



**CASSINI TOST SEGMENT T89**

**Rev 181 Handoff Package**

**Segment Boundary 2013-047T08:26:00 – 2013-049T08:11:00**

**16 July 2012**

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SMT report and SPASS

Science Highlights

Notes & Liens

# SMT report

TOST T89

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

DOWNLINK PASS NAME	Start doy hh:mm	End doy hh:mm	OBSERVATION_PERIOD							DOWNLINK_PASS							
			P4						P5	RECORDED		PLAYBACK					
			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)	NET_MARGN (%)	CAROVR (Mb)
SP_181EA_C34BWGNON047_PRIME	047 13:56	047 23:25	0	385	23	409	3322	2914	0	605	56	1069	356	-714	6	0%	713
SP_181EA_M34BWGNON047_PRIME	047 23:25	048 06:56	713	0	0	713	3322	2609	0	1419	44	2177	284	-1893	6	0%	1893
SP_181EA_G34BWGNON048_PRIME	048 06:56	048 13:56	1893	0	0	1893	3322	1429	0	223	41	2157	264	-1893	6	0%	1893
SP_181EA_M70METNON048_PRIME	048 23:11	049 08:11	1893	549	39	2481	3322	841	0	248	53	2782	2788	5	6	0%	0

# SPASS

TOST T89

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S77, length = 72 days		2013-013T17:51:00		071T19:24:00	2013-085T13:15:00			
Titan Flyby T89 Segment		2013-047T08:26:00		001T23:45:00	2013-049T08:11:00			
SP_181TI_WAYPTTURN047_PRIME		2013-047T08:26:00		000T00:40:00	2013-047T09:06:00	XBAND to Earth	POS_X to NEP	
<b>NEW WAYPOINT</b>		<b>2013-047T09:06:00</b>		<b>001T14:05:00</b>	<b>2013-048T23:11:0</b>	<b>XBAND to Earth</b>	<b>POS_X to NEP</b>	
SP_181TI_DEADTIME047_PRIME		2013-047T09:06:00		000T00:14:59	2013-047T09:20:5	XBAND to Earth	POS_X to NEP	
CIRS_181TI_MIDIRTMAP001_PRIM I, U, V		2013-047T09:20:59	GMB_E181_TITAN_T89-000T16:35:36	000T02:30:36	2013-047T11:51:35	CIRS_FPB to Titan	PIC	Make sure to cover northern hemisphere (north pole) so VIMS can observe lakes. Likely only time for 1/2 disk coverage (or less) depending on turn times. CAN
SP_181EA_C34BWGNON047_PRIMI C, R		2013-047T13:56:35	GMB_E181_TITAN_T89-000T12:00:00	000T09:29:24	2013-047T23:25:59	XBAND to Earth	POS_X to NEP	
SP_181EA_M34BWGNON047_PRIM C, M, R		2013-047T23:25:59	GMB_E181_TITAN_T89-000T02:30:36	000T07:30:36	2013-048T06:56:35	XBAND to Earth	POS_X to NEP	
181TI (t) T89 TITAN Outbou...		2013-048T01:56:35		000T00:00:01	2013-048T01:56:36			
SP_181EA_G34BWGNON048_PRIMI C, R		2013-048T06:56:35	GMB_E181_TITAN_T89+000T05:00:00	000T07:00:00	2013-048T13:56:35	XBAND to Earth	POS_X to NEP	
CIRS_181TI_MIDIRTMAP002_PRIM I, U, V		2013-048T13:56:35	GMB_E181_TITAN_T89+000T12:00:00	000T08:19:24	2013-048T22:15:59	CIRS_FPB to Titan	PIC	Collaborative Rider(s): ISS. Template A2: CIRS-ISS. Time (30 mins) for ISS dwells at start and end.
SP_181TI_DEADTIME048_PRIME		2013-048T22:15:5	GMB_E181_TITAN_T89+000T20:19:	000T00:15:00	2013-048T22:30:5	XBAND to Earth	POS_X to NEP	
SP_181SA_DLTURN048_PRIME		2013-048T22:31:00		000T00:40:00	2013-048T23:11:00	XBAND to Earth (0.0,0.0,-9.5 deg. offset NEG_Y to Saturn		
<b>NEW WAYPOINT</b>		<b>2013-048T23:11:00</b>		<b>000T09:00:00</b>	<b>2013-049T08:11:0</b>	<b>XBAND to Earth (0.0,0.0,-9.5 deg. of NEG_Y to Saturn</b>		
SP_181EA_M70METNON048_PRIME C, R		2013-048T23:11:00		000T09:00:00	2013-049T08:11:00	XBAND to Earth (0.0,0.0,-9.5 deg. offset NEG_Y to Saturn MIMI. NEG_Y to Saturn (0,0,-9.5). CIRS heating		

