



CASSINI TOST_283 SEGMENT

Rev 283 Handoff Package

Segment Boundary 2017-191T01:14:00 – 2017-193T00:13:00

19 Jan 2017

Rudy Boehmer

SMT Report, Timeline, SPASS

Science Highlights

Notes & Liens

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

SMT Report

TOST 283

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_283EA_C34BWGNON192_PRIME	192 12:35	192 17:14	0	2078	149	2228	3322	1094	0	98	27	2353	393	-1961	4	0%	1960
SP_283EA_M70METNON192_PRIME	192 17:14	193 00:13	1960	0	0	1960	3322	1362	0	180	41	2181	2185	3	4	0%	0

SSR PARTITION SIZE SUMMARY - SELECTED SSR CONFIGURATION: DOUBLE

OBSERVATION PERIOD	SSR A/B		
	P4 Size (Frames)	P5 Size (Frames)	P6 Size (Frames)
SP_283NA_OBSERV191_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	191 01:14	192 12:35	0.0	53.3	337.9	17.0	1025.0	62.9	81.4	0.0	166.7	175.2	140.0	0.0	147.7	2207.3
SP_283EA_C34BWGNON192_PRIME	192 12:35	192 17:14	0.0	7.0	39.4	1.7	0.0	8.3	10.7	0.0	27.5	2.6	0.0	0.0	0.0	97.2
SP_283EA_M70METNON192_PRIME	192 17:14	193 00:13	0.0	10.5	0.0	4.4	0.0	12.4	16.1	0.0	130.7	3.8	0.0	0.0	0.0	178.0
DAILY TOTAL SCIENCE	191 01:14	193 00:13	0.0	70.9	377.3	23.2	1025.0	83.6	108.2	0.0	325.0	181.6	140.0	0.0	147.7	
TOTAL RECORDED (OPNAV data not included)			0.0	70.9	377.3	23.2	1025.0	83.6	108.2	0.0	325.0	181.6	140.0	0.0		

TOST_283 Master Timeline

TOST 283

283TI	264294					
Start Time	End Time	Prime Activity	Obs. Detail	Op Mode	TLM Mode	Comments
2017-191T01:14	2017-191T01:20	IVP Gap - Beginning of Seq.		DFPW Normal	S N ER 3	
2017-191T01:20	2017-191T02:50	Y-Bias - Beginning of Seq.		DFPW Normal	S N ER 3	
2017-191T02:50	2017-191T03:30	SP Turn to WP	NEG_Y to Titan / NEG_X to Sun	DFPW Normal	S N ER 3	Secondary is preferred by MIMI & ISS
2017-191T03:30	2017-191T04:20	ISS	TC1a, TC1b, TN1a, TN2c, TN2d	DFPW Normal	S N ER 3	
2017-191T04:20	2017-191T08:06	CIRS COMPMAP	TC1b, TN1c	DFPW Normal	S N ER 3	
2017-191T08:06	2017-191T09:06	ISS CLOUD PIE	TC1a, TC1b, TN1a, TN2c, TN2d	DFPW Normal	S N ER 3	
2017-191T09:06	2017-191T13:21	CIRS MID-IR T-MAP	TC1b, TN1c	DFPW Normal	S N ER 3	
2017-191T13:21	2017-191T14:21	ISS CLOUD PIE	TC1a, TC1b, TN1a, TN2c, TN2d	DFPW Normal	S N ER 3	
2017-191T13:50:50		CLOSEST APPROACH				TOST priority 1: approaches over Menrva, North Pole from Saturn side, recedes over Kraken!! ~80°N from ~70-330°W Ligela?
2017-191T14:21	2017-191T19:06	CIRS MID-IR T-MAP	TC1b, TN1c	DFPW Normal	S N ER 3	
2017-191T19:06	2017-191T20:36	ISS CLOUD PIE	TC1a, TC1b, TN1a, TN2c, TN2d	DFPW Normal	S N ER 3	
2017-191T20:36	2017-191T23:36	CIRS MID-IR T-MAP	TC1b, TN1c	DFPW Normal	S N ER 3	ISS Collaborative Rider: 10min ISS non-standard collaborative targeting to capture northern seas. A single NAC frame for 10 minutes would need to be collaborative with CIRS, pointing to ~73N/300W in the middle of the time block (flexible on the exact start time).
2017-191T23:36	2017-192T00:36	ISS CLOUD PIE	TC1a, TC1b, TN1a, TN2c, TN2d	DFPW Normal	S N ER 3	
2017-192T00:36	2017-192T04:18	CIRS COMPMAP	TC1b, TN1c	DFPW Normal	S N ER 3	ISS Collaborative Rider: 10min ISS non-standard collaborative targeting to capture northern seas. A single NAC frame for 10 minutes would need to be collaborative with CIRS, pointing to ~73N/300W in the middle of the time block (flexible on the exact start time).
2017-192T04:18	2017-192T06:03	ISS CLOUD PIE	TC1a, TC1b, TN1a, TN2c, TN2d	DFPW Normal	S N ER 3	
2017-192T06:03	2017-192T07:34	UVIS SATURN PIE	SC1a, SC2a, SN1c (Out-of-Discipline UVIS Beta CMA Occultation)	DFPW Normal	S N ER 3	
2017-192T07:34	2017-192T08:04	ISS	TC1a, TC1b, TN1a, TN2c, TN2d	DFPW Normal	S N ER 3	
2017-192T08:04	2017-192T09:55	CIRS COMPMAP	TC1b, TN1c	DFPW Normal	S N ER 3	
2017-192T09:55	2017-192T10:25	ISS	TC1a, TC1b, TN1a, TN2c, TN2d	DFPW Normal	S N ER 3	
2017-192T10:25	2017-192T11:05	SP Turn to Earth for downlink	XBAND to Earth / NEG_Y to Saturn (0.0, 0.0, -9.5 deg offset)	DFPW Normal	S N ER 3	
2017-192T11:05	2017-192T12:35	Ybias Gap		DFPW Normal	S N ER 3	
2017-192T12:35	2017-192T17:14	Canberra 34M BWG		DFPW Normal	RTE N SPB	
2017-192T17:14	2017-193T00:13	Madrid 70M		DFPW Normal	RTE N SPB	

