

Patch HIFI DPU OBS in instrument Intermediate mode
File: H_FCP_OBS_3111.xls
Author: Liviu Stefanov



Procedure Summary

Objectives

This Herschel OBSM nominal procedure is used to patch the HIFI OBS in instrument Intermediate mode (OBS patch from Application SW). It is called by the FOP HIFI procedure H_FCP_HIF_CPOM. The patches are loaded into the HIFI DPU PM-High memory and the image integrity after upload is checked via checksum calculation and verification. The OBS image is copied from PM-Low to PM-High by the calling procedure, before starting the patch upload.

The copying of the OBS image from PM-High to PM-Low and OBS restart is executed in the calling procedure H_FCP_HIF_CPOM. The calling procedure 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 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: H_FCP_OBS_3110 can be used for the full upload of the HIFI DPU OBS from ASW.

Summary of Constraints

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

Memory areas are Loaded through TC(6,2) and Checked through TC(6,9); 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

OFCP3111

Referenced Displays

Status : Version 3 - Unchanged
Last Checkin: 08/09/09

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ANDs GRDs SLDs
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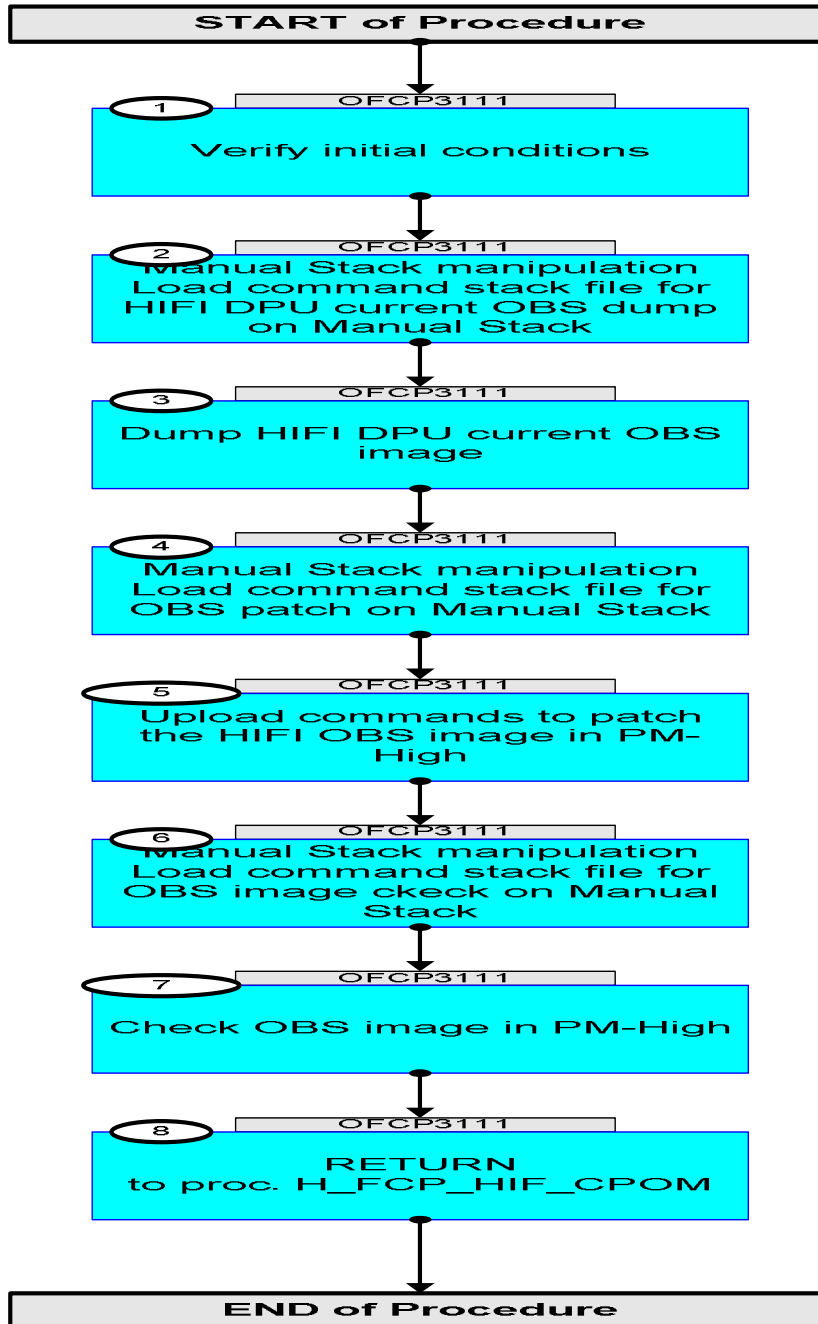
Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
30/01/08	1	1	Created	Istefanov-hp	
16/06/09		2	1. added current steps 2 and 3, with sub-steps, to dump the HIFI OBS image from PM-Low before patch 2. step 4 and sub-steps updated to separate patch stack load from check stack load and stack load for Prime and Redundant 3. added current step 6 to separate check stack load from patch stack load 4. current steps 6 and 7 and sub-steps updated for verification via checksums of the whole OBS image in PM-High, as advised by Luc Dubbeldam in e-mail from 11/06/2009 5. added current step 8 to include return to calling procedure and instruct for OBS image dump from PM-Low	Istefanov-hp	
08/09/09	2.5	3	1. step 2.3 and substeps updated for OBS image dump from PM-High and exclusion of the runtime header memory area from OBSM Monitor/Comparison, as advised by Luc Dubbeldam in e-mail from 23/06/2009 2. step 3.5 updated for "Image UPDATE" instead of "Image MONITOR" 3. step 4.3 updated to instruct the operator to always patch ("Must be Patched" in CT) the runtime header memory area with the values in the latest OBSM Reference Image and skip the patching of the inter-segment memory area, filled with zeroes - as advised by Luc Dubbeldam in e-mail from 23/06/2009 4. steps 6.3 and 7 with sub-steps updated to reflect the checksum verification strategy ((0x00-0xFF)+0x3FFFF and [0x4000-EOF]+0x3FFFF) suggested by Luc Dubbeldam in e-mail from 23/06/2009	Istefanov-hp	

