Science Planning & Sequence Team — CASSINI

CASSINI TOST SEGMENT

Rev 207-T104 Handoff Package

Segment Boundary 2014-232T10:21:00 – 2014-234T13:21:00

6 Feb 2014

Jan Berkeley

SMT report and SPASS

Science Highlights

Notes & Liens

SMT report

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DATA VOLUME SUMMARY --- TRANSFER FRAME OVERHEAD INCLUDED (80 BITS PER 8800-BIT FRAME)
-------------------------------------------------------------------------------------------------------------------|
                                      |                  OBSERVATION_PERIOD              |           DOWNLINK_PASS            |
                                      |                                                 |                                   |
                                      |-------------------------------------------------|-----------------------------------|
                                      |                  P4                 |    P5      |  RECORDED   |      PLAYBACK        |
                                      |                                     |            |             |                     |
                         Start    End | START  SCI  HK+E  TOTAL CPACTY MRGN | OPNAV | SCI   ENGR | TOTAL CPACTY MARGN  NET_MARGN CAROVR|
   DOWNLINK PASS NAME    doy hh:mm doy hh:mm| (Mb)  (Mb)  (Mb)  (Mb)  (Mb)  (Mb) | (Mb)  | (Mb)  (Mb) | (Mb)  (Mb)   (Mb)   (Mb)  (%)  (Mb)|
-------------------------------------------------------------------------------------------------------------------|
SP_207EA_C70METNON234_PRIME 234 01:21 234 11:21   0  3055   175  3229  3322    93     0   194    59   3482   3543    61     61    2%     0 |
SP_207EA_M70METNON234_PRIME 234 11:21 234 13:21   0     0     0     0  3322  3322     0   529    12    541    429  -112      0    0%   112 |
-------------------------------------------------------------------------------------------------------------------|
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Saturn 207_208 will accept carryover