TOST_283 SPASS

TOST 283

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End	Primary	Secondary	Comments
Sequence S101, length = 67 days		2017-191T01:14:00		067T19:22:00	2017-258T20:36:00			
TOST_283 Segment		2017-191T01:14:00		001T22:59:00	2017-193T00:13:00			
SP_283EA_S101IVP236_PRIME		2017-191T01:14:00		000T00:06:00	2017-191T01:20:00	XBAND to Earth	NEG_Y to Saturn	S101 IVP Gap
ENGR_283SC_KPTYBIAS191_PRIME		2017-191T01:20:00		000T01:30:00	2017-191T02:50:00	POS_Z to DELTA_H	NEG_X to Sun	
SP_283TI_WAYPTTURN191_PRIME		2017-191T02:50:00		000T00:40:00	2017-191T03:30:00	NEG_Y to Titan	NEG_X to Sun	
NEW WAYPOINT		2017-191T03:30:00		001T07:35:00	2017-192T11:05:00	NEG_Y to Titan	NEG_X to Sun	
ISS_283TI_LRMONITOR001_PRIME	C, V	2017-191T03:30:00		000T00:50:00	2017-191T04:20:00	ISS_NAC to Titan	NEG_X to Sun	
CIRS_283TI_COMPMAP001_PRIME	I, V	2017-191T04:20:00		000T03:46:00	2017-191T08:06:00	CIRS_FPB to Titan	NEG_X to Sun	
ISS_283TI_CLOUD001_PIE	C, V	2017-191T08:06:00		000T01:00:00	2017-191T09:06:00	ISS_NAC to Titan	NEG_X to Sun	
CIRS_283TI_MIDIRTMAP001_PRIME	I, V	2017-191T09:06:00		000T04:15:00	2017-191T13:21:00	CIRS_FPB to Titan	NEG_X to Sun	
ISS_283TI_CLOUD002_PIE	C, V	2017-191T13:21:00		000T01:00:00	2017-191T14:21:00	ISS_NAC to Titan	NEG_X to Sun	
283TI (nt) TITAN Inbound		2017-191T13:50:50		000T00:00:01	2017-191T13:50:51			
CIRS_283TI_MIDIRTMAP002_PRIME	I, V	2017-191T14:21:00		000T04:45:00	2017-191T19:06:00	CIRS_FPB to Titan	NEG_X to Sun	
ISS_283TI_CLOUD003_PIE	C, V	2017-191T19:06:00		000T01:30:00	2017-191T20:36:00	ISS_NAC to Titan	NEG_X to Sun	
CIRS_283TI_MIDIRTMAP003_PRIME	I, V	2017-191T20:36:00		000T03:00:00	2017-191T23:36:00	CIRS_FPB to Titan	NEG_X to Sun	Collaborative Rider(s): ISS
ISS_283TI_CLOUD004_PIE	C, V	2017-191T23:36:00		000T01:00:00	2017-192T00:36:00	ISS_NAC to Titan	NEG_X to Sun	
CIRS_283TI_COMPMAP002_PRIME	I, V	2017-192T00:36:00		000T03:42:00	2017-192T04:18:00	CIRS_FPB to Titan	NEG_X to Sun	Collaborative Rider(s): ISS
ISS_283TI_CLOUD005_PIE	C, V	2017-192T04:18:00		000T01:45:00	2017-192T06:03:00	ISS_NAC to Titan	NEG_X to Sun	
UVIS_283ST_BETCMA001_PIE		2017-192T06:03:00		000T01:31:00	2017-192T07:34:00	UVIS_FUV to 95.675/-17.956	NEG_X to Sun	
ISS_283TI_LRMONITOR002_PRIME	C, V	2017-192T07:34:00		000T00:30:00	2017-192T08:04:00	ISS_NAC to Titan	NEG_X to Sun	
CIRS_283TI_COMPMAP003_PRIME	I, V	2017-192T08:04:00		000T01:51:00	2017-192T09:55:00	CIRS_FPB to Titan	NEG_X to Sun	
