**Project: Solar Orbiter SWA**

**Author:** Gethyn Lewis

**TITLE: SWA FM Full Functional Test Procedure**

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# Introduction

This document describes the procedure to carry out the full functional test (FFT) of the flight model SO-SWA suite (SWA-FM).

# Scope and applicability

## Scope

This test procedure defines the instructions for conducting the FFT on the flight model (FM) of the Solar Wind Analyser (SWA) of the SO-SWA project. This test procedure is based on the requirements found in NR1 and NR2.

At present this procedure will not run to completion due to power issues with HIS as detailed in NR4.

## Purpose

The purpose of the FFT is to verify all the functionality of the instrument and to ensure that all mode and state transitions are performed correctly. This is achieved by monitoring certain housekeeping parameters in order to verify that power consumption and configuration of the sensors is correct. The science packets will also be verified in post processing. The SWA-FM sensor units **do have** functioning detector systems, therefore, this test procedure is applicable for an airside set-up or environment only if the required Air saftey plugs are inserted correctly. See NR5 for details.

# 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.

|  |  |  |
| --- | --- | --- |
| **Ref.** | **No** | **Title** |
| NR1 | SOL-EST-RCD-0050 | Solar Orbiter Experiment Interface Document Part A |
| NR2 | SOL.S.ASTR.TN.00235 | Input Format Required for Spacecraft Level Instrument Test Procedures |
| NR3 | SO-SWA-MSSL-PR-29 | SWA Power Up & Power Down procedure |
| NR4 | SO-SWA-MSSL-NC-26 | Integration of HIS to DPU Reboot |
| NR5 | 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 |

# Requirements to be verified

The EID-A document makes the following statements:

1. Full instrument functional tests (FFT) are foreseen at least once at the start of the spacecraft-level environmental test campaign, and another one before the launch campaign. **They shall serve to demonstrate full functioning of all elements of an instrument and all instrument operational modes, as far as compatible with operations in ambient conditions. However, instrument performance characteristics will, in general, not be (re-)verified during the spacecraft AIT campaign**. They should typically last no more than 8 hours.. EIDA-3851.
2. The instrument FFTs, SFTs will be conducted in normal cleanroom conditions, as foreseen during the spacecraft AIV-program. They will not rely on any specific constraints on the spacecraft (such as spacecraft orientation, temperature, access by personnel, or stimuli (open loop). EIDA-3855.
3. Potential constraints on what can be done within these tests might depend on the SC AIT sequence. Ideally, the tests should not be dependent on any particular orientation of the spacecraft and should not require any breaking of electrical or mechanical connections (i.e. be non-invasive) and should not require the use of any optical or mechanical I-EGSE. EIDA-3855.

The purpose of the full functional test (FFT) is to verify the complete functionality of the SWA suite during further Airbus testing campaigns.

## Test Facility & Setup

The FFT 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 NR5 for details of the safety plug configuration.

# Test constraints and operations

## TRR

Before a test can proceed, a test readiness review (TRR), shall be convened by the test manager. All the relevant test and facility documentation will be made available. The TRR must give approval before the test can commence.

## TRB

At the end of the test a Test Review Board (TRB) shall be convened and approve the dismantling of the test setup.

If a non-conformance report (NCR) is raised during a test the TRB will decide the next steps.

## Rejection and retest

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.

If a failure, malfunction, or out of tolerance occurs during or after test as appropriate the test shall be halted and an NCR shall be issued.

A test report shall be produced logging all events and the results of the visual inspections. The test report shall also contain the environmental measurement data (taken during the test) and the calibration/qualification certificates of the test facility.

# Test Flow

It is assumed that the SWA and sensors have been powered on and are configured ready for testing.

The procedure detailed in NR3 provides full details on how to get to that state.

The test can be run on the nominal side or the redundant side. A full power down should take place between testing on these sides. See NR3 for details on how to power down SWA.

# DPU Test

|  |  |  |
| --- | --- | --- |
| **Step N°** | **FFT Commanding Flow** | **Checks and PASS/FAIL Criteria** |
| **; DPU HK Packets Tests** | | |
|  | ; Switch DPU TC count HK on  **TC, ZIA58050, PIA58050, EQUAL, DPU\_TC\_CNT\_HK** | ; Reception of at least one:  **TM,YIA58204 ;** TM(3,26) SID=4 SWA\_TM\_DPU\_RECEIVED\_TC\_CNT\_HK |
|  | ; Switch DPU TC count HK off  **TC, ZIA58051, PIA58050, EQUAL, DPU\_TC\_CNT\_HK** |  |
|  | ; Switch DPU validity parameters HK on  **TC, ZIA58050, PIA58050, EQUAL, DPU\_VALID\_PAR\_HK** | ; Reception of at least one:  **TM,YIA58205 ;** TM(3,26) SID=5 SWA\_TM\_DPU\_VALIDITY\_PARAM\_HK |
|  | ; Switch DPU validity parameters HK off  **TC, ZIA58050, PIA58050, EQUAL, DPU\_VALID\_PAR\_HK** |  |
|  | ; Switch DPU diagnostic parameters HK on  **TC, ZIA58050, PIA58050, EQUAL, DPU\_HW\_DIAG\_HK** | ; Reception of at least one:  **TM,YIA58206 ;** TM(3,26) SID=6 SWA\_TM\_DPU\_HW\_DIAGN\_PARAM\_HK |
|  | ; Switch DPU diagnostic parameters HK off  **TC, ZIA58050, PIA58050, EQUAL, DPU\_HW\_DIAG\_HK** |  |
|  | ; Switch DPU maximum duration HK on  **TC, ZIA58050, PIA58050, EQUAL, DPU\_MAX\_DUR\_HK** | ; Reception of at least one:  **TM,YIA58207 ;** TM(3,26) SID=7 SWA\_TM\_MAX\_DURATION\_SSID\_HK |
|  | ; Switch DPU maximum manager duration HK off  **TC, ZIA58050, PIA58050, EQUAL, DPU\_MAX\_DUR\_HK** |  |
|  | ; Switch DPU FDIR parameters HK on  **TC, ZIA58050, PIA58050, EQUAL, DPU\_FDIR\_ST\_HK** | ; Reception of at least one:  **TM,YIA58208 ;** TM(3,26) SID=8 SWA\_TM\_FDIR\_STATUS\_PARAMS\_HK |
|  | ; Switch DPU FDIR parameters HK off  **TC, ZIA58050, PIA58050, EQUAL, DPU\_FDIR\_ST\_HK** |  |
|  | ; Switch DPU derived HK on  **TC, ZIA58050, PIA58050, EQUAL, DPU\_FDIR\_MON\_HK** | ; Reception of at least one:  **TM,YIA58209 ;** TM(3,26) SID=9 SWA\_TM\_DPU\_FDIR\_MONITOR\_PARAMS\_HK |
|  | ; Switch DPU derived HK off  **TC, ZIA58050, PIA58050, EQUAL, DPU\_FDIR\_MON\_HK** |  |
|  | ; Switch DPU derived HK on  **TC, ZIA58050, PIA58050, EQUAL, DPU\_MON\_DER\_HK** | ; Reception of at least one:  **TM,YIA58210 ;** TM(3,26) SID=10 SWA\_TM\_DPU\_DERIVED\_PARAMS\_HK |
|  | ; Switch DPU derived HK off  **TC, ZIA58050, PIA58050, EQUAL, DPU\_MON\_DER\_HK** |  |
|  | ; Switch DPU TM counters HK on  **TC, ZIA58050, PIA58050, EQUAL, DPU\_TM\_CNT** | ; Reception of at least one:  **TM,YIA58214 ;** TM(3,26) SID=12 SWA\_DPU\_TM\_CNT\_HK |
|  | ; Switch DPU TM Counters HK off  **TC, ZIA58050, PIA58050, EQUAL, DPU\_TM\_CNT** |  |
|  | ; Switch DPU error counters HK on  **TC, ZIA58050, PIA58050, EQUAL, DPU\_ERR\_CNT** | ; Reception of at least one:  **TM,YIA58215 ;** TM(3,26) SID=13 SWA\_DPU\_ERR\_CNT\_HK |
|  | ; Switch DPU error counters HK off  **TC, ZIA58050, PIA58050, EQUAL, DPU\_ERR\_CNT** |  |
| **; DPU Memory Tests** | | |
|  | ; Dump RAM  **TC, ZIA58054, PIA58056, EQUAL, DPU\_RAM**  **TC, ZIA58054, PIA60330, EQUAL, 0x40 00 00 00**  **TC, ZIA58054, PIA60329, EQUAL, 10** | ; Parameters to be checked  **TM, YIA58164, NIA01547#1, EQUAL, DPU\_RAM** |
|  | ; Dump MRAM  **TC, ZIA58054, PIA58056, EQUAL, DPU\_MRAM1**  **TC, ZIA58054, PIA60330, EQUAL, 0x10 00 00 00**  **TC, ZIA58054, PIA60329, EQUAL, 10** | ; Parameters to be checked  **TM, YIA58173 NIA01547#1, EQUAL, DPU\_MRAM1** |
|  | ; Dump PROM  **TC, ZIA58054, PIA58056, EQUAL, DPU\_PROM**  **TC, ZIA58054, PIA60330, EQUAL, 0x00 00 00 00**  **TC, ZIA58054, PIA60329, EQUAL, 10** | ; Parameters to be checked  **TM, YIA58174 NIA01547#1, EQUAL, DPU\_PROM** |
|  | ; Dump MRAM2  **TC, ZIA58054, PIA58056, EQUAL, DPU\_MRAM2**  **TC, ZIA58054, PIA60330, EQUAL, 0x10 00 00 00**  **TC, ZIA58054, PIA60329, EQUAL, 10** | ; Parameters to be checked  **TM, YIA58179 NIA01547#1, EQUAL, DPU\_MRAM2** |
|  | ; Write to RAM  **TC, ZIA58053, PIA58056, EQUAL, DPU\_RAM**  **TC, ZIA58053, PIA60330, EQUAL, 0x40 70 00 00**  **TC, ZIA58053, PIA60329, EQUAL, 4**  **TC, ZIA58053, PIA60432, EQUAL, 0xAB**  **TC, ZIA58053, PIA60432, EQUAL, 0xCD**  **TC, ZIA58053, PIA60432, EQUAL, 0xEF**  **TC, ZIA58053, PIA60432, EQUAL, 0x01** |  |
|  | ; Check RAM  **TC, ZIA58055, PIA58056, EQUAL, DPU\_RAM**  **TC, ZIA58055, PIA60330, EQUAL, 0x40 70 00 00**  **TC, ZIA58055, PIA60329, EQUAL, 4** | ; Parameters to be checked  **TM, YIA58165, NIA01547#1, EQUAL, DPU\_RAM**  **TM, YIA58165, NIA01550, EQUAL, 1186** |
|  | ; Check MRAM1  **TC, ZIA58055, PIA58056, EQUAL, DPU\_MRAM1**  **TC, ZIA58055, PIA60330, EQUAL, 0x10 1E 10 00**  **TC, ZIA58055, PIA60329, EQUAL, 52** | ; Parameters to be checked  **TM, YIA58165, NIA01547#1, EQUAL, DPU\_MRAM1**  **TM, YIA58165, NIA01550, EQUAL, 16815** |
|  | ; Check PROM  **TC, ZIA58055, PIA58056, EQUAL, DPU\_PROM**  **TC, ZIA58055, PIA60330, EQUAL, 0x00 00 00 00**  **TC, ZIA58055, PIA60329, EQUAL, 100** | ; Parameters to be checked  **TM, YIA58165, NIA01547#1, EQUAL, DPU\_PROM**  **TM, YIA58165, NIA01550, EQUAL, 22271** |
|  | ; Check MRAM2  **TC, ZIA58055, PIA58056, EQUAL, DPU\_MRAM2**  **TC, ZIA58055, PIA60330, EQUAL, 0x10 1E 10 00**  **TC, ZIA58055, PIA60329, EQUAL, 52** | ; Check the contents of the  **TM, YIA58165, NIA01547#1, EQUAL, DPU\_MRAM2**  **TM, YIA58165, NIA01550, EQUAL, 16815** |
|  | ; Check not valid address  **TC, ZIA58055, PIA58056, EQUAL, DPU\_RAM**  **TC, ZIA58055, PIA60330, EQUAL, 0x00 00 00 00**  **TC, ZIA58055, PIA60329, EQUAL, 16000** | ; Reception of:  **TM,YIA58152 ;** TM(1,8) SWA\_CMD\_INVALID\_START\_ADDR |
|  | ; Check not valid length  **TC, ZIA58055, PIA58056, EQUAL, DPU\_RAM**  **TC, ZIA58055, PIA60330, EQUAL, 0x40 00 00 00**  **TC, ZIA58055, PIA60329, EQUAL, 0x80 00 00** | ; Reception of:  **TM,YIA58153 ;** TM(1,8) SWA\_CMD\_INVALID\_LENGTH |
|  | ; Check dump abort while not dumping  **TC, ZIA58056** | ; Reception of:  **TM,YIA58155 ;** TM(1,8) SWA\_CMD\_NO\_DUMP\_ONGOING |

# HIS Low Voltage Tests

## HIS Test Case 1: Power Up BOOT test

|  |  |  |
| --- | --- | --- |
| **Step N°** | **FFT Commanding Flow** | **Checks and PASS/FAIL Criteria** |
|  | ; \*WAIT\*, 0:02:00, From previous command |  |
|  | ; Reset HIS  **TC, ZIA58916, PIA59010, EQUAL, HIS** | ; Reception of:  **TM, YIA58601** ; ; EID 43801  **TM, YIA58213, NIA03004, EQUAL, 0** ; Verify HIS is in BOOT mode  **TM, YIA58213, NIA03006, EQUAL, 0** ; Verify no commanding  **TM, YIA58213, NIA03007, EQUAL, 0** ; |
|  | ; \*WAIT\*, 0:00:22, From previous command |  |
|  | ; Enable command echoing  **TC, ZIA58927, PIA59000, EQUAL, ENABLE**  **TC,, PIA60359, EQUAL, 43827** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Command HK at 1 Hz  **TC, ZIA58931, PIA59056, EQUAL, BOOT\_TREP**  **TC,, PIA60361, EQUAL, 1** | ; Verify HK at 1Hz  **TM, YIA58213, NIA03004, EQUAL, 2**  **TM,, NIA03006, EQUAL, 204**; HIS\_CMD\_LAST\_ACC\_TYPE  **TM,, NIA03007, EQUAL, 176**; HIS\_CMD\_LAST\_ACC\_STYPE |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Verify NOP  **TC, ZIA58915** |  |
|  |  | ; Verify HIS is in Maintenance mode  **TM, YIA58213, NIA03004, EQUAL, 3** ; HIS\_CMD\_ACC\_CNT  **TM,, NIA03006, EQUAL, 204**; HIS\_CMD\_LAST\_ACC\_TYPE  **TM,, NIA03007, EQUAL, 143** ; HIS\_CMD\_LAST\_ACC\_STYPE |
|  |  | ; Verify time messages are arriving  **TM, YIA58213, NIA03000, NOT\_EQUAL, 13** ; time\_msg\_cnt |
|  |  | ; Verify time codes are arriving  **TM, YIA58213, NIA03001, NOT\_EQUAL, 25** ; time\_code\_cnt |
|  |  | ; Verify sequence count is incrementing  **TM, YIA58213, NIA03025, NOT\_EQUAL, 7** ; sequence\_count |
|  |  | ; Verify FSW/Table image test status  **TM, YIA58213, NIA03501, EQUAL, 0xC0DEC0DE** ; eeprom\_1\_code\_magic\_num  **TM,, NIA03502, EQUAL, 0x639DBB2D** ; HIS\_EEPROM1\_REP\_CKS  **TM,, NIA03503, EQUAL, 0x00009EBD** ;HIS\_EEPROM1\_LEN  **TM,, NIA03504, EQUAL, 0x43170503** ; HIS\_EEPROM1\_VER  **TM,, NIA03505, EQUAL, 0x40080000**; eeprom\_1\_code\_addr  **TM,, NIA03506, EQUAL, 0xC0DEC0DE**; eeprom\_2\_code\_magic\_num  **TM,, NIA03507, EQUAL, 0x639DBB2D**; HIS\_EEPROM2\_REP\_CKS  **TM,, NIA03508, EQUAL, 0x00009EBD**; HIS\_EEPROM2\_LEN  **TM,, NIA03509, EQUAL, 0x43170503**; HIS\_EEPROM2\_VER  **TM,, NIA03510, EQUAL, 0x40080000**; eeprom\_2\_code\_addr  **TM,, NIA03511, EQUAL, 0x639DBB2D**; HIS\_EEPROM1\_CAL\_CKS  **TM,, NIA03512, EQUAL, 0x639DBB2D**; HIS\_EEPROM2\_CAL\_CKS  **TM, YIA58213, NIA03513, EQUAL, 0x007AB1E5**; eeprom\_1\_table\_magic\_num  **TM,, NIA03514, EQUAL, 0xA0777494**; HIS\_EEPROM1\_TABLE\_REP\_CKS  **TM,, NIA03515, EQUAL, 0x00017F86**; HIS\_EEPROM1\_TABLE\_LEN  **TM,, NIA03516, EQUAL, 0x01170506**; HIS\_EEPROM1\_TABLE\_VER  **TM,, NIA03517, EQUAL, 0x007AB1E5**; eeprom\_2\_table\_magic\_num  **TM,, NIA03518, EQUAL, 0xA0777494**; HIS\_EEPROM2\_TABLE\_REP\_CKS  **TM,, NIA03519, EQUAL, 0x00017F86**; HIS\_EEPROM2\_TABLE\_LEN  **TM,, NIA03520, EQUAL, 0x01170506**; HIS\_EEPROM2\_TABLE\_VER  **TM,, NIA03521, EQUAL, 0xA0777494**; HIS\_EEPROM1\_TABLE\_CAL\_CKS  **TM,, NIA03522, EQUAL, 0xA0777494;** HIS\_EEPROM2\_TABLE\_CAL\_CKS |
|  |  | ; Verify digital status  **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 |
|  |  | ; Wait for memory test to complete  **TM, YIA58213, NIA03010, GREATER, 90** ; his\_proc\_idle |
|  |  | ; Verify memory test status  **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 analog telemetry being received from CDH  **TM, YIA58213, 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, -0.618, 0.618** ; HIS\_HVPS\_TOP\_DEF\_AVE  **TM,, NIA01409, LIMIT, -0.618, 0.618** ; 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, -0.618, 0** ; HIS\_HVPS\_ANL\_AVE  **TM,, NIA01349, LIMIT, -0.618, 0.618** ; 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, -0.618, 0.618** ; HIS\_HVPS\_TOP\_DEF\_MIN  **TM,,NIA01337, LIMIT, -0.618, 0.618** ; 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, -0.618, 0** ; HIS\_HVPS\_ANL\_MIN  **TM,,NIA01347, LIMIT, -0.618, 0.618** ; 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, -0.618, 0.618** ; HIS\_HVPS\_TOP\_DEF\_MAX  **TM,,NIA01373, LIMIT, -0.618, 0.618** ; 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, -0.618, 0** ; HIS\_HVPS\_ANL\_MAX  **TM,,NIA01348, LIMIT, -0.618, 0.618** ; 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 |
|  | ; \*WAIT\*, 0:00:10, From previous command |  |
|  | ; Verify BOOT image checksum is correct  **TC, ZIA58055, PIA58056, EQUAL, PROM**  **TC,, PIA60330, EQUAL, 0**  **TC,, PIA60329, EQUAL, 79840** | ; Reception of:  **TM, YIA58603** ; EID 43803 |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Verify MRAM write enable  **TC, ZIA58900, PIA58999, EQUAL, ENABLE** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Pre-zero memory test areas (MRAM)  **TC, ZIA58902, PIA59004, EQUAL, ABSOLUTE**  **TC,, PIA60350, EQUAL, 0x10150000**  **TC,, PIA60329, EQUAL, 16**  **TC,, PIA60352, EQUAL, 0**  **TC,, PIA60346, EQUAL, 0**  **TC,, PIA59045, EQUAL, STANDARD**  **TC,, PIA59046, EQUAL, COMPLETE** | ; Reception of:  **TM, YIA58605** ; EID 43805 |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Pre-zero memory test areas (SRAM)  **TC, ZIA58902, PIA59004, EQUAL, ABSOLUTE**  **TC,, PIA60350, EQUAL, 0x40080000**  **TC,, PIA60329, EQUAL, 16**  **TC,, PIA60352, EQUAL, 0**  **TC,, PIA60346, EQUAL, 0**  **TC,, PIA59045, EQUAL, STANDARD**  **TC,, PIA59046, EQUAL, COMPLETE** | ; Reception of  **TM, YIA58605** ; EID 43805 |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Memory load to MRAM test area  **TC, ZIA58053, PIA58056, EQUAL, MRAM**  **TC,, PIA60330, EQUAL, 0x150000**  **TC,, PIA60329, EQUAL, 16**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 1**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 2**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 3** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Copy from MRAM test area to SRAM test area  **TC, ZIA58901, PIA59002, EQUAL, MRAM**  **TC,, PIA60349, EQUAL, 0x150000**  **TC,, PIA59001, EQUAL, SRAM**  **TC,, PIA60348, EQUAL, 0x80000**  **TC,, PIA60329, EQUAL, 16** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Verify MRAM write disable  **TC, ZIA58900, PIA58999, EQUAL, DISABLE** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify memory load to MRAM test area  **TC, ZIA58902, PIA59004, EQUAL, ABSOLUTE**  **TC,, PIA60350, EQUAL, 0x10150000**  **TC,, PIA60329, EQUAL, 16**  **TC,, PIA60352, EQUAL, 0**  **TC,, PIA60346, EQUAL, 1**  **TC,, PIA59045, EQUAL, STANDARD**  **TC,, PIA59046, EQUAL, VERIFY\_ONLY** | ; Reception of:  **TM, YIA58605** ; EID 43805 |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Verify memory load to SRAM test area  **TC, ZIA58902, PIA59004, EQUAL, ABSOLUTE**  **TC,, PIA60350, EQUAL, 0x40080000**  **TC,, PIA60329, EQUAL, 16**  **TC,, PIA60352, EQUAL, 0**  **TC,, PIA60346, EQUAL, 1**  **TC,, PIA59045, EQUAL, STANDARD**  **TC,, PIA59046, EQUAL, VERIFY\_ONLY** | ; Reception of:  **TM, YIA58605** ; EID 43805 |
|  |  | ; Verify no command rejections  **TM, YIA58213, NIA03005, EQUAL, 0** ; HIS\_CMD\_REJ\_CNT  **TM,, NIA03008, EQUAL, 0** ; command\_rejected\_last\_service  **TM,, NIA03009, EQUAL, 0** ; command\_rejected\_last\_subservice |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Verify intentional command rejection  **TC, ZIA58919, PIA60356, EQUAL, HK\_ACCUM\_SECS**  **TC,, PIA60352, EQUAL, 1** | ; Verify intentional command rejection  **TM, YIA58213, NIA03005, EQUAL, 1** ; HIS\_CMD\_REJ\_CNT  **TM,, NIA03008, EQUAL, 204** ; command\_rejected\_last\_service  **TM,, NIA03009, EQUAL, 147** ; command\_rejected\_last\_subservice |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify clearing of command rejection  **TC, ZIA58918, PIA59016, EQUAL, CMDS\_REJ\_CNT** | **TM, YIA58213, NIA03005, EQUAL, 0 ;** HIS\_CMD\_REJ\_CNT |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify clearing of command rejection  **TC, ZIA58918, PIA59016, EQUAL, CMDS\_REJ\_SVC** | ; Verify clearing of command rejection  **TM, YIA58213, NIA03008, EQUAL, 0 ;** command\_rejected\_last\_service  **TM, YIA58213, NIA03009, EQUAL, 0** ; command\_rejected\_last\_subservice |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify memory dump packet received  **TC, ZIA58054, PIA58056, EQUAL, ABSOLUTE**  **TC,, PIA60330, EQUAL, 0x10150000**  **TC,, PIA60329, EQUAL, 16** | **TM, YIA58500, NIA01547#1, EQUAL, ABSOLUTE** ; MEM\_DUMP\_ABS  **TM,, NIA01548, EQUAL, 0x10150000** ; MEM\_DUMP\_ABS  **TM,, NIA01549, EQUAL, 16** ; MEM\_DUMP\_ABS( |

