

Load ACC OBS in EEPROM  
 File: H\_FCP\_OBS\_2210.xls  
 Author: lstefanov-hp



## Procedure Summary

### Objectives

This Herschel OBSM nominal procedure is used to conduct an ACC On-Board SW upload in PM EEPROM.

The whole OBS image is loaded into either 'Image 1' or 'Image 2' memory area.

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  
 -ACC in Operational mode

Execution of service 6 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  
 - ACC in Operational mode

#### End of Procedure

Same as start except:  
 - New OBS image loaded in 'Image 1' or 'Image 2'

### Reference File(s)

#### Input Command Sequences

#### Output Command Sequences

OFCP221A  
 OFCP221B

### Referenced Displays

<b>ANDs</b>	<b>GRDs</b>	<b>SLDs</b>
ZAA09999		(None)

### Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
16/06/08		1	Created	Istefanov-hp	

Status : Version 4 - Unchanged  
 Last Checkin: 13/04/09

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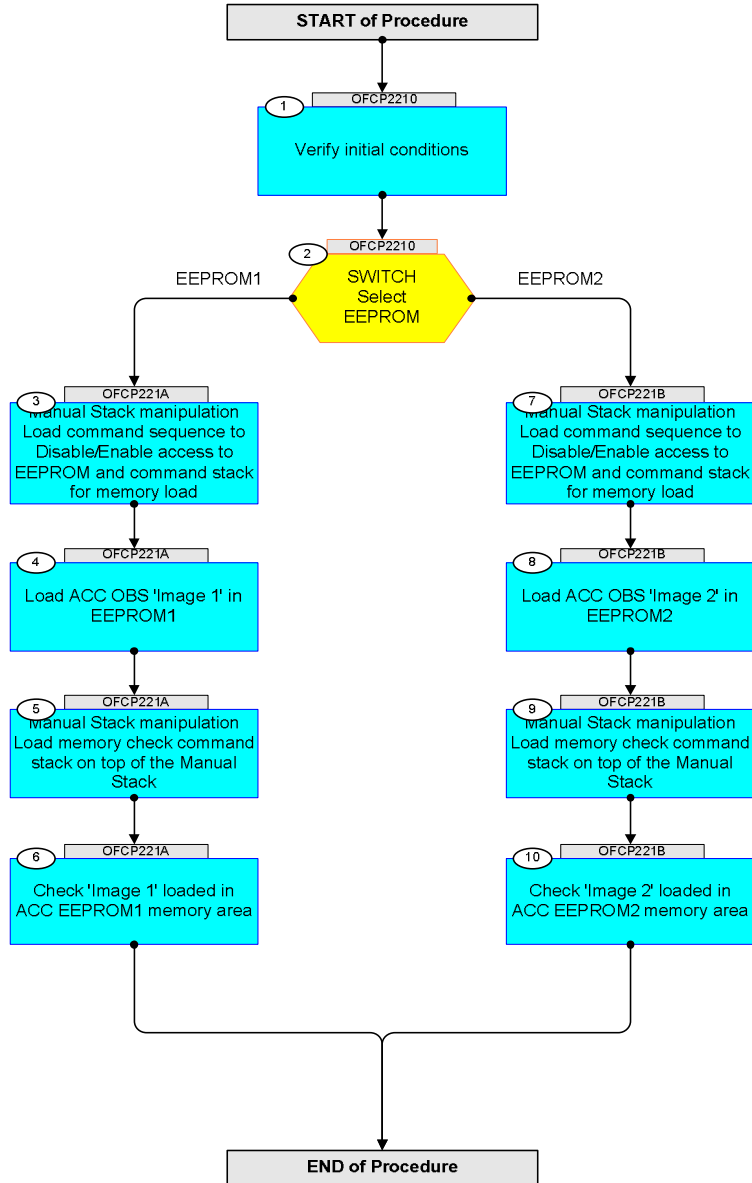


24/06/08	1	2	<ul style="list-style-type: none"> <li>1. steps 5.1 and 9.1: updated addresses and lengths in the list of TC param.values</li> <li>2. steps 6.2 and 10.2 and sub-steps: updated to include reference to Attachment 1</li> <li>3. added Attachment 1 ('CRC checksums' worksheet) and Attachment 2 ('ANC32 checksums' worksheet)</li> </ul>	lstefanov-hp	
11/03/09	2.2	3	<ul style="list-style-type: none"> <li>1. current step 3.2 updated: sub-steps 3.2.1 and 3.2.2 created to separate command stack load for ACC PM A and B</li> <li>2. added current step 3.3.1 to check the # of mem. load commands in the stack</li> <li>3. added current step 3.3.2 for Mem.ID check for all commands in the stack</li> <li>4. current step 5 updated: sub-steps 5.1 and 5.2 created to separate command stack load for ACC PM A and B</li> <li>5. current step 7.2 updated: sub-steps 7.2.1 and 7.2.2 created to separate command stack load for ACC PM A and B</li> <li>6. added current step 7.3.1 to check the # of mem. load commands in the stack</li> <li>7. added current step 7.3.2 for Mem.ID check for all commands in the stack</li> <li>8. current step 9 updated: sub-steps 9.1 and 9.2 created to separate command stack load for ACC PM A and B</li> <li>9. updated CRC and ANC32 checksum values in Attachment 1 and 2 for ACMS OBS v4.0B004</li> </ul>	lstefanov-hp	
13/04/09	2.3	4	<ul style="list-style-type: none"> <li>1. corrected typo in steps 3.2.1, 3.2.2, 5.1, 5.2, 7.2.1, 7.2.2, 9.1 and 9.2: 'pmcsops' replaced by 'hmcops'</li> <li>2. updated tables in Attachment1 and Attachment2: removed checksums for modified image (used only in SVTs)</li> </ul>	lstefanov-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>					
OFCP2210		TC Seq. Name : OFCP2210 ( ACC OBS LOAD EEPROM ) Load ACC OBS in EEPROM  TimeTag Type: Sub Schedule ID:  <input type="checkbox"/>			
1		Verify initial conditions		Next Step: 2	
		Check: - CDMU in Operational Mode - ACC in Operational Mode			
		CDMS SOE to confirm CDMU mode			
		ACMS SOE to confirm ACC mode			
2		SWITCH Select EEPROM  type: [Switch]		Next Step: EEPROM1 3 EEPROM2 7	
End of Sequence					
OFCP221A		TC Seq. Name : OFCP221A ( ACC OBS LD EEPROM1 ) Load ACC OBS 'Image 1' in EEPROM1  TimeTag Type: N Sub Schedule ID:  <input type="checkbox"/>			
3		Manual Stack manipulation Load command sequence to Disable/Enable access to EEPROM and command stack for memory load		Next Step: 4	
3.1		Load command sequence OFCP221A on top of the Manual Stack			
3.1.1		Sequence data  FP: N/A TT: N/A			
3.2		Load memory load command stack			
		<b>Load</b> command stack at <b>line 2</b> of Manual Stack			