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S85, length = 67 days		2014-212T05:09:00		066T19:52:00	2014-279T01:01:00			
Titan Flyby T104 Segment		2014-232T10:21:00		002T03:00:00	2014-234T13:21:00			
SP_207TI_WAYPTTURN232_PRIME		2014-232T10:21:00		000T00:45:00	2014-232T11:06:00	NEG_Y to Titan (8.0,0.0,0.0 deg. offset)	POS_X to 316.0/13.6	
SP_207TI_DEADTIME232_PRIME		2014-232T11:06:00		000T00:09:59	2014-232T11:15:59	NEG_Y to Titan (8.0,0.0,0.0 deg. offset)	POS_X to 313.0/13.6	
CIRS_207TI_MIDIRTMAP001_PRIME	I, V	2014-232T11:15:59	GMB_E207_TITAN_T104-000T20:53:10	000T06:53:10	2014-232T18:09:09	CIRS_FPB to Titan	PIC	Collaborative Rider(s): ISS. Template M3?
ISS_207TI_MONITORNA001_PRIME	C, V	2014-232T18:09:09	GMB_E207_TITAN_T104-000T14:00:00	000T02:00:00	2014-232T20:09:09	ISS_NAC to Titan	No_Preference	No Preference to secondary pointing
CIRS_207TI_FIRNADCMP001_PRIME	I, U, V	2014-232T20:09:09	GMB_E207_TITAN_T104-000T12:00:00	000T03:00:00	2014-232T23:09:09	CIRS_FP1 to Titan	PIC	
VIMS_207TI_MEDRES001_PRIME	C, I	2014-232T23:09:09	GMB_E207_TITAN_T104-000T09:00:00	000T03:00:00	2014-233T02:09:09	VIMS_IR to Titan	No_Preference	No Preference to secondary pointing
RADAR_207TI_T104INRAD001_PRIME		2014-233T02:09:09	GMB_E207_TITAN_T104-000T06:00:00	000T03:45:00	2014-233T05:54:09	NEG_Z to Titan	NEG_Y to NTP	Use -Y to NTP and -X to NTP as secondary axis for two polarizations.
RADAR_207TI_T104INSCT001_PRIME	M	2014-233T05:54:09	GMB_E207_TITAN_T104-000T02:15:00	000T01:03:00	2014-233T06:57:09	NEG_Z to Titan	NEG_X to NTP	
RADAR_207TI_T104IHSAR001_PRIME	M	2014-233T06:57:09	GMB_E207_TITAN_T104-000T01:12:00	000T00:41:00	2014-233T07:38:09	NEG_Z to Titan	NEG_X to NTP	
ENGR_207SC_RADRCS233_PRIME	M	2014-233T07:38:09	GMB_E207_TITAN_T104-000T00:31:00	000T00:01:00	2014-233T07:39:09	NEG_Z to Titan	PIC	Deadband = (0.5, 0.5, 2.0)
RADAR_207TI_T104INALT001_PRIME	M	2014-233T07:39:09	GMB_E207_TITAN_T104-000T00:30:00	000T00:15:00	2014-233T07:54:09	NEG_Z to Titan	NEG_X to Titan_SC_RAM	
Begin Dual Playback Science		2014-233T07:54:09	GMB_E207_TITAN_T104-000T00:15:00	000T00:00:01	2014-233T07:54:10			
RADAR_207TI_T104RASAR001_PRIME	M	2014-233T07:54:09	GMB_E207_TITAN_T104-000T00:15:00	000T00:15:00	2014-233T08:09:09	NEG_X to Titan_SC_RAM	NEG_Z to Titan	Ride-along at c/a.
207TI (t) T104 TITAN Outbou…		2014-233T08:09:09		000T00:00:01	2014-233T08:09:10			
RADAR_207TI_T104OTSAR001_PRIME	M	2014-233T08:09:09	GMB_E207_TITAN_T104+000T00:00:00	000T00:18:00	2014-233T08:27:09	NEG_Z to Titan	NEG_X to Titan_SC_RAM	
End Dual Playback Science		2014-233T08:27:09	GMB_E207_TITAN_T104+000T00:18:00	000T00:00:01	2014-233T08:27:10			
RADAR_207TI_T104OTALT001_PRIME	M	2014-233T08:27:09	GMB_E207_TITAN_T104+000T00:18:00	000T00:21:00	2014-233T08:48:09	NEG_Z to Titan	POS_X to NTP	
ENGR_207SC_DFPWBIAS233_PPS	M, V	2014-233T08:48:09	GMB_E207_TITAN_T104+000T00:39:00	000T00:21:09	2014-233T09:09:18	VIMS_IR to Titan	NEG_X to NEP	Deadband=(2,2,20)
VIMS_207TI_REGMAP001_PRIME	C, I, M, U	2014-233T09:09:18	GMB_E207_TITAN_T104+000T01:00:09	000T01:14:51	2014-233T10:24:09	VIMS_IR to Titan	No_Preference	Collaborative Rider(s): ISS. No Preference to secondary pointing
VIMS_207TI_REGMAP002_PRIME	C, I, U	2014-233T10:24:09	GMB_E207_TITAN_T104+000T02:15:00	000T02:45:00	2014-233T13:09:09	VIMS_IR to Titan	No_Preference	No Preference to secondary pointing
VIMS_207TI_MEDRES002_PRIME	C	2014-233T13:09:09	GMB_E207_TITAN_T104+000T05:00:00	000T04:00:00	2014-233T17:09:09	VIMS_IR to Titan	No_Preference	No Preference to secondary pointing
CIRS_207TI_FIRNADCMP002_PRIME	I, U, V	2014-233T17:09:09	GMB_E207_TITAN_T104+000T09:00:00	000T03:00:00	2014-233T20:09:09	CIRS_FP1 to Titan	PIC	
ISS_207TI_MONITORNA002_PRIME	C, V	2014-233T20:09:09	GMB_E207_TITAN_T104+000T12:00:00	000T02:00:00	2014-233T22:09:09	ISS_NAC to Titan	No_Preference	No Preference to secondary pointing
CIRS_207TI_MIDIRTMAP002_PRIME	I, V	2014-233T22:09:09	GMB_E207_TITAN_T104+000T14:00:00	000T02:16:52	2014-234T00:26:01	CIRS_FPB to Titan	PIC	Template A2: CIRS-ISS
SP_207TI_DEADTIME234_PRIME		2014-234T00:26:01	GMB_E207_TITAN_T104+000T16:16:52	000T00:14:59	2014-234T00:41:00	CIRS_FPB to Titan	PIC	
SP_207EA_DLTURN234_PRIME		2014-234T00:41:00		000T00:40:00	2014-234T01:21:00	XBAND to Earth (0.0,0.0,-9.5 deg. offset)	NEG_Y to Saturn	
NEW WAYPOINT		2014-234T01:21:00		000T12:00:00	2014-234T13:21:00	XBAND to Earth (0.0,0.0,-9.5 deg. offset)	NEG_Y to Saturn	
SP_207EA_C70METNON234_PRIME	C	2014-234T01:21:00		000T10:00:00	2014-234T11:21:00	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
Pointer Reset in preparatio…		2014-234T11:21:00		000T00:00:01	2014-234T11:21:01			
SP_207EA_M70METNON234_PRIME	C	2014-234T11:21:00		000T02:00:00	2014-234T13:21:00	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

DOY 232 (August 20):

