



## Spire Report

**SPIRE AVM Report**  
Allan Dowell & A.A.Aramburu

<b>Ref:</b>	SPIRE-RAL-REP-2711
<b>Issue:</b>	1.1
<b>Date:</b>	16 <sup>th</sup> Februray 2007
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## 1. Introduction

This document reports on the activities carried out to verify the procedures and setup of the AVM to be used at FN for the AVM UFTs.

### 1.1 Scope

The results appearing in report are only applicable to the AVM scenario, although the same CCS templates will be used for both the AVM and the FM.

### 1.2 Applicable Documents

AD#	Title	Reference	Issue#	Date
AD01	SPIRE_WU_INT_Procedures	SPIRE-RAL-PRC-002680	1.3	15 <sup>th</sup> Feb 2007
AD02				

### 1.3 Reference Documents

RD#	Title	Reference	Issue#	Date
RD01	SPIRE Instrument User Manual	SPIRE-RAL-PRJ-002395	1.0	08/04/2005
RD02	H/P OBT-UTC Time Synchronisation Technical Note	PT-CMOC-OPS-TN-6604-OPS- OGH	1.3	Sep 2004
RD03	Spire Instrument Block Diagram	SPIRE-RAL-DWG-000646	6.1	
RD04	DRCU Simulator HW/SW User Manual		1.0	26/11/2003

### 1.4 Change Record

Doc	Issue#	Changes	Date of Change
Issue	1.0		
Issue	1.1	Updated report after using the latest AVM procedures to check the templates.	16/02/07

### 1.5 List of Acronyms

<b>FM</b>	Flight Model
<b>AVM</b>	Avionics Model
<b>OBT</b>	On Board Time
<b>FPU</b>	Focal Plane Unit
<b>CCS</b>	Central Checkout System
<b>FM</b>	Integrated System Test
<b>EGSE</b>	Electrical Ground Support Equipment
<b>DPU</b>	Digital Processing Unit
<b>DRCU</b>	Detector Readout and Control Unit



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## 2. Test Configuration

The following sections describe the hardware and ESGE configuration present at the time of the test. The main differences between the AVM and the FM configurations are with respect to the hardware. On the SPIRE AVM hardware the Warm Units and the FPU are substituted by a DRCU simulator.

### 2.1 AVM (at RAL) Test Configuration

This is the required hw/sw configuration prior to the start of the test:

#### *Hardware:*

SPIRE WU and CDMS Sim:

- The SPIRE DRCU Simulator PC powered ON and the operating system running.
- The SPIRE DRCU Simulator PC interconnected with the SPIRE FM DPU following RD04.
- The SPIRE AVM1 DPU PRIME 1553 interface to the CDMS Simulator connected (HSDPU J03).
- The SPIRE AVM1 DPU PRIME power interface to power supply connected (HSDPU J01).

#### *Software:*

EGSE:

- HCSS v0.4.1 Build (# 1123)
- Router, gateway, packet display running on chichester
- The SPIRE MIB 2.2.G1 imported on the CCS.
- SCOS2.3eP5 running on Truro
- CCS templates v1.1 from CVS AVM folder
- Using configuration wu\_int\_config on the test\_backup db



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### 3. Warm Units Integration Test Procedure Overview

#### 3.1 General 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 3.4 of this document specifies the sequence to be executed. Each of the steps in the sequence has a detailed specification later on sections 4.1 and 4.2. The operator should refer to the later in order to execute detailed steps.
- The procedure tables in section 4.1 and 4.2 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.

#### 3.2 General 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 a failed test execution 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.

#### 3.3 Constrains

A general constrain (inferred from the test configuration described above) is that the SPIRE DPU and DRCU power interfaces to the Herschel satellite must be connected and the DPU and DRCU must be interconnected before carrying out this procedure.

