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LFI Instrument Operation Team

Planck LFI

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CHANGE RECORD

Issue	Date	Sheet	Description of Change	Release
1	May ‘13	All	Draft issue of document containing overall procedures	0.1
2	June ‘13		Draft issue of document containing overall procedures	0.2
3	Aug ‘13		More detailed Procedures	0.5
4	Aug ‘13		More detailed Procedures + Thermal tests	0.6
5	Sept ‘13		First Issue of complete document	1.1
6	Sept ‘13		Procedures revision	2.0
7	Oct ‘13		Procedures revision	2.3

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 No-fly Region**	**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 FEM Passivation**	**Set FEM biases to zero**	**As needed**		**TPFs (7)**	**Yes**	40
C2	**Saturation Passivation**	**Prevent RCA saturation**	**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	LFI EoL Initialization			
	Detailed Description	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).		
	Objective	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.		
	Constraints	Start OD: **2013-10-03 20:00:00Z**		
	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	N/A		
	Execution Type	**Real-time**		
	Duration	**10 minutes** **Wait 2 hours 50 minutes before next test**		
Step	**Reference**	**Proc. Ref.**	**Proc. Title**	**Procedure Inputs**
1	**LFI EOL initialization**			
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**	

1.3	Set processing type to 1	**P_FCP_LFI_CSSX**	**Change Science Processing Mode**	**TPF:** PFLCSPM_C_SCI_PM_0011.IPF

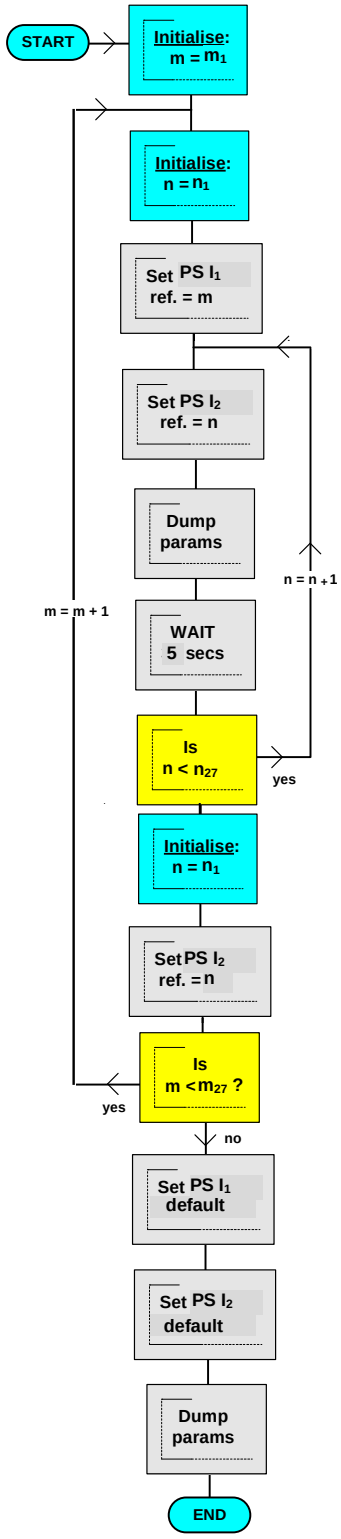
Additional Comments

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



Test Definition

Phase Switch A/B and C/D exercised separately:

Loop on 27 values of PS I_1 and, within the I_1 loop, on 27 values of PS I_2;
Set PS I_1, I_2 to the default.

#2	**ADC Non-linearity Pre-run**			
	Detailed Description	ADC Non-linearity Pre-run Two separate loops on 27 (to match the duration of 3 hrs) values of $I_{switch1}$ P/S biases ("Configure Iswitch1" P_FCP_LFI_MSXC) and, within this $I_{switch1}$ loop, 27 values of $I_{switch2}$ ("Configure Iswitch2" P_FCP_LFI_MSYC). 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). The final step of the test will assert the default Phase Switch currents ($I_{switch1}$ and $I_{switch2}$) on each ACA (Step 2.3).		
	Objective	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. ADC Input signals can be slightly perturbed acting on Phase Switch attenuation ($I_{switch1}$ and $I_{switch2}$ 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. With respect to the proper test #8, the pre-run is organized only in loops of P/S $I_{switch1}$ and $I_{switch2}$ (each 27 values, TBC), here exercised separately, one loop inside the other one. The acquisition time is set to 5 seconds.		
	Constraints	Start OD: **2013-10-03 23:00:00**		
	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	**MTL**		
	Duration	**3 hours** **Wait 30 minutes at the end of the test for stabilization**		
Step	**Reference**	**Proc. Ref.**	**Proc. Title**	**Procedure Inputs**
2	**ADC Non-linearity Pre-run**			
	All RCAs, all ACAs			
	Test on all A/C Phase Switches			
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)

