

Make STR1 operational as main
File: H_FCP_AOC_4S11.xls
Author: dsalt-hp



Procedure Summary

Objectives

The objective of this Herschel ACMS procedure is to prepare STR1 for use as main STR.

The procedure involves the following activities:

- verify STR1 status & mode
- uplink DTM (SA15 & SA19)
- Switch unit on
- Verify power status
- Command STR to stand-by mode loading memory image from EEPROM
- Check configuration data and health status
- update S/C velocity vector in STR, if necessary (calls H_FCP_AOC_4S41)
- Modify STRmain CCD ref. temp. (calls sequence HFA4S81X)
- Command STR to AAD
- Verify tracking in ATFAD
- remove DTM (SA15 & SA19)

Summary of Constraints

Main constraints:

- ACMS must be in SAM
- STR1 must be configured as main
- LCL is assumed to be on at the start of the procedure
- as procedure uses DTMs, the operator must make sure no more than one other DTM is enabled when this procedure is executed.

Spacecraft Configuration

Start of Procedure

Spacecraft initial conditions:

- S/C in SAM
- STR1 designated as Main
- STR1 not switched ON

End of Procedure

Spacecraft final conditions:

- as initial but with STR1 switched ON
- SRTM in ATFAD/AAD mode

Reference File(s)

Input Command Sequences

HFA4S81X

Output Command Sequences

HFA4S11A
HFA4S11B

Referenced Displays

ANDs GRDs SLDs

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ZAA01999
 ZAA06999
 ZAA05999
 ZAADA999
 ZAADK999

