

Patch STR2 memory
File: H_FCP_AOC_8PM2.xls
Author: dsalt-hp



Procedure Summary

Objectives

The objective of this Herschel ACMS procedure is to patch the EEPROM and/or the RAM memory of STR2.

The procedure involves the following activities:

- verifying initial ACMS mode & STR2 status
- transition to SAM, if necessary (calls H_FCP_AOC_3A01)
- load and enable DTM (SA10)
- commanding STR2 reset
- patch STR2 EEPROM, as necessary (calls H_FCP_OCC_2282)
- patch STR2 RAM, as necessary (calls H_FCP_OCC_2284)
- commanding STR1 to STB with or without RAM load
- verifying STR2 status
- commanding STR2 to AAD mode
- disable and remove DTM (SA10)

Summary of Constraints

The ACMS must be in SAM if SRT1 is designated as Main. Otherwise, if STR1 is designated as Redundant, it is assumed to be powered ON prior to executing the procedure.

The worst case duration of a STR memory load depends on the rate with which memory load TC's are sent. The maximum rate with which data can be sent to the STR by the ACC is 56 32-bit words in a single ACMS cycle equivalent to 224 words / second.

The loading of STR memory is carried out using a dedicated TC provided by the ACC ASW. The size of the TC packet imposes limitations on the number of words that can be uplinked in a single command. If the TC's are sent directly from ground, packet size limitations restrict the number of 32-bit data words to 55; for TC's sent through the MTL the maximum is reduced further to 52 words.

The maximum size of an STR memory block that can be uploaded is 512 kb, which requires 2384 TC's. If the TC's are sent at a rate of one command per second, the time required will be close to 40 minutes.

Spacecraft Configuration

Start of Procedure

Spacecraft initial conditions:
- S/C nominal

End of Procedure

Spacecraft final conditions:
- as initial conditions but with STR2 memory patched

Reference File(s)

Input Command Sequences

Output Command Sequences

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HFA8PM2A
 HFA8PM2B
 HFA8PM2C
 HFA8PM2D

