



## **CASSINI SOST SEGMENT**

**Rev 130 EN (WHEELS DESIGN) Handoff Package**

**Segment Boundary 2010-117T07:47:00 – 2010-119T01:03:00**

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Links to files

Science Highlights

Notes & Liens

Integration Checklist

# Links to files

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Master TOL:

[https://cassini.jpl.nasa.gov/sp/icy/130EN/SOST\\_130EN\\_W\\_TOL\\_090923.txt](https://cassini.jpl.nasa.gov/sp/icy/130EN/SOST_130EN_W_TOL_090923.txt)

[https://cassini.jpl.nasa.gov/sp/icy/130EN/SOST\\_130EN\\_W\\_TOL\\_090923.xls](https://cassini.jpl.nasa.gov/sp/icy/130EN/SOST_130EN_W_TOL_090923.xls)

SPASS:

[https://cassini.jpl.nasa.gov/sp/icy/130EN/SPASS\\_SOST\\_130\\_W\\_090923.txt](https://cassini.jpl.nasa.gov/sp/icy/130EN/SPASS_SOST_130_W_090923.txt)

[https://cassini.jpl.nasa.gov/sp/icy/130EN/SPASS\\_SOST\\_130\\_W\\_090923.xls](https://cassini.jpl.nasa.gov/sp/icy/130EN/SPASS_SOST_130_W_090923.xls)

[https://cassini.jpl.nasa.gov/sp/icy/130EN/SPASS\\_SOST\\_130\\_W\\_090923.pdf](https://cassini.jpl.nasa.gov/sp/icy/130EN/SPASS_SOST_130_W_090923.pdf)

SMT report:

[https://cassini.jpl.nasa.gov/sp/icy/130EN/SOST\\_130EN\\_W\\_090923.rpt](https://cassini.jpl.nasa.gov/sp/icy/130EN/SOST_130EN_W_090923.rpt)

[https://cassini.jpl.nasa.gov/sp/icy/130EN/SOST\\_130EN\\_W\\_090923.warning](https://cassini.jpl.nasa.gov/sp/icy/130EN/SOST_130EN_W_090923.warning)

DSN:

[https://cassini.jpl.nasa.gov/sp/icy/130EN/SOST\\_130EN\\_W\\_090923\\_seg.txt](https://cassini.jpl.nasa.gov/sp/icy/130EN/SOST_130EN_W_090923_seg.txt)

# Science Highlights

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April 27-29 (DOY 117-119):

The 130EN (E9) flyby is an extremely high-priority RSS gravity experiment to look for mass anomalies associated with the Enceladus plume.

DOY 117 – This segment begins with an RSS observation of a Saturn-solar occultation, both ingress and egress. This is followed by RSS gravity observations which will be used as a baseline for comparison to the results of the E9 flyby. MAPS instruments collect information on the Saturn-Enceladus environment.

DOY 118 – RSS gravity observations continue as Cassini travels over the south pole of Enceladus at an altitude of 100 km, through the plume. These observations will be used to look for anomalies indicating the presence or absence of mass concentrations at the south polar region of Enceladus, which will in turn provide insight into the source material for the plume. MAPS instruments will also collect information as we pass through the plume. After we pass Enceladus, RSS will continue to monitor the spacecraft's trajectory as a baseline for comparison with the flyby results. Fourteen hours after closest approach, we begin to downlink the MAPS data over the Madrid 70 meter DSN station.

DOY 119 – Downlink completes, and the segment ends.

# Notes and Liens

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## Notes:

- Pointing:
  - The pointing for this segment was agreed to stay at Earth point to simplify the AACS workload as part of the dual timeline agreement
- Data Volume:
  - no carryover; no negative SSR
- DSN:
  - Rev130 Saturn Atmospheric Occultation and Enceladus Gravity  
Level 3 requested from 2010-116/2230 till 2010-118/1800  
Stations: DSS-25, DSS-15, DSS-34, DSS-43, DSS-55 (some antennas have multiple supports)
- Opmodes:
  - Several opmodes are named beginning with a “W” to differentiate between ones that are in the thrusters timelines.
  - All good: accommodating MAPS and RSS (and relevant warm-ups)
  - RSS using all three bands during occultations
- Special Activities:
  - Dual timeline.

## Sequence Liens:

- This is the nominal, wheels-based design for the E9 flyby. Once the E7 flyby occurs, AACS will determine if it is safe to proceed with this design. If not, the alternate (thrusters) design will be used.
- CRC items that are OK “From OpMode of UNIQUE in Request ENGR\_130SC\_WRSSKRWAF117\_PPS does not match To Opmode of DFPW\_normal in Request ENGR\_130SC\_TDFPW117\_PPS” Opmode strategy has been validated. May want to double-check after single timeline has been selected.

