CASSINI SOSTSEGMENT

Rev 121 Handoff Package

Segment Boundary 2009-324T11:37:00– 2009-326T01:22:00

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Links to files

Science Highlights

Notes & Liens

Integration Checklist

Links to files

Master TOL:
https://cassini.jpl.nasa.gov/sp/icy/121EN/SOST_121EN_TOL_090508.txt
https://cassini.jpl.nasa.gov/sp/icy/121EN/SOST_121EN_TOL_090508.xls

SPASS:
https://cassini.jpl.nasa.gov/sp/icy/121EN/SPASS_SOST_121_090508.txt
https://cassini.jpl.nasa.gov/sp/icy/121EN/SPASS_SOST_121_090508.xls
https://cassini.jpl.nasa.gov/sp/icy/121EN/SPASS_SOST_121_090508.pdf

SMT report:
https://cassini.jpl.nasa.gov/sp/icy/121EN/SOST_121EN_090507.rpt
https://cassini.jpl.nasa.gov/sp/icy/121EN/SOST_121EN_090507.warning

DSN:
https://cassini.jpl.nasa.gov/sp/icy/121EN/SOST_121EN_090507_text.txt
https://cassini.jpl.nasa.gov/sp/icy/121EN/SOST_121EN_090507_seg.txt
https://cassini.jpl.nasa.gov/sp/icy/121EN/SOST_121EN_090507_nav.txt
https://cassini.jpl.nasa.gov/sp/icy/121EN/SOST_121EN_090507_faster.txt

Science Highlights

Nov. 20- Nov. 22, 2009 (DOY 324-326)

This busy segment encompasses the E8 (Rev 121) Enceladus targeted flyby with a closest-approach altitude of 1600 km, and a non-targeted Rhea flyby with a closest-approach altitude of 24417 km. Both flybys have ORS prime instruments. This segment also includes an RSS Saturn egress occultation observation and MAPS surveys.

DOY 324: UVIS begins the segment with an observation of Dione, measuring the satellite's albedo in ultraviolet light to determine the phase function. This is part of the ongoing campaign to investigate surface microstructure and frost properties as a function of location. CIRS and VIMS will ride along.

As we approach Enceladus, ISS will image the plume with high resolution at very high phase angles while CIRS, UVIS, and VIMS ride along. RSS will then observe the egress occultation of Saturn's ionosphere and atmosphere, to measure vertical profiles of electron density in the ionosphere, and of density, pressure, and temperature in the neutral atmosphere.

DOY 325: VIMS observes Enceladus as the moon emerges from eclipse, followed by a CIRS fast raster scan of Enceladus' night side. ISS takes over for extremely important high resolution plume observations. CIRS will then have prime control during closest approach for a high resolution FP3 scan of Damascus or Baghdad Sulcus, tracking the south polar region to examine plume sources. This is followed by ISS- and VIMS-driven mapping of the sunlit surface of Enceladus on departure. UVIS will perform a long stare for a tenuous atmosphere search, which will provide data to associate plume activity with the quantity of volatiles near Enceladus. We then turn Cassini's high-gain antenna to Earth to downlink a portion of this data. Over the downlink, RSS will perform gravity science to better determine Enceladus' mass.

UVIS picks back up again with a search for the Rhea ring, targeting beta Ori and kappa Ori. This observation will also be used to look for volatiles. CIRS performs a limb-to-limb fast scan along Rhea's equator, including night and early morning. ISS then takes over prime pointing for a mosaic and stereo coverage of the wispy streaks region of Rhea, followed by a VIMS point-and-stare observation. ISS closes out the segment with a mosaic of Rhea's equator. Our final downlink for this segment begins at the end of the day.

DOY 326: Downlink continues at Canberra.

Notes and Liens

Notes:

- Pointing:
  - Pointing within the CIRS prime observation at GMB-00:06:00 (2009-325T02:03:50) has been carefully negotiated between the ORS teams. There is already an SASF; Marcia Segura is the point of contact for this and will be seeing it through implementation.
  - There are 2 two-part turns in this segment to avoid FR violations
  - The turn to the final downlink was given 35 min to increase the downlink time as much as possible
  - See “Special Activities” below
- Data Volume:
  - We are carrying over 178 Mb, but have a verbal OK from the following segment
  - No negative margin
- DSN:
  - No maintenance conflicts
- Opmodes:
  - All good: accommodating ORS, MAPS, and RSS (with relevant warm-up)
- Special Activities:
  - Enceladus and the sun are in the same direction from Cassini for the beginning of the segment, so pointing ORS to EN is tricky. We cannot point at EN before 324T14:12:00, so our WP turn ends at 324T14:15:00

Sequence Liens:

- CRC items that are OK: Opmode transition for RSS WU references GMB outside of GMB (OK’d by L. Burke); MP_121EN_FLYBYE008_NA does not return to the WP as it is a SPASS note not a prime.
- CRC item still to be cleaned up: pointing for the ISS_121EN_PLMHR001_PRIME observation at 2009-325T01:32:50 in the custom period needs to be changed to: Pick up at NEG Y to EN, Neg X to NEP (0, -10, 0); Hand off at ISS_NAC to 36.129/16.948, POS_Z to 302.97/9.98

Segment Checklist p1

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 – see notes on special activites. Also violations during custom period (325T01:59-2:10)
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	Turns to and from LUB were given SOST Leads approval for normal turn rates (not slower) due to criticality of occ observations (2009-324T19:24-22:00)
8. There are no more than 3 waypoint changes in a 24 hour period	X
6. The minimum prime instrument request duration outside ±5 hours from a targeted satellite flyby is 30 minutes	CIRS_121_FP1EQSCAN001_PRIME at 2009-325T17:26:00 has a 10 minute duration request. CIRS is aware of this.
7. Custom handoffs are limited to the following periods: 1) ±3 hours around a targeted Titan flybys, 2) ±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)	X
9. Custom period requests have “pick up at” and “hand off at” information filled in correctly (n/a for opnavs)	See notes
10. Use rolling_sru if required (not using rolling_bias as a default anymore as of 12/08)	X
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 ≤4 hours can use 2 cakes, put playback_gap in 2nd pass	N/A
14. Downlinks (attitude/rolling) match XMDLWG plan. Negotiated changes should be reported back to the WG	X
15. (guideline) The downlink attitude secondary vectors (and offsets) are mostly the same between RWA biases	N/A

Segment Checklist p2

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	N/A
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
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	X – see notes
24. Run SMT, if SSR not empty at end of segment include in notes, and instances of <-90 SSR margin	No neg. margin, but carryover - see notes page
25. Examine SMT warnings report, include dispositions here of any items (negative SSR margin already covered)	X

Segment Checklist p3

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	N/A
28. List your percent 70M stations requested - avoid >35% (ha ha)	100%, 1 for 2 hours and 2 for ~ 5 hours each
29. Examine “ap_downlink report nav” output, MP should ensure NAV OK with gaps in 2way	We split our downlinks, so NAV may request early uplink to get enough tracking data
30. In CIMS check for “start before”, “end before”, “start after”, “end after” requests - fix if any problems found	X
31. Verify OPNAVs are in SNER5, sanity check rest of tlm modes	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 https://cassini.jpl.nasa.gov/wiki/bin/view/Cassini/XMOpModes	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. RAMAVOID: new waypoint, NOT in custom period	N/A
39. If on thrusters, confirm deadbands	X – (.5, .5, .5)
40. Segment products & this package linked to XM deliveries page	X