## HIS Test Case 2: Aliveness Test

|  |  |  |
| --- | --- | --- |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Go to LVENG mode  **TC, ZIA58917, PIA59011, EQUAL, LVENG** | ; Verify HIS is in LVENG mode and no commanding  **TM, YIA58212, NIA03004, EQUAL, 0** ; HIS\_CMD\_ACC\_CNT  **TM,, NIA03006, EQUAL, 0** ; command\_accepted\_last\_service  **TM,, NIA03007, EQUAL, 0** ; command\_accepted\_last\_subservice |
|  | ; \*WAIT\*, 0:00:07, From previous command |  |
|  | ; Enable command echoing  **TC, ZIA58927, PIA59000, EQUAL, ENABLE**  **TC,, PIA60359, EQUAL, 43827** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Command HK at 1 Hz  **TC, ZIA58931, PIA59056, EQUAL, HK\_TREP**  **TC, ZIA58931, PIA60361, EQUAL, 1** | ; Verify HK at 1 Hz  **TM, YIA58212, NIA03004, EQUAL, 2** ; HIS\_CMD\_ACC\_CNT  **TM, YIA58212, NIA03006, EQUAL, 204** ; command\_accepted\_last\_service  **TM, YIA58212, NIA03007, EQUAL, 176** ; command\_accepted\_last\_subservice |
|  |  | ; Verify command echo enabled  **TM, YIA58627** ; EID 43827 |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Verify NOP  **TC, ZIA58915** | ; Verify NOP  **TM, YIA58212, NIA03004, EQUAL, 3** ; HIS\_CMD\_ACC\_CNT  **TM, YIA58212, NIA03006, EQUAL, 204** ; command\_accepted\_last\_service  **TM, YIA58212, NIA03007, EQUAL, 143** ; command\_accepted\_last\_subservice |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Queue error messages  **TC, ZIA58919, PIA60356, EQUAL, EV\_QUEUE\_BYPASS**  **TC, ZIA58919, PIA60352, EQUAL, 0** | ; Verify time messages are arriving  **TM, YIA58212, NIA03000, GREATER, 11** ; time\_msg\_cnt |
|  |  | ; Verify time codes are arriving  **TM, YIA58212, NIA03001, GREATER, 11** ; time\_code\_cnt |
|  |  | ; Verify sequence count is incrementing  **TM, YIA58212, NIA03025, GREATER, 13** ; sequence\_count |
|  | ; Wait for DSCB communication to complete |  |
|  |  | ; Verify digital status  **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,, NIA04583, EQUAL, 0xFFF** ; dscb\_adc\_waits  **TM,, NIA04588, EQUAL, 3** ; lim\_pers\_voltage  **TM,, NIA04589, EQUAL, 3** ; lim\_pers\_current  **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, -0.618, 0.618**; HIS\_HVPS\_TOP\_DEF\_AVE  **TM,, NIA01409, LIMIT, -0.618, 0.618**; 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, -0.618, 0**; HIS\_HVPS\_ANL\_AVE  **TM,, NIA01349, LIMIT, -0.618, 0.618**; 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, -0.618, 0.618**; HIS\_HVPS\_TOP\_DEF\_MIN  **TM,, NIA01337, LIMIT, -0.618, 0.618**; 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, -0.618, 0**; HIS\_HVPS\_ANL\_MIN) >= -0.618  **TM,, NIA01347, LIMIT, -0.618, 0.618**; 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, -0.618, 0.618**, HIS\_HVPS\_TOP\_DEF\_MAX  **TM,, NIA01373, LIMIT, -0.618, 0.618**, 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, -0.618, 0**, HIS\_HVPS\_ANL\_MAX  **TM,, NIA01348, LIMIT, -0.618, 0.618**, 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,, 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,, NIA04668, LIMIT, 0, 5**; HIS\_OFFSETIMON\_AVE  **TM,, NIA04669, LIMIT, 0..61, 0.0156**; HIS\_V\_IMON\_REF\_AVE  **TM,, NIA04670, LIMIT, -40, 80**; HIS\_HVPS\_TEMP\_AVE  **TM,, NIA04671, LIMIT, -40, 80**; HIS\_DSIB\_TEMP\_AVE  **TM,, NIA04672, LIMIT, -40, 80**; HIS\_SSD\_TEMP\_AVE  **TM,, NIA04673, LIMIT, -40, 80**; HIS\_ASIC\_TEMP\_AVE  **TM,, NIA04674, LIMIT, -40, 80**; HIS\_START\_TEMP\_AVE  **TM,, NIA04609, LIMIT, 0, 0.33**; HIS\_STARTMCPVMON\_MIN  **TM,, NIA04610, LIMIT, 0, 0.33**; HIS\_STOPMCPVMON\_MIN  **TM,, NIA04611, LIMIT, 0, 110**; HIS\_SSDVMON\_MIN  **TM,, NIA04612, LIMIT, 0, 0.145**; HIS\_OFFSETVMON\_MIN  **TM,, NIA04613, LIMIT, 0, 11.604**; HIS\_STARTMCPIMON\_MIN  **TM,, NIA04614, LIMIT, 0, 15.211**; HIS\_STOPMCPIMON\_MIN  **TM,, NIA04615, LIMIT, -40, 80**; HIS\_STOP\_TEMP\_MIN  **TM,, NIA04616, LIMIT, -40, 80**; HIS\_DSCB\_TEMP\_MIN  **TM,, NIA04617, LIMIT, 4.9098, 5.0601**; HIS\_P5V\_DAC\_REF\_MON\_MIN  **TM,, NIA04618, LIMIT, 3.26242, 3.345645**; HIS\_P3\_3V\_ADC\_REF\_MIN  **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 |
|  | ; \*WAIT\*, 0:00:05, From previous command |  |
|  | ; Verify Boot image checksum is correct  **TC, ZIA58055, PIA58056, EQUAL, PROM**  **TC,, PIA60330, EQUAL, 0**  **TC,, PIA60329, EQUAL, 79840** | ; Reception of:  **TM, YIA58603,** ; EID 43803 |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Verify MRAM write enable  **TC, ZIA58900, PIA58999, EQUAL, ENABLE** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Pre-zero memory test areas (MRAM and SRAM)  **TC, ZIA58902, PIA59004, EQUAL, ABSOLUTE**  **TC,, PIA60350, EQUAL, 0x10160000**  **TC,, PIA60329, EQUAL, 16**  **TC,, PIA60352, EQUAL, 0**  **TC,, PIA60346, EQUAL, 0**  **TC,, PIA59045, EQUAL, STANDARD**  **TC,, PIA59046, EQUAL, COMPLETE** | ; Reception of:  **TM, YIA58605,** ; EID 43805 |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Pre-zero memory test areas (MRAM and SRAM)  **TC, ZIA58902, PIA59004, EQUAL, ABSOLUTE**  **TC,, PIA60350, EQUAL, 0x40080000**  **TC,, PIA60329, EQUAL, 16**  **TC,, PIA60352, EQUAL, 0**  **TC,, PIA60346, EQUAL, 0**  **TC,, PIA59045, EQUAL, STANDARD**  **TC,, PIA59046, EQUAL, COMPLETE** | ; Reception of:  **TM, YIA58605,** ; EID 43805 |
|  | ; \*WAIT\*, 0:00:04, From previous command |  |
|  | **TC, ZIA58902, PIA59004, EQUAL, ABSOLUTE**  **TC,, PIA60350, EQUAL, 0x60000000**  **TC,, PIA60329, EQUAL, 16**  **TC,, PIA60352, EQUAL, 0**  **TC,, PIA60346, EQUAL, 0**  **TC,, PIA59045, EQUAL, STANDARD**  **TC,, PIA59046, EQUAL, COMPLETE** | ; Reception of:  **TM, YIA58605,** ;EID 43805 |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Memory load to MRAM test area  **TC, ZIA58053, PIA58056, EQUAL, MRAM**  **TC,, PIA60330, EQUAL, 0x160000**  **TC,, PIA60329, EQUAL, 16**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 7**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 6**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 5**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 4** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Copy from MRAM test area to SRAM test area  **TC, ZIA58901, PIA59002, EQUAL, MRAM**  **TC,, PIA60349, EQUAL, 0x160000**  **TC,, PIA59001, EQUAL, SRAM**  **TC,, PIA60348, EQUAL, 0x80000**  **TC,, PIA60329, EQUAL, 16** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Verify MRAM write disable  **TC, ZIA58900, PIA58999, EQUAL, DISABLE** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify memory load to MRAM test area  **TC, ZIA58902, PIA59004, EQUAL, ABSOLUTE**  **TC,, PIA60350, EQUAL, 0x10160000**  **TC,, PIA60329, EQUAL, 16**  **TC,, PIA60352, EQUAL, 7**  **TC,, PIA60346, EQUAL, -1**  **TC,, PIA59045, EQUAL, STANDARD**  **TC,, PIA59046, EQUAL, VERIFY\_ONLY** | ; Reception of:  **TM, YIA58605,** ; EID 43805 |
|  | ; \*WAIT\*, 0:00:10, From previous command |  |
|  | ; Verify copy from MRAM test area to SRAM test area  **TC, ZIA58902, PIA59004, EQUAL, ABSOLUTE**  **TC,, PIA60350, EQUAL, 0x40080000**  **TC,, PIA60329, EQUAL, 16**  **TC,, PIA60352, EQUAL, 7**  **TC,, PIA60346, EQUAL, -1**  **TC,, PIA59045, EQUAL, STANDARD**  **TC,, PIA59046, EQUAL, VERIFY\_ONLY** | ; Reception of:  **TM, YIA58605,** ; EID 43805 |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Memory load to BRAM test area  **TC, ZIA58053, PIA58056, EQUAL, CDH\_SRAM**  **TC,, PIA60330, EQUAL, 0**  **TC,, PIA60329, EQUAL, 16**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 7**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 6**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 5**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 0**  **TC,, PIA60432, EQUAL, 4** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Verify memory load to BRAM test area  **TC, ZIA58902, PIA59004, EQUAL, ABSOLUTE**  **TC,, PIA60350, EQUAL, 0x60000000**  **TC,, PIA60329, EQUAL, 16**  **TC,, PIA60352, EQUAL, 7**  **TC,, PIA60346, EQUAL, -1**  **TC,, PIA59045, EQUAL, STANDARD**  **TC,, PIA59046, EQUAL, VERIFY\_ONLY** | ; Reception of:  **TM, YIA58605**; EID 43805 |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Verify intentional command rejection  **TC, ZIA58931, PIA59056, EQUAL, BOOT\_TREP**  **TC,, PIA60361, EQUAL, 1** | ; Verify no command rejections  **TM, YIA58212, NIA03005, EQUAL, 0**  **TM,, NIA03008, EQUAL, 0**  **TM,, NIA03009, EQUAL, 0**  **TM,, NIA03005, EQUAL, 1**  **TM,, NIA03008, EQUAL, 204**  **TM,, NIA03009, EQUAL, 176** |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify clearing of command rejection  **TC, ZIA58918, PIA59016, EQUAL, CMDS\_REJ\_CNT** | ; Reception of:  **TM, YIA58212, NIA03005, EQUAL, 0** |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify clearing of command rejection  **TC, ZIA58918, PIA59016, EQUAL, CMDS\_REJ\_SVC** | ; Reception of:  **TM, YIA58212, NIA03008, EQUAL, 0**  **TM,, NIA03009, EQUAL, 0** |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify memory dump packet received  **TC, ZIA58054, PIA58056, EQUAL, ABSOLUTE**  **TC,, PIA60330, EQUAL, 0x10160000**  **TC,, PIA60329, EQUAL, 16** | ; Reception of:  **TM, YIA58500, NIA01547#1, EQUAL, ABSOLUTE**  **TM,, NIA01548, EQUAL, 0x10160000**  **TM,, NIA01549, EQUAL, 16** |

## HIS Test Case 3: Full Command & Telemetry Test

|  |  |  |
| --- | --- | --- |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify no EDAC errors  **TC, ZIA58904, PIA59003, EQUAL, ABSOLUTE**  **TC,, PIA60350, EQUAL, 0**  **TC,, PIA60329, EQUAL, 16**  **TC,, PIA60342, EQUAL, 0xFFFFFFFF** | ; Reception of:  **TM, YIA58500, NIA01547#1, EQUAL, ABSOLUTE**  **TM,, NIA01548, EQUAL, 0**  **TM,, NIA01549, EQUAL, 16** |
|  | ; \*WAIT\*, 0:00:11, From previous command |  |
|  | ; Verify memory dwell disable  **TC, ZIA58905** |  |
|  | ; \*WAIT\*, 0:00:21, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Verify safe mode command  **TC, ZIA58917, PIA59011, EQUAL, SAFE** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify HIS is in LVENG mode  **TC, ZIA58917, PIA59011, EQUAL, LVENG** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify DSCB reg read  **TC, ZIA58933, PIA60350, EQUAL, 0x02C** | ; Reception of:  **TM, YIA58607,** ; EID 43807 |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Verify parameter set command  **TC, ZIA58919, PIA60356, EQUAL, DSCB\_HK\_RATE**  **TC,, PIA60352, EQUAL, 4** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify parameter set command  **TC, ZIA58919, PIA60356, EQUAL, DSCB\_HK\_RATE**  **TC,, PIA60352, EQUAL, 3** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify DAC SET/REL  **TC, ZIA58908, PIA59050, EQUAL, START\_B**  **TC,, PIA60354, EQUAL, 1024**  **TC,, PIA60353, EQUAL, 4095**  **TC,, PIA60345, EQUAL, 1**  **TC,, PIA59054, EQUAL, NONE** |  |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Verify DAC SET/REL  **TC, ZIA58908, PIA59050, EQUAL, START\_B**  **TC,, PIA60354, EQUAL, 2048**  **TC,, PIA60353, EQUAL, 4095**  **TC,, PIA60345, EQUAL, 1**  **TC,, PIA59054, EQUAL, NONE** |  |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Verify DAC SET/REL  **TC, ZIA58909, PIA59050, EQUAL, START\_B**  **TC,, PIA60355, EQUAL, 10**  **TC,, PIA60353, EQUAL, 20**  **TC,, PIA60345, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Verify DAC SET/REL  **TC, ZIA58909, PIA59050, EQUAL, START\_B**  **TC,, PIA60355, EQUAL, -20**  **TC,, PIA60353, EQUAL, 30**  **TC,, PIA60345, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Verify AC Link disable  **TC, ZIA58928, PIA59000, EQUAL, DISABLE** |  |
|  | ; \*WAIT\*, 0:00:03, From previous command |  |
|  | ; Verify AC Link enable  **TC, ZIA58928, PIA59000, EQUAL, ENABLE** |  |
|  | ; \*WAIT\*, 0:00:05, From previous command |  |
|  | ; Verify safety limit update (and trip)  **TC, ZIA58939, PIA60763, EQUAL, OP\_THERM\_1**  **TC,, PIA60764, EQUAL, 4095**  **TC,, PIA60765, EQUAL, 0**  **TC,, PIA60766, EQUAL, 65535**  **TC,, PIA60767, EQUAL, 65535**  **TC,, PIA60768, EQUAL, 65535**  **TC,, PIA60769, EQUAL, 65535**  **TC,, PIA60770, EQUAL, 65535**  **TC,, PIA60771, EQUAL, 65535** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Clear FDIR response  **TC, ZIA58918, PIA59016, EQUAL, FDIR\_RESPONSE** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify HIS is in LVENG mode  **TC, ZIA58917, PIA59011, EQUAL, LVENG** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify nominal safe (slow rampdown)  **TC, ZIA58941** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Clear FDIR response  **TC, ZIA58918, PIA59016, EQUAL, FDIR\_RESPONSE** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify HIS is in LVENG mode  **TC, ZIA58917, PIA59011, EQUAL, LVENG** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify nominal safe (fast rampdown)  **TC, ZIA58940** |  |
|  | ; \*WAIT\*, 0:00:57, From previous command |  |
|  | ; Wait for macro to complete (HK slows)  **TC, ZIA58931, PIA59056, EQUAL, HK\_TREP**  **TC, ZIA58931, PIA60361, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Verify HIS reset  **TC, ZIA58916, PIA59010, EQUAL, HIS** | ; Verify bootup message received  **TM, YIA58601,** ; EID 43801 |
|  | ; \*WAIT\*, 0:01:12, From previous command |  |
|  | ; Enable command echoing  **TC, ZIA58927, PIA59000, EQUAL, ENABLE**  **TC,, PIA60359, EQUAL, 43827** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Command HK at 1 Hz  **TC, ZIA58931, PIA59056, EQUAL, HK\_TREP**  **TC, ZIA58931, PIA60361, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Queue error messages  **TC, ZIA58919, PIA60356, EQUAL, EV\_QUEUE\_BYPASS**  **TC, ZIA58919, PIA60352, EQUAL, 0** |  |

## HIS Test Case 4 & 5: SW, FPGA Mode & LV DS-TOF STIM Test

|  |  |  |
| --- | --- | --- |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Configure 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 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 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 |  |
|  | **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_TOP\_PLATE**  **TC,, PIA60352, EQUAL, 0** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure DSCB for Normal Coincidence (TOF Only)  **TC, ZIA58919, PIA60356, EQUAL, DSCB\_REG\_CTR\_ST**  **TC,, PIA60352, EQUAL, 0** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure DSCB thresholds for stims test  **TC, ZIA58913, PIA60001, EQUAL, 31** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure DSCB for Multi-SSD  **TC, ZIA58919, PIA60356, EQUAL, MULTI\_SSD\_ENABLE**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable sensor test packet  **TC, ZIA58919, PIA60356, EQUAL, SENS\_TEST\_PKT\_EN**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable matrix (disabled by default)  **TC, ZIA58919, PIA60356, EQUAL, MATRIX\_EN\_NORM**  **TC,, PIA60352, EQUAL, 0x7FFFFFFF** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable matrix (disabled by default)  **TC, ZIA58919, PIA60356, EQUAL, MATRIX\_EN\_BURS\_1**  **TC,, PIA60352, EQUAL, 0x7FFFFFFF** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable matrix (disabled by default)  **TC, ZIA58919, PIA60356, EQUAL, MATRIX\_EN\_B2**  **TC,, PIA60352, EQUAL, 0x7FFFFFFF** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable stim pulse table  **TC, ZIA58919, PIA60356, EQUAL, STIM\_TABLE\_NO**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable stim pulse table  **TC, ZIA58919, PIA60356, EQUAL, STIM\_TABLE\_B1**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable stim pulse table  **TC, ZIA58919, PIA60356, EQUAL, STIM\_TABLE\_B2**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable stim pulse table  **TC, ZIA58927, PIA59000, EQUAL, ENABLE**  **TC,, PIA60359, EQUAL, 43831** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set Low Latency interval to scan time  **TC, ZIA58919, PIA60356, EQUAL, LL\_INTERNAL\_SEC**  **TC,, PIA60352, EQUAL, 30** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enter Normal mode  **TC, ZIA58913, PIA60001, EQUAL, 10** |  |
|  | ; \*WAIT\*, 0:02:02, From previous command |  |
|  | ; Enter PRE\_BURST mode  **TC, ZIA58913, PIA60001, EQUAL, 5** | ; Check for received packets  **TM, YIA58212, NIA03010, GREATER, 90** |
|  | ; \*WAIT\*, 0:00:33, From previous command |  |
|  | ; Set Low Latency interval to scan time  **TC, ZIA58919, PIA60356, EQUAL, LL\_INTERNAL\_SEC**  **TC,, PIA60352, EQUAL, 4** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set burst mode stims  **TC, ZIA58919, PIA60356, EQUAL, NUM\_BURST\_SECS**  **TC,, PIA60352, EQUAL, 32** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enter Burst mode  **TC, ZIA58913, PIA60001, EQUAL, 6** |  |
|  | ; \*WAIT\*, 0:00:34, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |

# HIS High Voltage Tests

The entire section 9 contains HIS HV tests. Check HV plug state before running HIS HV FFT.

|  |  |  |
| --- | --- | --- |
|  |  | ; Check for received packets  **TM, YIA58212, NIAG1206, EQUALS, 76** |

**ONLY RUN THESE TESTS IF YIA58212 NIAG1206 EQUALS 76**

**DO NOT RUN THESE TESTS IF YIA58212 NIAG1206 DOES NOT EQUAL 76**

## HIS Test Case 6: HV Control Test

|  |  |  |
| --- | --- | --- |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable PA  **TC, ZIA58907, PIA59000, EQUAL, ENABLE**  **TC,, PIA59006, EQUAL, PA** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Ramp Up PA  **TC, ZIA58908, PIA59050, EQUAL, PA**  **TC,, PIA60354, EQUAL, -1712**  **TC,, PIA60353, EQUAL, 122**  **TC,, PIA60345, EQUAL, 10**  **TC,, PIA59054, EQUAL, NONE** | ; Verify PA voltage and current  **TM, YIA58212, NIA01350, LIMIT, -3.0, -2.0** ; HIS\_PA\_HVPS\_VOLT\_M\_MIN  **TM,, NIA01351, LIMIT, -3.0, -2.0** ; HIS\_PA\_HVPS\_VOLT\_M\_MAX  **TM,, NIA01352, LIMIT, -3.0, -2.0** ; HIS\_PA\_HVPS\_VOLT\_M\_AVE  **TM,, NIA01724, LIMIT, -0.041, -0.027** ; HIS\_LVPS\_N12V\_CUR\_MIN  **TM,, NIA01725, LIMIT, -0.041, -0.027** ; HIS\_LVPS\_N12V\_CUR\_MAX  **TM,, NIA01726, LIMIT, -0.041, -0.027** ; HIS\_LVPS\_N12V\_CUR\_AVE  **TM,, NIA01739, LIMIT, 0.034, 0.043 ;** HIS\_LVPS\_P12V\_CUR\_MIN  **TM,, NIA01740, LIMIT, 0.034, 0.043** ; HIS\_LVPS\_P12V\_CUR\_MAX  **TM,, NIA01741, LIMIT, 0.034, 0.043** ; HIS\_LVPS\_P12V\_CUR\_AVE |
|  | ; \*WAIT\*, 0:02:40, From previous command |  |
|  | ; Enable OFFSET  **TC, ZIA58907, PIA59000, EQUAL, ENABLE**  **TC,, PIA59006, EQUAL, OFFSET** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Ramp Up OFFSET  **TC, ZIA58908, PIA59050, EQUAL, OFFSET**  **TC,, PIA60354, EQUAL, 205**  **TC,, PIA60353, EQUAL, 102**  **TC,, PIA60345, EQUAL, 5**  **TC,, PIA59054, EQUAL, NONE** | ; Verify OFFSET voltage and current  **TM, YIA58212, NIA04612, LIMIT, 0.095, 0.105** ; HIS\_OFFSETVMON\_MIN  **TM,, NIA04634, LIMIT, 0.095, 0.105** ; HIS\_OFFSETVMON\_MAX  **TM,, NIA04656, LIMIT, 0.095, 0.105** ; HIS\_OFFSETVMON\_AVE  **TM,, NIA04624, LIMIT, 0.41, 0.60** ; HIS\_OFFSETIMON\_MIN  **TM,, NIA04646, LIMIT, 0.41, 0.60** ; HIS\_OFFSETIMON\_MAX  **TM,, NIA04668, LIMIT, 0.41, 0.60** ; HIS\_OFFSETIMON\_AVE |
|  | ; \*WAIT\*, 0:00:16, From previous command |  |
|  | ; Enable Start MCP  **TC, ZIA58907, PIA59000, EQUAL, ENABLE**  **TC,, PIA59006, EQUAL, START\_MCP** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Enable Stop MCP  **TC, ZIA58907, PIA59000, EQUAL, ENABLE**  **TC,, PIA59006, EQUAL, STOP\_MCP** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Enable SSD  **TC, ZIA58907, PIA59000, EQUAL, ENABLE**  **TC,, PIA59006, EQUAL, SSD** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Ramp Up Start MCP  **TC, ZIA58908, PIA59050, EQUAL, START\_MCP**  **TC,, PIA60354, EQUAL, 246**  **TC,, PIA60353, EQUAL, 41**  **TC,, PIA60345, EQUAL, 5**  **TC,, PIA59054, EQUAL, NONE** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Ramp Up Stop MCP  **TC, ZIA58908, PIA59050, EQUAL, STOP\_MCP**  **TC,, PIA60354, EQUAL, 246**  **TC,, PIA60353, EQUAL, 41**  **TC,, PIA60345, EQUAL, 5**  **TC,, PIA59054, EQUAL, NONE** | ; Verify START\_MCP voltage and current  **TM, YIA58212, NIA04609, LIMIT, 0.285, 0.315**; HIS\_STARTMCPVMON\_MIN  **TM,, NIA04631, LIMIT, 0.285, 0.315**; HIS\_STARTMCPVMON\_MAX  **TM,, NIA04653, LIMIT, 0.285, 0.315**; HIS\_STARTMCPVMON\_AVE  **TM,, NIA04613, LIMIT, 0.8, 1.5**; HIS\_STARTMCPIMON\_MIN  **TM,, NIA04635, LIMIT, 0.8, 1.5**; HIS\_STARTMCPIMON\_MAX  **TM,, NIA04657, LIMIT, 0.8, 1.5**; HIS\_STARTMCPIMON\_AVE |
|  |  | ; Verify STOP\_MCP voltage and current  **TM, YIA58212, NIA04610, LIMIT, 0.285, 0.315**; HIS\_STOPMCPVMON\_MIN  **TM,, NIA04632, LIMIT, 0.285, 0.315**; HIS\_STOPMCPVMON\_MAX  **TM,, NIA04654, LIMIT, 0.285, 0.315**; HIS\_STOPMCPVMON\_AVE  **TM,, NIA04614, LIMIT, 1.2, 2.0**; HIS\_STOPMCPIMON\_MIN  **TM,, NIA04636, LIMIT, 1.2, 2.0** ; HIS\_STOPMCPIMON\_MAX  **TM,, NIA04658, LIMIT, 1.2, 2.0** ; HIS\_STOPMCPIMON\_AVE |
|  | ; \*WAIT\*, 0:00:28, From previous command |  |
|  | ; Ramp Up SSD  **TC, ZIA58908, PIA59050, EQUAL, SSD**  **TC,, PIA60354, EQUAL, 491**  **TC,, PIA60353, EQUAL, 164**  **TC,, PIA60345, EQUAL, 1**  **TC,, PIA59054, EQUAL, NONE** | ; Verify SSD voltage and current  **TM, YIA58212, NIA04611, LIMIT, 28.5, 31.5**; HIS\_SSDVMON\_MIN  **TM,, NIA04633, LIMIT, 28.5, 31.5**; HIS\_SSDVMON\_MAX  **TM,, NIA04655, LIMIT, 28.5, 31.5**; HIS\_SSDVMON\_AVE  **TM,, NIA04623, LIMIT, 0.54, 0.90**; HIS\_SSDIMON\_MIN  **TM,, NIA04645, LIMIT, 0.54, 0.90**; HIS\_SSDIMON\_MAX  **TM,, NIA04667, LIMIT, 0.54, 0.90**; HIS\_SSDIMON\_AVE |
|  | ; \*WAIT\*, 0:00:06, From previous command |  |
|  | ; Enable EAIS  **TC, ZIA58907, PIA59000, EQUAL, ENABLE**  **TC,, PIA59006, EQUAL, IRAP** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Ramp Up MAIN  **TC, ZIA58908, PIA59050, EQUAL, MAIN**  **TC,, PIA60354, EQUAL, 4095**  **TC,, PIA60353, EQUAL, 229**  **TC,, PIA60345, EQUAL, 10**  **TC,, PIA59054, EQUAL, NONE** | ; Verify MAIN voltage and current  **TM, YIA58212, NIA01341, LIMIT, 0.5643, 0.6237** ; HIS\_HVPS\_MAIN\_POS\_MIN  **TM,, NIA01342, LIMIT, 0.5643, 0.6237** ; HIS\_HVPS\_MAIN\_POS\_MAX  **TM,, NIA01343, LIMIT, 0.5643, 0.6237** ; HIS\_HVPS\_MAIN\_POS\_AVE  **TM,, NIA01335, LIMIT, -0.6237, -0.5643** ; HIS\_HVPS\_MAIN\_NEG\_MIN  **TM,, NIA01371, LIMIT, -0.6237, -0.5643** ; HIS\_HVPS\_MAIN\_NEG\_MAX  **TM,, NIA01407, LIMIT, -0.6237, -0.5643**; HIS\_HVPS\_MAIN\_NEG\_AVE  **TM,, NIA01709, LIMIT, 0.02115, 0.0285** ; HIS\_HVPS\_P12V\_CUR\_MIN  **TM,, NIA01710, LIMIT, 0.02115, 0.0285** ; HIS\_HVPS\_P12V\_CUR\_MAX  **TM,, NIA01711, LIMIT, 0.02115, 0.0285** ; HIS\_HVPS\_P12V\_CUR\_AVE  **TM,, NIA01712, LIMIT, -0.0285, -0.02115** ; HIS\_HVPS\_N12V\_CUR\_MIN  **TM,, NIA01713, LIMIT, -0.0285, -0.02115** ; HIS\_HVPS\_N12V\_CUR\_MAX  **TM,, NIA01714, LIMIT, -0.0285, -0.02115** ; HIS\_HVPS\_N12V\_CUR\_AVE |
|  | ; \*WAIT\*, 0:02:53, From previous command |  |
|  | ; Ramp Up Analyzer  **TC, ZIA58908, PIA59050, EQUAL, ANALYZER**  **TC,, PIA60354, EQUAL, -295**  **TC,, PIA60353, EQUAL, 258**  **TC,, PIA60345, EQUAL, 10**  **TC,, PIA59054, EQUAL, HIGH** | ; Verify settings  **TM, YIA58212, NIA01344, LIMIT, -0.06, -0.03** ; HIS\_HVPS\_ANL\_MIN  **TM,, NIA01345, LIMIT, -0.06, -0.03** ; HIS\_HVPS\_ANL\_MAX  **TM,, NIA01346, LIMIT, -0.06, -0.03** ; HIS\_HVPS\_ANL\_AVE |
|  | ; \*WAIT\*, 0:00:13, From previous command |  |
|  | ; Ramp Up Top Deflector  **TC, ZIA58908, PIA59050, EQUAL, TOP\_DFL**  **TC,, PIA60354, EQUAL, 280**  **TC,, PIA60353, EQUAL, 258**  **TC,, PIA60345, EQUAL, 10**  **TC,, PIA59054, EQUAL, HIGH** | ; Verify settings  **TM, YIA58212, NIA01336, LIMIT, 0.03, 0.05** ; HIS\_HVPS\_TOP\_DEF\_MIN  **TM,, NIA01372, LIMIT, 0.03, 0.05** ; HIS\_HVPS\_TOP\_DEF\_MAX  **TM,, NIA01408, LIMIT, 0.03, 0.05** ; HIS\_HVPS\_TOP\_DEF\_AVE |
|  | ; \*WAIT\*, 0:00:14, From previous command |  |
|  | ; Ramp Up Bottom Deflector  **TC, ZIA58908, PIA59050, EQUAL, BOT\_DFL**  **TC,, PIA60354, EQUAL, -280**  **TC,, PIA60353, EQUAL, 258**  **TC,, PIA60345, EQUAL, 10**  **TC,, PIA59054, EQUAL, HIGH** | ; Verify settings  **TM, YIA58212, NIA01337, LIMIT, -0.05, -0.03** ; HIS\_HVPS\_BOT\_DEF\_MIN  **TM,, NIA01373, LIMIT, -0.05, -0.03** ; HIS\_HVPS\_BOT\_DEF\_MAX  **TM,, NIA01409, LIMIT, -0.05, -0.03** ; HIS\_HVPS\_BOT\_DEF\_AVE |
|  | ; \*WAIT\*, 0:00:13, From previous command |  |
|  | ; Ramp Up Top Plate  **TC, ZIA58908, PIA59050, EQUAL, TOP\_PLATE**  **TC,, PIA60354, EQUAL, 287**  **TC,, PIA60353, EQUAL, 258**  **TC,, PIA60345, EQUAL, 10**  **TC,, PIA59054, EQUAL, HIGH** | ; Verify settings  **TM, YIA58212, NIA01347, LIMIT, 0.03, 0.05** ; HIS\_HVPS\_TOP\_PLATE\_MIN  **TM,, NIA01348, LIMIT, 0.03, 0.05** ; HIS\_HVPS\_TOP\_PLATE\_MAX  **TM,, NIA01349, LIMIT, 0.03, 0.05** ; HIS\_HVPS\_TOP\_PLATE\_AVE |
|  | ; \*WAIT\*, 0:00:13, From previous command |  |
|  | ; Ramp Down Top Plate  **TC, ZIA58908, PIA59050, EQUAL, TOP\_PLATE**  **TC,, PIA60354, EQUAL, 0**  **TC,, PIA60353, EQUAL, 258**  **TC,, PIA60345, EQUAL, 3**  **TC,, PIA59054, EQUAL, HIGH** |  |
|  | ; \*WAIT\*, 0:00:06, From previous command |  |
|  | ; Ramp Down Bottom Deflector  **TC, ZIA58908, PIA59050, EQUAL, BOT\_DFL**  **TC,, PIA60354, EQUAL, 0**  **TC,, PIA60353, EQUAL, 258**  **TC,, PIA60345, EQUAL, 3**  **TC,, PIA59054, EQUAL, HIGH** |  |
|  | ; \*WAIT\*, 0:00:06, From previous command |  |
|  | ; Ramp Down Top Deflector  **TC, ZIA58908, PIA59050, EQUAL, TOP\_DFL**  **TC,, PIA60354, EQUAL, 0**  **TC,, PIA60353, EQUAL, 258**  **TC,, PIA60345, EQUAL, 3**  **TC,, PIA59054, EQUAL, HIGH** |  |
|  | ; \*WAIT\*, 0:00:06, From previous command |  |
|  | ; Ramp Down Analyzer  **TC, ZIA58908, PIA59050, EQUAL, ANALYZER**  **TC,, PIA60354, EQUAL, 0**  **TC,, PIA60353, EQUAL, 258**  **TC,, PIA60345, EQUAL, 3**  **TC,, PIA59054, EQUAL, HIGH** |  |

## HIS Test Case 7: HV DS-TOF Stim Test

|  |  |  |
| --- | --- | --- |
|  | ; \*WAIT\*, 0:00:06, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure for HV sweeping  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_ANALYZER**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set top deflector  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_TOP\_DFL**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set bottom deflector  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_BOT\_DFL**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set top plate  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_TOP\_PLATE**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure DSCB for Normal Coincidence (TOF Only)  **TC, ZIA58919, PIA60356, EQUAL, DSCB\_REG\_CTR\_ST**  **TC,, PIA60352, EQUAL, 0** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure stim test setup, go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure DSCB thresholds for stims test  **TC, ZIA58913, PIA60001, EQUAL, 31** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure DSCB for Multi-SSD  **TC, ZIA58919, PIA60356, EQUAL, MULTI\_SSD\_ENABLE**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable sensor test packet  **TC, ZIA58919, PIA60356, EQUAL, SENS\_TEST\_PKT\_EN**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable matrix (disabled by default)  **TC, ZIA58919, PIA60356, EQUAL, MATRIX\_EN\_NORM**  **TC,, PIA60352, EQUAL, 0x7FFFFFFF** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set burst matrix  **TC, ZIA58919, PIA60356, EQUAL, MATRIX\_EN\_BURS\_1**  **TC,, PIA60352, EQUAL, 0x7FFFFFFF** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set matrix  **TC, ZIA58919, PIA60356, EQUAL, MATRIX\_EN\_B2**  **TC,, PIA60352, EQUAL, 0x7FFFFFFF** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable stim pulse table  **TC, ZIA58919, PIA60356, EQUAL, STIM\_TABLE\_NO**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set stim table  **TC, ZIA58919, PIA60356, EQUAL, STIM\_TABLE\_B1**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set stim table  **TC, ZIA58919, PIA60356, EQUAL, STIM\_TABLE\_B2**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Enable event report  **TC, ZIA58927, PIA59000, EQUAL, ENABLE**  **TC,, PIA60359, EQUAL, 43831** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set Low Latency interval to scan time  **TC, ZIA58919, PIA60356, EQUAL, LL\_INTERNAL\_SEC**  **TC,, PIA60352, EQUAL, 30** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Run normal mode stims, enter Normal mode  **TC, ZIA58913, PIA60001, EQUAL, 10** |  |
|  | ; \*WAIT\*, 0:02:02, From previous command |  |
|  | ; Enter PRE\_BURST mode  **TC, ZIA58913, PIA60001, EQUAL, 5** | ; Check for received packets  **TM, YIA58212, NIA03010, GREATER, 90** ; his\_proc\_idle |
|  | ; \*WAIT\*, 0:00:33, From previous command |  |
|  | ; Set Low Latency interval to scan time  **TC, ZIA58919, PIA60356, EQUAL, LL\_INTERNAL\_SEC**  **TC,, PIA60352, EQUAL, 4** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Run burst mode stims, enter Burst mode  **TC, ZIA58919, PIA60356, EQUAL, NUM\_BURST\_SECS**  **TC,, PIA60352, EQUAL, 32** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Start macro  **TC, ZIA58913, PIA60001, EQUAL, 6** |  |
|  | ; \*WAIT\*, 0:00:34, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |

## HIS Test Case 8: HV SSD Performance Test

|  |  |  |
| --- | --- | --- |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure no HV sweeping (static ouput only)  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_ANALYZER**  **TC,, PIA60352, EQUAL, 0** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set top deflector  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_TOP\_DFL**  **TC,, PIA60352, EQUAL, 0** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set bottom deflector  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_BOT\_DFL**  **TC,, PIA60352, EQUAL, 0** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set top plate parameter  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_TOP\_PLATE**  **TC,, PIA60352, EQUAL, 0** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure DSCB for Energy Only |  |
|  | **TC, ZIA58919, PIA60356, EQUAL, DSCB\_REG\_CTR\_ST**  **TC,, PIA60352, EQUAL, 2** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure stim test setup. Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure DSCB thresholds for stims test  T**C, ZIA58913, PIA60001, EQUAL, 31** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure DSCB for Multi-SSD  **TC, ZIA58919, PIA60356, EQUAL, MULTI\_SSD\_ENABLE**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable sensor test packet  **TC, ZIA58919, PIA60356, EQUAL, SENS\_TEST\_PKT\_EN**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable matrix (disabled by default)  **TC, ZIA58919, PIA60356, EQUAL, MATRIX\_EN\_NORM**  **TC,, PIA60352, EQUAL, 0x7FFFFFFF** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set matrix  **TC, ZIA58919, PIA60356, EQUAL, MATRIX\_EN\_BURS\_1**  **TC,, PIA60352, EQUAL, 0x7FFFFFFF** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set matrix  **TC, ZIA58919, PIA60356, EQUAL, MATRIX\_EN\_B2**  **TC,, PIA60352, EQUAL, 0x7FFFFFFF** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set stim pulse table  **TC, ZIA58919, PIA60356, EQUAL, STIM\_TABLE\_NO**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set stim table  **TC, ZIA58919, PIA60356, EQUAL, STIM\_TABLE\_B1**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set stim table  **TC, ZIA58919, PIA60356, EQUAL, STIM\_TABLE\_B2**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable event report  **TC, ZIA58927, PIA59000, EQUAL, ENABLE**  **TC,, PIA60359, EQUAL, 43831** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Set Low Latency interval to scan time  **TC, ZIA58919, PIA60356, EQUAL, LL\_INTERNAL\_SEC**  **TC,, PIA60352, EQUAL, 30** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Run normal mode macro  **TC, ZIA58913, PIA60001, EQUAL, 10** |  |
|  | ; \*WAIT\*, 0:02:02, From previous command |  |
|  | ; Run PRE\_BURST mode macro  **TC, ZIA58913, PIA60001, EQUAL, 5** | ; Check for received packets  **TM, YIA58212, NIA03010, GREATER, 90** ; his\_proc\_idle |
|  | ; \*WAIT\*, 0:00:34, From previous command |  |
|  | ; Set Low Latency interval to scan time  **TC, ZIA58919, PIA60356, EQUAL, LL\_INTERNAL\_SEC**  **TC,, PIA60352, EQUAL, 4** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enter Burst mode  **TC, ZIA58919, PIA60356, EQUAL, NUM\_BURST\_SECS**  **TC,, PIA60352, EQUAL, 32** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Run mode macro  **TC, ZIA58913, PIA60001, EQUAL, 6** |  |
|  | ; \*WAIT\*, 0:00:34, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |

## HIS Test Case 9: HV PS System PerformanceTest

|  |  |  |
| --- | --- | --- |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure for HV sweeping  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_ANALYZER**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_TOP\_DFL**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable top plate  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_BOT\_DFL**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enable bottom deflector  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_TOP\_PLATE**  **TC,, PIA60352, EQUAL, 1** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Enter Low Cadence mode  **TC, ZIA58913, PIA60001, EQUAL, 3** |  |
|  | ; \*WAIT\*, 0:06:01, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** | ; Verify min/max for sweeping  **TM, YIA58998, NIA00834, LESS\_OR\_EQUAL, 600.0** ; PCDM\_HK\_IMON\_HIS) |
|  |  | ; Verify static HV standard deviation  **TM, YIA58998, NIA05130, LESS\_OR\_EQUAL, 2000.0** ; HK\_I\_P28V\_PRI |
|  | ; \*WAIT\*, 0:00:05, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Ramp Down Top Plate  **TC, ZIA58908, PIA59050, EQUAL, TOP\_PLATE**  **TC,, PIA60354, EQUAL, 0**  **TC,, PIA60353, EQUAL, 258**  **TC,, PIA60345, EQUAL, 3**  **TC,, PIA59054, EQUAL, HIGH** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Ramp Down Bottom Deflector  **TC, ZIA58908, PIA59050, EQUAL, BOT\_DFL**  **TC,, PIA60354, EQUAL, 0**  **TC,, PIA60353, EQUAL, 258**  **TC,, PIA60345, EQUAL, 3**  **TC,, PIA59054, EQUAL, HIGH** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Ramp Down Top Deflector  **TC, ZIA58908, PIA59050, EQUAL, TOP\_DFL**  **TC,, PIA60354, EQUAL, 0**  **TC,, PIA60353, EQUAL, 258**  **TC,, PIA60345, EQUAL, 3**  **TC,, PIA59054, EQUAL, HIGH** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Ramp Down Analyzer  **TC, ZIA58908, PIA59050, EQUAL, ANALYZER**  **TC,, PIA60354, EQUAL, 0**  **TC,, PIA60353, EQUAL, 258**  **TC,, PIA60345, EQUAL, 3**  **TC,, PIA59054, EQUAL, HIGH** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Ramp Down MAIN  **TC, ZIA58908, PIA59050, EQUAL, MAIN**  **TC,, PIA60354, EQUAL, 0**  **TC,, PIA60353, EQUAL, 229**  **TC,, PIA60345, EQUAL, 3**  **TC,, PIA59054, EQUAL, NONE** |  |
|  | ; \*WAIT\*, 0:00:55, From previous command |  |
|  | ; Disable EAIS  **TC, ZIA58907, PIA59000, EQUAL, DISABLE**  **TC,, PIA59006, EQUAL, IRAP** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Ramp Down Start MCP  **TC, ZIA58908, PIA59050, EQUAL, START\_MCP**  **TC,, PIA60354, EQUAL, 0**  **TC,, PIA60353, EQUAL, 41**  **TC,, PIA60345, EQUAL, 5**  **TC,, PIA59054, EQUAL, NONE** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Ramp Down Stop MCP  **TC, ZIA58908, PIA59050, EQUAL, STOP\_MCP**  **TC,, PIA60354, EQUAL, 0**  **TC,, PIA60353, EQUAL, 41**  **TC,, PIA60345, EQUAL, 5**  **TC,, PIA59054, EQUAL, NONE** |  |
|  | ; \*WAIT\*, 0:00:28, From previous command |  |
|  | ; Disable Start MCP  **TC, ZIA58907, PIA59000, EQUAL, DISABLE**  **TC,, PIA59006, EQUAL, START\_MCP** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Disable Stop MCP  **TC, ZIA58907, PIA59000, EQUAL, DISABLE**  **TC,, PIA59006, EQUAL, STOP\_MCP** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Ramp Down OFFSET  **TC, ZIA58908, PIA59050, EQUAL, OFFSET**  **TC,, PIA60354, EQUAL, 0**  **TC,, PIA60353, EQUAL, 102**  **TC,, PIA60345, EQUAL, 5**  **TC,, PIA59054, EQUAL, NONE** |  |
|  | ; \*WAIT\*, 0:00:13, From previous command |  |
|  | ; Disable OFFSET  **TC, ZIA58907, PIA59000, EQUAL, DISABLE**  **TC,, PIA59006, EQUAL, OFFSET** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Ramp Down SSD  **TC, ZIA58908, PIA59050, EQUAL, SSD**  **TC,, PIA60354, EQUAL, 0**  **TC,, PIA60353, EQUAL, 164**  **TC,, PIA60345, EQUAL, 1**  **TC,, PIA59054, EQUAL, NONE** |  |
|  | ; \*WAIT\*, 0:00:06, From previous command |  |
|  | ; Disable SSD  **TC, ZIA58907, PIA59000, EQUAL, DISABLE**  **TC,, PIA59006, EQUAL, SSD** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Ramp Down PA  **TC, ZIA58908, PIA59050, EQUAL, PA**  **TC,, PIA60354, EQUAL, 0**  **TC,, PIA60353, EQUAL, 122**  **TC,, PIA60345, EQUAL, 10**  **TC,, PIA59054, EQUAL, NONE** |  |
|  | ; \*WAIT\*, 0:02:23, From previous command |  |
|  | ; Disable PA  **TC, ZIA58907, PIA59000, EQUAL, DISABLE**  **TC,, PIA59006, EQUAL, PA** |  |

# PAS Test

|  |  |  |
| --- | --- | --- |
| **Step N°** | **FFT Commanding Flow** | **Checks and PASS/FAIL Criteria** |
|  | ~~; Run the HV Ramp Macro~~  **~~TM, ZIA58856, PIA60791,EQUAL,0~~**  **~~TM,,PIA60790,EQUAL,0xCCC~~**  **~~TM,,PIA60792,EQUAL,0x1FD~~**  **~~TM,,PIA60793,EQUAL,0x1E~~** | Shall be in ON procedure. |
|  | ; Wait 00:05:00 (5 minutes) |  |
|  | ; Modify the Snap shot table with K=4  **TC, ZIA58706, PIA60133,EQUAL,1**  **TC,,PIA60136,EQUAL,0x3008**  **TC,,PIA60135,EQUAL,30**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x02**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x5C**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x09**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x30**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x03**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x04**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x07**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x01** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Accept the change  **TC, ZIA58708** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Dump the configuration parameters  **TC, ZIA58707, PIA60137, EQUAL, 1**  **TC,,PIA60138,EQUAL,0x3008** | ; Check the snap shot table change  **TM, YIA58906, NIA01503,EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x02**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x5C**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x09**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x30**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x03**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x04**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x07**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x01** |
|  | ; Modify the Burst Table with K = 4  **TC, ZIA58706, PIA60133,EQUAL,1**  **TC,,PIA60136,EQUAL,0x3009**  **TC,,PIA60135,EQUAL,30**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x02**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x5C**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x09**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x30**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x03**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x04**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x1E**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x00**  **TC,,PIA60134,EQUAL,0x0A** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Accept the change  **TC, ZIA58708** |  |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Dump the configuration parameters to check the change was correct  **TC, ZIA58707, PIA60137,EQUAL,1**  **TC,,PIA60138,EQUAL,0x3009** | ; Check the burst table change  **TM, YIA58906, NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x02**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x5C**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x09**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x30**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x03**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x04**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x1E**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x00**  **TM,,NIA01503, EQUAL,0x0A** |
|  | ; Start Science Cyclogram  **TC, ZIA58943,PIA60777,EQUAL,22** | **THIS COMMAND CAN BE EXECUTED IF AIRSAFE PLUG IS INSTALLED**  **IF DISABLE PLUG IS INSTASLLED, DO NOT EXECUTE THIS COMMAND**  ; Check PAS packets arrive:  ; Normal 3d at 4s, 48 energies  **TM, YIA58700;** TM(21,3) SID=192  **TM, YIA58705;** TM(21,6) SID=193  ; Snaps at around the 300s  **TM,YIA58982;** TM(21,3) SID=205  **TM, YIA58992;** TM(21,3) SID=206  **TM, YIA58993;** TM(21,6) SID=207  ; Moments at 100s  **TM, YIA58729;** TM(21,3) SID=215 |
|  | ; \*WAIT\*, 0:01:00, (1 minute) From previous command |  |
|  | ; Upload a PAS pulse table every minute for 11 minutes  ; Upload the PAS pulse table #1  **TC,ZIA58878,PIA60719,EQUAL,0x0F1A6E**  **TC,,PIA60433,EQUAL,0x28**  **TC,,PIA60672,EQUAL,0x4**  **TC,,PIA60717,EQUAL,0x0**  **TC,,PIA60718,EQUAL,0x14** |  |
|  | ; \*WAIT\*, 0:01:00, (1 minute) From previous command |  |
|  | ; Upload the PAS pulse table #2  **TC,ZIA58878,PIA60719,EQUAL,0x0F1A6E**  **TC,,PIA60433,EQUAL,0x28**  **TC,,PIA60672,EQUAL,0x4**  **TC,,PIA60717,EQUAL,0x1**  **TC,,PIA60718,EQUAL,0x14** |  |
|  | ; \*WAIT\*, 0:01:00, (1 minute) From previous command |  |
|  | ; Upload the PAS pulse table #3  **TC,ZIA58878,PIA60719,EQUAL,0x0F1A6E**  **TC,,PIA60433,EQUAL,0x28**  **TC,,PIA60672,EQUAL,0x4**  **TC,,PIA60717,EQUAL,0x2**  **TC,,PIA60718,EQUAL,0x14** |  |
|  | ; \*WAIT\*, 0:01:00, (1 minute) From previous command |  |
|  | ; Upload the PAS pulse table #4  **TC,ZIA58878,PIA60719,EQUAL,0x0F1A6E**  **TC,,PIA60433,EQUAL,0x28**  **TC,,PIA60672,EQUAL,0x4**  **TC,,PIA60717,EQUAL,0x3**  **TC,,PIA60718,EQUAL,0x14** |  |
|  | ; \*WAIT\*, 0:01:00, (1 minute) From previous command |  |
|  | ; Upload the PAS pulse table #5  **TC,ZIA58878,PIA60719,EQUAL,0x0F1A6E**  **TC,,PIA60433,EQUAL,0x28**  **TC,,PIA60672,EQUAL,0x4**  **TC,,PIA60717,EQUAL,0x4**  **TC,,PIA60718,EQUAL,0x14** |  |
|  | ; \*WAIT\*, 0:01:00, (1 minute) From previous command |  |
|  | ; Upload the PAS pulse table #6  **TC,ZIA58878,PIA60719,EQUAL,0x0F1A6E**  **TC,,PIA60433,EQUAL,0x1E**  **TC,,PIA60672,EQUAL,0x6**  **TC,,PIA60717,EQUAL,0x5**  **TC,,PIA60718,EQUAL,0x14** |  |
|  | ; \*WAIT\*, 0:01:00, (1 minute) From previous command |  |
|  | ; Upload the PAS pulse table #7  **TC,ZIA58878,PIA60719,EQUAL,0x0F1A6E**  **TC,,PIA60433,EQUAL,0x1E**  **TC,,PIA60672,EQUAL,0x6**  **TC,,PIA60717,EQUAL,0x6**  **TC,,PIA60718,EQUAL,0x14** |  |
|  | ; \*WAIT\*, 0:01:00, (1 minute) From previous command |  |
|  | ; Upload the PAS pulse table #8  **TC,ZIA58878,PIA60719,EQUAL,0x0F1A6E**  **TC,,PIA60433,EQUAL,0x1E**  **TC,,PIA60672,EQUAL,0x6**  **TC,,PIA60717,EQUAL,0x7**  **TC,,PIA60718,EQUAL,0x14** |  |
|  | ; \*WAIT\*, 0:01:00, (1 minute) From previous command |  |
|  | ; Upload the PAS pulse table #9  **TC,ZIA58878,PIA60719,EQUAL,0x0F1A6E**  **TC,,PIA60433,EQUAL,0x1E**  **TC,,PIA60672,EQUAL,0x6**  **TC,,PIA60717,EQUAL,0x8**  **TC,,PIA60718,EQUAL,0x14** |  |
|  | ; \*WAIT\*, 0:01:00, (1 minute) From previous command |  |
|  | ; Upload the PAS pulse table #10  **TC,ZIA58878,PIA60719,EQUAL,0x0F1A6E**  **TC,,PIA60433,EQUAL,0x1E**  **TC,,PIA60672,EQUAL,0x6**  **TC,,PIA60717,EQUAL,0x9**  **TC,,PIA60718,EQUAL,0x14** |  |
|  | ; \*WAIT\*, 0:01:00, (1 minute) From previous command |  |
|  | ; Upload the PAS pulse table #11  **TC,ZIA58878,PIA60719,EQUAL,0x0F1A6E**  **TC,,PIA60433,EQUAL,0x1E**  **TC,,PIA60672,EQUAL,0x6**  **TC,,PIA60717,EQUAL,0x5**  **TC,,PIA60718,EQUAL,0x14** |  |
|  | ; \*WAIT\*, 0:01:00, (1 minute) From previous command |  |
|  | ; Upload the PAS pulse table #5  **TC,ZIA58878,PIA60719,EQUAL,0x0F1A6E**  **TC,,PIA60433,EQUAL,0x28**  **TC,,PIA60672,EQUAL,0x4**  **TC,,PIA60717,EQUAL,0x4**  **TC,,PIA60718,EQUAL,0x14** |  |
|  | ; Enter PAS into Burst Mode for 300 seconds  **TC, ZIA58726, PIA60157,EQUAL,0**  **TC,,PIA60158,EQUAL,0**  **TC,,PIA60159,EQUAL,0**  **TC,,PIA60160,EQUAL,0**  **TC,,PIA60163,EQUAL,2480**  **TC,,PIA60164,EQUAL,0**  **TC,,PIA60170,EQUAL,DYNAMIC**  **TC,,PIA60161,EQUAL,0**  **TC,,PIA60162,EQUAL,0** | ; Check PAS packets arrive:  **TM, YIA58886;** TM(21,3) SID=211 Burst Start  **TM, YIA58887;** TM(21,3) SID=212 Burst First  **TM, YIA58888;** TM(21,6) SID=213 Burst Data |
|  |  | ; Wait for all BM packets to arrive. Check PAS cyclogram packets continue to arrive:  ; Normal 3d at 4s, 48 energies  **TM, YIA58700;** TM(21,3) SID=192  **TM, YIA58705;** TM(21,6) SID=193  ; Snaps at around the 300s  **TM,YIA58982;** TM(21,3) SID=205  **TM, YIA58992;** TM(21,3) SID=206  **TM, YIA58993;** TM(21,6) SID=207  ; Moments at 100s  **TM, YIA58729;** TM(21,3) SID=215 |
|  | ; \*WAIT\*, 0:10:00, (10 minute) From previous command |  |
|  | ; Put PAS into no science mode  **TC**,**ZIA58944** |  |