Load ACC OBS in EEPROM File: H_FCP_OBS_2210.xls Author: lstefanov-hp	
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		<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			
3.2.1		IF ACC PM A			
		Select file  <b>ACCEE1PG_PI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine</b>  from directory  <a href="#">/home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/ACCEE1PG</a>  as indicated by the OBSM engineer			
		<b>IMPORTANT:</b>  <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			
		<b>File name example:</b>  - No model associated to the memory image:  <b>ACCEE1PG_PI_0002001_N_NoModel_NoModel_2008_133T123300.sun045</b>			
3.2.2		ELSE ACC PM B			
		Select file  <b>ACCEE1PB_PI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine</b>  from directory  <a href="#">/home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/ACCEE1PB</a>  as indicated by the OBSM engineer			
		<b>IMPORTANT:</b>  <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			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment															
		File name <b>example:</b>  - No model associated to the memory image:  ACCE1PB_PI_0002001_N_NoModel_NoModel_2008_133T123300_sun045																		
3.3		Check memory load command stack loaded																		
		<b>Note:</b> The start and end address address of the EEPROM 'Image 1' are (Memory ID included):  <b>Start Address = 0080.0000 hex</b> <b>End Address = 008F.FFFF hex</b> <b>Length = 100000 hex</b>  <b>Note:</b> The Memory ID of the target memory device is stored in the MS 12 bits of the 16-bit long Mem ID TM parameter. The LS 4 bits of the same parameter carry the most significant 4 bits of the Start Address.																		
3.3.1		Check number of memory load commands in the stack																		
		Check that loaded stack contains: <b>4600 TCs XC001999</b>																		
3.3.2		Check Memory ID																		
		Display the Manual Stack in 'Full mode' and check that the <b>Memory ID</b> parameter in the XC001999 commands is set to <b>008 hex</b> :  <b>Memory ID = 008 hex</b>  <b>Note:</b> The Memory ID of the target memory device is stored in the MS 12 bits of the 16-bit long Mem ID TC parameter. The LS 4 bits of the same parameter carry the most significant 4 bits of the Start Address.																		
		Execute Telecommand  <div style="text-align: right; margin-right: 20px;"><b>Patch APID 512</b></div> <div style="text-align: right; margin-right: 20px;"><b>XC001999</b></div> <b>Command Parameter(s) :</b> <table style="width:100%; border: none;"> <tr> <td style="width:40%;">Memory Id (-----)</td> <td style="width:20%;">XH000999</td> <td style="width:40%;">008x &lt;hex&gt;</td> </tr> <tr> <td>Start Address (-----)</td> <td>XH001999</td> <td>&lt;hex&gt; (Def)</td> </tr> <tr> <td>Length of Block (8 bits)</td> <td>XH003999</td> <td>&lt;dec&gt; (Def)</td> </tr> <tr> <td>Variable len. octet str</td> <td>XH004999</td> <td>&lt;hex&gt; (Def)</td> </tr> <tr> <td>Checksum (-----)</td> <td>XH005999</td> <td>&lt;hex&gt; (Def)</td> </tr> </table> <b>TC Control Flags :</b> <div style="text-align: right; margin-right: 20px;"><b>GBM IL DSE</b></div> <div style="text-align: right; margin-right: 20px;"><b>--Y -- ---</b></div> <b>Subsch. ID : 1</b> <b>Det. descr. : Patch APID 512</b>  This Telecommand will not be included in the export	Memory Id (-----)	XH000999	008x <hex>	Start Address (-----)	XH001999	<hex> (Def)	Length of Block (8 bits)	XH003999	<dec> (Def)	Variable len. octet str	XH004999	<hex> (Def)	Checksum (-----)	XH005999	<hex> (Def)		<b>TC</b>	
Memory Id (-----)	XH000999	008x <hex>																		
Start Address (-----)	XH001999	<hex> (Def)																		
Length of Block (8 bits)	XH003999	<dec> (Def)																		
Variable len. octet str	XH004999	<hex> (Def)																		
Checksum (-----)	XH005999	<hex> (Def)																		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment															
3.3.3		Check start address and length of the first memory load command in the stack																		
		<p>With the Manual Stack in 'Full mode', check the <b>Start Address</b> and <b>Length</b> in the <b>first</b> XC001999 command (Memory ID included):</p> <p><b>Start Address</b> = 0080.0000 hex  <b>Length</b> = 228 dec</p> <p><b>Note:</b>            The Memory ID of the target memory device is stored in the MS 12 bits of the 16-bit long Mem ID TC parameter. The LS 4 bits of the same parameter carry the most significant 4 bits of the Start Address.</p>																		
