STATUS REPORT

Worldspace W02
(Asiastar - 105E)

REPORTING PERIOD:
July 1 through July 31, 2020

1.0 SUMMARY:

Worldspace W02 – Asiastar provided quality uninterrupted service through this reporting period.

New Service Impacting Anomalies:

- None

New Non-Service Impacting Anomalies:

- None

Closed Anomalies:

- None

Operations:

Routine operations continued as normal.

- S/K maneuvers and ranging.
- IRES Blinding loads.
  IRES Blindings performed via Time Tagged Queue.
  Manual IRES Scan Procedures in place for backup operations to TTQ.
- Orbital Oscillator Update performed (07/10).

Routine periodic activities performed in this period were:

- None

Non-periodic activities performed in this period were:

- Dwell on Payload to confirm DX1, DX3, and DX5 frequencies (07/06).

2.0 LIFE PROJECTIONS AND EXPECTATIONS:

2.1 Solar Array/Battery

- No degradation of EPS subsystem during this reporting period.

2.2 Propulsion:

- Thruster 5A underperformed for the last three maneuvers in May 2017 (reported to Engineering in early June 2017). OML impact to be further analyzed when we have more data on B-Branch performance (expected to be minimal).

- The satellite was launched in March 2000. The current predicted End of Life / Operational Mission Life (EOL/OML) estimate is March 2026 without Inclination control. The OML date assumes a 300 Km deorbit altitude with no station changes.
    - Estimated Inclination at EOL in March 2026 is 9.0 deg.

2.3 Spacecraft Inclination:

- Inclination 4.1 degrees.

3.0 PAYLOAD CONFIGURATION:

No changes this reporting period (Date updated to reflect review).

ASIASTAR PAYLOAD W02 CONFIGURATION
June 01, 2020

UNITS COMMON TO BOTH PAYLOADS

	Number	Output Voltage	Consumption (A) / Temp Deg C
MLO	3	5.10	0.09 / 80
X/IF Receiver	1		0.11

TRANSPARENT PAYLOAD IF DEMULTIPLEXER / *TRANSMIT SECTION*

Chain #	Status	RX Frequency	TX Frequency	ALC	Gain Step	TDM Identifier -hex-	Noise Reduction	TWTA Selection / Bus #	Feed & Polarization	Reflector & Coverage Area
DX1	ON	7034.092	1489.724	OFF	25	2600h	Upper Band	5+6 / Bus2	B /RHCP	B / South
DX2	OFF									
DX3	ON	7052.332	1481.444	OFF	26	2400h	Upper Band	10+12 / Bus2	A1/A3/RHCP	A / NE
DX4	OFF									
DX5	ON	7070.572	1473.164	OFF	24	2200h	Upper Band	13+14 /Bus1	A2/RHCP	A / NW

PROCESSED PAYLOAD IF CONVERTER & BBP- RX CHAINS / *BBP& IF CONVERTER - TX CHAINS* / *TRANSMIT SECTION*

Rx IF Chain #	Rx IF Conv Status	RX Frequency Mhz	BBP Rx Chain #	BBP Rx Chain Status	BBP Tx Chain #	BBP Tx Chain Status and TDM ID Value (hex)	Tx IF Chain #	Tx IF Conv Status	Tx Frequency Mhz	Gain Step	Noise Reduction	TWTA Selection / Bus #	Feed & Polarization	Reflector & Coverage Area
1	ON	7038.835	0	ON	0	ON	MOD1	ON	1485.584	24	Upper Band	1+3 / Bus2	B /LHCP	B / South
2	ON	7042.483	1	ON	1	OFF	MOD2	OFF						
3	ON	7046.131	2	ON	2	ON	MOD3	ON	1469.024	26	Upper Band	7+9/Bus1	A1/A3/LHCP	A / NE
4	OFF		3	OFF	3	OFF	MOD4	OFF						
5	ON	7057.075	4	ON	4	ON	MOD5	ON	1477.304	25	Upper Band	16+18/Bus1	A2 /LHCP	A / NW
6	ON	7060.723	5	ON										
7	ON	7064.371	6	ON										
8	OFF		7	OFF										

