# BC-SIM-TR-001
# SIMBIO-SYS NECP
# Data Produced Analysis

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# 1. Document Change Record

| Issue | Revision | Date | Affected Pages | Change description |
|---|---|---|---|---|
| **1** | 1 | 12/02/2019 | Section 3.X.5 | Moved the failed TC list and description to the Annex |
| | 2 | 18/02/2019 | Section 3.X.4 | Replaced in the table "*Telecommands*" with "*Sessions*" |
| | | | Section 3.22.8 | Rewriten sentence |
| | 3 | 16/04/2020 | All | Addressing referee suggestions |

# 2. Introduction

## 2.1. Scope

In this document we will describe all the tests performed during the Near Earth Commissioning Phase (NECP) for the Spectrometers and Imagers for MPO BepiColombo Integrated Observatory SYStem (SIMBIO-SYS). For each test will be reported a sheet with the pipeline report and a discussion eventually on the detected anomalies.

## 2.2. Reference Document

**[RD.1]** BC-SIM-PL-001 The Test Planning for the SIMBIO-SYS Near Earth Commissioning Phase (DOI: http://dx.doi.org/10.20371/INAF/TechRep/17);
**[RD.2]** Software User Manual, in preparation;
**[RD.3]** BC-SIM-GAF-IC-002_rev12 – SIMBIO-SYS Software Interface Control Document
**[RD.4]** The Flight Operation Procedures of the SIMBIO-SYS instrument aboard the BepiColombo ESA mission BC-ASD-SP-00176_1_4 SIMBIO URD, http://hdl.handle.net/20.500.12386/23810
**[RD.5]** BC-ASD-SP-00176_1_4 SIMBIO URD
**[RD.6]** BC-SIM-GAF-MA-002 10 001 – SIMBIO-SYS User Manual

## 2.3. PDOR sequences

In the document [RD.1] are attached the PDOR file released for the NECP phase.
Follow the list of the PDOR realesed for easy reference:

**[PS.1]** PDOR_BPSS_C_SS_SIMBIOSYS_stc_nominal_test_00151.BC
**[PS.2]** PDOR_BPSS_C_SS_SIMBIOSYS_stc_out_filters_test_00152.BC
**[PS.3]** PDOR_BPSS_C_SS_SIMBIOSYS_stc_reset_test_00153.BC
**[PS.4]** PDOR_BPSS_C_SS_SIMBIOSYS_stc_single_filters_test_00154.BC
**[PS.5]** PDOR_BPSS_C_SS_SIMBIOSYS_hric_comp_test_noOBCP_00166.BC
**[PS.6]** PDOR_BPSS_C_SS_SIMBIOSYS_hric_dc_test_noOBCP_00167.BC
**[PS.7]** PDOR_BPSS_C_SS_SIMBIOSYS_hric_reset_test_noOBCP_00168.BC
**[PS.8]** PDOR_BPSS_C_SS_SIMBIOSYS_hric_sc_test_noOBCP_00169.BC
**[PS.9]** PDOR_BPSS_C_SS_SIMBIOSYS_MAX_DR_test_noME_00175.BC
**[PS.10]** PDOR_BPSS_C_SS_SIMBIOSYS_MAX_STRESS_test_noME_00176.BC
**[PS.11]** PDOR_BPSS_C_SS_SIMBIOSYS_ORBIT_test_noME_00177.BC

## 2.4. Acronyms

| | |
|---|---|
| **APID** | Application Process IDentifier |
| **CSV** | Comma Separated Values |
| **FOP** | Flight Operation Plan. |
| **FPA** | Focal Plane Assembly |
| **HK** | Housekeeping |

| | |
|---|---|
| **HRIC** | High spatial Resolution Imaging Channel |
| **ME** | Main Electronics |
| **NECP** | Near Earth Commissioning Phase |
| **PDS** | Planetary Data System |
| **PDOR** | Payload Direct Operation Request |
| **PE** | Proximity Electronics |
| **PNG** | Portable Network Graphics |
| **PSC** | Packet Sequence Control |
| **SIMBIO-SYS** | Spectrometers and Imagers for MPO BepiColombo Integrated Observatory SYStem |
| **SSC** | Source Sequence Count |
| **STC** | STereo imaging Channel |
| **TC** | Telecommand |
| **TM** | Telemetry |
| **VIHI** | VIsible and Hyper-spectral Imaging channel |
| **XML** | eXtensible Markup Language |

## 2.5. The test plan

The NECP test was planned on three days. Follow the test schema from [RD.1].

| Date | AOS10 | LOS10 | Start Time | Activity | Dur. [h] | Start Time | Outside pass activity | Dur. [h] |
|---|---|---|---|---|---|---|---|---|
| 10/12/2018 | 07:56:53 | 19:06:32 | AOS10+2h | P45 ME functional checkout | 0.50 | LOS10+2h | P42 HRIC commissioning - performance test | 4,00 |
| | | | | P42 HRIC Com. main | 2.30 | | | |
| | | | | P43 STC Com. main | 2.30 | | | |
| | | | | P44 VIHI Com. main | 2.30 | | | |
| 11/12/2018 | 07:53:57 | 19:02:42 | AOS10+8h | P42 HRIC com. red | 0.60 | LOS10+2h | P43 STC Commissioning - performance test | 9,00 |
| | | | | P43 STC Com. red | 1.00 | | | |
| | | | | P44 VIHI Com. red | 0.60 | | | |
| 12/12/2018 | 07:51:04 | 19:02:56 | AOS10+1h | P45 SIMBIO Performance tests - max stress/max DR | | | | |
| | | | AOS10+3h | P45 SIMBIO Performance tests- orb simulation | 1.50 | | | |
| | | | AOS10+4.5h | P44 VIHI Com. - Performance tests | 1.30 | | | |

*Table 1: Test schema of the NECP Commissioning plan Right columns describe outpass activities*

During the test some results required a deep analysis, including additional tests.
The final tests plan was structured as follow:

| Day | Test |
|---|---|
| **DAY 1** | 01 - ME Functional Test<br>02 - HRIC Functional Test<br>03 - STC Functional Test |

| | |
|---|---|
| | 04 - VIHI Functional Test<br>05 - HRIC Other Test |
| **DAY 1 OutPass** | HRIC Performance Test |
| **DAY 2** | 01 - HRIC TEC test<br>02 - STC TEC test<br>03 - VIHI TEC test<br>04 - HRIC functional test redundant<br>05 - STC functional test redundant<br>06 - VIHI functional test redundant<br>07 - Other test |
| **DAY 2 OutPass** | STC Performance Test |
| **DAY 3** | 01 - SIMBIO TEC INIT<br>02 - MAX STRESS Test<br>03 - MAX DR Test<br>04 - ORBIT Test<br>05 - VIHI Performance 1 Test<br>06 - VIHI Performance 2 Test<br>07 - STC Outpass 2 recovery<br>08 - VIHI Performance 1 Test backup |

*Table 2 Tests plan of the three days of the SIMBIO-SYS NECP.*

## 2.6. Report schema

For each test the report will be formed by four sections created by an automatic procedure:

- a summary of all the data produced in that test;
- a report for the events and telecommand acknowledgments;
- a report of the PE events;
- a check on the lost packets.

The repost includes even two sections with the comparison between the TC and the data results. Eventual problems or discrepancies will be discussed.

The complete list of the Sections defined for each test is shown in Table 2 and described in subsections below.

| Session Number | Session Name |
|---|---|
| **1** | Telecomands |
| **2** | Data Procedure |
| **3** | Events Check |
| **4** | PE Event |
| **5** | Lost packets |
| **6** | Discussion |

*Table 3 Section structure defined for each Test.*

### 2.6.1. Telecommands

In this Section the telecommands used for the test will be reported. For each telecommand an analysis and a prevision of the data output will be performed.

### 2.6.2. Data produced

In this Section a table with the data produced will be reported. The output files are two different type of CSVs (one for the diagnostic housekeeping and one with all the housekeeping parameters related to a single image) and a file containing the image in binary format. All the data are in PDS4 format, that means that they include an XML file with all the parameters of each acquisition, both considering as source the instrument or the spacecraft. A complete description of the file structure and of the folder tree is reported in [RD.2]. For each image is present an extra file in PNG format as quick preview.
In the summary schema will be reported number and total size of the follow file types:

- Diagnostic HKs
- Acquisition HKs;
- Images

### 2.6.3. Events check

In the event checks are reported:

- all the negative telecommand acknowledgments,
- the rejected telecommands, TM(1,2),
- the failed telecommands, TM(1,8).

For each rejected or failed telecommand event is reported a sheet with all the information about the telecommand, mnemonic name, description, time of execution and all the parameters.
For each event is reported a list for the low severity (TM(5,2)), medium severity (TM(5,3)) and high severity (TM(5,4)) errors with a description of the event.
The complete list of event and telecommand acknowledgments is reported into the Event file stored in each test folder. All the information for the event and telecommand acknowledgments are from [RD.3].

### 2.6.4. PE Events

From an automatic analysis of the diagnostic HK, a list of the negative event alerts, sent by the PE, is created. Each alert is reported with the decimal ID and with the complete description. All the information for the PE events refers to [RD.3].

### 2.6.5. Lost packets

The automatic check on the lost packets is performed using the Packet Sequence Control number (see [RD.3]). The PSC is a progressive number associated to the TM packets and follows a different enumeration for different APID. A list of the used APID is reported in the following table:

| APID | Description |
|---|---|
| 801 | TC Verification |
| 804 | HK Reports |
| 807 | Event Reports |
| 828 | HRIC Data High Priority |
| 844 | STC Data High Priority |
| 860 | VIHI Data High Priority |
| 870 | HRIC Data Low Priority |
| 892 | STC Data Low Priority |
| 908 | VIHI Data Low Priority |

*Table 4 List of the APIDs associated to each dataflow.*

The PSC number is stored in 14 bits. This means that the maximum value is 16383, after that the counter is reinitialized.
**NB:** A manual check in required in order to evaluate if some packets are lost at the begin and at the end of the acquisition. The automatic check detects only holes in the PSC sequence.

### 2.6.6. Test Results

In this section we will discuss the results, the discrepancies and the errors if they are present.

# 3. NECP results analysis

## 3.1.General consideration

With reference to Table 2, we summarize the following satisfaction table:

| Test satisfaction list | |
|---|---|
| 01 - ME Functional Test | |
| 02 - HRIC Functional Test on MAIN ME channel | |
| 03 - STC Functional Test on MAIN ME channel | |
| 04 - VIHI Functional Test on MAIN ME channel | |
| 05 - HRIC Other Test | |
| HRIC Performance Test | |
| 01 - HRIC TEC Test | |
| 02 - STC TEC Test | |
| 03 - VIHI TEC Test | |
| 04 - HRIC Functional Test on REDUNDANT ME channel | |
| 05 - STC Functional Test on REDUNDANT ME channel | |
| 06 - VIHI Functional Test on REDUNDANT ME channel | |
| 07 - Other Test | |
| STC Performance Test | |
| 01 - TEC INIT Test | |
| 02 - MAX STRESS Test | |
| 03 - MAX DR Test | |
| 04 - ORBIT TEST | |
| 05 - VIHI Performance 1 Test | |
| 06 - VIHI Performance 2 Test | |
| 07 - STC Performance R | |
| 08 - VIHI Performance 1 Test backup | |

Where green is test passed, orange passed with problems and red failed.

## 3.2.ME Functional Test

### 3.2.1. Test scope

The scope of this test is to check the ME functionality on both MAIN and REDUNDANT channels after launch.

