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Test Report

Herschel

Title: Test Report for SPIRE SFT before TV

CI-No: 112 200

Prepared by:	A. Koppe	Date:	13.11.08
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Distribution: See Distribution List (last page)

Issue	Date	Sheet	Description of Change	Release
1	13.11.08	All	Formal Issue	

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1 Scope

This document reports on the SPIRE SFT at He1 conditions, performed before the HERSCHEL TB/TV test, to verify proper instrument operation.

The test was executed with the S/C in vertical position using the Herschel CCS & I-EGSE.

1.1 Objective

The objective of this SFT was:

- To check the correct functional operation of the SPIRE FM under He1 conditions on nominal and redundant side
- To verify that the SPIRE instrument is ready for TV testing

Note: The SPIRE detector checks, Mechanism and LPU tests were not part of this SFT.

1.2 Test Flow

The SFT Test flow is as follows:

1. Power on not required since S/C already ON
2. configure SPIRE I-EGSE for test
3. Power on SPIRE Prime and enable Mil1553B-bus interface
4. Run Nominal SFT Procedures as per table 1.2-1
5. Disable Mil1553B-bus interface and Power off SPIRE Prime
6. Power on SPIRE Redundant and enable Mil1553B-bus interface
7. Run Redundant SFT Procedures as per table 1.2-2
8. Disable Mil1553B-bus interface and Power off SPIRE Redundant
9. Disconnect and Switch-Off all SPIRE I-EGSE

Step #	Procedure Name	Purpose
1.	SPIRE-FM-SFT-FUNC-SCU-01-P	SCU Nominal Science Packet Generation Check PRIME
2.	SPIRE-FM-SFT-FUNC-SCU-03-P	SCU DC Thermometry check PRIME
3.	SPIRE-FM-SFT-FUNC-SCU-06-P	SCU AC Thermometry check PRIME
4.	SPIRE-FM-SFT-FUNC-SCU-07-P	Sorption Cooler Heaters Check PRIME
5.	SPIRE-FM-SFT-FUNC-SCU-04-P	Photometer Calibrator Check PRIME
6.	SPIRE-FM-SFT-FUNC-SCU-05-P	Spectrometer Calibrator Check PRIME
7.	SPIRE-FM-SFT-FUNC-MCU-01-P	MCU Boot Check PRIME
8.	SPIRE-FM-SFT-FUNC-MCU-02-P	MCU Nominal Science Packet Generation Check PRIME
9.	SPIRE-FM-SFT-FUNC-BSM-01-P	BSM Chop/Jiggle Sensors check PRIME
10.	SPIRE-FM-SFT-BSM-0FF-P	BSM switch OFF PRIME
11.	SPIRE-FM-SFT-FUNC-SMEC-01-P	SMEC Encoder and LVDT check PRIME
12.	SPIRE-FM-SFT-SMEC-OFF-P	SMEC switch OFF
13.	SPIRE-FM-FUNC-DCU-01-P	DCU Science Packet Generation Check PRIME
14.	SPIRE-FM-SFT-FUNC-DCU-04-PHOT-P	Photometer LIAs Check PRIME
15.	SPIRE-FM-SFT-PLIA-OFF-P	Photometer LIAs Switch OFF PRIME
16.	SPIRE-FM-SFT-FUNC-DCU-04-SPEC-P	Spectrometer LIAs Check PRIME
17.	SPIRE-FM-SFT-SLIA-OFF-P	Spectrometer LIAs Switch OFF PRIME
18.	SPIRE-FM-SFT-FUNC-MCU-OFF-P	MCU switch OFF PRIME
19.	SPIRE-FM-SFT-FUNC-SCU-OFF-P	SCU Switch OFF PRIME
20.	SPIRE-FM-SFT-LPU-01-P	Checkout of LPU PRIME **not performed (PVS#1)**

Table 1.2-1 SPIRE Prime Functional Procedures

Step #	Procedure Name	Purpose
1.	SPIRE-FM-SFT-FUNC-SCU-01-R	SCU Nominal Science Packet Generation Check REDUNDANT
2.	SPIRE-FM-SFT-FUNC-SCU-03-R	SCU DC Thermometry Check REDUNDANT
3.	SPIRE-FM-SFT-FUNC-SCU-06-R	SCU AC Thermometry Check REDUNDANT
4.	SPIRE-FM-SFT-FUNC-SCU-07-R	Sorption Cooler Heaters Check REDUNDANT
5.	SPIRE-FM-SFT-FUNC-SCU-04-R	Photometer Calibrator Check REDUNDANT
6.	SPIRE-FM-SFT-FUNC-SCU-05-R	Spectrometer Calibrator Check REDUNDANT
7.	SPIRE-FM-SFT-FUNC-MCU-01-R	MCU Boot Check REDUNDANT
8.	SPIRE-FM-SFT-FUNC-MCU-02-R	MCU Nominal Science Packet Generation Check REDUNDANT
9.	SPIRE-FM-SFT-FUNC-BSM-01-R	BSM Chop/Jiggle Sensors check REDUNDANT
10.	SPIRE-FM-SFT-BSM-0FF-R	BSM Switch OFF REDUNDANT
11.	SPIRE-FM-SFT-FUNC-SMEC-01-R	SMEC Encoder and LVDT check REDUNDANT
12.	SPIRE-FM-SFT-SMEC-OFF-R	SMEC Switch OFF
13.	SPIRE-FM-FUNC-DCU-01-R	DCU Science Packet Generation Check REDUNDANT
14.	SPIRE-FM-SFT-FUNC-DCU-04-PHOT-R	Photometer LIAs Check REDUNDANT
15.	SPIRE-FM-SFT-PLIA-OFF-R	Photometer LIAs Switch OFF REDUNDANT
16.	SPIRE-FM-SFT-FUNC-DCU-04-SPEC-R	Spectrometer LIAs Check REDUNDANT
17.	SPIRE-FM-SFT-SLIA-OFF-R	Spectrometer LIAs Switch OFF REDUNDANT
18.	SPIRE-FM-SFT-FUNC-MCU-OFF-R	MCU Switch OFF REDUNDANT
19.	SPIRE-FM-SFT-FUNC-SCU-OFF-R	SCU Switch OFF REDUNDANT
20.	SPIRE-FM-SFT-LPU-01-R	Checkout of LPU REDUNDANT **not performed (PVS#1)**

Table 1.2-2: SPIRE Redundant Functional Procedures

1.3 Procedure Execution Summary:

This test has been run with the HERSCHEL S/C in vertical position and on SPIRE nominal and redundant side.

The following temperatures have been seen before and after the SFT (ref. ANNEX 3):

The L0 temperature(T222) was around 4,4 K.

The L1 temperature (T234) was around 6,7 K.

The L2 temperature (T242) was around 6,8 K

After switch off of the redundant side

The L0 temperature(T222) was around 5,4 K.

The L1 temperature (T234) was around 6,0 K.

The L2 temperature (T242) was around 11,4 K

The test duration of the SPIRE SFT Test was ~ 4 hours.

The following protocols have been written documenting the SPIRE Short Functional Test status:

TRR for SPIRE SFT in He1 before TV	27.10.2008, HP-2-ASED-MN-1627
PTR for SPIRE SFT in He1 before TV	31.10.2008, H-P-2-TAS-MN-10969

Location: ESTEC, Noordwijk, NL

Test Session Name:

2008_10_31_05_29_her cdmu_hpws22_REALTIME_S_SFT He1

Environment: HP_2_ASED _TP_212_iss_1_3_SPIRE_SFT_HE1_END_002

OBSW: CDMS 3.4.0.9, ACMS 3.7

HPSDB: HP-ASP-LI-1441_21

HPCCS Release: HPCCS Release_2.0-1317

Procedure variations as recorded in the Procedure Variation Summary in § 8.1 for the corresponding “as-run” procedure are:

PVS#1	skip LPU tests
PVS#2	record cryo temperatures
PVS#3	skip IEGSE time synchronisation
PVS#4	power on CCU in mode 2.

All non-compliances are recorded in the Observation/NCR Summary below as applicable and detailed further in Section 3.

The following observations were made during the test:

Time (UTC)	Test Procedure / Step / Script / Command / Event / Anomaly	Remarks / Cause of anomaly / Corrective action	C/A type (T/P)	NCR ref. (P
	LSS 21.3 deg C & 49% rel. humidity			
05:29	New session started			
05:56	Start SC Switch ON as per PR0070 i.a.w. TP-0212	Normal Expected OOL seen during PWR ON		
06:19	CDMU completed Switch ON			
06:21	PWR on CCU to Mode 2 i.a.w. PVS			PVS#4
06:40	Perform TP-0212 section 7.2.2 Switch ON SPIRE Prime to STBY	PVS#3 had been prepared prior to start of test but has not been executed. N/A for this test.		
06:45	Expected OOL for SPIRE observed as identified with in procedure TP-0212 during the PWR on of SPIRE.	Expected SPIRE loss of TM & Temp alarms due to switch ON.		
06:57	Start SPIRE SFT Nom			
07:56	Expected CCS Alarm as defined in procedure 7.2.3.17 SPIRE_ALARM_LSMCU_DEAD.			
08:00	Prime SPIRE SFT Completed switch OFF SPIRE PRIME	Expected SPIRE loss of TM alarm due to switch off as defined in proc		
08:07	Skip Section 7.2.5			PVS#1
08:07	Switch on SPIRE Redundant sect 7.2.6	Expected SPIRE loss of TM & Temp alarms due to switch ON as defined in proc		
08:18	Record CRYO Temps during Test prior to start of Section 7.2.7			PVS#2
08:20	Start SPIRE SFT Redund			
09:36	Expected CCS Alarm as defined in procedure 7.2.7.18 SPIRE_ALARM_LSMCU_DEAD.			
09:40	Redundant SPIRE SFT Completed switch of SPIRE Redun 7.2.8	Expected SPIRE loss of TM alarm due to switch off as defined in proc		
13:35	Accidentally aborted the realtime session. Restarted new CCS session and execute operator note 37			
	New Session 2008_10_31_12_34_hercdmu_hpws22_REALTIME_S_SFT_he1			
17:00	Start ACS-435, system time setting to future with running S/C			
17:40	Step 5, close all session on the CCS and change the time of the server and workstartion 21, 22 to future. 2009-10-31			
17:48	Step 6, start session 2009_10_31_17_48_hercdmu_hpws22_REALTIME_futurejmp			

Time (UTC)	Test Procedure / Step / Script / Command / Event / Anomaly	Remarks / Cause of anomaly / Corrective action	C/A type (T/P)	NCR ref. (P
18:14	During time synchronization for future time, we got three (5,4) events cdmuAsw event 5-4 Cyclic Task Overrun			
18:15	Confirm CCS is synchronized with S/C			
18:33	Close all session on the CCS and change the time of the server and workstation 21, 22.			
18:45	start the session using operator note 15 2008_10_31_18_45_hercdmu_hpws22_REALTIME_backagain			
19:08	During time synchronization for current time, no (5,4) event			
19:19	Confirmed that CCS and CCS lite are synchronized with S/C and SCOES. S/C is nominal.			
19:59	PACS and SPIRE OBCP commands failed. (they are already off)			
20:02	Acms command ACAA1002 discarded, (ACMS is off)			
20:05	Commands stopOnBoardSched and StopOBCPManag failed, because that they are already off			
20:35	After have finished the script Z010999MCVT002_TBTV_POWER_OFF_FAST, We noticed that BSSCOE was still online, we set it on offline manually.			
20:45	All nominal SC = OFF End of the session.			
21:08	Rebooted WS 21 and WS 22	Clean start for tomorrow		

Table 1: SPIRE SFT Test Summary

2 Documents/Drawings

2.1 Applicable Documents

AD1	SPIRE FM Short Functional Test (Warm or Cold)	HP-2-ASED-TP-0212, Issue 1.3

2.2 Reference Documents

None

2.3 Other Documents

None

2.4 Acronyms & Abbreviations

See “as-run” procedure.

3 Main Observations and Problems Identified.

The following NCR´s reoccurred during this run of the SPIRE SFT at He1:

3.1 SPIRE (NCR-3955)

Has been closed, but was seen again

3.2 SPIRE (NCR-4289)

SCALTEMP value on redundant side found not compatible to primary side value in procedure 7.2.7.2, SPIRE-FM-SFT-FUNC-SCU-03-R. The expected value is ~ 11 K the value seen is 32.9 K.

The MIB is to be corrected accordingly.

No other NCR have been raised.

3.3 Procedure Changes

No updates or clarifications have been identified during the SFT procedure.

4 Conclusion

The SPIRE SFT at He1 conditions before TV was successfully performed.

The detailed evaluation of the test results will be performed by RAL and issued in a separate instrument test report.

4.1 Open Issues

none

4.2 Requirements Verified

With the above SFT the health check of the SPIRE instrument before the TV test has been proven.

5 Appendix 1: SPIRE FM Short Functional Test

As-Run Procedure

(ref. HP-2-ASED-TP-0212, issue 1.3)

AS Run Copy 31/10/08

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Test Procedure **Herschel**

2008_10_31_05_2g_herdmn_hpws22-REALTIME_S_SPI_hel

HP_2_ASED_TP_212_iss1_3_SPIRE_SPI-Hel_END.007

Title: **SPIRE FM Short Functional Test (Warm or Cold)**

CI-No: 125 200

Prepared by:	S. Hamer/ TERMA AS A. Koppe		Date: 24th October 2008
Checked by:	S. Idler		30.10.2008
Product Assurance:	R. Stritter		27/10/08
Configuration Control:	W. Wietbrock		30.10.2008
Project Management:	for W. Fricke		30.10.2008
TAS-F	D. Montet		

Distribution: See Distribution List (last page)

Issue	Date	Sheet	Description of Change	Release
1	30.01.08	All	First Formal Issue	
1.1	03.06.08	11 24 29,68 58 59 65 91 94 95,96 97	Typo in AD1, AD2, AD3 references Modification of text in chapter 7.2 Mode is "DRCU ON" with raw value x0100 Note for type 5/4 event included and typo in script name, step1, removed typo in script name, step1, removed typo in script name, step1, removed typo in negative voltage PLIAM9V (step2) typo in negative voltage SLIAM9V (step2) typo in script name, step1, removed typo in script name, step1, removed	
1.2	19.06.08	all	Implementation of updated RAL SFT procedure, ref. SPIRE-RAL-PRC-2494, issue 2.5 and red-markings according to as-run procedure of SFT performed on 9.06.2008	
1.3	24.10.08		Update of IEGSE check and TBTV specifics. Implementation of updated RAL SFT procedure , ref. SPIRE-RAL-PRC-2494, issue 2.6	

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1 Scope

This document describes the set of Short Functional Tests (SFTs) to be performed on the fully integrated SPIRE FM Instrument to check correct operation using the Herschel CCS without the need of connection to I-EGSE.

Specifically this procedure is part of the overall Satellite SFT which will be performed after shipment to ESTEC (SFT1) and also at the end of Environment Testing (SFT2). It can be performed in either Warm or Cold (Hel or HeII) conditions. Both redundancies are tested within this procedure.

It will also be executed during TBTV cold and hot phases.

Constraints

- Before carrying out the next procedure within the test sequence always ask for the go ahead by the SPIRE staff.
- SMEC
- Any text in boldface in the procedural steps generally indicates an action which may have to be performed manually by the CCS staff.

1.1 Objective

1. The objective of the test is to perform a short "health-check" of the FM instrument.

1.2 Test Flow

This test flow is structured to reflect nominal operations of the FM SPIRE.

The flow is as follows:

1. Power on and configure SPIRE I-EGSE for test if required
2. Power on and configure SVM for test
3. Power on SPIRE Prime and enable Mil1553B-bus interface
4. Run Nominal SFT Procedures as per table 1.2-1
5. Disable Mil1553B-bus interface and Power off SPIRE Prime
6. Power on SPIRE Redundant and enable Mil1553B-bus interface
7. Run Redundant SFT Procedures as per table 1.2-2
8. Disable Mil1553B-bus interface and Power off SPIRE Redundant
9. Power off SVM
10. Switch off all EGSE

Step #	Procedure Name	Purpose	Duration
1.	SPIRE-FM-SFT-FUNC-SCU-01-P	SCU Nominal Science Packet Generation Check PRIME	3 min
2.	SPIRE-FM-SFT-FUNC-SCU-03-P	SCU DC Thermometry check PRIME	8 min
3.	SPIRE-FM-SFT-FUNC-SCU-06-P	SCU AC Thermometry check PRIME	2 min
4.	SPIRE-FM-SFT-FUNC-SCU-07-P	Sorption Cooler Heaters Check PRIME	5 min
5.	SPIRE-FM-SFT-FUNC-SCU-04-P	Photometer Calibrator Check PRIME	3 min
6.	SPIRE-FM-SFT-FUNC-SCU-05-P	Spectrometer Calibrator Check PRIME	5 min
7.	SPIRE-FM-SFT-FUNC-MCU-01-P	MCU Boot Check PRIME	5 min
8.	SPIRE-FM-SFT-FUNC-MCU-02-P	MCU Nominal Science Packet Generation Check PRIME	5 min
9.	SPIRE-FM-SFT-FUNC-BSM-01-P	BSM Chop/Jiggle Sensors check PRIME	3 min
10.	SPIRE-FM-SFT-BSM-0FF-P	BSM switch OFF PRIME	3 min
11.	SPIRE-FM-SFT-FUNC-SMEC-01-P	SMEC Encoder and LVDT check PRIME	3 min
12.	SPIRE-FM-SFT-SMEC-OFF-P	SMEC switch OFF	3 min
13.	SPIRE-FM-FUNC-DCU-01-P	DCU Science Packet Generation Check PRIME	5 min
14.	SPIRE-FM-SFT-FUNC-DCU-04-PHOT-P	Photometer LIAs Check PRIME	5 min
15.	SPIRE-FM-SFT-PLIA-OFF-P	Photometer LIAs Switch OFF PRIME	2 min
16.	SPIRE-FM-SFT-FUNC-DCU-04-SPEC-P	Spectrometer LIAs Check PRIME	5 min
17.	SPIRE-FM-SFT-SLIA-OFF-P	Spectrometer LIAs Switch OFF PRIME	2 min
18.	SPIRE-FM-SFT-FUNC-MCU-OFF-P	MCU switch OFF PRIME	2 min
19.	SPIRE-FM-SFT-FUNC-SCU-OFF-P	SCU Switch OFF PRIME	2 min
20.	SPIRE-FM-SFT-LPU-01-P	Checkout of LPU PRIME	5 min

Table 1.2-1 SPIRE Prime Functional Procedures

Step #	Procedure Name	Purpose	Duration
1.	SPIRE-FM-SFT-FUNC-SCU-01-R	SCU Nominal Science Packet Generation Check REDUNDANT	3 min
2.	SPIRE-FM-SFT-FUNC-SCU-03-R	SCU DC Thermometry Check REDUNDANT	8 min
3.	SPIRE-FM-SFT-FUNC-SCU-06-R	SCU AC Thermometry Check REDUNDANT	2 min
4.	SPIRE-FM-SFT-FUNC-SCU-07-R	Sorption Cooler Heaters Check REDUNDANT	5 min
5.	SPIRE-FM-SFT-FUNC-SCU-04-R	Photometer Calibrator Check REDUNDANT	3 min
6.	SPIRE-FM-SFT-FUNC-SCU-05-R	Spectrometer Calibrator Check REDUNDANT	5 min
7.	SPIRE-FM-SFT-FUNC-MCU-01-R	MCU Boot Check REDUNDANT	5 min
8.	SPIRE-FM-SFT-FUNC-MCU-02-R	MCU Nominal Science Packet Generation Check REDUNDANT	5 min
9.	SPIRE-FM-SFT-FUNC-BSM-01-R	BSM Chop/Jiggle Sensors check REDUNDANT	3 min

