Science Planning & Sequence Team
CASSINI

CASSINI TOST T82 SEGMENT

Rev 161Handoff Package

Segment Boundary 2012-049T14:59:00 – 2012-051T07:44:00

28 JUL 2011

Jo Pitesky

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 (Mb)
SP_161EA_M70METNON050_PRIME	050 22:14	051 07:44	0	2818	132	2950	3322	372	0	281	56	3286	3288	2	2 0%	0

SPASS

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S72, length = 73 days		2012-024T22:55:00		072T12:52:00	2012-097T11:47:00			
Titan Flyby T82 Segment		2012-049T14:59:00		001T16:45:00	2012-051T07:44:00			
SP_161TI_WAYPTTURN049_PRIME		2012-049T14:59:00		000T00:40:00	2012-049T15:39:00	NEG_Y to Titan	NEG_X to 48.0/74.0	
NEW WAYPOINT		2012-049T15:39:00		001T05:05:00	2012-050T20:44:00	NEG_Y to Titan	NEG_X to 48.0/74.0	
SP_161TI_DEADTIME049_PRIME		2012-049T15:39:00		000T00:15:00	2012-049T15:54:00	NEG_Y to Titan	NEG_X to NTP	
CIRS_161TI_MIDIRTMAP001_PRIM	I, V	2012-049T15:54:00	GMB_E161_TITAN_T82-000T16:49:17	000T04:49:17	2012-049T20:43:17	CIRS_FPB to Titan	PIC	
CIRS_161TI_FIRNADCMP001_PRIM	I, V	2012-049T20:43:17	GMB_E161_TITAN_T82-000T12:00:00	000T02:00:00	2012-049T22:43:17	CIRS_FP1 to Titan	PIC	
ISS_161TI_MONITORNA001_PRIME	C, V	2012-049T22:43:17	GMB_E161_TITAN_T82-000T10:00:00	000T01:00:00	2012-049T23:43:17	ISS_NAC to Titan	NEG_X to Sun	Collaborative Rider(s): VIMS
CIRS_161TI_MIRLMBINT001_PRIM	I, U, V	2012-049T23:43:17	GMB_E161_TITAN_T82-000T09:00:00	000T04:00:00	2012-050T03:43:17	CIRS_FPB to Titan	PIC	
CIRS_161TI_FIRNADMAP001_PRIM	I, V	2012-050T03:43:17	GMB_E161_TITAN_T82-000T05:00:00	000T02:45:00	2012-050T06:28:17	CIRS_FP1 to Titan	PIC	
CIRS_161TI_FIRLMBINT001_PRIM	I, M, V	2012-050T06:28:17	GMB_E161_TITAN_T82-000T02:15:00	000T01:00:00	2012-050T07:28:17	CIRS_FP1 to Titan	PIC	
CIRS_161TI_FIRLMBAER001_PRIM	I, M, U, V	2012-050T07:28:17	GMB_E161_TITAN_T82-000T01:15:00	000T00:30:00	2012-050T07:58:17	CIRS_FP1 to Titan	PIC	
CIRS_161TI_FIRLMBT001_PRIME	I, M, V	2012-050T07:58:17	GMB_E161_TITAN_T82-000T00:45:00	000T00:45:00	2012-050T08:43:17	CIRS_FP1 to Titan	PIC	
161TI (t) T82 TITAN Inboun...		2012-050T08:43:17		000T00:00:01	2012-050T08:43:18			
CIRS_161TI_FIRLMBT002_PRIME	I, M, V	2012-050T08:43:17	GMB_E161_TITAN_T82+000T00:00:0	000T00:45:00	2012-050T09:28:17	CIRS_FP1 to Titan	PIC	
CIRS_161TI_FIRLMBAER002_PRIM	I, M, U, V	2012-050T09:28:17	GMB_E161_TITAN_T82+000T00:45:0	000T00:30:00	2012-050T09:58:17	CIRS_FP1 to Titan	PIC	
CIRS_161TI_FIRLMBINT002_PRIM	I, M, V	2012-050T09:58:17	GMB_E161_TITAN_T82+000T01:15:0	000T01:00:00	2012-050T10:58:17	CIRS_FP1 to Titan	PIC	
CIRS_161TI_FIRNADMAP002_PRIM	I, V	2012-050T10:58:17	GMB_E161_TITAN_T82+000T02:15:0	000T02:45:00	2012-050T13:43:17	CIRS_FP1 to Titan	PIC	Collaborative Rider(s): VIMS. CIRS to point at Senkyo (330W, 0N) for VIMS if possible for 15 mins at +2:15
CIRS_161TI_MIRLMBMAP002_PRIM	I, U, V	2012-050T13:43:17	GMB_E161_TITAN_T82+000T05:00:0	000T04:00:00	2012-050T17:43:17	CIRS_FPB to Titan	PIC	
CIRS_161TI_FIRNADCMP002_PRIM	I, V	2012-050T17:43:17	GMB_E161_TITAN_T82+000T09:00:0	000T02:05:43	2012-050T19:49:00	CIRS_FP1 to Titan	PIC	
SP_161TI_DEADTIME050_PRIME		2012-050T19:49:00	GMB_E161_TITAN_T82+000T11:05:0	000T00:15:00	2012-050T20:04:00	NEG_Y to Titan	NEG_X to NTP	
SP_161EA_DLTURN050_PRIME		2012-050T20:04:00		000T00:40:00	2012-050T20:44:00	XBAND to Earth	NEG_X to NEP	
NEW WAYPOINT		2012-050T20:44:00		000T11:00:00	2012-051T07:44:00	XBAND to Earth	NEG_X to NEP	
SP_161NA_YBIAS050_PRIME	E	2012-050T20:44:00		000T01:30:00	2012-050T22:14:00	XBAND to Earth	NEG_X to NEP	
SP_161EA_M70METNON050_PRIME	C	2012-050T22:14:00		000T09:30:00	2012-051T07:44:00	XBAND to Earth	NEG_X to NEP	NEG_X to NEP or NSP, CAPS

