CASSINI TOST SEGMENT

Rev 158 Handoff Package (T79)

Segment Boundary 2011-347T04:05:00 – 2011-350T11:20:00

5 May 2011

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SMT report and SPASS

Science Highlights

Notes & Liens

Integration Checklist

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SSR MANAGEMENT TOOL (SMT) VERSION: SMT-D14.2
REPORT FOR 158TI_T79_110505.apf
USING DICTIONARY FILE   /cas/msspath/MSS.D14.2.1/base/mss_sw/smt/dict/dict.txt
AND SSR CONFIGURATION TABLE /cas/msspath/MSS.D14.2.1/base/mss_sw/smt/tables/CDS_B_Normal.conf


DATA VOLUME SUMMARY --- TRANSFER FRAME OVERHEAD INCLUDED (80 BITS PER 8800-BIT FRAME)
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			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) (%)
SP_158EA_C70METNON348_PRIME	348 15:05	349 02:35	0	3117	148	3265	3322	57	0	305	68	3637	3538	-100	137 2%
SP_158EA_M70METNON350_PRIME	350 02:20	350 11:20	100	1894	101	2095	3322	1228	0	414	53	2562	2699	137	137 5%

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S71, length = 70 days		2011-320T03:02:00		069T19:53:00	2012-024T22:55:00			
Titan Flyby T79 Segment		2011-347T04:05:00		003T07:15:00	2011-350T11:20:00			
SP_158TI_DEADTIME347_PRIME		2011-347T04:05:00		000T00:15:00	2011-347T04:20:00	XBAND to Earth	POS_X to 193.0/81.0	
CAPS_158TI_T79PTG001_PRIME	C, M	2011-347T04:20:00	GMB_E158_TITAN_T79-000T15:51:24	001T00:11:24	2011-348T04:31:24	POS_Y to COROT	PIC	Secondary and offsets for RBOT and MIMI
158TI (t) T79 TITAN Outbou...		2011-347T20:11:24		000T00:00:01	2011-347T20:11:25			
SP_158TI_WAYPTTURN348_PRIME	M	2011-348T04:31:24	GMB_E158_TITAN_T79+000T08:20:0	000T00:40:00	2011-348T05:11:24	NEG_Y to Titan	NEG_X to NEP	
NEW WAYPOINT		2011-348T05:11:24		000T08:23:36	2011-348T13:35:00	NEG_Y to Titan	NEG_X to NEP	
VIMS_158TI_GLOBMAP001_PRIME	C, I	2011-348T05:11:24	GMB_E158_TITAN_T79+000T09:00:0	000T05:00:00	2011-348T10:11:24	VIMS_IR to Titan	NEG_X to Sun	
CIRS_158TI_MIDIRTMAP002_PRIME	I, V	2011-348T10:11:24	GMB_E158_TITAN_T79+000T14:00:0	000T02:28:36	2011-348T12:40:00	CIRS_FPB to Titan	PIC	
SP_158NA_DEADTIME348_PRIME		2011-348T12:40:00	GMB_E158_TITAN_T79+000T16:28:	000T00:15:00	2011-348T12:55:00	NEG_Y to Titan	NEG_X to NEP	
SP_158EA_DLTURN348_PRIME		2011-348T12:55:00		000T00:40:00	2011-348T13:35:00	XBAND to Earth	NEG_X to 295.0/-5.0	
NEW WAYPOINT		2011-348T13:35:00		000T13:40:00	2011-349T03:15:00	XBAND to Earth	NEG_X to 295.0/-5.0	
SP_158NA_YBIAS348_PRIME	E	2011-348T13:35:00		000T01:30:00	2011-348T15:05:00	XBAND to Earth	NEG_X to 295.0/-5.0	
SP_158EA_C70METNON348_PRIME	C	2011-348T15:05:00		000T11:30:00	2011-349T02:35:00	XBAND to Earth	Rolling	NEG_Y to Saturn (0,0,-9.5),
SP_158TI_WAYPTTURN349_PRIME		2011-349T02:35:00		000T00:40:00	2011-349T03:15:00	CIRS_FPB to Titan	POS_Z to NTP	
NEW WAYPOINT		2011-349T03:15:00		000T21:35:00	2011-350T00:50:00	CIRS_FPB to Titan	POS_Z to NTP	
ISS_158TI_CLOUD001_PRIME	C, V	2011-349T03:15:00		000T03:00:00	2011-349T06:15:00	ISS_NAC to Titan	NEG_X to Sun	Collaborative Rider(s): CIRS
ISS_158TI_CLOUD002_PRIME	C, V	2011-349T06:15:00		000T03:00:00	2011-349T09:15:00	ISS_NAC to Titan	NEG_X to Sun	Collaborative Rider(s): CIRS
ISS_158TI_CLOUD003_PRIME	C, V	2011-349T09:15:00		000T03:00:00	2011-349T12:15:00	ISS_NAC to Titan	NEG_X to Sun	Collaborative Rider(s): CIRS
ISS_158TI_CLOUD004_PRIME	C, V	2011-349T12:15:00		000T03:00:00	2011-349T15:15:00	ISS_NAC to Titan	NEG_X to Sun	Collaborative Rider(s): CIRS
ISS_158TI_CLOUD005_PRIME	C, V	2011-349T15:15:00		000T03:00:00	2011-349T18:15:00	ISS_NAC to Titan	NEG_X to Sun	Collaborative Rider(s): CIRS
ISS_158TI_CLOUD006_PRIME	C, V	2011-349T18:15:00		000T03:00:00	2011-349T21:15:00	ISS_NAC to Titan	NEG_X to Sun	Collaborative Rider(s): CIRS
RADAR_158TI_RADIOMCAL112_PRIME		2011-349T21:15:00		000T02:00:00	2011-349T23:15:00	NEG_Z to Titan	NEG_Y to NTP	
ISS_158TI_CLOUD007_PRIME	C, V	2011-349T23:15:00		000T00:55:00	2011-350T00:10:00	ISS_NAC to Titan	NEG_X to Sun	Collaborative Rider(s): CIRS
SP_158EA_DLTURN350_PRIME		2011-350T00:10:00		000T00:17:00	2011-350T00:27:00	XBAND to 89.58/-30.9	POS_X to 209.89/-40.05	
SP_158EA_DLTURN450_PRIME		2011-350T00:27:00		000T00:23:00	2011-350T00:50:00	XBAND to Earth	NEG_X to 295.0/-5.0	
NEW WAYPOINT		2011-350T00:50:00		000T10:30:00	2011-350T11:20:00	XBAND to Earth	NEG_X to 295.0/-5.0	
SP_158NA_YBIAS350_PRIME	E	2011-350T00:50:00		000T01:30:00	2011-350T02:20:00	XBAND to Earth	NEG_X to 295.0/-5.0	
SP_158EA_M70METNON350_PRIME	C	2011-350T02:20:00		000T09:00:00	2011-350T11:20:00	XBAND to Earth	Rolling	NEG_X to (295, -5), CDA

