



## **CASSINI TOST\_T121 SEGMENT**

**Rev 238 Handoff Package**

**Segment Boundary 2016-206T23:27:00 – 2016-209T13:27:00**

**31 Dec 2015**

Rudy Boehmer

SMT Report, Timeline, SPASS

Science Highlights

Notes & Liens

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

# SMT Report

TOST T121

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)	(%)	CAROVR (Mb)
SP_238EA_C70METNON208_PRIME	208 04:27	208 13:27	0	2683	135	2817	3322	505	0	186	53	3057	3820	763	764	14%	0
SP_238EA_G70METNON209_PRIME	209 02:27	209 04:27	0	1295	55	1349	3322	1973	0	41	12	1402	807	-596	1	0%	595
SP_238EA_C34BWGNON209_PRIME	209 04:27	209 13:27	595	0	0	595	3322	2727	0	211	53	859	860	0	1	0%	0

Note: 504 Mb carryover expected from preceding Saturn\_238

SSR PARTITION SIZE SUMMARY - SELECTED SSR CONFIGURATION: DOUBLE

OBSERVATION PERIOD	SSR A/B		
	P4 Size (Frames)	P5 Size (Frames)	P6 Size (Frames)
SP_238NA_OBSERV206_NA	188954	10	38863
SP_238NA_OBSERV208_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	206 23:27	208 04:27	0.0	54.7	295.1	20.5	225.0	65.8	98.1	1042.2	533.2	93.6	230.0	0.0	133.0	2791.2
SP_238EA_C70METNON208_PRIME	208 04:27	208 13:27	0.0	17.0	86.4	3.2	0.0	16.0	27.5	0.0	29.5	4.9	0.0	0.0	0.0	184.6
DAILY TOTAL SCIENCE	206 23:27	208 13:27	0.0	71.7	381.5	23.7	225.0	81.8	125.6	1042.2	562.7	98.5	230.0	0.0	133.0	
OBSERVATION_NOR	208 13:27	209 02:27	0.0	24.5	73.2	4.7	300.0	23.1	39.8	0.0	93.5	8.5	25.0	0.0	744.8	1337.1
SP_238EA_G70METNON209_PRIME	209 02:27	209 04:27	0.0	3.8	10.8	0.7	0.0	3.6	6.1	0.0	14.4	1.1	0.0	0.0	0.0	40.5
SP_238EA_C34BWGNON209_PRIME	209 04:27	209 13:27	0.0	17.0	75.6	3.2	0.0	16.0	27.5	0.0	64.7	4.9	0.0	0.0	0.0	209.0
DAILY TOTAL SCIENCE	208 13:27	209 13:27	0.0	45.3	159.6	8.6	300.0	42.7	73.4	0.0	172.7	14.5	25.0	0.0	744.8	
TOTAL RECORDED (OPNAV data not included)			0.0	117.0	541.1	32.3	525.0	124.5	199.1	1042.2	735.4	113.0	255.0	0.0		