10.	SPIRE-FM-SFT-BSM-0FF-R	BSM Switch OFF REDUNDANT	3 min
11.	SPIRE-FM-SFT-FUNC-SMEC-01-R	SMEC Encoder and LVDT check REDUNDANT	3 min
12.	SPIRE-FM-SFT-SMEC-OFF-R	SMEC Switch OFF	3 min
13.	SPIRE-FM-FUNC-DCU-01-R	DCU Science Packet Generation Check REDUNDANT	5 min
14.	SPIRE-FM-SFT-FUNC-DCU-04-PHOT-R	Photometer LIAs Check REDUNDANT	5 min
15.	SPIRE-FM-SFT-PLIA-OFF-R	Photometer LIAs Switch OFF REDUNDANT	2 min
16.	SPIRE-FM-SFT-FUNC-DCU-04-SPEC-R	Spectrometer LIAs Check REDUNDANT	5 min
17.	SPIRE-FM-SFT-SLIA-OFF-R	Spectrometer LIAs Switch OFF REDUNDANT	2 min
18.	SPIRE-FM-SFT-FUNC-MCU-OFF-R	MCU Switch OFF REDUNDANT	2 min
19.	SPIRE-FM-SFT-FUNC-SCU-OFF-R	SCU Switch OFF REDUNDANT	2 min
20.	SPIRE-FM-SFT-LPU-01-R	Checkout of LPU REDUNDANT	5 min

Table 1.2-2: SPIRE Redundant Functional Procedures

2 Documents/Drawings

2.1 Applicable Documents

AD 1	FM SPIRE PFM Final Electrical Integration Procedure	HP-2-ASED-TP-0166
AD 2	Herschel PCDU & CDMS Nominal Switch On/Off Procedure, Issue 1	HP-2-ASED-PR-0070
AD 3	Herschel SAT Emergency Switch Off Procedure	HP-2-ASED-PR-0071
AD 4	PA Plan	HP-2-ASED-PL-0007
AD 6	Test Specification for Herschel Instrument AVM & FM Tests Performed at Satellite Level, Issue 2	H-P-2-ASP-TS-1083
AD 7	H-P GDIR	H-P-1-ASPI-SP-0027
AD 8	SPIRE I-EGSE Set-Up, Issue 2.1	SPIRE-RAL-DOC-002841

2.2 Reference Documents

RD 1	Herschel Planck Central Checkout System System User Manual	H-P-4-TE-MA-0010
RD 2	SPIRE FM Short Functional Test Procedures	SPIRE-RAL-PRC-2494, iss. 2.6
RD 3	Herschel CDMU ASW S/W Interface Control Document	H-P-4-SSF-IC-0001
RD 4	Herschel CDMU BSW S/W Interface Control Document	H-P-4-SES-NT-0076
RD 5	SPIRE IID-B	SCI-PT-IIDB/SPIRE-02124
RD 6	SPIRE Functional Test Specification Iss. 1.4	SPIRE-RAL-DOC-001652
RD 7	SPIRE Instrument User Manual Iss. 1.3	SPIRE-RAL-PRJ-002395
RD 8	H/P OBT-UTC Time Synchronisation Technical Note Iss. 1.3	PT-CMOC-OPS-TN-6604-OPS- OGH

2.3 Other Documents

None

2.4 Acronyms & Abbreviations

1553	MIL-STD-1553B conform communication interface
AAD	Attitude Anomaly Detector
ACC	ACMS Control Computer
ACMS	Attitude Control and Measurement Subsystem
AD	Applicable Document
AIR	ACC In Reconfiguration
AIT	Assembly, Integration and Test
AIV	Assembly, Integration and Verification
APID	Application Process ID
ASW	Application Software
AVM	Avionics Model
BOLC	BOLometer Control unit (PACS)
BSW	Basic Software
CBH	Catalyst Bed Heater
CCS	Central Check-out System
CCSDS	Consultative Committee for Space Data Systems
CDMU	Control and Data Management Unit
CDMS	Control and Data Management Sub-system
CIR	CDMU In Reconfiguration
CLCW	Command Link Control Word
CLTU	Command Link Transmission Unit
CPDU	Command Pulse Distribution Unit
CRS	Coarse Rate Sensor
CTR	Central on board Reference Time
DCU	Detector Control Unit (SPIRE)
DEC	Detectors Electronics Control unit (PACS)
DMC	Detector and Mechanism Control unit (PACS)
DPU	Digital Processing Unit

DRCU	Detector Readout & Control Unit (SPIRE)
EEPROM	Electrically Erasable PROM
EGSE	Electrical Ground Support Equipment
FCL	Fold-back Current Limiter
FCU	FPU Control Unit (Spire)
FCV	Flow Control Valves
FDIR	Failure Detection, Isolation, and Recovery
FPU	Focal Plane Unit
GDIR	General Design and Interface Requirement
GRP	Group Heaters Switch
HBR	High Bit Rate
HL/HLC	High Level command
HP/HPC	High Priority commands
HPLM	Herschel PayLoad Module
HPSDB	Herschel Planck System Data Base
HW	Hardware
i.a.w.	In accordance with
I/F	InterFace
I/O	Input/Output
ICD	Interface Control Document
IST	Integrated System Test
LCL	Latching Current Limiter
LV	Latching Valves
LBR	Low Bit Rate
MAP	Multiplexed Access Point
MBR	Medium Bit Rate
MCU	Mechanisms Control Unit (SPIRE)
MEC	Mechanisms Electronics Control unit (PACS)
ML 16	Memory Load command (ML 16)
MM	Memory Module
MOIS	Mission Operations Information System
MTL	Mission Timeline

NRZ-L	Non Return to Zero – Litton
OBCP	On-Board Control Procedure
OBDH	On-Board Data Handling
OBMF	On-Board Monitoring Function
OBRT/OBT	On-Board Reference Time
OIRD	Operation Interface Requirement Document
PACS	Photodetector Array Camera & Spectrometer
P/L	Payload
PCDU/PCS	Power Control Distribution Unit/Power Control Subsystem
PM	Processor Module
PROM	Programmable Read Only Memory
PSK	Phase Shift Keying
RA	Rate Anomaly
RAM	Random Access Memory
RCS	Reaction Control Subsystem
RD	Reference Document
RF	Radio Frequency
RM	Reconfiguration Module
RT	1553 Remote Terminal
RTU	RT Unit
RTA	RTU
RWL	Reaction Wheel Assembly
SA	1553 Remote Terminal Sub Address
SAS	Sun Acquisition Sensor
SCOE	Special Check-out Equipment
SCU	Subsytems Control Unit (SPIRE)
SIR	S/C In Reconfiguration
SIT	Subsystem Integrated Test
SP	Sun Pointing
SPIRE	Spectral & Photometric Imaging Receiver
SPU	Signal Processing Unit (PACS)
SSMM	Solid State Mass Memory

STR	Star Tracker
SVM	Service Module
SW	Software
TAI	International Atomic Time
TC	TeleCommand
TFG	Transfer Frame Generator
TM	TeleMetry
TTC	Telemetry Tracking & Command subsystem
TTR	Telemetry Telecommand and Reconfiguration
UFT	Unit Functional Test
VC	Virtual Channel
WD	Watchdog

3 Configuration

3.1 Satellite Configuration

The test requires use of the FM SVM powered on in its basic test mode (i.e. quick switch on (PCDU & CDMS) in accordance with AD 2. SPIRE FM units will be powered ON as per this procedure and assumes that FPU has already been successfully integrated to the warm units.

The procedures detailed in this document can be executed in any foreseen orientation.

3.2 EGSE Configuration

This test requires the EGSE to be configured and elements powered on in accordance with AD 2.

I-EGSE can be configured and connected to the HPCCS in accordance with AD 8, however it is not mandatory to have the I-EGSE connected for the SFT.

3.3 Set-up

SPIRE Test Scripts for the test must be loaded on to the HPCCS and checked in prior to start of test.

4 Test Scripts

The following SPIRE test scripts are required for execution on the HPCCS they do NOT reflect the test steps or order in which the steps are executed (the latter is defined in the order of the procedure):

No.	Tcl Script Name	Comment	Confirmed
1.	SPIRE-FM-SFT-DPU-START-P-SP	DPU ON PRIME	✓
2.	SPIRE-FM-SFT-DRCU-START-P-STEP1	DRCU ON PRIME Step1	✓
3.	SPIRE-FM-SFT-DRCU-START-P-STEP2	DRCU ON PRIME Step2	✓
4.	SPIRE-FM-SFT-FUNC-SCU-01-P	SCU science generation check	✓
5.	SPIRE-FM-SFT-FUNC-SCU-03-P	SCU DC thermometry check	✓
6.	SPIRE-FM-SFT-FUNC-SCU-06-P	SCU AC thermometry check	✓
7.	SPIRE-FM-SFT-FUNC-SCU-07-P	Sorption Cooler Heater Check	✓
8.	SPIRE-FM-SFT-FUNC-SCU-04-P	Photometer Calibration Check	✓
9.	SPIRE-FM-SFT-FUNC-SCU-05-P	Spectrometer Calibration Check	✓
10.	SPIRE-FM-SFT-FUNC-MCU-01-P	MCU (Prime) Boot Check	✓
11.	SPIRE-FM-SFT-FUNC-MCU-02-P	MCU Nominal Frame Generation Check	✓
12.	SPIRE-FM-SFT-FUNC-BSM-01-P	BSM (Prime) Chop/Jiggle Sensor Check	✓
13.	SPIRE-FM-SFT-BSM-OFF-P	BSM (Prime) Switch OFF	✓
14.	SPIRE-FM-SFT-FUNC-DCU-01-P	DCU Nominal Science Packet Generation Check PRIME	✓
15.	SPIRE-FM-SFT-FUNC-DCU-04-PHOT-P	Photometer LIAs Check PRIME	✓
16.	SPIRE-FM-SFT-PLIA-OFF-P	Photometer LIAs Switch OFF PRIME	✓
17.	SPIRE-FM-SFT-FUNC-DCU-04-SPEC-P	Spectrometer LIAs Check PRIME	✓
18.	SPIRE-FM-SFT-SLIA-OFF-P	Spectrometer LIAs Switch OFF PRIME	✓
19.	SPIRE-FM-SFT-MCU-OFF-P	MCU Switch OFF PRIME	✓
20.	SPIRE-FM-SFT-SCU-OFF-P	SCU Switch OFF PRIME	✓
21.	SPIRE-FM-SFT-DRCU-OFF-P	DRCU Switch OFF PRIME	✓
22.	SPIRE-FM-SFT-FUNC-SMEC-01-P	SMEC Encoder and LVDT check PRIME	✓
23.	SPIRE-FM-SFT-SMEC-OFF-P	SMEC Switch OFF PRIME	✓
	REDUNDANT UNIT SCRIPTS		
24.	SPIRE-FM-SFT-DPU-START-R-PP	DPU ON REDUN	✓
25.	SPIRE-FM-SFT-DRCU-START-R-STEP1	DRCU ON REDUN Step1	✓

No.	Tcl Script Name	Comment	Confirmed
26.	SPIRE-FM-SFT-DRCU-START-R-STEP2	DRCU ON REDUN Step2	✓
27.	SPIRE-FM-SFT-FUNC-SCU-01-R	SCU Nominal Science Packet Generation Check REDUN.	✓
28.	SPIRE-FM-SFT-FUNC-SCU-03-R	SCU DC Thermometry Check REDUN.	✓
29.	SPIRE-FM-SFT-FUNC-SCU-06-R	SCU AC Thermometry Check REDUN.	✓
30.	SPIRE-FM-SFT-FUNC-SCU-07-R	Sorption Cooler Heaters Check REDUN.	✓
31.	SPIRE-FM-SFT-FUNC-SCU-04-R	Photometer Calibrator Check REDUN.	✓
32.	SPIRE-FM-SFT-FUNC-SCU-05-R	Spectrometer Calibrator Check REDUN.	✓
33.	SPIRE-FM-SFT-FUNC-MCU-01-R	MCU Boot Check REDUN.	✓
34.	SPIRE-FM-SFT-FUNC-MCU-02-R	MCU Nominal Science Packet Generation Check REDUN.	✓
35.	SPIRE-FM-SFT-FUNC-BSM-01-R	BSM Chop/Jiggle Sensors Check REDUN.	✓
36.	SPIRE-FM-SFT-BSM-0FF-R	BSM Switch OFF REDUN.	✓
37.	SPIRE-FM-SFT-FUNC-DCU-01-R	DCU Nominal Science Packet Generation Check REDUN.	✓
38.	SPIRE-FM-SFT-FUNC-DCU-04-PHOT-R	Photometer LIAs Check REDUN.	✓
39.	SPIRE-FM-SFT-PLIA-OFF-R	Photometer LIAs Switch OFF REDUN.	✓
40.	SPIRE-FM-SFT-FUNC-DCU-04-SPEC-R	Spectrometer LIAs Check REDUN.	✓
41.	SPIRE-FM-SFT-SLIA-OFF-R	Spectrometer LIAs switch OFF REDUN.	✓
42.	SPIRE-FM-SFT-MCU-OFF-R	MCU Switch OFF REDUN.	✓
43.	SPIRE-FM-SFT-SCU-OFF-R	SCU Switch OFF REDUN.	✓
44.	SPIRE-FM-SFT-DRCU-OFF-R	DRCU Switch OFF REDUN	✓
45.	SPIRE-FM-SFT-FUNC-SMEC-01-R	SMEC Encoder and LVDT Check REDUN.	✓
46.	SPIRE-FM-SFT-SMEC-OFF-R	SMEC Switch OFF REDUN.	✓

The HPCSS must also have the following MIB files for SPIRE loaded:

HPCCS Software	Version	Comment	Confirmed Installed
SPIRE MIB version	2.2.M1 PR	HPSDB: HP-ASP-Li-1441-21	✓

The SPIRE I-EGSE will be running the following software for the test:

I-EGSE Software	Version	Comment
SPIRE MIB version		
SCOS version		

5 Conditions

5.1 Personnel

Responsibility	Name / Organisation
Test Director	B. Collaudin
Test Conductor	A. Koppe (on call) / S. Elsley
EGSE Operator	S. Elsley
Electrical Engineer	N/A
Specialist Engineer	N/A
Element Cognizant	N/A
PA Responsible	B. Hogg
Instrument Representative	S. Sidher (on call)
Customer Representative	N/A
ESA Representative	C. Schamberg (on call)

5.2 Environmental

The actual clean room environmental conditions for the test shall be recorded below.

Environmental	Nominal	Actual	P	N
Clean Room Class	class 100000 or better			
Temperature	22°C ± 3°C			
Rel. Humidity	40 % - 60 %			
Pressure	Ambient			

S/C Cryo conditions: see section 7.1

5.3 General Precautions and Safety

Non-test specific precautions and safety considerations are detailed in section 5.3 of AD 2. Specific safety issues and general precautions for the tests to be performed are detailed in the following sections.

5.3.1 General Safety Requirements, Precautions

In the event of unrecoverable anomaly requiring emergency switch off of the satellite, the switch off shall be performed in accordance with AD 3.

5.3.2 ESD constraints

Normal ESD constraints are to be observed during the test.

5.3.3 Special QA Requirements

None.

5.4 GSE

Non-test specific GSE details are provided in section 5.4 of AD 2. Specific GSE needs for the tests to performed are detailed in the following sections.

5.4.1 MGSE

None.

5.4.2 CVSE

None.

5.4.3 EGSE

The I-EGSE is not mandatory for this test, but if used can be connected to the HPCCS in accordance with AD 8.

5.4.4 OGSE

None.

5.4.5 Special Equipment

None.

6 Verification Requirements and Test Criteria

This is a short functional check of all SPIRE PFM subsystems in warm or cold conditions. No specific requirements are to be verified.

Functional performance and status parameter actual values recorded will be checked during the test and must be the same as the nominal status value indicated.

The test will only be deemed successful once all offline analysis of the results has been performed. Typically, the PTR will be held before completion of this activity and therefore only a preliminary assessment of the test success can be provided to allow disconnection of any specific GSE required for the test and which needs to be removed before further activities can be performed.

Enter Start Date|Time:			

7 Test Procedure

7.1 Initial EGSE and Satellite Configuration for the Test

The Spire FM Final Integration according to the Test Procedure ref. AD 1 must be successfully completed before the execution of this procedure.

The EGSE and Satellite must be configured according to AD 2 prior to start of test.

In case of anomaly on SPIRE requiring immediate switch off as directed by SPIRE responsible supporting the test section 7.2.11 shall be executed.

In the event of emergency the Satellite SHALL be switched down according to AD 3.

Test Location:	ESTEC
Test Session Id(s):	2008_10_31_05_29_herschdmo_hpus22 - REALTIME_S_SFT_he1
Environment:	HP22_ASED_TP_212_iss1_3_SPIRE_SFT_He1_END_002

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
	SPIRE: OFF						
0.1	Check that all open work identified at the TRR is closed	OK		ok		✓	
0.2	Check SPIRE FPU interface temperatures (throughout the test):						
	Level 0 (HTT upper bulk) T222	As per TRR					
	Level 1 (Vent line) T234	As per TRR					
	Level 2 (OBA) T242	As per TRR					
0.3	No constraints on thermal shield or CVV	N/A					
0.4	Check cover temperature	As per TRR					
0.5	Stabiliity (drifting)						
	L0	As per TRR					
	L1/L2	As per TRR					
0.6	Check cryostat angle Keep angle constant throughout the test	As per TRR					
	SPIRE: OFF						

Enter Date/Time:	31/10/08	06/10	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	05:50	

7.2 Step by Step Procedure

7.2.1 EGSE & Satellite Switch On

The following test steps are not applicable for TBTV tests.

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
	Install Test Box and Satellite & EGSE Switch On						
1.1	Confirm I-EGSE physically connected to HPCCS	OK		ok	Steps 1.1, 1.3 to 1.7 are not mandatory for test execution	✓	
1.2	If not already on, switch on HPCCS, SCOEs and Satellite/SVM and configure into Basic Test Mode i.a.w. AD 2 Section 7.1 to 7.5			ok		✓	
1.3	Confirm that EGSE and Satellite are in the correct configuration as per AD 2	OK		ok		✓	
1.4	Switch on & configure SPIRE I-EGSE i.a.w. **AD 8**			N/A	already on	✓	
1.5	Confirm SPIRE I-EGSE is in the correct configuration as per AD 8	OK					
1.6	From HPCCS Test Conductor console issue command to connect to SPIRE I-EGSE **connect HSPIREEGSE**	YZS29940 = connected		Connected	ok	✓	
1.7	Verify correct connection and time synchronisation with IEGSE: **Y102999ETVT036_ASDGEN_VERSPIREIEGSE**	OK		ok		✓	
	READY FOR START OF SPIRE SFT						

PVS #4 ✓

PVS #3 ✓

Enter Date/Time:	31/10/08	06:40	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	06:40	

7.2.2 *Switch On SPIRE PRIME To DRCU ON (Standby)*

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 DRCU ON mode. When in DRCU ON mode one parameter remains OOL (soft) namely SMD2V505 (NCR3955 refers) this is also expected.

