



## **CASSINI TOST SEGMENT**

**Rev 206 T103 Handoff Package**

**Segment Boundary 2014-200T12:26:00 – 2014-204T05:40:00**

**26 NOV 2013**

J. Pitesky

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 206

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)	NET_MARGN (%)	CAROVR (Mb)
SP_206EA_C70METSEQ202_PRIME	202 04:25	202 13:25	0	3150	169	3319	3322	3	0	199	53	3572	3621	49	49	1%	0
SP_206EA_M70METNON202_PRIME	202 13:25	202 15:25	0	0	0	0	3322	3322	0	450	12	462	455	-7	0	0%	6
SP_206EA_G34BWGSEQ203_PRIME	203 20:40	204 05:40	6	1028	124	1158	3322	2164	0	191	53	1402	627	-776	0	0%	775

# SPASS

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Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S84, length = 68 days		2014-144T10:01:00		067T19:08:00	2014-212T05:09:00			
Titan Flyby T103 Segment		2014-200T12:26:00		003T17:14:00	2014-204T05:40:00			
SP_206TI_WAYPTTURN200_PRIME		2014-200T12:26:00		000T00:40:00	2014-200T13:06:00	NEG_Y to Titan	NEG_X to NTP	
<b>NEW WAYPOINT</b>		<b>2014-200T13:06:00</b>		<b>001T13:49:00</b>	<b>2014-202T02:55:00</b>	<b>NEG_Y to Titan</b>	<b>NEG_X to NTP</b>	
SP_206TI_DEADTIME200_PRIME		2014-200T13:06:00		000T00:14:59	2014-200T13:20:59	NEG_Y to Titan	NEG_X to NTP	
CIRS_206TI_MIDIRTMAP001_PRIME	I, V	2014-200T13:20:59	GMB_E206_TITAN_T103-000T0007:19:59	2014-200T20:40:58	2014-200T20:40:58	CIRS_FPB to Titan	PIC	Collaborative Rider(s): ISS. Template M3?
ISS_206TI_MONITORNA001_PRIME	C, V	2014-200T20:40:58	GMB_E206_TITAN_T103-000T0002:00:00	2014-200T22:40:58	2014-200T22:40:58	ISS_NAC to Titan	NEG_X to NTP	No Preference to secondary pointing
CIRS_206TI_FIRNADCMPO01_PRIME	I, U, V	2014-200T22:40:58	GMB_E206_TITAN_T103-000T0003:00:00	2014-201T01:40:58	2014-201T01:40:58	CIRS_FP1 to Titan	PIC	
VIMS_206TI_MEDRES001_PRIME	C, I	2014-201T01:40:58	GMB_E206_TITAN_T103-000T0004:00:00	2014-201T05:40:58	2014-201T05:40:58	VIMS_IR to Titan	NEG_X to Titan_SC_RAM	
VIMS_206TI_REGMAP001_PRIME	C, I	2014-201T05:40:58	GMB_E206_TITAN_T103-000T0002:45:00	2014-201T08:25:58	2014-201T08:25:58	VIMS_IR to Titan	NEG_X to Titan_SC_RAM	
CIRS_206TI_FIRLMBINT005_PRIME	M, V	2014-201T08:25:58	GMB_E206_TITAN_T103-000T0001:00:00	2014-201T09:25:58	2014-201T09:25:58	CIRS_FP1 to Titan	PIC	
CIRS_206TI_FIRLMBAR001_PRIME	M, V	2014-201T09:25:58	GMB_E206_TITAN_T103-000T0000:30:00	2014-201T09:55:58	2014-201T09:55:58	CIRS_FP1 to Titan	PIC	
UVIS_206SU_UTISUNOCC001_PRIME	C, M, V	2014-201T09:55:58	GMB_E206_TITAN_T103-000T0001:16:00	2014-201T11:11:58	2014-201T11:11:58	UVIS_SOL_OFF to Sun	NEG_X to 0.0/0.0	
Begin Dual Playback Science		2014-201T10:05:58	GMB_E206_TITAN_T103-000T0000:00:01	2014-201T10:05:59	2014-201T10:05:59			
206TI (t) T103 TITAN Outbou...		2014-201T10:40:58		000T00:00:01	2014-201T10:40:59			
End Dual Playback Science		2014-201T11:11:58	GMB_E206_TITAN_T103+000T0000:00:01	2014-201T11:11:59	2014-201T11:11:59			
UVIS_206TI_EUVFUV001_PRIME	C, I, M, V	2014-201T11:11:58	GMB_E206_TITAN_T103+000T0000:19:00	2014-201T11:30:58	2014-201T11:30:58	UVIS_FUV to Titan	NEG_Z to Earth	
UVIS_206ST_ALPERITIO01_PRIME	C, I, M, V	2014-201T11:30:58	GMB_E206_TITAN_T103+000T0002:10:00	2014-201T13:40:58	2014-201T13:40:58	UVIS_FUV to 24.429/-57.237 (0.25)	NEG_X to Sun	
