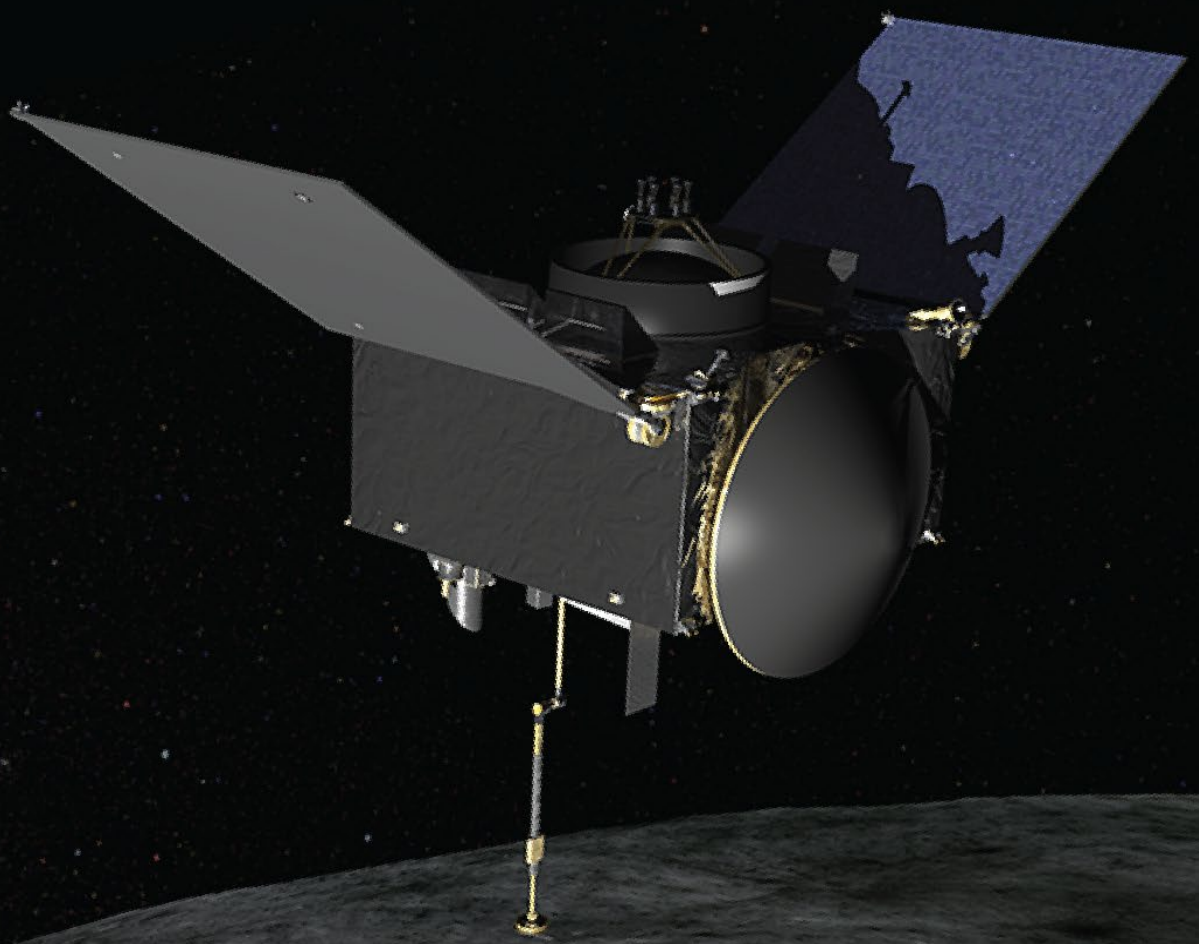
Daily Downlink Tagup

Friday, July 5, 2019 (DOY 186)

OSIRIS-REx™

ASTEROID SAMPLE RETURN MISSION



Agenda & Logistics

- **Quicklook**
- **DSN Schedule**
- **Observation Timeline**
- **Uplink/Execution/Downlink Summary**
- **Alarms, Watch items, ISAs, PFRs**
- **Need for Retransmit, need for Replay?**
- **Science / PI Comments**
- **Go-backs / Additional Comments**

Daily Downlink Summaries available shortly after each Tagup at on the OREx Ops Wiki:

https://orexwiki.lpl.arizona.edu/wiki/Main_Page (LDAP login)

Daily Downlink Slides available shortly after each Tagup at:

OSIRIS-REx Bennu Proximity Operations/Science Implementation/Downlink_Daily_Summary/2019

Quicklook & Weekly Status

Team	Status	Comment
Spacecraft	G	No issues
Electrical Power System	G	No issues
Flight Software	G	No issues
Fault Protection	G	No issues
G&NC	G	No issues
Mechanisms	G	No issues
Propulsion	G	No issues
Telecom	G	No issues
Thermal	G	No issues
Payload Interfaces	G	No issues

	Health				Safety		Performance			Powered State	GO/NO-GO
OCAMS										**ON**	**GO**
OLA										**OFF**	**GO**
OTES										**ON**	**GO**
OVIRS										**OFF**	**GO**
REXIS										**ON**	**GO**
	Thermal	Power	Command Response	Alarms	Trending	Limited Life & Mechanisms	Data Completeness	Pipeline Status	Science Concurrence		

OLA Safing – DOY 183

Timeline of Events leading up to Safing

DOY 182

- We kicked off the first Global Mapping ATF on DOY 2019-182/21:00. Involved OCAMS, OLA, OTES and REXIS data collection at NADIR point.

