Transition from OCM or SCM to SAM
File: H_FCP_AOC_3A01.xls
Author: dsalt-hp

Procedure Summary

Objectives

The objective of this Herschel ACMS procedure is to go to Sun
Acquisition Mode, SAM.

The procedure involves the following activities:
- check current ACMS mode (OCM or SCM)
- switch ON the RCS heaters, if in SCM
  (calls H_FCP_AOC_5CBH)
- check RCS status and temperatures
- check SAS channel and health
- check gyro health
- wait for completion of switch-over to LGA, if necessary
- command transition to SAM
- verify correct transition to SAM with Sun acquisition

Summary of Constraints

The mode prior to the switch is either Orbit Control Mode, OCM,
or Science Mode, SCM.

Spacecraft Configuration

Start of Procedure

ACMS Mode either OCM or SCM

End of Procedure

ACMS Mode SAM

Reference File(s)

Input Command Sequences

Output Command Sequences

HFA3A01A

Referenced Displays

ANDs	GRDs	SLDs
ZAA01999		
ZAA02999		
ZAA06999		
ZAA07999		
ZAZ30999		
ZAZ31999		
ZAA00999		

Configuration Control Information

Status   : Version 4 - Unchanged
Last Checkin: 20/03/09

Doc No.   :PT-HMOC-OPS-FOP-6001-OPS-OAH
Fop Issue :   3.0
Issue Date: 13/04/10

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DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
02/08/08	1	1	Created	dsalt-hp	
15/10/08		2	Modified TM checks for LCL and catbed heaters (Step 3-10)	dsalt-hp	
03/12/08	2	3	Modified to include optional call to generic RCS catbed heater switch ON procedure at Step 3	dsalt-hp	
20/03/09	2.2	4	Steps added to check if switch-over to LGA is needed and, if necessary, to wait for completion before performing the ACMS mode transition to SAM	dsalt-hp	

