

Check SPU software (Nominal)
 File: H_FCP_PAC_NCSM.xls
 Author: R. Biggins



Procedure Summary

Objectives

The objective of this procedure is to check the on-board software for the nominal SPU

- Enable RT interrogation for PACS A
- Switch ON DPU
- Switch ON SPU
- Establish SPU-DPU links
- Execute SPU red and blue memory checks
- Check and verify EEPROM contents
- Copy HLSW (red and blue) to EEPROM
- Check and verify SPU RAM contents
- Switch OFF PACS

Based on procedures:

Pacs_Switch_On_DPU_SPULLSW_Nominal_30_07_2007
 Pacs_Spu_MemCheck_All_13_8_05_10_2007
 PACS_Switch_Off_Nominal_28_07_2007

Summary of Constraints

PACS has been switched off for at least 4 minutes.

This procedure is valid for the SPU software version 13.96

Spacecraft Configuration

Start of Procedure

- PACS is OFF
- All PACS units powered off
 - UIU table shows PACS units OFF

End of Procedure

- PACS is OFF
- All PACS units powered off
 - UIU table shows PACS units OFF

Reference File(s)

Input Command Sequences

Output Command Sequences

HFPNCSM

Referenced Displays

ANDs GRDs SLDs
 ZAZ9A999

Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
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Status : Version 7 - Unchanged
 Last Checkin: 20/03/09

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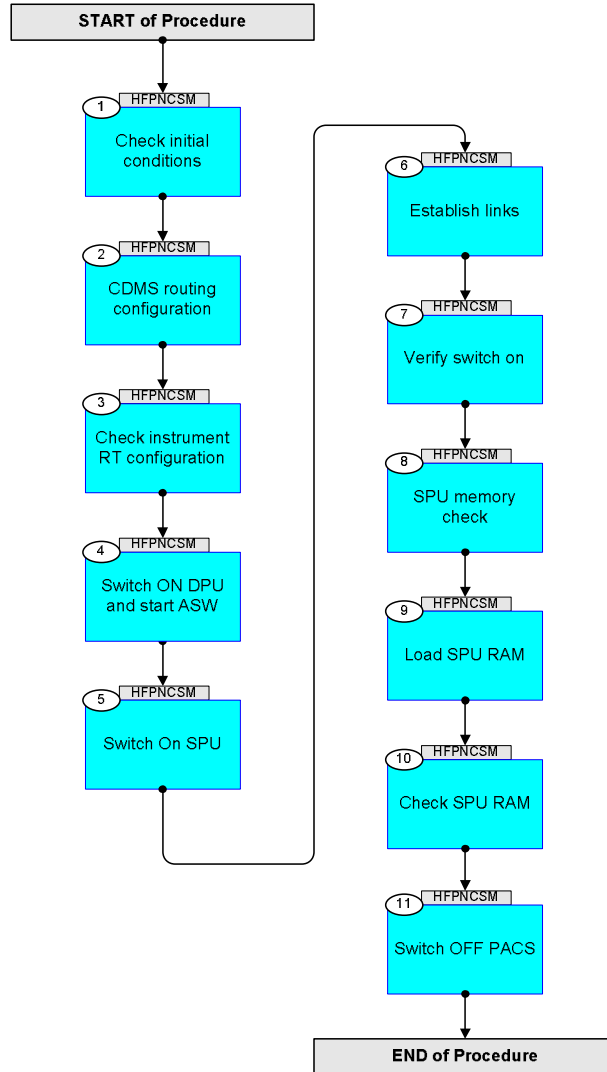