DOY 347: This upstream encounter, near a local time of noon in Saturn's magnetosphere will help characterize the plasma which interacts with Titan, before that plasma is perturbed. The spacecraft pointing is optimized for CAPS by keeping the expected plasma flow direction well within the instrument's nearly-hemispheric field of view. This assures that plasma parameters such as ion density and flow speed can be accurately determined. Measure the ion and electron temperatures, densities and the ion composition and flow field in the vicinity of Titan, to characterize and understand its interaction with the magnetosphere of Saturn. Observe any seasonal or other long-term variability in the characteristics of this interaction, and study the processes by which Titan's atmosphere and ionosphere are lost to the magnetosphere.

DOY 348: CIRS performs temperature mapping to continue monitoring of seasonal change in the Titanian stratosphere. VIMS conducts a global mapping of cloud coverage at 100 km/pixel. Titan data is downlinked.

DOY 349: Downlinking Titan data continues. During this so-called "caboose" period, ISS monitors Titan for cloud coverage, with a brief interruption for a RADAR calibration.

DOY 350: Titan data is downlinked.

Notes and Liens

- Pointing:
    - Caboose period ISS prime observations are collaborative with CIRS
    - No Custom handoffs
    - No CIRS heating during waypoints
    - All observations use RBOT-friendly secondaries EXCEPT for CIRS limb observations. RBOT changes to CIRS requests containing the letters "LMB" should be made in conjunction with the CIRS team.
    - Ybias always precedes downlink

- Data Volume:
    - No issues. No dual playback

- DSN:
    - No special requests

- Opmodes:
    - No special arrangements.

