CASSINI SOST_164EN SEGMENT

Rev 164 E18 Handoff Package

Segment Boundary 2012-104T17:33:00 to 2012-107T17:18:00

13 October 2011

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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 (Mb)
SP_164EA_C70METNON106_PRIME	106 09:18	106 18:18	0	3136	186	3321	3322	1	0	232	53	3606	3745	138	348	7%	0
SP_164EA_M70METNON106_PRIME	106 18:18	106 19:58	0	0	0	0	3322	3322	0	254	10	264	460	195	195	14%	0
SP_164EA_C34BWGNON107_PRIME	107 08:18	107 17:18	0	646	52	698	3322	2624	0	232	53	983	915	-68	0	0%	68

SMT warnings: none

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S73, length = 73 days		2012-097T11:47:00		073T11:11:00	2012-170T22:58:00			
Enceladus Flyby E18 Segment		2012-104T17:33:00		002T23:45:00	2012-107T17:18:00			
SP_164EN_WAYPTTURN104_PRIME		2012-104T17:33:00		000T00:40:00	2012-104T18:13:00	ISS_NAC to Enceladus	NEG_X to 92.9/36.6	
NEW WAYPOINT		**2012-104T18:13:00**		**001T13:35:00**	**2012-106T07:48:00**	**ISS_NAC to Enceladus**	**NEG_X to 92.9/36.6**	
ISS_164TI_M90R2CLD104_PRIME	C	2012-104T18:13:00	E164_M90R2CLD104+000T00:00:00	000T01:30:00	2012-104T19:43:00	ISS_NAC to Titan	NEG_X to 92.9/36.6	No Preference to secondary pointing
ISS_164OT_L5RHEA104_PRIME		2012-104T19:43:00		000T04:00:00	2012-104T23:43:00	ISS_NAC to Rocks	NEG_X to 92.2/36.6	
SP_164EN_DEADTIME104_PRIME		**2012-104T23:43:00**		**000T00:05:00**	**2012-104T23:48:00**	**ISS_NAC to Enceladus**	**NEG_X to 92.9/36.6**	
VIMS_164EN_ENCELPLUM001_PRIME	C	2012-104T23:48:00	GMB_E164_ENCELADUS_E18-000T14:13:38	000T05:27:00	2012-105T05:15:00	ISS_NAC to Enceladus	NEG_X to 92.9/36.6	
ISS_164EN_PLMHPMR001_PIE	C, U, V	2012-105T05:15:00	GMB_E164_ENCELADUS_E18-000T08:46:38	000T05:20:00	2012-105T10:35:00	ISS_NAC to Enceladus	NEG_X to NSP	SOST PIE
CIRS_164EN_ENCEL001_PIE	M, U, V	2012-105T10:35:00	GMB_E164_ENCELADUS_E18-000T03:26:38	000T02:25:00	2012-105T13:00:00	ISS_NAC to Enceladus	NEG_X to 92.9/36.6	
INMS_164EN_ENCEL18001_PIE	C, I, M, U, V	2012-105T13:00:00	GMB_E164_ENCELADUS_E18-000T01:01:38	000T02:00:00	2012-105T15:00:00	NEG_X to SC_RAM	NEG_Y to 322.0/81.0	
164EN (t) E18 ENCELADUS In...		2012-105T14:01:38		000T00:00:01	2012-105T14:01:39			
CIRS_164EN_ENCEL002_PRIME	M, U, V	2012-105T15:00:00	GMB_E164_ENCELADUS_E18+000T00:58:22	000T01:55:00	2012-105T16:55:00	ISS_NAC to Enceladus	NEG_X to 92.9/36.6	
SP_164EN_DEADTIME105_PRIME		**2012-105T16:55:00**		**000T00:05:00**	**2012-105T17:00:00**	**ISS_NAC to Enceladus**	**NEG_X to 92.9/36.6**	
Begin Custom		**2012-105T17:00:00**		**000T00:00:01**	**2012-105T17:00:01**			
VIMS_164SA_ALPCMIOCC001_PIE	C	2012-105T17:00:00		000T02:40:00	2012-105T19:40:00	VIMS_IR to 114.825/5.225	PIC	Collaborative Rider(s): CIRS. Pick up at ISS_NAC to Enceladus, NEG_X to 92.9/36.6; Hand off at ISS_NAC to Tethys, POS_X to 264.0/68.0. Collaborative Rider(s): CIRS
Periapse R = 3.253 Rs, lat ...		2012-105T17:03:11		000T00:00:01	2012-105T17:03:12			
CIRS_164TE_TETHYS001_PRIME	U, V	2012-105T19:40:00		000T00:50:00	2012-105T20:30:00	ISS_NAC to Tethys	POS_X to 264.0/68.0	Pick up at ISS_NAC to Tethys, POS_X to 264.0/68.0; Hand off at ISS_NAC to Tethys, POS_X to 264.0/68.0.
