



Science Planning & Sequence Team  
CASSINI

## **CASSINI TOST\_T123 SEGMENT**

**Rev 243 Handoff Package**

**Segment Boundary 2016-270T09:19:00 – 2016-273T09:18:00**

**18 Mar 2016**

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 T123

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

| DOWNLINK              | PASS  | NAME | Start     |       | End       |       | OBSERVATION_PERIOD |             |              |               |                | DOWNLINK_PASS |               |             |              |               |                |               |                  |                |     |
|-----------------------|-------|------|-----------|-------|-----------|-------|--------------------|-------------|--------------|---------------|----------------|---------------|---------------|-------------|--------------|---------------|----------------|---------------|------------------|----------------|-----|
|                       |       |      | doy hh:mm |       | doy hh:mm |       | START<br>(Mb)      | SCI<br>(Mb) | HK+E<br>(Mb) | TOTAL<br>(Mb) | CPACTY<br>(Mb) | MRGN<br>(Mb)  | OPNAV<br>(Mb) | RECORDED    |              | PLAYBACK      |                |               |                  |                |     |
|                       |       |      |           |       |           |       |                    |             |              |               |                |               |               | SCI<br>(Mb) | ENGR<br>(Mb) | TOTAL<br>(Mb) | CPACTY<br>(Mb) | MARGN<br>(Mb) | NET_MARGN<br>(%) | CAROVR<br>(Mb) |     |
| SP_243EA_C70METNON272 | PRIME |      | 272       | 00:18 | 272       | 10:18 | 0                  | 3105        | 165          | 3270          | 3322           | 52            | 0             | 223         | 59           | 3551          | 3569           | 17            | 27               | 1%             | 0   |
| SP_243EA_G70METNON272 | PRIME |      | 272       | 21:48 | 273       | 00:18 | 0                  | 969         | 49           | 1017          | 3322           | 2305          | 0             | 48          | 15           | 1080          | 821            | -259          | 9                | 1%             | 259 |
| SP_243EA_C34BWGNON273 | PRIME |      | 273       | 00:18 | 273       | 09:18 | 259                | 0           | 0            | 259           | 3322           | 3063          | 0             | 361         | 53           | 672           | 681            | 8             | 9                | 1%             | 0   |

SSR PARTITION SIZE SUMMARY - SELECTED SSR CONFIGURATION: DOUBLE

| OBSERVATION PERIOD    | SSR A/B             |                     |                     |
|-----------------------|---------------------|---------------------|---------------------|
|                       | P4 Size<br>(Frames) | P5 Size<br>(Frames) | P6 Size<br>(Frames) |
| SP_243NA_OBSERV270_NA | 188954              | 10                  | 38863               |
| SP_243NA_OBSERV272_NA | 188954              | 10                  | 38863               |

