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<b>Authors</b>	CUTTAIA, FRANCESCO, GREGORIO, Anna, MORGANTE, GIANLUCA, TERENCE, LUCA
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Prepared by	<b>F. CUTTAIA, A. GREGORIO, G. MORGANTE, L. TERENCE</b>  LFI Instrument Operation team	<b>Date:</b> October 4 <sup>th</sup> , 2013 <b>Signature:</b> _____
Agreed by	<b>C. BUTLER</b> LFI Program Manager	<b>Date:</b> October 4 <sup>th</sup> , 2013 <b>Signature:</b> _____
Approved by	<b>N. MANDOLESI</b> LFI Principal Investigator	<b>Date:</b> October 4 <sup>th</sup> , 2013 <b>Signature:</b> _____







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## **1 Introduction**

This document describes the activities to be performed on LFI at the End of Life of the Planck satellite. The starting condition of LFI is considered to be “Nominal”.

The aim of this document is to describe in detail the **operations** that are required to be performed at the End of Life on LFI. Each activity is ultimately broken down to the procedure level, and all inputs are defined. The starting conditions for each activity stage are defined, as well as the activity constraints and conditions, for example the temperature range within which the activity shall be performed.

Due to the complexity of some (tuning) activities, the MOC operations will be pre-prepared using proprietary application that will construct a Manual Stack with all of the commands specific to the particular ‘tuning activity’ of an activity stage. The commands for some tuning activities will be time-tagged, and will execute from the on-board MTL. This allows the activities to be controlled more efficiently, and of course accommodates the long duration execution of some activities. The commanding activities for a particular stage may involve both real-time command execution, together with MTL commanding. In all cases the complete activity stage will be prepared in advance. The ‘commanding products’ produced prior to each activity stage will be sent to LFI for formal approval prior to uplink.

### **1.1 Cryogenic Overview with LFI Activities**

The figure shown below presents the cool-down profile consistent with CPV observations, with the main LFI Activity Stages identified.



## 2 LFI CP/CPV Operations Overview

#	Activity	Description	Constraints	Commissioning Reference	LFI Product	Ready	P.
1	EoL Initialization	LFI EoL Initialization activities	Start OD: 2013-10-03 20:00:00Z		1 TPF	Yes	3
2	ADC Non-linearity Pre-run	Pre-run of proper Non-linearity test #8	ASAP Prior to ADC Linearity Test; Start OD: 2013-10-03 23:00:00		Special product	Yes	4
T1	Thermal Verification 1		MTL/Realtime; Start OD: 2013-10-04 02:30:00Z		N/A	N/A	37
3	Drain Current Verification	Drain current verification	Start OD: 2013-10-04 22:30:00Z	P_PVP_LFI_0002_01	Special product + TPFs (2)	Yes	7
4	CRYO-2	Functional Test	Before #5; Start OD: 2013-10-05 02:30:00Z	P_PVP_LFI_0003_01	TPFs (14) D	Yes	9
5	Reference Test	Reference Functional Test	Start OD: 2013-10-05 06:00:00Z	P_PVP_LFI_0008_01	TPFs (299) R	Yes	10
7b	Spike Test #2	Spike Test #2	Start OD: 2013-10-05 10:00:00Z	P_PVP_LFI_0050_01 P_PVP_LFI_0150_01	TPFs (32) K	Yes	24
6	R-Factor	R-Factor Test	Start OD: 2013-10-06 03:00:00Z		TPFs (4)	No, (#2)	23
9	ADC Region No-fly	No-fly Region test	Start OD: 2013-10-06 07:00:00Z		Special product + TPFs (14) L	No (#2)	29
8	ADC Non-linearity	ADC Non-linearity test	Start OD: 2013-10-06 20:30:00Z		Special product + TPFs (4)	No (#2)	27



10	LNA & P/S Bias Tuning Check	LNA & P/S Bias Tuning Check activities	Start OD: 2013-10-07 12:00:00Z		TPFs (8) H	No, TBD	31
11	BEM Offset Calculation	BEM Offset Calculation activities	Start OD: 2013-10-07 16:30:00Z		TPFs (55) B	No, TBD	33
E1	RF Susceptibility	TBC, TBW	Start OD: 2013-10-07 19:00:00Z		N/A	N/A	39
E2	Thermal Changes VS Pointing	TBC, TBW	Start OD: TBD		N/A	N/A	
E3	Telescope Loss	TBC, TBW	Start OD: 2013-10-07 21:00:00Z		N/A	N/A	39
T2	Thermal Verification 2		Start OD: 2013-10-08 08:00:00Z		N/A	N/A	38
7a	Spike Test #1	Spike Test #1	Start OD: 2013-10-10 21:00:00Z	P_PVP_LFI_0050_01 P_PVP_LFI_0150_01	No	N/A	24
T3	Thermal Verification 3		Start OD: 2013-10-11 21:00:00Z		N/A	N/A	38
12	Change Nave	Change N_average	Realtime; Start OD: 2013-10-14 14:00:00Z		TPF (1)	Yes	36
2.1	LFI Passivation FEM	Set FEM biases to zero	As needed		TPFs (7)	Yes	40
C2	Saturation Passivation	Prevent saturation RCA	As needed		TPFs (7)	Yes	40

Notes:



1. The **LVHX2** reference is taken from SCS parameter:

- **SD029540 T3 OR T4 VALUE**

2. The **4K Stage** reference is taken from HFI parameters:

- **HD494280 RHC2-TempK**

- **HD495280 RHC3-TempK**



## 2.2 Detailed Activity Stage Definitions

### 2.2.1 Activity #1 – EoL Initialization

#1	<b>LFI EoL Initialization</b>			
	<b>Detailed Description</b>	LFI EoL Initialization Activities Reference: LFI User Manual v.04 PL-LFI-PST-MA-001 § 13.2.18 (step 1.1), § 13.2.6 (step 1.2) and § 13.2.10 (step 1.3).		
	<b>Objective</b>	The procedure is two folds. 1. It is required to disable the LFI Autonomous Functions that otherwise could be activated during the following test activities. 2. The LFI processing type should be set to "type 1" (data un-compressed, averaged over N_average) otherwise the noise properties, that during the tests could be quite, could affect the quality of the data compression.		
	<b>Constraints</b>	Start OD: <b>2013-10-03 20:00:00Z</b>		
	<b>Start Condition</b>	LFI (NOM) in <b>Nominal Science Mode</b>		
	<b>End Condition</b>	No change in LFI configuration		
	<b>Initial Configuration</b>	Cryo biases, 4kHz switching on B/D ( <b>RCA23 switching on A/C</b> ), Polarization A/C=1, B/D=0		
	<b>End Configuration</b>	N/A		
	<b>Execution Type</b>	<b>Real-time</b>		
	<b>Duration</b>	<b>10 minutes</b> <b>Wait 2 hours 50 minutes before next test</b>		
<b>Step</b>	<b>Reference</b>	<b>Proc. Ref.</b>	<b>Proc. Title</b>	<b>Procedure Inputs</b>
1	<b>LFI EoL initialization</b>			
1.1	Disable Autonomous Function	P_FCP_LFI_CSAD	Disable Autonomous Functions	(none)
1.1.b	Disable Monitoring Function	P_FCP_LFI_CSMD	Disable Monitoring Functions	(none)
1.2	Stop Calibration Switching	P_FCP_LFI_CSWD	Stop Calibration Switching	



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1.3	Set processing type to 1	P_FCP_LFI_CSSX	<b>Change Science Processing Mode</b>	<b>TPF:</b> PFLCSPM_C_SCI_PM_0011.IPF
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**Additional Comments**

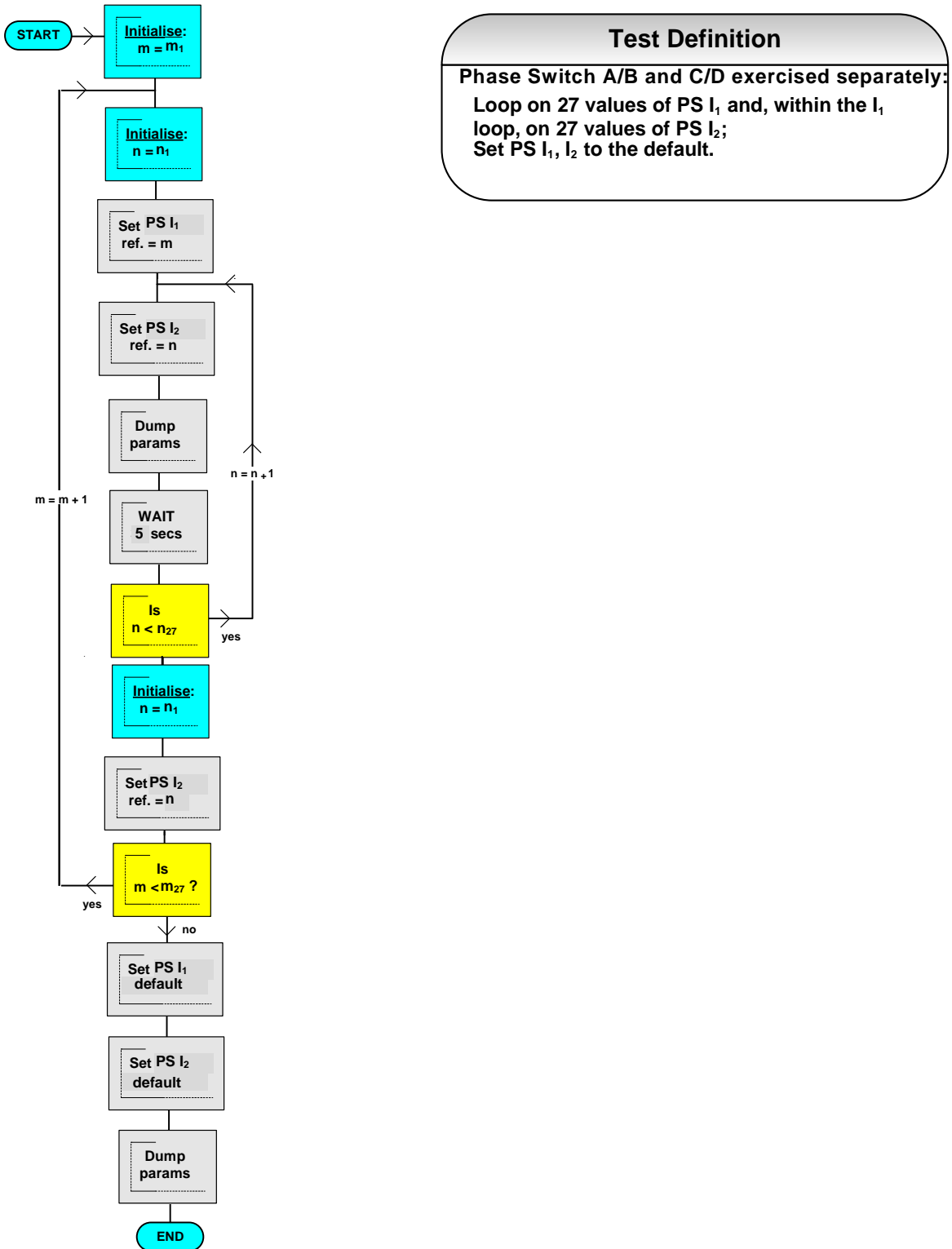
Dedicated procedures, specific to prepare the LFI to the following test activities

Note for step 1.3: a contingency procedure needs to be ready in case of any anomaly caused by modifying the processing type (see also waiting time at the end of the test).

By now the procedure does not foresee to change the number of samples (N\_average) over which the average computation is performed.



## **2.2.2 Activity #2 – ADC Non-linearity Pre-run**





#2	<b>ADC Non-linearity Pre-run</b>			
	<b>Detailed Description</b>	<p>ADC Non-linearity Pre-run</p> <p>Two separate loops on 27 (to match the duration of 3 hrs) values of <math>I_{switch1}</math> P/S biases ("Configure Iswitch1" P_FCP_LFI_MSXC) and, within this <math>I_{switch1}</math> loop, 27 values of <math>I_{switch2}</math> ("Configure Iswitch2" P_FCP_LFI_MSXC).</p> <p>All the values are simultaneously set of all LFI A/C Phase Switches leaving the B/D Phase Switch to the nominal configuration (Step 2.1) and, separately, on of all LFI B/D Phase Switches leaving the A/C Phase Switch to the nominal configuration (Step 2.2).</p> <p>The final step of the test will assert the default Phase Switch currents (<math>I_{switch1}</math> and <math>I_{switch2}</math>) on each ACA (Step 2.3).</p>		
	<b>Objective</b>	<p>Pre-run of #8 ADC Non-linearity whose main objective is validating the ADC non-linear model. This is achieved by activating / deactivating conditions supposed to trigger the ADC non-linear behavior, introducing small perturbations in the ADC input voltage.</p> <p>ADC Input signals can be slightly perturbed acting on Phase Switch attenuation (<math>I_{switch1}</math> and <math>I_{switch2}</math> P/S biases) coupled to few steps of DAE offset changes. In this test the perturbation is achieved by acting on the P/S biases.</p> <p>With respect to the proper test #8, the pre-run is organized only in loops of P/S <math>I_{switch1}</math> and <math>I_{switch2}</math> (each 27 values, TBC), here exercised separately, one loop inside the other one. The acquisition time is set to 5 seconds.</p>		
	<b>Constraints</b>	Start OD: <b>2013-10-03 23:00:00</b>		
	<b>Start Condition</b>	LFI (NOM) in <b>Nominal Science</b> Mode		
	<b>End Condition</b>	No change in LFI configuration		
	<b>Initial Configuration</b>	Cryo biases, 4kHz switching on B/D ( <b>RCA23 switching on A/C</b> ), Polarization A/C=1, B/D=0		
	<b>End Configuration</b>	Unchanged		
	<b>Execution Type</b>	<b>MTL</b>		
	<b>Duration</b>	<b>3 hours</b> <b>Wait 30 minutes at the end of the test for stabilization</b>		
<b>Step</b>	<b>Reference</b>	<b>Proc. Ref.</b>	<b>Proc. Title</b>	<b>Procedure Inputs</b>
2	<b>ADC Non-linearity Pre-run</b>			
	All RCAs, all ACAs			
	<b>Test on all A/C Phase Switches</b>			
2.1	Perform Non Linearity	DAE_NonLinearity_Pre	(Special Command)	Loop on P/S biases



			Sequence product)	
Test on all B/D Phase Switches				
2.2	Perform Non Linearity	DAE_NonLinearity_Pre	(Special Command Sequence product)	Loop on P/S biases
2.3	Apply Default DAE Configuration as current configuration	P_FCP_LFI_CADC	Apply DEFAULT Configuration as Current	(none)
<b>Additional Comments</b>				
<p>Acquisition time during the ADC Non Linearity Pre-run is set to 5 seconds. Phase Switch currents (nested loops on <math>I_{switch1}</math> and <math>I_{switch2}</math>) are simultaneously changed on all A/C Phase Switches and, separately, on all B/D Phase Switches over 27 values (exact number to match the total duration of 3 hrs). The values depend on each radiometer (still TBD) and the difference between two consecutive steps is not a constant.</p> <p>It is still TBC if an initial step is required to lower the Gain values of some channel to avoid saturation.</p> <p>The TPFs will be produced before the start of the test activities by the end of September 2013.</p>				



