware Configuration 7.1.2 change all RFDN SM values from BBBB to ABBB (See procedure variations) 7.1.2 change value of "Bat.SCOE in table for launch clean run 7.1.2 change value of "TTR in SM" in table for "FDIR" and "Nom mode Robustness" 7.1.2 Correct SSMM configuration for ACMS commissioning 7.1.3 Step 1 add script name 7.1.3 Step 2 describe how to open window 7.1.3 Step 4 additional remark N/A for "Launch Clean Run" 7.1.3 Step 5 additional remark N/A for "Launch Clean Run" 7.1.3 Step 7 additional remark N/A for "Launch Clean Run" 7.1.3 Move Step 7b as 9b 7.1.3 Step 8-9 appears always (not only for launch cases) 7.1.3 step 20 add Operator Note 11 reference 7.1.3 step 22 deleted 7.1.3 step 23 added "Satellite state displayed" 7.1.3 step 29 remark deleted 7.1.3 step 33-34 Remark moved from step 34 to step 33 7.1.3 step 39 additional remark 7.1.4.1 step 9 add SPR 282 7.1.4.2 step 4 correct script name 7.1.4.2 step 5-6-7 clarify N/A 7.1.4.2 step 8 move remark to step 10 7.1.4.2 step 10 add SPR and NCR and expected TM(5,1) 7.1.4.2 step 13 add PM_reset TC Not Acknowledged 7.3 step 2 change YES to Confirm	

			7.3 step 2 add "RWL ON" condition 7.3 step 5 correct typo 7.3 step 7 add out of limit comment 7.3 add step 12a 7.3 remove step24 7.3 move step21 after WRITE_CROME step 23 7.3.1 4th Step 31 Add event TM(5,1) expected during ACC OFF Annex D add Operator Note 11 Rename Chapter 7 as IST Test Create new subchapters 7.1 HPCCS configuration for IST Test 7.1.1 Apply Tag on test files	
3	17.04.08		Update IST START procedure according to the AS RUN procedure for Nominal Mode Robstness (minor changes), 4.3.1 & 4.3.2 to include SCOE Sk01J04 and to correct hcu connector ident Typo's 7.2.1 Insert IST Start overview test flow diagram 7.2.2 update table 5.8.12 Nom Mode Robustness table to be i.a.w. the IST Specification	
4	24.04.08		Update IST START procedure according to the AS RUN procedure for minor updates, Include step 21 in Section 7.2.4 - start a CCU log file to monitor temperature TLM's	

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1 Scope

This Test Procedure contains the overall IST start-up and shutdown procedures for the satellite covering all the defined test cases as well as being the entry point for calling the appropriate test configuration.

It also contains the supporting definition of the relevant supporting infrastructure and pre test conditions required for the IST tests to be performed correctly.

All pre-requisites for the Helium II procedures shall be incorporated into a future issue of this document.

1.1 Objective

This document is the entry point for the Integrated Satellite Test - IST - test cases to be executed as part of the overall IST campaign for the Herschel project.

This document shall act as the leading procedure, to become 'as run' procedure for each IST test case that is executed, and shall be identified on the front sheet in 'Red' before start of test. A new 'as run' copy of the procedure shall be used for each test run, and will become a accurate history of the test performed. All activities will be recorded, with results obtained. Any anomalies found will be noted in the step by step section as they arise, and where applicable an SPR (Software Problem reports) will be raised.

The identification of hazardous conditions associated with the test article and the operations, which might damage equipment, cause injury or invalidate test data, will be herein provided. Precautions to be observed, with correlation to the specific areas of applicability, will be provided as well in the descriptions of the test set-up to be adopted.

1.2 Flow

The test flow is divided into two main areas: IST1 pre-environmental testing and IST2 which will be performed post environmental testing. For IST1 the tests will be grouped into 3 main test groups: Warm Case, He I, and He II condition. (See list below). For IST2 all testing shall be performed in He II condition.

IST 1

- **Warm case**
  - Launch clean run
  - Launch phase, separation and post separation
  - Satellite Commissioning warm case
  - ACMS commissioning
  - Launch sequence robustness
  - Mode transitions Warm case

- **He I**
  - Mode transitions He I or He II
  - S/C reconfiguration
  - NOM mode robustness
  - Test of Instrument FDIR OBCP

- **He II**
  - Instruments commissioning and performance verification
  - CDMS management
  - DTCP worst case scenario
  - Satellite/ CCU Commissioning He II only
  - Reference Mission Scenario

IST 2

All tests will be performed in He II

Tests may be run in any order

2 Documents

2.1 Applicable Documents

This section contains the list of documents originator of the test procedure, the list of documents filled with the requirement applicable to the activities explained in this procedure, the list of documents used to define the activities on the items (like design reports)

AD 2.1.1 Herschel Integrated Satellite Test Specification H-P-2-ASP-0939

2.2 Reference Documents

This section contains a list of documents filled with statements necessary to organise and to detail the operative execution of the test activities

~~RD 2.2.1.a.~~	~~Herschel/Planck Reference Mission Scenario~~	~~SCI-PT-12759~~
RD 2.2.1.b.	H/P ACMS S/S AVM SIT Specification	H-P-SP-AI-0059
RD 2.2.1.c.	H CDMS SIT Specification	H-P-SP-AI-0065
RD 2.2.1.d.	H TT&C SIT Specification	H-P-SP-AI-0078
RD 2.2.1.e.	H PCS SIT Specification	H-P-SP-AI-0079
RD 2.2.1.f. 6603	Packet Store Usage on H/P	PT-CMOC-OPS-TN-
RD 2.2.1.g.	Software user's Manual	P-HPL-NOT-0029-SE
RD 2.2.1.h.	CDMU ASW Requirement Specification	H-P-SP-AI-0031
RD 2.2.1.l.	Basic Software Requirement Specification	H-P-SP-AI-0006
~~RD 2.2.1.m.~~	~~H/P ACMS Requirement Specification~~	~~H-P-SP-AI-0011~~
RD 2.2.1.n.	SVM FDIR Design Specification	H-P-TN-AI-0024
RD 2.2.1.o.	Herschel Planck PSICD	SCI-PT-ICD-07527
RD 2.2.1.p.	H-P-CDMU ASW User Manual	H-P-4-SSF-MA-0001
RD 2.2.1.q.	H-P ACMS Design Report	H-P-4-DS-TN-0011
RD 2.2.1.r.	H-P ACMS TC Definition	H-P-4-DS-TN-0024
RD 2.2.1.s.	ACMS FDIR Analysis Report	H-P-4-DS-TN-0010
RD 2.2.1.t.	CDMU HW User Manual	P-HPL-NOT-0009

2.3 Other Documents

Additional to the IST Leading procedure there are the Step by Step IST procedure for each test case and a separate Instrument Power ON/OFF Switching procedure (see the table below).

IST Step by Step Test Procedures	HP-2-ASED-	Test to be performed
Herschel IST Test Case 'Launch Phase, Separation and Post Separation'	TP-0185	
Herschel IST Test Case 'Satellite Commissioning'	TP-0186	
Herschel IST Test Case 'ACMS Commissioning'	TP-0187	
Herschel IST Test Case 'Instruments Commissioning and Performance Verification'	TP-0188	
Herschel IST Test Case 'Mode Transitions'	TP-0189	
Herschel IST Test Case 'S/C Reconfiguration'	TP-0190	
Herschel IST Test Case 'CDMS Management'	TP-0191	
Herschel IST Test Case 'DTCP Worst Case Scenario'	TP-0192	
Herschel IST Test Case 'REFERENCE Mission Scenario'	TP-0193	
Herschel IST Test Case 'Launch Clean Run'	TP-0194	
Herschel IST Test Case 'Launch Sequence Robustness'	TP-0195	
Herschel IST Test Case 'NOM Mode Robustness'	TP-0196	
Herschel IST Test Case 'Test of Instrument FDIR OBCP'	TP-0197	
Herschel Instrument Power On/Off and Mode Switching Procedure for Functional Testing	TP-0206	

3 Requirements to be verified

See AD 2.1.1 "Herschel Integrated Satellite Test Specification" section 9

4 Configuration

4.1 Hardware Configuration

The activities described in this test procedure require the complete system configuration according to the hardware matrix here below reported.

S/S	Unit	Configuration	SCOE simulated equipments	Remarks
		Herschel		
EGSE	CCS	1		
	CCS lite	1		
	TM/TC DFE	1		
	CDMU SCOE	1		
	ACMS SCOE	1		
	TT&C SCOE	1		
	POWER SCOE	1		
	CCU SCOE			
IGSE	**HIFI IGSE**	1		
	PACS IGSE	1		
	SPIRE IGSE	1		
PCS	PCDU	1+1		
	Battery	1 Installed. Only connected for Launch clean run	1	Battery Simulation for other tests
	Solar Array	30 nom sections not required for IST	1	Power SCOE
CDMS	CDMU	1+1		
ACMS	ACC	1+1		
	RWA	3+1		
	GYRO	3+1		
	STR	2		
	CRS	2		
	AAD	1+1 internal red		
	SAS	2+2 internal red		
TT&C	XPND	2		
	TWT	2		
	EPC	2		
	LGA	2 (not used during the IST)		

S/S	Unit	Configuration	SCOE simulated equipments	Remarks
	MGA	1 (not used during the IST)		
~~RCS~~		~~1+1 (not used during the IST)~~		~~ACMS SCOE~~
TCS		1 (partially installed)		
VMC		1		
SREM		1		
HIFI		1		
PACS		1		
SPIRE		1		
Telescope		1		
HSS		1		

Table 1: Satellite configuration required for IST

4.2 SW Configuration

The Satellite IST will be run with the on-board software configuration as detailed in the IST TRR.

The actual configuration of the software should be noted here to ensure correct system status

- CDMS OBSW: ____________________
- ACMS OBSW: ____________________
- STR PROM SW: ____________________
- STR EEPROM SW: ____________________
- PACS DPU SW: ____________________
- PACS SPU SW: ____________________
- PACS DMC SW: ____________________
- HIFI ICU SW: ____________________
- SPIRE DPU SW: ____________________

4.3 SCOE Cables Connection

For the IST there are four different SCOE cables configuration.

- Configuration 1 for "Nominal Launch" and "RMS" see 4.3.1
- Configuration 2 for " Instrument Commissioning", "Mode Transitions", "S/C Reconfiguration", "Launch Mode Robustness", "CDMS management", "ACMS Commissioning", "Satellite commissioning" and "DTCP Worst Case Scenario" " NOM Mode Robustness" 4.3.2
- Configuration 3 for " Launch Clean Run" 4.3.3

4.3.1 SCOE cable connection for "RMS"

SCOE CABLES CONNECTION to HERSCHEL S/C

SKIN-01	PWR Panel (PCDU)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	BS Nom Power	SK01BJ09	PCDU		PCDU Flight Plug SK01BP09 Plugged
	BS Red Power	SK01BJ10	PCDU		PCDU Flight Plug SK01BP09 Plugged
	BDR1 AIT	SK01BJ11	PCDU	LPS SCOE Cable Plugged	
	BDR2 AIT	SK01BJ12	PCDU	LPS SCOE Cable Plugged	
	SA Nom Power	SK01AJ01	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ02	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ03	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ04	PCDU	Connector Cover	
	SA Red Power	SK01AJ05	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ06	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ07	PCDU	POWER SCOE Cable Plugged	
SKIN-02	PWR Panel (ACC, CDMU, RCS, 1553 & Thruster)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-02	DMS 1553 Bus_A	J01	CDMU	Bus Monitor Cable Plugged	
SKIN-02	DMS 1553 Bus_B	J02	CDMU	Bus Monitor Cable Plugged	
SKIN-02	ACMS 1553 Bus_A	J03	ACC	ACMS SCOE Cable Plugged	
SKIN-02	ACMS 1553 Bus_B	J04	ACC	ACMS SCOE Cable Plugged	
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	ACMS SCOE Cable Plugged	
SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	ACMS SCOE Cable Plugged	

SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH	ACMS SCOE Cable Plugged	
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS	ACMS SCOE Cable Plugged	
SKIN-02	CDMU and ACC EEPROM reprogramming input	J09	ACC/CDMU		Flight Cap SK02P09 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J10	ACC/CDMU		Flight Cap SK02P10 Plugged
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS	ACMS SCOE Cable Plugged	
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	ACMS SCOE Cable Plugged	
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH	ACMS SCOE Cable Plugged	
SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		ACMS Flight Cap SK02P14 Plugged
SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		ACMS Flight Cap SK02P15 Plugged
SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		ACMS Flight Cap SK02P16 Plugged
SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		ACMS Flight Cap SK02P17 Plugged
SKIN-03	TTC Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-03	Test point TC + protection jumper EPC1	SK03J01	XPND1/EPC1		Plastic cap (See note1)
SKIN-03	Test point TC + protection jumper EPC2	SK03J02	XPND2/EPC2		Plastic cap (See note1)
	RF LINK				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	RF link for antenna LGA1	N/A	LGA1	RF SCOE LGA1 Plugged	LGA1 Anechoic Cap
	RF link for antenna LGA2	N/A	LGA2	RF SCOE LGA2 Plugged	LGA2 Anechoic Cap
	RF link for antenna MGA	N/A	MGA	RF SCOE MGA Plugged	MGA Anechoic Cap
SKIN-04	ACMS Panel (RWE)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-04	RWL1 Sgn	J01	ACC/RWL-1		ACMS Flight Cap SK04P01 Plugged
SKIN-04	RWL2 Sgn	J02	ACC/RWL-2		ACMS Flight Cap SK04P02 Plugged
SKIN-04	RWL3 Sgn	J03	ACC/RWL-3		ACMS Flight Cap SK04P03 Plugged

SKIN-04	RWL4 Sgn	J04	ACC/RWL-4		ACMS Flight Cap SK04P04 Plugged
SKIN-05	GYR/QRS Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-05	CRS1 AOCS Sgn	J01	CRS-1/ACC		ACMS Flight Cap
SKIN-05	CRS2 AOCS Sgn	J02	CRS-2/ACC		ACMS Flight Cap
SKIN-05	GYRO RS422 / Test	J03	GYRO	ACMS SCOE Cable Plugged	
SKIN-05	CRS 1/2 Stimuli	J04	CRS-1,2	ACMS SCOE Cable Plugged	
SKIN-05	AAD Sgn M	J05	AAD/ACC	ACMS SCOE Cable Plugged	
SKIN-05	SAS1/2 Sgn M	J06	SAS/ACC	ACMS SCOE Cable Plugged	
SKIN-05	SAS1/2 Sgn R	J07	SAS/ACC	ACMS SCOE Cable Plugged	
SKIN-05	AAD Sgn R	J08	AAD/ACC	ACMS SCOE Cable Plugged	
SKIN-06	STR Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-06	STR1 Stimuli	J01	STR1	ACMS SCOE Cable Plugged	
SKIN-06	STR2 Stimuli	J02	STR2	ACMS SCOE Cable Plugged	
	UMBILICAL				
	Connector Function	Connector	S/C unit	SCOE CABLE	
	Power/Data	HU1 J01	SYSTEM	SCOEs cable Plugged	
	Power/Data	HU2 J01	SYSTEM	SCOEs cable Plugged	

CryoSCOE harness setup for ACS/PR/TP No.:

Annex No.:

315 100	on top of				
Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
Temperature Sensors	315100-J01	T117, T118, T207, T211, T238, T239, T249,T251, T253, T255, T423, T443, T463, T851, T852, T853, T861	Cryo SCOE J07 & J15		no flight
Temperature & pressure Sensors	315100-J03	T702, T872, P101, T103, T115, T116, T704, T802, T803, T805, T806, T871	Cryo SCOE J01 & J17		no flight
Temperature Sensors	315100-J05	T331, T333, T335, T337, T339, T341 (Telescope)	Cryo SCOE J14		X
Temperature Sensors	315100-J06	T332, T334, T336, T338, T340, T342 (Telescope)	Cryo SCOE J10		X
316 100	on top of				
Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
Valve Sensor	316100-J01	VS501, VS504			X
Valve Sensor	316100-J02	VS503, VS505			X
321 100	on top of				
Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
	321100-J01	L701, H701	Cryo SCOE J11		no flight
	321100-J02	LL702, H702	Cryo SCOE J03		no flight
	321100-J03	H502, H503	Cryo SCOE J06		no flight
	321100-J04	P501	Cryo SCOE J01		no flight

		321100-J05	H103, H701, L102, VT102, VT103, VT105, VT701, VH102, VH103, VH105, VH701, VS102, VS105, VS701	Cryo SCOE J11		no flight
		321100-J06	H104, H702, L101, VT104, VT106, VT702, VH104, VH106, VH702, VS104, VS702	Cryo SCOE J03		no flight
		321100-J07	H501	Cryo SCOE J06		no flight
		321100-J08	T502	Cryo SCOE J01		no flight
321 200	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
		321200-J01	T202, T212, T221, T223, T227, T228, T232, T234, T236, T242, T244, T246, T250, T254, T258, T424, T464	Cryo SCOE J08		X
		321200-J02	T102, T105, T106, T111, PR_P701, T421, T442, T461, H101	Cryo SCOE J04		X
		321200-J03	T321, T323, T501, T505, T651, T901, T903, T907, T911	Cryo SCOE J09		X
		321200-J04	T312, T314, T316, T905, T909, T931, T933, T935	Cryo SCOE J09		X
		321200-J05	VS103, H102	Cryo SCOE J04		X
321 300	on top of					
	Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected

		321300-J01	T208, T213, T222, T224, T225, T226, T231, T233, T235, T237, T247, T248, T252, T256, T862, T444	Cryo SCOE J02		X
		321300-J02	T101, T104, T107, T112, T703, T422, T441, T462, T701, H102	Cryo SCOE J04		X
		321300-J03	P502,T322, T324, T504, T506, T507, T652, T902, T908, T912	Cryo SCOE J18		X
		321300-J04	T311, T313, T315, T904, T906, T910, T932, T934	Cryo SCOE J14		X
		321300-J05	VS106, H102	Cryo SCOE J04		X
CVSE I/F	on top of					
	Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected
				Cryo SCOE J18		X

to be approved & released before start of ACS/PR/TP by Floor-Manager	Date:	Sign:

SAFE / ARM plug setup for ACS/PR/TP No.:						
Annex No.:						
314 200	on top of					
	Connector Function	Connector	S/C unit	SAFE	ARM	Sign
	SAFE / ARM plug	314 200-J03	NED (601)	X		
	SAFE / ARM plug	314 200-J04	NED (602)	X		
	SAFE / ARM plug	314 200-J05	SI 601	X		
	SAFE / ARM plug	314 200-J06	SI 602	X		
to be approved & released before start of ACS/PR/TP by Floor-Manager	Date:		Sign:			

4.3.2 SCOE cable connection for " Nominal Launch", " Satellite Commissioning",,"Instrument Commissioning "ACMS Commissioning", "Mode Transitions", S/C Reconfiguration", "CDMS management", DTCP Worst Case Scenario", "Launch Mode Robustness",."NOM Mode Robustness" and "Instrument FDIR"

SCOE CABLES CONNECTION to HERSCHEL S/C					
SKIN-01	PWR Panel (PCDU)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	BS Nom Power	SK01BJ09	PCDU	BS SCOE Cable Plugged	
	BS Red Power	SK01BJ10	PCDU	BS SCOE Cable Plugged	
	BDR1 AIT	SK01BJ11	PCDU	LPS SCOE Cable Plugged	
	BDR2 AIT	SK01BJ12	PCDU	LPS SCOE Cable Plugged	
	SA Nom Power	SK01AJ01	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ02	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ03	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ04	PCDU	Connector Cover	
	SA Red Power	SK01AJ05	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ06	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ07	PCDU	POWER SCOE Cable Plugged	
SKIN-02	PWR Panel (ACC, CDMU, RCS, 1553 & Thruster)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-02	DMS 1553 Bus_A	J01	CDMU	Bus Monitor Cable Plugged	
SKIN-02	DMS 1553 Bus_B	J02	CDMU	Bus Monitor Cable Plugged	
SKIN-02	ACMS 1553 Bus_A	J03	ACC	ACMS SCOE Cable Plugged	
SKIN-02	ACMS 1553 Bus_B	J04	ACC	ACMS SCOE Cable Plugged	
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	ACMS SCOE	

				Cable Plugged	
SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	ACMS SCOE Cable Plugged	
SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH	ACMS SCOE Cable Plugged	
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS	ACMS SCOE Cable Plugged	
SKIN-02	CDMU and ACC EEPROM reprogramming input	J09	ACC/CDMU		Flight Cap SK02P09 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J10	ACC/CDMU		Flight Cap SK02P10 Plugged
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS	ACMS SCOE Cable Plugged	
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	ACMS SCOE Cable Plugged	
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH	ACMS SCOE Cable Plugged	
SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		ACMS Flight Cap SK02P14 Plugged
SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		ACMS Flight Cap SK02P15 Plugged
SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		ACMS Flight Cap SK02P16 Plugged
SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		ACMS Flight Cap SK02P17 Plugged
SKIN-03	TTC Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-03	Test point TC + protection jumper EPC1	SK03J01	XPND1/EPC1		Plastic cap (See note1)
SKIN-03	Test point TC + protection jumper EPC2	SK03J02	XPND2/EPC2		Plastic cap (See note1)
	RF LINK				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	RF link for antenna LGA1	N/A	LGA1	RF SCOE LGA1 Plugged	LGA1 Anechoic Cap
	RF link for antenna LGA2	N/A	LGA2	RF SCOE LGA2 Plugged	LGA2 Anechoic Cap
	RF link for antenna MGA	N/A	MGA	RF SCOE MGA Plugged	MGA Anechoic Cap
SKIN-04	ACMS Panel (RWE)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-04	RWL1 Sgn	J01	ACC/RWL-1		ACMS Flight Cap SK04P01 Plugged
SKIN-04	RWL2 Sgn	J02	ACC/RWL-2		ACMS Flight Cap

					SK04P02 Plugged
SKIN-04	RWL3 Sgn	J03	ACC/RWL-3		ACMS Flight Cap SK04P03 Plugged
SKIN-04	RWL4 Sgn	J04	ACC/RWL-4		ACMS Flight Cap SK04P04 Plugged
SKIN-05	GYR/QRS Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-05	CRS1 AOCS Sgn	J01	CRS-1/ACC		ACMS Flight Cap
SKIN-05	CRS2 AOCS Sgn	J02	CRS-2/ACC		ACMS Flight Cap
SKIN-05	GYRO RS422 / Test	J03	GYRO	ACMS SCOE Cable Plugged	
SKIN-05	CRS 1/2 Stimuli	J04	CRS-1,2	ACMS SCOE Cable Plugged	
SKIN-05	AAD Sgn M	J05	AAD/ACC	ACMS SCOE Cable Plugged	
SKIN-05	SAS1/2 Sgn M	J06	SAS/ACC	ACMS SCOE Cable Plugged	
SKIN-05	SAS1/2 Sgn R	J07	SAS/ACC	ACMS SCOE Cable Plugged	
SKIN-05	AAD Sgn R	J08	AAD/ACC	ACMS SCOE Cable Plugged	
SKIN-06	STR Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-06	STR1 Stimuli	J01	STR1	ACMS SCOE Cable Plugged	
SKIN-06	STR2 Stimuli	J02	STR2	ACMS SCOE Cable Plugged	
	UMBILICAL				
	Connector Function	Connector	S/C unit	SCOE CABLE	
	Power/Data	HU1 J01	SYSTEM	SCOEs cable Plugged	
	Power/Data	HU2 J01	SYSTEM	SCOEs cable Plugged	