DATA VOLUME REPORT --- TRANSFER FRAME OVERHEAD NOT INCLUDED

| Event                 | Start<br>doy hh:mm | End<br>doy hh:mm | CAPS<br>(Mb) | CDA<br>(Mb) | CIRS<br>(Mb) | INMS<br>(Mb) | ISS<br>(Mb) | MAG<br>(Mb) | MIMI<br>(Mb) | RADAR<br>(Mb) | RPWS<br>(Mb) | UVIS<br>(Mb) | VIMS<br>(Mb) | PROBE<br>(Mb) | ENGR<br>(Mb) | TOTAL<br>(Mb) |
|-----------------------|--------------------|------------------|--------------|-------------|--------------|--------------|-------------|-------------|--------------|---------------|--------------|--------------|--------------|---------------|--------------|---------------|
| OBSERVATION_NOR       | 270 09:19          | 272 00:18        | 0.0          | 73.5        | 466.2        | 24.1         | 490.0       | 112.0       | 128.6        | 0.0           | 1170.4       | 266.7        | 345.0        | 0.0           | 162.9        | 3239.6        |
| SP_243EA_C70METNON272 | PRIME              | 272 00:18        | 272 10:18    | 0.0         | 18.9         | 97.2         | 3.6         | 0.0         | 17.8         | 30.6          | 0.0          | 47.2         | 5.5          | 0.0           | 0.0          | 220.7         |
| DAILY TOTAL SCIENCE   | 270 09:19          | 272 10:18        | 0.0          | 92.4        | 563.4        | 27.7         | 490.0       | 129.8       | 159.2        | 0.0           | 1217.6       | 272.2        | 345.0        | 0.0           | 162.9        |               |
| OBSERVATION_NOR       | 272 10:18          | 272 21:48        | 0.0          | 21.7        | 0.0          | 4.1          | 350.0       | 20.5        | 35.2         | 0.0           | 54.2         | 7.2          | 25.0         | 0.0           | 490.2        | 1008.1        |
| SP_243EA_G70METNON272 | PRIME              | 272 21:48        | 273 00:18    | 0.0         | 4.7          | 16.2         | 0.9         | 0.0         | 4.4          | 7.6           | 0.0          | 11.8         | 1.4          | 0.0           | 0.0          | 47.1          |
| SP_243EA_C34BWGNON273 | PRIME              | 273 00:18        | 273 09:18    | 0.0         | 17.0         | 97.2         | 3.2         | 0.0         | 16.0         | 27.5          | 0.0          | 191.6        | 4.9          | 0.0           | 0.0          | 357.5         |
| DAILY TOTAL SCIENCE   | 272 10:18          | 273 09:18        | 0.0          | 43.4        | 113.4        | 8.3          | 350.0       | 40.9        | 70.4         | 0.0           | 257.6        | 13.6         | 25.0         | 0.0           | 490.2        |               |

|  | CAPS<br>(Mb) | CDA<br>(Mb) | CIRS<br>(Mb) | INMS<br>(Mb) | ISS<br>(Mb) | MAG<br>(Mb) | MIMI<br>(Mb) | RADAR<br>(Mb) | RPWS<br>(Mb) | UVIS<br>(Mb) | VIMS<br>(Mb) | PROBE<br>(Mb) |
|--|--------------|-------------|--------------|--------------|-------------|-------------|--------------|---------------|--------------|--------------|--------------|---------------|
| TOTAL RECORDED (OPNAV data not included) | 0.0          | 135.8       | 676.8        | 36.0         | 840.0       | 170.7       | 229.6        | 0.0           | 1475.2       | 285.8        | 370.0        | 0.0           |

