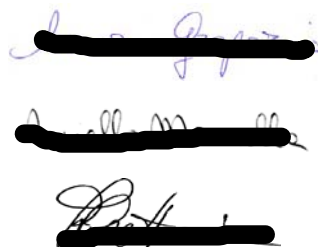

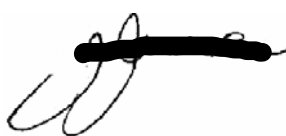




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1 ACRONYMS

AIV	Assembly, Integration, Verification
ASW	Application Software
BEM	Back End Module
BEU	Back End Unit
CCS	Central Check-out System
CDMU	Central Data Management Unit
DAE	Data Acquisition Electronics
DPU	Digital Processing Unit
EGSE	Electrical ground Support Equipment
FEM	Front End Module
FPT	Focal Plane Temperature
FPU	Focal Plane Unit
I-EGSE	Instrument EGSE
ILT	Instrument Level Test
IOT	Instrument Operation Team
IST	Integrated Satellite Test
LNA	Low Noise Amplifier
OBC	On Board Clock
P/S	Phase Shifter
RAA	Radiometer Array Assembly
RCA	Radiometer Chain Assembly
REBA	Radiometric Electronic Box Assembly
S/C	Spacecraft
SCE	Sorption Cooler Electronics
SCOE	Spacecraft Control and Operation System
SCS	Sorption Cooler System
SFT	Short functional Test
SPU	Signal Processing Unit
SUSW	Start- Up Software
SVM	Service Module
TBC	To Be Confirmed
TBD	To Be Defined
TBW	To Be Written
TC	Telecommand
TM	Telemetry
UFT	Unit Functional Test
WFT	Warm Functional Test



2 INTRODUCTION

This document has been issued in the frame of ASI contract that has been released for the activities of Planck-LFI Phase E2

2.1 Purpose and Scope

Scope of this document is to give a description of the steps to be performed when a possible contingency action is required, in particular when unexpected features on the drain currents value is observed.

The test sequence will be applied if necessary while the LFI is in cryogenic condition under vacuum inside the CSL facility.

The test is scheduled respect to TAS-F plan and test specification.



3 APPLICABLE AND REFERENCE DOCUMENTS

3.1 Applicable Documents

- [AD1] Herschel/Planck Instrument Interface document Part A
SCI-PT-IIDA-04624 Issue 3.3
- [AD2] Herschel/Planck Instrument Interface document Part B
SCI-PT-IIDB-04142 Issue 3.1
- [AD3] Herschel/Planck Instrument Interface document Part B
SCI-PT-IIDB-04142 Issue 3.1, Annex 3, ICD 750800115
- [AD4] Herschel/Planck Instrument Interface document Part A
SCI-PT-IIDA-04624 Issue 3.3 Annex 10

3.2 Reference Documents

- [RD1] Planck FM TV/TB test specification
H-P-3-ASP-TS-0893
- [RD2] Planck LFI User Manual
PL-LFI-PST-MA-001
- [RD3] Planck LFI REBA Herschel PACS SPU: LFI REBA FMs User's Manual
PL-FPL-MA-1214-04 CRS
- [RD4] LFI- REBA application Software User Manual (SUM)
DS/UM_FIR/178v.4
- [RD5] LFI Short Functional test Procedure (SFT)
PL-LFI_PST-PR-018
- [RD6] Warm Functional test Procedure (WFT)
PL-LFI_PST-PR-017
- [RD7] Combined LFI EMC test at System level
PL-LFI_PST_PR_020
- [RD8] Planck FM TV test sequence
Issue 7.5 (Excel file)
- [RD9] Tuning of REBA scientific parameters
PL-LFI-PST-PR-024
- [RD10] IST1 and IST2 Combined LFI and HFI test
PL-LFI-PST-PR-019
- [RD11] TV tests: LFI Test Under Cryogenic Vacuum
PL-LFI-PST-PR-021



4 GENERAL REQUIREMENTS

4.1 Responsibilities

TAS-F will be the test conductor and will be the responsible of the test.
The Instrument Operation Team (IOT) will witness the tests and will support TAS-F during tests performing.