		<p>Execute Telecommand</p> <p style="text-align: right;"><b>Patch APID 512</b></p> <p><b>Command Parameter(s) :</b></p> <table border="0"> <tr> <td>Memory Id (-----)</td> <td>XH000999</td> <td>0080 &lt;hex&gt;</td> </tr> <tr> <td>Start Address (-----)</td> <td>XH001999</td> <td>0000 &lt;hex&gt;</td> </tr> <tr> <td>Length of Block (8 bits)</td> <td>XH003999</td> <td>228 &lt;dec&gt;</td> </tr> <tr> <td>Variable len. octet str</td> <td>XH004999</td> <td>patch data</td> </tr> <tr> <td>Checksum (-----)</td> <td>XH005999</td> <td>calculated by OBSM</td> </tr> </table> <p><b>TC Control Flags :</b></p> <p style="text-align: right;"><b>GBM IL DSE</b>  <b>--Y -- --</b></p> <p><b>Subsch. ID : 1</b>  <b>Det. descr. : Patch APID 512</b></p> <p>This Telecommand will not be included in the export</p>	Memory Id (-----)	XH000999	0080 <hex>	Start Address (-----)	XH001999	0000 <hex>	Length of Block (8 bits)	XH003999	228 <dec>	Variable len. octet str	XH004999	patch data	Checksum (-----)	XH005999	calculated by OBSM	XC001999	TC	
Memory Id (-----)	XH000999	0080 <hex>																		
Start Address (-----)	XH001999	0000 <hex>																		
Length of Block (8 bits)	XH003999	228 <dec>																		
Variable len. octet str	XH004999	patch data																		
Checksum (-----)	XH005999	calculated by OBSM																		
3.3.4		Check start address and length of the last memory load command in the stack																		
		<p>With the Manual Stack in 'Full mode', check the <b>Start Address</b> and <b>Length</b> in the <b>last</b> XC001999 command (Memory ID included):</p> <p><b>Start Address</b> = 008F.FFFC hex  <b>Length</b> = 4 dec</p> <p><b>Note:</b>            The Memory ID of the target memory device is stored in the MS 12 bits of the 16-bit long Mem ID TC parameter. The LS 4 bits of the same parameter carry the most significant 4 bits of the Start Address.</p>																		
		<p>Execute Telecommand</p> <p style="text-align: right;"><b>Patch APID 512</b></p> <p><b>Command Parameter(s) :</b></p> <table border="0"> <tr> <td>Memory Id (-----)</td> <td>XH000999</td> <td>008F &lt;hex&gt;</td> </tr> <tr> <td>Start Address (-----)</td> <td>XH001999</td> <td>FFFC &lt;hex&gt;</td> </tr> <tr> <td>Length of Block (8 bits)</td> <td>XH003999</td> <td>4 &lt;dec&gt;</td> </tr> <tr> <td>Variable len. octet str</td> <td>XH004999</td> <td>patch data</td> </tr> <tr> <td>Checksum (-----)</td> <td>XH005999</td> <td>calculated by OBSM</td> </tr> </table> <p><b>TC Control Flags :</b></p> <p style="text-align: right;"><b>GBM IL DSE</b>  <b>--Y -- --</b></p> <p><b>Subsch. ID : 1</b>  <b>Det. descr. : Patch APID 512</b></p> <p>This Telecommand will not be included in the export</p>	Memory Id (-----)	XH000999	008F <hex>	Start Address (-----)	XH001999	FFFC <hex>	Length of Block (8 bits)	XH003999	4 <dec>	Variable len. octet str	XH004999	patch data	Checksum (-----)	XH005999	calculated by OBSM	XC001999	TC	
Memory Id (-----)	XH000999	008F <hex>																		
Start Address (-----)	XH001999	FFFC <hex>																		
Length of Block (8 bits)	XH003999	4 <dec>																		
Variable len. octet str	XH004999	patch data																		
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
4		Load ACC OBS 'Image 1' in EEPROM1		Next Step: 5	
4.1		Disable EEPROM write protection			
		Verify Telemetry EEPromWriteProt                    AEGU3050                    = ENABLED		AND=ZAA09999	
		Uplink TC with ARM GO			
		Execute Telecommand  TC Control Flags :  Subsch. ID : 20 Det. descr. : Enable write to EEPROM	EnableEEWrite  AC806070  GBM IL DSE --Y -- ---	TC	
		Verify Telemetry EEPromWriteProt                    AEGU3050                    = DISABLED		AND=ZAA09999	
4.2		Uplink the memory load commands			
		Memory load details:  Start address: 0080.0000 hex End address : 008F.FFFF hex # of TCs : 4600 dec			
		Uplink TCs XC001999 with ARM-GO			
		For each TC XC001999 successfully executed on-board, a TM(1,1) and a TM(1,7) packet shall be received on ground.			
		Verify Packet Reception  Telecommand Acceptance Report - Success Packet Mnemonic :            A_TcAccSucc APID :                        512 Type :                         1 Subtype :                     1 PI1 : PI2 :			
		Verify Packet Reception  Telecommand Execution Report - Completed Packet Mnemonic :            A_TcExeComp APID :                        512 Type :                         1 Subtype :                     7 PI1 : PI2 :			
4.3		Enable EEPROM write protection			
		Verify Telemetry EEPromWriteProt                    AEGU3050                    = DISABLED		AND=ZAA09999	
		Uplink TC with ARM GO			



