



Science Planning & Sequence Team
CASSINI

CASSINI 278TWT SEGMENT

Rev 278 Handoff Package

Segment Boundary 2017-159T06:46:00 – 2017-161T00:55:00

07 DEC 2016

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Science Highlights

Notes & Liens

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

SMT Report

TOST rev 278

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)	MGRN (Mb)	OPNAV (Mb)	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGN (Mb)	NET_MARGN (Mb)	(%)	CAROVN (Mb)
SP_278EA_C70METNON160_PRIME	160 13:30	160 19:30	0	2077	130	2207	3322	1115	0	249	35	2492	2333	-159	15	1%	159
SP_278EA_M34BWGRSS160_PRIME	160 19:30	161 00:55	159	0	0	159	3322	3164	0	176	32	366	381	14	15	4%	0

SSR PARTITION SIZE SUMMARY - SELECTED SSR CONFIGURATION: DOUBLE

OBSERVATION PERIOD	SSR A/B		
	P4 Size (Frames)	P5 Size (Frames)	P6 Size (Frames)
SP_278NA_OBSERV159_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	159 06:46	160 13:30	0.0	58.0	361.6	11.1	1100.0	54.7	117.1	0.0	237.2	0.0	119.0	0.0	128.4	2187.0
SP_278EA_C70METNON160_PRIME	160 13:30	160 19:30	0.0	11.3	54.0	2.2	0.0	10.7	18.4	0.0	146.9	3.3	0.0	0.0	0.0	246.7
SP_278EA_M34BWGRSS160_PRIME	160 19:30	161 00:55	0.0	10.2	0.0	2.0	0.0	9.6	16.6	0.0	132.6	3.0	0.0	0.0	0.0	173.9
DAILY TOTAL SCIENCE	159 06:46	161 00:55	0.0	79.5	415.6	15.2	1100.0	75.0	152.0	0.0	516.6	6.3	119.0	0.0	128.4	

	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	79.5	415.6	15.2	1100.0	75.0	152.0	0.0	516.6	6.3	119.0	0.0

Master Timeline

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278TI	369872
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Start Time	End Time	Prime Activity	Obs. Detail	Op Mode	TLM Mode	Comments
2017-159T06:46:00	2017-159T07:26:00	SP Turn to WP	NEG_Y to Titan/NEG_X to Sun	DFPW Normal	S_N_ER_3	Secondary is preferred by MIMI. Preceded by rolling MAG downlink, assume -X to NSP.
2017-159T07:26:00	2017-159T08:26:00	ISS_278TI_CLOUD001_PRIME	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-159T08:26:00	2017-159T11:26:00	CIRS_278TI_COMPMAP001_PRIME	(TC1b)	DFPW Normal	S_N_ER_3	
2017-159T11:26:00	2017-159T12:26:00	ISS_278TI_CLOUD002_PRIME	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-159T12:26:00	2017-159T15:26:00	CIRS_278TI_MIDIRTMAP001_PRIME	(TC1b)	DFPW Normal	S_N_ER_3	
2017-159T15:26:00	2017-159T16:26:00	ISS_278TI_CLOUD003_PRIME	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-159T16:26:00	2017-159T19:26:00	CIRS_278TI_MIDIRTMAP002_PRIME	(TC1b)	DFPW Normal	S_N_ER_3	
2017-159T18:44:45		CLOSEST APPROACH				
2017-159T19:26:00	2017-159T20:26:00	ISS_278TI_CLOUD004_PRIME	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-159T20:26:00	2017-159T22:26:00	CIRS_278TI_MIDIRTMAP003_PRIME	(TC1b)	DFPW Normal	S_N_ER_3	
2017-159T22:26:00	2017-159T23:26:00	ISS_278TI_CLOUD005_PRIME	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-159T23:26:00	2017-160T02:26:00	CIRS_278TI_MIDIRTMAP004_PRIME	(TC1b)	DFPW Normal	S_N_ER_3	
2017-160T02:26:00	2017-160T03:26:00	ISS_278TI_CLOUD006_PRIME	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-160T03:26:00	2017-160T06:26:00	CIRS_278TI_MIDIRTMAP005_PRIME	(TC1b)	DFPW Normal	S_N_ER_3	
2017-160T06:26:00	2017-160T07:26:00	ISS_278TI_CLOUD007_PRIME	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-160T07:26:00	2017-160T10:20:00	CIRS_278TI_MIDIRTMAP006_PRIME	(TC1b)	DFPW Normal	S_N_ER_3	
2017-160T10:20:00	2017-160T11:20:00	ISS_278TI_CLOUD008_PRIME	(TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2017-160T11:20:00	2017-160T12:00:00	SP Turn to Earth for downlink	299.7/63.6	DFPW Normal	S_N_ER_3	
2017-160T12:00:00	2017-160T13:30:00	Ybias Gap		DFPW Normal	S_N_ER_3	
2017-160T13:30:00	2017-160T19:30:00	Canberra 70M	Xband to Earth/+X to RADec 299.7/63.6	DFPW Normal	RTE_N_SPB	RSS Gravity friendly secondary.
2017-160T19:30:00	2017-161T00:55:00	Madrid 70M	Xband to Earth/+X to RADec 299.7/63.6	RSS_K_RWAF	RTE_N_SPB	MIMI-friendly secondary. RSS Gravity Warmup and KA Down. Downgrade to 34m.

