1. INTRODUCTION

This document reports on the WARM FUNCTIONAL TESTS carried out (started) on the 15th March 2006 for SPIRE to verify the instrument's correct functioning.

1.1 SCOPE

To judge the success or failure of a warm functional test by checking that:

- The telecommand sequence generated for a particular functional test is correctly received and executed on board by the SPIRE DPU.
- No error/event reports or command failures are generated during the execution of these commands.
- Telemetry is generated by the instrument as a result of telemetry requests to its different subunits.
- Particular telemetry parameters for each functional test change in an expected manner.
- A particular success criterion/criteria (specified in this document) is/are met.

1.2 REFERENCE DOCUMENTS

Ref	Document	Name	Version/Issue Nb.
RD01	SPIRE-RAL-DOC-001652	SPIRE Functional Tests Specification	Issue 1.4
RD02	SPIRE-RAL-DOC-001630	SPIRE EGSE-ILT Start-Up Procedures	Issue 0.7
RD03	SPIRE-RAL-PRC-002222	DRCU Switch ON Procedure	Issue 1.0
RD04	SPIRE-RAL-PRJ-001078	SPIRE Data ICD	Issue 2.0
RD05	Sap-SPIRE-CCa-076-02	DRCU/DPU Interface Control Document	Issue 1.2
RD06	LAM.PJT.SPI.NOT.011011	MCU/DPU Command List ICD	Issue 5.0
RD07	SPIRE-IFS-PRJ-001391	SPIRE OBS User Manual	Issue 2.1

1.3 CHANGE RECORD

Document	Change date	Changes
Issue 1.0	15th March 2006	Created

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2. FUNCTIONAL TEST CONFIGURATION

2.1 Software Configuration

Annotate in the table the current EGSE software configuration for the tests:

EGSE component	Version/Build number	Comment
SCOS2000	**SCOS2.3e Patch 5**	**Operations done on the 14th March 2006:** **SCOS archives for PFM3_TEST1 under /spired/hfiles and /spired/TMD (12 GB free on /spired – OK to proceed with WFTs)** **Imported MIB PFM3_Issue2.1.G1 – success (Previous MIB PFM3_Issue2.1.E1_14032006.tar.gz, as used for the DRCU QM2 AT, is in ~/SCOS2.3eP5/data)** **Restarted SCOS** **Started Test Control Server on Lichfield – success**
HCSS	**Build #812**	
QLA	**3.0 Alpha**	
QLA scripts	**?**	
Test Control scripts	**See Annexe2**	
CUS Scripts	**See Annexe 2**	

2.2 EGSE Configuration Checks

To check for the success of failure of a functional test, the real time telemetry of the instrument has to be monitored. The following applications must be running to do so. Before the test sequence starts, make the following checks:

Workstation	EGSE component	Status	Check	Comments
Lichfield	EGSE router	Started	✓	Started by typing router R
Lichfield	EGSE Gateway	Started	✓	Started by typing router S –scosapids 1280,1282,2036-2038
Lichfield	Telemetry Ingestion	Started	✓	
Lichfield	Packet Display	Started	✓	
Lincoln	SCOS2000	Started	✓	
Lincoln	EXIF + TOPE	Started	✓	
Lincoln	Manual Stack	Started		

			✓	
Gordon	CDMS Simulator	Started	✓	CDMS telemetry appearing in PacketDisplay
Lichfiehd	Test Control Server	Started	✓	

2.3 SPIRE Instrument Configuration

The functional test flow is such that at a given time during the procedure is possible that the instrument configuration does not conform to any nominal configuration as specified in Annexe 1. Nevertheless the configuration prior and after a test is specified for each functional test, and were applicable and the instrument configuration is in accordance to Anexe1, this will be denoted by showing the main configuration in blue bold font and any additional subsystems configuration in black.
The **initial** instrument configuration for WFT does conform to a 'known' configuration and should be SPIRE **DRCU_ON**.
Perform the following actions to ensure that the instrument is in the correct configuration for the tests.

Step#	Action	Comments	Check
1	In SCOS open **DPU_AND_OBS_PARAMETERS display** Check if : TM2N is incrementing by one @1Hz. TM1N is incrementing by one @0.5Hz. - If they are, go to step 5. - If they are not, go to step 2.	**15/03/06: No telemetry currently appears in the displays as a new archive was created yesterday. Will go to step 2.**	✓
2	Check if the DPU is powered ON: - If ON, the DPU power supply LCD will show ~ 28V and 0.40A, go to step 4. - If not ON, power ON DPU see comments on the right, then go to step 3.	**15/03/06: DPU is switched OFF. Will go to step 3.**	✓
3	In SCOS open **Boot_ROM_Memory_Check display** and check no errors are reported: - If no errors are reported, execute DPU_ON from HCSS Test Procedures. Then repeat step 1. - If the (5,1) contains errors: Check the error code in RD07. Then switch OFF the DPU and repeat step 2	**15/03/06: DPU produces an event packet (5,1) as expected after switch ON with the following contents: ID: 0D00 Seq: C000 Len: 0019 0000: 0D00 C000 0019 0005 0100 8000 0000 0000 8008 0003 ABAB CDCD 0051 AAAA 0000 AE6C** **No errors reported on the penultimate field.** **Note: SCOS display shows an erroneous reading of 0xABAB errors, probably due to the change of the length of this packet in the latest OBS version.** **Executed DPU_START procedure, the name of the script should be corrected in the procedure.** **Received the following events as expected:** **ID: 0D00 Seq: C000 Len: 0019 0000: 0D00 C000 0019 0005 0100 8000**	✓

		0000 0000 8008 0003 ABAB CDCD 0051 AAAA 0000 AE6C **ID: 0D00** **Seq: C001** **Len: 0019** **0000: 0D00 C001 0019 0005 0100 8000 0000 0000 8008 0003 1D00 C000 0011 CAFE 0001 8D01** **ID: 0D00** **Seq: C000** **Len: 001D** **0000: 0D00 C000 001D 0005 0100 8000 0000 073A 0521 510F 0000 0D05 0000 0000 0000 9800** **0020: 0000 2B58** **ID: 0D00** **Seq: C001** **Len: 001D** **0000: 0D00 C001 001D 0005 0100 8000 0000 0A0B 0522 5110 0000 0D05 0000 0000 0001 A800** **0020: 0000 D389** **ID: 0D00** **Seq: C002** **Len: 001D** **0000: 0D00 C002 001D 0005 0100 8000 0000 0CDB 0520 510E 0000 0D05 0000 0000 0002 8C12** **0020: 0000 2F97** **ID: 0D00** **Seq: C004** **Len: 001F** **0000: 0D00 C004 001F 0005 0100 8000 0000 18DA 0512 5117 0000 0D05 0000 0000 0003 0000** **0020: 0000 0000 68DF** **Will proceed to step 1 as specified in the procedure.**	
4	Execute **define_new_HK_report.tcl** HCSS Test procedure.		
5	In SCOS open **SCU_PARAMETERS display** - If SCUP5V/P9V/M9V are jittering and **BIAS_PARAMETERS display** - If BIAS1TEMP,BIAS2TEMP,… show ambient temperature, the DRCU is ON.Go to step 6. - If DRCU is not ON, refer to RD03 on how to start up the DRCU.	**15/03/06:** **DRCU is not ON.** **Will clear Nominal and Critical HK reports and proceed to DRCU switch ON procedure.** **Run clear_HK_report.tcl procedure and received an event (5,1) with the following contents:**	✓

		ID: 0D00 **Seq: C164** **Len: 001D** **0000: 0D00 C164 001D 0005 0100 5AAA 9C8A 0424 0511 5111 0000 0D05 0000 0000 0004 0000** **0020: 0003 664C** **Used manual stack UpdateHKTable_21G.lincoln to update Nominal HK table contents.** **Both commands successful.** **Will power UP the DRCU now:** **1. Powered UP main DRCU power and secondary (DRCU power display shows 28.0V and 0.38 A)** **2. Run DRCU_ON HCSS Test procedure** **3. Opened SCU and DCU displays** **ALL SCU VOLTAGES LOOKING GOOD.** **SCUP5V = 5.22V** **SCUP9V =9.0652V** **SCUM9V = -9.07V** **ALL BIAS VOLTAGES LOOKING GOOD.** **BIASP5V = 5.12V** **BIASP9V = 8.95V** **BIASM9V= -9.08V**	
6	**In SCOS open** DPU_AND_OBS_PARAMETERS display **and check that the MODE housekeeping parameter is DRCU_ON.**	**15/03/06;** **MODE (RAW)= 0x100** **MODE (ENG) = DRCU_ON**	✓

Table 1. Initial configuration check

3. TEST PROCEDURE

The following two sections describe general pass/fail criteria (Section 3.1), the general test procedure layout (Section 3.1) and the detailed procedure for each functional test (Section 3.2).

3.1 GENERAL PASS/FAIL CRITERIA

The general criterion for declaring a single test failed is the repeated failure of 2 consecutive runs of this test. In that case the functional test procedure should be aborted and the overall functional testing declared FAILED.
In the case of a 'first run' failure followed by a successful execution a third run of the same test should be performed and in the unlikely event of this third run being a failure the test procedure should be also aborted and the overall functional testing declared FAILED, as this would imply a not reliable operability of the instrument.
As a general remark ANY failure should be closely analyzed.

Note: If the functional test is declared FAILED refer to section 4.1 for instrument switch OFF.

3.2 GENERAL TEST PROCEDURE LAYOUT

The table below shows the general WFT sequence as it should be performed. In each step of this procedure the operator should refer to the detailed procedure in Section 3.2 .Test Control TCL scripts are available to invoke the correspondent CUS script stored in the HCSS database for each functional test. These CUS scripts will generate the appropriate command sequence for the particular functional test.

Step	Subsystem tested	Test Id	Test Purpose
1	SCU	FUNC-SCU-01	SCU Nominal Science Generation Check
2		FUNC-SCU-03	FPU DC Thermometry Check
3		FUNC-SCU-06	FPU AC Thermometry Check
4		FUNC-SCU-02	SCU Nominal Science Contents Check
5		FUNC-SCU-08	SCU Test Pattern Check
6		FUNC-SCU-07	Sorption Cooler Check
7		FUNC-SCU-04	Photometer Calibrator Check
8		FUNC-SCU-05	Spectrometer Calibrators Check
9	MCU	FUNC-MCU-01	MCU Boot Check
10		FUNC-MCU-02	MCU Nominal Science Generation Check
11		FUNC-MCU-03	MCU Nominal Science Contents Check
12		FUNC-MCU-04	MCU Test Pattern Check
13	BSMm	FUNC-BSM-01	BSM Switch ON Check
14		FUNC-BSM-02c	BSM Chop Sensor Polarity Check
15		FUNC-BSM-02j	BSM Jiggle Sensor Polarity Check
16		FUNC-BSM-03	BSM Open Loop dynamics Check
17		BSM_INIT*	Close loop on chop/jiggle axis.
18		FUNC-BSM-06	BSM Operational Mode Check
18	SMECm	FUNC-SMEC-02A/B*	SMEC Launch Latch Open/Close Check
19		FUNC-SMEC-01	SMECm Switch ON Check

20		**FUNC-SMEC-03**	SMEC LED Optical Encoder LED Check
21		**FUNC-SMEC-04**	SMEC Positioning Test (Open Loop)
22	**DCU**	**FUNC-DCU-01**	DCU Nominal Science Generation Check
23		**FUNC-DCU-02**	DCU Nominal Science Contents Check
24		**FUNC-DCU-03**	DCU Test Pattern Check
25	**Photometer LIAs**	**FUNC-DCU-04P**	Photometer LIAs Check
26		**FUNC-DCU-05P**	Photometer Manual Offset Setting Check
27		**FUNC-DCU-11P**	Photometer Detectors Switch ON Check
28	**Photometer BDAs**	**FUNC-DCU-013P**	Photometer Detectors Check
29	**Spectrometer LIAs**	**FUNC-DCU-04S**	Spectrometer LIAs Check
30		**FUNC-DCU-05S**	Spectrometer Manual Offset Setting Check
31		**FUNC-DCU-11S**	Spectrometer Detectors Switch ON Check
32	**Spectrometer BDAs**	**FUNC-DCU-013S**	Spectrometer Detectors Check

Table 2. General WFT sequence

***Note**: If the procedure is executed prior to an FPU cooldown FUNC-SMEC-02A should be executed. If the procedure is executed after an FPU warm up FUNC-SMEC-02B should be executed.

***Note:** This procedure is not a functional test, is a close loop initialisation procedure required to test the close loop operability of the BSM.

3.3 DETAILED TEST PROCEDURE

The following is a detailed (test by test) procedure including the steps required to perform each functional test individually.

Step#	Action	Comments
0	Open **SCU_PARAMETERS** display on SCOS Alpha Numeric Displays.	

3.3.1 FUNC-SCU-01

Test Id:	**FUNC-SCU-01**
Initial Configuration:	**DRCU_ON**
Final Configuration:	**DRCU_ON**
Success Criteria:	Test passed if : 1. Two SCU Nominal Science Report telemetry packets are received on QLA with the following characteristics:

APID	Type	Subtype	SID	FrameID	Frame length
0x508	21	1	0xA20	0x20	0x1E

2. The frame time difference between consecutive SCU frames within these packets corresponds to the sampling rate. Nominal SCU sampling rate is 80Hz ➔ $\Delta t = 12.5$ ms
3. The SPIRE HK parameter SCUFRAMECNT increments by 31.
4. No events are generated during the frame generation.

