CASSINI SOST SEGMENT

Rev 144 Handoff Package

Segment Boundary 2011-029T15:29:00 to 2011-033T07:44:00

9 July 2010

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SMT report and SPASS

Science Highlights

Notes & Liens

Integration Checklist

SMT report

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	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGN (Mb)	NET_MARGN (Mb)	CAROVR (%)	CAROVR (Mb)
SP_144EA_G34BWGNON030_PRIME	030 06:29	030 15:29	0	557	63	620	3319	2698	0	232	53	905	765	-140	0	0%	140
SP_144EA_M70METOTP031_PRIME	031 22:44	032 07:44	140	2597	132	2869	3319	449	0	232	53	3154	2899	-256	0	0%	255
SP_144EA_M34BWGOTB032_PRIME	032 22:44	033 07:44	255	577	63	896	3319	2423	0	232	53	1181	739	-442	0	0%	442

Carryover OK with following MAG segment, cleared after first downlink pass

SPASS

SOST rev 144

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S66, length = 49 days		2011-017T08:42:00		049T04:20:00	2011-066T13:02:00			
SOST_144 Segment		2011-029T15:29:00		003T16:15:00	2011-033T07:44:00			
UVIS_144DI_ICYSTARE001_PRIME	C, I	2011-029T15:29:00		000T12:50:00	2011-030T04:19:00	UVIS_FUV to Dione	NEG_X to 79.9/15.0	
SP_144EA_DLTURN030_PRIME		2011-030T04:19:00		000T00:40:00	2011-030T04:59:00	XBAND to Earth	POS_X to NEP	
NEW WAYPOINT		**2011-030T04:59:00**		**000T11:50:00**	**2011-030T16:49:00**	**XBAND to Earth**	**POS_X to NEP**	
SP_144EA_YBIAS030_PRIME	E	2011-030T04:59:00		000T01:30:00	2011-030T06:29:00	XBAND to Earth	POS_X to NEP	
SP_144EA_G34BWGNON030_PRIME	C	2011-030T06:29:00		000T09:00:00	2011-030T15:29:00	XBAND to Earth	Rolling	POS_X to NEP
SP_144EN_DEADTIME030_PRIME		**2011-030T15:29:00**		**000T00:40:00**	**2011-030T16:09:00**	**XBAND to Earth**	**POS_X to NEP**	
SP_144EN_WAYPTTURN030_PRIME	V	2011-030T16:09:00	LMB_E144_Peri-000T10:41:17	000T00:40:00	2011-030T16:49:00	ISS_NAC to Enceladus	NEG_X to 75.5/62.3	
NEW WAYPOINT		**2011-030T16:49:00**		**001T05:15:00**	**2011-031T22:04:00**	**ISS_NAC to Enceladus**	**NEG_X to 75.5/62.3**	
ISS_144EN_PLMHPHR001_PIE	C, U, V	2011-030T16:49:00	LMB_E144_Peri-000T10:01:17	000T03:36:00	2011-030T20:25:00	ISS_NAC to Enceladus	NEG_X to NSP	SOST PIE
CIRS_144MI_MIMAS001_PRIME	I, M, U, V	2011-030T20:25:00	LMB_E144_Peri-000T06:25:17	000T07:35:00	2011-031T04:00:00	ISS_NAC to Mimas	NEG_X to 75.5/62.3	
Periapse R = 3.559 Rs, lat ...		2011-031T02:50:17		000T00:00:01	2011-031T02:50:18			
ISS_144EN_PLMHPHR002_PIE	C, U, V	2011-031T04:00:00	LMB_E144_Peri+000T01:09:43	000T01:30:00	2011-031T05:30:00	ISS_NAC to Enceladus	NEG_X to NSP	SOST PIE
ISS_144EN_ENCEL001_PIE	C, U, V	2011-031T05:30:00	LMB_E144_Peri+000T02:39:43	000T02:00:00	2011-031T07:30:00	ISS_NAC to Enceladus	NEG_X to 75.5/62.3	
Begin Custom		**2011-031T07:30:00**	**LMB_E144_Peri+000T04:39:43**	**000T00:00:01**	**2011-031T07:30:01**	**ISS_NAC to Enceladus**	**NEG_X to 75.5/62.3**	
ISS_144MI_MIMAS001_PIE	C, U, V	2011-031T07:30:00	LMB_E144_Peri+000T04:39:43	000T01:30:00	2011-031T09:00:00	ISS_NAC to Mimas	POS_X to 266.6/-68.7	Pick up at ISS_NAC to Enceladus, NEG_X to 75.5/62.3; Hand off at ISS_NAC to Mimas, POS_X to 266.6/-68.7.
ISS_144HE_HELENE001_PIE	C, U, V	2011-031T09:00:00	LMB_E144_Peri+000T06:09:43	000T03:00:00	2011-031T12:00:00	ISS_NAC to Helene	POS_X to 244.6/-80.9	Pick up at ISS_NAC to Mimas, POS_X to 266.6/-68.7; Hand off at ISS_NAC to Helene, POS_X to 244.6/-80.9.
VIMS_144MI_MIMAS001_PIE	C, I, U	2011-031T12:00:00	LMB_E144_Peri+000T09:09:43	000T01:30:00	2011-031T13:30:00	ISS_NAC to Mimas	POS_X to 266.6/-68.7	Pick up at ISS_NAC to Helene, POS_X to 244.6/-80.9; Hand off at ISS_NAC to Mimas, POS_X to 266.6/-68.7.
UVIS_144MI_ICYLON004_PRIME	C, I, V	2011-031T13:30:00	LMB_E144_Peri+000T10:39:43	000T02:30:00	2011-031T16:00:00	UVIS_FUV to Mimas	POS_X to 266.6/-68.7	Pick up at ISS_NAC to Mimas, POS_X to 266.6/-68.7; Hand off at ISS_NAC to Enceladus, NEG_X to 75.5/62.3.
End Custom		**2011-031T16:00:00**	**LMB_E144_Peri+000T13:09:43**	**000T00:00:01**	**2011-031T16:00:01**	**ISS_NAC to Enceladus**	**NEG_X to 75.5/62.3**	
SP_144EN_DLTURN031_PRIME		2011-031T21:15:00	LMB_E144_Peri+000T18:24:43	000T00:15:00	2011-031T21:30:00	ISS_NAC to Enceladus	NEG_X to NEP	pt 1 of 2
SP_144EA_DLTURN031_PRIME		2011-031T21:30:00	LMB_E144_Peri+000T18:39:43	000T00:34:00	2011-031T22:04:00	XBAND to Earth	POS_X to NEP	
NEW WAYPOINT		**2011-031T22:04:00**		**001T09:40:00**	**2011-033T07:44:00**	**XBAND to Earth**	**POS_X to NEP**	
SP_144EA_DEADTIME031_PRIME		**2011-031T22:04:00**	**LMB_E144_Peri+000T19:13:43**	**000T00:40:00**	**2011-031T22:44:00**	**XBAND to Earth**	**POS_X to NEP**	
SP_144EA_M70METOTP031_PRIME	C, N	2011-031T22:44:00		000T09:00:00	2011-032T07:44:00	XBAND to Earth	4_Hr_Rolling	POS_X to NEP or NSP (changed to RA/DEC equiv), CAPS
ISS_144OT_L5MIMAS032_PRIME	C, V	2011-032T08:29:00		000T03:40:00	2011-032T12:09:00	ISS_NAC to Rocks	NEG_Z to Earth	No return to WP (ISS-internal hand-off)
ISS_144OT_MIMASL4032_PRIME	C, V	2011-032T12:09:00		000T03:20:00	2011-032T15:29:00	ISS_NAC to Rocks	NEG_Z to Earth	Pick-up at Mimas-L5 attitude (ISS-internal hand-off)
SP_144EA_M34BWGOTB032_PRIME	C, N	2011-032T22:44:00		000T09:00:00	2011-033T07:44:00	XBAND to Earth	4_Hr_Rolling	same as OTP pass, CAPS

