RPW SHORT FUNCTIONAL TEST
AS-RUN 1:
CNES CONFIGURATION WITH SCM AND PA

	Date	Signature
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Document status :			

HISTORY OF DOCUMENT MODIFICATIONS

Version	Date	Modifications
1/0	25/09/2014	*Document creation*
1/1	06/11/2014	*Section "Test description" reorganized and improved by including grouping of tests by activity and specifying sub-step number for step 5 description.* *Removal of "check test connection set-up" from step 1 of step-by-step procedure. Justification: HW set up shall be performed before SFT as described in SOLO-RPWAI-TN-1135-CNES.* *Step-by-step procedure, steps 7.29 to 7.32: margins have been widen as they, as long as transfer functions, are not perfectly set at this stage. This work is to be carried out on EM2 and SFT procedure will need to be updated in this regard.* *Step 11 "SFT RESULT" in step-by-step procedure added.* *Section "Test Conclusion" added.* *List TBC and TBD updated.* *Step 9 of step-by-step procedure updated.* *TMTC list added.*

1/2	02/03/2015	***Table "List of TBC and TBD" has been updated.***
		Section "Organization and timing" has been updated:
		• *New stages added:*
		  ○ *Load DBS and perform a short test on it*
		  ○ *Go through Science Mode with compression*
		  ○ *Switch to MEB redundant chain*
		• *Change in the duration of SBM1 mode (from 10 to 11 minutes) and SBM2 mode (from 10 to 12 minutes)*
		• *New naming of steps: A, B, C, D, E, F and G.*
		• *Color code added to distinguish type of stage: instrument manipulations, script execution, assertion checks and verification of results.*
		Section "Step-by-step Procedure" has been updated:
		• *An overview of different stages and associated color code has been added.*
		• *Instrument manipulations:*
		  ○ *Configuration of SCM simulator added,*
		  ○ *Sending of S/C related TC added,*
		  ○ *Manual setting of a prefix for log test files,*
		  ○ *Draft procedure to switch to redundant chain added,*
		  ○ *MEB switch OFF procedure through S/C TC added.*
		• *Script execution:*
		  ○ *The configurations of LFR, TDS and THR have been fixed to the nominal ones,*
		  ○ *Change in the duration of SBM1 mode (from 10 to 11 minutes) and SBM2 mode (from 10 to 12 minutes),*
		  ○ *SFT DBS test added,*
		  ○ *Draft procedure to test science modes in compression mode added,*
		  ○ *Draft procedure to test redundant chain added,*

		• *Assertion checks:*
		  ○ *Values of expected scientific TM packets have been updated to take into account new analyzer configuration (nominal conf) and the change in the duration of certain modes,*
		  ○ *Added a verification of ACK and EXE SUCCESS TC,*
		  ○ *Temperatures check added,*
		  ○ *Automatic verification of DBS, DAS, LFR, TDS and THR SW versions added,*
		  ○ *Draft assertion check added to verify science modes in compression mode added,*
		  ○ *Draft assertion check added to verify redundant chain added.*
		Section "TMTC list" has been updated.
		Annexe "Script references": *actualization to script version v1.2*

2/0	12/06/2015	***Section "Organization and timing":*** *update concerning step B5 (scientific modes with compression mechanism activated)*
		Section "Step-by-step Procedure" has been updated:
		• *Script execution (step B):*
		  ○ *Step B1: Enable watchdog added after DBS reset*
		  ○ *Step B3.9: Configure BIAS relays and currents*
		  ○ *Step B5: Science modes with compression mechanism enabled*
		• *Assertion Checks (step F):*
		  ○ *Step F2.10: heart beat check update to ACTIVE*
		  ○ *Step F5: Science modes with compression mechanism enabled*
		Section "Annex: Script References": *updated to version 2.0*
		Section "Test Conclusion": *minor update*

3/0	10/11/2015	***Section "Step-by-step Procedure" has been updated:***
		• *Step B1 : add a 1s delay after each ENABLE WATCHDOG*
		• *Steps B1 to B4: Position of the verification of test log creation changed*
		• *TCs modified in R3 have been updated (not implicitly mentioned in the procedure:*
		  ○ ***TC_DPU_DAS_LOAD_COMMON_PAR:***
		  ▪ *SY_DPU_EQ_RECOVERY_ATTEMPT renamed SY_DPU_EQ_SWITCH_ON_ATTEMPT*
		  ▪ *Deleted: SY_DPU_OBC_LA2 and SY_DPU_OBC_LA3*
		  ▪ *Addresses of executables in EEPROM*
		  ▪ *Timeout period for the Spacewire connection to an analyser (from 1000 to 100 ms)*
		  ▪ *Max rates for different modes updated*
		  ○ ***TC_THR_LOAD_NORMAL_PAR_1:***
		  ▪ *SY_THR_N_SET_DO_AN_MOD*
		  ▪ *PA_RPW_SPARE8_1*
		  ○ ***TC_TDS_DUMP_NORMAL_TSWF :***
		  ▪ *CP_TDS_N_PARAM removed*
		  ○ ***TC_TDS_DUMP_SBM2*** *:*
		  ▪ *CP_TDS_S2_PARAM removed*

		○ ***TCs configuration TDS**: removed parameters.* • Automatic steps marked in gray to indicate that they do not need to be completed during test execution • *Update SW versions to be verified:* ○ *DBS V1.3.0.0* ○ *DAS V3.0.0.0* ○ *TNR-HFR SW V3.3.0.1* ○ *TDS SW V3.0.1.0* ○ *LFR SW V3.0.0.10* • *Simplification of assertion checks (F section) by grouping similar checks in one single step*
3/1	21/07/2016	***Main page:** Added electrical and quality responsible to sign page.* ***Section "Introduction"** updated to take into account EM2.* ***Section "References"** updated.* ***Section "Organization and timing"** updated* ***Section "Step-by-step Procedure"** updated:* • ***General:** Some "Results" and "OK/NOK" cells have been marked in grey to indicate that no element is needed to be noted down (automatic steps).* • ***Step A:** New setup description taking into account different configurations for CNES and ADS/ETB configurations.* • ***Step B1:** Corrections added (timings, new TCs, etc).* • ***Step B2:** Added synchronization TC to be sent by S/C (required by DAS R3).* • ***Step B3:*** ○ *Added DAS_Configuration section.* ○ *Correction of DAS power down mode configuration: POWER_DOWN_MODE set to disabled and POWER_DOWN_MODE_SIM set to enabled.* ○ *SFT_Switch_ON_Equipments section updated.* ○ *Default BIAS configuration updated.* ○ *Analyzers Configurations sections updated: new format of TCs added, values of configuration parameters have been tuned, etc.* • ***Step B4:*** ○ *This step is now performed with compression enabled.* ○ *TDS snapshots are now automatically requested by DAS after 7min in SBM2 mode.* ○ *Other minor corrections (typos, etc).* • ***Step B5:*** ○ *This step is now performed with compression disabled.* ○ *Duration of first DETECTION mode reduced to 1 min (so as to the 3 min in SBM1 mode will be enough to download all accumulated data).* ○ *Added request of 12 TDS snapshots during SBM2 mode.* • ***New step B6 added** to verify the correct delivery of TCs that have not been sent in previous sections.* • ***Step B7:*** ○ *Added TC_XXX_LOAD_MEMORY (which are to be rejected by DAS since analyzers are OFF at this stage).*

		○ *Added synchronization TC after DPU reset.* • ***New step F1 added*** *to verify correct loading of DBS (B1)* • ***Step F2:*** ○ *Added verification of DAS SW version (V3.2.0.4).* ○ *Added verification of DAS time synchronization.* ○ *Removal of currents, voltages and temperatures checks (taken into account by FDIR services)* • ***Step F3:*** ○ *Updated verification of analyzers SW versions:* *TNR-HFR SW V3.5.0.2* *TDS SW V3.2.0.0* *LFR SW V3.0.0.22* ○ *Removal of currents, voltages and temperatures checks (taken into account by FDIR services).* ○ *Verification of BIAS and analyezers states added (HeartBeats).* ○ *The analyzers configuration used for SFT has been frozen. Only some justified minor deviations are used with respect to default configurations as per RD2.* • ***Steps F4 and F5:*** *Update of expected values of HK and science TM counters.* • ***New step F6 added*** *to verify correct execution of new section B6.* • ***Step F7:*** ○ *Removal of currents, voltages and temperatures checks (taken into account by FDIR services)* ○ *Added verification of rejection of TC_XXX_LOAD_MEMORY.* • ***Step G updated*** *with new expected number of successful checks.* ***Annex 2 "List of TM/TC"*** *updated to take into account all executed TCs (which has greatly increased due to new sections B6/F6) and TMs.* ***Annex 3 "Script references"*** *updated to take into account SFT v3.1 scripts.* ***Annex "Expected voltages, currents and temperatures"*** *removed (taken into account by FDIR configuration parameters available in scripts and TM/TC plans).* ***Annex 4 "TNR-HFR default configuration"*** *updated.* ***New annex "Electrical SFT configuration"*** *added.*
3/2	07/11/2016	***Section "Step-by-step Procedure"*** *updated:* • ***Step F1.18:*** *Update to take DAS R3+ (V3.4.0.0) CRC into account.* • ***Step F2.9:*** *Updated to DAS R3+* • ***Step F4.0 and F5.0:*** *Some acceptance margins associated to these tables have been increased to assure a minimum of 5% margin. This has been done directly in the assertion files, as this procedure does not show the particular values of acceptance margins. This is related to AD&S NCR.321.*
3/3	24/05/2017	***Section "References"*** *updated to last SSS 4.4 and TM/TC packet definitions 4.3.3* ***Section "Overview"*** *updated to take into account implementation of redundant chain testing* ***Section "Step-by-step Procedure"*** *updated:* • ***Step A1.2*** *updated to take into account configuration without SCM/PA* • ***Steps A2.2 and C4*** *updated with waiting time and power consumption target value in CNES configuration (160 mA).*

		• ***Step A1.6*** *added to indicate selected HW configuration* • ***Steps B1.3, B1.18, B1.25 and B7.8:*** *added S/C command to stop S20 before DPU reset (required to avoid an error case occurring in ADS configuration)* • ***Steps B1.4, B1.19, B1.28 and B7.9:*** *added S/C command to resume S20 after DPU reset* • ***Step B1.11:*** *correction added to set procedure in line with script.* • ***Steb B1.16 and F1.18:*** *updated to (i) take into account increase of DAS size which requires 2 memory checks per EEPROM region, (ii) verification of both EEPROM1 and EEPROM2 DAS regions, (iii) take into account new CRC values* • ***New step B1.20:*** *activation of HK after TC RESET* • ***Step B3.5:*** *Power and temperature FDIR for SCM and PA are, by default, disabled.* SY_DPU_EQ_BOOT_TIMEOUT updated • ***Steps B3.5 and F3.2:*** TC_DPU_LOAD_RWF_PAR added • ***Step B3.7:*** *Script renamed to SFT_Switch_ON_MEB_Equipements and switching ON of SCM and PA removed from it.* • ***New step B3.8 added:*** *New script SFT_Switch_ON_SCM_ANT_Equipements added to switch ON SCM and PA and verifying the behavior of the PA relays commanded by BIAS. Power and temperature FDIR for SCM and PA are enabled in this script.* • ***Steps B4.7 and F4.3*** *updated to activate BIAS calibration verification for 235 s (in parallel to DETECTION mode) and to verify proper reception of associated TM* • ***Step B7.3 removed*** *since already performed in SFT_Dump_Stacks_Queues* • ***Step B7.5 added:*** *modified configuration parameters are set to default values as per IDB 4.3.3* • ***Step C2*** *added to swtich to redundant SpaceWire link before switching ON redundant chain* • ***Step F2.9 updated:*** *Verification of TM_DPU_EVENT_PR_DAS_BOOT packet removed since already verified in step F2.1* • ***New step F3.4*** *added to verify BIAS relays bahaviour* • ***Steps F3.5 to F3.7 corrected:*** *Verification of TC_DPU_BOOT_XXX changed to TM_DPU_EVENT_PR_XXX_BOOT* • ***Steps F:*** *Added automatic verification of event anomaly counters before any RESET or HK clear* • ***Step F4.0:*** *table updated for HK_DPU_TM_SCIENCE_CNT packets in DETECTION (4 pakets expected) and SBM1 (2 remaining packets due tu LFR latency expected).* • ***Steps G:*** *updated number of verification checks. G8 modified: no offline verification of received anomaly events is required (since done now automatically), this step is now in charge of verifying redundant chain results.* ***Annex 2 "List of TM/TC"*** *updated to reach 100% TC coverage and TM_DPU_RWF_HK.* ***Annex 5 "Electrical SFT configuration"*** *updated to include the case where SCM and Antennas are not installed in the test configuration*

LIST OF TBC AND TBD

TBC/TBD	Paragraph	Entitled brief

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1 INTRODUCTION

1.1 PURPOSE OF THE DOCUMENT

This document defines the test procedure to be employed to validate the Short Functional Test to be performed at ESA/ASUK.

1.2 APPLICATION

This procedure applies to the RPW EM2 and PFM.

2 REFERENCES

2.1 APPLICABLE DOCUMENTS

Mark	Reference	Document title
AD1	SOL-EST-RCD-0050	Experiment Interface Document – Part A
AD2	RPW-SYS-MEB-AIV-00042-LES Iss01 Rev 00	AIT-AIV Plan MEB
AD3	SOLO-RPWAI-TN-1084-CNES	SFT v3.3

2.2 REFERENCE DOCUMENTS

Mark	Reference	Document title
RD1	RPW-SYS-SSS-00013-LES Issue 4.4	Software System Specification (SSS)
RD2	RPW-SYS-MEB-DPS-ICD-000210-LES Issue 4.3.4	RPW TC Packet Definition
RD3	RPW-SYS-MEB-DPS-ICD-000211-LES Issue 4.3.4	RPW TM Packet Definition
RD4	PW-SYS-MEB-SPC-00021-LES Issue 3.0	Specification for the Main Electronics Box
RD5	RPW-SYS-MEB-DPS-RP-00109-IWF Issue 1.2	DBS Software Configuration File for DBS Release V1.3
RD6	SO-UM-RPW-SC-0060-LPC2E	SCM Sensor Simulator User Guide

3 ACRONYMS

Acronym	Definition
AIT	Assembly Integration and Test
AIV	Assembly Integration and Validation
ANT	ANTenna
C-SGSE	Command – Software Ground Support Equipment
DAS	DPU Application Software
DBS	DPU Boot Software
DPU	Data Processing Unit
EGSE	Electrical Ground Support Equipment
EM	Engineering Model
FFT	Full Functional Test
FM	Flight Model
GSE	Ground Support Equipment
HF	High Frequency
HK	House Keeping
LF	Low Frequency
LFR	Low Frequency Receiver
LVPS	Low-Voltages Power Supply
MA-SGSE	Monitoring and Analysis – Software Ground Support Equipment
MEB	Main Electronics Box
PA	PreAmplifier
PCB	Printed Circuit Board
PDU	Power Distribution Unit
PSU	Power Supply Unit
QM	Qualification Model
RIU	Remote Interface Unit
RPW	Radio and Plasma Waves
S/C	SpaceCraft
SBM	Selected Burst Mode
SBM1	Selected Burst Mode1 (interplanetary shock measurement)

SBM2	In-situ Type III measurements
SCM	Search Coil Magnetometer
SFT	Short Functional Test
SGSE	Software Ground Support Equipment
SpW	SpaceWire
TBC	To Be Confirmed
TBD	To Be Defined
TBW	To Be Written
TC	TeleCommand
TDS	Time Domain Sampler
TM	TeleMetry
TNR-HFR	Thermal Noise Receiver – High Frequency Receiver
TSWF	Triggered Snapshot Wafe Forms

4 TEST DESCRIPTION

4.1 OVERVIEW

The Short Functional Test (SFT) is designed for the instrument-level AIV-flow as quick necessary and sufficient diagnostic tool after any mayor testing activity. For test procedure, please see [AD3].

The SFT tests both the nominal and redundant branches.

During the SFT test, all RPW operational modes will be activated. These operational modes, which are described in more depth in section 8 are the following:

- **SAFE mode**,
- Operational modes:
  - **STANDBY**,
  - **SERVICE**,
  - Science:
    - Survey:
      - **NORMAL**,
      - **BURST**,
      - **BACK UP**.
    - Detection:
      - **SBM DETECTION**,
      - **SBM1 DUMP**,
      - **SBM2 ACQUISITION**.

4.2 ORGANIZATION AND TIMING

The table below gives the organization of SFT stages and associated timing:

Activity	Step		Description	Time
Instrument initialization	A	A1	Set-up Checks	5 min
		A2	Switch ON of MEB nominal chain	3 min
Script execution on nominal chain	B	B1	Load DBS and perform a short test on it	3 min
		B2	Load DAS and enter Standby Mode	1 min
		B3	Enter Service Mode & configure RPW equipments	2 min
		B4	Go through Science Modes with compression	32 min
		B5	Go through Science Mode without compression	15 min
		B6	Verification of remaining TCs	4 min
		B7	Test end: back to Safe Mode	2 min
Switch to redundant	C	-	Switch to MEB redundant chain	
Script execution on redundant chain	D	D1	Short test on redundant chain	9 min
Instrument switch OFF	E	-	MEB Switch OFF	
Assertion checks	F	F1	Loading and short testing of DBS (HK TM)	2 min
		F2	Reseting of DBS and loading of DAS (HK TM)	
		F3	Service Mode & configuration of equipments (HK TM)	
		F4	Science Modes with compression (Science TM)	
		F5	Science Modes without compression (Science TM)	
		F6	Verification of remaining TCs	
		F7	Test end (HK TM)	
		F8	Assertion checks of redundant chain	
SFT Results	G	-	Verify the output reports of assertion checks	1 min
			Total time:	~ **1h20min**

Color code:

- Instrument manipulations
- Script execution
- Assertion checks
- Verification of results

Each script is associated to a given assertion check, which is verified at the end of the SFT:

Script		Assertion check		Verif. of results
B1	⇔	F1	⇔	G1
B2	⇔	F2	⇔	G2
B3	⇔	F3	⇔	G3
B4	⇔	F4	⇔	G4
B5	⇔	F5	⇔	G5
B6	⇔	F6	⇔	G6
D1	⇔	F7	⇔	G7
…	⇔	…	⇔	…

The main part of script execution (B4), when all science modes are tested with compression function enabled, is divided as follows:

Mode	Duration	Comment
NORMAL	10 s	
SBM_DET	2 min + 2 min	Dump 16 TDS Snapshots after 2 min
SBM1	11 min	
BURST	3 min	
SBM_DET	10 s	
SBM2	12 min	Dump 48 TDS Snapshots after 7 min (automatically requested by DAS)
Service	1 min	
Back-up	10 s	
Service	10 s	

Step B5 is a simplified version of the just mentioned B4 in which data compression mechanism is disabled:

Mode	Duration	Comment
NORMAL	10 s	
SBM_DET	**2 min**	
SBM1	**3 min**	
BURST	3 min	
SBM_DET	10 s	
SBM2	**3 min + 3 min**	Dump 12 TDS Snapshots
Service	1 min	
Back-up	10 s	
Service	10 s	

4.3 SUCCESS CRITERIA

The following criteria shall be met to allow for the continuation of AIT activities related to MEB:

All assertion tests marked as "success" (see step "G" in "step-by-step" section).

5 PLATFORM CONFIGURATION REQUIREMENTS

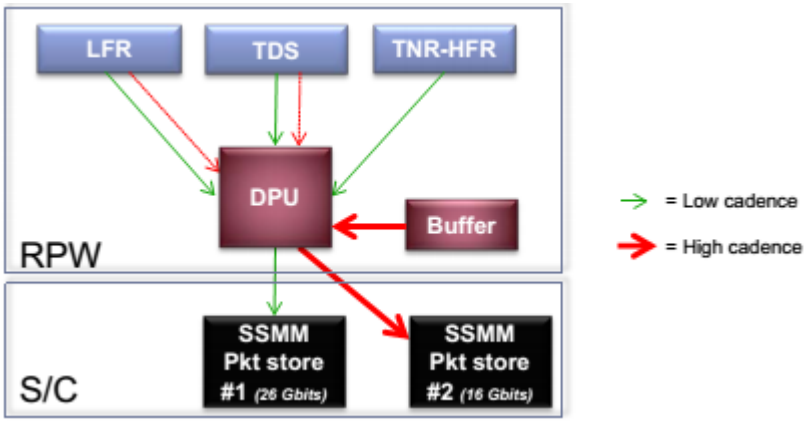
Only two RPW configurations exist:

1. Nominal (prime) LCL + nominal SpW/DPU,
2. Redundant LCL + redundant SpW/DPU.

For EM, only the nominal chain is available. Thus, nominal chain is the configuration needed for SFT at this stage.