CryoSCOE harness setup for ACS/PR/TP No.:

Annex No.:

315 100	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
	Temperature Sensors	315100-J01	T117, T118, T207, T211, T238, T239, T249,T251, T253, T255, T423, T443, T463, T851, T852, T853, T861	Cryo SCOE J07 & J15		no flight
	Temperature & pressure Sensors	315100-J03	T702, T872, P101, T103, T115, T116, T704, T802, T803, T805, T806, T871	Cryo SCOE J01 & J17		no flight
	Temperature Sensors	315100-J05	T331, T333, T335, T337, T339, T341 (Telescope)	Cryo SCOE J14		X
	Temperature Sensors	315100-J06	T332, T334, T336, T338, T340, T342 (Telescope)	Cryo SCOE J10		X
316 100	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
	Valve Sensor	316100-J01	VS501, VS504			X
	Valve Sensor	316100-J02	VS503, VS505			X
321 100	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
		321100-J01	L701, H701	Cryo SCOE J11		no flight
		321100-J02	LL702, H702	Cryo SCOE J03		no flight
		321100-J03	H502, H503	Cryo SCOE J06		no flight

		321100-J04	P501	Cryo SCOE J01		no flight
		321100-J05	H103, H701, L102, VT102, VT103, VT105, VT701, VH102, VH103, VH105, VH701, VS102, VS105, VS701	Cryo SCOE J11		no flight
		321100-J06	H104, H702, L101, VT104, VT106, VT702, VH104, VH106, VH702, VS104, VS702	Cryo SCOE J03		no flight
		321100-J07	H501	Cryo SCOE J06		no flight
		321100-J08	T502	Cryo SCOE J01		no flight
321 200	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
		321200-J01	T202, T212, T221, T223, T227, T228, T232, T234, T236, T242, T244, T246, T250, T254, T258, T424, T464	Cryo SCOE J08		X
		321200-J02	T102, T105, T106, T111, PR_P701, T421, T442, T461, H101	Cryo SCOE J04		X
		321200-J03	T321, T323, T501, T505, T651, T901, T903, T907, T911	Cryo SCOE J09		X
		321200-J04	T312, T314, T316, T905, T909, T931, T933, T935	Cryo SCOE J09		X
		321200-J05	VS103, H102	Cryo SCOE J04		X

321 300	on top of					
	Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected
		321300-J01	T208, T213, T222, T224, T225, T226, T231, T233, T235, T237, T247, T248, T252, T256, T862, T444	Cryo SCOE J02		X
		321300-J02	T101, T104, T107, T112, T703, T422, T441, T462, T701, H102	Cryo SCOE J04		X
		321300-J03	P502,T322, T324, T504, T506, T507, T652, T902, T908, T912	Cryo SCOE J18		X
		321300-J04	T311, T313, T315, T904, T906, T910, T932, T934	Cryo SCOE J14		X
		321300-J05	VS106, H102	Cryo SCOE J04		X
CVSE I/F	on top of					
	Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected
				Cryo SCOE J18		X

to be approved & released before start of ACS/PR/TP by Floor-Manager	Date:	Sign:

SAFE / ARM plug setup for ACS/PR/TP No.:						
Annex No.:						
314 200	on top of					
	Connector Function	Connector	S/C unit	SAFE	ARM	Sign
	SAFE / ARM plug	314 200-J03	NED (601)	X		
	SAFE / ARM plug	314 200-J04	NED (602)	X		
	SAFE / ARM plug	314 200-J05	SI 601	X		
	SAFE / ARM plug	314 200-J06	SI 602	X		
to be approved & released before start of ACS/PR/TP by Floor-Manager	Date:			Sign:		

4.3.3 SCOE cable connection for" Launch Clean Run"

SVM / EGSE harness setup for ACS/PR/TP No.:

Annex No.:

SKIN-01	PWR Panel (PCDU)						
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	SA Nom Power	SAS SCOE	PCDU	SK01A J/P01	disconnected		
	SA Nom Power	SAS SCOE	PCDU	SK01A J/P02	disconnected		
	SA Nom Power	SAS SCOE	PCDU	SK01A J/P03	disconnected		
			Battery	SK01A J/P04	EMC cover		
	SA Red Power	SAS SCOE	PCDU	SK01A J/P05	disconnected		
	SA Red Power	SAS SCOE	PCDU	SK01A J/P06	disconnected		
	SA Red Power	SAS SCOE	PCDU	SK01A J/P07	disconnected		
	BS Nom Power	BS SCOE	PCDU	SK01B J/P09	Flight		
	BS Red Power	BS SCOE	PCDU	SK01B J/P10	Flight		
	BDR1 AIT	SAS SCOE	PCDU	SK01B J/P11	LPS SCOE Cable Plugged		
	BDR2 AIT	SAS SCOE	PCDU	SK01B J/P12	LPS SCOE Cable Plugged		
SKIN-02	PWR Panel (ACC, CDMU, RCS, 1553 & Thruster)						
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	DMS 1553 Bus_A	CDMU SCOE	CDMU	SK02 J/P01	Flight		
	DMS 1553 Bus_B	CDMU SCOE	CDMU	SK02 J/P02	Flight		
	ACMS 1553 Bus_A	ACMS SCOE	ACC	SK02 J/P03	Flight		
	ACMS 1553 Bus_B	ACMS SCOE	ACC	SK02 J/P04	Flight		
	LV1/FCV 20N CMD S/A M	ACMS SCOE	ACC/RCS	SK02 J/P05	disconnected		
	LV2/FCV 20N CMD S/A R	ACMS SCOE	ACC/RCS	SK02 J/P06	disconnected		
	RCS Press/Tank Temp/PT Pwr	ACMS SCOE	ACC/PT&TH	SK02 J/P07	Flight		
	Thruster Temp M/LV1 Sts	ACMS SCOE	ACC/RCS	SK02 J/P08	Flight		

	Quick S/W load	grey ACMS	black CDMS	SK02 J/P09	disconnected		
	Quick S/W load	grey ACMS	black CDMS	SK02 J/P10	disconnected		
	Thruster Temp R/LV2 Sts	ACMS SCOE	ACC/RCS	SK02 J/P11	Flight		
	Thruster C/B Heaters M	ACMS SCOE	ACC/CBH	SK02 J/P12	disconnected		
	Thruster C/B Heaters R	ACMS SCOE	ACC/CBH	SK02 J/P13	disconnected		
	Str1/2 On/Off Cmd M/Str1 Sts	ACMS SCOE	ACC/STR-1	SK02 J/P14	Flight		
	Str1/2 On/Off Cmd R/Str2 Sts	ACMS SCOE	ACC/STR-2	SK02 J/P15	Flight		
	Gyro A On/Off Cmd		ACC/GYRO-E1	SK02 J/P16	Flight		
	Gyro B On/Off Cmd		ACC/GYRO-E2	SK02 J/P17	Flight		
SKIN-03	TTC Panel						
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	Test point TC + protection jumper EPC1	Plastic Cap	XPND1/EPC1	SK03 J/P01	Flight		
	Test point TC + protection jumper EPC2	Plastic Cap	XPND2/EPC2	SK03 J/P02	Flight		
	RF LINK						
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	RF link for antenna LGA1	TT&C SCOE	LGA1	LGA1 Anechoic Cap	RF-SCOE		
	RF link for antenna LGA2	TT&C SCOE	LGA2	LGA2 Anechoic Cap	RF-SCOE		
	RF link for antenna MGA	TT&C SCOE	MGA	MGA Anechoic Cap	RF-SCOE		
SKIN-04	ACMS Panel (RWE)						
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	RWL1 Sgn		ACC/RWL-1	SK04 J/P01	Flight		
	RWL2 Sgn		ACC/RWL-2	SK04 J/P02	Flight		
	RWL3 Sgn		ACC/RWL-3	SK04 J/P03	Flight		
	RWL4 Sgn		ACC/RWL-4	SK04 J/P04	Flight		

SKIN-05	GYR/QRS Panel						
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	CRS1 AOCS Sgn		CRS-1/ACC	SK05 J/P01	Flight		
	CRS2 AOCS Sgn		CRS-2/ACC	SK05 J/P02	Flight		
	GYRO RS422 / Test	ACMS SCOE	GYRO	SK05 J/P03	disconnected		
	CRS 1/2 Stimuli	ACMS SCOE	CRS-1,2	SK05 J/P04	disconnected		
	AAD Sgn M	ACMS SCOE	AAD/ACC	SK05 J/P05	Flight		
	SAS1/2 Sgn M	ACMS SCOE	SAS/ACC	SK05 J/P06	Flight		
	SAS1/2 Sgn R	ACMS SCOE	SAS/ACC	SK05 J/P07	Flight		
	AAD Sgn R	ACMS SCOE	AAD/ACC	SK05 J/P08	Flight		
SKIN-06	STR Panel						
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	STR1 Stimuli	STR1	STR1	SK06 J/P01	disconnected		
	STR2 Stimuli	STR2	STR2	SK06 J/P02	disconnected		
UMBILICAL							
	Connector Function	SCOE	S/C unit	Connector	Connection		Sign
	Power/Data	System	SYSTEM	HUJ01	SCOE		
	Power/Data	System	SYSTEM	HUJ02	SCOE		
approved SE		approved AIT		approved PA/Safety		approved Floor-Manger	
sign off:							

CryoSCOE harness setup for ACS/PR/TP No.:

Annex No.:

315 100	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
	Temperature Sensors	315100-J01	T117, T118, T207, T211, T238, T239, T249,T251, T253, T255, T423, T443, T463, T851, T852, T853, T861	Cryo SCOE J07 & J15		no flight
	Temperature & pressure Sensors	315100-J03	T702, T872, P101, T103, T115, T116, T704, T802, T803, T805, T806, T871	Cryo SCOE J01 & J17		no flight
	Temperature Sensors	315100-J05	T331, T333, T335, T337, T339, T341 (Telescope)	Cryo SCOE J14		X
	Temperature Sensors	315100-J06	T332, T334, T336, T338, T340, T342 (Telescope)	Cryo SCOE J10		X
316 100	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
	Valve Sensor	316100-J01	VS501, VS504			X
	Valve Sensor	316100-J02	VS503, VS505			X
321 100	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
		321100-J01	L701, H701	Cryo SCOE J11		no flight
		321100-J02	LL702, H702	Cryo SCOE J03		no flight
		321100-J03	H502, H503	Cryo SCOE J06		no flight
		321100-J04	P501	Cryo SCOE J01		no flight

		321100-J05	H103, H701, L102, VT102, VT103, VT105, VT701, VH102, VH103, VH105, VH701, VS102, VS105, VS701	Cryo SCOE J11		no flight
		321100-J06	H104, H702, L101, VT104, VT106, VT702, VH104, VH106, VH702, VS104, VS702	Cryo SCOE J03		no flight
		321100-J07	H501	Cryo SCOE J06		no flight
		321100-J08	T502	Cryo SCOE J01		no flight
321 200	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
		321200-J01	T202, T212, T221, T223, T227, T228, T232, T234, T236, T242, T244, T246, T250, T254, T258, T424, T464	Cryo SCOE J08		X
		321200-J02	T102, T105, T106, T111, PR_P701, T421, T442, T461, H101	Cryo SCOE J04		X
		321200-J03	T321, T323, T501, T505, T651, T901, T903, T907, T911	Cryo SCOE J09		X
		321200-J04	T312, T314, T316, T905, T909, T931, T933, T935	Cryo SCOE J09		X
		321200-J05	VS103, H102	Cryo SCOE J04		X
321 300	on top of					
	Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected

		321300-J01	T208, T213, T222, T224, T225, T226, T231, T233, T235, T237, T247, T248, T252, T256, T862, T444	Cryo SCOE J02		X
		321300-J02	T101, T104, T107, T112, T703, T422, T441, T462, T701, H102	Cryo SCOE J04		X
		321300-J03	P502,T322, T324, T504, T506, T507, T652, T902, T908, T912	Cryo SCOE J18		X
		321300-J04	T311, T313, T315, T904, T906, T910, T932, T934	Cryo SCOE J14		X
		321300-J05	VS106, H102	Cryo SCOE J04		X
CVSE I/F	on top of					
	Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected
				Cryo SCOE J18		X

to be approved & released before start of ACS/PR/TP by Floor-Manager	Date:	Sign:

SAFE / ARM plug setup for ACS/PR/TP No.:

Annex No.:

314 200	on top of					
	Connector Function	Connector	S/C unit	SAFE	ARM	Sign
	SAFE / ARM plug	314 200-J03	NED (601)	X		
	SAFE / ARM plug	314 200-J04	NED (602)	X		
	SAFE / ARM plug	314 200-J05	SI 601	X		
	SAFE / ARM plug	314 200-J06	SI 602	X		

to be approved & released before start of ACS/PR/TP by Floor-Manager	Date:	Sign:

5 Conditions

5.1 Personnel

The following table shall be filled in detailing which personnel are required to be present for the test. The signature of the appropriate responsible is classified as agreement to start the test as stated in the TRR.

Responsibility	Required for Test (Y/N)	Name / Organization	Signature
Floor Manager	Y		
Test Director	Y		
Test Conductor	Y		
EGSE Operator			
SVM Support Engineer			
Cryo Support Engineer			
HIFI Instrument Support Engineer			
PACS Instrument Support Engineer			
Spire Instrument Support Engineer			
PA Responsible	Y		
Customer Representative			

Table 2: List of IST test attendants

Persons, other than test personal as mentioned in the test team organization and participants of the TRR, are allowed to observe the test at the discretion of the Test Director and Test Conductor.

5.2 Environmental

During all the phases of the test the HERSCHEL Satellite shall be maintained in a controlled environment in order to prevent degradation or contamination of the satellite equipment and surface, which could result in operational failures.

ESTEC site clean room will be used.

Ambient conditions shall comply with ISO14644-1 for cleanliness requirement.

The characteristic shall be:

- Temperature = 22C ± 3C
- Relative Humidity = 50 % +/- 10%
- Delta Pressure = above 0.6 mm H2O
- Clean Conditions = Class 100 000

The following table defines the S/C conditions for each IST test sequence with respect to Cryostat He I/He II status, tilting angle and usage of the real battery.

IST 1 Part 1 Warm preferred

Chapter of IST Spec Issiue 4		Instr. Mode	Real Battery required	Satellite X-Axis tilting	Ambient or cool down (deviating from IST Spec !!!)	He I HTT venting >20mg/sec	He II HTT venting >20mg/sec
5.8.2	**Launch phase, separation and post separation**	3 shift	4 shift	5 shift	6 shift	7 shift	8 shift
5.8.2.3	Initial configuration	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.2	Satellite power ON	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.4	Configuration for launch	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.5	Launch	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.6	Separation	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.7	Post separation	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.8	Initial check out in SAM mode	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.9	CDMS transition to NOM mode	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.10	Orbit Control Manoeuvre	OFF	Y	n.a	Preferred	alternative	alternative
5.8.2.4.11	End of the sequence	OFF	Y	n.a	Preferred	alternative	alternative
5.8.3	**Satellite Commissioning**						
5.8.3.3	Test start configuration	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.4	TTC commissioning	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.5	CDMS commissioning	OFF	N	n.a	Preferred	alternative	alternative
	TCS commissioning	OFF	N	n.a.	Preferred	alternative	alternative
5.8.3.7	PCS commissioning	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.10	SREM commissioning	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.11	TCS commissioning	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.12	Telescope decontamination	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.13	Cryo Cover opening	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.14	Test end	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.9	**ACMS commissioning**						
5.8.3.9.1	AAD, SAS, CRS, STR, GYR, RCS unit check	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.9.2	RWLs health check	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.9.3	STR functional verification	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.9.4	ACC health check	OFF	N	n.a	Preferred	alternative	alternative
5.8.3.9.5	ACMS dynamic verification	OFF	N	n.a	Preferred	alternative	alternative
5.8.5	**Mode transitions**						
5.8.5.3	Test start configuration	OFF	N	n.a	Preferred	alternative	alternative
5.8.5.4	Launch to Launch	OFF	N	n.a	Preferred	alternative	alternative
5.8.5.5	Launch to SAM	OFF	N	n.a	Preferred	alternative	alternative
5.8.5.6	SAM to SAM	OFF	N	n.a	Preferred	alternative	alternative
5.8.5.7	SAM to NOM	OFF	N	n.a	Preferred	alternative	alternative
5.8.10	**Launch clean run**						
		OFF	Y	n.a	Preferred	alternative	alternative
5.8.11	**Launch sequence robustness**						
5.8.11.3.2	Satellite power on	OFF	N	n.a	Preferred	alternative	alternative
5.8.11.3.4	Configuration for launch (status)	OFF	N	n.a	Preferred	alternative	alternative
5.8.11.3.5	Configuration for launch	OFF	N	n.a	Preferred	alternative	alternative
5.8.11.3.6	Separation	OFF	N	n.a	Preferred	alternative	alternative
5.8.11.3.7	S/C acquisition	OFF	N	n.a	Preferred	alternative	alternative
5.8.11.3.8	Initial checkout in SAM mode	OFF	N	n.a	Preferred	alternative	alternative
5.8.11.3.9	Transition to NOM mode	OFF	N	n.a	Preferred	alternative	alternative
5.8.11.3.10	Orbit control manoeuvre	OFF	N	n.a	Preferred	alternative	alternative

IST 1 Part 2 He I or He II

Chapter of IST Spec Issiue 4		Instr. Mode	Real Battery required	Satellite X- Axis tilting	Ambient or cool down (deviating from IST Spec !!!)	He I HTT venting >20mg/sec	He II HTT venting >20mg/sec
5.8.5	**Mode transitions**						
5.8.5.8	NOM to NOM	PACS spectro SPIRE STBY HIFI STBY	N	0-23		alternative	Preferred
5.8.5.9	NOM to EAM	PACS STBY SPIRE STBY HIFI STBY	N	0-23		alternative	Preferred
5.8.5.10	EAM to EAM	PACS STBY SPIRE STBY-> Photo->STBY HIFI STBY	N	0-23		alternative	Preferred
5.8.5.11	EAM to NOM	PACS STBY SPIRE STBY- >Photo	N	0-23		alternative	Preferred
5.8.5.12	NOM to SM	PACS STBY->OFF SPIRE Photo->OFF HIFI STBY->OFF	N	0-23		alternative	Preferred
5.8.5.13	SM to SM	OFF	N	0-23		alternative	Preferred
5.8.5.14	SM to SAM	OFF	N	0-23		alternative	Preferred
5.8.5.17	EAM to SAM (needs new SAM to NOM and NOM to EAM)	PACS STBY SPIRE STBY HIFI Science -> STBY	N	0-23		alternative	Preferred
5.8.5.18	NOM to SAM (needs new SAM to NOM)	PACS Burst- >STBY SPIRE STBY	N	0-23		alternative	Preferred
5.8.5.19	Test end	OFF	N	0-23		alternative	Preferred
5.8.6	**S/C reconfiguration**						
5.8.6.2	Test start configuration	PACS STBY SPIRE STBY HIFI STBY	N	0-23		alternative	Preferred
5.8.6.3	CDMS level 3a	PACS STBY SPIRE STBY HIFI Prime-	N	0-23		alternative	Preferred
5.8.6.4	CDMS level 3b	PACS STBY SPIRE STBY HIFI STBY	N	0-23		alternative	Preferred
5.8.6.5	ACMS level 4	PACS Prime->OFF SPIRE STBY->OFF HIFI STBY->OFF	N	0-23		alternative	Preferred
5.8.6.6	ACMS recovery from Survival Mode (ACMS SASM to SAM)	OFF	N	0-23		alternative	Preferred
5.8.6.7	CDMS level 4	PACS Prime->OFF SPIRE STBY->OFF HIFI STBY->OFF	N	0-23		alternative	Preferred
5.8.6.8	Test end	OFF	N	0-23		alternative	Preferred
5.8.12	**NOM mode robustness**						
5.8.12.3.1	Initial State	PACS STBY SPIRE Photo HIFI STBY	N	0-23		alternative	Preferred
5.8.12.3.2	CDMS PM 1553 BC failure simulation	PACS STBY SPIRE Photo- >STBY	N	0-23		alternative	Preferred
5.8.12.3.3	CDMS PM 1553 BC failure recovery	PACS Photo SPIRE STBY HIFI STBY	N	0-23		alternative	Preferred
5.8.12.3.4	Initial state second test	PACS Photo SPIRE STBY HIFI STBY	N	0-23		alternative	Preferred
5.8.12.3.5	ACMS 1553 RT failure simulation	PACS Photo - >STBY SPIRE STBY	N	0-23		alternative	Preferred
5.8.12.3.6	ACMS 1553 RT failure recovery	PACS STBY->OFF SPIRE STBY->OFF HIFI STBY->OFF	N	0-23		alternative	Preferred
5.8.13	**Test of Instrument FDIR OBCP**						
5.8.13.4	SPIRE FDIR OBCP	SPIRE	N	0-23		alternative	Preferred
5.8.13.5	PACS FDIR OBCP	PACS	N	0-23		alternative	Preferred
5.8.13.6	HIFI FDIR OBCP	HIFI	N	0-23		alternative	Preferred
5.9	**DEGRADED CASES**						
5.9.1	S/C ability to be operated in degraded modes					alternative	Preferred

IST 1 Part 3 He II only

Chapter of IST Spec Issue 4	Instr. Mode	Real Battery required	Satellite X-Axis tilting	Ambient or cool down (deviating from IST Spec !!!)	He I HTT venting >20mg/sec	He II HTT venting >20mg/sec
Satellite Commissioning						
CCU (cryostat) commissioning	OFF	N	23			Required
Instruments commissioning and performance verification						
Test start (restart) configuration	OFF	N	23			Required
						Required
SPIRE commissioning test	Spire	N	23 -> 90			Required
PACS commissioning test	PACS	N	23			Required
HIFI commissioning test	HIFI	N	0-23			Required
SPIRE and PACS parallel mode	SPIRE/PACS	N	23			Required
Test end or interruption	OFF	N				Required
CDMS management						
General Sequence (Integration with RMS DTCP number 2)	PACS Prime STBY -> Burst -> X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
MTL management	PACS Prime STBY -> Burst -> X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
OBCP management	PACS Prime STBY -> Burst -> X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
SSMM management	PACS Prime STBY -> Burst -> X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
FDIR level 1 & 2	PACS Prime STBY -> Burst -> X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
OBT management	PACS Prime STBY -> Burst -> X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
DTCP worst case scenario						
	PACS (Burst) SPIRE STBY HIFI Prime	N	0-23		TBC	Preferred
REFERENCE Mission Scenario						
Test start configuration		Y				Required
Test steps		Y				Required
HIFI OD	HIFI OD	Y	0-23			Required
PACS OD	PACS OD	Y	0-23			Required
SPIRE OD	SPIRE OD	Y	0-23			Required
Test end		Y				Required

Table 3: S/C conditions for each IST test sequence

5.3 General Precautions and Safety

5.3.1 General Safety Requirements, Precautions

Special condition and hazards

The following Operational restrictions shall be carefully taken into account:

1. ~~Before any test article modification the relevant power sources shall be switched OFF~~
2. Protective caps shall be installed on each harness or unit connector when these are not linked to their equipment
3. All the test data shall be recorded
4. Before starting the test sequence, care must be taken in verifying that all hardware links are correctly connected.
5. to avoid possible damages, no signal shall be applied in no powered units, except where otherwise specified
6. During testing the step by step procedure shall be followed. Changes will be possible and will be managed by a Procedure Variation Sheet approved by the AIV and PA.
7. In case of any failure, the activities shall be stopped until troubleshooting plan is generated and approved.
8. In case of non-conformance, the procedure addressed in [AD 2.1.2.b] shall be applied.
9. The time of usage (ON/OFF cycles and ON duration) of each limited life equipment (FPGAs', etc?) shall be noted and recorded by the QA.
10. No stimulus has to be applied to any CRS switched-OFF
11. The EPC cannot be switched-ON for more than 5 minutes without any TWT turned-ON.
12. Care must be exercised when working around the S/C; in particular, if real IMU(s) or CRS rate sensors are involved, which may register any mechanical vibration affecting the responses of the ACC and/or invalidating the overall test results.
13. In case of AC failure, when the AC power will be again available, preliminary checks will be performed to verify that no damage has be caused to EGSE, SLE and S/L. The test conductor can decide to restart or to continue the test depending on the point where the failure happened.
14. Considering the SVM NCR affecting the XPND FM4, the transponder will be continuously flushed with Nitrogen during the tests.
15. Due to the use of liquid Helium during the Herschel mechanical test campaign, particular safety precautions need to be taken. The cryostat operations which require handling of liquid Helium are described in a dedicated procedure.
16. It shall be ensured that, for the beginning of each IST_START, the BDR's have been switched offi in order that skin plug reconfiguration can be carried out safely in presence of the flight battery. Note : During IST End the power down sequence, commands to turn the BDR's off (to isolate the battery)are issued via the CDMU. If it is suspected for any reason the battery has not been isolated by

switching the BDR's off then the stand alone procedure "BDR Isolation" from HP-2-ASED-TP-0215 shall be executed, startup from the power down state.

