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

CI-No:

100000

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

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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

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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

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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.

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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	ОК
2	30M-1G	Н	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	ОК
4	30M-1G	Н	PACS	SPIRE noisy	Max noise level : 37 dBuV/m at 40 MHz	ОК
5	1G-18G	V	PACS	SPIRE noisy	Only one notable Emission due to TX at 8.467G	ОК
6	1G-18G	Н	PACS	SPIRE noisy	Only one notable Emission due to TX at 8.467G	ОК
7	10k- 200M	V	SPIRE_extra	SPIRE noisy	Max noise level : 62 dBuV/m at 3 MHz	ОК
8	30M- 200M	Н	SPIRE_extra	SPIRE noisy	Max noise level < 30 dBuV/m	ОК
9	10k-1G	V	SPIRE_nom	SPIRE noisy	Max noise level : 60 dBuV/m at 3 MHz	ОК
10	30M-1G	Н	SPIRE_nom	SPIRE noisy	Max noise level < 35 dBuV/m	ОК
11	TC notch	V	SPIRE_nom	SPIRE noisy	No notable emission	ОК
12	1G-18G	V	SPIRE_nom	SPIRE noisy	Only one notable Emission due to TX at 8.467G	ОК
13	TC notch	Н	SPIRE_nom	SPIRE noisy	No notable emission	ОК
14	1G-18G	Н	SPIRE_nom	SPIRE noisy	Only one notable Emission due to TX at 8.467G	ОК
16	10k-1G	V	HIFI	HIFI noisy	Max noise level : 54 dBuV/m at 2 MHz	ОК
17	30M-1G	Н	HIFI	HIFI noisy	Max noise level < 36 dBuV/m	ОК
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

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Plot n°	Freq range	Polar	Antenna pos	S/C status	Notable Results	Comments
20	TC notch	Н	HIFI	HIFI noisy	No notable emission	OK, XPND OFF
21	HIFI notch	Н	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	Н	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	Н	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

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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.

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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

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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

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As Run

Title:

HERSCHEL FM SAT RE / AutoComp EMC Test

Procedure

CI-No:

100000

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30.04.08

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Issue	Date	Shee t	Description of Change	Release
1	Date 30.04.08	Shee t All	Initial issue. RS test separated from doc (see HP-2-ASED-TP-0222); RE and AutoComp. test updated	Release

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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.

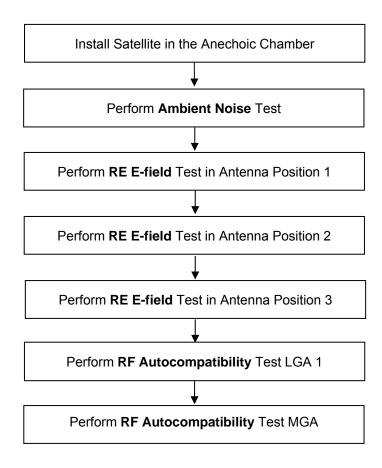


Figure 1.2-1: HERSCHEL FM Radiated EMC Test Flow

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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.

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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

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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.

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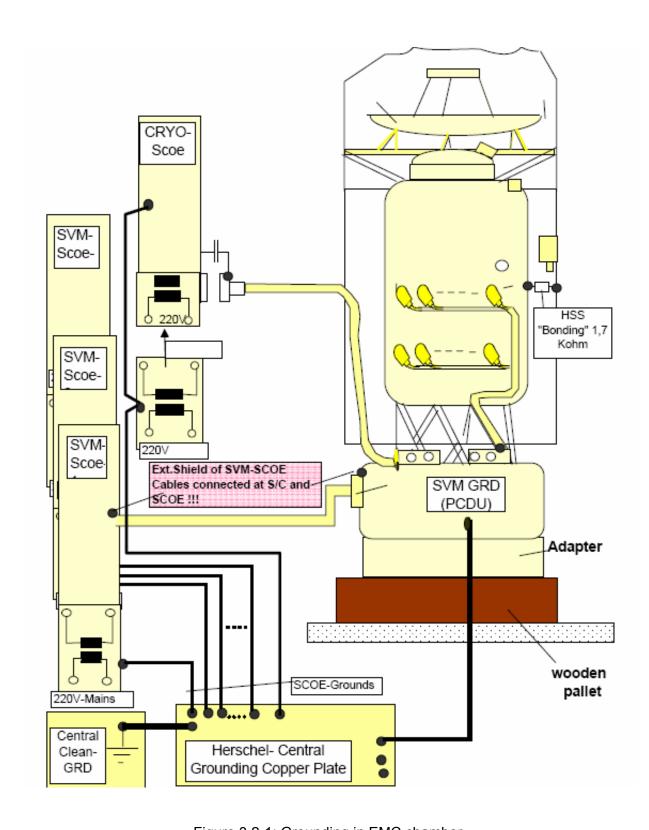


Figure 3.2-1: Grounding in EMC chamber

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EGSE Configuration 3.2

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.

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	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	1	1	1
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	1	1	1
AAD	1	1	1
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.

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	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

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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	∣ E Test Report f	l from ETS pa	 age 9		

Table 3.4-1: Test Equipment List

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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.

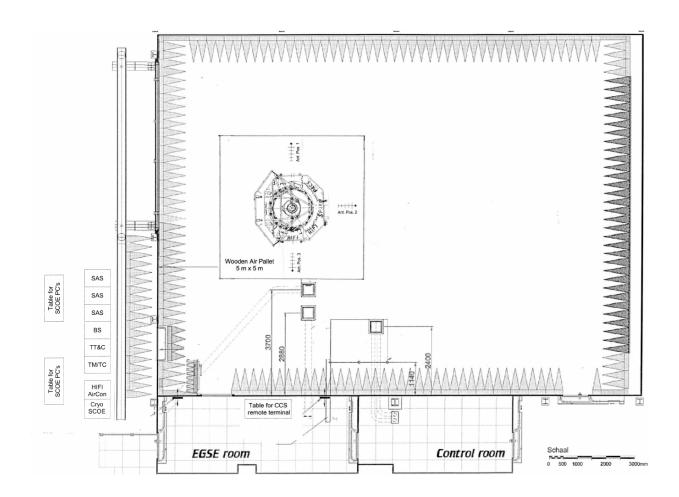


Figure 3.5-1 Arrangement of the EGSE and S/C in facility

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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

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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

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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.

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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 (TASF 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.).

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- 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.

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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

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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

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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.

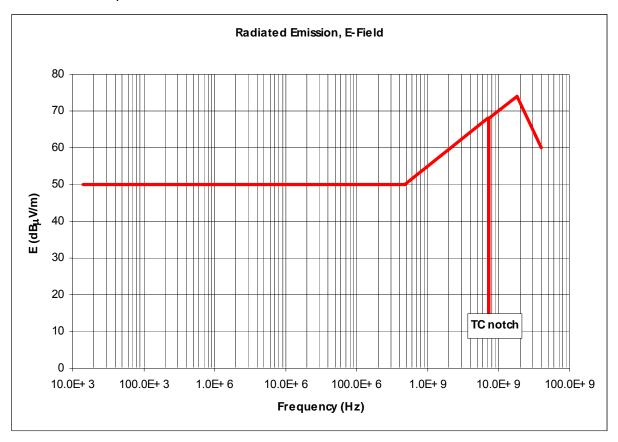


Figure 4.1-1: PACS and SPIRE RE E-Field General Limit

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

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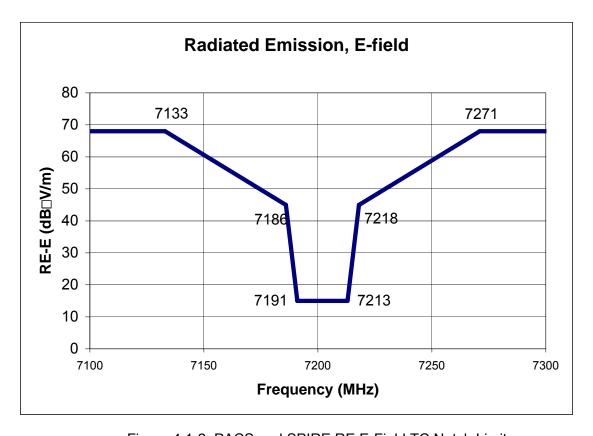


Figure 4.1-2: PACS and SPIRE RE E-Field TC Notch Limit

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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.

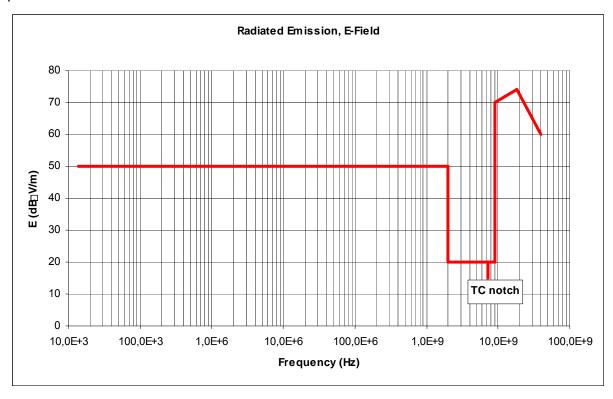


Figure 4.1-3: HIFI RE E-Field General Limit

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

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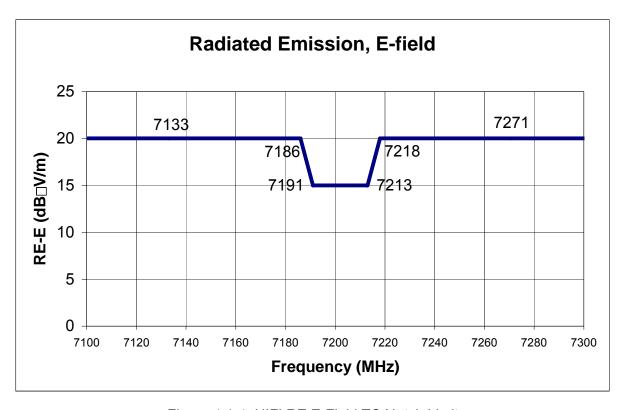


Figure 4.1-4: HIFI RE E-Field TC Notch Limit

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.

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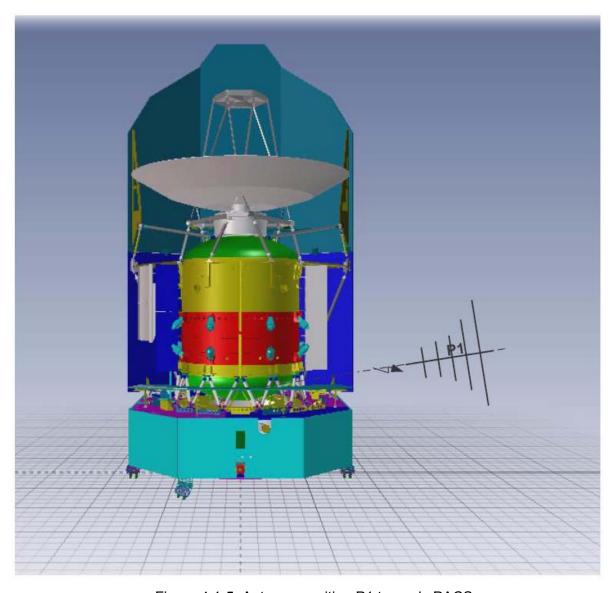


Figure 4.1-5: Antenna position P1 towards PACS

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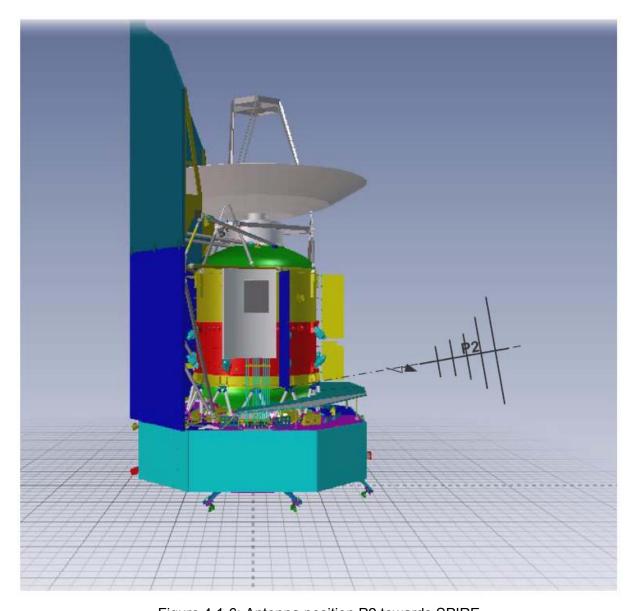


Figure 4.1-6: Antenna position P2 towards SPIRE

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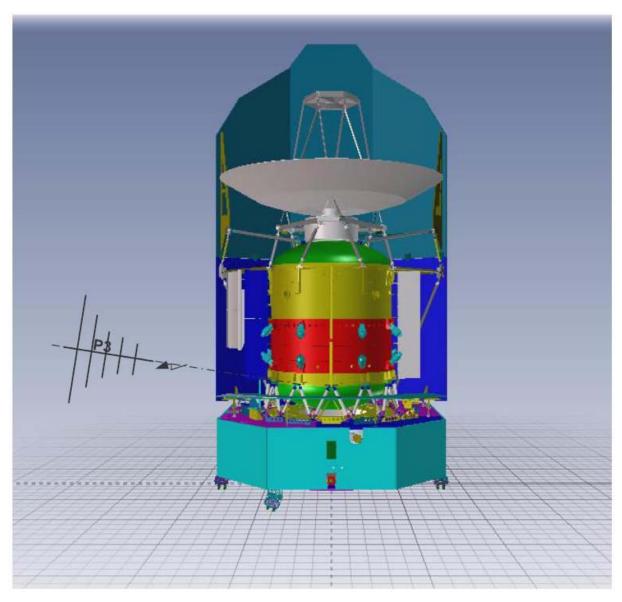


Figure 4.1-7: Antenna position P3 towards HIFI

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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.

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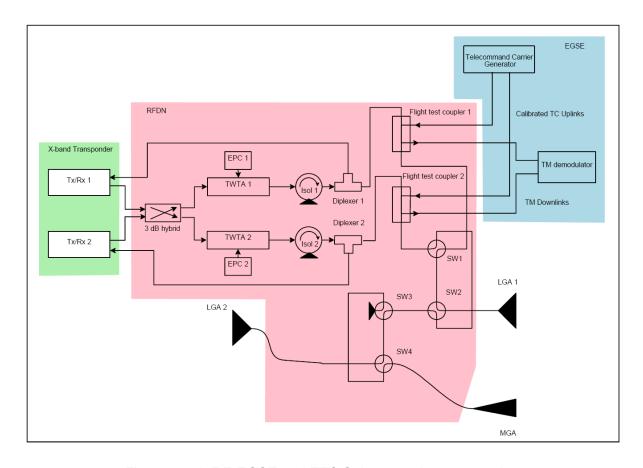


Figure 4.2-1: RF-EGSE and TTC Subsystem interconnection

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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

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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

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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		Р	N
1.1	Install the calibrated EMC Instrumentation.								P
1.2	Switch ON EGSE according AD5							V	
1.3	Confirm with operator that the spacecraft is switched OFF and all EGSE is active.							V	/
1.4	Perform sniff test with portable spectrum analyzer along the S/C to SCOE harness.					Not perfor	med	٨	
1.5	Position P2. Antennas in 1 m distance from the SPIRE panel, directed to SPIRE harness. Perform the following measurements:					Position of to PA because homes is on &	hanged se the flission	V	
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	Plot1 vest. Plot 2 horr	(X)	U	
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 vertice Plot 2 honge	cel*)		

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1.6	Collect excel frequency to amp the result of the measurement requirements limit. The measurement limit.	and compare it with the		Ste MA	: fle: Palaka av	nbleat ats	
Test location	T 3	Operator 7-03-00 F	Product-Assurance: 07/65/68		Date: 7-5-0	08	
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5.2 Antenna Position P1 (towards PACS)

2.5.00

*******************************									-3K * - 5	5.00
Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Commer	it	Р	N	
2.1	Install the calibrated EMC Instrumentation. Verify that the on board LGA / MGA antennas are covered with test caps.							V		
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.	ОР				POWER SCOE BYTHODE SE SIR	INSTEAD			
2.2.2	Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5.	OP				OF V 35K	HODE			
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 we with PACS,	es stoni	tec	(16:25 4(E) 5
2.2.5	Switch SPIRE from STB into SPIRE Noisiest Mode. Execute test steps sect. of 8.1.3.2 of AD5.	OP				with the st	31 11	V	r ca	16:20
2.3	Verify correct Mode 1 with EGSE operator.	ОР						V		16:20
2.4.	Position P1. Antennas in 1 m distance from the PACS panel, directed to PACS harness. Perform the following measurements:					Busenna tu is 2,20 m	64	V		
2.4.1	Measure emissions in the range from 14 kHz to 30 MHz for vertical polarisation.		Figure 4.1-1		See Plot	Plat 3		U		

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Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	Р	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	v	
2.4.3	Measure emissions in the range from 30 MHz to 1 GHz for vertical polarisation.		Figure 4.1-1		See Plot	Plox 31	V	
2.4.4	Measure emissions in the range from 1 GHz to 18 GHz for horizontal polarisation.		Figure 4.1-1		See Plot	601000 will CXTAB-578P3.4.8	Pla	16
2.4.5	Measure emissions in the range from 7133 MHz to 7271 MHz for horizontal polarisation, noteh.	generation -	Figure 4.1-2		See Plot	Step not per for No sicandennas PACS side	reed	
2.4.6	Measure emissions in the range from 1 GHz to 18 GHz for vertical polarisation.		Figure 4.1-1		See Plot	Plad 5	L	
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 performe No SIC antennas PACS side	d	
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 since tex will be	pesof	on a

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Step- No.	Interration-Stan-Description		Nom Val	Tol.	Act. Val.	Comment	Р	N
2.6.1	Switch SPIRE from SPIRE Noisiest Mode into STB. Execute test steps sect. 8.1.3.3 of AD5.	OP				NIA		
2.6.2	Switch SPIRE from STB into OFF. Execute test steps sect. 8.1.3.4 of AD5.	OP	Weekling and the control of the cont			WIA		
2.6.3	Switch PACS from Safe Mode into OFF. Execute test steps of sect. 8.1.2.4 of AD5.	OP	V V V V V V V V V V V V V V V V V V V			NIA		
2.6.4	Switch HIFI from STB into OFF. Execute test steps sect. 8.1.4.4 of AD5.	OP	A P. A. Barkerina (A Province Constitution of Section Constitution Constitut			NIA		
2.6.5	Switch OFF EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	ОР				NIA		
2.7	Verify that S/C is OFF with EGSE operator.	ОР			n	NIA		
Test location	Operator 8 - 05 - 08 Produ	S S	/	1/2		Date:		

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5.3 Antenna Position P2 (towards SPIRE)

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Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Commer	nt	Р	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 wolf	oefor Mu Sur Wed	4, 191	/
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.	ОР				POWER SCOE IN MODE INSTEAD SIR MODE	SECTELY SF	<i>x</i>	
3.2.1	Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	OP	A Common A Contraction of the Common and Adults						
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						And decimentation of the second secon	
3.2.4	Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5.	OP				500 2	2.4	V	
3.2.5	Switch SPIRE from STB into SPIRE Noisiest Mode. Execute test steps sect. of 8.1.3.2 of AD5.	OP	The second secon			*		L	
3.3	Verify correct Mode 1 with EGSE operator.	OP	9 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			₩		V	
3.4.	Position P2. Antennas in 1 m distance from the SPIRE panel, directed to SPIRE harness. Perform the following measurements:					Anthan hig	hy	V	

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3.4.9	Measure emissions in Alevanje from 144/2-30 M/z, vertical	Plot 7	V
	Measure envisations in the vante of to 200 MHz, horizontal and watted	Ploxe	V
	So on with stop 3.4.1		



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Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	Р	N
3.4.1	Measure emissions in the range from 14 kHz to 30 MHz for vertical polarisation.		Figure 4.1-1		See Plot	Plox 9	V	
3.4.2	Measure emissions in the range from 30 MHz to 1 GHz for horizontal polarisation.		Figure 4.1-1		See Plot	Plat 10	L	
3.4.3	Measure emissions in the range from 30 MHz to 1 GHz for vertical polarisation.		Figure 4.1-1		See Plot	Plat 9	v	
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	V	
3.4.5	Measure emissions in the range from 7133 MHz to 7271 MHz for horizontal polarisation, notch.		Figure 4.1-2		See Plot	Plat 13	V	
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	V	
3.4.7	Measure emissions in the range from 7133 MHz to 7271 MHz for horizontal polarisation, notch.		Figure 4.1-2		See Plot	P6+ 11	V	
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.							

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Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	Р	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							20:08
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 &	9	u ed	
3.6.3	Switch PACS from Safe Mode into OFF. Execute test steps of sect. 8.1.2.4 of AD5.	OP				Test continues o	nika	2 5	ect. 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.	ОР	Λ						
Test locatio	F7S Operator 05-08 Produ	uct-Assuran	cei No	8	5.50	8 Date: 8.5.08			

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5.4 Antenna Position P3 (towards HIFI)

Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	Р	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						1	
4.2.2	Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	ОР				EGSE is DN already. TWT's are not		
4.2.3	Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5.	ОР				TWT's are not		
4.2.4	Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5.	ОР				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.	ОР				agreed by TAS		
4.2	Switch HIFI from STB into HIFI Noisiest Mode. Execute test steps sect. of 8.1.4.2 of AD5.	ОР					V	
4.3	Verify correct Mode 2 with EGSE operator.	OP						

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Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment		Р	N
4.4.	Position P3. Antennas in 1 m distance from the HIFI panel, directed to HIFI harness. Perform the following measurements:					Rill. Hight:			
4.4.1	Measure emissions in the range from 14 kHz to 30 MHz for vertical polarisation.		Figure 4.1-3		See Plot	Plo 116		ν	
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		r	
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		
4.4.4	Measure emissions in the range from 1 GHz to 18 GHz for horizontal polarisation.		Figure 4.1-3		See Plot	Plot 2-1		V	
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+2-1		L	
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			50.
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.								7

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Doc. No: HP-2-ASED-TP-0180 // Sq MP Q5 4.4.1 // Plot 24

Issue: 1 Sa MP Q5 4.4.4 // TX+TWTF+4+171077 >

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Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	Р	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				Procedure 116		
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.	ОР						
4.7	Verify that S/C is OFF with EGSE operator.	ОР		0.0				
Test location	Operator Produ	uct-Assurance)		N-00/00/00 00 10 10 10 10 10 10 10 10 10 10 10 1	Date: 9.5.08		

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6 Step by Step Procedure Auto-Compatibility Test

6.1 Nominal AutoComp Test

8.5.08

							0.0	. V «	Sec. mark
Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Commen		Р	N
1.1	Remove test caps from on board LGA / MGA antennas.					Tx and EPC switched OF	FLAN	V	
	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.			-		semoving	testca	65	
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.	ОР				Steps 1.2.1 continued	-1.2.	4	<i>t</i> .
1.2.2	Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5.	OP				5.3	7307		
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.	ОР		-					
	Switch DN Tx and EPC1	OP				BS safety	Loop		1
Joc. No:	FIP-Z-ASED-112-0180	The control of the last of the	De la company	enaleste en		No. of the Contract of the Con	T T	On 1	L

Doc. No.

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Step- No.	Integration-Step-Description	OP/ EMC	Nom Val	Tol.	Act. Val.	Comment	Р	N
1.4	Perform AutoComp test according sect. of 8.1.7 of AD5.							
1.5	Switch S/C and instruments OFF					Switch OFF L	9	
1.5.1	Switch SPIRE from STB into OFF. Execute test steps sect. 8.1.3.4 of AD5.	OP				Switch OFF b Safety Loop		
1.5.2	Switch PACS from Safe Mode into OFF. Execute test steps of sect. 8.1.2.4 of AD5.	ОР						
1.5.3	Switch HIFI from Noisiest Mode into STB. Execute test steps of sect. 8.1.2.3 of AD5.	ОР						
1.5.4	Switch HIFI from STB into OFF. Execute test steps sect. 8.1.4.4 of AD5.	ОР						
1.5.5	Switch OFF EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	ОР		-				
1.6	Verify that S/C is OFF with EGSE operator.	ОР						
Test location	ETS Operator 8.5.08 Produ	ct-Assuran	ce:		L	Date: 8.5.08		

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6 Step by Step Procedure Auto-Compatibility Test

6.1 Nominal AutoComp Test

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						45		100
Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Commen	t	Р	N
Remove test caps from on board LGA / MGA antennas.					Tx and EPC OFF for remo	1 switc	hea	l Cai
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.					•	9		
Set S/C into Mode 2 according tables 3.3-1 and 3.3-2								
Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	ОР				Steps 1.2.	1-1.23 faom	sect	(.
Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5.	OP		:		3.4			
Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5.	OP	N	:					
Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5.	OP						V	
Switch HIFI from STB into HIFI Noisiest Mode. Execute test steps sect. of 8.1.4.2 of AD5.	OP						V	
Verify correct Mode 2 with EGSE operator.	ОР						10	
	Remove test caps from on board LGA / MGA antennas. 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. Set S/C into Mode 2 according tables 3.3-1 and 3.3-2 Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5. Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5. Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5. Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5. Switch HIFI from STB into HIFI Noisiest Mode. Execute test steps sect. of 8.1.4.2 of AD5.	Remove test caps from on board LGA / MGA antennas. 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. Set S/C into Mode 2 according tables 3.3-1 and 3.3-2 Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5. Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5. Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5. Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5. Switch HIFI from STB into HIFI Noisiest Mode. Execute test steps sect. of 8.1.4.2 of AD5.	Remove test caps from on board LGA / MGA antennas. 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. Set S/C into Mode 2 according tables 3.3-1 and 3.3-2 Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5. Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5. Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5. Switch HIFI from OFF into STB. Execute test steps sect. of Since HIFI from STB into HIFI Noisiest Mode. Execute test steps sect. OP	Remove test caps from on board LGA / MGA antennas. 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. Set S/C into Mode 2 according tables 3.3-1 and 3.3-2 Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5. Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5. Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5. Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5. Switch HIFI from STB into HIFI Noisiest Mode. Execute test steps sect. of 8.1.4.2 of AD5.	Remove test caps from on board LGA / MGA antennas. 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. Set S/C into Mode 2 according tables 3.3-1 and 3.3-2 Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5. Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5. Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5. Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5. Switch HIFI from STB into HIFI Noisiest Mode. Execute test steps sect. OP	Remove test caps from on board LGA / MGA antennas. 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. Set S/C into Mode 2 according tables 3.3-1 and 3.3-2 Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5. Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5. Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5. Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5. Switch HIFI from STB into HIFI Noisiest Mode. Execute test steps sect. of 8.1.4.2 of AD5.	Remove test caps from on board LGA / MGA antennas. 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. Set S/C into Mode 2 according tables 3.3-1 and 3.3-2 Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5. Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5. Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5. Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5. Switch HIFI from STB into HIFI Noisiest Mode. Execute test steps sect. of 8.1.4.2 of AD5.	Remove test caps from on board LGA / MGA antennas. 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. Set S/C into Mode 2 according tables 3.3-1 and 3.3-2 Switch ON EGSE and S /C. Execute test steps sect. 8.1.1 of AD5. Switch PACS from OFF into Safe Mode. Execute test steps of sect. 8.1.2.1 of AD5. Switch SPIRE from OFF into STB. Execute test steps sect. of 8.1.3.1 of AD5. Switch HIFI from OFF into STB. Execute test steps sect. of 8.1.4.1 of AD5. Switch HIFI from STB into HIFI Noisiest Mode. Execute test steps sect. of 8.1.4.2 of AD5.

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Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	Р	N
1.4	Perform AutoComp test according sect. of 8.1.7 of AD5.			-			V	Ī
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		·			V	
1.5.2	Switch PACS from Safe Mode into OFF. Execute test steps of sect. 8.1.2.4 of AD5.	OP					V	
1.5.3	Switch HIFI from Noisiest Mode into STB. Execute test steps of sect. 8.1.2.3 of AD5.	ОР					V	
1.5.4	Switch HIFI from STB into OFF. Execute test steps sect. 8.1.4.4 of AD5.	ОР					V	<u> </u>
1.5.5	Switch OFF EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.	ОР					V	
1.6	Verify that S/C is OFF with EGSE operator.	OP					V	<u></u>
est location	ETS Operator 10.5.08 Produ	ct-Assuranc	e:		L	Date: 10.5.08)	L

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6.2 Optional AutoComp Test

Not performed since results of sect. 6.1 are

OPI Nom | Act. | Comment | P N in Spec.

Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	Р	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						
2m . 2m . 2m	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						

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Step- No.	Integration-Step-Description		Nom Val	Tol.	Act. Val.	Coi	mment	Р	N
2.5.2	2.5.2 Switch PACS from Safe Mode into OFF. Execute test steps of sect. 8.1.2.4 of AD5.								
2.5.3	2.5.3 Switch HIFI from STB into OFF. Execute test steps sect. 8.1.4.4 of AD5.								
2.5.4	2.5.4 Switch OFF EGSE and S /C. Execute test steps sect. 8.1.1 of AD5.								
2.6	Verify that S/C is OFF with EGSE operator.	OP							
Test location	Operator		Product-As	surance:	<u> </u>	Date:		l	

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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

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Summary Sheets

7.2 Procedure Variation Summary

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

		Т	est Change	Curr. No.: Date:		
				Page 1	of 1	
Test designation			Test Procedure	Issue	Rev.	
Herschel EMC Test				1, dated		
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. T		Test Leader Project Engineer				
PA/QA Prime			Customer			

Table 7.2-1: Procedure Variation Sheet

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7.3 Non Conformance Report (NCR) Summary

NCR - No.	NCR - Title	Date	Open	PA
			Closed	sig.
	No NCR were			
	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. Malner
EMC Expert		11///
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.

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	Name	Dep./Comp.		Name	Dep./Comp.
	Baldock Richard	FAE12	х	Sonn Nico	ASG51
Х	Barlage Bernhard	AED13		Steininger Eric	AED32
Х	Bayer Thomas	ASA42	Х	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	х	Tigges Klaus	AED32
Χ	Fricke Wolfgang Dr.	AED 65		Wagner Klaus	ASG23
	Geiger Hermann	ASA42	Х	Wietbrock Walter	AET12
	Grasl Andreas	OTN/ASA44		Wöhler Hans	ASG23
	Grasshoff Brigitte	AET12		Wössner Ulrich	ASE252
Х	Hamer Simon	Terma		Zumstein Armin	ASQ42
	Hanka, Erhard	FI552			
	Hendrikse Jeffrey	HE Space			
Х	Hendry David	Terma			
	Hengstler Reinhold	ASA42			
	Hinger Jürgen	ASG23			
Х	Hohn Rüdiger	AED65			
	Hofmann Rolf	ASE252			
Х	Hopfgarten Michael	AED32			
X	Huber Johann	ASA42			
	Hund Walter	ASE252			
Х	Idler Siegmund	AED312			
	Ivády von András	FAE12			
	Jahn Gerd Dr.	ASG23			
	Jolk Matthias	AET1	Х	ESA/ESTEC	ESA
	Klenke Uwe	ASG72	X	Thales Alenia Space Cannes	TAS-F
Х	Koelle Markus	ASA43	X	Thales Alenia Space Torino	TAS-I
X	Koppe Axel	AED312	, ,	The second opace terms	
X	Kroeker Jürgen	AED65		Instruments:	
	La Gioia Valentina	Terma	×	MPE (PACS)	MPE
	Lang Jürgen	ASE252	X	RAL (SPIRE)	RAL
	Langenstein Rolf	AED15	X	SRON (HIFI)	SRON
Х	Langfermann Michael	ASA41		ercert (rm r)	CITOIT
^	Liberatore Danilo	Rhea			
	Martin Olivier	ASA43		Subcontractors:	
	Maukisch Jan	ASA43		Austrian Aerospace	AAE
	Much Christoph	ASA43		Austrian Aerospace	AAEM
Х	Müller Martin	ASA43		BOC Edwards	BOCE
^	Pietroboni Karin	AED65		Dutch Space Solar Arrays	DSSA
	Platzer Wilhelm	AED03		EADS Astrium Sub-Subsyst. & Equipment	
	Reichle Konrad	ASA42		EADS CASA Espacio	CASA
X	Runge Axel	OTN/ASA44		EADS CASA Espacio	ECAS
	Sauer Maximilian Dr.	AED65	,,	<u> </u>	ETS
		AED32	Х	European Test Services	PANT
	Schink Dietmar			Patria New Technologies Oy	
	Schmidt Thomas Schweickert Gunn	AED15 ASG23		SENER Ingenieria SA Thales Alenia Space, Antwerp	SEN TAS-ETCA

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Annex 2

Test Diary

Content:

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

5 pages

Doc. No: HP-2-ASED-TR-0254

Issue:



Herschel

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.

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- 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)
- spire noisiest mode. (1 to 18 GHz) 18:42 Start RE in spire position SC in 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

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Issue:





Herschel

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.
- Start RE in HIFI position SC in HIFI noisiest mode. (transponder OFF) vertical polarization Antenna height is 2.65 meter above the floor level
 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

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Issue: 1



Herschel

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)

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Herschel

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

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Issue:



Herschel

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

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Issue:



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	Р	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.		

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Issue: 1



Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	Р	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! Referen ce 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! Referen ce source not found.		See Plot	See 1.5.1	~	

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Issue:



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Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	Р	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	Р	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	>	

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Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	Р	ı	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! Referen ce 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! Referen ce 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! Referen ce source not found.		See Plot	Plot 3: SPIRE noisy mode in PACS location (vertical)	•		

→ Going on with step EXTRA-3.4.8

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Issue: 1



→ Coming from Step 3.4.7

2.4.4	Measure emissions in the range from 1 GHz to 18 GHz for horizontal polarisation.	Error! Referen ce 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! Referen ce 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					

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Issue:



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	Р	N
3.1	Install the calibrated EMC Instrumentation. Verify					3.1 – 3.3 not performed. Test Mode already switched ON	~	
	that the on board LGA / MGA antennas are							
	covered with test caps.					Power SCOE in Battery mode instead of S3R mode.		
3.2	Set S/C into Mode 1 according tables 3.3-1 and	OP						
	3.3-2.							
	Depending on current mode the test conductor							
	has to decide which steps will be executed and							
	which not.							

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Issue:



Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	Р	
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! Referen ce source not found.	See Plot	Plot 9: SPIRE noisy mode in SPIRE nominal location (vertical)	~	

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Issue:



3.4.2	Measure emissions in the range from 30 MHz to 1 GHz for horizontal polarisation.	Error! Referen ce 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! Referen ce 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! Referen ce 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! Referen ce 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 frange.	•
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)	~

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Issue:



→ Going on with 2.4.4

→ Coming from step 2.4.3

Extra antenna position:

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)	>	
	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.)	>	
Extra 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		0pen → ETS will send to Astrium on 13.05.08	
	measurement and compare it with the			
	requirements limit. The measured result shall			
	be 6 dB below the measurement limit.			

→ Going on with step 3.4.1

→ Coming from step 2.7

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	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 With step 6.1 auto compatibility.	because test contin.		
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.

Third day of testing

09.05.08

+	1					<u> </u>		
Step-	Integration-Step-Description	OP/	Nom	Tol.	Act.	Comment	P	N
No.	integration otep besoription	EMC	Val	101.	Val.	Comment	1.	

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Issue:



Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	Р	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)	*	

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Issue:



Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	Р	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)	~	

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Issue:



Step- No.	Integration-Step-Description	OP / EMC	Nom Val	Tol.	Act. Val.	Comment	Р	N
<u>Extra</u> 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".		
<u>Extra</u> 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)		

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Issue:



Step- No. <u>Extra</u> 4.4.10	Integration-Step-Description Same measurement as for step 4.4.4 – 4.4.7 with HIFI+TX+TWTA "OFF". Horizontal and vertical antenna position.	OP / EMC	Nom Val	Tol.	Act. Val.	Comment As initially foreseen in the test procedure. → In order to see the impact of the HIFI for RE.	Р	N
						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						

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Issue:



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

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Issue:







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

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Issue:

ets european test services

Your access to the ESA/ESTEC Test Centre

Herschel FM SC RE EMC Test

ETS Facility Data report

Project: Herschel



ets european

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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

ΑM **Amplitude Modulation**

BOB Break Out Box CW **Continuous Wave** Diff.M. Differential Mode ΕP Electro Propulsion

ESD Electro Static Discharge

E.Field Electric Field

EGSE **Electrical Ground Support Equipment**

Engineering Model ΕM

EMC Electro Magnetic Compatibility EMI Electro Magnetic Interference

EUT **Equipment Under Test**

FSS Fine Sun Sensor

FΜ Flight Model - or - Frequency Modulation

LNA Low Noise Amplifier MIL-STD Military Standard NB Narrow Band peak to peak pp RE

Radiated Emission

RFC Radio Frequency Compatibility

RS Radiated Susceptibility SAR Search And Rescue

with respect to w.r.t.

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4. Introduction

4.1 General Information

Order Number: 340610

European Test Services B.V. complies with the ISO 9001:2000 Quality **Quality Assurance:**

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: FΜ

4.3 Objective

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

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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.

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6. Test Description

6.1 Responsibilities

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

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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	В	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 preselection is available)

The used bandwidth and measuring times can be found in the table below.

Start	Stop	Step Width	Bandwidth	Measurement time	Dotootor	Transducer
Frequency	Frequency				Detector	Hansuucei
		Narrowbai	nd E-Field Re	ceiver 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

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	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 Sp	ectrum analy	zer 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	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		Maximum ambient level measured is
+1a to	E-Field Vertical polarization 10 kHz to 1 GHz	40 dB µV/m around 2.8 MHz
1e	File name : Herschel RE 1	40 dB µV/III around 2.6 MH2
16	Zero Run	Plot 1a to 1e are decade prints of the
	Antenna at Pac location 270 cm above	same measurement results
	floor 1 meter from SVM	Same measurement results
2	E-Field Horizontal polarization	No significant emissions above the
+2a	30 MHz to 1 GHz	noise floor.
and 2b	File name : Herschel RE2	Plot 2a and 2b are decade prints of the
	Zero Run	same measurement results
	Antenna at Pac location 270 cm above	
	floor 1 meter from SVM	
3	E-Field Vertical polarization	Maximum emissions level measured
+3a to	10 kHz to 1 GHz	around 2.8 MHz at 58 dBµV/m
3e	File name : Herschel RE 3	
	Spire in noisiest mode	Plot 3a to 3e are decade prints of the
	Antenna at Pac location 270 cm above	same measurement results
	floor 1 meter from SVM	
4	E-Field Horizontal polarization	Maximum emissions level measured
+4a	30 MHz to 1 GHz	around 39 MHz at 35 dBµV/m
and 4b	File name : Herschel RE 4	
	Spire in noisiest mode	Plot 4a and 4b are decade prints of the
	Antenna at Pac location 270 cm above	same measurement results
5	floor 1 meter from SVM	
5	E-Field Vertical polarization 1 GHz to 18 GHz	Emission measured at 8.4686 GHz
	File name : Herschel RE 5	level 86.3 dBµV/m and its first harmonic.
	Spire in noisiest mode	Harmonic.
	Antenna at Pac location 270 cm above	
	floor 1 meter from SVM	
6	E-Field Horizontal polarization	Emission measured at 8.4686 GHz
ľ	1 GHz to 18 GHz	level 93.2 dBµV/m and its first harmonic
	File name : Herschel RE 6	is to the dispersion and its mornamonio
	Spire in noisiest mode	
	Antenna at Pac location 270 cm above	
	floor 1 meter from SVM	



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



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PLOT	MEASUREMENT	REMARKS
16	E-Field Vertical polarization	Maximum emissions level measured is
+ 16a	10 kHz to 1 GHz	53 dBµV/m at 2 MHz
to 16e	File name : Herschel RE 16	Plot 16a to 16e are decade prints of the
	Hifi in noisiest mode Antenna at Hifi location 265 cm above floor	same measurement results
	at 1 meter SVM	
17	E-Field Horizontal polarization	Maximum emissions level measured is
+17a	30 MHz to 1 GHz	32 dBµV/m
and	File name : Herschel RE 17	Plot 17a and 17b are decade prints of
17b	Hifi in noisiest mode	the same measurement results
	Antenna at Hifi location 265 cm above floor	
	at 1 meter SVM	
18	E-Field Vertical polarization	In the Hifi slot signals are measured at
	1 GHz to 18 GHz	2.4989 GHz - 23.0 dBµV/m.
	File name : Herschel RE 18	3.7434 GHz - 24.0 dBµV/m
	Hifi in noisiest mode	4.9969 GHz – 27.7 dBμV/m
	Antenna at Hifi nominal location 265 cm	6.5661 GHz – 20.9 dBµV/m
40	above floor at 1 meter SVM	No and all and an analysis
19	E-Field vertical polarization 7 GHz Notch	No emissions measured
	File name : Herschel RE 19	
	Hifi in noisiest mode	
	Antenna at Hifi nominal location 265 cm	
	above floor at 1 meter SVM	
20	E-Field Horizontal polarization	No emissions measured
	7 GHz Notch	
	File name : Herschel RE 20	
	Hifi in noisiest mode	
	Antenna at Hifi nominal location 265 cm	
21	above floor at 1 meter SVM	In the Hift elet cianale are recovered at
21	E-Field Horizontal polarization 1 GHz to 18 GHz	In the Hifi slot signals are measured at 2.49899 GHz – 26.4 dBµV/m.
	File name : Herschel RE 21	3.7434 GHz - 26.0 dBµV/m
	Hifi in noisiest mode	4.9969 GHz – 20.1 dBµV/m
	Antenna at Hifi nominal location 265 cm	6.5661 GHz – 20.0 dBµV/m
	above floor at 1 meter SVM	
22	E-Field Vertical polarization	In the Hifi slot signals are measured at
	1 GHz to 18 GHz	2.4989 GHz – 24.3 dBμV/m.
	File name : Herschel RE 22	3.7434 GHz – 23.6 dBμV/m
	Hifi in noisiest mode TWT ON	4.9969 GHz – 23.6 dBµV/m
	Antenna at Hifi nominal location 265 cm	6.2505 GHz – 2.3.5 dBµV/m
	above floor at 1 meter SVM	8.4689 GHz – 90.0 dBµV/m *
23	E-Field Horizontal polarization	16.935 GHz – 61.6 dBµV/m In the Hifi slot signals are measured at
23	1 GHz to 18 GHz	2.4989 GHz – 27.0 dBµV/m.
	File name : Herschel RE 23	3.7434 GHz – 26.9 dBµV/m
	Hifi in noisiest mode TWT ON	4.9969 GHz – 17.4 dBµV/m
	Antenna at Hifi nominal location 265 cm	6.2505 GHz – At noise level
	above floor at 1 meter SVM	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.



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

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

 \times

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

 \boxtimes The specified test requirements, conditions and input levels were met satisfactorily, \boxtimes All required data were measured and recorded, \boxtimes The data have adequate quality and are suitable for exploitation, \boxtimes The results of the on-site evaluation and checks are satisfactory, \boxtimes No non-conformance affecting the results is open,

No more than 10% of the measurements have been lost.

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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

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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	05.05-250D
Approved by :	Jaap vd Meulen	ETS-TE	125-105-015
Authorized by:	JL Le Carreres	ETS-QAM	Trust 30





Annex B. Radiated Emission

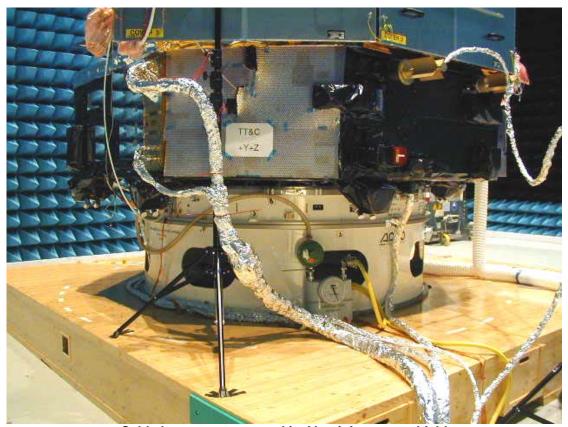




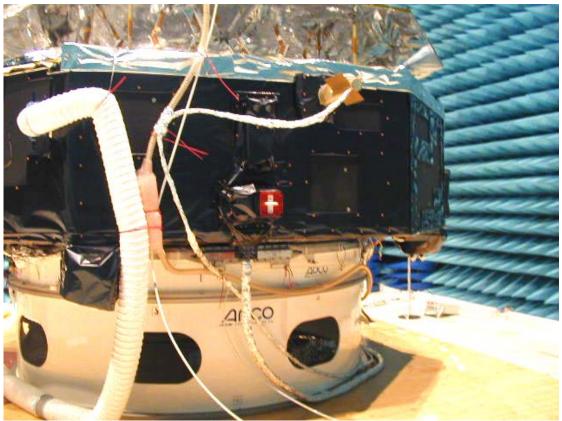


Herschel in final position in Maxwell.



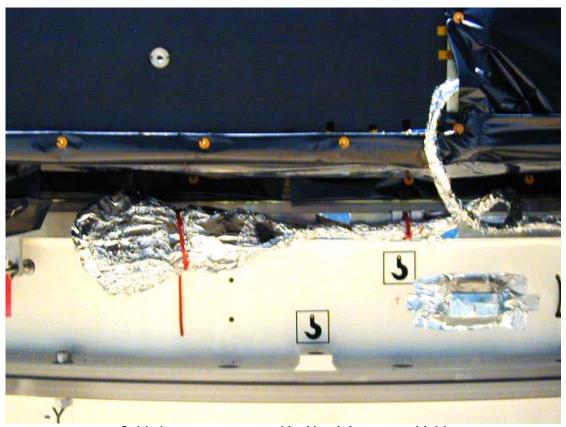


Cable harnesses wrapped in Aluminium over shield



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



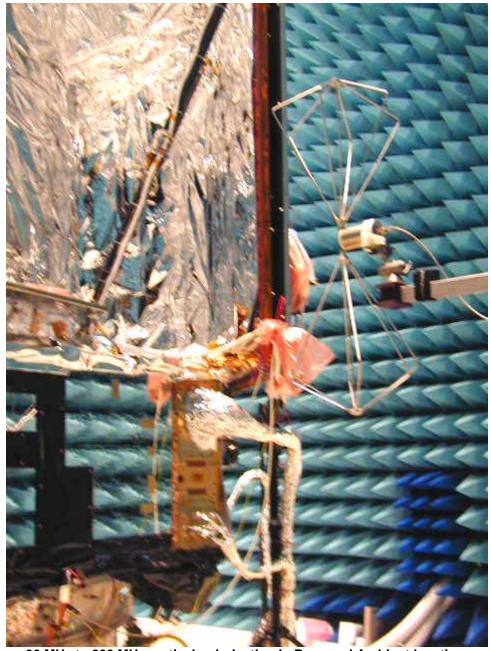




10 kHz to 30 MHz vertical polarisation in Pacs and Ambient location.



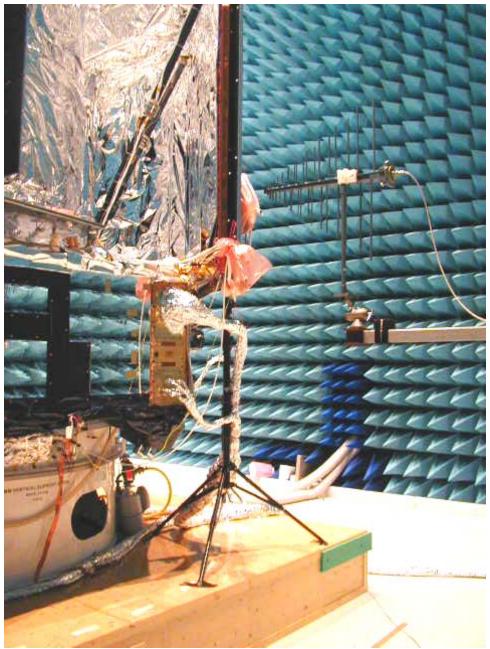




30 MHz to 200 MHz vertical polarisation in Pacs and Ambient location.



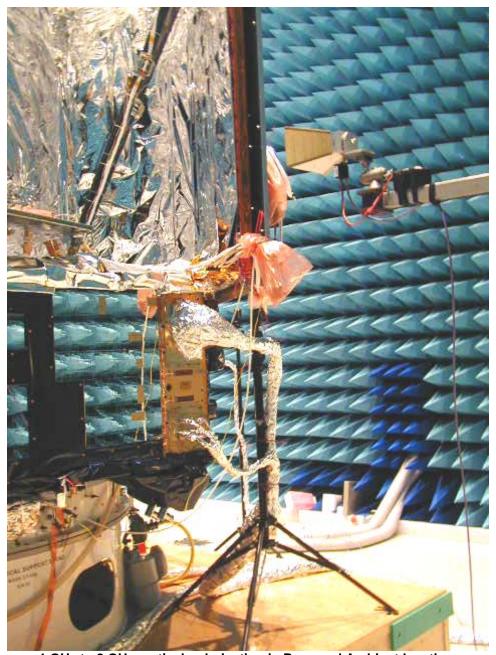




200 MHz to 1 GHz vertical polarisation in Pacs and Ambient location.



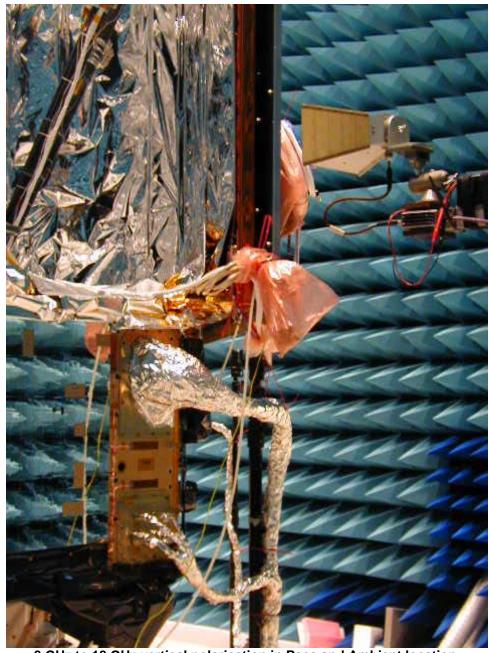




1 GHz to 8 GHz vertical polarisation in Pacs and Ambient location.

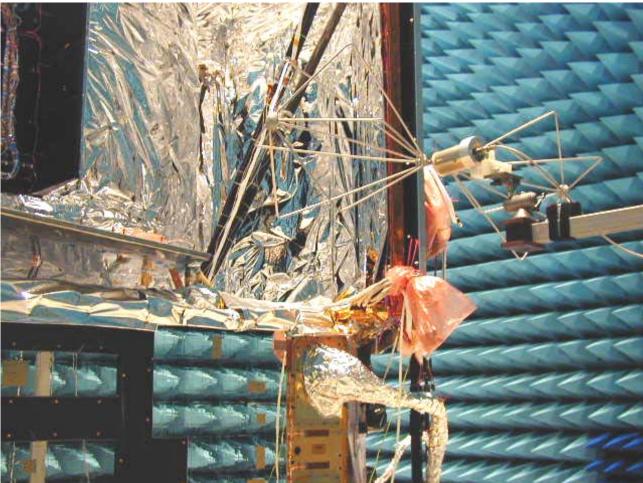






8 GHz to 18 GHz vertical polarisation in Pacs and Ambient location.

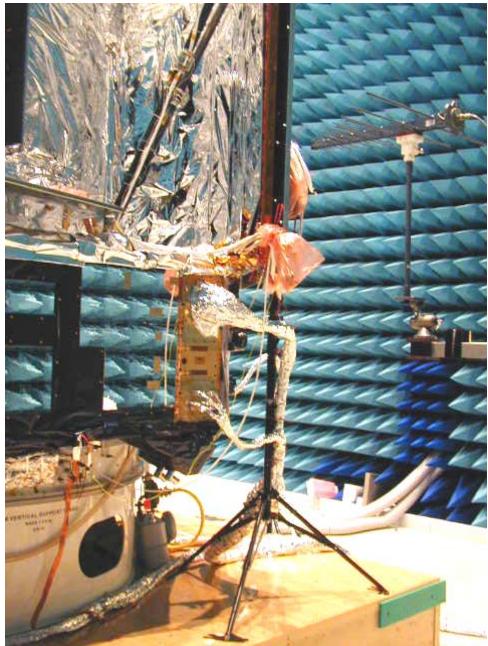




30 MHz to 200 MHz horizontal polarisation in Pacs and Ambient location.

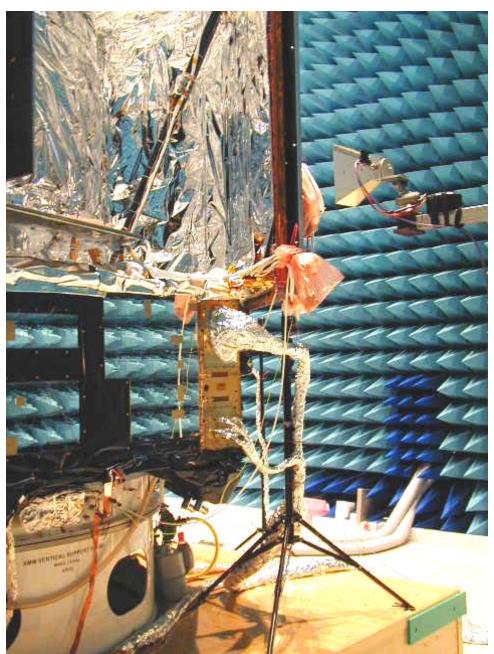






200 MHz to 1 GHz horizontal polarisation in Pacs and Ambient location.

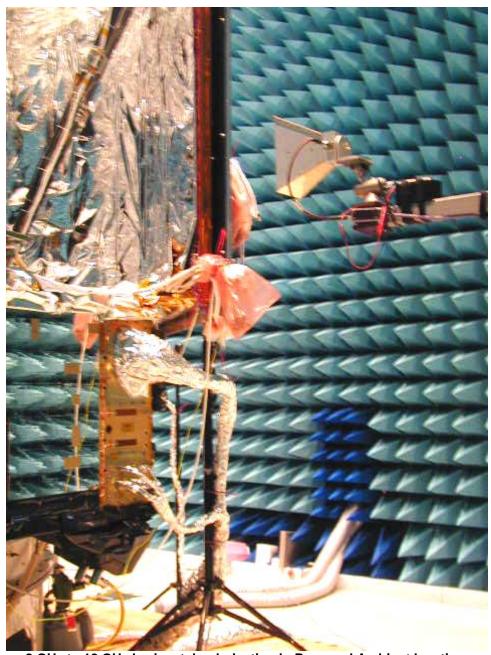




1 GHz to 8 GHz horizontal polarisation in Pacs and Ambient location.

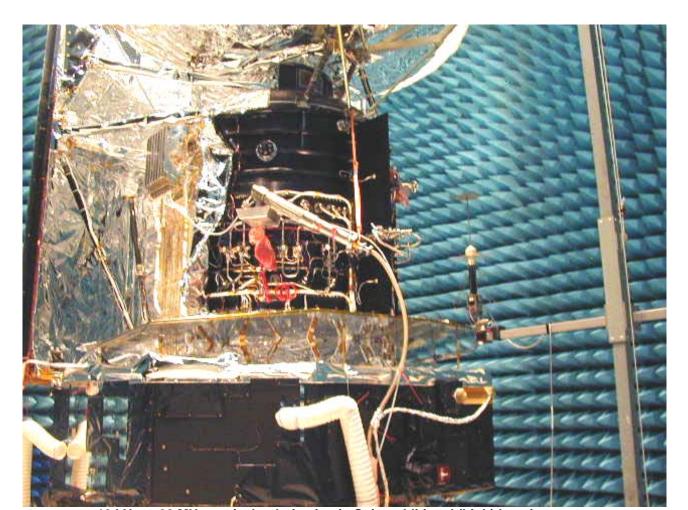






8 GHz to 18 GHz horizontal polarisation in Pacs and Ambient location.

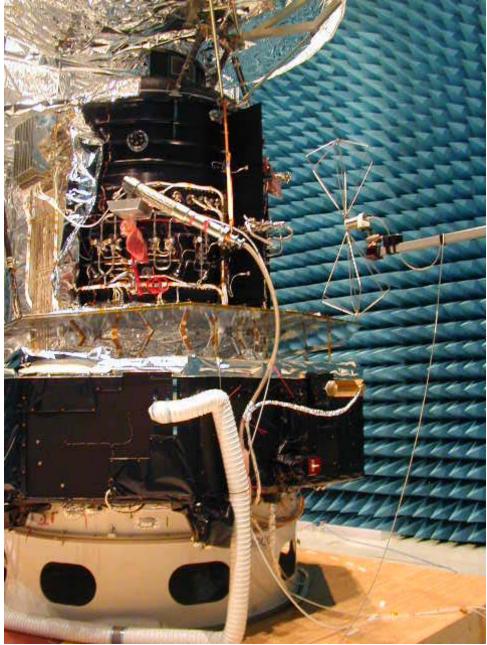




10 kHz to 30 MHz vertical polarisation in Spire additional (high) location.



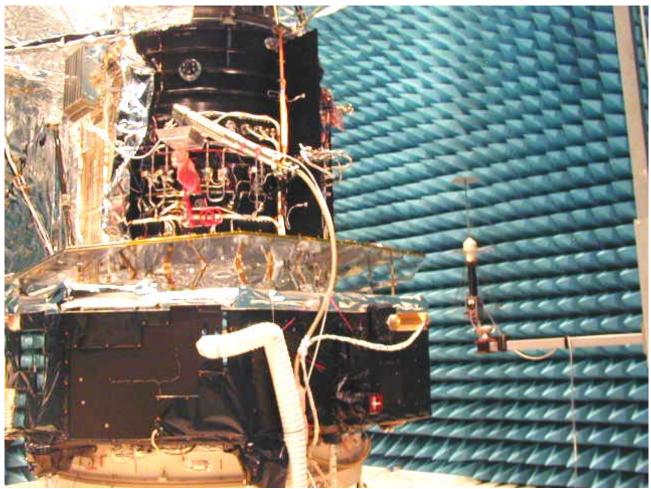




30 MHz to 200 MHz vertical polarisation in Spire additional (high) location.



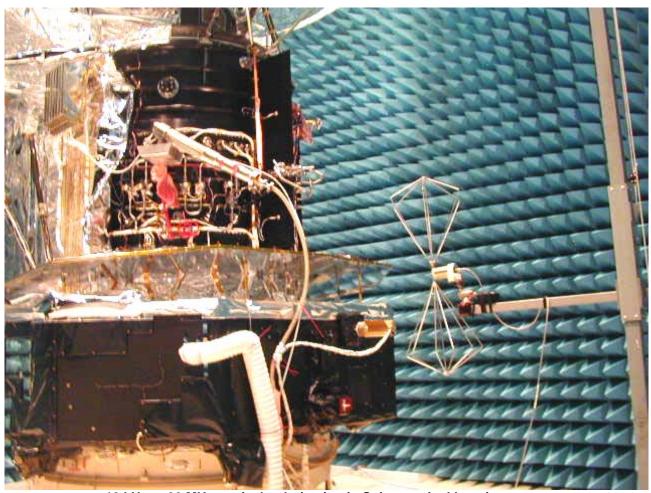




10 kHz to 30 MHz vertical polarisation in Spire nominal location.

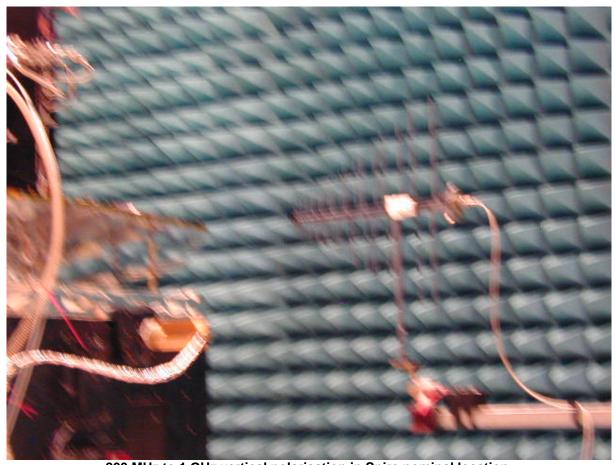






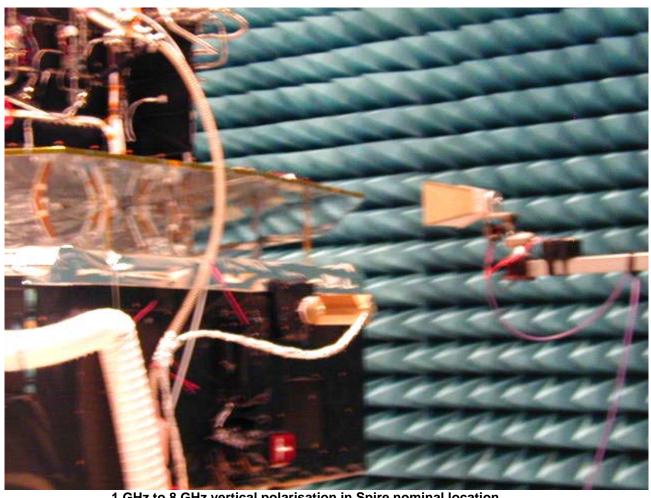
10 kHz to 30 MHz vertical polarisation in Spire nominal location.





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

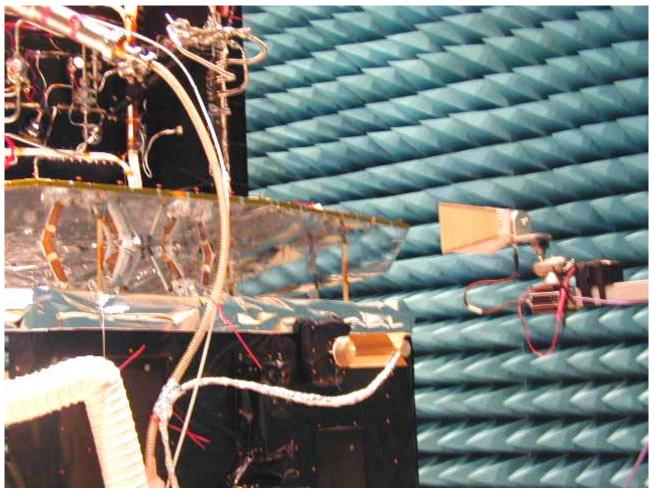




1 GHz to 8 GHz vertical polarisation in Spire nominal location. (camera autofocus had problems)

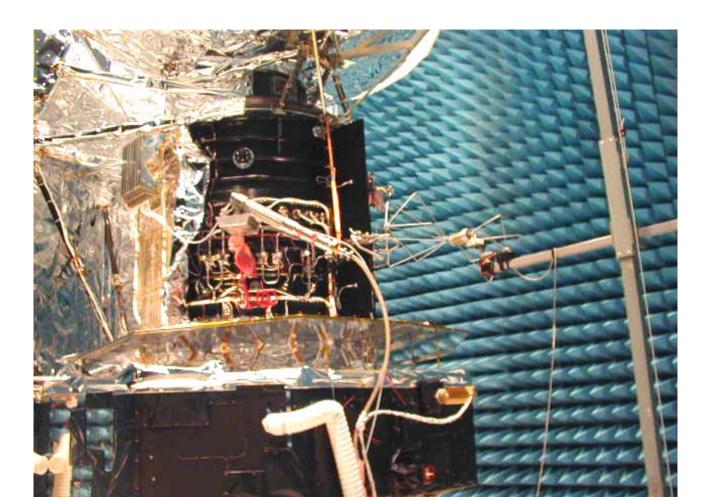






8 GHz to 18 GHz vertical polarisation in Spire nominal location.

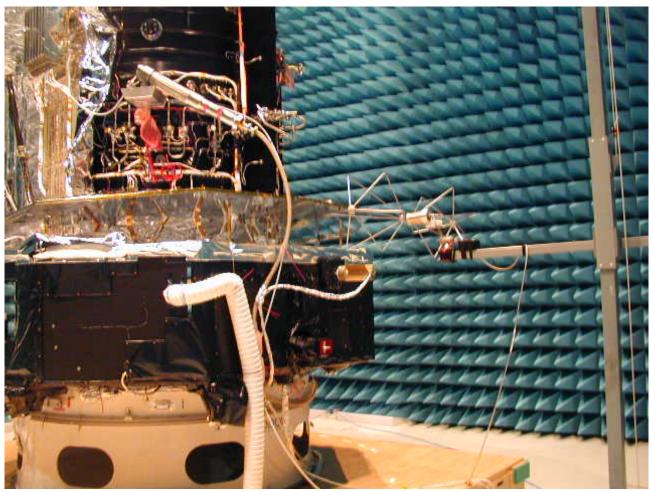




30 MHz to 200 MHz horizontal polarisation in Spire additional (high) location.

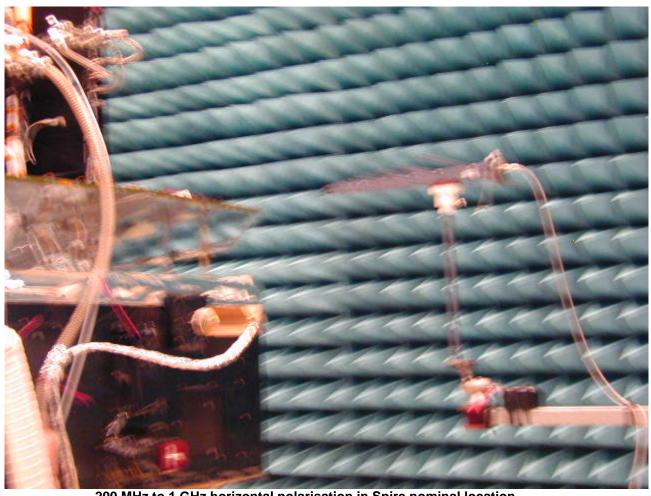






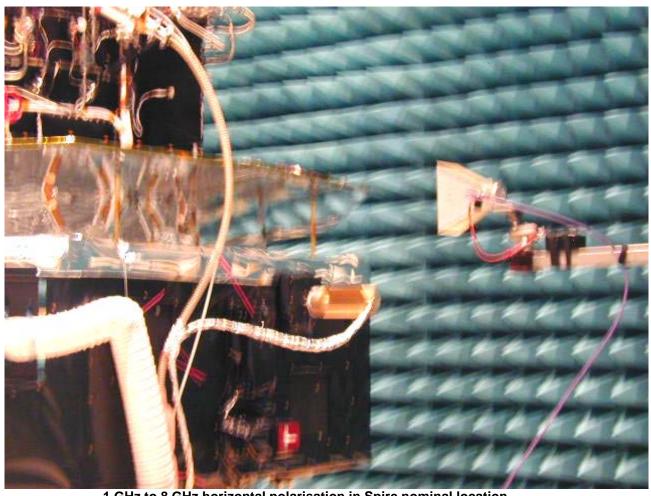
30 MHz to 200 MHz horizontal polarisation in Spire nominal location.





