1. INTRODUCTION

This document reports on the COLD functional test performed on the SPIRE MAIN instrument during the PFM5 ILT test campaign.

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 (specified in this document) is met.

1.2 REFERENCE DOCUMENTS

Ref	Document	Name	Version/Issue No.
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 2.2

1.3 CHANGE RECORD

Document	Change date	Changes
Issue 1.0	27/02/06	Document created

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2. FUNCTIONAL TEST CONFIGURATION

2.1 Software Configuration

Write down in the table the current EGSE software configuration for the tests:

EGSE component	Version/Build number	Comment
SCOS2000	2.3eP5	
HCSS	v0.4.1 Build (#1023)	
QLA	v3.3	
QLA scripts	To be filled later	
Test Control scripts	To be filled later	
CUS Scripts	To be filled later	

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
Lichfield	EGSE router	Started	✓
Lichfield	EGSE Gateway	Started	✓
Lichfield	Telemetry Ingestion	Started	✓
Lichfield	Packet Display	Started	✓
Lincoln	SCOS2000	Started	✓
Lincoln	EXIF + TOPE	Started	✓
Lincoln	Manual Stack	Started	✓
Gordon	CDMS Simulator	Started	✓
Lincoln	Test Control Server	Started	✓

2.3 SPIRE Instrument Configuration

The following checks were performed to ensure that the instrument was in the correct initial 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 only TM2N is incrementing it means that the critical HK report request has been stopped, go to step5. - If they are not, 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, refer to RD2, then 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 (5,2) contains errors: Check the error code in RD07. Then switch OFF the DPU and repeat step 2		
4	Execute **define_new_HK_report.tcl** HCSS Test procedure. Repeat step 1.		
5	In SCOS open **SCU_PARAMETERS display** - Check SCUP5V/P9V/M9V In SCOS open **BIAS_PARAMETERS display** - Check BIASTEMP, BIASP9V,BIASM9V,BIASP5V **Go to step 6.**	**SCU VOLTAGES LOOK NOMINAL:** **SCUP5 = 5.24V** **SCUP9 = 9.08V** **SCUM9 = -9.08V** **BIAS VOLTAGES LOOK NOMINAL:** **BIASTEMP = 296.0K** **BIASP5 = 5.12V** **BIASP9 = 8.98V** **BIASM9 = -9.04V**	✓
6	In SCOS open **DPU_AND_OBS_PARAMETERS display** - Check MODE HK parameter, it should be DRCU_ON (RAW=0x100)		✓

Table 1. Initial configuration check

3. TEST PROCEDURE

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

3.1 GENERAL PASS/FAIL CRITERIA

The general criteria 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 CFT 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-07**	Sorption Cooler Check
5		**FUNC-PCAL-01**	Photometer Calibrator Characterisation
6		**FUNC-SCAL-01**	Spectrometer Calibrators Characterisation
7	**MCU**	**FUNC-MCU-01**	MCU Boot Check
8		**FUNC-MCU-02**	MCU Nominal Science Generation Check
9	**BSMm**	**FUNC-BSM-01**	BSM Switch ON Check
10		**FUNC-BSM-03**	BSM Open Loop dynamics Check
11		**FUNC-BSM-05A**	BSM Open Loop chop test
12		**BSM-INIT**	BSM Initialisation Procedure
13		**FUNC-BSM-05B**	BSM Close Loop chop test
14		**FUNC-BSM-06**	BSM Operational Mode Check
15	**SMECm**	**FUNC-SMEC-01**	SMECm Switch ON Check
16		**FUNC-SMEC-04A**	SMEC Open Loop Position Test
17		**FUNC-SMEC-09**	SMEC Open Loop Scan Test
18		**SMEC-INIT***	SMEC Initialisation Procedure
19		**FUNC-SMEC-03**	SMEC LED Output Characterisation
20		**FUNC-SMEC-04B**	SMEC Close Loop Position Test

21		**FUNC-SMEC-07**	SMEC Close Loop Scan Test
22		**FUNC-SMEC-06**	SMEC Close Loop Saw Tooth Scan Test
23	**DCU**	**FUNC-DCU-01**	DCU Nominal Science Generation Check
24	**Photometer LIAs**	**FUNC-DCU-04P**	Photometer LIAs Check
25		**FUNC-DCU-05P**	Photometer Manual Offset Setting Check
26		**FUNC-DCU-11P**	Photometer Detectors Switch ON Check
27	**Photometer BDAs**	**FUNC-DCU-013P**	Photometer Detectors Check
28	**Spectrometer LIAs**	**FUNC-DCU-04S**	Spectrometer LIAs Check
29		**FUNC-DCU-05S**	Spectrometer Manual Offset Setting Check
30		**FUNC-DCU-11S**	Spectrometer Detectors Switch ON Check
31	**Spectrometer BDAs**	**FUNC-DCU-013S**	Spectrometer Detectors Check

Table 2. General CFT sequence

***Note 1:** This procedure is not a functional test, is a close loop initialisation procedure required to test the close loop operability of the BSM.

***Note 2:** This procedure is not a functional test, is a close loop initialisation procedure required to test the close loop operability of the SMEC.

3.3 DETAILED TEST PROCEDURE

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

0	Open **SCU_PARAMETERS** display on SCOS Alpha Numeric Displays.	

3.3.1 FUNC-SCU-01

Test Id:	**FUNC-SCU-01**
Test Purpose:	SCU Nominal Science Generation Check
Initial Configuration:	**DRCU_ON** + AC/DC thermometry ON
Final Configuration:	**DRCU_ON** + AC/DC thermometry ON
Success Criteria:	Test passed if : 1. Two SCU Nominal Science telemetry packets are received on QLA with the following characteristics: 2. The frame time difference between consecutive SCU frames within these packets corresponds to the sampling rate. Nominal SCU sampling rate is 80Hz ➔ Δt = 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.

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

Test Procedure:

Step#	Action
1	Write down the initial value of SCUFRAMECNT parameter located in SCU_PARAMETERS display.
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 using default input parameters
4	Write down the final value of SCUFRAMECNT.
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	No. of frames received	Test Result
FUNC-SCU-01	**SCUFRAMECNT**	**n/ n+ 31**	0/31	31	**Pass**

Start time @: 10:12
End time @: 10:13
OBSID: 0x30012049
Comments:
SCU frame count 0 at start and 31 at end

3.3.2 FUNC-SCU-03

Test Id:	FUNC-SCU-03
Test Purpose:	FPU DC Thermometry Check
Initial Configuration:	**DRCU_ON** + AC/DC thermometry ON
Final Configuration:	**DRCU_ON** + AC/DC thermometry ON
Success Criteria:	Test passed if thermometry channels 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**

Test Procedure:

Step#	Action
1	Run QLA script FUNC-SCU-03.py on QLA console.
2	Run FUNC-SCU-03 test procedure from the HCSS Test Procedure window on TOPE using default input parameters
3	Contingency: If test fails: 1. Execute SCU_OFF procedure. 2. Execute FUNC-SCU-03 procedure. 3. Repeat step 1 of the Test Procedure.

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	No. of frames received	Test Result
FUNC-SCU-03	**SCUTEMPSTAT**	**0xFFFF/0xFFFF**	**0xFFFF/0xFFFF**	**N/A**	**Pass**

Start time @: 10:15
End time @: 10:16
OBSID: 0x3001204A
Comments:

3.3.3 FUNC-SCU-06

Test Id:	FUNC-SCU-06
Test Purpose:	FPU AC Thermometry Check
Initial Configuration:	**DRCU_ON** + AC/DC thermometry ON
Final Configuration:	**DRCU_ON** + AC/DC thermometry ON
Success Criteria:	At ~ 4K the SUBKTEMP reading should calibration should start being in range. **Open Circuit Criterion:** **RAW reading in the range 0 -100** **Short Circuit Criterion:** **RAW reading of -32768**

Test Procedure:

Step#	Action
1	Run FUNC-SCU-06 test procedure from the HCSS Test Procedure window on TOPE using default input parameters
2	Contingency: If test fails : 1. Send manual command: SEND_DRCU_COMMAND Parameter1 = 0xA0860000 Parameter2 = 0 2. Then repeat steps 1 and 2 of the Test Procedure. **Note:** **If the test fails and the SUBKTEMP channel is switched OFF manually, the expected value before/after execution of FUNC-SCU-06 for SUBKSTAT is 0/1**

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	No. of frames received	Test Result
FUNC-SCU-06	**SUBKSTAT** **SUBKTEMP**	**n/a**	1/1	**N/A**	**Pass**

Start time @: 10:18
End time @: 10:19
OBSID: 0x3001204B
Comments:

Subktemp	RAW	Converted
Before	32613	4.16K
After	32613	4.16K

Note:
The channel was already ON (therefore no change on the temperature) .
The temp reading agrees with instrument temperature.

3.3.4 FUNC-PCAL-01

Test Id:	FUNC-PCAL-01
Test Purpose:	Photometer Calibrator Characterisation
Initial Configuration:	**DRCU_ON** + AC/DC thermometry ON
Final Configuration:	**DRCU_ON** + AC/DC thermometry ON
Success Criteria:	Test passed if : • PCALCURR HK parameter shows the commanded current. • PCALV parameter shows a linear increase proportional to the bias applied. (the proportionality constant in this case should be the PCAL resistor value)

Test Procedure

Step#	Action
1	Run QLA script FUNC-PCAL-01.py on QLA console.
2	Run FUNC-PCAL-01 test procedure from the HCSS Test Procedure window on TOPE with default input parameters
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	No. of frames received	Test Result
FUNC-PCAL-01	**PCALCURR PCALV**	**0/1,2.5,4.0,5.5,7mA**	**0/ 1.044 mA 2.51 mA 4.02 mA 5.53 mA 7.049mA**	**N/A**	**Pass**

Start time @: 10:24
End time @: 10:27
OBSID: 0x3001204D

Comments:

1. **Test control script was in debug mode, hence the jump in obsid.**
2. **Test Control script input parameters need to be updated to show run time actual values.**

Monitored PCAL current on SCOS, current steps OK

3.3.5 FUNC-SCAL-01

Test Id:	FUNC-PCAL-01
Test Purpose:	Spectrometer Calibrator Characterisation
Initial Configuration:	**DRCU_ON** + AC/DC thermometry ON
Final Configuration:	**DRCU_ON** + AC/DC thermometry ON
Success Criteria:	Test passed if : • SCAL4CURR HK parameter shows the commanded current sequence (1,2,3,4,5,5.5mA) • SCAL2CURR HK parameter shows the commanded current sequence(1,2,3,4,5,5.5mA) • SCA2LV parameter shows a linear increase proportional to the bias applied. (the proportionality constant in this case should be the SCAL2V resistor value) • SCAL4V parameter shows a linear increase proportional to the bias applied. (the proportionality constant in this case should be the SCAL4V resistor value) • SCAL2TEMP and SCAL4TEMP values follow the increased bias settings

Test Procedure

Step#	Action
1	Run QLA script FUNC-SCAL-01.py on QLA console.
2	Run FUNC-SCAL-01 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/During test	Actual Value Before/After	No. of frames received	Test Result
FUNC-SCAL-01	**SCAL2CURR** **SCAL4CURR** **SCAL2V** **SCAL4V** **SCAL2TEMP** **SCAL4TEMP**	**0/1,2,3,4,5,5.5mA** **0/1,2,3,4,5,5.5mA** **0/0.5,1.0,1.5,2.0,2.5.2.75V** **0/0.5,1.0,1.5,2.0,2.5.2.75V**		**N/A**	**Pass**

Start time @: 10:40
End time @: not finished
OBSID: n /a
Comments:

Error in Test Control script, CUS calling parameters mismatch.
Action: Updated TC script "set params(scal2_...) and set params(scal4_...)" statements to set params(s2_...) and set params(s4_...) respectively.
New configuration required:

1. **Stop test control server**
2. **Checking the current configurations : missetup -listconfig**
3. **Created new configuration : missetup –addconfig iltconfig4**
4. **Created new instrument model in this new configuration : cus –createinsmodel iltconfig4**
5. **Updated user.props file under lichfield:/home/sg55/.hcss/ hcss.ccm.mission.config property from iltconfig3 to iltconfig4**
6. **Restarted testcontrol server**
7. **Executed script FUNC-SCAL-01.tcl**

Result: unexpected behaviour, SCAL bias commands showing 'odd' values.

After inspection of the CUS script and the test control script still cannot see anything wrong with them. Verified the input parameters to both the test control script and the cus and the output of the bblocks and mode of the CUS , everything seems fine there, i.e. the cus commands are correct and seem to be 'transformed' when they get to the test control.

