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Planck LFI

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Prepared by	**L. STRINGHETTI** **F. CUTTAIA** **O. D'ARCANGELO** **E. FRANCESCHI** **A. MENNELLA** **M. MICCOLIS** **M. SANDRI**	**Date:** November 14th , 2007 **Signature:** [redacted]
Agreed by	**C. BUTLER** **LFI Program Manager**	**Date:** November 14th , 2007 **Signature:** [redacted]
Approved by	**N. MANDOLESI** **LFI Principal Investigator**	**Date:** November 14th , 2007 **Signature:** [redacted]

DISTRIBUTION LIST

Recipient	Company / Institute	E-mail address	Sent
N. MANDOLESI	INAF/IASF – Bologna	mandolesi@iasfbo.inaf.it	Yes
R.C. BUTLER	INAF/IASF – Bologna	butler@iasfbo.inaf.it	Yes
M. BERSANELLI	UNIMI – Milano	marco.bersanelli@mi.infn.it	Yes
M. BALASINI	TAS-I – Milan	maurizio.balasini@thalesaleniaspace.com	Yes
R. SILVESTRI	TAS-I – Milan	roberto.silvestri@thalesaleniaspace.com	Yes
P. LEUTENEGGER	TAS-I – Milan	paolo.leutenegger@thalesaleniaspace.com	Yes
M. MICCOLIS	TAS-I – Milan	maurizio.miccolis@thalesaleniaspace.com	Yes
G. CAFAGNA	TAS-I – Milan	gaetano.cafagna@thalesaleniaspace.com	Yes
A. MENNELLA	UNIMI – Milano	aniello.mennella@fisica.unimi.it	Yes
J. PATTERSON	ESA	Janice.Patterson@esa.int	Yes
L. PEREZ CUEVAS	ESA	leticia.perez.cuevas@esa.int	Yes
O. PIERSANTI	ESA	Osvaldo.Piersanti@esa.int	Yes
J.P. CHAMBELLAND	TAS-F Cannes	jean-philippe.chambelland@thalesaleniaspace.com	Yes
B. COLLAUDIN	TAS-F Cannes	Bernard.Collaudin@thalesaleniaspace.com	Yes
P. RIHET	TAS-F Cannes	Patrick.Rihet@thalesaleniaspace.com	Yes
N. SEVILLE	TAS-F Cannes	Norbert.Seville@thalesaleniaspace.com	Yes
J.P. HAYET	TAS-F Cannes	Jean-pierre.hayet@thalesaleniaspace.com	Yes
LFI System PCC	INAF/IASF – Bologna	lfispcc@iasfbo.inaf.it	Yes

CHANGE RECORD

Issue	Date	Sheet	Description of Change	Release
0.1	August	All	First Draft of Document	
1.0	October		Analysis refined on Id and Vout values, correcting for cross talk between channels. Updated Id plots and Vout plots in AMB_02 analysis. "Other features" chapter completed. Spikes analysis added.	
2.0	November	-	Data Analysis completed	

TABLE OF CONTENTS

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
I-EGSE	Instrument EGSE
IST	Integrated Satellite Test
OBC	On Board Clock
RAA	Radiometer Array Assembly
REBA	Radiometric Electronic Box Assembly
S/C	Spacecraft
SCOE	Spacecraft Control and Operation System
SPU	Signal Processing Unit
SUSW	Start- Up Software
SVM	Service Module
TBC	To Be Checked
TBW	To Be Written
TC	Telecommand
TM	Telemetry
UFT	Unit Functional Test

2 INTRODUCTION

This document has been issued as a part of the activity performed under the ASI contract for Planck LFI phase E2.

2.1 Purpose and Scope

Scope of this document is to give a first quick look analysis response of the functionality of the LFI instrument during its first Warm Functional Test (WFT) performed in TAS F Cannes from the 30th of July till the 9th of August 2007.
The document is divided in two sections. The first section is related to the description of the work done that is to say the description of the LFI Log Book and the description of the performed tests. The second section is the summary of the results of each test coming from both real time and offline data analysis.

2.2 Test configuration

The test configuration is the following

SCOS 2 K HPCCS Version 2.0.787
LFI Gateway Version V0R9
TQL 3.1.0
LIFE Machine version OM 3.00

LFI Personnel involved during the test is:

LFI AIV Manager	Luca Stringhetti IASF Bologna stringhetti@iasfbo.inaf.it
I-EGSE Engineer	Enrico Franceschi IASF Bologna franceschi@iasfbo.inaf.it
LFI IOT	Francesco Cuttaia IASF Bologna cuttaia@iasfbo.inaf.it Ocleto D'Arcangelo IASF Bologna ocleto@ifp.cnr.it
Calibration Scientist	Daniele Mennella UNIMI Aniello.Mennella@fisica.unimi.it
TAS-I Support	Maurizio Miccolis Maurizio.miccolis@thalesaleniaspace.com

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 Instrument Testing at PFM S/C levels
H-P-3-ASP-TN-0676, Issue 1.0

[RD2] Planck LFI User Manual
PL-LFI-PST-MA-001 Issue 2.1

[RD3] Planck LFI REBA Herschel PACS SPU: LFI REBA FMs User's Manual
FPL-MA-1214-04 CRS Issue 1.0

[RD4] LFI- REBA application Software User Manual (SUM)
DS/UM_FIR/178v.4

[RD5] LFI Warm Functional Test Procedure (WFT)
PST-PR-017_2_1

4 DAE/REBA Connection test

Before the WFT a connection test has been performed in order to guarantee that the electrical connection was fine before the panel closure. The procedure followed is described hereafter

LFI Single Operation: Full Warm Functional test (redundant Unit)					2.28.00	
	Switch ON LFI				0.39.00	
		Switch ON REBA	OFF to standby	0.32.00	0.32.00	0.32.00
		Switch ON RAA + Synch.	Standby to DAE set up	0.07.00	0.07.00	0.39.00
	LFI in Normal Science (Warm test Config..)				0.24.00	
		Setting Telemetry Rate (Room test Values)		0.02.00	0.02.00	0.41.00
		Event Packet Enabling		0.02.00	0.02.00	0.43.00
		Changing Processing Type to nominal (T1)		0.05.00	0.05.00	0.48.00
		Definition of science parameters		0.02.00	0.02.00	0.50.00
		SPU Connection		0.02.00	0.02.00	0.52.00
		Science activation		0.02.00	0.02.00	0.54.00
		Configure DAE		0.02.00	0.02.00	0.56.00
		RCA Activation + acquiring data	Nominal	0.07.00	0.07.00	1.03.00
	Switch OFF LFI				0.11.00	
		LFI to Standby	DAE Set Up to Standby	0.05.00	0.09.00	1.12.00
		Switch OFF	Standby to OFF	0.05.00	0.02.00	1.14.00

The test has been repeated two times for the Redundant REBA and for the Nominal one. The two tests were successfully and the panel has been closed Wednesday the 1st of August.
The data are collected in two different files

XXX_ 0098 For the REBA Redundant.
AMB_0073 – AMB_0074 For the REBA Nominal.

In the mean while the I-EGSE update was performed. New version of SCOS has been tested and verified (SCOS Version 2.0.787). And new version of LIFE was installed and tested with real data. No change in the TQL system.

4.1 Results and Conclusions

The checksum values are put in the procedure. Test scripts must be updated.

Pass and Fail Criteria

No errors from the REBA HW Self check	PASSED
No un-expected event Packets	PASSED
REBA Power Consumption within the ranges of expected values	PASSED
EEPROM Check Sum passed	PASSED
REBA synchronization achieved	PASSED
DAE Power Consumption within the ranges of expected values	PASSED
DAE Synchronization achieved	PASSED
I-EGSE Is receiving Scientific Telemetry	PASSED

1) With this configuration we do receive packets from ground equipment EGSE (APID 2020 for example) and also the TC packets. These packets are not recognized by LFI SCOS configuration, because we were not prepared to have them, and we continuously receive warning messages on LFI Gateway side. These warnings are annoying also because it could be difficult to find out if in the meanwhile we receive a real warning.

2) LFI EGSE is not receiving the TM (6,10). In principle this TM type was not requested by LFI because in the first test procedure this packet was requested only once, but after some iterations with ESA and TAS the procedure has been updated and now it is important to have these packets. Take also in mind that the LFI configuration, when EGSE is receiving these telemetry packets, is REBA stand by, so the LFI telemetry production rate is quite low because no DAE telemetry or scientific telemetry is arriving, and the impact of this telemetry on the telemetry budget is very low.

5 Warm functional test Execution

For each modular block of procedure test results and conclusions are presented.

5.1 Up to DAE set up with REBA redundant

5.1.1 Procedure/ Test sequence

Test Sequence				LFI Single Operation: Full Warm Functional test (Redundant Unit)			0.43.00
TS1			Switch ON LFI				0.39.00
				Switch ON REBA R	OFF to standby	0.22.00	0.32.00
				Switch ON RAA	Standby to DAE set up	0.05.00	0.07.00
			Switch OFF LFI				0.04.00
				Switch OFF RAA	DAE set Up to Stand By	0.02.00	0.02.00
				Switch OFF REBA	Stand By to OFF	0.02.00	0.02.00

5.1.2 Results and Conclusions

The procedure has run on the 2nd of August without any problem and the test has finished successfully.

Pass and Fail Criteria

No errors from the REBA HW Self check	PASSED
No un-expected event Packets	PASSED
REBA Power Consumption within the ranges of expected values	PASSED
EEPROM Check Sum passed	PASSED
REBA synchronization achieved	PASSED
DAE Power Consumption within the ranges of expected values	PASSED
DAE Synchronization achieved	PASSED

5.2 Up to DAE set up with REBA Nominal and Science acquisition

5.2.1 Procedure/ Test sequence

			Switch ON LFI			0.39.00	
TS2			Switch ON REBA	OFF to standby	0.22.00	0.32.00	1.15.00
			Switch ON RAA	Standby to DAE set up	0.07.00	0.07.00	1.22.00
			LFI in Normal Science (Warm test Config..)			0.17.00	
			Event Packet Enabling		0.02.00	0.02.00	1.24.00
			Setting Telemetry Rate (Room test Values)		0.02.00	0.02.00	1.26.00
			Changing Processing Type to 1		0.02.00	0.02.00	1.28.00
			Definition of science Processing Parameters		0.02.00	0.02.00	1.30.00
			SPU Connection		0.02.00	0.02.00	1.32.00
			Science Activation Type 1		0.05.00	0.05.00	1.35.00
			Configure DAE		0.02.00	0.02.00	1.37.00

5.2.2 Results and Conclusions

The procedure has run on the 2nd of August and the test has finished successfully.

Pass and Fail Criteria

No errors from the REBA HW Self check	PASSED
No un-expected event Packets	PASSED
REBA Power Consumption within the ranges of expected values	PASSED
EEPROM Check Sum passed	PASSED
REBA synchronization achieved	PASSED
DAE Power Consumption within the ranges of expected values	PASSED
DAE Synchronization achieved	PASSED
Science Telemetry is arriving to I-EGSE	PASSED

Some NCRs have been raised:

NCR	Description
14328	Telemetry Validity Voltage and Currents of power groups that are in off conditions give OOL alarm even if their content has no meaning. Database shall be updated to cover this issue.
14328	Wrong unit in database Current values related to power groups consumption are read in mA while the unit in database is A, this causes a alarm beep in the CCS work station. During procedure execution a patch is running changing the OOL values in order to not have the alarm. Database shall be updated.
14341	Power Group The order of the power group related to the RCA is wrong in the procedure. The procedure has to be modified and the Database too because of a wrong text description.

5.3 AMB 01

5.3.1 Procedure/ Test sequence

	LFI Full Warm Functional Test						8.31.00	
	Switch ON S/C						0.45.00	
Test Sequence	LFI Single Operation: Full Warm Functional test (Nominal Unit)						7.16.00	
TS2	Switch ON LFI					1	0.29.00	
	LFI in Normal Science (Warm test Config..)					1	0.17.00	
	Radiometer Test Sequence (power GROUP 3 and 4xRCAx4 = 16 leg)					1	4.05.00	
TS3	RCA Activation		0.05.00	1	0.05.00	0.05.00		
	Configure DAE (Switch ACA on)		0.02.00	16	0.32.00	0.37.00		
	Update RCA Config. (Change PS status)		0.04.00	16	1.04.00	1.41.00		
	Update RCA Config. (Switch on 4KHz PS)		0.04.00	16	1.04.00	2.45.00		
	Update Channel config. (Switch off the ACA)		0.05.00	16	1.20.00	4.05.00		

The procedure is repeated for all the four power group. For each power group

5.3.2 Results and Conclusions

Power Group #1 (RCA 18 and 26) completed Saturday 4th August TQL File AMB_0083

Power Group #4 (RCA 23 and 25) completed Saturday 4th August TQL File AMB_0084
Power Group #3 (RCA 19 20 and 28) Completed Monday 6th August TQL File AMB_0085
Power Group #2 (RCA 21 22 24 and 27) Completed Tuesday 7th August TQL File AMB_0087

The test was successfully completed.

Pass and Fail Criteria

No un-expected event Packets	PASSED
REBA Power Consumption within the ranges of expected values	PASSED
DAE Power Consumption within the ranges of expected values	PASSED
Every single LNA is functioning as expected	PASSED
Every single PS is functioning as expected	PASSED

Some NCRs have been raised:

NCR	Description
14354	FEM's Current consumption values Even if the dedicated power group is on the currents read looks like the power group is off. The circuitry has not been activated yet so it reads meaningless values, once the circuitry is initialised the current drops to zero as expected. The solution proposed is to change procedure and to perform initialization of biases once power group is activated.
14328	Wrong Graphical Display The parameters disposition of LFI26 alphanumeric display is wrong and there is the need to check the database and update the AND091332
14341	Biases table The biases table shall be corrected because some inconsistencies were found between HEX and DEC values. (Table already corrected in test script)

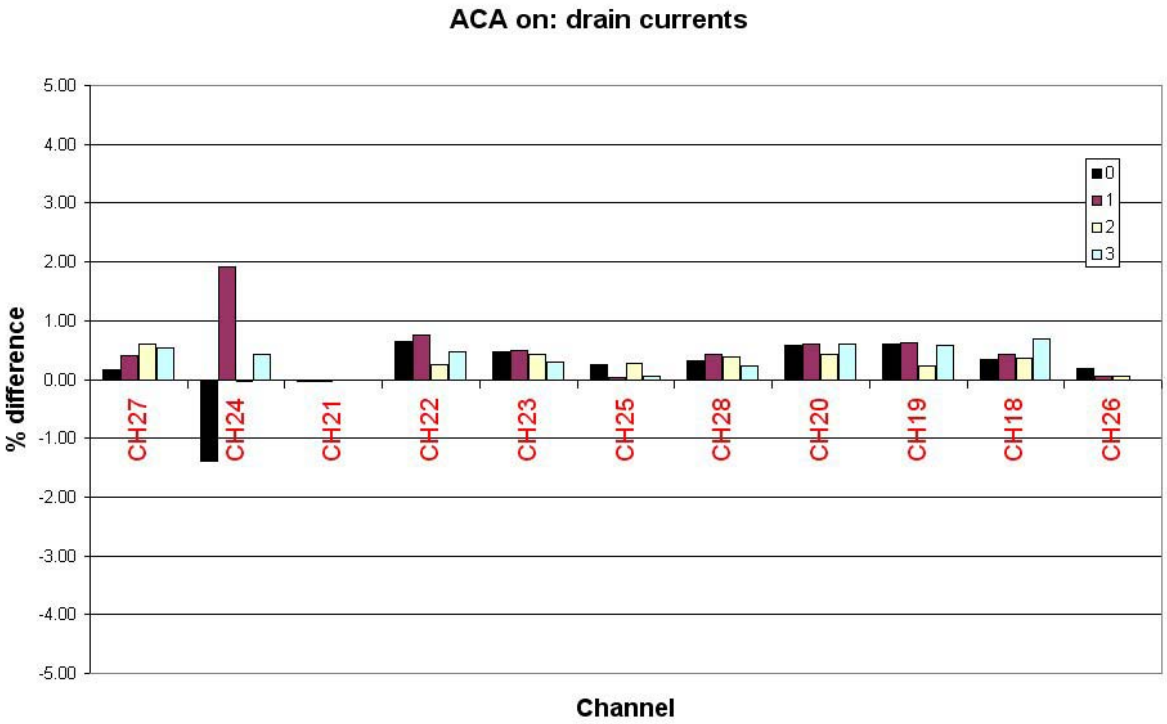


Figure 1 Current consumption AMB_01. Values expressed in percentage respect to FM values

ACA ON Id				
	0	1	2	3
CH27	0.16	0.41	0.60	0.53
CH24	-1.40	1.92	-0.03	0.42
CH21	-0.04	-0.04	-0.02	0.00
CH22	0.65	0.76	0.26	0.47
CH23	0.48	0.49	0.43	0.30
CH25	0.25	0.03	0.27	0.06
CH28	0.31	0.42	0.39	0.22
CH20	0.59	0.59	0.43	0.59
CH19	0.60	0.63	0.24	0.59
CH18	0.34	0.43	0.37	0.69
CH26	0.18	0.06	0.06	0.00

Figure 2 Percentage values of Idrain current consumption obtained during AMB_01 respect to FM test.

ACA ON Vout					
	R0D0	R0D1	R1D0	R1D1	average
CH27	-0.85	-1.07	-0.47	-0.35	-0.77
	-1.56	-1.66	-1.61	-1.50	
	-0.18	-0.39	-0.69	-0.43	
	-0.21	-0.24	-0.63	-0.46	
CH24	-7.12	-6.12	-5.95	-5.83	-4.73
	-6.02	-5.17	-6.18	-5.88	
	6.56	-6.45	-3.61	-2.44	
	-6.41	-6.25	-4.81	-4.00	
CH21	-5.42	-5.75	-5.73	-5.37	-6.17
	-4.14	-4.31	-4.01	-4.10	
	-5.32	-4.91	-5.58	-5.88	
	-9.22	-9.32	-9.85	-9.88	
CH22	-1.79	-1.91	-2.35	-2.20	-1.41
	-0.20	-0.35	-1.02	-0.73	
	-0.45	-0.77	-1.84	-1.50	
	-1.33	-1.51	-2.40	-2.17	
CH23	-1.14	-1.39	-1.06	-0.73	-1.32
	-1.12	-1.27	-1.08	-0.85	
	-4.58	-4.92	-4.22	-4.03	
	1.01	0.88	1.61	1.80	
CH25	3.56	3.58	3.70	3.33	1.29
	3.35	3.05	3.13	3.23	
	-1.63	-2.21	-2.06	-1.36	
	0.25	0.24	0.24	0.25	
CH28	2.26	2.58	1.81	1.76	0.03
	-0.38	-0.19	-1.00	-0.60	
	-1.27	-1.39	-0.87	-0.95	
	-0.49	-0.70	-0.21	0.05	
CH20	-0.42	-0.77	-0.17	0.23	0.98
	0.05	-0.35	0.58	0.71	
	2.08	1.52	0.84	1.62	
	2.95	2.83	2.04	2.02	
CH19	-5.66	-5.98	-5.02	-4.74	-1.37
	1.08	1.00	0.14	0.38	
	0.82	0.25	0.07	0.42	
	-0.44	-0.85	-0.52	-2.89	
CH18	3.16	2.94	3.55	3.60	4.21
	3.16	2.92	3.45	3.41	
	5.45	5.78	5.19	4.67	
	5.09	5.77	4.74	4.49	
CH26	1.04	1.60	2.09	2.11	1.75
	0.00	0.00	1.22	1.43	
	2.96	2.73	2.70	2.46	
	1.87	1.92	1.92	1.88	

Figure 3 Variation of Voltage output of AMB_01 from FM test expressed in percentage.