Notes: Sept 15, Updated phase positions after PAP 4 trip

TWTA PHASE SHIFTER STATUS

TWTA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Status	On	Off	On	Off	On	On	On	Off	On	On	Off	On	On	On	Off	On	Off	On
Outgassing																		
Phase Set K041 - K058	30	0	36	0	49	16	56	0	8	48	0	15	52	14	0	48	0	13

UNIT INTERFACES

	TM/TC	DC/DC	Consumption (A)
IF Converter	1	1	1.08
BBP	1	1	1.44
IF Demux	1	1	0.71

4.0 REDUNDANCY:

Bus Subsystem/Units	Design Redundancy	Actual Redundancy
Electrical Power (Independent North and South power bus)		
Battery Charge Interface Units	2/1	2/1
Array Switching Regulators	2/1	2/1
Solar Wing Circuits	2 x 20/19	2 x 20/19
Battery Cells	2 x 27	2 x 27
Data Handling		
Central Interface Unit	2/1	2/1
OBDH data bus	2/1	2/1
Remote Interface Unit	2/1	2/1
Payload Interface Unit	2/1	2/1
Attitude Control		
Central Processing Electronics	2/1	2/1
Earth Sensors	2/1	2/1
Gyros	2/1	2/1
Linear Analog Sun Sensor	4/2	4/2
BiAxial Sun Sensor	6/3	6/3
Fixed Momentum Wheel	2/1	2/1
Telemetry and Command		
Command Receivers S-Band	2/1	2/1
Command Receivers X-Band	2/1	2/1
Telemetry Transmitters S Band	2/1	2/1
Telemetry Transmitters L Band	2/1	2/1
Propulsion (Redundant Subsystems)		
Tanks Fuel	2/1	2/1
Tanks Oxidizer	2/1	2/1
10 N Thrusters	See Below	
1 (N/S DeltaV and Control)	2/1	2/1
2 (N/S DeltaV and Control)	2/1	2/1
3 (N/S DeltaV and Control)	2/1	2/1
4 (E DeltaV)	2/1	2/1
5 (W DeltaV)	2/1	**2/1***
6 (Control)	2/1	2/1
7 (Control)	2/1	2/1
Thermal Heaters		
Battery heater set	2 x 4/2	2x 4/2
IRES heater set	2/1	2/1
FMW heater set	2 x 2/1	2 x 2/1
Propulsion heater set	See Below	
Thrusters	14 x 2/1	14 x 2/1
NTO Tanks	2 x 8/4	2 x 8/4
MMH Tanks	2 x 8/4	2 x 8/4
Line Heaters	20/10	20/10

*** Thruster 5A – Thruster 5A underperformance (see Cumulative Anomalies).**

5.0 ANOMALIES

5.1 New Anomalies:

- None

5.2 Status of Open Anomalies:

- None

5.3 Status of Closed Anomalies:

- Suspected Micrometeorite Strike (02/07/20). Closed to micrometeorite strike after Airbus analysis. Package delivery to NYBB directly from Airbus (08/04). Intelsat generated, export capable package also provided.

5.4 Cumulative Anomalies:

CTX-10 Switch Stuck:
Failure of switch discovered during IOT. Affects South Beam Transparent Payload operations in the event of a TWTA5 failure. Only an issue if TWTA5 fails. Paired Tubes 5&6 will be reconfigured to use TWTA4 or TWTA3 if TWTA6 fails. Provision exists for an attempt to rotate stuck CTX-10 switch if TWTA5 fails but would be a last resort.