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Procedure Flowchart Overview
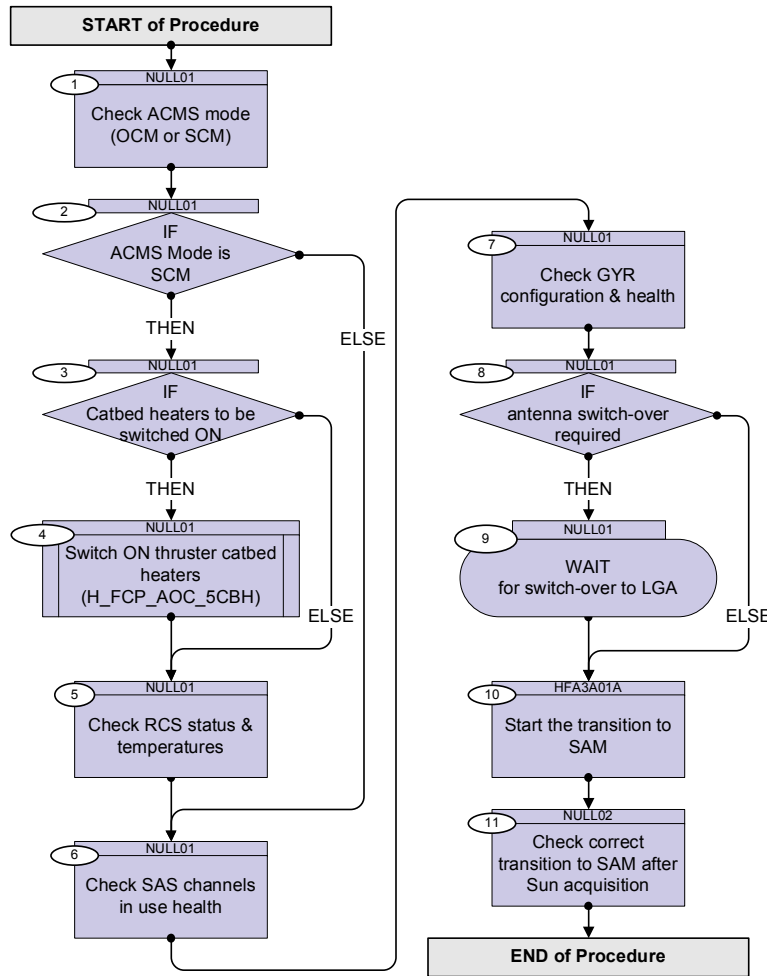
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Beginning of Procedure		
		TC Seq. Name :NULL01 (Null Sequence 01) *TimeTag Type:* *Sub Schedule ID:*		
1		*Check ACMS mode (OCM or SCM)*		Next Step: 2
		Verify Telemetry 　　　　　**AcmsMode**　　　　**AESMG002**	**= OCM or SCM**	AND=ZAA01999
		Note the ACMS mode (OCM or SCM) for use in subsequent branching step		
2		*IF* *ACMS Mode is* *SCM*		Next Step: THEN 3 ELSE 6
		Use ACMS mode status from initial check		
3		*IF* *Catbed heaters to be switched ON*		Next Step: THEN 4 ELSE 5
4		*Switch ON thruster catbed heaters (H_FCP_AOC_5CBH)*		Next Step: 5
		Execute Procedure: 　**H_FCP_AOC_5CBH** 　**Switch ON thruster catbed heaters**		
5		*Check RCS status & temperatures*		Next Step: 6
5.1		*Verify nominal RCS branch*		
		Verify Telemetry 　　　　　**Nom Conf RCS**　　　　**AESCF002**	**= RCS-A** **= RCS-B**	AND=ZAA01999
5.1.1		*Check RCS-A health, if flagged as nominal branch*		
		Verify Telemetry 　　　　　**RCSA Health Sts**　　　　**AESK1002**	**= Healthy**	AND=ZAA02999
5.1.2		*Check RCS-B health, if flagged as nominal branch*		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry **RCSB Health Sts** **AESK2002**	**= Healthy**	AND=ZAA02999
5.2		*Verify LV status for MAIN branch RCS*		
5.2.1		*Verify LV status for RCS-A, if MAIN branch*		
		Verify Telemetry **RCS-A LV closed** **AMTL2109**	**= FALSE**	AND=ZAA06999
		Verify Telemetry **RCS-A LV open** **AMTL1109**	**= TRUE**	AND=ZAA06999
5.2.2		*Verify LV status for RCS-B, if MAIN branch*		
		Verify Telemetry **RCS-B LV open** **AMTL3109**	**= TRUE**	AND=ZAA07999
		Verify Telemetry **RCS-B LV closed** **AMTL4109**	**= FALSE**	AND=ZAA07999
5.3		*Verify FCV temps for MAIN branch RCS*		
5.3.1		*Verify FCV temps for RCS-A, if MAIN branch*		
		NOTE: *The temperatures used in the verification criteria above are those the CDMU ASW derives by averaging data from three individual thermistors mounted on the same thermal node.* *The positions of the nodes are as follows:* *#22 - FCV A1A* *#42 - FCV A2A* *#41 - FCV C1A* *#23 - FCV C2A* *#44 - FCV C3A* *#51 - FCV C4A*		
		Verify Telemetry **ThermAvgTemp022** **DEA8D170**	**< 65.0 deg C** **> 10.0 deg C**	AND=ZAZ30999
		Verify Telemetry **ThermAvgTemp042** **DEAA1170**	**< 65.0 deg C** **> 10.0 deg C**	AND=ZAZ31999
		Verify Telemetry **ThermAvgTemp041** **DEAA0170**	**< 65.0 deg C** **> 10.0 deg C**	AND=ZAZ31999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry **ThermAvgTemp023** **DEA8E170**	**< 65.0 deg C** **> 10.0 deg C**	AND=ZAZ30999
		Verify Telemetry **ThermAvgTemp044** **DEAA3170**	**< 65.0 deg C** **> 10.0 deg C**	AND=ZAZ31999
		Verify Telemetry **ThermAvgTemp051** **DEAAA170**	**< 65.0 deg C** **> 10.0 deg C**	AND=ZAZ31999
5.3.2		*Verify FCV temps for RCS-B, if MAIN branch*		
		NOTE: *The temperatures used in the verification criteria* *above are those the CDMU ASW derives by averaging* *data from three individual thermistors mounted on the* *same thermal node.* *The positions of the nodes are as follows:* *#03 - FCV A1B* *#09 - FCV A2B* *#08 - FCV C1B* *#04 - FCV C2B* *#28 - FCV C3B* *#10 - FCV C4B*		
		Verify Telemetry **ThermAvgTemp003** **DEA7A170**	**< 65.0 deg C** **> 10.0 deg C**	AND=ZAZ30999
		Verify Telemetry **ThermAvgTemp009** **DEA80170**	**< 65.0 deg C** **> 10.0 deg C**	AND=ZAZ30999
		Verify Telemetry **ThermAvgTemp008** **DEA7F170**	**< 65.0 deg C** **> 10.0 deg C**	AND=ZAZ30999
		Verify Telemetry **ThermAvgTemp004** **DEA7B170**	**< 65.0 deg C** **> 10.0 deg C**	AND=ZAZ30999
		Verify Telemetry **ThermAvgTemp028** **DEA93170**	**< 65.0 deg C** **> 10.0 deg C**	AND=ZAZ30999
		Verify Telemetry **ThermAvgTemp010** **DEA81170**	**< 65.0 deg C** **> 10.0 deg C**	AND=ZAZ30999
6		*Check SAS channels in use health*		Next Step: 7

