

**BepiColombo**

**FLIGHT REPORTS**  
**of MPO-MAG**

**BC-MAG-TR-1009**

Issue: 2    Revision: 1

2022-12-19

**OVERVIEW OF**  
**AVAILABLE MPO-MAG DATA**  
**AND**  
**DATA QUALITY ASSESSMENT**

Mission Phase:	MGA-1
Time Period	September 30, 2021 - October 04, 2021

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## 1 Introduction

This document provides information about all available data and its quality for the time period between September 30, 2021 until October 04, 2021. This covers the Mission Phase Mercury Gravity Assist 1 (MGA-1).

For every year, month and day where measurement data are available overview plots have been created. The data availability plots show all data calibration levels available. The science modes of the data are distinguished by different colors. An overview table of available data completes the data overview.

Furthermore a list of known relevant events happening onboard the s/c is present to give a hint, where the data quality might be diminished by s/c interference.

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## 1.1 Relevant Events for MPOMAG

Switch on	Switch off	EVENTS	VISIBLE	REFERENCE
2021-09-23T12:10	2021-09-21T23:10:00	<p>MPO-MAG switched off due to IMU test MPO-MAG switch on (16 Hz)</p> <p>REMARK: On the -X wing, most power is still being provided by the external panel APRs 20 to 30), with regulation being done on APR 2 and 4. On the +X wing, APR 7 and 13 to 29 are at 0, APR1 generates max. power, APR 3 and 5 are regulating. Ka-band Tx on DST1 switched off on 2021-09-29T16:19 2021-09-29T21:03 HPR heater off MTM pre-heating started at 2021-09-30T23:23 2021-09-30T23:34 MPOMAG to 128Hz for C/A science</p> <p>2021-10-01T07:24 SERENA ON (PICAM and MIPA) 2021-10-01T18:34 Swap from HGA to MGA 2021-10-01T18:34 to 21.34 slew to C/A attitude 2021-10-01T22:34 MGA commanded to HOLD MTM pre-heating stopped at 2021-10-01T23:18 2021-10-01T23:18 MTM heaters configured for eclipse, MTM heater consumption drops ;50W 2021-10-01T23:21 PLDs disabled, MPO battery starts to discharge 2021-10-01T23:23 Eclipse start, MTM battery starts to discharge 2021-10-01T23:25 MPO battery EoC set to 22.2V (40%) to prevent battery re-charge after eclipse 2021-10-01T23:33 STR2 shutters closed Periherm: 2021-10-01T23:34:41.604, Eclipse for 13 min 19s (penumbra entry to exit). Periherm distance is 2639.272 km (199 km altitude) 2021-10-01T23:36 Eclipse end, MTM battery starts to recharge</p>	yes	<p>PN, Tiago PN, Tiago</p> <p>MOR #123</p> <p>MOR #124 MOR #124 DR-01-10 DR-01-10</p> <p>DR-01-10 DR-01-10 DR-01-10 DR-01-10 DR-02-10 DR-02-10</p> <p>DR-02-10</p> <p>DR-02-10</p> <p>DR-02-10</p> <p>DR-02-10 MOR #125</p> <p>MOR #125 DR-02-10</p>

Switch on	Switch off	EVENTS	VISIBLE	REFERENCE
		2021-10-01T23:38 PLDs enabled		DR-02-10
		2021-10-01T23:39 MTM heaters set to cruise settings		DR-02-10
		2021-10-02T00:06 PHEBUS Off		DR-02-10
		2021-10-02T00:29 STR2 shutters open		DR-02-10
		2021-10-02T00:34 MGA back to Earth tracking		DR-02-10
		2021-10-02T01:04 MIXS-C and MIXS-T power down by OBCP		DR-02-10
		2021-10-02T01:12 SERENA MPIA/PICAM switch off via OBCP		DR-02-10
		2021-10-02T01:34 WOL		DR-02-10
		2021-10-02T02:19 SERENA switch on, IPA ON (02:21) and PICAM on (02:24)		DR-02-10
		2021-10-02T02:29 HGA commanded to STEER		DR-02-10
		2021-10-02T02:34 Slew from C/A starts		DR-02-10
		2021-10-02T02:59 HGA commanded back to HOLD for the slew		DR-02-10
		2021-10-02T03:14 STR2 back to tracking		DR-02-10
		2021-10-02T03:33 STR1 lost tracking		DR-02-10
		2021-10-02T04:15 STR1 re-gained tracking		DR-02-10
		2021-10-02T05:19 Carrier down at NNO, ranging stopped prior to antenna swap MGA → HGA		DR-02-10
		2021-10-02T05:25 Swap from MGA to HGA commanded on board		DR-02-10
		2021-10-02T05:34 HGA commanded to Earth tracking, slew from CA ends		DR-02-10
		2021-10-02T05:39 AOS on HGA		DR-02-10
		2021-10-02T05:44 Sweep completed and RNG restarted		DR-02-10
		2021-10-02T07:27 SERENA MIPA/PICAM switch off		DR-02-10
		2021-10-02T07:34 MGA commanded to HOLD		DR-02-10

