



CASSINI TOST SEGMENT

T94 Handoff Package

Segment Boundary 2013-254T08:03:00 – 2013-257T08:03:00

19 Feb 2013

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SMT report and SPASS

Science Highlights

Notes & Liens

SMT report

TOST T94

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 (%)	CAROVN (Mb)
SP_197EA_C70METNON255_PRIME	255 21:48	256 09:03	0	3142	159	3302	3322	20	0	249	66	3617	3483	-134	0	0%	134
SP_197EA_M70METNON256_PRIME	256 09:03	256 12:03	134	0	0	134	3322	3188	0	547	18	699	698	-1	0	0%	1
SP_197EA_C70METNON256_PRIME	256 23:03	257 00:03	1	615	46	662	3322	2660	0	16	6	684	291	-393	0	0%	393
SP_197EA_C34HEFNON256_PRIME	257 00:03	257 08:03	393	0	0	393	3322	2929	0	216	47	656	624	-32	0	0%	32

Carryover is not real. Data compression/utilization will take care of it.

Master Timeline for T94

TOST T94

197TI_T94	1400					
Start Time	End Time	Prime Activity	Obs. Detail	Op Mode	TLM Mode	Comments
2013-254T08:03:00	2013-254T08:43:00	SP Turn to WP	NEG_Y to Titan, NEG_X to NEP	DFPW Normal	S_N_ER_3	
2013-254T08:43:00	C/A-22:45:56	OD Uncertainty Dead Time				
C/A-22:45:56	-14:00	CIRS	A2 (Tc1b)	DFPW Normal	S_N_ER_3	ISS rider
-14:00	-09:00	CIRS	C (TN1c)	DFPW Normal	S_N_ER_3	VIMS rider
begin custom period						
-09:00	-05:00	ISS	H (TC1a, TN1a, TN2c (Could also be TC1b and/or TN1c, depending on geometry, or TN2d, depending on timing.))	DFPW Normal	S_N_ER_3	
-05:00	-02:15	ISS	J1 (TC1a, TN1a (Could also be TC1b and/or TN1c, depending on geometry, or TN2c and TN2d, depending on timing.))	DFPW Normal	S_N_ER_3	
-02:15	-01:00	ISS	hand off at waypoint	DFPW Normal	S_N_ER_3	Northern lakes
-01:00	-00:30	VIMS	(TC1a, TN1a)	DFPW Normal	S_N_ER_3	
-00:30	0	VIMS	(TC1a, TN1a)	DFPW Normal	S_N_ER_3	ISS ridealong
2013-255T07:43:56		CLOSEST APPROACH	NEG_Y to Titan (Tc2a)	DFPW Normal	S_N_ER_3	N Lakes RSS LGA Flyby Candidate
0	+00:40	VIMS	(TC1a, TN1a) VIMS turning to CIRS attitude	DFPW Normal	S_N_ER_3	ISS ridealong
+00:40	+02:15	CIRS	TN1c	DFPW Normal	S_N_ER_3	
end custom period						
+02:15	+09:00	UVIS	X (TN1c. ISS ridealong is photon WAC (TN1c and TC1a))	DFPW Normal	S_N_ER_3	
+09:00	C/A+11:39:04	VIMS	O (TN1a (Specular reflection of lakes- depending on geometry))	DFPW Normal	S_N_ER_3	
C/A+11:39:04	2013-255T19:38:00	OD Uncertainty Dead Time				
2013-255T19:38:00	2013-255T20:18:00	SP Turn to Earth for downlink	XBAND to Earth, NEG_Y to 298/36	DFPW Normal	S_N_ER_3	
2013-255T20:18:00	2013-255T21:48:00	Y-Bias window		DFPW Normal	S_N_ER_3	
2013-255T21:48:00	2013-256T09:03:00	Canberra 70M		DFPW Normal	RTE_N_SPB	
2013-256T09:03:00	2013-256T12:03:00	Madrid 70M		DFPW Normal	RTE_N_SPB	Dual playback for VIMS, -00:29 to +00:40