#### 3.4 Test Sequence

This section specifies the sequence to be executed with estimated times for each execution. **During AVM although no redundancy is present the redundant procedures can still be tested with the AVM DPU PRIME as the uplink test sequences do not change, executing the redundant procedures on the PRIME DPU will not result in any harm to the unit.**

Step #	Procedure Name	Purpose	Duration
1	<a href="#">SPIRE-WU-INT-DPU-ON-P</a>	DPU PRIME Power up and OBS start	5 min
2	<a href="#">SPIRE-WU-INT-DRCU-ON-P</a>	DRCU PRIME Power up	5 min
3	<a href="#">SPIRE-WU-INT-SCU-01-P</a>	SCU Low Speed Link check	5 min
4	<a href="#">SPIRE-WU-INT-SCU-02-P</a>	SCU High Speed Link check	5 min
5	<a href="#">SPIRE-WU-INT-MCU-01-P</a>	MCU Low Speed Link check	5 min
6	<a href="#">SPIRE-WU-INT-MCU-02-P</a>	MCU High Speed Link check	5 min
7	<a href="#">SPIRE-WU-INT-DCU-01-P</a>	DCU Low Speed Link check	5 min
8	<a href="#">SPIRE-WU-INT-DCU-02-P</a>	DCU High Speed Link check	5 min
9	<a href="#">SPIRE-WU-INT-MCU-OFF-P</a>	MCU power off	5 min
10	<a href="#">SPIRE-WU-INT-DRCU-OFF-P</a>	DRCU PRIME power off	5 min
11	<a href="#">SPIRE-WU-INT-DPU-OFF-P</a>	DPU PRIME power off	5 min



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12	<b>Reconfigure the 1553 Spacecraft bus from SPIRE DPU PRIME (RT = 21) to SPIRE DPU REDUNDANT (RT = 22).</b>		5 min
13	<b>Change to SPIRE Redundant MIB on the CCS (If applicable)</b>		5 min
14	<a href="#">SPIRE-WU-INT-DPU-ON-R</a>	DPU RED Power up and OBS start	5 min
15	<a href="#">SPIRE-WU-INT-DRCU-ON-R</a>	DRCU RED Power up	5 min
16	<a href="#">SPIRE-WU-INT-SCU-01-R</a>	SCU Low Speed Link check	5 min
17	<a href="#">SPIRE-WU-INT-SCU-02-R</a>	SCU High Speed Link check	5 min
18	<a href="#">SPIRE-WU-INT-MCU-01-R</a>	MCU Low Speed Link check	5 min
19	<a href="#">SPIRE-WU-INT-MCU-02-R</a>	MCU High Speed Link check	5 min
20	<a href="#">SPIRE-WU-INT-DCU-01-R</a>	DCU Low Speed Link check	5 min
21	<a href="#">SPIRE-WU-INT-DCU-02-R</a>	DCU High Speed Link check	5 min
22	<a href="#">SPIRE-WU-INT-MCU-OFF-R</a>	MCU power off	5 min
23	<a href="#">SPIRE-WU-INT-DRCU-OFF-R</a>	DRCU RED power off	5 min
24	<a href="#">SPIRE-WU-INT-DPU-OFF-R</a>	DPU RED power off	5 min

**Total: ~ 120 min**



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## 4. AVM Database Backup

### 4.1 Backing up the avm database:

Step#	Action	Command line	Result
1	Stopped the db you want to backup	stopdb -s avm_test@chichester	
2	Put the db into single user mode	stopdb -s avm_test@chichester	
3	Backed up the db: Created 2 backups: One is the test backup that will be restored here (at RAL).  The other is the 'real' backup that will be taken to FN.	vbackup -device test_backup.bck -backup avm_test@chichester  vbackup -device avm_test_backup.bck -backup avm_test@chichester	
4	Compressed backups:	gzip test_backup.bck gzip avm_test_backup.bck	
5	Uncompressed test backup:	gunzip test_backup.bck	
6	Restored test backup: 1. Change dir to dbs directory: 2. Create folder that will hold database volumes: 3. Restore database from backup:	AT RAL : cd /spired/verant/db AT FN: cd /data/versant/db AT RAL : makedb test_backup AT FN: makedb avm_test  AT RAL: vbackup -device /home/sg55/test_backup.bck -restore avm_test@chichester -rename test_backup@chichester  AT FN: vbackup -device full_path_where_back_up_is/avm_test_backup.bck -restore avm_test@db_server_name (hos4-d?)	
7	Change the user.props file ( <i>var.database.devel</i> ) located under <code>\${USER_HOME}/.hcss</code> to refer to the new restored database.	Edit the file	
8	Try to open the cusgui. Note: At RAL got an error complaining about the name of the database so had to do: db_admin -n test_bakcup@chichester in order to get it to work.	cusgui&	



