

Entry into SCM for the first time after PM start/reset
File: H_FCP_AOC_3S07.xls
Author: dsalt-hp



Procedure Summary

Objectives

The objective of this Herschel ACMS procedure is to define the steps necessary to insure that the ACMS is ready to execute the first scientific operations.

The procedure involves the following activities:

- check initial status of key ACMS units (RCS, GYR, STR)
- declare RWL assembly operational and check health (calls H_FCP_AOC_4R14)
- perform pointing in OCM (calls H_FCP_AOC_0OCM), if necessary
- Update OBDB for new ASW_SETTLE_COUNTER value (=20)
- Check OBDB value (calls H_FCP_AOC_DODD)
- check ERD for non-nominal events (calls H_FCP_AOC_3011)
- perform SCM Fine Pointing (calls H_FCP_AOC_0SCM)
- switch OFF the RCS catbed heaters

Summary of Constraints

Ground contact is assumed to monitor progress of the procedure, the first entry in SCM being mission critical.

Spacecraft Configuration

Start of Procedure

ACMS mode OCM pointing
RCS control mode is coarse

End of Procedure

ACMS mode SCM

Reference File(s)

Input Command Sequences

Output Command Sequences

HFA3S07A
HFA3S07C

Referenced Displays

ANDs	GRDs	SLDs
ZAA01999		
ZAA02999		
ZAA00999		
WALC1584		
ZAA04999		

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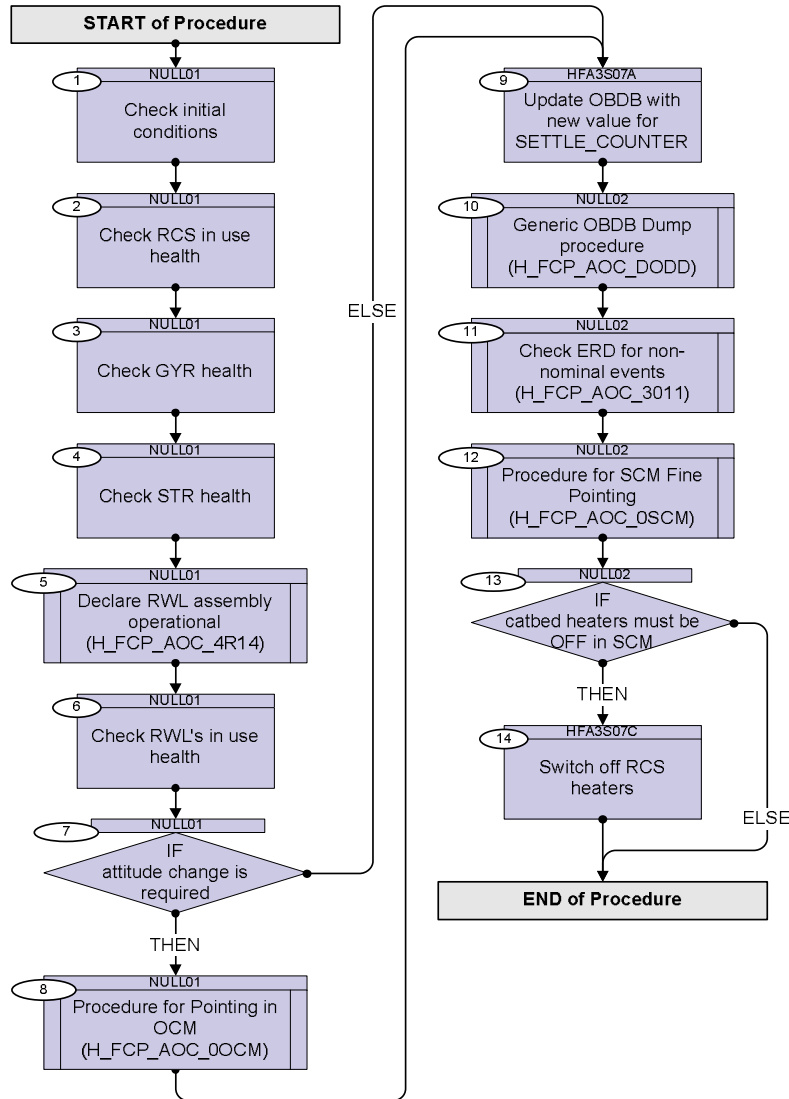
Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
03/08/08	1	1	Created	dsalt-hp	
26/11/08		2	Step 7 & 8 added (Cf. NCR2529) and order of Step 11 & 12 swapped to ensure minimal period with RCS in Fine mode.	dsalt-hp	
27/11/08		3	Comments updated in Step 7 & 11	dsalt-hp	
02/12/08	2	4	Steps added (7 & 8) for OBDB update of "Settle Counter" from NCR2529. <input type="checkbox"/> Additional checks added in Step 10 to ensure TC for OCM transition is in the time-tag queue before uplinking RCS Fine TC in STEP 11, where delta time-tag is now updated to 21 seconds before the OCM transition TC.	dsalt-hp	
22/03/09		5	Updated to enable SCM pointing TC execution with RCS in Coarse as nominal (see Step 5 and subsequent call to H_FCP_AOC_4R34) with option to use RCS Fine if necessary (Step 11 & 12), as per Section 2.1.2 of H-P-4-DS-MA-007 (Issue 2, Rev.5) <input type="checkbox"/> NOTE: The additional TCs defined in MA-007 are linked to the TPF=RWL to ensure autonomous loading during routine Delta-Vs and all other OCM-to-SCM transitions that require wheel bias/hold conditions	dsalt-hp	
