Declare STR Operational
File: H_FCP_AOC_4S01.xls
Author: dsalt-hp

Procedure Summary

Objectives

The objective of this Herschel ACMS procedure is to switch ON and verify the health of the Main Star Tracker (STRM) in SAM in order to enable a transition to OCM or SCM.

The procedure involves the following activities:
- verification of initial status of the spacecraft and FAs
- identification and switch ON of the designated STR
  (calls H_FCP_AOC_4S11 for STR1)
  (calls H_FCP_AOC_4S21 for STR2)
- verification of STRM status, consistency and stability

After launch the STR will be off, likewise after each autonomous entry to SAM, the STR will have been switched off by the ACC ASW to save power. Before leaving SAM, the STR has to be made operational again to allow a safe transition to either SCM or OCM for re-orientation or deltaV manoueuvre.

Note that a detailed perfomance assessment can only be done after entry in SCM.

Summary of Constraints

Main constraints:
- Ground contact to monitor the progress is assumed.

Spacecraft Configuration

Start of Procedure

Spacecraft initial conditions:
- ACMS mode SAM/Point
- STRM switched OFF

End of Procedure

Spacecraft final conditions:
- ACMS mode SAM/Point
- STRM switched ON and in ATFAD/AAD mode

Reference File(s)

Input Command Sequences

Output Command Sequences

Referenced Displays

ANDs **GRDs** **SLDs**

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ZAA01999
ZAA00999
ZAA02999
AA01X109
ZAA05999

Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
03/08/08	1	1	Created	dsalt-hp	
24/03/09	2.2	2	Procedure name change only	dsalt-hp	

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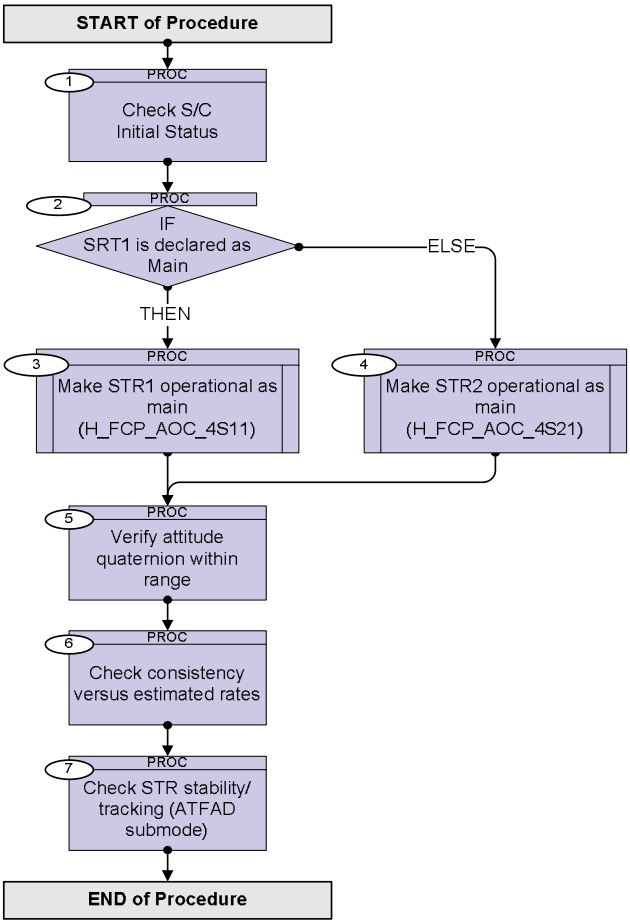
Procedure Flowchart Overview



