Patch and dump HIFI DPU PRAM memory
File: H_FCP_OBS_3122.xls
Author: Liviu Stefanov

Procedure Summary

Objectives

This Herschel OBSM nominal procedure is used to patch HIFI DPU PRAM memory areas. It can be used for small patches to be applied to the OBS, as an alternative to procedure H_FCP_OBS_3111. Note: The OBS image has to be copied from PM-Low to PM-High prior to loading the patches into DPU PM-High. This can be done using procedure H_FCP_HIF_CPOM.

The patches are loaded into the HIFI DPU PM-High memory and the verification of the patched areas is done by memory dump.

The copying of the OBS image from PM-High to PM-Low and OBS restart can be executed using procedure H_FCP_HIF_CPOM. This also includes the PM-High OBS image checksum verification and the updated OBS patch number verification.

This procedure assumes that the memory load and memory dump 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.

Summary of Constraints

CDMU in Operational Mode
- HIFI in Intermediate mode (ASW running)

Memory areas are Loaded through TC(6,2) and Dumped through TC(6,5); this TC 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
- HIFI in Intermediate mode (ASW running)

End of Procedure

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

Reference File(s)

Input Command Sequences

Output Command Sequences

OFCP3122

Referenced Displays

ANDs   GRDs   SLDs

Status   : Version 4 - Unchanged
Last Checkin: 27/08/08

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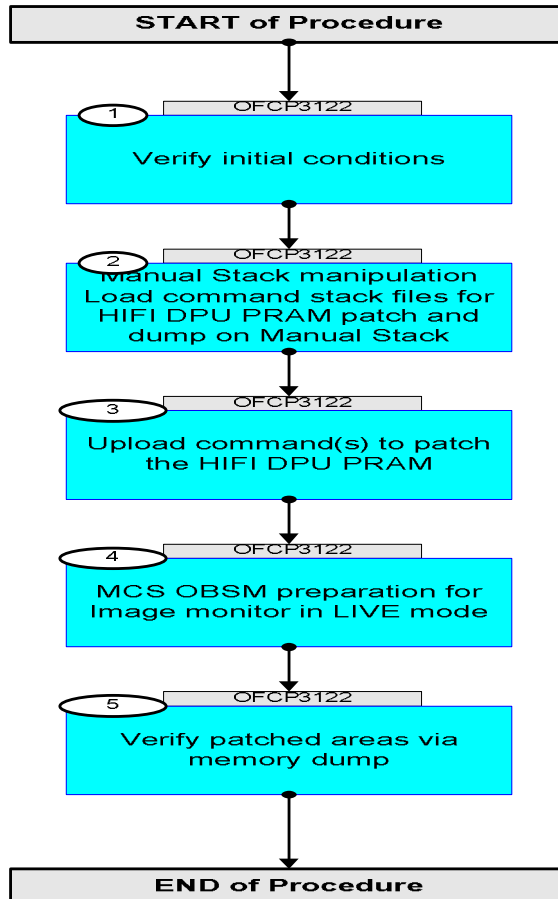
Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
30/01/08	1	1	Created	lstefanov-hp	
26/08/08		2	1. added steps 2.1.1 and 2.1.2 to separate patch stack load for HIFI Nom and Red 2. added steps 2.3.1 and 2.3.2 to separate dump stack load for HIFI Nom and Red 3. step 2.4 updated: TC HC004289 replaced by ESOC HIFI mem. dump TC XC005998 4. added steps 4.2.1 and 4.2.2 to separate image selection for HIFI Nom and Red 5. added step 5.2.1: save merged image if mismatches reported by OBSM	lstefanov-hp	
26/08/08		3	1. step 2.4 updated: corrected typo in 1st and 2nd comments - HC005998 replaced by XC005998 2. step 4.2 updated: removed comment, which appears now in step 4.2.1	lstefanov-hp	
27/08/08	2	4	1. steps 2.3.1 and 2.3.2 updated: corrected typos in file name examples in 3rd comment - PI replaced by DI 2. step 2.4 updated: changed 2nd comment to reflect the 16 bit length of the Mem ID param. of TC XC005998 3. added step 5.1 for mem. dump command(s) upload	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			
	OFCP3122	*TC Seq. Name :* OFCP3122 ( ) Patch and dump HIFI DPU PRAM memory *TimeTag Type:* B *Sub Schedule ID:*			
1		Verify initial conditions		Next Step: 2	
		Check HIFI instrument in **Intermediate mode** (ASW running)			
		Instrument SOE to confirm HIFI instrument mode			
		Note: Initial conditions are verified in calling procedure H_FCP_HIF_CLOM.			
2		Manual Stack manipulation Load command stack files for HIFI DPU PRAM patch and dump on Manual Stack		Next Step: 3	
2.1		Load memory load command stack			
		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			
2.1.1		IF HIFI Nominal			
		Select file **HIDPRMPG_PI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss. machine** from directory /home/pmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OB SM/HIDPRMPG 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: HIDPRMPG_PI_0002001_N_NoModel_NoModel_2007_254T123300.sun043 - CT HIDPRMPG1, ID 0003, Version 001 associated to the memory image: HIDPRMPG_PI_0002001_C_HIDPRMPG1_0003001_2007_337T093320.sun043			
2.1.2		ELSE HIFI Redundant			
		Select file **HIDPRMPR_PI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine** from directory /home/pmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/HIDPRMPR 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: HIDPRMPR_PI_0002001_N_NoModel_NoModel_2007_254T123300.sun043 - CT HIDPRMPR1, ID 0003, Version 001 associated to the memory image: HIDPRMPR_PI_0002001_C_HIDPRMPR1_0003001_2007_337T093320.sun043			
2.2		Check memory load command stack loaded			
		Check that loaded stack contains one or more TCs **XC000998**.			
		Display the Manual Stack in 'Full mode' and check that the **Memory ID** parameter in the XC000998 command(s) 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.			

