CASSINI TOST T115 SEGMENT

Rev 230 Handoff Package

Segment Boundary 2016-015T12:01:00 – 2016-017T04:01:00

5 June 2015

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Science Highlights

Notes & Liens

SMT Report

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

			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 (Mb)	(%)	CAROVR (Mb)
SP_230EA_C70METNON016_PRIME	016 16:31	017 04:01	0	3024	120	3145	3322	177	0	258	68	3470	3515	44	45	1%	0

SSR PARTITION SIZE SUMMARY - SELECTED SSR CONFIGURATION: DOUBLE

	SSR A/B		
OBSERVATION PERIOD	P4 Size (Frames)	P5 Size (Frames)	P6 Size (Frames)
SP_230NA_OBSERV415_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	015 12:01	016 16:31	0.0	53.8	326.2	20.3	310.0	64.9	96.6	0.0	1713.5	166.6	245.0	0.0	119.1	3116.0
SP_230EA_C70METNON016_PRIME	016 16:31	017 04:01	0.0	21.7	113.4	4.1	0.0	20.5	35.2	0.0	54.2	6.3	0.0	0.0	0.0	255.4
DAILY TOTAL SCIENCE	015 12:01	017 04:01	0.0	75.5	439.6	24.5	310.0	85.4	131.8	0.0	1767.8	172.9	245.0	0.0	119.1	

	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	75.5	439.6	24.5	310.0	85.4	131.8	0.0	1767.8	172.9	245.0	0.0

T115 TOST Master Timeline

230TI_T115	3817

Start Time	End Time	Prime Activity	Obs. Detail	Op Mode	TLM Mode	Comments
2016-015T12:01:00	**2016-015T12:41:00**	SP Turn to WP	NEG_Y to Titan / NEG_X to NTP	DFPW Normal	S_N_ER_3	
2016-015T12:41:00	C/A-13:24:24	OD Uncertainty Dead Time		DFPW Normal	S_N_ER_3	
C/A-13:24:24	-09:00	**CIRS**	C extended (TN1c)	DFPW Normal	S_N_ER_3	ISS, UVIS, VIMS riders
-09:00	-02:15	**UVIS**	X (TN1c. ISS ridealong is photon WAC (TN1c and TC1a))	DFPW Normal	S_N_ER_3	CIRS, ISS, VIMS riders
-02:15	**-01:15**	**CIRS**	TN1c (Limb vertical sounding of stratospheric compounds)	DFPW Normal	S_N_ER_3	ISS, MIMI, UVIS, VIMS riders
-01:15	**-00:45**	**CIRS**	TN1c (Limb scanning for aerosol abundance)	DFPW Normal	S_N_ER_3	MIMI, VIMS riders
-00:45	**0**	**CIRS**	TN1c (Limb scanning for temperature)	DFPW Normal	S_N_ER_3	MIMI, VIMS riders
2016-016T02:20:24		**CLOSEST APPROACH**	**NEG_Y to Titan (Tc2a)**	DFPW Normal	S_N_ER_3	
0	**+00:45**	**CIRS**	TN1c (Limb scanning for temperature)	DFPW Normal	S_N_ER_3	MIMI, VIMS riders
+00:45	**+01:15**	**CIRS**	TN1c (Limb scanning for aerosol abundance)	DFPW Normal	S_N_ER_3	MIMI, VIMS riders
+01:15	**+02:15**	**CIRS**	TN1c (Limb vertical sounding of stratospheric compounds)	DFPW Normal	S_N_ER_3	ISS, MIMI, UVIS, VIMS riders
+02:15	+05:00	**CIRS**	T (TN2c (surface temperature))	DFPW Normal	S_N_ER_3	VIMS rider: Collaborative North limb specular reflection at C/A+04:50:00
+05:00	+09:00	**CIRS**	R (TC1b. VIMS rider (TN2c))	DFPW Normal	S_N_ER_3	VIMS rider
+09:00	C/A+11:45:36	**VIMS**	O (TC1a, TC1b. CIRS rider (TN1a))	DFPW Normal	S_N_ER_3	CIRS, ISS riders
C/A+11:45:36	2016-016T14:21:00	OD Uncertainty Dead Time		DFPW Normal	S_N_ER_3	
2016-016T14:21:00	**2016-016T15:01:00**	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	
2016-016T15:01:00	2016-016T16:31:00	Y-Bias window		DFPW Normal	S_N_ER_3	
2016-016T16:31:00	**2016-017T04:01:00**	Canberra 70M		DFPW Normal	RTE_N_SPB	