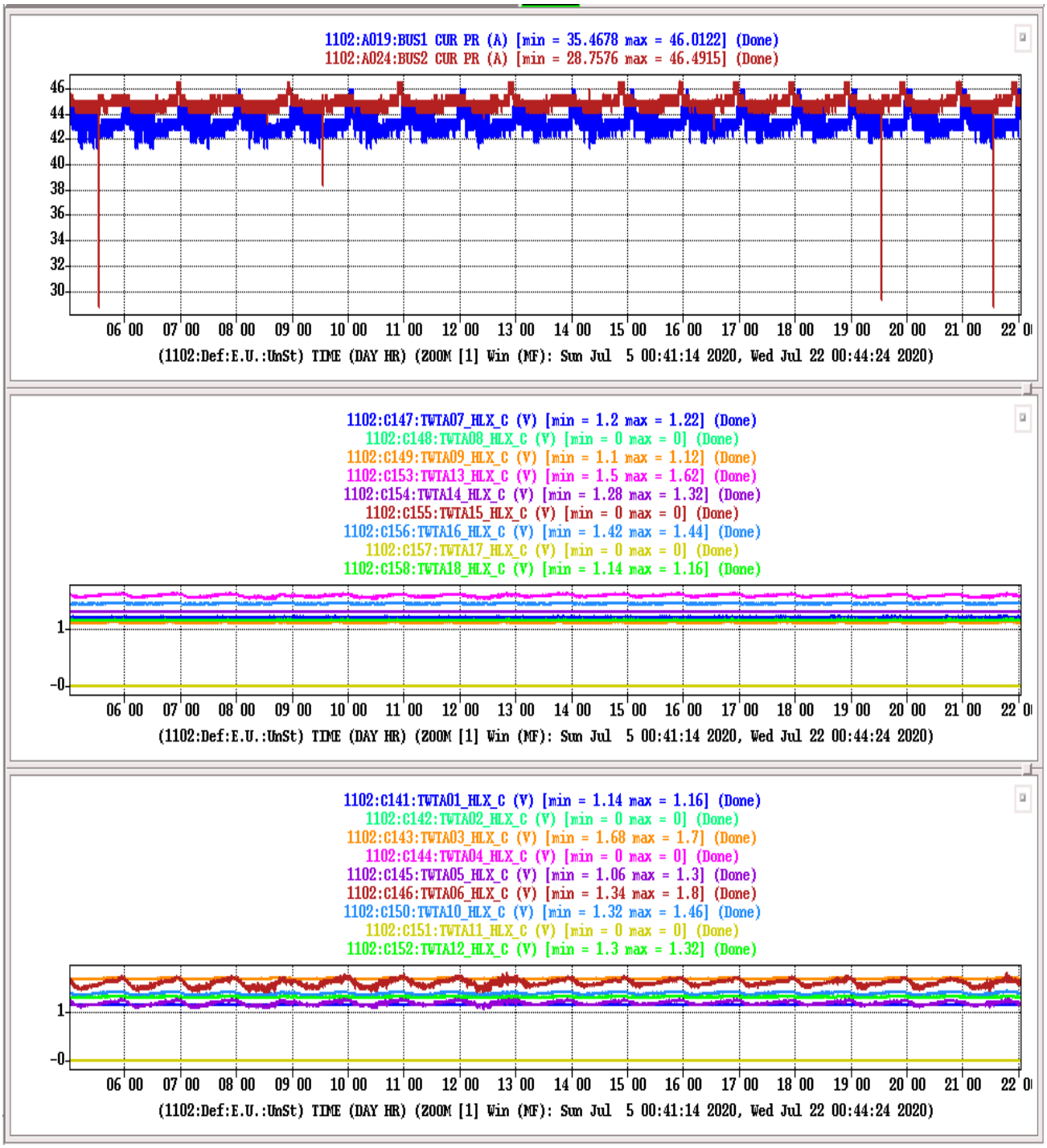
Thruster 5A Underperformance:
Thruster 5A underperformed in April-June 2017, potentially due to degradation of Kalrez seals blocking the small internal passages in the thruster. AIRBUS indicated that thruster 5A should be quarantined and not used again (not considered failed but is less efficient than 5B). Thruster 5B is being used for West Delta-V thrust.

+X Ant Temp Sensor Erratic Readings:
Telemetry Point I126 occasionally displays erratic data, spiking to unrealistic temperatures. This is analogous, though not as severe as on Afristar's identical sensor. Limits removed from this point on 09/18/17. This is an environmental temperature, not used for thermal control.

6.0 OBSERVATIONS:

6.1 Intermittent Payload Bus Current Alarms (07/05, 07/09, 07/19, and 07/21):

- Suspected continuation of switching at the uplink station.
- Very short duration intermittent Bus Power alarms Duration of approximately 2-5 seconds and not picked up on slower samples of Helix Current.