### 3.2.2. Test execution

Time Frame: 2018-12-10T08:28:51.1 ÷ 2018-12-10T08:57:13.9

This test has been performed through the execution of a pre-defined FOP named SS-TST-001 whose specifications can be found in [RD.4].

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| OFF | OFF | OFF | OFF |

We sent several TCs interleaved by HK rate generation variation (i.e., ZSS00329) to better follow the behavior of the channel.
In particular, the FOP commands:

- Switch on ME using the redundant electronics;
- Dump of memory area;
- Switch off ME
- Switch on ME using nominal electronics;
- Dump of memory area;

The initial status of ME was off and it has been turned-on by means of an OBCP (i.e., ZSSK4000) whose specifications can be found in [RD.4].

### 3.2.3. Science

Not Applicable.

### 3.2.4. Data Produced

| Bundle | Miscellaneous | | |
|---|---|---|---|
| File | CSV: | | |
| | | #: | 1 |
| | | Size: | 0.031 MB |

*Table 5: Data produced in miscellaneous bundle during the ME Functional Test.*

### 3.2.5. ME Events

None.

### 3.2.6. PE Events

None.

### 3.2.7. Lost Packets

| | | |
|---|---|---|
| Telecommand Verification: | 12 | [lost packats: 0] |
| HK Report: | 57 | [lost packats: 0] |
| Event/Anomaly Report: | 12 | [lost packats: 0] |

*Table 6: Summary of the packets downloaded and lost during the ME Functional Test.*

### 3.2.8. Test Results

Produced output is in line with what expected, and no anomaly was detected.

## 3.3.HRIC Functional Test on MAIN ME channel

### 3.3.1. Test scope

The scope of this test is to check the HRIC functionality on ME MAIN channel after launch.

### 3.3.2. Test execution

Time Frame 2018-12-10T09:00:00 ÷ 2018-12-10T10:35:00

This test has been performed through the execution of a pre-defined FOP named SS-TST-010 whose specifications can be found in [RD.4].

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | OFF | OFF | OFF |

We sent several TCs interleaved by HK rate generation variation (i.e., ZSS00329) to better follow the behavior of the channel.
In particular the FOP commands:

- Switch on of the PE
- Switch on of the Detector
- Switch on of the TEC
- Test of the reading and writing of a specific memory address
- Science acquisitions
- Switch off of the TEC
- Switch off of the Detector
- Switch off of the PE

### 3.3.3. Science

With reference to the Science TCs, the following three science sessions have been performed:

1. 2 minutes of 640x2048 window size acquisitions with:
   Repetition Time = 1s, Integration Time = 50 μs and IBR=32
2. 2 minutes of 640x2048 window size acquisitions with:
   Repetition Time = 1s, Integration Time = 315 ms and IBR=32
3. 10 acquisitions of 640x2048 window with:
   Repetition Time = 1s, Integration Time = 50 μs and IBR=32

Table 7 describes the duration and the number of images and frames expected for each TCs commanded during Functional Test.

| N(TC) | Duration | ZSS | Mode | Repetition Time [s] | Expected Acquisitions | Expected Frames |
|---|---|---|---|---|---|---|
| 1 | 2m | Science | continuous | 1 | 120 | 120 |
| 2 | 2m | Science | continuous | 1 | 120 | 120 |
| 3 | 10s | Science | limited | 1 | 10 | 10 |
| 3 | 2m 30s | - | - | - | 250 | 250 |

*Table 7: Summary of the science telecommand used during the HRIC Functional Test.*

### 3.3.4. Data Produced

| Bundle | Miscellaneous | | |
|---|---|---|---|
| File | CSV: | | |
| | | #: | 2 |
| | | size | 2.207 MB |

*Table 8: Summary of the data produced in the miscellaneous bundle for the HRIC Functional Test.*

| Bundle | RAW | HRIC | |
|---|---|---|---|
| File | CSV: | | |
| | | #: | 250 |
| | | size: | 0.977 MB |
| | DAT: | | |
| | | #: | 250 |
| | | size: | 625 MB |
| Science | Sections | # | 3 |

*Table 9:Summary of the data produced in the Raw bundle for the HRIC Functional Test.*

### 3.3.5. ME Events

None.

### 3.3.6. PE Events

None.

### 3.3.7. Lost Packets

| | | |
|---|---|---|
| Telecommand Verification: | 74 | [lost packets: 0] |
| HK Report: | 2732 | [lost packets: 0] |
| Event/Anomaly Report: | 8 | [lost packets: 0] |
| HRIC low Priority: | 20250 | [lost packets: 0] |
| HRIC high Priority: | 0 | [lost packets: 0] |

*Table 10: Summary of the packets downloaded and lost during the HRIC Functional Test.*

### 3.3.8. Test Results

Produced output is in line with what expected.
The details are reported in Table 11 with information from section 3.3.3 and 3.3.4.

| | Commanded | From TM |
|---|---|---|
| Images | 250 | 250 |
| Science Sessions | 3 | 3 |

*Table 11: Comparison between Commanded and downloaded science during the HRIC Functional Test.*

Minor anomaly was detected during TEC activation due to wrong TEC activation parameters. This "error" has been detected on all following tests (i.e., functional and performance ones of all channels) and a solution has been implemented almost in real time (i.e., before TEC activation a new set of Upload Parameters TCs have been used). Before being applied, this solution has been validated during a specific test (see section 3.8, 3.9 and 3.10).

## 3.4.STC Functional Test on MAIN ME channel

### 3.4.1. Test scope

The scope of this test is to check the STC functionality on ME MAIN channel after launch.

### 3.4.2. Test execution

Time Frame: 2018-12-10T10:40:00 ÷ 2018-12-10T13:45:00.

This test has been performed through the execution of a pre-defined FOP named SS-TST-020 whose specifications can be found in [RD.4].

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | OFF | OFF | OFF |

We sent several TCs interleaved by HK rate generation variation ones (i.e., ZSS00329) to better follow the behavior of the channel.
In particular the FOP commands:

- Switch on of the PE
- Switch on of the Detector
- Switch on of the TEC
- Test of the reading and writing of a specific memory address
- Science acquisitions
- Switch off of the TEC
- Switch off of the Detector
- Switch off of the PE

### 3.4.3. Science

With reference to the Science TCs, the following four science sessions have been performed:

1. 2 minutes of CM compressed acquisitions with:
   Repetition Time = 400 ns, Integration Time = 50 μs and IBR=63
2. 50 CM compressed acquisitions with:
   Repetition Time = 400 ms, Integration Time = 50 μs and IBR=63
3. 50 CM compressed acquisitions with:
   Repetition Time = 200 ms, Integration Time = 50 μs and IBR=63
4. 10 CM compressed acquisitions with:
   Repetition Time = 2s, Integration Time ~ 1s and IBR=63

Where “CM” (Color Mode) is the acquisition of the 4 Broadband filters and the mitigation window.

Table 12 describes the duration and the number of images and frames expected for each TCs commanded during Functional Test.

| N(TC) | Duration | ZSS | Mode | Repetition Time [ms] | Expected Acquisitions | Expected Frames |
|---|---|---|---|---|---|---|
| 1 | 2m | Science | continuous | 400 | 300 | 1500 |
| 2 | 20s | Science | limited | 400 | 50 | 250 |
| 3 | 10s | Science | limited | 200 | 50 | 250 |
| 4 | 20s | Science (1ms) | limited | 2000 | 10 | 50 |
| 4 | 2m 50s | 4 | - | - | 410 | 2050 |

*Table 12: Summary of the science telecommand used during the STC Functional Test.*

### 3.4.4. Data Produced

| Bundle | Miscellaneous | | |
|---|---|---|---|
| File | CSV: | | |
| | | #: | 2 |
| | | size: | 3.672 MB |

*Table 13:Summary of the data produced in the miscellaneous bundle for the STC Functional Test.*

| Bundle | RAW | STC | |
|---|---|---|---|
| File | CSV: | | |
| | | #: | 2050 |
| | | size: | 8.008 MB |
| File | DAT | | |
| | | #: | 2050 |
| | | size: | 185.781 MB |
| Science: | Sessions | # | 3 |

*Table 14:Summary of the data produced in the Raw bundle for the STC Functional Test.*

### 3.4.5. ME Events

None.

### 3.4.6. PE Events

None.

### 3.4.7. Lost Packets

| Telecommand Verification: | 88 | [lost packets: 0] |
|---|---|---|
| HK Report: | 4573 | [lost packets: 0] |
| Event/Anomaly Report: | 10 | [lost packets: 0] |
| STC low Priority: | 11890 | [lost packets: 0] |
| STC high Priority: | 0 | [lost packets: 0] |

*Table 15: Summary of the packets downloaded and lost during the STC Functional Test.*

### 3.4.8. Test Results

Produced output is in line with what expected, and no anomaly was detected.
The details are reported in Table 16 with information from section 3.4.3 and 3.4.4.

| | Commanded | From TM |
|---|---|---|
| Images | 2050 | 2050 |
| Science Sessions | 4 | 4 |

*Table 16: Comparison between Commanded and downloaded science during the STC Functional Test.*

As anticipated in section 3.3.8, before TEC activation a set of Upload Parameter TCs have been executed to properly set-up the TEC controller.

## 3.5.VIHI Functional Test on MAIN ME channel

### 3.5.1. Test scope

The scope of this test is to check the VIHI functionality on ME MAIN channel after launch.

### 3.5.2. Test execution

Time Frame: 2018-12-10T13:50:00 ÷ 2018-12-10T15:45:00.

This test has been performed through the execution of a pre-defined FOP named SS-TST-037 whose specifications can be found in [RD.4].

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | OFF | OFF | OFF |

We sent several TCs interleaved by HK rate generation variation ones (i.e., ZSS00329) to better follow the behavior of the channel.
In particular the FOP commands:

- Switch on of the PE
- Switch on of the Detector
- Switch on of the TEC
- Test of the reading and writing of a specific memory address
- Science acquisitions
- Switch off of the TEC
- Switch off of the Detector
- Switch off of the PE

### 3.5.3. Science

With reference to the Science TCs, the following four science sessions have been performed:

1. 5.2 s of full frame acquisitions with:
   Repetition Time = 0.1s, Integration Time = 205.5 µs and IBR=0
2. 5.2 s of full frame acquisitions with:
   Repetition Time = 0.1s, Integration time = 137 µs, Dark subtraction and IBR=0

Table 17 describes the duration and the number of frames expected for each TCs commanded during Functional Test.

| N(TC) | Duration | ZSS | Mode | Repetition Time [ms] | Expected Frames |
|---|---|---|---|---|---|
| 1 | 5.2 s | Science | continuous | 100 | 52 |
| 2 | 5.2 s | Science | continuous | 100 | 52 |
| 2 | 10s | | - | - | 104 |

*Table 17: Summary of the science telecommand used during the VIHI Functional Test.*

### 3.5.4. Data Produced

| | | | |
|---|---|---|---|
| Bundle | Miscellaneous | | |
| File | CSV | | |
| | | #: | 2 |
| | | size: | 3.594 MB |

*Table 18: Summary of the data produced in the miscellaneous bundle for the VIHI Functional Test.*

| | | | |
|---|---|---|---|
| Bundle | RAW | VIHI | |
| File | CSV | | |
| | | #: | 104 |
| | | size: | 0.406 MB |
| File | DAT | | |
| | | #: | 104 |
| | | size: | 13 MB |
| Science | Sessions | #: | 2 |

*Table 19: Summary of the data produced in the Raw bundle for the VIHI Functional Test.*

### 3.5.5. ME Events

None.

### 3.5.6. PE Events

None.