17. The maximum continuous battery discharge limit of 36 A shall be respected at all times.

5.3.1.1 Instrument specific safety requirements and precautions

HIFI

LOU being at ambient temperature, IMT objectives on HIFI will be limited. Specifically, the LO power should be limited and higher frequency channel should not used (IID-B). ~~The bias range to the mixers and electromagnets should also be restricted~~

PACS

Whenever PACS FPU is at HEII conditions:

Prior to any PACS instrument switch-on within this procedure, the FDIR mechanisms as described in "PACS Failure Detection Isolation and Recovery"(PACS-ME-GP-002, Issue 1.2) must be in place and have to be up and running on the CDMU. This shall remain activate during all modes of the PACS instrument, except the off mode.

5.3.2 ESD constraints

- The spacecraft must be grounded
- All connectors have to be covered with ESD dust caps when not mated
- All AIT personnel have to wear antistatic shoes and clothes
- The clean room floor around and under the item under test shall be covered with an antistatic carpet, which is grounded to facility ground.

5.3.3 *Grounding Configuration*

A distributed single point grounding (DSPG) approach is used between the facility GSE and the satellite for electrical integration and performance tests.

Instrument signal ground isolation to the EGSE data processing electronics will be ensured.

5.3.4 *Test Equipment Calibration and Performances*

All equipment used for test activities shall be within their normal calibration period performed and certified either by the Facility or equipment supplier. Certification and calibration labels shall be available for inspections before activity start. Calibration shall be performed by/with qualified personnel/procedures under PA/QA supervision and approval. All the instrumentation to be used for the test shall follow the relevant PA rules.

Item Name	Item Type	Serial Number	Calibration Status

5.3.5 Special QA Requirements

The QA/PA representative shall be present during all test activities.
All documentation shall be inspected and approved before start and end of each test activity. The responsible PA engineer shall ensure that all 'as run' procedures have all the relevant information correctly recorded.

5.4 GSE

Test Equipment List					
Item	Manuf.	Model No.	SN No.	Invent No.	Next Calib.

5.4.1 MGSE

No additional mechanical GSE is required to perform the test described in this test procedure.

5.4.2 CVSE

The set-up of the CVSE will be performed according to HP-2-ASED-0095

Helium operations will be performed according

The cool down and filling procedure: HP-2-ASED-PR-0082 for Helium I

The Helium II top-up procedure: HP-2-ASED-TP-0083 for Helium II

The cover cooling procedure: HP-2-ASED-PR-0048 for special instrument stimulation

A list of the CVSE hardware which might be used is given below.

Qty.	Designation/Manufacturer	Provided by	Drawing/Ident. NR:	Calibr. Date
2	LHe Service Vacuum Pumping Unit I	BOCE	CI No. 142 310-01	
2	LHe Service Vacuum Pumping Unit II	BOCE	CI No. 142 310-02	
1	Main High Vacuum Pumping Unit	BOCE	CI No. 142 310-03	
1	Mobile High Vacuum Pumping Unit	BOCE	CI No. 142 310-03	
3	Molecular Turbo pumps	BOCE	CI No. 142 310-03	
1	Laboratory Vacuum Pump in safety unit	BOCE	CI No. 142 310-04	
1	Laboratory Vacuum Pump in scaffolding	BOCE	CI No. 142 310-04	
1	Laboratory Vacuum Pump in scaffolding (Ex proof.)	BOCE	CI No. 142 310-05	
2	CVSE Monitoring Rack	BOCE	CI No. 142 310-06	
2	Leak Detector Spectron 5000	BOCE	CI No. 142 310-07	
3	He I transfer lines (Y0211/Y0221/Y0231)	DeMaCo	CI No. 142 310-08	
3	He II transfer lines (Y0201-1, -2, -3)	De MaCo	CI No. 142 310-08	
2	Dewar to dewar transfer lines (Y0241 - Y0242)	De MaCo	CI No. 142 310-08	
1	Cover flushing line inlet (L1 + L2, separable)	AAE	CI No. 155 210	
1	Cover flushing line outlet (L3 + L4, separable)	AAE	CI No. 155 210	
1	Heater unit for cover inlet line	DeMaCo		
3	Venting line (Y0601/Y0602/Y0601-3)	DeMaCo	CI No. 142 310-09	
2	Pumping lines (Y0611-1 / Y0611-2)	DeMaCo	CI No. 142 310-09	
Set	Bake out lines (Y0633)	ASED	CI No. 142 310-09	
Set	HiVac Pumping lines (Y0673)	ASED	CI No. 142 310-09	

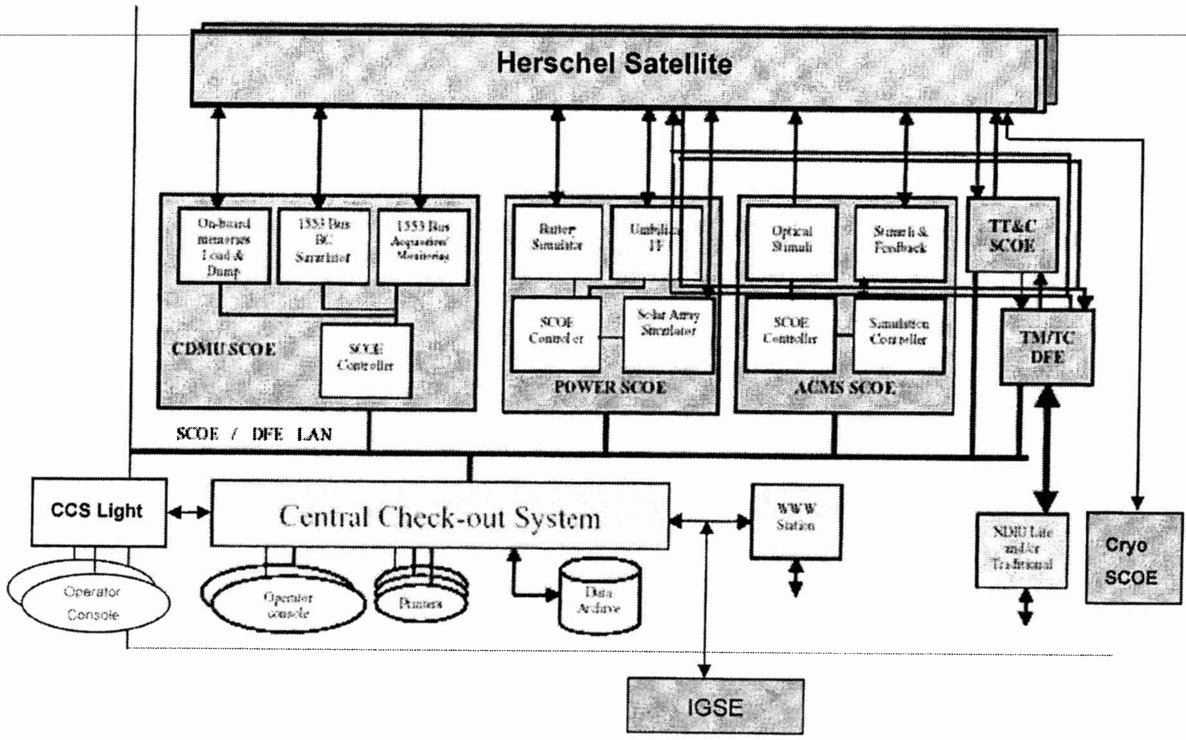
Qty.	Designation/Manufacturer	Provided by	Drawing/Ident. NR:	Calibr. Date
Set	Helium I lines (Y0612)	ASED	CI No. 142 310-09	
Set	Helium II Pumping lines (Y0602)	ASED	CI No. 142 310-09	
2	Scaffolding for He lines	ASED	CI No. 142 310-10	
10	450 l LHe Dewars type HDS 450 -EIPS	Linde		
1	Spiro pump DryTel 1025	ASED		
2	Liquid level sensor	ASED		
2	Helium depth indicator	ASED		
3	Pressure indicator (Keller)	ASED		
1	Laminar flow meter (0-10 mg/s / 0-70 mg/s)	ASED		
1	Standard flow meter (0-5 g/s)	ASED		
2	Gas flow counter	ASED		
Set	Vacuum houses	ASED		
Set	Miscellaneous vacuum seals	ASED		
Set	Vacuum parts	ASED		
Set	Special tools	ASED		
1	Scale	ASED		
1	Pressure Control unit (0-1500 mbar, Ziegler)	ASED		
Set	Plastic pipes (Diameter 20-40 mm, different length)	ASED		
1	HEXA He heating unit	CryoVac	S-21-7021	
Set	Stands	ASED		
Set	Trip tray	ASED		
Set	Special adapters	ASED		
1	Gate valve DN160	ASED		
1	He II bypass valve	ASED		

5.4.3 EGSE

5.4.3.1 EGSE Hardware Configuration

The EGSE configuration, when completed, is shown in the figure below

S/S	Unit	Configuration			SCOE simulated equipments	Remarks
		Herschel				
EGSE	CCS	1				
	CCS Light	1				
	TM/TC DFE	1				
	CDMU SCOE	1				
	ACMS SCOE	1				
	TT&C SCOE	1				
	POWER SCOE	1				
	Cryo SCOE					
	NDIU					



The Herschel/ EGSE will be built with the following equipment:

- Central Check Out System (CCS)

- Central Check Out System Light (CCS Lite)
- The Power Control Subsystem SCOE (Power SCOE)
- The Telemetry, Tracking and Command SCOE (TT&C SCOE)
- The Telemetry and Telecommand Data Front End Equipment (TM/TC DFE)
- The Attitude and Control Measurement Subsystem SCOE (ACMS SCOE)
- The Central Data Management Unit SCOE (CDMU SCOE)
- The Cryo SCOE which performs four general tasks
  - Control and monitoring the Cryostat Instrumentation either directly by the Cryo SCOE, i.e. locally or initiated by the CCS, i.e. remotely.
  - Substitution of the real CCU if the CCU is not available
  - Monitoring of several parameters of the Cryo Vacuum Support Equipment (CVSE).
  - Simulate the launcher interface by providing "dry loop commands" to be sent to the CCU.

All the above items are interconnected through an Ethernet Local Area Network (LAN) used to exchange both data and command & control information.

The CCS Lite will be used and configured in order to have a hot TM/TC backup in case of main CCS crashes.

The NDIU will be configured to put ESOC in listening mode.

5.4.3.2 EGSE User Software

Most of the Test Software will be developed on the CCS, based on SCOS 2k, and will interface the HPSDB. It will consists mainly of:

- Test Sequences
- Synoptic Displays
- Data Evaluation and Test Analysis Software
- Simulation Software Master sequences (mainly for ACMS S/S).

On the contrary, on the SCOE's/DFE only a very peculiar type of software will be developed; it will mainly consist of:

- Configuration/set-up files for SCOE's/DFE instrumentation
- Sequence of commands
- Simulation files for Dynamic control and ACMS Sensors simulation
- Telemetry Simulation file for Missing Unit (Experiments).

A complete list of EGSE SW version (particularly CCS and HPSDB) shall be provided before start of test and attached to this procedure.

5.4.4 OGSE

No OGSE is required to carry out the test activities of the IST.

5.4.5 Special Equipment

5.4.5.1 Cooling device

The HIFI units when equipped with MLI (WEV, WEH, HRV, HRH) exceed their maximum operating temperature, WEV 35,5°C vs30°C, HRV 40,1°C vs 40°C, WEH 35,3°C vs 30°C, HRH 41,9°C vs 40°C.

Therefore the implementation of a cooling system for the two HIFI panels (forced convection directed in these areas) is mandatory.

All the units stay in their operating temperature range with comfortable margins, except:

- GYRO baseplate 63,5°C vs 55°C, due to use of flight thermal control parameters, covered by RFD HP-300000-AI-RD-0011 issue 03.
- CRS1 and CRS2 around 50°C, due to use of flight thermal control parameters, covered by RFD H-P-300000-AI-RD-0014 issue03.

6 Verification Requirements and Test Criteria

PASS/FAIL CRITERIA

At each test stage completion, the test success is determined comparing the results obtained against the expected values.

If the compliance between obtained and expected values has been met, and authorisation to proceed with the next stage of the test is given, then the actual test stage must be considered satisfactory completed.

The success of the overall testing activities is determined from the satisfactory completion of all test stages.

Successful criteria to be satisfied in each test stage shall be:

- Test conditions according to specification requirement;
- Complete verification of the requirement aspects according to the test specifications
- Fulfilment of test results with respect to required data;
- Verification that all the TM parameters used to monitor the SAT do not exceed the limit thresholds loaded in the HPSDB (OOL display);
- Verification that the TM (5,2), TM (5,4) and TM (1,8) received event reports are only those ones expected to fulfil the pass test criteria.

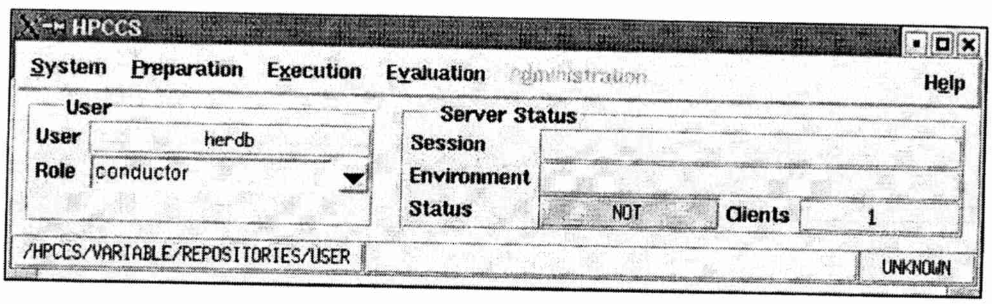
7 IST Test

7.1 HPCCS Configuration for IST Test

7.1.1 Apply Tag on test files

The **EGSE operator** has to perform the following steps **before starting IST test**:

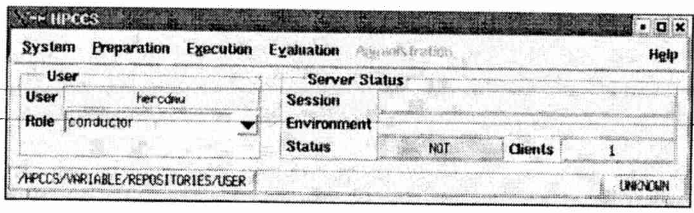
1. On a Workstation login as **herdb** (password **hertest**), being this user dedicated to DB operations for Herschel FM Checkout System, and open a shell (xterm).
2. Logged as herdb, run Startmmi and the following window will occur



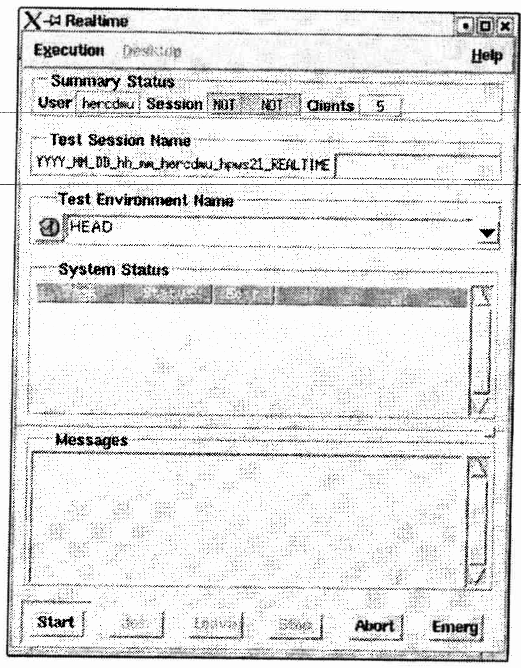
3. Logged as herdb, in HPCCS window, select menu "**Preparation → Prepare**"
4. Logged as herdb, In **PREP** window, select menu "**Preparation→ Discard all**"
5. Logged as herdb, In **Confirm Discard** window, click the button **Discard**
6. Logged as herdb, in **PREP** window, select menu "**Preparation→ Update**"
7. Logged as herdb, in **Check out environment** window, click the button **Check out** and then **Close**
8. Logged as herdb, in **PREP** window, select menu "**Tag → Apply**"
9. Logged as herdb, in the window **Apply Tag →New Tag,** insert TAG name
   Currently, TAG name for IST has the format:
   IST_x_PART_x_TP_xxxx_x_x_BEGIN_xxx
10. Logged as herdb, push **Apply → Apply**
11. Logged as herdb, confirm Tag Application Push Apply button
12. Logged as herdb, open a new **shell** window (xterm)
13. Logged as herdb, execute the command **update_tag**
14. Logged as herdb, insert the name of **TAG**
    IST_x_PART_x_TP_xxxx_x_x_BEGIN_xxx
15. Logged as herdb, in **PREP** window, select menu "**Tag → Apply**"
16. Logged as herdb, in **Apply tag** window, select in the list the TAG
    IST_x_PART_x_TP_xxxx_x_x_BEGIN_xxx
17. Logged as herdb, push **Copy selected tag**
18. Logged as herdb, modify the TAG name with **IST_x_PART_x_TP_xxxx_x_x_END_xxx**
19. Logged as herdb, push **Apply → Apply**
20. Logged as herdb, confirm Tag Application Push Apply button

7.1.2 *Start test session on HPCCS*

Logged as **hercdmu** or **heracms** run "startmmi"



On **HPCCS** window, select menu **"Execution → Start"** in order to open the following window. In the **"Test Session Name"** field, insert an abbreviation describing which IST test will be performed and click the button **"Start"** to proceed.



Once the real time session initialized, the button **"Join"** is enabled and shall be clicked. Then configure desktop of different CCS stations throught the menu "Desktop" and the following menus:

- Monitoring → Telemetry Desktop
- Monitoring → Telemetry Packet history
- Monitoring → Out of limit
- Monitoring → On Board Event History
- Test Sequences → Test Conductor Console
- Command → Telecommand History

7.2 IST START for Spacecraft configuration

7.2.1 *Diagram Overview*

The flow of the "IST START" sequence is depicted in the diagram below. To save time during the satellite power on, the SSMM initialising and the ACMS switch on is performed in parallel.

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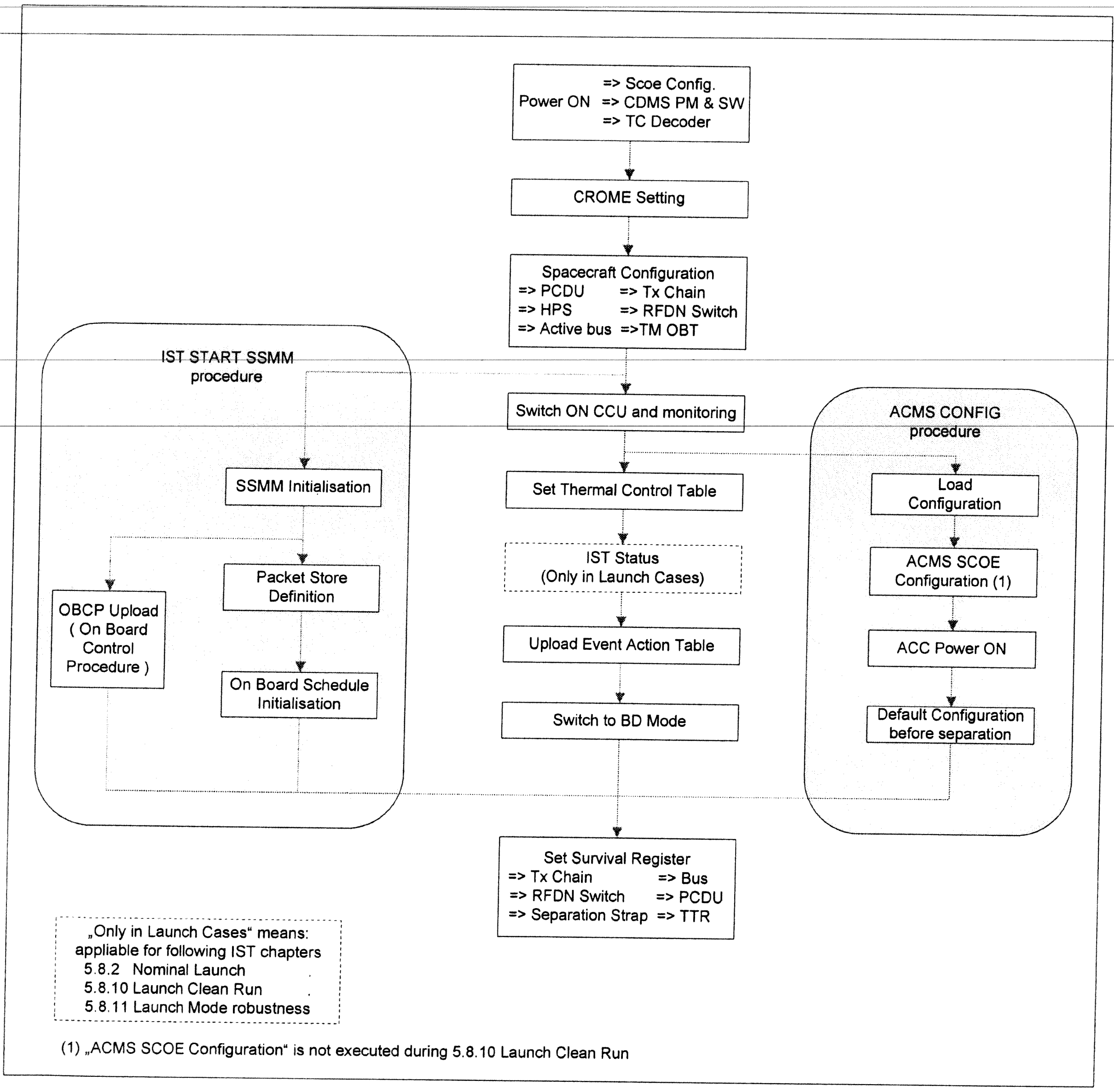


7.2.2 *IST Configuration Table*

The Herschel Satellite configuration for each IST test case is listed in the table below.

