



Science Planning & Sequence Team
CASSINI

CASSINI TOST_259 SEGMENT

Rev 259 Handoff Package

Segment Boundary 2017-032T07:39:00 – 2016-034T07:05:00

3 Jun 2016

Karl Mitchell

Science Highlights

Notes & Liens

This document has been reviewed and determined not to contain export controlled technical data

SMT Report

TOST rev 259

OPNAV TELEMETRY MODE REPORT

 OPNAV REQUEST START TIME TELEMETRY MODE OBSERVATION PERIOD

DATA VOLUME SUMMARY --- TRANSFER FRAME OVERHEAD INCLUDED (80 BITS PER 8800-BIT FRAME)

DOWNLINK PASS NAME	Start doy hh:mm	End doy hh:mm	OBSERVATION_PERIOD							DOWNLINK_PASS							
			P4				P5			RECORDED		PLAYBACK					
			START (Mb)	SCI (Mb)	HK+E (Mb)	TOTAL (Mb)	CPACTY (Mb)	MRGN (Mb)	OPNAV (Mb)	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGN (Mb)	NET_MARGN (Mb)	(%)	CAROVR (Mb)
SP_259EA_C70METSEQ033_PRIME	033 17:01	034 03:46	481	1922	141	2544	3322	778	0	239	63	2846	3326	480	561	16%	0
SP_259EA_M34HEFSEQ034_PRIME	034 03:46	034 07:05	0	0	0	0	3322	3322	0	68	20	87	169	81	81	48%	0

SSR PARTITION SIZE SUMMARY - SELECTED SSR CONFIGURATION: DOUBLE

OBSERVATION PERIOD	SSR A/B		
	P4 Size (Frames)	P5 Size (Frames)	P6 Size (Frames)
	* INITIAL CONDITION *		
	188954	10	38863
SP_259NA_OBSERV032_NA	188954	10	38863

DATA VOLUME REPORT --- TRANSFER FRAME OVERHEAD NOT INCLUDED

Event	Start doy hh:mm	End doy hh:mm	CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)	ENGR (Mb)	TOTAL (Mb)
OBSERVATION_NOR	032 07:39	033 17:01	0.0	62.9	428.5	12.0	775.0	59.3	102.1	0.0	157.4	124.8	182.5	0.0	139.5	2043.9
SP_259EA_C70METSEQ033_PRIME	033 17:01	034 03:46	0.0	20.3	104.0	3.9	0.0	19.1	32.9	0.0	50.7	5.9	0.0	0.0	0.0	236.8
SP_259EA_M34HEFSEQ034_PRIME	034 03:46	034 07:05	0.0	6.3	26.3	1.2	0.0	5.9	10.1	0.0	15.6	1.8	0.0	0.0	0.0	67.2
DAILY TOTAL SCIENCE	032 07:39	034 07:05	0.0	89.5	558.8	17.1	775.0	84.4	145.1	0.0	223.7	132.5	182.5	0.0	139.5	
TOTAL RECORDED (OPNAV data not included)			0.0	89.5	558.8	17.1	775.0	84.4	145.1	0.0	223.7	132.5	182.5	0.0		

DOY 032/Feb 1, 2017 - CIRS makes several observations types on rev 259, beginning with distant maps of composition and temperature, complementing adjacent flybys and providing further resolution of temporal changes. Near closest approach CIRS will make a limb mapping observation in the mid-infrared, using the methane emission at 7 microns to determine the vertical variation of temperatures at a range of latitudes. **ISS** will acquire a series of medium-resolution (~1-2 km) global-scale mosaics, observing Titan's surface and atmosphere: inbound, over Tsegihi at southern mid-latitudes on Titan's sub-Saturnian hemisphere; and near C/A, southeast of Yalaing Terra. The series of observations over ~32 hours allows ISS to monitor Titan to track clouds and haze and the evolution thereof, of particular scientific interest as Titan's northern summer equinox approaches. **VIMS** will monitor the evolution of cloud coverage at the North Pole in particular and the evolution of the South Polar Vortex.

DOY 033/Feb 2, 2017 - CIRS makes several observations types on rev 259, beginning with distant maps of composition and temperature, complementing adjacent flybys and providing further resolution of temporal changes. Near closest approach CIRS will make a limb mapping observation in the mid-infrared, using the methane emission at 7 microns to determine the vertical variation of temperatures at a range of latitudes. **ISS** will acquire a series of medium-resolution (~1-2 km) global-scale mosaics, observing Titan's surface and atmosphere: outbound, these will be high-phase-angle observations of Titan's limb hazes from an equatorial vantage point. The series of observations over ~32 hours allows ISS to monitor Titan to track clouds and haze and the evolution thereof, of particular scientific interest as Titan's northern summer equinox approaches. **VIMS** will monitor the evolution of cloud coverage at the North Pole in particular and the evolution of the South Polar Vortex.

