



SPIRE Document

PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton

Ref: SPIRE-RAL-REP-002837
Issue: 1.0
Date: 05/02/2007
Page: 1 of 48

1. INTRODUCTION

This document reports on the cool functional tests performed on the SPIRE Redundant Flight Instrument on the 2nd February 2007 during the cooldown of 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/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
RD08		SPIRE ILT Functional Testing Overview	

1.3 Change Record

Document	Change date	Changes
Issue 1.0	05/02/07	Document created



TABLE OF CONTENTS

1.	Introduction.....	1
1.1	Scope	1
1.2	Reference Documents.....	1
1.3	Change Record	1
2.	Functional Tests Configuration.....	3
2.1	SPIRE Instrument Configuration (REDUNDANT).....	3
2.2	Software Configuration	3
2.3	EGSE Configuration Checks.....	4
3.	Test procedure.....	6
3.1	GENERAL PASS/FAIL CRITERIA.....	6
3.2	GENERAL TEST PROCEDURE LAYOUT.....	6
4.	Detailed Test Results on REDUNDANT instrument.....	7
4.1	FUNC-SCU-01	7
4.2	FUNC-SCU-03.....	9
4.3	FUNC-SCU-06.....	11
4.4	FUNC-SCU-07.....	12
4.5	FUNC-SCU-04.....	13
4.6	FUNC-SCU-05.....	14
4.7	FUNC-MCU-01.....	15
4.8	FUNC-MCU-02.....	16
4.9	FUNC-BSM-01	17
4.10	FUNC-BSM-03.....	18
4.11	FUNC-SMEC-03	20
4.12	FUNC-SMEC-01	22
4.13	FUNC-SMEC-04a	24
4.14	FUNC-SMEC-09	26
4.15	FUNC-SMEC-07	27
4.16	FUNC-DCU-01.....	30
4.17	FUNC-DCU-11P	33
4.18	FUNC-DCU-13P	35
4.19	FUNC-DCU-14P	36
4.20	FUNC-DCU-11S	37
4.21	FUNC-DCU-13S	38
4.22	FUNC-DCU-14S	39
5.	END TEST SEQUENCE.....	39
6.	APPENDIX 1. Instrument nominal configurations.....	40
7.	APPENDIX 2. Results of Load Curves	41



SPIRE Document

PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton

Ref: SPIRE-RAL-REP-002837
Issue: 1.0
Date: 05/02/2007
Page: 3 of 48

2. Functional Tests Configuration

2.1 SPIRE Instrument Configuration (REDUNDANT)

SPIRE FPU:

- FPU In Tank. (Spectrometer JFET Chassis ~ 90 K, Phot JFET Chassis ~ 90K)
- Cryostat under vacuum:
 - Pump Port Pressure = $\sim 1.3 \times 10^{-7}$ bar
 - Tank Top Pressure = $\sim 4.8 \times 10^{-7}$ bar
- DRCU to Cryostat harnesses connected (Grounding pins connected)
- Cryo-harness connected to FPU

SPIRE FM DPU:

- DPU Power supply connected on DPU Power MAIN (J01) connector (DPU side).
- 1553 Mil Bus connected on MAIN Connector Bus A (J03) connector (DPU side).
- DPU-DRCU warm interconnect harnesses (flight harnesses):
 - DPU J07 to DCU J01 *DPU to DCU PRIME*
 - DPU J08 to FCU J01 *DPU to MCU PRIME*
 - DPU J09 to FCU J03 *DPU to SCU PRIME*
 - DPU J10 to DCU J02 *DPU to DCU RED*
 - DPU J11 to FCU J02 *DPU to MCU RED*
 - DPU J12 to FCU J04 *DPU to SCU RED*

SPIRE FM DRCU:

- DRCU Power supply connected on DRCU Power MAIN (J05) connector (DRCU side on FCU).
- FCU to DCU PRIME power connectors J7 (FCU) to J03 (DCU) and FCU to DCU REDUNDANT power connectors J06 FCU to J04.

2.2 Software Configuration

The current EGSE software configuration for the PRIME instrument tests:

EGSE component	Version/Build number	Comment
SCOS2000	2.3eP5	Archive: PFM5_TEST1_REDUNDANT MIB : Redundant
HCSS	v0.4.1 Build# 1106	
QLA	v3.2	
QLA scripts		
Test Control scripts		
CUS Scripts	PFM5_CUS_DEFINITIONS_V1	
OBS	2.2.D	2.2.G has been acceptance tested but not yet installed on FM DPU



Boot Software	2.0	
---------------	-----	--

2.3 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	✓



The following checks were performed to verify the correct initial instrument configuration for the tests.

Step#	Action	Comments (Write any comments under this tab)	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 both are incrementing of only TM2N is incrementing , go to step 5. - If they are not, go to step 2.	TM2N is incrementing by 1 @ 1Hz TM1N is incrementing by 1 @ 0.5Hz Will go to step 5	✓
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.		
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 - If SCUP5V/P9V/M9V are jittering and BIAS_PARAMETERS display - If BIASTEMP shows 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.	SCU VOLTAGES LOOKING GOOD. SCUP5V = 5.22V SCUP9V = 9.08V SCUM9V = -9.10V BIAS VOLTAGES LOOKING GOOD. BIASP5V = 5.11V BIASP9V = 9.00V BIASM9V= -9.05V BIASTEMP LOOKING GOOD. BIASTEMP = 296.33K	✓
6	In SCOS open DPU_AND_OBS_PARAMETERS display and check that the MODE housekeeping parameter is DRCU_ON.	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 Short 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-07	Sorption Cooler Check
5		FUNC-SCU-04	Photometer Calibrator Check
6		FUNC-SCU-05	Spectrometer Calibrators Check
9	MCU	FUNC-MCU-01	MCU Boot Check
10		FUNC-MCU-02	MCU Nominal Science Generation Check
11	BSMm	FUNC-BSM-01	BSM Switch ON Check
12		FUNC-BSM-03	BSM Open Loop dynamics Check
13	SMECM	FUNC-SMEC-02A/B*	SMEC Launch Latch Open/Close Check
14		FUNC-SMEC-01	SMECM Switch ON Check
15		FUNC-SMEC-03	SMEC LED Integrity Check
16		FUNC-SMEC-04	SMEC Positioning Test (Open Loop)
17	DCU	FUNC-DCU-01	DCU Nominal Science Generation Check
18	Photometer LIAs	FUNC-DCU-04P	Photometer LIAs Check
19	Spectrometer LIAs	FUNC-DCU-04S	Spectrometer LIAs Check

Table 2. General Short WFT sequence



4. Detailed Test Results on REDUNDANT instrument.

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.
----------	---

4.1 FUNC-SCU-01

Test Id:	FUNC-SCU-01												
Initial Configuration:	DRCU_ON												
Final Configuration:	DRCU_ON												
Success Criteria:	<p>Test passed if :</p> <ol style="list-style-type: none"> Two SCU Nominal Science Report telemetry packets are received on QLA with the following characteristics: <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>APID</th> <th>Type</th> <th>Subtype</th> <th>SID</th> <th>FrameID</th> <th>Frame length</th> </tr> </thead> <tbody> <tr> <td>0x509</td> <td>21</td> <td>1</td> <td>0xA20</td> <td>0x20</td> <td>0x1E</td> </tr> </tbody> </table> <ol style="list-style-type: none"> 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 The SPIRE HK parameter SCUFRAMECNT increments by 31. No events are generated during the frame generation. <p>QLA to give go ahead.</p>	APID	Type	Subtype	SID	FrameID	Frame length	0x509	21	1	0xA20	0x20	0x1E
APID	Type	Subtype	SID	FrameID	Frame length								
0x509	21	1	0xA20	0x20	0x1E								

Test Procedure:

Step#	Action
1	Write 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
4	Write 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	Nb. of frames received	Test Result
FUNC-SCU-01	SCUFRAMECNT	n/ n+ 31	0/ 31	31	Success



SPIRE Document

Ref: SPIRE-RAL-REP-002837
Issue: 1.0
Date: 05/02/2007
Page: 8 of 48

PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton

Start time @: 10:37
End time @: 10:38
OBSID: 0x30012029
Comments:

SCU: OBSID = 30012029, BBTYPE = 0x8000, APID = 0x509, SID = 0xa20

Parameter	Initial	Final	Increment	Expect	Incre.	Packet Chars.
SCUFRAMECNT	0	31	31	31		Packet type = 0x15
TM5N	16383	1	49153	2		subtype = 0x1
FrameTime	12.4960	12.4992				Frame ID = 0x20 Frame Len = 0x1E

STATISTICS ON TIME BETWEEN RECEPTION OF 2 CONSECUTIVE FRAMES:
mean = 12.49792 ms
sigma = 0.00160 ms



SPIRE Document

Ref:	SPIRE-RAL-REP-002837
Issue:	1.0
Date:	05/02/2007
Page:	9 of 48

**PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton**

4.2 FUNC-SCU-03

Test Id:	FUNC-SCU-03
Initial Configuration:	DRCU_ON
Final Configuration:	DRCU_ON + DC thermometry ON
Success Criteria:	<p>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.</p> <p>Open Circuit Criterion: RAW reading in the range [0, -100]</p> <p>Short Circuit Criterion: RAW reading of -32768</p> <p>Note: All calibration with an upper limit of T > ~ 80K are likely to show short circuit readings</p>

Test Procedure:

Step#	Action
1	Record all 16 FPU temperatures on the log
2	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	0/0xFFFF	0xFFFF/0xFFFF	N/A	Success



SPIRE Document

PFM5 80K SHORT FUNCTIONAL TEST REPORT Redundant Side

A.A.Aramburu / E. T. Polehampton

Ref: SPIRE-RAL-REP-002837
Issue: 1.0
Date: 05/02/2007
Page: 10 of 48

Start time @: 10:39

End time @: 10:40

OBSID: 0x3001202A

Comments:

SCU-03 Thermometry Check
OBSID = 0x3001202a

PUMPHTRTEMP	50.09	32768
PUMPHSTEMP	36.42	32768
EVAPHSTMP	39.25	32768
SHUNTTEMP	18.05	32768
EMCFILTMP	77.63	52148
SL0TEMP	19.89	32768
PL0TEMP	22.52	32768
OPTTEMP	77.40	43218
BAFTEMP	78.34	45581
BSMIFTEMP	77.45	39338
SCAL2TEMP	76.42	44562
SCAL4TEMP	76.61	42250
SCALTEMP	83.15	32768
SMECIFTEMP	74.76	42002
SMECTEMP	27.28	32768
BSMTEMP	13.13	32768



SPIRE Document

Ref:	SPIRE-RAL-REP-002837
Issue:	1.0
Date:	05/02/2007
Page:	11 of 48

**PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton**

4.3 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
1	Record the current value of SUBKTEMP channel on the log
3	Contingency: If test fails : <ol style="list-style-type: none"> 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	0/1	1/1	N/A	Success

Start time @: 10:42
End time @: 10:43
OBSID: 0x3001202B
Comments:

FPU TEMP	TEMP(K)	TEMP(RAW)
Subktemp	~ 80K	Before:32767 After :32767

Note: The behaviour is as in PFM4, the raw value of the SUBKTEMP does not change on the redundant when is switched ON at this temperature. Despite this , the channel works fine.



