Perform SCM Fine Pointing
File: H_FCP_AOC_3S01.xls
Author: dsalt-hp

Procedure Summary

Objectives

The objective of this Herschel ACMS procedure is for the routine execution of single target pointings in SCM.

The procedure involves the following activities:
- check ACMS configuration
- select & uplink the Fine Pointing command
- verify slew start
- verify pointing an interlacing, if necessary

It is used when SCM fine pointing is needed during routine science operations, so specifies as a constraint that ACMS must already be in SCM pointing (N.B. this is the final ACMS state after any pointing command, including rasters and scans). It is a basic tool used in many high level calibration procedure (e.g. calibration of STR LOS against the payload, determination of GYR scale factor, alignment and bias, determination of wheel friction and distrubance torques).

NOTE: Procedures for first entry into SCM and return to SCM after an orbit correction manoeuvre are specified separately and do not rely on this procedure to execute the necessary command.

Summary of Constraints

Prior to execution in routine operations, the ACMS must be in conditions which will prevent the triggering of TC execution checks.

All necessary conditions are verified by calling procedure Verify SCM Configuration, which carries out the following checks:
1. ACMS in SCM and pointing.
2. ACMS configuration allows execution of SCM pointing commands; i.e., the following conditions must be satisfied:
2.1. No SIR
2.2. No CIR
2.3. No critical TC flag raised.
3. Unit configuration is sufficient to carry out an SCM pointing. The procedure accepts any valid unit configuration for SCM and is not limited to the defaults (RWL 1-2-3-4, GYR 1-2-3, STR1),
3.1 One STR in active configuration, powered and healthy. STR mode = AAD, STR submode = ATFAD.
3.2 At least three wheels in active configuration, powered and healthy
3.3 One GYRE selected, powered and healthy.
3.4 Three GYR sensors in active configuration are healthy

[N.B. Flight Dynamics ensure no wheel unloading when defining their TC inputs]

Spacecraft Configuration

Start of Procedure

Type Pre-condition Here

End of Procedure

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Type Post-condition Here

Reference File(s)

Input Command Sequences

Output Command Sequences

AESFP_00

Referenced Displays

ANDs	GRDs	SLDs
ZAA50999		(None)
ZAA01999		
ZAA52999		

Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
03/08/08	1	1	Created	dsalt-hp	
05/12/08	2	2	TC in Step 3 now time-tagged to enable use of TPF=SFP with an execution time.	dsalt-hp	