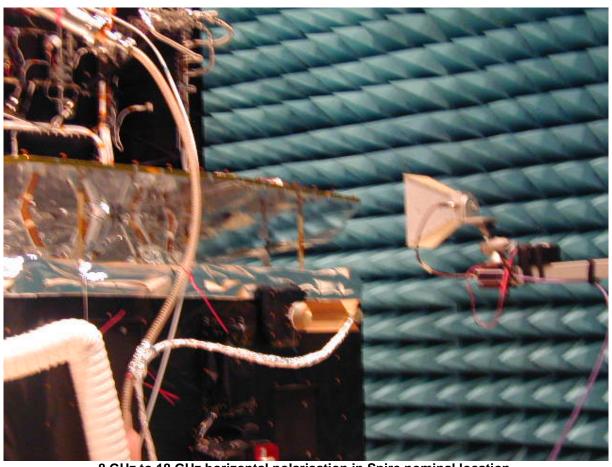
200 MHz to 1 GHz horizontal polarisation in Spire nominal location. (camera autofocus had problems)





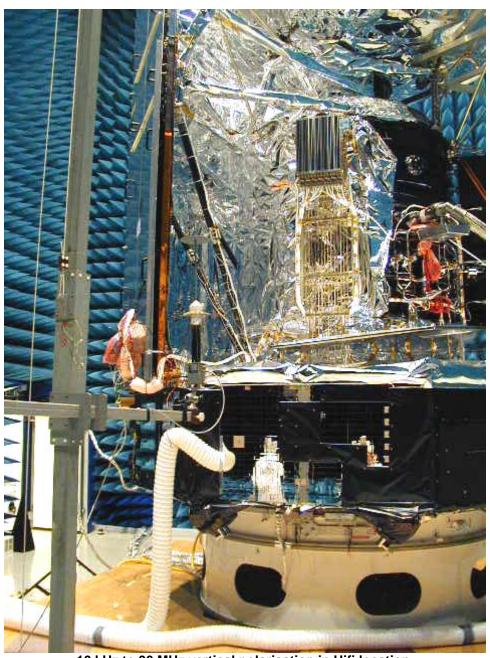
1 GHz to 8 GHz horizontal polarisation in Spire nominal location. (camera autofocus had problems)





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

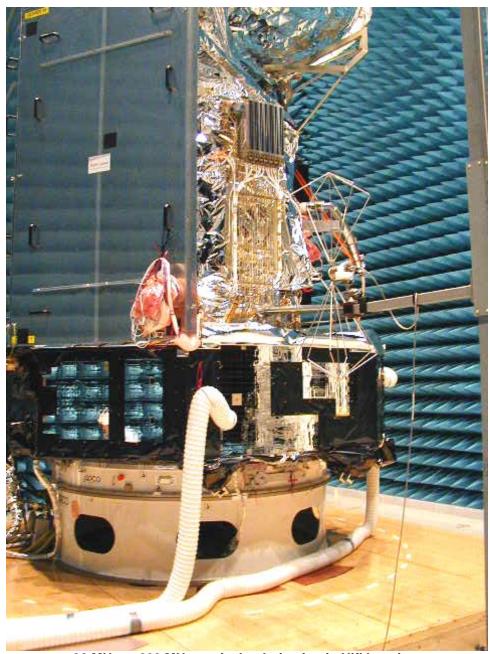




10 kHz to 30 MHz vertical polarisation in Hifi location.



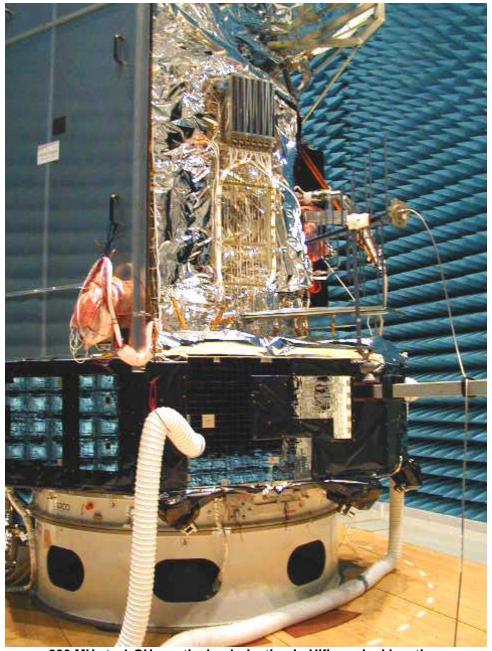




30 MHz to 200 MHz vertical polarisation in Hifi location.

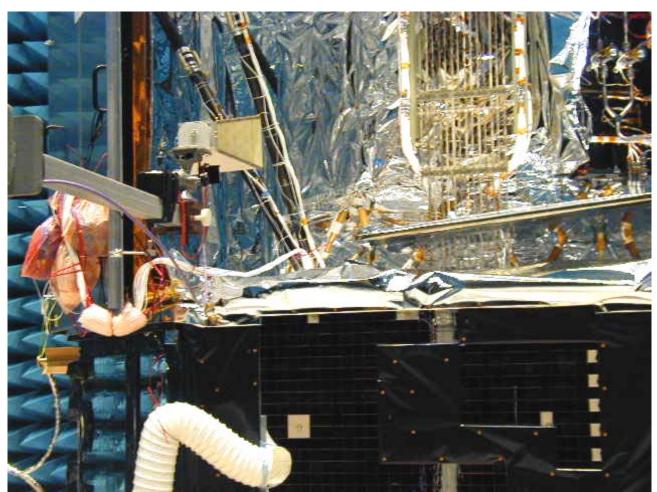






200 MHz to 1 GHz vertical polarisation in Hifi nominal location.

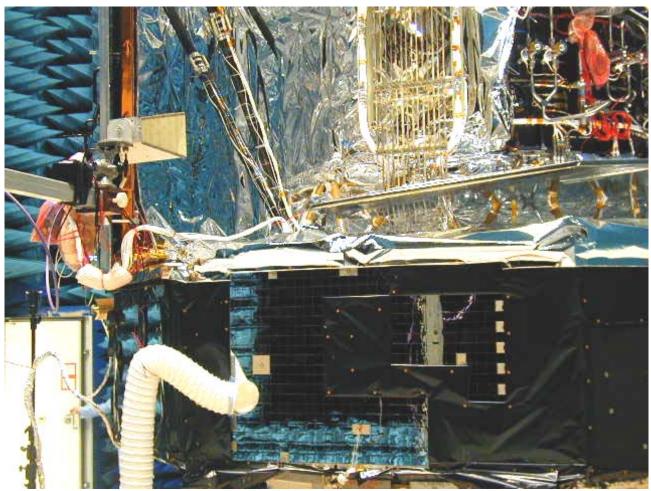




1 GHz to 8 GHz vertical polarisation in Hifi nominal location.

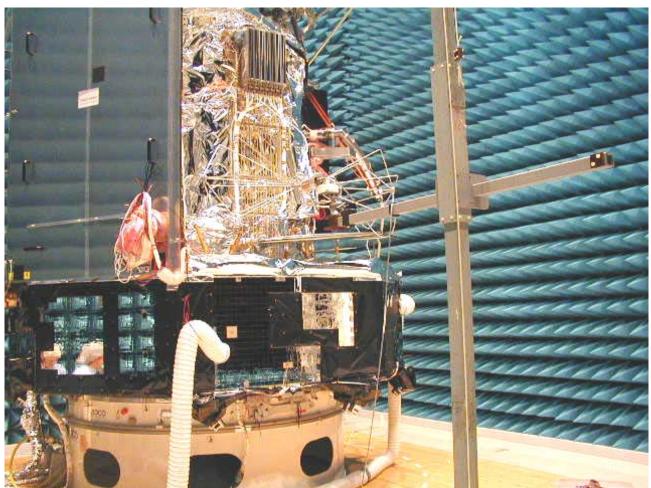






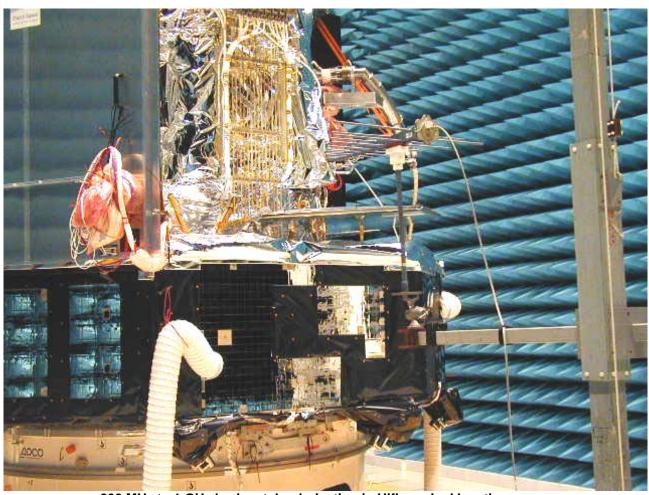
8 GHz to 18 GHz vertical polarisation in Hifi nominal location.