Switch on	Switch off	EVENTS	VISIBLE	REFERENCE
		<p>2021-10-02T12:00 start of MPO battery discharge to 40%                      As the MPO power consumption is quite low, 3 PLDs OFF are not enough to start battery discharge. The fourth PLD is therefore switched OFF at 2021-10-02T12:22.                      Still, the battery current is -8A and discharge to slow.                      To ensure a quick completion the following actions are taken at 2021-10-02T13:40:</p> <ul style="list-style-type: none"> <li>— switch on PLD 4</li> <li>— switch on Ka-band TX on DST1 (90W) → with PLD 4 ON, the increased power demand is still insufficient to start battery discharge.</li> <li>— switch off PLD 4 at 2021-10-02T13:54</li> </ul> <p>Switch off of Ka-band TX on DST1 at 2021-10-02T18:30.                      2021-10-02T16:50 Event "DMS S12 trig MPO Battery 40% SoC" triggers stopping the MPO battery discharge .                      After the restart of the PLDs, the MPO Battery voltage (NPWSY150) =reads 22.19 V, i.e. the discharge process does not need to be repeated.</p> <p>2021-10-02T23:34 MPOMAG back to 16Hz for cruise science</p>		<p>DR-02-10                      DR-02-10</p> <p>DR-02-10</p> <p>DR-02-10</p> <p>MOR #124</p>