# T123 TOST Master Timeline

TOST T123

|            |      |
|------------|------|
| 243TI T123 | 1774 |
|------------|------|

| Start Time        | End Time          | Prime Activity                | Obs. Detail   | Op Mode     | TLM Mode  | Comments                                     |
|-------------------|-------------------|-------------------------------|---|-------------|-----------|--|
| 2016-270T09:19:00 | 2016-270T09:59:00 | SP Turn to WP                 | NEG_Y to Titan, NEG_X to Sun                                    | DFPW Normal | S_N_ER_3  |  |
| 2016-270T09:59:00 | C/A-18:09:01      | OD Uncertainty Dead Time      |   | DFPW Normal | S_N_ER_3  |  |
| C/A-18:09:01      | -14:00            | CIRS Mid-IR T-MAP             | A3 (TN1c)   | DFPW Normal | S_N_ER_3  | ISS Collaborative Rider                      |
| -14:00            | -09:00            | VIMS GLOBMAP                  | V (TC1a, TC1b)  | DFPW Normal | S_N_ER_3  |  |
| -09:00            | -02:15            | UVIS EUVFUV                   | X (TN1c, TC1a)  | DFPW Normal | S_N_ER_3  |  |
| -02:15            | -00:53            | VIMS REGMAP                   | (TC1a, TN1a (depending on pointing), TN2c)                      | DFPW Normal | S_N_ER_3  |  |
| -00:53            | -00:20            | VIMS OCC: -00:43 to -00:30    | TC1a  | DFPW Normal | S_N_ER_3  |  |
| -00:20            | 0                 | VIMS HIRES                    | TN1a  | DFPW Normal | S_N_ER_3  |  |
| 2016-271T04:16:59 |                   | CLOSEST APPROACH              | NEG_Y to Titan (TC2a)   | DFPW Normal | S_N_ER_3  | Hotel at 5 km/pixel                          |
| 0                 | +00:15            | VIMS HIRES                    | VIMS turn to CIRS attitude                                      | DFPW Normal | S_N_ER_3  |  |
| +00:15            | +00:45            | CIRS Far-IR Limb              | (TN1c)  | DFPW Normal | S_N_ER_3  |  |
| +00:45            | +01:15            | CIRS Far-IR Limb              | (TN1c)  | DFPW Normal | S_N_ER_3  |  |
| +01:15            | +02:15            | CIRS Far-IR Limb              | (TN1c)  | DFPW Normal | S_N_ER_3  |  |
| +02:15            | +09:00            | UVIS EUVFUV                   | X (TN1c, TC1a)  | DFPW Normal | S_N_ER_3  |  |
| +09:00            | C/A+17:36:01      | VIMS GLOBMAP                  | O (TC1a, TC1b, CIRS rider (TN1a))                               | DFPW Normal | S_N_ER_3  |  |
| C/A+17:36:01      | 2016-271T22:08:00 | OD Uncertainty Dead Time      |   | DFPW Normal | S_N_ER_3  |  |
| 2016-271T22:08:00 | 2016-271T22:48:00 | SP Turn to Earth for downlink | XBAND to Earth, NEG_Y to Saturn<br>Offset: (0.0, 0.0, -9.5 deg) | DFPW Normal | S_N_ER_3  |  |
| 2016-271T22:48:00 | 2016-272T00:18:00 | Y-Bias window                 |   | DFPW Normal | S_N_ER_3  |  |
| 2016-272T00:18:00 | 2016-272T10:18:00 | Canberra 70M                  |   | DFPW Normal | RTE_N_SPB |  |
| 2016-272T10:18:00 | 2016-272T10:58:00 | SP Turn to WP                 | NEG_Y to Titan, NEG_X to NTP                                    | DFPW Normal | S_N_ER_3  |  |
| 2016-272T10:58:00 | 2016-272T14:58:00 | ISS CLOUD                     | Cloud Monitoring Campaign (TC1a, TC1b, TN1a, TN2c, TN2d)        | DFPW Normal | S_N_ER_3  |  |
| 2016-272T14:58:00 | 2016-272T18:38:00 | ISS CLOUD                     | Cloud Monitoring Campaign (TC1a, TC1b, TN1a, TN2c, TN2d)        | DFPW Normal | S_N_ER_3  |  |
| 2016-272T18:38:00 | 2016-272T19:38:00 | ISS CLOUD                     | Cloud Monitoring Campaign (TC1a, TC1b, TN1a, TN2c, TN2d)        | DFPW Normal | S_N_ER_3  |  |
| 2016-272T19:38:00 | 2016-272T20:18:00 | SP Turn to Earth for downlink | XBAND to Earth, NEG_Y to Saturn<br>Offset: (0.0, 0.0, -9.5 deg) | DFPW Normal | S_N_ER_3  |  |
| 2016-272T20:18:00 | 2016-272T21:48:00 | Ybias window                  |   | DFPW Normal | S_N_ER_3  |  |
| 2016-272T21:48:00 | 2016-273T00:18:00 | Goldstone 70M                 |   | DFPW Normal | RTE_N_SPB | Dual playback for VIMS occ, -00:53 to +00:15 |
| 2016-273T00:18:00 | 2016-273T09:18:00 | Canberra 34M                  |   | DFPW Normal | RTE_N_SPB |  |