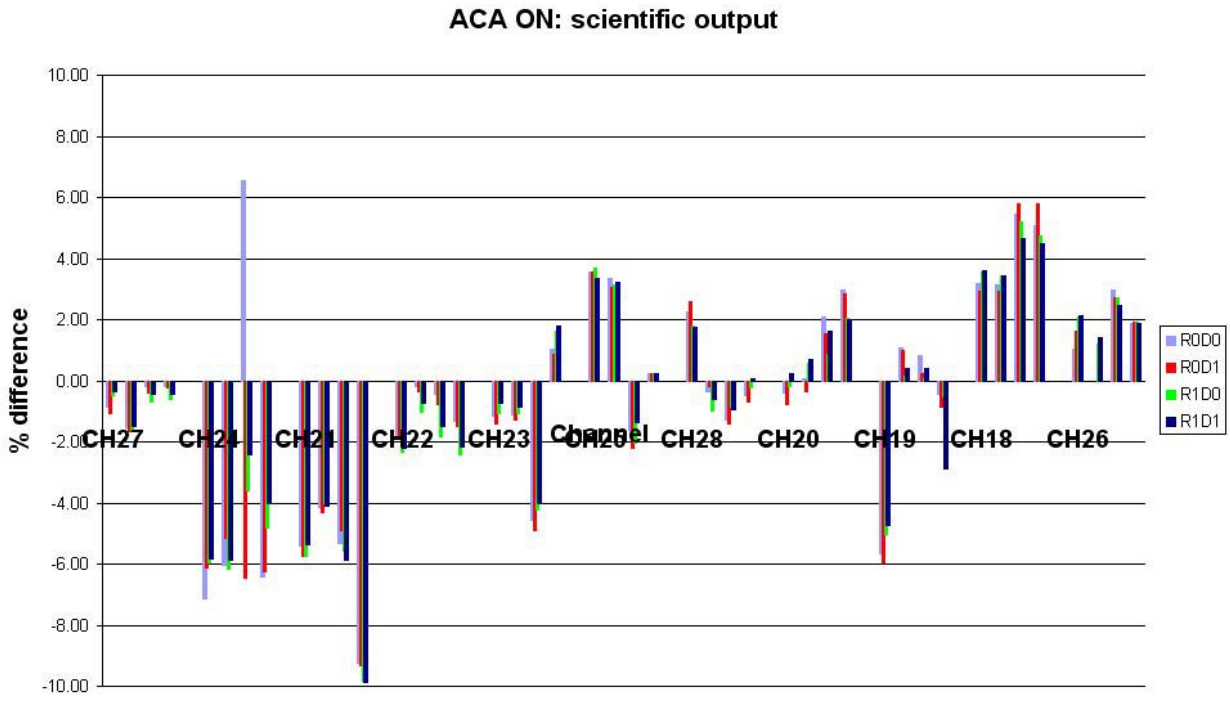


Figure 4 Voltage output variation of AMB_01 respect to FM tests expressed in percentage

5.4 AMB 02

5.4.1 Procedure/Test sequence

			Radiometric functional tests				3.14.00
TS4				RCA Activation		0.05.00	0.05.00
				Wait for thermalization of the power group		0.30.00	0.30.00
				Configure DAE (Switch ACA on)		0.02.00	0.02.00
				Wait for thermalization of the FPU		0.15.00	0.15.00
				Acquiring data		0.10.00	0.10.00
				Enable 4Khz switching ON A/C		0.02.00	0.02.00
				Acquiring data		0.30.00	0.30.00
				change P/S status on B/D to 1		0.02.00	0.02.00
				Acquiring data		0.30.00	0.30.00
				Disable 4Khz switching ON A/C		0.02.00	0.02.00
				change P/S status on A/C and B/D to 0		0.02.00	0.02.00
				Enable 4Khz switching ON B/D		0.02.00	0.02.00
				Acquiring data		0.30.00	0.30.00
				Conf . Polar : change the A/C Status to 1		0.02.00	0.02.00
				Acquiring data		0.30.00	0.30.00

5.4.2 Results and Conclusions

Test AMB_0089 For the A/C switching condition 8th August 2007
Test AMB_0091 For the B/D switching condition 8th August 2007

Pass and Fail Criteria

No un-expected event Packets	PASSED
REBA Power Consumption within the ranges of expected values	PASSED
DAE Power Consumption within the ranges of expected values	PASSED
The FEM I Drain Currents obtained from Telemetry are within the ranges expected (5%)	PASSED
The DC voltages Outputs (Science Telemetry) are within the ranges expected. (10%)	PASSED
No unexpected features in FFT spectrum (Spike, Pop corn noise, currents drops…)	PASSED

Some NCRs have been raised:

NCR	Description
14341	Biases table The biases table shall be corrected because some inconsistencies were found between biases applied following the table reported in procedure document and the reference test from FM test. LP010320 is 118 instead of 218. The biases has been already corrected in test script and it has been applied using manual stack during frirst A/C switching status in AMB_0089.
	Lost connection between SCOS and CCS. I-EGSE needed to be perform a boot in order to have connection again. To be understand what happened.

The analysis presented in the following plots and tables is slightly different w.r.t. that presented in the first Issue of this document (draft) during the PTR. Some numbers have been refined taking into account the electrical cross talk (Figure 5) between channels RCA 21, RCA 22, RCA 24, RCA 27 due to a wrong bias set in channel RCA 21 (Vg1-S1 : set 218 instead of 118 during AMB_0089) . The new analysis considers just the region where the correct bias was set after correction.
Numbers from the new analysis are closer to the FM results, both with regard to drain currents and output voltages.

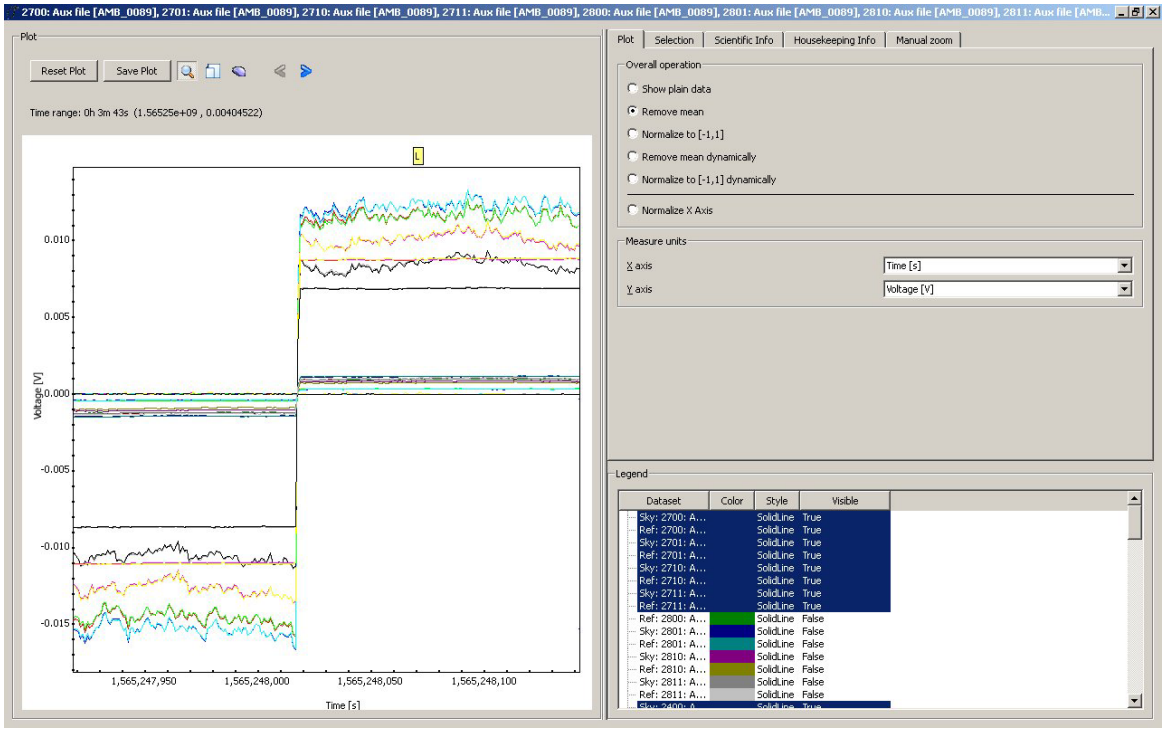


Figure 5 electric cross talk between RCA 21 and other channels when Vg1S1 is changed from 218 to 118 (the effect is largely evident on channels RCA 27 and RCA 22)

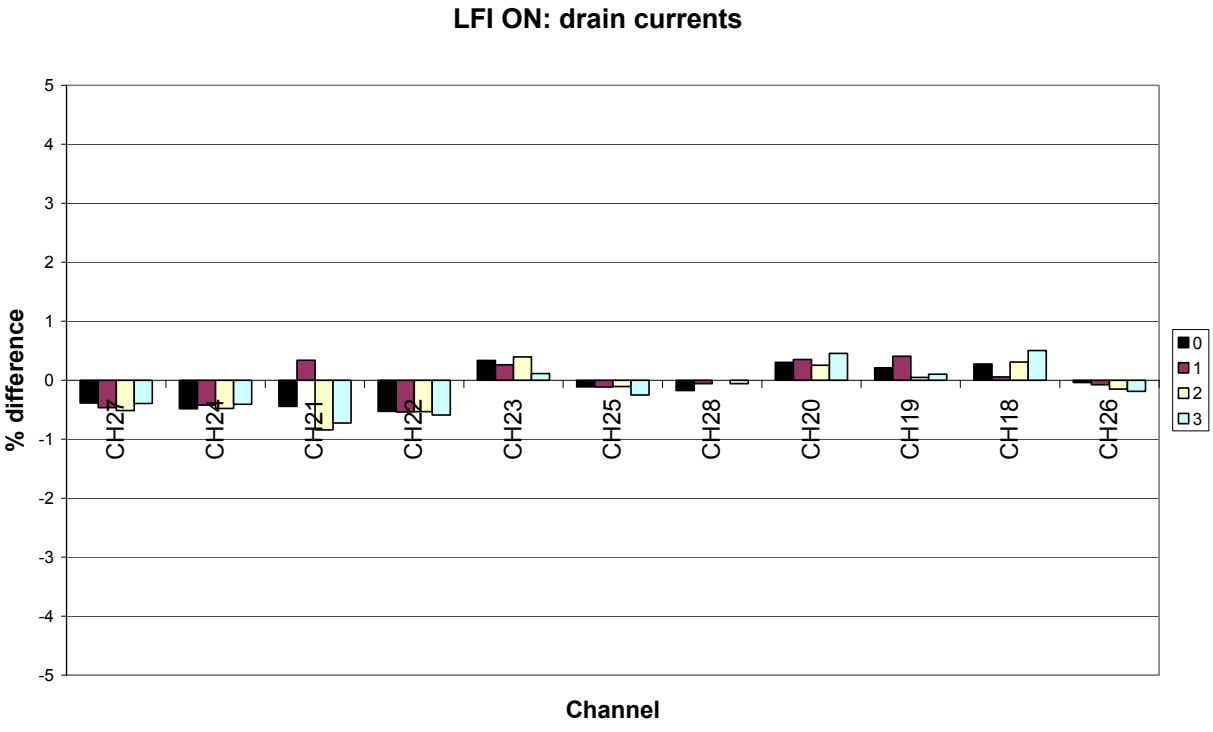


Figure 6 Current consumption of ACA from AMB-02 respect to FM level. The values are expressed in percentage

Id w.r.t RAA				
CH	<00>	<01>	<10>	<11>
CH27	-0.39	-0.46	-0.51	-0.40
CH24	-0.49	-0.42	-0.48	-0.41
CH21	-0.44	0.34	-0.84	-0.73
CH22	-0.53	-0.54	-0.54	-0.59
CH23	0.33	0.26	0.40	0.11
CH25	-0.11	-0.11	-0.11	-0.25
CH28	-0.18	-0.06	0.00	-0.06
CH20	0.30	0.35	0.26	0.45
CH19	0.21	0.40	0.05	0.10
CH18	0.27	0.06	0.31	0.50
CH26	-0.04	-0.08	-0.15	-0.19

Figure 7 Current consumption of ACA from AMB-02 respect to FM level. The values are expressed in percentage

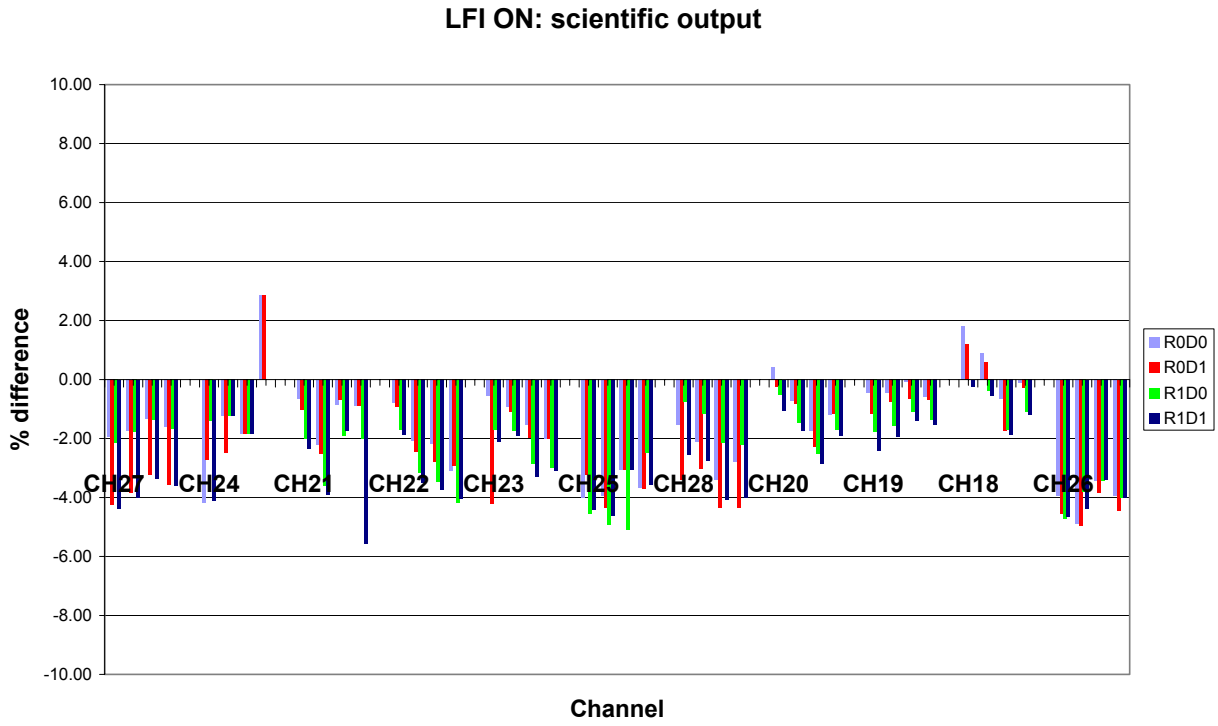


Figure 8 Output Voltage variation of AMB:02 respect to FM tests, the values are expressed in percentages.

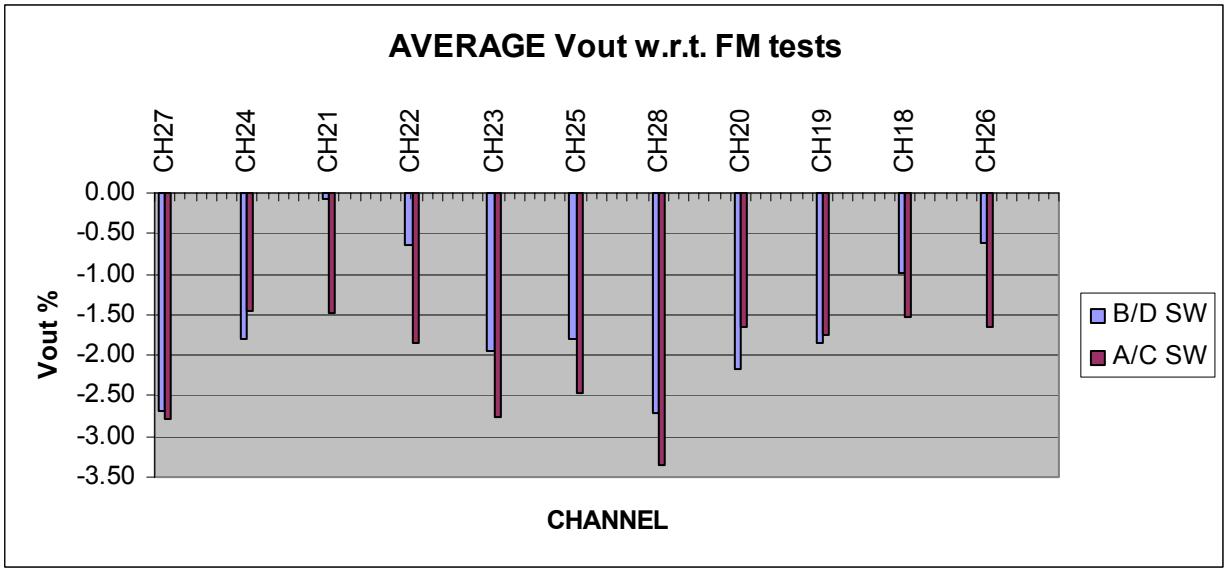


Figure 9 Average Voltage variation of AMB.02 w.r.t. FM tests, for both switching modes. The values are expressed in percentages. Values are obtained averaging over the four diodes' outputs.

Summarizing the general results:

- All drain currents are in agreement with FM data within 0.8 % (requirement 5%)
- All output voltages are in agreement with FM data within 6% (requirement 10 %) . Average values are within 3.5 %.
- Although drain currents comparison with FM data gives a homogeneous distribution , output voltages seem to suffer a drop (with exception of two diodes) , showing a negative offset w.r.t. FM data. This could be ascribed to the effect of different environmental conditions (temperature) on BEM amplifiers and diodes.
- All phase switches respond as expected: change in status (0-1) and in switching mode (A/C , B/D) are highlighted in ANNEX 8.2 for each channel.