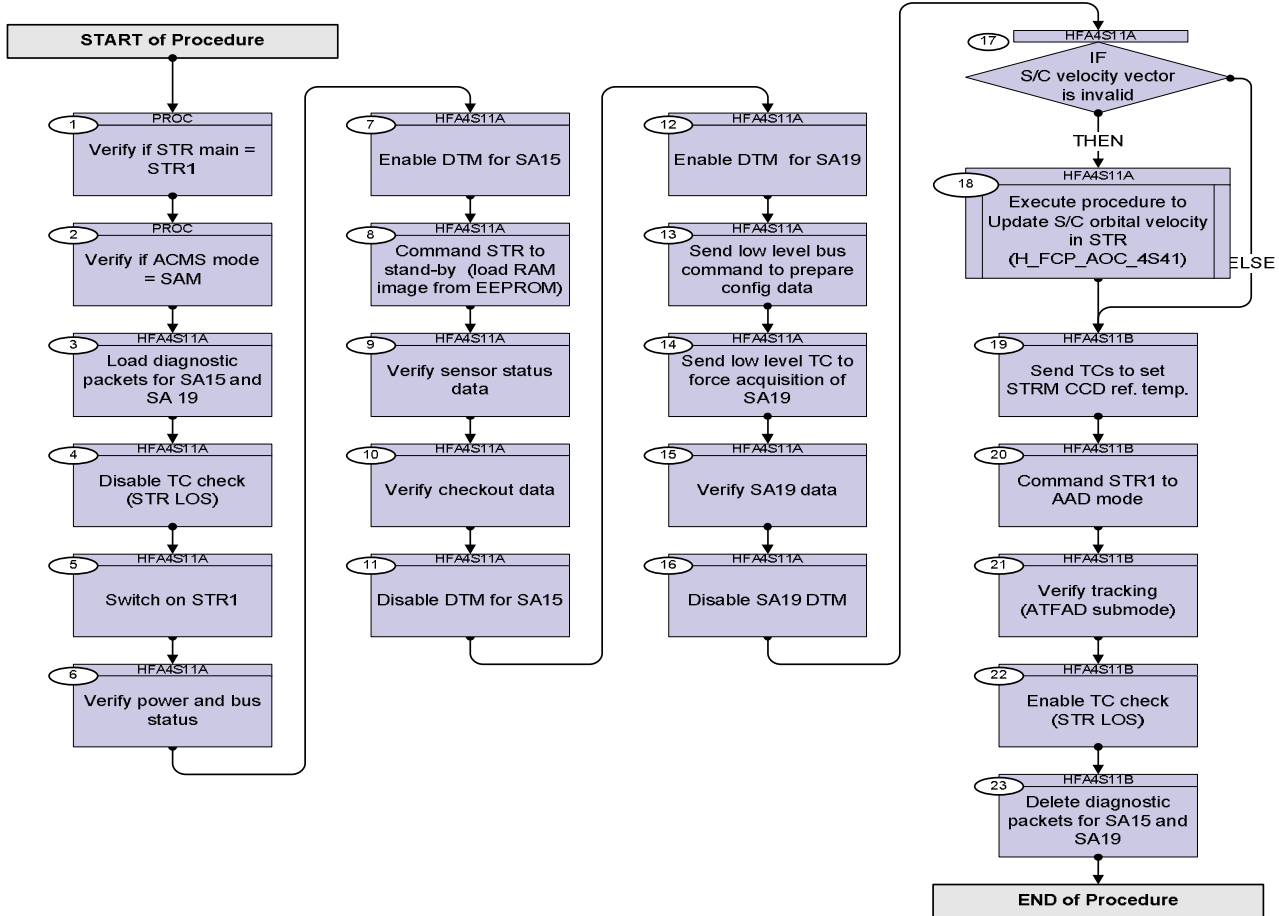
Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
03/08/2008	1	1	Created	dsalt-hp	
02/02/2009	2	2	Cheched-in for FOP release (02/02/09)	dsalt-hp	
22/03/2009	2.2	3	Steps 4 & 21 added to disable & enable STR LOS check to avoid Moon blinding, as per Section 2.1.1 of H-P-4-DS-MA-007 (Issue 2, Rev.5)	dsalt-hp	
01/04/2010	3	4	Step 19 added to ensure STRmain CCD ref. temp. update via sequence HFA4S81X	dsalt-hp	
26/07/2010	3.1	5	Comment added at Step 19 to ensure STR1 CCD ref. temp. is commended back to -10C via 3 steps in order to avoid a thermal undershoot.	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				
<p><i>TC Seq. Name :PROC (Procedure Properties)</i></p> <p><i>TimeTag Type: N</i> <i>Sub Schedule ID:</i></p> <p style="text-align: center;">□</p>				
1		Verify if STR main = STR1		Next Step: 2
		Verify Telemetry Curr STR in use AES18002 = STR 1		AND=ZAA01999
2		Verify if ACMS mode = SAM		Next Step: 3
		Verify Telemetry AcmsMode AESMG002 = SAM		AND=ZAA01999
<p><i>TC Seq. Name :HFA4S11A (STR1 Switch ON)</i></p> <p><i>TimeTag Type: N</i> <i>Sub Schedule ID:</i></p> <p style="text-align: center;">□</p>				
3		Load diagnostic packets for SA15 and SA 19		Next Step: 4
		Execute Telecommand TC32H STR SA15D	ACZYG109	
		Command Parameter(s) : HK Packet ID AH3PK109 106 <dec> (Def) TC3x_SID AHW04109 DTM Str12Sa15 Interval AH3SA109 (Def) DID number AH3PA109 4 <dec> (Def) DID number AH3PA109 16744 <dec> (Def) 17077 <dec> (Def)		
		TC Control Flags : GBM IL DSE --Y -- ---		
		Subsch. ID : 20 Det. descr. : TC(3,2) Define H DTM STR 1/2 SA15D		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand <p style="text-align: right;">TC32H STR SA19D</p> Command Parameter(s) : HK Packet ID AH3PK109 TC3x_SID AHW04109 Interval AH3SA109 DID number AH3PA109 DID number AH3PA109 TC Control Flags : <p style="text-align: right;">GBM IL DSE --Y -- ---</p> Subsch. ID : 20 Det. descr. : TC(3,2) Define H DTM STR 1/2 SA19D	ACZYH109 107 <dec> (Def) DTM Str12Sa19 (Def) 4 <dec> (Def) 16764 <dec> (Def) 17097 <dec> (Def)	
		The DTM packet definitions downloaded to verify correct uplinking.		
		Execute Telecommand <p style="text-align: right;">Report Diag Report Def</p> Command Parameter(s) : Number of pkts AH3NP109 HK Packet ID AH3PK109 TC Control Flags : <p style="text-align: right;">GBM IL DSE --Y -- ---</p> Subsch. ID : 20 Det. descr. : TC(3,11) Report Diagnostic Parameter Report Definitions	AC311109 1 <dec> (Def) 106 <dec>	
		Execute Telecommand <p style="text-align: right;">Report Diag Report Def</p> Command Parameter(s) : Number of pkts AH3NP109 HK Packet ID AH3PK109 TC Control Flags : <p style="text-align: right;">GBM IL DSE --Y -- ---</p> Subsch. ID : 20 Det. descr. : TC(3,11) Report Diagnostic Parameter Report Definitions	AC311109 1 <dec> (Def) 107 <dec>	
4		Disable TC check (STR LOS)		Next Step: 5
		To avoid STR being declared unhealthy due to Moon blinding or other perturbing events, disable the FDIR for STR loss		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand <p style="text-align: center;">DisChkSTRlossStar-initQ</p> <i>Command Parameter(s) :</i> DisChk DF86Cmd AH8C1001 Enable 86 DisChk DD86Cmd AH8C2001 Enable 86 <i>TC Control Flags :</i> <p style="text-align: right;">GBM IL DSE --Y -- ---</p> <i>Subsch. ID : 20</i> Det. descr. : TC(8,1) - Disable check FDIR - DisChkSTRlossStar-initQ	ACY6Z109	