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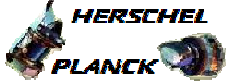

Procedure Flowchart Overview



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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
Beginning of Procedure					
OFCP3111 TC Seq. Name : OFCP3111 () Patch HIFI OBS from ASW and check image 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 file for HIFI DPU current OBS dump on Manual Stack		Next Step: 3	
		NOTE: The current procedure assumes that the memory dump in Live mode is performed using commands with immediate execution.			
		Select the File -> LoadStack option from the main menu of the Manual Stack window			
2.1		IF HIFI Prime			
		Select file HIDPRMPG_DI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine from directory /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/HIDPRMPG 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 HIDPRMPG_DI_0002001_N_NoModel_NoModel_2007_254T123300.sun043			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
2.2		ELSE HIFI Redundant			
		Select file HIDPRMPR_DI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine from directory /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/HIDPRMPR 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 HIDPRMPR_DI_0002001_N_NoModel_NoModel_2007_254T123300.sun043			
2.3		Check memory dump command stack loaded			
		Note: The HIFI DPU OBS image is dumped from the PM-High area			
		Note: The HIFI OBS image delivered in ICD-14 format consists of one block. The block contains three segments : - the runtime header starts at 0x00, length= 0x100 - the init-segemnt starts at 0x4000 - the PM-code segment. The regions between segments are filled with 0x00 .			
		IMPORTANT: The runtime header in PM-Low changes continuously. A memory model (CT) shall be used to exclude this memory area from OBSM Image Monitor or Image Compare against an OBSM Base Image.			
		For HIFI OBS v.6.2.1: Start Address = 03.FFFF hex End Address = 05.852A hex Length = 1852C hex			
		IMPORTANT: # of TCs, Address and Length values in the following sub-steps are applicable to HIFI OBS v.6.1.2			
		Note: The ' Length ' parameter of the memory dump command is a 16-bit long parameter. A memory dump TC can cover a number of 65535 dec (FFFF hex) SAUs .			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
2.3.1		Check number of memory dump commands in the stack			
		Check that loaded stack contains: 2 TCs XC005998			
2.3.2		Check Memory ID			
		Display the Manual Stack in 'Full mode' and check that the Memory ID parameter in the XC005998 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 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	XC005998	TC	
2.3.3		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 XC005998 command: Start Address = 03.FFFF hex Length = FFFF 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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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Execute Telecommand <p style="text-align: right;">HIFI Memory Dump</p> 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	XC005998	TC	
2.3.4		Check start address and length of second command in the stack			
		With the Manual Stack in 'Full mode', check the Start Address and Length in the second XC005998 command: Start Address = 04.FFFE hex Length = 852D 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 <p style="text-align: right;">HIFI Memory Dump</p> 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	XC005998	TC	
3		Dump HIFI DPU current OBS image		Next Step: 4	
		Note: The HIFI DPU OBS image is dumped from the PM-High area			
3.1		MCS OBSM preparation for Image update in LIVE mode			
		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
3.1.1		Select 'Image UPDATE' from the menu			
		Select the Image menu of the <i>OBSM Desktop</i> . From the Image menu, select Update . The 'Image Catalog' window opens.			
3.1.2		Select image to be updated			
3.1.2.1		IF HIFI Prime			