Performed an SCAL check FUNC-SCU-05 test instead just to verify that the SCAL still works
Input parameters = 2.0 mA each bias

Start time @: 16:07
End time @:
OBSID: 0x3001200781
Comments:

SCAL4CURR showed the input bias (I (measured) = 2.0047 V (measured) = 1.0022)
SCAL4TEMP up to 25K

SCAL2CURR showed the input bias (I (measured) = 2.0033 V (measured) = 1.0016)
SCAL4TEMP up to 30K

Test passed

3.3.6 FUNC-SCU-07

Test Id:	FUNC-SCU-07
Test Purpose:	Sorption Cooler Check
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
1	Run FUNC-SCU-07 test procedure from the HCSS Test Procedure window on TOPE with default input parameters.
2	While the test is running Write down 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	No. of frames received	Test Result
FUNC-SCU-07	**SPHSV** **EVHSV** **SPHTRV**	**0/ ~ 323 mV** **0/ ~ 323 mV** **0/ ~ 8 V**	~0./ 324.51 mV ~0/ 324.40mV ~0/ 8.86V	**N/A**	

Start time @: 11:16
End time @: 11:19
OBSID: 0x30012055
Comments:

FPU temp	Initial value	Increase
PumpHtrTemp	~ 4.1 K	Up to ~9.0 K
PumpHsTemp	~ 4.1 K	Up to ~5.6K
EvapHsTemp	~ 4.1 K	Up to ~5.6 K

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

3.3.7 FUNC-MCU-01

Test Id:	**FUNC-MCU-01**
Test Purpose:	MCU Boot Check
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 Board Temperature Reading shows ambient temperature.

Test Procedure:

Step#	Action
1	Run FUNC-MCU-01 test procedure from the HCSS Test Procedure window on TOPE
2	When procedure is finished Write down 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	No. of frames received	Test Result
FUNC-MCU-01	**MCUP5V** **MCUP15V** **MCUP14V** **MCUM14V** **MCUM15V** **MCUMACTEMP** **MCUBSMTEMP** **MCUSMECTEMP**	**N/A/ ~ 5V** **N/A / ~15V** **N/A / ~ 14V** **N/A / ~ -14V** **N/A / ~ -15V** **N/A / ~ 300K** **N/A / ~ 300K** **N/A / ~ 300K**	5.01 V 15.54 V 14.16V -14.47 V -15.63 V 289.50 K 294.39K 293.98 K	**N/A**	**Pass**

Start time @: 11:22
End time @: 11:23
OBSID: 0x30012056
Comments:

MCU Booted correctly.

Current consumption : I = 0.87A

3.3.8 FUNC-MCU-02

Test Id:	FUNC-MCU-02
Test Purpose:	MCU Nominal Science Generation Check
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
1	Write down 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 with default input parameters.
4	When test is finished Write down 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	No. of frames received	Test Result
FUNC-MCU-02	**MCUFRAMECNT**	**0/ ~ 6600**	0 / 6492	6492	**Pass**

Start time @: 11:25
End time @: 11:27
OBSID: 0x30012057
Comments:

Insert QLA files later

Extra test inserted on the sequence:

Note: Running FUNC-SCU-02
Start time: 11:05
End time: 11:06
OBSID: 30011120

Will report measurements later

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

3.3.9 FUNC-BSM-01

Test Id:	FUNC-BSM-01
Test Purpose:	BSM Switch ON Check
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. CHOPSENSIG HK parameter changes 3. JIGGSENSPWR HK parameter goes from 0 to 1 4. JIGGSENSSIG HK parameter changes

Test Procedure

Step#	Action
1	Run FUNC-BSM-01 test procedure from the HCSS Test Procedure window on TOPE
2	When the test is finished record all the Key parameters noted bellow
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	No. of frames received	Test Result
FUNC-BSM-01	**CHOPSENSPWR** **CHOPLOOPMODE** **CHOPSENSSIG** **JIGGSENSPWR** **JIGGLOOPMODE** **JIGGSENSSIG**	**0/1** **3/3** **?/?** **0/1** **3/3** **?/?**	0 / 1 3 / 3 - / 0x92DC 0 / 1 3 / 3 - / 0x9A2D	**N/A**	**Pass**

Start time @: 11:29
End time @: 11:30
OBSID: 0x30012058
Comments:

3.3.10 FUNC-BSM-03

Test Id:	FUNC-BSM-03
Test Purpose:	BSM Open Loop dynamics Check
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 choppos2 > choppos1 ➔ chopsenssig2 > chopsenssig1) for each jiggle position.

Test Procedure

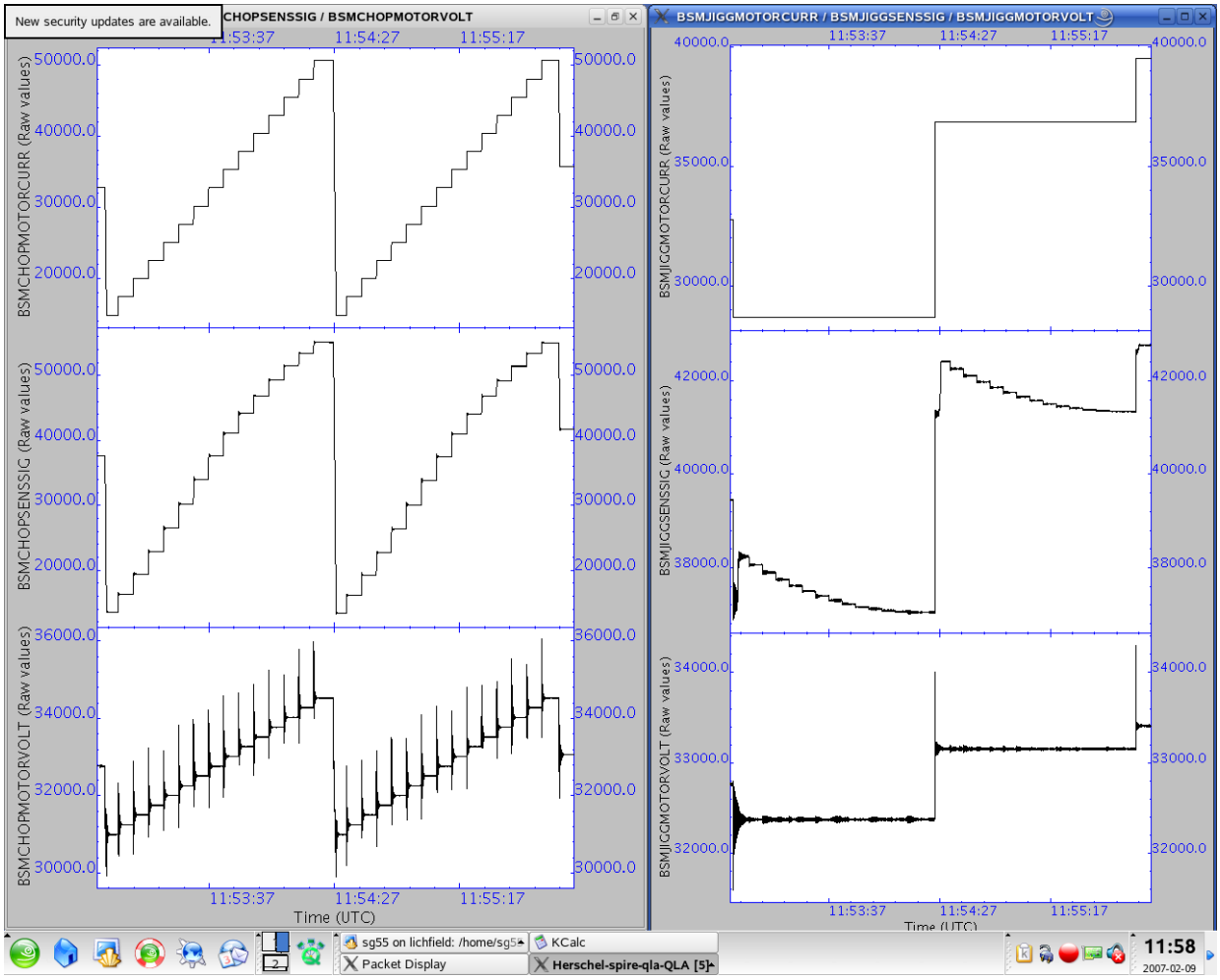
Step#	Action
1	**On QLA open up 2 time series display with the following HK parameters in each display:** **Display 1:** *HK* : CHOPPOSN *BSM Nominal Science*: BSMCHOPMOTORCURR BSMCHOPSENSSIG BSMCHOPMOTORVOLT **Display2:** *HK* : JIGGPOSN *BSM Nominal Science*: BSMJIGGMOTORCURR BSMJIGGSENSSIG BSMJIGGMOTORVOLT
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	No. of frames received	Test Result
FUNC-BSM-03				**N/A**	**Pass**

Start time @: 11:53
End time @: 11:57
OBSID: 0x30012059
Comments:
Jiggle start = 0x7000
Jiggle end = 0x9000,
Jiggle step = 0x2000
Chop start = 0x1000
Chop end = 0xf000
Chop step = 0x1000.

Saved screenshot of QLA display with name FUNC_BSM_03_09feb07_30012059.png (in /home/sg55)



3.3.11 FUNC-BSM-05A

Test Id:	FUNC-BSM-05A
Test Purpose:	BSM Open Loop chop test (Degraded operational mode check)
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 dumping of the natural oscillations of the BSM in chop axis via motor bemf, through the use of the commendable motor resistance value.** **As it is now is just a check of the default motor resistance value.** **NO adjusting of this value should be attempted during this test.** **The success criteria are therefore not applicable.**

Test Procedure

Step#	Action
1	**On QLA open up a time series display of HK parameters:** BSMCHOPSENSSIG BSMCHOPMOTORCURR BSMCHOPMOTORVOLT
2	**Run FUNC-BSM-05A 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	No. of frames received	Test Result
FUNC-BSM-05A	**BSMCHOPSENSSIG** **BSMCHOPMOTORCURR** **BSMCHOPMOTORVOLT**	**?/?** **?/?** **?/?**		**N/A**	**Pass**

Start time @: 12:02
End time @: 12:03
OBSID: 0x30011205A
Comments: Written screenshot to file FUNC_BSM_05A_09feb07_30011205A.png in /home/qla/images/PFM5
TOPE script input parameters:

On source chop pos 0xA000;
On source jiggle pos 0x8000;
Off source chop pos 0x8000;
Off source jiggle pos 0x8000;
Chop cycles 50;
Chop cycle period 0.5 s;
Data type 0 (= Full Photometer); DCU samples 4; DCU delay 34959; BSM samples 31.

3.3.12 FUNC-BSM-05B

Test Id:	FUNC-BSM-05B
Test Purpose:	BSM Close Loop chop test
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:** **Currently this test does not differ at ALL from the next one.** **In any case the success/fail criteria are NOT applicable for this test.**

Test Procedure

Step#	Action
1	**Execute BSM_INIT from HCSS Test Procedures**
2	**On QLA open up a time series display of HK parameters:** BSMCHOPSENSSIG BSMCHOPMOTORCURR BSMCHOPMOTORVOLT
3	Run FUNC-BSM-05B test procedure from the HCSS Test Procedure window on TOPE
4	Contingency: None contemplated.

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	No. of frames received	Test Result
FUNC-BSM-06	**BSMCHOPSENSSIG** **BSMCHOPMOTORCURR** **BSMCHOPMOTORVOLT**	**?/?** **?/?** **?/?**		**N/A**	**N/A**

Start time: 12:18
End time: 12:20
OBSID: 0x3001205B

Comments:
On source chop pos 0xb600;
On source jiggle pos 0x9a60;
Off source chop pos 0x6a28;
Off source jiggle pos 0x9a60;
Chop cycles 50;
Chop cycle period 0.5 s;
Data type 0;
DCU samples 4;
DCU delay 34959;
BSM samples 31.

Had not executed BSM_INIT

Will execute BSM_INIT now.

Repeated FUNC-BSM-05B
Start time: 12:24
End time: 12: 26
OBSID: 0x3001205D

3.3.13 FUNC-BSM-06

Test Id:	FUNC-BSM-06
Test Purpose:	BSM Operational Mode Check
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
1	**On QLA open up a time series display of science parameters:** BSMCHOPSENSSIG BSMCHOPMOTORCURR BSMCHOPMOTORVOLT
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	No. of frames received	Test Result
FUNC-BSM-06	**BSMCHOPSENSSIG** **BSMCHOPMOTORCURR** **BSMCHOPMOTORVOLT**	**?/?** **?/?** **?/?**		**N/A**	**N/A**

Start time @: 12:31
End time @: 12:33
OBSID: 0x3001205E

Comments:

Had to updated the default input parameters to match the previous set, ALL BSM chopping related functional test must have the same input parameters (chop, jiggle positions for consistency)

On source chop pos 0xb600;
On source jiggle pos 0x9a60;
Off source chop pos 0x6a28;
Off source jiggle pos 0x9a60;
Chop cycles 50;
Chop cycle period 0.5 s;
Data type 0;
DCU samples 4;
DCU delay 34959;
BSM samples 31.