20/09/07		1	Created	R. Biggins	
22/11/07		1.01	Validation : Time tags added to SVM commands	R. Biggins	
04/12/07		2	TC and TM updated for SPU UM v3.2.2, software version 13.8	R. Biggins	
21/01/08		3	Update due to initial testing against the simulator: - TCs updated due to new DB - Editorial updates	R. Biggins	
03/03/08		4	Update due to testing against MOC Simulator and comments by S. Pezzuto: - Telecommand flags updated - Telemetry check added to step 6.2 - Editorial updates	R. Biggins	
27/05/08	1	5	Updates due to SVT-1 testing: - TC to start RT interrogations updated (step 4.3) - TC to enable FDIR moved from step 11.4 to step 4.5 - TC to disable RT interrogations moved to before LCL switch off - SPU memory check checksum values (EEPROM) moved to attachment - SPU memory check checksum values (RAM) moved to attachment - Expected LCL currents updated - Comments added/updated - Flags updated - AND updated for all TM parameters	R. Biggins	
23/10/08	2	6	Updates due to new procedures from industry - Step 4.2 and 4.3 combined - TC DC005161 database definition updated	R. Biggins	
20/03/09	2.2	7	Final updates before flight - Summary updated - TC flags updated - Memory checks updated to reflect current software versions	R. Biggins	
17/04/09	2.3	7.01	Validation : Editorial updates due to comments from project/industry	R. Biggins	

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Procedure Flowchart Overview



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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
Beginning of Procedure				
TC Seq. Name : HFPNCSM (Check SPU s/w (Nom))				
TimeTag Type: N				
Sub Schedule ID:				
□				
1		Check initial conditions		Next Step: 2
		Verify: PACS has been switched off for at least 4 minutes		
1.1		PACS input		□
		Verify that the PACS ICC has indicated whether the DPU is to be booted from the primary or secondary partition (step 4.4) DPU_PRTN = 1 or 2		
1.2		Spacecraft mode		□
		Verify Telemetry CurrentMode DEL34170 = Nominal		AND=ZAZ9A999
		Verify Telemetry ACC_A_MODE AEE8G050 = Nominal		AND=ZAZ9A999
1.3		Bus status		□
		Verify Bus configuration		
		Verify: Active 1553 bus Active_Bus_A_B DEFJ1160 = BUS_A		AND=ZAZ9A999
		Verify: 1553 bus FDIR status SDB_FDIR DEFJ4160 = ENABLED		AND=ZAZ9A999
		Verify: SDB handling status BSW_SDB_ENAB DEF60160 = ENABLED		AND=ZAZ9A999
		Verify bus health status		
		Verify: Bus (side A) health status BusA_HealthySts DEFJ2160 = Healthy		AND=ZAZ9A999
		Verify: Bus (side B) health status BusB_HealthySts DEFJ3160 = Healthy		AND=ZAZ9A999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
3		Check instrument RT configuration		Next Step: 4
3.1		Remote Terminal configuration		<input type="checkbox"/>
		Verify Telemetry PACS_VitalNonV DED5G161	= NonVital	AND=ZAZ9A999
		Verify Telemetry PACS_TmRetry DED5Z161	= ON	AND=ZAZ9A999
3.2		Remote Terminal Status		<input type="checkbox"/>
		Nominal units		
		Verify Telemetry PACSA_OnOff DED2G161	= OFF	AND=ZAZ9A999
		Verify Telemetry PACSA_DeadAliv DED2H161	= Alive	AND=ZAZ9A999
		Verify Telemetry PACSA_WellsiTC DED2Z161	= Well	AND=ZAZ9A999
		Verify Telemetry PACSA_WellsiTM DED2J161	= Well	AND=ZAZ9A999
		Verify Telemetry PACSA_ValidInv DED2K161	= Invalid	AND=ZAZ9A999
		Redundant units		
		Verify Telemetry PACSB_OnOff DED31161	= OFF	AND=ZAZ9A999
		Verify Telemetry PACSB_DeadAliv DED32161	= Alive	AND=ZAZ9A999
		Verify Telemetry PACSB_WellsiTC DED33161	= Well	AND=ZAZ9A999
		Verify Telemetry PACSB_WellsiTM DED34161	= Well	AND=ZAZ9A999
		Verify Telemetry PACSB_ValidInv DED35161	= Invalid	AND=ZAZ9A999
4		Switch ON DPU and start ASW		Next Step: 5
4.1		Set Bus Profile		<input type="checkbox"/>