DOY 183

- OLA completed 17 of 19 Scans in the first execution of ATF "A"
- OLA did not respond to an aliveness check after 183/01:54:45. The laser was not scanning at that time, and the OLA system was in the "ARMED" state.
- S/C detected First Aliveness error at 01:54:47.3
- The S/C vm loaded OLA safing block into Engine 13 at 2019-183/01:54:47. 7
- OLA was powered OFF and the Operational heaters were set back to NON-OP at 2019-183/01:54:54
- Global Mapping proceeding without OLA. PolyCam utilized the default Orb B focus position

OLA Team Assessment:

- SC channelized telemetry do not indicate any issues (current draw, line voltages, heaters)
- OLA internal data indicate that all internal voltages and temperatures were nominal up until the point at which the anomaly occurred.
- There were two anomalous OLA bits read out in internal OLA SOH data:
  - LELT Power – which indicates the last command that was issued to the laser
  - LELT Ready – which is a readout of the current thermal state of the LELT laser (ready to scan or not)
  - This SOH message was sent at 01:54:35.6 (last message before SAFE). OLA was in the "ARMED" state, and was waiting for the next scan (no laser operation).
- The S/C Integrated Report did not indicate anything anomalous in instrument or S/C commanding around the time of the safing event

S/C Team Assessment:

- Spacecraft subsystems identified no anomalous readings in power or thermal around the time of the safing event

Possible causes:

- It is possible that the OLA Single Board Computer (SBC) or an internal FPGA was upset (SEU).
  - Both of these parts are latch-up immune, and are expected to recover on cycling power.

OLA Safing – DOY 183

OLA Recommendation:

- Cycle OLA power to see if the fault is persistent.
- Attempt a LELT scan to see if the system has fully recovered. This can be done in series with power cycling.
- We do not require direct communication with SC during this period.
- MDA believes that this should either clear the fault (in the event of a SEU) or should again SAFE (if something more serious is the root cause).
  - There is no indication that OLA will become damaged, or cause damage to the SC, as a result of this power cycle + scan.

Path Forward

- Preheat OLA:
  - 2019-183/19:11 UTC (12:11 MST) – MSA Uplinked the contingency commanding to return OLA_ELEC and OLA_OPTICS back to their OPERATIONAL set points. As of this morning, OLA has confirmed the sensor temps have warmed up nominally and OLA is safe to power-on
- Clear the OLA Safing GV:
  - 2019-184/13:50 UTC (6:50 MST) – MSA Uplinked the contingency commanding to set GV_OLA_SAFED to "FALSE". This will allow OLA to accept the commanding to power-on
- Power-ON OLA:
  - 2019-184/20:44 UTC (13:44 MST) - Sci-genie will run ola_pwr_on_no_htr (out of contact).
- Proceed with Nominal Ops, which will including firing LELT:
  - 2019-184/21:00 UTC (14:00 MST) – ATF "A" will kick off. This includes firing LELT for 5-min durations every ~18 minutes over a 5.4 hour window (total of 19 OLA scans)
- Review OLA science and housekeeping
- 2019-185/14:15 UTC (07:15 MST) – HGA Pass start. We will get an alarm immediately at the start of the pass if OLA has safed again. Otherwise, we should see the OLA science data begin to arrive at the SPOC ~45 minutes into the HGA Pass, around 15:00 (8 AM MST).

Downlink Schedule (times in UTC)

