



Science Planning & Sequence Team
CASSINI

CASSINI TOST SEGMENT

Rev 209-T106 Handoff Package

Segment Boundary 2014-296T06:15:00 – 2014-299T06:00:00

17 Apr 2014

Jan Berkeley

SMT report and Master Timeline

Science Highlights

Notes & Liens

This document has been reviewed and determined not to contain export controlled technical data

SMT report

TOST T106

DATA VOLUME SUMMARY --- TRANSFER FRAME OVERHEAD INCLUDED (80 BITS PER 8800-BIT FRAME)

DOWNLINK PASS NAME	OBSERVATION_PERIOD									DOWNLINK_PASS							
	Start doy hh:mm	End doy hh:mm	P4			P5			RECORDED		PLAYBACK						
			START (Mb)	SCI (Mb)	HK+E (Mb)	TOTAL (Mb)	CPACTY (Mb)	MGRN (Mb)	OPNAV (Mb)	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGN (Mb)	NET_MARGN (Mb)	(%)	CAROVR (Mb)
SP_209EA_C70METNON297_PRIME	297 19:45	298 08:00	0	2633	192	2824	3322	498	0	423	72	3320	3488	167	168	4%	0
SP_209EA_G70METNON298_PRIME	298 21:00	299 00:00	0	775	55	830	3322	2492	0	65	18	912	723	-190	0	0%	189
SP_209EA_C34BWGNON298_PRIME	299 00:00	299 06:00	189	0	0	189	3322	3133	0	152	35	376	374	-2	0	0%	2

SSR PARTITION SIZE SUMMARY - SELECTED SSR CONFIGURATION: DOUBLE

OBSERVATION PERIOD	SSR A/B		
	P4 Size (Frames)	P5 Size (Frames)	P6 Size (Frames)
SP_209NA_OBSERV296_NA	188954	10	38863
SP_209NA_OBSERV298_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	296 06:15	297 19:45	0.0	141.5	384.9	23.6	553.0	80.9	124.1	0.0	919.9	50.8	330.0	0.0	190.2	2798.8
SP_209EA_C70METNON297_PRIME	297 19:45	298 08:00	0.0	46.2	86.4	4.4	0.0	21.8	37.5	0.0	216.3	6.7	0.0	0.0	0.0	419.3
DAILY TOTAL SCIENCE	296 06:15	298 08:00	0.0	187.7	471.3	28.0	553.0	102.7	161.6	0.0	1136.2	57.5	330.0	0.0	190.2	
OBSERVATION_NOR	298 08:00	298 21:00	0.0	49.0	146.4	4.7	400.0	23.1	39.8	0.0	61.3	18.4	25.0	0.0	54.3	822.1
SP_209EA_G70METNON298_PRIME	298 21:00	299 00:00	0.0	11.3	21.6	1.1	0.0	5.3	9.2	0.0	14.1	1.6	0.0	0.0	0.0	64.3
SP_209EA_C34BWGNON298_PRIME	299 00:00	299 06:00	0.0	22.6	64.8	2.2	0.0	10.7	18.4	0.0	28.3	3.3	0.0	0.0	0.0	150.2
DAILY TOTAL SCIENCE	298 08:00	299 06:00	0.0	83.0	232.8	7.9	400.0	39.1	67.3	0.0	103.8	23.4	25.0	0.0	54.3	