4.4 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:	<p>Test passed if during the execution of the test the following SCU HK parameters give correspondent readings of:</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>SCU HK parameter</th> <th>RAW</th> <th>Converted</th> </tr> </thead> <tbody> <tr> <td>SPHSV</td> <td>~12715</td> <td>~323mV</td> </tr> <tr> <td>EVHSV</td> <td>~12715</td> <td>~323mV</td> </tr> <tr> <td>SPHTRV</td> <td>~14390</td> <td>~ 8 V</td> </tr> </tbody> </table>	SCU HK parameter	RAW	Converted	SPHSV	~12715	~323mV	EVHSV	~12715	~323mV	SPHTRV	~14390	~ 8 V
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.
2	While the test is running Write 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	0/323.21mV 0/324.25mV 0/8.85V	N/A	Success

Start time @: 12:58

End time @: 12:59

OBSID: N/A

Comments:

As the pump heater is already at full power running as backup for the failed heater did manually check the correct functioning of the Pump/Evaporator heat switched by sending commands:

Switch ON Pump Heat Switch (half bias) : SEND_DRCU_COMMAND(0xA0C40800,0)
 Switch OFF Pump Heat Switch : SEND_DRCU_COMMAND(0xA0C40800,0)
 Switch ON Evap Heat Switch (half bias) : SEND_DRCU_COMMAND(0xA0C50800,0)
 Switch OFF Evap Heat Switch : SEND_DRCU_COMMAND(0xA0C40800,0)

The voltages read are recorder on the 'actual' values box up.



SPIRE Document

Ref:	SPIRE-RAL-REP-002837
Issue:	1.0
Date:	05/02/2007
Page:	13 of 48

**PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton**

4.5 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: <ul style="list-style-type: none"> 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	Write 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 Write 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/ During test	Nb. of frames received	Test Result
FUNC-SCU-04	PCALCURR PCALV	0/0.1mA 0/0.02V	0/0.1008mA 0/0.0191V	N/A	Success

Start time @: 10:45
End time @: 10:46
OBSID: 0x30012002C
Comments:



SPIRE Document

Ref:	SPIRE-RAL-REP-002837
Issue:	1.0
Date:	05/02/2007
Page:	14 of 48

**PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton**

4.6 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 : <ul style="list-style-type: none"> • 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	Write 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	0/0.0998mA 0/0.0500V 0/0.1016mA 0/0.0508V	N/A	Success

Start time @: 10:46
End time @: 10:48
OBSID: 0x30012002D
Comments:



SPIRE Document

Ref: SPIRE-RAL-REP-002837
Issue: 1.0
Date: 05/02/2007
Page: 15 of 48

PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton

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

4.7 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: <ol style="list-style-type: none"> 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 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 MCUBSMTEMP MCUSMECTEMP	N/A / ~ 5V N/A / ~15V N/A / ~ 14V N/A / ~ -14V N/A / ~ -15V N/A / ~ 300K	/ 5.01V / 15.50V / 14.13V / -14.49V / -15.63V / 293.75 K / 298.22 K / 295.65 K	N/A	Success

Start time @: 10:50

End time @: 10:

OBSID: 0x3001202E

Comments:

MCU Powered ON I = 0.83

MCU Booted I = 0.89

MCU Booted properly.



4.8 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:	<p>Test passed if :</p> <ol style="list-style-type: none"> MCU produces each type of the frames requested and with the following characteristics. <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Frame</th> <th>APID</th> <th>Type</th> <th>Subtype</th> <th>SID</th> <th>FrameID</th> <th>Frame length</th> </tr> </thead> <tbody> <tr> <td>Eng.</td> <td>0x509</td> <td>21</td> <td>3</td> <td>0x814</td> <td>0x14</td> <td>0x15</td> </tr> <tr> <td>BSM</td> <td>0x509</td> <td>21</td> <td>1</td> <td>0x612</td> <td>0x12</td> <td>0xD</td> </tr> <tr> <td>SMEC</td> <td>0x509</td> <td>21</td> <td>1</td> <td>0x410</td> <td>0x10</td> <td>0xC</td> </tr> <tr> <td>BSM +SMEC</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <ol style="list-style-type: none"> No events are generated during the different frames generation. 	Frame	APID	Type	Subtype	SID	FrameID	Frame length	Eng.	0x509	21	3	0x814	0x14	0x15	BSM	0x509	21	1	0x612	0x12	0xD	SMEC	0x509	21	1	0x410	0x10	0xC	BSM +SMEC						
Frame	APID	Type	Subtype	SID	FrameID	Frame length																														
Eng.	0x509	21	3	0x814	0x14	0x15																														
BSM	0x509	21	1	0x612	0x12	0xD																														
SMEC	0x509	21	1	0x410	0x10	0xC																														
BSM +SMEC																																				

Test Procedure:

Step#	Action
1	Write 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 Write 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	0 / ~ 6600	0 / 6493		Success
Start time @: 11:00 End time @: 11: 02 OBSID: 0x3001202F Comments:					



SPIRE Document

Ref: SPIRE-RAL-REP-002837
Issue: 1.0
Date: 05/02/2007
Page: 17 of 48

**PFM5 80K SHORT FUNCTIONAL TEST REPORT
 Redundant Side
 A.A.Aramburu / E. T. Polehampton**

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

4.9 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: <ol style="list-style-type: none"> 1. CHOPSENSPWR HK parameter goes from 0 to 1 2. CHOPSENSIG HK parameter shows variation from off to on 3. JIGGSENSPWR HK parameter goes from 0 to 1 4. JIGGSENSSIG HK parameter shows variation from off to on

Test Procedure

Step#	Action
1	Run FUNC-BSM-01.py script on QLA
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 below
	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 CHOPSENSSIG JIGGSENSPWR JIGGLOOPMODE JIGGSENSSIG	0/1 3/3 0/? 0/1 3/3 0/?	0/1 3/3 0x7FED/~ 0xA156 0/1 3/3 0x7FE4/0x90d0	N/A	Success

Start time @:11:05

End time @:11:06

OBSID:0x30012030

Comments:

BSM switched ON normally



4.10 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
1	Run FUNC-BSM-03.py script on QLA
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	Success



SPIRE Document

Ref: SPIRE-RAL-REP-002837
Issue: 1.0
Date: 05/02/2007
Page: 19 of 48

**PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side**

A.A.Aramburu / E. T. Polehampton

Start time @: 11:08

End time @: 11:13

OBSID: 0x30012031

Comments:

Run the test with the following parameters:

BSM sampling 64Hz

Chop start position = 0x1000

Chop end position = 0xf000

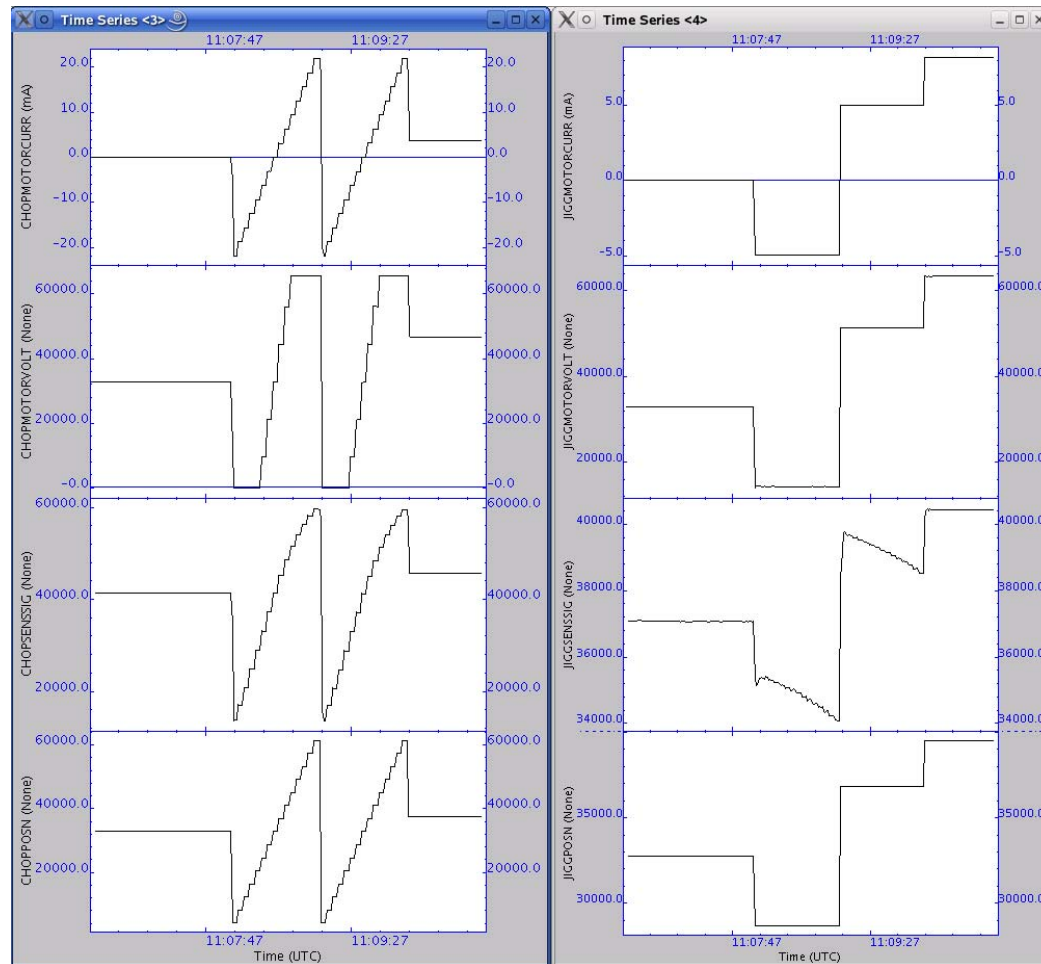
Chop step = 0x1000

Jigg start position = 0x7000

Jigg end position = 0x9000

Jigg step = 0x2000

T at each position = 3 sec



Step#	Action	Comments
4	Execute BSM_OFF from HCSS Test Procedures	14:18 Obsid: 0x3001200F



SPIRE Document

Ref:	SPIRE-RAL-REP-002837
Issue:	1.0
Date:	05/02/2007
Page:	20 of 48

**PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton**

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

4.11 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 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	Nb. of frames received	Test Result
FUNC-SMEC-03	SMECENCPWR SMECENC SIG1 SMECENC SIG2		Values changed from 3 to 6 as expected	Not relevant	Success



SPIRE Document

PFM5 80K SHORT FUNCTIONAL TEST REPORT Redundant Side

A.A.Aramburu / E. T. Polehampton

Ref: SPIRE-RAL-REP-002837
Issue: 1.0
Date: 05/02/2007
Page: 21 of 48

Start time @: 11:14

End time @: 11:15

OBSID: 0x30012033

Comments:

