

CDMU Memory Patch  
 File: H\_CRP\_SYS\_PATC.xls  
 Author: F. Keck



## Procedure Summary

### Objectives

Performing standard CDMU memory patches of all 4 images.

### Summary of Constraints

Activities must be coordinated with the SGS and mission planning. Instruments should be in standby/safemode and no MTL activities must be planned at the same time.

This procedure assumes that the current OBSW images are available on ground (dumped by H\_FCP\_OBS\_1242).

### Spacecraft Configuration

#### Start of Procedure

Mode = NOM/SCM  
 Instruments must be in standby/safemode

#### End of Procedure

Mode = NOM/SCM  
 Instruments in standby/safemode

### Reference File(s)

#### Input Command Sequences

#### Output Command Sequences

HCYPATC

### Referenced Displays

**ANDs**      **GRDs**      **SLDs**  
 (None)

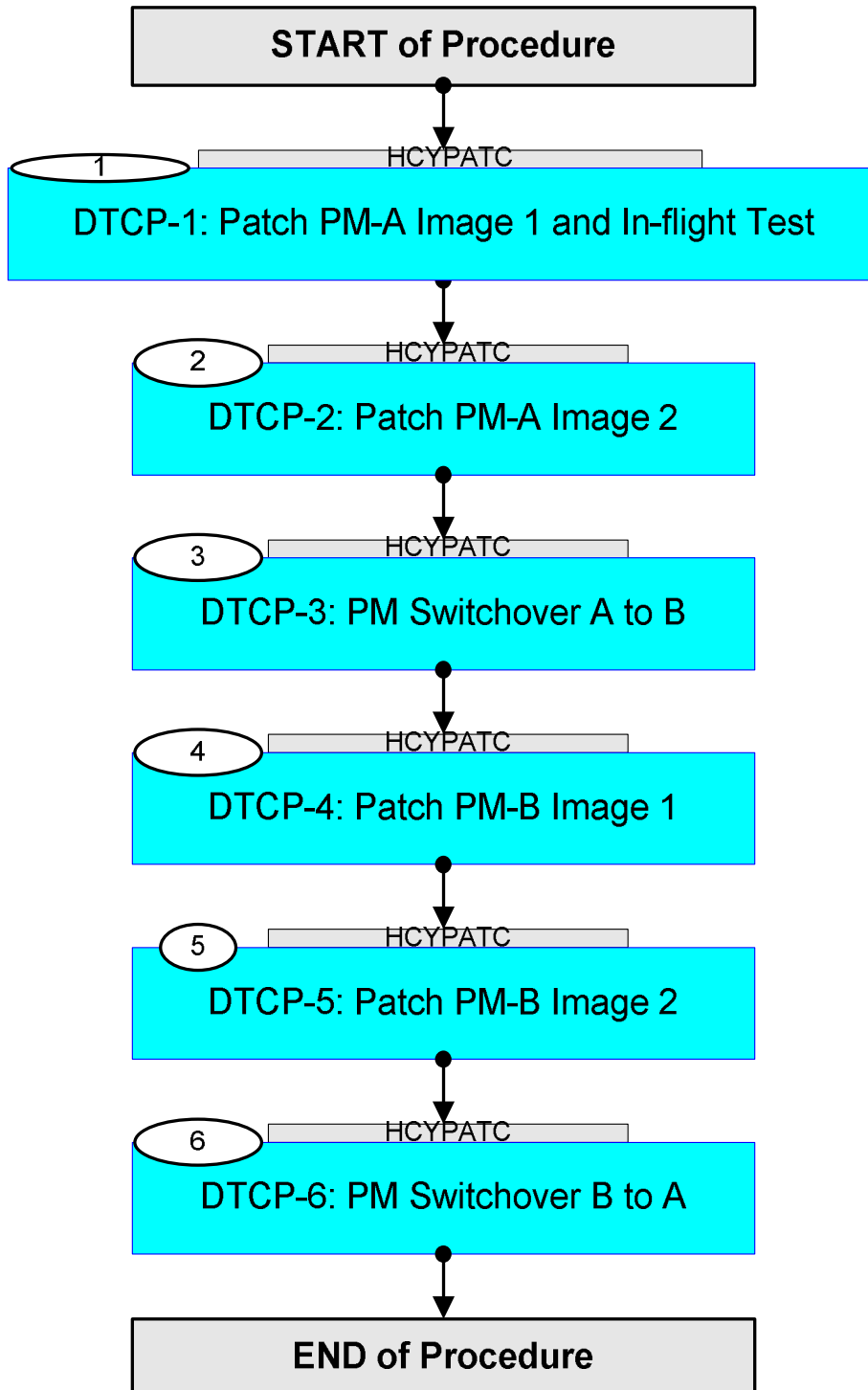
### Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
08/01/09		1	Created	F. Keck	
13/01/09	2	1.01	Validation : Update of reference procedure calls	F. Keck	
05/03/09	2.1	2	Complete re-design	F. Keck	
21/04/09	2.3	3	Update of procedure references. Update of comments.	F. Keck	
16/07/09		4	Update calls to reference procedures	F. Keck	
18/07/09		5	Checkout and recovery after PM reboot replaced by standard CRPs (H_CRP_SYS_CHECK and H_CRP_SYS_ANOM)	F. Keck	
22/09/09	2.5	6	Update to 6 DTCPs strategy	F. Keck	