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		F9 DH027161 F10 DH028161 F11 DH029161 TC Control Flags : Subsch. ID : 10 Det. descr. : Configure SDB FDIR GBM IL DSE --Y -- ---	Healthy Healthy DISABLED	
		Wait up to 1 minute for the generation of the D_Hk_P64 packet from the CDMU (APID = 18)		
		Verify: 1553 bus FDIR status SDB_FDIR DEFJ4160	= DISABLED	AND=ZAZ9A999
		Verify Telemetry PACS_NomRed DED5H161	= NOMINAL	AND=ZAZ9A999
		Verify Telemetry PACSA_OnOff DED2G161	= ON	AND=ZAZ9A999
		Verify Telemetry PACSA_ValidInv DED2K161	= Valid	AND=ZAZ9A999
4.3		Switch ON DPU LCL		<input type="checkbox"/>
		Switching ON the DPU LCL will initialise BSW. This will initially execute memory checks (failures will generate TM(5,4) packets) and then generate TM(5,1) [EVENT_REPORT_3_32776] packets every 10 seconds.		
	ET=+ UT=+00.00.00	Execute Telecommand SwOn_PacsD_N_L41 TC Control Flags : Subsch. ID : 10 Det. descr. : PCDU: TC(8,4,112,5) PACS DPU Nom - switch LCL_41 on GBM IL DSE --Y -- ---	DC41D170	
		Verify: DPU LCL status PacsD_N_L41_S WM72B565	= ON	AND=ZAZ9A999
		Verify: DPU LCL current (+/- 0.1A) PacsD_N_L41_I WM707565	= 0.49 A	AND=ZAZ9A999
4.4		DPU Force Boot		<input type="checkbox"/>
		Sending the FORCE_BOOT TC will generate a TM(5,1) [EVENT_REPORT_3_33041] packet from the BSW.		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.15	DPU_LLSW_FORCE_BOOT DPU_LLSW_FORCE_BOOT Command Parameter(s) : DPU_STRUCTURE_ID PP002380 DPU_PARTITION PP267380 SSID : 90	PC032380 1 <dec> (Def) DPU_PRTN	
		Verify: The following TM(3,25) packets should be produced: PACS_essential_HK (APID 1152) PACS_NO_PRIME_HK (APID 1154)		
4.5		Re-enable SDB FDIR		<input type="checkbox"/>
	ET=+ UT=+00.00.00	Execute Telecommand ConfigureSDBFDIR Command Parameter(s) : RTA DH011161 M0 DH030161 M1 DH031161 M2 DH032161 M3 DH033161 M4 DH034161 M5 DH035161 M6 DH036161 M7 DH037161 F0 DH018161 F1 DH019161	DC005161 PACS A Ignore Flag Ignore Flag Ignore Flag Ignore Flag Ignore Flag Ignore Flag Ignore Flag Ignore Flag OFF Alive	
		F2 DH020161 F3 DH021161 F4 DH022161 F5 DH023161 F6 DH024161 F7 DH025161 M12 DH051161 M_C DH043161 M8 DH038161 M9 DH039161 M10 DH040161 M11 DH041161 F12 DH050161 CNT DH042161 F8 DH026161	Well TC Well TM Invalid Non-vital NOMINAL OFF Ignore Flag Ignore CNT Ignore Flag Ignore Flag Ignore Flag Update status ENABLED LoopCnt1 Bus A	
		F9 DH027161 F10 DH028161 F11 DH029161 TC Control Flags : Subsch. ID : 10 Det. descr. : Configure SDB FDIR	Healthy Healthy ENABLED GBM IL DSE --Y -- --	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Wait up to 1 minute for the generation of the D_Hk_P64 packet from the CDMU (APID = 18)		
		Verify: 1553 bus FDIR status SDB_FDIR DEFJ4160	= ENABLED	AND=ZAZ9A999
5		Switch On SPU		Next Step: 6
	ET=+ UT=+00.00.00	Execute Telecommand SwOn_PacsS_N_L35 TC Control Flags : Subsch. ID : 10 Det. descr. : PCDU: TC(8,4,112,5) PACS SPU Nom - switch LCL_35 on	DC35D170	
		Verify: SPU LCL status PacsS_N_L35_S WM52A565	= ON	AND=ZAZ9A999
		Verify: SPU LCL current (+/- 0.1A) PacsS_N_L35_I WM506565	= 0.4 A	AND=ZAZ9A999
6		Establish links		Next Step: 7
6.1		DPU reset of 1355		<input type="checkbox"/>
	ET=+ UT=+00.00.28	DPU_RESET_1355 SSID : 90	DPU_RESET_1355 PC025380	
6.2		DPU - SPU links		<input type="checkbox"/>
		WARNING: the following TCs must be sent with the exact time delay as defined		
		Sending this TC will generate the following TM(5,1) packets: EVENT_REPORT_5_28 - Unexp 1355 ACK EVENT_REPORT_0_14 - SPUS DEAD		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.10	Initialise DPU - blue SPU links <p style="text-align: right;">DPU_START_OBCP</p> Command Parameter(s) : PROCEDURE_ID PP012380 NUMBER_OF_TIMES PP010380 PAR_ID PP011380 PAR_VALUE PP017380 PAR_ID PP011380 PAR_VALUE PP017380 TC Control Flags : <p style="text-align: right;">GBM IL DSE --Y -- ---</p> Subsch. ID : 90	PC012380 START_1355_LINK 2 <dec> (Def) 1 <dec> 1 <dec> 2 <dec> 1 <dec>	
		Det. descr. : START AN OBCP WITH THE COMMANDED PARAMETERS		
		Sending this TC will generate the following TM(5,1) packets: EVENT_REPORT_5_28 - Unexp 1355 ACK EVENT_REPORT_0_10 - SPUL DEAD		
	ET=+ UT=+00.00.04	Initialise DPU - red SPU links <p style="text-align: right;">DPU_START_OBCP</p> Command Parameter(s) : PROCEDURE_ID PP012380 NUMBER_OF_TIMES PP010380 PAR_ID PP011380 PAR_VALUE PP017380 PAR_ID PP011380 PAR_VALUE PP017380 SSID : 90	PC012380 START_1355_LINK 2 <dec> (Def) 1 <dec> 2 <dec> 2 <dec> 1 <dec>	
		Verify Telemetry <p style="text-align: right;">DP_SPS_LINK PM020380</p>	= ON	AND=ZAZ9A999
		Verify Telemetry <p style="text-align: right;">DP_SPL_LINK PM021380</p>	= ON	AND=ZAZ9A999
6.3		SPU Memory self test: dump blue		☐
	ET=+ UT=+00.00.04	DPU_MEMORY_DUMP <p style="text-align: right;">DPU_MEMORY_DUMP</p> Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : <p style="text-align: right;">GBM IL DSE --Y -- ---</p> Subsch. ID : 90 Det. descr. : DUMP OF A DPU MEMORY AREA	PC028380 5100 <hex> 0 <hex> 17 <dec>	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify: The following TM(6,6) packet should be produced: PACS_MEMORY_DUMP (APID 1152)		
		For PACS SPU OBSW v13.96 : 0x 0000 0001 0x 0007 FFFF 0x 0000 6823 0x 0000 6823 Although the rest of the dump should be 0x0000 0000, it is not unexpected if it is not. This should be analysed by PACS offline		
6.4		<i>SPU Memory self test: dump red</i>		□
	ET=+ UT=+00.00.01	DPU_MEMORY_DUMP DPU_MEMORY_DUMP Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : DUMP OF A DPU MEMORY AREA	PC028380	7100 <hex> 0 <hex> 17 <dec>
		Verify: The following TM(6,6) packet should be produced: PACS_MEMORY_DUMP (APID 1152)		
		For PACS SPU OBSW v13.96 : 0x 0000 0001 0x 0007 FFFF 0x 0000 6823 0x 0000 6823 Although the rest of the dump should be 0x0000 0000, it is not unexpected if it is not. This should be analysed by PACS offline		
7		<i>Verify switch on</i>		Next Step: 8
		Verify Telemetry DP_SPUS_HK PM026380	= NO NEW HK	AND=ZAZ9A999
		Verify Telemetry DP_SPUL_HK PM027380	= NO NEW HK	AND=ZAZ9A999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
8		SPU memory check		Next Step: 9
8.1		Check table segments in SPU EEPROM		<input type="checkbox"/>
		The following checks will verify the contents of the SPU Program Memory (EEPROM)		
		For PACS SPU OBSW v13.96: CHECKSUM1 = FEB0 CHECKSUM2 = DDCD		
	ET=+ UT=+00.00.00	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380	
		Verify: SPU memory checksum CHECKSUM PM132380	CHECKSUM1	AND=ZAZ9A999
	ET=+ UT=+00.00.01	Check init table segment DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380	
		Verify: SPU memory checksum CHECKSUM PM132380	CHECKSUM2	AND=ZAZ9A999
8.2		Check program code segment in SPU EEPROM		<input type="checkbox"/>
		The following checks will verify the contents of the SPU Program Memory (EEPROM)		
		Uplink the memory check commands one by one and verify the received checksums (PM132380) against the corresponding expected values in Attachment 1.		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8300 <hex> A00 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8300 <hex> 1200 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8300 <hex> 1A00 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8300 <hex> 2200 <hex> 800 <hex>	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8300 <hex> 2A00 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8300 <hex> 3200 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8300 <hex> 3A00 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8300 <hex> 4200 <hex> 800 <hex>	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8300 <hex> 4A00 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8300 <hex> 5200 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8300 <hex> 5A00 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8300 <hex> 6200 <hex> 800 <hex>	