### 3.5.7. Lost Packets

| | | |
|---|---|---|
| Telecommand Verification: | 98 | [lost packets: 0] |
| HK Report: | 2862 | [lost packets: 0] |
| Event/Anomaly Report: | 4 | [lost packets: 0] |
| VIHI low Priority: | 3432 | [lost packets: 0] |
| VIHI high Priority: | 0 | [lost packets: 0] |

*Table 20: Comparison between Commanded and downloaded science during the VIHI Functional Test.*

### 3.5.8. Test Results

Produced output is in line with what expected, and no anomaly was detected.

The details are reported in Table 21 with information from section 3.5.3 and 3.5.4.

| | Commanded | From TM |
|---|---|---|
| Images | 104 | 104 |
| Science Sessions | 2 | 2 |

*Table 21: Comparison between Commanded and downloaded science during the VIHI Functional Test.*

**In the 2nd Science Acquisition the Dark Subtraction operational mode without Dark Image (to store in the PE buffer) acquired before, was tested. As a result, the obtained frames contain unpredictable negative values.**

As anticipated in section 3.3.8, before TEC activation a set of Upload Parameter TCs have been executed to properly set-up the TEC controller.

## 3.6.HRIC Other Test

### 3.6.1. Test scope

The scope of this test is to understand in which configuration (i.e., ME on and HRIC PE off, ME and HRIC PE on and TEC off, etc.) the commanding TEC parameters must be given.

### 3.6.2. Test execution

Time Frame: 2018-12-10T16:25:00 ÷ 2018-12-10T18:05:00.

This test has been performed through the execution of a set of telecommands to load the TEC parameters and to switch-on/off of the HRIC PE, TEC and detector.

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | OFF | OFF | OFF |

We execute the follwing TCs:

- 5 Upload + Confirm telecommands with the values indicated in Section 8.3.16 of [RD.6]
- Switch on of the PE
- 5 Upload + Confirm telecommands with the values indicated in Section 8.3.16 of [RD.6]
- Switch on of the detector
- Switch on of the TEC
- Switch off of the TEC
- Switch off of the detector
- Switch off of the PE
- Switch on of the PE
- 5 Upload + Confirm Telecommands with the values indicated in Section 8.3.16 of [RD.6]

### 3.6.3. Science

Not applicable.

### 3.6.4. Data Produced

| | | | |
|---|---|---|---|
| **Bundle** | Miscellaneous | | |
| **File** | CSV | | |
| | | # | 2 |
| | | size: | 3.945 MB |

*Table 22: Summary of the data produced in the miscellaneous bundle for the HRIC Other Test.*

### 3.6.5. ME Events

| | |
|---|---|
| Rejected telecommand: | 0 |
| Failed telecommand: | 10 |
| Low severity error: | 1 |
| Medium severity error: | 0 |
| High severity error: | 0 |

*Table 23: Summary of negative events and awk during the HRIC Other Test.*

#### *3.6.5.1. Failed Telecommand*

The list of the failed telecommand is reported in the section 4.1.1. For each telecommand all the parameters are reported.

#### *3.6.5.2. Low Severity Error*

```
[2018-12-10T16:59:59.841] - TM(5,2) - [APID 807] - Event 40800 - HK Discarted due to SpW
                            error on link from HRIC
```

### 3.6.6. PE Events

There is 1 HRIC PE event:

```
[2018-12-10T17:00:00.310400] TC Timer Overflow (16)
```

### 3.6.7. Lost Packets

| | | |
|---|---|---|
| Telecommand Verification: | 84 | [lost packets: 0] |
| HK Report: | 4871 | [lost packets: 0] |
| Event/Anomaly Report: | 5 | [lost packets: 0] |

*Table 24: Comparison between Commanded and downloaded science during the HRIC Other Test.*

### 3.6.8. Test Results

With reference to Section 8.3.16 of [RD.6] we verified that TEC settings must be done once HRIC PE is switched on.

## 3.7.HRIC Performance Test

### 3.7.1. Test scope

The scope of this test is to perform a subset of calibration measurements for monitoring the HRIC performance after launch.

### 3.7.2. Test execution

Time Frame: 2018-12-10T18:45:00 ÷ 2018-12-10T22:15:00.

This test has been performed through the execution of 4 pre-defined PDORs ([PS.5], [PS.6], [PS.7] and [PS.8]) described in to [RD.1].

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | ON | OFF | OFF |

### 3.7.3. Science

We sent several telecommands performing the following 4 science sessions:

1. hric_comp_test: 5 512x512 pixels acquisitions with variable compression factor (i.e., IBR=0, 1, 16, 32, 56)
2. hric_dc_test: reduced dark current calibration campaign on FPAN and BB filters with low and high priority
3. hric_sc_test: several acquisitions of BB filters (complete and small version) read in different order and with different integration time
4. hric_reset_test: several acquisition of small region of the detector at different combination of integration and repetition time
5. hric_sc_test: several acquisitions of BB filters (complete and reduced version) read in different order and with different integration time

Table 25 describes the duration and the number of images and frames expected for each telecommands commanded during Functional Test.

| PDOR | Number of telecommands | Duration [h:mm] | Expected Acquisition's | Expected Frames |
|---|---|---|---|---|
| hric_comp_test | 5 | 0:05 | 5 | 5 |
| hric_dc_test | 68 | 0:24 | 680 | 1360 |
| hric_reset_test | 30 | 0:47 | 450 | 450 |
| hric_sc_test | 36 | 0:35 | 720 | 2160 |
| Total | 139 | 1:51 | 1855 | 3975 |

*Table 25: Summary of the science telecommand used during the HRIC Performance Test.*

### 3.7.4. Data Produced

| | | | |
|---|---|---|---|
| **Bundle** | Miscellaneous | | |
| **File** | CSV | | |
| | | # | 2 |
| | | size | 6.336 MB |

*Table 26: Summary of the data produced in the miscellaneous bundle for the HRIC Performance Test.*

| | | | |
|---|---|---|---|
| **Bundle** | RAW | HRIC | |
| **File** | CSV | | |
| | | # | 3975 |
| | | size | 15.527 MB |
| **File** | DAT | | |
| | | # | 3975 |
| | | size | 2502.03 MB |
| **Science** | Sessions | #: | 139 |

*Table 27: Summary of the data produced in the Raw bundle for the HRIC Functional Test.*

### 3.7.5. ME Events

None.

### 3.7.6. PE Events

None.

### 3.7.7. Lost Packets

| | | |
|---|---|---|
| **Telecommand Verification:** | 278 | [lost packets: 0] |
| **HK Report:** | 13411 | [lost packets: 0] |
| **Event/Anomaly Report:** | 145 | [lost packets: 0] |
| **HRIC low Priority:** | 238975 | [lost packets: 0] |
| **HRIC high Priority:** | 20060 | [lost packets: 0] |

*Table 28: Comparison between Commanded and downloaded science during the HRIC Performance Test.*

### 3.7.8. Test Results

Produced output is in line with what expected, and no anomalies were detected.

The details are reported in Table 29 with information from section 3.7.3 and 3.7.4.

| | Commanded | From TM |
|---|---|---|
| Images | 3975 | 3975 |
| Science Sessions | 139 | 139 |

*Table 29: Comparison between Commanded and downloaded science during the HRIC Performance Test.*

## 3.8.HRIC TEC Test

### 3.8.1. Test scope

The scope of this test is to verify if TEC activation parameters survive to PE switch-off.

### 3.8.2. Test execution

Time Frame: 2018-12-11T10:05:00 ÷ 2018-12-11T10:45:00.

This test has been performed through the execution of a set of TC to load the correct TEC parameters and switch-on/off of the HRIC PE, TEC and detector.

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | OFF | OFF | OFF |

We sent several TCs to upload the TEC parameters and to verify their survival in ME/PE buffers after HRIC PE switch-off. In particular we execute the follwing TCs:

- Switch on of the PE
- 5 Upload + Confirm telecommands with the values indicated in Section 8.3.16 of [RD.6]
- Switch on of the detector
- Switch on of the TEC
- Switch off of the TEC
- Switch off of the detector
- Switch off of the PE
- Switch on of the HRIC PE, detector and PE by OBCP whose specifications can be found in [RD.4].
- Switch off of the HRIC PE, detector and PE by OBCP whose specifications can be found in [RD.4].

### 3.8.3. Science

Not applicable.

### 3.8.4. Data Produced

| | | | |
|---|---|---|---|
| **Bundle** | Miscellaneous | | |
| **File** | CSV | | |
| | | # | 2 |
| | | Size | 1.367 MB |

*Table 30: Summary of the data produced in the miscellaneous bundle for the HRIC TEC Test.*

### 3.8.5. ME Events

None.

### 3.8.6. PE Events

None.

### 3.8.7. Lost Packets

| | | |
|---|---|---|
| **Telecommand Verification:** | 34 | [lost packets: 0] |
| **HK Report:** | 1685 | [lost packets: 0] |
| **Event/Anomaly Report:** | 4 | [lost packets: 0] |

*Table 31: Comparison between Commanded and downloaded science during the HRIC TEC Test.*

### 3.8.8. Test Results

Produced output is in line with what expected, and no anomaly was detected.

## 3.9.STC TEC Test

### 3.9.1. Test scope

The scope of this test is to verify that TEC parameters setting survive to PE switch-off.

### 3.9.2. Test execution

Time Frame: 2018-12-11T10:45:00 ÷ 2018-12-11T11:44:00.

This test has been performed through the execution of a set of TC to load the correct TEC parameters and switch-on/off of the STC PE, TEC and detector.

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | OFF | OFF | OFF |

We sent several TCs to upload the TEC parameters and to verify their survival in ME/PE buffers after STC PE switch-off. In particular we execute the follwing TCs:

- Switch on of the PE
- 5 Upload + Confirm telecommands with the values indicated in Section 8.3.16 of [RD.6]
- Switch on of the detector
- Switch on of the TEC
- Switch off of the TEC
- Switch off of the detector
- Switch off of the PE
- Switch on of the STC PE, detector and PE by OBCP whose specifications can be found in [RD.4].
- Switch off of the STC PE, detector and PE by OBCP whose specifications can be found in [RD.4].

### 3.9.3. Science

Not applicable.

### 3.9.4. Data Produced

| | | | |
|---|---|---|---|
| **Bundle** | Miscellaneous | | |
| **File** | CSV | | |
| | | # | 2 |
| | | Size | 1.211 MB |

*Table 32: Summary of the data produced in the miscellaneous bundle for the STC TEC Test.*

### 3.9.5. ME Events

None.

### 3.9.6. PE Events

None.

### 3.9.7. Lost Packets

| | | |
|---|---|---|
| **Telecommand Verification:** | 36 | [lost packet(s): 0] |
| **HK Report:** | 1490 | [lost packet(s): 0] |
| **Event/Anomaly Report:** | 4 | [lost packet(s): 0] |

*Table 33: Comparison between Commanded and downloaded science during the STC TEC Test.*

### 3.9.8. Test Results

Produced output is in line with what expected, and no anomaly was detected.

## 3.10. VIHI TEC Test

### 3.10.1. Test scope

The scope of this test is to verify that TEC parameters setting survive to PE switch-off.

### 3.10.2. Test execution

Time Frame: 2018-12-11T11:44:00 ÷ 2018-12-11T12:31:00.

This test has been performed through the execution of a set of TC to load the correct TEC parameters and switch-on/off of the VIHI PE, TEC and detector.

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | OFF | OFF | OFF |

We sent several TCs to upload the TEC parameters and to verify their survival in ME/PE buffers after VIHI PE switch-off. In particular we execute the follwing TCs:

- Switch on of the PE
- 5 Upload + Confirm telecommands with the values indicated in Section 8.3.16 of [RD.6]
- Switch on of the detector
- Switch on of the TEC
- Switch off of the TEC
- Switch off of the detector
- Switch off of the PE
- Switch on of the VIHI PE, detector and PE by OBCP whose specifications can be found in [RD.4].
- Switch off of the VIHI PE, detector and PE by OBCP whose specifications can be found in [RD.4].

