



## Operations Notes

FOS Team @ ESAC

Reported by:

*J. Fauste/J.M. Castro Cerón*

Topic:

Date:

Issue:

**FOS Report for week 37, year 2016**

from 12 SEP 2016 to 19 SEP 2016

**1.0**

## 1 General Comments

Activities scheduled for this week are those planned for the 37<sup>th</sup> calendar week of 2016:

12 SEP 2016 to 19 SEP 2016 (DoYs 256 to 263).

The following routine activities were planned this week (see Gantt chart on next page and CRF 602):

- One PMS Offset on 15 SEP 2016 (DoY 259), including three Short Calibrations at 05:02:00,0z, 05:02:34,8z, and 05:03:09,6z (orbit 36104). **Cancelled** due to CCU reset on the 14<sup>th</sup> of September.
- Local Oscillator Calibrations every 10 minutes.
- X band Passes over ESAC and Svalbard.

## 2 Mission Planning Deviations

Due to the CCU reset that took place on the 14<sup>th</sup> of September 2016, the PMS Offset calibration that was supposed to take place on the 15<sup>th</sup> of September was cancelled. Also the following XBand passes were not acquired on ground due to the same anomaly:

GS Pass	AOS	LOS	Dur
Xband_SVAL	2016-09-14T23:07:02	2016-09-14T23:17:18	615
Xband_SVAL	2016-09-15T00:45:42	2016-09-15T00:56:04	622
Xband_SVAL	2016-09-15T02:24:39	2016-09-15T02:35:06	627
Xband_SVAL	2016-09-15T04:04:29	2016-09-15T04:14:23	593
Xband_ESAC	2016-09-15T05:35:00	2016-09-15T05:43:15	495
Xband_SVAL	2016-09-15T07:26:22	2016-09-15T07:33:36	434
Xband_SVAL	2016-09-15T09:08:45	2016-09-15T09:13:39	293
Xband_SVAL	2016-09-15T10:51:03	2016-09-15T10:54:32	209
Xband_SVAL	2016-09-15T12:32:04	2016-09-15T12:36:44	279
Xband_SVAL	2016-09-15T14:12:11	2016-09-15T14:19:10	419



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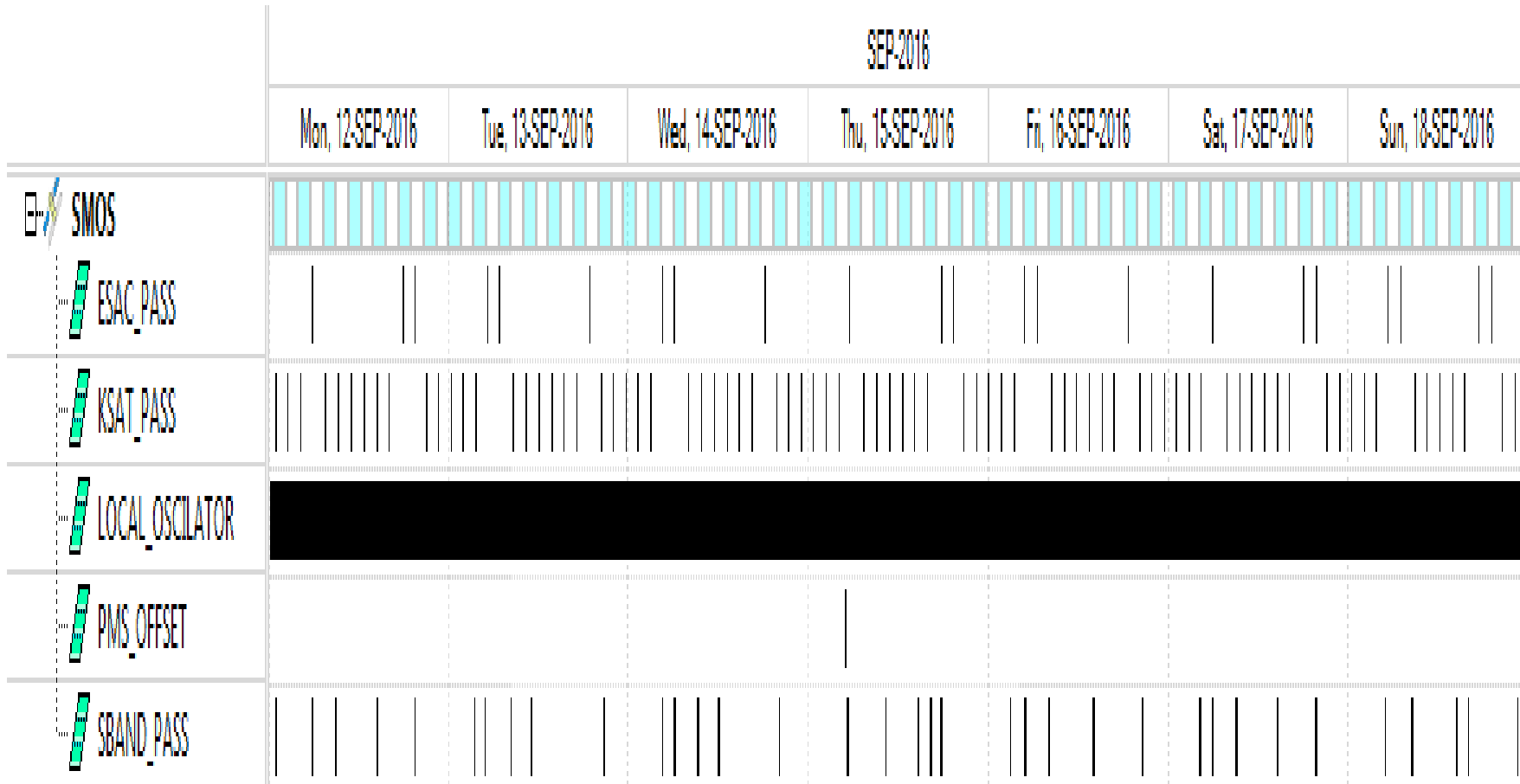
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### 3 TC Failures

