



## **CASSINI T97 SEGMENT**

### **Rev 200 Handoff Package**

**Segment Boundary 2013-365T01:48:00 – 2014-003T05:48:00**

**24 May 2013**

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SMT report and SPASS

Science Highlights

Notes & Liens

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

# SMT report

TOST rev 200

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)	MRGN (Mb)	OPNAV (Mb)	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGN (Mb)	NET_MARGN (Mb)	CAROVR (%)	CAROVR (Mb)
SP_200EA_C70METNON365_PRIME	365 16:48	001 01:48	0	768	64	831	3322	2491	0	199	53	1084	2979	1894	2103	30%	0
SP_200EA_C70METNON002_PRIME	002 16:48	003 02:48	0	2949	165	3114	3322	208	0	193	59	3366	3432	66	327	8%	0
SP_200EA_M70METNON003_PRIME	003 02:48	003 05:48	0	0	0	0	3322	3322	0	402	18	419	680	261	261	38%	0

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	365 01:48	365 16:48	0.0	28.3	146.4	5.4	400.0	26.7	45.9	7.2	70.7	0.0	30.0	0.0	62.7	823.3
SP_200EA_C70METNON365_PRIME	365 16:48	001 01:48	0.0	17.0	86.4	3.2	0.0	16.0	27.5	0.0	42.4	4.9	0.0	0.0	0.0	197.5
DAILY TOTAL SCIENCE	365 01:48	001 01:48	0.0	45.3	232.8	8.6	400.0	42.7	73.4	7.2	113.2	4.9	30.0	0.0	62.7	
OBSERVATION_NOR	001 01:48	002 16:48	0.0	73.6	508.3	24.1	715.0	112.0	116.1	0.0	718.4	64.6	590.0	0.0	163.0	3085.1
SP_200EA_C70METNON002_PRIME	002 16:48	003 02:48	0.0	18.9	86.4	3.6	0.0	17.8	27.0	0.0	32.4	5.5	0.0	0.0	0.0	191.5
SP_200EA_M70METNON003_PRIME	003 02:48	003 05:48	0.0	5.7	28.8	1.1	0.0	5.3	8.1	0.0	9.8	1.6	0.0	0.0	337.5	397.9
DAILY TOTAL SCIENCE	001 01:48	003 05:48	0.0	98.1	623.5	28.8	715.0	135.2	151.2	0.0	760.6	71.7	590.0	0.0	500.5	

	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	143.4	856.3	37.4	1115.0	177.8	224.6	7.2	873.8	76.6	620.0	0.0