# T123 TOST SPASS

TOST T123

| Request                                 | Riders  | Start (SCET)      | Start (Epoch)                    | Duration     | End (SCET)        | Primary                                   | Secondary       | Comments  |
|---|---------|-------------------|----------------------------------|--------------|-------------------|---|-----------------|---|
| Sequence S96, length = 76 days          |         | 2016-252T10:36:00 |                                  | 075T19:07:00 | 2016-328T05:43:00 |   |                 |   |
| Titan Flyby T123 Segment                |         | 2016-270T09:19:00 |                                  | 002T23:59:00 | 2016-273T09:18:00 |   |                 |   |
| SP_243TI_WAYPTTURN270_PRIME             |         | 2016-270T09:19:00 |                                  | 000T00:40:00 | 2016-270T09:59:00 | NEG_Y to Titan                            | NEG_X to Sun    |   |
| NEW WAYPOINT                            |         | 2016-270T09:59:00 |                                  | 001T12:49:00 | 2016-271T22:48:00 | NEG_Y to Titan                            | NEG_X to Sun    |   |
| SP_243TI_DEADTIME270_PRIME              |         | 2016-270T09:59:00 |                                  | 000T00:08:58 | 2016-270T10:07:58 | NEG_Y to Titan                            | NEG_X to Sun    |   |
| CIRS_243TI_MIDIRTMAP001_PRIME           | I, V    | 2016-270T10:07:58 | GMB_E243_TITAN_T123-000T18:09:01 | 000T04:09:01 | 2016-270T14:16:59 | CIRS_FP to Titan                          | PIC             | Collaborative Rider(s): ISS. Template A2: CIRS-ISS  |
| VIMS_243TI_GLOBMAP001_PRIME             | C, I    | 2016-270T14:16:59 | GMB_E243_TITAN_T123-000T14:00:00 | 000T05:00:00 | 2016-270T19:16:59 | VIMS_IR to Titan                          | NEG_X to Sun    | No Preference to secondary pointing   |
| UVIS_243TI_EUVFUV001_PRIME              | C, I, V | 2016-270T19:16:59 | GMB_E243_TITAN_T123-000T09:00:00 | 000T06:45:00 | 2016-271T02:01:59 | UVIS_FUV to Titan                         | NEG_X to Sun    |   |
| Begin Custom Period                     |         | 2016-271T02:01:59 | GMB_E243_TITAN_T123-000T02:15:00 | 000T00:00:01 | 2016-271T02:02:00 |   |                 |   |
| VIMS_243TI_REGMAP001_PRIME              | C, I, M | 2016-271T02:01:59 | GMB_E243_TITAN_T123-000T02:15:00 | 000T01:22:00 | 2016-271T03:23:59 | VIMS_IR to Titan                          | NEG_X to Sun    | No Preference to secondary pointing. Pick up at NEG_Y to Titan, NEG_X to Sun; Hand off at NEG_Y to Titan, NEG_X to Sun. No Preference to secondary pointing                   |
| Begin Dual Playback Science             |         | 2016-271T03:23:59 | GMB_E243_TITAN_T123-000T00:53:00 | 000T00:00:01 | 2016-271T03:24:00 |   |                 |   |
| VIMS_243TI_ALPBOCC001_PRIME             | C, I, M | 2016-271T03:23:59 | GMB_E243_TITAN_T123-000T00:53:00 | 000T00:33:00 | 2016-271T03:56:59 | VIMS_IR to 213.915/19.183                 | PIC             | Pick up at NEG_Y to Titan, NEG_X to Sun; Hand off at VIMS_IR to 213.915/19.183, NEG_X to Sun.   |
| VIMS_243TI_HIRES001_PRIME               | C, I, M | 2016-271T03:56:59 | GMB_E243_TITAN_T123-000T00:20:00 | 000T00:35:00 | 2016-271T04:31:59 | VIMS_IR to Titan                          | NEG_X to Sun    | No Preference to secondary pointing. Pick up at VIMS_IR to 213.915/19.183, NEG_X to Sun; Hand off at NEG_Y to Titan, NEG_X to 141.0/24.0. No Preference to secondary pointing |
| 243TI (t) T123 TITAN Outbound           |         | 2016-271T04:16:59 |                                  | 000T00:00:01 | 2016-271T04:17:00 |   |                 |   |
| End Dual Playback Science               |         | 2016-271T04:31:59 | GMB_E243_TITAN_T123+000T00:15:00 | 000T00:00:01 | 2016-271T04:32:00 |   |                 |   |
| CIRS_243TI_FIRLMBT002_PRIME             | M, V    | 2016-271T04:31:59 | GMB_E243_TITAN_T123+000T00:15:00 | 000T00:30:00 | 2016-271T05:01:59 | CIRS_FP1 to Titan                         | PIC             | Pick up at NEG_Y to Titan, NEG_X to 141.0/24.0; Hand off at CIRS_FP1 to Titan, PIC.   |
| CIRS_243TI_FIRLMBT002_PRIME             | M, V    | 2016-271T05:01:59 | GMB_E243_TITAN_T123+000T00:45:00 | 000T00:30:00 | 2016-271T05:31:59 | CIRS_FP1 to Titan                         | PIC             | Pick up at CIRS_FP1 to Titan, PIC; Hand off at CIRS_FP1 to Titan, PIC.  |