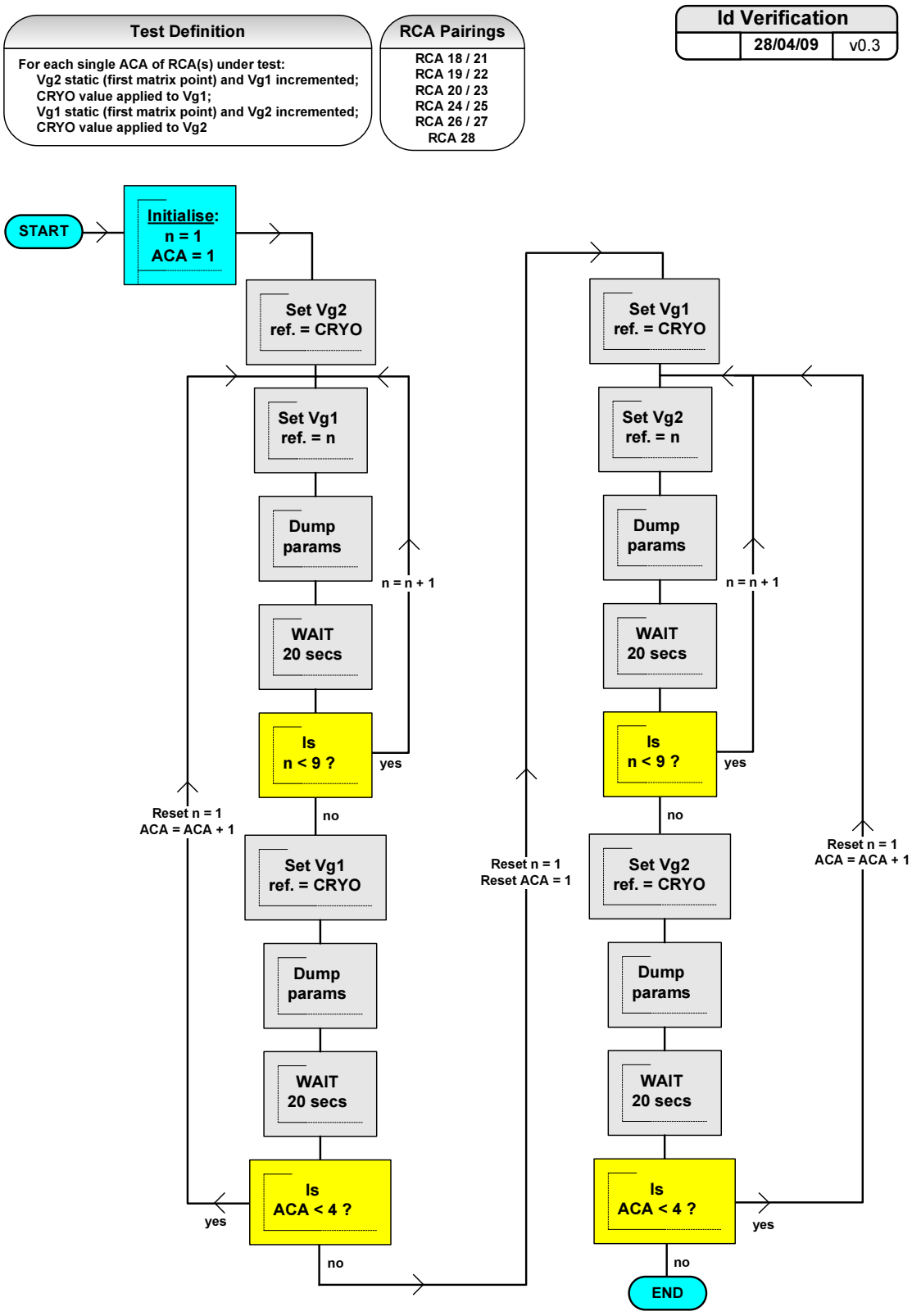
Additional Comments

Acquisition time during the ADC Non Linearity Pre-run is set to 5 seconds. Phase Switch currents (nested loops on $I_{switch1}$ and $I_{switch2}$) 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.

It is still TBC if an initial step is required to lower the Gain values of some channel to avoid saturation.

The TPFs will be produced before the start of the test activities by the end of September 2013.

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
START
Initialise:
n = 1
ACA = 1
Set Vg2 ref. = CRYO
Set Vg1 ref. = n
Dump params
WAIT 20 secs
Is n < 9 ?
yes
n = n + 1
no
Set Vg1 ref. = CRYO
Dump params
WAIT 20 secs
Is ACA < 4 ?
yes
Reset n = 1
ACA = ACA + 1
no
Reset n = 1
Reset ACA = 1
Set Vg1 ref. = CRYO
Set Vg2 ref. = n
Dump params
WAIT 20 secs
Is n < 9 ?
yes
n = n + 1
no
Set Vg2 ref. = CRYO
Dump params
WAIT 20 secs
Is ACA < 4 ?
yes
Reset n = 1
ACA = ACA + 1
no
END

#3	Drain Current Verification			
	Detailed Description	Drain Current Verification Reference: LFI User Manual v.04 PL-LFI-PST-MA-001 § 13.1.2.4		
	Objective	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.		
	Constraints	Start OD: **2013-10-04 22:30:00Z**		
	Start Condition	LFI (NOM) in **Nominal Science** Mode		
	End Condition	No change in LFI configuration		
	Initial Configuration	Cryo biases, 4kHz switching on B/D (**but RCA 23 on A/C**), Polarization A/C=1, B/D=0		
	End Configuration	Unchanged.		
	Execution Type	**MTL**		
	Duration	**3 hours** **Wait 1 hour at the end of the test for stabilization**		
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			

Additional Comments

Performed for each RCA:

1) ACA1 Increment Vg1 against static Vg2; Apply **Cryo** value to Vg1 and Vg2;
2) ACA2 Increment Vg1 against static Vg2; Apply **Cryo** value to Vg1 and Vg2;
3) ACA3 Increment Vg1 against static Vg2; Apply **Cryo** value to Vg1 and Vg2;
4) ACA4 Increment Vg1 against static Vg2; Apply **Cryo** value to Vg1 and Vg2;
5) ACA1 Increment Vg2 against static Vg1; Apply **Cryo** value to Vg2 and Vg1;
6) ACA2 Increment Vg2 against static Vg1; Apply **Cryo** value to Vg2 and Vg1;
7) ACA3 Increment Vg2 against static Vg1; Apply **Cryo** value to Vg2 and Vg1;
8) ACA4 Increment Vg2 against static Vg1; Apply **Cryo** value to Vg2 and Vg1;

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: **2013-10-05 02:30:00Z**		
	Start Condition	LFI (NOM) in **Nominal Science** Mode		
	End Condition	No change in LFI configuration		
	Initial Configuration	Cryo biases, 4kHz switching on B/D (**but RCA 23 on A/C**), Polarization A/C=1, B/D=0		
	End Configuration	Unchanged.		
	Execution Type	**MTL**		
	Duration	**2 hours** **Wait 1 hour at the end of the test for stabilization (in the timeline 1.5 hrs as a margin)**		
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, Iswitch1 and Iswitch2 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)