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N	
1.	ONLY APPLICABLE FOR TBTV: Verify the following TCS baseplate temperature for SPIRE Warm Units before switching ON: **HSDCU (DEA88710)**	> -30°C		N/A	✓		JS
2.	On HPCCS start Packet History displays for the following APIDs:1280,1282	OK			✓		JS
3.	From the HPCCS test conductor console start the test script to power SPIRE Prime to DRCU ON mode: **S102999SCVT005_ASDSFTSPIR_PWR_ON_P**				✓		JS
4.	On HPCCS when prompted: "SPIRE Switch ON for SFT related tests in any conditions - Select NO to abort TS if not correct"	YES	YES		✓		JS

Enter Date/Time:	31/10/2008	06:43	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	06:43

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N	
5.	If in any doubt about the script being executed **NO** should be selected to abort the script. Before restarting consult the relevant instrument support engineer to confirm the correct script to be used for the test in question.			N/A	✓		δ
6.	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 DRCU ON mode.			A number of soft/hard OOL´s are reported	✓		δ
7.	On HPCCS when prompted: "Check Telemetry Updating Correctly and OBT is Consistent with CDMU - OK to continue"	OK THSK = TSYNC	ok		✓		δ
8.	If I-EGSE connected when prompted on HPCCS, perform check requested: "Check IEGSE Time Consistent - OK to continue when RAL confirm"	OK	~~ok~~ N/A		✓		δ
9.	On HPCCS when prompted: "Check Telemetry No Longer Updating - OK to continue" Check that parameters:	ok		**AND: SA_1_559**	✓		δ

Enter Date/Time:	31/10/08	06:49	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/07	06:49

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	THSK TM2N	Not refreshing Not incrementing				
10.	Select OK to continue	OK	ok		✓	
11.	On HPCCS when prompted: "Check Telemetry Updating Correctly - OK to continue" Check that parameters: THSK TM2N	 Refreshing @ 1Hz Incrementing by 1 @ 1Hz	 ✓ ✓	AND: SA_1_559	✓	
12.	Select OK to continue	OK	ok		✓	
13.	On HPCCS when all autonomous actions have been completed by the power on script **S102999SCVT005_ASDSFTSPIR_PWR_ON_P** it will prompt: "Set Bus Profile Back to Original Setting?" Select NO	NO	No		✓	

Enter Date/Time:	31/10/08	06:52	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	06:52	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N	
14.	At the prompt: "Bus Profile left unchanged" Select OK to continue	OK	ok		V		S
15.	Verify HK TM packets are being received on APIDs 1280 & 1282		ok		V		S
16.	MODE parameter is set to "DRCU ON" mode (RAW value 0x0100)	SM00M500 = 0x0100 (DRCU ON)	DRCU-ON !	**AND: SA_1_559**	V		S
17.	ONLY APPLICABLE FOR TBTV: Verify the following TCS baseplate temperature for SPIRE Warm Units before operating SPIRE: **HSDCU (DEA88710)**	> -25°C & < TBD - TBC	N/A		V		S
	SPIRE powered and in DRCU ON mode						

Enter Date/Time:	31/10/08	06:53	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	06:54	

7.2.3 *Short Functional Tests - Nominal*

7.2.3.1 Procedure SPIRE-FM-SFT-FUNC-SCU-01-P 06:57

Version	2.4
Date	4th June 2008
Purpose	SCU science packet generation check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced
Final configuration	Unchanged
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS and DPU & OBS PARAMETERS displays are selected on the CCS
Duration	3 minutes
Pass/Fail Criteria	Specified SCU HK parameters show expected increment.

Procedure Steps:

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-SCU-01-P.tcl	SCUFRAMECNT (On SFT PARAMETERS display)	0/31	0 / 31	OK
		TM5N (On DPU & OBS PARAMETERS display)	0x3FFF/1	0X3FFF/1	OK
Test Result (Pass/Fail):					

Enter Date/Time:	31/10/08	06:58	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	06:59	

Procedure SPIRE-FM-SFT-FUNC-SCU-03-P 06:59

Version	2.3
Date	28th August 2007
Purpose	SCU DC thermometry check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and DC thermometry is ON
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	8 minutes
Pass/Fail Criteria	DC Thermometry channels show temperature readings according to the actual instrument temperature* *: At warm temperatures all channels should show short circuit RAW readings of -32768

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure	
1	Execute TCL script SPIRE-FM-SFT-FUNC-SCU-03-P.tcl	—	—	— V	— V	S
2	**Wait for the parameter BBFULLTYPE to get set to SCU_DC_Therm**			V	V	S

Enter Date/Time:	31/10/08	07:01	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	07:01

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
3	A few seconds later record the value of parameter SCUTEMPSTAT	SCUTEMPSTAT	0/0xFFFF/0xFFFF	0 / 0xFFFF/ 0xFFFF	✓
4	If the instrument is at He II temperatures check the values of SCU DC thermometry channels. **Note that the measured channel values will depend on the actual cryostat Level 0 and Level 1 temperatures.**	PUMPHTRTEMP PUMPHSTEMP EVAPHSTEMP SHUNTTEMP EMCFILTEMP SL0TEMP PL0TEMP OPTTEMP BAFTEMP BSMIFTEMP SCAL2TEMP SCAL4TEMP SCALTEMP SMECIFTEMP SMECTEMP BSMTEMP	~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L0 K ~ L0 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K	N/A	✓
5	If the instrument is at He I				

Enter Date/Time:	31/10/08	07:08	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	07:02	

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
	temperatures check the values of SCU DC thermometry channels. **Note that the measured channel values will depend on the actual cryostat Level 1 temperature.**	PUMPHTRTEMP PUMPHSTEMP EVAPHSTEMP SHUNTTEMP EMCFILTEMP SL0TEMP PL0TEMP OPTTEMP BAFTEMP BSMIFTEMP SCAL2TEMP SCAL4TEMP SCALTEMP SMECIFTEMP SMECTEMP BSMTEMP	~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K	OK (See attached)	✓
6	If the instrument is warm: **Configure the SFT PARAMETERS display to show the RAW values of SCU DC**	PUMPHTRTEMP PUMPHSTEMP EVAPHSTEMP SHUNTTEMP EMCFILTEMP	— — — — —	N/A	

Enter Date/Time:	31/10/08	07:03	Sign Off	TC:	PA:

DS: 65535 ID: SA_4_5 Title: SCU PARAMETERS Sample Time: 2008.305.07.02.14.642 Workstation: hpws22

NAME	DESCRIPTION	VALUE	UNIT
SM10N500	OBSID	B0000000	HEX
SM2LN500	BBFULLTYPE	Null	
SMD0N520	SCUFRAMECNT	31	DEC
SMD1F520	SCUIFSTAT	00000000	HEX
SMD2F520	SCUIFCTRL	00000007	HEX
SMD0T520	SCUSSDEL	0.07	ms
SM_0F520	SCUSTAT	00000000	HEX
SM_1F520	SCUTEMPSTAT	0000FFFF	HEX
SM_2F520	SCUDCDCSTAT	00000000	HEX
SM_0V520	SCUP5V	5.2390	V
SM_1V520	SCUP9V	9.0886	V
SM_2V520	SCUM9V	-9.0815	V
SMH0A520	SPHSV	0.1045	mV
SMT0A520	EVHSV	0.1342	mV
SMF0A520	TCHTRV	0.000906	V
SMT1A520	SPHTRV	0.0035	V
SMT0K520	CCUTEMP	295.8681	K
SMT1K520	TCUTEMP	296.1733	K
SMW0K520	PSUTEMP1	298.9199	K
SM_0N520	SCUFRAMECONF	00000000	HEX
SM_1N520	SCUFRAMES	0000001F	HEX
SMD3F520	SCUFRAMESTAT	00000000	HEX
SMD4F520	SCUCTRL	00000001	HEX
SMP0V520	PCALV	0.000298	V
SMS0V520	SCAL2V	0.000436	V
SMS1V520	SCAL4V	0.000268	V
SMS2V520	SCUCHT2_5V	2.5294	V
SMS3V520	SCUCHTREF	1.2275	V
SMS4V520	SCUCHTGND	0.0017	V
SMP0A520	PCALCURR	0.0012	mA
SMS0A520	SCAL2CURR	0.000102	mA
SMS1A520	SCAL4CURR	0.000625	mA

NAME	DESCRIPTION	VALUE	UNIT
SMW1K520	PSUTEMP2	299.2251	K
SMK0F520	SUBKSTAT	00000000	HEX
SMF0K520	PUMPHTRTEMP	5.16937764	K
SMF1K520	PUMPHSTEMP	7.01040332	K
SMF2K520	EVAPHSTEMP	6.69268084	K
SMF3K520	SHUNTTEMP	4.29728348	K
SMF4K520	EMCFILTEMP	10.59887025	K
SMF5K520	SL0TEMP	4.30456673	K
SMF6K520	PL0TEMP	4.37329246	K
SMF7K520	OPTTEMP	10.65281083	K
SMF8K520	BAFTEMP	11.16873254	K
SMF9K520	BSMIFTEMP	10.74339363	K
SMS0K520	SCAL2TEMP	10.66944000	K
SMS1K520	SCAL4TEMP	10.50866945	K
SMS2K520	SCALTEMP	10.60706711	K
SMFAK520	SMECIFTEMP	10.43837670	K
SMFBK520	SMECTEMP	10.46883237	K
SMFCK520	BSMTEMP	10.61829089	K
SMK0K520	SUBKTEMP	605.98700000	K
SMKEV520	SCUTHTREF	1.2298	V
SMKFV520	SCUTHTGND	-0.000765	V
SM_0X520	PLIABITSTAT	00000000	HEX
SM_1X520	SLIABITSTAT	00000000	HEX
SM_2X520	MCUBITSTAT	00000000	HEX

Enter Start Date|Time:	31/10/08	07:03	

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
	thermometry channels. Record the RAW values of SCU DC thermometry channels. Nominal values should show a short circuit status (or RAW - 32768). **Non Nominal (Open Circuit Criterion):** **RAW reading in the range [0, -100]**	SL0TEMP PL0TEMP OPTTEMP BAFTEMP BSMIFTEMP SCAL2TEMP SCAL4TEMP SCALTEMP SMECIFTEMP SMECTEMP BSMTEMP	— — — — — — — — — — —	N/A	
Test Result (Pass/Fail):	PASS				

Enter Start Date|Time:	31/10.08	07:04	

7.2.3.2 Procedure SPIRE-FM-SFT-FUNC-SCU-06-P

Version	2.3
Date	28th August 2007
Purpose	SCU AC thermometry check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and DC thermometry is ON
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	2 minutes
Pass/Fail Criteria	AC Thermometry channel shows temperature readings according to the actual instrument temperature

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure	
1	Execute TCL script SPIRE-FM-SFT-FUNC-SCU-06-P.tcl	—	—	√	√	S
2	**Wait for the parameter BBFULLTYPE to get set to SCU_AC_Therm**			√	√	S
3	A few seconds later record the value of parameter	SUBKSTAT	0/1/1	0/1/1	√	S

Enter Date/Time:	31/10/08	07:06	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	07:06

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
	SUBKSTAT				
4	If the instrument is at He II temperatures check the value of SCU AC thermometry channel. **Note that the measured channel value will depend on the cryostat Level 0 temperature.**	SUBKTEMP	~L0 K	N/A	J
5	If the instrument is at He I temperatures check the value of SCU AC thermometry channel. **Note that the measured channel value will depend on the cryostat Level 1 temperature.**	SUBKTEMP	~L1 K	4,4K	J
6	If the instrument is warm: **Configure the SFT PARAMETERS display to show the RAW value of SCU AC thermometry channel.** Only record the RAW value of SCU AC thermometry channel if it indicates an open circuit. **Open Circuit Criterion:** **RAW reading in the range [0, -100]**	SUBKTEMP	—	N/A	

Enter Date/Time:	31/10/08	07:08	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	07:05	

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
Test Result (Pass/Fail):	PASS				

Enter Start Date|Time:	31/10/08	07:06	

7.2.3.3 Procedure SPIRE-FM-SFT-FUNC-SCU-07-P

Version	2.2
Date	2nd January 2007
Purpose	Sorption Cooler Heater Check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and DC thermometry is ON
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail Criteria	Sorption cooler heat switches and pump heater show expected voltages

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-SCU-07-P.tcl	—	—	—	—
2	**Wait for the parameter BBFULLTYPE to get set to Cooler_Htr_Che**	BBFULLTYPE	Cooler_Htr_Che		
3	Record the value of parameter SPHSV – the Sorption Pump Heat Switch Voltage. *This voltage stays on for ~20 seconds. Wait for the voltage to go to zero to continue.*	SPHSV - mV	0/~323/0	0 / 324 / 0	V

Enter Date/Time:	31/10/08	07:14	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	07:14	

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
4	Record the value of parameter EVHSV – the Evaporator Heat Switch Voltage. *This voltage stays on for ~20 seconds. Wait for the voltage to go to zero to continue.*	EVHSV - mV	0/~323/0	0/324/0	J
5	Record the value of parameter SPHTRV – the Sorption Pump Heater Voltage. *This voltage stays on for ~20 seconds. Wait for the voltage to go to zero to continue.*	SPHTRV - V	0/~8.8/0	0/8.8/0	J
Test Result (Pass/Fail):	PASS				

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7.2.3.4 Procedure SPIRE-FM-SFT-FUNC-SCU-04-P

Version	2.3
Date	28th August 2007
Purpose	Photometer Calibration Check (PRIME)
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Final configuration	Unchanged
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail Criteria	PCAL voltage and current agree with expected values

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Procedure Steps:

Step	Description	Parameter Name - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-SCU-04-P.tcl **The expected values during the test should be monitored when parameter BBFULLTYPE in the SFT PARAMETERS display is set to PCAL_Check This usually happens about 30 seconds from the start of test execution.**	PCALCURR - mA PCALV – V BBFULLTYPE	0.0/0.1/0.0 0.0/~0.02/0.0 PCAL_Check	0/0.1/0 0/0.02/0 ✓	✓ ✓
Test Result (Pass/Fail):	PASS				

Enter Start Date|Time:	31/10/08	07:17	

7.2.3.5 Procedure SPIRE-FM-SFT-FUNC-SCU-05-P

Version	2.3
Date	28th 2007
Purpose	Spectrometer Calibration Check (PRIME)
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Final configuration	Unchanged
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	SCAL2 and SCAL4 voltage and currents agree with expected values

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-SCU-05-P.tcl	—	—	—	√
2	**Wait for the parameter BBFULLTYPE to get set to SCAL4_Check**	BBFULLTYPE	SCAL4_Check		√

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Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
3	A few seconds later record the value of parameters SCAL4CURR and SCAL4V *These parameters are set back to 0 after ~20 seconds*	SCAL4CURR – mA SCAL4V – V	0.0/~0.10/0.0 0.0/~0.05/0.0	0/0.1/0 0/0.05/0	V
4	**Wait for the parameter BBFULLTYPE to get set to SCAL2_Check**	BBFULLTYPE	SCAL2_Check	V	V
5	A few seconds later record the values of parameters SCAL2CURR and SCAL2V *These parameters are set back to 0 after ~20 seconds*	SCAL2CURR – mA SCAL2V – V	0.0/~0.10/0.0 0.0/~0.05/0.0	0/0.1/0 0/0.05/0	V
Test Result (Pass/Fail):	PASS				

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7.2.3.6 Procedure SPIRE-FM-SFT-FUNC-MCU-01-P

Version	2.4
Date	4th June 2008
Purpose	MCU (PRIME) Boot Check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	MCU voltages and board temperatures show expected 'ON' values

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure	
1	Execute TCL script SPIRE-FM-SFT-FUNC-MCU-01-P.tcl	—	—	—√	√	√
2	Check that the MCU is booted up successfully	MCUBITSTAT	0/1/1	0/1/1	√	√

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Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
3	Check MCU HK parameter values and ensure that the values are refreshing	MCUP5V MCUP14V MCUM14V MCUP15V MCUM15V MCUMACTEMP MCUSMECTEMP MCUBSMTEMP	~ 5.0 ± 0.2V ~ 14.0 ± 0.5V ~ -14.0 ± 0.6V ~ 15.0 ± 0.6V ~ -15.0 ± 0.7V ~300K ~300K ~300K	5.01 V 14.15 V -14.47 V 15.54 V -15.63 V 291,36 K 296,6 K 296.25 K	✓ ✓
Test Result (Pass/Fail): PASS					

Enter Date/Time:	31/10/08	07:23	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	07:24	

7.2.3.7 Procedure: SPIRE-FM-SFT-FUNC-MCU-02-P

Version	2.2
Date	2nd January 2007
Purpose	MCU Nominal Frame Generation Check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Final configuration	Unchanged.
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified MCU HK parameters show expected increment

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-MCU-02-P.tcl	MCUFRAMECNT	**FM** : 0/297	— 0/297	— V

Test Result (Pass/Fail): PASS

Enter Date/Time:	31/10/08	07:25	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	07:26	

7.2.3.8 Procedure SPIRE-FM-SFT-FUNC-BSM-01-P

Version	2.3
Date	28th August 2007
Purpose	BSM (PRIME) Chop/Jiggle Sensor Check.
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. BSM Chop/Jiggle sensors are ON.
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail criteria	HK Parameters CHOPSENSPWR and JIGGSENSPWR show expected ON values.