| CIRS_243TI_FIRLMBWTR001_PRIME           | M, V    | 2016-271T05:31:59 | GMB_E243_TITAN_T123+000T01:15:00 | 000T01:00:00 | 2016-271T06:31:59 | CIRS_FP1 to Titan                         | PIC             | Pick up at CIRS_FP1 to Titan, PIC; Hand off at NEG_Y to Titan, NEG_X to Sun.  |
| End Custom Period                       |         | 2016-271T06:31:59 | GMB_E243_TITAN_T123+000T02:15:00 | 000T00:00:01 | 2016-271T06:32:00 |   |                 |   |
| UVIS_243TI_EUVFUV002_PRIME              | C, I, V | 2016-271T06:31:59 | GMB_E243_TITAN_T123+000T02:15:00 | 000T06:45:00 | 2016-271T13:16:59 | UVIS_FUV to Titan                         | NEG_X to Sun    |   |
| VIMS_243TI_GLOBMAP002_PRIME             | C, I    | 2016-271T13:16:59 | GMB_E243_TITAN_T123+000T09:00:00 | 000T08:36:01 | 2016-271T21:53:00 | VIMS_IR to Titan                          | NEG_X to Sun    | No Preference to secondary pointing   |
| SP_243TI_DEADTIME271_PRIME              |         | 2016-271T21:53:00 | GMB_E243_TITAN_T123+000T17:36:01 | 000T00:15:00 | 2016-271T22:08:00 | NEG_Y to Titan                            | NEG_X to Sun    |   |
| SP_243EA_DLTURN271_PRIME                |         | 2016-271T22:08:00 |                                  | 000T00:40:00 | 2016-271T22:48:00 | XBAND to Earth (0.0,0.0,-9.5 deg. offset) | NEG_Y to Saturn |   |
| NEW WAYPOINT                            |         | 2016-271T22:48:00 |                                  | 000T12:10:00 | 2016-272T10:58:00 | XBAND to Earth (0.0,0.0,-9.5 deg. offset) | NEG_Y to Saturn |   |
| SP_243EA_YGAP271_PRIME                  | E       | 2016-271T22:48:00 |                                  | 000T01:30:00 | 2016-272T00:18:00 | XBAND to Earth (0.0,0.0,-9.5 deg. offset) | NEG_Y to Saturn |   |
| SP_243EA_C70METNON272_PRIME             | C       | 2016-272T00:18:00 |                                  | 000T10:00:00 | 2016-272T10:18:00 | XBAND to Earth (0.0,0.0,-9.5 deg. offset) | NEG_Y to Saturn | MIMI.NEG_Y to Saturn (0.0,-9.5).  |
| Pointer Reset in preparation of Dual PB |         | 2016-272T10:18:00 |                                  | 000T00:00:01 | 2016-272T10:18:01 |   |                 |   |
| SP_243TI_WAYPTTURN272_PRIME             |         | 2016-272T10:18:00 |                                  | 000T00:40:00 | 2016-272T10:58:00 | NEG_Y to Titan                            | NEG_X to NTP    |   |
| NEW WAYPOINT                            |         | 2016-272T10:58:00 |                                  | 000T09:20:00 | 2016-272T20:18:00 | NEG_Y to Titan                            | NEG_X to NTP    |   |
| ISS_243TI_CLOUD001_PRIME                | U, V    | 2016-272T10:58:00 |                                  | 000T04:00:00 | 2016-272T14:58:00 | ISS_NAC to Titan                          | NEG_X to NTP    | No Preference to secondary pointing   |
| ISS_243TI_CLOUD002_PRIME                | V       | 2016-272T14:58:00 |                                  | 000T03:40:00 | 2016-272T18:38:00 | ISS_NAC to Titan                          | NEG_X to NTP    | No Preference to secondary pointing   |
| ISS_243TI_CLOUD003_PRIME                | V       | 2016-272T18:38:00 |                                  | 000T01:00:00 | 2016-272T19:38:00 | ISS_NAC to Titan                          | NEG_X to NTP    | No Preference to secondary pointing   |
| SP_243EA_DLTURN272_PRIME                |         | 2016-272T19:38:00 |                                  | 000T00:40:00 | 2016-272T20:18:00 | XBAND to Earth (0.0,0.0,-9.5 deg. offset) | NEG_Y to Saturn |   |
| NEW WAYPOINT                            |         | 2016-272T20:18:00 |                                  | 000T13:00:00 | 2016-273T09:18:00 | XBAND to Earth (0.0,0.0,-9.5 deg. offset) | NEG_Y to Saturn |   |
| SP_243EA_YGAP272_PRIME                  | E       | 2016-272T20:18:00 |                                  | 000T01:30:00 | 2016-272T21:48:00 | XBAND to Earth (0.0,0.0,-9.5 deg. offset) | NEG_Y to Saturn |   |
| SP_243EA_G70METNON272_PRIME             | C       | 2016-272T21:48:00 |                                  | 000T02:30:00 | 2016-273T00:18:00 | XBAND to Earth (0.0,0.0,-9.5 deg. offset) | NEG_Y to Saturn | MIMI.NEG_Y to Saturn (0.0,-9.5).  |
| SP_243EA_C34BWGNON273_PRIME             | C       | 2016-273T00:18:00 |                                  | 000T09:00:00 | 2016-273T09:18:00 | XBAND to Earth (0.0,0.0,-9.5 deg. offset) | NEG_Y to Saturn | MIMI.NEG_Y to Saturn (0.0,-9.5).  |
| Apoapse: Per = 9.6 d                    |         | 2016-273T05:34:16 |                                  | 000T00:00:01 | 2016-273T05:34:17 |   |                 |   |