		Select the image to be updated for the memory device HIDPRMPG . The 'Image UPDATE' window opens.			
3.1.2.2		ELSE HIFI Redundant			
		Select the image to be updated for the memory device HIDPRMPR . The 'Image UPDATE' window opens.			
3.1.3		Start dump TM processing			
		In LIVE mode, processing of incoming real-time telemetry starts automatically after the image selection.			
3.2		Upload commands to dump the HIFI DPU current OBS image			
		Uplink the XC005998 memory dump commands with ARM-GO			
		For each command, several TM(6,6) packets must be received on ground.			
3.3		Verify reception of TM(6,6)			
		Note: One or more TM(6,6) packets will be received for each memory dump command uplinked.			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
3.3.1		IF HIFI Prime			
		Verify Packet Reception HIFI_memory_dump Packet Mnemonic : H_mem_dump APID : 1024 Type : 6 Subtype : 6 PI1 : PI2 :			
3.3.2		ELSE HIFI Redundant			
		Verify Packet Reception HIFI_R_memory_dump Packet Mnemonic : H_mem_dump APID : 1025 Type : 6 Subtype : 6 PI1 : PI2 :			
3.4		Check OBSM dump packet processing			
		Check that the OBSM is processing the incoming memory dump packets.			
3.5		Save merged image			
		Save merged image with new ID .			
4		Manual Stack manipulation Load command stack file for OBS patch on Manual Stack		Next Step: 5	
		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			
4.1		IF HIFI Prime			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Select file HIDPRMPG_PI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThmmss.machine from directory /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/HIDPRMPG as indicated by the OBSM engineer			
		IMPORTANT: XXXXYYY = Image ID(X) and Version(Y) - depend on image used for stack generation YYYY_DDD hhmss - depend on stack generation time machine - depends on the name of the machine used for stack generation			
		File name example HIDPRMPG_PI_0002001_N_NoModel_NoModel_2007_254T123300.sun043			
4.2		ELSE HIFI Redundant			
		Select file HIDPRMPR_PI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThmmss.machine from directory /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/HIDPRMPR as indicated by the OBSM engineer			
		IMPORTANT: XXXXYYY = Image ID(X) and Version(Y) - depend on image used for stack generation YYYY_DDD hhmss - depend on stack generation time machine - depends on the name of the machine used for stack generation			
		File name example HIDPRMPR_PI_0002001_N_NoModel_NoModel_2007_254T123300.sun043			
4.3		Check memory load command stack loaded			
		Note: The HIFI OBS image delivered in ICD-14 format consists of one block. The block contains three segments : - the runtime header starts at 0x00, length= 0x100 - the init-segemnt starts at 0x4000 - the PM-code segment. The regions between segments are filled with 0x00.			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment															
		<p>IMPORTANT: A memory model (CT) shall be used to: - avoid the useless patching of the areas between segments (filled with zeroes) - always patch ("Must be Patched") the runtime header memory area with the values in the Uplink Image (the latest OBSM Reference image), irrespective of the comparison results of the Uplink Image against the Base Image (previous Reference Image or old OBS Dump Image)</p>																		
		<p>The patch sequence will be: - upload the runtime header segment [0x00-0xFF] to PM-High (+ 0x3FFFF) - upload the differences between [0x4000 - EOF of Uplink Image] with respect to the Base Image to PM-High (+ 0x3FFFF)</p>																		
4.3.1		Check number of memory load commands in the stack																		
		Check that loaded stack contains one or more TCs XC000998 .																		
4.3.2		Check Memory ID																		
		<p>Display the Manual Stack in 'Full mode' and check that the Memory ID parameter in the XC000998 commands is set to 00 hex:</p> <p>Memory ID = 00 hex</p> <p>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.</p>																		
