**Project: Solar Orbiter SWA**

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# Introduction

This document describes the procedure to power up and power down the flight model of the Solar Orbiter Solar Wind Analyser suite (SWA-FM).

# Scope and applicability

## Scope

These procedures define the instructions for powering up and powering down the flight model (FM) of the Solar Wind Analyser (SWA) of the SO-SWA project.

## Purpose

The purpose of the procedure is to provide all users with the correct procedure for putting SWA into the correct state for any further testing such as FFT, SFT etc. The procedure then provides the correct manner to power down SWA after any testing has been completed. This document should be referenced in any testing procedure documents used on SWA FM.

# References

## Normative references

This document incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at appropriate places in the text and publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these apply to this document only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

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| **Ref.** | **No** | **Title** |
| NR1 | SO-SWA-MSSL-PR-031 | SWA PFM Red/Green Tag Items Procedure |

# Abbreviations

|  |  |
| --- | --- |
| **Abbreviation** | **Meaning** |
| ACK / NACK | Acknowledge / Not-Acknowledge |
| AIT | Assembly Integration and Test |
| DPU | Data Processing Unit |
| EAS | Electron Analyser System |
| EGSE | Electrical Ground Support Equipment |
| EID | Experiment Interface Document |
| FM | Flight Model |
| ESA | European Space Agency |
| ETB | Electrical Test Bench |
| CFT | Complete Functional Test |
| HIS | Heavy Ion System |
| HK | House Keeping |
| HPC | High Power Command |
| HV | High Voltage |
| MSSL | Mullard Space Science Laboratory |
| N/A | Not Applicable |
| OTB | Operational Test Bench |
| PAS | Proton Alpha System |
| POST | Power On System-Test |
| PSU | Power Supply Unit |
| SC | SpaceCraft |
| SFT | Short Functional Test |
| SIIS | Spacecraft Instrument Interface System |
| SO | Solar Orbiter |
| SpW | Space Wire |
| SWA | Solar Wind Analyser |
| TBC | To Be Confirmed |
| TBD | To Be Defined |
| TC | Tele-command |
| TM | Telemetry Packet |

# Operating Facility & Setup

The procedures for the SWA units described in this document will be performed by Airbus. It is therefore assumed that the SWA is electrically integrated to the control system in the correct manner.

The units under test will remain purged throughout the test. The usual electrical discharge safe environment practices must be obeyed along with the usual clean room practices.

**The SWA sensor units are ESD sensitive and appropriate caution must be taken.**

The SWA sensor units must be correctly grounded.

The SWA must have SWA DPU software (vers 3.3.2) including ASW (vers 3.0.2) and ExOS (vers 3.1.2), or above.

The controlling system must have IDB version 4.1.0 or above.

All numbers quoted in the procedure below are decimal unless preceded by 0x to indicate hex.

**All HIS, EAS 1&2 and PAS HV Disable or Airsafe plugs must be installed in the correct configuration for the appropriate, following test.**

**The HIS entrance aperture cover shall be INSTALLED when using the DISABLE PLUG.**

**The HIS entrance aperture cover shall be REMOVED when using the AIRSAFE PLUG.**

See NR1 for details of the safety plug configuration.

In the event of any HK checks being out of limits or the TM checks being incorrect, the procedure should be halted immediately and advice sought from the SWA team.

# SWA Power Up Procedure

This power up procedure can be run on the Nominal side and the Redundant side.

The DPU must be powered up and configured first. Following this, HIS, PAS, EAS1 & EAS2 can be powered and configured in any order.

## Power up and configure the DPU

|  |  |  |
| --- | --- | --- |
| **Step N°** | **Commanding Flow** | **Checks and PASS/FAIL Criteria** |
|  | ; Switch on SWA with HPC  **TC, ZCSD11D2, PCSB0036\_:SPV** := “UNIT\_B” ; Redundant  Or  **TC, ZCSD11D2,** **PCSB0036\_:SPV** := “UNIT\_A” ; Nominal | ; Parameter to be checked in TM(5,1) SID= 43796 SWA\_E\_BOOT\_EVENT  **TM, YIA58452, NIA01633, EQUAL, BootEvent** |
|  | ; Wait 00:00:04 (4 seconds) |  |
|  | ; Enable Time Code Distribution |  |
|  | ; Wait 00:00:01 (1 seconds) |  |
|  | ; Send a Service 9 synchronization packet |  |
|  | ; Wait 00:00:01 (1 seconds) |  |
|  | ; Enable OBC SWA HeartBeat |  |
|  | ; Wait 00:00:50 (50 seconds) |  |
|  | ; Send command to leave Boot Mode  **TC, ZIA58735** |  |
|  | ; Wait 00:00:08 (8 seconds) from last TC. |  |
|  | ; Enable S20 with a frequency of 8Hz (125 msec) |  |
|  | ; Wait 00:00:01 (1 second) |  |
|  | ; Send a Service 9 synchronization packet | ; Reception of:  **TM, YIA58435** ;TM(5,1) SID=43535 SWA\_E\_ASW\_NOM\_PHASE\_REACHED  ; Parameter to be checked  **TM, YIA58435, NIA01633, EQUAL, ASWNomPhReach** |
|  | ; Wait 00:01:00 (60 seconds) |  |
|  | ; Perform the SpW connection test  **TC, ZIA58001** | ; Reception of:  **TM,YIA58061 ;** TM(17,2) SID=0 SWA\_TM\_CT\_REP |
|  | ; Check sensor currents | ; Parameter to be checked  **TM, YIA58200,NIA00837, LIMIT, 100,200** ; Eng DCDC current  **TM,,NIA00833, LIMIT, 0,10**; Eng EAS1 current  **TM,,NIA00832, LIMIT, 0,10**; Eng EAS2 current  **TM,,NIA00835, LIMIT, 0,10**; Eng PAS current  **TM,,NIA00834, LIMIT, 0,10**; Eng HIS current  ; Time packet is now synchronised with onboard time |
|  | ; Switch DPU into OPS mode  **TC, ZIA58703** | ; Parameter to be checked  **TM, YIA58445, NIA01633, EQUAL, DpuOpsState** |
|  | ; Adjust the HK rate  **TC, ZIA58052, PIA58050, EQUAL, DPU\_HK**  **TC, ZIA58052, PIA58052, EQUAL, 80** (10 seconds) | ; Wait 40 seconds |