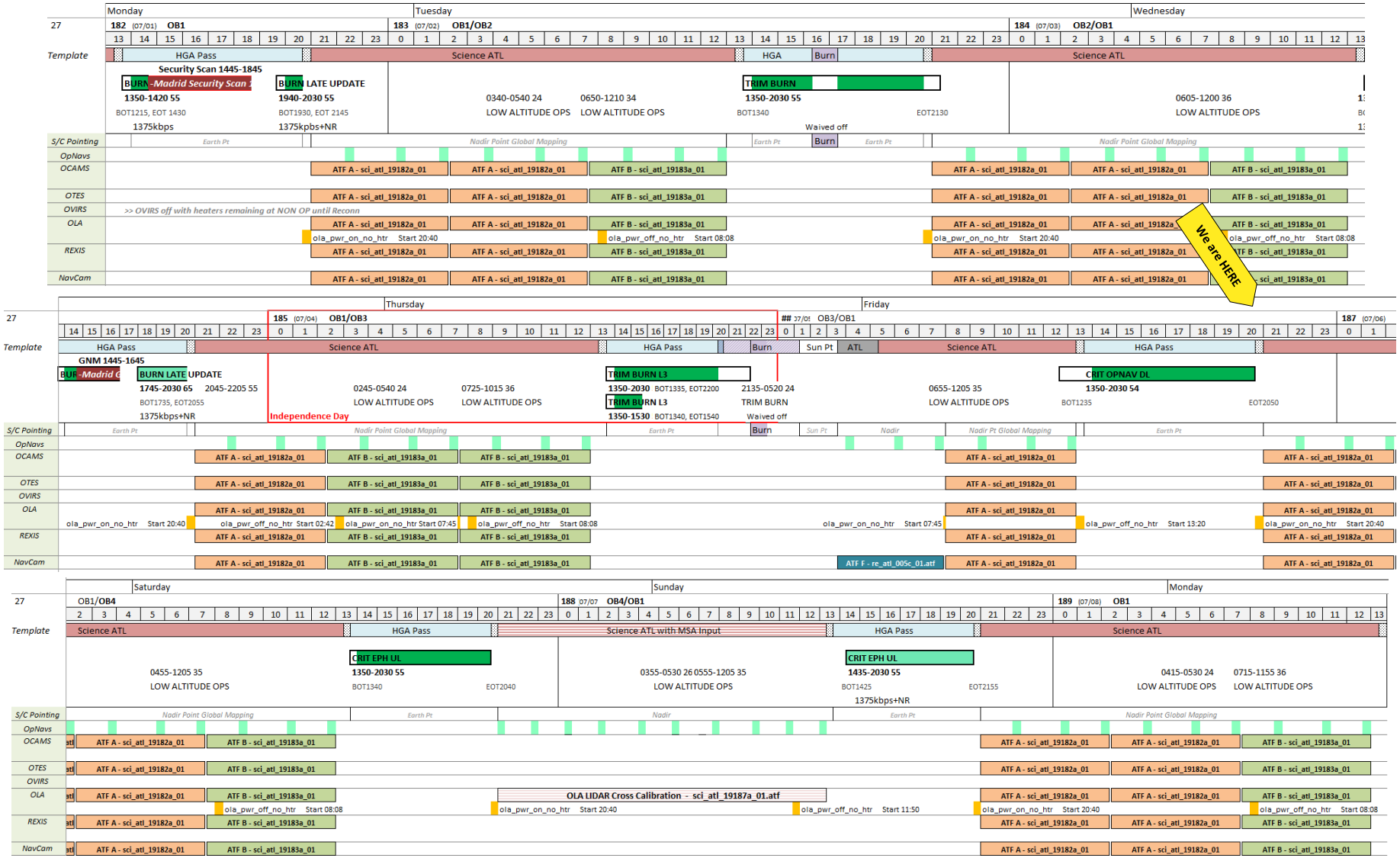
- ***Current Data Rate: 1.3 Mbps***

WOY	DOY	Start Date	HGA Start	End Date	HGA End	Duration	Note
26	182	2019-07-01	13:40	2019-07-01	20:40	00:45	**1.3 Mbps – Split Pass reduces downlink to < 1 hr *COMPLETE***
27	183	2019-07-02	14:03	2019-07-02	20:30	5:49*	***M6B *Waived Off*. Return to 916 kbps. *COMPLETE***
27	184	2019-07-03	14:06	2019-07-03	20:34	2:10	**1.3 Mbps – Madrid GNM will reduce downlink duration by ~2.5 hrs. *PROBLEMS***
27	185	2019-07-04	14:03	2019-07-04	20:38	6:35*	***M7B *Waived Off*. Return to 916 kbps. *COMPLETE***
27	186	2019-07-05	14:06	2019-07-05	20:40	6:34	*IN PROGRESS*
27	187	2019-07-06	14:06	2019-07-06	20:39	6:33	
27	188	2019-07-07	14:52	2019-07-07	20:38	5:46	**1.3 Mbps**

```
Madrid Unable to Build Links, DOY 184/1645z
On DOY 184/1645z, at the end of Madrid's Ground Network Maintenance,
upcoming links did not build nominally and workarounds were used to build
links.  Projects impacted include ORX. At 2000z, the Madrid SA recommended
reverting back to previous network switch configuration.

Madrid is now able to build connection links, DOY 184/2130z, Closed
On DOY 184/2130z, SPC-10 reported Madrid is now able to build connection
links. Please refer to the Electronic Equipment Status Board on DRMS for
details

DSS65/ORX     184/1740Z  DR  M111582   Unknown/MDS1            Entered
              184/2055Z  0195
              Originating Site:GDSCC
              Controlling Site:GDSCC

              Because of the problems with MDS1, no data was obtained. After the MDS
              issue had been resolved, the station could not bring up any
              subsystems. Around 2000z, the station was able to bring up
              displays and attempted to get the antenna on point. However, they
              could no load predicts. Multiple attempts to distribute predicts from
              the SDL were unsuccessful.

              TLM     LOST        180
              CMD     LOST        190
              DOP1    LOST        20
              DOP2    LOST        175
```

```
RED EQUIPMENT STATUS:
SPC/DSS    EQUIPMENT     ETRO
-------    ---------     ----
SPC10      RSR2          186/2300z
DSS54      NDA           236/1530z
DSS14      X500kw-R      310/2300z
SPC60      VSR           350/1648z
DSS63      EAC           355/1621z
```

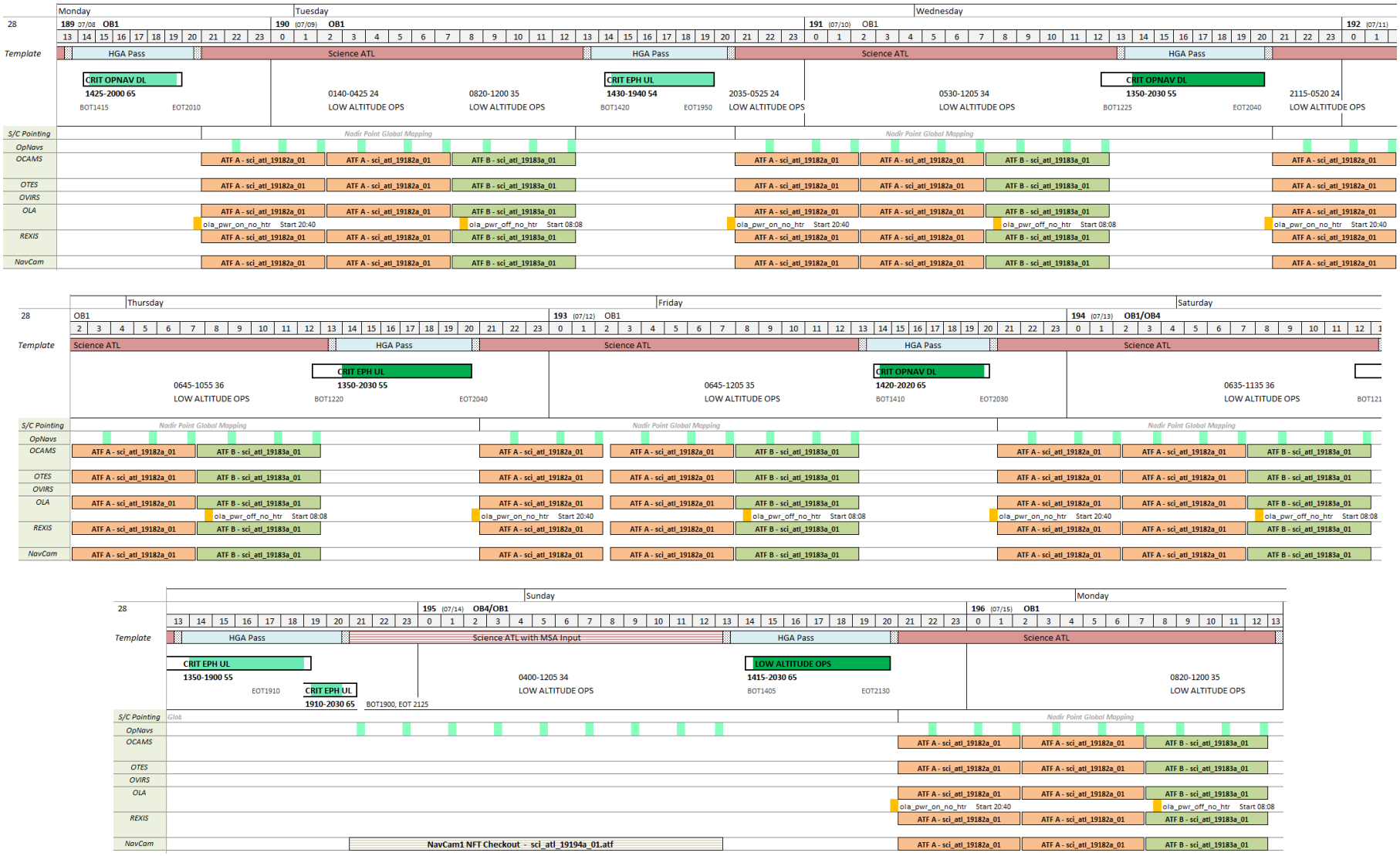
Orbital B Global Mapping, OLA LIDAR Cross Cal 1, M6B & M7B *(both waived off)*
WOY 27



