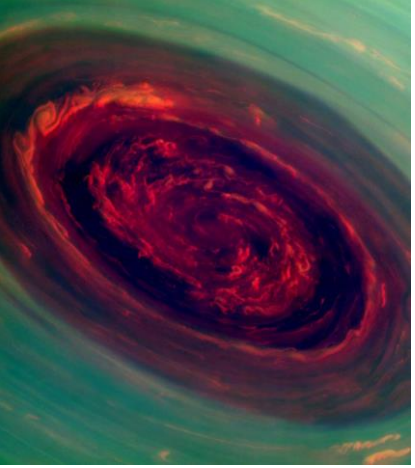

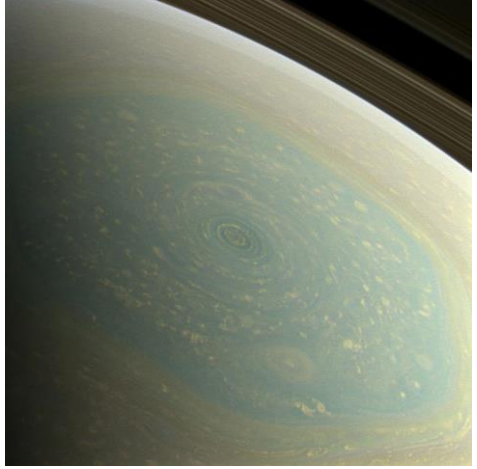
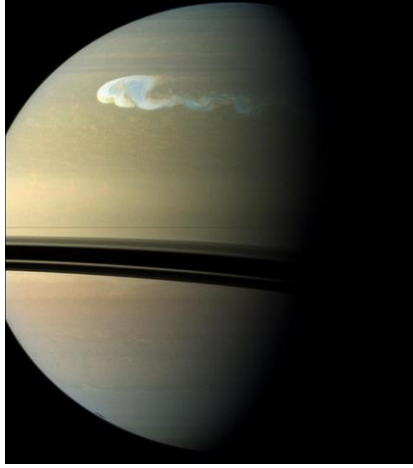

Science Planning & Sequence Team
CASSINI

SATURN TARGET WORKING TEAM

Rev 233_234 Segment Legacy Package

Segment Boundary: March 11, 2016 – March 31, 2016
2016-071T22:53:00 – 2016-091T15:11:00 (SCET)

Integration Began 05/04/2015
Segment Delivered to S93 Sequence 08/14/2015
Lead Integrator was Shawn Brooks

Legacy Package Assembled by Shawn Boll

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*** N.A. = Slide present but content not available.**

Segment Overview and Final Products

Segment Summary

- This was a 20 day long segment early in the second inclined phase (IN-2) of the Solstice Mission. It was centered about Rev 234 apoapse, starting 2 days after Rev 233 periapse and ending 2 days before Rev 234 periapse.

- The segment started with views of Saturn's equator in high phase. As the spacecraft traveled outbound and the inclination angle grew, the view was of a mostly lit northern hemisphere.

- Being an apoapse segment, the timeline was dominated by CAKE (Cassini Apoapse for Kronian Exploration) templated activities. These CAKEs were dedicated Saturn-focused apoapse periods and were spaced roughly every 6 months in the Solstice Mission.

- Saturn science included VIMS global movies and mosaics in the days nearest the periapses on each end of the segment. Per the CAKE "recipe", UVIS EUV/FUVs, CIRS Mid-IR and Far-IR mapping, and wind studies (ISS and CIRS alternating observations) were spaced throughout the timeline. This segment was a good example of a textbook "CAKE".

- Other than periodic Titan cloud monitoring campaign observations and a look at the small, irregular satellite Surtur, there were no other out-of-discipline activities.

- Waypoints were changed several times to accommodate the day's science objectives, but reaction wheel friendly secondaries were used in many cases.

- This segment included one of the larger OTMs in the Solstice Mission.