LFI ON VOUT (w.r.t RAA-FM)						
	B/D SW		A/C SW		average B/D	average A/C
	SKY	REF	SKY	REF		
CH27	-1.95	-4.25	-2.14	-4.37	-2.69	-2.79
	-1.74	-3.84	-1.78	-4.00		
	-1.33	-3.22	-1.36	-3.36		
	-1.61	-3.56	-1.69	-3.60		
CH24	0.00	0.00	0.00	0.00	-1.80	-1.47
	-4.17	-2.74	-1.41	-4.11		
	-1.25	-2.50	-1.25	-1.25		
	-1.85	-1.85	-1.85	-1.85		
CH21	2.86	2.86	0.00	0.00	-0.09	-1.48
	0.00	0.00	0.00	0.00		
	-0.67	-1.02	-2.00	-2.34		
	-2.20	-2.51	-3.61	-3.90		
CH22	-0.85	-0.69	-1.91	-1.75	-0.63	-1.86
	-0.89	-0.88	-2.00	-5.58		
	0.00	0.00	0.00	0.00		
	-0.79	-0.93	-1.72	-1.88		
CH23	-2.07	-2.47	-3.16	-3.50	-1.94	-2.77
	-2.17	-2.78	-3.47	-3.75		
	-3.09	-2.94	-4.20	-4.05		
	0.00	0.00	0.00	0.00		
CH25	-0.54	-4.23	-1.71	-2.13	-1.79	-2.47
	-0.94	-1.08	-1.76	-1.91		
	-1.56	-1.97	-2.86	-3.29		
	-2.00	-2.01	-3.00	-3.11		
CH28	0.00	0.00	0.00	0.00	-2.70	-3.34
	-4.00	-3.24	-4.57	-4.43		
	-3.93	-4.34	-4.94	-4.64		
	-3.06	-3.06	-5.10	-3.06		
CH20	-3.66	-3.70	-2.47	-3.58	-2.18	-1.66
	0.00	0.00	0.00	0.00		
	-1.53	-3.40	-0.77	-2.55		
	-2.11	-3.04	-1.17	-2.77		
CH19	-3.41	-4.35	-2.15	-4.09	-1.84	-1.76
	-2.81	-4.35	-2.22	-4.02		
	0.00	0.00	0.00	0.00		
	0.43	-0.26	-0.52	-1.05		
CH18	-0.74	-0.82	-1.48	-1.73	-0.99	-1.53
	-1.73	-2.29	-2.53	-2.85		
	-1.19	-1.18	-1.72	-1.92		
	0.00	0.00	0.00	0.00		
CH26	-0.47	-1.18	-1.78	-2.41	-0.61	-1.64
	-0.44	-0.76	-1.56	-1.96		
	-0.09	-0.66	-1.12	-1.40		
	-0.59	-0.68	-1.35	-1.54		

Figure 10 Output Voltage variation of AMB.02 respect to FM tests, the values are expressed in percentages.

5.5 LFI in Normal Science

5.5.1 Procedure/Test sequence

		Normal science and Start channel swicthing				**0.55.00**
TS5			Science de-activation		0.02.00	0.02.00
			Setting Telemetry Rate 48 Kbps		0.02.00	0.02.00
			Changing Processing Type to nominal (T5)		0.02.00	0.02.00
			Definition of science parameters		0.02.00	0.02.00
			Science activation		0.05.00	0.05.00
			Start channel switching		0.02.00	0.02.00
			Aquisition in stable condition		0.30.00	0.30.00
			Save Configuration		0.10.00	0.10.00

5.5.2 Results and Conclusions

Session saved in test file AMB_0094 8th August 2007

Pass and Fail Criteria

No un-expected event Packets	PASSED
REBA Power Consumption within the ranges of expected values	PASSED
DAE Power Consumption within the ranges of expected values	PASSED
The Calibration channel switching is achieved	PASSED

5.6 Diagnostic on Telemetry

5.6.1 Procedure/Test sequence

		Test Ancillary functions - Diag on TM				**1.16.00**
TS7			Diagnostic TM SID 300		0.02.00	0.02.00
			Science déactivation		0.02.00	0.02.00
			Changing Processing Type to 0 (extended)		0.02.00	0.02.00
			Science activation		0.02.00	0.02.00
			Science déactivation		0.02.00	0.02.00
			Changing Processing Type to nominal (T5)		0.02.00	0.02.00
			Science activation		0.02.00	0.02.00
			Diagnostic TM SID 300		0.02.00	0.02.00
			Diagnostic TM		1.00.00	1.00.00

5.6.2 Results and Conclusions

Session saved in test file AMB_0095
Pass and Fail Criteria

No un-expected event Packets	PASSED
REBA Power Consumption within the ranges of expected values	PASSED
DAE Power Consumption within the ranges of expected values	PASSED
Telemetry readings are the one expected	PASSED

The saved Packet are presented in Annex to this document.

NCR	Description
14341	Wrong SPID Some packet are identified with the wrong SPID number. The right SPID has been identified and procedure is needed to be corrected.
	Command Failed The TC LC018320 was not executed. (around 12:15...) TC was sent again and was executed. The test sequence was repeated in order to send the TC in exactly the same configuration as when it failed, but it was not possible to reproduce the failure. Investigation with REBA team is needed.
	Temperature drop in Lateral Tray. Basically the temperature drops when science acquisition is switched on and raise at the same values when science acquisition is switched off. Detailed investigation is needed to search for any other effects in other telemetry and understand the reason of this behaviour. The difference between two state of the temperature is less than half a °C.
14341	Ending Diagnostic Procedure. The Diagnostic procedure shall end enabling TM(3,25) and disabling TM(3,26). Procedure shall be corrected.

5.7 Fall Back

5.7.1 Procedure/Test sequence

			Test Ancillary functions - LFI Go back to stand by (Fall Back)			0.19.00
TS6			Stop calibration channel		0.02.00	0.02.00
			Configure RCA to 0		0.02.00	0.02.00
			Science déactivation		0.05.00	0.05.00
			RCA Déactivation		0.05.00	0.05.00
			Switch OFF RAA		0.05.00	0.05.00
			Restart REBA		0.05.00	0.05.00

5.7.2 Results and Conclusions

Session saved in test file AMB_0096
Pass and Fail Criteria

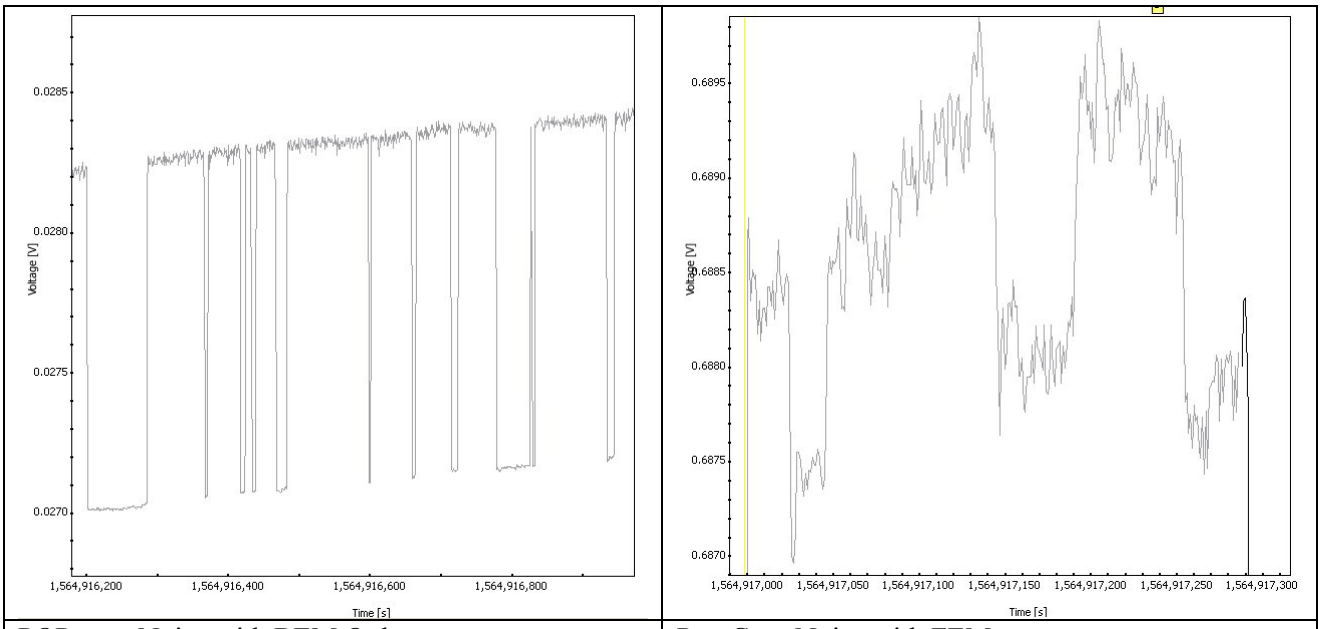
No un-expected event Packets	PASSED
REBA Power Consumption within the ranges of expected values	PASSED
DAE Power Consumption within the ranges of expected values	PASSED

NCR	Description
14341	Fall Back Wrong check on telemetry in procedure LM206342 =00 02h. Test script already corrected. Procedure shall be corrected

5.8 ALREADY KNOWN FEATURES FROM FM LEVEL TESTING

5.8.1 Pop Corn Noise in RCA 23

This issue was covered by the NCR 4137 (closed "use as is") during FM level tests. The feature is monitored to follow the problem.



POP corn Noise with BEM Only	Pop Corn Noise with FEM on

Figure 11

5.8.2 Pop Corn Noise in RCA 21

This issue was covered by the NCR 4118 (closed "use as is") during FM level tests. The feature is monitored to follow the problem.
Probably due to a wrong (218 instead of 118) bias set on RCA 21 a long drift with sharp drops was observed (Figure 12) . Once the bias was substituted with the right one, this feature was never observed again. It remains just the characteristic pop corn noise, expected for this chain (Figure 13)

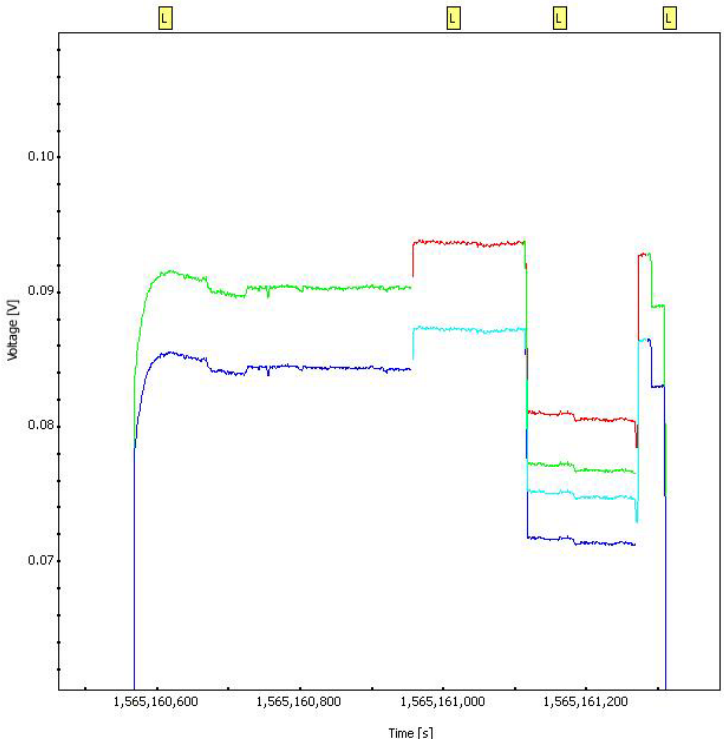


Figure 12 long slow drift probably due to wrong Vg bias set on RCA 21

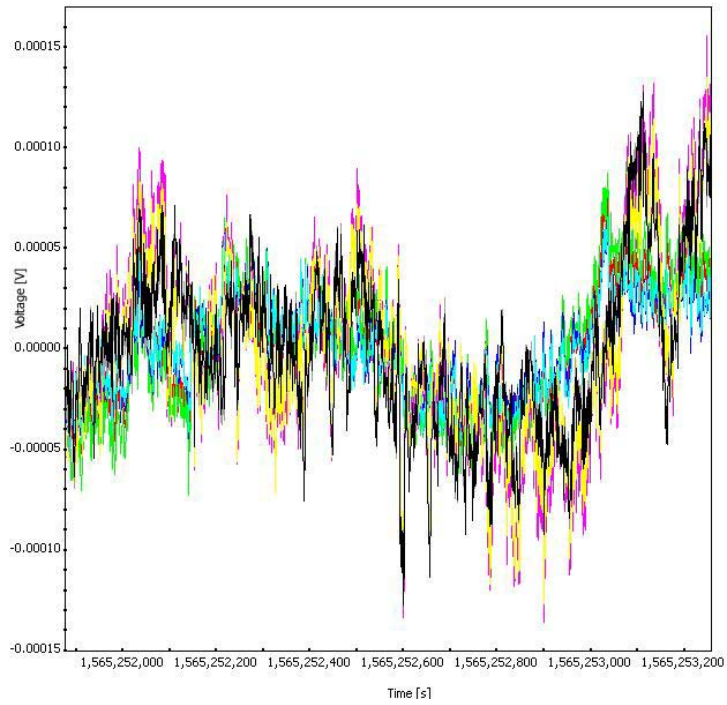
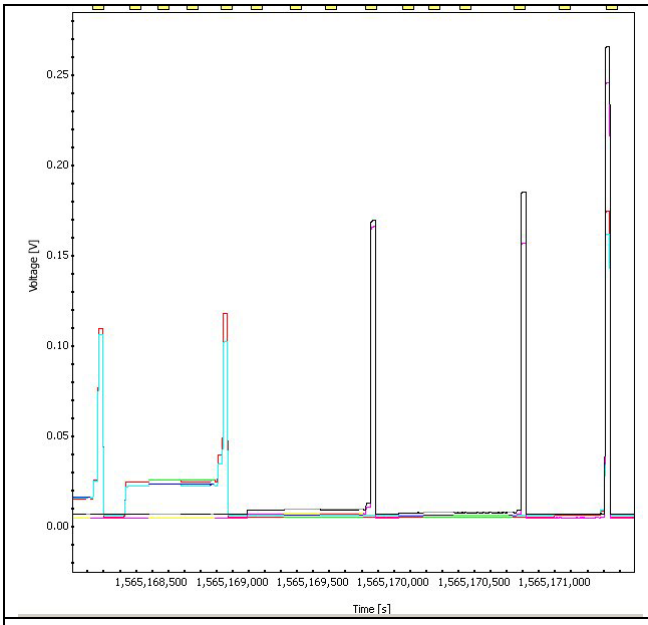


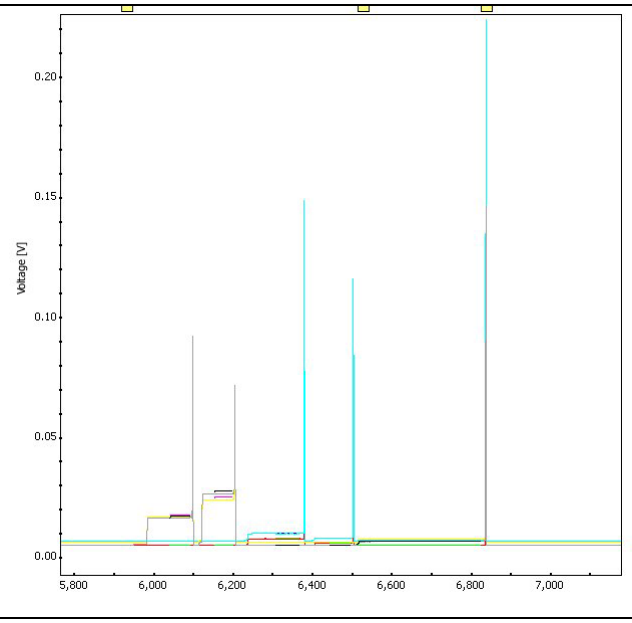
Figure 13 RCA 21 pop corn noise after bias correction

5.8.3 Switch off Feature on 30 and 44 GHz

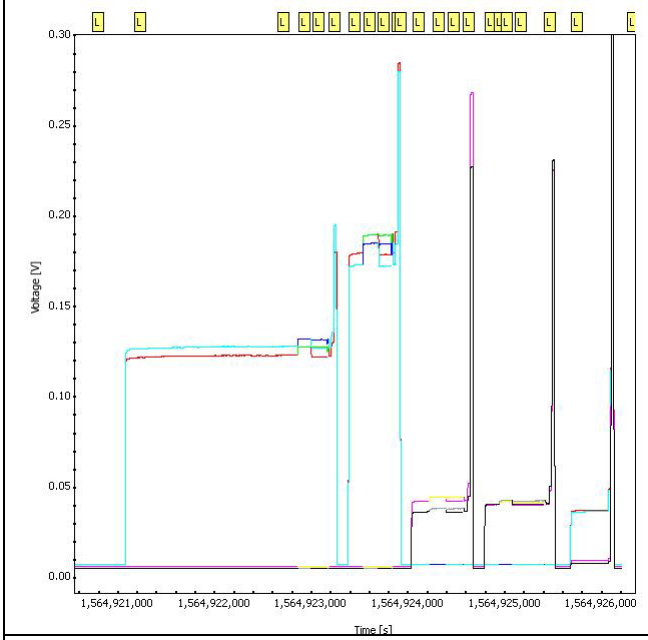
The output voltage signal is increasing while the switching off procedure is applied. This feature was already observed at FM level.