# T121 TOST Master Timeline (1/2)

TOST T121

238TI_T121	976
------------	-----

Start Time	End Time	Prime Activity	Obs. Detail	Op Mode	TLM Mode	Comments
2016-206T23:27:00	2016-207T00:07:00	SP Turn to WP	NEG_Y to Titan, NEG_X to NTP	DFPW Normal	S_N_ER_3	
2016-207T00:07:00	C/A-09:42:40	OD Uncertainty Dead Time		DFPW Normal	S_N_ER_3	
C/A-09:42:40	-05:00	CIRS	F extended (TC1b or TN1c)	DFPW Normal	S_N_ER_3	
-05:00	-02:15	CIRS	E (TN2c)	RADWU	S_N_ER_5A for 1st 15 minutes, then S_N_ER_3	
<b>Begin custom period</b>						
-02:15	-01:06	VIMS stellar occ -01:20 to -00:20	TN1c	RADWU	S_N_ER_3	Ingress-only occ
-01:06	-01:05	ENGR: RADWU to RADRWA		RADRWA	S_N_ER_8	For RADAR ESS power on RADRWA: ISS/VIMS in sleep, UVIS no HDAC, CDA no articulation
-01:05	-01:04	RWA to RCS Transition		RADRCS	S_N_ER_8	
-01:04	-00:30	RADAR HiSAR	RADAR turning from VIMS attitude	RADRCS	S_N_ER_8	Deadband = (0.5, 0.5, 2.0)
-00:30	-00:18	RADAR Altimetry	TN2b	RADRCS	S_N_ER_8	INMS Rider
-00:18	0	RADAR SAR	TC1a, TN1a, TN1b, TN2b	RADRCS	S_N_ER_8	INMS Rider
2016-207T09:58:23		CLOSEST APPROACH	NEG_Z to Titan, NEG_X to RAM (Tc2a)			Tui and Hotei switch hitter
0	+00:18	RADAR SAR	TC1a, TN1a, TN1b, TN2b	RADRCS	S_N_ER_8	INMS Rider
+00:18	+00:30	RADAR Altimetry	TN2b	RADRCS	S_N_ER_8	INMS Rider
+00:30	+00:52	RCS to RWA Transition		RADRWA	S_N_ER_8	Deadband = (2.0, 2.0, 2.0) RADRWA: ISS/VIMS in sleep, UVIS no HDAC, CDA no articulation
+00:52	+01:37	RADAR HiSAR	Tc1a, TN1a, TN1b, TN2b	RADRWA	S_N_ER_8	
+01:37	+02:15	RADAR scatterometry	TN2c, TN1a	RADRWA	S_N_ER_8	
<b>End custom period</b>						
+02:15	+05:00	VIMS	Y (TN1c)	DFPW Normal	S_N_ER_3	
+05:00	+09:00	VIMS	Q (TN1a)	DFPW Normal	S_N_ER_3	ISS Collaborative Rider
+09:00	+12:30	CIRS	N1 (TN1b, TN1c aerosol)	DFPW Normal	S_N_ER_3	
+12:30	C/A+17:33:37	CIRS	M4 (Tc1b TN1c on outbound)	DFPW Normal	S_N_ER_3	
C/A+17:33:37	2016-208T03:47:00	OD Uncertainty Dead Time		DFPW Normal	S_N_ER_3	
2016-208T03:47:00	2016-208T04:27:00	SP Turn to Earth for downlink	XBAND to Earth, NEG_Y to Saturn, offset (0, 0, -9.5 deg)	DFPW Normal	S_N_ER_3	
2016-208T04:27:00	2016-208T13:27:00	Canberra 70M		DFPW Normal	RTE_N_SPB	

# T121 TOST Master Timeline (2/2)

TOST T121

<b>238TI_T121</b>	976
-------------------	-----

Start Time	End Time	Prime Activity	Obs. Detail	Op Mode	TLM Mode	Comments
<b>2016-208T13:27:00</b>	<b>2016-208T14:07:00</b>	SP Turn to WP	NEG_Y to Titan, NEG_X to NTP	DFPW Normal	S_N_ER_3	
2016-208T14:07:00	2016-208T18:47:00	ISS	Cloud Monitoring Campaign (TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2016-208T18:47:00	2016-208T23:17:00	ISS	Cloud Monitoring Campaign (TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
2016-208T23:17:00	2016-209T00:17:00	ISS	Cloud Monitoring Campaign (TC1a, TC1b, TN1a, TN2c, TN2d)	DFPW Normal	S_N_ER_3	
<b>2016-209T00:17:00</b>	<b>2016-209T00:57:00</b>	SP Turn to Earth for downlink	XBAND to Earth, NEG_Y to Saturn, offset (0, 0, -9.5 deg)	DFPW Normal	S_N_ER_3	
2016-209T00:57:00	2016-209T02:27:00	Ybias window		DFPW Normal	S_N_ER_3	
<b>2016-209T02:27:00</b>	<b>2016-209T04:27:00</b>	Goldstone 70M		DFPW Normal	RTE_N_SPB	Dual playback for RADAR, -00:18 to +00:18
<b>2016-209T04:27:00</b>	<b>2016-209T13:27:00</b>	Canberra 34M		DFPW Normal	RTE_N_SPB	