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

2.2.5 Activity #5 - Reference Test

#5	Reference Test			
	Detailed Description	Reference Functional Test Reference: LFI User Manual v.04 PL-LFI-PST-MA-001 § 13.1.2.9		
	Objective	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.		
	Constraints	Start OD: **2013-10-05 06:00:00Z**		
	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	**MTL**		
	Duration	**3 hours** **Wait 1 hour at the end of the test for stabilization**		
Step	**Reference**	**Proc. Ref.**	**Proc. Title**	**Procedure Inputs**
5	**Reference Test** (UM section 13.1.2.9)			
5.1	**RCA 18 and 21**			
5.1.1	**Set zero bias on ACA1 and ACA2 of RCA 18 and 21**	**P_FCP_LFI_MRCA**	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	**TPF:** PFLMRCA_M_5x_RCA_9231.IPF
5.1.2	**Disable B/D 4kHz on**	**P_FCP_LFI_MSDC**	Enable/Disable the B-D	**TPF:**

	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, Iswitch1 and Iswitch2 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 Iswitch1 low value on ACA1 RCA 18, 21**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_8892.IPF
5.1.14	**WAIT 1 minute**			
5.1.15	**Set Iswitch1 nominal value on ACA1 RCA 18, 21**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_8891.IPF
5.1.16	**Set Iswitch2 low value on ACA1 RCA 18, 21**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_8892.IPF
5.1.17	**WAIT 1 minute**			
5.1.18	**Set Iswitch2 nominal value on ACA1 RCA 18, 21**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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 Iswitch1 low value on ACA3 RCA 18, 21**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_9092.IPF
5.1.49	**WAIT 1 minute**			
5.1.50	**Set Iswitch1 nominal value on ACA3 RCA 18, 21**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_9091.IPF

5.1.51	**Set Iswitch2 low value on ACA3 RCA 18, 21**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_9092.IPF
5.1.52	**WAIT 1 minute**			
5.1.53	**Set Iswitch2 nominal value on ACA3 RCA 18, 21**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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 Iswitch1 low value on ACA2 RCA 18, 21**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_9192.IPF
5.1.64	**WAIT 1 minute**			
5.1.65	**Set Iswitch1 nominal value on ACA4 RCA 18, 21**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_9191.IPF
5.1.66	**Set Iswitch2 low value on ACA4 RCA 18, 21**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_9192.IPF

5.1.67	**WAIT 1 minute**			
5.1.68	**Set Iswitch2 nominal value on ACA4 RCA 18, 21**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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 Iswitch1 low value on ACA1 RCA 19, 22**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_88A2.IPF
5.2.14	**WAIT 1 minute**			
5.2.15	**Set Iswitch1 nominal value on ACA1 RCA 19, 22**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_88A1.IPF
5.2.16	**Set Iswitch2 low value on ACA1 RCA 19, 22**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_88A2.IPF
5.2.17	**WAIT 1 minute**			
5.2.18	**Set Iswitch2 nominal value on ACA1 RCA 19, 22**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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 Iswitch1 low value on ACA2 RCA 19, 22**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_89A2.IPF
5.2.29	**WAIT 1 minute**			
5.2.30	**Set Iswitch1 nominal value on ACA2 RCA 19, 22**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_89A1.IPF
5.2.31	**Set Iswitch2 low value on ACA2 RCA 19, 22**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_89A2.IPF
5.2.32	**WAIT 1 minute**			
5.2.33	**Set Iswitch2 nominal value on ACA2 RCA 19, 22**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** 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, Iswitch1 and Iswitch2 parameters	**TPF:** 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, Iswitch1 and Iswitch2 parameters	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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, Iswitch1 and Iswitch2 parameters	**TPF:** 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 Iswitch1 low value on ACA3 RCA 19, 22**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_90A2.IPF
5.2.49	**WAIT 1 minute**			
5.2.50	**Set Iswitch1 nominal value on ACA3 RCA 19, 22**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_90A1.IPF
5.2.51	**Set Iswitch2 low value on ACA3 RCA 19, 22**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_90A2.IPF
5.2.52	**WAIT 1 minute**			
5.2.53	**Set Iswitch2 nominal value on ACA3 RCA 19, 22**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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 Iswitch1 low value on ACA2 RCA 19, 22**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_91A2.IPF
5.2.64	**WAIT 1 minute**			
5.2.65	**Set Iswitch1 nominal value on ACA4 RCA 19, 22**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_91A1.IPF
5.2.66	**Set Iswitch2 low value on ACA4 RCA 19, 22**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_91A2.IPF
5.2.67	**WAIT 1 minute**			
5.2.68	**Set Iswitch2 nominal value on ACA4 RCA 19, 22**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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 Iswitch2 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, Iswitch1 and Iswitch2 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 Iswitch1 low value on ACA3 RCA 20, 23**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_90B2.IPF
5.3.49	**WAIT 1 minute**			
5.3.50	**Set Iswitch1 nominal value on ACA3 RCA 20, 23**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_90B1.IPF
5.3.51	**Set Iswitch2 low value on ACA3 RCA 20, 23**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_90B2.IPF
5.3.52	**WAIT 1 minute**			

5.3.53	**Set Iswitch2 nominal value on ACA3 RCA 20, 23**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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 Iswitch1 low value on ACA2 RCA 20, 23**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_91B2.IPF
5.3.64	**WAIT 1 minute**			
5.3.65	**Set Iswitch1 nominal value on ACA4 RCA 20, 23**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_91B1.IPF
5.3.66	**Set Iswitch2 low value on ACA4 RCA 20, 23**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_91B2.IPF
5.3.67	**WAIT 1 minute**			
5.3.68	**Set Iswitch2 nominal value on ACA4 RCA 20, 23**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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 Iswitch1 low value on ACA1 RCA 25, 24**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:**

				PFLMSXC_M_SWTCH1_88C2.IPF
5.4.14	**WAIT 1 minute**			
5.4.15	**Set Iswitch1 nominal value on ACA1 RCA 25, 24**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_88C1.IPF
5.4.16	**Set Iswitch2 low value on ACA1 RCA 25, 24**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_88C2.IPF
5.4.17	**WAIT 1 minute**			
5.4.18	**Set Iswitch2 nominal value on ACA1 RCA 25, 24**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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 Iswitch1 low value on ACA2 RCA 25, 24**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_89C2.IPF
5.4.29	**WAIT 1 minute**			