SPASS

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SPASS for Delivery: TOST_278 Records 1-23 (Page 1 of 1)						Observation Attitude		
Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S100, length = 46 ...		2017-145T08:57:00		045T16:17:00	2017-191T01:14:00			
TOST_278 Segment		2017-159T06:46:00		001T18:09:00	2017-161T00:55:00			
SP_278TI_WAYPTTURN159_PRIME		2017-159T06:46:00		000T00:40:00	2017-159T07:26:00	NEG_Y to Titan	NEG_X to Sun	
NEW WAYPOINT		2017-159T07:26:00		001T04:34:00	2017-160T12:00:00	NEG_Y to Titan	NEG_X to Sun	
ISS_278TI_CLOUD001_PRIME	C, V	2017-159T07:26:00		000T01:00:00	2017-159T08:26:00	ISS_NAC to Titan	NEG_X to Sun	No Preference to secondary pointing
CIRS_278TI_COMPMAP001_PRIME	I, V	2017-159T08:26:00		000T03:00:00	2017-159T11:26:00	CIRS_FPB to Titan	POS_Z to NTP	
ISS_278TI_CLOUD002_PRIME	C, V	2017-159T11:26:00		000T01:00:00	2017-159T12:26:00	ISS_NAC to Titan	NEG_X to Sun	No Preference to secondary pointing
CIRS_278TI_MIDIRTMAP001_PRIME	I, V	2017-159T12:26:00		000T03:00:00	2017-159T15:26:00	CIRS_FPB to Titan	NEG_X to Sun	No Preference to secondary pointing
ISS_278TI_CLOUD003_PRIME	C, V	2017-159T15:26:00		000T01:00:00	2017-159T16:26:00	ISS_NAC to Titan	NEG_X to Sun	No Preference to secondary pointing
CIRS_278TI_MIDIRTMAP002_PRIME	I, V	2017-159T16:26:00		000T03:00:00	2017-159T19:26:00	CIRS_FPB to Titan	NEG_X to Sun	No Preference to secondary pointing
278TI (nt) TITAN Inboun...		2017-159T18:44:45		000T00:00:01	2017-159T18:44:46			
ISS_278TI_CLOUD004_PRIME	C, V	2017-159T19:26:00		000T01:00:00	2017-159T20:26:00	ISS_NAC to Titan	NEG_X to Sun	No Preference to secondary pointing
CIRS_278TI_MIDIRTMAP003_PRIME	I, V	2017-159T20:26:00		000T02:00:00	2017-159T22:26:00	CIRS_FPB to Titan	NEG_X to Sun	No Preference to secondary pointing
ISS_278TI_CLOUD005_PRIME	C, V	2017-159T22:26:00		000T01:00:00	2017-159T23:26:00	ISS_NAC to Titan	NEG_X to Sun	No Preference to secondary pointing
CIRS_278TI_MIDIRTMAP004_PRIME	I, V	2017-159T23:26:00		000T03:00:00	2017-160T02:26:00	CIRS_FPB to Titan	NEG_X to Sun	No Preference to secondary pointing
ISS_278TI_CLOUD006_PRIME	C, V	2017-160T02:26:00		000T01:00:00	2017-160T03:26:00	ISS_NAC to Titan	NEG_X to Sun	No Preference to secondary pointing
CIRS_278TI_MIDIRTMAP005_PRIME	I, V	2017-160T03:26:00		000T03:00:00	2017-160T06:26:00	CIRS_FPB to Titan	NEG_X to Sun	No Preference to secondary pointing
ISS_278TI_CLOUD007_PRIME	C, V	2017-160T06:26:00		000T01:00:00	2017-160T07:26:00	ISS_NAC to Titan	NEG_X to Sun	No Preference to secondary pointing
CIRS_278TI_MIDIRTMAP006_PRIME	I, V	2017-160T07:26:00		000T02:54:00	2017-160T10:20:00	CIRS_FPB to Titan	NEG_X to Sun	No Preference to secondary pointing
ISS_278TI_CLOUD008_PRIME	C, V	2017-160T10:20:00		000T01:00:00	2017-160T11:20:00	ISS_NAC to Titan	NEG_X to Sun	No Preference to secondary pointing
SP_278TI_DLTURN161_PRIME		2017-160T11:20:00		000T00:40:00	2017-160T12:00:00	XBAND to Earth	POS_X to 299.7/63.6	
NEW WAYPOINT		2017-160T12:00:00		000T12:55:00	2017-161T00:55:00	XBAND to Earth	POS_X to 299.7/63.6	
SP_278TI_YGAP160_PRIME	E	2017-160T12:00:00		000T01:30:00	2017-160T13:30:00	XBAND to Earth	POS_X to 299.7/63.6	Previously secondary MIMI.NEG_Y to SA (0,0,-9.5 offset) Changed to secondary +X to 299.7/63.6
SP_278EA_C70METNON160_PRIME	C, R	2017-160T13:30:00		000T06:00:00	2017-160T19:30:00	XBAND to Earth	POS_X to 299.7/63.6	Previously MIMI. XBAND to EARTH (0,0,-9.5), NEG_Y to SA Switched to POS_X to RA/DEC 299.7/63.6
SP_278EA_M34BWGRSS160_PRIME	R	2017-160T19:30:00		000T05:25:00	2017-161T00:55:00	XBAND to Earth	POS_X to 299.7/63.6	Originally MIMI. XBAND to EARTH (0,0,-9.5), NEG_Y to SA. SRU Switched to XBAND to EARTH, PosX to 299.7/63.6 to support subsequent RSS PIE.