		<p>Execute Telecommand</p> <p style="text-align: center;">HIFI Memory Load</p> <p>Command Parameter(s) :</p> <table border="0" style="width: 100%;"> <tr> <td style="padding-left: 20px;">Memory ID</td> <td style="padding-left: 20px;">XH000998</td> <td style="padding-left: 20px;">00xx hex</td> </tr> <tr> <td style="padding-left: 20px;">Start Address</td> <td style="padding-left: 20px;">XH001998</td> <td style="padding-left: 20px;"><hex> (Def)</td> </tr> <tr> <td style="padding-left: 20px;">Length of Block</td> <td style="padding-left: 20px;">XH003998</td> <td style="padding-left: 20px;"><dec> (Def)</td> </tr> <tr> <td style="padding-left: 20px;">Var length octet string</td> <td style="padding-left: 20px;">XH004998</td> <td style="padding-left: 20px;"><hex> (Def)</td> </tr> <tr> <td style="padding-left: 20px;">Checksum</td> <td style="padding-left: 20px;">XH005998</td> <td style="padding-left: 20px;"><hex> (Def)</td> </tr> </table> <p>TC Control Flags :</p> <p style="padding-left: 40px;">GBM IL DSE --Y --</p> <p>Subsch. ID : 30 Det. descr. : Load HIFI Memory Using Absolute Addresses</p> <p>This Telecommand will not be included in the export</p>	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)	XC000998	TC	
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)																		
4.3.3		Check start address of the memory load command(s) in the stack																		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		<p>For HIFI OBS v.6.2.1:</p> <p>The start address of the HIDPRMPG memory image used for memory load command stack generation is 00.0000 hex, and the last address in the image is 01.852B hex.</p> <p>The offset applied to the memory image for OBS upload in PM-High is 03.FFFF hex.</p> <p>Consequently, the first address to be loaded is 03.FFFF hex, and the last address is 05.852A hex:</p> <p>Start Address = 03.FFFF hex End Address = 05.852A hex Length = 1852C hex</p>			
		<p>With the Manual Stack in 'Full mode', check that the Start Address values in the XC000998 command(s) are within the range defined above.</p> <p>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.</p>			
5		Upload commands to patch the HIFI OBS image in PM-High		Next Step: 6	
		Uplink the XC000998 memory load command(s) with ARM-GO			
		For each TC XC000998 successfully executed on-board, a TM(1,1) and TM(1,7) packet shall be received on ground.			
5.1		IF HIFI Prime			
		<p>Verify Packet Reception</p> <p>HIFI_TC_acceptance_OK Packet Mnemonic : H_Accepted APID : 1024 Type : 1 Subtype : 1 PI1 : PI2 :</p>			
		<p>Verify Packet Reception</p> <p>HIFI_TC_execution_OK Packet Mnemonic : H_Completed APID : 1024 Type : 1 Subtype : 7 PI1 : PI2 :</p>			
5.2		IF HIFI Redundant			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		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 :			
6		Manual Stack manipulation Load command stack file for OBS image ccheck on Manual Stack		Next Step: 7	
		Note: The whole HIFI DPU OBS image in the PM-High area is checked			
		Select the File -> LoadStack option from the main menu of the Manual Stack window			
6.1		IF HIFI Prime			
		Select file HIDPRMPG_CI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine from directory /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/HIDPRMPG 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 HIDPRMPR_CI_0002001_N_NoModel_NoModel_2007_254T123300.sun043			
6.2		ELSE HIFI Redundant			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Select file HIDPRMPR_CI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThmmss.machine from directory /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/HIDPRMPR as indicated by the OBSM engineer			
		IMPORTANT: XXXXYYY = Image ID(X) and Version(Y) - depend on image used for stack generation YYYY_DDD hhmss - depend on stack generation time machine - depends on the name of the machine used for stack generation			
		File name example HIDPRMPR_CI_0002001_N_NoModel_NoModel_2007_254T123300.sun043			
