Spire Procedure

SPIRE Warm Units Integration Test Procedures
A.A.Aramburu & Sunil D.Sidher

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1.INTRODUCTION

This document describes the procedure to verify the correct integration of the SPIRE FM Warm Units **after** these have been interconnected and **before** integration with the SPIRE FM FPU.
This procedure requires the presence of the SPIRE personnel as the IEGSE will be required to assess the results of part of test data.

1.1Change Record

Draft 0.1 03/07/2006 - First draft version
Issue 1.0 01/08/2006 - Included a general test sequence section.
Included a check for the correct OBT setting
Included a separated section for REDUDANT procedures.
Issue 1.1 22/08/2006 Updated procedure to conform to the rest of SPIRE IST procedures

1.2Scope

This procedure is intended to be used for the checkout of the correct integration of SPIRE warm units prior to the integration with SPIRE FM FPU during the IST **but can also be used during the AVM campaign as a tool to verify all relevant CCS templates**. The same templates will be used for both the AVM and the IST.

- Where deviations from the behaviour of the real instrument are expected (AVM), this is clearly identified by separate sequences within the actual procedure, i.e., ***Procedure Steps for IST:*** and ***Procedure Steps for AVM:*** are available.
- Where applicable PRIME/ REDUDANT references are only to do with the 1553 Spacecraft Bus redundancy NOT with power of the warm units. The warm units will be tested only with prime spacecraft power supply.

1.3Applicable Documents

AD01 SPIRE Functional Test Specification, Issue 1.4, SPIRE-RAL-DOC-001652, 22/07/2005
AD02 SPIRE ILT Warm Functional Test Procedure, Issue 1.2, SPIRE-RAL-PRC-002322, 27/01/2006

1.4Reference Documents

RD01 SPIRE Instrument User Manual, Issue 1.0, SPIRE-RAL-PRJ-002395, 08/04/2005
RD02 H/P OBT-UTC Time Synchronisation Technical Note Issue 1.3,
PT-CMOC-OPS-TN-6604-OPS- OGH Sep 2004

1.5General instructions for executing the test procedures

- Before carrying out the next procedure within the test sequence always ask for the go ahead by the SPIRE staff.
- Section 3.1 of this document specifies the sequence to be executed. Each of the steps in the sequence has a detailed specification later on section 3.2. The operator should refer to the later in order to execute detailed steps.
- The procedure tables in section 3.2 include blank boxes where the actual values of parameters can be noted. Based on the comparison with the expected values the success or failure of a step should be recorded in the final column of the table.
- The last row in a procedure table should be used to record the overall Pass/Fail result of each test.
- Any text in **boldface** in the procedural steps generally indicates an action which may have to be performed manually by the CCS staff.

1.6Open Issues

- Names of the Herschel Satellite procedures for powering on/off the SPIRE DPU and DRCU are to be filled in the next version. In this version they are marked as procedure XXXXXX.

1.7Duration

The estimated duration for executing the entire procedure, from DPU switch ON back to DPU switch OFF is estimated to be approximately **2 hours.**

1.8List of Acronyms

FM	Flight Model
OBT	On Board Time
FPU	Focal Plan Unit
CCS	Central Checkout System
IST	Integrated System Test

2.TEST CONFIGURATION

2.1IST Test Configuration

- The SPIRE DRCU should be interconnected with the SPIRE DPU.
- The SPIRE DPU should be connected to the HDCMU through the 1553 Spacecraft on both PRIME and REDUNDANT bus.
- The Bus list selected on the HCDMU should be SPIRE PRIME Instrument, i.e., 27 TM slots allocated for SPIRE telemetry.
- The HCDMU and CCS should be interconnected.
- The CCS and the IEGSE should be interconnected via the Pipe GW
- CCSHandler application software should be running.
- IEGSE system is up and running.(Database, SCOS , QLA, EGSE Router and Gateway)

2.2AVM Test Configuration

There is no redundancy on AVM

- The SPIRE DRCU Simulator should be interconnected with the SPIRE DPU.
- The SPIRE DPU should be connected to the HDCMU through the 1553 Spacecraft Bus PRIME.
- The rest of the configuration is identical to the IST.