24/03/09	2.2	6	Procedure rationalised by adding calls to separate procedures for: - attitude change in OCM (calls H_FCP_AOC_0OCM) at Step 8 - transition to SCM (calls H_FCP_AOC_0SCM) at Step 12 <input type="checkbox"/> NOTE: Both called procedures include all TCs to disable/desensitise relevant checks	dsalt-hp	
21/04/09	2.3	7	Sequence ID names corrected	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: <input type="checkbox"/>				
1		Check initial conditions		Next Step: 2
		Verify Telemetry AcmsMode AESMG002	= OCM	AND=ZAA01999
		Verify Telemetry AcmsSubstate AESMF002	= OCM Pointing	AND=ZAA01999
		Verify Telemetry AcmsMain AID AESM3002	= OCM point fine	AND=ZAA01999
2		Check RCS in use health		Next Step: 3
2.1		RCSA in use ?		<input type="checkbox"/>
		Verify Telemetry Nom Conf RCS AESCF002	= RCS-A	AND=ZAA01999
2.2		Check RCSA health		<input type="checkbox"/>
		Verify Telemetry RCSA Health Sts AESK1002	= Healthy	AND=ZAA02999
2.3		RCSB in use ?		<input type="checkbox"/>
		Verify Telemetry Nom Conf RCS AESCF002	= RCS-B	AND=ZAA01999
2.4		Check RCSB health		<input type="checkbox"/>
		Verify Telemetry RCSB Health Sts AESK2002	= Healthy	AND=ZAA02999
3		Check GYR health		Next Step: 4
		In order to cope with a configuration with only 3 gyros, the health checks need to be conditional.		

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3.1		GYR1 in use ?		<input type="checkbox"/>
		Verify Telemetry Curr GYRs use AES19002	<> GYR 2-3-4	AND=ZAA01999
		The configuration set to GYR 2-3-4 is the only one that excludes GYR1		
3.2		Verify GYR1 health		<input type="checkbox"/>
		Verify Telemetry GYR1 Health Sts AES41002	= Healthy	AND=ZAA02999
3.3		GYR2 in use ?		<input type="checkbox"/>
		Verify Telemetry Curr GYRs use AES19002	<> GYR 1-3-4	AND=ZAA01999
		The configuration set to GYR 1-3-4 is the only one that excludes GYR2		
3.4		Verify GYR2 health		<input type="checkbox"/>
		Verify Telemetry GYR2 Health Sts AES42002	= Healthy	AND=ZAA02999
3.5		GYR3 in use ?		<input type="checkbox"/>
		Verify Telemetry Curr GYRs use AES19002	<> GYR 1-2-4	AND=ZAA01999
		The configuration set to GYR 1-2-4 is the only one that excludes GYR3		
3.6		Verify GYR3 health		<input type="checkbox"/>
		Verify Telemetry GYR3 Health Sts AES43002	= Healthy	AND=ZAA02999
3.7		GYR4 in use ?		<input type="checkbox"/>
		Verify Telemetry Curr GYRs use AES19002	<> GYR 1-2-3	AND=ZAA01999
		The configuration set to GYR 1-2-3 is the only one that excludes GYR4		