### **2.2.3 Activity #3 - Drain Current Verification**



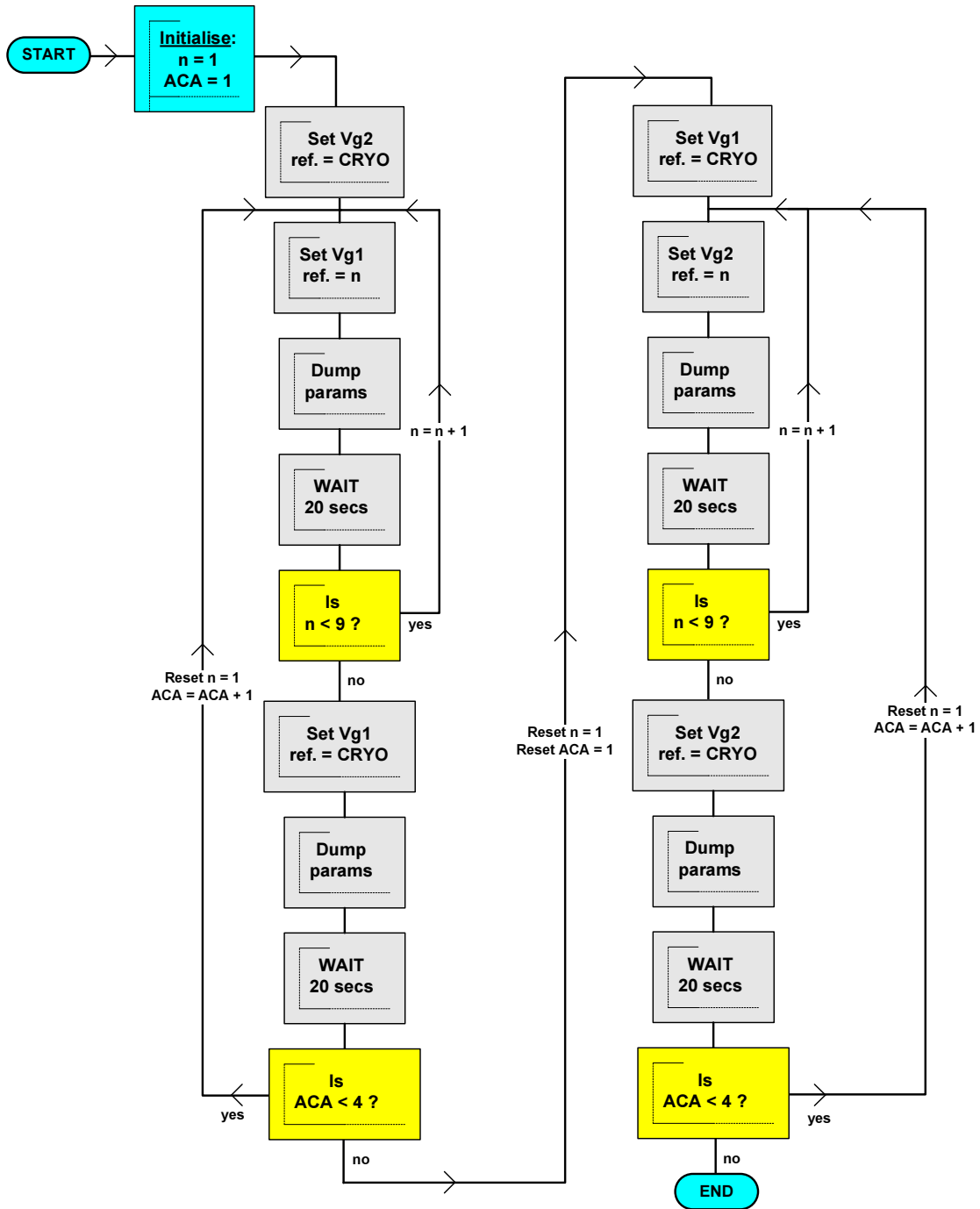
**Test Definition**

For each single ACA of RCA(s) under test:  
 Vg2 static (first matrix point) and Vg1 incremented;  
 CRYO value applied to Vg1;  
 Vg1 static (first matrix point) and Vg2 incremented;  
 CRYO value applied to Vg2

**RCA Pairings**

RCA 18 / 21  
 RCA 19 / 22  
 RCA 20 / 23  
 RCA 24 / 25  
 RCA 26 / 27  
 RCA 28

Id Verification	
28/04/09	v0.3





#3	Drain Current Verification			
	<b>Detailed Description</b>	Drain Current Verification Reference: LFI User Manual v.04 PL-LFI-PST-MA-001 § 13.1.2.4		
	<b>Objective</b>	Investigate possible variations in the Characteristic and Transfer Curves of the FEU LNAs.  Originally it was foreseen to perform this test at the end of any survey but was never run after CPV. The accurate knowledge of the I-V curves is crucial to check, at the end of the Planck mission, any possible changes in the radiometers response due to aging, bias fluctuation or to any other criticality.		
	<b>Constraints</b>	Start OD: <b>2013-10-04 22:30:00Z</b>		
	<b>Start Condition</b>	LFI (NOM) in <b>Nominal Science</b> Mode		
	<b>End Condition</b>	No change in LFI configuration		
	<b>Initial Configuration</b>	Cryo biases, 4kHz switching on B/D ( <b>but RCA 23 on A/C</b> ), Polarization A/C=1, B/D=0		
	<b>End Configuration</b>	Unchanged.		
	<b>Execution Type</b>	<b>MTL</b>		
	<b>Duration</b>	<b>3 hours</b>  <b>Wait 1 hour at the end of the test for stabilization</b>		
Step	Reference	Proc. Ref.	Proc. Title	Procedure Inputs
3	Drain Current Verification (UM section 13.1.2.4)			
3.1	Set DAE Gain values	P_FCP_LFI_MSGC	Configure Gain	TPF: PFLMSGC_M__GAIN_0021.IPF
3.2	Set DAE offset values	P_FCP_LFI_MSOC	Configure Offset	TPF: PFLMSOC_M_OFFSET_0021.IPF
	RCA 18 and 21			
3.3	Vg1, Vg2 tuning for each ACA of RCA18, 21	Id_18_21_4xACA	(Special Command Sequence product)	Id Matrix
	RCA 19 and 22			
3.4	Vg1, Vg2 tuning for each	Id_19_22_4xACA	(Special Command	Id Matrix



	ACA of RCA19, 22		Sequence product)	
RCA 20 and 23				
3.5	Vg1, Vg2 tuning for each ACA of RCA20, 23	Id_20_23_4xACA	(Special Command Sequence product)	Id Matrix
RCA 25 and 24				
3.6	Vg1, Vg2 tuning for each ACA of RCA25, 24	Id_25_24_4xACA	(Special Command Sequence product)	Id Matrix
RCA 26 and 27				
3.7	Vg1, Vg2 tuning for each ACA of RCA26, 27	Id_26_27_4xACA	(Special Command Sequence product)	Id Matrix
RCA 28				
3.8	Vg1, Vg2 tuning for each ACA of RCA28	Id_28_4xACA	(Special Command Sequence product)	Id Matrix
3.9	Apply Default DAE Configuration as current configuration	P_FCP_LFI_CADC	Apply DEFAULT Configuration as Current	(none)
CHECK POINT: Wait for LFI Analysis				
<b>Additional Comments</b>				
<p><b>Performed for each RCA:</b></p> <ol style="list-style-type: none"> <li>1) ACA1 Increment Vg1 against static Vg2; Apply <b>Cryo</b> value to Vg1 and Vg2;</li> <li>2) ACA2 Increment Vg1 against static Vg2; Apply <b>Cryo</b> value to Vg1 and Vg2;</li> <li>3) ACA3 Increment Vg1 against static Vg2; Apply <b>Cryo</b> value to Vg1 and Vg2;</li> <li>4) ACA4 Increment Vg1 against static Vg2; Apply <b>Cryo</b> value to Vg1 and Vg2;</li> <li>5) ACA1 Increment Vg2 against static Vg1; Apply <b>Cryo</b> value to Vg2 and Vg1;</li> <li>6) ACA2 Increment Vg2 against static Vg1; Apply <b>Cryo</b> value to Vg2 and Vg1;</li> <li>7) ACA3 Increment Vg2 against static Vg1; Apply <b>Cryo</b> value to Vg2 and Vg1;</li> <li>8) ACA4 Increment Vg2 against static Vg1; Apply <b>Cryo</b> value to Vg2 and Vg1;</li> </ol>				



2.2.4 Activity #4 - CRYO-2

#4	CRYO-2			
	Detailed Description	Reference Functional Test Reference: LFI User Manual v.04 PL-LFI-PST-MA-001 § 13.1.2.5		
	Objective	Together with the following #5 Reference Test, to investigate possible variations in LNAs and Phase Switch functionality.  Check the functionality of radiometers in all the possible phase switch and 4kHz combinations; Output voltage in all possible configurations of LNAs and PH/SW biasing will be compared, together with other parameters as drain currents level, noise properties as 1/f, white noise, spikes. Check R-factor values.		
	Constraints	Prior to Reference Test #5, Start OD: <b>2013-10-05 02:30:00Z</b>		
	Start Condition	LFI (NOM) in <b>Nominal Science</b> Mode		
	End Condition	No change in LFI configuration		
	Initial Configuration	Cryo biases, 4kHz switching on B/D ( <b>but RCA 23 on A/C</b> ), Polarization A/C=1, B/D=0		
	End Configuration	Unchanged.		
	Execution Type	<b>MTL</b>		
	Duration	<b>2 hours</b> <b>Wait 1 hour at the end of the test for stabilization (in the timeline 1.5 hrs as a margin)</b>		
Step	Reference	Proc. Ref.	Proc. Title	Procedure Inputs
4	CRYO-2 (UM section 13.1.2.5)			
4.1	Disable A/C 4kHz	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_0001.IPF
4.2	Disable B/D 4kHz	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_0001.IPF
4.3	Set A/C P/S Status (0)	P_FCP_LFI_MSAC	Configure the A-C phase switch	TPF: PFLMSAC_M_POLA_C_0001.IPF
4.4	Set B/D P/S Status (0)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF:



				PFLMSBC_M_POLB_D_0001.IPF
4.5	Set Cryo values on all (same values as cryo-2 in CSL)	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_0021.IPF
4.6	Enable A/C 4kHz	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_0011.IPF
4.7	WAIT 30 minutes			
4.8	Set B/D P/S Status (1)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_0011.IPF
4.9	WAIT 30 minutes			
4.10	Disable A/C 4kHz	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_0001.IPF
4.11	Set A/C P/S Status (0)	P_FCP_LFI_MSAC	Configure the A-C phase switch	TPF: PFLMSAC_M_POLA_C_0001.IPF
4.12	Set B/D P/S Status (0)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_0001.IPF
4.13	Enable B/D 4kHz	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_0011.IPF
4.14	WAIT 30 minutes			
4.15	Set A/C P/S Status (1)	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_0011.IPF
4.16	WAIT 30 minutes			
4.17	Disable B/D 4kHz	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_0001.IPF
4.18	Set A/C P/S Status (0)	P_FCP_LFI_MSAC	Configure the A-C phase switch	TPF: PFLMSAC_M_POLA_C_0001.IPF
4.19	Apply Default DAE Configuration as current configuration	P_FCP_LFI_MADC	Apply DEFAULT Configuration as Current	(none)



<b>Additional Comments</b>
A total of 14 TPFs to be sent but many of these are sent several times

### 2.2.5 Activity #5 - Reference Test

<b>#5</b>	<b>Reference Test</b>			
<b>Detailed Description</b>	Reference Functional Test Reference: LFI User Manual v.04 PL-LFI-PST-MA-001 § 13.1.2.9			
<b>Objective</b>	Together with the previous #4 Cryo-2 test, to investigate possible variations in LNAs and Phase Switch functionality.  Check the functionality of radiometers in all the possible phase switch and 4kHz combinations; Output voltage in all possible configurations of LNAs and PH/SW biasing will be compared, together with other parameters as drain currents level, noise properties as 1/f, white noise, spikes. Check R-factor values.			
<b>Constraints</b>	Start OD: <b>2013-10-05 06:00:00Z</b>			
<b>Start Condition</b>	LFI (NOM) in <b>Nominal Science Mode</b>			
<b>End Condition</b>	No change in LFI configuration			
<b>Initial Configuration</b>	Cryo biases, 4kHz switching on <b>B/D (RCA23 switching on A/C)</b> , Polarization <b>A/C=1, B/D=0</b>			
<b>End Configuration</b>	Unchanged			
<b>Execution Type</b>	<b>MTL</b>			
<b>Duration</b>	<b>3 hours</b>  <b>Wait 1 hour at the end of the test for stabilization</b>			
<b>Step</b>	<b>Reference</b>	<b>Proc. Ref.</b>	<b>Proc. Title</b>	<b>Procedure Inputs</b>
<b>5</b>	<b>Reference Test</b> (UM section 13.1.2.9)			
<b>5.1</b>	<b>RCA 18 and 21</b>			
<b>5.1.1</b>	<b>Set zero bias on ACA1 and ACA2 of RCA 18 and 21</b>	<b>P_FCP_LFI_MRCA</b>	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	<b>TPF:</b> PFLMRCA_M_5x_RCA_9231.IPF
<b>5.1.2</b>	<b>Disable B/D 4kHz on</b>	<b>P_FCP_LFI_MSDC</b>	Enable/Disable the B-D	<b>TPF:</b>



	RCA 18 and 21		phase switch	PFLMSDC_M_E_DB_D_8201.IPF
5.1.3	Disable A/C 4kHz on RCA 18 and 21	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8201.IPF
5.1.4	Set A/C P/S Status (0) on RCA 18 and 21	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8201.IPF
5.1.5	Set B/D P/S Status (0) on RCA 18 and 21	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8201.IPF
5.1.6	WAIT 1 minute			
5.1.7	Set Cryo bias on ACA1 of RCA 18, 21	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_8891.IPF
5.1.8	WAIT 1 minute			
5.1.9	Set A/C P/S Status (1) on RCA 18 and 21	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8211.IPF
5.1.10	WAIT 1 minute			
5.1.11	Enable 4kHz (A/C) RCA 18 and 21	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8211.IPF
5.1.12	WAIT 1 minute			
5.1.13	Set lswitch1 low value on ACA1 RCA 18, 21	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_8892.IPF
5.1.14	WAIT 1 minute			
5.1.15	Set lswitch1 nominal value on ACA1 RCA 18, 21	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_8891.IPF
5.1.16	Set lswitch2 low value on ACA1 RCA 18, 21	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_8892.IPF
5.1.17	WAIT 1 minute			
5.1.18	Set lswitch2 nominal value on ACA1 RCA 18, 21	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_8891.IPF



5.1.19	Disable 4kHz (A/C) RCA 18, 21	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8201.IPF
5.1.20	Set A/C P/S Status (0) on RCA 18 and 21	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8201.IPF
5.1.21	Set zero bias on ACA1 of RCA 18, 21	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_8831.IPF
5.1.22	Set Cryo bias on ACA2 of RCA 18, 21	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_8991.IPF
5.1.23	WAIT 1 minute			
5.1.24	Set B/D P/S Status (1) on RCA 18 and 21	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8211.IPF
5.1.25	WAIT 1 minute			
5.1.26	Enable 4kHz (B/D) RCA 18 and 21	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8211.IPF
5.1.27	WAIT 1 minute			
5.1.28	Set Iswitch1 low value on ACA2 RCA 18, 21	P_FCP_LFI_MSXC	Configure Iswitch1	TPF: PFLMSXC_M_SWTCH1_8992.IPF
5.1.29	WAIT 1 minute			
5.1.30	Set Iswitch1 nominal value on ACA2 RCA 18, 21	P_FCP_LFI_MSXC	Configure Iswitch1	TPF: PFLMSXC_M_SWTCH1_8991.IPF
5.1.31	Set Iswitch2 low value on ACA2 RCA 18, 21	P_FCP_LFI_MSYC	Configure Iswitch2	TPF: PFLMSYC_M_SWTCH2_8992.IPF
5.1.32	WAIT 1 minute			
5.1.33	Set Iswitch2 nominal value on ACA2 RCA 18, 21	P_FCP_LFI_MSYC	Configure Iswitch2	TPF: PFLMSYC_M_SWTCH2_8991.IPF
5.1.34	Set Cryo bias on ACA1 of RCA 18, 21	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_8891.IPF



5.1.35	WAIT 1 minute			
Note: ACA1 and 2 of RCA 18 and 21 now set with Cryo values				
5.1.36	Set zero bias on ACA3 and ACA4 of RCA 18 and 21	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_9331.IPF
5.1.37	Disable B/D 4kHz on RCA 18 and 21	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8201.IPF
5.1.38	Disable A/C 4kHz on RCA 18 and 21	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8201.IPF
5.1.39	Set A/C P/S Status (0) on RCA 18 and 21	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8201.IPF
5.1.40	Set B/D P/S Status (0) on RCA 18 and 21	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8201.IPF
5.1.41	WAIT 1 minute			
5.1.42	Set Cryo bias on ACA3 of RCA 18, 21	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_9091.IPF
5.1.43	WAIT 1 minute			
5.1.44	Set A/C P/S Status (1) on RCA 18 and 21	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8211.IPF
5.1.45	WAIT 1 minute			
5.1.46	Enable 4kHz (A/C) RCA 18 and 21	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8211.IPF
5.1.47	WAIT 1 minute			
5.1.48	Set lswitch1 low value on ACA3 RCA 18, 21	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_9092.IPF
5.1.49	WAIT 1 minute			
5.1.50	Set lswitch1 nominal value on ACA3 RCA 18, 21	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_9091.IPF