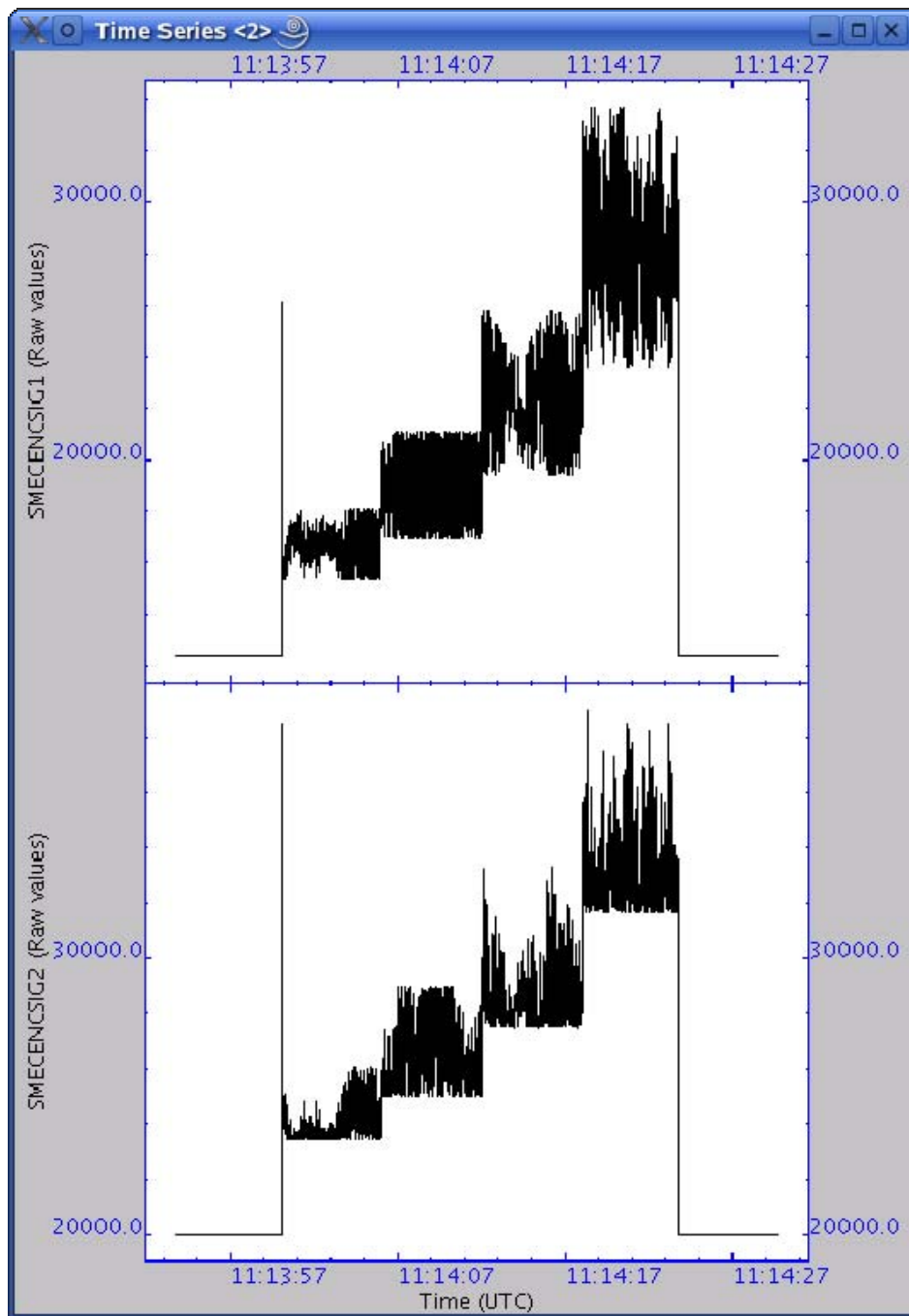
Input parameters for TOPE script:

Start level = 3

End level = 6

Step level = 1

T at each level = 5





SPIRE Document

Ref:	SPIRE-RAL-REP-002837
Issue:	1.0
Date:	05/02/2007
Page:	22 of 48

**PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton**

4.12 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 : <ol style="list-style-type: none"> 1. SMECENCPWR HK parameter changes from 0 to 6. 2. SMEC encoder signals 1 and 2 level show variation when encoder is switched ON. 3. SMEC LVDT is switched ON. (SMECLVDTPWR HK parameter goes from 0 to 1) 4. SMEC LVDT DC and AC signals show variation when LVDT is switched ON.

Test Procedure:

Step#	Action
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	Nb. of frames received	Test Result
FUNC-SMEC-01	SMECENCPWR SMECLVDTPWR SMECENC SIG1 SMECENC SIG2		0/ 6 0/ 1 0xFFFF ~ 0xF000	N/A	Success



SPIRE Document

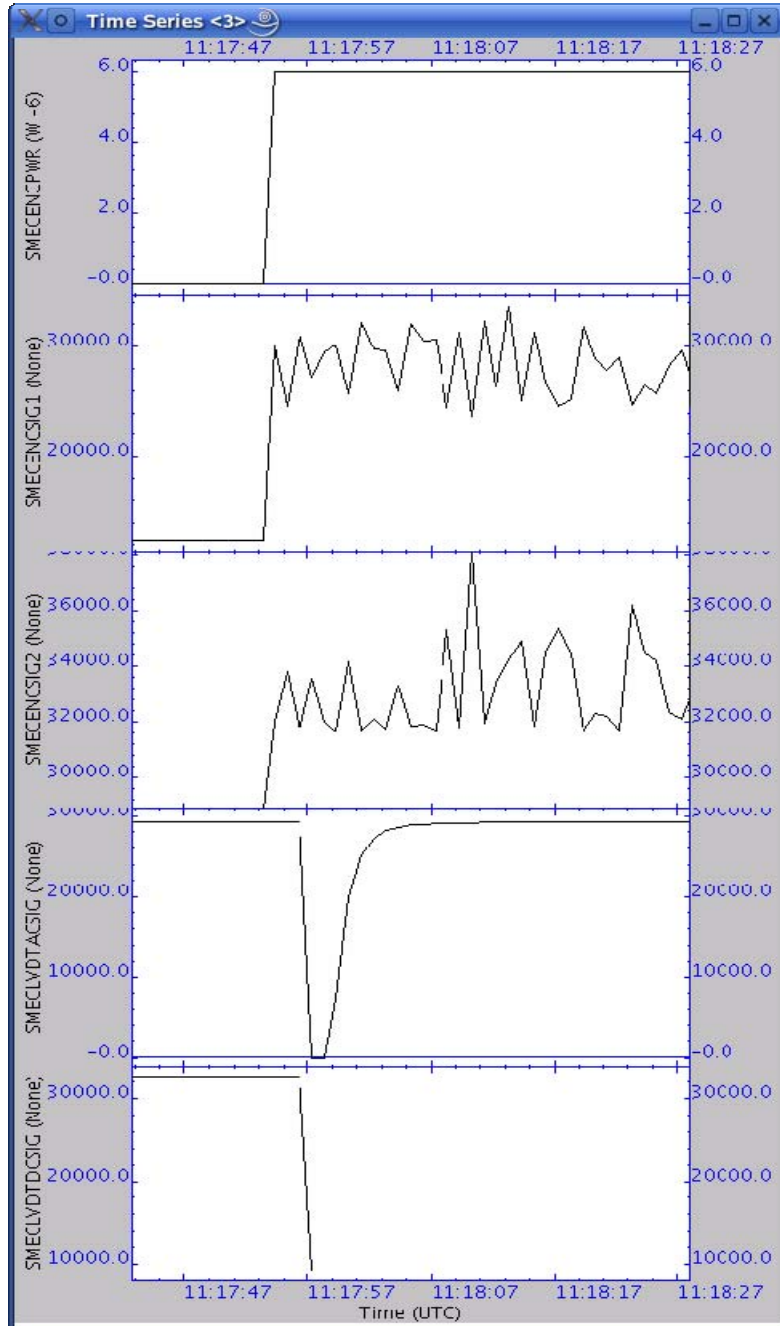
PFM5 80K SHORT FUNCTIONAL TEST REPORT Redundant Side

A.A.Aramburu / E. T. Polehampton

Ref: SPIRE-RAL-REP-002837
Issue: 1.0
Date: 05/02/2007
Page: 23 of 48

Start time @: 11:18
End time @: 11:19
OBSID: 0x30012034
Comments:

Will manually reset the offset signals1 and 2 in order to make the encoder start counting
SEND_DRCU_COMMAND(0x90586D60,0)
SEND_DRCU_COMMAND(0x905A80E8,0)





SPIRE Document

**PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton**

Ref:	SPIRE-RAL-REP-002837
Issue:	1.0
Date:	05/02/2007
Page:	24 of 48

4.13 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
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	Nb. of frames received	Test Result
FUNC-SMEC-04a	SMECLVDTDCSIG				Success



SPIRE Document

PFM5 80K SHORT FUNCTIONAL TEST REPORT Redundant Side

A.A.Aramburu / E. T. Polehampton

Ref: SPIRE-RAL-REP-002837
Issue: 1.0
Date: 05/02/2007
Page: 25 of 48

Start time @: 11:23

End time @: 11:26

OBSID: 0x30012035

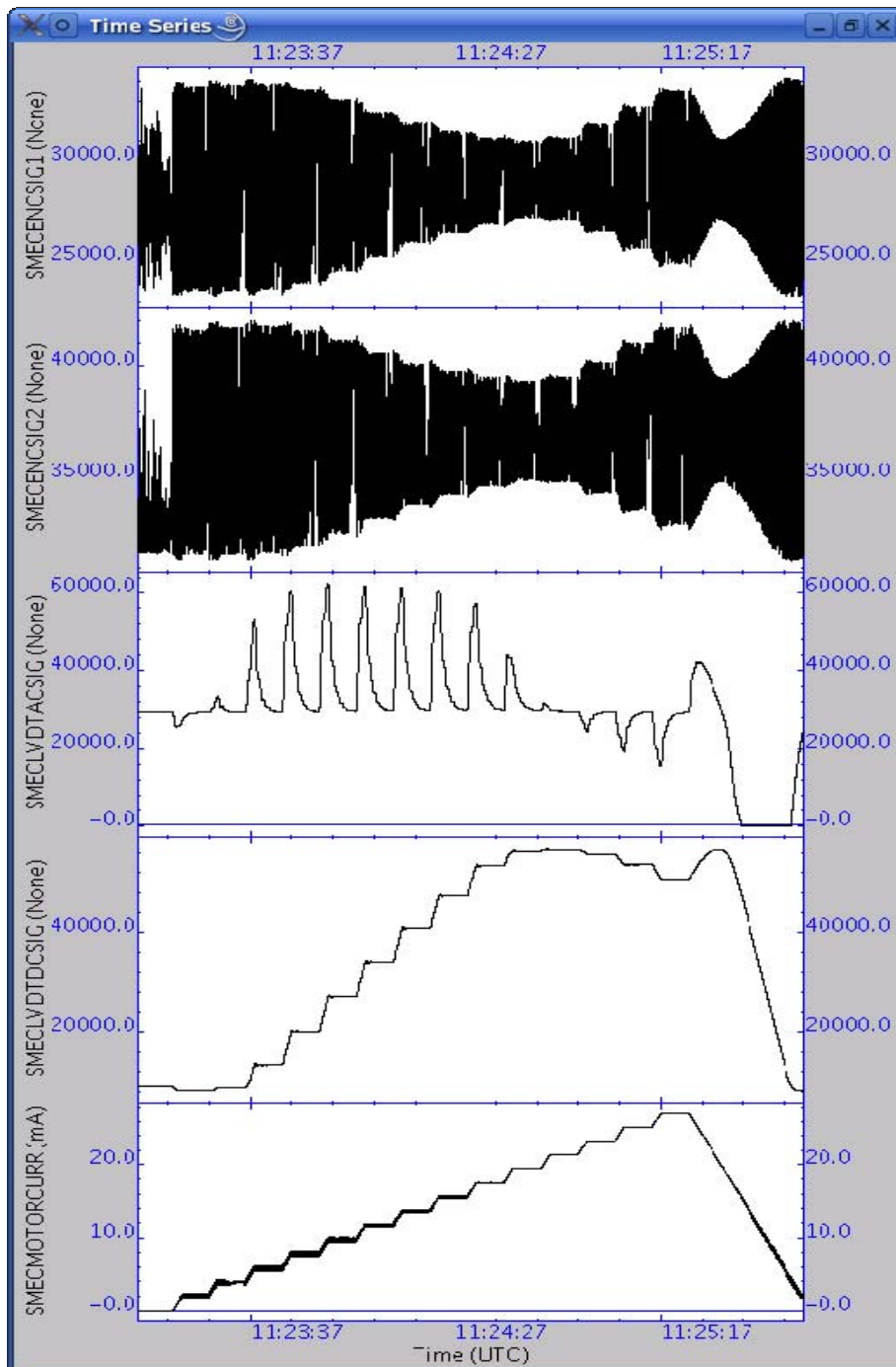
Comments:

Scan start = 1 mm

Scan end = 15 mm

Scan step = 1 mm

Speed = 0.5 mm/s





4.14 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	SMECENCPOSN	N/A	N/A	N/A	Success
<p>Start time @: 11:32 End time @: 11:35 OBSID: 0x30012036 Comments:</p> <p>Manually adjusted offsets: Signal 1 offset = 0x90587148 Signal 1 offset = 0x905A9088</p> <p>Start point = 1 mm, End point = 25 mm, Speed = 0.5 mm/s (forward/revers) Scans. = 2</p>					



SPIRE Document

Ref:	SPIRE-RAL-REP-002837
Issue:	1.0
Date:	05/02/2007
Page:	27 of 48

**PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton**

Step#	Action	Comments
0	Execute SMEC_INIT from HCSS Test Procedures Input parameter = warm	11:40 Obsid: 0x30012037

4.15 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 (close loop)
Final Configuration:	DRCU_ON + AC/DC thermometry ON+MCU ON+ SMEC ON (close 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	SMECENCPOSN	N/A	N/A	N/A	Success



SPIRE Document

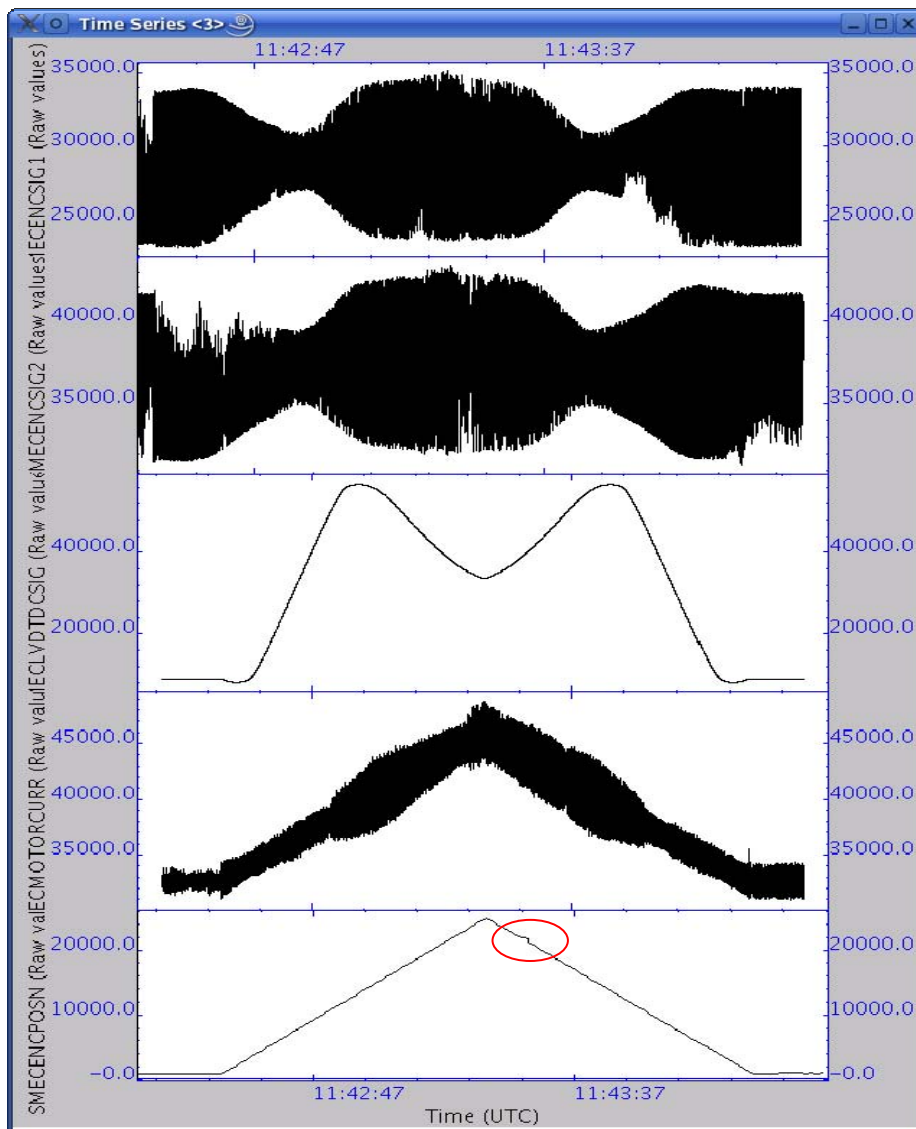
PFM5 80K SHORT FUNCTIONAL TEST REPORT Redundant Side

A.A.Aramburu / E. T. Polehampton

Ref: SPIRE-RAL-REP-002837
Issue: 1.0
Date: 05/02/2007
Page: 28 of 48

Start time @: 11:42
End time @: 11:45
OBSID: 0x30012038
Comments:

Start point = 1 mm,
End point = 25 mm,
Speed = 0.5 mm/s (forward/revers)
Scans = 2



Note: A lost of counts on the encoder can be appreciated on the 'down' scan which is correlated to SIG2 missing fringes



SPIRE Document

Ref: SPIRE-RAL-REP-002837
Issue: 1.0
Date: 05/02/2007
Page: 29 of 48

PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton

Step#	Action	Comments
4	Execute SMEC_OFF from HCSS Test Procedures	11:51 Obsid: 0x30012039



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

4.16 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:	<p>Test passed if:</p> <ol style="list-style-type: none"> DCU produces each type of DCU nominal science frame with the following characteristics. <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>APID</th> <th>Type</th> <th>S.type</th> <th>SID</th> <th>Frame ID</th> <th>Frame type</th> <th>Nb. Of frames</th> <th>Nb. of pkts.</th> </tr> </thead> <tbody> <tr> <td>0x505</td> <td>21</td> <td>1</td> <td>0x200</td> <td>0</td> <td>PF</td> <td>100</td> <td>100</td> </tr> <tr> <td>0x507</td> <td>21</td> <td>1</td> <td>0x201</td> <td>1</td> <td>SF</td> <td>100</td> <td>17</td> </tr> <tr> <td>0x505</td> <td>21</td> <td>2</td> <td>0x102</td> <td>2</td> <td>PSW</td> <td>100</td> <td>34</td> </tr> <tr> <td>0x505</td> <td>21</td> <td>2</td> <td>0x103</td> <td>3</td> <td>PMW</td> <td>100</td> <td>25</td> </tr> <tr> <td>0x505</td> <td>21</td> <td>2</td> <td>0x104</td> <td>4</td> <td>PLW</td> <td>100</td> <td>12</td> </tr> <tr> <td>0x507</td> <td>21</td> <td>2</td> <td>0x105</td> <td>5</td> <td>SSW</td> <td>100</td> <td>12</td> </tr> <tr> <td>0x507</td> <td>21</td> <td>2</td> <td>0x106</td> <td>6</td> <td>SLW</td> <td>100</td> <td>7</td> </tr> </tbody> </table> <ol style="list-style-type: none"> The frame time difference between consecutive DCU frames of each type corresponds to the sampling rate. Photometer Sampling rate is 15.3Hz → Δt ~ 65.5 ms Spectrometer Sampling rate is 80Hz → Δt = 12.5 ms The SPIRE HK parameter DCUFRAMECNT increments by 700. No events are generated during the frames generation. 	APID	Type	S.type	SID	Frame ID	Frame type	Nb. Of frames	Nb. of pkts.	0x505	21	1	0x200	0	PF	100	100	0x507	21	1	0x201	1	SF	100	17	0x505	21	2	0x102	2	PSW	100	34	0x505	21	2	0x103	3	PMW	100	25	0x505	21	2	0x104	4	PLW	100	12	0x507	21	2	0x105	5	SSW	100	12	0x507	21	2	0x106	6	SLW	100	7
APID	Type	S.type	SID	Frame ID	Frame type	Nb. Of frames	Nb. of pkts.																																																										
0x505	21	1	0x200	0	PF	100	100																																																										
0x507	21	1	0x201	1	SF	100	17																																																										
0x505	21	2	0x102	2	PSW	100	34																																																										
0x505	21	2	0x103	3	PMW	100	25																																																										
0x505	21	2	0x104	4	PLW	100	12																																																										
0x507	21	2	0x105	5	SSW	100	12																																																										
0x507	21	2	0x106	6	SLW	100	7																																																										

Test Procedure:

Step#	Action
1	Write the current value of DCUFRAMECNT located d in DCU PARAMETERS AND
2	Run FUNC-DCU-01.py script on QLA
3	Run FUNC-DCU-01 test procedure from the HCSS Test Procedure window on TOPE
4	Write the current value of DCUFRAMECNT located d in DCU PARAMETERS AND
5	Contingency: If test fails repeat steps 1 to 3.



SPIRE Document

PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton

Ref: SPIRE-RAL-REP-002837
Issue: 1.0
Date: 05/02/2007
Page: 31 of 48

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	5986/ 6686	700	Success



SPIRE Document

PFM5 80K SHORT FUNCTIONAL TEST REPORT Redundant Side A.A.Aramburu / E. T. Polehampton

Ref: SPIRE-RAL-REP-002837
Issue: 1.0
Date: 05/02/2007
Page: 32 of 48

Start time @: 11:51
End time @: 11:55
OBSID: 0x3001203A
Comments:

PHOTF: OBSID = 3001203A, BBTYP E = 0x8800, APID = 0x505, SID = 0x200

Parameter	Initial	Final	Increment	Expect	Incr.	Packet Chars.
DCUFRAMECNT	5986	6086	100	100		Packet type = 0x15
TM3N	5985	6085	100	100		subtype = 0x1
FrameTime	53.7568	53.7600				Frame ID = 0x0 Frame Len = 0x126

STATISTICS ON TIME BETWEEN RECEPTION OF 2 CONSECUTIVE FRAMES:
mean = 53.75877 ms
sigma = 0.00151 ms

PHOTSW: OBSID = 3001203A, BBTYP E = 0x8802, APID = 0x505, SID = 0x102

Parameter	Initial	Final	Increment	Expect	Incr.	Packet Chars.
DCUFRAMECNT	6086	6186	100	100		Packet type = 0x15
TM3N	6085	6119	34	34		subtype = 0x2
FrameTime	53.7600	53.7600				Frame ID = 0x2 Frame Len = 0x96

STATISTICS ON TIME BETWEEN RECEPTION OF 2 CONSECUTIVE FRAMES:
mean = 53.75880 ms
sigma = 0.00162 ms

PHOTMW: OBSID = 3001203A, BBTYP E = 0x8803, APID = 0x505, SID = 0x103

Parameter	Initial	Final	Increment	Expect	Incr.	Packet Chars.
DCUFRAMECNT	6186	6286	100	100		Packet type = 0x15
TM3N	6119	6144	25	25		subtype = 0x2
FrameTime	53.7600	53.7600				Frame ID = 0x3 Frame Len = 0x66

STATISTICS ON TIME BETWEEN RECEPTION OF 2 CONSECUTIVE FRAMES:
mean = 53.75880 ms
sigma = 0.00155 ms