4.2 Environmental Conditions

All “Warm” operations outside CSL Chamber shall be conducted at ambient temperature, humidity, and pressure conditions in a class 100.000 environment or better in accordance with [AD2].
CSL Facility chamber as specification. [RD1]

4.3 Operational Constraints and Recommendations

LFI database loaded in CCS
I-EGSE Connected to CCS and fully tested.
TQL machine is connected to I-EGSE and fully tested.
TQL User Manual Available
LIFE machine available
LIFE User Manual Available.
IOT on site



5 Drain Currents Overlimits

With reference to the ACA tuning Verification test Ph 5-03-B-2 (Par. 5.6.5.3 [RD11]), there is a Warning, Warning 09, that states “The table of Cryo values must be checked by IOT before running the test. It might be the case that some biases values are different from FM and a new table should be produced.”

This will be the result of the check of the drain currents that is performed for the first time when the LFI is switch On at 20 K (see Ph 5-02-d) since one of the pass/fail criteria of this test is “Id currents are with margins expected” (as specified in the database). The check of the drain currents is in fact an important indicator of the status of the LFI instrument.

If one or several currents will not be within the limits, the procedure proposed here can give us an important indication of the status and health of the channels (ACAs not behaving as expected). The test will last approximately 3 hours.

Note that the implementation of this test will speed the process of investigation of the LFI behaviour in this new cold conditions, with the LFI integrated in the satellite.

To speed up the execution of the procedure the sequence is built to perform the test operating over two different ACAs in parallel. The chosen ACAs are belonging to different power groups and BEM trays, in order to minimize the coupling between radiometers biases. The sequence chosen for the channels is the same as for the matrix tuning, and is indicated in the table below.

RCA Under Tests in parallel
RCA 18 + RCA 21
RCA 19 + RCA 22
RCA 20 + RCA 23
RCA 25 + RCA 24
RCA 26 + RCA 27
RCA 28

	Name of Procedure	Reference	Note	Time
0	Start TQL session			
1	Update RCA parameters	Tab 35 Pag 42 [RD6] and new table to be produced when the contingency appears. See example in tab. 1	Apply the values 1 to N=9 of Vg1 and wait 20 second for each step on the first ACA of the FEMs Under Test	3 hours
2	Update RCA parameters	Tab 35 Pag 42 [RD6]	Apply the Vg1 Cryo values on the first ACA	



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	Name of Procedure	Reference	Note	Time
		and Tab 45 pag 86 [RD11]	of the FEMs Under Test	
3			Repeat step 1 and 2 for all the other 3 ACAs of the FEMs under test	
4	Update RCA parameters	Tab 35 Pag 42 [RD6] and new table to be produced when the contingency appears. See example in tab. 1	Apply the values 1 to N=9 of Vg2 and wait 20 second for each step on the first ACA of the FEMs Under Test	
5	Update RCA parameters	Tab 35 Pag 42 [RD6] and Tab 45 pag 86 [RD11]	Apply the Vg2 Cryo values on the first ACA of the FEMs Under Test	
6			Repeat step 4 and 5 for all the other 3 ACAs of the FEMs under test	
7			Repeat step 1 to 6 for all the FEMs	
12	Stop TQL session and save data file			



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RCA #	Detector ID	SCOS Parameter	Start Values				Stop Values				Step Vg1 DEC	Step Vg2 DEC
			Vg1		Vg2		Vg1		Vg2			
			DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX		
CH27	00	M1	LP001320									
	01	M2	LP002320									
	02	S1	LP003320									
	03	S2	LP004320									
CH24	04	M2	LP005320									
	05	M1	LP006320									
	06	S2	LP007320									
	07	S1	LP008320									
CH21	08	S2	LP009320									
	09	S1	LP010320									
	0A	M1	LP011320									
	0B	M2	LP012320									
CH22	0C	S2	LP013320									
	0D	S1	LP014320									
	0E	M1	LP015320									
	0F	M2	LP016320									
CH23	10	S2	LP017320									
	11	S1	LP018320									
	12	M1	LP019320									
	13	M2	LP020320									
CH25	14	M1	LP021320									
	15	M2	LP022320									
	16	S1	LP023320									
	17	S2	LP024320									
CH28	18	M1	LP025320									
	19	M2	LP026320									
	1A	S1	LP027320									
	1B	S2	LP028320									
CH20	1C	S2	LP029320									
	1D	S1	LP030320									
	1E	M1	LP031320									
	1F	M2	LP032320									
CH19	20	S2	LP033320									
	21	S1	LP034320									
	22	M1	LP035320									
	23	M2	LP036320									
CH18	24	S2	LP037320									
	25	S1	LP038320									
	26	M1	LP039320									
	27	M2	LP040320									
CH26	28	M2	LP041320									
	29	M1	LP042320									
	2A	S2	LP043320									
	2B	S1	LP044320									

1. Tab Example for the verification procedure