SASLPS SCOE	Bat. SCOE	Crome PAP/CCS	Sep. Strap SM	TTR SM	TM OBT	TC Dec.	PM SW	SSMM	Bus SM		PCDU SM		HPS	TxChain SM		RFDN SM		CCU ON	CCU Mode	ACMS Config. File
5.8.2 NOMINAL LAUNCH																				
SAS	Sim. Charged + Launch	PM A Nominal	Not Separated	B	A	A	A1	A 0-1-2 B 0-1-2	A	B	A	B	A	A	B	1&3	ABBB	A&B	2	IST_FN
5.8.3a ACMS Commissioning																				
SAS	Sim. Charged	PM A Nominal	Separated	B	A	B	A1	A 0-1-2 B 0-1-2	A	B	A	B	A	A	B	1&3	ABBB	A&B	1	IST_SCA1
5.8.3b S/C Commissioning																				
SAS	Sim. Charged	PM A Nominal	Separated	B	A	A	A1	A 0-1-2 B 0-1-2	A	B	A	B	A	A	B	1&3	ABBB	A&B	1	IST_MOD
5.8.4.5.1 SPIRE Commissioning																				
SAS	Sim. Charged	PM A Nominal	Separated	B	A	A	A1	A 1 B 1	B	A	A	B	A	A	B	1&3	ABBB	A&B	1	
5.8.4.5.2 SPIRE Spectrometer Complementary Test																				
SAS	Sim. Charged	PM B Nominal	Separated	A	B	B	B1	A 3 B 3	B	A	B	A	B	B	A	2&4	AABB	A&B	1	

SASLPS SCOE	Bat. SCOE	Crome PAP/CCS	Sep. Strap SM	TTR SM	TM OBT	TC Dec.	PM SW	SSMM	Bus SM		PCDU SM		HPS	TxChain SM		RFDN SM		CCU ON	CCU Mode	ACMS Config. File
5.8.4.6 PACS Commissioning																				
SAS	Sim. Charged	PM A Nominal	Separated	A	A	B	A1	A 2 B 2	B	A	B	A	B	B	A	2&4	AABB	A&B	1	
5.8.4.7 HIFI Commissioning																				
SAS	Sim. Charged	PM B Nominal	Separated	B	A	A	B1	A 3 B 3	A	B	A	B	A	A	B	1&3	ABBB	A&B	1	
5.8.4.8 Parallel Mode Commissioning																				
SAS	Sim. Charged	PM B Nominal	Separated	A	B	B	B1	A 0 B 0	A	B	B	A	B	B	A	2&4	AABB	A&B	1	
5.8.5 Mode Transition																				
SAS	Sim. Charged	PM A Nominal	Separated	B	A	A	A1	A 1 B 1	A	B	A	B	A	A	B	1&3	ABBB	A&B	2	IST_MOD
5.8.6 SC Reconfiguration																				
SAS	Sim. Charged	PM A Nominal	Separated	A	B	B	A1	A 2 B 2	B	A	B	A	B	B	A	2&4	AABB	A&B	1	IST_FD_B
5.8.7 CDMS Management																				
SAS	Sim. Charged	PM A Nominal	Separated	B	A	A	A2	A 1 B 1	A	B	A	B	A	A	B	1&3	ABBB	A&B	2	IST_CDMS
5.8.8 DTCP Worst Case Scenario																				
SAS	Sim. Charged	PM B Nominal	Separated	A	B	B	B2	A 2 B 2	B	A	B	A	B	B	A	2&4	AABB	A&B	2	IST_WCS

SASL PS	Bat. SCOE	Crome PAP/CCS	Sep. Strap SM	TTR SM	TM OBT	TC Dec.	PM SW	SSMM	Bus SM		PCDU SM		HPS	TxChain SM		RFDN SM		CCU ON	CCU Mode	ACMS Config. File
5.8.9 RMS Reference Mission Scenario																				
SAS	Sim. Charged	PM A Nominal	Separated	B	A	A	A1	A 0-1-2 B 0	A	B	A	B	A	A	B	1&3	ABBB	A&B	1	IST_RMS
5.8.9 Launch Clean Run																				
LPS	REAL	PM A Nominal	Not Separated	B	A	A	A1	A 0-1-2 B 0-1-2	A	B	A	B	A	A	B	1&3	ABBB	A&B	2	IST_CLN
5.8.11 Launch Mode Robustness																				
SAS	Sim. Charged +Launch	PM A Nominal	Not Separated	B	A	A	A1	A 0 B 0	A	B	A	B	A	A	B	1&3	ABBB	A&B	2	IST_LSR
5.8.12 NOM Mode Robustness																				
SAS	Sim. Charged	PM A Nominal	Separated	A	B	B	A1	A 3 B 3	B	A	B	A	B	B	A	2&4	AABB	A&B	1	IST_NMR
5.8.13 Instrument FDIR																				
SAS	Sim. Charged	PM A Nominal	Separated	B	A	A	A2	A 1 B 1	A	B	A	B	A	A	B	1&3	ABBB	A&B	1	IST_CDMS

7.2.3 *Initialisation*

Step-No.	Initialisation-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	TT&C SCOE initialisation						
1	Verify that TT&C SCOE application SW is running Otherwise go on TTC SCOE or access remotely (command "startCMD ttcvnc" on shell window") and click "TTC SCOE Herschel" icon on TT&C SCOE desktop controller and wait for self test completion.					√	
2	On TT& SCOE application, in window ":: CONF namespace" (that can be open by menu "windows/SCOE config"), select menu "Config/Load", load the file "Herschel.conf" then click "open" button.					√	
	SPACECRAFT SKIN CONNECTORS CONFIGURATION						
3	**Verify that all the SCOE skin connectors cables are installed** • Goto chapter 4.3 • Choose according to the IST Test case the related skin configuration table • Check the list and sign off (together with PA and Floor Manager).	SKIN CONNECTOR CONFIGURATION IS CONTROLLED BY PROCEDURE 0116 ANNEX 2 and ANNEX 3 ACCORDING TO DIRECTION OF THE TEST CONDUCTOR, EMC EXPERT AND TEST DIRECTOR AS DETERMINED BY THE TEST ORDER WITH REFERENCE TO TOPLEVEL PROCEDURE 0180					

JMP

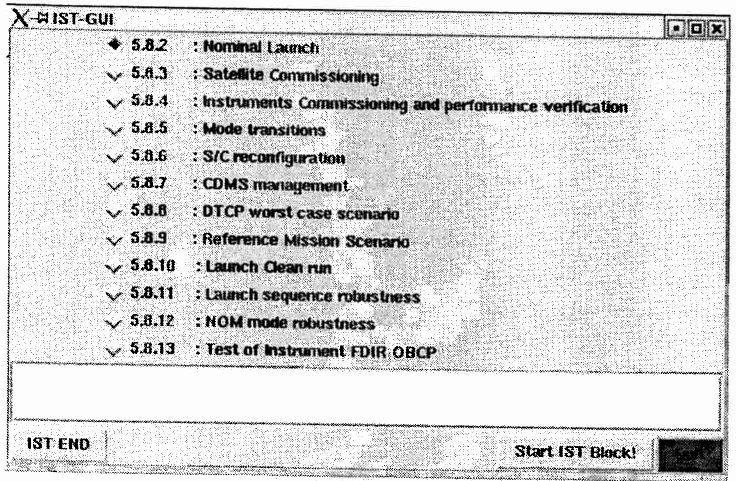
Test location:	Operator	Product Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	00:43

Step-No.	Initialisation-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	ACMS SCOE CHECK						
4 N/A for "Launch Clean Run"	Verify that the ACMS SCOE is ON and operational	THE ACMS SCOE IS NOT CONNECTED IN THIS TEST				8NP	
5 N/A for "Launch Clean Run"	In the Clean Room, check on the ACMS SCOE that STR UCE Electrical Stimuli program on PC2 and PC3 are enabled (i.e. double click on "scroll lock" and check "01-02 & 01-03" that mouse pointer can be moved). Otherwise execute Annex D Operator Note 3		DITTO			8NP	

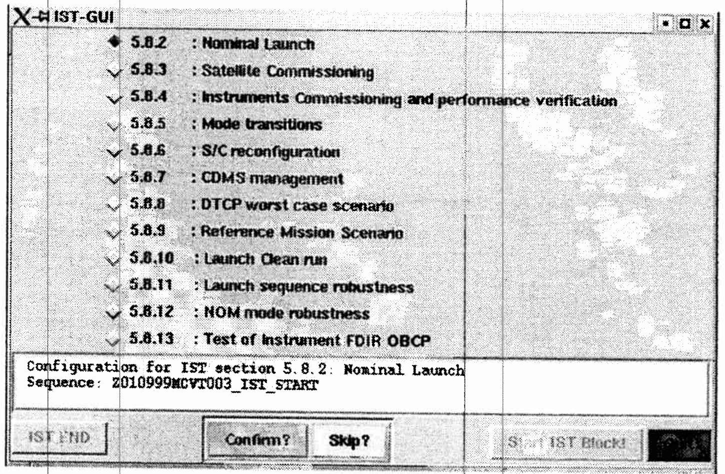
Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC			9/5/08	00 : 43

7.2.4 IST Start Step by Step Procedure

At the CCS test sequence console call the sequence "Z010999MCVT201_IST_GUI " to start an IST test. When the Graphical User Interface (see Picture 1) occurs, select the appropriate test case (and note it down in this Test Procedure) followed by a click on the "Start IST Block".



Picture 1

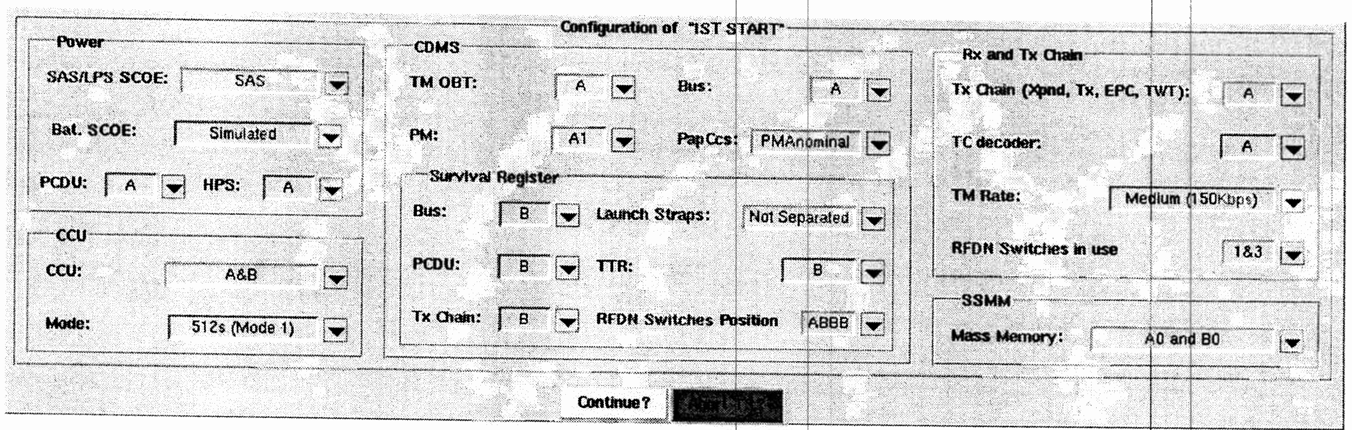


Picture 2

Then configuring the spacecraft for the selected IST Test is proposed to be run or skipped (see Picture 2).
If the button "Confirm" has been clicked, continue with step 1 of the following IST START step description. Otherwise pressing the button "Skip" will lead to chapter 7.2

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	00:43

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
1	**Z010999MCVT003_IST_START** At the bottom of the window, the IST_START configuration panel displays all parameters applied during the IST_START. ⇨ Click the button "Continue" to proceed	To Check in Config. Table (Page 73)				✓	



IST_START Configuration Panel

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	00 :43

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
2	**Z010999MCVT003_IST_START** Note the execution diagram, resuming each configuration steps and check all parameters are set as previously (particularly if any modification has been done on configuration panel) **"START Satellite HERSCHEL "IST_START""** ⇨ Choose "Yes" or "No"	YES				✓	
3	**Z010999MCVT097_ASDGEN_CRIT_PARS_CHECK** This script will run during the whole session to monitor critical parameters. As soon as wrong value will be detected. A popup window will occur alerting the operator about incorrect TM checks ⇨ Minimise this window by clicking the corresponding button (on corner top right, first button from left)					✓	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[illegible]	[illegible]	9/5/08	00 :43

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value		Remarks	P	N
4	**Z010999MCVT003_IST_START** Reply to the prompt: **"SPACECRAFT POWER_ON"** ⇨ Click the button "Confirm" to proceed					Conf. 00:44	/	
5	**Z010999MCVT001_POWER_ON_HER_IST** **Set Battery ??????????** **Set TCDecoder to ?** **Set PM_SW ??** Do you want to continue with the upper configuration: If these parameter values are in accordance with the IST Configuration Table (Page 73), ⇨ click the button "OK" to proceed	To Check in Config. Table (Page 73) Bat.SCOE TCDec. PM/SW				OK 00:45		

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	00 :44

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
6	**Z010999MCVT001_POWER_ON_HER_IST** A Popup window occurs asking to verify data reception on TM/TC Data Front End workstation: In window "System Status", check following panels ➔ TM chain / TM Acquisition synchronised and locked Status expected ➔ View / TM Transfer Frame Monitor TM frame data should be received before few minutes ⇨ click the button "OK" to proceed				OK 00:54	✓	
7	**Z010999MCVT001_POWER_ON_HER_IST** A Popup Window occurs asking to start a new acquisition in Bus Monitor with name IST on the CDMU SCOE: - start a new acquisition by clicking "Menu Mode/Start new Acquisition" If an acquisition is already started, please stop and restart ⇨ click the button "OK" to proceed After few minutes Data transfer should be visible on the Bus Monitor.				N/A for "Launch Clean Run" as the cables for CDMU BUS monitor are disconnected N/A	✓	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	00:54

IS THIS A DUPLICATION OF STEP 8 ?

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
8	**D102159SCVT001_GET_ALARM_STATUS** Check that both DOD ext1 and ext2 are "Not Asserted". Otherwise execute Annex D – Operator Note 8 ⇨ Click the button "End TS!" to proceed				OK 00:58	✓	
9	**D102159SCVT001_GET_ALARM_STATUS** Check that both DOD ext1 and ext2 are "Not Asserted". Otherwise execute Annex D – Operator Note 8 ⇨ Click the button "End TS!" to proceed				OK 00:59	✓	
9b when BCR OCP are detected ACTIVE	**Z010999MCVT001_POWER_ON_HER_IST** Temporary workaround until **SPR-107 / NCR-3312** are solved ⇨ click the button "YES" to proceed the workaround **See SPR 107 / NCR 3312**	YES		CONT YES 01:14	NCR **3492**: TTRMMemCorEr_A1 := 0 SPR **244**: OutOfLimit for SA_Pan?_Temp_N/R (WMB0?569) SPR **284**: WARNING about missing TC SPR **285**: many TCs not acknowleged For launch clean run with real Battery fully charged, parameters BCR1, BCR2 are expected active.	✓	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	01:14

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
10	**D102159SCVT032TIMESYNCRO** Wait until the synchronization between CDMS On-board Time and CCS is finished ⇨ Click the button "End TS!" to proceed				TM parameter ZE00999 out of limits and back in limits again at synchronisation to be expected.	✓	
11	**Z010999MCVT001_POWER_ON_HER_IST** ⇨ Click the button "End TS!" to proceed				01:16	✓	
12	**D102159SCVT001_GET_ALARM_STATUS** Check that both DOD ext1 and ext2 are "Not Asserted". Otherwise execute Annex D – Operator Note 8 ⇨ Click the button "End TS!" to proceed				OK 01:16	✓	
13	**Z010999MCVT003_IST_START** Reply to the prompt: **"CDMS Configuration:"** **"CROME settings PM?????"** If the CROME settings is in accordance with the CROME PAP/CCS of IST Configuration Table (Page73), ⇨ Click the button "Confirm" to proceed	To Check in Config. Table (Page 73) CROME PAP/CCS					

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC			9/5/08	01:16

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
14	**D102159SCVT176_WRITE_CROME** ⇨ Click the button "End TS!" to proceed				OK 01:18		
15	**Z010999MCVT003_IST_START** Reply to the prompt: **"CDMS Configuration:"** **"Set configuration"** **"Bus ? PCDU ? HPS ? TxChain ? RFDN ???"** **"TM-OBT ? TMrate Medium (150Kbps)"** If all these parameter value are in accordance with the IST Configuration Table (Page 73), ⇨ Click the button "Confirm" to proceed	To Check in Config. Table (Page 73) BUS PCDU HPS TxCh. RFDN TM-Obt			Please note that the TMrate Medium (150 Kbps) is not specified in IST Config. Table on page 73. OK 01:19		
16 Only if Encoder B is req.	**D102159SCVT104_ENCODER_SELECT** ⇨ Click the button "End TS!" to proceed				SPR 286: TM check needs repeat N/A		

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	01:19

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
17	**D102159SCVT174_IST_REDUNDANT_CONF** ⇨ Click the button "End TS!" to proceed				N/A		
18	**Z010999MCVT003_IST_START** Reply to the prompt: **"SSMM Configuration" ????????"** ⇨ Click the button "Confirm" to proceed	To Check in Config. Table (Page 73) SSMM			A0 + B0 01:21		
19	**Z010999MCVT005_IST_START_SSMM** Start initialising with Steps 1-2 of IST START SSMM Procedure (see Page 96). Then continue with the next test step of IST_START. **NOTE:** After completion of Mass Memory initialisation (roughly 12 minutes per bank), i.e. when **ALL** affected mass memory banks are **ON**, continue with step 3 of IST START SSMM Procedure (see Page 96).				In Launch cases, IST_START_SSMM shall be completely performed before next step OK 01:22		

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	01 : 22

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
20	**Z010999MCVT003_IST_START** Reply to the prompt: **"SWITCH ON CCU ??? and" "START MONITORING in MODE ?"** ⇨ Click the button "Confirm" to proceed In case that TM checks for CCU valves are failed, see Annex D Operator note 11 and perform actions if required.	To Check in Config. Table (Page 73) CCU On Mode		Conf. 01:22	**NCR-3119:** Alarms for TMs o KM130300 o KM120300 o KM110300 fails status consistency check during CCU A on And for TMs o KM130301 o KM120301 o KM110301 fails status consistency check The following is expected until TC DCT53170 is sent: o Events 28417 CCU A monitoring discarded o Events 28418 CCU B monitoring discarded		

Test location:	Operator	Product-Assurance:	Date:	Time
Estec			9/5/08	1 : 22

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
21	**Z010999MCVT003_IST_START** Reply to the prompt: **"Record CCU Temp In Background"** ⇨ Click the button "Confirm" to proceed				**Minimise Log file after starting** ~~GA~~ Conf. 1:32		
22 applicable only in launch (IST spec. 5.8.2 5.8.10 5.8.11)	**Z010999MCVT003_IST_START** Reply to the prompt : **"STATUS SPACECRAFT and EGSE (Power ON)"** ⇨ Click the button "Confirm" to proceed Reply to the next prompt: **"Do you want to stop and notice each failure?"** ⇨ Choose "YES" to proceed				N/A		

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	1:32

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
23 applicable only in launch (IST spec. 5.8.2 5.8.10 5.8.11)	**Z010999MCVT1533_IST_STATUS** Check the Satellite status displayed and ⇨ Click the button "OK" to proceed				N/A		
24	**Z010999MCVT003_IST_START** Reply to the prompt: **ACMS SCOE Configuration – ACMS Power ON** ⇨ Click the button "Confirm" to proceed Execute ACMS CONFIG procedure (Page 100) in parallel to the IST_START master				01:33		

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	01 :33

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
25	**Z010999MCVT003_IST_START** Reply to the prompt: **"SET TCT Table for Ambient Temperature"** ⇨ Click the button “Confirm” to proceed				OK 1:34	/	
26	**D102159SCVT032EnNomTCSLoops** ⇨ Click the button "End TS!" to proceed				OK	✓	
27	**D102159SCVT115_CHECK_HCS_OFF** ⇨ Click the button "End TS!" to proceed				OK	✓	
28	**Z010999MCVT003_IST_START** Reply to the prompt: **"EAT UPLOADING"** ⇨ Click the button “Confirm” to proceed”				CONT 1:41	/	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	01:41

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value		Remarks	P	N
29	**D102159SCVT192_GET_EAT_REPORT** Check that every initial entries of the Event Action Table are successfully checked ⇨ Click the button "End TS!" to proceed					OK	✓	
30	**D102159SCVT192_GET_EAT_REPORT** Check that every initial entries of the Event Action Table are correctly set ⇨ Click the button "End TS!" to proceed					OK	✓	
31	**D102159SCVT192_IST_UPLOAD_EAT** ⇨ Click the button "End TS!" to proceed					OK 01:48	✓	
32	**Z010999MCVT003_IST_START** Ckeck that ACC is running on TM Packet history with filter on APID 512 (set on Step 1 of ACMS Configuration Procedure 7.2.4.2 Page 100) and checking packets reception.					OK		

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	01 : 50

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
33	**Z010999MCVT003_IST_START** Do not perform before the completion of the procedures: - IST START SSMM and - ACMS Configuration Cannot be run in parallel with other "active" sequences or TCs send in parallel Reply to the prompt: **"CDMS CONFIGURATION:"** **"SURVIVAL REGISTER SETTING"** **"(Bus ?, PCDU ?, RFDN ????, TxChain ?, TTR ?, Sep Strap ?????)"** ⇨ Click the button "Confirm" to proceed	To Check in Config. Table (Page 73) Bus PCDU RFDN TxCh. TTR Sep Strap		CONF 02:17		✓	
34	**D102159SCVT175_SET_SURV_REG** ⇨ Click the button "End TS!" to proceed			OK 2:21	SPR 289 No TM return for TM check	✓	
35 (only in launch test cases	**Z010999MCVT003_IST_START** Prompt: "Check CDMS Tables" ⇨ Click the button "Confirm" to proceed			N/A			

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC			9/5/08	2:21

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
36 (only in launch test cases	**D102159SCVT219_GET_BSW_HEALTH_UIU** ⇨ Click the button "End TS!" to proceed			N/A			
37 (only in launch test cases)	**D102159SCVT204_GET_MOT** ⇨ Click the button "End TS!" to proceed			N/A			
38 (only in launch test cases)	**D102159SCVT192_GET_EAT_REPORT** Check that every uploaded entries of the Event Action Table are correctly set ⇨ Click the button "End TS!" to proceed			N/A			
39 (only in launch test cases)	**D102159SCVT205_SAT_COM_TCT** ⇨ Click the button "End TS!" to proceed			N/A	Expected that checks will fail as the uploaded TCT is for ambient but the checks are performed against the		