Dual Playback: -00:29 to +00:40

Master Timeline for T94

TOST T94

Start Time	End Time	Prime Activity	Obs. Detail	Op Mode	TLM Mode	Comments
2013-256T12:03:00	2013-256T12:43:00	SP Turn to WP	NEG_Y to Titan, NEG_X to NEP	DFPW Normal	S_N_ER_3	
2013-256T12:43:00	2013-256T16:43:00	ISS	<i>ISS mosaic at first, then sit and stare for</i>	DFPW Normal	S_N_ER_3	
2013-256T16:43:00	2013-256T19:53:00	ISS	<i>ISS mosaic at first, then sit and stare for CIRS and VIMS (TN2c, TN2d)</i>	DFPW Normal	S_N_ER_3	
2013-256T19:53:00	2013-256T20:53:00	ISS mosaic	<i>ISS mosaic at first, then sit and stare for CIRS and VIMS (TN2c, TN2d)</i>	DFPW Normal	S_N_ER_3	
2013-256T21:53:00	2013-256T22:33:00	SP Turn to Earth for downlink	XBAND to Earth, NEG_Y to 298/36	DFPW Normal	S_N_ER_3	
2013-256T22:33:00	2013-257T00:03:00	Ybias window		DFPW Normal	S_N_ER_3	
2013-256T23:03:00	2013-257T00:03:00	Canberra 70M		DFPW Normal	RTE_N_SPB	
2013-257T00:03:00	2013-257T08:03:00	Canberra 34M		DFPW Normal	RTE_N_SPB	

