STR health check
File: H_FCP_AOC_5007.xls
Author: dsalt-hp

Procedure Summary

Objectives

The objective of this Herschel ACMS procedure is to lists all activities necessary to assess the health and status of the STR.

The procedure involves the following activities:
- define/enable DTM (SA10)
- check STR health status
- check CCD health status
- check error status
- check CCD data
- disable/delete DTM (SA10)

Summary of Constraints

n/a

Spacecraft Configuration

Start of Procedure

n/a

End of Procedure

n/a

Reference File(s)

Input Command Sequences

Output Command Sequences

HFA5007B

Referenced Displays

ANDs	GRDs	SLDs
ZAA01999		
ZAA00999		
ZAA02999		
ZAA05999		
ZAAA1999		
ZAAAB999		

Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
03/08/2008	1	1	Created	dsalt-hp	

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03/09/2010	3.1	2	Step 1 & 6 modified to include TCs for DTM (SA10) instead of reference to a generic procedure.	dsalt-hp	

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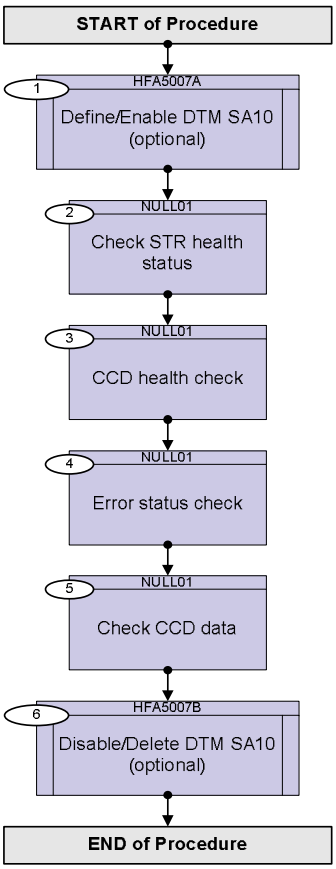
Procedure Flowchart Overview



Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Beginning of Procedure		
		TC Seq. Name :HFA5007A (Define/Enable DTM SA) *TimeTag Type: N* *Sub Schedule ID: 20*		
1		*Define/Enable DTM SA10 (optional)*		Next Step: 2
		If compatible with the current TM bandwidth enable the Diagnostic packet SA10, in order to have super-sampled sensor data. Unless specifically stated all parameters referred in the subsequent checks are always available as part of the Essential Telemetry.		
		Execute Telecommand **TC32H STR SA10D1 Super** *Command Parameter(s) :* **HK Packet ID AH3PK109** **TC3x_SID AHW04109** **Interval AH3SA109** **DID number AH3PA109** **DID number AH3PA109** **DID number AH3PA109** **DID number AH3PA109** **DID number AH3PA109** **DID number AH3PA109** **DID number AH3PA109** **DID number AH3PA109**	**ACZYA109** **100 <dec>** (Def) **DTM Str12Sa10s** (Def) **4 <dec>** (Def) **16447 <dec>** (Def) **16447 <dec>** (Def) **16447 <dec>** (Def) **16447 <dec>** (Def) **16780 <dec>** (Def) **16780 <dec>** (Def) **16780 <dec>** (Def) **16780 <dec>** (Def)	
		TC Control Flags : **GBM IL DSE** **--Y -- ---** *Subsch. ID : 20* Det. descr. : TC(3,2) Define H DTM STR 1/2 SA10D1 Supersampled		
		The DTM packet definitions downloaded to verify correct uplinking.		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand **Report Diag Report Def** *Command Parameter(s) :* **Number of pkts** **AH3NP109** **HK Packet ID** **AH3PK109** *TC Control Flags :* **GBM IL DSE** **--- Y--Y YY-** *Subsch. ID : 20* Det. descr. : TC(3,11) Report Diagnostic Parameter Report Definitions	**AC311109** **1 <dec>** (Def) **100 <dec>**	
		Enable DTM for SA10.		
		Execute Telecommand **EnableTmGen** *Command Parameter(s) :* **N** **AH017070** **Sub-Type** **AH019070** **Packet-ID** **AH020070** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 20* Det. descr. : Enable Generation of Telemetry Packets	**AC900070** **1 <dec>** (Def) **Diag Report** **100 <dec>**	
		Verify Packet Reception **H DTM STR1-2 SA10D1 Supersampled** *Packet Details:* **APID:** **Type:** **Subtype:** **PI1:** **PI2:**	**A3DHSTRSA10S** **514** **3** **26** **20000**	
		TC Seq. Name :NULL01 (Null Sequence 01) *TimeTag Type:* *Sub Schedule ID:*		
2		*Check STR health status*		Next Step: 3
2.1		*STR1 in use and powered?*		
		Verify Telemetry **Curr STR in use** **AES18002**	**= STR 1**	AND=ZAA01999
		Verify Telemetry **STR1 pwr conf** **AEXP1002**	**= Switch ON**	AND=ZAA00999