Final Sequenced SPASS (1 of 2)

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End	Primary	Secondary	Comments
Sequence S93, length = 72 days		2016-038T00:48:00		071T17:55:00	2016-109T18:43:00			
SATURN_233_234 Segment		2016-071T22:53:00		019T16:18:00	2016-091T15:11:00			
SP_233SA_WAYPTTURN071_PRIME	M	2016-071T22:53:00		000T00:35:00	2016-071T23:28:00	ISS_NAC to Saturn	NEG_X to 186.6/73.7	
NEW WAYPOINT		2016-071T23:28:00		001T12:40:00	2016-073T12:08:00	ISS_NAC to Saturn	NEG_X to 186.6/73.7	
VIMS_233SA_GLOBALMOV001_PRIME	C, M	2016-071T23:28:00		000T11:00:00	2016-072T10:28:00	VIMS_IR to Saturn	NEG_X to NSP	
UVIS_233SA_EUVFUV001_PRIME	C, I, M, V	2016-072T10:28:00		000T14:00:00	2016-073T00:28:00	UVIS_FUV to Saturn	NEG_X to 186.6/73.7	
CIRS_233SA_FIRMAP001_PRIME	V	2016-073T00:28:00		000T11:00:00	2016-073T11:28:00	CIRS_FP1 to Saturn	NEG_X to NSP	Northern hemisphere
SP_233EA_DLTURN073_PRIME		2016-073T11:28:00		000T00:40:00	2016-073T12:08:00	XBAND to Earth	POS_X to 35.27/-63.48	
NEW WAYPOINT		2016-073T12:08:00		000T11:10:00	2016-073T23:18:00	XBAND to Earth	POS_X to 35.27/-63.48	
ENGR_233SC_KPTYBIAS073_PRIME		2016-073T12:08:00		000T01:30:00	2016-073T13:38:00	NEG_Z to DELTA_H (0.0,0.0,87.0 deg. offset)	NEG_X to Sun	
SP_233EA_C34HEFNON073_PRIME	C	2016-073T13:38:00		000T09:00:00	2016-073T22:38:00	XBAND to Earth	5_Hr_Rolling	MIMI.NEG_Y to Saturn (0,0,-9.5).SRU.CIRS heating.
SP_233SA_WAYPTTURN073_PRIME		2016-073T22:38:00		000T00:40:00	2016-073T23:18:00	ISS_NAC to Saturn	POS_Z to 186.6/73.7	
NEW WAYPOINT		2016-073T23:18:00		001T12:50:00	2016-075T12:08:00	ISS_NAC to Saturn	POS_Z to 186.6/73.7	
VIMS_233SA_GLOBALMOV002_PRIME	C	2016-073T23:18:00		000T14:10:00	2016-074T13:28:00	VIMS_IR to Saturn	POS_Z to NSP	
CIRS_233SA_MIRMAP002_PRIME	I, V	2016-074T13:28:00		000T22:00:00	2016-075T11:28:00	CIRS_FP3 to Saturn	POS_Z to 186.6/73.7	
SP_233EA_DLTURN075_PRIME		2016-075T11:28:00		000T00:40:00	2016-075T12:08:00	XBAND to Earth	POS_X to 43.16/-65.69	
NEW WAYPOINT		2016-075T12:08:00		000T11:10:00	2016-075T23:18:00	XBAND to Earth	POS_X to 43.16/-65.69	
SP_233EA_C70METNON075_PRIME	C	2016-075T12:08:00		000T05:00:00	2016-075T17:08:00	XBAND to Earth	Rolling/SRU	MIMI.NEG_Y to Saturn (0,0,-9.5).SRU.CIRS heating.
SP_233SA_WAYPTTURN075_PRIME		2016-075T22:38:00		000T00:40:00	2016-075T23:18:00	ISS_NAC to Saturn	POS_Z to 186.4/73.8	
NEW WAYPOINT		2016-075T23:18:00		001T12:36:00	2016-077T11:54:00	ISS_NAC to Saturn	POS_Z to 186.4/73.8	