Step#	Action	Comments
4	Execute BSM_OFF from HCSS Test Procedures	Start time: 12:08 End time: 12:09 OBSID: 0x3001205F Because the mode is set to PHOTSTBY by the BSM_INIT procedure, switching off the BSM leaves CHOPSENSPWR and JIGGSENSPWR in hard limits. Manually set the MODE to REDY SET_OBS_MODE (0x200)

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

3.3.14 FUNC-SMEC-03

Test Id:	**FUNC-SMEC-03**
Test Purpose:	SMEC LED Output Characterisation
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
1	**Run FUNC-SMEC-03.py script on QLA**
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:

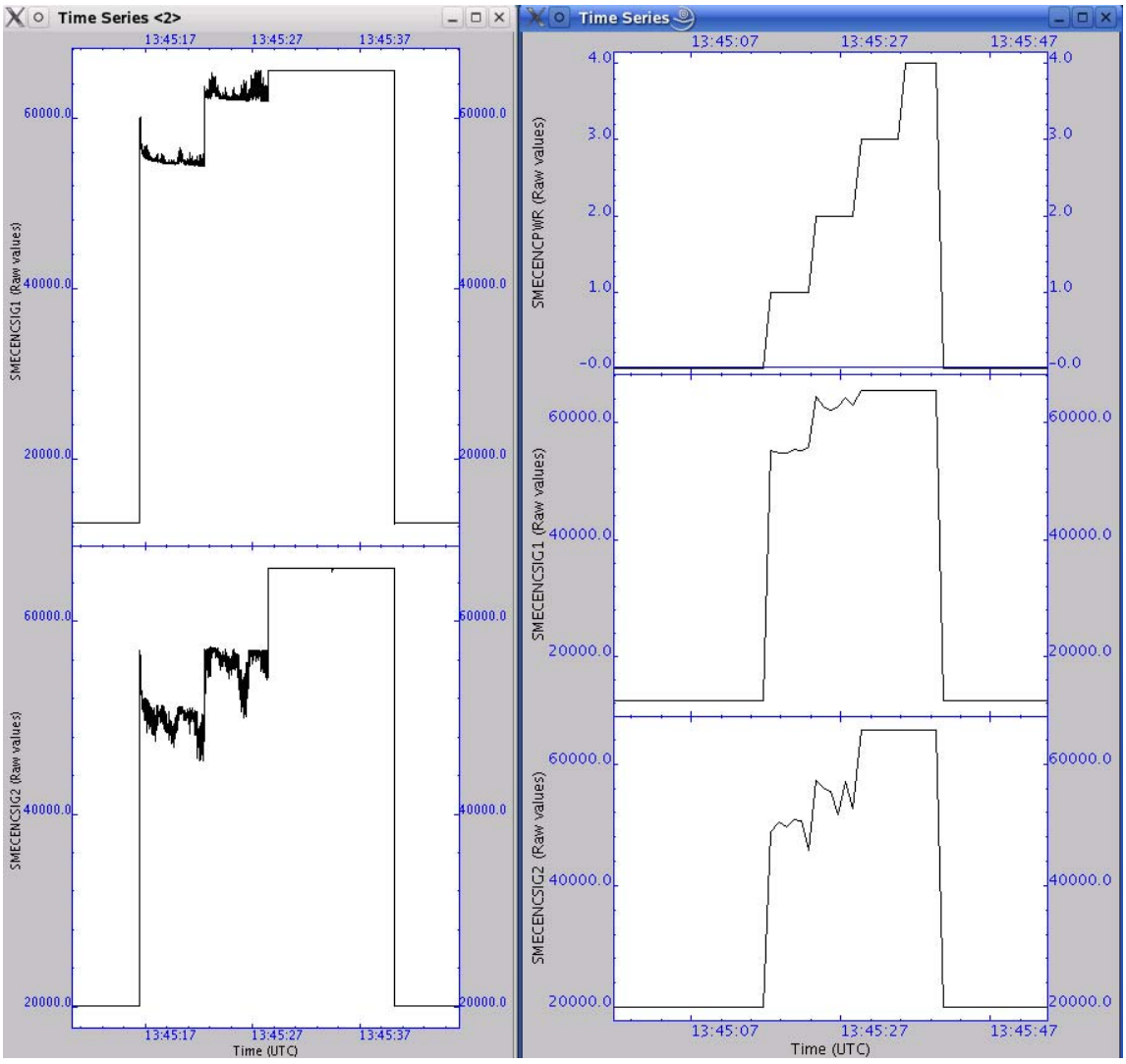
Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	No. of frames received	Test Result
FUNC-SMEC-03	**SMECENCPWR** **SMECENCSIG1AMP** **SMECENCSIG2AMP**				

Start time @: 13:45
End time @: 13:47
OBSID: 0x30012060
Comments:

Test Control script input parameters:

Starting level = 1
Ending level = 4
Step = 1
Time at each = 5 sec

Both signals saturate at level 3 of the encoder as expected



3.3.15 FUNC-SMEC-01

Test Id:	FUNC-SMEC-01
Test Purpose:	SMEC Switch ON Check.. Encoder and LVDT alive check.
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 4. 2. SMEC encoder signals 1 and 2 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.

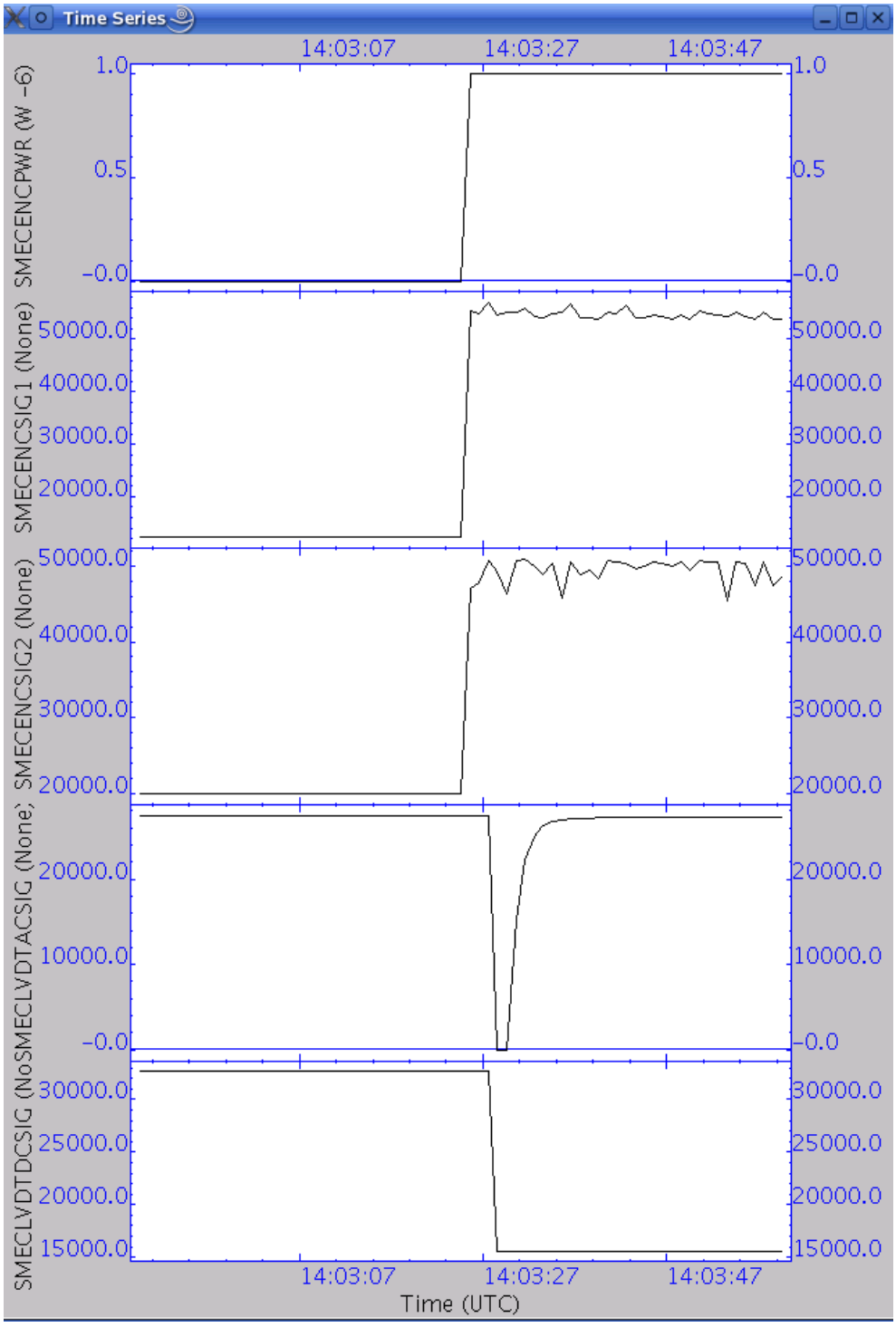
Test Procedure:

Step#	Action	Comments
1	Run FUNC-SMEC-01.py script on QLA	
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	No. of frames received	Test Result
FUNC-SMEC-01	**SMECENCPWR** **SMECLVDTPWR** **SMECENCSIG1** **SMECENCSIG2**			**N/A**	**Pass**

Start time @: 14:04
End time @: 14:05
OBSID: 0x30012061
Comments:



Note:
The encoder signals 1/ 2 amplitudes are zero, showing that the encoder has not start counting. Will manually change the offsets to try to get it counting.
SEND_DRCU_COMMAND(0x9058E678,0)
SEND_DRCU_COMMAND(0x905ABF68,0)

3.3.16 FUNC-SMEC-04A

Test Id:	FUNC-SMEC-04A
Test Purpose:	SMEC Open Loop Position Test. SMEC displacement check.
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:

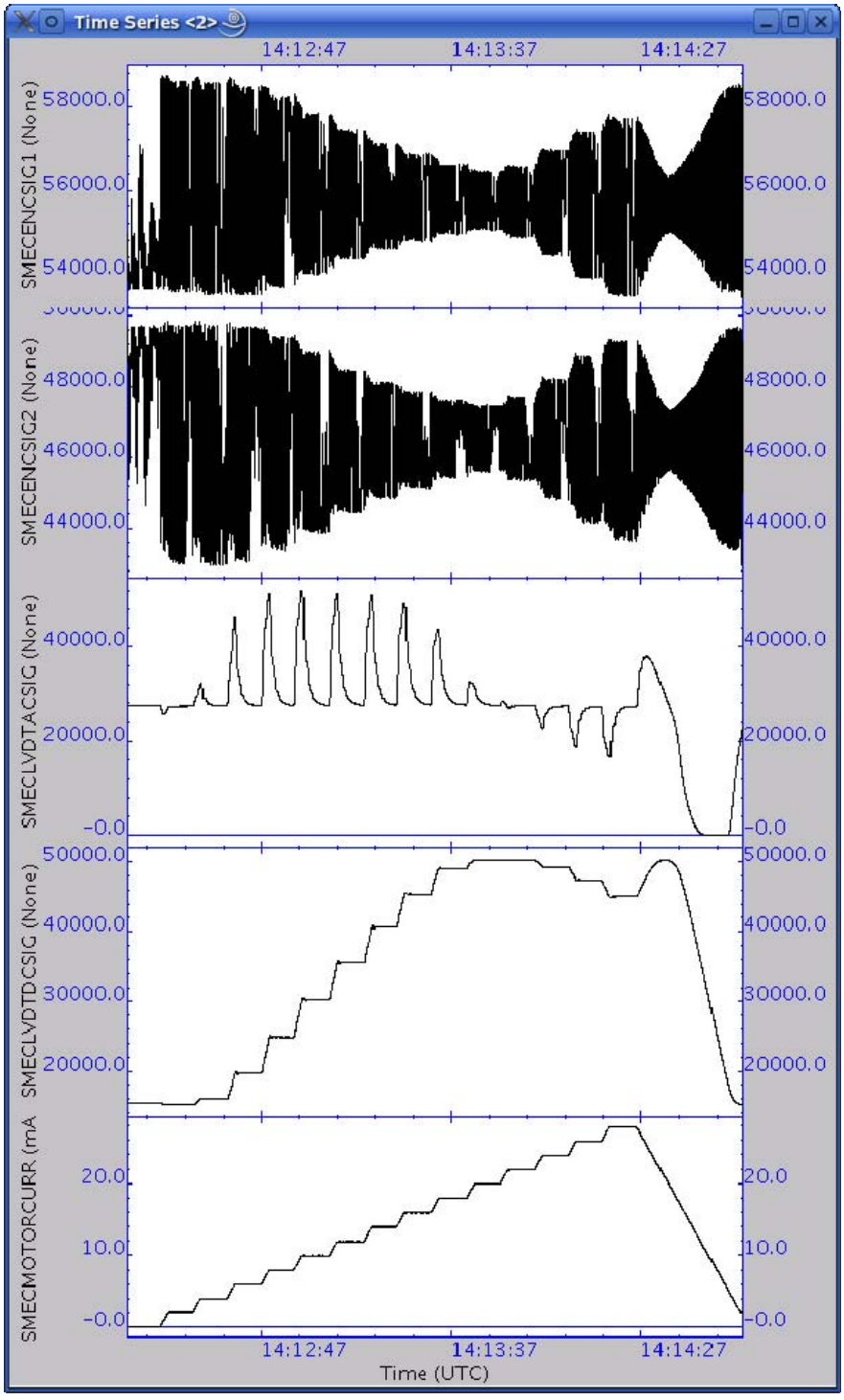
Step#	Action
1	**Run FUNC-SMEC-04a.py script on QLA.**
2	**Run FUNC-SMEC-04a test procedure from the HCSS Test Procedure window on TOPE**
3	Contingency: If test fails repeat steps 1.