Mission stats as of 2019-06-26 (L+1021):

- Earth Range: 1.11 AU (↑)
- Sun Range: 1.31 AU (↑)
- Bennu Range: 0.95 km (in orbit)
- One Way Light-Time: 00:09:15 hh:mm:s (↑)

Orbital B Global Mapping, NavCam1 NFT Checkout 1
WOY 28



Orbital B Key

ATF A: OLA, PolyCam, OTES, REXIS, OpNav, and Particle Imaging
ATF B: Polycam, OTES, REXIS, OpNav, and Particle Imaging
ATF C: OTES, REXIS, OpNav, and Particle Imaging
ATF D: MapCam, OTES, REXIS, OpNav, and Particle Imaging
ATF E: OLA, OTES, REXIS, OpNav, and Particle Imaging
ATF F: OpNav + Particle Imaging Only

Uplink Summary

UPLINK

WOY 28 (2019-189 – 2019-196)

- BG Seq, Sci Genies, Payload Sequences uplinked 2019-186

Ephemeris Updates

- Ephemeris Update: od159 uplinked 2019-180
- Ephemeris Update: od160 uplinked 2019-183
- Ephemeris Update: od161 uplinked 2019-186

Other Files

Uplink products related to OLA Safing Event - 183

- Thermal commanding to set OLA_OPTICS and OLA_ELEC to their "OP" set points uplinked 2019-183/19:12
- S/C Cleanup commanding after OLA-safing uplinked 2019-183/19:12
- Contingency commanding to clear GV_OLA_SAFING uplinked 2019-184/13:50

Execution Summary

Executed (times in UTC):

- 2019/183 (Tuesday, July 2nd)
  - Start of Global Mapping for Orbital B.
  - Executes ATF A, A, B
    - # of NavCam OpNav images expected: 9 / 9
    - # of NavCam Particle images expected: 18 /18
    - # of PolyCam images expected: 60 /141
    - # of MapCam images expected: None
    - OTES Data Vol expected: 104.7 / 104.7 MB
    - OLA Data Vol expected: **~717 / 1604 MB** *SEE OLA SAFE MODE SUMMARY
    - REXIS Data Vol expected: 59.78 / 59.78 MB
- 2019/184 (Wednesday, July 3)
  - Executes ATF A, A, B
    - # of NavCam OpNav images expected: 9 / 9
    - # of NavCam Particle images expected: 0 / 18
    - # of PolyCam images expected: 0 / 141
    - # of MapCam images expected: None
    - OTES Data Vol expected: 0 / 104.7 MB
    - OLA Data Vol expected: 0 MB
    - REXIS Data Vol expected: 0 / 59.78 MB
- 2019/185 (Thursday, July 4th)
  - ATF A, B, B
    - # of NavCam OpNav images expected: 9
    - # of NavCam Particle images expected: 18
    - # of PolyCam images expected: 141
    - # of MapCam images expected: None
    - OTES Data Vol expected: 104.7 MB
    - OLA Data Vol expected: 802 MB
    - REXIS Data Vol expected: 59.78 MB
- 2019/186 (Friday, July 5th)
  - ATF F, B (Waived Trim Burn Day)
    - # of NavCam OpNav images expected: 6 / 6
    - # of NavCam Particle images expected: 12 / 12
    - # of PolyCam images expected: 47 - processing
    - # of MapCam images expected: None
    - OTES Data Vol expected: 37.43 MB / 37.43 MB
    - OLA Data Vol expected: 802 MB / 802 MB
    - REXIS Data Vol expected: 22.24 MB / 22.24 MB

Up Next (times In UTC):

- 2019/187 (Saturday, July 6th)
  - ATF A, A, B – Plus DOY 184 retransmit
    - # of NavCam OpNav images expected: 9
    - # of NavCam Particle images expected: 18
    - # of PolyCam images expected: 141
    - # of MapCam images expected: None
    - OTES Data Vol expected: 104.7 MB
    - OLA Data Vol expected: 1604 MB
    - REXIS Data Vol expected: 59.78 MB
- 2019/188 (Sunday, July 7th)
  - OLA – LIDAR cross cal
    - # of NavCam OpNav images expected: 9
    - # of NavCam Particle images expected: 10
    - OLA Data Vol expected: 111 MB

Downlink Summary

- ***Current Data Rate: 918 kbps***

Downlink

- Today's Partition Status :