6.3		Check memory check command stack loaded			
		Note: The OBS image in PM-High is verified after load using checksum calculation over the following 3 memory areas: For HIFI OBS v.6.2.1: Start Address = 03.FFFF hex End Address = 04.00FE hex Length = 100 hex Checksum = TBC hex Start Address = 04.3FFF hex End Address = 05.3FFD hex Length = FFFF hex Checksum = TBC hex Start Address = 05.3FFE hex End Address = 05.852A hex Length = 452D hex Checksum = TBC hex			
		IMPORTANT: # of TCs, Address and Length values in the following sub-steps are applicable to HIFI OBS v.6.1.2			
		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 .			
6.3.1		Check number of memory check commands in the stack			
		Check that loaded stack contains: 3 TCs XC006998			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment																			
6.3.2		Check Memory ID																						
		<p>Display the Manual Stack in 'Full mode' and check that the Memory ID parameter in the XC006998 commands is set to 00 hex:</p> <p>Memory ID = 00 hex</p> <p>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.</p>																						
		<p>Execute Telecommand</p> <p style="text-align: center;">HIFI Memory Check</p> <p>XC006998</p> <p>Command Parameter(s) :</p> <table style="width: 100%;"> <tr> <td style="width: 30%;">Memory ID</td> <td style="width: 20%;">XH008998</td> <td style="width: 30%;">00xx <hex></td> <td style="width: 20%;"></td> </tr> <tr> <td>Start Address</td> <td>XH009998</td> <td><hex> (Def)</td> <td></td> </tr> <tr> <td>Length</td> <td>XH010998</td> <td><hex> (Def)</td> <td></td> </tr> </table> <p>TC Control Flags :</p> <table style="width: 100%;"> <tr> <td style="width: 30%;"></td> <td style="width: 20%;">GBM IL DSE</td> <td style="width: 30%;"></td> <td style="width: 20%;"></td> </tr> <tr> <td></td> <td>--Y -- ---</td> <td></td> <td></td> </tr> </table> <p>Subsch. ID : 70 Det. descr. : Check HIFI Memory Using Absolute Addresses This Telecommand will not be included in the export</p>	Memory ID	XH008998	00xx <hex>		Start Address	XH009998	<hex> (Def)		Length	XH010998	<hex> (Def)			GBM IL DSE				--Y -- ---			TC	
Memory ID	XH008998	00xx <hex>																						
Start Address	XH009998	<hex> (Def)																						
Length	XH010998	<hex> (Def)																						
	GBM IL DSE																							
	--Y -- ---																							
6.3.3		Check start address and length of first command in the stack																						
		<p>With the Manual Stack in 'Full mode', check the Start Address in the first XC006998 command:</p> <p>Start Address = 03.FFFF hex Length = 100 hex</p> <p>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.</p>																						
		<p>Execute Telecommand</p> <p style="text-align: center;">HIFI Memory Check</p> <p>XC006998</p> <p>Command Parameter(s) :</p> <table style="width: 100%;"> <tr> <td style="width: 30%;">Memory ID</td> <td style="width: 20%;">XH008998</td> <td style="width: 30%;">0003 <hex></td> <td style="width: 20%;"></td> </tr> <tr> <td>Start Address</td> <td>XH009998</td> <td>FFFF <hex></td> <td></td> </tr> <tr> <td>Length</td> <td>XH010998</td> <td>100 <hex></td> <td></td> </tr> </table> <p>TC Control Flags :</p> <table style="width: 100%;"> <tr> <td style="width: 30%;"></td> <td style="width: 20%;">GBM IL DSE</td> <td style="width: 30%;"></td> <td style="width: 20%;"></td> </tr> <tr> <td></td> <td>--Y -- ---</td> <td></td> <td></td> </tr> </table> <p>Subsch. ID : 70 Det. descr. : Check HIFI Memory Using Absolute Addresses This Telecommand will not be included in the export</p>	Memory ID	XH008998	0003 <hex>		Start Address	XH009998	FFFF <hex>		Length	XH010998	100 <hex>			GBM IL DSE				--Y -- ---			TC	
Memory ID	XH008998	0003 <hex>																						
Start Address	XH009998	FFFF <hex>																						
Length	XH010998	100 <hex>																						
	GBM IL DSE																							
	--Y -- ---																							
6.3.4		Check start address and length of second command in the stack																						