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	No. of frames received	Test Result
FUNC-SMEC-04a	**All above mentioned in step 2**	**N/A**	**N/A**	**N/A**	**Pass**

Start time @: 14:12
End time @: 14:16
OBSID: 0x30012062
Comments:

Start point = 1 mm
End point = 15 mm
Step size = 1 mm,
Forward speed = 0.5 mm/s
Reverse speed = 1 mm/s, time at each position 5 s.



3.3.17 FUNC-SMEC-09

Test Id:	FUNC-SMEC-09
Test Purpose:	SMEC Open Loop Scan Test.
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 position of the SMEC along the scan.

Test Procedure:

Step#	Action
1	**Run FUNC-SMEC-09.py script on QLA**
2	**Run FUNC-SMEC-09 test procedure from the HCSS Test Procedure window on TOPE**
3	Contingency: If test fails repeat steps 1.

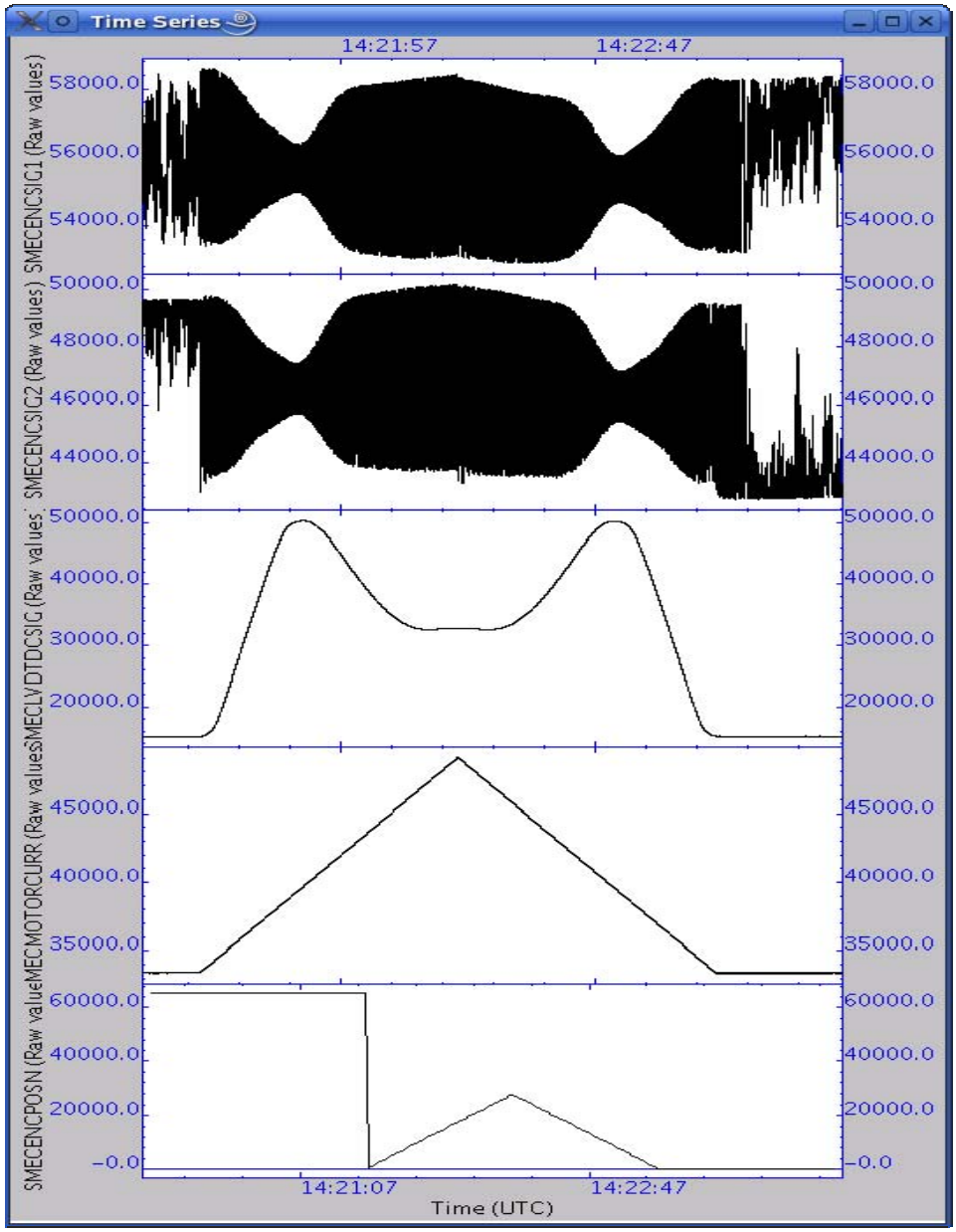
Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	No. of frames received	Test Result
FUNC-SMEC-09	**All above mentioned in step 2**	**N/A**	**N/A**	**N/A**	**Pass**

Start time @: 14:21
End time @: 14:25
OBSID: 0x30012063
Comments:

Note:
The encoder signals 1/ 2 amplitudes are zero, showing that the encoder has not started counting. Will manually change the offsets to try to get it counting.
SEND_DRCU_COMMAND(0x9058DAC0,0)
SEND_DRCU_COMMAND(0x905AB3B0,0)
The amplitude of signals 1 and 2 switched to different from zero ,encoder counting

Start point = 1 mm
End point = 25 mm
Forward speed = 0.5 mm/s,
Reverse speed = 0.5 mm/s
2 scans.



3.3.18 FUNC-SMEC-04B

Test Id:	FUNC-SMEC-04B
Test Purpose:	SMEC Close Loop Position Test. SMEC close loop operation check.
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 : SMECENCPOS HK parameter shows identical values as those of the SMECTRAJPOSN HK parameter for the different commanded SMEC positions.(1mm to 25mm in steps of 1mm)

Test Procedure:

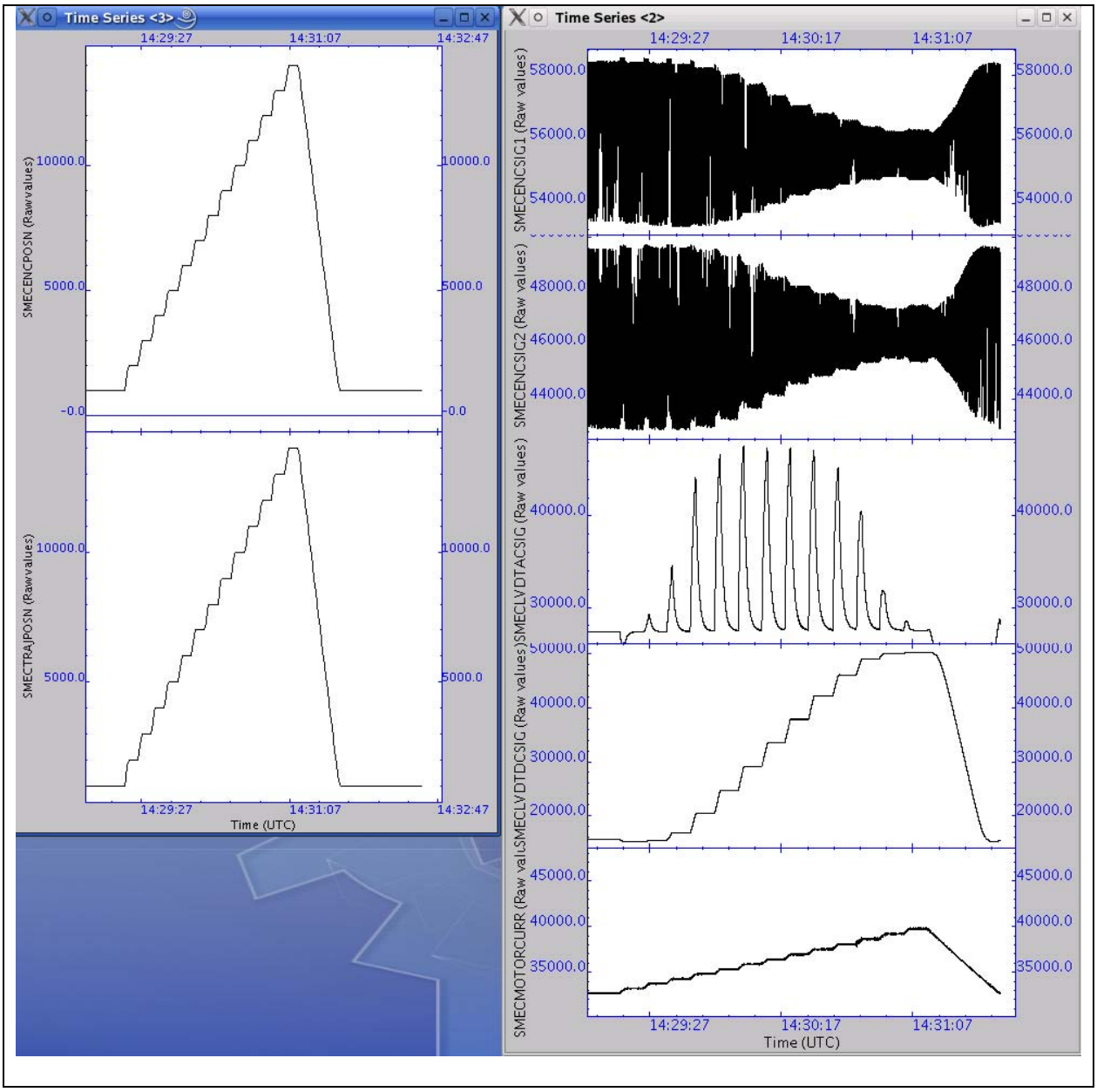
Step#	Action
1	**Execute SMEC_INIT from HCSS Test Procedures**
2	**Run FUNC-SMEC-04B.py script on QLA**
3	**Run FUNC-SMEC-04B test procedure from the HCSS Test Procedure window on TOPE**
4	Contingency: If test fails repeat steps 1.

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	No. of frames received	Test Result
FUNC-SMEC-04B	**All above mentioned in step 1**	**N/A**	**N/A**	**N/A**	

Start time @: 14:29
End time @: 14: 32
OBSID: 0x30012065
Comments:

Start point = 1 mm
End point = 15 mm
Step size = 1 mm,
Forward speed = 0.5 mm/s
Reverse speed = 1 mm/s, time at each position 5 s.


Time Series <3>
14:29:27
14:31:07
14:32:47
SMECENCPOSN (Raw values)
10000.0
5000.0
-0.0
SMECTRAJPOSN (Raw values)
Time (UTC)
Time Series <2>
14:29:27
14:30:17
14:31:07
SMECENCSIG1 (Raw values)
58000.0
56000.0
54000.0
SMECENCSIG2 (Raw values)
48000.0
46000.0
44000.0
SMECLVDTACSIG (Raw values)
40000.0
30000.0
SMECLVDTDCSIG (Raw values)
50000.0
40000.0
30000.0
20000.0
SMECMOTORCURR (Raw values)
45000.0
40000.0
35000.0
Time (UTC)

3.3.19 FUNC-SMEC-07

Test Id:	FUNC-SMEC-07
Test Purpose:	SMEC Close Loop Scan Test.
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: SMECENCPOS HK parameter shows identical values as those of the SMECTRAJPOSN HK parameter during the scan.