## Power up and configure HIS

|  |  |  |
| --- | --- | --- |
|  | ; Send DPU command to power on HIS.  **TC, ZIA58729** |  |
|  | ; Wait 00:00:01 for DPU to enable HIS SpW |  |
|  | ; OBC switch the power on to HIS (OBC commands) (TBD by Airbus) |  |
|  | ; Wait 00:01:30 for HIS to boot (90 seconds) | ; Verify bootup message received  **TM, YIA58601** ; EID 43801 |
|  | ; Enable DPU HIS HB monitor  **TC, ZIA58063, PIA60452, EQUAL, 1**  **TC,, PIA60449, EQUAL, 47** |  |
|  |  | ; Verify FSW/Table image test status in BOOT TM  **TM, YIA58213, NIA03501, EQUAL, 0xC0DEC0DE** ; eeprom\_1\_code\_magic\_num  **TM,, NIA03505, EQUAL, 0x40080000** ; eeprom\_1\_code\_addr  **TM,, NIA03506, EQUAL, 0xC0DEC0DE** ; eeprom\_2\_code\_magic\_num  **TM,, NIA03510, EQUAL, 0x40080000** ; eeprom\_2\_code\_addr  **TM,, NIA03513, EQUAL, 0x007AB1E5** ; eeprom\_1\_table\_magic\_num  **TM,, NIA03515, EQUAL, 0x00017F86** ; HIS\_EEPROM1\_TABLE\_LEN  **TM,, NIA03517, EQUAL, 0x007AB1E5** ; eeprom\_2\_table\_magic\_num  **TM,, NIA03519, EQUAL, 0x00017F86** ; HIS\_EEPROM2\_TABLE\_LEN  **TM,, NIA03520, EQUAL, 0x01170506** ; HIS\_EEPROM2\_TABLE\_VER |
|  |  | ; Verify digital status in BOOT  **TM, YIA58213, NIA03546, EQUAL, 0x83** ; spw\_link\_version  **TM,, NIA03545, EQUAL, 0xFFFF** ; adc\_wait\_states  **TM,, NIA03541, EQUAL, 0x360802ff** ; sparc\_mem\_cfg\_reg\_1  **TM,, NIA03543, EQUAL, 0xc8000300** ; sparc\_mem\_cfg\_reg\_3  **TM,, NIA04700, EQUAL, 19** ; cdh\_fpga\_rev  **TM,, NIA04400, GREATER, 0** ; pkt\_creation\_time\_whole |
|  |  | ; Verify memory test status in BOOT  **TM, YIA58213, NIA03525, EQUAL, 0** ; HIS\_SCI\_MEM\_TEST\_FST  **TM,, NIA03526, EQUAL, 0** ; HIS\_SCI\_MEM\_TEST\_LST  **TM,, NIA03527, EQUAL, 0** ; HIS\_SCI\_MEM\_PAT\_FAI\_CNT  **TM,, NIA03528, EQUAL, 0** ; HIS\_SCI\_MEM\_PAT\_BAD\_BLKS  **TM,, NIA03529, EQUAL, 0** ; HIS\_SCI\_MEM\_INV\_TEST\_FST  **TM,, NIA03530, EQUAL, 0** ; HIS\_SCI\_MEM\_INV\_TEST\_LST  **TM,, NIA03531, EQUAL, 0** ; HIS\_SCI\_MEM\_INV\_FAI\_CNT  **TM,, NIA03532, EQUAL, 0** ; HIS\_SCI\_MEM\_INV\_BAD\_BLKS  **TM,, NIA03533, EQUAL, 0** ; HIS\_CDH\_PAT\_FST\_FAI\_ADD  **TM,, NIA03534, EQUAL, 0** ; HIS\_CDH\_PAT\_LST\_FAI\_ADD  **TM,, NIA03535, EQUAL, 0** ; HIS\_CDH\_PAT\_FAI\_CNT  **TM,, NIA03536, EQUAL, 0** ; HIS\_CDH\_PAT\_BAD\_BLKS  **TM,, NIA03537, EQUAL, 0** ; HIS\_CDH\_INV\_FST\_FAI\_ADD  **TM,, NIA03538, EQUAL, 0** ; HIS\_CDH\_INV\_LST\_FAI\_ADD  **TM,, NIA03539, EQUAL, 0** ; HIS\_CDH\_INV\_FAI\_CNT  **TM,, NIA03540, EQUAL, 0** ; HIS\_CDH\_INV\_BAD\_BLKS  **TM,, NIA03523, EQUAL, 0x4a55** ; boot\_mem\_addr  **TM,, NIA03524, EQUAL, 0x4a55** ; boot\_mem\_data |
|  |  | **;** Verify digital status in HK  **TM, YIA58212, NIA03010, GREATER, 90** ; his\_proc\_idle  **TM,,NIA04400, GREATER, 0** ; pkt\_creation\_time\_whole  **TM,,NIA04560, EQUAL, 0** ; macro\_current\_wait  **TM,,NIA04561, EQUAL, 0** ; macro\_last\_accepted\_service  **TM,,NIA04562, EQUAL, 0** ; macro\_last\_accepted\_subservice  **TM,,NIA04563, EQUAL, 0** ; macro\_last\_rejected\_service  **TM,,NIA04564, EQUAL, 0** ; macro\_last\_rejected\_subservice  **TM,,NIA04567, EQUAL, 0** ; con\_test\_cnt  **TM,,NIA04590, EQUAL, 0** ; dscb\_wdog\_count  **TM,,NIA04591, EQUAL, 6** ; dscb\_fpga\_rev  **TM,,NIA04592, EQUAL, 0x14** ; dscb\_fpga\_base  **TM,,NIA04594, EQUAL, 0** ; dscb\_corr\_edac  **TM,,NIA04595, EQUAL, 0** ; dscb\_uncorr\_edac  **TM,,NIA04599, EQUAL, 0** ; dscb\_naks |
|  |  | ; Verify analog telemetry being received from CDH  **TM, YIA58212, NIA01392, LIMIT, -40, 80** ; his\_lvps\_ac\_link\_t\_ave  **TM,,NIA01393, LIMIT, -40, 80** ; HIS\_LVPS\_12V\_DCDC\_TMP\_AVE  **TM,,NIA01394, LIMIT, -40, 80** ; HIS\_LVPS\_P3\_3V\_DCDC\_TMP\_AVE  **TM,,NIA01395, LIMIT, -40, 80** ; his\_lvps\_5V\_dcdc\_tmp\_ave  **TM,,NIA01396, LIMIT, -40, 80** ; HIS\_PS\_HVPS\_TMP\_AVE  **TM,,NIA01397, LIMIT, -40, 80** ; HIS\_CDH\_BOARD\_TMP\_AVE  **TM,,NIA01398, LIMIT, -40, 80** ; HIS\_CDH\_CPU\_TMP\_AVE  **TM,,NIA01399, LIMIT, -40, 80** ; HIS\_HVPS\_TMP\_AVE  **TM,,NIA01400, LIMIT, -0.01, 0.1683** ; his\_lvps\_ac\_link\_i\_ave  **TM,,NIA01401, LIMIT, 0, 24.3716** ; his\_lvps\_ac\_link\_v\_ave  **TM,,NIA01402, LIMIT, -13.2, -12.3481** ; HIS\_LVPS\_N12V\_AVE  **TM,,NIA01403, LIMIT, 1.72078, 1.82825** ; his\_cdh\_p1\_8v\_v\_ave  **TM,,NIA01404, LIMIT, 1.4453, 1.53676** ; his\_cdh\_p1\_5v\_v\_ave  **TM,,NIA01405, LIMIT, 12.04837, 12.80496** ; HIS\_LVPS\_P12V\_AVE  **TM,,NIA01406, LIMIT, 0.239, 0.448** ; HIS\_LVPS\_P3\_3V\_CUR\_AVE  **TM,,NIA01407, LIMIT, -0.618, 0** ; HIS\_HVPS\_MAIN\_NEG\_AVE  **TM,,NIA01408, LIMIT, -22.1, 22.1** ; HIS\_HVPS\_TOP\_DEF\_AVE  **TM,,NIA01409, LIMIT, -22.1, 22.1** ; HIS\_HVPS\_BOT\_DEF\_AVE  **TM,,NIA01340, LIMIT, -40, 80** ; his\_eais\_port\_tmp\_t\_ave  **TM,,NIA01343, LIMIT, 0, 0.618** ; HIS\_HVPS\_MAIN\_POS\_AVE  **TM,,NIA01346, LIMIT, -22.1, 0** ; HIS\_HVPS\_ANL\_AVE  **TM,,NIA01349, LIMIT, -22.1, 22.1** ; HIS\_HVPS\_TOP\_PLATE\_AVE  **TM,,NIA01352, LIMIT, -2.64, 0** ; HIS\_PA\_HVPS\_VOLT\_M\_AVE  **TM,,NIA01702, LIMIT, 4.93317, 5.08674** ; his\_cdh\_p5v\_dac\_v\_ave  **TM,,NIA01705, LIMIT, 3.28086, 3.346853** ; his\_cdh\_p3\_3v\_adc\_v\_ave  **TM,,NIA01708, LIMIT, 9, 25** ; his\_cdh\_ground\_v\_ave  **TM,,NIA01711, LIMIT, 0.0198, 0.07** ; HIS\_HVPS\_P12V\_CUR\_AVE  **TM,,NIA01714, LIMIT, -0.07, -0.018** ; HIS\_HVPS\_N12V\_CUR\_AVE  **TM,,NIA01723, LIMIT, -0.0121, -0.009** ; HIS\_LVPS\_N5V\_CUR\_AVE  **TM,,NIA01726, LIMIT, -0.066, -0.0225** ; HIS\_LVPS\_N12V\_CUR\_AVE  **TM,,NIA01729, LIMIT, 3.20682, 3.41548** ; HIS\_LVPS\_P3\_3V\_AVE  **TM,,NIA01732, LIMIT, 0.02937, 0.0429** ; HIS\_LVPS\_P5V\_CUR\_AVE  **TM,,NIA01735, LIMIT, 4.90432, 5.21077** ; HIS\_LVPS\_P5V\_AVE  **TM,,NIA01738, LIMIT, -5.22954, -4.97319** ; HIS\_LVPS\_N5V\_AVE  **TM,,NIA01741, LIMIT, 0.02, 0.066** ; HIS\_LVPS\_P12V\_CUR\_AVE  **TM,,NIA01320, LIMIT, -40, 80** ; his\_lvps\_ac\_link\_t\_min  **TM,,NIA01321, LIMIT, -40, 80** ; HIS\_LVPS\_12V\_DCDC\_TMP\_MIN  **TM,,NIA01322, LIMIT, -40, 80** ; HIS\_LVPS\_P3\_3V\_DCDC\_TMP\_MIN  **TM,,NIA01323, LIMIT, -40, 80** ; his\_lvps\_5V\_dcdc\_tmp\_min  **TM,,NIA01324, LIMIT, -40, 80** ; HIS\_PS\_HVPS\_TMP\_MIN  **TM,,NIA01325, LIMIT, -40, 80** ; HIS\_CDH\_BOARD\_TMP\_MIN  **TM,,NIA01326, LIMIT, -40, 80** ; HIS\_CDH\_CPU\_TMP\_MIN  **TM,,NIA01327, LIMIT, -40, 80** ; HIS\_HVPS\_TMP\_MIN  **TM,,NIA01328, LIMIT, -0.01, 0.1683** ; his\_lvps\_ac\_link\_i\_min  **TM,,NIA01329, LIMIT, 0, 24.3716** ; his\_lvps\_ac\_link\_v\_min  **TM,,NIA01330, LIMIT, -13.2, -12.3481** ; HIS\_LVPS\_N12V\_MIN  **TM,,NIA01331, LIMIT, 1.72078, 1.82825** ; his\_cdh\_p1\_8v\_v\_min  **TM,,NIA01332, LIMIT, 1.4453, 1.53676** ; his\_cdh\_p1\_5v\_v\_min  **TM,,NIA01333, LIMIT, 12.04837, 12.80496** ; HIS\_LVPS\_P12V\_MIN  **TM,,NIA01334, LIMIT, 0.239, 0.448** ; HIS\_LVPS\_P3\_3V\_CUR\_MIN  **TM,,NIA01335, LIMIT, -0.618, 0** ; HIS\_HVPS\_MAIN\_NEG\_MIN  **TM,,NIA01336, LIMIT, -22.1, 22.1** ; HIS\_HVPS\_TOP\_DEF\_MIN  **TM,,NIA01337, LIMIT, -22.1, 22.1** ; HIS\_HVPS\_BOT\_DEF\_MIN  **TM,,NIA01338, LIMIT, -40, 80** ; his\_eais\_port\_tmp\_t\_min  **TM,,NIA01341, LIMIT, 0, 0.618** ; HIS\_HVPS\_MAIN\_POS\_MIN  **TM,,NIA01344, LIMIT, -22.1, 0** ; HIS\_HVPS\_ANL\_MIN  **TM,,NIA01347, LIMIT, -22.1, 22.1** ; HIS\_HVPS\_TOP\_PLATE\_MIN  **TM,,NIA01350, LIMIT, -2.64, 0** ; HIS\_PA\_HVPS\_VOLT\_M\_MIN  **TM,,NIA01700, LIMIT, 4.93317, 5.08674** ; his\_cdh\_p5v\_dac\_v\_min  **TM,,NIA01703, LIMIT, 3.28086, 3.346853** ; his\_cdh\_p3\_3v\_adc\_v\_min  **TM,,NIA01706, LIMIT, 9, 25** ; his\_cdh\_ground\_v\_min  **TM,,NIA01709, LIMIT, 0.0198, 0.07** ; HIS\_HVPS\_P12V\_CUR\_MIN  **TM,,NIA01712, LIMIT, -0.07, -0.018** ; HIS\_HVPS\_N12V\_CUR\_MIN  **TM,,NIA01721, LIMIT, -0.0121, -0.009** ; HIS\_LVPS\_N5V\_CUR\_MIN  **TM,,NIA01724, LIMIT, -0.066, -0.0225** ; HIS\_LVPS\_N12V\_CUR\_MIN  **TM,,NIA01727, LIMIT, 3.20682, 3.41548** ; HIS\_LVPS\_P3\_3V\_MIN  **TM,,NIA01730, LIMIT, 0.02937, 0.0429** ; HIS\_LVPS\_P5V\_CUR\_MIN  **TM,,NIA01733, LIMIT, 4.90432, 5.21077** ; HIS\_LVPS\_P5V\_MIN  **TM,,NIA01736, LIMIT, -5.22954, -4.97319** ; HIS\_LVPS\_N5V\_MIN  **TM,,NIA01739, LIMIT, 0.02, 0.066** ; HIS\_LVPS\_P12V\_CUR\_MIN  **TM,,NIA01356, LIMIT, -40, 80** ; his\_lvps\_ac\_link\_t\_max  **TM,,NIA01357, LIMIT, -40, 80** ; HIS\_LVPS\_12V\_DCDC\_TMP\_MAX  **TM,,NIA01358, LIMIT, -40, 80** ; HIS\_LVPS\_P3\_3V\_DCDC\_TMP\_MAX  **TM,,NIA01359, LIMIT, -40, 80** ; his\_lvps\_5V\_dcdc\_tmp\_max  **TM,,NIA01360, LIMIT, -40, 80** ; HIS\_PS\_HVPS\_TMP\_MAX  **TM,,NIA01361, LIMIT, -40, 80** ; HIS\_CDH\_BOARD\_TMP\_MAX  **TM,,NIA01362, LIMIT, -40, 80** ; HIS\_CDH\_CPU\_TMP\_MAX  **TM,,NIA01363, LIMIT, -40, 80** ; HIS\_HVPS\_TMP\_MAX  **TM,,NIA01364, LIMIT, -0.01, 0.1683** ; his\_lvps\_ac\_link\_i\_max  **TM,,NIA01365, LIMIT, 0, 24.3716** ; his\_lvps\_ac\_link\_v\_max  **TM,,NIA01366, LIMIT, -13.2, -12.3481** ; HIS\_LVPS\_N12V\_MAX  **TM,,NIA01367, LIMIT, 1.72078, 1.82825** ; his\_cdh\_p1\_8v\_v\_max  **TM,,NIA01368, LIMIT, 1.4453, 1.53676** ; his\_cdh\_p1\_5v\_v\_max  **TM,,NIA01369, LIMIT, 12.04837, 12.80496** ; HIS\_LVPS\_P12V\_MAX  **TM,,NIA01370, LIMIT, 0.239, 0.448** ; HIS\_LVPS\_P3\_3V\_CUR\_MAX  **TM,,NIA01371, LIMIT, -0.618, 0** ; HIS\_HVPS\_MAIN\_NEG\_MAX  **TM,,NIA01372, LIMIT, -22.1, 22.1** ; HIS\_HVPS\_TOP\_DEF\_MAX  **TM,,NIA01373, LIMIT, -22.1, 22.1** ; HIS\_HVPS\_BOT\_DEF\_MAX  **TM,,NIA01339, LIMIT, -40, 80** ; his\_eais\_port\_tmp\_t\_max  **TM,,NIA01342, LIMIT, 0, 0.618** ; HIS\_HVPS\_MAIN\_POS\_MAX  **TM,,NIA01345, LIMIT, -22.1, 0** ; HIS\_HVPS\_ANL\_MAX  **TM,,NIA01348, LIMIT, -22.1, 22.1** ; HIS\_HVPS\_TOP\_PLATE\_MAX  **TM,,NIA01351, LIMIT, -2.64, 