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
2.2		*check STR1 health status*		
		Verify Telemetry **STR1 Health Sts AES31002**	**= Healthy**	AND=ZAA02999
		In case the status is set to "unavailable" wait 1 ETM cycle and check again.		
2.2.1		*Unhealthy and in AFO?*		
		Verify Telemetry **STR1 Health Sts AES31002**	**= Unhealthy**	AND=ZAA02999
		Verify Telemetry **FdirMode AESMJ002**	**= AFO rcfg ena**	AND=ZAA01999
2.2.2		*Contigency*		
		Even though in AFO the reconfiguration did not take place as STR1 is still flagged as in use. A fallback to SAM should be considered.		
2.2.3		*Unhealthy and in AFS?*		
		Verify Telemetry **STR1 Health Sts AES31002**	**= Unhealthy**	AND=ZAA02999
		Verify Telemetry **FdirMode AESMJ002**	**= AFS rfg dis**	AND=ZAA01999
2.2.4		*Contigency*		
		If possible one should reconfigure the STR to use STR2.		
2.3		*STR2 in use and powered?*		
		Verify Telemetry **Curr STR in use AES18002**	**= STR 2**	AND=ZAA01999
		Verify Telemetry **STR2 pwr conf AEXP2002**	**= Switch ON**	AND=ZAA00999
2.4		*check STR2 health status*		
		Verify Telemetry **STR2 Health Sts AES32002**	**= Healthy**	AND=ZAA02999

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		In case the status is set to "unavailable" wait 1 ETM cycle and check again.		
2.4.1		*Unhealthy and in AFO?*		□
		Verify Telemetry **STR2 Health Sts** **AES32002**	**= Unhealthy**	AND=ZAA02999
		Verify Telemetry **FdirMode** **AESMJ002**	**= AFO rcfg ena**	AND=ZAA01999
2.4.2		*Contigency*		□
		Even though in AFO the reconfiguration did not take place as STR2 is still flagged as in use. A fallback to SAM should be considered.		
2.4.3		*Unhealthy and in AFS?*		□
		Verify Telemetry **STR2 Health Sts** **AES32002**	**= Unhealthy**	AND=ZAA02999
		Verify Telemetry **FdirMode** **AESMJ002**	**= AFS rfg dis**	AND=ZAA01999
2.4.4		*Contigency*		□
		If possible one should reconfigure the STR to use STR1.		
3		*CCD health check*		Next Step: 4
3.1		*Failure detected*		□
		Verify Telemetry **STRM hlth summ** **AEX18001**	**= Failure**	AND=ZAA05999
3.2		*Failure identification*		□
		CCD temperature 1 is out of range **STRM CCDt1fail** **AEX17001**	**= Failure**	AND=ZAA05999
		CCD temperature 2 is out of range **STRM CCDt2fail** **AEX16001**	**= Failure**	AND=ZAA05999
		Optics temperature is out of range **STRM opticTfail** **AEX15001**	**= Failure**	AND=ZAA05999

