CASSINI 292TWT SEGMENT

Rev 292 Handoff Package

Segment Boundary 2017-254T04:37:00 – 2017-226T12:25:00

17 JAN 2017

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Science Highlights

Notes & Liens

SMT Report

			OBSERVATION_PERIOD							DOWNLINK_PASS						
			P4						P5	RECORDED		PLAYBACK				
DOWNLINK PASS NAME	Start doy hh:mm	End doy hh:mm	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 (%)	CAROVR (Mb)
SP_293EA_G70METNON255_PRIME	255 23:56	256 04:37	0	3138	183	3321	3322	1	0	111	28	3460	1411	-2050	520	12%	2049
SP_293EA_C70METNON256_PRIME	256 04:37	256 12:25	2049	0	0	2049	3322	1273	0	193	46	2288	2808	519	520	19%	0

SSR PARTITION SIZE SUMMARY - SELECTED SSR CONFIGURATION: DOUBLE

	SSR A/B		
OBSERVATION PERIOD	P4 Size (Frames)	P5 Size (Frames)	P6 Size (Frames)
SP_292NA_OBSERV254_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	254 04:37	255 23:56	0.0	104.5	523.2	25.7	1215.0	154.1	132.5	471.4	204.3	109.0	170.0	0.0	181.0	3290.7
SP_293EA_G70METNON255_PRIME	255 23:56	256 04:37	0.0	13.3	39.8	1.7	0.0	16.7	14.3	0.0	22.1	2.6	0.0	0.0	0.0	110.4
SP_293EA_C70METNON256_PRIME	256 04:37	256 12:25	0.0	22.1	73.4	2.8	0.0	27.7	23.9	0.0	36.8	4.3	0.0	0.0	0.0	191.0
DAILY TOTAL SCIENCE	254 04:37	256 12:25	0.0	139.8	636.4	30.2	1215.0	198.5	170.7	471.4	263.2	115.8	170.0	0.0	181.0	

	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	139.8	636.4	30.2	1215.0	198.5	170.7	471.4	263.2	115.8	170.0	0.0

Master Timeline

292TI	117922

Start Time	End Time	Prime Activity	Obs. Detail	Op Mode	TLM Mode	Comments
2017-254T04:37:00	**2017-254T05:17:00**	SP Turn to WP	NEG_Y to Titan/NEG_X to Sun	DFPW Normal	S_N_ER_3	Secondary is preferred by MIMI
2017-254T05:17:00	**2017-254T06:22:00**	**ISS CLOUD PIE**	TC1a, TC1b, TN1a, TN2c, TN2d	DFPW Normal	S_N_ER_3	
2017-254T06:22:00	2017-254T09:16:00	CIRS MidIRTMap	TC1b	DFPW Normal	S_N_ER_3	CIRS: v close northern flyby late in mission, last chance for limb mapping or anything else! Heating may be an issue.
2017-254T09:16:00	2017-254T10:16:00	ISS	TC1a, TC1b, TN1a, TN2c, TN2d	DFPW Normal	S_N_ER_3	
2017-254T10:16:00	**2017-254T15:16:00**	**CIRS MIRLMBMap PIE**	TN1c, TC1b	DFPW Normal	S_N_ER_3	ISS non-standard Collaborative Rider: 10 minute WAC sit and stare in middle of this interval (represented as one hour ISS PIE in middle of CIRS PIE). **CIRS renamed their (formerly non-PIE) observation as a PIE to ISS PIE observation.**
2017-254T15:16:00	**2017-254T20:33:00**	**ISS CLOUD PIE**	TC1a, TC1b, TN1a, TN2c, TN2d	RADWU	S_N_ER_5A for first 15m, S_N_ER_3 afterwards.	Try to make sure that RADAR target is in ISS/VIMS image in this PIE or the PIE following RADAR
2017-254T19:03:43		**CLOSEST APPROACH**				TOST priority 1: approaches over eastern leading hemisphere, high northern lats from anti-Saturn side, recedes over trailing hemisphere (which is better illuminated than rev 261)!! >60°N 110-240°W
2017-254T20:33:00	**2017-254T22:13:00**	**RADAR ALTIMETRY PIE**	TN1a, TN2c	RADRWA	S_N_ER_8	ISS VIMS SLEEP. RADAR will do turns to and from target. No custom period planned. RADAR track start 171.3W/70.1N end 191.4W/69.9N
2017-254T22:13:00	**2017-254T23:46:00**	**ISS CLOUD PIE**	TC1a, TC1b, TN1a, TN2c, TN2d	DFPW Normal	S_N_ER_3	Try to make sure that RADAR target is in ISS/VIMS image or In the PIE preceding RADAR
2017-254T23:46:00	2017-255T02:46:00	CIRS FIRNadMap	TC1b, TN1c	DFPW Normal	S_N_ER_3	
2017-255T02:46:00	2017-255T03:46:00	ISS	TC1a, TC1b, TN1a, TN2c, TN2d	DFPW Normal	S_N_ER_3	
2017-255T03:46:00	2017-255T06:46:00	CIRS CompMap	TC1b	DFPW Normal	S_N_ER_3	
2017-255T06:46:00	**2017-255T07:46:00**	**ISS CLOUD PIE**	TC1a, TC1b, TN1a, TN2c, TN2d	DFPW Normal	S_N_ER_3	
2017-255T07:46:00	2017-255T12:46:00	CIRS MidIRTMap	TC1b	DFPW Normal	S_N_ER_3	
2017-255T12:46:00	2017-255T13:46:00	ISS	TC1a, TC1b, TN1a, TN2c, TN2d	DFPW Normal	S_N_ER_3	
2017-255T13:46:00	2017-255T18:16:00	CIRS MidIRTMap	TC1b	DFPW Normal	S_N_ER_3	
2017-255T18:16:00	2017-255T18:46:00	ISS	TC1a, TC1b, TN1a, TN2c, TN2d	DFPW Normal	S_N_ER_3	
2017-255T18:46:00	2017-255T21:06:00	CIRS CompMap	TC1b	DFPW Normal	S_N_ER_3	
2017-255T21:06:00	2017-255T21:36:00	ISS	TC1a, TC1b, TN1a, TN2c, TN2d	DFPW Normal	S_N_ER_3	
2017-255T21:36:00	**2017-255T22:16:00**	SP Turn to Earth for downlink	Xband to Earth/NEG_Y to Saturn	DFPW Normal	S_N_ER_3	
2017-255T22:16:00	**2017-255T23:56:00**	Ybias Gap		DFPW Normal	S_N_ER_3	
2017-255T23:56:00	**2017-256T04:37:00**	Goldstone 70M		DFPW Normal	RTE_N_SPB	Rolling downlink for MAG
2017-256T04:37:00	**2017-256T12:25:00**	Canberra 70M		DFPW Normal	RTE_N_SPB	Rolling downlink for MAG