0** ; HIS\_PA\_HVPS\_VOLT\_M\_MAX  **TM,,NIA01701, LIMIT, 4.93317, 5.08674** ; his\_cdh\_p5v\_dac\_v\_max  **TM,,NIA01704, LIMIT, 3.28086, 3.346853** ; his\_cdh\_p3\_3v\_adc\_v\_max  **TM,,NIA01707, LIMIT, 9, 25** ; his\_cdh\_ground\_v\_max  **TM,,NIA01710, LIMIT, 0.0198, 0.07** ; HIS\_HVPS\_P12V\_CUR\_MAX  **TM,,NIA01713, LIMIT, -0.07, -0.018** ; HIS\_HVPS\_N12V\_CUR\_MAX  **TM,,NIA01722, LIMIT, -0.0121, -0.009** ; HIS\_LVPS\_N5V\_CUR\_MAX  **TM,,NIA01725, LIMIT, -0.066, -0.0225** ; HIS\_LVPS\_N12V\_CUR\_MAX  **TM,,NIA01728, LIMIT, 3.20682, 3.41548** ; HIS\_LVPS\_P3\_3V\_MAX  **TM,,NIA01731, LIMIT, 0.02937, 0.0429** ; HIS\_LVPS\_P5V\_CUR\_MAX  **TM,,NIA01734, LIMIT, 4.90432, 5.21077** ; HIS\_LVPS\_P5V\_MAX  **TM,,NIA01737, LIMIT, -5.22954, -4.97319** ; HIS\_LVPS\_N5V\_MAX  **TM,,NIA01740, LIMIT, 0.02, 0.066** ; HIS\_LVPS\_P12V\_CUR\_MAX |
|  |  | ; Verify analog telemetry being received from DSCB  **TM, YIA58212, NIA04653, LIMIT, 0, 0.33** ; HIS\_STARTMCPVMON\_AVE  **TM,,NIA04654, LIMIT, 0, 0.33** ; HIS\_STOPMCPVMON\_AVE  **TM,,NIA04655, LIMIT, 0, 110** ; HIS\_SSDVMON\_AVE  **TM,,NIA04656, LIMIT, 0, 0.145** ; HIS\_OFFSETVMON\_AVE  **TM,,NIA04657, LIMIT, 0, 11.604** ; HIS\_STARTMCPIMON\_AVE  **TM,,NIA04658, LIMIT, 0, 15.211** ; HIS\_STOPMCPIMON\_AVE  **TM,,NIA04659, LIMIT, -40, 80** ; HIS\_STOP\_TEMP\_AVE  **TM,,NIA04660, LIMIT, -40, 80** ; HIS\_DSCB\_TEMP\_AVE  **TM,,NIA04661, LIMIT, 4.9098, 5.0601** ; HIS\_P5V\_DAC\_REF\_MON\_AVE  **TM,,NIA04662, LIMIT, 3.26242, 3.345645** ; HIS\_P3\_3V\_ADC\_REF\_AVE  **TM,,NIA04663, LIMIT, 4.91176, 5.06212** ; HIS\_P5V\_ADC\_REF\_MON\_AVE  **TM,,NIA04664, LIMIT, 0, 4095** ; HIS\_ASIC\_MON\_AVE  **TM,,NIA04665, LIMIT, 3.19809, 3.39591** ; HIS\_P3\_3V\_AVE  **TM,,NIA04666, LIMIT, 1.42595, 1.57815** ; HIS\_P1\_5V\_AVE  **TM,,NIA04667, LIMIT, 0, 4** ; HIS\_SSDIMON\_AVE  **TM,,NIA04619, LIMIT, 4.91176, 5.06212** ; HIS\_P5V\_ADC\_REF\_MON\_MIN  **TM,,NIA04620, LIMIT, 0, 4095** ; HIS\_ASIC\_MON\_MIN  **TM,,NIA04621, LIMIT, 3.19809, 3.39591** ; HIS\_P3\_3V\_MIN  **TM,,NIA04622, LIMIT, 1.42595, 1.57815** ; HIS\_P1\_5V\_MIN  **TM,,NIA04623, LIMIT, 0, 4** ; HIS\_SSDIMON\_MIN  **TM,,NIA04624, LIMIT, 0, 5** ; HIS\_OFFSETIMON\_MIN  **TM,,NIA04625, LIMIT, 0..61, 0.0156** ; HIS\_V\_IMON\_REF\_MIN  **TM,,NIA04626, LIMIT, -40, 80** ; HIS\_HVPS\_TEMP\_MIN  **TM,,NIA04627, LIMIT, -40, 80** ; HIS\_DSIB\_TEMP\_MIN  **TM,,NIA04628, LIMIT, -40, 80** ; HIS\_SSD\_TEMP\_MIN  **TM,,NIA04629, LIMIT, -40, 80** ; HIS\_ASIC\_TEMP\_MIN  **TM,,NIA04630, LIMIT, -40, 80** ; HIS\_START\_TEMP\_MIN  **TM,,NIA04631, LIMIT, 0, 0.33** ; HIS\_STARTMCPVMON\_MAX  **TM,,NIA04632, LIMIT, 0, 0.33** ; HIS\_STOPMCPVMON\_MAX  **TM,,NIA04633, LIMIT, 0, 110** ; HIS\_SSDVMON\_MAX  **TM,,NIA04634, LIMIT, 0, 0.145** ; HIS\_OFFSETVMON\_MAX  **TM,,NIA04635, LIMIT, 0, 11.604** ; HIS\_STARTMCPIMON\_MAX  **TM,,NIA04636, LIMIT, 0, 15.211** ; HIS\_STOPMCPIMON\_MAX  **TM,,NIA04637, LIMIT, -40, 80** ; HIS\_STOP\_TEMP\_MAX  **TM,,NIA04638, LIMIT, -40, 80** ; HIS\_DSCB\_TEMP\_MAX  **TM,,NIA04639, LIMIT, 4.9098, 5.0601** ; HIS\_P5V\_DAC\_REF\_MON\_MAX  **TM,,NIA04640, LIMIT, 3.26242, 3.345645** ; HIS\_P3\_3V\_ADC\_REF\_MAX  **TM,,NIA04641, LIMIT, 4.91176, 5.06212** ; HIS\_P5V\_ADC\_REF\_MON\_MAX  **TM,,NIA04642, LIMIT, 0, 4095** ; HIS\_ASIC\_MON\_MAX  **TM,,NIA04643, LIMIT, 3.19809, 3.39591** ; HIS\_P3\_3V\_MAX  **TM,,NIA04644, LIMIT, 1.42595, 1.57815** ; HIS\_P1\_5V\_MAX  **TM,,NIA04645, LIMIT, 0, 4** ; HIS\_SSDIMON\_MAX  **TM,,NIA04646, LIMIT, 0, 5** ; HIS\_OFFSETIMON\_MAX  **TM,,NIA04647, LIMIT, 0..61, 0.0156** ; HIS\_V\_IMON\_REF\_MAX  **TM,,NIA04648, LIMIT, -40, 80** ; HIS\_HVPS\_TEMP\_MAX  **TM,,NIA04649, LIMIT, -40, 80** ; HIS\_DSIB\_TEMP\_MAX  **TM,,NIA04650, LIMIT, -40, 80** ; HIS\_SSD\_TEMP\_MAX  **TM,,NIA04651, LIMIT, -40, 80** ; HIS\_ASIC\_TEMP\_MAX  **TM,,NIA04652, LIMIT, -40, 80** ; HIS\_START\_TEMP\_MAX |
|  | ; Put HIS into standby mode  **TC, ZIA58917, PIA59011,EQUAL, HVSTDBY** | ; Reception of:  **TM, YIA58602 ;** SWA\_E\_HIS\_MODE\_CHANGE |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure HIS to no HV sweeping (static ouput only)  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_ANALYZER**  **TC,, PIA60352, EQUAL, 0** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure HIS to no HV sweeping (static ouput only)  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_TOP\_DFL**  **TC,, PIA60352, EQUAL, 0** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure HIS to no HV sweeping (static ouput only)  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_BOT\_DFL**  **TC,, PIA60352, EQUAL, 0** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure HIS to no HV sweeping (static ouput only)  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_TOP\_PLATE**  **TC,, PIA60352, EQUAL, 0** |  |

