



CASSINI TOST SEGMENT

147TI_T75 Handoff Package

Segment Boundary 2011-108T10:18:00 – 2011-111T10:03:00

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SMT report and SPASS
Science Highlights
Notes & Liens
Integration Checklist



Master Timeline for T75

TOST T75

Start Time	End Time	Prime Activity	Obs. Detail	Op Mode	TLM Mode	Comments
147TI_T75	10053					
2011-108T10:18:00	2011-108T10:58:00	SP Turn to WP	Waypt: NAC to Radeç(-129,+14) Secondary is Neg Z to NTP	DFPW Normal	S_N_ER_3	
2011-108T10:58:00	C/A-17:47:39	OD Uncertainty Dead Time		DFPW Normal	S_N_ER_3	
C/A-17:47:39	-13:00	CAPS	Z extended (TN1c, TC1a)	DFPW Normal	S_N_ER_3	
-13:00	-09:00	CAPS	Z extended (TN1c, TC1a)	DFPW Normal	S_N_ER_3	
-09:00	-05:00	CAPS	Z (TN1c, TC1a)	DFPW Normal	S_N_ER_3	
-05:00	-02:15	CAPS	Z (TN1c, TC1a)	DFPW Normal	S_N_ER_3	
-02:15	0	CAPS	(TN1c, TC1a)	DFPW Normal	S_N_ER_3	
2011-109T05:00:39		CLOSEST APPROACH	POS_Y to corotation	DFPW Normal	S_N_ER_3	Mid-range wake crossing near noon, pored w/ T79 (upstream at noon)
0	+02:30	CAPS	(TN1c, TC1a)	DFPW Normal	S_N_ER_3	
+02:30	+09:00	UVIS	X (TN1c, TC1b)	DFPW Normal	S_N_ER_3	
+09:00	C/A+17:37:21	UVIS	X extended (TN1c, TC1b)	DFPW Normal	S_N_ER_3	
C/A+17:37:21	2011-109T22:53:00	OD Uncertainty Dead Time		DFPW Normal	S_N_ER_3	
2011-109T22:53:00	2011-109T23:33:00	SP Turn to Earth for downlink	XBAND to Earth, NEG-Y to Saturn (0,0,-9.5)	DFPW Normal	S_N_ER_3	
2011-109T23:33:00	2011-110T01:03:00	Y-Bias window		DFPW Normal	S_N_ER_3	
2011-110T01:03:00	2011-110T10:03:00	Goldstone 70M		DFPW Normal	RTE_N_SPB	
2011-110T10:03:00	2011-110T10:43:00	SP Turn to WP	-Y to Titan, -Z to NSP	DFPW Normal	S_N_ER_5a for 15 min @ 10:03 then S_N_ER_3	-X to NEP also works
2011-110T10:43:00	2011-110T15:43:00	ISS	TC1a, TN1a	RADWU	S_N_ER_3	
2011-110T15:43:00	2011-110T17:43:00	RADAR	obtain distant Titan radiometer science and calibration data (TN2c)	RADRWA	S_N_ER_8	
2011-110T17:43:00	2011-110T22:43:00	ISS	TC1a, TN1a	DFPW Normal	S_N_ER_3	
2011-110T22:43:00	2011-110T23:33:00	SP Turn to Earth for downlink	XBAND to Earth, NEG-X to (282,-5)	DFPW Normal	S_N_ER_3	
2011-110T23:33:00	2011-111T01:03:00	Ybias window		DFPW Normal	S_N_ER_3	
2011-111T01:03:00	2011-111T10:03:00	Goldstone 34M		DFPW Normal	RTE_N_SPB	

No Dual Playback



T75 SMT report

TOST T75

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_147EA_G34BWGSEQ110_PRIME	110 01:03	110 10:03	0	2589	164	2753	3319	566	0	232	53	3038	885	-2153	52	1%	2153
SP_147EA_G70METSEQ111_PRIME	111 01:03	111 10:03	2153	1050	64	3267	3319	52	0	232	53	3552	4277	725	726	17%	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	108 10:18	110 01:03	442.4	87.4	255.0	24.0	448.0	111.6	127.9	0.0	659.5	234.9	175.0	0.0	162.0	2727.6
SP_147EA_G34BWGSEQ110_PRIME	110 01:03	110 10:03	32.4	17.0	86.4	3.2	0.0	16.0	27.5	0.0	42.4	4.9	0.0	0.0	0.0	229.9
DAILY TOTAL SCIENCE	108 10:18	110 10:03	474.8	104.4	341.4	27.3	448.0	127.6	155.5	0.0	701.9	239.8	175.0	0.0	162.0	
OBSERVATION_NOR	110 10:03	111 01:03	54.0	28.3	72.0	5.4	700.0	26.7	45.9	7.6	70.7	0.0	30.0	0.0	62.7	1103.3
SP_147EA_G70METSEQ111_PRIME	111 01:03	111 10:03	32.4	17.0	86.4	3.2	0.0	16.0	27.5	0.0	42.4	4.9	0.0	0.0	0.0	229.9
DAILY TOTAL SCIENCE	110 10:03	111 10:03	86.4	45.3	158.4	8.6	700.0	42.7	73.4	7.6	113.2	4.9	30.0	0.0	62.7	
TOTAL RECORDED (OPNAV data not included)			561.2	149.7	499.8	35.9	1148.0	170.3	228.9	7.6	815.1	244.8	205.0	0.0		