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9	Check whether all configurations are there.	missetup –listconfig	
10	Update the configuration for the required test: i.e. for WU INT test will updated the configuration to wu_int_config.	Edit user.props	





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## 5. Warm Units Integration Detailed Test Results

### 5.1.1 Prime Results

#### 5.1.1.1 Procedure SPIRE-WU-INT-DPU-ON-P

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<b>Version</b>	1.3
<b>Date</b>	15 <sup>th</sup> February 2007
<b>Purpose</b>	To switch on the SPIRE DPU PRIME and start generating housekeeping
<b>Initial configuration</b>	SPIRE DPU and DRCU PRIME are switched off
<b>Final configuration</b>	SPIRE DPU PRIME is ON and SPIRE HK is being produced , SPIRE DRCU PRIME is OFF
<b>Preconditions</b>	<ul style="list-style-type: none"> <li>• SPIRE FM DPU is electrically integrated with the Herschel Satellite</li> <li>• SPIRE MIB PRIME is imported in the CCS database.</li> <li>• CCS is up and running</li> <li>• IEGSE is up and running</li> <li>• DPU AND OBS PARAMETERS display is selected on the CCS</li> </ul>
<b>Duration</b>	5 minutes
<b>Pass/Fail criteria</b>	Nominal and critical HK reports start being generated at their nominal rates of 1Hz and 0.5Hz respectively.



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### Procedure Steps for AVM:

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	<b>Power ON the SPIRE DPU PRIME unit using the dedicated spacecraft LCL line and configure 1553 Spacecraft bus for SPIRE DPU PRIME (RT = 21)</b>	—	—	—	✓
3	Wait for the boot software to produce at least 2 event packets (5,1)				✓
4	From manual stack sent FORCE_BOOT_PRIMARY, then pressed the reset RED button.	—	—	—	✓
5	Check that Nominal and Critical HK packets are arriving at the CCS: <b>SPIRE Nominal HK:</b> <ul style="list-style-type: none"> <li>• (type ,subtype) : (3,25)</li> <li>• APID : 0x502</li> </ul> <b>SPIRE Critical HK:</b> <ul style="list-style-type: none"> <li>• (type ,subtype) : (3,25)</li> <li>• APID: 0x500</li> </ul>				✓
6	<b>When the HK requests start being generated several HK parameters will go Out of Limits (Hard). This is a design feature of the DRCU Simulator and cannot be avoided.</b>	PLIAP5V PLIAP9V PLIAM9V SLIAP5V SLIAP9V SLIAM9V LIAPiTEMP LIASiTEMP BIASTEMP DAQTEMP	-/ OOL -/ OOL -/ OOL -/ OOL -/ OOL -/ OOL -/ OOL -/ OOL -/ OOL -/ OOL		✓
7	Check that THSK parameter is refreshing every second	THSK	Refreshing @ 1 Hz	—	✓
8	Check that TM2N parameter is incrementing by 1 every second	TM2N	Incrementing by 1 @ 1Hz	—	✓
9	Check that TM1N parameter is incrementing by 1 every 2 second	TM1N	Incrementing by 1 @ 0.5Hz		✓
10	<b>On CCS check the consistency of the SPIRE on board time to the HCDMU time and the CCS. *</b>	—	—		✓
11	On IEGSE check the consistency between SCOS time and THSK and QLA time.	THSK	Incrementing once per second		✓
<b>Test Result (Pass/Fail): Pass</b>					



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### 5.1.1.2 Procedure SPIRE-WU-INT-DRCU-ON-P

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<b>Version</b>	1.3
<b>Date</b>	15 <sup>th</sup> February 2007
<b>Purpose</b>	To switch on the SPIRE DRCU PRIME and start generating housekeeping
<b>Initial configuration</b>	SPIRE DPU is ON and the DRCU are switched off
<b>Final configuration</b>	SPIRE DPU and DRCU are ON and SPIRE HK is being produced
<b>Preconditions</b>	<ul style="list-style-type: none"> <li>• SPIRE FM DPU and DRCU are electrically integrated with the Herschel Satellite</li> <li>• SPIRE MIB PRIME is imported in the CCS database.</li> <li>• CCS is up and running</li> <li>• IEGSE is up and running</li> <li>• FUNCTIONAL TEST PARAMETERS display is selected on the CCS</li> </ul>
<b>Duration</b>	5 minutes
<b>Pass/Fail criteria</b>	DRCU housekeeping telemetry shows expected 'ON' voltages