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3.8		Verify GYR4 health		<input type="checkbox"/>
		Verify Telemetry GYR4 Health Sts AES44002	= Healthy	AND=ZAA02999
3.9		GYRE1 in use ?		<input type="checkbox"/>
		Verify Telemetry Curr GYRE use AES20002	= GYRE 1	AND=ZAA01999
3.10		Check GYRE1 health		<input type="checkbox"/>
		Verify Telemetry GYRE1 Hlth Sts AESK3002	= Healthy	AND=ZAA02999
3.11		GYRE2 in use ?		<input type="checkbox"/>
		Verify Telemetry Curr GYRE use AES20002	= GYRE 2	AND=ZAA01999
3.12		Check GYRE2 health		<input type="checkbox"/>
		Verify Telemetry GYRE2 Hlth Sts AESK4002	= Healthy	AND=ZAA02999
4		Check STR health		Next Step: 5
4.1		IF STR1 in use		<input type="checkbox"/>
		Verify Telemetry Curr STR in use AES18002	= STR 1	AND=ZAA01999
4.2		Verify STR1 Power and Health		<input type="checkbox"/>
		Verify Telemetry STR1 power AE4P1002	= ON	AND=ZAA00999
		Verify Telemetry STR1 Health Sts AES31002	= Healthy	AND=ZAA02999
4.3		IF STR2 in use		<input type="checkbox"/>
		Verify Telemetry Curr STR in use AES18002	= STR 2	AND=ZAA01999

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4.4		Verify STR2 Power and Health		<input type="checkbox"/>
		Verify Telemetry STR2 power AE4P2002	= ON	AND=ZAA00999
		Verify Telemetry STR2 Health Sts AES32002	= Healthy	AND=ZAA02999
5		Declare RWL assembly operational (H_FCP_AOC_4R14)		Next Step: 6
		Execute Procedure: H_FCP_AOC_4R14 Declare RWL assembly operational		
6		Check RWL's in use health		Next Step: 7
		The logic is the same as for the gyros, but for the wheels the power status has to be checked as well.		
6.1		IF RWL in use not RWL 2-3-4		<input type="checkbox"/>
		Verify Telemetry Curr RWLs use AES21002	<> RWL 2-3-4	AND=ZAA01999
6.2		Verify RWL1 Power and Health		<input type="checkbox"/>
		Verify Telemetry RWL1 power AE4P3002	= ON	AND=ZAA00999
		Verify Telemetry RWL1 Health Sts AES45002	= Healthy	AND=ZAA02999
6.3		IF RWL in use not RWL 1-3-4		<input type="checkbox"/>
		Verify Telemetry Curr RWLs use AES21002	<> RWL 1-3-4	AND=ZAA01999
6.4		Verify RWL2 Power and Health		<input type="checkbox"/>
		Verify Telemetry RWL2 power AE4P4002	= ON	AND=ZAA01999
		Verify Telemetry RWL2 Health Sts AES46002	= Healthy	AND=ZAA02999

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6.5		IF RWL in use not RWL 1-2-4		<input type="checkbox"/>
		Verify Telemetry Curr RWLs use AES21002	<> RWL 1-2-4	AND=ZAA01999
6.6		Verify RWL3 Power and Health		<input type="checkbox"/>
		Verify Telemetry RWL3 power AE4P5002	= ON	AND=ZAA01999
		Verify Telemetry RWL3 Health Sts AES47002	= Healthy	AND=ZAA02999
6.7		IF RWL in use not RWL 1-2-3		<input type="checkbox"/>
		Verify Telemetry Curr RWLs use AES21002	<> RWL 1-2-3	AND=ZAA01999
6.8		Verify RWL4 Power and Health		<input type="checkbox"/>
		Verify Telemetry RWL4 power AE4P6002	= ON	AND=ZAA01999
		Verify Telemetry RWL4 Health Sts AES48002	= Healthy	AND=ZAA02999
7		IF attitude change is required		Next Step: THEN 8 ELSE 9
8		Procedure for Pointing in OCM (H_FCP_AOC_00CM)		Next Step: 9
		Execute Procedure: H_FCP_AOC_00CM Procedure for Pointing in OCM		
TC Seq. Name :HFA3S07A (OBDB update SETTLE) TimeTag Type: Sub Schedule ID: <input type="checkbox"/>				
9		Update OBDB with new value for SETTLE_COUNTER		Next Step: 10