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment									
		<p>With the Manual Stack in 'Full mode', check the Start Address in the second XC006998 command:</p> <p>Start Address = 04.3FFF hex Length = FFFF hex</p> <p>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.</p>												
		<p>Execute Telecommand</p> <p style="text-align: center;">HIFI Memory Check</p> <p>Command Parameter(s) :</p> <table border="0"> <tr> <td style="padding-right: 20px;">Memory ID</td> <td style="padding-right: 20px;">XH008998</td> <td style="padding-right: 20px;">0004 <hex></td> </tr> <tr> <td>Start Address</td> <td>XH009998</td> <td>3FFF <hex></td> </tr> <tr> <td>Length</td> <td>XH010998</td> <td>FFFF <hex></td> </tr> </table> <p>TC Control Flags :</p> <p style="text-align: center;">GBM IL DSE --Y -- ---</p> <p>Subsch. ID : 70 Det. descr. : Check HIFI Memory Using Absolute Addresses This Telecommand will not be included in the export</p>	Memory ID	XH008998	0004 <hex>	Start Address	XH009998	3FFF <hex>	Length	XH010998	FFFF <hex>	XC006998	TC	
Memory ID	XH008998	0004 <hex>												
Start Address	XH009998	3FFF <hex>												
Length	XH010998	FFFF <hex>												
6.3.5		Check start address and length of third command in the stack												
		<p>With the Manual Stack in 'Full mode', check the Start Address in the third XC006998 command:</p> <p>Start Address = 05.3FFE hex Length = 452D hex</p> <p>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.</p>												
		<p>Execute Telecommand</p> <p style="text-align: center;">HIFI Memory Check</p> <p>Command Parameter(s) :</p> <table border="0"> <tr> <td style="padding-right: 20px;">Memory ID</td> <td style="padding-right: 20px;">XH008998</td> <td style="padding-right: 20px;">0005 <hex></td> </tr> <tr> <td>Start Address</td> <td>XH009998</td> <td>3FFE <hex></td> </tr> <tr> <td>Length</td> <td>XH010998</td> <td>452D <hex></td> </tr> </table> <p>TC Control Flags :</p> <p style="text-align: center;">GBM IL DSE --Y -- ---</p> <p>Subsch. ID : 70 Det. descr. : Check HIFI Memory Using Absolute Addresses This Telecommand will not be included in the export</p>	Memory ID	XH008998	0005 <hex>	Start Address	XH009998	3FFE <hex>	Length	XH010998	452D <hex>	XC006998	TC	
Memory ID	XH008998	0005 <hex>												
Start Address	XH009998	3FFE <hex>												
Length	XH010998	452D <hex>												
7		Check OBS image in PM-High		Next Step: 8										
		For each TC(6,9), a TM(6,10) packet shall be received on ground.												
		IMPORTANT: Address, Length and Checksum values in the following sub-steps are applicable to HIFI OBS v.6.1.2												

