



# Operations Notes

FOS Team @ ESAC

Reported by:

J. Fauste/J.M. Castro Cerón

Topic:

Date:

Issue:

**FOS Report for week 27, year 2020**

from 29 JUN 2020 to 06 JUL 2020

**1.0**

## 1 General Comments

Activities scheduled for this week are those planned for the 27<sup>th</sup> calendar week of 2020:

29 JUN 2020 to 06 JUL 2020 (DoYs 181 to 188).

The following routine activities were planned this week (see Gantt chart on next page and CRF 898).

- One FTR Calibration on 29 JUN 2020 (DoY 181) with ETO 16:25:45z (orbit 56011; ASCENDING: thermally UNSTABLE) and with the following expected calibration values:
  - B.T. = 3.64°
  - R.M.S. = 0.05
  - Sun elevation = -8.21°
  - Moon elevation = -51.44°
  - R.A. = 13.00°
  - DEC. = -32.13°
- One PMS Offset on 02 JUL 2020 (DoY 184), including three Short Calibrations at 05:50:30.0z, 05:51:04.8z, and 05:51:39.6z (orbit 56048).
- Local Oscillator Calibrations every 10 minutes.
- X band Passes over ESAC and Svalbard.

## 2 Mission Planning Deviations

Because of the CCU reset 29 JUN 2020 the following X band GS passes were not acquired (see Sect. 4):

Station	AoS	LoS	Duration
Xband_SVAL	2020-06-29T20:16:41	2020-06-29T20:27:07	625
Xband_SVAL	2020-06-29T21:55:34	2020-06-29T22:05:52	617
Xband_SVAL	2020-06-29T23:34:16	2020-06-29T23:44:32	616
Xband_SVAL	2020-06-30T01:12:58	2020-06-30T01:23:23	624
Xband_SVAL	2020-06-30T02:52:03	2020-06-30T03:02:29	625
Xband_SVAL	2020-06-30T04:32:17	2020-06-30T04:41:49	572
Xband_SVAL	2020-06-30T07:54:31	2020-06-30T08:01:09	398
Xband_SVAL	2020-06-30T09:37:00	2020-06-30T09:41:21	260
Xband_SVAL	2020-06-30T11:19:02	2020-06-30T11:22:35	212