		Execute Telecommand <p style="text-align: center;">Fire Disable Check</p> <i>Command Parameter(s) :</i> FireFun DF86Cmd AH8F1001 Enable 86 FireFun DD86Cmd AH8F2001 Enable 86 <i>TC Control Flags :</i> <p style="text-align: right;">GBM IL DSE --Y -- ---</p> <i>Subsch. ID : 20</i> Det. descr. : TC(8,4) Fire Command - Fire Disable Check	ACZ7M109	
		Verify Telemetry <p style="text-align: center;">STR loss check AES4A001</p>	= Disabled	AND=ZAA06999
5		Switch on STR1		Next Step: 6
		Execute Telecommand <p style="text-align: center;">STR Main switch ON</p> <i>Command Parameter(s) :</i> UnitSw DF86 Cmd AH8P1001 Enable 86 UnitSw DD86 Cmd AH8P2001 Enable 86 <i>TC Control Flags :</i> <p style="text-align: right;">GBM IL DSE --Y -- ---</p> <i>Subsch. ID : 20</i> Det. descr. : TC(8,1) Switch ACMS unit on/off - STR Main switch ON	ACZ44109	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand FireSwitchACMSunitONOFF Command Parameter(s) : FireFun DF86Cmd AH8F1001 FireFun DD86Cmd AH8F2001 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 20 Det. descr. : TC(8,4) Fire Command - FireSwitchACMSunitONOFF	ACZ1M109 Enable 86 Enable 86	
		Wait 10 seconds to allow the command to be executed		
6		Verify power and bus status		Next Step: 7
		Verify Telemetry STR-1 pwr sts AMXY0074	= Switch ON	AND=ZAA06999
		Verify Telemetry Comm bus STR1 AES75002	<> Not comm cfg	AND=ZAA01999
		<i>The check on bus configuration is intended to make sure that STR1 is being interrogated. Any bus selection (either A or B) will be accepted as valid.</i>		
		<i>Note on expected events. A number of events are generated during the powering and installation of the STR. These events may represent status information or warnings due to actions taken autonomously by the ASW. The following are expected immediately after the STR has been powered: TM 5-1-16390 reporting successful power status check for the STR; TM 5-1-16449 reporting a DatGet error on the SA12 block for the STR. The second event is due to the fact that SA12 interrogated late in the cycle and data is not available in the first cycle in which the ASW copies STR data from the data pool. The following is taken from the equivalent Planck procedure (needs to be checked) One other event is generated when the STR is commanded to stand-by mode: TM 5-1-16394 reports a HK check trigger caused by the fact that TM_SENSOR_STATUS data becomes available only in the second cycle after the transition to STB mode. Only a single occurrence of either event is expected.</i>		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand Fire Cmd STR config Command Parameter(s) : FireFun DF86Cmd AH8F1001 FireFun DD86Cmd AH8F2001 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 20 Det. descr. : TC(8,4) Fire Command - Fire Cmd STR config	ACZ4M109 Enable 86 Enable 86	
		<i>After being powered on the STR must be commanded to stand-by mode with software load. This requires specification of addresses and the number of words to be transferred from the EEPROM. The values valid for the current release of the STR software have been provided as defaults in the listing of the STR stand-by command above.</i>		
		<i>The transition to stand-by causes a generation of event 5-1-16394 signalling a trigger of the STR HK data check. This is due to the fact that in the first cycle after transition to STB, the HC_STATUS word in the SA10 data block is not valid. Only a single occurrence of the event is expected.</i>		
9		Verify sensor status data		Next Step: 10
		Wait 10 minutes to make sure the STR status is correctly reflected in TM after the commanded mode transition.		