	Part. Start Vol (MB)	New Data Vol (MB)	Partition Fill (MB)	Expected Partition Fill (%)	Current End Partition (%)	Comments
OpNav	0.00	66.23	66.23	9.46%	0.00%	
OTES	0.00	29.90	37.43	13.56%	0.00%	
REXIS	0.00	10.00	15.00	10.14%	0.00%	
OLA	0.00	768.20	802.20	86.63%	0.00%	
OVIRS	0.00	0.00	0.00	0.00%	0.00%	
OCAMS	0.00	242.76	249.81	6.76%	0.00%	
Tagcams/Overflow	0.00	0.00	0.00	0.00%	0.00%	

Downlink Summary

- ***Tomorrow's Data Rate: 918 kbps***

Downlink

- Tomorrow's Expected Partition Status :

	Part. Start Vol (MB)	Volume Retransmit (MB)	New Data Vol (MB)	Partition Fill (MB)	Expected Partition Fill (%)	Expected End Partition (%)	Comments
OpNav	0.00	0.00	99.37	99.37	14.20%	0.00%	
OTES	0.00	97.17	89.64	97.17	35.21%	0.00%	
REXIS	0.00	15.00	10.00	15.00	10.14%	0.00%	
OLA	0.00	0.00	858.00	926.00	100.00%	0.00%	
OVIRS	0.00	0.00	678.00	678.00	64.82%	0.00%	
OCAMS	0.00	953.95	529.55	536.60	14.53%	14.53%	
Tagcams/Overflow	0.00	0.00	0.00	0.00	0.00%	0.00%	

Downlink Summary

- ***Sunday's Data Rate: 1375 kbps***

Downlink

- Tomorrow's Expected Partition Status :

	Part. Start Vol (MB)	New Data Vol (MB)	Partition Fill (MB)	Expected Partition Fill (%)	Expected End Partition (%)	Comments
OpNav	0.00	99.37	99.37	14.20%	0.00%	
OTES	0.00	0.00	7.53	2.73%	0.00%	
REXIS	0.00	0.00	6.74	4.55%	0.00%	
OLA	0.00	22.12	111.12	12.00%	0.00%	
OVIRS	0.00	0.00	0.00	0.00%	0.00%	
OCAMS	536.60	110.45	654.10	17.71%	0.00%	
Tagcams/Overflow	0.00	0.00	0.00	0.00%	0.00%	

Need for Retransmit? Need for Replay?

- Retransmit request for DOY 184 has been uplinked

List of Unexpected Alarms, Watch Items, ISAs, PFRs

Unexpected Alarms

- gv_ola_safed (See OLA Safing Event slides)

New or Updated Watch Items, ISA's and PFR's

- **ISA # 10568 – OLA was safed on DOY 183 2019 during Orbit-B Phase**
  - ISA Status: In Progress
  - ISA Type: Spacecraft minor
  - ISA Criticality: 2 – Significant Impact
- **ISA # 10466 – TAGCAMS DOY 2019-175 Uncorrectable errors, rejected commands and images not transferred**
  - ISA Status: New
  - ISA Type: Spacecraft minor
  - ISA Criticality: 3 – minimal impact
- **ISA # 10201 - RW3 Digital Tach Variance & Low Voltage Red Alarms**
  - ISA Status: In Progress
  - ISA Type: Spacecraft minor
  - ISA Criticality: 3 – minimal impact
- **ISA #10004 - 1923 ote_spacecal_002 missing from payload bundle and weeklong softsim**
  - ISA Status: In Progress
  - ISA Type: Ground Minor
  - ISA Criticality: 3 – minimal impact
- ~~**ISA # 9704 - 4 Uplinks Failed in Full-Duration SS Test**~~
  - ~~ISA Status: **CLOSED**~~
  - ~~ISA Type: Ground Minor~~
  - ~~ISA Criticality: 4 – no significant impact~~
- **ISA # 9628 – Red alarm notifications were not received by MSA personnel for the TAGCAMS safing event**
  - ISA Status: In Progress
  - ISA Type: Ground Minor
  - ISA Criticality: 3 – minimal impact
- **ISA # 8809 – SPOC FEDS to SPOCFLIGHT data delivery drop outs**
  - ISA Status: In Progress
  - ISA Type: Ground minor
  - ISA Criticality: 3 – minimal impact
- **ISA # 8767 - Re-occurrence: STL intermittent downlink issues during setup**
  - ISA Status: In Progress
  - ISA Type: Ground minor
  - ISA Criticality: 3 – minimal impact

Science Status and/or PI Status

Looking Ahead

	25							26							27							28						
	168	169	170	171	172	###	###	175	176	177	178	179	###	###	182	183	184	185	186	###	###	189	190	191	192	193	###	###
	6/17	6/18	6/19	6/20	6/21	###	###	6/24	6/25	6/26	6/27	6/28	###	###	7/1	7/2	7/3	7/4	7/5	7/6	7/7	7/8	7/9	7/10	7/11	7/12	###	###
	M	T	W	R	F	Sa	Su	M	T	W	R	F	Sa	Su	M	T	W	R	F	Sa	Su	M	T	W	R	F	Sa	Su
Milestones				Site 1 Selected																								
Week 8 - Tactical kickoff																												
Week 7 - SOS																												
Week 6 - J-A 1																												
Week 5 - J-A 2	xm1930 - Orbit B Global Week 4							xm1931 - Orbit B Global Week 5							xm1932 - Orbit C (Opnav, Particle Img Only)							xm1933 - Orbit C (Opnav, Particle Img Only)						
Week 4 - TCR approval, Handshake	xm1929 - Orbit B Global Week 3							xm1930 - Orbit B Global Week 4							xm1931 - Orbit B Global Week 5							xm1932 - Orbit C (Opnav, Particle Img Only)						
Week 3 - FA Kickoff	xm1928 - Orbit B Global Week 2							xm1929 - Orbit B Global Week 3							xm1930 - Orbit B Global Week 4							xm1931 - Orbit B Global Week 5						
Week 2 - Final Build/Delivery/Test	xm1927 - Orbit B Global Week 1							xm1928 - Orbit B Global Week 2							xm1929 - Orbit B Global Week 3							xm1930 - Orbit B Global Week 4						
Week 1 - Review/Uplink	xm1926 - Orbit B Particle Imaging 2							xm1927 - Orbit B Global Week 1							xm1928 - Orbit B Global Week 2							xm1929 - Orbit B Global Week 3						
Week 0 - Execution	**xm1925 - Orbit B Particle Imaging 1**							**xm1926 - Orbit B Particle Imaging 2**							**xm1927 - Orbit B Global Week 1**							**xm1928 - Orbit B Global Week 2**						