#### Procedure Steps for AVM:

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/Failure
1	Execute TCL script SPIRE-WU-INT-DRCU-START-P-STEP1.tcl	—	—	—	✓
2	Check that THSK parameter is not refreshing anymore	THSK	Not refreshing	Not refreshing	✓
3	Check that TM2N parameter is not incrementing anymore	TM2N	Not incrementing	Not incrementing	✓
4	Start DRCU simulator application software.*	—	—	—	✓
5	Execute TCL script SPIRE-WU-INT-DRCU-START-P-STEP2.tcl	—	—	—	✓
6	Check that THSK parameter is again refreshing every second	THSK	Refreshing @ 1Hz	Refreshing @ 1Hz	✓
7	Check that TM2N parameter is again incrementing every second	TM2N	Incrementing by 1 @ 1Hz	Incrementing by 1 @ 1Hz	✓

**Test Result (Pass/Fail): Pass**

\* It is assumed that the DRCU simulator PC is already ON. Double click on the Transmit.exe icon on the desktop of the PC to start the application software.



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### 5.1.1.3 Procedure SPIRE-WU-INT-SCU-01-P

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<b>Version</b>	1.3
<b>Date</b>	15 <sup>th</sup> February 2007
<b>Purpose</b>	To check the correct functioning of the SCU PRIME Low Speed Link
<b>Initial configuration</b>	SPIRE DPU and DRCU PRIME are switched ON, SPIRE HK is being produced
<b>Final configuration</b>	Identical
<b>Preconditions</b>	<ul style="list-style-type: none"> <li>• <b>SPIRE-WU-INT-DPU-ON-P</b> and <b>SPIRE-WU-INT-DRCU-ON-P</b> procedures have been executed.</li> <li>• SPIRE MIB PRIME is imported in the CCS database.</li> <li>• CCS is up and running</li> <li>• IEGSE is up and running</li> <li>• FUNCTIONAL TEST PARAMETERS display is selected on the CCS</li> </ul>
<b>Duration</b>	5 minutes
<b>Pass/Fail criteria</b>	SCUTEMPSTAT and SUBKSTAT HK parameters show expected values

#### Procedure Steps:

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Pass/Fail
1	Execute TCL script SPIRE-WU-INT-SCU-01-P.tcl	SCUTEMPSTAT SUBKSTAT	0/0xFFFF 0/1	0/0xFFFF 0/1	
<b>Test Result (Pass/Fail): Pass</b>					



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### 5.1.1.4 Procedure SPIRE-WU-INT-SCU-02-P

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<b>Version</b>	1.3
<b>Date</b>	15 <sup>th</sup> February 2007
<b>Purpose</b>	To check the correct functioning of the SCU PRIME High Speed Link
<b>Initial configuration</b>	SPIRE DPU and DRCU PRIME are switched ON, SPIRE HK is being produced
<b>Final configuration</b>	Identical
<b>Preconditions</b>	<ul style="list-style-type: none"> <li>• <b>SPIRE-WU-INT-DPU-ON-P</b> and <b>SPIRE-WU-INT-DRCU-ON-P</b> procedures have been executed.</li> <li>• SPIRE MIB PRIME is imported in the CCS database.</li> <li>• CCS is up and running</li> <li>• IEGSE is up and running</li> <li>• FUNCTIONAL TEST PARAMETERS display is selected on CCS</li> </ul>
<b>Duration</b>	5 minutes
<b>Pass/Fail criteria</b>	Two SCU Nominal Science telemetry packets are received at CCS with : <ul style="list-style-type: none"> <li>• (type,subtype): (21,1).</li> <li>• APID : 0x508</li> </ul>