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**2 2021**



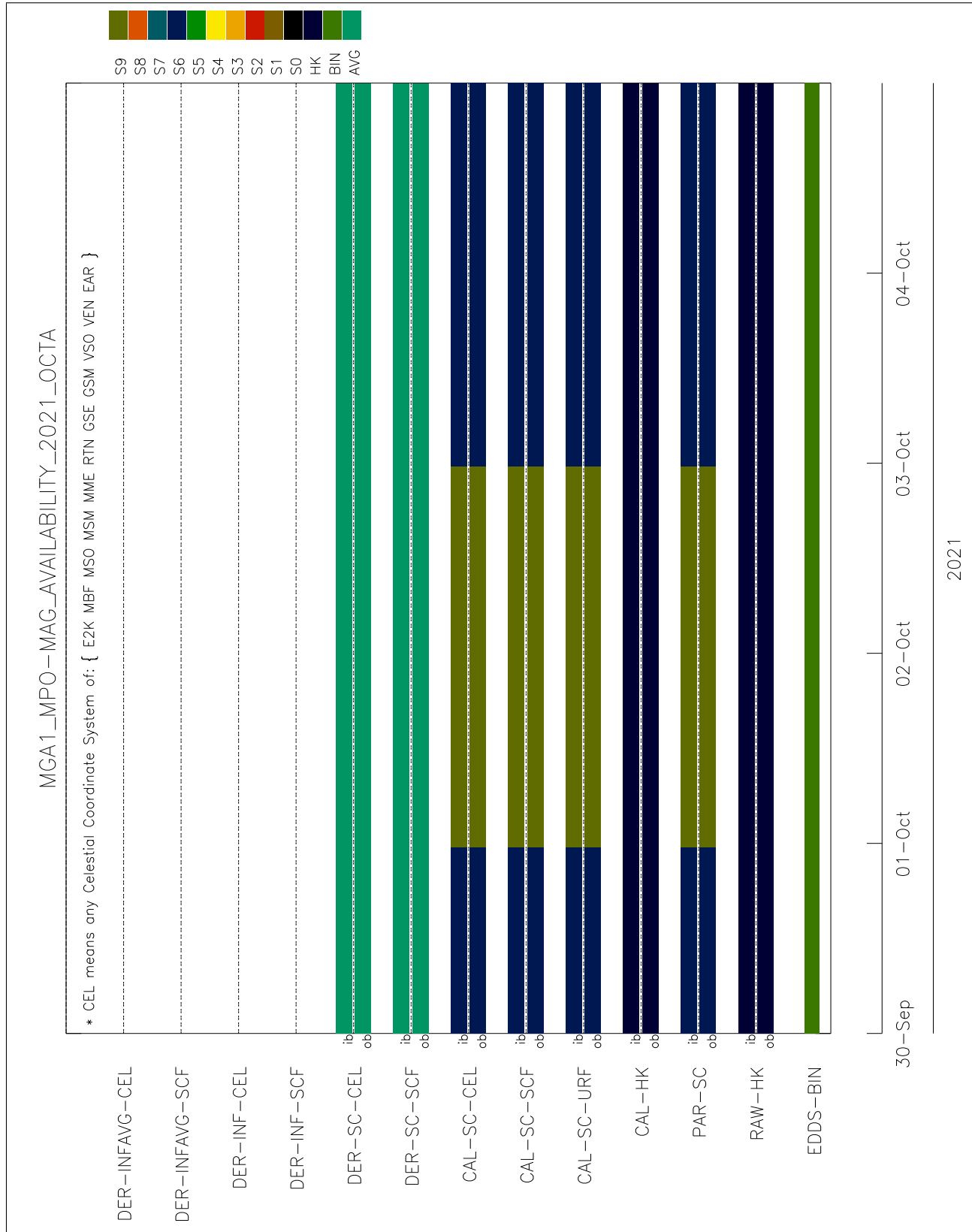


Figure 1: Overview September/October 2021

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DATE	CALIBRATION LEVEL	COORDINATES	SAMPLE RATES (Hz)		
2021-09-30	edds_bin	URF	all available		
2021-09-30	raw_hk_ob	URF	standard HK rate		
2021-09-30	cal_hk_ob	URF	standard HK rate		
2021-09-30	par_sc_ob	URF	16	128	
2021-09-30	cal_sc_ob	URF	16	128	
2021-09-30	cal_sc_ob	SCF	16	128	
2021-09-30	cal_sc_ob	E2K MSO	16	128	
2021-09-30	der_sc_ob	URF	N / A		
2021-09-30	der_sc_ob	SCF			AVG
2021-09-30	der_sc_ob	E2K MSO			AVG
2021-09-30	raw_hk_ib	URF	standard HK rate		
2021-09-30	cal_hk_ib	URF	standard HK rate		
2021-09-30	par_sc_ib	URF	16	128	
2021-09-30	cal_sc_ib	URF	16	128	
2021-09-30	cal_sc_ib	SCF	16	128	
2021-09-30	cal_sc_ib	E2K MSO	16	128	
2021-09-30	der_sc_ib	URF	N / A		
2021-09-30	der_sc_ib	SCF			AVG
2021-09-30	der_sc_ib	E2K MSO			AVG
2021-09-30	der_inf	URF	N / A		
2021-09-30	der_inf	SCF	N / A		
2021-09-30	der_inf		MISSING!!		
2021-10-01	edds_bin	URF	all available		
2021-10-01	raw_hk_ob	URF	standard HK rate		
2021-10-01	cal_hk_ob	URF	standard HK rate		
2021-10-01	par_sc_ob	URF		128	
2021-10-01	cal_sc_ob	URF		128	
2021-10-01	cal_sc_ob	SCF		128	
2021-10-01	cal_sc_ob	E2K MSO		128	
2021-10-01	der_sc_ob	URF	N / A		
2021-10-01	der_sc_ob	SCF			AVG
2021-10-01	der_sc_ob	E2K MSO			AVG
2021-10-01	raw_hk_ib	URF	standard HK rate		
2021-10-01	cal_hk_ib	URF	standard HK rate		
2021-10-01	par_sc_ib	URF		128	
2021-10-01	cal_sc_ib	URF		128	
2021-10-01	cal_sc_ib	SCF		128	
2021-10-01	cal_sc_ib	E2K MSO		128	
2021-10-01	der_sc_ib	URF	N / A		
2021-10-01	der_sc_ib	SCF			AVG
2021-10-01	der_sc_ib	E2K MSO			AVG
2021-10-01	der_inf	URF	N / A		