CIRS_206TI_FIRNADMAP002_PRIME	I, V	2014-201T13:40:58	GMB_E206_TITAN_T103+000T0002:00:00	2014-201T15:40:58	2014-201T15:40:58	CIRS_FP1 to Titan	PIC	
CIRS_206TI_MIRLMBINT002_PRIME	I, V	2014-201T15:40:58	GMB_E206_TITAN_T103+000T0004:00:00	2014-201T19:40:58	2014-201T19:40:58	CIRS_FPB to Titan	PIC	
CIRS_206TI_FIRNADCMPO02_PRIME	I, U, V	2014-201T19:40:58	GMB_E206_TITAN_T103+000T0003:00:00	2014-201T22:40:58	2014-201T22:40:58	CIRS_FP1 to Titan	PIC	
ISS_206TI_MONITORNA002_PRIME	C, V	2014-201T22:40:58	GMB_E206_TITAN_T103+000T0003:19:01	2014-202T01:59:59	2014-202T01:59:59	ISS_NAC to Titan	NEG_X to NTP	No Preference to secondary pointing
SP_206TI_DEADTIME202_PRIME		2014-202T01:59:59	GMB_E206_TITAN_T103+000T0000:15:01	2014-202T02:15:00	2014-202T02:15:00	NEG_Y to Titan	NEG_X to NTP	
SP_206EA_DLTURN202_PRIME		2014-202T02:15:00		000T00:40:00	2014-202T02:55:00	XBAND to Earth (0.0,0.0,-9.5 deg. o	NEG_Y to Saturn	
<b>NEW WAYPOINT</b>		<b>2014-202T02:55:00</b>		<b>000T15:10:00</b>	<b>2014-202T18:05:00</b>	<b>XBAND to Earth (0.0,0.0,-9.5 deg. o</b>	<b>NEG_Y to Saturn</b>	
SP_206EA_YGAP202_PRIME	E	2014-202T02:55:00		000T01:30:00	2014-202T04:25:00	XBAND to Earth (0.0,0.0,-9.5 deg. o	NEG_Y to Saturn	
SP_206EA_C70METSEQ202_PRIME	C	2014-202T04:25:00		000T09:00:00	2014-202T13:25:00	XBAND to Earth (0.0,0.0,-9.5 deg. o	Rolling	MIMI. NEG_Y to Saturn (0.0,-9.5). CIRS heating
Pointer Reset in preparatio...		2014-202T13:25:00		000T00:00:01	2014-202T13:25:01			
SP_206EA_M70METNON202_PRIME	C	2014-202T13:25:00		000T02:00:00	2014-202T15:25:00	XBAND to Earth (0.0,0.0,-9.5 deg. o	Rolling	MIMI. NEG_Y to Saturn (0.0,-9.5). CIRS heating
SP_206TI_WAYPTTURN202_PRIME		2014-202T17:25:00		000T00:40:00	2014-202T18:05:00	NEG_Y to Titan	NEG_X to 353.0/28.0	
<b>NEW WAYPOINT</b>		<b>2014-202T18:05:00</b>		<b>001T01:05:00</b>	<b>2014-203T19:10:00</b>	<b>NEG_Y to Titan</b>	<b>NEG_X to 353.0/28.0</b>	
ISS_206TI_CLOUD001_PRIME	C, U, V	2014-202T18:05:00		000T05:00:00	2014-202T23:05:00	ISS_NAC to Titan	NEG_X to Sun	
ISS_206TI_CLOUD002_PRIME	C, U, V	2014-202T23:05:00		000T05:00:00	2014-203T04:05:00	ISS_NAC to Titan	NEG_X to Sun	
ISS_206TI_CLOUD003_PRIME	C, U, V	2014-203T04:05:00		000T04:00:00	2014-203T08:05:00	ISS_NAC to Titan	NEG_X to Sun	
ISS_206TI_CLOUD004_PRIME	C, U, V	2014-203T08:05:00		000T04:00:00	2014-203T12:05:00	ISS_NAC to Titan	NEG_X to Sun	
ISS_206TI_CLOUD005_PRIME	C, U, V	2014-203T12:05:00		000T03:25:00	2014-203T15:30:00	ISS_NAC to Titan	NEG_X to Sun	
RADAR_206TI_RADIOCAL130_PRIME		2014-203T15:30:00		000T02:00:00	2014-203T17:30:00	NEG_Z to Titan	NEG_X to 353.0/28.0	No Preference to secondary pointing
ISS_206TI_CLOUD006_PRIME	C, U, V	2014-203T17:30:00		000T01:00:00	2014-203T18:30:00	ISS_NAC to Titan	NEG_X to Sun	
SP_206EA_DLTURN203_PRIME		2014-203T18:30:00		000T00:40:00	2014-203T19:10:00	XBAND to Earth (0.0,0.0,-9.5 deg. o	NEG_Y to Saturn	
<b>NEW WAYPOINT</b>		<b>2014-203T19:10:00</b>		<b>000T10:30:00</b>	<b>2014-204T05:40:00</b>	<b>XBAND to Earth (0.0,0.0,-9.5 deg. o</b>	<b>NEG_Y to Saturn</b>	
SP_206EA_YGAP203_PRIME	E	2014-203T19:10:00		000T01:30:00	2014-203T20:40:00	XBAND to Earth (0.0,0.0,-9.5 deg. o	NEG_Y to Saturn	
SP_206EA_G34HEFSEQ203_PRIME	C	2014-203T20:40:00		000T09:00:00	2014-204T05:40:00	XBAND to Earth (0.0,0.0,-9.5 deg. o	Rolling/SRU	MIMI. NEG_Y to Saturn (0.0,-9.5). SID suspend. CIRS heating