#### Procedure Steps:

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-WU-INT-SCU-02-P.tcl	SCUFRAMECNT TM5N	0/31 0x3FFF/1	0/0 0x3FFF/1	<b>Failure</b>
2	Verify that two telemetry packets with : <ul style="list-style-type: none"> <li>• (type,subtype): (21,1).</li> <li>• APID : 0x508</li> </ul> have been received at CCS				

**Test Result (Pass/Fail): DRCU Simulator has produced 2 (21,4) tm packets**



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### 5.1.1.5 Procedure SPIRE-WU-INT-MCU-01-P

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<b>Version</b>	1.3
<b>Date</b>	15 <sup>th</sup> February 2007
<b>Purpose</b>	To check the correct functioning of the MCU PRIME Low Speed Link
<b>Initial configuration</b>	SPIRE DPU and DRCU PRIME are switched ON, SPIRE HK is being produced
<b>Final configuration</b>	SPIRE DPU and DRCU PRIME are switched ON, SPIRE HK is being produced and MCU is booted.
<b>Preconditions</b>	<ul style="list-style-type: none"> <li>• <b>SPIRE-WU-INT-DPU-ON-P</b> and <b>SPIRE-WU-INT-DRCU-ON-P</b> procedures have been executed.</li> <li>• SPIRE MIB PRIME is imported in the CCS database.</li> <li>• CCS is up and running</li> <li>• IEGSE is up and running</li> <li>• MCU PARAMETERS display is selected on the CCS</li> <li>• FUNCTIONAL TEST PARAMETERS display is selected on the CCS</li> </ul>
<b>Duration</b>	5 minutes
<b>Pass/Fail criteria</b>	MCU housekeeping telemetry shows expected 'ON' voltages

#### Procedure Steps for AVM:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Pass/Fail
1	Execute TCL script SPIRE-WU-INT-MCU-01-P.tcl	—	—	—	—
2	Check that the MCU is booted up successfully	MCUBITSTAT	0/-/1	0/-/1	✓

**Test Result (Pass/Fail):** Pass



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### 5.1.1.6 Procedure: SPIRE-WU-INT-MCU-02-P

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<b>Version</b>	1.3
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<b>Purpose</b>	To check the correct functioning of the MCU PRIME High Speed Link
<b>Initial configuration</b>	SPIRE DPU and DRCU are switched ON, SPIRE HK is being produced and MCU is booted.
<b>Final configuration</b>	Identical
<b>Preconditions</b>	<ul style="list-style-type: none"> <li>• <b>SPIRE-WU-INT-DPU-ON-P</b> and <b>SPIRE-WU-INT-DRCU-ON-P</b> procedures have been executed.</li> <li>• <b>SPIRE-WU-INT-MCU-01-P</b> has been run successfully</li> <li>• SPIRE MIB PRIME is imported in the CCS database.</li> <li>• CCS is up and running</li> <li>• IEGSE is up and running</li> <li>• FUNCTIONAL TEST PARAMETERS display is selected on the CCS</li> </ul>
<b>Duration</b>	5 minutes
<b>Pass/Fail criteria</b>	<p>The following MCU telemetry packet types are received at CCS with :</p> <p>ENG:</p> <ul style="list-style-type: none"> <li>- (type,subtype): (21,3).</li> <li>- APID 0x508</li> </ul> <p>BSM</p> <ul style="list-style-type: none"> <li>- (type,subtype): (21,1).</li> <li>- APID 0x508</li> </ul> <p>SMEC</p> <ul style="list-style-type: none"> <li>- (type,subtype): (21,1).</li> <li>- APID 0x508</li> </ul>

#### Procedure Steps:



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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-P.tcl	—	—	—	—
2	Record the values of MCUFRAMECNT at the start and end of the test	MCUFRAMECNT	<b>FM:</b> 0/297 <b>AVM:</b> 0/~300	0/~202	<b>Failure</b>
3	Verify that the following type of MCU telemetry packets have been received at the CCS : ENG: - (type,subtype): (21,3). - APID 0x508 BSM - (type,subtype): (21,1). - APID 0x508 SMEC -(type,subtype): (21,1). - APID 0x508	—	—	—	

**Test Result (Pass/Fail): DRCU Simulator produces 2 ENG frames , then 100 SMEC , then 100 BSM**





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### 5.1.1.7 Procedure SPIRE-WU-INT-DCU-01-P