7.0 OPERATIONS

7.1 Satellite Control Support

- Maneuvers completed as scheduled (See Appendix A for detail).
- Intelsat evaluating possible relocation of Asiastar to 21E at NYBB request.

7.2 Ground Station Performance

- Brisbane Ground Station:
  None

- Mauritius Ground Station:
  Ongoing:
  Hazcon: SSPAs - Degraded cooling for SSPAs and supporting equipment are creating operational constraints for Intelsat. Command carrier management must now be performed for extended routine operations.

  07/16/17: ACU Blower Motor Failed. Sent out for repair (no status update).

  05/11/18: No telemetry from Mauritius. Mauritius disconnected telemetry due to payment dispute (no status update).

  07/01/18: MAU2 Antenna Comm Faults. NYBB (Lance) MAU1 restored by Lance and advised not to attempt to move MAU2 going forward (no status update).

  Antenna: Inclination growth requires tracking files for antenna.

- Ground network.
  None

7.3 Software support systems.

- Ongoing: DSS Context Corruption:
  Engineering attempted to save a context (scenario) incorrectly on the DSS and corrupted the context used for procedure validation. It was partially recovered, and engineering is working to get the configuration of the DSS to exactly match the spacecraft again.

7.4 Payload monitor and control MCC

- Intelsat system not functional. MCC system at Melbourne used for monitoring and CMD generation if necessary.

8.0 PREDICTED ECLIPSES AND SUN OUTAGES:

All times are in Greenwich Mean Time.

8.1 Sun Outage Predictions

Intelsat is currently revising the sun outage prediction site.

- Web address will be updated when available again.

8.2 Satellite Worldspace W02 Moon Shadows 2020:

Moon Eclipses for 2020:

Date:	Enter	Exit	Max Obscuration
11/15/2020	04:37	05:30	100%

8.3 Satellite Worldspace W02 Earth Eclipse Fall 2020:

ENTER					EXIT					DURATION	ENTER					EXIT					DURATION
YYYY	MM	DD	HH	MM	YYYY	MM	DD	HH	MM	MIN	YYYY	MM	DD	HH	MM	YYYY	MM	DD	HH	MM	MIN
----	--	--	--	--	----	--	--	--	--	--------	----	--	--	--	--	----	--	--	--	--	--------
2020	8	18	16	58	2020	8	18	17	10	12.71	2020	9	12	16	20	2020	9	12	17	31	71.86
2020	8	19	16	52	2020	8	19	17	16	23.49	2020	9	13	16	19	2020	9	13	17	31	71.68
2020	8	20	16	48	2020	8	20	17	19	30.46	2020	9	14	16	19	2020	9	14	17	31	71.35
2020	8	21	16	45	2020	8	21	17	21	35.93	2020	9	15	16	19	2020	9	15	17	30	70.90
2020	8	22	16	43	2020	8	22	17	23	40.48	2020	9	16	16	19	2020	9	16	17	29	70.31
2020	8	23	16	40	2020	8	23	17	26	44.44	2020	9	17	16	19	2020	9	17	17	29	69.59
2020	8	24	16	38	2020	8	24	17	26	47.90	2020	9	18	16	19	2020	9	18	17	28	68.74
2020	8	25	16	36	2020	8	25	17	27	50.96	2020	9	19	16	19	2020	9	19	17	27	67.72
2020	8	26	16	35	2020	8	26	17	28	53.75	2020	9	20	16	20	2020	9	20	17	26	66.58
2020	8	27	16	33	2020	8	27	17	29	56.23	2020	9	21	16	20	2020	9	21	17	25	65.25
2020	8	28	16	32	2020	8	28	17	30	58.45	2020	9	22	16	20	2020	9	22	17	24	63.76
2020	8	29	16	30	2020	8	29	17	31	60.46	2020	9	23	16	21	2020	9	23	17	23	62.10
2020	8	30	16	29	2020	8	30	17	31	62.26	2020	9	24	16	22	2020	9	24	17	22	60.25
2020	8	31	16	28	2020	8	31	17	32	63.88	2020	9	25	16	22	2020	9	25	17	20	58.18
2020	9	1	16	27	2020	9	1	17	32	65.34	2020	9	26	16	23	2020	9	26	17	19	55.89
2020	9	2	16	26	2020	9	2	17	32	66.62	2020	9	27	16	24	2020	9	27	17	17	53.35
2020	9	3	16	25	2020	9	3	17	33	67.75	2020	9	28	16	25	2020	9	28	17	16	50.51
2020	9	4	16	24	2020	9	4	17	33	68.74	2020	9	29	16	27	2020	9	29	17	14	47.34
2020	9	5	16	23	2020	9	5	17	33	69.59	2020	9	30	16	28	2020	9	30	17	12	43.76
2020	9	6	16	23	2020	9	6	17	33	70.31	2020	10	1	16	30	2020	10	1	17	10	39.67
2020	9	7	16	22	2020	9	7	17	33	70.90	2020	10	2	16	32	2020	10	2	17	7	34.90
2020	9	8	16	21	2020	9	8	17	33	71.35	2020	10	3	16	35	2020	10	3	17	4	29.05
2020	9	9	16	21	2020	9	9	17	32	71.68	2020	10	4	16	38	2020	10	4	17	0	21.35
2020	9	10	16	20	2020	9	10	17	32	71.86	2020	10	5	16	45	2020	10	5	16	52	7.31
2020	9	11	16	20	2020	9	11	17	32	71.93											