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
6.1		*Check SAS configuration in use*		
		Verify Telemetry **Nom Conf SAS** AESCB002	**= SAS1 N SAS2 R** **= SAS1 R SAS2 N** **= SAS12 N** **= SAS12 R**	AND=ZAA01999
6.2		*Checks if configuration = SAS12 N*		
		Verify Telemetry **SAS1N Hlth Sts** AESK5002	**= Healthy**	AND=ZAA02999
		Verify Telemetry **SAS2N Hlth Sts** AESK7002	**= Healthy**	AND=ZAA02999
6.3		*Checks if configuration = SAS1 N SAS2 R*		
		Verify Telemetry **SAS1N Hlth Sts** AESK5002	**= Healthy**	AND=ZAA02999
		Verify Telemetry **SAS2R Hlth Sts** AESK8002	**= Healthy**	AND=ZAA02999
6.4		*Checks if configuration = SAS1 R SAS2 N*		
		Verify Telemetry **SAS1R Hlth Sts** AESK6002	**= Healthy**	AND=ZAA02999
		Verify Telemetry **SAS2N Hlth Sts** AESK7002	**= Healthy**	AND=ZAA02999
6.5		*Checks if configuration = SAS12 R*		
		Verify Telemetry **SAS1R Hlth Sts** AESK6002	**= Healthy**	AND=ZAA02999
		Verify Telemetry **SAS2R Hlth Sts** AESK8002	**= Healthy**	AND=ZAA02999
7		*Check GYR configuration & health*		Next Step: 8
		The checks must be conditional to cover all valid configurations of the GYR assembly. In particular, normal operations are possible with one GYR channel excluded from the hardware configuration and checks must be executed only for the GYR channels included in the current configuration in use.		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
7.1		*Check GYR configuration*		
		Verify Telemetry **Curr GYRs use** **AES19002**	**= GYR 1-2-3** **= GYR 1-2-3-4** **= GYR 1-2-4** **= GYR 1-3-4** **= GYR 2-3-4**	AND=ZAA01999
		Verify Telemetry **Curr GYRE use** **AES20002**	**= GYRE 1** **= GYRE 2**	AND=ZAA01999
7.2		*Check GYR health*		
		NOTE: ***GYR 2-3-4 excludes GYR1*** ***GYR 1-3-4 excludes GYR2*** ***GYR 1-2-4 excludes GYR3*** ***GYR 1-2-3 excludes GYR4***		
		Verify Telemetry **GYR1 Health Sts** **AES41002**	**= Healthy**	AND=ZAA02999
		Verify Telemetry **GYR2 Health Sts** **AES42002**	**= Healthy**	AND=ZAA02999
		Verify Telemetry **GYR3 Health Sts** **AES43002**	**= Healthy**	AND=ZAA02999
		Verify Telemetry **GYR4 Health Sts** **AES44002**	**= Healthy**	AND=ZAA02999
7.3		*Check GYR-E health*		
		Verify Telemetry **GYRE1 Hlth Sts** **AESK3002**	**= Healthy**	AND=ZAA02999
		Verify Telemetry **GYRE2 Hlth Sts** **AESK4002**	**= Healthy**	AND=ZAA02999
8		*IF* *antenna switch-over required*		Next Step: THEN 9 ELSE 10
		***** WARNING ***** ***If sun-pointing attitude is outside the MGA constraints, or if unknown, a switch-over from MGA to LGA must be performed before commencing this ACMS mode transition.***		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Check with Flight Dynamics if sun-pointing attitude is outside the MGA constraints		
9		*WAIT* *for switch-over to LGA*		Next Step: 10
		Check with CDMS SOE that switch-over to LGA is complete (this may include a reduction of TH rate to 5kbps)		
		TC Seq. Name :HFA3A01A (Command SAM) *TimeTag Type:* *Sub Schedule ID:*		
10		*Start the transition to SAM*		Next Step: 11
		Execute Telecommand **SAM Herschel** Command Parameter(s) : **ASW Function ID AHFUN002** **AcmsH AID Cmd AHHF0002** **AcmsH DF86 Cmd AH8G1002** **AcmsH DD86 Cmd AH8G2002** TC Control Flags : **GBM IL DSE** **--Y -- ---** *Subsch. ID : 20* Det. descr. : TC_PERFORM_SAM	**ACAA1002** **ACMSMain** (Def) **SAM sunacq cmd** (Def) **Enable 86** **Enable 86**	
		TC Seq. Name :NULL02 (Null Sequence 02) *TimeTag Type:* *Sub Schedule ID:*		
11		*Check correct transition to SAM after Sun acquisition*		Next Step: END
		The coasting rate being 8 deg/s and the longest distance through which the spacecraft may have to be slewed being about 30deg, 4 minutes should be enough. Though one should allow some additional time for acceleration, deceleration and settling so 10 minutes might be more reasonable.		