Referenced Displays

ANDs **GRDs** **SLDs**
 ZAA01999
 ZAA00999
 ZAAAD999

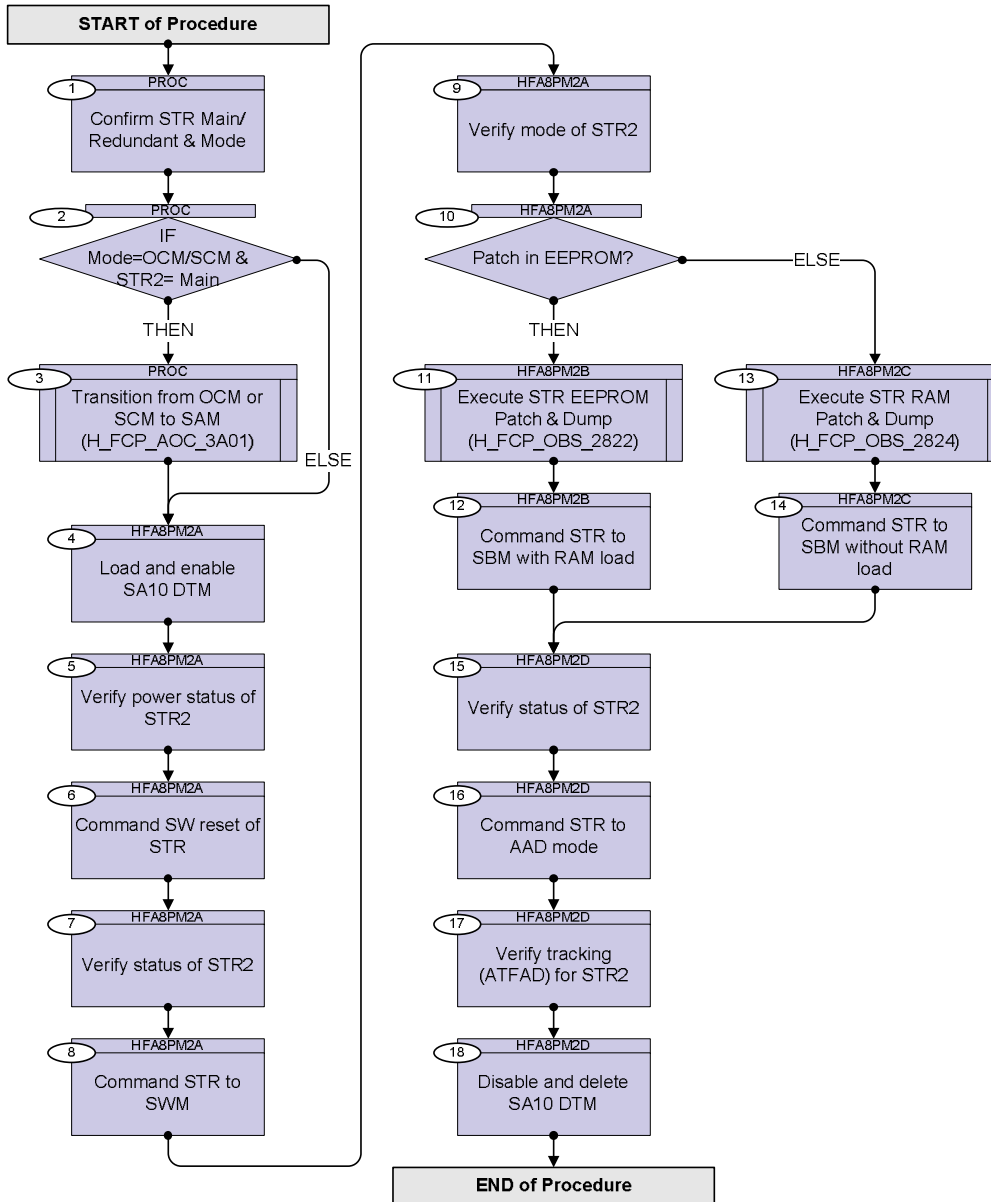
Configuration Control Information

| DATE | FOP ISSUE | VERSION | MODIFICATION DESCRIPTION | AUTHOR | SPR REF |
|----------|-----------|---------|--------------------------|----------|---------|
| 03/08/08 | 1 | 1 | Created | 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 | | Confirm STR Main/ Redundant & Mode | | Next Step: 2 |
| | | Verify Telemetry AcmsMode AESMG002 = SAM | | AND=ZAA01999 |
| | | Verify Telemetry Curr STR in use AES18002 = STR 1 | | AND=ZAA01999 |
| 2 | | IF Mode=OCM/SCM & STR2= Main | | Next Step: ELSE 4 THEN 3 |
| 3 | | Transition from OCM or SCM to SAM (H_FCP_AOC_3A01) | | Next Step: 4 |
| | | Execute Procedure: H_FCP_AOC_3A01 Transition from OCM or SCM to SAM | | |
| HFA8PM2A Ready SRT2 for patch | | | | |
| SSID : | | | | |
| 4 | | Load and enable SA10 DTM | | Next Step: 5 |

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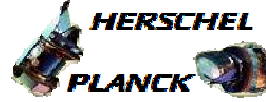
| Step No. | Time | Activity/Remarks | TC/TLM | Display/ Branch |
|----------|------|--|---|-----------------|
| | | Execute Telecommand TC32H STR SA10D1 Super | ACZYA109 | |
| | | Command Parameter(s) : HK Packet ID AH3PK109 TC3x_SID AHW04109 Interval AH3SA109 DID number AH3PA109 DID number AH3PA109 DID number AH3PA109 DID number AH3PA109 DID number AH3PA109 DID number AH3PA109 DID number AH3PA109 DID number AH3PA109 DID number AH3PA109 | 100 <dec> (Def) DTM Str12Sa10s (Def) 4 <dec> (Def) 16447 <dec> (Def) 16447 <dec> (Def) 16447 <dec> (Def) 16447 <dec> (Def) 16447 <dec> (Def) 16780 <dec> (Def) 16780 <dec> (Def) 16780 <dec> (Def) | |
| | | TC Control Flags : GBM IL DSE --Y -- --- SSID : 20 | | |
| | | Download packet definition to verify correct uplinking | | |
| | | Execute Telecommand Report Diag Report Def | AC311109 | |
| | | Command Parameter(s) : Number of pkts AH3NP109 HK Packet ID AH3PK109 | 1 <dec> (Def) 100 <dec> | |
| | | TC Control Flags : GBM IL DSE --Y -- --- SSID : 20 | | |
| | | Enable packet if correct uplinking has been confirmed | | |
| | | Execute Telecommand EnableTmGen | AC900070 | |
| | | Command Parameter(s) : N AH017070 Sub-Type AH019070 Packet-ID AH020070 | 1 <dec> (Def) Diag Report 100 <dec> | |
| | | TC Control Flags : GBM IL DSE --Y -- --- SSID : 20 | | |

