Load HIFI DPU OBS in instrument Rescue mode
File: H_FCP_OBS_3112.xls
Author: Liviu Stefanov

Procedure Summary

Objectives

This Herschel OBSM nominal procedure is used to execute the HIFI
OBS full image upload in instrument Rescue mode (OBS upload from
Boot SW). It is called by the FOP HIFI procedures H_FCP_HIF_NLBM
and H_FCP_HIF_RLBM.
The OBS image is loaded into the HIFI DPU DRAM memory.
Note that memory dump and check commands cannot be executed by
BSW, therefore image verification after load can only be done
after DM to PM-Low copy. FOP procedure H_FCP_OBS_3143 shal be
used for PM-Low dump.

The copying of the OBS image from DM to PM-Low and OBS restart is
executed in the calling procedure H_FCP_HIF_NLBM or
H_FCP_HIF_RLBM.
The updated OBS release numbers are also verified in the calling
procedure.

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

Note: The full upload of the HIFI DPU OBS in instrument
Intermediate mode can be conducted via H_FCP_OBS_31

Summary of Constraints

CDMU in Operational Mode
- HIFI in Rescue mode (BSW running)

No memory load command shall patch accros a DM page boundary.

Memory areas are Loaded through TC(6,2); 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 Rescue mode (BSW running)

End of Procedure

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

Reference File(s)

Input Command Sequences

Output Command Sequences

OFCP3112

Status   : Version 6 - Updated
Last Checkin: 14/04/2011

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Referenced Displays

ANDs   GRDs   SLDs

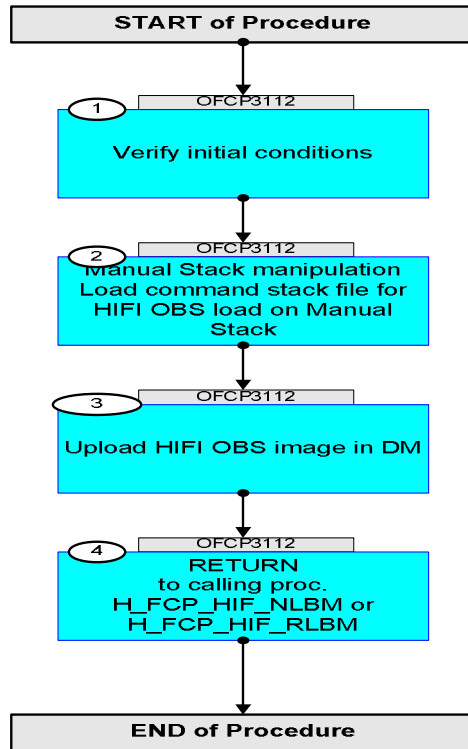## Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
30/01/2008	1	1	Created	lstefanov-hp	
13/01/2009		2	1. current step 2.1 updated: created current sub-steps 2.1.1 and 2.1.2 to separate memory load command stack load for Prime and Redundant units 2. added current step 4 to point to HFI new OBS image dump from PM-Low, after the new image has been copied from DM to PM-Low in higher-level calling procedure	lstefanov-hp	
19/01/2009	2	3	1. step 2.2 and sub-steps updated: addresses and length updated for HIFI OBS v5.8.1. and v5.9.0	lstefanov-hp	
16/06/2009	2.5	4	1. step 2.2 and sub-steps updated for HIFI OBS v.6.2.1 2. step 4 updated: call to proc. H_FCP_OBS_3142 replaced by call to H_FCP_OBS_3142 (image monitor replaced by image update)	lstefanov-hp	
27/01/2011		5	Updated for HIFI OBS v.6.5.2 (Step 2.2 and sub-steps)	n.krusenstiern-hp	
14/04/2011	3.1	6	Updated for HIFI OBS 6.5.3	n.krusenstiern-hp	

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Procedure Flowchart Overview

```
            ┌─────────────────────────────────┐
            │       START of Procedure        │
            └─────────────────────────────────┘
                             │
            ┌───────┬─────────────────────────┐
         ①  │       │   OFCP3112              │
            │       Verify initial conditions │
            └─────────────────────────────────┘
                             │
            ┌───────┬─────────────────────────┐
         ②  │       │   OFCP3112              │
            │   Manual Stack manipulation     │
            │   Load command stack file for   │
            │   HIFI OBS load on Manual       │
            │   Stack                         │
            └─────────────────────────────────┘
                             │
            ┌───────┬─────────────────────────┐
         ③  │       │   OFCP3112              │
            │   Upload HIFI OBS image in DM   │
            └─────────────────────────────────┘
                             │
            ┌───────┬─────────────────────────┐
         ④  │       │   OFCP3112              │
            │        RETURN                   │
            │     to calling proc.            │
            │   H_FCP_HIF_NLBM or             │
            │   H_FCP_HIF_RLBM                │
            └─────────────────────────────────┘
                             │
            ┌─────────────────────────────────┐
            │        END of Procedure         │
            └─────────────────────────────────┘
```