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/ After	Actual Values Before/During/ After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-BSM-01-P.tcl	—	—	— √	— √
2	Check that the Chop and Jiggle sensors have switched on	CHOPSENSPWR JIGGSENSPWR	0/1/1 0/1/1	0 / 1 / 1 0 / 1 / 1	√

Test Result (Pass/Fail): PASS

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Enter Start Date|Time:	31/10/08	07:28	

7.2.3.9 Procedure SPIRE-FM-SFT-BSM-OFF-P

Version	2.3
Date	28th August 2007
Purpose	BSM (PRIME) Switch OFF
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. BSM Chop/Jiggle sensors are ON.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. BSM Chop/Jiggle sensors are OFF.
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail criteria	HK Parameters CHOPSENSPWR and JIGGSENSPWR show expected OFF values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-FM-SFT-BSM-OFF-P.tcl	—	—	—	—
2	Check that the power to the BSM sensors is switched off	CHOPSENSPWR JIGGSENSPWR	1/-/0 1/-/0	1/-/0 1/-/0	J
Test Result (Pass/Fail): PASS					

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Enter Start Date|Time:	31/10/08	07:29	

7.2.3.10 Procedure SPIRE-FM-SFT-FUNC-SMEC-01-P

Version	2.3
Date	28th August 2007
Purpose	SMEC (PRIME) Encoder/LVDT Sensor Check.
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are ON.
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail criteria	HK Parameters SMECENCPWR and SMECLVDTPWR show expected ON values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-SMEC-01-P.tcl	—	—	—	— ✓
2	Check that power to the SMEC LED and LVDT sensor is on	SMECENCPWR SMECLVDTPWR	0/-/1 0/-/1	0/-/1 0/-/1	✓
Test Result (Pass/Fail): PASS					

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7.2.3.11 Procedure SPIRE-FM-SFT-SMEC-OFF-P

Version	2.3
Date	28th August 2007
Purpose	SMEC (PRIME) Switch OFF
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are ON.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are OFF.
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail criteria	HK Parameters SMECENCPWR and SMECLVDTPWR show expected OFF values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-FM-SFT-SMEC-OFF-P.tcl	—	—	— ✓	— ✓
2	Check that the power to the SMEC sensors is switched off	SMECENCPWR	1/-/0	1/-/0	✓
		SMECLVDTPWR	1/-/0	1/-/0	✓
Test Result (Pass/Fail): PASS					

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7.2.3.12 Procedure SPIRE-FM-SFT-FUNC-DCU-01-P

Version	2.2
Date	2nd January 2007
Purpose	DCU science packet generation check for all Photometer and Spectrometer packet types (PF, PSW, PMW, PLW, SF, SSW and SLW)
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Final configuration	Unchanged
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified DCU HK parameter shows expected increment

Procedure Steps:

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-DCU-01-P.tcl	DCUFRAMECNT	0/700	0/700	✓
Test Result (Pass/Fail): PASS					

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Enter Start Date|Time:	31/10/08	07:36	

7.2.3.13 Procedure SPIRE-FM-SFT-FUNC-DCU-04-PHOT-P

Version	2.4
Date	10th Sept 2007
Purpose	Photometer LIAs PRIME Check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. Photometer LIAs are ON
Constraints	• SPIRE DRCU PRIME is switched ON • Photometer LIAs are OFF • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • DCU PARAMETERS & SFT PARAMETERS displays are selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified Photometer LIA HK parameters show expected ON values

Procedure Steps:

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-DCU-04-PHOT-P.tcl	PLIABITSTAT	0/1/1	0/1/1	J

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Enter Start Date|Time:	31/10/08	07:38	

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
2	Check Photometer LIA HK parameter values and ensure that the values are refreshing	PLIAP5V PLIAP9V PLIAM9V	0.0/-/ 5.2 ± 0.2V 0.0/-/ 11.5 ± 0.5V 0.0/-/-11.5 ± 0.5V	0 / -1 5.17V 0 / -1 11.58V 0 / -1 -11.76V	√
3	**On the DCU PARAMETERS display check that the LIA temperatures are slowly warming up.** At switch-on it is possible that some of the LIA temperatures will be in soft or even hard limits. No action is required.	LIAP1TEMP to LIAP9TEMP	~ 290-300 K See attached		√
4	**Wait for ~3 minutes before continuing with the SFTs**	—	—	—	—

Test Result (Pass/Fail): PASS

Enter Date/Time:	31/10/08	07:41	Sign Off	TC:	PA:

DS: 65535 ID: SA_5_5 Title: DCU PARAMETERS Sample Time: 2008.305.07.41.07.658 Workstation: hpws22

NAME	DESCRIPTION	VALUE	UNIT
SM10N500	OBSID	B0000000	HEX
SM2LN500	BBFULLTYPE	Null	
SMD1N510	DCUFRAMECNT	700	DEC
SMD0M510	DCUDATAMODE	SLW	
SMD0N510	DCUDATAFRMS	********	
SMD2F510	DCUDATASTAT	OFF	
SMP0H510	PHOTBIASDIV	00000006	HEX
SM20R510	PSWPHASE	0	deg
SM30R510	PMWPHASE	0	deg
SM50R510	PLWPHASE	0	deg
SMC0R510	TCPHASE	00000000	HEX
SM20F510	PSWJFETSTAT	00000000	HEX
SM80F510	PMLWJFETSTAT	00000000	HEX
SM20V510	PSWJFET1V	0	V
SM21V510	PSWJFET2V	0	V
SM22V510	PSWJFET3V	0	V
SM23V510	PSWJFET4V	0	V
SM24V510	PSWJFET5V	0	V
SM25V510	PSWJFET6V	0	V
SM30V510	PMWJFET1V	0	V
SM31V510	PMWJFET2V	0	V
SM32V510	PMWJFET3V	0	V
SM33V510	PMWJFET4V	0	V
SM50V510	PLWJFET1V	0	V
SM51V510	PLWJFET2V	0	V
SMP0V510	PHOTHTRV	0	V
SMT0V510	TCJFETV	0	V
SMF0H510	SPECBIASDIV	00000001	HEX
SM00R510	SSWPHASE	0	deg
SM10R510	SLWPHASE	0	deg
SMF0F510	SPECJFETSTAT	00000000	HEX
SM00V510	SSWJFET1V	0	V
SM01V510	SSWJFET2V	0	V
SM10V510	SLWJFET1V	0	V
SMF0V510	SPECHTRV	0	V
SMC0K510	TC1TEMP	0	mV
SMC1K510	TC2TEMP	0	mV
SMC2K510	TC3TEMP	0	mV
SML0V510	PLIAP5V	5.23	V
SML1V510	PLIAP9V	11.58	V
SML2V510	PLIAM9V	-11.58	V
SML3V510	SLIAP5V	0.10	V
SML4V510	SLIAP9V	0.016	V
SML5V510	SLIAM9V	0.016	V
SML0K510	LIAP9TEMP	294.89	K
SML1K510	LIAP8TEMP	295.23	K
SML2K510	LIAP7TEMP	294.94	K
SML3K510	LIAP6TEMP	294.95	K
SML4K510	LIAP5TEMP	294.91	K
SML5K510	LIAP4TEMP	295.14	K
SML6K510	LIAP3TEMP	294.85	K
SML7K510	LIAP2TEMP	294.85	K
SML8K510	LIAP1TEMP	295.15	K
SML9K510	LIAS1TEMP	294.76	K
SMLAK510	LIAS2TEMP	294.57	K
SMLBK510	LIAS3TEMP	294.34	K
SMB0K510	BIASTEMP	297.21	K
SMD0K510	DAQTEMP	299.61	K
SML0F510	LIASTAT	00000000	HEX

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7.2.3.14 Procedure SPIRE-FM-SFT-PLIA-OFF-P

Version	2.4
Date	10th Sept 2007
Purpose	Photometer LIAs PRIME Switch OFF
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. Photometer LIAs are ON
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. Photometer LIAs are OFF
Constraints	• SPIRE DRCU PRIME is switched ON • Photometer LIAs are ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	2 minutes
Pass/Fail criteria	Specified Photometer LIA HK parameters show expected OFF values

Procedure Steps:

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-PLIA-OFF-P.tcl	PLIABITSTAT	1/-/0	1/-/0	✓
2	Check Photometer LIA HK parameter values	PLIAP5V PLIAP9V PLIAM9V	5.2 ± 0.2V/-/0.0 11.5 ± 0.5V/-/0.0 11.5 ± 0.5V/-/0.0	5.2 V / 0 V 11.58 / 0 V -11.58 / 0 V	✓

Test Result (Pass/Fail): PASS

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Enter Start Date|Time:	31/10/08	07:47	

7.2.3.15 Procedure SPIRE-FM-SFT-FUNC-DCU-04-SPEC-P

Version	2.4
Date	10th Sept 2007
Purpose	Spectrometer LIAs PRIME Check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. Spectrometer LIAs are ON
Constraints	• SPIRE DRCU PRIME is switched ON • Spectrometer LIAs are OFF • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS & DCU PARAMETERS displays are selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified Spectrometer LIA HK parameters show expected ON values

Procedure Steps:

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-DCU-04-SPEC-P.tcl	SLIABITSTAT	0/1/1	0/1/1	Y

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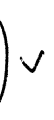
Enter Start Date|Time:	31/10/08	07:49	

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
2	Check Spectrometer LIA HK parameter values and ensure that the values are refreshing	SLIAP5V SLIAP9V SLIAM9V	0.0/-/ 5.2 ± 0.2V 0.0/-/ 11.5 ± 0.5V 0.0/-/-11.5 ± 0.5V	0/-/ 5.25V 0/-/ 11.59V 0/-/-11.56V	✓
3	**On the DCU PARAMETERS display check that the LIA temperatures are slowly warming up.** At switch-on it is possible that some of the LIA temperatures will be in soft or even hard limits. No action is required.	LIAS1TEMP to LIAS3TEMP	~ 290-300 K	✓	✓
4	**Wait for ~3 minutes before continuing with the SFTs**	—	—	—	—
Test Result (Pass/Fail):	PASS				

DS: 65535 ID: SA_5_5 Title: DCU PARAMETERS Sample Time: 2008.305.07.49.44.663 Workstation: hpws22

NAME	DESCRIPTION	VALUE	UNIT
SM10N500	OBSID	B0000000	HEX
SM2LN500	BBFULLTYPE	Null	
SMD1N510	DCUFRAMECNT	700	DEC
SMD0M510	DCUDATAMODE	SLW	
SMD0N510	DCUDATAFRMS	********	
SMD2F510	DCUDATASTAT	OFF	
SMP0H510	PHOTBIASDIV	00000006	HEX
SM20R510	PSWPHASE	0	deg
SM30R510	PMWPHASE	0	deg
SM50R510	PLWPHASE	0	deg
SMC0R510	TCPHASE	00000000	HEX
SM20F510	PSWJFETSTAT	00000000	HEX
SM80F510	PMLWJFETSTAT	00000000	HEX
SM20V510	PSWJFET1V	0	V
SM21V510	PSWJFET2V	0	V
SM22V510	PSWJFET3V	0	V
SM23V510	PSWJFET4V	0	V
SM24V510	PSWJFET5V	0	V
SM25V510	PSWJFET6V	0	V
SM30V510	PMWJFET1V	0	V
SM31V510	PMWJFET2V	0	V
SM32V510	PMWJFET3V	0	V
SM33V510	PMWJFET4V	0	V
SM50V510	PLWJFET1V	0	V
SM51V510	PLWJFET2V	0	V
SMP0V510	PHOTHTRV	0	V
SMT0V510	TCJFETV	0	V
SMF0H510	SPECBIASDIV	00000001	HEX
SM00R510	SSWPHASE	0	deg
SM10R510	SLWPHASE	0	deg
SMF0F510	SPECJFETSTAT	00000000	HEX
SM00V510	SSWJFET1V	0	V

NAME	DESCRIPTION	VALUE	UNIT
SM01V510	SSWJFET2V	0	V
SM10V510	SLWJFET1V	0	V
SMF0V510	SPECHTRV	0	V
SMC0K510	TC1TEMP	0	mV
SMC1K510	TC2TEMP	0	mV
SMC2K510	TC3TEMP	0	mV
SML0V510	PLIAP5V	0.25	V
SML1V510	PLIAP9V	0.016	V
SML2V510	PLIAM9V	0.016	V
SML3V510	SLIAP5V	5.25	V
SML4V510	SLIAP9V	11.58	V
SML5V510	SLIAM9V	-11.56	V
SML0K510	LIAP9TEMP	295.34	K
SML1K510	LIAP8TEMP	295.87	K
SML2K510	LIAP7TEMP	295.60	K
SML3K510	LIAP6TEMP	295.63	K
SML4K510	LIAP5TEMP	295.56	K
SML5K510	LIAP4TEMP	295.75	K
SML6K510	LIAP3TEMP	295.38	K
SML7K510	LIAP2TEMP	295.44	K
SML8K510	LIAP1TEMP	295.63	K
SML9K510	LIAS1TEMP	295.55	K
SMLAK510	LIAS2TEMP	295.18	K
SMLBK510	LIAS3TEMP	294.89	K
SMB0K510	BIASTEMP	297.49	K
SMD0K510	DAQTEMP	299.90	K
SML0F510	LIASTAT	00000000	HEX



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7.2.3.16 Procedure SPIRE-FM-SFT-SLIA-OFF-P

Version	2.4
Date	10th Sept 2007
Purpose	Spectrometer LIAs PRIME Switch OFF
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. Spectrometer LIAs are ON
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. Spectrometer LIAs are OFF
Constraints	• SPIRE DRCU PRIME is switched ON • Spectrometer LIAs are ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	2 minutes
Pass/Fail criteria	Specified Spectrometer LIA HK parameters show expected OFF values

Procedure Steps:

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-SLIA-OFF-P.tcl	SLIABITSTAT	1/-/0	1/-/0	J

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Enter Start Date|Time:			

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
2	Check Photometer LIA HK parameter values	SLIAP5V SLIAP9V SLIAM9V	5.2 ± 0.2V/-/0.0 11.5 ± 0.5V/-/0.0 -11.5 ± 0.5V/-/0.0	5.25V / 0 11.58V / 0 -11.56V / 0	V

Test Result (Pass/Fail): PASS

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7.2.3.17 Procedure SPIRE-FM-SFT-FUNC-MCU-OFF-P

Version	2.4
Date	4th June 2008
Purpose	MCU PRIME Switch OFF
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is OFF.
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is ON. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	2 minutes
Pass/Fail criteria	Specified MCU HK Parameter shows expected value.

Note: type 5/4 event: ALARM_LSMCU_DEAD is expected

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7.2.3.18 Procedure SPIRE-FM-SFT-FUNC-SCU-OFF-P

Version	2.4
Date	4th June 2008
Purpose	SCU PRIME Switch OFF
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is OFF
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	2 minutes
Pass/Fail criteria	Specified SCU HK Parameters show expected value.

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT- SCU-OFF-P.tcl	—	—	— √	— √

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Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-FM-SFT -MCU-OFF-P.tcl	—	—	— V	— V
2	Check that the MCU is switched off Expected events: • A TM(5,1) event report with Event ID 0x0521 and SID 0x510F will be received to indicate that the DPU is not receiving a response from the MCU. • A TM(5,4) event report with Event ID 0x550D and SID 0x5420 will be received to indicate the MCU disconnection from the DPU.	MCUBITSTAT	1/-/0	1/-/0	V
Test Result (Pass/Fail): PASS					

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Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
2	A few seconds later record the value of parameter SCUTEMPSTAT a) EVID 1313 No_MCU_Response_Error b) EVID 21773 ALARM_LSMCU_DEAD	SCUTEMPSTAT	0xFFFF/-/0	0xFFFF/-/0	✓
3	A few seconds later record the value of parameter SUBKSTAT	SUBKSTAT	1/-/0	1/-/0	✓
Test Result (Pass/Fail): PASS					

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Enter Start Date|Time:	31/10/08	08:00	

7.2.4 *Switch Off DRCU & DPU PRIME*

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 DRCU ON: **S102999SCVT007_ASDSFTSPIR_PWR_OFF_P**	OK	ok		✓		✓
2.	On HPCCS when prompted: "SPIRE Switch OFF for SFT related tests in any conditions - Select NO to abort TS if not correct"	YES	YES		✓		✓
3.	If in any doubt about the script being executed **NO** should be selected to abort the script. Before restarting consult the relevant instrument support engineer to confirm the correct script to be used for the test in question.		N/A		✓		✓
4.	If **YES** is selected the test script will go on to automatically power off all SPIRE warm units.		YES		✓		✓

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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: c) EVID 1313 No_MCU_Response_Error d) EVID 21773 ALARM_LSMCU_DEAD		ok		✓	
6.	On HPCCS when prompted: "Check Telemetry No Longer Updating - OK to continue" Check that parameters: THSK TM2N	 Not refreshing Not incrementing	 Not reporting	AND: SA_1_559 N/A	✓	
7.	Select OK to continue	OK	ok		✓	
8.	On HPCCS when all autonomous actions have been completed by the power on script **S102999SCVT007_ASDSFTSPIR_PWR_OFF_P** it will prompt: "Bus profile left as SPIRE PRIME, change manually after if required - OK to continue"				✓	

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Enter Start Date|Time:	31/10/08	08:06	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
9.	Select OK to continue	OK	ok		✓	
10.	On HPCCS stop Packet History displays for the following APIDs:1280,1282	OK	ok		✓	
	SPIRE OFF					

Enter Date/Time:	31/10/08	08:07	Sign Off	TC:	PA:

Enter Start Date|Time:			

PUS 1 ~~7.2.5~~ ***Procedure SPIRE-FM-WFT-LPU-01-P***

Version	1.0
Date	Tuesday, 28 August 2007
Purpose	DPU PRIME Switch OFF
Initial configuration	Prime and redundant DPU and DRCU are off
Final configuration	Prime and redundant DPU and DRCU are off
Constraints	• Cryostat is vertical to within ±45° • Prime and redundant DPU and DRCU are off
Duration	5 minutes
Pass/Fail criteria	The specified current is drawn when the LPU is enabled and is switched off when the LPU is disabled

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	**Power on Prime LPU LCL (LCL #25)** Execute: **DC25D170**	LCL status	OFF/ /ON		State of LCL #25 switches to ON
2	**Send HL command #5 (LPU Enable Prime)** Execute: **DCT01170, DHT01170 = "CMD_ID_HLC5"**	LCL #25 current	0mA/ /130-180mA		Current between 130-180mA

SKIPPED

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Enter Start Date|Time:			

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
4	**Send HL command #6 (LPU Disable Prime)** Execute: **DCT01170, DHT01170 = "CMD_ID_HLC6"**	LCL #25 current	130-180mA/ /0mA		Current off
5	**Un-power Prime LPU LCL (LCL # 25)** Execute: **DC25B170**	LCL status	ON/ / OFF		State of LCL #25 switches to OFF
Test Result (Pass/Fail):					

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7.2.6 *Switch On SPIRE REDUNDANT DPU & DRCU*

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 DRCU ON mode. When in DRCU ON mode one parameter remains OOL (soft) namely SMD2V505 (NCR3955 refers) this is also expected.

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N	
1.	ONLY APPLICABLE FOR TBTV: Verify the following TCS baseplate temperature for SPIRE Warm Units before operating SPIRE: **HSDCU (DEA88710)**	> -30°C		N/A	✓		✓
1.	On HPCCS start Packet History displays for the following APIDs:1281,1283	OK	OK		✓		✓
2.	From the HPCCS test conductor console start the test script to power SPIRE Prime to DRCU ON: **S102999SCVT006_ASDSFTSPIR_PWR_ON_R**		OK		✓		✓
3.	On HPCCS when prompted: "SPIRE Switch ON for SFT related test in any condition - Select NO to abort TS if not correct"	YES	YES		✓		✓

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Enter Start Date|Time:	31/10/08	08:08

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.		N/A		✓		
5.	If **YES** is selected the test script will go on to automatically power on all SPIRE warm units, force boot the DPU ASW and configure the instrument to DRCU ON mode.		YES		✓		
6.	On HPCCS when prompted: "Check Telemetry Updating Correctly and OBT is Consistent with CDMU - OK to continue"	OK	ok		✓		
7.	If I-EGSE connected when prompted on HPCCS, perform check requested: "Check IEGSE Time Consistent - OK to continue when RAL confirm"	OK	N/A		✓		
8.	On HPCCS when prompted: "Check Telemetry No Longer Updating - OK to continue" Check that parameters:		ok	**AND: SA_1_559**	✓		

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Enter Start Date|Time:	31/10/08	08:17	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N	
	THSK TM2N	Not refreshing Not incrementing	Not refreshing		✓		SA
9.	Select OK to continue	OK	ok		✓		SA
10.	On HPCCS when prompted: "Check Telemetry Updating Correctly - OK to continue" Check that parameters: THSK TM2N	 Refreshing @ 1Hz Incrementing by 1 @ 1Hz	 @ 1Hz @ 1Hz	**AND: SA_1_559**	✓		SA
11.	Select OK to continue	OK	ok		✓		SA
12.	On HPCCS when all autonomous actions have been completed by the power on script **S102999SCVT006_ASDSFTSPIR_PWR_ON_R** it will prompt: "Set Bus Profile Back to Original Setting?" Select NO	NO	No		✓		SA

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Enter Start Date|Time:	31/10/08	08:18	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N	
13.	At the prompt: "Bus Profile left unchanged" Select OK to continue	OK	ok		✓		S.
14.	Verify HK TM packets are being received on APIDs 1281 & 1283		ok		✓		S.
15.	MODE parameter is set to "DRCU ON" mode (RAW value 0x0100)	SM00M500 = 0x0100 (DRCU ON)	DRCU_ON	**AND: SA_1_559**	✓		S.
16.	ONLY APPLICABLE FOR TBTV: Verify the following TCS baseplate temperature for SPIRE Warm Units before operating SPIRE: **HSDCU (DEA88710)**	> -25°C & < TBD - TBC		N/A	✓		S.
	SPIRE powered and in DRCU ON mode						

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7.2.7 *Short Functional Tests - Redundant*

7.2.7.1 Procedure SPIRE-FM-SFT-FUNC-SCU-01-R

Version	2.4
Date	4th June 2008
Purpose	SCU science packet generation check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced
Final configuration	Unchanged
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail Criteria	Specified SCU HK parameters show expected increment.