T75 SPASS

TOST T75

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary
Sequence S67, length = 49 days		2011-066T13:02:00		049T03:01:00	2011-115T16:03:00		
Titan Flyby T75 Segment		2011-108T10:18:00		002T23:45:00	2011-111T10:03:00		
SP_147TI_WAYPTTURN108_PRIME		2011-108T10:18:00		000T00:40:00	2011-108T10:58:00	NEG_Y to -129.0/14.0	NEG_Z to NTP
NEW WAYPOINT		2011-108T10:58:00		001T12:35:00	2011-109T23:33:00	NEG_Y to -129.0/14.0	NEG_Z to NTP
SP_147NA_DEADTIME108_PRIME	M	2011-108T10:58:00		000T00:15:00	2011-108T11:13:00	NEG_Y to -129.0/14.0	NEG_Z to NTP
CAPS_147TI_T75PTG001_PRIME	C, M	2011-108T11:13:00	GMB_E147_TITAN_T75-000T17:47:39	000T20:17:39	2011-109T07:30:39	POS_Y to COROT	PIC
147TI (t) T75 TITAN Outbou...		2011-109T05:00:39		000T00:00:01	2011-109T05:00:40		
UVIS_147TI_EUVFUV001_PRIME	C, I, V	2011-109T07:30:39	GMB_E147_TITAN_T75+000T02:30:00	000T06:30:00	2011-109T14:00:39	UVIS_FUV to Titan	NEG_Z to NTP
UVIS_147TI_HDACSTARE001_PRIME	C, I, V	2011-109T14:00:39	GMB_E147_TITAN_T75+000T09:00:00	000T08:37:21	2011-109T22:38:00	UVIS_FUV to Titan	NEG_X to NTP
SP_147NA_DEADTIME109_PRIME		2011-109T22:38:00	GMB_E147_TITAN_T75+000T17:37:21	000T00:15:00	2011-109T22:53:00	NEG_Y to -129.0/14.0	NEG_Z to NTP
SP_147NA_DLTURN109_PRIME		2011-109T22:53:00		000T00:40:00	2011-109T23:33:00	XBAND to Earth (0.0,0.0,-9.5 deg.	NEG_Y to Saturn
NEW WAYPOINT		2011-109T23:33:00		000T11:10:00	2011-110T10:43:00	XBAND to Earth (0.0,0.0,-9.5 deg.	NEG_Y to Saturn
SP_147EA_YBIAS109_PRIME	E	2011-109T23:33:00		000T01:30:00	2011-110T01:03:00	XBAND to Earth (0.0,0.0,-9.5 deg.	NEG_Y to Saturn
SP_147EA_G34BWGSEQ110_PRIME	C	2011-110T01:03:00		000T09:00:00	2011-110T10:03:00	XBAND to Earth (0.0,0.0,-9.5 deg.	Rolling
SP_147TI_WAYPTTURN109_PRIME		2011-110T10:03:00		000T00:40:00	2011-110T10:43:00	NEG_Y to Titan	NEG_Z to NSP
NEW WAYPOINT		2011-110T10:43:00		000T12:50:00	2011-110T23:33:00	NEG_Y to Titan	NEG_Z to NSP
ISS_147TI_CLOUD001_PRIME	C, V	2011-110T10:43:00		000T05:00:00	2011-110T15:43:00	ISS_NAC to Titan	NEG_X to 37.5/83.7
RADAR_147TI_RADIOMCAL006_PRIME		2011-110T15:43:00		000T02:00:00	2011-110T17:43:00	NEG_Z to Titan	POS_Y to NTP
ISS_147TI_CLOUD002_PRIME	C, V	2011-110T17:43:00		000T05:00:00	2011-110T22:43:00	ISS_NAC to Titan	NEG_X to 37.5/83.7
SP_147NA_DLTURN110_PRIME		2011-110T22:43:00		000T00:50:00	2011-110T23:33:00	XBAND to Earth	NEG_X to 282.0/-5.0
NEW WAYPOINT		2011-110T23:33:00		000T10:30:00	2011-111T10:03:00	XBAND to Earth	NEG_X to 282.0/-5.0
SP_147EA_YBIAS110_PRIME	E	2011-110T23:33:00		000T01:30:00	2011-111T01:03:00	XBAND to Earth	NEG_X to 282.0/-5.0
SP_147EA_G70METSEQ111_PRIME	C	2011-111T01:03:00		000T09:00:00	2011-111T10:03:00	XBAND to Earth	Rolling