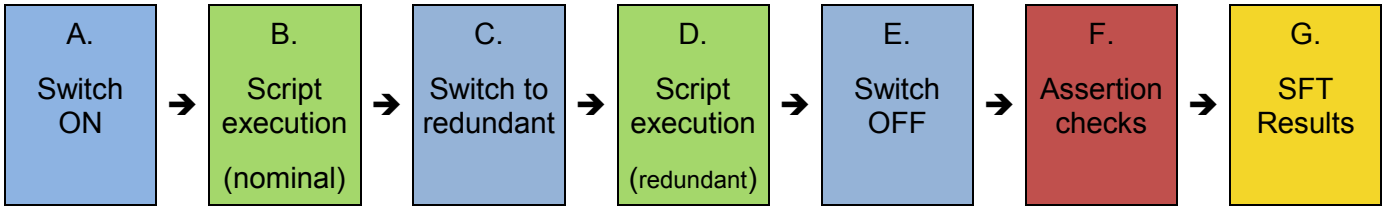
Regarding platform data storage, two packet stores are required for SFT (see image below):

1. SSMM packet store #1 for normal flux,
2. SSMM packet store #2 for high cadence.



6 STEP-BY-STEP PROCEDURE

Color code:



Instrument manipulations
Script execution
Assertion checks
Verification of results

Automatic step: no need to note down "Result" or "OK/NOK" columns

STEP	DESCRIPTION	RESULTS	OK / NOK
A1	Set-up Checks		
A1.1	Note down RPW model (EM2, PFM) and serial number.	RPW-MEB-PFM-01	OK
A1.2	**If RPW model is at CNES only:** If in SCM/PA configuration: 1) Verify that PAs are connected to the MEB 2) Check that SCM EM is correctly installed in the mu-metal Box and close the Box 3) Verify that SCM is connected to the MEB via RPW25H-B and RPW26H harnesses. 4) Check that 1MΩ or 50Ω BNC load on each input of the three antenna preamplifiers: ANT1/2/3 PA (x3) if PA are connected, In any case: 5) Check that the external power supply is connected to J301 (Nominal) of the MEB 6) Check that SGSE are connected to the MEB J500 (Nominal) via SpaceWire USB Brick 7) Check that RPW instrument is connected as per configurations shown in Annex 5 Run all SGSE (Engine computer, Database computer, MA-		OK

STEP	DESCRIPTION	RESULTS	OK / NOK
	SGSE, C-SGSE and Foreign GSE)		
A1.3	**If RPW model is at Airbus DS only:** Check electrical configuration against the expected one as per annex 5: 1. **SFT ADS EM2 Configuration**. In that case, verify SC configuration: ○ Set HEATER SIM to OFF position, ○ Set TEMP to OFF position. ○ Set Power Supply switch to MEB position 2. **SFT ADS PFM Configuration RPW integrated to the S/C <u>without</u> SCM and the Antennas**. In that case, please take into account that last commands in step B3.7 are not to be sent. 3. **SFT ADS PFM Configuration RPW fully integrated to the S/C**		NA
A1.4	Note down database version	4.3.3	OK
A1.5	Note down the version of SFT scripts and assertion checks to be run ***Note:*** *the version of SFT scripts and assertion checks should be identical*	3.3	OK
A1.6	Note down hardware configuration option: • CNES/ADS configuration • with/withouth SCM and PA;	CNES configuration With SCM/PA	OK
A2	MEB switch ON (Enter Safe Mode)		
A2.1	Send the S/C TC to switch ON nominal RPW chain: **TC ZCSD1192:** • **Parameter PCSB0036 = UNIT_A** ***Note:*** *This power-up function includes the command to power the instrument LCL, followed by the HPC-ON command for the instrument internal switch*		OK
A2.2	Wait at least 4s, which is the time required by DBS to complete its initialization. Check Power Consumption in CNES configuration: **I_28V = 160 mA +/- 10%**		OK
A2.3	Check HKTM acquisition on SGSE / Airbus DS acquisition		OK

STEP	DESCRIPTION	RESULTS	OK / NOK
	system.		
A2.4	Send the S/C TC to synchronise the instrument time with the spacecraft Onboard Time (OBT): **TC ZCD00982:** • **PID (PCD09821) = 75** • **Period (PCD09822) = 0 (one-shot)**		OK
A2.5	In "SFT_Test_Preparation" file: Set the value of the parameter "SetPrefix" to current date (yyyy-mm-dd). ***Note:*** *By doing so, the name of the generated log files will always start by yyyy-mm-dd.*	2017-05-24_run10	OK
A2.6	Run converted SFT script from custom check-out system. ***Important:*** 1. *Unless otherwise stated, all steps are performed automatically (manual steps are marked in **blue**).* 2. *Parameter descriptions have been omitted to keep a clean and understandable procedure. Only in a few cases (where it is essential to understand a given TC) we have presented a short parameter definition.* 3. *Scientific TM data is to be stored by operator in case it should be sent to CNES for further processing.*		OK
B1	Load DBS and perform a short test on it		
B1.1	Run script « SFT_Load_DBS»		
B1.2	**Check that the following test log has been generated:** **yyyy-mm-dd_SFT_Load_DBS**		OK
B1.3	Send the S/C TC to stop S20*: **SetService20State** (S20State = DISABLE) ***Note:*** *required for ADS configuration to avoid an error case which occurs when reseting the SpW link while S20 is active.* Reset DPU: **TC_DPU_RESET** And wait 10s, which is more than the time required by DBS to complete its initialization.		

STEP	DESCRIPTION	RESULTS	OK / NOK
B1.4	Send the S/C TC to stop S20: **SetService20State** (S20State = DISABLE) Send the S/C TC to synchronise the instrument time with the spacecraft Onboard Time (OBT): **TC ZCD00982:** • **PID (PCD09821) = 75** • **Period (PCD09822) = 0 (one-shot)** ***Note :*** *in CNES configuration, this is performed by automatically sending* ***SC::EmitTimeUpdate(Occurences=1)***		OK
B1.5	Set period of DBS HK to 1s: **TC_DPU_UPDATE_HK_PERIOD**		
B1.6	Wait 5s		
B1.7	Perform a connection test: **TC_DPU_TEST_CONNECTION**		
B1.8	Set both the PDU and OBC HK periods to 1s: **TC_DPU_UPDATE_HK_PERIOD** **TC_DPU_OBC_UPDATE_HK_PERIOD** And request a parameters dump to verify above values: **TC_DPU_DBS_DUMP_PAR**		
B1.9	Disable DBS, PDU and OBC HK: **TC_DPU_DISABLE_HK** **TC_DPU_DISABLE_HK** **TC_DPU_OBC_DISABLE_HK** And request a parameters dump to verify above values: **TC_DPU_DBS_DUMP_PAR**		
B1.10	Enable DBS, PDU and OBC HK: **TC_DPU_ENABLE_HK** **TC_DPU_ENABLE_HK** **TC_DPU_OBC_ENABLE_HK** And request a parameters dump to verify above values: **TC_DPU_DBS_DUMP_PAR**		
B1.11	Disable the following error event report:		

STEP	DESCRIPTION	RESULTS	OK / NOK
	TC_DPU_DISABLE_EVENT (ME_DPU_BOOT) Load a wrong DAS to verify that the above event is not produced: **TC_DPU_BOOT_DAS** Re-enable event report: **TC_DPU_ENABLE_EVENT** (ME_DPU_BOOT) Load a wrong DAS to verify that the **ME_DPU_BO** event is not produced: **TC_DPU_BOOT_DAS**		
B1.12	Perform an Enable/Disable sequence on the DPU Watchdog: **TC_DPU_ENABLE_WATCHDOG** **TC_DPU_DISABLE_WATCHDOG** Wait 1s		
B1.13	Test DPU RAM memory by loading/dumping 16 bytes on/from it: **TC_DPU_LOAD_MEMORY** **TC_DPU_DUMP_MEMORY**		
B1.14	Test DPU EEPROM memory by loading/dumping 16 bytes on/from it: **TC_DPU_LOAD_MEMORY** **TC_DPU_DUMP_MEMORY**		
B1.15	Dump large block of memory (EEPROM, RAM, PROM and registers): **TC_DPU_DUMP_MEMORY** Wait 5s **TC_DPU_DUMP_MEMORY** Wait 5s **TC_DPU_DUMP_MEMORY** Wait 3s **TC_DPU_DUMP_MEMORY** Wait 3s		
B1.16	Check PROM (lower and higher PROMs regions) and EEPROM memories:		

STEP	DESCRIPTION	RESULTS	OK / NOK
	TC_DPU_CHECK_MEMORY **Note:** this TC is sent once for PROM lower part, once for PROM higher part, twice for DAS EEPROM1 region and twice for DAS EEPROM2 region.		
B1.17	Load and dump the DBS DPU Functional and Operational Common Parameters: **TC_DPU_DBS_LOAD_COMMON_PAR** (HK_INIT_PER = 100 for DBS, PDU and OBC instead of default values) **TC_DPU_DBS_DUMP_PAR** **Note :** the rest of the parameters are set to default values as per last TC packet definition document applicable to DBS v1.3.0.0 [RD2]		
B1.18	Send the S/C TC to stop S20*: **SetService20State** (S20State = DISABLE) ***Note:*** *required for ADS configuration to avoid an error case which occurs when reseting the SpW link while S20 is active.* Reset DPU: **TC_DPU_RESET** And wait 10s, which is more than the time required by DBS to complete its initialization.		
B1.19	Send the S/C TC to stop S20: **SetService20State** (S20State = DISABLE) Send the S/C TC to synchronise the instrument time with the spacecraft Onboard Time (OBT): **TC ZCD00982:** • **PID (PCD09821) = 75** • **Period (PCD09822) = 0 (one-shot)** **Note :** in CNES configuration, this is performed by automatically sending **SC::EmitTimeUpdate(Occurences=1)**		OK
B1.20	Set period of DBS HK to 1s: **TC_DPU_UPDATE_HK_PERIOD**		
B1.21	Send an TC with illegal subtype (subtype = BOOT_LFR): **TC_DPU_BOOT_LFR**		
B1.22	Send a TC with illegal APID:		

STEP	DESCRIPTION	RESULTS	OK / NOK
	TC_LFR_CHECK_MEMORY		
B1.23	Perform a wrong DUMP (wrong address): **TC_DPU_DUMP_MEMORY**		
B1.24	Perform a wrong booting of DAS: **TC_DPU_BOOT_DAS**		
B1.25	Send the S/C TC to stop S20*: **SetService20State** (S20State = DISABLE) ***Note:*** *required for ADS configuration to avoid an error case which occurs when reseting the SpW link while S20 is active.* Reset due to watchdog: **TC_DPU_ENABLE_WATCHDOG** Wait 1s **TC_DPU_LOAD_MEMORY : to block DBS and trigger a WDG RESET** Wait 5s		
B1.26	Reset DPU: **TC_DPU_RESET** And wait 10s, which is more than the time required by DBS to complete its initialization. **Note :** since no TC_DPU_DBS_LOAD_COMMON_PAR is sent after reset, all parameters are set to default values as per last TC packet definition document applicable to DBS v1.3.0.0 [RD2]		
B1.27	Enable watchdog after DBS restart: **TC_DPU_ENABLE_WATCHDOG** Wait 1s		
B1.28	Send the S/C TC to stop S20: **SetService20State** (S20State = DISABLE) Send the S/C TC to synchronise the instrument time with the spacecraft Onboard Time (OBT): **TC ZCD00982:** • **PID (PCD09821) = 75** • **Period (PCD09822) = 0 (one-shot)**		OK

STEP	DESCRIPTION	RESULTS	OK / NOK
	Note : in CNES configuration, this is performed by automatically sending **SC::EmitTimeUpdate(Occurences=1)**		
B2	Load DAS and enter Standby Mode		
B2.1	Run script « SFT_Load_DAS »		
B2.2	**Check that the following test log has been generated:** **yyyy-mm-dd_SFT_Load_DAS**		OK
B2.3	Boot DAS to enter Stand-by mode: **TC_DPU_BOOT_DAS**		
B2.4	Wait 5s after boot DAS and then send the S/C TC to synchronise the instrument time with the spacecraft Onboard Time (OBT): **TC ZCD00982:** • **PID (PCD09821) = 75** • **Period (PCD09822) = 0 (one-shot)** **Note :** in CNES configuration, this is performed by automatically sending **SC::EmitTimeUpdate(Occurences=1)**		
B3	Enter Service Mode & configure RPW equipments		
B3.1	Run script « SFT_Service_Conf »		
B3.2	**Check that the following test log has been generated:** **yyyy-mm-dd_SFT_Service_Conf**		OK
B3.3	Clear all the counters and statistic information contained in the DAS HK reports: **TC_DPU_CLEAR_HK**		
B3.4	Enter Service Mode: **TC_DPU_ENTER_SERVICE**		
B3.5	Run script « SFT_DAS_Configuration » to: • Load the DAS DPU Functional and Operational Common Parameters: **TC_DPU_DAS_LOAD_COMMON_PAR**, **Note:** all parameters are set to default values as per last TC packet definition document [RD2] (except for SY_DPU_EQ_FAILURE_DELAY which is set to 30s, and SY_DPU_EQ_BOOT_TIMEOUT = 6000). • And dump them to ground : **TC_DPU_DAS_DUMP_PAR** • Load the parameters defining the structure of the		

STEP	DESCRIPTION	RESULTS	OK / NOK
	waveform science packets: **TC_DPU_LOAD_WAVEFORM_PAR** • Load the power FDIR configuration (*SCM and PA FDIR is set to DISABLED; if SCM/PA are installed, it will be enabled in script SFT_Switch_ON_Optional_Equipements*): **TC_DPU_LOAD_POWER_PAR** • Load the BIAS HV FDIR parameters: **TC_DPU_LOAD_BHV_PAR** • Load the temperature FDIR (*SCM and PA FDIR is set to DISABLED; if SCM/PA are installed, it will be enabled in script SFT_Switch_ON_Optional_Equipements*): **TC_DPU_LOAD_TEMP_PAR** • Load default S/C potential computation algorithm: **TC_DPU_LOAD_VSC_PAR** • Load default SUN distance value : **TC_DPU_LOAD_SUN_DISTANCE** • Load default parameters for SBM1 algorithm: **TC_DPU_LOAD_SBM1_PAR** • Load default parameters for SBM2 algorithm: **TC_DPU_LOAD_SBM2_PAR** (note: PER is set to 420s instead of 300s and ALGO = NONE instead of RPW) • Load default parameters for RWF mechanism: **TC_DPU_LOAD_RWF_PAR**		
B3.6	Run script « SFT_Configure_HK » to: • Set DAS, DAS statistics, BIAS and PDU HK period to 1s, • Set LFR, THR and TDS HK period to 4s, • Set OBC and S20 HK reports to 1s and • Enable the above HK reports.		
B3.7	Run script « SFT_Switch_ON_MEB_Equipements » to: • Switch ON LVPS-PDU converters #1 and #2 (converters for SCM PA, antennas PAs, analyzers and BIAS): **TC_DPU_SWITCH_ON_EQUIPMENT** (CP_DPU_SWITCH_ON_EQ = RPW_CONV_EID)		

STEP	DESCRIPTION	RESULTS	OK / NOK
	• Boot LFR, TDS and THR SW images from EEPROM: **TC_DPU_BOOT_LFR** **TC_DPU_BOOT_TDS** **TC_DPU_BOOT_THR** • Switch ON BIAS : **TC_DPU_SWITCH_ON_EQUIPMENT** (CP_DPU_SWITCH_ON_EQ = RPW_BIA_EID)		
B3.8	Run script « SFT_Switch_ON_SCM_PA_Equipements » **only if SCM and PA are present in the test set-up** to: • *Enable SCM and PA power/temperature FDIR*: **TC_DPU_LOAD_POWER_PAR** **TC_DPU_LOAD_TEMP_PAR** • Activate BIAS High Voltage (HV): **TC_DPU_SET_BIAS_MODE** **Note:** Setting HV will result on BIAS current consumption (BIAS_P5V_CURRENT and BIAS_M5V_CURRENT) • Set BIASx3 currents to 0A: **TC_DPU_SET_BIAS1, 2 & 3** **Note:** by default these currents are in fact set to 0 • Switch ON antennas PAs and SCM: **TC_DPU_SWITCH_ON_EQUIPMENT** (CP_DPU_SWITCH_ON_EQ = RPW_ANT1_EID, RPW_ANT2_EID, RPW_ANT3_EID, RPW_SCM_EID) • Configure BIAS: Enable BIASx3 (SET_RELAY_BIA = ENABLED), connect probes (SET_RELAY_SWITCH = NOT_SELECTED) and set gain to 5: **TC_DPU_SET_BIAS_RELAY** • Wait 10s		

STEP	DESCRIPTION	RESULTS	OK / NOK
	Verification of correct behavior of PA relays commanded by BIAS: • Set the three PA realys from PROBE to RESISTANCE: **TC_DPU_SET_BIAS_RELAY** • Set BIASx3 currents to 50 uA: **TC_DPU_SET_BIAS1, 2 & 3** • Wait 10s • Return to the original configuration (PA relays on PROBES and BIAS currents set to 0 A): **TC_DPU_SET_BIAS1, 2 & 3** **TC_DPU_SET_BIAS_RELAY** ***Note:*** *the objectif of this last four bullets is to set, through BIAS commands, the PA relays into the calibration resistance. Once there, the electric current is set to maximum. Expected values are verified in section F3. Finally, default values are set again (relays into PROBE and currents to 0 A).*		
B3.9	Configure TDS (call script « SFT_TDS_Configuration »): **TC_TDS_LOAD_COMMON_PAR** **TC_TDS_LOAD_NORMAL_PAR** **TC_TDS_LOAD_BURST_PAR** **TC_TDS_LOAD_LFM_PAR** **TC_TDS_LOAD_SBM1_PAR** **TC_TDS_LOAD_SBM2_PAR** **Note:** all parameters other than the following ones have been set to default values as per last TC packet definition document [RD2]: **SY_TDS_N_1D_HIST_PERIOD = 150** instead of 600 **SY_TDS_N_2D_HIST_PERIOD = 900** instead of 1800		

STEP	DESCRIPTION	RESULTS	OK / NOK
	SY_TDS_N_RS_DELAY_COARSE = 150 instead of 300 **SY_TDS_LFM_PS_CH4_B1 = True** (at least one component for the spectra needs to be selected if SY_TDS_LFM_PS is set to True; otherwise the TC_TDS_LOAD_LFM_PAR will be marked as EXE_INCONSISTENT) **SY_TDS_ALGO_MIN_AMP = 0** instead of 64 (required since no real stimuli is present at TDS input; if set to 64, the noise will not be enough and no TWF will be stored by TDS)		
B3.10	Configure LFR (call script « SFT_LFR_Configuration »): **TC_LFR_LOAD_COMMON_PAR** **TC_LFR_LOAD_NORMAL_PAR** **TC_LFR_LOAD_BURST_PAR** **TC_LFR _LOAD_SBM1_PAR** **TC_LFR _LOAD_SBM2_PAR** **Note:** all parameters are set to default values as per last TC packet definition document [RD2].		
B3.11	Configure THR (call script « SFT_THR_Configuration »): **TC_THR_LOAD_NORMAL_PAR_1** **TC_THR_LOAD_BURST_PAR_1** **TC_THR_LOAD_CALIBRATION_PAR** **Note:** see annex in section 11 for the details of TNR-HFR default configuration		
B4	Enter Science Mode with compression		
B4.1	Run script « SFT_Science_Modes_C »		
B4.2	**Check that the following test log has been generated:** **yyyy-mm-dd_SFT_Science_Modes_C**		OK
B4.3	Enable the compression of the waveform products: **TC_DPU_ENABLE_COMPRESSION**		
B4.4	Enter in the Science Survey Normal mode: **TC_DPU_ENTER_SURVEY_NORMAL**		
B4.5	Clear all the counters and statistic information contained in the DAS HK reports: **TC_DPU_CLEAR_HK**		
B4.6	Wait 10 seconds.		
B4.7	Enter in the Science SBM Detection mode:		

STEP	DESCRIPTION	RESULTS	OK / NOK
	TC_DPU_ENTER_SBM_DETECTION And activate BIAS calibration verification with a duration slightly below to that of DETECTION mode: **TC_DPU_START_BIAS_CALIB (235 s)**		
B4.8	Clear all the counters and statistic information contained in the DAS HK reports: **TC_DPU_CLEAR_HK**		
B4.9	Wait 2 minutes.		
B4.10	Dump 16 TDS snapshots (NORMAL mode) : **TC_TDS_DUMP_NORMAL_TSWF**		
B4.11	Wait 2 minutes.		
B4.12	Enter in the SBM1 DUMP mode : **TC_DPU_ENTER_SBM1_DUMP**		
B4.13	Clear all the counters and statistic information contained in the DAS HK reports: **TC_DPU_CLEAR_HK**		
B4.14	Wait 11 minutes.		
B4.15	Enter in the Science Survey Burst mode: **TC_DPU_ENTER_SURVEY_BURST**		
B4.16	Clear all the counters and statistic information contained in the DAS HK reports: **TC_DPU_CLEAR_HK**		
B4.17	Wait 3 minutes.		
B4.18	Enter in the Science SBM Detection mode: **TC_DPU_ENTER_SBM_DETECTION**		
B4.19	Wait 10 s		
B4.20	Enter in the SBM2 Acquisition mode: **TC_DPU_ENTER_SBM2_ACQ**		
B4.21	Clear all the counters and statistic information contained in the DAS HK reports: **TC_DPU_CLEAR_HK**		
B4.22	Wait 12 min. **Note:** DAS automatically request 48 snapshots to TDS after 7 minutes in SBM2 mode		
B4.23	Enter Service mode : **TC_DPU_ENTER_SERVICE**		
B4.24	Clear all the counters and statistic information contained in the DAS HK reports: **TC_DPU_CLEAR_HK**		
B4.25	Wait 1 minutes.		