### 3.10.3. Science

Not applicable.

### 3.10.4. Data Produced

| | | | |
|---|---|---|---|
| **Bundle** | Miscellaneous | | |
| **File** | CSV | | |
| | | # | 2 |
| | | Size | 1.844 MB |

*Table 34: Summary of the data produced in the miscellaneous bundle for the VIHI TEC Test.*

### 3.10.5. ME Events

None.

### 3.10.6. PE Events

None.

### 3.10.7. Lost Packets

| | | |
|---|---|---|
| **Telecommand Verification:** | 44 | [lost packet(s): 0] |
| **HK Report:** | 1440 | [lost packet(s): 0] |
| **Event/Anomaly Report:** | 4 | [lost packet(s): 0] |

*Table 35: Comparison between Commanded and downloaded science during the VIHI TEC Test.*

### 3.10.8. Test Results

Produced output is in line with what expected, and no anomalies were detected.

## 3.11. HRIC Functional Test on REDUNDANT ME channel

### 3.11.1. Test scope

The scope of this test is to check the HRIC functionality on ME REDUNDANT channel after launch.

### 3.11.2. Test execution

Time Frame: 2018-12-11T13:40:00 ÷ 2018-12-11T14:03:00.

This test has been performed through the execution of a pre-defined FOP named SS-TST-011 whose specifications can be found in [RD.4].

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (REDUNDANT channel) | OFF | OFF | OFF |

We sent several telecommands interleaved by HK rate generation variation (i.e., ZSS00329) to better follow the behavior of the channel.
In particular the FOP commands:

- Switch on of the PE
- Switch on of the Detector
- Switch on of the TEC
- Test of the reading and writing of a specific memory address
- Science acquisitions
- Switch off of the TEC
- Switch off of the Detector
- Switch off of the PE

### 3.11.3. Science

With reference to the Science TCs, we acquired 640x2048 pixels windows with Repetition Time = 1s, Integration Time = 50 μs and IBR=32.

Table 36 describes the duration and the number of images and frames expected for each TC commanded during Functional Test.

| N(TC) | Duration | ZSS | Mode | Repetition Time [s] | Expected Acquisitions | Expected Frames |
|---|---|---|---|---|---|---|
| 1 | 2m | Science | continuous | 1 | 120 | 120 |
| 1 | 2ms | - | - | - | 120 | 120 |

*Table 36: Summary of the science telecommand used during the HRIC Functional Test.*

### 3.11.4. Data Produced

| | | | |
|---|---|---|---|
| **Bundle** | Miscellaneous | | |
| **File** | CSV | | |
| | | # | 2 |
| | | size | 0.988 MB |

*Table 37: Summary of the data produced in the miscellaneous bundle for the HRIC Functional Test.*

| | | | |
|---|---|---|---|
| **Bundle** | RAW | HRIC | |
| **File** | CSV | | |
| | | # | 120 |
| | | size | 0.469 MB |
| **File** | DAT | | |
| | | # | 120 |
| | | size | 300 MB |
| **Science** | Sessions | # | 1 |

*Table 38: Summary of the data produced in the Raw bundle for the HRIC Functional Test.*

### 3.11.5. ME Events

None.

### 3.11.6. PE Events

None.

### 3.11.7. Lost Packets

| | | |
|---|---|---|
| **Telecommand Verification:** | 24 | [lost packet(s): 0] |
| **HK Report:** | 1238 | [lost packet(s): 0] |
| **Event/Anomaly Report:** | 4 | [lost packet(s): 0] |
| **HRIC low Priority:** | 9720 | [lost packet(s): 0] |
| **HRIC high Priority:** | 0 | [lost packet(s): 0] |

*Table 39: Summary of the packets downloaded and lost during the HRIC Functional Test.*

### 3.11.8. Test Results

Produced output is in line with what expected, and no anomalies were detected.

The details are reported in Table 40 with information from section 3.11.3 and 3.11.4.

| | Commanded | From TM |
|---|---|---|
| Images | 120 | 120 |
| Science Sessions | 1 | 1 |

*Table 40: Comparison between Commanded and downloaded science during the HRIC Functional Test.*

## 3.12. STC Functional Test on REDUNDANT ME channel

### 3.12.1. Test scope

The scope of this test is to check the STC functionality on ME REDUNDANT channel after launch.

### 3.12.2. Test execution

Time Frame: 2018-12-11T14:09:00 ÷ 2018-12-11T14:32:00.

This test has been performed through the execution of a pre-defined FOP named SS-TST-020 whose specifications can be found in [RD.4].

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (REDUNDANT channel) | OFF | OFF | OFF |

We sent several TCs interleaved by HK rate generation variation (i.e., ZSS00329) to better follow the behavior of the channel.
In particular the FOP commands:

- Switch on of the PE
- Switch on of the Detector
- Switch on of the TEC
- Test of the reading and writing of a specific memory address
- Science acquisitions
- Switch off of the TEC
- Switch off of the Detector
- Switch off of the PE

### 3.12.3. Science

With reference to the Science TCs, 2 minutes of CM in continuous mode with short integration time, compression (IBR=63), Repetition Time=400ms has been executed.

Table 41 describes the duration and the number of images and frames expected for each TC commanded during Functional Test.

| N(TC) | Duration | ZSS | Mode | Repetition Time [ms] | Expected Acquisitions | Expected Frames |
|---|---|---|---|---|---|---|
| 1 | 2m | Science | continuous | 400 | 300 | 1500 |
| 1 | 2m | | | | | 1500 |

*Table 41:Summary of the science telecommand used during the STC Functional Test.*

### 3.12.4. Data Produced

| | | | |
|---|---|---|---|
| **Bundle** | Miscellaneous | | |
| **File** | CSV | | |
| | | # | 2 |
| | | size: | 0.961 MB |

*Table 42: Summary of the data produced in the miscellaneous bundle for the STC Functional Test.*

| | | | |
|---|---|---|---|
| **Bundle** | Raw | STC | |
| **File** | CSV | | |
| | | # | 1500 |
| | | Size | 5.859 MB |
| **File** | DAT | | |
| | | # | 1500 |
| | | Size | 135.938 MB |
| **Science** | Sessions | # | 1 |

*Table 43: Summary of the data produced in the Raw bundle for the STC Functional Test.*

### 3.12.5. ME Events

None.

### 3.12.6. PE Events

None.

### 3.12.7. Lost Packets

| | | |
|---|---|---|
| **Telecommand Verification:** | 24 | [lost packet(s): 0] |
| **HK Report:** | 1178 | [lost packet(s): 0] |
| **Event/Anomaly Report:** | 4 | [lost packet(s): 0] |
| **STC low Priority:** | 8700 | [lost packet(s): 0] |
| **STC high Priority:** | 0 | [lost packet(s): 0] |

*Table 44: Comparison between Commanded and downloaded science during the STC Functional Test.*

### 3.12.8. Test Results

Produced output is in line with what expected, and no anomalies were detected.

The details are reported in Table 45 with information from section 3.12.3 and 3.12.4.

| | Commanded | From TM |
|---|---|---|
| Images | 1500 | 1500 |
| Science Sessions | 1 | 1 |

*Table 45: Comparison between Commanded and downloaded science during the STC Functional Test.*

## 3.13. VIHI Functional Test on REDUNDANT ME channel

### 3.13.1. Test scope

The scope of this test is to check the VIHI functionality on ME REDUNDANT channel after launch.

### 3.13.2. Test execution

Time Frame: 2018-12-11T14:36:00 ÷ 2018-12-11T14:56:00.

This test has been performed through the execution of a pre-defined FOP named SS-TST-033 whose specifications can be found in [RD.4].

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (REDUNDANT channel) | OFF | OFF | OFF |

We sent several TCs interleaved by HK rate generation variation (i.e., ZSS00329) to better follow the behavior of the channel.
In particular the FOP commands:

- Switch on of the PE
- Switch on of the Detector
- Switch on of the TEC
- Test of the reading and writing of a specific memory address
- Science acquisitions
- Switch off of the TEC
- Switch off of the Detector
- Switch off of the PE

### 3.13.3. Science

With reference to the Science TCs, 35s of full frame acquisitions with Repetition Time = 0.505s has been performed.

Table 46 describes the duration and the number of frames expected for each TC commanded during Functional Test.

| N(TC) | Duration | ZSS | Mode | Repetition Time [ms] | Expected Frames |
|---|---|---|---|---|---|
| 1 | 35s | Science | continuous | 505 | 45 |
| **1** | **35s** | **-** | **-** | **-** | **45** |

*Table 46: Summary of the science telecommand used during the VIHI Functional Test.*

### 3.13.4. Data Produced

| | | | |
|---|---|---|---|
| **Bundle** | Miscellaneous | | |
| **File** | CSV | | |
| | | # | 2 |
| | | Size | 1.344 MB |

*Table 47: Summary of the data produced in the miscellaneous bundle for the VIHI Functional Test.*

| | | | |
|---|---|---|---|
| **Bundle** | RAW | VIHI | |
| **File** | CSV | | |
| | | # | 45 |
| | | Size | 0.176 MB |
| **File** | DAT | | |
| | | # | 45 |
| | | Size | 5.625 MB |
| **Science** | Sessions | # | 1 |

*Table 48: Summary of the data produced in the Raw bundle for the VIHI Functional Test.*

### 3.13.5. ME Events

None.

### 3.13.6. PE Events

None.

### 3.13.7. Lost Packets

| | | |
|---|---|---|
| **Telecommand Verification:** | 14 | [lost packet(s): 0] |
| **HK Report:** | 1032 | [lost packet(s): 0] |
| **Event/Anomaly Report:** | 2 | [lost packet(s): 0] |
| **VIHI low Priority:** | 1485 | [lost packet(s): 0] |
| **VIHI high Priority:** | 0 | [lost packet(s): 0] |

*Table 49: Comparison between Commanded and downloaded science during the VIHI Functional Test.*

### 3.13.8. Test Results

Produced output is in line with what expected, and no anomalies were detected.

The details are reported in Table 52 with information from section 3.13.3 and 3.13.4.

| | Commanded | From TM |
|---|---|---|
| Images | 45 | 45 |
| Science Sessions | 1 | 1 |

*Table 50: Comparison between Commanded and downloaded science during the VIHI Functional Test.*

## 3.14. Other Test

### 3.14.1. Test scope

The scope of this test is to upload the STC TEC parameters in preparation of the following STC performance test.

### 3.14.2. Test execution

Time Frame: 2018-12-11T15:00:00 ÷ 2018-12-11T17:58:00.

This test has been performed through the execution of a set of TC to load the correct TEC parameters and switch-on/off of the STC PE, TEC and detector.

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (REDUNDANT channel) | OFF | OFF | OFF |

### 3.14.3. Science

Not applicable.

### 3.14.4. Data Produced

| | | | |
|---|---|---|---|
| **Bundle** | Miscellaneous | | |
| **File** | CSV | | |
| | | # | 1 |
| | | Size | 0.160 MB |

*Table 51: Summary of the data produced in the miscellaneous bundle for the Other Test.*

### 3.14.5. ME Events

None.

### 3.14.6. PE Events

None.

### 3.14.7. Lost Packets

| | | |
|---|---|---|
| **Telecommand Verification:** | 0 | [lost packet(s): 0] |
| **HK Report:** | 305 | [lost packet(s): 0] |
| **Event/Anomaly Report:** | 0 | [lost packet(s): 0] |

*Table 52: Comparison between Commanded and downloaded science during the Other Test.*

### 3.14.8. Test Results

Produced output is in line with what expected, and no anomaly was detected.