T94 SPASS pg 1

TOST T94

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S80, length = 70 days		2013-226T09:51:00		069T13:24:00	2013-295T23:15:00			
Titan Flyby T94 Segment		2013-254T08:03:00		003T00:00:00	2013-257T08:03:00			
SP_197TI_WAYPTTURN254_PRIME		2013-254T08:03:00		000T00:40:00	2013-254T08:43:00	NEG_Y to Titan	NEG_X to NTP	
NEW WAYPOINT		2013-254T08:43:00		001T11:35:00	2013-255T20:18:00	NEG_Y to Titan	NEG_X to NTP	
SP_197NA_DEADTIME254_PRIME		2013-254T08:43:00		000T00:14:59	2013-254T08:57:59	NEG_Y to Titan	NEG_X to NTP	
CIRS_197TI_MIDIRTMAP001_PRIME I, V		2013-254T08:57:59	GMB_E197_TITAN_T94-000T	000T08:45:57	2013-254T17:43:56	CIRS_FP1 to Titan	NEG_X to NTP	No Preference to secondary pointing
CIRS_197TI_FIRNADCMP001_PRIME I, U, V		2013-254T17:43:56	GMB_E197_TITAN_T94-000T	000T05:00:00	2013-254T22:43:56	CIRS_FP1 to Titan	NEG_X to NTP	
Begin custom period		2013-254T22:43:56	GMB_E197_TITAN_T94-000T	000T00:00:01	2013-254T22:43:57			
ISS_197TI_GLOBMAP001_PRIME	C, U, V	2013-254T22:43:56	GMB_E197_TITAN_T94-000T	000T04:00:00	2013-255T02:43:56	ISS_NAC to Titan	NEG_Z to SC_RAM	Pick up at NEG_Y to Titan, NEG_X to NTP; Hand off at ISS_NAC to Titan, NEG_Z to SC_RAM.
ISS_197TI_REGMAP001_PRIME	C, R, U, V	2013-255T02:43:56	GMB_E197_TITAN_T94-000T	000T02:45:00	2013-255T05:28:56	ISS_NAC to Titan	NEG_Z to SC_RAM	Pick up at ISS_NAC to Titan, NEG_Z to SC_RAM; Hand off at ISS_NAC to Titan, NEG_Z to SC_RAM.
ISS_197TI_HIRES001_PRIME	C, M, R, U,	2013-255T05:28:56	GMB_E197_TITAN_T94-000T	000T01:15:00	2013-255T06:43:56	ISS_NAC to Titan	NEG_Z to SC_RAM	Pick up at ISS_NAC to Titan, NEG_Z to SC_RAM; Hand off at VIMS_IR to Titan, NEG_Z to Titan_SC_RAM.
VIMS_197TI_HIRES001_PRIME	C, I, M, R, U	2013-255T06:43:56	GMB_E197_TITAN_T94-000T	000T00:30:00	2013-255T07:13:56	VIMS_IR to Titan	NEG_X to NTP	No Preference to secondary pointing. Pick up at VIMS_IR to Titan, NEG_Z to Titan_SC_RAM; Hand off at VIMS_IR to Titan, NEG_Z to Titan_SC_RAM. No Preference to secondary pointing
VIMS_197TI_HIRES002_PRIME	C, I, M, R, U	2013-255T07:13:56	GMB_E197_TITAN_T94-000T	000T01:10:00	2013-255T08:23:56	VIMS_IR to Titan	NEG_Z to Titan_SC_F	Pick up at VIMS_IR to Titan, NEG_Z to Titan_SC_RAM; Hand off at CIRS_FP1 to Titan, PIC. For handoff, primary CIRS_FP1 to Titan, LAT_VIEW, 19N, 90 deg view angle, LHS, altitude -120 km. Secondary, POS_Z to Titan FOV_LIMB, 19N, LHS.
Begin Dual Playback Science		2013-255T07:14:56	GMB_E197_TITAN_T94-000T	000T00:00:01	2013-255T07:14:57			
197TI (t) T94 TITAN Outbou...		2013-255T07:43:56		000T00:00:01	2013-255T07:43:57			
End Dual Playback Science		2013-255T08:23:56	GMB_E197_TITAN_T94+000T	000T00:00:01	2013-255T08:23:57			
CIRS_197TI_FIRLMBAPER002_PRIME	M, R, U, V	2013-255T08:23:56	GMB_E197_TITAN_T94+000T	000T00:35:00	2013-255T08:58:56	CIRS_FP1 to Titan	PIC	Pick up at CIRS_FP1 to Titan, PIC; Hand off at CIRS_FP1 to Titan, PIC. Pickup at CIRS_FP1 to Titan LAT_VIEW, 19N, 90 degrees, LHS, -120 km altitude; POS_Z to Titan FOV_LIMB, 19N, LHS.
CIRS_197TI_FIRLMBINT002_PRIME	I, M, R, U, \	2013-255T08:58:56	GMB_E197_TITAN_T94+000T	000T01:00:00	2013-255T09:58:56	CIRS_FP1 to Titan	PIC	Pick up at CIRS_FP1 to Titan, PIC; Hand off at NEG_Y to Titan, NEG_X to North_Pole_Dir.
End custom period		2013-255T09:58:56	GMB_E197_TITAN_T94+000T	000T00:00:01	2013-255T09:58:57			