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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Execute Telecommand  <b>DisableEEWrite</b>  <i>TC Control Flags :</i>  GBM IL DSE --Y -- ---  Subsch. ID : 20 Det. descr. : Disable write to EEPROM	AC805070	TC	
		Verify Telemetry  <b>EEPromWriteProt</b> <b>AEGU3050</b>	= <b>ENABLED</b>	AND=ZAA09999	
5		Manual Stack manipulation Load memory check command stack on top of the Manual Stack		Next Step: 6	
		Select the File -> <b>LoadStack</b> option from the main menu of the Manual Stack window			
5.1		IF ACC PM A			
		Select file  <b>ACCE1PG_CI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine</b>  from directory  <a href="#">/home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/ACCE1PG</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>example:</b>  - No model associated to the memory image:  <b>ACCE1PG_CI_0002001_N_NoModel_NoModel_2008_133T123300.sun045</b>			
5.2		ELSE ACC PM B			

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment																																																																								
		Select file  <b>ACCEE1PB_CI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine</b>  from directory  /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/ACCEE1PB  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>example:</b>  - No model associated to the memory image:  ACCEE1PB_CI_0002001_N_NoModel_NoModel_2008_133T123300.sun045																																																																											
5.3		Check command stack loaded																																																																											
		With the Manual Stack in 'Full mode', check the 17 TCs <b>AC069109</b> in loaded stack.  <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">TC #</th> <th style="text-align: left;">Memory_ID</th> <th style="text-align: left;">Start_Address</th> <th style="text-align: left;">N</th> </tr> </thead> <tbody> <tr><td>1</td><td>0080</td><td>0000</td><td>FFFF</td></tr> <tr><td>2</td><td>0080</td><td>FFFF</td><td>FFFF</td></tr> <tr><td>3</td><td>0081</td><td>FFFE</td><td>FFFF</td></tr> <tr><td>4</td><td>0082</td><td>FFFD</td><td>FFFF</td></tr> <tr><td>5</td><td>0083</td><td>FFFC</td><td>FFFF</td></tr> <tr><td>6</td><td>0084</td><td>FFFB</td><td>FFFF</td></tr> <tr><td>7</td><td>0085</td><td>FFFA</td><td>FFFF</td></tr> <tr><td>8</td><td>0086</td><td>FFF9</td><td>FFFF</td></tr> <tr><td>9</td><td>0087</td><td>FFF8</td><td>FFFF</td></tr> <tr><td>10</td><td>0088</td><td>FFF7</td><td>FFFF</td></tr> <tr><td>11</td><td>0089</td><td>FFF6</td><td>FFFF</td></tr> <tr><td>12</td><td>008A</td><td>FFF5</td><td>FFFF</td></tr> <tr><td>13</td><td>008B</td><td>FFF4</td><td>FFFF</td></tr> <tr><td>14</td><td>008C</td><td>FFF3</td><td>FFFF</td></tr> <tr><td>15</td><td>008D</td><td>FFF2</td><td>FFFF</td></tr> <tr><td>16</td><td>008E</td><td>FFF1</td><td>FFFF</td></tr> <tr><td>17</td><td>008F</td><td>FFF0</td><td>10</td></tr> </tbody> </table>	TC #	Memory_ID	Start_Address	N	1	0080	0000	FFFF	2	0080	FFFF	FFFF	3	0081	FFFE	FFFF	4	0082	FFFD	FFFF	5	0083	FFFC	FFFF	6	0084	FFFB	FFFF	7	0085	FFFA	FFFF	8	0086	FFF9	FFFF	9	0087	FFF8	FFFF	10	0088	FFF7	FFFF	11	0089	FFF6	FFFF	12	008A	FFF5	FFFF	13	008B	FFF4	FFFF	14	008C	FFF3	FFFF	15	008D	FFF2	FFFF	16	008E	FFF1	FFFF	17	008F	FFF0	10			
TC #	Memory_ID	Start_Address	N																																																																										
1	0080	0000	FFFF																																																																										
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10	0088	FFF7	FFFF																																																																										
11	0089	FFF6	FFFF																																																																										
12	008A	FFF5	FFFF																																																																										
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14	008C	FFF3	FFFF																																																																										
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16	008E	FFF1	FFFF																																																																										
17	008F	FFF0	10																																																																										
		<b>Note:</b> Only the <b>first TC AC069109</b> is included below, as example.																																																																											
		Execute Telecommand  <div style="text-align: right; margin-right: 20px;"><b>Check Memory</b></div> <div style="text-align: right; margin-right: 20px;"><b>AC069109</b></div> Command Parameter(s) : <table style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Memory ID</td> <td style="text-align: right;">AH6M0109</td> <td style="text-align: left;">0080 &lt;hex&gt;</td> </tr> <tr> <td style="text-align: right;">Start Address</td> <td style="text-align: right;">AH6M1109</td> <td style="text-align: left;">0000 &lt;hex&gt; (Def)</td> </tr> <tr> <td style="text-align: right;">Length SAU</td> <td style="text-align: right;">AH6M3109</td> <td style="text-align: left;">FFFF &lt;hex&gt;</td> </tr> </table> TC Control Flags : <div style="text-align: right; margin-right: 20px;"><b>GBM IL DSE</b></div> <div style="text-align: right; margin-right: 20px;">--Y --</div> Subsch. ID : 20 Det. descr. : TC(6,9) Check Memory Using Absolute Addresses This Telecommand will not be included in the export	Memory ID	AH6M0109	0080 <hex>	Start Address	AH6M1109	0000 <hex> (Def)	Length SAU	AH6M3109	FFFF <hex>		TC																																																																
Memory ID	AH6M0109	0080 <hex>																																																																											
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Length SAU	AH6M3109	FFFF <hex>																																																																											