3.WARM UNITS INTEGRATION TEST PROCEDURES

3.1General Pass/Fail Criteria

Consecutive failure of 2 executions of the same procedure is enough to declare the overall test result as failed. If the repetition of the procedure is successful this one should be repeated once again as a 'health' check. In case of overall failure of the test procedure the switch off steps 9, 10 and 11 (or 22, 23 and 24) from the next section should be executed.

3.2Test Sequence

This specifies the sequence of sub procedures to be executed.
Note: During AVM as no redundancy is present only steps 1 to 11 should be executed.

Step #	Procedure Name	Purpose	Duration
1	SPIRE-WU-INT-DPU-ON-P	DPU Power up and OBS start	5 min
2	SPIRE-WU-INT-DRCU-ON-P	DRCU Power up	5 min
3	SPIRE-WU-INT-SCU-01-P	SCU Low Speed Link check	5 min
4	SPIRE-WU-INT-SCU-02-P	SCU High Speed Link check	5 min
5	SPIRE-WU-INT-MCU-01-P	MCU Low Speed Link check	5 min
6	SPIRE-WU-INT-MCU-02-P	MCU High Speed Link check	5 min
7	SPIRE-WU-INT-DCU-01-P	DCU Low Speed Link check	5 min
8	SPIRE-WU-INT-DCU-02-P	DCU High Speed Link check	5 min
9	SPIRE-WU-INT-MCU-OFF-P	MCU power off	5 min
10	SPIRE-WU-INT-DRCU-OFF-P	DRCU power off	5 min
11	SPIRE-WU-INT-DPU-OFF-P	DPU power off	5 min
12	**Change 1553 Spacecraft bus from SPIRE DPU PRIME to SPIRE DPU REDUNDANT.**		unknown
13	**Change to SPIRE Redundant MIB on the CCS (If applicable)**		
14	SPIRE-WU-INT-DPU-ON-R	DPU Power up and OBS start	5 min
15	SPIRE-WU-INT-DRCU-ON-R	DRCU Power up	5 min
16	SPIRE-WU-INT-SCU-01-R	SCU Low Speed Link check	5 min
17	SPIRE-WU-INT-SCU-02-R	SCU High Speed Link check	5 min
18	SPIRE-WU-INT-MCU-01-R	MCU Low Speed Link check	5 min
19	SPIRE-WU-INT-MCU-02-R	MCU High Speed Link check	5 min
20	SPIRE-WU-INT-DCU-01-R	DCU Low Speed Link check	5 min
21	SPIRE-WU-INT-DCU-02-R	DCU High Speed Link check	5 min
22	SPIRE-WU-INT-MCU-OFF-R	MCU power off	5 min
23	SPIRE-WU-INT-DRCU-OFF-R	DRCU power off	5 min
24	SPIRE-WU-INT-DPU-OFF-R	DPU power off	5 min

Total: ~ 120 min

3.3Detailed Test Procedures

Remark: The PRIME and REDUDANT procedure make use make use of the same TCL script.

3.3.1Prime Procedures:

3.3.1.1Procedure SPIRE-WU-INT-DPU-ON-P

Version: 1.0
Date: 3rd July 2006
Purpose: To switch on the SPIRE DPU and start generating housekeeping
Duration: 5 minutes

Preconditions:

- Procedure to supply 28V Power Supply from the satellite to the SPIRE DPU PRIME is available
- SPIRE MIB PRIME is imported in the CCS database.
- CCS is up and running (SCOS, TOPE and the CDMU Simulator)
- DPU AND OBS PARAMETERS display is selected on the CCS

Initial Configuration: SPIRE Warm Electronics (DPU and DRCU) are switched off

Procedure Steps:

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Pass/ Fail
1	Select DPU AND OBS PARAMETERS display is on the CCS	—	—	—	
2	**Using CCS procedure XXXXX Power on the SPIRE DPU PRIME 28V Power Supply**	—	—	—	
3	Execute TCL script SPIRE-WU-INT-DPU-START.tcl	MODE	-/-/DPU_ON	—	
4	Check that THSK parameter is refreshing every second	—	—	—	
5	Check that TM2N parameter is incrementing every second	—	—	—	
6	**On CCS check the consistency of the SPIRE on board time to the CDMU time and the CCS.** **Note:** **If OBT is assigned following RD02, i.e, OBT is TAI, there should be a 33 second difference between OBS and CCS time.**	THSK	Incrementing once per second		
7	On IEGSE check the consistency between SCOS time and THSK and QLA time.	THSK	Incrementing once per second		
Test Result (Pass/Fail):					

Final Configuration: SPIRE DPU is powered ON and OBS is running.

3.3.1.2Procedure SPIRE-WU-INT-DRCU-ON-P

Version: 1.1
Date: 22nd August 2006
Purpose: To switch on the SPIRE DRCU and start generating housekeeping
Duration: 4 minutes

Preconditions: SPIRE FM is electrically integrated with the Herschel Satellite

Initial Configuration:

- SPIRE DPU is on and generating HK
- DRCU is switched off
- FUNCTIONAL TEST PARAMETERS display is selected on the CCS

Procedure Steps for IST ONLY:

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
1	Execute TCL script SPIRE-IST-DRCU-ON-STEP1.tcl	—	—	—	
2	Check that THSK parameter is not refreshing anymore	—	—	—	
3	Check that TM2N parameter is not incrementing anymore	—	—	—	
4	**When instructed by the I-EGSE staff Power on the SPIRE DRCU using the CCS procedure XXXXXX**	—	—	—	
5	Execute TCL script SPIRE-IST-DRCU-ON-STEP2.tcl	—	—	—	
6	Check that THSK parameter is again refreshing every 4 seconds	—	—	—	
7	Check that TM2N parameter is again incrementing every 4 seconds	—	—	—	
Test Result (Pass/Fail):					

Procedure Steps for AVM ONLY:

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
1	Execute TCL script SPIRE-IST-DRCU-ON-STEP1.tcl	—	—	—	
2	Check that THSK parameter is not refreshing anymore	—	—	—	
3	Check that TM2N parameter is not incrementing anymore	—	—	—	
4	Start DRCU simulator application software.	—	—	—	
5	Execute TCL script SPIRE-IST-DRCU-ON-STEP2.tcl **Note:** At this moment two HK parameters BIASTEMP and DAQTEMP will go Out Of limits (Hard Limits). This is an inherent feature of the DRCU simulator which cannot be avoided.	BIASTEMP DAQTEMP	—	**OOL**	
6	Check that THSK parameter is again refreshing every 4 seconds	—	—	—	
7	Check that TM2N parameter is again incrementing every 4 seconds	—	—	—	
Test Result (Pass/Fail):					

Final Configuration:

- SPIRE DPU and DRCU are both on
- HK generation is on

3.3.1.3Procedure SPIRE-WU-INT-SCU-01-P

Version: 1.0
Date: 3rd July 2006
Purpose: SCU low speed link check
Duration: 5 minutes

Preconditions:

- **SPIRE-WU-INT-DPU-ON-P** and **SPIRE-WU-INT-DRCU-ON-P** procedures have been executed.

Initial Configuration:

- DPU and DRCU are switched ON
- SPIRE DPU is on and generating HK

Procedure Steps:

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Pass/Fail
1	Select SCU PARAMETERS display on the CCS	—	—	—	
2	Execute TCL script SPIRE-WU-INT-SCU-01.tcl	SCUTEMPSTAT SUBKSTAT	0/0xFFFF 0/1		
Test Result (Pass/Fail):					

Final Configuration: Unchanged

3.3.1.4Procedure SPIRE-WU-INT-SCU-02-P

Date: 3rd July 2006
Purpose: SCU high speed link check
Duration: 5 minutes

Preconditions:

- **SPIRE-WU-INT-DPU-ON-P** and **SPIRE-WU-INT-DRCU-ON-P** procedures have been executed.