Step No.	Time	Activity/Remarks		TC/TLM	Display/ Branch
		Volt1 is out of range **STRM volt1 fail**	**AEX14001**	**= Failure**	AND=ZAA05999
		Volt2 is out of range **STRM volt2 fail**	**AEX13001**	**= Failure**	AND=ZAA05999
		Volt3 is out of range **STRM volt3 fail**	**AEX12001**	**= Failure**	AND=ZAA05999
		TEC current is out of range **STRM TECcurfail**	**AEX11001**	**= Failure**	AND=ZAA05999
3.3		*In case of HK timeout*			□
		Verify Telemetry **STRM timeout HK**	**AEX0E001**	**= Failure**	AND=ZAA05999
3.4		*Check following conditions are met:*			□
		Verify Telemetry **STRM CCD temp1**	**AEX0V001**	**>= 248.0 K** **<= 295.5 K**	AND=ZAA05999
		Verify Telemetry **STRM CCD temp2**	**AEX0W001**	**>= 248.0 K** **<= 295.5 K**	AND=ZAA05999
		Verify Telemetry **STRM optic temp**	**AEX0X001**	**>= 248.0 K** **<= 338.0 K**	AND=ZAA05999
		Verify Telemetry **STRM HK volt 1**	**AEX0S001**	**>= 19.8 V** **<= 22.2 V**	AND=ZAA05999
		Verify Telemetry **STRM HK volt 2**	**AEX0T001**	**>= 7.65 V** **<= 9.35 V**	AND=ZAA05999
		Verify Telemetry **STRM HK volt 3**	**AEX0U001**	**<= -13.5 V** **>= -16.5 V**	AND=ZAA05999
		Verify Telemetry **STRM TEC curr**	**AEX0Y001**	**>= -0.6 A** **<= 1.2 A**	AND=ZAA05999
4		*Error status check*			Next Step: 5
4.1		*Double error in EEPROM?*			□
		Verify Telemetry **STRM 2err EEPRM**	**AEX08001**	**= Failure**	AND=ZAA05999

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
4.2		*Error position*		
		Error in lower half of EEPROM **STRM 2error pos AEX09001**	**= EEPROM err low**	AND=ZAA05999
		Or error in upper half of EEPROM **STRM 2error pos AEX09001**	**= EEPROM err upp**	AND=ZAA05999
4.3		*Other possible errors*		
		EEPROM single error detected but not corrected **STRM 1errEEPROM AEX06001**	**= Failure**	AND=ZAA05999
		PROM loading checksum error **STRM PROM load AEX07001**	**= Failure**	AND=ZAA05999
		ASIC RAM overflow **STRM ASIC RAM AEX0B001**	**= Failure**	AND=ZAA05999
		ASIC errors: timeout reached or wrong pixel number. **STRM wrong pxnr AEX0C001**		AND=ZAA05999
		Note: if AEX0C001 is not reset after a couple of STR cycles then a CCD failure may have occured. A reconfiguration of the STR is required, unless an erronated CCD related TC was sent previously. All CCD stars data may not be valid.		
		ASIC EOF interrupt **STRM timeoutEOF AEX0D001**	**= Failure**	AND=ZAA05999
		Note: if AEX0D001 is not reset after a couple of STR cycles then a CCD failure may have occured. A reconfiguration of the STR is required, unless an erronated CCD related TC was sent previously. All CCD stars data may not be valid.		
		HK not available or wrong HK number **STRM timeout HK AEX0E001**	**= Failure**	AND=ZAA05999
		The last TC was rejected by the STR SW. **STRM lastTC sts AEX0G001**	**= Failure**	AND=ZAA05999
		Note: AEX0G001 will be reset when the next command is accepted.		
5		*Check CCD data*		Next Step: 6
5.1		*Valid preconditions?*		
		Verify Telemetry **STRM wrong pxnr AEX0C001**	**= No failure**	AND=ZAA05999