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Procedure Flowchart Overview



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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
<b>Beginning of Procedure</b>				
<p><i>TC Seq. Name : HCYPATC (CDMU Memory Patch)</i></p> <p><i>TimeTag Type: N</i>  <i>Sub Schedule ID:</i></p> <p style="text-align: center;">□</p>				
1		<i>DTCP-1: Patch PM-A Image 1 and In-flight Test</i>		Next Step: 2
		Expected impact on the nominal DTCP activities: - Complete dump of packet store 2 unlikely - Dump of packet store 3 unlikely		
		Activities: - Patch image A1 - Option: Stop MTL - Option: Mode Transition to EAM - Reboot PM-A with new image (by FDIR 3a) - Recovery from 3a to rejoin operations		
1.1		<i>Apply Patch to PM-A Image 1</i>		□
		While patching image 1, image 2 must be selected to handle properly an unexpected reboot.		
		Execute Telecommand <div style="text-align: right;"><b>PM_A_bit_1_SW_Image_2</b></div> <i>TC Control Flags :</i> <div style="text-align: right;"><b>GBM IL DSE</b>  <b>--Y -- --</b></div> <i>Subsch. ID : 10</i> <i>Det. descr. : Reset PM A bit 1 = Select SW Image 2 - High Priority Standard</i>	<b>DCA59170</b>	
		Verify Telemetry <div style="text-align: center;"><b>PMA_R1_TTR-RM_A</b>                      <b>DEEX2160</b></div> <b>= 1 &lt;dec&gt;</b>		(None)
		Patch PM-A Image 1		
		Execute Procedure: <b>H_FCP_OBS_1210</b> <b>Load CDMU OBS in EEPROM</b>		
		Execute Telecommand <div style="text-align: right;"><b>PM_A_bit_1_SW_Image_1</b></div> <i>TC Control Flags :</i> <div style="text-align: right;"><b>GBM IL DSE</b>  <b>--Y -- --</b></div> <i>Subsch. ID : 10</i> <i>Det. descr. : Set PM A bit 1 = Select SW Image 1 - High Priority Standard</i>	<b>DCA58170</b>	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry PMA_R1_TTR-RM_A DEEX2160	= 0 <dec>	(None)
1.2		Disable ODB for CIR		<input type="checkbox"/>
		Execute Procedure: H_FCP_AOC_DCIR Modify CIR flag in OBDB		
1.3		Option: Stop MTL		<input type="checkbox"/>
		This step is optional, because the MTL will automatically be stopped later by the FDIR 3a.		
		Execute Procedure: H_FCP_DHS_3025 Starting or stopping the MTL function		
1.4		Option: Manual mode transition NOM to EAM		<input type="checkbox"/>
		This step is optional, because a transition to EAM will automatically be triggered later by the FDIR 3a.		
		Execute Procedure: H_FCP_DHS_4005 S/C Mode transition from Nominal to Earth Acquisition		
		Transition to EAM will automatically trigger the Payload OBCPs (all instruments to standby/safemode).  ACMS mode remains SCM. CIR is not triggered, so the attitude remains DTCP pointing.		
1.5		Reboot PM-A with new Image		<input type="checkbox"/>