PHOTLW: OBSID = 3001203A, BBTYP E = 0x8804, APID = 0x505, SID = 0x104

Parameter	Initial	Final	Increment	Expect	Incr.	Packet Chars.
DCUFRAMECNT	6286	6386	100	100		Packet type = 0x15
TM3N	6144	6156	12	12		subtype = 0x2
FrameTime	53.7600	53.7600				Frame ID = 0x4 Frame Len = 0x36

STATISTICS ON TIME BETWEEN RECEPTION OF 2 CONSECUTIVE FRAMES:
mean = 53.75880 ms
sigma = 0.00161 ms

SPECF: OBSID = 3001203A, BBTYP E = 0x8801, APID = 0x507, SID = 0x201

Parameter	Initial	Final	Increment	Expect	Incr.	Packet Chars.
DCUFRAMECNT	6386	6486	100	100		Packet type = 0x15
TM4N	16383	16	49168	17		subtype = 0x1
FrameTime	12.4928	12.4928				Frame ID = 0x1 Frame Len = 0x4E

STATISTICS ON TIME BETWEEN RECEPTION OF 2 CONSECUTIVE FRAMES:
mean = 12.49251 ms
sigma = 0.00093 ms



SPIRE Document

**PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton**

Ref:	SPIRE-RAL-REP-002837
Issue:	1.0
Date:	05/02/2007
Page:	33 of 48

4.17 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: <ol style="list-style-type: none"> PSWJFETVSS1/2/3/4/5/6 (RAW: 0x4C CONVERTED ~ -1.5V). PMLWJFETVSS1/2/3/4 (RAW: 0x4C CONVERTED ~ -1.5V). PSWJFETSTAT = 0x3F 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 Write 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 0/0x7f 0V/-1.5V 0V/-1.5V 0V/-1.5V	0/0x03f 0/0x07f 0/-1.49 0/-1.49 0/-1.49	N/A	Success



SPIRE Document

PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side

A.A.Aramburu / E. T. Polehampton

Ref:	SPIRE-RAL-REP-002837
Issue:	1.0
Date:	05/02/2007
Page:	34 of 48

Start time @: 11:59

End time @: 12:00

OBSID: 0x3001203B

Comments:

PSW:

A10 appear to be dead (no signal before of after, only during the JFET switch on they showed a spike).
G8 and C12 have a much higher output (~ 50000 ADUs against ~ 16400) than the rest of the array.

PMW:

C8 started of with signal an when the JFETS were started the signal went bottom of the scale.
T2 does not have signal. DP1 has now signal against its behaviour during WFTs.

PLW:

Seems to be fine.



SPIRE Document

Ref:	SPIRE-RAL-REP-002837
Issue:	1.0
Date:	05/02/2007
Page:	35 of 48

**PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton**

4.18 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	On QLA bring up a time series display of a couple of pixels on each of the photometer BDAs
2	Run FUNC-DCU-13P.py script on QLA
3	Run FUNC-DCU-13P test procedure from the HCSS Test Procedure window on TOPE
4	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	To Check

Ran Proc_Stop_DCU_Data as data still running after DCU-11

Start time @: 12:03
End time @: 12:15
OBSID: 0x3001203C
Comments:

See appendix 2 for the full trace for each bolometer.



SPIRE Document

Ref: SPIRE-RAL-REP-002837
Issue: 1.0
Date: 05/02/2007
Page: 36 of 48

PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton

4.19 FUNC-DCU-14P

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
				N/A	To Check
Start time @: 12:17 End time @: 12:22 OBSID: 0x3001203D Comments: Executed ILT-PERF-DNA-P Input parameters: Array = PF Time = 300 sec					

Step#	Action	Comments
1	From TOPE HCSS Test Procedures run PDET-OFF	Executed @: 12:25 OBSID 0x3001203E



SPIRE Document

Ref:	SPIRE-RAL-REP-002837
Issue:	1.0
Date:	05/02/2007
Page:	37 of 48

**PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton**

4.20 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 SCUDDCSTAT 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 Write 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	SCUDDCSTAT LIASTAT SLIAP5V SLIAP9V SLIAN9V SPECJFETSTAT SSWJFET1V SSWJFET2V SLWJFET1V	6/6 0/0 0V/ ~ 5V 0V/~11V 0V/~11V 0/7 0V/-2.10V 0V/-1.61V 0V/-1.71V	6/6 0/0 ~0/5.23 ~0/11.57 ~0/~11.56 0/0x7 0V/-2.10V 0V/-1.61V 0V/-1.71V	N/A	Success

Start time @: 12:27

End time @: 12:28

OBSID: 0x3001203F

Comments:

Generally all pixels looking responsive

SSW: D5 seem to show higher RAW output (~ 40000 ADUs against ~ 164000 ADUs) then the rest.

SLW: C2,B3 seems to show low responsivity

DP2 seems dead.



SPIRE Document

PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton

Ref: SPIRE-RAL-REP-002837
Issue: 1.0
Date: 05/02/2007
Page: 38 of 48

4.21 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	To Check
<p>Start time @: 12:31 End time @: 12:42 OBSID: 0x30012040</p> <p>See appendix 2 for the full trace for each bolometer.</p>					



SPIRE Document

Ref:	SPIRE-RAL-REP-002837
Issue:	1.0
Date:	05/02/2007
Page:	39 of 48

**PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton**

4.22 FUNC-DCU-14S

Test Id	Key Parameter(s)	Expected Value Before/After	Actual Value Before/After	Nb. of frames received	Test Result
				N/A	To Check
Start time @: 12:44 End time @: 12:49 OBSID: 0x30012041 Comments: Executed ILT-PERF-DNA-S Input parameters: Array = SF Time = 300 sec					

Step#	Action	Comments
1	From TOPE HCSS Test Procedures run SDET-OFF	Executed @: OBSID 0x30012042

5. 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	0 0	✓ ✓
2	Check SMEC is OFF	SMECENCPWR	0	0	✓
3	Run MCU-OFF from the HCSS Test Procedure window on TOPE	SCUDCDCSTAT	0	0	✓
4	Check Instrument Configuration	MODE	0x100/ DRCU_ON	DRCU_ON	✓



SPIRE Document

**PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton**

Ref:	SPIRE-RAL-REP-002837
Issue:	1.0
Date:	05/02/2007
Page:	40 of 48

6. APPENDIX 1. Instrument nominal configurations

	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		TC	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		



7. APPENDIX 2. 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 3001203D for phot and 30012041 for spec.

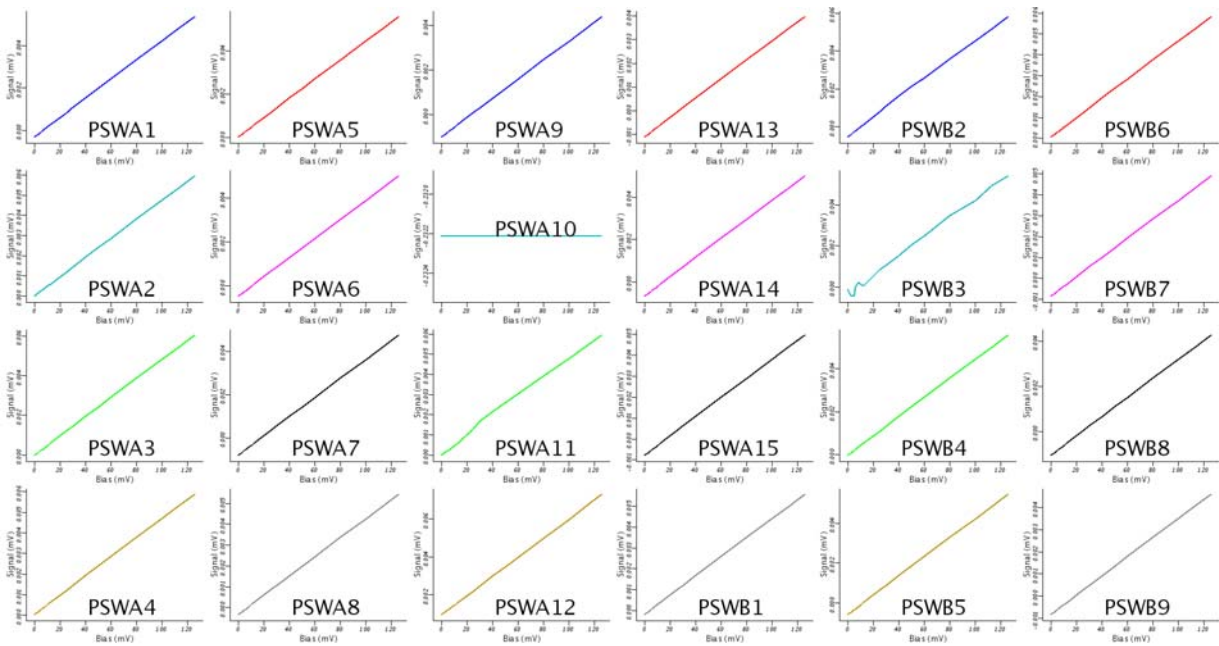


Figure 1. PSW Detectors (1)

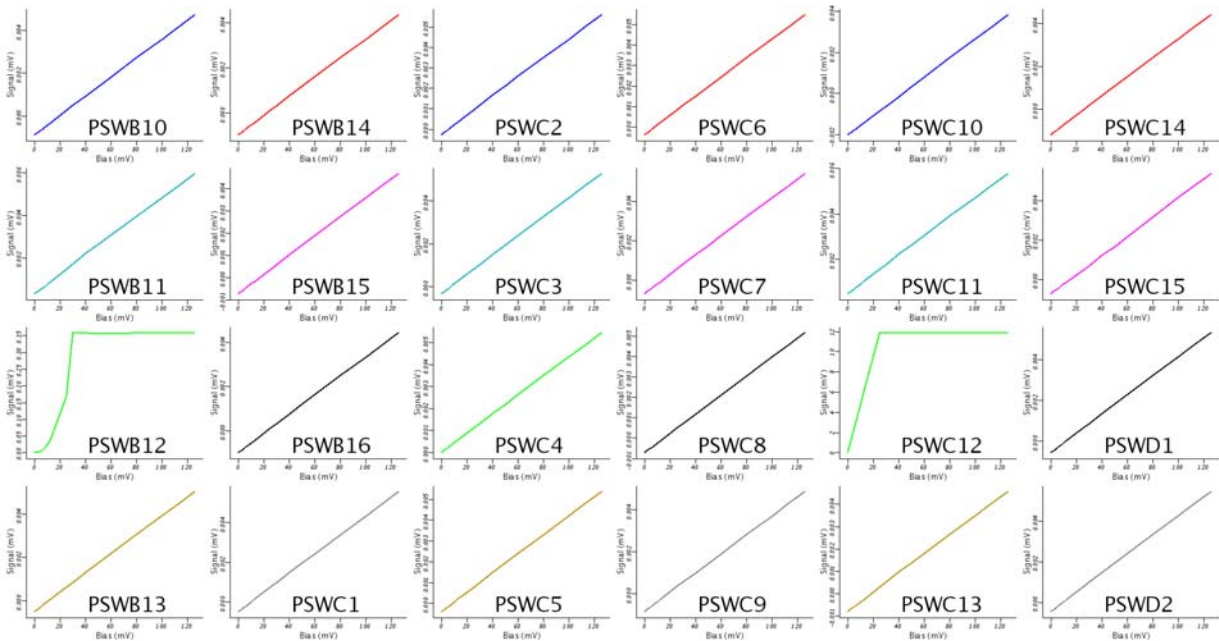


Figure 2. PSW Detectors (2)