Test Procedure:

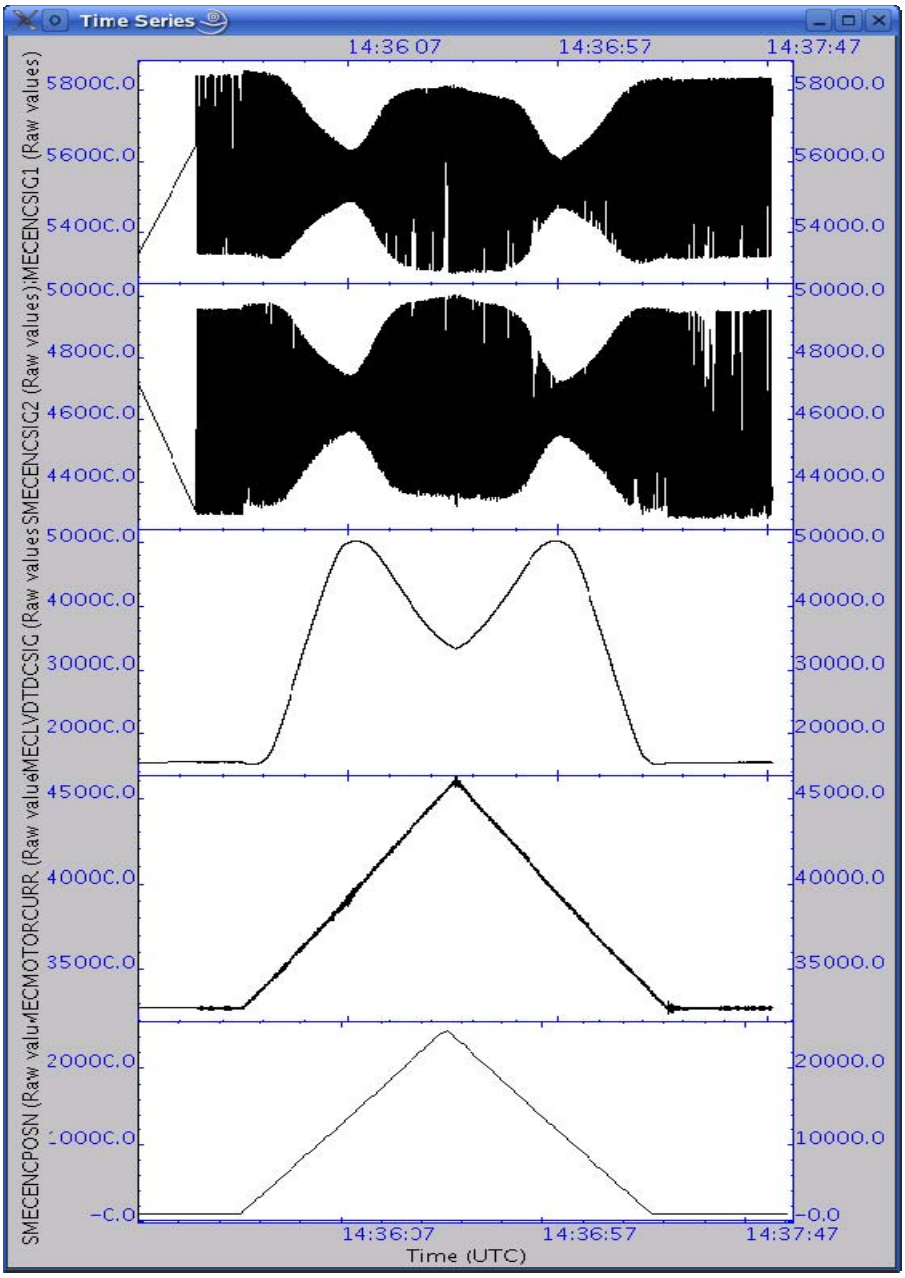
Step#	Action
1	**Run FUNC-SMEC-07.py script on QLA**
2	**Run FUNC-SMEC-07 test procedure from the HCSS Test Procedure window on TOPE**
3	Contingency: If test fails repeat steps 1.

Test Log:

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	No. of frames received	Test Result
FUNC-SMEC-07	**All above mentioned in step 1**	**N/A**	**N/A**	**N/A**	

Start time @: 14: 36
End time @: 14: 39
OBSID: 0x30012066
Comments:

Start point = 1 mm
End point = 25 mm
Forward speed = 0.5 mm/s,
Reverse speed = 0.5 mm/s
2 scans.



Note : higher dispersion on SMECMOTORCURR in close loop than in open loop (we are using PFM4 PRIME PID parameters)

Step#	Action	Comments
4	Execute SMEC_OFF from HCSS Test Procedures	Done at 12:58; Obsid:30012067

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

3.3.20 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	Write 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 with default input parameters	
4	Write 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**	**m/m+1400**	1720 / 2420	700	**Success**

Start time @: 14:44
End time @: 14: 47
OBSID: 0x30012068

Comments:

Contents of QLA created files show sampling times to be consistent with input parameters entered for sampling frequencies of photometer 18Hz (Δt ~ 53.3 ms) and spectrometer 80Hz Δt ~ 12.5 ms.

3.3.21 FUNC-DCU-11P

Test Id:	FUNC-DCU-11P
Test Purpose:	Photometer BDAs Switch ON Check
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 (values according to latest Vss). 2. PMLWJFETVSS1/2/3/4 (values according to latest Vss). 3. PSWJFETSTAT = 0x3F 4. PMLWJFETSTAT = 0x3F

Test Procedure:

Step#	Action
1	Run FUNC-DCU-11P test procedure from the HCSS Test Procedure window on TOPE with default input parameters
2	After the test Write down 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	No. of frames received	Test Result
FUNC-DCU-11P	**PSWJFETSTAT** **PMLWJFETSTAT**	**0/0x3f** **0/0x7f**	0 / 0x3f 0 / 0x7f	**N/A**	**Pass**

Start time @: 14:49
End time @: 13:14
OBSID: 0x30012069
Comments:
PSW:
A10 is dead, G8 and C12 show a higher RAW output than the rest.
PMW:
C8 and T2 are dead
PLW:
fine

3.3.22 FUNC-DCU-13P

Test Id:	FUNC-DCU-13P
Test Purpose:	Photometer Detectors Check
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
1	Run FUNC-DCU-13P.py script on QLA
2	Run FUNC-DCU-13P test procedure from the HCSS Test Procedure window on TOPE with default input parameters
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	No. of frames received	Test Result
FUNC-DCU-13P				**N/A**	**Pass**

Obsid:0x3001206A
Start: 14:54
End: 15: 07
Comments:

Results look nominal ,See Appendix 1

3.3.23 FUNC-DCU-14-P

Test Id:	
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 don't show excess noise.

Test Procedure:

Step#	Action	Comments
1	**Run ILT-PERF-DNA-P 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
ILT_PERF_DNA_P				**N/A**	

Start time @: 15:15
End time @: 15:20
OBSID: 0x3001206B

Comments:

Detectors settings:

Bias frequency: 130 Hz
Sampling frequency: 18 Hz
PSW phase: 180.71 deg
PMW phase: 180.71 deg
PLW phase: 180.71 deg
PSW bias : ~ 31mV
PMW bias : ~ 31mV
PLW bias : ~ 31mV
TC bias : ~ 62 mV

Duration of test: 5 minutes

Step#	Action	Comments
1	From TOPE HCSS Test Procedures run **PDET-OFF**	Ran PDET_OFF @ 15:21 0x3001206C

3.3.24 FUNC-DCU-11S

Test Id:	FUNC-DCU-11S
Test Purpose:	Spectrometer BDAs switch ON check
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
1	**Run FUNC-DCU-11S test procedure from the HCSS Test Procedure window on TOPE**
2	**After the test Write down 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	No. of frames received	Test Result
FUNC-DCU-11S	**SSWJFETSTAT** **SLWJFETSTAT** **SSWJFET1V** **SSWJFET2V** **SLWJFET1V**	**0/7** **0/7** **0V/-1.5V** **0V/-1.5V** **0V/-1.5V**	0 / 7 (SPECJFETSTAT) 0 / -2.07 0 / -1.59 0/-1.68	**N/A**	**Pass**

Start time @: 15:23
End time @: 15:24
OBSID: 0x3001206D
Comments:
SSW: D5 has higher response
SLW: C2 and B3 look "ill", DP2 is definitely dead

3.3.25 FUNC-DCU-13S

Test Id:	FUNC-DCU-13S
Test Purpose:	Spectrometer detectors check
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	On QLA bring up a time series display of a couple of pixels on each of the spectrometer BDAs	
2	Run FUNC-DCU-13S 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	No. of frames received	Test Result
FUNC-DCU-13S				N/A	**Pass**

Using default input values
Started at 15:30
Finished at 15:42
Obsid: **0x3001206E**

See Annexe 1 for plots of load curves on each pixel.

3.3.26 FUNC-DCU-14-S

Test Id:	
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 don't show excess noise.

Test Procedure:

Step#	Action	Comments
1	**Run ILT-PERF-DNA-S 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
ILT_PERF_DNA_S				**N/A**	

Start time @: 15:58
End time @: 16:04
OBSID: 0x3001206F
Comments:

Detectors settings:
Bias frequency: 160.09 Hz
Sampling frequency: 80.04 Hz
SSW phase: 180.71 deg
SLW phase: 179.29 deg
SSW bias : ~ 31mV
SLW bias : ~ 31mV
Duration of test: 5 minutes

Step#	Action	Comments
1	From TOPE HCSS Test Procedures run **SDET-OFF**	**16:04 Obsid: 0x30012070**

4. END TEST SEQUENCE

4.1 NORMAL END TEST SEQUENCE

The following table shows the steps performed to end the functional test sequence. Note that ins this case the final instrument configuration was REDY as a cooler recycle took place just after finishing the functional test sequence.

Step#	Action	HK parameters	Expected Value	Comments	Check
1	Check BSM is OFF	CHOPSENSPWR JIGGSENSPWR	0 0	0 0	✓ ✓
2	Check SMEC is OFF	SMECENCPWR	0	0	✓

Final instrument configuration is REDY.

5. ANNEXE 1 (RESULTS OF LOAD CURVES)

The following graphs (1-12) show the response of the 288 Photometer detectors to the input voltage during the Load Curve (FUNC-DCU-13). The graph (13) shows the response of the 3 PTC channels to the input voltage during the Load Curve. The graphs (14-16) show the spectrometer 78 detectors output voltage during the load curve performed on the spectrometer side. These plots are for OBSIDs 3001206A for phot and 3001206E for spec.

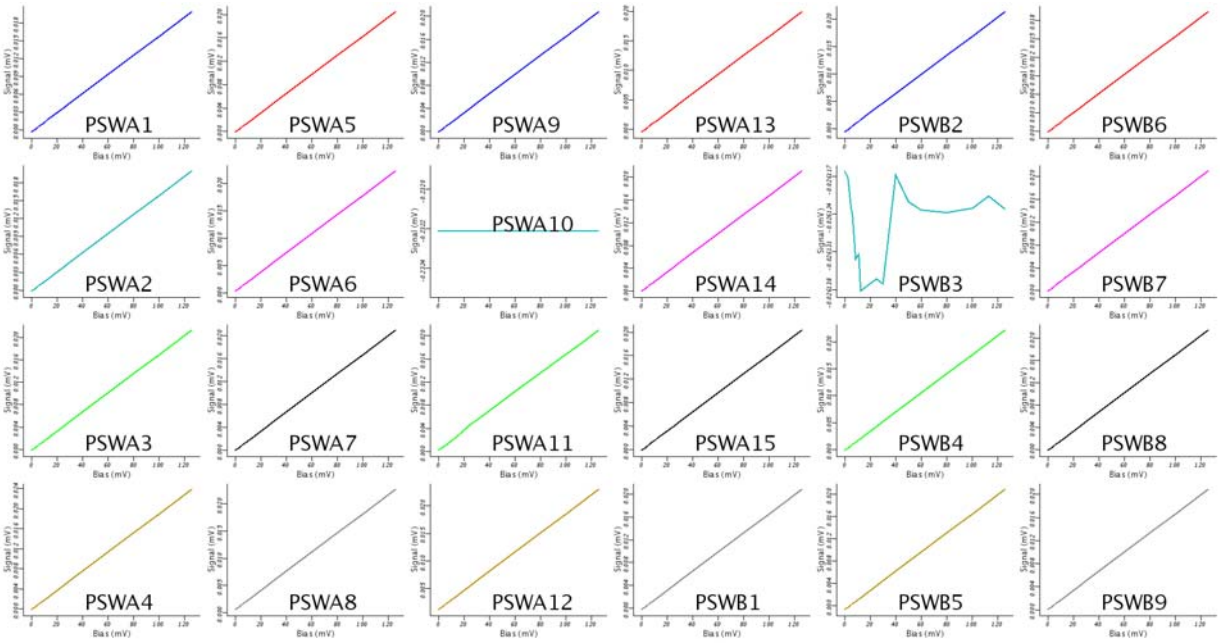


Figure 1. PSW Detectors (1)