	QLA to give go ahead.

Test Procedure:

Step#	Action	Comments
1	Annotate the initial value of SCUFRAMECNT parameter located in SCU_PARAMETERS display and the initial value of TM1N located in DPU_AND-OBS_PARAMETERS display.	SCUFRAMCNT = 0
2	Run QLA script FUNC-SCU-01.py on QLA console.	
3	Run FUNC-SCU-01 test procedure from the HCSS Test Procedure window on TOPE	
4	Annotate the final value of SCUFRAMECNT and TM1N.	SCUFRAMCNT = 31
5	Contingency: If test fails repeat steps 1 to 4.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-SCU-01	**SCUFRAMECNT TM1N**	**n/ n+ 31**	0/ 31 Not stable as critical HK is running	31	**Success**

Start time @:16:39
End time @: 16:40
OBSID: 0x3000E003
Comments:

QLA produces QLA-SCU-01_3000E003.txt file which shows that the contents of the SCU nominal science telemetry packets are as expected according to success criterion.

3.3.2 FUNC-SCU-03

Test Id:	FUNC-SCU-03
Initial Configuration:	DRCU_ON
Final Configuration:	DRCU_ON + DC thermometry ON
Success Criteria:	Test passed if all FPU DC thermometry sensors show temperature values indicating a correct functioning of the sensor, not open/short-circuited. If ANY reading is anomalous check RAW sensor reading. **Open Circuit Criterion:** **RAW reading in the range [0, -100]** **Short Circuit Criterion:** **RAW reading of -32768** **Note:** For some parameters the calibration curve above 75K has only 2 points, thus the linearly interpolated temperature reading given by SCOS is usually not correct at T > 75K.

Test Procedure:

Step#	Action	Comments
1	Run FUNC-SCU-03 test procedure from the HCSS Test Procedure window on TOPE	
2	When the test is finished annotate the current value of SCUTEMPSTAT and the RAW/converted values of the 16 FPU temperatures located in SCU_PARAMETERS display.	
3	Contingency: If test fails execute SCU_OFF procedure from HCSS Test Procedure window on TOPE and then repeat steps 1 and 2.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-SCU-03	**SCUTEMPSTAT** **0**	**0/0xFFFF** **0/0xffff**	**0/0xffff**	**N/A**	**Pass**

Start time @:16:43
End time @:16:44
OBSID:0x3000E004
Commets:
PUMPHTRTEMP = 55.22 K RAW=-32768
PUMPHSTEMP = 37.3 K RAW=-32768
EVAPHSTMP = 38.52 K RAW=-32768
SHUNTTEMP = 19.94 K RAW=-32768
EMCFIELDTMP = 284.03 K RAW = -29544
SL0TEMP = 19.89 K RAW =-32768
PL0TEMP= 21.3 K RAW = -32768
OPTTEMP =148.48 K RAW = -32768
BAFTEMP = 187.81 RAW =-32768
BSMIFTEMP =97.61 K RAW =-32768
SCAL2TEMP = 85.99 K RAW=-32768
SCAL4TEMP =88.89 K RAW =-32768
SCALTEMP=86.61K RAW=-32768
SMECIFTEMP=93.13K RAW=-32768
SMECTEMP=8.39K RAW=-32768
BSMTEMP=12.14 K RAW=-32768

3.3.3 FUNC-SCU-06

Test Id:	FUNC-SCU-06
Initial Configuration:	**DRCU_ON** + DC thermometry ON
Final Configuration:	**DRCU_ON** + AC/DC thermometry ON
Success Criteria:	Test passed if SUBKSTAT parameter went from 0 to 1. **Open Circuit Criterion:** **RAW reading in the range 0 -100** **Short Circuit Criterion:** **RAW reading of -32768**

Test Procedure:

Step#	Action	Comments
1	Run FUNC-SCU-06 test procedure from the HCSS Test Procedure window on TOPE.	
2	When the test is finished annotate the current value of SUBKSTAT located in SCU_PARAMETERS display. Also write down the RAW value of the SUBKTEMP parameter.	
3	Contingency: If test fails : 1. Send manual command: SEND_DRCU_COMMAND Parameter1 = 0xA0860000 Parameter2 = 0 2. Then repeat steps 1 and 2.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-SCU-06	**SUBKSTAT** **0**	**0/1** **1**	0/1	**N/A**	**Pass**

Start time @:16:53
End time @:16:54
OBSID:0x3000E005
Commets:Success

3.3.4 FUNC-SCU-02

Test Id:	FUNC-SCU-02
Initial Configuration:	DRCU_ON + AC/DC thermometry ON
Final Configuration:	DRCU_ON + AC/DC thermometry ON
Success Criteria:	Test passed if : 1. Parameters in the SCU Nominal science packets and the same parameters in the Nominal HK packet have similar RAW/converted values to within 10%. 2. The SPIRE HK parameter SCUFRAMECNT located in **SCU_PARAMETERS** display increments by 31. 3. No events are generated during the frame generation. QLA to give the go ahead.

Test Procedure:

Step#	Action	Comments
1	Annotate the current value of SCUFRAMECNT located in SCU_PARAMETERS display.	
2	Run QLA script FUNC-SCU-02.py on QLA console.	
3	Run FUNC-SCU-02 test procedure from the HCSS Test Procedure window on TOPE	
4	When the test is finished annotate the current value of SCUFRAMCNT.	
5	Contingency: If test fails repeat steps 1 to 4.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-SCU-02	**SCUFRAMECNT TM5N**	**n+31/n+62**	31/62	31	**Pass**

Start time @:16:56
End time @:16:57
OBSID:0x3000E006
Commets: All parameters the same between NHK and SCUNOMINAL except SCAL4CURR and TCHTRV
SCAL4CURR NHK=13 SCU=0 – Time series plot of NHK on QLA shows the 'normal' jumping between 0 and 65535. This value on SCOS is showing a lot of noise (raw value jumping between -31 and 31 and this is probably the cause of the discrepancy.
TCHTRV NHK=0 SCU=1 – This is noise so is OK

3.3.5 FUNC-SCU-08

Test Id:	FUNC-SCU-08
Initial Configuration:	DRCU_ON + AC/DC thermometry ON
Final Configuration:	DRCU_ON + AC/DC thermometry ON
Success Criteria:	Test passed if : 1. Two SCU Diagnostic Science Report telemetry packets are received with the following characteristics: 2. The SCU Test Pattern agrees with the reference test pattern. QLA to give go ahead.

APID	Type	Subtype	SID	FrameID	Frame length
0x508	21	3	0x1120	0x21	0x1E

Test Procedure:

Step#	Action	Comments
1	Annotate the current values of SCUFRAMECNT located in SCU_PARAMETERS display.	
2	Run QLA script FUNC-SCU-08.py on QLA console.	
3	Run FUNC-SCU-08 test procedure from the HCSS Test Procedure window on TOPE	
4	When the test is finished annotate the current value of SCUFRAMCNT.	
5	Contingency: If test fails repeat steps 1 to 4.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-SCU-08	**SCUFRAMECNT and SCU test pattern frame parameters**	**n+62/n+93**	62/93	31	Pass

Start time @:17:12
End time @:17:13
OBSID:0x3000E007
Commets: QLA has written file FUNC-SCU-08_3000E007

3.3.6 FUNC-SCU-04

Test Id:	FUNC-SCU-04
Initial Configuration:	**DRCU_ON** + AC/DC thermometry ON
Final Configuration:	**DRCU_ON** + AC/DC thermometry ON
Success Criteria:	Test passed if PCALCURR/PCALV SCU HK parameters show the following values: • PCALCURR HK parameter which shows the measured PCAL current is ~ 0.1 mA. • PCALV HK parameter which shows the measured PCAL voltage is ~ 0.02V

Test Procedure:

Step#	Action	Comments
1	Annotate the current value of PCALV and PCALCURR located in SCU_PARAMETERS display.	
2	Run FUNC-SCU-04 test procedure from the HCSS Test Procedure window on TOPE	
3	While the test is running Annotate the values of PCALV and PCALCURR.	
4	Contingency: If test fails repeat steps 1 to 3.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/During test	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-SCU-04	**PCALCURR** **PCALV**	**0/0.1mA** **0/0.02V**	PCALV=0, 0.021 V PCALCURR=0, 0.0996 mA	**N/A**	Passed

Start time @:17:15
End time @:17:16
OBSID:0x3000E008
Commets:

3.3.7 FUNC-SCU-05

Test Id:	FUNC-SCU-05
Initial Configuration:	DRCU_ON + AC/DC thermometry ON
Final Configuration:	DRCU_ON + AC/DC thermometry ON
Success Criteria:	Test passed if : • SCAL2CURR ,SCAL4CURR HK parameters which show the measured current read ~ 0.1 mA • SCAL2V,SCAL4V parameters which show the measured voltage read ~ 0.05V.

Test Procedure

Step#	Action	Comments
1	Annotate the current value of SCAL2V ,SCAL2CURR,SCAL4V,SCAL4CURR located in SCU_PARAMETERS display.	
2	Run FUNC-SCU-05 test procedure from the HCSS Test Procedure window on TOPE	
3	While the test is running write the values of SCAL2V ,SCAL2CURR,SCAL4V,SCAL4CURR.	
4	Contingency: If test fails repeat steps 1 to 3.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/During test	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-SCU-05	**SCAL2CURR** **SCAL2V** **SCAL4CURR** **SCAL4V**	**0/0.1mA** **0/0.05V** **0/0.1mA** **0/0.05V**	0, 0.1 mA 0, 0.05 V 0, 0.1 mA 0, 0.05 V	**N/A**	Pass

Start time @:17:18
End time @:17:21
OBSID:0x3000E009
Commets:

3.3.8 FUNC-SCU-07

Test Id:	FUNC-SCU-07
Initial Configuration:	DRCU_ON + AC/DC thermometry ON
Final Configuration:	DRCU_ON + AC/DC thermometry ON
Success Criteria:	Test passed if during the execution of the test the following SCU HK parameters give correspondent readings of:

SCU HK parameter	RAW	Converted
SPHSV	**~12715**	**~323mV**
EVHSV	**~12715**	**~323mV**
SPHTRV	**~14390**	**~ 8 V**

Test Procedure:

Step#	Action	Comments
1	Run FUNC-SCU-07 test procedure from the HCSS Test Procedure window on TOPE.	
2	While the test is running annotate the values of current values of SPHSV, EVHSV, SPHTRV located in SCU_PARAMETERS display. (RAW and CONVERTED)	
3	Contingency: If test fails repeat steps 1 and 2.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/During test	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-SCU-07	**SPHSV** **EVHSV** **SPHTRV**	**0/ ~ 323 mV** **0/ ~ 323 mV** **0/ ~ 8 V**	0.11, 323.94 mV 0.0189,323.13 mV 0.0037, 8.83 V	**N/A**	Pass

Start time @:17:23
End time @:17:26
OBSID:0x3000E00A
Commets:

Step#	Action	Comments
0	Open **MCU_PARAMETERS** display on SCOS Alpha Numeric Displays.	

3.3.9 FUNC-MCU-01

Test Id:	**FUNC-MCU-01**
Initial Configuration:	**DRCU_ON** + AC/DC thermometry ON
Final Configuration:	**DRCU_ON** + AC/DC thermometry ON +MCU ON
Success Criteria:	Test passed if: 1. MCU boots. 2. MCU voltages show expected values. 3. MAC, SMEC and BSM board temperatures shows ambient temperature.

Test Procedure:

Step#	Action	Comments
1	Run **FUNC-MCU-01** test procedure from the HCSS Test Procedure window on TOPE	
2	When procedure is finished Annotate the values of the MCU voltages.	
3	Contingency: If test fails repeat steps 1 and 2.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result

FUNC-MCU-01	**MCUP5V** **MCUP15V** **MCUP14V** **MCUM14V** **MCUM15V** **MCUMACTEMP** **MCUSMECTEMP** **MCUBSMTEMP**	**N/A/ ~ 5V** **N/A / ~15V** **N/A / ~ 14V** **N/A / ~ -14V** **N/A / ~ -15V** **N/A / ~ 300K** **N/A / ~ 300K** **N/A / ~ 300K**	20V,5.0V 75.36,15.52 75.36,14.53 75.36,-14.61 75.36,-15.60 1651.51,289.84 1651.51,293.58 1651.51,293.13	**N/A**	Pass
Start time @:18:04 **End time @:18:06** **OBSID:0x3000E00B** **Commets:SCUDCDCSTAT went from 0 to 4 as expected**					

3.3.10 FUNC-MCU-02

Test Id:	FUNC-MCU-02
Initial Configuration:	DRCU_ON + AC/DC thermometry ON +MCU ON
Final Configuration:	DRCU_ON + AC/DC thermometry ON +MCU ON
Success Criteria:	Test passed if : 1. MCU produces each type of the frames requested and with the following characteristics.