## Power up and configure PAS

|  |  |  |
| --- | --- | --- |
| **Step N°** | **FFT Commanding Flow** | **Checks and PASS/FAIL Criteria** |
|  | ; Enable PAS HK  **TC, ZIA58050, PIA58050, EQUAL, PAS\_SENS\_HK** |  |
|  | ; Modify Macro PAS ON +28V monitor  **TC, ZIA58711, PIA60146,EQUAL,0x0011**  **TC,,PIA60149,EQUAL,2**  **TC,,PIA60150,EQUAL,0x0001**  **TC,,PIA60410,EQUAL,0x31**  **TC,,PIA60409,EQUAL,0x00**  **TC,,PIA60151,EQUAL,0x0000**  **TC,,PIA60147,EQUAL,0x0000**  **TC,,PIA60148,EQUAL,0x0000**  **TC,,PIA60139,EQUAL,0x0000**  **TC,,PIA60140,EQUAL,0x01**  **TC,,PIA60142,EQUAL,0x00**  **TC,,PIA60143,EQUAL,0x2A**  **TC,,PIA60144,EQUAL,0x00**  **TC,,PIA60145,EQUAL,0x02**  **TC,,PIA60141,EQUAL,0x2B**  **TC,,PIA60150,EQUAL,0x0002**  **TC,,PIA60410,EQUAL,0x31**  **TC,,PIA60409,EQUAL,0x00**  **TC,,PIA60151,EQUAL,0x0000**  **TC,,PIA60147,EQUAL,0x0000**  **TC,,PIA60148,EQUAL,0x0000**  **TC,,PIA60139,EQUAL,0x0000**  **TC,,PIA60140,EQUAL,0x01**  **TC,,PIA60142,EQUAL,0x00**  **TC,,PIA60143,EQUAL,0x2A**  **TC,,PIA60144,EQUAL,0x01**  **TC,,PIA60145,EQUAL,0x08**  **TC,,PIA60141,EQUAL,0x6C** | ; Wait 00:00:02 (2 seconds) |
|  | ; Modify Macro PAS ON +12V monitor  **TC,ZIA58711,PIA60146,EQUAL,0x0011**  **TC,,PIA60149,EQUAL,2**  **TC,,PIA60150,EQUAL,0x0003**  **TC,,PIA60410,EQUAL,0x31**  **TC,,PIA60409,EQUAL,0x00**  **TC,,PIA60151,EQUAL,0x0000**  **TC,,PIA60147,EQUAL,0x0000**  **TC,,PIA60148,EQUAL,0x0000**  **TC,,PIA60139,EQUAL,0x0000**  **TC,,PIA60140,EQUAL,0x01**  **TC,,PIA60142,EQUAL,0x00**  **TC,,PIA60143,EQUAL,0x24**  **TC,,PIA60144,EQUAL,0x00**  **TC,,PIA60145,EQUAL,0x01**  **TC,,PIA60141,EQUAL,0x1F**  **TC,,PIA60150,EQUAL,0x0004**  **TC,,PIA60410,EQUAL,0x31**  **TC,,PIA60409,EQUAL,0x00**  **TC,,PIA60151,EQUAL,0x0000**  **TC,,PIA60147,EQUAL,0x0000**  **TC,,PIA60148,EQUAL,0x0000**  **TC,,PIA60139,EQUAL,0x0000**  **TC,,PIA60140,EQUAL,0x01**  **TC,,PIA60142,EQUAL,0x00**  **TC,,PIA60143,EQUAL,0x24**  **TC,,PIA60144,EQUAL,0x01**  **TC,,PIA60145,EQUAL,0x0F**  **TC,,PIA60141,EQUAL,0x87** | ; Wait 00:00:02 (2 seconds) |
|  | ; Modify Macro PAS ON -12V monitor  **TC,ZIA58711,PIA60146,EQUAL,0x0011**  **TC,,PIA60149,EQUAL,2**  **TC,,PIA60150,EQUAL,0x0005**  **TC,,PIA60410,EQUAL,0x31**  **TC,,PIA60409,EQUAL,0x00**  **TC,,PIA60151,EQUAL,0x0000**  **TC,,PIA60147,EQUAL,0x0000**  **TC,,PIA60148,EQUAL,0x0000**  **TC,,PIA60139,EQUAL,0x0000**  **TC,,PIA60140,EQUAL,0x01**  **TC,,PIA60142,EQUAL,0x00**  **TC,,PIA60143,EQUAL,0x26**  **TC,,PIA60144,EQUAL,0x00**  **TC,,PIA60145,EQUAL,0x00**  **TC,,PIA60141,EQUAL,0xCC**  **TC,,PIA60150,EQUAL,0x0006**  **TC,,PIA60410,EQUAL,0x31**  **TC,,PIA60409,EQUAL,0x00**  **TC,,PIA60151,EQUAL,0x0000**  **TC,,PIA60147,EQUAL,0x0000**  **TC,,PIA60148,EQUAL,0x0000**  **TC,,PIA60139,EQUAL,0x0000**  **TC,,PIA60140,EQUAL,0x01**  **TC,,PIA60142,EQUAL,0x00**  **TC,,PIA60143,EQUAL,0x26**  **TC,,PIA60144,EQUAL,0x01**  **TC,,PIA60145,EQUAL,0x0F**  **TC,,PIA60141,EQUAL,0x32** | ; Wait 00:00:02 (2 seconds) |
|  | ; Modify Macro PAS ON +3.3V monitor  **TC, ZIA58711,PIA60146,EQUAL,0x0011**  **TC,,PIA60149,EQUAL,2**  **TC,,PIA60150,EQUAL,0x0007**  **TC,,PIA60410,EQUAL,0x31**  **TC,,PIA60409,EQUAL,0x00**  **TC,,PIA60151,EQUAL,0x0000**  **TC,,PIA60147,EQUAL,0x0000**  **TC,,PIA60148,EQUAL,0x0000**  **TC,,PIA60139,EQUAL,0x0000**  **TC,,PIA60140,EQUAL,0x01**  **TC,,PIA60142,EQUAL,0x00**  **TC,,PIA60143,EQUAL,0x28**  **TC,,PIA60144,EQUAL,0x00**  **TC,,PIA60145,EQUAL,0x00**  **TC,,PIA60141,EQUAL,0xE6**  **TC,,PIA60150,EQUAL,0x0008**  **TC,,PIA60410,EQUAL,0x31**  **TC,,PIA60409,EQUAL,0x00**  **TC,,PIA60151,EQUAL,0x0000**  **TC,,PIA60147,EQUAL,0x0000**  **TC,,PIA60148,EQUAL,0x0000**  **TC,,PIA60139,EQUAL,0x0000**  **TC,,PIA60140,EQUAL,0x01**  **TC,,PIA60142,EQUAL,0x00**  **TC,,PIA60143,EQUAL,0x28**  **TC,,PIA60144,EQUAL,0x01**  **TC,,PIA60145,EQUAL,0x0A**  **TC,,PIA60141,EQUAL,0xCB}** | ; Wait 00:00:02 (2 seconds) |
|  | ; Modify Macro PAS ON +1.5V monitor  **TC, ZIA58711,PIA60146,EQUAL,0x0011**  **TC,,PIA60149,EQUAL,2**  **TC,,PIA60150,EQUAL,0x0009**  **TC,,PIA60410,EQUAL,0x31**  **TC,,PIA60409,EQUAL,0x00**  **TC,,PIA60151,EQUAL,0x0000**  **TC,,PIA60147,EQUAL,0x0000**  **TC,,PIA60148,EQUAL,0x0000**  **TC,,PIA60139,EQUAL,0x0000**  **TC,,PIA60140,EQUAL,0x01**  **TC,,PIA60142,EQUAL,0x00**  **TC,,PIA60143,EQUAL,0x2C**  **TC,,PIA60144,EQUAL,0x00**  **TC,,PIA60145,EQUAL,0x02**  **TC,,PIA60141,EQUAL,0x71**  **TC,,PIA60150,EQUAL,0x000A**  **TC,,PIA60410,EQUAL,0x31**  **TC,,PIA60409,EQUAL,0x00**  **TC,,PIA60151,EQUAL,0x0000**  **TC,,PIA60147,EQUAL,0x0000**  **TC,,PIA60148,EQUAL,0x0000**  **TC,,PIA60139,EQUAL,0x0000**  **TC,,PIA60140,EQUAL,0x01**  **TC,,PIA60142,EQUAL,0x00**  **TC,,PIA60143,EQUAL,0x2C**  **TC,,PIA60144,EQUAL,0x01**  **TC,,PIA60145,EQUAL,0x0A**  **TC,,PIA60141,EQUAL,0xD1}** | ; Wait 00:00:02 (2 seconds) |
