Patch SPIRE OBS in PM
File: H_FCP_OBS_5111.xls
Author: Liviu Stefanov

Procedure Summary

Objectives

This Herschel OBSM nominal procedure is used to patch the SPIRE OBS when the Application Software (ASW) is running. It is called by the FOP SPIRE procedure H_FCP_SPI_CPOM.
The patches are loaded into the SPIRE DPU PM-High memory and the image integrity after upload is checked via checksum calculation and verification.

The copying of the OBS image from PM-High to PM-Low and OBS restart is executed in the calling procedure H_FCP_SPI_CPOM.
The calling procedure also includes the PM-Low OBS image checksum verification and updated OBS version numbers verification.

This procedure assumes that the memory load and memory check command stacks have already been generated using the OBSM system and are ready for loading on the Manual Stack. The command stack generation activity is not covered by this procedure.

Note: The full upload of the SPIRE OBS from the ASW can be conducted via procedure H_FCP_OBS_5110.

Summary of Constraints

CDMU in Operational Mode
- SPIRE DPU is ON
- SPIRE ASW running

Memory areas are Loaded through TC(6,2) and Checked through TC(6,9); this TCs will be delayed when there is an ongoing:
- TC(6,2) Load Memory Using Absolute Addresses
- TC(6,5) Dump Memory Using Absolute Addresses
- TC(6,9) Check Memory Using Absolute Addresses
- TC(8,4,1,1) Copy Memory

Spacecraft Configuration

Start of Procedure

CDMU in Operational Mode
- SPIRE DPU is ON
- SPIRE ASW running

End of Procedure

Same as start except:
- New SPIRE OBS image loaded in DPU PM-High memory

Reference File(s)

Input Command Sequences

Output Command Sequences

OFCP5111

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Referenced Displays

ANDs	GRDs	SLDs
SA_1_559		
SAM4_500		

Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
30/01/08	1	1	Created	lstefanov-hp	
07/10/09	2.5	2	1. step 2 and sub-steps updated to separate patch stack load for Prime and Redundant 2. step 2 updated for SPIRE OBS v.3.0.B 3. added current step 4 to separate check stack load from patch stack load 4. added current step 6 to include return to calling procedure	lstefanov-hp	

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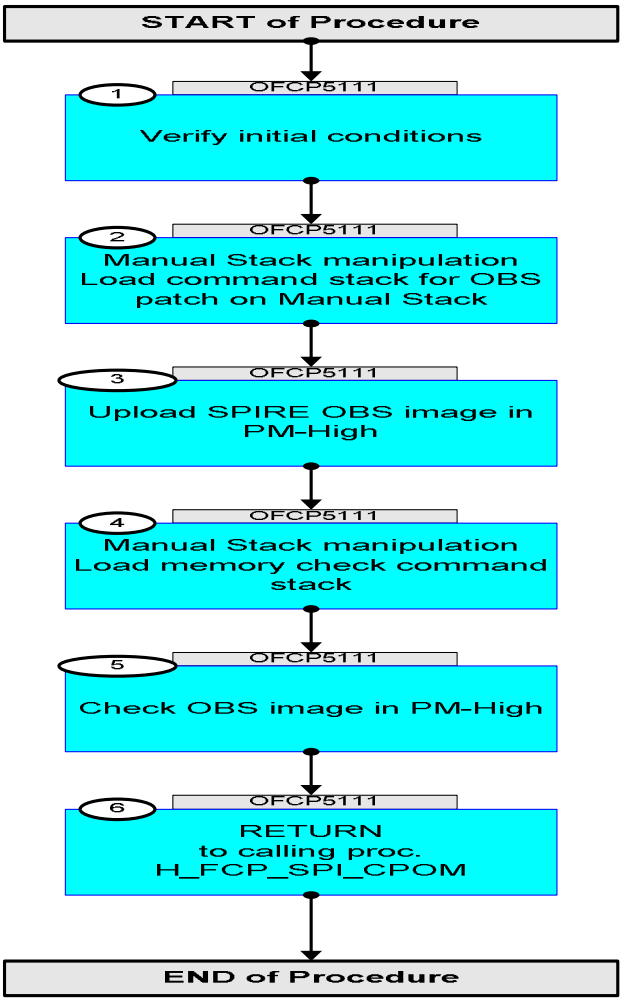
Procedure Flowchart Overview