- 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. No rocking downlinks. No AZSCANS (IGAPIMAGE). No arrayed downlinks.	X
3. Examine SPASS, ensure SP turns correctly designated PRIME or NEW WAYPOINT. Prime RSS observations require the Xband to Earth attitude be a waypoint, use DLTURN with spass type New Waypoint (also for DLTURN before Ybiases)	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- use ctv_batch or PDT. Fix any issues found. First turn of segment has been checked using correct final attitude of previous segment. All turns use the slower XM slew rates and include 2 minutes turn margin. Allow extra turn time whenever possible to aid possible RBOT changes.	X used prev. seg DL 2ndary POS_X to 193/81
6. YBIAS windows have been included as required, guidelines met per https://cassini.jpl.nasa.gov/sp/xxmdev/ybias_mpforum.pdf	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 flyby or an asymmetric 10 hour window for Icy Satellite flybys. 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
10. PIEs are properly identified via _PIE naming convention. All agreed to PIEs have been integrated.	X
11. Prime/rider coordination: secondaries have all been reviewed and agreed to, collaborative observations are so designated, pre-designed in PDT, prime instrument agrees to work with riders for collaborate designs	X
12. Use rolling_sru if required. Follow rolling guidelines per SCO, see the ScoRules wiki page (linked to integration procedure)	N/a
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). MUST have a full length 9 hour station requested for NAV tracking data	N/a

Segment Checklist p2

Item	Disposition notes, or X if complete
16. Moving any downlink pass to a different view period requires coordination with Navigation. Changes to the DSN strawman plan require SPST manager approval.	N/a
17. Any observation >3 hours in which the target body travels > 60 degrees must have a SPLAT item stating that the design must include quiescent periods approximately every 3 hours for 20 minutes	X
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). Waypoint same entering as leaving, and is valid throughout. Avoid skeet shoots in LMBs. If CMT management required, contain within LMB. 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
19. Pointing is not altered for science during any SCO/MP activity that has pointing requirements (e.g., dust hazards). [Note that science turns are allowed for all but the first minute of an inbound thruster transition during a Titan or icy satellite flyby. No science turns are allowed during any portion of the outbound transition]	x
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 (Tour Atlas)	X
23. Dual playback of high value data is performed within this segment and does not affect downstream segments. CIMS entries are correct and SPASS type Note. SSR-A is emptied after the first downlink. Open a SPLAT item (tied to the ENGR request that resets the pointers, ie the DUALPB_CDS request) which says, "During DSN negotiations ensure that SSR-A is emptied before the pointers are reset. This item cannot be closed until the DSN negotiations are complete for both downlink passes, or the dual playback is deleted."	N/a
24. Run the resource checker in CIMS and fix errors found. Remaining notes disposition here or on notes page	ISS is OK with telem change during obs.
25. SMT: note if SSR not empty at end of segment, have approval from following segment. No carryover across sequence boundaries. Aim for empty SSR every 4 days. No negative SSR margin during integration. List discrepancies on notes page.	X
26. Examine SMT warnings report, include dispositions here or on notes page of any items	RADAR data not written. OK. SSRs not properly modelled in CIMS.
27. RSS boresight: one _SP pass, two _PRIME downlink passes, one hour observation block in SNER_3	N/a

Segment Checklist p3

Item	Disposition notes, or X if complete
28. Examine "ap_downlink report check" output, include dispositions here or on notes page of any items (see next two items).	>35% 70m (TOST)
29. List any DSN stations requested during maintenance periods, AND JUSTIFICATION. **AVOID!!!!!**	X
30. Avoid requesting two overlapping stations (except for RSS science) whenever possible – use RSS station for downlink too	X
31. Compare RSS requests to DSN requests, make sure they jive (ORT, occ, etc), ORTs are integrated.	N/a
32. Apoapse segments only: List your percent 70M stations requested - avoid >35%.	100% (TOST)
33. Apoapse segments only: Follow Integration Guideline & Constraint #15c regarding "two out of three" types of science per RBOT segment. ME OTM's split an RBOT segment.	N/a
34. Periapse segments: >3 hr observations with >60 degree target motion are broken up by a 20 min inertial period (lien if not explicit in SPASS)	X
35. Support images use _XXM or _XXM3 activity type	N/a
36. In CIMS check for "start before", "end before", "start after", "end after" requests - fix if any problems found	X
37. 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
38. If sequence boundary at START of segment, ensure IVPGAP info correct, NO "start before" MAPS requests, OpNav is not first thing in segment	N/a
39. If sequence boundary at END of segment (ie in the next segment), ensure 6 "SEQ" upload DSN passes - will probably ripple into preceding segment(s), notify them. Last pass has Ybias window in front, no bonus science. NO "end after" MAPS requests	N/a
40. Verify opmodes correct (RSS and RADAR especially), teams going to sleep have agreed? MIMI: not in sleep during RPX? Use table at https://cassini.jpl.nasa.gov/wiki/bin/view/Cassini/XXMOpModes	X
41. If conjunction is in your segment, see Conjunction page on SP Wiki	N/a
42. RAMAVOID: new waypoint, NOT in custom period	N/a
43. If only thrusters, confirm deadbands	N/a
44. Segment products linked to XXM deliveries page, & this package when you are done	Tautology

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