
# CASSINI SOST_177 SEGMENT

## Handoff Package

## Segment Boundary 2012-357T11:34:00 to 2012-359T11:34:00

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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 (Mb) | SCI (Mb) | ENGR (Mb) | TOTAL (Mb) | CPACTY (Mb) | MARGN (Mb) | NET_MARGN (Mb) | CAROVR (%) | CAROVR (Mb) |
| SP_177EA_G34BWGNON358_PRIME | 358 11:40 | 358 17:34 | 0 | 2701 | 102 | 2803 | 3322 | 519 | 0 | 160 | 35 | 2998 | 364 | -2635 | 0 | 0% | 2634 |
| SP_177EA_C34HEFNON358_PRIME | 358 17:34 | 359 02:34 | 2634 | 0 | 0 | 2634 | 3322 | 688 | 0 | 300 | 53 | 2987 | 674 | -2314 | 0 | 0% | 2313 |
| SP_177EA_M70METNON359_PRIME | 359 02:34 | 359 11:34 | 2313 | 0 | 0 | 2313 | 3322 | 1009 | 0 | 140 | 53 | 2506 | 2383 | -123 | 0 | 0% | 123 |

SMT warnings: 2, one for each RADAR warmup activity on doy 357 (the usual SNER mismatch)

| Request | Riders | Start (SCET) | Start (Epoch) | Duration | End (SCET) | Primary | Secondary | Comments |
|---|---|---|---|---|---|---|---|---|
| Sequence S76, length = 72 days | | 2012-307T14:30:00 | | 072T03:21:00 | 2013-013T17:51:00 | | | |
| SOST_177 Segment | | 2012-357T11:34:00 | | 002T00:00:00 | 2012-359T11:34:00 | | | |
| SP_177RH_WAYPTTURN357_PRIME | | 2012-357T11:34:00 | | 000T00:40:00 | 2012-357T12:14:00 | ISS_NAC to Rhea | NEG_X to 330.6/10.2 | |
| **NEW WAYPOINT** | | **2012-357T12:14:00** | | **000T21:56:00** | **2012-358T10:10:00** | **ISS_NAC to Rhea** | **NEG_X to 330.6/10.2** | |
| ISS_177OT_SURROT015_PRIME | | 2012-357T12:14:00 | | 000T06:31:00 | 2012-357T18:45:00 | UVIS_FUV to Rocks | POS_Z to Sun | |
| CIRS_177RH_SPOLSCAN001_PRIME | U, V | 2012-357T18:45:00 | | 000T01:00:00 | 2012-357T19:45:00 | CIRS_FP3 to Rhea | POS_X to NSP | |
| **Begin Custom** | | **2012-357T19:45:00** | | **000T00:00:01** | **2012-357T19:45:01** | | | |
| RADAR_177RH_SCATTRAD001_PIE | | 2012-357T19:45:00 | | 000T02:00:00 | 2012-357T21:45:00 | NEG_Z to Rhea | NEG_X to 330.6/10.2 | Pick up at ISS_NAC to Rhea, NEG_X to 330.6/10.2; Hand off at NEG_Z to Rhea, NEG_X to 330.6/10.2. |
| ISS_177RH_RHEA001_PIE | M, U, V | 2012-357T21:45:00 | | 000T04:15:00 | 2012-358T02:00:00 | ISS_NAC to Rhea | NEG_X to 330.6/10.2 | Pick up at NEG_Z to Rhea, NEG_X to 330.6/10.2; Hand off at ISS_NAC to Rhea, NEG_X to 330.6/10.2. Collaborative Rider(s): UVIS. 2 min. dwell |
| ISS_177EN_PLMHPMR001_PIE | U, V | 2012-358T02:00:00 | | 000T02:00:00 | 2012-358T04:00:00 | ISS_NAC to Enceladus | NEG_X to NSP | Pick up at ISS_NAC to Rhea, NEG_X to 330.6/10.2; Hand off at ISS_NAC to Enceladus, NEG_X to 330.6/10.2. SOST PIE |
| RADAR_177DI_SCATTRAD001_PRIME | | 2012-358T04:00:00 | | 000T02:00:00 | 2012-358T06:00:00 | NEG_Z to Dione | NEG_X to 330.6/10.2 | Pick up at ISS_NAC to Enceladus, NEG_X to 330.6/10.2; Hand off at NEG_Z to Dione, NEG_X to 330.6/10.2. |
| ISS_177DI_GLOCOL001_PRIME | U, V | 2012-358T06:00:00 | | 000T01:30:00 | 2012-358T07:30:00 | ISS_NAC to Dione | POS_X to NEP | Pick up at NEG_Z to Dione, NEG_X to 330.6/10.2; Hand off at ISS_NAC to Dione, POS_X to NEP. |
| UVIS_177IC_ALPVIR001_PRIME | | 2012-358T07:30:00 | | 000T02:35:00 | 2012-358T10:05:00 | UVIS_FUV to Star | POS_X to 252.214/72.271 | Pick up at ISS_NAC to Dione, POS_X to NEP; Hand off at XBAND to Earth, POS_X to NEP. |
| Periapse R = 7.424 Rs, lat ... | | 2012-358T08:30:16 | | 000T00:00:01 | 2012-358T08:30:17 | | | |
| SP_177EA_DLTURN358_PRIME | | 2012-358T10:05:00 | | 000T00:05:00 | 2012-358T10:10:00 | XBAND to Earth | POS_X to NEP | Pick up at XBAND to Earth, POS_X to NEP; Hand off at XBAND to Earth, POS_X to NEP. |
| **NEW WAYPOINT** | | **2012-358T10:10:00** | | **001T01:24:00** | **2012-359T11:34:00** | **XBAND to Earth** | **POS_X to NEP** | |
| **End Custom** | | **2012-358T10:10:00** | | **000T00:00:01** | **2012-358T10:10:01** | | | |
| SP_177EA_YGAP358_PRIME | E | 2012-358T10:10:00 | | 000T01:30:00 | 2012-358T11:40:00 | XBAND to Earth | POS_X to NEP | |
| SP_177EA_G34BWGNON358_PRIME | C | 2012-358T11:40:00 | | 000T05:54:00 | 2012-358T17:34:00 | XBAND to Earth | 3_Hr_Rolling | CAPS. POS_X to NEP or NSP. SID suspend |
| SP_177EA_C34HEFNON358_PRIME | C | 2012-358T17:34:00 | | 000T09:00:00 | 2012-359T02:34:00 | XBAND to Earth | Rolling/SRU | CAPS. POS_X to NEP or NSP. SID suspend |
| SP_177EA_M70METNON359_PRIME | | 2012-359T02:34:00 | | 000T09:00:00 | 2012-359T11:34:00 | XBAND to Earth | Rolling/SRU | CAPS. POS_X to NEP or NSP. SID suspend |