5.1.51	Set lswitch2 low value on ACA3 RCA 18, 21	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_9092.IPF
5.1.52	WAIT 1 minute			
5.1.53	Set lswitch2 nominal value on ACA3 RCA 18, 21	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_9091.IPF
5.1.54	Disable 4kHz (A/C) RCA 18, 21	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8201.IPF
5.1.55	Set A/C P/S Status (0) on RCA 18 and 21	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8201.IPF
5.1.56	Set zero bias on ACA3 of RCA 18, 21	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_9031.IPF
5.1.57	Set Cryo bias on ACA4 of RCA 18, 21	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_9191.IPF
5.1.58	WAIT 1 minute			
5.1.59	Set B/D P/S Status (1) on RCA 18 and 21	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8211.IPF
5.1.60	WAIT 1 minute			
5.1.61	Enable 4kHz (B/D) RCA 18 and 21	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8211.IPF
5.1.62	WAIT 1 minute			
5.1.63	Set lswitch1 low value on ACA2 RCA 18, 21	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_9192.IPF
5.1.64	WAIT 1 minute			
5.1.65	Set lswitch1 nominal value on ACA4 RCA 18, 21	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_9191.IPF
5.1.66	Set lswitch2 low value on ACA4 RCA 18, 21	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_9192.IPF



5.1.67	WAIT 1 minute			
5.1.68	Set lswitch2 nominal value on ACA4 RCA 18, 21	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_9191.IPF
5.1.69	Set Cryo bias on ACA3 of RCA 18, 21	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_9091.IPF
5.1.70	WAIT 1 minute			
Note: All ACAs of RCA 18 and 21 now set with Cryo values				
5.2	RCA 19 and 22			
5.2.1	Set zero bias on ACA1 and ACA2 of RCA 19 and 22	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_9241.IPF
5.2.2	Disable B/D 4kHz on RCA 19 and 22	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8301.IPF
5.2.3	Disable A/C 4kHz on RCA 19 and 22	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8301.IPF
5.2.4	Set A/C P/S Status (0) on RCA 19 and 22	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8301.IPF
5.2.5	Set B/D P/S Status (0) on RCA 19 and 22	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8301.IPF
5.2.6	WAIT 1 minute			
5.2.7	Set Cryo bias on ACA1 of RCA 19, 22	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_88A1.IPF
5.2.8	WAIT 1 minute			
5.2.9	Set A/C P/S Status (1) on RCA 19 and 22	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8311.IPF
5.2.10	WAIT 1 minute			
5.2.11	Enable 4kHz (A/C)	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF:



	RCA 19 and 22			PFLMSCC_M_E_DA_C_8311.IPF
5.2.12	WAIT 1 minute			
5.2.13	Set lswitch1 low value on ACA1 RCA 19, 22	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_88A2.IPF
5.2.14	WAIT 1 minute			
5.2.15	Set lswitch1 nominal value on ACA1 RCA 19, 22	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_88A1.IPF
5.2.16	Set lswitch2 low value on ACA1 RCA 19, 22	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_88A2.IPF
5.2.17	WAIT 1 minute			
5.2.18	Set lswitch2 nominal value on ACA1 RCA 19, 22	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_88A1.IPF
5.2.19	Disable 4kHz (A/C) RCA 19, 22	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8301.IPF
5.2.20	Set A/C P/S Status (0) on RCA 19 and 22	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8301.IPF
5.2.21	Set zero bias on ACA1 of RCA 19, 22	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_8841.IPF
5.2.22	Set Cryo bias on ACA2 of RCA 19, 22	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_89A1.IPF
5.2.23	WAIT 1 minute			
5.2.24	Set B/D P/S Status (1) on RCA 19 and 22	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8311.IPF
5.2.25	WAIT 1 minute			
5.2.26	Enable 4kHz (B/D) RCA 19 and 22	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8311.IPF
5.2.27	WAIT 1 minute			



5.2.28	Set lswitch1 low value on ACA2 RCA 19, 22	P_FCP_LFI_MSXC	Configure lswitch1	<b>TPF:</b> PFLMSXC_M_SWTCH1_89A2.IPF
5.2.29	WAIT 1 minute			
5.2.30	Set lswitch1 nominal value on ACA2 RCA 19, 22	P_FCP_LFI_MSXC	Configure lswitch1	<b>TPF:</b> PFLMSXC_M_SWTCH1_89A1.IPF
5.2.31	Set lswitch2 low value on ACA2 RCA 19, 22	P_FCP_LFI_MSYC	Configure lswitch2	<b>TPF:</b> PFLMSYC_M_SWTCH2_89A2.IPF
5.2.32	WAIT 1 minute			
5.2.33	Set lswitch2 nominal value on ACA2 RCA 19, 22	P_FCP_LFI_MSYC	Configure lswitch2	<b>TPF:</b> PFLMSYC_M_SWTCH2_89A1.IPF
5.2.34	Set Cryo bias on ACA1 of RCA 19, 22	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	<b>TPF:</b> PFLMRCA_M_5x_RCA_88A1.IPF
5.2.35	WAIT 1 minute			
Note: ACA1 and 2 of RCA 19 and 22 now set with Cryo values				
5.2.36	Set zero bias on ACA3 and ACA4 of RCA 19 and 22	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	<b>TPF:</b> PFLMRCA_M_5x_RCA_9341.IPF
5.2.37	Disable B/D 4kHz on RCA 19 and 22	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	<b>TPF:</b> PFLMSDC_M_E_DB_D_8301.IPF
5.2.38	Disable A/C 4kHz on RCA 19 and 22	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	<b>TPF:</b> PFLMSCC_M_E_DA_C_8301.IPF
5.2.39	Set A/C P/S Status (0) on RCA 19 and 22	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	<b>TPF:</b> PFLMSAC_M_POLA_C_8301.IPF
5.2.40	Set B/D P/S Status (0) on RCA 19 and 22	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	<b>TPF:</b> PFLMSBC_M_POLB_D_8301.IPF
5.2.41	WAIT 1 minute			
5.2.42	Set Cryo bias on ACA3 of RCA 19, 22	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	<b>TPF:</b> PFLMRCA_M_5x_RCA_90A1.IPF



5.2.43	WAIT 1 minute			
5.2.44	Set A/C P/S Status (1) on RCA 19 and 22	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8311.IPF
5.2.45	WAIT 1 minute			
5.2.46	Enable 4kHz (A/C) RCA 19 and 22	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8311.IPF
5.2.47	WAIT 1 minute			
5.2.48	Set lswitch1 low value on ACA3 RCA 19, 22	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_90A2.IPF
5.2.49	WAIT 1 minute			
5.2.50	Set lswitch1 nominal value on ACA3 RCA 19, 22	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_90A1.IPF
5.2.51	Set lswitch2 low value on ACA3 RCA 19, 22	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_90A2.IPF
5.2.52	WAIT 1 minute			
5.2.53	Set lswitch2 nominal value on ACA3 RCA 19, 22	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_90A1.IPF
5.2.54	Disable 4kHz (A/C) RCA 19, 22	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8301.IPF
5.2.55	Set A/C P/S Status (0) on RCA 19 and 22	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8301.IPF
5.2.56	Set zero bias on ACA3 of RCA 19, 22	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_9041.IPF
5.2.57	Set Cryo bias on ACA4 of RCA 19, 22	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_91A1.IPF
5.2.58	WAIT 1 minute			
5.2.59	Set B/D P/S Status (1) on RCA 19 and 22	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF:



				PFLMSBC_M_POLB_D_8311.IPF
5.2.60	WAIT 1 minute			
5.2.61	Enable 4kHz (B/D) RCA 19 and 22	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8311.IPF
5.2.62	WAIT 1 minute			
5.2.63	Set lswitch1 low value on ACA2 RCA 19, 22	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_91A2.IPF
5.2.64	WAIT 1 minute			
5.2.65	Set lswitch1 nominal value on ACA4 RCA 19, 22	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_91A1.IPF
5.2.66	Set lswitch2 low value on ACA4 RCA 19, 22	P_FCP_LFI_MSXC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_91A2.IPF
5.2.67	WAIT 1 minute			
5.2.68	Set lswitch2 nominal value on ACA4 RCA 19, 22	P_FCP_LFI_MSXC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_91A1.IPF
5.2.69	Set Cryo bias on ACA3 of RCA 19, 22	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_90A1.IPF
5.2.70	WAIT 1 minute			
	Note: All ACAs of RCA 19 and 22 now set with Cryo values			
5.3	RCA 20 and 23			
5.3.1	Set zero bias on ACA1 and ACA2 of RCA 20 and 23	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_9251.IPF
5.3.2	Disable B/D 4kHz on RCA 20 and 23	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8401.IPF
5.3.3	Disable A/C 4kHz on RCA 20 and 23	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8401.IPF



5.3.4	Set A/C P/S Status (0) on RCA 20 and 23	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8401.IPF
5.3.5	Set B/D P/S Status (0) on RCA 20 and 23	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8401.IPF
5.3.6	WAIT 1 minute			
5.3.7	Set Cryo bias on ACA1 of RCA 20, 23	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_88B1.IPF
5.3.8	WAIT 1 minute			
5.3.9	Set A/C P/S Status (1) on RCA 20 and 23	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8411.IPF
5.3.10	WAIT 1 minute			
5.3.11	Enable 4kHz (A/C) RCA 20 and 23	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8411.IPF
5.3.12	WAIT 1 minute			
5.3.13	Set Iswitch1 low value on ACA1 RCA 20, 23	P_FCP_LFI_MSXC	Configure Iswitch1	TPF: PFLMSXC_M_SWTCH1_88B2.IPF
5.3.14	WAIT 1 minute			
5.3.15	Set Iswitch1 nominal value on ACA1 RCA 20, 23	P_FCP_LFI_MSXC	Configure Iswitch1	TPF: PFLMSXC_M_SWTCH1_88B1.IPF
5.3.16	Set Iswitch2 low value on ACA1 RCA 20, 23	P_FCP_LFI_MSYC	Configure Iswitch2	TPF: PFLMSYC_M_SWTCH2_88B2.IPF
5.3.17	WAIT 1 minute			
5.3.18	Set Iswitch2 nominal value on ACA1 RCA 20, 23	P_FCP_LFI_MSYC	Configure Iswitch2	TPF: PFLMSYC_M_SWTCH2_88B1.IPF
5.3.19	Disable 4kHz (A/C) RCA 20, 23	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8401.IPF
5.3.20	Set A/C P/S Status (0)	P_FCP_LFI_MSAC	Configure Polarisation	TPF:



	on RCA 20 and 23		of A-C Phase Switch	PFLMSAC_M_POLA_C_8401.IPF
5.3.21	Set zero bias on ACA1 of RCA 20, 23	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_8851.IPF
5.3.22	Set Cryo bias on ACA2 of RCA 20, 23	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_89B1.IPF
5.3.23	WAIT 1 minute			
5.3.24	Set B/D P/S Status (1) on RCA 20 and 23	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8411.IPF
5.3.25	WAIT 1 minute			
5.3.26	Enable 4kHz (B/D) RCA 20 and 23	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8411.IPF
5.3.27	WAIT 1 minute			
5.3.28	Set Iswitch1 low value on ACA2 RCA 20, 23	P_FCP_LFI_MSXC	Configure Iswitch1	TPF: PFLMSXC_M_SWTCH1_89B2.IPF
5.3.29	WAIT 1 minute			
5.3.30	Set Iswitch1 nominal value on ACA2 RCA 20, 23	P_FCP_LFI_MSXC	Configure Iswitch1	TPF: PFLMSXC_M_SWTCH1_89B1.IPF
5.3.31	Set Iswitch2 low value on ACA2 RCA 20, 23	P_FCP_LFI_MSYC	Configure Iswitch2	TPF: PFLMSYC_M_SWTCH2_89B2.IPF
5.3.32	WAIT 1 minute			
5.3.33	Set Iswitch2 nominal value on ACA2 RCA 20, 23	P_FCP_LFI_MSYC	Configure Iswitch2	TPF: PFLMSYC_M_SWTCH2_89B1.IPF
5.3.34	Set Cryo bias on ACA1 of RCA 20, 23	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_88B1.IPF
5.3.35	WAIT 1 minute			
	Note: ACA1 and 2 of RCA 20 and 23 now set with Cryo values			
5.3.36	Set zero bias on ACA3 and ACA4 of RCA 20	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1	TPF: PFLMRCA_M_5x_RCA_9351.IPF



	and 23		and lswitch2 parameters	
5.3.37	Disable B/D 4kHz on RCA 20 and 23	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8401.IPF
5.3.38	Disable A/C 4kHz on RCA 20 and 23	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8401.IPF
5.3.39	Set A/C P/S Status (0) on RCA 20 and 23	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8401.IPF
5.3.40	Set B/D P/S Status (0) on RCA 20 and 23	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8401.IPF
5.3.41	WAIT 1 minute			
5.3.42	Set Cryo bias on ACA3 of RCA 20, 23	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_90B1.IPF
5.3.43	WAIT 1 minute			
5.3.44	Set A/C P/S Status (1) on RCA 20 and 23	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8411.IPF
5.3.45	WAIT 1 minute			
5.3.46	Enable 4kHz (A/C) RCA 20 and 23	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8411.IPF
5.3.47	WAIT 1 minute			
5.3.48	Set lswitch1 low value on ACA3 RCA 20, 23	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_90B2.IPF
5.3.49	WAIT 1 minute			
5.3.50	Set lswitch1 nominal value on ACA3 RCA 20, 23	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_90B1.IPF
5.3.51	Set lswitch2 low value on ACA3 RCA 20, 23	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_90B2.IPF
5.3.52	WAIT 1 minute			



5.3.53	Set lswitch2 nominal value on ACA3 RCA 20, 23	P_FCP_LFI_MSyc	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_90B1.IPF
5.3.54	Disable 4kHz (A/C) RCA 20, 23	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8401.IPF
5.3.55	Set A/C P/S Status (0) on RCA 20 and 23	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8401.IPF
5.3.56	Set zero bias on ACA3 of RCA 20, 23	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_9051.IPF
5.3.57	Set Cryo bias on ACA4 of RCA 20, 23	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_91B1.IPF
5.3.58	WAIT 1 minute			
5.3.59	Set B/D P/S Status (1) on RCA 20 and 23	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8411.IPF
5.3.60	WAIT 1 minute			
5.3.61	Enable 4kHz (B/D) RCA 20 and 23	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8411.IPF
5.3.62	WAIT 1 minute			
5.3.63	Set lswitch1 low value on ACA2 RCA 20, 23	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_91B2.IPF
5.3.64	WAIT 1 minute			
5.3.65	Set lswitch1 nominal value on ACA4 RCA 20, 23	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_91B1.IPF
5.3.66	Set lswitch2 low value on ACA4 RCA 20, 23	P_FCP_LFI_MSyc	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_91B2.IPF
5.3.67	WAIT 1 minute			
5.3.68	Set lswitch2 nominal value on ACA4 RCA 20, 23	P_FCP_LFI_MSyc	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_91B1.IPF



5.3.69	Set Cryo bias on ACA3 of RCA 20, 23	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_90B1.IPF
5.3.70	WAIT 1 minute			
	Note: All ACAs of RCA 20 and 23 now set with Cryo values			
5.4	RCA 25 and 24			
5.4.1	Set zero bias on ACA1 and ACA2 of RCA 25 and 24	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_9261.IPF
5.4.2	Disable B/D 4kHz on RCA 25 and 24	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8501.IPF
5.4.3	Disable A/C 4kHz on RCA 25 and 24	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8501.IPF
5.4.4	Set A/C P/S Status (0) on RCA 25 and 24	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8501.IPF
5.4.5	Set B/D P/S Status (0) on RCA 25 and 24	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8501.IPF
5.4.6	WAIT 1 minute			
5.4.7	Set Cryo bias on ACA1 of RCA 25, 24	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_88C1.IPF
5.4.8	WAIT 1 minute			
5.4.9	Set A/C P/S Status (1) on RCA 25 and 24	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8511.IPF
5.4.10	WAIT 1 minute			
5.4.11	Enable 4kHz (A/C) RCA 25 and 24	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8511.IPF
5.4.12	WAIT 1 minute			
5.4.13	Set lswitch1 low value on ACA1 RCA 25, 24	P_FCP_LFI_MSXC	Configure lswitch1	TPF:



				PFLMSXC_M_SWTCH1_88C2.IPF
5.4.14	WAIT 1 minute			
5.4.15	Set lswitch1 nominal value on ACA1 RCA 25, 24	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_88C1.IPF
5.4.16	Set lswitch2 low value on ACA1 RCA 25, 24	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_88C2.IPF
5.4.17	WAIT 1 minute			
5.4.18	Set lswitch2 nominal value on ACA1 RCA 25, 24	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_88C1.IPF
5.4.19	Disable 4kHz (A/C) RCA 25, 24	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8501.IPF
5.4.20	Set A/C P/S Status (0) on RCA 25 and 24	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8501.IPF
5.4.21	Set zero bias on ACA1 of RCA 25, 24	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_8861.IPF
5.4.22	Set Cryo bias on ACA2 of RCA 25, 24	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_89C1.IPF
5.4.23	WAIT 1 minute			
5.4.24	Set B/D P/S Status (1) on RCA 25 and 24	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8511.IPF
5.4.25	WAIT 1 minute			
5.4.26	Enable 4kHz (B/D) RCA 25 and 24	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8511.IPF
5.4.27	WAIT 1 minute			
5.4.28	Set lswitch1 low value on ACA2 RCA 25, 24	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_89C2.IPF
5.4.29	WAIT 1 minute			