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Step No.	Time	Activity/Remarks		TC/TLM	Display/ Branch
		Control Execution	0000.10.00.000	WAIT	
		Check ACMS mode data			
		Verify Telemetry SpacecraftMode	AESME002	= Nominal	AND=ZAA01999
		Verify Telemetry AcmsMode	AESMG002	= SAM	AND=ZAA01999
		Verify Telemetry AcmsSubstate	AESMF002	= SAM Sun Point	AND=ZAA01999
		Verify Telemetry AcmsMain AID	AESM3002	= SAM pnt coarse	AND=ZAA01999
		Check ACMS unit power configuration data			
		Verify Telemetry STR1 pwr conf	AEXP1002	= Switch OFF	AND=ZAA00999
		Verify Telemetry STR2 pwr conf	AEXP2002	= Switch OFF	AND=ZAA00999
		Verify Telemetry RWL1 pwr conf	AEWP1002	= Switch OFF	AND=ZAA00999
		Verify Telemetry RWL2 pwr conf	AEWP2002	= Switch OFF	AND=ZAA00999
		Verify Telemetry RWL3 pwr conf	AEWP3002	= Switch OFF	AND=ZAA00999
		Verify Telemetry RWL4 pwr conf	AEWP4002	= Switch OFF	AND=ZAA00999
		Check ACMS unit status data			
		Verify Telemetry STR1 power	AE4P1002	= OFF	AND=ZAA00999
		Verify Telemetry STR2 power	AE4P2002	= OFF	AND=ZAA00999
		Verify Telemetry RWL1 power	AE4P3002	= OFF	AND=ZAA00999
		Verify Telemetry RWL2 power	AE4P4002	= OFF	AND=ZAA01999
		Verify Telemetry RWL3 power	AE4P5002	= OFF	AND=ZAA01999
		Verify Telemetry RWL4 power	AE4P6002	= OFF	AND=ZAA01999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
End of Procedure			