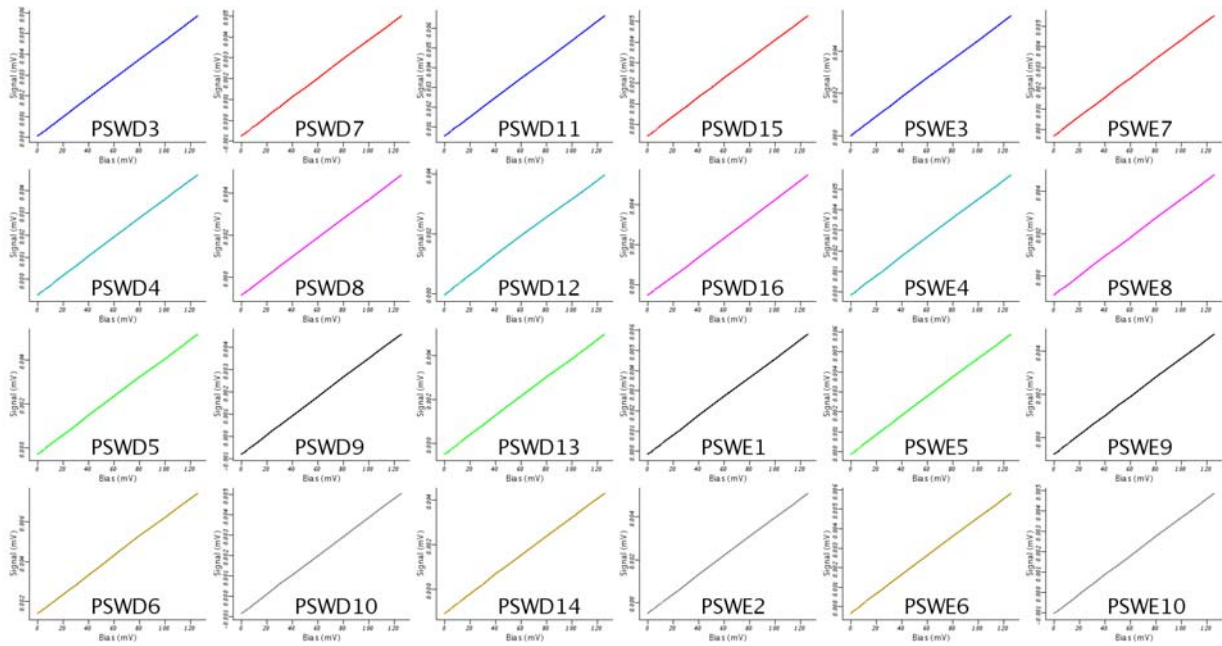


Figure 3. PSW Detectors (3)

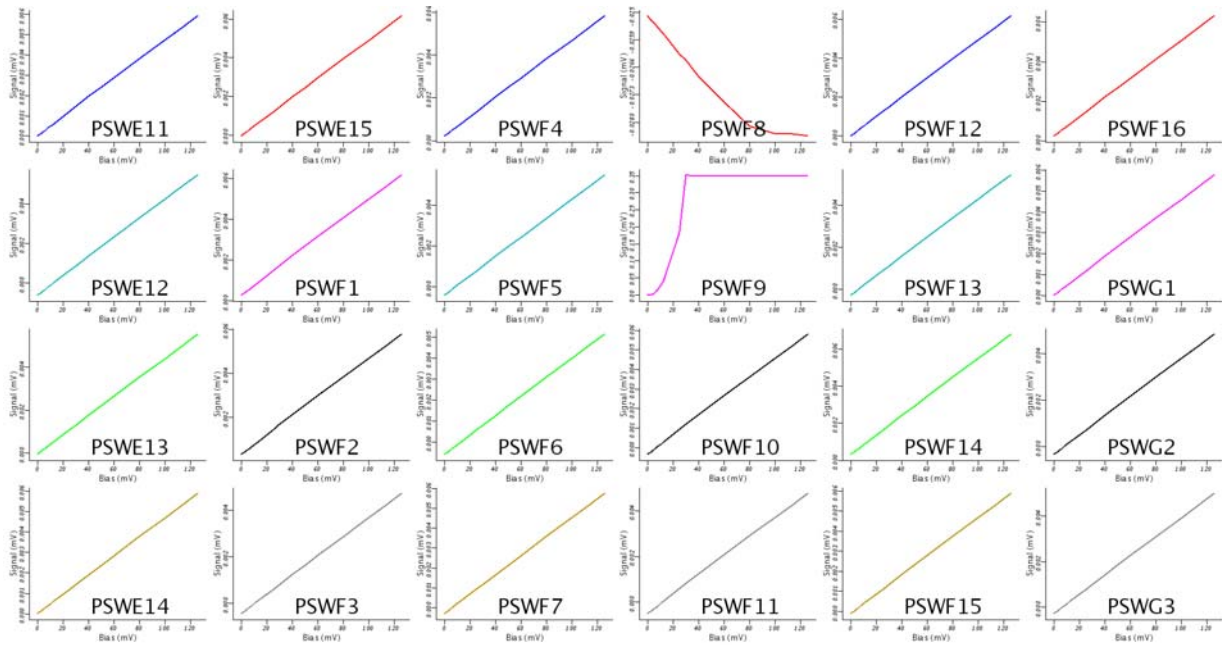


Figure 4. PSW Detectors (4)

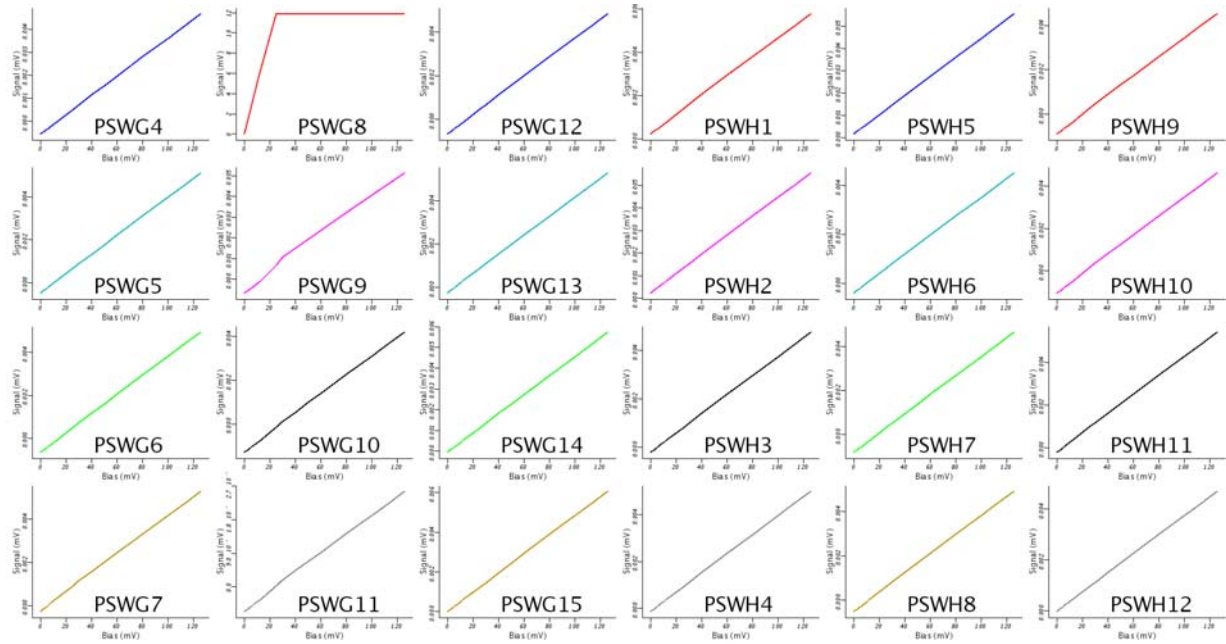


Figure 5. PSW Detectors (5)

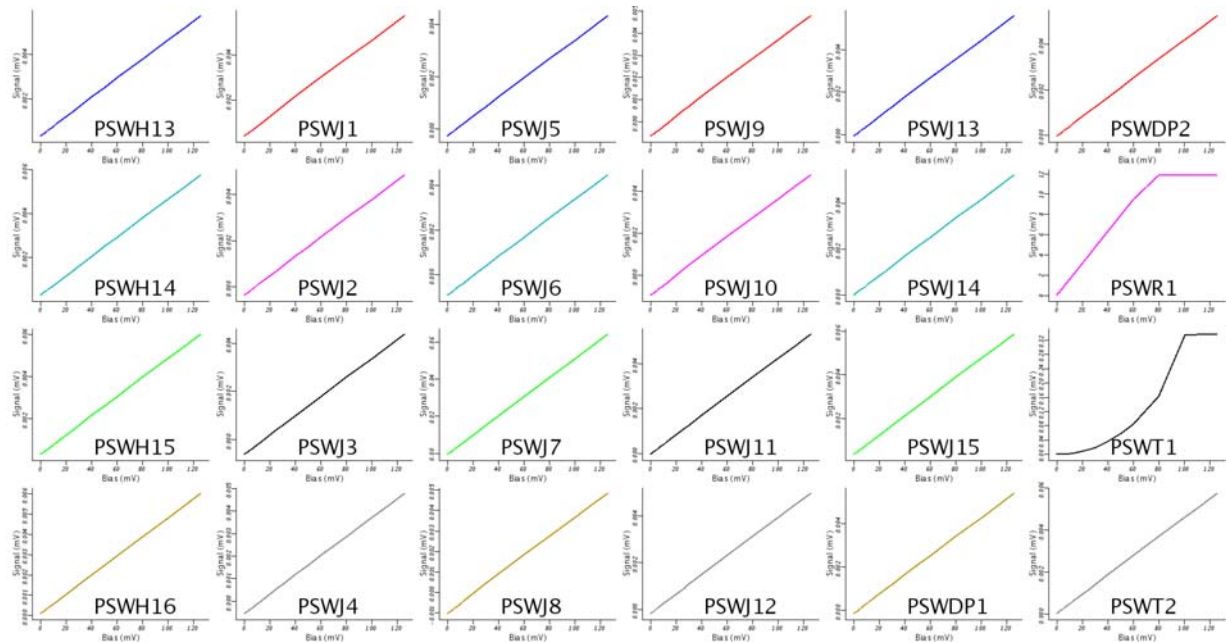


Figure 6. PSW Detectors (6)