Initial Configuration:

- SPIRE DPU is on and generating HK
- DRCU is switched ON
- SCU PARAMETERS display is selected on the CCS

Procedure Steps:

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-WU-INT-SCU-02.tcl	SCUFRAMECNT TM5N	0/31 0x3FFF/1		
2	Verify that two telemetry packets with : ▪ (type,subtype): (21,1). ▪ APID : 1288 have been received at CCS				
Test Result (Pass/Fail):					

3.3.1.5Procedure SPIRE-WU-INT-MCU-01-P

Version: 1.0
Date: 3rd July 2006
Purpose: MCU low speed link check
Duration: 5 minutes

Preconditions:

- **SPIRE-WU-INT-DPU-ON-P** and **SPIRE-WU-INT-DRCU-ON-P** procedures have been executed.

Initial Configuration:

- SPIRE DPU is on and generating HK
- DRCU is switched ON

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Pass/Fail
1	Select MCU PARAMETERS display on the CCS	—	—	—	—
2	Execute TCL script SPIRE-IST-FUNC-MCU-01.tcl	—	—	—	—
3	Check that the MCU is booted up successfully	MCUBITSTAT MCUP5V MCUP14V MCUM14V MCUP15V MCUM15V	0/-/1 ~5V ~14V ~ -14V ~ 15V ~ -15V		
Test Result (Pass/Fail):					

Final Configuration:

- MCU is switched on and booted up.

3.3.1.6Procedure: SPIRE-WU-INT-MCU-02-P

Version: 1.0
Date: 3rd July 2006
Purpose: MCU high speed link check
Duration: 5 minutes

Preconditions:

- **SPIRE-WU-INT-DPU-ON-P** and **SPIRE-WU-INT-DRCU-ON-P** procedures have been executed.
- **SPIRE-WU-INT-MCU-01-P has been run**

Initial Configuration:

- SPIRE DPU is on and generating HK
- DRCU is switched ON
- MCU PARAMETERS display is selected on the CCS

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-WU-INT-MCU-02.tcl	—	—	—	—
2	Record the values of MCUFRAMECNT at the start and end of the test	MCUFRAMECNT	0/300		
3	Verify that the following type of MCU telemetry packets have been received at the CCS : ENG: - (type,subtype): (21,1). - APID 1288 - SID 2068 BSM - (type,subtype): (21,1). - APID 1288 - SID 1554 SMEC -(type,subtype): (21,1). - APID 1288 - SID 1040	—	—	—	
Test Result (Pass/Fail):					

Final Configuration: Unchanged

3.3.1.7Procedure SPIRE-WU-INT-DCU-01-P

Version: 1.0
Date: 3rd July 2006
Purpose: DCU low speed link check
Duration: 5 minutes

Preconditions:

- **SPIRE-WU-INT-DPU-ON-P** and **SPIRE-WU-INT-DRCU-ON-P** procedures have been executed.

Initial Configuration:

- SPIRE DPU is on and generating HK
- DRCU is switched ON

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Select DCU PARAMETERS display on the CCS	—	—	—	—
2	Execute TCL script SPIRE-WU-INT-DCU-01.tcl	PSWBIAS PMWBIAS PLWBIAS	0/0xff/0 0/0xff/0 0/0xff/0	—	—
Test Result (Pass/Fail):					

Final Configuration: Unchanged

3.3.1.8Procedure SPIRE-WU-INT-DCU-02-P

Version: 1.0
Date: 3rd July 2006
Purpose: DCU high speed link check
Duration: 5 minutes

Preconditions:

- **SPIRE-WU-INT-DPU-ON-P** and **SPIRE-WU-INT-DRCU-ON-P** procedures have been executed.