5.4.30	**Set Iswitch1 nominal value on ACA2 RCA 25, 24**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_89C1.IPF
5.4.31	**Set Iswitch2 low value on ACA2 RCA 25, 24**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_89C2.IPF
5.4.32	**WAIT 1 minute**			
5.4.33	**Set Iswitch2 nominal value on ACA2 RCA 25, 24**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** 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, Iswitch1 and Iswitch2 parameters	**TPF:** 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, Iswitch1 and Iswitch2 parameters	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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, Iswitch1 and Iswitch2 parameters	**TPF:** 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	**TPF:** 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 Iswitch1 low value on ACA3 RCA 25, 24**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_90C2.IPF
5.4.49	**WAIT 1 minute**			
5.4.50	**Set Iswitch1 nominal value on ACA3 RCA 25, 24**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_90C1.IPF
5.4.51	**Set Iswitch2 low value on ACA3 RCA 25, 24**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_90C2.IPF
5.4.52	**WAIT 1 minute**			
5.4.53	**Set Iswitch2 nominal value on ACA3 RCA 25, 24**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**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, Iswitch1 and Iswitch2 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	**TPF:** PFLMSXC_M_SWTCH1_0821.IPF
5.4.61	**Set Iswitch2 on ACA4 of RCA 24**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** PFLMSXC_M_SWTCH1_91C1.IPF
5.4.71	**Set Iswitch2 low value on ACA4 RCA 25, 24**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** 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_MSYC**	Configure Iswitch2	**TPF:** 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	**TPF:** 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 Iswitch2 low value on ACA1 RCA 26, 27**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_88D2.IPF
5.5.17	**WAIT 1 minute**			
5.5.18	**Set Iswitch2 nominal value on ACA1 RCA 26, 27**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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 Iswitch1 low value on ACA2 RCA 26, 27**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_89D2.IPF
5.5.29	**WAIT 1 minute**			
5.5.30	**Set Iswitch1 nominal value on ACA2 RCA 26, 27**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_89D1.IPF
5.5.31	**Set Iswitch2 low value on ACA2 RCA 26, 27**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_89D2.IPF

5.5.32	**WAIT 1 minute**			
5.5.33	**Set Iswitch2 nominal value on ACA2 RCA 26, 27**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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 Iswitch1 low value on ACA3 RCA 26, 27**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_90D2.IPF
5.5.49	**WAIT 1 minute**			
5.5.50	**Set Iswitch1 nominal value on ACA3 RCA 26, 27**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_90D1.IPF
5.5.51	**Set Iswitch2 low value on ACA3 RCA 26, 27**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_90D2.IPF
5.5.52	**WAIT 1 minute**			
5.5.53	**Set Iswitch2 nominal value on ACA3 RCA 26, 27**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** 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	**TPF:** 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	**TPF:** 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, Iswitch1 and Iswitch2 parameters	**TPF:** 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, Iswitch1 and Iswitch2 parameters	**TPF:** 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	**TPF:** 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	**TPF:** PFLMSDC_M_E_DB_D_8611.IPF
5.5.62	**WAIT 1 minute**			
5.5.63	**Set Iswitch1 low value on ACA2 RCA 26, 27**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_91D2.IPF

5.5.64	**WAIT 1 minute**			
5.5.65	**Set Iswitch1 nominal value on ACA4 RCA 26, 27**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_91D1.IPF
5.5.66	**Set Iswitch2 low value on ACA4 RCA 26, 27**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_91D2.IPF
5.5.67	**WAIT 1 minute**			
5.5.68	**Set Iswitch2 nominal value on ACA4 RCA 26, 27**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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 Iswitch1 low value on ACA1 RCA 28**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_88E2.IPF
5.6.15	**WAIT 1 minute**			
5.6.16	**Set Iswitch1 nominal value on ACA1 RCA 28**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_88E1.IPF
5.6.17	**Set Iswitch2 low value on ACA1 RCA 28**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_88E2.IPF
5.6.18	**WAIT 1 minute**			
5.6.19	**Set Iswitch2 nominal value on ACA1 RCA 28**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**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, Iswitch1 and Iswitch2 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_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_89E2.IPF
5.6.34	**WAIT 1 minute**			
5.6.35	**Set Iswitch2 nominal value on ACA2 RCA 28**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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 Iswitch1 low value on ACA3 RCA 28**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_90E2.IPF

5.6.52	**WAIT 1 minute**			
5.6.53	**Set Iswitch1 nominal value on ACA3 RCA 28**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_90E1.IPF
5.6.54	**Set Iswitch2 low value on ACA3 RCA 28**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**TPF:** PFLMSYC_M_SWTCH2_90E2.IPF
5.6.55	**WAIT 1 minute**			
5.6.56	**Set Iswitch2 nominal value on ACA3 RCA 28**	**P_FCP_LFI_MSYC**	Configure Iswitch2	**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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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 Iswitch1 low value on ACA2 RCA 28**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**TPF:** PFLMSXC_M_SWTCH1_91E2.IPF
5.6.67	**WAIT 1 minute**			
5.6.68	**Set Iswitch1 nominal value on ACA4 RCA**	**P_FCP_LFI_MSXC**	Configure Iswitch1	**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)
Additional Comments				
None				

2.2.6 Activity #6 - R-factor

#6	**LFI R-factor Test**	
	Detailed Description	LFI R-factor test The procedure foresees to exercise 4 different sets of P/S and LNA biases (P_FCP_LFI_MRCA) in order to: - Change the Phase Switch bias balancing acting on $I_{switch1}$ and $I_{switch2}$ bias of: - the switching P/S, - the fixed P/S, - Change the FEU amplifier gain acting on LNAs bias.
	Objective	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.