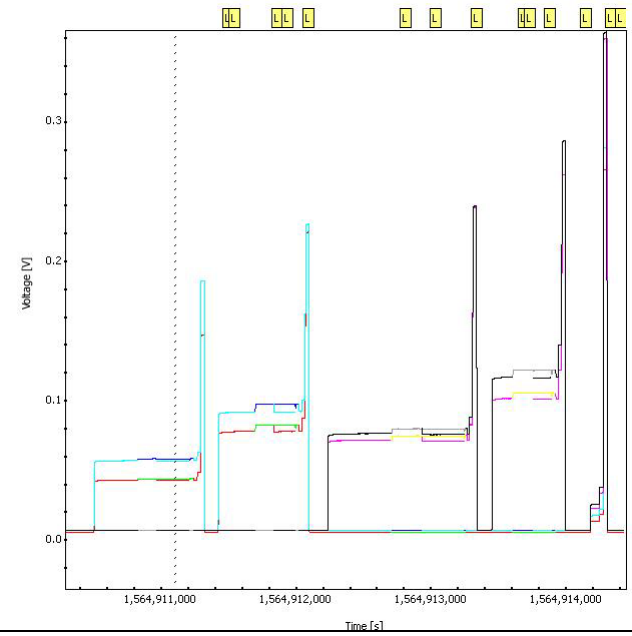
RCA 24 Off during AMB01 WFT



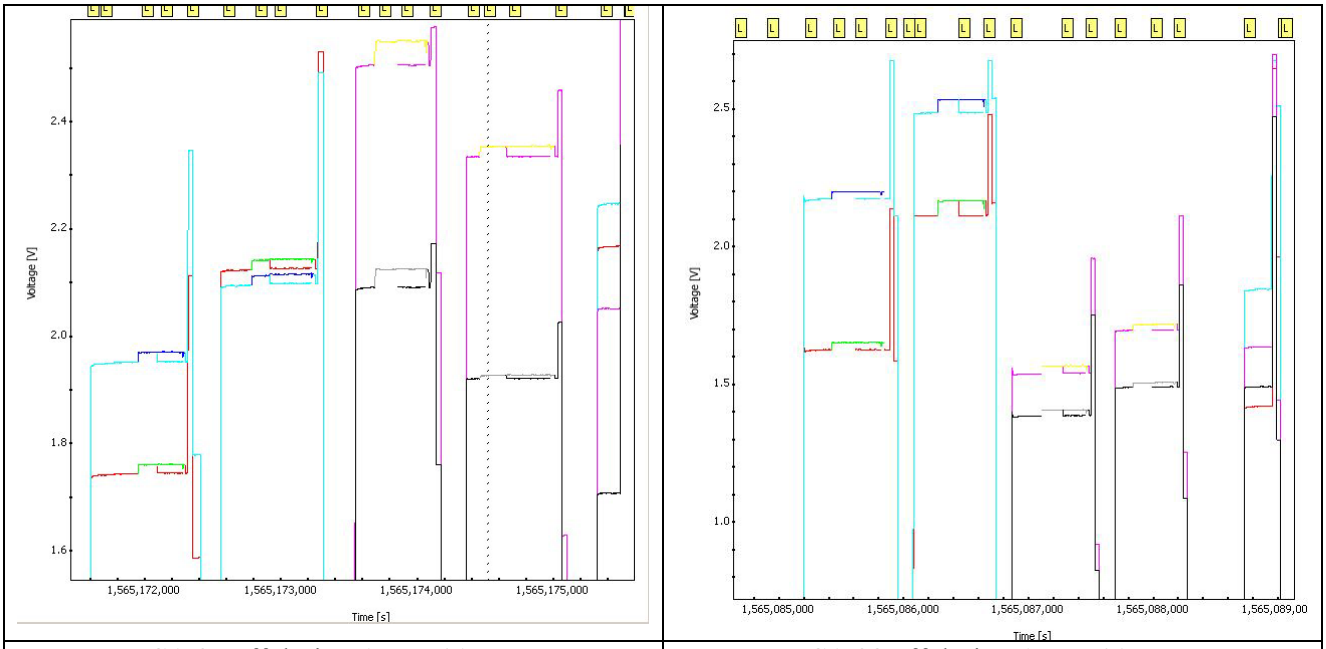
RCA 24 Off during FM test



RCA 25 off during AMB_01 WFT



RCA 25 off during AMB_01 WFT



RCA 27 off during AMB_01 WFT	RCA 28 off during AMB_01 WFT

Figure 14

5.8.4 1Hz Signal in FFT spectrum

This issue was covered by the NCR 4081 (closed "use as is") during FM level tests. The feature is monitored to follow the problem.
The analysis has been performed on the test AMB_02 , having quite stable conditions. In the analysis, all the combinations of phase switch status and switching modes are considered.
A/ C switching :

B mode 0
B mode 1

B/D switching

A mode 0
A mode 1

Results have been compared with the last test AMB_02 performed at FM level before instrument delivery. Two approaches have been followed:
To study spikes on the longest data sample available in stable conditions. This is to find spikes otherwise hidden with a shorter time analysis and to maximize their amplitude.
To study spikes on data samples equal for WFT and FM tests. This is to compare directly (in terms of number of spikes, frequency and amplitude) with FM results.

5.8.4.1 Data samples analysed

WFT AMB-02 is divided in the two files AMB_0089 and AMB_0091: data will be compared with the FM AMB-02 performed in Milan during the last November 2006 (AMB_0101). In particular, this comparison has been performed in terms of spikes in the amplitude power spectra. Here follow the data set analysed, with the corresponding selected ranges (time duration) for each phase switch state:

FM (Instrument Level) in Milan (November 2006)

`AMB_0101` in which 4KHz is ON on B/D and A/C=0 [3861, 4469] (608 s)
`AMB_0101` in which 4KHz is ON on B/D and A/C=1 [4699, 5363] (664 s)
`AMB_0101` in which 4KHz is ON on A/C and B/D=0 [5685, 6286] (601 s)
`AMB_0101` in which 4KHz is ON on A/C and B/D=1 [6410, 6922] (512 s)

WFT (System Level) in Cannes (August 2007)

`AMB_0089` in which 4KHz is ON on A/C and B/D=0 [1565248068, 1565248403] (335 s)
`AMB_0089` in which 4KHz is ON on A/C and B/D=1 [1565248558, 1565249897] (1339 s)
`AMB_0091` in which 4KHz is ON on B/D and A/B=0 [1565252034, 1565253209] (1175 s)
`AMB_0091` in which 4KHz is ON on B/D and A/B=1 [1565253539, 1565254674] (1135 s)

Results for this choice are reported in the next paragraph 5.8.4.2

Since, as previously said, the time intervals are quite different, due to some problems occurred during the test (wrong bias set in the first interval of WFT reducing the useful time in normal conditions) , a comparison has been done also taking only 5 minutes of acquisition for each test (being . the longer useful interval for this consition)The results are reported in Sect. 5.8.5.
In all the following plots the blue line is for the sky signal, green for the ref signal and red for the differenced data.
For all the plots the maximum frequency available is 8 Hz, being Nave set to 256 for all channels. Analysis is always done in mode AVR1.

As a general result, the longer intervals from WFT tests determine a better resolution at smaller frequencies, producing at these frequencies a larger number of spikes w.r.t those observed in FM tests. Data set that will be investigated deeper in dedicated further analysis.
Instead, the comparison between power spectra computed over 300 seconds of acquisition shows a great similarity (WFT and FM) .
Just some representative cases are here displayed: however, all other plots are fully reported attached as ANNEX 2 .

5.8.4.2 WFT in Cannes vs FM in Milan

WFT in Cannes in which A/C is switching and B/D = 0 have spectra that seem always clearer in terms of spikes. This is not true when B/D = 1 or B/D is switching. In the WFT in Cannes:

- 70 GHz have more spikes at frequencies lower than 2 Hz and spikes are evident also in the differenced data
- 44 GHz have spectra that are quite similar
- 30 GHz show much more spikes at frequencies lower than 4 Hz but the 4 Hz is not yet present (it was quite high in Milan)

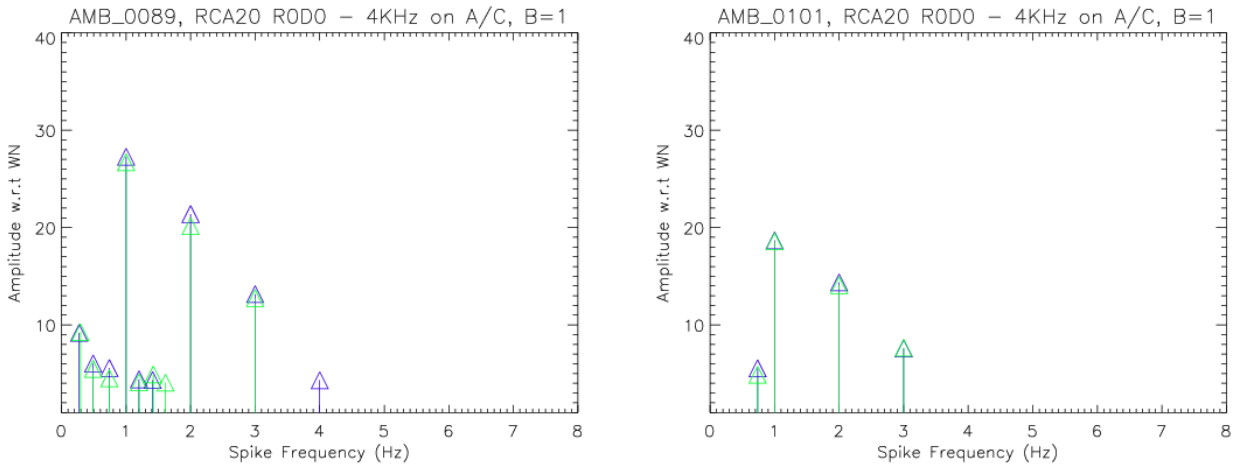


Figure 15 WFT in Cannes (left) vs WFT in Milan (right), RCA20 in which 4KHz is on A/C and B/D =1.

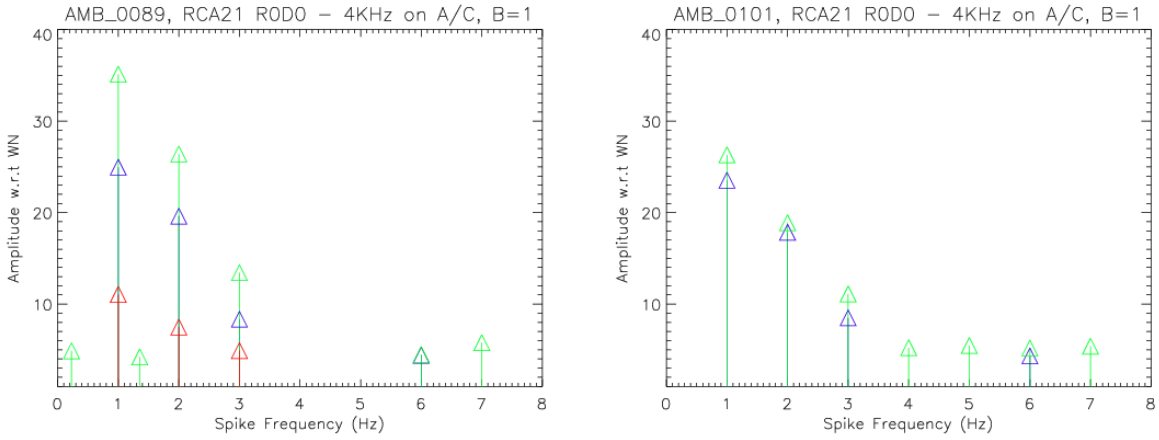


Figure 16 WFT in Cannes (left) vs WFT in Milan (right), RCA21 in which 4KHz is on A/C and B/D =1.

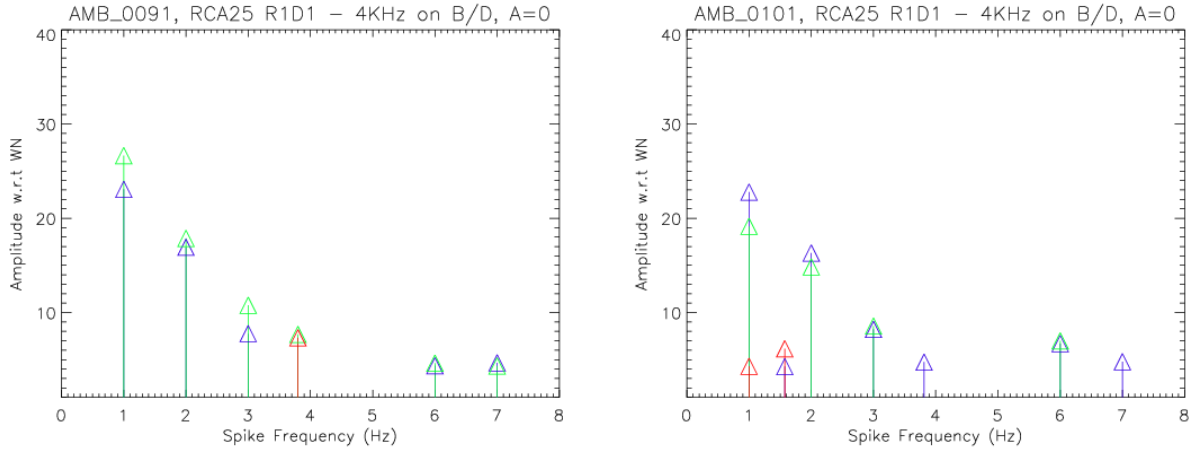


Figure 17 WFT in Cannes (left) vs WFT in Milan (right), RCA25 in which 4KHz is on B/D and A/C =0.

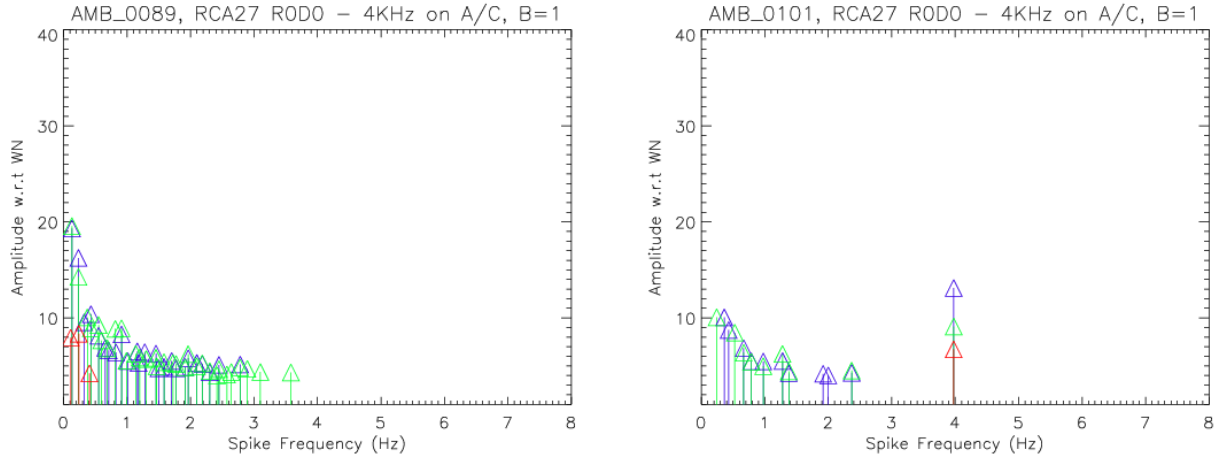


Figure 18 WFT in Cannes (left) vs WFT in Milan (right), RCA27 in which 4KHz is on A/C and B/D =1.

5.8.5 WFT in Cannes vs FM tests in Milan (300 sec)

In this case, spikes are generally very similar, in frequency and amplitude. In some cases they are slightly worse. The RCA 22 shows a spike at about 3 Hz in two arms that in the WFT in Milan was not present. In Milan there was a spike at about 6 Hz. Also in this case in the 30 GHz there are more spikes at lower frequency but the 4 Hz is disappeared.

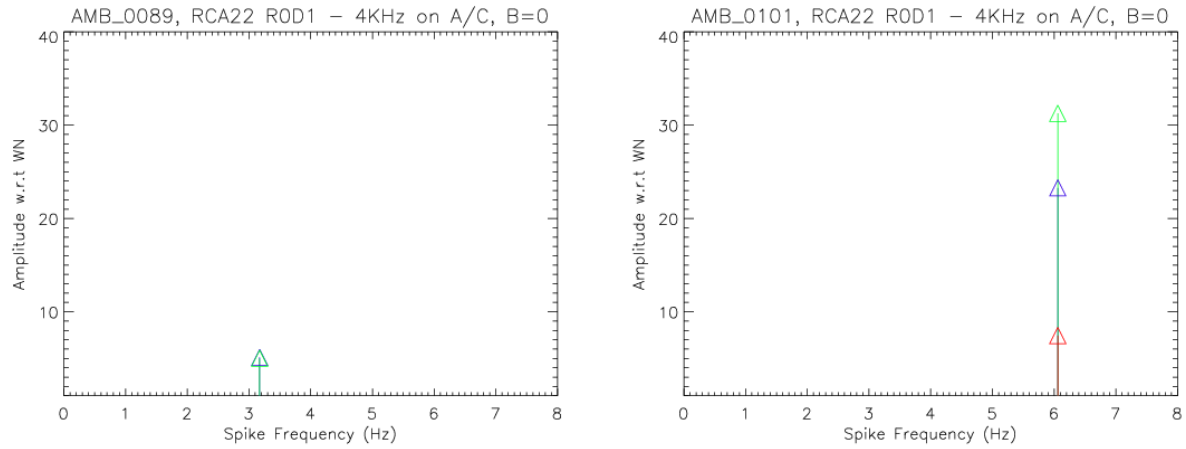


Figure 19 WFT in Cannes (left) vs WFT in Milan (right), RCA22 in which 4KHz is on A/C and B/D =0.

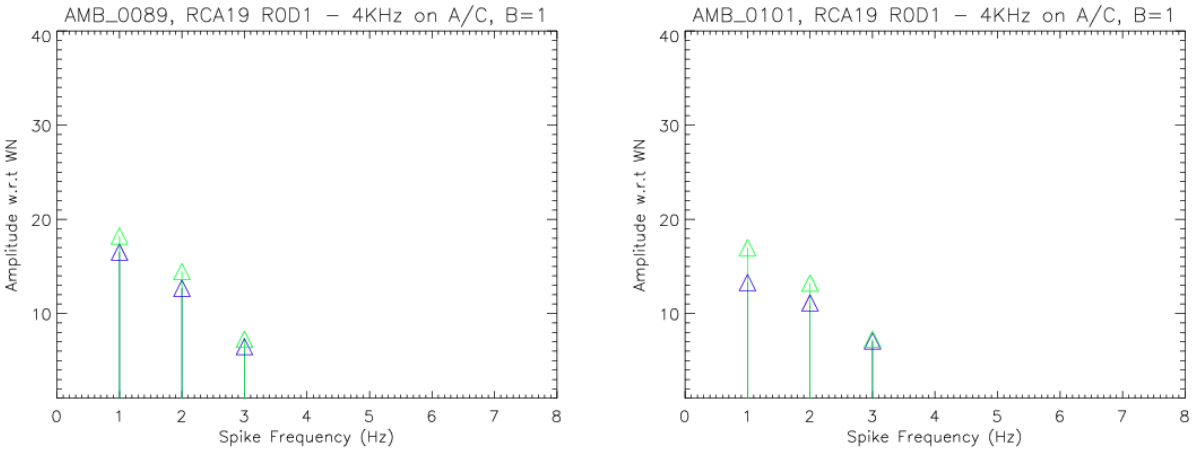


Figure 20 WFT in Cannes (left) vs WFT in Milan (right), RCA19 in which 4KHz is on A/C and B/D =1.

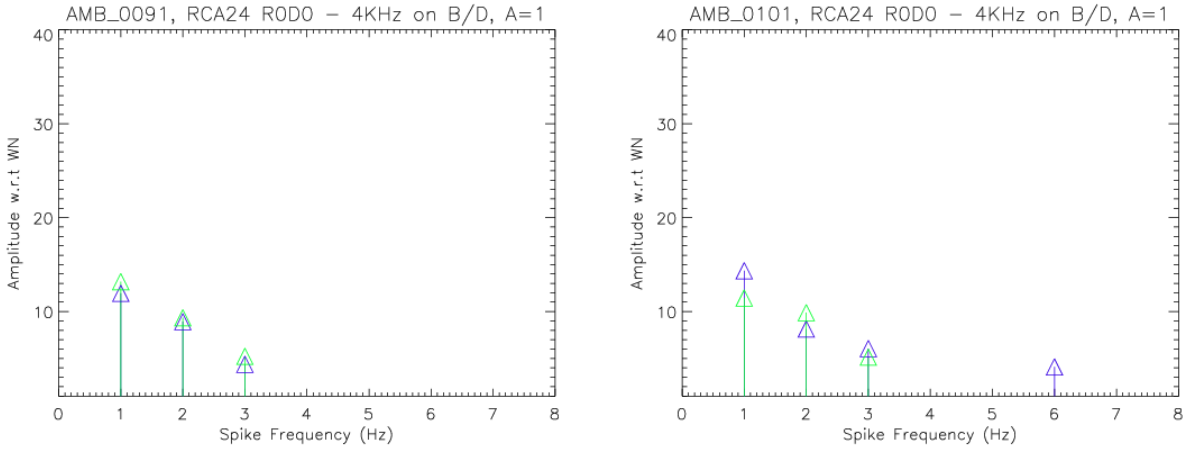


Figure 21 WFT in Cannes (left) vs WFT in Milan (right), RCA24 in which 4KHz is on B/D and A/C =1.