Initial Configuration:

- SPIRE DPU is on and generating HK
- DRCU is switched ON

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-WU-INT-DCU-02.tcl	DCUFRAMECNT	0/700		
2	Verify that the following type of DCU science telemetry packets have been received at the CCS : Full Photometer: - (type,subtype): (21,1). - APID 1284 - SID 512 PSW - (type,subtype): (21,1). - APID 1284 - SID 258 PMW -(type,subtype): (21,1). - APID 1284 - SID 259 PLW -(type,subtype): (21,1). - APID 1284 - SID 260 Full Spectrometer: - (type,subtype): (21,1). - APID 1286 - SID 513 SSW - (type,subtype): (21,1). - APID 1286 - SID 261 SLW -(type,subtype): (21,1). - APID 1286 - SID 261	—	—	—	
Test Result (Pass/Fail):					

Final Configuration: Unchanged

3.3.1.9Procedure SPIRE-WU-INT-MCU-OFF-P

Version: 1.0
Date: 3rd July 2006
Purpose: Switch off the SPIRE MCU
Duration: 5 minutes

Preconditions:

- **SPIRE-WU-INT-DPU-ON-P** and **SPIRE-WU-INT-DRCU-ON-P**

Initial Configuration:

- SPIRE DPU is on and generating HK
- DRCU is switched ON

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute SPIRE-IST-MCU-OFF.tcl	—	—	—	—
2	Check that the MCU is switched off	MCUBITSTAT	1/-/0		
Test Result (Pass/Fail):					

Final Configuration: SPIRE MCU is OFF.

3.3.1.10Procedure SPIRE-WU-INT-DRCU-OFF-P

Version: 1.1
Date: 22nd August 2006
Purpose: Switch off the DRCU

Preconditions:

- **Procedure SPIRE-IST-SCU-OFF has been successfully executed**
- **SPIRE is electrically integrated with the Herschel FM.**

Initial Configuration:

- SPIRE DPU is on and generating HK
- DRCU is switched ON
- FUNCTIONAL TEST PARAMETERS display is selected on the CCS

Procedure Steps for IST ONLY:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-DRCU-OFF.tcl	—	—	—	
2	Check that THSK parameter is not refreshing anymore	—	—	—	
3	Check that TM2N parameter is not incrementing anymore	—	—	—	
4	**When instructed by the I-EGSE staff Power off the SPIRE DRCU using CCS procedure XXXXXX**	—	—	—	
Test Result (Pass/Fail):					

Procedure Steps for AVM ONLY:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-DRCU-OFF.tcl	—	—	—	
2	Check that THSK parameter is not refreshing anymore	—	—	—	
3	Check that TM2N parameter is not incrementing anymore	—	—	—	
4	IEGSE staff: Stop DRCU Simulator application software	—	—	—	
Test Result (Pass/Fail):					

Final Configuration:

- DRCU is switched off
- SPIRE DPU is on but not generating HK

3.3.1.11Procedure SPIRE-WU-INT-DPU-OFF-P

Version: 1.0
Date: 3rd July 2006
Purpose: Switch off the SPIRE DPU
Duration: 5 minutes

Preconditions:

- **SPIRE-WU-INT-DRCU-OFF-P** has been executed**.**

Initial Configuration:

- SPIRE DPU is powered ON.
- DRCU is switched OFF

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	**Power off the SPIRE DPU PRIME using CCS procedure XXXXXX**	—	—	—	
Test Result (Pass/Fail):					

Final Configuration: SPIRE DPU is OFF.