# Science Highlights

TOST T89

DOY 047: CIRS continues its stratospheric monitoring campaign on the wings of the RSS gravity encounter. VIMS will observe the illuminated North Pole area as CIRS prime observations permit. This will provide data to monitor the evolution of the polar hood. The RSS Titan Gravity experiment starts later in the day. During the Solstice Mission, the main science objectives of gravity measurements at Titan are: 1) Assess the presence of a global subsurface ocean by measuring the short-period changes of the gravity field induced by Saturn's tidal field (eccentricity tides). 2) Determine the geoid of the satellite and the presence of large scale gravity anomalies. 3) Determine the rheology of the icy crust by correlative analysis with altimetric data. T89 is another high inclination (1500 km) flyby in the post noon sector of Saturn's magnetosphere. With closest approach near the day/night terminator, Cassini will be able to study the diffusion of the external magnetic field at low altitudes and high solar zenith angles. A comparison with T83, T84, T85, T86, T87, and T88 will be very useful.

DOY 048: The RSS Titan Gravity experiment continues. During the Solstice Mission, the main science objectives of gravity measurements at Titan are: 1) Assess the presence of a global subsurface ocean by measuring the short-period changes of the gravity field induced by Saturn's tidal field (eccentricity tides). 2) Determine the geoid of the satellite and the presence of large scale gravity anomalies. 3) Determine the rheology of the icy crust by correlative analysis with altimetric data. CIRS continues its stratospheric monitoring campaign on the wings of the RSS gravity encounter. ISS will ride along with CIRS' observation to image Titan's surface and atmosphere, including the region where extensive surface changes were observed in Fall 2010 and an area at mid-southern latitudes on the trailing hemisphere that has only been imaged at lower resolution. VIMS will look for the evolution of the cloud pattern at mid-latitudes. Data is downlinked over

# Y bias and RSS

TOST T89

No Y-Bias Window (RSS GSE)

- From 2013-046T23:26:00 to 2013-049T08:11:00
- Most critical period is during prime gravity observation 2013-047T13:36:36 to 048T13:56:36

The following segment (XD\_181\_182) has agreed to schedule a Y-bias window ENGR\_171SC\_KPTYBIAS048\_PRIME at the start of the segment after the end of the final T89 downlink. SCO noted this on their CIMS input and it was negotiated with the XD TWT (Kelly, Mike Evans)

# Notes

TOST T89

- Pointing:
  - See previous page re: YGAP issues (none during RSS, XD agrees to take ybias window at start of following segment)
  - Known SPASS gap from 2013-047T11:51:35 to 2013-047T13:56:35
  - RSS activities are riders on SP pointing near C/A.
- Data Volume:
  - No issues
- DSN:
  - Rev 181 T89 Titan Gravity Observation: Level 3 request from 2013-047/1200 to 2013-048/1545
    - Stations: DSS-25, DSS-34, DSS-55, DSS-25
- Resource checker:
  - No issues except known SPASS gap (see pointing)
- Opmodes:
  - RSS opmode change made in previous segment.
- Hydrazine:
  - N/a
- Special Activities:
  - CDA No-Articulation zone  
C/A +/- 2 hrs  
4 hrs inbound at high DSN elevation (tentatively 2013-047T15:41:00 to 2013-047T19:41:00 subject to RSS/CDA negotiation)  
4 hrs outbound at high DSN elevation (tentatively 2013-048T08:26:00 to 2013-048T12:26:00 subject to RSS/CDA negotiation)

# Liens

TOST T89

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## Sequence Liens (should all be SPLAT items):

- RSS thruster keep out zones (SPLAT item)
- No-Articulation zone (SPLAT item)