Operations Notes
FOS Team @ ESAC
Reported by:
J. Fauste/J.M. Castro Cerón

Topic:
Date:
Issue:

FOS Report for week 25, year 2017
from 19 JUN 2017 to 26 JUN 2017

1.0

1 General Comments

Activities scheduled for this week are those planned for the 25th calendar week of 2017:

```
19 JUN 2017 to 26 JUN 2017 (DoYs 170 to 177).
```

The following routine activities were planned this week (see Gantt chart on next page and CRF 665):

- One Warm NIR Calibration on 21 JUN 2017 (DoY 172) with ETO 06:47:00z (orbit 40120) and with the following expected calibration values:

```
B.T.              =    3,5025°
R.M.S.            =    0,1175
Sun Elevation     =    9,8385°
Moon elevation    = -25,3002°
R.A.              = 186,89°
DEC.              =   40,32°
```

- One PMS Offset on 22 JUN 2017 (DoY 173), including three Short Calibrations at 13:21:20,0z, 13:21:54,8z, and 13:22:29,6z (orbit 40138).
- Local Oscillator Calibrations every 10 minutes.
- *X* band Passes over ESAC and Svalbard.

2 Mission Planning Deviations

The following *X* band passes were not acquired because of the CCU reset of 21 JUN 2017 (DoY 172):

Type	Start Time	Stop Time	Duration (s)
X band_ESAC	2017-06-21T04:38:15	2017-06-21T04:43:38	323
X band_SVAL	2017-06-21T08:07:51	2017-06-21T08:14:10	379
X band_SVAL	2017-06-21T09:50:21	2017-06-21T09:54:27	245
X band_SVAL	2017-06-21T11:32:13	2017-06-21T11:35:53	219
X band_SVAL	2017-06-21T13:12:47	2017-06-21T13:18:21	333
X band_SVAL	2017-06-21T14:52:43	2017-06-21T15:00:33	470

The NIR calibration scheduled 21 JUN 2017 (DoY 172) was acquired (i.e. the spacecraft manoeuvre was executed as planned). However, data products for that calibration were not the expected ones because the MIRAS configuration at that time was not the nominal one.

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Schedule Name: 2017_w25_cr   ###   Display start: 19-06-2017 00:00:00.000   ###   Display end: 26-06-2017 00:00:00.000

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3   TC Failures

None.

4   Unforeseen Out of Limits (OOLs)

Several parameters went OOL (see Appendix A for further details) as the MIRAS instrument:

- unit C3, unlocked 19 JUN 2017 (DoY 170),
- CCU reset 21 JUN 2017 (DoY 172),
- MM, partition P9, latched 23 JUN 2017 (DoY 174).

5   On Board Anomalies

- The MIRAS instrument CMN, unit C3, unlocked on 2017-06-19T09:03:34,820z (DoY 170). This anomaly was geolocated over Eastern Brazil:

$$Latitude = -9,806124°$$
$$Longitude = 315,827827°$$

  Locking status parameter, SPM22167, went out of limits in the FOS PLPC system. The anomaly recovered in 6 epochs.

- The MIRAS instrument CCU reset on 2017-06-21T03:08:57z (DoY 172). First symptoms of the reset were observed by the FOS on call Engineer when the expected ESAC *X* band morning pass was not received on time. The CCU reset was confirmed upon reception of the first *S* band morning pass (AUS-25 AOS=04:33z; LOS=04:48z).

  The reset took place at the end of the Svalbard *X* band GS pass commencing on 2017-06-21T03:05:00z. Said GS pass was scheduled for a duration of 623 seconds. The reset occurred 248 seconds after AOS, and before the switch off of the *X* band antenna, scheduled for 2017-06-21T03:15:24z. The last TM packet received before the reset was time-stamped at 2017-06-21T03:08:57.354z. As detailed on the instrument boot report packet issued immediately after the reset, the cause of the anomaly was the already known «Task Overrun» error.

  MIRAS re-planning was issued by FOS the same morning, 21 JUN 2017 (DoY 172), via CRF No. 666, and uploaded by CNES, following the execution of PRO-CRP-100, during *S* band GS pass KUX-27 on 2017-06-21T09:22:22z. As per this re-planning, nominal MIRAS *X* band GS dumps will be resumed on 2017-06-21 at 16:32:22z.

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The sequence of events leading to the CCU reset was:

On Board Time	Type	TM Packet Description
2017.172.03.04.49,821	EVENT	*X* Band Powered On
2017.172.03.05.13,821	EVENT	MM Full Dump Start

The values of the READ and WRITE pointers at the time of the reset were:

```
Read   = 2560389,   MM Partition P5
Write  = 2820239,   MM Partition P6
```

The anomaly was geolocated over Svalbard:

```
LAT.    = 72,790548°
LONG.   = 14,538707°
```

- The MIRAS instrument MM, partition P9, latched up on 2017-06-23T09:46:24,476z (OBT; DoY 174). This anomaly was geolocated over the jungles of Mato Grosso, Brazil:

```
LAT.    = -15,128961°
LONG.   = 305,943753°
```

There were no science data losses associated with this anomaly because it affected one of the spare partitions (P9). Recovery took place on 26 JUN 2017 (DoY 177), at 14:00:00z (CRF 668).