Inbound, CIRS focuses on mid- and far-infrared nadir integrations to measure the abundances of CO, H2O and HCN. ISS will acquire a mosaic of southern latitudes on Titan's sub-Saturnian hemisphere. Next, VIMS will take low resolution (150 km/pixel) images of the southern hemisphere while riding merrily along with ISS. During its prime observation, VIMS will acquire a mosaic of the southern hemisphere between the equator and 60 S and will monitor the evolution of the South polar vortex. Specular reflection geometry is at the equator and will be checked.
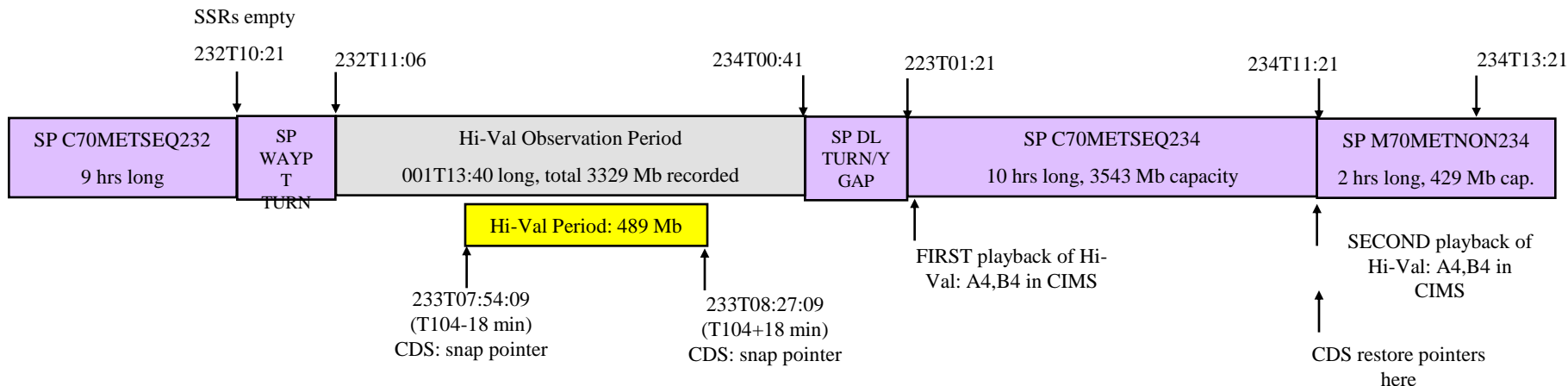
DOY 233 (August 21):
RADAR performs altimetry over most of the closest approach time. This will include altimetry over Kraken and estuary. Priority SAR over Ligeia is performed with precise care to image 'magic island' region and a new region of Kraken. INMS is prime inbound, riding with RADAR outbound, to perform ionospheric measurements. INMS compliments T100 in close temporal proximity and will allow direct comparisons of the noon and midnight regions for Titan relative to Saturn.. On the outbound, VIMS is prime after RADAR. It will monitor specular reflection on Kraken Mare to assess whether liquids are still present and if still liquid, whether winds create knarly waves. VIMS will also be looking for clouds at high northern latitudes and will map the northern pole area to monitor the evolution of the lakes and seas. Outbound ISS will acquire a mosaic of northern latitudes on Titan's trailing hemisphere approaching northern summer (multiple opportunities to observe northern latitudes are important in case of cloud activity).

Dual Playback

Flyby	BEGHIVAL	ENDHIVAL	P4 Dual Playback Data Volume	SSR empty before hi-val observation period? (if not verify any carryover on A fits with Hi-Val data)	SSR-A empty after first playback?	PPL set to A4,B4 for first AND second playbacks?	SSRs empty after second playback? (if not does any Hi-Val data carry over?)
T104	T104-18 min	T104+18 min	489 Mb	Yes	Yes	Yes	No (Yes 112 Mb)

Playbacks contiguous:

SSRs empty

232T10:21   232T11:06   234T00:41   223T01:21   234T11:21   234T13:21

| SP C70METSEQ232 9 hrs long | SP WAYPT TURN | Hi-Val Observation Period 001T13:40 long, total 3329 Mb recorded | SP DL TURN/Y GAP | SP C70METSEQ234 10 hrs long, 3543 Mb capacity | SP M70METNON234 2 hrs long, 429 Mb cap. |

Hi-Val Period: 489 Mb

233T07:54:09 (T104-18 min) CDS: snap pointer

233T08:27:09 (T104+18 min) CDS: snap pointer

FIRST playback of Hi-Val: A4,B4 in CIMS

SECOND playback of Hi-Val: A4,B4 in CIMS

CDS restore pointers here

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

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

Notes

- Pointing:
  - CIRS and VIMS temperature violations around c/a.
    - CIRS temperature rises from 74.6 deg K to 83.7 deg K (dT = 9 deg K).
    - VIMS temperature rises from 61.4 deg K to 64.5 deg K (dT = 3 deg K).
    - CIRS and VIMS to accept
  - POS_X to SUN angle dips down to a minimum angle of 23.87 deg (POS_X to SUN angle threshold is 83 deg.). RADAR to accept
  - Turn to waypoint > 40 minutes; dead time decreased to allow turn time.

- Data Volume:
  - Carryover of 112 Mb accepted by Saturn 207_208
  - Unusual priority playback tables due to dual playback

- DSN:
  - Overlap between C70/M70 stations on DOY 234 is shorter than usual; treated as two separate downlink blocks (5 minute playback delay on M70 downlink)

- Resource checker:
  - Dual playback warnings (acceptable)

- Opmodes:
  - No issues.

- Hydrazine:
  - KPT Estimate: 330.53 g (per L. Andrade analysis)
  - FSDS Estimate: 415.55 g
  - Deadband (per RADAR): (0.5, 0.5, 2.0)
  - Steps for walking deadband = 3

- Special Activities:
  - None

Liens

Sequence Liens (should all be SPLAT items):

- Dual playback for T104 (SPLAT item)

- CIRS/VIMS heating violations

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