	Constraints	Start OD: **2013-10-06 03:00:00Z**
	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	**MTL**
	Duration	**3 hours** **Wait 1 hour at the end of the test for stabilization**

Step	Reference	Proc. Ref.	Proc. Title	Procedure Inputs
6	**R-factor**			
6.1	**Exercising different P/S and LNA biasing: 1st bias set**			
6.1.1	**Set bias values on all**	**P_FCP_LFI_MRCA**	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	**TPF:** PFLMRCA_M_5x_RCA_0011.IPF
6.1.2	**WAIT 45 minutes**			
6.2	**Exercising different P/S and LNA biasing: 2nd bias set**			
6.2.1	**Set bias values on all**	**P_FCP_LFI_MRCA**	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	**TPF:** PFLMRCA_M_5x_RCA_0012.IPF
6.2.2	**WAIT 45 minutes**			
6.3	**Exercising different P/S and LNA biasing: 3rd bias set**			
6.3.1	**Set bias values on all**	**P_FCP_LFI_MRCA**	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	**TPF:** PFLMRCA_M_5x_RCA_0013.IPF
6.3.2	**WAIT 45 minutes**			
6.4	**Exercising different P/S and LNA biasing: 4th bias set**			
6.4.1	**Set bias values on all**	**P_FCP_LFI_MRCA**	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	**TPF:** PFLMRCA_M_5x_RCA_0014.IPF

6.4.2	**WAIT 45 minutes**			
6.5	**Apply DEFAULT Configuration**			
6.5.1	**Apply Default DAE Configuration as current configuration**	**P_FCP_LFI_MADC**	Apply DEFAULT Configuration as Current	(none)
Additional Comments				
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 5th prior to the CEB DTCP.				

2.2.7 Activity #7 - Spike Tests

#7a	**Spike Test 1**			
	Detailed Description	Spike Test 1 Reference: LFI User Manual v.04 PL-LFI-PST-MA-001 § 13.1.2.1.1		
	Objective	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.		
	Constraints	Start OD: **2013-10-10 21:00:00Z**		
	Start Condition	LFI (NOM) in **Nominal Science** Mode		
	End Condition	No change in LFI configuration		
	Initial Configuration	Cryo biases, 4kHz switching on B/D (**but RCA 23 on A/C**), Polarization A/C=1, B/D=0		
	End Configuration	Unchanged.		
	Execution Type	**MTL**		
	Duration	**30 hours** **Waiting time included in the test**		
Step	**Reference**	**Proc. Ref.**	**Proc. Title**	**Procedure Inputs**
7.1	**Spike Test 1** (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			

Additional Comments

Note: the test 7#a can be applied once the #T2 (4K off) is already performed. For this reason it has been included in the manouevering 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.

Note: 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

#7b	Spike Test 2	
	Detailed Description	Spike Test 2 Reference: LFI User Manual v.04 PL-LFI-PST-MA-001 § 13.1.2.1.2
	Objective	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).
	Constraints	Start OD: **2013-10-05 10:00:00Z**
	Start Condition	LFI (NOM) in **Nominal Science** Mode
	End Condition	No change in LFI configuration
	Initial Configuration	4kHz switching on **B/D** (but **RCA 23 on A/C**), Polarization A/C=1, B/D=0
	End Configuration	Unchanged.
	Execution Type	**MTL**
	Duration	**16 hours** **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). 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**

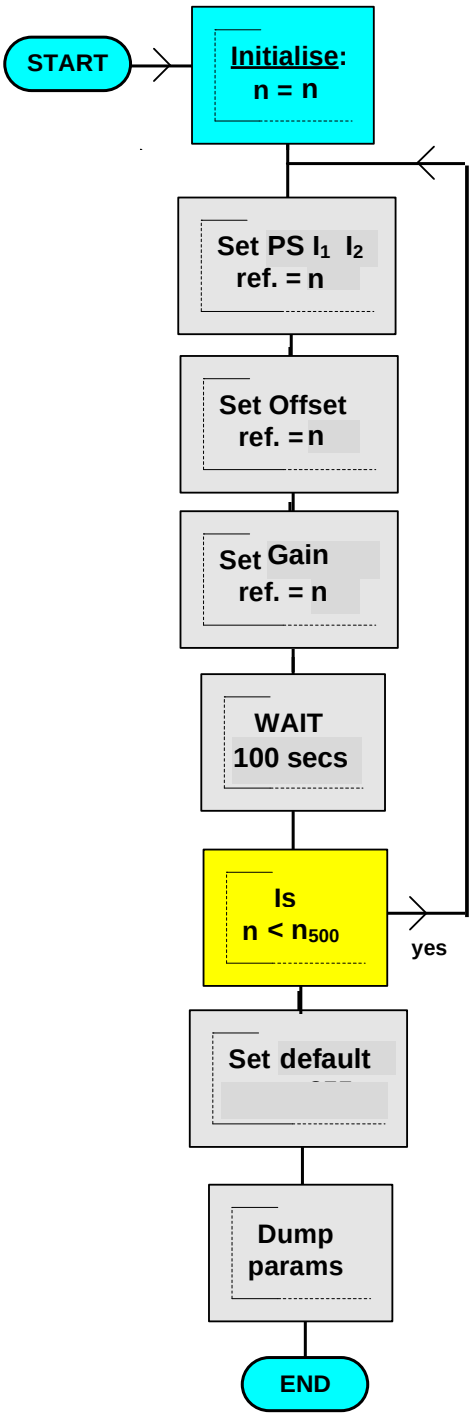
Step	Reference	Proc. Ref.	Proc. Title	Procedure Inputs
7.2	**Spike Test 2** (UM section 13.1.n.n)			
~~**7.2.0**~~	~~**Disable DAE Sequencer**~~	~~**P_FCP_LFI_MDAD**~~	~~Disable DAE HK Sequencer~~	
7.2.1	**Disable A/C 4kHz**	**P_FCP_LFI_MSCC**	Enable/Disable the A-C phase switch	**TPF:** PFLMSCC_M_E_DA_C_0001.IPF
7.2.2	**Disable B/D 4kHz**	**P_FCP_LFI_MSDC**	Enable/Disable the B-D phase switch	**TPF:** 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	**TPF:** 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	**TPF:** PFLMSBC_M_POLB_D_0001.IPF
7.2.5	**Enable A/C 4kHz**	**P_FCP_LFI_MSCC**	Enable/Disable the A-C phase switch	**TPF:** PFLMSCC_M_E_DA_C_0011.IPF
7.2.6	**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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:** 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	**TPF:**

			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)
Additional Comments				
The waiting time is applied between steps 7.2.50 and 7.2.51				

2.3.1 Activity #8 – ADC Non-linearity



Test Definition

All RCAs/ACAs tuned together:
Loop on 500 values of PS I_1 and I_2, DAE Offset and Gain;
Set PS I_1, I_2 and DAE Offset and Gain to the default.

