Science Planning & Sequence Team
CASSINI

CASSINI TOST SEGMENT

Rev 205-T102 Handoff Package

Segment Boundary 2014-168T14:44:00 – 2014-170T14:29:00

26 Nov 2013

Jan Berkeley

SMT report and SPASS

Science Highlights

Notes & Liens

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 (%)	CAROVR (Mb)
SP_205EA_C70METNON170_PRIME	170 05:29	170 14:29	0	2983	206	3189	3322	133	0	287	53	3530	3848	317	318	8%	0

SSR PARTITION SIZE SUMMARY - SELECTED SSR CONFIGURATION: DOUBLE

	SSR A/B		
OBSERVATION PERIOD	P4 Size (Frames)	P5 Size (Frames)	P6 Size (Frames)
SP_205NA_OBSERV168_NA	188954	10	38863

DATA VOLUME REPORT --- TRANSFER FRAME OVERHEAD NOT INCLUDED

Event	Start doy hh:mm	End doy hh:mm	CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)	ENGR (Mb)	TOTAL (Mb)
OBSERVATION_NOR	168 14:44	170 05:29	0.0	73.1	399.2	24.0	800.0	116.9	127.9	0.0	1105.9	110.1	199.0	0.0	204.3	3160.5
SP_205EA_C70METNON170_PRIME	170 05:29	170 14:29	0.0	17.0	86.4	3.2	0.0	16.0	27.5	0.0	129.6	4.9	0.0	0.0	0.0	284.7
DAILY TOTAL SCIENCE	168 14:44	170 14:29	0.0	90.1	485.6	27.3	800.0	132.9	155.5	0.0	1235.5	115.1	199.0	0.0	204.3	

	CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)
TOTAL RECORDED (OPNAV data not included)	0.0	90.1	485.6	27.3	800.0	132.9	155.5	0.0	1235.5	115.1	199.0	0.0

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S84, length = 68 days		2014-144T10:01:00		067T19:08:00	2014-212T05:09:00			
Titan Flyby T102 Segment		2014-168T14:44:00		001T23:45:00	2014-170T14:29:00			
SP_205TI_WAYPTTURN168_PRIME		2014-168T14:44:00		000T00:40:00	2014-168T15:24:00	NEG_Z to Titan	NEG_X to NEP	
NEW WAYPOINT		**2014-168T15:24:00**		**000T17:39:25**	**2014-169T09:03:25**	**NEG_Z to Titan**	**NEG_X to NEP**	
SP_205TI_DEADTIME168_PRIME		**2014-168T15:24:00**		**000T00:14:40**	**2014-168T15:38:40**	**NEG_Z to Titan**	**NEG_X to NEP**	
CIRS_205TI_MIDIRTMAP001_PRIME	I, V	2014-168T15:39:00	GMB_E205_TITAN_T102-000T21:49:25	000T07:49:25	2014-168T23:28:25	CIRS_FPB to Titan	PIC	Collaborative Rider(s): ISS. Template A3: ISS Rider
ISS_205TI_MONITORNA001_PRIME	C, V	2014-168T23:28:25	GMB_E205_TITAN_T102-000T14:00:00	000T02:00:00	2014-169T01:28:25	ISS_NAC to Titan	NEG_X to NEP	No Preference to secondary pointing
CIRS_205TI_FIRNADCMP001_PRIME	I, U, V	2014-169T01:28:25	GMB_E205_TITAN_T102-000T12:00:00	000T03:00:00	2014-169T04:28:25	CIRS_FP1 to Titan	PIC	
CIRS_205TI_MIRLMBINT001_PRIME	I, V	2014-169T04:28:25	GMB_E205_TITAN_T102-000T09:00:00	000T04:24:00	2014-169T08:52:25	CIRS_FPB to Titan	PIC	