ISS_164TE_TETHYS001_PIE	C, U, V	2012-105T20:30:00		000T04:00:00	2012-106T00:30:00	ISS_NAC to Tethys	POS_X to 264.0/68.0	Collaborative Rider(s): CIRS, UVIS. Collaborative Rider(s): CIRS, UVIS. Pick up at ISS_NAC to Tethys, POS_X to 264.0/68.0; Hand off at ISS_NAC to Tethys, POS_X to 264.0/68.0. Collaborative Rider(s): CIRS, UVIS. Moves 163 degrees over the four hours, must be broken by an inertial stare o...
CIRS_164TE_TETHYS002_PRIME	U, V	2012-106T00:30:00		000T02:00:00	2012-106T02:30:00	ISS_NAC to Tethys	POS_X to 264.0/68.0	Pick up at ISS_NAC to Tethys, POS_X to 264.0/68.0; Hand off at ISS_NAC to Tethys, POS_X to 264.0/68.0.
VIMS_164TE_TETHYS001_PRIME	C, I, M, U	2012-106T02:30:00		000T04:30:00	2012-106T07:00:00	ISS_NAC to Tethys	POS_X to 264.0/68.0	Collaborative Rider(s): CIRS. Pick up at ISS_NAC to Tethys, POS_X to 264.0/68.0; Hand off at ISS_NAC to Tethys, POS_X to 264.0/68.0. Collaborative Rider(s): CIRS
SP_164EA_DLTURN106_PRIME	M	2012-106T07:00:00		000T00:48:00	2012-106T07:48:00	XBAND to Earth	POS_X to NEP	Pick up at ISS_NAC to Tethys, POS_X to 264.0/68.0; Hand off at XBAND to Earth, POS_X to NEP.
NEW WAYPOINT		**2012-106T07:48:00**		**000T12:50:00**	**2012-106T20:38:00**	**XBAND to Earth**	**POS_X to NEP**	
End Custom		**2012-106T07:48:00**		**000T00:00:01**	**2012-106T07:48:01**			
SP_164EA_YBIAS106_PRIME	E, M	2012-106T07:48:00		000T01:30:00	2012-106T09:18:00	XBAND to Earth	POS_X to NEP	
SP_164EA_C70METNON106_PRIME	C, E	2012-106T09:18:00		000T09:00:00	2012-106T18:18:00	XBAND to Earth	Rolling	POS_X to NEP or NSP, CAPS
SP_164EA_M70METNON106_PRIME	C	2012-106T18:18:00		000T01:40:00	2012-106T19:58:00	XBAND to Earth	Rolling	POS_X to NEP or NSP, CAPS
SP_164RH_WAYPTTURN106_PRIME		2012-106T19:58:00		000T00:40:00	2012-106T20:38:00	ISS_NAC to Rhea	NEG_X to NSP	
NEW WAYPOINT		**2012-106T20:38:00**		**000T10:10:00**	**2012-107T06:48:00**	**ISS_NAC to Rhea**	**NEG_X to NSP**	
ISS_164TI_M90R2CLD106_PRIME	C	2012-106T20:38:00	E164_M90R2CLD106+000T00:00:00	000T01:30:00	2012-106T22:08:00	ISS_NAC to Titan	NEG_X to NSP	No Preference to secondary pointing
CIRS_164RH_RHEA001_PRIME	U, V	2012-106T22:08:00		000T01:30:00	2012-106T23:38:00	ISS_NAC to Rhea	NEG_X to NSP	
ISS_164OT_RHEAL4106_PRIME	V	2012-106T23:38:00		000T06:30:00	2012-107T06:08:00	ISS_NAC to Rocks	NEG_X to NSP	
SP_164EA_DLTURN107_PRIME		2012-107T06:08:00		000T00:34:30	2012-107T06:42:30	XBAND to Earth (0.0,0.0,20.0 deg. offset)	POS_X to NEP	pt 1 of 2
SP_164EA_DLTURN407_PRIME		2012-107T06:42:30		000T00:05:30	2012-107T06:48:00	XBAND to Earth	POS_X to NEP	pt 2 of 2
NEW WAYPOINT		**2012-107T06:48:00**		**000T10:30:00**	**2012-107T17:18:00**	**XBAND to Earth**	**POS_X to NEP**	
SP_164EA_YBIAS107_PRIME	E	2012-107T06:48:00		000T01:30:00	2012-107T08:18:00	XBAND to Earth	POS_X to NEP	
SP_164EA_C34BWGNON107_PRIME	C, R	2012-107T08:18:00		000T09:00:00	2012-107T17:18:00	XBAND to Earth	Rolling	POS_X to NEP or NSP, CAPS

Science Highlights

E18 is a 74 km inbound targeted flyby occurring on April 14

The segment begins on doy 104 with a Titan cloud monitor and satellite search around Rhea L5 Lagrange point.