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	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8300 <hex> 6A00 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8300 <hex> 7200 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8300 <hex> 7A00 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8300 <hex> 8200 <hex> 39F <hex>	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
9		Load SPU RAM		Next Step: 10
9.1		Load SPU Red HLSW from EEPROM to RAM		<input type="checkbox"/>
	ET=+ UT=+00.00.01	SPUL_LLSW_LOAD_EEPROM SPUL_LLSW_LOAD_EEPROM Command Parameter(s) : SPUL_EEPROM_MEMORY_ID PP040390 SPUL_EEPROM_START_ADDR PP042390 SPUL_RAM_MEMORY_ID PP041390 SPUL_RAM_START_ADDR PP043390 SPUL_DATA_LENGTH_HLSW PP038390 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : LOAD SPU HLSW FROM EEPROM FOR RED SPU	PC070390	
	ET=+ UT=+00.00.02	SPUL_LLSW_LOAD_EEPROM SPUL_LLSW_LOAD_EEPROM Command Parameter(s) : SPUL_EEPROM_MEMORY_ID PP040390 SPUL_EEPROM_START_ADDR PP042390 SPUL_RAM_MEMORY_ID PP041390 SPUL_RAM_START_ADDR PP043390 SPUL_DATA_LENGTH_HLSW PP038390 Subsch. ID : 90 Det. descr. : LOAD SPU HLSW FROM EEPROM FOR RED SPU	PC070390	
	ET=+ UT=+00.00.02	SPUL_LLSW_LOAD_EEPROM SPUL_LLSW_LOAD_EEPROM Command Parameter(s) : SPUL_EEPROM_MEMORY_ID PP040390 SPUL_EEPROM_START_ADDR PP042390 SPUL_RAM_MEMORY_ID PP041390 SPUL_RAM_START_ADDR PP043390 SPUL_DATA_LENGTH_HLSW PP038390 Subsch. ID : 90 Det. descr. : LOAD SPU HLSW FROM EEPROM FOR RED SPU	PC070390	
9.2		Load SPU Blue HLSW from EEPROM to RAM		<input type="checkbox"/>