|  | ; Modify Macro PAS ON Control Register to,EQUAL,0x18  **TC, ZIA58711,PIA60146,EQUAL,0x0011**  **TC,,PIA60149,EQUAL,2**  **TC,,PIA60150,EQUAL,0x000C**  **TC,,PIA60410,EQUAL,0x13**  **TC,,PIA60409,EQUAL,0x00**  **TC,,PIA60151,EQUAL,0x0000**  **TC,,PIA60147,EQUAL,0x0000**  **TC,,PIA60148,EQUAL,0x0000**  **TC,,PIA60139,EQUAL,0x0000**  **TC,,PIA60140,EQUAL,0x00**  **TC,,PIA60142,EQUAL,0x00**  **TC,,PIA60143,EQUAL,0x18**  **TC,,PIA60144,EQUAL,0x00**  **TC,,PIA60145,EQUAL,0x00**  **TC,,PIA60141,EQUAL,0x00**  **TC,,PIA60150,EQUAL,0x000E**  **TC,,PIA60410,EQUAL,0x29**  **TC,,PIA60409,EQUAL,0x00**  **TC,,PIA60151,EQUAL,0x0000**  **TC,,PIA60147,EQUAL,0x0000**  **TC,,PIA60148,EQUAL,0x0000**  **TC,,PIA60139,EQUAL,0x0000**  **TC,,PIA60140,EQUAL,0x00**  **TC,,PIA60142,EQUAL,0x00**  **TC,,PIA60143,EQUAL,0x18**  **TC,,PIA60144,EQUAL,0xFF**  **TC,,PIA60145,EQUAL,0x00**  **TC,,PIA60141,EQUAL,0x00}** | ; Wait 00:00:02 (2 seconds) |
|  | ; Modify Macro PAS ON delay to 1000ms on step 18  **TC,ZIA58711,PIA60146,EQUAL,0x0011**  **TC,,PIA60149,EQUAL,2**  **TC,,PIA60150,EQUAL,0x0010**  **TC,,PIA60410,EQUAL,0x1D**  **TC,,PIA60409,EQUAL,0x00**  **TC,,PIA60151,EQUAL,0x0008**  **TC,,PIA60147,EQUAL,0x0000**  **TC,,PIA60148,EQUAL,0x0000**  **TC,,PIA60139,EQUAL,0x0000**  **TC,,PIA60140,EQUAL,0x00**  **TC,,PIA60142,EQUAL,0x00**  **TC,,PIA60143,EQUAL,0x01**  **TC,,PIA60144,EQUAL,0x00**  **TC,,PIA60145,EQUAL,0x00**  **TC,,PIA60141,EQUAL,0x00**  **TC,,PIA60150,EQUAL,0x0011**  **TC,,PIA60410,EQUAL,0x06**  **TC,,PIA60409,EQUAL,0x01**  **TC,,PIA60151,EQUAL,0x0008**  **TC,,PIA60147,EQUAL,0x0000**  **TC,,PIA60148,EQUAL,0x0000**  **TC,,PIA60139,EQUAL,0x0000**  **TC,,PIA60140,EQUAL,0x00**  **TC,,PIA60142,EQUAL,0x00**  **TC,,PIA60143,EQUAL,0x00**  **TC,,PIA60144,EQUAL,0x00**  **TC,,PIA60145,EQUAL,0x00**  **TC,,PIA60141,EQUAL,0x00}** | ; Wait 00:00:02 (2 seconds) |
|  | ; Accept Macro Change  **TC,ZIA58713,PIA60154,EQUAL,0x0011**  **TC,,PIA60153,EQUAL,0x2F71** | ; Wait 00:00:02 (2 seconds) |
|  | ; Run PAS Power on  **TC, ZIA58858** | ; After 45 seconds check the PAS current in the DPU HK  **TM,YIA58200, NIA00835, EQUAL, 56,120** |
|  | ; Use PAS master control register to enable Main HV  **TC, ZIA58863 PIA60343,EQUAL, 0x1C** |  |
|  | ; Request a PAS HK packet  **TC, ZIA58866** | ; Check PAS HK parameters before continuing  **TM, YIA58203,NIA00500,LIMIT,0,10** ;V\_MON\_C  **TM,,NIA00501,LIMIT,0, 10** ;V\_MON\_L  **TM,,NIA00509** PLUS\_5\_V\_CEM\_OUT **= 0, 10**  **TM,,NIA00510** PLUS\_12\_V\_HT\_OUT **= 0, 15**  **TM,,NIA00511** MINUS\_12\_V\_HT\_OUT **= -15, 0**  **TM,,NIA00504** T\_MON\_C **= 0, 60**  **TM,,NIA00505** T\_MON\_L **= 0, 60**  **TM,,NIA00506** T1\_HEATER **= 0, 60**  **TM,,NIA00507** T2\_HEATER **= 0, 60**  **TM,,NIA00523** T3\_HEATER **= 0, 60**  **TM,,NIA00514** TEMP\_DCDC **= 0, 60**  **TM,,NIA00530** TEMP\_HVPS **= 0, 60**  **TM,,NIA00515** TEMP\_FPGA **= 0, 60**  **TM,,NIA00531** TEMP\_EA **= 0, 60**  **TM,,NIA00516** HK\_I\_PLUS\_24V\_CEM **= 0, 100**  **TM,,NIA00517** HK\_I\_PLUS\_5V\_CEM **= 0, 100**  **TM,,NIA00518** HK\_I\_PLUS\_12V\_HT **= 0, 100**  **TM,,NIA00519** HK\_I\_MINUS\_12V\_HT **= 0, 100**  **TM,,NIA00522** HK\_I\_2V5\_FPGA **= 0, 200** |
|  | ; Run PAS Config Macro  **TC, ZIA58853** | **Skip ALL command in 5.3.13 – 5.3.17 interval if the plug DISABLE is installed**  **Execute if AIRSAFE Plug ONLY** |
|  | ; Wait 00:10:00 (10 minutes) | ; Check PAS HK parameters before continuing  **TM, YIA58203,NIA00526,LIMIT,500,1000** ;HK\_ANL  **TM,,NIA00527,LIMIT,-1000, -500** ;HK\_TOP\_DEFL  **Execute if AIRSAFE Plug ONLY** |
|  | ; Use PAS master control register to set CEM general switch ON  **TC, ZIA58863 PIA60343,EQUAL, 0x1D** | ; Waitfor 00:00:02 (2 seconds)  **Execute if AIRSAFE Plug ONLY** |
|  | ; Use PAS master control register to set CEM centr’ And CEM periph’ ON  **TC, ZIA58863 PIA60343,EQUAL, 0x5** | ; Waitfor 00:00:02 (2 seconds)  **Execute if AIRSAFE Plug ONLY** |
|  | ;Run PAS HV Ramp UP Macro  **TM, ZIA58856, PIA60791,EQUAL,0 ; Init value**  **TM,,PIA60790,EQUAL,0xCCC ; Nominal Value**  **TM,,PIA60792,EQUAL,0x1FD ; Step**  **TM,,PIA60793,EQUAL,0x1E ; Delay between steps** | **Execute if AIRSAFE Plug ONLY** |

