**Project: Solar Orbiter SWA**

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**TITLE: SWA Instrument Post Covid Commission Plan**

**Document Number: SO-SWA-MSSL-PL 024 Issue 2**

**Date:**

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**CONTENTS**

1 Introduction 6

2 Reference Documents 6

3 Acronym and Abbreviation List 7

4 General requirements 8

4.1 Spacecraft Location and Plasma Environment 8

4.2 Required Configuration of the Spacecraft 8

4.3 Spacecraft Pointing 8

4.4 Spacecraft-generated Gases 8

4.5 Telemetry 8

4.6 Required Configuration of other Instruments 8

4.7 Inter-Experiment Links - Service 20 8

4.8 Verification process during commissioning 9

Performance Verification 9

Spacecraft EGSE Real-time Housekeeping Parameters 9

Real-time SWA Housekeeping Parameters 9

Real-time SWA Science Data 9

4.9 Order of commissioning of the DPU and SWA sensors 9

5 SWA Commissioning flow 1

6 2nd April. SWA-5 (IA-5) End of day Power Down (MTL) 2

7 2nd April. SWA-5 (IA-5) Start of day procedure 5

7.1 DPU Power up (MTL) 5

7.2 Disable EAS FDIR (MTL) 5

7.3 EAS Power up 7

7.4 EAS1 Thresholds 10

7.5 EAS1 Zero Deflectors 12

7.6 EAS Configure heater 12

8 EAS1 HV Commission 14

8.1 EAS1 Hemisphere Commission 14

8.2 EAS1 Deflector Commission 24

8.3 EAS Flight Deflectors 38

8.4 EAS1 VGF commission 43

8.5 EAS1 MCP commission 47

8.6 EAS1 POST MCP commission 54

8.7 EAS1 Eng Mode 7 55

8.8 EAS1 Start Normal Mode 56

9 2nd April. SWA-5 (IA-5) End of day Power Down (MTL) 56

10 6th April. SWA-5 (IA-5) End of day Power Down (MTL) 57

11 6th April. SWA-5 (IA-5) Start of day procedure 60

11.1 DPU Power up (MTL) 60

11.2 Disable EAS FDIR (MTL) 60

11.3 EAS Power up 62

11.4 EAS2 Thresholds 65

11.5 EAS2 Zero Deflectors 67

11.6 EAS Configure heater 67

12 EAS2 HV Commission 69

12.1 EAS2 Hemisphere commission 69

12.2 EAS2 Deflectors commission 79

12.3 EAS2 VGF commission 93

12.4 EAS2 MCP commission 97

12.5 EAS2 POST MCP commission 104

12.6 EAS2 Eng Mode 7 105

12.7 EAS2 Start Normal Mode 105

13 6th April. SWA-5 (IA-5) End of day Power Down (MTL) 106

14 7th April. SWA-5 (IA-5) End of day Power Down (MTL) 107

15 7th April. SWA-5 (IA-5) Start of day procedure 110

15.1 DPU Power up (MTL) 110

15.2 Disable EAS FDIR (MTL) 110

15.3 EAS Power up 112

15.4 EAS Thresholds 115

15.5 EAS Flight Deflectors 119

15.6 EAS Configure heater 129

15.7 EAS Start Normal Mode 130

15.8 EAS 1 Engineering modes 131

15.9 EAS 2 Engineering modes 133

15.10 EAS Configure heater 135

16 7th April. SWA-5 (IA-5) End of day Power Down (MTL) 137

17 14th April. SWA-4 (IA-4) Day 1 138

17.1 14th April. SWA-4 (IA-4) End of day Power Down (MTL) 138

17.2 Start of day procedure. DPU Power up (MTL) 140

17.3 PAS Power 141

17.4 PAS Ramp up main HV 143

17.5 PAS Engineering stepping 146

17.6 PAS Detector commission 147

18 14th April. SWA-4 (IA-4) End of day Power Down (MTL) 154

19 15th April. SWA-4 (IA-4) Day 2 155

19.1 15th April. SWA-4 (IA-4) End of day Power Down (MTL) 155

19.2 PAS Resume detector 157

19.3 PAS Normal science check 164

20 15th April. SWA-4 (IA-4) End of day Power Down (MTL) 167

21 SWA-6 (IA-6) SWA commissioning procedure 170

21.1 SWA Normal mode 170

21.2 PAS Calibration mode 177

21.3 SWA Burst mode 179

21.4 SWA Cadence test 180

22 SWA Commission conclusion 189

23 SWA-7 (IA-7) Inter-instrument campaign 190

24 IW-6.3 Interference campaign 190

25 Appendices 191

25.1 Emergency Contingency Plans 191

# Introduction

The primary objective of this document is to describe the in-flight commissioning plan of the SWA flight instrument. The proposed tests will demonstrate that the performance of the instrument meets the operational requirements. The aim is to define activities with an emphasis on performing tests that require real time contact with the spacecraft.

# Reference Documents

The documents listed below form a part of this document, to the extent specified and described herein.

|  |  |  |
| --- | --- | --- |
| Ref. | No | Title |
| NR1 | SOL-EST-IF-0050 | Solar Orbiter Experiment Interface Document Part A |
| NR2 | SOL-EST-RS-1937 | Solar Orbiter Product Assurance Requirements for Instruments |
| NR3 | SO-SWA-MSSL-SP-006 | SWA Instrument Scientific Requirements Report |
| NR4 | SO-SWA-MSSL-PL-006 | SWA Product Assurance Plan |
| NR5 | MSSL-SO-SWA-EID-B | SWA EID-B |
| NR6 | SO-SWA-LPP-LP-039\_MCP Acceptance Test | LPP MCP Acceptance and characterisation Plan |
| NR7 | SO-SWA-LPP-RP-078\_1\_1-MCP\_test\_report\_PartI | MCP detector characterisation test report |
| NR8 | SO-SWA-LPP-RP-092 EAS Det FM1 Test Report rev 1-4.pdf | LPP detector sub-system test report FM1 |
| NR9 | SO-SWA-LPP-RP-093 EAS Det FM2 Test Report rev 1-2.pdf | LPP detector sub-system test report FM2 |
| NR10 | SO-SWA-MSSL-SP-012\_EAS-DPU\_Interface\_Specification\_Issue\_2.pdf | EAS-DPU Interface Specification |
| NR11 | SO-SWA-MSSL-PL-013 | SWA EAS Calibration Plan |
| NR12 | SO-SWA-MSSL-UM-002 | SWA Instrument User manual |

# Acronym and Abbreviation List

|  |  |
| --- | --- |
| **Abbreviation** | **Meaning** |
| PDOR | Payload Direct Operations Request |
| MDOR | Memory Direct Operations Request |
| IA-FCP | Instrument (SWA) – Flight Control Procedure |
| TC | TeleCommand |
| IIC | Inter Instrument Check |
|  |  |
|  |  |

# General requirements

## Spacecraft Location and Plasma Environment

To be included

## Required Configuration of the Spacecraft

There is no particular spacecraft configuration required during SWA commission.

## Spacecraft Pointing

There is no designated pointing required during the SWA commission phase.

## Spacecraft-generated Gases

SWA commissioning, particularly involving high voltages, should not begin until sufficient time has elapsed for spacecraft outgassing to be essentially complete. It has been estimated that at least 20 days are required after launch, following assessment of data from TQCM.

No thruster firing should occur during SWA commissioning, and a sufficient time should be allowed between any thruster firing and the start of commissioning.

## Telemetry

A telemetry requirement of xxx will be required for SWA commissioning

## Required Configuration of other Instruments

It is accepted by SWA that some other instruments are powered on during the SWA commission. However if SWA feel that the other instruments are causing interference to SWA commission, then SWA will request that those instruments be powered down. It is also expected that no other instrument commanding will take place during SWA commission periods.

## Inter-Experiment Links - Service 20

The IEL inputs to SWA are from

* MAG
* RPW

Until completion of commissioning of each sensor, IEL inputs will be disabled at the DPU.

## Verification process during commissioning

### Performance Verification

Following each command in the commissioning sequence the experimenter will either confirm that the command was executed as expected or recommend that a contingency plan is executed.

### Spacecraft EGSE Real-time Housekeeping Parameters

Checking of the housekeeping parameters will be performed using the spacecraft EGSE. Visual checking of the real time housekeeping by a SWA team member viewing the ESOC video display.  **Unless otherwise stated, each command in the commissioning sequences given should be followed by inspection of the housekeeping by an SWA team member before the next command in the sequence is sent.**

### Real-time SWA Housekeeping Parameters

Visual checking of the near-real time housekeeping data by an SWA team member viewing the SWA EGSE display. Data will be acquired via tbd mechanism. The EGSE provides a range of graphical displays for the interpretation of the housekeeping and science data and will have limit checking similar to that used for ground testing. Specific parameters which will be checked in this way are listed in the detailed procedures in this document.

### Real-time SWA Science Data

Real-time assessment of science data from the SWA sensors will be required during commissioning. Interpretation and visualisation of the data will use SWA provided EGSE, both for engineering and science assessments.

## Order of commissioning of the DPU and SWA sensors

The basic order of commissioning of the different SWA units is as follows:

* DPU
* HIS
* PAS
* EAS
* All SWA

The outline plan for SWA commission is provided in the MOC NECP Timeline plan. Currently this is illustrated in Table 4.1

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **NECP Phase** | **NECP number** | **Date** | **Day** | **Start Time** | **End Time** | **Duration** | **One Way Light Time (Seconds)** | **Comments** |
| SWA-5 | IA-5 | 02 Apr | Thurs | 10:27 | 18:27 | 08:00 | 70-77 | EAS |
|  | IA-5 | 06 Apr | Mon | 08:54 | 16:54 | 08:00 | 80-88 | EAS |
|  | IA-5 | 07 Apr | Tues | 11:51 | 19:51 | 08:00 | 80-88 | EAS |
| SWA-4 | IA-4 | 14 Apr | Tues | 10:29 | 18:29 | 08:00 | 90-101 | PAS. PAS left on overnight |
|  | IA-4 | 15 Apr | Wed | 10:56 | 18:56 | 08:00 | 90-101 | PAS |
| SWA-5 | IA-5 | 16 Apr | Thurs | 10:49 | 18:49 | 08:00 | 90-101 | EAS |
| SWA-6 | IA-6 | 22 Apr | Wed | 07:20 | 15:20 | 08:00 | 105-117 | SWA |
|  | IA-6 | 24 Apr | Fri | 07:20 | 15:20 | 08:00 | 105-117 | SWA |

Table 4.1 MOC Timeline for each SWA commission phase (version 5.1). All times are in UTC.

# SWA Commissioning flow

The overall post covid commissioning flow for the SWA instrument is as follows:

* The DPU, HIS (LV) & EAS (LV) have already been commissioned.
* The next step will be to commission PAS
* Then complete the EAS HV commission
* HIS may want to do further HV testing
* Following completion of commissioning of each of the three sensors, the DPU will be commissioned for operation of all three sensors and step through the suite level commissioning process. This process will
  + Demonstrate Normal Mode operation
  + Demonstrate Burst and Triggered mode operation. MAG and RPW will require to be commissioned and operational for this step
  + Perform suite level performance optimisation, particularly carrying out tests where real time contact is required
* Following demonstration of suite level operation, the instrument suite will be operated for a period of time, possibly in parallel with other instruments being commissioned.
* Finally, the Suite will participate in inter-instrument operations and interference campaigns

The rest of the section details the commissioning plan for the DPU and each individual sensor.

# 2nd April. SWA-5 (IA-5) End of day Power Down (MTL)

Before the activity starts, the end of day commanding is loaded onto the MTL. This is shown here as it is unknown at this point where this activity will end. Wherever the end is, the activity will be halted, EAS powered down. Then the following day will power up and continue where this activity ended.

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
| --- | --- | --- | --- |
|  | Power down EAS1  Stop Science  Ramp MCP to zero  Turn heater off  Switch Off  Stop HK | **PDOR\_SSWA\_EAS1\_HV2SwitchOff\_00001.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x0  Wait 00:00:01 (1 second)  ZIA58784, PIA60218 = 0  Wait 00:00:40 (40 second)  ZIA58757, PIA60773 = 0  PIA60774 = 0  PIA60775 = 0  Wait 00:00:01 (1 second)  ZIA58756  Wait 00:01:00 (60 second)  ZIA58051, PIA58050 = EAS1\_SENS\_HK |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Power down EAS2  Stop Science  Ramp MCP to zero  Turn heater off  Switch Off  Stop HK | **PDOR\_SSWA\_EAS2\_HV2SwitchOff\_00001.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x0  Wait 00:00:01 (1 second)  ZIA58832, PIA60218 = 0  Wait 00:00:40 (40 second)  ZIA58805, PIA60773 = 0  PIA60774 = 0  PIA60775 = 0  Wait 00:00:01 (1 second)  ZIA58804  Wait 00:01:00 (60 second)  ZIA58051, PIA58050 = EAS2\_SENS\_HK |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Power down DPU | IA-FCP-002 |  |

# 2nd April. SWA-5 (IA-5) Start of day procedure

## DPU Power up (MTL)

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
| --- | --- | --- | --- |
|  | Power DPU on | IA-FCP-011 |  |
|  | Configure the DPU | IA-FCP-030 |  |

## Disable EAS FDIR (MTL)

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
| --- | --- | --- | --- |
|  | Disable EAS1 FDIR | **PDOR\_SSWA\_EAS1\_Disable\_FDIR\_00001.SOL**  ZIA58064, PIA60452 = 12  PIA60449 = EAS1SPWHB\_MI  PIA60449 = E1\_3V3\_MI  PIA60449 = E1\_1V5\_MI  PIA60449 = E1OPTEMPMON  PIA60449 = E1HVOUTVMON  PIA60449 = E1MCPVMON  PIA60449 = E1GRIDVMON  PIA60449 = E110VAPOSVMON  PIA60449 = E128VPOSVMON  PIA60449 = E1HVGENTHERMON  PIA60449 = E1HVMODTHERMON  PIA60449 = EAS1MISSACK\_MI | Time = Instant |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Disable EAS2 FDIR | **PDOR\_SSWA\_EAS2\_Disable\_FDIR\_00001.SOL**  ZIA58064, PIA60452 = 12  PIA60449 = EAS2SPWHB\_MI  PIA60449 = E2\_3V3\_MI  PIA60449 = E2\_1V5\_MI  PIA60449 = E2OPTEMPMON  PIA60449 = E2HVOUTVMON  PIA60449 = E2MCPVMON  PIA60449 = E2GRIDVMON  PIA60449 = E210VAPOSVMON  PIA60449 = E228VPOSVMON  PIA60449 = E2HVGENTHERMON  PIA60449 = E2HVMODTHERMON  PIA60449 = EAS2MISSACK\_MI | Time = Instant |

## EAS Power up

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
| --- | --- | --- | --- |
|  | Power Up to IDLE EAS1  Enable EAS1 HK  Power EAS1 on  POST macro on EAS1  IDLE macro on EAS1  Request EAS1 HK | **PDOR\_SSWA\_EAS1\_PowerUp\_Post2Idle\_00001.SOL**  ZIA58050, PIA58050 = EAS1\_SENS\_HK  Wait 00:00:01 (1 second)  ZIA58760  Wait 00:00:05 (5 second)  ZIA58934, PIA60739 = POST  Wait 00:00:05 (5 second)  ZIA58753  Wait 00:00:30 (30 second)  ZIA58782 | Time = 41 seconds |

**SWA Team to check HK before Proceeding**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Go to RUN state EAS1  RUN macro on EAS1 | **PDOR\_SSWA\_EAS1\_PowerUp\_Run\_00001.SOL**  ZIA58758  Wait 00:00:20 (20 second) | Time = 20 seconds |
|  | Power Up to IDLE EAS2  Enable EAS2 HK  Power EAS2 on  POST macro on EAS2  IDLE macro on EAS2  Request EAS2 HK | **PDOR\_SSWA\_EAS2\_PowerUp\_Post2Idle\_00001.SOL**  ZIA58050, PIA58050 = EAS2\_SENS\_HK  Wait 00:00:01 (1 second)  ZIA58808  Wait 00:00:05 (5 second)  ZIA58936, PIA60740 = POST  Wait 00:00:05 (5 second)  ZIA58801  Wait 00:30:00 (30 second)  ZIA58830 | Time = 41 seconds |

**SWA Team to check HK before Proceeding**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Go to RUN state EAS2  RUN macro on EAS2 | **PDOR\_SSWA\_EAS2\_PowerUp\_Run\_00001.SOL**  ZIA58806  Wait 00:00:20 (20 second) | Time = 20 seconds |