5.9 NEW FEATURES

5.9.1 Temperature change with science activation / deactivation

Each time nominal science mode is activated or deactivated a change in temperature sensors:
LM207332 (L-BEM Temp 1)
LM208332 (L-BEM-Temp 2)
LM210332 (L-FEM-Temp 2)
Is observed .
At present, no explanation has been given for the feature. It looks a strange behaviour since the change is abrupt and sharp, different w.r.t. what could be expected from a just thermal change (no inertial drift is here observed) . It could be due to some digital interaction with the system monitoring temperatures. Moreover, basing on what we observed up to present, it seems to not affect scientific output and radiometers' performances .

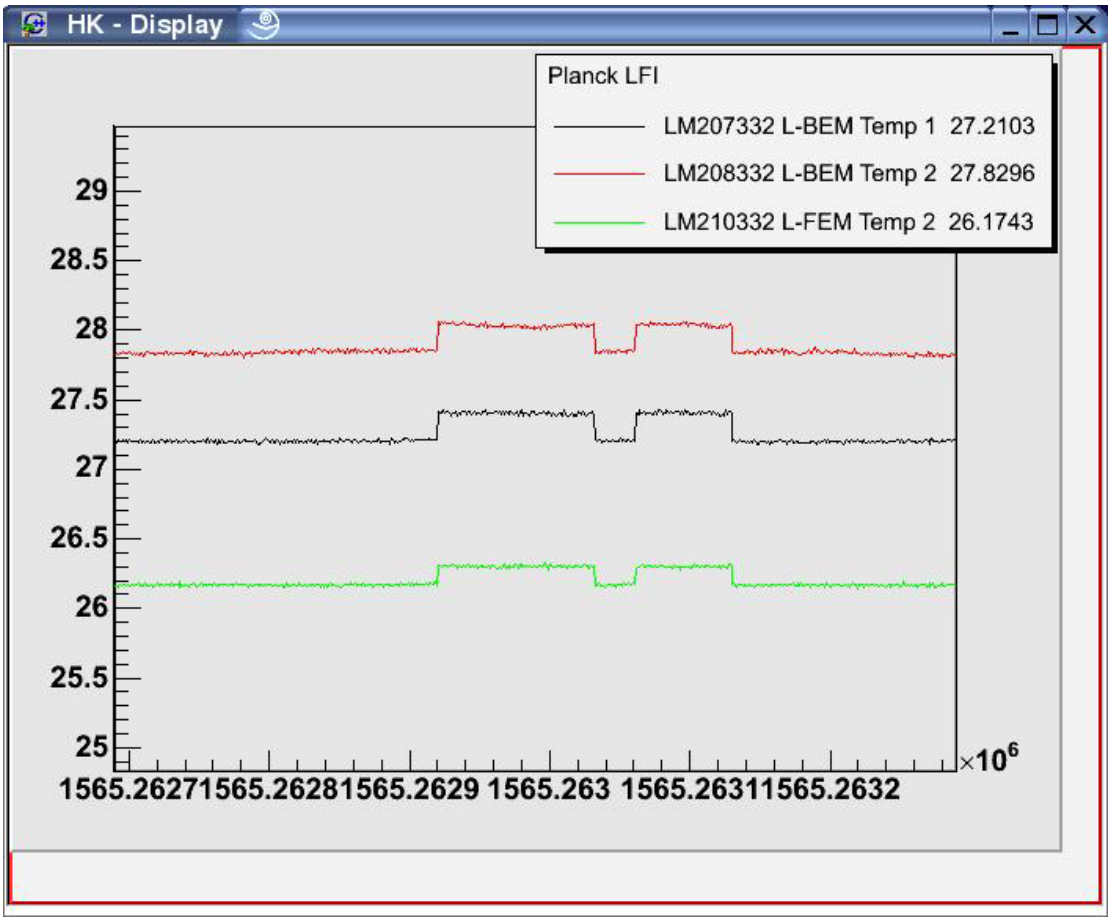


Figure 22 temperature change corresponding to activation and deactivation of nominal science mode.

6 WFT Conclusion

All the pass/fail criteria requested form the procedure have been checked and passed so the warm functional test is considered successfully ended.

7 NCR and TBC list

Type	Number	Description	Notes

8 Annex

8.1 REBA Diagnostic Packet

8.1.1 Compression Factor HK Packet format

```
TM Packet Query Display
=======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: SPU Max Per Description: SPU Maximum Memory Periodical
S/C ID: 489 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 12858 Type: 3 Subtype: 26 PI1: 302
PI2: 0
SPID: 120302350 TPSD: -1 HFA Counter: 0 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.11.33.53.026 Reception time: 2007.220.11.33.58.806
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 21AA B946 2A66 0000 26AA B946 E44D 0C00 0100 0000 E901 0000 4004 0000
0020:1138 FFFF 0000 0000 0EAB 2B07 0000 0000 0400 0000 FFFF FFFF 10FF 0206 3A32 031A
Packet Raw Data:
0000:0E02 F23A 03F9 0003 1A00 5D4C 08A1 06B2 012E 6B05 8028 047E 6A05 4028 047B 6905
0020:8028 0477 6805 4028 0474 5705 8028 0446 5605 4028 0443 5505 8028 0440 5405 4028
0040:043C 4705 8028 0433 4605 4028 0430 4505 8028 042C 4405 4028 0428 4081 40EF 0170
0060:6705 4044 04C0 6605 8044 04BB 6505 4044 04B4 6405 8044 04AE 6305 4044 04A8 6205
0080:8044 04A2 6105 4044 049D 6005 8044 0497 5F05 4044 0491 5E05 8044 048B 5D05 4044
00A0:0485 5C05 8044 047F 5305 4044 0473 5205 8044 046D 5105 4044 0467 5005 8044 0461
00C0:4F05 4044 045B 4E05 8044 0455 4D05 4044 044F 4C05 8044 0449 4B05 4044 0444 4A05
00E0:8044 043D 4905 4044 0438 4805 8044 0431 4081 40EE 0170 4081 40ED 0170 4081 40EC
0100:0170 4081 40EB 0170 6705 4043 04C0 6605 8043 04BB 6505 4043 04B4 6405 8043 04AE
0120:6305 4043 04A8 6205 8043 04A2 6105 4043 049D 6005 8043 0497 5F05 4043 0491 5E05
0140:8043 048B 5D05 4043 0485 5C05 8043 047F 5305 4043 0473 5205 8043 046D 5105 4043
0160:0467 5005 8043 0461 4F05 4043 045B 4E05 8043 0455 4D05 4043 044F 4C05 8043 0449
0180:4B05 4043 0444 4A05 8043 043D 4905 4043 0438 4805 8043 0431 5B05 801B 043F 5A05
01A0:401B 043C 5905 801B 043A 5805 401B 0437 4305 801B 0435 4205 401B 0432 4105 801B
01C0:042F 4005 401B 042C 4081 40EA 0170 6B05 8027 047E 6A05 4027 047B 6905 8027 0477
01E0:6805 4027 0474 5705 8027 0446 5605 4027 0443 5505 8027 0440 5405 4027 043C 4705
0200:8027 0433 4605 4027 0430 4505 8027 042C 4405 4027 0428 4081 40E9 0170 4081 40E8
0220:0170 6705 4042 04C0 6605 8042 04BB 6505 4042 04B4 6405 8042 04AE 6305 4042 04A8
0240:6205 8042 04A2 6105 4042 049D 6005 8042 0497 5F05 4042 0491 5E05 8042 048B 5D05
0260:4042 0485 5C05 8042 047F 5305 4042 0473 5205 8042 046D 5105 4042 0467 5005 8042
0280:0461 4F05 4042 045B 4E05 8042 0455 4D05 4042 044F 4C05 8042 0449 4B05 4042 0444
02A0:4A05 8042 043D 4905 4042 0438 4805 8042 0431 4081 40E7 0170 4081 40E6 0170 4081
02C0:40E5 0170 4081 40E4 0170 6B05 8026 047E 6A05 4026 047B 6905 8026 0477 6805 4026
02E0:0474 6705 4041 04C0 6605 8041 04BB 6505 4041 04B4 6405 8041 04AE 6305 4041 04A8
0300:6205 8041 04A2 6105 4041 049D 6005 8041 0497 5F05 4041 0491 5E05 8041 048B 5D05
0320:4041 0485 5C05 8041 047F 5705 8026 0446 5605 4026 0443 5505 8026 0440 5405 4026
0340:043C 5305 4041 0473 5205 8041 046D 5105 4041 0467 5005 8041 0461 4F05 4041 045B
0360:4E05 8041 0455 4D05 4041 044F 4C05 8041 0449 4B05 4041 0444 4A05 8041 043D 4905
0380:4041 0438 4805 8041 0431 4705 8026 0433 4605 4026 0430 4505 8026 042C 4405 4026
03A0:0428 4081 40E3 0170 4081 40E2 0170 5B05 801A 043F 5A05 401A 043C 5905 801A 043A
03C0:5805 401A 0437 4305 801A 0435 4205 401A 0432 4105 801A 042F 4005 401A 042C 4081
03E0:40E1 0170 6705 4040 04C0 6605 8040 04BB 6505 4040 04B4 6405 8040 04AE 0028 982D
```

8.1.2 SPU maximum memory occupancy dignostic packets TM(3,26)

```
TM Packet Query Display
```

```
======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: SPU Max Per Description: SPU Maximum Memory Periodical
S/C ID: 489 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 12858 Type: 3 Subtype: 26 PI1: 302
PI2: 0
SPID: 120302350 TPSD: -1 HFA Counter: 0 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.11.33.53.026 Reception time: 2007.220.11.33.58.806
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 21AA B946 2A66 0000 26AA B946 E44D 0C00 0100 0000 E901 0000 4004 0000
0020:1138 FFFF 0000 0000 0EAB 2B07 0000 0000 0400 0000 FFFF FFFF 10FF 0206 3A32 031A
Packet Raw Data:
0000:0E02 F23A 03F9 0003 1A00 5D4C 08A1 06B2 012E 6B05 8028 047E 6A05 4028 047B 6905
0020:8028 0477 6805 4028 0474 5705 8028 0446 5605 4028 0443 5505 8028 0440 5405 4028
0040:043C 4705 8028 0433 4605 4028 0430 4505 8028 042C 4405 4028 0428 4081 40EF 0170
0060:6705 4044 04C0 6605 8044 04BB 6505 4044 04B4 6405 8044 04AE 6305 4044 04A8 6205
0080:8044 04A2 6105 4044 049D 6005 8044 0497 5F05 4044 0491 5E05 8044 048B 5D05 4044
00A0:0485 5C05 8044 047F 5305 4044 0473 5205 8044 046D 5105 4044 0467 5005 8044 0461
00C0:4F05 4044 045B 4E05 8044 0455 4D05 4044 044F 4C05 8044 0449 4B05 4044 0444 4A05
00E0:8044 043D 4905 4044 0438 4805 8044 0431 4081 40EE 0170 4081 40ED 0170 4081 40EC
0100:0170 4081 40EB 0170 6705 4043 04C0 6605 8043 04BB 6505 4043 04B4 6405 8043 04AE
0120:6305 4043 04A8 6205 8043 04A2 6105 4043 049D 6005 8043 0497 5F05 4043 0491 5E05
0140:8043 048B 5D05 4043 0485 5C05 8043 047F 5305 4043 0473 5205 8043 046D 5105 4043
0160:0467 5005 8043 0461 4F05 4043 045B 4E05 8043 0455 4D05 4043 044F 4C05 8043 0449
0180:4B05 4043 0444 4A05 8043 043D 4905 4043 0438 4805 8043 0431 5B05 801B 043F 5A05
01A0:401B 043C 5905 801B 043A 5805 401B 0437 4305 801B 0435 4205 401B 0432 4105 801B
01C0:042F 4005 401B 042C 4081 40EA 0170 6B05 8027 047E 6A05 4027 047B 6905 8027 0477
01E0:6805 4027 0474 5705 8027 0446 5605 4027 0443 5505 8027 0440 5405 4027 043C 4705
0200:8027 0433 4605 4027 0430 4505 8027 042C 4405 4027 0428 4081 40E9 0170 4081 40E8
0220:0170 6705 4042 04C0 6605 8042 04BB 6505 4042 04B4 6405 8042 04AE 6305 4042 04A8
0240:6205 8042 04A2 6105 4042 049D 6005 8042 0497 5F05 4042 0491 5E05 8042 048B 5D05
0260:4042 0485 5C05 8042 047F 5305 4042 0473 5205 8042 046D 5105 4042 0467 5005 8042
0280:0461 4F05 4042 045B 4E05 8042 0455 4D05 4042 044F 4C05 8042 0449 4B05 4042 0444
02A0:4A05 8042 043D 4905 4042 0438 4805 8042 0431 4081 40E7 0170 4081 40E6 0170 4081
02C0:40E5 0170 4081 40E4 0170 6B05 8026 047E 6A05 4026 047B 6905 8026 0477 6805 4026
02E0:0474 6705 4041 04C0 6605 8041 04BB 6505 4041 04B4 6405 8041 04AE 6305 4041 04A8
0300:6205 8041 04A2 6105 4041 049D 6005 8041 0497 5F05 4041 0491 5E05 8041 048B 5D05
0320:4041 0485 5C05 8041 047F 5705 8026 0446 5605 4026 0443 5505 8026 0440 5405 4026
0340:043C 5305 4041 0473 5205 8041 046D 5105 4041 0467 5005 8041 0461 4F05 4041 045B
0360:4E05 8041 0455 4D05 4041 044F 4C05 8041 0449 4B05 4041 0444 4A05 8041 043D 4905
0380:4041 0438 4805 8041 0431 4705 8026 0433 4605 4026 0430 4505 8026 042C 4405 4026
03A0:0428 4081 40E3 0170 4081 40E2 0170 5B05 801A 043F 5A05 401A 043C 5905 801A 043A
03C0:5805 401A 0437 4305 801A 0435 4205 401A 0432 4105 801A 042F 4005 401A 042C 4081
03E0:40E1 0170 6705 4040 04C0 6605 8040 04BB 6505 4040 04B4 6405 8040 04AE 0028 982D
```

8.1.3 Non periodical SPU maximum memory occupancy dignostic packets TM(3,26)

```
TM Packet Query Display
======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: SPU Max NPer Description: SPU Max Mem Occu Format Non Per
S/C ID: 489 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 12939 Type: 3 Subtype: 26 PI1: 1302
PI2: 0
SPID: 121302350 TPSD: -1 HFA Counter: 0 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
```

```
Generation time: 2007.220.11.36.24.332 Reception time: 2007.220.11.36.28.013
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 B8AA B946 E812 0500 BCAA B946 5835 0000 0100 0000 E901 0000 4004 0000
0020:1138 FFFF 0000 0000 4EED 3A07 0000 0000 0400 0000 FFFF FFFF 10FF 0206 8B32 031A
Packet Raw Data:
0000:0E02 F28B 03F9 0003 1A00 5D4C 0938 5520 0516 4081 4118 0170 6705 4050 04C0 6605
0020:8050 04BB 6505 4050 04B4 6405 8050 04AE 6305 4050 04A8 6205 8050 04A2 6105 4050
0040:049D 6005 8050 0497 5F05 4050 0491 5E05 8050 048B 5D05 4050 0485 5C05 8050 047F
0060:5305 4050 0473 5205 8050 046D 5105 4050 0467 5005 8050 0461 4F05 4050 045B 4E05
0080:8050 0455 4D05 4050 044F 4C05 8050 0449 4B05 4050 0444 4A05 8050 043D 4905 4050
00A0:0438 4805 8050 0431 4081 4117 0170 4081 4116 0170 4081 4115 0170 6705 404F 04C0
00C0:6605 804F 04BB 6505 404F 04B4 6405 804F 04AE 6305 404F 04A8 6205 804F 04A2 6105
00E0:404F 049D 6005 804F 0497 5F05 404F 0491 5E05 804F 048B 5D05 404F 0485 5C05 804F
0100:047F 5305 404F 0473 5205 804F 046D 5105 404F 0467 5005 804F 0461 4F05 404F 045B
0120:4E05 804F 0455 4D05 404F 044F 4C05 804F 0449 4B05 404F 0444 4A05 804F 043D 4905
0140:404F 0438 4805 804F 0431 4081 4114 0170 5B05 8020 043F 5A05 4020 043C 5905 8020
0160:043A 5805 4020 0437 4305 8020 0435 4205 4020 0432 4105 8020 042F 4005 4020 042C
0180:4081 4113 0170 6B05 802E 047E 6A05 402E 047B 6905 802E 0477 6805 402E 0474 5705
01A0:802E 0446 5605 402E 0443 5505 802E 0440 5405 402E 043C 4705 802E 0433 4605 402E
01C0:0430 4505 802E 042C 4405 402E 0428 4081 4112 0170 4081 4111 0170 6705 404E 04C0
01E0:6605 804E 04BB 6505 404E 04B4 6405 804E 04AE 6305 404E 04A8 6205 804E 04A2 6105
0200:404E 049D 6005 804E 0497 5F05 404E 0491 5E05 804E 048B 5D05 404E 0485 5C05 804E
0220:047F 5305 404E 0473 5205 804E 046D 5105 404E 0467 5005 804E 0461 4F05 404E 045B
0240:4E05 804E 0455 4D05 404E 044F 4C05 804E 0449 4B05 404E 0444 4A05 804E 043D 4905
0260:404E 0438 4805 804E 0431 4081 4110 0170 4081 410F 0170 4081 410E 0170 6705 404D
0280:04C0 6605 804D 04BB 6505 404D 04B4 6405 804D 04AE 6305 404D 04A8 6205 804D 04A2
02A0:6105 404D 049D 6005 804D 0497 5F05 404D 0491 5E05 804D 048B 5D05 404D 0485 5C05
02C0:804D 047F 5305 404D 0473 5205 804D 046D 5105 404D 0467 5005 804D 0461 4F05 404D
02E0:045B 4E05 804D 0455 4D05 404D 044F 4C05 804D 0449 4B05 404D 0444 4A05 804D 043D
0300:4905 404D 0438 4805 804D 0431 4081 410D 0170 6B05 802D 047E 6A05 402D 047B 6905
0320:802D 0477 6805 402D 0474 5705 802D 0446 5605 402D 0443 5505 802D 0440 5405 402D
0340:043C 4705 802D 0433 4605 402D 0430 4505 802D 042C 4405 402D 0428 4081 410C 0170
0360:5B05 801F 043F 5A05 401F 043C 5905 801F 043A 5805 401F 0437 4305 801F 0435 4205
0380:401F 0432 4105 801F 042F 4005 401F 042C 4081 410B 0170 4081 410A 0170 6705 404C
03A0:04C0 6605 804C 04BB 6505 404C 04B4 6405 804C 04AE 6305 404C 04A8 6205 804C 04A2
03C0:6105 404C 049D 6005 804C 0497 5F05 404C 0491 5E05 804C 048B 5D05 404C 0485 5C05
03E0:804C 047F 5305 404C 0473 5205 804C 046D 5105 404C 0467 5005 804C 0461 0000 F796
```