# Science Highlights (1 of 2)

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DOY 200 (July 19): Inbound, ISS will acquire a mosaic of southern latitudes on Titan's sub-Saturnian hemisphere, including Mezzoramia near the winter terminator. CIRS extends its long-term campaign of monitoring stratospheric temperatures to evaluate seasonal change from northern spring to summer.

# Science Highlights

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DOY 201 (July 20): The highlight of the day is the UVIS stellar occultation of Alp Eri. This is an exceptional UVIS science opportunity—one of the two best in the Solstice mission--because (1) the stellar occultation is very slow, providing much better signal/noise and vertical resolution than most occultations, (2) there is also a solar occultation on this flyby, and (3) we are also doing a limb observation at the same latitude as the solar occultation. The limb observation and solar occultation give complementary information on conditions (temperature, density) in Titan's thermosphere and so-called "ignorasphere". This combination will allow us to cross-check the results from each experiment. The limb observation is to measure emissions from nitrogen molecules and atoms. T103 is a high altitude (5103 km) flyby occurring in the midnight sector of Saturn's magnetosphere on the side facing away from Saturn. Cassini might possibly explore Titan's induced magnetosphere; MAG measurements can be compared with flybys T101 and T102. ISS will acquire an outbound mosaic of high northern latitudes on Titan's trailing hemisphere approaching northern summer (multiple opportunities to observe northern latitudes are important in case of cloud activity). ISS will also ride along with CIRS, VIMS, and UVIS inbound and outbound, to image Titan's surface and atmosphere. On the inbound, VIMS will ride along with ISS and CIRS and will take images of the southern hemisphere at low resolution. VIMS will also look for specular reflection at the equator. During the prime observation, VIMS will acquire a mosaic of the southern hemisphere. VIMS will observe the ingress and egress solar occultation while riding along with UVIS in order to continue the monitoring of the haze density in Titan's atmosphere. On the outbound, VIMS will monitor specular reflection on Kraken Mare and will be looking for clouds at high northern latitudes while riding along with CIRS.