T115 TOST SPASS

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S92, length = 74 days		2015-329T06:08:00		073T18:40:00	2016-038T00:48:00			
Titan Flyby T115 Segment		2016-015T12:01:00		001T16:00:00	2016-017T04:01:00			
SP_230TI_WAYPTTURN015_PRIME		2016-015T12:01:00		000T00:40:00	2016-015T12:41:00	NEG_Y to Titan	NEG_X to NTP	
NEW WAYPOINT		**2016-015T12:41:00**		**001T02:20:00**	**2016-016T15:01:00**	**NEG_Y to Titan**	**NEG_X to NTP**	
SP_230TI_DEADTIME015_PRIME		**2016-015T12:41:00**		**000T00:14:31**	**2016-015T12:55:31**	**NEG_Y to Titan**	**NEG_X to NTP**	
CIRS_230TI_FIRNADCMP001_PRIME	I, U, V	2016-015T12:55:31	GMB_E230_TITAN_T115-000T13:24:53	000T04:24:53	2016-015T17:20:24	CIRS_FP1 to Titan	PIC	
UVIS_230TI_EUVFUV001_PRIME	C, I, V	2016-015T17:20:24	GMB_E230_TITAN_T115-000T09:00:00	000T06:45:00	2016-016T00:05:24	UVIS_FUV to Titan	NEG_X to NTP	
CIRS_230TI_FIRLMBINT001_PRIME	I, M, V	2016-016T00:05:24	GMB_E230_TITAN_T115-000T02:15:00	000T01:00:00	2016-016T01:05:24	CIRS_FP1 to Titan	PIC	
CIRS_230TI_FIRLMBAER004_PRIME	M, V	2016-016T01:05:24	GMB_E230_TITAN_T115-000T01:15:00	000T00:30:00	2016-016T01:35:24	CIRS_FP1 to Titan	PIC	
CIRS_230TI_FIRLMBT001_PRIME	M, V	2016-016T01:35:24	GMB_E230_TITAN_T115-000T00:45:00	000T00:45:00	2016-016T02:20:24	CIRS_FP1 to Titan	PIC	
230TI (t) T115 TITAN Outbound 3548.1 km		2016-016T02:20:24		000T00:00:01	2016-016T02:20:25			
CIRS_230TI_FIRLMBT002_PRIME	M, V	2016-016T02:20:24	GMB_E230_TITAN_T115+000T00:00:00	000T00:45:00	2016-016T03:05:24	CIRS_FP1 to Titan	PIC	
CIRS_230TI_FIRLMBAER005_PRIME	M, V	2016-016T03:05:24	GMB_E230_TITAN_T115+000T00:45:00	000T00:30:00	2016-016T03:35:24	CIRS_FP1 to Titan	PIC	
CIRS_230TI_FIRLMBINT002_PRIME	I, M	2016-016T03:35:24	GMB_E230_TITAN_T115+000T01:15:00	000T01:00:00	2016-016T04:35:24	CIRS_FP1 to Titan	PIC	
CIRS_230TI_FIRNADMAP002_PRIME	V	2016-016T04:35:24	GMB_E230_TITAN_T115+000T02:15:00	000T02:45:00	2016-016T07:20:24	CIRS_FP1 to Titan	PIC	Collaborative Rider(s): VIMS
CIRS_230TI_MIRLMBMAP002_PRIME	V	2016-016T07:20:24	GMB_E230_TITAN_T115+000T05:00:00	000T04:00:00	2016-016T11:20:24	CIRS_FPB to Titan	PIC	
VIMS_230TI_GLOBMAP001_PRIME	C, I	2016-016T11:20:24	GMB_E230_TITAN_T115+000T09:00:00	000T02:45:07	2016-016T14:05:31	VIMS_IR to Titan	NEG_X to NTP	No Preference to secondary pointing
SP_230TI_DEADTIME016_PRIME		**2016-016T14:05:31**	**GMB_E230_TITAN_T115+000T11:45:07**	**000T00:15:29**	**2016-016T14:21:00**	**NEG_Y to Titan**	**NEG_X to NTP**	
SP_230EA_DLTURN016_PRIME		2016-016T14:21:00		000T00:40:00	2016-016T15:01:00	XBAND to Earth (0.0,0.0,-9.5 deg. offset)	NEG_Y to Saturn	
NEW WAYPOINT		**2016-016T15:01:00**		**000T13:00:00**	**2016-017T04:01:00**	**XBAND to Earth (0.0,0.0,-9.5 deg. offset)**	**NEG_Y to Saturn**	
SP_230EA_YGAP016_PRIME	E	2016-016T15:01:00		000T01:30:00	2016-016T16:31:00	XBAND to Earth (0.0,0.0,-9.5 deg. offset)	NEG_Y to Saturn	
SP_230EA_C70METNON016_PRIME	C	2016-016T16:31:00		000T11:30:00	2016-017T04:01:00	XBAND to Earth (0.0,0.0,-9.5 deg. offset)	Rolling	MIMI.NEG_Y to Saturn (0,0,-9.5).