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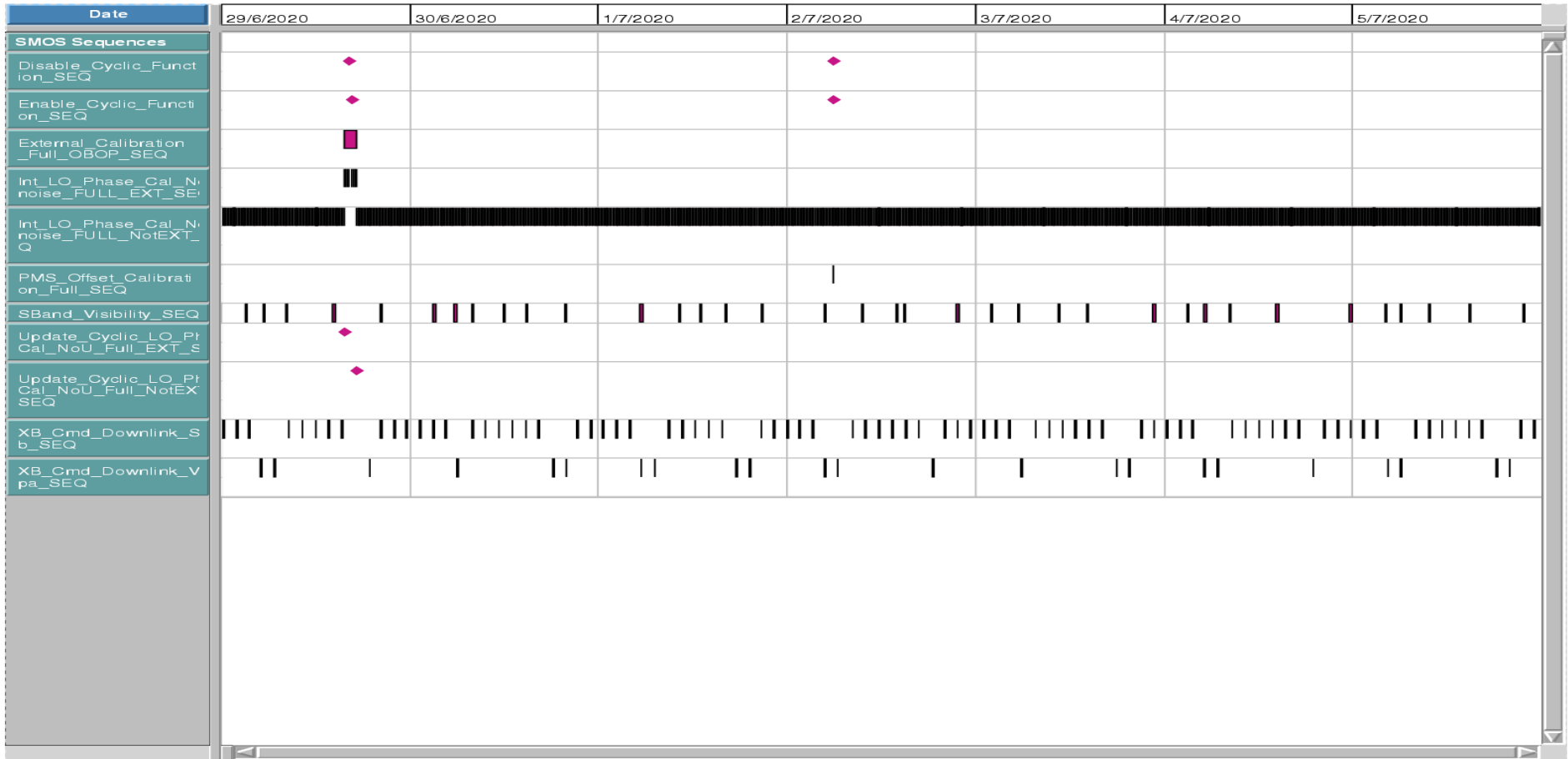
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Schedule Name: 2020\_w27\_cr ### Display start: 29-06-2020 00:00:00.000 ### Display end: 06-07-2020 00:00:00.000





## 3 TC Failures

None.

## 4 On Board Anomalies

- A new MIRAS CCU reset happened on 2020-06-29T18:53:26z. The reset took place in the middle of X band ESAC pass with AOS at 18:49:08z. First suspicions for the anomaly were triggered by the FOS X band data model SW since 20% of the expected data for that pass was not received on ground. Final confirmation of the CCU reset came upon reception of S band pass with AOS at 20:16:51z and notified to FOS through a phone call from CNES on-call support. Following that call, another one from KSAT to FOS also notified the not acquisition on ground of Svalbard X band pass with AOS at 20:16:41z.

After the reset and while the spacecraft was still flying over ESAC, the on-board auto-downlink function triggered the switch on of the X band transmitter from 18:54:04z to 18:54:52z. This show once more that the new OBSW version 2.8.5.1. which fixed the auto-downlink problem found in November 2018, is now working nominally. Recovery took place on the 30th of June according CRF-899 and uploaded during S band pass IVK-29 with AOS at 07:55:44z. According to this CRF, resume of X band activities took place on the 30th of June at 13:00:15z.

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

2020-06-29T18:49:40,082	XBand Powered On
2020-06-29T18:50:04,082	MM Full Dump Start

And immediately after, without any further error or alarm packet, the instrument reset. As reported in the instrument Boot report packet, the reason for the reset was the usual Task Overrun error.

See Appendix A for a list of OOLs displayed in the FOS PLPC system immediately after the reset. Immediately after the reset, and once the OBSW restarted, the following event packets marked the execution of the auto-downlink function:

2020-06-29T18:54:03,538	GS_Detection_Visible
2020-06-29T18:54:04,508	Event_Action_Released
2020-06-29T18:54:04,738	XBand Powered On
2020-06-29T18:54:28,738	MM Full Dump Start
2020-06-29T18:54:31,138	MM Dump Ended
2020-06-29T18:54:52,739	XBand Powered Off
2020-06-29T18:58:35,942	GS_Detection_NOT_Visible
2020-06-29T18:58:36,912	Event_Action_Released
2020-06-29T18:58:36,912	MM No Dump Aborted

The ESAC X band pass scheduled 2020-06-30T06:02:20z was executed through the on-board auto-downlink function.