T75 Science Highlights

TOST T75

DOY 108:

T75 is a pre-dusk, high altitude equatorial flyby across Titan's induced magnetic tail downstream from the moon. As in previous flyby T9, the geometry for T75 is ideal to study the structure of the magnetotail and possibly the current sheet that separates its two lobes. Adequate pointing from CAPS will lead to important measurements of the ion and electron species escaping from the moon as a result of its interaction with Saturn's magnetospheric flow.

DOY 109:

UVIS will obtain an image cube of Titan's atmosphere at EUV and FUV wavelengths by sweeping its slit across the disk. These cubes provide spectral and spatial information on nitrogen emissions, H emission and absorption, absorption by simple hydrocarbons, and the scattering properties of haze aerosols. This is one of many such cubes gathered over the course of the mission to provide latitude and seasonal coverage of Titan's middle atmosphere and stratosphere.

CIRS will ride along with a slow UVIS scan across the surface, to determine seasonally changing surface temperatures at 19 microns.

DOY 110:

The ORS instruments will determine seasonal changes in the methane-hydrocarbon hydrological cycle: of lakes, clouds, aerosols, and their seasonal transport.

RADAR will obtain distant Titan radiometer science and calibration data.



Notes and Liens

TOST T75

- Pointing:
 - Prime/Rider coordination for ISS_147TI_CLOUD001_PRIME and ISS_147TI_CLOUD002_PRIME with CIRS.
- Data Volume:
 - No issues.
- DSN:
 - none
- Opmodes:
 - none
- Special Activities:
 - none

Sequence Liens:

- none



Segment Checklist p1

TOST T75

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 large turns >60 degrees use the slower XM slew rates and include turn margin as specified in the Extended Mission slew margin policy. Exceptions to this rule are specified in FR07D145	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	X
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!	X
11. Prime/rider coordination: secondaries have all been reviewed and agreed to, co-designed observations are so designated, pre-designed in PDT	X
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	X
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)	n/a
16. Downlinks (attitude/rolling) match XMDLWG plan. Negotiated changes should be reported back to the WG	X



Segment Checklist p2

TOST T75

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.	GMB Deadtime prior = 15:00 min Deadtime after = 15:00 min
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. Paste remaining notes here with disposition 2011-110T01:03:00 SP_147EA_G34BWGSEQ110_PRIME First_Part value of SSRBP4 does not match default of SSRBP5. Second_Part value of SSRAP4 does not match default of SSRAP5. Third_Part value of SSRNULL does not match default of SSRBP4. Fourth_Part value of SSRNULL does not match default of SSRAP4	New SSR playback implemented by Emily from MP.
25. Run SMT, if SSR not empty at end of segment include in notes, and instances of <-90 SSR margin	(see notes page)
26. Examine SMT warnings report, include dispositions here of any items (negative SSR margin should already be on SP_SMT_1 RADAR 2011-110T10:03:00.000 RADAR_147OT_WU4RADCAL006_RIDER: Found an activity whose data are NOT recorded in this telemetry mode "S_N_ER_3" commanded at 2011-110T10:18:00.000. Volume of 9.389952 Mb.	Ok. We always see this when we do RADAR warmup.
27. RSS boresight: one _SP pass, two _PRIME downlink passes, one hour observation block in SNER_3	No RSS



Segment Checklist p3

TOST T75

Item	Disposition notes, or X if complete
28. Examine “ap_downlink report check” output, include dispositions here of any items (see next two items). Warning: 70m usage for sequence exceeds project commitment of <= 35%; is at 100%	OK.
29. List any DSN stations requested during maintenance periods, AND JUSTIFICATION. AVOID!!!!	n/a
30. List your percent 70M stations requested - avoid >35%	100% only 70M array only downlink pass in segment.
31. Examine “ap_downlink report nav” output, MP should ensure NAV OK with gaps in 2way	Gap in doppler for Titan flyby
32. In CIMS check for “start before”, “end before”, “start after”, “end after” requests - fix if any problems found	X
33. 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
34. If sequence boundary at START of your segment, ensure IVPGAP info correct, NO “start before” MAPS requests	n/a
35. 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
36. 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	No RSS
37. Compare RSS requests to DSN requests, make sure they jive (ORT, occ, etc), ORTs are integrated.	No RSS
38. If conjunction is in your segment, see Conjunction page on SP Wiki	n/a
39. RAMAVOID: new waypoint, NOT in custom period	n/a
40. If on thrusters, confirm deadbands	n/a
41. Segment products & this package linked to XM deliveries page	X