Master Timeline

TOST rev 259

259TI	221985
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Start Time	End Time	Prime Activity	Obs. Detail	Op Mode	TLM Mode	Comments
2017-032T07:39:00	2017-032T08:19:00	SP Turn to WP	NEG_Y to Titan/NEG_X to Sun	DFPW Normal	S_N_ER_3	Secondary is preferred by MIMI
2017-032T08:19:00	2017-032T09:19:00	ISS	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-032T09:19:00	2017-032T13:06:00	CIRS	(TC1b)	DFPW Normal	S_N_ER_3	
2017-032T13:06:00	2017-032T14:06:00	ISS_259TI_CLOUD001_PIE	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-032T14:06:00	2017-032T19:21:00	CIRS_259TI_COMPMAP001_PIE	(TC1b)	DFPW Normal	S_N_ER_3	
2017-032T19:21:00	2017-032T20:21:00	ISS_259TI_CLOUD002_PIE	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-032T19:52:52		CLOSEST APPROACH				(2017-032T13:21 to 2017-033T02:21) TOST priority 1: highest southern latitude encounter
2017-032T20:21:00	2017-033T01:36:00	CIRS	(TN1c)	DFPW Normal	S_N_ER_3	
2017-033T01:36:00	2017-033T02:36:00	ISS_259TI_CLOUD003_PIE	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-033T02:36:00	2017-033T15:21:00	CIRS	(TC1b)	DFPW Normal	S_N_ER_3	ISS WACs if possible
2017-033T15:21:00	2017-033T16:21:00	ISS	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	End of segment can use haze sequence as a template
2017-033T16:21:00	2017-033T17:01:00	SP Turn to Earth for downlink	XBAND to Earth/Rolling (per MAG)	DFPW Normal	S_N_ER_3	Hand-off at (0.0,0.0,-9.5) offset per MIMI
2017-033T17:01:00	2017-034T03:46:00	Canberra 70M		DFPW Normal	RTE_N_SPB	End of sequence, no ybias gap needed
2017-034T03:46:00	2017-034T07:05:00	Madrid 34M		DFPW Normal	RTE_N_SPB	End of sequence, no ybias gap needed

SPASS

TOST rev 259

Colorize		SPASS for Delivery: TOST_259				Records 1-17 (Page 1 of 1)		Observation Attitude	
Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments	
Sequence S97, length = 72 days		2016-328T05:43:00		072T01:22:00	2017-034T07:05:00				
TOST_259 Segment		2017-032T07:39:00		001T23:26:00	2017-034T07:05:00				
SP_259TI_WAYPTTURN032_PRIME		2017-032T07:39:00		000T00:40:00	2017-032T08:19:00	NEG_Y to Titan	NEG_X to Sun	MIMI.NEG_X to Sun	
NEW WAYPOINT		2017-032T08:19:00		001T08:42:00	2017-033T17:01:00	NEG_Y to Titan	NEG_X to Sun		
ISS_259TI_LRMONITOR001_PRIME	C, V	2017-032T08:19:00		000T01:00:00	2017-032T09:19:00	ISS_NAC to Titan	NEG_X to Sun		
CIRS_259TI_MIDIRTMAP001_PRIME	I, V	2017-032T09:19:00		000T03:47:00	2017-032T13:06:00	CIRS_FPB to Titan	PIC	Template A2: CIRS-ISS	
ISS_259TI_CLOUD001_PIE	C, U, V	2017-032T13:06:00		000T01:00:00	2017-032T14:06:00	ISS_NAC to Titan	NEG_X to Sun		
CIRS_259TI_COMPMPAP001_PIE	I, U, V	2017-032T14:06:00		000T05:15:00	2017-032T19:21:00	CIRS_FPB to Titan	NEG_Z to NTP	CIRS_FPB to 80S; arrays span 70S-90S; FP1 on disk	
ISS_259TI_CLOUD002_PIE	C, U, V	2017-032T19:21:00		000T01:00:00	2017-032T20:21:00	ISS_NAC to Titan	NEG_X to Sun		
259TI (nt) TITAN Outbou...		2017-032T19:52:52		000T00:00:01	2017-032T19:52:53				
CIRS_259TI_MIRLMBMAP002_PRIME	V	2017-032T20:21:00		000T05:15:00	2017-033T01:36:00	CIRS_FPB to Titan	PIC		
ISS_259TI_CLOUD003_PIE	C, V	2017-033T01:36:00		000T01:00:00	2017-033T02:36:00	ISS_NAC to Titan	NEG_X to Sun		
CIRS_259TI_MIDIRTMAP002_PRIME	I, V	2017-033T02:36:00		000T07:00:00	2017-033T09:36:00	CIRS_FPB to Titan	PIC	Template A2: CIRS-ISS	
CIRS_259TI_COMPMPAP002_PRIME	I, V	2017-033T09:36:00		000T05:45:00	2017-033T15:21:00	CIRS_FPB to Titan	NEG_Z to NTP	CIRS_FPB to 45S; arrays span 20S-90S	
ISS_259TI_LRMONITOR002_PRIME	C, V	2017-033T15:21:00		000T01:00:00	2017-033T16:21:00	ISS_NAC to Titan	NEG_X to Sun		
SP_259EA_DLTURN033_PRIME		2017-033T16:21:00		000T00:40:00	2017-033T17:01:00	XBAND to Earth (0.0,0.0,-9.5 deg. offset)	NEG_Y to Saturn	MAG.Rolling Downlink	
NEW WAYPOINT		2017-033T17:01:00		000T14:04:00	2017-034T07:05:00	XBAND to Earth (0.0,0.0,-9.5 deg. offset)	NEG_Y to Saturn		
SP_259EA_C70METSEQ033_PRIME	C	2017-033T17:01:00		000T10:45:00	2017-034T03:46:00	XBAND to Earth (0.0,0.0,-9.5 deg. offset)	Rolling		
SP_259EA_M34HEFSEQ034_PRIME	C	2017-034T03:46:00		000T03:19:00	2017-034T07:05:00	XBAND to Earth (0.0,0.0,-9.5 deg. offset)	Rolling		

