Load PACS DMC OBS in instrument INIT mode
File: H_FCP_OBS_4310.xls
Author: Liviu Stefanov

Procedure Summary

Objectives

This Herschel OBSM nominal procedure is used to execute the PACS DMC OBS full image upload in instrument INIT mode (DPU Application SW running). It is called by the FOP PACS procedures H_FCP_PAC_NLMM and H_FCP_PAC_RLMM.
The two OBS image segments (seg_init and seg_pmco) are loaded into the PACS DMC PM memory and the image integrity after upload is checked via checksum calculation and verification.

The DMC OBSW restart is executed in the calling procedure H_FCP_PAC_NLMM or H_FCP_PAC_RLMM.
The calling procedure also includes the DMC PM OBS image checksum 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.

Summary of Constraints

CDMU in Operational Mode
- PACS in INIT mode (DPU ASW running)
- DMC ON
- DPU-DMC communication established

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
- PACS in INIT mode (DPU ASW running)
- DMC ON
- DPU-DMC communication established

End of Procedure

Same as start except:
- New PACS DMC OBS image loaded in DMC PM memory

Reference File(s)

Input Command Sequences

Output Command Sequences

OFCP4310

Referenced Displays

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ANDs	GRDs	SLDs
PA000380		
PA029380		

Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
30/01/2008	1	1	Created	lstefanov-hp	
07/10/2009	2.5	2	1. updated Attachment 1 for PACS DMC OBS v.6.028 2. step 2 and sub-steps updated to separate patch stack load for Prime and Redundant 3. step 2 updated for PACS DMC OBS v.6.028 4. added current step x to separate check stack load from patch stack load 5. added current step 6 to include return to calling procedure	lstefanov-hp	
05/10/2010	3.1	3	 1. Updated for PACS DMC OBS v6.034	n.krusenstiern-hp	

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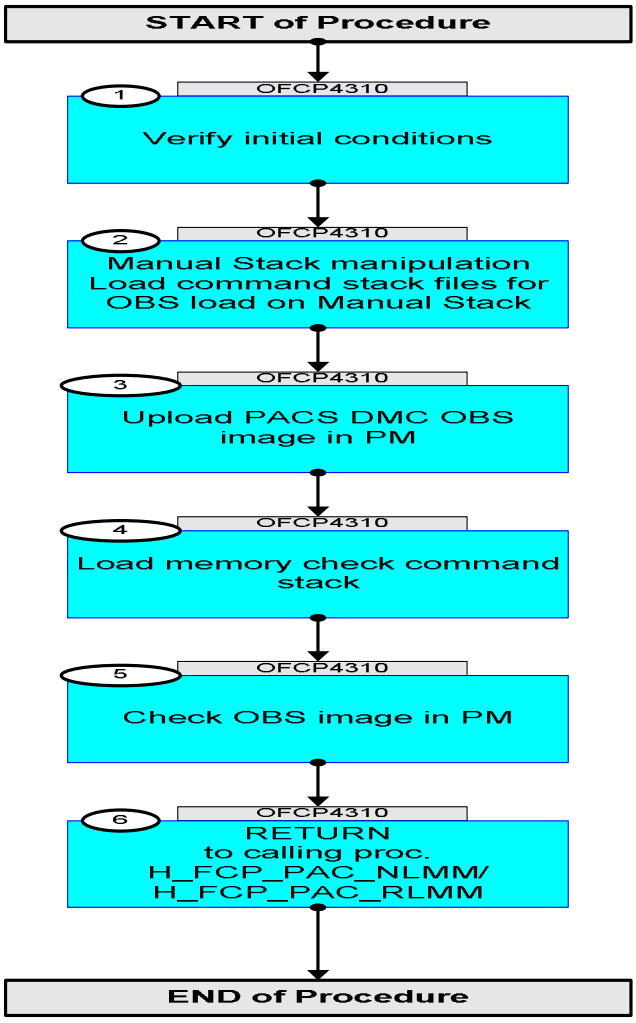
Procedure Flowchart Overview