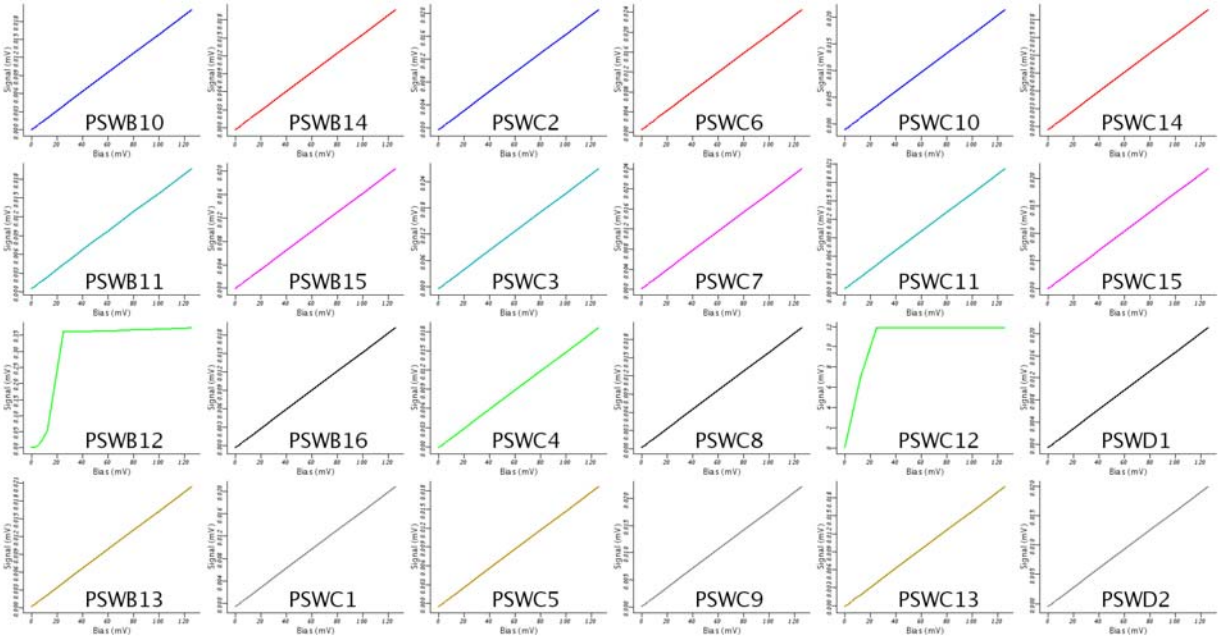


Figure 2. PSW Detectors (2)

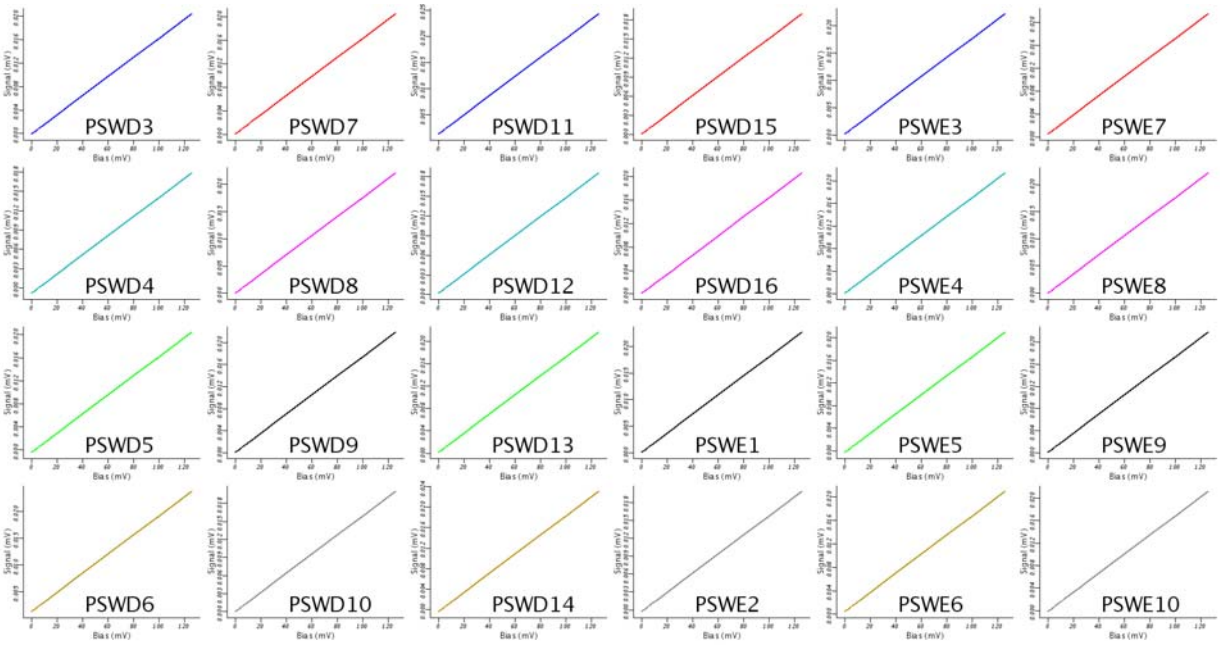


Figure 3. PSW Detectors (3)

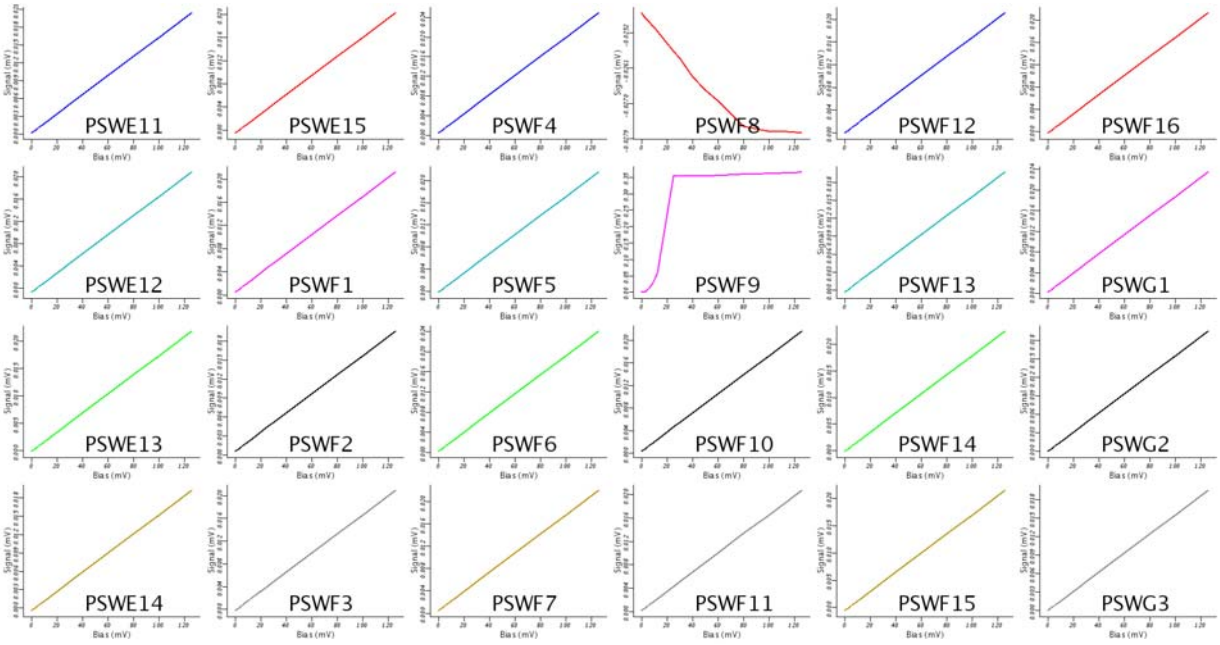


Figure 4. PSW Detectors (4)

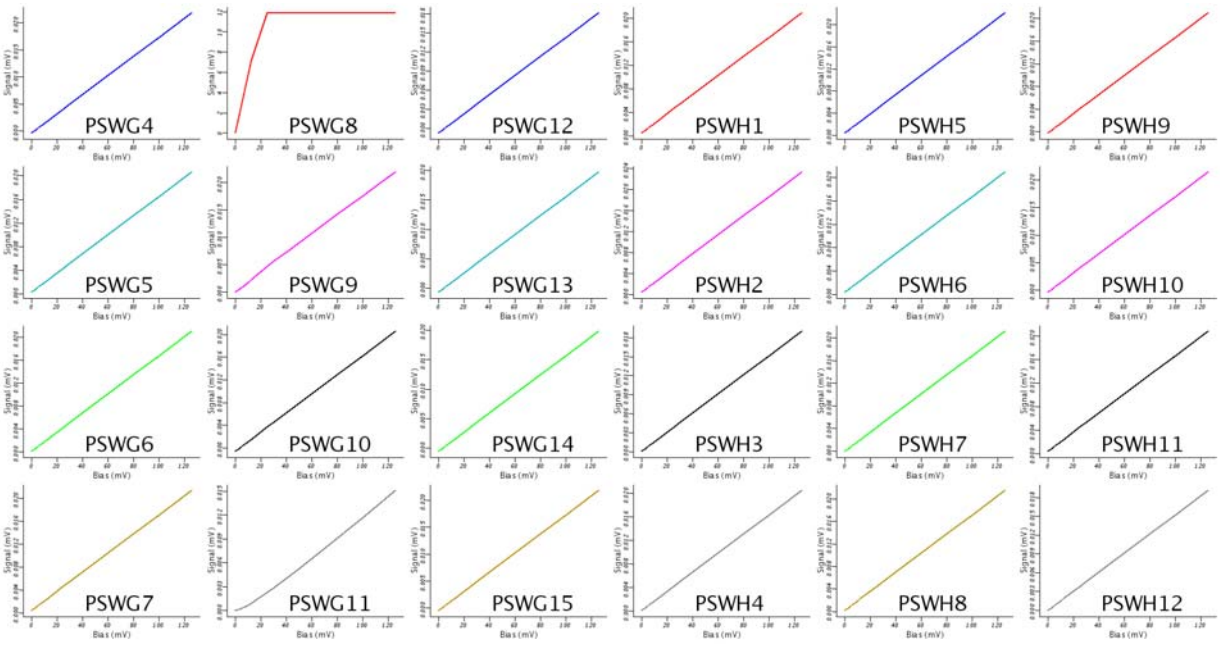


Figure 5. PSW Detectors (5)

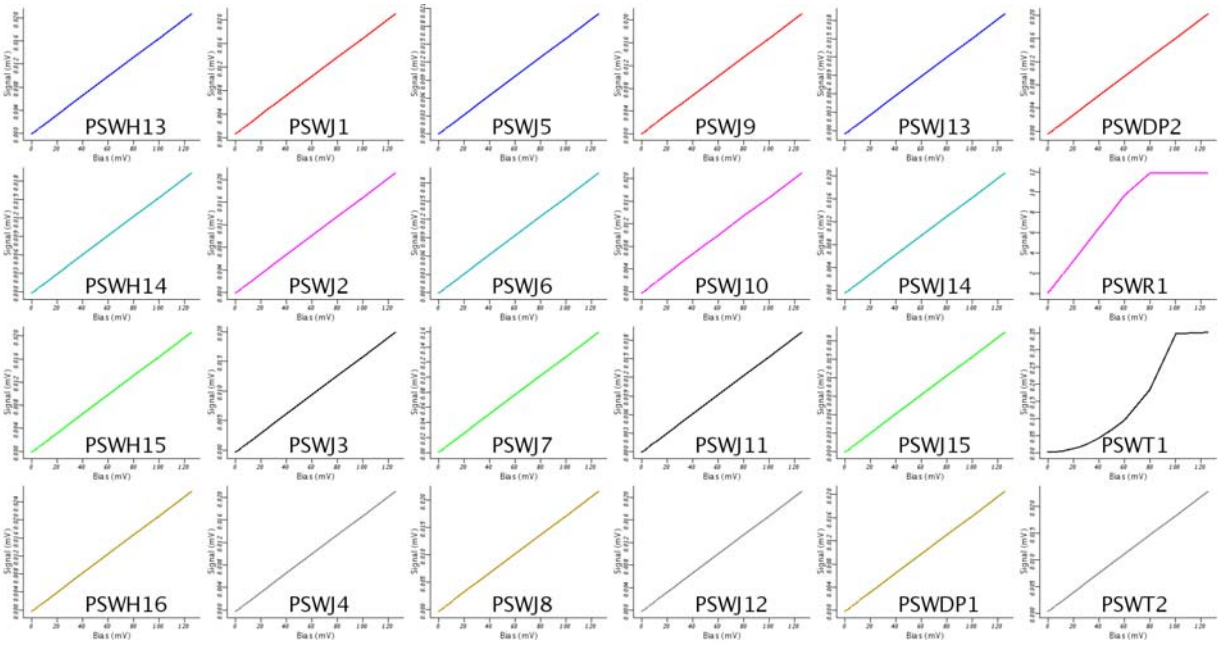


Figure 6. PSW Detectors (6)

