CASSINI TOST SEGMENT

138TI_T72 Handoff Package

Segment Boundary 2010-267T05:17:00 – 2010-269T06:17:00

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Kim Steadman

SMT report and SPASS
Science Highlights
Notes & Liens
Integration Checklist

DATA VOLUME SUMMARY --- TRANSFER FRAME OVERHEAD INCLUDED (80 BITS PER 8800-BIT FRAME)

			OBSERVATION_PERIOD							DOWNLINK_PASS							
			P4						P5	RECORDED		PLAYBACK					
DOWNLINK PASS NAME	Start doy hh:mm	End doy hh:mm	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_138EA_C70ARRNON268_PRIME	268 19:32	269 06:17	0	3008	162	3169	3319	149	0	266	63	3499	3430	-69	0	0%	69

SSR PARTITION SIZE SUMMARY - SELECTED SSR CONFIGURATION: DOUBLE

	SSR A/B		
OBSERVATION PERIOD	P4 Size (Frames)	P5 Size (Frames)	P6 Size (Frames)
SP_138NA_C70OBSNON267_NA	188750	213	38863

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	267 05:17	268 19:32	230.3	72.2	349.5	23.8	775.0	88.2	169.6	0.0	618.6	133.1	520.0	0.0	159.9	3140.3
SP_138EA_C70ARRNON268_PRIME	268 19:32	269 06:17	27.1	20.3	86.4	3.9	0.0	23.2	46.4	0.0	50.7	5.9	0.0	0.0	0.0	263.9
DAILY TOTAL SCIENCE	267 05:17	269 06:17	257.4	92.4	435.9	27.7	775.0	111.4	216.0	0.0	669.3	139.0	520.0	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)	257.4	92.4	435.9	27.7	775.0	111.4	216.0	0.0	669.3	139.0	520.0	0.0

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S63, length = 35 days		2010-249T06:33:00		034T21:44:00	2010-284T04:17:00			
Titan Flyby T72 Segment		2010-267T05:17:00		002T01:00:00	2010-269T06:17:00			
SP_138TI_WAYPTTURN267_PRIME	M	2010-267T05:17:00		000T00:22:00	2010-267T05:39:00	XBAND to Earth	NEG_X to NTP	
SP_138TI_WAYPTTURN367_PRIME	M	2010-267T05:39:00		000T00:18:00	2010-267T05:57:00	NEG_Y to Titan	NEG_X to NTP	
NEW WAYPOINT		**2010-267T05:57:00**		**001T12:05:00**	**2010-268T18:02:00**	**NEG_Y to Titan**	**NEG_X to NTP**	
SP_138NA_DEADTIME267_PRIME	**M**	**2010-267T05:57:00**		**000T00:15:41**	**2010-267T06:12:41**	**NEG_Y to Titan**	**NEG_X to NTP**	
CIRS_138TI_FIRNADCMP001_PRIME	I, M, V	2010-267T06:12:41	GMB_E138_Titan72-000T12:26:00	000T03:26:00	2010-267T09:38:41	CIRS_FP1 to Titan	PIC	
CIRS_138TI_MIRLMBMAP001_PRIME	I, M, V	2010-267T09:38:41	GMB_E138_Titan72-000T09:00:00	000T04:00:00	2010-267T13:38:41	CIRS_FPB to Titan	PIC	
CIRS_138TI_FIRNADMAP001_PRIME	I, M, V	2010-267T13:38:41	GMB_E138_Titan72-000T05:00:00	000T02:45:00	2010-267T16:23:41	CIRS_FP1 to Titan	NEG_X to 313.7/4.8	
Begin Custom Period		**2010-267T16:23:41**	**GMB_E138_Titan72-000T02:15:00**	**000T00:00:01**	**2010-267T16:23:42**	**NEG_Y to Titan**	**NEG_X to NTP**	
CIRS_138TI_FIRLMBINT001_PRIME	I, M, V	2010-267T16:23:41	GMB_E138_Titan72-000T02:15:00	000T01:00:00	2010-267T17:23:41	CIRS_FP1 to Titan	PIC	Pick up at NEG_Y to Titan, NEG_X to NTP; Hand off at CIRS_FP1 to Titan, PIC.
CIRS_138TI_FIRLMBAER001_PRIME	I, M, V	2010-267T17:23:41	GMB_E138_Titan72-000T01:15:00	000T00:30:00	2010-267T17:53:41	CIRS_FP1 to Titan	PIC	Pick up at CIRS_FP1 to Titan, PIC; Hand off at CIRS_FP1 to Titan, PIC. Includes a VIMS Titan atmosphere occultation of alpTau (RA/Dec: 68.980/16.509) from 2010-028T21:32:00 to 21:36:00.
CIRS_138TI_FIRLMBT001_PRIME	I, M, V	2010-267T17:53:41	GMB_E138_Titan72-000T00:45:00	000T00:30:00	2010-267T18:23:41	CIRS_FP1 to Titan	PIC	Pick up at CIRS_FP1 to Titan, PIC; Hand off at NEG_Y to Titan, NEG_X to Sun.
VIMS_138TI_HIGHRES001_PRIME	C, I, M	2010-267T18:23:41	GMB_E138_Titan72-000T00:15:00	000T02:30:00	2010-267T20:53:41	VIMS_IR to Titan	NEG_X to Sun	Pick up at NEG_Y to Titan, NEG_X to Sun; Hand off at NEG_Y to Titan, NEG_X to NTP.
138TI (t) T72 TITAN Outbou...		2010-267T18:38:41		000T00:00:01	2010-267T18:38:42			
End Custom Period		**2010-267T20:53:41**	**GMB_E138_Titan72+000T02:15:00**	**000T00:00:01**	**2010-267T20:53:42**	**NEG_Y to Titan**	**NEG_X to NTP**	
UVIS_138TI_EUVFUV001_PRIME	C, I, M, V	2010-267T20:53:41	GMB_E138_Titan72+000T02:15:00	000T06:45:00	2010-268T03:38:41	UVIS_FUV to Titan	NEG_X to Sun	
VIMS_138TI_GLOBMAP001_PRIME	C, I, M	2010-268T03:38:41	GMB_E138_Titan72+000T09:00:00	000T05:00:00	2010-268T08:38:41	VIMS_IR to Titan	NEG_X to Sun	
VIMS_138TI_GLOBMAP002_PRIME	C, I, M	2010-268T08:38:41	GMB_E138_Titan72+000T14:00:00	000T08:25:00	2010-268T17:03:41	VIMS_IR to Titan	NEG_X to Sun	
SP_138NA_DEADTIME268_PRIME	**M**	**2010-268T17:03:41**	**GMB_E138_Titan72+000T22:25:00**	**000T00:18:19**	**2010-268T17:22:00**	**NEG_Y to Titan**	**NEG_X to NTP**	
SP_138NA_DLTURN268_PRIME	M	2010-268T17:22:00		000T00:40:00	2010-268T18:02:00	XBAND to Earth	NEG_Y to 277.23/-3.19	
NEW WAYPOINT		**2010-268T18:02:00**		**000T12:15:00**	**2010-269T06:17:00**	**XBAND to Earth**	**NEG_Y to 277.23/-3.19**	
SP_138EA_YBIAS268_PRIME	E, M	2010-268T18:02:00		000T01:30:00	2010-268T19:32:00	XBAND to Earth	NEG_Y to 277.23/-3.19	
SP_138EA_C70ARRNON268_PRIME	C, M	2010-268T19:32:00		000T10:45:00	2010-269T06:17:00	XBAND to Earth	Rolling/SRU	NEG_Y to 277.23/-3.19, (NEG_Y to Saturn (0,0,-9.5)), MIMI