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		Execute Telecommand
		
		          HIFI Memory Load
		
		Command Parameter(s) :
		      Memory ID **XH000998**
		    Start Address **XH001998**
		    Length of Block **XH003998**
		  Var length octet string **XH004998**
		       Checksum **XH005998**
		
		TC Control Flags :
		              GBM IL DSE
		              --Y -- ---
		
		Subsch. ID : 30
		Det. descr. : Load HIFI Memory Using Absolute Addresses
		
		This Telecommand will not be included in the export
			XC000998
			
			00xx <hex>
			<hex> (Def)
			<dec> (Def)
			<hex> (Def)
			<hex> (Def)
				TC	

2.3		Load memory dump command stack			
		Select the File -> **LoadStack** option from the main menu of the Manual Stack window			
2.3.1		IF HIFI Nominal			
		Select file **HIDPRMPG_DI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine** from directory /home/pmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/HIDPRMPG 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: HIDPRMPG_DI_0002001_N_NoModel_NoModel_2007_254T123300.sun043 - CT HIDPRMPG1, ID 0003, Version 001 associated to the memory image: HIDPRMPG_DI_0002001_C_HIDPRMPG1_0003001_2007_337T093320.sun043			
2.3.2		ELSE HIFI Redundant			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Select file **HIDPRMPR_DI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine** from directory /home/pmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/HIDPRMPR 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: HIDPRMPR_DI_0002001_N_NoModel_NoModel_2007_254T123300.sun043 - CT HIDPRMPR1, ID 0003, Version 001 associated to the memory image: HIDPRMPR_DI_0002001_C_HIDPRMPR1_0003001_2007_337T093320.sun043			
2.4		Check memory dump command stack loaded			
		Check that loaded stack contains one or several TCs **XC005998**			
		Display the Manual Stack in 'Full mode' and check that the **Memory ID** parameter in the XC005998 command(s) 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
		                              HIFI Memory Dump
		