		Send TC(8,4,116,42) to issue a SW alarm.  This will trigger the PAP-1 and causing an FDIR 3a reboot of PM-A.  Effect: - CIR will be sent to ACC (but ignored) - MTL will be stopped - OBCPs will be triggered - CDMU mode will become EAM		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand <b>FdirSwAlarm</b>  Command Parameter(s) : <b>SwAlarmParam</b> <b>DH153170</b>  TC Control Flags :  <b>GBM IL DSE</b> <b>--Y -- ---</b>  Subsch. ID : 10 Det. descr. : FDIR Recovery: SW Alarm TC(8,4,116,42)	<b>DCN36170</b>  <b>TaskCrFail</b>	
		Wait for boot completion.		
1.6		Enable ODB for CIR		<input type="checkbox"/>
		Execute Procedure: <b>H_FCP_AOC_DCIR</b> <b>Modify CIR flag in OBDB</b>		
1.7		Select Image 2		<input type="checkbox"/>
		Should the new software cause problems and result in a level 3a FDIR, the PM reboot shall use the old software on image 2.		
		Execute Telecommand <b>PM_A_bit_1_SW_Image_2</b>  TC Control Flags :  <b>GBM IL DSE</b> <b>--Y -- ---</b>  Subsch. ID : 10 Det. descr. : Reset PM A bit 1 = Select SW Image 2 - High Priority Standard	<b>DCA59170</b>	
		Verify Telemetry <b>PMA_R1_TTR-RM_A</b> <b>DEEX2160</b>	<b>= 1 &lt;dec&gt;</b>	(None)
1.8		Recovery from FDIR 3a		<input type="checkbox"/>
		To rejoin science operations the standard CRPs to recover from an FDIR 3a can be used.		
1.8.1		Checkout of Level 3a FDIR		<input type="checkbox"/>
		Execute Procedure: <b>H_CRP_SYS_CHECK</b> <b>FDIR 3&amp;4 Anomaly Checkout</b>		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
1.8.2		Recovery to rejoin Nominal Operations		□
		Execute Procedure: <b>H_CRP_SYS_ANOM</b> <b>System Anomalies</b>		
2		DTCP-2: Patch PM-A Image 2		Next Step: 3
		This step has no impact on the nominal DTCP activities.  Time to recover the packet store dumps of DTCP-1.		
		Activities: - Patch image A2		
		Select image 1		
		Execute Telecommand <div style="text-align: right;"><b>PM_A_bit_1_SW_Image_1</b></div> TC Control Flags : <div style="text-align: right;"><b>GBM IL DSE</b></div> <div style="text-align: right;"><b>--Y -- ---</b></div> Subsch. ID : 10 Det. descr. : Set PM A bit 1 = Select SW Image 1 - High Priority Standard	<b>DCA58170</b>	
		Verify Telemetry <div style="text-align: center;"><b>PMA_R1_TTR-RM_A</b>                      <b>DEEX2160</b></div>	<b>= 0 &lt;dec&gt;</b>	(None)
		Patch Image A2		
		Execute Procedure: <b>H_FCP_OBS_1210</b> <b>Load CDMU OBS in EEPROM</b>		
3		DTCP-3: PM Switchover A to B		Next Step: 4
		Expected impact on the nominal DTCP activities: - Complete dump of packet store 2 unlikely - Dump of packet store 3 unlikely		
		Activities: - Switchover PM A to B		
		Execute Procedure: <b>H_CRP_SYS_PMSC</b> <b>CDMU PM Switchover</b>		