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	2:21

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
40 (only in launch test cases)	**D102159SCVT207_SAT_COM_FCCT** ⇨ Click the button "End TS!" to proceed			N/A			
41	**Z010999MCVT003_IST_START** Reply to the prompt: **"DOWNLINK SSMM PACKET STORE and CEL A&B"** ⇨ Click the button "Confirm" to proceed			2:22			
42	**D102159SCVT188_IST_DUMP_PKT_STORE** ⇨ Click the button " End TS!" to proceed			2:26 2:31	With parameters: 0 80 1 81 2 82 3 83		
43	**D102159SCVT188_IST_DUMP_PKT_STORE** ⇨ Click the button " End TS!" to proceed			2:31 2:34 ~~2:3~~	With parameters: CEL_A CEL_B **All events, warnings and alarms recorded before the dump, are re-occuring during this step**		

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	:

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
44	Z010999MCVT003_IST_START ⇨ Click the button "End TS!" to proceed			02:35		✓	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	02:35

7.2.4.1 IST_START_SSMM Procedure

Step-No.	IST_START_SSMM-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
1	**Z010999MCVT005_IST_START_SSMM** Reply to the prompt: **"SSMM CONFIGURATION ??????"** ⇨ Click the button “Confirm” to proceed	To Check in Config. Table (Page 73) SSMM			01:22	✓	
2	**D102159SCVT186_IST_SSMM_ON** **Reply to the prompt “Do you want to continue” “with such configuration?”** Check the SSMM configuration and then ⇨ Click the button “Continue” to proceed				Mass Memory config. takes about 12 minutes per bank. Therefore, the next step in IST_START procedure can be executed.	✓	
3	**D102159SCVT186_IST_SSMM_ON** ⇨ Click the button "End TS!" to proceed					✓	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	:

Step-No.	IST_START_SSMM-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
4	**Z010999MCVT005_IST_START_SSMM** Reply to the prompt: **"OBCP UPLOADING"** ⇨ Click the button "Confirm" to proceed **Let run in parallel the sequence** **D102159SCVT193_IST_UPLOAD_OBCP** and continue with next step "Packet Store Definition"			01:56	occurrence of 2 BSW problems EvtID 30738		
5	**Z010999MCVT005_IST_START_SSMM** Reply to the prompt: **"Definition of the Packet Store"** ⇨ Click the button "Confirm" to proceed			01:57			
6	If only 1 Bank (bank 0, 1, 2 or 3) is initialised on each SSMM **D102159SCVT185_IST_PACKET_STORE_DEF** If 3 banks (banks 0, 1 and 2) are initialised on each SSMM **D102159SCVT189_IST_PACKET_STORE_DEF2** If SSMM A banks 0, 1 and 2 and only SSMM B bank 0 are initialised **D102159SCVT178_RMS_PKT_STORE_DEF** When the requested SSMM bank are initialised ⇨ Click the button "Yes" to proceed			01:57			

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	01:57

Step-No.	IST_START_SSMM-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
7	If only 1 Bank is initialised on SSMM A & B **D102159SCVT185_IST_PACKET_STORE_DEF** If 3 banks are initialised on SSMM A & B **D102159SCVT189_IST_PACKET_STORE_DEF2** If 3 banks on SSMM A and only 1 on SSMM B are initialised **D102159SCVT178_RMS_PKT_STORE_DEF** ⇨ Click the button "End TS!" to proceed			OK 2:02	**NCR-3492** occurs: (TTRRMMemCorEr_A 2 := 1)!		
8	**Z010999MCVT005_IST_START_SSMM** Reply to the prompt: **"Initialise MTL Service Buffers"** ⇨ Click the button “Confirm” to proceed			OK 02:03	TM(5,4) alarms expected: o Evt_MTLBufADel (ID:26914) o Evt_MTLBufBDel (ID 26915)		
9	**D102159SCVT209_START_ON_BOARD_SCHEDULE** ⇨ Click the button "End TS!" to proceed			02:15	SPR 282 TM failure: too quick check		
10	**D102159SCVT193_IST_UPLOAD_OBCP** ⇨ Click the button "End TS!" to proceed			02:14			

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	02:16

Step-No.	IST_START_SSMM-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
11	**Z010999MCVT005_IST_START_SSMM** ⇨ Click the button "End TS!" to proceed			02:16			

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	02:16

7.2.4.2 ACMS Configuration Procedure

Step-No.	ACMS_CONFIG-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
1	Open the ACMS_H_BLOC MIM Display to verify the telemetry status updating. Configure a "Telemetry Packet History" window set with filter APID = 512						
2	**A102109SPVT003_ACMS_CONFIG25** At the prompt "Enter your choice", insert **"1"** to select **"Select/Load ACMS_CONFIG Input File"** ⇨ Click the button "OK" to proceed	1		IST_EMC	IST_EM. 01:36	8MP	
3	**A102109SPVT003_ACMS_CONFIG25** ⇨ Click the button "Continue" to proceed				OK		
4	**A102109SPVT004_ACMS_LOADCONFIG1** At the prompt, **"Enter your choice:** ⇨ Click the button "OK" to proceed	To Check in Config. Table (Page 73) ACMS Config. File			OK		

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	[signature]	[signature]	9/5/08	1:36

Step-No.	ACMS_CONFIG-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
5 N/A for "Launch Clean Run"	**A102109SPVT003_ACMS_CONFIG25** At the prompt "Enter your choice", insert **"6"** to select **"ACMS SCOE Configuration"** ⇨ Click the button "OK" to proceed	6	SKIP	8NP			
6 N/A for "Launch Clean Run"	**A102109SPVT003_ACMS_CONFIG25** ⇨ Click the button "Continue" to proceed		SKIP	8NP			
7 N/A for "Launch Clean Run"	**A102109SPVT003_ACMS_CONFIG25** Verify on AND YA001939 AMCS SCOE - AS_PSEUDO 1 of 1 the parameters YMACT939 (ACMS SCOE state) YMASE939 (Simulator stata) YMAMS939 (MILFE state) YMAUS939 (UIFE state)	executing executing executing executing	SKIP	8NP	Alarms are expected for TM with APID 2018 and EVID 4 when the parameters on the left have not reached the executing stage yet.		

Test location:	Operator	Product-Assurance:	Date:	Time
				:

Step-No.	ACMS_CONFIG-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
8	**A102109SPVT003_ACMS_CONFIG25** At the prompt "Enter your choice", insert **"4"** to select **"ACMS Power ON (in Pre-Sep configuration)"** ⇨ click the button "OK" to proceed	4			4. 1:39		
9	**A102109SPVT003_ACMS_CONFIG25** ⇨ Click the button "CONTINUE" to proceed				OK		
10	**A102109SPVT011_ACMS_ON** During this sequence, following events are expected: - TM(5,4) Event Report and Reconfiguration Log - TM(5,2) APID:2018 (ACMS_SCOE) indicates ACMS "TestDataWord" needs to be switched ON. A few seconds later when the corresponding TC is sent, this TM(5,2) must disappear. - Multiple other events TM(5,1), such as "Fdir Task Overrun" or "Fdir Rm Parity Error"				Expected Out of Limit of AEYYY109 (synchronisation) ACC may become INVALID for a short time SPR **245** NCR **2862**: Out of Limit of HKA_ANTH?_Data SPR **334** OutOfLimit of Gyro Calib Curve in LCR		

* AFTER STEP 10 IS COMPLETED DO NOT PERFORM ANY MORE ACMS CONFIGURATION STEPS *

Test location:	Operator	Product-Assurance:	Date:	Time
				:

Step-No.	ACMS_CONFIG-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
11	**A102109SPVT003_ACMS_CONFIG25** At the prompt "Enter your choice", Insert **"5"** to select **"Modify ACC SGM/RM content"** ⇨ Click the button "OK" to proceed	5	SKIP	BND			
12	**A102109SPVT003_ACMS_CONFIG25** ⇨ Click the button "Continue" to proceed		SKIP	BND			
13	**A102109SPVT003_ACMS_CONFIG25** At the prompt "Enter your choice", Insert **"20"** for **"Default configuration for separation"** ⇨ Click the button "OK" to proceed	20	SKIP	BND	Expected Out of Limit of AEYYY109 (synchronisation) ACC may become INVALID for a short time TC PM_Reset (ACY42109) not acknowledge expected		
14	**A102109SPVT003_ACMS_CONFIG25** ⇨ Click the button "Continue" to proceed		SKIP	BND			

Test location:	Operator	Product-Assurance:	Date:	Time
				:

Step-No.	ACMS_CONFIG-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
15	**A102109SPVT003_ACMS_CONFIG25** After about 10 min verify that ACMS Sequences are correctly terminated and ACMS CONFIG MAIN MENU 1.0 is available.	SKIP		8NP			
16	**A102109SPVT003_ACMS_CONFIG25** At the prompt "Enter your choice", Insert **"99"** to select **"Return to Main Menu 1.0"** ⇨ Click the button "OK" to proceed	SKIP 99		8NP			
17	**A102109SPVT003_ACMS_CONFIG25** ⇨ Click the button "Continue" to proceed	SKIP		8NP			

Test location:	Operator	Product-Assurance:	Date:	Time
				:

7.3 IST Test Case

According to the actual IST Test Case, IST_GUI will prompt with following window(see Figure 1) to execute the relevant test sequence / procedure as listed below.

Click the button “Confirm” to call the appropriate sequence displayed in the message box.

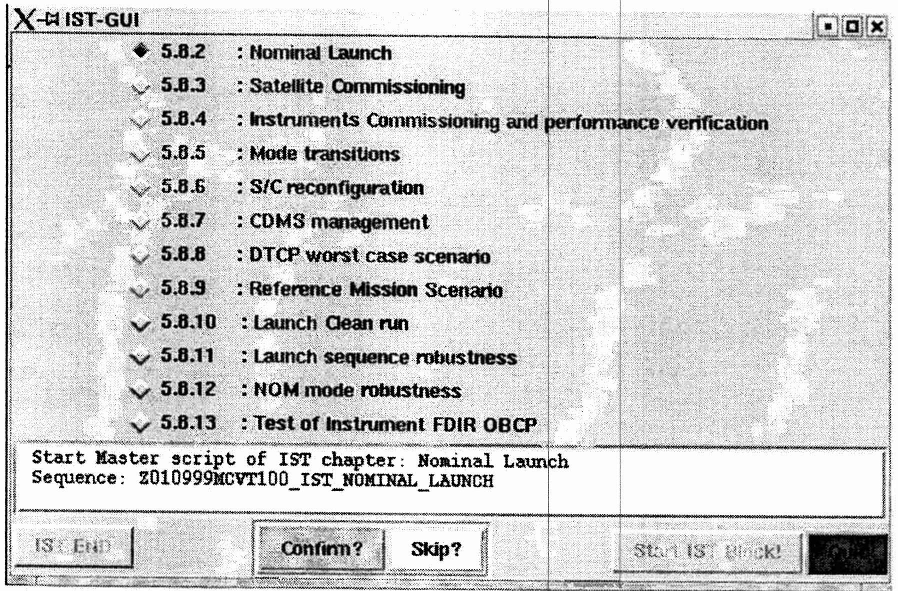


Figure 1: IST_GUI calling Master sequence, for instance “Nominal Launch”

Test location:	Operator	Product-Assurance:	Date:	Time :

Important Note: After execution of the IST Test Case, S/C has to be switched off with the "IST END" procedure as described in chapter 7.4.

Herschel IST Test Case 'Launch Phase, Separation and Post Separation':	HP-2-ASED-TP-0185
Herschel IST Test Case 'Satellite Commissioning':	HP-2-ASED-TP-0186
Herschel IST Test Case 'ACMS Commissioning':	HP-2-ASED-TP-0187
Herschel IST Test Case 'Instruments Commissioning and Performance Verification':	HP-2-ASED-TP-0188
Herschel IST Test Case 'Mode Transitions':	HP-2-ASED-TP-0189
Herschel IST Test Case 'S/C Reconfiguration':	HP-2-ASED-TP-0190
Herschel IST Test Case 'CDMS Management': ..	HP-2-ASED-TP-0191
Herschel IST Test Case 'DTCP Worst Case Scenario': ..	HP-2-ASED-TP-0192
Herschel IST Test Case 'REFERENCE Mission Scenario':	HP-2-ASED-TP-0193
Herschel IST Test Case 'Launch Clean Run':	HP-2-ASED-TP-0194
Herschel IST Test Case 'Launch Sequence Robustness':	HP-2-ASED-TP-0195
Herschel IST Test Case 'NOM Mode Robustness':	HP-2-ASED-TP-0196
Herschel IST Test Case 'Test of Instrument FDIR OBCP'	HP-2-ASED-TP-0197

Highlight the TEST Case to be performed in the above

Test location:	Operator	Product-Assurance:	Date:	Time
				:

7.4 IST END Procedure

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
1.	**IST_GUI** ⇨ Click the button "OK" and then ⇨ Click the button "IST_END" to proceed				IST_END called by Test Conductor Console	✓	
2.	**D102159SCVT188_IST_DUMP_PKT_STORE** ⇨ Click the button "Confirm" to proceed	Cy		Cy		✓	
3.	**D102159SCVT188_IST_DUMP_PKT_STORE** ⇨ Click the button " End TS!" to proceed	End Ts!		〃		✓	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	Ade	[illegible]	10/09	00.30

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
4. Only if PACS, SPIRE or HIFI is still ON	**Z010999MCVT004_IST_END** If one of the instruments is detected "ON" reply to the prompt: "Should the sequence" Z102999SCVT011_ASDGEN_PACSPWROFF_P Z102999SCVT005_ASDGEN_SPIREPWROFF_P Z102999SCVT015_ASDGEN_HIFIPWROFF_P "be called?" ⇨ Click the button "YES" to proceed						
5. Only if CCU A is ON	**Z010999MCVT004_IST_END** If CCU is detected "ON" reply to the prompt: Should the sequence "K102999ECVT001_ASDGENCCU_ABPWROFF be called ⇨ Click the button "YES" to proceed	Yes		Yes		✓	

Test location:	Operator	Product-Assurance:	Date:	Time
Estec	Ade	[illegible]	10/05	:

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
6. Only if RWL ON and ACMS is still in SCM	**Z010999MCVT004_IST_END** "Please ensure that ACMS is set in OCM mode, otherwise select the correct menu in the ACMS_CONFIG25" Perform chapter 7.4.1 then click OK						
7. Only if RWL are still spinning	**Z010999MCVT004_IST_END** Start the sequence A102109SPVT061_RWL_SPINDOWN? ⇨ Click the button "YES" to proceed				Out of Limits concerning RWL speed are expected during RWL spin down		
8. Only if ACMS is still ON	**Z010999MCVT004_IST_END** Start the sequence A102109SPVT012_ACMS_OFF ? ⇨ Click the button "YES" to proceed	YES		YES		✓	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	ADe	B.D.L.	10/05	:

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
9. Only if ACMS is still ON	**A102109SPVT012_ACMS_OFF** During this sequence, following event are expected to occur: • TM(5,2) EvtID: 33 Event Report - ACB Rx Failed • TM(5,2) EvtID: 33 Event Report - ACB Rx Failed • TM(5,4) EvtId:16426 Mode SBSM Entry • Event Report - Boot Report and Reconfiguration Log • Event Report - SDB Unhealthy • Multiple "New Tm 251004939" • Multiple "New Tm 251001939" • Multiple "New Tm 251002939" This sequence needs time to be completely run, so let run in parallel with the following steps.	Ok		Ok		✓	
10. Only if SREM is still ON	**Z102999SCVT002_SREM_OFF** ⇨ Click the button "End TS!" to proceed	Ok		Ok	SPR 35-290 NCR 3986 Wrong TM set in HPSDB	✓	
11.	**D102159SCVT174_IST_REDUNDANT_CONF** ⇨ Click the button "Ens TS" to proceed	Ok				✓	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	ADe	[illegible]	10/05	:

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
12. Only if Survival Register set with separated flag	**Z010999MCVT004_IST_END** At the prompt "The survival register is set with the launch flag "separated". It must be set to "not separated" to avoid any reconfiguration during power off" ⇨ Click the button "Yes" to proceed						
13. Only if Survival Register set with separated flag	**D102159SCVT175_SET_SURV_REG** ⇨ Click the button "End TS!" to proceed						

Test location:	Operator	Product-Assurance:	Date:	Time :

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
14. Only if CROME wrongly set	**Z010999MCVT004_IST_END** Reply to the prompt "The CROME registers are not configured " "in PMA or PMB nominal " "Such configuration will block TM during Power OFF" ⇨ Click the button "YES" to proceed						
15. Only if CROME wrongly set	**D102159SCVT176_WRITE_CROME** ⇨ Click the button "End TS!" to proceed						
16. Only if SSMM is ON	**D102159SCVT188_IST_DUMP_PKT_STORE** ⇨ Click the button "End TS!" to proceed				Terminated Pkt Store already dumped	✓	
17. Only if SSMM is ON	**D102159SCVT181_Disable_PKT_STORE** ⇨ Click the button "End TS!" to proceed	ok		ok			

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	ADe	BM.	10/05	:

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
18. Only if SSMM is ON	**D102159SCVT187_IST_SSMM_OFF** During this sequence, the following events are expected: • TM(5,2) EvtId: 84 PM COCOS SPW C Reconnection • TM(5,4) EvtId: 88 MM A COCOS RT Failure • TM(5,4) EvtId: 148 MM SPW C address transfer error • TM(5,2) EvtId: 85 PM COCOS SPW C Reconnection • TM(5,4) EvtId: 89 MM A COCOS RT Failure • TM(5,4) EvtId: 149 MM SPW C address transfer error ⇨ Click the button "End TS!" to proceed	Ok		Ok		✓	
19. Not for Launch Cases	**D102159SCVT001PM_SELECT** ⇨ Click the button "End TS!" to proceed	Ok		Ok		✓	
20.	**Z010999MCVT002_POWER_OFF_HER_IST** ⇨ Click the button "End TS!" to proceed	Ok		Ok		✓	

Test location:	Operator	Product-Assurance:	Date:	Time
[illegible]	ADe	[illegible]	10/05	:

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
21 Only if TTC-SCOE is still ON	**Y102989ETVT020_TTC_SCOE_OFF** ⇨ Click the button "End TS!" to proceed						
21.	**Z010999MCVT004_IST_END** ⇨ Click the button "End TS!" to proceed	OK				✓	
22.	**IST_GUI** ⇨ Click the button "Quit" to terminate the test sequence						
23.	**Update CVS Tag** 1. Open a **shell** (xterm) 2. Execute the command **update_tag** Insert the name of **TAG →** **IST_x_PART_x_TP_xxxx_x_x_END_xxx**						

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	Ade	BM.	10/05	:

7.4.1 ACMS SCM to OCM transition for power off

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
24.	**A102109SPVT003_ACMS_CONFIG25** At the prompt "Enter your choice", insert **"2"** to select **"Transition SCM to OCM"** ⇨ Click the button "OK" to proceed, then "Continue"	2					
25.	**A102109SPVT003_ACMS_CONFIG25** At the prompt Menu 7 "Enter your choice", insert **"5"** to select **"Reaction wheels spin down"** Click the button "OK" to proceed, then "Continue"	5					
26.	**A102109SPVT003_ACMS_CONFIG25** At the prompt Menu 9 "Enter your choice", insert **"1"** to select **"Switch off ACMS"** Click the button "OK" to proceed, then "Continue"	1					

Test location:	Operator	Product-Assurance:	Date:	Time :

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
27.	**A102109SPVT012_ACMS_OFF** During this sequence, following event are expected to occur: • TM(5,4) EvtId:16426 Mode SBSM Entry • Event Report - Boot Report and Reconfiguration Log • Event Report - SDB Unhealthy • TM(5,2) EvtID: 33 Event Report - ACB Rx Failed • TM(5,2) EvtID: 33 Event Report - ACB Rx Failed • Multiple "New Tm 251004939" • Multiple "New Tm 251001939" • Multiple "New Tm 251002939" • Multiple TM(5,1) such as "FDir Task Overrun", etc...						
28.	**A102109SPVT003_ACMS_CONFIG25** At the prompt "Enter your choice", insert **"99"** to select **"Terminate ACMS_CONFIG25"** Click the button "OK" to proceed, then "Confirm" and continue in parallel with the next step.	99					

Test location:	Operator	Product-Assurance:	Date:	Time
				:

Step-No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
29.	**A102109SPVT017_ACMS_CRS_BACKGROUND** ⇨ Terminate the sequence.						

Test location:	Operator	Product-Assurance:	Date:	Time :

8 Summary Sheets

8.1 Procedure Variation Summary

	Test Change		Curr. No.: Date Page of	
Test designation	Test Procedure		Issue	Rev.
Test step changed	Reason for Change			

Prepared by:	Resp. Test Leader	Project Engineer
PA/QA	Prime	Customer

Table 8.1-1: Procedure Variation Sheet

8.2 Non Conformance Report (NCR) and SPR Summary

The status of all NCRs/SPRs generated during the test shall be given in the table below:

NCR/SPR - No.	Title	Date	Open/ Closed	PA sig.

Table 8.2-2: NCR/SPR Record Sheet

8.3 Sign-off Sheet

To finalise the test campaign, all responsible personnel shall sign off the filled-in procedure in the following table:

	Date	Signature
Test Director		
Test Conductor		
PA Responsible	10/05/08	RBM.