		NOTE: All checks of sensor status data rely on parameters of the main STR in the ETM packet. These parameters can be acquired independently of the selection of STR1 or STR2.		
		Verify Telemetry STRM Mode AEX04001	= Standby	AND=ZAA05999
		Verify Telemetry STRM Submode AEX03001	= STB nom ATFAD	AND=ZAA05999
		Verify Telemetry STRM Mode trans AEX02001	= Cmd mode trans	AND=ZAA05999
		Verify Telemetry STRM 1errEEPROM AEX06001	= No failure	AND=ZAA05999
		Verify Telemetry STRM PROM load AEX07001	= No failure	AND=ZAA05999
		Verify Telemetry STRM 2err EEPROM AEX08001	= No failure	AND=ZAA05999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry STRM timeout HK AEX0E001	= No failure	AND=ZAA05999
		Verify Telemetry STRM timeoutEOF AEX0D001	= No failure	AND=ZAA05999
		Verify Telemetry STRM lastTC sts AEX0G001	= No failure	AND=ZAA05999
		Verify Telemetry STRM TECcurfail AEX11001	= No failure	AND=ZAA05999
		Verify Telemetry STRM volt1 fail AEX14001	= No failure	AND=ZAA05999
		Verify Telemetry STRM volt2 fail AEX13001	= No failure	AND=ZAA05999
		Verify Telemetry STRM volt3 fail AEX12001	= No failure	AND=ZAA05999
		Verify Telemetry STRM opticTfail AEX15001	= No failure	AND=ZAA05999
		Verify Telemetry STRM CCDt1fail AEX17001	= No failure	AND=ZAA05999
		Verify Telemetry STRM CCDt2fail AEX16001	= No failure	AND=ZAA05999
		Verify Telemetry STRM hlth summ AEX18001	= No failure	AND=ZAA05999
		<i>All analog HK parameters should be within the nominal operating limits.</i>		
		***** NOTE ***** <i>All of these analogue parameters (temperatures, volts) need to be stated in <u>all the relevant steps</u> of this procedure!</i>		
		Verify Telemetry STRM HK volt 1 AEX0S001		AND=ZAA05999
		Verify Telemetry STRM HK volt 2 AEX0T001		AND=ZAA05999
		Verify Telemetry STRM HK volt 3 AEX0U001		AND=ZAA05999
		Verify Telemetry STRM CCD temp1 AEX0V001		AND=ZAA05999
		Verify Telemetry STRM CCD temp2 AEX0W001		AND=ZAA05999
		Verify Telemetry STRM optic temp AEX0X001		AND=ZAA05999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry STRM TEC curr AEX0Y001		AND=ZAA05999
		Verify Telemetry STR SEU counter AEX19001		AND=ZAA05999
		Verify Telemetry STRM CCD bkg av AEXB1001		AND=ZAA05999
		Verify Telemetry STRM CCD bkg sd AEXB2001		AND=ZAA05999
10		Verify checkout data		Next Step: 11
		<i>A subset of STR checkout data (bits from the RST_STATUS) word is available for the main STR in ETM. Remaining data must be obtained for the specific unit through the SA15 diagnostic package.</i>		
		Verify Telemetry STRM reset type AEX6F001	= HW reset	AND=ZAA06999
		Verify Telemetry STRM aut SWrst AEX6D001	= SW reset	AND=ZAA06999
		<i>The setting used above for the STRM SW reset parameter indicates that no autonomous SW reset due to an error has taken place since the start-up of the unit.</i>		
		Verify Telemetry STR1 SW rev nr AMXM1074		AND=ZAADA999
		Verify Telemetry STR1 SW iss nr AMXM2074		AND=ZAADA999
		<i>Values of software issue and revision will be provided for the flight configuration of the ACMS.</i>		
		Verify Telemetry STR1 CPU IO cnf AMXMB074	= No failure	AND=ZAADA999
		Verify Telemetry STR1 CPUWaitCon AMXMC074	= No failure	AND=ZAADA999
		Verify Telemetry STR1 CPUMemConf AMXMD074	= No failure	AND=ZAADA999
		Verify Telemetry STR1 CPUctrlreg AMXME074	= No failure	AND=ZAADA999
		Verify Telemetry STR1 EDAC check AMXMF074	= OK	AND=ZAADA999
		Verify Telemetry STR1 RAM fail AMXMK074	= No failure	AND=ZAADA999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
