



CASSINI TOST SEGMENT

Rev 140 Handoff Package (T73)

Segment Boundary 2010-314T20:19:00 – 2010-316T21:04:00

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SMT report and SPASS

Science Highlights

Notes & Liens

Integration Checklist

SMT report

TOST rev 140 T73

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)	MARGN (Mb)	OPNAV (Mb)	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGN (Mb)	NET_MARGN (Mb)	CAROVN (%)	CAROVN (Mb)
SP_140EA_G70METNON316_PRIME	316 10:34	316 21:04	0	2906	162	3068	3553	485	0	239	62	3369	3369	0	0	0%	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	314 20:19	316 10:34	230.3	62.2	361.2	23.8	845.0	75.1	105.8	0.0	611.3	155.2	410.0	0.0	159.9	3039.8
SP_140EA_G70METNON316_PRIME	316 10:34	316 21:04	26.5	17.1	102.6	3.8	0.0	18.7	28.3	0.0	34.0	5.8	0.0	0.0	0.0	236.7
DAILY TOTAL SCIENCE	314 20:19	316 21:04	256.8	79.2	463.8	27.6	845.0	93.8	134.2	0.0	645.3	161.0	410.0	0.0	159.9	

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)	256.8	79.2	463.8	27.6	845.0	93.8	134.2	0.0	645.3	161.0	410.0	0.0

SPASS

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Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S64, length = 45 days		2010-284T04:17:00		044T15:18:00	2010-328T19:35:00			
Titan Flyby T73 Segment		2010-314T20:19:00		002T00:45:00	2010-316T21:04:00			
SP_140TI_WAYPTTURN314_PRIME		2010-314T20:19:00		000T00:20:00	2010-314T20:39:00	NEG_Y to 350.0/25.0 (0.0,0.0,5.0 deg. of POS_X to 120.0/54.0		
SP_140TI_WAYPTTURN514_PRIME		2010-314T20:39:00		000T00:20:00	2010-314T20:59:00	NEG_Y to Titan (0.0,0.0,5.0 deg. offset)	POS_X to 120.0/54.0	
NEW WAYPOINT		2010-314T20:59:00		001T12:05:00	2010-316T09:04:00	NEG_Y to Titan (0.0,0.0,5.0 deg. offse	POS_X to 120.0/54.0	
SP_140TI_DEADTIME314_PRIME		2010-314T20:59:00		000T00:15:00	2010-314T21:14:00	NEG_Y to Titan (0.0,0.0,5.0 deg. offse	POS_X to 120.0/54.0	
CIRS_140TI_MIDIRMAP001_PRIM I, V		2010-314T21:14:00	GMB_E140_TITAN_T73-000T16:23:01	000T03:23:01	2010-315T00:37:01	CIRS_FP1 to Titan	PIC	
CIRS_140TI_FIRNADCMP001_PRIM I, U, V		2010-315T00:37:01	GMB_E140_TITAN_T73-000T13:00:00	000T04:00:00	2010-315T04:37:01	CIRS_FP1 to Titan (-1.604,0.0,0.0 deg. of	PIC	
CIRS_140TI_MIRLMBMAP001_PRIM I, U, V		2010-315T04:37:01	GMB_E140_TITAN_T73-000T09:00:00	000T04:00:00	2010-315T08:37:01	CIRS_FP1 to Titan	PIC	
CIRS_140TI_FIRNADMAP001_PRIM I, V		2010-315T08:37:01	GMB_E140_TITAN_T73-000T05:00:00	000T02:45:00	2010-315T11:22:01	CIRS_FP1 to Titan	PIC	
CAPS_140TI_T73INPTG001_PRIME C, M		2010-315T11:22:01	GMB_E140_TITAN_T73-000T02:15:00	000T01:50:00	2010-315T13:12:01	NEG_Y to Titan (-20.0,0.0,15.0 deg. offse	POS_X to 120.0/54.0	
CIRS_140TI_FIRLMBT002_PRIME I, M, V		2010-315T13:12:01	GMB_E140_TITAN_T73-000T00:25:00	000T01:10:00	2010-315T14:22:01	CIRS_FP1 to Titan	PIC	
140TI (t) T73 TITAN Outbou...		2010-315T13:37:01		000T00:00:01	2010-315T13:37:02			
CIRS_140TI_FIRLMBT002_PRIME I, M, V		2010-315T14:22:01	GMB_E140_TITAN_T73+000T00:45:00	000T00:30:00	2010-315T14:52:01	CIRS_FP1 to Titan	PIC	
CIRS_140TI_FIRLMBINT002_PRIME I, M, V		2010-315T14:52:01	GMB_E140_TITAN_T73+000T01:15:00	000T01:00:00	2010-315T15:52:01	CIRS_FP1 to Titan	PIC	
VIMS_140TI_REGMAP001_PRIME C, I		2010-315T15:52:01	GMB_E140_TITAN_T73+000T02:15:00	000T02:45:00	2010-315T18:37:01	VIMS_IR to Titan	NEG_X to 300.8/-53.8	
VIMS_140TI_MEDRES001_PRIME C, I		2010-315T18:37:01	GMB_E140_TITAN_T73+000T05:00:00	000T04:00:00	2010-315T22:37:01	VIMS_IR to Titan	NEG_X to 301.9/-51.6	
VIMS_140TI_GLOBMAP001_PRIME C, I		2010-315T22:37:01	GMB_E140_TITAN_T73+000T09:00:00	000T05:00:00	2010-316T03:37:01	VIMS_IR to Titan	NEG_X to 305.3/-41.0	
VIMS_140TI_GLOBMAP002_PRIME C, I		2010-316T03:37:01	GMB_E140_TITAN_T73+000T14:00:00	000T04:31:59	2010-316T08:09:00	VIMS_IR to Titan	NEG_X to 311.7/-4.2	
SP_140TI_DEADTIME316_PRIM C		2010-316T08:09:00	GMB_E140_TITAN_T73+000T18:31:	000T00:15:00	2010-316T08:24:00	NEG_Y to Titan (0.0,0.0,5.0 deg. offse	POS_X to 120.0/54.0	
SP_140TI_DLTURN316_PRIME		2010-316T08:24:00		000T00:40:00	2010-316T09:04:00	XBAND to Earth	NEG_Y to 282.5/-1.92	
NEW WAYPOINT		2010-316T09:04:00		000T12:00:00	2010-316T21:04:00	XBAND to Earth	NEG_Y to 282.5/-1.92	
SP_140EA_YBIAS316_PRIME E		2010-316T09:04:00		000T01:30:00	2010-316T10:34:00	XBAND to Earth	NEG_Y to 282.5/-1.92	
SP_140EA_G70METNON316_PRIME C		2010-316T10:34:00		000T10:30:00	2010-316T21:04:00	XBAND to Earth	Rolling/SRU	NEG_Y to 282.50/-1.92 (NEG_Y to Saturn (0,0,-9.5),