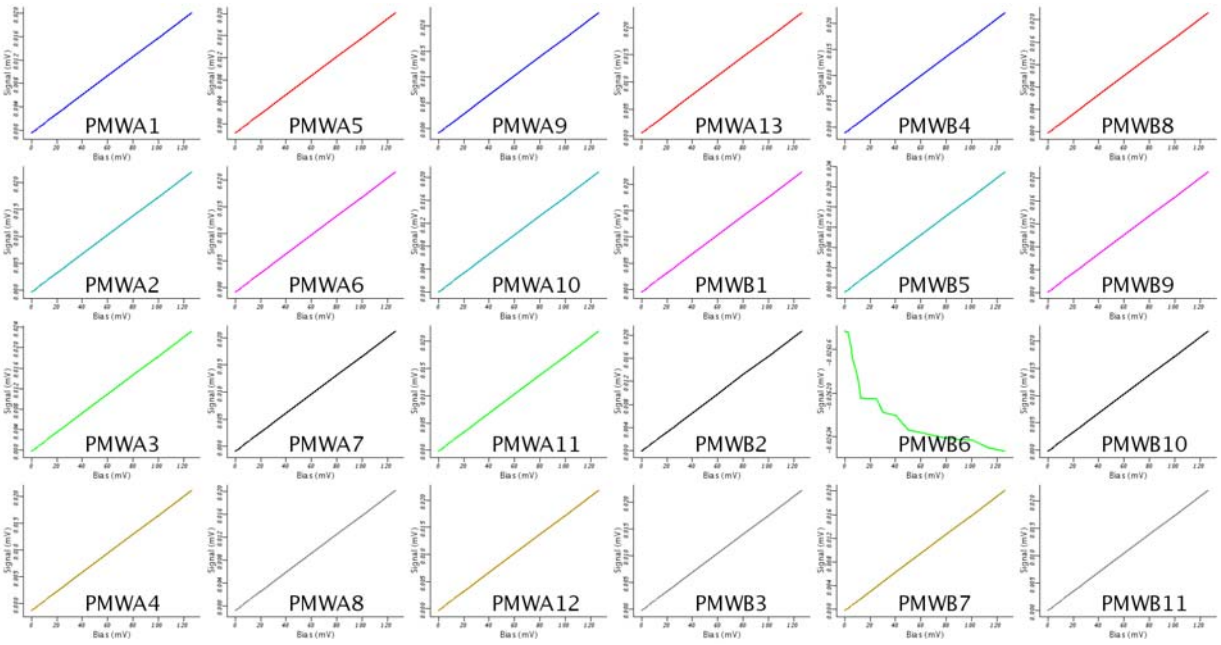


Figure 7. PMW Detectors (1)

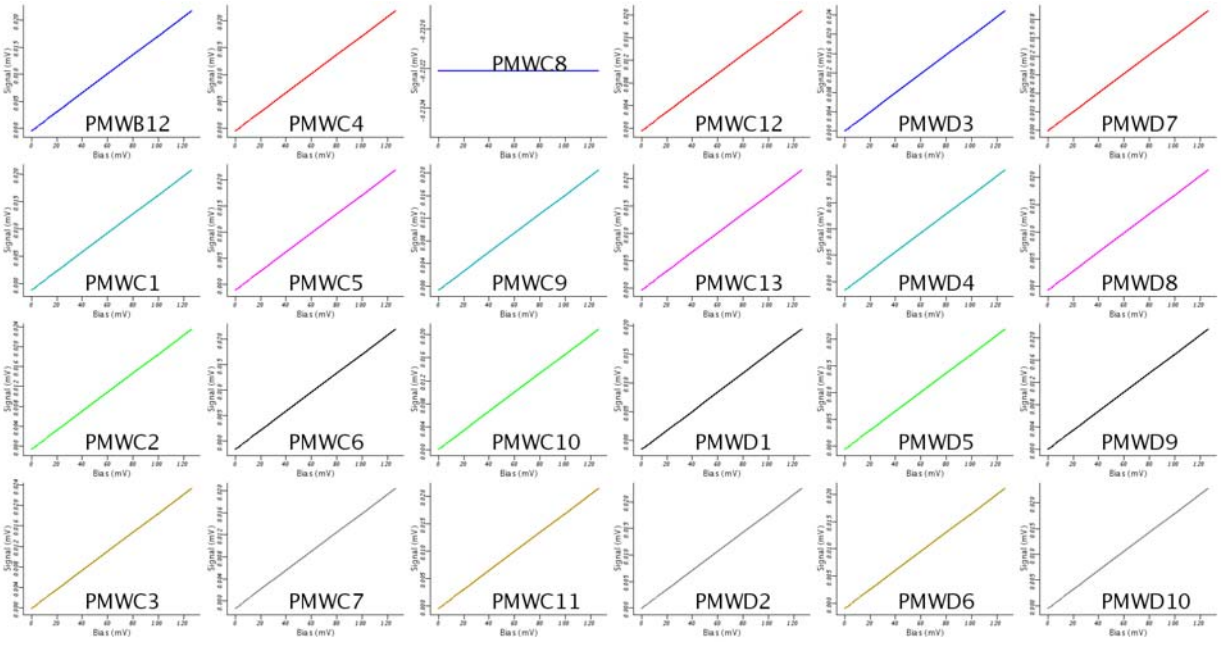


Figure 8. PMW Detectors (2)

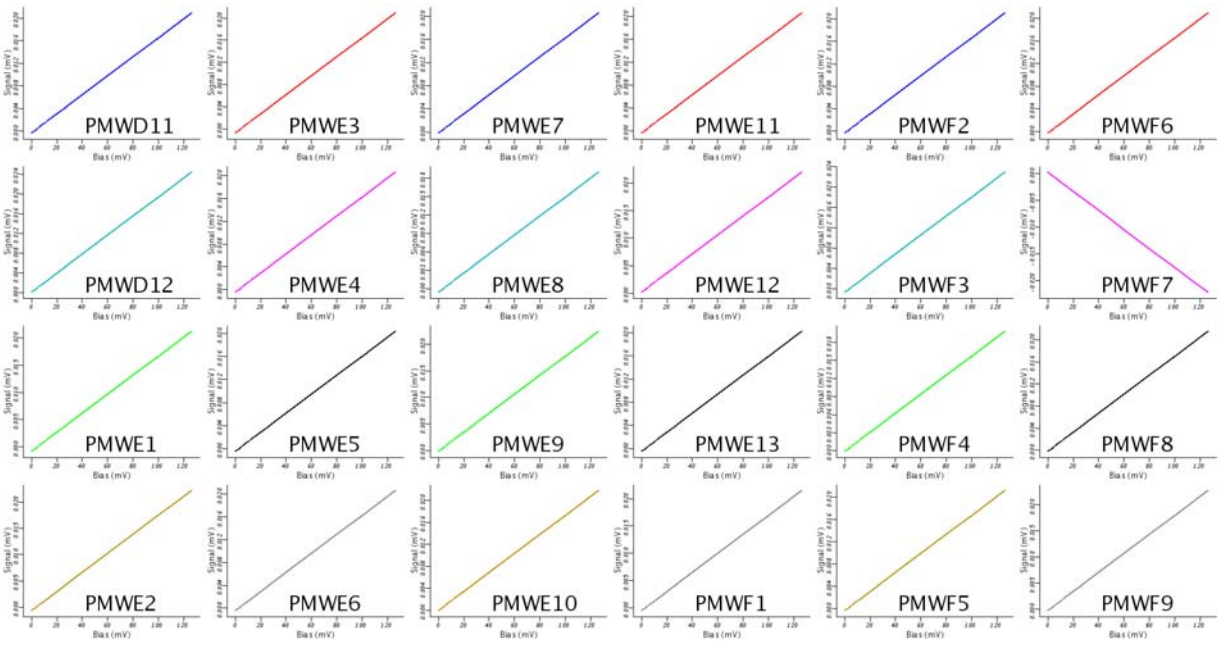


Figure 9. PMW Detectors (3)

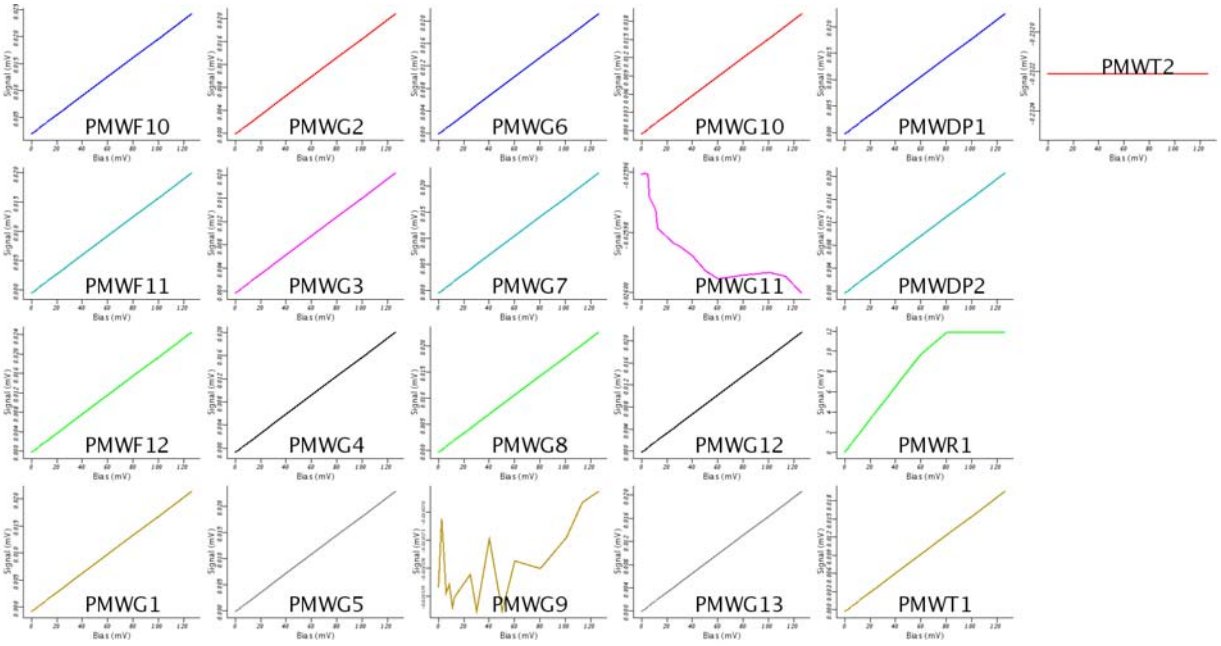


Figure 10. PMW Detectors (4)

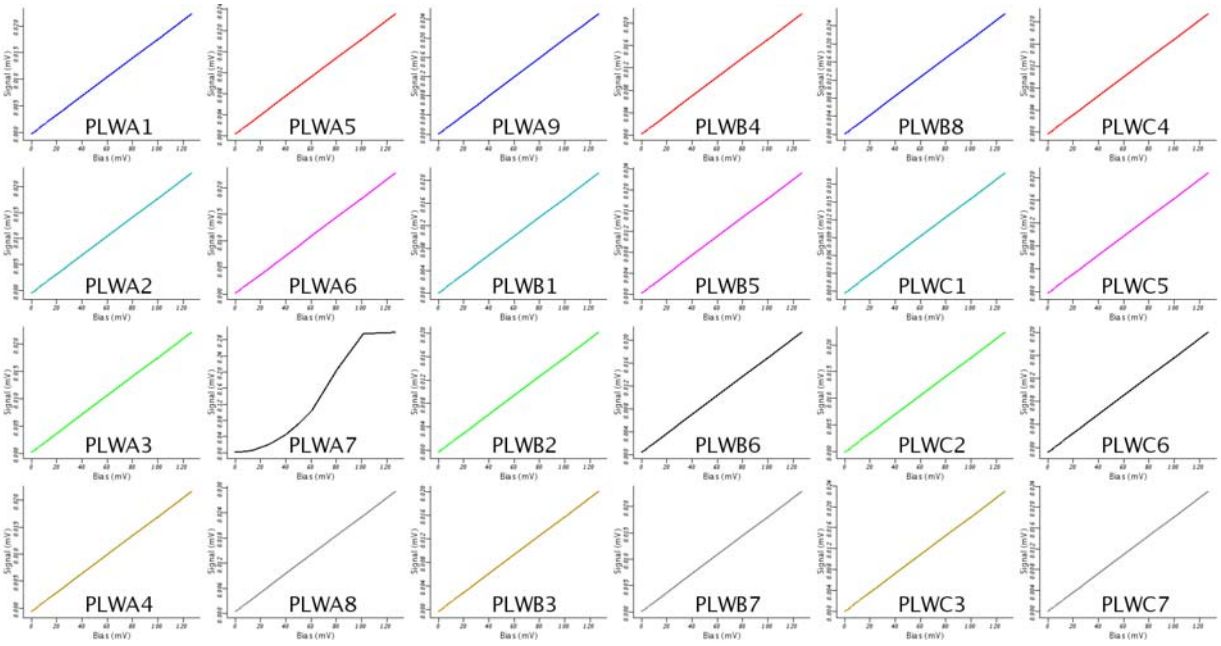


Figure 11. PLW Detectors (1)