ENGR_205SC_ORSRCS169_PRIME	V	2014-169T08:52:25	GMB_E205_TITAN_T102-000T04:36:00	000T00:01:00	2014-169T08:53:25	CIRS_FP1 to Titan	PIC	deadband =(0.5,0.5,2)
SP_205EA_WAYPTTURN468_PRIME	V	2014-169T08:53:25	GMB_E205_TITAN_T102-000T04:35:00	000T00:10:00	2014-169T09:03:25	XBAND to Earth	POS_Y to Saturn	
NEW WAYPOINT		**2014-169T09:03:25**		**000T07:28:00**	**2014-169T16:31:25**	**XBAND to Earth**	**POS_Y to Saturn**	
RSS_205TI_BISTATIN001_PRIME	M	2014-169T11:18:25	LUB_E205_TITAN_T102-000T02:10:00	000T01:57:00	2014-169T13:15:25	XBAND to Titan	POS_Y to Saturn	
RSS_205TI_OCC001_PRIME	M	2014-169T13:15:25	LUB_E205_TITAN_T102-000T00:13:00	000T00:37:00	2014-169T13:52:25	XBAND to Earth	NEG_Y to Saturn_North_Pole	
205TI (t) T102 TITAN Outbou...		2014-169T13:28:25		000T00:00:01	2014-169T13:28:26			
RSS_205TI_BISTATOUT002_PRIME	M	2014-169T13:52:25	LUB_E205_TITAN_T102+000T00:24:00	000T01:46:00	2014-169T15:38:25	XBAND to Titan	PIC	
ENGR_205SC_DFPWBIAS169_PPS	V	2014-169T15:38:25	GMB_E205_TITAN_T102+000T02:10:00	000T00:21:07	2014-169T15:59:32	NEG_Y to Titan	NEG_X to 54.0/24.8	Deadband: (2,2,2).
SP_205TI_WAYPTTURN169_PRIME	I, V	2014-169T15:59:32	GMB_E205_TITAN_T102+000T02:31:07	000T00:31:53	2014-169T16:31:25	NEG_Y to Titan	NEG_Z to NEP	
NEW WAYPOINT		**2014-169T16:31:25**		**000T12:57:35**	**2014-170T05:29:00**	**NEG_Y to Titan**	**NEG_Z to NEP**	
CIRS_205TI_FIRNADMAP002_PRIME	I, V	2014-169T16:31:25	GMB_E205_TITAN_T102+000T03:03:00	000T01:57:00	2014-169T18:28:25	CIRS_FP1 to Titan	PIC	
CIRS_205TI_MIRLMBMAP002_PRIME	V	2014-169T18:28:25	GMB_E205_TITAN_T102+000T05:00:00	000T04:00:00	2014-169T22:28:25	CIRS_FPB to Titan	PIC	
CIRS_205TI_FIRNADCMP002_PRIME	I, U, V	2014-169T22:28:25	GMB_E205_TITAN_T102+000T09:00:00	000T03:00:00	2014-170T01:28:25	CIRS_FP1 to Titan	PIC	
ISS_205TI_MONITORNA002_PRIME	C, V	2014-170T01:28:25	GMB_E205_TITAN_T102+000T12:00:00	000T03:05:35	2014-170T04:34:00	ISS_NAC to Titan	NEG_Z to NEP	No Preference to secondary pointing
SP_205TI_DEADTIME170_PRIME		**2014-170T04:34:00**	**GMB_E205_TITAN_T102+000T15:05:35**	**000T00:15:00**	**2014-170T04:49:00**	**NEG_Y to Titan**	**NEG_Z to NEP**	
SP_205EA_DLTURN170_PRIME		2014-170T04:49:00		000T00:40:00	2014-170T05:29:00	XBAND to Earth	NEG_Y to Saturn	
NEW WAYPOINT		**2014-170T05:29:00**		**000T09:00:00**	**2014-170T14:29:00**	**XBAND to Earth**	**NEG_Y to Saturn**	
SP_205EA_C70METNON170_PRIME	C	2014-170T05:29:00		000T09:00:00	2014-170T14:29:00	XBAND to Earth	Rolling	MIMI. NEG_Y to Saturn (0,0,-9.5).