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

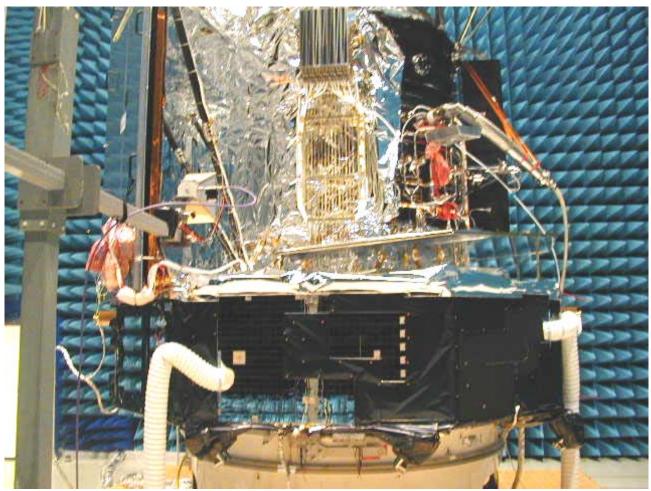




200 MHz to 1 GHz horizontal polarisation in Hifi nominal location.



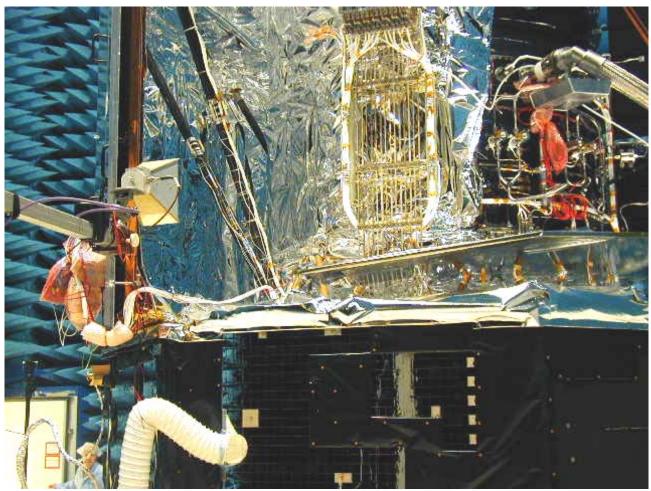




1 GHz to 8 GHz horizontal polarisation in Hifi nominal location.



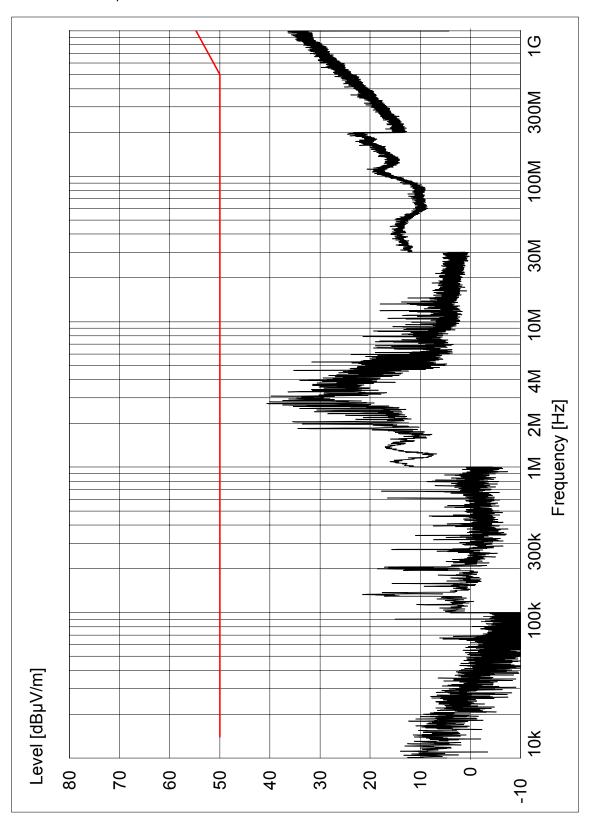




8 GHz to 18 GHz horizontal polarisation in Hifi nominal location.

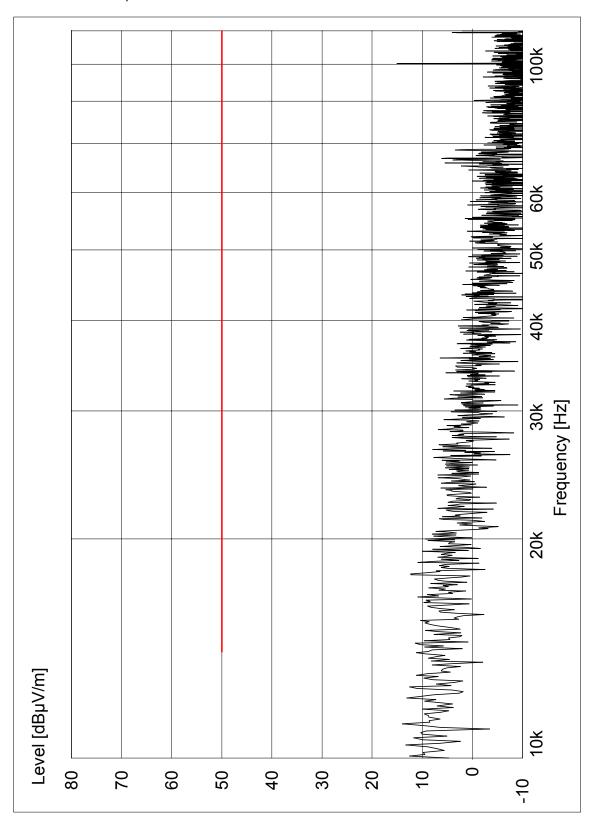


07-05-2008 19:47 Plot 1 Ambient in pacs location VP



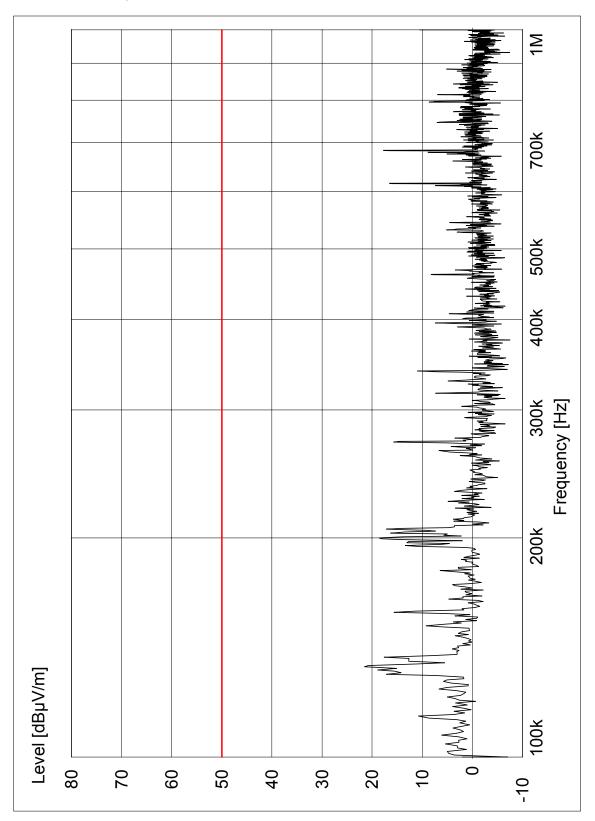


07-05-2008 19:47 Plot 1a Ambient in pacs location VP



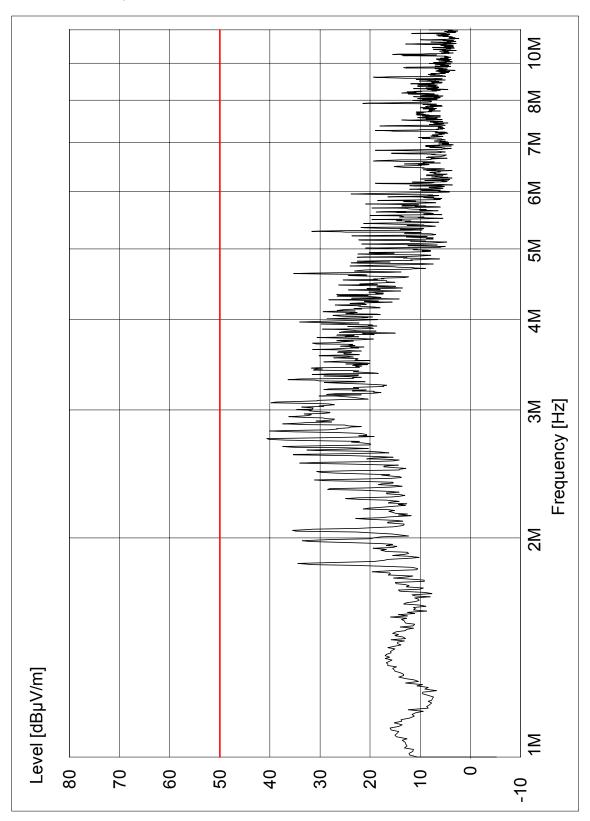


07-05-2008 19:47 Plot 1b Ambient in pacs location VP



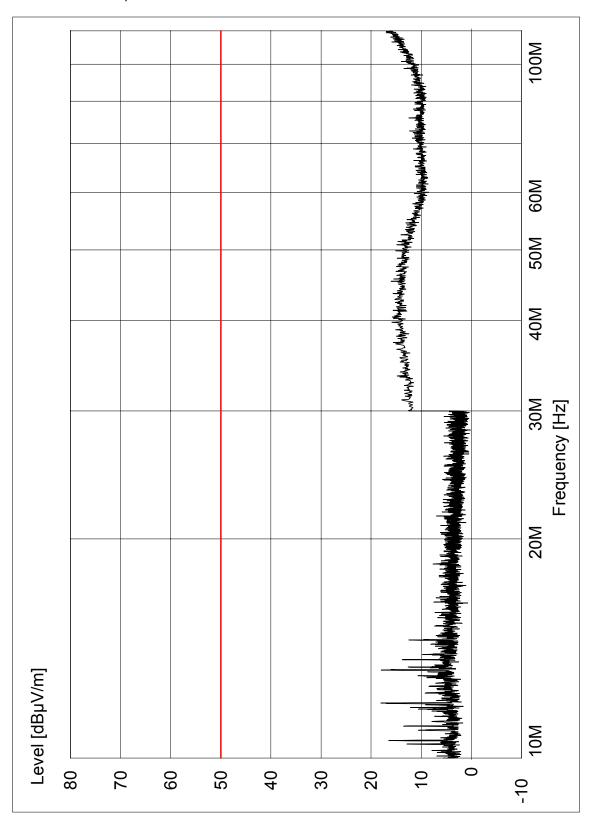


07-05-2008 19:47 Plot 1c Ambient in pacs location VP



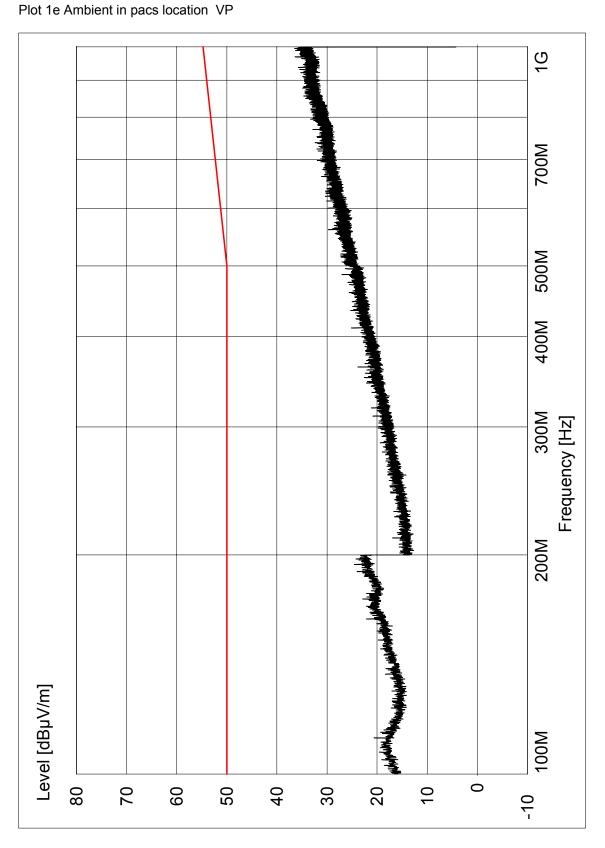


07-05-2008 19:47 Plot 1d Ambient in pacs location VP



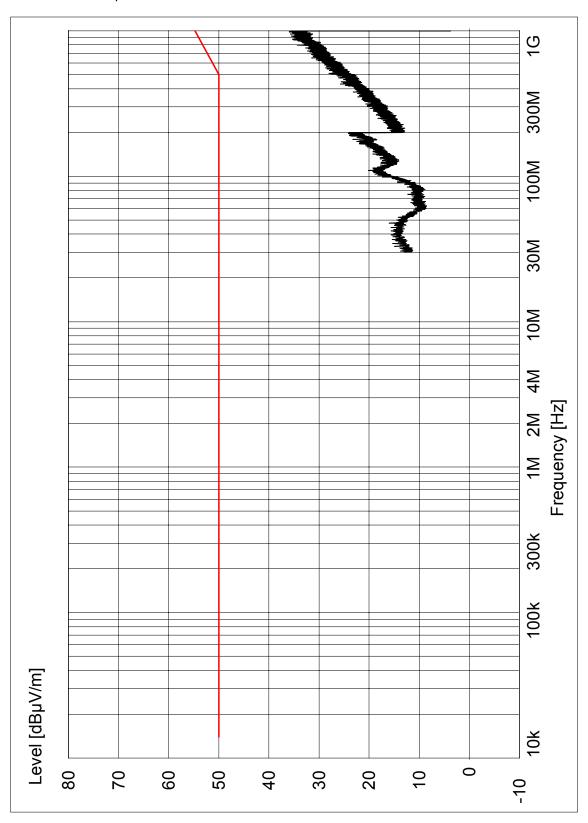


07-05-2008 19:47



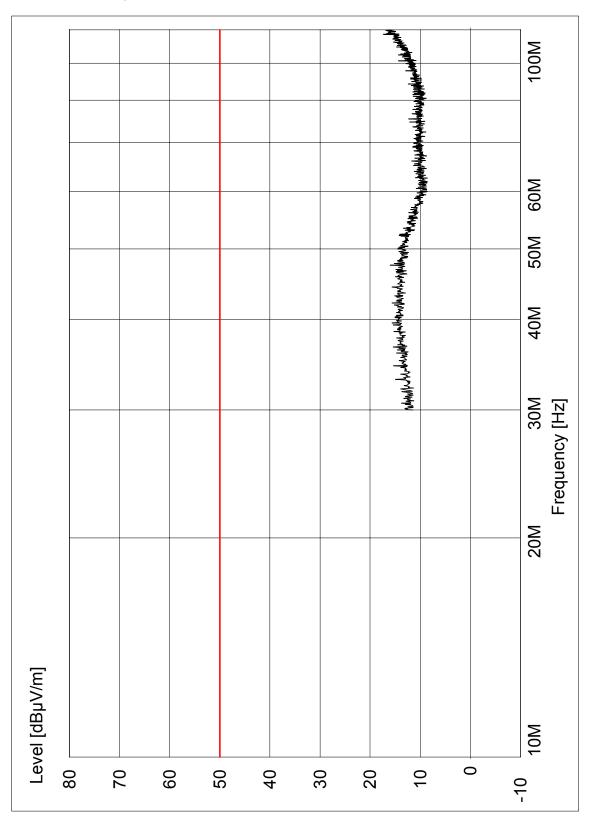


07-05-2008 20:04 Plot 2 Ambient in pacs location HP



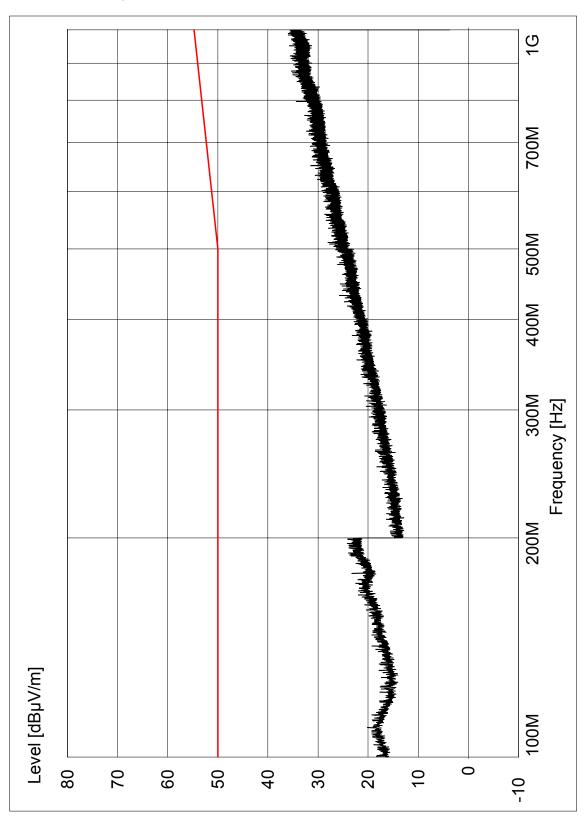


07-05-2008 20:04 Plot 2a Ambient in pacs location HP



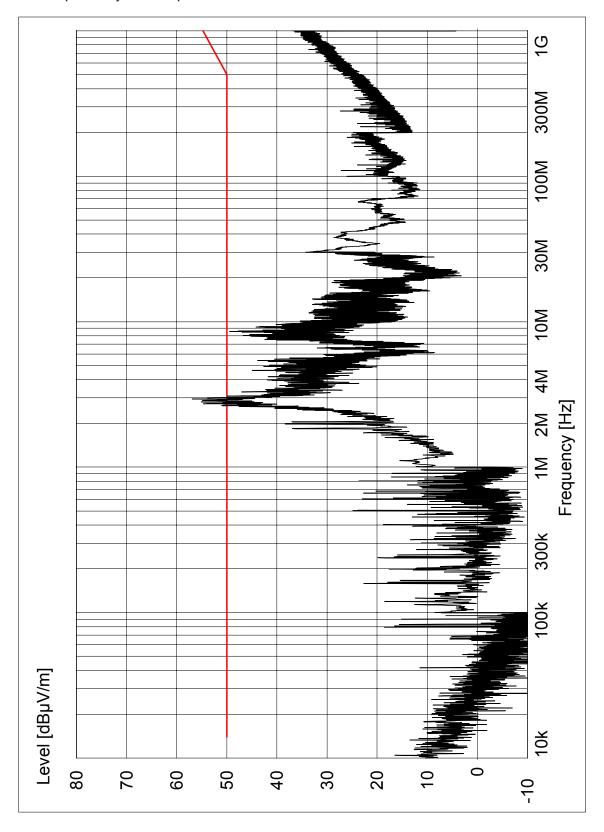


07-05-2008 20:04 Plot 2b Ambient in pacs location HP



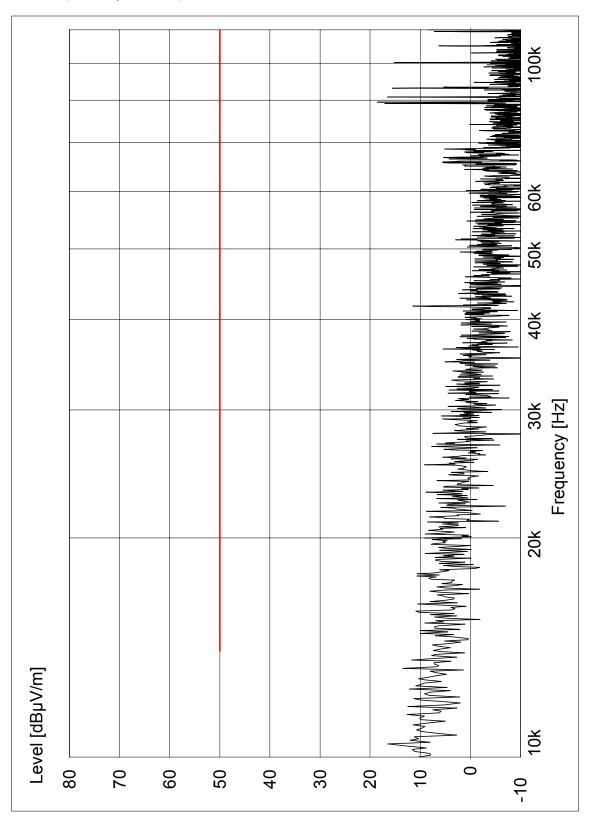


08-05-2008 16:43 Plot 3 Spire noisy mode in pacs location VP



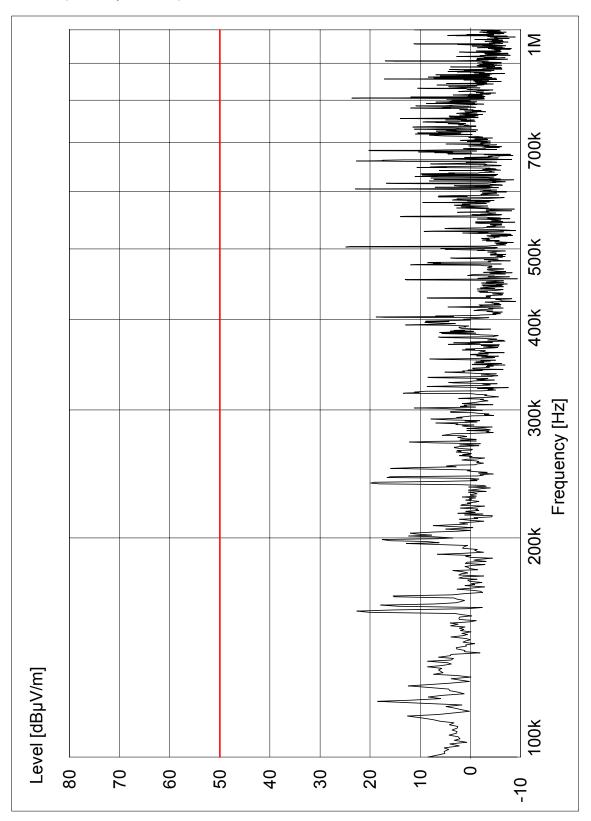


08-05-2008 16:43 Plot 3a Spire noisy mode in pacs location VP



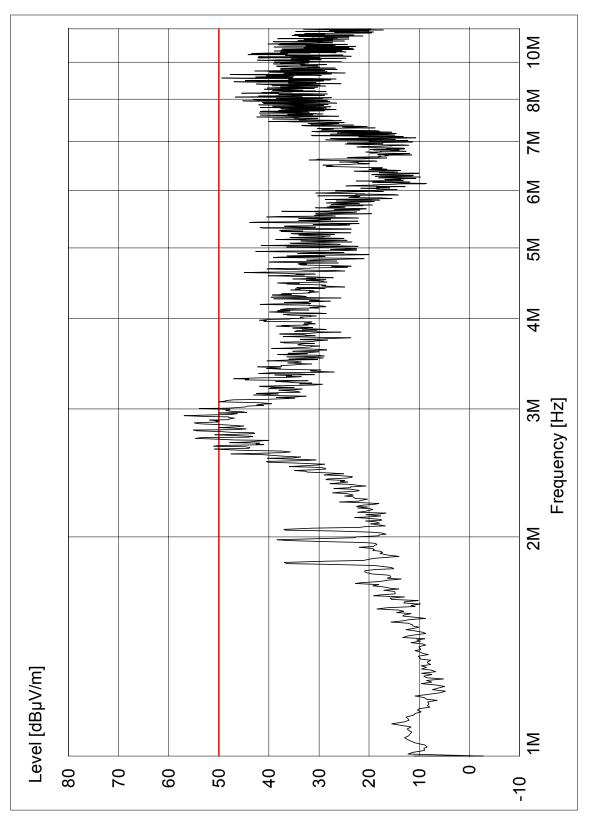


08-05-2008 16:43 Plot 3b Spire noisy mode in pacs location VP



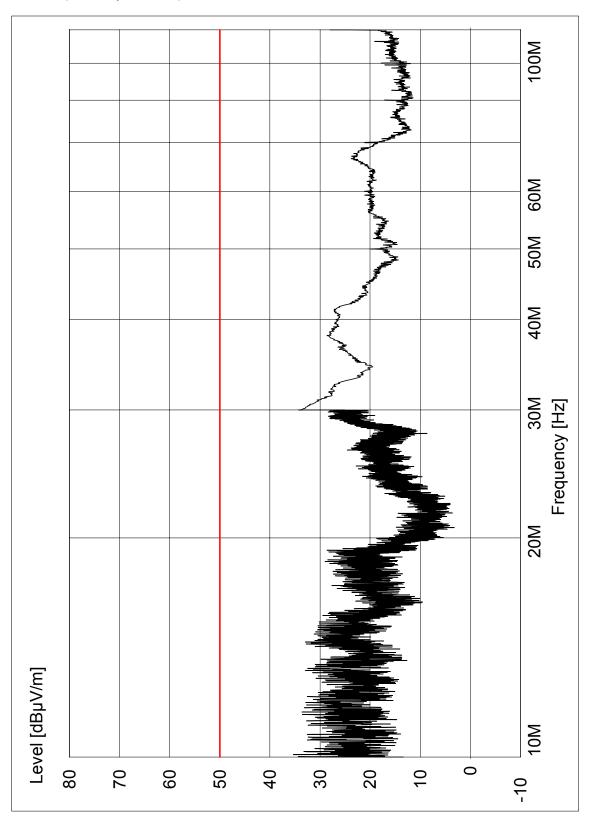


08-05-2008 16:43 Plot 3c Spire noisy mode in pacs location VP



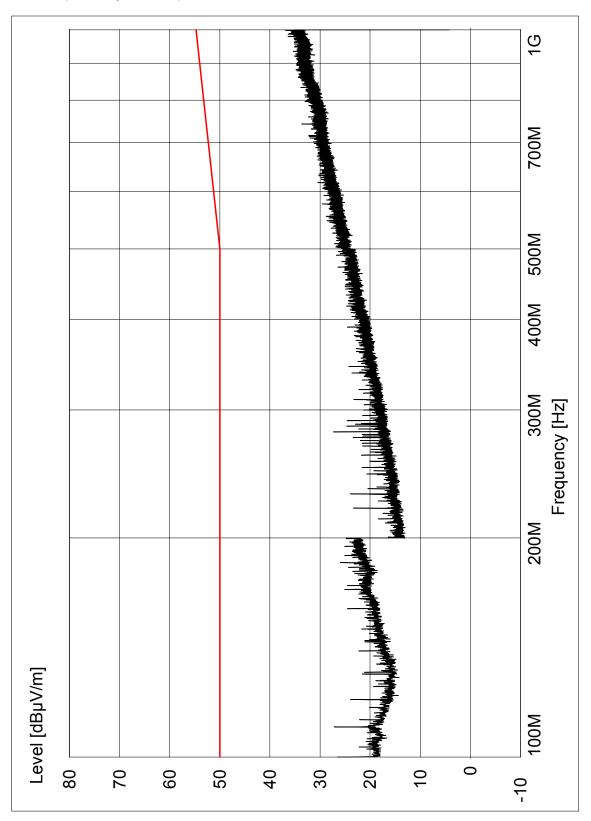


08-05-2008 16:43 Plot 3d Spire noisy mode in pacs location VP



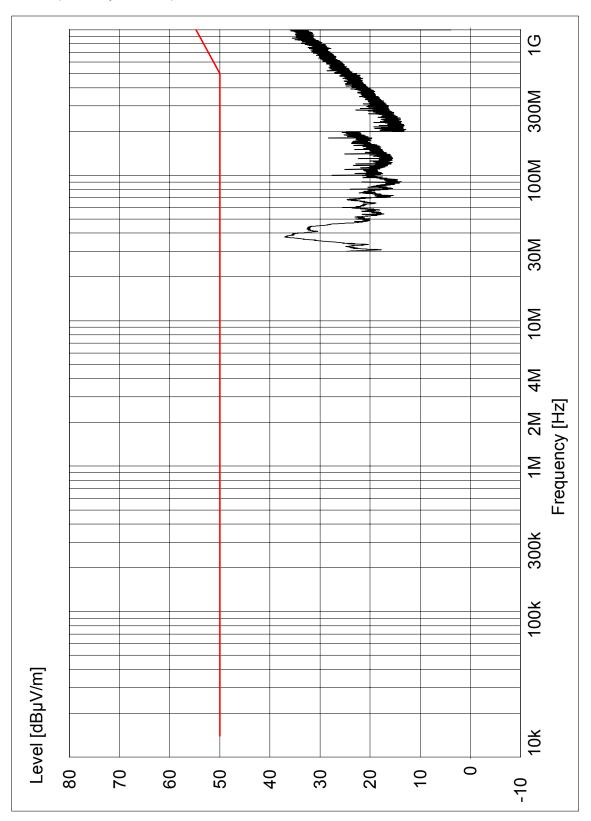


08-05-2008 16:43 Plot 3e Spire noisy mode in pacs location VP



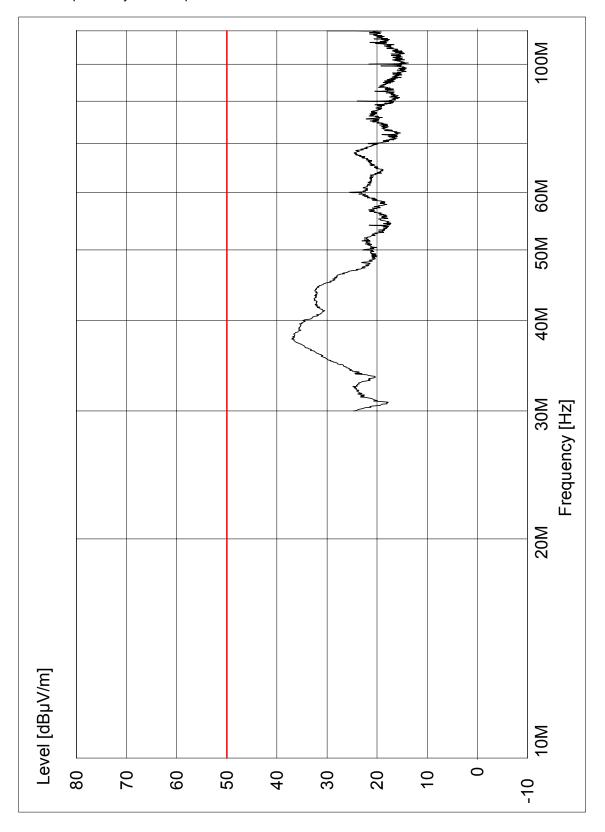


08-05-2008 16:55 Plot 4 Spire noisy mode in pacs location HP



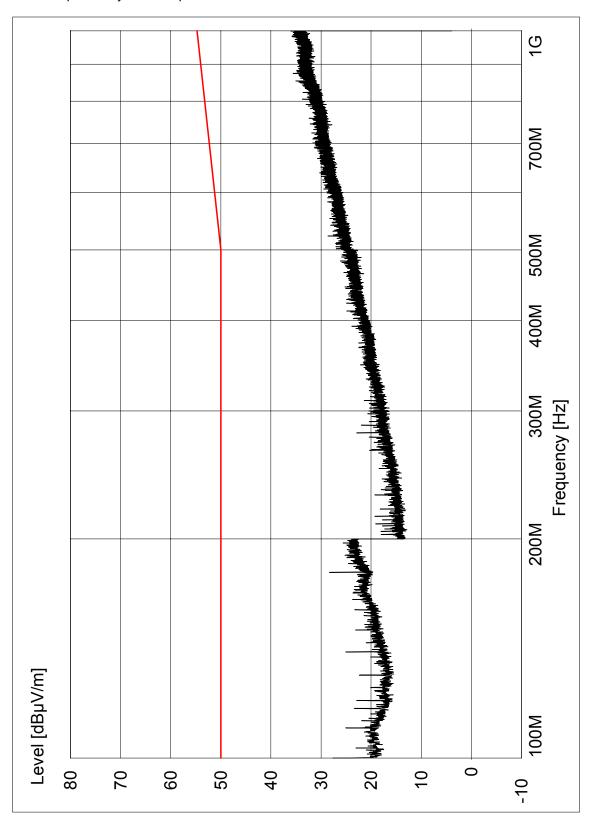


08-05-2008 16:55 Plot 4a Spire noisy mode in pacs location HP



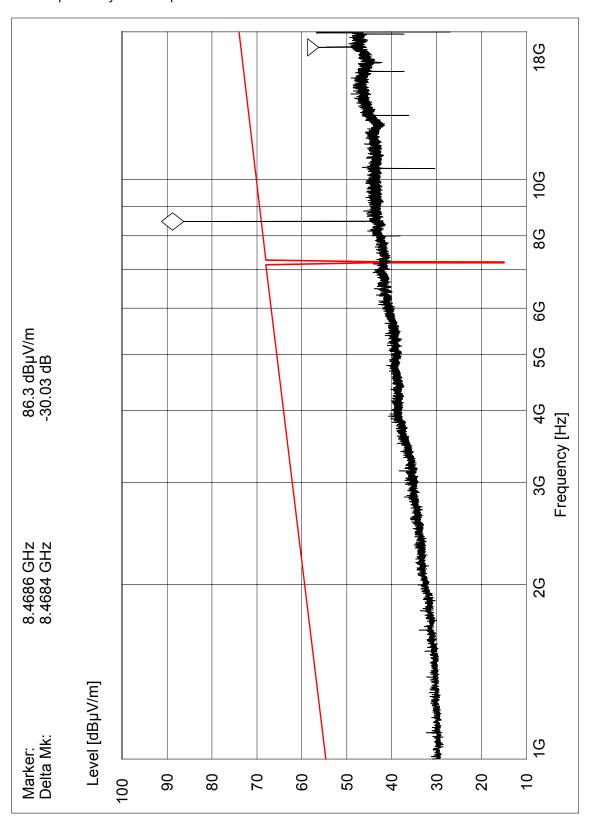


08-05-2008 16:55 Plot 4b Spire noisy mode in pacs location HP



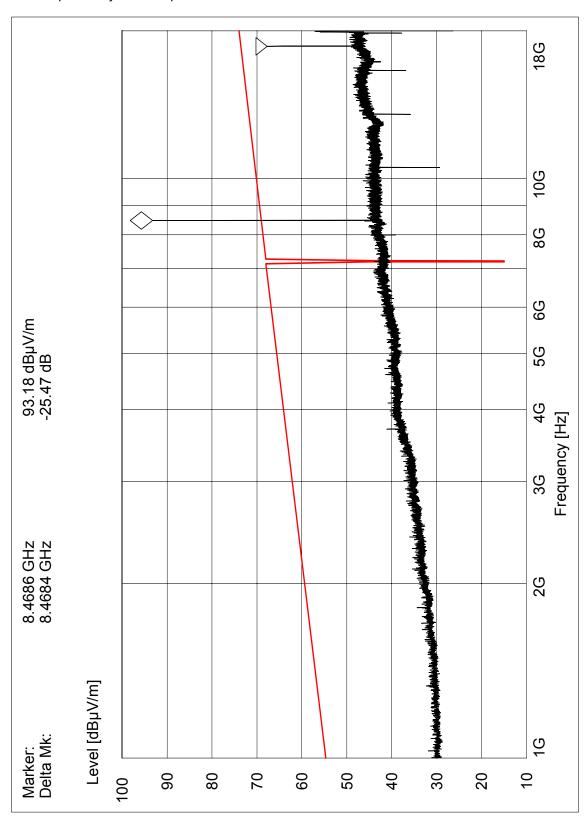


08-05-2008 19:41 Plot 5 Spire noisy mode in pacs location VP



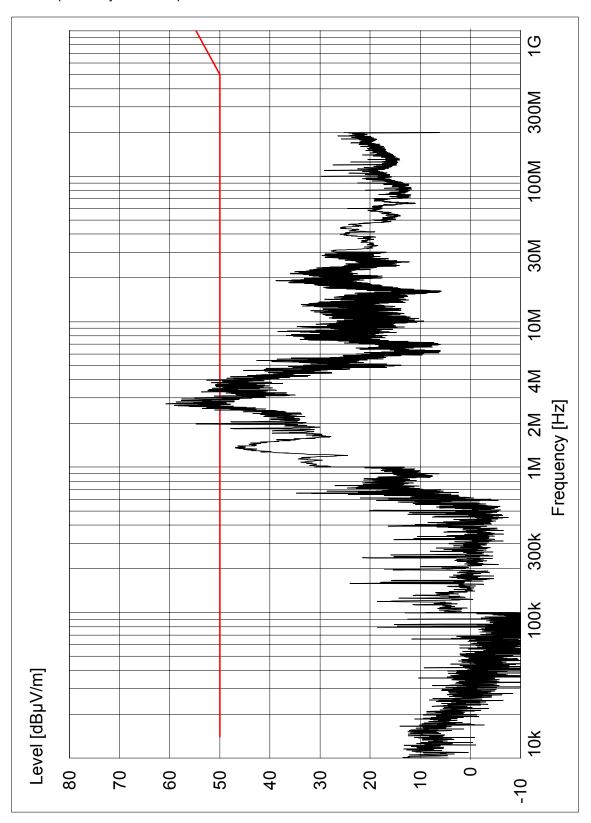


08-05-2008 20:03 Plot 6 Spire noisy mode in pacs location HP



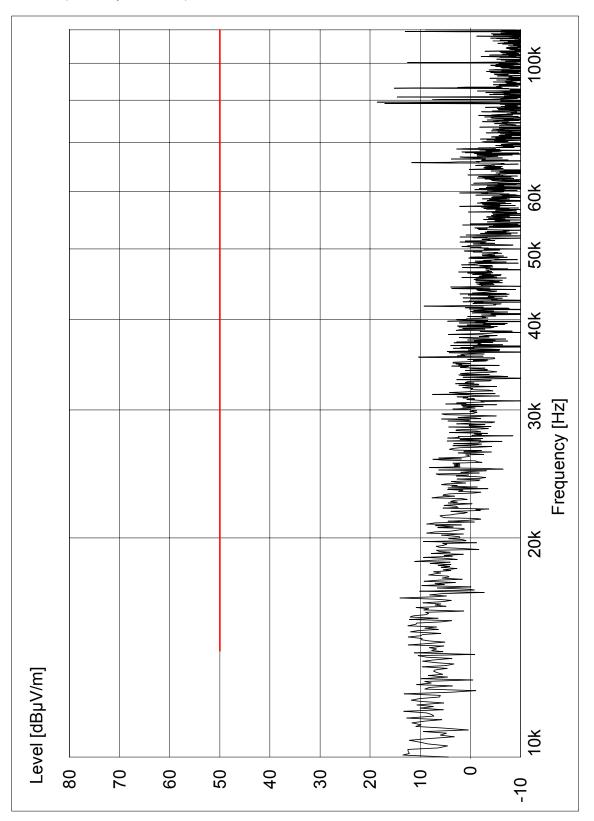


08-05-2008 17:57 Plot 7 Spire noisy mode in spire extra location VP



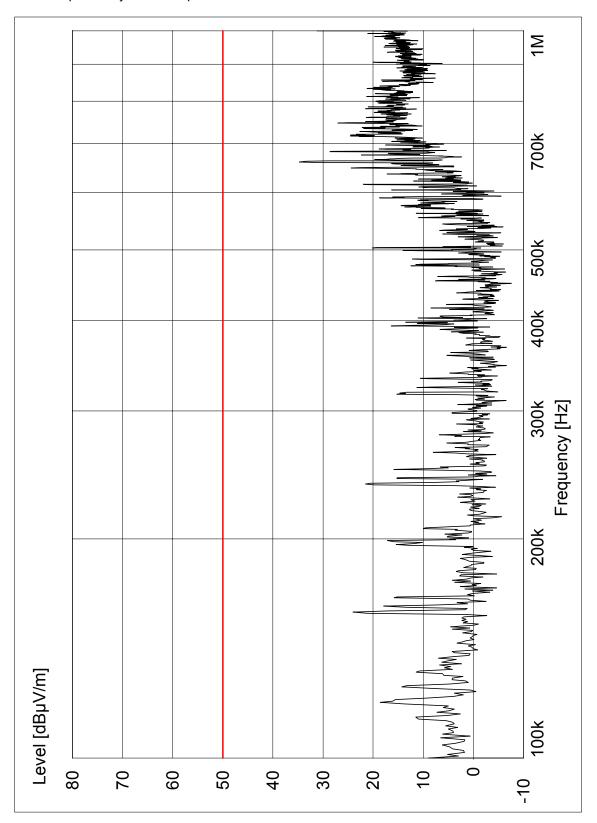


08-05-2008 17:57 Plot 7a Spire noisy mode in spire extra location VP



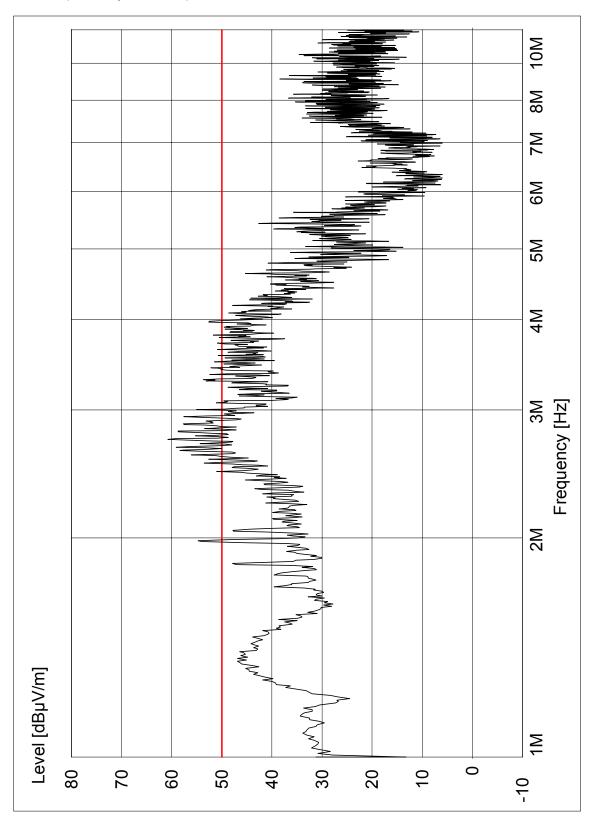


08-05-2008 17:57 Plot 7b Spire noisy mode in spire extra location VP



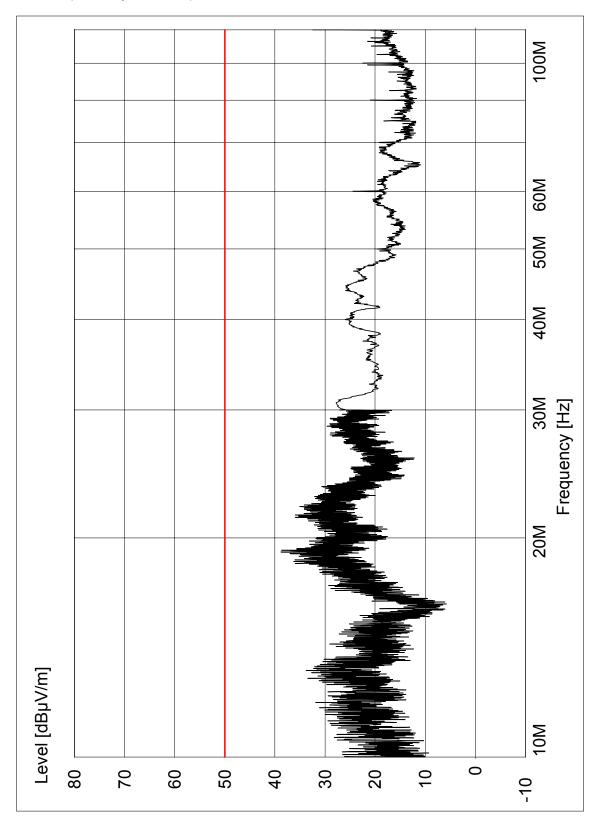


08-05-2008 17:57 Plot 7c Spire noisy mode in spire extra location VP



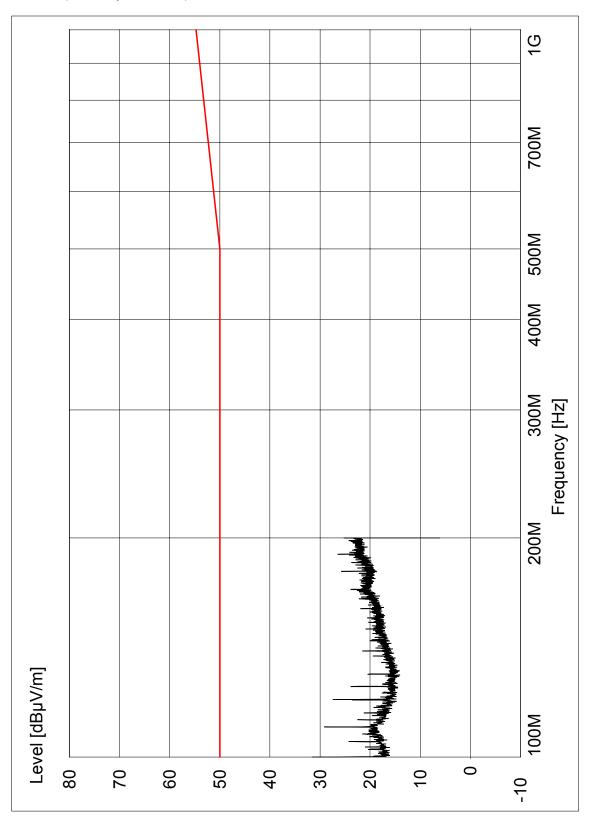


08-05-2008 17:57 Plot 7d Spire noisy mode in spire extra location VP



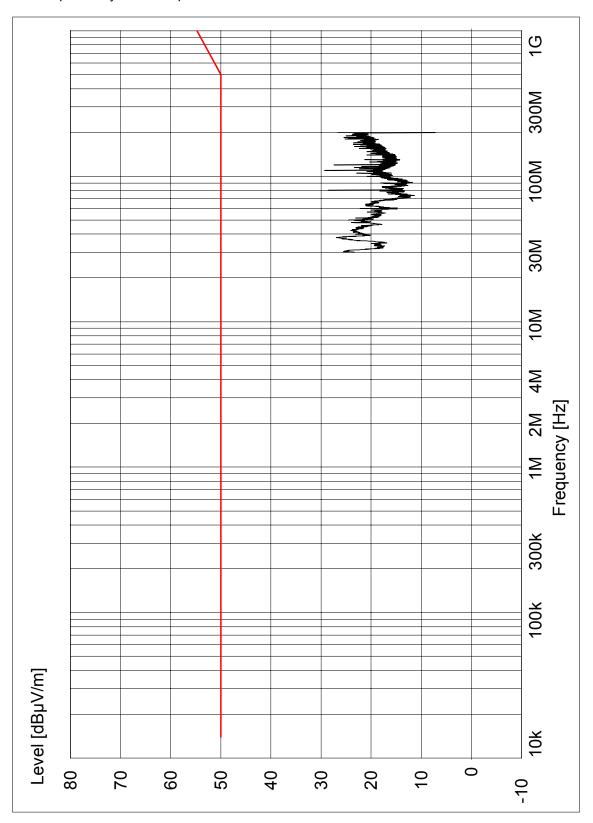


08-05-2008 17:57 Plot 7e Spire noisy mode in spire extra location VP



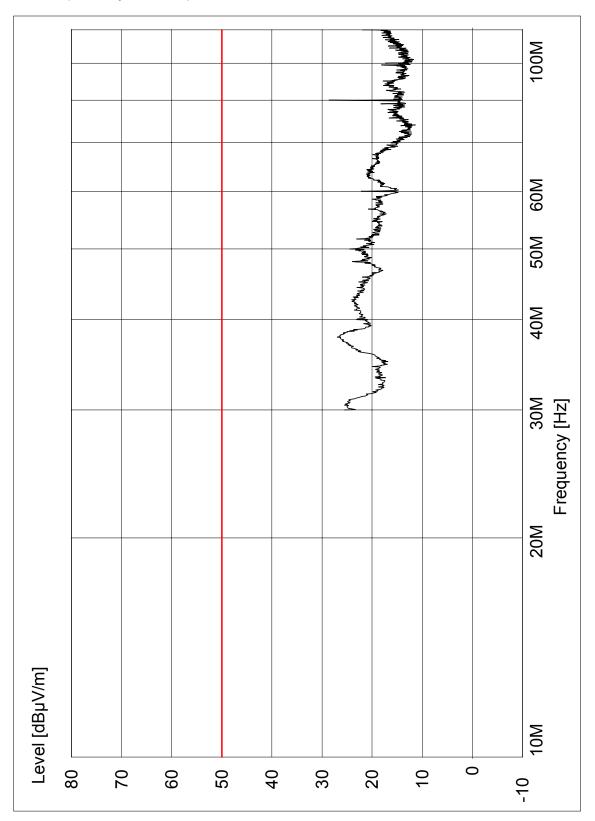


08-05-2008 18:01 Plot 8 Spire noisy mode in spire extra location HP



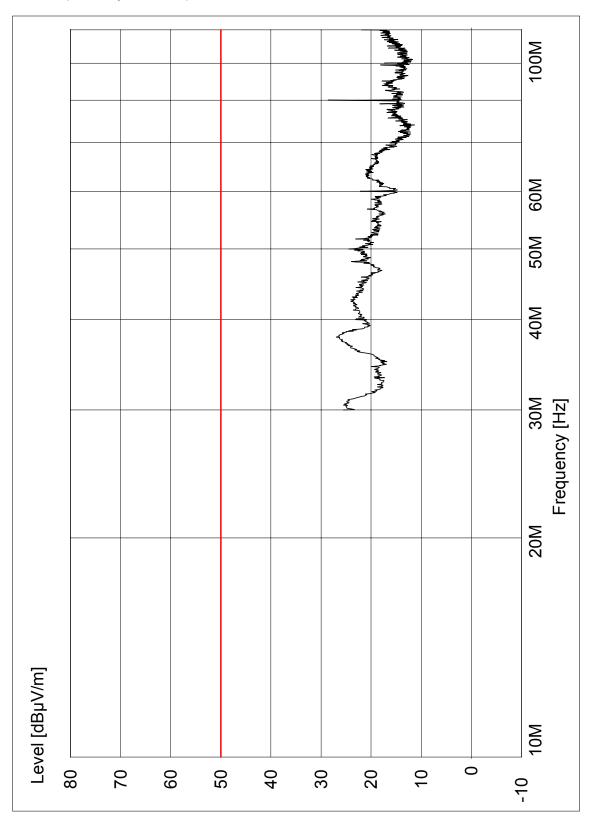


08-05-2008 18:01 Plot 8a Spire noisy mode in spire extra location HP



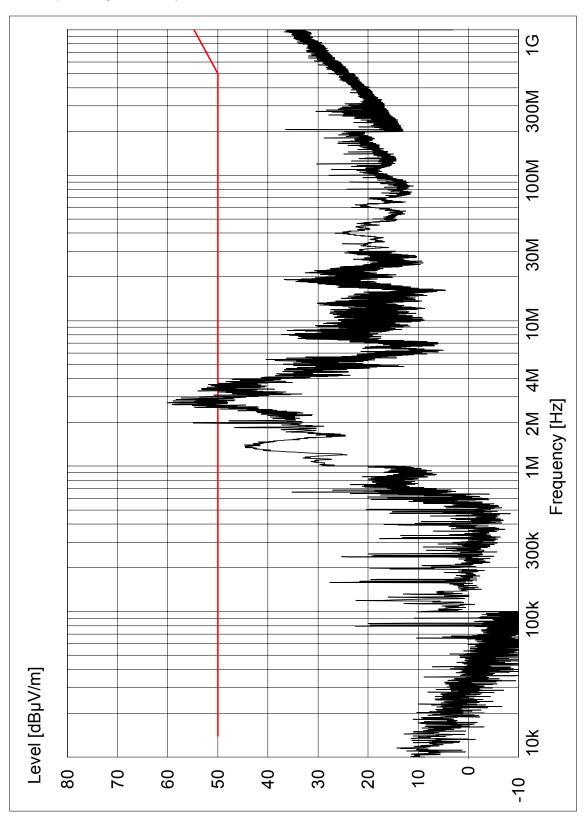


08-05-2008 18:01 Plot 8b Spire noisy mode in spire extra location HP



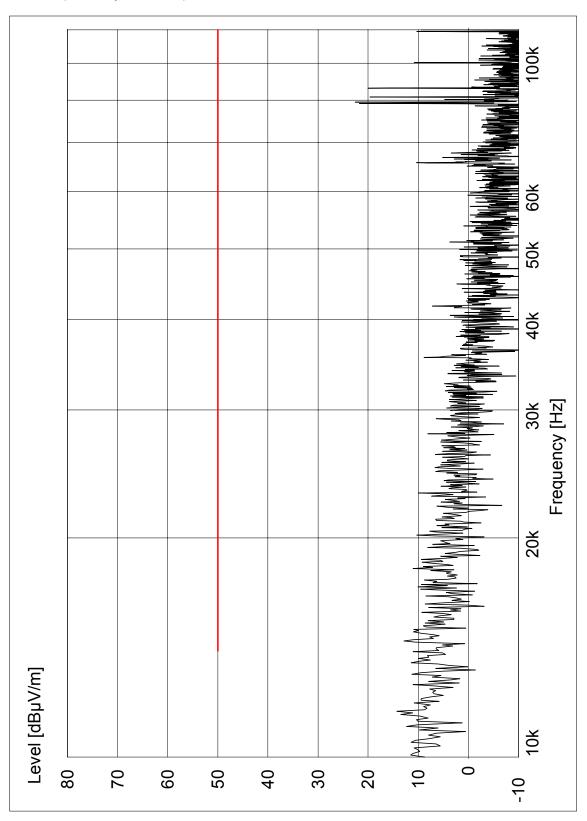


08-05-2008 18:21 Plot 9 Spire noisy mode in spire nominal loc VP



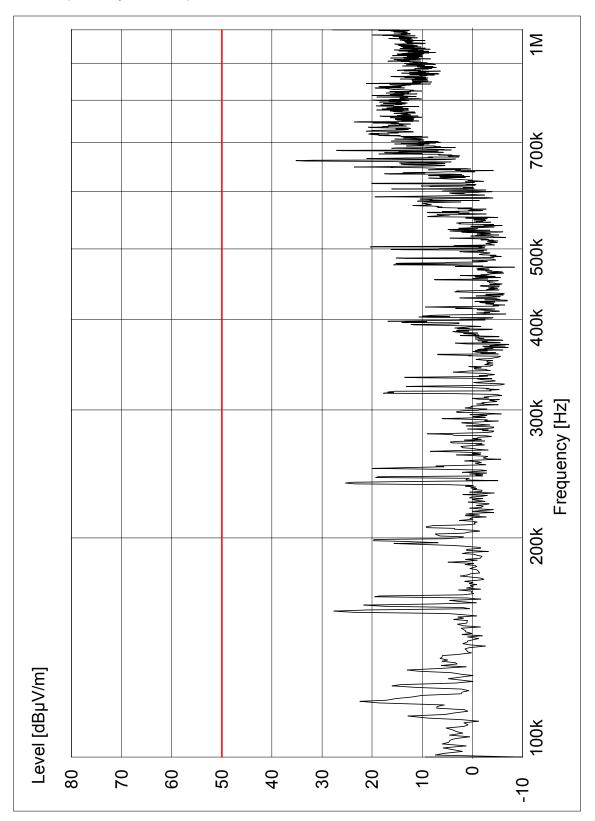


08-05-2008 18:21 Plot 9a Spire noisy mode in spire nominal loc VP



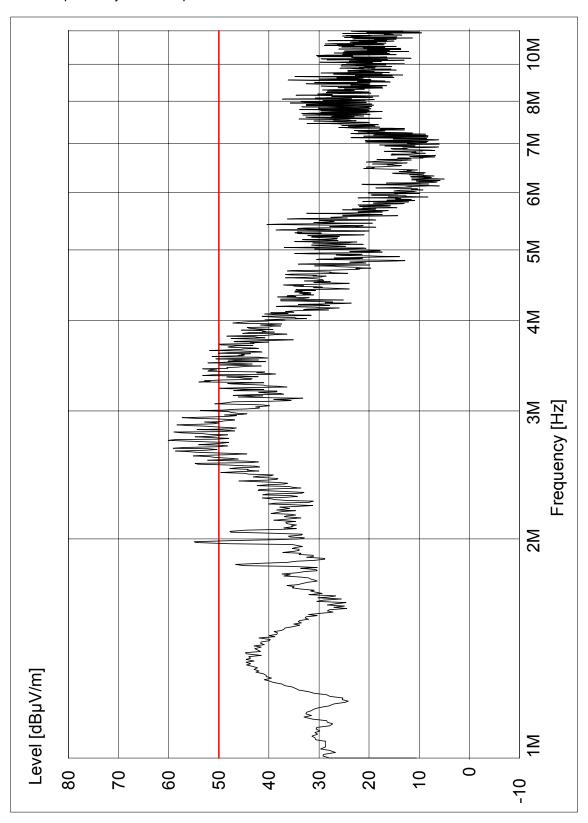


08-05-2008 18:21 Plot 9b Spire noisy mode in spire nominal loc VP



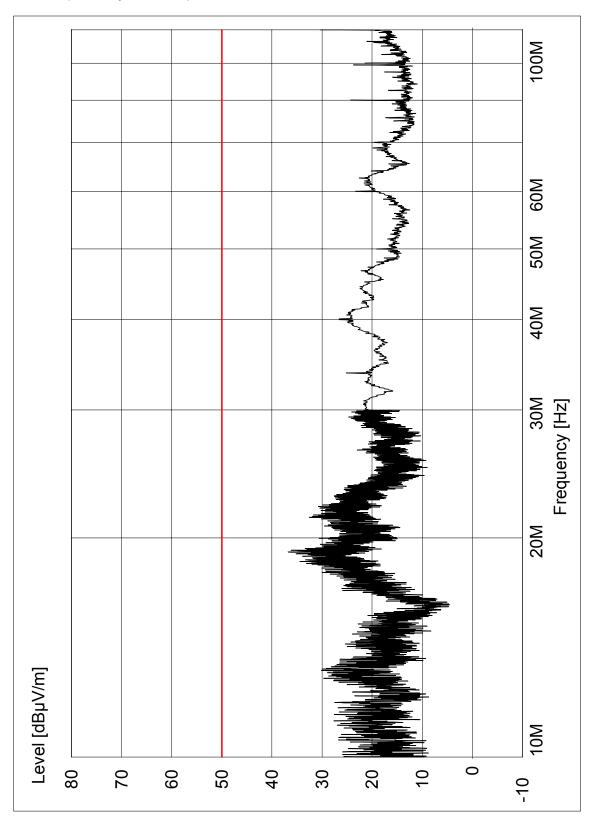


08-05-2008 18:21 Plot 9c Spire noisy mode in spire nominal loc VP



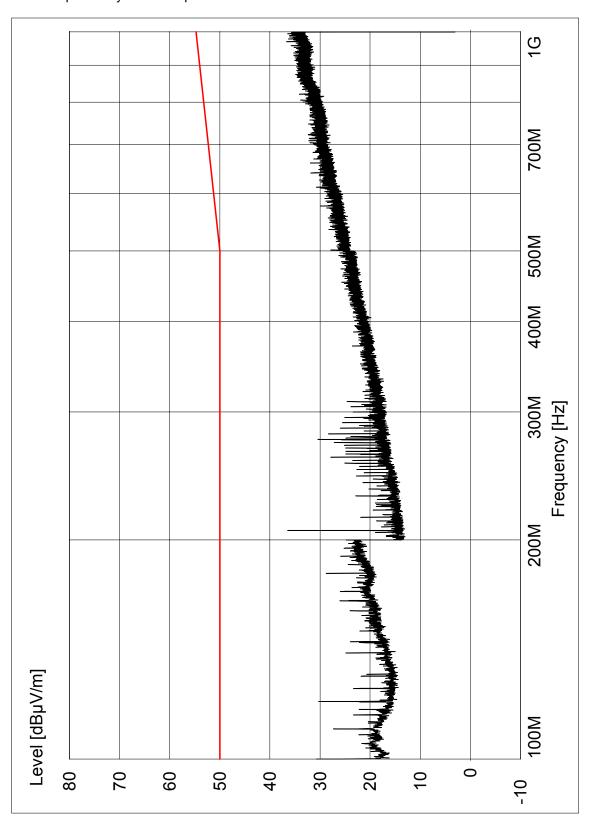


08-05-2008 18:21 Plot 9d Spire noisy mode in spire nominal loc VP



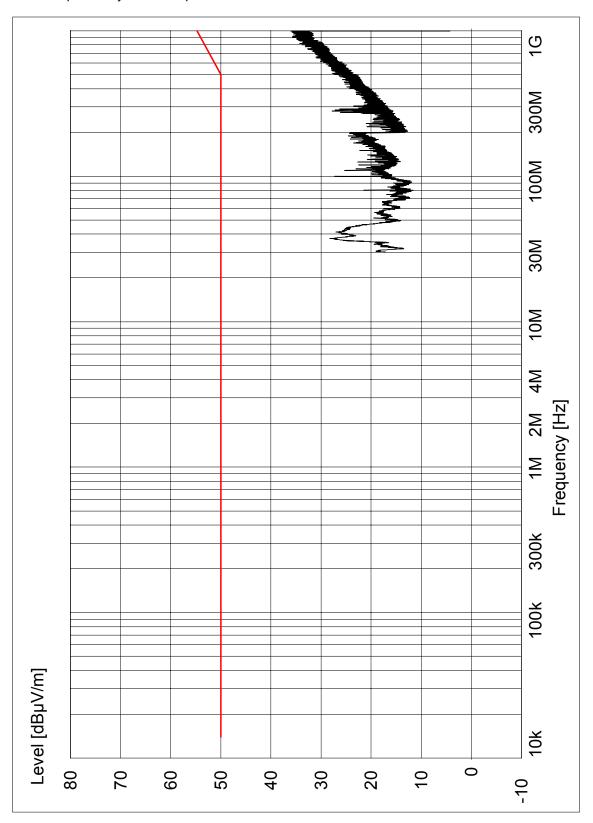


08-05-2008 18:21 Plot 9e Spire noisy mode in spire nominal loc VP



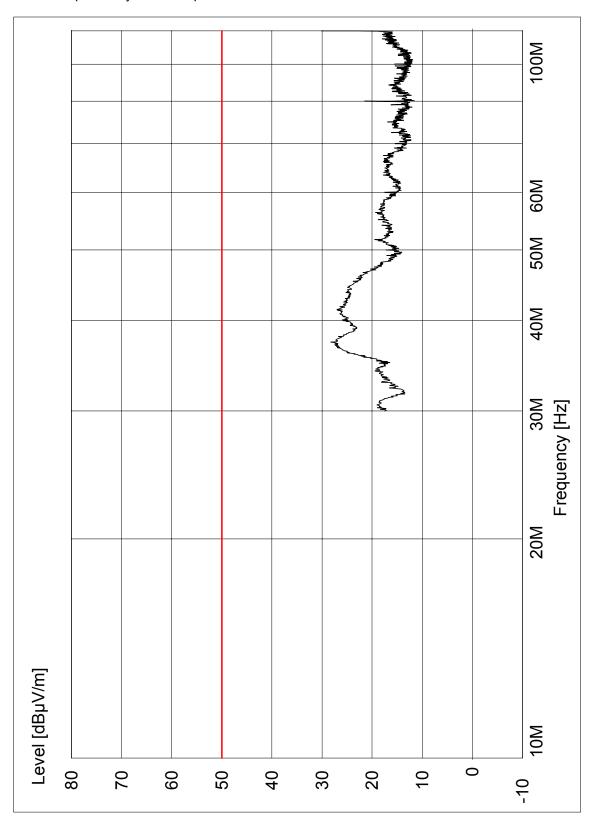


08-05-2008 18:31 Plot 10 Spire noisy mode in spire nominal loc HP



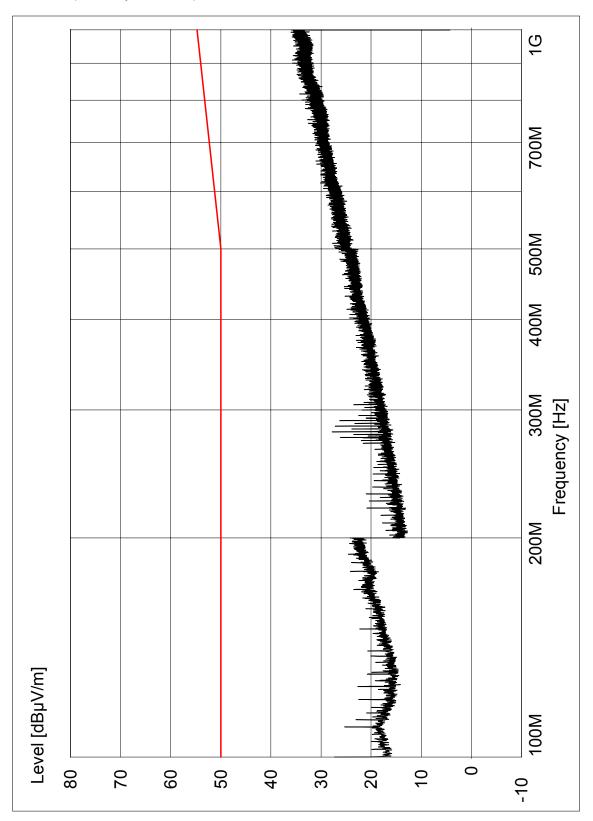


08-05-2008 18:31 Plot 10a Spire noisy mode in spire nominal loc HP



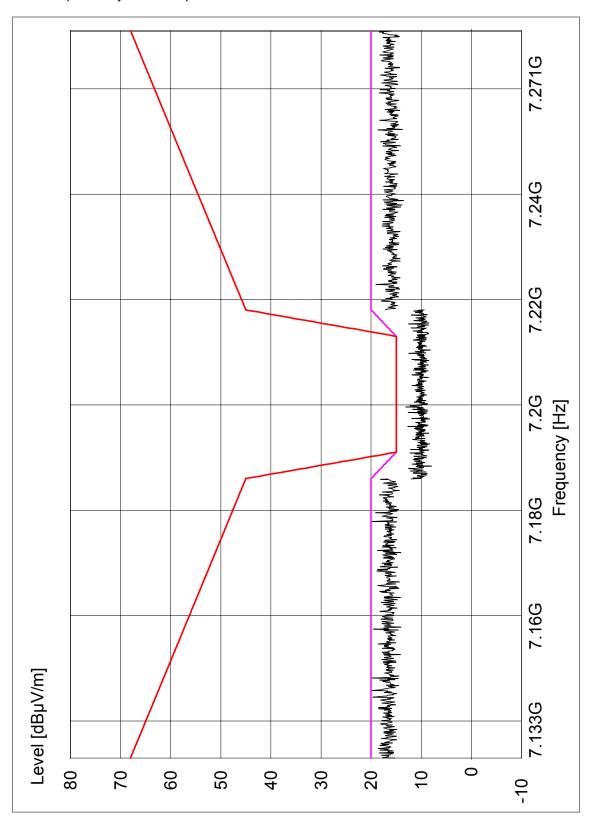


08-05-2008 18:31 Plot 10b Spire noisy mode in spire nominal loc HP



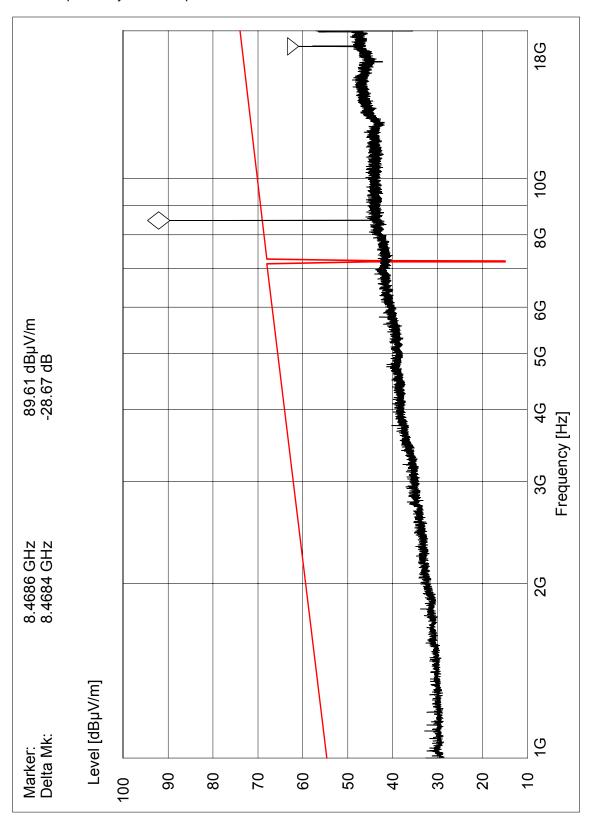


08-05-2008 18:43 Plot 11 Spire noisy mode in spire nominal loc VP



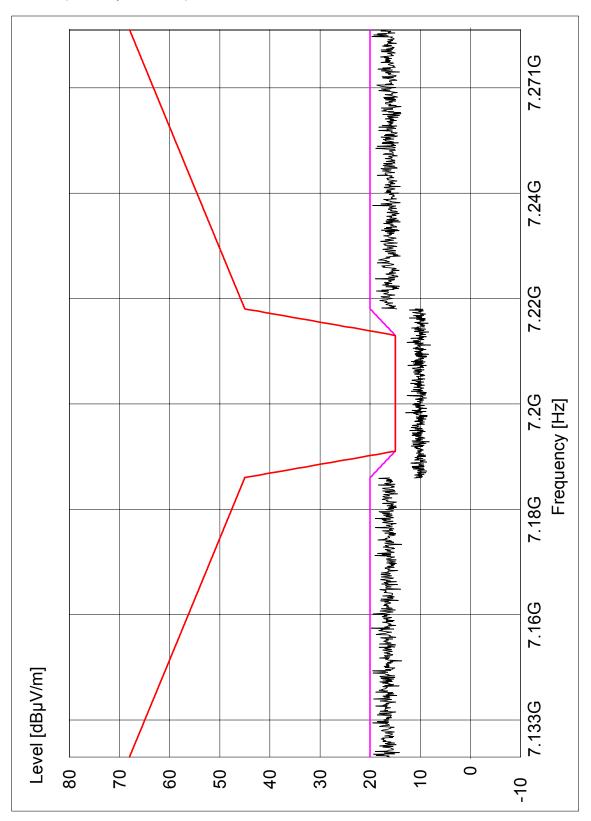


08-05-2008 18:58 Plot 12 Spire noisy mode in spire location VP



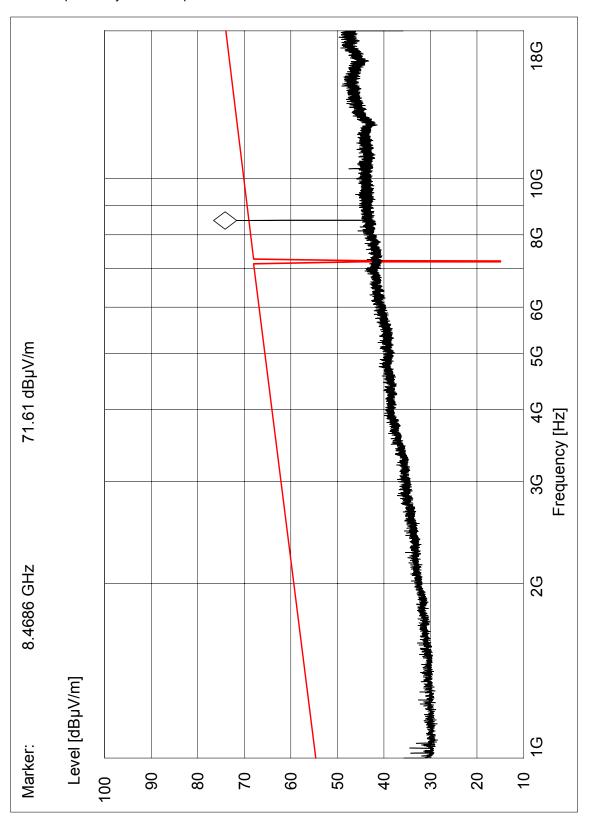


08-05-2008 19:04 Plot 13 Spire noisy mode in spire nominal loc HP



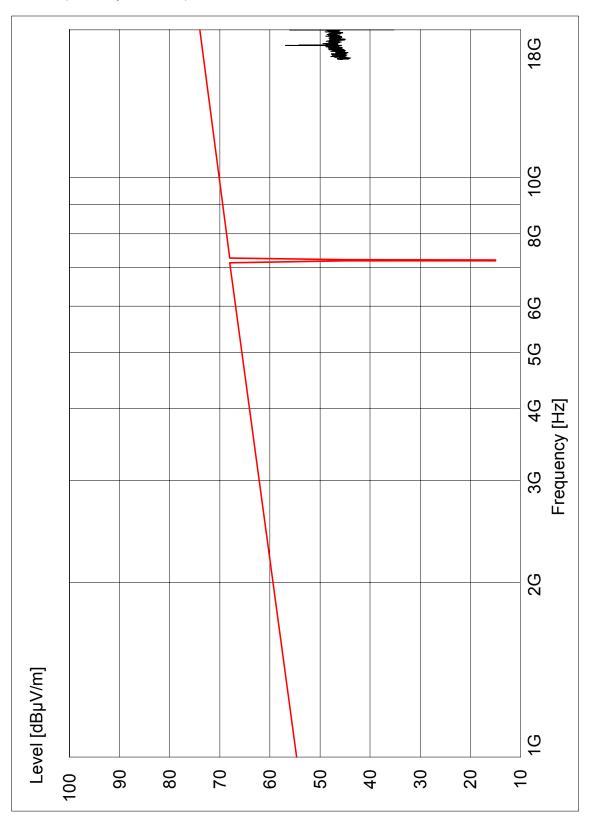


08-05-2008 19:16 Plot 14 Spire noisy mode in spire location HP



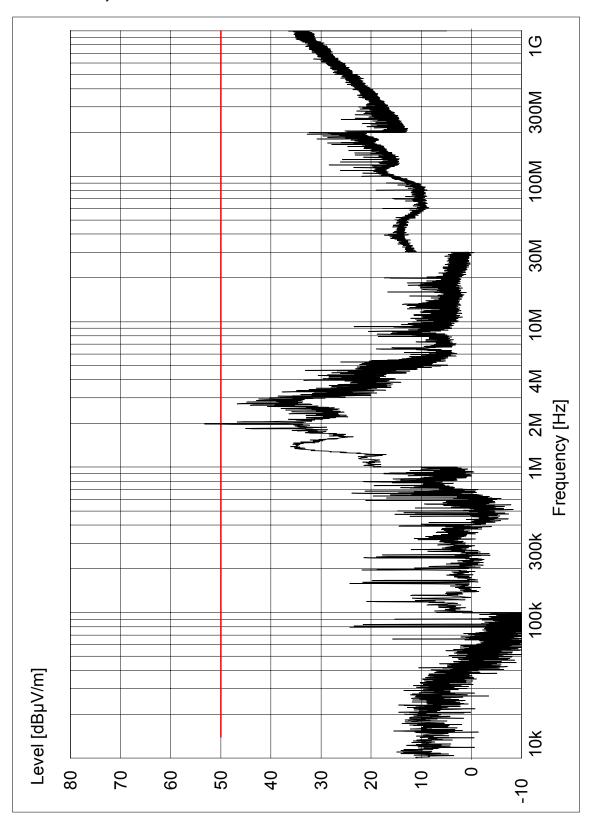


08-05-2008 19:24 Plot 15 Spire noisy mode in spire location VP



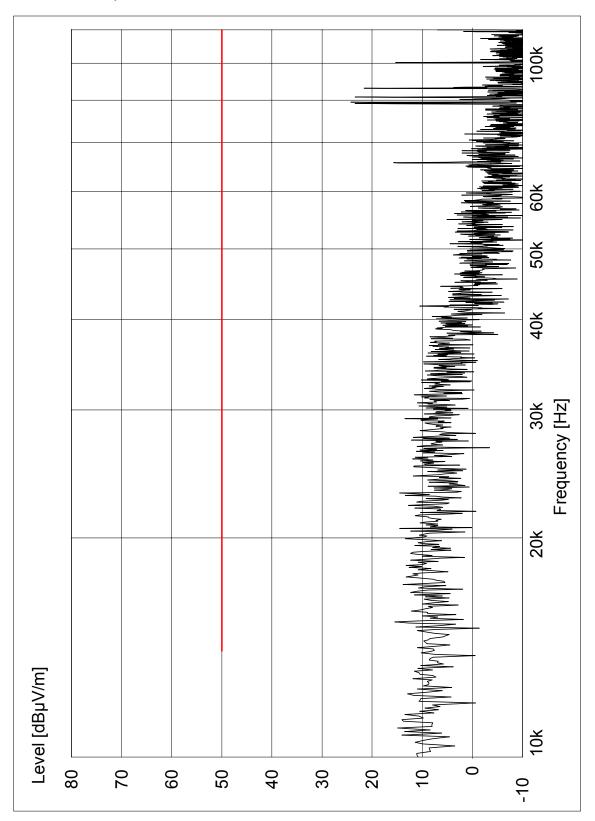


09-05-2008 10:48 Plot 16 Hifi noisy mode in Hifi location VP



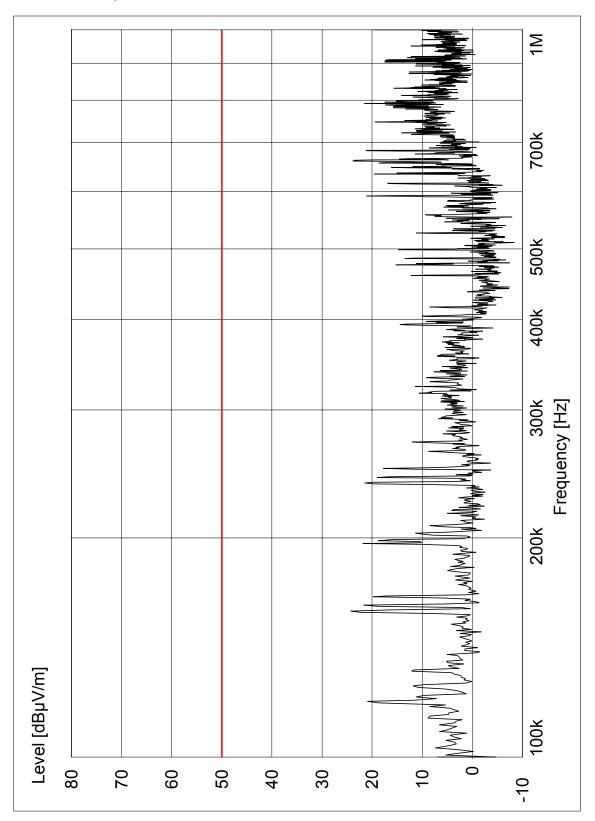


09-05-2008 10:48 Plot 16a Hifi noisy mode in Hifi location VP



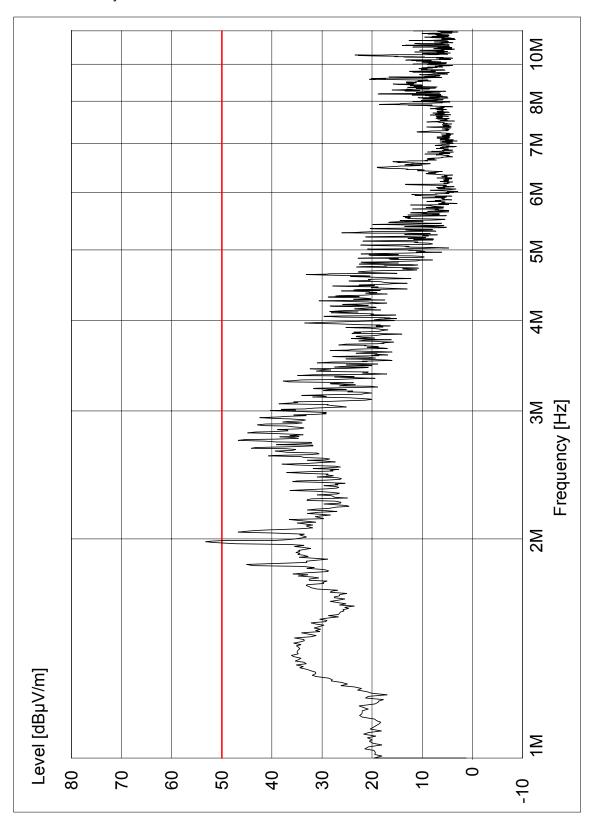


09-05-2008 10:48 Plot 16b Hifi noisy mode in Hifi location VP



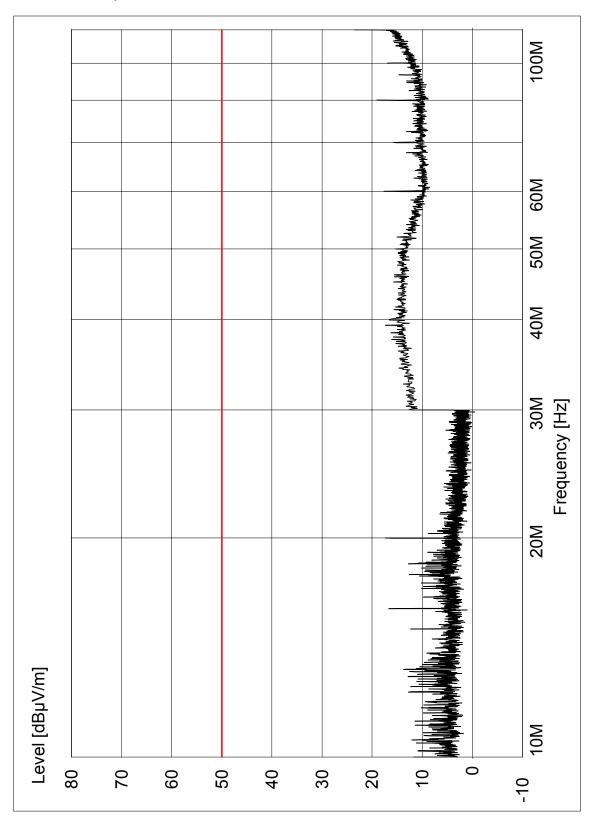


09-05-2008 10:48 Plot 16c Hifi noisy mode in Hifi location VP



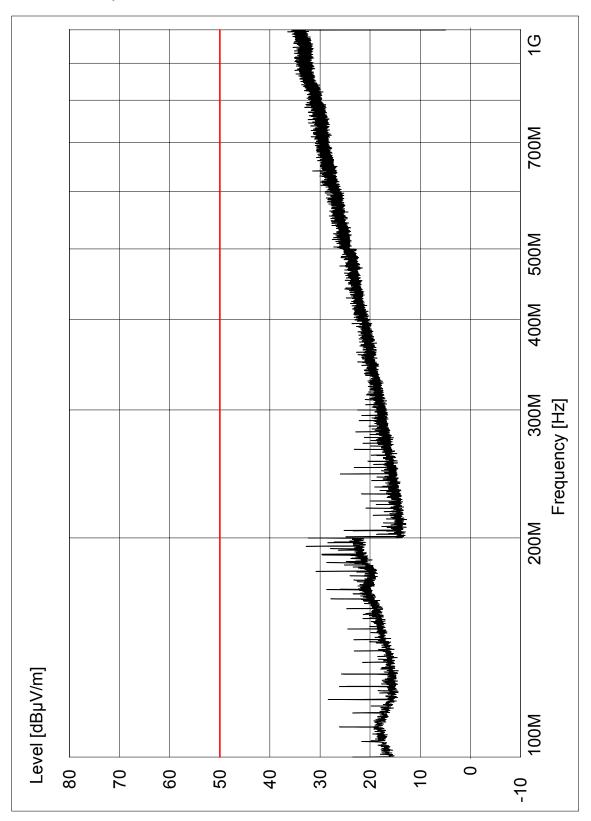


09-05-2008 10:48 Plot 16d Hifi noisy mode in Hifi location VP



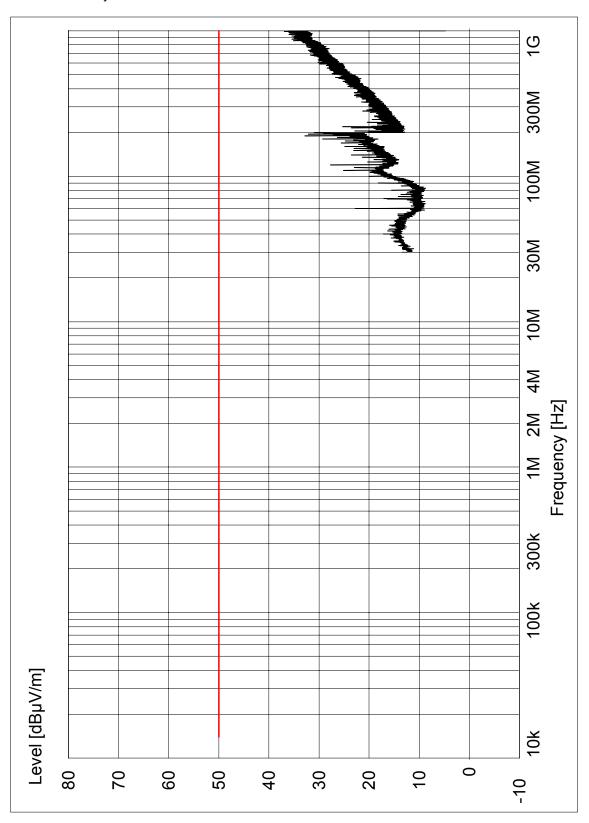


09-05-2008 10:48 Plot 16e Hifi noisy mode in Hifi location VP



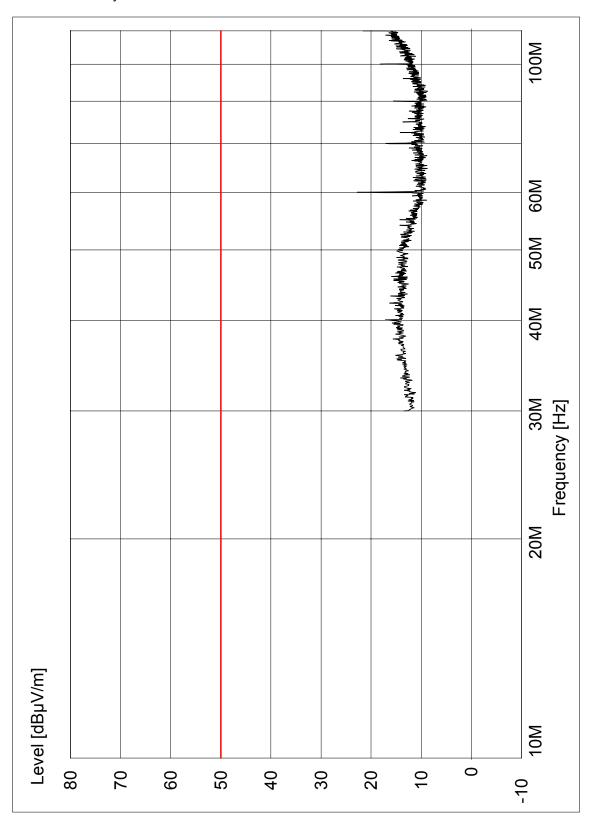


09-05-2008 11:02 Plot 17 Hifi noisy mode in Hifi location HP



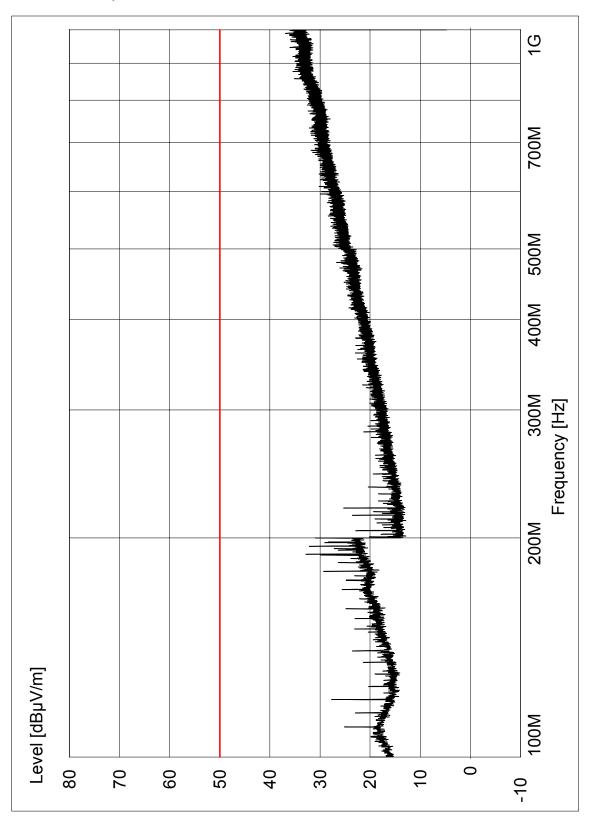


09-05-2008 11:02 Plot 17a Hifi noisy mode in Hifi location HP



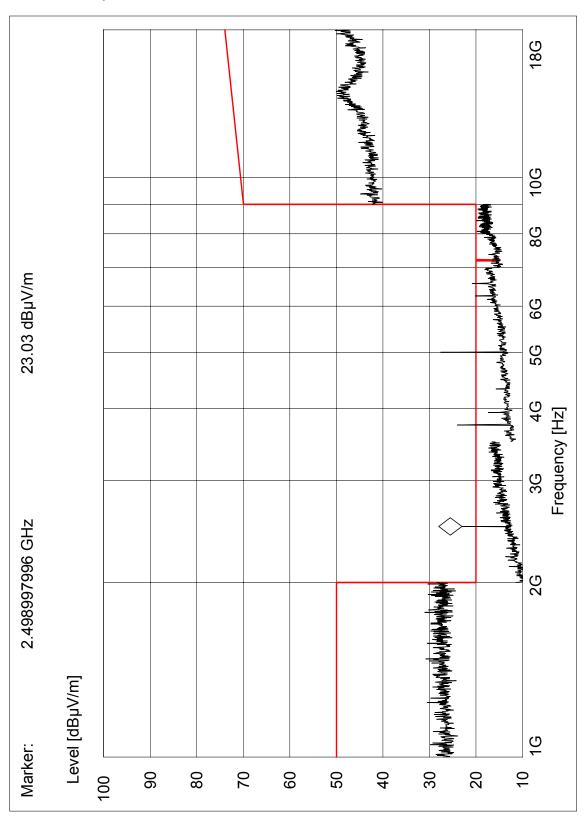


09-05-2008 11:02 Plot 17b Hifi noisy mode in Hifi location HP



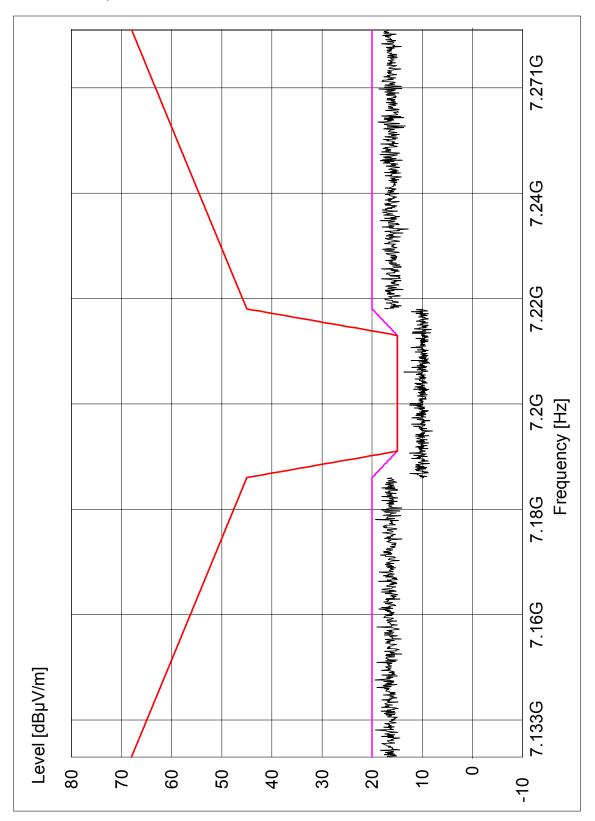


09-05-2008 11:42 Plot 18 Hifi noisy mode in Hifi location VP



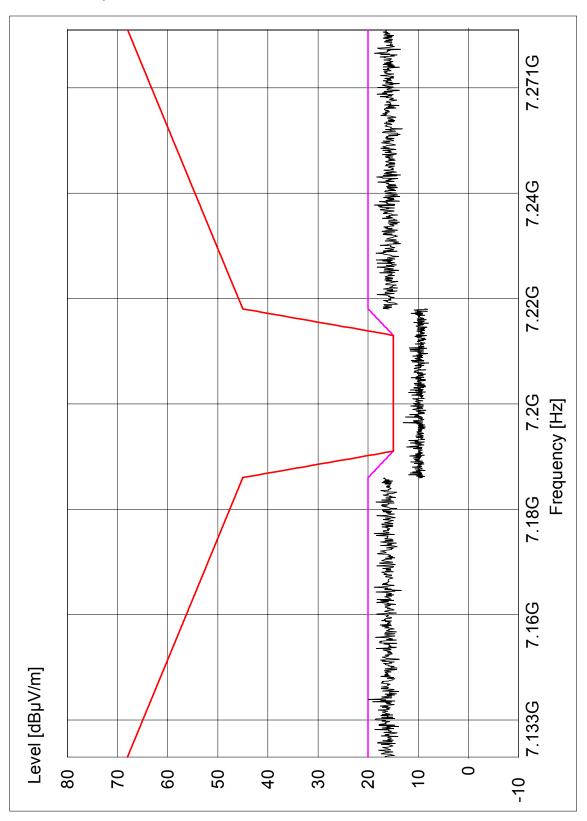


09-05-2008 11:53 Plot 19 Hifi noisy mode in Hifi location VP



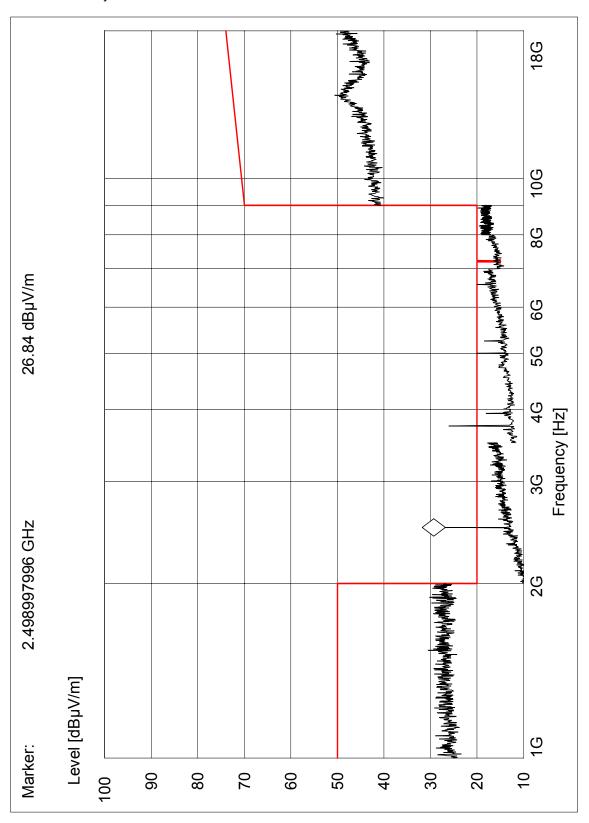


09-05-2008 11:58 Plot 20 Hifi noisy mode in Hifi location HP



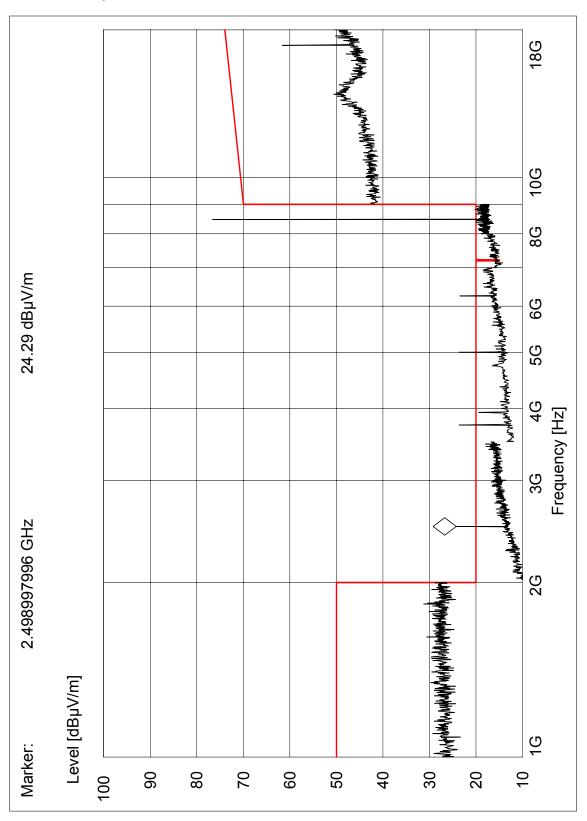


09-05-2008 12:34 Plot 21 Hifi noisy mode in Hifi location HP



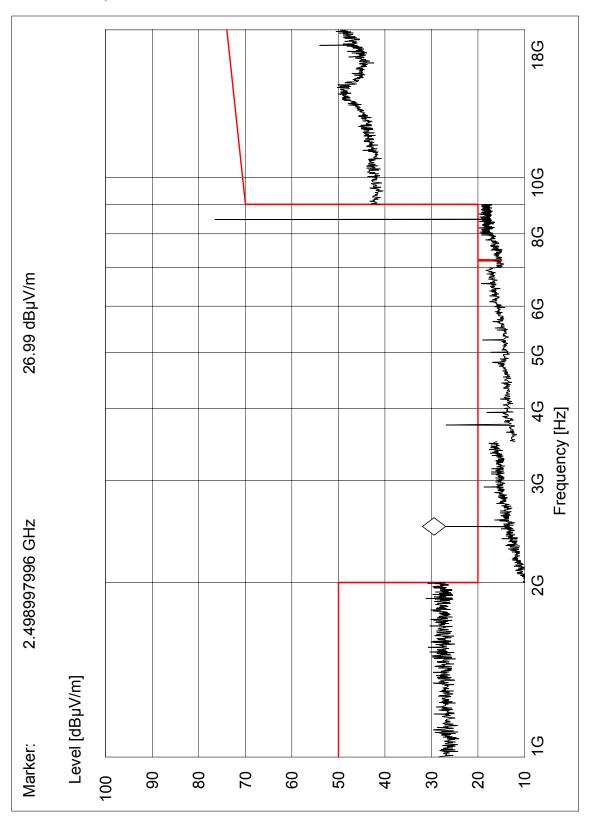


09-05-2008 15:00 Plot 22 Hifi noisy mode in Hifi location twt on VP



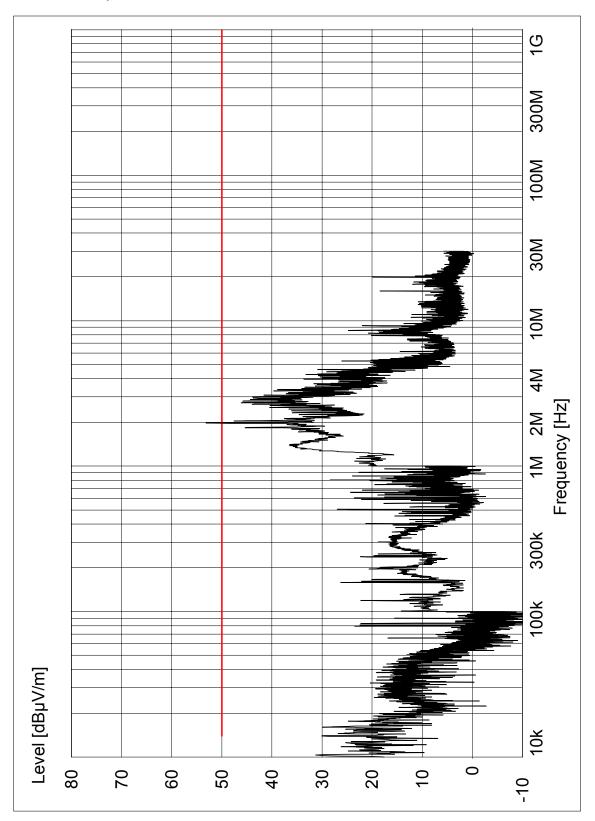


09-05-2008 14:59 Plot 23 Hifi noisy mode in Hifi location twt on HP



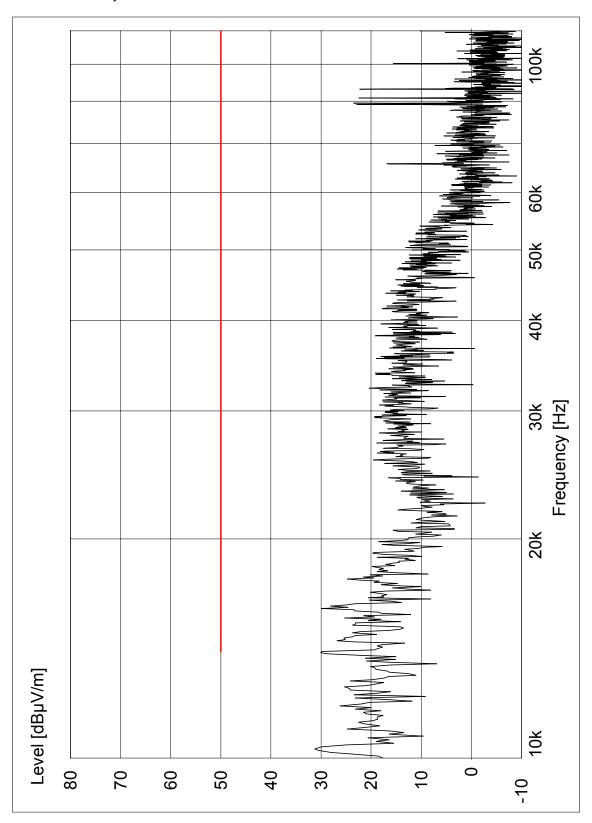


09-05-2008 15:13 Plot 24 Hifi noisy mode in Hifi location TWT on VP



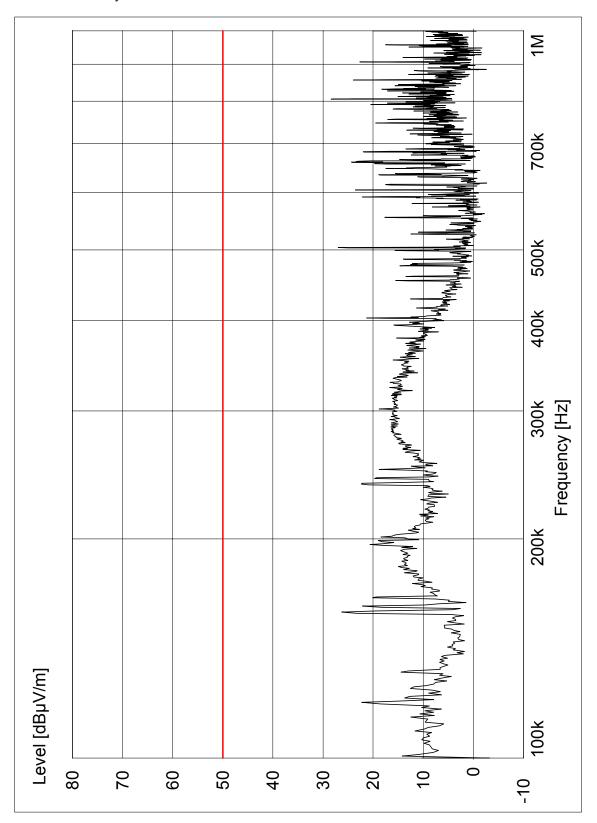


09-05-2008 15:13 Plot 24a Hifi noisy mode in Hifi location TWT on VP



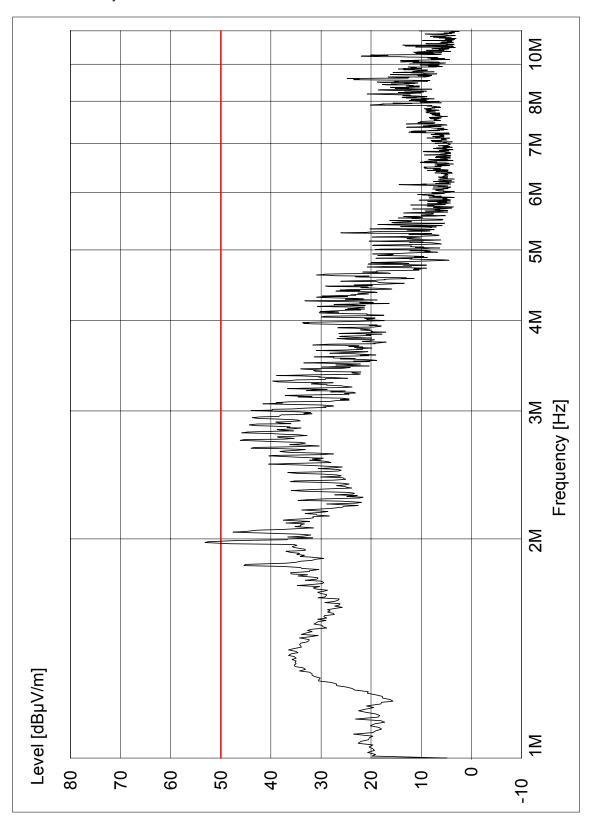


09-05-2008 15:13 Plot 24b Hifi noisy mode in Hifi location TWT on VP



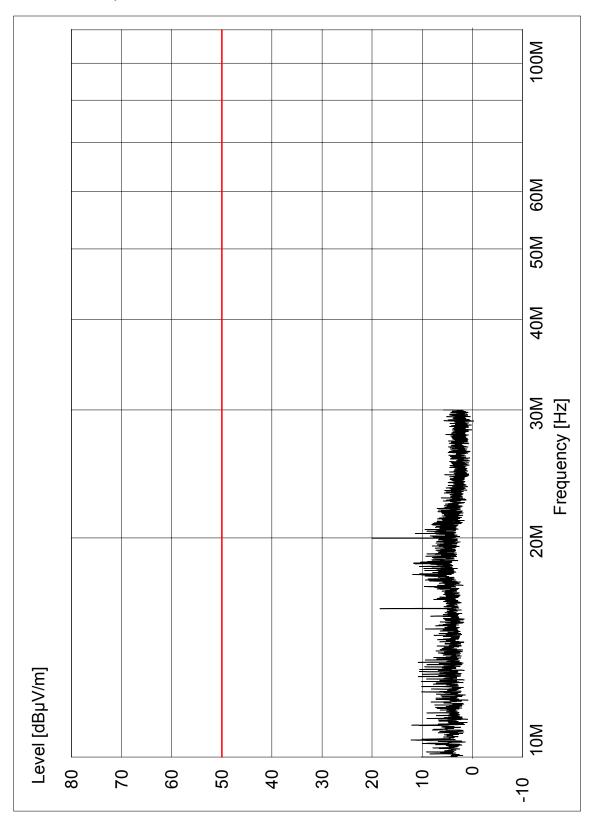


09-05-2008 15:13 Plot 24c Hifi noisy mode in Hifi location TWT on VP



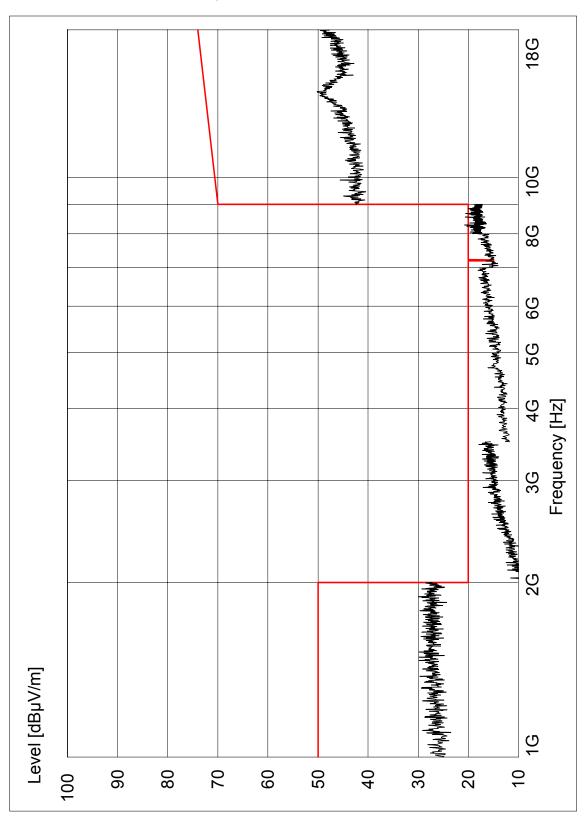


09-05-2008 15:13 Plot 24d Hifi noisy mode in Hifi location TWT on VP



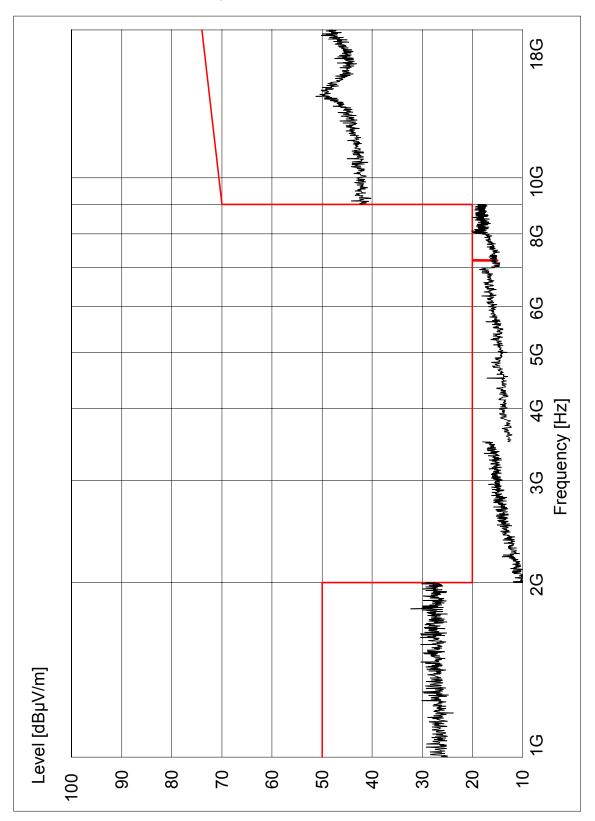


09-05-2008 16:07 Plot 25 Hifi Off in Hifi location transp OFF VP





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









Results of Auto-Compatibility Test

5 pages

Doc. No: HP-2-ASED-TR-0254

Issue: 1

Date: 02.06.2008 File: HP-2-ASED-TR-0254_1.doc



Herschel

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	Locked/NoLocked	AGC RMB20442	AGC RMB09442
SCOE LEVEL) [dBm]		[dBm] / RAW	[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	Locked/NoLocked	AGC RMB20442	AGC RMB09442
SCOE LEVEL) [dBm]		[dBm] / RAW	[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

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

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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	Υ
-88.1	Locked	ON	-128 / 49	-128.1 / 738	Υ
-88.4	Locked	ON	-129 / 48	-128.85 / 725	Υ
-88.7	Locked	ON	-130 / 47	-129.5 / 714	Υ
-89.0	Locked	ON	-130.5 / 46	-130.38 / 701	Υ
-89.3	Locked	ON	-131 /45	-131.0 / 693	Υ
-89.6	Locked	ON	-132 /44	-131.73 / 682	Υ
-89.9	Locked	ON	-132 /44	-132.46 / 671	Υ
-90.2	Locked	ON	-133 /43	-133.5 / 659	Υ
-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

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XPND-2 Summary Table:

Xpnd-2 Lock Acquisition:

Signal Strength (TTC	Locked / NoLocked	AGC RMB41442	AGC RMB10442
SCOE LEVEL) [dBm]		[dBm] / RAW	[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	Locked/NoLocked	AGC RMB41442	AGC RMB10442
SCOE LEVEL) [dBm]		[dBm] / RAW	[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	Υ
-89.3	Locked	ON	-124 /48	-123.75 / 735	Υ
-89.6	Locked	ON	-124 /48	-124.1 / 728	Υ
-89.9	Locked	ON	-124.5 /47	-124.47 / 721	Υ
-90.2	Locked	ON	-124.5 /47	-124.8 / 715	Υ
-90.5	Locked	ON	-125 /46	-125.18 / 707	N (98%)

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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	Υ
-89.3	Locked	ON	-124 /48	-123.8 / 735	Υ
-89.6	Locked	ON	-124.5 /47	-124.15 / 727	Υ
-89.9	Locked	ON	-124.5 /47	-124.52 / 720	Υ
-90.2	Locked	ON	-125 /46	-124.84 / 714	Υ
-90.5	Locked	ON	-125 /46	-125.23 / 706	Υ
-90.8	Locked	ON	-126 /45	-125.5 / 700	Υ
-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

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Annex 6

Functional AIT 'AS-RUN' Procedures

Content:

- Filled-in 'Herschel EGSE, Satellite & Instrument Procedure for EMC Radiated Test '; HP-2-ASED-PR-0116, Issue 1, Start of formal run
- 90 pages
- Filled-in 'Herschel EGSE, Satellite & Instrument Procedure for EMC Radiated Test '; HP-2-ASED-PR-0116, Issue 1, Continuation of formal run
 pages
- Filled-in 'Leading Procedure for Herschel integrated Satellite Test '; HP-2-ASED-TP-0134, Issue 1, Switch-ON prior to Try Runs
 pages
- 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

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START OF FORMAL RUN



EADS

Procedure

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PROCEDURE FOR EMC RE/AUTOCOMP TESTING

OR May to Destroy 2008

RE With SPIRE NOISY + anterna

Title:

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

CI-No:

100000

2008_03_08_04_12_... EMC_RE

07/05/08 A Di Capua Prepared by: P Modesto Date: 07/05/01 Koll 07/05/08 M Koelle Checked by: 07/05/08 AIT: R. Hohn 07/05/08 **D** Priestley Engineering: Product Assurance: R. Stritter W. Wietbrock Configuration Control: Dr. W. Fricke Project Management; 08/05/08 Approved by TAS-F: D Montet

Doc. No.

HP-2-ASED-PR-0116

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See Distribution List (last page)





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1	06.05.2008		Initial Version (HIPT and ESA comments incorporated)	0
				ě
				1 06.05.2008 Initial Version (HIPT and ESA comments

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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.

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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

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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

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3 Requirements to be verified

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

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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

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5 **Conditions**

Personnel 5.1

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:

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S/C Environmental	Limits	Actual
Cryostat Connection (Valves)	N/A	
Cryostat Status (Hel/Hell)	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.

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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.

SPIRE 5.3.2.3

None

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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

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5.5.3 EGSE

5.5.3.1 EGSE Hardware Configuration

S/S	Unit	Unit Co		SCOE simulated eqpts	Remarks
		Herschel			
EGSE	ccs	1			The second secon
-	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			

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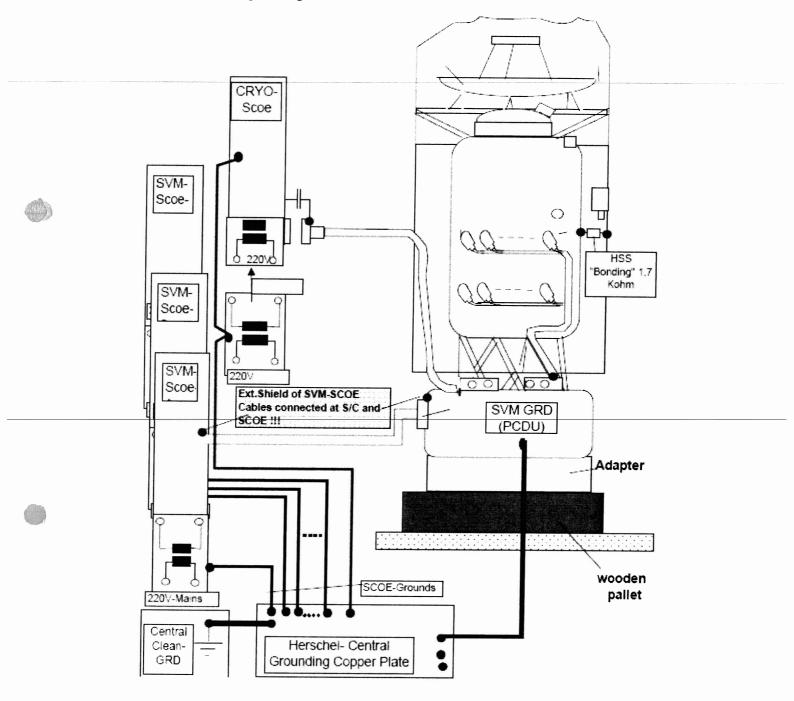
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5.5.3.3 Grounding Configuration



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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

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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.