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
6		Check 'Image 1' loaded in ACC EEPROM1 memory area		Next Step: END	
6.1		Command memory checksum calculation			
		<b>Uplink</b> the 17 <b>AC069109</b> memory check commands (one by one) with <b>ARM-GO</b>			
		For each TC AC069109 uplinked, a TM(6,10) packet shall be received on ground.			
6.2		Verify reception and contents of TM(6,10)			
		Verify Packet Reception  Memory Check Report - Absolute Addresses Packet Mnemonic : MemChkRepAbs APID : 512 Type : 6 Subtype : 10 PI1 : PI2 :			
		Verify Telemetry  <b>Memory_ID</b> <b>AE060070</b>		(None)	
		Verify Telemetry  <b>Start_Address</b> <b>AE061070</b>		(None)	
		Verify Telemetry  <b>N</b> <b>AE062070</b>		(None)	
		Verify Telemetry  <b>Checksum</b> <b>AE064070</b>		(None)	
6.2.1		Verify checksum values			
		Check the received checksums against the expected values listed in <b>Attachment 1</b> (worksheet "CRC checksums").  <b>IMPORTANT:</b> Checksum values depend on the OBS version.			
		Verify Telemetry  <b>Checksum</b> <b>AE064070</b>	<b>= expected value</b>	(None)	
End of Sequence					
	<b>OFCP221B</b>	<i>TC Seq. Name</i> : OFCP221B ( ACC OBS LD EEPROM2 ) Load ACC OBS 'Image 1' in EEPROM2  <i>TimeTag Type</i> : N <i>Sub Schedule ID</i> :  <input type="checkbox"/>			

Load ACC OBS in EEPROM  
 File: H\_FCP\_OBS\_2210.xls  
 Author: lstefanov-hp




Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
7		Manual Stack manipulation Load command sequence to Disable/Enable access to EEPROM and command stack for memory load		Next Step: 8	
7.1		Load command sequence OFCP221B on top of the Manual Stack			
7.1.1		Sequence data FP: N/A TT: N/A			
7.2		Load memory load command stack			
		<b>Load</b> command stack at <b>line 2</b> of Manual Stack			
		<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			
7.2.1		IF ACC PM A			
		Select file  <b>ACC EE2PG_PI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine</b>  from directory  <a href="#">/home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/ACC EE2PG</a>  as indicated by the OBSM engineer			
		<b>IMPORTANT:</b>  <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>example:</b>  - No model associated to the memory image:  ACC EE2PG_PI_0002001_N_NoModel_NoModel_2008_133T123300.sun045			

Load ACC OBS in EEPROM  
 File: H\_FCP\_OBS\_2210.xls  
 Author: lstefanov-hp




Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
7.2.2		ELSE ACC PM B			
		Select file  ACCEE2PB_PI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss. machine  from directory  /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OB SM/ACCEE2PB  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 <b>example:</b>  - No model associated to the memory image:  ACCEE2PB_PI_0002001_N_NoModel_NoModel_2008_133T123300. sun045			
7.3		Check memory load command stack loaded			
		<b>Note:</b> The start and end address address of the EEPROM 'Image 2' are (Memory ID included):  <b>Start Address = 0090.0000 hex</b> <b>End Address = 009F.FFFF hex</b> <b>Length = 100000 hex</b>  <b>Note:</b> The Memory ID of the target memory device is stored in the MS 12 bits of the 16-bit long Mem ID TC parameter. The LS 4 bits of the same parameter carry the most significant 4 bits of the Start Address.			
7.3.1		Check number of memory load commands in the stack			
		Check that loaded stack contains: <b>4600 TCs XC001999</b>			
7.3.2		Check Memory ID			

Load ACC OBS in EEPROM File: H_FCP_OBS_2210.xls Author: lstefanov-hp	
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		Display the Manual Stack in 'Full mode' and check that the <b>Memory ID</b> parameter in the XC001999 commands is set to <b>009 hex</b> :  <b>Memory ID = 009 hex</b>  <b>Note:</b> The Memory ID of the target memory device is stored in the MS 12 bits of the 16-bit long Mem ID TC parameter. The LS 4 bits of the same parameter carry the most significant 4 bits of the Start Address.			
		Execute Telecommand <div style="text-align: right; margin-right: 20px;"><b>Patch APID 512</b></div> <div style="text-align: right; margin-right: 20px;"><b>XC001999</b></div> <i>Command Parameter(s) :</i> <b>Memory Id (-----)</b> XH000999    009x <hex> <b>Start Address (-----)</b> XH001999    <hex> (Def) <b>Length of Block (8 bits)</b> XH003999    <dec> (Def) <b>Variable len. octet str</b> XH004999    <hex> (Def) <b>Checksum (-----)</b> XH005999    <hex> (Def)  <i>TC Control Flags :</i> <div style="text-align: right; margin-right: 20px;"><b>GBM IL DSE</b></div> <div style="text-align: right; margin-right: 20px;"><b>--Y -- ---</b></div> <i>Subsch. ID : 1</i> <i>Det. descr. : Patch APID 512</i>  This Telecommand will not be included in the export		TC	
7.3.3		Check start address and length of the first memory load command in the stack			
		With the Manual Stack in 'Full mode', check the <b>Start Address</b> and <b>Length</b> in the <b>first</b> XC001999 command (Memory ID included):  <b>Start Address = 0090.0000 hex</b> <b>Length = 228 dec</b>  <b>Note:</b> The Memory ID of the target memory device is stored in the MS 12 bits of the 16-bit long Mem ID TC parameter. The LS 4 bits of the same parameter carry the most significant 4 bits of the Start Address.			
		Execute Telecommand <div style="text-align: right; margin-right: 20px;"><b>Patch APID 512</b></div> <div style="text-align: right; margin-right: 20px;"><b>XC001999</b></div> <i>Command Parameter(s) :</i> <b>Memory Id (-----)</b> XH000999    0090 <hex> <b>Start Address (-----)</b> XH001999    0000 <hex> <b>Length of Block (8 bits)</b> XH003999    228 <dec> <b>Variable len. octet str</b> XH004999    patch data <b>Checksum (-----)</b> XH005999    calculated by OBSM  <i>TC Control Flags :</i> <div style="text-align: right; margin-right: 20px;"><b>GBM IL DSE</b></div> <div style="text-align: right; margin-right: 20px;"><b>--Y -- ---</b></div> <i>Subsch. ID : 1</i> <i>Det. descr. : Patch APID 512</i>  This Telecommand will not be included in the export		TC	
7.3.4		Check start address and length of the last memory load command in the stack			