3.3.2Redundant Procedures:

3.3.2.1Procedure SPIRE-WU-INT-DPU-ON-R

Version: 1.0
Date: 3rd July 2006
Purpose: To switch on the SPIRE DPU and start generating housekeeping
Duration: 5 minutes

Preconditions:

- Procedure to supply 28V Power Supply from the satellite to the SPIRE DPU PRIME is available
- SPIRE MIB REDUNDANT is imported in the CCS database.
- CCS is up and running (SCOS, TOPE and the CDMU Simulator)
- DPU AND OBS PARAMETERS display is selected on the CCS

Initial Configuration: SPIRE Warm Electronics (DPU and DRCU) are switched off

Procedure Steps:

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Pass/ Fail
1	Select DPU AND OBS PARAMETERS display is on the CCS	—	—	—	
2	**Using CCS procedure XXXXX Power on the SPIRE DPU PRIME 28V Power Supply**	—	—	—	
3	Execute TCL script SPIRE-WU-INT-DPU-START.tcl	MODE	-/-/DPU_ON	—	
4	Check that THSK parameter is refreshing every second	—	—	—	
5	Check that TM2N parameter is incrementing every second	—	—	—	
6	**On CCS check the consistency of the SPIRE on board time to the CDMU time and the CCS.** **Note: If OBT is assigned following RD02, i.e, OBT is TAI, there should be a 33 second difference between OBS and CCS time.**	THSK	Incrementing once per second		
7	On IEGSE check the consistency between SCOS time and THSK and QLA time.	THSK	Incrementing once per second		
Test Result (Pass/Fail):					

Final Configuration: SPIRE DPU is powered ON and OBS is running.

3.3.2.2Procedure SPIRE-WU-INT-DRCU-ON-R

Version: 1.1
Date: 22nd August 2006
Purpose: To switch on the SPIRE DRCU and start generating housekeeping
Duration: 4 minutes

Preconditions: SPIRE FM is electrically integrated with the Herschel Satellite

Initial Configuration:

- SPIRE DPU is on and generating HK
- DRCU is switched off
- FUNCTIONAL TEST PARAMETERS display is selected on the CCS

Procedure Steps for IST ONLY:

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
1	Execute TCL script SPIRE-IST-DRCU-ON-STEP1.tcl	—	—	—	
2	Check that THSK parameter is not refreshing anymore	—	—	—	
3	Check that TM2N parameter is not incrementing anymore	—	—	—	
4	**When instructed by the I-EGSE staff Power on the SPIRE DRCU using the CCS procedure XXXXXX**	—	—	—	
5	Execute TCL script SPIRE-IST-DRCU-ON-STEP2.tcl	—	—	—	
6	Check that THSK parameter is again refreshing every 4 seconds	—	—	—	
7	Check that TM2N parameter is again incrementing every 4 seconds	—	—	—	
Test Result (Pass/Fail):					

Procedure Steps for AVM ONLY:

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/ Failure
1	Execute TCL script SPIRE-IST-DRCU-ON-STEP1.tcl	—	—	—	
2	Check that THSK parameter is not refreshing anymore	—	—	—	
3	Check that TM2N parameter is not incrementing anymore	—	—	—	
4	Start DRCU simulator application software.	—	—	—	
5	Execute TCL script SPIRE-IST-DRCU-ON-STEP2.tcl **Note:** At this moment two HK parameters BIASTEMP and DAQTEMP will go Out Of limits (Hard Limits). This is an inherent feature of the DRCU simulator which cannot be avoided.	BIASTEMP DAQTEMP	—	**OOL**	
6	Check that THSK parameter is again refreshing every 4 seconds	—	—	—	
7	Check that TM2N parameter is again incrementing every 4 seconds	—	—	—	
Test Result (Pass/Fail):					

Final Configuration:

- SPIRE DPU and DRCU are both on
- HK generation is on

3.3.2.3Procedure SPIRE-WU-INT-SCU-01-R

Version: 1.0
Date: 3rd July 2006
Purpose: SCU low speed link check
Duration: 5 minutes

Preconditions:

- **SPIRE-WU-INT-DPU-ON-R** and **SPIRE-WU-INT-DRCU-ON-R** procedures have been executed.