ISS_233SA_WIND5HR001_PRIME	C, U, V	2016-075T23:18:00		000T05:00:00	2016-076T04:18:00	ISS_NAC to Saturn	POS_Z to 186.4/73.8	No Preference to secondary pointing
CIRS_233SA_COMPSIT003_PRIME	U	2016-076T04:18:00		000T06:00:00	2016-076T10:18:00	CIRS_FP3 to Saturn	POS_Z to 186.4/73.8	
ISS_233SA_WIND5HR002_PRIME	C, U, V	2016-076T10:18:00		000T05:00:00	2016-076T15:18:00	ISS_NAC to Saturn	POS_Z to 186.4/73.8	No Preference to secondary pointing
ISS_233SA_WIND5HR003_PRIME	C, U, V	2016-076T15:18:00		000T05:00:00	2016-076T20:18:00	ISS_NAC to Saturn	POS_Z to 186.4/73.8	No Preference to secondary pointing
CIRS_233SA_COMPSIT004_PRIME	U	2016-076T20:18:00		000T06:00:00	2016-077T02:18:00	CIRS_FP3 to Saturn	POS_Z to 186.4/73.8	
ISS_233SA_WIND5HR004_PRIME	C, U, V	2016-077T02:18:00		000T05:00:00	2016-077T07:18:00	ISS_NAC to Saturn	POS_Z to 186.4/73.8	No Preference to secondary pointing
CIRS_233SA_COMPSIT005_PRIME	U, V	2016-077T07:18:00		000T04:00:00	2016-077T11:18:00	CIRS_FP3 to Saturn	POS_Z to 186.4/73.8	
SP_233EA_DLTURN077_PRIME		2016-077T11:18:00		000T00:36:00	2016-077T11:54:00	XBAND to Earth	POS_X to 48.37/-66.77	
NEW WAYPOINT		2016-077T11:54:00		000T11:10:00	2016-077T23:04:00	XBAND to Earth	POS_X to 48.37/-66.77	
SP_233EA_YGAP077_PRIME		2016-077T11:54:00		000T01:30:00	2016-077T13:24:00	XBAND to Earth	POS_X to 48.37/-66.77	
SP_233EA_C34BWGNON077_PRIME	C, E, R	2016-077T13:24:00		000T07:30:00	2016-077T20:54:00	XBAND to Earth	5_Hr_Rolling	MIMI.NEG_Y to Saturn (0,0,-9.5).SRU.CIRS heating.
SP_233SA_WAYPTTURN077_PRIME		2016-077T22:24:00		000T00:40:00	2016-077T23:04:00	ISS_NAC to Saturn	POS_Z to 186.4/73.8	
NEW WAYPOINT		2016-077T23:04:00		001T12:50:00	2016-079T11:54:00	ISS_NAC to Saturn	POS_Z to 186.4/73.8	
ISS_233TI_M90R3CLD077_PRIME	V	2016-077T23:04:00	E233_M90R3CLD077+000T00:00:00	000T01:30:00	2016-078T00:34:00	ISS_NAC to Titan	POS_Z to 112.091/72.703	
UVIS_233SA_EUVFUV002_PRIME	C, I	2016-078T00:34:00		000T16:00:00	2016-078T16:34:00	UVIS_FUV to Saturn	POS_Z to 186.4/73.8	
CIRS_233SA_COMPSIT006_PRIME	M, U, V	2016-078T16:34:00		000T18:40:00	2016-079T11:14:00	CIRS_FP3 to Saturn	POS_Z to 186.4/73.8	
SP_233EA_DLTURN079_PRIME	M	2016-079T11:14:00		000T00:40:00	2016-079T11:54:00	XBAND to Earth	POS_X to 52.63/-67.47	
NEW WAYPOINT		2016-079T11:54:00		000T11:10:00	2016-079T23:04:00	XBAND to Earth	POS_X to 52.63/-67.47	