## 3.15. STC Performance Test

### 3.15.1. Test scope

The scope of this test is to perform a subset of calibration measurements for monitoring the STC performance after.

### 3.15.2. Test execution

Time Frame: 2018-12-11T18:25:00 ÷ 2018-12-11T23:40:00.

This test has been performed through the execution of 4 pre-defined PDORs ([PS.1], [PS.2], [PS.3] and [PS.4]) described in [RD.1].

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | OFF | ON | OFF |

### 3.15.3. Science

We sent several telecommands performing the following 4 science sessions:

1. *stc_nominal_test*: reduced dark current campaign for the Color Mode and Global Mapping operation modes (high priority).
2. *single_filters_test*: reduced dark current campaign for the separated filters (high priority).
3. *stc_out_filters_test*: reduced spurious charge calibration (low priority) campaign of the FPA.
4. *stc_reset_test*: several acquisitions of the mitigation windows (low priority) to test the reset capabilities of the detector.

Table 53 describes the duration and the number of images and frames expected for each telecommand commanded during Functional Test.

| PDOR | Number of Telecommands | Duration [h:mm] | Expected Acquisition's | Expected Frames |
|---|---|---|---|---|
| stc_nominal_test | 84 | 1:18 | 840 | 3360 |
| single_filters_test | 169 | 1:56 | 1690 | 3380 |
| stc_out_filters_test | 44 | 0:43 | 272 | 272 |
| stc_reset_test | 84 | 1:44 | 1680 | 1680 |
| Total | **381** | **5:41** | 4482 | 8692 |

*Table 53: Summary of the science telecommand used during the STC Performance Test.*

### 3.15.4. Data Produced

| | | | |
|---|---|---|---|
| **Bundle** | Miscellaneous | | |
| **File** | CSV | | |
| | | # | 2 |
| | | Size | 0.531 MB |

*Table 54: Summary of the data produced in the miscellaneous bundle for the STC Performance Test.*

| | | | |
|---|---|---|---|
| **Bundle** | RAW | STC | |
| **File** | CSV | | |
| | | # | 8524 |
| | | Size | 33.297 MB |
| **File** | DAT | | |
| | | # | 8524 |
| | | Size | 1634.22 MB |
| **Science** | Sessions | # | 353 |

*Table 55: Summary of the data produced in the Raw bundle for the STC Functional Test.*

## 3.15.5. ME Events

| | |
|---|---|
| **Rejected telecommand:** | 0 |
| **Failed telecommand:** | 28 |
| **Low severity error:** | 0 |
| **Medium severity error:** | 0 |
| **High severity error:** | 0 |

*Table 56: Summary of negative events and awk during the STC Performance Test.*

### *3.15.5.1. Failed Telecommand*

The list of the failed telecommand is reported in the section 4.1.2. For each telecommand all the parameters are reported.

## 3.15.6. PE Events

None.

## 3.15.7. Lost Packets

| | | |
|---|---|---|
| **Telecommand Verification:** | 786 | [lost packet(s): 0] |
| **HK Report:** | 1344 | [lost packet(s): 0] |
| **Event/Anomaly Report:** | 772 | [lost packet(s): 0] |
| **STC low Priority:** | 82365 | [lost packet(s): -1] |
| **STC high Priority:** | 286550 | [lost packet(s): 0] |

*Table 57: Comparison between Commanded and downloaded science during the STC Performance Test.*

The -1 code stay for a repeted packets in the telemetry.

## 3.15.8. Test Results

The output is **not** in line with what expected.
The packet repeated (see Session 3.15.7) has corrupted one image of the test: the image sim_img_stc_low_sc_0_filterx_NECP_20181211T201033269567, part of the *stc_reset_test*.
A set of science sessions are missing. The details are reported in table Table 58 with information from section 3.15.3 and 3.15.4.

| | Commanded | From TM | Missing |
|---|---|---|---|
| Acqusitions | 8692 | 8524 | *168* |
| Science Sessions | 381 | 353 | *28* |

*Table 58: Comparison between Commanded and downloaded science during the STC Performance Test.*

The missing science sessions are due to the 28 telecommands failed.
These telecommands are divided in:

- 12 full along track acquisitions (1 window and 10 acq/tc)
- 8 spurious charge test acqusitions (1 window and 3 acq/tc)

For a total of 168 images as verified.
Part of the telecommands (28 science telecommands) of the “stc_out_filters_test” were rejected by ME due to a wrong initialization of the window size. The tests were repeated successfully the day after in the so called, “STC outpass recovery” (see Section 3.22).

## 3.16. TEC INIT Test

### 3.16.1. Test scope

The scope of this test is to upload the TEC parameters of all SIMBIO-SYS channels in preparation of the following inter-channels performance tests.

### 3.16.2. Test execution

Time Frame: 2018-12-12T10:00:00 ÷ 2018-12-12T10:30:00.

This test has been performed through the execution of a set of TC to load the correct TEC parameters and switch-on/off of the all PEs, TECs and detectors.

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | OFF | OFF | OFF |

### 3.16.3. Science

Not applicable.

### 3.16.4. Data Produced

| | | | |
|---|---|---|---|
| **Bundle** | Miscellaneous | | |
| **File** | CSV | | |
| | | # | 4 |
| | | Size | 0.176 MB |

*Table 59: Summary of the data produced in the miscellaneous bundle for the Init Test.*

### 3.16.5. ME Events

None.

### 3.16.6. PE Events

None.

### 3.16.7. Lost Packets

| | | |
|---|---|---|
| **Telecommand Verification:** | 74 | [lost packet(s): 0] |
| **HK Report:** | 319 | [lost packet(s): 0] |
| **Event/Anomaly Report:** | 12 | [lost packet(s): 0] |

*Table 60: Comparison between Commanded and downloaded science during the Init Test.*

### 3.16.8. Test Results

Produced output is in line with what expected and no anomaly was detected.

## 3.17. MAX STRESS Test

### 3.17.1. Test scope

The scope of this test is to command in science mode all the three channels of SIMBIO-SYS opportunely configured to stress at maximum all the units (i.e., PE and ME) involved during acquisitions.

### 3.17.2. Test execution

Time Frame: 2018-12-12T10:40:00 ÷ 2018-12-12T11:30:00.

This test has been performed through the execution of a pre-defined PDOR, [PS.10]

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | ON | ON | ON |

### 3.17.3. Science

We sent 3 TCs performing for 10 minutes the following 3 science sessions:

1. 512x512 window HRIC acquisitions with:
   8x8 binning, IBR=63 and Repetition Time 0.5s
2. STC acquisitions in CM with:
   IBR=63 and Repetition Time 0.2s
3. VIHI in full frame acquisition with:
   dark subtraction and Repetition Time 0.04s

Table 61 describes the duration and the number of images and frames expected for each TC commanded during MAX STRESS Test.

| N(TC) | Duration | ZSS | Mode | Repetition Time [s] | Expected Acquisitions | Expected Frames |
|---|---|---|---|---|---|---|
| 1 | 10m | Science | continuous | 0.5 | 1200 | 1200 |
| 2 | 10m | Science | continuous | 0.2 | 3000 | 15000 |
| 3 | 10m | Science | continuous | 0.04 | 15000 | 15000 |
| 3 | 10m | - | - | - | 19200 | 31200 |

*Table 61: Summary of the science telecommand used during the MAX STRESS Test.*

### 3.17.4. Data Produced

| Bundle | Miscellaneous | | |
|---|---|---|---|
| File | CSV | | |
| | | # | 4 |
| | | Size | 5.762 MB |

*Table 62: Summary of the data produced in the miscellaneous bundle for the MAX STRESS Test.*

| Bundle | RAW | HRIC | |
|---|---|---|---|
| File | CSV | | |

| | | | |
|---|---|---|---|
| | | # | 1200 |
| | | Size | 4.688 MB |
| File | DAT | | |
| | | # | 1200 |
| | | Size | 75 MB |
| Science | Sessions | # | 1 |

*Table 63: Summary of the data produced in the Raw bundle for the MAX STRESS Test for the HRIC channel.*

| | | | |
|---|---|---|---|
| Bundle | RAW | STC | |
| File | CSV | | |
| | | # | 7605 |
| | | Size | 29.707 MB |
| File | DAT | | |
| | | # | 7605 |
| | | Size | 689.203 MB |
| Science | Sessions | # | 1 |

*Table 64: Summary of the data produced in the Raw bundle for the MAX STRESS Test for the STC channel.*

| | | | |
|---|---|---|---|
| Bundle | RAW | VIHI | |
| File | CSV | | |
| | | # | 15000 |
| | | Size | 58.594 MB |
| File | DAT | | |
| | | # | 15000 |
| | | Size | 468.75 MB |
| Science | Sessions | # | 1 |

*Table 65: Summary of the data produced in the Raw bundle for the MAX STRESS Test for the VIHI channel.*

### 3.17.5. ME Events

None.

### 3.17.6. PE Events

None.

### 3.17.7. Lost Packets

| | | |
|---|---|---|
| Telecommand Verification: | 14 | [lost packet(s): 0] |
| HK Report: | 7218 | [lost packet(s): 0] |
| Event/Anomaly Report: | 9 | [lost packet(s): 0] |
| HRIC low Priority: | 4800 | [lost packet(s): 0] |
| STC low Priority: | 44108 | [lost packet(s): 0] |
| VIHI low Priority: | 15000 | [lost packet(s): 0] |
| HRIC high Priority: | 0 | [lost packet(s): 0] |
| STC high Priority: | 0 | [lost packet(s): 0] |
| VIHI high Priority: | 0 | [lost packet(s): 0] |

*Table 66: Comparison between Commanded and downloaded science during the MAX STRESS Test.*

### 3.17.8. Test Results

Produced output, for HRIC and VIHI, is in line with what expected, and no anomaly was detected.

The details are reported in table Table 70 with information from section 3.17.3 and 3.17.4.

| | | Commanded | From TM | Missing |
|---|---|---|---|---|
| Images | HRIC | 1200 | 1200 | 0 |
| | STC | 15000 | 7606 | 7394 |
| | VIHI | 15000 | 15000 | 0 |
| Science Sessions | HRIC | 1 | 1 | 0 |
| | STC | 1 | 1 | 0 |
| | VIHI | 1 | 1 | 0 |

*Table 67: Comparison between Commanded and downloaded science during the Max Stress Test.*

In the data were found the following problems that will be discussed in the report of each channel:

- **About half of the STC Science data are completely lost (1274 MB expected 689 MB obtained;**
- **Last available STC frame present an incomplete subframe (i.e., row=00, col=12) and a missing subframe (i.e., row=00, col=13) in F920;**
- **VIHI Science Acquisitions contain unknown values since Dark Subtraction flag has been used without previous acquisition of Dark Image;**

Aftrer a fast investigation we discovered that the STC lost data are due to the overwriting of the SSMM by the “STC Outpass 2 recovery” performed later the same day.

## 3.18. MAX DR Test

### 3.18.1. Test scope

The scope of this test is to command in science mode all the three channels of SIMBIO-SYS opportunely configured to evaluate ME behavior during acquisitions at maximum Data Rate.

### 3.18.2. Test execution

Time Frame: 2018-12-12T11:30:00 ÷ 2018-12-12T11:35:00.

This test has been performed through the execution of a pre-defined PDORs named "PDOR_BPSS_C_SS_SIMBIOSYS_MAX_DR_test_noME_00175.BC" whose specifications can be found in [RD.4].