		Command Parameter(s) :
		                    Memory ID XH008998
		               Start Address XH009998
		                         Length XH010998
		
		TC Control Flags :
		                                    GBM IL DSE
		                                    --Y -- ---
		Subsch. ID : 70
		Det. descr. : Dump HIFI Memory Using Absolute Addresses
		This Telecommand will not be included in the export
			TC
			
			XC005998
			
			00xx <hex>
			 <hex> (Def)
			 <hex> (Def)
				TC	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
3		Upload command(s) to patch the HIFI DPU PRAM		Next Step: 4	
		Uplink the **XC000998** memory load command(s) with **ARM-GO**			
		For each TC XC000998 successfuly executed on-board, a TM(1,1) and TM(1,7) packet shall be received on ground.			
3.1		IF HIFI Prime			
		Verify Packet Reception HIFI_TC_acceptance_OK Packet Mnemonic : H_Accepted APID : 1024 Type : 1 Subtype : 1 PI1 : PI2 :			
		Verify Packet Reception HIFI_TC_execution_OK Packet Mnemonic : H_Completed APID : 1024 Type : 1 Subtype : 7 PI1 : PI2 :			
3.2		ELSE HIFI Redundant			
		Verify Packet Reception HIFI_R_TC_acceptance_OK Packet Mnemonic : H_Accepted APID : 1025 Type : 1 Subtype : 1 PI1 : PI2 :			
		Verify Packet Reception HIFI_R_TC_execution_OK Packet Mnemonic : H_Completed APID : 1025 Type : 1 Subtype : 7 PI1 : PI2 :			
4		MCS OBSM preparation for Image monitor in LIVE mode		Next Step: 5	
		Note: It is assumed that the OBSM application is already running and the OBSM Desktop is displayed on the MCS client. Starting the OBSM application is not covered by the current procedure.			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
4.1		Select 'Image MONITOR' from the menu			
		Select the **Image** menu of the *OBSM Desktop*. From the Image menu, select **Monitor**. The 'Image Catalog' window opens.			
4.2		Select image to be monitored			
4.2.1		IF HIFI Nominal			
		Select the image to be monitored for the memory device **HIDPRMPG.** The 'Image MONITOR' window opens.			
4.2.2		ELSE HIFI Redundant			
		Select the image to be monitored for the memory device **HIDPRMPR.** The 'Image MONITOR' window opens.			
4.3		Start dump TM processing			
		In **LIVE** mode, processing of incoming real-time telemetry starts automatically after the image selection.			
5		Verify patched areas via memory dump		Next Step: END	
5.1		Upload command(s) to dump the HIFI DPU PRAM			
		Uplink the **XC005998** memory dump command(s) with **ARM-GO**			
		For each command, one or more TM(6,6) packets must be received on ground.			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
5.2		Verify reception of TM(6,6)			
		Note: One or more TM(6,6) packets will be received for each memory dump command uplinked.			
5.2.1		IF HIFI Prime			
		Verify Packet Reception HIFI_memory_dump Packet Mnemonic : H_mem_dump APID : 1024 Type : 6 Subtype : 6 PI1 : PI2 :			
5.2.2		ELSE HIFI Redundant			
		Verify Packet Reception HIFI_R_memory_dump Packet Mnemonic : H_mem_dump APID : 1025 Type : 6 Subtype : 6 PI1 : PI2 :			
5.3		Check contents of memory dump packets			
		Verify that there are **NO OBSM reported differences** between the memory dump data and the ground image used for monitoring. **Note:** The ground memory image used for dump monitoring is the same image used for patch command stack generation.			
5.3.1		Save merged image			
		IF there are **mismatches** reported by OBSM, save merged image with **new ID**. Conduct off-line analysis of the reported mismatches.			
		End of Sequence			
		End of Procedure			