SP_233EA_C70METNON079_PRIME	C, M	2016-079T11:59:00		000T08:25:00	2016-079T20:24:00	XBAND to Earth	Rolling/SRU	MIMI.NEG_Y to Saturn (0,0,-9.5).SRU.CIRS heating.
SP_233SA_WAYPTTURN079_PRIME		2016-079T22:24:00		000T00:40:00	2016-079T23:04:00	ISS_NAC to Saturn	POS_Z to 186.4/73.8	
NEW WAYPOINT		2016-079T23:04:00		000T23:35:00	2016-080T22:39:00	ISS_NAC to Saturn	POS_Z to 186.4/73.8	
CIRS_233SA_MIRMAP003_PRIME	I, M, V	2016-079T23:04:00		000T22:55:00	2016-080T21:59:00	CIRS_FP3 to Saturn	POS_Z to 186.4/73.8	
SP_233EA_DLTURN080_PRIME	M	2016-080T21:59:00		000T00:40:00	2016-080T22:39:00	XBAND to Earth	POS_X to 55.48/-67.86	
NEW WAYPOINT		2016-080T22:39:00		000T09:35:00	2016-081T08:14:00	XBAND to Earth	POS_X to 55.48/-67.86	
ENGR_233SC_KPTYBIAS080_PRIME	M	2016-080T22:39:00		000T01:30:00	2016-081T00:09:00	POS_Z to DELTA_H (0.0,0.0,-19.0 deg. offset)	NEG_X to Sun	
SP_233EA_M70METNON081_PRIME	C, M	2016-081T00:09:00		000T07:15:00	2016-081T07:24:00	XBAND to Earth	5_Hr_Rolling	MIMI.NEG_Y to Saturn (0,0,-9.5).SRU.CIRS heating.
SP_233TI_WAYPTTURN081_PRIME	M	2016-081T07:54:00		000T00:20:00	2016-081T08:14:00	ISS_NAC to Titan	NEG_Z to 63.86/-10.18	
NEW WAYPOINT		2016-081T08:14:00		001T04:55:00	2016-082T13:09:00	ISS_NAC to Titan	NEG_Z to 63.86/-10.18	
ISS_233TI_M90R2CLD081_PRIME	C, M, V	2016-081T08:14:00	E233_M90R2CLD081+000T00:00:00	000T01:30:00	2016-081T09:44:00	ISS_NAC to Titan	NEG_Z to 83.061/11.858	
ISS_233OT_SURROT044_PRIME	M	2016-081T09:44:00		001T03:00:00	2016-082T12:44:00	UVIS_FUV to Rocks	NEG_Z to Sun	Jettison Activity: Might be deleted if RBOT issues occur
Apoapse Per = 23.9 d, inc ...		2016-081T21:40:59		000T00:00:01	2016-081T21:41:00			
SP_234SA_WAYPTTURN082_PRIME	M	2016-082T12:44:00		000T00:25:00	2016-082T13:09:00	ISS_NAC to Saturn	NEG_X to Sun	
NEW WAYPOINT		2016-082T13:09:00		000T16:30:00	2016-083T05:39:00	ISS_NAC to Saturn	NEG_X to Sun	
UVIS_234SA_EUVFUV001_PRIME	C, I, M, V	2016-082T13:09:00		000T16:00:00	2016-083T05:09:00	UVIS_FUV to Saturn	NEG_X to Sun	
SP_234EA_DLTURN083_PRIME		2016-083T05:09:00		000T00:30:00	2016-083T05:39:00	XBAND to Earth	POS_X to 60.0/-68.35	
NEW WAYPOINT		2016-083T05:39:00		000T10:40:00	2016-083T16:19:00	XBAND to Earth	POS_X to 60.0/-68.35	
SP_234EA_YGAP083_PRIME		2016-083T05:39:00		000T01:30:00	2016-083T07:09:00	XBAND to Earth	POS_X to 60.0/-68.35	
SP_234EA_G34B26NON083_PRIME	C	2016-083T07:09:00		000T08:30:00	2016-083T15:39:00	XBAND to Earth	5_Hr_Rolling	MIMI.NEG_Y to Saturn (0,0,-9.5).SRU.CIRS heating.