9.0 SCHEDULED EVENTS FOR AUGUST 2020:

9.1 SKM Operations:

West SKM:	08/11/2020
West SKM:	08/25/2020

9.2 IRES Blindings:

```
2020/08/06 05:05 - 08:22   SOUTH / MOON
2020/08/09 07:53 - 11:13   NORTH / MOON
2020/08/19 16:00 - 19:04   NORTH / SUN
2020/08/20 16:00 - 19:04   NORTH / SUN
2020/08/21 16:00 - 19:04   NORTH / SUN
2020/08/22 16:00 - 19:04   NORTH / SUN
2020/08/23 16:00 - 19:04   NORTH / SUN
2020/08/24 16:00 - 19:04   NORTH / SUN
2020/08/25 16:00 - 19:04   NORTH / SUN
2020/08/26 16:00 - 19:04   NORTH / SUN
2020/08/27 16:00 - 19:04   NORTH / SUN
2020/08/28 16:00 - 19:04   NORTH / SUN
2020/08/29 16:00 - 19:04   NORTH / SUN
2020/08/30 16:00 - 19:04   NORTH / SUN
```

9.3 Routine Housekeeping:

- Oscillator Update (08/12).

9.4 Planned Operations

- Eclipse Season M-30 Days Configuration (08/15).

Appendix A: Maneuver Report

```
Maneuver Type: WEST SKM
Maneuver Execute: 20-196-07:37:00
Ground Loaded Torques
Pre-Maneuver Torque X: 0x0000 / Maneuver Torque X:  0xFFDF
Pre-Maneuver Torque Y: 0x0000 / Maneuver Torque Y:  0x0038
Pre-Maneuver Torque Z: 0x0000 / Maneuver Torque Z:  0x0010

WEST SKM With Momentum Dump Requested - H Consign Loaded:  0xB66B

PAP1 SKM Dumped Parameters:
MAN Time MSW: 0x2620
MAN Time LSW: 0x498a
PAP MAN DUR:  0x00ae
Return To SOSA MSW: 0x2620
Return To SOSA LSW: 0x4b50

Gyro Calibration Results: Roll: PASS, Yaw: PASS
Roll Gyro Drift Over 5 Minutes -0.00040000000000000002 degrees.
Yaw Gyro Drift Over 5 Minutes  -0.0011999877925985229 degrees.
Gyro Re-Calibrations Required:  0

Gyro Roll Calibration: 0XEB48
Gyro Yaw Calibration:  0XF116
ARE GYRO Roll Compensation: 0X14B8
ARE GYRO Yaw Compensation:  0X0EEA

Angular Momentum Pre-SKM:   -44.9452192755
Angular Momentum Post-SKM:  -45.8217108676

S/C Observed Torques:
Maneuver Torque - X: 0xFFDB
Maneuver Torque - Y: 0x0038
Maneuver Torque - Z: 0x0026

Thruster Actuations / On-Times:
FCV1 - Activations: 78 / On-Time: 1.429
FCV2 - Activations: 63 / On-Time: 1.115
FCV3 - Activations: 84 / On-Time: 1.492
FCV4 - Activations:  0 / On-Time: 0
FCV5 - Activations:  1 / On-Time: 11.826
FCV6 - Activations: 20 / On-Time: 0.279
FCV7 - Activations: 26 / On-Time: 0.353

WSIF MSW:  0x9C5A
WSIF LSW:  0xBBF9

Recording Pre / Post Maneuver PSS Temperatures / Pressures:
NTO Upstream Pressure Transducer:    13.8387891626 / 13.8191802956 bar.
NTO Downstream Pressure Transducer:  13.8537541872 / 13.8537541872 bar.
MMH Upstream Pressure Transducer:    13.1210049261 / 13.1210049261 bar.
MMH Downstream Pressure Transducer:  13.1626194581 / 13.1626194581 bar.
NTO Tank 1 Temperature:                      23.5 / 24.0 degC.
MMH Tank 2 Temperature:                      30.0 / 30.0 degC.
NTO Tank 3 Temperature:                      30.0 / 30.0 degC.
MMH Tank 4 Temperature:                      23.0 / 22.6 degC.
```