8.1.4 SPU Current Memory Consumption TM(3,26)

```
TM Packet Query Display
=======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: SPU Cur Per Description: SPU Current Memory Periodical
S/C ID: 489 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 13069 Type: 3 Subtype: 26 PI1: 303
PI2: 0
SPID: 120303350 TPSD: -1 HFA Counter: 0 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.11.40.33.035 Reception time: 2007.220.11.40.37.356
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 B1AB B946 318C 0000 B5AB B946 A46F 0500 0100 0000 E901 0000 4004 0000
0020:1138 FFFF 0000 0000 F6AE 2B07 0000 0000 0400 0000 FFFF FFFF 10FF 0206 0D33 031A
Packet Raw Data:
0000:0E02 F30D 03F9 0003 1A00 5D4C 0A31 0930 012F 4081 415A 0000 6705 4063 008D 6605
0020:8063 0087 6505 4063 0082 6405 8063 007B 6305 4063 0076 6205 8063 0070 6105 4063
0040:006A 6005 8063 0064 5F05 4063 005E 5E05 8063 0058 5D05 4063 0053 5C05 8063 004C
0060:5305 4063 0046 5205 8063 0040 5105 4063 003B 5005 8063 0035 4F05 4063 002F 4E05
0080:8063 0029 4D05 4063 0023 4C05 8063 001D 4B05 4063 0018 4A05 8063 0011 4905 4063
```

```
00A0:000B 4805 8063 0005 4081 4159 0018 6B05 803A 002A 6A05 403A 0027 6905 803A 0023
00C0:6805 403A 001F 5705 803A 001C 5605 403A 0018 5505 803A 0015 5405 403A 0011 4705
00E0:803A 000E 4605 403A 000A 4505 803A 0007 4405 403A 0003 4081 4158 0000 5B05 8028
0100:0014 5A05 4028 0012 5905 8028 0010 5805 4028 000D 4305 8028 000B 4205 4028 0008
0120:4105 8028 0005 4005 4028 0002 4081 4157 0000 4081 4156 0064 6705 4062 008D 6605
0140:8062 0087 6505 4062 0082 6405 8062 007B 6305 4062 0076 6205 8062 0070 6105 4062
0160:006A 6005 8062 0064 5F05 4062 005E 5E05 8062 0058 5D05 4062 0052 5C05 8062 004C
0180:5305 4062 0047 5205 8062 0040 5105 4062 003B 5005 8062 0035 4F05 4062 002F 4E05
01A0:8062 0029 4D05 4062 0023 4C05 8062 001D 4B05 4062 0017 4A05 8062 0011 4905 4062
01C0:000B 4805 8062 0005 4081 4155 0000 4081 4154 0000 6B05 8039 002A 6A05 4039 0027
01E0:6905 8039 0023 6805 4039 0020 5705 8039 001C 5605 4039 0018 5505 8039 0015 5405
0200:4039 0011 4705 8039 000E 4605 4039 000A 4505 8039 0007 4405 4039 0003 4081 4153
0220:0000 6705 4061 008D 6605 8061 0088 6505 4061 0082 6405 8061 007B 6305 4061 0075
0240:6205 8061 0070 6105 4061 006A 6005 8061 0064 5F05 4061 005E 5E05 8061 0058 5D05
0260:4061 0053 5C05 8061 004C 5305 4061 0047 5205 8061 0040 5105 4061 003B 5005 8061
0280:0035 4F05 4061 002F 4E05 8061 0029 4D05 4061 0023 4C05 8061 001D 4B05 4061 0017
02A0:4A05 8061 0011 4905 4061 000B 4805 8061 0005 4081 4152 0000 4081 4151 0000 4081
02C0:4150 0000 6705 4060 008D 6605 8060 0087 6505 4060 0082 6405 8060 007B 6305 4060
02E0:0075 6205 8060 0070 6105 4060 006A 6005 8060 0064 5F05 4060 005E 5E05 8060 0058
0300:5D05 4060 0052 5C05 8060 004C 5305 4060 0046 5205 8060 0040 5105 4060 003B 5005
0320:8060 0035 4F05 4060 002E 4E05 8060 0029 4D05 4060 0023 4C05 8060 001D 4B05 4060
0340:0017 4A05 8060 0011 4905 4060 000B 4805 8060 0005 4081 414F 0000 5B05 8027 0015
0360:5A05 4027 0012 5905 8027 0010 5805 4027 000D 4305 8027 000B 4205 4027 0008 4105
0380:8027 0005 4005 4027 0002 4081 414E 0000 6B05 8038 002A 6A05 4038 0026 6905 8038
03A0:0023 6805 4038 001F 5705 8038 001C 5605 4038 0018 5505 8038 0015 5405 4038 0011
03C0:4705 8038 000E 4605 4038 000A 4505 8038 0007 4405 4038 0003 4081 414D 0000 4081
03E0:414C 0004 6705 405F 008D 6605 805F 0087 6505 405F 0082 6405 805F 007B 0028 F466
```

8.1.5 Non Periodical SPU Current Memory Consumption TM(3,26)

```
TM Packet Query Display
=======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: SPU Cur NPer Description: SPU Curr Mem Occ Format Non Per
S/C ID: 489 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 13115 Type: 3 Subtype: 26 PI1: 1303
PI2: 0
SPID: 121303350 TPSD: -1 HFA Counter: 0 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.11.41.57.332 Reception time: 2007.220.11.42.01.980
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 05AC B946 7113 0500 09AC B946 98F7 0E00 0100 0000 E901 0000 4004 0000
0020:1138 FFFF 0000 0000 36F1 3A07 0000 0000 0400 0000 FFFF FFFF 10FF 0206 3B33 031A
Packet Raw Data:
0000:0E02 F33B 03F9 0003 1A00 5D4C 0A85 5529 0517 6B05 803E 0048 6A05 403E 0045 6905
0020:803E 0041 6805 403E 003E 5B05 802B 0028 5A05 402B 0026 5905 802B 0023 5805 402B
0040:0021 5705 803E 002C 5605 403E 0028 5505 803E 0025 5405 403E 0022 4705 803E 001E
0060:4605 403E 001A 4505 803E 0017 4405 403E 0013 4305 802B 000B 4205 402B 0008 4105
0080:802B 0005 4005 402B 0002 4081 4170 0000 4081 416F 0000 6705 4069 008D 6605 8069
00A0:0088 6505 4069 0081 6405 8069 007B 6305 4069 0075 6205 8069 006F 6105 4069 006A
00C0:6005 8069 0064 5F05 4069 005E 5E05 8069 0058 5D05 4069 0053 5C05 8069 004C 5305
00E0:4069 0046 5205 8069 0040 5105 4069 003A 5005 8069 0035 4F05 4069 002E 4E05 8069
0100:0028 4D05 4069 0023 4C05 8069 001C 4B05 4069 0017 4A05 8069 0011 4905 4069 000B
0120:4805 8069 0005 4081 416E 0000 4081 416D 0000 4081 416C 0000 4081 416B 0030 6705
0140:4068 008D 6605 8068 0088 6505 4068 0082 6405 8068 007C 6305 4068 0076 6205 8068
0160:0070 6105 4068 006A 6005 8068 0064 5F05 4068 005F 5E05 8068 0058 5D05 4068 0053
0180:5C05 8068 004C 5305 4068 0047 5205 8068 0041 5105 4068 003B 5005 8068 0035 4F05
01A0:4068 002F 4E05 8068 0029 4D05 4068 0023 4C05 8068 001D 4B05 4068 0018 4A05 8068
01C0:0011 4905 4068 000C 4805 8068 0005 6B05 803D 002A 6A05 403D 0027 6905 803D 0023
01E0:6805 403D 001F 5705 803D 001C 5605 403D 0018 5505 803D 0015 5405 403D 0011 4705
```

```
0200:803D 000E 4605 403D 000A 4505 803D 0007 4405 403D 0003 4081 416A 0000 4081 4169
0220:0000 4081 4168 0014 5B05 802A 0014 5A05 402A 0012 5905 802A 0010 5805 402A 000D
0240:4305 802A 000B 4205 402A 0008 4105 802A 0005 4005 402A 0002 6705 4067 008D 6605
0260:8067 0088 6505 4067 0082 6405 8067 007B 6305 4067 0076 6205 8067 0070 6105 4067
0280:006A 6005 8067 0064 5F05 4067 005F 5E05 8067 0058 5D05 4067 0053 5C05 8067 004C
02A0:5305 4067 0047 5205 8067 0041 5105 4067 003B 5005 8067 0035 4F05 4067 002F 4E05
02C0:8067 0029 4D05 4067 0023 4C05 8067 001D 4B05 4067 0018 4A05 8067 0011 4905 4067
02E0:000C 4805 8067 0005 4081 4167 0000 4081 4166 0000 4081 4165 0000 6B05 803C 002A
0300:6A05 403C 0026 6905 803C 0023 6805 403C 0020 5705 803C 001C 5605 403C 0018 5505
0320:803C 0015 5405 403C 0011 4705 803C 000E 4605 403C 000A 4505 803C 0007 4405 403C
0340:0003 4081 4164 0040 6705 4066 008E 6605 8066 0088 6505 4066 0082 6405 8066 007B
0360:6305 4066 0076 6205 8066 0070 6105 4066 006A 6005 8066 0064 5F05 4066 005F 5E05
0380:8066 0058 5D05 4066 0053 5C05 8066 004C 5305 4066 0047 5205 8066 0041 5105 4066
03A0:003B 5005 8066 0035 4F05 4066 002F 4E05 8066 0029 4D05 4066 0023 4C05 8066 001D
03C0:4B05 4066 0018 4A05 8066 0011 4905 4066 000C 4805 8066 0005 4081 4163 0000 4081
03E0:4162 0000 4081 4161 0000 6705 4065 008E 6605 8065 0088 6505 4065 0082 0000 5D50
```

8.1.6 SPU CPU Consumption TM (3,26)

```
TM Packet Query Display
=======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: SPU CPU Per Description: SPU CPU Consumption Periodical
S/C ID: 489 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 13155 Type: 3 Subtype: 26 PI1: 304
PI2: 0
SPID: 120304350 TPSD: -1 HFA Counter: 0 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.11.43.13.039 Reception time: 2007.220.11.43.18.085
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 51AC B946 AD9A 0000 56AC B946 684C 0100 0100 0000 E901 0000 4004 0000
0020:1138 FFFF 0000 0000 DEB2 2B07 0000 0000 0400 0000 FFFF FFFF 10FF 0206 6333 031A
Packet Raw Data:
0000:0E02 F363 03F9 0003 1A00 5D4C 0AD1 0A23 0130 4081 4185 0000 4081 4184 0000 4081
0020:4183 0000 6705 406F 0048 6605 806F 004C 6505 406F 0050 6405 806F 0049 6305 406F
0040:004E 6205 806F 0047 6105 406F 004C 6005 806F 004A 5F05 406F 004D 5E05 806F 0044
0060:5D05 406F 0053 5C05 806F 0047 5305 406F 004A 5205 806F 004D 5105 406F 0048 5005
0080:806F 0051 4F05 406F 004B 4E05 806F 0047 4D05 406F 004C 4C05 806F 0048 4B05 406F
00A0:0050 4A05 806F 004A 4905 406F 004F 4805 806F 0044 4081 4182 0002 6B05 8041 004B
00C0:6A05 4041 004B 6905 8041 0049 6805 4041 0051 5705 8041 004E 5605 4041 0045 5505
00E0:8041 004E 5405 4041 004B 4705 8041 004D 4605 4041 004C 4505 8041 004F 4405 4041
0100:004B 5B05 802D 004B 5A05 402D 004A 5905 802D 004D 5805 402D 004A 4305 802D 0054
0120:4205 402D 0056 4105 802D 0056 4005 402D 0055 4081 4181 0000 4081 4180 0001 6705
0140:406E 0048 6605 806E 004C 6505 406E 0050 6405 806E 0049 6305 406E 004B 6205 806E
0160:0048 6105 406E 004C 6005 806E 004A 5F05 406E 004E 5E05 806E 0044 5D05 406E 0052
0180:5C05 806E 0048 5305 406E 004D 5205 806E 004C 5105 406E 0048 5005 806E 0050 4F05
01A0:406E 004B 4E05 806E 0047 4D05 406E 004C 4C05 806E 0048 4B05 406E 0050 4A05 806E
01C0:004A 4905 406E 004F 4805 806E 0044 4081 417F 0000 4081 417E 0001 4081 417D 0000
01E0:6B05 8040 004B 6A05 4040 004A 6905 8040 004A 6805 4040 004F 6705 406D 0047 6605
0200:806D 004E 6505 406D 0050 6405 806D 0049 6305 406D 004C 6205 806D 0047 6105 406D
0220:004C 6005 806D 0049 5F05 406D 004D 5E05 806D 0044 5D05 406D 0052 5C05 806D 0048
0240:5705 8040 004D 5605 4040 0046 5505 8040 004D 5405 4040 004C 5305 406D 004B 5205
0260:806D 004E 5105 406D 0049 5005 806D 0050 4F05 406D 004B 4E05 806D 0048 4D05 406D
0280:004C 4C05 806D 0047 4B05 406D 0050 4A05 806D 004A 4905 406D 004F 4805 806D 0045
02A0:4705 8040 004D 4605 4040 004B 4505 8040 0050 4405 4040 004A 4081 417C 0000 4081
02C0:417B 0000 4081 417A 0000 4081 4179 0000 5B05 802C 004C 5A05 402C 004B 5905 802C
02E0:004B 5805 402C 004C 4305 802C 0053 4205 402C 0056 4105 802C 0057 4005 402C 0057
0300:6705 406C 0046 6605 806C 004E 6505 406C 004F 6405 806C 0049 6305 406C 004B 6205
0320:806C 0047 6105 406C 004C 6005 806C 004A 5F05 406C 004E 5E05 806C 0044 5D05 406C
0340:0054 5C05 806C 0046 5305 406C 004C 5205 806C 004D 5105 406C 0048 5005 806C 0050
```

```
0360:4F05 406C 004A 4E05 806C 0048 4D05 406C 004E 4C05 806C 0046 4B05 406C 0050 4A05
0380:806C 004A 4905 406C 004E 4805 806C 0044 4081 4178 0000 4081 4177 0001 6B05 803F
03A0:004C 6A05 403F 004A 6905 803F 0049 6805 403F 0051 5705 803F 004D 5605 403F 0047
03C0:5505 803F 004B 5405 403F 004B 4705 803F 004F 4605 403F 004A 4505 803F 0050 4405
03E0:403F 004A 4081 4176 0000 6705 406B 0046 6605 806B 004D 6505 406B 004F 0028 8A9D
```

8.1.7 Non periodical SPU CPU Consumption TM(3,26)

```
TM Packet Query Display
=======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: SPU CPU NPer Description: SPU CPU Consump Format Non Per
S/C ID: 490 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 13186 Type: 3 Subtype: 26 PI1: 1304
PI2: 0
SPID: 121304350 TPSD: -1 HFA Counter: 0 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.11.44.09.332 Reception time: 2007.220.11.44.13.173
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 89AC B946 8013 0500 8DAC B946 97A4 0200 0100 0000 EA01 0000 4004 0000
0020:1138 FFFF 0000 0000 1EF5 3A07 0000 0000 0400 0000 FFFF FFFF 10FF 0206 8233 031A
Packet Raw Data:
0000:0E02 F382 03F9 0003 1A00 5D4C 0B09 552A 0518 4081 4194 0000 6B05 8044 004B 6A05
0020:4044 004B 6905 8044 0049 6805 4044 0051 5705 8044 004E 5605 4044 0045 5505 8044
0040:004C 5405 4044 004A 4705 8044 004F 4605 4044 004A 4505 8044 0050 4405 4044 004A
0060:4081 4193 0000 4081 4192 0000 5B05 802F 004C 5A05 402F 0049 5905 802F 004D 5805
0080:402F 0049 4305 802F 0052 4205 402F 0056 4105 802F 0058 4005 402F 0055 4081 4191
00A0:0000 6705 4073 0045 6605 8073 0050 6505 4073 0050 6405 8073 0049 6305 4073 004D
00C0:6205 8073 0045 6105 4073 004F 6005 8073 0049 5F05 4073 004D 5E05 8073 0045 5D05
00E0:4073 0050 5C05 8073 0049 5305 4073 004B 5205 8073 004F 5105 4073 0047 5005 8073
0100:0050 4F05 4073 004C 4E05 8073 0048 4D05 4073 004C 4C05 8073 0048 4B05 4073 0050
0120:4A05 8073 004A 4905 4073 004F 4805 8073 0044 4081 4190 0000 4081 418F 0000 4081
0140:418E 0000 6B05 8043 004B 6A05 4043 004D 6905 8043 0049 6805 4043 0050 5705 8043
0160:004A 5605 4043 0047 5505 8043 004C 5405 4043 004C 4705 8043 004B 4605 4043 004D
0180:4505 8043 004E 4405 4043 004B 6705 4072 0047 6605 8072 004D 6505 4072 004F 6405
01A0:8072 0048 6305 4072 004F 6205 8072 0044 6105 4072 004F 6005 8072 004A 5F05 4072
01C0:004D 5E05 8072 0044 5D05 4072 0051 5C05 8072 0048 5305 4072 004A 5205 8072 004F
01E0:5105 4072 0048 5005 8072 0050 4F05 4072 004C 4E05 8072 0047 4D05 4072 004C 4C05
0200:8072 0047 4B05 4072 0050 4A05 8072 0049 4905 4072 004F 4805 8072 0044 4081 418D
0220:0000 4081 418C 0000 4081 418B 0000 4081 418A 0000 6705 4071 0047 6605 8071 004C
0240:6505 4071 004F 6405 8071 0049 6305 4071 004D 6205 8071 0045 6105 4071 004F 6005
0260:8071 004A 5F05 4071 004D 5E05 8071 0045 5D05 4071 0052 5C05 8071 0048 5305 4071
0280:004A 5205 8071 004C 5105 4071 0048 5005 8071 0050 4F05 4071 004C 4E05 8071 0047
02A0:4D05 4071 004C 4C05 8071 0048 4B05 4071 0050 4A05 8071 0049 4905 4071 004E 4805
02C0:8071 0044 5B05 802E 004C 5A05 402E 004A 5905 802E 004C 5805 402E 0048 4305 802E
02E0:0055 4205 402E 0054 4105 802E 0058 4005 402E 0055 4081 4189 0000 4081 4188 0001
0300:6B05 8042 004B 6A05 4042 004B 6905 8042 004C 6805 4042 004E 5705 8042 004E 5605
0320:4042 0045 5505 8042 004B 5405 4042 004B 4705 8042 004E 4605 4042 004B 4505 8042
0340:0050 4405 4042 004B 4081 4187 0000 6705 4070 0046 6605 8070 004D 6505 4070 0050
0360:6405 8070 0049 6305 4070 004B 6205 8070 0047 6105 4070 004D 6005 8070 004A 5F05
0380:4070 004E 5E05 8070 0044 5D05 4070 0054 5C05 8070 0046 5305 4070 004C 5205 8070
03A0:004D 5105 4070 0048 5005 8070 0050 4F05 4070 004B 4E05 8070 0047 4D05 4070 004C
03C0:4C05 8070 0048 4B05 4070 0050 4A05 8070 004A 4905 4070 004F 4805 8070 0044 4081
03E0:4186 0000 4081 4185 0000 4081 4184 0000 4081 4183 0000 6705 406F 0048 0000 F1E1
```