Procedure Steps:

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-SCU-01-R.tcl	SCUFRAMECNT (On SFT PARAMETERS display) TM5N (On DPU & OBS PARAMETERS display)	0/31 0x3FFF/1	0/31 0x3FFF/1	✓

Test Result (Pass/Fail):

Enter Date/Time:	31/10/08	08:32	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	08:34	

7.2.7.2 Procedure SPIRE-FM-SFT-FUNC-SCU-03-R

Version	2.3
Date	28th August 2007
Purpose	SCU DC thermometry check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and DC thermometry is ON
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	8 minutes
Pass/Fail Criteria	DC Thermometry channels show temperature readings according to the actual instrument temperature* *: At warm temperatures all channels should show short circuit RAW readings of -32768

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-SCU-03-R.tcl	—	—	— ✓	— ✓

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Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
2	**Wait for the parameter BBFULLTYPE to get set to SCU_DC_Therm**				
3	A few seconds later record the value of parameter SCUTEMPSTAT	SCUTEMPSTAT	0/FFFF/FFFF	0 / 0xFFFF	V
4	If the instrument is at He II temperatures check the values of SCU DC thermometry channels. **Notes:** **• The measured channel values will depend on the cryostat Level 0 and Level 1 temperatures.** **SCALTEMP is expected to show an anomalous value. HP-112000-ASED-NC – 4289 is open. Fix will require an update to**	PUMPHTRTEMP PUMPHSTEMP EVAPHSTEMP SHUNTTEMP EMCFILTEMP SL0TEMP PL0TEMP OPTTEMP BAFTEMP BSMIFTEMP SCAL2TEMP SCAL4TEMP SCALTEMP SMECIFTEMP SMECTEMP	~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L0 K ~ L0 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K	U/A	N

Enter Date/Time:	31/10/08	08:45	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	08:45	

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
	the SPIRE MIB.	BSMTEMP	~ L1 K		
5	If the instrument is at He I temperatures check the values of SCU DC thermometry channels. **Notes:** **• The measured channel values will depend on the cryostat Level 1 temperatures.** **SCALTEMP is expected to show an anomalous value. HP-112000-ASED-NC – 4289 is open. Fix will require an update to the SPIRE MIB.**	PUMPHTRTEMP PUMPHSTEMP EVAPHSTEMP SHUNTTEMP EMCFILTEMP SL0TEMP PL0TEMP OPTTEMP BAFTEMP BSMIFTEMP SCAL2TEMP SCAL4TEMP SCALTEMP SMECIFTEMP SMECTEMP BSMTEMP	~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K ~ L1 K (NCR open) ~ L1 K ~ L1 K ~ L1 K	See attached recovered!	✓
6	If the instrument is warm: **Configure the SFT PARAMETERS display to show**	PUMPHTRTEMP PUMPHSTEMP EVAPHSTEMP SHUNTTEMP	— — — —	N/A	✓

Enter Date/Time:	31/10/08	08:45	Sign Off	TC:	PA:

DS: 65535 ID: SA_7_5 Title: SFT PARAMETERS Sample Time: 2008.305.08.45.27.658 Workstation: hpws22

NAME	DESCRIPTION	VALUE	UNIT	NAME	DESCRIPTION	VALUE	UNIT
SM10N500	OBSID	B0000000	HEX	SM_1V520	SCUP9V	9.0886	V
SM2LN500	BBFULLTYPE	Null		SM_2V520	SCUM9V	-9.1052	V
SM00M500	MODE	DRCU_ON		SMT0A520	EVHSV	-0.0189	mV
SM00T500	THSK	2008.305.08.45.27.110	HEX	SMH0A520	SPHSV	-0.0484	mV
SMT1N500	TM2N	000007B7	HEX	SMT1A520	SPHTRV	0.0017	V
SMD1N510	DCUFRAMECNT	0		SMP0V520	PCALV	0.0004	V
SMD0N515	MCUFRAMECNT	0		SMP0A520	PCALCURR	0.000679	mA
SMD0N520	SCUFRAMECNT	31		SMS0V520	SCAL2V	3.6e-05	V
SMB6V510	BIASP5V	5.17	V	SMS0A520	SCAL2CURR	0.000102	mA
SMB7V510	BIASP9V	9.01	V	SMS1V520	SCAL4V	0.000168	V
SMB8V510	BIASM9V	-9.07	V	SMS1A520	SCAL4CURR	0.000447	mA
SML0V510	PLIAP5V	0.012	V	SMK0F520	SUBKSTAT	00000000	HEX
SML1V510	PLIAP9V	0.0096	V	SMF0K520	PUMPHTRTEMP	6.49095877	K
SML2V510	PLIAM9V	0.0096	V	SMF1K520	PUMPHSTEMP	7.19492234	K
SML3V510	SLIAP5V	0.011	V	SMF2K520	EVAPHSTEMP	6.94634164	K
SML4V510	SLIAP9V	0.0091	V	SMF3K520	SHUNTTEMP	4.32401503	K
SML5V510	SLIAM9V	0.0096	V	SMF4K520	EMCFILTEMP	10.80547722	K
SM_4V515	MCUP5V	20.00	V	SMF5K520	SL0TEMP	4.37281115	K
SM_2V515	MCUP14V	75.36	V	SMF6K520	PL0TEMP	4.38952996	K
SM_3V515	MCUM14V	75.36	V	SMF7K520	OPTTEMP	10.92177928	K
SM_0V515	MCUP15V	75.36	V	SMF8K520	BAFTEMP	11.39933538	K
SM_1V515	MCUM15V	75.36	V	SMF9K520	BSMIFTEMP	10.89363276	K
SMM0K515	MCUMACTEMP	1651.51	K	SMS0K520	SCAL2TEMP	10.74320395	K
SMF0K515	MCUSMECTEMP	1651.51	K	SMS1K520	SCAL4TEMP	10.76453365	K
SMB0K515	MCUBSMTEMP	1651.51	K	SMS2K520	SCALTEMP	32.33354657	K
SMS0W515	SMECENCPWR	0000FFFF	HEX	SMFAK520	SMECIFTEMP	10.62292995	K
SMS1W515	SMECLVDTPWR	0000FFFF	HEX	SMFBK520	SMECTEMP	10.58059044	K
SMS1M515	SMECLOOPMODE	0000FFFF	HEX	SMFCK520	BSMTEMP	10.85299853	K
SMC0W515	CHOPSENSPWR	0000FFFF	HEX	SMK0K520	SUBKTEMP	55.15210000	K
SMJ0W515	JIGGSENSPWR	0000FFFF	HEX	SM_0X520	PLIABITSTAT	00000000	HEX
SM_1F520	SCUTEMPSTAT	0000FFFF	HEX	SM_1X520	SLIABITSTAT	00000000	HEX
SM_0V520	SCUP5V	5.2283	V	SM_2X520	MCUBITSTAT	00000000	HEX

Enter Start Date|Time:	31/12/08	08:46	

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
	the RAW values of SCU DC thermometry channels. Record the RAW values of SCU DC thermometry channels. Nominal values should show a short circuit status (or RAW - 32768). **Non Nominal (Open Circuit Criterion):** **RAW reading in the range [0, -100]**	EMCFILTEMP SL0TEMP PL0TEMP OPTTEMP BAFTEMP BSMIFTEMP SCAL2TEMP SCAL4TEMP SCALTEMP SMECIFTEMP SMECTEMP BSMTEMP	— — — — — — — — — — — —		✓
Test Result (Pass/Fail): PASS					

Enter Start Date|Time:	31/10/08	08:46	

7.2.7.3 Procedure SPIRE-FM-SFT-FUNC-SCU-06-R

Version	2.3
Date	28th August 2007
Purpose	SCU AC thermometry check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and DC thermometry is ON
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	2 minutes
Pass/Fail Criteria	AC Thermometry channel shows temperature readings according to the actual instrument temperature

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-SCU-06-R.tcl	—	—	~~—~~ √	~~✓~~
2	**Wait for the parameter BBFULLTYPE to get set to SCU_AC_Therm**			√	√

Enter Date/Time:	31/10/08	08:47	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	08:48	

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure	
3	A few seconds later record the value of parameter SUBKSTAT	SUBKSTAT	0/1/1	0/1/1	√	SJ
4	If the instrument is at He II temperatures check the value of SCU AC thermometry channel. **Note that the measured channel value will depend on the cryostat Level 0 temperature.**	SUBKTEMP	~L0 K	N/A	√	SJ
5	If the instrument is at He I temperatures check the value of SCU AC thermometry channel. **Note that the measured channel value will depend on the cryostat Level 1 temperature.**	SUBKTEMP	~L1 K	4.665K	√	SJ

Enter Start Date|Time:	31/12/08	08:49	

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
6	If the instrument is warm: **Configure the SFT PARAMETERS display to show the RAW value of SCU AC thermometry channel.** Only record the RAW value of SCU AC thermometry channel if it indicates an open circuit. **Open Circuit Criterion:** **RAW reading in the range [0, -100]**	SUBKTEMP	— N/A	U	U

Test Result (Pass/Fail): PASS

7.2.7.4 Procedure SPIRE-FM-SFT-FUNC-SCU-07-R

Version	2.2
Date	2nd January 2007
Purpose	Sorption Cooler Heater Check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and DC thermometry is ON

Enter Date/Time:	31/12/08	08:49	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	08:50	

Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail Criteria	Sorption cooler heat switches and pump heater show expected voltages

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-SCU-07-R.tcl	—	—	— √	√
2	**Wait for the parameter BBFULLTYPE to get set to Cooler_Htr_Che**	BBFULLTYPE	Cooler_Htr_Che	√	√
3	Record the value of parameter SPHSV – the Sorption Pump Heat Switch Voltage. *This voltage stays on for ~20 seconds. Wait for the voltage to go to zero to continue.*	SPHSV - mV	0/~323/0	0/323/	√

Enter Date/Time:	31/10/08	08:57	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	08:51

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
4	Record the value of parameter EVHSV – the Evaporator Heat Switch Voltage. *This voltage stays on for ~20 seconds. Wait for the voltage to go to zero to continue.*	EVHSV - mV	0/~323/0	0/324/0	✓
5	Record the value of parameter SPHTRV – the Sorption Pump Heater Voltage. *This voltage stays on for ~20 seconds. Wait for the voltage to go to zero to continue.*	SPHTRV - V	0/~8.8/0	0/8.85/0	✓
Test Result (Pass/Fail): PASS					

Enter Start Date|Time:	31/10/08	08:52	

7.2.7.5 Procedure SPIRE-FM-SFT-FUNC-SCU-04-R

Version	2.3
Date	28th August 2007
Purpose	Photometer Calibration Check (REDUNDANT)
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Final configuration	Unchanged
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail Criteria	PCAL voltage and current agree with expected values

Procedure Steps:

Step	Description	Parameter Name - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-SCU-04-R.tcl **The expected values during the test should be monitored when parameter BBFULLTYPE in the SFT PARAMETERS display is set to PCAL_Check This usually happens about 30 seconds from the start of test execution.**	PCALCURR - mA PCALV – V BBFULLTYPE	0.0/0.1/0.0 0.0/~0.02/0.0 PCAL_Check	0/0.1/0 0/0.0189/0 PCAL_Check	✓

Test Result (Pass/Fail): PASS

Enter Date/Time:	31/10/08	08:54	Sign Off	TC:	PA:

Enter Start Date|Time:	31/12/08	08:54	

7.2.7.6 Procedure SPIRE-FM-SFT-FUNC-SCU-05-R

Version	2.2
Date	2nd January 2007
Purpose	Spectrometer Calibration Check (REDUNDANT)
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Final configuration	Unchanged
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	SCAL2 and SCAL4 voltage and currents agree with expected values

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-SCU-05-R.tcl	—	—	— V	V
2	**Wait for the parameter BBFULLTYPE to get set to SCAL4_Check**	BBFULLTYPE	SCAL4_Check	SCAL4_Check	V

Enter Date/Time:	31/12/08	08:56	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	08:56	

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
3	A few seconds later record the value of parameters SCAL4CURR and SCAL4V *These parameters are set back to 0 after ~30 seconds*	SCAL4CURR – mA SCAL4V – V	0.0/~0.10/0.0 0.0/~0.05/0.0	0/0.1/ 0/0.05/	V
4	**Wait for the parameter BBFULLTYPE to get set to SCAL2_Check**	BBFULLTYPE	SCAL2_Check	SCAL2_Check	V
5	A few seconds later record the values of parameters SCAL2CURR and SCAL2V *These parameters are set back to 0 after ~30 seconds*	SCAL2CURR – mA SCAL2V – V	0.0/~0.10/0.0 0.0/~0.05/0.0	0/0.1/0 0/0.05/0	V
Test Result (Pass/Fail): PASS					

Enter Date/Time:	31/10/08	08:56	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	08:57	

7.2.7.7 Procedure SPIRE-FM-SFT-FUNC-MCU-01-R

Version	2.4
Date	4th June 2008
Purpose	MCU (REDUNDANT) Boot Check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	MCU voltages and board temperatures show expected 'ON' values

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure	
1	Execute TCL script SPIRE-FM-SFT-FUNC-MCU-01-R.tcl	—	—	V	V	δ
2	Check that the MCU is booted up successfully	MCUBITSTAT	0/1/1	0/1/1	V	δ

Enter Date/Time:	31/10/08	08:58	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	08:58	

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
3	Check MCU HK parameter values and ensure that the values are refreshing	MCUP5V MCUP14V MCUM14V MCUP15V MCUM15V MCUMACTEMP MCUSMECTEMP MCUBSMTEMP	~ 5.0 ± 0.2V ~ 14.0 ± 0.5V ~ -14.0 ± 0.6V ~ 15.0 ± 0.6V ~ -15.0 ± 0.7V ~300K ~300K ~300K	5.00V 14.13V -14.49V 15.1V -15.6V 293.73K 298.0+K 292.86K	J J
Test Result (Pass/Fail): PASS					

J

Enter Date/Time:	31/10/08	08:59	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	08:59	

7.2.7.8 Procedure: SPIRE-FM-SFT-FUNC-MCU-02-R

Version	2.2
Date	2nd January 2007
Purpose	MCU Nominal Frame Generation Check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Final configuration	Unchanged.
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified MCU HK parameters show expected increment

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-MCU-02-R.tcl	MCUFRAMECNT	**FM** : 0/297	— 0/297	—V
Test Result (Pass/Fail):	Pass.				

Enter Date/Time:	31/10/08	09:05	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	09:06	

7.2.7.9 Procedure SPIRE-FM-SFT-FUNC-BSM-01-R

Version	2.3
Date	28th August 2007
Purpose	BSM (REDUNDANT) Chop/Jiggle Sensor Check.
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. BSM Chop/Jiggle sensors are ON.
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail criteria	HK Parameters CHOPSENSPWR and JIGGSENSPWR show expected ON values.

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-BSM-01-R.tcl	—	—	— √	√
2	Check that the Chop and Jiggle sensors have switched on	CHOPSENSPWR JIGGSENSPWR	0/1/1 0/1/1	0/1/1 0/1/1	√
Test Result (Pass/Fail): PASS					

Enter Date/Time:	31/10/08	09:07	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	09:08	

7.2.7.10 Procedure SPIRE-FM-SFT-BSM-OFF-R

Version	2.3
Date	28th August 2007
Purpose	BSM (REDUNDANT) Switch OFF
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. BSM Chop/Jiggle sensors are ON.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. BSM Chop/Jiggle sensors are OFF.
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail criteria	HK Parameters CHOPSENSPWR and JIGGSENSPWR show expected OFF values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute SPIRE-FM-SFT-BSM-OFF-R.tcl	—	—	— ✓	— ✓
2	Check that the power to the BSM sensors is switched off	CHOPSENSPWR JIGGSENSPWR	1/-/0 1/-/0	1 1 – 10 1 1 – 10	✓
Test Result (Pass/Fail):	Pass				

Enter Date/Time:	31/10/08	09:09	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	09:09	

7.2.7.11 Procedure SPIRE-FM-SFT-FUNC-SMEC-01-R

Version	2.3
Date	28th August 2007
Purpose	SMEC (REDUNDANT) Encoder/LVDT Sensor Check.
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are ON.
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail criteria	HK Parameters SMECENCPWR and SMECLVDTPWR show expected ON values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-SMEC-01-R.tcl	—	—	— ✓	— ✓
2	Check that power to the SMEC LED and LVDT sensor is on	SMECENCPWR SMECLVDTPWR	0/-/1 0/-/1	0 / - / 1 0 / - / 1	✓
Test Result (Pass/Fail): PASS					

Enter Date/Time:	31/10/08	09:13	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	09:14	

7.2.7.12 Procedure SPIRE-FM-SFT-SMEC-OFF-R

Version	2.3
Date	28th August 2007
Purpose	SMEC (REDUNDANT) Switch OFF
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are ON.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are OFF.
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail criteria	HK Parameters SMECENCPWR and SMECLVDTPWR show expected OFF values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-FM-SFT-SMEC-OFF-R.tcl	—	—	— √	√
2	Check that the power to the SMEC sensors is switched off	SMECENCPWR	1/-/0	1 / - / 0	√
		SMECLVDTPWR	1/-/0	1 / - / 0	
Test Result (Pass/Fail):					

Enter Date/Time:	31/10/08	09:16	Sign Off	TC:	PA:

Enter Start Date|Time:	31/10/08	09:16	

7.2.7.13 Procedure SPIRE-FM-SFT-FUNC-DCU-01-R

Version	2.2
Date	2nd January 2007
Purpose	DCU science packet generation check for all Photometer and Spectrometer packet types (PF, PSW, PMW, PLW, SF, SSW and SLW)
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Final configuration	Unchanged
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified DCU HK parameter shows expected increment

Procedure Steps:

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-DCU-01-R.tcl	DCUFRAMECNT	0/700	0/700	✓
Test Result (Pass/Fail):	PASS				✓

Enter Date/Time:	31/10/08	09:	Sign Off	TC: S. Eggel	PA:

Enter Start Date|Time:	31/10/08	09:24	

7.2.7.14 Procedure SPIRE-FM-SFT-FUNC-DCU-04-PHOT-R

Version	2.4
Date	10th Sept 2007
Purpose	Photometer LIAs REDUNDANT Check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. Photometer LIAs are ON
Constraints	• SPIRE DRCU REDUNDANT is switched ON • Photometer LIAs are OFF • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS & DCU PARAMETERS displays are selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified Photometer LIA HK parameters show expected ON values

Procedure Steps:

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-DCU-04-PHOT-R.tcl	PLIABITSTAT	0/1/1	0/1	✓

Enter Date/Time:	31/10/08	09:22	Sign Off	TC: S. Eggel	PA:

Enter Start Date|Time:	31/10/08	09:22

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
2	Check Photometer LIA HK parameter values and ensure that the values are refreshing	PLIAP5V PLIAP9V PLIAM9V	0.0-/ 5.2 ± 0.2V 0.0/-/ 11.5 ± 0.5V 0.0/-/-11.5 ± 0.5V	0 / 5.24 0 / 11.6 0 / -11.6	✓
3	**On the DCU PARAMETERS display check that the LIA temperatures are slowly warming up.** At switch-on it is possible that some of the LIA temperatures will be in soft or even hard limits. No action is required.	LIAP1TEMP to LIAP9TEMP	~ 290-300 K	295 K	✓
4	**Wait for ~3 minutes before continuing with the SFTs**	—	—	—	—
Test Result (Pass/Fail):	PASS				✓

Enter Start Date|Time:	31/10/08	09:26	

7.2.7.15 Procedure SPIRE-FM-SFT-PLIA-OFF-R

Version	2.4
Date	10th Sept 2007
Purpose	Photometer LIAs REDUNDANT Switch OFF
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. Photometer LIAs are ON
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. Photometer LIAs are OFF
Constraints	• SPIRE DRCU REDUNDANT is switched ON • Photometer LIAs are ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	2 minutes
Pass/Fail criteria	Specified Photometer LIA HK parameters show expected OFF values

Procedure Steps:

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-PLIA-OFF-R.tcl	PLIABITSTAT	1/-/0	1/0	✓
2	Check Photometer LIA HK parameter values	PLIAP5V PLIAP9V PLIAM9V	5.2 ± 0.2V/-/0.0 11.5 ± 0.5V/-/0.0 -11.5 ± 0.5V/-/0.0	5.24/0 11.6/0 -11.59/0	✓
Test Result (Pass/Fail):				PASS ✓	

Enter Date/Time:	31/10/08	09:28	Sign Off	TC: S. Eccleston	PA:

Enter Start Date|Time:	31/10/08	09:28	

7.2.7.16 Procedure SPIRE-FM-SFT-FUNC-DCU-04-SPEC-R

Version	2.4
Date	10th Sept 2007
Purpose	Spectrometer LIAs REDUNDANT Check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. Spectrometer LIAs are ON
Constraints	• SPIRE DRCU REDUNDANT is switched ON • Spectrometer LIAs are OFF • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS & DCU PARAMETERS displays are selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified Spectrometer LIA HK parameters show expected ON values

Procedure Steps:

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-FUNC-DCU-04-SPEC-R.tcl	SLIABITSTAT	0/1/1	0/1	✓

Enter Date/Time:	31/10/08	09:30	Sign Off	TC: S. Essex	PA:

Enter Start Date|Time:	31/10/08	09:30	

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
2	Check Spectrometer LIA HK parameter values and ensure that the values are refreshing	SLIAP5V SLIAP9V SLIAM9V	0.0/-/ 5.2 ± 0.2V 0.0/-/ 11.5 ± 0.5V 0.0/-/-11.5 ± 0.5V	0 / 5.25 0 / 11.59 0 / -11.57	✓
3	**On the DCU PARAMETERS display check that the LIA temperatures are slowly warming up.** At switch-on it is possible that some of the LIA temperatures will be in soft or even hard limits. No action is required.	LIAS1TEMP to LIAS3TEMP	~ 290-300 K	296 K	✓
4	**Wait for ~3 minutes before continuing with the SFTs**	—	—	—	—
Test Result (Pass/Fail):				PASS ✓	

Enter Date/Time:	31/10/08	09:31	Sign Off	TC: S. Eisley	PA:

Enter Start Date|Time:	31/10/08	09:31	

7.2.7.17 Procedure SPIRE-FM-SFT-SLIA-OFF-R

Version	2.4
Date	10th Sept 2007
Purpose	Spectrometer LIAs REDUNDANT Switch OFF
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. Spectrometer LIAs are ON
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. Spectrometer LIAs are OFF
Constraints	• SPIRE DRCU REDUNDANT is switched ON • Spectrometer LIAs are ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	2 minutes
Pass/Fail criteria	Specified Spectrometer LIA HK parameters show expected OFF values

Procedure Steps:

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT-SLIA-OFF-R.tcl	SLIABITSTAT	1/-/0	1/0	✓
2	Check Photometer LIA HK parameter values	SLIAP5V SLIAP9V SLIAM9V	5.2 ± 0.2V/-/0.0 11.5 ± 0.5V/-/0.0 -11.5 ± 0.5V/-/0.0	5.25/0 11.51/0 -11.51/0	✓

Test Result (Pass/Fail):

Enter Date/Time:	31/10/8	09:34	Sign Off	TC: S. ELSLEY	PA:

Enter Start Date|Time:	31/10/08	09:34	

7.2.7.18 Procedure SPIRE-FM-SFT-FUNC-MCU-OFF-R

Version	2.4
Date	4th June 2008
Purpose	MCU REDUNDANT Switch OFF
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is OFF.
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is ON. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	2 minutes
Pass/Fail criteria	Specified MCU HK Parameter shows expected value.

Enter Start Date|Time:	31/10/08	09:35	

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-FM-SFT- MCU-OFF-R.tcl	—	—	—	—
2	Check that the MCU is switched off Expected events: • A TM(5,1) event report with Event ID 0x0521 and SID 0x510F will be received to indicate that the DPU is not receiving a response from the MCU. • A TM(5,4) event report with Event ID 0x550D and SID 0x5420 will be received to indicate the MCU disconnection from the DPU.	MCUBITSTAT	1/-/0	1/0	✓
Test Result (Pass/Fail):				PASS	✓

Enter Date/Time:	31/10/08	09:37	Sign Off	TC:	S. ELSLEY	PA:

Enter Start Date|Time:	31/10/08	09:37	

7.2.7.19 Procedure SPIRE-FM-SFT-FUNC-SCU-OFF-R

Version	2.4
Date	4th June 2008
Purpose	SCU REDUNDANT Switch OFF
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is OFF
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SFT PARAMETERS display is selected on the CCS
Duration	2 minutes
Pass/Fail criteria	Specified SCU HK Parameters show expected value.

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-FM-SFT- SCU-OFF-R.tcl	—	—	—	—

Enter Start Date|Time:	31/10/08	09:39	

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
2	A few seconds later record the value of parameter SCUTEMPSTAT a) EVID 1313 No_MCU_Response_Error b) EVID 21773 ALARM_LSMCU_DEAD	SCUTEMPSTAT	0xFFFF/-/0	FFFF / 0	✓
3	A few seconds later record the value of parameter SUBKSTAT	SUBKSTAT	1/-/0	1 / 0	✓
Test Result (Pass/Fail):				PASS	✓

Enter Start Date|Time:	31/10/08	09:40	

7.2.8 *Switch Off DRCU & DPU REDUNDANT*

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 DRCU ON: **S102999SCVT008_ASDSFTSPIR_PWR_OFF_R**	OK		ok	✓	
2.	On HPCCS when prompted: "SPIRE Switch OFF for SFT related tests in any conditions - Select NO to abort TS if not correct"	YES		Yes	✓	
3.	If in any doubt about the script being executed **NO** should be selected to abort the script. Before restarting consult the relevant instrument support engineer to confirm the correct script to be used for the test in question.				N/A	
4.	If **YES** is selected the test script will go on to automatically power off all SPIRE warm units.				✓	

Enter Date/Time:	31/10/08	09:41	Sign Off	TC: S. Eisley	PA:

Enter Start Date|Time:	31/10/08	09:41	

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: c) EVID 1313 No_MCU_Response_Error d) EVID 21773 ALARM_LSMCU_DEAD			NOT SEEN		
6.	On HPCCS when prompted: "Check Telemetry No Longer Updating - OK to continue" Check that parameters: THSK TM2N	 Not refreshing Not incrementing		AND: SA_1_559	✓	
7.	Select OK to continue	OK	OK		✓	
8.	On HPCCS when all autonomous actions have been completed by the power on script **S102999SCVT008_ASDSFTSPIR_PWR_OFF_R** it will prompt: "Bus profile left as SPIRE PRIME, change manually after if required - OK to continue"				✓	

Enter Date/Time:	31/10/08	09:46	Sign Off	TC: S. Elsey	PA:

Enter Start Date|Time:	31/10/08	09:46	

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
9.	Select OK to continue	OK	Go!		✓	
10.	On HPCCS stop Packet History displays for the following APIDs:1281,1283	OK	OK		✓	
	SPIRE OFF					

Enter Date/Time:	31/10/08	09:47	Sign Off	TC: S. Elsey	PA:

Enter Start Date|Time:			

7.2.9 *Procedure SPIRE-FM-SFT-LPU-01-R*

Version	1.0
Date	Tuesday, 28 August 2007
Purpose	DPU PRIME Switch OFF
Initial configuration	Prime and redundant DPU and DRCU are off
Final configuration	Prime and redundant DPU and DRCU are off
Constraints	• Cryostat is vertical to within ±45° • Prime and redundant DPU and DRCU are off
Duration	5 minutes
Pass/Fail criteria	The specified current is drawn when the LPU is enabled and is switched off when the LPU is disabled

VSN 1-2

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	**Power on Redundant LPU LCL (LCL #26)** Execute **DC26D170**	LCL status	OFF/ /ON		State of LCL #26 switches to ON
3	**Send HL command #21 (LPU Enable Redundant)** Execute: **DCT01170, DHT01170 = "CMD_ID_HLC21"**	LCL #26 current	0mA/ /130-180mA		Current between 130-180mA
4	**Send HL command #22 (LPU Disable Redundant)** Execute: **DCT01170, DHT01170 = "CMD_ID_HLC22"**	LCL #26 current	130-180mA/ /0mA		Current off
5	**Un-power Prime LPU LCL (LCL # 25)** Execute: **DC26B170**	LCL status	ON/ / OFF		State of LCL #26 switches to OFF

Enter Date/Time:	31/10/08		Sign Off	TC:	PA:

Enter Start Date|Time:			

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
Test Result (Pass/Fail):					

PVS#1-2

7.2.10 Satellite & EGSE Switch Off

The following test steps are not applicable for TBTV tests.

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remark	P	N
	Satellite & EGSE Switch Off						
	Initial Conditions: Nominal & Redundant SPIRE warm units OFF						
1	From HPCCS Test Conductor console issue command to disconnect from SPIRE I-EGSE **disconnect HSPIREEGSE**	OK			Steps 10.1-10.3 are only necessary if Steps 1.1, 1.3 to 1.7 were executed		
2	Confirm from HPCSS and SPIRE I-EGSE that the disconnection was successful	YZS2994 = disconnected					
3	If required Switch OFF I-EGSE i.a.w. AD 8						
4	Switch OFF Satellite/SVM, HPCCS and SCOEs i.a.w. procedure AD 2 Sections 7.7 to 7.11	OK					
5	Confirm both Satellite and EGSE powered down	OK					
	End Conditions: Satellite and EGSE OFF						
	END OF TEST						

Enter Date/Time:			Sign Off	TC:	PA:

Enter Start Date|Time:			

7.2.11 SPIRE SAFE Switch Off

The following procedure describes the necessary steps to safely switch off SPIRE when directed by RAL personnel if an anomaly should occur.

Not applicable for TBTV

Version	2.3
Date	10th Sept. 2007
Purpose	To switch OFF the SPIRE instrument if an anomaly should occur
Initial configuration	SPIRE can be in ANY configuration - Prime or Redundant - as specified in the procedure steps
Final configuration	SPIRE is OFF
Preconditions	• SPIRE FM DPU is electrically integrated with the Herschel Satellite • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	~5-8 minutes
Pass/Fail Criteria	SPIRE is OFF. All instrument subsystems are completely powered OFF.

Note:
All HK parameters relevant to this procedure can be located on the FUNCTIONAL TEST PARAMETERS CCS display. The exact name of the script to be executed at each step depends on whether the Prime or Redundant instrument is switched on.

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter - Unit	Value	Actual value before/ after
1	**Check to see if the Photometer LIAs are on** If PLIABITSTAT=1 then execute SPIRE-FM-SFT-PLIA-OFF-<P/R>.tcl	PLIABITSTAT	**0 or 1**	
2	**Check to see if the Spectrometer LIAs are on** If SLIABITSTAT=1 then execute SPIRE-FM-SFT-SLIA-OFF-<P/R>.tcl	SLIABITSTAT	**0 or 1**	
3	**Check to see if the BSM is on** If CHOPSENSPWR=1 or JIGGSENSPWR=1, then execute SPIRE-FM-SFT-BSM-OFF-<P/R>.tcl	CHOPSENSPWR JIGGSENSPWR	**0 or 1** **0 or 1**	
4	**Check to see if the SMEC is on** If SMECENCPWR=1 or SMECLVDTPWR=1, then execute SPIRE-FM-SFT-SMEC-OFF-<P/R>.tcl	SMECENCPWR SMECLVDTPWR	**0 or 1** **0 or 1**	
5	**Check to see if the MCU is on** If MCUBITSTAT=1 then execute SPIRE-FM-SFT-MCU-OFF-<P/R>.tcl	MCUBITSTAT	**0 or 1**	

Enter Date/Time:			Sign Off	TC:	PA:

Enter Start Date|Time:			

Step	Description	Parameter - Unit	Value	Actual value before/ after
6	**Check to see if the SCU DC/AC thermometry is on** If SUBKSTAT=1 or SCUTEMPSTAT≠0, then execute SPIRE-FM-SFT-SCU-OFF-<P/R>.tcl	SUBKSTAT SCUTEMPSTAT	**0 or 1** **≠ 0**	
7	If SPIRE PRIME powered execute Section 7.2.4	OK		
8	If SPIRE REDUNDANT powered execute Section 7.2.8	OK		

8 Summary Sheets

8.1 Procedure Variation Summary

	Test Change	Curr. No.: Date Page of	
Test designation	Test Procedure	Issue	Rev.
Test step changed	Reason for Change		

PVS #1 skip LPU tests

PVS #2 record cryo temperatures

PVS #3 skip IEGSE time synchronisation

PVS #4 power on CCU in mode 2

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

Table 8.1-1: Procedure Variation Sheet

8.2 Non Conformance Report (NCR) Summary

NCR - No.	NCR - Title	Date	Open Closed	PA sig.
- 3955	reoccurred			
- 4289	SCAL temperature OOL → MIB to be corrected			

Table 8.2-1: Non-Conformance Record Sheet

8.3 Sign-off Sheet

	Date	Signature
Test Manager	13.11.08	A. Lepe
Operator	13.11.08	
PA Responsible	13.11.08	
ESA Representative		

END OF DOCUMENT

	Name	Dep./Comp.
	Baldock Richard	FAE12
	Barlage Bernhard	AED13
	Bayer Thomas	ASA42
	Brune Holger	ASA45
	Chen Bing	HE Space
	Davis William	Captec
	Edelhoff Dirk	AED21
	Fehringer Alexander	ASG15
X	Fricke Wolfgang Dr.	AED 65
	Geiger Hermann	ASA42
	Grasl Andreas	OTN/ASA44
	Grasshoff Brigitte	AET12
X	Hamer Simon	Terma
	Hanka, Erhard	FI522
	Hendrikse Jeffrey	HE Space
X	Hendry David	Terma
	Hengstler Reinhold	ASA42
	Hinger Jürgen	ASG23
X	Hohn Rüdiger	AED65
	Hopfgarten Michael	AET32
	Huber Johann	ASA42
	Hund Walter	ASE252
X	Idler Siegmund	AED312
	Iványi von András	FAE12
	Jahn Gerd Dr.	ASG23
X	Kölle Markus	ASA43
	König Werner	AET32
X	Koppe Axel	AED312
X	Kroeker Jürgen	AED65
	La Gioia Valentina	Terma
	Lang Jürgen	ASE252
	Langenstein Rolf	AED15
	Langfermann Michael	ASA41
	Liberatore Danilo	Rhea
X	Martin Olivier	Altec
X	Maukisch Jan	ASA43
X	Much Christoph	ASA43
X	Müller Martin	ASA43
	Pietroboni Karin	AED65
	Reichle Konrad	ASA42
	Runge Axel	OTN/ASA44
	Saal Christoph	External
	Schink Dietmar	AED321
	Schmidt Thomas	AED15
	Schweickert Gunn	ASG23
X	Sonn Nico	ASG51
	Steininger Eric	AED321
X	Stritter Rene	AED11

	Name	Dep./Comp.
	Suess Rudi	OTN/ASA44
X	Theunissen Martijn	ASA43
	Vascotto Riccardo	HE Space
	Wagner Klaus	ASG23
X	Wietbrock Walter	AET12
	Wöhler Hans	ASG23
	Wössner Ulrich	ASE252
	Zumstein Armin	AED15
X	ESA/ESTEC	ESA
X	Thales Alenia Space Cannes	TAS-F
	Thales Alenia Space Torino	TAS-I
	Instruments:	
	MPE (PACS)	MPE
X	RAL (SPIRE)	RAL
	SRON (HIFI)	SRON
	Subcontractors:	
	Austrian Aerospace	AAE
	Austrian Aerospace	AAEM
	BOC Edwards	BOCE
	Dutch Space Solar Arrays	DSSA
	EADS Astrium Sub-Subsyst. & Equipment	ASSE
	EADS CASA Espacio	CASA
	EADS CASA Espacio	ECAS
	European Test Services	ETS
	Patria New Technologies Oy	PANT
	SENER Ingeniería SA	SEN
	Thales Alenia Space, Antwerp	TAS-ETCA

6 Appendix 2: HERSCHEL PCDU & CDMS nominal switch on/off procedure

As-Run Procedure

(ref. HP-2-ASED-PR-0070, issue 3)

As Run

31/10/08

EADS astrium

Procedure

Herschel

2008_10_31_05_29_herschel_hpw22_REALTIME_S_SFT_hel

HP_2_ASED_TP_212_1881_3_SPIRE_SFT_Hel_END_002

Title: **Herschel PCDU & CDMS nominal switch on / off procedure**

CI-No:

Prepared by:	Functional AIT		Date:20 August 2008
Checked by:	for C. Much	J. Menkiel	20.08.2008
Product Assurance:	for J. Hall	R. Goossens	20.08.2008
Configuration Control:	for W. Wietbrock		29.08.2008
TASF Engineering	for F. Sauvage		20.08.2008
TASF Test Director	N/A		
Project Management:	Dr. W. Fricke / R. Hohn		22.08.08
Project Management:	D. Montet		20.08.08

Distribution: See Distribution List (last page)

Issue	Date	Sheet	Description of Change	Release
1	22.05.2007	All	Initial version	
2	17.07.2008	All	Cover page - new Section 7.5 – Power On Update Section 7.7 – Power Off Update Distribution list – new	
3	19.08.2008	All	Location / Operator / PA / Date footer added Section 7.5 - Power On GUI added Section 7.7 – Power Off Update	

Table of Content

1 Scope

1.1 Objective

This Procedure represents the nominal Herschel PCDU & CDMS switch on / off procedure to support electrical integrations and electrical tests.

1.2 Operational Flow

In paragraph 7 is provided the detailed step-by-step test procedure.

2 Documents/Drawings

2.1 Applicable Documents

The following documents form a part of this document to the extent specified herein. Unless an issue is quoted for a document, the current issue is deemed to apply. When an issue is quoted, this issue and no other must be used.

AD-1 Herschel / Planck EGSE – Service Module Configuration Commissioning Procedure H-P-2-PR-AI-0039

2.2 Reference Documents

N/A

2.3 Other Documents

N/A

2.4 Acronyms

The following terms and definitions are specific to this document and to Herschel Project.