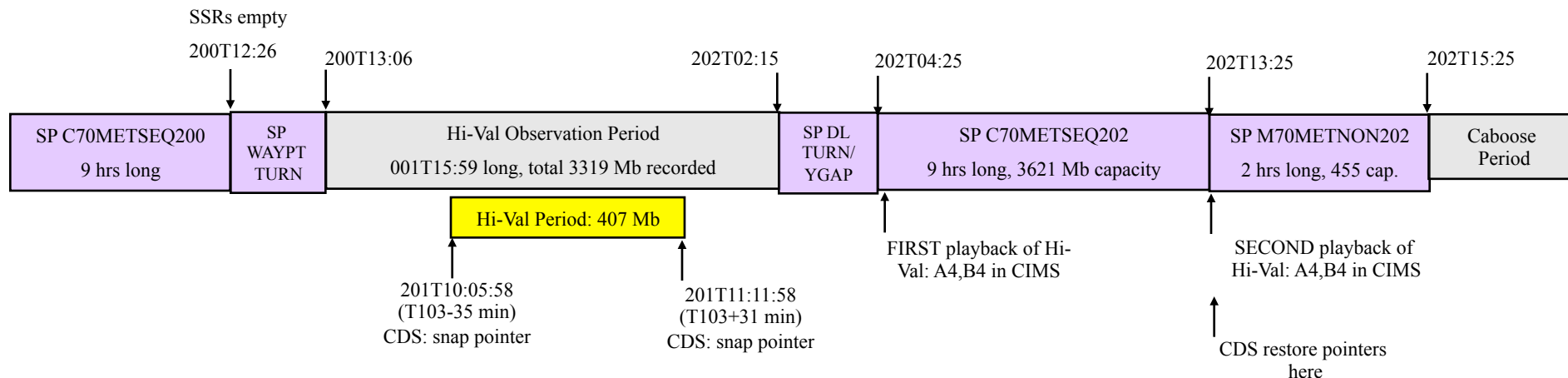
DOY 202 (July 21): For an extra day after the Titan encounter, ISS will monitor Titan's high northern latitudes, where it will be important to track clouds and the evolution thereof as summer approaches.

# Dual Playback

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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?)
T103	T103-35 min	T103+31 min	407 Mb	Yes	Yes	Yes	No (Yes 7 Mb)

## Playbacks contiguous:



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

# Notes

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- Pointing:
  - RBOT\_MY\_SPASS did not return useable results for waypoint on flyby day, using inertial WP.
- Data Volume:
  - Three SMT warnings for data not being recorded in specific modes—all are OK.
  - Carryover of 775 Mb being accepted by XD\_206
  - Unusual priority playback tables due to dual playback
  - ISS has permission to restore 18 Mb of data volume that didn't need to be cut from "caboose" period
- DSN:
  - Overlap between C70/M70 stations on DOY 202 is shorter than usual; treated as two separate downlink blocks (5 minute playback delay on M70 downlink)
- Resource checker:
  - Change in telemetry mode during ISS observation is OK per ISS
  - Gap in SPASS after dual PB is intentional
- Opmodes:
  - Nothing unusual
- Special Activities:
  - None

# Liens

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

- List any Liens to be worked in SIP, ie
  - Dual playback as noted in SPLAT