# EAS1 Test

## Macros Test

|  |  |  |
| --- | --- | --- |
| **Step N°** | **FFT Commanding Flow** | **Checks and PASS/FAIL Criteria** |
|  | ; Start normal mode on EAS1  **TC, ZIA58771, PIA60031, EQUAL, MBOX1**  **TC, ZIA58771, PIA60446, EQUAL, 0**  **TC, ZIA58771, PIA60447, EQUAL, 0**  **TC, ZIA58771, PIA60448, EQUAL, 0xC2** | ; Check reception of at least one of each:  **TM,YIA58727** ;TM(21,3) SSID=20 SWA\_TM\_SCI\_EAS\_PARTIAL\_MOMENTS\_RAW\_DATA  **TM, YIA58703** ; TM(21,3) SSID=0 SWA\_TM\_SCI\_EAS1\_FULL3D\_RAW\_HEAD  **TM, YIA58704** ; TM(21,6) SSID=1 SWA\_TM\_SCI\_EAS1\_FULL3D\_RAW\_DATA  **TM,YIA58713** ; TM(21,6) SSID=9 SWA\_TM\_SCI\_EAS1\_STRAHL\_RAW\_DATA |
|  | ; Wait 00:02:00 (2 minutes) |  |
|  | ; Switch to no science mode on EAS1  **TC, ZIA58771, PIA60031, EQUAL, MBOX1**  **TC, ZIA58771, PIA60446, EQUAL, 0**  **TC, ZIA58771, PIA60447, EQUAL, 0**  **TC, ZIA58771, PIA60448, EQUAL, 0** |  |
|  | ; Switch to Eng mode 2 on EAS1  **TC, ZIA58788, PIA60165, EQUAL, 60** ;1 minute | ; Check reception of at least one of each:  **TM, YIA58946** ; TM(21,3) SSID=14 SWA\_TM\_SCI\_EAS1\_ENG\_2-5-6-8-9\_TRIGG\_COMPR\_START  **TM, YIA58942** ; TM(21,3) SSID=18 SWA\_TM\_SCI\_EAS1\_ENG\_2-5-6-8-9\_RAW\_FIRST  **TM, YIA58944** ; TM(21,6) SSID=19 SWA\_TM\_SCI\_EAS1\_ENG\_2-5-6-8-9\_RAW\_DATA |
|  | ; Run post-eng mode macro on EAS1  **TC, ZIA58934,PIA60739,EQUAL,POST\_ENG** |  |
|  | ; Switch to Sweeping Eng mode 3 on EAS1  **TC, ZIA58789, PIA60101, EQUAL, 0** ;Start MCP  **TC, ZIA58789, PIA60100, EQUAL, 0xFF** ;Final MCP  **TC, ZIA58789, PIA60102, EQUAL, 0xF** ;Step MCP  **TC, ZIA58789, PIA60437, EQUAL, 0xA** ;1st ramp time  **TC, ZIA58789, PIA60444, EQUAL, 1** ;Inter ramp time  **TC, ZIA58789, PIA60165, EQUAL, 2** ;Acq time  **TC, ZIA58789, PIA60760, EQUAL, 0x20** Hem bin  **TC, ZIA58789, PIA60761, EQUAL, 0x8** ;Def number  **TC, ZIA58789, PIA60762, EQUAL, SWEEP\_MACRO** ;ctrl | ; Check reception of at least one of each:  **TM, YIA58927** ; TM(21,3) SSID=14 SWA\_TM\_SCI\_EAS1\_ENG\_3-4\_TRIGG\_COMPR\_START  **TM, YIA58921** ; TM(21,3) SSID=18 SWA\_TM\_SCI\_EAS1\_ENG\_3-4\_RAW\_FIRST  **TM, YIA58922** ; TM(21,6) SSID=19 SWA\_TM\_SCI\_EAS1\_ENG\_3-4\_RAW\_DATA |
|  | ; Switch to Nominal Eng mode 3 on EAS1  **TC, ZIA58789, PIA60101, EQUAL, 0** ;Start MCP  **TC, ZIA58789, PIA60100, EQUAL, 0xFF** ;Final MCP  **TC, ZIA58789, PIA60102, EQUAL, 0xF** ;Step MCP  **TC, ZIA58789, PIA60437, EQUAL, 0xA** ;1st ramp time  **TC, ZIA58789, PIA60444, EQUAL, 1** ;Inter ramp time  **TC, ZIA58789, PIA60165, EQUAL, 2** ;Acq time  **TC, ZIA58789, PIA60760, EQUAL, 0x20** Hem bin  **TC, ZIA58789, PIA60761, EQUAL, 0x8** ;Def number  **TC, ZIA58789, PIA60762, EQUAL, FIXED\_MACRO** ;ctrl | ; Check reception of at least one of each:  **TM, YIA58927** ; TM(21,3) SSID=14 SWA\_TM\_SCI\_EAS1\_ENG\_3-4\_TRIGG\_COMPR\_START  **TM, YIA58921** ; TM(21,3) SSID=18 SWA\_TM\_SCI\_EAS1\_ENG\_3-4\_RAW\_FIRST  **TM, YIA58922** ; TM(21,6) SSID=19 SWA\_TM\_SCI\_EAS1\_ENG\_3-4\_RAW\_DATA |
|  | ; Run post-eng mode macro on EAS1  **TC, ZIA58934,PIA60739,EQUAL,POST\_ENG** |  |
|  | ; Switch to Eng mode 4 on EAS1  **TC, ZIA58790, PIA60104, EQUAL, 0x724** ; Start Thresh  **TC, ZIA58790, PIA60103, EQUAL, 0x477** ; End Thresh  **TC, ZIA58790, PIA60105, EQUAL, 0x200** ; Thresh step  **TC, ZIA58790, PIA60106, EQUAL, 0x0** ; MCP Value  **TC, ZIA58790, PIA60171, EQUAL, 0xA** ; MCP wait  **TC, ZIA58790, PIA60165, EQUAL, 2** ; Acq time  **TC, ZIA58790, PIA60760, EQUAL, 0x20** Hem bin  **TC, ZIA58790, PIA60761, EQUAL, 0x8** ;Def number | ; Check reception of at least one of each:  **TM, YIA58927** ; TM(21,3) SSID=14 SWA\_TM\_SCI\_EAS1\_ENG\_3-4\_TRIGG\_COMPR\_START  **TM, YIA58921** ; TM(21,3) SSID=18 SWA\_TM\_SCI\_EAS1\_ENG\_3-4\_RAW\_FIRST  **TM, YIA58922** ; TM(21,6) SSID=19 SWA\_TM\_SCI\_EAS1\_ENG\_3-4\_RAW\_DATA |
|  | ; Run post-eng mode macro on EAS1  **TC, ZIA58934,PIA60739,EQUAL,POST\_ENG** |  |
|  | ; Switch to Eng mode 5 on EAS1  **TC, ZIA58791, PIA60454, EQUAL, 0xFF** ; PA1 stim  **TC, ZIA58791, PIA60455, EQUAL, 0xFF** ; PA2 stim  **TC, ZIA58791, PIA60040, EQUAL, 0x724** ; Start Thresh  **TC, ZIA58791, PIA60039, EQUAL, 0x477** ; End Thresh  **TC, ZIA58791, PIA60041, EQUAL, 0x76** ; Thresh step  **TC, ZIA58791, PIA60106, EQUAL, 0x0** ; MCP value  **TC, ZIA58791, PIA60171, EQUAL, 0xA** ; MCP wait  **TC, ZIA58791, PIA60165, EQUAL, 2** ; Acq time | ; Check reception of at least one of each:  **TM, YIA58946** ; TM(21,3) SSID=14 SWA\_TM\_SCI\_EAS1\_ENG\_2-5-6-8-9\_TRIGG\_COMPR\_START  **TM, YIA58942** ; TM(21,3) SSID=18 SWA\_TM\_SCI\_EAS1\_ENG\_2-5-6-8-9\_RAW\_FIRST  **TM, YIA58944** ; TM(21,6) SSID=19 SWA\_TM\_SCI\_EAS1\_ENG\_2-5-6-8-9\_RAW\_DATA |
|  | ; Run post-eng mode macro on EAS1  **TC, ZIA58934,PIA60739,EQUAL,POST\_ENG** |  |
|  | ; Switch to Eng mode 6 on EAS1  **TC, ZIA58792, PIA60457, EQUAL, 0xFF** ; Stim high  **TC, ZIA58792, PIA60458, EQUAL, 0x32** ; Stim low  **TC, ZIA58792, PIA60459, EQUAL, 0x29** ; Stim step  **TC, ZIA58792, PIA60106, EQUAL, 0x0** ; MCP value  **TC, ZIA58792, PIA60171, EQUAL, 0xA** ; MCP wait  **TC, ZIA58792, PIA60165, EQUAL, 2** ; Acq time | ; Check reception of at least one of each:  **TM, YIA58946** ; TM(21,3) SSID=14 SWA\_TM\_SCI\_EAS1\_ENG\_2-5-6-8-9\_TRIGG\_COMPR\_START  **TM, YIA58942** ; TM(21,3) SSID=18 SWA\_TM\_SCI\_EAS1\_ENG\_2-5-6-8-9\_RAW\_FIRST  **TM, YIA58944** ; TM(21,6) SSID=19 SWA\_TM\_SCI\_EAS1\_ENG\_2-5-6-8-9\_RAW\_DATA |
|  | ; WE ARE NOT RUNNING ENG MODE 7 |  |
|  | ; Run post-eng mode macro on EAS1  **TC, ZIA58934,PIA60739,EQUAL,POST\_ENG** |  |
|  | ; Switch to Eng mode 8 on EAS1  **TC, ZIA58794, PIA60735, EQUAL, 0xFF** ; VR  **TC, ZIA58794, PIA60716, EQUAL, 0x32** ; HV  **TC, ZIA58794, PIA60165, EQUAL, 0x10** ; Acq time | ; Check reception of at least one of each:  **TM, YIA58946** ; TM(21,3) SSID=14 SWA\_TM\_SCI\_EAS1\_ENG\_2-5-6-8-9\_TRIGG\_COMPR\_START  **TM, YIA58942** ; TM(21,3) SSID=18 SWA\_TM\_SCI\_EAS1\_ENG\_2-5-6-8-9\_RAW\_FIRST  **TM, YIA58944** ; TM(21,6) SSID=19 SWA\_TM\_SCI\_EAS1\_ENG\_2-5-6-8-9\_RAW\_DATA |
|  | ; Run post-eng mode macro on EAS1  **TC, ZIA58934,PIA60739,EQUAL,POST\_ENG** |  |
|  | ; Switch to Eng mode 9 on EAS1  **TC, ZIA58795, PIA60165, EQUAL, 0x10** ; Acq time | ; Check reception of at least one of each:  **TM, YIA58946** ; TM(21,3) SSID=14 SWA\_TM\_SCI\_EAS1\_ENG\_2-5-6-8-9\_TRIGG\_COMPR\_START  **TM, YIA58942** ; TM(21,3) SSID=18 SWA\_TM\_SCI\_EAS1\_ENG\_2-5-6-8-9\_RAW\_FIRST  **TM, YIA58944** ; TM(21,6) SSID=19 SWA\_TM\_SCI\_EAS1\_ENG\_2-5-6-8-9\_RAW\_DATA |
|  | ; Run post-eng mode macro on EAS1  **TC, ZIA58934,PIA60739,EQUAL,POST\_ENG** |  |
|  | ; Power down EAS1  **TC, ZIA58761** | ; Check EAS1 current in the DPU HK  **TM, YIA58200, NIA00833, LIMIT, 0, 10 ;** PCDM\_HK\_01\_IMON\_EAS1 |

## Low Level TC Test

|  |  |  |
| --- | --- | --- |
|  | ; Turn on EAS1 on  **TC, ZIA58755** | ; Check the EAS1 current in the DPU HK  **TM, YIA58200, NIA00833, LIMIT, 60, 150 ;** PCDM\_HK\_01\_IMON\_EAS1 |
|  | ; Clear EAS1 shared RAM  **TC, ZIA58763** |  |
|  | ; Wait 30 seconds  ; 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 |
|  | ; Set EAS1 master control register  **TC, ZIA58776, PIA60423, EQUAL, 0x00**  **TC, ZIA58776, PIA60424, EQUAL, 0x00**  **TC, ZIA58776, PIA60425, EQUAL, 0x60** |  |
|  | ; Turn EAS1 preamp1 on  **TC, ZIA58777, PIA58066, EQUAL, ON**  **TC, ZIA58777, PIA58067, EQUAL, OFF** |  |
|  | ; Turn EAS1 preamp2 on  **TC, ZIA58777, PIA58066, EQUAL, ON**  **TC, ZIA58777, PIA58067, EQUAL, ON** |  |
|  | ; Upload sequence to EAS1  **TC, ZIA58772** |  |
|  | ; Set EAS1 deflector ratios  **TC, ZIA58765, PIA60474, EQUAL, 0x80**  **TC, ZIA58765, PIA60475, EQUAL, 0x00**  **TC, ZIA58765, PIA60578, EQUAL, 0x00**  **TC, ZIA58765, PIA60589, EQUAL, 0x00**  **TC, ZIA58765, PIA60600, EQUAL, 0x00**  **TC, ZIA58765, PIA60611, EQUAL, 0x00**  **TC, ZIA58765, PIA60622, EQUAL, 0x80**  **TC, ZIA58765, PIA60633, EQUAL, 0x00**  **TC, ZIA58765, PIA60644, EQUAL, 0x00**  **TC, ZIA58765, PIA60655, EQUAL, 0x00**  **TC, ZIA58765, PIA60476, EQUAL, 0x00**  **TC, ZIA58765, PIA60487, EQUAL, 0x00**  **TC, ZIA58765, PIA60498, EQUAL, 0x70**  **TC, ZIA58765, PIA60509, EQUAL, 0x00**  **TC, ZIA58765, PIA60520, EQUAL, 0x00**  **TC, ZIA58765, PIA60531, EQUAL, 0x00**  **TC, ZIA58765, PIA60542, EQUAL, 0x00**  **TC, ZIA58765, PIA60553, EQUAL, 0x00**  **TC, ZIA58765, PIA60564, EQUAL, 0x60**  **TC, ZIA58765, PIA60575, EQUAL, 0x00**  **TC, ZIA58765, PIA60579, EQUAL, 0x00**  **TC, ZIA58765, PIA60580, EQUAL, 0x00**  **TC, ZIA58765, PIA60581, EQUAL, 0x00**  **TC, ZIA58765, PIA60582, EQUAL, 0x00**  **TC, ZIA58765, PIA60583, EQUAL, 0x50**  **TC, ZIA58765, PIA60584, EQUAL, 0x00**  **TC, ZIA58765, PIA60585, EQUAL, 0x00**  **TC, ZIA58765, PIA60586, EQUAL, 0x00**  **TC, ZIA58765, PIA60587, EQUAL, 0x00**  **TC, ZIA58765, PIA60588, EQUAL, 0x00**  **TC, ZIA58765, PIA60590, EQUAL, 0x40**  **TC, ZIA58765, PIA60591, EQUAL, 0x00**  **TC, ZIA58765, PIA60592, EQUAL, 0x00**  **TC, ZIA58765, PIA60593, EQUAL, 0x00**  **TC, ZIA58765, PIA60594, EQUAL, 0x00**  **TC, ZIA58765, PIA60595, EQUAL, 0x00**  **TC, ZIA58765, PIA60596, EQUAL, 0x30**  **TC, ZIA58765, PIA60597, EQUAL, 0x00**  **TC, ZIA58765, PIA60598, EQUAL, 0x00**  **TC, ZIA58765, PIA60599, EQUAL, 0x00**  **TC, ZIA58765, PIA60601, EQUAL, 0x00**  **TC, ZIA58765, PIA60602, EQUAL, 0x00**  **TC, ZIA58765, PIA60603, EQUAL, 0x20**  **TC, ZIA58765, PIA60604, EQUAL, 0x00**  **TC, ZIA58765, PIA60605, EQUAL, 0x00**  **TC, ZIA58765, PIA60606, EQUAL, 0x00**  **TC, ZIA58765, PIA60607, EQUAL, 0x00**  **TC, ZIA58765, PIA60608, EQUAL, 0x00**  **TC, ZIA58765, PIA60609, EQUAL, 0x00**  **TC, ZIA58765, PIA60610, EQUAL, 0x00**  **TC, ZIA58765, PIA60612, EQUAL, 0x00**  **TC, ZIA58765, PIA60613, EQUAL, 0x20**  **TC, ZIA58765, PIA60614, EQUAL, 0x00**  **TC, ZIA58765, PIA60615, EQUAL, 0x00**  **TC, ZIA58765, PIA60616, EQUAL, 0x00**  **TC, ZIA58765, PIA60617, EQUAL, 0x00**  **TC, ZIA58765, PIA60618, EQUAL, 0x00**  **TC, ZIA58765, PIA60619, EQUAL, 0x30**  **TC, ZIA58765, PIA60620, EQUAL, 0x00**  **TC, ZIA58765, PIA60621, EQUAL, 0x00**  **TC, ZIA58765, PIA60623, EQUAL, 0x00**  **TC, ZIA58765, PIA60624, EQUAL, 0x00**  **TC, ZIA58765, PIA60625, EQUAL, 0x00**  **TC, ZIA58765, PIA60626, EQUAL, 0x40**  **TC, ZIA58765, PIA60627, EQUAL, 0x00**  **TC, ZIA58765, PIA60628, EQUAL, 0x00**  **TC, ZIA58765, PIA60629, EQUAL, 0x00**  **TC, ZIA58765, PIA60630, EQUAL, 0x00**  **TC, ZIA58765, PIA60631, EQUAL, 0x00**  **TC, ZIA58765, PIA60632, EQUAL, 0x50**  **TC, ZIA58765, PIA60634, EQUAL, 0x00**  **TC, ZIA58765, PIA60635, EQUAL, 0x00**  **TC, ZIA58765, PIA60636, EQUAL, 0x00**  **TC, ZIA58765, PIA60637, EQUAL, 0x00**  **TC, ZIA58765, PIA60638, EQUAL, 0x00**  **TC, ZIA58765, PIA60639, EQUAL, 0x60**  **TC, ZIA58765, PIA60640, EQUAL, 0x00**  **TC, ZIA58765, PIA60641, EQUAL, 0x00**  **TC, ZIA58765, PIA60642, EQUAL, 0x00**  **TC, ZIA58765, PIA60643, EQUAL, 0x00**  **TC, ZIA58765, PIA60645, EQUAL, 0x00**  **TC, ZIA58765, PIA60646, EQUAL, 0x70**  **TC, ZIA58765, PIA60647, EQUAL, 0x00**  **TC, ZIA58765, PIA60648, EQUAL, 0x00**  **TC, ZIA58765, PIA60649, EQUAL, 0x00**  **TC, ZIA58765, PIA60650, EQUAL, 0x00**  **TC, ZIA58765, PIA60651, EQUAL, 0x00**  **TC, ZIA58765, PIA60652, EQUAL, 0x80**  **TC, ZIA58765, PIA60653, EQUAL, 0x00**  **TC, ZIA58765, PIA60654, EQUAL, 0x00**  **TC, ZIA58765, PIA60656, EQUAL, 0x00**  **TC, ZIA58765, PIA60657, EQUAL, 0x00**  **TC, ZIA58765, PIA60658, EQUAL, 0x00**  **TC, ZIA58765, PIA60659, EQUAL, 0x80**  **TC, ZIA58765, PIA60660, EQUAL, 0x00**  **TC, ZIA58765, PIA60661, EQUAL, 0x00** |  |
|  | ; Set EAS1 hemisphere voltage max  **TC, ZIA58767, PIA60441, EQUAL, 0x02**  **TC, ZIA58767, PIA60442, EQUAL, 0x9C**  **TC, ZIA58767, PIA60443, EQUAL, 0x80** |  |
|  | ; Set EAS1 hemisphere voltage ratio  **TC, ZIA58766, PIA60469, EQUAL, 0xDE**  **TC, ZIA58766, PIA60470, EQUAL, 0xB8**  **TC, ZIA58766, PIA60471, EQUAL, 0x51** |  |
|  | Load the EAS1 VGF ratio  **TC, ZIA58768, PIA60460, EQUAL, 0**  **TC, ZIA58768, PIA60461, EQUAL, 0**  **TC, ZIA58768, PIA60462, EQUAL, 0**  **TC, ZIA58768, PIA60463, EQUAL, 0**  **TC, ZIA58768, PIA60464, EQUAL, 0**  **TC, ZIA58768, PIA60465, EQUAL, 0**  **TC, ZIA58768, PIA60466, EQUAL, 0**  **TC, ZIA58768, PIA60467, EQUAL, 0**  **TC, ZIA58768, PIA60468, EQUAL, 0** |  |
|  | ; Load the EAS1 VGF pointer  **TC, ZIA58770, PIA59035, EQUAL, 0** |  |
|  | ; Start the EAS1 sequence  **TC,** **ZIA58773** |  |
|  | ; Load the EAS1 MCP max voltage  **TC, ZIA58783, PIA60169, EQUAL, 0x800** |  |
|  | ; Load the EAS1 MCP ramp voltage  **TC, ZIA58784, PIA60218, EQUAL, 0x400** | ; Wait 40 seconds for MCP ramp and HK update  ; Check the MCP voltage in the EAS1 HK  **TM, YIA58201, NIA00910, LIMIT, 0, 15 ;** Eng EAS1\_EMCPV |
|  | ; Load the EAS1 grid voltage  **TC, ZIA58781, PIA60423, EQUAL, 0x00**  **TC, ZIA58781, PIA60424, EQUAL, 0x08**  **TC, ZIA58781, PIA60425, EQUAL, 0x00** | ; Check the Grid voltage in the EAS1 HK  **TM, YIA58201, NIA00911, LIMIT, -10, 0 ; Eng** EAS1\_EGRIDV |
|  | ; Load the EAS1 Voltage offsets  **TC, ZIA58769, PIA60411, EQUAL, 0x00**  **TC,, PIA60412, EQUAL, 0x00**  **TC,, PIA60415, EQUAL, 0x00**  **TC,, PIA60416, EQUAL, 0x00**  **TC,, PIA60417, EQUAL, 0x00**  **TC,, PIA60418, EQUAL, 0x00**  **TC,, PIA60419, EQUAL, 0x00**  **TC,, PIA60420, EQUAL, 0x00**  **TC,, PIA60421, EQUAL, 0x00**  **TC,, PIA60422, EQUAL, 0x00**  **TC,, PIA60413, EQUAL, 0x00**  **TC,, PIA60414, EQUAL, 0x00** |  |
|  | ; Load the EAS1 Dither value  **TC, ZIA58754, PIA60736, EQUAL, 0x00**  **TC, ZIA58754, PIA60737, EQUAL, 0x00**  **TC, ZIA58754, PIA60738, EQUAL, 0x00** |  |
|  | ; Load the EAS1 stim values on preamp1  **TC, ZIA58774, PIA60013, EQUAL, PRE-AMP1**  **TC, ZIA58774, PIA60429, EQUAL, 0x00**  **TC, ZIA58774, PIA60430, EQUAL, 0x0F**  **TC, ZIA58774, PIA60431, EQUAL, 0xF0** |  |
|  | ; Load the EAS1 stim values on preamp2  **TC, ZIA58774, PIA60013, EQUAL, PRE-AMP2**  **TC, ZIA58774, PIA60429, EQUAL, 0x00**  **TC, ZIA58774, PIA60430, EQUAL, 0x0F**  **TC, ZIA58774, PIA60431, EQUAL, 0xF0** |  |
|  | ; Load the EAS1 threshold values  **TC, ZIA58797, PIA60174, EQUAL, 0x5F40**  **TC,, PIA60185, EQUAL, 0x5F41**  **TC,, PIA60196, EQUAL, 0x5F42**  **TC,, PIA60200, EQUAL, 0x5F43**  **TC,, PIA60201, EQUAL, 0x5F44**  **TC,, PIA60202, EQUAL, 0x5F45**  **TC,, PIA60203, EQUAL, 0x6586**  **TC,, PIA60204, EQUAL, 0x6587**  **TC,, PIA60205, EQUAL, 0x66C8**  **TC,, PIA60175, EQUAL, 0x5F49**  **TC,, PIA60176, EQUAL, 0x5F4A**  **TC,, PIA60177, EQUAL, 0x5F4B**  **TC,, PIA60178, EQUAL, 0x5F4C**  **TC,, PIA60179, EQUAL, 0x5F4D**  **TC,, PIA60180, EQUAL, 0x5F4E**  **TC,, PIA60181, EQUAL, 0x5F4F**  **TC,, PIA60182, EQUAL, 0x5F40**  **TC,, PIA60183, EQUAL, 0x5F41**  **TC,, PIA60184, EQUAL, 0x5F42**  **TC,, PIA60186, EQUAL, 0x5F43**  **TC,, PIA60187, EQUAL, 0x5F44**  **TC,, PIA60188, EQUAL, 0x5F45**  **TC,, PIA60189, EQUAL, 0x5F46**  **TC,, PIA60190, EQUAL, 0x5F47**  **TC,, PIA60191, EQUAL, 0x5F48**  **TC,, PIA60192, EQUAL, 0x5F49**  **TC,, PIA60193, EQUAL, 0x5F4A**  **TC,, PIA60194, EQUAL, 0x5CCB**  **TC,, PIA60195, EQUAL, 0x5F4C**  **TC,, PIA60197, EQUAL, 0x5F4D**  **TC,, PIA60198, EQUAL, 0x5F4E**  **TC,, PIA60199, EQUAL, 0x5F4F** |  |
|  | ; Upload a LUT to the EAS1 energy table  **TC, ZIA58764, PIA60474, EQUAL, 0x0**  **TC,, PIA60475, EQUAL, 0x0**  **TC,, PIA60578, EQUAL, 0x0**  **TC,, PIA60589, EQUAL, 0x0**  **TC,, PIA60600, EQUAL, 0x0**  **TC,, PIA60611, EQUAL, 0x0**  **TC,, PIA60622, EQUAL, 0x0**  **TC,, PIA60633, EQUAL, 0x0**  **TC,, PIA60644, EQUAL, 0x0**  **TC,, PIA60655, EQUAL, 0x0**  **TC,, PIA60476, EQUAL, 0x0**  **TC,, PIA60487, EQUAL, 0x0**  **TC,, PIA60498, EQUAL, 0x0**  **TC,, PIA60509, EQUAL, 0x0**  **TC,, PIA60520, EQUAL, 0x0**  **TC,, PIA60531, EQUAL, 0x0**  **TC,, PIA60542, EQUAL, 0x0**  **TC,, PIA60553, EQUAL, 0x0**  **TC,, PIA60564, EQUAL, 0x0**  **TC,, PIA60575, EQUAL, 0x0**  **TC,, PIA60579, EQUAL, 0x0**  **TC,, PIA60580, EQUAL, 0x0**  **TC,, PIA60581, EQUAL, 0x0**  **TC,, PIA60582, EQUAL, 0x0**  **TC,, PIA60583, EQUAL, 0x0**  **TC,, PIA60584, EQUAL, 0x0**  **TC,, PIA60585, EQUAL, 0x0**  **TC,, PIA60586, EQUAL, 0x0**  **TC,, PIA60587, EQUAL, 0x0**  **TC,, PIA60588, EQUAL, 0x0**  **TC,, PIA60590, EQUAL, 0x0**  **TC,, PIA60591, EQUAL, 0x0**  **TC,, PIA60592, EQUAL, 0x0**  **TC,, PIA60593, EQUAL, 0x0**  **TC,, PIA60594, EQUAL, 0x0**  **TC,, PIA60595, EQUAL, 0x0**  **TC,, PIA60596, EQUAL, 0x0**  **TC,, PIA60597, EQUAL, 0x0**  **TC,, PIA60598, EQUAL, 0x0**  **TC,, PIA60599, EQUAL, 0x0**  **TC,, PIA60601, EQUAL, 0x0**  **TC,, PIA60602, EQUAL, 0x0**  **TC,, PIA60603, EQUAL, 0x0**  **TC,, PIA60604, EQUAL, 0x0**  **TC,, PIA60605, EQUAL, 0x0**  **TC,, PIA60606, EQUAL, 0x0**  **TC,, PIA60607, EQUAL, 0x0**  **TC,, PIA60608, EQUAL, 0x0**  **TC,, PIA60609, EQUAL, 0x0**  **TC,, PIA60610, EQUAL, 0x0**  **TC,, PIA60612, EQUAL, 0x0**  **TC,, PIA60613, EQUAL, 0x0**  **TC,, PIA60614, EQUAL, 0x0**  **TC,, PIA60615, EQUAL, 0x0**  **TC,, PIA60616, EQUAL, 0x0**  **TC,, PIA60617, EQUAL, 0x0**  **TC,, PIA60618, EQUAL, 0x0**  **TC,, PIA60619, EQUAL, 0x0**  **TC,, PIA60620, EQUAL, 0x0**  **TC,, PIA60621, EQUAL, 0x0**  **TC,, PIA60623, EQUAL, 0x0**  **TC,, PIA60624, EQUAL, 0x0**  **TC,, PIA60625, EQUAL, 0x0**  **TC,, PIA60626, EQUAL, 0x0**  **TC,, PIA60627, EQUAL, 0x0**  **TC,, PIA60628, EQUAL, 0x0**  **TC,, PIA60629, EQUAL, 0x0**  **TC,, PIA60630, EQUAL, 0x0**  **TC,, PIA60631, EQUAL, 0x0**  **TC,, PIA60632, EQUAL, 0x0**  **TC,, PIA60634, EQUAL, 0x0**  **TC,, PIA60635, EQUAL, 0x0**  **TC,, PIA60636, EQUAL, 0x0**  **TC,, PIA60637, EQUAL, 0x0**  **TC,, PIA60638, EQUAL, 0x0**  **TC,, PIA60639, EQUAL, 0x0**  **TC,, PIA60640, EQUAL, 0x0**  **TC,, PIA60641, EQUAL, 0x0**  **TC,, PIA60642, EQUAL, 0x0**  **TC,, PIA60643, EQUAL, 0x0**  **TC,, PIA60645, EQUAL, 0x0**  **TC,, PIA60646, EQUAL, 0x0**  **TC,, PIA60647, EQUAL, 0x0**  **TC,, PIA60648, EQUAL, 0x0**  **TC,, PIA60649, EQUAL, 0x0**  **TC,, PIA60650, EQUAL, 0x0**  **TC,, PIA60651, EQUAL, 0x0**  **TC,, PIA60652, EQUAL, 0x0**  **TC,, PIA60653, EQUAL, 0x0**  **TC,, PIA60654, EQUAL, 0x0**  **TC,, PIA60656, EQUAL, 0x0**  **TC,, PIA60657, EQUAL, 0x0**  **TC,, PIA60658, EQUAL, 0x0**  **TC,, PIA60659, EQUAL, 0x0**  **TC,, PIA60660, EQUAL, 0x0**  **TC,, PIA60661, EQUAL, 0x0**  **TC,, PIA60662, EQUAL, 0x0**  **TC,, PIA60663, EQUAL, 0x0**  **TC,, PIA60664, EQUAL, 0x0**  **TC,, PIA60665, EQUAL, 0x0**  **TC,, PIA60477, EQUAL, 0x0**  **TC,, PIA60478, EQUAL, 0x0**  **TC,, PIA60479, EQUAL, 0x0**  **TC,, PIA60480, EQUAL, 0x0**  **TC,, PIA60481, EQUAL, 0x0**  **TC,, PIA60482, EQUAL, 0x0**  **TC,, PIA60483, EQUAL, 0x0**  **TC,, PIA60484, EQUAL, 0x0**  **TC,, PIA60485, EQUAL, 0x0**  **TC,, PIA60486, EQUAL, 0x0**  **TC,, PIA60488, EQUAL, 0x0**  **TC,, PIA60489, EQUAL, 0x0**  **TC,, PIA60490, EQUAL, 0x0**  **TC,, PIA60491, EQUAL, 0x0**  **TC,, PIA60492, EQUAL, 0x0**  **TC,, PIA60493, EQUAL, 0x0**  **TC,, PIA60494, EQUAL, 0x0**  **TC,, PIA60495, EQUAL, 0x0**  **TC,, PIA60496, EQUAL, 0x0**  **TC,, PIA60497, EQUAL, 0x0**  **TC,, PIA60499, EQUAL, 0x0**  **TC,, PIA60500, EQUAL, 0x0**  **TC,, PIA60501, EQUAL, 0x0**  **TC,, PIA60502, EQUAL, 0x0**  **TC,, PIA60503, EQUAL, 0x0**  **TC,, PIA60504, EQUAL, 0x0**  **TC,, PIA60505, EQUAL, 0x0**  **TC,, PIA60506, EQUAL, 0x0**  **TC,, PIA60507, EQUAL, 0x0**  **TC,, PIA60508, EQUAL, 0x0**  **TC,, PIA60510, EQUAL, 0x0**  **TC,, PIA60511, EQUAL, 0x0**  **TC,, PIA60512, EQUAL, 0x0**  **TC,, PIA60513, EQUAL, 0x0**  **TC,, PIA60514, EQUAL, 0x0**  **TC,, PIA60515, EQUAL, 0x0**  **TC,, PIA60516, EQUAL, 0x0**  **TC,, PIA60517, EQUAL, 0x0**  **TC,, PIA60518, EQUAL, 0x0**  **TC,, PIA60519, EQUAL, 0x0**  **TC,, PIA60521, EQUAL, 0x0**  **TC,, PIA60522, EQUAL, 0x0**  **TC,, PIA60523, EQUAL, 0x0**  **TC,, PIA60524, EQUAL, 0x0**  **TC,, PIA60525, EQUAL, 0x0**  **TC,, PIA60526, EQUAL, 0x0**  **TC,, PIA60527, EQUAL, 0x0**  **TC,, PIA60528, EQUAL, 0x0**  **TC,, PIA60529, EQUAL, 0x0**  **TC,, PIA60530, EQUAL, 0x0**  **TC,, PIA60532, EQUAL, 0x0**  **TC,, PIA60533, EQUAL, 0x0**  **TC,, PIA60534, EQUAL, 0x0**  **TC,, PIA60535, EQUAL, 0x0**  **TC,, PIA60536, EQUAL, 0x0**  **TC,, PIA60537, EQUAL, 0x0**  **TC,, PIA60538, EQUAL, 0x0**  **TC,, PIA60539, EQUAL, 0x0**  **TC,, PIA60540, EQUAL, 0x0**  **TC,, PIA60541, EQUAL, 0x0**  **TC,, PIA60543, EQUAL, 0x0**  **TC,, PIA60544, EQUAL, 0x0**  **TC,, PIA60545, EQUAL, 0x0**  **TC,, PIA60546, EQUAL, 0x0**  **TC,, PIA60547, EQUAL, 0x0**  **TC,, PIA60548, EQUAL, 0x0**  **TC,, PIA60549, EQUAL, 0x0**  **TC,, PIA60550, EQUAL, 0x0**  **TC,, PIA60551, EQUAL, 0x0**  **TC,, PIA60552, EQUAL, 0x0**  **TC,, PIA60554, EQUAL, 0x0**  **TC,, PIA60555, EQUAL, 0x0**  **TC,, PIA60556, EQUAL, 0x0**  **TC,, PIA60557, EQUAL, 0x0**  **TC,, PIA60558, EQUAL, 0x0**  **TC,, PIA60559, EQUAL, 0x0**  **TC,, PIA60560, EQUAL, 0x0**  **TC,, PIA60561, EQUAL, 0x0**  **TC,, PIA60562, EQUAL, 0x0**  **TC,, PIA60563, EQUAL, 0x0**  **TC,, PIA60565, EQUAL, 0x0**  **TC,, PIA60566, EQUAL, 0x0**  **TC,, PIA60567, EQUAL, 0x0**  **TC,, PIA60568, EQUAL, 0x0**  **TC,, PIA60569, EQUAL, 0x0**  **TC,, PIA60570, EQUAL, 0x0**  **TC,, PIA60571, EQUAL, 0x0**  **TC,, PIA60572, EQUAL, 0x0**  **TC,, PIA60573, EQUAL, 0x0**  **TC,, PIA60574, EQUAL, 0x0**  **TC,, PIA60576, EQUAL, 0x0** |  |
|  | ; Select the EAS1 Strahl bin  **TC, ZIA58796, PIA60173, EQUAL, 0x18** |  |
|  | ; Set the heater controls on EAS1  **TC, ZIA58778, PIA60166, EQUAL, 0x50** ; Ki  **TC, ZIA58778, PIA60167, EQUAL, 0x40** ; Kp |  |
|  | ; Turn the heater set point up on EAS1  **TC, ZIA58779, PIA60168, EQUAL, 0x6CC** ; Set Point | ; After 180 seconds check the EAS1 current in the DPU HK and the EAS1 temperature in the EAS1 HK  **TM, YIA58200, NIA00833, LIMIT, 60, 300 ;** PCDM\_HK\_IMON\_EAS1  **TM, YIA58201,NIA00907, LIMIT, 280, 330** ; EAS1\_EOPTEMP |
|  | ; Turn the heater set point down on EAS1  **TC, ZIA58779, PIA60168, EQUAL, 0x0** ; Set Point | ; Check the EAS1 current in the DPU HK  **TM, YIA58200, NIA00833, LIMIT, 60, 300 ;** PCDM\_HK\_IMON\_EAS1 |
|  | ; Set moment elab on EAS1  **TC, ZIA58786, PIA60338, EQUAL, 0x05**  **TC, ZIA58786, PIA60339, EQUAL, 0x10** |  |
|  | ; Dump some EAS1 parameters  **TC, ZIA58785, PIA58061, EQUAL, CmdReadHemVRatio** | ; Reception of:  **TM,YIA58904 ;** TM(201,200) SWA\_TM\_EAS1\_PARAM\_REPORT  ; Check that the Hem Voltage has been dumped correctly in the dump report  **TM, YIA58904, NIA01503 #1, EQUAL, 222 ;** PARAM\_DATA  **TM, YIA58904, NIA01503 #2, EQUAL, 47185 ;** PARAM\_DATA |
|  | ; Build the EAS1 energy table  **TC, ZIA58771, PIA60031, EQUAL, MBOX3**  **TC, ZIA58771, PIA60446, EQUAL, 0**  **TC, ZIA58771, PIA60447, EQUAL, 0**  **TC, ZIA58771, PIA60448, EQUAL, 1** |  |
|  | ; Start normal mode on EAS1  **TC, ZIA58771, PIA60031, EQUAL, MBOX1**  **TC, ZIA58771, PIA60446, EQUAL, 0**  **TC, ZIA58771, PIA60447, EQUAL, 0**  **TC, ZIA58771, PIA60448, EQUAL, 0xC2** | ; Check the reception of at least one of each:  **TM,YIA58727** ;TM(21,3) SSID=20 SWA\_TM\_SCI\_EAS\_MOMENTS\_RAW\_DATA  **TM, YIA58703** ; TM(21,3) SSID=0 SWA\_TM\_SCI\_EAS1\_FULL3D\_RAW\_HEAD  **TM, YIA58704** ; TM(21,6) SSID=1 SWA\_TM\_SCI\_EAS1\_FULL3D\_RAW\_DATA  **TM,YIA58713** ; TM(21,6) SSID=9 SWA\_TM\_SCI\_EAS1\_STRAHL\_RAW\_DATA |
|  | ; \*WAIT\*, 0:02:00, (2 minute) From previous command |  |
|  | ; Stop normal mode on EAS1  **TC, ZIA58771, PIA60031, EQUAL, MBOX1**  **TC, ZIA58771, PIA60446, EQUAL, 0**  **TC, ZIA58771, PIA60447, EQUAL, 0**  **TC, ZIA58771, PIA60448, EQUAL, 0** |  |