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.02	SPUS_LLSW_LOAD_EEPROM SPUS_LLSW_LOAD_EEPROM Command Parameter(s) : SPUS_EEPROM_MEMORY_ID PP058400 SPUS_EEPROM_START_ADDR PP060400 SPUS_RAM_MEMORY_ID PP059400 SPUS_RAM_START_ADDR PP061400 SPUS_DATA_LENGTH_HLSW PP056400 Subsch. ID : 90 Det. descr. : LOAD SPU HLSW FROM EEPROM FOR BLUE SPU	PC069400	
	ET=+ UT=+00.00.02	SPUS_LLSW_LOAD_EEPROM SPUS_LLSW_LOAD_EEPROM Command Parameter(s) : SPUS_EEPROM_MEMORY_ID PP058400 SPUS_EEPROM_START_ADDR PP060400 SPUS_RAM_MEMORY_ID PP059400 SPUS_RAM_START_ADDR PP061400 SPUS_DATA_LENGTH_HLSW PP056400 Subsch. ID : 90 Det. descr. : LOAD SPU HLSW FROM EEPROM FOR BLUE SPU	PC069400	
	ET=+ UT=+00.00.02	SPUS_LLSW_LOAD_EEPROM SPUS_LLSW_LOAD_EEPROM Command Parameter(s) : SPUS_EEPROM_MEMORY_ID PP058400 SPUS_EEPROM_START_ADDR PP060400 SPUS_RAM_MEMORY_ID PP059400 SPUS_RAM_START_ADDR PP061400 SPUS_DATA_LENGTH_HLSW PP056400 Subsch. ID : 90 Det. descr. : LOAD SPU HLSW FROM EEPROM FOR BLUE SPU	PC069400	
10		Check SPU RAM		Next Step: 11
10.1		Check table segments in SPU RAM		<input type="checkbox"/>
		The following checks will verify the contents of the SPU Program Memory (RAM)		
		For PACS SPU OBSW v13.96: CHECKSUM1 = FEB0 CHECKSUM2 = DDCD		