SPASS for Delivery: TOST_292 Records 1-26 (Page 1 of 1)

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Observation Attitude: Primary	Observation Attitude: Secondary	Comments
Sequence S101, length = 67 ...		2017-191T01:14:00		067T19:22:00	2017-258T20:36:00			
TOST_292 Segment		2017-254T04:37:00		002T07:48:00	2017-256T12:25:00			
SP_292TI_WAYPTTURN254_PRIME		2017-254T04:37:00		000T00:40:00	2017-254T05:17:00	NEG_Y to Titan	NEG_X to Sun	
NEW WAYPOINT		**2017-254T05:17:00**		**001T16:59:00**	**2017-255T22:16:00**	**NEG_Y to Titan**	**NEG_X to Sun**	
ISS_292TI_CLOUD001_PIE	C, V	2017-254T05:17:00		000T01:05:00	2017-254T06:22:00	ISS_NAC to Titan	NEG_X to Sun	
CIRS_292TI_MIDIRTMAP001_PRIME	I, V	2017-254T06:22:00		000T02:54:00	2017-254T09:16:00	CIRS_FPB to Titan	NEG_X to Sun	No Preference to secondary pointing
ISS_292TI_LRMONITOR001_PRIME	C, V	2017-254T09:16:00		000T01:00:00	2017-254T10:16:00	ISS_NAC to Titan	NEG_X to Sun	No Preference to secondary pointing
CIRS_292TI_MIRLMBMAP001_PIE	I, V	2017-254T10:16:00		000T05:00:00	2017-254T15:16:00	CIRS_FPB to Titan	PIC	Collaborative Rider(s): ISS. CIRS_FPB to 85N
ISS_292TI_CLOUD002_PIE	C, U, V	2017-254T15:16:00		000T05:17:00	2017-254T20:33:00	ISS_NAC to Titan	NEG_X to Sun	
292TI (nt) TITAN Outbou...		2017-254T19:03:43		000T00:00:01	2017-254T19:03:44			
RADAR_292TI_ALTIMETRY002_PIE		2017-254T20:33:00		000T01:40:00	2017-254T22:13:00	NEG_Z to Titan	NEG_X to Titan_North_Pole	
ISS_292TI_CLOUD003_PIE	C, U, V	2017-254T22:13:00		000T01:33:00	2017-254T23:46:00	ISS_NAC to Titan	NEG_X to Sun	
CIRS_292TI_FIRNADMAP001_PRIME	V	2017-254T23:46:00		000T03:00:00	2017-255T02:46:00	CIRS_FPB to Titan	NEG_X to Sun	No Preference to secondary pointing
ISS_292TI_LRMONITOR002_PRIME	C, V	2017-255T02:46:00		000T01:00:00	2017-255T03:46:00	ISS_NAC to Titan	NEG_X to Sun	No Preference to secondary pointing
CIRS_292TI_COMPMAP001_PRIME	I, V	2017-255T03:46:00		000T03:00:00	2017-255T06:46:00	CIRS_FPB to Titan	NEG_X to Sun	CIRS_FPB to 89.9N
Apoapse Per = 6.4 d, inc =...		2017-255T05:37:34		000T00:00:01	2017-255T05:37:35			
ISS_292TI_CLOUD004_PIE	C, V	2017-255T06:46:00		000T01:00:00	2017-255T07:46:00	ISS_NAC to Titan	NEG_X to Sun	
CIRS_292TI_MIDIRTMAP002_PRIME	I, V	2017-255T07:46:00		000T05:00:00	2017-255T12:46:00	CIRS_FPB to Titan	NEG_X to Sun	No Preference to secondary pointing
ISS_293TI_LRMONITOR003_PRIME	C, V	2017-255T12:46:00		000T01:00:00	2017-255T13:46:00	ISS_NAC to Titan	NEG_X to Sun	No Preference to secondary pointing