5.4.30	Set lswitch1 nominal value on ACA2 RCA 25, 24	P_FCP_LFI_MSXC	Configure lswitch1	<b>TPF:</b> PFLMSXC_M_SWTCH1_89C1.IPF
5.4.31	Set lswitch2 low value on ACA2 RCA 25, 24	P_FCP_LFI_MSYC	Configure lswitch2	<b>TPF:</b> PFLMSYC_M_SWTCH2_89C2.IPF
5.4.32	WAIT 1 minute			
5.4.33	Set lswitch2 nominal value on ACA2 RCA 25, 24	P_FCP_LFI_MSYC	Configure lswitch2	<b>TPF:</b> PFLMSYC_M_SWTCH2_89C1.IPF
5.4.34	Set Cryo bias on ACA1 of RCA 25, 24	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	<b>TPF:</b> PFLMRCA_M_5x_RCA_88C1.IPF
5.4.35	WAIT 1 minute			
Note: ACA1 and 2 of RCA 25 and 24 now set with Cryo values				
5.4.36	Set zero bias on ACA3 and ACA4 of RCA 25 and 24	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	<b>TPF:</b> PFLMRCA_M_5x_RCA_9361.IPF
5.4.37	Disable B/D 4kHz on RCA 25 and 24	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	<b>TPF:</b> PFLMSDC_M_E_DB_D_8501.IPF
5.4.38	Disable A/C 4kHz on RCA 25 and 24	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	<b>TPF:</b> PFLMSCC_M_E_DA_C_8501.IPF
5.4.39	Set A/C P/S Status (0) on RCA 25 and 24	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	<b>TPF:</b> PFLMSAC_M_POLA_C_8501.IPF
5.4.40	Set B/D P/S Status (0) on RCA 25 and 24	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	<b>TPF:</b> PFLMSBC_M_POLB_D_8501.IPF
5.4.41	WAIT 1 minute			
5.4.42	Set Cryo bias on ACA3 of RCA 25, 24	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	<b>TPF:</b> PFLMRCA_M_5x_RCA_90C1.IPF
5.4.43	WAIT 1 minute			
5.4.44	Set A/C P/S Status (1) on RCA 25 and 24	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	<b>TPF:</b> PFLMSAC_M_POLA_C_8511.IPF



5.4.45	WAIT 1 minute			
5.4.46	Enable 4kHz (A/C) RCA 25 and 24	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8511.IPF
5.4.47	WAIT 1 minute			
5.4.48	Set lswitch1 low value on ACA3 RCA 25, 24	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_90C2.IPF
5.4.49	WAIT 1 minute			
5.4.50	Set lswitch1 nominal value on ACA3 RCA 25, 24	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_90C1.IPF
5.4.51	Set lswitch2 low value on ACA3 RCA 25, 24	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_90C2.IPF
5.4.52	WAIT 1 minute			
5.4.53	Set lswitch2 nominal value on ACA3 RCA 25, 24	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_90C1.IPF
5.4.54	Disable 4kHz (A/C) RCA 25, 24	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8501.IPF
5.4.55	Set A/C P/S Status (0) on RCA 25 and 24	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8501.IPF
5.4.56	Set zero bias on ACA3 of RCA 25, 24	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_9061.IPF
Set Cryo values on ACA4 RCA 24 (Special ordering)				
5.4.57	Set Vg2 on ACA4 of RCA 24	P_FCP_LFI_MS2C	Configure Vgate2	TPF: PFLMS2C_M_VGATE2_0821.IPF
5.4.58	Set Vdrain on ACA4 of RCA 24	P_FCP_LFI_MSNC	Configure Vdrain	TPF: PFLMSNC_M_DRAIN_0821.IPF
5.4.59	Set Vg1 on ACA4 of RCA 24	P_FCP_LFI_MS1C	Configure Vgate1	TPF: PFLMS1C_M_VGATE1_0821.IPF



5.4.60	Set Iswitch1 on ACA4 of RCA 24	P_FCP_LFI_MSXC	Configure Iswitch1	<b>TPF:</b> PFLMSXC_M_SWTCH1_0821.IPF
5.4.61	Set Iswitch2 on ACA4 of RCA 24	P_FCP_LFI_MSXC	Configure Iswitch2	<b>TPF:</b> PFLMSYC_M_SWTCH2_0821.IPF
5.4.62	Set Cryo bias on ACA4 of RCA 25	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	<b>TPF:</b> PFLMRCA_M_5x_RCA_2421.IPF
5.4.63	WAIT 1 minute			
5.4.64	Set B/D P/S Status (1) on RCA 25 and 24	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	<b>TPF:</b> PFLMSBC_M_POLB_D_8511.IPF
5.4.65	WAIT 1 minute			
5.4.66	Enable 4kHz (B/D) RCA 25 and 24	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	<b>TPF:</b> PFLMSDC_M_E_DB_D_8511.IPF
5.4.67	WAIT 1 minute			
5.4.68	Set Iswitch1 low value on ACA2 RCA 25, 24	P_FCP_LFI_MSXC	Configure Iswitch1	<b>TPF:</b> PFLMSXC_M_SWTCH1_91C2.IPF
5.4.69	WAIT 1 minute			
5.4.70	Set Iswitch1 nominal value on ACA4 RCA 25, 24	P_FCP_LFI_MSXC	Configure Iswitch1	<b>TPF:</b> PFLMSXC_M_SWTCH1_91C1.IPF
5.4.71	Set Iswitch2 low value on ACA4 RCA 25, 24	P_FCP_LFI_MSXC	Configure Iswitch2	<b>TPF:</b> PFLMSYC_M_SWTCH2_91C2.IPF
5.4.72	WAIT 1 minute			
5.4.73	Set Iswitch2 nominal value on ACA4 RCA 25, 24	P_FCP_LFI_MSXC	Configure Iswitch2	<b>TPF:</b> PFLMSYC_M_SWTCH2_91C1.IPF
5.4.74	Set Cryo bias on ACA3 of RCA 25, 24	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	<b>TPF:</b> PFLMRCA_M_5x_RCA_90C1.IPF
5.4.75	WAIT 1 minute			
Note: All ACAs of RCA 25 and 24 now set with Cryo values				



5.5	RCA 26 and 27			
5.5.1	Set zero bias on ACA1 and ACA2 of RCA 26 and 27	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_9271.IPF
5.5.2	Disable B/D 4kHz on RCA 26 and 27	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8601.IPF
5.5.3	Disable A/C 4kHz on RCA 26 and 27	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8601.IPF
5.5.4	Set A/C P/S Status (0) on RCA 26 and 27	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8601.IPF
5.5.5	Set B/D P/S Status (0) on RCA 26 and 27	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8601.IPF
5.5.6	WAIT 1 minute			
5.5.7	Set Cryo bias on ACA1 of RCA 26, 27	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_88D1.IPF
5.5.8	WAIT 1 minute			
5.5.9	Set A/C P/S Status (1) on RCA 26 and 27	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8611.IPF
5.5.10	WAIT 1 minute			
5.5.11	Enable 4kHz (A/C) RCA 26 and 27	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8611.IPF
5.5.12	WAIT 1 minute			
5.5.13	Set Iswitch1 low value on ACA1 RCA 26, 27	P_FCP_LFI_MSXC	Configure Iswitch1	TPF: PFLMSXC_M_SWTCH1_88D2.IPF
5.5.14	WAIT 1 minute			
5.5.15	Set Iswitch1 nominal value on ACA1 RCA 26, 27	P_FCP_LFI_MSXC	Configure Iswitch1	TPF: PFLMSXC_M_SWTCH1_88D1.IPF



5.5.16	Set lswitch2 low value on ACA1 RCA 26, 27	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_88D2.IPF
5.5.17	WAIT 1 minute			
5.5.18	Set lswitch2 nominal value on ACA1 RCA 26, 27	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_88D1.IPF
5.5.19	Disable 4kHz (A/C) RCA 26, 27	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8601.IPF
5.5.20	Set A/C P/S Status (0) on RCA 26 and 27	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8601.IPF
5.5.21	Set zero bias on ACA1 of RCA 26, 27	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_8871.IPF
5.5.22	Set Cryo bias on ACA2 of RCA 26, 27	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_89D1.IPF
5.5.23	WAIT 1 minute			
5.5.24	Set B/D P/S Status (1) on RCA 26 and 27	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8611.IPF
5.5.25	WAIT 1 minute			
5.5.26	Enable 4kHz (B/D) RCA 26 and 27	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8611.IPF
5.5.27	WAIT 1 minute			
5.5.28	Set lswitch1 low value on ACA2 RCA 26, 27	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_89D2.IPF
5.5.29	WAIT 1 minute			
5.5.30	Set lswitch1 nominal value on ACA2 RCA 26, 27	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_89D1.IPF
5.5.31	Set lswitch2 low value on ACA2 RCA 26, 27	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_89D2.IPF



5.5.32	WAIT 1 minute			
5.5.33	Set lswitch2 nominal value on ACA2 RCA 26, 27	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_89D1.IPF
5.5.34	Set Cryo bias on ACA1 of RCA 26, 27	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_88D1.IPF
5.5.35	WAIT 1 minute			
	Note: ACA1 and 2 of RCA 26 and 27 now set with Cryo values			
5.5.36	Set zero bias on ACA3 and ACA4 of RCA 26 and 27	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_9371.IPF
5.5.37	Disable B/D 4kHz on RCA 26 and 27	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8601.IPF
5.5.38	Disable A/C 4kHz on RCA 26 and 27	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8601.IPF
5.5.39	Set A/C P/S Status (0) on RCA 26 and 27	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8601.IPF
5.5.40	Set B/D P/S Status (0) on RCA 26 and 27	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8601.IPF
5.5.41	WAIT 1 minute			
5.5.42	Set Cryo bias on ACA3 of RCA 26, 27	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_90D1.IPF
5.5.43	WAIT 1 minute			
5.5.44	Set A/C P/S Status (1) on RCA 26 and 27	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8611.IPF
5.5.45	WAIT 1 minute			
5.5.46	Enable 4kHz (A/C) RCA 26 and 27	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8611.IPF
5.5.47	WAIT 1 minute			



5.5.48	Set lswitch1 low value on ACA3 RCA 26, 27	P_FCP_LFI_MSXC	Configure lswitch1	<b>TPF:</b> PFLMSXC_M_SWTCH1_90D2.IPF
5.5.49	WAIT 1 minute			
5.5.50	Set lswitch1 nominal value on ACA3 RCA 26, 27	P_FCP_LFI_MSXC	Configure lswitch1	<b>TPF:</b> PFLMSXC_M_SWTCH1_90D1.IPF
5.5.51	Set lswitch2 low value on ACA3 RCA 26, 27	P_FCP_LFI_MSYC	Configure lswitch2	<b>TPF:</b> PFLMSYC_M_SWTCH2_90D2.IPF
5.5.52	WAIT 1 minute			
5.5.53	Set lswitch2 nominal value on ACA3 RCA 26, 27	P_FCP_LFI_MSYC	Configure lswitch2	<b>TPF:</b> PFLMSYC_M_SWTCH2_90D1.IPF
5.5.54	Disable 4kHz (A/C) RCA 26, 27	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	<b>TPF:</b> PFLMSCC_M_E_DA_C_8601.IPF
5.5.55	Set A/C P/S Status (0) on RCA 26 and 27	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	<b>TPF:</b> PFLMSAC_M_POLA_C_8601.IPF
5.5.5	Set zero bias on ACA3 of RCA 26, 27	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	<b>TPF:</b> PFLMRCA_M_5x_RCA_9071.IPF
5.5.57	Set Cryo bias on ACA4 of RCA 26, 27	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	<b>TPF:</b> PFLMRCA_M_5x_RCA_91D1.IPF
5.5.58	WAIT 1 minute			
5.5.59	Set B/D P/S Status (1) on RCA 26 and 27	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	<b>TPF:</b> PFLMSBC_M_POLB_D_8611.IPF
5.5.60	WAIT 1 minute			
5.5.61	Enable 4kHz (B/D) RCA 26 and 27	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	<b>TPF:</b> PFLMSDC_M_E_DB_D_8611.IPF
5.5.62	WAIT 1 minute			
5.5.63	Set lswitch1 low value on ACA2 RCA 26, 27	P_FCP_LFI_MSXC	Configure lswitch1	<b>TPF:</b> PFLMSXC_M_SWTCH1_91D2.IPF



5.5.64	WAIT 1 minute			
5.5.65	Set lswitch1 nominal value on ACA4 RCA 26, 27	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_91D1.IPF
5.5.66	Set lswitch2 low value on ACA4 RCA 26, 27	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_91D2.IPF
5.5.67	WAIT 1 minute			
5.5.68	Set lswitch2 nominal value on ACA4 RCA 26, 27	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_91D1.IPF
5.5.69	Set Cryo bias on ACA3 of RCA 26, 27	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_90D1.IPF
5.5.70	WAIT 1 minute			
	Note: All ACAs of RCA 26 and 27 now set with Cryo values			
5.6	RCA 28			
5.6.1	Set zero bias on ACA1 and ACA2 of RCA 28	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_9281.IPF
5.6.2	Disable B/D 4kHz on RCA 28	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8701.IPF
5.6.3	Disable A/C 4kHz on RCA 28	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8701.IPF
5.6.4	Set A/C P/S Status (0) on RCA 28	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8701.IPF
5.6.5	Set B/D P/S Status (0) on RCA 28	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8701.IPF
5.6.6	WAIT 1 minute			
5.6.7	Power on ACA1 and ACA2 with Soft Switch-On procedure	4x P_FCP_LFI_MRCA	RCA28 Soft Switch-On procedure (ACA 1 + 2)	TPF: PFLMRCA_M_5x_RCA_92E1.IPF PFLMRCA_M_5x_RCA_92E2.IPF



				PFLMRCA_M_5x_RCA_92E3.IPF PFLMRCA_M_5x_RCA_92E4.IPF
5.6.8	Set Cryo bias on ACA2 of RCA 28	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_8981.IPF
5.6.9	WAIT 1 minute			
5.6.10	Set A/C P/S Status (1) on RCA 28	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8711.IPF
5.6.11	WAIT 1 minute			
5.6.12	Enable 4kHz (A/C) RCA 28	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8711.IPF
5.6.13	WAIT 1 minute			
5.6.14	Set lswitch1 low value on ACA1 RCA 28	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_88E2.IPF
5.6.15	WAIT 1 minute			
5.6.16	Set lswitch1 nominal value on ACA1 RCA 28	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_88E1.IPF
5.6.17	Set lswitch2 low value on ACA1 RCA 28	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_88E2.IPF
5.6.18	WAIT 1 minute			
5.6.19	Set lswitch2 nominal value on ACA1 RCA 28	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_88E1.IPF
5.6.20	Disable 4kHz (A/C) RCA 28	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8701.IPF
5.6.21	Set A/C P/S Status (0) on RCA 28	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8701.IPF
5.6.22	Set zero bias on ACA1 of RCA 28	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_8881.IPF



5.6.23	Power on ACA1 and ACA2 with Soft Switch-On procedure	4x P_FCP_LFI_MRCA	RCA28 Soft Switch-On procedure (ACA 1 + 2)	TPF: PFLMRCA_M_5x_RCA_92E1.IPF PFLMRCA_M_5x_RCA_92E2.IPF PFLMRCA_M_5x_RCA_92E3.IPF PFLMRCA_M_5x_RCA_92E4.IPF
5.6.24	Set Cryo bias on ACA1 of RCA 28	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_8881.IPF
5.6.25	WAIT 1 minute			
5.6.26	Set B/D P/S Status (1) on RCA 28	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8711.IPF
5.6.27	WAIT 1 minute			
5.6.28	Enable 4kHz (B/D) RCA 28	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8711.IPF
5.6.29	WAIT 1 minute			
5.6.30	Set Iswitch1 low value on ACA2 RCA 28	P_FCP_LFI_MSXC	Configure Iswitch1	TPF: PFLMSXC_M_SWTCH1_89E2.IPF
5.6.31	WAIT 1 minute			
5.6.32	Set Iswitch1 nominal value on ACA2 RCA 28	P_FCP_LFI_MSXC	Configure Iswitch1	TPF: PFLMSXC_M_SWTCH1_89E1.IPF
5.6.33	Set Iswitch2 low value on ACA2 RCA 28	P_FCP_LFI_MSXC	Configure Iswitch2	TPF: PFLMSXC_M_SWTCH2_89E2.IPF
5.6.34	WAIT 1 minute			
5.6.35	Set Iswitch2 nominal value on ACA2 RCA 28	P_FCP_LFI_MSXC	Configure Iswitch2	TPF: PFLMSXC_M_SWTCH2_89E1.IPF
5.6.36	Set zero bias on ACA2 of RCA 28	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_8981.IPF
5.6.37	Power on ACA1 and ACA2 with Soft Switch-On procedure	4x P_FCP_LFI_MRCA	RCA28 Soft Switch-On procedure (ACA 1 + 2)	TPF: PFLMRCA_M_5x_RCA_92E1.IPF