#8	ADC Non-linearity			
	Detailed Description	ADC Non-linearity proper test 500 (TBC) sets of values that will simultaneously act on: - P/S biases $I_{switch1}$: "Configure Iswitch1" P_FCP_LFI_MSXC; - P/S biases $I_{switch2}$: "Configure Iswitch2" P_FCP_LFI_MSYC; - DAE offset: "Configure Offset" P_FCP_LFI_ MSOC; - DAE gain: "Configure Gain" P_FCP_LFI_MSGC. 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: **2013-10-06 20:30:00Z**		
	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	**MTL**		
	Duration	**15 hours** **Wait 30 minutes at the end of the test for stabilization**		
Step	**Reference**	**Proc. Ref.**	**Proc. Title**	**Procedure Inputs**
8	**ADC Non-linearity**			
	All RCAs, all ACAs			
8.1	**Perform Non Linearity**	**500x**	**(Special Command**	**Loop on 500 P/S biases, DAE Offset**

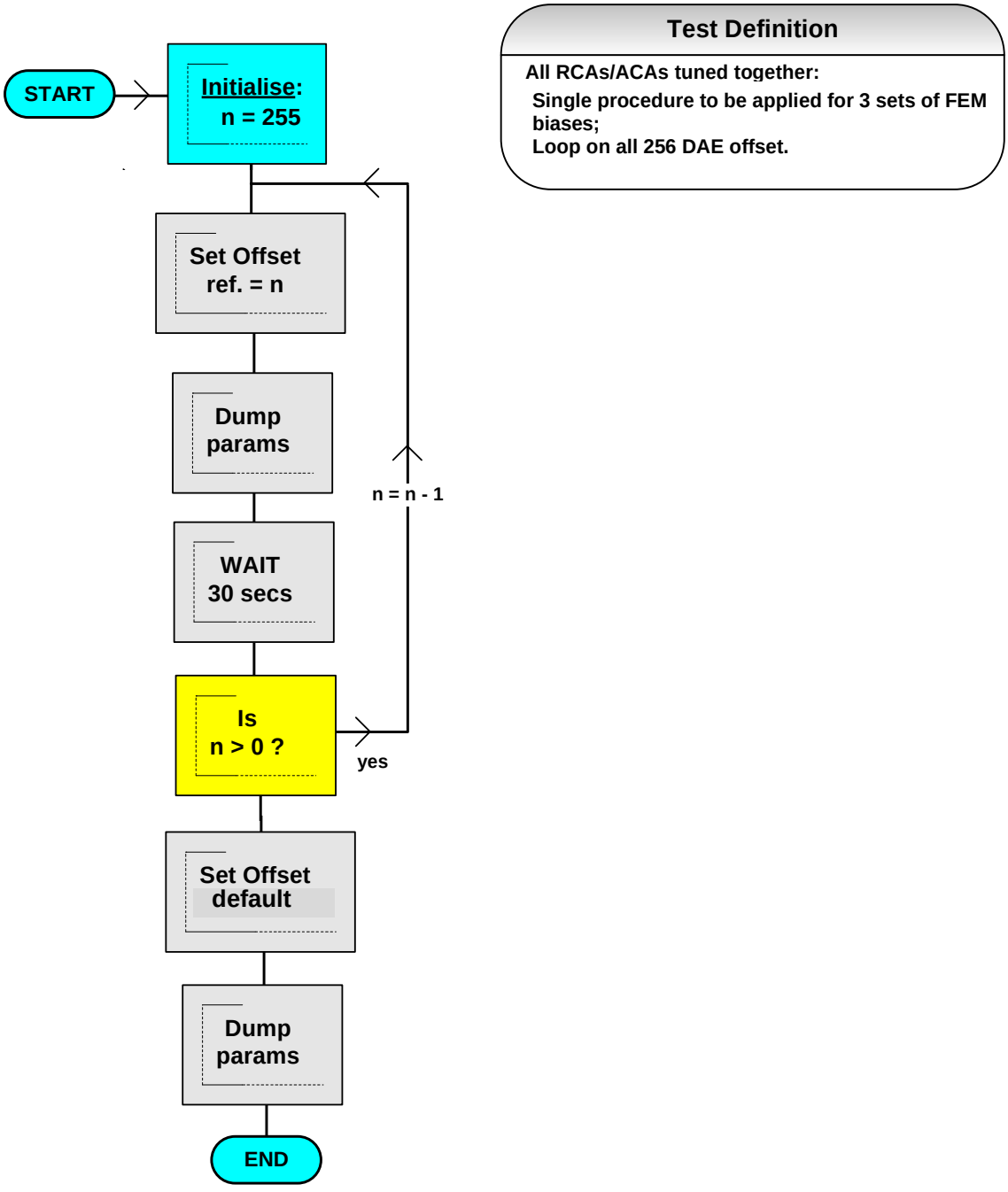
		P_FCP_LFI_MSXC **P_FCP_LFI_MSYC** **P_FCP_LFI_MSOC** **P_FCP_LFI_MSGC**	**Sequence product)**	**and Gain**
8.2	**Apply DEFAULT Configuration**			
8.2.1	**Apply Default DAE Configuration as current configuration**	**P_FCP_LFI_CADC**	Apply DEFAULT Configuration as Current	(none)

Additional Comments

Acquisition time during the ADC Non Linearity Proper test is set to 100 seconds. Phase Switch currents ($I_{switch1}$ and $I_{switch2}$ 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.

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 6th prior to the CEB DTCP.