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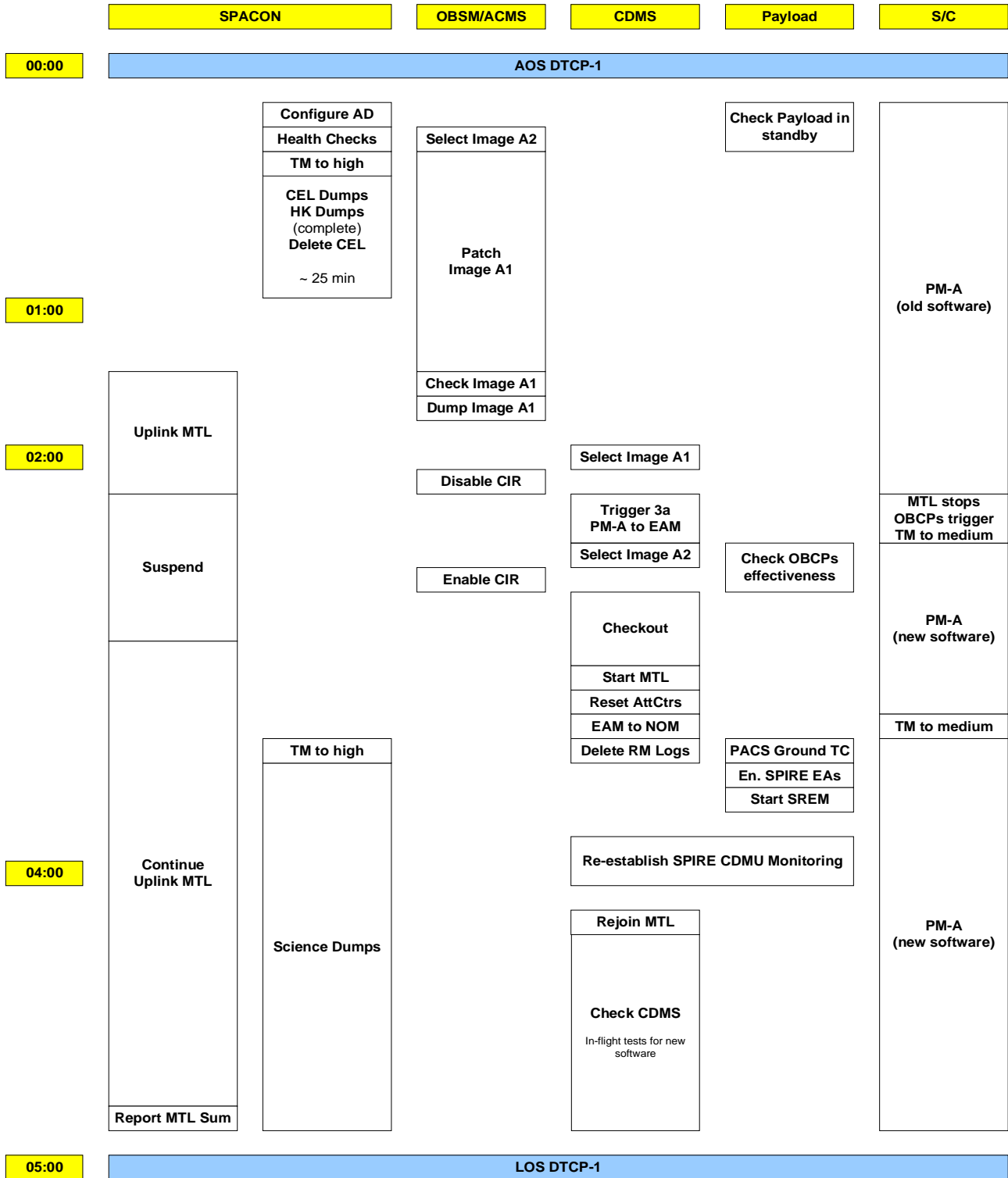
Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
6		<i>DTCP-6: PM Switchover B to A</i>		Next Step: END
		Expected impact on the nominal DTCP activities: - Complete dump of packet store 2 unlikely - Dump of packet store 3 unlikely		
		Activities: - Switchover PM B to A		
		Execute Procedure: <b>H_CRP_SYS_PMSC</b> <b>CDMU PM Switchover</b>		
6.1		<i>Correction of MOT and EAT</i>		□
		Should the new software has different settings in the MOT and/or EAT they must be corrected.  Procedures/sequences/stacks depend on the specific software.		
<b>End of Procedure</b>				