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| Step No. | Time | Activity/Remarks | TC/TLM | Display/ Branch |
|----------|------|--|------------------|-----------------|
| 5 | | Verify power status of STR2 | | Next Step: 6 |
| | | Verify Telemetry STR2 power AE4P2002 | = ON | AND=ZAA00999 |
| 6 | | Command SW reset of STR | | Next Step: 7 |
| | | Execute Telecommand STR2 SW RESET | ACZM2109 | |
| | | 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 1 <dec> | | |
| | | TC Control Flags : GBM IL DSE --Y -- --- SSID : 20 | | |
| | | Execute Telecommand Fire Cmd STR config | ACZ4M109 | |
| | | Command Parameter(s) : FireFun DF86Cmd AH8F1001 Enable 86 FireFun DD86Cmd AH8F2001 Enable 86 | | |
| | | TC Control Flags : GBM IL DSE --Y -- --- SSID : 20 | | |
| | | <i>The STR reset command with the reset type set to 1 causes a SW reset in which only some initialisations are carried out. In particular, the contents of the RAM are entirely preserved.</i> | | |
| | | ACYHH109 STRmain SW RESET ACYHJ109 STRred SW RESET ACZM1109 STR1 SW RESET ACZM2109 STR2 SW RESET | | |
| 7 | | Verify status of STR2 | | Next Step: 8 |
| | | Verify Telemetry STR2 Mode AMX12075 | = Initialisation | AND=ZAAAD999 |
| | | Verify Telemetry STR2 2errEEPROM AMX18075 | = No failure | AND=ZAAAD999 |
| 8 | | Command STR to SWM | | Next Step: 9 |

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| Step No. | Time | Activity/Remarks | TC/TLM | Display/ Branch |
|--|------|--|--|----------------------------------|
| | | Execute Telecommand STR2 SWM Command Parameter(s) : STRCfG DF86 Cmd AH8J3001 STRCfG DD86 Cmd AH8J4001 STRCfG Nrof Wrđ AHFX8001 STRCfG Data Wrđ AHFX9001 TC Control Flags : GBM IL DSE --Y -- --- SSID : 20 | ACZN7109 Enable 86 Enable 86 1 <dec> (Def) 0 <dec> | |
| | | Execute Telecommand Fire Cmd STR config Command Parameter(s) : FireFun DF86Cmd AH8F1001 FireFun DD86Cmd AH8F2001 TC Control Flags : GBM IL DSE --Y -- --- SSID : 20 | ACZ4M109 Enable 86 Enable 86 | |
| | | Wait 30 seconds to allow mode change to be reflected in TM | | |
| 9 | | Verify mode of STR2 | | Next Step: 10 |
| | | Verify Telemetry STR2 Mode AMX12075 | = SW Maintenance | AND=ZAAAD999 |
| 10 | | Patch in EEPROM? | | Next Step: THEN 11 ELSE 13 |
| HFA8PM2B Patch EEPROM SSID : | | | | |
| 11 | | Execute STR EEPROM Patch & Dump (H_FCP_OBS_2822) | | Next Step: 12 |
| | | Execute Procedure: H_FCP_OBS_2822 Execute STR EEPROM memory patch and dump | | |
| 12 | | Command STR to SBM with RAM load | | Next Step: 15 |

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| Step No. | Time | Activity/Remarks | TC/TLM | Display/ Branch |
|----------------------------|------|--|------------------|------------------|
| | | Execute Telecommand STR2 STAND_BY Command Parameter(s) : STRCfG DF86 Cmd AH8J3001 Enable 86 STRCfG DD86 Cmd AH8J4001 Enable 86 STRCfG Nrof WrD AHFX8001 10 <dec> (Def) STRCfG Data WrD AHFX9001 1 <dec> STRCfG Data WrD AHFX9001 0 <dec> STRCfG Data WrD AHFX9001 0 <dec> STRCfG Data WrD AHFX9001 0 <dec> STRCfG Data WrD AHFX9001 0 <dec> STRCfG Data WrD AHFX9001 0 <dec> STRCfG Data WrD AHFX9001 0 <dec> STRCfG Data WrD AHFX9001 0 <dec> STRCfG Data WrD AHFX9001 0 <dec> STRCfG Data WrD AHFX9001 0 <dec> STRCfG Data WrD AHFX9001 0 <dec> TC Control Flags : GBM IL DSE --Y -- --- SSID : 20 | ACZM4109 | |
| | | Execute Telecommand Fire Cmd STR config Command Parameter(s) : FireFun DF86Cmd AH8F1001 Enable 86 FireFun DD86Cmd AH8F2001 Enable 86 TC Control Flags : GBM IL DSE --Y -- --- SSID : 20 | ACZ4M109 | |
| | | The TC selects the SBM option without reloading of the RAM from EEPROM. | | |
| HFA8PM2D STR2 to AAD | | | | |
| SSID : | | | | |
| 15 | | Verify status of STR2 | | Next Step: 16 |
| | | Verify Telemetry STR2 Mode AMX12075 | = Standby | AND=ZAAAD999 |
| | | Verify Telemetry STR2 Mode trans AMX10075 | = Cmd mode trans | AND=ZAAAD999 |
| | | Verify Telemetry STR2 1errEEPROM AMX16075 | = No failure | AND=ZAAAD999 |
| | | Verify Telemetry STR2 PROM load AMX17075 | = No failure | AND=ZAAAD999 |