Looking Ahead – Science Observation Forecast (1 of 2)

Task Name	Related DP #	MRD	Baseline Finish	WOY BL Finish
Orbital B Science Observations				
Global Mapping Observations				
OLA Observations				
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/1/2019	2019-27
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/2/2019	2019-27
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/3/2019	2019-27
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/4/2019	2019-27
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/5/2019	2019-27
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/6/2019	2019-27
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/7/2019	2019-27
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/8/2019	2019-28
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/9/2019	2019-28
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/10/2019	2019-28
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/11/2019	2019-28
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/12/2019	2019-28
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/14/2019	2019-28
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/15/2019	2019-29
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/16/2019	2019-29
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/17/2019	2019-29
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/18/2019	2019-29
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/19/2019	2019-29
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/21/2019	2019-29
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/25/2019	2019-28
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/26/2019	2019-29
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/28/2019	2019-29
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/29/2019	2019-29
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/30/2019	2019-29
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	7/31/2019	2019-29
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	8/1/2019	2019-29
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	8/2/2019	2019-29
Shape & Tilt: OLA Scans (PRI.)	ALT-18, 5cm OLA shape model	115b	8/4/2019	2019-29
PolyCam Observations				
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/1/2019	2019-27
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/2/2019	2019-27
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/3/2019	2019-27
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/4/2019	2019-27
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/5/2019	2019-27
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/7/2019	2019-27
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/8/2019	2019-28
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/9/2019	2019-28
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/10/2019	2019-28
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/11/2019	2019-28
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/12/2019	2019-28
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/14/2019	2019-28
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/15/2019	2019-29

Looking Ahead – Science Observation Forecast (2 of 2)

Task Name	Related DP #	MRD	Baseline Finish	WOY BL Finish
Orbital B Science Observations				
Global Mapping Observations				
PolyCam Observations				
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/16/2019	2019-29
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/17/2019	2019-29
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/18/2019	2019-29
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/19/2019	2019-29
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/21/2019	2019-29
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/25/2019	2019-29
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/26/2019	2019-29
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/28/2019	2019-29
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/29/2019	2019-29
Sampleability imagery: PolyCam Images (PRI.)	RD-3	183c2	7/30/2019	2019-29
OTES Observations				
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/1/2019	2019-27
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/2/2019	2019-27
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/3/2019	2019-27
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/4/2019	2019-27
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/5/2019	2019-27
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/7/2019	2019-27
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/8/2019	2019-28
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/9/2019	2019-28
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/10/2019	2019-28
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/11/2019	2019-28
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/12/2019	2019-28
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/13/2019	2019-28
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/14/2019	2019-28
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/15/2019	2019-29
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/16/2019	2019-29
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/17/2019	2019-29
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/18/2019	2019-29
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/19/2019	2019-29
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/20/2019	2019-29
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/21/2019	2019-29
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/25/2019	2019-27
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/26/2019	2019-29
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/27/2019	2019-29
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/28/2019	2019-29
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/29/2019	2019-29
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/30/2019	2019-29
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	7/31/2019	2019-29
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	8/1/2019	2019-29
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	8/3/2019	2019-29
Local Thermal Inertia: OTES Spectra (PRI.)	SA-10	540	8/4/2019	2019-29