13		Send low level bus command to prepare config data		Next Step: 14
		Execute Telecommand <p style="text-align: right;">STRmain CONFIG</p> Command Parameter(s) : STRCfg DF86 Cmd AH8J3001 Enable 86 STRCfg DD86 Cmd AH8J4001 Enable 86 STRCfg Nrof Wrđ AHFX8001 1 <dec> (Def) STRCfg Data Wrđ AHFX9001 0 <dec> TC Control Flags : <p style="text-align: right;">GBM IL DSE --Y -- ---</p> Subsch. ID : 20 Det. descr. : TC(8,1) Command STR config - STRmain CONFIG	ACYJG109	
		Execute Telecommand <p style="text-align: right;">Fire Cmd STR config</p> Command Parameter(s) : FireFun DF86Cmd AH8F1001 Enable 86 FireFun DD86Cmd AH8F2001 Enable 86 TC Control Flags : <p style="text-align: right;">GBM IL DSE --Y -- ---</p> Subsch. ID : 20 Det. descr. : TC(8,4) Fire Command - Fire Cmd STR config	ACZ4M109	
14		Send low level TC to force acquisition of SA19		Next Step: 15
		Execute Telecommand <p style="text-align: right;">Command STR config</p> Command Parameter(s) : ASW Function ID AHFUN001 STR config (Def) STRCfg DF86 Cmd AH8J3001 Enable 86 STRCfg DD86 Cmd AH8J4001 Enable 86 STRConf HP_ID AHFX1001 Common STRConf 1553 TR AHFX6001 Transmit STRConf Subaddr AHFX4001 Read cfg data STRConf Unit AHFX5001 Main STR STRConf DWC MC AHFX7001 7 <dec> STRCfg Nrof Wrđ AHFX8001 0 <dec> TC Control Flags : <p style="text-align: right;">GBM IL DSE --Y -- ---</p> Subsch. ID : 20 Det. descr. : TC_COMMAND_STR_CONFIGURATION	ACXC1001	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand Fire Cmd STR config Command Parameter(s) : FireFun DF86Cmd AH8F1001 FireFun DD86Cmd AH8F2001 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 20 Det. descr. : TC(8,4) Fire Command - Fire Cmd STR config	ACZ4M109 Enable 86 Enable 86	
15		Verify SA19 data		Next Step: 16
		Verify Telemetry STR1 ASW rev nr AMXPN074	<to be read>	AND=ZAADK999
		Verify Telemetry STR1 ASW issue AMXPP074	<to be read>	AND=ZAADK999
		Verify Telemetry STR1 Serial nr AMXPR074	<to be read>	AND=ZAADK999
16		Disable SA19 DTM		Next Step: 17
		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 107 <dec>	
17		IF S/C velocity vector is invalid		Next Step: THEN 18 ELSE 19
18		Execute procedure to Update S/C orbital velocity in STR (H_FCP_AOC_4S41)		Next Step: 19
		Execute Procedure: H_FCP_AOC_4S41 Update S/C orbital velocity in STR		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
TC Seq. Name :HFA4S11B (STR1 to AAD) TimeTag Type: N Sub Schedule ID: <input type="checkbox"/>				
19		Send TCs to set STRM CCD ref. temp.		Next Step: 20
		NOTE: Enter the CCD reference temperature (CCDrefTC) as a raw signed integer, via the following calibration... CCD reference temperature * 10 = CCDrefTC (e.g. +13.5C = +135 <dec>) The min/max allowed values for CCDrefTC are... MAX. value, +30C = +300 <dec> MIN. value, -10C = -100 <dec>		
		***** CONSTRAINT ***** Instrument calibrations assume STR1 is configured to operate with its CCD cooled to -10C and so it must be commanded back to this condition. In order to prevent a thermal undershoot, this operation should involve 3 instances of the TC separated by sufficient time (~10 minutes) to reach each of the CCD reference target temperatures: +6C = +60 <dec> -2C = -20 <dec> -10C = -100 <dec>		
		***** WARNING ***** This TC instance is defined to update <u>STM Main</u>		
		Execute Sequence HFA4S81X Change CCD Ref temp v03 Sequence Grouping = - Sequence Parameter(s) CCDrefTC = CCDrefTC This Sequence Reference is not included in the generated sequence SSID : 0		SEQ
20		Command STR1 to AAD mode		Next Step: 21