DOY 049: CIRS measures stratospheric temperatures and chemical species in Titan's atmosphere. ISS has a one-hour unilluminated prime observation primarily for photometry. T82 is a dusk sector equatorial flyby across Titan's magnetic tail. Similar in geometry, but at a lower altitude (3844 km) than T78, Cassini will be able to provide a better characterization of the magnetotail by providing samples at different radial distances from the moon at a fixed local time.

DOY 050: CIRS performs a wide variety of observations, including limb sounding, and mapping of surface and atmospheric temperatures. Far-infrared limb sounding near closest approach reaches the most northerly latitude of the Solstice Mission. (75N) until 2015, providing insights into the transition of the northern polar circulation from spring to summer, and to search for possible condensates. VIMS rides along to detect clouds to monitor climatic changes after the equinox.

DOY 051: Cassini finishes downlinking Titan data.

Notes and Liens

- Pointing:
    - Waypoint goes bad during small interval near C/A, but CIRS controls pointing, so this should be OK.
    - Waypoint secondary chosen to facilitate RSS LGA science opportunity
    - Collaborative prime/rider coordination designs
        ISS_161TI_MONITORNA001_PRIME (VIMS collaborative)
        CIRS_161TI_FIRNADMAP002_PRIME (ISS collaborative)

- Data Volume:
    - No issues

- DSN:
    - RSS LGA OPPORTUNITY: station support should be removed if RSS analysis does not confirm that this is a good flyby for LGA science. See SPLAT item S72000006

- Opmodes:
    - Nothing unique

- Hydrazine:
    - None used

- Special Activities:
    - VERY FIRST RSS LGA OPPORTUNITY: See SPLAT item S72000006

Sequence Liens:

- FIRST RSS LGA OPPORTUNITY: Follow procedure for RSS and project approval of RSS LGA science. If RSS cannot confirm that opportunity exists (by first checking c-kernel deliveries and then rechecking if any changes are made during RBOT), remove SP_161NA_M70METNON450_SP and SP_161NA_G70METNON050_SP and inform DSN that passes are no longer needed.

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	WP bad @C/A
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!	n/a
10. PIEs are properly identified via _PIE naming convention. All agreed to PIEs have been integrated.	n/a
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	x
12. Use rolling_sru if required. Follow rolling guidelines per SCO, see the ScoRules wiki page (linked to integration procedure)	n/a
13. The secondary axis for downlinks that contain prime and backup OTMs is the same, and inertially fixed	n/a
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)	n/a
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	n/a

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.	n/a
17. Any observation >3 hours in which the target body travels > 60 degrees must have a SPLAT item stating that the design must include quiescent periods approximately every 3 hours for 20 minutes	n/a
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).	n/a
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]	n/a
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	n/a
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.	n/a
22. Check your GMB, LMB, LUB, Occ times against current reference trajectory (Tour Atlas)	Emily 2 update
23. Dual playback of high value data is performed within this segment and does not affect downstream segments. CIMS entries are correct and SPASS type Note. SSR-A is emptied after the first downlink. Open a SPLAT item (tied to the ENGR request that resets the pointers, ie the DUALPB_CDS request) which says, "During DSN negotiations ensure that SSR-A is emptied before the pointers are reset. This item cannot be closed until the DSN negotiations are complete for both downlink passes, or the dual playback is deleted."	n/a
24. Run the resource checker in CIMS and fix errors found. Remaining notes disposition here or on notes page	YBIAS name issue, not a problem.
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.	x
26. Examine SMT warnings report, include dispositions here or on notes page of any items	x

Segment Checklist p3

Item	Disposition notes, or X if complete
27. Examine "ap_downlink report check" output, include dispositions here or on notes page of any items (see next two items).	x
28. List any DSN stations requested during maintenance periods, AND JUSTIFICATION. **AVOID!!!!!**	x
29. Avoid requesting two overlapping stations (except for RSS science) whenever possible – use RSS station for downlink too	Overlapping stations for RSS LGA opp.
30. Compare RSS requests to DSN requests, make sure they jive (ORT, occ, etc), ORTs are integrated.	x
31. RSS boresight: one _SP pass, two _PRIME downlink passes, one hour observation block in SNER_3	n/a: RSS LGA
32. Apoapse segments only: Follow Integration Guideline & Constraint #15c regarding "two out of three" types of science per RBOT segment. ME OTM's split an RBOT segment.	n/a
33. Apoapse segments only: List your percent 70M stations requested - avoid >35%.	n/a
34. Support images use _XXM or _XXM3 activity type	n/a
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)	n/a
37. If sequence boundary at START of segment, ensure IVPGAP info correct, NO "start before" MAPS requests, OpNav is not first thing in segment	n/a
38. If sequence boundary at END of segment (ie in the next segment), ensure 6 "SEQ" upload DSN passes - will probably ripple into preceding segment(s), notify them. Last pass has Ybias window in front, no bonus science. NO "end after" MAPS requests	n/a
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	n/a
41. RAMAVOID: new waypoint, NOT in custom period	n/a
42. If on thrusters, confirm deadbands	n/a
43. Segment products linked to XXM deliveries page, & this package when you are done	x