Final Sequenced SPASS (2 of 2)

SP_234SA_WAYPTTURN083_PRIME		2016-083T15:39:00		000T00:40:00	2016-083T16:19:00	ISS_NAC to Saturn	POS_Z to 186.4/73.8	
NEW WAYPOINT		2016-083T16:19:00		000T13:21:00	2016-084T05:40:00	ISS_NAC to Saturn	POS_Z to 186.4/73.8	
ISS_234TI_M120R2HZ083_PRIME	C, V	2016-083T16:19:00	E234_M120R2HZ083+000T00:00:00	000T01:30:00	2016-083T17:49:00	ISS_NAC to Titan	POS_Z to 179.336/59.825	
CIRS_234SA_MIRMAP004_PRIME	I, M, V	2016-083T17:49:00		000T11:15:00	2016-084T05:04:00	CIRS_FP3 to Saturn	POS_Z to 186.4/73.8	
SP_234EA_DLTURN084_PRIME	M	2016-084T05:04:00		000T00:36:00	2016-084T05:40:00	XBAND to Earth	POS_X to 62.09/-68.53	
NEW WAYPOINT		2016-084T05:40:00		000T10:40:00	2016-084T16:20:00	XBAND to Earth	POS_X to 62.09/-68.53	
SP_234EA_YGAP084_PRIME	M	2016-084T05:40:00		000T01:30:00	2016-084T07:10:00	XBAND to Earth	POS_X to 62.09/-68.53	
SP_234EA_G34B26NON084_PRIME	C, M	2016-084T07:10:00		000T08:30:00	2016-084T15:40:00	XBAND to Earth	Rolling/SRU	MIMI.NEG_Y to Saturn (0,0,-9.5).SRU.CIRS heating.
SP_234SA_WAYPTTURN084_PRIME	M	2016-084T15:40:00		000T00:40:00	2016-084T16:20:00	ISS_NAC to Saturn	POS_Z to 186.5/73.8	
NEW WAYPOINT		2016-084T16:20:00		000T20:35:00	2016-085T12:55:00	ISS_NAC to Saturn	POS_Z to 186.5/73.8	
ISS_234SA_WIND5HR001_PRIME	C, M, U, V	2016-084T16:20:00		000T05:00:00	2016-084T21:20:00	ISS_NAC to Saturn	POS_Z to 186.5/73.8	No Preference to secondary pointing
CIRS_234SA_COMPSIT004_PRIME	M, U	2016-084T21:20:00		000T06:00:00	2016-085T03:20:00	CIRS_FP3 to Saturn	POS_Z to 186.5/73.8	
ISS_234SA_WIND5HR002_PRIME	C, U, V	2016-085T03:20:00		000T05:00:00	2016-085T08:20:00	ISS_NAC to Saturn	POS_Z to 186.5/73.8	No Preference to secondary pointing
CIRS_234SA_COMPSIT005_PRIME	U, V	2016-085T08:20:00		000T04:00:00	2016-085T12:20:00	CIRS_FP3 to Saturn	POS_Z to 186.5/73.8	
SP_234EA_DLTURN085_PRIME		2016-085T12:20:00		000T00:35:00	2016-085T12:55:00	XBAND to Earth	POS_X to 66.83/-68.83	
NEW WAYPOINT		2016-085T12:55:00		000T09:30:00	2016-085T22:25:00	XBAND to Earth	POS_X to 66.83/-68.83	
SP_234EA_C34HEFOTP085_PRIME	C, N	2016-085T12:55:00		000T09:00:00	2016-085T21:55:00	XBAND to Earth	4_Hr_Rolling	MIMI.RA/DEC for NEG_Y to Saturn (0,0,-9.5).OTP.SRU.CIRS heating.
SP_234SA_WAYPTTURN085_PRIME		2016-085T21:55:00		000T00:30:00	2016-085T22:25:00	ISS_NAC to Saturn	NEG_X to Sun	
NEW WAYPOINT		2016-085T22:25:00		000T14:30:00	2016-086T12:55:00	ISS_NAC to Saturn	NEG_X to Sun	
UVIS_234SA_EUVFUV002_PRIME	C, I, V	2016-085T22:25:00		000T14:00:00	2016-086T12:25:00	UVIS_FUV to Saturn	NEG_X to Sun	
SP_234EA_DLTURN086_PRIME		2016-086T12:25:00		000T00:30:00	2016-086T12:55:00	XBAND to Earth	POS_X to 66.83/-68.83	
NEW WAYPOINT		2016-086T12:55:00		000T09:30:00	2016-086T22:25:00	XBAND to Earth	POS_X to 66.83/-68.83	
SP_234EA_C70METOTB086_PRIME	C, N	2016-086T12:55:00		000T09:00:00	2016-086T21:55:00	XBAND to Earth	4_Hr_Rolling	MIMI.same secondary as OTP pass.OTB.SRU.CIRS heating.
SP_234SA_WAYPTTURN086_PRIME		2016-086T21:55:00		000T00:30:00	2016-086T22:25:00	ISS_NAC to Saturn	POS_Z to 187.2/73.7	
NEW WAYPOINT		2016-086T22:25:00		001T08:30:00	2016-088T06:55:00	ISS_NAC to Saturn	POS_Z to 187.2/73.7	
ISS_234SA_WIND5HR003_PRIME	C, U, V	2016-086T22:25:00		000T05:00:00	2016-087T03:25:00	ISS_NAC to Saturn	POS_Z to 187.2/73.7	No Preference to secondary pointing
CIRS_234SA_COMPSIT006_PRIME	U	2016-087T03:25:00		000T06:00:00	2016-087T09:25:00	CIRS_FP3 to Saturn	POS_Z to 187.2/73.7	
ISS_234SA_WIND5HR004_PRIME	C, U, V	2016-087T09:25:00		000T05:00:00	2016-087T14:25:00	ISS_NAC to Saturn	POS_Z to 187.2/73.7	No Preference to secondary pointing