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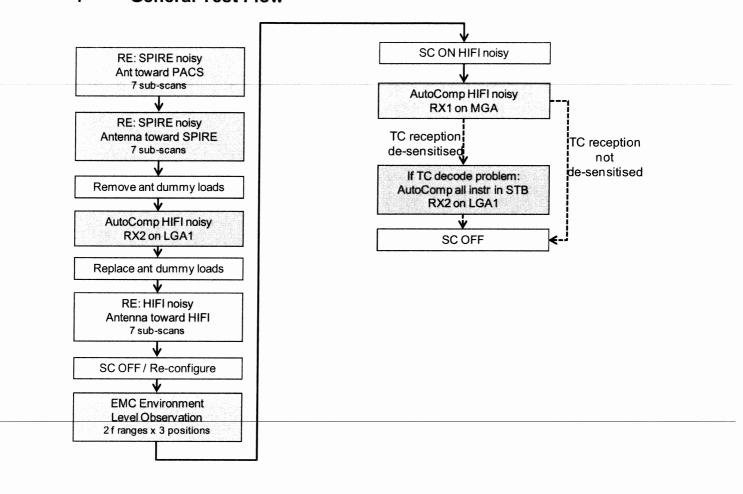
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8 Test Execution Step-by-Step Procedure

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 NOTE THAT WHETHER		IS USEN /	FORRE)	- ANNEX 3 /	10,	AITC
20	Switch on scoe to allow EMC team to perform the ambient noise (SC OFF)	IS UNDE	and the second second	NORDLOF	THE TEST COX	1000	PR
30	Perform Herschel IST Leading Procedure HP-2-ASED-PR-0134 From the test conductor: Write		VINE (U		In the Chapter 7.2.4.2(ACMS ON) Perform only the steps:	3010	
	Callasync Z010999MCVT003_IST_START EMC				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						

Test location:	Operator:	QA:	Date/Time:

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Step- No.	Test-Step-Description	1	Nominal Value	Tolerance	Actual Value	Rem	arks	P	N
60	D102159SCVT226_EMC_SETUP				Value			1	†
	Click "End TS " to continue								
70	OPERETOR INFO Communicate to the EMC TEAM that the SC is switched or and ready to start EMC	n							
80	Z010999MCVT200_EMC The EGSE and SVM are now set								
	Click in window the button "OK" to proceed								

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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 Hel/Hell). 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	ок				
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				

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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.	οκ				

Test location:	Operator:	QA:	Dat	ate/Time:	

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Step- No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	On HPCCS when all autonomous actions have been completed by the power on script P102999SCVT905_ASDISTPACS_PWR_ON_N it will prompt:					
6.	"Set Bus Profile Back to Original Setting?"	NO				
	Select YES if it is likely that other non-PACS instrument related activities are to be performed, otherwise select NO .					
	If YES selected the original Bus Profile will be restored.					
7.	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:	ФК				
	"Bus Profile left unchanged, as original setting 0 (Launch)"					
	If prompted select OK to continue					

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Step- No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	If NO selected then at the prompt:					
8.	"Bus Profile left unchanged"	ок				
	Select OK to continue					
9.	The script will automatically terminate	ок				
10.	Verify HK TM packets are being received on APIDs 1152 & 1154	ок				
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:	Incrementing		AND: PA019420		
	DM_BOL_REC_PAC (PM038420) is incrementing					
12.	PACS in SAFE mode. Return to calling Procedure	ок				

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8.1.2.2 Transition from Standby to PACS Noisiest Mode

N/A

8.1.2.3 Transition from PACS Noisiest Mode to Standby

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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:					
7.	Z102999SCVT011_ASDGEN_PACSPWROFF_P					
	On HPCCS when prompted:					
2.	"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	A CONTRACTOR OF THE PROPERTY O			

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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:	NO				
	"Set Bus Profile Back to Original Setting?"					
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)"	i i				
6.	If NO selected then at the prompt: "Bus Profile left unchanged" Select OK to continue	ок				

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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	ок				
8.	PACS OFF. Return to calling Procedure	ОК				

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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	ок				
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				

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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				

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Step- No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	Select YES if it is likely that other non-SPIRE					†
	instrument related activities are to be performed.					
7.	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)"					
	If NO selected then at the prompt:					1
8.	"Bus Profile left unchanged"	ФК				
	Select OK to continue					
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:			AND: SA_1_559		
	THSK (SM00T500) parameter refreshing @ 0.25 Hz	ок				

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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	ФК				
	MODE parameter is set to "REDY" mode (RAW value 0x0200)	\$M00M500 = 0x0200 (REDY)				
11.	SPIRE powered and in REDY mode Return to calling Procedure					

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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			ot SP
2.	Execute TCL script SPIRE-IST-EMC- RE-STBY2PHOTOPS.tcl – Issue 1.1	_	_	_	OEMP
3.	Check that THSK parameter is refreshing every second	THSK	Refreshing @ 1Hz	- 1 Sec	ok Sp
4.	Check that TM1N and TM2N parameters are incrementing as indicated	TM1N TM2N	@ 0.5Hz @ 1Hz	- 2 Sec - 1 Sec	okap
5.	Check that the Photometer LIAs have switched on	PLIABITSTAT	0/1	4	ok MP
6.	Check that the BSM sensors have switched on	CHOPSENSPWR JIGGSENSPWR	0/1 0/1	3	ok Sp
7.	Check that the SMEC sensors are switched on	SMECENCPWR SMECLVDTPWR	0/1 0/1	1	ok MP
8.	Check that TM3N is incrementing as indicated	TM3N	~18-20 Hz	- 2 ZOHE	019P

T 11 11 11 11 11 11 11 11 11 11 11 11 11	011	1			
Test location: ES+EC Operator: 36	908 B	i Work	l II	Date/Time:	DE-105/08 11:20
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Step	Description	Parameter	Expected Values Before/After	Actual Values	Success/
9.	Check that TM5N is incrementing as indicated	TM5N	Incrementing by ~4- 5 every 2 seconds	Before/After - 5	Failure
10.	Check that DCUFRAMECNT and MCUFRAMECNT on the FUNCTIONAL TEST PARAMETERS AND are incrementing as indicated	DCUFRAMECNT	~18-20 Hz	- 18 HZ	ok SP
		MCUFRAMECNT	Incrementing by ~96-100 every 2 seconds	- ST HA THE	
11.	Check that the MODE parameter is set to RAW value 0xFFCD for the "PHOTOPS" mode	MODE	REDY (0x200) / 0xFFCD = 65485	=> ok	ot HP
	Note that "PHOTOPS" is a dummy value for the EMC RE activities – no converted value is defined.				
12.	Notify EMC Test Conductor SPIRE in noisest mode. Return to calling procedure	ОК	ok	ok	ok TPO

Test location: FS+50 Operator: Photo 4	
restrictation. ES+6C Operator: The Operator	QA: Date/Time: 8/05/08 1/1:21
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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	_	OIL
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	DCUFRAMECNT	_	_	OIL
	PARAMETERS AND have stopped incrementing	MCUFRAMECNT	_	_	ok

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Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/
6.	Check that SPIRE is in REDY mode (RAW 0x200)	MODE	0xFFCD/0x200 (REDY)	Re DY	Failure
7.	Check that the Photometer LIAs are switched off	PLIABITSTAT	1/0	٥	OK
8.	Check that the BSM sensors have switched off	CHOPSENSPWR JIGGSENSPWR	1/0 1/0	0	ox
9.	Check that the SMEC sensors are switched off	SMECENCPWR SMECLVDTPWR	1/0 1/0	Ó	O K
10.	Notify EMC Test Conductor SPIRE in Standby (REDY) mode. Return to calling procedure	ОК		0/2	ox

I PERFORM PLS#1 - REMOVE CAPS IN PARRALLEZ PERFORM ACS 333
I THEN ON COMPLETION OF ARS 333 START AUTO COMP PERFORM PLS#2

SAFETY LOOP TRIGGERET) NCR 4207 Test location: Essec Enc Operator:

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PJS 3 - SAFETY LOOP RECOVERY OF SC

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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					
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.					

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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 \$102999SCVT019_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)"	ОК				

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

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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 locati	on:	Operator:	QA:	Date/Time:		
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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	Non Valu	ninal ie	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						
2.	From HPCCS Test Conductor console issue command to connect to HIFI I-EGSE connect HHIFIEGSE		27940 = INECTED		AND SYS_PARS		
	Perform the following two steps if command parameter exchange is required between the IEGSE and HPCCS for the test concerned.						

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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	ОК				
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	ОК				
8.	On HPCCS start Packet History displays for the following APIDs:1024,1026	ОК				

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			Date/I	ime:

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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	ок		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"	ОК				
	Select OK to continue					

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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>=</obsid></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></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.</obsid>	ОК				

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Step- No.	Test-Step-Description	Nom	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?"					
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)"	ОК				
·	Select OK to continue					

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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	ОК				
17.	Verify HK TM packets are being received on APIDs 1024 & 1026	ОК				
18.	Start HIFI Panel Active Cooling as per procedure AD-3	ОК				
19.	HIFI Nominal powered and ready mode Return to calling procedure	ОК				

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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	ок			AND: HA003289		
2.	If HIFI Prime Bus Profile not selected then send the following command from manual command stack: DC819160 DH049160=2	ОК			AND: ZAD07999 PAR: DEF5F160		
3.	Execute test script: HIFIST_nom_IST_Init_6b_key_warm	ок			Testmode_Init band 6b lo_freq 1584.0		
4.	Execute test script: HIFIST_nom_IST_LO_on_6b_warm	ОК			Testmode_LCU_s witchon band 6b		
5.	Execute test script: HIFIST_nom_IST_LOtune_6b_key_warm	ОК			Testmode_LO_tur ng band 6b lo_fred 1584.0	1	

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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	ОК			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	ОК			223		

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8.1.4.3 Transition from HIFI Noisiest Mode to Standby

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

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8.1.4.4 HIFI Standby to OFF

Step- No.	Test-Step-Description		ominal lue	Actual Value	Remarks	P	N
1.	Stop HIFI Panel Active Cooling as per procedure AD-3	Oł					
2.	From the HPCCS test conductor console start the test script: Z102999SCVT015_ASDGEN_HIFIPWROFF_P	Oł	<				
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"	YE	S				
	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.						

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	1	ominal Ilue	Actual Value	Remarks		P	N
The test script will go on to automatically power off all HIFI warm units.							
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?"	N)					
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	1	<					
ir p HOBCS "F	erformed. lowever note that if the original Bus Profile was (launch) the script will automatically leave the us Profile unchanged as this profile is not ompatible with instruments being powered in tandby: Bus Profile left unchanged, as	Instrument related activities are to be erformed. It was erformed. Other erformed	ostrument related activities are to be erformed. Nowever note that if the original Bus Profile was (launch) the script will automatically leave the us Profile unchanged as this profile is not ompatible with instruments being powered in tandby: Bus Profile left unchanged, as	Instrument related activities are to be serformed. It was a comparison of the script will automatically leave the sus Profile unchanged as this profile is not compatible with instruments being powered in tandby: Bus Profile left unchanged, as	Instrument related activities are to be serformed. It is a serious and the original Bus Profile was (launch) the script will automatically leave the sus Profile unchanged as this profile is not compatible with instruments being powered in tandby:	Instrument related activities are to be serformed. It is a serious erformed. OK on the script will automatically leave the sus Profile unchanged as this profile is not compatible with instruments being powered in tandby: It is a serious erformed. OK on the script will automatically leave the sus Profile unchanged as this profile is not compatible with instruments being powered in tandby:	Instrument related activities are to be derformed. It is a substrument related activities are to be derformed. It is a substrument related activities are to be derformed. It is a substrument related activities are to be derformed. OK on the script will automatically leave the dust profile unchanged as this profile is not compatible with instruments being powered in tandby: Bus Profile left unchanged, as

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Step- No.	Test-Step-Description	1	minal lue	Actual Value	Remarks	P	N
	If NO selected then at the prompt:						
6.	"Bus Profile left unchanged"	OŁ	(
	Select OK to continue						
7.	On HPCCS stop Packet History displays for the following APIDs:1024,1026	Oł	<				
8.	From HPCCS Test Conductor console issue command to disconnect PACS I-EGSE disconnect HHIFIEGSE	DI:	SCONNECTE		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	Oł	<				

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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			, and			
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

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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 ASTR1_DUMPING						
2	During ASTR1_DUMPING						
	Select from menu: 13 (STR1 CCD Dump)						
	This puts STR1 in dump mode which takes ca. 1 ½ h						
3	Stop CCD Dumping						

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8.1.7 Autocompatibility TTC part

Step	Operations	Resu	ults		
———	Operations	Required Value	Actual Value	Remarks and Record	
	TTC check	during AutoCompatib	ility		
10	From Test Conductor Console, execute script: R102479SPVT124_TTC_Autocomp.tcl	ОК			
	The following Menu shall appear:				
	TTC COMMISSIONING				
20	1. 100 TCs 2. TM X-Check on chain-1				
20	RNG Group delay chain-1 TM X-Check on chain-2	OK			
	5. RNG Group delay chain-2				
	99. Set back TTC to initial setting				
	Select Option 1				

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

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Step	Operations		Results			
			Required Value	Actual Value	Remarks and Record	
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	C	DΚ		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	C	DK		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 dBr at RX level (Herschel operational frequency + 65 KHz)	m c	DK .		TJ). TO CLOVOTIO TO TO GETTI	
130	Perform a triangular sweep with above settings by: Windows -> Test Commands -> Op modes -> TC Operation And then ONLINE	, (DK			
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		DK			
150	From TTC SCOE, change the Uplink Power at step of 0.3 d Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	IB:)K			

					
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Step	Operations	Results			
0. 0p	Operations		Required Value	Actual Value	Remarks and Record
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	n OK			
170	Check from TTC synoptic that XPND is locked	ОК			
180	Repeat steps 150-170 until XPND gets unlocked TC Threshold	ОК			At the end of the 'loop' record the final Uplink Power Value
Cnain-1					
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	ОК			
200	From TTC SCOE, change the Uplink Power at -86 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	ОК			Power level @ TTC SCOE is set to -86 dBm to take into account IL path (See [AD 1]). RX level is -118 dBm
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Step	Operations	Resi	_	
	Operations	Required Value	Actual Value	Remarks and Record
0.4.0	At TTC SCOE level, apply modulation by selecting: Windows -> SCOE Config -> Uplink -> Tc Mod Index:			
210	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	ОК		
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	ОК		
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).	ОК		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	ОК		аррош адапт.

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Step	Operations	Resu		
Step	Operations	Required Value Actual Value		Remarks and Record
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	ОК		
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.	ОК		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	ОК		@ 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	ОК		Power level @ TTC SCOE is set to -86 dBm to take into account IL path (See [AD 1]). RX level is -118 dBm

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Step	Operations	Res		
	Operations	Required Value	Actual Value	Remarks and Record
	At TTC SCOE level, apply modulation by selecting: Windows -> SCOE Config -> Uplink -> Tc Mod Index:			
310	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	ОК		
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	ОК		
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).	ОК		During the execution of the script, if any of the TC is not 'completed' script can be terminated. Main Menu will
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	ОК		appear again.
L	And then SAVE			

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Step	Operations	Resu		
	Required Value	Actual Value	Remarks and Record	
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	ОК		
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.	ОК		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	ОК		
Chain-1	And then SAVE 1 RNG Group Delay			
400	Ensure that TTC SCOE is in remote mode	ОК		
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	ОК		TTC SCOE is set to -73
430	Script TTC_OP_METHOD is called to lock XPND-1	ОК		

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Step	Operations	Resu		
	Operations	Required Value	Actual Value	Remarks and Record
440	At Script completion check from TTC synoptic that TTC is locked	ОК		
450	Routine to measure RNG group delay is called. At the end of script, record the value	ОК		Result Directory on TTC SCOE: ~/Spool/[current session day]
TM Cha	in-1 check		<u> </u>	r coscien dayj
460	From Main Menu, select option 2	ОК		
470	TM is routed via RF	ОК		
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	ОК		
490	TM is routed back via Umbilical	OK		
500	Chain-1 is switched-off and Chain-2 is switched-on	ОК		This step is performed via Umbilical
510	From SAT synoptic, check that the above configuration is reached.	ок		
Chain-2	Lock Acquisition	. I management and an appropriate and appropri		I
520	TTC SCOE is set to perform 1 triangular sweep @ -137 dBm at RX level (Herschel operational frequency)	ОК		Power level @ TTC SCOE is set to -106 dBm to take into account IL path (See [AD 1])

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Step	Operations	Resi		
Сюр	Operations	Required Value	Actual Value	Remarks and Record
530	Script Y102989ECVT018_TTC_TC_OP_METHOD shall popup. When Script is over, from TTC synoptic check that XPND-1 is Locked	ок		
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	ОК		
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	ок		
570	Check from TTC synoptic that XPND is locked	ОК		
580	Repeat steps 550-570 until XPND gets unlocked	ОК		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:					
	Test location: O	perator:	QA:	Date/Time:	

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Step	Operations	Resu	_		
Ctop	Operations	Required Value	Actual Value	Remarks and Record	
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	ОК		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	ОК		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)	ОК		dom	
620	Perform a triangular sweep with above settings by: Windows -> Test Commands -> Op modes -> TC Operation And then ONLINE	ОК			
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	ОК			

Test location:	_			
Test location:	Operator:	1 0 1	D - 1 - /T:	1
	operator.	QA:	Date/Time:	l i
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Step	Operations		Resu		
	oporation to		Required Value	Actual Value	Remarks and Record
640	From TTC SCOE, change the Uplink Power at step of 0.3 dl Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	B: OI	<		
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	O	<		
660	Check from TTC synoptic that XPND is locked	OI	<	-	
670	Repeat steps 640-670 until XPND gets unlocked	OI	<		At the end of the 'loop' record the final Uplink Power Value
Chain-2	TC Threshold				1 Ower value
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	Oł	<		
690	From TTC SCOE, change the Uplink Power at -87 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	Oł	<		Power level @ TTC SCOE is set to -87 dBm to take into account IL path (See [AD 1]). RX level is -118 dBm
Test loca	ation: Operator:	QA		Date/Time	

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Step	Operations	Resu		
Сюр	Operations	Required Value	Actual Value	Remarks and Record
	At TTC SCOE level, apply modulation by selecting: Windows -> SCOE Config -> Uplink -> Tc Mod Index:			
700	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	ОК		
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	ОК		
730	From Main Script Menu, select option '100 TCs'	ОК		
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).	ОК		During the execution of the script, if any of the TC is not 'completed' script can be terminated. Main Menu will
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	ОК		appear again.

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Toot loosties.			·		Y
l lest location:	Operator:	I I OA		Data /Time	1
	Operator.	Q P	١.	Date/Time:	1

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Step	Operations	Resu	_	
	Operations	Required Value	Actual Value	Remarks and Record
760	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then <u>SET</u>	ОК		
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.			At the end of the 'loop' record the final Uplink Power Value
Chain-2	2 TC Threshold with Doppler Shift			
780	From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal with Doppler (7207.8483 MH - 65 KHz)': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.7833 MHz And then SAVE	z OK		@ TTC SCOE level: -88 dBm

ī							
	Test location:	Operator:	Q/	A:	Date/	Гime:	

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Step	Operations	Resu	_	
<u> </u>	Operations	Required Value	Actual Value	Remarks and Record
790	From TTC SCOE, change the Uplink Power at -87 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE	ОК		Power level @ TTC SCOE is set to -86 dBm to take into account IL path (See [AD
	At TTC SCOE level, apply modulation by selecting: Windows -> SCOE Config -> Uplink -> Tc Mod Index:			1]). RX level is -118 dBm
800	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	ОК		
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).	ОК		During the execution of the script, if any of the TC is not 'completed' script can be terminated. Main Menu will appear again.

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Step	Operations	Resu		
	Operations	Required Value	Actual Value	Remarks and Record
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	ОК		
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	ОК		
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.	ОК		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	ОК		

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st location: Operator:	1 1 0 4 . 1	- · /	
or location.	(JA:	Date/Time:	1
		Date/ Hille.	1

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Step	Operations		Resu	ılts		
	Operations		Required Value	Actual Value	Remarks and Record	
890	From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal with Doppler (7207.8483 M - 65 KHz)': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.7833 MHz	1Hz	ОК		@ TTC SCOE level: -88 dBm	
	And then <u>SAVE</u>					
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		ОК		TTC SCOE is set to -73	
930	Script TTC_OP_METHOD is called to lock XPND-1		OK		dbiii	
940	At Script completion check from TTC synoptic that TTC is locked	* 1.*1	ОК			
950	Routine to measure RNG group delay is called. At the end script, record the value	of	ОК		Result Directory on TTC SCOE: ~/Spool/[current session day]	
TM Cha	in-2 check				session day	
960	From Main Menu, select option 2		OK			
970	TM is routed via RF		OK			

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Step	Operations	Results		
	Operations	Required Value	Actual Value	Remarks and Record
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			
990	TM is routed back via Umbilical	ОК		
1000	Chain-1 is switched-off and Chain-2 is switched-on	ОК		This step is performed via Umbilical
1010	From SAT synoptic, check that the above configuration is reached.	ОК		- Cinibilical
Reset s	tarting conditions			
1020	From Main Menu, select option 99	ОК		
1030	TTC Chain-2 is switched-off while chain-1 is set ON	ОК		
1040	From TTC Synoptic check that above conditions are met	ОК		

Taskinskiski			
l lest location:	Operator:	1 0 4 . 1	
. oot loodiloit.	Operator.	QA:	Date/Time:

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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	ОК				<u> </u>	
2	Verify no TM except system packet (SCOE TM)	OK					

Test location: Operator:	QA:	Date/Time:

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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	ОК					

Test location:	Operator:	QA:	Date/Time	:

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9 Summary Sheets

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Procedure Variation Summary

	7	 Гest Change	Curr. No.: 1	
			Date 64-05-20	08
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Test designation		Test Procedure	Issue	Rev.
EMC RE Autocomp (d	ry-run)	PR-0116	1.0	-
Test step changed		Reason for Change		
		eans Cabic	and co.	raget
to the FT	C TES	+ POINTS.		
Soud to.	•		०४१०५०४	१८५०
		DCN 80170		تاد
TWTA	OFF =	DC 06 E 170	7	OK. She
VERIFY ON	TIM	TT8CHP th	at;	
EPC 1				OK
XPNO1	ISOF	F		σχ
LCL 23		,		0 0
LCL 49	15 OPE			076
Now they	GCHANI	CALTEATT CA	~ Cha.	~66
The A~	6~~~	1 No. 1		
Water on	6 tine	that the A	etimity 17	3 Enden
The Hall	2 How	x #c/ //		
		12 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1		-
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 = X	DEN 83740		
TRATAX	なで下ジ	acher als)	
Prepared by: 0	Respl	Vest Leader	Project Engineer	
Tocoto	1/1	Bell	- -	
PAVOA ZHOGGE R	Prime		Customer	

DS: 65535 ID: TT&C_H Title: MIMICS DISPLAY Sample Time: 2008.129.18.13.57.295 Workstation: hpws24 TT&C HERSCHEL/PLANCK 2006/09/29 Text Field XPND2 - RX -129.4 dBm 5.00 AGC 0.73 V SEC. VOLTAGE IVI SPE 3.12 -21.40 kHz 32.93 TEMPERATURE [C] FCL 4 Curr ANODE VOLT. [V] 724.51 Locked LCL50 BIT RATE [bps] 125 bps LOCK STATUS 0.30 24.06 TEMP. [C] OFF SQUELCH -0.04 HELIX I [mA] XPND2 - TX LOCK STATUS LCL 50 Curr ON OFF ON ON EPC2 0.00 **SQUELCH** 0.10 HBR SECONDARY VOLTAGE [V] TX MODE LCL16 27.63 Coher OFF TEMPERATURE [C] TWTA2 LCL 16 Curr OFF -13.52 Rang OUTPUT POWER [dBm] 0.01 0.5 0.2 RNG MI [rad] 24.31 24.16 TM MI [rad] 3 dB Caupler 29.47 29.07 XPND1 - TX OFF ON OFF OFF SW1 pos A TWTA1 0.11 MBR SECONDARY VOLTAGE [V] TX MODE ON 36.88 TEMPERATURE [C] Coher LCL23 EPC1 ON LCL49 -13.71 **OUTPUT POWER [dBm]** Rang LCL 23 Curr 1.2 RNG MI [rad] ANODE VOLT. [V] 849.26 TM MI [rad] 0.01 32.89 LCL 49 Curr TEMP. [C]

XPND1 - RX HELIX I [mA] -0.06 0.00 AGC 0.52 V -149.(dBm SW3 pos A 4.99 FCL3 Curr SEC. VOLTAGE [V] SPE 3.38 V -52.11 kHz 40.65 0.31 TEMPERATURE [C] No locked LOCK STATUS BIT RATE [bps] 125 bps OFF SQUELCH LGA1 -120dBm -100dBm -40dBm -145dBm RX1 AGC SW2 pos B RX2 AGC -130kHz 0kHz +130kHz LGA2/3 MGA RX1 SPE RX2 SPE SW4 pos B No Start Seq TC DECODER SELECTION RX1 No Start Seg TC DECODER SELECTION RX2



8.1 Procedure Variation Summary

	Test Change	Curr. No.:	#2
		Date 5	8/5/08
		Page	/ of /
Test designation EMCRE Auto	Test Procedure	ON6 Issue	Rev.
Test step changed	Reason for Change		
, 00, 010 p 011211 g = 1	Swow	TWTA-14)	X PND_1
BY PUSH IN ORDER TEST THEY USE THE	(PND_I WERE TO REMOVE TO CONTINU NEED TO BE SE TCS:	THE CAP	S.
LAT S	S WINS & CHEC	K TWTA-1	TM
DCH 8	3170 (xpv)	L1 - ON)	
X			
3 4			7
THEN TH	E SAFETY LO	104 TRIBE	EREDO
Drangrad by:	Resp. Test Leader	Project Engir	neer
Prepared by:	Acop. 1000 Educati	. 10,000 2119.1	
	i i		
PARON SID	Prime	Customer	



8.1 Procedure Variation Summary

•	Test Change	Curr. No.: 🎉	L #3
		Date 9/5	08
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Test designation EMC RE Auto Ca	Test Procedure		Rev.
Test step changed RECOVERY	Reason for Change	SAFETYLOOP	TRIEGERE
	ommand Stad = 0] YCO43: [RM-A SISABE [RM-B DISAB	946 (4843094	6=0);
	Short Power Co		
3) As Soon	it on SAS So	Power Sc 1	3 ws
Prepared	e Pour or S Pour Off Sc 99 MCUTOO2 - P	cript has fi	Fassille
Prepared by:		Project Engineer	
PA/QA SHLON	Prime	Customer	

Table 8.1-1: Procedure Variation Sheet



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EADS

9.2 Non Conformance Report (NCR) Summary

NCI	R - No.	NCR - Title	Date	Open	PA	
one (or				Closed	sig.	
Ner	4207	SAFETY LOOP TRIEGERED) DURING AUTOCOMP	80/20/90	ofen	39.	
L				<u>l</u>		

Table 9.2-1: Non-Conformance Record Sheet

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9.3 Sign-off Sheet

	Date			Signature	
Test Manager					
Operator		4			
PA Responsible	9	15	108	BAGE	
ESA Representative		,			

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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).

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

KIN-01	PWR Panel (PCDU)				
XIIV-01	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	
N-02	PWR Panel (ACC, CDMU, RCS, 15				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
(IN-02	DMS 1553 Bus_A	J01	CDMU		Flight Plug SK02P01 Plugged
(IN-02	DMS 1553 Bus_B	J02	CDMU		Flight Plug SK02P02 Plugged
(IN-02	ACMS 1553 Bus_A	J03	ACC		Flight Plug SK02P03 Plugged
(IN-02	ACMS 1553 Bus_B	J04	ACC		Flight Plug SK02P04 Plugged
(IN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	Copper Tape	
IN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	Copper Tape	Flight Plug
(IN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH		SK02P07 Plugged
(IN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS		Flight Plug

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1					SK02P08 Plugged
	CDMU and ACC EEPROM				Flight Cap
SKIN-02	reprogramming input	J09	ACC/CDMU		SK02P09 Plugged
	CDMU and ACC EEPROM				Flight Cap
SKIN-02	reprogramming input	J10	ACC/CDMU		SK02P10 Plugged
		+		1	Flight Plug
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS	ļ	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	31(0301	AFIND I/LFC1		
OKIN-00	jumper EPC2	SK03J02	XPND2/EPC2	Copper Tape	
	RFLINK	01(00002	A NOZZEI GZ	<u> </u>	L
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
					LGA1 Anechoic
	RF link for antenna LGA1	N/A	LGA1		Cap + termination
	RF link for antenna LGA2	N/A	LGA2		LGA2 Anechoic Cap + termination
					MGA Anechoic Cap
	RF link for antenna MGA	N/A	MGA	1	+ tarmination
	RF link for antenna MGA	N/A	MGA	MGA	+ termination
	TTC Panel Test point J 15	N/A	MGA	MGA	+ termination
SKIN-04	TTC Panel Test point J 15 TTC Panel Test point J 60	N/A	MGA	MGA LGA1	+ termination
SKIN-04	TTC Panel Test point J 15 TTC Panel Test point J 60 ACMS Panel (RWE)			LGA1	
	TTC Panel Test point J 15 TTC Panel Test point J 60	N/A Skin Connector	MGA S/C unit		Flight Connector
SKIN-04 SKIN-04	TTC Panel Test point J 15 TTC Panel Test point J 60 ACMS Panel (RWE) Connector Function	Skin Connector	S/C unit	LGA1	Flight Connector ACMS Flight Plug
	TTC Panel Test point J 15 TTC Panel Test point J 60 ACMS Panel (RWE)			LGA1	Flight Connector ACMS Flight Plug SK04P01 Plugged
SKIN-04	TTC Panel Test point J 15 TTC Panel Test point J 60 ACMS Panel (RWE) Connector Function	Skin Connector	S/C unit	LGA1	Flight Connector ACMS Flight Plug
SKIN-04	TTC Panel Test point J 15 TTC Panel Test point J 60 ACMS Panel (RWE) Connector Function RWL1 Sgn	Skin Connector J01	S/C unit ACC/RWL-1	LGA1	Flight Connector ACMS Flight Plug SK04P01 Plugged ACMS Flight Plug
SKIN-04 SKIN-04	TTC Panel Test point J 15 TTC Panel Test point J 60 ACMS Panel (RWE) Connector Function RWL1 Sgn	Skin Connector J01	S/C unit ACC/RWL-1	LGA1	Flight Connector ACMS Flight Plug SK04P01 Plugged ACMS Flight Plug SK04P02 Plugged
SKIN-04 SKIN-04	TTC Panel Test point J 15 TTC Panel Test point J 60 ACMS Panel (RWE) Connector Function RWL1 Sgn RWL2 Sgn	Skin Connector J01 J02	S/C unit ACC/RWL-1 ACC/RWL-2	LGA1	Flight Connector ACMS Flight Plug SK04P01 Plugged ACMS Flight Plug SK04P02 Plugged ACMS Flight Plug

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	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 UMBILICAL	J02	STR2		ACMS Flight Plug			
	Connector Function	Connector	S/C unit	SCOE CABLE				
				SCOEs cable				
	Power/Data	HU1 J01	SYSTEM	Plugged				
	Power/Data	HU2 J01	SYSTEM	SCOEs cable Plugged				

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

SKIN-01	PWR Panel (PCDU)					
	Connector Function	Skin Connector S/C unit		SCOE CABLE	Flight Connector	
				BS SCOE Cable		
	BS Nom Power	SK01BJ09	PCDU	Plugged		
				BS SCOE Cable		
	BS Red Power	SK01BJ10	PCDU	Plugged	ļ	
				LPS SCOE		
	BDR1 AIT	SK01BJ11	PCDU	Cable Plugged		
				LPS SCOE		
	BDR2 AIT	SK01BJ12	PCDU	Cable Plugged	 	
	SA Nom Power	SK01AJ01	PCDU	POWER SCOE Cable Plugged		
	SA NOITI FOWEI	SKUTAJUT	PCDO	POWER SCOE		
	SA Nom Power	SK01AJ02	PCDU	Cable Plugged		
	C/(Noin') GNC	CRO IAGO	1 000	POWER SCOE		
	SA Nom Power	SK01AJ03	PCDU	Cable Plugged		
		0,10.7.500		Connector		
	SA Red Power	SK01AJ04	PCDU	Cover		
				POWER SCOE		
	SA Red Power	SK01AJ05	PCDU	Cable Plugged		
				POWER SCOE		
	SA Red Power	SK01AJ06	PCDU	Cable Plugged		
				POWER SCOE		
	SA Red Power	SK01AJ07	PCDU	Cable Plugged		
(IN-02	PWR Panel (ACC, CDMU, RCS, 15					
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector	
		1000			Flight Plug	
SKIN-02	DMS 1553 Bus_A	J01	CDMU		SK02P01 Plugged	
1/11/1 00	DNO 4550 D D	100	001111		Flight Plug	
KIN-02	DMS 1553 Bus_B	J02	CDMU	 	SK02P02 Plugged	
KIN-02	ACMS 1553 Bus_A	102	ACC		Flight Plug	
1111-02	ACIVIS 1333 BUS_A	J03	ACC	 	SK02P03 Plugged Flight Plug	
KIN-02	ACMS 1553 Bus_B	J04	ACC		SK02P04 Plugged	
KIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	Copper Tape	UNULI DE L'IUUUU	
KIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	Copper Tape		
	2.2. 0. 20. 0	555		Supple Topo	Flight Plug	
KIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH		SK02P07 Plugged	
KIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS		Flight Plug	

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	1				1	SK02P08 Plugged
		CDMU and ACC EEPROM				Flight Cap
	SKIN-02	reprogramming input	J09	ACC/CDMU		SK02P09 Plugged
		CDMU and ACC EEPROM				Flight Cap
	SKIN-02	reprogramming input	J10	ACC/CDMU		SK02P10 Plugged
						Flight Plug
	SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS		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	
						ACMS Flight Plug
	SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		SK02P14 Plugged
						ACMS Flight Plug
	SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		SK02P15 Plugged
*49						ACMS Flight Plug
	SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		SK02P16 Plugged
						ACMS Flight Plug
	SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		SK02P17 Plugged
	SKIN-03	TTC Panel				
		Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	SKIN-03	Test point TC + protection				
	0	jumper EPC1	SK03J01	XPND1/EPC1	Copper Tape	
	SKIN-03	Test point TC + protection				
	Siture 55	jumper EPC2	SK03J02	XPND2/EPC2	Copper Tape	
		RFLINK	1			
		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		
90		TTC Panel Test point J 15	14/7	illor.	MGA	
3		TTC Panel Test point J 60			LGA1	
	SKIN-04	ACMS Panel (RWE)	L	L	20/1/	
	5KIN-04		Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	01/11/04	Connector Function	Skill Collifector	3/G unit	SCOE CABLE	ACMS Flight Plug
	SKIN-04	DWI 1 Can	J01	ACC/RWL-1		SK04P01 Plugged
	01/11/04	RWL1 Sgn	301	ACC/RVIL-1		ACMS Flight Plug
	SKIN-04	DIAM O Com	J02	ACC/RWL-2		SK04P02 Plugged
	000	RWL2 Sgn	302	ACC/RVVL-2		ACMS Flight Plug
	SKIN-04	DIMI O O	102	ACC/DWL 2		SK04P03 Plugged
	02211.01	RWL3 Sgn	J03	ACC/RWL-3	 	ACMS Flight Plug
	SKIN-04	DIAW 4.Com	104	ACC/DW/L 4		SK04P04 Plugged
		RWL4 Sgn	J04	ACC/RWL-4	1	onverse mugged
	SKIN-05	GYR/QRS Panel	OLE O	8/0 : "	BOOF CARLE	Eliaht Connector
		Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	SKIN-05	CRS1 AOCS Sgn	J01	CRS-1/ACC	<u> </u>	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 UMBILICAL	J02	STR2		ACMS Flight Plug
	Connector Function	Connector	S/C unit	SCOE CABLE	
				SCOEs cable	
	Power/Data	HU1 J01	SYSTEM	Plugged	
	Power/Data	HU2 J01	SYSTEM	SCOEs cable Plugged	

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	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	Х	Stritter Rene	AED11
	Chen Bing	HE Space		Suess Rudi	OTN/ASA4
	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			
<u>X</u>	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	Х	Thales Alenia Space Cannes	TAS-F
<u>X</u>	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. & Equipmen	
	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 Ov	PANT
	Schmidt Thomas	AED15		SENER Ingenieria SA	SEN
	Schweickert Gunn	ASG23		Thales Alenia Space, Antwerp	TAS-ETCA

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CONT OF FORMAL RUN



EADS	Procedure	Herschel
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2008-05	-08-04-12-heredmi	u_hpws22_
Title:	Herschel EGSE, Satellite & Instrume	ent Procedure
	for the EMC Radiated Emission and RF	AutoCompTests
CI-No:	100000	
		07/08/08
Prepared by:	A Di Capua A. A. Capua	
		te: 07/05/08
Checked by:	M Koelle M. Koll	07(05/08
AIT:	R. Hohn (May	07/05/08
Engineering:	D Priestley & M heath	07/05/08
Product Assurance:	R. Stritter pp. A 10.	8/5/08.
Configuration Control:	W. Wietbrock	
Project Management;	Dr. W. Fricke	08/05/03
Approved by TAS-F:	D Montet Jouth	08/05/08
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Distribution:	See Distribution List (last page)	

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AS RUN 09/05/08

following Ner "4207" 'Sajety Log during Antoeomp'

Title:

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

CI-No:

100000

Prepared by:	A Di Capua A. A. Gorana P Modesto H. M. La		07/08/08
	- Modesto 70 gr	Date:	07/05/08
Checked by:	M Koelle M. Köll		07/05/08
AIT:	R. Hohn (C. Mad		07/05/08
Engineering:	D Priestley & M Preste		07/05/08
Product Assurance:	R. Stritter pp. A.10.		8/5/08.
Configuration Control:	W. Wietbrock		,
Project Management;	Dr. W. Fricke		08/05/08
Approved by TAS-F:	D Montet Doubt		08/05/08
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Issue	Date	Sheet	Description of Change	Releas e	•
1	06.05.2008		Initial Version (HIPT and ESA comments incorporated)	0	

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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.

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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

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2.2 Reference Documents

	RD-1	Herschel PCDU & CDMS nominal switch on / off procedure	HP-2-ASED-PR-0070
00000000000000000000000000000000000000	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

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3 Requirements to be verified

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

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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

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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:

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S/C Environmental	Limits	Actual
Cryostat Connection (Valves)	N/A	
Cryostat Status (Hel/Hell)	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

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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

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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

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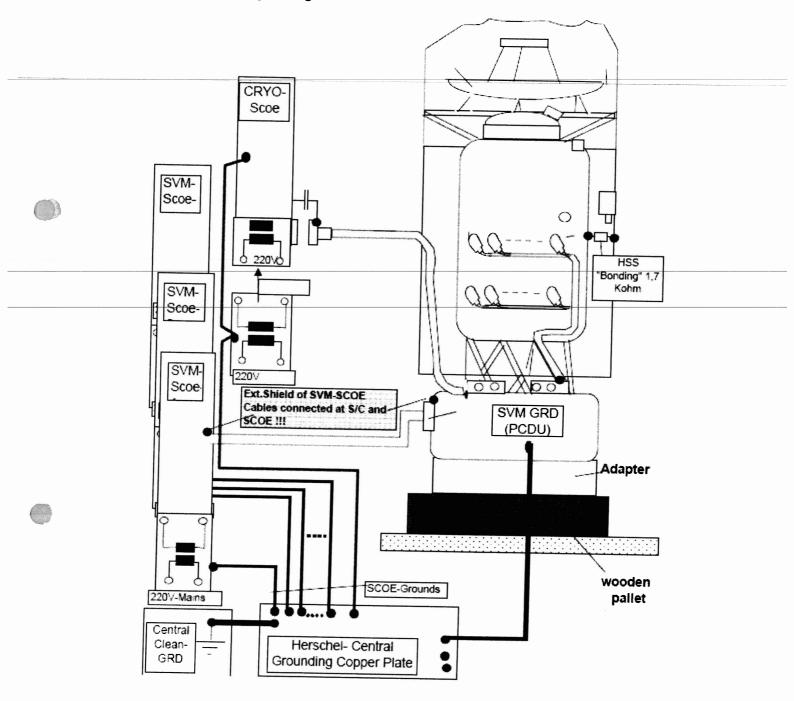
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5.5.3.3 Grounding Configuration



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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

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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.

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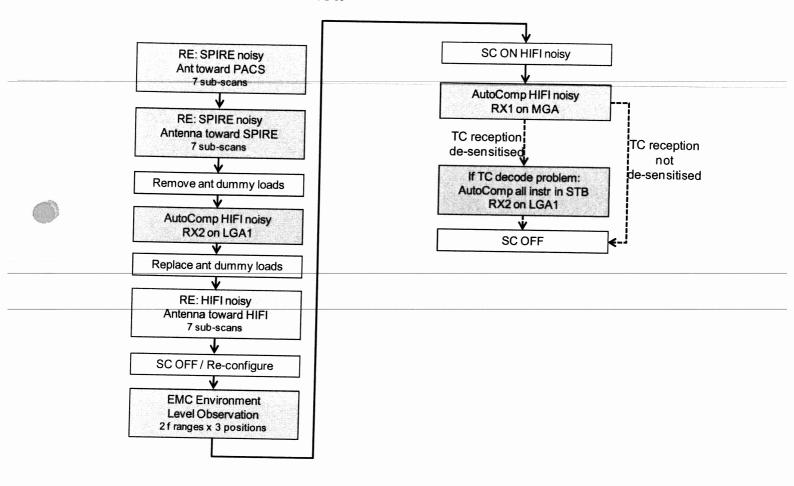
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7 General Test Flow



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EADS

Procedure

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Test Execution Step-by-Step Procedure

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8.1 Radiated FM SAT EMC

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

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

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u	EAUS	Proc	Procedure			_	lers	Herschel
Sten	Tree Store Deserve				100 -144-145(300)73			
No.	rest-Step-Description	Nominal	Tolerance Actual	Actual	Remarks	٩	>	
		Value		Value				
09	Click "End TS " to continue							
	OPERETOR INTO			02:55				1 4010
1	O FINE OR INFO						Ť	ーナクラーヤ
2	Communicate to the EMC TEAM that the SC is switched on		***************************************					7
	and ready to start EMC							ナ # SO /
	7010999MCVT200 EMC				AATON SAN SAN SAN SAN SAN SAN SAN SAN SAN SA			0 5 7 0
							I	ことない
80								
3	THE EGOE and SVM are now set							
	Click iii wifidow the button "OK" to proceed					-		

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8.1.2 PACS Instrument Procedures

EADS

PACS OFF to Standby (SAFE) 8.1.2.1

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).

Sten.	Took Store Brands		-				
No.	rest-Step-Description	Nominal	Actual	Actual Value	Remarks	Ь	>
	On HPCCS start Books I Lists in the	value				1	•
1.	following APIDs: 1152, 1154	Š	k 0				
	From the HPCCS test conductor consolo at a					7	
^	the test script to power PACS Prime to SAFE:						
i	Z102999SCVT010_ASDGEN_PACSPWRON_P	3,0	2			7	
	On HDCCs whom a second of						
	di ili cos wileli prompted:						
რ	"FM PACS Switch ON in Warm or Cold conditions, FPU connected - Select NO to abort TS if not correct"	YES	v Ú			 7	

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Mo. On HPCCS when promp " PACS FDIR OBCPS// enabled? - If not abort TS" If in any doubt about the NO should be selected to Before restarting consult support engineer to conf be used for the test in qu If YES is selected the test	On HPCCS when prompted:	Nominal						
	when prompted:		Act	Actual Value	Remarks	٩	_	
		Value						
If in any douk NO should be Before restar Support engir be used for the	FAUS FUIR OBCPs/EATs loaded and enabled? - If not select NO to abort TS"	YES	S W					
If YES is sele	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.							
automatically force boot the instrument to	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)							
If AFO mode script P102999SCV 5. will prompt th	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	Ą	7 6			7		
appears.								

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Step-	Test-Step-Description	Mominal						
No.		Value	Act	Actual Value	Remarks	4	>	
	On HPCCS when all autonomous actions have been completed by the power on script P102999SCVT905_ASDISTPACS_PWR_ON_N it will prompt:							
.6	"Set Bus Profile Back to Original Setting?"	O N	2				7	
	Select YES if it is likely that other non-PACS instrument related activities are to be performed, otherwise select NO .							
	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:		2			/	7	
	"Bus Profile left unchanged, as original setting 0 (Launch)"							
	If prompted select OK to continue							
Test location:	Estec Esa Operator:	QA:	1/1/		Date/Time		0.00	
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	Procedure									F	T-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	0 K
		Nominal Value		Ş	ś		OK XO	\ 	5	Incrementing		š
	EAUS	Test-Step-Description	If NO selected then at the prompt:	"Bus Profile left unchanged"	Select OK to continue	T		Verify HK TM packets are being received on APIDS 1152 9 1153	Either using the ANDs indicated vorition 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	PACS in SAFE mode. Return to calling Procedure
(< L		Step- No.		<u></u> α		(o,	10.		11.		12.

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Procedure	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	Operator: QA:
EADS	8.1.2.2 Transition from N/A 8.1.2.3 Transition from N/A	Test location: Doc. No: HP-2-ASED-PR-0116 Issue: 1.0 Date: 06.05.08

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8.1.2.4 PACS Standby (SAFE) to OFF

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

	Ston	Г			er - revenir no			
	No.	rest-Step-Description	Nominal	Actual Value	Remarks		d	2
	7	From the HPCCS test conductor console start the test script to power OFF PACS Prime from SAFE:	Value					
	•	Z102999SCVT011_ASDGEN_PACSPWROFF_P	2	40				
		On HPCCS when prompted:					>	
	7	"FM PACS Switch OFF in Warm or Cold conditions, FPU connected - Select NO to abort TS if not correct"	YES	<u> </u>			>	
		If in any doubt about the script being executed			N - N - N			
		NO should be selected to abort the script. Before restarting consult the relevant instrument support engineer to confirm the correct script to be used		etas	A/N			
		If VES is selected the total						
		automatically power off all PACS warm units.	Z	£			>	
	3.	Note: During switch off of PACS (5,2) TM event packets are expected	(5,2) events	3				
Test	Test location:	0000	opserved				>	
	2000		QA:	Stock	Date/Time:	100		

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No.	l est-Step-Description	Nominal	Actual Value	Remarks	٩	2
4.	On HPCCS when all autonomous actions have been completed by the power on script P102999SCVT906_ASDISTPACS_PWR_OFF_N it will prompt:		2		>	
	"Set Bus Profile Back to Original Setting?"					
	Select YES if it is likely that other non-PACS instrument related activities are to be performed.					
۲۶.	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:	ΟĶ	N			
	"Bus Profile left unchanged, as original setting ((Lanneh)"					
	If NO selected then at the prompt:					
	"Bus Profile left unchanged"					
	Select OK to continue	<u> </u>	7		>	

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Test-Step-Description Nominal Mominal Actual Value Remarks P N Value On HPCCS step Packet History displays for the following APIDs:1152,1154 PACS OF F. Return to calling Procedure OK
OK CALUATIVATURE REMARKS P OK CALUATIVATURE R OK
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SPIRE Instrument Procedures 8.1.3

8.1.3.1 SPIRE OFF to Standby (REDY)

The following will switch ON and configure SPIRE Prime instrument in REDY (\$tandby) 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

On HPCCS start Packet History displays for the following APIDs:1280,1282 From the HPCCS test conductor console start the test script to power SPIRE Prime to REDY: Z102999SCVT004_ASDGEN_SPIREPWRON_P On HPCCS when prompted: "SPIRE Switch ON for IST activities in any conditions - Select NO to about TS if not correct." EXECUTION OF TIME AND TIME TO THE TO THE TS IS IN THE SWITCH ON TO THE TS IS IN THE TS IS IN THE TS IS IS IN THE TS IS IS IN THE TS IS IN THE TS IS IN THE TS IS IN THE TS IS IS IN THE TS IS IN		Ston	Took Often B.					
T Packet History displays for the :1280,1282 S test conductor console start the wer SPIRE Prime to REDY: O4_ASDGEN_SPIREPWRON_P In prompted: In ON for IST activities tions - Select NO to not correct." Operator: Op		No.	rest-step-Description	Nominal	Actual Value	Remarks	Q	2
S test conductor console start the ver SPIRE Prime to REDY: 04_ASDGEN_SPIREPWRON_P In prompted: In ON for IST activities It ions - Select No to not correct." Operator: Operator: Operator: Operator: Operator Operato			On HPCCS start Packet History displays for the	Value			_	≥
S test conductor console start the ver SPIRE Prime to REDY: 04_ASDGEN_SPIREPWRON_P In prompted: In ON for IST activities tions - Select NO to not correct." Operator: Operator: Operator: Operator		7.	following APIDs:1280,1282	Š	<u> </u>		-	
Wer SPIRE Prime to REDY: 04_ASDGEN_SPIREPWRON_P ON for IST activities To N for IST activities Nets			From the HPCCS test conductor console start the		/		7	
n prompted: n ON for IST activities tions - Select NO to not correct." Operator: Operator: Operator: Operator O			test script to power SPIRE Prime to REDY:					
n prompted: 1 ON for IST activities YES YES tions - Select NO to not correct."			Z102999SCVT004_ASDGEN_SPIREPWRON_P	70	√ 0		7	
1 ON for IST activities YES VES UES Onet correct"			On HPCCS when prompted:					
tions - Select NO to not correct" Operator:			boolbied.					
not correct" Operator:		ກ່	"SPIRE Switch ON for IST activities in any conditions - Select NO +2	YES	YES		7	
Operator:			abort TS if not correct"					
	Test	ocation:		OA				

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No.	rest-Step-Description	Nominal	Actua	Actual Value	Remarks		Ь	~
	If in any doubt about the script being executed	Value						
4.	restarting consult the relevant instrument support							
	engineer to confirm the correct script to be used	¥	¢ Z				7	
	If VEC is colooped the test in							
	automatically power or all Spipe		-					
5.	force boot the DPU ASW and configure the	70	7				7.777	
	instrument to REDY (Standby mode).	<u> </u>	¥3,				7	
	On HPCCS when all autonomous actions have							
9	it will promote							
- -	is will profitible.	<u> </u>	0			-/		
	"Set Bus Drofilo Bash to o						7	*
	Setting?"							

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Procedure

Select VES 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 (flaunch) 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)" If NO selected then at the prompt: 8. "Bus Profile left unchanged" Original setting 0 (Launch)" If NO selected then at the prompt: 8. "Bus Profile left unchanged" Original setting 0 (Launch)" If NO selected then at the prompt: Select OK to continue Select OK to continue Select OK to continue Original setting 0 (Launch)" If NO selected then at the prompt: Select OK to continue Select OK to continue Original setting 0 (Launch)" APIDs 1280 & 1282 Either using the ANDs indicated verify the correct status of the following SPIRE specific TM parameters or if the IEGSE is connected request lEGSE Operator to confirm that: THSK (SM00T500) parameter refreshing @ 0.25 OK OX Hz Occation: Estrec Gree Operator: Operator: Ox OA: TENTER CANDERS 10. Apide occation: Estrec Gree Ox Ox Ox 10. Apide occation: Estrec Gree Ox Ox 10. Apide occution occation: Estrec Gree Ox Ox 10. Apide occution occution occation: Estrec Gree Ox 10. Apide occution occution occation occation occution occation occatio	Step- No.	Test-Step-Description	Nominal	Actual Value		Remarks		Ф	>
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)" If NO selected then at the prompt: 8. "Bus Profile left unchanged" Original setting 0 (Launch)" If NO selected then at the prompt: Select OK to continue 9. Verify HT IM packets are being received on Verify HT IM packets are being received on Select OK to continue 10. parameters of the following SPIRE specific TM parameters or if the EGSE is connected request IEGSE Operator to confirm that: THSK (SM00T500) parameter refreshing @ 0.25 HZ PP2-ASED-PR-0116 10. OA: TENTER (SM00T500) parameter refreshing @ 0.25 HZ PP2-ASED-PR-0116 10. OA: TENTER (SM00T500) parameter refreshing @ 0.25 HZ PP2-ASED-PR-0116		Select YES if it is likely that other non-SPIRE instrument related activities are to be performed.	Value						
"Bus Profile left unchanged, as original setting 0 (Launch)" If NO selected then at the prompt: 8. "Bus Profile left unchanged" 9. Verify HK TM packets are being received on APIDs 1280 & 1282 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 OK OK 10. Operator: APIDS 1282 APIDS 1282 OK OK 11. Operator: APIDS 1282 OK OK 12. Operator: APIDS 1282 OK OK 13. Operator: APIDS 1282 OK OK 14. Operator: APIDS 1282 OK OK 15. Operator: APIDS 1282 OK 16. Operator: APIDS 1282 OK 16. Operator: APIDS 1282 OK 16. Operator: APIDS 1282 OK 17. Operator: APIDS 1282 OK 18. Operator: APIDS 1282 OK 19. Operator: APIDS 1282 OK 19. Operator: APIDS 1282 OK 10. Op		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:	Š					7	
8. "Bus Profile left unchanged" OK OK. Select OK to continue 9. Verify HK TM packets are being received on APIDs 1280 & 1282 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 OK OK HP2-ASED-PR-0116		unchanged, 0 (Launch)"							
8. "Bus Profile left unchanged" Select OK to continue 9. Verify HK TM packets are being received on APIDs 1280 & 1282 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 Occation: Estec Gr.C. Operator: OA: DA: HP2-ASED-PR-0116 1.0		If NO selected then at the prompt:							
Select OK to continue 9. Verify HK TM packets are being received on APIDs 1280 & 1282 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 Occation: Estec Gre Operator: Occation: AP2-ASED-PR-0116 10 OCCATION: AP2-ASED-PR-0116 10 OCCATION: AP2-ASED-PR-0116 10 OCCATION: AP2-ASED-PR-0116			OK	لا 0				Î	
9. Verify HK TM packets are being received on APIDs 1280 & 1282 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 Occation: Estec Gra Operator: Operator: Operat		Select OK to continue			71.7)	
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		Verify HK TM packets are being received on APIDs 1280 & 1282							- 1
TO. parameters or if the IEGSE is connected request lEGSE Operator to confirm that: THSK (SM00T500) parameter refreshing @ 0.25 OK OK Ocation: Estec Gre Operator: A OA: Estec Gre OA: Estec Gre OA: Estec Gre OA: Estec Gre OA: OA: OB: O		Either using the ANDs indicated verify the correct			4	AND: SA 1 559			ı
THSK (SM00T500) parameter refreshing @ 0.25 OK Ocation: Estec Gra Operator: OA: HP-2-ASED-PR-0116 1.0		status of the following SPIRE specific TM parameters or if the IEGSE is connected request IEGSE Operator to confirm that:			<u> </u>				
Ocation: Estec Gre Operator: Asset OA: Asset OA: 1.0	,	SK (SM00T500) parameter refreshing @ 0.25	Š					7	
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	Procedure	A		อิ	Rem	Ö
	Pro				ll .	
		Nominal	Value	Š	SM00M500 = 0x0200	(KEUY)
	EADS	Test-Step-Description	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)	SPIRE powered and in REDY mode 11. Return to calling Procedure
	EAD	Step- No.				11.

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8.1.3.2 Transition from Standby to SPIRE Noisiest Mode

Ston	Docomination					
90	Description	Parameter	Expected Values	Actual Values	Success/	
-	If SPIRE Prime Bus Profile not selected	AND. 7AD07000	Before/After	Before/After	Failure	
	then send the following command from	AND: 2AD0/999				T
	manual command stack:					
	DC819160	DEFECTIONS				
	DH049160=3	DEF 3F 100=3				
2	Execute TCL script SPIRE-IST-EMC-					
	RE-STBY2PHOTOPS.tcl - Issue 1 1			1		Γ
ď	Check that THSK parameter is	, id				
s	refreshing every second	YSH	Refreshing @ 1Hz			T
4	Check that TM1N and TM2N	41,444				
÷	parameters are incrementing as		@ 0.5Hz			T-
	indicated	NZIN	@ 1Hz			
75	Check that the Photometer I IAs have	+4+0+104				
;	switched on	rLIABIISIAI	0/1			т-
Œ	Check that the BSM sepsors have					
j	Switched on	CHOPSENSPWR	0/1			_
	10 po	JIGGSENSPWR	0/1			
`.	Check that the SMEC sensors are	SMECENCPWR	0/1			
	Switchied Off	SMECLVDTPWR	0/1			
œί	Check that TM3N is incrementing as indicated	TM3N	~18-20 Hz			

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0,00					
daic	Description	Parameter	Expected Values	Actual Values	Success/
တ်	Check that TM5N is incrementing as indicated	TM5N	berore/Atter Incrementing by ~4- 5 every 2 seconds	Before/After —	Failure
10.		DCUFRAMECNT	~18-20 Hz	1	
	incrementing as indicated	MCUFRAMECNT	Incrementing by ~96-100 every 2	I	
17.		MODE	seconds REDY (0x200) /		
	"PHOTOPS" mode				
	Note that "PHOTOPS" is a dummy value for the EMC RE activities – no converted value is defined.				
12.		OK			
	Return to calling procedure				

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Sten	- Tringgo				
	Description	Parameter	Expected Values	Actual	Success!
-	Execute TOI series		Before/After	Values Before/After	Ouccess/
<u>·</u>	EMC-RE-PHOTOPS2STBY.tcl – Issue 1.0	ı	I		railure
2.	Check that the THSK parameter is refreshing every 4 seconds	THSK	Refreshing @	-	
က်	Check that TM1N and TM2N parameters are incrementing as indicated	N1M1	Incrementing by 2 every 4 seconds		
		TM2N	Incrementing by one every 4		
4.	Check that TM3N and TM5N have stopped incrementing	TM3N	seconds —		
		TM5N	I	I	
5.	Check that DCUFRAMECNT and MCUFRAMECNT on the	DCUFRAMECNT			
	PARAMETERS AND have stopped incrementing	MCUFRAMECNT			

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ion: Operator:	HP-2-ASED-PR-0116
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Ctor					
d go	Description	Parameter	Expected Values	Actual	Success/
9	Check that SPIRE is in REDY mode (RAW 0x200)	MODE	Betore/After 0xFFCD/0x200 (REDY)	Values Before/After	Failure
7.	Check that the Photometer LIAs are switched off	PLIABITSTAT	1/0		
ω ં	Check that the BSM sensors have switched off	CHOPSENSPWR JIGGSENSPWR	1/0		
တ်	Check that the SMEC sensors are switched off	SMECENCPWR SMECLVDTPWR	1/0		
10.	Notify EMC Test Conductor SPIRE in Standby (REDY) mode. Return to calling procedure	OK			

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8.1.3.4 SPIRE Standby (REDY) to OFF

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

Step-	Test-Step-Description	Nominal	Actual Value	/alue	Romarks	6	
j E	From the HDCCs took	Value			SUBJECT	L	2
-	test script to power OFF SPIRE Prime from REDY:						
	Z102999SCVT005_ASDGEN_SPIREPWROFF_P	Ą	OK	J		>	
	On HPCCS when prompted:						
i	"SPIRE Switch OFF for IST activities in any conditions - Select NO to abort TS if not correct"	YES				>	
	If in any doubt about the script brings						
ო	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 7		
	If YES is selected the test script will go on to						
4.	automatically power off all SPIRE warm units.						

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tion: Carae	HP-2-ASED-PR-0116
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Step- No.	Test-Step-Description	Nominal	Actu	Actual Value	Remarks	Ь	2
٠ <i>٠</i>	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:						
i	a) EVID 1313 No_MCU_Response_Error b) EVID 21773 ALARM_LSMCU_DEAD	8	2	2		7	
9	On HPCCS when all autonomous actions have been completed by the power on script S102999SCVT019_ASDGENSPIR_PWR_OFF_P it will prompt:	C	·/-	9			
	"Set Bus Profile Back to Original Setting?")	9) •			
	Select YES if it is likely that other non-SPIRE instrument related activities are to be performed.						
۲.	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:	Š			(A/2)		
	"Bus Profile left unchanged, as original setting 0 (Launch)"						

Operator: Test location: (PST36)

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Step- No.	Test-Step-Description	Nominal	Actu	Actual Value	Remarks	٩	>	
	If NO selected then at the prompt:	Value						Ī
89	"Bus Profile left unchanged"	Š		×				
	Select OK to continue	Ś))				
9.	On HPCCS stop Packet History displays for the following APIDs:1280,1282	OK.		7				
10.						2		
								-

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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

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Some additional parameters may exhibit OOL during the test:

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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

Sten-	Test-Sten Description			 					
No.	- 1	Nominal Value	Actu	Actual Value	an	Remarks		٩	>
7.	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	ý	<u>3</u>					7	
6.	From HPCCS Test Conductor console issue command to connect to HIFI I-EGSE	YZS27940 = CONNECTED	A) reaches	33	3	AND SYS_PARS	(2	
	Perform the following two steps if command parameter exchange is required between the IEGSE and HPCCS for the test concerned.								

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Step- No.	Test-Step-Description	Nominal	Act	Actual Value	ar.	Remarks	٩	2
c	If not already running from the HPCCS test conductor console execute the test script:							
က်	ALL_SubscribeParams	OK	0				1	
4.	Verify HPCCS-IEGSE connection by sending the following test command from manual command stack (repeater value 0) and verify received OK on IEGSE:	OK	y(0	.1			7	
	Patch HIFI synthetic parameters for warm conditions by executing the following scripts:							
	HIFIST_ASED_PatchPtvChecksum							
.5	HIFIST_ASED_PatchTempLimits	Š	0				7	
	Note these scripts replace HIFIST_CCS_conf_ptv_checksum_warm due to NCR-3652							
&	On HPCCS start Packet History displays for the following APIDs:1024,1026	Ą	70	1			7	T
								1

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	From the HPCCS test conductor console start the test script:			< I	ANDs HA000289		
D)	Z102999SCVT014_ASDGEN_HIFIPWRON_P	Š	710	工	HA004289	7	
	On HPCCS when prompted:						
10.	"FM HIFI Switch ON for IST or SFT in HeI/HeII conditions with warm LOU - Select NO to abort TS if not correct"	YES	ZEZ			7	
	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.						
3 × × × × × × × × × × × × × × × × × × ×	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 = 90000xxxx hex), Note: at start & end value is 90000000 hex	Š	0 1/2			1	
3	"Select OK to continue"						***************************************
- 0,	Select OK					A. Landerson	

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Step- No.	l est-Step-Description	Nominal Value	Actual Value	Value	Remarks	٩	2	
, ,	Value of OBS_ID during table read commanding. Give both Hex and Dec values:		Hex <0BSI	= 0	AND: HA000289			T
<u>,</u>	HM003190)600 40 44 Dec <08 510 >= 24 (59 25 5 6	5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6		7		
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></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.</obsid>	Ą	y o			1		

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Step- No.	Test-Step-Description	Nominal Value	Actual Value	alue	Remarks	Ь	2
14.	On HPCCS when all autonomous actions have been completed by the power on script H102999SCVT015_ASDISTHIFI_PWR_ON_P it will prompt:	O N				>	
	"Set Bus Profile Back to Original Setting?"					>	
	Select YES if it is likely that other non-HIFI instrument related activities are to be performed.						
15.	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:	X			N.	7	
	"Bus Profile left unchanged, as original setting 0 (Launch)"						
	Select OK to continue						

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Step- No.	Test-Step-Description	Nominal	Actual Value	e Remarks	٩	>	
	If NO selected then at the prompt:	value					- 1
16.	"Bus Profile left unchanged"	X	6				
	Select OK to continue	<u>,</u>	۲ 0	···········	>	Market State of the State of th	Professional State of
	Verify HK TM packets are heing received on						T
17.	47. APIDs 1024 & 1026	Š	Q O		7		
	Start HIFI Panel Active Cooling as per						-т
18.		Ą	016		_7		
	HIFI Nominal promote Leading						
19.	Return to calling procedure	OK	010	***************************************	7		

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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

Stor No	Toot 64-						
Step-Mo.	rest-step-Description	Nominal	Tolerance		Remarks	Ь	2
1.	Confirm HIFI nominal is powered on and in	Value		Value	AND: HA003289	,	
	anoili Indivini			!		7	
	If HIFI Prime Bus Profile not selected then send the				AND: ZAD07999		
2	Tollowing command from manual command stack:			(PAR: DEF5F160		
i	DC819160	Š	-	706		7	
	DH049160=2						
	Execute test script:				Testmode Init		
c							
	HIFIST_nom_IST_Init_6b_key_warm	OK		N O	1584.0	7	
	Execute test script:				Testmode_LCU_s		
4.	HIFIST_nom_IST_LO_on_6b_warm	OK		70	witchon band 6b	7	
	Execute test script:				Testmode_LO_tuni		
.5	HIFIST_nom_IST_LOtune_6b_key_warm	OK XO		20	ng band 6b lo_freq 1584.0	7	

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Step-No.	Step-No. Test-Step-Description	Nominal	Tolerance Actual	Actual	Remarks	Ь	2
		value		Value			
					Testmode_stability		
	Execute test script (runs for approximately 20mins):				_internal_load		
ď					band 6b		
j	HIFIST_nom_EMC_emis_20_warm	Ŏ		2 Z	hrs_mode_h wb8		
	ı	,		Pry 1	hrs_mode_v wb8	•	
				1	integ_time 4 n 150		
					backend both		
7.	Notify EMC Test Conductor that HIFI is configured in its noisest mode for test	Ş				,	
	Return to calling procedure	Ś		J O		7	

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8.1.4.3 Transition from HIFI Noisiest Mode to Standby

Step-	Test-Step-Description	Nominal	Actual Value	Remarks	Q	~
No.		Value		Sulging		:
	Configure HIFI for power OFF					
	Execute test script:			Testmode_LCU		
1.	HIFIST_nom_SFT_LCU_switch_off_warm	OK	9	_switchoff	>	
				Testmode_HIFI		
				_Nominal		
	Execute test script:		,	laser_H	\	
2			2	Lasers_off	>	
	HIFIST_nom_SFT_Nominal_off_warm	ý		laser_V	,	
				Lasers_off		
				chop_loop		
				OPEN	\	
~	HIFI in Standby	ì	7		,	
oj.	Return to calling procedure	ž	<u>ه</u>		>	

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8.1.4.4 HIFI Standby to OFF

כניניני	l est-Step-Description	Nominal	Actual Value	Domarke	۵	V
No.		Value	Jeigal Value	Nelliains		>
7.	Stop HIFI Panel Active Cooling as per procedure AD-3	OK	3		7	
2.	From the HPCCS test conductor console start the test script: Z102999SCVT015_ASDGEN_HIFIPWROFF_P	OK	0h		7	
<i>დ</i>	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	Z)		>	
	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.					