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<b>Version</b>	1.3
<b>Date</b>	15 <sup>th</sup> February 2007
<b>Purpose</b>	To check the correct functioning of the DCU PRIME Low Speed Link
<b>Initial configuration</b>	SPIRE DPU and DRCU PRIME are switched ON, SPIRE HK is being produced and MCU is booted.
<b>Final configuration</b>	Identical
<b>Preconditions</b>	<ul style="list-style-type: none"> <li>• <b>SPIRE-WU-INT-DPU-ON-P</b> and <b>SPIRE-WU-INT-DRCU-ON-P</b> procedures have been executed.</li> <li>• SPIRE MIB PRIME is imported in the CCS database.</li> <li>• CCS is up and running</li> <li>• IEGSE is up and running</li> <li>• BIAS PARAMETERS display is selected on the CCS</li> <li>• FUNCTIONAL TEST PARAMETERS display is selected on the CCS</li> </ul>
<b>Duration</b>	5 minutes
<b>Pass/Fail criteria</b>	PSWBIAAS,PMWBIAAS and PLWBIAAS HK parameters show expected values

#### Procedure Steps:

Step	Description	Parameter	Expected Values Before/After	Actual Values Before/After	Success/Failure
1	Execute TCL script SPIRE-WU-INT-DCU-01-P.tcl	PSWBIAAS PMWBIAAS PLWBIAAS	0/0xff/0 0/0xff/0 0/0xff/0	0/0xff/0 0/0xff/0 0/0xff/0	✓

**Test Result (Pass/Fail):** Pass



## Spire Report

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### 5.1.1.8 Procedure SPIRE-WU-INT-DCU-02-P

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<b>Version</b>	1.3
<b>Date</b>	15 <sup>th</sup> February 2007
<b>Purpose</b>	To check the correct functioning of the DCU PRIME High Speed Link
<b>Initial configuration</b>	SPIRE DPU and DRCU PRIME are switched ON, SPIRE HK is being produced and MCU is booted.
<b>Final configuration</b>	Identical
<b>Preconditions</b>	<ul style="list-style-type: none"> <li>• <b>SPIRE-WU-INT-DPU-ON-P</b> and <b>SPIRE-WU-INT-DRCU-ON-P</b> procedures have been executed.</li> <li>• SPIRE MIB PRIME is imported in the CCS database.</li> <li>• CCS is up and running</li> <li>• IEGSE is up and running</li> <li>• DCU PARAMETERS display is selected on the CCS</li> <li>• FUNCTIONAL TEST PARAMETERS display is selected on the CCS</li> </ul>
<b>Duration</b>	5 minutes
<b>Pass/Fail criteria</b>	<p>The following DCU telemetry packet types are received at CCS with :</p> <p>Full Photometer:          - (type,subtype): (21,1).          - APID 0x504</p> <p>PSW          - (type,subtype): (21,2).          - APID 0x504</p> <p>PMW          -(type,subtype): (21,2).          - APID 0x504</p> <p>PLW          -(type,subtype): (21,2).          - APID 0x504</p> <p>Full Spectrometer:          - (type,subtype): (21,1).          - APID 0x506</p> <p>SSW          - (type,subtype): (21,2).          - APID 0x506</p> <p>SLW          -(type,subtype): (21,2).          - APID 0x506</p>

#### Procedure Steps:



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Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-WU-INT-DCU-02-P.tcl	DCUFRAMECNT	FM: 0/700 AVM: 0/~700	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 0x504 PSW - (type,subtype): (21,2). - APID 0x504 PMW -(type,subtype): (21,2). - APID 0x504 PLW -(type,subtype): (21,2). - APID 0x504 Full Spectrometer: - (type,subtype): (21,1). - APID 0x506 SSW - (type,subtype): (21,2). - APID 0x506 SLW -(type,subtype): (21,2). - APID 0x506	—	—	—	✓
<b>Test Result (Pass/Fail): Pass</b>					



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### 5.1.1.9 Procedure SPIRE-WU-INT-MCU-OFF-P