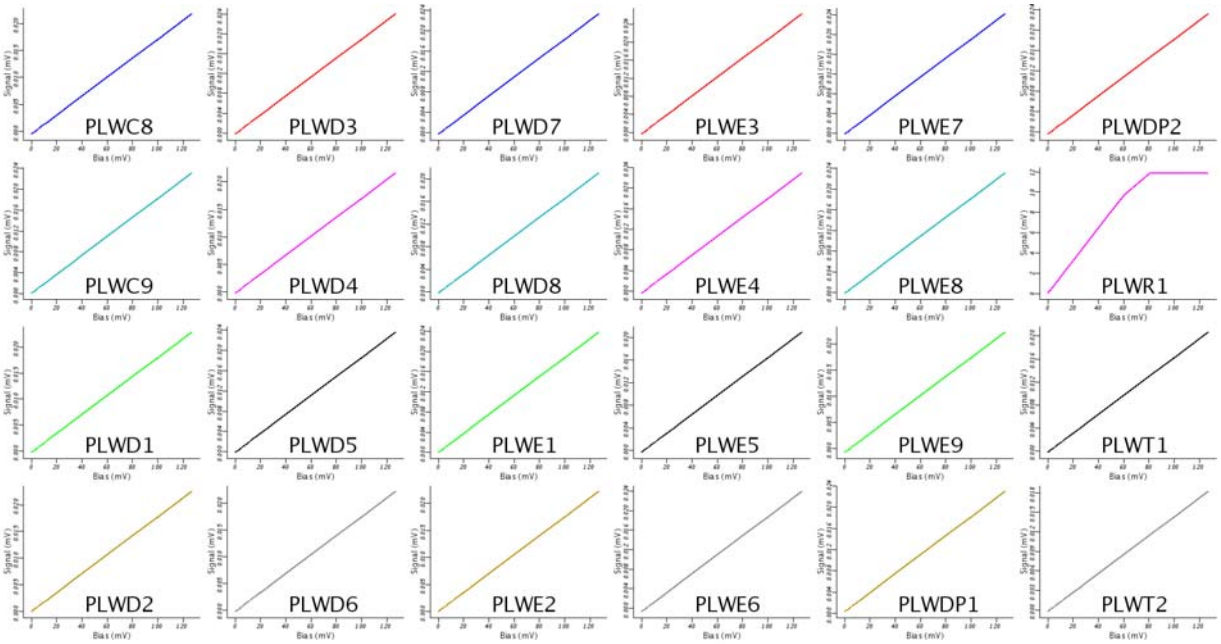


Figure 12. PLW Detectors (2)

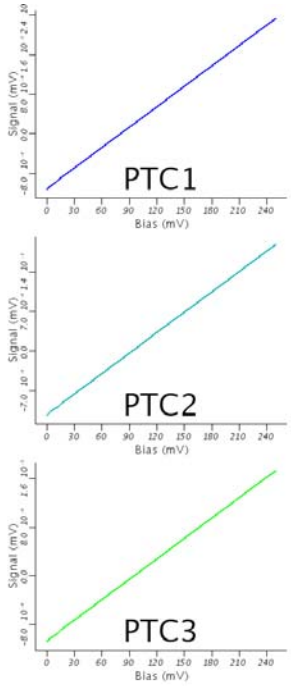


Figure 13. PTC Detectors (1)

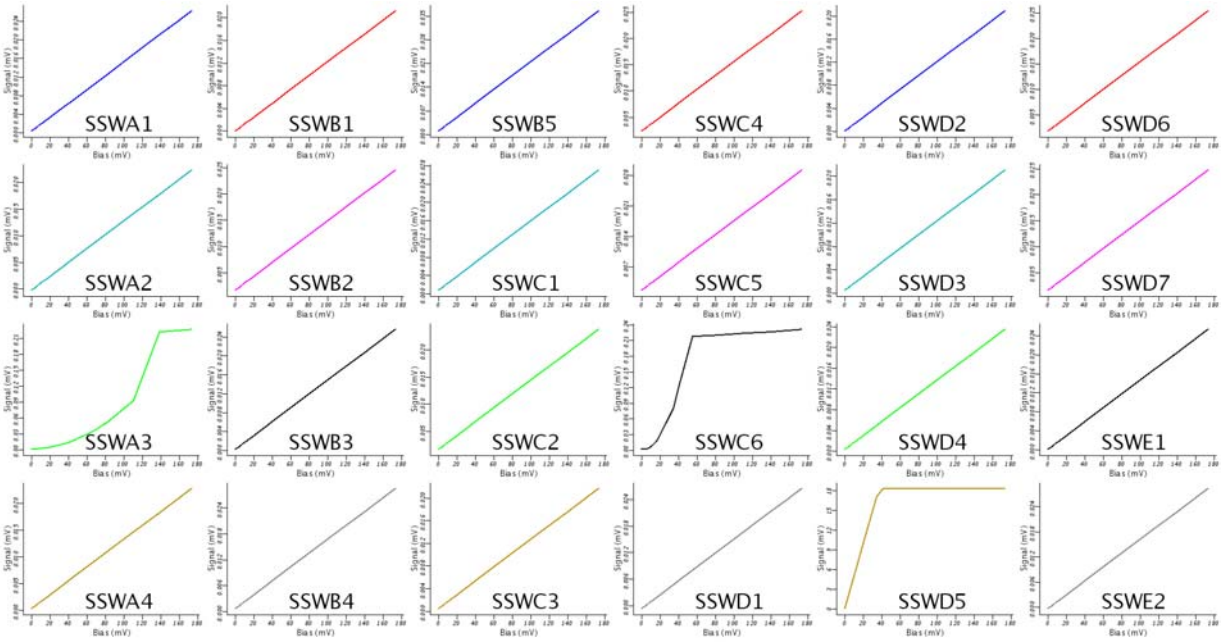


Figure 14. SSW Detectors (1)

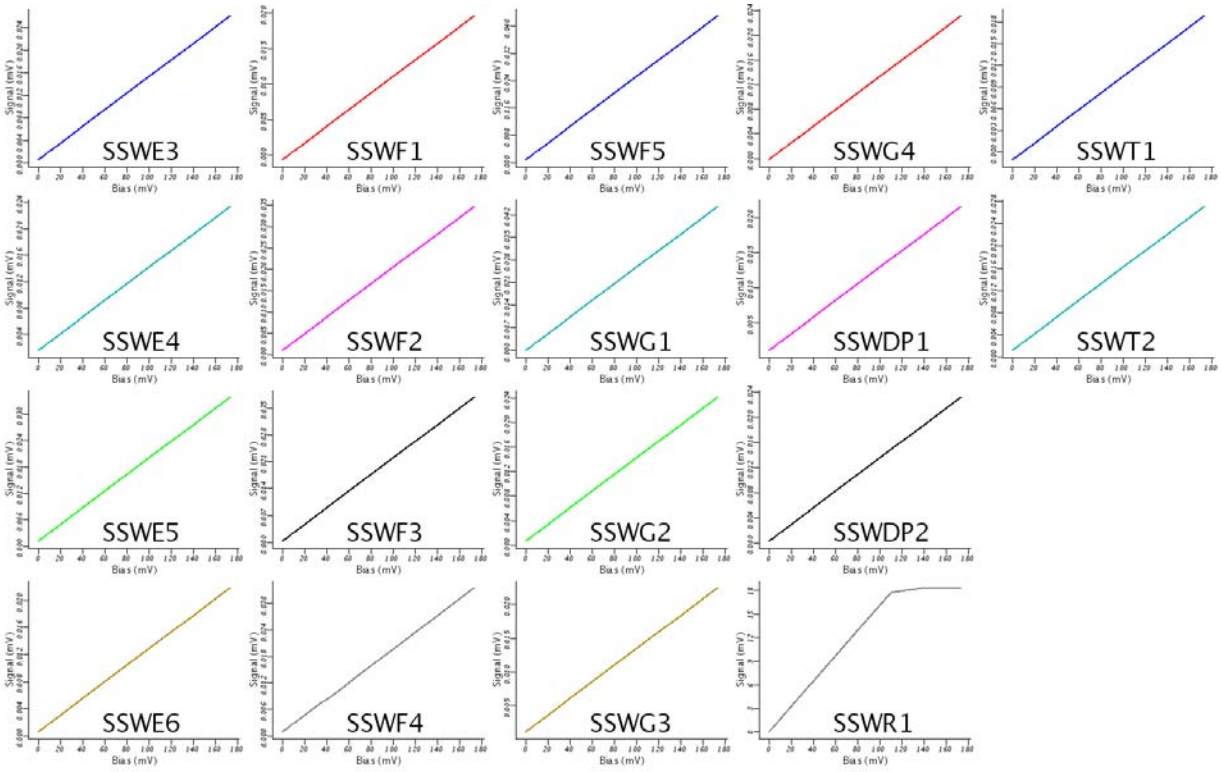


Figure 135. SSW Detectors (2)

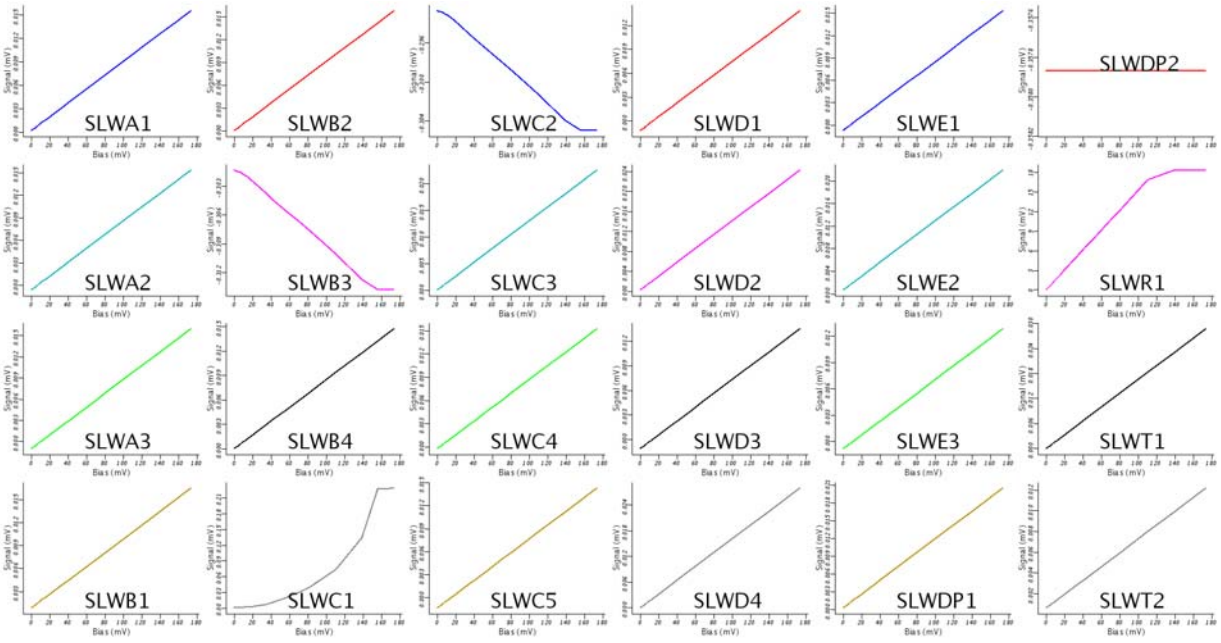


Figure 146. SLW Detectors (1)