STEP	DESCRIPTION	RESULTS	OK / NOK
B4.26	Enter in the Science Survey Backup mode: **TC_DPU_ENTER_SURVEY_BACKUP**		
B4.27	Wait 10 seconds.		
B4.28	Enter Service mode : **TC_DPU_ENTER_SERVICE**		
B4.29	Wait 10 seconds.		
B5	Enter Science Mode without compression		
B5.1	Run script « SFT_Science_Modes_NC »		
B5.2	**Check that the following test log has been generated:** **yyyy-mm-dd_SFT_Science_Modes_NC**		OK
B5.3	Disable the compression of the waveform products: **TC_DPU_DISABLE_COMPRESSION**		
B5.4	Enter in the Science Survey Normal mode: **TC_DPU_ENTER_SURVEY_NORMAL**		
B5.5	Clear all the counters and statistic information contained in the DAS HK reports: **TC_DPU_CLEAR_HK**		
B5.6	Wait 10 seconds.		
B5.7	Enter in the Science SBM Detection mode: **TC_DPU_ENTER_SBM_DETECTION**		
B5.8	Clear all the counters and statistic information contained in the DAS HK reports: **TC_DPU_CLEAR_HK**		
B5.9	Wait 1 minute.		
B5.10	Enter in the SBM1 DUMP mode : **TC_DPU_ENTER_SBM1_DUMP** Wait 3min Request 12 TDS snapshots: **TC_TDS_DUMP_SBM2_TSWF**		
B5.11	Clear all the counters and statistic information contained in the DAS HK reports: **TC_DPU_CLEAR_HK**		
B5.12	Wait 3 minutes.		
B5.13	Enter in the Science Survey Burst mode: **TC_DPU_ENTER_SURVEY_BURST**		
B5.14	Clear all the counters and statistic information contained in the DAS HK reports: **TC_DPU_CLEAR_HK**		
B5.15	Wait 3 minutes.		
B5.16	Enter in the Science SBM Detection mode: **TC_DPU_ENTER_SBM_DETECTION**		
B5.17	Wait 10 s		

STEP	DESCRIPTION	RESULTS	OK / NOK
B5.18	Enter in the SBM2 Acquisition mode: **TC_DPU_ENTER_SBM2_ACQ**		
B5.19	Clear all the counters and statistic information contained in the DAS HK reports: **TC_DPU_CLEAR_HK**		
B5.20	Wait 3 min Request 12 TDS snaptshots : **TC_TDS_DUMP_SBM2_TSWF** Wait 3 min		
B5.21	Enter Service mode : **TC_DPU_ENTER_SERVICE**		
B5.22	Clear all the counters and statistic information contained in the DAS HK reports: **TC_DPU_CLEAR_HK**		
B5.23	Wait 1 minutes.		
B5.24	Enter in the Science Survey Backup mode: **TC_DPU_ENTER_SURVEY_BACKUP**		
B5.25	Wait 10 seconds.		
B5.26	Enter Service mode : **TC_DPU_ENTER_SERVICE**		
B5.27	Wait 10 seconds.		
B6	Verification of TCs		
B6.1	Run script « SFT_Verification_TCs »		
B6.2	**Check that the following test log has been generated:** **yyyy-mm-dd_ SFT_Verification_TCs**		OK
B6.3	Send remaining TCs of LFR process for S/C interface verification purposes		
B6.4	Send remaining TCs of TDS process for S/C interface verification purposes		
B6.5	Send remaining TCs of THR process for S/C interface verification purposes		
B6.6	Send remaining TCs of BIAS for S/C interface verification purposes		
B6.7	Send remaining TCs of DPU process for S/C interface verification purposes		
B7	Test End (back to Safe Mode)		
B7.1	Run script « SFT_End » ***Note:*** *This scripts records some technical informations (system stack, task stack, task queues) and returns to Safe Mode*		
B7.2	**Check that the following test log has been generated:** **yyyy-mm-dd_SFT_End**		OK
B7.3	Run script « SFT_Dump_Stacks_Queues » to dump stacks and queues		

STEP	DESCRIPTION	RESULTS	OK / NOK
B7.4	**Clean state:** send the following configuration TCs to set modified parameters to default values: **TC_DPU_DAS_LOAD_COMMON_PAR** **TC_DPU_LOAD_POWER_PAR** **TC_DPU_LOAD_TEMP_PAR** **TC_DPU_LOAD_SBM2_PAR** **Please note:** the rest of configuration TCs have been sent using parameter values as per last TC packet definition. Thus it is not need to re-send them with default values here		
B7.5	Enter in the Standby mode: **TC_DPU_ENTER_STANDBY**		
B7.6	Test the execution of the following TCs: **TC_LFR_LOAD_MEMORY** **TC_TDS_LOAD_MEMORY** **TC_THR_LOAD_MEMORY** **Note:** To avoid any risk, these TCs are sent once the three analysers are OFF (DPU in STANDBY mode).		
B7.7	Send the S/C TC to stop S20*: **SetService20State** (S20State = DISABLE) ***Note:*** *required for ADS configuration to avoid an error case which occurs when reseting the SpW link while S20 is active.* Enter the RPW Safe mode by reseting the DPU: **TC_DPU_RESET** And wait at least 10s, which is more than the time required by DBS to complete its initialization. DBS clean state: Send **TC_DPU_DBS_LOAD_COMMON_PAR** with default values		
B7.8	Send the S/C TC to stop S20: **SetService20State** (S20State = DISABLE) Send the S/C TC to synchronise the instrument time with the spacecraft Onboard Time (OBT): **TC ZCD00982:** • **PID (PCD09821) = 75** • **Period (PCD09822) = 0 (one-shot)** **Note :** in CNES configuration, this is performed by automatically sending **SC::EmitTimeUpdate(Occurences=1)**		OK
B7.9	Set period of DBS HK to 1s: **TC_DPU_UPDATE_HK_PERIOD**		

STEP	DESCRIPTION	RESULTS	OK / NOK
	Wait 5s		
C	Switch to MEB redundant chain *Important: to be performed only for MEB models that implement redundancy (i.e. from EM2 on)*		
C1	Send the S/C TC to switch OFF main chain of RPW: **TC ZCSD1193:** • **PCSB0036 = UNIT_A** ***Note:*** *The power down function contains the command to stop the distribution of Service 20 to the instrument, such that no separate command to stop Service 20 is necessary.*		OK
C.2	Switch SpaceWire connection to redundant: • In CNES configuration: send **RACK_LINK_SPW_TO(RED)** if MEB connected to SGSE Stimuli, or **SwitchSpacewireFrontend (AUX)** if MEB connected to SC simulator. • In ADS configuration: send SC TC equivalent to **SwitchSpacewireFrontend (AUX)**		OK
C3	Send the S/C TC to switch ON redundant RPW chain: **TC ZCSD1192:** • **Parameter PCSB0036 = UNIT_B**		OK
C4	Wait at least 4s, which is the time required by DBS to complete its initialization. Check Power Consumption in CNES configuration: **I_28V = 160 mA +/- 10%**		OK
C5	Check HKTM acquisition on SGSE / Airbus DS acquisition system.		OK
C6	Send the S/C TC to start the transmission of service 20 (information distribution) to the instrument: TC ZCD2Z015 : Period (PCD14012) = 8 (i.e. 8 * 125 ms = 1 s)		OK
D	Script execution on redundant chain		
D1	Note down test log ID for redundant part	2017-05-24_run9	OK
D2	Run script « **SFT_Load_DBS_RED** » **Note:** same test than the one run on DBS in the nominal		

STEP	DESCRIPTION	RESULTS	OK / NOK
	chain		
D3	Run script « **SFT_Load_DAS_EEPROM2** » **Note:** In addition, DAS is loaded from region 2 of EEPROM during this part of the SFT		
D4	Run script « **SFT_Service_Conf_RED** » **Note:** no test on BIAS realys is performed here since already done for nominal chain		
D5	Run script « **SFT_DETECTION_Mode_C** » **Note:** 10 sec in NORMAL mode + 1min in DETECTION mode + 10s in SERVICE mode. Compression is activated		
D6	Run script « **SFT_End_RED** » **Note:** same test than the one run in nominal chain		
E	MEB Switch OFF		
E1	Send the S/C TC to switch OFF redundant chain of RPW: **TC ZCSD1193:** • **PCSB0036 = UNIT_B (important: UNIT_A if steps C/D have not been performed)** **Note:** The power down function contains the command to stop the distribution of Service 20 to the instrument, such that no separate command to stop Service 20 is necessary.		
F1	Assert Check: Loading and short testing of DBS		
F1.1	**Run "SFT_1_Load_DBS"**		OK
F1.2	Initial Start: A low severity error is received that indicates a reset of DPU: **Count(TM_DPU_EVENT_LE_DPU_RESET) != 0** Verify reception of DBS readiness report: **Count(TM_DPU_EVENT_PR_DBS_BOOT) != 0** A telemetry transmission of monitoring data to OBC has been sent: **Count(TM_DPU_DBS_HK) != 0** S/C SpaceWire interface status is enabled: **HK_DPU_SC_SPW_ENABLED = ENABLED** S/C SpaceWire interface link is running:		OK

STEP	DESCRIPTION	RESULTS	OK / NOK
	HK_DPU_SC_SPW_LINK_STATE = RUN Nominal DPU is selected: **HK_DPU_UNIT = NOMINAL** Confirm the correct operation of the load converter for 1.9V SRAM core supply voltage: **HK_DPU_SRAM_POL_PG = OK** Confirm that EEPROM is ready: **HK_DPU_EEPROM_READY_BUSY = READY** Confirm that EEPROM HW reset is active: **HK_DPU_EEPROM_HW_RESET = ACTIVE** Check DBS SW version is 1.3.0.0: **SY_DPU_DBS_SW_VERSION_N1=1** **SY_DPU_DBS_SW_VERSION_N2=3** **SY_DPU_DBS_SW_VERSION_N2=0** **SY_DPU_DBS_SW_VERSION_N2=0**		
F1.3	Verify test connection: **Count(TM_DPU_LINK_CONNECTION_REPORT) != 0**		OK
F1.4	Verify periods HK = 1s (8 * 8 Hz): **Count(TM_DPU_DBS_PARAMETER_DUMP) = 1** **SY_DPU_DBS_HK_GEN_PER = 8** **SY_DPU_PDU_HK_GEN_PER = 8** **SY_DPU_OBC_HK_GEN_PER = 8**		OK
F1.5	Verify HK reports have been disabled: **Count(TM_DPU_DBS_PARAMETER_DUMP) = 2** **SY_DPU_DBS_HK_ENABLED = 0** **SY_DPU_PDU_HK_ENABLED = 0** **SY_DPU_OBC_HK_ENABLED = 0**		OK
F1.6	Verify HK reports have been enabled: **Count(TM_DPU_DBS_PARAMETER_DUMP) = 3** **SY_DPU_DBS_HK_ENABLED = 1** **SY_DPU_PDU_HK_ENABLED = 1**		OK

STEP	DESCRIPTION	RESULTS	OK / NOK
	SY_DPU_OBC_HK_ENABLED = 1		
F1.7	Verify that events are disabled: **Count(TM_DPU_EVENT_ME_DPU_BOOT) = 0**		OK
F1.8	Verify that events are enabled: **Count(TM_DPU_EVENT_ME_DPU_BOOT) = 1**		OK
F1.9	Verify WATCHDOG has been enabled: **HK_DPU_WATCHDOG_ENABLED = 1**		OK
F1.10	Verify WATCHDOG has been disabled: **HK_DPU_WATCHDOG_ENABLED = 0**		OK
F1.11	Verify that dumped TM packet from RAM matches loaded one: **PA_RPW_START_ADDR_DUMP = 1074004032** **PA_RPW_BLK_LEN_DUMP = 16** **SOURCE_DATA [0 to 15] = *16 loaded bytes***		OK
F1.12	Verify that dumped TM packet from EEPROM matches loaded one: **PA_RPW_START_ADDR_DUMP = 272628736** **PA_RPW_BLK_LEN_DUMP = 16** **SOURCE_DATA [0 to 15] = *16 loaded bytes***		OK
F1.13	Verify the dump of a large EEPROM memory block (25 EEPROM dump packets are required to download 100000 Bytes): **Count(TM_DPU_MEMORY_DUMP_EEPROM) = 25**		OK
F1.14	Verify the dump of a large RAM memory block (25 RAM dump packets are required to download 100000 Bytes): **Count(TM_DPU_MEMORY_DUMP_RAM) = 25**		OK
F1.15	Verify the dump of a large PROM memory block (3 PROM dump packets are required to download 10000 Bytes): **Count(TM_DPU_MEMORY_DUMP_PROM) = 3**		OK
F1.16	Verify the dump of 64 bytes of REGISTER memory block (1 REGISTER dump packet is required to download 64 Bytes): **Count(TM_DPU_MEMORY_DUMP_REGISTER) = 1**		OK
F1.17	Check the whole PROM memory by comparing the CRC of its		OK

STEP	DESCRIPTION	RESULTS	OK / NOK
	lower and higher parts to expected value [RD5]: **Count(TM_DPU_MEMORY_CHECK) = 1** **PA_RPW_CRC_CHECK = 58981** **Count(TM_DPU_MEMORY_CHECK) = 2** **PA_RPW_CRC_CHECK = 30682**		
F1.18	Check EEPROM 1 and 2 memory regions (DAS 3.6.0.4 size = 1075804 bytes; CRC of first 1000000 bytes = 16502 and CRC of last 75804 bytes is 32906): • DAS EEPROM region 1: **Count(TM_DPU_MEMORY_CHECK) = 3** **PA_RPW_CRC_CHECK = 16502** **Count(TM_DPU_MEMORY_CHECK) = 4** **PA_RPW_CRC_CHECK = 32906** • DAS EEPROM region 2: **Count(TM_DPU_MEMORY_CHECK) = 5** **PA_RPW_CRC_CHECK = 16502** **Count(TM_DPU_MEMORY_CHECK) = 6** **PA_RPW_CRC_CHECK = 32906**		OK
F1.19	Verify modified parameters: **Count(TM_DPU_DBS_PARAMETER_DUMP) = 2** **SY_DPU_DBS_HK_INIT_PER = 100** **SY_DPU_PDU_HK_INIT_PER = 100** **SY_DPU_OBC_HK_INIT_PER = 100**		OK
F1.20	**Anomaly check nr. 1:** verify anomaly counters and last received error since last reset: **HK_DPU_LE_CNT = 1** (due to Reset) **HK_DPU_ME_CNT = 2** (due to 2 wrong TCs) **HK_DPU_HE_CNT = 0** **HK_DPU_LAST_ER_RID = ME_DPU_BOOT**		OK
F1.21	Verify that DBS is reset by TC: **Count(TM_DPU_EVENT_LE_DPU_RESET) = 1** **Count(TM_DPU_EVENT_PR_DBS_BOOT) = 1**		OK

STEP	DESCRIPTION	RESULTS	OK / NOK
	HK_DPU_RESET_CAUSE = 2		
F1.22	Verify that a TM_DPU_TC_ACC_ILLEGAL_SUBTYPE packet is received after TC_DPU_BOOT_LFR: **Count(TM_DPU_TC_ACC_ILLEGAL_SUBTYPE) = 1** **PA_RPW_TC_SUBTYPE = 13**		OK
F1.23	Verify that a TM_DPU_TC_ACC_ILLEGAL_APID is received after TC_LFR_CHECK_MEMORY: **Count(TM_DPU_TC_ACC_ILLEGAL_APID) = 1** **PA_RPW_TC_SERVICE = 6** **PA_RPW_TC_SUBTYPE = 9**		OK
F1.24	Verify that a TM_DPU_TC_EXE_INCONSISTENT packet is received after wrong TC_DPU_DUMP_MEMORY: **Count(TM_DPU_TC_EXE_INCONSISTENT) = 1** **PA_RPW_TC_SERVICE = 6** **PA_RPW_TC_SUBTYPE = 5**		OK
F1.25	Verify that a TM_DPU_TC_EXE_ERROR packet is received after trying a wrong boot of DAS: **Count(TM_DPU_TC_EXE_ERROR) = 1** **PA_RPW_TC_SERVICE = 180** **PA_RPW_TC_SUBTYPE = 11**		OK
F1.26	**Anomaly check nr. 2:** verify anomaly counters and last received error since last reset: **HK_DPU_LE_CNT DPU = 1** (due to Reset) **HK_DPU_ME_CNT = 1** (due to wrong TC_DPU_BOOT_DAS) **HK_DPU_HE_CNT = 0** **HK_DPU_LAST_ER_RID = ME_DPU_BOOT**		OK
F1.27	Verify that the watchdog has triggered a reset: **Count(TM_DPU_EVENT_HE_DPU_RESET) != 0** **HK_DPU_RESET_CAUSE = 3**		OK
F1.28	Verify that DBS follows a regular: **Count(TM_DPU_EVENT_LE_DPU_RESET) != 0** **Count(TM_DPU_EVENT_PR_DBS_BOOT) != 0**		OK
F2	Assert Check: Loading of DAS (HK TM)		

STEP	DESCRIPTION	RESULTS	OK / NOK
F2.1	Run "SFT_2_Load_DAS_Assert.xml"		OK
F2.2	A DAS boot readiness report is received: **Count(TM_DPU_EVENT_PR_DAS_BOOT) != 0**		OK
F2.3	A DAS Housekeeping parameter report is received: **Count(TM_DPU_DAS_HK)!=0**		OK
F2.4	Check that STANDBY mode has been entered: **HK_DPU_MODE = DPU_STANDBY**		OK
F2.5	Heart beat status of PDU: **HK_DPU_PDU_HEART_BEAT = ALIVE**		OK
F2.6	Check status of SpaceWire interfaces with S/C and analyzers: **HK_DPU_SC_SPW_ENABLED = ENABLED** **HK_DPU_SC_SPW_LINK_STATE = RUN** **HK_DPU_LFR_SPW_ENABLED = DISABLED** **HK_DPU_LFR_SPW_LINK_STATE = READY** **HK_DPU_THR_SPW_ENABLED = DISABLED** **HK_DPU_THR_SPW_LINK_STATE = READY** **HK_DPU_TDS_SPW_ENABLED = DISABLED** **HK_DPU_TDS_SPW_LINK_STATE = READY**		OK
F2.7	Check status of SiS interfaces with BIAS and PDU: **HK_DPU_BIA_SIS_LINK_STATE = OK** **HK_BIA_LINK_ERR_FLAG = NO_ERROR** **HK_DPU_PDU_SIS_LINK_STATE = OK** **HK_PDU_LINK_ERR_FLAG = NO_ERROR**		OK
F2.8	Check OFF status for all equipments: **HK_PDU_SCM_ON_OFF = OFF** **HK_PDU_ANT3_ON_OFF = OFF** **HK_PDU_ANT2_ON_OFF = OFF** **HK_PDU_ANT1_ON_OFF = OFF** **HK_PDU_THR_ON_OFF = OFF** **HK_PDU_TDS_ON_OFF = OFF** **HK_PDU_LFR_ON_OFF = OFF** **HK_PDU_BIAS_ON_OFF = OFF**		OK
F2.9	Check DAS SW version:		OK