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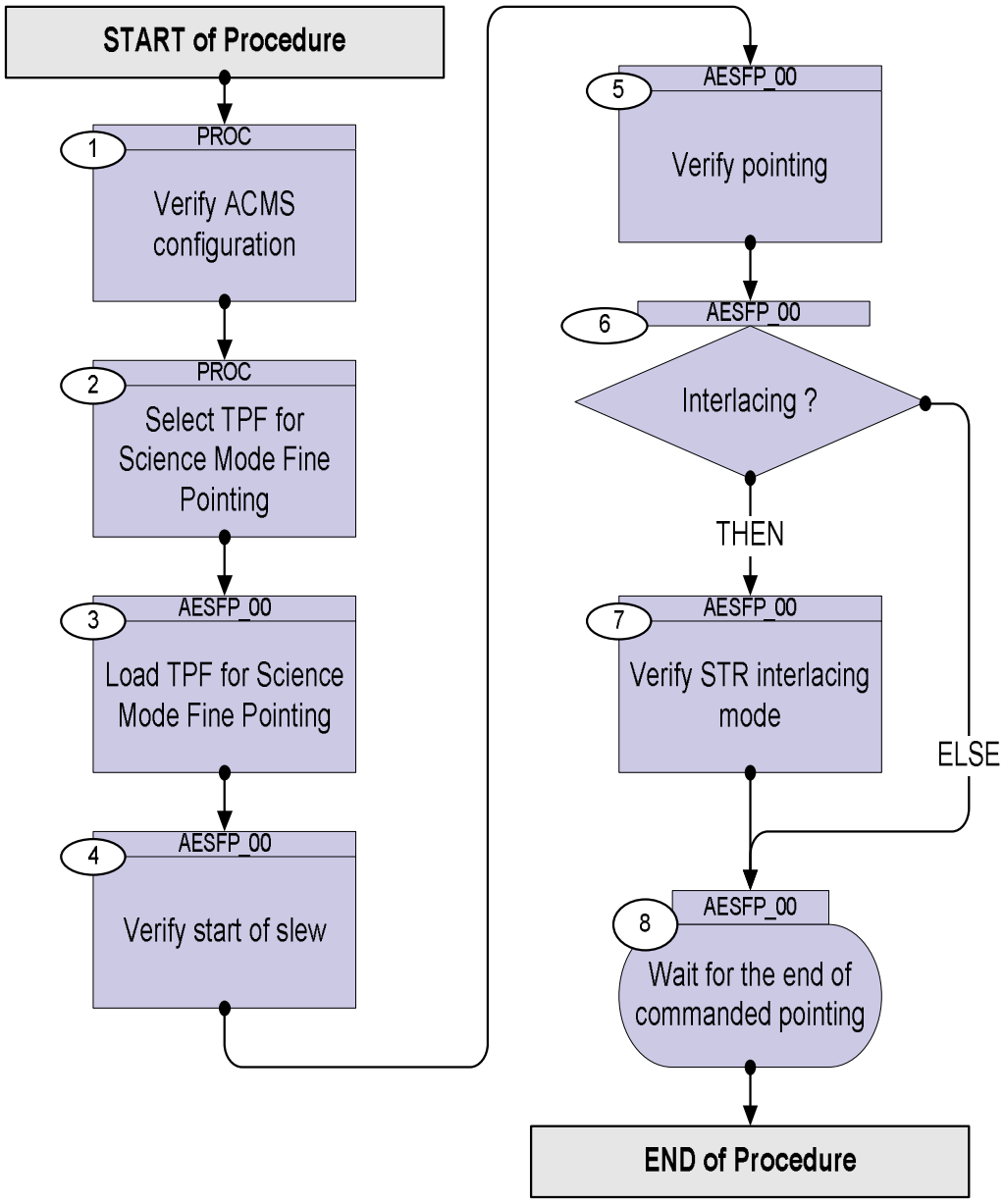
Procedure Flowchart Overview