# SPASS

TOST rev 200

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S82, length = 76 days		2013-362T01:47:00		075T19:25:00	2014-072T21:12:00			
Titan Flyby T97 Segment		2013-365T01:48:00		003T04:00:00	2014-003T05:48:00			
SP_200TI_WAYPTTURN365_PRIME		2013-365T01:48:00		000T00:40:00	2013-365T02:28:00	NEG_Y to Titan	POS_X to NTP	
<b>NEW WAYPOINT</b>		<b>2013-365T02:28:00</b>		<b>000T12:50:00</b>	<b>2013-365T15:18:00</b>	<b>NEG_Y to Titan</b>	<b>POS_X to NTP</b>	
ISS_200TI_CLOUD001_PRIME	C, V	2013-365T02:28:00		000T04:00:00	2013-365T06:28:00	ISS_NAC to Titan	POS_X to NTP	No Preference to secondary pointing
ISS_200TI_CLOUD002_PRIME	C, V	2013-365T06:28:00		000T04:10:00	2013-365T10:38:00	ISS_NAC to Titan	POS_X to NTP	No Preference to secondary pointing
ISS_200TI_CLOUD003_PRIME	C, V	2013-365T10:38:00		000T01:00:00	2013-365T11:38:00	ISS_NAC to Titan	POS_X to NTP	No Preference to secondary pointing
RADAR_200TI_RADIOCAL140_PRIME		2013-365T11:38:00		000T02:00:00	2013-365T13:38:00	NEG_Z to Titan	POS_X to NTP	No Preference to secondary pointing
ISS_200TI_CLOUD004_PRIME	C, V	2013-365T13:38:00		000T01:00:00	2013-365T14:38:00	ISS_NAC to Titan	POS_X to NTP	No Preference to secondary pointing
SP_200EA_DLTURN365_PRIME		2013-365T14:38:00		000T00:40:00	2013-365T15:18:00	XBAND to Earth	NEG_Y to 139.0/4.0	
<b>NEW WAYPOINT</b>		<b>2013-365T15:18:00</b>		<b>000T11:10:00</b>	<b>2014-001T02:28:00</b>	<b>XBAND to Earth</b>	<b>NEG_Y to 139.0/4.0</b>	
SP_200EA_YGAP365_PRIME	E	2013-365T15:18:00		000T01:30:00	2013-365T16:48:00	XBAND to Earth	NEG_Y to 139.0/4.0	
SP_200EA_C70METNON365_PRIME	C	2013-365T16:48:00		000T09:00:00	2014-001T01:48:00	XBAND to Earth	NEG_Y to 139.0/4.0	MIMI. NEG_Y to Saturn (0,0,-9.5). pre-TOST flyby
SP_200TI_WAYPTTURN001_PRIME		2014-001T01:48:00		000T00:40:00	2014-001T02:28:00	NEG_Y to Titan	POS_X to NTP	
<b>NEW WAYPOINT</b>		<b>2014-001T02:28:00</b>		<b>001T04:53:41</b>	<b>2014-002T07:21:4</b>	<b>NEG_Y to Titan</b>	<b>POS_X to NTP</b>	
<b>SP_200TI_DEADTIME001_PRIME</b>		<b>2014-001T02:28:00</b>		<b>000T00:14:55</b>	<b>2014-001T02:42:5</b>	<b>NEG_Y to Titan</b>	<b>NEG_X to Earth</b>	
CIRS_200TI_MIDIRTMAP001_PRIME	I, V	2014-001T02:42:59	GMB_E200_TITAN_T97-000T19:16:42	000T05:16:42	2014-001T07:59:41	CIRS_FP1 to Titar PIC		Collaborative Rider(s): ISS. Template A3: ISS Rider
ISS_200TI_MONITORNA001_PRIME	C, V	2014-001T07:59:41	GMB_E200_TITAN_T97-000T14:00:00	000T02:00:00	2014-001T09:59:41	ISS_NAC to Titan	POS_X to NTP	No Preference to secondary pointing
CIRS_200TI_FIRNADCMP001_PRIME	I, U, V	2014-001T09:59:41	GMB_E200_TITAN_T97-000T12:00:00	000T03:00:00	2014-001T12:59:41	CIRS_FP1 to Titar PIC		
UVIS_200TI_EUVFUV001_PRIME	C, I, R, V	2014-001T12:59:41	GMB_E200_TITAN_T97-000T09:00:00	000T06:45:00	2014-001T19:44:41	UVIS_FUV to Titan	NEG_Z to Earth	
<b>Begin Custom Period</b>		<b>2014-001T19:44:41</b>	<b>GMB_E200_TITAN_T97-000T02:15:00</b>	<b>000T00:00:01</b>	<b>2014-001T19:44:42</b>			
VIMS_200TI_HIRES001_PRIME	C, I, M, F	2014-001T19:44:41	GMB_E200_TITAN_T97-000T02:15:00	000T01:45:00	2014-001T21:29:41	VIMS_IR to Titan	POS_X to NTP	No Preference to secondary pointing. Pick up at NEG_Y to Titan, POS_X to NTP; Hand off at NEG_Y to Titan, POS_X to NTP. No Preference to secondary pointing