ISS_234SA_WIND5HR005_PRIME	C, U, V	2016-087T14:25:00		000T05:00:00	2016-087T19:25:00	ISS_NAC to Saturn	POS_Z to 187.2/73.7	No Preference to secondary pointing
CIRS_234SA_COMPSIT007_PRIME	U	2016-087T19:25:00		000T06:00:00	2016-088T01:25:00	CIRS_FP3 to Saturn	POS_Z to 187.2/73.7	
ISS_234SA_WIND5HR006_PRIME	C, U, V	2016-088T01:25:00		000T05:00:00	2016-088T06:25:00	ISS_NAC to Saturn	POS_Z to 187.2/73.7	No Preference to secondary pointing
SP_234EA_DLTURN088_PRIME		2016-088T06:25:00		000T00:30:00	2016-088T06:55:00	XBAND to Earth	POS_X to 73.18/-69.03	
NEW WAYPOINT		2016-088T06:55:00		000T10:30:00	2016-088T17:25:00	XBAND to Earth	POS_X to 73.18/-69.03	
OTM-428 and -444 have a det...		2016-088T06:55:00		000T08:30:00	2016-088T15:25:00			
SP_234EA_G34BWGNON088_PRIME	C	2016-088T06:55:00		000T08:30:00	2016-088T15:25:00	XBAND to Earth	4_Hr_Rolling	MIMI.NEG_Y to Saturn (0,0,-9.5).SRU.CIRS heating.
SP_234EA_YGAP088_PRIME		2016-088T15:25:00		000T01:30:00	2016-088T16:55:00	XBAND to Earth	POS_X to 73.18/-69.03	
SP_234SA_WAYPTTURN088_PRIME		2016-088T16:55:00		000T00:30:00	2016-088T17:25:00	ISS_NAC to Saturn	POS_Z to 187.2/73.7	
NEW WAYPOINT		2016-088T17:25:00		000T11:45:00	2016-089T05:10:00	ISS_NAC to Saturn	POS_Z to 187.2/73.7	
CIRS_234SA_MIRMAP005_PRIME	I, V	2016-088T17:25:00		000T11:15:00	2016-089T04:40:00	CIRS_FP3 to Saturn	POS_Z to 187.2/73.7	
SP_234EA_DLTURN089_PRIME		2016-089T04:40:00		000T00:30:00	2016-089T05:10:00	XBAND to Earth	POS_X to 77.16/-69.03	
NEW WAYPOINT		2016-089T05:10:00		000T10:35:00	2016-089T15:45:00	XBAND to Earth	POS_X to 77.16/-69.03	
SP_234EA_YGAP089_PRIME		2016-089T05:10:00		000T01:30:00	2016-089T06:40:00	XBAND to Earth	POS_X to 77.16/-69.03	
SP_234EA_G34HEFNON089_PRIME	C	2016-089T06:40:00		000T08:30:00	2016-089T15:10:00	XBAND to Earth	Rolling/SRU	MIMI.NEG_Y to Saturn (0,0,-9.5).SRU.CIRS heating.
SP_234SA_WAYPTTURN089_PRIME		2016-089T15:10:00		000T00:35:00	2016-089T15:45:00	ISS_NAC to Saturn	NEG_X to Sun	
NEW WAYPOINT		2016-089T15:45:00		000T17:40:00	2016-090T09:25:00	ISS_NAC to Saturn	NEG_X to Sun	
ISS_234TI_M90R3CLD089_PRIME	C, V	2016-089T15:45:00	E234_M90R3CLD089+000T00:00:00	000T01:30:00	2016-089T17:15:00	ISS_NAC to Titan	NEG_X to Sun	No Preference to secondary pointing
UVIS_234SA_EUVFUV003_PRIME	C, I, V	2016-089T17:15:00		000T15:40:00	2016-090T08:55:00	UVIS_FUV to Saturn	NEG_X to Sun	
SP_234EA_DLTURN090_PRIME		2016-090T08:55:00		000T00:30:00	2016-090T09:25:00	XBAND to Earth	POS_X to 84.37/-68.8	
NEW WAYPOINT		2016-090T09:25:00		000T10:55:00	2016-090T20:20:00	XBAND to Earth	POS_X to 84.37/-68.8	
SP_234EA_YGAP090_PRIME		2016-090T09:25:00		000T01:30:00	2016-090T10:55:00	XBAND to Earth	POS_X to 84.37/-68.8	
SP_234EA_C70METNON090_PRIME	C	2016-090T10:55:00		000T05:30:00	2016-090T16:25:00	XBAND to Earth	5_Hr_Rolling	
SP_234SA_WAYPTTURN090_PRIME		2016-090T19:55:00		000T00:25:00	2016-090T20:20:00	ISS_NAC to Saturn	NEG_X to 187.2/73.7	
NEW WAYPOINT		2016-090T20:20:00		000T08:51:00	2016-091T05:11:00	ISS_NAC to Saturn	NEG_X to 187.2/73.7	
VIMS_234SA_GLOBALMOS001_PRIME		2016-090T20:20:00		000T08:30:00	2016-091T04:50:00	ISS_NAC to Saturn	NEG_X to NSP	
SP_234EA_DLTURN091_PRIME		2016-091T04:50:00		000T00:21:00	2016-091T05:11:00	XBAND to Earth	POS_X to 92.43/-68.15	
NEW WAYPOINT		2016-091T05:11:00		000T10:40:00	2016-091T15:51:00	XBAND to Earth	POS_X to 92.43/-68.15	
ENGR_234SC_KPTYBIAS091_PRIME		2016-091T05:11:00		000T01:30:00	2016-091T06:41:00	NEG_Z to DELTA_H (0.0,0.0,10.0 deg. offset)	NEG_X to Sun	
SP_234EA_G34BWGNON091_PRIME	C, E	2016-091T06:41:00		000T08:30:00	2016-091T15:11:00	XBAND to Earth	POS_X to 92.43/-68.15	MIMI.NEG_Y to Saturn (0,0,-9.5).CIRS heating.