# T121 TOST SPASS (1/2)

TOST T121

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S95, length = 74 days		2016-178T15:44:00		073T18:52:00	2016-252T10:36:00			
Titan Flyby T121 Segment		2016-206T23:27:00		002T14:00:00	2016-209T13:27:00			
SP_238TI_WAYPTTURN207_PRIME		2016-206T23:27:00		000T00:40:00	2016-207T00:07:00	NEG_Y to Titan	NEG_X to NTP	
<b>NEW WAYPOINT</b>		<b>2016-207T00:07:00</b>		<b>001T04:20:00</b>	<b>2016-208T04:27:00</b>	<b>NEG_Y to Titan</b>	<b>NEG_X to NTP</b>	
SP_238TI_DEADTIME207_PRIME		2016-207T00:07:00		000T00:08:43	2016-207T00:15:43	NEG_Y to Titan	NEG_X to NTP	
CIRS_238TI_MIRLMBINT002_PRIME	I, V	2016-207T00:15:43	GMB_E238_TITAN_T121-000T09:42:40	000T04:42:40	2016-207T04:58:23	CIRS_FP1 to Titan	PIC	
CIRS_238TI_FIRNADMAP001_PRIME	V	2016-207T04:58:23	GMB_E238_TITAN_T121-000T05:00:00	000T02:45:00	2016-207T07:43:23	CIRS_FP1 to Titan	PIC	
<b>Begin Custom Period</b>		<b>2016-207T07:43:23</b>	<b>GMB_E238_TITAN_T121-000T02:15:00</b>	<b>000T00:00:01</b>	<b>2016-207T07:43:24</b>			
VIMS_238TI_30HEROCC001_PRIME	I, M	2016-207T07:43:23	GMB_E238_TITAN_T121-000T02:15:00	000T01:09:00	2016-207T08:52:23	VIMS_IR to 247.16/41.882	NEG_X to NTP	Pick up at NEG_Y to Titan, NEG_X to NTP; Hand off at VIMS_IR to 247.16/41.882, NEG_X to NTP. Pick up at NEG_Y to Titan, NEG_X to NTP; handoff at VIMS_IR to 247.16/41.882, NEG_X to NTP
ENGR_238SC_RADRCS207_PRIME	M	2016-207T08:53:23	GMB_E238_TITAN_T121-000T01:05:00	000T00:01:00	2016-207T08:54:23	VIMS_IR to 247.16/41.882	NEG_X to NTP	Pick up at VIMS_IR to 247.16/41.882, NEG_X to NTP; Hand off at VIMS_IR to 247.16/41.882, NEG_X to NTP. Deadband = (0.5,0.5,2.0)
RADAR_238TI_T121IHSAR001_PRIME	M	2016-207T08:54:23	GMB_E238_TITAN_T121-000T01:04:00	000T00:34:00	2016-207T09:28:23	NEG_Z to Titan	NEG_X to NTP	Pick up at VIMS_IR to 247.16/41.882, NEG_X to NTP; Hand off at NEG_Z to Titan, NEG_X to NTP.
RADAR_238TI_T121INALT001_PRIME	M	2016-207T09:28:23	GMB_E238_TITAN_T121-000T00:30:00	000T00:12:00	2016-207T09:40:23	NEG_Z to Titan	NEG_X to Titan_SC_RAM	Pick up at NEG_Z to Titan, NEG_X to NTP; Hand off at NEG_Z to Titan, NEG_X to Titan_SC_RAM.
Begin Dual Playback Science		2016-207T09:40:23	GMB_E238_TITAN_T121-000T00:18:00	000T00:00:01	2016-207T09:40:24			