Appendix A: Maneuver Report

```
Maneuver Type: WEST SKM
Maneuver Execute: 20-210-08:07:18
Ground Loaded Torques
Pre-Maneuver Torque X: 0x0000 / Maneuver Torque X:  0xFFDF
Pre-Maneuver Torque Y: 0x0000 / Maneuver Torque Y:  0x007B
Pre-Maneuver Torque Z: 0x0000 / Maneuver Torque Z:  0x0010

WEST SKM With Momentum Dump Requested - H Consign Loaded:  0xB6B9

PAP1 SKM Dumped Parameters:
MAN Time MSW: 0x2632
MAN Time LSW: 0xc5a5
PAP MAN DUR:  0x00b1
Return To SOSA MSW: 0x2632
Return To SOSA LSW: 0xc76c

Gyro Calibration Results: Roll: PASS, Yaw: PASS
Roll Gyro Drift Over 5 Minutes -0.00040000000000000002 degrees.
Yaw Gyro Drift Over 5 Minutes   0.0028 degrees.
Gyro Re-Calibrations Required:  0

Gyro Roll Calibration: 0XEB6A
Gyro Yaw Calibration:  0XF110
ARE GYRO Roll Compensation: 0X1496
ARE GYRO Yaw Compensation:  0X0EF0

Angular Momentum Pre-SKM:   -44.9867244484
Angular Momentum Post-SKM:  -45.6703390606

S/C Observed Torques:
Maneuver Torque - X: 0xFFE7
Maneuver Torque - Y: 0x007B
Maneuver Torque - Z: 0x001F

Thruster Actuations / On-Times:
FCV1 - Activations: 77 / On-Time: 1.275
FCV2 - Activations: 50 / On-Time: 0.899
FCV3 - Activations: 76 / On-Time: 1.302
FCV4 - Activations:  0 / On-Time: 0
FCV5 - Activations:  1 / On-Time: 12.483
FCV6 - Activations: 21 / On-Time: 0.283
FCV7 - Activations: 20 / On-Time: 0.244

WSIF MSW:  0xB2BE
WSIF LSW:  0x6CFA

Recording Pre / Post Maneuver PSS Temperatures / Pressures:
NTO Upstream Pressure Transducer:    13.7603536946 / 13.7603536946 bar.
NTO Downstream Pressure Transducer:  13.7953871921 / 13.7953871921 bar.
MMH Upstream Pressure Transducer:    13.0621931034 / 13.0621931034 bar.
MMH Downstream Pressure Transducer:  13.0844293103 / 13.1039768473 bar.
NTO Tank 1 Temperature:                      23.0 / 22.6 degC.
MMH Tank 2 Temperature:                      28.0 / 28.0 degC.
NTO Tank 3 Temperature:                      28.5 / 28.0 degC.
MMH Tank 4 Temperature:                      22.2 / 22.2 degC.
```

Appendix B: Routine Maintenance

None.