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Step-	Test-Step-Description	Nominal	Actual Value	Remarks	Q	>
No.		Value		Neillains		\
	The test script will go on to automatically power off all HIFI warm units.					
	On HPCCS when all autonomous actions have been completed by the power on script H102999SCVT016_ASDISTHIFI_PWR_OFF_P					
4	it will prompt:	ON	NES		7	
	"Set Bus Profile Back to Original Setting?"					
	Select YES if it is likely that other non-HIFI instrument related activities are to be performed.					
rè,	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:	ÒĶ	3			
	"Bus Profile left unchanged, as original setting 0 (Launch)"					
		l l				
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Step- No.	l est-Step-Description	Nominal Value	Actual Value	Remarks	Ь	~
	If NO selected then at the prompt:					
9	"Bus Profile left unchanged"	OK		**	>	
	Select OK to continue			No.	•	
7.	On HPCCS stop Packet History displays for the following APIDs:1024,1026	OK	Sr.		P	
α	From HPCCS Test Conductor console issue command to disconnect PAGS I-EGSE	DISCONNECTE	8	AND: SYS_PARS		
oj.	disconnect HHIFIEGSE	Q))		>	
6	If no longer required for other instrument activities, from the HPCCS test conductor console terminate the test script:	-		sost-Jan	>	
	ALL_SubscribeParams			- to 2		
10.	HIFI OFF Return to calling Procedure) V	2		>	

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		Remarks				
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		Actual Value			Date	
		Tolerance				
		Toler				
dure		Nominal Value				
Procedure		Not Val	8			
	RWLs 1-4 in noisiest mode for ca. 20 minutes	Test-Step-Description Using A102109SPVT206_ACMS_RWL_EMC_SETUP	menu: 45 (Apply torque commands WLs)	NOTE: Wheels will spin down to zero (with friction) after TBD minutes	Operator: QA:	
EADS	8.1.5 RWLs 1-4 in nois	Step-No. Test-Step-Description Using A102109SPVT20	Select from the menu: clockwise to all RWLs)	OTE: Wheels will spin dowr	HP-2-ASED-PR-0116 1.0 06.05.08	
Ш		<u> </u>	8	ž	Test location: Doc. No: Issue: Date:	

8.1.6 Switch STR 1 to dumping mode (CCD)

	170							
Execute ASTR1_DUMPING During ASTR1_DUMPING Select from menu: 13 (STR1 CCD Dump) This puts STR1 in dump mode which takes ca. 1 ½ h Stop CCD Dumping	step-No.	l est-Step-Description	Nominal	Tolerance	Actual	Remarks	Ь	2
	1	Execute ASTR1_DUMPING			value			
	2	During ASTR1_DUMPING						
		Select from menu: 13 (STR1 CCD Dump)						
		This puts STR1 in dump mode which takes ca. 1 ½ h						
	က	Stop CCD Dumping						

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Herschel			Remarks and Record						(A) (1-02 110	Page 55 of 87
		ts	Actual Value	lity	8		Z		Date/Time:	
 Procedure		Results	Required Value	Compatibi						
Proc			Requir	ing Auto	Ą		Š		aA:	
EADS	8.1.7 Autocompatibility TTC part	Operations	-	TTC check during AutoCompatibility	From Test Conductor Console, execute script: R102479SPVT124_TTC_Autocomp.tcl The following Menuschall appears	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	Chain-1 Lock Acquisition	ition: ESCE Operator: ACC	HP-2-ASED-PR-0116 1.0 06.05.08
Щ		Step			10		20	Chain-1	Test location:	Doc. No: Issue: Date:

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	Step	Operations		Results	
****	*KIS# 1- 4267		Required Value	Je Actual Value	Remarks and Record
	30	at 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
	STACT SWEET	Script Y102989ECVT018_TTC_TC_OP_METHOD shall pop- #p. When Script is over, from TTC synoptic check that XPND- 1 is Locked	OK YO	XPADD LOCKED	Score Set Machand South (See [AD 1]) Score Set Machand South South Control of the
3 1 20 1 50 1 50 1 50 1 50 1 50	50	Put TTC SCOE in Local Mode	OK.	A SEC ANNEX	
	09	From 11C SCOE, change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level) Xo	. 40	
		And then SAVE		,	
		Once the Uplink Power is set, apply the signal selecting at TTC SCOE level:			
	2	Windows -> Test Commands -> Op modes -> TC Operation	λ	*	
	Co	And then SET , EXECUTE			
***************************************	90	Check from TTC synoptic that XPND is locked	Š	8	
	06	Repeat steps 50-70 until XPND gets unlocked	OK	MAST VALUE	At the end of the 'loop' record the final Uplink Power
	Chain-1	Chain-1 Lock Acquisition with Doppler Shift		TTC SCOE CEVEL	value

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Herschel

Step	Operations	Res	Results	
		Required Value	Actual Value	Remarks and Record
	From LTC SCOE in Local Mode, change operational frequency from 'Herschel Nominal (7207.8483 MHz)' to 'Herschel Nom +(65 KHz')		and variety	
100	Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.9133 MHz OR Apply depth Stuff	¥0	ð	Power level @ TTC SCOE is set to -105 dBm to take into account IL path (See [AD 1])
	From TTC SCOPE change the United St	,		
110	Windows -> SCOE Config -> Uplink -> Uplink Level	ž	\$	Power level @ TTC SCOE is set to -105 dBm to take into
	And then SAVE	<u> </u>		account IL path (See [AD
120	TTC SCOE is set to perform 1 triangular sweep @ -137 dBm at RX level (Herschel operational frequency + 65 KHz)	OK N	8	1]). RX level is -137 dBm
	Perform a triangular sweep with above settings by:			
130	Windows -> Test Commands -> Op modes -> TC Operation	ò		
	And then ONLINE, Executa "Tally!	<u> </u>	Z	
140	Wait for sweep to be completed. On TTC SCOE, a window shall popular asking if Years			Mandle Joked Dans
	Check on TTC synoptic that XPND-1 is locked and click OK	Š	ž	
9	From TTC SCOE, change the Uplink Power at step of 0.3 dB:			TO TO KHE hap
001		OK	8	
	And then SAVE			
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	Operator:	OA.		

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Herschel

	Operations	Results	lts		Γ
1	Oron the confidence of the con	Required Value	Actual Value	Remarks and Record	
	Office the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation	Š	3		
	And then <u>SET</u>	Ś	2		***
	Check from TTC synoptic that XPND is locked Repeat steps 150-170 until XPND gets unlocked	OK	ž		
		¥	ž	At the end of the 'loop' 77C record the final Uplink Power Co	200
7	Chain-1 TC Threshold				
	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	λO	770		
	And then SAVE				
	Windows -> SCOE Config -> Uplink -> Uplink Level	ž		Power level @ TTC SCOE is set to -86 dBm to take into	
	And then <u>SAVE</u>	5	ž	account IL path (See [AD	
σ	Test location: & CC Operator:	QA: Sulum	Date/Time:		
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Procedure

Step	Onerations		Results	-
-		Required Value	e Actual Value	Remarks and Record
	At TTC SCOE level, apply modulation by selecting: Windows -> SCOE Config -> Uplink -> Tc Mod Index:			
210	Туре: 1.0	*	8	
	And then SAVE			
220	Perform a triangular sweep with above settings by: Windows -> Test Commands -> Op modes -> TC Operation	Š	B	
	And then ONLINE , EXECUTE		\$	
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) X	*	
240	From Main Script Menu, select option '100 TCs'	OK	B	
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).	ŎĶ	8	During the execution of the script, if any of the TC is not 'completed' script can be terminated. Main Menu will
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	Ą	4	appeal agail.
	And then SAVE			
Test location:	ESTEC Operator	THE THE PERSON NAMED IN COLUMN TO SERVICE AND ADDRESS OF THE PERSON NAMED ADDRESS OF THE PERSON NAMED IN COLUMN TO SERVICE AND ADDRESS OF		2/30
3	Coperator:	QA:	S Date/Time:	50/00/20

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Step Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: 220 Mindows > 2COE Config > Uplink Power is set, apply the signal selecting at TTC SCOE level: 280 Repeat Steps 240-280 until XPND is locked and SQUELCH And then SET From TTC SCOE in Local Mode, change operational frequency is on. From TTC SCOE in Local Mode, change operational frequency is on. Typer 7207.7833 MHz And then SAVE From TTC SCOE change the Uplink Power at -86 dBm: Mindows > SCOE Config > Uplink > Uplink Level Mindows > SCOE Config > Uplink > Uplink + Uplink Level And then SAVE From TTC SCOE change the Uplink Power at -86 dBm: Mindows > SCOE Config > Uplink > Uplink + Uplink Level Mindows > SCOE Config > Uplink > Uplink + Up	IJ	EADS	Procedure		Herschel
Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows > Test Commands > Op modes > TC Operation Windows > Test Commands > Op modes > TC Operation Windows > Test Commands > Op modes > TC Operation From TTC Synoptic, check if XPND is locked and SQUELCH Repeat Steps 240-280 until XPND 100 TCs are not correctly Repeat Steps 240-280 until VPND 100 TCs are not correctly Repeat Steps 240-280 are not correctly Repeat Steps 240-280 are not correctly and the not	Step	Operations	Result	S	
TTC SCOE level: Windows > Test Commands -> Op modes -> TC Operation TTC SCOE level: Windows > Test Commands -> Op modes -> TC Operation And then SET From TTC Synoptic, check if XPND is locked and SQUELCH Repeat Steps 240-280 until XPND 100 TCs are not correctly 100 TCs ar			Required Value	Actual Value	Remarks and Record
And then SET From TTC Synoptic, check if XPND is locked and SQUELCH is ON is O	270	Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation		Acted Value	
From TTC Scote are doing to be dead and SQUELCH Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. Repeat Steps 240-280 until Tcs are not correctly acquired. Repeat Steps 240-280 until Tcs are not correctly acquired. Repeat Steps 240-280 until Tcs are not correctly acquired. Repeat Steps 240-280 until Tcs are not correctly acquired. Repeat Steps 240-280 until Tcs are not correctly acquired. Repeat Steps 240-280 until Tcs are not cor		And then SET	ś	7	,
Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired. At the end of the 'loop' of acquired. At the end of the 'loop' of acquired.	080	From TTC Synoptic, check if XPND is locked and SQUELCH is ON.			
From TTC SCOE in Local Mode, change operational frequency to 'Herschel with Doppler Shift. 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 From TTC SCOE, change the Uplink Power at -86 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE From TTC SCOE, change the Uplink Power at -86 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE And then S	3	Repeat Steps 240-280 until XPND 100 TCs are not correctly acquired.	OK	2	end of the 'loop' the final Uplink Pov
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: And then SAVE From TTC SCOE, change the Uplink Power at -86 dBm: Windows -> SCOE Config -> Uplink Level And then SAVE And then SAVE From TTC SCOE, change the Uplink Level ONF And then SAVE And then SAVE And then SAVE Fig. 1924SED-PR-0116 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Chain-1	TC Threshold with Doppler Shift			value
frequency to 'Herschel Nominal with Doppler (7207.8483 MHz - 65 KHz): Windows -> SCOE Config -> Uplink -> Uplink Frequency: And then SAVE From TTC SCOE, change the Uplink Power at -86 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level Windows -> SCOE Config -> Uplink -> Uplink Level And then SAVE From TTC SCOE, change the Uplink Power at -86 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level OK And then SAVE Free HP2-ASED-PR-0116 10 0A: Date/Time:		From TTC SCOE in Local Mode, change operational			
Windows -> SCOE Config -> Uplink -> Uplink Frequency: And then SAVE From TTC SCOE, change the Uplink Power at -86 dBm: Windows -> SCOE Config -> Uplink Level And then SAVE And then SAVE And then SAVE And then SAVE And then SAVE And then SAVE OA: HP-2-ASED-PR-0116 1.0 06.05.08 Fig. HP-2-ASED-PR-0116 1.0		frequency to 'Herschel Nominal with Doppler (7207.8483 MHz - 65 KHz)':			
And then SAVE From TTC SCOE, change the Uplink Power at -86 dBm: Windows -> SCOE Config -> Uplink Level And then SAVE And then SAVE I location: HP-2-ASED-PR-0116 1.0 0.06.05.08 File: HP-2-ASED-PR-0116 0.06.05.08	06	Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.7833 MHz	Ř	2	@ TTC SCOE level: -88 dBm
From TTC SCOE, change the Uplink Power at -86 dBm: Windows -> SCOE Config -> Uplink Level And then SAVE And then SAVE I location: HP-2-ASED-PR-0116 1.0 06.05.08 File: HP-2-ASED-PR-0116 1.0 06.05.08		And then SAVE			
And then SAVE And then SAVE I location: PP-2-ASED-PR-0116 Date/Time: Date/Ti		From TTC SCOE, change the Uplink Power at -86 dBm:			Power level @ TTC SCOE
And then SAVE And then SAVE t location: Image: Instant of the control of the c	0	Villages -> SCOE Config -> Uplink -> Uplink Level	ŏ	8	is set to -86 dBm to take
t location: Character QA: RAY: Page 1:0 1:0 File: HP-2-ASED-PR-0116.doc File: HP-2-ASED-PR-0116.doc Of:		And then <u>SAVE</u>			into account IL path (See [AD 1]). RX level is -118
lo: HP-2-ASED-PR-0116 1.0 06.05.08 File: HP-2-ASED-PR-0116.doc	est locat	Operator:			dBm
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Step	Operations		Results		Remarks and Record
	At TTC SCOE level, apply modulation by selecting: Windows -> SCOE Config -> Uplink -> Tc Mod Index:	veduled value	o value	Actual Value	
310	Type: 1.0	ð		20	
	And then SAVE				
320	Perform a triangular sweep with above settings by: Windows -> Test Commands -> Op modes -> TC Operation) A	8	8	needly bother
	And then ONLINE				1
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	Š		8	
340	From Main Script Menu, select option '100 TCs'	Š		SK	
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		Z	During the execution of the script, if any of the TC is not 'completed' script can be terminated. Main Menu will
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	OK Y		8	appear again.
	And then SAVE				05
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Herschel		Remarks and Record	KIND LOCKED BY	Result Directory on TTC SCOE: ~/Spool/[current	Session day							MADURELY DOUGH SITH TARK	performed v	Ombilical		Power level @ TTC SCOE is set to -106 dBm to take into	account IL path (See [AD 1])
	ults	Actual Value		x	1 A C. D. 20	1	5 7	5	\	Z,		Sh.	2	*			
Procedure	Results	Required Value															
Proc		Requir	OK	Ŏ X		Š	<u> </u>	5	č	ž		Š	Š	¥) No	
EADS Land The	Onerations		At Script completion check from TTC synoptic that TTC is locked	Routine to measure RNG group delay is called. At the end of script, record the value	TM Chain-1 check	From Main Menu, select option 2	TM is routed via RF	At Prompt:	Check TM flowing' Open a TM Packet History and check that TM Call April 200	correctly flowing down	I nen, click OK to continue	TM is routed back via Umbilical	Chain-1 is switched-off and Chain-2 is switched-on	From SAT synoptic, check that the above configuration is reached.	Chain-2 Lock Acquisition	TTC SCOE is set to perform 1 triangular sweep @ -137 dBm at RX level (Herschel operational frequency)	
	Step		440	450	TM Cha	460	470		480		00	064	200	510	Chain-2	520	

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Script Y102999ECVT018_TTC_TC_OP_METHOD shall pop- up. When Script is ever, from TIC synoptic check that XPND- up. When Script is ever, from TIC synoptic check that XPND- up. When Script is ever, from TIC synoptic check that XPND- up. When Script is ever, from TIC synoptic check that XPND- from TIC SCOE, change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink -> Uplink Level Once the Uplink Power is set, apply the signal selecting at TIC SCOE levei: Windows -> Test Commands -> Op modes -> TC Operation And then SET And then SET And then SET Once the Uplink Power is set, apply the signal selecting at TIC SCOE levei: Windows -> Test Commands -> Op modes -> TC Operation Once the Uplink Power is set, apply the signal selecting at TIC SCOE levei: Windows -> Test Commands -> Op modes -> TC Operation Once the Uplink Power is set, apply the signal selecting at the	Sk that XPND- OK The of 0.3 dB: Shelting at OK OK OK OK OK OK OK OK OK O				Actual Value	Remarks and Record
acript TruczesbecV1018_TTC_TC_OP_METHODS hall populy. When Script is ever, from TTC synoptic check that XPND- 1 is Tocked Put TTC SCOE in Local Mode From TTC SCOE, change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink Level Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET Check from TTC synoptic that XPND is locked Check from TTC synoptic that XPND gets unlocked Repeat steps 550-570 until XPND gets unlocked OK Repeat steps 550-570 until XPND gets unlocked OK Repeat steps 550-570 until XPND gets unlocked	action 7 10289BECV 1018_TTC_TC_OP_METHOD shall pop- 1 is Lock Acquisition with Doppler Shift					
Put TTC SCOE in Local Mode From TTC SCOE, change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink Level Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then <u>SET</u> Check from TTC synoptic that XPND is locked Check from TTC synoptic that XPND gets unlocked Check from TTC synoptic that XPND gets unlocked Check from TTC synoptic that XPND gets unlocked OK Check from TTC synoptic that XPND gets unlocked OK Check from TTC synoptic that XPND gets unlocked OK Check from TTC synoptic that XPND gets unlocked	Put TTC SCOE in Local Mode From TTC SCOE, change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink Level Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET Check from TTC synoptic that XPND is locked OK Repeat steps 550-570 until XPND gets unlocked OK Repeat steps 550-570 until XPND gets unlocked OK Repeat steps 550-570 until XPND gets unlocked		of 0.3 dB:) OK		SCOZ SET HOURY,
From TTC SCOE, change the Uplink Level Windows -> SCOE Config -> Uplink Level Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET Check from TTC synoptic that XPND is locked OK Repeat steps 550-570 until XPND gets unlocked OK OK OK OK OK OK OK OK OK O	From TTC SCOE, change the Uplink Power at step of 0.3 dB: Windows -> SCOE Config -> Uplink Level And then SAVE Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET Check from TTC synoptic that XPND is locked Check from TTC synoptic that XPND gets unlocked Repeat steps 550-570 until XPND gets unlocked OK Repeat Steps 550-570 until XPND gets unlocked OK Repeat Steps 550-570 until XPND gets unlocked		of 0.3 dB:	Ž,		7-467
And then SAVE Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET Check from TTC synoptic that XPND is locked Check from TTC synoptic that XPND gets unlocked Repeat steps 550-570 until XPND gets unlocked OK OK OK OK OK	And then SAVE Once the Uplink Power is set, apply the signal selecting at TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET Check from TTC synoptic that XPND is locked Check from TTC synoptic that XPND gets unlocked Repeat steps 550-570 until XPND gets unlocked Inn-2 Lock Acquisition with Doppler Shift	And then Once the TTC SCC		OK	<u>3</u>	
TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET Check from TTC synoptic that XPND is locked Repeat steps 550-570 until XPND gets unlocked OK OK OK OK OK OK OK OK OK O	And then SET Check from TTC synoptic that XPND is locked Repeat steps 550-570 until XPND gets unlocked Inn-2 Lock Acquisition with Doppler Shift	TTC SCC	SAVE			
And then <u>SET</u> Check from TTC synoptic that XPND is locked Repeat steps 550-570 until XPND gets unlocked or OK OK OK OK OK	And then <u>SET</u> Check from TTC synoptic that XPND is locked Repeat steps 550-570 until XPND gets unlocked OK OK OK OK OK Iin-2 Lock Acquisition with Doppler Shift		e Uplink Power is set, apply the signal selecting at OE level:			
Check from TTC synoptic that XPND is locked OK OK Repeat steps 550-570 until XPND gets unlocked OK	Check from TTC synoptic that XPND is locked OK OK Repeat steps 550-570 until XPND gets unlocked OK		operation of the contract of t	Ϋ́	8	
Repeat steps 550-570 until XPND gets unlocked OK OK OK OK OK OK OK OK OK O	Repeat steps 550-570 until XPND gets unlocked OK OK OK OK OK OK OK OK OK O		: : : : : : : : : : : : : : : : : : : :			
Repeat steps 550-570 until XPND gets unlocked OK OK iin-2 Lock Acquisition with Doppler Shift	Repeat steps 550-570 until XPND gets unlocked ok iin-2 Lock Acquisition with Doppler Shift			X	75	
			-	¥	Sh.	At the end of the 'loop' record the final Uplink Power
		hain-2 Lock Acqu	luisition with Doppler Shift			Value 6 - 109.8 (Q)

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Procedure

	Actual Value	Power level @ TTC SCOE is set to -106-dBm to take into account IL path (See [AD 1])	Power level @ TTC SCOE is set to -106 dBm to take	Into account IL path (See [AD 1]). RX level is -137	dBm			
Results	Required Value Actua		8		3	ব		3
Operations		From 11C 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	From 11C SCOE, change the Uplink Power at -406 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level OK		TTC SCOE is set to perform 1 triangular sweep @ -137 dBm at RX level (Herschel operational frequency + 65 OK KHz)	Perform a triangular sweep with above settings by: Windows -> Test Commands -> Op modes -> TC Operation OK	And then ONLINE	shall 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
Step		290	009		610	620		630

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Step	Operations		Results		
	From TTO SOOR	Redui	Required Value	Actual Value	Remarks and Record
640	Windows -> SCOE Config -> Uplink -> Uplink Level	Š		Š	
	And then SAVE	<u> </u>		Ž	
	Once the Uplink Power is set, apply the signal selecting at				
650	Windows -> Test Commands -> Op modes -> TC Operation	š		96	
	And then SET				
099	Check from TTC synoptic that XPND is locked	Š		Č	
029	Repeat steps 640-670 until XPND gets unlocked	š			At the end of the 'loop' record the final Uplink
ain-2	Chain-2 TC Threshold)	Power Value 1 - 109.8
	From TTC SCOE in Local Mode, change operational				
680	frequency to 'Herschel Nominal (7207.8483 MHz)': Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.8483 MHz	Š		OK.	
	And then SAVE				
069	From TTC SCOE, change the Uplink Power at -87 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level	à			Power level @ TTC SCOE is
	And then SAVE	5			account IL path (See [AD
Test location:	Contraction (Contraction)				1]). RX level is -1 & dBm
3			T. S.	Date/Time:	10/05
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Ш	EADS	Procedure		Herschel
Sten	Oncertione		Results	-
	Operations	Required Value	Actual Value	Remarks and Record
	At TTC SCOE level, apply modulation by selecting: Windows -> SCOE Config -> Uplink -> Tc Mod Index:			
200	Type: 1.0		Ý	
	And then SAVE			
710	Perform a triangular sweep with above settings by: Windows -> Test Commands -> Op modes -> TC Operation	OK	4	
	And then ONLINE		4	
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	Z's	
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).	ΟĶ	*	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	OK	8	
	And then SAVE			
H				To

Date/Time: ö Ö Operator: HP-2-ASED-PR-0116 Test location: Doc. No: Issue: Date:

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		Procedure		Herschel
Step	Operations	Results	ılts	
	Onco the conference of the con	Required Value	Actual Value	Remarks and Record
760	TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation And then SET	OK	3	
	From TTC Synoptic, check if XPND is locked and SQUELCH is ON. Repeat Steps 730-770 until XPND 100 TCs are not correctly acquired.			-90.20TTC S
022		O YO	Z	At the end of the 'loop' record the final Uplink Power Value
hain-2	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	OK	Z	@ TTC SCOE level: -88 dBm
Test location:	Block Operator: ARC	QA:	Date/Time:	605
Doc. No: Issue: Date:	HP-2-ASED-PR-0116 1.0 06.05.08			Page 68 of: 87

Procedure

From TTC SCOE, change the Uplink Power at -87 dBn: Windows > SCOE Config > Uplink - Uplink Level OK	Step	Operations		Results		
and TC SCOE, change the Uplink Power at -87 dBm: Indows -> SCOE Config -> Uplink -> Uplink Level Id then SAVE TTC SCOE level, apply modulation by selecting: Indows -> SCOE Config -> Uplink -> Tc Mod Index: Indows -> SCOE Config -> Uplink -> Tc Mod Index: Indows -> SCOE Config -> Uplink -> Tc Mod Index: Indows -> SCOE Config -> Uplink -> Tc Mod Index: Indows -> Test Commands -> Op modes -> TC Operation It for sweep to be completed. On TTC SCOE, a window If pop-up asking if XPND is locked and SQUELCH is ON. In Main Script Menu, select option '100 Tcs' TCs (Connection Test Type) are sent via RF. At script pletion, check from CMD History that all TCs have been pletion, check from CMD History that all TCs have been pletion. Check from CMD History that all TCs have			Require	d Value	A Other Park	Remarks and Record
dithen SAVE TTC SCOE level, apply modulation by selecting: adows -> SCOE Config -> Uplink -> Tc Mod Index: be: 1.0 Ithen SAVE form a triangular sweep with above settings by: Ithen ONLINE It for sweep to be completed. On TTC SCOE, a window Il pop-up asking if XPND is locked and SQUELCH is ON. Coch on TTC synoptic that XPND-1 is locked and click OK TCS (Connection Test Type) are sent via RF. At script pipletion, check from CMD History that all TCs have been pipled and completed (TM (1,1) and (1,7) received for TC).	790	From TTC SCOE, change the Uplink Power at -87 dBm: Windows -> SCOE Config -> Uplink -> Uplink Level			Actual value	Power level @ TTC SCOE is
TITC SCOE level, apply modulation by selecting: adows -> SCOE Config -> Uplink -> Tc Mod Index: be: 1.0 It hen SAVE form a triangular sweep with above settings by: from a triangular sweep with a sent via RE. At script by: from a triangular sweep with a sent via RE. At script by: from a triangular sweep with a sent via RE. At script by: from a triangular sweep with a sent via RE. At script by: from a triangular sweep with a sent via RE. At script by: from a triangular sweep with a sent via RE. At script by: from a triangular sweep with a sent via RE. from a triangular sweep with a sent via RE. from a triangular sweep with a sent via RE. from a triangular sweep with a sent via RE. from a triangular sweep with a sent via RE. from a triangular sweep with a sent via RE. from a triangular sweep with a sent via RE. from a triangular sweep with a sent via RE. from a triangular sweep with a sent via RE. from a triangular sweep with a		And then SAVE	5		2	account IL path (See [AD
1 then SAVE form a triangular sweep with above settings by: Idows -> Test Commands -> Op modes -> TC Operation I then ONLINE It for sweep to be completed. On TTC SCOE, a window Il pop-up asking if XPND is locked and SQUELCH is ON. Sek on TTC synoptic that XPND-1 is locked and click OK In Main Script Menu, select option '100 TCs' TCs (Connection Test Type) are sent via RF. At script pletion, check from CMD History that all TCs have been pletion, check from CMD History that all TCs have been appled and completed (TM (1,1) and (1,7) received for a TC).		At TTC SCOE level, apply modulation by selecting: Windows -> SCOE Config -> Uplink -> Tc Mod Index:				1]). RX level is -118 dBm
form a triangular sweep with above settings by: Idows -> Test Commands -> Op modes -> TC Operation It hen ONLINE It for sweep to be completed. On TTC SCOE, a window Il pop-up asking if XPND is locked and SQUELCH is ON. Eck on TTC synoptic that XPND-1 is locked and click OK In Main Script Menu, select option '100 TCs' TCs (Connection Test Type) are sent via RF. At script pletion, check from CMD History that all TCs have been peted and completed (TM (1,1) and (1,7) received for a CAC. In Date/Time	200	Type: 1.0		9		
form a triangular sweep with above settings by: Idows -> Test Commands -> Op modes -> TC Operation It then ONLINE It for sweep to be completed. On TTC SCOE, a window If pop-up asking if XPND is locked and SQUELCH is ON. Il pop-up asking if XPND is locked and SQUELCH is ON. Il pop-up asking if XPND is locked and click OK In Main Script Menu, select option '100 TCs' TCs (Connection Test Type) are sent via RF. At script apletion, check from CMD History that all TCs have been apted and completed (TM (1,1) and (1,7) received for nTC). In Main Script Menu, select option '100 TCs' OK OK OA:		And then SAVE				
If then ONLINE It for sweep to be completed. On TTC SCOE, a window Il pop-up asking if XPND is locked and SQUELCH is ON. Sek on TTC synoptic that XPND-1 is locked and click OK m Main Script Menu, select option '100 TCs' TCs (Connection Test Type) are sent via RF. At script pletion, check from CMD History that all TCs have been apted and completed (TM (1,1) and (1,7) received for a TC). OR OR OR OR OR OR OR OR OR O	110	Perform a triangular sweep with above settings by: Windows -> Test Commands -> Op modes -> TC Operation) S			
If for sweep to be completed. On TTC SCOE, a window Il pop-up asking if XPND is locked and SQUELCH is ON. The script Menu, select option '100 TCs' The script man Script Menu, select option '100 TCs' The script Menu, select option '100 TCs' The script man Script Menu, select option '100 TCs' The script Menu, '100 TCs' The script Me		And then ONLINE	<u></u>)	
TCs (Connection Test Type) are sent via RF. At script pletion, check from CMD History that all TCs have been spted and completed (TM (1,1) and (1,7) received for TC).	50	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) Xo		2	1 Coursely lotted
TCs (Connection Test Type) are sent via RF. At script pletion, check from CMD History that all TCs have been spted and completed (TM (1,1) and (1,7) received for TC).	30	From Main Script Menu, select option '100 TCs'	OK OK			>
Operator: Operator: Operator: Date/Time:	40	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).) X		8	During the execution of the script, if any of the TC is not 'completed' script can be terminated. Main Menu will
Operator: AR AR Date/Time:						appear again.
OA: OA: Date/Time:	est local	Constitution Operation	1			
		Operator.	A: 12		Date/Time	000

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Procedure

Step	Operations		Results		
		Required Value	alue	Action Volum	Remarks and Record
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	, X		Actual Value	
	And then SAVE			100 M	
860	TTC SCOE level: Windows -> Test Commands -> Op modes -> TC Operation	OK.		7	
	And then SET		747741444		
870	is ON.			441	At the end of the 'loop'
	Repeat Steps 340-380 until XPND 100 TCs are not correctly acquired.	ž		OK.	record the final Uplink Power
880	From TTC SCOE in Local Mode, change operational frequency to 'Herschel Nominal with Deppler (7207.8483) MHz—65 KHz): Windows -> SCOE Config -> Uplink -> Uplink Frequency: Type: 7207.7833 MHz And then SAVE	OK		3	- 10.8 (C) 10.

Operator: Test location:

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Date/Time:

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Herschel		Remarks and Record	@ TTC SCOE level: -88 dBm					TTC SCOE is set to -73	Jor Jerner		Result Directory on TTC SCOE: ~/Spool/[current	MAX VARI 382.4545			<i>/</i>	10/05/08	Page 71	
		Actual Value				3	**	TCC		**	Resu	NESSE	904	3	ļ	Date/Time:		
Procedure	Results	Required Value	Xo			OK OK	Š	OK	OK OK	O X	OK OK) X	OK OK		OA: CAMP		
		Operations	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		, A	Ensure that TTC SCOE is in remote mode	From Main Menu, select Option 3 TTC Scot CALL	deliver an Up	Script TTC_OP_METHOD is called to lock XPND-1	At Script completion check from TTC synoptic that TTC is locked	Routine to measure RNG group delay is called. At the end of script, record the value		u, select option 2	RF		Operator:	-0116	
EADS	net		From TTC SCOE in Lofrequency to 'Herschel': - 65 KHz'): Windows -> SCOE Co Type: 7207.7833 MHź	And then SAVE	Chain-2 RNG Group Delay	900 Ensure that TTC	910 From Main Menu	920 TTC SCOE is set in order to XPND-RX level of -105 dBm	Script TTC_OP_	940 At Script complet locked	Routine to measure RN script, record the value	TM Chain-2 check	From Main Menu, select option 2	970 TM is routed via RF	-	lest location: ASTEC	.o <u>.</u>	Issue: 1.0

HTIM THE E# 2VI

Herschel		Remarks and Record			This step is performed via	Umbilical										Page 72	of: 87
	ults	Actual Value	8	S	16	7 7	,	1		#/>		î		150	Date/ I me		
Procedure	Results	Required Value															
ā			s A	Š	š	¥		Š	Š	5 3	5			OA:			
	Operations	, bu	Open a TM Packet History and check that TM with APID 16 is correctly flowing down Then, click OK to continue	k via Umbilical	Chain-1 is switched-off and Chain-2 is switched-on	From SAT synoptic, check that the above configuration is reached.		, select option 99	TTC Chain-2 is switched-off while chain-1 is set ON	From TTC Synoptic check that above conditions are met				Operator:	116		
EADS		At Prompt: 'Check TM flowing'	Open a TM Packet History correctly flowing down Then, click OK to continue	IM is routed back via Umbilical	Chain-1 is switch	From SAT synopireached.	Reset starting conditions	From Main Menu, select option 99	TTC Chain-2 is so	From TTC Synop				01: 22 CC	HP-2-ASED-PR-0116	1.0	06.05.08
Ш	Step	Coo	000	088	1000	1010	Reset sta	\top		1040				Test location:	Doc. No:	lssue:	Date:

	Herschel				2	>		A N	Page 73
en i describenta del manda del conserva del					Remarks			Remarks	Date/Time:
					se Actual	B		e Actual Value ØK	Da
	dure				Tolerance			Tolerance	
	Procedure			CO	Nominal Value	30	owered)	Nominal Value OK OK	OA:
				edure for the satellite and for the CCU		or of the scriet IST Leading Procedure HP-2-ASED-PR-10134 To switch off use the sequence IST END	all satellite equipment is OFF (unpowered)		Operator: And File: HP-2-ASED-PR-0116.doc
	EADS	8.2 D Off mode	8.2.1 D.4 Satellite OFF	8.2.1.1 D.4.1Follow procedure for the satellite and	Test-Step-Description	To switch off use the sequence IST END	8.2.1.2 D.4.2 Confirm that all satellite equipment is	Test-Step-Description Verify SCOE amber lamp (indicating if S/C pow Verify no TM except system packet (SCOE TM)	HP-2-ASED-PR-0116 1.0 06.05.08
	_	₩			Step- No.	1	ω ΄	Step-No.	Test location: Doc. No: Issue: Date:

Herschel	arks P N	: Page 74 of: 87
dure	Tolerance Actual Remarks Value	
Procedure	Nominal Value OK	File: HP-2-ASED-PR-0116.doc
EADS - LIT	8.2.2 D.5 Switch all EGSE OFF Step- No. 1 Verify no TM packet from SCOE TM	Test location: Operator: Operator: Doc. No: HP-2-ASED-PR-0116 Issue: 1.0 Date: 06.05.08



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9 Summary Sheets

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9.1 Procedure Variation Summary

	05/2008
	· · · · · · · · · · · · · · · · · · ·
Page /	of /
Test designation EMC RE Auto COMP PR - 0116	Rev.
Test step changed 8.1.7 Step SO Reason for Change MOVE STEP	
REMOVE STEP SO TO IN BETWEEN S	STEP 20
PERFORM MANUALE ADJUSTMENT TO SCOT	
R. HORE A. Di Copo	
PA/QA Prime Customer	

Table 9.1-1: Procedure Variation Sheet

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Procedure Variation Summary 9.1

		Test Change	Curr. No.: #2-4207	
The second secon			Date 10/05/2008	
	Test designation EMC RE Auto comp	Test Procedure	Page / of /	
	Test step changed 8.1.7. 235	Paggar for Char	TIONAL STEP	
	INSERT STEP.			
	TMTC TO BE	E SET SUCH	THAT TO CHID'S	
	Prepared by: Resp. PA/QA Prime	Test Leader	Project Engineer Customer	
	Table 9.1-1: Procedure Variation She	eet		

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9.1 Procedure Variation Summary

		Ī	Test Change	Curr. No.: #	3-4207
The same of the sa				Date 10/0	05/08
				Page 1	of /
	Test designation EMC RE /Auto Con	че	Test Procedure	Issue	Rev.
	Test step changed 8.1.7 . STEPS	400 430	Reason for Change	L SET UP O	f ScoE
	STEP 400 - PUT	TTC	SCOE INTO LOS	cae	ok
	STEP 410 - NO				
	STEP 420 - PER	(FORM	AS PROCEDURE		ot
	INSERT STEP 425	- SET	T XIND I MOD	INDEX 0:0	ox
	STEP 430 - CALL	FROM	TTC SCOE ROW	ITINE FOR I	0.16-00-0
		DELAY	(ANTENNA MO	EA)	ok Great
	Prepared by: B. HOGG	Resp. Tes	t Leader	Project Engineer	
	PA/QA	Prime		Customer	

Table 9.1-1: Procedure Variation Sheet

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ate: 06.05.08

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9.1 Procedure Variation Summary

		Test Change	14 112 100 00 00 00 00 00 00 00 00 00 00 00 00		F4-4207
Test designation EMC RE / Aut		Test Procedure	116	Page (Rev.
Test step changed 8.1.7. 455	, >	Reason for Chang	e Ami	TIONAL	STEP
RE ENABLE	= Mo)	INDEX	1:2 6	QUAGN G	LEVEZ
Prepared by:	Resp. Tes	t/Leader	Pi	roject Engineer	
B. HOGE	Prime	the		ustomer	
Sy					

Table 9.1-1: Procedure Variation Sheet

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Non Conformance Report (NCR) Summary 9.2

	NCR - No.	NCR - Title	Date	Open	PA
				Closed	
					J.g.
- Annual Control of the Control of t					
	Table 9.2-1: Non Co-	nformance Record Sheet			

Table 9.2-1: Non-Conformance Record Sheet

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9.3 Sign-off Sheet

	Date	Signature	
Test Manager			
Operator			
PA Responsible	10/05/08	FLAD	
ESA Representative	13733	57.	

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ANNEX 1: Procedure Hierarchy 10

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).

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

SKIN-01	PWR Panel (PCDU)						
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector		
				BS SCOE Cable	1		
	BS Nom Power	SK01BJ09	PCDU	Plugged	1		
				BS SCOE Cable	\		
	BS Red Power	SK01BJ10	PCDU	Plugged	V		
				LPS SCOE	1/		
	BDR1 AIT	SK01BJ11	PCDU	Cable Plugged	Y/		
	DDD0 AIT	01/045 140		LPS SCOE	Ψ.		
	BDR2 AIT	SK01BJ12	PCDU	Cable Plugged	1/		
	SA Nom Power	CI/O1A IO1	DCDII	POWER SCOE	\bigvee		
	OA NOITI FOWEI	SK01AJ01	PCDU	Cable Plugged	/		
	SA Nom Power	SK01AJ02	PCDU	POWER SCOE 1 Cable Plugged	Ψ,		
	O/ THOM I ONG	ONO IAGOZ	1 000	POWER SCOE	/		
	SA Nom Power	SK01AJ03	PCDU	Cable Plugged	4		
				Connector			
	SA Red Power	SK01AJ04	PCDU	Cover	1		
				POWER SCOE	1		
	SA Red Power	SK01AJ05	PCDU	Cable Plugged	1		
				POWER SCOE			
	SA Red Power	SK01AJ06	PCDU	Cable Plugged	1/		
				POWER SCOE	/		
	SA Red Power	SK01AJ07	PCDU	Cable Plugged			
KIN-02	PWR Panel (ACC, CDMU, RCS, 15			a water care and			
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector		
CIZINI OO	DM0 4550 B A	10.4			Flight Plug		
SKIN-02	DMS 1553 Bus_A	J01	CDMU		SK02P01 Plugged		
SKIN-02	DMS 1553 Bus_B	J02	CDMU		Flight Plug		
OIXIIV-02	DINIO 1000 BUS_B	302	CDIVIO		SK02P02 Plugged		
SKIN-02	ACMS 1553 Bus_A	J03	ACC		Flight Plug SK02P03 Plugged		
100 A T	,				Flight Plug		
SKIN-02	ACMS 1553 Bus_B	J04	ACC		SK02P04 Plugged		
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	Copper Tape \	/ I digged		
SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	Copper Tape	/		
					Flight Plug		
SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH		SK02P07 Plugged		
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS		Flight Plug		

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				1	SK02P08 Plugged
	CDMU and ACC EEPROM				Flight Cap
SKIN-02	reprogramming input	J09	ACC/CDMU		SK02P09 Plugged
	CDMU and ACC EEPROM				Flight Cap
SKIN-02	reprogramming input	J10	ACC/CDMU		SK02P10 Plugged
					Flight Plug
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS		SK02P11 Plugged
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	Copper Tape \	11
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH	Copper Tape	/
					ACMS Flight Plug
KIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		SK02P14 Plugged
					ACMS Flight Plug
KIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		SK02P15 Plugged
					ACMS Flight Plug
KIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		SK02P16 Plugged
					ACMS Flight Plug
KIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		SK02P17 Plugged
KIN-03	TTC Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
KIN-03	Test point TC + protection			Copper Tape	/
	jumper EPC1	SK03J01	XPND1/EPC1	Обррет таро	1
KIN-03	Test point TC + protection			Copper Tape	
	jumper EPC2	SK03J02	XPND2/EPC2	Jooppo, . apa	
	RF LINK				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
				Colfle com	LGA1 Anechoic
	RF link for antenna LGA1	N/A	LGA1		Cap + termination
				Cable conn.	LGA2 Anechoic
	RF link for antenna LGA2	N/A	LGA2		Cap + termination
	25" 1 (100)			Cable com	MGA Anechoic Cap
	RF link for antenna MGA	N/A	MGA	10	+ termination
	1 TTO D T - 1 - 1 1 1 7			MOA 501	2 Tempestal
	TTC Panel Test point J 15				- 1 :
CIN OA	TTC Panel Test point J 60				2 Termeto
KIN-04	TTC Panel Test point J 60 ACMS Panel (RWE)	21.0		LOAT STO	
	TTC Panel Test point J 60	Skin Connector	S/C unit	LOAT STO	Flight Connector
	TTC Panel Test point J 60 ACMS Panel (RWE) Connector Function			LOAT STO	Flight Connector ACMS Flight Plug
KIN-04	TTC Panel Test point J 60 ACMS Panel (RWE)	Skin Connector J01	S/C unit ACC/RWL-1	LOAT STO	Flight Connector ACMS Flight Plug SK04P01 Plugged
(IN-04	TTC Panel Test point J 60 ACMS Panel (RWE) Connector Function RWL1 Sgn	J01	ACC/RWL-1	LOAT STO	Flight Connector ACMS Flight Plug SK04P01 Plugged ACMS Flight Plug
KIN-04 KIN-04	TTC Panel Test point J 60 ACMS Panel (RWE) Connector Function			LOAT STO	Flight Connector ACMS Flight Plug SK04P01 Plugged ACMS Flight Plug SK04P02 Plugged
KIN-04 KIN-04	TTC Panel Test point J 60 ACMS Panel (RWE) Connector Function RWL1 Sgn RWL2 Sgn	J01 J02	ACC/RWL-1 ACC/RWL-2	LOAT STO	Flight Connector ACMS Flight Plug SK04P01 Plugged ACMS Flight Plug SK04P02 Plugged ACMS Flight Plug
KIN-04 KIN-04 KIN-04 KIN-04 KIN-04	TTC Panel Test point J 60 ACMS Panel (RWE) Connector Function RWL1 Sgn	J01	ACC/RWL-1	LOAT STO	Flight Connector ACMS Flight Plug SK04P01 Plugged ACMS Flight Plug SK04P02 Plugged ACMS Flight Plug SK04P03 Plugged
KIN-04 KIN-04	TTC Panel Test point J 60 ACMS Panel (RWE) Connector Function RWL1 Sgn RWL2 Sgn	J01 J02	ACC/RWL-1 ACC/RWL-2	LOAT STO	Flight Connector ACMS Flight Plug SK04P01 Plugged ACMS Flight Plug SK04P02 Plugged ACMS Flight Plug

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	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	
				SCOEs cable	/
	Power/Data	HU1 J01	SYSTEM	Plugged	1,
				SCOEs cable	1
	Power/Data	HU2 J01	SYSTEM	Plugged	4

Fi. Mgr. 17. Miller 09.05.07 03.45

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

SKIN-01	PWR Panel (PCDU)	PWR Panel (PCO) II						
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connecto			
	BS Nom Power	SK01BJ09	PCDU	BS SCOE Cable Plugged	- Ingris Commons			
	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				
N-02	PWR Panel (ACC, CDMU, RCS, 15							
(IN-02	Connector Function DMS 1553 Bus_A	Skin Connector J01	S/C unit	SCOE CABLE	Flight Connector Flight Plug SK02P01 Plugger			
(IN-02	DMS 1553 Bus_B	J02	CDMU		Flight Plug SK02P02 Plugger			
IN-02	ACMS 1553 Bus_A	J03	ACC		Flight Plug SK02P03 Plugged			
IN-02	ACMS 1553 Bus_B	J04	ACC		Flight Plug SK02P04 Plugged			
IN-02 IN-02	LV1/FCV 20N CMD S/A M LV2/FCV 20N CMD S/A R	J05 J06	ACC/RCS ACC/RCS	Copper Tape Copper Tape				
IN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH	1	Flight Plug SK02P07 Plugged			
IN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS		Flight Plug			

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						SK02P08 Plugged
		CDMU and ACC EEPROM				Flight Cap
	SKIN-02	reprogramming input	J09	ACC/CDMU		SK02P09 Plugged
		CDMU and ACC EEPROM				Flight Cap
	SKIN-02	reprogramming input	J10	ACC/CDMU		SK02P10 Plugged
	SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS		Flight Plug
	SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH		SK02P11 Plugged
	SKIN-02	Thruster C/B Heaters R	J13		Copper Tape	
		Thirdder O/D Fiedlers IX	313	ACC/CBH	Copper Tape	
	SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		ACMS Flight Plug SK02P14 Plugged
dia.						ACMS Flight Plug
	SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		SK02P15 Plugged
	1					ACMS Flight Plug
	SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		SK02P16 Plugged
						ACMS Flight Plug
	SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		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	NI/A	1044		LGA1 Anechoic
		THE INICIONAL COAT	N/A	LGA1	 	Cap + termination
		RF link for antenna LGA2	A1/A	1.0.0		LGA2 Anechoic
		TVI IIIIK IOI aliterilia LGAZ	N/A	LGA2	 	Cap + termination
		RF link for antenna MGA	NI/A			MGA Anechoic Cap
		TTC Panel Test point J 15	N/A	MGA		+ termination
		TTC Panel Test point J 60		 	MGA	-
	SKIN-04	ACMS Panel (RWE)		L	LGA1	
	31(114-04			BEAUTH CARREST		
	SKIN-04	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	3N1N-04	DWI 1 Con	10.4			ACMS Flight Plug
	SKIN-04	RWL1 Sgn	J01	ACC/RWL-1		SK04P01 Plugged
	3KIIV-04	DWI 2 Can	100			ACMS Flight Plug
	SKIN-04	RWL2 Sgn	J02	ACC/RWL-2		SK04P02 Plugged
	3KIN-04	DWI 2 Con				ACMS Flight Flug
	SKINLOA	RWL3 Sgn	J03	ACC/RWL-3		SK04P03 Plugged
	SKIN-04	PIMI 4 San	10.4	100/201/		ACMS Flight Plug
		RWL4 Sgn	J04	ACC/RWL-4		SK04P04 Plugged
	ONIN-UD	GYR/QRS Panel				

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	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				1
	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	
				SCOEs cable	
	Power/Data	HU1 J01	SYSTEM	Plugged	
	Power/Data	HU2 J01	SYSTEM	SCOEs cable Plugged	

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SKIN-01	PWR Panel (PCDU)						
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector		
				BS SCOE Cable	/		
	BS Nom Power	SK01BJ09	PCDU	Plugged	¥		
				BS SCOE Cable	. /		
	BS Red Power	SK01BJ10	PCDU	Plugged	Ψ,		
	DDD4 AIT	01/045144	2001	LPS SCOE	/		
	BDR1 AIT	SK01BJ11	PCDU	Cable Plugged	Ψ,		
	BDR2 AIT	SK01BJ12	PCDU	LPS SCOE	/		
	DDIV2 ATT	SKUIBJIZ	PCDU	Cable Plugged POWER SCOE	1/		
	SA Nom Power	SK01AJ01	PCDU	Cable Plugged	<i>J</i>		
	- CONTROLL CONTROL	CI (CI / LOC)	1 000	POWER SCOE	1/		
	SA Nom Power	SK01AJ02	PCDU	Cable Plugged	/		
				POWER SCOE	1/		
	SA Nom Power	SK01AJ03	PCDU	Cable Plugged	1.		
				Connector 1	/		
	SA Red Power	SK01AJ04	PCDU	Cover	1		
				POWER SCOE	/		
	SA Red Power	SK01AJ05	PCDU	Cable Plugged	Į.		
				POWER SCOE	/		
	SA Red Power	SK01AJ06	PCDU	Cable Plugged	V /		
				POWER SCOE	/		
	SA Red Power	SK01AJ07	PCDU	Cable Plugged	<u>Y</u>		
KIN-02	PWR Panel (ACC, CDMU, RCS, 15	A 在 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector		
CIZINI OO	DM0 4550 B A	10.4			Flight Plug		
SKIN-02	DMS 1553 Bus_A	J01	CDMU		SK02P01 Plugged		
SKIN-02	DMS 1553 Bus_B	J02	CDMU		Flight Plug		
OKIN-02	DING 1000 BUS_B	302	CDMU		SK02P02 Plugged		
SKIN-02	ACMS 1553 Bus_A	J03	ACC		Flight Plug SK02P03 Plugged		
	7.0.00 1000 840_7(000	100		Flight Plug		
SKIN-02	ACMS 1553 Bus_B	J04	ACC		SK02P04 Plugged		
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	Copper Tape	CROZI 041 lugged		
SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	Copper Tape	/		
				- Copportage	Flight Plug		
SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH		SK02P07 Plugged		
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS		Flight Plug		

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					SK02P08 Plugged
100	CDMU and ACC EEPROM				Flight Cap
SKIN-02	reprogramming input	J09	ACC/CDMU		SK02P09 Plugge
	CDMU and ACC EEPROM				Flight Cap
SKIN-02	reprogramming input	J10	ACC/CDMU		SK02P10 Plugge
					Flight Plug
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS		SK02P11 Plugged
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	Copper Tape	\mathcal{V}_{ℓ}
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH	Copper Tape	V
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
					ACMS Flight Plug
SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		SK02P17 Plugge
SKIN-03	TTC Panel				1
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-03	Test point TC + protection jumper EPC1	SK03J01	XPND1/EPC1	Copper Tape	$\sqrt{}$
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	1
	TTC Panel Test point J 60			LGA1	1
SKIN-04	ACMS Panel (RWE)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-04					ACMS Flight Plug
	RWL1 Sgn	J01	ACC/RWL-1		SK04P01 Plugged
SKIN-04					ACMS Flight Plug
	RWL2 Sgn	J02	ACC/RWL-2		SK04P02 Plugged
SKIN-04		-			ACMS Flight Plug
	RWL3 Sgn	J03	ACC/RWL-3		SK04P03 Plugged
					ACMS Flight Plug
SKIN-04	l				
	RWL4 Sgn	J04	ACC/RWL-4		SK04P04 Plugged
SKIN-04 SKIN-05	RWL4 Sgn GYR/QRS Panel	J04	ACC/RWL-4		SK04P04 Plugged
	EN ELLANDER ACTUAL DE LA COMPANIONE	J04 Skin Connector	ACC/RWL-4 S/C unit	SCOE CABLE	Flight Connector

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SKIN-05	CRS2 AOCS Sgn	J02	L CDC OVACO	Ĭ	1 1
SKIN-05	GYRO RS422 / Test		CRS-2/ACC	-	ACMS Flight plug
SKIN-05		J03	GYRO		ACMS Flight Cap
	CRS 1/2 Stimuli	J04	CRS-1,2		ACMS Flight Cap
SKIN-05	AAD Sgn M	J05	AAD/ACC		ACMS Flight Plug 1
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 1
	UMBILICAL				
	AND RESIDENCE OF THE PARTY OF T			THE RESIDENCE OF THE PARTY OF T	
	Connector Function	Connector	S/C unit	SCOE CABLE	THE REAL PROPERTY.
	Connector Function	Connector	S/C unit	SCOE CABLE SCOEs cable	
	Connector Function Power/Data	Connector HU1 J01	S/C unit		
				SCOEs cable	

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SKIN-01	PWR Panel (PCDU)						
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connecto		
	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			
VIN-UZ	PWR Panel (ACC, CDMU, RCS, 15 Connector Function	Skin Connector	6/6 : 11	Logorouse			
SKIN-02	DMS 1553 Bus_A	J01	S/C unit	SCOE CABLE	Flight Connector Flight Plug SK02P01 Plugged		
KIN-02	DMS 1553 Bus_B	J02	CDMU		Flight Plug SK02P02 Plugged		
KIN-02	ACMS 1553 Bus_A	J03	ACC		Flight Plug SK02P03 Plugged		
KIN-02	ACMS 1553 Bus_B	J04	ACC		Flight Plug SK02P04 Plugged		
KIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	Соррег Таре			
KIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	Соррег Таре	P*1		
KIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH		Flight Plug SK02P07 Plugged		
KIN-02	Thruster Temp M/LV1 Sts		ACC/RCS		Flight Plug		

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					SK02P08 Plugged
	CDMU and ACC EEPROM		£		Flight Cap
SKIN-02	reprogramming input	J09	ACC/CDMU		SK02P09 Plugged
	CDMU and ACC EEPROM	i		İ	Flight Cap
SKIN-02	reprogramming input	J10	ACC/CDMU		SK02P10 Plugged
01/11/100					Flight Plug
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS		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	Strat 12 On 10ff Cond NAIGHA Cha		100,075		ACMS Flight Plug
SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		SK02P14 Plugged
SKIN-02	C4-1/2 O-/O# O D/O+-0 O+-				ACMS Flight Plug
SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2	 	SK02P15 Plugged
SKIN-02	Curs A On/Off Cond	140	100/0//00 54		ACMS Flight Plug
JANIN-UZ	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		SK02P16 Plugged
SKIN-02	Gyro B On/Off Cmd	147	ACC/CVDO F2		ACMS Flight Plug
SKIN-03	TTC Panel	J17	ACC/GYRO-E2		SK02P17 Plugged
3/(14-03	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Trians Comment
SKIN-03	Test point TC + protection	Skill Conflector	5/C unit	SCUE CABLE	Flight Connector
31/114-03	jumper EPC1	SK03J01	XPND1/EPC1	Copper Tape	
SKIN-03	Test point TC + protection	GROSSOT	ALIADIVELLOT	 	
071.77	jumper EPC2	SK03J02	XPND2/EPC2	Copper Tape	
	RF LINK	0.100002	70.1002.2.02		
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	RF link for antenna LGA1	N/A	LGA1	0.000.000.000	1 light Connector
	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)				<u> </u>
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-04					ACMS Flight Plug
	RWL1 Sgn	J01	ACC/RWL-1		SK04P01 Plugged
SKIN-04					ACMS Flight Plug
	RWL2 Sgn	J02	ACC/RWL-2		SK04P02 Plugged
SKIN-04					ACMS Flight Plug
	RWL3 Sgn	J03	ACC/RWL-3		SK04P03 Plugged
SKIN-04					ACMS Flight Plug
	RWL4 Sgn	J04	ACC/RWL-4		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
KIN-05 SAS1/2 Sgn R	J07	SAS/ACC		ACMS Flight Plug
KIN-05 AAD Sgn R	J08	AAD/ACC		ACMS Flight Plug
KIN-06 STR Panel				- Andrews
Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
KIN-06 STR1 Stimuli	J01	STR1		ACMS Flight Plug
KIN-06 STR2 Stimuli UMBILICAL	J02	STR2		ACMS Flight Plug
Connector Function	Connector	S/C unit	SCOE CABLE	
Power/Data	HU1 J01	SYSTEM	SCOEs cable Plugged	
Power/Data	LI 12 101	CVCTEM	SCOEs cable	
Power/D	lata	lata HII2 IO1	lata HII2 IO1 SYSTEM	50.00.00.00.00.00.00.00.00.00.00

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	Name	Dep./Comp.		Name	Dep./Comp.
	Baldock Richard	FAE12	Х	Sonn Nico	ASG51
	Barlage Bernhard	AED13		Steininger Eric	AED32
	Bayer Thomas	ASA42		Stiehle Hubert	AET32
	Brune Holger	ASA45	Х	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	Х	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			
Х	Hopfgarten Michael	AED32			
	Huber Johann	ASA42			
· · · · · · · · · · · · · · · · · · ·	Hund Walter	ASE252			
X	Idler Siegmund	AED312			
	Ivády von András	FAE12			
	Jahn Gerd Dr.	ASG23			
	Jolk Matthias	AET1	Х	ESA/ESTEC	ESA
	Klenke Uwe	ASG72	Х	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:	
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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. & Equipmen	t 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

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SWITCH ON SC FOR EMC

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



Herschel



PRIOR EMC-RE DEY RUN SWITCH ON

Title:

Leading Procedure for Herschel Integrated Satellite Test

KUN.

CI-No:

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Prepared by:	Functional Team	Date:	
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Herschel

Change Record:

1.1 11.01.2008 Initial version 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 S.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 5 additional remark N/A for "Launch Clean Run" 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 20 add Operator Note 11 reference 7.1.3 step 23 added "Satellite state displayed" 7.1.3 step 23 added "Satellite state displayed" 7.1.3 step 23 added "Satellite state displayed" 7.1.4 step 29 add SPR 282 7.1.4.1 step 9 add SPR 282 7.1.4.2 step 4 correct script name 7.1.4.2 step 10 add SPR and NCR and expected TM(5,1) 7.1.4.2 step 10 add SPR and NCR and expected TM(5,1) 7.1.4.2 step 10 add SPR and NCR and expected TM(5,1) 7.1.4.2 step 10 add SPR and NCR and expected TM(5,1) 7.1.4.2 step 10 add SPR and NCR and expected TM(5,1) 7.1.4.2 step 10 add SPR and NCR and expected TM(5,1) 7.1.4.2 step 10 add SPR and NCR and expected TM(5,1) 7.1.4.2 step 10 add SPR and NCR and expected TM(5,1) 7.1.4.2 step 10 add SPC Confirm 7.1.3 step 2 change YES to Confirm	ssue	Date	Sheet Do	escription of Change	Release
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24.04.2008 Date:

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Herschel Integrated Satellite Test Procedure

Herschel

		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		
ľ	17.01.00	for Nominal Mode Robstness (minor changes),		
		ion restauration residences (minor changes),		
		4.3.1 & 4.3.2 to include SCOE Sk01J04 and to correct hou		
		connector ident Typo's		
		, mom 1, po 0		
		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		1
		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.

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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.

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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.

