CASSINI SOST SEGMENT

Rev 080 Handoff Package

Segment Boundary: 2008-224T00:20:00 – 2008-226T00:04:00

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Links to files

Science Highlights

Notes & Liens

Integration Checklist

Links to files

Timeline plot:
https://cassini.jpl.nasa.gov/sp/icy/080EN/SOST_80_timeline_080212.pdf

TOL (xls, txt):
https://cassini.jpl.nasa.gov/sp/icy/080EN/SOST_80_TOL_080212.xls
https://cassini.jpl.nasa.gov/sp/icy/080EN/SOST_80_TOL_080212.txt

SPASS (txt, pdf, xls):
https://cassini.jpl.nasa.gov/sp/icy/080EN/SPASS_SOST_80_080212.txt
https://cassini.jpl.nasa.gov/sp/icy/080EN/SPASS_SOST_80_080212.pdf
https://cassini.jpl.nasa.gov/sp/icy/080EN/SPASS_SOST_80_080212.xls

SMT report:
https://cassini.jpl.nasa.gov/sp/icy/080EN/SOST_80_080212.rpt

DSN (text, nav, seg):
https://cassini.jpl.nasa.gov/sp/icy/080EN/SOST_80_080212_text.txt
https://cassini.jpl.nasa.gov/sp/icy/080EN/SOST_80_080212_nav.txt
https://cassini.jpl.nasa.gov/sp/icy/080EN/SOST_80_080212_seg.txt

Aug. 11-12, 2008 (DOY 224-225)

All teams will be busy observing Enceladus as we fly by (E4) emphasizing Optical Remote Sensing (ORS) instrument activities. Observing the active plumes emanating from the south pole of Enceladus is the major focus of this flyby.

The Visible and Infrared Mapping Subsystem (VIMS) will measure the spectra of the Enceladus plumes to: search for trace compounds in the plumes, determine the ice grain size distribution, and search for water vapor (all as a function of plume source and plume height). VIMS will also be doing compositional mapping at the highest spatial resolution to search for trace compounds in the ice to determine what drives the plumes. These compounds include (non-exhaustive list): organics, ammonia, CO2, and Hydrogen compounds. VIMS will search for other phases of ice that may be stable on Enceladus, such as, amorphous, Ice II, and Ice XI. Other areas of activities for this flyby are: ice grain size mapping for the purpose of studying the thermal history of the surface, phase angle studies to map microphysical properties and determine bolometric bond albedo, and the search for hot spots. (VIMS does very well at detecting temperatures above 150K and as temperatures rise above that level, VIMS can detect small sub-pixel sources and determine fractional area as well as temperature, all the way up to and above 273 K.)

The Imaging Science Subsystem (ISS) will obtain a 6.5-hr-long plume 'tendril' movie with the wide angle camera (WAC) during approach to Enceladus while at high inclination (i.e. sub-spacecraft latitude of ~75 degrees, phase angle of ~90 degrees) to characterize the structure in the E ring in the vicinity of Enceladus and detect any temporal variability in these structures (tendrils). ISS will also detect any possible non-thermal emission or auroral activity associated with the plumes while Enceladus is in eclipse (by riding along with CIRS observations of the south polar terrain at high resolution). These observations may be modified as needed after obtaining results from similar observations in Rev. 61 (Enceladus E3 fly by).

The Composite Infrared Spectrometer (CIRS) will be mapping the thermal emission from small regions of the south polar terrain at very high spatial resolution (~1 km) to help to understand the plume generation mechanisms. Full-disk mapping of Enceladus' long-wavelength thermal emission will help to constrain total heat flow from the interior. Additionally, CIRS will do full-disk mapping of Enceladus' short-wavelength thermal emission to look for time variability in the south polar thermal emission and search for hot spots elsewhere on Enceladus. CIRS will observe the warming of Enceladus as it emerges from Saturn's shadow two hours after the flyby, to understand surface physical properties.

Ultraviolet Imaging Spectrometer (UVIS) observations of the surface of Enceladus will be used to look for differences in UV albedo at high spatial resolution that can be used to characterize water ice grain sizes near and far from the tiger stripes. A systematic change in the grain size may be correlated with the surface age and types of processes the surface has experienced. UVIS observations of the space around Enceladus will search for the signature of oxygen, a product of the dissociation of the water molecules coming from Enceladus' plume.

The Magnetometer (MAG) hopes to determine the variability of plasma loading from Enceladus' south pole plume by modeling the magnetic field signature. Other goals include determining whether Enceladus generates an induced magnetic field from a subsurface ocean and determining the composition of plume material from measurement of ion cyclotron waves in the magnetic field measurements.