RADAR_238TI_T121IOSAR001_PRIME	M	2016-207T09:40:23	GMB_E238_TITAN_T121-000T00:18:00	000T00:36:00	2016-207T10:16:23	NEG_Z to Titan	NEG_X to Titan_SC_RAM	Pick up at NEG_Z to Titan, NEG_X to Titan_SC_RAM; Hand off at NEG_Z to Titan, NEG_X to Titan_SC_RAM.
238TI (t) T121 TITAN Outbound		2016-207T09:58:23		000T00:00:01	2016-207T09:58:24			
End Dual Playback Science		2016-207T10:16:23	GMB_E238_TITAN_T121+000T00:18:00	000T00:00:01	2016-207T10:16:24			
RADAR_238TI_T121OTALT001_PRIME	M	2016-207T10:16:23	GMB_E238_TITAN_T121+000T00:18:00	000T00:12:00	2016-207T10:28:23	NEG_Z to Titan	NEG_X to NTP	Pick up at NEG_Z to Titan, NEG_X to Titan_SC_RAM; Hand off at NEG_Z to Titan, NEG_X to NTP.
ENGR_238SC_RADRWBIAS207_PPS	M	2016-207T10:28:23	GMB_E238_TITAN_T121+000T00:30:00	000T00:22:00	2016-207T10:50:23	NEG_Z to Titan	NEG_X to NTP	Pick up at NEG_Z to Titan, NEG_X to NTP; Hand off at NEG_Z to Titan, NEG_X to NTP.
RADAR_238TI_T121OHSAR001_PRIME	M	2016-207T10:50:23	GMB_E238_TITAN_T121+000T00:52:00	000T00:45:00	2016-207T11:35:23	NEG_Z to Titan	NEG_X to NTP	Pick up at NEG_Z to Titan, NEG_X to NTP; Hand off at NEG_Z to Titan, NEG_X to NTP.
RADAR_238TI_T121OTSCT001_PRIME	M	2016-207T11:35:23	GMB_E238_TITAN_T121+000T01:37:00	000T00:38:00	2016-207T12:13:23	NEG_Z to Titan	NEG_X to NTP	Pick up at NEG_Z to Titan, NEG_X to NTP; Hand off at NEG_Y to Titan, NEG_X to NTP.
<b>End Custom Period</b>		<b>2016-207T12:13:23</b>	<b>GMB_E238_TITAN_T121+000T02:15:00</b>	<b>000T00:00:01</b>	<b>2016-207T12:13:24</b>			
VIMS_238TI_REGMAP001_PRIME	C, I	2016-207T12:13:23	GMB_E238_TITAN_T121+000T02:15:00	000T02:45:00	2016-207T14:58:23	VIMS_IR to Titan	NEG_X to NTP	No Preference to secondary pointing
VIMS_238TI_MEDRES001_PRIME	C, I	2016-207T14:58:23	GMB_E238_TITAN_T121+000T05:00:00	000T04:00:00	2016-207T18:58:23	VIMS_IR to Titan	NEG_X to NTP	Collaborative Rider(s): ISS. No Preference to secondary pointing
CIRS_238TI_FIRNADCMP002_PRIME	I, U, V	2016-207T18:58:23	GMB_E238_TITAN_T121+000T09:00:00	000T03:30:00	2016-207T22:28:23	CIRS_FP1 to Titan	PIC	
CIRS_238TI_MIDIRTMAP002_PRIME	I, V	2016-207T22:28:23	GMB_E238_TITAN_T121+000T12:30:00	000T05:03:37	2016-208T03:32:00	CIRS_FP1 to Titan	PIC	Template A2: CIRS-ISS
SP_238TI_DEADTIME208_PRIME		2016-208T03:32:00	GMB_E238_TITAN_T121+000T17:33:37	000T00:15:00	2016-208T03:47:00	NEG_Y to Titan	NEG_X to NTP	