STEP	DESCRIPTION	RESULTS	OK / NOK
	SY_DPU_ DAS _SW_VERSION_N1=3 **SY_DPU_ DAS _SW_VERSION_N2=6** **SY_DPU_ DAS _SW_VERSION_N2=0** **SY_DPU_ DAS _SW_VERSION_N2=4**		
F2.10	Check that the DAS time is synchronized: **HK_DPU_TIME_SYNC_FLAG = NO_ERROR**		OK
F2.11	**Anomaly check nr. 3:** verify anomaly counters and last received error: **HK_DPU_LE_CNT DPU = 0** **HK_DPU_ME_CNT = 0** **HK_DPU_HE_CNT = 0** **HK_DPU_LAST_ER_RID = NO_ERROR**		OK
F3	Assert Check: Service Mode and configuration of equipments (HK TM)		
F3.1	Run "SFT_3_Service_Conf"		OK
F3.2	Verify that DAS configuration TCs have been properly executed: **Total count (TM_DPU_TC_EXE_SUCCESS) = 13**		OK
F3.3	Verify that BIAS has properly been switched ON: **HK_DPU_BIA_SIS_LINK_STATE = OK** **Count(TM_DPU_BIA_HK) != 0** **HK_DPU_BIA_HEART_BEAT = ALIVE**		OK
F3.4	Firstly, and **ONLY IF SCM and PA ARE INSTALLED**, verify that relays are set to the RESISTOR position (bypassing the probes) and that voltage and current values are in the below ranges: **HK_BIA_BIAS1, 2, 3 = [45, 55] uA** **HK_BIA_M1, 2, 3= [33, 45] V** **HK_BIA_MODE_BYPASS_PROBE1, 2, 3 = ENABLED** Secondly, verify that relays are correctly retourned to the PROBE position and that voltage and currents are set to 0: **HK_BIA_BIAS1, 2, 3 = 0 uA** **HK_BIA_M1, 2, 3= 0 V**		OK

STEP	DESCRIPTION	RESULTS	OK / NOK
	HK_BIA_MODE_BYPASS_PROBE1, 2, 3 = DISABLED		
F3.5	Verify that LFR FSW has properly been loaded: **Count(TM_DPU_EVENT_PR_LFR_BOOT) != 0** **Count(TM_LFR_HK) != 0** **HK_DPU_LFR_SPW_ENABLED = ENABLED** **HK_DPU_LFR_HEART_BEAT = ALIVE** **SY_DPU_ LFR _SW_VERSION_N1=3** **SY_DPU_ LFR _SW_VERSION_N2=2** **SY_DPU_ LFR _SW_VERSION_N2=0** **SY_DPU_ LFR _SW_VERSION_N2=15**		OK
F3.6	Verify that TDS FSW has properly been loaded: **Count(TM_DPU_EVENT_PR_TDS_BOOT) != 0** **Count(TM_TDS_HK) != 0** **HK_DPU_TDS_SPW_ENABLED = ENABLED** **HK_DPU_TDS_HEART_BEAT = ALIVE** **SY_DPU_ TDS _SW_VERSION_N1=3** **SY_DPU_ TDS _SW_VERSION_N2=2** **SY_DPU_ TDS _SW_VERSION_N2=2** **SY_DPU_ TDS _SW_VERSION_N2=0**		OK
F3.7	Verify that THR FSW has properly been loaded: **Count(TM_DPU_EVENT_PR_THR_BOOT) != 0** **Count(TM_THR_HK) != 0** **HK_DPU_THR_SPW_ENABLED = ENABLED** **HK_DPU_HFR_HEART_BEAT = ALIVE** **SY_DPU_ THR _SW_VERSION_N1=3** **SY_DPU_ THR _SW_VERSION_N2=6** **SY_DPU_ THR _SW_VERSION_N2=0** **SY_DPU_ THR _SW_VERSION_N2=0**		OK
F4	Assert Check : Science Modes in nominal chain with compression mechanism (Science TM)		
F4.0	**Remark:** This table contains the expected values of TM counters. This section (F4) will verify each received counter against the values presented in this table.		

STEP	DESCRIPTION	RESULTS	OK / NOK

Mode:	NORMAL	DETECTION (1/2)*	SBM1	BURST	DETECTION (2/2)	SBM2**	SERVICE (1/2)	BACKUP	SERVICE (2/2)
Duration (s):	10	240	660	180	10	720	60	10	10
HK_DPU_TM_SCIENCE_CNT		4	2	0		0	0		
HK_LFR_TM_SCIENCE_CNT		222	673	570		708	0		
HK_TDS_TM_SCIENCE_CNT		558	97	38		100	0		
HK_THR_TM_SCIENCE_CNT		4	13	18		14	0		
HK_LFR_SBM_TM_SCIENCE_CNT		0	4126	0		2277	0		
HK_TDS_SBM_TM_SCIENCE_CNT		0	720	0		1584	0		
HK_DPU_TM_HK_CNT		960	2640	720		2880	240		
HK_DPU_OBC_TM_HK_CNT		240	660	180		720	60		
HK_DPU_S20_TM_HK_CNT		240	660	180		720	60		
HK_LFR_TM_HK_CNT		60	165	45		180	15		
HK_TDS_TM_HK_CNT		60	165	45		180	15		
HK_THR_TM_HK_CNT		60	165	45		180	15		

F4.1	Run "SFT_4_Science_Modes_NC"		OK
F4.2	**Anomaly check nr. 4:** LE/ME/HE counters = 0 and "NO_ERROR" Check that NORMAL mode has been entered: **HK_DPU_MODE = DPU_SVY_NORMAL**		OK
F4.3	**Anomaly check nr. 5:** LE/ME/HE counters = 0 and "NO_ERROR" Check that DETECTION mode has been entered: **HK_DPU_MODE = DPU_SBM_DET** Check the number of scientific and HK packets in DETECTION mode: **column DETEC 1/2 of table in section F4.0** Check that BIAS calibration has generated the expected TM: **Count (TM_DPU_SCIENCE_BIAS_CALIB_C) > 0** **Count (TM_DPU_EVENT_PR_BIA_CALIB) > 1** **PA_DPU_BIA_CALIB_PR_CODE = END_CALID**		OK

STEP	DESCRIPTION	RESULTS	OK / NOK
F4.4	Check that SBM1 mode has been entered: **HK_DPU_MODE = DPU_SBM1_DUMP** **Anomaly check nr. 6:** LE/ME/HE counters = 0 and "NO_ERROR" Check that DETECTION mode has been entered after SBM1 mode is automatically ended: **HK_DPU_MODE = DPU_SBM_DET** Check the number of scientific and HK packets received in DETECTION mode after SBM1 mode: **column SBM1 of table in section F4.0**		OK
F4.5	**Anomaly check nr. 7:** LE/ME/HE counters = 0 and "NO_ERROR" Check that BURST mode has been entered: **HK_DPU_MODE = DPU_SVY_BURST** Check the number of scientific and HK packets in BURST mode: **column BURST of table in section F4.0**		OK
F4.6	Check that DETECTION mode has been entered: **HK_DPU_MODE = DPU_SBM_DET**		OK
F4.7	**Anomaly check nr. 8:** LE/ME/HE counters = 0 and "NO_ERROR" Check that SBM2 mode has been entered: **HK_DPU_MODE = DPU_SBM2_ACQ** Check the number of scientific and HK packets in SBM2 mode: **column SBM2 of table in section F4.0**		OK
F4.8	**Anomaly check nr. 9:** LE/ME/HE counters = 0 and "NO_ERROR" Check that SERVICE mode has been entered: **HK_DPU_MODE = DPU_SERVICE** Check the number of scientific packets in SERVICE mode: **column SERVICE 1/2 of table in section F4.0**		OK
F4.9	Check that BACKUP mode has been entered: **HK_DPU_MODE = DPU_SVY_BACKUP**		OK
F4.10	Check that SERVICE mode has been entered: **HK_DPU_MODE = DPU_SERVICE**		OK
F5	Assert Check: Science Modes in redundant chain without compression mechanism (Science TM)		
F5.0	**Remark:** This table contains the expected values of TM counters. This section (F5) will verify each received counter against the values presented in this table.		

STEP	DESCRIPTION	RESULTS	OK / NOK

Mode:	NORMAL	DETECTION (1/2)*	SBM1	BURST	DETECTION (2/2)	SBM2**	SERVICE (1/2)	BACKUP	SERVICE (2/2)
Duration (s):	10	60	180	180	10	360	60	10	10
HK_DPU_TM_SCIENCE_CNT		0	0	0		0	0		
HK_LFR_TM_SCIENCE_CNT		56	167	570		354	0		
HK_TDS_TM_SCIENCE_CNT		5	27	38		50	0		
HK_THR_TM_SCIENCE_CNT		1	3	18		6	0		
HK_LFR_SBM_TM_SCIENCE_CNT		0	1031	0		1138	0		
HK_TDS_SBM_TM_SCIENCE_CNT		0	180	0		396	0		
HK_DPU_TM_HK_CNT		240	720	720		1440	240		
HK_DPU_OBC_TM_HK_CNT		60	180	180		360	60		
HK_DPU_S20_TM_HK_CNT		60	180	180		360	60		
HK_LFR_TM_HK_CNT		15	45	45		90	15		
HK_TDS_TM_HK_CNT		15	45	45		90	15		
HK_THR_TM_HK_CNT		15	45	45		90	15		

F5.1	Run "SFT_5_Science_Modes_C"		OK
F5.2	**Anomaly check nr. 10:** LE/ME/HE counters = 0 and "NO_ERROR" Check that NORMAL mode has been entered: **HK_DPU_MODE = DPU_SVY_NORMAL**		OK
F5.3	**Anomaly check nr. 11:** LE/ME/HE counters = 0 and "NO_ERROR" Check that DETECTION mode has been entered: **HK_DPU_MODE = DPU_SBM_DET** Check the number of scientific and HK packets in DETECTION mode: **column DETEC 1/2 of table in section F5.0**		OK
F5.4	Check that SBM1 mode has been entered: **HK_DPU_MODE = DPU_SBM1_DUMP** **Anomaly check nr. 12:** LE/ME/HE counters = 0 and "NO_ERROR" Check that DETECTION mode has been entered after SBM1 mode is automatically ended: **HK_DPU_MODE = DPU_SBM_DET**		OK

STEP	DESCRIPTION	RESULTS	OK / NOK
	Check the number of scientific and HK packets received in DETECTION mode after SBM1 mode: **column SBM1 of table in section F5.0**		
F5.5	**Anomaly check nr. 13:** LE/ME/HE counters = 0 and "NO_ERROR" Check that BURST mode has been entered: **HK_DPU_MODE = DPU_SVY_BURST** Check the number of scientific and HK packets in BURST mode: **column BURST of table in section F5.0**		OK
F5.6	Check that DETECTION mode has been entered: **HK_DPU_MODE = DPU_SBM_DET**		OK
F5.7	**Anomaly check nr. 14:** LE/ME/HE counters = 0 and "NO_ERROR" Check that SBM2 mode has been entered: **HK_DPU_MODE = DPU_SBM2_ACQ** Check the number of scientific and HK packets received in SBM2 mode: **column SBM2 of table in section F5.0**		OK
F5.8	**Anomaly check nr. 15:** LE/ME/HE counters = 0 and "NO_ERROR" Check that SERVICE mode has been entered: **HK_DPU_MODE = DPU_SERVICE** Check the number of scientific and HK packets received in SERVICE mode: **column SERVICE 1/2 of table in section F5.0**		OK
F5.9	Check that BACKUP mode has been entered: **HK_DPU_MODE = DPU_SVY_BACKUP**		OK
F5.10	Check that SERVICE mode has been entered: **HK_DPU_MODE = DPU_SERVICE**		OK
F6	Assert Check: Verification remaining TCs		
F6.1	**Run "SFT_6_Verification_TCs_Asserts.xml"**		OK
F6.2	Verify LFR TCs		OK
F6.3	Verify TDS TCs		OK
F6.4	Verify THR TCs		OK
F6.5	Verify BIAS TCs		OK
F6.6	Verify DPU TCs		OK
F7	Assert Check: Test End (HK TM)		

STEP	DESCRIPTION	RESULTS	OK / NOK
F7.1	Run "SFT_7_End_Asserts.xml"		OK
F7.2	Check that the total number of received TM_DPU_MEMORY_DUMP_RAM packets is 131. This is the addition of 33 packets corresponding to first memory dump (cf. step 6.3: CP_RPW_BLK_LEN_DUMP / PA_RPW_BLK_LEN_DUMP) plus 98 packets corresponding to the dump stacks queues script (cf. step 6.4): **HK_DPU_TM_DUMP_CNT = 131**		OK
F7.3	Check that DAS Mode is STAND-BY: **HK_DPU_MODE = DPU_STANDBY**		OK
F7.4	Check that the TC_XXX_LOAD_MEMORY (for XXX = LFR, TDS and THR) are rejected		OK
F7.5	**Anomaly check nr. 16:** LE/ME/HE counters = 0 and "NO_ERROR"		OK
F7.6	Check that DPU is in SAFE Mode (DBS only mode) after sending TC_DPU_RESET: **HK_DPU_MODE = DPU_SAFE**		OK
F8	Assert Check: Redundant chain		
F8.1	Verify **Loading of DBS** **Note:** same checks than F1		OK
F8.2	Verify **Loading of DAS** (from EEPROM 2) **Note:** same checks than F2		OK
F8.3	Verify **SERVICE mode** **Note:** similar checks than F3 (no verification needed for BIAS relays)		OK
F8.4	Verify **DETECTION mode**		OK
F8.5	Verfiy **Test End** **Note:** same checks than F7		OK
G	SFT RESULT		
G1	Verify steps B1 & F1 (correct loading and testing of **DBS**): Success =82/82	Success =82/ 82 Failures = 0/ 82 Invalid = 0/ 82 Untested = 0/82	OK
G2	Verify steps B2 & F2 (correct loading of **DAS** and entering in Standby Mode):	Success =33/33	OK

STEP	DESCRIPTION	RESULTS	OK / NOK
	Success = 33/33	Failures = 0/33 Invalid = 0/33 Untested = 0/33	
G3	Verify steps B3 & F3 (configuration of equipments in **Service Mode**): Success = 54/54 (if SCM and PA are installed) Success = 45/54 and Untested = 9/54 (if SCM and PA are not installed	Success =54/54 Failures = 0/54 Invalid = 0/54 Untested = 0/54	OK
G4	Verify steps B4 & F4 (RPW nominal chain performance throughout **scientific modes with compression**): Success = 97/97	Success =97/97 Failures = _/97 Invalid = _/97 Untested = _/97	OK
G5	Verify steps B5 &F5 (RPW performance throughout **scientific modes without compression**): Success = 94/94	Success = 94/94 Failures = 0/94 Invalid = 0/94 Untested = 0/94	OK
G6	Verify steps B6 & F6 (**verification of remaining TCs**) Success = 60/60	Success = 60/60 Failures = 0/60 Invalid = 0/60 Untested = 0/60	OK
G7	Verify steps B7 & F7 (**end sequence** of DPU): Success = 10/10	Success = 10/10 Failures = 0/10 Invalid = 0/10 Untested = 0/10	OK
G8	Verify steps D & F8 (**redundant** chain): Success = 194/194	Success = 194/194 Failures = 0/194 Invalid = 0/194 Untested = 0/194	OK
G9	**Conclusion:** Verify steps G1 to G8		OK

7 TEST CONCLUSION

Please refer to step G9 of §6 to get the result of a particular run of SFT.

8 ANNEX 1: RPW OPERATIONAL MODES OVERVIEW

8.1 INTRODUCTION

The present information is an extract from “Software System Specification” (RD1).

The diagrams below give a description of the RPW software modes:

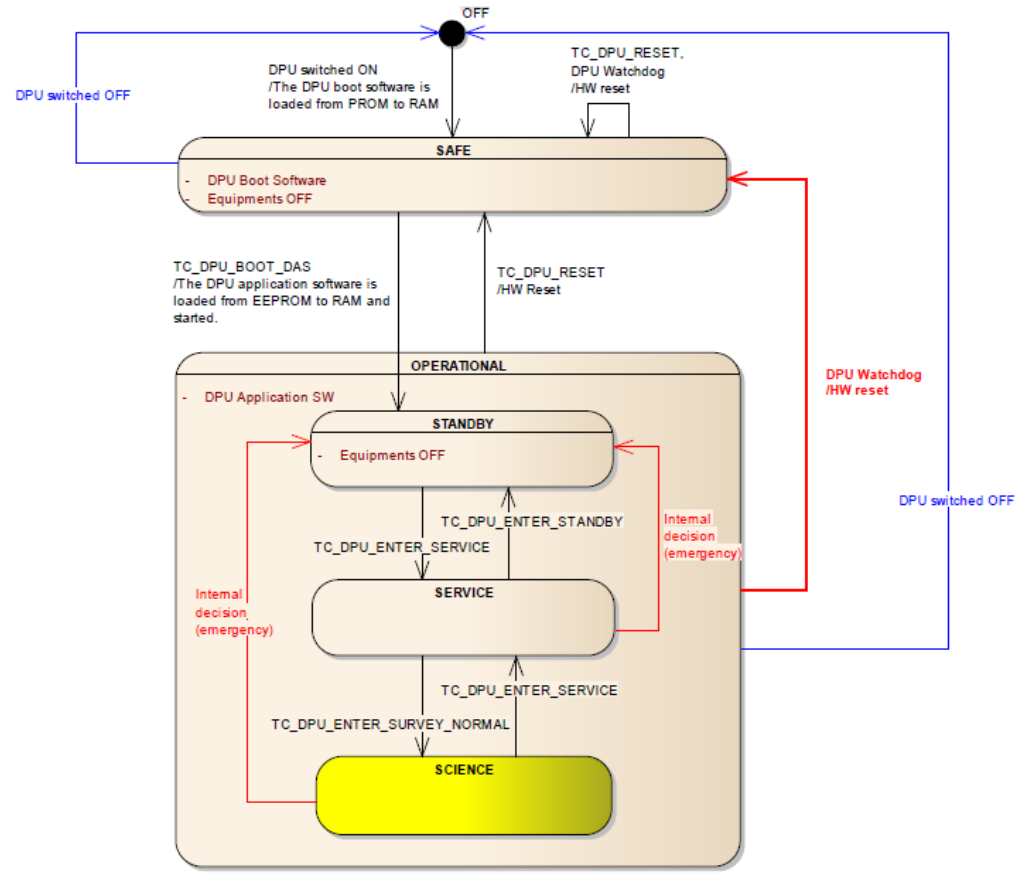


Figure 1: Overview of the RPW Software mode

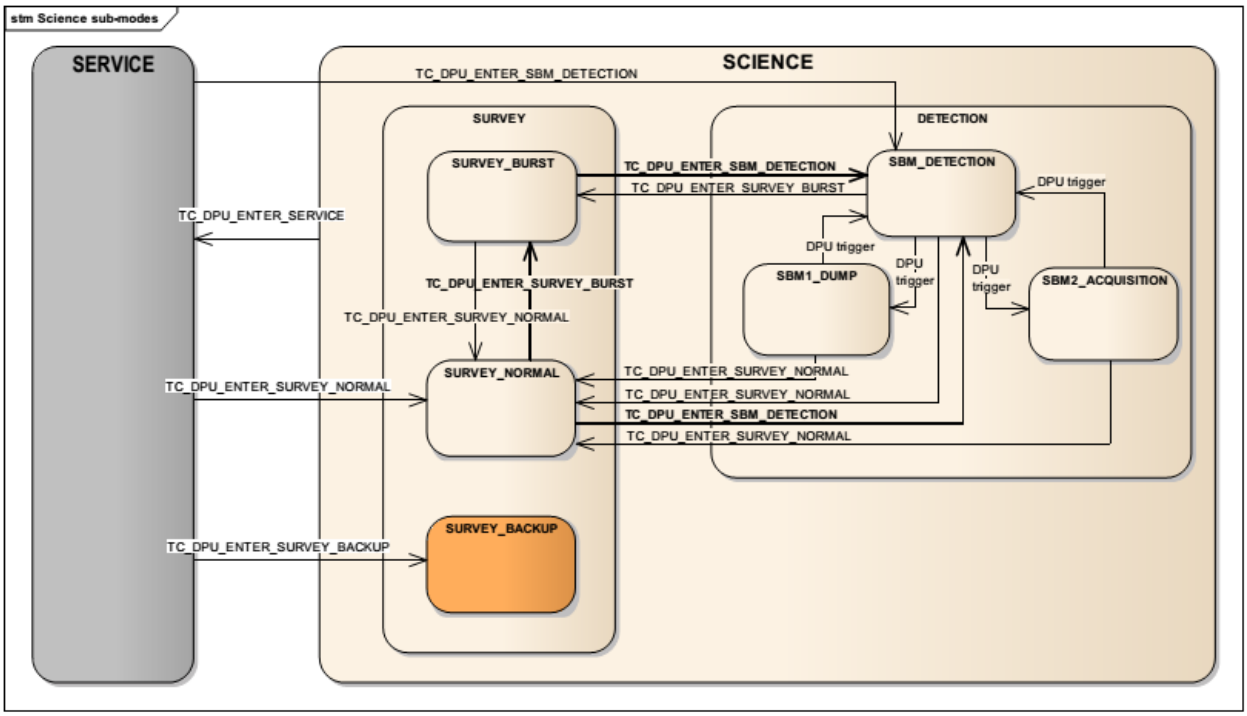


Figure 2: DPU SCIENCE mode state chart.

