



CASSINI TOST SEGMENT

Rev 213-T110 Handoff Package

Segment Boundary 2015-074T21:55:00 – 2015-077T02:10:00

27 August 2014

Jan Berkeley

SMT report and Master Timeline

Science Highlights

Notes & Liens

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

SMT report

TOST T110

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)	CAROV (%)	CAROV (Mb)
SP_213EA_C70METNON076_PRIME	076 14:25	076 23:25	0	2795	171	2966	3322	356	0	423	53	3442	3564	121	375	9%	0
SP_213EA_M70METNON076_PRIME	076 23:25	077 02:10	0	0	0	0	3322	3322	0	465	16	481	734	253	253	34%	0

SSR PARTITION SIZE SUMMARY - SELECTED SSR CONFIGURATION: DOUBLE

OBSERVATION PERIOD	SSR A/B		
	P4 Size (Frames)	P5 Size (Frames)	P6 Size (Frames)
SP_213NA_OBSERV074_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	074 21:55	076 14:25	0.0	76.4	468.4	24.6	430.0	86.3	133.3	0.0	1077.0	43.5	430.0	0.0	169.3	2938.6
SP_213EA_C70METNON076_PRIME	076 14:25	076 23:25	0.0	17.0	86.4	3.2	0.0	16.0	27.5	0.0	264.4	4.9	0.0	0.0	0.0	419.5
SP_213EA_M70METNON076_PRIME	076 23:25	077 02:10	0.0	5.2	29.7	1.0	0.0	4.9	8.4	0.0	80.8	1.5	0.0	0.0	329.3	460.8
DAILY TOTAL SCIENCE	074 21:55	077 02:10	0.0	98.6	584.5	28.9	430.0	107.1	169.2	0.0	1422.2	49.9	430.0	0.0	498.6	

T110 TOST Master timeline

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213TI_T110	2275					
Start Time	End Time	Prime Activity	Obs. Detail	Op Mode	TLM Mode	Comments
2015-074T21:55:00	2015-074T22:35:00	SP Turn to WP	NEG_Y to Titan (Tc2a); POSX to RAM	DFPW Normal	S_N_ER_3	
2015-074T22:35:00	C/A-15:39:49	OD Uncertainty Dead Time				
C/A-15:39:49	-14:00	CIRS	A (Tc1b)	DFPW Normal	S_N_ER_3	
-14:00	-09:00	CIRS	C (TN1c)	DFPW Normal	S_N_ER_3	VIMS rider
-09:00	-05:00	CIRS	F (TC1b OR TN1c)	DFPW Normal	S_N_ER_3	
-05:00	-02:15	VIMS	Y (TC1a, TN1a (depending on pointing) and TN2c)	DFPW Normal	S_N_ER_3	
-02:15	0	VIMS	(TN1a, TC1a)	DFPW Normal	S_N_ER_3	Dual playback for VIMS, -00:30 to +00:30
2015-075T14:29:49		CLOSEST APPROACH	NEG_Y to Titan (Tc2a)			Lakes - Sinlap - Quivira - unique RSS LGA Flyby Candidate
0	+00:30	VIMS	VIMS hands off at CIRS attitude	DFPW Normal	S_N_ER_3	
+00:30	+02:15	CIRS	(TN1c)	DFPW Normal	S_N_ER_3	
+02:15	+05:00	CIRS	T (TN2c (surface temperature))	DFPW Normal	S_N_ER_3	
+05:00	+09:00	CIRS	R (TN1c or Tc1b, decided in implementation)	DFPW Normal	S_N_ER_3	
+09:00	+13:00	CIRS	N1 (Tc1b, TN1c aerosol)	DFPW Normal	S_N_ER_3	
+13:00	C/A+21:30:11	CIRS	M4 (Tc1b (TN1c on outbound))	DFPW Normal	S_N_ER_3	
C/A+21:30:11	2015-076T12:15:00	OD Uncertainty Dead Time				
2015-076T12:15:00	2015-076T12:55:00	SP Turn to Earth for downlink	X-Band to EARTH; Neg_Y to Saturn (0.0,0.0,-9.5 offset)	DFPW Normal	S_N_ER_3	
2015-076T12:55:00	2015-076T14:25:00	Y-Bias window	X-Band to EARTH; Neg_Y to Saturn (0.0,0.0,-9.5 offset)	DFPW Normal	S_N_ER_3	
2015-076T14:25:00	2015-076T23:25:00	Canberra 70M	X-Band to EARTH; Neg_Y to Saturn (0.0,0.0,-9.5 offset)	DFPW Normal	RTE_N_SPB	
2015-076T23:25:00	2015-077T02:10:00	Madrid 70M	X-Band to EARTH; Neg_Y to Saturn (0.0,0.0,-9.5 offset)	DFPW Normal	RTE_N_SPB	

DOY 074: This Titan T110 segment begins with a CIRS Mid-IR thermal map to obtain information on the thermal structure of Titan's stratosphere by measuring seasonal changes in atmospheric dynamics and winds. ISS and VIMS are riders.