## EAS1 Thresholds

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Adjust Thresholds on EAS1  Adjust the Thresholds | **PDOR\_SSWA\_EAS1\_Thresh\_496\_00001.SOL**  ZIA58797, PIA60174 = 0x4960  PIA60185 = 0x4961  PIA60196 = 0x4962  PIA60200 = 0x4963  PIA60201 = 0x4964  PIA60202 = 0x4965  PIA60203 = 0x4966  PIA60204 = 0x4967  PIA60205 = 0x4968  PIA60175 = 0x4969  PIA60176 = 0x496A  PIA60177 = 0x496B  PIA60178 = 0x496C  PIA60179 = 0x496D  PIA60180 = 0x496E  PIA60181 = 0x496F  PIA60182 = 0x4960  PIA60183 = 0x4961  PIA60184 = 0x4962  PIA60186 = 0x4963  PIA60187 = 0x4964  PIA60188 = 0x4965  PIA60189 = 0x4966  PIA60190 = 0x4967  PIA60191 = 0x4968  PIA60192 = 0x4969  PIA60193 = 0x496A  PIA60194 = 0x496B  PIA60195 = 0x496C  PIA60197 = 0x496D  PIA60198 = 0x496E  PIA60199 = 0x496F | Time = 2 seconds |

## EAS1 Zero Deflectors

|  |  |  |  |
| --- | --- | --- | --- |
|  | Zero the EAS1 Deflectors | **PDOR\_SSWA\_EAS1\_Deflector\_Zero\_00001.SOL**  ZIA58765, PIA60474 = 0x00  PIA60475 = 0x00  **PLUS 96 BYTES** | Time = Instant |

## EAS Configure heater

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** | |
| --- | --- | --- | --- | --- |
|  | Turn the manual heater on for EAS1  Master Control Register  Heater Control | **PDOR\_SSWA\_EAS1\_Partial\_Heater\_00001.SOL**  ZIA58776, PIA60423 = 0x00  PIA60424 = 0x40  PIA60425 = 0x60  ZIA58757, PIA60773 = 0x00  PIA60774 = 0x00  PIA60775 = 0xE8 | | Time = Instant  Control EAS heaters to ¾ max  0xE8 |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Turn the manual heater on for EAS2  Master control Register  Heater Control | **PDOR\_SSWA\_EAS2\_Partial\_Heater\_00001.SOL**  ZIA58824, PIA60423 = 0x00  PIA60424 = 0x40  PIA60425 = 0x60  ZIA58805, PIA60773 = 0x00  PIA60774 = 0x00  PIA60775 = 0xE8 | Time = Instant  Control EAS1 heaters to ¾ max  0xE8 |

# EAS1 HV Commission

## EAS1 Hemisphere Commission

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS1 Hemisphere Commission  Set the Hem Ratio to FDB22D  Set EAS High Cadence  Set hemisphere voltage max to  **100V**  Conversion = 0.001894467  Rebuild Energy Table  Start science  Wait  Stop Science  Set hemisphere voltage max to  **200V**  Conversion = 0.001894467  Rebuild Energy Table  Start science  Wait  Stop Science  Set hemisphere voltage max to  **300V**  Conversion = 0.001894467  Rebuild Energy Table  Start science  Wait  Stop Science  Set hemisphere voltage max to  **400V**  Conversion = 0.001894467  Rebuild Energy Table  Start science | **PDOR\_SSWA\_EAS1\_Hem\_pt1\_Comm\_00001.SOL**  ZIA58766, PIA60469 = 0xFD  PIA60470 = 0xB2  PIA60471 = 0x2D  ZIA58728, PIA60096 = 0  PIA60097 = 0  PIA60099 = 1  PIA60098 = 1  ZIA58767, PIA60441 = 0x0C  PIA60442 = 0xE3  PIA60443 = 0x10  ZIA58771, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58767, PIA60441 = 0x19  PIA60442 = 0xC6  PIA60443 = 0x20  ZIA58771, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58767, PIA60441 = 0x26  PIA60442 = 0xA9  PIA60443 = 0x30  ZIA58771, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58767, PIA60441 = 0x33  PIA60442 = 0x8C  PIA60443 = 0x50  ZIA58771, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS1 Hemisphere Commission  Stop Science  Set hemisphere voltage max to  **500V**  Conversion = 0.001894467  Rebuild Energy Table  Start science  Wait  Stop Science  Set hemisphere voltage max to  **600V**  Conversion = 0.001894467  Rebuild Energy Table  Start science  Wait  Stop Science  Set hemisphere voltage max to  **700V**  Conversion = 0.001894467  Rebuild Energy Table  Start science  Wait  Stop Science  Set hemisphere voltage max to  **800V**  Conversion = 0.001894467  Rebuild Energy Table  Start science  Wait  Stop Science  Set the Hem Ratio to 0xDEB851  Rebuild the energy table  Start science | **PDOR\_SSWA\_EAS1\_Hem\_pt2\_Comm\_00001.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58767, PIA60441 = 0x40  PIA60442 = 0x6F  PIA60443 = 0x60  ZIA58771, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58767, PIA60441 = 0x4D  PIA60442 = 0x52  PIA60443 = 0x70  ZIA58771, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58767, PIA60441 = 0x5A  PIA60442 = 0x35  PIA60443 = 0x90  ZIA58771, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58767, PIA60441 = 0x67  PIA60442 = 0x18  PIA60443 = 0xA0  ZIA58771, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58766, PIA60469 = 0xDE  PIA60470 = 0xB8  PIA60471 = 0x51  ZIA58771, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

## EAS1 Deflector Commission

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS1 Upper Deflector Commission  Stop Science  Set Deflectors to 0.4  Start science | **PDOR\_SSWA\_EAS1\_U\_Def\_04\_Comm\_00002.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58765 PIA60474 = 0x00  PIA60475 = 0x00  PIA60578 = 0x00  PIA60589 = 0x19  PIA60600 = 0x99  PIA60611 = 0x99  **PLUS 90 FURTHER BYTES**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

**PAUSE WAIT SWA INTERVENTION**

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|  | EAS1 Upper Deflector Commission  Stop Science  Set Deflectors to 0.8  Start science  Stop Science  Set Deflectors to 1.2  Start science | **PDOR\_SSWA\_EAS1\_U\_Def\_12\_Comm\_00003.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58765 PIA60474 = 0x00  PIA60475 = 0x00  PIA60578 = 0x00  PIA60589 = 0x33  PIA60600 = 0x33  PIA60611 = 0x33  **PLUS 90 FURTHER BYTES**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58765 PIA60474 = 0x00  PIA60475 = 0x00  PIA60578 = 0x00  PIA60589 = 0x4C  PIA60600 = 0xCC  PIA60611 = 0xCC  **PLUS 90 FURTHER BYTES**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

**PAUSE WAIT SWA INTERVENTION**

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS1 Upper Deflector Commission  Stop Science  Set Deflectors to 1.6  Start science  Wait  Stop Science  Set Deflectors to 2.0  Start science | **PDOR\_SSWA\_EAS1\_U\_Def\_20\_Comm\_00003.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58765 PIA60474 = 0x00  PIA60475 = 0x00  PIA60578 = 0x00  PIA60589 = 0x66  PIA60600 = 0x66  PIA60611 = 0x66  **PLUS 90 FURTHER BYTES**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58765 PIA60474 = 0x00  PIA60475 = 0x00  PIA60578 = 0x00  PIA60589 = 0x99  PIA60600 = 0x99  PIA60611 = 0x99  **PLUS 90 FURTHER BYTES**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

**PAUSE WAIT SWA INTERVENTION**

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| --- | --- | --- | --- |
|  | EAS1 Upper Deflector Commission  Stop Science  Set Deflectors to 2.4  Start science  Wait  Stop Science  Set Deflectors to 2.8  Start science | **PDOR\_SSWA\_EAS1\_U\_Def\_28\_Comm\_00003.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58765 PIA60474 = 0x00  PIA60475 = 0x00  PIA60578 = 0x00  PIA60589 = 0xB3  PIA60600 = 0x33  PIA60611 = 0x33  **PLUS 90 FURTHER BYTES**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58765 PIA60474 = 0x00  PIA60475 = 0x00  PIA60578 = 0x00  PIA60589 = 0xB3  PIA60600 = 0x33  PIA60611 = 0x33  **PLUS 90 FURTHER BYTES**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

**PAUSE WAIT SWA INTERVENTION**

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS1 Lower Deflector Commission  Stop Science  Set Deflectors to 0.4  Start science | **PDOR\_SSWA\_EAS1\_L\_Def\_04\_Comm\_00002.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58765 PIA60474 = 0x19  PIA60475 = 0x99  PIA60578 = 0x99  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  **PLUS 90 FURTHER BYTES**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

**PAUSE WAIT SWA INTERVENTION**

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS1 Lower Deflector Commission  Stop Science  Set Deflectors to 0.8  Start science  Wait  Stop Science  Set Deflectors to 1.2  Start science | **PDOR\_SSWA\_EAS1\_L\_Def\_12\_Comm\_00003.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58765 PIA60474 = 0x33  PIA60475 = 0x33  PIA60578 = 0x33  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  **PLUS 90 FURTHER BYTES**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58765 PIA60474 = 0x4C  PIA60475 = 0xCC  PIA60578 = 0xCC  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  **PLUS 90 FURTHER BYTES**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

**PAUSE WAIT SWA INTERVENTION**

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS1 Lower Deflector Commission  Stop Science  Set Deflectors to 1.6  Start science  Wait  Stop Science  Set Deflectors to 2.0  Start science | **PDOR\_SSWA\_EAS1\_L\_Def\_20\_Comm\_00003.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58765 PIA60474 = 0x66  PIA60475 = 0x66  PIA60578 = 0x66  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  **PLUS 90 FURTHER BYTES**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58765 PIA60474 = 0x80  PIA60475 = 0x00  PIA60578 = 0x00  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  **PLUS 90 FURTHER BYTES**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

**PAUSE WAIT SWA INTERVENTION**

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS1 Lower Deflector Commission  Stop Science  Set Deflectors to 2.4  Start science  Wait  Stop Science  Set Deflectors to 2.8  Start science | **PDOR\_SSWA\_EAS1\_L\_Def\_28\_Comm\_00003.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58765 PIA60474 = 0x99  PIA60475 = 0x99  PIA60578 = 0x99  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  **PLUS 90 FURTHER BYTES**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58765 PIA60474 = 0xB3  PIA60475 = 0x33  PIA60578 = 0x33  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  **PLUS 90 FURTHER BYTES**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

## EAS Flight Deflectors

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| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Adjust Deflectors on EAS1  Stop Normal Mode on EAS1  Adjust the Deflector Ratios | **PDOR\_SSWA\_EAS1\_Deflectors\_Flight\_00001.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58765, PIA60474 = 0xB0  PIA60475 = 0xC4  PIA60578 = 0x9B  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  PIA60622 = 0x88  PIA60633 = 0xC4  PIA60644 = 0x9B  PIA60655 = 0x00  PIA60476 = 0x00  PIA60487 = 0x00  PIA60498 = 0x62  PIA60509 = 0x7E  PIA60520 = 0xF9  PIA60531 = 0x00  PIA60542 = 0x00  PIA60553 = 0x00  PIA60564 = 0x3F  PIA60575 = 0xAE  PIA60579 = 0x14  PIA60580 = 0x00  PIA60581 = 0x00  PIA60582 = 0x00  PIA60583 = 0x20  PIA60584 = 0x20  PIA60585 = 0xC4  PIA60586 = 0x00  PIA60587 = 0x00  PIA60588 = 0x00  PIA60590 = 0x04  PIA60591 = 0x49  PIA60592 = 0xBA  PIA60593 = 0x00  PIA60594 = 0x00  PIA60595 = 0x00  PIA60596 = 0x00  PIA60597 = 0x00  PIA60598 = 0x00  PIA60599 = 0x14  PIA60601 = 0x39  PIA60602 = 0x58  PIA60603 = 0x00  PIA60604 = 0x00  PIA60605 = 0x00  PIA60606 = 0x29  PIA60607 = 0x78  PIA60608 = 0xD4  PIA60609 = 0x00  PIA60610 = 0x00  PIA60612 = 0x00  PIA60613 = 0x3B  PIA60614 = 0xE7  PIA60615 = 0x6C  PIA60616 = 0x00  PIA60617 = 0x00  PIA60618 = 0x00  PIA60619 = 0x4C  PIA60620 = 0x8B  PIA60621 = 0x43  PIA60623 = 0x00  PIA60624 = 0x00  PIA60625 = 0x00  PIA60626 = 0x5C  PIA60627 = 0x39  PIA60628 = 0x58  PIA60629 = 0x00  PIA60630 = 0x00  PIA60631 = 0x00  PIA60632 = 0x6A  PIA60634 = 0xF1  PIA60635 = 0xA9  PIA60636 = 0x00  PIA60637 = 0x00  PIA60638 = 0x00  PIA60639 = 0x7A  PIA60640 = 0x3D  PIA60641 = 0x70  PIA60642 = 0x00  PIA60643 = 0x00  PIA60645 = 0x00  PIA60646 = 0x8B  PIA60647 = 0xB6  PIA60648 = 0x45  PIA60649 = 0x00  PIA60650 = 0x00  PIA60651 = 0x00  PIA60652 = 0x9F  PIA60653 = 0xEF  PIA60654 = 0x9D  PIA60656 = 0x00  PIA60657 = 0x00  PIA60658 = 0x00  PIA60659 = 0xB7  PIA60660 = 0xDF  PIA60661 = 0x3B |  |

## EAS1 VGF commission

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|  | Stop Science  Set VGF ratio  Set VGF Ratio Pointer to 0  Start science  Wait  Stop Science  Set VGF Ratio Pointer to 1  Start science  Wait  Stop Science  Set VGF Ratio Pointer to 2  Start science  Wait  Stop Science  Set VGF ratio to ratio  Set VGF Ratio Pointer to 0  Start science | **PDOR\_SSWA\_EAS1\_VGF\_Comm\_00002.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58768, PIA60460 = 0x09  PIA60461 = 0x99  PIA60462 = 0x99  PIA60463 = 0x16  PIA60464 = 0x66  PIA60465 = 0x66  PIA60466 = 0x13  PIA60467 = 0x33  PIA60468 = 0x33  ZIA58770, PIA60460 = 0  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 00:01:10 (70 second)  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58770, PIA60460 = 1  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 00:01:10 (70 second)  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58770, PIA60460 = 2  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 00:01:10 (70 second)  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  Wait 00:01:10 (70 second)  ZIA58768, PIA60460 = 0x0  PIA60461 = 0x0  PIA60462 = 0x0  PIA60463 = 0x0  PIA60464 = 0x0  PIA60465 = 0x0  PIA60466 = 0x0  PIA60467 = 0x0  PIA60468 = 0x0  ZIA58770, PIA60460 = 0  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

## EAS1 MCP commission

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| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Zero the Deflectors | **PDOR\_SSWA\_EAS1\_Deflector\_Zero\_00001.SOL** |  |

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|  | Commission EAS1 MCP  Stop normal mode on EAS1  Perform Eng Mode 3  [Conversion = 1.022 ]  Set the EAS1 MCP back by 25V  Start normal mode on EAS1 | **PDOR\_SSWA\_EAS1\_MCP1\_Comm\_00001.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x0  ZIA58789, PIA60101 = [Start MCP]  PIA60100 = [Final MCP]  PIA60102 = 0x33 Step MCP  PIA60437 = 1 1st ramp time  PIA60444 = 1 Inter ramp time  PIA60165 = 20 Acq time  PIA60760 = 0x20 Hem bin  PIA60761 = 0x8 Def number  PIA60762 = SWEEP\_MACRO ctrl  **TM(5,2) Expected**  Wait 00:00:30 (30 seconds)  ZIA58784, PIA60218 = [MCP Value]  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  **SEND IN GROUPS OF 8 TCs THEN WAIT BEFORE SENDING THE NEXT 8** | This PDOR has the following sequence of procedures run for 7 times. Each loop has the following inputs.   |  |  |  |  | | --- | --- | --- | --- | |  | Start MCP | Final MCP | MCP Value | |  | PIA60101 | PIA60100 | PIA60218 | | 1 | 19 | 1A | 0 | | 2 | 33 | 34 | 19 | | 3 | 4C | 4D | 33 | | 4 | 66 | 67 | 4C | | 5 | 7F | 80 | 66 | | 6 | 99 | 9A | 7F | | 7 | B2 | B3 | 99 | | 8 | CC | CD | B2 | | 9 | E5 | E6 | CC | | 10 | FF | 100 | E5 | | 11 | 119 | 11A | FF | | 12 | 132 | 133 | 119 | | 13 | 14C | 14D | 132 | | 14 | 165 | 166 | 14C | | 15 | 17F | 180 | 165 | |
| **SWA Operator Confirm to Proceed Round the Loop**  **SWA Operator to check Counts in 3d packets and EM3 packets** | | | |