These RPW software modes are managed by the DPU Software. For their part, the RPW analysers shall manage the following modes:

- A STANDBY mode: a mode where no scientific measurements are performed,
- A SCIENCE mode: a mode itself decomposed in four sub-modes: NORMAL mode, BURST mode, SBM1 mode, SBM2 mode.

8.2 SAFE MODE

After power-on or a reset (commanded by TC or triggered by the watchdog), the RPW experiment shall go to the SAFE mode. In this mode:

- The DPU and PDU are switched on.
- The active DPU flight software is the boot software (DBS).
- The Bias Unit, the three receivers (TNR-HFR, TDS, LFR), the ANT PA and the SCM PA are switched off.
- There is no communication between the DPU and RPW equipments excepting the PDU.
- No science TM is generated.
- The DPU communicates with the PDU and periodically acquires its HK (status, currents of the RPW equipments, temperatures).
- All the operations concerning the DPU application software maintenance (code upload, etc.) can be performed in this mode.

The transition to the OPERATIONAL mode shall be done upon a RPW TC (TC_DPU_BOOT_DAS). This TC commands the deployment in the working memory of the DPU application software (DAS) and its starting.

8.3 OPERATIONAL MODE

In the OPERATIONAL mode, the running DPU flight software shall be the DAS. The OPERATIONAL mode shall be decomposed in three sub-modes:

- The STANDBY mode,
- The SERVICE mode,
- The SCIENCE mode.

8.3.1 STANDBY MODE

After being initialized, the DAS shall enter in the STANDBY mode. This mode shall be the “safe” mode of the DPU Application Software in which only the DPU and the PDU are switched on.

Note: In case of loss of the service 20 packet from the S/C, the DAS will go into the STANDBY from itself (emergency case).

8.3.2 SERVICE MODE

In the SERVICE mode, the DAS shall be able to perform the following operations:

- Switching on and switching off the RPW equipments by commanding the PDU. Each RPW equipment (Bias Unit, the three analyzers, ANT1_PA, ANT2_PA, ANT3_PA, SCM_PA, BIA_PA) can be switched on or off independently of the others upon TC requests.
- Booting the RPW equipment flight software from the DPU memory over the SpaceWire link.
- Commanding RPW analyzer self-tests.
- Performing the RPW equipment flight software maintenance.
- Performing the RPW DPU flight software maintenance.
- Starting/stopping the RPW analyzer transparent communication sub-mode.
- Starting/Stopping DPU test sub-modes.
- Configuring the RPW equipments (parameter setting, etc.).

The SERVICE mode will also be used during the test and integration activities.

No scientific measurements shall be performed in the SERVICE mode excepting in the transparent communication sub-mode for test purposes.

When the DAS enters in SERVICE mode, whatever the transition and the incoming mode or sub-mode, it shall put the three analyzers in the STANDBY mode.

8.3.3 SCIENCE MODE

The SCIENCE mode shall be the main mode of the RPW instrument in which the measurements are active. This mode shall be made up of two sub-modes:

- SURVEY mode,
- DETECTION mode.

The SCIENCE modes defined above are DPU Software modes. The RPW analyzers (LFR, TDS, TNR-HFR) have their own SCIENCE modes. Concerning the production of science data, the following modes are defined at the RPW analyser level:

- NORMAL mode: low cadence mode (allows covering more than 80% of the mission).
- BURST mode: high cadence mode for periodic triggering (about 10 minutes per day, configurable by TC).
- SBM1 mode: high cadence mode for interplanetary shock measurements (not implemented by TNR-HFR).
- SBM2 mode: high cadence mode for in-situ type III measurements (not implemented by TNR-HFR).
- LFM mode: LFR backup mode only implemented by TDS (in this mode, TDS generates LF products instead of HF products).

At the level of each analyzer, each SCIENCE mode is defined by a set of configuration parameters which specifies which products are acquired and at what rate. For example, LFR, which manages the four SCIENCE modes, has to handle four distinct sets of configuration parameters.

8.3.3.1 SURVEY MODE

This mode is a very simple working mode in which data are acquired from the analyzers at low or high cadence and transmitted as scientific TM packets without any treatment other than compression.

The SURVEY mode shall be decomposed in a SURVEY_BURST sub-mode, a SURVEY_NORMAL sub-mode and a SURVEY_BACKUP sub-mode:

- The **SURVEY_NORMAL** sub-mode shall allow to manage the "Normal" telemetric data flow. In the SURVEY_NORMAL sub-mode, the data rate from the analyzers is lower than 10 kbps and the scientific TM data rate produced by the DPU is lower than 10 kbps. Typically, the scientific TM data rate, when the compression is activated, will be about 4.3 kbps.
- The **SURVEY_BURST** sub-mode shall allow to manage the "Burst" telemetric data flow. In the SURVEY_BURST sub-mode, the data rate from the analyzers is lower than 100 kbps and the scientific TM data rate produced by the DPU is lower than 100 kbps. Typically, the scientific TM data rate, when the compression is activated, will be about 24.7 kbps.
- The **SURVEY_BACKUP** sub-mode shall allow to manage the RPW degraded mode in which LFR is out of and TDS replaces it by using its LFM mode (LFR backup mode).

8.3.3.2 DETECTION MODE

The DETECTION mode is a complex mode where detection algorithms are activated to perform the measurements of interplanetary shocks (SBM1 events) and in-situ type III (SBM2 events).

In this mode, the RPW DPU interacts with other Solar Orbiter instruments (MAG, SWA, EPD): it uses their data to detect the events and it sends to them periodically the S/C potential and sporadically a trigger flag if an event has been detected. The SBM1 events are detected with a delay of several minutes which requires that the data shall be always acquired from the analyzers at a very high cadence (high resolution), so that, when an event is detected, the data corresponding to the occurrence of this event are not lost.

The data are not transmitted continuously to the S/C at this high cadence: only the data corresponding to the occurrence of a SBM event are transmitted to the S/C with such a high cadence. Moreover, these data are transmitted toward a dedicated packet store of the S/C SSMM.

In the DETECTION mode, the RPW DPU continuously produces scientific data packet at a rate corresponding to the SURVEY_NORMAL sub-mode (low cadence).

The DETECTION mode is itself decomposed in the following sub-modes:

- **SBM_DETECTION** sub-mode. This is the main sub-mode of the DETECTION mode in which the detection algorithms (shock crossing and in-situ type III) are activated. The acquisition and storage in a circular buffer of the SBM1 events are performed in this mode. A transition to the SBM1_DUMP sub-mode is triggered if a SBM1 event has been detected. A transition to the SBM2_ACQUISITION sub-mode is triggered if the presence of type III has been detected in the HFR data.
- **SBM1_DUMP** sub-mode. RPW shall enter in this sub-mode if the DPU has detected a SBM1 event. In this sub-mode, the DPU transfers the content of the SBM1 data circular buffer to the S/C SSMM.
- **SBM2_ACQUISITION** sub-mode. RPW shall enter in this sub-mode only if RPW has received an EPD trigger. The acquisition and storage in the S/C SSMM of the SBM2 events are performed in this mode.

Unlike the SBM1 events, there is no dedicated mode for dumping the SBM2 events in the S/C SSMM: the SBM2 events are dumped in the S/C SSMM over their acquisition.

In the DETECTION mode (SBM_DETECTION sub-mode, SBM1_DUMP sub-mode or SBM2_ACQUISITION sub-mode), whatever the enabled detection algorithms and whatever the input acquisition cadence, the DAS shall continuously generate, from the low cadence data stream coming from the analyzers, a telemetry flow corresponding to the "Normal" telemetric data flow.

9 ANNEX 2: LIST OF TM/TC

This section lists RPW TC/TM packets sent to/from RPW SW.

9.1 TC LIST

As presented in [RD2] and more particularly in the table below, a total of **140 TC packets** exist. In the context of the SFT:

85 / 140 TCs, marked in **dark green,** are sent towards RPW and validated by checking a specific response TM packet or a change in the parameters of periodic TM.

55 / 140 TCs, marked in **light green,** are sent towards RPW and validated by checking the associated TC verification telemetry (e.g. EXE = SUCCESS, ACC = SUCCESS).

TC Packet Name	SRDB ID	PUS Service
TC_DPU_ENABLE_HK	ZIW00000	3
TC_DPU_DISABLE_HK	ZIW00001	3
TC_DPU_UPDATE_HK_PERIOD	ZIW00002	3
TC_DPU_OBC_ENABLE_HK	ZIW00003	3
TC_DPU_OBC_DISABLE_HK	ZIW00004	3
TC_DPU_OBC_UPDATE_HK_PERIOD	ZIW00005	3
TC_DPU_S20_ENABLE_HK	ZIW00161	3
TC_DPU_S20_DISABLE_HK	ZIW00162	3
TC_DPU_S20_UPDATE_HK_PERIOD	ZIW00163	3
TC_DPU_ENABLE_EVENT	ZIW00006	5
TC_DPU_DISABLE_EVENT	ZIW00007	5
TC_DPU_LOAD_MEMORY	ZIW00008	6
TC_DPU_DUMP_MEMORY	ZIW00009	6
TC_DPU_CHECK_MEMORY	ZIW00010	6
TC_DPU_UPDATE_TIME	ZIW00011	9
TC_DPU_TEST_CONNECTION	ZIW00012	17
TC_DPU_UPDATE_INFO	ZIW00013	20
TC_DPU_RESET	ZIW00014	180
TC_DPU_ENABLE_WATCHDOG	ZIW00015	180
TC_DPU_DISABLE_WATCHDOG	ZIW00016	180
TC_DPU_BOOT_LFR	ZIW00020	180
TC_DPU_BOOT_TDS	ZIW00021	180
TC_DPU_BOOT_THR	ZIW00022	180

TC_DPU_BOOT_DAS	ZIW00017	180
TC_DPU_EXECUTE_BIAS_CMD	ZIW00023	180
TC_DPU_SET_BIAS1	ZIW00024	180
TC_DPU_SET_BIAS2	ZIW00025	180
TC_DPU_SET_BIAS3	ZIW00026	180
TC_DPU_SET_BIAS_MODE	ZIW00027	180
TC_DPU_SET_BIAS_PAGE	ZIW00028	180
TC_DPU_SET_BIAS_RELAY	ZIW00029	180
TC_DPU_SET_BIAS_SWEEP	ZIW00031	180
TC_DPU_SET_BIAS_RFREQ	ZIW00030	180
TC_DPU_EXECUTE_PDU_CMD	ZIW00032	180
TC_DPU_SWITCH_ON_EQUIPMENT	ZIW00033	180
TC_DPU_SWITCH_OFF_EQUIPMENT	ZIW00034	180
TC_DPU_ENTER_STANDBY	ZIW00035	180
TC_DPU_ENTER_SERVICE	ZIW00036	180
TC_DPU_ENTER_SURVEY_NORMAL	ZIW00037	180
TC_DPU_ENTER_SURVEY_BURST	ZIW00038	180
TC_DPU_ENTER_SURVEY_BACKUP	ZIW00039	180
TC_DPU_ENTER_SBM_DETECTION	ZIW00040	180
TC_DPU_ENTER_SBM1_DUMP	ZIW00041	180
TC_DPU_ENTER_SBM2_ACQ	ZIW00042	180
TC_DPU_START_TEST	ZIW00043	180
TC_DPU_STOP_TEST	ZIW00044	180
TC_DPU_ENABLE_TRANS_MODE	ZIW00045	180
TC_DPU_DISABLE_TRANS_MODE	ZIW00046	180
TC_DPU_ENABLE_COMPRESSION	ZIW00047	180
TC_DPU_DISABLE_COMPRESSION	ZIW00048	180
TC_DPU_ENABLE_INFO_PKT	ZIW00061	180
TC_DPU_DISABLE_INFO_PKT	ZIW00062	180
TC_DPU_DAS_DUMP_PAR	ZIW00054	180
TC_DPU_DBS_LOAD_COMMON_PAR	ZIW00018	180
TC_DPU_DBS_DUMP_PAR	ZIW00019	180
TC_DPU_DAS_LOAD_COMMON_PAR	ZIW00053	180
TC_DPU_LOAD_POWER_PAR	ZIW00055	180
TC_DPU_LOAD_TEMP_PAR	ZIW00056	180
TC_DPU_LOAD_SBM1_PAR	ZIW00057	180

TC_DPU_LOAD_SBM2_PAR	ZIW00058	180
TC_DPU_START_FROM_CONTEXT	ZIW00059	180
TC_DPU_LOAD_BIAS_SWEEP	ZIW00060	180
TC_DPU_START_BIAS_CALIB	ZIW00158	180
TC_DPU_START_BIAS_SWEEP	ZIW00062	180
TC_DPU_RESET_TM_BUFFER	ZIW00064	180
TC_DPU_CLEAR_HK	ZIW00065	180
TC_DPU_LOAD_WAVEFORM_PAR	ZIW00146	180
TC_DPU_LOAD_SUN_DISTANCE	ZIW00164	180
TC_DPU_LOAD_BHV_PAR	ZIW00151	180
TC_DPU_CLEAR_BIAS_SWEEP	ZIW00159	180
TC_DPU_SAVE_CONTEXT	ZIW00160	180
TC_DPU_LOAD_VSC_PAR	ZIW00165	180
TC_DPU_LOAD_RWF_PAR	ZIW00168	180
TC_DPU_ENABLE_SCIENCE	ZIW00066	21
TC_DPU_DISABLE_SCIENCE	ZIW00067	21
TC_DPU_PID5_ENABLE_SCIENCE	ZIW00088	21
TC_DPU_PID5_DISABLE_SCIENCE	ZIW00089	21
TC_DPU_PID6_ENABLE_SCIENCE	ZIW00110	21
TC_DPU_PID6_DISABLE_SCIENCE	ZIW00111	21
TC_LFR_LOAD_MEMORY	ZIW00070	6
TC_LFR_DUMP_MEMORY	ZIW00071	6
TC_LFR_CHECK_MEMORY	ZIW00072	6
TC_LFR_ENABLE_HK	ZIW00073	3
TC_LFR_DISABLE_HK	ZIW00074	3
TC_LFR_UPDATE_HK_PERIOD	ZIW00075	3
TC_LFR_RESET	ZIW00076	181
TC_LFR_LOAD_COMMON_PAR	ZIW00077	181
TC_ LFR _LOAD_NORMAL_PAR	ZIW00078	181
TC_ LFR _LOAD_BURST_PAR	ZIW00079	181
TC_ LFR _LOAD_SBM1_PAR	ZIW00080	181
TC_ LFR _LOAD_SBM2_PAR	ZIW00081	181
TC_LFR_DUMP_PAR	ZIW00082	181
TC_LFR_ENABLE_CALIBRATION	ZIW00083	181
TC_LFR_DISABLE_CALIBRATION	ZIW00084	181
TC_LFR_ENTER_MODE	ZIW00085	181

TC_LFR_LOAD_KCOEFFICIENTS	ZIW00155	181
TC_LFR_DUMP_KCOEFFICIENTS	ZIW00156	181
TC_LFR_LOAD_FBINS_MASK	ZIW00157	181
TC_LFR_LOAD_FILTER_PAR	ZIW00167	181
TC_LFR_ENABLE_SCIENCE	ZIW00086	21
TC_LFR_DISABLE_SCIENCE	ZIW00087	21
TC_TDS_LOAD_MEMORY	ZIW00090	6
TC_TDS_DUMP_MEMORY	ZIW00091	6
TC_TDS_CHECK_MEMORY	ZIW00092	6
TC_TDS_RESET	ZIW00093	181
TC_TDS_DUMP_NORMAL_TSWF	ZIW00094	181
TC_TDS_DUMP_SBM2_TSWF	ZIW00095	181
TC_TDS_DUMP_PAR	ZIW00096	181
TC_TDS_LOAD_COMMON_PAR	ZIW00097	181
TC_TDS_LOAD_NORMAL_PAR	ZIW00098	181
TC_TDS_LOAD_BURST_PAR	ZIW00099	181
TC_TDS_LOAD_SBM1_PAR	ZIW00100	181
TC_TDS_LOAD_SBM2_PAR	ZIW00101	181
TC_TDS_PERFORM_DIAGNOSIS	ZIW00102	181
TC_TDS_LOAD_LFM_PAR	ZIW00103	181
TC_TDS_ENTER_MODE	ZIW00104	181
TC_TDS_ENABLE_HK	ZIW00105	3
TC_TDS_DISABLE_HK	ZIW00106	3
TC_TDS_UPDATE_HK_PERIOD	ZIW00107	3
TC_TDS_ENABLE_SCIENCE	ZIW00108	21
TC_TDS_DISABLE_SCIENCE	ZIW00109	21
TC_THR_LOAD_NORMAL_PAR_1	ZIW00112	181
TC_THR_LOAD_NORMAL_PAR_2	ZIW00113	181
TC_THR_LOAD_NORMAL_PAR_3	ZIW00114	181
TC_THR_LOAD_BURST_PAR_1	ZIW00115	181
TC_THR_LOAD_BURST_PAR_2	ZIW00116	181
TC_THR_LOAD_BURST_PAR_3	ZIW00117	181
TC_THR_LOAD_CALIBRATION_PAR	ZIW00118	181
TC_THR_RESET	ZIW00119	181
TC_THR_DUMP_PAR	ZIW00120	181
TC_THR_ENTER_MODE	ZIW00121	181

TC_THR_ENABLE_CALIBRATION	ZIW00122	181
TC_THR_DISABLE_HK	ZIW00123	3
TC_THR_ENABLE_HK	ZIW00124	3
TC_THR_UPDATE_HK_PERIOD	ZIW00125	3
TC_THR_CHECK_MEMORY	ZIW00126	6
TC_THR_DUMP_MEMORY	ZIW00127	6
TC_THR_LOAD_MEMORY	ZIW00128	6
TC_THR_ENABLE_SCIENCE	ZIW00129	21
TC_THR_DISABLE_SCIENCE	ZIW00130	21

9.2 TM LIST

As presented in [RD3] and more particularly in the table below, a total of **287 TM packets** exist. In the context of the SFT:

128 / 287 TMs, marked in **dark green,** are sent by RPW towards the S/C.

Please note that the majority of not sent packets are those related to error reporting.