Begin Dual Playback Science		2014-001T21:29:41	GMB_E200_TITAN_T97-000T00:30:00	000T00:00:01	2014-001T21:29:42			
VIMS_200TI_HIRES002_PRIME	C, I, M, F	2014-001T21:29:41	GMB_E200_TITAN_T97-000T00:30:00	000T01:00:00	2014-001T22:29:41	VIMS_IR to Titan	POS_X to NTP	No Preference to secondary pointing. Pick up at NEG_Y to Titan, POS_X to NTP; Hand off at CIRS_FP1 to 119.0/63.0, NEG_X to 14.0/8.0. No Preference to secondary pointing
200TI (t) T97 TITAN Inbound...		2014-001T21:59:41		000T00:00:01	2014-001T21:59:42			
End Dual Playback Science		2014-001T22:29:41	GMB_E200_TITAN_T97+000T00:30:00	000T00:00:01	2014-001T22:29:42			
CIRS_200TI_FIRLMBBAER002_PRIME	M, R, V	2014-001T22:29:41	GMB_E200_TITAN_T97+000T00:30:00	000T00:45:00	2014-001T23:14:41	CIRS_FP1 to Titar PIC		Pick up at CIRS_FP1 to 119.0/63.0, NEG_X to 14.0/8.0; Hand off at CIRS_FP1 to Titan, PIC.
CIRS_200TI_FIRLMBINT002_PRIME	I, M, R, V	2014-001T23:14:41	GMB_E200_TITAN_T97+000T01:15:00	000T01:00:00	2014-002T00:14:41	CIRS_FP1 to Titar PIC		Pick up at CIRS_FP1 to Titan, PIC; Hand off at NEG_Y to Titan, POS_X to NTP.
<b>End Custom Period</b>		<b>2014-002T00:14:42</b>	<b>GMB_E200_TITAN_T97+000T02:15:00</b>	<b>000T00:00:01</b>	<b>2014-002T00:14:42</b>			
UVIS_200TI_EUVFUV002_PRIME	C, I, R, V	2014-002T00:14:41	GMB_E200_TITAN_T97+000T02:15:00	000T06:45:00	2014-002T06:59:41	UVIS_FUV to Titan	NEG_Z to Earth	
SP_200TI_WAYPTTURN002_PRIME	I, V	2014-002T06:59:41	GMB_E200_TITAN_T97+000T09:00:00	000T00:22:00	2014-002T07:21:41	NEG_Y to Titan	POS_Z to NTP	
<b>NEW WAYPOINT</b>		<b>2014-002T07:21:41</b>		<b>000T07:56:15</b>	<b>2014-002T15:18:00</b>	<b>NEG_Y to Titan</b>	<b>POS_Z to NTP</b>	
CIRS_200TI_FIRNADCMP002_PRIME	I, U, V	2014-002T07:21:41	GMB_E200_TITAN_T97+000T09:22:00	000T03:38:00	2014-002T10:59:41	CIRS_FP1 to Titar PIC		
CIRS_200TI_MIDIRTMAP002_PRIME	I, V	2014-002T10:59:41	GMB_E200_TITAN_T97+000T13:00:00	000T03:23:18	2014-002T14:22:59	CIRS_FP1 to Titar PIC		Collaborative Rider(s): ISS. Template A2: CIRS-ISS
<b>SP_200TI_DEADTIME002_PRIME</b>		<b>2014-002T14:22:59</b>	<b>GMB_E200_TITAN_T97+000T16:23:00</b>	<b>000T00:15:01</b>	<b>2014-002T14:38:00</b>	<b>NEG_Y to Titan</b>	<b>NEG_X to Earth</b>	
SP_200EA_DLTURN002_PRIME		2014-002T14:38:00		000T00:40:00	2014-002T15:18:00	XBAND to Earth	NEG_Y to 295.0/54.0	
<b>NEW WAYPOINT</b>		<b>2014-002T15:18:00</b>		<b>000T14:30:00</b>	<b>2014-003T05:48:00</b>	<b>XBAND to Earth</b>	<b>NEG_Y to 295.0/54.0</b>	
SP_200EA_YGAP002_PRIME	E	2014-002T15:18:00		000T01:30:00	2014-002T16:48:00	XBAND to Earth	NEG_Y to 295.0/54.0	
SP_200EA_C70METNON002_PRIME	C	2014-002T16:48:00		000T10:00:00	2014-003T02:48:00	XBAND to Earth	NEG_Y to 295.0/54.0	MIMI. NEG_Y to Saturn (0,0,-9.5).
Pointer Reset in preparatio...		2014-003T02:48:00		000T00:00:01	2014-003T02:48:01			
SP_200EA_M70METNON003_PRIME	C	2014-003T02:48:00		000T03:00:00	2014-003T05:48:00	XBAND to Earth	NEG_Y to 295.0/54.0	MIMI. NEG_Y to Saturn (0,0,-9.5). SID suspend