# Segment Checklist p1

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Item	Disposition notes, or X if complete
1. Disposition all requests in CIMS - approve all pending requests	X
2. Version the SPASS in CIMS, use label INTEG_FIN, in description put date and your name	X
3. Examine SPASS, ensure opnav & 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	X
4. Waypoints and downlinks have been checked and are violation free (per CTV). NOTE ON ISSUES PAGE if periods of no valid waypoint	X
5. SP turns have been checked, have adequate time, and are violation free. All large turns >60 degrees use the slower slew rates as specified by AACS in FR07D145 and include turn margin as specified in the Extended Mission slew margin policy. Exceptions to this rule are specified in FR07D145	X
8. There are no more than 3 waypoint changes in a 24 hour period	X
6. The minimum prime instrument request duration outside $\pm 5$ hours from a targeted satellite flyby is 30 minutes	X
7. Custom handoffs are limited to the following periods: 1) $\pm 3$ hours around a targeted Titan flybys, 2) $\pm 3$ hours around a targeted Icy Satellite flyby, and 3) for OPNAVs that precede or follow a Downlink (special case)	X
8. Custom periods designated properly with SPASS notes (n/a for opnavs)	N/A
9. Custom period requests have "pick up at" and "hand off at" information filled in correctly (n/a for opnavs)	N/A
10. Use rolling_sru if required (not using rolling_bias as a default anymore)	N/A
11. The secondary axis for downlinks that contain prime and backup OTMs is the same, and inertially fixed	N/A
12. Downlinks that contain OTPs only roll for the first 4 hours of the downlink pass max. OTB: 6_hr rolling OK, unless SRU issues, then 4_Hr_Rolling max	N/A
13. 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 $\leq 4$ hours can use 2 cakes, put playback_gap in 2nd pass, put OTP/OTB in name of BOTH passes (for CDA)	N/A
14. Downlinks (attitude/rolling) match XMDLWG plan. Negotiated changes should be reported back to the WG	X
15. The final downlink of a SEQUENCE is no more than 5 hour rolling (due to end of sequence bias)	N/A

# Segment Checklist p2

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Item	Disposition notes, or X if complete
16. Multi-revolution turns about the X-axis have an offset greater than or equal to 30 degrees about X	X
17. 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
18. 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. 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
20. 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
21. Check your GMB, LMB, LUB, Occ times against current reference trajectory	X
22. 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
23. Run the resource checker in CIMS and fix errors found. Paste remaining notes here with disposition	1 error but OK – see sequence liens
24. Run SMT, if SSR not empty at end of segment include in notes, and instances of <-90 SSR margin	(see notes page)
25. Examine SMT warnings report, include dispositions here of any items (negative SSR margin already covered)	X

# Segment Checklist p3

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Item	Disposition notes, or X if complete
26. Examine "ap_downlink report check" output, include dispositions here of any items (see next two items).	X
27. List any DSN stations requested during maintenance periods, AND JUSTIFICATION	See notes
28. List your percent 70M stations requested - avoid >35% (ha ha)	100% not counting for RSS passes, 33% if you do count RSS passes
29. Examine "ap_downlink report nav" output, MP should ensure NAV OK with gaps in 2way	X
30. In CIMS check for "start before", "end before", "start after", "end after" requests - fix if any problems found	RSS DSN passes for occs start before sequence begins. OK.  Final RSS DSN pass ends after sequence boundary - fix
31. Verify OPNAVs are in SNER5 and are support_image class, sanity check rest of tlm modes (Tilman often wants SNER5, RADAR 15 min in 5A/activity in 5A or 8, etc)	N/A
32. If sequence boundary at START of your segment, ensure IVPGAP info correct, NO "start before" MAPS requests	N/A
33. If sequence boundary at END of your segment (ie in the next segment), ensure 5 "SEQ" upload DSN passes - will probably ripple into preceding segment(s), make sure to notify them. NO "end after" MAPS requests	N/A
34. Verify opmodes correct (RSS and RADAR especially), teams going to sleep have agreed? Use table at <a href="https://cassini.jpl.nasa.gov/wiki/bin/view/Cassini/XMOpModes">https://cassini.jpl.nasa.gov/wiki/bin/view/Cassini/XMOpModes</a>	X
35. Compare RSS requests to DSN requests, make sure they jive (ORT, occ, etc), ORTs are integrated.	X
36. If conjunction is in your segment, see Conjunction page on SP Wiki	N/A
37. Be aware of any AZSCANSs in your segment (only 2 planned in 2009)	N/A
38. RAMA VOID: new waypoint, NOT in custom period	N/A
39. If on thrusters, confirm deadbands	N/A
40. Segment products & this package linked to XM deliveries page	X