# EAS2 Test

## Macros Test

|  |  |  |
| --- | --- | --- |
| **Step N°** | **FFT Commanding Flow** | **Checks and PASS/FAIL Criteria** |
|  | ; Start normal mode on EAS2  **TC, ZIA58819, PIA60031, EQUAL, MBOX1**  **TC, ZIA58819, PIA60446, EQUAL, 0**  **TC, ZIA58819, PIA60447, EQUAL, 0**  **TC, ZIA58819, PIA60448, EQUAL, 0xC2** | ; Check reception of at least one of each:  **TM,YIA58727** ;TM(21,3) SSID=20 SWA\_TM\_SCI\_EAS\_PARTIAL\_MOMENTS\_RAW\_DATA  **TM, YIA58701** ; TM(21,3) SSID=30 SWA\_TM\_SCI\_EAS2\_FULL3D\_RAW\_HEAD  **TM, YIA58702** ; TM(21,6) SSID=31 SWA\_TM\_SCI\_EAS2\_FULL3D\_RAW\_DATA  **TM,YIA58711** ; TM(21,6) SSID=39 SWA\_TM\_SCI\_EAS2\_STRAHL\_RAW\_DATA |
|  | ; Wait 00:02:00 (2 minutes) |  |
|  | ; Switch to no science mode on EAS2  **TC, ZIA58819, PIA60031, EQUAL, MBOX1**  **TC, ZIA58819, PIA60446, EQUAL, 0**  **TC, ZIA58819, PIA60447, EQUAL, 0**  **TC, ZIA58819, PIA60448, EQUAL, 0** |  |
|  | ; Switch to Eng mode 2 on EAS2  **TC, ZIA58836, PIA60165, EQUAL, 10** | ; Check reception of at least one of each:  **TM, YIA58947** ; TM(21,3) SSID=44 SWA\_TM\_SCI\_EAS2\_ENG\_2-5-6-8-9\_TRIGG\_COMPR\_START  **TM, YIA58943** ; TM(21,3) SSID=48 SWA\_TM\_SCI\_EAS2\_ENG\_2-5-6-8-9\_RAW\_FIRST  **TM, YIA58945** ; TM(21,6) SSID=49 SWA\_TM\_SCI\_EAS2\_ENG\_2-5-6-8-9\_RAW\_DATA |
|  | ; Run post-eng mode macro on EAS2  **TC, ZIA58936,PIA60740,EQUAL,POST\_ENG** |  |
|  | ; Switch to Sweeping Eng mode 3 on EAS2  **TC, ZIA58837, PIA60101, EQUAL, 0** ; Start MCP  **TC, ZIA58837, PIA60100, EQUAL, 0xFF** ; Final MCP  **TC, ZIA58837, PIA60102, EQUAL, 0xF** ; Step MCP  **TC, ZIA58837, PIA60437, EQUAL, 0xA** ; 1st ramp time  **TC, ZIA58837, PIA60444, EQUAL, 1** ; Inter ramp time  **TC, ZIA58837, PIA60165, EQUAL, 2** ; Acq time  **TC, ZIA58837, PIA60760, EQUAL, 0x20** ; Hem bin  **TC, ZIA58837, PIA60761, EQUAL, 0x8** ; Def number  **TC, ZIA58837, PIA60762, EQUAL, SWEEP\_MACRO** ; ctrl | ; Check reception of at least one of each:  **TM, YIA58926** ; TM(21,3) SSID=44 SWA\_TM\_SCI\_EAS2\_ENG\_3-4\_TRIGG\_COMPR\_START  **TM, YIA58924** ; TM(21,3) SSID=48 SWA\_TM\_SCI\_EAS2\_ENG\_3-4\_RAW\_FIRST  **TM, YIA58925** ; TM(21,6) SSID=49 SWA\_TM\_SCI\_EAS2\_ENG\_3-4\_RAW\_DATA |
|  | ; Switch to Nominal Eng mode 3 on EAS2  **TC, ZIA58837, PIA60101, EQUAL, 0** ; Start MCP  **TC, ZIA58837, PIA60100, EQUAL, 0xFF** ; Final MCP  **TC, ZIA58837, PIA60102, EQUAL, 0xF** ; Step MCP  **TC, ZIA58837, PIA60437, EQUAL, 0xA** ; 1st ramp time  **TC, ZIA58837, PIA60444, EQUAL, 1** ; Inter ramp time  **TC, ZIA58837, PIA60165, EQUAL, 2** ; Acq time  **TC, ZIA58837, PIA60760, EQUAL, 0x20** ; Hem bin  **TC, ZIA58837, PIA60761, EQUAL, 0x8** ; Def number  **TC, ZIA58837, PIA60762, EQUAL, FIXED\_MACRO** ; ctrl | ; Check reception of at least one of each:  **TM, YIA58926** ; TM(21,3) SSID=44 SWA\_TM\_SCI\_EAS2\_ENG\_3-4\_TRIGG\_COMPR\_START  **TM, YIA58924** ; TM(21,3) SSID=48 SWA\_TM\_SCI\_EAS2\_ENG\_3-4\_RAW\_FIRST  **TM, YIA58925** ; TM(21,6) SSID=49 SWA\_TM\_SCI\_EAS2\_ENG\_3-4\_RAW\_DATA |
|  | ; Run post-eng mode macro on EAS2  **TC, ZIA58936,PIA60740,EQUAL,POST\_ENG** |  |
|  | ; Switch to Eng mode 4 on EAS2  **TC, ZIA58838, PIA60104, EQUAL, 0x724** ; Start Thresh  **TC, ZIA58838, PIA60103, EQUAL, 0x477** ; End Thresh  **TC, ZIA58838, PIA60105, EQUAL, 0x200** ; Thresh step  **TC, ZIA58838, PIA60106, EQUAL, 0x0** ; MCP value  **TC, ZIA58838, PIA60171, EQUAL, 0xA** ; MCP wait  **TC, ZIA58838, PIA60165, EQUAL, 2** ; Acq time  **TC, ZIA58838, PIA60760, EQUAL, 0x20** Hem bin  **TC, ZIA58838, PIA60761, EQUAL, 0x8** ;Def number | ; Check reception of at least one of each:  **TM, YIA58926** ; TM(21,3) SSID=44 SWA\_TM\_SCI\_EAS2\_ENG\_3-4\_TRIGG\_COMPR\_START  **TM, YIA58924** ; TM(21,3) SSID=48 SWA\_TM\_SCI\_EAS2\_ENG\_3-4\_RAW\_FIRST  **TM, YIA58925** ; TM(21,6) SSID=49 SWA\_TM\_SCI\_EAS2\_ENG\_3-4\_RAW\_DATA |
|  | ; Run post-eng mode macro on EAS2  **TC, ZIA58936, PIA60740, EQUAL,POST\_ENG** |  |
|  | ; Switch to Eng mode 5 on EAS2  **TC, ZIA58839, PIA60454, EQUAL, 0xFF** ; PA1 stim  **TC, ZIA58839, PIA60455, EQUAL, 0xFF** ; PA2 stim  **TC, ZIA58839, PIA60040, EQUAL, 0x724** ; Start Thresh  **TC, ZIA58839, PIA60039, EQUAL, 0x477** ; End Thresh  **TC, ZIA58839, PIA60041, EQUAL, 0x76** ; Thresh step  **TC, ZIA58839, PIA60106, EQUAL, 0x0** ; MCP value  **TC, ZIA58839, PIA60171, EQUAL, 0xA** ; MCP wait  **TC, ZIA58839, PIA60165, EQUAL, 2** ; Acq time | ; Check reception of at least one of each:  **TM, YIA58947** ; TM(21,3) SSID=44 SWA\_TM\_SCI\_EAS2\_ENG\_2-5-6-8-9\_TRIGG\_COMPR\_START  **TM, YIA58943** ; TM(21,3) SSID=48 SWA\_TM\_SCI\_EAS2\_ENG\_2-5-6-8-9\_RAW\_FIRST  **TM, YIA58945** ; TM(21,6) SSID=49 SWA\_TM\_SCI\_EAS2\_ENG\_2-5-6-8-9\_RAW\_DATA |
|  | ; Run post-eng mode macro on EAS2  **TC, ZIA58936, PIA60740, EQUAL,POST\_ENG** |  |
|  | ; Switch to Eng mode 6 on EAS2  **TC, ZIA58840, PIA60457, EQUAL, 0xFF** ; Stim high  **TC, ZIA58840, PIA60458, EQUAL, 0x32** ; Stim low  **TC, ZIA58840, PIA60459, EQUAL, 0x29** ; Stim step  **TC, ZIA58840, PIA60106, EQUAL, 0x0** ; MCP value  **TC, ZIA58840, PIA60171, EQUAL, 0xA** ; MCP wait  **TC, ZIA58840, PIA60165, EQUAL, 2** ; Acq time | ; Check reception of at least one of each:  **TM, YIA58947** ; TM(21,3) SSID=44 SWA\_TM\_SCI\_EAS2\_ENG\_2-5-6-8-9\_TRIGG\_COMPR\_START  **TM, YIA58943** ; TM(21,3) SSID=48 SWA\_TM\_SCI\_EAS2\_ENG\_2-5-6-8-9\_RAW\_FIRST  **TM, YIA58945** ; TM(21,6) SSID=49 SWA\_TM\_SCI\_EAS2\_ENG\_2-5-6-8-9\_RAW\_DATA |
|  | ; Run post-eng mode macro on EAS2  **TC, ZIA58936,PIA60740,EQUAL,POST\_ENG** |  |
|  | ; Switch to Eng mode 8 on EAS2  **TC, ZIA58842, PIA60735, EQUAL, 0xFF** ; VR  **TC, ZIA58842, PIA60716, EQUAL, 0x32** ; HV  **TC, ZIA58842, PIA60165, EQUAL, 0x10** ; Acq time | ; Check reception of at least one of each:  **TM, YIA58947** ; TM(21,3) SSID=44 SWA\_TM\_SCI\_EAS2\_ENG\_2-5-6-8-9\_TRIGG\_COMPR\_START  **TM, YIA58943** ; TM(21,3) SSID=48 SWA\_TM\_SCI\_EAS2\_ENG\_2-5-6-8-9\_RAW\_FIRST  **TM, YIA58945** ; TM(21,6) SSID=49 SWA\_TM\_SCI\_EAS2\_ENG\_2-5-6-8-9\_RAW\_DATA |
|  | ; Run post-eng mode macro on EAS2  **TC, ZIA58936,PIA60740,EQUAL,POST\_ENG** |  |
|  | ; Switch to Eng mode 9 on EAS2  **TC, ZIA58843, PIA60165, EQUAL, 0x10** ; Acq time | ; Check reception of at least one of each:  **TM, YIA58947** ; TM(21,3) SSID=44 SWA\_TM\_SCI\_EAS2\_ENG\_2-5-6-8-9\_TRIGG\_COMPR\_START  **TM, YIA58943** ; TM(21,3) SSID=48 SWA\_TM\_SCI\_EAS2\_ENG\_2-5-6-8-9\_RAW\_FIRST  **TM, YIA58945** ; TM(21,6) SSID=49 SWA\_TM\_SCI\_EAS2\_ENG\_2-5-6-8-9\_AW\_DATA |
|  | ; Run post-eng mode macro on EAS2  **TC, ZIA58936,PIA60740,EQUAL,POST\_ENG** |  |
|  | ; Power down EAS2  **TC, ZIA58809** | ; Check the EAS2 current in the DPU HK  **TM, YIA58200, NIA00832, LIMIT, 0, 20 ;** PCDM\_HK\_01\_IMON\_EAS2 |