The flyby period follows, beginning with long Enceladus plume observations led by VIMS and ISS and obtained at a low latitude and at a variety of spatial scales for morphological studies and context. Next CIRS leads ORS viewing of Enceladus (nightside observation of Enceladus' equatorial anti-Saturn hemisphere, with dark sky behind) to search for possible hot spots away from the tiger stripes, followed by INMS being prime at closest approach (one of a set of 3 flybys of high priority for CAPS and CDA as well as INMS). The purpose of this series of observations is to understand variability in Enceladus's activity and to map the three dimensional structure of the plume. CIRS takes images outbound to complete its coverage and to search for additional hot spots (dayside observation of Enceladus equatorial Saturn-facing hemisphere on departure).

Following that (on doy 105/106), VIMS has an Alpha CMI Saturn occultation PIE, and then we use a custom period turn to perform a series of Tethys observations (nontargeted 9053 km flyby) led by various ORS instruments. The purpose of this flyby is to extend the mapping of geologic features on Tethys and to understand the interaction of the E-ring and magnetospheric particles with the surface of Tethys. Searches will be made for "pacman" like features similar to the one observed on Mimas.

After the dual-playback downlinks we have a caboose observation period on doy 106/107, filled with a Titan cloud monitor, a daytime observation of Rhea (small dark crescent - phase is <40 deg) with dark sky behind, and a search for rocks in the Rhea L4 points

Dual playbacks

- A Dual Playback for High Value Science has been planned
- Based on DSN requests, SMT results indicate it will fit within this segment
- A SPLAT item has been opened until the DSN negotiations for this time period are complete

Flyby	Driving Instrument	BEGHIVAL	ENDHIVAL	P4 Dual Playback	SSR-A empty after first playback?	Anything nonstandard?
E18	INMS/ MAPS	E17-20Min	E17+20 Min	215.7 Mb	Yes	No

Notes

- Pointing:
  - Collaborative prime/rider coordination designs: 3, see the spass
  - Enceladus waypoint is good for the flyby. So we placed a custom period afterwards for the nontargeted Tethys flyby. We couldn't use a Tethys waypoint due to a lack of turn time and a Phase angle <15 degrees between 2130-2149 during ISS_164TE_TETHYS001_PIE
  - >3 hr observations: ISS_164TE_TETHYS001_PIE moves 163 degrees over the four hours, must be broken by an inertial stare or two.
  - All Ybias windows are before the downlinks and named YGAP
  - RBOT-friendly secondaries used where possible

- DSN: Due to view periods, the two dual playback passes are not a handover situation so the second pass has a 5 min playback delay (ignore the two resulting ap_downlink report check complaints)
- Data Volume:
  - Dual playback meets guidelines, first downlink empties both SSRs
  - 68 Mb carryover to following XD segment, OK with them
  - No SMT warnings
- Resource Checker items (all can be marked as "ignore"):

Track Num	Wrk Tm	Time	Request	Lien or Action	Ignore Reason
SOST_164_E18-000079	VIMS	2012-105T20:30:00	VIMS_164TE_TETHYS002_ISS	Rider request VIMS_164TE_TETHYS002_ISS start/end 2012-105T20:30:00/2012-106T00:30:00 <> Prime request CIRS_164TE_TETHYS002_PRIME start/end 2012-106T00:30:00/2012-106T02:30:00	I have multiple observations with similar names, this is not a valid complaint
SOST_164_E18-000080	INMS	2012-105T16:01:38	INMS_164EN_E18OUTBND001_INMS	Request referencing GMB_E164_ENCELADUS_E18 occurs outside of corresponding Movable Block	GMB epoch will not be redefined so this is not an issue
SOST_164_E18-000081	INMS	2012-106T02:01:38	INMS_164SA_SURVEYSEG004_INMS	Request referencing GMB_E164_ENCELADUS_E18 occurs outside of corresponding Movable Block	GMB epoch will not be redefined so this is not an issue
SOST_164_E18-000082	SP	2012-106T07:00:00	SP_164EA_DLTURN106_PRIME	Waypoint change cannot occur during a Custom Period	This 'rule' goes back to the days of thinking we would pull an entire custom period, which we now agre won't happen. The mini Tethys flyby could not be done with a Tethys waypoint. Without adding the DLTURN to the end of the custom period there would have been an unnecessary turn from Tethys to Enceladus and then to Earth. Turning directly from Tethys to Earth will be more RBOT friendly.

Liens

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Sequence Liens:

- Dual playback lien regarding DSN negotiations
- ISS TETHYS PIE design to take into account both phase angle issues and add inertial period for RBOT