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|  | Commission EAS1 MCP  Stop normal mode on EAS1  Perform Eng Mode 3  [Conversion = 1.022 ]  Set the EAS1 MCP back by 25V  Start normal mode on EAS1 | **PDOR\_SSWA\_EAS1\_MCP2\_Comm\_00001.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x0  ZIA58789, PIA60101 = [Start MCP]  PIA60100 = [Final MCP]  PIA60102 = 0x33 Step MCP  PIA60437 = 1 1st ramp time  PIA60444 = 1 Inter ramp time  PIA60165 = 20 Acq time  PIA60760 = 0x20 Hem bin  PIA60761 = 0x8 Def number  PIA60762 = SWEEP\_MACRO ctrl  **TM(5,2) Expected**  Wait 00:00:30 (30 seconds)  ZIA58784, PIA60218 = [MCP Value]  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  **SEND IN GROUPS OF 16 TCs THEN WAIT BEFORE SENDING THE NEXT 16** | This PDOR has the following sequence of procedures run for 13 times. Each loop has the following inputs.   |  |  |  |  | | --- | --- | --- | --- | |  | Start MCP | Final MCP | MCP Value | |  | PIA60101 | PIA60100 | PIA60218 | | 1 | 198 | 199 | 17F | | 2 | 1B2 | 1B3 | 198 | | 3 | 1CB | 1CC | 1B2 | | 4 | 1E5 | 1E6 | 1CB | | 5 | 1FF | 200 | 1E5 | | 6 | 218 | 219 | 1FE | | 7 | 232 | 233 | 218 | | 8 | 24B | 24C | 232 | | 9 | 265 | 266 | 24B | | 10 | 27E | 27F | 265 | | 11 | 298 | 299 | 27E | | 12 | 2B1 | 2B2 | 298 | | 13 | 2CB | 2CC | 2B1 | | 14 | 2E4 | 2E5 | 2CB | | 15 | 2FE | 2FF | 2E4 | | 16 | 318 | 319 | 2FE | | 17 | 331 | 332 | 318 | | 18 | 34B | 34C | 331 | | 19 | 364 | 365 | 34B | | 20 | 37E | 37F | 364 | | 21 | 397 | 398 | 37E | | 22 | 3B1 | 3B2 | 397 | | 23 | 3CA | 3CB | 3B1 | | 24 | 3E4 | 3E5 | 3CA | | 25 | 3FE | 3FF | 3E4 | | 26 | 417 | 418 | 3FE | | 27 | 431 | 432 | 417 | | 28 | 44A | 44B | 431 | | 29 | 464 | 465 | 44A | | 30 | 47D | 47E | 464 | | 31 | 497 | 498 | 47D | | 32 | 4B0 | 4B1 | 497 | | 33 | 4CA | 4CB | 4B0 | | 34 | 4E3 | 4E4 | 4CA | | 35 | 4FD | 4FE | 4E3 | | 36 | 517 | 518 | 4FD | | 37 | 530 | 531 | 517 | | 38 | 54A | 54B | 530 | | 39 | 563 | 564 | 54A | | 40 | 57D | 57E | 563 | | 41 | 596 | 597 | 57D | | 42 | 5B0 | 5B1 | 596 | | 43 | 5C9 | 5CA | 5B0 | | 44 | 5E3 | 5E4 | 5C9 | | 45 | 5FD | 5FE | 5E3 | | 46 | 616 | 617 | 5FD | | 47 | 630 | 631 | 616 | | 48 | 649 | 64A | 630 | | 49 | 663 | 664 | 649 | | 50 | 67C | 67D | 663 | | 51 | 696 | 697 | 67C | | 52 | 6AF | 6B0 | 696 | | 53 | 6C9 | 6CA | 6AF | | 54 | 6E2 | 6E3 | 6C9 | | 55 | 6FC | 6FD | 6E2 | |
| **SWA Operator Confirm to Proceed Round the Loop**  **SWA Operator to check Counts in 3d packets and EM3 packets** | | | |

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|  | Commission EAS1 MCP  Stop normal mode on EAS1  Perform Eng Mode 3  [Conversion = 1.022 ]  Set the EAS1 MCP back by 25V  Start normal mode on EAS1 | **PDOR\_SSWA\_EAS1\_MCP3\_Comm\_00001.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x0  ZIA58789, PIA60101 = [Start MCP]  PIA60100 = [Final MCP]  PIA60102 = 0x33 Step MCP  PIA60437 = 1 1st ramp time  PIA60444 = 1 Inter ramp time  PIA60165 = 20 Acq time  PIA60760 = 0x20 Hem bin  PIA60761 = 0x8 Def number  PIA60762 = SWEEP\_MACRO ctrl  **TM(5,2) Expected**  Wait 00:00:30 (30 seconds)  ZIA58784, PIA60218 = [MCP Value]  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  **SEND IN GROUPS OF 8 TCs THEN WAIT BEFORE SENDING THE NEXT 8.** | This PDOR has the following sequence of procedures run for 44 times. Each loop has the following inputs.   |  |  |  |  | | --- | --- | --- | --- | |  | Start MCP | Final MCP | MCP Value | |  | PIA60101 | PIA60100 | PIA60218 | | 1 | 716 | 717 | 6FC | | 2 | 72F | 730 | 716 | | 3 | 749 | 74A | 72F | | 4 | 762 | 763 | 749 | | 5 | 77C | 77D | 762 | | 6 | 795 | 796 | 77C | | 7 | 7AF | 7B0 | 795 | | 8 | 7C8 | 7C9 | 7AF | | 9 | 7E2 | 7E3 | 7C8 | | 10 | 7FC | 7FD | 7E2 | | 11 | 815 | 816 | 7FC | | 12 | 82F | 830 | 815 | | 13 | 848 | 849 | 82F | | 14 | 862 | 863 | 848 | | 15 | 87B | 87C | 862 | | 16 | 895 | 896 | 87B | | 17 | 8AE | 8AF | 895 | | 18 | 8C8 | 8C9 | 8AE | | 19 | 8E1 | 8E2 | 8C8 | | 20 | 8FB | 8FC | 8E1 | | 21 | 915 | 916 | 8FB | | 22 | 92E | 92F | 915 | | 23 | 948 | 949 | 92E | | 24 | 961 | 962 | 948 | | 25 | 97B | 97C | 961 | | 26 | 994 | 995 | 97B | | 27 | 9AE | 9AF | 994 | | 28 | 9C7 | 9C8 | 9AE | | 29 | 9E1 | 9E2 | 9C7 | | 30 | 9FB | 9FC | 9E1 | | 31 | A0A | A0B | 9F0 | | 32 | A19 | A1A | A00 | | 33 | A28 | A29 | A0F | | 34 | A38 | A39 | A1E | | 35 | A47 | A48 | A2E | | 36 | A56 | A57 | A3D | | 37 | A66 | A67 | A4C | | 38 | A75 | A76 | A5C | | 39 | A84 | A85 | A6B | | 40 | A94 | A95 | A7A | | 41 | AA3 | AA4 | A8A | | 42 | AB2 | AB3 | A99 | | 43 | AC2 | AC3 | AA8 | | 44 | AD1 | AD2 | AB8 | |
| **SWA Operator Confirm to Proceed Round the Loop**  **SWA Operator to check Counts in 3d packets and EM3 packets** | | | |

## EAS1 POST MCP commission

|  |  |  |  |
| --- | --- | --- | --- |
|  | Post EAS1 MCP Commission  Stop normal mode on EAS1  Set the EAS1 MCP to 2695V =  0xAC2  Start normal mode on EAS1 | **PDOR\_SSWA\_EAS1\_Post\_MCP\_Comm\_00002.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x0  ZIA58784, PIA60218 = 0xAC2  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

## EAS1 Eng Mode 7

|  |  |  |  |
| --- | --- | --- | --- |
|  | Eng mode 7 (HV Sweep TEST)  Stop Science  Start Eng Mode 7 | **PDOR\_SSWA\_EAS1\_EngMode\_7\_00001.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58793  Wait 00:02:00 (120 second) |  |

## EAS1 Start Normal Mode

|  |  |  |  |
| --- | --- | --- | --- |
|  | Start normal mode on EAS1 | **PDOR\_SSWA\_EAS1\_NormalMode\_00001.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

# 2nd April. SWA-5 (IA-5) End of day Power Down (MTL)

See details above.

# 6th April. SWA-5 (IA-5) End of day Power Down (MTL)

Before the activity starts, the end of day commanding is loaded onto the MTL. This is shown here as it is unknown at this point where this activity will end. Wherever the end is, the activity will be halted, EAS powered down. Then the following day will power up and continue where this activity ended.

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
| --- | --- | --- | --- |
|  | Power down EAS1  Stop Science  Ramp MCP to zero  Turn heater off  Switch Off  Stop HK | **PDOR\_SSWA\_EAS1\_HV2SwitchOff\_00001.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x0  Wait 00:00:01 (1 second)  ZIA58784, PIA60218 = 0  Wait 00:00:40 (40 second)  ZIA58757, PIA60773 = 0  PIA60774 = 0  PIA60775 = 0  Wait 00:00:01 (1 second)  ZIA58756  Wait 00:01:00 (60 second)  ZIA58051, PIA58050 = EAS1\_SENS\_HK |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Power down EAS2  Stop Science  Ramp MCP to zero  Turn heater off  Switch Off  Stop HK | **PDOR\_SSWA\_EAS2\_HV2SwitchOff\_00001.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x0  Wait 00:00:01 (1 second)  ZIA58832, PIA60218 = 0  Wait 00:00:40 (40 second)  ZIA58805, PIA60773 = 0  PIA60774 = 0  PIA60775 = 0  Wait 00:00:01 (1 second)  ZIA58804  Wait 00:01:00 (60 second)  ZIA58051, PIA58050 = EAS2\_SENS\_HK |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Power down DPU | IA-FCP-002 |  |

# 6th April. SWA-5 (IA-5) Start of day procedure

## DPU Power up (MTL)

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
| --- | --- | --- | --- |
|  | Power DPU on | IA-FCP-011 |  |
|  | Configure the DPU | IA-FCP-030 |  |

## Disable EAS FDIR (MTL)

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
| --- | --- | --- | --- |
|  | Disable EAS1 FDIR | **PDOR\_SSWA\_EAS1\_Disable\_FDIR\_00001.SOL**  ZIA58064, PIA60452 = 12  PIA60449 = EAS1SPWHB\_MI  PIA60449 = E1\_3V3\_MI  PIA60449 = E1\_1V5\_MI  PIA60449 = E1OPTEMPMON  PIA60449 = E1HVOUTVMON  PIA60449 = E1MCPVMON  PIA60449 = E1GRIDVMON  PIA60449 = E110VAPOSVMON  PIA60449 = E128VPOSVMON  PIA60449 = E1HVGENTHERMON  PIA60449 = E1HVMODTHERMON  PIA60449 = EAS1MISSACK\_MI | Time = Instant |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Disable EAS2 FDIR | **PDOR\_SSWA\_EAS2\_Disable\_FDIR\_00001.SOL**  ZIA58064, PIA60452 = 12  PIA60449 = EAS2SPWHB\_MI  PIA60449 = E2\_3V3\_MI  PIA60449 = E2\_1V5\_MI  PIA60449 = E2OPTEMPMON  PIA60449 = E2HVOUTVMON  PIA60449 = E2MCPVMON  PIA60449 = E2GRIDVMON  PIA60449 = E210VAPOSVMON  PIA60449 = E228VPOSVMON  PIA60449 = E2HVGENTHERMON  PIA60449 = E2HVMODTHERMON  PIA60449 = EAS2MISSACK\_MI | Time = Instant |

## EAS Power up

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
| --- | --- | --- | --- |
|  | Power Up to IDLE EAS1  Enable EAS1 HK  Power EAS1 on  POST macro on EAS1  IDLE macro on EAS1  Request EAS1 HK | **PDOR\_SSWA\_EAS1\_PowerUp\_Post2Idle\_00001.SOL**  ZIA58050, PIA58050 = EAS1\_SENS\_HK  Wait 00:00:01 (1 second)  ZIA58760  Wait 00:00:05 (5 second)  ZIA58934, PIA60739 = POST  Wait 00:00:05 (5 second)  ZIA58753  Wait 00:00:30 (30 second)  ZIA58782 | Time = 41 seconds |

**SWA Team to check HK before Proceeding**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Go to RUN state EAS1  RUN macro on EAS1 | **PDOR\_SSWA\_EAS1\_PowerUp\_Run\_00001.SOL**  ZIA58758  Wait 00:00:20 (20 second) | Time = 20 seconds |
|  | Power Up to IDLE EAS2  Enable EAS2 HK  Power EAS2 on  POST macro on EAS2  IDLE macro on EAS2  Request EAS2 HK | **PDOR\_SSWA\_EAS2\_PowerUp\_Post2Idle\_00001.SOL**  ZIA58050, PIA58050 = EAS2\_SENS\_HK  Wait 00:00:01 (1 second)  ZIA58808  Wait 00:00:05 (5 second)  ZIA58936, PIA60740 = POST  Wait 00:00:05 (5 second)  ZIA58801  Wait 00:30:00 (30 second)  ZIA58830 | Time = 41 seconds |

**SWA Team to check HK before Proceeding**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Go to RUN state EAS2  RUN macro on EAS2 | **PDOR\_SSWA\_EAS2\_PowerUp\_Run\_00001.SOL**  ZIA58806  Wait 00:00:20 (20 second) | Time = 20 seconds |

## EAS2 Thresholds

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Set the EAS2 threshold values to 0x496 | **PDOR\_SSWA\_EAS2\_Thresh\_496\_00001.SOL**  ZIA58845, PIA60174 = 0x4960  PIA60185 = 0x4961  PIA60196 = 0x4962  PIA60200 = 0x4963  PIA60201 = 0x4964  PIA60202 = 0x4965  PIA60203 = 0x4966  PIA60204 = 0x4967  PIA60205 = 0x4968  PIA60175 = 0x4969  PIA60176 = 0x496A  PIA60177 = 0x496B  PIA60178 = 0x496C  PIA60179 = 0x496D  PIA60180 = 0x496E  PIA60181 = 0x496F  PIA60182 = 0x4960  PIA60183 = 0x4961  PIA60184 = 0x4962  PIA60186 = 0x4963  PIA60187 = 0x4964  PIA60188 = 0x4965  PIA60189 = 0x4966  PIA60190 = 0x4967  PIA60191 = 0x4968  PIA60192 = 0x4969  PIA60193 = 0x496A  PIA60194 = 0x496B  PIA60195 = 0x496C  PIA60197 = 0x496D  PIA60198 = 0x496E  PIA60199 = 0x496F |  |

## EAS2 Zero Deflectors

|  |  |  |  |
| --- | --- | --- | --- |
|  | Zero the EAS2 Deflectors | **PDOR\_SSWA\_EAS2\_Deflector\_Zero\_00001.SOL**  ZIA58813, PIA60474 = 0x00  PIA60475 = 0x00  **PLUS 96 BYTES** | Time = Instant |

## EAS Configure heater

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** | |
| --- | --- | --- | --- | --- |
|  | Turn the manual heater on for EAS1  Master Control Register  Heater Control | **PDOR\_SSWA\_EAS1\_Partial\_Heater\_00001.SOL**  ZIA58776, PIA60423 = 0x00  PIA60424 = 0x40  PIA60425 = 0x60  ZIA58757, PIA60773 = 0x00  PIA60774 = 0x00  PIA60775 = 0xE8 | | Time = Instant  Control EAS heaters to ¾ max  0xE8 |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Turn the manual heater on for EAS2  Master control Register  Heater Control | **PDOR\_SSWA\_EAS2\_Partial\_Heater\_00001.SOL**  ZIA58824, PIA60423 = 0x00  PIA60424 = 0x40  PIA60425 = 0x60  ZIA58805, PIA60773 = 0x00  PIA60774 = 0x00  PIA60775 = 0xE8 | Time = Instant  Control EAS1 heaters to ¾ max  0xE8 |