Annex B: Script Hierarchy

============ IST START ================

>Z010999MCVT001_POWER_ON_HER_IST $PM $tcDec $batScoe
|-----> Y102989EPVT007_IST_PWR_SCOE_ON $configBS
|-----|-----> Z010999MMXX002UNITS_CHECK
|-----> async referby timeSynchronisation D102159SCVT032TIMESYNCRO
|-----> ~~D102159SCVT210_GET_ALARM_STATUS~~
|-----> D102159SCVT210_GET_ALARM_STATUS
|-----> W102584EPVT007_IST_CHECK_PCDU
|-----> Z010999MMXX002UNITS_CHECK
|-----> R102479ECVT009_UNITS_SELECTION
> Z010999MCVT001_POWER_ON_HER_IST $PM $tcDec $batScoe
|-----> Y102989EPVT007_IST_PWR_SCOE_ON $configBS
|-----|-----> Z010999MMXX002UNITS_CHECK
|-----> async referby timeSynchronisation D102159SCVT032TIMESYNCRO
|-----> D102159SCVT210_GET_ALARM_STATUS
|-----> D102159SCVT210_GET_ALARM_STATUS
|-----> W102584EPVT007_IST_CHECK_PCDU
|-----> Z010999MMXX002UNITS_CHECK
|-----> R102479ECVT009_UNITS_SELECTION
> D102159SCVT210_GET_ALARM_STATUS
> ~~D102159SCVT176_WRITE_CROME $papCcs 1~~
> D102159SCVT174_IST_REDUNDANT_CONF $bus $pcduTmTc $hps $txChain $rfdn $tmObt $tmRate
|-----> D102159SCVT104_ENCODER_SELECT $tmObt $tm_Enc_Config
> async referby istStartSSMM Z010999MCVT005_IST_START_SSMM $ssmm]
> K102999ECVT001_ASDGENCCU_ABPWRON
|-----> K102999ECVT001_ASDGENCCU_MnDisDLC
|-----> K102999ECVT001_ASDGENCCUA_POWERON
|-----|-----> Z010999MMXX002UNITS_CHECK
|-----> K102999ECVT001_ASDGENCCUA_ChkEssTM
|-----> K102999ECVT001_ASDGENCCUB_POWERON
|-----|-----> Z010999MMXX002UNITS_CHECK
|-----> K102999ECVT001_ASDGENCCUB_ChkEssTM
> K102999ECVT001_ASDGENCCU_MnEBOTH2
> K102999ECVT001_ASDGENCCU_MnEBOTH1
> K102999ECVT001_ASDGENCCUA_POWERON
|-----> Z010999MMXX002UNITS_CHECK
> K102999ECVT001_ASDGENCCUA_MnEnaMd2
> K102999ECVT001_ASDGENCCUA_MnEnaMd1
> K102999ECVT001_ASDGENCCUB_POWERON
|-----> Z010999MMXX002UNITS_CHECK
> K102999ECVT001_ASDGENCCUB_MnEnaMd2
> K102999ECVT001_ASDGENCCUB_MnEnaMd1
> Z010999MCVT153_IST_STATUS 5.8.2.4.2
|-----> ACMS_get_RM_status RMA
|-----> ACMS_get_RM_status RMB
> async A102109SPVT003_ACMS_CONFIG25
|-----> A102109SPVT004_ACMS_LOADCONFIG1
|-----> A102109SPVT010_ACMS_SCOE_CONFIG1
|-----|-----> async A102109SPVT017_ACMS_CRS_BACKGROUND
|-----> A102109SPVT011_ACMS_ON
|-----|-----> Z010999MMXX002UNITS_CHECK
|-----|-----> ACMS_get_RM_status RMA

|-----|-----> ACMS_get_RM_status RMB
|-----> A102109SPVT021_ACMS_ACC_SEPARA
> D102159SCVT032EnNomTCSLoops ist_herschel_tcs_config
> D102159SCVT115_CHECK_HCS_OFF
> D102159SCVT192_IST_UPLOAD_EAT
|-----> D102159SCVT192_GET_EAT_REPORT
|-----> D102159SCVT192_GET_EAT_REPORT 1
> D102159SCVT175_SET_SURV_REG $busSM $pcduSM $rfdnSM $txChainSM $ttrSM $sepStsSM
> D102159SCVT219_GET_BSW_HEALTH_UIU 1
> D102159SCVT204_GET_MOT 1
> D102159SCVT192_GET_EAT_REPORT 1
> D102159SCVT205_SAT_COM_TCT 1
> D102159SCVT207_SAT_COM_FCCT 1
> D102159SCVT188_IST_DUMP_PKT_STORE 0 80 1 81 2 82 3 83
> async referby celDownlink D102159SCVT188_IST_DUMP_PKT_STORE CEL_A CEL_B

============ IST END ================

> $swOFFsequence
> A102109SPVT061_RWL_SPINDOWN
> async referby acmsOff A102109SPVT012_ACMS_OFF
> Z102999SCVT002_SREM_OFF
> D102159SCVT174_IST_REDUNDANT_CONF A A 0 0 0 0 0
|-----> D102159SCVT104_ENCODER_SELECT $tmObt $tm_Enc_Config
> D102159SCVT175_SET_SURV_REG B B ABBB B B not
> D102159SCVT176_WRITE_CROME AB 1
> D102159SCVT181_DISABLE_PKT_STORE
> D102159SCVT187_IST_SSMM_OFF
> Y102989ETVT020_TTC_SCOE_OFF
|-----> Y102989ECVT018_TTC_TC_OP_METHOD OFFLINE
|-----|-----> Y102989ETVT017_TTC_CHECK_ROUTINE
|-----|-----> Y102989ETVT019_TTC_SCOE_ACTIVITY
> W102584SPVT101_PCDU_TRANSITION_FDIR 5
> Z010999MCVT002_POWER_OFF
|-----> D102159SCVT028SSMM_OFF
|-----> D102159SCVT001PM_SELECT B
|-----|-----> D102159SCVT003DISTHERMALCONTROL
|-----|-----> Z010999MMXX002UNITS_CHECK
|-----> D102159SCVT001PM_SELECT A
|-----|-----> D102159SCVT003DISTHERMALCONTROL
|-----|-----> Z010999MMXX002UNITS_CHECK
|-----> R102479SMXX001_XPND_HUM_TXT
|-----> Y102989EPVT002_PWR_SCOE_OFF
|-----|-----> Z010999MMXX003UNITS_CHECK_PWR_OFF
|-----|-----> Z010999MMXX003UNITS_CHECK_PWR_OFF
|-----|-----> Z010999MMXX003UNITS_CHECK_PWR_OFF
|-----> Z010999MMXX003UNITS_CHECK_PWR_OFF

Annex C: Session Record

Test Description	
Session ID	
Start Time:	
End Time	
CVS Tag for Test	
Applicable IST Specification	
Test conductor	
QA Approval	

Test Description	
Session ID	
Start Time:	
End Time	
CVS Tag for Test	
Applicable IST Specification	
Test conductor	
QA Approval	

Test Description	
Session ID	
Start Time:	
End Time	
CVS Tag for Test	
Applicable IST Specification	
Test conductor	
QA Approval	

Annex D: Operation Notes

Operation Note 3

Title: ACMS SCOE does not boot	Date: 06/02/08
Observation:	
The ACMS SCOE does not boot. Reason: One of the STR UCE (Unit Checkout Equipment) electrical stimuli programs hangs.	
Operator Action: Until NCR / SPR is solved the following workaround is proposed (by Martijn): During powering the Power SCOE in the cleanroom: 1) Go to the STR UCE (in cleanroom) and select electrica stimuli PC on the KVM switch, press 2 time 'scroll lock' and select PC#2. 2) Kill the running application, by pressing the cross in the upper right corner. 3) Start the UCE application by double clicking the icon 'SMI', an application 'Star Mapper Analogue Chain Simulation' should start up. 4) Press 2 time 'scroll lock' and select PC#3 and repeat step 3.	

Operation Note 8

Title: DOD Alarm	Date: 14/02/08

Observation:

During each Power on within the "IST_START" there is a check of the DOD flag. Directly after the "D102159SVT32TIMESYNCRO" the dump of the RM LOG and the DOD Flag check is performed by the "D102159SCVT210_Get_ALARM_STATUS".

If the DOD alarm is present it has to be reset , otherwise the S/C will enter Save Mode directly after separation.

Operator Action:

For resetting the DOD alarm decrease the Vbat under the DoD threshold and then increasing the Vbat upper the DoD threshold therefore perform the following steps:
Open a shell window -> startCMD bsvnc
On the window "H-P BS SCOE" switch to local
On the window "BS SCOE Config" change the Battery Voltage from 25,4 to 19
The push the button save&update
On the window "BS SCOE Config" change the Battery Voltage from 19 to 25,4
The push the button save&update
On the window "H-P BS SCOE" switch to remote

Execute the script: D102159SCVT210_Get_ALARM_STATUS
to dump the RM Log to check DOD Flag Check if DOD alarm is still present

Operation Note 11

Title: Failure in TM Check of CCU Valves	Date: 14/02/08
Observation:	
If CCU Valves sensing lines are connected to CRYO SCOE instead of CCU the valves status check fails at CCU Power ON	
Operator Action:	
1) On Test conductor Console, perform "connect PFM_CRYO" 2) Thanks Telemetry Query Display (TQD) check following TMs - YM648958 (VLV_STATUS_V103) instead of KM269302 = "CLOSED" - YM649958 (VLV_STATUS_V106) instead of KM269303 = "CLOSED" - YM640958 (VLV_STATUS_V501) instead of KM270302 = "CLOSED" - YM641958 (VLV_STATUS_V503) instead of KM270303 = "CLOSED" - YM643 958 (VLV_STATUS_V505) instead of KM271303 = "OPEN" 3) On Test conductor Console, perform "disconnect PFM_CRYO"	

END OF DOCUMENT

Insert actual distribution list

Annex 7

SCOE-and Flight-skin connector configuration

Content:

1. Filled in SCOE and Flight skin connector configuration, Annex 3 of AD3. Also contained in Filled-in 'Herschel EGSE, Satellite & Instrument Procedure for EMC Radiated Test '; HP-2-ASED-PR-0116, Issue 1, Continuation of formal run

3 pages

11.2 ANNEX 3: SCOE Cable Connection Requirement (AUTO-COMP tests)

SCOE CABLES CONNECTION to HERSCHEL S/C					
SKIN-01	PWR Panel (PCDU)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	BS Nom Power	SK01BJ09	PCDU	BS SCOE Cable Plugged	
	BS Red Power	SK01BJ10	PCDU	BS SCOE Cable Plugged	
	BDR1 AIT	SK01BJ11	PCDU	LPS SCOE Cable Plugged	
	BDR2 AIT	SK01BJ12	PCDU	LPS SCOE Cable Plugged	
	SA Nom Power	SK01AJ01	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ02	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ03	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ04	PCDU	Connector Cover	
	SA Red Power	SK01AJ05	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ06	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ07	PCDU	POWER SCOE Cable Plugged	
SKIN-02	PWR Panel (ACC, CDMU, RCS, 1553 & Thruster)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-02	DMS 1553 Bus_A	J01	CDMU		Flight Plug SK02P01 Plugged
SKIN-02	DMS 1553 Bus_B	J02	CDMU		Flight Plug SK02P02 Plugged
SKIN-02	ACMS 1553 Bus_A	J03	ACC		Flight Plug SK02P03 Plugged
SKIN-02	ACMS 1553 Bus_B	J04	ACC		Flight Plug SK02P04 Plugged
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	Copper Tape	
SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	Copper Tape	
SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH		Flight Plug SK02P07 Plugged
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS		Flight Plug

Fl.Mgr M.Müller 09.05.08 17:05

					SK02P08 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J09	ACC/CDMU		Flight Cap SK02P09 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J10	ACC/CDMU		Flight Cap SK02P10 Plugged
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS		Flight Plug SK02P11 Plugged
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	Copper Tape	
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH	Copper Tape	
SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		ACMS Flight Plug SK02P14 Plugged
SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		ACMS Flight Plug SK02P15 Plugged
SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		ACMS Flight Plug SK02P16 Plugged
SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		ACMS Flight Plug SK02P17 Plugged
SKIN-03	TTC Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-03	Test point TC + protection jumper EPC1	SK03J01	XPND1/EPC1	Copper Tape	
SKIN-03	Test point TC + protection jumper EPC2	SK03J02	XPND2/EPC2	Copper Tape	
	RF LINK				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	RF link for antenna LGA1	N/A	LGA1		
	RF link for antenna LGA2	N/A	LGA2		
	RF link for antenna MGA	N/A	MGA		
	TTC Panel Test point J 15			MGA	
	TTC Panel Test point J 60			LGA1	
SKIN-04	ACMS Panel (RWE)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-04	RWL1 Sgn	J01	ACC/RWL-1		ACMS Flight Plug SK04P01 Plugged
SKIN-04	RWL2 Sgn	J02	ACC/RWL-2		ACMS Flight Plug SK04P02 Plugged
SKIN-04	RWL3 Sgn	J03	ACC/RWL-3		ACMS Flight Plug SK04P03 Plugged
SKIN-04	RWL4 Sgn	J04	ACC/RWL-4		ACMS Flight Plug SK04P04 Plugged
SKIN-05	GYR/QRS Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-05	CRS1 AOCS Sgn	J01	CRS-1/ACC		ACMS Flight plug

Fl.Mg / M.Rästle 09.05.08 17:05

SKIN-05	CRS2 AOCS Sgn	J02	CRS-2/ACC		ACMS Flight plug √
SKIN-05	GYRO RS422 / Test	J03	GYRO		ACMS Flight Cap √
SKIN-05	CRS 1/2 Stimuli	J04	CRS-1,2		ACMS Flight Cap √
SKIN-05	AAD Sgn M	J05	AAD/ACC		ACMS Flight Plug √
SKIN-05	SAS1/2 Sgn M	J06	SAS/ACC		ACMS Flight Plug √
SKIN-05	SAS1/2 Sgn R	J07	SAS/ACC		ACMS Flight Plug √
SKIN-05	AAD Sgn R	J08	AAD/ACC		ACMS Flight Plug √
SKIN-06	STR Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-06	STR1 Stimuli	J01	STR1		ACMS Flight Plug √
SKIN-06	STR2 Stimuli	J02	STR2		ACMS Flight Plug √
	UMBILICAL				
	Connector Function	Connector	S/C unit	SCOE CABLE	
	Power/Data	HU1 J01	SYSTEM	SCOEs cable Plugged √	
	Power/Data	HU2 J01	SYSTEM	SCOEs cable Plugged √	

Fi. Mgr. M. Müller
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Annex 8

Analysis Of Tm Generation Compatibility With MGA Transmission

10 pages

Annex 8

1 ANALYSIS OF TM GENERATION COMPATIBILITY WITH MGA TRANSMISSION

1.1 Introduction

The primary objective of the first Auto-compatibility test (context Re/AutoComp) was to measure the receiver de-sensitisation due to telemetry transmission into the chamber using the MGA and LGA1.
However, advantage can be taken of the periods of transmission on the MGA during the AutoComp test to analyse the compatibility of Tm generation with transmission, whilst the spacecraft sits its own side-lobe near-field. This annex presents a preliminary analysis of the compatibility of Tm generation with MGA transmission.

1.2 Results Summary

Sub-sets of the Platform RT HK Tm and of the 3 Instruments RT HK Tm were analysed for continuity and self consistency (monotonicity) during an extended period of time ranging from before, during and after the switch-on of TWTA1 (driving MGA transmission into the chamber).
The selected Tm includes parameters originating in the analogue domain, integer parameters and state (binary) parameters.
The Tm analysis demonstrates the following (with reference to the change from umbilical to freely transmitted Tm):

- Platform RT HK:
  - No degradation in continuity,
  - No degradation in self-consistency (value monotonicity),.
  - No disruption of the digital processes (e.g. packetisation) responsible for Tm generation
- PACS, SPIRE and HIFI RT HK:
  - No degradation in continuity,
  - No degradation in self-consistency (value monotonicity),
  - No disruption of the digital processes (e.g. packetisation) responsible for Tm generation.

No science data was generated by the instruments during this period, so this process was not verified.
The SSMM dump was carried out by a standard “IST_END” procedure, in which the data was dumped over the umbilical (no RF), so this process was not verified.
For both these cases the reader is referred to the introduction concerning the primary test objectives.

1.3 Test Conditions Summary

During the period of interest, the spacecraft was in He1 with the instruments operating as follows:

- PACS: ON in standby
- SPIRE: ON in standby
- HIFI: ON in prime (noisy) mode

EGSE connections to the spacecraft were at the minimum level:

- AMCS SCOE not connected
- CDMS bus spy not connected
- Power SCOEs connected
- Umbilical connected (Tm)
- RF SCOE cables connected to Flight Test Connectors
- Antenna dummy loads were removed (free transmission into the chamber)

RFDN switch setting:

- Mode 6 (ABAB):
  - TWTA1 Downlink path: MGA

1.4 Telemetry Generated During MGA Transmission

Platform and Instrument Real-Time House-Keeping telemetry were enabled throughout the test.
TWTA1 and TWTA2 were alternately activated (for the AutoComp tests), during which times Tm was freely transmitted into the EMC chamber. TWTA1 drove the MGA.
Telemetry Selected For Post-Test Analysis

1.4.1 Platform Telemetry Items

The following sub-set of the platform IST post-test telemetry extraction list were selected for this analysis:

Tm Reference	Tm Short Name	Additional Descriptor	Plotted
DE824170	Mode	Integer value	commented
DE81D170	FdirMode	State: AFO/AFS	commented
KM270302	Valv_Stat_VS501	State: Open/Closed	commented
RMC04442	RX2_Temp_DID	Raw integer value	✓
RMC02442	RX1_Temp_DID	Raw integer value	✓
WMB00565	PCDU_Temp1_DID	Raw integer value	
WM806565	HfiB8B9_L43_I	Current /A	
WM709565	HiFiLCU_N_L53_I	Current /A	
WM609565	HiFiICU_R_L68_I	Current /A	commented
WM608565	HiFiHRV_L67_I	Current /A	
WM509565	HiFiICU_N_L64_I	Current /A	
WM508565	HiFiHRH_L63_I	Current /A	✓
WM409565	HiFiLCU_R_L54_I	Current /A	commented
WM306565	HifiWEV_L44_I	Current /A	
WMT07565	TM2_VBUS	Voltage /V	✓
WMT06565	TM1_VBUS	Voltage /V	
WMT22565	DIDPcduVbatBdr2	BDR-2 Input Switch Monitor, Raw integer value	
WMT21565	DIDPcduVbatBdr1	BDR-1 Input Switch Monitor , Raw integer value	
RMB04439	EPC2_HELIX_CURR	Current /A	✓
RMB01439	EPC1_ANODE_VOLT	Voltage /V	
RMB02439	EPC1_HELIX_CURR	Current /A	✓
RMB10442	XPD2_RX2_AGC_LV	AGC /dBm	✓
RMB09442	XPD1_RX1_AGC_LV	AGC /dBm	✓

1.4.2 Instrument Telemetry Items

The following sub-set of the instrument telemetry were selected for this analysis:

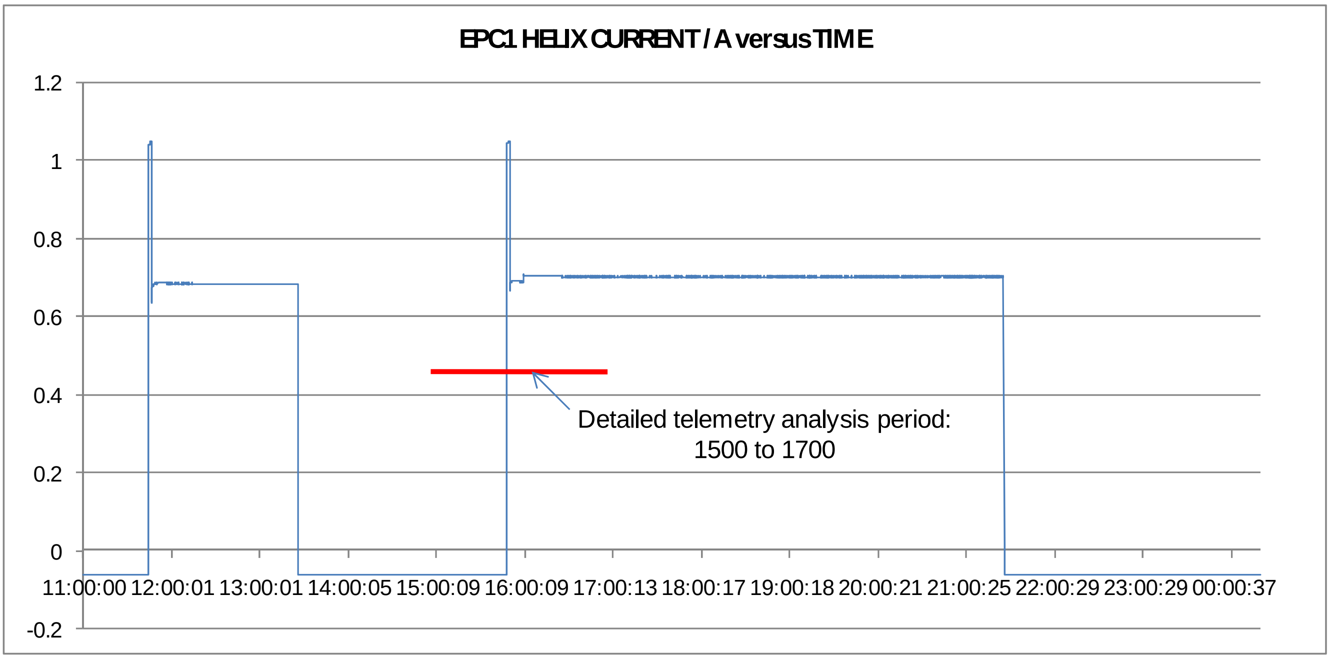
Tm Reference	Tm Short Name	Additional Descriptor	Plotted
SMB0K510	BIASTEMP	SPIRE /K	✓
SMF9K520	BSMIFTEMP	SPIRE /K	
SMM0K515	MCUMACTEMP	SPIRE /K	✓
PM410410	BOL_TEMP_FPU_ST	PACS /K	✓
PM408410	BOL_TEMP_TS	PACS /K	✓
PM406410	BOL_TEMP_SP	PACS /K	
HM250191	HF_AP_4K_END_CT	HIFI /K	✓
HM248191	HF_AP_2K_IF_CT	HIFI /K	✓

1.5 Telemetry Analysis Period Definition

The following tele-commands were issued to turn on/off TWTA1 (MGA downlink):

- ttcCommandTwta1On at 2008.130.15.46.59.464
- ttcCommandTwta1Off at 2008.130.21.25.29.705

The following Figure shows the corresponding EPC helix current in relation to the detailed telemetry analysis period.