Frame	APID	Type	Subtype	SID	FrameID	Frame length
Eng.	**0x508**	**21**	**3**	**0x814**	**0x14**	**0x15**
BSM	**0x508**	**21**	**1**	**0x612**	**0x12**	**0xD**
SMEC	**0x508**	**21**	**1**	**0x410**	**0x10**	**0xC**
BSM +SMEC						

2. No events are generated during the different frames generation.

Test Procedure:

Step#	Action	Comments
1	Annotate the current value of MCUFRAMECNT located in MCU_PARAMETERS display	
2	Run QLA script FUNC-MCU-02.py on QLA console.	
3	Run FUNC-MCU-02 test procedure from the HCSS Test Procedure window on TOPE	
4	When test is finished annotate the current value of MCUFRAMECNT.	
5	Contingency: If test fails repeat steps 1 to 4.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-MCU-02	**MCUFRAMECNT TM1N**	**0/ ~ 3300**	0/6637		Pass

Start time @:18:09
End time @:18:11
OBSID:0x3000E00C
Commets: Used all the default parameters when running the TOPE script
Framecount is correct procedure needs to be changed
Packet parameters checked – all OK
Events checked – no events

3.3.11 FUNC-MCU-03

Test Id:	FUNC-MCU-03
Initial Configuration:	DRCU_ON + AC/DC thermometry ON +MCU ON
Final Configuration:	DRCU_ON + AC/DC thermometry ON +MCU ON
Success Criteria:	Test passed if : 1. MCU produces 100 frames of each type of frames requested with the following characteristics:

Frame	APID	Type	Subtype	SID	FrameID	Frame length
Eng.	**0x508**	**21**	**3**	**0x814**	**0x14**	**0x15**
BSM	**0x508**	**21**	**1**	**0x612**	**0x12**	**0xD**
SMEC	**0x508**	**21**	**1**	**0x410**	**0x10**	**0xC**
BSM +SMEC						

2. No events are generated during the different frames generation.
3. QLA analysis results are correct.(FIXME)

QLA to give go ahead.

Test Procedure:

Step#	Action	Comments
1	Annotate the current value of MCUFRAMECNT located MCU_PARAMETERS display.	
2	Run QLA script FUNC-MCU-03.py on QLA console.	
3	Run FUNC-MCU-03 test procedure from the HCSS Test Procedure window on TOPE	
4	When test is finished annotate the current value of MCUFRAMECNT	
5	Contingency: If test fails repeat steps 1 to 4.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-MCU-03	**MCUFRAMECNT**	**n/ n+300** **n~3300**	6637/6934		To Check

Start time @:18:16
End time @:18:17
OBSID:0x3000E00D
Comments: Has not produced 300, instead has produced 297

QLA has produced files:
QLA-MCU-03_3000E00D_8901.txt,
QLA-MCU-03_3000E00D_8902.txt,
QLA-MCU-03_3000E00D_8903.txt

Errors found during playback of SCOS –
computePkt: Multiple packets for packet 190001559 pktTime 2006-03-15T18:13:05
also at 18:11:51 and other times

This is a SCOS error but hampers being able to determine the cause of the 297 frames.

For the BSM it produced 99 frames, SMEC produced only 98 frames, Eng 100 frames

This is likely to be due to an incorrect setting of the DSP scheduler unit time inside the CUS building block, this does not prevent a test pass.

Asier to investigate.

3.3.12 FUNC-MCU-04

Test Id:	**FUNC-MCU-04**
Initial Configuration:	**DRCU_ON** + AC/DC thermometry ON +MCU ON
Final Configuration:	**DRCU_ON** + AC/DC thermometry ON +MCU ON
Success Criteria:	Test passed if: 1. MCU produces 100 frames of Test Pattern with the following characteristics: Frame: **Test** — APID: **0x508** — Type: **21** — Subtype: **3** — SID: **0x915** — FrameID: **0x15** — Frame length: **0x15** 2. MCU Test pattern produced is the same as the previous time this test was run. QLA to give go ahead.

Test Procedure:

Step#	Action	Comments
1	Annotate the current value of MCUFRAMECNT located in MCU_PARAMETERS display.	
2	Run QLA script FUNC-MCU-04.py on QLA console.	
3	On Lincoln run FUNC-MCU-04 test procedure from the HCSS Test Procedure window on TOPE	
4	When test is finished annotate the current	

	value of MCUFRAMECNT	
5	Contingency: If test fails repeat steps 1 to 4.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-MCU-04	**MCUFRAMECNT**	**m/ m+100 m~3600**	6934, 7033		Pass

Start time @:18:31
End time @:18:32
OBSID:0x3000E00E
Comments:

Produced 99 frames instead of 100

QLA checked test pattern, this is OK

File produced QLA-MCU-04_3000E00E_8905

Step#	Action	Comments
0	Open **CHOP PARAMETERS display** on SCOS Alpha Numeric Displays.	

3.3.13 FUNC-BSM-01

Test Id:	**FUNC-BSM-01**
Initial Configuration:	**DRCU_ON +** AC/DC thermometry ON +MCU ON
Final Configuration:	**DRCU_ON +** AC/DC thermometry ON +MCU ON + BSM ON (open loop)
Success Criteria:	Test passed if: 1. CHOPSENSPWR HK parameter goes from 0 to 1 2. CHOPDACVAL HK parameter goes from 0 to 0x8000 3. CHOPSENSIG HK parameter shows variation from off to on 4. JIGGSENSPWR HK parameter goes from 0 to 1 5. JIGGDACVAL parameter goes from 0 to 0x8000 6. JIGGSENSSIG HK parameter shows variation from off to on

Test Procedure

Step#	Action	Comments
1	On QLA bring up a time series display of the following HK parameters: CHOPSENSPWR CHOPDACVAL CHOPSENSIG JIGGSENSPWR JIGGDACVAL JIGGSENSSIG	
2	Run FUNC-BSM-01 test procedure from the HCSS Test Procedure window on TOPE	
3	When the test is finished record all the Key parameters noted bellow	
	Contingency: If test fails repeat steps 1 and 2.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-BSM-01	**CHOPSENSPWR** **CHOPLOOPMODE** **CHOPDACVAL** **CHOPFFGAIN** **CHOPSENSSIG** **JIGGSENSPWR** **JIGGLOOPMODE** **JIGGDACVAL** **JIGGFFGAIN** **JIGGSENSSIG**	**0/1** **0/3** **0/0x8000** **0/0xBEB** **0/?** **0/1** **0/3** **0/0x8000** **0/0xBEB** **0/?**	0/1 3/3 8000/8000 BEB/BEB 7FE9/8E5A 0/1 3/3 8000/8000 BEB/BEB 7FE9/0x9164	**N/A**	Pass

Start time @:18:44
End time @:
OBSID:0x3000E00F
Commets: The success criteria for the DACVAL should be corrected.

3.3.14 FUNC-BSM-02c

Test Id:	FUNC-BSM-02c
Initial Configuration:	DRCU_ON + AC/DC thermometry ON +MCU ON + BSM ON (open loop)
Final Configuration:	DRCU_ON + AC/DC thermometry ON +MCU ON + BSM ON (open loop)
Success Criteria:	Test passed if the chop sensor signal evolves in the same way as the positions set.(i.e if (pos1 > pos2 ➔ sig1 > sig2)

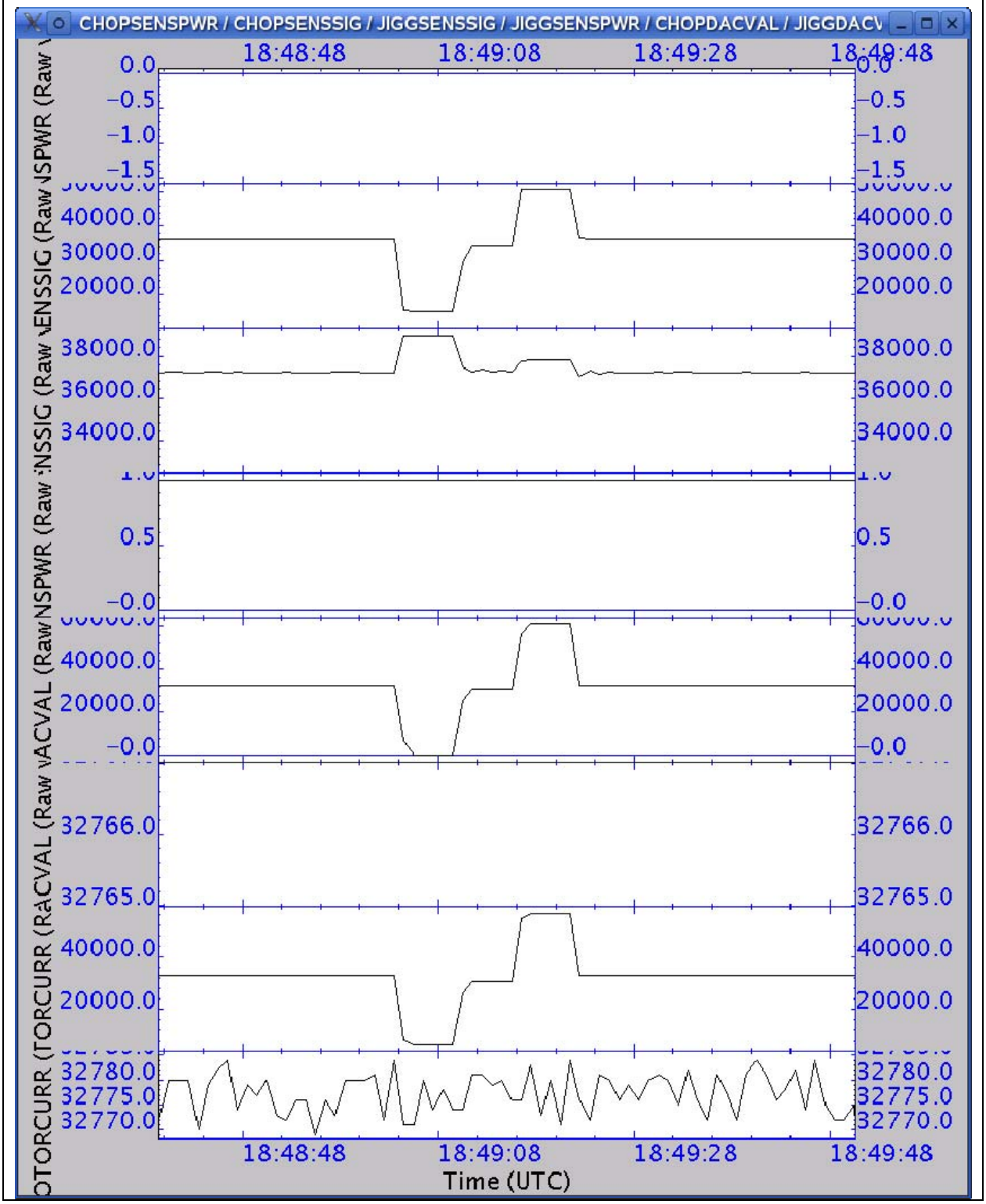
Test Procedure:

Step#	Action	Comments
1	On QLA open up a time series display of HK parameter CHOPDACVAL and CHOPSENSSIG	
2	Run FUNC-BSM-02c test procedure from the HCSS Test Procedure window on TOPE	
3	Contingency: If test fails repeat steps 1.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-BSM-02c	**CHOPDACVAL** **CHOPSENSSIG**		**0x8000** **0x8E60**	**N/A**	Pass

Start time @:18:49
End time @:18:50
OBSID:0x3000E10
Comments:The BSM moved!