None.

### 4 Unforeseen Out of Limits (OOLs)

Several unexpected Out of limits were received during this reporting period due to the CCU reset, MM latch up and CMN unlock anomalies that happened during this week. Further details can be found in section 5 and Appendix-A of this report.

### 5 On Board Anomalies

- A new Mass Memory latch-up in partition P9 happened on 2016-09-14T20:24:12.414z (DOY 258).

This anomaly was geolocated over the east coast of Brazil at the following geographical coordinates:

Latitude = -25.043795

Longitude = 319.995267

There were no science data losses associated with this anomaly because it affected one of the spare partitions (P9).

No manual recovery was necessary because the CCU reset about one hour later (2016-09-14T21:33:47.916z; DOY 258) cleaned up the latch-up.

At the time of the anomaly the position of the MM pointers were as follows:

READ= 3469254, (partition P7)

WRITE= 3553576, (partition P8)

- The MIRAS instrument CCU reset on 2016-09-14T21:33:47.916z (DOY 258). First indications of a possible CCU reset were initially triggered by a phone call from KSAT to the FOS hotline on 15 SEP 2016, around 01:30z. At that time the following X band GS passes over Svalbard were not received:

*from 2016-09-14T23:07:02.270z to 2016-09-14T23:17:18.068z*

*from 2016-09-15T00:45:42.648z to 2016-09-15T00:56:04.870z*

The reset was confirmed by CNES on reception of S band GS pass HBX-14 (AOS = 2016-09-15T05:14:10z).

The reset befell in the middle of a Svalbard X band GS pass commencing on 2016-09-14T21:28:18.708z (transponder on). Said GS pass was scheduled for a duration of 619 seconds. The reset occurred 349 seconds after AOS, and before the switch off of the X



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band antenna, scheduled on 2016-09-14T21:38:38.484z. The last TM packet received before the reset came on 2016-09-14T21:33:14.867z. MIRAS re-planning was issued by FOS that morning via CRF No. 605, and uploaded by CNES, execution of PRO-CRP-100, during S band GS pass KUX-20 on 2016-09-15T10:23:39z. As per this re-planning, nominal MIRAS X band GS dumps were resumed on 2016-09-15T15:51:55.910z.

The sequence of events leading to the CCU reset was as follows:

2016-09-15T21:29:39,184z ==> XBand Powered On

2016-09-15T21:30:03,195z ==> MM Full Dump Start

No warnings or alarm packets were received prior to the reset event.

- The MIRAS instrument CMN, unit H1, unlocked on 2016-09-15T10:24:48,348z (DOY 259).

The anomaly was geolocated over northeast of Bolivia:

Latitude = -11,095358?

Longitude = 295,461731?

Both parameters, output power SPM11162 and locking status SPM11167, went out of limits in the FOS PLPC system. The anomaly recovered by itself after 10 Epochs.

## 6 On Board Events Telemetry

The following RAM Single Bit errors befell this week:

Event Description	Severity	Event Time	Parameters
RAM single Bit Error	WARN	2016.258.21.33.48.416	21847C4

## 7 FOS Systems Status

All FOS systems nominal.