IST₁

> 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

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2 Documents

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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

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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.I.	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

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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	

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3 Requirements to be verified

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

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4 Configuration

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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	1	Battery Simulation for other tests
		Installed. Only		
		connected for Launch		,
		clean run		
	Solar Array	30 nom sections	1	Power SCOE
		not required for IST		
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)		

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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

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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:	

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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

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4.3.1 SCOE cable connection for "RMS"

SKIN-01	PWR Panel (PCDU)							
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector			
					PCDU Flight Plug			
	BS Nom Power	SK01BJ09	PCDU		SK01BP09 Plugged			
	BS Red Power	SK01BJ10	PCDU		PCDU Flight Plug SK01BP09 Plugged			
				LPS SCOE				
	BDR1 AIT	SK01BJ11	PCDU	Cable Plugged				
				LPS SCOE				
	BDR2 AIT	SK01BJ12	PCDU	Cable Plugged				
				POWER SCOE				
	SA Nom Power	SK01AJ01	PCDU	Cable Plugged				
	SA Nom Power	SK01AJ02	PCDU	POWER SCOE				
	SA NOITI FOWEI	SNUTAJUZ	PCDU	Cable Plugged POWER SCOE				
	SA Nom Power	SK01AJ03	PCDU	Cable Plugged				
		01.017.000	1 000	Connector				
	SA Red Power	SK01AJ04	PCDU	Cover				
				POWER SCOE				
	SA Red Power	SK01AJ05	PCDU	Cable Plugged				
				POWER SCOE				
	SA Red Power	SK01AJ06	PCDU	Cable Plugged				
				POWER SCOE				
	SA Red Power	SK01AJ07	PCDU	Cable Plugged				
SKIN-02	PWR Panel (ACC, CDMU, RCS,		1 0/0 -4	LOGOT CARLE				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector			
SKIN-02	DMS 1553 Bus_A	J01	CDMU	Bus Monitor Cable Plugged				
OTTIT OZ	Bine 1000 Bus_1	001	ODIVIO	Bus Monitor				
SKIN-02	DMS 1553 Bus_B	J02	CDMU	Cable Plugged				
				ACMS SCOE				
SKIN-02	ACMS 1553 Bus_A	J03	ACC	Cable Plugged				
				ACMS SCOE				
		J04	ACC	Cable Plugged				
SKIN-02	ACMS 1553 Bus_B							
				ACMS SCOE				
SKIN-02 SKIN-02	ACMS 1553 Bus_B LV1/FCV 20N CMD S/A M	J05	ACC/RCS	ACMS SCOE Cable Plugged ACMS SCOE				

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			1	ACMS SCOE	1
SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH	Cable Plugged	
Oran oz	1000 F 1000/Fullik Follip/FFFFW	007	7100/114111	ACMS SCOE	
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS	Cable Plugged	
0,,,,,,	CDMU and ACC EEPROM		7.00/1.00	- Cubic Flugged	Flight Cap
SKIN-02	reprogramming input	J09	ACC/CDMU		SK02P09 Plugged
O: \;;; \ O =	CDMU and ACC EEPROM	000	7.00/05/110		Flight Cap
SKIN-02	reprogramming input	J10	ACC/CDMU		SK02P10 Plugged
G , G2	roprogramming input	0.0	7,00,00,00	ACMS SCOE	orkozi io i laggou
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS	Cable Plugged	
			7,007,00	ACMS SCOE	
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	Cable Plugged	
			7,100,001.	ACMS SCOE	
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH	Cable Plugged	
	THE GOLD TO COLOT TO	0.10	710070211	- Cable 1 lagged	ACMS Flight Cap
SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		SK02P14 Plugged
OI III OL	Cuitz official cities and an out office	011	7.00/011(1		ACMS Flight Cap
SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		SK02P15 Plugged
71.111.77		0.10	7.00/01/12		ACMS Flight Cap
SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		SK02P16 Plugged
			7,00,01,102,		ACMS Flight Cap
SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		SK02P17 Plugged
SKIN-03	TTC Panel	ration of the second	on Rule Care for the		
01/114.02	ITOTALLE				
JKII4-03	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-03	THE POWER CONTROL AND THE PARTY OF THE PARTY	Skin Connector	S/C unit	SCOE CABLE	Flight Connector Plastic cap
THE PROPERTY OF THE PROPERTY O	Connector Function	Skin Connector SK03J01	S/C unit XPND1/EPC1	SCOE CABLE	
THE PROPERTY OF THE PROPERTY O	Connector Function Test point TC + protection			SCOE CABLE	Plastic cap
SKIN-03	Connector Function Test point TC + protection jumper EPC1			SCOE CABLE	Plastic cap (See note1)
SKIN-03	Connector Function Test point TC + protection jumper EPC1 Test point TC + protection	SK03J01	XPND1/EPC1	SCOE CABLE	Plastic cap (See note1) Plastic cap
SKIN-03	Connector Function Test point TC + protection jumper EPC1 Test point TC + protection jumper EPC2	SK03J01	XPND1/EPC1	SCOE CABLE SCOE CABLE	Plastic cap (See note1) Plastic cap
SKIN-03	Connector Function Test point TC + protection jumper EPC1 Test point TC + protection jumper EPC2 RF LINK	SK03J01 SK03J02	XPND1/EPC1 XPND2/EPC2		Plastic cap (See note1) Plastic cap (See note1)
SKIN-03	Connector Function Test point TC + protection jumper EPC1 Test point TC + protection jumper EPC2 RF LINK	SK03J01 SK03J02	XPND1/EPC1 XPND2/EPC2	SCOE CABLE	Plastic cap (See note1) Plastic cap (See note1) Flight Connector
SKIN-03	Connector Function Test point TC + protection jumper EPC1 Test point TC + protection jumper EPC2 RF LINK Connector Function	SK03J01 SK03J02 Skin Connector	XPND1/EPC1 XPND2/EPC2 S/C unit	SCOE CABLE RF SCOE	Plastic cap (See note1) Plastic cap (See note1) Flight Connector LGA1 Anechoic
SKIN-03	Connector Function Test point TC + protection jumper EPC1 Test point TC + protection jumper EPC2 RF LINK Connector Function	SK03J01 SK03J02 Skin Connector	XPND1/EPC1 XPND2/EPC2 S/C unit	SCOE CABLE RF SCOE LGA1 Plugged	Plastic cap (See note1) Plastic cap (See note1) Flight Connector LGA1 Anechoic Cap
SKIN-03	Connector Function Test point TC + protection jumper EPC1 Test point TC + protection jumper EPC2 RF LINK Connector Function RF link for antenna LGA1	SK03J01 SK03J02 Skin Connector N/A	XPND1/EPC1 XPND2/EPC2 S/C unit LGA1	SCOE CABLE RF SCOE LGA1 Plugged RF SCOE	Plastic cap (See note1) Plastic cap (See note1) Flight Connector LGA1 Anechoic Cap LGA2 Anechoic Cap
SKIN-03	Connector Function Test point TC + protection jumper EPC1 Test point TC + protection jumper EPC2 RF LINK Connector Function RF link for antenna LGA1	SK03J01 SK03J02 Skin Connector N/A	XPND1/EPC1 XPND2/EPC2 S/C unit LGA1	SCOE CABLE RF SCOE LGA1 Plugged RF SCOE LGA2 Plugged	Plastic cap (See note1) Plastic cap (See note1) Flight Connector LGA1 Anechoic Cap LGA2 Anechoic
SKIN-03	Connector Function Test point TC + protection jumper EPC1 Test point TC + protection jumper EPC2 RF LINK Connector Function RF link for antenna LGA1 RF link for antenna LGA2	SK03J01 SK03J02 Skin Connector N/A N/A	XPND1/EPC1 XPND2/EPC2 S/C unit LGA1 LGA2	SCOE CABLE RF SCOE LGA1 Plugged RF SCOE LGA2 Plugged RF SCOE	Plastic cap (See note1) Plastic cap (See note1) Flight Connector LGA1 Anechoic Cap LGA2 Anechoic Cap
SKIN-03 SKIN-03	Connector Function Test point TC + protection jumper EPC1 Test point TC + protection jumper EPC2 RF LINK Connector Function RF link for antenna LGA1 RF link for antenna LGA2 RF link for antenna MGA	SK03J01 SK03J02 Skin Connector N/A N/A	XPND1/EPC1 XPND2/EPC2 S/C unit LGA1 LGA2	SCOE CABLE RF SCOE LGA1 Plugged RF SCOE LGA2 Plugged RF SCOE	Plastic cap (See note1) Plastic cap (See note1) Flight Connector LGA1 Anechoic Cap LGA2 Anechoic Cap
SKIN-03 SKIN-03	Connector Function Test point TC + protection jumper EPC1 Test point TC + protection jumper EPC2 RF LINK Connector Function RF link for antenna LGA1 RF link for antenna LGA2 RF link for antenna MGA ACMS Panel (RWE)	SK03J01 SK03J02 Skin Connector N/A N/A N/A	XPND1/EPC1 XPND2/EPC2 S/C unit LGA1 LGA2 MGA	SCOE CABLE RF SCOE LGA1 Plugged RF SCOE LGA2 Plugged RF SCOE MGA Plugged	Plastic cap (See note1) Plastic cap (See note1) Flight Connector LGA1 Anechoic Cap LGA2 Anechoic Cap MGA Anechoic Cap
SKIN-03 SKIN-03	Connector Function Test point TC + protection jumper EPC1 Test point TC + protection jumper EPC2 RF LINK Connector Function RF link for antenna LGA1 RF link for antenna LGA2 RF link for antenna MGA ACMS Panel (RWE)	SK03J01 SK03J02 Skin Connector N/A N/A N/A	XPND1/EPC1 XPND2/EPC2 S/C unit LGA1 LGA2 MGA	SCOE CABLE RF SCOE LGA1 Plugged RF SCOE LGA2 Plugged RF SCOE MGA Plugged	Plastic cap (See note1) Plastic cap (See note1) Flight Connector LGA1 Anechoic Cap LGA2 Anechoic Cap MGA Anechoic Cap Flight Connector ACMS Flight Cap
SKIN-03 SKIN-03 SKIN-04 SKIN-04	Connector Function Test point TC + protection jumper EPC1 Test point TC + protection jumper EPC2 RF LINK Connector Function RF link for antenna LGA1 RF link for antenna LGA2 RF link for antenna MGA ACMS Panel (RWE) Connector Function	SK03J01 SK03J02 Skin Connector N/A N/A N/A Skin Connector	XPND1/EPC1 XPND2/EPC2 S/C unit LGA1 LGA2 MGA S/C unit	SCOE CABLE RF SCOE LGA1 Plugged RF SCOE LGA2 Plugged RF SCOE MGA Plugged	Plastic cap (See note1) Plastic cap (See note1) Plastic cap (See note1) Flight Connector LGA1 Anechoic Cap LGA2 Anechoic Cap MGA Anechoic Cap Flight Connector ACMS Flight Cap SK04P01 Plugged
SKIN-03 SKIN-03 SKIN-04 SKIN-04	Connector Function Test point TC + protection jumper EPC1 Test point TC + protection jumper EPC2 RF LINK Connector Function RF link for antenna LGA1 RF link for antenna LGA2 RF link for antenna MGA ACMS Panel (RWE) Connector Function	SK03J01 SK03J02 Skin Connector N/A N/A N/A Skin Connector	XPND1/EPC1 XPND2/EPC2 S/C unit LGA1 LGA2 MGA S/C unit	SCOE CABLE RF SCOE LGA1 Plugged RF SCOE LGA2 Plugged RF SCOE MGA Plugged	Plastic cap (See note1) Plastic cap (See note1) Flight Connector LGA1 Anechoic Cap LGA2 Anechoic Cap MGA Anechoic Cap Flight Connector ACMS Flight Cap SK04P01 Plugged ACMS Flight Cap
SKIN-03 SKIN-03	Connector Function Test point TC + protection jumper EPC1 Test point TC + protection jumper EPC2 RF LINK Connector Function RF link for antenna LGA1 RF link for antenna LGA2 RF link for antenna MGA ACMS Panel (RWE) Connector Function	SK03J01 SK03J02 Skin Connector N/A N/A N/A Skin Connector J01	XPND1/EPC1 XPND2/EPC2 S/C unit LGA1 LGA2 MGA S/C unit ACC/RWL-1	SCOE CABLE RF SCOE LGA1 Plugged RF SCOE LGA2 Plugged RF SCOE MGA Plugged	Plastic cap (See note1) Plastic cap (See note1) Flight Connector LGA1 Anechoic Cap LGA2 Anechoic Cap MGA Anechoic Cap Flight Connector ACMS Flight Cap SK04P01 Plugged

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

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Annex N	on top of							
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight		
	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		
16 100	on top of							
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected		
	Valve Sensor	316100-J01	VS501, VS504	3000	COMMODICAL STREET	X		
	Valve Sensor	316100-J02	VS503, VS505			Х		
1 100	on top of							
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected		
	OWN TIME TO THE CONTROL OF T	321100-J01	L701, H701	Cryo SCOE J11		no flight		
	Control of the contro	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		

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			1	1	I	92m
		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
The second secon	Control of the contro	321100-J07	H501	Cryo SCOE J06		no flight
The second secon		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		×
		321200-J04	T312, T314, T316, T905, T909, T931, T933, T935	Cryo SCOE J09		×
		321200-J05	VS103, H102	Cryo SCOE J04		X
	AND THE RESERVE OF THE PARTY OF		New York Consults	1.46304.561		
321 300	on top of					

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

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Anne	x 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		
. IF E	SAFE / ARM plug	314 200-J06	SI 602	X		

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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"

	sco	DE CABLES CONNECT	FION to HERSCHI	EL S/C	
SKIN-01	PWR Panel (PCDU)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
				BS SCOE Cable	
	BS Nom Power	SK01BJ09	PCDU	Plugged	
				BS SCOE Cable	
	BS Red Power	SK01BJ10	PCDU	Plugged	
				LPS SCOE	
	BDR1 AIT	SK01BJ11	PCDU	Cable Plugged	
				LPS SCOE	
	BDR2 AIT	SK01BJ12	PCDU	Cable Plugged	
				POWER SCOE	
	SA Nom Power	SK01AJ01	PCDU	Cable Plugged	
		ĺ		POWER SCOE	
	SA Nom Power	SK01AJ02	PCDU	Cable Plugged	
				POWER SCOE	
	SA Nom Power	SK01AJ03	PCDU	Cable Plugged	
				Connector	
	SA Red Power	SK01AJ04	PCDU	Cover	
				POWER SCOE	
	SA Red Power	SK01AJ05	PCDU	Cable Plugged	
				POWER SCOE	
	SA Red Power	SK01AJ06	PCDU	Cable Plugged	
				POWER SCOE	
1100	SA Red Power	SK01AJ07	PCDU	Cable Plugged	
KIN-02	PWR Panel (ACC, CDMU, RCS,	1553 & Thruster)			
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
				Bus Monitor	
SKIN-02	DMS 1553 Bus_A	J01	CDMU	Cable Plugged	
				Bus Monitor	
SKIN-02	DMS 1553 Bus_B	J02	CDMU	Cable Plugged	
				ACMS SCOE	
SKIN-02	ACMS 1553 Bus_A	J03	ACC	Cable Plugged	
				ACMS SCOE	
SKIN-02	ACMS 1553 Bus_B	J04	ACC	Cable Plugged	
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	ACMS SCOE	

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

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			Î	1	SK04P02 Plugged			
SKIN-04					ACMS Flight Cap			
	RWL3 Sgn	J03	ACC/RWL-3		SK04P03 Plugged			
SKIN-04					ACMS Flight Cap			
	RWL4 Sgn	J04	ACC/RWL-4		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				ACMS SCOE				
	GYRO RS422 / Test	J03	GYRO	Cable Plugged				
SKIN-05		5 C C C C C C C C C C C C C C C C C C C		ACMS SCOE				
	CRS 1/2 Stimuli	J04	CRS-1,2	Cable Plugged				
SKIN-05				ACMS SCOE				
	AAD Sgn M	J05	AAD/ACC	Cable Plugged				
SKIN-05				ACMS SCOE				
	SAS1/2 Sgn M	J06	SAS/ACC	Cable Plugged				
SKIN-05				ACMS SCOE				
	SAS1/2 Sgn R	J07	SAS/ACC	Cable Plugged				
SKIN-05				ACMS SCOE				
	AAD Sgn R	J08	AAD/ACC	Cable Plugged				
SKIN-06	STR Panel							
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector			
				ACMS SCOE				
SKIN-06	STR1 Stimuli	J01	STR1	Cable Plugged				
				ACMS SCOE				
SKIN-06	STR2 Stimuli	J02	STR2	Cable Plugged				
	UMBILICAL							
	Connector Function	Connector	S/C unit	SCOE CABLE				
				SCOEs cable				
	Power/Data	HU1 J01	SYSTEM	Plugged				
				SCOEs cable				
	Power/Data	HU2 J01	SYSTEM	Plugged				

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Annex N	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	Comparter	C/C unit	SCOE	CryoSCOE	CCU Flight		
	Function Valve Sensor	316100-J01	VS501, VS504	SCOE	connected	connected		
	Valve Sensor	316100-J02	VS503, VS505			X		
21 100	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		

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The second secon		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
	And the second of the second o	321100-J07	H501	Cryo SCOE J06		no flight
	The state of the s	321100-J08	T502	Cryo SCOE J01		no flight
321 200	on top of				i v	
	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
	- At	321200-J05	VS103, H102	Cryo SCOE J04		Х

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321 300	on top of					
And the second s	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	321300-303	7 7 3 100, 11102	1 304		
CVSE IIF	Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected
	Turouori	OKIII OOTIII EELO	O/O unit	Cryo SCOE J18	Connected	X
to be approved & released before start of ACS/PR/TP by Floor- Manager		Date:		Sign:		

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Annex	k 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				

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4.3.3 SCOE cable connection for" Launch Clean Run"

IN-01	No.: PWR Panel (PCDU)	PWR Panel (PCDU)					
						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
	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		
					LPS SCOE		
	BDR1 AIT	SAS SCOE	PCDU	SK01B J/P11	Cable Plugged		
					LPS SCOE		
	BDR2 AIT	SAS SCOE	PCDU	SK01B J/P12	Cable Plugged	1 X 2 T	
	PWR Panel (ACC, CDML	J, RCS, 1553 &					
KIN-02	Thruster)					B. (0=0=0=0	
							作表 建设
	Connector Function	SCOE	S/C unit	Skin Connector	Connection	A STATE OF	Sign
	Notice to the control of the control	0011110000	ODM	01/00 1/201	FULL		
	DMS 1553 Bus_A	CDMU SCOE	CDMU	SK02 J/P01	Flight		
	DMC 1552 Duo D	CDMITCOOL	CDMIT	CKU3 ND03	Elicht		
	DMS 1553 Bus_B	CDMU SCOE	CDMU	SK02 J/P02	Flight		
	ACMS 1553 Bus_A	ACMS SCOE	ACC	SK02 J/P03	Flight		
	ACIVIO 1000 DUS_A	ACIVIO OCCE	1,00	31\02 3/F03	riigiit		
	ACMS 1553 Bus_B	ACMS SCOE	ACC	SK02 J/P04	Flight		
	LV1/FCV 20N CMD S/A	7.0110 0001	7.00	01.02 0/1 04	riigiit		
	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		

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	Quick S/W load	grey ACMS	black CDMS	SK02 J/P09	disconnected	T	
100 mm (100 mm)	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		
200 (1997) (1997	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	3.00	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)	1140 0001	INIOA	Сар	NI-300E		
		2002	C/C usit	Skin Oo	The State of the Sale		0
	Connector Function RWL1 Sgn	SCOE	S/C unit	Skin Connector	Connection		Sign
	RWL1 Sgn		ACC/RWL-1 ACC/RWL-2	SK04 J/P01 SK04 J/P02	Flight		
	RWL3 Sgn		ACC/RWL-2	SK04 J/P02 SK04 J/P03	Flight Flight		
	RWL4 Sgn		ACC/RWL-3	SK04 J/P03 SK04 J/P04	Flight		

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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					- 1 19	
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	STR1 Stimuli	STR1	STR1	SK06 J/P01	disconnected	D. W. STONES OF THE P.	Oigii
	STR2 Stimuli	STR2	STR2	SK06 J/P02	disconnected		
UMBILICAL							
	Connector Function	SCOE	S/C unit	Connector	Connection		Cign
	Power/Data	System	SYSTEM	HUJ01	SCOE	1. 10. 10. 10. 10. 10. 10. 10. 10. 10. 1	Sign
	Power/Data	System	SYSTEM	HUJ02	SCOE		
approved SE		approved		approved PA		appro	oved r-Mange
					- caloty	1, 1001	Ividinge
sign off:							

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Annex N	No.:							
315 100	on top of							
	Connector				CryoSCOE	CCU Fligh		
	Function	Connector	S/C unit	SCOE	connected	connected		
			T117, T118, T207, T211,					
	Temperature Sensors	315100-J01	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		
			T004 T000					
	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		Y		
6 100	Sensors 315100-J06 (Telescope) J10 X on top of							
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected		
	Valve Sensor	316100-J01	VS501, VS504			Х		
	Valve Sensor	316100-J02	VS503, VS505			X		
1 100	on top of							
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected		
		321100-J01	L701, H701	Cryo SCOE J11	connected	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		

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			VT103, VT105, VT701, VH102, VH103, VH105,			
	The second secon	321100-J05	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
The second secon	12 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	321100-J07	H501	Cryo SCOE J06		no flight
	6 (4 (2 (4 (4 (4 (4 (4 (4 (4 (4 (4 (4 (4 (4 (4	321100-J08	T502	Cryo SCOE J01		
321 200	on top of	321100-300	11002	1301		no flight
	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
			T102, T105, T106, T111, PR_P701, T421,	Cryo SCOE		
		321200-J02 321200-J03	T321, T323, T501, T505, T651, T901, T903, T907, T911	J04 Cryo SCOE J09		X
		321200-J04	T312, T314, T316, T905, T909, T931, T933, T935	Cryo SCOE J09		Х
		321200-J05	VS103, H102	Cryo SCOE J04		Х

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to be approved & released before start of ACS/PR/TP by Floor- Manager		Date:		Sign:		
				J18		X
	Connector Function	Skin Connector	S/C unit	SCOE Cryo SCOE	SCOE Cable connected	Flight Cap connected
CVSE I/F	on top of	021000-000	V3100,1110Z	304		
A CONTROL OF THE CONT		321300-J04 321300-J05	T932, T934 VS106, H102	J14 Cryo SCOE J04		X
		204000 104	T311, T313, T315, T904, T906, T910,	Cryo SCOE		
		321300-J03	P502,T322, T324, T504, T506, T507, T652, T902, T908, T912	Cryo SCOE J18		X
		321300-J02	T101, T104, T107, T112, T703, T422, T441, T462, T701, H102	Cryo SCOE J04		X
		321300-J01	T208, T213, T222, T224, T225, T226, T231, T233, T235, T237, T247, T248, T252, T256, T862, T444	Cryo SCOE J02		X

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Vo veik											
VC			on top of								
S/C unit	SAFE	ARM	Sign								
NED (601)	Х										
NED (602)	Х										
SI 601	X										
SI 602	X										
	HED (602)	IED (602) X	IED (602) X II 601 X								

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5 Conditions

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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	Υ		
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.

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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.

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Chapter	of IST Spec Issiue 4	Instr. Mode	Real Battery required	Satellite X-Axis tilting	Ambient or cool down (deviating from	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		Preferred		
5.8.3.4	TTC commissioning	OFF	N	n.a	Preferred Preferred	alternative	alternative
.8.3.5	CDMS commissioning	OFF	N N	n.a		alternative	alternative
	TCS commissioning	OFF		n.a	Preferred	alternative	alternative
.8.3.7	PCS commissioning	OFF	N N	n.a.	Preferred	alternative	alternative
8.3.10	SREM commissioning	OFF		n.a	Preferred	alternative	alternative
.8.3.11			N	n.a	Preferred	alternative	alternative
1.8.3.12	TCS commissioning	OFF	N	n.a	Preferred	alternative	alternative
.8.3.13	Telescope decontamination	OFF	N	n.a	Preferred	alternative	alternative
.8.3.14	Cryo Cover opening Test end	OFF OFF	N N	n.a n.a	Preferred Preferred	alternative alternative	alternative alternative
.8.3.9	ACMS commissioning	J.,		11.0	Treferred	alternative	aiternative
							30 - 30
.8.3.9.1	AAD. SAS, CRS, STR, GYR, RCS unit check	OFF	N	n.a	Preferred	alternative	alternative
.8.3.9.2	RWLs health check	OFF	N	n.a	Preferred	alternative	alternative
.8.3.9.3	STR functional verification	OFF	N	n.a	Preferred	alternative	alternative
8.3.9.4	ACC health check	OFF	N	n.a	Preferred	alternative	alternative
.8.3.9.5	ACMS dynamic verification	OFF	N	n.a	Preferred	alternative	alternative
5.8.5	Mode transitions						
.8.5.3	Test start configuration	OFF			5 (
8.5.4	Launch to Launch	OFF	N	n.a	Preferred	alternative	alternative
8.5.5	Launch to SAM	OFF	N	n.a	Preferred	alternative	alternative
8.5.6	SAM to SAM		N	n.a	Preferred	alternative	alternative
.8.5.7	SAM to NOM	OFF	N N	n.a n.a	Preferred Preferred	alternative alternative	alternative alternative
0.40				1124	, totelled	anemaave	anternative
.8.10	Launch clean run	OFF	Y		0	1. 41	
	X1, 34, 11, 11, 11, 11, 11, 11, 11, 11, 11, 1	- OFF		n.a	Preferred	alternative	alternative
8.11	Launch sequence robustness						
	Satellite power on	OFF	N	n.a	Preferred	alternative	alternative
8.11.3.4	Configuration for launch (status)	OFF	N	n.a	Preferred	alternative	alternative
	Configuration for launch	OFF	N	n.a	Preferred	alternative	alternative
8.11.3.6	Separation	OFF	N	n.a	Preferred	alternative	alternative
8.11.3.7	S/C acquisition	OFF	N	n.a	Preferred	alternative	alternative
8 11.3.8	Initial checkout in SAM mode	OFF	N	n.a	Preferred	alternative	alternative
8.11.3.9	Transition to NOM mode	OFF	N	n.a	Preferred	alternative	alternative
8 11.3 10	Orbit control manoeuvre	OFF	N I	n.a	Preferred	alternative	alternative

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5.8.5.8 16.8.5.9 16.8.5.10 E	Mode transitions NOM to NOM NOM to EAM EAM to EAM EAM to NOM NOM to SM SM to SM EAM to SAM EAM to SAM EAM to SAM EAM to SAM (needs new SAM to NOM and NOM to EAM) NOM to SAM (needs new SAM to NOM)	PACS SPECTO SPIRE STBY HIFI STBY SPIRE STBY SPIRE STBY SPIRE STBY HIFI STBY PACS STBY SPIRE STBY SPIRE STBY SPIRE STBY PACS STBY SPIRE STBY-Photo PACS STBY PACS STBY SPIRE STBY-OFF HIFI STBY-OFF OFF OFF PACS STBY PACS STBY SPIRE STBY-OFF STBY-OFF OFF PACS STBY PACS STBY SPIRE STBY PACS STBY SPIRE STBY PACS STBY PACS STBY PACS STBY PACS STBY PACS STBY PACS SUPERIOR STBY PACS STBY	N N N N N N N N N N N N N N N N N N N	0-23 0-23 0-23 0-23 0-23 0-23	IST Spec !!!)	alternative alternative alternative alternative alternative	Preferred Preferred Preferred Preferred Preferred
5.8.5.9 P 5.8.5.10 E 5.8.5.11 E 5.8.5.12 N 5.8.5.13 S 5.8.5.14 S 5.8.5.14 S 6.8.5.17 E 6.8.5.18 N 6.8.5.19 T 6.8.6.3 C 6.8.6.3 C 6.8.6.3 C 6.8.6.3 C 6.8.6.3 C	NOM to EAM EAM to EAM EAM to NOM NOM to SM SM to SAM EAM to SAM EAM to SAM (needs new SAM to NOM and NOM to EAM)	SPIRE STBY HIFI STBY PACS STBY SPIRE STBY SPIRE STBY PACS STBY SPIRE STBY PACS STBY SPIRE STBY PACS STBY PACS STBY PACS STBY PACS STBY PACS STBY PACS STBY OFF OFF PACS STBY PACS STBY SPIRE STBY OFF OFF PACS STBY SPIRE STBY PACS STBY PACS STBY PACS STBY PACS STBY PACS STBY	N N N N N N	0-23 0-23 0-23 0-23		alternative alternative alternative	Preferred Preferred Preferred
5.8.5.11 E 5.8.5.12 N 5.8.5.13 S 5.8.5.14 S 5.8.5.17 E 5.8.5.17 E 5.8.5.18 N 6.8.5.19 T 6.8.6 S 6.8.6.2 T 6.8.6.3 C 6.8.6.3 C 6.8.6.3 C 6.8.6.3 C	EAM to EAM EAM to NOM NOM to SM SM to SM EAM to SAM EAM to SAM (needs new SAM to NOM and NOM to EAM) NOM to SAM (needs new SAM to NOM)	HIFI STBY PACS STBY HIFI STBY SPIRE STBY-SPIRE STBY-SCIENCE-STBY-STBY-STBY-STBY-STBY-STBY-STBY-STBY	N N N	0-23 0-23 0-23 0-23		alternative alternative alternative	Preferred Preferred Preferred
5.8.5.11 E 5.8.5.12 N 5.8.5.13 S 5.8.5.14 S 5.8.5.17 E 5.8.5.17 E 5.8.5.18 N 6.8.5.19 T 6.8.6 S 6.8.6.2 T 6.8.6.3 C 6.8.6.3 C 6.8.6.3 C 6.8.6.3 C	EAM to EAM EAM to NOM NOM to SM SM to SM EAM to SAM EAM to SAM (needs new SAM to NOM and NOM to EAM) NOM to SAM (needs new SAM to NOM)	SPIRE STBY PACS STBY SPIRE STBY- SPIRE STBY- Photo-ST- SPIRE STBY- Photo-OFF OFF OFF PACS STBY-OFF OFF PACS STBY-OFF STBY-OFF OFF PACS STBY-OFF PACS STBY-OFF STBY-OFF OFF PACS STBY-OFF STBY-OFF OFF PACS STBY-OFF P	N N N	0-23 0-23 0-23		alternative alternative	Preferred Preferred
5.8.5.11 E 5.8.5.12 M 5.8.5.13 S 5.8.5.14 S 5.8.5.17 E 5.8.5.17 E 5.8.5.18 N 6.8.5.19 T 6.8.6.2 T 6.8.6.3 C 8.6.4 C 8.6.5 A 8.6.5 A	EAM to NOM NOM to SM SM to SM SM to SAM EAM to SAM (needs new SAM to NOM and NOM to EAM) NOM to SAM (needs new SAM to NOM)	SPIRE STBY-> Photo->STBY HIFE STBY PACS STBY >Photo- SPIRE Photo->OFF HIFE STBY->OFF OFF OFF PACS STBY->OFF PACS STBY- SPIRE STBY- PACS STBY- SPIRE STBY- PACS STBY->SPIRE STBY- PACS STBY- SPIRE STBY SPIRE STBY PACS Burst- >STBY- PACS Burst- >STBY	N N N	0-23 0-23 0-23		alternative alternative	Preferred Preferred
5.8.5.12 N 5.8.5.13 S 5.8.5.14 S 5.8.5.17 E 6.8.5.18 N 6.8.5.19 T 6.8.5.19 T 6.8.6.3 C 8.6.3 C 8.6.4 C 8.6.5 A	NOM to SM SM to SM SM to SAM EAM to SAM (needs new SAM to NOM and NOM to EAM) NOM to SAM (needs new SAM to NOM)	PACS STBY Photo PACS STBY-OFF OFF OFF PACS STBY SPIRE PACS STBY SPIRE PACS STBY SPIRE STBY PACS STBY PACS STBY PACS Burst- STBY	N N N	0-23 0-23		alternative	Preferred
5.8.5.13 S 5.8.5.14 S 5.8.5.17 E 5.8.5.18 N 5.8.5.19 T 5.8.6 S 6.8.6.2 T 6.8.6.3 C 6.8.6.3 C 6.8.6.4 C	SM to SM SM to SAM EAM to SAM (needs new SAM to NOM and NOM to EAM) NOM to SAM (needs new SAM to NOM)	PACS STBY→OFF SPIRE Photo→OFF HIFI STBY→OFF OFF OFF PACS STBY PACS STBY HIFI Science → STBY PACS Burst->STBY	N N	0-23			100
5.8.5.14 S 5.8.5.17 E 5.8.5.18 N 5.8.5.19 T 5.8.6 S 6.8.6.2 T 6.8.6.3 C 6.8.6.3 C 6.8.6.4 C	SM to SAM EAM to SAM (needs new SAM to NOM and NOM to EAM) NOM to SAM (needs new SAM to NOM)	OFF OFF PACS STBY SPIRE STBY HIFI Science -> STBY PACS Burst- >STBY	N			alternative	Preferred
5.8.5.17 E 5.8.5.18 N 5.8.5.19 T 5.8.6 S 6.8.6.2 T 6.8.6.3 C 6.8.6.3 C 8.6.4 C	EAM to SAM (needs new SAM to NOM and NOM to EAM) NOM to SAM (needs new SAM to NOM)	PACS STBY SPIRE STBY HIFI Science -> STBY PACS Burst- >STBY					reieneu
5.8.5.18 N 5.8.5.19 T 5.8.6 S 5.8.6.2 T 5.8.6.3 C 6.8.6.3 C	NOM to SAM (needs new SAM to NOM)	SPIRE STBY HIFI Science -> STBY PACS Burst- >STBY	N	0-23		alternative	
5.8.5.19 T 5.8.6 S 6.8.6.2 T 6.8.6.3 C 6.8.6.4 C 6.8.6.5 A 6.8.6.5 A	*	PACS Burst- >STBY		0-23		alternative	Preferred Preferred
5.8.6 S 5.8.6.2 T 5.8.6.3 C 5.8.6.4 C	Fest end	SPIRE STBY	N	0-23		alternative	Preferred
5.8.6.3 C 5.8.6.4 C 5.8.6.5 A		OFF	N	0-23		alternative	Preferred
5.8.6.3 C	S/C reconfiguration						
5.8.6.4 C	est start configuration	PACS STBY SPIRE STBY HIFI STBY	N	0-23		alternative	Preferred
5.8.6.5 A	CDMS level 3a	PACS STBY SPIRE STBY HIFI Prime-	N	0-23		alternative	Preferred
866 Д	CDMS level 3b	PACS STBY SPIRE STBY HIFI STBY	N	0-23		alternative	Preferred
	CMS level 4	PACS Prime->OFF SPIRE STBY->OFF HIFI STBY->OFF	N	0-23		alternative	Preferred
.8.6.7 C	CMS recovery from Survival Mode (ACMS SASM to SAM)	OFF	N	0-23		alternative	Preferred
	DMS level 4	PACS Prime-OFF SPIRE STBY->OFF HIFI STBY->OFF	N	0-23		alternative	Preferred
8.6.8 Te	est end	OFF	N	0-23		alternative	Preferred
.8.12 N	OM mode robustness						
	itial State	PACS STBY SPIRE Photo HIFI STBY	N	0-23		alternative	Preferred
8.12.3.2 CI	DMS PM 1553 BC failure simulation	PACS STBY SPIRE Photo- >STBY	N	0-23		alternative	Preferred
8.12.3.3 CI	DMS PM 1553 BC failure recovery	PACS Photo SPIRE STBY HIFI STBY	N	0-23		alternative	Preferred
8 12 3.4 Ini	itial state second test	PACS Photo SPIRE STBY	N	0-23		alternative	Preferred
8.12.3.5 AC	CMS 1553 RT failure simulation	PACS Photo - >STBY SPIRE STBY	N	0-23		alternative	Preferred
8.12.3.6 AC	CMS 1553 RT failure recovery	PACS STBY->OFF SPIRE STBY->OFF HIFI STBY->OFF	N	0-23		alternative	Preferred
	est of Instrument FDIR OBCP						
8.13.4 SF	PIRE FDIR OBCP	SPIRE	N	0-23		alternative	Preferred
	ACS FDIR OBCP FI FDIR OBCP	PACS	N	0-23		alternative	Preferred
3.00	TITUR ODOF	HIFI	N	0-23		alternative	Preferred
9 DE 9.1 S/0		注				1	

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	ter 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
1.3	Satellite Commissioning	110000				1. 4550	
3.8	CCU (cryostat) commissioning	OFF	N	23			D
4	Instruments commissioning and performance verification						Required
4.3	Test start (restart) configuration	OFF	N	23		425-5	1 10
d d				23			Required
4.6	SPIRE commissioning test	Spire	N	22 . 00	-		Required
4.6	PACS commissioning test	PACS	N N	23 -> 90			Required
47	HIFI commissioning test	HIFI	N N	23			Required
4.6	SPIRE and PACS parallel mode	SPIRE/PACS	N	0-23			Required
4.9	Test end or interruption	OFF	N	23		-	Required Required
		1					Kequired
7	CDMS management	200			100		
7.2.	General Sequence (integration with Kins DTGP number 2)	PACS Prime STBY >> Burst >> X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
722		PACS Prime STBY > Burst > X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
723		PACS Prime STBY -> Burst -> X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
(24	SSMM management	PACS Prime STBY >> Burst -> X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
25		PACS Prime STBY → Burst → X SPIRE STBY HIFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
2.6	OBT management	PACS Prime STBY >> Burst -> X SPIRF STBY	И	0-23		alternatively if MTL is compatible with instrument	Preferred
		HIFI STBY				operations	
i	DTCP worst case scenario				3424 (22)		11/4
	DEFENSE NO	PACS (Burst) SPIRE STBY HIFI Prime	N	0-23		TBC	Preferred
2	REFERENCE Mission Scenario						
	Test start configuration		Υ				Required
3	Test steps		Υ				Required
4	HIFLOD	HIFI OD	Y	0-23			Required
5	PACS OD	PACS OD	Υ	0-23			
6	SPIRE OD	SPIRE OD	Y				Required
7	Test end	5		0-23			Required
	rest one	1	Υ				Required

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

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5.3 General Precautions and Safety

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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
- 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

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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.

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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.

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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.

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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.

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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

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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.

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5.4 **GSE**

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

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5.4.1 MGSE

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

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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	Cl 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	Cl No. 142 310-06	
2	Leak Detector Spectron 5000	BOCE	Cl No. 142 310-07	
3	He I transfer lines (Y0211/Y0221/Y0231)	DeMaCo	Cl 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	Cl 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	Cl No. 142 310-09	
Set	HiVac Pumping lines (Y0673)	ASED	CI No. 142 310-09	

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Qty.	Designation/Manufacturer	Provided by	Drawing/Ident. NR:	Calibr. Date
Set	Helium I lines (Y0612)	ASED	Cl No. 142 310-09	
Set	Helium II Pumping lines (Y0602)	ASED	Cl No. 142 310-09	
2	Scaffolding for He lines	ASED	CI No. 142 310-10	
10	450 I 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		

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5.4.3 EGSE

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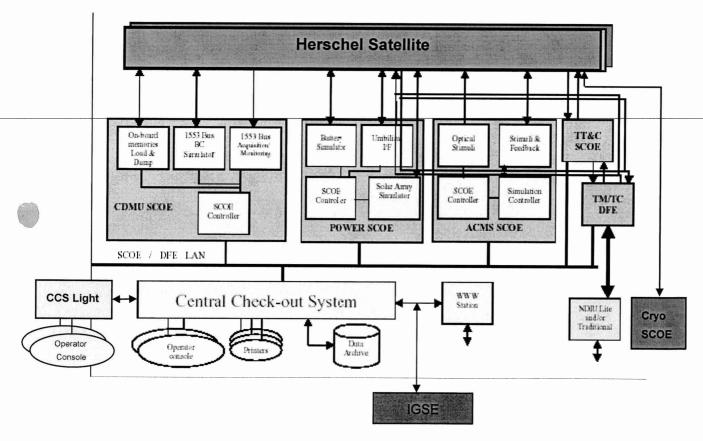
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5.4.3.1 EGSE Hardware Configuration

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

S/S	Unit	Configuration			SCOE simulated equipments	Remarks
		Herschel				
EGSE	ccs	1				The second secon
	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)

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- 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.

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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.

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5.4.4 OGSE

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

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5.4.5 Special Equipment

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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-Al-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.

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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.

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7.1 HPCCS Configuration for IST Test

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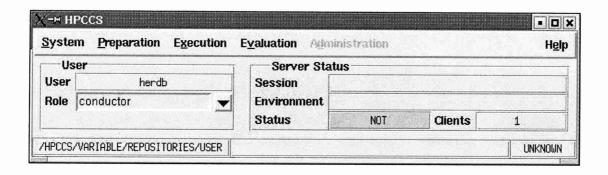
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7.1.1 Apply Tag on test files

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

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



- Logged as herdb, in HPCCS window, select menu "Preparation → Prepare" 3.
- Logged as herdb, In PREP window, select menu "Preparation→ Discard all" 4.
- 5. Logged as herdb, In Confirm Discard window, click the button Discard
- 6. Logged as herdb, in PREP window, select menu "Preparation→ Update"
- Logged as herdb, in Check out environment window, click the button Check out and 7. 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
- Logged as herdb, confirm Tag Application Push Apply button 11.
- 12. Logged as herdb, open a new shell window (xterm)
- Logged as herdb, execute the command update_tag 13.
- 14. Logged as herdb, insert the name of TAG

IST_x_PART_x_TP_xxxx_x_x_BEGIN_xxx

- Logged as herdb, in PREP window, select menu "Tag → Apply" 15.
- 16. Logged as herdb, in Apply tag window, select in the list the TAG

IST_x_PART_x_TP_xxxx_x_x_BEGIN_xxx Logged as herdb, push Copy selected tag

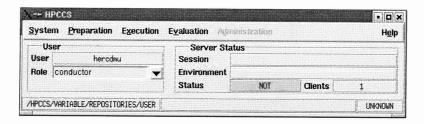
- 17.
- Logged as herdb, modify the TAG name with IST_x_PART_x_TP_xxxx_x_x_END_xxx 18.
- 19. Logged as herdb, push Apply → Apply
- Logged as herdb, confirm Tag Application Push Apply button 20.

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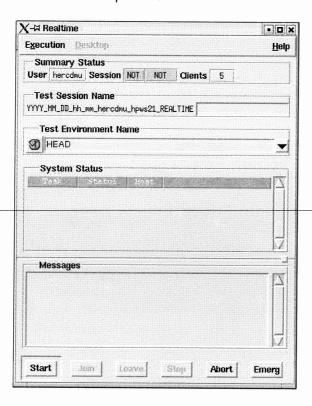
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7.1.2 Start test session on HPCCS

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



On **HPCCS** window, select menu "**Execution** \rightarrow **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

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7.2 IST START for Spacecraft configuration

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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.

=> Scoe Config. Power ON => CDMS PM & SW => TC Decoder **CROME Setting** Spacecraft Configuration => PCDU => Tx Chain => HPS => RFDN Switch => Active bus =>TM OBT IST START SSMM procedure **ACMS CONFIG** Switch ON CCU and monitoring procedure Load SSMM Initialisation Set Thermal Control Table Configuration **IST Status** ACMS SCOE (Only in Launch Cases) Packet Store Configuration (1) Definition OBCP Upload (On Board Upload Event Action Table ACC Power ON Control Procedure) On Board Schedule Initialisation Default Configuration Switch to BD Mode before separation Set Survival Register => Tx Chain => Bus => RFDN Switch => PCDU => Separation Strap => TTR "Only in Launch Cases" means: appliable for following IST chapters 5.8.2 Nominal Launch 5.8.10 Launch Clean Run 5.8.11 Launch Mode robustness (1) "ACMS SCOE Configuration" is not executed during 5.8.10 Launch Clean Run

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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	TTR SM	TM OBT	TC Dec.	PM SW	SSMM	В	us sm	PC	DU SM	HPS	TxC	hain sm	RF	DN SM	CC	U Mode	ACMS Config. File
						5.8	.2 NO	MINAL LA	UNG	СН					- - - - - - - - - -			OIL	vioue	Connig. File
SAS	Sim. Charged + Launch	Monninal	Not Separated	В	Α	Α	A1	A 0-1-2 B 0-1-2	Α	В	Α	В	А	Α	В	1&3	ABBB	A&B	2	IST_FN
						5.8.3	a ACN	IS Commi	ssio	ning		a secondary sec		STATE OF THE PARTY.						C years and a second
SAS	Sim. Charged	PM A Nominal	Separated	В	Α	В	A1	A 0-1-2 B 0-1-2	Α	В	Α	В	Α	Α	В	1&3	АВВВ	A&B	1	IST_SCA1
						5.8.	3b \$/C	Commis	sion	ing										
SAS	Sim. Charged	PM A Nominal	Separated	В	Α	Α	A1	A 0-1-2 B 0-1-2	Α	В	Α	В	Α	Α	В	1&3	ABBB	A&B	1	IST_MOD
						5.8.4.5	.1 SPI	RE Comn	nissi	onin	g	NI ALAMAN DE LA CONTRACTOR DE LA CONTRAC		Dunkanishes						
SAS	Sim. Charged	PM A Nominal	Separated	В	Α	Α	A1	A 1 B 1	В	Α	Α	В	Α	Α	В	1&3	ABBB	A&B	1	
				5.	8.4.5.2	SPIRE	Spect	rometer C	om	olem	enta	ry Te	st	ALTO COLUMNOS SES		***				
SAS	Sim. Charged	PM B Nominal	Separated	Α	В	В	В1	A 3 B 3	В	Α	В	A	В	В	А	2&4	AABB	A&B	1	

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SASLPS SCOE		Crome PAP/CCS	Sep. Strap	TTR SM	TM OBT	TC Dec.	PM SW	SSMM	В	us sm	PC	DU SM	HPS	TxC	hain sm	RF	DN SM	CC ON	U Mode	ACMS Config. File
	1100					5.8.4	.6 PA	CS Comm	nissi	oning	3	Terres and the control of	100	STREET					wouc	Comig. The
SAS	Sim. Charged	PM A Nominal	Separated	Α	Α	В	A1	A 2 B 2	В	А	В	А	В	В	Α	2&4	AABB	A&B	1	
				<u></u>		5.8.	4.7 HII	- I Commi	ssio	ning						l				
SAS	Sim. Charged	PM B Nominal	Separated	В	Α	Α	B1	A 3 B 3	А	В	Α	В	Α	Α	В	1&3	ABBB	A&B	1	
					5	.8.4.8 P	arallel	Mode Co	mm	issio	ning	BURNERS				<u></u>	-			1
SAS	Sim. Charged	PM B Nominal	Separated	Α	В	В	B1	A 0 B 0	А	В	В	А	В	В	Α	2&4	AABB	A&B	1	
						5	5.8.5 M	ode Tran	sitio	n		aprile to le					1			
SAS	Sim. Charged	PM A Nominal	Separated	В	Α	Α	A1	A 1 B 1	А	В	Α	В	Α	Α	В	1&3	ABBB	A&B	2	IST_MOD
					-	5.8	3.6 SC	Reconfig	urat	ion		All Districts		Website Book						
SAS	Sim. Charged	PM A Nominal	Separated	Α	В	В	A1	A 2 B 2	В	Α	В	А	В	В	Α	2&4	AABB	A&B	1	IST_FD_B
						5.8	3.7 CD	MS Manag	gem	ent						-	1			
SAS	Sim. Charged	PM A Nominal	Separated	В	Α	Α	A2	A 1 B 1	Α	В	Α	В	А	Α	В	1&3	ABBB	A&B	2	IST_CDMS
						5.8.8 D	TCP V	Vorst Cas	se Sc	enar	io	termental/States								
SAS	Sim. Charged	PM B Nominal	Separated	Α	В	В	B2	A 2 B 2	В	Α	В	Α	В	В	A	2&4	AABB	A&B	2	IST_WCS

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SASL PS	Bat. SCOE	Crome PAP/CCS	Sep. Strap sм	TTR sm	TM OBT	TC Dec.	PM SW	SSMM	В	us sm	PC	DU SM	HPS	TxC	hain sm	RF	F DN SM	CC ON	U Mode	ACMS Config. File
					5.	8.9 RMS	Refe	rence Mis	sior	ı Sce	nari	0		ON THE PROPERTY OF THE PARTY OF						Comig. 1 lic
SAS	Sim. Charged	PM A Nominal	Separated	В	Α	Α	A1	A 0-1-2 B 0	Α	В	Α	В	Α	Α	В	1&3	ABBB	A&B	1	IST_RMS
			Niji Mg			5.	8.9 La	unch Clea	an R	un		Manualiagene		amissingentas		L			Lange Control	
LPS	REAL	PM A Nominal	Not Separated	В	Α	Α	A1	A 0-1-2 B 0-1-2	Α	В	Α	В	Α	Α	В	1&3	АВВВ	A&B	2	IST_CLN
						5.8.11	Launc	h Mode F	lobu	stne	SS			Harman Services				E14041,7.099978		
SAS	Sim. Charged +Launch	PM A Nominal	Not Separated	В	Α	Α	A1	A 0 B 0	Α	В	Α	В	А	Α	В	1&3	ABBB	A&B	2	IST_LSR
		•				5.8.12	2 NOM	Mode Ro	bus	tnes	S	(C) (A) (C) (A)	169				J			
SAS	Sim. Charged	PM A Nominal	Separated	Α	В	В	A1	A 3 B 3	В	Α	В	Α	В	В	A	2&4	AABB	A&B	1	IST_NMR
						5.	8.13 lı	nstrumen	t FD	İR	types man force									
SAS	Sim. Charged	PM A Nominal	Separated	В	Α	Α	A2	A 1 B 1	Α	В	Α	В	Α	Α	В	1&3	АВВВ	A&B	1	IST_CDMS

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7.2.3 Initialisation

Step- No.	Initialisation-Step-Description		Nominal Value	Tolerance	Actual Value		Р	N
	TT&C S	COE	initialisatio	<u>n</u>				1
1	Verify that TT&C SCOE application SW is running Otherwise go on TTC SCOE or access remotely (com "startCMD ttcvnc" on shell window") and click "TTC startCMD ttcvnc" on STAC SCOE desktop controller and w self test completion.	SCOE					Ų	
2	On TT& SCOE application, in window ":: CONF namespathat can be open by menu "windows/SCOE config"), select menu "Config/Load", load the file "Herschel.conf" to click "open" button.						V	
	SPACECRAFT SKIN C	ONN	ECTORS CO	ONFIGURA ^T	TION			1
3	Verify that all the SCOE skin connectors cables are installed • Goto chapter 4.3 • Choose according to the IST Test case the relate skin configuration table • Check the list and sign off (together with PA and Manager).		SH CHECH CAL	IN CON	ANNEX	AATION IS		

Test location:	Operator /	Product-Assurance:	Date:	Time
D / -	- 1/	i i i i i i i i i i i i i i i i i i i	Date.	Time
6 8 10 mg		1 1/ 1	1 0 00 000	01 . 20
1210	17.11her	16 1/2-2 11	1-S-200F	04 · 30
V	1000	1. parcola		ι

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Step- No.	Initialisation-Step-Description		Nominal Value	Tolerance	Actual Value		Р	N
	ACM	SSC	OE CHECK					1
4/	Verify that the ACMS SCOE is ON and operational	X					T	T
N/A for			10	12		ale D		
"Laynch			3			SMI		
Clean								
Run"			()					
5/	In the Clean Room, check on the ACMS SCOE that STE	UCE					1	
	Electrical Stimuli program on PC2 and PC3 are enable					C 1 - D		
	double click on "scroll lock" and check "01-02 & 01-03					SKU		
	mouse pointer can be moved).							
1 / /	Otherwise execute Annex D Operator Note 3							

Test location;	Operator	Product-	Assurance:	Date:	Time
17 C/TBC			1.000	Date.	illie
12 31 12 (// //.		//1/	AL OF	9000 04:200
	1 they		190	0 - 7	2000 09.30
	- /		/		

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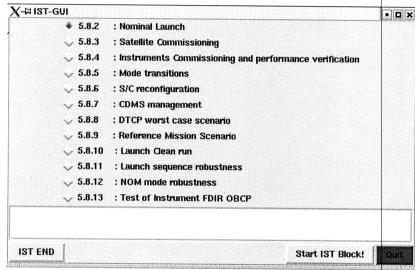


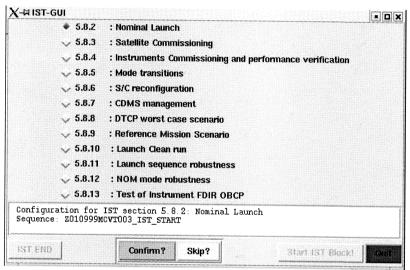
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7.2.4 IST Start Step by Step Procedure

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".





NR

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 pressing the button "Skip" will lead to chapter 7.2

Test locati	on: ZSME	Operator / //	Product-Assurance:	Date:	Time	: 22	
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Herschel

Step- No.	IST_START-Step-Descrip	tion	Nominal Value	Tolerance	Actual Value	Remarks	Р	N
1	Z010999MCVT003_IST_START At the bottom of the window, the IST_START panel displays all parameters applied during t ⇔ Click the button "Continue" to proceed	he IST_START.	To Check in Config. Table (Page 73)			Ving parameter	V	
			figuration of "IST STAR	Γ"				
	Power	CDMS			Rx and Tx Chain	***************************************		
	SAS/LPS SCOE: SAS	тм овт:	▼ Bus:	A	Tx Chain (Xpnd, 1	(x, EPC, TWT):		
	Bat. SCOE: Simulated	PM: A1	▼ PapCcs: P	MAnominal 🔻	TC decoder:	\[\begin{array}{c c c c c c c c c c c c c c c c c c c		
	PCDU: A HPS: A W	Survival Register Bus: B	Launch Straps: No	Separated 🕌	TM Rate:	Medium (150Kbps)		
	CCU: A&B		TTR:	B	RFDN Switches in	1 use 183 🔻		
	Mode: 512s (Mode 1) ▼	Tx Chain: B	RFDN Switches Positio	n ABBB	SSMM Mass Memory:	A0 and B0		
	8s (Moder)							
			ontinue? Abort TS?					
		IST_STA	RT Configuratio	n Panel				
Test lo	Opera B(BC	tor	Product-Assu	rance:	Date:	Time	2	

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Herschel

Step- No.	IST_START-Step-Description		Nominal Value	Tolerance	Actual Value	Remarks	Р	N
	Z010999MCVT003_IST_START							
2	Note the execution diagram, resuming each configuration ste and check all parameters are set as previously (particularly if any modification has been done on configuration panel)		YES				V	
	"START Satellite HERSCHEL "IST_START"" ⇒ Choose "Yes" or "No"							
	Z010999MCVT097_ASDGEN_CRIT_PARS_CHECK							
	This script will run during the whole session to monitor criti parameters.	ical						
	As soon as wrong value will be detected. A popup window voccur alerting the operator about incorrect TM checks	will					\	
	Minimise this window by clicking the corresponding button (on corner top right, first button from left)							

Test location:	Operator			
1 est location.	Operator	Product-Assurance:	Date:	Time
Retral	Jelkers	P. Jasul	J-5-2001	4:49

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Date: 24.04.2008

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Herschel

Step- No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	Р	N
4	Z010999MCVT003_IST_START Reply to the prompt: "SPACECRAFT POWER_ON" ⇒ Click the button "Confirm" to proceed					V	
	Z010999MCVT001_POWER_ON_HER_IST Set Battery Set TCDecoder to Set PM_SW	To Check in Config. Table (Page 73)		SAS + sim A A1	(24 4)	V V V	
5	Do you want to continue with the upper configuration: If these parameter values are in accordance with the IST Configuration Table (Page 73),	Bat.SCOE TCDec. PM/SW				\	

Test location:	Operator	Product-Assurance:	Date:	Time
	1.1	1 Todast Alocaranoc:	Date.	Time
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124150	1000-7	7. 12.00	CX 0-8-2	001 9 . 3 /

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Herschel

Step- No.	IST_START-Step-Description	ı	lominal Value	Tolerance	Actual Value	Remarks	Р	N
	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	5					a 🗸	
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					N/A for "Launch Clean Run" as the cables for CDMU BUS monitor are disconnected	V	

Test location:	Operator			
rest location.	Operator	Product-Assurance:	Date:	Time
ESTEC	Koll	The fascotho	8/5/08	5:10

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Herschel

Step- No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	Р	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					V	
0	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						
	Z010999MCVT001_POWER_ON_HER_IST				NCR 3492 : TTRMMemCorEr_A		
when BCR	Temporary workaround until SPR-107 / NCR-3312 are solved ⇔ click the button "YES" to proceed the workaround				1 := 0 SPR 244 : OutOfLimit for SA_Pan?_Temp_N/R (WMB0?569) SPR 284 : WARNING about missing TC		
OCP are detected ACTIVE		YES			SPR 285 : many TCs not acknowleged For launch clean run with real Battery fully charged, parameters BCR1, BCR2 are expected active.	1	

Test location:

ESTEC

Operator

Product-Assurance:

Date:

Time

5:15

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Herschel

	Step-No.	IST_START-Step-Description		Nominal Value	Tolerance	Actual Value	Remarks	Р	N	
	D1021599	SCVT032TIMESYNCRO					TM parameter ZE00999 out of limits			1
10	1	he synchronization between CDMS On-board Time	and				and back in limits again at	/		
	CCS is finis						synchronisation to be expected.			
		ck the button "End TS!" to proceed								
1.1	Z010999N	MCVT001_POWER_ON_HER_IST						. /		
11	⇒ Clie	ck the button "End TS!" to proceed								5
		SCVT001_GET_ALARM_STATUS								-
	Check that	both DOD ext1 and ext2 are "Not Asserted".								
12	Otherwise	execute Annex D – Operator Note 8						/		
	⇒ Clie	ck the button "End TS!" to proceed								
	Z010999N	MCVT003_IST_START							***************************************	
	Reply to the	e prompt:		To Check in						
		"CDMS Configuration:"		Config. Table						
13		"CROME settings PM22222"		(Page 73)		PMA nomi	ral	V		
	If the CRO	ME settings is in accordance with the CROME		CROME						
	1	of IST Configuration Table (Page73),		PAP/CCS						
	⇒ Clie	ck the button "Confirm" to proceed								
	looation:]

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Herschel

Step-No.	IST_START-Step-Description		Nominal Value	Tolerance	Actual Value	Remarks	Р	N
14	D102159SCVT176_WRITE_CROME						./	
14	⇒ Click the button "End TS!" to proceed						V	
	Z010999MCVT003_IST_START		To Check in			Please note that the TMrate Medium (150 Kbps) is not		
	Reply to the prompt: "CDMS Configuration:" "Set configuration"		Config. Table (Page 73) BUS		A	specified in IST Config. Table on page 73.		
15	"Bus PCDU HPS TxChain RFDN "TM-OBT TMrate Medium (150Kbps		PCDU HPS		A		V	
	If all these parameter value are in accordance with the I Configuration Table (Page 73),	ST	TxCh. RFDN TM-Obt		A 143 A			
	⇒ Click the button "Confirm" to proceed		(Th rate		Tedium)			
10	D102159SCVT104_ENCODER_SELECT					SPR 286: TM check needs		
Only if Encoder B is req.	⇒ Click the button "End TS!" to proceed					repeat	VA .	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	Cole	B. Vosable	815108	5:53

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Herschel

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	Р	N
	D102159SCVT174_IST_REDUNDANT_CONF						
17	⇒ Click the button "End TS!" to proceed					V	
140	Z010999MCVT003_IST_START						
18	Reply to the prompt: "SSMM Configuration"	To Check in Config. Table (Page 73) SSMM		A0+B9		/	
	⇔ Click the button "Confirm" to proceed					/	
19	Z010999MCVT005_IST_START_SSMM Start initialising with Steps 1-2 of IST START SSMM Procedure (see Page 96). Then continue with the next tes step of IST_START.				In Launch cases, IST_START_SSMM shall be completely performed before next step 250 for Enc. 2	V	
	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).	5					

Test location:	Operator	Produc	t-Assurance:	Date:	Time
ESTEC	lole		h. Versen le	812108	2:30

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Herschel

Step-No.	IST_START-Step-Description	n	Nominal Value	Tolerance	Actual Value	Remarks	Р	N
20	Z010999MCVT003_IST_START Reply to the prompt: "SWITCH ON CCU "START MONITORING	in MODE ?	To Check in Config. Table (Page 73) CCU On Mode		A 2 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	V	

Test location:	Operator	P	Product-Assurance:	Date:	Time
ESTEC	löll		Ph. Varole	8/5/08	06:07

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Herschel

Step-No.	IST_START-Step-Description		Nominal Value	Tolerance	Actual Value	Remarks	Р	N
	Z010999MCVT003_IST_START Reply to the prompt: "Record CCU Temp In Backgrour Click the button "Confirm" to proceed	d"				Minimise Log file after starting	V	
applicable only in launch (IST	Z010999MCVT003_IST_START Reply to the prompt: "STATUS SPACECRAFT and EGSE (Power	Í				NA		

Test location:	Operator	1	Product-Assurance:	Date:	Time /
ESTEC	1-01	las		801318	6 : W

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Date: 24.04.2008

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Herschel

Step-No.	IST_START-Step-Description		Nominal Value	Tolerance	Actual Value	Remarks	Р	N
23	Z010999MCVT1533_IST_STATUS							
applicable only in	Check the Satellite status displayed and							
launch (IST spec. 5.8.2	⇒ Click the button "OK" to proceed					NA		
5.8.10								
5.8.11)								
	Z010999MCVT003_IST_START							
	Reply to the prompt:							
24	ACMS SCOE Configuration – ACMS Power	ON					\checkmark	
27	⇒ Click the button "Confirm" to proceed							
	Execute ACMS CONFIG procedure (Page 100) in para the IST_START master	llel to						

Test location:	Operator	Product-Assurance:	Date:	Time /
Estrc	Lellry		8-5-200)	6:18

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Herschel

Step-No.	IST_START-Step-Description		Nominal Value	Tolerance	Actual Value	Remarks	Р	N
	Z010999MCVT003_IST_START							
25	Reply to the prompt: "SET TCT Table for Ambient Tempera	ture"					V	
	⇔ Click the button "Confirm" to proceed							
26	D102159SCVT032EnNomTCSLoops ⇒ Click the button "End TS!" to proceed						V	
	D102159SCVT115_CHECK_HCS_OFF							
27	⇒ Click the button "End TS!" to proceed						V	
	Z010999MCVT003_IST_START						-	
28	Reply to the prompt: "EAT UPLOADING"						<i>\'</i>	
	⇒ Click the button "Confirm" to proceed"							

Test location: Product-Assurance: Date: Time 815/08 6:33						
	Test location:	ESTEC	Operator	Product-Assurance:	Date: 8/5/09	Time 6:33

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Step-No.	IST_START-Step-Description		Nominal Value	Tolerance	Actual Value	Remarks	Р	N
	D102159SCVT192_GET_EAT_REPORT							
29	Check that every initial entries of the Event Action Tab successfully checked	le are					/	
	⇔ Click the button "End TS!" to proceed							
	D102159SCVT192_GET_EAT_REPORT							
30	Check that every initial entries of the Event Action Tab correctly set	le are					1	
	⇒ Click the button "End TS!" to proceed							
	D102159SCVT192_IST_UPLOAD_EAT							
31	⇔ Click the button "End TS!" to proceed						1	
	Z010999MCVT003_IST_START							
32	Ckeck that ACC is running on TM Packet history with on APID 512 (set on Step 1 of ACMS Configuent Procedure 7.2.4.2 Page 100) and checking pareception.	ration					V	

Test location:	Operator	Product-Assurance:	Date:	Time ,
	a position	1 Toddot 7 toddianoc.	Date.	Tille /
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72 7	78.		(9)	

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Issue: Date: 4.0 24.04.2008

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Herschel

Step-No.	IST_START-Step-Description		Nominal Value	Tolerance	Actual Value	Remarks	Р	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 TCs send in parallel Reply to the prompt: "CDMS CONFIGURATION:" "SURVIVAL REGISTER SETTING "(Bus , PCDU , RFDN , TxCha TTR , Sep Strap)" □ Click the button "Confirm" to proceed	or "	To Check in Config. Table (Page 73) Bus PCDU RFDN TxCh. TTR Sep Strap				V	
34	D102159SCVT175_SET_SURV_REG					SPR 289 No TM return for TM check	V	
35 (only in launch test cases	Z010999MCVT003_IST_START Prompt: "Check CDMS Tables"					NA	A.	