Science Highlights

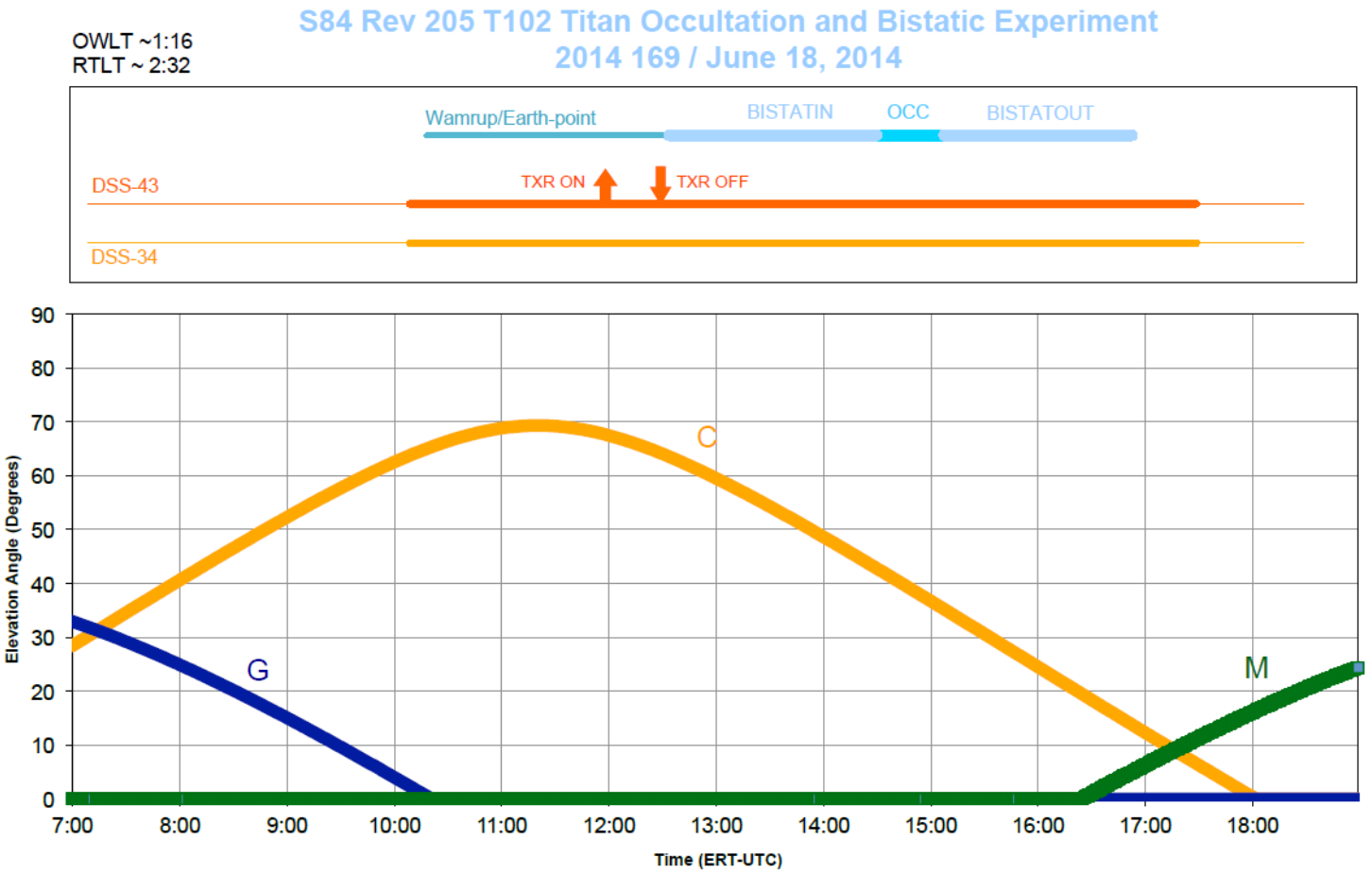
DOY 168: CIRS continues monitoring of surface and atmospheric temperatures. ISS will acquire a mosaic of northern latitudes on Titan's leading hemisphere, approaching northern summer (multiple observations of northern latitudes may be needed in case of cloud cover obscuring the surface). ISS will ride along with CIRS on approach to track clouds at high northern latitudes. VIMS will ride along with CIRS and ISS to monitor the evolution of the vortex at the South Pole and the cloud activity at high latitudes. VIMS will acquire low resolution (100 km/pixel at best) images of Titan near the sub Saturn meridian.

Science Highlights

DOY 169: Nearing closest approach, RSS begins its Titan bistatic and occultation observations. The occultation will 1) determine seasonal changes in the high latitude atmosphere, specifically the temperature structure and formation and breakup of the winter polar vortex; 2) determine tropospheric winds from radio occultation measurements of tropospheric temperature profiles; 3) determine the atmospheric and ionospheric structure at all levels. The second of two northern lake-crossing bistatic opportunities implemented in association with RSS Titan occultations. The geometry of such opportunities is usually less optimal than that of standalone bistatic opportunities such as those on T106 and T124, hence tend to have less chance of surface echo detectability. They have proved useful nonetheless. The T102 bistatic ground grazes presently known edge of Ligeia Mare (2009), covering roughly the 70N to 75N latitude region between 240W and 310W longitude. It terminates within the northern region of Kraken Mare. It captures scattering angles decreasing from about 80 to 60 degrees, partly within the Brewster angle range. The inbound bistatic covers the region (20S, 15W) to (50S, 25W) and covers incidence angle increasing from about 45 to 70 degrees, also partly within the Brewster angle range. Measurements of the absolute strength of the echo and its polarization properties, when detectable, yield critical information about the surface status (liquid/solid), surface reflectivity, surface dielectric constant and implied composition, and surface roughness.

Following closest approach, CIRS continues to monitor surface and atmospheric temperatures, and trace gas vertical profiles. ISS will ride along with CIRS on approach to track clouds at high northern latitudes, as well as with VIMS, UVIS, and CIRS observations, inbound and outbound, to image Titan's surface and atmosphere. VIMS will be riding along with CIRS to acquire low resolution images of the North Pole area and will monitor the evolution of the seas. The geometry for specular reflection is achieved on Kraken Mare, which will provide unique observations on the presence of waves.

RSS Bistat – T102



Notes

- Pointing:
  - No issues
  - 02:15 gap in SPASS due to RSS warmup
- Data Volume:
  - No SMT warnings
- DSN:
  - Level 3 requests: C70 and C34BWG passes on DOY 169 in support of RSS bistat
- Resource checker:
  - Gap due to RSS warmup
  - RSS activities referenced to LUB inside of GMB
- Opmodes:
  - No issues. Similar strategy as T101
  - Hydrazine:
  - KPT Estimate: 206g (per L. Andrade analysis)
  - FSDS Estimate: 227 g
  - Deadband (per RSS): (0.5, 0.5, 2.0)
  - Steps for walking deadband = 3
- Special Activities:
  - None

Liens

Sequence Liens (should all be SPLAT items):

- None