CASSINI SOST SEGMENT

Rev 153 Handoff Package

Segment Boundary 2011-256T07:47:00 to 2011-258T16:47:00

16 Mar 2011

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SMT report and SPASS

Science Highlights

Notes & Liens

Integration Checklist

SMT report

ATA 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 (Mb)
SP_153EA_M34HEFNON257_PRIME	257 07:47	257 16:47	0	2624	102	2727	3322	595	0	352	53	3132	614	-2518	3	0%	2518
SP_153EA_C70METNON257_PRIME	257 22:17	258 07:47	2518	346	23	2887	3322	435	0	160	56	3103	2870	-233	3	0%	233
SP_153EA_M34HEFOTP258_PRIME	258 07:47	258 16:47	233	0	0	233	3322	3089	0	219	53	504	507	2	3	1%	0

Now -34 after predict updates

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S70, length = 70 days		2011-250T00:48:00		070T02:14:00	2011-320T03:02:00			
SOST_153 Segment		2011-256T07:47:00		002T09:00:00	2011-258T16:47:00			
SP_153SA_WAYPTTURN256_PRIME		2011-256T07:47:00		000T00:50:00	2011-256T08:37:00	ISS_NAC to Saturn	NEG_X to 40.0/64.0	
NEW WAYPOINT		2011-256T08:37:00		000T21:40:00	2011-257T06:17:00	ISS_NAC to Saturn	NEG_X to 40.0/64.0	
ISS_153EN_PLMPMR001_PIE	C,U	2011-256T08:37:00		000T03:23:00	2011-256T12:00:00	ISS_NAC to Enceladus	NEG_X to NSP	SOST PIE
UVIS_153SA_ENAURFOOT001_PRIME		2011-256T12:00:00		000T06:00:00	2011-256T18:00:00	UVIS_FUV to Saturn	NEG_X to 95.992/67.159	
Begin Custom		2011-256T18:35:00		000T00:00:01	2011-256T18:35:01			
CDA_153OT_RINGSHAD001_PIE		2011-256T18:35:01		000T03:24:59	2011-256T22:00:00	NEG_Z to Earth (-20.0,-80.0,0.0 deg. offset)	NEG_X to 2.0/3.0	Pick up at ISS_NAC to Saturn, NEG_X to 40.0/64.0; Hand off at ISS_NAC to 238.8/64.9, NEG_X to 4.0/15.0.
ISS_153EN_ENCEL001_PIE	C,U,V	2011-256T22:00:00		000T03:00:00	2011-257T01:00:00	ISS_NAC to Enceladus	POS_X to 220.8/-82.2	Pick up at ISS_NAC to 238.8/64.9, NEG_X to 4.0/15.0; Hand off at ISS_NAC to 340.0/-30.0, POS_X to 220.8/-82.2.
Periapse R = 3.231 Rs, lat ...		2011-256T23:01:16		000T00:00:01	2011-256T23:01:17			
ISS_153PL_PALLENE001_PIE	C,U,V	2011-257T01:00:00		000T01:30:00	2011-257T02:30:00	ISS_NAC to Pallene	POS_X to 220.8/-82.2	Pick up at ISS_NAC to 340.0/-30.0, POS_X to 220.8/-82.2; Hand off at ISS_NAC to Pallene, NEG_X to 56.1/82.3.
CIRS_153TE_PACMAN001_PRIME	I,U,V	2011-257T02:30:00		000T03:07:00	2011-257T05:37:00	CIRS_FP3 to Tethys	POS_X to NEP	Pick up at ISS_NAC to Pallene, NEG_X to 56.1/82.3; Hand off at ISS_NAC to Saturn, NEG_X to 40.0/64.0.
End Custom		2011-257T05:37:00		000T00:00:01	2011-257T05:37:01			
SP_153EA_DLTURN257_PRIME		2011-257T05:37:00		000T00:30:00	2011-257T06:07:00	XBAND to Earth (0.0,0.0,20.0 deg. offset)	POS_X to NEP	pt 1 of 2
SP_153EA_DLTURN457_PRIME		2011-257T06:07:00		000T00:10:00	2011-257T06:17:00	XBAND to Earth	POS_X to NEP	pt 2 of 2
NEW WAYPOINT		2011-257T06:17:00		001T10:30:00	2011-258T16:47:00	XBAND to Earth	POS_X to NEP	
SP_153EA_YBIAS257_PRIME	E	2011-257T06:17:00		000T01:30:00	2011-257T07:47:00	XBAND to Earth	POS_X to NEP	
SP_153EA_M34HEFNON257_PRIME	C, E	2011-257T07:47:00		000T09:00:00	2011-257T16:47:00	XBAND to Earth	Rolling	POS_X to NEP or NSP, CAPS
CIRS_153TE_PACMAN002_PRIME	U	2011-257T16:47:00		000T04:00:00	2011-257T20:47:00	CIRS_FP3 to Tethys	POS_X to NEP	
ISS_153TI_M60R2CLD257_PRIME	C, V	2011-257T20:47:00	E153_M60R2CLD257+000T00:00:00	000T01:30:00	2011-257T22:17:00	ISS_NAC to Titan	POS_X to NEP	
SP_153EA_C70METNON257_PRIME		2011-257T22:17:00		000T09:30:00	2011-258T07:47:00	XBAND to Earth	Rolling	
SP_153EA_M34HEFOTP258_PRIME	C, N	2011-258T07:47:00		000T09:00:00	2011-258T16:47:00	XBAND to Earth	4_Hr_Rolling	POS_X to NEP or NSP, CAPS