Load ACC OBS in EEPROM File: H_FCP_OBS_2210.xls Author: lstefanov-hp	
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment																												
		With the Manual Stack in 'Full mode', check the <b>Start Address</b> and <b>Length</b> in the first XC001999 command (Memory ID included):  <b>Start Address = 0090.0000 hex</b> <b>Length = 4 dec</b>  <b>Note:</b> The Memory ID of the target memory device is stored in the MS 12 bits of the 16-bit long Mem ID TC parameter. The LS 4 bits of the same parameter carry the most significant 4 bits of the Start Address.																															
		Execute Telecommand <div style="text-align: right; margin-right: 20px;"><b>Patch APID 512</b></div> <div style="text-align: center;"><b>XC001999</b></div> <i>Command Parameter(s) :</i> <table style="width:100%; border: none;"> <tr> <td style="width:40%;">Memory Id (-----)</td> <td style="width:20%;">XH000999</td> <td style="width:20%;">009F &lt;hex&gt;</td> <td style="width:20%;"></td> </tr> <tr> <td>Start Address (-----)</td> <td>XH001999</td> <td>FFFC &lt;hex&gt;</td> <td></td> </tr> <tr> <td>Length of Block (8 bits)</td> <td>XH003999</td> <td>4 &lt;dec&gt;</td> <td></td> </tr> <tr> <td>Variable len. octet str</td> <td>XH004999</td> <td>patch data</td> <td></td> </tr> <tr> <td>Checksum (-----)</td> <td>XH005999</td> <td>calculated by OBSM</td> <td></td> </tr> </table> <i>TC Control Flags :</i> <table style="width:100%; border: none;"> <tr> <td style="width:40%;"></td> <td style="width:20%; text-align: center;">GBM IL DSE</td> <td style="width:20%;"></td> <td style="width:20%;"></td> </tr> <tr> <td></td> <td style="text-align: center;">--Y -- --</td> <td></td> <td></td> </tr> </table> <i>Subsch. ID : 1</i> <i>Det. descr. : Patch APID 512</i>  This Telecommand will not be included in the export	Memory Id (-----)	XH000999	009F <hex>		Start Address (-----)	XH001999	FFFC <hex>		Length of Block (8 bits)	XH003999	4 <dec>		Variable len. octet str	XH004999	patch data		Checksum (-----)	XH005999	calculated by OBSM			GBM IL DSE				--Y -- --				TC	
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	GBM IL DSE																																
	--Y -- --																																
8		Load ACC OBS 'Image 2' in EEPROM2		Next Step: 9																													
8.1		Disable EEPROM write protection																															
		Verify Telemetry <table style="width:100%; border: none;"> <tr> <td style="width:40%; text-align: right;"><b>EEPromWriteProt</b></td> <td style="width:20%; text-align: center;">AEGU3050</td> <td style="width:20%;">= ENABLED</td> <td style="width:20%;">AND=ZAA09999</td> </tr> </table>	<b>EEPromWriteProt</b>	AEGU3050	= ENABLED	AND=ZAA09999																											
<b>EEPromWriteProt</b>	AEGU3050	= ENABLED	AND=ZAA09999																														
		Uplink TC with <b>ARM GO</b>																															
		Execute Telecommand <div style="text-align: right; margin-right: 20px;"><b>EnableEEWrite</b></div> <div style="text-align: center;"><b>AC806070</b></div> <i>TC Control Flags :</i> <table style="width:100%; border: none;"> <tr> <td style="width:40%;"></td> <td style="width:20%; text-align: center;">GBM IL DSE</td> <td style="width:20%;"></td> <td style="width:20%;"></td> </tr> <tr> <td></td> <td style="text-align: center;">--Y -- --</td> <td></td> <td></td> </tr> </table> <i>Subsch. ID : 20</i> <i>Det. descr. : Enable write to EEPROM</i>		GBM IL DSE				--Y -- --				TC																					
	GBM IL DSE																																
	--Y -- --																																
		Verify Telemetry <table style="width:100%; border: none;"> <tr> <td style="width:40%; text-align: right;"><b>EEPromWriteProt</b></td> <td style="width:20%; text-align: center;">AEGU3050</td> <td style="width:20%;">= DISABLED</td> <td style="width:20%;">AND=ZAA09999</td> </tr> </table>	<b>EEPromWriteProt</b>	AEGU3050	= DISABLED	AND=ZAA09999																											
<b>EEPromWriteProt</b>	AEGU3050	= DISABLED	AND=ZAA09999																														
8.2		Uplink the memory load commands																															
		Memory load details:  <b>Start address:</b> 0090.0000 hex <b>End address :</b> 009F.FFFF hex <b># of TCs :</b> 4600 dec																															
		Uplink TCs <b>XC001999</b> with <b>ARM-GO</b>																															