Initial Configuration:

- DPU and DRCU are switched ON
- SPIRE DPU is on and generating HK

Procedure Steps:

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Pass/Fail
1	Select SCU PARAMETERS display on the CCS	—	—	—	
2	Execute TCL script SPIRE-WU-INT-SCU-01.tcl	SCUTEMPSTAT SUBKSTAT	0/0xFFFF 0/1		
Test Result (Pass/Fail):					

Final Configuration: Unchanged

3.3.2.4Procedure SPIRE-WU-INT-SCU-02-R

Date: 3rd July 2006
Purpose: SCU high speed link check
Duration: 5 minutes

Preconditions:

- **SPIRE-WU-INT-DPU-ON-R** and **SPIRE-WU-INT-DRCU-ON-R** procedures have been executed.

Initial Configuration:

- SPIRE DPU is on and generating HK
- DRCU is switched ON
- SCU PARAMETERS display is selected on the CCS

Procedure Steps:

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-WU-INT-SCU-02.tcl	SCUFRAMECNT TM5N	0/31 0x3FFF/1		
2	Verify that two telemetry packets with : ▪ (type,subtype): (21,1). ▪ APID : 1288 have been received at CCS				
Test Result (Pass/Fail):					

3.3.2.5Procedure SPIRE-WU-INT-MCU-01-R

Version: 1.0
Date: 3rd July 2006
Purpose: MCU low speed link check
Duration: 5 minutes

Preconditions:

- **SPIRE-WU-INT-DPU-ON-R** and **SPIRE-WU-INT-DRCU-ON-R** procedures have been executed.

Initial Configuration:

- SPIRE DPU is on and generating HK
- DRCU is switched ON

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Pass/Fail
1	Select MCU PARAMETERS display on the CCS	—	—	—	—
2	Execute TCL script SPIRE-IST-FUNC-MCU-01.tcl	—	—	—	—
3	Check that the MCU is booted up successfully	MCUBITSTAT MCUP5V MCUP14V MCUM14V MCUP15V MCUM15V	0/-/1 ~5V ~14V ~ -14V ~ 15V ~ -15V		
Test Result (Pass/Fail):					

Final Configuration:

- MCU is switched on and booted up.

3.3.2.6Procedure: SPIRE-WU-INT-MCU-02-R

Version: 1.0
Date: 3rd July 2006
Purpose: MCU high speed link check
Duration: 5 minutes

Preconditions:

- **SPIRE-WU-INT-DPU-ON-R** and **SPIRE-WU-INT-DRCU-ON-R** procedures have been executed.
- **SPIRE-WU-INT-MCU-01-R has been run**

Initial Configuration:

- SPIRE DPU is on and generating HK
- DRCU is switched ON
- MCU PARAMETERS display is selected on the CCS

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-WU-INT-MCU-02.tcl	—	—	—	—
2	Record the values of MCUFRAMECNT at the start and end of the test	MCUFRAMECNT	0/300		
3	Verify that the following type of MCU telemetry packets have been received at the CCS : ENG: - (type,subtype): (21,1). - APID 1288 - SID 2068 BSM - (type,subtype): (21,1). - APID 1288 - SID 1554 SMEC -(type,subtype): (21,1). - APID 1288 - SID 1040	—	—	—	
Test Result (Pass/Fail):					

Final Configuration: Unchanged

3.3.2.7Procedure SPIRE-WU-INT-DCU-01-R

Version: 1.0
Date: 3rd July 2006
Purpose: DCU low speed link check
Duration: 5 minutes

Preconditions:

- **SPIRE-WU-INT-DPU-ON-R** and **SPIRE-WU-INT-DRCU-ON-R** procedures have been executed.

