



Science Planning & Sequence Team
CASSINI

CASSINI 288TWT SEGMENT

Rev 288 Handoff Package

Segment Boundary 2017-222T15:11:00 – 2017-224T12:26:00

17 JAN 2017

Karl Mitchell

Science Highlights

Notes & Liens

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

SMT Report

TOST rev 288

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 CPACTY (Mb)	MRGN (Mb)	OPNAV (Mb)	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGN (Mb)	NET_MARGN (Mb)	NET_MARGN (%)	CAROVR (Mb)	
SP_288EA_C70METNON224_PRIME	224 03:26	224 12:26	0	2304	153	2457	3322	865	0	216	53	2725	3757	1031	1031	27%	0

SSR PARTITION SIZE SUMMARY - SELECTED SSR CONFIGURATION: DOUBLE

OBSERVATION PERIOD	SSR A/B		
	P4 Size (Frames)	P5 Size (Frames)	P6 Size (Frames)
SP_287NA_OBSERV222_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	222 15:11	224 03:26	0.0	68.4	471.6	23.1	1080.0	72.3	110.9	0.0	171.0	120.5	165.0	0.0	151.5	2434.2
SP_288EA_C70METNON224_PRIME	224 03:26	224 12:26	0.0	17.0	86.4	3.2	0.0	32.0	27.5	0.0	42.4	4.9	0.0	0.0	0.0	213.6
DAILY TOTAL SCIENCE	222 15:11	224 12:26	0.0	85.4	558.0	26.4	1080.0	104.3	138.5	0.0	213.4	125.4	165.0	0.0	151.5	

	CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)
TOTAL RECORDED (OPNAV data not included)	0.0	85.4	558.0	26.4	1080.0	104.3	138.5	0.0	213.4	125.4	165.0	0.0

Master Timeline

TOST rev 288

288TI	194978
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Start Time	End Time	Prime Activity	Obs. Detail	Op Mode	TLM Mode	Comments
2017-222T15:11:00	2017-222T15:51:00	SP Turn to WP	NEG_Y to Titan/NEG_X to Sun	DFPW Normal	S_N_ER_3	Secondary is preferred by MIMI; From Xband to Earth, -Y to 92.4/-64.9 (Rolling)
2017-222T15:51:00	2017-222T16:51:00	ISS LRMONITOR	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-222T16:51:00	2017-222T23:31:00	CIRS MIDIRTMAP	(TC1b)	DFPW Normal	S_N_ER_3	
2017-222T23:31:00	2017-223T00:31:00	ISS CLOUD PIE	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-223T00:31:00	2017-223T05:31:00	CIRS COMP MAP PIE	(TC1b)	DFPW Normal	S_N_ER_3	
2017-223T05:03:41		CLOSEST APPROACH				TOST priority 1: approaches south of Menrva, high northern lats from anti-Saturn side, recedes over trailing hemisphere (which is better illuminated than rev 261) !! >60°N 120-260°W Ligeia!
2017-223T05:31:00	2017-223T06:31:00	ISS CLOUD PIE	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-223T06:31:00	2017-223T11:31:00	CIRS COMP MAP PIE	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	ISS Collaborative Rider. 10min ISS non-standard collaborative targeting to capture flying directly over Ligeia. 82/260 for lat/lon and specific timing TBC
2017-223T11:31:00	2017-223T12:31:00	ISS CLOUD PIE	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-223T12:31:00	2017-223T17:01:00	CIRS COMP MAP PIE	(TC1b)	DFPW Normal	S_N_ER_3	
2017-223T17:01:00	2017-223T18:01:00	ISS CLOUD PIE	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-223T18:01:00	2017-224T00:16:00	CIRS COMP MAP	(TC1b)	DFPW Normal	S_N_ER_3	
2017-224T00:16:00	2017-224T01:16:00	ISS LRMONITOR	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-224T01:16:00	2017-224T01:56:00	SP Turn to Earth for downlink	XBAND to Earth (0.0,-9.5), -Y to Saturn	DFPW Normal	S_N_ER_3	Secondary preferred by MIMI
2017-224T01:56:00	2017-224T03:26:00	Ybias Gap		DFPW Normal	S_N_ER_3	
2017-224T03:26:00	2017-224T12:26:00	Canberra 70M		DFPW Normal	RTE_N_SPB	

SPASS for Delivery: **TOST_288** Records 1-19 (Page 1 of 1)