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand Fire critical command Command Parameter(s) : FireFun DF86Cmd AH8F1001 Enable 86 FireFun DD86Cmd AH8F2001 Enable 86 FireFun CritFID AHFFH001 201 <dec> TC Control Flags : GBM IL DSE --Y -- -- Subsch. ID : 20 Det. descr. : TC_FIRE_COMMAND	ACFC1001	
		Load database commands complete CEV correctly		
TC Seq. Name : NULL02 (Null sequence 02) TimeTag Type: Sub Schedule ID: <input type="checkbox"/>				
10		Generic OBDB Dump procedure (H_FCP_AOC_DODD)		Next Step: 11
		NOTE: This procedure enables a direct dump of the OBDB from RAM or Safe-Guard Memory (SGM), as well as reading the OBDB via diagnostic telemetry (DTM) packets		
		Relevant details for use with H_FCP_AOC_DODD Based upon the latest ASW ICD (H-P-4-TASW-IF-0002, Issue 3 F), this procedure loads the following parameter into a specific OBDB offset location in RAM: H_SCM_CTRL_ASW_SETTLE_COUNTER at offsets 1851 This is located in Block 8 of the OBDB This parameters is not copied to SGM		
10.1		Dump via DTM		<input type="checkbox"/>
		Relevant details for use with H_FCP_AOC_DODD The following parameter H_SCM_CTRL_ASW_SETTLE_COUNTER are located in Block 8 of the OBDB		
		Use sequence HFADODDH		

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		<p>NOTE: The contents of diagnostic packet A3DH0BDB8109 {DTM with Herschel OBDB data8} are spread over a group of 4 monitoring displays:</p> <p>ZAZ6S999 DTMOBDB8_1 ZAZ6T999 DTMOBDB8_2 <- values are in this display ZAZ6U999 DTMOBDB8_3 ZAZ6V999 DTMOBDB8_4</p>		
		<p>NOTE: This step enables diagnostic packets that contain data from specific blocks of the OBDB, where each block contains 250 onboard database parameters.</p> <p>The Herschel onboard database currently contains 2134 parameters and there are 8 diagnostic packets defined to cover the first 2000 entries. In HP-4-TASW-IF-0002 (ACC ASW_ICD) section 6.1 you can find a list of Herschel OBDB parameters ordered by offset.</p>		
10.2		Dump from RAM		□
		<p><u>Relevant details for use with H_FCP_AOC_DODD</u></p> <p>Based upon the latest ASW ICD (H-P-4-TASW-IF-0002, Issue 3 F), this procedure loads the following parameters into specific OBDB offset locations in RAM: H_SCM_CTRL_ASW_SETTLE_COUNTER at offset 1851</p> <p>The <u>absolute address</u> of offset 1851 is therefore: 020A = Memory ID EC04 = Start Address</p>		
		<p>Use sequence HFADODDL to dump <u>all</u> the OBDB in RAM, or edit: Start Address = EC04 Length = 4</p>		