# Science Highlights

TOST rev 200

DOY 365: ISS will monitor Titan's high northern latitudes, where it will be important to track clouds and the evolution thereof as summer approaches, for an extra day before the Titan encounter.

DOY 001: During this flyby, VIMS is the prime instrument during closest approach from Titan's surface (1400km). During the inbound wing, VIMS will map the lakes and seas of the North Pole area. As the spacecraft moves from the North Pole to the South Pole, the "pushbroom" mode will be used to map the equatorial region East of Adiri at a resolution of 1 km/pixel. VIMS will also look for clouds during both the inbound (North Pole area) and the outbound (high southern latitudes). CIRS makes distant mapping observations for temperature and trace gas abundances to continue a long-term monitoring campaign. ISS will acquire a mosaic of high northern latitudes on Titan's leading hemisphere, approaching northern summer (multiple observations of high northern latitudes may be needed in case of cloud cover obscuring the surface). ISS will ride along with CIRS on approach to track clouds at high northern latitudes, as well as with UVIS', VIMS', and CIRS' observations, inbound and outbound, to image Titan's surface and atmosphere. T97 is another high inclination flyby in the noon sector of Saturn's magnetosphere, very similar to T95 but at an altitude of 1400 km. With closest approach in the dayside, Cassini will be able to study the draping and the diffusion of the external magnetic field at low altitudes and over the flank facing away from Saturn. A comparison with flybys at similar local times (T83-T96) will be very useful. *Possible RSS LGA gravity pass—will add detailed highlight if this science is approved.*

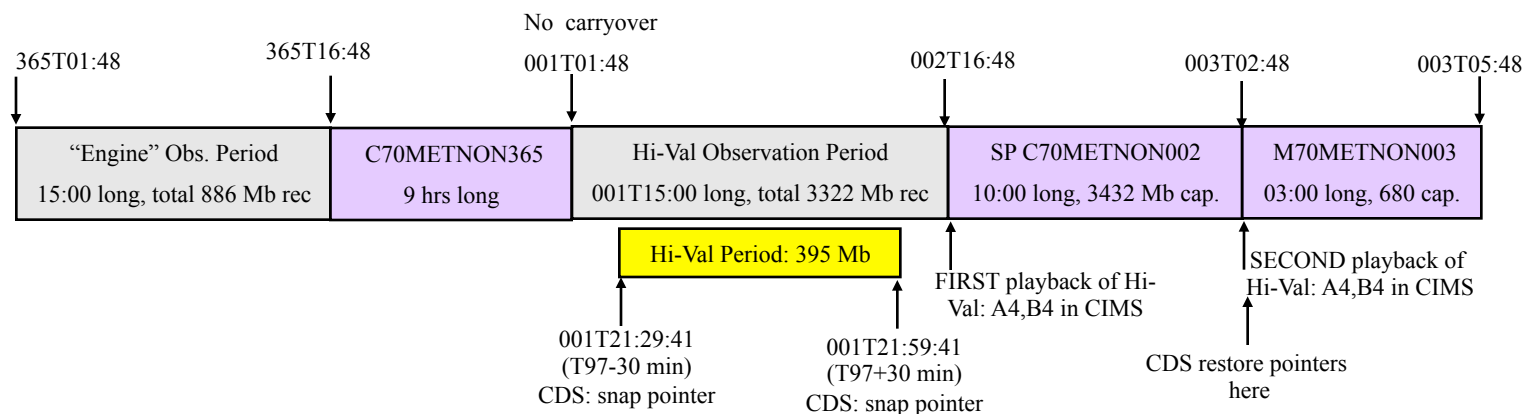
DOY 002: CIRS conducts far-infrared limb-sounding near the equator to measure gases and aerosols. Data is sent back to Earth via the Canberra 70m station.

# Dual Playback

TOST rev 200

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?)
T97	T97-30 min	T97+30 min	407 Mb	Yes	Yes	Yes	Yes

## Playbacks contiguous:



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

# Notes

TOST rev 200

- Pointing:
  - Waypoint goes bad during custom period
- Data Volume:
  - All SMT warnings (data not recorded for single RADAR/CIRS/ISS observations, unusual priority p/b tables) are OK
- DSN:
  - Short overlap between C70/M70 stations on DOY 003 but it's not an uplink pass so OK
  - Passes requested for RSS LGA opportunity may be released if LGA not implemented
- Resource checker:
  - Odd Priority p/b tables due to dual p/b
  - CIRS using PIC in custom handoff to hand off to itself
  - ISS OK with change in telemetry mode during observation
- Special Activities:
  - RSS LGA Opportunity (see SPLAT items)

# Liens

TOST rev 200

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## Sequence Liens (should all be SPLAT items):

- Watch out for:
  - Dual Playback
  - LGA flyby candidate