2.3.2 Activity #9 – ADC No-fly Region



#9	ADC No-fly Region			
	Detailed Description	ADC No-fly Region test Three different loops on all DAE offset values (255 to 0) ("Configure Offset" P_FCP_LFI_MSOC), using three different sets of FEM biases: - Nominal bias conditions: just run the default ADC bias tuning test, with DAE Gain=1, step 9.1.2, to check/confirm CPV results; - Apply P/S bias table reducing the unbalance between sky and reference load (look for a mitigation of the differential effect); - Switch off FEM LNAs to equalize the input signal on sky and reference load (the differential effect should disappear. Note that the test is similar to the **DAE Offset/Gain Tuning** 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. 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.		
	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: **2013-10-06 07:00:00Z**		
	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	**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)**		
	Duration	**11 hours** **Wait 2 hours at the end of the test for stabilization**		
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, Iswitch1 and Iswitch2 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 No-Fly Region	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, Iswitch1 and Iswitch2 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 No-Fly Region	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, Iswitch1 and Iswitch2 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 No-Fly Region	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)	**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
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)	**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
9.5.3	**Apply Default DAE Configuration as current configuration**	**P_FCP_LFI_CADC**	Apply DEFAULT Configuration as Current	(none)

Additional Comments

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.

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 **PFLMRCA_C_5x_RCA_0020.IPF** will be produced based on the results of the #2 Pre-run and thus will be delivered as soon as possible on October 5th prior to the CEB DTCP.

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).

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

#10	LNA & P/S Bias Tuning			
	Detailed Description	LNA & P/S Bias Tuning Check The test consists in applying 4 different sets of bias tables ("Configure Vgate1, Vgate2, VDrain, Iswitch1 and Iswitch2 parameters", P_FCP_LFI_MRCA) and acquiring 1-hour data in the corresponding configuration.		
	Objective	The objective of the test is two folds: - 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. - Verify a different bias table aimed at minimizing the correlation effects (especially white noise) between coupled detectors.		
	Constraints	Start OD: **2013-10-07 12:00:00Z**		
	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	**MTL**		
	Duration	**4 hours** **Wait 30 minutes at the end of the test for stabilization**		
Step	**Reference**	**Proc. Ref.**	**Proc. Title**	**Procedure Inputs**
10	**LNA & P/S Bias Tuning Check**			
10.1	**Exercising different LNA & P/S biasing: 1st bias set**			
10.1.1	**Set DAE Offset**	**P_FCP_LFI_MSOC**	**Configure Offset**	**TPF:** PFLMSOC_M_OFFSET_xxxx.IPF
10.1.2	**Set DAE Gain**	**P_FCP_LFI_MSGC**	**Configure Gain**	**TPF:** PFLMSGC_M___GAIN_xxxx.IPF
10.1.3	**Configure 5 RCA parameters**	**P_FCP_LFI_MRCA**	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	**TPF:** PFLMRCA_M_5x_RCA_xxxx.IPF

~~10.1.2~~	~~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: 2nd 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, Iswitch1 and Iswitch2 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: 3rd 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: 4th 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_MSCC**~~	~~Enable/Disable the A-C phase switch~~	~~**TPF:** PFLMSCC_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_MSAC**~~	~~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_MSCC**~~	~~Enable/Disable the A-C phase switch~~	~~**TPF:** PFLMSCC_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	BEM Offset Calculation Test			
	Detailed Description	BEM Offset Calculation Test 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. Note that the test has some similarities with the **Phase Switch Tuning** 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.		
	Objective	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.		
	Constraints	Start OD: **2013-10-07 16:30:00Z**		
	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	**MTL**		
	Duration	**1.5 hours** **Wait 1 hour at the end of the test for stabilization**		
Step	**Reference**	**Proc. Ref.**	**Proc. Title**	**Procedure Inputs**
11	**BEM Offset Calculation Test**			
11.01	**Set DAE Gain to 1 (0h)**	**P_FCP_LFI_MSGC**	**Configure Gain**	**TPF:** PFLMSGC_M___GAIN_0001.IPF
11.02	**Set DAE Offset**	**P_FCP_LFI_MSOC**	**Configure Offset**	**TPF:** PFLMSOC_M_OFFSET_xxxx.IPF
11.1	**RCA 18**			

11.1.1	**Set zero bias on ACA1,2 of RCA 18**	**P_FCP_LFI_MRCA**	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and	**TPF:** PFLMRCA_M_5x_RCA_xxxx.IPF

	RCA 22		Iswitch2 parameters	
11.5.4	**Set zero bias on ACA3,4 of RCA 22**	**P_FCP_LFI_MRCA**	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and	**TPF:**

	RCA 24		Iswitch2 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_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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 parameters	**TPF:** PFLMRCA_M_5x_RCA_xxxx.IPF
11.9.4	**Set zero bias on ACA3,4 of RCA 26**	**P_FCP_LFI_MRCA**	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	**TPF:** PFLMRCA_M_5x_RCA_xxxx.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, Iswitch1 and Iswitch2 parameters	**TPF:** PFLMRCA_M_5x_RCA_xxxx.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, Iswitch1 and Iswitch2 parameters	**TPF:** PFLMRCA_M_5x_RCA_xxxx.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, Iswitch1 and Iswitch2 parameters	**TPF:** PFLMRCA_M_5x_RCA_xxxx.IPF
11.10.4	**Set zero bias on ACA3,4 of RCA 27**	**P_FCP_LFI_MRCA**	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	**TPF:** PFLMRCA_M_5x_RCA_xxxx.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, Iswitch1 and Iswitch2 parameters	**TPF:** PFLMRCA_M_5x_RCA_xxxx.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, Iswitch1 and Iswitch2 parameters	**TPF:** PFLMRCA_M_5x_RCA_xxxx.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_92E1.IPF PFLMRCA_M_5x_RCA_92E2.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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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, Iswitch1 and Iswitch2 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)
Additional Comments				
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	**2.4** 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: **2013-10-14 14:00:00Z (TBC if it can be advanced)**
	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	N/A		
	Execution Type	**Real-time**		
	Duration	**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
Additional Comments				
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**	
	Detailed Description	Thermal Verification 1: LFI FPU thermal susceptibility Two procedure involved: - varying the SCS TSA set-point in two steps (forth and back, ±0.5 K, ±1.25 K); - varying the 4K PID in one step (forth and back, possibly ±0.15 K).
	Objective	Measure LFI FPU thermal susceptibility by varying the SCS TSA set-point in two steps and the 4K PID in one step.
	Constraints	Start OD: **2013-10-04 02:30:00Z**
	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	Unchanged