## Low Level TC Test

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|  | ; Turn EAS2 on  **TC, ZIA58803** | ; Check the EAS2 current in the DPU HK  **TM, YIA58200, NIA00832, LIMIT, 60, 106 ;** PCDM\_HK\_01\_IMON\_EAS2 |
|  | ; Clear EAS2 shared RAM  **TC, ZIA58811** |  |
|  | ; Wait 30 seconds  ; 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 |
|  | ; Set EAS2 master control register  **TC, ZIA58824, PIA60423, EQUAL, 0x00**  **TC, ZIA58824, PIA60424, EQUAL, 0x00**  **TC, ZIA58824, PIA60425, EQUAL, 0x60** |  |
|  | ; Turn EAS2 preamp2 on  **TC, ZIA58825, PIA58066, EQUAL, ON**  **TC, ZIA58825, PIA58067, EQUAL, OFF** |  |
|  | ; Turn EAS2 preamp2 on  **TC, ZIA58825, PIA58066, EQUAL, ON**  **TC, ZIA58825, PIA58067, EQUAL, ON** |  |
|  | ; Upload sequence to EAS2  **TC, ZIA58820** |  |
|  | ; Set EAS2 deflector ratios  **TC, ZIA58813, PIA60474, EQUAL, 0x80**  **TC, ZIA58813, PIA60475, EQUAL, 0x00**  **TC, ZIA58813, PIA60578, EQUAL, 0x00**  **TC, ZIA58813, PIA60589, EQUAL, 0x00**  **TC, ZIA58813, PIA60600, EQUAL, 0x00**  **TC, ZIA58813, PIA60611, EQUAL, 0x00**  **TC, ZIA58813, PIA60622, EQUAL, 0x80**  **TC, ZIA58813, PIA60633, EQUAL, 0x00**  **TC, ZIA58813, PIA60644, EQUAL, 0x00**  **TC, ZIA58813, PIA60655, EQUAL, 0x00**  **TC, ZIA58813, PIA60476, EQUAL, 0x00**  **TC, ZIA58813, PIA60487, EQUAL, 0x00**  **TC, ZIA58813, PIA60498, EQUAL, 0x70**  **TC, ZIA58813, PIA60509, EQUAL, 0x00**  **TC, ZIA58813, PIA60520, EQUAL, 0x00**  **TC, ZIA58813, PIA60531, EQUAL, 0x00**  **TC, ZIA58813, PIA60542, EQUAL, 0x00**  **TC, ZIA58813, PIA60553, EQUAL, 0x00**  **TC, ZIA58813, PIA60564, EQUAL, 0x60**  **TC, ZIA58813, PIA60575, EQUAL, 0x00**  **TC, ZIA58813, PIA60579, EQUAL, 0x00**  **TC, ZIA58813, PIA60580, EQUAL, 0x00**  **TC, ZIA58813, PIA60581, EQUAL, 0x00**  **TC, ZIA58813, PIA60582, EQUAL, 0x00**  **TC, ZIA58813, PIA60583, EQUAL, 0x50**  **TC, ZIA58813, PIA60584, EQUAL, 0x00**  **TC, ZIA58813, PIA60585, EQUAL, 0x00**  **TC, ZIA58813, PIA60586, EQUAL, 0x00**  **TC, ZIA58813, PIA60587, EQUAL, 0x00**  **TC, ZIA58813, PIA60588, EQUAL, 0x00**  **TC, ZIA58813, PIA60590, EQUAL, 0x40**  **TC, ZIA58813, PIA60591, EQUAL, 0x00**  **TC, ZIA58813, PIA60592, EQUAL, 0x00**  **TC, ZIA58813, PIA60593, EQUAL, 0x00**  **TC, ZIA58813, PIA60594, EQUAL, 0x00**  **TC, ZIA58813, PIA60595, EQUAL, 0x00**  **TC, ZIA58813, PIA60596, EQUAL, 0x30**  **TC, ZIA58813, PIA60597, EQUAL, 0x00**  **TC, ZIA58813, PIA60598, EQUAL, 0x00**  **TC, ZIA58813, PIA60599, EQUAL, 0x00**  **TC, ZIA58813, PIA60601, EQUAL, 0x00**  **TC, ZIA58813, PIA60602, EQUAL, 0x00**  **TC, ZIA58813, PIA60603, EQUAL, 0x20**  **TC, ZIA58813, PIA60604, EQUAL, 0x00**  **TC, ZIA58813, PIA60605, EQUAL, 0x00**  **TC, ZIA58813, PIA60606, EQUAL, 0x00**  **TC, ZIA58813, PIA60607, EQUAL, 0x00**  **TC, ZIA58813, PIA60608, EQUAL, 0x00**  **TC, ZIA58813, PIA60609, EQUAL, 0x00**  **TC, ZIA58813, PIA60610, EQUAL, 0x00**  **TC, ZIA58813, PIA60612, EQUAL, 0x00**  **TC, ZIA58813, PIA60613, EQUAL, 0x20**  **TC, ZIA58813, PIA60614, EQUAL, 0x00**  **TC, ZIA58813, PIA60615, EQUAL, 0x00**  **TC, ZIA58813, PIA60616, EQUAL, 0x00**  **TC, ZIA58813, PIA60617, EQUAL, 0x00**  **TC, ZIA58813, PIA60618, EQUAL, 0x00**  **TC, ZIA58813, PIA60619, EQUAL, 0x30**  **TC, ZIA58813, PIA60620, EQUAL, 0x00**  **TC, ZIA58813, PIA60621, EQUAL, 0x00**  **TC, ZIA58813, PIA60623, EQUAL, 0x00**  **TC, ZIA58813, PIA60624, EQUAL, 0x00**  **TC, ZIA58813, PIA60625, EQUAL, 0x00**  **TC, ZIA58813, PIA60626, EQUAL, 0x40**  **TC, ZIA58813, PIA60627, EQUAL, 0x00**  **TC, ZIA58813, PIA60628, EQUAL, 0x00**  **TC, ZIA58813, PIA60629, EQUAL, 0x00**  **TC, ZIA58813, PIA60630, EQUAL, 0x00**  **TC, ZIA58813, PIA60631, EQUAL, 0x00**  **TC, ZIA58813, PIA60632, EQUAL, 0x50**  **TC, ZIA58813, PIA60634, EQUAL, 0x00**  **TC, ZIA58813, PIA60635, EQUAL, 0x00**  **TC, ZIA58813, PIA60636, EQUAL, 0x00**  **TC, ZIA58813, PIA60637, EQUAL, 0x00**  **TC, ZIA58813, PIA60638, EQUAL, 0x00**  **TC, ZIA58813, PIA60639, EQUAL, 0x60**  **TC, ZIA58813, PIA60640, EQUAL, 0x00**  **TC, ZIA58813, PIA60641, EQUAL, 0x00**  **TC, ZIA58813, PIA60642, EQUAL, 0x00**  **TC, ZIA58813, PIA60643, EQUAL, 0x00**  **TC, ZIA58813, PIA60645, EQUAL, 0x00**  **TC, ZIA58813, PIA60646, EQUAL, 0x70**  **TC, ZIA58813, PIA60647, EQUAL, 0x00**  **TC, ZIA58813, PIA60648, EQUAL, 0x00**  **TC, ZIA58813, PIA60649, EQUAL, 0x00**  **TC, ZIA58813, PIA60650, EQUAL, 0x00**  **TC, ZIA58813, PIA60651, EQUAL, 0x00**  **TC, ZIA58813, PIA60652, EQUAL, 0x80**  **TC, ZIA58813, PIA60653, EQUAL, 0x00**  **TC, ZIA58813, PIA60654, EQUAL, 0x00**  **TC, ZIA58813, PIA60656, EQUAL, 0x00**  **TC, ZIA58813, PIA60657, EQUAL, 0x00**  **TC, ZIA58813, PIA60658, EQUAL, 0x00**  **TC, ZIA58813, PIA60659, EQUAL, 0x80**  **TC, ZIA58813, PIA60660, EQUAL, 0x00**  **TC, ZIA58813, PIA60661, EQUAL, 0x00** |  |
|  | ; Set EAS2 hemisphere voltage max  **TC, ZIA58815, PIA60441, EQUAL, 0x04**  **TC, ZIA58815, PIA60442, EQUAL, 0x00**  **TC, ZIA58815, PIA60443, EQUAL, 0x00** |  |
|  | ; Set EAS2 hemisphere voltage ratio  **TC, ZIA58814, PIA60469, EQUAL, 0xDE**  **TC, ZIA58814, PIA60470, EQUAL, 0xB8**  **TC, ZIA58814, PIA60471, EQUAL, 0x51** |  |
|  | Load the EAS2 VGF ratio  **TC, ZIA58816, PIA60460, EQUAL, 0**  **TC, ZIA58816, PIA60461, EQUAL, 0**  **TC, ZIA58816, PIA60462, EQUAL, 0**  **TC, ZIA58816, PIA60463, EQUAL, 0**  **TC, ZIA58816, PIA60464, EQUAL, 0**  **TC, ZIA58816, PIA60465, EQUAL, 0**  **TC, ZIA58816, PIA60466, EQUAL, 0**  **TC, ZIA58816, PIA60467, EQUAL, 0**  **TC, ZIA58816, PIA60468, EQUAL, 0** |  |
|  | ; Load the EAS2 VGF pointer  **TC, ZIA58818, PIA59035, EQUAL, 0** |  |
|  | ; Start the EAS2 sequence  **TC,** **ZIA58821** |  |
|  | ; Load the EAS2 MCP max voltage  **TC, ZIA58831, PIA60169, EQUAL, 0x800** |  |
|  | ; Load the EAS2 MCP ramp voltage  **TC, ZIA58832, PIA60218, EQUAL, 0x400** | ; Wait 40 seconds for MCP ramp and HK update  ; Check the MCP voltage in the EAS2 HK  **TM, YIA58202, NIA10910, LIMIT, 0, 15 ;** EAS2\_EMCPV |
|  | ; Load the EAS2 grid voltage  **TC, ZIA58829, PIA60423, EQUAL, 0x00**  **TC, ZIA58829, PIA60424, EQUAL, 0x08**  **TC, ZIA58829, PIA60425, EQUAL, 0x00** | ; Check the Grid voltage in the EAS2 HK  **TM, YIA58202, NIA10911, LIMIT, -10, 0 ;** EAS2\_EGRIDV |
|  | ; Load the EAS2 Voltage offsets  **TC, ZIA58817, PIA60411, EQUAL, 0x00**  **TC,, PIA60412, EQUAL, 0x00**  **TC,, PIA60415, EQUAL, 0x00**  **TC,, PIA60416, EQUAL, 0x00**  **TC,, PIA60417, EQUAL, 0x00**  **TC,, PIA60418, EQUAL, 0x00**  **TC,, PIA60419, EQUAL, 0x00**  **TC,, PIA60420, EQUAL, 0x00**  **TC,, PIA60421, EQUAL, 0x00**  **TC,, PIA60422, EQUAL, 0x00**  **TC,, PIA60413, EQUAL, 0x00**  **TC,, PIA60414, EQUAL, 0x00** |  |
|  | ; Load the EAS2 Dither value  **TC, ZIA58802, PIA60736, EQUAL, 0x00**  **TC, ZIA58802, PIA60737, EQUAL, 0x00**  **TC, ZIA58802, PIA60738, EQUAL, 0x00** |  |
|  | ; Load the EAS2 stim values on preamp1  **TC, ZIA58822, PIA60013, EQUAL, PRE-AMP1**  **TC, ZIA58822, PIA60429, EQUAL, 0x00**  **TC, ZIA58822, PIA60430, EQUAL, 0x0F**  **TC, ZIA58822, PIA60431, EQUAL, 0xF0** |  |
|  | ; Load the EAS2 stim values on preamp2  **TC, ZIA58822, PIA60013, EQUAL, PRE-AMP2**  **TC, ZIA58822, PIA60429, EQUAL, 0x00**  **TC, ZIA58822, PIA60430, EQUAL, 0x0F**  **TC, ZIA58822, PIA60431, EQUAL, 0xF0** |  |
|  | ; Load the EAS2 threshold values  **TC, ZIA58845, PIA60174, EQUAL, 0x5F40**  **TC,, PIA60185, EQUAL, 0x5F41**  **TC,, PIA60196, EQUAL, 0x5F42**  **TC,, PIA60200, EQUAL, 0x5F43**  **TC,, PIA60201, EQUAL, 0x5F44**  **TC,, PIA60202, EQUAL, 0x5F45**  **TC,, PIA60203, EQUAL, 0x6586**  **TC,, PIA60204, EQUAL, 0x6587**  **TC,, PIA60205, EQUAL, 0x66C8**  **TC,, PIA60175, EQUAL, 0x5F49**  **TC,, PIA60176, EQUAL, 0x5F4A**  **TC,, PIA60177, EQUAL, 0x5F4B**  **TC,, PIA60178, EQUAL, 0x5F4C**  **TC,, PIA60179, EQUAL, 0x5F4D**  **TC,, PIA60180, EQUAL, 0x5F4E**  **TC,, PIA60181, EQUAL, 0x5F4F**  **TC,, PIA60182, EQUAL, 0x5F40**  **TC,, PIA60183, EQUAL, 0x5F41**  **TC,, PIA60184, EQUAL, 0x5F42**  **TC,, PIA60186, EQUAL, 0x5F43**  **TC,, PIA60187, EQUAL, 0x5F44**  **TC,, PIA60188, EQUAL, 0x5F45**  **TC,, PIA60189, EQUAL, 0x5F46**  **TC,, PIA60190, EQUAL, 0x5F47**  **TC,, PIA60191, EQUAL, 0x5F48**  **TC,, PIA60192, EQUAL, 0x5F49**  **TC,, PIA60193, EQUAL, 0x5F4A**  **TC,, PIA60194, EQUAL, 0x5CCB**  **TC,, PIA60195, EQUAL, 0x5F4C**  **TC,, PIA60197, EQUAL, 0x5F4D**  **TC,, PIA60198, EQUAL, 0x5F4E**  **TC,, PIA60199, EQUAL, 0x5F4F** |  |
|  | ; Upload a LUT to the EAS2 energy table  **TC, ZIA58812, PIA60474, EQUAL, 0x0**  **TC,, PIA60475, EQUAL, 0x0**  **TC,, PIA60578, EQUAL, 0x0**  **TC,, PIA60589, EQUAL, 0x0**  **TC,, PIA60600, EQUAL, 0x0**  **TC,, PIA60611, EQUAL, 0x0**  **TC,, PIA60622, EQUAL, 0x0**  **TC,, PIA60633, EQUAL, 0x0**  **TC,, PIA60644, EQUAL, 0x0**  **TC,, PIA60655, EQUAL, 0x0**  **TC,, PIA60476, EQUAL, 0x0**  **TC,, PIA60487, EQUAL, 0x0**  **TC,, PIA60498, EQUAL, 0x0**  **TC,, PIA60509, EQUAL, 0x0**  **TC,, PIA60520, EQUAL, 0x0**  **TC,, PIA60531, EQUAL, 0x0**  **TC,, PIA60542, EQUAL, 0x0**  **TC,, PIA60553, EQUAL, 0x0**  **TC,, PIA60564, EQUAL, 0x0**  **TC,, PIA60575, EQUAL, 0x0**  **TC,, PIA60579, EQUAL, 0x0**  **TC,, PIA60580, EQUAL, 0x0**  **TC,, PIA60581, EQUAL, 0x0**  **TC,, PIA60582, EQUAL, 0x0**  **TC,, PIA60583, EQUAL, 0x0**  **TC,, PIA60584, EQUAL, 0x0**  **TC,, PIA60585, EQUAL, 0x0**  **TC,, PIA60586, EQUAL, 0x0**  **TC,, PIA60587, EQUAL, 0x0**  **TC,, PIA60588, EQUAL, 0x0**  **TC,, PIA60590, EQUAL, 0x0**  **TC,, PIA60591, EQUAL, 0x0**  **TC,, PIA60592, EQUAL, 0x0**  **TC,, PIA60593, EQUAL, 0x0**  **TC,, PIA60594, EQUAL, 0x0**  **TC,, PIA60595, EQUAL, 0x0**  **TC,, PIA60596, EQUAL, 0x0**  **TC,, PIA60597, EQUAL, 0x0**  **TC,, PIA60598, EQUAL, 0x0**  **TC,, PIA60599, EQUAL, 0x0**  **TC,, PIA60601, EQUAL, 0x0**  **TC,, PIA60602, EQUAL, 0x0**  **TC,, PIA60603, EQUAL, 0x0**  **TC,, PIA60604, EQUAL, 0x0**  **TC,, PIA60605, EQUAL, 0x0**  **TC,, PIA60606, EQUAL, 0x0**  **TC,, PIA60607, EQUAL, 0x0**  **TC,, PIA60608, EQUAL, 0x0**  **TC,, PIA60609, EQUAL, 0x0**  **TC,, PIA60610, EQUAL, 0x0**  **TC,, PIA60612, EQUAL, 0x0**  **TC,, PIA60613, EQUAL, 0x0**  **TC,, PIA60614, EQUAL, 0x0**  **TC,, PIA60615, EQUAL, 0x0**  **TC,, PIA60616, EQUAL, 0x0**  **TC,, PIA60617, EQUAL, 0x0**  **TC,, PIA60618, EQUAL, 0x0**  **TC,, PIA60619, EQUAL, 0x0**  **TC,, PIA60620, EQUAL, 0x0**  **TC,, PIA60621, EQUAL, 0x0**  **TC,, PIA60623, EQUAL, 0x0**  **TC,, PIA60624, EQUAL, 0x0**  **TC,, PIA60625, EQUAL, 0x0**  **TC,, PIA60626, EQUAL, 0x0**  **TC,, PIA60627, EQUAL, 0x0**  **TC,, PIA60628, EQUAL, 0x0**  **TC,, PIA60629, EQUAL, 0x0**  **TC,, PIA60630, EQUAL, 0x0**  **TC,, PIA60631, EQUAL, 0x0**  **TC,, PIA60632, EQUAL, 0x0**  **TC,, PIA60634, EQUAL, 0x0**  **TC,, PIA60635, EQUAL, 0x0**  **TC,, PIA60636, EQUAL, 0x0**  **TC,, PIA60637, EQUAL, 0x0**  **TC,, PIA60638, EQUAL, 0x0**  **TC,, PIA60639, EQUAL, 0x0**  **TC,, PIA60640, EQUAL, 0x0**  **TC,, PIA60641, EQUAL, 0x0**  **TC,, PIA60642, EQUAL, 0x0**  **TC,, PIA60643, EQUAL, 0x0**  **TC,, PIA60645, EQUAL, 0x0**  **TC,, PIA60646, EQUAL, 0x0**  **TC,, PIA60647, EQUAL, 0x0**  **TC,, PIA60648, EQUAL, 0x0**  **TC,, PIA60649, EQUAL, 0x0**  **TC,, PIA60650, EQUAL, 0x0**  **TC,, PIA60651, EQUAL, 0x0**  **TC,, PIA60652, EQUAL, 0x0**  **TC,, PIA60653, EQUAL, 0x0**  **TC,, PIA60654, EQUAL, 0x0**  **TC,, PIA60656, EQUAL, 0x0**  **TC,, PIA60657, EQUAL, 0x0**  **TC,, PIA60658, EQUAL, 0x0**  **TC,, PIA60659, EQUAL, 0x0**  **TC,, PIA60660, EQUAL, 0x0**  **TC,, PIA60661, EQUAL, 0x0**  **TC,, PIA60662, EQUAL, 0x0**  **TC,, PIA60663, EQUAL, 0x0**  **TC,, PIA60664, EQUAL, 0x0**  **TC,, PIA60665, EQUAL, 0x0**  **TC,, PIA60477, EQUAL, 0x0**  **TC,, PIA60478, EQUAL, 0x0**  **TC,, PIA60479, EQUAL, 0x0**  **TC,, PIA60480, EQUAL, 0x0**  **TC,, PIA60481, EQUAL, 0x0**  **TC,, PIA60482, EQUAL, 0x0**  **TC,, PIA60483, EQUAL, 0x0**  **TC,, PIA60484, EQUAL, 0x0**  **TC,, PIA60485, EQUAL, 0x0**  **TC,, PIA60486, EQUAL, 0x0**  **TC,, PIA60488, EQUAL, 0x0**  **TC,, PIA60489, EQUAL, 0x0**  **TC,, PIA60490, EQUAL, 0x0**  **TC,, PIA60491, EQUAL, 0x0**  **TC,, PIA60492, EQUAL, 0x0**  **TC,, PIA60493, EQUAL, 0x0**  **TC,, PIA60494, EQUAL, 0x0**  **TC,, PIA60495, EQUAL, 0x0**  **TC,, PIA60496, EQUAL, 0x0**  **TC,, PIA60497, EQUAL, 0x0**  **TC,, PIA60499, EQUAL, 0x0**  **TC,, PIA60500, EQUAL, 0x0**  **TC,, PIA60501, EQUAL, 0x0**  **TC,, PIA60502, EQUAL, 0x0**  **TC,, PIA60503, EQUAL, 0x0**  **TC,, PIA60504, EQUAL, 0x0**  **TC,, PIA60505, EQUAL, 0x0**  **TC,, PIA60506, EQUAL, 0x0**  **TC,, PIA60507, EQUAL, 0x0**  **TC,, PIA60508, EQUAL, 0x0**  **TC,, PIA60510, EQUAL, 0x0**  **TC,, PIA60511, EQUAL, 0x0**  **TC,, PIA60512, EQUAL, 0x0**  **TC,, PIA60513, EQUAL, 0x0**  **TC,, PIA60514, EQUAL, 0x0**  **TC,, PIA60515, EQUAL, 0x0**  **TC,, PIA60516, EQUAL, 0x0**  **TC,, PIA60517, EQUAL, 0x0**  **TC,, PIA60518, EQUAL, 0x0**  **TC,, PIA60519, EQUAL, 0x0**  **TC,, PIA60521, EQUAL, 0x0**  **TC,, PIA60522, EQUAL, 0x0**  **TC,, PIA60523, EQUAL, 0x0**  **TC,, PIA60524, EQUAL, 0x0**  **TC,, PIA60525, EQUAL, 0x0**  **TC,, PIA60526, EQUAL, 0x0**  **TC,, PIA60527, EQUAL, 0x0**  **TC,, PIA60528, EQUAL, 0x0**  **TC,, PIA60529, EQUAL, 0x0**  **TC,, PIA60530, EQUAL, 0x0**  **TC,, PIA60532, EQUAL, 0x0**  **TC,, PIA60533, EQUAL, 0x0**  **TC,, PIA60534, EQUAL, 0x0**  **TC,, PIA60535, EQUAL, 0x0**  **TC,, PIA60536, EQUAL, 0x0**  **TC,, PIA60537, EQUAL, 0x0**  **TC,, PIA60538, EQUAL, 0x0**  **TC,, PIA60539, EQUAL, 0x0**  **TC,, PIA60540, EQUAL, 0x0**  **TC,, PIA60541, EQUAL, 0x0**  **TC,, PIA60543, EQUAL, 0x0**  **TC,, PIA60544, EQUAL, 0x0**  **TC,, PIA60545, EQUAL, 0x0**  **TC,, PIA60546, EQUAL, 0x0**  **TC,, PIA60547, EQUAL, 0x0**  **TC,, PIA60548, EQUAL, 0x0**  **TC,, PIA60549, EQUAL, 0x0**  **TC,, PIA60550, EQUAL, 0x0**  **TC,, PIA60551, EQUAL, 0x0**  **TC,, PIA60552, EQUAL, 0x0**  **TC,, PIA60554, EQUAL, 0x0**  **TC,, PIA60555, EQUAL, 0x0**  **TC,, PIA60556, EQUAL, 0x0**  **TC,, PIA60557, EQUAL, 0x0**  **TC,, PIA60558, EQUAL, 0x0**  **TC,, PIA60559, EQUAL, 0x0**  **TC,, PIA60560, EQUAL, 0x0**  **TC,, PIA60561, EQUAL, 0x0**  **TC,, PIA60562, EQUAL, 0x0**  **TC,, PIA60563, EQUAL, 0x0**  **TC,, PIA60565, EQUAL, 0x0**  **TC,, PIA60566, EQUAL, 0x0**  **TC,, PIA60567, EQUAL, 0x0**  **TC,, PIA60568, EQUAL, 0x0**  **TC,, PIA60569, EQUAL, 0x0**  **TC,, PIA60570, EQUAL, 0x0**  **TC,, PIA60571, EQUAL, 0x0**  **TC,, PIA60572, EQUAL, 0x0**  **TC,, PIA60573, EQUAL, 0x0**  **TC,, PIA60574, EQUAL, 0x0**  **TC,, PIA60576, EQUAL, 0x0** |  |
|  | ; Select the EAS2 Strahl bin  **TC, ZIA58844, PIA60173, EQUAL, 0x18** |  |
|  | ; Set the heater controls on EAS2  **TC, ZIA58826, PIA60166, EQUAL, 0x50** ; Ki  **TC, ZIA58826, PIA60167, EQUAL, 0x40** ; Kp |  |
|  | ; Turn the heater set point up on EAS2  **TC, ZIA58827, PIA60168, EQUAL, 0x6CC** ; Set Point | ; After 180 seconds check the EAS2 current in the DPU HK and the EAS2 temperature in the EAS2 HK  **TM, YIA58200, NIA00832, LIMIT, 60, 300 ;** PCDM\_HK\_IMON\_EAS2  **TM,YIA58202, NIA10907, LIMIT, 280, 330 ;** EAS2\_EOPTEMP |
|  | ; Turn the heater set point down on EAS2  **TC, ZIA58827, PIA58068, EQUAL, 0x0** ; Set Point | ; Check the EAS2 current in the DPU HK  **TM, YIA58200, NIA00832, LIMIT, 60, 300 ;** PCDM\_HK\_IMON\_EAS2 |
|  | ; Set moment elab on EAS2  **TC, ZIA58834, PIA60338, EQUAL, 0x05**  **TC, ZIA58834, PIA60339, EQUAL, 0x10** |  |
|  | ; Dump some EAS2 parameters  **TC, ZIA58833, PIA58061, EQUAL, CmdReadHemVRatio** | ; Reception of:  **TM,YIA58905 ;** TM(202,200) SWA\_TM\_EAS2\_PARAM\_REPORT  ; Check that the HEM Voltage has been dumped correctly in the dump report  **TM, YIA58905, NIA01503 #1, EQUAL, 222 ;** PARAM\_DATA  **TM, YIA58905, NIA01503 #2, EQUAL, 47185 ;** PARAM\_DATA |
|  | ; Build the EAS2 energy table  **TC, ZIA58819, PIA60031, EQUAL, MBOX3**  **TC, ZIA58819, PIA60446, EQUAL, 0**  **TC, ZIA58819, PIA60447, EQUAL, 0**  **TC, ZIA58819, PIA60448, EQUAL, 1** |  |
|  | ; Start normal mode on EAS2  **TC, ZIA58819, PIA60031, EQUAL, MBOX1**  **TC, ZIA58819, PIA60446, EQUAL, 0**  **TC, ZIA58819, PIA60447, EQUAL, 0**  **TC, ZIA58819, PIA60448, EQUAL, 0xC2** | ; Check the reception of at least one of each:  **TM,YIA58727**;TM(21,3) SSID=20 SWA\_TM\_SCI\_EAS\_PARTIAL\_MOMENTS\_RAW\_DATA  **TM, YIA58701** ; TM(21,3) SSID=30 SWA\_TM\_SCI\_EAS2\_FULL3D\_RAW\_HEAD  **TM, YIA58702** ; TM(21,6) SSID=31 SWA\_TM\_SCI\_EAS2\_FULL3D\_RAW\_DATA  **TM,YIA58711** ; TM(21,6) SSID=39 SWA\_TM\_SCI\_EAS2\_STRAHL\_RAW\_DATA |
|  | ; \*WAIT\*, 0:05:00, (5 minute) From previous command |  |
|  | ; Stop normal mode on EAS2  **TC, ZIA58819, PIA60031, EQUAL, MBOX1**  **TC, ZIA58819, PIA60446, EQUAL, 0**  **TC, ZIA58819, PIA60447, EQUAL, 0**  **TC, ZIA58819, PIA60448, EQUAL, 0** |  |