Telemetry Analysis Summary

The following Tm points represented states (constant throughout the test period):

- DE81D170 FdirMode
  - Indicated “AFO” throughout period of test
  - Unperturbed by transmission on MGA
- KM270302 Valv_Stat_VS501
  - Indicated “Closed” throughout period of test
  - Unperturbed by transmission on MGA

The following Tm point was an integer value (constant throughout the test period):

- DE824170 Mode
  - Indicated “1280” throughout period of test
  - Unperturbed by transmission on MGA

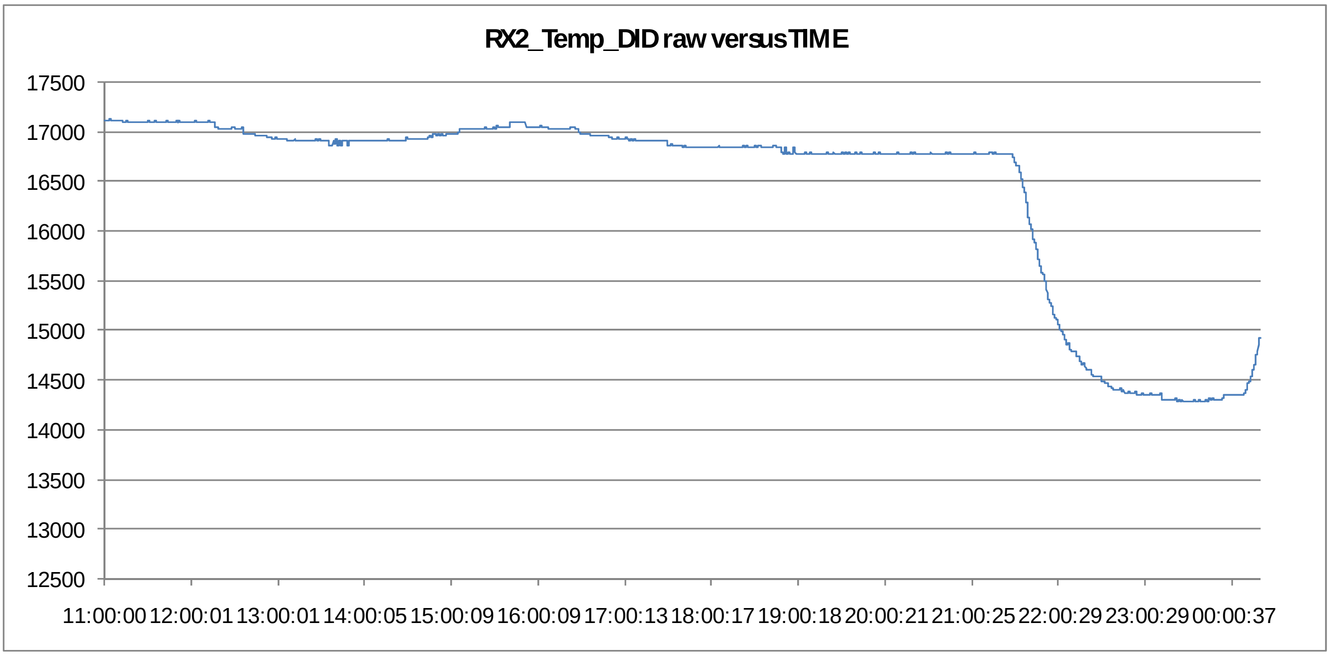
The following Tm points represented analogue values (constant throughout the test period):

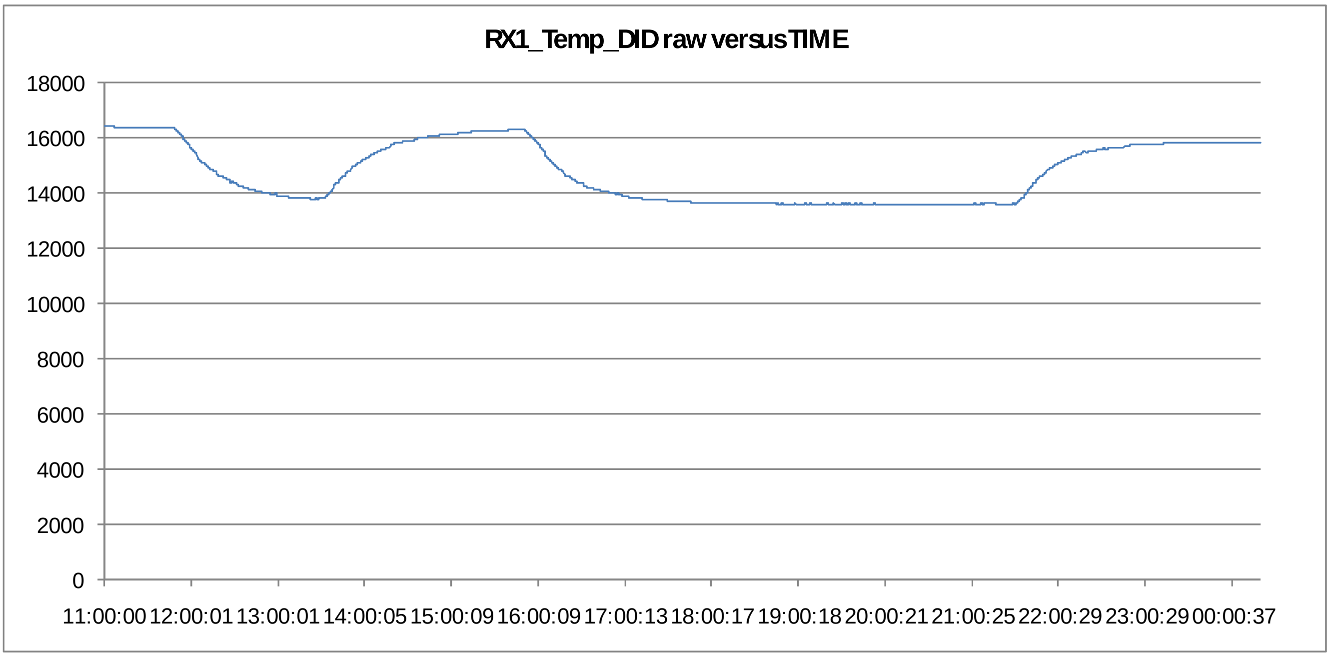
- WM609565 HiFiICU_R_L68_I
  - L68 was off throughout period of test and Tm indicated a constant current “0”
  - Unperturbed by transmission on MGA
- WM409565 HiFiLCU_R_L54_I
  - L54 was off throughout period of test and Tm indicated a constant current of “0”
  - Unperturbed by transmission on MGA

1.6 Graphical Output

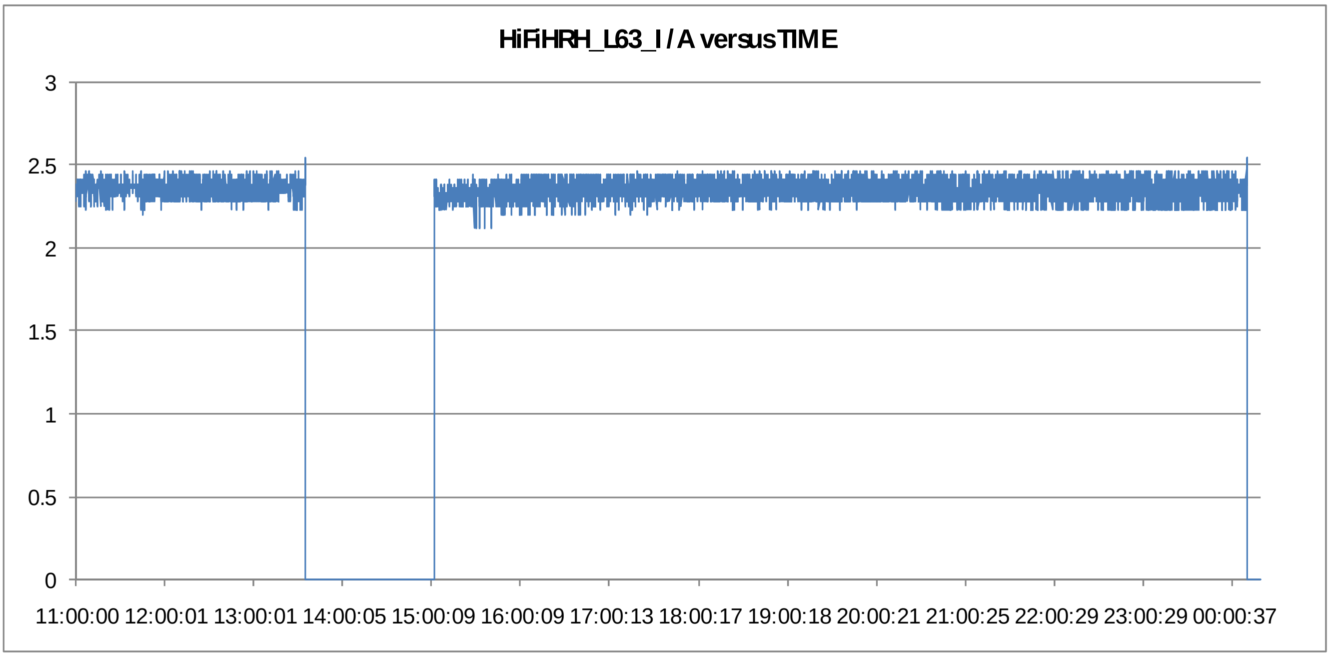
All the following graphical outputs indicate continuous telemetry with monotonic trend throughout the period of Tm transmission by umbilical and over the MGA.

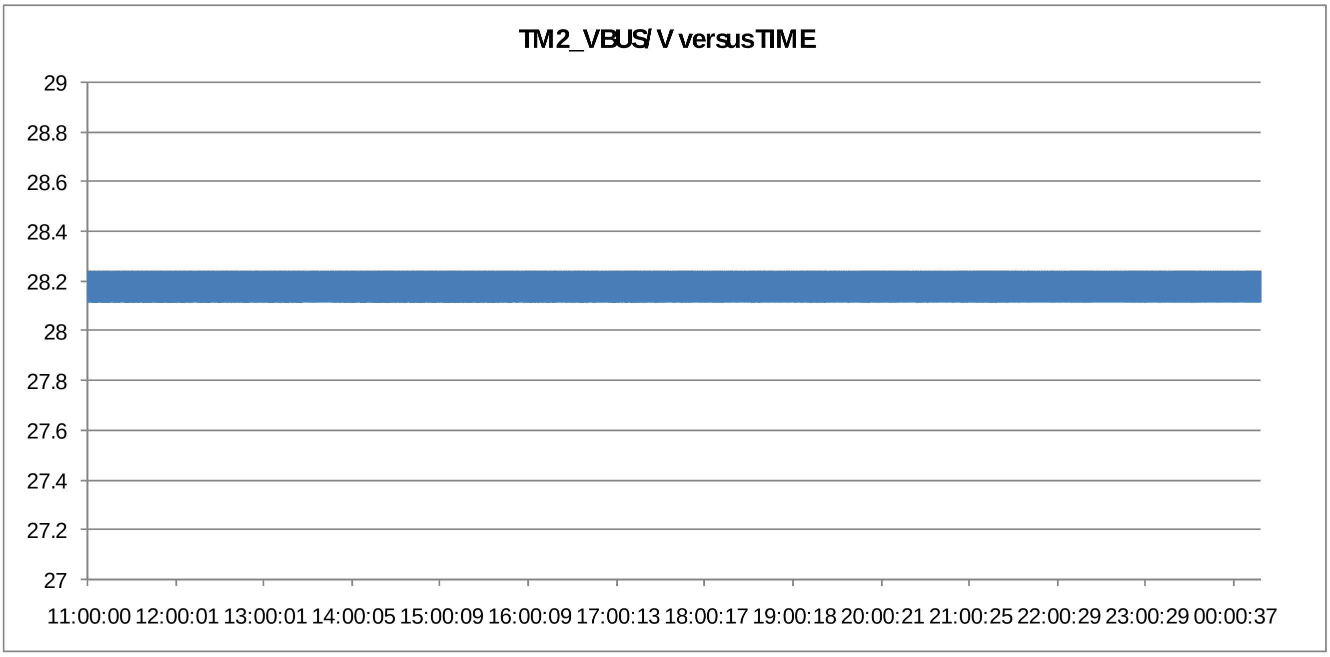
1.6.1 Platform Telemetry

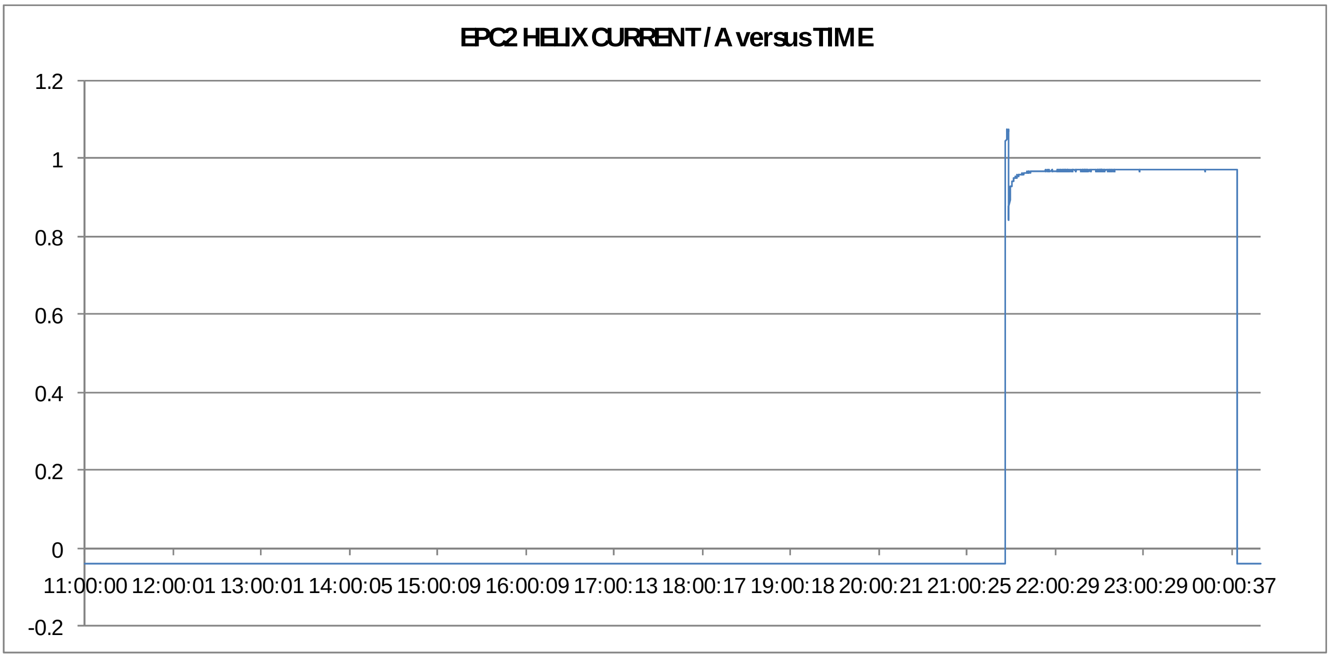




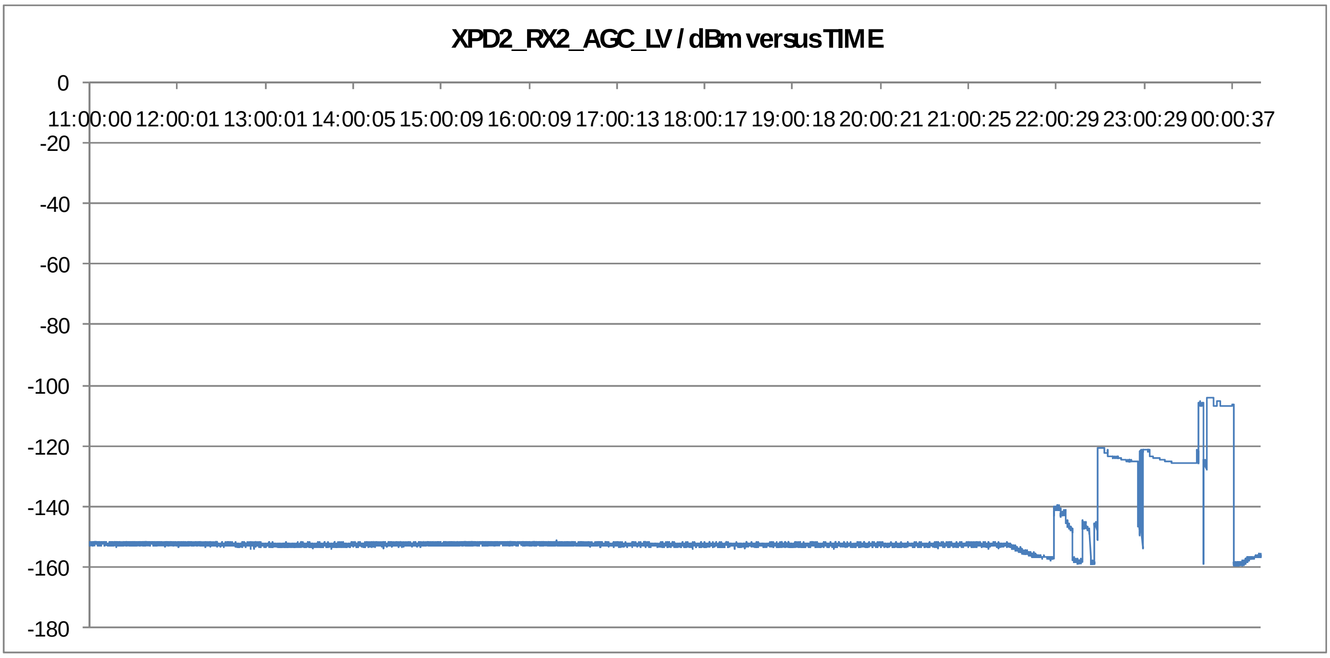
Note that the HIFI instrument was placed in Standby for the period approximately 1335 until 1505.
This off-period is not a feature induced by the effect of MGA on the telemetry.

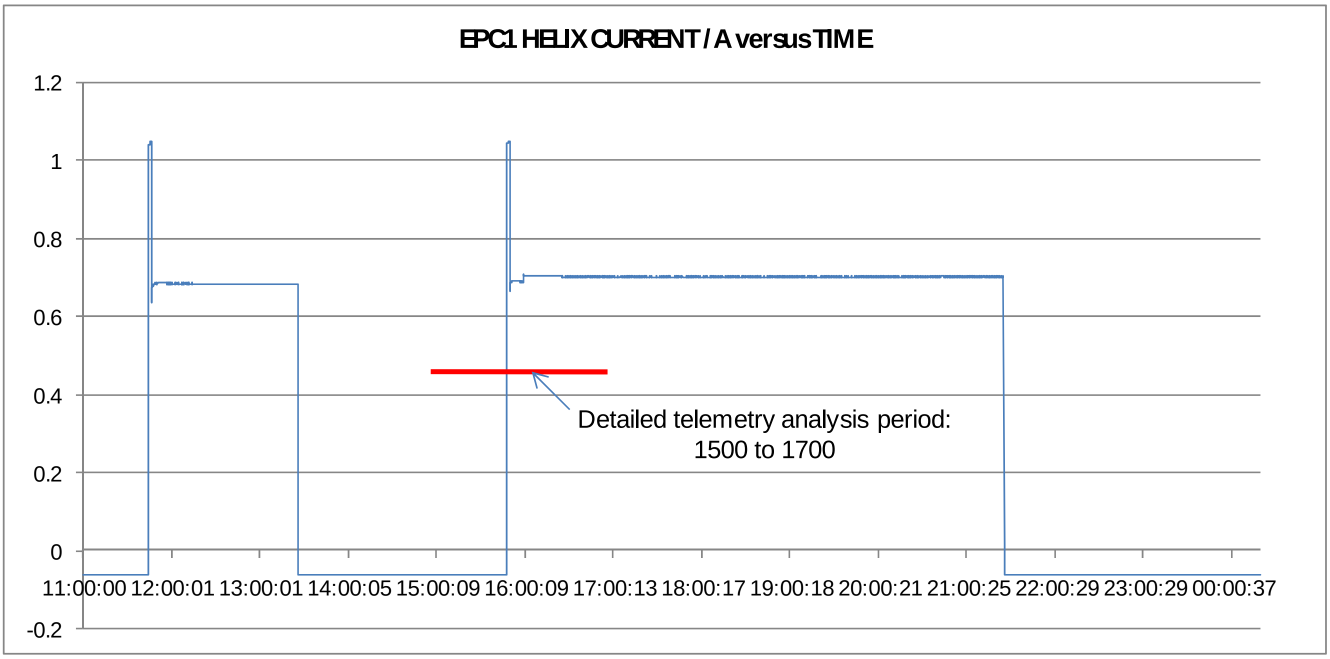




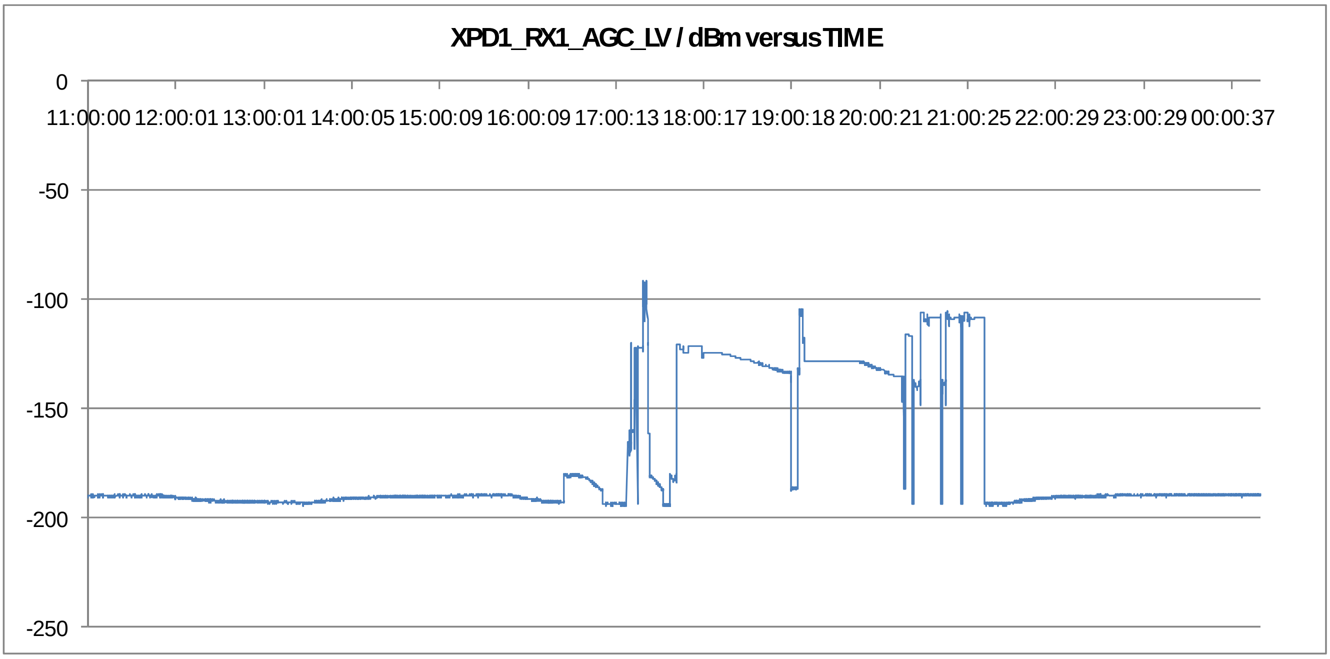


The XPD2 graph shows the effects of variations of Rx input power (and intentional receiver unlocks)