3.3.15 FUNC-BSM-02j

Test Id:	FUNC-BSM-02j
Initial Configuration:	DRCU_ON + AC/DC thermometry ON +MCU ON + BSM ON (open loop)
Final Configuration:	DRCU_ON + AC/DC thermometry ON +MCU ON + BSM ON (open loop)
Success Criteria:	Test passed if the jiggle sensor signal evolves in the same way as the positions set.(i.e if (pos1 > pos2 ➔ sig1 > sig2)

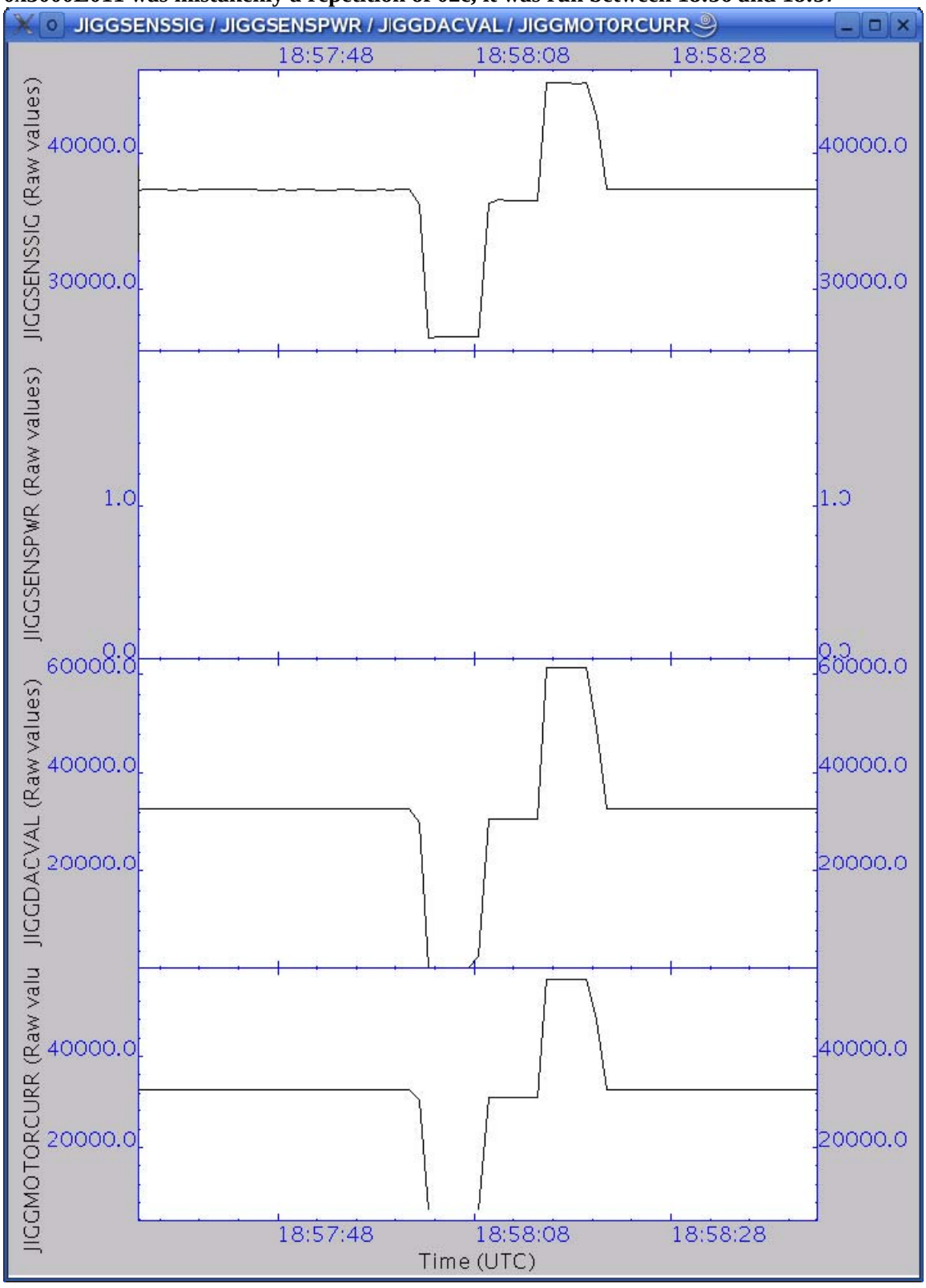
Test Procedure:

Step#	Action	Comments
1	On QLA open up a time series display of HK parameter JIGGDACVAL and JIGGSENSSIG	
2	Run FUNC-BSM-02j test procedure from the HCSS Test Procedure window on TOPE	
3	Contingency: If test fails repeat steps 1.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-BSM-02j	**JIGGDACVAL JIGGSENSSIG**		**0x8000 0x9150**	**N/A**	Pass

Start time @:18:58
End time @:18:59
OBSID:0x3000E012
Comments: It moved
0x3000E011 was mistakenly a repetition of 02c, it was run between 18:56 and 18:57



3.3.16 FUNC-BSM-03

Test Id:	FUNC-BSM-03
Initial Configuration:	**DRCU_ON +** AC/DC thermometry ON +MCU ON + BSM ON (open loop)
Final Configuration:	**DRCU_ON +** AC/DC thermometry ON +MCU ON + BSM ON (open loop)
Success Criteria:	Test passed if the chop sensor signal evolves in the same way as the positions set.(i.e if (pos1 > pos2 ➔ sig1 > sig2) for each jiggle position. **Note:** During warm tests the voltages on both chop and jiggle motors are likely to be saturated (CHOP/JIGGMOTORVOLT RAW values of ~ 0xFFFF) due to the high resistance of the motor coil at ambient temperature.

Test Procedure

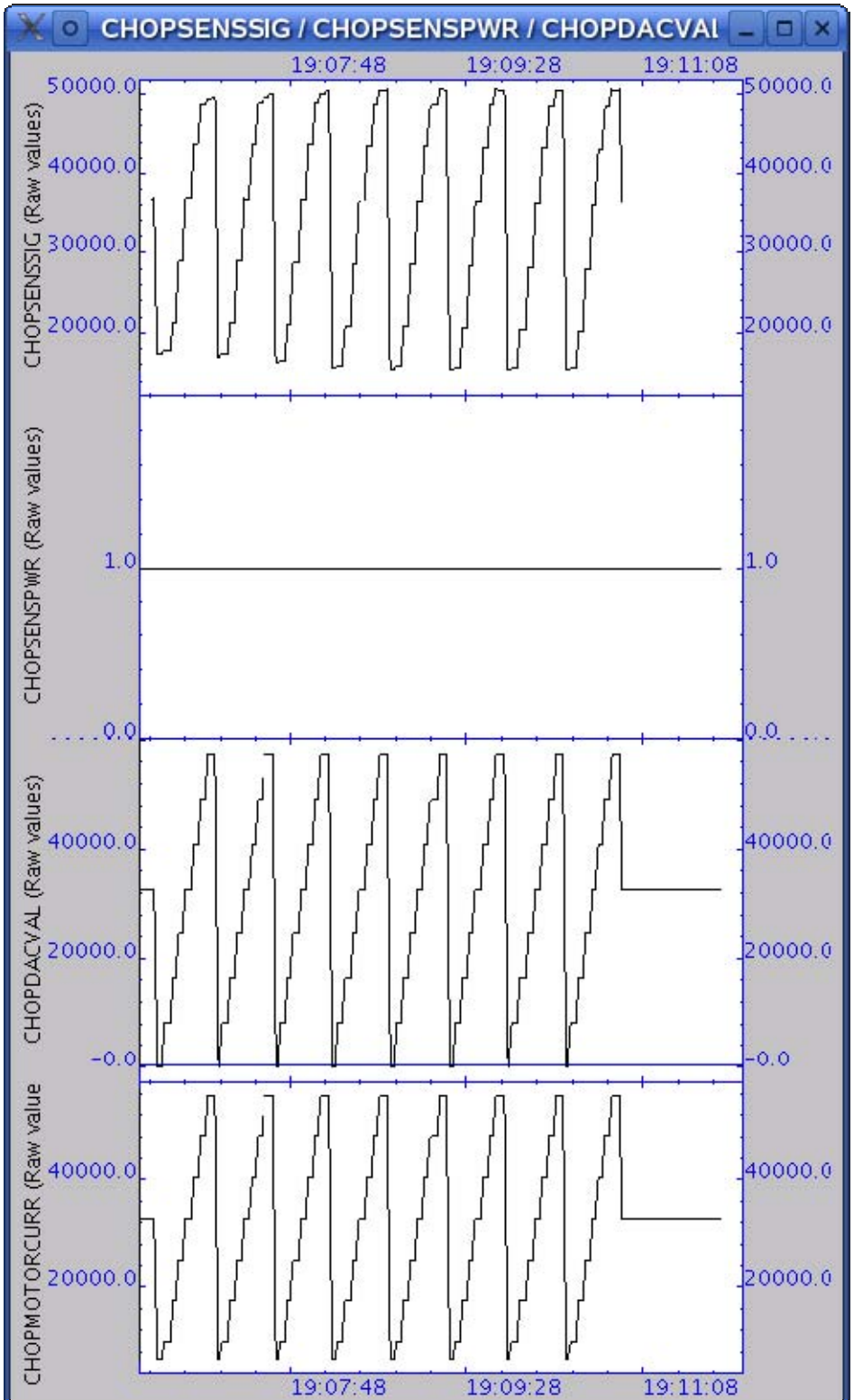
Step#	Action	Comments
1	On QLA open up a time series display of HK parameters: CHOPPOSN CHOPDACVAL CHOPMOTORCURR CHOPSENSSIG CHOPMOTORBEMF JIGGPOSN JIGGDACVAL JIGGMOTORCURR JIGGSENSSIG JIGGMOTORBEMF	
2	Run FUNC-BSM-03 test procedure from the HCSS Test Procedure window on TOPE	
3	Contingency: If test fails repeat step 2.	

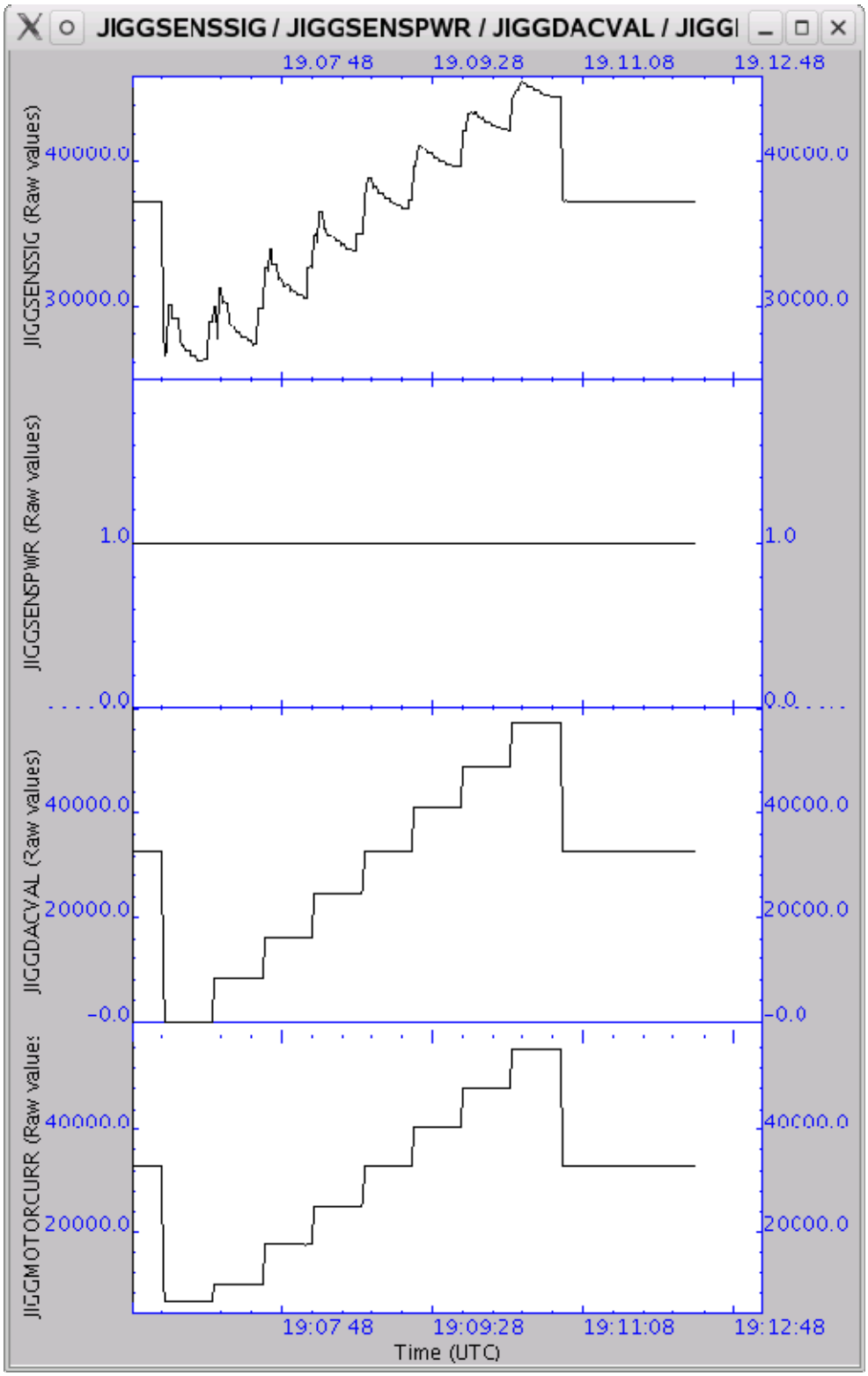
Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-BSM-03				**N/A**	Pass

Start time @:19:06
End time @:19:11
OBSID:0x3000E013
Comments:
Procedure needs changing from BEMF to CHOPMOTORVOLT
Running the procedure with 0x2000 per step instead of 0x1000 and 3seconds per step instead of 5 seconds per step

Jiggle position as given by senssig shows going to position then coming back as the chop position is stepped. This needs to be investigated.