CIRS_293TI_MIDIRTMAP003_PRIME	I, V	2017-255T13:46:00		000T04:30:00	2017-255T18:16:00	CIRS_FPB to Titan	NEG_X to Sun	No Preference to secondary pointing
ISS_293TI_LRMONITOR004_PRIME	C, V	2017-255T18:16:00		000T00:30:00	2017-255T18:46:00	ISS_NAC to Titan	NEG_X to Sun	No Preference to secondary pointing
CIRS_293TI_COMPMAP002_PRIME	I, V	2017-255T18:46:00		000T02:20:00	2017-255T21:06:00	CIRS_FPB to Titan	NEG_X to Sun	
ISS_293TI_LRMONITOR005_PRIME	C, V	2017-255T21:06:00		000T00:30:00	2017-255T21:36:00	ISS_NAC to Titan	NEG_X to Sun	No Preference to secondary pointing
SP_293EA_DLTURN255_PRIME		2017-255T21:36:00		000T00:40:00	2017-255T22:16:00	XBAND to Earth	NEG_Y to Saturn	
NEW WAYPOINT		**2017-255T22:16:00**		**000T14:09:00**	**2017-256T12:25:00**	**XBAND to Earth**	**NEG_Y to Saturn**	
SP_293EA_YGAP255_PRIME	E	2017-255T22:16:00		000T01:40:00	2017-255T23:56:00	XBAND to Earth	NEG_Y to Saturn	
SP_293EA_G70METNON255_PRIME	C	2017-255T23:56:00		000T04:41:00	2017-256T04:37:00	XBAND to Earth	Rolling/SRU	SRU, CIRS heating
SP_293EA_C70METNON256_PRIME	C	2017-256T04:37:00		000T07:48:00	2017-256T12:25:00	XBAND to Earth	Rolling/SRU	SRU, CIRS heating

High-Priority Observations

Sequence 292ti: 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_292TI_CLOUD001_PIE	2017-254T05:17:00	2017-254T06:22:00	Flexible	Unique dataset: last view of Titan in mission.	TC1a, TC1b, TN1a, TN2c, TN2d	Jason Perry <volcanopele@gmail.com>
Titan	CIRS_292TI_MIDIRLMBMAP_PIE	2017-254T10:16:00	2017-254T15:16:00	Significant Science Impact if Secondary Changed	Unique dataset: last view of Titan in mission.	TC1b, TN1c	Todd Antsy <tma22@cornell.edu>
Titan	ISS_292TI_CLOUD002_PIE	2017-254T15:16:00	2017-254T20:33:00	Flexible	Unique dataset: last view of Titan in mission.	TC1a, TC1b, TN1a, TN2c, TN2d	Jason Perry <volcanopele@gmail.com>
Titan	RADAR_292TI_ALTIMETRY002_PIE	2017-254T20:33:00	2017-254T22:13:00	Flexible	Unique dataset: last view of Titan in mission.	TC1a, TN1a	Yanhua Anderson <Yanhua.Z.Anderson@jpl.nasa.gov>
Titan	ISS_292TI_CLOUD003_PIE	2017-254T22:13:00	2017-254T23:46:00	Flexible	Unique dataset: last view of Titan in mission.	TC1a, TC1b, TN1a, TN2c, TN2d	Jason Perry <volcanopele@gmail.com>
Titan	ISS_292TI_CLOUD004_PIE	2017-255T06:46:00	2017-255T07:46:00	Flexible	Unique dataset: last view of Titan in mission.	TC1a, TC1b, TN1a, TN2c, TN2d	Jason Perry <volcanopele@gmail.com>