DOY 075: CIRS performs a 3-hour observation to obtain information on CO, HCN and CH₄. Limb mapping by CIRS follows to obtain vertical profiles of temperatures in Titan's stratosphere.

VIMS performs a medium resolution (10 km/pixel) mosaic of the dune fields and bright plateaus on the Saturn facing side of Titan. ISS and CIRS are riders, and will image equatorial sub-Saturnian hemisphere, including northern Tsegihi and eastern Aztlan. Closest approach science consists of VIMS regional mapping at high resolution of the North polar lakes. A high resolution (less than 5 km per pixel) mosaic of part of the North polar area will be acquired to look for changes as summer solstice approaches. *Possible RSS LGA gravity pass—will add detailed highlight if this science is approved; roughly overlaps the VIMS high res observation.*

CIRS limb scanning for aerosols followed by CIRS outbound far IR vertical sounding of stratospheric compounds on Titan, including H₂O, is the beginning of the outbound science following VIMS. CIRS far IR Nadir mapping is performed next for information on surface & tropopause temperatures, and on tropospheric CH₄. The outbound CIRS mid-IR limb observation will obtain vertical profiles of temperatures in Titan's stratosphere in order to measure the seasonal and diurnal changes. CIRS far IR nadir observation will gain information on CO, HCN, CH₄.

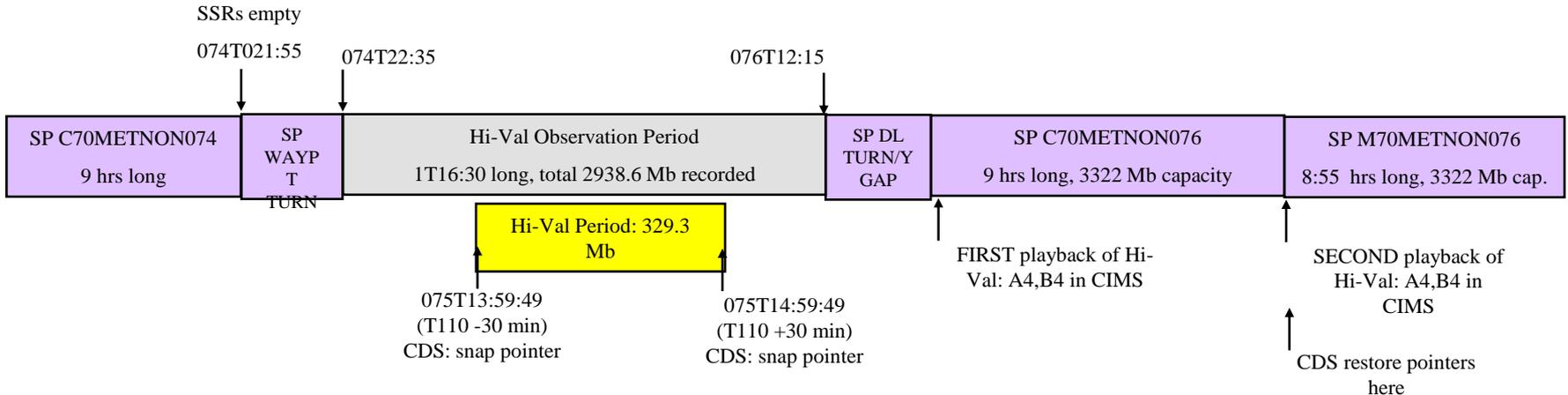
DOY 076: CIRS Mid IR thermal map is performed for information on the thermal structure of Titan's stratosphere. The segment concludes with data playback of the flyby. And scene.

T110 Dual Playback (VIMS)

TOST T110

Flyby	BEGHIVAL	ENDHIVAL	P4 Dual Playback Data Volume	SSR empty before hi-val observation period? (if not verify any carryover on A fits with Hi-Val data)	SSR-A empty after first playback?	PPL set to A4,B4 for first AND second playbacks?	SSRs empty after second playback? (if not does any Hi-Val data carry over?)
T110	T110-30 min	T110+30 min	329.3 Mb	Yes	Yes	Yes	Yes

Playbacks contiguous:



Reminder - ALL instruments' data is played back twice during P4 dual playback periods

- Pointing:
 - Custom period still requires updates
- Data Volume:
 - SSRs empty at end of segment
 - Unusual priority playback tables due to dual playback
- DSN:
 - Level 3 requests: G70METNON075 and C34BWGNON075 passes on DOY 075 in support of RSS LGA request
 - G70METNON075 during DSN maintenance
 - No overlap needed for DOY 075/076 playback passes
- Resource checker:
 - Custom period still requires updates
 - Unusual priority playback tables due to dual playback
- Opmodes
 - No issues
- Special Activities:
 - RSS LGA request

Sequence Liens (should all be SPLAT items):

- Custom period pointing
- Dual Playback status during DSN allocation process
- RSS LGA candidate
- DSS 43 for RSS LGA is in maintenance