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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Beginning of Procedure		
		PROC Procedure Properties *SSID :*		
1		*Check S/C* *Initial Status*		Next Step: 2
1.1		*Check S/C mode status*		
		Verify Telemetry **SpacecraftMode AESME002**	**= Nominal**	AND=ZAA01999
		Verify Telemetry **AcmsMode AESMG002**	**= SAM**	AND=ZAA01999
		Verify Telemetry **AcmsSubstate AESMF002**	**= SAM Sun Point**	AND=ZAA01999
1.2		*Check Star Tracker status, configuration & health*		
		Verify Telemetry **STR1 power AE4P1002**	**= OFF**	AND=ZAA00999
		Verify Telemetry **STR2 power AE4P2002**	**= OFF**	AND=ZAA00999
		Verify Telemetry **Curr STR in use AES18002**	**= STR 1** **= STR 2**	AND=ZAA01999
		Verify Telemetry **STR1 Health Sts AES31002**	**= Healthy**	AND=ZAA01999
		Verify Telemetry **STR2 Health Sts AES32002**	**= Healthy**	AND=ZAA02999
2		*IF* *SRT1 is declared as Main*		Next Step: THEN 3 ELSE 4
3		*Make STR1 operational as main* *(H_FCP_AOC_4S11)*		Next Step: 5
		Execute Procedure: **H_FCP_AOC_4S11** **Make STR1 operational as main**		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
4		*Make STR2 operational as main (H_FCP_AOC_4S21)*		Next Step: 5
		Execute Procedure: **H_FCP_AOC_4S21** **Make STR2 operational as main**		
5		*Verify attitude quaternion within range*		Next Step: 6
		The attitude quaternion (STR quaternion transformed to body frame and corrected for misalignments) should be within a strip of the celestrial sphere around the Sun vector, taking into account the limited cycle size in SAM. Expressed in the angle φ about the X axis and the angle θ between the Sun Vector and the body YZ plane, this strip is: $\|\varphi\| < 5deg$ and $\|\theta\| < 30.6deg$		
		An alternative would be to : 1. check the attitude of the STR boresight axis. In this case no transformation of STR quaternion to body frame is needed and the allowed zone would be a strip of +5deg centred on a great circle orthogonal to the Sun vector. 2. check the attitude of the Z axis after a transformation from STR to body. The allowed zone would be a 5 deg cone.		
		Verify Telemetry **Est Attitude Q1** **AESA6001**		AND=AA01X109
		Verify Telemetry **Est Attitude Q2** **AESA7001**		AND=AA01X109
		Verify Telemetry **Est Attitude Q3** **AESA8001**		AND=AA01X109
		Verify Telemetry **Est Attitude Q4** **AESA9001**		AND=AA01X109
6		*Check consistency versus estimated rates*		Next Step: 7
		Verify Telemetry **STRM Att Q1** **AEXA1001**		AND=AA01X109
		Verify Telemetry **STRM Att Q2** **AEXA2001**		AND=AA01X109
		Verify Telemetry **STRM Att Q3** **AEXA3001**		AND=AA01X109
		Verify Telemetry **STRM Att Q4** **AEXA4001**		AND=AA01X109
		Check estimated angular rates		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry **Est ang rate X** **AESR7001**		AND=ZAA00999
		Verify Telemetry **Est ang rate Y** **AESR8001**		AND=ZAA00999
		Verify Telemetry **Est ang rate Z** **AESR9001**		AND=ZAA00999
7		*Check STR stability/tracking (ATFAD submode)*		Next Step: END
		Control Execution **0000.10.00.000**	**WAIT**	
		Verify Telemetry **STRM Submode** **AEX03001**	**= STB nom ATFAD**	AND=ZAA05999
		Verify Telemetry **STRM AAD status** **AEX65001**	**= ATFAD q valid**	AND=ZAA05999
		Verify Telemetry **STRM 1 trackwin** **AEX61001**	**= More 1 trk wnd**	AND=ZAA05999
		Verify Telemetry **STRM Att qual** **AEXMY001**		AND=ZAA05999
		Verification of housekeeping parameters and error status specified in detail above can be repeated periodically throughout the STR installation procedure. The sensor output can also be verified, but no specific criteria can be provided in the procedure for the attitude quaternion.		

End of Procedure