# EAS2 HV Commission

## EAS2 Hemisphere commission

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | EAS2 Hemisphere Commission  Set the Hem Ratio to FDB22D  Set EAS High Cadence  Set hemisphere voltage max to  **100V**  Conversion = 0.001894467  Rebuild Energy Table  Start science  Wait  Stop Science  Set hemisphere voltage max to  **200V**  Conversion = 0.001894467  Rebuild Energy Table  Start science  Wait  Stop Science  Set hemisphere voltage max to  **300V**  Conversion = 0.001894467  Rebuild Energy Table  Start science  Wait  Stop Science  Set hemisphere voltage max to  **400V**  Conversion = 0.001894467  Rebuild Energy Table  Start science | **PDOR\_SSWA\_EAS2\_Hem\_pt1\_Comm\_00001.SOL**  ZIA58814, PIA60469 = 0xFD  PIA60470 = 0xB2  PIA60471 = 0x2D  ZIA58728, PIA60096 = 0  PIA60097 = 0  PIA60099 = 1  PIA60098 = 1  ZIA58815, PIA60441 = 0x0C  PIA60442 = 0xE3  PIA60443 = 0x10  ZIA58819, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58815, PIA60441 = 0x19  PIA60442 = 0xC6  PIA60443 = 0x20  ZIA58819, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58815, PIA60441 = 0x26  PIA60442 = 0xA9  PIA60443 = 0x30  ZIA58819, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58815, PIA60441 = 0x33  PIA60442 = 0x8C  PIA60443 = 0x50  ZIA58819, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS2 Hemisphere Commission  Stop Science  Set hemisphere voltage max to  **500V**  Conversion = 0.001894467  Rebuild Energy Table  Start science  Wait  Stop Science  Set hemisphere voltage max to  **600V**  Conversion = 0.001894467  Rebuild Energy Table  Start science  Wait  Stop Science  Set hemisphere voltage max to  **700V**  Conversion = 0.001894467  Rebuild Energy Table  Start science  Wait  Stop Science  Set hemisphere voltage max to  **800V**  Conversion = 0.001894467  Rebuild Energy Table  Start science  Wait  Stop Science  Set the Hem Ratio to 0xDEB851  Rebuild the energy table  Start science | **PDOR\_SSWA\_EAS2\_Hem\_pt2\_Comm\_00001.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58815, PIA60441 = 0x40  PIA60442 = 0x6F  PIA60443 = 0x60  ZIA58819, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58815, PIA60441 = 0x4D  PIA60442 = 0x52  PIA60443 = 0x70  ZIA58819, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58815, PIA60441 = 0x5A  PIA60442 = 0x35  PIA60443 = 0x90  ZIA58819, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58815, PIA60441 = 0x67  PIA60442 = 0x18  PIA60443 = 0xA0  ZIA58819, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58766, PIA60469 = 0xDE  PIA60470 = 0xB8  PIA60471 = 0x51  ZIA58771, PIA60031 = MBOX3  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x1  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

## EAS2 Deflectors commission

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS2 Upper Deflector Commission  Stop Science  Set Deflectors to 0.4  Start science  Wait | **PDOR\_SSWA\_EAS2\_U\_Def\_04\_Comm\_00002.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58813 PIA60474 = 0x00  PIA60475 = 0x00  PIA60578 = 0x00  PIA60589 = 0x19  PIA60600 = 0x99  PIA60611 = 0x99  **PLUS 90 FURTHER BYTES**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

**PAUSE WAIT SWA INTERVENTION**

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS2 Upper Deflector Commission  Stop Science  Set Deflectors to 0.8  Start science  Wait  Stop Science  Set Deflectors to 1.2  Start science | **PDOR\_SSWA\_EAS2\_U\_Def\_12\_Comm\_00003.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58813 PIA60474 = 0x00  PIA60475 = 0x00  PIA60578 = 0x00  PIA60589 = 0x33  PIA60600 = 0x33  PIA60611 = 0x33  **PLUS 90 FURTHER BYTES**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58813 PIA60474 = 0x00  PIA60475 = 0x00  PIA60578 = 0x00  PIA60589 = 0x4C  PIA60600 = 0xCC  **PLUS 90 FURTHER BYTES**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

**PAUSE WAIT SWA INTERVENTION**

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS2 Upper Deflector Commission  Stop Science  Set Deflectors to 1.6  Start science  Wait  Stop Science  Set Deflectors to 2.0  Start science | **PDOR\_SSWA\_EAS2\_U\_Def\_20\_Comm\_00003.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58813 PIA60474 = 0x00  PIA60475 = 0x00  PIA60578 = 0x00  PIA60589 = 0x66  PIA60600 = 0x66  PIA60611 = 0x66  **PLUS 90 FURTHER BYTES**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58813 PIA60474 = 0x00  PIA60475 = 0x00  PIA60578 = 0x00  PIA60589 = 0x80  PIA60600 = 0x00  PIA60611 = 0x00  **PLUS 90 FURTHER BYTES**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

**PAUSE WAIT SWA INTERVENTION**

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS2 Upper Deflector Commission  Stop Science  Set Deflectors to 2.4  Start science  Wait  Stop Science  Set Deflectors to 2.8  Start science | **PDOR\_SSWA\_EAS2\_U\_Def\_28\_Comm\_00003.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58813 PIA60474 = 0x00  PIA60475 = 0x00  PIA60578 = 0x00  PIA60589 = 0x99  PIA60600 = 0x99  PIA60611 = 0x99  **PLUS 90 FURTHER BYTES**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58813 PIA60474 = 0x00  PIA60475 = 0x00  PIA60578 = 0x00  PIA60589 = 0xB3  PIA60600 = 0x33  PIA60611 = 0x33  **PLUS 90 FURTHER BYTES**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

**PAUSE WAIT SWA INTERVENTION**

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS2 Lower Deflector Commission  Stop Science  Set Deflectors to 0.4  Start science | **PDOR\_SSWA\_EAS2\_L\_Def\_04\_Comm\_00002.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58813 PIA60474 = 0x19  PIA60475 = 0x99  PIA60578 = 0x99  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  **PLUS 90 FURTHER BYTES**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

**PAUSE WAIT SWA INTERVENTION**

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS2 Lower Deflector Commission  Stop Science  Set Deflectors to 0.8  Wait  Start science  Stop Science  Set Deflectors to 1.2  Start science | **PDOR\_SSWA\_EAS2\_L\_Def\_12\_Comm\_00003.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58813 PIA60474 = 0x33  PIA60475 = 0x33  PIA60578 = 0x33  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  **PLUS 90 FURTHER BYTES**  Wait 30 seconds  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58813 PIA60474 = 0x4C  PIA60475 = 0xCC  PIA60578 = 0xCC  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  **PLUS 90 FURTHER BYTES**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

**PAUSE WAIT SWA INTERVENTION**

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS2 Lower Deflector Commission  Stop Science  Set Deflectors to 1.6  Start science  Wait  Stop Science  Set Deflectors to 2.0  Start science | **PDOR\_SSWA\_EAS2\_L\_Def\_20\_Comm\_00003.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58813 PIA60474 = 0x66  PIA60475 = 0x66  PIA60578 = 0x66  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  **PLUS 90 FURTHER BYTES**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58813 PIA60474 = 0x80  PIA60475 = 0x00  PIA60578 = 0x00  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  **PLUS 90 FURTHER BYTES**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

**PAUSE WAIT SWA INTERVENTION**

|  |  |  |  |
| --- | --- | --- | --- |
|  | EAS2 Lower Deflector Commission  Stop Science  Set Deflectors to 2.4  Start science  Wait  Stop Science  Set Deflectors to 2.8  Start science | **PDOR\_SSWA\_EAS2\_L\_Def\_28\_Comm\_00003.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58813 PIA60474 = 0x99  PIA60475 = 0x99  PIA60578 = 0x99  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  **PLUS 90 FURTHER BYTES**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 30 seconds  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58813 PIA60474 = 0xB3  PIA60475 = 0x33  PIA60578 = 0x33  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

## EAS2 VGF commission

|  |  |  |  |
| --- | --- | --- | --- |
|  | Stop Science  Set VGF ratio  Set VGF Ratio Pointer to 0  Start science  Wait  Stop Science  Set VGF Ratio Pointer to 1  Start science  Wait  Stop Science  Set VGF Ratio Pointer to 2  Start science  Wait  Stop Science  Set VGF ratio to zero  Set VGF Ratio Pointer to 0  Start Science | **PDOR\_SSWA\_EAS2\_VGF\_Comm\_00002.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58816, PIA60460 = 0x09  PIA60461 = 0x99  PIA60462 = 0x99  PIA60463 = 0x16  PIA60464 = 0x66  PIA60465 = 0x66  PIA60466 = 0x13  PIA60467 = 0x33  PIA60468 = 0x33  ZIA58818, PIA60460 = 0  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 00:01:10 (70 second)  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58818, PIA60460 = 1  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 00:01:10 (70 second)  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58818, PIA60460 = 2  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  Wait 00:01:10 (70 second)  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  Wait 00:01:10 (70 second)  ZIA58816, PIA60460 = 0x0  PIA60461 = 0x0  PIA60462 = 0x0  PIA60463 = 0x0  PIA60464 = 0x0  PIA60465 = 0x0  PIA60466 = 0x0  PIA60467 = 0x0  PIA60468 = 0x0  ZIA58818, PIA60460 = 0  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

## EAS2 MCP commission

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Zero the Deflectors | **PDOR\_SSWA\_EAS2\_Deflector\_Zero\_00001.SOL** |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  | Commission EAS2 MCP  Stop normal mode on EAS2  Perform Eng Mode 3  [Conversion = 1.022 ]  Set the EAS2 MCP back by 25V  Start normal mode on EAS2 | **PDOR\_SSWA\_EAS2\_MCP1\_Comm\_00001.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x0  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58837, PIA60101 = [Start MCP]  PIA60100 = [Final MCP]  PIA60102 = 0x33 Step MCP  PIA60437 = 1 1st ramp time  PIA60444 = 1 Inter ramp time  PIA60165 = 20 Acq time  PIA60760 = 0x20 Hem bin  PIA60761 = 0x8 Def number  PIA60762 = SWEEP\_MACRO ctrl  **TM(5,2) Expected**  Wait 00:00:30 (30 seconds)  ZIA58832, PIA60218 = [MCP Value]  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  **SEND IN GROUPS OF 8 TCs THEN WAIT BEFORE SENDING THE NEXT 8** | This PDOR has the following sequence of procedures run for 7 times. Each loop has the following inputs.   |  |  |  |  | | --- | --- | --- | --- | |  | Start MCP | Final MCP | MCP Value | |  | PIA60101 | PIA60100 | PIA60218 | | 1 | 19 | 1A | 0 | | 2 | 33 | 34 | 19 | | 3 | 4C | 4D | 33 | | 4 | 66 | 67 | 4C | | 5 | 7F | 80 | 66 | | 6 | 99 | 9A | 7F | | 7 | B2 | B3 | 99 | | 8 | CC | CD | B2 | | 9 | E5 | E6 | CC | | 10 | FF | 100 | E5 | | 11 | 119 | 11A | FF | | 12 | 132 | 133 | 119 | | 13 | 14C | 14D | 132 | | 14 | 165 | 166 | 14C | | 15 | 17F | 180 | 165 | |
| **SWA Operator Confirm to Proceed Round the Loop**  **SWA Operator to check Counts in 3d packets and EM3 packets** | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Commission EAS2 MCP  Stop normal mode on EAS2  Perform Eng Mode 3  [Conversion = 1.022 ]  Set the EAS2 MCP back by 25V  Start normal mode on EAS2 | **PDOR\_SSWA\_EAS2\_MCP2\_Comm\_00001.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x0  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58837, PIA60101 = [Start MCP]  PIA60100 = [Final MCP]  PIA60102 = 0x33 Step MCP  PIA60437 = 1 1st ramp time  PIA60444 = 1 Inter ramp time  PIA60165 = 20 Acq time  PIA60760 = 0x20 Hem bin  PIA60761 = 0x8 Def number  PIA60762 = SWEEP\_MACRO ctrl  **TM(5,2) Expected**  Wait 00:00:30 (30 seconds)  ZIA58832, PIA60218 = [MCP Value]  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  **SEND IN GROUPS OF 16 TCs THEN WAIT BEFORE SENDING THE NEXT 16** | This PDOR has the following sequence of procedures run for 114 times. Each loop has the following inputs.   |  |  |  |  | | --- | --- | --- | --- | |  | Start MCP | Final MCP | MCP Value | |  | PIA60101 | PIA60100 | PIA60218 | | 1 | 198 | 199 | 17F | | 2 | 1B2 | 1B3 | 198 | | 3 | 1CB | 1CC | 1B2 | | 4 | 1E5 | 1E6 | 1CB | | 5 | 1FF | 200 | 1E5 | | 6 | 218 | 219 | 1FE | | 7 | 232 | 233 | 218 | | 8 | 24B | 24C | 232 | | 9 | 265 | 266 | 24B | | 10 | 27E | 27F | 265 | | 11 | 298 | 299 | 27E | | 12 | 2B1 | 2B2 | 298 | | 13 | 2CB | 2CC | 2B1 | | 14 | 2E4 | 2E5 | 2CB | | 15 | 2FE | 2FF | 2E4 | | 16 | 318 | 319 | 2FE | | 17 | 331 | 332 | 318 | | 18 | 34B | 34C | 331 | | 19 | 364 | 365 | 34B | | 20 | 37E | 37F | 364 | | 21 | 397 | 398 | 37E | | 22 | 3B1 | 3B2 | 397 | | 23 | 3CA | 3CB | 3B1 | | 24 | 3E4 | 3E5 | 3CA | | 25 | 3FE | 3FF | 3E4 | | 26 | 417 | 418 | 3FE | | 27 | 431 | 432 | 417 | | 28 | 44A | 44B | 431 | | 29 | 464 | 465 | 44A | | 30 | 47D | 47E | 464 | | 31 | 497 | 498 | 47D | | 32 | 4B0 | 4B1 | 497 | | 33 | 4CA | 4CB | 4B0 | | 34 | 4E3 | 4E4 | 4CA | | 35 | 4FD | 4FE | 4E3 | | 36 | 517 | 518 | 4FD | | 37 | 530 | 531 | 517 | | 38 | 54A | 54B | 530 | | 39 | 563 | 564 | 54A | | 40 | 57D | 57E | 563 | | 41 | 596 | 597 | 57D | | 42 | 5B0 | 5B1 | 596 | | 43 | 5C9 | 5CA | 5B0 | | 44 | 5E3 | 5E4 | 5C9 | | 45 | 5FD | 5FE | 5E3 | | 46 | 616 | 617 | 5FD | | 47 | 630 | 631 | 616 | | 48 | 649 | 64A | 630 | | 49 | 663 | 664 | 649 | | 50 | 67C | 67D | 663 | | 51 | 696 | 697 | 67C | | 52 | 6AF | 6B0 | 696 | | 53 | 6C9 | 6CA | 6AF | | 54 | 6E2 | 6E3 | 6C9 | | 55 | 6FC | 6FD | 6E2 | |
| **SWA Operator Confirm to Proceed Round the Loop**  **SWA Operator to check Counts in 3d packets and EM3 packets** | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  | Commission EAS2 MCP  Stop normal mode on EAS2  Perform Eng Mode 3  [Conversion = 1.022 ]  Set the EAS2 MCP back by 25V  Start normal mode on EAS2 | **PDOR\_SSWA\_EAS2\_MCP3\_Comm\_00001.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x0  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58837, PIA60101 = [Start MCP]  PIA60100 = [Final MCP]  PIA60102 = 0x33 Step MCP  PIA60437 = 1 1st ramp time  PIA60444 = 1 Inter ramp time  PIA60165 = 20 Acq time  PIA60760 = 0x20 Hem bin  PIA60761 = 0x8 Def number  PIA60762 = SWEEP\_MACRO ctrl  **TM(5,2) Expected**  Wait 00:00:30 (30 seconds)  ZIA58832, PIA60218 = [MCP Value]  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2  **SEND IN GROUPS OF 8 TCs THEN WAIT BEFORE SENDING THE NEXT 8** | This PDOR has the following sequence of procedures run for 114 times. Each loop has the following inputs.   |  |  |  |  | | --- | --- | --- | --- | |  | Start MCP | Final MCP | MCP Value | |  | PIA60101 | PIA60100 | PIA60218 | | 1 | 716 | 717 | 6FC | | 2 | 72F | 730 | 716 | | 3 | 749 | 74A | 72F | | 4 | 762 | 763 | 749 | | 5 | 77C | 77D | 762 | | 6 | 795 | 796 | 77C | | 7 | 7AF | 7B0 | 795 | | 8 | 7C8 | 7C9 | 7AF | | 9 | 7E2 | 7E3 | 7C8 | | 10 | 7FC | 7FD | 7E2 | | 11 | 815 | 816 | 7FC | | 12 | 82F | 830 | 815 | | 13 | 848 | 849 | 82F | | 14 | 862 | 863 | 848 | | 15 | 87B | 87C | 862 | | 16 | 895 | 896 | 87B | | 17 | 8AE | 8AF | 895 | | 18 | 8C8 | 8C9 | 8AE | | 19 | 8E1 | 8E2 | 8C8 | | 20 | 8FB | 8FC | 8E1 | | 21 | 915 | 916 | 8FB | | 22 | 92E | 92F | 915 | | 23 | 948 | 949 | 92E | | 24 | 961 | 962 | 948 | | 25 | 97B | 97C | 961 | | 26 | 994 | 995 | 97B | | 27 | 9AE | 9AF | 994 | | 28 | 9C7 | 9C8 | 9AE | | 29 | 9E1 | 9E2 | 9C7 | | 30 | 9FB | 9FC | 9E1 | | 31 | A0A | A0B | 9F0 | | 32 | A19 | A1A | A00 | | 33 | A28 | A29 | A0F | | 34 | A38 | A39 | A1E | | 35 | A47 | A48 | A2E | | 36 | A56 | A57 | A3D | | 37 | A66 | A67 | A4C | | 38 | A75 | A76 | A5C | | 39 | A84 | A85 | A6B | | 40 | A94 | A95 | A7A | | 41 | AA3 | AA4 | A8A | | 42 | AB2 | AB3 | A99 | | 43 | AC2 | AC3 | AA8 | | 44 | AD1 | AD2 | AB8 | |
| **SWA Operator Confirm to Proceed Round the Loop**  **SWA Operator to check Counts in 3d packets and EM3 packets** | | | |

## EAS2 POST MCP commission

|  |  |  |  |
| --- | --- | --- | --- |
|  | Post EAS2 MCP Commission  Stop normal mode on EAS2  Set the EAS2 MCP to 2695V =  0xAC2  Start normal mode on EAS2 | **PDOR\_SSWA\_EAS2\_Post\_MCP\_Comm\_00002.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58832, PIA60218 = 0xAC2  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 2 |  |

## EAS2 Eng Mode 7

|  |  |  |  |
| --- | --- | --- | --- |
|  | Eng mode 7 (HV Sweep TEST)  Stop Science  Start Eng Mode 7 | **PDOR\_SSWA\_EAS2\_EngMode\_7\_00001.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58841  Wait 00:02:00 (120 second) |  |

## EAS2 Start Normal Mode

|  |  |  |  |
| --- | --- | --- | --- |
|  | Start normal mode on EAS1 | **PDOR\_SSWA\_EAS2\_NormalMode\_00001.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

# 6th April. SWA-5 (IA-5) End of day Power Down (MTL)

See details above.