Go Backs / Additional Comments

- **Daily Downlink this Friday, 7/5**

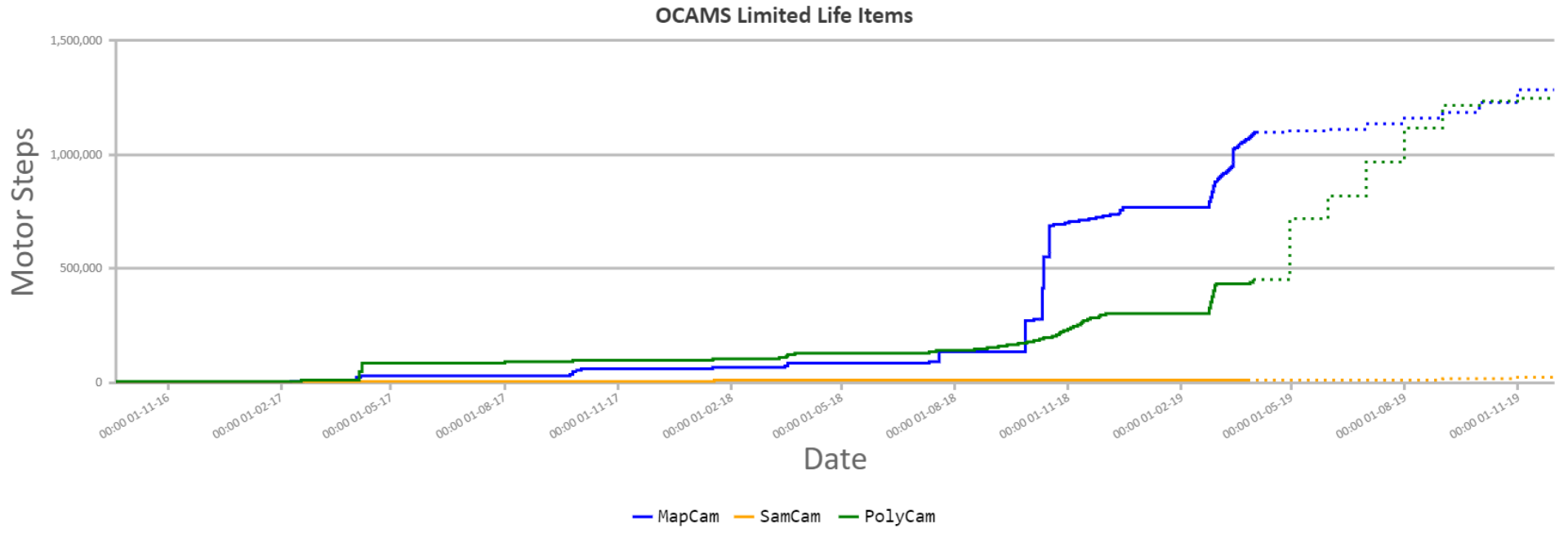
Instrument Weekly Status

- **OCAMS (Bashar) – On and temperatures, voltages and currents look like they are supposed to. Temperatures at their higher setpoints.**
- **OLA (Emily) – Off and nominal, heaters have turned on, good and ready to go**
- **OTES (Chris) – On and heaters looks like they are warming to set point. We're good.**
- **OVIRS (Amy) – Off and nominal**
- **REXIS (Maddy) – On in science mode with telem off. Ready to take data.**

OCAMS Mechanism Life Tracking

	Launch (steps)	Flight (steps)	NTE (steps)
MapCam	1057475	1583532	3400320
SamCam	738110	15246	958384
PolyCam	1775496	462567	8876160

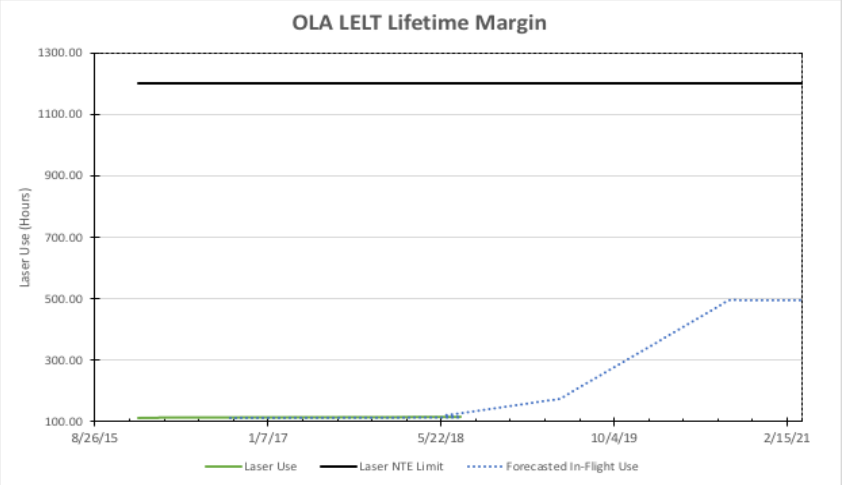
Status as of May 31, 2019

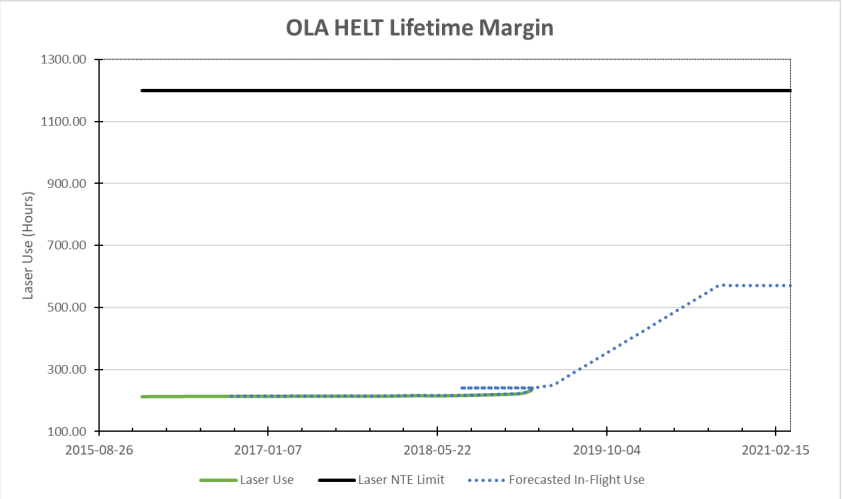


OLA Limited Life Laser Tracking

	Launch (hours)	Flight (hours)	NTE Margin (hours)
LELT	110.70	4.29	1,085.01
HELT	212.50	87.83	983.80

Status as of May 31, 2019
OLA Downlink Report WOY 21





SPOC Watch Item List

Todays Date:	06/10/2019	SPOC Watch Item List									
Status	Date Added	Date Removed	Item ID	Instrument	Title	Watch Item Description	Impact Type	Watch Item Age	ISA # or TCR #	Watch Item Action	Watch Item Action Plan
Open	4/3/18		Item10	OLA	OLA T0 Intensity	L+10 day, L+6 mo, and L+10 mo On-orbit checkouts showed that OLA's T0 signal intensity (Return Intensity) is an order of magnitude lower than expected as compared with pre-launch spacecraft and stand-alone test data. The L+18 calibrations revealed that the T0 intensity is at pre-launch levels on both the Gold and Silver sides of OLA. SPOC has opted to close ISA 2257 and continue to monitor T0 intensity as a watch item.	Instrument Performance	433		Watch	Monitor the T0 Intensity at the L+22 and L+30 OLA checkouts Update 08/06/2018: Based on results from L+18 and L+22, OLA has not been able to discern a temperature dependency with t0 Intensity value. We will continue to watch, but may never fully understand the cause. OLA can still operate as expected despite the inconsistency seen in the t0 value. Update 5/9/2019: The OLA Team continues to monitor the T0 intensity. Since it was first detected, the behavior of the HELT laser has remained constant through Orbital A and Detailed Survey. At this time, our recommendation is to maintain this item on the watch list through (at least) Orbital-B so as to observe behavior of the second laser (LELT).
Open	9/5/18		Item11	OCAMS	OCAMS Error on Polycam Startup	During power on of the OCAMS cameras there is the possibility of a 4 byte packet being created due to line noise. SPOCFLIGHT is unsure what to do with this packet, so flags it as an error. So far this has only occurred twice during flight, both times with Polycam but it is possible this could occur with any of the OCAMS cameras. As OCAMS has only been used sparingly during Cruise, it is not certain how frequently this error will occur.	Instrument Performance	278		Watch	Will monitor for future occurances across all of the OCAMS cameras and assess if any action is warranted. Update 5/7/2019: We are continuing to monitor this behavior. We have seen this issue crop up all when powering on PolyCam.