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | ON | ON | ON |

### 3.18.3. Science

We sent 3 Telecommands performing for 1 minute the following 3 science sessions:

1. FPAN HRIC acquisitions with:
   IBR=63 and Repetition Time 1.115s
2. STC acquisitions in CM with:
   IBR=63 and Repetition Time 0.2s
3. VIHI in full frame acquisition with:
   IBR=1 and Repetition Time 0.04s

Table 68 describes the duration and the number of images and frames expected for each TC commanded during MAX DR Test.

| N(TC) | Duration | ZSS | Mode | Repetition Time [s] | Expected Acquisitions | Expected Frames |
|---|---|---|---|---|---|---|
| 1 | 1m | Science | continuous | 1.115 | 55 | 55 |
| 2 | 1m | Science | continuous | 0.2 | 300 | 1500 |
| 3 | 1m | Science | continuous | 0.04 | 1508 | 1508 |
| 3 | 1m | - | - | - | 1863 | 3063 |

*Table 68: Summary of the science telecommand used during the MAX DR Test.*

### 3.18.4. Data Produced

| Bundle | Miscellaneous | | |
|---|---|---|---|
| File | CSV | | |
| | | # | 4 |
| | | Size | 1.063 MB |

*Table 69: Summary of the data produced in the miscellaneous bundle for the MAX DR Test.*

| | | | |
|---|---|---|---|
| **Bundle RAW** | HRIC | | |
| **File** | CSV | | |
| | | # | 55 |
| | | Size | 0.215 MB |
| **File** | DAT | | |
| | | # | 55 |
| | | Size | 137.5 MB |
| **Science** | Sessions | #: | 1 |

*Table 70: Summary of the data produced in the Raw bundle for the MAX DR Test for the HRIC channel.*

| | | | |
|---|---|---|---|
| **Bundle** | RAW | STC | |
| **File** | CSV | | |
| | | # | 0 |
| | | Size | 0 MB |
| **File** | DAT | | |
| | | # | 0 |
| | | Size | 0 MB |
| **Science** | Sessions | #: | 0 |

*Table 71: Summary of the data produced in the Raw bundle for the MAX DR Test for the STC channel.*

| | | | |
|---|---|---|---|
| **Bundle** | RAW | VIHI | |
| **File** | CSV | | |
| | | # | 1508 |
| | | Size | 5.891 MB |
| **File** | DAT | | |
| | | # | 1508 |
| | | Size | 188.5 MB |
| **Science** | Sessions | #: | 1 |

*Table 72: Summary of the data produced in the Raw bundle for the MAX DR Test for the VIHI channel.*

### 3.18.5. ME Events

None.

### 3.18.6. PE Events

None.

### 3.18.7. Lost Packets

| | | |
|---|---|---|
| **Telecommand Verification:** | 12 | [lost packet(s): 0] |
| **HK Report:** | 1200 | [lost packet(s): 0] |
| **Event/Anomaly Report:** | 6 | [lost packet(s): 0] |
| **HRIC low Priority:** | 8690 | [lost packet(s): 0] |
| **STC low Priority:** | 0 | [lost packet(s): 0] |
| **VIHI low Priority:** | 28652 | [lost packet(s): 0] |
| **HRIC high Priority:** | 0 | [lost packet(s): 0] |
| **STC high Priority:** | 0 | [lost packet(s): 0] |
| **VIHI high Priority:** | 0 | [lost packet(s): 0] |

*Table 73: Comparison between Commanded and downloaded science during the MAX DR Test.*

### 3.18.8. Test Results

Produced output received is in line with what expected.

The details are reported in table Table 78 with information from section 3.18.3 and 3.18.4.

| | | Commanded | From TM | Missing |
|---|---|---|---|---|
| Images | HRIC | 55 | 55 | 0 |
| | STC | 1500 | 0 | 1500 |
| | VIHI | 1508 | 1508 | 0 |
| Science Sessions | HRIC | 1 | 1 | 0 |
| | STC | 1 | 0 | 1 |
| | VIHI | 1 | 1 | 0 |

*Table 74: Comparison between Commanded and downloaded science during the Max DR Test.*

**Note that all STC Science data are lost (125 MB expected).**

STC lost data are due to the overwriting of the SSMM by the “STC Outpass 2 recovery” performed later the same day.

## 3.19. ORBIT TEST

### 3.19.1. Test scope

The scope of this test is to command in science mode all the three channels of SIMBIO-SYS opportunely configured to evaluate ME behavior during acquisitions simulating the nominal operation mode of SIMBIO-SYS during the Global Mapping Phase.

### 3.19.2. Test execution

Time Frame: 2018-12-12T11:35:00 ÷ 2018-12-12T12:50:00.

This test has been performed through the execution of a pre-defined PDOR, [PS.11].

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | ON | ON | ON |

### 3.19.3. Science

The test simultated a nominal orbit of SIMBIO-SYS acquiring images with all the three channels; in particular:

1. STC acquired images continuously changing integration time, repetition time and crosstrack dimention for 9 different section of orbit. It acquired in Global Mapping mode lossy (IBR=32) changing its cross track window size from 128 px to 640 px.
2. VIHI acquired images continously changing integration time and repetition time for 8 different sections of orbit.
3. HRIC acquired images in target mode mode with PAN filter in lossy (IBR=32) compression.

The table below summarizes the ORBIT Test timeline for all the three channels.

| Absolute Start Time | Duration [s] | Channel | NACQ | Orbit Section | Repetition Time [s] | Expected Acquisitions | Expected Frames |
|---|---|---|---|---|---|---|---|
| 11:38:14 | 540 | STC | Continous | STC1 | 12.3 | 43 | 129 |
| 11:38:16 | 240 | VIHI | Continous | VIHI1 | 0.13 | 1847 | 1847 |
| 11:42:16 | 480 | VIHI | Continous | VIHI2 | 0.1 | 4800 | 2400 |
| 11:47:14 | 300 | STC | Continous | STC2 | 11.575 | 25 | 75 |
| 11:50:16 | 300 | VIHI | Continous | VIHI3 | 0.08 | 3756 | 1878 |
| 11:50:18 | 240 | HRIC | 120 | HRIC1 | 2 | 120 | 120 |
| 11:52:14 | 180 | STC | Continous | STC3 | 10.32 | 17 | 51 |
| 11:55:14 | 300 | STC | Continous | STC4 | 8.7 | 34 | 102 |
| 11:55:16 | 420 | VIHI | Continous | VIHI4 | 0.06 | 6996 | 1749 |
| 12:00:14 | 780 | STC | Continous | STC5 | 7.665 | 101 | 303 |
| 12:02:16 | 900 | VIHI | Continous | VIHI5 | 0.04 | 22512 | 5628 |
| 12:02:18 | 120 | HRIC | 80 | HRIC2 | 1.5 | 80 | 80 |
| 12:13:15 | 240 | STC | Continous | STC6 | 7.97 | 30 | 90 |
| 12:17:15 | 180 | STC | Continous | STC7 | 8.695 | 20 | 60 |
| 12:17:17 | 660 | VIHI | Continous | VIHI6 | 0.05 | 13204 | 6602 |
| 12:20:15 | 240 | STC | Continous | STC8 | 9.635 | 25 | 75 |
| 12:24:15 | 180 | STC | Continous | STC9 | 11.24 | 16 | 48 |
| 12:28:17 | 180 | VIHI | Continous | VIHI7 | 0.07 | 2572 | 1285 |
| 12:31:17 | 360 | VIHI | Continous | VIHI8 | 0.08 | 2250 | 2250 |
| 12:31:19 | 2.5 | HRIC | 1 | HRIC3 | 2.5 | 1 | 1 |

*Table 75: ORBIT Test timeline.*

| PDOR | Number of Telecommands | Duration [h:mm] | Expected Acquisition's | Expected Frames |
|---|---|---|---|---|
| HRIC | 3 | 1:00 | 201 | 201 |
| STC | 9 | 1:00 | 311 | 933 |
| VIHI | 8 | 1:00 | 60166 | 23639 |
| Total | 381 | 1:00 | | |

*Table 76: Summary of the science telecommand used during the ORBIT Test.*

## 3.19.4. Data Produced

| | | | |
|---|---|---|---|
| Bundle | Miscellaneous | | |
| File | CSV | | |
| | | # | 4 |
| | | Size | 14.871 MB |

*Table 77: Summary of the data produced in the miscellaneous bundle for the ORBIT Test.*

| | | | |
|---|---|---|---|
| **Bundle** | RAW | HRIC | |
| **File** | CSV | | |
| | | # | 201 |
| | | Size | 0.785 MB |
| **File** | DAT | | |
| | | # | 201 |
| | | Size | 502.5 MB |
| **Science** | Sessions | # | 3 |

*Table 78: Summary of the data produced in the Raw bundle for the ORBIT Test for the HRIC channel.*

| | | | |
|---|---|---|---|
| **Bundle** | RAW | STC | |
| **File** | CSV | | |
| | | # | 525 |
| | | Size | 2.051 MB |
| **File** | DAT | | |
| | | # | 525 |
| | | Size | 127.234 MB |
| **Science** | Sessions | # | 5 |

*Table 79: Summary of the data produced in the Raw bundle for the ORBIT Test for the STC channel.*

| | | | |
|---|---|---|---|
| **Bundle** | RAW | VIHI | |
| **File** | CSV | | |
| | | # | 18257 |
| | | Size | 71.316 MB |
| **File** | DAT | | |
| | | # | 18257 |
| | | Size | 285.266 MB |
| **Science** | Sessions | # | 5 |

*Table 80: Summary of the data produced in the Raw bundle for the ORBIT Test for the VIHI channel.*

### 3.19.5. ME Events

None.

### 3.19.6. PE Events

None.

### 3.19.7. Lost Packets

| | | |
|---|---|---|
| **Telecommand Verification:** | 44 | [lost packet(s): 0] |
| **HK Report:** | 16908 | [lost packet(s): 0] |
| **Event/Anomaly Report:** | 12 | [lost packet(s): 0] |
| **HRIC low Priority:** | 16584 | [lost packet(s): 0] |
| **STC low Priority:** | 4160 | [lost packet(s): 0] |
| **VIHI low Priority:** | 18257 | [lost packet(s): 0] |
| **HRIC high Priority:** | 0 | [lost packet(s): 0] |
| **STC high Priority:** | 0 | [lost packet(s): 0] |
| **VIHI high Priority:** | 0 | [lost packet(s): 0] |

*Table 81: Comparison between Commanded and downloaded science during the ORBIT Test.*

### 3.19.8. Test Results

Produced output received is in line with what expected.

The details are reported in table Table 90 with information from section 3.19.3 and 3.19.4.

| | | Commanded | From TM | Missing |
|---|---|---|---|---|
| Images | HRIC | 201 | 201 | 0 |
| | STC | 933 | 525 | 408 |
| | VIHI | 23639 | 18257 | 5382 |
| Science Sessions | HRIC | 3 | 3 | 0 |
| | STC | 9 | 5 | 4 |
| | VIHI | 8 | 5 | 3 |

*Table 82: Comparison between Commanded and downloaded science during the Orbit Test.*

**The following anomalies were detected:**

- **Data of first 4 STC Science TCs (low priority) are lost (226 MB expected, 127 MB obtained).**
- **First 19 Acqusitions of 5$^{th}$ STC Science TC (low priority) are incomplete.**
- **Data of first and last two VIHI Science TCs are lost <u>even if the Packet Sequence Count has no gap</u>.**

STC lost data are due to the overwriting of the SSMM by the “STC Outpass 2 recovery” performed later the same day.

## 3.20. VIHI Performance 1 Test

### 3.20.1. Test scope

The scope of this test is to perform a subset of calibration measurements for monitoring the VIHI performance after launch.