High Priority Observations

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Sequence 259ti: Summary of PIEs and Other High Priority Observations

Discipline	CIMS Request Name	Start Time	End Time	Flexibility in secondary pointing	Comments (e.g., pointing tolerance, uniqueness; relative priority)	Science Traceability Matrix Code(s)	Pointing designer POC
Titan	ISS_259TI_CLOUD001_PIE	2017-032T13:06:00	2017-032T14:06:00	Flexible		TC1a, TC1b, TN1a, TN2c, TN2d	Jason Perry <volcanopele@gmail.com>
Titan	CIRS_259TI_COMPMAP001_PIE	2017-032T14:06:00	2017-032T19:21:00	Flexible		TC1b	Conor Nixon <conor.a.nixon@nasa.gov>
Titan	ISS_259TI_CLOUD002_PIE	2017-032T19:21:00	2017-032T20:21:00	Flexible		TC1a, TC1b, TN1a, TN2c, TN2d	Jason Perry <volcanopele@gmail.com>
Titan	CIRS_259TI_MIRLMBMAP002_PRIME	2017-032T20:21:00	2017-033T01:36:00	Flexible		TN1c	Conor Nixon <conor.a.nixon@nasa.gov>
Titan	ISS_259TI_CLOUD003_PIE	2017-033T01:36:00	2017-033T02:36:00	Flexible		TC1a, TC1b, TN1a, TN2c, TN2d	Jason Perry <volcanopele@gmail.com>

- Pointing:
 - No YGAP due to end of sequence.
- Data Volume:
 - Carryover agreement, 481 Mb, from SOST_258_259 (Vandermeij), included as starting condition in SMT report.
 - SMT: “SP_SMT_1 SP NO SSR_PREP block is created in SMT SASF when carryover is greater than zero.” We assume that this relates to the above carryover and is not an issue.
- DSN:
 - SP_259EA_M34HEFSEQ034_PRIME: SP_259EA_M34HEFSEQ034_PRIME is a SEQ upload pass and should be at least 9 hours in duration. “*The 9 hour SEQ downlink rule is gone for FRPO (source: Vandermeij).*” No action required.
 - DSN Strategy Change. Second and final 70 m downlink has been downgraded to 34 m (DSS-65) relative to DSN strawman, to simplify DSN negotiations. There is no impact to delivered data volumes. In order to implement this, a 7 minute shift was necessary for the hand-off between C70 and M34 downlinks.
 - Final downlinks are rolling, and can be changed to rolling/SRU if needed for AACS purposes.
 - If 20 minutes of quiescent time does not already exist at end of final downlink, fine to remove a roll revolution.
- Resource checker:
 - SP_259EA_M34HEFSEQ034_PRIME: Downlink Pass for sequence request has a duration of 000T03:26:00. Proposed solution was that the “downlink pass for sequence should be at least nine hours”. See comments under DSN (above). No action required.
- Opmodes:
 - N/A
- Hydrazine:
 - N/A
- Special Activities:
 - N/A

Sequence Liens (should all be SPLAT items):

- None.