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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Beginning of Procedure		
		TC Seq. Name :PROC (Procedure Properties) *TimeTag Type:* *Sub Schedule ID:*		
1		*Verify ACMS configuration*		Next Step: 2
		Check suitable configuration for SCM pointing by calling procedure Verify SCM Configuration		
		Execute Procedure: **H_FCP_AOC_3001** **Verify SCM Configuration**		
2		*Select TPF for Science Mode Fine Pointing*		Next Step: 3
		Check with Flight Dynamics the **exact name of the TPF instance** to be uplinked		
		NOTE: The decision whether or not interlacing is to be used is taken off-line and is defined within the TPF instance delivered by Flight Dynamics. *The selection defined within the TPF determines the execution of some verification steps.*		
		NOTE: *Flight Dynamics check that RWL profiles will not exceed any constraints during the maneouvre (i.e. the wheel momenta should be sufficient to stay within allowed boundaries during the entire operation) when generating this TPF.* *If there is a likelihood of this happening, they will also provide an associated wheel bias TPF (RWB), to be applied beforehand (i.e. via H_SVT_AOC_4R20)*		
		TC Seq. Name :AESFP_00 (Command Fine Pointin) *TimeTag Type: B* *Sub Schedule ID: 20* *Formal Parameter List :*	<dec>	
		AcmsH STR IL STRILACE=	<dec>	
		AcmsH Cmd TQ1r Q_FIN_X=	<dec>	
		AcmsH Cmd TQ2r Q_FIN_Y=	<dec>	
		AcmsH Cmd TQ3r Q_FIN_Z=	s	
		AcmsH Cmd TQ4r Q_FIN_S=	s	
		AcmsH T_slew T_SLEW=		
		AcmsH T_p T_POINT=		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
3		*Load TPF for Science Mode Fine Pointing*		Next Step: 4
	ET=TR+00.00.00 UT=+	Execute Telecommand **SCM Fine pointing** *Command Parameter(s) :* **ASW Function ID** **AHFUN002** **AcmsH AID Cmd** **AHHF0002** **AcmsH DF86 Cmd** **AH8G1002** **AcmsH DD86 Cmd** **AH8G2002** **AcmsH STR IL** **AHHXL002** **AcmsH Cmd TQ1r** **AHHC6002** **AcmsH Cmd TQ2r** **AHHC7002** **AcmsH Cmd TQ3r** **AHHC8002** **AcmsH Cmd TQ4r** **AHHC9002** **AcmsH T_slew** **AHHD1002** **AcmsH T_p** **AHHD2002** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 20* Det. descr. : TC_PERFORM_SCM_FINE_POINTING	**ACAF1002** **ACMSMain** (Def) **SCM prep pnt** (Def) **Enable 86** **Enable 86** **STRILACE** **Q_FIN_X** **Q_FIN_Y** **Q_FIN_Z** **Q_FIN_S** **T_SLEW** **T_POINT**	
4		*Verify start of slew*		Next Step: 5
		Verify Packet Reception **AccAsw TM_5_1_16427 - New mode_state** *Packet Details:* **APID:** **Type:** **Subtype:** **PI1:** **PI2:**	**A51CSTATE109** **512** **5** **1** **16427** **0**	
		Verify Packet Telemetry (Pkt = A51CSTATE109) **Substate Event** **AE5ST109**	= **SCM Tracking**	AND=ZAALH999
		The event packet indicates the start of slew as a change of substate. *The change of substate occurs as soon as the slew path has been calculated by the path planner.* *The verification of the reception of the event packet may therefore be omitted and verification steps below can be executed as soon as the TC is acknowledged through TM(1,1).*		
5		*Verify pointing*		Next Step: 6
		Verify Telemetry **AcmsSubstate** **AESMF002**	**= SCM Pointing**	AND=ZAA50999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry **AcmsMain AID** **AESM3002**	**= SCM pnt F rdy**	AND=ZAA01999
		Verify Telemetry **ScmType** **AESMC002**	**= Point**	AND=ZAA50999
		Verify Telemetry **OnTargetFlag** **AESM0002**	**= HIGH**	AND=ZAA50999
		Verify Telemetry **ACMS Main AID** **AE5A0001**	**= SCM Point Fine**	(None)
		The checks above are specified assuming that the commanded slew time was sufficient to cover the duration of both the rotation determined by the ASW path planner and the settling of the controller. **If mission planners specify pointings with shorter slew times only the check on AcmsSubstate should be executed and all other checks should be omitted** (AcmsSubstate is switched at the end of the path planner-controlled phase of the slew and all other status indicators change value only after settling).		
		Verify Telemetry **STRM Mode** **AEX04001**	**= Auto attdetect**	AND=ZAA50999
		Verify Telemetry **STRM Submode** **AEX03001**	**= STB nom ATFAD**	AND=ZAA50999
6		*Interlacing ?*		Next Step: THEN 7 ELSE 8
7		*Verify STR interlacing mode*		Next Step: 8
		Verify Telemetry **InterlacingSts** **AESMX002**	**= Interlacing ON**	AND=ZAA50999
		Verify Telemetry **STRM IL sts** **AEXJ1002**	**= IL active**	AND=ZAA52999
8		*Wait for the end of commanded pointing*		Next Step: END
		Verify Packet Reception **AccAsw TM_5_1_16441 - Mode Timedevent** *Packet Details:* **APID:** **Type:** **Subtype:** **PI1:** **PI2:**	**A51T1MEVE109** **512** **5** **1** **16441** **0**	
		Verify Packet Telemetry (Pkt = A51T1MEVE109) **Time_Id** **AE5FG109**	= **Time Id Tp**	AND=ZAALH999

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