1553	MIL-STD-1553B conform communication interface
AAD	Attitude Anomaly Detector
ACC	ACMS Control Computer
ACMS	Attitude Control and Measurement Subsystem
AIR	ACC In Reconfiguration
AIT	Assembly, Integration and Test
AIV	Assembly, Integration and Verification
APID	Application Process ID
ASW	Application Software
AVM	Avionics Model

BSW	Basic Software
CBH	Cathalyst Bed Heater
CCS	Central Check-out System
CCSDS	Consultative Committee for Space Data Systems
CDMU	Control and Data Management Unit
CDMS	Control and Data Management Sub-system
CIR	CDMU In Reconfiguration
CLCW	Command Link Control Word
CLTU	Command Link Transmission Unit
CPDU	Command Pulse Distribution Unit
CRS	Coarse Rate Sensor
CTR	Central on board Reference Time
EEPROM	Electrically Erasable PROM
EGSE	Electrical Ground Support Equipment
FCL	Fold-back Current Limiter
FCV	Flow Control Valves
FDIR	Failure Detection, Isolation, and Recovery
GDIR	General Design and Interface Requirement
GRP	Group Heaters Switch
HBR	High Bit Rate
HL/HLC	High Level command
HP/HPC	High Priority commands
HPSDB	Herschel Planck System Data Base
HW	Hardware
I/F	InterFace
I/O	Input/Output
ICD	Interface Control Document
IST	Integrated System Test
LV	Latching Valves
LBR	Low Bit Rate
MAP	Multiplexed Access Point
MBR	Medium Bit Rate

ML 16	Memory Load command (ML 16)
MM	Memory Module
MOIS	Mission Operations Information System
MTL	Mission Timeline
NRZ-L	Non Return to Zero – Litton
OBCP	On-Board Control Procedure
OBDH	On-Board Data Handling
OBMF	On-Board Monitoring Function
OBRT/OBT	On-Board Reference Time
OIRD	Operation Interface Requirement Document
P/L	Payload
PCDU/PCS	Power Control Distribution Unit/Power Control Subsystem
PM	Processor Module
PROM	Programmable Read Only Memory
PSK	Phase Shift Keying
RA	Rate Anomaly
RAM	Random Access Memory
RCS	Reaction Control Subsystem
RF	Radio Frequency
RM	Reconfiguration Module
RT	1553 Remote Terminal
RWL	Reaction Wheel Assebly
SA	1553 Remote Terminal Sub Address
SAS	Sun Acquisition Sensor
SCOE	Special Check-out Equipment
SIR	S/C In Reconfiguration
SIT	Subsystem Integrated Test
SP	Sun Pointing
SSMM	Solid State Mass Memory
STR	Star Tracker
SVM	Service Module
SW	Software

TAI	International Atomic Time
TC	TeleCommand
TFG	Transfer Frame Generator
TM	TeleMetry
TTC	Telemetry Tracking & Command subsystem
TTR	Telemetry Telecommand and Reconfiguration
UFT	Unit Functional Test
VC	Virtual Channel
WD	Watchdog

3 Requirements to be verified

N/A

4 Configuration

4.1 Herschel S/C Configuration

4.1.1 Hardware Configuration

The activities described in this test procedure require the complete SVM configuration.

4.1.2 Software Configuration

The PCDU & CDMS Switch On / Off will be run with the following on-board software configuration:

- CDMS OBSW: the actual SW version shall be used

4.1.3 Test Configuration

N/A

4.1.4 Simulated Equipments

N/A

4.2 Set-up

N/A

5 Conditions

5.1 Personnel

Responsibility	Name / Organization
EGSE Operator	

5.2 Environmental

N/A

5.3 General Precautions and Safety

5.3.1 General Safety Requirements, Precautions

Special condition and hazards

The following Operational restrictions shall be carefully taken into account:

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

5.3.2 ESD constraints

N/A

5.3.3 Special QA Requirements

N/A

5.4 GSE

5.4.1 MGSE

N/A

5.4.2 CVSE

N/A

5.4.3 EGSE

5.4.3.1 EGSE Hardware Configuration

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

5.4.3.2 EGSE User Software

- CCS the actual SW version shall be used
- TMTC DFE the actual SW version shall be used
- BS SOE the actual SW version shall be used
- LPS/SAS SCOE the actual SW version shall be used
- HPSDB the actual SW version shall be used

5.4.3.3 Grounding Configuration

N/A

5.4.3.4 Test Equipment

N/A

5.4.3.5 Data Acquisition System

N/A

5.4.4 OGSE

N/A

5.4.5 Special Equipment

N/A

6 Verification Requirements and Test Criteria

N/A

7 Step by Step Procedure

7.1 CCS login, session start up and standard operator HCI set up

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
10	Verify the S/C Switch-On sheet (at the window), if S/C (PCDU & CDMS) is allowed to be switched on	Pass					
20	Make initial entries into the Logbook • Page • Date • Operator name • Test Session – and Test Environment Name should be added during step 60 • Planned activity incl. procedure reference number	Pass					
30	Verify "Red Hat Login window" is displayed and ready for login at • on both operator double screen workstations	Pass					
	At rightmost double screen workstation (left screen)						
40	Perform Log on as Test Conductor to the CCS system at both operator double screen workstations and write into the "Remarks" column • Username: heregse or hercdmu (during IST) • Password: hertest hertest	Pass					

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

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
50	Open the "Session Manager System Window" HPCSS • click (1x) on the desktop icon "Start MMi" • verify if a.m. window appears	Pass					
60	Open the "Session Manager Execution Window" REALTIME for starting a Test Session • from "Session Manager System Window" HPCSS Execution → Start • verify if a.m. window appears.	Pass					
70	Prepare start of a Test Session in the "REALTIME Window" • select in field "Test Environment Name" the default Test Environment "HEAD" or • another Test Environment name if required for the specific Integration or Test	Pass					
80	Start the Test Session in the "REALTIME Window" • Click on "Start" button • Update logbook with Test Session and Environment name • Wait for ca. 4 minutes • verify Status in "Session Manager System Window" HPCSS changes from INIT to RUN	Pass					
90	Verify Session Status in the "REALTIME Window" • RUN and NOT	Pass					

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

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
100	Connect to an already running Test Session • in the "REALTIME Window" click on Join button • verify on the CCS Desktop that a top banner SCOS 2000 and a bottom LOG window appears • verify Session Status in the "REALTIME Window" RUN-RUN	Pass					
110	To avoid unintentionally stop a the running test session • minimize the "Session Manager System Window" HPCSS	Pass					
120	Configure the HCI: From the "Session Manager Execution Window" REALTIME • open "HPCSS Test Conductor Console Window" with Desktop -> Test Sequences -> Console and move window to upper left corner • open the "SCOS 2000 Command History Window" with Desktop -> Commanding -> Command History, resize the window (smaller) and put it at the bottom	Pass					

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

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	At rightmost double screen workstation (right screen)						
130	Configure the HCI From the "Session Manager Execution Window" REALTIME • open "Telemetry Packet History Display" with Desktop -> Monitoring -> Packet History -> LIVE, resize window (smaller) and put at top of screen • open "Telemetry Packet History Display" with Desktop -> Monitoring -> Packet History -> STOP, Set Filter APID=16 -> LIVE, resize window (smaller) and put at middle of screen • open "Onboard Event Display Window" with Desktop -> Monitoring -> Onboard Event History -> LIVE, resize window (smaller) and put at bottom of screen	Pass					
	At leftmost double screen workstation (left screen)						
140	Perform Join to a running Test Session (1) • Open the "Session Manager System Window" HPCSS by click (1x) on the desktop icon "Start Mmi" • verify if a.m. window appears	Pass					

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

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
150	Join a running Test Session (2) • from "Session Manager System Window" HPCSS with Execution -> Join • minimize HPCSS window to avoid unintended stop of session	Pass					
160	Join a running Test Session (3) • From the "Session Manager Execution Window" REALTIME click on Join • Wait for Session Status RUN-RUN	Pass					
170	Configure the HCI From the "Session Manager Execution Window" REALTIME • open "Telemetry Desktop Window" with Desktop -> Monitoring -> Monitoring Desktop -> MIM (Synoptics) • select Power (UL) GEN_POWER -> Apply • select LCL (UR) LCL_HERSCHEL -> Apply • select Heaters & FCL (LL) HEATERS -> Apply • select SAT (LR) SAT -> OK • click on Resize -> Large medium • click on List -> available synoptics shown • click on 4 (right of List) • click on List • resize 4 Large	Pass					

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

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	At leftmost double screen workstation (right screen)						
180	Configure the HCI From the "Session Manager Execution Window" REALTIME • open "Telemetry Window" with Desktop -> Monitoring -> Monitoring Desktop -> AND (Alpha Numeric) and select all essential low / high HK • select TM/TC DFE HK parameters 1-3: YAHK 1946, 2946, 3946 -> Apply • select BS SCOE HK parameters: YAHK1956 -> Apply • select LPS SCOE HK parameters 1-2, 2-2: YAHK1952, 2952 -> OK • click on List • Resize 4 large	Pass					

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

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
190	Switch on Bus Monitor at CDMU SCOE Workstation (set-3) Verify at TM/TC rack in MIL-1553B BUS if Monitor is switched on (green light)? User H-P_user Password H-P IF Monitor not already running, click 2x on Shortcut to StartBM.bat Verify that MIL-STD-1553b Bus Monitor and Raw Data windows appear MIL-STD -> Mode -> On-line Mode MIL-STD -> Mode -> Start New Acquisition						

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

7.2 TM/TC DFE nominal switch on

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	At the TM/TC DFE rack						
10.	Switch on the "Insulation Transformer" (at bottom left, if not already ON) Note: Sometimes it is necessary to switch on also the bottom mid breaker	Pass					
	At the TM/TC DFE PC						
20.	Switch on the "User Workstation" (black button) Verify the boot is successfully completed	Pass					
	At the TM/TC DFE rack						
30.	Switch on the External Interface Unit „EIU".	Pass					
40.	During system power-up verify the LED's on the EIU Front Panel come on and He TM/TC EIU ... at screen	LED's On					
50.	Switch on the TM/TC "Baseband Processor" and wait for it to boot. (Kippschalter)	Pass					

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

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
60.	During system power-up verify that multiple LED's on the TM/TC "Baseband Processor Front Panel" will light. Wait until number of lighting LED`s is reduced.	LED's On					
	At the TM/TC DFE PC						
70.	Log-on as User: H-P_User Password: H-P	Pass					
80.	Start ikon SysCtrl.exe Verify that the TM/TC DFE CMS software is automatically started.	Started					
90.	Bring "System Status Window" into front. From the "System Status Window" → System Page → System State Box → Operation Mode Verify that this label is set to 'Off-line'.	Offline					
100.	From the "System Status Window" → System Page → System State Box → Control Mode Verify that this label is set to 'Remote'.	Remote					
110.	From the "System Status Window" → System Page → System State Box → Last System BIST Result, Verify that this label is set to 'Passed'.	Passed					

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

7.3 BS SCOE nominal switch on => in Cleanroom

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	At the BS SCOE rack (right)						
10.	Switch on the SCOE rack power (key, down left)	OK					
	At the BS SCOE PC (left)						
20.	Switch on the SCOE controller and wait until the boot of the operating system is finished	OK					
30.	Log in as SCOE user. Username: hpp Password: HPP_us -> GO	OK					
40.	Start the SCOE application by clicking on the SCOE icon (H-P BS) (1x)	OK					
50.	On the popped up H-P BS SCOE window "Startup parameters" select the value for • Payload Model: HERSCHEL • Startup method: NORMAL -> OK	Pass					
60.	Verify in the H-P BS SCOE window the SCOE State is "LOCAL"	OK					

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

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
70.	Verify in the H-P BS SCOE window the S/C interface is "OFFLINE" Wait for 100 % Selftest: PASSED	OK					

7.4 LPS/SAS SCOE nominal switch on => in Cleanroom

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	At the SAS SCOE rack						
10.	Switch on the MITU on front panel of the rack 1 (black button, down left)	OK					
20.	Switch on the rack 2 and the rack 3, pressing the green button on the front side of the racks (bottom of 2, top of 3)	OK					
30.	Switch on the ELGAR SAS controller Slave (bottom) and wait 20 sec. Draw and open the rack 2 ELGAR Monitorscreen at rack 2 (mid)	OK					
40.	Switch on the ELGAR SAS controller Master (up)	OK					

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

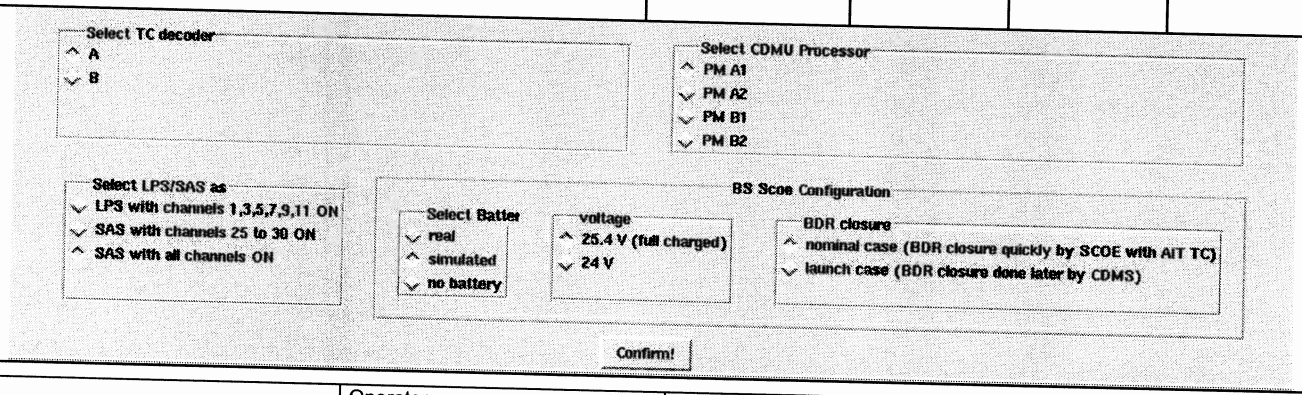
Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	At the SAS SCOE PC						
50.	Switch on the PC workstation Note: sometimes it may take longer, due to scan disc	OK					
60.	Login as "Normal LPS SCOE operator" User: hpp Password: HPP_us -> GO	OK					
70.	Verify at the ELGAR Master PC Monitor (rack 2) if LPS/SAS SCOE is started. Application is correct when screen shows all values in a matrix.	OK					
80.	Start the LPS/SAS SCOE Application SW by clicking on the "H-P LPS" icon (1x)	OK					
90.	Into the "Startup Parameter" window select • Payload model: Herschel • Startup method: NORMAL -> OK.	OK					
100.	Into the "Operator Comment" window confirm the installed harness is the same of the S/C model selected, type in "yes" -> OK	OK					
110.	Verify the SelfTest, connections, etc. is started and wait until it is 100% finished. (ca. 10 min)	OK					

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

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
120.	Verify into the "H-P LPS SAS SCOE" main window the following fields: • Selftest State: Passed (green coloured). • SCOE State: LOCAL • SCOE activity: IDLE • S/C interface: ISOLATED	OK					

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

7.5 S/C (PCDU & CDMS) Power ON

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
10.	From "HPCCS Conductor Console" window select File -> Start -> Select ->**Z010999MCVT001_POWER_ON_HER_IST** Select the following on the GUI: • TC Decoder = A • CDMU Processor = PM A1 • LPS/SAS = SAS with all channels ON • Battery = Simulated • Voltage = 25.4V • BDR Closure = Nominal Case	Confirm		CONFIRM		✓	
							

Test location:	Operator	Product Assurance:	Date:	Time:
ESTEC	S. EISLER		31/10/08	05:57

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
20.	**Z010999MCVT001_POWER_ON_HER_IST** A Popup window occurs asking to verify data reception on TM/TC Data Front End workstation: In window "System Status", check following panels ➔ TM chain / TM Acquisition synchronised and locked Status expected ➔ View / TM Transfer Frame Monitor TM frame data should be received before few minutes ➔ click the button "OK" to proceed	OK		OK		✓	
30.	**Z010999MCVT001_POWER_ON_HER_IST** A Popup Window occurs asking to start a new acquisition in Bus Monitor with name IST on the CDMU SCOE: - start a new acquisition by clicking "Menu Mode/Start new Acquisition" If an acquisition is already started, please stop and restart ➔ click the button "OK" to proceed After few minutes Data transfer should be visible on the Bus Monitor.	OK		OK		✓	

Test location:	Operator	Product Assurance:	Date:	Time:
ESTEC	S. Eckert		31/10/08	06:06

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
40.	**D102159SCVT001_GET_ALARM_STATUS** Check that both DOD ext1 and ext2 are "Not Asserted". Otherwise execute Operator Note 8 ➔ Click the button "End TS!" to proceed	End TS		End TS	No DOD	✓	
50.	**D102159SCVT001_GET_ALARM_STATUS** Check that both DOD ext1 and ext2 are "Not Asserted". Otherwise execute Operator Note 8 ➔ Click the button "End TS!" to proceed	End TS		End TS	No DOD	✓	
60.	**Z010999MCVT001_POWER_ON_HER_IST** Temporary workaround until **SPR-107 / NCR-3312** are solved ➔ click the button "YES" to proceed the workaround	YES		YES		✓	

Test location:	Operator	Product Assurance	Date:	Time:
ESTEC	S. ELSEN		31/10/08	06:11

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
70.	**D102159SCVT032TIMESYNCRO** Wait until the synchronization between CDMS On-board Time and CCS is finished ➔ Click the button "End TS!" to proceed	End TS		End TS		✓	
80.	**Z010999MCVT001_POWER_ON_HER_IST** ➔ Click the button "End TS!" to proceed	End TS		End TS		✓	

[redacted]

7.6 Perform Corresponding Procedure

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
10.	Perform corresponding procedure and then return here to switch off	OK		OK		✓	

Test location:	Operator	Product-Assurance:	Date:	Time:
ESTEC	S. Elsner	[redacted]	31/10/08	06:21

7.7 S/C (CDMS & PCDU) Power OFF

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
10.	From "HPCCS Conductor Console" window select File -> Start -> Select -> **Z010999MCVT002_POWER_OFF_HER_IST**	Pass					
20	**D012159SCVT001_PM_SELECT** Click the button "End TS!" to proceed	End TS					
30.	**Z010999MCVT001_POWER_ON_HER_IST** ➔ Click the button "End TS!" to proceed	End TS					

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

7.8 LBS/SAS SCOE nominal switch off => in Clean-room

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	At the LBS/SAS SCOE PC (right)						
10.	Verify into the "H-P LPS SAS SCOE" main window the following fields: • SCOE State: LOCAL • SCOE activity: IDLE • S/C interface: ISOLATED	OK					
20.	Into the "H-P LPS SAS SCOE" main window select the menu option File → RackShutdownExit	OK					
30.	Into the "Logout confirmation" window select "Go OFFLINE/Isolate S/C" and click "Logout". Press Shutdown. (Note: This takes a while to complete, ca. 5 min)	OK					
40.	Verify the application is stopped.	OK					
	At the LBS/SAS SCOE rack						
50.	After the monitor in the rack is switched off, switch off both the ELGAR controller PCs.	OK					
60.	Shutdown and switch off the PC workstation.	OK					
70.	Switch off the rack 3 (button at top of rack – also switches off rack 2)	OK					
80.	Switch off the rack 1 (the MITU), button at bottom left	OK					