8.1.8 DAE actual configuration packet TM(3,26)

```
TM Packet Query Display
=======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: DAE Actual Description: DAE Actual Configuration Format
S/C ID: 489 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 13206 Type: 3 Subtype: 26 PI1: 1101
PI2: 0
SPID: 121101369 TPSD: -1 HFA Counter: 30 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.11.44.48.345 Reception time: 2007.220.11.44.53.215
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 B0AC B946 F643 0500 B5AC B946 704B 0300 0100 0000 E901 0000 7603 0000
0020:1138 FFFF 1E00 0000 39DC 3707 0000 0000 0400 0000 FFFF FFFF 10FF 0206 9633 031A
Packet Raw Data:
0000:0E02 F396 032F 0003 1A00 5D4C 0B30 5857 044D 00FA 00FA 00FA 00FA 00F1 00F1 00F1
0020:00F1 00D9 0076 0085 0097 00A6 008E 009A 008E 00A2 0094 008D 00B7 00F2 00F2 00F2
0040:00F2 00F7 00F7 00F6 00F7 0097 0070 007F 0091 006D 009D 00AC 0073 00B1 0087 009C
0060:00A5 00F1 00F2 00F1 00F1 0082 0082 0082 0082 00F1 00F1 00F1 00F1 00B2 00A3 00B2
0080:00A3 00AC 007C 007C 0079 0082 007F 0085 00B1 00F2 00F2 00F2 00F2 0080 0080 0080
00A0:0080 007F 00AC 009A 00AC 0072 0094 00AE 00A8 0084 00B4 0093 0081 00F2 00F1 00F1
00C0:00F1 00C8 00C8 00C8 00C8 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF
00E0:00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00C8 00C8 00C8 00C8 00FF 00FF 00FF
0100:00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00CD 00CD 00CD
0120:00CD 00CD 00CD 00CD 00CD 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF
0140:00FF 00CD 00CD 00CD 00CD 00CE 00CD 00CD 00CE 00FF 00FF 00FF 00FF 00FF 00FF 00FF
0160:00FF 00FF 00FF 00FF 00FF 00CD 00CD 00CD 00CD 00CD 00CD 00CD 00CD 00CD 00CD 00CD
0180:00CD 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00CD 00CD 00CD
01A0:00CD 00CD 00CE 00CE 00CD 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF
01C0:00FF 00CD 00CD 00CD 00CD 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
01E0:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0200:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0220:0000 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF
0240:00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF
0260:00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 102F 0FE4 1050
0280:1005 1C88 1C15 1D1C 1D22 1457 11E4 11DA 1340 1318 12A1 1279 129B 1223 133E 11A6
02A0:1241 1A84 19FB 1AF5 1B3F 11B3 117E 119C 1158 13D3 13D9 13AA 13FE 1317 13D5 13B0
02C0:138D 123E 1226 1098 1212 1ADD 1A27 1A73 1A33 0000 0000 0000 0000 0000 0000 0000
02E0:0000 0000 0000 0000 0001 0001 0001 0001 0001 0001 0001 0001 0001 0001 0001 0001
0300:0001 0001 0001 0001 0001 0001 0001 0001 0001 0001 0000 0000 0000 0000 0000 0000
0320:0000 0000 0000 0000 0000 0001 0001 0001 0001 0100 3FBA
```

8.1.9 DAE default configuration packet TM(3,26)

```
TM Packet Query Display
=======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: DAE Default Description: DAE Default Config HK Format
S/C ID: 490 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 13342 Type: 3 Subtype: 26 PI1: 1111
```

```
PI2: 0
SPID: 121111369 TPSD: -1 HFA Counter: 0 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.11.49.11.335 Reception time: 2007.220.11.49.16.088
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 B7AD B946 9A1F 0500 BCAD B946 565B 0100 0100 0000 EA01 0000 7603 0000
0020:1138 FFFF 0000 0000 4903 3807 0000 0000 0400 0000 FFFF FFFF 10FF 0206 1E34 031A
Packet Raw Data:
0000:0E02 F41E 032F 0003 1A00 5D4C 0C37 55F5 0457 00FA 00FA 00FA 00FA 00F1 00F1 00F1
0020:00F1 00D9 0076 0085 0097 00A6 008E 009A 008E 00A2 0094 008D 00B7 00F2 00F2 00F2
0040:00F2 00F7 00F7 00F6 00F7 0097 0070 007F 0091 006D 009D 00AC 0073 00B1 0087 009C
0060:00A5 00F1 00F2 00F1 00F1 0082 0082 0082 0082 00F1 00F1 00F1 00F1 00B2 00A3 00B2
0080:00A3 00AC 007C 007C 0079 0082 007F 0085 00B1 00F2 00F2 00F2 00F2 0080 0080 0080
00A0:0080 007F 00AC 009A 00AC 0072 0094 00AE 00A8 0084 00B4 0093 0081 00F2 00F1 00F1
00C0:00F1 00C8 00C8 00C8 00C8 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF
00E0:00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00C8 00C8 00C8 00C8 00FF 00FF 00FF
0100:00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00CD 00CD 00CD
0120:00CD 00CD 00CD 00CD 00CD 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF
0140:00FF 00CD 00CD 00CD 00CD 00CE 00CD 00CD 00CE 00FF 00FF 00FF 00FF 00FF 00FF 00FF
0160:00FF 00FF 00FF 00FF 00FF 00CD 00CD 00CD 00CD 00CD 00CD 00CD 00CD 00CD 00CD 00CD
0180:00CD 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00CD 00CD 00CD
01A0:00CD 00CD 00CE 00CE 00CD 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF
01C0:00FF 00CD 00CD 00CD 00CD 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
01E0:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0200:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0220:0000 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF
0240:00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF
0260:00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 00FF 0000 0000 0000
0280:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
02A0:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
02C0:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
02E0:0000 0000 0000 0000 0001 0001 0001 0001 0001 0001 0001 0001 0001 0001 0001 0001
0300:0001 0001 0001 0001 0001 0001 0001 0001 0001 0001 0000 0000 0000 0000 0000 0000
0320:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 D462
```

8.1.10 DPU HW register and EDAC failure HK TM (3,26)

```
TM Packet Query Display
=======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: DPU HW Reg Description: DPU HW Registers and EDAC Failu
S/C ID: 489 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 13387 Type: 3 Subtype: 26 PI1: 2021
PI2: 0
SPID: 122021340 TPSD: -1 HFA Counter: 0 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.11.50.35.333 Reception time: 2007.220.11.50.40.202
TM Packet Raw Data
------------------
SCOS-2000 Header:
```

```
0000:0000 0000 0BAE B946 8218 0500 10AE B946 6017 0300 0100 0000 E901 0000 5003 0000
0020:1138 FFFF 0000 0000 DCE5 4507 0000 0000 0400 0000 FFFF FFFF 10FF 0206 4B34 031A
Packet Raw Data:
0000:0E02 F44B 0309 0003 1A00 5D4C 0C8B 557E 07E5 0001 0A07 9F1E 3C10 B209 9306 CF5E
0020:BD7A CF5E BD7A 0000 0000 0000 3FF6 0000 0000 0000 7FFF 0000 0000 0080 CC00 0080
0040:DD00 0000 0000 0000 0000 0000 6000 0000 00FF 0000 0001 0000 0000 0000 02C6 FFFF
0060:FFFF FFFF 21C0 BA97 4FE3 0000 0000 0000 0000 BA98 1916 0000 0000 0000 0000 0000
0080:0000 0000 0000 0000 FFFF 0000 FFFF 0000 8E00 BF1E 3C05 9F04 1078 BF08 0878 B01E
00A0:3C05 0000 0000 0000 3FF8 0000 0000 0000 7FFF 0000 0000 0001 AA00 0001 BB00 0000
00C0:0000 0000 0000 0000 6000 0000 00FF 0000 0001 0000 0000 0000 0009 0000 FA00 4650
00E0:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0100:0000 0000 800F 0000 CFFC 0000 0002 0000 0010 0000 0000 0000 0000 0000 0000 0000
0120:0000 0000 0000 0000 0000 01F0 7C1D 01F0 7C1D 01F0 7C1D 01F0 7C1D 0000 0020 4C55
0140:5250 0000 0008 0000 0000 0000 000C 0000 0008 0000 0009 0000 0000 0000 0000 0000
0160:0000 0000 0004 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0180:0000 0000 0000 0000 0033 0000 0000 0000 0000 0000 0001 0000 0001 0000 0002 0000
01A0:0002 0000 0000 0000 0000 0000 0400 0000 0400 0000 05F7 0000 05F7 0000 0400 0000
01C0:0400 0000 6429 0000 0000 0000 000C 0000 0008 0000 0009 0000 0000 0000 0000 0000
01E0:0000 0000 0004 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000
0200:0000 0000 0000 0000 0011 0000 0670 0000 0670 0000 0670 0000 0670 0000 0671 0000
0220:0671 0000 0000 0000 0000 0000 0680 0000 0680 0000 0681 0000 0681 0000 0681 0000
0240:0681 0000 001B 0000 0000 0000 000C 0000 0008 0000 0009 0000 0000 0000 0000 0000
0260:0000 0000 0004 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000
0280:0000 0000 0000 0000 0011 0000 0700 0000 0700 0000 072B 0000 072B 0000 072C 0000
02A0:072C 0000 0000 0000 0000 0000 0A00 0000 0A00 0000 29FF 0000 29FF 0000 0A33 0000
02C0:0A33 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
02E0:0000 0000 0000 0000 0000 0002 8F80 92D2 00C4 0000 0B8D 0000 8015 0000 0825 0000
0300:0000 0000 F811 0010 0100 0000 0000 2FF3
```

8.1.11 SPU HW register and EDAC failure HK TM (3,26)

```
TM Packet Query Display
=======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: SPU HW Reg Description: SPU HW Registers and EDAC Failu
S/C ID: 489 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 13562 Type: 3 Subtype: 26 PI1: 2121
PI2: 0
SPID: 122121350 TPSD: -1 HFA Counter: 0 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.11.56.11.335 Reception time: 2007.220.11.56.16.174
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 5BAF B946 2F1F 0500 60AF B946 CCA7 0200 0100 0000 E901 0000 5003 0000
0020:1138 FFFF 0000 0000 866C 4707 0000 0000 0400 0000 FFFF FFFF 10FF 0206 FA34 031A
Packet Raw Data:
0000:0E02 F4FA 0309 0003 1A00 5D4C 0DDB 55EE 0849 0001 0A00 9F1E 3C10 B209 9306 CF5E
0020:BD7A CF5E BD7A 0000 0000 0000 3FFE 0000 0000 0000 7FFF 0000 0000 0080 CC00 0080
0040:DD00 0000 0000 0000 0000 0000 6000 0000 00FF 0000 0001 0000 0000 0000 0001 FFFF
0060:FFFF FFFF 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0080:0000 0000 0000 0000 FFFF 0000 FFFF 0000 8A30 BF1E 3C05 9F04 1078 BF08 0878 B01E
00A0:3C05 0000 0000 0000 3FDC 0000 0000 0000 7FFF 0000 0000 0001 AA00 0001 BB00 0000
00C0:0000 0000 0000 0000 6000 0000 00FF 0000 0001 0000 0000 0000 0009 0000 FA00 4650
00E0:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
```

```
0100:0000 0000 800F 0000 CFFF 0000 0002 0000 0010 0000 0000 0000 0000 0000 0000 0000
0120:0000 0000 0000 0000 0000 0190 641D 0190 641D 0190 641D 0190 641D 0000 0020 4C55
0140:5250 0000 0008 0000 0000 0000 000C 0000 0008 0000 0019 0000 0000 0000 0000 0000
0160:0000 0000 0004 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0180:0000 0000 0000 0000 0033 0000 0110 0000 0110 0000 0124 0000 0124 0000 0125 0000
01A0:0125 0000 0000 0000 0000 0000 13A0 0000 13A0 0000 13E0 0000 13E0 0000 13A1 0000
01C0:13A1 0005 0001 0000 0000 0000 000C 0000 0008 0000 0019 0000 0000 0000 0000 0000
01E0:0000 0000 0004 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000
0200:0000 0000 0000 0000 0011 0000 13F0 0000 13F0 0000 13F0 0000 13F0 0000 13F1 0000
0220:13F1 0000 0000 0000 0000 0000 13F8 0000 13F8 0000 13F9 0000 13F9 0000 13F9 0000
0240:13F9 0000 0002 0000 0000 0000 000C 0000 0008 0000 0009 0000 0000 0000 0000 0000
0260:0000 0000 0004 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000
0280:0000 0000 0000 0000 0013 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
02A0:0000 0000 0000 0000 0000 0000 1400 0000 1400 0000 47FF 0000 47FF 0000 1F40 0000
02C0:1F40 212C 213F 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
02E0:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0300:0000 0000 0000 0000 0000 0000 0000 BAB0
```

8.1.12 DPU 1355 link error HK TM (3,26)

```
TM Packet Query Display
=======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: SPU 1355 Description: SPU 1355 Links Errors Format
S/C ID: 489 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 13626 Type: 3 Subtype: 26 PI1: 2122
PI2: 0
SPID: 122122350 TPSD: -1 HFA Counter: 0 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.11.58.10.332 Reception time: 2007.220.11.58.15.849
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 D2AF B946 A214 0500 D7AF B946 EFF5 0C00 0100 0000 E901 0000 6C00 0000
0020:1138 FFFF 0000 0000 6E70 4707 0000 0000 0400 0000 FFFF FFFF 10FF 0206 3A35 031A
Packet Raw Data:
0000:0E02 F53A 0025 0003 1A00 5D4C 0E52 553D 084A 0000 0000 0000 0000 0000 0001 0000
0020:0000 0000 0000 0000 0000 633F
```

8.1.13 DAE SMCS1 registers HK TM (3,26)

```
TM Packet Query Display
=======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: DAE SMCS 1 Description: DAE SMCS 1 Packet Format
S/C ID: 489 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 13658 Type: 3 Subtype: 26 PI1: 2029
PI2: 0
SPID: 122029328 TPSD: -1 HFA Counter: 0 Filing: E
Distribution: E
```

```
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.11.59.11.369 Reception time: 2007.220.11.59.15.932
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 0FB0 B946 D6A1 0500 13B0 B946 213A 0E00 0100 0000 E901 0000 3402 0000
0020:1138 FFFF 0000 0000 1005 4607 0000 0000 0400 0000 FFFF FFFF 10FF 0206 5A35 031A
Packet Raw Data:
0000:0E02 F55A 01ED 0003 1A00 5D4C 0E8F 5E7E 07ED 0000 0000 0000 0010 0000 0000 0000
0020:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0040:0000 0000 00FF 0000 0050 0000 0008 0000 0000 0000 0003 0000 0000 0000 0000 0000
0060:0000 0000 0000 0000 0000 0000 0004 0000 0000 0000 0000 0000 0000 0000 0000 0000
0080:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
00A0:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
00C0:0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0009 0000 0008 0000 0019 0000
00E0:0000 0000 0000 0000 0000 0000 0004 0000 0000 0000 0010 0000 0000 0000 0000 0000
0100:0000 0000 0000 0000 0000 0000 0000 0000 0011 0000 0000 0000 0000 0000 0000 0000
0120:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0140:0000 0000 0000 0000 0000 0000 0000 0000 0011 0000 0009 0000 0008 0000 0019 0000
0160:0000 0000 0000 0000 0000 0000 0004 0000 0000 0000 0010 0000 0000 0000 0000 0000
0180:0000 0000 0000 0000 0000 0000 0000 0000 0011 0000 0040 0000 0000 0000 0072 0000
01A0:0000 0000 0073 0000 0000 0000 0000 0000 0000 0000 00C1 0000 0000 0000 00EC 0000
01C0:0000 0000 00ED 0000 0000 0000 0000 0000 0011 0000 00FF 0000 0000 0000 0000 0000
01E0:0000 0000 001B 0000 0000 0000 001B 0000 0000 BF85
```

8.1.14 DAE SMCS1 GPIO HK TM (3,26)

```
TM Packet Query Display
=======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: SMCS 1 GPIO Description: DAE SMCS 1 GPIO Packet Format
S/C ID: 489 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 13679 Type: 3 Subtype: 26 PI1: 2099
PI2: 0
SPID: 122099328 TPSD: -1 HFA Counter: 0 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.11.59.51.333 Reception time: 2007.220.11.59.55.986
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 37B0 B946 BB17 0500 3BB0 B946 760E 0F00 0100 0000 E901 0000 5800 0000
0020:1138 FFFF 0000 0000 8016 4707 0000 0000 0400 0000 FFFF FFFF 10FF 0206 6F35 031A
Packet Raw Data:
0000:0E02 F56F 0011 0003 1A00 5D4C 0EB7 5571 0833 1B00 1B00 B33F
```

8.1.15 DAE SMCS2 registers TM (3,26)

```
TM Packet Query Display
=======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: DAE SMCS 2 Description: DAE SMCS 2 Packet Format
S/C ID: 489 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 13705 Type: 3 Subtype: 26 PI1: 2129
```

```
PI2: 0
SPID: 122129328 TPSD: -1 HFA Counter: 0 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.12.00.37.352 Reception time: 2007.220.12.00.42.050
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 65B0 B946 0F62 0500 6AB0 B946 EAC5 0000 0100 0000 E901 0000 3402 0000
0020:1138 FFFF 0000 0000 B08B 4707 0000 0000 0400 0000 FFFF FFFF 10FF 0206 8935 031A
Packet Raw Data:
0000:0E02 F589 01ED 0003 1A00 5D4C 0EE5 5A50 0851 0000 0000 0000 0010 0000 0000 0000
0020:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0040:0000 0000 00FF 0000 0050 0000 0008 0000 0000 0000 0003 0000 0000 0000 0000 0000
0060:0000 0000 0000 0000 0000 0000 0004 0000 0000 0000 0000 0000 0000 0000 0000 0000
0080:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
00A0:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
00C0:0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0009 0000 0008 0000 0019 0000
00E0:0000 0000 0000 0000 0000 0000 0004 0000 0000 0000 0010 0000 0000 0000 0000 0000
0100:0000 0000 0000 0000 0000 0000 0000 0000 0011 0000 0000 0000 0000 0000 0000 0000
0120:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0140:0000 0000 0000 0000 0000 0000 0000 0000 0011 0000 0009 0000 0008 0000 0019 0000
0160:0000 0000 0000 0000 0000 0000 0004 0000 0000 0000 0010 0000 0000 0000 0000 0000
0180:0000 0000 0000 0000 0000 0000 0000 0000 0011 0000 0000 0000 0000 0000 003F 0000
01A0:0000 0000 0040 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
01C0:0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 00FF 0000 0000 0000 0000 0000
01E0:0000 0000 0001 0000 0003 0000 0001 0000 0003 7A6F
```