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
7.1		Command and verify the first checksum			
		Uplink the first XC006998 memory check commands with ARM-GO			
		Execute Telecommand HIFI Memory Check Command Parameter(s) : Memory ID XH008998 0003 <hex> Start Address XH009998 FFFF <hex> Length XH010998 100 <hex> TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 70 Det. descr. : Check HIFI Memory Using Absolute Addresses This Telecommand will not be included in the export	XC006998	TC	
7.1.1		Verify reception and contents of TM(6,10)			
		Note: A TM(6,10) packet will be received for each memory check command uplinked.			
7.1.1.1		IF HIFI Prime			
		Verify Packet Reception HIFI_memory_check Packet Mnemonic : H_mem_check APID : 1024 Type : 6 Subtype : 10 PI1 : PI2 :			
		Verify Telemetry HI_check_mem_id HM072190	= 00 hex	AND=HA070289	
		Verify Telemetry HI_check_start HM073190	= 3FFFF <hex>	AND=HA070289	
		Verify Telemetry HI_check_length HM074190	= 265 <dec>	AND=HA070289	
		Verify Telemetry HI_data_crc HM075190		AND=HA070289	
7.1.1.2		ELSE HIFI Redundant			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Verify Packet Reception HIFI_memory_check Packet Mnemonic : H_mem_check APID : 1024 Type : 6 Subtype : 10 PI1 : PI2 :			
		Verify Telemetry HI_check_mem_id HM072190	= 00 hex	AND=HA070289	
		Verify Telemetry HI_check_start HM073190	= 4FFFF <hex>	AND=HA070289	
		Verify Telemetry HI_check_length HM074190	= 65535 <dec>	AND=HA070289	
		Verify Telemetry HI_data_crc HM075190		AND=HA070289	
7.2.1.2		ELSE HIFI Redundant			
		Verify Packet Reception HIFI_R_memory_check Packet Mnemonic : H_mem_check APID : 1025 Type : 6 Subtype : 10 PI1 : PI2 :			
		Verify Telemetry HI_check_mem_id HM072190	= 00 hex	AND=HA070289	
		Verify Telemetry HI_check_start HM073190	= 4FFFF <hex>	AND=HA070289	
		Verify Telemetry HI_check_length HM074190	= 65535 <dec>	AND=HA070289	
		Verify Telemetry HI_data_crc HM075190		AND=HA070289	
7.2.2		Verify checksum value			
		Check the received checksum against the expected value			
		Verify Telemetry HI_data_crc HM075190		AND=HA070289	
7.3		Command and verify the third checksum			
		Uplink the third XC006998 memory check commands with ARM-GO			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Execute Telecommand HIFI Memory Check Command Parameter(s) : Memory ID XH008998 Start Address XH009998 Length XH010998 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 70 Det. descr. : Check HIFI Memory Using Absolute Addresses This Telecommand will not be included in the export	XC006998	TC	
7.3.1		Verify reception and contents of TM(6,10)			
		Note: A TM(6,10) packet will be received for each memory check command uplinked.			
7.3.1.1		IF HIFI Prime			
		Verify Packet Reception HIFI_memory_check Packet Mnemonic : H_mem_check APID : 1024 Type : 6 Subtype : 10 PI1 : PI2 :			
		Verify Telemetry HI_check_mem_id HM072190	= 00 hex	AND=HA070289	
		Verify Telemetry HI_check_start HM073190	= 53FFE <hex>	AND=HA070289	
		Verify Telemetry HI_check_length HM074190	= 17709 <dec>	AND=HA070289	
		Verify Telemetry HI_data_crc HM075190		AND=HA070289	
7.3.1.2		ELSE HIFI Redundant			
		Verify Packet Reception HIFI_R_memory_check Packet Mnemonic : H_mem_check APID : 1025 Type : 6 Subtype : 10 PI1 : PI2 :			
		Verify Telemetry HI_check_mem_id HM072190	= 00 hex	AND=HA070289	
		Verify Telemetry HI_check_start HM073190	= 53FFE <hex>	AND=HA070289	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Verify Telemetry HI_check_length HM074190	= 17709 <dec>	AND=HA070289	
		Verify Telemetry HI_data_crc HM075190		AND=HA070289	
7.3.2		Verify checksum value			
		Check the received checksum against the expected value			
		Verify Telemetry HI_data_crc HM075190		AND=HA070289	
8		RETURN to proc. H_FCP_HIF_CPOM		Next Step: END	
		IMPORTANT: After OBS image copy from PM-High to PM-Low executed in H_FCP_HIF_CPOM, dump the HFI DPU new OBS image from PM-Low using FOP procedure H_FCP_OBS_3143			
End of Sequence					
End of Procedure					