TM Packet Name	SRDB ID	PUS Service
TM_DPU_TC_ACC_SUCCESS	YIW00000	1
TM_DPU_TC_ACC_ILLEGAL_APID	YIW00001	1
TM_DPU_TC_ACC_INCOMPLETE	YIW00002	1
TM_DPU_TC_ACC_WRONG_CRC	YIW00003	1
TM_DPU_TC_ACC_ILLEGAL_TYPE	YIW00004	1
TM_DPU_TC_ACC_ILLEGAL_SUBTYPE	YIW00005	1
TM_DPU_TC_ACC_NOT_ALLOWED	YIW00006	1
TM_DPU_TC_ACC_WRONG_SOURCE_ID	YIW00007	1
TM_DPU_TC_EXE_SUCCESS	YIW00008	1
TM_DPU_TC_EXE_INCONSISTENT	YIW00009	1
TM_DPU_TC_EXE_NOT_EXECUTABLE	YIW00010	1
TM_DPU_TC_EXE_NOT_IMPLEMENTED	YIW00011	1
TM_DPU_TC_EXE_ERROR	YIW00012	1
TM_DPU_OBC_TC_ACC_SUCCESS	YIW00013	1
TM_DPU_OBC_TC_ACC_ILLEGAL_APID	YIW00014	1
TM_DPU_OBC_TC_ACC_INCOMPLETE	YIW00015	1
TM_DPU_OBC_TC_ACC_WRONG_CRC	YIW00016	1

TM_DPU_OBC_TC_ACC_ILLEGAL_TYPE	YIW00017	1
TM_DPU_OBC_TC_ACC_ILLEGAL_SUBTYPE	YIW00018	1
TM_DPU_OBC_TC_ACC_NOT_ALLOWED	YIW00019	1
TM_DPU_OBC_TC_ACC_WRONG_SOURCE_ID	YIW00020	1
TM_DPU_OBC_TC_EXE_SUCCESS	YIW00021	1
TM_DPU_OBC_TC_EXE_INCONSISTENT	YIW00022	1
TM_DPU_OBC_TC_EXE_NOT_EXECUTABLE	YIW00023	1
TM_DPU_OBC_TC_EXE_NOT_IMPLEMENTED	YIW00024	1
TM_DPU_OBC_TC_EXE_ERROR	YIW00025	1
TM_DPU_PID5_TC_ACC_SUCCESS	YIW00131	1
TM_DPU_PID5_TC_ACC_INCOMPLETE	YIW00132	1
TM_DPU_PID5_TC_ACC_WRONG_CRC	YIW00133	1
TM_DPU_PID5_TC_ACC_ILLEGAL_TYPE	YIW00134	1
TM_DPU_PID5_TC_ACC_ILLEGAL_SUBTYPE	YIW00135	1
TM_DPU_PID5_TC_ACC_NOT_ALLOWED	YIW00136	1
TM_DPU_PID5_TC_ACC_WRONG_SOURCE_ID	YIW00137	1
TM_DPU_PID5_TC_ACC_ILLEGAL_APID	YIW00138	1
TM_DPU_PID5_TC_EXE_SUCCESS	YIW00145	1
TM_DPU_PID5_TC_EXE_INCONSISTENT	YIW00146	1
TM_DPU_PID5_TC_EXE_NOT_EXECUTABLE	YIW00147	1
TM_DPU_PID5_TC_EXE_NOT_IMPLEMENTED	YIW00148	1
TM_DPU_PID5_TC_EXE_ERROR	YIW00149	1
TM_DPU_PID6_TC_ACC_SUCCESS	YIW00198	1
TM_DPU_PID6_TC_ACC_INCOMPLETE	YIW00199	1
TM_DPU_PID6_TC_ACC_WRONG_CRC	YIW00200	1
TM_DPU_PID6_TC_ACC_ILLEGAL_TYPE	YIW00201	1
TM_DPU_PID6_TC_ACC_ILLEGAL_SUBTYPE	YIW00202	1
TM_DPU_PID6_TC_ACC_NOT_ALLOWED	YIW00203	1
TM_DPU_PID6_TC_ACC_WRONG_SOURCE_ID	YIW00204	1
TM_DPU_PID6_TC_ACC_ILLEGAL_APID	YIW00205	1
TM_DPU_PID6_TC_EXE_SUCCESS	YIW00212	1
TM_DPU_PID6_TC_EXE_INCONSISTENT	YIW00213	1
TM_DPU_PID6_TC_EXE_NOT_EXECUTABLE	YIW00214	1
TM_DPU_PID6_TC_EXE_NOT_IMPLEMENTED	YIW00215	1
TM_DPU_PID6_TC_EXE_ERROR	YIW00216	1
TM_DPU_DAS_HK	YIW00059	3

TM_DPU_DAS_STATISTICS_HK	YIW00060	3
TM_DPU_DBS_HK	YIW00026	3
TM_DPU_PDU_HK	YIW00027	3
TM_DPU_BIA_HK	YIW00061	3
TM_DPU_OBC_HK	YIW00028	3
TM_DPU_S20_HK	YIW00062	3
TM_DPU_IIT_HK	YIW00302	3
TM_DPU_DAS_SBM1_HK	YIW00307	3
TM_DPU_RWF_HK	YIW00308	3
TM_DPU_EVENT_PR_DBS_BOOT	YIW00030	5
TM_DPU_EVENT_PR_DPU_PDU_LINK	YIW00031	5
TM_DPU_EVENT_PR_DAS_BOOT	YIW00064	5
TM_DPU_EVENT_PR_DPU_BIA_LINK	YIW00065	5
TM_DPU_EVENT_PR_DPU_LFR_LINK	YIW00066	5
TM_DPU_EVENT_PR_DPU_TDS_LINK	YIW00067	5
TM_DPU_EVENT_PR_DPU_THR_LINK	YIW00068	5
TM_DPU_EVENT_PR_PDU_OPERATION	YIW00069	5
TM_DPU_EVENT_PR_LFR_COMMAND	YIW00070	5
TM_DPU_EVENT_PR_TDS_COMMAND	YIW00071	5
TM_DPU_EVENT_PR_THR_COMMAND	YIW00072	5
TM_DPU_EVENT_PR_DPU_MODE	YIW00073	5
TM_DPU_EVENT_PR_LFR_MODE	YIW00074	5
TM_DPU_EVENT_PR_TDS_MODE	YIW00075	5
TM_DPU_EVENT_PR_THR_MODE	YIW00076	5
TM_DPU_EVENT_PR_LFR_BOOT	YIW00077	5
TM_DPU_EVENT_PR_TDS_BOOT	YIW00078	5
TM_DPU_EVENT_PR_THR_BOOT	YIW00079	5
TM_DPU_EVENT_PR_BIA_SWEEP	YIW00287	5
TM_DPU_EVENT_PR_BIA_CALIB	YIW00290	5
TM_DPU_EVENT_PR_DPU_WAIT_SYNC	YIW00291	5
TM_DPU_EVENT_PR_DPU_RECOVERY	YIW00303	5
TM_DPU_EVENT_PR_DPU_SBM1	YIW00304	5
TM_DPU_EVENT_PR_DPU_SBM2	YIW00305	5
TM_DPU_EVENT_LE_DPU_LFR_SPW	YIW00080	5
TM_DPU_EVENT_LE_DPU_TDS_SPW	YIW00081	5
TM_DPU_EVENT_LE_DPU_THR_SPW	YIW00082	5
TM_DPU_EVENT_LE_DPU_ADC	YIW00032	5
TM_DPU_EVENT_LE_DPU_AHB	YIW00033	5

TM_DPU_EVENT_LE_DPU_PDU_LINK	YIW00034	5
TM_DPU_EVENT_LE_DPU_SC_LINK	YIW00035	5
TM_DPU_EVENT_LE_DPU_PDU_SIS	YIW00036	5
TM_DPU_EVENT_LE_DPU_SC_SPW	YIW00037	5
TM_DPU_EVENT_LE_DPU_TIME	YIW00038	5
TM_DPU_EVENT_LE_DPU_TIMECODE	YIW00039	5
TM_DPU_EVENT_LE_DPU_RESET	YIW00040	5
TM_DPU_EVENT_LE_DPU_LFR_RMAP	YIW00083	5
TM_DPU_EVENT_LE_DPU_TDS_RMAP	YIW00084	5
TM_DPU_EVENT_LE_DPU_THR_RMAP	YIW00085	5
TM_DPU_EVENT_LE_RPW_CURRENT	YIW00086	5
TM_DPU_EVENT_LE_DPU_BIA_SIS	YIW00087	5
TM_DPU_EVENT_LE_DPU_BIA_LINK	YIW00088	5
TM_DPU_EVENT_LE_DPU_COMP	YIW00089	5
TM_DPU_EVENT_LE_DPU_LFR_LINK	YIW00090	5
TM_DPU_EVENT_LE_DPU_TDS_LINK	YIW00091	5
TM_DPU_EVENT_LE_DPU_THR_LINK	YIW00092	5
TM_DPU_EVENT_ME_DPU_LFR_SPW	YIW00093	5
TM_DPU_EVENT_ME_DPU_TDS_SPW	YIW00094	5
TM_DPU_EVENT_ME_DPU_THR_SPW	YIW00095	5
TM_DPU_EVENT_ME_DPU_AHB	YIW00041	5
TM_DPU_EVENT_ME_DPU_EEPROM	YIW00042	5
TM_DPU_EVENT_ME_DPU_MEMORY	YIW00043	5
TM_DPU_EVENT_ME_DPU_PDU_SIS	YIW00044	5
TM_DPU_EVENT_ME_DPU_SC_SPW	YIW00045	5
TM_DPU_EVENT_ME_DPU_BOOT	YIW00046	5
TM_DPU_EVENT_ME_DBS_BUFFER	YIW00047	5
TM_DPU_EVENT_ME_DPU_LFR_RMAP	YIW00096	5
TM_DPU_EVENT_ME_DPU_TDS_RMAP	YIW00097	5
TM_DPU_EVENT_ME_DPU_THR_RMAP	YIW00098	5
TM_DPU_EVENT_ME_RPW_CURRENT	YIW00100	5
TM_DPU_EVENT_ME_LFR_BOOT	YIW00101	5
TM_DPU_EVENT_ME_TDS_BOOT	YIW00102	5
TM_DPU_EVENT_ME_THR_BOOT	YIW00103	5
TM_DPU_EVENT_ME_DPU_BIA_SIS	YIW00104	5
TM_DPU_EVENT_ME_DAS_BUFFER	YIW00105	5
TM_DPU_EVENT_ME_LFR_PROCESSOR	YIW00106	5
TM_DPU_EVENT_ME_TDS_PROCESSOR	YIW00107	5

TM_DPU_EVENT_ME_THR_PROCESSOR	YIW00108	5
TM_DPU_EVENT_ME_LFR_COMMAND	YIW00109	5
TM_DPU_EVENT_ME_TDS_COMMAND	YIW00110	5
TM_DPU_EVENT_ME_THR_COMMAND	YIW00111	5
TM_DPU_EVENT_ME_DPU_MODE	YIW00112	5
TM_DPU_EVENT_ME_LFR_MODE	YIW00113	5
TM_DPU_EVENT_ME_TDS_MODE	YIW00114	5
TM_DPU_EVENT_ME_THR_MODE	YIW00115	5
TM_DPU_EVENT_ME_DPU_PARAM	YIW00048	5
TM_DPU_EVENT_ME_PDU_OPERATION	YIW00116	5
TM_DPU_EVENT_ME_DPU_TIME	YIW00283	5
TM_DPU_EVENT_ME_DPU_SC_LINK	YIW00284	5
TM_DPU_EVENT_ME_BIA_SWEEP	YIW00288	5
TM_DPU_EVENT_ME_BIA_CALIB	YIW00292	5
TM_DPU_EVENT_ME_DPU_WAIT_SYNC	YIW00293	5
TM_DPU_EVENT_HE_DPU_ADC	YIW00049	5
TM_DPU_EVENT_HE_DPU_PDU_LINK	YIW00051	5
TM_DPU_EVENT_HE_DPU_RESET	YIW00052	5
TM_DPU_EVENT_HE_RPW_TEMPERATURE	YIW00117	5
TM_DPU_EVENT_HE_DPU_BIA_LINK	YIW00119	5
TM_DPU_EVENT_HE_DPU_LFR_LINK	YIW00120	5
TM_DPU_EVENT_HE_DPU_TDS_LINK	YIW00121	5
TM_DPU_EVENT_HE_DPU_THR_LINK	YIW00122	5
TM_DPU_EVENT_HE_BIAS_HV	YIW00285	5
TM_DPU_EVENT_HE_RPW_OVC	YIW00286	5
TM_DPU_EVENT_HE_RPW_OVV	YIW00306	5
TM_DPU_MEMORY_CHECK	YIW00053	6
TM_DPU_MEMORY_DUMP_RAM	YIW00054	6
TM_DPU_MEMORY_DUMP_PROM	YIW00055	6
TM_DPU_MEMORY_DUMP_EEPROM	YIW00056	6
TM_DPU_MEMORY_DUMP_REGISTER	YIW00057	6
TM_DPU_LINK_CONNECTION_REPORT	YIW00058	17
TM_DPU_DBS_PARAMETER_DUMP	YIW00029	180
TM_DPU_DAS_PARAMETER_DUMP	YIW00063	180
TM_DPU_SCIENCE_BIAS_CALIB	YIW00294	21
TM_DPU_SCIENCE_BIAS_CALIB_LONG	YIW00295	21
TM_DPU_SCIENCE_BIAS_CALIB_C	YIW00296	21
TM_DPU_SCIENCE_BIAS_CALIB_LONG_C	YIW00297	21

TM_LFR_TC_ACC_SUCCESS	YIW00123	1
TM_LFR_TC_ACC_INCOMPLETE	YIW00124	1
TM_LFR_TC_ACC_WRONG_CRC	YIW00125	1
TM_LFR_TC_ACC_ILLEGAL_TYPE	YIW00126	1
TM_LFR_TC_ACC_ILLEGAL_SUBTYPE	YIW00127	1
TM_LFR_TC_ACC_NOT_ALLOWED	YIW00128	1
TM_LFR_TC_ACC_WRONG_SOURCE_ID	YIW00129	1
TM_LFR_TC_ACC_ILLEGAL_APID	YIW00130	1
TM_LFR_TC_EXE_SUCCESS	YIW00139	1
TM_LFR_TC_EXE_INCONSISTENT	YIW00140	1
TM_LFR_TC_EXE_NOT_EXECUTABLE	YIW00141	1
TM_LFR_TC_EXE_NOT_IMPLEMENTED	YIW00142	1
TM_LFR_TC_EXE_ERROR	YIW00143	1
TM_LFR_TC_EXE_CORRUPTED	YIW00144	1
TM_LFR_MEMORY_CHECK	YIW00150	6
TM_LFR_MEMORY_DUMP_RAM	YIW00151	6
TM_LFR_MEMORY_DUMP_REGISTER	YIW00152	6
TM_LFR_HK	YIW00153	3
TM_LFR_SCIENCE_NORMAL_SWF_F0	YIW00155	21
TM_LFR_SCIENCE_NORMAL_SWF_F1	YIW00156	21
TM_LFR_SCIENCE_NORMAL_SWF_F2	YIW00157	21
TM_LFR_SCIENCE_NORMAL_CWF_F3	YIW00158	21
TM_LFR_SCIENCE_BURST_CWF_F2	YIW00159	21
TM_LFR_SCIENCE_SBM1_CWF_F1	YIW00160	21
TM_LFR_SCIENCE_SBM2_CWF_F2	YIW00161	21
TM_LFR_SCIENCE_NORMAL_ASM_F0	YIW00162	21
TM_LFR_SCIENCE_NORMAL_ASM_F1	YIW00163	21
TM_LFR_SCIENCE_NORMAL_ASM_F2	YIW00164	21
TM_LFR_SCIENCE_NORMAL_BP1_F0	YIW00165	21
TM_LFR_SCIENCE_NORMAL_BP1_F1	YIW00166	21
TM_LFR_SCIENCE_NORMAL_BP1_F2	YIW00167	21
TM_LFR_SCIENCE_NORMAL_BP2_F0	YIW00168	21
TM_LFR_SCIENCE_NORMAL_BP2_F1	YIW00169	21
TM_LFR_SCIENCE_NORMAL_BP2_F2	YIW00170	21
TM_LFR_SCIENCE_BURST_BP1_F0	YIW00171	21
TM_LFR_SCIENCE_BURST_BP2_F0	YIW00172	21
TM_LFR_SCIENCE_BURST_BP1_F1	YIW00173	21
TM_LFR_SCIENCE_BURST_BP2_F1	YIW00174	21

TM_LFR_SCIENCE_SBM1_BP1_F0	YIW00175	21
TM_LFR_SCIENCE_SBM1_BP2_F0	YIW00176	21
TM_LFR_SCIENCE_SBM2_BP1_F0	YIW00177	21
TM_LFR_SCIENCE_SBM2_BP2_F0	YIW00178	21
TM_LFR_SCIENCE_SBM2_BP1_F1	YIW00179	21
TM_LFR_SCIENCE_SBM2_BP2_F1	YIW00180	21
TM_LFR_SCIENCE_NORMAL_SWF_F0_C	YIW00181	21
TM_LFR_SCIENCE_NORMAL_SWF_F1_C	YIW00182	21
TM_LFR_SCIENCE_NORMAL_SWF_F2_C	YIW00183	21
TM_LFR_SCIENCE_NORMAL_CWF_F3_C	YIW00184	21
TM_LFR_SCIENCE_BURST_CWF_F2_C	YIW00185	21
TM_LFR_SCIENCE_SBM1_CWF_F1_C	YIW00186	21
TM_LFR_SCIENCE_SBM2_CWF_F2_C	YIW00187	21
TM_LFR_SCIENCE_NORMAL_CWF_LONG_F3	YIW00188	21
TM_LFR_SCIENCE_NORMAL_CWF_LONG_F3_C	YIW00189	21
TM_LFR_PARAMETER_DUMP	YIW00154	181
TM_LFR_KCOEFFICIENTS_DUMP	YIW00289	181
TM_TDS_TC_ACC_SUCCESS	YIW00190	1
TM_TDS_TC_ACC_INCOMPLETE	YIW00191	1
TM_TDS_TC_ACC_WRONG_CRC	YIW00192	1
TM_TDS_TC_ACC_ILLEGAL_TYPE	YIW00193	1
TM_TDS_TC_ACC_ILLEGAL_SUBTYPE	YIW00194	1
TM_TDS_TC_ACC_NOT_ALLOWED	YIW00195	1
TM_TDS_TC_ACC_WRONG_SOURCE_ID	YIW00196	1
TM_TDS_TC_ACC_ILLEGAL_APID	YIW00197	1
TM_TDS_TC_EXE_SUCCESS	YIW00206	1
TM_TDS_TC_EXE_INCONSISTENT	YIW00207	1
TM_TDS_TC_EXE_NOT_EXECUTABLE	YIW00208	1
TM_TDS_TC_EXE_NOT_IMPLEMENTED	YIW00209	1
TM_TDS_TC_EXE_ERROR	YIW00210	1
TM_TDS_TC_EXE_CORRUPTED	YIW00211	1
TM_TDS_MEMORY_CHECK	YIW00217	6
TM_TDS_MEMORY_DUMP_RAM	YIW00218	6
TM_TDS_MEMORY_DUMP_REGISTER	YIW00219	6
TM_TDS_HK	YIW00220	3
TM_TDS_SCIENCE_NORMAL_RSWF	YIW00223	21
TM_TDS_SCIENCE_SBM1_RSWF	YIW00224	21
TM_TDS_SCIENCE_NORMAL_TSWF	YIW00225	21