### 3.20.2. Test execution

Time Frame: 2018-12-12T12:51:00 ÷ 2018-12-12T13:24:00.

This test has been performed through the execution of a pre-defined FOP named SS-TST-031 whose specifications can be found in [RD.4].

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | OFF | OFF | ON |

### 3.20.3. Science

We sent several telecommands performing the following 4 science sessions:

- Dark acquisition
- Science acquisition
- Lamp acquisition with shutter open
- LED acquisition with shutter open

Table 83 describes the duration and the number of frames expected for each telecommand commanded during Functional Test.

| Session | Number of Telecommands | Duration [hh:mm:ss] | Expected Acquisition's | Expected Frames |
|---|---|---|---|---|
| Dark Acquisition | 4 | 00:01:00 | 60 | 60 |
| Science Acquisition | 4 | 00:08:00 | 240 | 240 |
| Lamp Acquisition | 5 | 00:08:00 | 300 | 300 |
| LED acquisition | 4 | 00:08:00 | 240 | 240 |
| Total | 17 | 00:25:00 | 840 | 840 |

*Table 83: Summary of the science telecommand used during the VIHI Performance Test 1.*

### 3.20.4. Data Produced

| | | | |
|---|---|---|---|
| **Bundle** | Miscellaneous | | |
| **File** | CSV | | |
| | | # | 2 |
| | | Size | 1.785 MB |

*Table 84: Summary of the data produced in the miscellaneous bundle for the VIHI Performance Test 1.*

| | | | |
|---|---|---|---|
| **Bundle** | RAW | VIHI | |
| **File** | CSV | | |
| | | # | 840 |
| | | Size | 3.281 MB |
| **File** | DAT | | |
| | | # | 840 |
| | | Size | 101.25 MB |
| **Science** | Sessions | # | 17 |

*Table 85: Summary of the data produced in the Raw bundle for the VIHI Performance Test 1.*

### 3.20.5. ME Events

None.

### 3.20.6. PE Events

There is 1 event:

```
[2018-12-12T12:52:51.880376] TC length not correct (4)
```

### 3.20.7. Lost Packets

| | | |
|---|---|---|
| Telecommand Verification: | 78 | [lost packet(s): 0] |
| HK Report: | 2906 | [lost packet(s): 0] |
| Event/Anomaly Report: | 28 | [lost packet(s): 0] |
| VIHI low Priority: | 26760 | [lost packet(s): 0] |
| VIHI high Priority: | 0 | [lost packet(s): 0] |

*Table 86: Comparison between Commanded and downloaded science during the VIHI Performace 1 Test.*

### 3.20.8. Test Results

Produced output is partially in line with what expected. Second and third science sessions are correctly executed but with wrong “tag” (i.e., dark acquisitions instead of SCIENCE and LAMP ones) since OPEN SHUTTER TC failed due to an error on PE-ME SpW.

The details are reported in Table 87 with information from section 3.20.3 and 3.20.4.

| | Commanded | From TM |
|---|---|---|
| Images | 840 | 840 |
| Science Sessions | 17 | 17 |

*Table 87: Comparison between Commanded and downloaded science during the VIHI Performace 1 Test.*

**N.B.: Each session has been commanded with the “Dark Acquisition” parameter set (=1) which is correct only for the first session.**

## 3.21. VIHI Performance 2 Test

### 3.21.1. Test scope

The scope of this test is to perform a subset of calibration measurements for monitoring the VIHI performance after launch.

### 3.21.2. Test Execution

Time Frame: 2018-12-12T13:32:51 ÷ 2018-12-12T14:15:33.

This test has been performed through the execution of a pre-defined FOP named SS-TST-032 whose specifications can be found in [RD.4].

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | OFF | OFF | ON |

### 3.21.3. Science

We sent several telecommands performing the following 2 science sessions:

- Dark acquisition
- Science acquisition

Table 88 describes the duration and the number of frames expected for each telecommand commanded during Functional Test.

| Session | Number of Telecommands | Duration [hh:mm:ss] | Expected Acquisition's | Expected Frames |
|---|---|---|---|---|
| Dark Acquisition | 7 | 00:01:45 | 104 | 104 |
| Science Acquisition | 14 | 00:28:00 | 701 | 701 |
| Total | **21** | **00:29:45** | **805** | **805** |

*Table 88: Summary of the science telecommand used during the VIHI Performance Test 2.*

### 3.21.4. Data Produced

| | | | |
|---|---|---|---|
| **Bundle** | Miscellaneous | | |
| **File** | CSV | | |
| | | # | 2 |
| | | Size | 1.824 MB |

*Table 89: Summary of the data produced in the miscellaneous bundle for the VIHI Performance Test 2.*

| | | | |
|---|---|---|---|
| **Bundle** | RAW | VIHI | |
| **File** | CSV | | |
| | | # | 805 |
| | | Size | 3.145 MB |
| **File** | DAT | | |
| | | # | 805 |
| | | Size | 82.578 MB |
| **Science** | Sessions | # | 21 |

*Table 90: Summary of the data produced in the Raw bundle for the VIHI Performance Test 2.*

### 3.21.5. ME Events

None.

### 3.21.6. PE Events

None.

### 3.21.7. Lost Packets

| | | |
|---|---|---|
| Telecommand Verification: | 78 | [lost packet(s): 0] |
| HK Report: | 3089 | [lost packet(s): 0] |
| Event/Anomaly Report: | 31 | [lost packet(s): 0] |
| VIHI low Priority: | 19635 | [lost packet(s): 0] |
| VIHI high Priority: | 0 | [lost packet(s): 0] |

*Table 91: Comparison between Commanded and downloaded science during the VIHI Performace 2 Test.*

### 3.21.8. Test Results

Produced output is in line with what expected from the number of frames expected.

The details are reported in Table 92 with information from section 3.21.3 and 3.21.4.

| | Commanded | From TM |
|---|---|---|
| Images | 805 | 805 |
| Science Sessions | 21 | 21 |

*Table 92: Comparison between Commanded and downloaded science during the VIHI Performance 2 Test.*

## 3.22. STC Performance Recovery

### 3.22.1. Test scope

The scope of this test is to recovery the Out of filters TCs (belonging to "PDOR PDOR_BPSS_C_SS_SIMBIOSYS_stc_out_filters_test") refused by the ASW during STC out of pass test. The scope of the test was acquiring a data bench to evaluate the STC spurious charge.

### 3.22.2. Test execution

Time Frame: 2018-12-12T14:22:00 ÷ 2018-12-12T15:04:00.

This test has been performed through the execution of a PDOR, [PS.2].

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | OFF | OFF | OFF |

### 3.22.3. Science

We sent several TCs performing a reduced spurious charge calibration (low priority) campaign of the FPA.

Table 93 describes the duration and the number of images and frames expected for the PDOR commanded during STC outpass recovery 2

| PDOR | NTCs | Duration [h:mm] | Expected Acquisition's | Expected Frames |
|---|---|---|---|---|
| STC_outfilters_PDOR_bup | 25 | 00:41:08 | 25 | 25 |
| Total | 25 | 00:41:08 | 25 | 25 |

*Table 93: Summary of the science telecommand used during the STC Performance Recovery Test.*

### 3.22.4. Data Produced

| | | | |
|---|---|---|---|
| **Bundle** | Miscellaneous | | |
| **File** | CSV | | |
| | | # | 2 |
| | | Size | 1.641 MB |

*Table 94: Summary of the data produced in the miscellaneous bundle for the STC Performance Recovery Test.*

| | | | |
|---|---|---|---|
| **Bundle** | RAW | STC | |
| **File** | CSV | | |
| | | # | 227 |
| | | Size | 0.887 MB |
| **File** | DAT | | |
| | | # | 227 |
| | | Size | 533.062 MB |
| **Science** | Sessions | # | 25 |

*Table 95: Summary of the data produced in the Raw bundle for the STC Functional Recovery Test.*

### 3.22.5. ME Events

None.

### 3.22.6. PE Events

None.

### 3.22.7. Lost Packets

| | | |
|---|---|---|
| **Telecommand Verification:** | 50 | [lost packet(s): 0] |
| **HK Report:** | 3091 | [lost packet(s): 0] |
| **Event/Anomaly Report:** | 24 | [lost packet(s): 0] |
| **STC low Priority:** | 119563 | [lost packet(s): 110] |
| | [2018-12-12T14:39:44.204000] [position: 19941] packet number(s): 300 | |
| | [2018-12-12T14:39:44.204427] [position: 19942] packet number(s): -301 | |
| | [2018-12-12T14:39:45.204732] [position: 20242] packet number(s): 1 | |
| | [2018-12-12T14:45:38.204000] [position: 113374] packet number(s): 635 | |
| | [2018-12-12T14:45:38.417669] [position: 113375] packet number(s): -636 | |
| | [2018-12-12T14:45:38.753622] [position: 113697] packet number(s): 110 | |
| | [2018-12-12T14:45:39.204717] [position: 113900] packet number(s): 1 | |
| **STC high Priority:** | 0 | [lost packet(s): 0] |

*Table 96: Comparison between Commanded and downloaded science during the STC Performance Recovery Test.*

### 3.22.8. Test Results

Produced output received is in line with what expected.

The details are reported in Table 100 with information from section 3.22.3 and 3.22.4.

| | Commanded | From TM |
|---|---|---|
| Images | 227 | 227 |
| Science Sessions | 25 | 25 |

*Table 97: Comparison between Commanded and downloaded science during the STC Performance Recovery Test.*

**N.B. The Test produced an overwriting on the SSMM of the APID "STC low priority". This is due to a capacity limit reached of the SSMM. This means that the PDOR cancelled part of the images data acquired the same day as specified in Section 3.17, 3.18 and 3.19.**

**Two packets result peculiar. The packets are sorted using the Generation Time and the Source Sequence Count (SSC). The SSC is resetted each 16383 packets due to the nuber of bits used for the storage of the info. On the interval of the SSC between 0 and 16383 the SSC and the generation Time order must be the same. Those two packets don't follow this rule, and the Fine Time is setted to 0. See the results of Table 96 in section 3.22.7. The anomaly is under investigation.**

## 3.23. VIHI Performance 1 Test backup

### 3.23.1. Test scope

The scope of this test is to re-run the VIHI Performance Test 1 to check the failed TC relative to the opening of the SHUTTER.

### 3.23.2. Text Execution

Time Frame: 2018-12-12T15:50:28 ÷ 2018-12-12T16:28:04.

This test has been performed through the execution of a pre-defined FOP named SS-TST-031 whose specifications can be found in [RD.4].

| INSTRUMENT INITIAL STATUS | | | |
|---|---|---|---|
| ME | HRIC | STC | VIHI |
| ON (MAIN channel) | OFF | OFF | OFF |

### 3.23.3. Science

We sent several telecommands performing the following 4 science sessions:

- Dark acquisition
- Science acquisition
- Lamp acquisition with shutter open
- LED acquisition with shutter open

Table 98 describes the duration and the number of frames expected for each telecommand commanded during Functional Test.

| Session | Number of Telecommands | Duration [h:mm] | Expected Acquisition's | Expected Frames |
|---|---|---|---|---|
| Dark Acquisition | 4 | 00:01:00 | 60 | 60 |
| Science Acquisition | 4 | 00:08:00 | 240 | 240 |
| Lamp Acquisition | 5 | 00:08:00 | 300 | 300 |
| LED acquisition | 4 | 00:08:00 | 240 | 240 |
| Total | **17** | **00:25:00** | **840** | **840** |

*Table 98: Summary of the science telecommand used during the VIHI Performance Recovery Test 1.*

### 3.23.4. Data Produced

| | | | |
|---|---|---|---|
| **Bundle** | Miscellaneous | | |
| **File** | CSV | | |
| | | # | 2 |
| | | Size | 2.641 MB |

*Table 99:Summary of the data produced in the miscellaneous bundle for the VIHI Performance Recovery Test 1.*

| | | | |
|---|---|---|---|
| **Bundle** | RAW | VIHI | |
| **File** | CSV | | |
| | | # | 840 |
| | | Size | 3.281 MB |
| **File** | DAT | | |
| | | # | 840 |
| | | Size | 101.25 MB |
| **Science** | Sessions | # | 17 |

*Table 100:Summary of the data produced in the Raw bundle for the VIHI Performance Recovery Test 1.*

### 3.23.5. ME Events

None.