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|----------|------|--|--------------|-----------------|
| | | Verify Telemetry STR2 2errEEPROM AMX18075 | = No failure | AND=ZAAAD999 |
| | | Verify Telemetry STR2 ASIC RAM AMX1B075 | = No failure | AND=ZAAAD999 |
| | | Verify Telemetry STR2 timeout HK AMX1E075 | = No failure | AND=ZAAAD999 |
| | | Verify Telemetry STR2 timeoutEOF AMX1D075 | = No failure | AND=ZAAAD999 |
| | | Verify Telemetry STR2 last TC st AMX1G075 | = No failure | AND=ZAAAD999 |
| | | Verify Telemetry STR2 TECcurfail AMX24075 | = No failure | AND=ZAAAD999 |
| | | Verify Telemetry STR2 volt1 fail AMX27075 | = No failure | AND=ZAAAD999 |
| | | Verify Telemetry STR2 volt2 fail AMX26075 | = No failure | AND=ZAAAD999 |
| | | Verify Telemetry STR2 volt3 fail AMX25075 | = No failure | AND=ZAAAD999 |
| | | Verify Telemetry STR2 opticTfail AMX28075 | = No failure | AND=ZAAAD999 |
| | | <i>STR housekeeping functions, including temperature control of the CCD, are suspended in software maintenance mode. The time necessary to bring the CCD temperature to nominal values when thermal control is re-started in standby mode depends on external conditions and may be as long as 10 minutes.</i> | | |
| | | Verify Telemetry STR2 CCDtmp1fai AMX2A075 | = No failure | AND=ZAAAD999 |
| | | Verify Telemetry STR2 CCDtmp2fai AMX29075 | = No failure | AND=ZAAAD999 |
| | | Verify Telemetry STR2 hlth summ AMX2B075 | = No failure | AND=ZAAAD999 |
| | | All analog HK parameters should have values within the nominal operating range. This applies also to CCD temperatures, even though the control of the thermoelectric cooler is not active in INI and SWM modes. | | |
| | | Verify Telemetry STR2 HK Volt 1 AMX1Y075 | | AND=ZAAAD999 |
| | | Verify Telemetry STR2 HK Volt 2 AMX1Z075 | | AND=ZAAAD999 |

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| Step No. | Time | Activity/Remarks | TC/TLM | Display/ Branch |
|-------------------------|------|---|---|-------------------|
| | | Execute Telecommand <p style="text-align: right;">Fire Cmd STR config</p> Command Parameter(s) : FireFun DF86Cmd AH8F1001 FireFun DD86Cmd AH8F2001 TC Control Flags : GBM IL DSE --Y -- --- SSID : 20 | ACZ4M109 Disable 86 Disable 86 | |
| | | Wait 40 seconds to make STR tracking is reflected in TM | | |
| 17 | | Verify tracking (ATFAD) for STR2 | | Next Step: 18 |
| | | Verify Telemetry <p style="text-align: right;">STR2 Submode AMX11075</p> | = STB nom ATFAD | AND=ZAAAD999 |
| | | Verify Telemetry <p style="text-align: right;">STR2 Mode AMX12075</p> | = Auto attdetect | AND=ZAAAD999 |
| 18 | | Disable and delete SA10 DTM | | Next Step: END |
| | | Execute Telecommand <p style="text-align: right;">DisableTmGen</p> Command Parameter(s) : N AH017070 Sub-Type AH019070 Packet-ID AH020070 TC Control Flags : GBM IL DSE --Y -- --- SSID : 20 | AC902070 1 <dec> (Def) Diag Report 100 <dec> | |
| | | Execute Telecommand <p style="text-align: right;">Clear Diagnostic Report</p> Command Parameter(s) : Number of pkts AH3NP109 HK Packet ID AH3PK109 TC Control Flags : GBM IL DSE --Y -- --- SSID : 20 | AC034109 1 <dec> (Def) 100 <dec> | |
| End of Procedure | | | | |