TM_TDS_SCIENCE_SBM2_TSWF	YIW00226	21
TM_TDS_SCIENCE_NORMAL_STAT	YIW00227	21
TM_TDS_SCIENCE_NORMAL_HIST1D	YIW00228	21
TM_TDS_SCIENCE_NORMAL_HIST2D	YIW00229	21
TM_TDS_SCIENCE_LFM_RSWF	YIW00230	21
TM_TDS_SCIENCE_LFM_CWF	YIW00231	21
TM_TDS_SCIENCE_LFM_PSD	YIW00232	21
TM_TDS_SCIENCE_LFM_SM	YIW00233	21
TM_TDS_SCIENCE_NORMAL_RSWF_C	YIW00234	21
TM_TDS_SCIENCE_NORMAL_TSWF_C	YIW00235	21
TM_TDS_SCIENCE_SBM1_RSWF_C	YIW00236	21
TM_TDS_SCIENCE_SBM2_TSWF_C	YIW00237	21
TM_TDS_SCIENCE_LFM_RSWF_C	YIW00238	21
TM_TDS_SCIENCE_LFM_CWF_C	YIW00239	21
TM_TDS_SCIENCE_NORMAL_MAMP	YIW00298	21
TM_TDS_SCIENCE_NORMAL_MAMP_C	YIW00301	21
TM_TDS_DIAGNOSIS	YIW00221	181
TM_TDS_PARAMETER_DUMP	YIW00222	181
TM_THR_TC_ACC_SUCCESS	YIW00240	1
TM_THR_TC_ACC_INCOMPLETE	YIW00241	1
TM_THR_TC_ACC_WRONG_CRC	YIW00242	1
TM_THR_TC_ACC_ILLEGAL_TYPE	YIW00243	1
TM_THR_TC_ACC_ILLEGAL_SUBTYPE	YIW00244	1
TM_THR_TC_ACC_NOT_ALLOWED	YIW00245	1
TM_THR_TC_ACC_WRONG_SOURCE_ID	YIW00246	1
TM_THR_TC_ACC_ILLEGAL_APID	YIW00247	1
TM_THR_TC_EXE_SUCCESS	YIW00248	1
TM_THR_TC_EXE_INCONSISTENT	YIW00249	1
TM_THR_TC_EXE_NOT_EXECUTABLE	YIW00250	1
TM_THR_TC_EXE_NOT_IMPLEMENTED	YIW00251	1
TM_THR_TC_EXE_ERROR	YIW00252	1
TM_THR_TC_EXE_CORRUPTED	YIW00253	1
TM_THR_MEMORY_CHECK	YIW00254	6
TM_THR_MEMORY_DUMP_RAM	YIW00255	6
TM_THR_MEMORY_DUMP_REGISTER	YIW00256	6
TM_THR_HK	YIW00257	3
TM_THR_SCIENCE_NORMAL_TNR	YIW00259	21
TM_THR_SCIENCE_NORMAL_HFR	YIW00260	21

TM_THR_SCIENCE_BURST_TNR	YIW00261	21
TM_THR_SCIENCE_BURST_HFR	YIW00262	21
TM_THR_SCIENCE_CALIBRATION_TNR	YIW00263	21
TM_THR_SCIENCE_CALIBRATION_HFR	YIW00264	21
TM_THR_SCIENCE_SPECTRAL_POWER	YIW00265	21
TM_THR_PARAMETER_DUMP	YIW00258	181

10 ANNEX 3: SCRIPT REFERENCES

Tree of SFT scripts (SFT CNES v3.3.xml):

- SFT_Main_Script_v3.3.xml
  - SFT_Test_Preparation_v3.3.xml
  - SFT_Load_DBS_v3.3.xml
  - SFT_Load_DAS_v3.3.xml
  - SFT_Service_Conf_v3.3.xml
    - SFT_DAS_Configuration_v3.3.xml
    - SFT_Configure_HK_v3.3.xml
    - SFT_Switch_ON_MEB_Equipements_v3.3.xml
    - SFT_Switch_ON_SCM_ANT_Equipements_v3.3.xml
    - SFT_TDS_Configuration_v3.3.xml
    - SFT_LFR_Configuration_v3.3.xml
    - SFT_THR_Configuration_v3.3.xml
  - SFT_Science_Modes_C_v3.3.xml
  - SFT_Science_Modes_NC_v3.3.xml
  - SFT_Verification_TCs_v3.3
    - SFT_Verification_TCs_LFR_v3.3
    - SFT_Verification_TCs_TDS_v3.3
    - SFT_Verification_TCs_THR_v3.3
    - SFT_Verification_TCs_BIAS_v3.3
    - SFT_Verification_TCs_DPU_v3.3
  - SFT_End_v3.3.xml
    - SFT_Dump_Stacks_Queues_v3.3.xml
  - SFT_Redundant_v3.3.xml
    - SFT_Load_DBS_RED_v3.3.xml
    - SFT_Load_DAS_EEPROM2_v3.3.xml
    - SFT_Service_Conf_RED_v3.3.xml
      - SFT_DAS_Configuration_RED_v3.3.xml
      - SFT_Configure_HK_v3.3.xml
      - SFT_Switch_ON_MEB_Equipements_v3.3.xml
      - SFT_Switch_ON_SCM_ANT_Eq_No_test_on_relays_v3.3.xml
      - SFT_TDS_Configuration_v3.3.xml
      - SFT_LFR_Configuration_v3.3.xml
      - SFT_THR_Configuration_v3.3.xml
    - SFT_DETECTION_Mode_C_v3.3.xml
    - SFT_End_RED_v3.3.xml
      - SFT_Dump_Stacks_Queues_v3.3.xml

Assertion Checks files (“*SFT_AssertChecker_v3.3”* folder):

- SFT_1_Load_DBS.xml
- SFT_2_Load_DAS.xml
- SFT_3_Service_Conf.xml
- SFT_4_Science_Modes_NC.xml
- SFT_5_Science_Modes_C.xml
- SFT_6_Verification_TCs.xml
- SFT_7_End.xml
- SFT_8_Redundant.xml

11 ANNEX 4: TNR-HFR DEFAULT CONFIGURATION

For the particular case of TNR-HFR FSW, default values of configuration parameters are mostly not indicated in [RD2]. For this reason, we present here the default configuration used in this SFT:

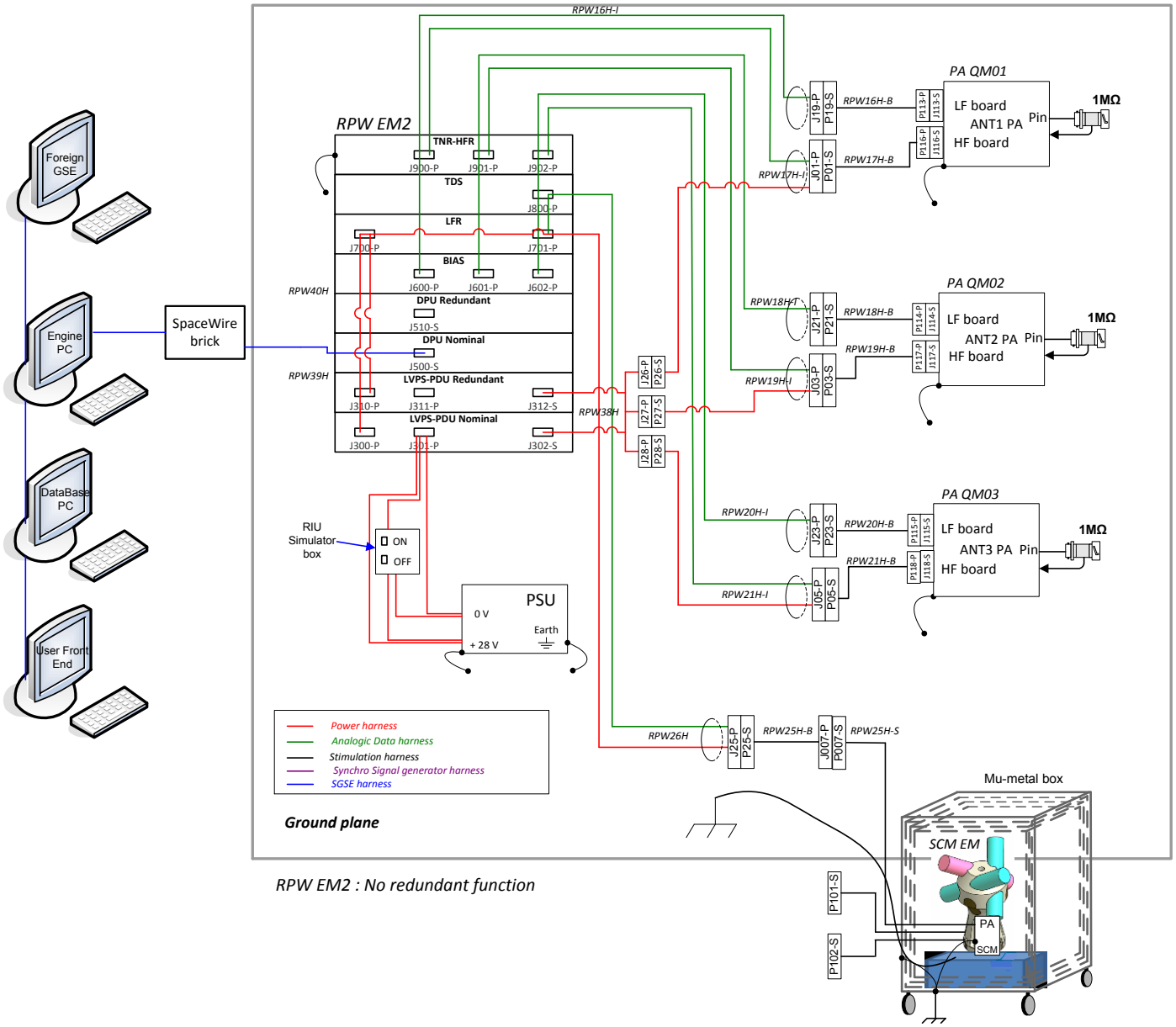
Parameter	TC_THR_LOAD_NORMAL_PAR_1 XXX = N	TC_THR_LOAD_BURST_PAR_1 XXX= B	TC_THR_LOAD_CALIBRATION_PAR XXX = CAL	
SY_THR_XXX_CNT_TS	4	4	4	TNR Setup (Loop 1) 4 micro-commandes
PAR_LOOP_1	4	4	4	
CP_THR_SEQ_POS	1	1	1	
SY_THR_XXX_SET_TS_AV	NR_AV_64	NR_AV_16	NR_AV_16	
SY_THR_XXX_SET_TS_CR	ENABLED	ENABLED	ENABLED	
SY_THR_XXX_SET_TS_AU	ENABLED	ENABLED	ENABLED	
SY_THR_XXX_SET_TS_BAND_D	true	true	true	
SY_THR_XXX_SET_TS_BAND_C	true	true	true	
SY_THR_XXX_SET_TS_BAND_B	true	true	true	
SY_THR_XXX_SET_TS_BAND_A	true	true	true	
CP_THR_SEQ_POS	10	10	0	
SY_THR_XXX_SET_TS_AV	NR_AV_64	NR_AV_16	NR_AV_16	
SY_THR_XXX_SET_TS_CR	DISABLED	DISABLED	DISABLED	
SY_THR_XXX_SET_TS_AU	ENABLED	ENABLED	DISABLED	
SY_THR_XXX_SET_TS_BAND_D	true	true	false	
SY_THR_XXX_SET_TS_BAND_C	true	true	false	
SY_THR_XXX_SET_TS_BAND_B	true	true	false	
SY_THR_XXX_SET_TS_BAND_A	true	true	false	
CP_THR_SEQ_POS	0	0	0	
SY_THR_XXX_SET_TS_AV	NR_AV_16	NR_AV_16	NR_AV_16	
SY_THR_XXX_SET_TS_CR	DISABLED	DISABLED	DISABLED	
SY_THR_XXX_SET_TS_AU	DISABLED	DISABLED	DISABLED	
SY_THR_XXX_SET_TS_BAND_D	false	false	false	
SY_THR_XXX_SET_TS_BAND_C	false	false	false	
SY_THR_XXX_SET_TS_BAND_B	false	false	false	
SY_THR_XXX_SET_TS_BAND_A	false	false	false	
CP_THR_SEQ_POS	0	0	0	
SY_THR_XXX_SET_TS_AV	NR_AV_16	NR_AV_16	NR_AV_16	
SY_THR_XXX_SET_TS_CR	DISABLED	DISABLED	DISABLED	
SY_THR_XXX_SET_TS_AU	DISABLED	DISABLED	DISABLED	
SY_THR_XXX_SET_TS_BAND_D	false	false	false	
SY_THR_XXX_SET_TS_BAND_C	false	false	false	
SY_THR_XXX_SET_TS_BAND_B	false	false	false	
SY_THR_XXX_SET_TS_BAND_A	false	false	false	
SY_THR_XXX_CNT_IS	10	10	10	Input Setup (Loop 2) 10 micro-
PAR_LOOP_2	10	10	10	
CP_THR_SEQ_POS	4	4	2	
SY_THR_XXX_SET_IS_FE	PREAMP	PREAMP	CAL	

SY_THR_XXX_SET_IS_TNR2	V1	V1	V1	commandes
SY_THR_XXX_SET_IS_TNR1	V1	V1	V1	
CP_THR_SEQ_POS	6	6	6	
SY_THR_XXX_SET_IS_FE	PREAMP	PREAMP	CAL	
SY_THR_XXX_SET_IS_TNR2	V2	V2	HF_V1	
SY_THR_XXX_SET_IS_TNR1	V2	V2	HF_V1	
CP_THR_SEQ_POS	8	8	0	
SY_THR_XXX_SET_IS_FE	PREAMP	PREAMP	GND	
SY_THR_XXX_SET_IS_TNR2	V3	V3	V1	
SY_THR_XXX_SET_IS_TNR1	V3	V3	V1	
CP_THR_SEQ_POS	11	11	0	
SY_THR_XXX_SET_IS_FE	PREAMP	PREAMP	GND	
SY_THR_XXX_SET_IS_TNR2	HF_V1_V2	HF_V1_V2	V1	
SY_THR_XXX_SET_IS_TNR1	V1	V1	V1	
CP_THR_SEQ_POS	0	0	0	
SY_THR_XXX_SET_IS_FE	GND	GND	GND	
SY_THR_XXX_SET_IS_TNR2	V1	V1	V2_V3	
SY_THR_XXX_SET_IS_TNR1	V1	V1	GND	
CP_THR_SEQ_POS	0	0	0	
SY_THR_XXX_SET_IS_FE	GND	GND	GND	
SY_THR_XXX_SET_IS_TNR2	V1	V1	V1	
SY_THR_XXX_SET_IS_TNR1	V1	V1	V1	
CP_THR_SEQ_POS	0	0	0	
SY_THR_XXX_SET_IS_FE	GND	OK	GND	
SY_THR_XXX_SET_IS_TNR2	GND	V1	V1	
SY_THR_XXX_SET_IS_TNR1	V3	V1	V1	
CP_THR_SEQ_POS	0	0	0	
SY_THR_XXX_SET_IS_FE	GND	OK	GND	
SY_THR_XXX_SET_IS_TNR2	V1	V1	V1	
SY_THR_XXX_SET_IS_TNR1	V1	V1	V1	
CP_THR_SEQ_POS	0	0	0	
SY_THR_XXX_SET_IS_FE	GND	GND	GND	
SY_THR_XXX_SET_IS_TNR2	V1	V1	V1	
SY_THR_XXX_SET_IS_TNR1	V1	V1	V1	
CP_THR_SEQ_POS	0	0	0	
SY_THR_XXX_SET_IS_FE	GND	GND	PREAMP	
SY_THR_XXX_SET_IS_TNR2	V1	V1	V3	
SY_THR_XXX_SET_IS_TNR1	V1	V1	V1	
SY_THR_XXX_CNT_HS	2	2	2	HFR Setup (Loop 3) 2 micro-commandes
PAR_LOOP_3	2	2	2	
CP_THR_SEQ_POS	2	2	4	
SY_THR_XXX_SET_HS_SW	AUTO_SWEEP	AUTO_SWEEP	AUTO_SWEEP	
SY_THR_XXX_SET_HS_INIT_FREQ	0	0	0	
SY_THR_XXX_SET_HS_HF2	true	true	true	

SY_THR_XXX_SET_HS_HF1	true	false	true	
SY_THR_XXX_SET_HS_AV	NR_AV_64	NR_AV_16	NR_AV_32	
CP_THR_SEQ_POS	0	0	0	
SY_THR_XXX_SET_HS_SW	AUTO_SWEEP	AUTO_SWEEP	AUTO_SWEEP	
SY_THR_XXX_SET_HS_INIT_FREQ	436	436	436	
SY_THR_XXX_SET_HS_HF2	false	false	false	
SY_THR_XXX_SET_HS_HF1	false	false	false	
SY_THR_XXX_SET_HS_AV	NR_AV_32	NR_AV_32	NR_AV_32	
SY_THR_XXX_CNT_HSS	2	2	2	HFR Sweep Setup (Loop 4) 2 mircro-commandes
PAR_LOOP_4	2	2	2	
CP_THR_SEQ_POS	3	3	5	
SY_THR_XXX_SET_HSS_S_NR_HF2	96	16	32	
SY_THR_XXX_SET_HSS_S_SIZE_HF2	2	2	2	
SY_THR_XXX_SET_HSS_S_NR_HF1	96	16	32	
SY_THR_XXX_SET_HSS_S_SIZE_HF1	1	1	1	
CP_THR_SEQ_POS	0	0	0	
SY_THR_XXX_SET_HSS_S_NR_HF2	0	0	0	
SY_THR_XXX_SET_HSS_S_SIZE_HF2	0	0	0	
SY_THR_XXX_SET_HSS_S_NR_HF1	0	0	0	
SY_THR_XXX_SET_HSS_S_SIZE_HF1	0	0	0	
SY_THR_XXX_CNT_DO_AN	10	10	10	Do Analysis (Loop 5) 10 micro-commandes
PAR_LOOP_5	10	10	10	
CP_THR_SEQ_POS	5	5	3	
SY_THR_XXX_SET_DO_AN_INT	10	0	6	
SY_THR_XXX_SET_DO_AN_MOD	QUIET	QUIET	QUIET	
SY_THR_XXX_SET_DO_AN_EOS	THR_LOOP	THR_LOOP	THR_LOOP	
SY_THR_XXX_SET_DO_AN_CH2	CH2_TNR	CH2_TNR	CH2_TNR	
SY_THR_XXX_SET_DO_AN_CH1	CH1_TNR	CH1_TNR	CH1_TNR	
CP_THR_SEQ_POS	7	7	7	
SY_THR_XXX_SET_DO_AN_INT	10	0	6	
SY_THR_XXX_SET_DO_AN_MOD	QUIET	QUIET	QUIET	
SY_THR_XXX_SET_DO_AN_EOS	THR_LOOP	THR_LOOP	THR_ONESHOT	
SY_THR_XXX_SET_DO_AN_CH2	CH2_TNR	CH2_TNR	CH2_HFR	
SY_THR_XXX_SET_DO_AN_CH1	CH1_TNR	CH1_TNR	CH1_HFR	
CP_THR_SEQ_POS	9	9	0	
SY_THR_XXX_SET_DO_AN_INT	10	0	0	
SY_THR_XXX_SET_DO_AN_MOD	QUIET	QUIET	QUIET	
SY_THR_XXX_SET_DO_AN_EOS	THR_LOOP	THR_LOOP	THR_LOOP	
SY_THR_XXX_SET_DO_AN_CH2	CH2_TNR	CH2_TNR	CH2_TNR	
SY_THR_XXX_SET_DO_AN_CH1	CH1_TNR	CH1_TNR	CH1_TNR	
CP_THR_SEQ_POS	12	12	0	
SY_THR_XXX_SET_DO_AN_INT	10	0	0	
SY_THR_XXX_SET_DO_AN_MOD	QUIET	QUIET	QUIET	
SY_THR_XXX_SET_DO_AN_EOS	THR_LOOP	THR_LOOP	THR_LOOP	