				PFLMRCA_M_5x_RCA_92E2.IPF PFLMRCA_M_5x_RCA_92E3.IPF PFLMRCA_M_5x_RCA_92E4.IPF
5.6.38	WAIT 1 minute			
	Note: ACA1 and 2 of RCA 28 now set with Cryo values			
5.6.39	Set zero bias on ACA3 and ACA4 of RCA 28	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_9381.IPF
5.6.40	Disable B/D 4kHz on RCA 28	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8701.IPF
5.6.41	Disable A/C 4kHz on RCA 28	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8701.IPF
5.6.42	Set A/C P/S Status (0) on RCA 28	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8701.IPF
5.6.43	Set B/D P/S Status (0) on RCA 28	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8701.IPF
5.6.44	WAIT 1 minute			
5.6.45	Set Cryo bias on ACA3 of RCA 28	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_90E1.IPF
5.6.46	WAIT 1 minute			
5.6.47	Set A/C P/S Status (1) on RCA 28	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8711.IPF
5.6.48	WAIT 1 minute			
5.6.49	Enable 4kHz (A/C) RCA 28	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8711.IPF
5.6.50	WAIT 1 minute			
5.6.51	Set lswitch1 low value on ACA3 RCA 28	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_90E2.IPF



5.6.52	WAIT 1 minute			
5.6.53	Set lswitch1 nominal value on ACA3 RCA 28	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_90E1.IPF
5.6.54	Set lswitch2 low value on ACA3 RCA 28	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_90E2.IPF
5.6.55	WAIT 1 minute			
5.6.56	Set lswitch2 nominal value on ACA3 RCA 28	P_FCP_LFI_MSYC	Configure lswitch2	TPF: PFLMSYC_M_SWTCH2_90E1.IPF
5.6.57	Disable 4kHz (A/C) RCA 28	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_8701.IPF
5.6.58	Set A/C P/S Status (0) on RCA 28	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_8701.IPF
5.6.59	Set zero bias on ACA3 of RCA 28	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_9081.IPF
5.6.60	Set Cryo bias on ACA4 of RCA 28	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_91E1.IPF
5.6.61	WAIT 1 minute			
5.6.62	Set B/D P/S Status (1) on RCA 28	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_8711.IPF
5.6.63	WAIT 1 minute			
5.6.64	Enable 4kHz (B/D) RCA 28	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_8711.IPF
5.6.65	WAIT 1 minute			
5.6.66	Set lswitch1 low value on ACA2 RCA 28	P_FCP_LFI_MSXC	Configure lswitch1	TPF: PFLMSXC_M_SWTCH1_91E2.IPF
5.6.67	WAIT 1 minute			
5.6.68	Set lswitch1 nominal value on ACA4 RCA	P_FCP_LFI_MSXC	Configure lswitch1	TPF:



	28			PFLMSXC_M_SWTCH1_91E1.IPF
5.6.69	Set Iswitch2 low value on ACA4 RCA 28	P_FCP_LFI_MSYC	Configure Iswitch2	TPF: PFLMSYC_M_SWTCH2_91E2.IPF
5.6.70	WAIT 1 minute			
5.6.71	Set Iswitch2 nominal value on ACA4 RCA 28	P_FCP_LFI_MSYC	Configure Iswitch2	TPF: PFLMSYC_M_SWTCH2_91E1.IPF
5.6.72	Set Cryo bias on ACA3 of RCA 28	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_90E1.IPF
5.6.7	WAIT 1 minute			
	Note: All ACAs of RCA 28 now set with Cryo values			
5.7	Apply DEFAULT Configuration			
5.7.1	Apply Default DAE Configuration as current configuration	P_FCP_LFI_MADC	Apply DEFAULT Configuration as Current	(none)
<b>Additional Comments</b>				
None				

2.2.6 Activity #6 - R-factor

#6	LFI R-factor Test			
	<b>Detailed Description</b>	<p>LFI R-factor test</p> <p>The procedure foresees to exercise 4 different sets of P/S and LNA biases (P_FCP_LFI_MRCA) in order to:</p> <ul style="list-style-type: none"> <li>- Change the Phase Switch bias balancing acting on I<sub>switch1</sub> and I<sub>switch2</sub> bias of:             <ul style="list-style-type: none"> <li>- the switching P/S,</li> <li>- the fixed P/S,</li> </ul> </li> <li>- Change the FEU amplifier gain acting on LNAs bias.</li> </ul>		
	<b>Objective</b>	<p>To investigate the cause of unexpected large R-factor in several channels (LFI 28 most affected) exploiting the space of parameters through P/S balancing and FEM LNAs gain mismatch.</p>		



	<b>Constraints</b>	Start OD: <b>2013-10-06 03:00:00Z</b>		
	<b>Start Condition</b>	LFI (NOM) in <b>Nominal Science Mode</b>		
	<b>End Condition</b>	No change in LFI configuration		
	<b>Initial Configuration</b>	Cryo biases, 4kHz switching on B/D ( <b>RCA23 switching on A/C</b> ), Polarization A/C=1, B/D=0		
	<b>End Configuration</b>	Unchanged		
	<b>Execution Type</b>	<b>MTL</b>		
	<b>Duration</b>	<b>3 hours</b> <b>Wait 1 hour at the end of the test for stabilization</b>		
Step	Reference	Proc. Ref.	Proc. Title	Procedure Inputs
6	R-factor			
6.1	<b>Exercising different P/S and LNA biasing: 1<sup>st</sup> bias set</b>			
6.1.1	Set bias values on all	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	<b>TPF:</b> PFLMRCA_M_5x_RCA_0011.IPF
6.1.2	WAIT 45 minutes			
6.2	<b>Exercising different P/S and LNA biasing: 2<sup>nd</sup> bias set</b>			
6.2.1	Set bias values on all	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	<b>TPF:</b> PFLMRCA_M_5x_RCA_0012.IPF
6.2.2	WAIT 45 minutes			
6.3	<b>Exercising different P/S and LNA biasing: 3<sup>rd</sup> bias set</b>			
6.3.1	Set bias values on all	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	<b>TPF:</b> PFLMRCA_M_5x_RCA_0013.IPF
6.3.2	WAIT 45 minutes			
6.4	<b>Exercising different P/S and LNA biasing: 4<sup>th</sup> bias set</b>			
6.4.1	Set bias values on all	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	<b>TPF:</b> PFLMRCA_M_5x_RCA_0014.IPF



<b>6.4.2 WAIT 45 minutes</b>			
<b>6.5 Apply DEFAULT Configuration</b>			
<b>6.5.1</b>	<b>Apply Default DAE Configuration as current configuration</b>	<b>P_FCP_LFI_MADC</b>	<b>Apply DEFAULT Configuration as (none)</b>
<b>Additional Comments</b>			
TPFs still to be produced, number of tables is here set to 4 but is still TBD (no more than 4).			
The TPFs will be produced as the result of the Pre-run activity #2 and will be delivered on October 5 <sup>th</sup> prior to the CEB DTCP.			

**2.2.7 Activity #7 - Spike Tests**

<b>#7a</b>	<b>Spike Test 1</b>			
	<b>Detailed Description</b>	Spike Test 1 Reference: LFI User Manual v.04 PL-LFI-PST-MA-001 § 13.1.2.1.1		
	<b>Objective</b>	Check any differences in the spike masks at the end of the mission by acquiring data with sequencer off for a very long period (at least 24 hours, here the duration is set to 30 hours). Characterize frequency spikes when the DAE sequencer is disabled.		
	<b>Constraints</b>	Start OD: <b>2013-10-10 21:00:00Z</b>		
	<b>Start Condition</b>	LFI (NOM) in <b>Nominal Science Mode</b>		
	<b>End Condition</b>	No change in LFI configuration		
	<b>Initial Configuration</b>	Cryo biases, 4kHz switching on B/D ( <b>but RCA 23 on A/C</b> ), Polarization A/C=1, B/D=0		
	<b>End Configuration</b>	Unchanged.		
	<b>Execution Type</b>	<b>MTL</b>		
	<b>Duration</b>	<b>30 hours</b> Waiting time included in the test		
<b>Step</b>	<b>Reference</b>	<b>Proc. Ref.</b>	<b>Proc. Title</b>	<b>Procedure Inputs</b>
<b>7.1</b>	<b>Spike Test 1</b> (UM section 13.1.2.1)			



7.1.1	LFI Spike Test 1	P_FCP_LFI_MSPK	LFI Spike Test 1	
7.1.2	Acquire data with DAE Sequencer Off: 24 hrs			
<b>Additional Comments</b>				
<p><b>Note:</b> the test 7#a can be applied once the #T2 (4K off) is already performed. For this reason it has been included in the manoeuvring period and it has been set just before the #T3 (SCS off) while the LFI is not performing any other activity, not even thermal stabilization monitoring because the 4K is already stabilized. The acquisition time should be as long as possible; by now it is set to 30 hours (24 hours is the minimum duration) but duration can be even longer if the 4K stabilizes before and no additional activity is being planned.</p> <p><b>Note:</b> the test is also performed (with zero biases on the FEM LNAs) at the end of #9 ADC No-fly (already included in this procedure, step 9.4) when the FEM LNA biases are already set to zero to optimize the recovery time after passivation. This time the acquisition is shorter, 2 hours</p>				

#7b	Spike Test 2	
	<b>Detailed Description</b>	Spike Test 2 Reference: LFI User Manual v.04 PL-LFI-PST-MA-001 § 13.1.2.1.2
	<b>Objective</b>	Check any differences in the spike masks at the end of the mission and compare the results in all the LFI Phase Switch configurations as performed during the CPV. Also the nominal configuration will be exercised, to be compared to #7a Spike Test 1 and with normal LFI data (DAE sequencer on).
	<b>Constraints</b>	Start OD: <b>2013-10-05 10:00:00Z</b>
	<b>Start Condition</b>	LFI (NOM) in <b>Nominal Science Mode</b>
	<b>End Condition</b>	No change in LFI configuration
	<b>Initial Configuration</b>	4kHz switching on <b>B/D</b> (but <b>RCA 23 on A/C</b> ), Polarization A/C=1, B/D=0
	<b>End Configuration</b>	Unchanged.
	<b>Execution Type</b>	<b>MTL</b>
	<b>Duration</b>	<b>16 hours</b> Wait 30 minutes at the end of the test for stabilization (in the timeline the waiting time is set to 1 hour as a margin). <b>Note that the waiting time is applied at the end of step 7.2.50, (Apply Default DAE Configuration as current configuration) and the very last command 7.2.51 (Enable DAE HK Sequencer) will be applied at the end of the waiting time, just before starting the next test, activity #6</b>



Step	Reference	Proc. Ref.	Proc. Title	Procedure Inputs
7.2	<b>Spike Test 2</b> (UM section 13.1.n.n)			
<b>7.2.0</b>	<b>Disable <del>DAE</del> Sequencer</b>	<b>P_FCP_LFI_MDAD</b>	<b>Disable <del>DAE</del> <del>HK</del> Sequencer</b>	
7.2.1	Disable A/C 4kHz	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	<b>TPF:</b> PFLMSCC_M_E_DA_C_0001.IPF
7.2.2	Disable B/D 4kHz	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	<b>TPF:</b> PFLMSDC_M_E_DB_D_0001.IPF
7.2.3	Set A/C P/S Status (0)	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	<b>TPF:</b> PFLMSAC_M_POLA_C_0001.IPF
7.2.4	Set B/D P/S Status (0)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	<b>TPF:</b> PFLMSBC_M_POLB_D_0001.IPF
7.2.5	Enable A/C 4kHz	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	<b>TPF:</b> PFLMSCC_M_E_DA_C_0011.IPF
7.2.6	Acquire Data (1 hour)			
7.2.7	Set B/D P/S Status (1)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	<b>TPF:</b> PFLMSBC_M_POLB_D_0011.IPF
7.2.8	Acquire Data (1 hour)			
7.2.9	Disable A/C 4kHz	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	<b>TPF:</b> PFLMSCC_M_E_DA_C_0001.IPF
7.2.10	Set A/C P/S Status (0)	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	<b>TPF:</b> PFLMSAC_M_POLA_C_0001.IPF
7.2.11	Set B/D P/S Status (0)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	<b>TPF:</b> PFLMSBC_M_POLB_D_0001.IPF
7.2.12	Enable B/D 4kHz on all but RCA23 (RCA 23 is left un-switching)	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	<b>TPF:</b> PFLMSDC_M_E_DB_D_9811.IPF



7.2.13	Acquire Data (1 hour)			
7.2.14	Set A/C P/S Status (1)	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_0011.IPF
7.2.15	Acquire Data (1 hour)			
7.2.16	Disable B/D 4kHz	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_0001.IPF
7.2.17	Set B/D P/S Status (0)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_0001.IPF
7.2.18	Acquire Data (1 hour)			
7.2.19	Set A/C P/S Status (0)	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_0001.IPF
7.2.20	Acquire Data (1 hour)			
7.2.21	Set B/D P/S Status (1)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_0011.IPF
7.2.22	Acquire Data (1 hour)			
7.2.23	Set A/C P/S Status (1)	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_0011.IPF
7.2.24	Acquire Data (1 hour)			
7.2.25	Set A/C P/S Status (0)	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_0001.IPF
7.2.26	Set B/D P/S Status (0)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_0001.IPF
7.2.27	Disable DAE HK Sequencer	P_FCP_LFI_MDAD	Disable DAE HK Sequencer	(none)
7.2.28	Enable A/C 4kHz	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_0011.IPF
7.2.29	Acquire Data (1 hour)			