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Beginning of Procedure			
	OFCP3112	*TC Seq. Name :*OFCP3112 (HIFI OBS load BSW) Load HIFI OBS from BSW and check image *TimeTag Type: B* *Sub Schedule ID:*			
1		Verify initial conditions		Next Step: 2	
		Check HIFI instrument in **Rescue mode** (BSW running)			
		Instrument SOE to confirm HIFI instrument mode			
		Note: Initial conditions are verified in calling procedure H_FCP_HIF_NLBM or H_FCP_HIF_RLBM.			
2		Manual Stack manipulation Load command stack file for HIFI OBS load 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 Prime			
		Select file **HIDBSWDM_PI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine** from directory /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/HIDBSWDM as indicated by the OBSM engineer			
		IMPORTANT: XXXXYYY = 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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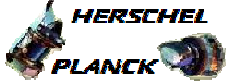
Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		File name **example** HIDBSWDM_PI_0002001_N_NoModel_NoModel_2007_254T123300.sun043			
2.1.2		ELSE HIFI Redundant			
		Select file **HIDBSWDR_PI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine** from directory /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/HIDBSWDR as indicated by the OBSM engineer			
		IMPORTANT: XXXXYYY = 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 **example** HIDBSWDR_PI_0006001_N_NoModel_NoModel_2011_101T172103.ws044			
2.2		Check memory load command stack loaded			
		For HIFI OBS **v.6.5.3**: The start address of the HIDBSWDM/HIDBSWDR memory image used for memory load command stack generation is **00.4000 hex**, and the last address in the image is **02.3FFF hex**. **NO offset** has to be applied to the memory image for OBS upload in DM. Consequently, the first address to be loaded is **00.4000 hex**, and the last address is **02.3FFF hex**: **Start Address = 00.4000 hex** **End Address = 02.3FFF hex** **Length = 0**2.0000 hex			
		IMPORTANT: **# of TCs**, **Address** and **Length** values in the following sub-steps are **applicable to** HIFI OBS **v.6.5.3**			
2.2.1		Check number of memory load commands in the stack			
		Check that loaded stack contains: **2304 TCs XC000998** for OBS **v.6.5.3**			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
2.2.2		Check Memory ID			
		Display the Manual Stack in 'Full mode' and check that the **Memory ID** parameter in the XC000998 commands is set to **11 hex**: **Memory ID = 11 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 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
			
			11xx hex
			\<hex\> (Def)
			\<dec\> (Def)
			\<hex\> (Def)
			\<hex\> (Def)
				TC	

2.2.3		Check start address and length of first command in the stack			
		With the Manual Stack in 'Full mode', check the **Start Address** and **Length** in the **first** XC000998 command: **Start Address = 00.4000 hex** **Length = 57 dec** **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 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
			
			1100 \<hex\>
			4000 \<hex\>
			57 \<dec\>
			patch data
			calculated by OBSM
				TC	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
2.2.4		Check start address and length of last command in the stack			
		With the Manual Stack in 'Full mode', check the **Start Address** and **Length** in the **last** XC000998 command: **Start Address = 2.3FC9 hex** **Length = 55 dec** **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 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	XC000998 1102 <hex> 3FC9 <hex> 55 <dec> patch data <hex> (Def)	TC	
		This Telecommand will not be included in the export			
2.2.5		Check DM page boundaries not violated by the memory load commands			
		IMPORTANT: Check that the OBSM generated memory load commands respect the **DM page boundaries**. A **DM page** is **1024 words** (**400 hex** words)large, where a **DM word** is **32-bit** long. The **DM starts** at address **00.0000 hex**.			
3		Upload HIFI OBS image in DM		Next Step: 4	
		Uplink the **XC000998** memory load commands 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			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		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		IF 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		RETURN to calling proc. H_FCP_HIF_NLBM or H_FCP_HIF_RLBM		Next Step: END	
		IMPORTANT: After OBS image copy from DM to PM-Low executed in H_FCP_HIF_NLBM or H_FCP_HIF_RLBM, **dump** the HFI DPU **new** **OBS image** from **PM-Low** using FOP procedure **H_FCP_OBS_3143**			
		End of Sequence			
		End of Procedure			