# T121 TOST SPASS (2/2)

TOST T121

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
SP_238EA_DLTURN208_PRIME		2016-208T03:47:00		000T00:40:00	2016-208T04:27:00	XBAND to Earth (0,0,0,0,-9.5 deg. offset)	NEG_Y to Saturn	
<b>NEW WAYPOINT</b>		<b>2016-208T04:27:00</b>		<b>000T09:40:00</b>	<b>2016-208T14:07:00</b>	<b>XBAND to Earth (0,0,0,0,-9.5 deg. offset)</b>	<b>NEG_Y to Saturn</b>	
SP_238EA_C70METNON208_PRIME	C	2016-208T04:27:00		000T09:00:00	2016-208T13:27:00	XBAND to Earth (0,0,0,0,-9.5 deg. offset)	Rolling/SRU	MIMI.NEG_Y to Saturn (0,0,-9.5).SRU.
Pointer Reset in preparation for Dual PB		2016-208T13:27:00		000T00:00:01	2016-208T13:27:01			
SP_238TI_WAYPTTURN208_PRIME		2016-208T13:27:00		000T00:40:00	2016-208T14:07:00	NEG_Y to Titan	NEG_X to NTP	
<b>NEW WAYPOINT</b>		<b>2016-208T14:07:00</b>		<b>000T10:50:00</b>	<b>2016-209T00:57:00</b>	<b>NEG_Y to Titan</b>	<b>NEG_X to NTP</b>	
ISS_238TI_CLOUD001_PRIME	C, U, V	2016-208T14:07:00		000T04:40:00	2016-208T18:47:00	ISS_NAC to Titan	NEG_X to NTP	No Preference to secondary pointing
ISS_238TI_CLOUD002_PRIME	C, V	2016-208T18:47:00		000T04:30:00	2016-208T23:17:00	ISS_NAC to Titan	NEG_X to NTP	No Preference to secondary pointing
ISS_238TI_CLOUD003_PRIME	C, V	2016-208T23:17:00		000T01:00:00	2016-209T00:17:00	ISS_NAC to Titan	NEG_X to NTP	No Preference to secondary pointing
SP_238EA_DLTURN209_PRIME		2016-209T00:17:00		000T00:40:00	2016-209T00:57:00	XBAND to Earth (0,0,0,0,-9.5 deg. offset)	NEG_Y to Saturn	
<b>NEW WAYPOINT</b>		<b>2016-209T00:57:00</b>		<b>000T12:30:00</b>	<b>2016-209T13:27:00</b>	<b>XBAND to Earth (0,0,0,0,-9.5 deg. offset)</b>	<b>NEG_Y to Saturn</b>	
SP_238EA_YGAP209_PRIME	E	2016-209T00:57:00		000T01:30:00	2016-209T02:27:00	XBAND to Earth (0,0,0,0,-9.5 deg. offset)	NEG_Y to Saturn	
SP_238EA_G70METNON209_PRIME	C	2016-209T02:27:00		000T02:00:00	2016-209T04:27:00	XBAND to Earth (0,0,0,0,-9.5 deg. offset)	NEG_Y to Saturn	MIMI.NEG_Y to Saturn (0,0,-9.5).SRU.
SP_238EA_C34BWGNON209_PRIME	C	2016-209T04:27:00		000T09:00:00	2016-209T13:27:00	XBAND to Earth (0,0,0,0,-9.5 deg. offset)	Rolling/SRU	MIMI.NEG_Y to Saturn (0,0,-9.5).SRU.