JIGGSENSSIG / JIGGSENSPWR / JIGGDACVAL / JIGG
19.07 48
19.09.28
19.11.08
19.12.48
JIGGSENSSIG (Raw values)
40000.0
30000.0
JIGGSENSPWR (Raw values)
1.0
0.0
JIGGDACVAL (Raw values)
40000.0
20000.0
-0.0
JIGGMOTORCURR (Raw value
40000.0
20000.0
19:07 48
19:09:28
19:11:08
19:12:48
Time (UTC)

3.3.17 FUNC-BSM-06

Step#	Action	Comments
0	Execute BSM_INIT from HCSS Test Procedures	Started at 19:20 Obsid :0x3000E014

Test Id:	**FUNC-BSM-06**
Initial Configuration:	**DRCU_ON** + AC/DC thermometry ON +MCU ON + BSM ON (open loop)
Final Configuration:	**DRCU_ON** + AC/DC thermometry ON +MCU ON + BSM ON (open loop)
Success Criteria:	**Note:** **The purpose of this test is to check the effectiveness of the BSM close loop initialisation procedure and the default PID parameters.** **If the dynamical behaviour of the BSM during chopping with these PID parameters is close or within requirements this indicates that the PID parameters used can be applied to cold testing with certain adjustment.** **If NOT these indicates that the PID parameters need further tuning BUT NOT TO BE DONE DURING THESE TEST.** **In any case the success/fail criteria are NOT applicable for this test.**

Test Procedure

Step#	Action	Comments
1	On QLA open up a time series display of HK parameters: CHOPDACVAL CHOPMOTORCURR CHOPSENSSIG	
2	Run FUNC-BSM-06 test procedure from the HCSS Test Procedure window on TOPE	
3	Contingency: None contemplated.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-BSM-06	**CHOPSENSSIG** **CHOPMOTORCURR** **CHOPDACVAL**	**?/?** **?/?** **?/?**		**N/A**	**N/A**

Start time @:19:30
End time @:
OBSID:0x3000E015
Comments:
Ran script with default values
On source chop = 0xA000
On source jiggle = 0x8000
Off source chop = 0x8000
Off source chop = 0x8000
Number of chop cycles = 50
Period of chop cycle = 2 Hz = 500000 micro seconds
61.46 milliseconds per sample using ~130 Hz and div=7
DCU frame type = 0 (= Full Photometer)
Number of DCU samples = 4
Leaves 4.16 milliseconds = 4160 micro seconds
Number of BSM samples = 15

Crashed OBS

Power cycle the DPU

Running DPU Start Procedure at 19:42 – OK

Producing BSM Frames – Don't know why

Stopped data generation by manual command 91C10000
Sent flush FIFO
Sent reset FIFO
All looks OK, voltages correct on MCU, SCU

Copied the command list from Q:\OBS\VMSIM\Table071-Chop\TC and updated table 71 with that file.

Re-run test with same parameters:
0x3000E017 hasn't crashed OBS this time but it is not chopping

Lots of Events:
Type 5 Subtype 2 Eventid 7000 sid 5201 sent 3 times

Produced BSM frames but didn't produce DCU frames, BSM didn't move.

Setting up for Overnight
Clearing critical HK report
Instrument Status:
DPU:ON
DRCU:ON
AC/DC Thermometry: ON
MCU:ON
BSM:ON
SMEC: OFF
PHOT/SPEC BDAs :OFF

Minimum delay is 6 milliseconds after talking with Ken

Re-tried FUNC-BSM-06 on 16th March after increasing sample rate to 18.60119 still bias frequency 130 Hz
On source chop = 0xA000
On source jiggle = 0x8000
Off source chop = 0x8000
Off source jiggle = 0x8000
Number of chop cycles = 50
Period of chop cycle = 2 Hz = 500000 micro seconds
53.76 milliseconds per sample using ~130 Hz and div=6
DCU frame type = 0 (= Full Photometer)
Number of DCU samples = 4
Leaves 34.959 milliseconds = 34959 micro seconds
Number of BSM samples = 15

OBSID=0x3000E01D start at 10:58 finish at 11:00

BSM moved but is not chopping gone to 0xA000 but did not chop off it. Test ended with BSM at stuck at 0xA000 on senssig but the chopposn went back to 0x8000 after going up to 0xA000 for the duration of the test.

11:16 Commanded BSM to move to 0x8000 it didn't move from 0xA000, no events

11:19 Running BSM-OFF OBSID = 0x3000E01F switched OFF OK moved back to nominal position

11:20 Running FUNC-BSM-01 to switch it on again OBSID = 0x3000E020 sensor at about A9A9

11:22 Run BSM-INIT to see if it goes to 0x8000, 0BSID=0x3000E021, senssig still at A000

11:24 Commanding BSM to move to 0xA000, hasn't moved as expected
11:24 Commanding BSM to move to 0x8000 didn't move

This requires an MCU Boot

11:25 Run BSM-OFF
11:27 Run MCU-OFF

11:29 Run FUNC-MCU-01, OBSID 0x3000E024. BSM back to 0x8000
11:30 Run FUNC-BSM-01, OBSID 0x3000E025. CHOPSENSSIG = 0x8E5A
11:35 Run BSM-INIT, OBSID 0x3000E026

11:46 Run FUNC-BSM-06, previous configuration, except number of BSM samples per chop position, now 65535. OBSID 0x3000E027. The BSM chopped but got stuck again at the end.

12:19 Run BSM_OFF, OBSID 0x3000E028.
12:20 Run MCU_OFF, OBSID 0x3000E029

12:22 Run FUNC-MCU-01, OBSID 0x3000E02A
12:23 Run FUNC-BSM-01, OBSID 0x3000E02B

12:25 Run BSM-INIT, OBSID 0x3000E02C

12:28 Run FUNC-BSM-03, OBSID 0x3000E02D
Frame rate: 64
Jiggle start, end, step: 0x8000, 0x9000, 0x1000
Chop start, end, step: 0x8000, 0x9000, 0x1000
Delay time: 5

12:32 Run FUNC-BSM-06, OBSID 0x3000E02E. Chops but gets stuck at the end.
Frame rate: 64
On source chop = 0x9000
On source jiggle = 0x8000
Off source chop = 0x8000
Off source jiggle = 0x8000
Number of chop cycles = 50
Period of chop cycle = 2 Hz = 500000 micro seconds
53.76 milliseconds per sample using ~130 Hz and div=7
DCU frame type = 0 (= Full Photometer)
Number of DCU samples = 4
Leaves 34.959 milliseconds = 34959 micro seconds
Number of BSM samples = 65535

12:35 Run FUNC-BSM-06 again, OBSID 0x3000E20F. Same as before.

13:40 Switch Off BSM, OBSID:0x3000E030

Step#	Action	Comments
4	Execute BSM_OFF from HCSS Test Procedures	

COMMENT INSERTED: (17/03/06) Asier Abreu

The reason for the chopper to get stuck at the on source position is due to the commanding within the chop VM, the VM sets the BSM move mode to 1 which is synchronous movement but then does not reset to normal mode 0. That is why we did not see the chopper coming back to 0x8000.

Step#	Action	Comments
0	Open **SMEC PARAMETERS display** on SCOS Alpha Numeric Displays.	

3.3.18 FUNC-SMEC-02A/B

Test Id:	**FUNC-SMEC-02A/B**
Initial Configuration:	**DRCU_ON** + AC/DC thermometry ON +MCU ON + SMEC ON **If WFT prior to cooldown** : Smec Latched **If WFT after warm up** : Smec Unlatched
Final Configuration:	**DRCU_ON +** AC/DC thermometry ON +MCU ON + SMEC ON **If WFT prior to cooldown** : Smec Unlatched **If WFT after warm up** : Smec Latched
Success Criteria:	Test passed if : Prior to un-latching the resistance across pins 7 and 8 of the launch latch is ~ 368 Ohms. After un-latching the resistance is 483 Ohms. **Note:** These resistance values were recorded for the CQM SMEC model, for the flight SMEC, these values are expected to vary.

Step#	Action	Comments
1	Measure the resistance across pins 7 and 8 of the launch latch.	
2	If WFT prior to cooldown: Run FUNC-SMEC-02A test procedure from the HCSS Test Procedure window on TOPE If WFT after warm up: Run FUNC-SMEC-02B test procedure from the HCSS Test Procedure window on TOPE	
3	Measure the resistance across pins 7 and 8 of the launch latch.	
4	Contingency: If test fails repeat steps 1.	

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-SMEC-02A/B				**N/A**	Passed

Start time @:
End time @:
OBSID:
Comments:

16/03/06:

Overnight Nominal HK request shows the 'usual' NO DCU RESPONSES Event ID (0x520) which get cleared within the second.

Measured resistance between pins 7 and 8:

R initial (latched) = 367.5 Ohms

Executed OBSID = 0x3000E018 – didn't unlatch so repeating the command

Re-run procedure at 09:58 OBSID = 0x3000E019

Measured resistance 483.3 Ohms latch has been undone

SMCLATCHSTAT did not change

3.3.19 FUNC-SMEC-01

Test Id:	FUNC-SMEC-01
Initial Configuration:	**DRCU_ON** + AC/DC thermometry ON +MCU ON+ SMEC ON (open loop)
Final Configuration:	**DRCU_ON** + AC/DC thermometry ON +MCU ON+ SMEC ON (open loop)
Success Criteria:	Test passed if : 1. SMECENCPWR HK parameter changes from 0 to 6. 2. SMEC encoder signals 1 and 2 amplitude show variation when encoder is switched ON. 3. SMEC LVDT is switched ON. 4. SMEC LVDT DC and AC signals show variation when LVDT is switched ON.

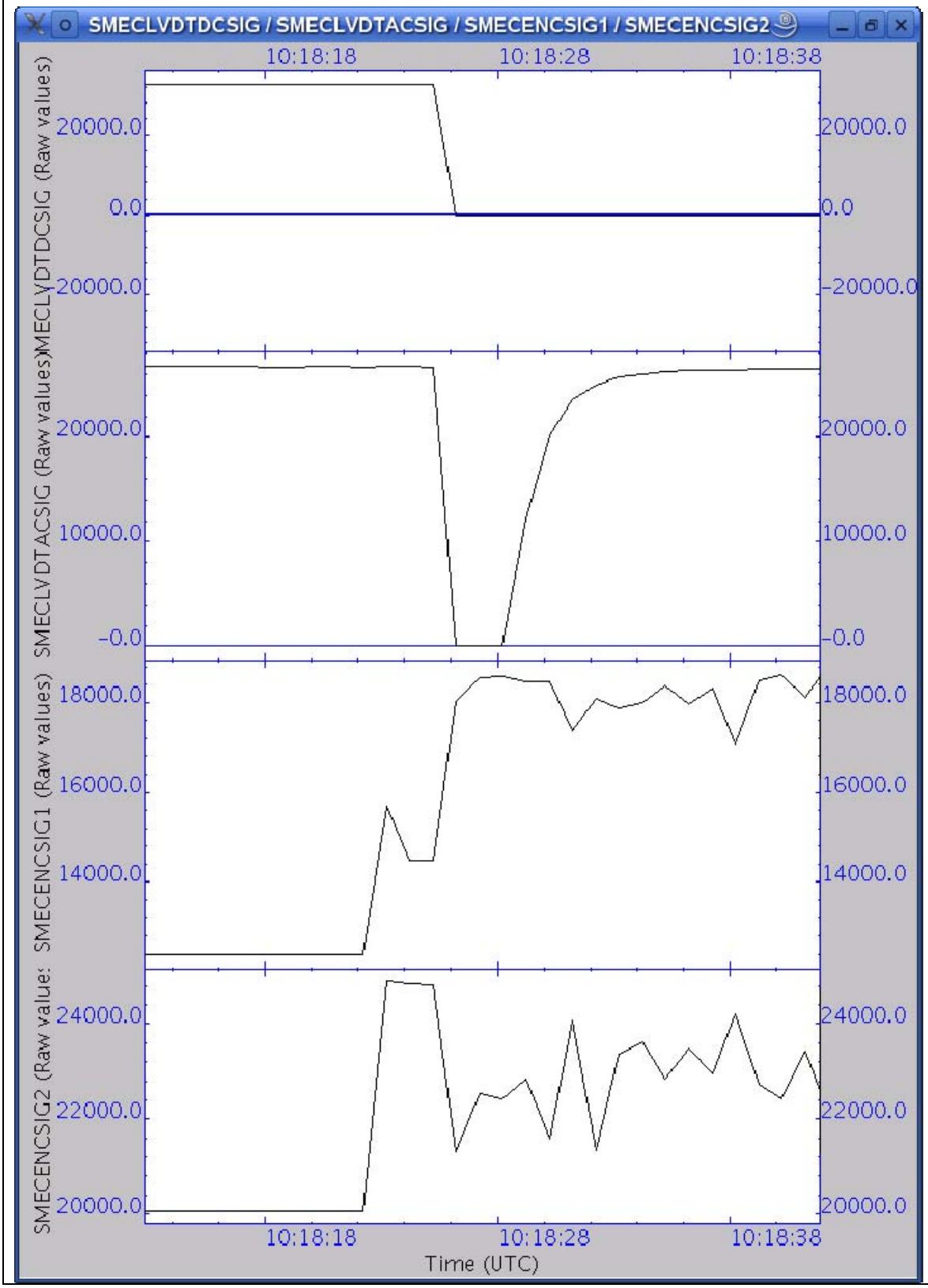
Test Procedure:

Step#	Action	Comments
1	On QLA bring up a display of the following HK parameters: SMECENCPWR SMECENCSIG1AMP SMECENCSIG2AMP SMECLVDTDCSIG SMECLVDTACSIG	
2	Run FUNC-SMEC-01 test procedure from the HCSS Test Procedure window on TOPE	
	Contingency: If test fails repeat steps 1.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-SMEC-01	**SMECENCPWR** **SMECLVDTPWR** **SMECENCSIG1** **SMECENCSIG1AMP** **SMECENCSIG1OFF** **SMECENCSIG2** **SMECENCSIG2AMP** **SMECENCSIG2OFF**		0/6 0/1 3060/4833 0/0 CE20/6590 4E5E/53F0 0/0 CE20/7918	**N/A**	Pass

Start time @:10:18
End time @:10:19
OBSID:0x3000E01A
Comments:
Added SMECENCOFF and AMP to procedure
QLA procedure needs to add SMECENCSIG1 and SMECENCSIG2



3.3.20 FUNC-SMEC-03

Test Id:	FUNC-SMEC-03
Initial Configuration:	DRCU_ON + AC/DC thermometry ON +MCU ON+ SMEC ON (open loop)
Final Configuration:	DRCU_ON + AC/DC thermometry ON +MCU ON+ SMEC ON (open loop)
Success Criteria:	Test passed if: SMEC encoder signals 1 and 2 show a variation on their amplitudes from one LED illumination level to another.