	Configuration	
	Execution Type	**MTL, Real-time for steps:** **T1.3: 4hr after the start, for 2hr 2013-10-04 06:30:00Z-08:30:00Z** ~~**T1.4 ?: 10hr after the start, for 3hr (HFI to confirm) 2013-10-04 12:30:00Z-15:30:00Z**~~ **T1.6: 14hr after the start, for 1hr 2013-10-04 16:30:00Z-17:30:00Z** **T1.7: 19hr after the start, for 1hr 2013-10-04 21:30:00Z-22:30:00Z**
	Duration	**20 hours** **Waiting time of 1 hour at the end of the test for stabilization is included in the procedure (step T1.7)**

Step	Reference	Start Time	End Time	Procedure Inputs
T1	**Thermal Verification 1**			
T1.1	**Set ΔTSA +0.5 K**	t0	t0 + 2 hr	
T1.2	**Set ΔTSA -0.5 K**	t0 + 2 hr	t0 + 4 hr	
T1.3	**Set ΔTSA +1.25 K**	t0 + 4 hr	t0 + 10 hr	
T1.4	**Set Δ4K shield +0.15 K (TBC)**	**2.5** t0 + 10 hr	t0 + 12 hr	
T1.5	**Set Δ4K shield -0.15 K (TBC)**	t0 + 12 hr	t0 + 14 hr	
T1.6	**Set ΔTSA -1.25 K**	t0 + 14 hr	t0 + 19 hr	
T1.7	**Monitor Thermal Stabilization**	t0 + 19 hr	t0 + 20 hr	
Additional Comments				
none				

2.5.1 Activity #T2 – Thermal Verification 2

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

		- 4K switch off; - Possibly an intermediate step with 4K at about 16 K (with TBC stability); - Data acquisition with 4K at 20 K.		
	Objective	Three folds: - Monitor LFI dynamic thermal response to reference load warm up. - 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. - 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.		
	Constraints	Start OD: **2013-10-08 08:00:00Z 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	**MTL, Real-time for step T2.1 (at start), T2.2 (about 20 hrs after the start of the test), T2.3**		
	Duration	**30 hours** **Waiting time included in the procedure**		
Step	**Reference**	**Start Time**	**End Time**	**Procedure Inputs**
T2	**Thermal Verification 2**			
T2.01	**Set DAE Offset to maximum (0h) 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	
	Monitor Thermal Stabilization (18 hrs)			

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: - Measure LFI FPU dynamical thermal susceptibility by monitoring the FPU to passive environment. - 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.			
	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	
Additional Comments				
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**			
	Detailed Description	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.		
	Objective	Verify the LFI susceptibility and possible systematic effects to tele-communication system activities		
	Constraints	Start OD: **2013-10-07 19:00:00Z TBC by MOC**		
	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**		
	Duration	**1 hour** **Waiting time: 1 hour**		
Step	**Reference**	**Start Time**	**End Time**	**Procedure Inputs**
E1	**RF Susceptibility**			
E1.1	**Enable LFI OBCP for DAE HK fast retrieval**			

E1.2	**Cycle on TWT (to be performed at least 10 times)**			
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**			
Additional Comments				

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

~~**#E2**~~	~~**Thermal Changes VS Pointing**~~

2.5.5 Activity #E3 – Telescope Loss

#E3	**Telescope Loss**	
	Detailed Description	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.
	Objective	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.
	Constraints	Start OD: **2013-10-07 21:00:00Z TBD by MOC**
	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	Unchanged

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

2.5.6 Activity #C1 – LFI FEM Passivation

#C1	**Initialisation**			
	Detailed Description	RCA Parameter Passivation		
	Constraints	**When needed**		
	Start Condition	LFI (NOM) in DAE Setup Mode		
	End Condition	No change in LFI configuration		
	Initial Configuration	N/A		
	End Configuration	Zero Biases, 4kHz all disabled, Polarization all = 0		
	Execution Type	**Real-time; Manual**		
	Duration	**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, Iswitch1 and Iswitch2 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
Additional Comments				
Initialisation sets the RCA parameters in 'zero bias' condition (zero current on FPU)				

2.5.7 Activity #C2 - Saturation Passivation

#13	**Saturation Passivation**			
	Detailed Description	Set RCA, DAE Gain, and Offset parameters to avoid saturation		
	Constraints	Start OD: **TBD**		
	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	**As required**		
	Execution Type	**Real-time; Manual**		
	Duration	**15 minutes**		
Step	**Reference**	**Proc. Ref.**	**Proc. Title**	**Procedure Inputs**

C2	**Saturation Passivation** (UM section 13.1.2.nn)			
C2.1	**Set Cryo values on all**	**P_FCP_LFI_CRCA**	Configure Vgate1, Vgate2, Drain, Iswitch1 and Iswitch2 parameters	**TPF:** PFLCRCA_C_5x_RCA_0021_n.IPF
C2.2	**Set PS status = 1 (A/C)**	**P_FCP_LFI_CSAC**	Configure Polarisation of A-C Phase Switch	**TPF:** PFLCSAC_C_POLA_C_0011_n.IPF
C2.3	**Set PS status = 0 (B/D)**	**P_FCP_LFI_CSBC**	Configure Polarisation of B-D Phase Switch	**TPF:** PFLCSBC_C_POLB_D_0001_n.IPF
C2.4	**Enable 4kHz (A/C)** **RCA23**	**P_FCP_LFI_CSCC**	Enable/Disable the A-C phase switch	**TPF:** PFLCSCC_C_E_DA_C_7111_n.IPF
C2.5	**Enable 4kHz (B/D)** **all but RCA 23**	**P_FCP_LFI_CSDC**	Enable/Disable the B-D phase switch	**TPF:** PFLCSDC_C_E_DB_D_9811_n.IPF
C2.6	**Save as default configuration**	**P_FCP_LFI_CSCD**	Save current configuration as default	(none)
C2.7	**Set DAE Gain values**	**P_FCP_LFI_CSGC**	Configure Gain	**TPF:** PFLCSGC_C___GAIN_0021_n.IPF
C2.8	**Set DAE offset values**	**P_FCP_LFI_CSOC**	Configure Offset	**TPF:** PFLCSOC_C_OFFSET_0021_n.IPF
Additional Comments				
None				