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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
Beginning of Procedure					
	OFCP5111	*TC Seq. Name :* OFCP5111 ( ) Patch SPIRE OBS in PM *TimeTag Type: B* *Sub Schedule ID:*			
1		Verify initial conditions		Next Step: 2	
		Check: - SPIRE DPU ON - SPIRE ASW running			
		Instrument SOE to confirm SPIRE instrument mode			
		Note: Initial conditions are verified in calling procedure H_FCP_SPI_CPOM.			
2		Manual Stack manipulation Load command stack for OBS patch on Manual Stack		Next Step: 3	
		NOTE: The current procedure assumes that the memory load is performed using commands with immediate execution.			
		Select the File -> **LoadStack** option from the main menu of the Manual Stack window			
2.1		IF SPIRE Nominal			
		Select file **SPDPRMPG_PI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine** from directory /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/SPDPRMPG as indicated by the OBSM engineer			
		IMPORTANT: XXXXYYYY = Image ID(X) and Version(Y) - depend on image used for stack generation YYYY_DDD hhmmss - depend on stack generation time machine - depends on the name of the machine used for stack generation			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		File name **examples** - No model associated to the memory image: SPDPRMPG_PI_0002001_N_NoModel_NoModel_2007_254T123300.sun043 - CT SPDPRMPG1, ID 0003, Version 001 associated to the memory image: SPDPRMPG_PI_0002001_C_SPDPRMPG1_0003001_2007_337T093320.sun043			
2.2		ELSE SPIRE Redundant			
		Select file **SPDPRMPR_PI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine** from directory /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/SPDPRMPR as indicated by the OBSM engineer			
		IMPORTANT: XXXXYYYY = Image ID(X) and Version(Y) - depend on image used for stack generation YYYY_DDD hhmmss - depend on stack generation time machine - depends on the name of the machine used for stack generation			
		File name **examples** - No model associated to the memory image: SPDPRMPR_PI_0002001_N_NoModel_NoModel_2007_254T123300.sun043 - CT SPDPRMPR1, ID 0003, Version 001 associated to the memory image: SPDPRMPR_PI_0002001_C_SPDPRMPR1_0003001_2007_337T093320.sun043			
2.3		Check memory load command stack loaded			
		Check that loaded stack contains one or more TCs **XC002998**.			
2.3.1		Check Memory ID			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Display the Manual Stack in 'Full mode' and check that the **Memory ID** parameter in the XC002998 commands is set to **00 hex**: **Memory ID = 00 hex** **Note**: The Memory ID of the target memory device is stored in the MSB of the 16-bit long Mem ID TC parameter. The LSB of the same parameter carries the most significant 8 bits of the Start Address.			
		Execute Telecommand **SPIRE Memory Load** **XC002998** *Command Parameter(s) :* **Memory ID XH000998 00xx hex** **Start Address XH001998 <hex>** (Def) **Length of Block XH003998 <dec>** (Def) **Var length octet string XH004998 <hex>** (Def) **Checksum XH005998 <hex>** (Def) *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 30* Det. descr. : Load SPIRE Memory Using Absolute Addresses This Telecommand will not be included in the export		**TC**	
2.3.2		Check start address of the memory load command(s) in the stack			
		For SPIRE OBS **v.3.0.B**: The start address of the SPDPRMPG memory image used for memory load command stack generation is **00.0000 hex**, and the last address in the image is **01.6E12 hex**. The **offset** applied to the memory image for OBS upload in PM-High is **04.0000 hex**. Consequently, the first address to be loaded is **04.0000 hex** , and the last address is **05.6E12 hex**.			