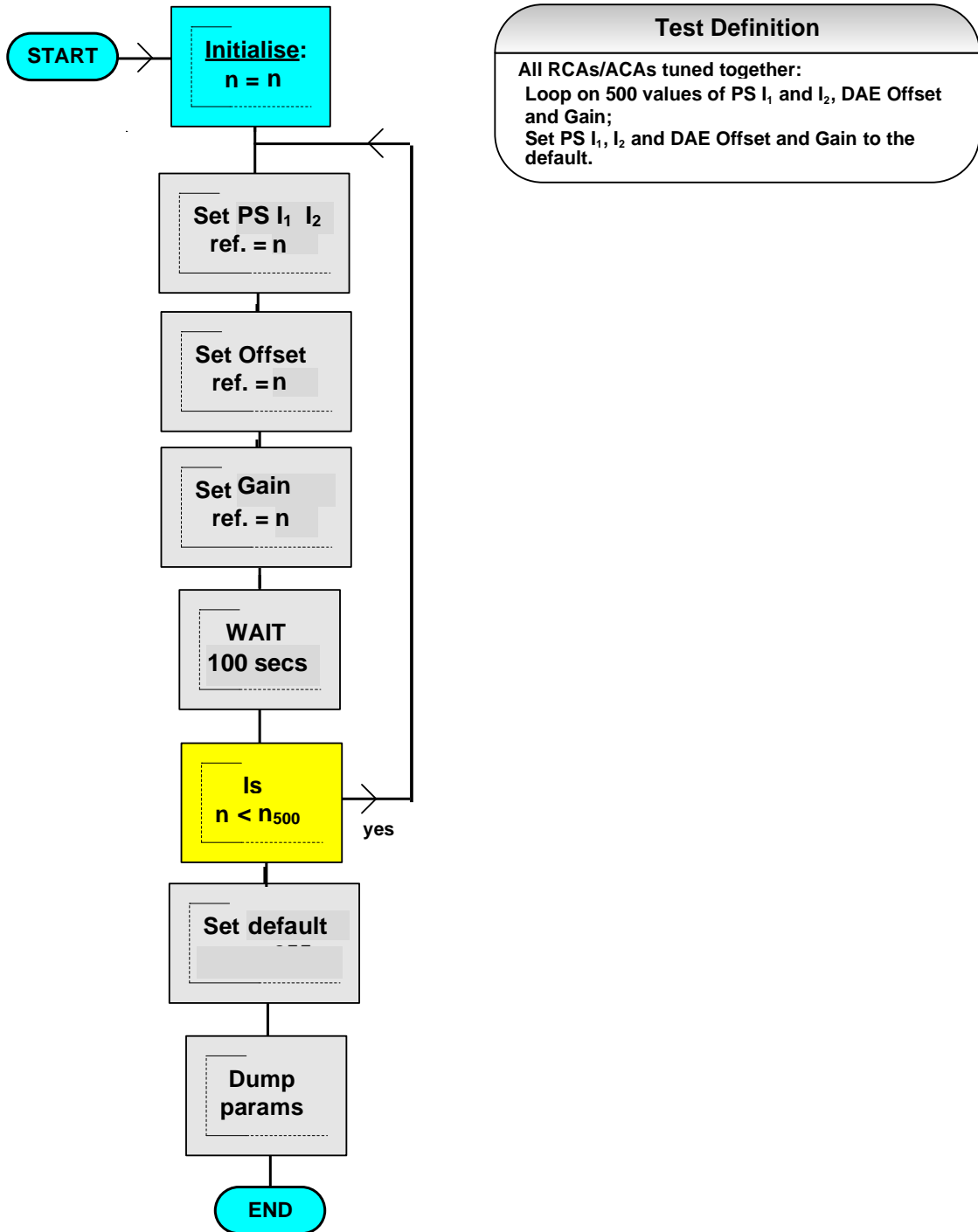


7.2.30	Set B/D P/S Status (1)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	<b>TPF:</b> PFLMSBC_M_POLB_D_0011.IPF
7.2.31	Acquire Data (1 hour)			
7.2.32	Disable A/C 4kHz	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	<b>TPF:</b> PFLMSCC_M_E_DA_C_0001.IPF
7.2.33	Set A/C P/S Status (0)	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	<b>TPF:</b> PFLMSAC_M_POLA_C_0001.IPF
7.2.34	Set B/D P/S Status (0)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	<b>TPF:</b> PFLMSBC_M_POLB_D_0001.IPF
7.2.35	Enable B/D 4kHz on all but RCA23 (RCA 23 is left un-switching)	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	<b>TPF:</b> PFLMSDC_M_E_DB_D_9811.IPF
7.2.36	Acquire Data (1 hour)			
7.2.37	Set A/C P/S Status (1)	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	<b>TPF:</b> PFLMSAC_M_POLA_C_0011.IPF
7.2.38	Acquire Data (1 hour)			
7.2.39	Disable B/D 4kHz	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	<b>TPF:</b> PFLMSDC_M_E_DB_D_0001.IPF
7.2.40	Set B/D P/S Status (0)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	<b>TPF:</b> PFLMSBC_M_POLB_D_0001.IPF
7.2.41	Acquire Data (1 hour)			
7.2.42	Set A/C P/S Status (0)	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	<b>TPF:</b> PFLMSAC_M_POLA_C_0001.IPF
7.2.43	Acquire Data (1 hour)			
7.2.44	Set B/D P/S Status (1)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	<b>TPF:</b> PFLMSBC_M_POLB_D_0011.IPF
7.2.45	Acquire Data (1 hour)			
7.2.46	Set A/C P/S Status (1)	P_FCP_LFI_MSAC	Configure Polarisation	<b>TPF:</b>



			of A-C Phase Switch	PFLMSAC_M_POLA_C_0011.IPF
7.2.47	Acquire Data (1 hour)			
7.2.48	Set A/C P/S Status (0)	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_0001.IPF
7.2.49	Set B/D P/S Status (0)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_0001.IPF
	Enable DAE HK Sequencer	P_FCP_LFI_MDAE	Enable DAE HK Sequencer	(none)
TEST COMPLETE				
7.2.50	Apply Default DAE Configuration as current configuration	P_FCP_LFI_MADC	Apply DEFAULT Configuration as Current	(none)
	Stabilization (waiting time 55 minutes)			
7.2.51	Enable DAE HK Sequencer	P_FCP_LFI_MDAE	Enable DAE HK Sequencer	(none)
<b>Additional Comments</b>				
The waiting time is applied between steps 7.2.50 and 7.2.51				

### 2.3.1 Activity #8 – ADC Non-linearity



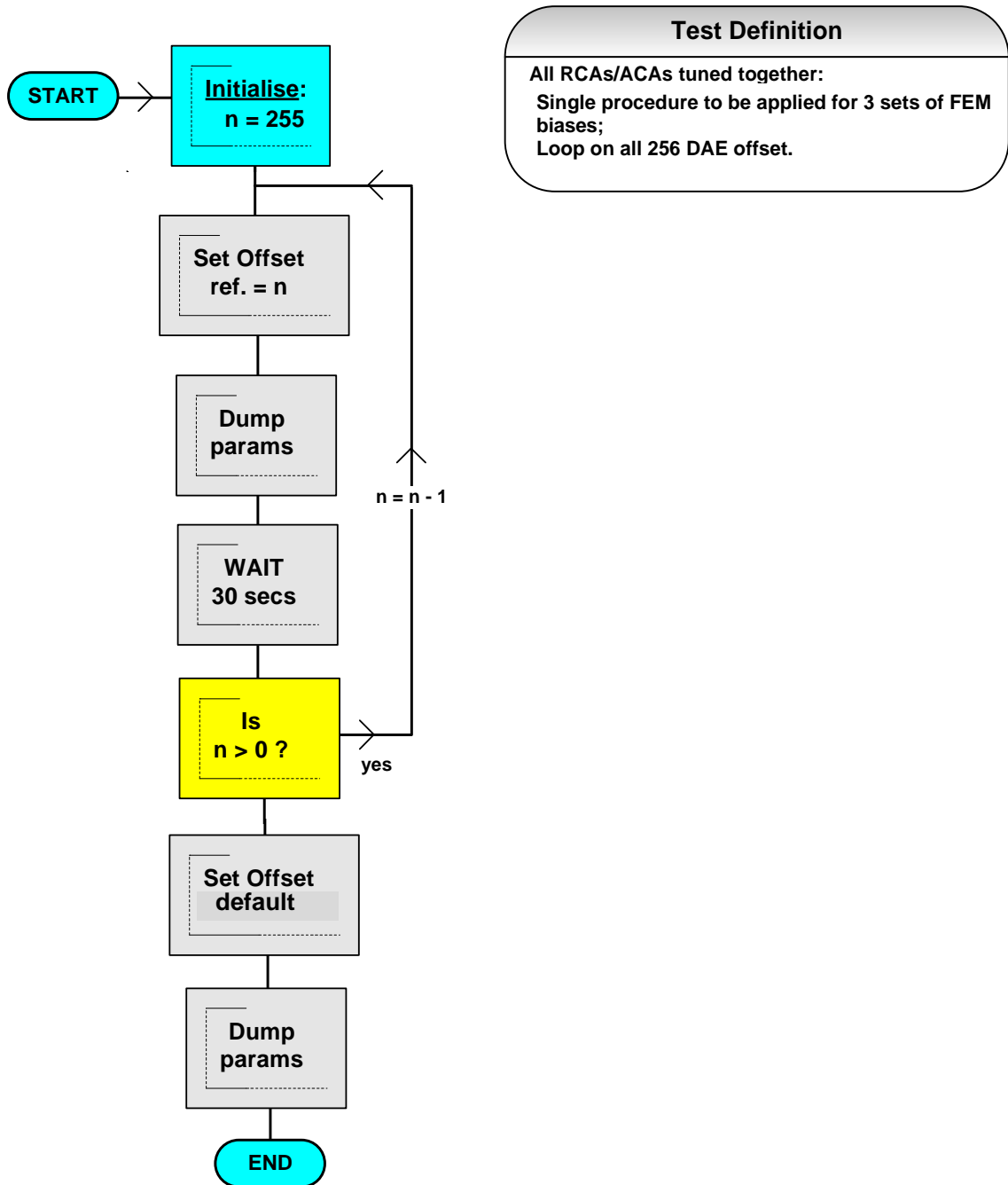


#8	ADC Non-linearity			
Detailed Description	ADC Non-linearity proper test  500 (TBC) sets of values that will simultaneously act on: <ul style="list-style-type: none"> <li>- P/S biases <math>I_{switch1}</math>: "Configure Iswitch1" P_FCP_LFI_MSXC;</li> <li>- P/S biases <math>I_{switch2}</math>: "Configure Iswitch2" P_FCP_LFI_MSXC;</li> <li>- DAE offset: "Configure Offset" P_FCP_LFI_MSOC;</li> <li>- DAE gain: "Configure Gain" P_FCP_LFI_MSGC.</li> </ul> All the values are simultaneously set of all LFI ACAs.			
	The final step of the test will assert the default Phase Switch biases ( $I_{switch1}$ and $I_{switch2}$ ) and DAE Offset and Gain for each ACA.			
Objective	Main objective is validating the ADC non-linear model. This is achieved by activating / deactivating conditions supposed to trigger the ADC non-linear behavior, introducing small perturbations in the ADC input voltage.			
	ADC Input signals can be slightly perturbed acting on Phase Switch attenuation ( $I_{switch1}$ and $I_{switch2}$ P/S biases) coupled to DAE offset changes (a portion of the full range explored to be exactly calculated channel by channel). Varying the DAE Gain allows to avoid saturation conditions. The perturbation is mainly performed by acting on the DAE offset while P/S biases are used for a fine tuning. All the values are changed together to optimize the step in the ADC input voltage.			
	With respect to the Pre-run test #2, that is organized in loops, here $I_{switch1}$ and $I_{switch2}$ , DAE offset and Gain, are all changed simultaneously. The acquisition time is set to 100 seconds.			
	Constraints	Start OD: <b>2013-10-06 20:30:00Z</b>		
	Start Condition	LFI (NOM) in <b>Nominal Science Mode</b>		
	End Condition	No change in LFI configuration		
	Initial Configuration	Cryo biases, 4kHz switching on B/D ( <b>RCA23 switching on A/C</b> ), Polarization A/C=1, B/D=0		
	End Configuration	Unchanged		
Execution Type	<b>MTL</b>			
Duration	<b>15 hours</b>  <b>Wait 30 minutes at the end of the test for stabilization</b>			
Step	Reference	Proc. Ref.	Proc. Title	Procedure Inputs
8	ADC Non-linearity			
	All RCAs, all ACAs			
8.1	Perform Non Linearity	<b>500x</b>	(Special Command	Loop on 500 P/S biases, DAE Offset



		P_FCP_LFI_MSXC P_FCP_LFI_MSYC P_FCP_LFI_MSOC P_FCP_LFI_MSGC	Sequence product)	and Gain
8.2	Apply DEFAULT Configuration			
8.2.1	Apply Default DAE Configuration as current configuration	P_FCP_LFI_CADC	Apply DEFAULT Configuration as Current	(none)
<b>Additional Comments</b>				
<p>Acquisition time during the ADC Non Linearity Proper test is set to 100 seconds. Phase Switch currents (<math>I_{switch1}</math> and <math>I_{switch2}</math> together), DAE offset and Gain are simultaneously changed on all RCA over 500 values (TBC). The values depend on each radiometer (still TBD) and the difference between two consecutive steps is not a constant.</p> <p>The table containing the 4 sets off 44 values (x500) will be produced based on the results of the #2 Pre-run and thus will be delivered on October 6<sup>th</sup> prior to the CEB DTCP.</p>				

### 2.3.2 Activity #9 – ADC No-fly Region





#9	ADC No-fly Region			
	Detailed Description	<p>ADC No-fly Region test</p> <p>Three different loops on all DAE offset values (255 to 0) ("Configure Offset" P_FCP_LFI_MSOC), using three different sets of FEM biases:</p> <ul style="list-style-type: none"> <li>- Nominal bias conditions: just run the default ADC bias tuning test, with DAE Gain=1, step 9.1.2, to check/confirm CPV results;</li> <li>- Apply P/S bias table reducing the unbalance between sky and reference load (look for a mitigation of the differential effect);</li> <li>- Switch off FEM LNAs to equalize the input signal on sky and reference load (the differential effect should disappear).</li> </ul> <p>Note that the test is similar to the <b>DAE Offset/Gain Tuning</b> test, Reference: LFI User Manual v.4 PL-LFI-PST-MA-001 § 13.1.2.8, but here the loop on the DAE gain is not applied and only a single set of gain value (=1) is used.</p> <p>Note that at the end of the test (step 9.4), before coming back to the nominal LFI configuration (step 9.5), the #7a Spike Test 1 is repeated. This time 2 hours data acquisition is required in FEM LNA zero bias configuration and DAE sequencer on, 2 more hours are required with the DAE sequencer off.</p>		
	Objective	Compare results at the end of the mission. Compare with results obtained during ILT characterization (2006, LABEN) trying to better understand the nature of this effect. Exercise several values for V0, modifying the error in the reconstructed signal exhibiting sudden jumps. The effect can be triggered acting on the voltage level of the ADC and disappear when sky and reference inputs are perfectly balanced.		
	Constraints	Start OD: <b>2013-10-06 07:00:00Z</b>		
	Start Condition	LFI (NOM) in <b>Nominal Science Mode</b>		
	End Condition	No change in LFI configuration		
	Initial Configuration	Cryo biases, 4kHz switching on B/D ( <b>RCA23 switching on A/C</b> ), Polarization A/C=1, B/D=0		
	End Configuration	Unchanged		
	Execution Type	<b>MTL, Realtime during or just after LFI soft switch on procedure, at least 11 hours after the start of the test 2013-10-06 18:00:00Z for 1 hour (step 9.5)</b>		
	Duration	<b>11 hours</b>  <b>Wait 2 hours at the end of the test for stabilization</b>		
Step	Reference	Proc. Ref.	Proc. Title	Procedure Inputs
9	ADC No-fly Region Test			
	All RCAs, all ACAs			
9.1	Set bias table n.1 (nominal LFI configuration)			



9.1.1	Set Bias table 1 on all	P_FCP_LFI_CRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLCRCA_C_5x_RCA_xxxx.IPF
9.1.2	Set DAE Gain to 1 (0h)	P_FCP_LFI_MSGC	Configure Gain	TPF: PFLMSGC_M_GAIN_0001_10.IPF
9.1.3	Perform Region No-Fly	ADC_NoFly	(Special Command Sequence product)	Loop on all 256 DAE Offset
9.2	Set bias table n.2			
9.2.1	Set Bias table 2 on all	P_FCP_LFI_CRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_C_5x_RCA_0020.IPF
9.2.2	Set DAE Gain to 1 (0h)	P_FCP_LFI_MSGC	Configure Gain	TPF: PFLMSGC_M_GAIN_0001.IPF
9.2.3	Perform Region No-Fly	ADC_NoFly	(Special Command Sequence product)	Loop on all 256 DAE Offset
9.3	Set bias table n.3 (LNA biases to zero)			
9.3.1	Set Bias table 3 on all	P_FCP_LFI_CRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_C_5x_RCA_0001_10.IPF
9.3.2	Set DAE Gain to 1 (0h)	P_FCP_LFI_MSGC	Configure Gain	TPF: PFLMSGC_M_GAIN_0001.IPF
9.3.3	Perform Region No-Fly	ADC_NoFly	(Special Command Sequence product)	Loop on all 256 DAE Offset
9.4	Spike test 1 (like #7a) (start time 2013-10-06 14:00:00Z)			
9.4.1	Acquire data with DAE Sequencer On: 2hrs			
9.4.2	Set DAE Gain to nominal	P_FCP_LFI_MSGC	Configure Gain	TPF: PFLMSGC_M_GAIN_0021_6.IPF



9.4.3	LFI Spike Test 1	P_FCP_LFI_MSPK	LFI Spike Test 1	(none)
9.5 Set LFI nominal biases (start time 2013-10-06 18:00:00Z)				
9.5.1	Power on ACA1 and ACA2 of RCA28 with Soft Switch-On procedure	4x P_FCP_LFI_MRCA	RCA28 Soft Switch-On procedure (ACA 1 + 2)	<b>TPF:</b> PFLMRCA_M_5x_RCA_92E1.IPF PFLMRCA_M_5x_RCA_92E2.IPF PFLMRCA_M_5x_RCA_92E3.IPF PFLMRCA_M_5x_RCA_92E4.IPF
9.5.2	Power on ACA4 of RCA24 with Soft Switch-On procedure	P_FCP_LFI_MS2C P_FCP_LFI_MSNC P_FCP_LFI_MS1C P_FCP_LFI_MSXC P_FCP_LFI_MSYC P_FCP_LFI_MRCA	RCA24 Soft Switch-On procedure (ACA4)	<b>TPF:</b> PFLMS2C_M_VGATE2_0821.IPF PFLMSNC_M_DRAIN_0821.IPF PFLMS1C_M_VGATE1_0821.IPF PFLMSXC_M_SWTCH1_0821.IPF PFLMSYC_M_SWTCH2_0821.IPF PFLMRCA_M_5x_RCA_0811.IPF
9.5.3	Apply Default DAE Configuration as current configuration	P_FCP_LFI_CADC	Apply DEFAULT Configuration as Current	(none)
<b>Additional Comments</b>				
<p>Acquisition time is set to 30 seconds for the step 9.1, 9.2 and 9.3. The test consists in applying a loop on all the 256 DAE offset values to three different sets of FEM bias tables. The schema represents the single DAE offset loop.</p> <p>The TPFs corresponding to table n.3 will be released by the end of September 2013, table n. 1 corresponds to the nominal LFI conditions and, being this the initial conditions, is not really required, the TPFs corresponding to table n.2 <b>PFLMRCA_C_5x_RCA_0020.IPF</b> will be produced based on the results of the #2 Pre-run and thus will be delivered as soon as possible <b>on October 5<sup>th</sup> prior to the CEB DTCP.</b></p> <p>Note that, since the last table (table n.3) corresponds to the zero LNA bias configuration, the last part of Spike test #7, part b, is included here as step 9.4, before coming back to the nominal LFI configuration in step 9.5. The total duration of this part is 2+2 hours, 2 hours with DAE sequencer on (step 9.4.1) and 2 hours with sequencer off (step 9.4.2, P_FCP_LFI_MSPK).</p>				