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		<p>NOTE: The RAM memory address for a parameter with a given OBDB ID can be calculated as follows: RAM address = OBDB start address + parameter offset; OBDB start address = address of Asw_DatabaseManager_Obj + 12; parameter offset = OBDB ID * 4.</p> <p>Parameter ID's are listed in the ASW ICD (H-P-4-TASW-IF-002).</p> <p>Asw_Databasemanager_Obj is an ASW container structure used in the management of the OBDB and its address has to be obtained from the linker memory map valid for the software build currently used onboard.</p>		
10.3		Dump from SGM		<input type="checkbox"/>
		<p>Relevant details for use with H SVT AOC DODD</p> <p>This step can be ignored - parameter not copied to SGM</p>		
		<p>NOTE: The address of a parameter with a given ID can be calculated as follows:</p> <p>SGMA Address = 0xBA0000 + (ParamID-1) * 4</p> <p>SGMB Address = 0xEA0000 + (ParamID-1) * 4</p> <p>Parameter ID's refer to the listing of SGM OBDB parameters in the ASW ICD (H-P-4-TASW-IF-0002) and are not the same as the ID's in the RAM OBDB.</p>		
11		Check ERD for non-nominal events (H_FCP_AOC_3011)		Next Step: 12
		<p>Execute Procedure: H_FCP_AOC_3011 ERD buffer dump</p>		
12		Procedure for SCM Fine Pointing (H_FCP_AOC_0SCM)		Next Step: 13
		<p>Execute Procedure: H_FCP_AOC_0SCM Procedure for SCM Fine Pointing</p>		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
13		IF catbed heaters must be OFF in SCM		Next Step: THEN 14 ELSE END
TC Seq. Name :HFA3S07C (RCS heating OFF) TimeTag Type: Sub Schedule ID: <input type="checkbox"/>				
14		Switch off RCS heaters		Next Step: END
		Verify Telemetry Nom Conf RCS AESCF002	= RCS-A = RCS-B	AND=ZAA01999
14.1		Switch OFF thruster heaters for RCS-A, if used		<input type="checkbox"/>
		Execute Telecommand All HTR RCS-A OFF Command Parameter(s) : RCSCfg DF86 Cmd AH8R3001 Enable 86 RCSCfg DD86 Cmd AH8R4001 Enable 86 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 20 Det. descr. : TC(8,1) Command RCS config - Herschel All HTR RCS-A OFF	ACZE6109	
		Execute Telecommand Fire Cmd RCS config Command Parameter(s) : FireFun DF86Cmd AH8F1001 Enable 86 FireFun DD86Cmd AH8F2001 Enable 86 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 20 Det. descr. : TC(8,4) Fire Command - Fire Cmd RCS config	ACZ2M109	
14.2		Check RCS catbed heater status & current		<input type="checkbox"/>
		Verify Telemetry CBH_N_L17_S WMA2H565	= OFF	AND=WALC1584

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry CBH_N_L17_I WMA13565	< 0.01 A >= 0.5 A changes to	AND=WALC1584
		Verify Telemetry CBH_R_L18_S WM12H565	= OFF	AND=WALC1584
		Verify Telemetry CBH_R_L18_I WM113565	0	AND=WALC1584
14.3		Switch OFF thruster heaters for RCS-B, if used		<input type="checkbox"/>
		Execute Telecommand All HTR RCS-B OFF ACZE7109 Command Parameter(s) : RCSCfg DF86 Cmd AH8R3001 Enable 86 RCSCfg DD86 Cmd AH8R4001 Enable 86 TC Control Flags : GBM IL DSE --Y -- -- Subsch. ID : 20 Det. descr. : TC(8,1) Command RCS config - Herschel All HTR RCS-B OFF		
		Execute Telecommand Fire Cmd RCS config ACZ2M109 Command Parameter(s) : FireFun DF86Cmd AH8F1001 Enable 86 FireFun DD86Cmd AH8F2001 Enable 86 TC Control Flags : GBM IL DSE --Y -- -- Subsch. ID : 20 Det. descr. : TC(8,4) Fire Command - Fire Cmd RCS config		
14.4		Check RCS catbed heater status & current		<input type="checkbox"/>
		Verify Telemetry CBH_N_L17_S WMA2H565	= OFF	AND=WALC1584
		Verify Telemetry CBH_N_L17_I WMA13565	0	AND=WALC1584
		Verify Telemetry CBH_R_L18_S WM12H565	= OFF	AND=WALC1584
		Verify Telemetry CBH_R_L18_I WM113565	< 0.01 A >= 0.5 A changes to	AND=WALC1584

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14.5		Verify decreasing catbed temps for MAIN branch		<input type="checkbox"/>
		Observe <u>decreasing values</u> of the catbed temperatures		
		Verify Telemetry A1D1 Ttemp act AETTA001		AND=ZAA04999
		Verify Telemetry A2D2 Ttemp act AETTB001		AND=ZAA04999
		Verify Telemetry C1F1 Ttemp act AETTC001		AND=ZAA04999
		Verify Telemetry C2F2 Ttemp act AETTD001		AND=ZAA04999
		Verify Telemetry C3U1 Ttemp act AETTE001		AND=ZAA04999
		Verify Telemetry C4U2 Ttemp act AETTF001		AND=ZAA04999
End of Procedure				