# Science Highlights

The segment begins on doy 357 with an observation of one of the irregular moons, Surtur.

Next is a nontargeted Rhea flyby. The flyby is at 357T23:07, 22880 km at a phase of 43 degrees. We start with CIRS, UVIS and VIMS observing the south pole on approach of the daytime hemisphere. Next RADAR performs scatterometry/radiometry, and then for closest approach ISS leads a combined ORS observation.

Following that (on doy 358), we turn to Enceladus for more plume observations, and then RADAR turns to Dione for more scatterometry/radiometry. ISS then does global color imaging of Dione, and finally UVIS was given time for a star calibration.

# Notes & Liens



- Pointing:
  - Collaborative prime/rider coordination designs: 1, ISS_177RH_RHEA_PIE
  - Rhea waypoint goes bad at 358T04:32; custom period ensures safety
  - >3 hr observations: ISS_177RH_RHEA001_PIE moves 137 degrees over the four hours, must be broken by an inertial stare or two.
  - UVIS is performing the turn to Earth point, the SP_DLTURN is a 'dummy' turn given 5 minutes duration to establish the waypoint
  - The back-to-back-to back downlinks will likely break the SPTURN script rolling algorithm and require a hand edit of the PDT sasf
  - RBOT-friendly secondaries used where possible

- DSN: With DSS43 down, the segment boundary for this segment was changed to switch us to a DSS63 pass. Its capacity on a 9 hour downlink is only 71.7% of a full SSR so we added more downlink time – even with nearly 24 continuous hours of downlink we barely get a full SSR down

- Data Volume:
  - 123 Mb carryover to following XD segment (CIRS will cut if this is a bit too much)
  - 2 SMT warnings, the usual ones for RADAR warmups (RADAR goes back to warmup mode inbetween its two PRIME activities)

- Resource Checker items (all can be marked as "ignore"): there are 2
  - ISS_177RH_RHEA001_PIE has a telemetry mode change during it, ISS has verified this is during the initial turn and thus OK (the first radar warmup was moved to during the waypoint turn to avoid a mode change in a different ISS observation)
  - SP_177EA_DLTURN358_PRIME has a complaint about a waypoint change during a custom period. This is by design to minimize unnecessary turns.

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**Sequence Liens:**

- ISS RHEA PIE design to add inertial period for RBOT