Observation Attitude

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S101, length = 67 ...		2017-191T01:14:00		067T19:22:00	2017-258T20:36:00			
TOST_288 Segment		2017-222T15:11:00		001T21:15:00	2017-224T12:26:00			
SP_287TI_WAYPTTURN222_PRIME		2017-222T15:11:00		000T00:40:00	2017-222T15:51:00	NEG_Y to Titan	NEG_X to Sun	
NEW WAYPOINT		2017-222T15:51:00		001T10:05:00	2017-224T01:56:00	NEG_Y to Titan	NEG_X to Sun	
ISS_287TI_LRMONITOR001_PRIME	C, V	2017-222T15:51:00		000T01:00:00	2017-222T16:51:00	ISS_NAC to Titan	NEG_X to Sun	No Preference to secondary pointing
CIRS_287TI_MIDIRMAP001_PRIME	I, V	2017-222T16:51:00		000T06:40:00	2017-222T23:31:00	CIRS_FP1 to Titan	NEG_X to Sun	No Preference to secondary pointing
Apoapse Per = 6.5 d, inc = ...		2017-222T22:56:28		000T00:00:01	2017-222T22:56:29			
ISS_287TI_CLOUD001_PIE	C, V	2017-222T23:31:00		000T01:00:00	2017-223T00:31:00	ISS_NAC to Titan	NEG_X to Sun	
CIRS_287TI_COMPMPA001_PIE	I, V	2017-223T00:31:00		000T05:00:00	2017-223T05:31:00	CIRS_FP1 to Titan	NEG_X to Sun	CIRS_FP1 to 89.9N
288TI (nt) TITAN Inboun...		2017-223T05:04:07		000T00:00:01	2017-223T05:04:08			
ISS_288TI_CLOUD002_PIE	C, U, V	2017-223T05:31:00		000T01:00:00	2017-223T06:31:00	ISS_NAC to Titan	NEG_X to Sun	
CIRS_288TI_COMPMPA001_PIE	I, U, V	2017-223T06:31:00		000T05:00:00	2017-223T11:31:00	CIRS_FP1 to Titan	NEG_X to Sun	Collaborative Rider(s): ISS. CIRS_FP1 to 89.9N
ISS_288TI_CLOUD003_PIE	C, U, V	2017-223T11:31:00		000T01:00:00	2017-223T12:31:00	ISS_NAC to Titan	NEG_X to Sun	
CIRS_288TI_COMPMPA002_PIE	I, V	2017-223T12:31:00		000T04:30:00	2017-223T17:01:00	CIRS_FP1 to Titan	NEG_X to Sun	CIRS_FP1 to 89.9N
ISS_288TI_CLOUD004_PIE	C, V	2017-223T17:01:00		000T01:00:00	2017-223T18:01:00	ISS_NAC to Titan	NEG_X to Sun	
CIRS_288TI_COMPMPA003_PIE	I, V	2017-223T18:01:00		000T06:15:00	2017-224T00:16:00	CIRS_FP1 to Titan	NEG_X to Sun	CIRS_FP1 to 89.9N
ISS_288TI_LRMONITOR002_PRIME	C, V	2017-224T00:16:00		000T01:00:00	2017-224T01:16:00	ISS_NAC to Titan	NEG_X to Sun	No Preference to secondary pointing
SP_288EA_DLTURN224_PRIME		2017-224T01:16:00		000T00:40:00	2017-224T01:56:00	XBAND to Earth (0.0,0.0,-9.5 deg. offset)	NEG_Y to Saturn	
NEW WAYPOINT		2017-224T01:56:00		000T10:30:00	2017-224T12:26:00	XBAND to Earth (0.0,0.0,-9.5 deg. offset)	NEG_Y to Saturn	
SP_288EA_YGAP224_PRIME	E	2017-224T01:56:00		000T01:30:00	2017-224T03:26:00	XBAND to Earth (0.0,0.0,-9.5 deg. offset)	NEG_Y to Saturn	
SP_288EA_C70METNON224_PRIME	C	2017-224T03:26:00		000T09:00:00	2017-224T12:26:00	XBAND to Earth (0.0,0.0,-9.5 deg. offset)	NEG_Y to Saturn	MIMI. XBAND to EARTH (0,0, -9.5), NEG_Y to SA

High-Priority Observations

TOST rev 288

Sequence 288ti: 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_287TI_CLOUD001_PIE	2017-222T23:31:00	2017-223T00:31:00	Flexible		TC1a, TC1b, TN1a, TN2c, TN2d	Jason Perry <volcanopele@gmail.com>
Titan	CIRS_287TI_COMPMAP001_PIE	2017-223T00:31:00	2017-223T05:31:00	Flexible		TC1b	Todd Antsy <tma22@cornell.edu>
Titan	ISS_288TI_CLOUD002_PIE	2017-223T05:31:00	2017-223T06:31:00	Flexible		TC1a, TC1b, TN1a, TN2c, TN2d	Jason Perry <volcanopele@gmail.com>
Titan	CIRS_288TI_COMPMAP001_PIE	2017-223T06:31:00	2017-223T11:31:00	Flexible		TC1b	Todd Antsy <tma22@cornell.edu>
Titan	ISS_288TI_CLOUD003_PIE	2017-223T11:31:00	2017-223T12:31:00	Flexible		TC1a, TC1b, TN1a, TN2c, TN2d	Jason Perry <volcanopele@gmail.com>
Titan	CIRS_288TI_COMPMAP002_PIE	2017-223T12:31:00	2017-223T17:01:00	Flexible		TC1b	Todd Antsy <tma22@cornell.edu>
Titan	ISS_288TI_CLOUD004_PIE	2017-223T17:01:00	2017-223T18:01:00	Flexible		TC1a, TC1b, TN1a, TN2c, TN2d	Jason Perry <volcanopele@gmail.com>
Titan	CIRS_288TI_COMPMAP003_PIE	2017-224T18:01:00	2017-224T00:16:00	Flexible		TC1b	Todd Antsy <tma22@cornell.edu>