# 7th April. SWA-5 (IA-5) End of day Power Down (MTL)

Before the activity starts, the end of day commanding is loaded onto the MTL. This is shown here as it is unknown at this point where this activity will end. Wherever the end is, the activity will be halted, EAS powered down. Then the following day will power up and continue where this activity ended.

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
| --- | --- | --- | --- |
|  | Power down EAS1  Stop Science  Ramp MCP to zero  Turn heater off  Switch Off  Stop HK | **PDOR\_SSWA\_EAS1\_HV2SwitchOff\_00001.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x0  Wait 00:00:01 (1 second)  ZIA58784, PIA60218 = 0  Wait 00:00:40 (40 second)  ZIA58757, PIA60773 = 0  PIA60774 = 0  PIA60775 = 0  Wait 00:00:01 (1 second)  ZIA58756  Wait 00:01:00 (60 second)  ZIA58051, PIA58050 = EAS1\_SENS\_HK |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Power down EAS2  Stop Science  Ramp MCP to zero  Turn heater off  Switch Off  Stop HK | **PDOR\_SSWA\_EAS2\_HV2SwitchOff\_00001.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x0  Wait 00:00:01 (1 second)  ZIA58832, PIA60218 = 0  Wait 00:00:40 (40 second)  ZIA58805, PIA60773 = 0  PIA60774 = 0  PIA60775 = 0  Wait 00:00:01 (1 second)  ZIA58804  Wait 00:01:00 (60 second)  ZIA58051, PIA58050 = EAS2\_SENS\_HK |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Power down DPU | IA-FCP-002 |  |

# 7th April. SWA-5 (IA-5) Start of day procedure

## DPU Power up (MTL)

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
| --- | --- | --- | --- |
|  | Power DPU on | IA-FCP-011 |  |
|  | Configure the DPU | IA-FCP-030 |  |

## Disable EAS FDIR (MTL)

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
| --- | --- | --- | --- |
|  | Disable EAS1 FDIR | **PDOR\_SSWA\_EAS1\_Disable\_FDIR\_00001.SOL**  ZIA58064, PIA60452 = 12  PIA60449 = EAS1SPWHB\_MI  PIA60449 = E1\_3V3\_MI  PIA60449 = E1\_1V5\_MI  PIA60449 = E1OPTEMPMON  PIA60449 = E1HVOUTVMON  PIA60449 = E1MCPVMON  PIA60449 = E1GRIDVMON  PIA60449 = E110VAPOSVMON  PIA60449 = E128VPOSVMON  PIA60449 = E1HVGENTHERMON  PIA60449 = E1HVMODTHERMON  PIA60449 = EAS1MISSACK\_MI | Time = Instant |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Disable EAS2 FDIR | **PDOR\_SSWA\_EAS2\_Disable\_FDIR\_00001.SOL**  ZIA58064, PIA60452 = 12  PIA60449 = EAS2SPWHB\_MI  PIA60449 = E2\_3V3\_MI  PIA60449 = E2\_1V5\_MI  PIA60449 = E2OPTEMPMON  PIA60449 = E2HVOUTVMON  PIA60449 = E2MCPVMON  PIA60449 = E2GRIDVMON  PIA60449 = E210VAPOSVMON  PIA60449 = E228VPOSVMON  PIA60449 = E2HVGENTHERMON  PIA60449 = E2HVMODTHERMON  PIA60449 = EAS2MISSACK\_MI | Time = Instant |

## EAS Power up

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
| --- | --- | --- | --- |
|  | Power Up to IDLE EAS1  Enable EAS1 HK  Power EAS1 on  POST macro on EAS1  IDLE macro on EAS1  Request EAS1 HK | **PDOR\_SSWA\_EAS1\_PowerUp\_Post2Idle\_00001.SOL**  ZIA58050, PIA58050 = EAS1\_SENS\_HK  Wait 00:00:01 (1 second)  ZIA58760  Wait 00:00:05 (5 second)  ZIA58934, PIA60739 = POST  Wait 00:00:05 (5 second)  ZIA58753  Wait 00:00:30 (30 second)  ZIA58782 | Time = 41 seconds |

**SWA Team to check HK before Proceeding**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Go to RUN state EAS1  RUN macro on EAS1 | **PDOR\_SSWA\_EAS1\_PowerUp\_Run\_00001.SOL**  ZIA58758  Wait 00:00:20 (20 second) | Time = 20 seconds |
|  | Power Up to IDLE EAS2  Enable EAS2 HK  Power EAS2 on  POST macro on EAS2  IDLE macro on EAS2  Request EAS2 HK | **PDOR\_SSWA\_EAS2\_PowerUp\_Post2Idle\_00001.SOL**  ZIA58050, PIA58050 = EAS2\_SENS\_HK  Wait 00:00:01 (1 second)  ZIA58808  Wait 00:00:05 (5 second)  ZIA58936, PIA60740 = POST  Wait 00:00:05 (5 second)  ZIA58801  Wait 00:30:00 (30 second)  ZIA58830 | Time = 41 seconds |

**SWA Team to check HK before Proceeding**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Go to RUN state EAS2  RUN macro on EAS2 | **PDOR\_SSWA\_EAS2\_PowerUp\_Run\_00001.SOL**  ZIA58806  Wait 00:00:20 (20 second) | Time = 20 seconds |

## EAS Thresholds

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Adjust Thresholds on EAS1  Adjust the Thresholds | **PDOR\_SSWA\_EAS1\_Thresh\_496\_00001.SOL**  ZIA58797, PIA60174 = 0x4960  PIA60185 = 0x4961  PIA60196 = 0x4962  PIA60200 = 0x4963  PIA60201 = 0x4964  PIA60202 = 0x4965  PIA60203 = 0x4966  PIA60204 = 0x4967  PIA60205 = 0x4968  PIA60175 = 0x4969  PIA60176 = 0x496A  PIA60177 = 0x496B  PIA60178 = 0x496C  PIA60179 = 0x496D  PIA60180 = 0x496E  PIA60181 = 0x496F  PIA60182 = 0x4960  PIA60183 = 0x4961  PIA60184 = 0x4962  PIA60186 = 0x4963  PIA60187 = 0x4964  PIA60188 = 0x4965  PIA60189 = 0x4966  PIA60190 = 0x4967  PIA60191 = 0x4968  PIA60192 = 0x4969  PIA60193 = 0x496A  PIA60194 = 0x496B  PIA60195 = 0x496C  PIA60197 = 0x496D  PIA60198 = 0x496E  PIA60199 = 0x496F | **Time = 2 seconds** |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Set the EAS2 threshold values to 0x496 | **PDOR\_SSWA\_EAS2\_Thresh\_496\_00001.SOL**  ZIA58845, PIA60174 = 0x4960  PIA60185 = 0x4961  PIA60196 = 0x4962  PIA60200 = 0x4963  PIA60201 = 0x4964  PIA60202 = 0x4965  PIA60203 = 0x4966  PIA60204 = 0x4967  PIA60205 = 0x4968  PIA60175 = 0x4969  PIA60176 = 0x496A  PIA60177 = 0x496B  PIA60178 = 0x496C  PIA60179 = 0x496D  PIA60180 = 0x496E  PIA60181 = 0x496F  PIA60182 = 0x4960  PIA60183 = 0x4961  PIA60184 = 0x4962  PIA60186 = 0x4963  PIA60187 = 0x4964  PIA60188 = 0x4965  PIA60189 = 0x4966  PIA60190 = 0x4967  PIA60191 = 0x4968  PIA60192 = 0x4969  PIA60193 = 0x496A  PIA60194 = 0x496B  PIA60195 = 0x496C  PIA60197 = 0x496D  PIA60198 = 0x496E  PIA60199 = 0x496F |  |

## EAS Flight Deflectors

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Adjust Deflectors on EAS1  Stop Normal Mode on EAS1  Adjust the Deflector Ratios | **PDOR\_SSWA\_EAS1\_Deflectors\_Flight\_00001.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58765, PIA60474 = 0xB0  PIA60475 = 0xC4  PIA60578 = 0x9B  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  PIA60622 = 0x88  PIA60633 = 0xC4  PIA60644 = 0x9B  PIA60655 = 0x00  PIA60476 = 0x00  PIA60487 = 0x00  PIA60498 = 0x62  PIA60509 = 0x7E  PIA60520 = 0xF9  PIA60531 = 0x00  PIA60542 = 0x00  PIA60553 = 0x00  PIA60564 = 0x3F  PIA60575 = 0xAE  PIA60579 = 0x14  PIA60580 = 0x00  PIA60581 = 0x00  PIA60582 = 0x00  PIA60583 = 0x20  PIA60584 = 0x20  PIA60585 = 0xC4  PIA60586 = 0x00  PIA60587 = 0x00  PIA60588 = 0x00  PIA60590 = 0x04  PIA60591 = 0x49  PIA60592 = 0xBA  PIA60593 = 0x00  PIA60594 = 0x00  PIA60595 = 0x00  PIA60596 = 0x00  PIA60597 = 0x00  PIA60598 = 0x00  PIA60599 = 0x14  PIA60601 = 0x39  PIA60602 = 0x58  PIA60603 = 0x00  PIA60604 = 0x00  PIA60605 = 0x00  PIA60606 = 0x29  PIA60607 = 0x78  PIA60608 = 0xD4  PIA60609 = 0x00  PIA60610 = 0x00  PIA60612 = 0x00  PIA60613 = 0x3B  PIA60614 = 0xE7  PIA60615 = 0x6C  PIA60616 = 0x00  PIA60617 = 0x00  PIA60618 = 0x00  PIA60619 = 0x4C  PIA60620 = 0x8B  PIA60621 = 0x43  PIA60623 = 0x00  PIA60624 = 0x00  PIA60625 = 0x00  PIA60626 = 0x5C  PIA60627 = 0x39  PIA60628 = 0x58  PIA60629 = 0x00  PIA60630 = 0x00  PIA60631 = 0x00  PIA60632 = 0x6A  PIA60634 = 0xF1  PIA60635 = 0xA9  PIA60636 = 0x00  PIA60637 = 0x00  PIA60638 = 0x00  PIA60639 = 0x7A  PIA60640 = 0x3D  PIA60641 = 0x70  PIA60642 = 0x00  PIA60643 = 0x00  PIA60645 = 0x00  PIA60646 = 0x8B  PIA60647 = 0xB6  PIA60648 = 0x45  PIA60649 = 0x00  PIA60650 = 0x00  PIA60651 = 0x00  PIA60652 = 0x9F  PIA60653 = 0xEF  PIA60654 = 0x9D  PIA60656 = 0x00  PIA60657 = 0x00  PIA60658 = 0x00  PIA60659 = 0xB7  PIA60660 = 0xDF  PIA60661 = 0x3B |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Adjust Deflectors on EAS2  Stop Normal Mode on EAS2  Adjust the Deflector Ratios | **PDOR\_SSWA\_EAS2\_Deflectors\_Flight\_00001.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58813, PIA60474 = 0xAD  PIA60475 = 0x0E  PIA60578 = 0x56  PIA60589 = 0x00  PIA60600 = 0x00  PIA60611 = 0x00  PIA60622 = 0x83  PIA60633 = 0x64  PIA60644 = 0x5A  PIA60655 = 0x00  PIA60476 = 0x00  PIA60487 = 0x00  PIA60498 = 0x5D  PIA60509 = 0x4F  PIA60520 = 0xDF  PIA60531 = 0x00  PIA60542 = 0x00  PIA60553 = 0x00  PIA60564 = 0x39  PIA60575 = 0xEB  PIA60579 = 0x85  PIA60580 = 0x00  PIA60581 = 0x00  PIA60582 = 0x00  PIA60583 = 0x1A  PIA60584 = 0xD0  PIA60585 = 0xE5  PIA60586 = 0x00  PIA60587 = 0x00  PIA60588 = 0x00  PIA60590 = 0x00  PIA60591 = 0xC4  PIA60592 = 0x9B  PIA60593 = 0x00  PIA60594 = 0x00  PIA60595 = 0x00  PIA60596 = 0x00  PIA60597 = 0x00  PIA60598 = 0x00  PIA60599 = 0x15  PIA60601 = 0x4F  PIA60602 = 0xDF  PIA60603 = 0x00  PIA60604 = 0x00  PIA60605 = 0x00  PIA60606 = 0x28  PIA60607 = 0x20  PIA60608 = 0xC4  PIA60609 = 0x00  PIA60610 = 0x00  PIA60612 = 0x00  PIA60613 = 0x38  PIA60614 = 0x83  PIA60615 = 0x12  PIA60616 = 0x00  PIA60617 = 0x00  PIA60618 = 0x00  PIA60619 = 0x47  PIA60620 = 0x5C  PIA60621 = 0x28  PIA60623 = 0x00  PIA60624 = 0x00  PIA60625 = 0x00  PIA60626 = 0x54  PIA60627 = 0xED  PIA60628 = 0x91  PIA60629 = 0x00  PIA60630 = 0x00  PIA60631 = 0x00  PIA60632 = 0x62  PIA60634 = 0x5E  PIA60635 = 0x35  PIA60636 = 0x00  PIA60637 = 0x00  PIA60638 = 0x00  PIA60639 = 0x71  PIA60640 = 0x99  PIA60641 = 0x99  PIA60642 = 0x00  PIA60643 = 0x00  PIA60645 = 0x00  PIA60646 = 0x83  PIA60647 = 0x33  PIA60648 = 0x33  PIA60649 = 0x00  PIA60650 = 0x00  PIA60651 = 0x00  PIA60652 = 0x98  PIA60653 = 0xC4  PIA60654 = 0x9B  PIA60656 = 0x00  PIA60657 = 0x00  PIA60658 = 0x00  PIA60659 = 0xB2  PIA60660 = 0x0C  PIA60661 = 0x49 |  |

## EAS Configure heater

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** | |
| --- | --- | --- | --- | --- |
|  | Turn the manual heater on for EAS1  Master Control Register  Heater Control | **PDOR\_SSWA\_EAS1\_Partial\_Heater\_00001.SOL**  ZIA58776, PIA60423 = 0x00  PIA60424 = 0x40  PIA60425 = 0x60  ZIA58757, PIA60773 = 0x00  PIA60774 = 0x00  PIA60775 = 0xE8 | | Time = Instant  Control EAS heaters to ¾ max  0xE8 |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Turn the manual heater on for EAS2  Master control Register  Heater Control | **PDOR\_SSWA\_EAS2\_Partial\_Heater\_00001.SOL**  ZIA58824, PIA60423 = 0x00  PIA60424 = 0x40  PIA60425 = 0x60  ZIA58805, PIA60773 = 0x00  PIA60774 = 0x00  PIA60775 = 0xE8 | Time = Instant  Control EAS1 heaters to ¾ max  0xE8 |

If the activities on the 2nd and the 6th are completed then this day will include some engineering mode test and further heater tests. If the 2nd and 6th activities have not completed they will continue into this day and the activities detailed below will be done at a later date.