2.3.3 Activity #10 – LNA & P/S Bias Tuning Check

#10	<b>LNA &amp; P/S Bias Tuning</b>			
	<b>Detailed Description</b>	LNA & P/S Bias Tuning Check  The test consists in applying 4 different sets of bias tables (“Configure Vgate1, Vgate2, VDrain, lswitch1 and lswitch2 parameters”, P_FCP_LFI_MRCA) and acquiring 1-hour data in the corresponding configuration.		
	<b>Objective</b>	The objective of the test is two folds:  <ul style="list-style-type: none"> <li>- Verify some problems occurred during the LNA Tuning by setting different bias tables. In detail: 1/f instability verification; cross-talk with channel 23; verification of three alternative Bias Tables already proposed during the mission.</li> <li>- Verify a different bias table aimed at minimizing the correlation effects (especially white noise) between coupled detectors.</li> </ul>		
	<b>Constraints</b>	Start OD: <b>2013-10-07 12:00:00Z</b>		
	<b>Start Condition</b>	LFI (NOM) in <b>Nominal Science Mode</b>		
	<b>End Condition</b>	No change in LFI configuration		
	<b>Initial Configuration</b>	Cryo biases, 4kHz switching on B/D ( <b>RCA23 switching on A/C</b> ), Polarization A/C=1, B/D=0		
	<b>End Configuration</b>	Unchanged		
	<b>Execution Type</b>	<b>MTL</b>		
	<b>Duration</b>	<b>4 hours</b>  <b>Wait 30 minutes at the end of the test for stabilization</b>		
<b>Step</b>	<b>Reference</b>	<b>Proc. Ref.</b>	<b>Proc. Title</b>	<b>Procedure Inputs</b>
10	<b>LNA &amp; P/S Bias Tuning Check</b>			
10.1	<b>Exercising different LNA &amp; P/S biasing: 1<sup>st</sup> bias set</b>			
10.1.1	<b>Set DAE Offset</b>	<b>P_FCP_LFI_MSOC</b>	<b>Configure Offset</b>	<b>TPF:</b> <b>PFLMSOC_M_OFFSET_xxxx.IPF</b>
10.1.2	<b>Set DAE Gain</b>	<b>P_FCP_LFI_MSGC</b>	<b>Configure Gain</b>	<b>TPF:</b> <b>PFLMSGC_M_GAIN_xxxx.IPF</b>
10.1.3	<b>Configure 5 RCA parameters</b>	<b>P_FCP_LFI_MRCA</b>	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	<b>TPF:</b> <b>PFLMRCA_M_5x_RCA_xxxx.IPF</b>



10.1.2	Disable A/C 4kHz	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_XXXX.IPF
10.1.3	Disable B/D 4kHz	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_XXXX.IPF
10.1.4	Set A/C P/S Status (0)	P_FCP_LFI_MSAC	Configure the A-C phase switch	TPF: PFLMSAC_M_POLA_C_XXXX.IPF
10.1.5	Set B/D P/S Status (0)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_XXXX.IPF
10.1.6	Enable A/C 4kHz	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_XXXX.IPF
10.1.7	Enable B/D 4kHz	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_XXXX.IPF
10.1.8	WAIT 60 minutes			
10.2	Exercising different LNA &P/S biasing: 2 <sup>nd</sup> bias set			
10.2.1	Set DAE Offset	P_FCP_LFI_MSOC	Configure Offset	TPF: PFLMSOC_M_OFFSET_XXXX.IPF
10.2.2	Set DAE Gain	P_FCP_LFI_MSGC	Configure Gain	TPF: PFLMSGC_M_GAIN_XXXX.IPF
10.2.3	Configure 5 RCA parameters	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
10.2.2	Disable A/C 4kHz	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_XXXX.IPF
10.2.3	Disable B/D 4kHz	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_XXXX.IPF
10.2.4	Set A/C P/S Status (0)	P_FCP_LFI_MSAC	Configure the A-C phase switch	TPF: PFLMSAC_M_POLA_C_XXXX.IPF
10.2.5	Set B/D P/S Status (0)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF:



				PFLMSBC_M_POLB_D_XXXX.IPF
10.2.6	Enable A/C 4kHz	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_XXXX.IPF
10.2.7	Enable B/D 4kHz	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_XXXX.IPF
10.2.4 WAIT 60 minutes				
10.3 Exercising different LNA & P/S biasing: 3 <sup>rd</sup> bias set				
10.3.1	Set DAE Offset	P_FCP_LFI_MSOC	Configure Offset	TPF: PFLMSOC_M_OFFSET_XXXX.IPF
10.3.2	Set DAE Gain	P_FCP_LFI_MSGC	Configure Gain	TPF: PFLMSGC_M_GAIN_XXXX.IPF
10.3.3	Configure 5 RCA parameters	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
10.3.2	Disable A/C 4kHz	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_XXXX.IPF
10.3.3	Disable B/D 4kHz	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_XXXX.IPF
10.3.4	Set A/C P/S Status (0)	P_FCP_LFI_MSAC	Configure the A-C phase switch	TPF: PFLMSAC_M_POLA_C_XXXX.IPF
10.3.5	Set B/D P/S Status (0)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_XXXX.IPF
10.3.6	Enable A/C 4kHz	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_XXXX.IPF
10.3.7	Enable B/D 4kHz	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_XXXX.IPF



10.3.4	WAIT 60 minutes			
10.4	Exercising different LNA & P/S biasing: 4 <sup>th</sup> bias set			
10.4.1	Set DAE Offset	P_FCP_LFI_MSOC	Configure Offset	TPF: PFLMSOC_M_OFFSET_XXXX.IPF
10.4.2	Set DAE Gain	P_FCP_LFI_MSGC	Configure Gain	TPF: PFLMSGC_M_GAIN_XXXX.IPF
10.4.3	Configure 5 RCA parameters	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
10.4.2	Disable A/C 4kHz	P_FCP_LFI_MSCG	Enable/Disable the A-C phase switch	TPF: PFLMSCG_M_E_DA_C_XXXX.IPF
10.4.3	Disable B/D 4kHz	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_XXXX.IPF
10.4.4	Set A/C P/S Status (0)	P_FCP_LFI_MSAG	Configure the A-C phase switch	TPF: PFLMSAC_M_POLA_C_XXXX.IPF
10.4.5	Set B/D P/S Status (0)	P_FCP_LFI_MSBC	Configure Polarisation of B-D Phase Switch	TPF: PFLMSBC_M_POLB_D_XXXX.IPF
10.4.6	Enable A/C 4kHz	P_FCP_LFI_MSCG	Enable/Disable the A-C phase switch	TPF: PFLMSCG_M_E_DA_C_XXXX.IPF
10.4.7	Enable B/D 4kHz	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_XXXX.IPF
10.4.4	WAIT 60 minutes			
10.5	Apply DEFAULT Configuration			
10.5.1	Apply Default DAE Configuration as current configuration	P_FCP_LFI_MADC	Apply DEFAULT Configuration as Current	(none)
Additional Comments				



All the TPFs will be released by the end of September 2013.

### 2.3.4 Activity #11 – BEM Offset Calculation

#11	<b>BEM Offset Calculation Test</b>			
	<b>Detailed Description</b>	<p>BEM Offset Calculation Test</p> <p>Switch off one radiometer per time (single arm), keeping the others ON. Keep P/S and 4kHz in nominal conditions. Acquire the signal for 3 minutes.</p> <p>Note that the test has some similarities with the <b>Phase Switch Tuning</b> test, reference: LFI User Manual v.4 PL-LFI-PST-MA-001 § 13.1.2.6, but here the two ACAs are switched off (and back on) together and there isn't any loop on P/S biases. In addition all radiometers are exercised, 70 GHz included.</p>		
	<b>Objective</b>	Measure the signal level at ADC input not due to the sky/ref signal. Possibly useful to check the offset excess in the gain model.		
	<b>Constraints</b>	Start OD: <b>2013-10-07 16:30:00Z</b>		
	<b>Start Condition</b>	LFI (NOM) in <b>Nominal Science</b> Mode		
	<b>End Condition</b>	No change in LFI configuration		
	<b>Initial Configuration</b>	Cryo biases, 4kHz switching on <b>B/D (RCA23 switching on A/C)</b> , Polarization <b>A/C=1</b> , B/D=0		
	<b>End Configuration</b>	Unchanged		
	<b>Execution Type</b>	<b>MTL</b>		
	<b>Duration</b>	<b>1.5 hours</b> <b>Wait 1 hour at the end of the test for stabilization</b>		
<b>Step</b>	<b>Reference</b>	<b>Proc. Ref.</b>	<b>Proc. Title</b>	<b>Procedure Inputs</b>
11	<b>BEM Offset Calculation Test</b>			
11.01	<b>Set DAE Gain to 1 (0h)</b>	<b>P_FCP_LFI_MSGC</b>	<b>Configure Gain</b>	<b>TPF:</b> <b>PFLMSGC_M__GAIN_0001.IPF</b>
11.02	<b>Set DAE Offset</b>	<b>P_FCP_LFI_MSOC</b>	<b>Configure Offset</b>	<b>TPF:</b> <b>PFLMSOC_M_OFFSET_xxxx.IPF</b>
11.1	<b>RCA 18</b>			



11.1.1	Set zero bias on ACA1,2 of RCA 18	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.1.2	WAIT 3 minutes			
11.1.3	Set Cryo bias on ACA1,2 of RCA 18	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.1.4	Set zero bias on ACA3,4 of RCA 18	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.1.5	WAIT 3 minutes			
11.1.6	Set Cryo bias on ACA3,4 of RCA 18	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.2	RCA 19			
11.2.1	Set zero bias on ACA1,2 of RCA 19	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.2.2	WAIT 3 minutes			
11.2.3	Set Cryo bias on ACA1,2 of RCA 19	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.2.4	Set zero bias on ACA3,4 of RCA 19	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.2.5	WAIT 3 minutes			
11.2.6	Set Cryo bias on ACA3,4 of RCA 19	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.3	RCA 20			
11.3.1	Set zero bias on ACA1,2 of RCA 20	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF



11.3.2	WAIT 3 minutes			
11.3.3	Set Cryo bias on ACA1,2 of RCA 20	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.3.4	Set zero bias on ACA3,4 of RCA 20	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.3.5	WAIT 3 minutes			
11.3.6	Set Cryo bias on ACA3,4 of RCA 20	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.4	RCA 21			
11.4.1	Set zero bias on ACA1,2 of RCA 21	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.4.2	WAIT 3 minutes			
11.4.3	Set Cryo bias on ACA1,2 of RCA 21	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.4.4	Set zero bias on ACA3,4 of RCA 21	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.4.5	WAIT 3 minutes			
11.4.6	Set Cryo bias on ACA3,4 of RCA 21	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.5	RCA 22			
11.5.1	Set zero bias on ACA1,2 of RCA 22	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.5.2	WAIT 3 minutes			
11.5.3	Set Cryo bias on ACA1,2 of	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF



	RCA 22		lswitch2 parameters	
11.5.4	Set zero bias on ACA3,4 of RCA 22	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.5.5	WAIT 3 minutes			
11.5.6	Set Cryo bias on ACA3,4 of RCA 22	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.6	RCA 23			
11.6.1	Set zero bias on ACA1,2 of RCA 23	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.6.2	WAIT 3 minutes			
11.6.3	Set Cryo bias on ACA1,2 of RCA 23	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.6.4	Set zero bias on ACA3,4 of RCA 23	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.6.5	WAIT 3 minutes			
11.6.6	Set Cryo bias on ACA3,4 of RCA 23	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.7	RCA 24			
11.7.1	Set zero bias on ACA1,2 of RCA 24	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.7.2	WAIT 3 minutes			
11.7.3	Set Cryo bias on ACA1,2 of RCA 24	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.7.4	Set zero bias on ACA3,4 of	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and	TPF:



	RCA 24		lswitch2 parameters	PFLMRCA_M_5x_RCA_XXXX.IPF
11.7.5	WAIT 3 minutes			
11.7.6	Power on ACA4 of RCA24 with Soft Switch-On procedure	P_FCP_LFI_MS2C P_FCP_LFI_MSNC P_FCP_LFI_MS1C P_FCP_LFI_MSXC P_FCP_LFI_MSXC P_FCP_LFI_MSYC P_FCP_LFI_MRCA	RCA24 Soft Switch-On procedure (ACA4)	TPF: PFLMS2C_M_VGATE2_0821.IPF PFLMSNC_M_DRAIN_0821.IPF PFLMS1C_M_VGATE1_0821.IPF PFLMSXC_M_SWTCH1_0821.IPF PFLMSYC_M_SWTCH2_0821.IPF PFLMRCA_M_5x_RCA_0811.IPF
11.7.7	Set Cryo bias on ACA3,4 of RCA 24	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.8	RCA 25			
11.8.1	Set zero bias on ACA1,2 of RCA 25	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.8.2	WAIT 3 minutes			
11.8.3	Set Cryo bias on ACA1,2 of RCA 25	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.8.4	Set zero bias on ACA3,4 of RCA 25	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.8.5	WAIT 3 minutes			
11.8.6	Set Cryo bias on ACA3,4 of RCA 25	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.9	RCA 26			
11.9.1	Set zero bias on ACA1,2 of RCA 26	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.9.2	WAIT 3 minutes			



11.9.3	Set Cryo bias on ACA1,2 of RCA 26	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_92E1.IPF
11.9.4	Set zero bias on ACA3,4 of RCA 26	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_92E2.IPF
11.9.5	WAIT 3 minutes			
11.9.6	Set Cryo bias on ACA3,4 of RCA 26	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_92E3.IPF
11.10	RCA 27			
11.10.1	Set zero bias on ACA1,2 of RCA 27	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_92E4.IPF
11.10.2	WAIT 3 minutes			
11.10.3	Set Cryo bias on ACA1,2 of RCA 27	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_92E5.IPF
11.10.4	Set zero bias on ACA3,4 of RCA 27	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_92E6.IPF
11.10.5	WAIT 3 minutes			
11.10.6	Set Cryo bias on ACA3,4 of RCA 27	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_92E7.IPF
11.11	RCA 28			
11.11.1	Set zero bias on ACA1,2 of RCA 28	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_92E8.IPF
11.11.2	WAIT 3 minutes			
11.11.3	Power on ACA1 and ACA2 with Soft Switch-On procedure	4x P_FCP_LFI_MRCA	RCA28 Soft Switch-On procedure (ACA 1 + 2)	TPF: PFLMRCA_M_5x_RCA_92E9.IPF PFLMRCA_M_5x_RCA_92E10.IPF



				PFLMRCA_M_5x_RCA_92E3.IPF PFLMRCA_M_5x_RCA_92E4.IPF
11.11.4	Set Cryo bias on ACA1,2 of RCA 28	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.11.5	Set zero bias on ACA3,4 of RCA 28	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
11.11.6	WAIT 3 minutes			
11.11.70	Set Cryo bias on ACA3,4 of RCA 28	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_XXXX.IPF
	Note: All ACAs of RCA 28 now set with Cryo values			
11.12	Apply DEFAULT Configuration			
11.12.1	Apply Default DAE Configuration as current configuration	P_FCP_LFI_MADC	Apply DEFAULT Configuration as Current	(none)
<b>Additional Comments</b>				
All the TPFs corresponding will be released by the end of September 2013.				