Check SPU software (Nominal)
 File: H_FCP_PAC_NCSM.xls
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8100 <hex> 1200 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8100 <hex> 1A00 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8100 <hex> 2200 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8100 <hex> 2A00 <hex> 800 <hex>	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8100 <hex> 3200 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8100 <hex> 3A00 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8100 <hex> 4200 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8100 <hex> 4A00 <hex> 800 <hex>	

Check SPU software (Nominal)
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8100 <hex> 5200 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8100 <hex> 5A00 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8100 <hex> 6200 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8100 <hex> 6A00 <hex> 800 <hex>	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8100 <hex> 7200 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8100 <hex> 7A00 <hex> 800 <hex>	
	ET=+ UT=+00.00.01	DPU_MEMORY_CHECK_RAW DPU_MEMORY_CHECK Command Parameter(s) : DPU_MEMORY_BLOCK_ID PP009380 DPU_MEMORY_ADDR PP003380 DPU_DATA_LENGTH PP008380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : REQUEST FOR A CHECKSUM OF A SPECIFIED MEMORY AREA	PC029380 8100 <hex> 8200 <hex> 39F <hex>	
11		Switch OFF PACS		Next Step: END
11.1		Go to SAFE MODE		□
		Sending the following TC will generate a TM(5,1) [EVENT_REPORT_6_3 - NACK] packet.		