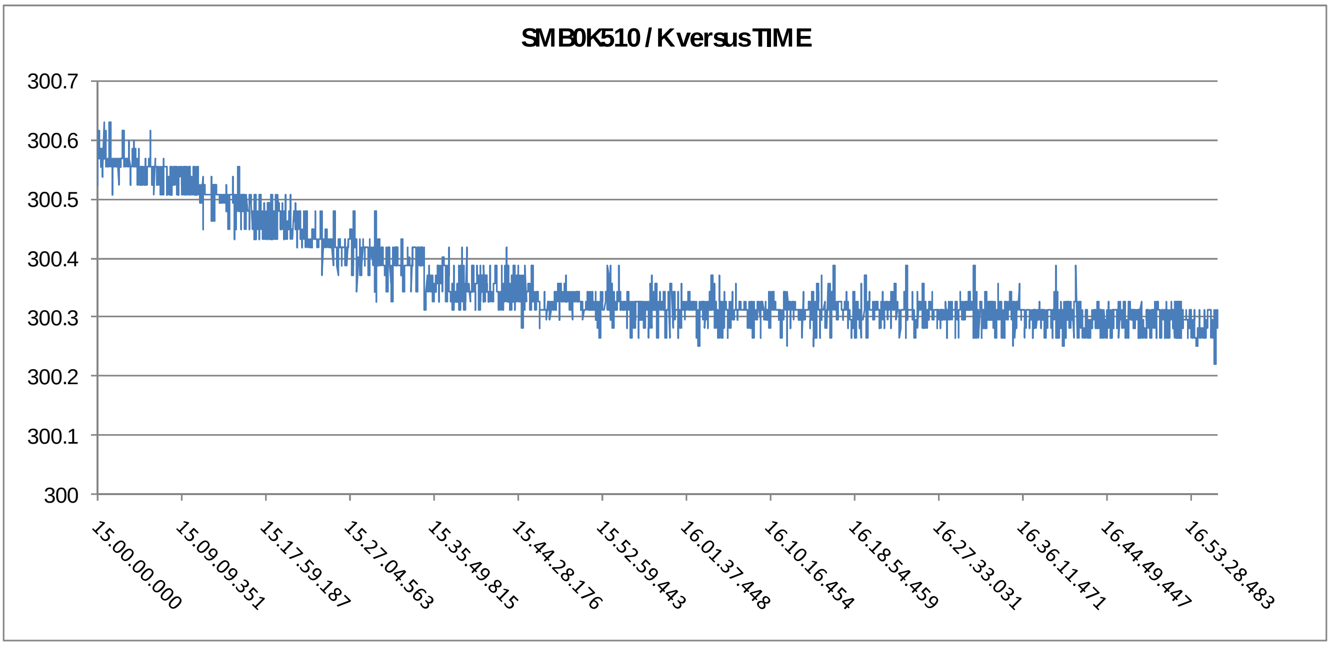


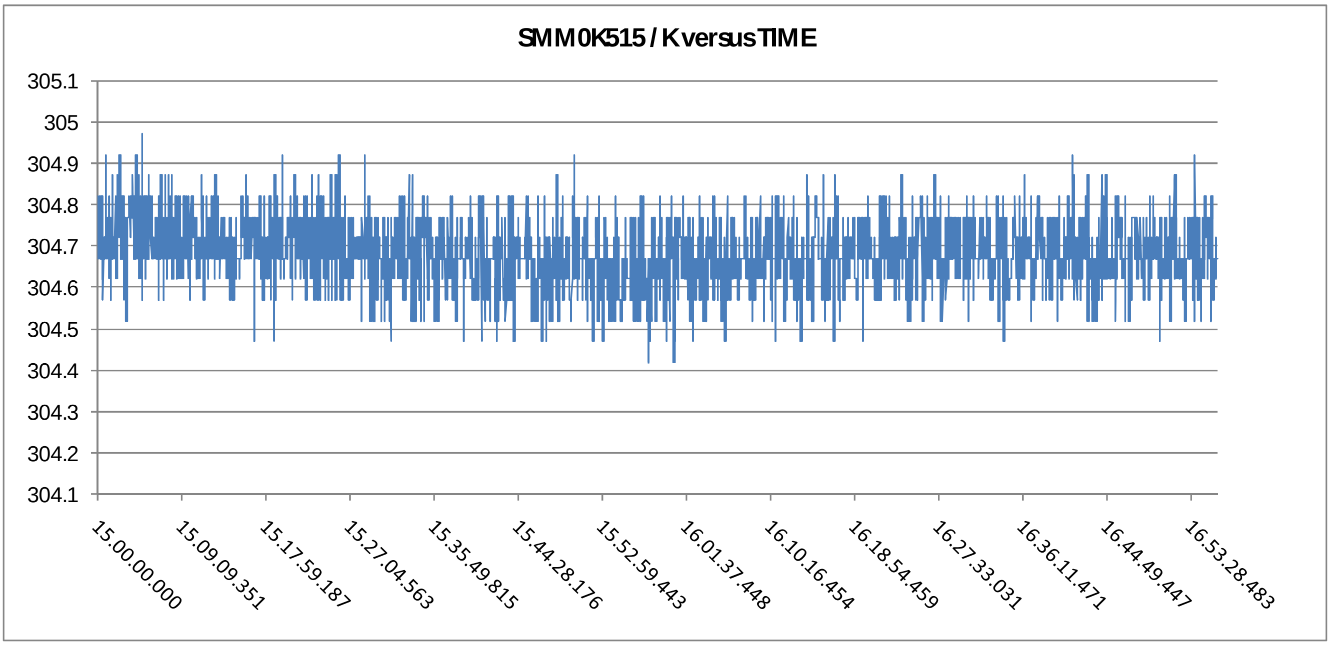
The XPD1 graph shows the effects of variations of Rx input power (and intentional receiver unlocks) during the second TWTA1 on-period.



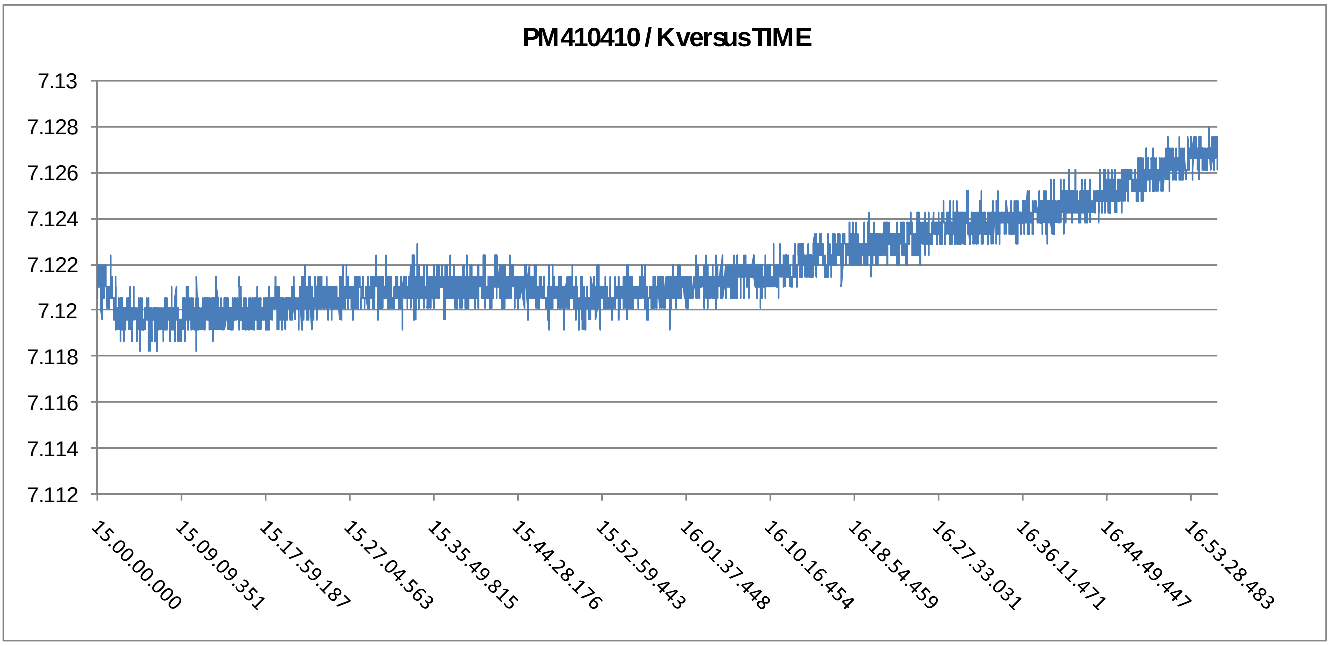
1.6.2 Instrument Telemetry

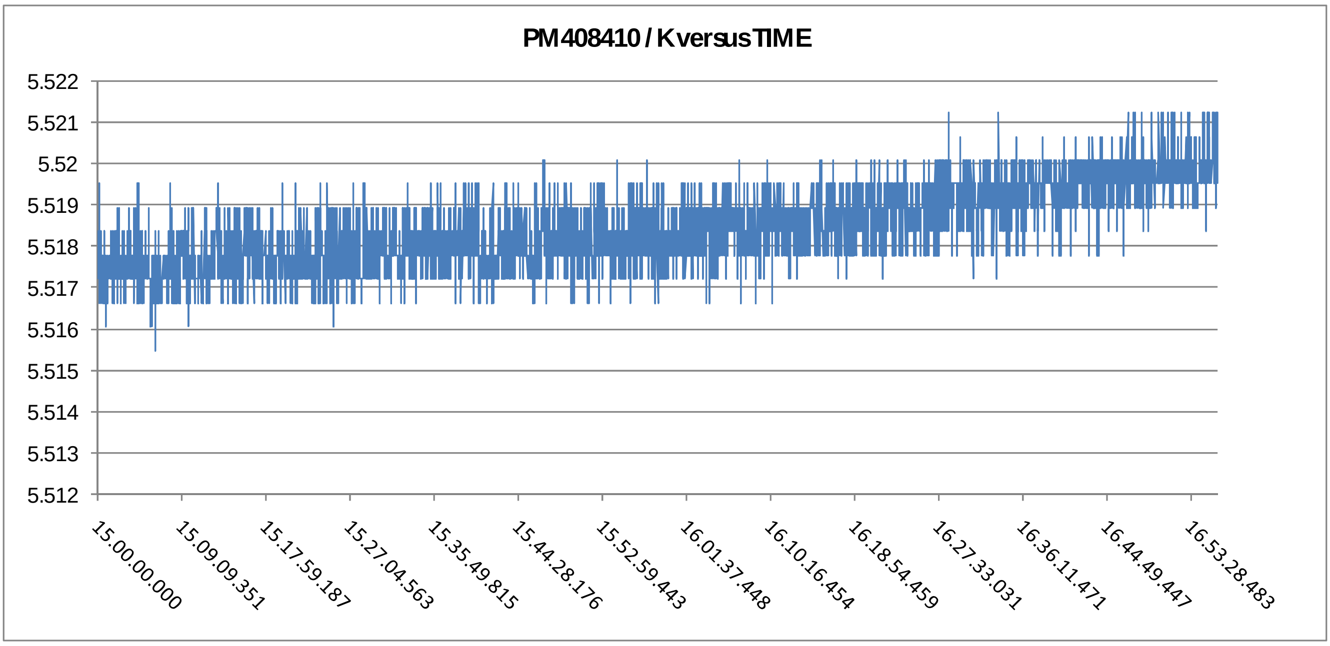
1.6.2.1 SPIRE instrument telemetry



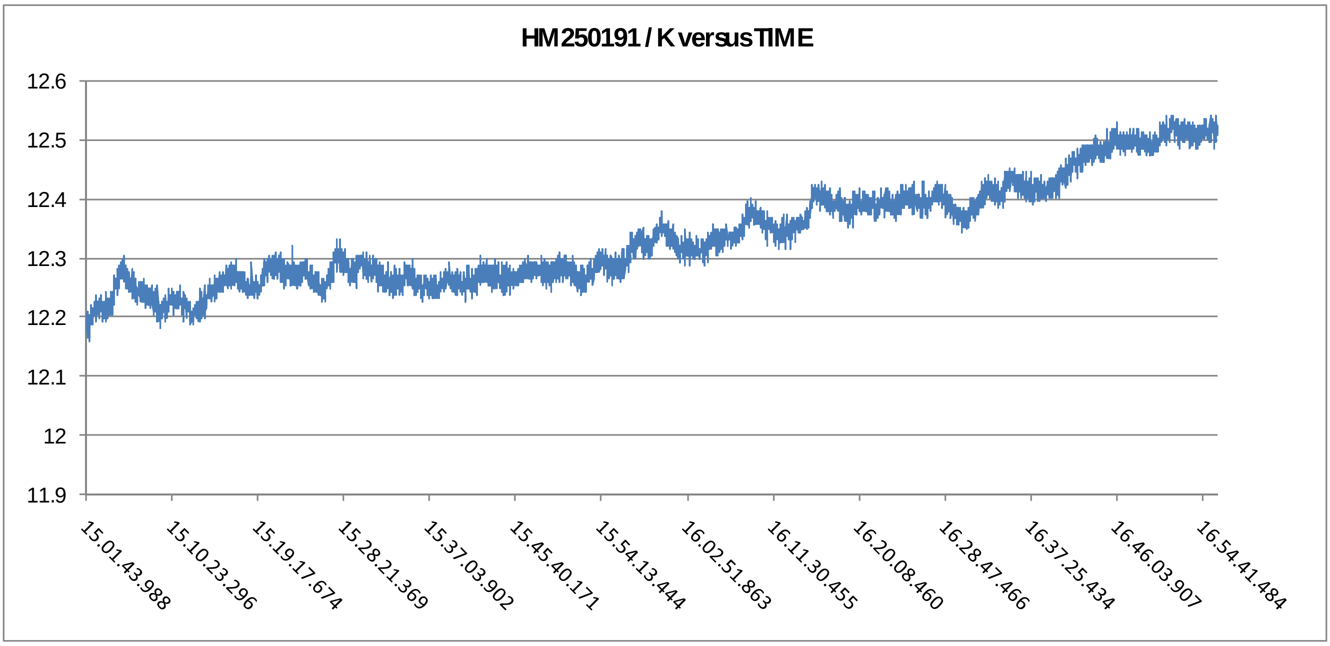


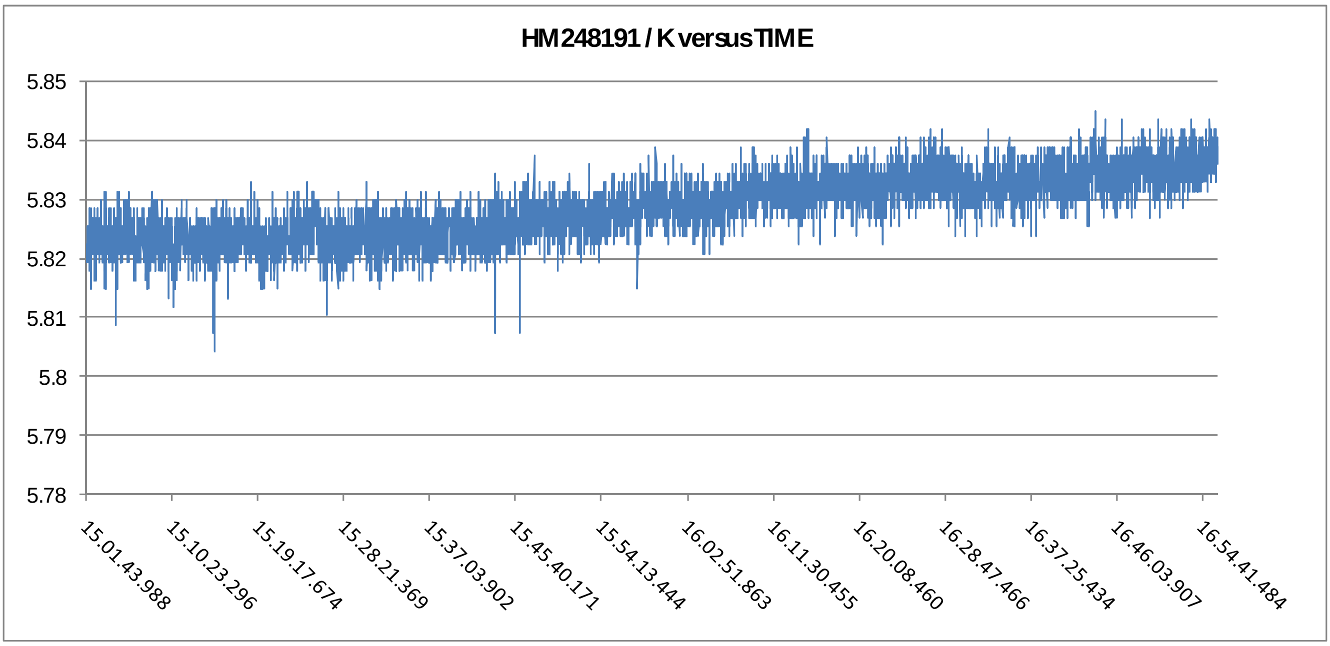
1.6.2.2 PACS instrument telemetry:





1.6.2.3 HIFI instrument telemetry:





Annex 9

NCR 4207

3 pages

Company	Project Name	
ALCATEL	HERSCHEL-PLANCK	NCR-No: HP-100000-ASED-NC-4207 Related internal NCR-No: Critical Item:Yes ☐ No ☒ Revision 0 Page 1 of 3

Nonconformance Report

NCR **Title** EMC Autocomp - Safety Loop triggered when switching back on Transponder

NC Item **Identification** HERSCHEL SATELITE

Next Higher Assembly HERSCHEL-PLANCK COMPOSITE

Drawing No | Sr No.

Procedure No HP-2-ASED-PR-0116

Supplier | Purchase Order

Subsystem | Model FM

NC Observation
Date: 08-MAY-08 Location: Estec

NC Detected During Test

Description of Nonconformance

Requirements Violated

In order to allow the start of Autocomp PVS#1 raised against PR-0116 to switch off the TWTA's & TRSP's for
the removal antenna CAPs

PVS 2 was raised to switch back on TWTA1 and Transponder1. TWTA1 was successfully switched on, however
during switch on of TRSP1 a safety loop trigger approximately 15 secs after the TC Cmd was sent. SC status
at the time of the Safety Loop was: Pacs Stby, Spire Stby, HiFi nosiey,ACMS Stby, Giro's On,ACC in Stby (see
attached files)

SW Config Status:

CDMS V3.4.0.9
ACMS V3.7
HPSD HP-2-ASP-L1-1441 V10

Initiator: Date, Name and Signature 09-MAY-08 Brian Hogg

Cause of NC

Corrective/Preventative Action(s)

Verification

Internal NRB Dispositions

Added By B Hogg

NRB 9th May 2008

AdC/IL/MP/AK/BH/WD

The SC was being powered by the BS providing 10A (I Trip set to 21A) In addition the SAS was also providing 12A (6 sections at 2A).

The Error reported from the BS was negative over current indication on the load sim of the BS relating to the Charge sim of the BS not the discharge which caused the safety loop to trigger. According to the project EGSE support engineer, this should not have happened.

Classification:
Major ☒ **Minor** ☐

Customer Notification
09-MAY-08

Company	Project Name	
ALCATEL	HERSCHEL-PLANCK	NCR-No: HP-100000-ASED-NC-4207 Related internal NCR-No: Critical Item:Yes ☐ No ☒ Revision 0 Page 2 of 3

Nonconformance Report - Continuation Sheet -

On investigation of the safety loop trigger it was noticed there is believed to be an error in the configuration file for the test. BS providing current to the SC when only the SAS is expected to provide the power for this test, (ref to SPR525).

Next Step is to recover the SC using the safety loop recover procedure as follows.

Reset the BS, then recover SC

The short power on script to be used with multi Cmds prepared to manually disable CMDU RM A&B. As soon as power is provided by the BS to the SC these TC Cmds shall be sent. At the end of the power on sequence the power off sequence shall be performed.

Added 09/05/08 @ 02:15, the above SC recovery procedure has successfully been completed.

NRB agrees that the SC shall be power on using the normal IST switch on procedure for continuation of EMC RE tests.

SPR 0525 has been raised to change the Configuration File to set the battery to full charge and to allow the SAS to apply max power in order to avoid the suspected source of this safety loop.

Subsequent to SC power on the instruments will brought to Stby mode.

Ref. to MoMs

Date:
Name:
Signature:

Company	Project Name	
ALCATEL	HERSCHEL-PLANCK	NCR-No: HP-100000-ASED-NC-4207 Related internal NCR-No: Critical Item:Yes [ ] No [X] Revision 0 Page 3 of 3

Nonconformance Report - Continuation Sheet -

NCR/NRB Attachments

	Description	Filename	Last Updated
1	Configuration File for Test	peppe.jpg	09-MAY-08 04:20:25
2	SC PWR prior safety loop	GEN-POWER_mimic1.jpg	09-MAY-08 04:25:48
3	Cmd history around time of safety loop occurrence	CMD_his_SafetyLoop.txt	09-MAY-08 04:27:38
4	CDMU log at time of safety loop	CDMU_bootreport_2008.129.	09-MAY-08 04:29:43
5	cdmu prior safety loop	CDMU_bootreport_2008.129.	09-MAY-08 04:28:48
6	SC status when safety loop occurred	SAT_mimic2.jpg	09-MAY-08 04:19:18
7	Applied test Configuration for RE and Auto Comp	IST_TEST_CONFIGURATION.tx	09-MAY-08 04:22:37
8	ACC report	ACC_bootreport_2008.129.0	09-MAY-08 04:28:07
9	herschel sat overview 1	SAT_mimic1.jpg	09-MAY-08 01:30:33
10	SC pwr at safety loop	GEN-POWER_mimic2.jpg	09-MAY-08 04:26:32
11	report of safety loop on SAS	SAS-SCOE_window2.jpg	09-MAY-08 04:24:28
12	SAS settings prior to safety loop	SAS-SCOE_window1.jpg	09-MAY-08 04:23:50
13	BS safety loop	BS-SCOE_window.jpg	09-MAY-08 04:25:15

END OF DOCUMENT

	Name	Dep./Comp.		Name	Dep./Comp.
	Baldock Richard	FAE12		Steininger Eric	AED321
	Barlage Bernhard	AED13		Stritter Rene	AED11
	Bayer Thomas	ASA42	x	Suess Rudi	OTN/ASA44
	Brune Holger	ASA45		Theunissen Martijn	DSSA
	Chen Bing	HE Space		Tigges Klaus	AET32
	Davis William	Captec		Vascotto Riccardo	HE Space
	Edelhoff Dirk	AED21		Wagner Klaus	ASG23
	Fehringer Alexander	ASG15	x	Wietbrock Walter	AET12
x	Fricke Wolfgang Dr.	AED 65		Wöhler Hans	ASG23
	Geiger Hermann	ASA42		Wössner Ulrich	ASE252
	Grasl Andreas	OTN/ASA44		Zumstein Armin	AED15
	Grasshoff Brigitte	AET12			
	Hamer Simon	Terma			
	Hanka, Erhard	FI522			
	Hendrikse Jeffrey	HE Space			
	Hendry David	Terma			
	Hengstler Reinhold	ASA42			
	Hinger Jürgen	ASG23			
x	Hohn Rüdiger	AED65			
	Hofmann Rolf	ASE252			
x	Hopfgarten Michael	AET32			
	Huber Johann	ASA42			
	Hund Walter	ASE252			
x	Idler Siegmund	AED312			
	Ivády von András	FAE12			
	Jahn Gerd Dr.	ASG23	x	ESA/ESTEC	ESA
	Jolk Matthias	AET1	x	Thales Alenia Space Cannes	TAS-F
	Klenke Uwe	ASG72		Thales Alenia Space Torino	TAS-I
	Koelle Markus	ASA43			
x	Koppe Axel	AED312		**Instruments:**	
x	Kroeker Jürgen	AED65	x	MPE (PACS)	MPE
	La Gioia Valentina	Terma	x	RAL (SPIRE)	RAL
	Lang Jürgen	ASE252	x	SRON (HIFI)	SRON
	Langenstein Rolf	AED15			
	Langfermann Michael	ASA41			
	Liberatore Danilo	Rhea		**Subcontractors:**	
	Martin Olivier	Altec		Austrian Aerospace	AAE
	Maukisch Jan	ASA43		Austrian Aerospace	AAEM
	Much Christoph	ASA43		BOC Edwards	BOCE
x	Müller Martin	ASA43		Dutch Space Solar Arrays	DSSA
	Pietroboni Karin	AED65		EADS Astrium Sub-Subsyst. & Equipment	ASSE
	Reichle Konrad	ASA42		EADS CASA Espacio	CASA
	Runge Axel	OTN/ASA44		EADS CASA Espacio	ECAS
	Schink Dietmar	AED321		European Test Services	ETS
	Schmidt Thomas	AED15		Patria New Technologies Oy	PANT
	Schweickert Gunn	ASG23		SENER Ingenieria SA	SEN
x	Sonn Nico	ASG51		Thales Alenia Space, Antwerp	TAS-ETCA