		Display the Manual Stack in 'Full mode' and check that addresses in the XC002998 commands are between the limits specified above.			
3		Upload SPIRE OBS image in PM-High		Next Step: 4	
		Uplink the **XC002998** memory load commands with **ARM-GO**			
		For **each TC XC002998** successfuly executed on-board, the DPU HK counter **TCEXEC** should be **incremented by one**.			
		Verify Telemetry **TCEXEC SM03N500** **= incremented by 1**		AND=SA_1_559	
		For each TC XC002998 successfuly executed on-board, a TM(1,1) and TM(1,7) packet shall be received on ground.			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
3.1		IF SPIRE Prime			
		Verify Packet Reception P_TC_Acceptance_Report Packet Mnemonic : SP11TCAR0500 APID : 1280 Type : 1 Subtype : 1 PI1 : PI2 :			
		Verify Packet Reception P_TC_Execution_Completed_Report Packet Mnemonic : SP15TCECR500 APID : 1280 Type : 1 Subtype : 7 PI1 : PI2 :			
3.2		IF SPIRE Redundant			
		Verify Packet Reception R_TC_Acceptance_Report Packet Mnemonic : SP11TCAR0500 APID : 1281 Type : 1 Subtype : 1 PI1 : PI2 :			
		Verify Packet Reception R_TC_Execution_Completed_Report Packet Mnemonic : SP15TCECR500 APID : 1281 Type : 1 Subtype : 7 PI1 : PI2 :			
4		Manual Stack manipulation Load memory check command stack		Next Step: 5	
		Select the File -> **LoadStack** option from the main menu of the Manual Stack window			
4.1		IF SPIRE Nominal			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Select file **SPDPRMPG_CI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine** from directory /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/SPDPRMPG as indicated by the OBSM engineer			
		IMPORTANT: XXXXYYYY = Image ID(X) and Version(Y) - depend on image used for stack generation YYYY_DDD hhmmss - depend on stack generation time machine - depends on the name of the machine used for stack generation			
		File name **examples** - No model associated to the memory image: SPDPRMPG_CI_0002001_N_NoModel_NoModel_2007_254T123300.sun043 - CT SPDPRMPG1, ID 0003, Version 001 associated to the memory image: SPDPRMPG_CI_0002001_C_SPDPRMPG1_0003001_2007_337T093320.sun043			
4.2		ELSE SPIRE Redundant			
		Select file **SPDPRMPR_CI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine** from directory /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/SPDPRMPR as indicated by the OBSM engineer			
		IMPORTANT: XXXXYYYY = Image ID(X) and Version(Y) - depend on image used for stack generation YYYY_DDD hhmmss - depend on stack generation time machine - depends on the name of the machine used for stack generation			
		File name **examples** - No model associated to the memory image: SPDPRMPR_CI_0002001_N_NoModel_NoModel_2007_254T123300.sun043 - CT SPDPRMPR1, ID 0003, Version 001 associated to the memory image: SPDPRMPR_CI_0002001_C_SPDPRMPR1_0003001_2007_337T093320.sun043			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
4.3		Check memory check command stack loaded			
		Check that **2 SCM02500** memory check commands have been loaded on the Manual Stack.			
		Display the Manual Stack in 'Full mode' and check the following addresses and lengths are covered by the SCM02500 commands:			
		For SPIRE OBS **v.3.0.B**: Memory ID **= 00 hex** Start Address = **04.0000 hex** End Address **= 05.6E12 hex**			
		Note: The '**Length**' parameter of the memory check command is a 16-bit long parameter. A memory check TC can cover a number of **65535 dec** (**FFFF hex**) **SAUs**.			