T115 TOST High-Priority Observations

T115: 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	CIRS_230TI_FIRLMBINT001_PRIME	2016-016T00:05:24	2016-016T01:05:24	Significant Science Impact if Secondary Changed	CIRS 10pt Titan flyby: Primary and secondary highly constrained	TN1c	Todd Ansty
Titan	CIRS_230TI_FIRLMBAER004_PRIME	2016-016T01:05:24	2016-016T01:35:24	Significant Science Impact if Secondary Changed	CIRS 10pt Titan flyby: Primary and secondary highly constrained	TN1c	Todd Ansty
Titan	CIRS_230TI_FIRLMBT001_PRIME	2016-016T01:35:24	2016-016T02:20:24	Significant Science Impact if Secondary Changed	CIRS 10pt Titan flyby: Primary and secondary highly constrained	TN1c	Todd Ansty
Titan	CIRS_230TI_FIRLMBT002_PRIME	2016-016T02:20:24	2016-016T03:05:24	Significant Science Impact if Secondary Changed	CIRS 10pt Titan flyby: Primary and secondary highly constrained	TN1c	Todd Ansty
Titan	CIRS_230TI_FIRLMBAER005_PRIME	2016-016T03:05:24	2016-016T03:35:24	Significant Science Impact if Secondary Changed	CIRS 10pt Titan flyby: Primary and secondary highly constrained	TN1c	Todd Ansty
Titan	CIRS_230TI_FIRLMBINT002_PRIME	2016-016T03:35:24	2016-016T04:35:24	Significant Science Impact if Secondary Changed	CIRS 10pt Titan flyby: Primary and secondary highly constrained	TN1c	Todd Ansty
Titan	CIRS_230TI_FIRNADMAP002_PRIME	2016-016T04:35:24	2016-016T07:20:24	Secondary Preferred	Preferred secondary axis	TN2c	Todd Ansty
Titan	CIRS_230TI_MIRLMBMAP002_PRIME	2016-016T07:20:24	2016-016T11:20:24	Significant Science Impact if Secondary Changed	Primary and secondary highly constrained	Tc1b	Todd Ansty

Note: This is an update from the Detailed Package

T115 TOST Science Highlights (1/2)

CIRS 10-point flyby: CIRS will perform limb mapping on both the north and south limbs of Titan on the same flyby. Having both north and south limb observations on the same flyby provides a comparison and contrast between the spring (north) and fall (south) hemispheres where rapid changes in atmospheric circulation are occurring. (In the south especially, we see changes in the structure of the polar vortex on each flyby.)

DOY 015 (Jan 15) – On the inbound, CIRS will perform limb mapping on the south (73S) limb of Titan, measuring how the gas and aerosol abundances varying with altitude; also measuring temperature profiles and potentially inferring the locations of cloud layers. VIMS will ride along with CIRS and UVIS and will monitor the formation and evolution of clouds as well as the South polar vortex. ISS will also ride along over Titan's sub-Saturnian hemisphere at low phase to image Titan's surface and atmosphere.

T115 has MAPS objectives as well. With SLT similar to T9 and T114 but at an altitude above the outer boundary of its induced magnetosphere, MAG will try to characterize the upstream counterpart of the induced magnetosphere of Titan explored during those previous flybys. MIMI will measure energetic ion and electron energy input to Titan's atmosphere. Finally, RPWS will measure thermal plasmas in Titan's ionosphere and surrounding environment, search for lightning in Titan's atmosphere, and investigate the interaction of Titan with Saturn's atmosphere.

T115 TOST Science Highlights (2/2)

DOY 016 (Jan 16) – On Titan outbound, CIRS will perform perform limb mapping on the north (57N) limb. As noted in the previous day's inbound, CIRS will measure how the gas and aerosol abundances vary with altitude, and will also measure temperature profiles and potentially inferring the locations of cloud layers.

During its prime observation, VIMS will map the North pole area at high emission angle and will monitor the evolution of the lakes and seas. In addition, VIMS has a collaborative rider with CIRS for a potential specular reflection on a large lake at 73.5N, 182W. ISS will ride along with CIRS and VIMS at closest approach and outbound over Titan's trailing hemisphere at high phase angle to image Titan's surface and atmosphere.

T115 MAPS objectives continue into DOY 016.

Playback of the data will occur over the Canberra 70M downlink.

DOY 017 (Jan 17) – Playback will continue over the Canberra 70M.

Notes

- Pointing:
  - Rolling downlink, some CIRS heating expected
- Data Volume:
  - No carryover to next segment
  - No SMT warnings
- DSN:
  - No extended DSN maintenances
  - No ap_downlink report check warnings
- Resource checker:
  - No open items
- Opmodes:
  - ORS only - No issues
- Hydrazine:
  - No RCS, not applicable
- Special Activities:
  - None (no dual playback)

Liens

Sequence Liens (should all be SPLAT items):

- No Liens for T113