Science Highlights

DOY 267:

ISS – ISS with ride along with VIMS' observations of Titan's trailing hemisphere during closest-approach.

VIMS – During this high altitude flyby (8175 km at C/A), VIMS will map an equatorial region of the trailing hemisphere known as Belet at a resolution of 5 km/pixel. The phase angle is high (60□ at C/A) but VIMS has shown that it can acquire good quality mosaics at 2 microns. This mosaic will complement the mosaics that will be obtained during T66 and T67 when VIMS is ridealong with ISS.

CIRS – On T72 CIRS performs medium-range and close limb sounding of Titan's stratosphere to probe the vertical structure near 60N. This is part of our campaign to monitor seasonal change during the early northern summer, as we expect to observe the break-up of the northern winter polar vortex and dissipation of the interior region of enhanced gas tracer species.

UVIS – 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 coarse of the mission to provide latitude and seasonal coverage of Titan's middle atmosphere and stratosphere.

RPWS – 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 268:

VIMS will perform a global mapping of Titan looking for clouds at northern mid-latitudes and near the poles.

ISS will make observations of Titan's anti-Saturnian hemisphere outbound, including tracking clouds that may be present.

Notes and Liens

- Pointing:
    - Prime/Rider coordination for CIRS_138TI_FIRLMBAER001_PRIME with VIMS for an occultation.
- Data Volume:
    - SMT report shows 69 Mb of carryover into the next segment. With data utilization of TOST segments taken into account, TOST doesn't expect to carryover any data.
- DSN:
    - none
- Opmodes:
    - none
- Special Activities:
    - none

Sequence Liens:

- none

Segment Checklist p1

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

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 = 12:26 min Deadtime after = 18:19 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	X
24. Run the resource checker in CIMS and fix errors found. Paste remaining notes here with disposition00030 2010-267T16:23:41 CIRS_138TI_FIRLMBINT001_PRIME Custom period request is using PIC in secondary BV of handoff pointing 2010-267T17:23:41 CIRS_138TI_FIRLMBAER001_PRIME Custom period request is using PIC in secondary BV of handoff pointing	These are ok. CIRS uses PIC when CIMS options don't allow them to properly input their pointing.
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 notes page)	No SMT warnings
27. RSS boresight: one _SP pass, two _PRIME downlink passes, one hour observation block in SNER_3	No RSS

Segment Checklist p3

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%	70M array only downlink in segment.
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