DOY 222/Aug 10, 2017 – ISS will acquire a series of medium- to high-resolution (~1 km) global-scale mosaics, observing Titan's surface (TC1a, TN1a) and atmosphere (TC1a, TC1b, TN2c, TN2d) over Menrva on Titan's leading hemisphere and, as Cassini nears closest approach, climbing to high northern mid-latitudes over the anti-Saturnian hemisphere towards Titan's lake district and eastern Ligeia Mare. The series of observations over ~33 hours allows ISS to monitor Titan to track clouds and the evolution thereof, of particular scientific interest near Titan's northern summer equinox (TC1a, TC1b, TN1a, TN2c, TN2d). The ground-track achieves the second highest northern latitude during the F-ring/Proximal non-targeted Titan flybys, providing ISS an opportunity to compare images to observations from late 2013 through early 2014, as well as more recent northern flybys, to look for surface changes that could result from summer rainstorms (TC1a, TC1b, TN1a, TN2c). **CIRS** will perform composition and temperature mapping of the atmosphere over Titan's northern hemisphere, where the lakes and seas are located. This will enable CIRS to monitor climatological changes that are occurring as the north moves into summer, including warming temperatures, continued dissipation of the northern winter gas remnants, and changes to the winds and global circulation in the middle atmosphere (TC1b). **VIMS** will ride along with CIRS and ISS, to monitor the evolution of cloud coverage at the North Pole in particular, and the evolution of the South Polar Vortex (TC1a and TC1b)

DOY 223/Aug 11, 2017 – ISS will acquire a series of medium- to high-resolution (~1 km) global-scale mosaics, observing Titan's surface (TC1a, TN1a) and atmosphere (TC1a, TC1b, TN2c, TN2d): inbound, over Menrva on Titan's leading hemisphere; near C/A, over high northern mid-latitudes, climbing over the anti-Saturnian hemisphere over Titan's lake district and eastern Ligeia Mare; and outbound, over northern mid-latitudes on the trailing hemisphere. The series of observations over ~33 hours allows ISS to monitor Titan to track clouds and the evolution thereof, of particular scientific interest near Titan's northern summer equinox (TC1a, TC1b, TN1a, TN2c, TN2d). The ground-track achieves the second highest northern latitude during the F-ring/Proximal non-targeted Titan flybys, providing ISS an opportunity to compare images to observations from late 2013 through early 2014, as well as more recent northern flybys, to look for surface changes that could result from summer rainstorms (TC1a, TC1b, TN1a, TN2c). **CIRS** will perform composition and temperature mapping of the atmosphere over Titan's northern hemisphere, where the lakes and seas are located. This will enable CIRS to monitor climatological changes that are occurring as the north moves into summer, including warming temperatures, continued dissipation of the northern winter gas remnants, and changes to the winds and global circulation in the middle atmosphere (TC1b). **UVIS** will ride along with ISS and CIRS to spatially resolve the main features of the Titan atmosphere, measuring airglow and reflected sunlight from the haze to extend our record of airglow emissions and some hydrocarbon absorptions all the way to summer solstice in the northern hemisphere. **VIMS** will ride along with ISS and CIRS to monitor the evolution of cloud coverage at the North Pole (TC1a and TC1b)

DOY 224/Aug 12, 2017 – ISS will acquire a series of global-scale images observing Titan's surface (TC1a, TN1a) and atmosphere (TC1a, TC1b, TN2c, TN2d) over northern mid-latitudes on the trailing hemisphere. This ends a series of observations over ~33 hours allows ISS to monitor Titan to track clouds and the evolution thereof, of particular scientific interest near Titan's northern summer equinox (TC1a, TC1b, TN1a, TN2c, TN2d). **CIRS** will perform composition and temperature mapping of the atmosphere over Titan's northern hemisphere, where the lakes and seas are located. This will enable CIRS to monitor climatological changes that are occurring as the north moves into summer, including warming temperatures, continued dissipation of the northern winter gas remnants, and changes to the winds and global circulation in the middle atmosphere (TC1b). **VIMS** will ride along with CIRS and ISS to monitor the evolution of cloud coverage at the North Pole (TC1a and TC1b)

Notes

TOST rev 288

- Pointing:
 - No issues.
- Data Volume:
 - No issues.
- DSN:
 - No issues.
- Resource checker:
 - No issues.
- Opmodes:
 - No issues. DFPW Normal throughout.
- Special Activities:
 - No special activities.

Liens

Sequence Liens (should all be SPLAT items):

None.