Aug. 13, 2008 (DOY 226) (only 4 seconds)

Notes and Liens

Notes:

- Pointing:
  - OK. See #7 in checklist for information on custom period.
- Data Volume:
  - OK
- DSN:
  - RSS pass SP_080NA_M34BWGRSS224_SP overlaps end of DSS-55 weekly maintenance by 6.8 hours. RSS is aware & will push back on DSN.
  - RSS passes SP_080NA_C34BWGRSS224_SP and SP_080NA_C34BWGRSS225_SP overlap major downtime MP_076NA_DSS34DOWN001_NA. RSS is aware, is meeting with Bob Mitchell on 02/13, and hopes to push back on DSN. DOY 225 is also a tracking pass, so if not approved will need DSS-45 or DSS-43 to downlink data. (SPLAT item added to S43)
- Opmodes:
  - OK
- Special Activities:
  - E4 flyby.

Sequence Liens:

- No liens. Watch for acceptance/rejection of RSS DSN passes during maintenance.

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	X
4. Waypoints and downlinks have been checked and are violation free (per CTV)	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 ±5 hours from a targeted satellite flyby is 30 minutes	27 min. DL turn at 2008-224T12:06:23
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)	May need waiver. Custom period > ±3 hours around EN, but can't track near C/A to have NAC to EN as waypt. Teams always return to same pseudo-WP (NAC to EN, -X to Sun) with true RA/Dec WP defined for safing/emergencies.
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)	X
10. An inertially fixed secondary attitude is used for all downlinks that contain prime and backup OTMs	N/A
11. The secondary axis for downlinks that contain prime and backup OTMs is the same	N/A
12. Downlinks that contain OTPs only roll for the first 4 hours of the downlink pass. OTB- no rolling/SRU	N/A
13. Downlinks (attitude/rolling) match XMDL working group plan. Negotiated changes should be reported back to the WG	Original DL matches XMDLWG. Added two tracking passes during RSS activities.
14. Multi-revolution turns about the X-axis have an offset greater than or equal to 30 degrees about X	N/A
15. There is one downlink pass block per OTM prime or backup window (one wedding cake for a split pass)	N/A
16. (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
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	N/A
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	N/A
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, 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. --- Item regarding WP turn: Says SPASS type should be New Waypoint, but we're in a custom period, so this is just the SP turn back to the hand-off attitude from the downlink attitude. (SPASS type: prime) --- Items regarding RSS DSN passes in maintenance. RSS is pushing back on DSN. Stay tuned.	X (see notes at left)
24. Run SMT, if SSR not empty at end of segment include in notes, and instances of <0 SSR margin	X
25. Examine SMT warnings report, include dispositions here of any items (negative SSR margin already covered)	X (no warnings)

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). --- M34 (DSS-55) and C34 (DSS-34) maintenance conflicts. RSS aware and pushing back. (see #27)	X
27. List any DSN stations requested during maintenance periods, AND JUSTIFICATION --- SP_080NA_M34BWGRSS224_SP overlaps end of DSS-55 weekly maintenance by 6.8 hours --- SP_080NA_C34BWGRSS224_SP overlaps major downtime MP_076NA_DSS34DOWN001_NA --- SP_080NA_C34BWGRSS225_SP overlaps major downtime MP_076NA_DSS34DOWN001_NA	X (RSS pushing back on DSN) (DOY 225 pass is also a tracking pass to downlink data volume)
28. List your percent 70M stations requested - avoid >35%	X (28.6%)
29. Examine “ap_downlink report nav” output, MP should ensure NAV OK with gaps in 2way	X (Note hand-over pass on DOY 225, but should be fine. Also DL pass on DOY 224 during RSS gravity experiment. No occ, no boresight activity, so should be fine.)
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	X
32. If sequence boundary at START of your segment, ensure IVPGAP info correct. If sequence boundary at END of your segment (ie in the next segment), ensure 5 “SEQ” upload DSN passes	X (Start of S43. IVPGAP correct.)
33. Verify opmodes correct (RSS and RADAR especially), teams going to sleep have agreed?	X
34. Compare RSS requests to DSN requests, make sure they jive (ORT, occ, etc), ORTs are integrated.	X (worked with Aseel)
35. If conjunction is in your segment, see Conjunction page on SP Wiki	N/A
36. Only 3 AZSCANSs per sequence. Each AZSCAN must be preceded and followed by a RWA bias.	N/A
37. RAMAVOID: new waypoint, NOT in custom period	N/A
38. If on thrusters, confirm deadbands	N/A
39. Segment products & this package linked to XM deliveries page	X