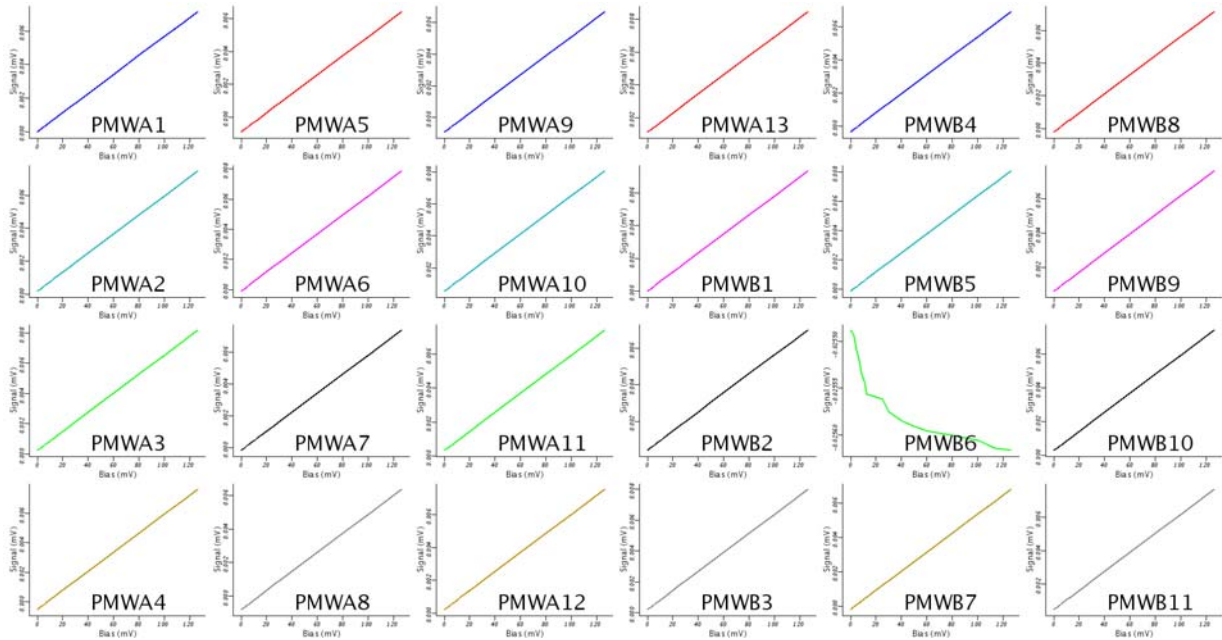


Figure 7. PMW Detectors (1)

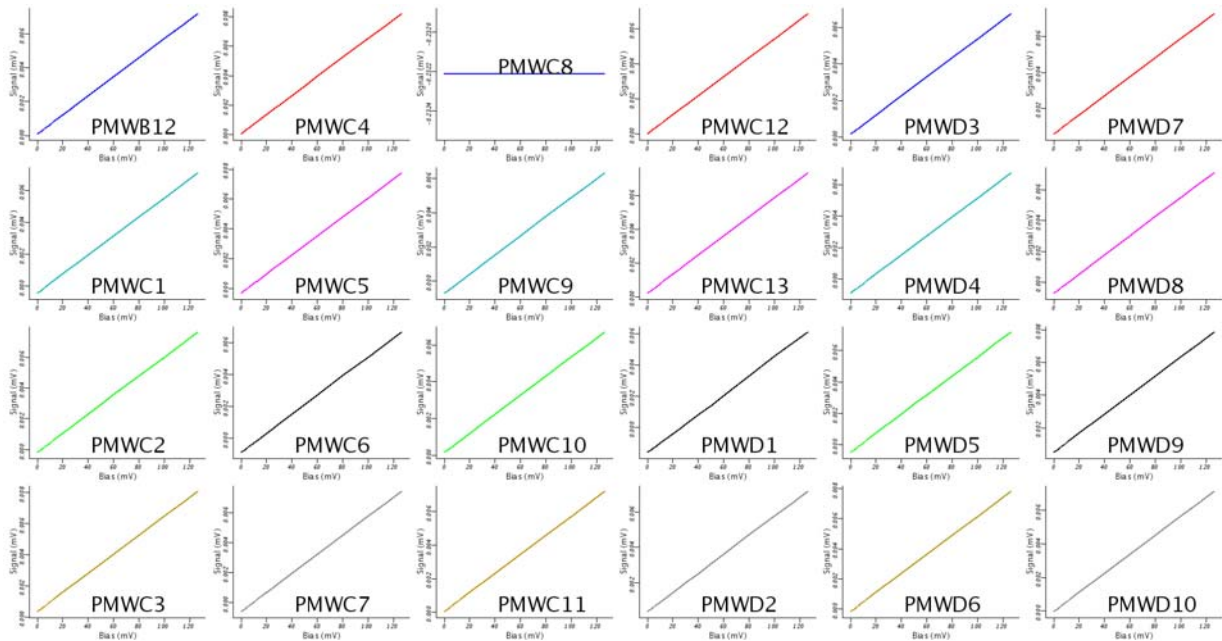


Figure 8. PMW Detectors (2)

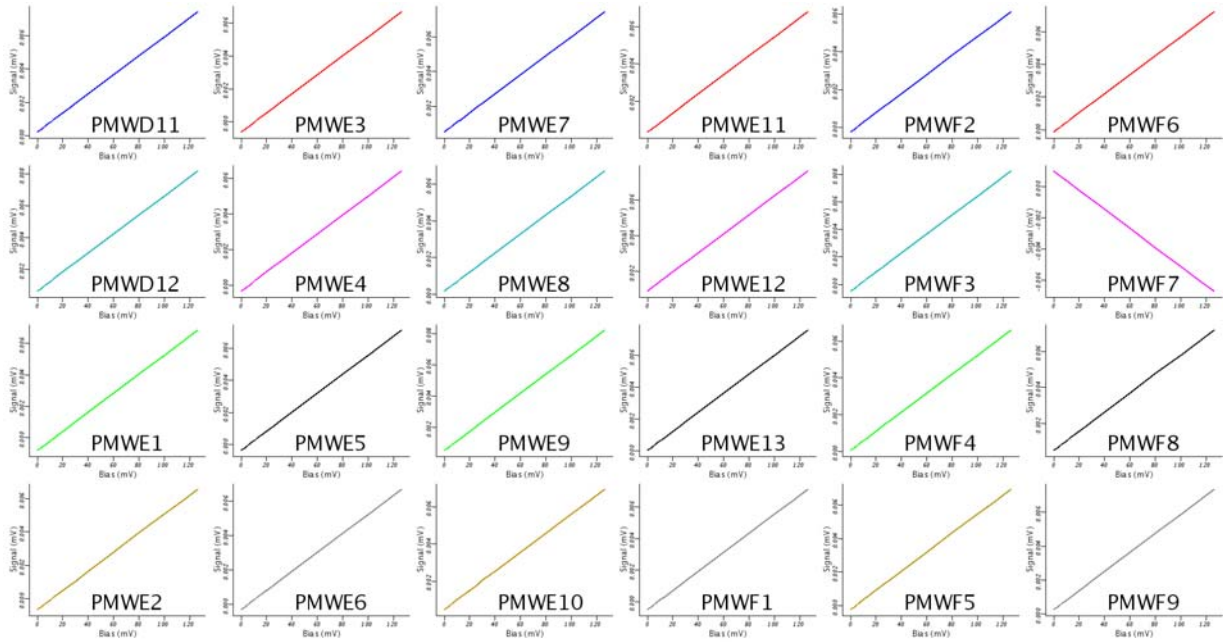


Figure 9. PMW Detectors (3)

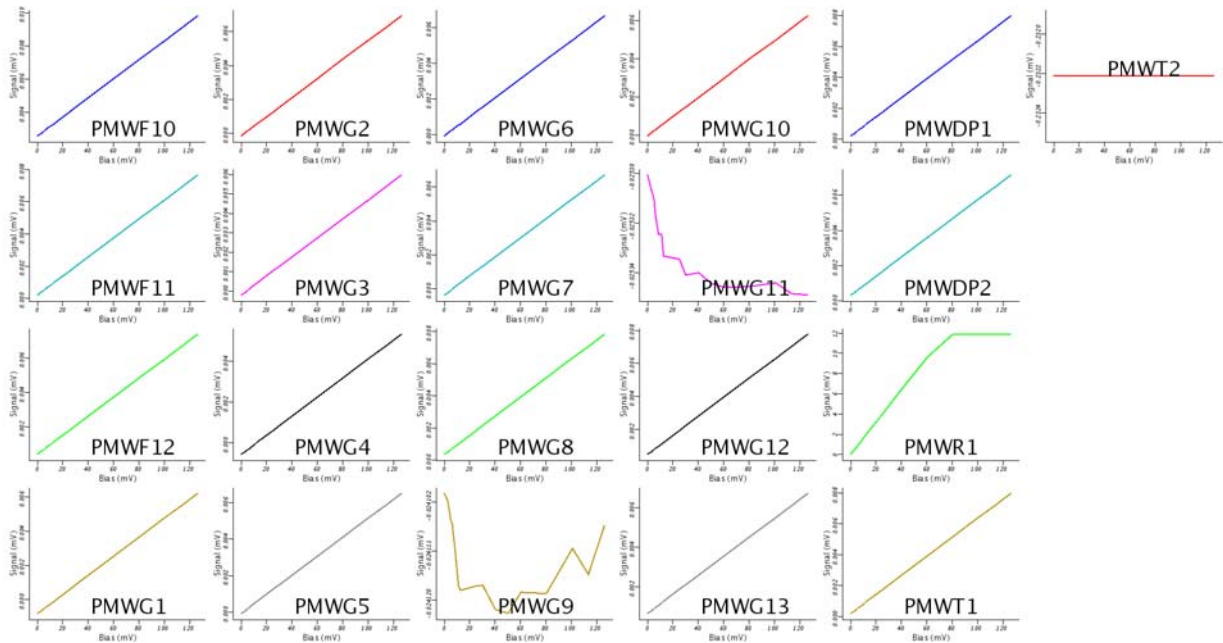


Figure 10. PMW Detectors (4)



PFM5 80K SHORT FUNCTIONAL TEST REPORT
Redundant Side
A.A.Aramburu / E. T. Polehampton

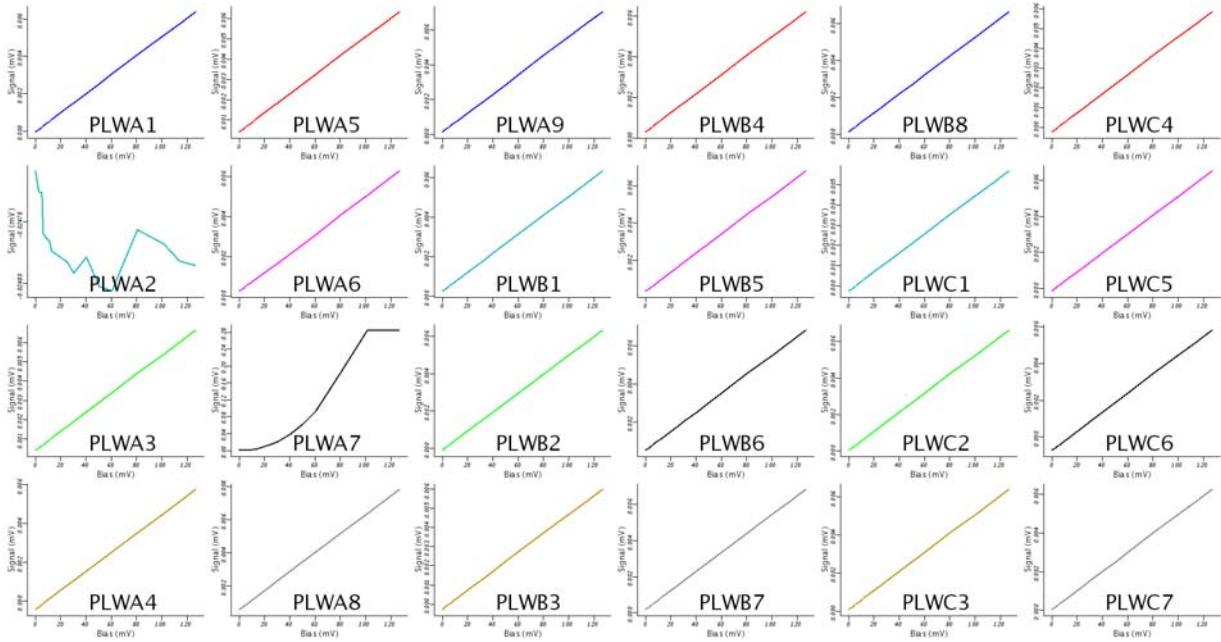


Figure 11. PLW Detectors (1)