# T123 TOST High-Priority Observations

TOST T123

| T123 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   | VIMS_243TI_REGMAP001_PRIME    | 2016-271T02:01:59 | 2016-271T03:23:59 | Flexible  |  | TC1a, TN1a, TN2c                    | Edward Audi<br><edaudi@lpl.arizona.edu> |
| Titan   | VIMS_243TI_ALPBOOCC001_PRIME  | 2016-271T03:23:59 | 2016-271T03:56:59 | Flexible  | Dual Playback data   | TC1a                                | Todd Ansty<br><tma22@cornell.edu>       |
| Titan   | VIMS_243TI_HIRES001_PRIME     | 2016-271T03:56:59 | 2016-271T04:31:59 | Flexible  | Dual Playback data   | TN1a                                | Edward Audi<br><edaudi@lpl.arizona.edu> |
| Titan   | CIRS_243TI_FIRLMBT002_PRIME   | 2016-271T04:31:59 | 2016-271T05:01:59 | Significant Science Impact if Secondary Changed | Significant Impact to Science                                      | TN1c                                | Todd Ansty<br><tma22@cornell.edu>       |
| Titan   | CIRS_243TI_FIRLMBAR002_PRIME  | 2016-271T05:01:59 | 2016-271T05:31:59 | Significant Science Impact if Secondary Changed | Significant Impact to Science                                      | TN1c                                | Todd Ansty<br><tma22@cornell.edu>       |
| Titan   | CIRS_243TI_FIRLMBWTR002_PRIME | 2016-271T05:31:59 | 2016-271T06:31:59 | Significant Science Impact if Secondary Changed | Significant Impact to Science                                      | TN1c                                | Todd Ansty<br><tma22@cornell.edu>       |