# T121 TOST High-Priority Observations

TOST T121

T121: Summary of PIEs and Other High Priority Observations

Discipline	CIMS Request Name	Start Time	End Time	Flexibility in secondary pointing	Comments (e.g., pointing tolerance, uniqueness; relative priority)	Science Traceability Matrix Code(s)	Pointing designer POC
Titan	CIRS_238TI_MIRLMBINT002_PRIME	2016-207T00:16:23	2016-207T04:58:23	Significant Science Impact if Secondary Changed	Significant Impact to Science	TC1b or TN1c	Todd Ansty <tma22@cornell.edu>
Titan	VIMS_238TI_30HEROCC001_PRIME	2016-207T07:43:23	2016-207T08:55:23			TN1c	Todd Ansty <tma22@cornell.edu>
Titan	RADAR_238TI_T121HISAR001_PRIME	2016-207T08:55:23	2016-207T09:27:23	Flexible		TC1a, TN1a, TN1b, TN2b	Yanhua Anderson <yanhua.z.anderson@jpl.nasa.gov>
Titan	RADAR_238TI_T121INALT001_PRIME	2016-207T09:28:23	2016-207T09:40:23	Significant Science Impact if Secondary Changed	On Thrusters. INMS rides along so secondary necessary.	TN2b	Yanhua Anderson <yanhua.z.anderson@jpl.nasa.gov>
Titan	RADAR_238TI_T121IOSAR001_PRIME	2016-207T09:40:23	2016-207T10:16:23	Significant Science Impact if Secondary Changed	On Thrusters. Dual Playback data. INMS rides along so secondary necessary.	Tc1a, TN1a, TN1b, TN2b	Yanhua Anderson <yanhua.z.anderson@jpl.nasa.gov>
Titan	RADAR_238TI_T121OTALT001_PRIME	2016-207T10:16:23	2016-207T10:28:23	Significant Science Impact if Secondary Changed	On Thrusters. INMS rides along so secondary necessary.	TN2b	Yanhua Anderson <yanhua.z.anderson@jpl.nasa.gov>
Titan	RADAR_238TI_T121OHSAR001_PRIME	2016-207T10:50:23	2016-207T11:35:23	Flexible		TC1a, TN1a, TN1b, TN2b	Yanhua Anderson <yanhua.z.anderson@jpl.nasa.gov>



# TOST T121 Science Highlights (1/2)

TOST T121

July 24 (DOY 206) – CIRS kicks off the Titan campaign with vertical atmospheric mapping in the mid-infrared to detect and monitor seasonal changes in gas abundances of hydrocarbons and nitriles. This is followed by far-infrared inbound mapping of surface temperatures, that can affect the stability of surface liquids. ISS rides along to image Titan's surface and atmosphere at Titan's sub-Saturnian hemisphere at mid-southern latitudes over Tsegih.

July 25 (DOY 207) – VIMS continues the Titan campaign with an inbound stellar occultation observation, used to determine the composition of Titan's atmosphere and monitor current atmospheric dynamics. RADAR takes over as prime with inbound high-altitude SAR (new territory coverage, north of Hotei Arcus at ~80 deg W, 20 deg S) and altimetry.

At C/A, RADAR will perform right-look SAR over Hotei Arcus and left-look SAR near Tui Regio to further characterize putative cryovolcanic features and perform change detection from T43/T48. Left-look SAR continues over the Xanadu/Shangri-La boundary. INMS will ride along with the C/A SAR – T121 is one of the few equatorial Titan passes in the Solstice mission and this INMS data will help build the seasonal change picture at the Titan equator vs. mid and high latitudes.

On outbound, RADAR continues with altimetry, high-altitude SAR (new territory coverage: equatorial area near 170 deg W where putative “tropical lakes” or swamps have been suggested) and scatterometry.