## 8 Data Reception from CNES

All S band passes were correctly received from CNES and successfully processed by the FOS PLPC system, with the following exceptions:

- S-Band GS pass HBX-17 (AOS = 2016-09-16T02:58:00z; LOS = 2016-09-16T03:08:52z) contained four PUS TM gaps:
  - from 2016-09-15T19:41:07z to 2016-09-15T19:41:34z
  - from 2016-09-15T19:48:06z to 2016-09-15T19:48:31z
  - from 2016-09-16T00:53:23z to 2016-09-16T00:54:21z
  - from 2016-09-16T01:00:12z to 2016-09-16T01:00:44z



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- S-Band GS pass STC-9 (AOS = 2016-09-17T04:17:00z; LOS = 2016-09-17T04:31:00z) contained two PUS TM gaps:
  - from 2016-09-16T23:17:36z to 2016-09-16T23:17:55z*
  - from 2016-09-16T23:18:06z to 2016-09-16T23:18:26*
- S-Band GS pass HBX-18 (AOS = 2016-09-18T04:57:17z; LOS = 2016-09-18T05:11:16z) contained six PUS TM gaps:
  - from 2016-09-17T22:01:21z to 2016-09-17T22:01:32z*
  - from 2016-09-17T22:08:08z to 2016-09-17T22:08:28z*
  - from 2016-09-18T01:04:31z to 2016-09-18T01:05:32z*
  - from 2016-09-18T01:11:08z to 2016-09-18T01:11:37z*
  - from 2016-09-18T04:03:33z to 2016-09-18T04:03:43z*
  - from 2016-09-18T04:10:15z to 2016-09-18T04:10:28z*

### **9 X Band Data Reception in PXMF**

Due to SBand data gaps reported in section 8, all the PUS Telemetry gaps were filled on the SMTA-MUST system using the PXMF XBand system.

### **10 Exceptional Activities**

None.

### **11 AOB**

None.



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### APPENDIX A: OOLs

At the time of the Mass Memory latch-up on the 14<sup>th</sup> of September the following parameters went Out of Limits on the PLPC system:

GS_TIME	OBTIME	PARAMETER	DESCRIPTION	OOL Value	Check Value
2016.259.05.46.11.316	2016.258.20.24.12.414	DMASME03	LU Switch P9	OFF	ON
2016.259.05.46.11.315	2016.258.20.24.12.414	DMASME37	SDD LU Detected	False	True

At the reception of the CCU reset anomaly the following parameters were displayed as Out of Limits on the PLPC system:

GS_TIME	OBTIME	PARAMETER	DESCRIPTION	OOL Value	Check Value
2016.259.05.49.53.947	2016.258.21.33.47.916	XNIRCAST	NIR CA VALID ST	NOT-OK	OK
2016.259.05.49.53.947	2016.258.21.33.47.916	XNIRBCST	NIR BC VALID ST	NOT-OK	OK
2016.259.05.49.53.946	2016.258.21.33.47.916	XNIRABST	NIR AB VALID ST	NOT-OK	OK
2016.259.05.49.53.943	2016.258.21.33.47.916	SPM13167	H3 LO_Locking	Unlock	Lock
2016.259.05.49.53.943	2016.258.21.33.47.916	SPM12172	H2 LO_locking	Unlock	Lock
2016.259.05.49.53.943	2016.258.21.33.47.916	SPM11167	H1 LO_Locking	Unlock	Lock
2016.259.05.49.53.943	2016.258.21.33.47.916	SPC02106	Instrument_Mode	Inst Init	Any Other
2016.259.05.49.53.942	2016.258.21.33.47.916	SPM17167	B1 LO_Locking	Unlock	Lock
2016.259.05.49.53.942	2016.258.21.33.47.916	SPM16167	A3 LO_Locking	Unlock	Lock
2016.259.05.49.53.942	2016.258.21.33.47.916	SPM15167	A2 LO_Locking	Unlock	Lock
2016.259.05.49.53.942	2016.258.21.33.47.916	SPM14167	A1 LO_Locking	Unlock	Lock
2016.259.05.49.53.941	2016.258.21.33.47.916	SPM20167	C1 LO_Locking	Unlock	Lock



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2016.259.05.49.53.941	2016.258.21.33.47.916	SPM19167	B3 LO_Locking	Unlock	Lock
2016.259.05.49.53.941	2016.258.21.33.47.916	SPM18167	B2 LO_Locking	Unlock	Lock
2016.259.05.49.53.940	2016.258.21.33.47.916	SPM22167	C3 LO_Locking	Unlock	Lock
2016.259.05.49.53.940	2016.258.21.33.47.916	SPM21167	C2 LO_Locking	Unlock	Lock

For the CMN Unlock on H1 unit the two following parameters went Out of Limits on PLPC system:

GS_TIME	OBTIME	PARAMETER	DESCRIPTION	OOL Value	Check Value
2016.259.11.06.44.790	2016.259.10.24.54.348	SPM11167	H1 LO_Locking	Unlock	Lock
2016.259.11.06.44.662	2016.259.10.24.48.348	SPM11162	H1 LO_Out_Power		

And when MIRAS instrument was recovered as part of the CCU recovery procedure, the following parameter went Out of Limits indicating that the on-board ITL was temporary disabled.

GS_TIME	OBTIME	PARAMETER	DESCRIPTION	OOL Value	Check Value
2016.259.15.10.29.166	2016.259.10.26.07.548	NTLHK022	ITL Ena State	Disable	Enable