September 26 (DOY 270) – CIRS kicks off the Titan-123 flyby campaign with hemispheric temperature mapping in the mid-infrared in order to monitor Titan's changing seasons, thus giving insights into the stratospheric circulation. VIMS takes over as prime to monitor cloud activity as well as the evolution of the south polar vortex. UVIS follows with an inbound EUVFUV observation to measure nitrogen emission features, aerosol scattering, and gaseous absorption features, and will contribute to latitude and seasonal coverage of Titan's middle atmosphere and stratosphere. ISS will ride along with CIRS, VIMS, and UVIS inbound to image Titan's surface and atmosphere over Titan's sub-Saturnian and leading hemisphere at mid-southern latitudes over Tsegihi.

September 27 (DOY 271) – Following UVIS, VIMS will observe an Arcturus ingress occultation that will provide information on the atmospheric composition and its evolution. After the occultation, VIMS will take a high-resolution image of an area on Xanadu at closest approach, using a relatively-new “noodle”-sweep technique to gain improved resolution. After closest approach into outbound, CIRS will make detailed scans of Titan's atmospheric limb near 50N revealing the vertical structure of temperature and trace gas abundances, such as hydrocarbons and nitriles. These valuable data will be used for comparison with observations of equivalent southern latitudes, which are currently experiencing late Fall (south) instead of spring (north). They will also be compared to views of the north earlier in the mission. UVIS follows with an outbound EUVFUV observation to again measure nitrogen emission features, aerosol scattering, and gaseous absorption features. VIMS will ride along with UVIS and will look for specular reflection on Titan seas to monitor the evolution of the liquid hydrocarbon reservoirs. Finally, ISS will also ride along with CIRS, VIMS, and UVIS outbound to image Titan's surface and atmosphere over Titan's anti-Saturnian hemisphere at mid-northern latitudes.

September 27 (DOY 271) continued – T123 has MAPS objectives as well. MAG will explore the sector of the magnetic tail facing away from Saturn. MIMI will measure energetic ion and electron energy input to Titan's atmosphere. Finally, RPWS will measure thermal plasmas in Titan's ionosphere and surrounding environment, search for lightning in Titan's atmosphere, and investigate the interaction of Titan with Saturn's atmosphere.

September 28 (DOY 272) – Playback of the closest approach observation period data will occur over the Canberra 70M downlink. Following the downlink, ISS will monitor Titan to track clouds and the evolution thereof as northern summer approaches. VIMS will also ride along to monitor the evolution of the North Pole area, and look for clouds at high northern latitudes. Dual Playback of the high-value VIMS closest-approach data will occur over the Goldstone 70M downlink.