# TOST T121 Science Highlights (2/2)

TOST T121

July 25 (DOY 207) continued – VIMS then takes over with regional mapping of Titan’s North Pole area. CIRS follows with 2-D mapping of atmospheric temperature and gas in the lower stratosphere, that add to the overall picture of changing atmospheric dynamics. These data are used to constrain photochemical and dynamical models of the atmosphere. ISS rides along with VIMS and CIRS on outbound to image Titan's surface and atmosphere at mid-northern latitudes on the anti-Saturnian hemisphere, at high phase angle.

Playback of the closest approach observation period data follows, taking place over the Canberra 70M downlink.

July 26 (DOY 208) – Playback of the closest approach observation period data continues. Following the playback, ISS will monitor Titan to track clouds and the evolution thereof as northern summer approaches. VIMS will ride along to look for clouds at mid-northern latitudes and will also acquire global views of the seas and lakes located at the North Pole. Dual Playback of the high-value RADAR SAR will occur over the Goldstone 70M downlink, followed by playback of DOY 208 ORS Titan cloud monitoring data over the subsequent Canberra 34M BWG downlink.

July 27 (DOY 209) – Playback continues over the Canberra 34M BWG downlink.

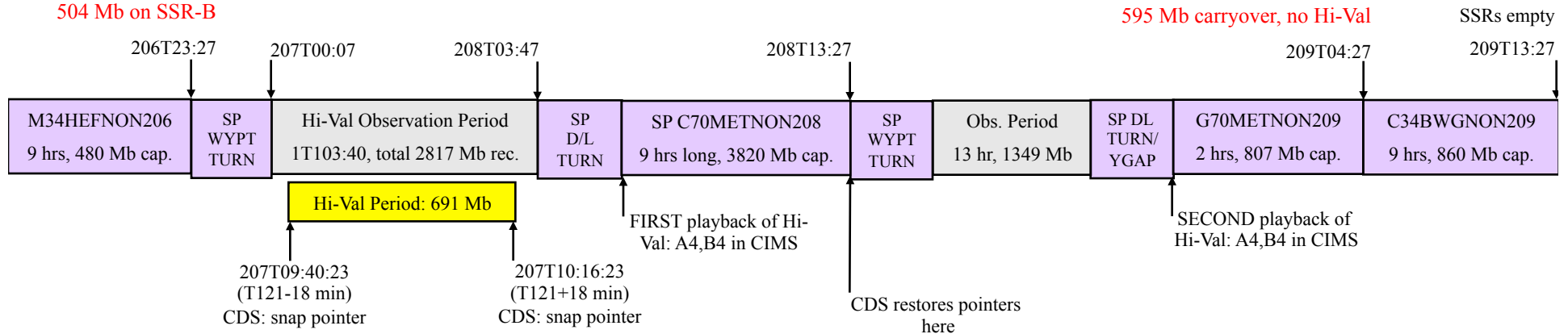
# T121 Dual Playback

TOST T121

Flyby	BEGHIVAL	ENDHIVAL	P4 Dual Playback Data Volume	SSR empty before hi-val observation period? <small>(if not verify any carryover on A fits with Hi-Val data)</small>	SSR-A empty after first playback?	PPL set to A4,B4 for first AND second playbacks?	SSRs empty after second playback? <small>(if not does any Hi-Val data carry over?)</small>
T121	T121-18 min	T121+18 min	691 Mb	<b>No</b> (SSR-A empty before Hi-Val starts)	Yes	Yes	<b>No</b> (no Hi-Val carryover)

## Playbacks NOT contiguous:

Saturn 238 carryover:  
504 Mb on SSR-B



Reminder - ALL instruments' data is played back twice during P4 dual playback periods