## EAS Start Normal Mode

|  |  |  |  |
| --- | --- | --- | --- |
|  | Start normal mode on EAS1 | **PDOR\_SSWA\_EAS1\_NormalMode\_00001.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Start normal mode on EAS1 | **PDOR\_SSWA\_EAS2\_NormalMode\_00001.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x2 |  |

## EAS 1 Engineering modes

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Perform Eng mode 4 on EAS1  Stop normal mode on EAS1  Eng mode 4 (Threshold Sweep)  Run post-eng mode macro on EAS1 | **PDOR\_SSWA\_EAS1\_EngMode4\_00001.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58790, PIA60104 = 0x724 Start Thresh  PIA60103 = 0x477 End Thresh  PIA60105 = 0x200 Thresh step  PIA60106 = 0x0 MCP Value  PIA60165 = 0xA MCP wait  PIA60851 = 2 Acq time  PIA60760 = 0x20 Hem bin  PIA60761 = 0x8 Def number  ZIA58934,PIA60739, EQUAL,POST\_ENG |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Perform Eng mode 5 on EAS1 | **PDOR\_SSWA\_EAS1\_EngMode5\_00001.SOL** |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Perform Eng mode 3 on EAS1  Stop normal mode on EAS1  Eng mode 3 (Gain Test)  Run post-eng mode macro on EAS1 | **PDOR\_SSWA\_EAS1\_EngMode3\_00001.SOL**  ZIA58771, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0x0  ZIA58789, PIA60101 = [Start MCP]  PIA60100 = [Final MCP]  PIA60102 = 0x33 Step MCP  PIA60437 = 1 1st ramp time  PIA60444 = 1 Inter ramp time  PIA60165 = 20 Acq time  PIA60760 = 0x20 Hem bin  PIA60761 = 0x8 Def number  PIA60762 = SWEEP\_MACRO ctrl  ZIA58934, PIA60739 = POST\_ENG |  |

## EAS 2 Engineering modes

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Perform Eng mode 4 on EAS2  Stop normal mode on EAS2  Eng mode 4 (Threshold Sweep)  Run post-eng mode macro on EAS2 | **PDOR\_SSWA\_EAS2\_EngMode4\_00001.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58838, PIA60104 = 0x724 Start Thresh  PIA60103 = 0x477 End Thresh  PIA60105 = 0x200 Thresh step  PIA60106 = 0x0 MCP Value  PIA60165 = 0xA MCP wait  PIA60851 = 2 Acq time  PIA60760 = 0x20 Hem bin  PIA60761 = 0x8 Def number  ZIA58936,PIA60740, EQUAL,POST\_ENG |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Perform Eng mode 5 on EAS2 | **PDOR\_SSWA\_EAS2\_EngMode5\_00001.SOL** |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Perform Eng mode 3 on EAS2  Stop normal mode on EAS2  Eng mode 3 (Gain Test)  Run post-eng mode macro on EAS2 | **PDOR\_SSWA\_EAS2\_EngMode3\_00001.SOL**  ZIA58819, PIA60031 = MBOX1  PIA60446 = 0  PIA60447 = 0  PIA60448 = 0  ZIA58837, PIA60101 = [Start MCP]  PIA60100 = [Final MCP]  PIA60102 = 0x33 Step MCP  PIA60437 = 1 1st ramp time  PIA60444 = 1 Inter ramp time  PIA60165 = 20 Acq time  PIA60760 = 0x20 Hem bin  PIA60761 = 0x8 Def number  PIA60762 = SWEEP\_MACRO ctrl  ZIA58936, PIA60740 = POST\_ENG |  |

## EAS Configure heater

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
| --- | --- | --- | --- |
|  | Turn the manual heater on for EAS1  Master Control Register  Heater Control | **PDOR\_SSWA\_EAS1\_Full\_Heater\_00001.SOL**  ZIA58776, PIA60423 = 0x00  PIA60424 = 0x40  PIA60425 = 0x60  ZIA58757, PIA60773 = 0x00  PIA60774 = 0x01  PIA60775 = 0x60 | Control EAS heaters to max  0x160 |
|  | Turn the manual heater on for EAS2  Master control Register  Heater Control | **PDOR\_SSWA\_EAS2\_Full\_Heater\_00001.SOL**  ZIA58824, PIA60423 = 0x00  PIA60424 = 0x40  PIA60425 = 0x60  ZIA58805, PIA60773 = 0x00  PIA60774 = 0x01  PIA60775 = 0x60 | Control EAS1 heaters to max  0x160 |

At this point, EAS 1&2 are now initially commissioned for use.

# 7th April. SWA-5 (IA-5) End of day Power Down (MTL)

See details above.

# 14th April. SWA-4 (IA-4) Day 1

During this sectionthe following is done:

DPU powered on

PAS powered on

PAS commission

PAS powered off

Be sure that the “commissioning” patch of PAS has been installed to DPU. If this patch has not been installed, send the patch commands HERE.

Unblock all dangerous TCs

## 14th April. SWA-4 (IA-4) End of day Power Down (MTL)

Before the activity starts, the end of day commanding is loaded onto the MTL. This is shown here as it is unknown at this point where this activity will end. Wherever the end is, the activity will be halted and PAS HV ramped down. Then the following day PAS will continue where this activity ended.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Abort Sequencer activity  Set HV to 1000V  Enable the Monitoring parameters  Turn PAS Preamps Off | **PDOR\_SSWA\_PAS\_Comm\_Post\_Det1\_00004.SOL**  ZIA58873, PIA60347 = 0x000000FF  Wait 00:08:20 (500 second)  ZIA58868, PIA60344 = 0x00000333  Wait 00:08:20 (500 second)  ZIA58063, PIA60452 = 27  PIA60449 = V\_MON\_C\_MI  PIA60449 = V\_MON\_L\_MI  PIA60449 = I\_MON\_C\_MI  PIA60449 = I\_MON\_L\_MI  PIA60449 = T\_MON\_C\_MI  PIA60449 = T\_MON\_L\_MI  PIA60449 = P24\_VCEMOUT\_MI  PIA60449 = P5\_VCEMOUT\_MI  PIA60449 = P12\_VHTOUT\_MI  PIA60449 = M12\_VHTOUT\_MI  PIA60449 = P3V\_3\_FPGA\_OMI  PIA60449 = P1V\_5\_FPGA\_OMI  PIA60449 = TEMP\_DCDC\_MI  PIA60449 = TEMP\_FPGA\_MI  PIA60449 = HK\_IP24V\_CEMMI  PIA60449 = HK\_IP5V\_CEMMI  PIA60449 = HK\_IP12V\_HTMI  PIA60449 = HK\_IM12V\_HTMI  PIA60449 = HK\_I3V3\_FPGAMI  PIA60449 = HK\_IP28V\_PRIMI  PIA60449 = HK\_IP28V\_PRIMI  PIA60449 = HK\_MHV\_POSMI  PIA60449 = HK\_MHV\_NEGMI  PIA60449 = TEMP\_HVPS\_MI  PIA60449 = HK\_IP28V\_PRSCI  PIA60449 = PASSPWHB\_MI  PIA60449 = PASMISSACK\_MI  ZIA58862, PIA58062 = OFF  PIA58063 = OFF | Get at least one HK packet to be sure that  HV stepping is finished  Wait for the HK with the corresponding  CEMs HV |

## Start of day procedure. DPU Power up (MTL)

| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
| --- | --- | --- | --- |
|  | Power DPU on | IA-FCP-011 |  |
|  | Configure the DPU | IA-FCP-030 |  |

## PAS Power

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Power Up PAS  Enable PAS HK  Disable Monitor Parameters  ( 29 parameters )  Power on PAS | **PDOR\_SSWA\_PAS\_Comm\_PowerOn\_00004.SOL**  ZIA58050, PIA58050 = PAS\_SENS\_HK  ZIA58064, PIA60452 = 28 NUM\_OF\_MON\_ID  PIA60449 = V\_MON\_C\_MI  PIA60449 = V\_MON\_L\_MI  PIA60449 = I\_MON\_C\_MI  PIA60449 = I\_MON\_L\_MI  PIA60449 = T\_MON\_C\_MI  PIA60449 = T\_MON\_L\_MI  PIA60449 = P24\_VCEMOUT\_MI  PIA60449 = P5\_VCEMOUT\_MI  PIA60449 = P12\_VHTOUT\_MI  PIA60449 = M12\_VHTOUT\_MI  PIA60449 = P3V\_3\_FPGA\_OMI  PIA60449 = P1V\_5\_FPGA\_OMI  PIA60449 = TEMP\_DCDC\_MI  PIA60449 = TEMP\_FPGA\_MI  PIA60449 = HK\_IP24V\_CEMMI  PIA60449 = HK\_IP5V\_CEMMI  PIA60449 = HK\_IP12V\_HTMI  PIA60449 = HK\_IM12V\_HTMI  PIA60449 = HK\_I3V3\_FPGAMI  PIA60449 = HK\_IP28V\_PRIMI  PIA60449 = HK\_IP28V\_PRIMI  PIA60449 = HK\_MHV\_POSMI  PIA60449 = HK\_MHV\_NEGMI  PIA60449 = TEMP\_HVPS\_MI  PIA60449 = HK\_IP28V\_PRSCI  PIA60449 = PASampOverCurr  PIA60449 = PASSPWHB\_MI}  PIA60449 = PASMISSACK\_MI  ZIA58858 |  |

WAIT AT LEAST 9 mins. Receive at least 3 HK packets and check contents.

## PAS Ramp up main HV

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Configure PAS  Set the Master control register to  Standby  Set the heater off  Enable MHV  Set the main HV to 650 V  Set the main HV to 1300 V  Set the main HV to 1950 V  Set the main HV to 2600 V  Set the main HV to 3250 V  Set the main HV to 3900 V  Set the main HV to 4550 V  Set the main HV to 5200 V  Set the main HV to 5850 V  Set the main HV to 6500 V | **PDOR\_SSWA\_PAS\_Comm\_HV\_00003.SOL**  ZIA58863, PIA60343 = 0x0000001A  ZIA58947, PIA60848 = OFF HEATHER  PIA60849 = 0x000 DUTY\_CYCLE  ZIA58863, PIA60343 = 0x0000001E  ZIA58869, PIA60344 = 0x00000199  Wait 00:10:00 (600 second)  ZIA58869, PIA60344 = 0x00000333  Wait 00:10:00 (600 second)  ZIA58869, PIA60344 = 0x000004CC  Wait 00:10:00 (600 second)  ZIA58869, PIA60344 = 0x00000666  Wait 00:10:00 (600 second)  ZIA58869, PIA60344 = 0x000007FF  Wait 00:10:00 (600 second)  ZIA58869, PIA60344 = 0x00000999  Wait 00:10:00 (600 second)  ZIA58869, PIA60344 = 0x00000B33  Wait 00:10:00 (600 second)  ZIA58869, PIA60344 = 0x00000CCC  Wait 00:10:00 (600 second)  ZIA58869, PIA60344 = 0x00000E66  Wait 00:10:00 (600 second)  ZIA58869, PIA60344 = 0x00000FFF | Check HV value and stability before  proceeding  Check HV value and stability before  proceeding.  Check HV value and stability before  proceeding.  Check HV value and stability before  proceeding.  Check HV value and stability before  proceeding.  Check HV value and stability before  proceeding.  Check HV value and stability before  proceeding.  Check HV value and stability before  proceeding.  Check HV value and stability before  proceeding.  Check HV value and stability before  proceeding. |

WAIT 10 mins and ground intervention

## PAS Engineering stepping

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Load the engineering table  Start Engineering scheme  Query Stop Engineering scheme  Abort Sequencer activity  Dump parameter | **PDOR\_SSWA\_PAS\_Eng\_Stepping\_00004.SOL**  ZIA58875, PIA60709 = 0x06004E8  PIA60711 = 0x416448  PIA60708 = 0x126FBD  PIA60706 = 0x1251B9  PIA60707 = 0x125F76  PIA60710 = 0x00003C  ZIA58873, PIA60347 = 0x00000003  Wait 00:08:20 (500 second)  ZIA58873, PIA60347 = 0x00000000  Wait 00:13:20 (800 second)  ZIA58873, PIA60347 = 0x000000FF  Wait 00:00:10 (10 second)  ZIA58942, PIA60776 = SequencerState | Wait at least 500s. And ground intervention.  Wait at least 800s. And ground intervention.  Wait at least 10s. And ground intervention. |

WAIT AT LEAST 9 mins and ground intervention

## PAS Detector commission

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Load the conf table  Dump Parameter  Master Control Register: Enable  CEMs  Master Control Register: CEMs On  Turn Pre Amps on  Load Static table  Start Static scheme  Set HV to 250V  Set HV to 500V  Set HV to 750V  Set HV to 1000V  Set HV to 1250V  Set HV to 1500V  Set HV to 1550V  Set HV to 1600V  Set HV to 1650V  Set HV to 1700V  Set HV to 1750V  Set HV to 1800V  Set HV to 1850V  Set HV to 1900V | **PDOR\_SSWA\_PAS\_Comm\_Det\_1\_00004.SOL**  ZIA58874, PIA60800 = 0x28F5C21A  PIA60801 = 0x3D700B85  PIA60802 = 0x1E063D70  PIA60803 = 0x1FD70A3C  PIA60804 = 0xF5C25614  PIA60805 = 0x7A6A3D70  PIA60806 = 0x7E147A8F  PIA60807 = 0x0A3D870A  PIA60808 = 0x3D6147AE  PIA60809 = 0x38F5C220  PIA60810 = 0xA3D7328F  PIA60811 = 0x5C570A3D  PIA60812 = 0x3147AE08  PIA60813 = 0xF5C20B85  PIA60814 = 0x1E228F5C  PIA60815 = 0x6B1E0DF1  PIA60816 = 0x6872F8A0  PIA60817 = 0x62937DEA  PIA60818 = 0x94932892  PIA60819 = 0x8DCF94B7  PIA60820 = 0xA892FBB7  PIA60821 = 0x96EFCF00  PIA60822 = 0x001585CD  PIA60823 = 0x800EB851  PIA60824 = 0x0EB85111  PIA60825 = 0xC28F1999  PIA60826 = 0x991D1EB8  PIA60827 = 0x191EB814  PIA60828 = 0x28F513D7  PIA60829 = 0x0A10F5C2  PIA60830 = 0x12E14714  PIA60831 = 0x28F50C28  PIA60832 = 0xF508F5C2  PIA60833 = 0x123D7012  PIA60834 = 0xE1471428  PIA60835 = 0xF50147AE  PIA60836 = 0x0B851E63  PIA60837 = 0x610070BF  PIA60838 = 0x8000003E  PIA60839 = 0x9C28F580  PIA60840 = 0x08008008  PIA60841 = 0x00800800  PIA60842 = 0x80080080  PIA60843 = 0x08008008  PIA60844 = 0x00000400  ZIA58942 PIA60776 = ConfTable  Wait 00:08:20 (500 second)  ZIA58863 PIA60343 = 0x0000001F  Wait 00:00:05 (5 second)  ZIA58863 PIA60343 = 0x00000007  Wait 00:00:05 (5 second)  ZIA58862, PIA58062 = ON  PIA58063 = ON  ZIA58876, PIA60700 = 0x000000  PIA60713 = 0x000008  PIA60705 = 0x000040  PIA60712 = 0x000000  PIA60704 = 0x000009  PIA60720 = 0x000001 (K)  PIA60721 = 0x000001  Wait 00:00:05 (5 second)  ZIA58873, PIA60347 = 0x00000001  Wait 00:08:20 (500 second)  ZIA58868, PIA60344 = 0x000000CD  Wait 00:05:00 (300 second)  ZIA58868, PIA60344 = 0x0000019A  Wait 00:05:00 (300 second)  ZIA58868, PIA60344 = 0x00000266  Wait 00:05:00 (300 second)  ZIA58868, PIA60344 = 0x00000333  Wait 00:05:00 (300 second)  ZIA58868, PIA60344 = 0x00000400  Wait 00:05:00 (300 second)  ZIA58868, PIA60344 = 0x000004CD  Wait 00:05:00 (300 second)  ZIA58868, PIA60344 = 0x000004F5  Wait 00:05:00 (300 second)  ZIA58868, PIA60344 = 0x0000051E  Wait 00:05:00 (300 second)  ZIA58868, PIA60344 = 0x00000547  Wait 00:05:00 (300 second)  ZIA58868, PIA60344 = 0x00000570  Wait 00:05:00 (300 second)  ZIA58868, PIA60344 = 0x00000599  Wait 00:05:00 (300 second)  ZIA58868, PIA60344 = 0x000005C2  Wait 00:05:00 (300 second)  ZIA58868, PIA60344 = 0x000005EB  Wait 00:05:00 (300 second)  ZIA58868, PIA60344 = 0x00000614 | Wait at least 500s. And ground intervention.  Wait 5s.  Wait 5s.  Such configuration is possible if the  Sequencer is patched to the  “Commissioning” version  ONLY. If NOT, K = 13500 (0x003F48)  Wait at least 500s. And ground intervention.  Wait for the HK with the corresponding  CEMs HV.  Continue in all these steps ONLY if there is  no problem with Science data and HK data  **IF CEM COUNT IS SATURATED STOP**  **THE PDOR.**  And proceed to the next PDOR |

WAIT AT LEAST 30 mins and ground intervention

# 14th April. SWA-4 (IA-4) End of day Power Down (MTL)

See details above.