Final Sequenced SMT and Data Volume (1 of 2)

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

			OBSERVATION_PERIOD							DOWNLINK_PASS						
			P4						P5	RECORDED		PLAYBACK				
DOWNLINK PASS NAME	Start doy hh:mm	End doy hh:mm	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_233EA_C34HEFNON073_PRIME	073 13:38	073 22:38	298	1837	170	2305	3322	1017	0	132	53	2490	827	-1664	-999	-9%	1664
SP_233EA_C70METNON075_PRIME	075 12:08	075 17:08	1664	1763	158	3585	3322	-262	0	58	29	3410	1729	-1682	-999	-7%	1681
SP_233EA_C34BWGNON077_PRIME	077 13:24	077 20:54	1681	1986	187	3854	3322	-531	0	105	44	3472	672	-2800	-999	-7%	2799
SP_233EA_C70METNON079_PRIME	079 11:59	079 20:24	2799	1358	165	4323	3322	-999	0	134	50	3505	3133	-372	-113	0%	372
SP_233EA_M70METNON081_PRIME	081 00:09	081 07:24	372	1606	117	2096	3322	1226	0	128	43	2266	2047	-220	-113	0%	219
SP_234EA_G34B26NON083_PRIME	083 07:09	083 15:39	219	1589	202	2010	3322	1312	0	152	50	2212	589	-1623	-113	0%	1623
SP_234EA_G34B26NON084_PRIME	084 07:10	084 15:40	1623	746	66	2434	3322	888	0	152	50	2635	585	-2051	-113	0%	2050
SP_234EA_C34HEFOTP085_PRIME	085 12:55	085 21:55	2050	1209	90	3349	3322	-26	0	161	53	3536	737	-2800	-113	0%	2799
SP_234EA_C70METOTB086_PRIME	086 12:55	086 21:55	2799	574	63	3436	3322	-113	0	162	53	3537	3764	227	97	1%	0
SP_234EA_G34BWGNON088_PRIME	088 06:55	088 15:25	0	1946	140	2086	3322	1236	0	167	50	2303	561	-1743	-129	0%	1742
SP_234EA_G34HEFNON089_PRIME	089 06:40	089 15:10	1742	700	65	2507	3322	815	0	167	50	2724	642	-2083	-410	-2%	2083
SP_234EA_C70METNON090_PRIME	090 10:55	090 16:25	2083	1010	83	3176	3322	146	0	94	32	3303	2022	-1281	-410	-2%	1281
SP_234EA_G34BWGNON091_PRIME	091 06:41	091 15:11	1281	493	60	1834	3322	1488	0	152	50	2035	566	-1470	-410	-3%	1470