### 3.23.6. PE Events

None.

### 3.23.7. Lost Packets

| | | |
|---|---|---|
| Telecommand Verification: | 76 | [lost packet(s): 0] |
| HK Report: | 4637 | [lost packet(s): 0] |
| Event/Anomaly Report: | 30 | [lost packet(s): 0] |
| VIHI low Priority: | 26760 | [lost packet(s): 0] |
| VIHI high Priority: | 0 | [lost packet(s): 0] |

*Table 101: Comparison between Commanded and downloaded science during the VIHI Performance 1 Recovery Test.*

### 3.23.8. Test Results

Produced output is in line with what expected, and no anomalies were detected.
The details are reported in Table 102 with information from section 3.23.3 and 3.23.4.

| | Commanded | From TM |
|---|---|---|
| Images | 840 | 840 |
| Science Sessions | 17 | 17 |

*Table 102: Comparison between Commanded and downloaded science during the VIHI Performance 2 Test.*

**N.B.: Each session has been commanded with the "Dark Acquisition" parameter set (=1) which is correct only for the first session.**

# 4. Annexes

## 4.1.Failed Telecommands

### 4.1.1. HRIC Other Test

```
[2018-12-10T16:27:18.965] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 7, APID: 812, Sequence n. 137]
  [2018-12-10T16:27:20.846292Z] SIMB HRIC Upload parameters [ZSS17105] [SSC: 137]
    HRIC param ID (PSS08007) = 1
    parameter value (PSS01604) = 77
```

```
[2018-12-10T16:27:24.091] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 7, APID: 812, Sequence n. 138]
  [2018-12-10T16:27:25.951107Z] SIMB HRIC Confirm Command [ZSS17104] [SSC: 138]
```

```
[2018-12-10T16:27:29.215] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 7, APID: 812, Sequence n. 139]
  [2018-12-10T16:27:31.075339Z] SIMB HRIC Upload parameters [ZSS17105] [SSC: 139]
    HRIC param ID (PSS08007) = 2
    parameter value (PSS01604) = 33
```

```
[2018-12-10T16:27:34.214] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 7, APID: 812, Sequence n. 140]
  [2018-12-10T16:27:36.139246Z] SIMB HRIC Confirm Command [ZSS17104] [SSC: 140]
```

```
[2018-12-10T16:27:39.215] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 7, APID: 812, Sequence n. 141]
  [2018-12-10T16:27:41.067163Z] SIMB HRIC Upload parameters [ZSS17105] [SSC: 141]
    HRIC param ID (PSS08007) = 3
    parameter value (PSS01604) = 112
```

```
[2018-12-10T16:27:44.215] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 7, APID: 812, Sequence n. 142]
  [2018-12-10T16:27:46.030097Z] SIMB HRIC Confirm Command [ZSS17104] [SSC: 142]
```

```
[2018-12-10T16:27:49.214] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 7, APID: 812, Sequence n. 143]
  [2018-12-10T16:27:51.091680Z] SIMB HRIC Upload parameters [ZSS17105] [SSC: 143]
    HRIC param ID (PSS08007) = 4
    parameter value (PSS01604) = 5
```

```
[2018-12-10T16:27:54.214] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 7, APID: 812, Sequence n. 144]
  [2018-12-10T16:27:56.092267Z] SIMB HRIC Confirm Command [ZSS17104] [SSC: 144]
```

```
[2018-12-10T16:27:59.215] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 7, APID: 812, Sequence n. 145]
```

```
  [2018-12-10T16:28:01.155430Z] SIMB HRIC Upload parameters [ZSS17105] [SSC: 145]
    HRIC param ID (PSS08007) = 5
    parameter value (PSS01604) = 3
```

```
[2018-12-10T16:28:04.340] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 7, APID: 812, Sequence n. 146]
  [2018-12-10T16:28:06.134585Z] SIMB HRIC Confirm Command [ZSS17104] [SSC: 146]
```

### 4.1.2. STC performance Test

```
 [2018-12-11T19:29:58.469] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 236]
  [2018-12-11T19:30:00.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 236]
    integration time (PSS01501) = 0
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 10
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 0
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 8
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 1
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:30:07.469] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 237]
  [2018-12-11T19:30:09.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 237]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 10
```

```
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 0
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 8
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 1
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:30:16.469] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 238]
  [2018-12-11T19:30:18.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 238]
    integration time (PSS01501) = 0
    repetition time STC (PSS01629) = 1000
    NbrAcq (PSS01602) = 10
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 0
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 8
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
```

```
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 1
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:31:08.469] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 239]
  [2018-12-11T19:31:10.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 239]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 1000
    NbrAcq (PSS01602) = 10
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 0
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 8
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 1
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:32:00.469] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 240]
  [2018-12-11T19:32:02.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 240]
    integration time (PSS01501) = 0
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 10
    number of windows (PSS00301) = 1
```

```
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 23
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 31
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 1
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:32:09.469] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 241]
  [2018-12-11T19:32:11.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 241]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 10
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 23
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 31
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
```

```
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 1
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:32:18.469] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 242]
  [2018-12-11T19:32:20.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 242]
    integration time (PSS01501) = 0
    repetition time STC (PSS01629) = 1000
    NbrAcq (PSS01602) = 10
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 23
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 31
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 1
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:33:10.468] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 243]
  [2018-12-11T19:33:12.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 243]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 1000
    NbrAcq (PSS01602) = 10
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
```

```
    start strip pixel w1 (PSS00501) = 23
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 31
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 1
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:34:02.468] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 244]
  [2018-12-11T19:34:04.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 244]
    integration time (PSS01501) = 0
    repetition time STC (PSS01629) = 240
    NbrAcq (PSS01602) = 10
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 9
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 23
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
```

```
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 1
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:34:16.468] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 245]
  [2018-12-11T19:34:18.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 245]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 240
    NbrAcq (PSS01602) = 10
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 9
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 23
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 1
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:34:30.468] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 246]
  [2018-12-11T19:34:32.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 246]
    integration time (PSS01501) = 0
    repetition time STC (PSS01629) = 1000
    NbrAcq (PSS01602) = 10
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 9
```

```
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 23
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 1
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:35:22.468] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 247]
  [2018-12-11T19:35:24.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 247]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 1000
    NbrAcq (PSS01602) = 10
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 9
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 23
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
```

```
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 1
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:40:38.467] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 256]
  [2018-12-11T19:40:40.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 256]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 3
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 11
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 20
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 0
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:40:43.467] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 257]
  [2018-12-11T19:40:45.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 257]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 3
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 128
    start strip pixel w1 (PSS00501) = 11
    end row pixel w1 (PSS01102) = 2047
```

```
    end strip pixel w1 (PSS00502) = 20
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 0
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:40:48.467] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 258]
  [2018-12-11T19:40:50.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 258]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 3
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 256
    start strip pixel w1 (PSS00501) = 11
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 20
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
```

```
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 0
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:40:53.467] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 259]
  [2018-12-11T19:40:55.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 259]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 3
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 384
    start strip pixel w1 (PSS00501) = 11
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 20
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 0
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:40:58.467] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 260]
  [2018-12-11T19:41:00.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 260]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 3
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 512
    start strip pixel w1 (PSS00501) = 11
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 20
```

```
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 0
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:41:03.466] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 261]
  [2018-12-11T19:41:05.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 261]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 3
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 640
    start strip pixel w1 (PSS00501) = 11
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 20
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
```

```
    Compression ratio w2 (PSS00602) = 0
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:41:08.467] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 262]
  [2018-12-11T19:41:10.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 262]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 3
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 768
    start strip pixel w1 (PSS00501) = 11
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 20
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 0
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:41:13.466] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 263]
  [2018-12-11T19:41:15.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 263]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 3
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 896
    start strip pixel w1 (PSS00501) = 11
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 20
    start row pixel w2 (PSS01103) = 0
```

```
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 0
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:41:58.466] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 272]
  [2018-12-11T19:42:00.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 272]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 3
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 12
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 20
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 0
```

```
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:42:03.466] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 273]
  [2018-12-11T19:42:05.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 273]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 3
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 13
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 20
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 0
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:42:08.466] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 274]
  [2018-12-11T19:42:10.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 274]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 3
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 14
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 20
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
```

```
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 0
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:42:13.466] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 275]
  [2018-12-11T19:42:15.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 275]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 3
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 15
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 20
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 0
    Compression ratio w3 (PSS00603) = 0
```

```
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:42:18.466] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 276]
  [2018-12-11T19:42:20.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 276]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 3
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 16
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 20
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 0
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:42:23.466] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 277]
  [2018-12-11T19:42:25.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 277]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 3
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 17
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 20
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
```

```
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 0
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:42:28.466] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 278]
  [2018-12-11T19:42:30.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 278]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 3
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 18
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 20
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 0
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
```

```
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```

```
[2018-12-11T19:42:33.466] - TM(1,8) - [APID 801] - Event N/A - Telecommand Execution
Failure [Failure ID: 40000, APID: 812, Sequence n. 279]
  [2018-12-11T19:42:35.000000Z] SIMB STC SCIENCE [ZSS17202] [SSC: 279]
    integration time (PSS01501) = 500
    repetition time STC (PSS01629) = 140
    NbrAcq (PSS01602) = 3
    number of windows (PSS00301) = 1
    start row pixel w1 (PSS01101) = 0
    start strip pixel w1 (PSS00501) = 19
    end row pixel w1 (PSS01102) = 2047
    end strip pixel w1 (PSS00502) = 20
    start row pixel w2 (PSS01103) = 0
    start strip pixel w2 (PSS00503) = 0
    end row pixel w2 (PSS01104) = 0
    end strip pixel w2 (PSS00504) = 1
    start row pixel w3 (PSS01105) = 0
    start strip pixel w3 (PSS00505) = 0
    end row pixel w3 (PSS01106) = 0
    end strip pixel w3 (PSS00506) = 1
    start row pixel w4 (PSS01107) = 0
    start strip pixel w4 (PSS00507) = 0
    end row pixel w4 (PSS01108) = 0
    end strip pixel w4 (PSS00508) = 1
    start row pixel w5 (PSS01109) = 0
    start strip pixel w5 (PSS00509) = 0
    end row pixel w5 (PSS01110) = 0
    end strip pixel w5 (PSS00510) = 1
    start row pixel w6 (PSS01111) = 0
    start strip pixel w6 (PSS00511) = 0
    end row pixel w6 (PSS01112) = 0
    end strip pixel w6 (PSS00512) = 1
    Compression box dimensio (PSS00205) = 1
    Compression ratio w1 (PSS00601) = 0
    Compression ratio w2 (PSS00602) = 0
    Compression ratio w3 (PSS00603) = 0
    Compression ratio w4 (PSS00604) = 0
    Compression ratio w5 (PSS00605) = 0
    Compression ratio w6 (PSS00606) = 0
    LS bit1 PE mode (PSS00101) = 0
    Priority (PSS08008) = 0
```