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry **STRM timeoutEOF AEX0D001**	**= No failure**	AND=ZAA05999
		Verify Telemetry **STRM CCDt1fail AEX17001**	**= No failure**	AND=ZAA05999
		Verify Telemetry **STRM Mode AEX04001**	**<> Initialisation** **<> STR data inval** **<> SW Maintenance**	AND=ZAA05999
5.2		*Check Background*		□
5.2.1		*Diagnostic packet SA10 was enabled (in step 1)*		□
		Monitor CCD background level parameters (of the STR in use) for 7 minutes		
5.2.1.1		*STR1 in use ?*		□
		Verify Telemetry **Curr STR in use AES18002**	**= STR 1**	AND=ZAA01999
5.2.1.2		*Check STR1 CCD background levels (via SA10)*		□
		Verify Telemetry **Mean CCD LocBkg AMX2J074**	**< 1500 <dec>**	AND=ZAAA1999
		Verify Telemetry **RMS CCD LocBkg AMX2K074**	**< 50 <dec>**	AND=ZAAA1999
		Verify Telemetry **Mean CCDGlobBkg AMX2N074**	**< 1500 <dec>**	AND=ZAAA1999
		Verify Telemetry **RMS CCD GlobBkg AMX2P074**	**< 50 <dec>**	AND=ZAAA1999
5.2.1.3		*STR2 in use ?*		□
		Verify Telemetry **Curr STR in use AES18002**	**= STR 2**	AND=ZAA01999

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
5.2.1.4		*Check STR2 CCD background levels (via SA10)*		
		Verify Telemetry **STR2 MeanCCDloc** **AMX2J075**	**< 1500 <dec>**	AND=ZAAAB999
		Verify Telemetry **STR2 RMS CCDloc** **AMX2K075**	**< 50 <dec>**	AND=ZAAAB999
		Verify Telemetry **STR2 Mean CCDgl** **AMX2N075**	**< 1500 <dec>**	AND=ZAAAB999
		Verify Telemetry **STR2 RMS CCDgl** **AMX2P075**	**< 50 <dec>**	AND=ZAAAB999
5.2.2		*Only Essential Telemetry available*		
		Monitor CCD background level parameters (of the STR in use) for 7 minutes Note: Not all background values are available.		
		Verify Telemetry **STRM CCD bkg av** **AEXB1001**	**< 1500 <dec>**	AND=ZAA05999
		Verify Telemetry **STRM CCD bkg sd** **AEXB2001**	**< 50 <dec>**	AND=ZAA05999
		TC Seq. Name :HFA5007B (Disable/Delete DTM S) *TimeTag Type: N* *Sub Schedule ID: 20*		
6		*Disable/Delete DTM SA10 (optional)*		Next Step: END
		Disable diagnostic packet SA10 (if enabled in step 1)		
		Execute Telecommand **DisableTmGen** *Command Parameter(s) :* **N** **AH017070** **Sub-Type** **AH019070** **Packet-ID** **AH020070** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 20* Det. descr. : Disable Generation of Telemetry Packets	**AC902070** **1 <dec>** (Def) **Diag Report** **100 <dec>**	

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Delete diagnostic packets for SA10 (if defined in step 1)		
		Execute Telecommand **Clear Diagnostic Report** *Command Parameter(s) :* **Number of pkts AH3NP109** **HK Packet ID AH3PK109** *TC Control Flags :* **GBM IL DSE** **--- Y--Y YY-** *Subsch. ID : 20* Det. descr. : TC(3,4) Clear Diagnostic Parameter Report Definitions	**AC034109** **1 <dec>** (Def) **100 <dec>**	
		End of Procedure		