# Notes (1/2)

TOST T121

- Pointing:
  - Custom Period invoked to minimize turn times among instruments (VIMS/RADAR) at closest approach
  - CIRS consumable-level temperature violation:
    - RADAR C/A on RCS, per AACS TOST Pre-Assessment KPT Run analysis:
      - CIRS temperature rises to max of 83.02 K at 2016-207T10:17:12 (dT = 8.42 K).
      - NOTE: No VIMS temperature violations
    - CIRS agreed to accept consumable; RADAR agreed to submit waiver.
  - POS\_X to SUN angle decreases to minimum angle of 56.4 degrees (padded threshold is 85 degrees).  
CMT management required from 207T09:36:43 – 207T10:16:57, per AACS TOST Pre-Assessment KPT Run.
- Data Volume:
  - TOST agrees to 504 Mb carryover from preceding Saturn\_238 segment. No carryover to next segment.
  - Dual-Playback: SSR-A will be empty at start time of High-Value data collection (1357 Mb on SSR-B: 504 Mb from Saturn\_238 carryover and 853 Mb from T121 collected prior to High-Value data)
  - SMT Warnings (2: OK and expected):
    - RADAR\_235OT\_WU4RADCAL134\_RIDER: Found an activity whose data are NOT recorded in this telemetry mode "S\_N\_ER\_3" commanded at 2016-129T00:09:00.000. Volume of 8.523187 Mb not given data policing space – **OK and expected**: RADAR Warmup in S\_N\_ER\_5A for 1st 15 minutes
    - SP\_238EA\_C70METNON208\_PRIME, SP\_238EA\_G70METNON209\_PRIME: Priority List conflicts with selected SSR (SSR\_B) – **OK and expected**: Dual Playback strategy requires SSR\_A playback first.
- DSN:
  - DSS-63 extended maintenance from DOY 200-232
    - Not requested in T121: 2hr Dual Playback pass moved from DSS-63 to DSS-14, preceding caboose downlink.
  - AP\_Downlink Report Check Warnings (2: to be resolved in DSN negotiations):
    - SP\_238NA\_C70METNON208\_SP overlaps end of DSS-43 weekly maintenance by 75 minute(s)
    - SP\_238NA\_C34BWGNON209\_SP overlaps end of DSS-34 weekly maintenance by 95 minute(s)

# Notes (2/2)

TOST T121

- Resource checker:
  - SP\_238EA\_C70METNON208\_PRIME, SP\_238EA\_G70METNON209\_PRIME: First\_Part value of SSRAP4 does not match default of SSRBP4 Second\_Part value of SSRBP4 does not match default of SSRAP4 – **OK and expected**, correct configuration for Dual Playback
  - VIMS\_238TI\_30HEROCC001\_PRIME: Gap in Prime SPASS requests between VIMS\_238TI\_30HEROCC001\_PRIME and ENGR\_238SC\_RADRCS207\_PRIME. Gap of 000T00:01:00 is greater than or equal to 60 seconds. – **OK and intentional**, 60 second gap necessary to transition opmodes (from RADWU to RADRWA to RADRCS) to put RADAR in active high-power prior to high-SAR observation, while putting VIMS in sleep mode (for 1 min) after VIMS Occultation observation.
- Opmodes:
  - 2 Transitions to RADRWA, which require ISS/VIMS in sleep, UVIS no-HDAC, CDA no-articulation:
    - GMB-01:06:00 to GMB-01:05:00
    - GMB+00:30:00 to GMB+00:52:00
      - NOTE: No ORS during these durations
- Hydrazine:
  - KPT Estimate: 432 g (per L. Andrade analysis)
  - FSDS Estimate: 397 g
    - NOTE: Estimates are higher than TOST predicts due to SAR “Switch-hitting” (i.e. right-look to left-look)
  - Deadband (per RADAR): 0.5, 0.5, 2.0 mrad
- Special Activities:
  - CMT Management for POS\_X to Sun violation
  - Consumable for CIRS heating during RADAR SAR at C/A

# Liens

TOST T121

---

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

- CIRS heating violation; POS\_X to Sun CMT violation
  - SPLAT item initiated for RADAR to submit waiver for CIRS heating consumable and CMT management.
- T121 Dual Playback
  - SPLAT item initiated for SP to track viability of dual playback strategy following DSN negotiations.