

Load SPIRE OBS from ASW  
File: H\_FCP\_OBS\_5110.xls  
Author Liviu Stefanov



## Procedure Summary

### Objectives

This Herschel OBSM nominal procedure is used to execute the SPIRE OBS full image upload from the Application Software (ASW). It is called by the FOP SPIRE procedures H\_FCP\_SPI\_CLOM and H\_FCP\_SPI\_CLOA.

The OBS image is 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\_CLOM or H\_FCP\_SPI\_CLOA.

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: Patching (as alternative to full image upload) of the SPIRE OBS from the ASW can be conducted via procedure H\_FCP\_OBS\_5111.

### 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

OFCP5110

### Referenced Displays

ANDs GRDs SLDs

Status : Version 4 - Updated  
Last Checkin: 07/10/2009

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SA\_1\_559  
 SAM4\_500

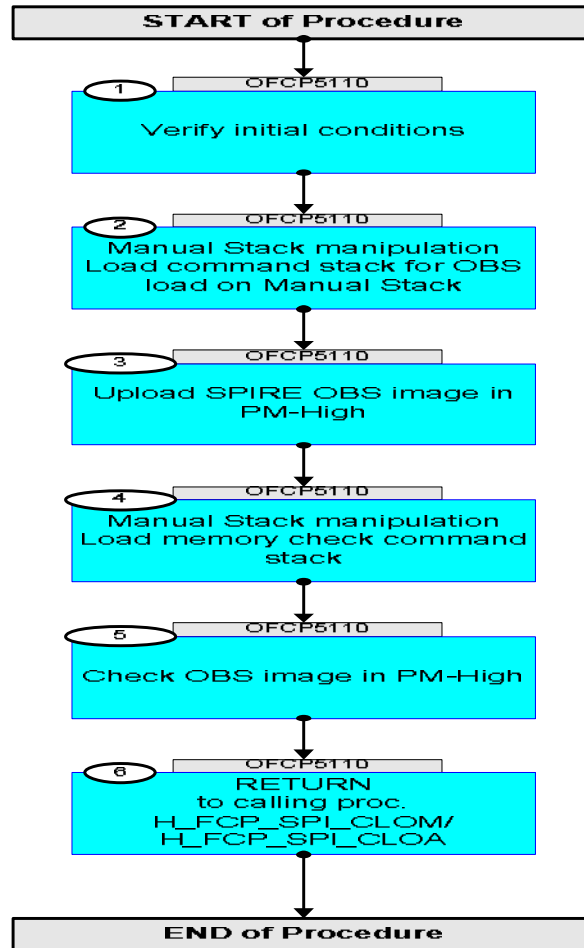
#### Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
30/01/2008	1	1	Created	Istefanov-hp	
			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	Istefanov-hp	
07/10/2009		2		Istefanov-hp	
07/10/2009		3	1. corrected some Cell Format Pattern problems	Istefanov-hp	
07/10/2009	2.5	4	1. corrected some Cell Format Pattern problems	Istefanov-hp	

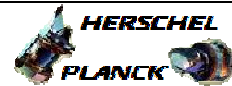
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## Procedure Flowchart Overview