Load ACC OBS in EEPROM  
 File: H\_FCP\_OBS\_2210.xls  
 Author: lstefanov-hp




Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		For each TC XC001999 successfully executed on-board, a TM(1,1) and a TM(1,7) packet shall be received on ground.			
		Verify Packet Reception  Telecommand Acceptance Report - Success Packet Mnemonic : A_TcAccSucc APID : 512 Type : 1 Subtype : 1 PI1 : PI2 :			
		Verify Packet Reception  Telecommand Execution Report - Completed Packet Mnemonic : A_TcExeComp APID : 512 Type : 1 Subtype : 7 PI1 : PI2 :			
8.3		Enable EEPROM write protection			
		Verify Telemetry EEPromWriteProt AEGU3050 = DISABLED		AND=ZAA09999	
		Uplink TC with ARM GO			
		Execute Telecommand DisableEEWrite  TC Control Flags : GBM IL DSE --Y -- ---  Subsch. ID : 20 Det. descr. : Disable write to EEPROM	AC805070	TC	
		Verify Telemetry EEPromWriteProt AEGU3050 = ENABLED		AND=ZAA09999	
9		Manual Stack manipulation Load memory check command stack on top of the Manual Stack		Next Step: 10	
		Select the File -> LoadStack option from the main menu of the Manual Stack window			
9.1		IF ACC PM A			
		Select file  ACCEE2PG_CI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThmmss.machine  from directory  /home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/ACCEE2PG  as indicated by the OBSM engineer			



Load ACC OBS in EEPROM File: H_FCP_OBS_2210.xls Author: lstefanov-hp	
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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 <b>example:</b>  - No model associated to the memory image:  ACCEE2PB_CI_0002001_N_NoModel_NoModel_2008_133T123300.sun045																																							
9.2		ELSE ACC PM B																																							
		Select file  ACCEE2PB_CI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss.machine  from directory  <a href="/home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/ACCEE2PB">/home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/ACCEE2PB</a>  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 <b>example:</b>  - No model associated to the memory image:  ACCEE2PB_CI_0002001_N_NoModel_NoModel_2008_133T123300.sun045																																							
9.3		Check command stack loaded																																							
		With the Manual Stack in 'Full mode', check the 17 TCs <b>AC069109</b> in loaded stack.  <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">TC #</th> <th style="text-align: left;">Memory_ID</th> <th style="text-align: left;">Start_Address</th> <th style="text-align: left;">N</th> </tr> </thead> <tbody> <tr><td>1</td><td>0090</td><td>0000</td><td>FFFF</td></tr> <tr><td>2</td><td>0090</td><td>FFFF</td><td>FFFF</td></tr> <tr><td>3</td><td>0091</td><td>FFFE</td><td>FFFF</td></tr> <tr><td>4</td><td>0092</td><td>FFFD</td><td>FFFF</td></tr> <tr><td>5</td><td>0093</td><td>FFFC</td><td>FFFF</td></tr> <tr><td>6</td><td>0094</td><td>FFFB</td><td>FFFF</td></tr> <tr><td>7</td><td>0095</td><td>FFFA</td><td>FFFF</td></tr> <tr><td>8</td><td>0096</td><td>FFF9</td><td>FFFF</td></tr> </tbody> </table>	TC #	Memory_ID	Start_Address	N	1	0090	0000	FFFF	2	0090	FFFF	FFFF	3	0091	FFFE	FFFF	4	0092	FFFD	FFFF	5	0093	FFFC	FFFF	6	0094	FFFB	FFFF	7	0095	FFFA	FFFF	8	0096	FFF9	FFFF			
TC #	Memory_ID	Start_Address	N																																						
1	0090	0000	FFFF																																						
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3	0091	FFFE	FFFF																																						
4	0092	FFFD	FFFF																																						
5	0093	FFFC	FFFF																																						
6	0094	FFFB	FFFF																																						
7	0095	FFFA	FFFF																																						
8	0096	FFF9	FFFF																																						

Load ACC OBS in EEPROM File: H_FCP_OBS_2210.xls Author: lstefanov-hp	
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
		9 0097 FFF8 FFFF 10 0098 FFF7 FFFF 11 0099 FFF6 FFFF 12 009A FFF5 FFFF 13 009B FFF4 FFFF 14 009C FFF3 FFFF 15 009D FFF2 FFFF 16 009E FFF1 FFFF 17 009F FFF0 10			
		<b>Note:</b> Only the first TC AC069109 is included below, as example.			
		Execute Telecommand <div style="text-align: right; margin-right: 100px;"><b>Check Memory</b></div> <div style="text-align: right; margin-right: 100px;"><b>AC069109</b></div> Command Parameter(s) : Memory ID            AH6M0109    0090 <hex> Start Address       AH6M1109    0000 <hex> (Def) Length SAU           AH6M3109    FFFF <hex>  TC Control Flags : <div style="text-align: right; margin-right: 100px;">GBM IL DSE</div> <div style="text-align: right; margin-right: 100px;">--Y -- ---</div> Subsch. ID : 20 Det. descr. : TC(6,9) Check Memory Using Absolute Addresses This Telecommand will not be included in the export		TC	
10		Check 'Image 2' loaded in ACC EEPROM2 memory area		Next Step: END	
10.1		Command memory checksum calculation			
		Uplink the 17 AC069109 memory check commands (one by one) with ARM-GO			
		For each TC AC069109 uplinked, a TM(6,10) packet shall be received on ground.			
10.2		Verify reception and contents of TM(6,10)			
		Verify Packet Reception  Memory Check Report - Absolute Addresses Packet Mnemonic : MemChkRepAbs APID : 512 Type : 6 Subtype : 10 PI1 : PI2 :			
		Verify Telemetry <div style="text-align: right; margin-right: 100px;"><b>Memory_ID</b></div> <div style="text-align: right; margin-right: 100px;"><b>AE060070</b></div>		(None)	
		Verify Telemetry <div style="text-align: right; margin-right: 100px;"><b>Start_Address</b></div> <div style="text-align: right; margin-right: 100px;"><b>AE061070</b></div>		(None)	
		Verify Telemetry <div style="text-align: right; margin-right: 100px;"><b>N</b></div> <div style="text-align: right; margin-right: 100px;"><b>AE062070</b></div>		(None)	
		Verify Telemetry <div style="text-align: right; margin-right: 100px;"><b>Checksum</b></div> <div style="text-align: right; margin-right: 100px;"><b>AE064070</b></div>		(None)	