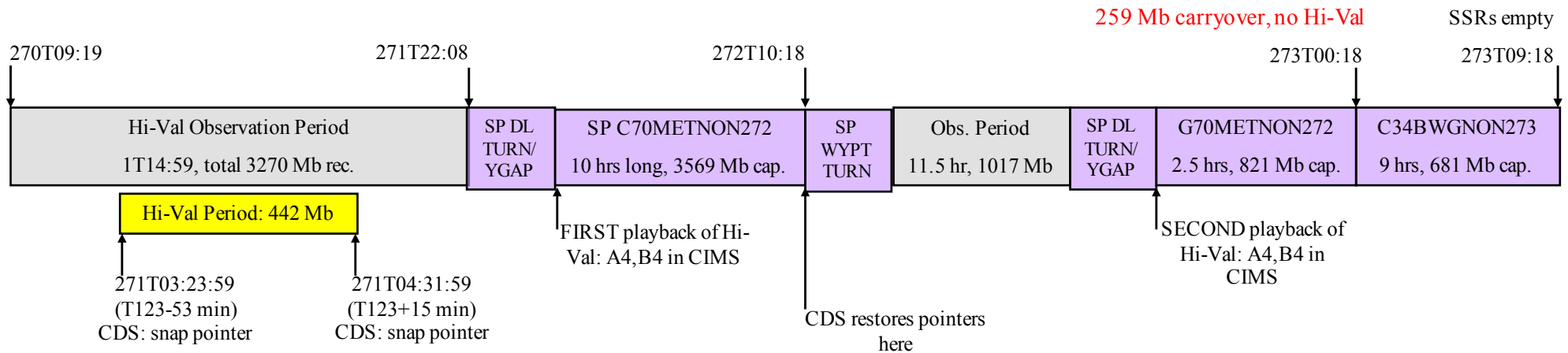
September 29 (DOY 273) – Playback continues on the Goldstone 70M downlink, followed immediately by playback of caboose cloud-monitoring data over the Canberra 34M BWG downlink.

# T123 Dual Playback

TOST T123

| Flyby | BEGHIVAL    | ENDHIVAL    | P4 Dual Playback Data Volume | SSR empty before hi-val observation period?<br><br>(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?) |
|-------|-------------|-------------|------------------------------|---|-----------------------------------|--|---|
| T123  | T123-53 min | T123+15 min | 442 Mb                       | Yes   | Yes                               | Yes  | <b>No</b> (no Hi-Val carryover)   |

## Playbacks NOT contiguous:



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



# Notes (1/2)

TOST T123

- Pointing:
  - Custom Period invoked to minimize turn time between VIMS and CIRS at closest approach.
  - Waypoint secondaries chosen for science, but close to RBOT-friendly RA/DECs.
  - Apoapse in segment: AACS “2 of 3” Rule met – no D/L or MAG rolls in segment.
- Data Volume:
  - No carryover to next segment.
  - SMT warnings:
    - SP\_243EA\_C70METNON272\_PRIME: Priority List conflicts with selected SSR (SSR\_B) – OK and expected. Dual Playback strategy requires SSR\_A playback first.
    - SP\_243EA\_G70METNON272\_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 242-274
    - Not requested in T123: 2.5hr Dual Playback pass moved from DSS-63 to DSS-14, preceding caboose downlink.
  - AP\_Downlink report check warnings:
    - SP\_243EA\_C70METNON272\_PRIME has an unusual priority playback list – OK and expected. Dual Playback strategy requires SSR\_A playback first.
    - SP\_243EA\_G70METNON272\_PRIME has an unusual priority playback list – OK and expected. Dual Playback strategy requires SSR\_A playback first.

- Resource checker (4 items):
  - SP\_243EA\_C70METNON272\_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. Dual Playback strategy requires SSR\_A playback first.
  - SP\_243EA\_C70METNON272\_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. Dual Playback strategy requires SSR\_A playback first.
  - CIRS\_243TI\_FIRLMBT002\_PRIME: Custom period request is using PIC in secondary BV of handoff pointing – OK, CIRS picking up/handing off to self.
  - CIRS\_243TI\_FIRLMBAER002\_PRIME: Custom period request is using PIC in secondary BV of handoff pointing – OK, CIRS picking up/handing off to self.
- Opmodes:
  - ORS only – no issues.
- Hydrazine:
  - No RCS, not applicable.
- Special Activities:
  - Dual Playback for VIMS

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

- T123 Dual Playback
  - SPLAT item initiated for SP to track viability of dual playback strategy following DSN negotiations.