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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
<b>Beginning of Procedure</b>					
OFCP5110		TC Seq. Name : OFCP5110 ( ) Load SPIRE OBS from ASW  TimeTag Type: B Sub Schedule ID:  <input type="checkbox"/>			
1		Verify initial conditions		Next Step: 2	
		Check: - SPIRE DPU ON - SPIRE ASW running			
		Instrument SOE to confirm SPIRE instrument mode			
		<b>Note:</b> Initial conditions are verified in calling procedure H_FCP_SPI_CLOM or H_FCP_SPI_CLOA.			
2		Manual Stack manipulation Load command stack for OBS load on Manual Stack		Next Step: 3	
		<b>NOTE:</b> The current procedure assumes that the memory load is performed using commands with immediate execution.			
		Select the File -> <b>LoadStack</b> 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:  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
		<p>File name <b>examples</b></p> <p>- No model associated to the memory image:</p> <p>SPDPRMPG_PI_0002001_N_NoModel_NoModel_2007_254T123300.sun043</p> <p>- CT SPDPRMPG1, ID 0003, Version 001 associated to the memory image:</p> <p>SPDPRMPG_PI_0002001_C_SPDPRMPG1_0003001_2007_337T093320.sun043</p>			
2.2		<p>ELSE</p> <p>SPIRE Redundant</p>			
		<p>Select file</p> <p><b>SPDPRMPR_PI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine</b></p> <p>from directory</p> <p><a href="#">/home/hmcops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/SPDPRMPR</a></p> <p>as indicated by the OBSM engineer</p>			
		<p>IMPORTANT:</p> <p><b>XXXXYYY</b> = Image ID(X) and Version(Y) - depend on image used for stack generation</p> <p><b>YYYY_DDD hhmmss</b> - depend on stack generation time</p> <p><b>machine</b> - depends on the name of the machine used for stack generation</p>			
		<p>File name <b>examples</b></p> <p>- No model associated to the memory image:</p> <p>SPDPRMPR_PI_0002001_N_NoModel_NoModel_2007_254T123300.sun043</p> <p>- CT SPDPRMPR1, ID 0003, Version 001 associated to the memory image:</p> <p>SPDPRMPR_PI_0002001_C_SPDPRMPR1_0003001_2007_337T093320.sun043</p>			
2.3		<p>Check memory load command stack loaded</p>			
		<p>For SPIRE OBS <b>v.3.0.B</b>:</p> <p>The start address of the SPDPRMPG memory image used for memory load command stack generation is <b>00.0000 hex</b>, and the last address in the image is <b>01.6E12 hex</b>.</p> <p>The <b>offset</b> applied to the memory image for OBS upload in PM-High is <b>04.0000 hex</b>.</p> <p>Consequently, the first address to be loaded is <b>04.0000 hex</b>, and the last address is <b>05.6E12 hex</b>.</p>			

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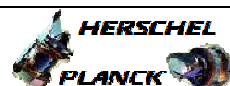
Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment																	
2.3.1		Check number of memory load commands in the stack																				
		Check that loaded stack contains <b>2467</b> TCs <b>XC002998</b>																				
2.3.2		Check Memory ID																				
		Display the Manual Stack in 'Full mode' and check that the <b>Memory ID</b> parameter in the XC002998 commands is set to <b>00 hex</b> :  <b>Memory ID = 00 hex</b>  <b>Note:</b> 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  <b>SPIRE Memory Load</b>  Command Parameter(s) : <table><tr><td>Memory ID</td><td>XH000998</td><td>00xx hex</td></tr><tr><td>Start Address</td><td>XH001998</td><td>&lt;hex&gt; (Def)</td></tr><tr><td>Length of Block</td><td>XH003998</td><td>&lt;dec&gt; (Def)</td></tr><tr><td>Var length octet string</td><td>XH004998</td><td>&lt;hex&gt; (Def)</td></tr><tr><td>Checksum</td><td>XH005998</td><td>&lt;hex&gt; (Def)</td></tr></table> TC Control Flags : <table><tr><td>GBM IL DSE</td></tr><tr><td>--Y -- ---</td></tr></table> Subsch. ID : 30 Det. descr. : Load SPIRE Memory Using Absolute Addresses This Telecommand will not be included in the export	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)	GBM IL DSE	--Y -- ---	<b>XC002998</b>	<b>TC</b>	
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)																				
GBM IL DSE																						
--Y -- ---																						
2.3.3		Check start address and length of first command in the stack																				
		With the Manual Stack in 'Full mode', check the <b>Start Address</b> in the <b>first</b> XC002998 command:  <b>Start Address = 40000 hex</b> <b>Length = 38 dec</b>  <b>Note:</b> 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 <div>SPIRE Memory Load</div> Command Parameter(s) : <div>Memory ID                    XH000998 Start Address                XH001998 Length of Block              XH003998 Var length octet string      XH004998 Checksum                      XH005998</div> TC Control Flags : <div>GBM IL DSE --Y -- ---</div> Subsch. ID : 30 Det. descr. : Load SPIRE Memory Using Absolute Addresses This Telecommand will not be included in the export	XC002998  0004 <hex> 0000 <hex> 38 <dec> <hex> (Def) <hex> (Def)	TC	
2.3.4		Check start address and length of last command in the stack			
		With the Manual Stack in 'Full mode', check the <b>Start Address</b> in the <b>last</b> XC002998 command:  Start Address = 05.6E0C hex Length        = 7 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 <div>SPIRE Memory Load</div> Command Parameter(s) : <div>Memory ID                    XH000998 Start Address                XH001998 Length of Block              XH003998 Var length octet string      XH004998 Checksum                      XH005998</div> TC Control Flags : <div>GBM IL DSE --Y -- ---</div> Subsch. ID : 30 Det. descr. : Load SPIRE Memory Using Absolute Addresses This Telecommand will not be included in the export	XC002998  0005 <hex> 6E0C <hex> 7 <dec> <hex> (Def) <hex> (Def)	TC	
3		Upload SPIRE OBS image in PM-High		Next Step: 4	
		Uplink the XC002998 memory load commands with ARM-GO			
		For each TC XC002998 successfully executed on-board, the DPU HK counter TCEXEC should be incremented by one. After all XC002998 TCs have been sent, the value of the counter should be: <b>incremented by 2467 for OBS v.3.0.B</b>			
		Verify Telemetry <div>TCEXEC                      SM03N500</div> <div>= incremented by 2467 dec</div>		AND=SA_1_559	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		For each TC XC002998 successfully executed on-board, a TM(1,1) and TM(1,7) packet shall be received on ground.			
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 -> <b>LoadStack</b> option from the main menu of the Manual Stack window			
4.1		IF SPIRE Nominal			