After execution of this PAS stays ON until the next day commissioning activity.

# 15th April. SWA-4 (IA-4) Day 2

## 15th April. SWA-4 (IA-4) End of day Power Down (MTL)

Before the activity starts, the end of day commanding is loaded onto the MTL. This is shown here as it is unknown at this point where this activity will end. Wherever the end is, the activity will be halted and PAS will be powered off.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Stop Science  Switch off the preamps  Disable the monitoring parameters  Ramp down the PAS HV  Final value = 0V  Initial value = **0x0NOMINAL**  Step size = 200V  Wait time = 6s  Power OFF PAS | **PDOR\_SSWA\_PAS\_NM2OFF\_0001.SOL**  ZIA58944  Wait 00:05:00 (300 second)  ZIA58862, PIA58062 = OFF  PIA58063 = OFF  ZIA58064, PIA60452 = 28  PIA60449 = V\_MON\_C\_MI  PIA60449 = V\_MON\_L\_MI  PIA60449 = I\_MON\_C\_MI  PIA60449 = I\_MON\_L\_MI  PIA60449 = T\_MON\_C\_MI  PIA60449 = T\_MON\_L\_MI  PIA60449 = P24\_VCEMOUT\_MI  PIA60449 = P5\_VCEMOUT\_MI  PIA60449 = P12\_VHTOUT\_MI  PIA60449 = M12\_VHTOUT\_MI  PIA60449 = P3V\_3\_FPGA\_OMI  PIA60449 = P1V\_5\_FPGA\_OMI  PIA60449 = TEMP\_DCDC\_MI  PIA60449 = TEMP\_FPGA\_MI  PIA60449 = HK\_IP24V\_CEMMI  PIA60449 = HK\_IP5V\_CEMMI  PIA60449 = HK\_IP12V\_HTMI  PIA60449 = HK\_IM12V\_HTMI  PIA60449 = HK\_I3V3\_FPGAMI  PIA60449 = HK\_IP28V\_PRIMI  PIA60449 = HK\_IP28V\_PRIMI  PIA60449 = HK\_MHV\_POSMI  PIA60449 = HK\_MHV\_NEGMI  PIA60449 = TEMP\_HVPS\_MI  PIA60449 = HK\_IP28V\_PRSCI  PIA60449 = PASampOverCurr  PIA60449 = PASSPWHB\_MI  PIA60449 = PASMISSACK\_MI  ZIA58857, PIA60790 = 0x0000  PIA60791= **0x0NOMINAL**  PIA60792 = 0x00B2  PIA60793 = 0x0006  Wait 00:05:00 (300 second)  ZIA58859 | Ensure all science packets have stopped  Wait the HK with the CEM V less than 200 V.  Ensure PAS is OFF |

## PAS Resume detector

Obtain the PAS HK packets from the previous night and analyse before proceeding.

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Power on pre amps  Start the static scheme  Set CEM HV to 1250V  Set CEM HV to 1500V  Set CEM HV to 1550V  Set CEM HV to 1600V  Set CEM HV to 1650V  Set CEM HV to 1700V  Set CEM HV to 1750V  Set CEM HV to 1800V  Set CEM HV to 1850V  Set CEM HV to 1900V | **PDOR\_SSWA\_PAS\_Comm\_Det\_2\_00005.SOL**  ZIA58862, PIA58062 = ON  PIA58063 = ON  Wait 00:00:05 (5 second)  ZIA58873, PIA60347 = 0x00000001  Wait 00:06:40 (400 second)  ZIA58868, PIA60344 = 0x00000400  Wait 00:08:20 (500 second)  ZIA58868, PIA60344 = 0x000004CD  Wait 00:58:20 (3500 second)  ZIA58868, PIA60344 = 0x000004F5  Wait 00:08:20 (500 second)  ZIA58868, PIA60344 = 0x0000051E  Wait 00:08:20 (500 second)  ZIA58868, PIA60344 = 0x00000547  Wait 00:08:20 (500 second)  ZIA58868, PIA60344 = 0x00000570  Wait 00:08:20 (500 second)  ZIA58868, PIA60344 = 0x00000599  Wait 00:08:20 (500 second)  ZIA58868, PIA60344 = 0x000005C2  Wait 00:08:20 (500 second)  ZIA58868, PIA60344 = 0x000005EB  Wait 00:08:20 (500 second)  ZIA58868, PIA60344 = 0x00000614 | Wait for the HK with the corresponding  CEMs HV, Continue if there is no problem  with Science data and HK data  From this point the step is 50 V  Continue in all these steps ONLY if there is no  problem with Science data and HK data  **IF CEM COUNT IS SATURATED STOP THE**  **PDOR.**  And proceed to the next PDOR |

WAIT AT LEAST 30 mins and ground intervention

|  |  |  |  |
| --- | --- | --- | --- |
|  | Abort the sequencer activity  Disable Monitoring parameters  Ramp the CEM HV to 0V in 500V  steps  Ramp the CEM HV back to 1250V  Ramp the CEM HV back to 1000V  Ramp the CEM HV back to 500V  Ramp the CEM HV back to 0V  Ramp the Main HV to 0V in 1000V  steps  Ramp the Main HV to 5000V  Ramp the Main HV to 4000V  Ramp the Main HV to 3000V  Ramp the Main HV to 2000V  Ramp the Main HV to 1000V  Ramp the Main HV to 0V | **PDOR\_SSWA\_PAS\_Post\_Det\_2\_00004.SOL**  ZIA58873, PIA60347 = 0x000000FF  Wait 00:05:00 (300 second)  ZIA58064, PIA60452 = 28  PIA60449 = V\_MON\_C\_MI  PIA60449 = V\_MON\_L\_MI  PIA60449 = I\_MON\_C\_MI  PIA60449 = I\_MON\_L\_MI  PIA60449 = T\_MON\_C\_MI  PIA60449 = T\_MON\_L\_MI  PIA60449 = P24\_VCEMOUT\_MI  PIA60449 = P5\_VCEMOUT\_MI  PIA60449 = P12\_VHTOUT\_MI  PIA60449 = M12\_VHTOUT\_MI  PIA60449 = P3V\_3\_FPGA\_OMI  PIA60449 = P1V\_5\_FPGA\_OMI  PIA60449 = TEMP\_DCDC\_MI  PIA60449 = TEMP\_FPGA\_MI  PIA60449 = HK\_IP24V\_CEMMI  PIA60449 = HK\_IP5V\_CEMMI  PIA60449 = HK\_IP12V\_HTMI  PIA60449 = HK\_IM12V\_HTMI  PIA60449 = HK\_I3V3\_FPGAMI  PIA60449 = HK\_IP28V\_PRIMI  PIA60449 = HK\_IP28V\_PRIMI  PIA60449 = HK\_MHV\_POSMI  PIA60449 = HK\_MHV\_NEGMI  PIA60449 = TEMP\_HVPS\_MI  PIA60449 = HK\_IP28V\_PRSCI  PIA60449 = PASampOverCurr  PIA60449 = PASSPWHB\_MI  PIA60449 = PASMISSACK\_MI  ZIA58868, PIA60344 = 0x00000400  Wait 00:05:00 (300 second)  ZIA58868, PIA60344 = 0x00000333  Wait 00:05:00 (300 second)  ZIA58868, PIA60344 = 0x0000019A  Wait 00:05:00 (300 second)  ZIA58868, PIA60344 = 0x00000000  Wait 00:05:00 (300 second)  ZIA58869, PIA60344 = 0x00000C4E  Wait 00:00:40 (40 second)  ZIA58869, PIA60344 = 0x000009D8  Wait 00:00:40 (40 second)  ZIA58869, PIA60344 = 0x00000762  Wait 00:00:40 (40 second)  ZIA58869, PIA60344 = 0x000004EC  Wait 00:00:40 (40 second)  ZIA58869, PIA60344 = 0x00000276  Wait 00:00:40 (40 second)  ZIA58869, PIA60344 = 0x00000000 | At this stage we should know what the  NOMINAL CEM HV is = **0x0NOMINAL**  Wait for the HK to show MHV < 200V. |

WAIT AT LEAST 5 mins and ground intervention

## PAS Normal science check

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Set the PAS config  Ramp the PAS HV  Initial value = 0V  Nominal Value = **0x0NOMINAL**  Step size = 100V  Wait time = 50s  Enable monitoring parameters  Start science cyclogram | **PDOR\_SSWA\_PAS\_Comm\_NM\_00005.SOL**  ZIA58853  Wait 00:18:20 (1100 second)  ZIA58856, PIA60791 = 0x0000  PIA60790= **0x0NOMINAL**  PIA60792 = 0x0052  PIA60793 = 0x0032  Wait 00:20:00 (1200 second)  ZIA58063, PIA60452 = 28  PIA60449 = V\_MON\_C\_MI  PIA60449 = V\_MON\_L\_MI  PIA60449 = I\_MON\_C\_MI  PIA60449 = I\_MON\_L\_MI  PIA60449 = T\_MON\_C\_MI  PIA60449 = T\_MON\_L\_MI  PIA60449 = P24\_VCEMOUT\_MI  PIA60449 = P5\_VCEMOUT\_MI  PIA60449 = P12\_VHTOUT\_MI  PIA60449 = M12\_VHTOUT\_MI  PIA60449 = P3V\_3\_FPGA\_OMI  PIA60449 = P1V\_5\_FPGA\_OMI  PIA60449 = TEMP\_DCDC\_MI  PIA60449 = TEMP\_FPGA\_MI  PIA60449 = HK\_IP24V\_CEMMI  PIA60449 = HK\_IP5V\_CEMMI  PIA60449 = HK\_IP12V\_HTMI  PIA60449 = HK\_IM12V\_HTMI  PIA60449 = HK\_I3V3\_FPGAMI  PIA60449 = HK\_IP28V\_PRIMI  PIA60449 = HK\_IP28V\_PRIMI  PIA60449 = HK\_MHV\_POSMI  PIA60449 = HK\_MHV\_NEGMI  PIA60449 = TEMP\_HVPS\_MI  PIA60449 = HK\_IP28V\_PRSCI  PIA60449 = PASampOverCurr  PIA60449 = PASSPWHB\_MI  PIA60449 = PASMISSACK\_MI  Wait 00:00:40 (40 second)  ZIA58943, PIA60777 = PASNc1 | Wait for the HK to show MHV = 6500V.  About 12 mins  INPUT from Ground  Wait about 20 mins to confirm CEM is nominal |

# 15th April. SWA-4 (IA-4) End of day Power Down (MTL)

See details above.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Stop Science  Switch off the preamps  Disable the monitoring parameters  Ramp down the PAS HV  Final value = 0V  Initial value = **0x0NOMINAL**  Step size = 200V  Wait time = 6s  Power OFF PAS | **PDOR\_SSWA\_PAS\_NM2OFF\_0001.SOL**  ZIA58944  Wait 00:05:00 (300 second)  ZIA58862, PIA58062 = OFF  PIA58063 = OFF  ZIA58064, PIA60452 = 28  PIA60449 = V\_MON\_C\_MI  PIA60449 = V\_MON\_L\_MI  PIA60449 = I\_MON\_C\_MI  PIA60449 = I\_MON\_L\_MI  PIA60449 = T\_MON\_C\_MI  PIA60449 = T\_MON\_L\_MI  PIA60449 = P24\_VCEMOUT\_MI  PIA60449 = P5\_VCEMOUT\_MI  PIA60449 = P12\_VHTOUT\_MI  PIA60449 = M12\_VHTOUT\_MI  PIA60449 = P3V\_3\_FPGA\_OMI  PIA60449 = P1V\_5\_FPGA\_OMI  PIA60449 = TEMP\_DCDC\_MI  PIA60449 = TEMP\_FPGA\_MI  PIA60449 = HK\_IP24V\_CEMMI  PIA60449 = HK\_IP5V\_CEMMI  PIA60449 = HK\_IP12V\_HTMI  PIA60449 = HK\_IM12V\_HTMI  PIA60449 = HK\_I3V3\_FPGAMI  PIA60449 = HK\_IP28V\_PRIMI  PIA60449 = HK\_IP28V\_PRIMI  PIA60449 = HK\_MHV\_POSMI  PIA60449 = HK\_MHV\_NEGMI  PIA60449 = TEMP\_HVPS\_MI  PIA60449 = HK\_IP28V\_PRSCI  PIA60449 = PASampOverCurr  PIA60449 = PASSPWHB\_MI  PIA60449 = PASMISSACK\_MI  ZIA58857, PIA60790 = 0x0000  PIA60791= **0x0NOMINAL**  PIA60792 = 0x00B2  PIA60793 = 0x0006  Wait 00:05:00 (300 second)  ZIA58859 | Ensure all science packets have stopped  Wait the HK with the CEM V less than 200 V.  Ensure PAS is OFF |

# SWA-6 (IA-6) SWA commissioning procedure

This section will test the SWA suite in Normal mode. It will then test the SWA Burst mode. The various cadences of the SWA sensors are also tested.

It is assumed at this point that the DPU is powered on and configured in OPS mode. And EAS is also powered on and configured in NO\_SCIENCE mode