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At the time of the anomaly the position of the MM write and read pointers was as follows:

Write Pointer= 223640, Partition P0

Read Pointer = 3692644, Partition P8

The anomaly took place over Spain around the following geographical coordinates:

Latitude = 39.98°

Longitude= 354.09°

## 5 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	WARNING	2019.181.18.54.02,508	231BB08
RAM Single Bit Error	730	WARNING	2019.184.21.44.14,011	22281D8

## 6 FOS Systems Status

All FOS systems nominal.

## 7 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:

- The following S band GS passes:

STATION	PASS	AoS	LoS
-----			
KRX	03	2020.185.22.38.11	2020.185.22.50.49

contained 11 s of MIRAS PUS TM without time correlation stamps. Consequently they were stored by SCOS-2000 in data stream 4. The affected data went:

*from 2020.185.14.16.17z to 2020.185.14.19.57z.*

- The following S band GS passes:

STATION	PASS	AoS	LoS
-----			
KRX	05	2020.187.14.46.33	2020.187.14.58.10

contained 2 MIRAS PUS TM gaps. The gaps went:

*from 2020.187.12.13.08z to 2020.187.12.13.27z; 109 packets lost  
from 2020.187.14.40.49z to 2020.187.14.41.52z; 107 packets lost*

To achieve completion MIRAS PUS TM was recovered from the X band PXMF system and ingested into the MUST-SMTA system 06 JUL 2020. The uncorrelated data were deleted both in data stream 4 and the MUST-SMTA system. PROTEUS E HKTM was not affected.



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## 8 X Band Data Reception in PXMF

- On 06 JUL 2020 the PXMF server was used to fill the following MIRAS PUS TM gaps:

*from 2020.185.14.16.17z to 2020.185.14.19.57z*

*from 2020.185.23.03.57z to 2020.185.23.04.07z*

*from 2020.187.12.13.08z to 2020.187.12.13.27z*

*from 2020.187.14.40.49z to 2020.187.14.41.52z*

PROTEUS E HKTM was not affected.

## 9 Exceptional Activities

None.

## 10 AOB

None.



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## APPENDIX A: OOLs

The following OOLs befell at the time the MIRAS instrument CCU reset 2020-06-29T18:53:26z (DoY 181):

GS_TIME	OB_TIME	PARAMETER	DESCRIPTION
2020.181.18.54.02.008	2020.181.20.57.48.735	XNIRCAST	NIR CA VALID ST
2020.181.18.54.02.008	2020.181.20.57.48.735	XNIRBCST	NIR BC VALID ST
2020.181.18.54.02.008	2020.181.20.57.48.735	XNIRABST	NIR AB VALID ST
2020.181.18.54.02.008	2020.181.20.57.48.734	SPM22167	C3 LO_Locking
2020.181.18.54.02.008	2020.181.20.57.48.734	SPM21167	C2 LO_Locking
2020.181.18.54.02.008	2020.181.20.57.48.734	SPM20167	C1 LO_Locking
2020.181.18.54.02.008	2020.181.20.57.48.734	SPM19167	B3 LO_Locking
2020.181.18.54.02.008	2020.181.20.57.48.734	SPM18167	B2 LO_Locking
2020.181.18.54.02.008	2020.181.20.57.48.734	SPM17167	B1 LO_Locking
2020.181.18.54.02.008	2020.181.20.57.48.734	SPM16167	A3 LO_Locking
2020.181.18.54.02.008	2020.181.20.57.48.734	SPM15167	A2 LO_Locking
2020.181.18.54.02.008	2020.181.20.57.48.734	SPM14167	A1 LO_Locking
2020.181.18.54.02.008	2020.181.20.57.48.734	SPM13167	H3 LO_Locking
2020.181.18.54.02.008	2020.181.20.57.48.734	SPM12172	H2 LO_locking
2020.181.18.54.02.008	2020.181.20.57.48.734	SPM11167	H1 LO_Locking
2020.181.18.54.02.008	2020.181.20.57.48.734	SPC02106	Instrument_Mode