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

```
READ   = 106597   (partition P0)
WRITE  = 298774   (partition P0)
```

6 On Board Events Telemetry

The following RAM Single Bit errors befell this week:

Event Description	Packet ID	Severity	Event Time	Parameters
RAM Single Bit Error	730	WARN	2017.176.02.55.16,799	2148470
RAM Single Bit Error	730	WARN	2017.172.03.08.57,854	2163404
RAM Single Bit Error	730	WARN	2017.171.09.53.33,790	2163404
RAM Single Bit Error	730	WARN	2017.171.01.02.58,680	232C074

7 FOS Systems Status

- The ingestion of *X* band TM (from PXMF to SMTA) failed on 20 JUN 2017 (DoY 171) because of changes in the PLPCEXT IP tables configuration following the implementation of the PLCEXT Security Plan (i.e. the connectivity rule between PLPCEXT and PXMF had not been included). The IP tables were correctly configured and the required TM ingested in the MUST system.

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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:

- A MIRAS PUS TM gap from 2017-06-21T13:46:46,926z to 2017-06-21T15:20:40,991z (DoY 172) was detected by the FOS PLPC system for GS pass KER-5 (AoS=2017-06-21T13:45:02z; LoS=2017-06-21T13:58:42z). The reason for the anomaly was the change of *S* band GS pass on the CNES side and the incorrect update of the PROTEUS MM Pointers for that pass. PUS Telemetry was ingested from the *X* band side using the PXMF server. The permanent E_HKTM gap caused by this anomaly went from 2017-06-21T13:46:22z to 2017-06-21T15:20:46z (DoY 172).

9 *X* Band Data Reception in PXMF

- The PXMF server was used to fill the MIRAS PUS TM gap reported in section 8.

10 Exceptional Activities

None.

11 AOB

None.

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APPENDIX A: OOLs

The following OOLs befell at the time the MIRAS instrument, unit C3, unlocked 2017-06-19T09:03:34,820z (DoY 170):

GS_TIME	OB_TIME	PARAMETER	DESCRIPTION	OOL Value	Check Value
2017-06-19T14:58:12	2017-06-19T09:03:34,820	SPM22167	C3	LO_Locking	UNLOCK

The following OOLs befell at the time the MIRAS instrument CCU reset 2017-06-21T03:08:57z (DoY 172):

GS_TIME	OB_TIME	PARAMETER	DESCRIPTION	OOL Value	Check Value
2017-06-21T05:26:01	2017-06-21T03:08:57	SPM22167	C3 LO_Locking	UNLOCK	LOCK
2017-06-21T05:26:01	2017-06-21T03:08:57	SPM21167	C2 LO_Locking	UNLOCK	LOCK
2017-06-21T05:26:01	2017-06-21T03:08:57	SPM20167	C1 LO_Locking	UNLOCK	LOCK
2017-06-21T05:26:01	2017-06-21T03:08:57	SPM19167	B3 LO_Locking	UNLOCK	LOCK
2017-06-21T05:26:01	2017-06-21T03:08:57	SPM18167	B2 LO_Locking	UNLOCK	LOCK
2017-06-21T05:26:01	2017-06-21T03:08:57	SPM17167	B1 LO_Locking	UNLOCK	LOCK
2017-06-21T05:26:01	2017-06-21T03:08:57	SPM16167	A3 LO_Locking	UNLOCK	LOCK
2017-06-21T05:26:01	2017-06-21T03:08:57	SPM15167	A2 LO_Locking	UNLOCK	LOCK
2017-06-21T05:26:01	2017-06-21T03:08:57	SPM14167	A1 LO_Locking	UNLOCK	LOCK
2017-06-21T05:26:01	2017-06-21T03:08:57	SPM13167	H3 LO_Locking	UNLOCK	LOCK
2017-06-21T05:26:01	2017-06-21T03:08:57	SPM12172	H2 LO_locking	UNLOCK	LOCK
2017-06-21T05:26:01	2017-06-21T03:08:57	SPM11167	H1 LO_Locking	UNLOCK	LOCK
2017-06-21T05:26:01	2017-06-21T03:08:57	SPC02106	Instrument_Mode	Inst Init	Dual Pol; Full Pol; Calibration; Test
2017-06-21T05:26:01	2017-06-21T03:08:57	XNIRABST	NIR AB VALID ST	NOT-OK	OK
2017-06-21T05:26:01	2017-06-21T03:08:57	XNIRBCST	NIR BC VALID ST	NOT-OK	OK
2017-06-21T05:26:01	2017-06-21T03:08:57	XNIRCAST	NIR CA VALID ST	NOT-OK	OK

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2017-06-21T14:20:43	2017-06-21T09:24:29	NTLHK022	ITL Ena State	Disabled	Enabled
2017-06-21T14:20:43	2017-06-21T09:24:29	NTLHK022	ITL Ena State	Disabled	Enabled

The following OOLs befell at the time the MIRAS instrument MM, partition P9, latched up 2017-06-23T09:46:24,476z (OBT; DoY 174):

GS_TIME	OB_TIME	PARAMETER	DESCRIPTION	OOL Value	Check Value
2017-06-23T17:29:45	2017-06-23T09:46:24,476	DMASME03	LU Switch P9	OFF	ON
2017-06-23T17:29:45	2017-06-23T09:46:24,476	DMASME37	SDD LU Detected	False	True