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry STRM 1 trackwin AEX61001	= More 1 trk wnd	AND=ZAA06999
		Verify Telemetry STRM Att qual AEXMY001	<to be read>	AND=ZAA05999
		<i>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.</i>		
22		<i>Enable TC check (STR LOS)</i>		Next Step: 23
		Execute Telecommand EnaChkSTRlossStar-initQ Command Parameter(s) : EnaChck DF86Cmd AH8F3001 EnaChck DD86Cmd AH8F4001 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 20 Det. descr. : TC(8,1) - Enable check FDIR - EnaChkSTRlossStar-initQ	ACZBW109 Enable 86 Enable 86	
		Verify Telemetry STR loss check AES4A001	= Enabled	AND=ZAA06999
23		<i>Delete diagnostic packets for SA15 and SA19</i>		Next Step: END
		Execute Telecommand Clear Diagnostic Report Command Parameter(s) : Number of pkts AH3NP109 HK Packet ID AH3PK109 TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 20 Det. descr. : TC(3,4) Clear Diagnostic Parameter Report Definitions	AC034109 1 <dec> (Def) 106 <dec>	

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		Execute Telecommand		
		Clear Diagnostic Report	AC034109	
		<i>Command Parameter(s) :</i> Number of pkts AH3NP109 HK Packet ID AH3PK109	1 <dec> (Def) 107 <dec>	
		<i>TC Control Flags :</i> GBM IL DSE --Y -- ---		
		<i>Subsch. ID : 20</i> <i>Det. descr. : TC(3,4) Clear Diagnostic Parameter Report Definitions</i>		
End of Procedure				