## SWA Normal mode

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Power up & configure HIS with ramped-up High Voltage ready to sweep. | **PDOR\_SSWA\_HIS\_PowerUpConfig\_00001.SOL**  IA-FCP-017  ZIA58913, PIA60001 = 9 |  |
|  | Wait 1 hour 22 mins | Wait 01:22:00 (4920 seconds) |  |
|  | Power up & configure PAS in No science  Enable HK  Disable FDIR  Power On  Master Control Register  Enable Monitor parameter  Enable Monitor parameter  Enable Monitor parameter  Disable Monitor parameter  Enable Monitor parameter  Master Control Register  PAS Config  Enable Moniter parameter  Master Control Register  Master Control Register  PAS HV Ramp up  Report Config parameters  Modify Config parameters  Accept  Report Config parameters  Enable FDIR monitoring  Turn Preamps on  Enable FDIR monitoring | **PDOR\_SSWA\_PAS\_PowerUpConfig\_00002.SOL**  ZIA58050, PIA58050 = PAS\_SENS\_HK  ZIA58064, PIA60452 = 28  PIA60449 = V\_MON\_C\_MI  PIA60449 = V\_MON\_L\_MI  PIA60449= I\_MON\_C\_MI  PIA60449 = I\_MON\_L\_MI  PIA60449 = T\_MON\_C\_MI  PIA60449 = T\_MON\_L\_MI  PIA60449 = P24\_VCEMOUT\_MI  PIA60449 = P5\_VCEMOUT\_MI  PIA60449 = P12\_VHTOUT\_MI  PIA60449 = M12\_VHTOUT\_MI  PIA60449 = P3V\_3\_FPGA\_OMI  PIA60449 = P1V\_5\_FPGA\_OMI  PIA60449 = TEMP\_DCDC\_MI  PIA60449 = TEMP\_FPGA\_MI  PIA60449 = HK\_IP24V\_CEMMI  PIA60449 = HK\_IP5V\_CEMMI  PIA60449 = HK\_IP12V\_HTMI  PIA60449 = HK\_IM12V\_HTMI  PIA60449 = HK\_I3V3\_FPGAMI  PIA60449 = HK\_IP28V\_PRIMI  PIA60449 = HK\_I1V5\_FPGAMI  PIA60449 = HK\_MHV\_POSMI  PIA60449 = HK\_MHV\_NEGMI  PIA60449 = TEMP\_HVPS\_MI  PIA60449 = HK\_IP28V\_PRSCI  PIA60449 = PASampOverCurr  PIA60449 = PASSPWHB\_MI  PIA60449 = PASMISSACK\_MI  ZIA58858  ZIA58863, PIA60343 = 0x0000001A  ZIA58063, PIA60452 = 1  PIA60449 = PASSPWHB\_MI  ZIA58063, PIA60452 = 1  PIA60449 = PASMISSACK\_MI=  ZIA58063, PIA60452 = 1  PIA60449 = HK\_IP28V\_PRIMI  ZIA58064, PIA60452 = 1  PIA60449 = HK\_IP28V\_PRIMI  ZIA58063, PIA60452 = 1  PIA60449 = HK\_IP28V\_PRSCI  ZIA58863, PIA60343 = 0x0000001E  ZIA58853  ZIA58063, PIA60452 = 6  PIA60449 = HK\_MHV\_POSMI  PIA60449 = HK\_MHV\_NEGMI  PIA60449 = P12\_VHTOUT\_MI  PIA60449 = M12\_VHTOUT\_MI  PIA60449 = HK\_IP12V\_HTMI  PIA60449 = HK\_IM12V\_HTMI  ZIA58863, PIA60343 = 0x0000001F  ZIA58863, PIA60343 = 0x00000007  ZIA58856, PIA60791 = 0  PIA60790 = **0x0NOM**  PIA60792 = 0x29  PIA60793 = 0x0014  Wait 00:20:00 (1200 seconds)  ZIA58707, PIA60137 = 1  PIA60138 = 3004  ZIA58706, PIA60133 = 1  PIA60136 = 3004  PIA60135 = 4  PIA60134 = **MSB of 0x0NOM**  PIA60134 = **LSB of 0x0NOM**  PIA60134 = 0  PIA60134 = 0x29  ZIA58708  ZIA58707, PIA60137 = 1  PIA60138 = 3004  ZIA58063, PIA60452 = 4  PIA60449 = V\_MON\_C\_MI  PIA60449 = V\_MON\_L\_MI  PIA60449 = I\_MON\_C\_MI  PIA60449 = I\_MON\_L\_MI  ZIA58862, PIA58062 = ON  PIA58063 = ON  ZIA58063, PIA60452 =13  PIA60449 = T\_MON\_C\_MI  PIA60449 = T\_MON\_L\_MI  PIA60449 = P24\_VCEMOUT\_MI  PIA60449 = P5\_VCEMOUT\_MI  PIA60449 = P3V\_3\_FPGA\_OMI  PIA60449 = P1V\_5\_FPGA\_OMI  PIA60449 = TEMP\_DCDC\_MI  PIA60449 = TEMP\_FPGA\_MI  PIA60449 = HK\_IP24V\_CEMMI  PIA60449 = HK\_IP5V\_CEMMI  PIA60449 = HK\_I3V3\_FPGAMI  PIA60449 = HK\_I1V5\_FPGAMI  PIA60449 = TEMP\_HVPS\_MI  Wait 00:30:00 (1800 seconds) |  |
|  | Puts HIS into NM | **PDOR\_SSWA\_HIS\_NORMSCI\_00001.SOL**  ZIA58913, PIA60001 = 15 |  |
|  | Test the Suite in Normal Mode  PAS into NM  HIS to HVSTBY  EAS 1&2 into NM | **PDOR\_SSWA\_Suite\_Comm\_NM\_00001.SOL**  IA-FCP-061, XF061A01 = 22  Wait 00:10:00 (600 seconds)  ZIA58917, PIA59011 = HVSTDBY  IA-FCP-041  IA-FCP-051  Wait 00:10:00 (600 seconds) |  |
|  | Puts HIS into NM | **PDOR\_SSWA\_HIS\_NORMSCI\_00001.SOL**  ZIA58913, PIA60001 = 15 |  |
|  | Wait 00:10:00 (600 seconds) |  |  |
|  | Enable Compression | IA-FCP-101 |  |

## PAS Calibration mode

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Run calibration test on PAS  Stop Science on PAS  Start Calibration Mode  Adjust the Thresholds  Start Science on PAS | **PDOR\_SSWA\_PAS\_Calibration\_00003.SOL**  ZIA58944  Wait 00:05:00 (300 seconds)  ZIA58850, PIA60780 = 0x0SRT  PIA60781 = 0x0029  PIA60782 = 0x0STP  PIA60783 = 0x0FFB  PIA60784 = 0x0FF7  PIA60785 = 0x0FEF  PIA60786 = 0x0FDF  PIA60787 = 0x0FBF  PIA60788 = 0x0NOM  PIA60789 = 0x0000  Wait 00:05:00 (300 seconds)  ZIA58943, PIA60777 = PASNc1 | Calculate SRT and STP as:  **SRT** = HEX( 0x0NOM - 200.0) / 1.221)  **STP** = HEX( 0x0NOM +200.0) / 1.221) |

## SWA Burst mode

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Test Burst Mode  All sensors into BM for 5 mins  5m = 300s / 8 = 2400  PAS only into BM for 5 mins  5m = 300s / 8 = 2400 | **PDOR\_SSWA\_Suite\_Comm\_BM\_00001.SOL**  Wait 00:10:00 (600 seconds)  ZIA58726, PIA60157 = 2400  PIA60158 = 0  PIA60159 = 2400  PIA60160 = 0  PIA60163 = 2400  PIA60164 = 0  PIA60170 = DYNAMIC  PIA60161 = 2400  PIA60162 = 0  Wait 00:20:00 (1200 seconds)  ZIA58726, PIA60157 = 0  PIA60158 = 0  PIA60159 = 0  PIA60160 = 0  PIA60163 = 2400  PIA60164 = 0  PIA60170 = DYNAMIC  PIA60161 = 0  PIA60162 = 0  Wait 00:20:00 (1200 seconds) |  |

## SWA Cadence test

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Commanding Flow** | **FCP ID or PDOR title & contents** | **Comments** |
|  | Test SWA Cadences  Decrease All SWA cadence  Increase EAS cadence  All SWA at nominal cadence | **PDOR\_SSWA\_Suite\_Comm\_Cadence\_00002.SOL**  ZIA58728, PIA60096 = 2  PIA60097 = 2  PIA60099 = 2  PIA60098 = 2  Wait 00:10:00 (600 seconds)  ZIA58728, PIA60096 = 0  PIA60097 = 0  PIA60099 = 1  PIA60098 = 1  Wait 00:10:00 (600 seconds)  ZIA58728, PIA60096 = 1  PIA60097 = 1  PIA60099 = 1  PIA60098 = 1  Wait 00:10:00 (600 seconds) |  |
|  | Enter Low Cadence Mode  Select Product Configuration Table 3 for Max Res  VDF  Select "SWA\_HIS\_LOW\_1TENTH" PHA  Select "SWA\_HIS\_LOW\_1TENTH" VDF  Select "SWA\_HIS\_LOW\_QUARTER" PHA  Select "SWA\_HIS\_LOW\_QUARTER" VDF  Select "SWA\_HIS\_LOW\_HALF" PHA  Select "SWA\_HIS\_LOW\_HALF" VDF  Select "SWA\_HIS\_LOW\_2THIRDS" PHA  Select "SWA\_HIS\_LOW\_2THIRDS" VDF  Enter Normal Cadence Mode  Select "SWA\_HIS\_NORMAL\_5X" PHA  Select "SWA\_HIS\_NORMAL\_5X" VDF  Select "SWA\_HIS\_NORMAL\_3X" PHA  Select "SWA\_HIS\_NORMAL\_3X" VDF  Select "SWA\_HIS\_NORMAL\_2X" PHA  Select "SWA\_HIS\_NORMAL\_2X" VDF  Select Product Configuration Table 0 for Half  Res VDF  Select "SWA\_HIS\_NORMAL" PHA  Select "SWA\_HIS\_NORMAL" VDF  Select Burst PHA  Select Burst PHA  Select Burst VDF  Select Burst VDF  Setup DPU for 5-minute HIS core burst  Setup DPU for 5-minute HIS optional burst  Command NOP to hold wait time | **PDOR\_SSWA\_HIS\_DATA\_RATE\_CADENCES\_00002.SOL**  Wait 0:00:01 (1 seconds)  ZIA58913, PIA60001 = 8  Wait 0:01:00 (60 seconds)  ZIA58919, PIA60356 = PR\_CONF\_TAB\_NO  PIA60352 = 3  Wait 0:00:01 (1 seconds)  ZIA58919, PIA60356 = PHA\_MAX\_NORMAL  PIA60352 = 5654  Wait 0:00:01 (1 seconds)  ZIA58919, PIA60356 = VDF\_EN\_NORM  PIA60352 = 0  Wait 0:22:00 (1320 seconds)  ZIA58919, PIA60356 = PHA\_MAX\_NORMAL  PIA60352 = 8928  Wait 0:00:01 (1 seconds)  ZIA58919, PIA60356 = VDF\_EN\_NORM  PIA60352 = 1  Wait 0:22:00 (1320 seconds)  ZIA58919, PIA60356 = PHA\_MAX\_NORMAL  PIA60352 = 11904  Wait 0:00:01 (1 seconds)  ZIA58919, PIA60356 = VDF\_EN\_NORM  PIA60352 = 1  Wait 0:22:00 (1320 seconds)  ZIA58919, PIA60356 = PHA\_MAX\_NORMAL  PIA60352 = 23808  Wait 0:00:01 (1 seconds)  ZIA58919, PIA60356 = VDF\_EN\_NORM  PIA60352 = 7  Wait 0:22:00 (1320 seconds)  ZIA58913, PIA60001 = 15  Wait 0:00:10 (10 seconds)  ZIA58919, PIA60356 = PHA\_MAX\_NORMAL  PIA60352 = 11904  Wait 0:00:01 (1 seconds)  ZIA58919, PIA60356 = VDF\_EN\_NORM  PIA60352 = 7  Wait 0:17:00 (1020 seconds)  ZIA58919, PIA60356 = PHA\_MAX\_NORMAL  PIA60352 = 13094  Wait 0:00:01 (1 seconds)  ZIA58919, PIA60356 = VDF\_EN\_NORM  PIA60352 = 1  Wait 0:12:00 (720 seconds)  ZIA58919, PIA60356 = PHA\_MAX\_NORMAL  PIA60352 = 5654  Wait 0:00:01 (1 seconds)  ZIA58919, PIA60356 = VDF\_EN\_NORM  PIA60352 = 1  Wait 0:12:00 (720 seconds)  ZIA58919, PIA60356 = PR\_CONF\_TAB\_NO  PIA60352 = 0  Wait 0:00:01 (1 seconds)  ZIA58919, PIA60356 = PHA\_MAX\_NORMAL  PIA60352 = 5357  Wait 0:00:01 (1 seconds)  ZIA58919, PIA60356 = VDF\_EN\_NORM  PIA60352 = 1  Wait 0:12:00 (720 seconds)  ZIA58919, PIA60356 = PHA\_MAX\_BURST\_1  PIA60352 = 4000  Wait 0:00:01 (1 seconds)  ZIA58919, PIA60356 = PHA\_TLM\_MAX\_B2  PIA60352 = 4000  Wait 0:00:01 (1 seconds)  ZIA58919, PIA60356 = VDF\_EN\_BURST\_1  PIA60352 = 0x3F  Wait 0:00:01 (1 seconds)  ZIA58919, PIA60356 = VDF\_EN\_B2  PIA60352 = 0x3F  Wait 0:00:01 (1 seconds)  ZIA58726, PIA60157 = 0  PIA60158 = 0  PIA60159 = 0  PIA60160 = 0  PIA60163 = 0  PIA60164 = 0  PIA60170 = DYNAMIC  PIA60161 = 2400  PIA60162 = 0  Wait 0:10:00 (600 seconds)  ZIA58726, PIA60157 = 0  PIA60158 = 0  PIA60159 = 0  PIA60160 = 0  PIA60163 = 0  PIA60164 = 0  PIA60170 = DYNAMIC  PIA60161 = 0  PIA60162 = 2400  Wait 0:10:00 (600 seconds)  ZIA58915 |  |

# SWA Commission conclusion

At this point, SWA is fully commissioned. It is expected to leave SWA operating in Normal Mode until any wheel offloads force SWA sensors into the safe state.

# SWA-7 (IA-7) Inter-instrument campaign

This test campaign is under control of SOC. The following PDORs and FCPs will be used during this campaign.

# IW-6.3 Interference campaign

The interference campaign is being managed by the SOC. The following PDORs and FCPs will be used during this campaign.

# Appendices

## Emergency Contingency Plans

The following procedure are to be used in the event of any un-expected or dangerous issues.

|  |  |  |  |
| --- | --- | --- | --- |
| **Step N°** | **Non Expected Outcome** | **FCP ID or PDOR title & contents** | **Action** |
|  | **EAS1 Temperature too high / too cold**  TM, YIA58201,NIA00907, LIMIT,280, 310 EAS1\_EOPTEMP  TM, YIA58201,NIA00915, LIMIT,280, 310 EAS1\_EHVGENTHER  TM, YIA58201,NIA00916, LIMIT,280, 310 EAS1\_EHVMODTHER | **PDOR\_SSWA\_EAS1\_Heater\_00001.SOL**  ZIA58757, PIA60773 = 0x00  PIA60774 = 0xnn  PIA60775 = 0xnn | Reduce the EAS1 Heater.  Default =  0x00  0x01  0x60 |
|  | **EAS2 Temperature too high / too cold**  TM, YIA58202,NIA10907, LIMIT,280, 310 EAS2\_EOPTEMP  TM, YIA58201,NIA10915, LIMIT,280, 310 EAS2\_EHVGENTHER  TM, YIA58201,NIA10916, LIMIT,280, 310 EAS2\_EHVMODTHER | **PDOR\_SSWA\_EAS2\_Heater\_00001.SOL**  ZIA58805, PIA60773 = 0x00  PIA60774 = 0xnn  PIA60775 = 0xnn | Reduce the EAS2 Heater.  Default =  0x00  0x01  0x60 |
|  | **EAS1 Electron Counts are too high**  TM, YIA58921 TM(21,3) SSID=18 SWA\_TM\_SCI\_EAS1\_ENG\_3-4\_RAW\_FIRST | **PDOR\_SSWA\_EAS1 MCP\_00001.SOL**  ZIA58784, PIA60218 = 0xnnn | Reduce EAS1 MCP level |
|  | **EAS2 Electron Counts are too high**  TM, YIA58921 TM(21,3) SSID=18 SWA\_TM\_SCI\_EAS1\_ENG\_3-4\_RAW\_FIRST | **PDOR\_SSWA\_EAS2 MCP\_00001.SOL**  ZIA58832, PIA60218 = 0xnnn | Reduce EAS2 MCP level |
|  | **Emergency EAS1 POWER OFF** | IA-FCP-004 | Slow MCP Ramp Down |
|  | **Emergency EAS2 POWER OFF** | IA-FCP-005 | Slow MCP Ramp Down |
|  | **Emergency EAS1 SWITCH OFF** | **PDOR\_SSWA\_EAS1\_SwitchOff\_00002.SOL** | Fast switch off |
|  | **Emergency EAS2 SWITCH OFF** | **PDOR\_SSWA\_EAS2\_SwitchOff\_00002.SOL** | Fast switch off |
|  | **Emergency PAS POWER OFF** |  |  |
|  | **Emergency HIS POWER OFF** |  |  |
|  | **Emergency DPU POWER OFF** | IA-FCP-002 |  |
|  |  | **PDOR\_SSWA\_DPU\_DIAG\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_DPU\_DIS\_EN\_TFF\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_DPU\_STANDBY\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_EAS1\_PreampsOff\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_EAS1\_PreampsOn\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_DPU\_DIS\_EN\_TM5\_00001** |  |
|  |  | **PDOR\_SSWA\_EAS1\_REP\_VALS\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_EAS2\_PreampsOff\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_EAS2\_PreampsOn\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_EAS2\_REP\_VALS\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_HIS\_DIS\_EN\_TFF\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_ResetErrorEventHandler\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_SET\_FDIR\_LIM\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_SensorCtrl\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_HIS\_HV\_EAIS\_MAIN\_STEP\_DOWN\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_HIS\_HV\_EAIS\_MAIN\_STEP\_UP\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_HIS\_HV\_OFFSET\_STEP\_DOWN\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_HIS\_HV\_OFFSET\_STEP\_UP\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_HIS\_HV\_PA\_STEP\_DOWN\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_HIS\_HV\_PA\_STEP\_UP\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_HIS\_HV\_SSD\_STEP\_DOWN\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_HIS\_HV\_SSD\_STEP\_UP\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_HIS\_HV\_START\_STOP\_STEP\_DOWN\_00001.SOL** |  |
|  |  | **PDOR\_SSWA\_HIS\_HV\_START\_STOP\_STEP\_UP\_00001.SOL** |  |