High-Priority Observations

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None.

DOY 159/Jun 8, 2017 – ISS will acquire a closely spaced (every ~3-4 hours) series of medium-resolution (~2-3 km) global-scale mosaics, observing Titan's surface (TC1a, TN1a) and atmosphere (TC1a, TC1b, TN2c, TN2d) over northern mid-latitudes: inbound and near C/A, over Titan's leading hemisphere, approaching near Menrva; and outbound, over the sub-Saturnian hemisphere. The series of observations over ~28 hours allows ISS to monitor Titan to track clouds and the evolution thereof, of particular scientific interest as Titan's northern summer equinox approaches (TC1a, TC1b, TN1a, TN2c, TN2d). The geometry of this flyby also makes it possible for ISS to fill the gap that remains in surface mapping coverage at northern mid-latitudes on the sub-Saturnian hemisphere (TN1a). **CIRS** will make a series of high signal-to-noise mid-infrared mapping observations, to continue monitoring the seasonal changes occurring in Titan's temperature field and the distribution of hydrocarbon gases. **VIMS** will monitor the evolution of cloud coverage at the North Pole in particular and the evolution of the South Polar Vortex.

DOY 160/Jun 9, 2017 - ISS ISS will acquire a closely spaced (every ~3-4 hours) series of medium-resolution (~2-3 km) global-scale mosaics, observing Titan's surface (TC1a, TN1a) and atmosphere (TC1a, TC1b, TN2c, TN2d) over sub-Saturnian northern mid-latitudes, also filling a gap in coverage of surface mapping. The entire series of observations over ~28 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** will perform several temperature scans over Titan's northern hemisphere and pole, mapping temperature field and gas concentrations. These maps will show how Titan's atmosphere is evolving over the summer pole, and provide contrasting information to the winter (southern) pole. The maps can also be used as constraints on dynamical/chemical models. **VIMS** will monitor the evolution of cloud coverage at the North Pole in particular and the evolution of the South Polar Vortex.

The following is a low priority request that is unlikely to be required, due to the existence of a Y-bias just before.

RSS requests no thruster during RSS_278SA_KADOWN001_RSS, from the beginning of the SP_278EA_M34BWGRSS160_PRIME downlink, starting 160/19:30:00, until the end of the downlink and segment at 161/00:55:00. If biases are needed during the GSEs, try to place them as early as possible during the track.

Notes

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- Pointing:
 - Non-inertial pointing for downlink selected for RSS, under agreement with MIMI (original design was MIMI-friendly).
- Data Volume:
 - No issues.
- DSN:
 - Voluntarily downgraded during integration from M70 to M34 DSS-55: SP_278EA_M34BWGRSS160_PRIME
 - Final downlink also supports RSS_278SA_KADOWN001_RSS and is designed to support RSS PIE in subsequent pass. DSS-84 ESA station activities begin during final downlink. Split pass includes:
 - SP_278NA_M34BWGRSS160_SP.
 - SP_278EA_DSS84MRSS161_SP.
 - AP_Downlink warnings relate to ESA DSS-84 station, and can be disregarded (K. Uchida, pers. comm.):
 - SP_278EA_DSS84MRSS161_SP DSS code is inconsistent with complex/antenna
 - SP_278EA_DSS84MRSS161_SP has a short precal time for an RSS pass
- Resource checker:
 - No issues.
- Opmodes:
 - RSS_K_RWAF to support RSS KADOWN and subsequent segment PIE.
- Special Activities:
 - No special activities.

Liens

Sequence Liens (should all be SPLAT items):

None.