Science Highlights

DOY 029:
This is an “engine” observation period for SOST. It was given to a UVIS led observation of Dione
DOY 030:
After a downlink, we begin a Live Moveable Block around periapse, set up because of large predicted pointing uncertainties after the E12-E13-R3 flybys. The LMB will allow us to update not only the vectors but the timing if necessary. The LMB begins with an Enceladus plume observation PIE, followed by thermal mapping of Mimas
DOY 031:
The LMB continues with another Enceladus plume observation PIE followed by ORS PIE imaging of Enceladus post closest approach. The PIEs continue with a custom Mimas-Helene-Mimas block with various ORS instruments being prime. We end the custom period and LMB and then end the day with a downlink
DOY 032:
This “caboose” observation period contains time to look for satellites in the Mimas L4/L5 Lagrange points, before a final downlink.

Notes and Liens

- Pointing:
  - PERIODS WITH NO VALID WAYPOINT – The Enceladus waypoint is bad from 031T0045-0325, which is during CIRS_MIMAS001
  - Periapse integrated as an LMB due to large predicted trajectory uncertainties
    - Waypoint is same entering and leaving LMB (Xband to Earth, +X to NEP), then we make the waypoint Enceladus during the LMB and return to Earth before the LMB ends (due to bad Enceladus time listed above) - no Enceladus waypoint was good for entire timeperiod
  - No Collaborative prime/rider coordination designs
  - custom handoffs and turn times should be OK
  - RBOT secondaries were used many places HOWEVER due to the number of different targets this probably won't help
  - Engine and caboose observation periods are low priority compared to the LMB
- Data Volume:
  - 442 Mb carryover to MAG 144_145, their first station is 70M, we couldn't upgrade the last pass due to weekly maintenance. No dual playbacks
- DSN: No issues
- Opmodes: No unique opmodes
- Hydrazine: n/a
- Special Activities:
  - Periapse integrated as an LMB due to large predicted trajectory uncertainties. R3+3D OD comes out doy 013, LMB is doy 030, plenty of time to analyze if turns complete after epoch shift

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	see notes
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!	x
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	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	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).	x
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	x
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.	x
22. Check your GMB, LMB, LUB, Occ times against current reference trajectory (Tour Atlas)	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 or on notes page SPASS gaps, Request name does not match SP naming convention – ignore Waypoint change cannot occur during a Live Movable Block – OK because we change back to the incoming waypoint	all OK
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.	See notes
26. Examine SMT warnings report, include dispositions here or on notes page of any items	none
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).	
29. List any DSN stations requested during maintenance periods, AND JUSTIFICATION. **AVOID!!!!!**	none
30. Avoid requesting two overlapping stations (except for RSS science) whenever possible – use RSS station for downlink too – or have RSS move ORT	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. Support images use _XXM or _XXM3 activity type	-
35. In CIMS check for “start before”, “end before”, “start after”, “end after” requests - fix if any problems found	x
36. 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)	-
37. If sequence boundary at START of your segment, ensure IVPGAP info correct, NO “start before” MAPS requests	-
38. 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	-
39. 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
40. If conjunction is in your segment, see Conjunction page on SP Wiki	-
41. RAMAVOID: new waypoint, NOT in custom period	-
42. If on thrusters, confirm deadbands	-
43. Segment products linked to XXM deliveries page, & this package when you are done	