## Power up and configure EAS1

|  |  |  |
| --- | --- | --- |
| **Step N°** | **FFT Commanding Flow** | **Checks and PASS/FAIL Criteria** |
|  | ; Lower the HV value in the Hem table on EAS1  **TC, ZIA58706, PIA60133,EQUAL,1**  **TC,,PIA60136,EQUAL,0x1003**  **TC,,PIA60135,EQUAL,6**  **TC,,PIA60134,EQUAL,0xDE**  **TC,,PIA60134,EQUAL,0xB8**  **TC,,PIA60134,EQUAL,0x51**  **TC,,PIA60134,EQUAL,0x02**  **TC,,PIA60134,EQUAL,0x9C**  **TC,,PIA60134,EQUAL,0x80** |  |
|  | ; Accept the new values  **TC, ZIA58708** |  |
|  | ; Switch EAS1 on  **TC, ZIA58760** | ; Check EAS1 current in DPU HK  **TM,YIA58200, NIA00833, LIMIT, 60,150** |
|  | ; Enable EAS1 HK  **TC, ZIA58050, PIA58050, EQUAL, EAS1\_SENS\_HK** |  |
|  | ; Run the EAS1 post transition macro  **TC, ZIA58934,PIA60739,EQUAL,POST** | ; Reception of:  **TM,YIA58904** ; TM(201,200) SWA\_TM\_EAS1\_PARAM\_REPORT |
|  | ; Run the EAS1 idle transition macro  **TC, ZIA58753** |  |
|  | ; Wait 00:00:30 (30 seconds) to let HK refresh |  |
|  | ; Request EAS1 HK packet  **TC, ZIA58782** | ; Check EAS1 HK parameters before continuing  **TM,YIA58201,NIA00903, LIMIT,2.5, 4.0** ; EAS1\_E33VD  **TM,,NIA00905, LIMIT,1.0, 2.0** ; EAS1\_E15VD  **TM,,NIA00907, LIMIT,280, 310** ; EAS1\_EOPTEMP  **TM,,NIA00909, LIMIT,20, 40** ; EAS1\_EHVOUTV  **TM,,NIA00910, LIMIT,0, 1** ; EAS1\_EMCPV  **TM,,NIA00911, LIMIT,0, 1** ; EAS1\_EGRIDV  **TM,,NIA00912, LIMIT,2, 10** ; EAS1\_E10VAPOSV  **TM,,NIA00914, LIMIT,25, 30** ; EAS1\_E28POSV  **TM,,NIA00915, LIMIT,280, 310** ; EAS1\_EHVGENTHER  **TM,,NIA00916, LIMIT,280, 310** ; EAS1\_EHVMODTHER |
|  | ; Run the EAS1 run transition macro  **TC, ZIA58758** |  |
|  | ; Wait 00:00:20 (20 seconds) | ; Check MCP and Grid voltage in EAS1 HK  **TM, YIA58201,NIA00910, LIMIT,0, 15** ; EAS1\_EMCPV  **TM, YIA58201,NIA00911, LIMIT,-10, 0** ; EAS1\_EGRIDV |
|  | ; Check the HV Max is low  **TC, ZIA58785, PIA58061,EQUAL, CmdReadHemHigVol** | ; Check the HV Max is low  **TM, YIA58904, NIA01503#1, EQUAL, 0x0002** ; EAS1 HV Max  **TM, YIA58904, NIA01503#2, EQUAL, 0x9C80** ; EAS1 HV Max |