		Execute Telecommand **CHECK_MEMORY** *Command Parameter(s) :* **MEMORYID_CHECKMEM SPM9N500** **STARTADDR_CHECKMEM SPMAN500** **NSAU_CHECKMEM SPMBN500** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 370* Det. descr. : CHECK MEMORY USING ABSOLUTE ADDRESSES This Telecommand will not be included in the export	**SCM02500** **0004 <hex>** **0000 <hex>** **FFFF <hex>**	**TC**	
		Execute Telecommand **CHECK_MEMORY** *Command Parameter(s) :* **MEMORYID_CHECKMEM SPM9N500** **STARTADDR_CHECKMEM SPMAN500** **NSAU_CHECKMEM SPMBN500** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 370* Det. descr. : CHECK MEMORY USING ABSOLUTE ADDRESSES This Telecommand will not be included in the export	**SCM02500** **0004 <hex>** **FFFF <hex>** **6E14 <hex>**	**TC**	
5		Check OBS image in PM-High		Next Step: 6	
		For each TC(6,9), a TM(6,10) packet shall be received on ground.			
5.1		Command and verify the first checksum			
		Uplink the first **SCM02500** memory check commands with **ARM-GO**			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
5.1.1		Verify reception and contents of TM(6,10)			
		Note: A TM(6,10) packet will be received for each memory check command uplinked.			
5.1.1.1		IF SPIRE Prime			
		Verify Packet Reception Memory_Check_Absolute_Addresses Packet Mnemonic : SMEMCHK00500 APID : 1280 Type : 6 Subtype : 10 PI1 : PI2 :			
		Verify Telemetry **MEMORYID_MCHK SMM8N500**	**= 0004 <hex>**	AND=SAM4_500	
		Verify Telemetry **STARTADDR_MCHK SMM9N500**	**= 0000 <hex>**	AND=SAM4_500	
		Verify Telemetry **NSAU_MCHK SMMAN500**	**= FFFF <hex>**	AND=SAM4_500	
		Verify Telemetry **CHK_MCHK SMMBN500**		AND=SAM4_500	
5.1.1.2		ELSE SPIRE Redundant			
		Verify Packet Reception R_Memory_Check_Absolute_Addresses Packet Mnemonic : SMEMCHK00500 APID : 1281 Type : 6 Subtype : 10 PI1 : PI2 :			
		Verify Telemetry **MEMORYID_MCHK SMM8N500**	**= 0004 <hex>**	AND=SAM4_500	
		Verify Telemetry **STARTADDR_MCHK SMM9N500**	**= 0000 <hex>**	AND=SAM4_500	
		Verify Telemetry **NSAU_MCHK SMMAN500**	**= FFFF <hex>**	AND=SAM4_500	
		Verify Telemetry **CHK_MCHK SMMBN500**		AND=SAM4_500	
5.1.2		Verify checksum value			
		Check the received checksum against the expected value			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Verify Telemetry **CHK_MCHK SMMBN500**	**= expected value**	AND=SAM4_500	
5.2		Command and verify the second checksum			
		Uplink the second **SCM02500** memory check commands with **ARM-GO**			
5.2.1		Verify reception and contents of TM(6,10)			
		Note: A TM(6,10) packet will be received for each memory check command uplinked.			
5.2.1.1		IF SPIRE Prime			
		Verify Packet Reception Memory_Check_Absolute_Addresses Packet Mnemonic : SMEMCHK00500 APID : 1280 Type : 6 Subtype : 10 PI1 : PI2 :			
		Verify Telemetry **MEMORYID_MCHK SMM8N500**	**= 0004 <hex>**	AND=SAM4_500	
		Verify Telemetry **STARTADDR_MCHK SMM9N500**	**= FFFF <hex>**	AND=SAM4_500	
		Verify Telemetry **NSAU_MCHK SMMAN500**	**= 6E14 <hex>**	AND=SAM4_500	
		Verify Telemetry **CHK_MCHK SMMBN500**		AND=SAM4_500	
5.2.1.2		ELSE SPIRE Redundant			
		Verify Packet Reception R_Memory_Check_Absolute_Addresses Packet Mnemonic : SMEMCHK00500 APID : 1281 Type : 6 Subtype : 10 PI1 : PI2 :			
		Verify Telemetry **MEMORYID_MCHK SMM8N500**	**= 0004 <hex>**	AND=SAM4_500	
		Verify Telemetry **STARTADDR_MCHK SMM9N500**	**= FFFF <hex>**	AND=SAM4_500	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Verify Telemetry **NSAU_MCHK SMMAN500**	**= 6E14 <hex>**	AND=SAM4_500	
		Verify Telemetry **CHK_MCHK SMMBN500**		AND=SAM4_500	
5.2.2		Verify checksum value			
		Check the received checksum against the expected value			
		Verify Telemetry **CHK_MCHK SMMBN500**	**= expected value**	AND=SAM4_500	
6		RETURN to calling proc. H_FCP_SPI_CPOM		Next Step: END	
		Return to calling procedure H_FCP_SPI_CPOM			
		End of Sequence			
		End of Procedure			