Test Procedure:

Step#	Action	Comments
1	On QLA bring up a time series display of the following Nominal HK parameters: SMECENCSIGAMP1 SMECENCSIGAMP2	
2	Run FUNC-SMEC-03 test procedure from the HCSS Test Procedure window on TOPE	
3	Contingency: If test fails repeat steps 1 and 2.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-SMEC-03	**SMECENCPWR** **SMECENCSIG1** **SMECENCSIG2**		6/4 430D/3262 5E08/4CA4		Pass

Start time @:10:32
End time @:10:34
OBSID:0x3000E01B
Comments:
ENCSIGAMP1 will not change so procedure needs to be revised to be ENCSIG1 and ENCSIG2 instead

3.3.21 FUNC-SMEC-04a

Test Id:	FUNC-SMEC-04a
Initial Configuration:	**DRCU_ON** + AC/DC thermometry ON+MCU ON+ SMEC ON (open loop)
Final Configuration:	**DRCU_ON** + AC/DC thermometry ON+MCU ON+ SMEC ON (open loop)
Success Criteria:	Test passed if SMECLVDTDCSIG parameter shows a variation according to the different positions set.

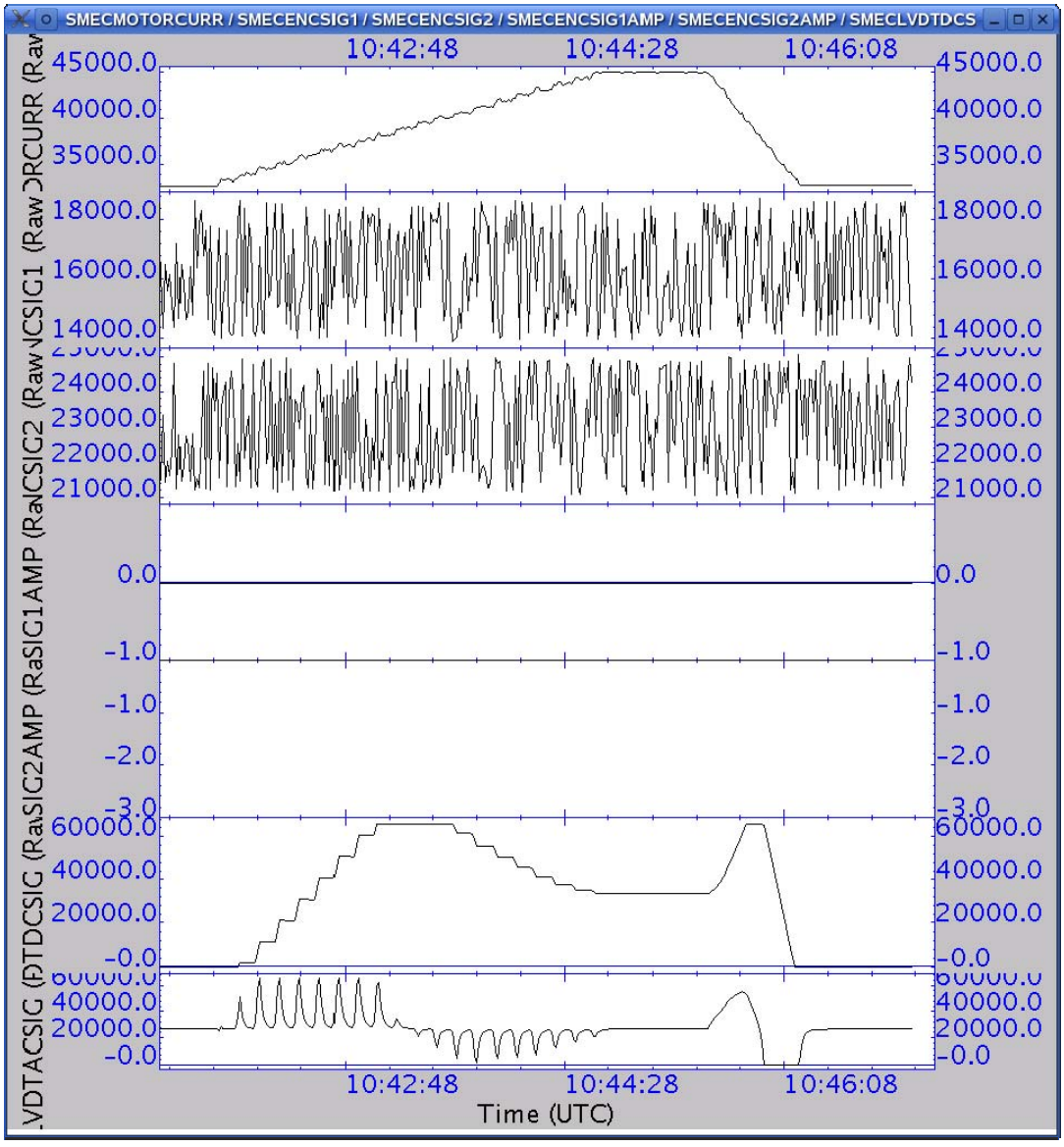
Test Procedure:

Step#	Action	Comments
1	On QLA bring up a time series display of the following Nominal HK parameters: SMECENCSIG1 SMECENCSIG2 SMECLVDTDCSIG SMECLVDTACSIG SMECMOTORCURR	
2	Run FUNC-SMEC-04a test procedure from the HCSS Test Procedure window on TOPE	
3	Contingency: If test fails repeat steps 1.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-SMEC-04a	**SMECLVDTDCSIG**		0/		Pass

Start time @:10:41
End time @:10:47
OBSID:0x3000E01C
Comments:
This should be run before SMEC-03 sequence needs to be changed The SMEC-03 test left the ENCPWR at 4 which is far too low for warm conditions this was manually put back to 6 before the start of this test.



Step#	Action	Comments
4	Execute SMEC_OFF from HCSS Test Procedures	0x3000E01D, SMEC is Off

Step#	Action	Comments
0	Open **DCU PARAMETERS** SCOS Alpha Numeric Display	

3.3.22 FUNC-DCU-01

Test Id:	**FUNC-DCU-01**
Initial Configuration:	**DRCU_ON** + AC/DC thermometry ON+MCU ON
Final Configuration:	**DRCU_ON** + AC/DC thermometry ON+MCU ON
Success Criteria:	Test passed if: 1. DCU produces each type of DCU nominal science frame with the following characteristics.

APID	Type	S.type	SID	Frame ID	Frame type	Nb. Of frames	Nb. of pkts.
0x504	**21**	**1**	**0x200**	**0**	**PF**	**100**	**100**
0x506	**21**	**1**	**0x201**	**1**	**SF**	**100**	**17**
0x504	**21**	**2**	**0x102**	**2**	**PSW**	**100**	**34**
0x504	**21**	**2**	**0x103**	**3**	**PMW**	**100**	**25**
0x504	**21**	**2**	**0x104**	**4**	**PLW**	**100**	**12**
0x506	**21**	**2**	**0x105**	**5**	**SSW**	**100**	**12**
0x506	**21**	**2**	**0x106**	**6**	**SLW**	**100**	**7**

2. The frame time difference between consecutive DCU frames of each type corresponds to the sampling rate.
   Photometer Sampling rate is 15.3Hz → $\Delta t \sim 65.5$ ms
   Spectrometer Sampling rate is 80Hz → $\Delta t = 12.5$ ms
3. The SPIRE HK parameter DCUFRAMECNT increments by 700.
4. No events are generated during the frames generation.

Test Procedure:

Step#	Action	Comments
1	Annotate the current value of DCUFRAMECNT located d in DCU PARAMETERS AND	
2	Run FUNC-DCU-01 test procedure from the HCSS Test Procedure window on TOPE	
3	Annotate the current value of DCUFRAMECNT located d in DCU	

	PARAMETERS AND	
4	Contingency: If test fails repeat steps 1 to 3.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-DCU-01	**DCUFRAMECNT**	**0/700**	3406/4806		Pass

Start time @:13:43
End time @:13:47
OBSID:0x3000E031
Commets:
Default parameters are wrong! Ran script with
Phot Bias Frequency:130
Sampling Frequency:18
Spec Bias Frequency: 160
Sampling Frequency:80
Number of Frames to request:100

Realised we have a QLA Script – should be added to the procedure – re-ran test

Start time @:13:49
End time @:
OBSID:0x3000E032
QLA produced file QLA-DCU-01_3000E032.txt. All packet types showed 100 frames have been produced

3.3.23 FUNC-DCU-02

Test Id:	FUNC-DCU-02
Initial Configuration:	**DRCU_ON** + AC/DC thermometry ON+MCU ON
Final Configuration:	**DRCU_ON** + AC/DC thermometry ON+MCU ON
Success Criteria:	Test passed if DCUFRAMECNT goes from 700 to 1400 and the frametime difference between consecutive frames computed by QLA script is in agreement with the expected differences based on commanded sampling rate: 1. Photometer Sampling rate is 15.3Hz → Δt ~ 65.5 ms 2. Spectrometer Sampling rate is 80Hz → Δt = 12.5 ms

Test Procedure:

Step#	Action	Comments
1	Annotate the current value of DCUFRAMECNT located d in DCU PARAMETERS AND	
2	Run QLA script FUNC-DCU-02.py on QLA console.	
3	Run FUNC-DCU-02 test procedure from the HCSS Test Procedure window on TOPE	
4	Annotate the current value of DCUFRAMECNT located d in DCU PARAMETERS AND	
5	Contingency: If test fails repeat steps 1 to 4.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-DCU-02	**DCUFRAMECNT**	**700/1400**	4806	5506	Pass

Start time @:13:56
End time @: 13:58
OBSID:0x3000E033
Comments:
Parameters changed to values used for previous test
QLA showed times as expected from parameters entered

3.3.24 FUNC-DCU-03

Test Id:	FUNC-DCU-03
Initial Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON
Final Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON
Success Criteria:	Test passed if : 1. DCU produces 100 frames of Full Photometer Test Pattern and 100 frame of Full Spectrometer Test Pattern test. 2. QLA analysis shows that phot/spec test patterns are the same as the reference phot/spec test patterns.

Test Procedure:

Step#	Action	Comments
1	Annotate the current value of DCUFRAMECNT located d in DCU PARAMETERS AND	
2	Run QLA script FUNC-DCU-03.py on QLA console.	
3	Run FUNC-DCU-03 test procedure from the HCSS Test Procedure window on TOPE	
4	Annotate the current value of DCUFRAMECNT located d in DCU PARAMETERS AND	
5	Contingency: If test fails repeat steps 1 to 4.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-DCU-03	**DCUFRAMECNT**	**1400/2100**	5506	5706	Pass

Start time @: 14:04
End time @: 14:05
OBSID: 0x3000E034
Comments: Changed photometer bias frequency to 130 Hz and sample rate to 18 Hz
Files produced by QLA:
QLA-DCU-03_3000E034_8807.txt
QLA-DCU-03_3000E034_8808.txt
Both files show a test pass
Note: expected after value is wrong

3.3.25 FUNC-DCU-04P

Test Id:	FUNC-DCU-04P
Initial Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON
Final Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON + Photometer LIAs ON
Success Criteria:	Test passed if : 1. SCUDCDCSTAT parameter goes from 4 to 5. 2. Photometer LIA card voltages are showing correct readings of +5V,+9V,-9V. 3. Photometer LIA temperatures show an increase indicating that they are ON.