T94 SPASS pg 2

TOST T94

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
UVIS_197TI_EUVFUV002_PRIME	C, I, R, V	2013-255T09:58:56	GMB_E197_TITAN_T94+000T	000T06:45:00	2013-255T16:43:56	UVIS_FUV to Titan	NEG_X to NTP	
VIMS_197TI_GLOMAP002_PRIME	C, I	2013-255T16:43:56	GMB_E197_TITAN_T94+000T	000T02:39:03	2013-255T19:22:59	VIMS_IR to Titan	NEG_X to NTP	Collaborative Rider(s): ISS. No Preference to secondary pointing
SP_197NA_DEADTIME255_PRIME		2013-255T19:22:59	GMB_E197_TITAN_T94+000T	000T00:15:00	2013-255T19:37:59	NEG_Y to Titan	NEG_X to NTP	
SP_197EA_DLTURN255_PRIME		2013-255T19:38:00		000T00:40:00	2013-255T20:18:00	XBAND to Earth	NEG_Y to 298.0/36.0	
NEW WAYPOINT		2013-255T20:18:00		000T16:25:00	2013-256T12:43:00	XBAND to Earth	NEG_Y to 298.0/36.0	
SP_197EA_YGAP255_PRIME	E	2013-255T20:18:00		000T01:30:00	2013-255T21:48:00	XBAND to Earth	NEG_Y to 298.0/36.0	
SP_197EA_C70METNON255_PRIME	C	2013-255T21:48:00		000T11:15:00	2013-256T09:03:00	XBAND to Earth	Rolling	MIMI. NEG_Y to Saturn (0,0,-15).
Pointer Reset in preparatio...		2013-256T09:03:00		000T00:00:01	2013-256T09:03:01			
SP_197EA_M70METNON256_PRIME	C	2013-256T09:03:00		000T03:00:00	2013-256T12:03:00	XBAND to Earth	Rolling/SRU	MIMI. NEG_Y to Saturn (0,0,-15). SID suspend
SP_197TI_WAYPTTURN256_PRIME		2013-256T12:03:00		000T00:40:00	2013-256T12:43:00	NEG_Y to Titan	NEG_X to NTP	
NEW WAYPOINT		2013-256T12:43:00		000T08:50:00	2013-256T21:33:00	NEG_Y to Titan	NEG_X to NTP	
ISS_197TI_CLOUD001_PRIME	C, V	2013-256T12:43:00		000T04:00:00	2013-256T16:43:00	ISS_NAC to Titan	NEG_X to Sun	
ISS_197TI_CLOUD002_PRIME	C, V	2013-256T16:43:00		000T03:10:00	2013-256T19:53:00	ISS_NAC to Titan	NEG_X to Sun	
ISS_197TI_CLOUD003_PRIME	C, V	2013-256T19:53:00		000T01:00:00	2013-256T20:53:00	ISS_NAC to Titan	NEG_X to Sun	
SP_197EA_DLTURN256_PRIME		2013-256T20:53:00		000T00:40:00	2013-256T21:33:00	XBAND to Earth	NEG_Y to 298.0/36.0	
NEW WAYPOINT		2013-256T21:33:00		000T10:30:00	2013-257T08:03:00	XBAND to Earth	NEG_Y to 298.0/36.0	
SP_197EA_YGAP256_PRIME	E	2013-256T21:33:00		000T01:30:00	2013-256T23:03:00	XBAND to Earth	NEG_Y to 298.0/36.0	
SP_197EA_C70METNON256_PRIME		2013-256T23:03:00		000T01:00:00	2013-257T00:03:00	XBAND to Earth	Rolling	MIMI. NEG_Y to Saturn (0,0,-15). XBAND to Earth, NEG_Y to 298/36
SP_197EA_C34HEFNON256_PRIME	C	2013-257T00:03:00		000T08:00:00	2013-257T08:03:00	XBAND to Earth	Rolling/SRU	MIMI. NEG_Y to Saturn (0,0,-15). SID suspend

Science Highlights

TOST T94

DOY 254: CIRS will obtain information on the thermal structure of Titan's stratosphere.

DOY 255: Inbound, ISS will acquire a medium- to- high-resolution mosaic of high northern latitudes approaching northern summer, including Titan's leading hemisphere which has not yet been well observed. VIMS is prime at closest approach and will obtain mosaics of Titan's northern lakes and latitudes.

Outbound from Titan, CIRS will perform limb scanning for aerosols. UVIS will do a stare with the slit in the radial direction, centered on the emission altitude (about 800 km) of the nitrogen features. The remaining time will be devoted to the spectral image. This is one of many such observations gathered over the course of the mission to provide latitude and seasonal coverage of Titan's middle atmosphere and stratosphere.

T94 is another high inclination low altitude (990 km) flyby in the noon sector of Saturn's magnetosphere. With closest approach in the dayside, Cassini will be able to study the diffusion of the external magnetic field at low altitudes and low solar zenith angles. A comparison with flybys T83-T93 will be very useful. MIMI will Measure energetic ion and electron energy input to atmosphere. RPWS will measure thermal plasmas in Titan's ionosphere and surrounding environment; search for lightning in Titan's atmosphere; investigate the interaction of Titan with Saturn's magnetosphere.