## Power up and configure EAS2

|  |  |  |
| --- | --- | --- |
| **Step N°** | **FFT Commanding Flow** | **Checks and PASS/FAIL Criteria** |
|  | ; Lower the HV value in the Hem table on EAS2  **TC, ZIA58706, PIA60133,EQUAL,1**  **TC,,PIA60136,EQUAL,0x2003**  **TC,,PIA60135,EQUAL,6**  **TC,,PIA60134,EQUAL,0xDE**  **TC,,PIA60134,EQUAL,0xB8**  **TC,,PIA60134,EQUAL,0x51**  **TC,,PIA60134,EQUAL,0x02**  **TC,,PIA60134,EQUAL,0x9C**  **TC,,PIA60134,EQUAL,0x80** |  |
|  | ; Accept the new values  **TC, ZIA58708** |  |
|  | ; Switch EAS2 on  **TC, ZIA58808** | ; Check EAS2 current in the DPU HK  **TM, YIA58200, NIA00832, EQUAL, 60,150** |
|  | ; Enable EAS2 HK  **TC, ZIA58050, PIA58050, EQUAL, EAS2\_SENS\_HK** |  |
|  | ; Run the EAS2 post transition macro  **TC, ZIA58936,PIA60740,EQUAL,POST** | ; Reception of:  **TM,YIA58905** ; TM(202,200) SWA\_TM\_EAS2\_PARAM\_REPORT |
|  | ; Run the EAS2 idle transition macro  **TC, ZIA58801** |  |
|  | ; Wait 00:00:30 (30 seconds) to allow HK to refresh |  |
|  | ; Request EAS2 HK packet  **TC, ZIA58830** | ; Check EAS2 HK parameters before continuing  **TM,YIA58202,NIA10903, LIMIT,2.5, 4.0** ; EAS2\_E33VD  **TM,,NIA10905, LIMIT,1.0, 2.0** ; EAS2\_E15VD  **TM,,NIA10907, LIMIT,280, 310** ; EAS2\_EOPTEMP  **TM,,NIA10909, LIMIT,20, 40** ; EAS2\_EHVOUTV  **TM,,NIA10910, LIMIT,0, 1** ; EAS2\_EMCPV  **TM,,NIA10911, LIMIT,0, 1** ; EAS2\_EGRIDV  **TM,,NIA10912, LIMIT,2, 10** ; EAS2\_E10VAPOSV  **TM,,NIA10914, LIMIT,25, 30** ; EAS2\_E28POSV  **TM,,NIA10915, LIMIT,280, 310** ; EAS2\_EHVGENTHER  **TM,,NIA10916, LIMIT,280, 310** ; EAS2\_EHVMODTHER |
|  | ; Run the EAS2 run transition macro  **TC, ZIA58806** |  |
|  | ; Wait 00:00:20 (20 seconds) | ; Check MCP and Grid voltages in EAS2 HK  **TM, YIA58202,NIA10910, LIMIT,0, 15** ; EAS2\_EMCPV  **TM, YIA58202,NIA10911, LIMIT,0, 1** ; EAS2\_EGRIDV |
|  | ; Check the HV Max is low  **TC, ZIA58833, PIA58061,EQUAL, CmdReadHemHigVol** | ; Check the HV Max is low  **TM, YIA58905, NIA01503#1, EQUAL, 0x0002** ; EAS2 HV Max  **TM, YIA58905, NIA01503#2, EQUAL, 0x9C80** ; EAS2 HV Max |

At this point, SWA is powered up and ready to be used.

# SWA Power Down Procedure

This procedure assumes all the SWA sensors are in normal science mode.

The DPU must be powered down last. Before this, HIS, PAS, EAS1 & EAS2 can be powered down in any order.

## HIS Power Down

|  |  |  |
| --- | --- | --- |
|  | ; Disable DPU HIS HB monitor TC  **TC, ZIA58064, PIA60452, EQUAL, 1**  **TC,, PIA60449, EQUAL, 47** |  |
|  | ; Power Down HIS for DPU to disable HIS SpW  **TC,** **ZIA58730**  ; (This command will also reset OBCP#5 in SWA HK for OBC monitoring) | ; Parameter to be checked  **TM, YIA58200,NIA00834, LIMIT, 0,10**; Eng HIS current |
|  | ; OBC switch off power to HIS (OBC commands) (TBD by Airbus) |  |

## PAS Power Down

|  |  |  |
| --- | --- | --- |
| **Power down PAS**  **If PAS AIRSAFE plug is installed, execute 6.2.1 and 6.2.2**  **If PAS DISABLE plus is installed, execute 6.2.3** | | |
|  | ;Run PAS PAS HV Rump Down macro  TC (203,135) | **Do if AIRSAFE plug ONLY** |
|  | ; Run PAS NORMAL OFF Macro  **~~TC,~~****~~ZIA58859~~,**  **TC (203,137)**  **NominalVal = 0xCCC**  **InitVatue = 0x000**  **StepValue = 0x1FD**  **HVWait = 0x01E** |  |
|  | TC PAS OFF  TC (203, 133) | **Do if DISABLE plug ONLY** |
|  | ; Wait 00:03:00 (3 minutes) | ; Parameter to be checked  **TM,YIA58200,NIA00835,LIMIT, 0,30** ; PCDM\_HK\_IMON\_PAS |

## EAS1 Power Down

|  |  |  |
| --- | --- | --- |
| **Step N°** | **FFT Commanding Flow** | **Checks and PASS/FAIL Criteria** |
|  | ; Put EAS1 into no science mode  **TC,ZIA58771,PIA60031**,**EQUAL,MBOX1**  **TC,ZIA58771,PIA60446,EQUAL,0**  **TC,ZIA58771,PIA60447,EQUAL,0**  **TC,ZIA58771,PIA60448,EQUAL,0** |  |
|  | ; Power down EAS1  **TC, ZIA58761** |  |
|  | ; Wait 00:01:00 (1 minute) | ; Parameter to be checked  **TM,YIA58200,NIA00833,LIMIT, 0,20** ; PCDM\_HK\_IMON\_EAS1 |

## EAS2 Power Down

|  |  |  |  |
| --- | --- | --- | --- |
|  | ; Put EAS2 into no science mode  **TC,ZIA58819,PIA60031**,**EQUAL,MBOX1**  **TC,ZIA58819,PIA60446,EQUAL,0**  **TC,ZIA58819,PIA60447,EQUAL,0**  **TC,ZIA58819,PIA60448,EQUAL,0** |  | |
|  | ; Power down EAS2  **TC, ZIA58809** | |  |
|  | ; Wait 00:01:00 (1 minute) | | ; Parameter to be checked  **TM,YIA58200,NIA00832,LIMIT, 0,20** ; PCDM\_HK\_IMON\_EAS2 |

## Power Down DPU

|  |  |  |
| --- | --- | --- |
|  | ; Switch off SWA with HPC  ; Main Spacewire set to Inactive  ; Main 28V power switched off |  |

At this point, SWA is now powered off.