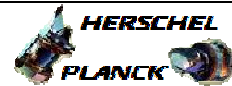


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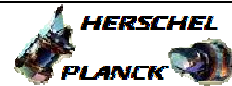
Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Select file  <b>SPDPRMPG_CI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine</b>  from directory  <a href="#">/home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/SPDPRMPG</a>  as indicated by the OBSM engineer			
		IMPORTANT:  <b>XXXXYYY</b> = Image ID(X) and Version(Y) - depend on image used for stack generation  <b>YYYY_DDD hhmmss</b> - depend on stack generation time  <b>machine</b> - depends on the name of the machine used for stack generation			
		File name <b>examples</b>  - 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  <b>SPDPRMPR_CI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine</b>  from directory  <a href="#">/home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/SPDPRMPR</a>  as indicated by the OBSM engineer			
		IMPORTANT:  <b>XXXXYYY</b> = Image ID(X) and Version(Y) - depend on image used for stack generation  <b>YYYY_DDD hhmmss</b> - depend on stack generation time  <b>machine</b> - depends on the name of the machine used for stack generation			
		File name <b>examples</b>  - 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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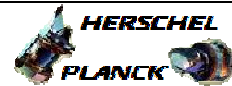
Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
4.3		Check memory check command stack loaded			
		Check that 2 SCM02500 memory check commands have been loaded on the Manual Stack.			
		Display the Manual Stack in 'Full mode' and check the following addresses and lengths are covered 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			
		<b>Note:</b> 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	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	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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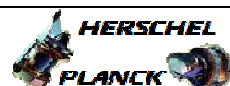
Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
5.1.1		Verify reception and contents of TM(6,10)			
		<b>Note:</b> A TM(6,10) packet will be received for each memory check command uplinked.			
5.1.1.1		IF SPIRE Prime			
		Verify Packet Reception  Memory_Check_Absolute_Addresses Packet Mnemonic : SMMCHK00500 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 : SMMCHK00500 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)			
		<b>Note:</b> 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_CLOM/H_FCP_SPI_CLOA		Next Step: END	
		Return to calling procedure H_FCP_SPI_CLOM or H_FCP_SPI_CLOA			
End of Sequence					
End of Procedure					