Science Highlights: TOST_292

DOY 254/Sep 11, 2017 – This is the final Titan flyby of the Cassini mission, providing several instruments with distant parting shots that extend the time baseline for change detection at high resolutions, most notably for cloud monitoring. **ISS** will acquire a closely spaced (every ~2-4 hours) series of medium- to high-resolution (~1 km) global-scale mosaics, observing Titan's surface (TC1a, TN1a) and atmosphere (TC1a, TC1b, TN2c, TN2d): inbound, at low latitudes over northeastern Xanadu on Titan's leading hemisphere; near C/A, over high northern latitudes, climbing over the anti-Saturnian hemisphere near Titan's lake district; and outbound, over northern mid-latitudes on the trailing hemisphere. This series of ISS Titan observations over ~40 hours is ISS' last opportunity 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). And the ground-track over high northern latitudes provides a final opportunity to compare to ISS images 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 make the final important limb sounding measurements in the mid-infrared. These will enable the vertical gradients of gases and temperature to be measured, providing valuable and last-of-a-kind information on the vertical structure of Titan's atmosphere. In addition, CIRS will make the last map of surface temperatures over the lake/sea terrain, the final global temperature map in the stratosphere, and the final mid-IR gas maps. All this information will provide a crucial final snapshot of Titan's atmospheric conditions as the northern summer solstice is reached, and the final constraints available for atmospheric modeling work until a future mission reaches Titan. **VIMS** will monitor the evolution of cloud coverage at the North Pole in particular and the evolution of the South Polar Vortex where geometry permits (TC1a and TC1b). **UVIS** will 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. **RADAR** will perform a search for Arecibo-like specular reflection from lakes at long range in altimeter mode. It will also provide the last Titan radar surface temperature measurement of the mission, to observe the impact of summer warming. (TN1a, TN2c).

Science Highlights: TOST_292

DOY 255/Sep 12, 2017 – This is the final Titan flyby of the Cassini mission, providing several instruments with distant parting shots that extend the time baseline for change detection at high resolutions, most notably for cloud monitoring. **ISS** will acquire a closely spaced (every ~2-4 hours) series of medium- to high-resolution (~1 km) global-scale mosaics, 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 ISS Titan observations over ~40 hours, and represents the last opportunity 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 make the last map of surface temperatures over the lake/sea terrain, the final global temperature map in the stratosphere, and the final mid-IR gas maps. This information will provide a crucial final snapshot of Titan's atmospheric conditions as the northern summer solstice is reached, and the final constraints available for atmospheric modeling work until a future mission reaches Titan. **VIMS** will monitor the evolution of cloud coverage at the North Pole (TC1a and TC1b). **UVIS** will 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.

Notes

- Pointing:
  - No issues.
- Data Volume:
  - SMT Warning; expected, can be ignored for RADAR warmups:
    - RADAR_292TI_WRMUP4ALT002_RIDER: Found an activity whose data are NOT recorded in this telemetry mode "S_N_ER_3" commanded at 2017-254T15:31:00.000. Volume of 8.593229 Mb not given data policing space.
- DSN:
  - No issues.
- Resource checker:
  - ENGR_292SC_DFPW254_PPS: Unable to find OpMode request after ENGR_292SC_DFPW254_PPS.
    - This is the final opmode change of the mission in CIMS, and so is to be expected.
  - ISS_292TI_CLOUD002_PIE: Telemetry Mode change during an ISS observation.
    - Telemetry mode transition at start of ISS observation, to S_N_ER_5A for 15 min (RADAR Warmup). OK with ISS.
- Opmodes:
  - No issues. RADRWA for RADAR altimetry, and RADWU for RADAR warmup.
- Special Activities:
  - No special activities.

Liens

Sequence Liens (should all be SPLAT items):

None.