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DATE	CALIBRATION LEVEL	COORDINATES	SAMPLE RATES (Hz)		
2021-10-02	edds_bin	URF	all available		
2021-10-02	raw_hk_ob	URF	standard HK rate		
2021-10-02	cal_hk_ob	URF	standard HK rate		
2021-10-02	par_sc_ob	URF	16	128	
2021-10-02	cal_sc_ob	URF	16	128	
2021-10-02	cal_sc_ob	SCF	16	128	
2021-10-02	cal_sc_ob	E2K MSO	16	128	
2021-10-02	der_sc_ob	URF	N / A		
2021-10-02	der_sc_ob	SCF			AVG
2021-10-02	der_sc_ob	E2K MSO			AVG
2021-10-02	raw_hk_ib	URF	standard HK rate		
2021-10-02	cal_hk_ib	URF	standard HK rate		
2021-10-02	par_sc_ib	URF	16	128	
2021-10-02	cal_sc_ib	URF	16	128	
2021-10-02	cal_sc_ib	SCF	16	128	
2021-10-02	cal_sc_ib	E2K MSO	16	128	
2021-10-02	der_sc_ib	URF	N / A		
2021-10-02	der_sc_ib	SCF			AVG
2021-10-02	der_sc_ib	E2K MSO			AVG
2021-10-02	der_inf	URF	N / A		
2021-10-02	der_inf	SCF	N / A		
2021-10-02	der_inf		MISSING!!		
2021-10-03	edds_bin	URF	all available		
2021-10-03	raw_hk_ob	URF	standard HK rate		
2021-10-03	cal_hk_ob	URF	standard HK rate		
2021-10-03	par_sc_ob	URF	16		
2021-10-03	cal_sc_ob	URF	16		
2021-10-03	cal_sc_ob	SCF	16		
2021-10-03	cal_sc_ob	E2K MSO	16		
2021-10-03	der_sc_ob	URF	N / A		
2021-10-03	der_sc_ob	SCF			AVG
2021-10-03	der_sc_ob	E2K MSO			AVG
2021-10-03	raw_hk_ib	URF	standard HK rate		
2021-10-03	cal_hk_ib	URF	standard HK rate		
2021-10-03	par_sc_ib	URF	16		
2021-10-03	cal_sc_ib	URF	16		
2021-10-03	cal_sc_ib	SCF	16		
2021-10-03	cal_sc_ib	E2K MSO	16		
2021-10-03	der_sc_ib	URF	N / A		
2021-10-03	der_sc_ib	SCF			AVG
2021-10-03	der_sc_ib	E2K MSO			AVG
2021-10-03	der_inf	URF	N / A		

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2021-10-04	edds_bin	URF	all available
2021-10-04	raw_hk_ob	URF	standard HK rate
2021-10-04	cal_hk_ob	URF	standard HK rate
2021-10-04	par_sc_ob	URF	16
2021-10-04	cal_sc_ob	URF	16
2021-10-04	cal_sc_ob	SCF	16
2021-10-04	cal_sc_ob	E2K MSO	16
2021-10-04	der_sc_ob	URF	N / A
2021-10-04	der_sc_ob	SCF	AVG
2021-10-04	der_sc_ob	E2K MSO	AVG
2021-10-04	raw_hk_ib	URF	standard HK rate
2021-10-04	cal_hk_ib	URF	standard HK rate
2021-10-04	par_sc_ib	URF	16
2021-10-04	cal_sc_ib	URF	16
2021-10-04	cal_sc_ib	SCF	16
2021-10-04	cal_sc_ib	E2K MSO	16
2021-10-04	der_sc_ib	URF	N / A
2021-10-04	der_sc_ib	SCF	AVG
2021-10-04	der_sc_ib	E2K MSO	AVG
2021-10-04	der_inf	URF	N / A
2021-10-04	der_inf	SCF	N / A
2021-10-04	der_inf		MISSING!!