DOY 314: CIRS focuses on temperature mapping of the stratosphere

DOY 315: CIRS focuses on temperature mapping of the stratosphere, including continuing monitoring of the changing vertical structure as the northern hemisphere warms through Titan's northern spring. At C/A, VIMS will ride along with CIRS and will map the Huygens Landing Site at medium resolution. CAPS will direct pointing to get a good view of the plasma. Then VIMS will acquire a mosaic of the areas known as Shangri-La and Adiri at a resolution of 10 km/pixel. It will also be looking for clouds at mid latitudes. ISS will be monitoring for clouds, riding along with VIMS. For MAG, T73 is a pre-dusk, high altitude (>4000 km) 'blind' flyby over the southpole of Titan that will be useful to characterize the background field in which Titan sits in. MIMI measures energetic ion and electron energy input to atmosphere, though the flyby geometry is not the best. 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 magnetosphere.

DOY 316: VIMS will continue to acquire a mosaic of the areas known as Shangri-La and Adiri at a resolution of 10 km/pixel. It will also be looking for clouds at mid latitudes. ISS will be monitoring for clouds, riding along with VIMS. Data is downlinked from the Titan flyby.

Notes and Liens

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- Pointing:
 - No prime/rider coordination designs
 - No custom handoffs
 - 2 part waypoint turn at start of segment to avoid FR violations
 - No CIRS heating during waypoints
 - All VIMS observations use RBOT-friendly secondaries. CAPS secondary is science-dependent; RBOT changes should be worked in conjunction with the CAPS team. CIRS secondaries are generally flexible, and will be looked at in implementation. The one exception is any LMB observations where secondary changes will impact the CIRS science.
- Data Volume:
 - No issues
- DSN:
 - No special requests
- Opmodes:
 - No special arrangements.
- Special Activities:
 - None

Sequence Liens:

- None

Segment Checklist p1

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Item	Disposition notes, or X if complete
1. Disposition all requests in CIMS - approve all pending requests, no outstanding revisions/new requests	X
2. Version the SPASS in CIMS, use label INTEG_FIN, in description put date and your name	x
3. Examine SPASS, ensure SP turns correctly designated PRIME or NEW WAYPOINT. Review Ybias presentation. Prime RSS observations require the Xband to Earth attitude be a waypoint, use DLTURN with spass type New Waypoint	x
4. Waypoints and downlinks are violation free (per CTV). NOTE ON ISSUES PAGE if periods of no valid waypoint	x
5. SP turns have been checked and are violation free. All turns use the slower XM slew rates and include 2 minutes turn margin. First turn of segment has been checked using correct final attitude of previous segment	x
6. YBIAS windows have been included as required, guidelines for integration met per MP forum package	x
7. There are no more than 3 waypoint changes in a 24 hour period (DLTURN waypoints for YBIAS do not count)	x
8. The minimum prime instrument request duration outside ± 5 hours from a targeted satellite flyby is 30 minutes	x
9. Custom handoffs are limited to ± 3 hours around a targeted Titan or Icy Satellite flyby	n/a
10. Custom periods 1) designated properly with SPASS notes 2) requests have "pick up at" and "hand off at" information filled in correctly 3) turn times and handoff attitudes have been verified – early PDT work recommended!	n/a
11. Prime/rider coordination: secondaries have all been reviewed and agreed to, co-designed observations are so designated, pre-designed in PDT	none
12. Use rolling_sru if required per CTV checks	x
13. The secondary axis for downlinks that contain prime and backup OTMs is the same, and inertially fixed	n/a
14. Downlinks that contain OTPs only roll for the first 4 hours of the downlink pass max. OTB: Full rolling OK, unless SRU issues, then 4_Hr_Rolling max (NO split rolls)	n/a
15. There is one downlink pass block per OTM prime or backup window (one wedding cake for a split pass). Exception - if first split downlink pass is ≤ 4 hours can use 2 cakes, put playback_gap in 2nd pass, put OTP/OTB in name of BOTH passes (for CDA)	x
16. Downlinks (attitude/rolling) match XMDLWG plan. Negotiated changes should be reported back to the WG	x

Segment Checklist p2

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Item	Disposition notes, or X if complete
17. Multi-revolution turns about the X-axis have an offset greater than or equal to 30 degrees about Z	n/a
18. Live moveable blocks (LMBs) include the appropriate time margin specified as a DEADTIME request in CIMS at the beginning and end of the moveable block. TLM modes in separate OBSMOV request (n/a for RSS)	n/a
19. Live moveable blocks use an LMB epoch and use the appropriate epoch naming conventions. Live Update Blocks use a LUB epoch (RSS only)	n/a
20. All stellar occultation observations include an additional +/-20 minutes of time (40 minutes total) when they occur within -1 day to +2 days of Saturn periapse	n/a
21. All Ground and Live Moveable blocks associated with non-targeted geometric events (e.g., solar and earth occultations) include an additional +/-20 minutes of time margin (40 minutes total) to account for reference trajectory changes.	n/a
22. Check your GMB, LMB, LUB, Occ times against current reference trajectory	x
23. Dual playback of high value science data is performed via multiple playbacks within this segment. CIMS entries are correct. Dual playback does not affect downstream segments	n/a
24. Run the resource checker in CIMS and fix errors found. Remaining notes disposition here	no errors
25. Run SMT, if SSR not empty at end of segment include in notes, and instances of <-90 SSR margin	x
26. Examine SMT warnings report, include dispositions here of any items (negative SSR margin should already be on notes page)	x
27. RSS boresight: one _SP pass, two _PRIME downlink passes, one hour observation block in SNER_3	n/a

Segment Checklist p3

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Item	Disposition notes, or X if complete
28. Examine “ap_downlink report check” output, include dispositions here of any items (see next two items).	70M usage 100%, but hey, it's TOST.
29. List any DSN stations requested during maintenance periods, AND JUSTIFICATION. AVOID!!!!	n/a
30. Avoid requesting two overlapping stations (except for RSS science) whenever possible – use RSS station for downlink too – or have RSS move ORT	n/a
31. Compare RSS requests to DSN requests, make sure they jive (ORT, occ, etc), ORTs are integrated.	n/a
32. List your percent 70M stations requested - avoid >35%	HAHAHAHAHAHA
33. Examine “ap_downlink report nav” output, MP should ensure NAV OK with gaps in 2way	x
34. In CIMS check for “start before”, “end before”, “start after”, “end after” requests - fix if any problems found	x
35. Verify OPNAVs are in SNER5 and are support_image class, sanity check rest of tlm modes (RADAR 15 min in 5A/activity in 5A or 8, etc)	n/a
36. If sequence boundary at START of your segment, ensure IVPGAP info correct, NO “start before” MAPS requests	n/a
37. If sequence boundary at END of your segment (ie in the next segment), ensure 6 “SEQ” upload DSN passes - will probably ripple into preceding segment(s), make sure to notify them. Last pass has Ybias window in front, no bonus science. NO “end after” MAPS requests	n/a
38. Verify opmodes correct (RSS and RADAR especially), teams going to sleep have agreed? Use table at https://cassini.jpl.nasa.gov/wiki/bin/view/Cassini/XXMOpModes	x
39. If conjunction is in your segment, see Conjunction page on SP Wiki	n/a
40. RAMAVOID: new waypoint, NOT in custom period	n/a
41. If on thrusters, confirm deadbands	n/a
42. Segment products & this package linked to XXM deliveries page	X in advance of actually linking