Initial Configuration:

- SPIRE DPU is on and generating HK
- DRCU is switched ON

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Select DCU PARAMETERS display on the CCS	—	—	—	—
2	Execute TCL script SPIRE-WU-INT-DCU-01.tcl	PSWBIAS PMWBIAS PLWBIAS	0/0xff/0 0/0xff/0 0/0xff/0	—	—
Test Result (Pass/Fail):					

Final Configuration: Unchanged

3.3.2.8Procedure SPIRE-WU-INT-DCU-02-R

Version: 1.0
Date: 3rd July 2006
Purpose: DCU high speed link check
Duration: 5 minutes

Preconditions:

- **SPIRE-WU-INT-DPU-ON-R** and **SPIRE-WU-INT-DRCU-ON-R** procedures have been executed.

Initial Configuration:

- SPIRE DPU is on and generating HK
- DRCU is switched ON

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-WU-INT-DCU-02.tcl	DCUFRAMECNT	0/700		
2	Verify that the following type of DCU science telemetry packets have been received at the CCS : Full Photometer: - (type,subtype): (21,1). - APID 1284 - SID 512 PSW - (type,subtype): (21,1). - APID 1284 - SID 258 PMW -(type,subtype): (21,1). - APID 1284 - SID 259 PLW -(type,subtype): (21,1). - APID 1284 - SID 260 Full Spectrometer: - (type,subtype): (21,1). - APID 1286 - SID 513 SSW - (type,subtype): (21,1). - APID 1286 - SID 261 SLW -(type,subtype): (21,1). - APID 1286 - SID 261	—	—	—	
Test Result (Pass/Fail):					

Final Configuration: Unchanged

3.3.2.9Procedure SPIRE-WU-INT-MCU-OFF-R

Version: 1.0
Date: 3rd July 2006
Purpose: Switch off the SPIRE MCU
Duration: 5 minutes

Preconditions:

- **SPIRE-WU-INT-DPU-ON-R** and **SPIRE-WU-INT-DRCU-ON-R**

Initial Configuration:

- SPIRE DPU is on and generating HK
- DRCU is switched ON

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute SPIRE-IST-MCU-OFF.tcl	—	—	—	—
2	Check that the MCU is switched off	MCUBITSTAT	1/-/0		
Test Result (Pass/Fail):					

Final Configuration: SPIRE MCU is OFF.

3.3.2.10Procedure SPIRE-WU-INT-DRCU-OFF-R

Version: 1.1
Date: 22nd August 2006
Purpose: Switch off the DRCU

Preconditions:

- **Procedure SPIRE-IST-SCU-OFF has been successfully executed**
- **SPIRE is electrically integrated with the Herschel FM.**

Initial Configuration:

- SPIRE DPU is on and generating HK
- DRCU is switched ON
- FUNCTIONAL TEST PARAMETERS display is selected on the CCS

Procedure Steps for IST ONLY:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-DRCU-OFF.tcl	—	—	—	
2	Check that THSK parameter is not refreshing anymore	—	—	—	
3	Check that TM2N parameter is not incrementing anymore	—	—	—	
4	**When instructed by the I-EGSE staff Power off the SPIRE DRCU using CCS procedure XXXXXX**	—	—	—	
Test Result (Pass/Fail):					

Procedure Steps for AVM ONLY:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-DRCU-OFF.tcl	—	—	—	
2	Check that THSK parameter is not refreshing anymore	—	—	—	
3	Check that TM2N parameter is not incrementing anymore	—	—	—	
4	IEGSE staff: Stop DRCU Simulator application software	—	—	—	
Test Result (Pass/Fail):					

Final Configuration:

- DRCU is switched off
- SPIRE DPU is on but not generating HK

3.3.2.11Procedure SPIRE-WU-INT-DPU-OFF-R

Version: 1.0
Date: 3rd July 2006
Purpose: Switch off the SPIRE DPU
Duration: 5 minutes

Preconditions:

- **SPIRE-WU-INT-DRCU-OFF-R** has been executed**.**

Initial Configuration:

- SPIRE DPU is powered ON.
- DRCU is switched OFF

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	**Power off the SPIRE DPU PRIME using CCS procedure XXXXXX**	—	—	—	
Test Result (Pass/Fail):					

Final Configuration: SPIRE DPU is OFF.