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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Beginning of Procedure			
	OFCP4310	*TC Seq. Name :* OFCP4310 ( ) Load PACS DMC OBS in INIT mode and check image *TimeTag Type: B* *Sub Schedule ID:*			
1		Verify initial conditions		Next Step: 2	
		Check: - PACS instrument in **INIT mode** (DPU ASW running) - DMC ON - DPU-DMC connection established			
		Instrument SOE to confirm PACS instrument mode and DMC status.			
		Note: Initial conditions are verified in calling procedure H_FCP_PAC_NLMM or H_FCP_PAC_RLMM.			
2		Manual Stack manipulation Load command stack files for OBS load on Manual Stack		Next Step: 3	
		IMPORTANT: The OBS image is delivered in two separate image files, one for each of the segments **seg_init** and **seg_pmco**. The current procedure assumes that the two images have been **merged** and saved in a single PACS DMC PRAM image, and a **single** memory load command **stack** was generated for the DMC OBS upload.			
		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 PACS Nominal			
		Select file **PADMRPRG_PI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine** from directory /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/PADMRPRG as indicated by the OBSM engineer			

Load PACS DMC OBS in instrument INIT mode
File: H_FCP_OBS_4310.xls
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		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 **example** PADMRPRG_PI_0002001_N_NoModel_NoModel_2007_254T123300.sun043			
2.2		IF PACS Redundant			
		Select file **PADMRPRR_PI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine** from directory /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/PADMRPRR 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 **example** PADMRPRR_PI_0005001_N_NoModel_NoModel_2010_277Thhmmss.ws44			
2.3		Check memory load command stack loaded			
		For PACS DMC OBSW **v.6.034:** - the start address of the PADMRPRG **seg_pmco** segment memory image is **00.8000 hex**, and the last address in the image is **00.FF2D hex**. - the start address of the PADMRPRG **seg_init** segment memory image is **06.EE00 hex**, and the last address in the image is **07.04A0 hex**. NO **offset** is applied to the memory image for OBS upload in PM. Consequently, the first address to be loaded is **00.8000 hex**, and the last address is **07.04A0 hex**.			
2.3.1		Check number of memory load commands in the stack			

Load PACS DMC OBS in instrument INIT mode
File: H_FCP_OBS_4310.xls
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Check that loaded stack contains **950** TCs **XC001998**			
2.3.2		Check Memory ID			
		Display the Manual Stack in 'Full mode' and check that the **Memory ID** parameter in the XC001998 commands is set to **21 hex**: **Memory ID = 21 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 **PACS Memory Load** **XC001998** *Command Parameter(s) :* **Memory ID XH000998 21xx 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 PACS Memory Using Absolute Addresses This Telecommand will not be included in the export		**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** in the **first** XC001998 command: **Start Address** = **00.8000 hex** **Length** = **38 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 **PACS Memory Load** **XC001998** *Command Parameter(s) :* **Memory ID XH000998 2100 <hex>** **Start Address XH001998 8000 <hex>** **Length of Block XH003998 38 <dec>** **Var length octet string XH004998 <hex>** (Def) **Checksum XH005998 <hex>** (Def) *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 30* Det. descr. : Load PACS Memory Using Absolute Addresses This Telecommand will not be included in the export		**TC**	

Load PACS DMC OBS in instrument INIT mode
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
2.3.4		Check start address and length of last command in the stack			
		With the Manual Stack in 'Full mode', check the **Start Address** in the **last** XC001998 command: **Start Address** = **7.0490 hex** **Length** = **16 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 **PACS Memory Load** **XC001998** *Command Parameter(s) :* **Memory ID** **XH000998** **2107 <hex>** **Start Address** **XH001998** **0490 <hex>** **Length of Block** **XH003998** **16 <dec>** **Var length octet string** **XH004998** **<hex>** (Def) **Checksum** **XH005998** **<hex>** (Def) *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 30* Det. descr. : Load PACS Memory Using Absolute Addresses This Telecommand will not be included in the export		**TC**	
3		Upload PACS DMC OBS image in PM		Next Step: 4	
		Uplink the **XC001998** memory load commands with **ARM-GO**			
		For **each TC XC001998** successfuly executed on-board, the DPU HK counter **DP_COM_REC_DPU** should be **incremented by one**. Ahter all XC001998 TCs have been sent, the value of the counter should be: **incremented by 1010**			
		Verify Telemetry **DP_COM_REC_DPU** **PM056380**	**= incremented by 1010 dec**	AND=PA000380	
		For each TC XC001998 successfuly executed on-board, a TM(1,1) and TM(1,7) packet shall be received on ground.			
3.1		IF PACS Prime			
		Verify Packet Reception TC_ACP_OK Packet Mnemonic : TC_ACP_OK APID : 1152 Type : 1 Subtype : 1 PI1 : PI2 :			