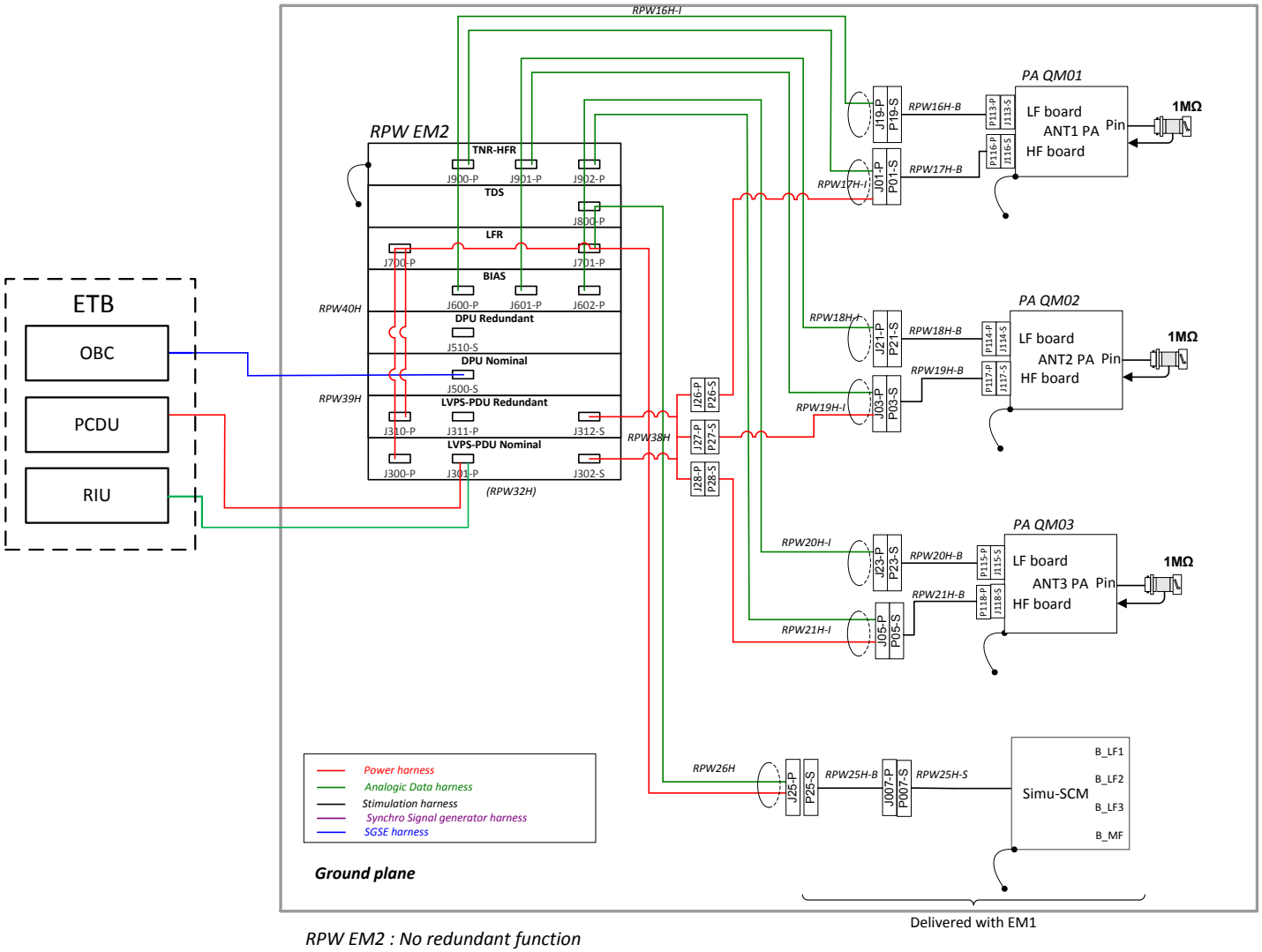
SY_THR_XXX_SET_DO_AN_CH2	CH2_HFR	CH2_HFR	CH2_TNR
SY_THR_XXX_SET_DO_AN_CH1	CH1_TNR	CH1_TNR	CH1_TNR
CP_THR_SEQ_POS	0	0	0
SY_THR_XXX_SET_DO_AN_INT	0	0	0
SY_THR_XXX_SET_DO_AN_MOD	QUIET	QUIET	QUIET
SY_THR_XXX_SET_DO_AN_EOS	THR_LOOP	THR_LOOP	THR_LOOP
SY_THR_XXX_SET_DO_AN_CH2	CH2_TNR	CH2_TNR	CH2_TNR
SY_THR_XXX_SET_DO_AN_CH1	CH1_TNR	CH1_TNR	CH1_TNR
CP_THR_SEQ_POS	0	0	0
SY_THR_XXX_SET_DO_AN_INT	0	0	0
SY_THR_XXX_SET_DO_AN_MOD	QUIET	QUIET	QUIET
SY_THR_XXX_SET_DO_AN_EOS	THR_LOOP	THR_LOOP	THR_LOOP
SY_THR_XXX_SET_DO_AN_CH2	CH2_TNR	CH2_TNR	CH2_TNR
SY_THR_XXX_SET_DO_AN_CH1	CH1_TNR	CH1_TNR	CH1_TNR
CP_THR_SEQ_POS	0	0	0
SY_THR_XXX_SET_DO_AN_INT	0	0	0
SY_THR_XXX_SET_DO_AN_MOD	QUIET	QUIET	QUIET
SY_THR_XXX_SET_DO_AN_EOS	THR_LOOP	THR_LOOP	THR_LOOP
SY_THR_XXX_SET_DO_AN_CH2	CH2_TNR	CH2_TNR	CH2_TNR
SY_THR_XXX_SET_DO_AN_CH1	CH1_TNR	CH1_TNR	CH1_TNR
CP_THR_SEQ_POS	0	0	0
SY_THR_XXX_SET_DO_AN_INT	0	0	0
SY_THR_XXX_SET_DO_AN_MOD	QUIET	QUIET	QUIET
SY_THR_XXX_SET_DO_AN_EOS	THR_LOOP	THR_LOOP	THR_LOOP
SY_THR_XXX_SET_DO_AN_CH2	CH2_TNR	CH2_TNR	CH2_TNR
SY_THR_XXX_SET_DO_AN_CH1	CH1_TNR	CH1_TNR	CH1_TNR
CP_THR_SEQ_POS	0	0	0
SY_THR_XXX_SET_DO_AN_INT	0	0	0
SY_THR_XXX_SET_DO_AN_MOD	QUIET	QUIET	QUIET
SY_THR_XXX_SET_DO_AN_EOS	THR_LOOP	THR_LOOP	THR_LOOP
SY_THR_XXX_SET_DO_AN_CH2	CH2_TNR	CH2_TNR	CH2_TNR
SY_THR_XXX_SET_DO_AN_CH1	CH1_TNR	CH1_TNR	CH1_TNR
CP_THR_SEQ_POS	0	0	0
SY_THR_XXX_SET_DO_AN_INT	0	0	0
SY_THR_XXX_SET_DO_AN_MOD	QUIET	QUIET	QUIET
SY_THR_XXX_SET_DO_AN_EOS	THR_LOOP	THR_LOOP	THR_LOOP
SY_THR_XXX_SET_DO_AN_CH2	CH2_TNR	CH2_TNR	CH2_TNR
SY_THR_XXX_SET_DO_AN_CH1	CH1_TNR	CH1_TNR	CH1_TNR

12 ANNEX 5: ELECTRICAL SFT CONFIGURATION



RPW EM2 : No redundant function

Figure 3: SFT CNES EM2 Configuration



RPW EM2 : No redundant function

Figure 4: SFT ADS EM2 Configuration

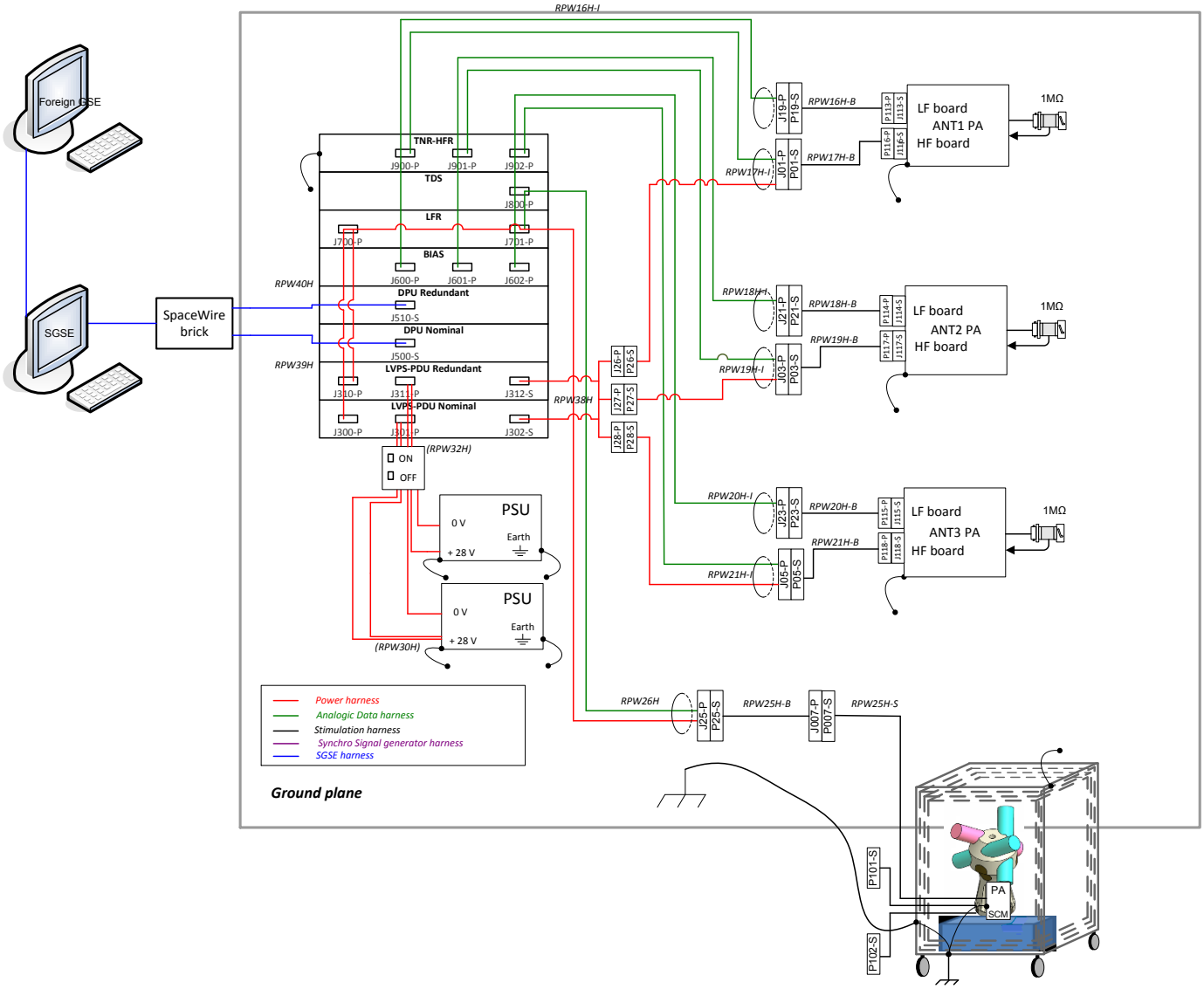


Figure 5: SFT CNES PFM Configuration

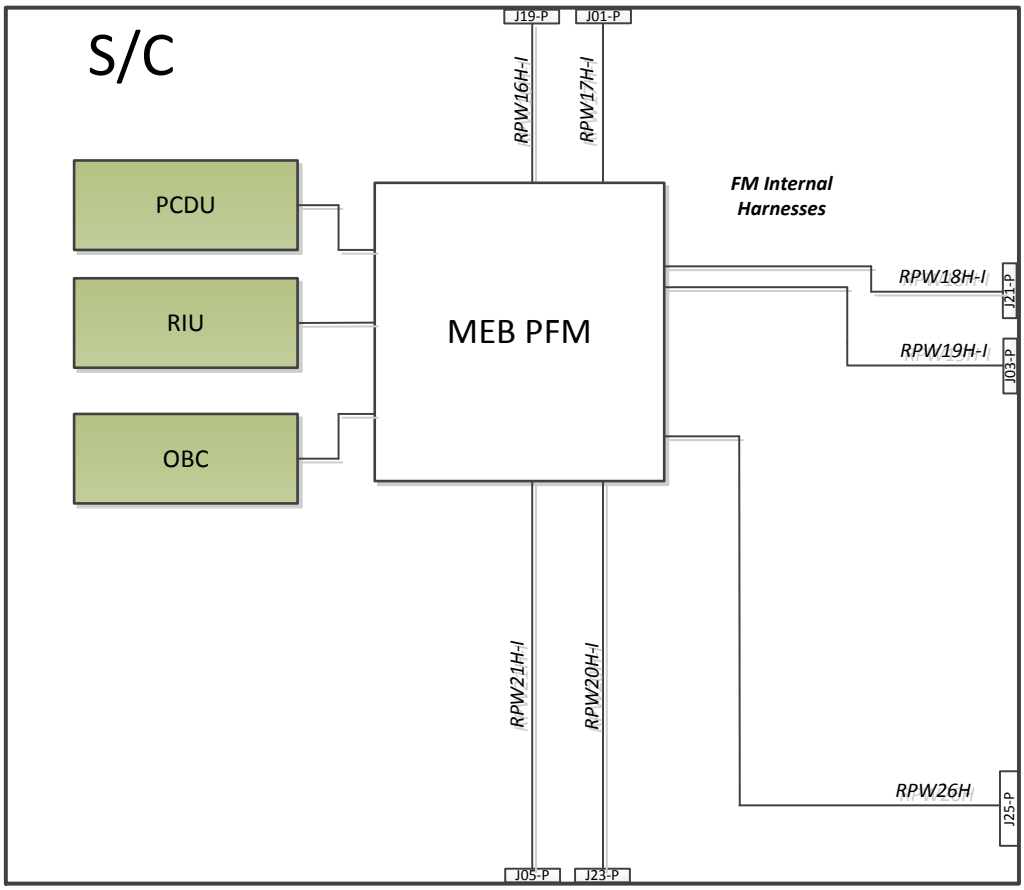


Figure 6: SFT ADS PFM Configuration RPW integrated to the S/C <u>without</u> SCM and the Antennas

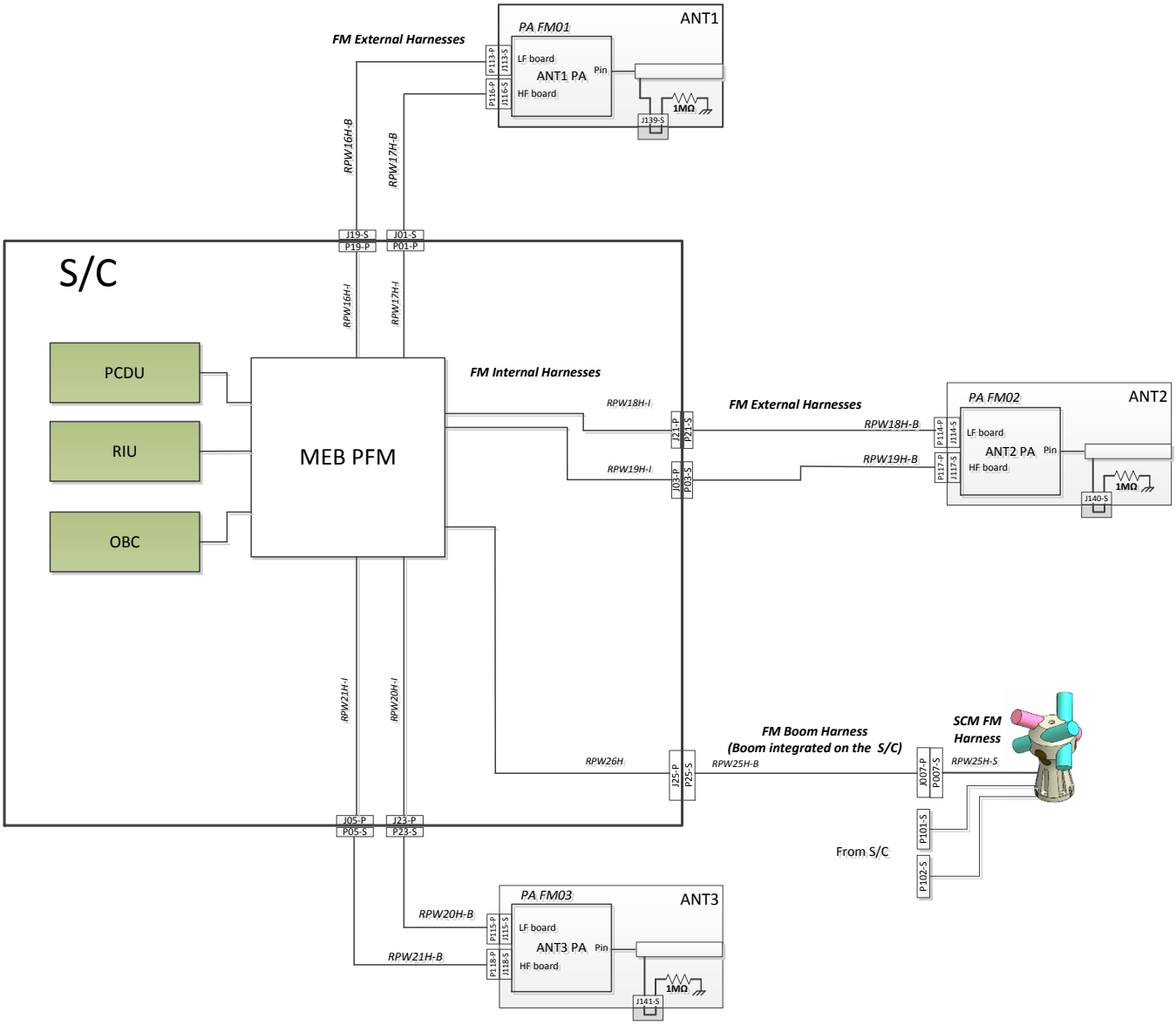


Figure 7: SFT ADS PFM Configuration RPW fully integrated to the S/C

DIFFUSION LIST

Dep	D	Name	TEL	BPI
DSO/SC/SOL	X	FRATTER I.	74427	2220
DSO/SC/SOL	X	GUILHEM E. (ALTRAN)	87604	2220
DSO/TB/EL	X	FIACHETTI C.	83576	1713
DSO/TB/SM		HOT A.	82594	1717
DSO/TB/SM		PUILLET C.	82305	1717
DSO/TB/MS		TREMOLIER E S.	73520	1715
DSO/SC/SOL	X	BELLOUARD E.	82615	2220
DSO/TB/TH		BRYSBAERT C.	74275	1717
DSO/TB/TH		LIQUIERES N. (EPSILON)	75612	
DSO/AVI/RI	X	SANISIDRO J.	73782	2212
DSO/AVI/RI	X	GASC P.	83049	2212
DSO/AVI/RI	X	TELLIER S (SOGETI)	74677	2212
DSO/AVI/RI	X	MERCIER M (SOGETI)	75227	2212
DSO/SC/EUC		DANTO P.	82921	2220
DSO/AVI/SI		JARLAUD J-L.	74950	2212
DSO/AVI/2I		VEGA J-F	73049	2212
DSO/AVI/AV		MEYER J-R	81567	1714
DSO/AQ/LE		FAYE D.	81812	1414
DSO/AQ/BA	X	JULIEN S. (LOGIQUAL)	73110	1415
DSO/AQ/BA	X	BENEZETH J-M. (LOGIQUAL)	75879	1415
DSO/AQ/BA	X	SENDER G. (LOGIQUAL)	75669	1415
DSO/AQ/BA	X	WORGAGUE M. (LOGIQUAL)	74768	1415
DSO/AQ/IM		RIBAIMONT A. (MI-GSO)	81914	1415

Dep	D	Name	TEL	BPI
DSO		CLAIR Marie-Anne	74629	2521
DSO/DA		MARCHAL Philippe	74456	2911
DSO/DA		BORRIEN Andre	81770	2911
DSO/BL		DUBOURG Vincent	73523	2222
DSO/BL		VARGAS Andre	73493	2222
DSO/AVI		LANDIECH Philippe	81958	1416
DSO/AVI		LADIETTE Nadine	74972	1416
DSO/DV		VAN-TROOSTENBERGHE Paola	81820	1421
DSO/DV		DESMAZEAUX Pascal	83345	1421
DSO/NT		BOLOH Loic	81401	212
DSO/NT		GUAY Philippe	82620	212
DSO/OT		GLEYZES Alain	73187	2524
DSO/OT		BRICOUT Jean-Noel	81320	2524
DSO/RF		PRADINES Dominique	74747	2512
DSO/RF		LAPORTE Christophe	81324	2512
DSO/SC		LIER Philippe	82155	2532
DSO/		PERBOS J.	74157	2532
DSO/SI		BOUSSARIE Eric	74354	1711
DSO/SI		CUGNY Bruno	73139	1711

DSO/AQ/MP		COMBES H.	73073	1414
DSO/DA/CP		LE GALLUDEC J.	81745	2502
DSO/TB/LV	**X**	CAMPO GARRIDO G.	83271	1715
DIA/DA		CASOLI F.	67862	Paris
DIA/SME		AMSIF .K	73704	213
DAJ/AR/TN		DOORN M.	73193	1605
DSO/TB/ET		SABA B.	82876	1713
DSO/DA/CP		BLANDIN C. (MI-GSO)	83142	2502
DSO/AVI/CC		TRAVERT J-M (ALTRAN)	82169	2213

DSO/TB		**SERENE Fabienne**	**83180**	**1716**
DSO/TB		**BRIET Richard**	**82322**	**1716**
DSO/AQ		**CADIOU Anne.**	**82632**	**1411**
DSO/AQ/IM		**MAZEAU Sophie.**	**82918**	**1415**
DSO/AQ/BA		**GEAY-KAMINSKI N.**	**82047**	**1415**