Test location:	Operator	 Product-Assurance:	Date:	Time
ESTEC	Koly	M. Vascoll	812108	6:44

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Issue:

Date: 24.04.2008

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Herschel

Step-No.	IST_START-Step-Description		Nominal Value	Tolerance	Actual Value	Remarks	Р	N
36 (only in launch test cases	D102159SCVT219_GET_BSW_HEALTH_UIU					NA		
37 (only in launch test cases)	D102159SCVT204_GET_MOT					a V		
38 (only in launch test cases)	D102159SCVT192_GET_EAT_REPORT Check that every uploaded entries of the Event Action are correctly set ⇒ Click the button "End TS!" to proceed	Table				iv n		
39 (only in launch test cases)	D102159SCVT205_SAT_COM_TCT					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
Tool location.	Operator	1 Toddot-Assurance.	Date.	Time
TSTEC	light	Dr. Vascoly	815/08	6:44

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Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	Р	N
40	D102159SCVT207_SAT_COM_FCCT						
(only in launch test cases)	⇒ Click the button "End TS!" to proceed				WA		
	Z010999MCVT003_IST_START						
41	Reply to the prompt: "DOWNLINK SSMM PACKET STORE and CEL A&B"					√	
	⇔ Click the button "Confirm" to proceed						
	D102159SCVT188_IST_DUMP_PKT_STORE				With parameters: 0 80 1 81 2 82 3 83		
42	⇒ Click the button " End TS!" to proceed				of SPR 509 & 510	V	
	D102159SCVT188_IST_DUMP_PKT_STORE		-		With parameters: CEL_A CEL_B		
43	⇒ Click the button " End TS!" to proceed				All events, warnings and alarms recorded before the dump, are re-occuring during this step	V	

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	Kolla	M. Vascela	812(08	6:45

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Herschel

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	Р	N
	Z010999MCVT003_IST_START					. /	
44	⇔ Click the button "End TS!" to proceed						

Test location:	Operator	Product-Assurance:	Date:	Time	
BSTEC	fellen	In Vascola	6	-t-200d 6:54	

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Herschel

7.2.4.1 IST_START_SSMM Procedure

Step- No.	IST_START_SSMM-Step-Description	Nominal Value	Tolerance	Actual Value		Р	N
	Z010999MCVT005_IST_START_SSMM	To Check in					
1	Reply to the prompt: "SSMM CONFIGURATION" ""	Config. Table (Page 73)				V	
	⇔ Click the button "Confirm" to proceed	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					/	,

Test location:	Operator	Product-Assurance:	Date:	Time
BSTRC	Jeffra	R. Vascols	A-5-2000	5:12

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Herschel

Step-No.	IST_START_SSMM-Step-Description	Nominal Value	Tolerance	Actual Value		Р	N
	Z010999MCVT005_IST_START_SSMM				occurrence of 2 BSW problems EvtID 30738	1	
	Reply to the prompt: "OBCP UPLOADING"				v		
4	⇒ Click the button "Confirm" to proceed					V	
	Let run in parallel the sequence D102159SCVT193_IST_UPLOAD_OBCP						
	and continue with next step "Packet Store Definition"						
	Z010999MCVT005_IST_START_SSMM			***************************************			
5	Reply to the prompt: "Definition of the Packet Store" ⇒ Click the button "Confirm" to proceed					V	
)	If only 1 Bank (bank 0, 1, 2 or 3) is initialised on each S\$MM D102159SCVT185_IST_PACKET_STORE_DEF						
	If 3 banks (banks 0, 1 and 2) are initialised on each SSMM D102159SCVT189_IST_PACKET_STORE_DEF2						
6	If SSMM A banks 0, 1 and 2 and only SSMM B bank 0 are initialised D102159SCVT178_RMS_PKT_STORE_DEF					V	
	When the requested SSMM bank are initialised						
	⇔ Click the button "Yes" to proceed						

Test location:	Operator	Product-Assurance:	Date:	Time
BSTRC)e//res	M. Varall	J-5-2008	- 5 : eg

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IST_START_SSMM-Step-Description		Nominal Value	Tolerance	Actual Value		Р	N
If 3 banks are initialised on SSMM A & B D102159SCVT189_IST_PACKET_STORE_D If 3 banks on SSMM A and only 1 on SSMM B are initial	DEF2				NCR-3492 occurs: (TTRRMMemCorEr_ A 2 := 1)!	V	
⇔ Click the button "End TS!" to proceed							
Z010999MCVT005_IST_START_SSMM Reply to the prompt: "Initialise MTL Service B	uffers"					i	
D102159SCVT209_START_ON_BOARD_SO	HEDULE				SPR 282 TM failure: too quick check	V	
D102159SCVT193_IST_UPLOAD_OBCP							
⇔ Click the button "End TS!" to proceed						V	
	If only 1 Bank is initialised on SSMM A & B D102159SCVT185_IST_PACKET_STORE_D If 3 banks are initialised on SSMM A & B D102159SCVT189_IST_PACKET_STORE_D If 3 banks on SSMM A and only 1 on SSMM B are initia D102159SCVT178_RMS_PKT_STORE_DEF □ Click the button "End TS!" to proceed Z010999MCVT005_IST_START_SSMM Reply to the prompt: "Initialise MTL Service B □ Click the button "Confirm" to proceed D102159SCVT209_START_ON_BOARD_SO □ Click the button "End TS!" to proceed D102159SCVT193_IST_UPLOAD_OBCP	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 Z010999MCVT005_IST_START_SSMM Reply to the prompt: "Initialise MTL Service Buffers" □ Click the button "Confirm" to proceed D102159SCVT209_START_ON_BOARD_SCHEDULE □ Click the button "End TS!" to proceed D102159SCVT193_IST_UPLOAD_OBCP	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 Z010999MCVT005_IST_START_SSMM Reply to the prompt: "Initialise MTL Service Buffers" ➡ Click the button "Confirm" to proceed D102159SCVT209_START_ON_BOARD_SCHEDULE ➡ Click the button "End TS!" to proceed D102159SCVT193_IST_UPLOAD_OBCP	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 Z010999MCVT005_IST_START_SSMM Reply to the prompt: "Initialise MTL Service Buffers" □ Click the button "Confirm" to proceed D102159SCVT209_START_ON_BOARD_SCHEDULE □ Click the button "End TS!" to proceed	IST_START_SSMM-Step-Description IST_START_SSMM-Step-Description	IST_START_SSMM-Step-Description 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 Z010999MCVT005_IST_START_SSMM Reply to the prompt: "Initialise MTL Service Buffers" □ Click the button "Confirm" to proceed D102159SCVT209_START_ON_BOARD_SCHEDULE □ Click the button "End TS!" to proceed D102159SCVT193_IST_UPLOAD_OBCP	IsT_START_SSMM-Step-Description Same Same Same Same Value Value Value Value Value Value Value Value Part Value Part Value Value Part
Test location:	Operator	Product-Assurance:	Date: Time				
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Step-No.	IST_START_SSMM-Step-Description	Nominal Value	Tolerance	Actual Value	٠ .	Р	N
	Z010999MCVT005_IST_START_SSMM						
11	⇔ Click the button "End TS!" to proceed					V	

Test location:	Operator	Product-Assurance:	Date:	Λ n	Time / . 0
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7.2.4.2 ACMS Configuration Procedure

Step- No.	ACMS_CONFIG-Step-Description		Nominal Value	Tolerance	Actual Value		Р	N	
1	Open the ACMS_H_BLOC MIM Display to verify the status updating. Configure a "Telemetry Packet History" window set w APID = 512						V		
2	A102109SPVT003_ACMS_CONFIG25 At the prompt "Enter your choice", insert to select "Select/Load ACMS_CONFIG Input File" ⇒ Click the button "OK" to proceed	"1"	1		1 (= 15T.E	ne) IST_EMC	V	<	1
3	A102109SPVT003_ACMS_CONFIG25 ⇒ Click the button "Continue" to proceed						V		
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				V		

Test location:	Operator	Product-Assurance:	Date:	Time
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A102109SPVT003_ACMS_CONFIG25 N/A for "Launch Clean Run" A102109SPVT003_ACMS_CONFIG25 N/A for "Launch Clean Run" A102109SPVT003_ACMS_CONFIG25 N/A for "Launch Clean Run" A102109SPVT003_ACMS_CONFIG25 Verify on AND YA001939 AMCS/SCOE - AS_PSEUDO 1 of 1 N/A for "Launch Clean Run" A102109SPVT003_ACMS_CONFIG25 Verify on AND YA001939 AMCS/SCOE - AS_PSEUDO 1 of 1 N/A for "Launch Clean YMACT939 (ACMS SCOE state) YMACT939 (ACMS SCOE state) YMASE939 (Simulator stata) YMASE939 (MILFE state) YMAUS939 (UIFE state) YMAUS939 (UIFE state) YMAUS939 (UIFE state)	Step- No.	ACMS_CONFIG-Step-Descrip	tion	Nominal Value	Tolerance	Actual Value		Р	N
N/A for "Launch Clean Run" A102109SPVT003_ACMS_CONFIG25 // Verify on AND YA001939 AMCS SCOE - AS PSEUDO 1 of 1 N/A the parameters for "Launch Clean Run" YMACT939 (ACMS SCOE state) YMASE939 (Simulator stata) YMAMS939 (MILFE state) Alarms are expected for TM with APID 2018 and EVID 4 when the parameters on the left have not reached the executing stage yet.	N/A for "Launch Clean	At the prompt "Enter your choice", insert to select "ACMS SCOE Configuration"	"6"	6			SKIP		
Verify on AND YA001939 AMCS/SCOE - AS_PSEUDO 1 of 1 N/A the parameters for "Launch Clean Run" YMACT939 (ACMS SCOE state) YMASE939 (Simulator stata) YMAMS939 (MILFE state) for TM with APID 2018 and EVID 4 when the parameters on the left have not reached the executing stage yet.	N/A for "Launch Clean		1	7/		1/1	SKIP		
	N/A for "Launch Clean Run"	Verify on AND YA001939 AMCS SCOE - AS P the parameters YMACT939 (ACMS SCOE state) YMASE939 (Simulator stata) YMAMS939 (MILFE state)	SEUDO 1 of 1	executing executing executing		SKIP	for TM with APID 2018 and EVID 4 when the parameters on the left have not reached the executing		

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Step- No.	ACMS_CONFIG-Step-Description	n	Nominal Value	Tolerance	Actual Value		Р	N
	A102109SPVT003_ACMS_CONFIG25							
	At the prompt "Enter your choice", insert to select "ACMS Power ON (in Pre-Sep configu	"4"	4				1/	
Ü	⇒ click the button "OK" to proceed	iation	4					
	A102109SPVT003_ACMS_CONFIG25							
9							V	
	A102109SPVT011_ACMS_ON				***************************************	Expected Out of Limit of		
						AEYYY109 (synchronisation)		
	During this sequence, following events are expected	d:				ACC may become INVALID		
	- TM(5,4) Event Report and Reconfiguration Lo	g				for a short time		
	- TM(5,2) APID:2018 (ACMS_SCOE) indicates	ACMS						
10	"TestDataWord" needs to be switched ON. A	few				SPR 245 NCR 2862: Out of	1	1
	seconds later when the corresponding TC is s	ent, this				Limit of HKA_ANTH?_Data		
	TM(5,2) must disappear.							
	- Multiple other events TM(5,1), such as "Fdir T	ask				SPR 334 OutOfLimit of		
	Overrun" or "Fdir Rm Parity Error"	×				Gyro Calib Curve in LCR		
DET	TR STEP 10 HAS COMPLETED	SKIPE	TORT	HER A	me e	TEPS IN THE		-

C 4 - A1 P	- 101 1	J 11113 CO. (. DC (CT	>/\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	11000000	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Test location:		Operator	Product-Assurance:	Date:	Time
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Step- No.	ACMS_CONFIG-Step-Description	n	Nominal Value	Tolerance	Actual Value		Р	N
	A102109SPVT003_ACMS_CONFIG25							
11	At the prompt "Enter your choice", Insert to select "Modify ACC SGM/RM content"	"5"	5					
	⇔ Click the button "OK" to proceed							
	A102109SPVT003_ACMS_CONFIG25							
12	⇒ Click the button "Continue" to proceed							
	A102109SPVT003_ACMS_CONFIG25					Expected Out of Limit of		
13	At the prompt "Enter your choice", Insert for "Default configuration for separation"	"20"	20			AEYYY109 (synchronisation) ACC may become INVALID for a short time		
	⇔ Click the button "OK" to proceed					TC PM_Reset (ACY42109)		
	A102109SPVT003_ACMS_CONFIG25					not acknowledge expected		
14	⇒ Click the button "Continue" to proceed							
L			L					

Test location:	Operator	Product-Assurance:	Date:	Time
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Step- No.	ACMS_CONFIG-Step-Description	n	Nominal Value	Tolerance	Actual Value	Р	N
	A102109SPVT003_ACMS_CONFIG25						
15	After about 10 min verify that ACMS Sequences a terminated and ACMS CONFIG MAIN MENU 1.0 i	1					
	A102109SPVT003_ACMS_CONFIG25						
16	At the prompt "Enter your choice", Insert to select "Return to Main Menu 1.0"	"99"	99				
	⇒ Click the button "OK" to proceed						
	A102109SPVT003_ACMS_CONFIG25						
17	⇔ Click the button "Continue" to proceed						

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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.

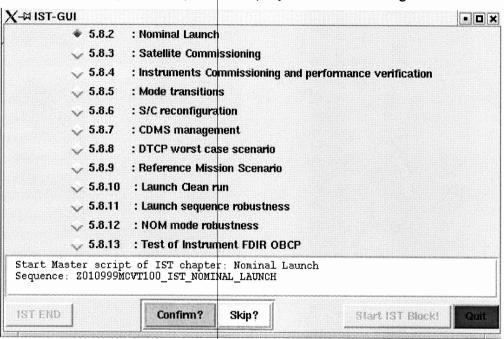


Figure 1: IST_GUI calling Master sequence, for instance "Nominal Launch"

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Test locatio	on:	Operator		Product-Assurance:	Date:	Time	
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Doc. No: Issue: Date:	HP-2-ASED-TP-0134 4.0 24.04.2008	File: HP-2-ASED-TP-0134_Herschel_IST_Leading_	Procedurei:	ss_4_0_24-		Page	105



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Page

Important Note: After execution of the least described in chapter 7.4.	ST Test Case, S/C h	has to be switched off wit	h the	e "IST END" procedu	ire as
Herschel IST Test Case 'Launch Phase	e, Separation and Po	ost Separation':	H	HP-2-ASED-TP-018	5
Herschel IST Test Case 'Satellite Com	missioning':		H	HP-2-ASED-TP-0186	3
Herschel IST Test Case 'ACMS Comm	issioning':		H	HP-2-ASED-TP-018	7
Herschel IST Test Case 'Instruments C	ommissioning and F	Performance Verification':	H	HP-2-ASED-TP-018	8
Herschel IST Test Case 'Mode Transiti	ons':		H	HP-2-ASED-TP-018	9
Herschel IST Test Case 'S/C Reconfig	uration':		H	HP-2-ASED-TP-019	0
Herschel IST Test Case 'CDMS Manag	gement':		H	HP-2-ASED-TP-019	1
Herschel IST Test Case 'DTCP Worst	Case Scenario':		F	HP-2-ASED-TP-0192	2
Herschel IST Test Case 'REFERENCE	Mission Scenario':		H	HP-2-ASED-TP-019	3
Herschel IST Test Case 'Launch Clear	Run':		H	HP-2-ASED-TP-019	4
Herschel IST Test Case 'Launch Sequ	ence Robustness'		F	HP-2-ASED-TP-019	5
Herschel IST Test Case 'NOM Mode R	obustness':		H	HP-2-ASED-TP-0196	6
Herschel IST Test Case 'Test of Instru	ment FDIR OBCP'		H	HP-2-ASED-TP-019	7
Highlight the TEST Case to be perform	ed in the above				
Test location:	Operator	Product-Assurance:	- Nove - Managemen	Date:	Time :
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7.4 IST END Procedure

Step- No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value	Р	N
	IST_GUI					
1.	 ⇔ Click the button "OK" and then ⇔ Click the button "IST_END" to proceed 					
	D102159SCVT188_IST_DUMP_PKT_STORE					
2.	⇔ Click the button "Confirm" to proceed					
	D102159SCVT188_IST_DUMP_PKT_STORE					
3.	⇔ Click the button " End TS!" to proceed					

Test location:	Operator	Product-Assurance:	Date:	Time
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Step- No.	IST_END-Step-Description		Nominal Value	Tolerance	Actual Value	Р	N
	Z010999MCVT004_IST_END						
4. Only if PACS, SPIRE or HIFI is still ON	If one of the instruments is detected "ON" reply to the pro "Should the sequence" Z102999SCVT011_ASDGEN_PACSPWROFF_P Z102999SCVT005_ASDGEN_SPIREPWROFF_P Z102999SCVT015_ASDGEN_HIFIPWROFF_P "be called?"						
	⇔ Click the button "YES" to proceed						
	Z010999MCVT004_IST_END						
Only if	If CCU is detected "ON" reply to the prompt: Should the sequence "K102999ECVT001_ASDGENCCU_ABPWROFF be call	ed					
	⇔ Click the button "YES" to proceed						

Test location:	Operator	 Product-Assurance:	Date:	Time
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Step- No.	IST_END-Step-Description		Nominal Value	Tolerance	Actual Value		Р	N
6.	Z010999MCVT004_IST_END							
Only if RWL ON and ACMS is still in SCM	"Please ensure that ACMS is set in OCM mode, otherwiselect the correct menu in the ACMS_CONFIG25" Perform chapter 7.4.1 then click OK	se						
7.	Z010999MCVT004_IST_END					Out of Limits concerning		
Only if RWL are	Start the sequence A102109SPVT061_RWL_SPINDOW	N?				RWL speed are expected during RWL spin down		
still spinning	⇔ Click the button "YES" to proceed							
1	Z010999MCVT004_IST_END							
8. Only if ACMS is still ON	Start the sequence A102109SPVT012_ACMS_OFF? ⇒ Click the button "YES" to proceed							

Test location:	Operator	Product-Assurance:	Date:	Time
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Step- No.	IST_END-Step-Description		Nominal Value	Tolerance	Actual Value		Р	N
	Multiple "New Tm 251001939 _"							
	Multiple "New Tm 251002939" This sequence needs time to be completely run, so let parallel with the following steps. 74020005CVT002_SPEM_OFF.	run in						
10. Only if SREM is still ON	Z102999SCVT002_SREM_OFF					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 Operator		Product-Assura	nce:	Date:	Time	;	

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Step- No.	IST_END-Step-Description		Nominal Value	Tolerance	Actual Value	Р	N
Only if Survival	"separated". It must be set to "not separated" to avoid reconfiguration during power off"	_	i				
13. Only if Survival Register set with	⇒ Click the button "End TS!" to proceed						
separated flag							

Test location:	Operator	***************************************	Product-Assurance:	Date:	Time	
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Step- No.	IST_END-Step-Description	ı	Nominal Value	Tolerance	Actual Value	Р	N
	Z010999MCVT004_IST_END						
14.	Reply to the prompt						
Only if	"The CROME registers are not configured "						
CROME	"in PMA or PMB nominal "						
wrongly	"Such configuration will block TM during Power OFF	,					
set							
	⇔ Click the button "YES" to proceed						
15.	D102159SCVT176_WRITE_CROME						
Only if							
CROME							
wrongly	⇔ Click the button "End TS!" to proceed						
set							
16.	D102159SCVT188_IST_DUMP_PKT_STORE						
Only if							
SSMM is	⇔ Click the button "End TS!" to proceed						
ON							
1	D102159SCVT181_Disable_PKT_STORE						
Only if							
SSMM is	⇔ Click the button "End TS!" to proceed						
ON							

Test location:	Operator	Product-Assurance:	Date:	Time	
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Step- No.	IST_END-Step-Description		Nominal Value	Tolerance	Actual Value	Р	N
18. Only if SSMM is ON		error					
19. Not for Launch	D102159SCVT001PM_SELECT						
20.	Z010999MCVT002_POWER_OFF_HER_IST ⇒ Click the button "End TS!" to proceed						

Test location:	Operator	Product-Assurance:	Date:	Time
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Step- No.	IST_END-Step-Description		Nominal Value	Tolerance	Actual Value	Р	N
21	Y102989ETVT020_TTC_SCOE_OFF						
Only if							
TTC-							
SCOE is	⇔ Click the button "End TS!" to proceed						
still ON							
	Z010999MCVT004_IST_END						
21.	⇔ Click the button "End TS!" to proceed						
	IST_GUI						
22.	⇔ Click the button "Quit" to terminate the test seque	ence					
	Update CVS Tag						
22	Open a shell (xterm) Execute the command update_tag						
1	Insert the name of TAG → IST_x_PART_x_TP_xxxxx_x_x_END_xxx						

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Ì	Test location:	Operator	Product-Assurance:	Date:	Time	
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7.4.1 ACMS SCM to OCM transition for power off

Step- No.	IST_END-Step-De	scription		Nominal Value	Tolerance	Actual Value		Р	N
24.	A102109SPVT003_ACMS_CONI At the prompt "Enter your choice", insto select "Transition SCM to OCM"	sert "2"	"	2					
25.	A102109SPVT003_ACMS_CONI At the prompt Menu 7 "Enter your che to select "Reaction wheels spin dov Click the button "OK" to proceed, the	oice", insert "5" wn"		5					
26.	A102109SPVT003_ACMS_CONI At the prompt Menu 9 "Enter your che to select "Switch off ACMS" Click the button "OK" to proceed, the	oice", insert "1"		1					
est location	n: C	Operator		Product-Assuran	ce:	Date:	Time	:	

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Step- No.	IST_END-Step-Description		Nominal Value	Tolerance	Actual Value	Р	N
27.	A102109SPVT012_ACMS_OFF During this sequence, following event are expected to oc TM(5,4) Evtld:16426 Mode SBSM Entry Event Report - Boot Report and Reconfiguration Event Report - SDB Unhealthy TM(5,2) EvtlD: 33 Event Report - ACB Rx Failed TM(5,2) EvtlD: 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", et	Log					
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 con in parallel with the next step.		99				

Test location:	Operator	Product-Assurance:	Date:	Time
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Step- No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value	Р	N
	A102109SPVT017_ACMS_CRS_BACKGROUND					
29.						
	⇒ Terminate the sequence.					

Test location:	Operator	Product-Assurance:	Date:	Time
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Summary Sheets

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8.1 Procedure Variation Summary

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

Table 8.1-1: Procedure Variation Sheet

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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.
		able 8 2-2: NCR/SPR Re			***************************************

Table 8.2-2: NCR/SPR Record Sheet

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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	FLM.

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Annex B: Script Hierarchy

```
>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
```

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```
|----| 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
> $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
```

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|-----| Z010999MMXX003UNITS_CHECK_PWR_OFF |----> Z010999MMXX003UNITS_CHECK_PWR_OFF

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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	

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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.

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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

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Operation Note 11

Title: Failure in TM Check of CCU Valves	Date: 14/02/08
Observation:	
If CCU Valves sensing lines are connected to CRY of CCU the valves status check fails at CCU Power	
Operator Action:	
 On Test conductor Console, perform "connect PFM_CRYO" Thanks Telemetry Query Display (TQD) check following TM - YM648958 (VLV_STATUS_V103) instead of KM269302 - YM649958 (VLV_STATUS_V106) instead of KM269303 - YM640958 (VLV_STATUS_V501) instead of KM270302 - YM641958 (VLV_STATUS_V503) instead of KM270303 - YM643 958 (VLV_STATUS_V505) instead of KM271303 On Test conductor Console, perform "disconnect PFM_CRYO" 	Is = "CLOSED" = "CLOSED" = "CLOSED" = "CLOSED" 3 = "OPEN"

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END OF DOCUMENT

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SWITCH ON SC FOR EMC AFRER NOR 4207 09/05/08

SWITCH OFF SC AFTER EMC 10/05/08

Herschel Integrated Satellite Test

Herschel

Procedure: Leading Procedure

AS RUN LEADING PROCEDURE FOR EMC/AUTOCOMP

Title:

Leading Procedure for Herschel Integrated Satellite Test

Sta May to 10th May

CI-No:

Prepared by:	Functional Team	Date:	
Checked by:	C. Much	1 25/4/2008	
Product Assurance:	J. Hall	25/4/2008.	
Configuration Control:	W. Wietbrock		
TASF Engineering	G. Beaufils Do Esclu	25 APR 08	
TASF Test Director	S. Mooney	25/4/2008.	
Project Management:	Dr. W. Fricke Agree 45 No.	MANDATORY SIGNATURE	15.
	FOR SMET OF TEST + 11	1 1 miles Charles	
Project Management	Denis Montet	28/4/08	29104108

Distribution:

See Distribution List (last page)

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PROCEDULE USED AFTER SAFETY LOOP TRECEPTED SWITCH ON FOR FORMAL RUN OF HIFI RE TEST AND AUTOCOMP. INCLUDES SWITCH OFF OF SC AFTER EMC.

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of: 129

Date:

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Change Record:

	Issue	Date	Sheet	Description of Change	Release	
	1	11.01.2008		Initial version	1	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,		
	2.0	11.03.2008		Update Hierarchy Script 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		
1989				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		

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Herschel Integrated Satellite Test Procedure

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			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	
			amon b dad oporator rioto ri	
			Rename Chapter 7 as IST Test	
			Create new subchapters	
			7.1 HPCCS configuration for IST Test	
			7.1.1 Apply Tag on test files	
			The state of the s	
	3	17.04.08	Update IST START procedure according to the AS RUN procedure	
'	'	17.07.00	for Nominal Mode Robstness (minor changes),	
			io Nomina Mode Nobsuless (minor changes),	
			4.3.1 & 4.3.2 to include SCOE Sk01J04 and to correct hou	
'	'		connector ident Typo's	
			The state of the 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	
	1			
	4	24.04.08	Update IST START procedure according to the AS RUN procedure	
			for minor updates,	
			19. Timor apactos,	
			Include step 21 in Section 7.2.4 - start a CCU log file to monitor	
			temperature TLM's	
			Somporatary reward	

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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.



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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.

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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



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2 Documents

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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

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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.I.	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

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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	



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3 Requirements to be verified

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

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4 Configuration

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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	Remarks
			equipments	
		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	1	Battery Simulation for other tests
		Installed. Only		
		connected for Launch		
		clean run		
	Solar Array	30 nom sections	1	Power SCOE
		not required for IST		
CDMS	СОМИ	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)		

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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

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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:



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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

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4.3.1 SCOE cable connection for "RMS"

	SCOE CA	BLES CONNECT	FION to HERSC	HEL S/C	
SKIN-01	PWR Panel (PCDU)				
on the second second second	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	BS Nom Power	SK01BJ09	PCDU		PCDU Flight Plug SK01BP09 Plugge
	BS Red Power	SK01BJ10	PCDU		PCDU Flight Plug SK01BP09 Plugge
	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	
				POWER SCOE	
	SA Nom Power	SK01AJ03	PCDU	Cable Plugged Connector	
	SA Red Power	SK01AJ04	PCDU	Cover POWER SCOE	
	SA Red Power	SK01AJ05	PCDU	POWER SCOE	
	SA Red Power	SK01AJ06	PCDU	Cable Plugged POWER SCOE	
SKIN-02	SA Red Power PWR Panel (ACC, CDMU, RCS, 15	SK01AJ07	PCDU	Cable Plugged	
/////-V2	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-02	DMS 1553 Bus_A	J01	CDMU	Bus Monitor Cable Plugged	Tigit, comode
SKIN-02	DMS 1553 Bus_B	J02	CDMU	Bus Monitor Cable Plugged	energia de la composition della
				ACMS SCOE	
SKIN-02	ACMS 1553 Bus_A	J03	ACC	ACMS SCOE	
SKIN-02	ACMS 1553 Bus_B	J04	ACC	Cable Plugged ACMS SCOE	
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	Cable Plugged ACMS SCOE	
SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	Cable Plugged	

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1		1		ACMS SCOE	1
SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH	Cable Plugged	
				ACMS SCOE	
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS	Cable Plugged	
	CDMU and ACC EEPROM				Flight Cap
SKIN-02	reprogramming input	J09	ACC/CDMU		SK02P09 Plugge
-	CDMU and ACC EEPROM				Flight Cap
SKIN-02	reprogramming input	J10	ACC/CDMU		SK02P10 Plugge
				ACMS SCOE	0.000.000.000
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS	Cable Plugged	
		 		ACMS SCOE	
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	Cable Plugged	
51 52	Till de die Colonia d	1 0,2	1710070311	ACMS SCOE	<u> </u>
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH	Cable Plugged	
SIXIIV-02	Thiuster O/D Heaters N	313	ACC/CBH	Cable Flugged	ACMO FUELLO
SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR 1		ACMS Flight Cap
JANIN-02	Sti 1/2 On/On Cind M/Sti 1 Sts	314	ACC/STR-1	 	SK02P14 Plugger
CKINI OO	D4-1/2 O-1/04 O-1-1 D104-2 D4-	145	ACC/CTD O		ACMS Flight Cap
SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		SK02P15 Plugge
					ACMS Flight Ca
SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		SK02P16 Plugge
					ACMS Flight Ca
SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2	1	SK02P17 Plugge
SKIN-03	TTC Panel			7	
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-03	Test point TC + protection				Plastic cap
	jumper EPC1	SK03J01	XPND1/EPC1		(See note1)
SKIN-03	Test point TC + protection				Plastic cap
	jumper EPC2	SK03J02	XPND2/EPC2		(See note1)
	RF LINK				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
				RF SCOE	LGA1 Anechoic
	RF link for antenna LGA1	N/A	LGA1	LGA1 Plugged	Cap
			1	RF SCOE	LGA2 Anechoic
	RF link for antenna LGA2	N/A	LGA2	LGA2 Plugged	Cap
				RF SCOE	
	RF link for antenna MGA	N/A	MGA	MGA Plugged	MGA Anechoic Ca
SKIN-04	ACMS Panel (RWE)		1		L
31111-04	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Eliaht Connector
CKIN 04	CONTROLOT FUNCTION	OVIII COULIECTOL	O/G UIII	OCCE CABLE	Flight Connector
SKIN-04	D)M/ 1 Cap	104	ACC/DW/ 4		ACMS Flight Cap
DIGITI C.	RWL1 Sgn	J01	ACC/RWL-1		SK04P01 Plugger
SKIN-04					ACMS Flight Cap
OKIII O4					CIVATOO DIVIDAN
	RWL2 Sgn	J02	ACC/RWL-2		
SKIN-04	RWL2 Sgn RWL3 Sgn	J02 J03	ACC/RWL-2 ACC/RWL-3		SK04P02 Plugged ACMS Flight Cap SK04P03 Plugged

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	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				ACMS SCOE	
	***************************************	GYRO RS422 / Test	J03	GYRO	Cable Plugged	
	SKIN-05	CDC 1/2 Ctimuli	10.4	CDC 1.0	ACMS SCOE	
	CIVINI OF	CRS 1/2 Stimuli	J04	CRS-1,2	Cable Plugged	-
	SKIN-05	AAD Sgn M	J05	AAD/ACC	ACMS SCOE Cable Plugged	
	SKIN-05				ACMS SCOE	†
		SAS1/2 Sgn M	J06	SAS/ACC	Cable Plugged	
}	SKIN-05				ACMS SCOE	
		SAS1/2 Sgn R	J07	SAS/ACC	Cable Plugged	
	SKIN-05				ACMS SCOE	
		AAD Sgn R	J08	AAD/ACC	Cable Plugged	
	SKIN-06	STR Panel				
		Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
					ACMS SCOE	
	SKIN-06	STR1 Stimuli	J01	STR1	Cable Plugged	
					ACMS SCOE	
	SKIN-06	STR2 Stimuli UMBILICAL	J02	STR2	Cable Plugged	
		Connector Function	Connector	S/C unit	SCOE CABLE	
					SCOEs cable	
		Power/Data	HU1 J01	SYSTEM	Plugged	
		Power/Data	HU2 J01	SYSTEM	SCOEs cable Plugged	

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			400/00 77			Address of the second second second			
	CryoSCOE harness setup for ACS/PR/TP No.: Annex No.:								
315 100									
	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			
			T702, T872,						
	Temperature & pressure Sensors	315100-J03	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			Х			
	Valve Sensor	316100-J02	VS503, VS505	<u> </u>		X			
321 100	on top of		To the second second			la santa de la companya de la compa			
	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			

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1	1	1	1	1	1	
		321100-J05	H103, H701, L102, VT102, VT103, VT105, VT701, VH102, VH103, VH105, VH701, VS102, VS105, VS701	Cryo SCOE J11		no flight
			H104, H702,			
		321100-J06	L101, VT104, VT106, VT702, VH104, VH106, VH702, VS104, VS702	Cryo SCOE		no flight
		321100-J07	H501	Cryo SCOE J06		no flight
				Cryo SCOE		
204 000		321100-J08	T502	J01	L	no flight
321 200	on top of					
	Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
			T202, T212,		- Comicator	- Somotion :
			T221, T223, T227, T228, T232, T234,			
		321200-J01	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
				Cryo SCOE		
221 200	on for of	321200-J05	VS103, H102	J04		Х
321 300	on top of		14 14 14			15
	Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected

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		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		Х	
		321300-J03	P502,T322, T324, T504, T506, T507, T652, T902, T908, T912	Cryo SCOE J18		Х	
		321300-J04	T311, T313, T315, T904, T906, T910, T932, T934	Cryo SCOE J14		х	
		321300-J05	VS106, H102	Cryo SCOE J04		Х	
CVSE I/F	on top of		hainin ayanda ayan ayan ayan ayan	A	2		
	Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected	
				Cryo SCOE J18		Х	
to be approved & released before start of ACS/PR/TP by Floor- Manager		Date:		Sign:			
					- The state of the		

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Anne	x 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		
released	proved & d before start of d/TP by Floor-	Date:		Sign:		

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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"

en company also recommon	SCOE	CABLES CONNEC	TION to HERSCHEL	S/C	
SKIN-01	PWR Panel (PCDU)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
				BS SCOE Cable	
	BS Nom Power	SK01BJ09	PCDU	Plugged	
				BS SCOE Cable	
	BS Red Power	SK01BJ10	PCDU	Plugged	
				LPS SCOE	
	BDR1 AIT	SK01BJ11	PCDU	Cable Plugged	
				LPS SCOE	
	BDR2 AIT	SK01BJ12	PCDU	Cable Plugged	
				POWER SCOE	
	SA Nom Power	SK01AJ01	PCDU	Cable Plugged	
				POWER SCOE	
	SA Nom Power	SK01AJ02	PCDU	Cable Plugged	
				POWER SCOE	
	SA Nom Power	SK01AJ03	PCDU	Cable Plugged	
		warman in his large at the large transfer		Connector	
	SA Red Power	SK01AJ04	PCDU	Cover	
				POWER SCOE	
	SA Red Power	SK01AJ05	PCDU	Cable Plugged	
				POWER SCOE	
	SA Red Power	SK01AJ06	PCDU	Cable Plugged	
	O/MOOT ONG	0110111100	1	POWER SCOE	
	SA Red Power	SK01AJ07	PCDU	Cable Plugged	
KIN-02	PWR Panel (ACC, CDMU, RCS, 15		1,000	_ occion logger	L
INIIV-V2	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	Controller and the		9,5	Bus Monitor	
SKIN-02	DMS 1553 Bus_A	J01	СДМИ	Cable Plugged	
Oran Oz	DMO 1000 Blag_A	001	0200	Bus Monitor	
SKIN-02	DMS 1553 Bus_B	J02	СОМИ	Cable Plugged	
CI (III UZ	Dino 1000 D00_D		551110	ACMS SCOE	
SKIN-02	ACMS 1553 Bus_A	J03	ACC	Cable Plugged	
OI VIII V-UZ	YOUNG 1000 DOG_V	000	7.00	ACMS SCOE	
SKIN-02	ACMS 1553 Bus_B	J04	ACC	Cable Plugged	
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	ACMS SCOE	

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			1		Cable Plugged	
					ACMS SCOE	
	SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	Cable Plugged	
					ACMS SCOE	
	SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH	Cable Plugged	
			1		ACMS SCOE	
	SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS	Cable Plugged	
		CDMU and ACC EEPROM				Flight Cap
	SKIN-02	reprogramming input	J09	ACC/CDMU		SK02P09 Plugged
		CDMU and ACC EEPROM		1		Flight Cap
	SKIN-02	reprogramming input	J10	ACC/CDMU		SK02P10 Plugged
	0,111, 02	Toprogramming triput	1 0,0	7100/00/10	ACMS SCOE	Crtozi 10 1 logged
	SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS	Cable Plugged	
	Oranvoz	Thirdster remptive v2 dis	011	ACOMOS	ACMS SCOE	·
	SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	Cable Plugged	
100	JAN114-02	Thruster C/D rieaters W	012	ACC/CBH		
	SKIN-02	Theretes C/D Heaters D	142	A00/00U	ACMS SCOE	
	5NIN-02	Thruster C/B Heaters R	J13	ACC/CBH	Cable Plugged	1000
	01/11/1 00	0,40,0,00,00,0,40,40,40	1	100/070 /		ACMS Flight Cap
	SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		SK02P14 Plugged
	2441.00					ACMS Flight Cap
	SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		SK02P15 Plugged
		22.10.8				ACMS Flight Cap
	SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1	 	SK02P16 Plugged
						ACMS Flight Cap
	SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2	<u> </u>	SK02P17 Plugged
	SKIN-03	TTC Panel				
		Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	SKIN-03	Test point TC + protection				Plastic cap
		jumper EPC1	SK03J01	XPND1/EPC1		(See note1)
	SKIN-03	Test point TC + protection				Plastic cap
		jumper EPC2	SK03J02	XPND2/EPC2	L	(See note1)
		RF LINK				
SELV.		Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
					RF SCOE	LGA1 Anechoic
		RF link for antenna LGA1	N/A	LGA1	LGA1 Plugged	Сар
					RF SCOE	LGA2 Anechoic
		RF link for antenna LGA2	N/A	LGA2	LGA2 Plugged	Cap
					RF SCOE	
		RF link for antenna MGA	N/A	MGA	MGA Plugged	MGA Anechoic Cap
	SKIN-04	ACMS Panel (RWE)	nsom transportation and a second			
		Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	SKIN-04					ACMS Flight Cap
		RWL1 Sgn	J01	ACC/RWL-1		SK04P01 Plugged
	SKIN-04	RWL2 Sgn	J02	ACC/RWL-2		ACMS Flight Cap

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		ļ			SK04P02 Plugge
SKIN-04	: ************************************				ACMS Flight Ca
	RWL3 Sgn	J03	ACC/RWL-3		SK04P03 Plugge
SKIN-04					ACMS Flight Ca
	RWL4 Sgn	J04	ACC/RWL-4	<u> </u>	SK04P04 Plugge
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 Ca
SKIN-05	CRS2 AOCS Sgn	J02	CRS-2/ACC		ACMS Flight Ca
SKIN-05	2 93 32 2 3			ACMS SCOE	
	GYRO RS422 / Test	J03	GYRO	Cable Plugged	
SKIN-05				ACMS SCOE	
	CRS 1/2 Stimuli	J04	CRS-1,2	Cable Plugged	
SKIN-05				ACMS SCOE	
	AAD Sgn M	J05	AAD/ACC	Cable Plugged	
SKIN-05				ACMS SCOE	
DIW. 05	SAS1/2 Sgn M	J06	SAS/ACC	Cable Plugged	
SKIN-05	010100 0			ACMS SCOE	
01/01/05	SAS1/2 Sgn R	J07	SAS/ACC	Cable Plugged	
SKIN-05				ACMS SCOE	
0//11/00	AAD Sgn R	J08	AAD/ACC	Cable Plugged	<u> </u>
SKIN-06	STR Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
01/11/00				ACMS SCOE	
SKIN-06	STR1 Stimuli	J01	STR1	Cable Plugged	
01/11/00	07777 04 4	200		ACMS SCOE	
SKIN-06	STR2 Stimuli	J02	STR2	Cable Plugged	
	UMBILICAL				
	Connector Function	Connector	S/C unit	SCOE CABLE	
	Power/Data	(1114-104		SCOEs cable	
}	rower/Data	HU1 J01	SYSTEM	Plugged	
	Power/Date	11110 104	0)/0==	SCOEs cable	
	Power/Data	HU2 J01	SYSTEM	Plugged	

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CryoSC	OE harness	setup for A	ACS/PR/TP	No.:			
Annex N	No.:			unija sa jekunduran ali	erija ili Cilic o Banalda e e e e kur		
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	
			T702, T872,				
			P101, T103,				
	Temperature & pressure Sensors	315100-J03	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		х	
	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			Х	
	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	

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i	1		1			
		321100-J04	P501	Cryo SCOE J01		no flight
		321100-J05	H103, H701, L102, VT102, VT103, VT105, VT701, VH105, VH103, VH105, VH701, VS102, VS105, VS701	Cryo SCOE		no flight
		021100000	H104, H702, L101, VT104, VT106, VT702,	311		The Hight
		321100-J06	V1106, V1702, 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				CryoSCOE	CCU Flight
	Function	Connector	S/C unit T202, T212,	SCOE	connected	connected
		321200-J01	T221, T223, 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		Х
		321200-J04	T312, T314, T316, T905, T909, T931, T933, T935	Cryo SCOE J09		X
		321200-J05	VS103, H102	Cryo SCOE J04		X

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321 300	on top of					
	Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected
		The contains a self-great a rest and a fine of a fine of	T208, T213, T222, T224, T225, T226, T231, T233, T235, T237, T247, T248,		A	
		321300-J01	T252, T256, T862, T444	Cryo SCOE J02		X
		321300-J02	T101, T104, T107, T112, T703, T422, T441, T462, T701, H102	Cryo SCOE J04		x
			B500 T000 T004			
		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		х
CVSE I/F	on top of Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected
di di di di di di di di di di di di di d				Cryo SCOE J18		Х
to be approved & released before start of ACS/PR/TP by Floor- Manager		Date:		Sign:		

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	/ ARM plug	setup for A	ACS/PR/T	P 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	х					
	SAFE / ARM plug	314 200-J06	SI 602	x					
	proved & before start of	Date:		Sign:		1			
CS/PR/ lanager	TP by Floor-								



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4.3.3 SCOE cable connection for" Launch Clean Run"

	No.:		T		r	1	T
SKIN-01	PWR Panel (PCDU)					The same of	
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	SA Nom Power	SAS SCOE	PCDU	SK01A J/P01	disconnected	<u> </u>	
	SA Nom Power	SAS SCOE	PCDU	SK01A J/P02	disconnected	<u> </u>	
	SA Nom Power	SAS SCOE	PCDU	SK01A J/P03	disconnected	<u> </u>	
			Battery	SK01A J/P04	EMC cover	<u> </u>	
	SA Red Power	SAS SCOE	PCDU	SK01A J/P05	disconnected	<u> </u>	
	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		
	PWR Panel (ACC, CDMI		1 000	010100112	Cable Flagged	 	
SKIN-02	Thruster)	5,1100, 1300 a					
	7-					Z4152	
	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		

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	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		<u></u>
	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	1					
	R/Str2 Sts	ACMS SCOE	ACC/STR-2	SK02 J/P15	Flight		<u> </u>
			ACC/GYRO-				
	Gyro A On/Off Cmd		E1	SK02 J/P16	Flight		ļ
			ACC/GYRO-		200		
Luniament	Gyro B On/Off Cmd		E2	SK02 J/P17	Flight		
SKIN-03	TTC Panel						
		+ 4 -					
	Connector Function	SCOE	S/C unit	Skin Connector	Connection	10%	Sign
	Test point TC +			01/00 1/004	FU-LA		
	protection jumper EPC1	Plastic Cap	XPND1/EPC1	SK03 J/P01	Flight		
	T1			ļ			
	Test point TC + protection jumper EPC2	Plastic Cap	XPND2/EPC2	SK03 J/P02	Flight		
	RF LINK	Triastic Cap	AT HUZILI UZ	0100 0/1 02	1 light		<u> </u>
	RF LINN		4.5				
	Connector Function	SCOE	S/C unit	Skin Connector	Connection		Sign
	RF link for antenna		O/O driit	LGA1 Anechoic			
	LGA1	TT&C SCOE	LGA1	Cap	RF-SCOE		
	RF link for antenna	1,140,000	20/11	LGA2 Anechoic			
	LGA2	TT&C SCOE	LGA2	Cap	RF-SCOE		
	RF link for antenna	1		MGA Anechoic			
	MGA	TT&C SCOE	MGA	Cap	RF-SCOE		
SKIN-04	ACMS Panel (RWE)						
						1 16	
	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		
1			ACC/RWL-4	SK04 J/P04	Flight		T

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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	<u> </u>	
	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		
UMBILIÇAL							
	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	appro Floor	oved -Manger
sign off:							

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CryoSC	OE harness	setup for A	CS/PR/TP	No ·		
Olycoo	OL Harricoo	octup tor /	100/110/11	110		·····
Annex N	No.:					
315 100	on top of					
	Connector				CryoSCOE	CCU Flight
	Function	Connector	S/C unit	SCOE	connected	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
			T702, T872,			
	Temperature & pressure Sensors	315100-J03	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			Х
	Valve Sensor	316100-J02	VS503, VS505			X
321 100	on top of				IMPA BENCE	T 2 - 2
	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

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		ć			ř.	ĩ
		321100-J05	H103, H701, L102, VT102, VT103, VT105, VT701, VH102, VH103, VH105, VH701, VS102, VS105, VS701	Cryo SCOE J11		no flight
			H104, H702,			
		321100-J06	L101, VT104, VT106, VT702, VH104, VH106, VH702, VS104, VS702	Cryo SCOE J03		no flight
		321100-J07	H501	Cryo SCOE J06		no flight
				Cryo SCOE		
224 200	an to- of	321100-J08	T502	J01	<u> </u>	no flight
321 200	on top of Connector Function	Connector	S/C unit	SCOE	CryoSCOE connected	CCU Flight connected
			T202, T212,			
			T221, T223, T227, T228, T232, T234, T236, T242, T244, T246,			
		321200-J01	T250, T254, T258, T424, T464	Cryo SCOE J08		х
		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	ALIAN AND AND AND AND AND AND AND AND AND A	Х
		321200-J04	T312, T314, T316, T905, T909, T931, T933, T935	Cryo SCOE J09		X
		321200-J05	VS103, H102	Cryo SCOE J04		×
321 300	on top of	321200-300	100,1102	004	L	^
027 000	Connector				SCOE Cable	Flight Cap
	Function	Skin Connector	S/C unit	SCOE	connected	connected

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		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	and the second s	х	
		204200 104	T311, T313, T315, T904, T906, T910, T932, T934	Cryo SCOE J14		X	
		321300-J04		Cryo SCOE J04		X	
0.05.15	 	321300-J05	VS106, H102	304	<u> </u>		
CVSE I/F	on top of Connector Function	Skin Connector	S/C unit	SCOE	SCOE Cable connected	Flight Cap connected	
				Cryo SCOE J18		Х	
to be approved & released before start of ACS/PR/TP by Floor-Manager		Date:		Sign:			

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Anne	x No.:					
314 200	on top of		- Carl San Japan		and Tourism	
	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)	х		
	SAFE / ARM plug	314 200-J05	SI 601	X		
	SAFE / ARM plug	314 200-J06	SI 602	x		

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5 Conditions

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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	Name / Organization	Signature
	(Y/N)		
Floor Manager	Υ		
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.

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Herschel

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.



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IST 1 Part 1 Warm preferred

	Mode	Battery required	X- Axis tilting	(deviating from IST Spec !!!)	HTT venting >20mg/sec	HTT venting >20mg/sec
Launch phase, separation and post separation	3 shift	4 shift	5 shift	6 shift	7 shift	8 shift
Initial configuration	OFF	Y	n.a	Preferred	alternative	alternative
Salelite power ON	OFF	Y	n.a	Preferred	alternative	alternative
Configuration for launch	OFF	Y	n.a	Preferred	alternative	alternative
		Y	n.a	Preferred	alternative	alternative
		Y	n.a	Preferred	alternative	alternative
			n.a		alternative	alternative
						alternative
						alternative
						alternative
End of the sequence	OFF.	Y	11.0	Preferred	alternative	alternetive
Satellite Commissioning				6 H		
Test start configuration	OFF	T N	n.a	Preferred	alternative	alternative
TTC commissioning	OFF	N	0.0	Preferred		alternative
CDMS commissioning	OFF	N	n.s	Preferred	alternative	elternative
TCS commissioning	OFF	N	n.a.	Preferred	alternative	alternative
PCS commissioning	OFF	N	n.a	Preferred	alternative	alternative
SREM commissioning	OFF	H	n.a	Preferred	alternative	alternative
TCS commissioning	OFF	N	n.a	Preferred	aitemative	alternative
			n.a	Preferred	alternative	alternative
			n.a		altemative	alternative
Test end	OFF	H	n.a	Preferred	alternative	alternative
ACMS commissioning			4-			
AAD SAS CRS STR GYR RCS unit check	OFF	N N		Proferred	alternative	alternative
						alternative
						alternative
ACMS dynamic verification	OFF	N	n.e	Preferred	alternative	alternative
Mode transitions						
Tool atod course walker	055	#400 Te 1500 Te 1500	2-18-18-18-18-18-18-18-18-18-18-18-18-18-		allo di	4.5
						alternative
						alternative
						alternative
SAM to NOM	OFF	N N	n.a	Preferred	alternative	alternative
Launch clean run						
	OFF	Y	n,a	Professed	altomative	alternative
Launch sequence robustness		ET REPUBLICATION	14 No. of the London		18.5	
Satellite power on	OFF	N	n.a	Preferred	alternative	alternative
Configuration for launch (status)	OFF	N	n.a	Preferred	alternative	alternative
Configuration for launch	OFF	N	n.a	Preferred	alternative	alternative
Separation	OFF	N	n.a	Preferred	alternative	alternative
S/C acquisition	OFF	N	n.a	Preferred	alternative	alternative
initial checkout in SAM mode	OFF	N	n.a	Preferred	alternative	alternative
Transition to NOM mode	OFF	N	n.a	Preferred	alternative	alternative
Orbit control manoeuvre	OFF	N	n.a	Preferred	alternative	alternative
	Initial configuration Salellite power ON Configuration for launch Launch Separation Post separation Initial check out in SAM mode CDMS transition to NOM mode Orbit Control Manoeuvre End of the sequence Satellite Commissioning Test start configuration TTC commissioning CDMS commissioning CDMS commissioning TCS commissioning REM commissioning TCS commissioning TCS commissioning TCS commissioning TCS commissioning TCS commissioning TCS commissioning Test end ACMS commissioning Test end ACMS commissioning Test end TRULE health check STR functional verification ACG health check ACMS dynamic verification Mode transitions Test start configuration Launch to SaM SAM to SAM SAM to SAM SAM to SAM SAM to SAM SAM to SAM SAM to SAM SAM to SAM SAM to SAM SAM to SAM SAM to NOM Launch clean run Launch sequence robustness Satellite power on Configuration for launch (status) Configuration for launch Separation S/C acquisition Initial checkout in SAM mode Transition to NOM mode	Initial configuration Salellite power ON OFF Salellite power ON OFF Configuration for isunch Launch Separation Post separation OFF Separation OFF Separation OFF Separation OFF Separation OFF Separation OFF Separation OFF Orbit Control Manoeuvre End of the sequence OFF Satellite Commissioning OFF TTC commissioning OFF TTC commissioning OFF TCS commissioning OFF CS commissioning OFF TCS commissioning OFF Test end OFF ACMS commissioning OFF Test end OFF Test end OFF ACMS commissioning AAD, SAS, CRS, STR, GYR, RCS unit check OFF STR functional verification OFF ACMS dynamic verification OFF ACMS dynamic verification OFF ACMS dynamic verification OFF ACMS dynamic verification OFF Launch to SAM OFF SAM to NOM OFF Launch to SAM OFF Configuration for launch Coff Configuration for launch (status) OFF Configuration for launch (status) OFF Separation OFF SC acquisition OFF Transition to NOM mode OFF Transition to NOM mode OFF	Launch phase, separation and post separation Initial configuration Satellite power ON Configuration for OFF Y Configuration for Satellite power ON Configuration for Separation OFF Y Separation OFF Y Post separation OFF Y CDMS transition to NOM mode OFF OFF CONFI Control Manoeuvre End of the sequence OFF Satellite Commissioning Test start configuration TCS commissioning OFF N TCS commissioning OFF N TCS commissioning OFF N ACMS commissioning OFF N Test send OFF N ACMS commissioning OFF N ACMS dynamic vegining OFF N ACMS dynamic verification OFF N ACMS dynamic verification OFF N Configuration for launch OFF N Transition to NOM mode Launch phase, separation and post separation Intel configuration Satellite power ON Configuration for launch Configuration OFF Y n.a Separation OFF Y n.a Configuration OFF Y n.a Configuration OFF Y n.a OFF Y n.a OFF Y n.a OFF Y n.a Configuration OFF Y n.a OFF N n.a N n.a OFF N n.a OFF N n.a OFF N n.a OFF N n.a ACMS commissioning OFF N n.a ACMS commissioning ACMS Commissioning ACMS Commissioning ACMS Commissioning ACMS Commissioning ACMS Commissioning OFF N n.a ACMS Commissioning OFF N n.a ACMS Commissioning ACMS Commissioning ACMS Commissioning OFF N n.a ACMS Commissioning OFF N n.a ACMS Commissioning ACMS Commissioning OFF N n.a ACMS Commissioning Launch phase, separation and post separation Institute of the configuration Satellite power ON Satellite power ON OFF Y A.A. Preferred Configuration for baunch OFF Y A.A. Preferred Configuration for baunch OFF Y A.A. Preferred Separation OFF Y A.A. Preferred Separation OFF Y A.A. Preferred Post separation OFF Y A.A. Preferred Post separation OFF Y A.A. Preferred OFF N A.A. 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IST 1 Part 2 He I or He II

Chapte	r of IST Spec issiue 4	Instr. Mode	Real Battery required	Satellite X-Axis tilting	Ambient or cool down (deviating from 1ST Spec!!!)	He I HTT venting >20mg/sec	He II HTT venting >20mg/sec
.8.5	Mode transitions	1 M	# . 1		3 30	第一条	6 14 1
858	NOM to NOM	PACS spectro SPIRE STBY HIFL STBY	N	0-23		alternative	Prelemed
8,5.9	NOM to EAM	PACS STBY SPIRE STBY HIFL STBY	N	0.23		alternative	Preferred
8.5.10	EAM to EAM	PACS STBY SPIRE STBY-> Photo->STBY HIF1 STBY	N	0.23		alternative	Preferred
8.5.11	EAH to NOM	PACS STBY SPIRE STBY. >Photo	N	0.23		alternative	Preferred
8 5 12	NOM to SM	PACS STBY-OFF SPIRE Photo-OFF HIF1 STBY-OFF	И	0-23		alternative	Preferred
8,5,13	SM to SM	OFF	н	0-23		alternative	Preferred
8,5.14	SM to SAM	OFF	N	0-23		alternative	Preferred
8.5.17	EAM to SAM (needs new SAM to NOM and NOM to EAM)	PACS STBY SPIRE STBY HIF! Science > STBY	Н	0-23		alternative	Preferred
	NOM to SAM (needs new SAM to NOM)	PACS Burst- >STBY SPIRE STBY	N	0-23		alternative	Preferred
8.5.19	Test end	OFF	N	0.23		alternative	Preferred
8.6	S/C reconfiguration						And the
8.6.2	Test start configuration	PACS STBY SPIRE STBY HIFL STBY	N	0.23		alternative	Preferred
8.6.3	CDMS level 3a	PACS STBY SPIRE STBY HIFI Prime-	И	0-23		alternative	Preferred
8.6.4	CDMS level 3b	PACS STBY SPIRE STBY HIFI STBY	И	0.23		alternative	Preferred
8.6.5	ACMS level 4	PACS Prime>OFF SPIRE STBY>OFF HIFI STBY>OFF	н	0-23		alternative	Preferred
8.6.6		OFF	N	0.23		alternative	Preferred
8.6.7		PACS Prime-OFF SPIRE STBY-OFF HIFI STBY-OFF	N	0-23		alternative	Preferred
Company Company	Test end	OFF	N	0-23		alternative	Preferred
3.12	NOM mode robustness	75 A 15			2252 - 1876		4 20
	Initial State	PACS STBY SPIRE Photo HIFI STBY	N	0.23		alternative	Preferred
8.12.3.2	CDMS PM 1553 BC failure simulation	PACS STBY SPIRE Photo- >STBY	N	0.23		alternative	Preferred
3 12 3 3	CDMS PM 1553 BC failure recovery	PACS Photo SPIRE STBY HIFL STBY	N	0.23		alternative	Preferred
	Initial state second test	PACS Photo SPIRE STBY HIFL STBY	N	0-23		alternative	Preferred
	ACMS 1553 RT failure simulation	PACS Photo - >STBY SPIRE STBY	N	0-23		alternative	Professed
1 12 3 6	ACMS 1553 RT failure recovery	PACS STBY-OFF SPIRE STBY-OFF HIFT STBY-OFF	И	0-23		alternative	Preferred
3.13	Test of Instrument FDIR OBCP						
13.4	SPIRE FOIR OBCP	SPIRE	N	0.23		alternative alternative	Preferred
1.13.6	PACS FDIR OBCP HIFI FDIR OBCP	PACS HIFI	N N	0-23 0-23		alternative	Preferred Preferred
	DEGRADED CASES	ter ter					
11	S/C ability to be operated in degraded modes					alternative	Preferred

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IST 1 Part 3 He II only

er of IST Spec Isslue 4	Instr. Mode	Real Battery required	Satellite X- Axis tilting	Ambient or cool down (deviating from IST Spec III)	He I HTT venting >20mg/sec	He II HTT ventin >20mg/sec
Satellite Commissioning				131 Spec 93	300 000	
CCU (cryostat) commissioning	OFF	N	23	PELL BENLLIN		
Instruments commissioning and performance verification				-		Required
						n 2 2 10
Test start (restart) configuration	OFF	N	23			Required
ODD						Required
SPIRE commissioning test PACS commissioning test	Spire	N	23 -> 90			Required
HIFI commissioning test	PACS	N N	23			Required
SPIRE and PACS parallel mode	SPIRE/PACS	N N	0.23	ļ	ļ	Required
Test end or interruption	OFF	N N	23	 		Required
Test End of Michigan	1 011				 	Required
CDMS management	English 1	9 (44)	30 75 30 75			
General Sequence (Integration with RMS DTCP number 2)	PACS Prime STBY → Burst → X SMRE STBY HiFI STBY	N	0-23		alternatively if MTL is compatible with instrument operations	Preferred
MTL management	PACS Prime STBY >> Burst >> X SPIRE STBY HIF! STBY	H	0-23		atternatively if MTL is compatible with instrument operations	Preferred
OBCP management	PACS Prime STBY → Burst → X SPIRE STBY	N	0-23		afternatively if LiTL is tompatible with instrument	Preferred
	HIFI STBY				operations	Tet Lac
SSMM management	PAC'S Prime STBY → Burst → X	N	0-23		alternatively if MTL is compatible with	Preferred
	SPIRE STBY				instrument operations	
FDIR level 1 & 2	PACS Prime STBY >> Burst >> X SPIRE STBY HIFL STBY	н	0-23		afternatively 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		J	00 120	1.00	TO STATE OF	
	PACS (Suret) SPIRE STBY	N	0.23		ТВС	Preferred
REFERENCE Mission Scenario	HIFI Prime					Lielbited
Test start configuration		- Y	and 18, 75/26	100		
		,				Required
Test steps		Y				Required
HIFLOD	HIFI OD	Y	0-23			Required
PACS OD	PACS OD	Y	0.23			
SPIRE OD	SPIRE OD	Y				Required
Test end		· Y	0-23			Required
		,				Required

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



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5.3 General Precautions and Safety

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5.3.1 General Safety Requirements, Precautions

Special condition and hazards

The following Operational restrictions shall be carefully taken into account:

- 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
- 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

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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.

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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.

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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.

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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.

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

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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

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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.

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5.4 GSE

Item	Manuf.	Model No.	SN No.	Invent	Next
				No.	Calib.
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5.4.1 MGSE

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

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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	Cl No. 142 310-01	
2	LHe Service Vacuum Pumping Unit II	BOCE	Cl No. 142 310-02	
1	Main High Vacuum Pumping Unit	BOCE	Cl No. 142 310-03	
1	Mobile High Vacuum Pumping Unit	BOCE	Cl 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	

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Qty.	Designation/Manufacturer	Provided by	Drawing/Ident.	Calibr.
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	Cl No. 142 310-10	
10	450 I 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		

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5.4.3 EGSE

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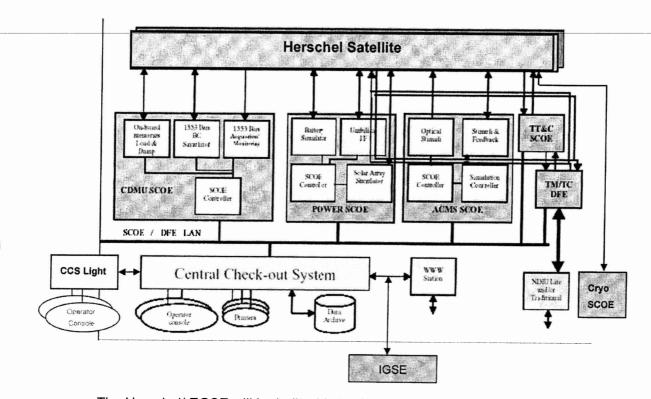
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5.4.3.1 EGSE Hardware Configuration

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)

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- 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.



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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.

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

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5.4.5 Special Equipment

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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-Al-RD-0014 issue03.

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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.

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7 IST Test

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7.1 HPCCS Configuration for IST Test

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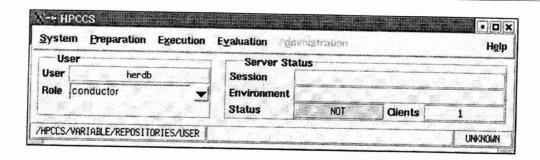


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7.1.1 Apply Tag on test files

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

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



- 3. Logged as herdb, in HPCCS window, select menu "Preparation → Prepare"
- Logged as herdb, In PREP window, select menu "Preparation→ Discard all" 4.
- 5. Logged as herdb, In Confirm Discard window, click the button Discard
- Logged as herdb, in PREP window, select menu "Preparation→ Update" 6.
- Logged as herdb, in Check out environment window, click the button Check out and 7. then Close
- 8. Logged as herdb, in PREP window, select menu "Tag → Apply"
- 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
- Logged as herdb, confirm Tag Application Push Apply button 11.
- Logged as herdb, open a new shell window (xterm) 12.
- 13. Logged as herdb, execute the command update_tag
- Logged as herdb, insert the name of TAG 14.

IST_x_PART_x_TP_xxxx_x_x_BEGIN_xxx

- Logged as herdb, in PREP window, select menu "Tag → Apply" 15.
- 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
- Logged as herdb, modify the TAG name with IST_x_PART_x_TP_xxxx_x_x_END_xxx 18.
- 19. Logged as herdb, push Apply → Apply
- Logged as herdb, confirm Tag Application Push Apply button 20.

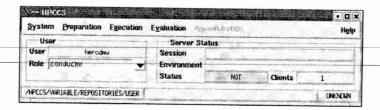
Page



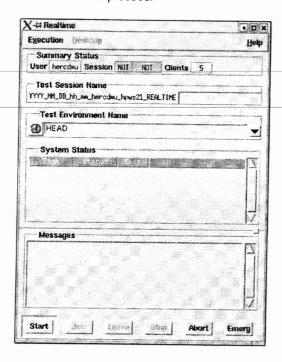
Herschel

7.1.2 Start test session on HPCCS

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



On **HPCCS** window, select menu "Execution \rightarrow 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



Herschel

7.2 IST START for Spacecraft configuration

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HP-2-ASED-TP-0134

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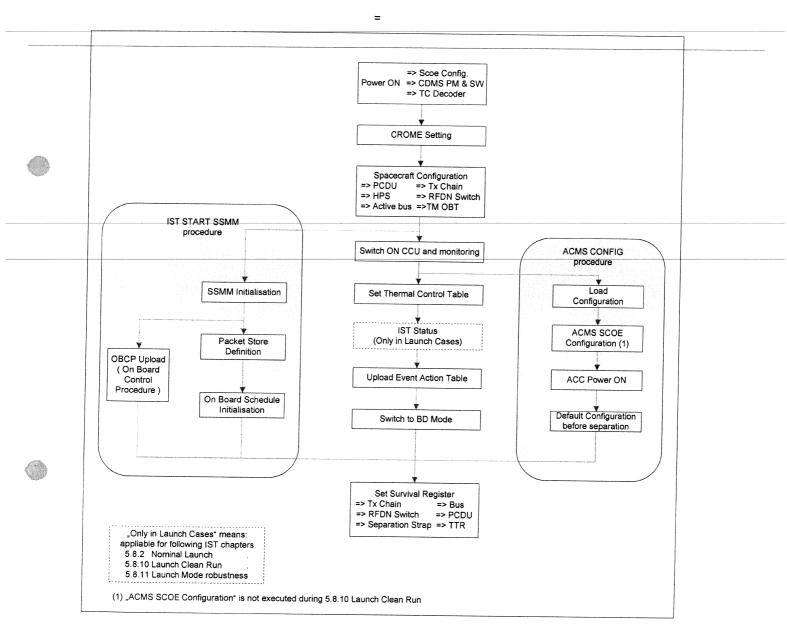
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7.2.1 Diagram Overview

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	TTR SM	TM OBT	TC Dec.	PM SW	SSMM	В	us SM	PC	DU SM	HPS	TxC	hain sm	RF	DN SM	CC	U Mode	ACMS Config. File
						5.8	.2 NO	MINAL LA	UN	СН								ON	vioue	Corning. File
	Sim. Charged + Launch		Not Separated	В	Α	Α	A1	A 0-1-2 B 0-1-2	A	В	А	В	Α	Α	В	1&3	АВВВ	A&B	2	IST_FN
						5.8.3	a ACM	S Commi	ssic	nina			L1							
SAS	Sim. Charged	PM A Nominal	Separated	В	Α	В	A1	A 0-1-2 B 0-1-2	A	В	Α	В	Α	Α	В	1&3	АВВВ	A&B	1	IST_SCA1
						5.8.	3b S/C	Commis	sion	ina		<u> </u>	I							~~~
SAS	Sim. Charged	PM A Nominal	Separated	В	Α	Α	A1	A 0-1-2 B 0-1-2	A	В	А	В	Α	Α	В	1&3	ABBB	A&B	1	IST_MOD
						5.8.4.5	.1 SPI	RE Comm	issi	onin	a									
SAS	Sim. Charged	PM A Nominal	Separated	В	Α	A	A1	A 1 B 1	В	Α	A	В	Α	Α	В	1&3	ABBB	A&B	1	
				5.	8.4.5.2	SPIRE	Specti	ometer C	om	olem	entai	rv Te	et							
SAS	Sim. Charged	PM B Nominal	Separated	A	В	В	B1	A 3 B 3	В	А	В	A	В	В	Α	2&4	AABB	A&B	1	

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SASLPS SCOE		Crome PAP/CCS	Sep. Strap	TTR SM	TM OBT	TC Dec.	PM SW	SSMM	E	us SM	100000	DU SM	HPS	TxC	hain sм	RF	DN SI		CC ON I		ACMS Config. File
						5.8.4	.6 PAC	CS Comm	nissi	onin	g .		*			***************************************				Wode	Comig. 1 lie
SAS	Sim. Charged	PM A Nominal	Separated	Α	Α	В	A1	A 2 B 2	В	Α	В	А	В	В	Α	2&4	AA	ВВ	A&B	1	
-						5.8.	4.7 HIF	I Commi	ssio	nina		<u> </u>	1		L	L		-		l	:
SAS	Sim. Charged	PM B Nominal	Separated	В	Α	Α	B1	A 3 B 3	Α	В	Α	В	Α	Α	В	1&3	АВ	ВВ	A&B	1	
					5.	.8.4.8 P	arallel	Mode Co	mm	issio	nina		1			L					
SAS	Sim. Charged	PM B Nominal	Separated	Α	В	В	B1	A 0 B 0	Α	В	В	Α	В	В	Α	2&4	AΑ	вв	A&B	1	
						5	.8.5 M	ode Tran	sitic	n		<u> </u>						\vdash			
SAS	Sim. Charged	PM A Nominal	Separated	в	Α	Α	A1	A 1 B 1	Α	В	А	В	Α	Α	В	1&3	AB	ВВ	A&B	2	IST_MOD
						5.8	.6 SC	Reconfig	urat	ion			L					\vdash			
SAS	Sim. Charged	PM A Nominal	Separated	Α	В	В	A1	A 2 B 2	В	Α	В	Α	В	В	Α	2&4	AA	вв	A&B	1	IST_FD_B
						5.8	.7 CDN	MS Mana	aem	ent									1		
SAS	Sim. Charged	PM A Nominal	Separated	В	Α	Α	A2	A 1 B 1	A	В	Α	В	Α	Α	В	1&3	AB	вв	A&B	2	IST_CDMS
						5.8.8 D	TCP W	orst Cas	e S	enar	io										
SAS	Sim. Charged	PM B Nominal	Separated	Α	В	В	B2	A 2 B 2	В	A	В	Α	В	В	Α	2&4	ΑAI	вв	A&B	2	IST_WCS

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Procedure





SASL PS	Bat. SCOE	Crome PAP/CCS	Sep. Strap	TTR SM	TM OBT	TC Dec.	PM SW	SSMM	В	S us SM	PC	DU SM	HPS	TxC	hain sm	RF	DN	CC	U Mode	ACMS Config. File
					5.8	8.9 RMS	Refe	rence Mis	sio	n Sce	nari	0			<u> </u>			OIN	wode	Coning. File
SAS	Sim. Charged	PM A Nominal	Separated	В	Α	Α	A1	A 0-1-2 B 0	A	В	Α	В	Α	Α	В	1&3	ABBB	A&B	1	IST_RMS
						5.	8.9 La	unch Clea	ın R	Lun.		I	11			<u> </u>	4	<u> </u>	<u> </u>	
LPS	REAL	PM A Nominal	Not Separated	В	Α	Α	A1	A 0-1-2 B 0-1-2	Α	В	Α	В	Α	A	В	1&3	АВВВ	A&B	2	IST_CLN
						5.8.11	Launc	h Mode R	obı	ıstne	SS.	<u> </u>			لننط	L	4	<u> </u>		
SAS	Sim. Charged +Launch	PM A Nominal	Not Separated	В	Α	Α	A1	A 0 B 0	Α	В	Α	В	Α	Α	В	1&3	АВВВ	A&B	2	IST_LSR
						5.8.12	NOM 2	Mode Ro	bus	tnes				-	1		4			-
SAS	Sim. Charged	PM A Nominal	Separated	Α	В	В	A1	A 3 B 3	В	А	В	Α	В	В	Α	2&4	ААВВ	A&B	1	IST_NMR
						5.	8.13 lr	strument	FD	IR			L1				4			
SAS	Sim. Charged	PM A Nominal	Separated	В	Α	Α	A2	A 1 B 1	Α	В	Α	В	Α	Α	В	1&3	АВВВ	A&B	1	IST_CDMS

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7.2.3 Initialisation

Step- No.	Initialisation-Step-Description	Nominal Value	Tolerance	Actual Value		Р	N
	TT&C SCOE	initialisatio	n				
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.					V	
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 CONN	ECTORS CO	NFIGURAT	TION			1
3	Verify that all the SCOE skin connectors cables are installed	ANNEX 2	and Ar	CONFIGURA PROCEDURE NNEX 3 AC THE TEST O	CORDING TO	>	
				NO TEST BIL		- 1	·
t loosti -		DET	ERMINED	BY THE TO	EST ORDER	inditta	+ R

Test location: THE TEST DRDER WITH KENERENCE Product-Assurance: Date: ESTEC 9/5/08 76 PROCEDURE 0180

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Step- No.	Initialisation-Step-Description	Nomi Valu		Tolerance	Actual Value		nandada da cara	Р	N	
	ACMS SC	OE CHE	ECK		•					
4 N/A for "Launch Clean Run"	Verify that the ACMS SCOE is ON and operational	THE	AC	ns sco	IN THIS	TES	T	81	P	:
N/A for "Launch Clean	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		1	Dita				81	8	

Test location:	Operator					
	Operator	Product-Assur	rance:	Date:		Time
C 3 (CC	(TS C) min	1 1 De		9/-1-01		an . 67
		A Sully		112108		00.43
				1 1	-	

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Issue: 4.0

Date: 24.04.2008

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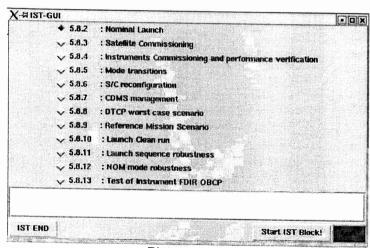
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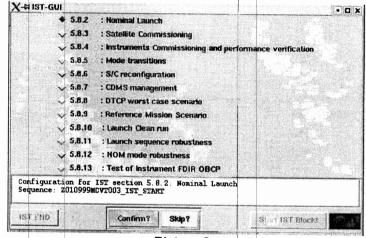


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7.2.4 IST Start Step by Step Procedure

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 loca	ation: ESTEC	Operator	Product-Assurance:	Date: 9(5(08	Time
Doc. No: Issue: Date:	HP-2-ASED-TP-0134 4.0 24.04.2008	File: HP-2-ASED-TP-0134_Herschel_IST_Leading_Procedui 04-08	re_iss_4_0_24-		Page 78



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Step- No.	IST_START-Step-Desc	ription	Nominal Value	To	olerance	Actual Value	Remarks	Р	N
	Z010999MCVT003_IST_START At the bottom of the window, the IST_STA panel displays all parameters applied durin ⇒ Click the button "Continue" to proc	ng the IST_START.	To Check in Config. Table (Page 73)					/	
	Power	COMS	iguration of "IST STAF	RT*-				7	
	SAS/LPS SCOE: SAS	TM OBT:	₩ Bus:		A	Rx and Tx Chain Tx Chain (Xpnd, Tx, EPC,	TWT): A		
	Bat. SCOE: Simulated		Pap Ccs	РМА	nominal 🔻	TC decoder:	A		
	PCDU: A W HPS: A W	Survival Register Bus: B Launch Straps: Not			parated 🕶	TM Rate: Me	edium (150Kbps)		
	CCU: A&B	PCDU: B			B. 📦	RFDN Switches in use	183		
	Made: 512s (Mode 1)	Tx Chain: B	RFDN Switches Position	on .	ABBB 🔻	SSMM Mass Memory:	A0 and B0		
		Co	ntinue?			I and the second		1	
		IST_STAI	RT Configuration	on F	Panel				
Test lo	cation: O	perator Company	Product-Ass	surar R	nce:	Date: 9(5/08	Time	:43	
Doc. No Issue:	o: HP-2-ASED-TP-0134 4.0				5		Page	79	



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Step- No.	IST_START-Step-Description	Nominal Value	Тс	lerance	Actual Value	Remarks	Р	N
	Z010999MCVT003_IST_START				Tuluo			
2	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""	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:	T:
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Step- No.	IST_START-Step-Description	Nominal Value	То	lerance	Actual Value	Remarks	Р	N
4	Z010999MCVT003_IST_START Reply to the prompt: "SPACECRAFT POWER_ON"				value	Carl.	/	
-	Z010999MCVT001_POWER_ON_HER_IST Set Battery ?????????? Set TCDecoder to ? Set PM_SW ??	To Check in Config. Table (Page 73)	1 1					
	Do you want to continue with the upper configuration: If these parameter values are in accordance with the IST Configuration Table (Page 73),	Bat.SCOE TCDec. PM/SW						
	⇔ click the button "OK" to proceed					0 K 00:45		

Test location:	Operator	Product-Assurance:	Date:	Time
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Step- No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value		Remarks	Р	N
	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			value		OK 00:54	1	
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				as the	"Launch Clean Run" ables for CDMU onitor are	/	

Test location:	Operator	T			1	
e com	Operator	Product-Assurar	nce:	Date:		Time
ESCEC	1. 5 Days	CICRIA		9/5/09	8	
		LARCE		(1,1)	1	00.54
	h		and the same of th		í	

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Step- No.	IST_START-Step-Description	Nominal Value	Tol	erance	Actual Value		Remarks	Р	N
8	D102159SCVT001_GET_ALARM_STATUS Check that both DOD ext1 and ext2 are "Not Asserted". Otherwise execute Annex D – Operator Note 8						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						8K	/	
9b when BCR OCP are detected		YES		C	CONT YES 01:14	1 := 0 SPR 24 SA_Pan? SPR 28 missing T SPR 28 acknowle For laun Battery f	5: many TCs not	al s	

Test location:

E STEC

Operator

Product-Assurance:

Date:

Time

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DUPLICATIONS OF STEP 8



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	Step-No.	IST_START-Step-Description		ninal lue	Tolerance	Actual Value		Remarks	Р	N
10	Wait until t	SCVT032TIMESYNCRO the synchronization between CDMS On-board Time and ished ick the button "End TS!" to proceed				Value	and back	neter ZE00999 out of limits in limits again at sation to be expected.	1	
11	Z010999I	MCVT001_POWER_ON_HER_IST ick the button "End TS!" to proceed						0(:(6	1	
12	Check that Otherwise	SCVT001_GET_ALARM_STATUS t both DOD ext1 and ext2 are "Not Asserted". execute Annex D – Operator Note 8 ick the button "End TS!" to proceed						OK O(:16	1	
13		MCVT003_IST_START	To Che Config. (Page	Table						
	PAP/CCS	ME settings is in accordance with the CROME of IST Configuration Table (Page73), ck the button "Confirm" to proceed	CRC PAP/							

Test location:					_
	Operator	Product-Assurance:	Date:	Time	
ESTEC	1 -20 .	3	-1-1-		
	U J OGGIN	Sprice S	915108	6(- (6	

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Step-No.		Nom Val		Tolerance	Actual Value		Remarks	Р	N
14	D102159SCVT176_WRITE_CROME						OK		
	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 Che Config. (Page BU PCE HP TxC RFE TM-C	Table 73) S OU S h.			Medium	note that the TMra (150 Kbps) is no d in IST Config. Tab	ot	
16 Only if Encoder B is req.	D102159SCVT104_ENCODER_SELECT					SPR 28 repeat	36: TM check need	S	

Test location:	Operator	I Down I do		
ESTE	Operator	Product-Assurance:	Date:	Time
Les and Care	Curs Down	AT WAR	915/08	01:19
			11,100	3(. ()

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Step-No.	IST_START-Step-Description	Nomin Value		Tolerance	Actual Value		Remarks	Р	N
	D102159SCVT174_IST_REDUNDANT_CONF								
17							NA		
	Z010999MCVT003_IST_START					-		-	-
18	Reply to the prompt: "SSMM Configuration" ????????	To Check Config. Ta (Page 7: SSMM	able 3)				A0180		
	⇔ Click the button "Confirm" to proceed	22 IVIIVI	1						
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						cases, RT_SSMM shall be y performed before		
	(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).								

Test location:	I O			
FSTE	Operator	Product-Assurance:	Date:	Time
COLEC	C Com	FIRE	9/5/08	01:20
			11,100	01.02

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Step-No.		Nomi Valı		Tolerance	Actual Value	Remarks	Р	N
20	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 Che Config. (Page CCU Mod	Table 73) On		Cont. 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 Combonia	Product-Assurance:	Date:	Time : ZZ

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Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value		Remarks	Р	N
	Z010999MCVT003_IST_START Reply to the prompt: "Record CCU Temp In Background"				Minimise L starting	og file after Coure. 1:3Z		
applicable only in launch (IST						in (A		

Test location:	I Opposite a			
A Million Co.	Operator	Product-Assurance:	Date:	Time
ESTEC	1 2 2		0/0/0	1 . 2 -
	000000	Malog	112/08	1.52

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Step-No	. IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	Р	N
23	Z010999MCVT1533_IST_STATUS						
applicabl only in							
launch (IS spec. 5.8.	Click the button "OV" to proceed				NA		
5.8.10 5.8.11)							
	Z010999MCVT003_IST_START	,,				-	
	Reply to the prompt:						
24	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				0(:33		

Test location:	Operator	Product-Assurance:	Date: 9(5(08	Time 0:33
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Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	Р	N
	Z010999MCVT003_IST_START						+
25	Reply to the prompt: "SET TCT Table for Ambient Temperature"				OK		
	⇔ Click the button "Confirm" to proceed				1:34		
	D102159SCVT032EnNomTCSLoops						+
26	⇔ Click the button "End TS!" to proceed				OK	/	
	D102159SCVT115_CHECK_HCS_OFF	:					+
26 D. 27 Z0	⇔ Click the button "End TS!" to proceed				OK	1	
	Z010999MCVT003_IST_START						+-
28	Reply to the prompt: "EAT UPLOADING"				CONF		
	⇔ Click the button "Confirm" to proceed"				1:41		

1	Test location:	Operator	D		
	_	Operator	Product-Assuran	ce: Date:	Time
	ESTEC	Cu-3clase	The second	9/5/08	01:01
į				33	00 11

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Herschel

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Rei	marks	Р	N
29	D102159SCVT192_GET_EAT_REPORT Check that every initial entries of the Event Action Table are successfully checked	Value		value		6K	/	
	○ Click the button "End TS!" to proceed D102159SCVT192_GET_EAT_REPORT Check that every initial entries of the Event Action Table are correctly set ○ Click the button "End TS!" to proceed					0(C	1	
31	D102159SCVT192_IST_UPLOAD_EAT					01:48 OK	/	
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:					
restrictation.	Operator	Product-Assurance:	Date:		Timo
F 6		The state of the s	Date.		Time
ESIEC	1/2/2	A DA C	9/5/	-	21.50
	U J Los	Stell	117108	5	01.)
		The state of the s			

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Herschel

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	Р	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 2, PCDU 2, RFDN 2???2, TxChain 2, TTR 2, Sep Strap 2????2)" □ Click the button "Confirm" to proceed	To Check in Config. Table (Page 73) Bus PCDU RFDN TxCh. TTR Sep Strap		Cove 02:17		/	
34	D102159SCVT175_SET_SURV_REG			OK 2:21	SPR 289 No TM return for TM check	/	
	Z010999MCVT003_IST_START Prompt: "Check CDMS Tables"			10/4			

Tanklesst					
Test location:	Operator	Product-Assurance:	Date:		Timo
par.		1 Journal Moderation.	Date.	1	Time
F STEC		314	9/2/		
from the same of t	C C C C C C C C C C C C C C C C C C C	A W	10108		7.7
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Herschel

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	Р	N
36	D102159SCVT219_GET_BSW_HEALTH_UIU						
(only in launch test cases	⇔ Click the button "End TS!" to proceed			NA			
37	D102159SCVT204_GET_MOT						
(only in launch test cases)	⇔ Click the button "End TS!" to proceed			NA			
	D102159SCVT192_GET_EAT_REPORT						
launch test	Check that every uploaded entries of the Event Action Table are correctly set			. (1)			
cases)	⇔ Click the button "End TS!" to proceed			MH			
39	D102159SCVT205_SAT_COM_TCT				Expected that checks will fail as		
(only in launch test cases)	⇔ Click the button "End TS!" to proceed			NA	the uploaded TCT is for ambient but the checks are performed against the		

Test location:	To :				
rest location.	Operator	Product-Assurance:	Date:		Time
ESTEC	wolver	Eddor	9(5(0	8	2: 21
					,

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Herschel

Step-No.	IST_START-Step-Description	Nominal Value	Tolerance	Actual Value		Remarks	Р	N
40	D102159SCVT207_SAT_COM_FCCT							
(only in launch test cases)	⇔ Click the button "End TS!" to proceed			NA				
	Z010999MCVT003_IST_START							
41	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	With param	eters: 0 80 1 81 2 82 3 83		
43	D102159SCVT188_IST_DUMP_PKT_STORE			2:31 2:34 2:37	All event alarms re	eters: CEL_A CEL_B s, warnings and ecorded before the e re-occuring during		

Test location:				
rest location;	Operator	Product-Assurance:	Date:	Time
ESTEC	Linder	E Market E	9(5(08	:

Doc. No:

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Herschel

:	Step-No.	IST_START-Step-Description	Nomina Value	Tolerance	Actual Value	Remarks	Р	N
	44	Z010999MCVT003_IST_START						
L		⇒ Click the button "End TS!" to proceed			02:35			

Test location:	2			
F S = C	Operator	Product-Assurance	e: Date:	Time
C 316 C	CJ SDOWN	· INTER	9/5/00	60.25
		Dariel	11,100	02.33

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Herschel

7.2.4.1 IST_START_SSMM Procedure

Step- No.	IST_START_SSMM-Step-Description	Nom Val		Tolerance	Actual Value			Р	N
1	Z010999MCVT005_IST_START_SSMM Reply to the prompt: "SSMM CONFIGURATION Click the button "Confirm" to proceed	To Che Config. (Page	Table 73)				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					take min The step prod	ss Memory config. s about 12 utes per bank. refore, the next in IST_START cedure can be cuted.	1	/
3	D102159SCVT186_IST_SSMM_ON							/	/

Test location:	10			
	Operator	Product-Assurance:	Date:	Time
ESTEC	wollow	THE	9/5/000	
			40100	•

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Step-No	. IST_START_SSMM-Step-Description	Nomi Valu	 Tolerance	Actual Value		Р	N
	Z010999MCVT005_IST_START_SSMM				occurrence of 2 BSW		
	Reply to the prompt: "OBCP UPLOADING"				problems EvtID 30738		
4	⇔ Click the button "Confirm" to proceed			01:56			
	Let run in parallel the sequence						
	D102159SCVT193_IST_UPLOAD_OBCP						
	and continue with next step "Packet Store Definition"						
	Z010999MCVT005_IST_START_SSMM						
5	Reply to the prompt: "Definition of the Packet Store"			01:57			
	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			01:57			

Test location:	Operator	Product-Assurance:	Date:	Time
ESTEC	inobers	BARG	9/5/08	01:57
			1	

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Step-No	IST_START_SSMM-Step-Description	Nomir Valu	 Tolerance	Actual Value			Р	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 7:62	1 1	-3492 occurs: RRMMemCorEr_ = 1)!		
8	Z010999MCVT005_IST_START_SSMM Reply to the prompt: "Initialise MTL Service Buffers"			OK 02:03	o Evt_	4) alarms expected: MTLBufADel (ID:26914) MTLBufBDel (ID 26915)		
9	D102159SCVT209_START_ON_BOARD_SCHEDULE Click the button "End TS!" to proceed			62:15	SPR 2	282 TM failure: too check		
10	D102159SCVT193_IST_UPLOAD_OBCP ⇒ Click the button "End TS!" to proceed			02:14				

Test location:	Operator				
EST-	Operator	Product-Assurance:	Date:		Time
ESTEC	wolder	Do	9/5/08		02:16
			1 1 1	1	, _

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Herschel

Step-No.		Nomin Value	loierance	Actual Value		Р	N
	Z010999MCVT005_IST_START_SSMM						
11	⇔ Click the button "End TS!" to proceed			02:16			

Test location:	1				
rest location.	Operator	Product-Assurance	ce:	Date:	 Time
ESTEC	Keroller	Barre		9/5/08	02:16

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Herschel

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"	1		15T.	EMC ISTLEM. 01=36	81	NP
3	A102109SPVT003_ACMS_CONFIG25 ⇒ Click the button "Continue" to proceed				OK		
4	A102109SPVT004_ACMS_LOADCONFIG1 At the prompt, "Enter your choice:	To Check in Config. Table (Page 73) ACMS Config File)		014		

Г	Toot location:						
- 1	Test location:	Operator	Product-Assuran	re.	Date:		Timo
- 1		o portato.	1 Toddet / tosulari	CC.	Date.		Time
- 1	- S-	1 %				_	
- 1	() (F		STATE	Managara	115108		1 137
- 1		00000	ENLA LE		(1)(0)		1 76
L			100				•

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Step- No.	ACMS_CONFIG-Step-Description	Nominal Value	Tolerance	Actual Value		Р	N
N/A for "Launch Clean Kun"	/ John State Proceed	6	5K1	P 81			
N/A for "Launch Clean Run"			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	8N3	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:	One-set-				Management of the Art	
	Operator	Product-	Assurance:	Date:	Time	
					and instrument or the state of	:
				1	E .	1

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Step- No.	ACMS_CONFIG-Step-Description	Nominal Value	Tolerance	Actual Value			Р	N
	A102109SPVT003_ACMS_CONFIG25							
	At the prompt "Enter your choice", insert "4" to select "ACMS Power ON (in Pre-Sep configuration)"	4				4.		
	⇔ click the button "OK" to proceed					1-51		
	A102109SPVT003_ACMS_CONFIG25							
9	⇔ Click the button "CONTINUE" to proceed					OK		
	A102109SPVT011_ACMS_ON				Expe	cted Out of Limit of		
	During this sequence, following events are expected: - TM(5,4) Event Report and Reconfiguration Log - TM(5,2) APID:2018 (ACMS_SCOE) indicates ACMS				ACC	Y109 (synchronisation) may become INVALID short time		
10	"TestDataWord" needs to be switched ON. A few seconds later when the corresponding TC is sent, this TM(5,2) must disappear.					245 NCR 2862 : Out of of HKA_ANTH?_Data		
	- Multiple other events TM(5,1), such as "Fdir Task Overrun" or "Fdir Rm Parity Error"					334 OutOfLimit of Calib Curve in LCR		
EPIO	D IS COMPLETED DO NOT PERFORM	ant m	DRE ACT	TE CONS		MATION ST	30	-

* AFTER STET ACMS CONFIGURATION STRYS IN Operator Product-Assurance: Date: Time

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Step- No.	ACMS_CONFIG-Step-Description	Nominal Value	Tolerance	Actual Value		Р	N
11	At the prompt "Enter your choice", Insert to select "Modify ACC SGM/RM content" Click the button "OK" to proceed	5	SHIP	J.N.			
12	A102109SPVT003_ACMS_CONFIG25 Click the button "Continue" to proceed		SKIP	an?			
	A102109SPVT003_ACMS_CONFIG25 At the prompt "Enter your choice", Insert for "Default configuration for separation" Click the button "OK" to proceed	20	ster P		Expected Out of Limit of AEYYY109 (synchronisation) ACC may become INVALID for a short time TC PM_Reset (ACY42109)		
14	A102109SPVT003_ACMS_CONFIG25 ⇒ Click the button "Continue" to proceed		SKIP	BN	nφt acknowledge expected		

Test location:	Operator	Product-	Assuran	ce:	Date:	Time
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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.	SKI	P	2NP		
16	A102109SPVT003_ACMS_CONFIG25 At the prompt "Enter your choice", Insert to select "Return to Main Menu 1.0" Click the button "OK" to proceed	5 K I	P			
17	A102109SPVT003_ACMS_CONFIG25 ⇒ Click the button "Continue" to proceed	SKIP	6	N		

tion:			
Operator Product-	Assurance:	Date:	Time
			•

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Herschel

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.

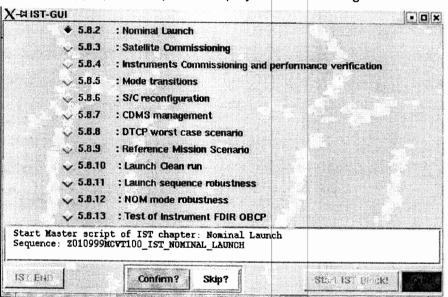


Figure 1: IST_GUI calling Master sequence, for instance "Nominal Launch"

	Test location	n:		Operator	Product-	Assuran	ce:	Date:	Time	:
	Doc. No: Issue: Date:	HP-2-ASED-TP-0134 4.0 24.04.2008	File: HP-2-ASEC 04-08	D-TP-0134_Herschei_IST_Leading_Pro	ocedure_iss_4_0_24-				Page	105



Herschel

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

Tastlessting				
Test location:	Operator	Product-Assurance:	Date:	Timo
		. roddot rtoddianbo.	Date.	Time
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7.4 IST END Procedure

Step- No.	IST_END-Step-Description	Nomi Valu		Tolerance	Actual Value				Р	N
1.	IST_GUI ⇒ Click the button "OK" and then ⇒ Click the button "IST_END" to proceed					IST colle Text	d	END by Letan	/	
2.	D102159SCVT188_IST_DUMP_PKT_STORE ⇒ Click the button "Confirm" to proceed	Cof			aj		<u>Wha</u>	,sac	V	/
3.	D102159SCVT188_IST_DUMP_PKT_STORE ⇒ Click the button " End TS!" to proceed	Ed.	T8?		ζ.				1	

Test location:	10			
Tool location.	Operator	Product-Assurance:	Date:	Time
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00000	1800	1891.	19/07	∞.50

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Herschel

Step- No.	IST_END-Step-Description	Nomi Valu		Tolerance	Actual Value			Р	N
	Z010999MCVT004_IST_END								
Only if	If one of the instruments is detected "ON" reply to the prompt:					Andrew Control of the Control			
PACS,	"Should the sequence"								
SPIRE or HIFI	Z102999SCVT011_ASDGEN_PACSPWROFF_P	THE REAL PROPERTY.	A STATE OF THE PARTY OF THE PAR						
is still	Z102999SCVT005_ASDGEN_SPIREPWROFF_P Z102999SCVT015_ASDGEN_HIFIPWROFF_P					-	and a second and a		
ON	"be called?"					***************************************			
	⇔ Click the button "YES" to proceed								
	Z010999MCVT004_IST_END							-	
CCUA	If CCU is detected "ON" reply to the prompt: Should the sequence "K102999ECVT001_ASDGENCCU_ABPWROFF be called	YE	3		Yes			V	

Test location:				
root location.	Operator	Product-Assurance:	Date:	Time
ES7378_	ADR	RIM!	10/0	•
		300	1001	

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Step- No.	IST_END-Step-Description	Nomin Value	 Tolerance	Actual Value			Р	N
6.	Z010999MCVT004_IST_END						-	+
Only if								
RWL	"Please ensure that ACMS is set in OCM mode, otherwise					Occasional		
ON and	select the correct menu in the ACMS_CONFIG25"							
ACMS is								
still in	Perform chapter 7.4.1 then click OK							
SCM				THE REAL PROPERTY AND ADDRESS OF THE PARTY O		A constant of the constant of		
7.	Z010999MCVT004_IST_END				Out of Lim	its concerning		-
	Start the sequence A102109SPVT061_RWL_SPINDOWN?				RWL spee	d are expected L spin down		
still spinning	⇔ Click the button "YES" to proceed							
8.	Z010999MCVT004_IST_END)
	Start the sequence A102109SPVT012_ACMS_OFF?	YES		709			1	
still ON	⇒ Click the button "YES" to proceed					Manager suppression		

Test location:	Operator	Product-Assurance:	Data	<u></u>
PRIDE	4500	Troduct-Assurance.	Date:	Time :
07.0		0000	19/05	

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Step- No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value			Р	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.	On		9_			i/	
Only if SREM is still ON		04				290 NCR 3986 set in HPSDB	V	/
11.	D102159SCVT174_IST_REDUNDANT_CONF ⇔ Click the button "Ens TS" to proceed	9K					U	,
Test location	Operator ADR	Product-Assurar	ice:	Date:	10/07	Time	:	

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Step- No.	IST_END-Step-Description	Nomi Valu		Tolerance	Actual Value		Р	N
Only if Survival	"separated". It must be set to "not separated" to avoid a reconfiguration during power off"	ag ny						
13. Only if Survival Register set with separated flag	D102159SCVT175_SET_SURV_REG							
est location:	Operator	Product-	Assurar	nce:	Date:	Time		

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Step- No.	IST_END-Step-Description	Nomi Valu		Tolerance	Actual Value			P	N
	Z010999MCVT004_IST_END							 	
14.	Reply to the prompt								
Only if	"The CROME registers are not configured "								
CROME									
wrongly set	"Such configuration will block TM during Power OFF"								
	⇔ Click the button "YES" to proceed								
15.	D102159SCVT176_WRITE_CROME							-	-
Only if	_								
CROME									
wrongly	⇔ Click the button "End TS!" to proceed								
set	·								
16.	D102159SCVT188_IST_DUMP_PKT_STORE					company.	+ /	 	-
Only if						len	roteol		
SSMM is	⇔ Click the button "End TS!" to proceed					Put	CTa.	/	
ON						dans			
17.	D102159SCVT181_Disable_PKT_STORE					es eady	Olyphi		-
Only if		01/			- 14	1	*		
SSMM is	⇒ Click the button "End TS!" to proceed	ok	-		or				
ON									

Test location:				
rest location.	Operator	Product-Assurance:	Date:	Time
271200	1-	- 2181	20.0.	Time
65036	400		10/ =	
	7000		(0)	

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Step- No.	IST_END-Step-Description	Nomina Value	Tolerance	Actual Value	Р	N
	in (a) i) Evaluating two living of the caddless figures entire	Øh.		Oh.	Y	
19. Not for Launch Cases	D102159SCVT001PM_SELECT	Qh_		on	\sim	//
20.	Z010999MCVT002_POWER_OFF_HER_IST ⇒ Click the button "End TS!" to proceed	OK		on		

Test location:				
Tool toodion.	Operator	Product-Assurance:	Date:	Time
9120	Mo	K/R/	5 /-0	•
			10/01	-

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Herschel

Step- No.	IST_END-Step-Description	Nomi Valu		Tolerance	Actual Value		Р	N
21	Y102989ETVT020_TTC_SCOE_OFF		and the same of th					\vdash
Only if		AND THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TO THE PERSON NAMED IN COLU						
TTC-								
SCOE is still ON	⇒ Click the button "End TS!" to proceed							
	Z010999MCVT004_IST_END							
21.	⇔ Click the button "End TS!" to proceed	OK					\/	
22.	IST_GUI							
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_xxxxx_x_x_END_xxx							

Test location:		1			
· set issuiton.	Operator	Product-Assurance:	Date:	Ti	ime
Estre	120	island	1 1 0	2.0	•
	100	911.	10/0)		•

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7.4.1 ACMS SCM to OCM transition for power off

Step- No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		Р	N
	A102109SPVT003_ACMS_CONFIG25						\dashv
	At the prompt "Enter your choice", insert "2" to select "Transition SCM to OCM"	2					
	⇔ Click the button "OK" to proceed, then "Continue"						
	A102109SPVT003_ACMS_CONFIG25					_	\dashv
	At the prompt Menu 7 "Enter your choice", insert "5" to select "Reaction wheels spin down"	5					
	Click the button "OK" to proceed, then "Continue"						
	A102109SPVT003_ACMS_CONFIG25					+	
26.	At the prompt Menu 9 "Enter your choice", insert "1" to select "Switch off ACMS"	1					
	Click the button "OK" to proceed, then "Continue"						
Test location	Operator	Product-Assura	ince:	Date:	Time		
						:	

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Step- No.	IST_END-Step-Description	Nominal Value	Tolerance	Actual Value		Р	N
27.	A102109SPVT012_ACMS_OFF During this sequence, following event are expected to occur: • TM(5,4) Evtld:16426 Mode SBSM Entry • Event Report - Boot Report and Reconfiguration Log • Event Report - SDB Unhealthy • TM(5,2) EvtlD: 33 Event Report - ACB Rx Failed • TM(5,2) EvtlD: 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					

T-11					
t location:	Operator	Product-Assurance:	Date:	Time	7
				•	1
				•	

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Step- No.	IST_END-Step-Description	Nom Val	 Tolerance	Actual Value		Р	N
	A102109SPVT017_ACMS_CRS_BACKGROUND						
29.							
	⇒ Terminate the sequence.						

Test location:				
rest location;	Operator	Product-Assurance:	Date:	Time
				111110
	1			: 1

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Summary Sheets

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8.1 Procedure Variation Summary

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

Table 8.1-1: Procedure Variation Sheet

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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/	PA	
			Closed	sig.	

Table 8.2-2: NCR/SPR Record Sheet

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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	Bby.

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Annex B: Script Hierarchy