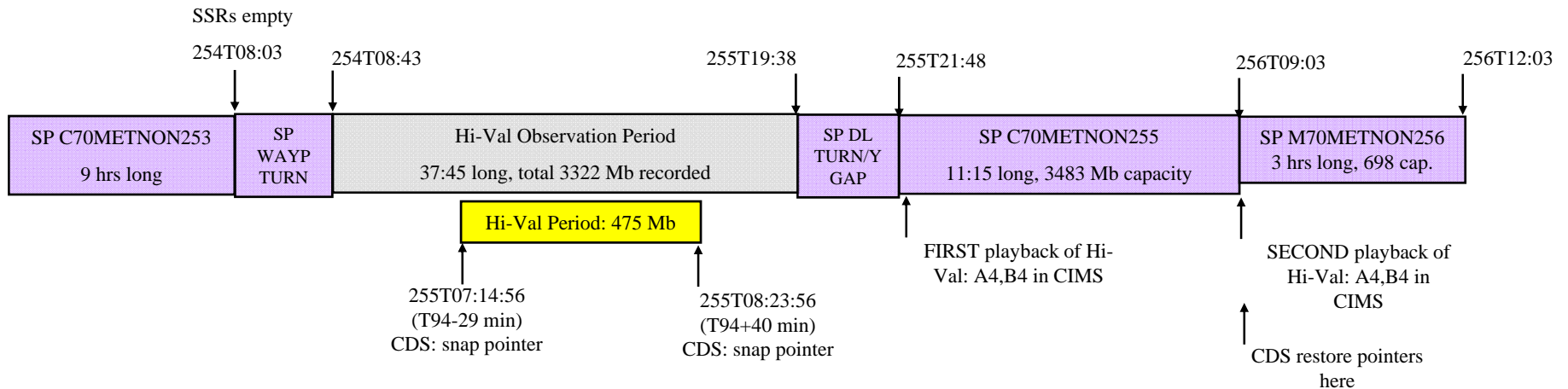
DOY 256: T94 data will be downlinked over Canberra 70M with the dual playback second playback occurring over the Madrid 70M. After the DSN passes are complete ISS taking mosaics for Titan cloud monitoring.

T94 Dual Playback

TOST T94

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?)
T94	T94-29 min	T94+40 min	475 Mb	Yes	Yes	Yes	Yes

Playbacks contiguous:



T94 Notes

- Pointing:
 - List periods with NO VALID WAYPOINT
 - 255T07:05:00 to 07:45:00. During Custom period.
- Data Volume:
 - Dual Playback implemented per rules.
- DSN:
 - SP_197TI_M70METRSS is fully within DSS-63 maintenance. Only station available for RSS LGA.
- Resource checker:
 - 000061 CIRS 2013-257T00:03:00 CIRS_197IC_DSCAL13257_SP CIRS DSCAL occurs within the first 45 minutes of a Downlink Pass During Integration: update request to start after the first 45 minutes of the Downlink Pass block.
 - This is during the a handover pass so it's ok.
 - 000062 SP 2013-255T07:13:56 VIMS_197TI_HIRES002_PRIME Custom period request is using PIC in secondary BV of handoff pointing.
 - This is ok.
 - 000063 SP 2013-255T08:23:56 CIRS_197TI_FIRLMBAER002_PRIME Custom period request is using PIC in secondary BV of handoff pointing
 - This is ok. CIRS and VIMS do this often.
- Hydrazine:
 - None
- Special Activities:
 - RSS LGA opportunity

T94 Liens

TOST T94

Sequence Liens (should all be SPLAT items):

- List any Liens to be worked in SIP, ie
 - T94 is an RSS LGA flyby candidate.
 - MADRID 70M for RSS LGA overlaps weekly maintenance.
 - Dual Playback should be watched during DSN negotiations.