# All Sensors Test

|  |  |  |
| --- | --- | --- |
| **Step N°** | **FFT Commanding Flow** | **Checks and PASS/FAIL Criteria** |
| **; Command all sensors into normal science mode** | | |
|  | ; Configure HIS DSCB for Normal Coincidence (TOF only)  **TC, ZIA58919, PIA60356, EQUAL, DSCB\_REG\_CTR\_ST**  **TC, ZIA58919, 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\_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** |  |
|  | ; Put HIS into normal science mode  **TC, ZIA58917, PIA59011, EQUAL, NORMAL\_SCI** |  |
|  | ; Start normal mode on EAS1 via the mailbox  **TC, ZIA58771, PIA60031, EQUAL, MBOX1**  **TC, ZIA58771, PIA60446, EQUAL, 0**  **TC, ZIA58771, PIA60447, EQUAL, 0**  **TC, ZIA58771, PIA60448, EQUAL, 0xC2** | ; Check reception of at least one of each:  **TM,YIA58727** ;TM(21,3) SSID=20 SWA\_TM\_SCI\_EAS\_PARTIAL\_MOMENTS\_RAW\_DATA  **TM,YIA58713** ; TM(21,6) SSID=9 SWA\_TM\_SCI\_EAS1\_STRAHL\_RAW\_DATA  **TM, YIA58703** ; TM(21,3) SSID=0 SWA\_TM\_SCI\_EAS1\_FULL3D\_RAW\_HEAD  **TM, YIA58704** ; TM(21,6) SSID=1 SWA\_TM\_SCI\_EAS1\_FULL3D\_RAW\_DATA |
|  | ; Start normal mode on EAS2 via the mailbox  **TC, ZIA58819, PIA60031, EQUAL, MBOX1**  **TC, ZIA58819, PIA60446, EQUAL, 0**  **TC, ZIA58819, PIA60447, EQUAL, 0**  **TC, ZIA58819, PIA60448, EQUAL, 0xC2** | ; Check reception of at least one of each:  **TM, YIA58701** ; TM(21,3) SSID=30 SWA\_TM\_SCI\_EAS2\_FULL3D\_RAW\_HEAD  **TM, YIA58702** ; TM(21,6) SSID=31 SWA\_TM\_SCI\_EAS2\_FULL3D\_RAW\_DATA  **TM,YIA58711** ; TM(21,6) SSID=39 SWA\_TM\_SCI\_EAS2\_STRAHL\_RAW\_DATA |
|  | ; Start PAS Science Cyclogram  **TC, ZIA58943,PIA60777,EQUAL,22** | **THIS COMMAND CAN BE EXECUTED IF AIRSAFE PLUG IS INSTALLED**  **IF DISABLE PLUG IS INSTASLLED, DO NOT EXECUTE THIS COMMAND**  ; Check PAS packets arrive:  ; Normal 3d at 4s, 48 energies  **TM, YIA58700;** TM(21,3) SID=192  **TM, YIA58705;** TM(21,6) SID=193  ; Snaps at around the 300s  **TM,YIA58982;** TM(21,3) SID=205  **TM, YIA58992;** TM(21,3) SID=206  **TM, YIA58993;** TM(21,6) SID=207  ; Moments at 100s  **TM, YIA58729;** TM(21,3) SID=215 |

**Leave all sensors in Science mode for 5 minutes.**

# Trigger & Burst Test

IF PASS DISABLE PLUGIN IS INSTALLED, Send TC PAS OFF RIGHT HERE!!!!

|  |  |  |
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| **Step N°** | **FFT Commanding Flow** | **Checks and PASS/FAIL Criteria** |
| **; Test the SWA Trigger mode response. This MUST only be done after 5 minutes of Normal Mode** | | |
|  | ; Enable RPW mode  **TC, ZIA58718, PIA60847,EQUAL,0** |  |
|  | ; Enable Trigger mode using Data Source Function to set the SMB1\_FLAG.  **SPWFEtc20modifyDataByte, AByteNumber, 148** ;  **SPWFEtc20modifyDataByte, NewValue, 64** | ; Reception of:  **TM, YIA58717** ; TM(21,3) SSID=10 SWA\_TM\_SCI\_EAS1\_TRIGG\_RAW\_START  **TM, YIA58715** ; TM(21,3) SSID=30 SWA\_TM\_SCI\_EAS2\_TRIGG\_RAW\_START  **TM, YIA58451** ; TM(5,1) SWA\_E\_RPW\_TRIGGER\_OCCURRED  ; Check reception of at least one of each:  **TM, YIA58721** ; TM(21,3) SSID=11 SWA\_TM\_SCI\_EAS1\_TRIGG\_RAW\_FIRST  **TM, YIA58719** ; TM(21,3) SSID=31 SWA\_TM\_SCI\_EAS2\_TRIGG\_RAW\_FIRST  **TM, YIA58725** ; TM(21,6) SSID=12 SWA\_TM\_SCI\_EAS1\_TRIGG\_RAW\_DATA  **TM, YIA58723** ; TM(21,6) SSID=32 SWA\_TM\_SCI\_EAS2\_TRIGG\_RAW\_DATA |
| **; Wait for the last of the Triggered mode data to arrive** | | |
| **; Test the SWA burst mode response** | | |
|  | ; Change the mag angle in the S20 packet using the DataSource Function  **SPWFEtc20modifyDataByte,94,127** ; Primary X comp’  **SPWFEtc20modifyDataByte,95,254** ; Primary X comp’  **SPWFEtc20modifyDataByte,96,128** ; Primary Y comp’  **SPWFEtc20modifyDataByte,97,19** ; Primary Y comp’  **SPWFEtc20modifyDataByte,98,127** ; Primary Z comp’  **SPWFEtc20modifyDataByte,99,235** ; Primary Z comp’ |  |
|  | ; Enter EAS into Burst Mode for 5 minutes  **TC, ZIA58726,PIA60157,EQUAL,2480**  **TC,,PIA60158,EQUAL,0**  **TC,,PIA60159,EQUAL,2480**  **TC,,PIA60160,EQUAL,0**  **TC,,PIA60163,EQUAL,0**  **TC,,PIA60164,EQUAL,0**  **TC,,PIA60170,EQUAL,DYNAMIC**  **TC,,PIA60161,EQUAL,0**  **TC,,PIA60162,EQUAL,0** | ; Check reception of at least one of:  **TM,YIA58726** ; (21,6) SSID=4 SWA\_TM\_SCI\_EAS1\_BURST\_COMPR\_DATA  ; Parameter to be checked  **TM,YIA58726,NIA00451,EQUAL,1** ; EAS ID  **TM,YIA58726,NIA00452,EQUAL,8** ; ELEVATION ID  **TM,YIA58726,NIA00454,EQUAL,32766** ; MAG\_DATA\_1  **TM,YIA58726,NIA00455,EQUAL,32787** ; MAG\_DATA\_2  **TM,YIA58726,NIA00456,EQUAL,32747** ; MAG\_DATA\_3 |
|  | ; Change the mag angle in the S20 packet using the DataSource Function  **SPWFEtc20modifyDataByte,94,127** ; Primary X comp’  **SPWFEtc20modifyDataByte,95,240** ; Primary X comp’  **SPWFEtc20modifyDataByte,96,127** ; Primary Y comp’  **SPWFEtc20modifyDataByte,97,239** ; Primary Y comp’  **SPWFEtc20modifyDataByte,98,128** ; Primary Z comp’  **SPWFEtc20modifyDataByte,99,002** ; Primary Z comp’ |  |
|  |  | ; After 10 seconds Parameter to be checked  **TM,YIA58726,NIA00451,EQUAL,0** ; EAS ID  **TM,YIA58726,NIA00452,EQUAL,0** ; ELEVATION ID  **TM,YIA58726,NIA00454,EQUAL,32752** ; MAG\_DATA\_1  **TM,YIA58726,NIA00455,EQUAL,32751** ; MAG\_DATA\_2  **TM,YIA58726,NIA00456,EQUAL,32770** ; MAG\_DATA\_3 |
| **; Test the SWA-HIS burst mode response** | | |
|  | ; \*WAIT\*, 0:00:02, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure no HV sweeping (static ouput only)  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_ANALYZER**  **TC, ZIA58919, PIA60352, EQUAL, 0** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure the top deflector  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_TOP\_DFL**  **TC, ZIA58919, PIA60352, EQUAL, 0** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure the bottom deflector  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_BOT\_DFL**  **TC, ZIA58919, PIA60352, EQUAL, 0** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; Configure the top plate  **TC, ZIA58919, PIA60356, EQUAL, SW\_EN\_TOP\_PLATE**  **TC, ZIA58919, PIA60352, EQUAL, 0** |  |
|  | ; \*WAIT\*, 0:00:01, From previous command |  |
|  | ; DPU configure suite for Burst. Setup for 1-minute core burst (DPU thinks in 8Hz frames)  **TC, ZIA58726, PIA60157, EQUAL, 0**  **TC, ZIA58726, PIA60158, EQUAL, 0**  **TC, ZIA58726, PIA60159, EQUAL, 0**  **TC, ZIA58726, PIA60160, EQUAL, 0**  **TC, ZIA58726, PIA60163, EQUAL, 0**  **TC, ZIA58726, PIA60164, EQUAL, 0**  **TC, ZIA58726, PIA60170, EQUAL, STATIC**  **TC, ZIA58726, PIA60161, EQUAL, 480**  **TC, ZIA58726, PIA60162, EQUAL, 0** |  |
|  | ; \*WAIT\*, 0:01:05, From previous command |  |
|  | ; Go to HVSTDBY mode  **TC, ZIA58917, PIA59011, EQUAL, HVSTDBY** |  |
|  | ; \*WAIT\*, 0:00:05, From previous command |  |
|  | ; DPU configure suite for Burst. Setup for 2-minute optional burst (DPU thinks in 8Hz frames)  **TC, ZIA58726, PIA60157, EQUAL, 0**  **TC, ZIA58726, PIA60158, EQUAL, 0**  **TC, ZIA58726, PIA60159, EQUAL, 0**  **TC, ZIA58726, PIA60160, EQUAL, 0**  **TC, ZIA58726, PIA60163, EQUAL, 0**  **TC, ZIA58726, PIA60164, EQUAL, 0**  **TC, ZIA58726, PIA60170, EQUAL, STATIC**  **TC, ZIA58726, PIA60161, EQUAL, 0**  **TC, ZIA58726, PIA60162, EQUAL, 960** |  |
|  | ; \*WAIT\*, 0:02:03, From previous command |  |

# All Sensors to No Science

|  |  |  |
| --- | --- | --- |
| **Step N°** | **FFT Commanding Flow** | **Checks and PASS/FAIL Criteria** |
|  | ; Put HIS into standby mode  **TC, ZIA58917, PIA59011,EQUAL,HVSTDBY** | ; Reception of:  **TM**,**YIA58602** ; (5,1) SID=43802 SWA\_E\_HIS\_MODE\_CHANGE |
|  | ; Put PAS into no science mode  **TC**,**ZIA58944** |  |
|  | ~~; Ramp PAS HV down~~  **~~TC, ZIA58857, PIA60790,EQUAL,0~~**  **~~TC,,PIA60791,EQUAL,0xCCC~~**  **~~TC,,PIA60792,EQUAL,0x1FD~~**  **~~TC,,PIA60793,EQUAL,0x1E~~** | This command shall be in OFF PROCEDURE |
|  | ; Wait 00:03:20 (200 seconds) |  |
|  | ; 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** |  |
|  | ; 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 sensors

Once the test is completed the SWA unit is left in its standby state. It can be left in this state for further operation or it can be powered down. See NR3 for details on how to power down SWA.

# Procedure variations and justifications

The FDIR monitoring HK is not currently tested as this functionality is not available.

# End of test

Once all SWA sensors and DPU have been powered down, the FFT is completed. The science data collected during the FFT will be processed post-test to verify instrument functionality.