```
>Z010999MCVT001_POWER_ON_HER_IST $PM $tcDec $batScoe
 |----> Y102989EPVT007 IST PWR SCOE ON $configBS
 |----> async referby timeSynchronisation D102159SCVT032TIMESYNCRO
 |----> D102159SCVT210_GET_ALARM_STATUS
 |----> D102159SCVT210_GET_ALARM_STATUS
 |----> W102584EPVT007 IST CHECK PCDU
 |----> Z010999MMXX002UNITS_CHECK
 I-----> 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
 I----> R102479ECVT009_UNITS_SELECTION
> D102159SCVT210_GET_ALARM_STATUS
> D102159SCVT176_WRITE_CROME $papCcs 1
> D102159SCVT174_IST_REDUNDANT_CONF $bus $pcduTmTc $hps $txChain $rfdn $tmObt
|----> 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
```



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```
|----|---> ACMS_get_RM_status RMB
I-----> 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
> $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
I-----> 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
```

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----> Z010999MMXX003UNITS_CHECK_PWR_OFF

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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	

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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 Ec programs hangs.	quipment) electrical stimuli
Operator Action:	
Until NCR / SPR is solved the following workarou	und is proposed (by Martijn):
During powering the Power SCOE in the cleanro	om:
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 cro	oss in the upper right corner.
3) Start the UCE application by double clicking th 'Star Mapper Analogue Chain Simulation' should	· • • • • • • • • • • • • • • • • • • •
4) Press 2 time 'scroll lock' and select PC#3 and	repeat step 3.

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Operation Note 8

Title:	DOD Alarm	Date: 14/02/08
Observ	ation:	
th d "l	ne DOD flag. Directly after the " ump of the RM LOG and the DO D102159SCVT210_Get_ALARM_	s to be reset , otherwise the S/C
Fo th fo O _I O _I Th Or Th	en increasing the Vbat upper the llowing steps: pen a shell window -> startCMD bsvr the window "H-P BS SCOE" switch the window "BS SCOE Config" cha te push the button save&update	to local nge the Battery Voltage from 25,4 to 19 nge the Battery Voltage from 19 to 25,4 to remote set_ALARM_STATUS



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Operation Note 11

	Title: Failure in TM Check of CCU Valves	Date: 14/02/08
*****	Observation:	
	If CCU Valves sensing lines are connected of CCU the valves status check fails at CC	
· · · · · · · · · · · · · · · · · · ·		
	Operator Action:	
	On Test conductor Console, perform "connect PF	M_CRYO"
	2) Thanks Telemetry Query Display (TQD) check foll - YM648958 (VLV_STATUS_V103) instead of K - YM649958 (VLV_STATUS_V106) instead of K - YM640958 (VLV_STATUS_V501) instead of K - YM641958 (VLV_STATUS_V503) instead of K - YM643 958 (VLV_STATUS_V505) instead of K	(M269302 = "CLOSED" (M269303 = "CLOSED" (M270302 = "CLOSED" (M270303 = "CLOSED"
	On Test conductor Console, perform "disconnect I	PFM_CRYO"

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Insert actual distribution list

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Annex 7

SCOE-and Flight-skin connector configuration

Content:

 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

Doc. No: HP-2-ASED-TR-0254

Issue: 1

Date: 02.06.2008 File: HP-2-ASED-TR-0254_1.doc



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

SKIN-01	PWR Panel (PCDU)			化美国 排泄 法特别	1100
	Connector Function	Skin Connector	S/C unit	SCOE CABLE Flight Co	nnector
	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			LPS SCOE	- II
		SK01BJ12	PCDU	Cable Plugged POWER SCOE \(\)	
	SA Nom Power	SK01AJ01	PCDU	Cable Plugged POWER SCOE	
	SA Nom Power	SK01AJ02	PCDU	Cable Plugged POWER SCOE	
	SA Nom Power	SK01AJ03	PCDU	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 V	
	SA Red Power	SK01AJ07	PCDU	POWER SCOE V	
SKIN-02	PWR Panel (ACC, CDMU, RCS, 15	53 & Thruster)			
	Connector Function	Skin Connector	S/C unit	SCOE CABLE Flight Co	nnector
SKIN-02	DMS 1553 Bus_A	J01	CDMU	Flight Plu SK02P01	-
SKIN-02	DMS 1553 Bus_B	J02	CDMU	Flight Plu SK02P02	•
SKIN-02	ACMS 1553 Bus_A	J03	ACC	Flight Plu SK02P03	•
SKIN-02	ACMS 1553 Bus_B	J04	ACC	Flight Plu SK02P04	•
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	Copper Tape	3500
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 Plu SK02P07	-
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS	Flight Plu	

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CRS1 AOCS Sgn	J01	CRS-1/ACC		ACMS Flight plug
Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
GYR/QRS Panel				
RWL4 Sgn	J04	ACC/RWL-4		ACMS Flight Plug SK04P04 Plugged
RWL3 Sgn	J03	ACC/RWL-3		SK04P03 Plugged
NVVLZ Ogii	J02	ACC/RWL-2		SK04P02 Plugged ACMS Flight Plug
DWI 2 San				ACMS Flight Plug
RWL1 Sgn	J01	ACC/RWL-1		ACMS Flight Plug SK04P01 Plugged
Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
ACMS Panel (RWE)				
TTC Panel Test point J 60				1
			MGA	/,
RF link for antenna MGA			/	/
RF link for antenna LGA2	N/A		1/	
			V/	I light connector
	Skin Connector	S/C unit	SCOF CABLE	Flight Connector
	J SNUJJUZ	AFINDZ/EPGZ		
Test point TC + protection	SKU3 IU3	YDND2/EDC2	Copper Tape	V
jumper EPC1	SK03J01	XPND1/EPC1	Copper Tape	Ψ
	Skill Conflector	S/C unit	SCOE CABLE	Flight Connector
	Skin Connector	S/C unit	SCOE CARLE	Flight Connect
	J17	ACC/GYRO-E2		SK02P17 Plugge
0				ACMS Flight Plu
Gyro A On/Off Cmd	J16	ACC/GYRO-E1		ACMS Flight Plu SK02P16 Plugge
Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		SK02P15 Plugged
Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		SK02P14 Plugged
Tilidatei O/D Fleateia IX	313	ACC/CBH	Соррегтаре	ACMS Flight Plug
				y
	J11	ACC/RCS	0 7	/SK02P11 Plugged
	310	ACC/CDIVIO		SK02P10 Plugge Flight Plug
	110	ACC/CDMU		Flight Cap
	J09	ACC/CDMU		SK02P09 Plugge
	1			Flight Cap
	Str1/2 On/Off Cmd R/Str2 Sts Gyro A On/Off Cmd Gyro B On/Off Cmd TTC Panel Connector Function Test point TC + protection jumper EPC1 Test point TC + protection jumper EPC2 RF LINK Connector Function RF link for antenna LGA1 RF link for antenna LGA2 RF link for antenna MGA TTC Panel Test point J 15 TTC Panel Test point J 60 ACMS Panel (RWE) Connector Function RWL1 Sgn RWL2 Sgn RWL3 Sgn RWL4 Sgn GYR/QRS Panel Connector Function	CDMU and ACC EEPROM reprogramming input Thruster Temp R/LV2 Sts Thruster C/B Heaters M J12 Thruster C/B Heaters R J13 Str1/2 On/Off Cmd M/Str1 Sts J14 Str1/2 On/Off Cmd R/Str2 Sts J15 Gyro A On/Off Cmd J16 Gyro B On/Off Cmd J17 TTC Panel Connector Function Test point TC + protection jumper EPC1 SK03J01 Test point TC + protection jumper EPC2 RF LINK Connector Function RF link for antenna LGA1 RF link for antenna LGA2 RF link for antenna MGA TTC Panel Test point J 15 TTC Panel Test point J 60 ACMS Panel (RWE) Connector Function RWL1 Sgn J01 RWL2 Sgn J03 RWL3 Sgn J04 GYR/QRS Panel Connector Function Skin Connector Skin Connector	CDMU and ACC EEPROM reprogramming input J10 ACC/CDMU Thruster Temp R/LV2 Sts J11 ACC/RCS Thruster C/B Heaters M J12 ACC/CBH Thruster C/B Heaters R J13 ACC/CBH Str1/2 On/Off Cmd M/Str1 Sts J14 ACC/STR-1 Str1/2 On/Off Cmd R/Str2 Sts J15 ACC/STR-2 Gyro A On/Off Cmd J16 ACC/GYRO-E1 Gyro B On/Off Cmd J17 ACC/GYRO-E2 TTC Panel Connector Function Skin Connector S/C unit Test point TC + protection jumper EPC1 SK03J01 XPND1/EPC1 Test point TC + protection jumper EPC2 SK03J02 XPND2/EPC2 RF Link Connector Function Skin Connector S/C unit RF link for antenna LGA1 N/A LGA1 LGA2 RF link for antenna MGA N/A MGA TTC Panel Test point J 15 TTC Panel Test point J 60 ACMS Panel (RWE) ACC/RWL-1 Connector Function Skin Connector S/C unit RWL2 Sgn J02 ACC/RWL-3 RWL3 Sgn J03 ACC/RWL	CDMU and ACC EEPROM reprogramming input Thruster Temp R/LV2 Sts Thruster C/B Heaters M J12 ACC/CBH Copper Tape Thruster C/B Heaters R J13 ACC/CBH Copper Tape Str1/2 On/Off Cmd M/Str1 Sts J14 ACC/STR-1 Str1/2 On/Off Cmd R/Str2 Sts J15 ACC/STR-2 Gyro A On/Off Cmd J16 ACC/GYRO-E1 Gyro B On/Off Cmd J17 ACC/GYRO-E2 TTC Panel Connector Function Test point TC + protection jumper EPC1 SK03J01 XPND1/EPC1 Test point TC + protection jumper EPC2 RF LINK Connector Function Skin Connector S/C unit SCOE CABLE RF link for antenna LGA1 N/A LGA1 N/A LGA1 N/A LGA2 N/A LGA2 RF link for antenna MGA TTC Panel Test point J 60 ACMS Panel (RWE) Connector Function Skin Connector S/C unit SCOE CABLE RWL1 Sgn J01 ACC/RWL-1 RWL2 Sgn J03 ACC/RWL-2 RWL4 Sgn J04 ACC/RWL-4 GYRQRS Panel Connector Function Skin Connector S/C unit SCOE CABLE SCOE CABLE COPPER Tape Copper Tape ACC/RWL-4 GYRQRS Panel Connector S/C unit SCOE CABLE SCOE CABLE COPPER TAPE COPPER TAPE ACC/RWL-1 ACC/RWL-1 ACC/RWL-2 RWL4 Sgn J03 ACC/RWL-3 RWL4 Sgn J04 ACC/RWL-4 GYRQRS Panel Connector Function

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SKIN-05 SKIN-05	GYRO RS422 / Test CRS 1/2 Stimuli	J03 J04	GYRO CRS-1,2		ACMS Flight Cap \ ACMS Flight Cap \
SKIN-05 SKIN-05	AAD Sgn M SAS1/2 Sgn M	J05 J06	AAD/ACC		ACMS Flight Plug \
SKIN-05	SAS1/2 Sgn R	J07	SAS/ACC SAS/ACC		ACMS Flight Plug \ ACMS Flight Plug \
SKIN-05	AAD Sgn R	J08	AAD/ACC		ACMS Flight Plug
SKIN-06	STR Panel	州特别的			
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-06	STR1 Stimuli	J01	STR1		ACMS Flight Plug
SKIN-06	STR2 Stimuli UMBILICAL	J02	STR2		ACMS Flight Plug \
THE RESERVE OF THE PARTY OF THE		The same of the sa	I amount to the second	AND DESCRIPTION OF THE PARTY OF	STATE OF THE PARTY
	Connector Function	Connector	S/C unit	SCOE CABLE	14.8至于是1284至6
	Connector Function Power/Data	Connector HU1 J01	S/C unit	SCOE CABLE SCOEs cable Plugged	

F1, Mg, M.M. 180 09.05.08 17:05

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Annex 8

Analysis Of Tm Generation Compatibility With MGA Transmission

10 pages

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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 desensitisation 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),...
 - o No disruption of the digital processes (e.g. packetisation) responsible for Tm generation
- PACS, SPIRE and HIFI RT HK:
 - No degradation in continuity,
 - o No degradation in self-consistency (value monotonicity),
 - o 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):
 - o 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:

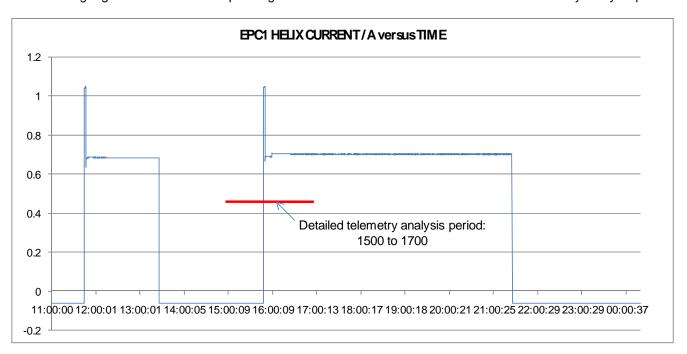
Tm Reference	Tm Short Name	Additional Descriptor	Plotted
SMB0K510	BIASTEMP	SPIRE /K	✓
SMF9K520	BSMIFTEMP	SPIRE /K	
SMM0K515	MCUMACTEMP	SPIRE /K	✓
PM410410	BOL_TEMP_FPU_ST	PACS /K	✓
PM408410	BOL_TEMP_TS	PACS /K	✓
PM406410	BOL_TEMP_SP	PACS /K	
HM250191	HF_AP_4K_END_CT	HIFI /K	✓
HM248191	HF_AP_2K_IF_CT	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
 - o 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
 - o Indicated "1280" throughout period of test
 - Unperturbed by transmission on MGA

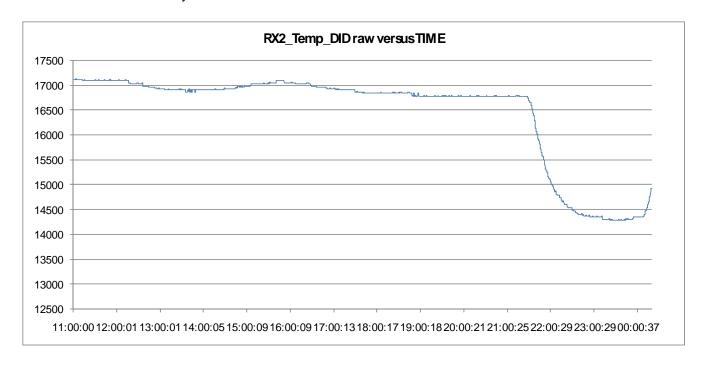
The following Tm points represented analogue values (constant throughout the test period):

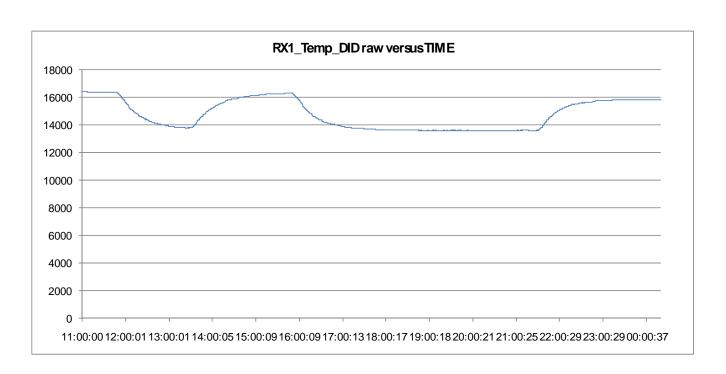
- WM609565 HiFilCU_R_L68_I
 - L68 was off throughout period of test and Tm indicated a constant current "0"
 - Unperturbed by transmission on MGA
- WM409565 HiFiLCU_R_L54_I
 - o L54 was off throughout period of test and Tm indicated a constant current of "0"
 - Unperturbed by transmission on MGA

1.6 Graphical Output

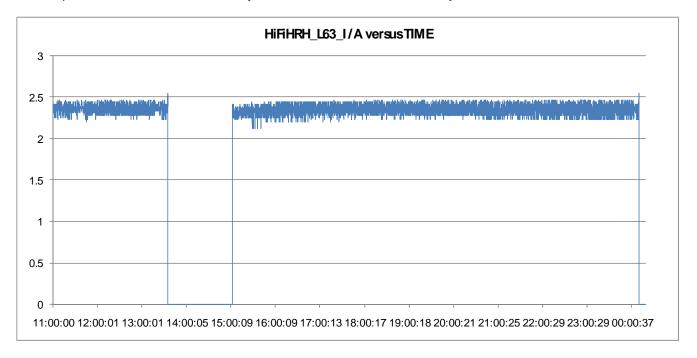
All the following graphical outputs indicate continuous telemetry with monotonic trend throughout the period of Tm transmission by umbilical and over the MGA.

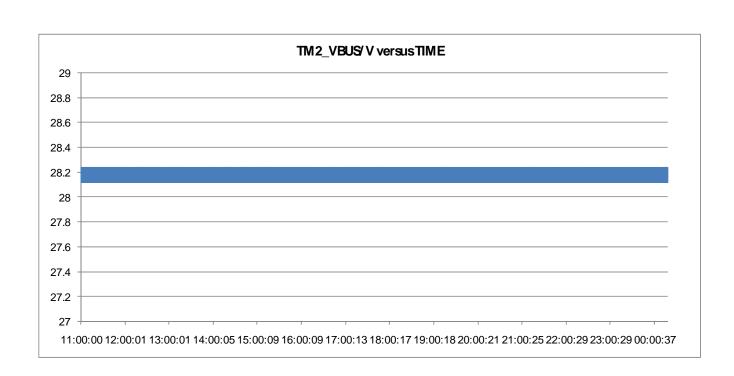
1.6.1 Platform Telemetry

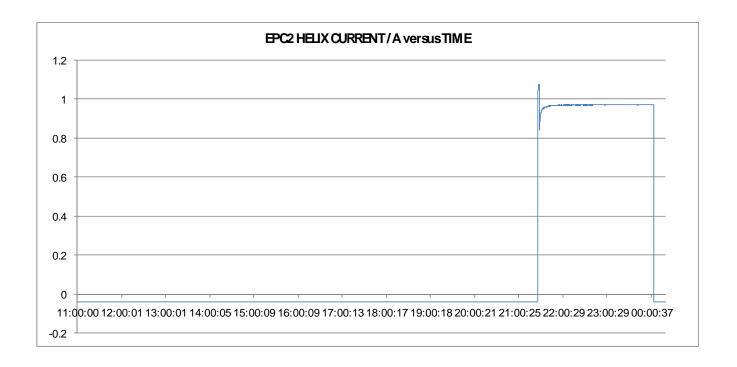




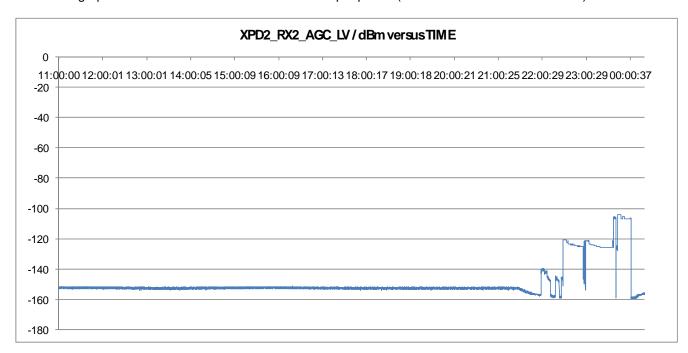
Note that the HIFI instrument was placed in Standby for the period approximately 1335 until 1505. This off-period is not a feature induced by the effect of MGA on the telemetry.

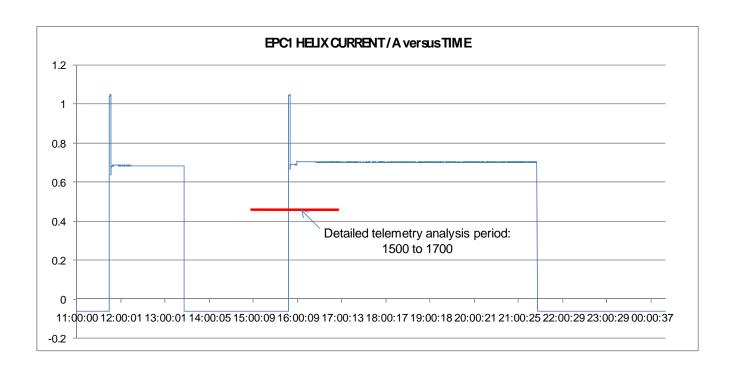




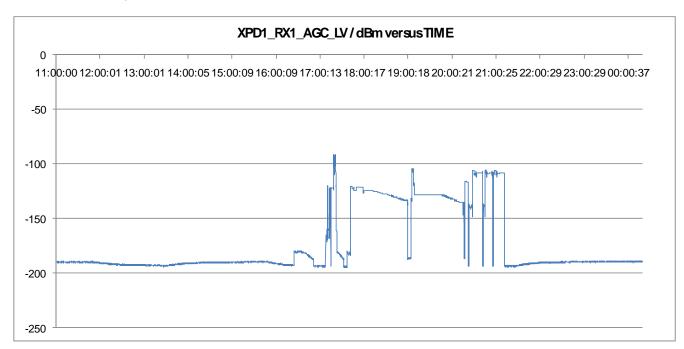


The XPD2 graph shows the effects of variations of Rx input power (and intentional receiver unlocks)



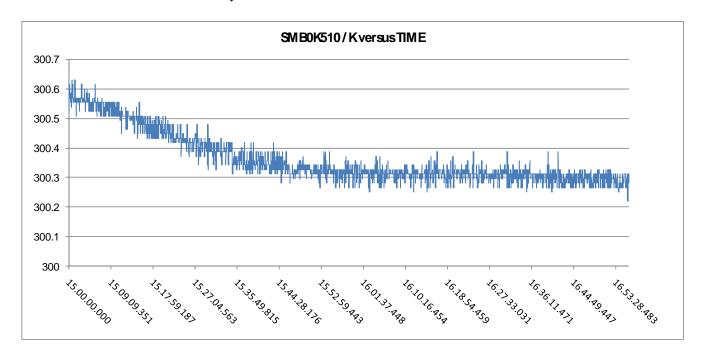


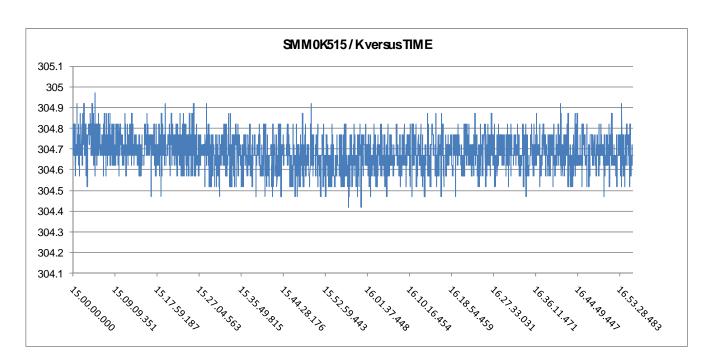
The XPD1 graph shows the effects of variations of Rx input power (and intentional receiver unlocks) during the second TWTA1 on-period.



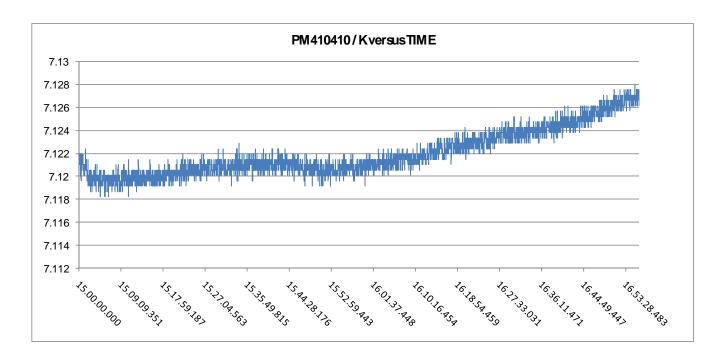
1.6.2 Instrument Telemetry

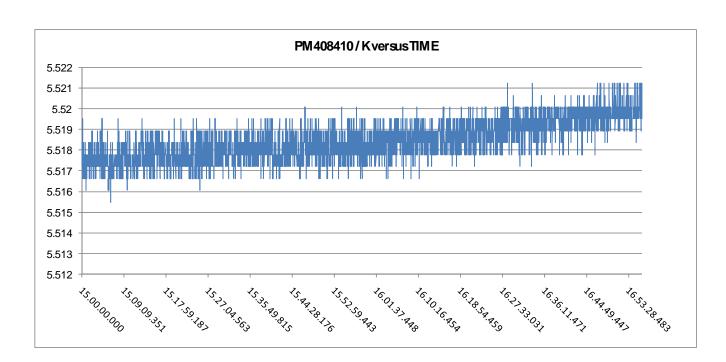
1.6.2.1 SPIRE instrument telemetry



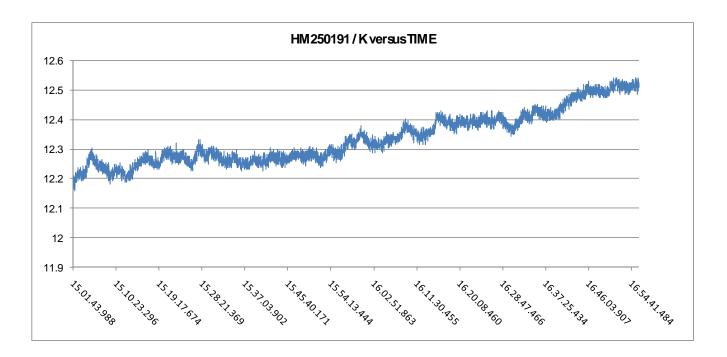


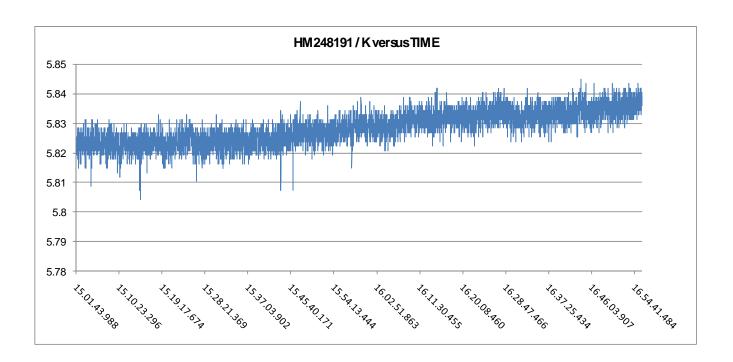
1.6.2.2 PACS instrument telemetry:





1.6.2.3 HIFI instrument telemetry:







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NCR 4207

3 pages

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Wednesday May 28 2008 4:6 PM

Company Project Name NCR-No: HP-100000-ASED-NC-4207				207		
ALCATEL	HERSCHEL-PLANCK	Related interna				
		Critical Item:Ye	es No X	Revision 0		
		Page 1 of 3				
	Nonconforr	nance Repo	rt			
NCR Title EMC Autocomp - Safety	Loop triggered when switching back	k on Transponder				
NC Item Identification HERSCHEL	. SATELITE					
Next Higher Assembly HERSCHEL	-PLANCK COMPOSITE					
Drawing No		Sr No.				
Procedure No HP-2-ASED-PR-0110	6 ·					
Supplier		Purchase Orde	er			
Subsystem		Model	FM			
NC Observation Date: 08-MAY-08 Location: Estec		NC Detected [Ouring Test			
Description of Nonconformance	Description of Nonconformance Requirements Violated					
In order to allow the start of Autocomfor the removal antenna CAPs	p PVS#1 raised against PR-0116 to	switch off the TWT	A's & TRSP's			
however during switch on of TRSP1 a safety to status at the time of the Safety Loop was: Proceeding the safety Loop was: Proce	acs Stby, Spire Stby, HiFi nosiey,A0					
Cause of NC Corrective/Preventative Action(s)						
Co.rection residuate residual						
Verification						
Internal NRB Dispositions Classification:						
Added By B Hogg	Added By B Hogg Major X Minor					
NRB 9th May 2008 Customer Notification						
AdC/IL/MP/AK/BH/WD	AdC/IL/MP/AK/BH/WD 09-MAY-08					
The SC was being powered by the B was also providing 12A (6 sections a	S providing 10A (I Trip set to 21A) I t 2A).	n addition the SAS				
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.						

Wednesday May 28 2008 4:6 PM

		1100::000	ay May 20 2000 7.0 1 W		
Company	Project Name	NCR-No: HP-100000-ASED-NC-4207	NCR-No: HP-100000-ASED-NC-4207		
ALCATEL	HERSCHEL-PLANCK	Related internal NCR-No:			
		Critical Item:Yes No X	Revision 0		
		Page 2 of 3			
No	onconformance Report	- Continuation Sheet -			
error in the configuration file for the	trigger it was noticed there is believed test. BS providing current to the SC power for this test, (ref to SPR525).				
Next Step is to recover the SC usin	g the safety loop recover procedure a	as follows.			
Reset the BS, then recover SC					
RM A&B. As soon as power is prov	ed with multi Cmds prepared to manu- rided by the BS to the SC these TC C ce the power off sequence shall be pe	mds shall be sent.			
Added 09/05/08 @ 02:15, the above SC recovery procedure has successfully been completed.					
NRB agrees that the SC shall be po continuation of EMC RE tests.	ower on using the normal IST switch of	on procedure for			
	ge the Configuration File to set the bally max power in order to avoid the su				
Subsequent to SC power on the ins	struments will brought to Stby mode.				
Ref. to MoMs					
Date: Name: Signature:					

	Wednesday May 28 2008 4:6					
	Company	Project Name		NCR-No: HP-100000-ASED-NC-4207		
ALCATEL		HERSCHEL-PLAN	NCK R	elated internal NCR-No:		
				ritical Item:Yes No X	Revision 0	
	No	nconformance R	Report - Co	ntinuation Sheet -		
NCR/NR	B Attachments					
	Description		Filename		Last Updated	
1	Configuration File for Tes	st	peppe.jpg		09-MAY-08 04:20:25	
	Description		Filename		Last Updated	
2	SC PWR prior safety loo	p	GEN-POWER_mimic1.jpg		09-MAY-08 04:25:48	
	Description		Filename		Last Updated	
3	Cmd history around time occurrence	of safety loop	CMD_his_SafetyLoop.txt		09-MAY-08 04:27:38	
	Description		Filename		Last Updated	
4	CDMU log at time of safe	ety loop	CDMU_bootreport_2008.129.		09-MAY-08 04:29:43	
	Description Filename			Last Updated		
5	cdmu prior safety loop		CDMU_bootreport_2008.129.		09-MAY-08 04:28:48	
	Description		Filename		Last Updated	
6	SC status when safety lo	ety loop occurred SAT_mimic2.jpg		pg	09-MAY-08 04:19:18	
	Description		Filename		Last Updated	
7	Applied test Configuration Comp	n for RE and Auto	IST_TEST_CONFIGURATION.tx		09-MAY-08 04:22:37	
	Description		Filename		Last Updated	
8	ACC report	4	ACC_bootreport_2008.129.0		09-MAY-08 04:28:07	
	Description		Filename		Last Updated	
9	herschel sat overview 1		SAT_mimic1.j	pg	09-MAY-08 01:30:33	
	Description		Filename		Last Updated	
10	SC pwr at safety loop		GEN-POWER	_mimic2.jpg	09-MAY-08 04:26:32	
	Description		Filename		Last Updated	
11	report of safety loop on S	AS	SAS-SCOE_window2.jpg		09-MAY-08 04:24:28	
	Description		Filename		Last Updated	
12	SAS settings prior to safe	ety loop	SAS-SCOE_w	rindow1.jpg	09-MAY-08 04:23:50	
	Description		Filename		Last Updated	
13	BS safety loop		BS-SCOE_wir	ndow.jpg	09-MAY-08 04:25:15	



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END OF DOCUMENT

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Test Report

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	Name	Dep./Comp.		Name	Dep./Comp.
	Baldock Richard	FAE12		Steininger Eric	AED321
	Barlage Bernhard	AED13		Stritter Rene	AED11
	Bayer Thomas	ASA42	Х	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	х	Wietbrock Walter	AET12
Х	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			
Х	Hohn Rüdiger	AED65			
	Hofmann Rolf	ASE252			
Х	Hopfgarten Michael	AET32			
	Huber Johann	ASA42			
	Hund Walter	ASE252			
Х	Idler Siegmund	AED312			
	Ivády von András	FAE12			
	Jahn Gerd Dr.	ASG23	Х	ESA/ESTEC	ESA
	Jolk Matthias	AET1	Х	Thales Alenia Space Cannes	TAS-F
	Klenke Uwe	ASG72		Thales Alenia Space Torino	TAS-I
	Koelle Markus	ASA43		·	
Х	Koppe Axel	AED312		Instruments:	
Х	Kroeker Jürgen	AED65	Х	MPE (PACS)	MPE
	La Gioia Valentina	Terma	Х	RAL (SPIRE)	RAL
	Lang Jürgen	ASE252	Х	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
Х	Müller Martin	ASA43		Dutch Space Solar Arrays	DSSA
	Pietroboni Karin	AED65		·	+
	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
Х	Sonn Nico	ASG51		Thales Alenia Space, Antwerp	TAS-ETCA

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