ISS_283TI_LRMONITOR003_PRIME	C, V	2017-192T09:55:00		000T00:30:00	2017-192T10:25:00	ISS_NAC to Titan	NEG_X to Sun	
SP_283EA_DLTURN192_PRIME		2017-192T10:25:00		000T00:40:00	2017-192T11:05:00	XBAND to Earth (0,0,0,0,-9.5 deg. offset)	NEG_Y to Saturn	
NEW WAYPOINT		2017-192T11:05:00		000T13:08:00	2017-193T00:13:00	XBAND to Earth (0,0,0,0,-9.5 deg. offset)	NEG_Y to Saturn	
SP_283EA_YGAP192_PRIME	E	2017-192T11:05:00		000T01:30:00	2017-192T12:35:00	XBAND to Earth (0,0,0,0,-9.5 deg. offset)	NEG_Y to Saturn	
SP_283EA_C34BWGNON192_PRIME	C, R	2017-192T12:35:00		000T04:39:00	2017-192T17:14:00	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
SP_283EA_M70METNON192_PRIME	R	2017-192T17:14:00		000T06:59:00	2017-193T00:13:00	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

TOST_283 High-Priority Observations

TOST 283

TOST_283: 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_283TI_CLOUD001_PIE	2017-191T08:06:00	2017-191T09:06:00	Flexible		TC1a, TC1b, TN1a, TN2c, TN2d	Jason Perry <volcanopele@gmail.com>
Titan	ISS_283TI_CLOUD002_PIE	2017-191T13:21:00	2017-191T14:21:00	Flexible		TC1a, TC1b, TN1a, TN2c, TN2d	Jason Perry <volcanopele@gmail.com>
Titan	ISS_283TI_CLOUD003_PIE	2017-191T19:06:00	2017-191T20:36:00	Flexible		TC1a, TC1b, TN1a, TN2c, TN2d	Jason Perry <volcanopele@gmail.com>
Titan	CIRS_283TI_MIDIRTMAP003_PRIME	2017-191T20:36:00	2017-191T23:36:00	Flexible	ISS Collaborative Rider: 10min ISS non-standard collaborative targeting to capture northern seas (a single NAC frame for 10 minutes pointing to ~73N/300W in the middle of the time block)	TC1b, TN1c	Todd Ansty <tma22@cornell.edu>
Titan	ISS_283TI_CLOUD004_PIE	2017-191T23:36:00	2017-192T00:36:00	Flexible		TC1a, TC1b, TN1a, TN2c, TN2d	Jason Perry <volcanopele@gmail.com>
Titan	CIRS_283TI_COMPMAP002_PRIME	2017-192T00:36:00	2017-192T04:18:00	Flexible	ISS Collaborative Rider: 10min ISS non-standard collaborative targeting to capture northern seas (a single NAC frame for 10 minutes pointing to ~73N/300W in the middle of the time block)	TC1b, TN1c	Todd Ansty <tma22@cornell.edu>
Titan	ISS_283TI_CLOUD005_PIE	2017-192T04:18:00	2017-192T06:03:00	Flexible		TC1a, TC1b, TN1a, TN2c, TN2d	Jason Perry <volcanopele@gmail.com>
Saturn	UVIS_283ST_BETCMA001_PIE	2017-192T06:03:00	2017-192T07:34:00	Flexible	Out-of-Discipline PIE	SC1a, SC2a, SN1c	Alain Jouchoux <alain.jouchoux@lasp.colorado.edu>