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<b>Version</b>	1.3
<b>Date</b>	15 <sup>th</sup> February 2007
<b>Purpose</b>	To switch OFF the MCU PRIME
<b>Initial configuration</b>	SPIRE DPU and DRCU PRIME are switched ON, SPIRE HK is being produced and MCU PRIME is booted.
<b>Final configuration</b>	SPIRE DPU and DRCU PRIME are switched ON, SPIRE HK is being produced and MCU PRIME is OFF.
<b>Preconditions</b>	<ul style="list-style-type: none"> <li>• <b>SPIRE-WU-INT-DPU-ON-P</b> and <b>SPIRE-WU-INT-DRCU-ON-P</b> procedures have been executed.</li> <li>• SPIRE MIB PRIME is imported in the CCS database.</li> <li>• CCS is up and running</li> <li>• IEGSE is up and running</li> <li>• FUNCTIONAL TEST PARAMETERS display is selected on the CCS</li> </ul>
<b>Duration</b>	5 minutes
<b>Pass/Fail criteria</b>	Specified MCU HK Parameter shows expected value.

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute SPIRE-WU-INT-MCU-OFF-P.tcl	—	—	—	—
2	Check that the MCU is switched off	MCUBITSTAT	1/-/0	<b>1 / 0</b>	✓

**Test Result (Pass/Fail):** Pass

**Procedure Steps:**



## Spire Procedure

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### 5.1.1.10 Procedure SPIRE-WU-INT-DRCU-OFF-P

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<b>Version</b>	1.3
<b>Date</b>	15 <sup>th</sup> February 2007
<b>Purpose</b>	To switch OFF the DRCU PRIME
<b>Initial configuration</b>	SPIRE DPU and DRCU PRIME are switched ON, SPIRE HK is being produced and MCU is OFF.
<b>Final configuration</b>	SPIRE DPU PRIME is ON (but no HK is being produced) and DRCU PRIME is switched OFF.
<b>Preconditions</b>	<ul style="list-style-type: none"> <li>• <b>SPIRE-WU-INT-DPU-ON-P</b> and <b>SPIRE-WU-INT-DRCU-ON-P</b> procedures have been executed.</li> <li>• SPIRE MIB PRIME is imported in the CCS database.</li> <li>• CCS is up and running</li> <li>• IEGSE is up and running</li> <li>• FUNCTIONAL TEST PARAMETERS display is selected on the CCS</li> </ul>
<b>Duration</b>	5 minutes
<b>Pass/Fail criteria</b>	THSK and TM2N stop refreshing/incrementing

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-WU-INT-DRCU-OFF-P.tcl	---	---	---	
2	Check that THSK parameter is not refreshing anymore	THSK	Not refreshing	Not refreshing	✓
3	Check that TM2N parameter is not incrementing anymore	TM2N	Not incrementing	Not incrementing	✓
4	IEGSE staff: Stop DRCU Simulator application software	---	---	---	
<b>Test Result (Pass/Fail):</b> <span style="background-color: #90EE90;">Pass</span>					

**Procedure Steps for AVM:**



# Spire Procedure

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## 5.1.1.11 Procedure SPIRE-WU-INT-DPU-OFF-P

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<b>Version</b>	1.3
<b>Date</b>	15 <sup>th</sup> February 2007
<b>Purpose</b>	To switch OFF the DPU PRIME
<b>Initial configuration</b>	SPIRE DPU PRIME is ON (but no HK is being generated) and the DRCU PRIME is OFF.
<b>Final configuration</b>	SPIRE DPU and DRCU PRIME are switched OFF.
<b>Preconditions</b>	<ul style="list-style-type: none"> <li>• <b>SPIRE-WU-INT-DRCU-OFF-P</b> procedure has been executed.</li> <li>• SPIRE MIB PRIME is imported in the CCS database.</li> <li>• CCS is up and running</li> <li>• IEGSE is up and running</li> <li>• FUNCTIONAL TEST PARAMETERS display is selected on the CCS</li> </ul>
<b>Duration</b>	5 minutes
<b>Pass/Fail criteria</b>	Power to SPIRE DPU PRIME is OFF

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Power OFF the SPIRE DPU PRIME unit.	—	—	—	
Test Result (Pass/Fail): <b>Pass</b>					

Procedure Steps:



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