Load ACC OBS in EEPROM File: H_FCP_OBS_2210.xls Author: lstefanov-hp	 
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch	AIT Comment
10.2.1		Verify checksum values			
		Check the received checksums against the expected values listed in <b>Attachment 1</b> (worksheet "CRC checksums").  <b>IMPORTANT:</b> Checksum values depend on the OBS version.			
		Verify Telemetry  <div style="display: flex; justify-content: space-between; width: 80%; margin-left: auto; margin-right: auto;"> <span>Checksum</span> <span>AE064070</span> </div>	= expected value	(None)	
End of Sequence					
<b>End of Procedure</b>					

**Herschel ACC OBS image CRC checksums**

**Attachment 1**

Load ACC OBS in EEPROM  
 File: H\_FCP\_OBS\_2210.xls  
 Author: lstefanov-hp

Checksum #	EEPROM1		EEPROM2		CRC checksums
	Start address	End address	Start address	End address	OBS v4.0b004 AAE ref.
1	0080.0000	0080.FFFE	0090.0000	0090.FFFE	8862
2	0080.FFFF	0081.FFFD	0090.FFFF	0091.FFFD	E094
3	0081.FFFE	0082.FFFC	0091.FFFE	0092.FFFC	AD9D
4	0082.FFFD	0083.FFFB	0092.FFFD	0093.FFFB	9860
5	0083.FFFC	0084.FFFA	0093.FFFC	0094.FFFA	FB9E
6	0084.FFFB	0085.FFF9	0094.FFFB	0095.FFF9	F5EF
7	0085.FFFA	0086.FFF8	0095.FFFA	0096.FFF8	39F0
8	0086.FFF9	0087.FFF7	0096.FFF9	0097.FFF7	5BB8
9	0087.FFF8	0088.FFF6	0097.FFF8	0098.FFF6	4F3C
10	0088.FFF7	0089.FFF5	0098.FFF7	0099.FFF5	8DED
11	0089.FFF6	008A.FFF4	0099.FFF6	009A.FFF4	642D
12	008A.FFF5	008B.FFF3	009A.FFF5	009B.FFF3	A7B1
13	008B.FFF4	008C.FFF2	009B.FFF4	009C.FFF2	FF00
14	008C.FFF3	008D.FFF1	009C.FFF3	009D.FFF1	FF00
15	008D.FFF2	008E.FFF0	009D.FFF2	009E.FFF0	FF00
16	008E.FFF1	008F.FFEF	009E.FFF1	009F.FFEF	B264
17	008F.FFF0	008F.FFFF	009F.FFF0	009F.FFFF	61BD

**Herschel ACC OBS image ANC32 checksums**

**Attachment 2**

Load ACC OBS in EEPROM  
 File: H\_FCP\_OBS\_2210.xls  
 Author: lstefanov-hp

Block #	EEPROM1		EEPROM2		ANC32 checksums
	Start address	End address	Start address	End address	OBS v4.0B004 AAE ref.
1	0080.0000	0080.FFFF	0090.0000	0090.FFFF	AE4F46BB
2	0081.0000	0081.FFFF	0091.0000	0091.FFFF	EEBD34BB
3	0082.0000	0082.FFFF	0092.0000	0092.FFFF	7813D96D
4	0083.0000	0083.FFFF	0093.0000	0093.FFFF	5C7ADC50
5	0084.0000	0084.FFFF	0094.0000	0094.FFFF	69E7E6F2
6	0085.0000	0084.FFFF	0095.0000	0094.FFFF	BE32B6DE
7	0086.0000	0086.FFFF	0096.0000	0096.FFFF	31B90F4C
8	0087.0000	0087.FFFF	0097.0000	0097.FFFF	8B7D16C7
9	0088.0000	0088.FFFF	0098.0000	0098.FFFF	516D9AA9
10	0089.0000	0089.FFFF	0099.0000	0099.FFFF	D8E238F2
11	008A.0000	008A.FFFF	009A.0000	009A.FFFF	27CA531D
12	008B.0000	008B.FFFF	009B.0000	009B.FFFF	95FAB7A1
13	008C.0000	008C.FFFF	009C.0000	009C.FFFF	FFFFC000
14	008D.0000	008D.FFFF	009D.0000	009D.FFFF	FFFFC000
15	008E.0000	008E.FFFF	009E.0000	009E.FFFF	FFFFC000
16	008F.0000	008F.FFBF	009F.0000	009F.FFBF	FFFFC010