July 10 (DOY 191) – TOST_283 is a Titan 264,294 km flyby with ISS, CIRS, and UVIS (Out-of-Discipline) as Prime Observers. ISS will begin the segment with imaging of Titan's surface over high northern latitudes, to compare with ISS images from late 2013 and early 2014 to look for surface changes. CIRS follows as Prime, making composition observations at high spectral resolution to map the distributions of trace gases and provide an insight into the stratospheric chemistry.

Next, ISS will begin its PIE campaign: a series of medium-resolution (~1-2 km) global-scale mosaics, observing Titan's surface and atmosphere over its leading hemisphere approaching Menrva during inbound (1 PIE mosaic), over Titan's high northern latitude lake district near C/A (1 PIE mosaic), and over Ladoga, Bolsena, and Jingpo Lacus and southwestern Kraken Mare during outbound (3 PIE mosaics). The series of observations over ~32 hours allows ISS to monitor Titan to track clouds and the evolution thereof, of particular scientific interest as Titan's northern summer equinox approaches.

CIRS and VIMS will ride along as non-collaborative observers on ISS primes. CIRS will continue monitoring the evolution of the global temperature and wind field, as the northern hemisphere approaches summer solstice. VIMS will monitor the evolution of cloud coverage at the North Pole.

Between the first 4 ISS PIE mosaics, CIRS will take over as Prime three times: making mid-infrared temperature maps over Titan's northern hemisphere, to monitor on-going seasonal changes. ISS and VIMS will ride along on the CIRS primes; on the final CIRS mid-IR Temperature map, ISS is a collaborative rider, targeting the northern seas (~73 N, 300 W).

July 11 (DOY 192) – After the fourth PIE mosaic, CIRS takes over as Prime with composition observations at high spectral resolution to map the distributions of trace gases and provide an insight into the stratospheric chemistry. ISS will be a collaborative rider, again targeting the northern seas (~73 N, 300 W), and then follow as Prime for its final PIE mosaic scan.

Afterwards, UVIS will be Prime for an Out-of-Discipline Saturn Occultation PIE with Beta Canus Majoris. Each Saturn occultation samples a specific latitude, collectively providing a set of vertical profiles of temperature and some hydrocarbon abundances in Saturn's largely unexplored thermosphere. With good latitudinal coverage, the suite of occultations can be used to address questions about how solar UV and energetic particle impacts destroy methane and form more complex hydrocarbons, how these processes contribute to the heating of the thermosphere (still a mystery), the zonal wind structure in the thermosphere, meridional circulation and tracer transport. Low-latitude occultations are also relevant to atmospheric density profiles, which feed into project assessment of the safety and the science to be obtained in the final five periapse passes.

ISS follows again as Prime with with imaging of Titan's surface over high northern latitudes, followed by CIRS compositional observations, followed again by ISS imaging. CIRS and VIMS ride along on ISS Primes, and ISS and VIMS ride along on CIRS Primes.

The segment concludes with playback of the observation data, occurring over a split Canberra 34M BWG/Madrid 70M downlink.

Notes

TOST 283

- Pointing:
 - Waypoint secondary chosen per science request, but close to RBOT-friendly RA/DECs
- Data Volume:
 - No carryover to next segment
 - No SMT warnings
- DSN:
 - Original DSN plan was C70/M70 – downgraded C70 to C34 to avoid over-request of 70M tracking
 - DSN maintenance: DSS-14 down from 2017-163 – 2017-202: OK, not requested.
 - No ap_downlink report check warnings
- Resource checker:
 - No open items
- Opmodes:
 - No RWA-slow or unique opmodes requested
 - RSSKRWAF requested during downlink (RSS Occultation ORT) – no issues (no RADAR or MAG SCAS at this time)
- Hydrazine:
 - No RCS, not applicable
- Special Activities:
 - None

Sequence Liens (should all be SPLAT items):

- None