8.1.16 GMFs and N-Averaging HK TM (3,26)

```
TM Packet Query Display
=======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: GMF Naverage Description: GMF and Naverage Packet Format
S/C ID: 490 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 13733 Type: 3 Subtype: 26 PI1: 2131
PI2: 0
SPID: 122131350 TPSD: -1 HFA Counter: 1 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.12.01.30.334 Reception time: 2007.220.12.01.36.127
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 9AB0 B946 A419 0500 A0B0 B946 4EF3 0100 0100 0000 EA01 0000 CA01 0000
0020:1138 FFFF 0100 0000 9693 4707 0000 0000 0400 0000 FFFF FFFF 10FF 0206 A535 031A
Packet Raw Data:
0000:0E02 F5A5 0183 0003 1A00 5D4C 0F1A 5591 0853 3F80 0000 3F80 0000 3F80 0000 3F80
0020:0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80
0040:0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80
0060:0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80
0080:0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80
00A0:0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80
00C0:0000 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59
00E0:999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59
0100:999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59
0120:999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59
0140:999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 3F59
0160:999A 3F59 999A 3F59 999A 3F59 999A 3F59 999A 007E 0058 0034 0034 0034 0058 007E
0180:0034 0034 0034 0058 5F67
```

8.1.17 Offset and Re-quant HK TM(3,26)

```
TM Packet Query Display
=======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: Offsets Req Description: Offsets and Requants Format
S/C ID: 489 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 13777 Type: 3 Subtype: 26 PI1: 2130
PI2: 0
SPID: 122130350 TPSD: -1 HFA Counter: 0 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.12.02.53.333 Reception time: 2007.220.12.03.00.242
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 EDB0 B946 7318 0500 F4B0 B946 3FB4 0300 0100 0000 E901 0000 B401 0000
0020:1138 FFFF 0000 0000 AE8F 4707 0000 0000 0400 0000 FFFF FFFF 10FF 0206 D135 031A
Packet Raw Data:
0000:0E02 F5D1 016D 0003 1A00 5D4C 0F6D 557D 0852 0000 0000 0000 0000 0000 0000 0000
0020:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0040:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0060:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0080:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
00A0:0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
00C0:0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80
00E0:0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80
0100:0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80
0120:0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80
0140:0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 3F80
0160:0000 3F80 0000 3F80 0000 3F80 0000 3F80 0000 D493
```

8.1.18 TM rate steps table HK TM (3,26)

```
TM Packet Query Display
=======================
TM Packet Details
-----------------
Simulated: N
Mnemonic: TM Rate Step Description: TM Rate Steps Table Format
S/C ID: 489 G/S ID: 0 SLE ID: 0 OCC ID: 0 VCID: 4
HFA D/S: 65535
Data Unit Type: GOOD SP Time Stamp Type: PG Time Quality: G
APID: 1538 SSC: 13811 Type: 3 Subtype: 26 PI1: 704
PI2: 0
SPID: 120704340 TPSD: -1 HFA Counter: 0 Filing: E
Distribution: E
Time Field: Y Packet Period: 0 [msec] CRC: ? Event
Severity: ?
TM Packet Parameter Data
------------------------
Generation time: 2007.220.12.03.59.332 Reception time: 2007.220.12.04.03.836
TM Packet Raw Data
------------------
SCOS-2000 Header:
0000:0000 0000 2FB1 B946 2112 0500 33B1 B946 1FC4 0C00 0100 0000 E901 0000 0401 0000
0020:1138 FFFF 0000 0000 54CD 3107 0000 0000 0400 0000 FFFF FFFF 10FF 0206 F335 031A
Packet Raw Data:
0000:0E02 F5F3 00BD 0003 1A00 5D4C 0FAF 5513 02C0 FFFF FFFF FFFF FFFF FFFF FFFF FFFF
0020:FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
0040:FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
0060:FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
0080:FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
```

```
00A0:FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
00C0:FFFF C520
```

8.2 PHASE SWITCHES FUNCTIONALITY VERIFICATION

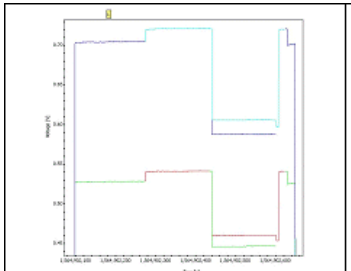


Figure 1 RCA18 M1

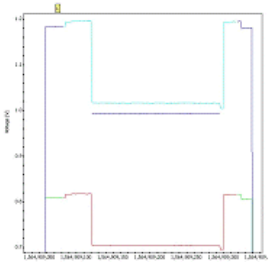


Figure 2 RCA 18 M2

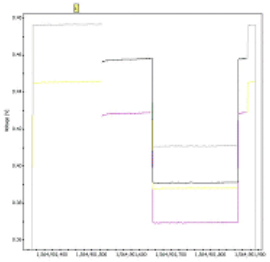


Figure 3 RCA 18 S1

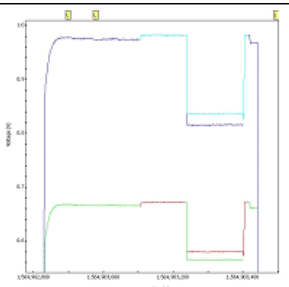


Figure 4 RCA 18 S2

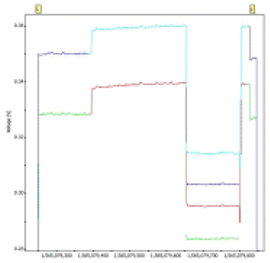


Figure 5 RCA19 M1

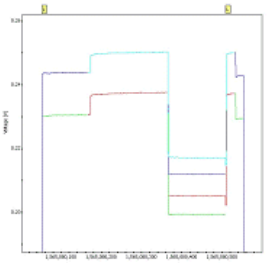


Figure 6 RCA 19 M2

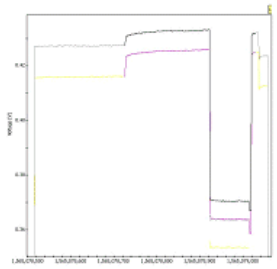


Figure 7 RCA 19 S1

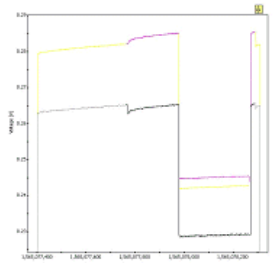


Figure 8 RCA 19 S2

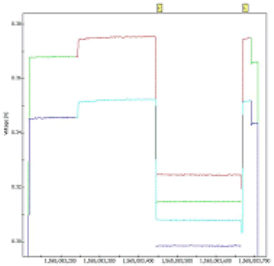


Figure 9 RCA20 M1

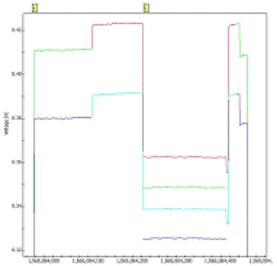


Figure 10 RCA 20 M2

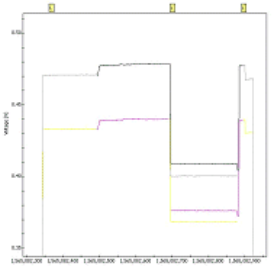


Figure 11 RCA 20 S1

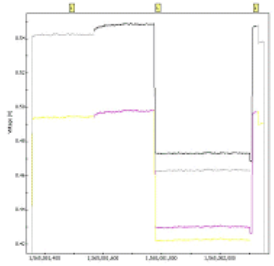


Figure 12 RCA 20 S2

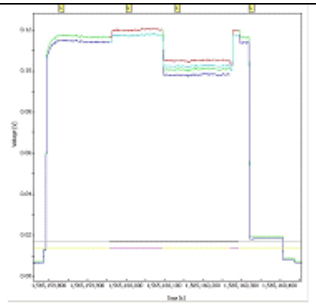


Figure 1 RCA21 M1

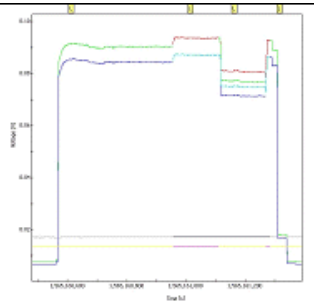


Figure 2 RCA 21 M2

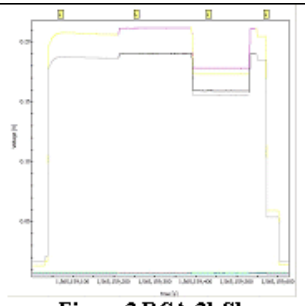


Figure 3 RCA 21 S1

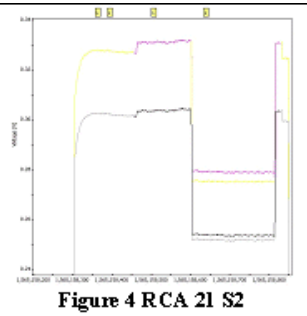


Figure 4 RCA 21 S2

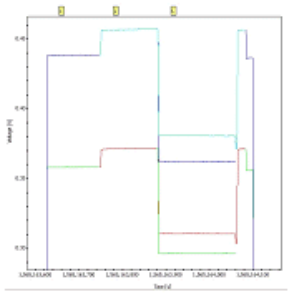


Figure 5 RCA22 M1

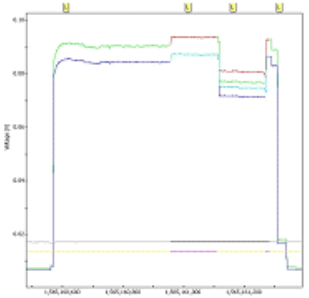


Figure 6 RCA22 M2

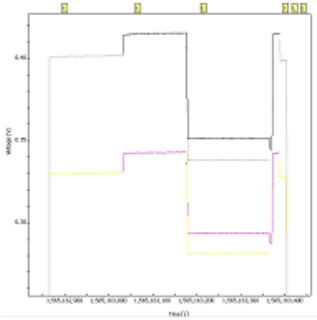


Figure 7 RCA 22 S1

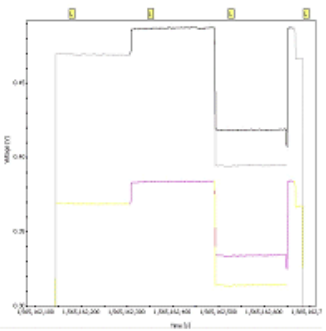


Figure 8 RCA 22 S2

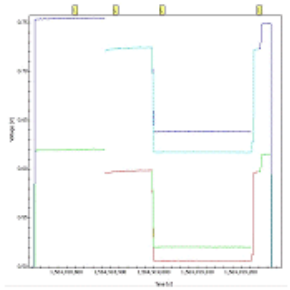


Figure 9 RCA23 M1

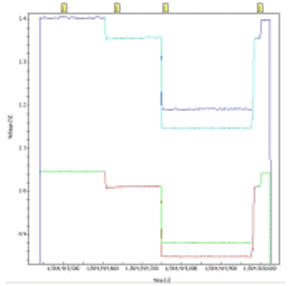


Figure 10 RCA23 M2

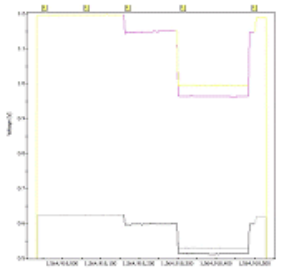


Figure 11 RCA 23 S1

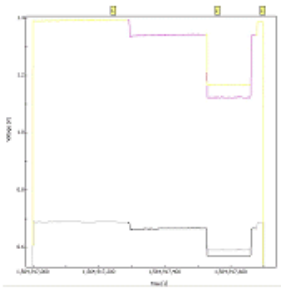


Figure 12 RCA 23 S2

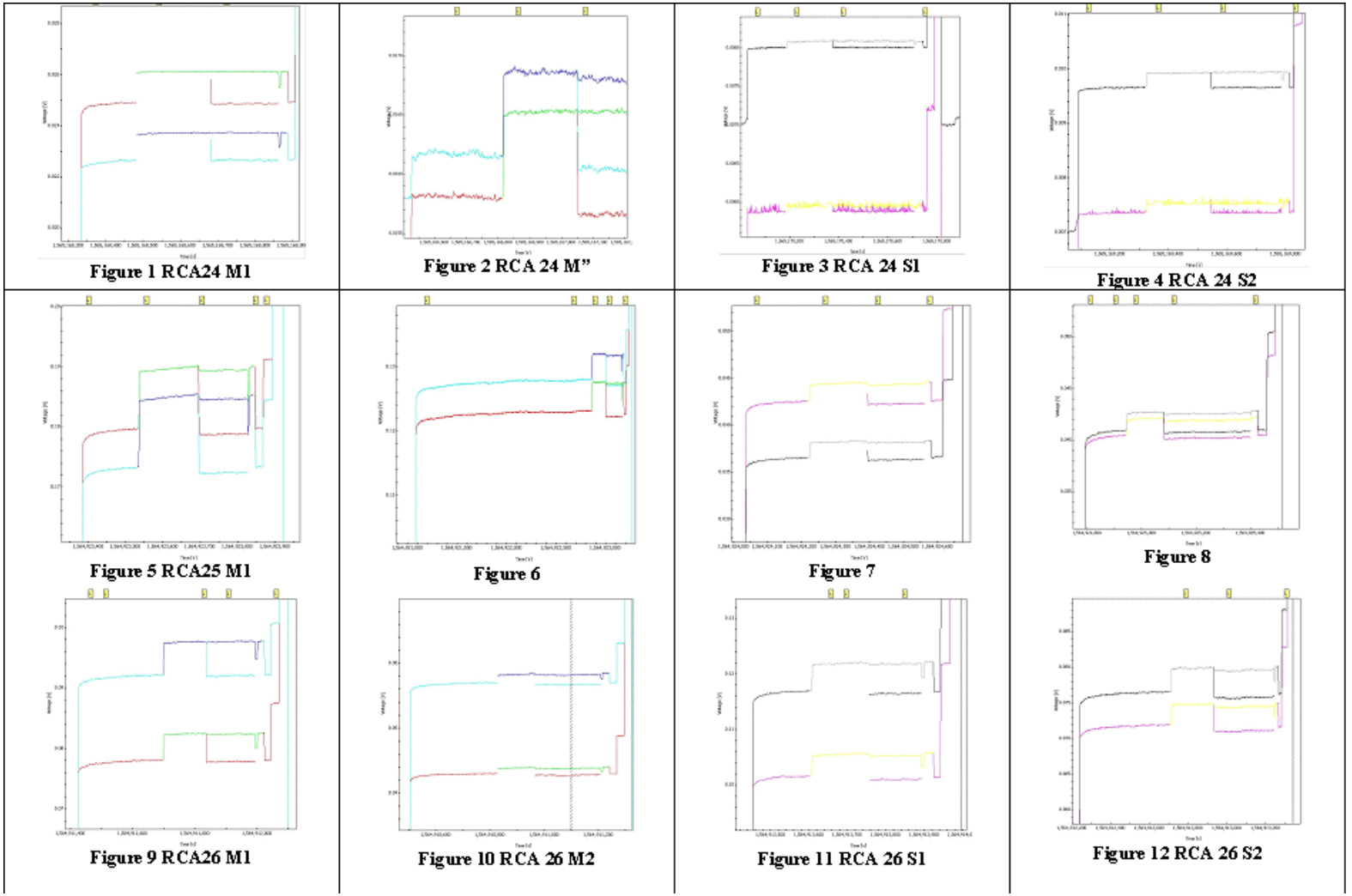


Figure 1 RCA24 M1

Figure 2 RCA 24 M"

Figure 3 RCA 24 S1

Figure 4 RCA 24 S2

Figure 5 RCA25 M1

Figure 6

Figure 7

Figure 8

Figure 9 RCA26 M1

Figure 10 RCA 26 M2

Figure 11 RCA 26 S1

Figure 12 RCA 26 S2

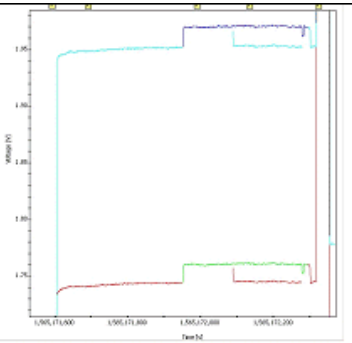


Figure 1 RCA27 M1

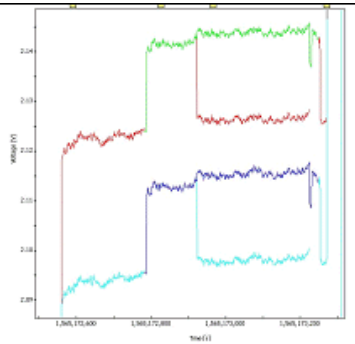


Figure 2

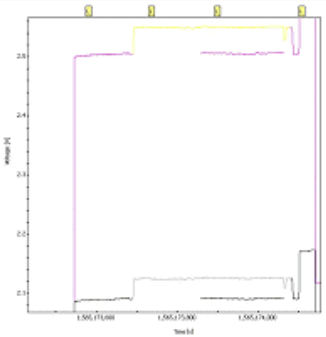


Figure 3

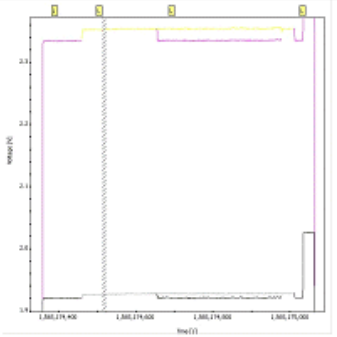


Figure 4

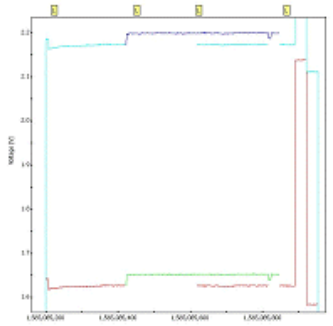


Figure 5 RCA28 M1

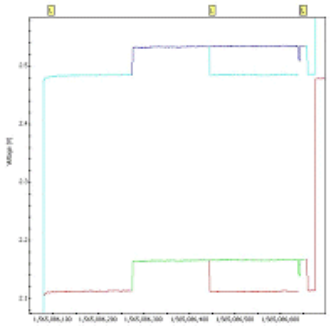


Figure 6 RCA 28 M2

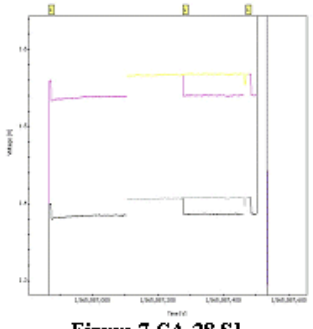


Figure 7 CA 28 S1

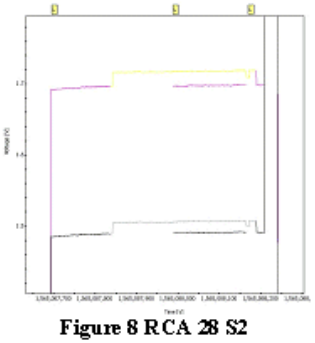


Figure 8 RCA 28 S2