T106 TOST Master timeline

TOST T106

209TI T106		1013					
Start Time	End Time	Prime Activity	Obs. Detail	Op Mode	TLM Mode	Comments	
2014-296T06:15:00	2014-296T06:55:00	SP Turn to WP	NEG Y to Titan, NEG X to NEP	DFPW Normal	S_N_ER_3		
2014-296T06:55:00	C/A-19:30:30	OD Uncertainty Dead Time		DFPW Normal	S_N_ER_3		
C/A-19:30:30	-14:00	CIRS	A3 (Tc1b)	DFPW Normal	S_N_ER_3	ISS rider	
-14:00	-12:00	ISS	D2 (TC1a, TC1b, TN1a, TN2c (Could also use TN1c for limb haze layer, depending on geometry if along limb, or	DFPW Normal	S_N_ER_3		
-12:00	-09:00	CIRS	D2 (TN1c)	DFPW Normal	S_N_ER_3	VIMS rider	
-09:00	-05:00	CIRS	F (TC1b OR TN1c)	DFPW Normal	S_N_ER_3		
-05:00	-03:26	VIMS	Y (TC1a, TN1a (depending on pointing) and TN2c)	DFPW Normal	S_N_ER_3		
-03:26	-03:25	RWA to RCS Transition		RSS3RCS	S_N_ER_3		
-03:25	-03:00	RSS warm up		RSS3RCS	S_N_ER_2		
-03:00	0	RSS Bistatic	(TN1a)	RSS3RCS	S_N_ER_2		
2014-297T02:40:30		CLOSEST APPROACH	XBAND to Titan (Tc2a)			Best Bistatic Opportunity over Lakes (Exit LUB)	
0	+02:25	RSS Bistatic	(TN1a)	RSS3RCS	S_N_ER_2		
+02:25	+02:47	RCS to RWA Transition		DFPW Normal	S_N_ER_3		
+02:47	+05:00	VIMS	Y (TC1a, TN1a (depending on pointing) and TN2c)	DFPW Normal	S_N_ER_3		
+05:00	+09:00	VIMS	Q (TN1a (Specular reflection of lakes-depending on geometry))	DFPW Normal	S_N_ER_3		
+09:00	+13:00	CIRS	N1 (Tc1b, TN1c aerosol)	DFPW Normal	S_N_ER_3		
+13:00	C/A+16:09:31	CIRS	M4 (Tc1b (TN1c on outbound))	DFPW Normal	S_N_ER_3		
C/A+16:09:30	2014-297T19:05:00	OD Uncertainty Dead Time		DFPW Normal	S_N_ER_3		
2014-297T19:05:00	2014-297T19:45:00	SP Turn to Earth for downlink	XBAND to Earth, NEG Y to Saturn	DFPW Normal	S_N_ER_3		
2014-297T19:45:00	2014-298T08:00:00	Canberra 70M	XBAND to Earth, NEG Y to Saturn	DFPW Normal	S_N_ER_3		
2014-298T08:00:00	2014-298T08:40:00	SP Turn to WP	NEG Y to Titan, NEG Z to NEP	DFPW Normal	S_N_ER_3		
2014-298T08:40:00	2014-298T12:40:00	ISS	ISS mosaic at first, then sit and stare for CIRS and VIMS (TN2c, TNd2)	DFPW Normal	S_N_ER_3		
2014-298T12:40:00	2014-298T16:40:00	ISS	ISS mosaic at first, then sit and stare for CIRS and VIMS (TN2c, TNd2)	DFPW Normal	S_N_ER_3		
2014-298T16:40:00	2014-298T18:50:00	ISS	ISS mosaic at first, then sit and stare for CIRS and VIMS (TN2c, TNd2)	DFPW Normal	S_N_ER_3		
2014-298T18:50:00	2014-298T19:30:00	SP Turn to Earth for downlink	XBAND to Earth, NEG Y to Saturn	DFPW Normal	S_N_ER_3		
2014-298T19:30:00	2014-298T21:00:00	Ybias window		DFPW Normal	S_N_ER_3		
2014-298T21:00:00	2014-299T06:00:00	Canberra 34M	XBAND to Earth, NEG Y to Saturn	DFPW Normal	S_N_ER_3		

DOY 296 (23 Oct): Inbound, CIRS trades off with ISS to performs mid-infrared meridional temperature mapping to extend temporal coverage for seasonal changes, with VIMS riding. Next, ISS will acquire a mosaic of mid-southern latitudes, over Tsegihi, on Titan's sub-Saturnian hemisphere (TN1a). VIMS will observe the evolution of the vortex / polar hood at the South Pole and will acquire low resolution (30 km/pixel at best) maps of Tsegihi and the dune fields of Aztlan. Far infrared mapping by CIRS follows. The day ends with regional mapping by VIMS, with ISS, UVIS and CIRS riding.