Test Procedure:

Step#	Action	Comments
1	On QLA bring up a time series display of the HK parameters: PLIAP5V PLIAP9V PLIAM9V LIAP1/2/3/4/5/6/7/8/9TEMP	
2	Run FUNC-DCU-04P test procedure from the HCSS Test Procedure window on TOPE	
5	Contingency: If test fails repeat steps 1 and 2.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-DCU-04P	**SCUDCDCSTAT** **PLIAP5V** **PLIAP9V** **PLIAM9V** **LIA1/2/3/4/5/6/7/9TEMP**	**4/5** **0/~ +5V** **0/~+9V** **0/~-9V** **N/A/ [290-300]K**	4/5 0/+5 0/+5 0/-9 ~290/warming up		Pass

Start time @: 14:31
End time @: 14:31
OBSID: 0x3000E035
Commets: LIAs switched on OK

3.3.26 FUNC-DCU-05P

Test Id:	FUNC-DCU-05P
Initial Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON+ Photometer LIAs ON
Final Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON+ Photometer LIAs ON
Success Criteria:	Test passed if : 1. The first channel of the 32 on each photometer LIA card (16 bit word in the photometer offset packet) shows the commanded offset variation 0x1,0x3,0x6,0x9,0xc,0xf

Test Procedure:

Step#	Action	Comments
1	On QLA bring up a time series display of the Photometer Offset Frame parameters: PHOTOFF001 PHOTOFF033 PHOTOFF055 PHOTOFF087 PHOTOFF119 PHOTOFF151 PHOTOFF183 PHOTOFF215 PHOTOFF247 PHOTOFF279	
2	Run FUNC-DCU-05P test procedure from the HCSS Test Procedure window on TOPE	
5	Contingency: If test fails repeat steps 1 and 2.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-DCU-05P					Pass

Start time @: 14:36
End time @: 14:39
OBSID: 0x3000E036
Comments:

3.3.27 FUNC-DCU-11P

Test Id:	FUNC-DCU-11P
Initial Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON+ Photometer LIAs ON
Final Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON+ Photometer LIAs ON + Photometer BIAS ON +Photometer JFETs ON
Success Criteria:	Test passed if Photometer JFET source and drain voltages are correct: 1. PSWJFETVSS1/2/3/4/5/6 (RAW: 0x4C CONVERTED ~ -1.5V). 2. PMLWJFETVSS1/2/3/4 (RAW: 0x4C CONVERTED ~ -1.5V). 3. PSWJFETSTAT = 0x3F 4. PMLWJFETSTAT = 0x1F

Test Procedure:

Step#	Action	Comments
1	Run FUNC-DCU-11P test procedure from the HCSS Test Procedure window on TOPE	
2	After the test Annotate the values RAW and converted values of: PSWJFETSTAT,PMLWJFETSTAT, PSWJFET1/2/3/4/5/6V PMWJFET1/2/3/4V PLWJFET1/2V located in DCU PARAMETERS AND	
3	Contingency: If test fails repeat steps 1 and 2.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-DCU-11P	**PSWJFETSTAT** **PMLWJFETSTAT** **PSWJFET1/2/3/4/5/6V** **PMWJFET1/2/3/4V** **PLWJFET1/2V**	**0/0x3f** **0/0x1f** **0V/-1.5V** **0V/-1.5V** **0V/-1.5V**	0/0x03f 0/0x03f 0/-1.49 0/-1.49 0/-1.49	**N/A**	Pass

Start time @: 14:43
End time @: 14:44
OBSID: 0x3000E037
Comments: Kept the default parameter values. PSW A10 and H9 appear to be dead. PMW C8, C5 and T2 seem to be dead as well. PSW G8 and C12 have the same output as the resistors.

3.3.28 FUNC-DCU-13P

Test Id:	FUNC-DCU-13P
Initial Configuration:	**DRCU_ON** + AC/DC thermometry ON+MCU ON+ Photometer LIAs ON + Photometer BIAS ON +Photometer JFETs ON
Final Configuration:	**DRCU_ON** + AC/DC thermometry ON+MCU ON+ Photometer LIAs ON + Photometer BIAS ON +Photometer JFETs ON
Success Criteria:	Test passed if : The photometer detectors show a small linear variation on the output voltage when different bias is applied through the load curve.

Test Procedure:

Step#	Action	Comments
1	On QLA bring up a time series display of a couple of pixels on each of the photometer BDAs	
2	Run FUNC-DCU-13P test procedure from the HCSS Test Procedure window on TOPE	
3	Contingency: If test fails repeat step 1 and 2.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-DCU-13P				**N/A**	Pass

Start time @: 14:50
End time @: 15:00
OBSID: 0x3000E038
Comments:
Array: PF
Bias frequency: 130 Hz
Sampling frequency: 18 Hz
PSW phase: 187.8 deg
PMW phase: 189.2 deg
PLW phase: 187.8 deg
Time at each level: 10 s
PSW G8 and C12 are alive but are showing larger changes of output level for each bias setting than the other detectors and unlike other detectors saturate about halfway through the load curve.

Step#	Action	Comments
1	From TOPE HCSS Test Procedures run **PDET-OFF**	**OBSID 0x3000E039**

3.3.29 FUNC-DCU-04S

Test Id:	FUNC-DCU-04S
Initial Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON
Final Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON + Spectrometer LIAs ON
Success Criteria:	Test passed if : 1. SCUDCDCSTAT parameter goes from 4 to 6. 2. Spectrometer LIA card voltages are showing correct readings of +5V,+9V,-9V. 3. Spectrometer LIA temperatures show an increase indicating that they are ON.

Test Procedure:

Step#	Action	Comments
1	On QLA bring up a time series display of the HK parameters: SLIAP5V SLIAP9V SLIAM9V LIAS1/2/3TEMP	
2	Run FUNC-DCU-04S test procedure from the HCSS Test Procedure window on TOPE	
5	Contingency: If test fails repeat steps 1 and 2.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-DCU-04S	**SCUDCDCSTAT** **SLIAP5V** **SLIAP9V** **SLIAM9V** **LIA1/2/3TEMP**	**4/6** **0/~ +5V** **0/~+9V** **0/~-9V** **N/A/ [290-300]K**	4/6 0.17/5.23 0.003/11.53 0.003/-11.52 ~292/warming up		Pass

Start time @: 15:35
End time @: 15:35
OBSID: 0x3000E03A
Comments: Note that the values for SLIAP9V and SLIAM9V are +11.5 and -11.5 V respectively.

3.3.30 FUNC-DCU-05S

Test Id:	FUNC-DCU-05S
Initial Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON + Spectrometer LIAs ON
Final Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON + Spectrometer LIAs ON
Success Criteria:	Test passed if : 1. The first channel of the 12 on each spectrometer LIA card (16 bit word in the photometer offset packet) shows the commanded offset variation 0x1,0x3,0x6,0x9,0xc,0xf

Test Procedure:

Step#	Action	Comments
1	On QLA bring up a time series display of the Photometer Offset Frame parameters: SPECOFF01 SPECOFF13 SPECOFF25 SPECOFF37 SPECOFF49 SPECOFF61	
2	Run FUNC-DCU-05S test procedure from the HCSS Test Procedure window on TOPE	
5	Contingency: If test fails repeat steps 1 and 2.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-DCU-05S					Pass

Start time @: 15:39
End time @: 15:42
OBSID: 0x3000E03B
Comments: QLA gave an "Unknown packet" message: APID 500, type 5, subtype 4, SID 5420.

3.3.31 FUNC-DCU-11S

Test Id:	FUNC-DCU-11S
Initial Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON + Spectrometer LIAs ON
Final Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON + Spectrometer LIAs ON + Spectrometer BIAS ON + Spectrometer JFETs ON
Success Criteria:	Test passed if SCUDCDCSTAT goes from 4 to 6, Spectrometer LIAs voltages are correct and SJFET voltages are also correct.

Test Procedure:

Step#	Action	Comments
1	Run FUNC-DCU-11S test procedure from the HCSS Test Procedure window on TOPE	
2	After the test Annotate the values RAW and converted values of: LIASTAT SLIAP5V, SLIAP9V, SLIAN9V, SSWJFETSTAT,SLWJFETSTAT, SSWJFET1V,SLWJFET2V located in DCU PARAMETERS AND	
3	Contingency: If test fails repeat steps 1 and 2.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-DCU-11S	**SCUDCDCSTAT** **LIASTAT** **SLIAP5V** **SLIAP9V** **SLIAN9V** **SSWJFETSTAT** **SLWJFETSTAT** **SSWJFET1/2V** **SLWJFET1/2V**	**4/6** **0/0** **0V/ ~ 5V** **0V/~11V** **0V/-11V** **0/0x3f** **0/0x3f** **0V/-1.5V** **0V/-1.5V**	6/6 0/0 5.23/5.23 11.53/11.53 -11.52/-11.53 0/0x7 0/0x7 0/-1.5 0/-1.5	**N/A**	Pass

Start time @: 15:48
End time @: 15:49
OBSID: 0x3000E03C
Comments: Kept default input parameters.

Note: for LIASTAT the values of LIAS1/2/3STAT have been written.
For SSWJFETSTAT and SLWJFETSTAT the value of SPECJFETSTAT has been written.
Some of the numbers in the "Expected Value" column are probably wrong

DP2 on SSW appears to be dead.

3.3.32 FUNC-DCU-13S

Test Id:	FUNC-DCU-13S
Initial Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON + Spectrometer LIAs ON + Spectrometer BIAS ON + Spectrometer JFETs ON
Final Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON + Spectrometer LIAs ON + Spectrometer BIAS ON + Spectrometer JFETs ON
Success Criteria:	Test passed if : The spectrometer detectors show a small linear variation on the output voltage when different bias is applied through the load curve.

Test Procedure:

Step#	Action	Comments
1	Run FUNC-DCU-13S test procedure from the HCSS Test Procedure window on TOPE	
2	Contingency: If test fails repeat step 1.	

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
FUNC-DCU-13S				N/A	Pass

Start time @: 15:55
End time @: 16:04
OBSID: 0x3000E03D
Comments:
Array: SF
Bias frequency: 160 Hz
Sampling frequency: 80 Hz
SSW phase shift: 207.5 deg
SLW phase shift: 207.5 deg
Time at each level: 10 s

Some of the SSW pixels did not show much change.

Step#	Action	Comments
1	From TOPE HCSS Test Procedures run **SDET-OFF**	**16:08, OBSID 0x3000E03E**

4. END TEST SEQUENCE

4.1 NORMAL END TEST SEQUENCE

The following table shows the necessary steps to be followed to end the warm functional test sequence.

Step#	Action	HK parameters	Expected Value	Comments	Check
1	Check BSM is OFF	CHOPSENSPWR JIGGSENSPWR	0 0		OK
2	Check SMEC is OFF	SMECENCPWR	0		OK
3	Run MCU-OFF from the HCSS Test Procedure window on TOPE	SCUDCDCSTAT	0	16:10 OBSID 0x3000E03F	OK
4	Check Instrument Configuration	MODE	0x100/ DRCU_ON		OK
5*	Run SCU_OFF from the HCSS Test Procedure window on TOPE	SCUDCDCSTAT SUBKSTAT	0 0	Left on	
6*	Run DRCU_OFF from the HCSS Test Procedure window on TOPE	MODE	0/ DPU_ON	Left on	

* These two steps should ONLY be executed if the functional test takes place BEFORE the instrument is placed in the test cryostat. If the instrument is already in the cryostat and the cryo-harness are connected this steps should NOT be executed.

FINAL INSTRUMENT CONFIGURATION IN THE CASE STEPS 1 to 4 are executed is DRCU_ON
FINAL INSTRUMENT CONFIGURATION IN THE CASE STEPS 1 to 6 are executed is DPU_ON

4.2 END TEST SEQUENCE WHEN THE FUNCTIONAL TEST HAS FAILED

The following table shows the necessary steps to be followed to end the warm functional test sequence when this has been declared failed.

Step#	Action	HK parameters	Expected Value	Comments	Check
1	Check BSM is OFF	CHOPSENSPWR JIGGSENSPWR	0 0		
2	Check SMEC is OFF	SMECENCPWR	0		
3	Run MCU-OFF from the HCSS Test Procedure window on TOPE	SCUDCDCSTAT	0		

4	**Check Instrument Configuration**	**MODE**	**0x100/ DRCU_ON**		
5	**Run SCU_OFF from the HCSS Test Procedure window on TOPE**	**SCUDCDCSTAT SUBKSTAT**	**0 0**		
6	**Run DRCU_OFF from the HCSS Test Procedure window on TOPE**	**MODE**	**0/ DPU_ON**		

FINAL INSTRUMENT CONFIGURATION IN THE CASE STEPS DPU_ON

5. ANNEXE1 (INSTRUMENT NOMINAL CONFIGURATION/MODES)

	OFF	INIT	DPU_ON	DRCU_ON	REDY	PHOT STBY	SPEC STBY	CREC	SAFE
DPU		**ON**	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**
Essential Hsk packets			0.5Hz	0.5Hz	0.5Hz	0.5Hz	0.5Hz	0.5Hz	0.5Hz
Normal Hsk packets			1.0Hz	1.0Hz	0.25Hz	0.25Hz	0.25Hz	1.0Hz	0.25Hz
TC Acceptance		TBC	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Event packets		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Science packets									
VM								Cooler_Recycle	
VM1						Det_Temp_Ctrl			
VM2									
VM3									
MODE			0x0000	0x0100	0x0200	0x0300	0x0400	0x0600	0x0900
DRCU			**ON**	**ON**	**ON**	**ON**	**ON**	**ON**	
SCU									
Temp Channels powered					Yes	Yes	Yes	Yes	
SubK Channel powered					Yes	Yes	Yes	Yes	
PCAL source powered									
SCAL sources powered							TBD		
TC Heater powered						Yes			
Cooler SP Heater powered								Yes	
Cooler EV HS powered								Yes	
Cooler SP HS powered					Yes	Yes	Yes	Yes	
DCU									
Photometer BIAS						Yes			
Photometer JFETS						Yes			
Photometer LIAs						Yes			
TC BIAS						Yes			
TC JFETS						Yes			
TC LIAs						Yes			
Spectrometer BIAS							Yes		
Spectrometer JFETS							Yes		
Spectrometer LIAs							Yes		
MCU									
DSP					On	On	On	On	
BSM						Hold	Hold		
SMEC							Hold		