Load PACS DMC OBS in instrument INIT mode
File: H_FCP_OBS_4310.xls
Author: n.krusenstiern-hp

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Verify Packet Reception TC_EXE_COMPL Packet Mnemonic : TC_EXE_COMPL APID : 1152 Type : 1 Subtype : 7 PI1 : PI2 :			
3.2		IF PACS Redundant			
		Verify Packet Reception TC_ACP_OK Packet Mnemonic : TC_ACP_OK APID : 1153 Type : 1 Subtype : 1 PI1 : PI2 :			
		Verify Packet Reception TC_EXE_COMPL Packet Mnemonic : TC_EXE_COMPL APID : 1153 Type : 1 Subtype : 7 PI1 : PI2 :			
4		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 PACS Nominal			
		Select file **PADMRPRG_CI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine** from directory /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/PADMRPRG 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 **example** PADMRPRG_CI_0002001_N_NoModel_NoModel_2007_254T123300.sun043			

Load PACS DMC OBS in instrument INIT mode
File: H_FCP_OBS_4310.xls
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
4.2		IF PACS Redundant			
		Select file **PADMRPRR_CI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine** from directory /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/PADMRPRR 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 **example** PADMRPRR_CI_0002001_N_NoModel_NoModel_2007_254T123300.sun043			
4.3		Check memory check command stack loaded			
		Note: The seg_pmco and seg_ini areas are checked in successive 2048 dec SAU pages. The start address, length and corresponding checksum for each page are summarised in **Annex 1**, for DMC OBS version **6.034**.			
		Check that **19 PC029380** 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 PC029380 commands:			
		See tables in **Annex 1** for DMC OBS **v.6.034**. **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.			
5		Check OBS image in PM		Next Step: 6	
		Uplink the **PC029380** memory check commands one by one with **ARM-GO** and verify the received **checksum** against the corresponding expected value in **Attachment 1**.			
		For each TC(6,9), a TM(6,10) packet shall be received on ground.			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
5.1		Verify reception and contents of TM(6,10)			
		Verify the TM(6,10) packet contents for each memory check command uplinked, using the tables in **Attachment 1**.			
5.1.1		IF PACS Prime			
		Verify Packet Reception MEMORY_CRC Packet Mnemonic : MEMORY_CRC APID : 1152 Type : 6 Subtype : 10 PI1 : PI2 :			
		Verify Telemetry **MEMORY_ID PM129380**		AND=PA029380	
		Verify Telemetry **START_ADDRESS PM130380**		AND=PA029380	
		Verify Telemetry **LENGTH PM131380**		AND=PA029380	
		Verify Telemetry **CHECKSUM PM132380**		AND=PA029380	
5.1.2		ELSE PACS Redundant			
		Verify Packet Reception MEMORY_CRC Packet Mnemonic : MEMORY_CRC APID : 1153 Type : 6 Subtype : 10 PI1 : PI2 :			
		Verify Telemetry **MEMORY_ID PM129380**		AND=PA029380	
		Verify Telemetry **START_ADDRESS PM130380**		AND=PA029380	
		Verify Telemetry **LENGTH PM131380**		AND=PA029380	
		Verify Telemetry **CHECKSUM PM132380**		AND=PA029380	
6		RETURN to calling proc. H_FCP_PAC_NLMM/H_FCP_PAC_RLMM		Next Step: END	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Return to calling procedure H_FCP_PAC_NLMM or H_FCP_PAC_RLMM			
		End of Sequence			
		End of Procedure			

Attachment 1

Load PACS DMC OBS in instrument INIT mode
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Author: lstefanov-hp

PACS DMC OBS v.6.034			
Start address [hex]	**Length [hex]**	**Checksum [hex]**	**segment**
06.EE00	800	0x8B90	seg_init
06.F600	800	0xD9A0	
06.FE00	6A0	0x62C5	
00.8000	800	0x1866	seg_pmco
00.8800	800	0x3596	
00.9000	800	0xE2DF	
00.9800	800	0x3126	
00.A000	800	0x4E17	
00.A800	800	0xF11F	
00.B000	800	0x4C52	
00.B800	800	0xE4C	
00.C000	800	0x163F	
00.C800	800	0x74E6	
00.D000	800	0xAB58	
00.D800	800	0xFD9B	
00.0000	800	0x1DB1	
00.E800	800	0xE1CF	
00.F000	800	0x6C3A	
00.F800	72D	0x7A0C	

Status : Version 3 - Updated
Last Checkin: 05/10/2010