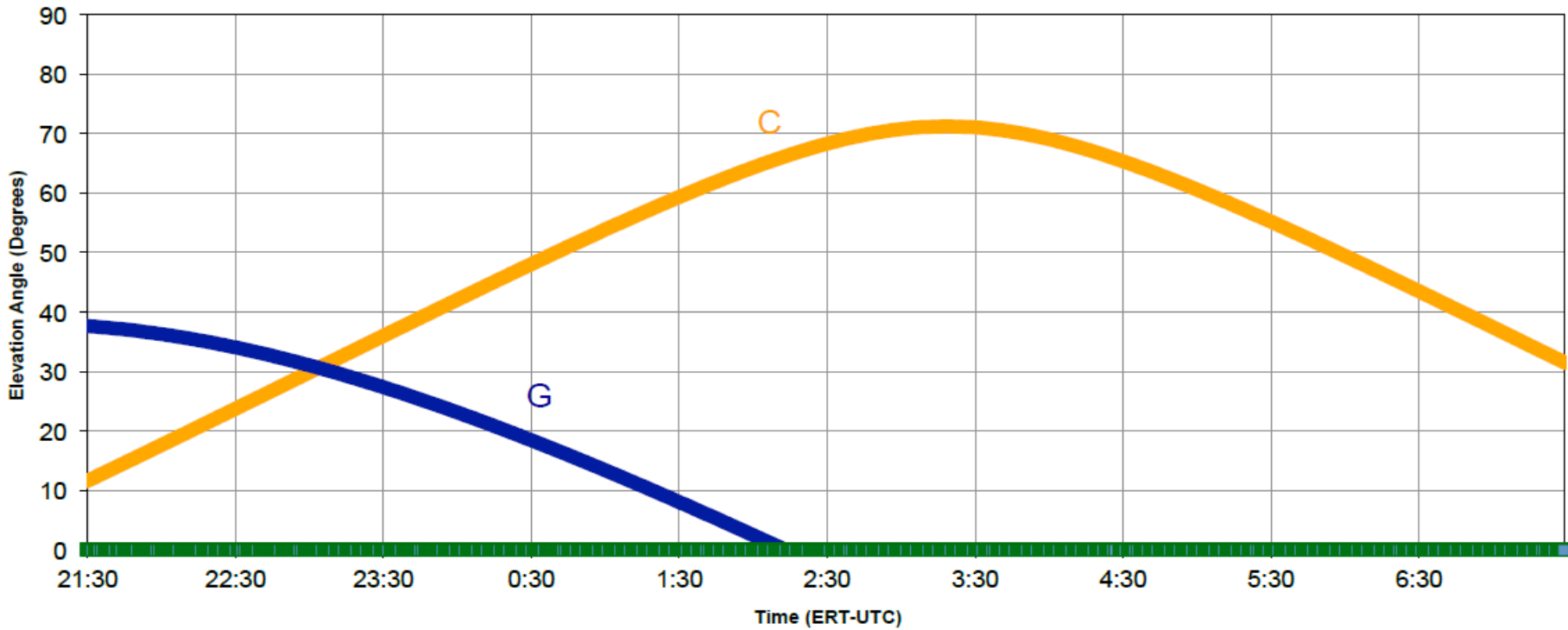
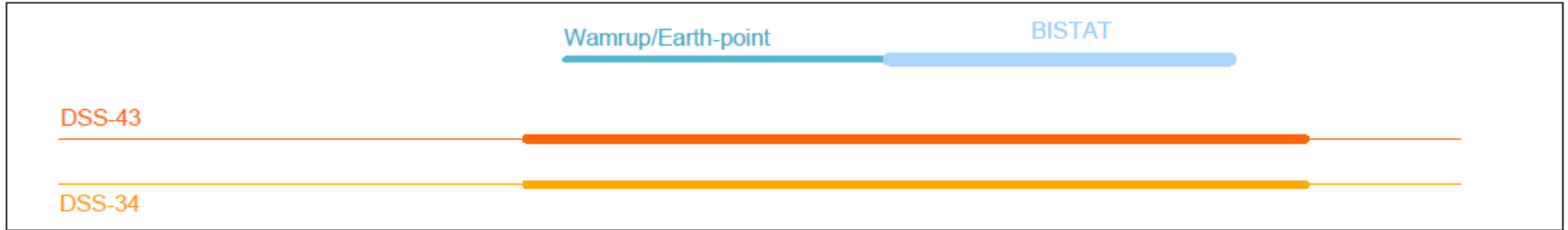
DOY 297 (24 Oct): For T106 closest approach, the RSS Bistat is one of only two XRM opportunities of outbound geometry optimally suited for capturing potential mirror-like surface echoes from the northern lakes region starting from about closest-approach (to enhance chances of surface echoes detectability). It primarily covers the eastern region of Kraken Mare, roughly from about (50N, 320W) to about (70N, 295W) degrees (lat, west long). It captures scattering angles increasing from about 50 to 60 degrees, well within the Brewster angle range for likely surface compositions. Measurements of the absolute strength of the echo and its polarization properties, when detectable, yield important information about the surface status (liquid/solid), surface reflectivity, surface dielectric constant and implied composition, and surface roughness.

Following the Bistat, VIMS will look for specular reflection on the eastern shore of Kraken Mare (70-72N, 293-299W) during its prime observation and a collaborative observation with CIRS. It will monitor cloud activity at the mid northern latitudes and will acquire global view of the seas and lakes located at the North Pole

DOY 298(25 Oct): ISS will monitor Titan's northern latitudes, where it will be important to track clouds and the evolution thereof as summer approaches (TC1a, TC1b, TN1a, TN2c, TN2d), with CIRS and VIMS riding.

S86 Rev 209 T106 Titan Bistatic Experiment 2014 296-297 / October 23-24, 2014

OWLTLT ~1:30
RTLTLT ~ 3:00



- Pointing:
 - FR37B15: For S/C to Titan altitudes < 1130 km, the angle +X to Titan atmosphere RAM shall be greater than 90. Exception- two Titan flybys with altitudes < 1130 km and with the angle +X to Titan atmosphere RAM 90 are allowed during Tour. These flybys account for two of the 40 consumables listed in MISSION PHASE DEPENDENCY
 - FR37B15 is in violation from 2014-297T02:37:48.990 to 2014-297T02:38:39.810. POS_X to Titan atmosphere Ram angle dips down below 90 degrees while at altitude < 1130 km.
- 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, 102
 - Hydrazine:
 - KPT Estimate: 253.841 g (per L. Andrade analysis)
 - FSDS Estimate: 263.769 g
 - Deadband (per RSS): (0.5, 0.5, 2.0)
 - Steps for walking deadband = 3
- Special Activities:
 - None

Sequence Liens (should all be SPLAT items):

- None