6. WARM FUCNTIONAL TEST CUS SOFTWARE CONFIGURATION

```
#
#$Id$
#
# INITIAL SOFTWARE CONFIGURATION FOR PFM3 BBLOCKS
#
string                          string                          string
BBNAME                          BBFULLTYPE                      VERSION

ClearObs_StandAlone             0x8021                          1.1
Block_DefineHK                  0x8006                          1.3
SMEC_Off                        0x820a                          1.6
SMEC_LED_Levels                 0x8205                          1.9
PTC_Test                        0x8d05                          1.2
S_Phase_Shift                   0x881d                          1.2
SCU_DC_Therm                    0x8a01                          1.2
SetChopTarget                   0x810c                          1.13
StartMCUdata                    0x8906                          1.5
Spec_LIAs_On                    0x880a                          1.3
Setup_PMW_Data                  0x8829                          1.2
SetJiggleTarget                 0x810d                          1.7
PSWTest_Patt                    0x880b                          1.2
P_Phase_Shift                   0x881c                          1.2
Block_HBB                       0x8b12                          1.2
PSWBeamPeakUp_SMECScan          0x8e05                          1.3
PJFET_Vss_Test                  0x881a                          1.8
PLWBeamPeakUp_SMECScan          0x8e07                          1.3
PSW_BDA_Off                     0x8505                          1.3
Scan_FTS                        0x8203                          1.10
SSW_BDA_On                      0x8601                          1.8
PLW_BDA_Off                     0x8507                          1.3
DCU_Data                        0x8014                          1.2
Chop                            0x8d07                          1.2
SF_Phase                        0x8854                          1.4
PCAL_FTable0                    0x8d00                          1.2
StartObs                        0x8002                          1.4
SCU_ACDC_Therm                  0x8a0a                          1.3
MCU_Off                         0x8908                          1.2
StartObs_StandAlone             0x8022                          1.1
ClearObs                        0x8001                          1.2
DPU_Switch_ON                   0x8c00                          1.3
PF_BDA_Off                      0x8504                          1.5
SF_BDA_On                       0x8600                          1.18
PF_Data_QLA                     0x8800                          1.3
PLWTest_Patt                    0x880d                          1.2
PLWJFET_Vss_Test                0x8824                          1.6
Flash_Table                     0x8d01                          1.2
MCU_SMEC_generation             0x8902                          1.3
PMW_BDA_On_No_Jfets             0x8f09                          1.2
PMWBeamPeakUp_SMECScan          0x8e06                          1.3
EndObs_StandAlone               0x8023                          1.1
PLW_BDA_On                      0x8503                          1.10
SF_BeamPeakUp                   0x8f03                          1.7
PSWJFET_Vss_Test                0x8822                          1.6
PCAL_Flash                      0x8302                          1.3
MCU_BSM_generation              0x8903                          1.3
JiggleMap                       0x8d03                          1.2
```

PFBias_Ampl	0x8840	1.4
Step_Look_Scan	0x8b14	1.4
Phot_LIAs_On	0x8809	1.3
Initialise_FTS	0x8200	1.12
PSW_Data_QLA	0x8802	1.4
SJFET_Vss_Test	0x881b	1.8
PF_BeamPeakUp	0x8e00	1.6
Setup_PLW_Data	0x882a	1.2
PFBeamPeakUp_SMECScan	0x8e04	1.3
PCAL_Bias	0x8305	1.2
SCAL4_Check	0x8a03	1.2
SSWTest_Patt	0x880e	1.2
Switch_On_FTS	0x8201	1.11
Setup_PSW_Data	0x8828	1.2
Block_CBB	0x8b11	1.2
Block_PCAL	0x830a	1.2
PMWTest_Patt	0x880c	1.2
BSM_Raster	0x8120	1.5
POffset_Manual	0x8816	1.3
PSWBias_Ampl	0x8841	1.3
SCU_ACDC_Therm_OFF	0x8a10	1.3
BSM_SwitchOn	0x8100	1.6
SF_BDA_Off	0x8603	1.3
SSWBeamPeakUp_SMECScan	0x8f05	1.5
SLW_Phase	0x8856	1.4
SLWBeamPeakUp_SMECScan	0x8f06	1.5
PLW_Data_QLA	0x8804	1.3
SFTest_Patt	0x8808	1.2
PF_BDA_On	0x8500	1.20
PF_BDA_On_No_Jfets	0x8f07	1.3
PLW_BeamPeakUp	0x8e03	1.5
SCU_PCAL_Freq	0x8069	1.2
MCU_ENG_generation	0x8901	1.3
SCAL_PID	0x8d04	1.2
SLWTest_Patt	0x880f	1.2
Phot_LIAs_Check	0x8810	1.2
InitialiseBSMchop	0x810a	1.7
SLW_BDA_On	0x8602	1.11
Flip_Mirror	0x8b10	1.1
MCU_SMECandBSM_generation	0x8904	1.3
PMW_BDA_On	0x8502	1.10
PBias_Freq	0x8820	1.2
PLWBias_Ampl	0x8843	1.3
SCUTest_Patt	0x8a07	1.3
PCAL_Check	0x8a02	1.2
PSW_BDA_On_No_Jfets	0x8f08	1.2
Setup_PF_Data	0x8826	1.7
SCAL2	0x8400	1.3
PJFET_Htr_Test	0x8818	1.2
SCAL4	0x8401	1.3
StopMCUdata	0x8907	1.5
PSW_BeamPeakUp	0x8e01	1.5
SSW_Data_QLA	0x8805	1.3
SSW_BDA_Off	0x8604	1.3
SLW_BDA_Off	0x8605	1.3
PMW_Data_QLA	0x8803	1.3
SOffset_Manual	0x8817	1.3
Step_Look_FTS	0x820c	1.16
CCS_StartObs	0x8026	1.1
SLWJFET_Vss_Test	0x882f	1.7

CCS_ClearObs	0x8025	1.1
SSWBias_Ampl	0x8845	1.3
SLW_BeamPeakUp	0x8f02	1.6
Phot_LIAs_Off	0x8811	1.2
SSWJFET_Vss_Test	0x882e	1.8
SSW_Phase	0x8855	1.4
Setup_SLW_Data	0x882c	1.2
SF_Data_QLA	0x8801	1.3
SCU_AC_Therm	0x8a05	1.2
PMWBias_Ampl	0x8842	1.3
POffset_Auto	0x881e	1.3
PLW_Phase	0x8853	1.4
PMWJFET_Vss_Test	0x8823	1.6
Setup_SSW_Data	0x882b	1.2
SMECm_Scan	0x8210	1.3
SLW_Data_QLA	0x8806	1.3
SBias_Freq	0x8821	1.2
SFBeamPeakUp_SMECScan	0x8f04	1.5
TFTS_Scan	0x8f00	1.2
InitialiseBSMjiggle	0x810e	1.5
SFBias_Ampl	0x8844	1.4
PMW_BeamPeakUp	0x8e02	1.6
SwitchBSMoff	0x810b	1.4
Setup_SF_Data	0x8827	1.10
Start_DCU_Data	0x8835	1.2
SJFET_Htr_Test	0x8819	1.2
EndObs	0x8003	1.2
SLWBias_Ampl	0x8846	1.3
SSW_BeamPeakUp	0x8f01	1.5
PF_Phase	0x8850	1.4
PMW_Phase	0x8852	1.4
Stop_DCU_Data	0x8836	1.2
DCUHK	0x8d08	1.1
Pupil_Scan	0x8b15	1.4
Block_ClearHK	0x8005	1.2
PLWJFetSwitchOff	0x8509	1.2
BSM_Chop	0x8110	1.4
PMW_BDA_Off	0x8506	1.3
PLW_BDA_On_No_Jfets	0x8f0a	1.2
SCAL2_Check	0x8a04	1.2
SCU_Nom_Data	0x8a00	1.3
Cooler_Htr_Check	0x8a06	1.2
Block_Phase	0x8814	1.2
Start_SMEC_MCUENG_data	0x890a	1.2
PSW_BDA_On	0x8501	1.10
Chop_Function	0x8d02	1.4
PSW_Phase	0x8851	1.4
PCAL_OFF	0x8301	1.2
MCU_TEST_generation	0x8905	1.3
MCU_Boot	0x8900	1.6
CCS_EndObs	0x8027	1.1
SOffset_Auto	0x881f	1.3
PCAL	0x8300	1.3
PLWJFetSwitchOn	0x8508	1.3
PFTest_Patt	0x8807	1.2

```
#
#$Id$
#
# INITIAL SOFTWARE CONFIGURATION FOR CUS MODES USED FOR PFM3 FUNCTIONAL
TESTING
string                          string
FUNCIONAL_TEST_CUS_MODE         VERSION

Mode_DcuFunc06_Spec             1.2
SCU_OFF                         1.2
BSM_OFF                         1.1
Mode_DCU_HK                     1.1
DRCU_ON                         1.3
BSM_INIT                        1.1
Mode_DcuFunc11_Phot_No_Jfets    1.1
Mode_SCALFunc01                 1.2
Mode_DcuFunc13_Phot             1.10
Mode_DcuFunc06_Phot             1.2
Mode_DcuFunc03_Full             1.2
Mode_DcuFunc07_Spec             1.3
Mode_SMECFunc01c                1.3
Mode_SMECFunc02a                1.1
Mode_SMECFunc02b                1.1
Mode_DcuFunc01                  1.5
Mode_DcuFunc02                  1.5
PDET_OFF                        1.4
Mode_SMECFunc04a                1.2
Mode_SMECFunc04b                1.5
Mode_DcuFunc07_Phot             1.3
Mode_SMECFunc01                 1.5
Mode_SMECFunc03                 1.4
Mode_BSMFunc01                  1.1
Mode_BSMFunc03                  1.3
Mode_DcuFunc11_Spec             1.2
Mode_BSMFunc06                  1.1
Mode_DcuFunc08_Spec             1.2
Mode_DcuFunc04_Spec             1.2
Mode_BSMFunc02c                 1.3
Mode_BSMFunc02j                 1.2
Mode_BSMFunc04c                 1.1
Mode_BSMFunc04j                 1.1
Mode_BSMFunc05c                 1.1
SMEC_OFF                        1.1
Mode_BSMFunc05j                 1.1
Mode_McuFunc01                  1.1
Mode_McuFunc02                  1.2
Mode_McuFunc03                  1.2
Mode_McuFunc04                  1.2
SDET_OFF                        1.5
Mode_DcuFunc11_Phot             1.2
Mode_DcuFunc08_Phot             1.2
Mode_DcuFunc04_Phot             1.2
Mode_DcuFunc03_Short            1.6
SCU_ON                          1.1
BSM_ON                          1.3
MCU_OFF                         1.2
Mode_DcuFunc12_Spec             1.4
Mode_DcuFunc05_Spec             1.2
PDET_ON                         1.3
DRCU_OFF                        1.1
```

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DPU_START                       1.4
MCU_BOOT                        1.1
SMEC_INIT                       1.2
Mode_DcuFunc12_Phot             1.3
Mode_PCALFunc01                 1.2
Mode_DcuFunc05_Phot             1.2
Mode_ScuFunc01                  1.2
Mode_ScuFunc02                  1.2
Mode_ScuFunc03                  1.2
SMEC_ON                         1.3
Mode_ScuFunc04                  1.2
Mode_ScuFunc05                  1.2
Mode_ScuFunc06                  1.2
Mode_ScuFunc07                  1.2
Mode_ScuFunc08                  1.2
SDET_ON                         1.2
Mode_DcuFunc13_Spec             1.13

#
#$Id$
#
# INITIAL SOFTWARE CONFIGURATION FOR CUS PROCEDURES USED FOR PFM3
string                          string
PROCEDURE_NAME                  VERSION

Proc_GetDCUData                 1.1
Proc_SSWJFET_On                 1.3
Proc_BSMRaster                  1.1
Proc_BSM_Init                   1.1
Proc_Start_DCU_Data             1.1
Proc_MCU_Off                    1.2
Proc_PJFET_Heater               1.3
Proc_Stop_DCU_Data              1.1
Proc_SetObsMode                 1.2
Proc_DPU_Start                  1.2
Proc_SetSpecBiasAmpl            1.2
Proc_PLWJFET_On                 1.3
Proc_SetupPhotData              1.3
Proc_ClearHK                    1.1
Proc_SMEC_Scan                  1.1
Proc_SCU_Off                    1.1
Proc_DefineNewHK                1.1
Proc_SJFET_Heater               1.3
Proc_BSM_Off                    1.2
Proc_SLWJFET_On                 1.3
Proc_SetPhotBiasAmpl            1.3
Proc_PMWJFET_On                 1.3
Proc_ZERO_DRCU_PARAMS           1.4
Proc_SMEC_Latch                 1.2
Proc_SetPhotPhase               1.2
Proc_LoadCommandList            1.1
Proc_SetupP                     1.6
Proc_SetupS                     1.4
Proc_PDET_Off                   1.4
raw_phase                       =
Proc_PDET_On                    1.4
Proc_SCU_On                     1.1
Proc_BSM_On                     1.2
Proc_MCU_Boot                   1.1
Proc_PSWJFET_On                 1.3
```

Proc_SMEC_Off	1.1
Proc_SetSpecPhase	1.1
Proc_SMEC_On	1.3
Proc_SDET_On	1.4
Proc_SMEC_Init	1.3
Proc_SDET_Off	1.3