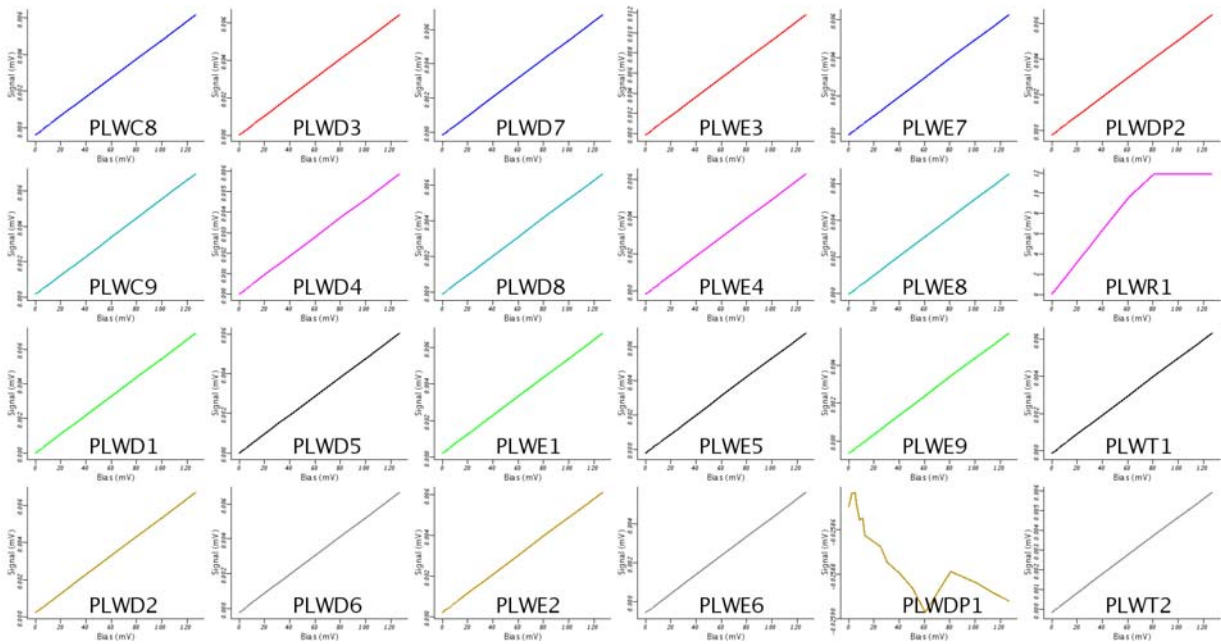


Figure 12. PLW Detectors (2)

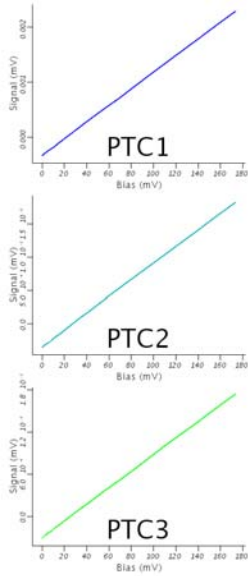


Figure 13. PTC Detectors (1)

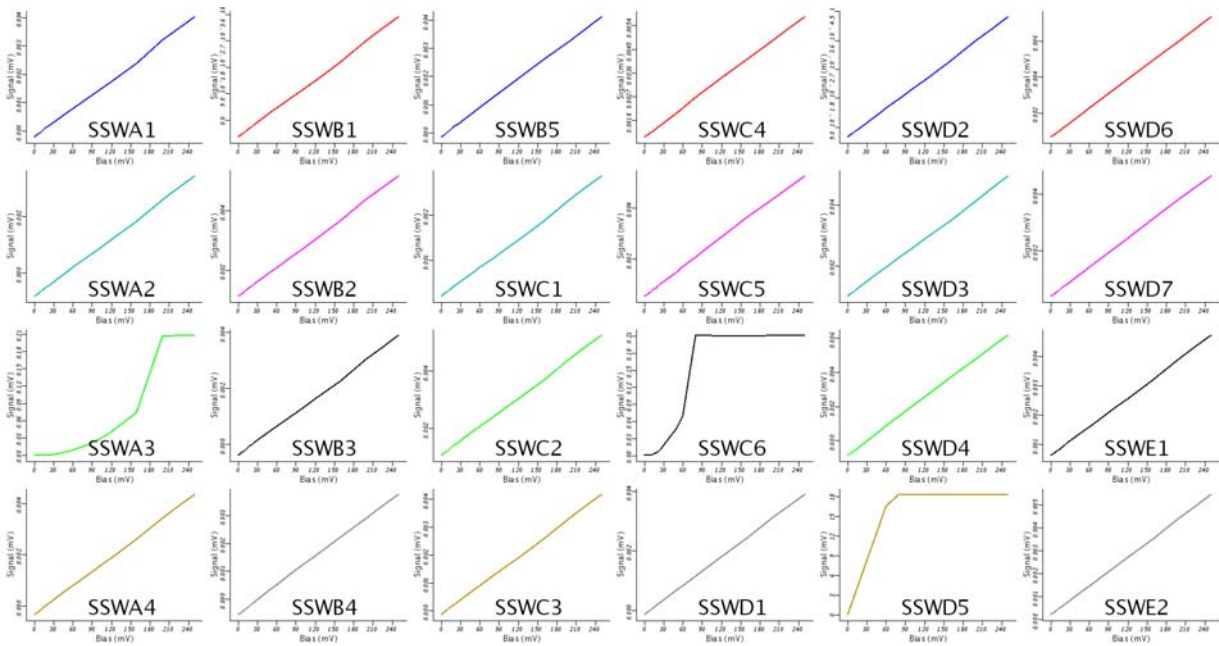


Figure 14. SSW Detectors (1)

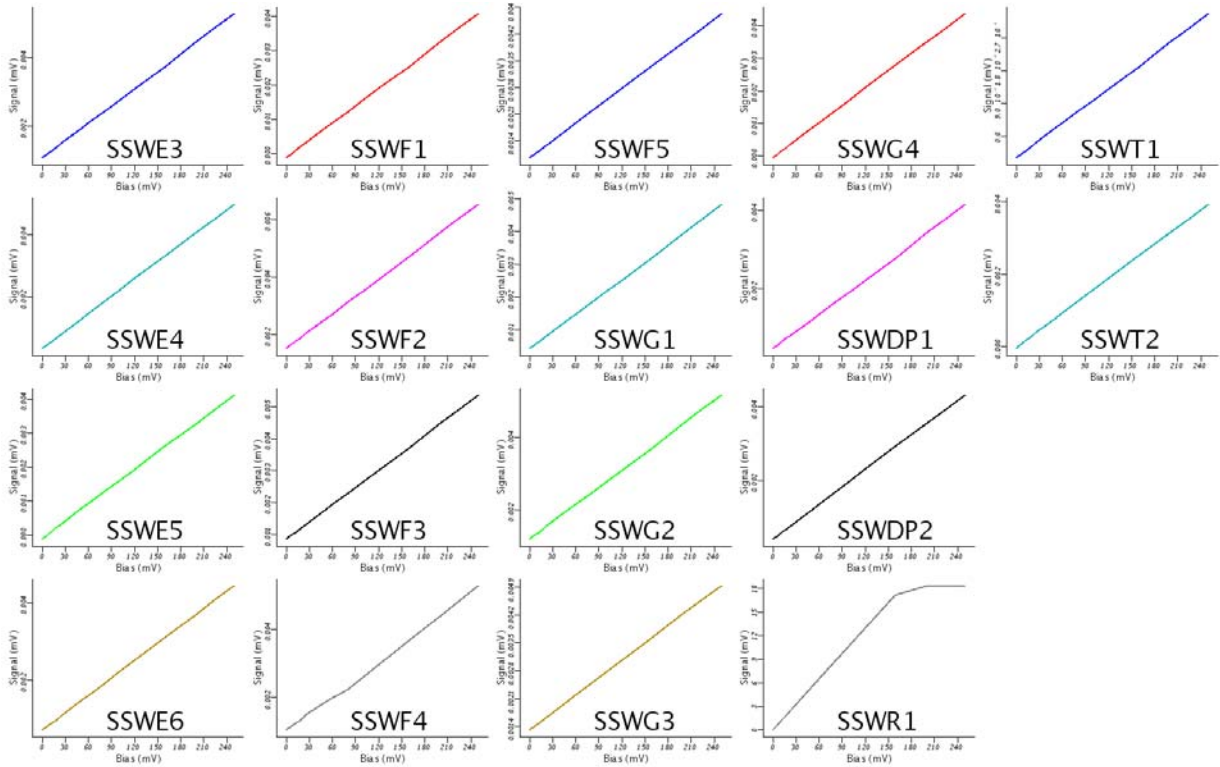


Figure 135. SSW Detectors (2)

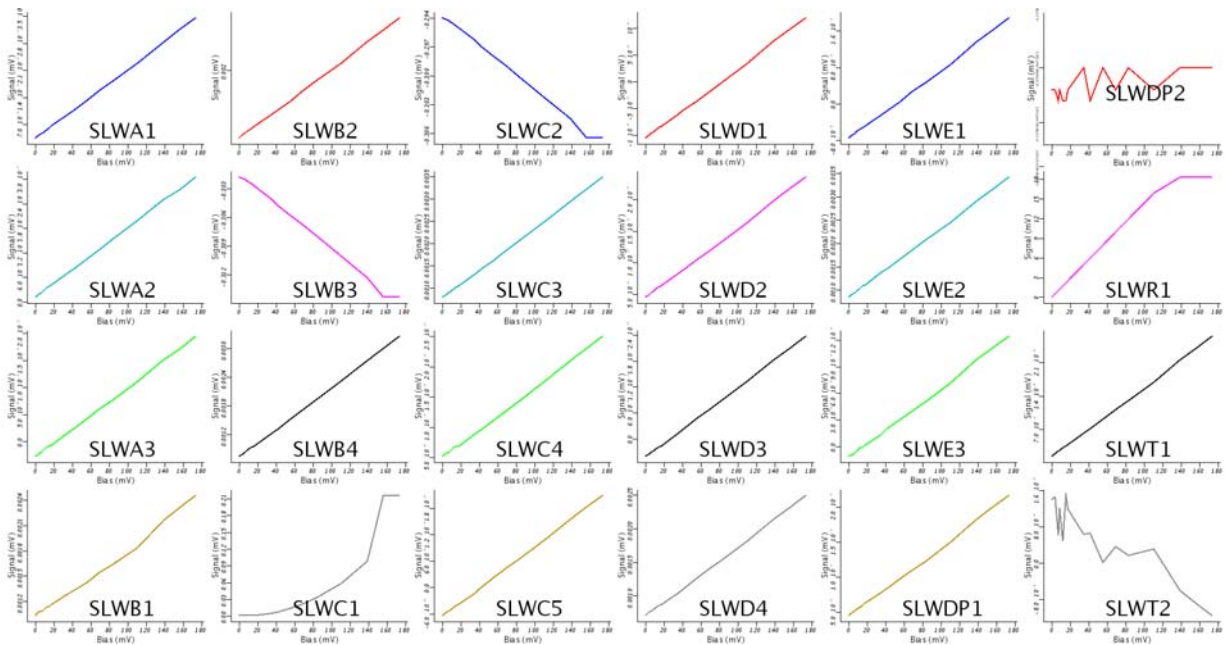


Figure 146. SLW Detectors (1)