Anomaly Response & Status

ISA #	Date Created	Type	Priority	Title	Detailed Description - Action Plan	Notes	Status	Resolved Date	Need Date
10004	5/24/19	Ground minor	Normal	1923 ote_spacecal_002 missing from payload bundle and weeklong softsim	The 1923 SS test revealed ote_spacecal_002 was missing from our uplink product set for the week. As we started digging, we noticed it was not explicitly included in the UPBL under “Previously delivered sequences”. This has been true for the past couple of weeks, and somehow the engineers added it without the explicit call out in the UPBL. Unfortunately, this time it did not get included in the payload bundle for the week.		In Progress	TBD	TBD
9931	5/22/19	Spacecraft Minor	Normal	TAGCAMS Safed on DOY 142 (2019)	TAGCAMS was marked failed and powered off by the aliveness Fault Protection check on DOY 142. Below are the times associated with the failure: 19/142-12:40:14 - First aliveness count 19/142-12:42:15 - Persistence of 3 reached, TAGCAMS marked failed and safing block loaded (NFT was also marked failed as a side effect) 19/142-12:42:25 - TGM_MAIN_PWR off		In Progress	TBD	TBD
9895	5/21/19	Ground Major	High	SPOC systems down 5/20/2019	SPOC servers went down due to an unknown reason at approximately 20:40 on 5/2/19. This caused email and all other systems to cease functioning.		In Progress	TBD	TBD
9628	5/4/19	Ground minor	Normal	Red alarm notifications were not received by MSA personnel for the TAGCAMS safing event	Red alarm text messages and/or e-mails were not received for any of the red alarms that occurred on board due to the TAGCAMS safing event on DOY 124.		In Progress	TBD	TBD
8809	3/25/19	Ground minor	Normal	SPOC FEDS to SPOCFlight data delivery drop outs	OPnav group has reported: Data delivery drop outs for NavCam OpNavs from 3/24 2300 and 3/25 0100 epochs, and MapCam OpNavs from 3/24 2300 and 3/25 0100 and 0300 epochs. This data showed up on the SPOC FEDS but not on SPOCFlight. Initial replays were attempted but did not resolve the issue, which is expected given that the data was on the FEDS.		In Progress	TBD	TBD
7704	1/10/19	Spacceraft Major	Normal	Potential particles detected in NavCam images while in Bennu Orbit-A Phase	Investigation and detailed image analysis are underway to determine if particles detected in a pair of NavCam images taken on 01/06/19 may have originated from Bennu (or from other causes such as cold traps on the spacecraft, cosmic rays, etc.) MPB convened to determine if it was safe for the spacecraft to remain in orbit and agreed to remain in orbit but to collect more data for the remaining weeks of the orbit phase as a precaution. The details of the additional and more efficient and targeted observations are being worked.		In Progress	TBD	TBD
7518	1/4/19	Ground Major	High	CenturyLink National Outage	A nationwide CenturyLink outage did not allow normal ground activities for OSIRIS-REx including uplink, downlink, and moving data between elements. Outage Start December 27, 2018 08:40 GMT Outage Stop December 29, 2018 10:12 GMT Approximately 50 hours		Monitor	TBD	TBD
7246	12/6/18	Ground Minor	High	FOB connection down	A FOB connectivity issue was discovered when team members were looking for the 12/06/18 downlink of OpNav images (criticality 3) on the FOB. The OpNav images were obtained via SpocFlight. Investigation ongoing.		In Progress	TBD	TBD

Current ISA Status

#	Status	Priority	Subject	Assignee	Updated
10201	In Progress	Normal	RW3 Digital Tach Variance & Low Voltage Red Alarms	Mark Fisher	6/6/19 15:36
10004	In Progress	Normal	1923 ote_spacecal_002 missing from payload bundle and weeklong softsim	OSIRIS-REx Operations	6/7/19 8:56
9931	In Progress	Normal	TAGCAMS Safed on DOY 142 (2019)	Brent Bos	5/28/19 10:22
9704	Monitor	Normal	1921: 4 Uplinks Failed in Full-Duration SS Test	Mark Fisher	5/24/19 9:50
9628	In Progress	Normal	Red alarm notifications were not received by MSA personnel for the TAGCAMS safing event	Paul Falkenstern	5/28/19 10:37
8913	In Progress	Normal	Products Sent Outside Uplink Window (preceding the window start)	Mark Fisher	5/24/19 9:54
8809	In Progress	Normal	SPOC FEDS to SPOCFlight data delivery drop outs	Karl Harshman	5/10/19 9:58
8767	In Progress	Normal	Re-occurrence: STL intermittent downlink issues during setup	Mike Skeen	3/29/19 14:44
8672	In Progress	Normal	JPL Firewall Config Changed without LM Notification - affected Matlab license access/use and Maneuver Automation	Andy Calloway	5/24/19 9:56
8542	In Progress	Normal	Uplink Products Could not be Radiated due to SEQ Configuration Change	Mark Fisher	5/24/19 10:03
7994	Monitor	Normal	ACSTBT Overburn	Ryan Olds	5/10/19 9:45
7704	In Progress	Normal	Potential particles detected in NavCam images while in Bennu Orbit-A Phase	Ron Mink	3/28/19 12:37
7518	Monitor	High	CenturyLink National Outages	Andy Calloway	4/17/19 14:04
7246	In Progress	High	FOB connection down	Paul Falkenstern	5/21/19 14:27