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

7.9 BS SCOE nominal switch off => in Clean-room

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	At the BS SCOE PC (left)						
10.	Verify the BS SCOE is in OFFLINE mode.	OK	OK				
20.	Verify the BS SCOE is in LOCAL mode.	OK					
30.	Stop the application, selecting the menu File → Exit, from the BS SCOE main window.	OK					
40.	On the popped up window "Log out confirmation" select the button "Go OFFLINE / Isolate S/C" and then click the "Log out" button.	Pass					
50.	Verify the main window disappears.	OK					
60.	Log off the system.	OK					
	At the BS SCOE rack						
70.	Switch off the BS rack by turning key at bottom left	OK					

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

7.10 TM/TC DFE nominal switch off

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	At the TM/TC DFE PC						
10.	From the "System Status Window" → System Page → System State Box → Control Mode Verify that this label is set to 'Local'. If not, command it (password: H-P).	Local					
20.	From the System Status Window → System Page → System State Box → Operation Mode Verify that this label is set to 'Offline'. If not, command it.	Offline					
30.	Stop the CMS application, from the menu File → Exit.	Pass					
40.	The Exit System window appears.	Pass					
50.	Select Platform Shutdown, CMS Shutdown and click OK.	Pass					
60.	Shutdown the Workstation.	Pass					
	At the TM/TC DFE rack						
70.	Switch off each unit of the TM/TC FE individually, in any order.	Pass					

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

7.11 CCS HCI close, session stop and logoff

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
10.	From the the "Session Manager Execution Window" REALTIME press the Leave button to disconnect from the running Test Session. Wait until into the Session fields RUN-NOT are displayed	Pass					
20.	From the "Session Manager Execution Window" REALTIME press the Stop button to stop the currently running Test Session. Verify that in the Realtime window into the Session fields NOT-NOT are displayed and into the System window the Status is NOT.	Pass					
30.	From the "Session Manager Execution Window" REALTIME, select the menu button Execution → Close. Verify the window disappears.	Pass					
40.	From the "Session Manager System Window" HPCSS, select the menu button System → Quit... Verify the window disappears.	Pass					
50.	Close all remaining HCI windows	Pass					

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

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
60.	Execute the System Logout from the KDE Start menu. Verify the Red Hat login window appears.	Pass					
70.	If not used anymore, switch off any other workstation (also in Cleanroom).	Pass					
80.	Switch off all workstation screens	Pass					
90.	Make an entry into the Logbook, that the S/C is powered off	Pass					
100.	Make a Printout of Script/Command History executed during the day and put it into the Logbook	Pass					

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

END OF DOCUMENT

	Name	Dep./Comp.
	Baldock Richard	FAE12
	Barlage Bernhard	AED13
	Bayer Thomas	ASA42
	Brune Holger	ASA45
	Chen Bing	HE Space
	Davis William	Captec
	Edelhoff Dirk	AED21
	Fehringer Alexander	ASG15
X	Fricke Wolfgang Dr.	AED 65
	Geiger Hermann	ASA42
	Grasl Andreas	OTN/ASA44
	Grasshoff Brigitte	AET12
X	Hamer Simon	Terma
	Hanka, Erhard	FI522
X	Hendrikse Jeffrey	HE Space
	Hendry David	Terma
	Hengstler Reinhold	ASA42
	Hinger Jürgen	ASG23
X	Hohn Rüdiger	AED65
X	Hopfgarten Michael	AET32
	Huber Johann	ASA42
	Hund Walter	ASE252
X	Idler Siegmund	AED312
	Iványi von András	FAE12
	Jahn Gerd Dr.	ASG23
	Jolk Matthias	AET1
	Klenke Uwe	ASG72
X	Kölle Markus	ASA43
	König Werner	AET32
X	Koppe Axel	AED312
X	Kroeker Jürgen	AED65
X	La Gioia Valentina	Terma
	Lang Jürgen	ASE252
	Langenstein Rolf	AED15
	Langfermann Michael	ASA41
	Leitermann Stefan	AET12
	Liberatore Danilo	Rhea
	Martin Olivier	Altec
X	Maukisch Jan	ASA43
X	Much Christoph	ASA43
X	Müller Martin	ASA43
	Pietroboni Karin	AED65
	Reichle Konrad	ASA42
	Runge Axel	OTN/ASA44
	Saal Christoph	External
X	Schink Dietmar	AED321
	Schmidt Thomas	AED15
	Schweickert Gunn	ASG23

	Name	Dep./Comp.
X	Sonn Nico	ASG51
	Steininger Eric	AED321
X	Stritter Rene	AED11
	Suess Rudi	OTN/ASA44
X	Theunissen Martijn	DSSA
X	Vascotto Riccardo	HE Space
	Wagner Klaus	ASG23
	Wietbrock Walter	AET12
	Wöhler Hans	ASG23
	Wössner Ulrich	ASE252
	Zumstein Armin	AED15
X	ESA/ESTEC	ESA
X	Thales Alenia Space Cannes	TAS-F
X	Thales Alenia Space Torino	TAS-I
	Instruments:	
	MPE (PACS)	MPE
	RAL (SPIRE)	RAL
	SRON (HIFI)	SRON
	Subcontractors:	
	Austrian Aerospace	AAE
	Austrian Aerospace	AAEM
	BOC Edwards	BOCE
	Dutch Space Solar Arrays	DSSA
	EADS Astrium Sub-Subsyst. & Equipment	ASSE
	EADS CASA Espacio	CASA
	EADS CASA Espacio	ECAS
	European Test Services	ETS
	Patria New Technologies Oy	PANT
	SENER Ingenieria SA	SEN
	Thales Alenia Space, Antwerp	TAS-ETCA

APPENDIX 1

Actual SCOE cable connection (to be confirmed by AIT)

SCOE CABLES CONNECTION to HERSCHEL S/C

SKIN-01 PWR Panel (PCDU)

Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector	~~Checked~~
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 Nom Power	SK01AJ04	Battery		Flight Cap	✓
SA Red Power	SK01AJ05	PCDU	POWER SCOE Cable Plugged	✓	
SA Red Power	SK01AJ06	PCDU	POWER SCOE Cable Plugged	✓	
SA Red Power	SK01AJ07	PCDU	POWER SCOE Cable Plugged	✓	

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

	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector	
SKIN-02	DMS 1553 Bus_A	J01	CDMU	Bus Monitor Cable Plugged	✓	
SKIN-02	DMS 1553 Bus_B	J02	CDMU	Bus Monitor Cable Plugged	✓	
SKIN-02	ACMS 1553 Bus_A	J03	ACC		Flight Plug SK02P03Plugged	✓
SKIN-02	ACMS 1553 Bus_B	J04	ACC		Flight Plug SK02P04 Plugged	✓
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS		~~Fliight Cap~~ open	✓
SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS		~~Fliight Cap~~ open	✓
SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH		~~Flight Cap~~ Plug	✓
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS		Flight Plug SK02P08 Plugged	✓
SKIN-02	CDMU and ACC EEPROM reprogramming input	J09	ACC/CDMU		Flight Plug SK02P09 Plugged	✓
SKIN-02	CDMU and ACC EEPROM reprogramming input	J10	ACC/CDMU		Flight Plug SK02P10 Plugged	✓
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS		Flight Plug SK02P11 Plugged	✓
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH		~~Fliight Cap~~ open	✓
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH		~~Fliight Cap~~ open	✓
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		Flight Cap	✓ ✓
SKIN-03	Test point TC + protection jumper EPC2	SK03J02	XPND2/EPC2		Flight Cap	✓ ✓
	RF LINK					
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**	
	RF link for antenna LGA1	N/A	LGA1	RF SCOE LGA1 Plugged	LGA1 Anechoic Cap	N/A ✓
	RF link for antenna LGA2	N/A	LGA2	RF SCOE LGA2 Plugged	LGA2 Anechoic Cap	N/A ✓
	RF link for antenna MGA	N/A	MGA	RF SCOE MGA Plugged	MGA Anechoic Cap	N/A ✓
SKIN-04	ACMS Panel (RWE)					
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**	
SKIN-04	RWL1 Sgn	J01	ACC/RWL-1		ACMS Flight Plug SK04P01 Plugged	✓ ✓
SKIN-04	RWL2 Sgn	J02	ACC/RWL-2		ACMS Flight Plug SK04P02 Plugged	✓ ✓
SKIN-04	RWL3 Sgn	J03	ACC/RWL-3		ACMS Flight Plug SK04P03 Plugged	✓ ✓
SKIN-04	RWL4 Sgn	J04	ACC/RWL-4		ACMS Flight Plug SK04P04 Plugged	✓ ✓
SKIN-05	GYR/QRS Panel					
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**	
SKIN-05	CRS1 AOCS Sgn	J01	CRS-1/ACC		ACMS Flight Plug	✓ ✓
SKIN-05	CRS2 AOCS Sgn	J02	CRS-2/ACC		ACMS Flight Plug	✓ ✓
SKIN-05	GYRO RS422 / Test	J03	GYRO		Flight Plug SK05P03 Plugged	✓ ✓
SKIN-05	CRS 1/2 Stimuli	J04	CRS-1,2		Flight Plug SK05P04 Plugged	✓ ✓
SKIN-05	AAD Sgn M	J05	AAD/ACC		Flight Plug SK05P05 Plugged	✓ ✓
SKIN-05	SAS1/2 Sgn M	J06	SAS/ACC		Flight Plug SK05P06 Plugged	✓ ✓
SKIN-05	SAS1/2 Sgn R	J07	SAS/ACC		Flight Plug SK05P07 Plugged	✓ ✓
SKIN-05	AAD Sgn R	J08	AAD/ACC		Flight Plug SK05P08 Plugged	✓ ✓
SKIN-06	STR Panel					
	Connector Function	**Skin Connector**	**S/C unit**	**SCOE CABLE**	**Flight Connector**	
SKIN-06	STR1 Stimuli	J01	STR1		Flight Plug SK06P01 Plugged	✓ ✓
SKIN-06	STR2 Stimuli	J02	STR2		Flight Plug SK06P02 Plugged	✓ ✓
	UMBILICAL					
	Connector Function	**Connector**	**S/C unit**	**SCOE CABLE**		
	Power/Data	HU1J01	SYSTEM	SCOEs cable Plugged	✓	✓ LSS int ext TV-C/H
	Power/Data	HU2J01	SYSTEM	SCOEs cable Plugged	✓	✓ LSS int ext TV-C/H

30.10.08 Sg 18:45

APPENDIX 2

r Sign: HERSCHEL SAT AIT constrains sheet 29.10.08 18:33
l: ESTEC-54125

	Op	Comments	Non Op
CDMS			
CDMU	X		
1553 MIL-BUS A	X		
1553 MIL-BUS B	X		
PCS			
PCDU	X		
BAT		**BS SCOE connected**	X
Solar Array		**Not connected**	X
TCS	X		
TT&C		**DO NOT SWITCH ON, warning unit installed**	**X**
MGA		**WG/COAX adapter installed, SCOE NOT connected**	X
LGA1		**WG/COAX adapter installed, SCOE NOT connected**	X
LGA2		**WG/COAX adapter installed, SCOE NOT connected**	X
ACMS			
1553 MIL-BUS A	X		
1553 MIL-BUS B	X		
ACC	X		
RWL1,2,3,4	X		
SAS1	X		
SAS2	X		
AAD	X		
GYR	X		
STR1	X		
STR2	X		
CRS1	X		
CRS2	X		
RCS	**X**	**RCS is in a safe mode**	
CCU	**X**	**Cryo SCOE not fully connected**	
SPIRE	**X**		
WUs			
FPU			
PACS	**X**		
WUs			
FPU			
HIFI	**X**	**!WARNING! If HIFI is switched ON, the cooler in the CleanRoom has to be switch ON too.**	
WUs			
FPU			
VMC	**X**		
SREM	**X**		
CryoCover		**Safe Plugs installed**	**X**
Telescope	**X**		

APPLICABLE ALSO 30/10/08

7 Appendix 2: SPIRE FM SFT As-Run Log

ThalesAlenia Space		REF.: H-P-TASF-AS-RUN-LOG	
		HERSCHEL	
		DATE : 31/10/07	PAGE : of
AS-RUN DOCUMENTS RAISED		PLACE : ESTEC	

TEST NAME: SPIRE FM SFT	TEST CONDUCTOR: S. ILSEN	
ACTIVITY CONTROL SHEET No's:		
LEADING PROCEDURE (Title)	Doc No	Issue
FOUP WMS NOM on/off.	HP-2-ABD-PR-0070	3
FUNCTIONAL PROCEDURE (Title)	Doc No	Issue
SPIRE FM SFT	HP-2-ABD-TP-0212	1.3
Session ID/s		
2005-10-31-05-29_herdmu-hpws22_REALTIME_S_SFT-hel		
HP_2_ABD-TP-212-iss1.3_SPIRE_SFT_Hel_END-002		

PVS # / Raised against	Description (brief summary of reason document is raised)
#4 - TP0212	PWR ON CCU INTO MODE 2.
#3 - TP0212	SKIP STEP IEGSE TIME SYNC IF ALREADY SYNC — PVS NOT APPLIC/NOT RU
#1 - TP0212	SKIP STEPS IN PROC - LPH CHECKS NOT REQUIRED
#2 - TP0212	RECORD CRYO TEMPS DURING TEST.

SPR # / Raised against	Description (same as SPR title)

NCR # / Raised against	Description (same as NCR title)

	Test Change	Curr. No.: 4 Date: 29/10/.2008 Page 1 of 1	
Test designation FM SPIRE SFT in He1	Test Procedure HP-2-ASED-TP-0212	Issue 1	Rev. 3
Test step changed See below	Reason for Change Power ON CCU to Mode 2 and start logging on CCS		

After Step 1.2 of section 7.2.1 execute the following scripts:

- K102999ECVT001_ASDGENCCU_ABPWRON ✓ S.ELSLEY
- K102999ECVT001_ASDGENCCU_MnEBOTH2 ✓ S.ELSLEY
- Execute K102999ECVT031_ ASDGEN_CCU_LOG ✓ S.ELSLEY
- testxceparams K* V S.Ilsley 06:53

Prepared by: S. Hamer	Resp. Test Leader	Project Engineer
PA/QA	Prime	Customer

	Test Change	Curr. No.: 3 Date: 27/10/.2008 Page 1 of 1	
Test designation F M SPIRE SFT in He1	Test Procedure HP-2-ASED-TP-0212	Issue 1	Rev. 3
Test step changed See below	Reason for Change Do not perform IEGSE time sync if already in sync		

As stated at the TRR if RAL confirm IEGSE already synchronised with CCS step 1.7 of section 7.2.1 shall be skipped (as CCS Handler will not be running)

N/A IEGSE & CCS Handler are running!

Step 1.7 is executed!

P/S N/A

Prepared by: S. Hamer	Resp. Test Leader	Project Engineer
PA/QA	Prime	Customer

	Test Change	Curr. No.: 2 Date: 27/10/.2008 Page 1 of 1

Test designation	Test Procedure	Issue	Rev.
FM SPIRE SFT in He1	HP-2-ASED-TP-0212	1	3

Test step changed	Reason for Change
See below	Record Cryo Temperatures during test

As stated at the TRR record the cryo temperatures at the start and end of the redundant SFT: → Connect PFM-CRYO → Not working. Cryo scoe values taken @ scoe not @ CCS.

- Before Section 7.2.7 @ 31/10/08 08:10

  Level 0 (HTT upper bulk) T222 = 4.43 K

  Level 1 (Vent line) T234 = 6.7 K

  Level 2 (OBA) T242 = 6.8 K

- After Section 7.2.8 @ 31/10/08 09:51

  Level 0 (HTT upper bulk) T222 = 5.37 K

  Level 1 (Vent line) T234 = 6.02 K

  Level 2 (OBA) T242 = 11.42 K

Prepared by:	Resp. Test Leader	Project Engineer
S. Hamer		
PA/QA	Prime	Customer

	Test Change	Curr. No.: 1 Date: 27/10/.2008 Page 1 of 1	
Test designation FM SPIRE SFT in He1	Test Procedure HP-2-ASED-TP-0212	Issue 1	Rev. 3
Test step changed See below	Reason for Change LPU checks not required		

As stated at the TRR the LPU checks shall not be performed during this test therefore the following steps shall be skipped:

- Section 7.2.5 √
- Section 7.2.9

Prepared by: S. Hamer	Resp. Test Leader	Project Engineer
PA/QA	Prime	Customer

E N D O F D O C U M E N T

	Name	Dep./Comp.
	Baldock Richard	FAE12
	Barlage Bernhard	AED13
	Bayer Thomas	ASA42
	Brune Holger	ASA45
	Chen Bing	HE Space
	Davis William	Captec
	Edelhoff Dirk	AED21
	Fehringer Alexander	ASG15
	Fricke Wolfgang Dr.	AED 65
	Geiger Hermann	ASA42
	Grasl Andreas	OTN/ASA44
	Grasshoff Brigitte	AET12
	Hamer Simon	Terma
	Hanka, Erhard	FI522
	Hendrikse Jeffrey	HE Space
X	Hendry David	Terma
	Hengstler Reinhold	ASA42
	Hinger Jürgen	ASG23
	Hofmann Rolf	ASE252
	Hohn Rüdiger	AED65
	Hopfgarten Michael	AET32
	Huber Johann	ASA42
	Hund Walter	ASE252
X	Idler Siegmund	AED312
	Iványi von András	FAE12
X	Jahn Gerd Dr.	ASG23
	Kölle Markus	ASA43
X	Koppe Axel	AED312
	Kroeker Jürgen	AED65
	Lang Jürgen	ASE252
	Langenstein Rolf	AED15
	Langfermann Michael	ASA41
	Liberatore Danilo	Rhea
	Martin Olivier	Altec
	Maukisch Jan	ASA43
X	Much Christoph	ASA43
	Müller Martin	ASA43
	Pietroboni Karin	AED65
	Reichle Konrad	ASA42
	Runge Axel	OTN/ASA44
	Saal Christoph	External
	Schink Dietmar	AED321
	Schmidt Thomas	AED15
	Schweickert Gunn	ASG23
X	Sonn Nico	ASG51
	Steininger Eric	AED321
X	Stritter Rene	AED11
	Suess Rudi	OTN/ASA44

	Name	Dep./Comp.
X	Theunissen Martijn	ASA43
	Vascotto Riccardo	HE Space
	Wagner Klaus	ASG23
X	Wietbrock Walter	AET12
	Wöhler Hans	ASG23
	Wössner Ulrich	ASE252
	Zumstein Armin	AED15
X	ESA/ESTEC	ESA
X	Thales Alenia Space Cannes	TAS-F
	Thales Alenia Space Torino	TAS-I
	Instruments:	
	MPE (PACS)	MPE
X	RAL (SPIRE)	RAL
	SRON (HIFI)	SRON
	Subcontractors:	
	Austrian Aerospace	AAE
	Austrian Aerospace	AAEM
	BOC Edwards	BOCE
	Dutch Space Solar Arrays	DSSA
	EADS Astrium Sub-Subsyst. & Equipment	ASSE
	EADS CASA Espacio	CASA
	EADS CASA Espacio	ECAS
	European Test Services	ETS
	Patria New Technologies Oy	PANT
	SENER Ingenieria SA	SEN
	Thales Alenia Space, Antwerp	TAS-ETCA