### 2.3.5 Activity #12 – Change Nave

#12	LFI EoL Initialization		
	Detailed Description	<b>2.4</b> Change Naverage Reference: LFI User Manual v.04 PL-LFI-PST-MA-001 § 13.2.28 and § 13.2.10.	
	Objective	In order to reduce the science TM rate, the processing parameter N_average (over which data, un-compressed, are averaged in “type 1”) is set to 256 on all channels.	
	Constraints	Start OD: <b>2013-10-14 14:00:00Z (TBC if it can be advanced)</b>	
	Start Condition	LFI (NOM) in <b>Nominal Science Mode</b>	



	<b>End Condition</b>	No change in LFI configuration		
	<b>Initial Configuration</b>	Cryo biases, 4kHz switching on B/D ( <b>RCA23 switching on A/C</b> ), Polarization A/C=1, B/D=0		
	<b>End Configuration</b>	N/A		
	<b>Execution Type</b>	Real-time		
	<b>Duration</b>	10 minutes		
Step	Reference	Proc. Ref.	Proc. Title	Procedure Inputs
12	LFI Change N_average			
12.1	Set processing type to 1	P_FCP_LFI_MSSX	Change Science Processing Mode	Set processing type to 1
12.1b	Update Naverage processing (to be executed between step 3 and 4 of 12.1)	P_FCP_LFI_CSNP	Update Naverage processing	TPF: PFLCSNP_C_NAVRGE_0011_3.IPF
<b>Additional Comments</b>				
Note that a contingency procedure needs to be ready in case of any anomaly caused by modifying the processing type.				

### 2.4.1 Activity #T1 – Thermal Verification 1

#T1	Thermal Verification 1	
	<b>Detailed Description</b>	Thermal Verification 1: LFI FPU thermal susceptibility  Two procedure involved: <ul style="list-style-type: none"> <li>- varying the SCS TSA set-point in two steps (forth and back, <math>\pm 0.5</math> K, <math>\pm 1.25</math> K);</li> <li>- varying the 4K PID in one step (forth and back, possibly <math>\pm 0.15</math> K).</li> </ul>
	<b>Objective</b>	Measure LFI FPU thermal susceptibility by varying the SCS TSA set-point in two steps and the 4K PID in one step.
	<b>Constraints</b>	Start OD: <b>2013-10-04 02:30:00Z</b>
	<b>Start Condition</b>	LFI (NOM) in <b>Nominal Science</b> Mode
	<b>End Condition</b>	No change in LFI configuration
	<b>Initial Configuration</b>	Cryo biases, 4kHz switching on <b>B/D</b> ( <b>RCA23 switching on A/C</b> ), Polarization <b>A/C=1</b> , B/D=0
	<b>End</b>	Unchanged



<b>Configuration</b>				
<b>Execution Type</b>	<p>MTL, Real-time for steps:</p> <p>T1.3: 4hr after the start, for 2hr <b>2013-10-04 06:30:00Z-08:30:00Z</b></p> <p><del>T1.4 ? : 10hr after the start, for 3hr (HFI to confirm) 2013-10-04 12:30:00Z-15:30:00Z</del></p> <p>T1.6: 14hr after the start, for 1hr <b>2013-10-04 16:30:00Z-17:30:00Z</b></p> <p>T1.7: 19hr after the start, for 1hr <b>2013-10-04 21:30:00Z-22:30:00Z</b></p>			
<b>Duration</b>	<p>20 hours</p> <p>Waiting time of 1 hour at the end of the test for stabilization is included in the procedure (step T1.7)</p>			
<b>Step</b>	<b>Reference</b>	<b>Start Time</b>	<b>End Time</b>	<b>Procedure Inputs</b>
T1	Thermal Verification 1			
T1.1	Set $\Delta T_{SA} +0.5$ K	t0	t0 + 2 hr	
T1.2	Set $\Delta T_{SA} -0.5$ K	t0 + 2 hr	t0 + 4 hr	
T1.3	Set $\Delta T_{SA} +1.25$ K	t0 + 4 hr	t0 + 10 hr	
T1.4	Set $\Delta 4K$ shield +0.15 K (TBC)	<b>2.5</b> t0 + 10 hr	t0 + 12 hr	
T1.5	Set $\Delta 4K$ shield -0.15 K (TBC)	t0 + 12 hr	t0 + 14 hr	
T1.6	Set $\Delta T_{SA} -1.25$ K	t0 + 14 hr	t0 + 19 hr	
T1.7	Monitor Thermal Stabilization	t0 + 19 hr	t0 + 20 hr	
<b>Additional Comments</b>				
none				

**2.5.1 Activity #T2 – Thermal Verification 2**

<b>#T2</b>	Thermal Verification 2	
<b>Detailed Description</b>	<p>Thermal Verification 2: LFI thermal susceptibility to 4K switch OFF</p> <p>Procedure into three steps:</p>	



		<ul style="list-style-type: none"> <li>- 4K switch off;</li> <li>- Possibly an intermediate step with 4K at about 16 K (with TBC stability);</li> <li>- Data acquisition with 4K at 20 K.</li> </ul>		
Objective	Objective	Three folds: <ul style="list-style-type: none"> <li>- Monitor LFI dynamic thermal response to reference load warm up.</li> <li>- Noise and Isolation Verification during the 4K warmup to 20K. Measure Noise Temperature and LNA Isolation at the end of mission using Y-factor to X-check noise properties calculated from spectral analysis. Non-linear response analysis.</li> <li>- Noise and Isolation Verification with the 4K at 20K. Measure Noise from spectral analysis. Measure 1/f properties in nominal bias conditions and with higher Reference Load temperature.</li> </ul>		
	Constraints	Start OD: <b>2013-10-08 08:00:00Z TBC</b>		
	Start Condition	LFI (NOM) in <b>Nominal Science Mode</b>		
	End Condition	No change in LFI configuration		
	Initial Configuration	Cryo biases, 4kHz switching on <b>B/D (RCA23 switching on A/C)</b> , Polarization <b>A/C=1, B/D=0</b>		
	End Configuration	Unchanged		
	Execution Type	<b>MTL, Real-time for step T2.1 (at start), T2.2 (about 20 hrs after the start of the test), T2.3</b>		
	Duration	<b>30 hours</b> Waiting time included in the procedure		
Step	Reference	Start Time	End Time	Procedure Inputs
T2	<b>Thermal Verification 2</b>			
T2.01	Set DAE Offset to maximum P_FCP_LFI_MSOC Configure Offset	2013-10-08T06:59:56Z		TPF: PFLMSGC_M__GAIN_0011_10.IPF
T2.02	Set DAE Gain to 1 (0h) P_FCP_LFI_MSGC Configure Gain	2013-10-08T06:59:58Z		TPF PFLMSOC_M_OFFSET_0011_10.IPF
T2.1	4K shield heatup: stop 4K cooling	t0	t0 + 2 hr	
<b>Monitor Thermal Stabilization (18 hrs)</b>				



T2.2	4K at ~16 K (TBC)	t0 + 20 hr	t0 + 22 hr	
Monitor Thermal Stabilization (7 hrs)				
T2.3	4K at 20 K	t0 + 29 hr	t0 + 30 hr	
Additional Comments				
None				

### 2.5.2 Activity #T3 – Thermal Verification 3

#T3	Thermal Verification 3			
Detailed Description	Thermal Verification 3: LFI dynamical thermal susceptibility SCS switch off and LFI monitoring			
Objective	Two folds: <ul style="list-style-type: none"> <li>- Measure LFI FPU dynamical thermal susceptibility by monitoring the FPU to passive environment.</li> <li>- Noise Verification with 4K and FPU passively thermalized around 60K. Measure Noise from spectral analysis. Measure 1/f properties. Useful to verify the behavior of a possible only passive instrument for a future experiment.</li> </ul>			
Constraints	Start OD: 2013-10-11 21:00:00Z TBC			
Start Condition	LFI (NOM) in Nominal Science Mode			
End Condition	No change in LFI configuration			
Initial Configuration	Cryo biases, 4kHz switching on B/D (RCA23 switching on A/C), Polarization A/C=1, B/D=0			
End Configuration	Unchanged			
Execution Type	Real-time for the duration of the test (3hrs)			
Duration	3 hours Waiting time: 20 hrs (next DTCP)			
Step	Reference	Start Time	End Time	Procedure Inputs
T3	Thermal Verification 2			
T3.1	FPU T step-down with 4K shield at 20K, TSA disabled	t0	t0 + 2 hr	



T3.2	Monitor FPU thermal transient	t0 + 2 hr	t0 + 2.5 hr	
T3.3	FPU heatup: Stop SCS cooling. Monitor thermal stabilization	t0 + 2.5 hr	t0 + 3 hr	
<b>Additional Comments</b>				
Note: SCS dedicated activities will start at the end of the LFI FPU dynamical thermal susceptibility and is not included here.				

### 2.5.3 Activity #E1 – RF Susceptibility

#E1	RF Susceptibility			
	<b>Detailed Description</b>	RF Susceptibility Cycles of RF On/Off (TWT), at least 10 cycles are desirable. During the test it is requested to have a fast sampling of the drain current TM, ideally every TC should be paired to a retrieval of a drain current TM packet (the way this is achieved is not an issue, OBCP enabled is a possibility, with the highest possible rate), see step E1.1.		
	<b>Objective</b>	Verify the LFI susceptibility and possible systematic effects to tele-communication system activities		
	<b>Constraints</b>	Start OD: <b>2013-10-07 19:00:00Z TBC by MOC</b>		
	<b>Start Condition</b>	LFI (NOM) in <b>Nominal Science Mode</b>		
	<b>End Condition</b>	No change in LFI configuration		
	<b>Initial Configuration</b>	Cryo biases, 4kHz switching on <b>B/D (RCA23 switching on A/C)</b> , Polarization <b>A/C=1, B/D=0</b>		
	<b>End Configuration</b>	Unchanged		
	<b>Execution Type</b>	<b>Real-time</b>		
	<b>Duration</b>	<b>1 hour</b> <b>Waiting time: 1 hour</b>		
<b>Step</b>	<b>Reference</b>	<b>Start Time</b>	<b>End Time</b>	<b>Procedure Inputs</b>
E1	RF Susceptibility			
E1.1	Enable LFI OBCP for DAE HK fast retrieval			



E1.2	<b>Cycle on TWT (to be performed at least 10 times)</b>		
E1.2.1	TWT Off		
E1.2.2	Wait 3 minutes		
E1.2.3	TWT On		
E1.3	Disable LFI OBCP for DAE HK fast retrieval		
<b>Additional Comments</b>			

~~2.5.4 Activity #E2 – Thermal Changes VS Pointing~~

#E2	<del>Thermal Changes VS Pointing</del>
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2.5.5 Activity #E3 – Telescope Loss

#E3	<b>Telescope Loss</b>	
	<b>Detailed Description</b>	Telescope Loss  The test must be executed when observing a constant field. Operate decontamination heaters on Shields; the dynamic range of heaters and the thermometers sensitivity are crucial. From rough preliminary calculations, a 10K change over PR and SR can produce about 40 mW of extra load on the FPU. This thermal excess could be mitigated by the SCS PID.
	<b>Objective</b>	Check uncertainties in pointing reconstruction related to a misalignment / distortion of mirrors due to thermal stresses.  The test will also allow to check the Telescope insertion Loss degradation at the end of mission.
	<b>Constraints</b>	Start OD: 2013-10-07 21:00:00Z TBD by MOC
	<b>Start Condition</b>	LFI (NOM) in Nominal Science Mode
	<b>End Condition</b>	No change in LFI configuration
	<b>Initial Configuration</b>	Cryo biases, 4kHz switching on B/D (RCA23 switching on A/C), Polarization A/C=1, B/D=0
	<b>End</b>	Unchanged



	<b>Configuration</b>			
	<b>Execution Type</b>	Real-time		
	<b>Duration</b>	TBD 2 hrs? Waiting Time 1 hour?		
Step	Reference	Start Time	End Time	Procedure Inputs
E3	Telescope Loss			
E3.1				
E3.2				
E3.3				
<b>Additional Comments</b>				

### 2.5.6 Activity #C1 – LFI FEM Passivation

#C1	Initialisation			
	<b>Detailed Description</b>	RCA Parameter Passivation		
	<b>Constraints</b>	When needed		
	<b>Start Condition</b>	LFI (NOM) in DAE Setup Mode		
	<b>End Condition</b>	No change in LFI configuration		
	<b>Initial Configuration</b>	N/A		
	<b>End Configuration</b>	Zero Biases, 4kHz all disabled, Polarization all = 0		
	<b>Execution Type</b>	Real-time; Manual		
	<b>Duration</b>	10 minutes		
Step	Reference	Proc. Ref.	Proc. Title	Procedure Inputs
C1	Initialisation (UM section 13.2.25)			
C1.1	Set DAE Offset to 0 (FFh)	P_FCP_LFI_MSOC	Configure Offset	TPF: PFLMSOC_M_OFFSET_0001.IPF



C1.2	Set DAE Gain to 1 (0h)	P_FCP_LFI_MSGC	Configure Gain	TPF: PFLMSGC_M___GAIN_0001.IPF
C1.3	Configure 5 RCA parameters	P_FCP_LFI_MRCA	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	TPF: PFLMRCA_M_5x_RCA_0001.IPF
C1.4	Disable A/C 4kHz	P_FCP_LFI_MSCC	Enable/Disable the A-C phase switch	TPF: PFLMSCC_M_E_DA_C_0001.IPF
C1.5	Disable B/D 4kHz	P_FCP_LFI_MSDC	Enable/Disable the B-D phase switch	TPF: PFLMSDC_M_E_DB_D_0001.IPF
C1.6	Set A/C P/S Status (0)	P_FCP_LFI_MSAC	Configure Polarisation of A-C Phase Switch	TPF: PFLMSAC_M_POLA_C_0001.IPF
C1.7	Set B/D P/S Status (0)	P_FCP_LFI_MSBC	Configure the B-D phase switch	TPF: PFLMSBC_M_POLB_D_0001.IPF
<b>Additional Comments</b>				
Initialisation sets the RCA parameters in 'zero bias' condition (zero current on FPU)				

### 2.5.7 Activity #C2 - Saturation Passivation

#13	<b>Saturation Passivation</b>			
	Detailed Description	Set RCA, DAE Gain, and Offset parameters to avoid saturation		
	Constraints	Start OD: <b>TBD</b>		
	Start Condition	LFI (NOM) in <b>Nominal Science</b> Mode		
	End Condition	No change in LFI configuration		
	Initial Configuration	Cryo biases, 4kHz switching on <b>B/D (RCA23 switching on A/C)</b> , Polarization <b>A/C=1</b> , B/D=0		
	End Configuration	<b>As required</b>		
	Execution Type	Real-time; Manual		
	Duration	15 minutes		
Step	Reference	Proc. Ref.	Proc. Title	Procedure Inputs



<b>C2</b>	<b>Saturation Passivation</b> (UM section 13.1.2.nn)			
<b>C2.1</b>	<b>Set Cryo values on all</b>	<b>P_FCP_LFI_CRCA</b>	Configure Vgate1, Vgate2, Drain, lswitch1 and lswitch2 parameters	<b>TPF:</b> PFLCRCA_C_5x_RCA_0021_n.IPF
<b>C2.2</b>	<b>Set PS status = 1 (A/C)</b>	<b>P_FCP_LFI_CSAC</b>	Configure Polarisation of A-C Phase Switch	<b>TPF:</b> PFLCSAC_C_POLA_C_0011_n.IPF
<b>C2.3</b>	<b>Set PS status = 0 (B/D)</b>	<b>P_FCP_LFI_CSBC</b>	Configure Polarisation of B-D Phase Switch	<b>TPF:</b> PFLCSBC_C_POLB_D_0001_n.IPF
<b>C2.4</b>	<b>Enable 4kHz (A/C) RCA23</b>	<b>P_FCP_LFI_CSCC</b>	Enable/Disable the A-C phase switch	<b>TPF:</b> PFLCSCC_C_E_DA_C_7111_n.IPF
<b>C2.5</b>	<b>Enable 4kHz (B/D) all but RCA 23</b>	<b>P_FCP_LFI_CSDC</b>	Enable/Disable the B-D phase switch	<b>TPF:</b> PFLCSDC_C_E_DB_D_9811_n.IPF
<b>C2.6</b>	<b>Save as default configuration</b>	<b>P_FCP_LFI_CSCD</b>	Save current configuration as default	(none)
<b>C2.7</b>	<b>Set DAE Gain values</b>	<b>P_FCP_LFI_CSGC</b>	Configure Gain	<b>TPF:</b> PFLCSGC_C__GAIN_0021_n.IPF
<b>C2.8</b>	<b>Set DAE offset values</b>	<b>P_FCP_LFI_CSOC</b>	Configure Offset	<b>TPF:</b> PFLCSOC_C_OFFSET_0021_n.IPF
<b>Additional Comments</b>				
None				