Check SPU software (Nominal)
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+ UT=+00.00.00	DPU_START_OBCP_RAW DPU_START_OBCP Command Parameter(s) : PROCEDURE_ID PP012380 NUMBER_OF_TIMES PP010380 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 90 Det. descr. : START AN OBCP WITH THE COMMANDED PARAMETERS	PC012380 24 <dec> 0 <dec>	
		Verify Telemetry DP_TM_RATE PM049380	= SAFE	AND=ZAZ9A999
11.2		Stop the instrument RT interrogation		<input type="checkbox"/>
	ET=+ UT=+00.00.00	Execute Telecommand ConfigureSDBFDIR Command Parameter(s) : RTA DH011161 M0 DH030161 M1 DH031161 M2 DH032161 M3 DH033161 M4 DH034161 M5 DH035161 M6 DH036161 M7 DH037161 F0 DH018161 F1 DH019161	DC005161 PACS A Update status Ignore Flag Ignore Flag Ignore Flag Update status Ignore Flag Ignore Flag Ignore Flag OFF Alive	
		F2 DH020161 F3 DH021161 F4 DH022161 F5 DH023161 F6 DH024161 F7 DH025161 M12 DH051161 M_C DH043161 M8 DH038161 M9 DH039161 M10 DH040161 M11 DH041161 F12 DH050161 CNT DH042161 F8 DH026161	Well TC Well TM Invalid Non-vital NOMINAL OFF Ignore Flag Ignore CNT Ignore Flag Ignore Flag Ignore Flag Ignore Flag ENABLED LoopCnt1 Bus A	
		F9 DH027161 F10 DH028161 F11 DH029161 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 10 Det. descr. : Configure SDB FDIR	Healthy Healthy ENABLED	

Check SPU software (Nominal)
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Wait up to 1 minute for the generation of the D_H_Hk_P64 packet from the CDMU (APID = 18)		
		Verify Telemetry PACSA_OnOff DED2G161	= OFF	AND=ZAZ9A999
		Verify Telemetry PACSA_ValidInv DED2K161	= Invalid	AND=ZAZ9A999
11.3		Switch OFF LCLs		<input type="checkbox"/>
	ET=+ UT=+00.00.00	Execute Telecommand SwOff_PacsS_N_L35 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 10 Det. descr. : PCDU: TC(8,4,112,3) PACS SPU Nom - switch LCL_35 off	DC35B170	
	ET=+ UT=+00.00.01	Execute Telecommand SwOff_PacsD_N_L41 Subsch. ID : 10 Det. descr. : PCDU: TC(8,4,112,3) PACS DPU Nom - switch LCL_41 off	DC41B170	
		Verify Telemetry PacsS_N_L35_S WM52A565	= OFF	AND=ZAZ9A999
		Verify Telemetry PacsD_N_L41_S WM72B565	= OFF	AND=ZAZ9A999
End of Procedure				

ATTACHMENT 1

SPU EEPROM contents

H_FCP_PAC_NCSM

Checksums for step 8.2

Block ID: 8300

SPU OBSW version 13.96

DPU_MEMORY_ADDR	DPU_DATA_LENGTH	Checksum (HEX)
A00	800	F921
1200	800	6B58
1A00	800	19D7
2200	800	A26B
2A00	800	21F8
3200	800	3FF2
3A00	800	4118
4200	800	6FB8
4A00	800	092F
5200	800	5D08
5A00	800	CACF
6200	800	CBFD
6A00	800	FDEE
7200	800	3B4F
7A00	800	EC6B
8200	39F	2AB0

Doc No. : PT-HMOC-OPS-FOP-6001-OPS-OAH
Fop Issue : 3.0
Issue Date: 13/04/10

Check SPU software (Nominal)
File: H_FCP_PAC_NCSM.xls
Author: R. Biggins

Status : Version 7 - Unchanged
Last Checkin: 20/03/09

ATTACHMENT 1

SPU PM RAM contents

H_FCP_PAC_NCSM

Checksums for step 10.2

Block ID: 8100

SPU OBSW version 13.96

DPU_MEMORY_ADDR	DPU_DATA_LENGTH	Checksum (HEX)
A00	800	F921
1200	800	6B58
1A00	800	19D7
2200	800	A26B
2A00	800	21F8
3200	800	3FF2
3A00	800	4118
4200	800	6FB8
4A00	800	092F
5200	800	5D08
5A00	800	CACF
6200	800	CBFD
6A00	800	FDEE
7200	800	3B4F
7A00	800	EC6B
8200	39F	2AB0

Doc No. : PT-HMOC-OPS-FOP-6001-OPS-OAH
Fop Issue : 3.0
Issue Date: 13/04/10

Check SPU software (Nominal)
File: H_FCP_PAC_NCSM.xls
Author: R. Biggins

Status : Version 7 - Unchanged
Last Checkin: 20/03/09