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**DTCP-1**



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**DTCP-2**

**SPACON**

**OBSM**

**CDMS**

**Payload**

**S/C**

**00:00**

**AOS DTCP-2**

Configure AD  
 Health Checks  
 TM to high  
 CEL Dumps  
 HK Dumps  
 (complete)  
 Delete CEL  
 ~ 25 min

Select Image A1

Patch  
 Image A2

Check Image A2

Dump Image A2

PM-A  
 (new software)

**01:00**

Uplink MTL

Science Dumps

Report MTL Sum

**03:00**

**LOS DTCP-2**

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**DTCP-3**

SPACON

ACMS

CDMS

Payload

S/C

00:00

AOS DTCP-3

Configure AD  
 Health Checks  
 TM to high  
 CEL Dumps  
 HK Dumps  
 (complete)  
 Delete CEL  
 ~ 25 min

Check Payload in  
 standby

PM-A  
 (new software)

01:00

Disable CIR

Trigger 3b  
 PM-B to EAM

Check OBCPs  
 effectiveness

MTL stops  
 OBCPs trigger  
 TM to medium

Enable CIR

Checkout

PM-B  
 (old software)

02:00

Start MTL

Reset AttCtrs

PAP Update

EAM to NOM

Delete RM Logs

PACS Ground TC

En. SPIRE EAs

Start SREM

TM to medium

TM to high

Re-establish SPIRE CDMU Monitoring

Rejoin MTL

Continue  
 Uplink MTL

PM-B  
 (old software)

04:00

Science Dumps

Report MTL Sum

05:00

LOS DTCP-3

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**DTCP-4**

**SPACON**

**OBSM**

**CDMS**

**Payload**

**S/C**

**00:00**

**AOS DTCP-4**

Configure AD

Health Checks

TM to high

CEL Dumps  
 HK Dumps  
 (complete)  
 Delete CEL

~ 25 min

Select Image B2

Patch  
 Image B1

Check Image B1

Dump Image B1

Select Image B1

PM-B  
 (old software)

**01:00**

Uplink MTL

Science Dumps

Report MTL Sum

**03:00**

**LOS DTCP-4**

CDMU Memory Patch  
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**DTCP-5**

**SPACON**      **OBSM**      **CDMS**      **Payload**      **S/C**

**00:00**      **AOS DTCP-5**

Configure AD  
 Health Checks  
 TM to high  
 CEL Dumps  
 HK Dumps  
 (complete)  
 Delete CEL  
 ~ 25 min

Patch  
 Image B2

Check Image B2  
 Dump Image B2

**01:00**

Uplink MTL  
 Report MTL Sum

Science Dumps

PM-B  
 (old software)

**03:00**      **LOS DTCP-5**

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**DTCP-6**

SPACON

ACMS

CDMS

Payload

S/C

00:00

AOS DTCP-6

Configure AD  
 Health Checks  
 TM to high

Check Payload in standby

PM-B  
 (old software)

CEL Dumps  
 HK Dumps  
 (complete)  
 Delete CEL  
 ~ 25 min

01:00

Disable CIR

Trigger 3b  
 PM-A to EAM

Check OBCPs effectiveness

MTL stops  
 OBCPs trigger  
 TM to medium

Enable CIR

Checkout

PM-A  
 (new software)

02:00

Start MTL

Reset AttCtrs

PAP Update

EAM to NOM

Delete RM Logs

PACS Ground TC

En. SPIRE EAs

Start SREM

TM to medium

TM to high

Re-establish SPIRE CDMU Monitoring

Rejoin MTL

Continue Uplink MTL

PM-A  
 (new software)

04:00

Science Dumps

Report MTL Sum

05:00

LOS DTCP-6