Science Highlights

Rev 153 is a non-targeted SOST periapse with 2 out of discipline PIEs (MAPS: UVIS Enceladus Auroral Footprint Search on Saturn to pinpoint possible interaction of particles modulated by Enceladus and bombarding the upper atmosphere of Saturn, Rings: CDA Ring Shadow Crossing).

In-discipline PIEs: Enceladus plume to aid in understanding their structure and morphology, temporal variability, and relationship to geological features and hot spots on the surface, Enceladus ORS (42224 km non-targeted flyby), Pallene (25960 km non-targeted flyby): BEST EVER Pallene

Other high priority SOST science: low-phase Tethys “pac-man” search on leading side to understand the global thermal properties and thermal inertia of Tethys

Other science: Titan Cloud Monitor

Notes and Liens

- Pointing:
  - There are no Collaborative prime/rider coordination designs
  - Saturn used as a waypoint due to variety of targets
  - A custom period was used, despite this not being a targeted flyby. Due to the variety of targets this will be more RBOT-friendly than using the waypoint
  - Teams have validated custom handoffs and turn times
  - A 9.5 hour downlink was added prior to an OTP pass so no Ybias window was added

- Data Volume/DSN:
  - Madrid 70M not available post-periapse due to maintenance. Long caboose period led us to add a 9.5 hour Canberra 70M downlink immediately prior to the OTM-290 prime pass; no Ybias window was added as the OTP pass does not require one
  - DSN predict updates cause SMT to model carryover to following segment (not real); SIP lead has agreed to handle this during DSN negotiations

- Opmodes:
  - Nothing special
- Hydrazine:
  - N/A
- 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
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!	Nope, OK with KM
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)	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)	x
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	x

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.	x
17. Multi-revolution turns about the X-axis have an offset greater than or equal to 30 degrees	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).	-
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]	-
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	-
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.	-
22. Check your GMB, LMB, LUB, Occ times against current reference trajectory (Tour Atlas)	-
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."	-
24. Run the resource checker in CIMS and fix errors found. Remaining notes disposition here or on notes page	x
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	x
27. RSS boresight: one _SP pass, two _PRIME downlink passes, one hour observation block in SNER_3	-

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).	X*
29. List any DSN stations requested during maintenance periods, AND JUSTIFICATION. **AVOID!!!!!**	-
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.	x
32. Apoapse segments only: List your percent 70M stations requested - avoid >35%.	-
33. Apoapse segments only: Follow Integration Guideline & Constaint #15c regarding “two out of three” types of science per RBOT segment. ME OTM’s split an RBOT segment.	-
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	x
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)	-
38. If sequence boundary at START of your segment, ensure IVPGAP info correct, NO “start before” MAPS requests	-
39. 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	-
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	-
42. RAMAVOID: new waypoint, NOT in custom period	-
43. If on thrusters, confirm deadbands	-
44. Segment products linked to XXM deliveries page, & this package when you are done	x