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	071 21:18	073 13:38	0.0	38.0	355.5	14.5	50.0	37.3	88.5	0.0	181.8	254.5	800.0	0.0	168.6	1988.8
SP_233EA_C34HEFNON073_PRIME	073 13:38	073 22:38	0.0	8.5	57.6	3.2	0.0	8.0	19.4	0.0	29.2	4.9	0.0	0.0	0.0	130.9
DAILY TOTAL SCIENCE	071 21:18	073 22:38	0.0	46.5	413.1	17.8	50.0	45.3	108.0	0.0	211.0	259.4	800.0	0.0	168.6	
OBSERVATION_NOR	073 22:38	075 12:08	0.0	35.4	260.4	13.5	51.6	33.3	81.0	0.0	121.5	0.0	1150.0	0.0	156.7	1903.4
SP_233EA_C70METNON075_PRIME	075 12:08	075 17:08	0.0	4.7	18.0	1.8	0.0	4.4	10.8	0.0	16.2	1.9	0.0	0.0	0.0	57.9
DAILY TOTAL SCIENCE	073 22:38	075 17:08	0.0	40.1	278.4	15.3	51.6	37.8	91.8	0.0	137.7	1.9	1150.0	0.0	156.7	
OBSERVATION_NOR	075 17:08	077 13:24	0.0	41.8	154.8	15.9	900.0	39.4	95.6	0.0	143.4	97.2	480.0	0.0	185.0	2153.1
SP_233EA_C34BWGNON077_PRIME	077 13:24	077 20:54	0.0	7.1	43.2	2.7	0.0	6.7	16.2	0.0	24.3	4.1	0.0	0.0	0.0	104.3
DAILY TOTAL SCIENCE	075 17:08	077 20:54	0.0	48.8	198.0	18.6	900.0	46.0	111.8	0.0	167.7	101.3	480.0	0.0	185.0	

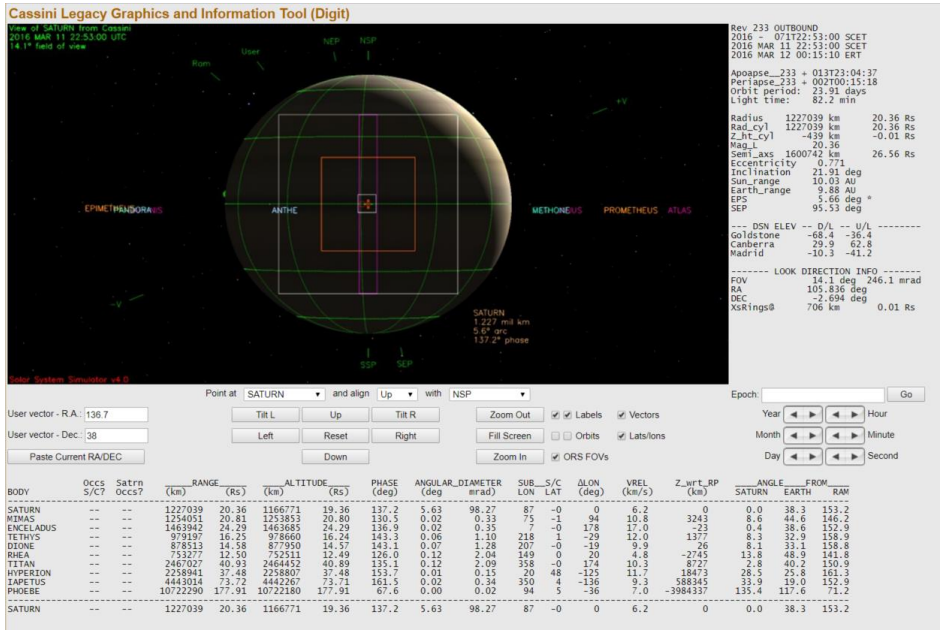
* NOTE: Negative SSR (P4) Margins did not result in data loss due to compression/under-utilization.

Final Sequenced SMT and Data Volume (1 of 2)

DATA VOLUME REPORT --- TRANSFER FRAME OVERHEAD NOT INCLUDED

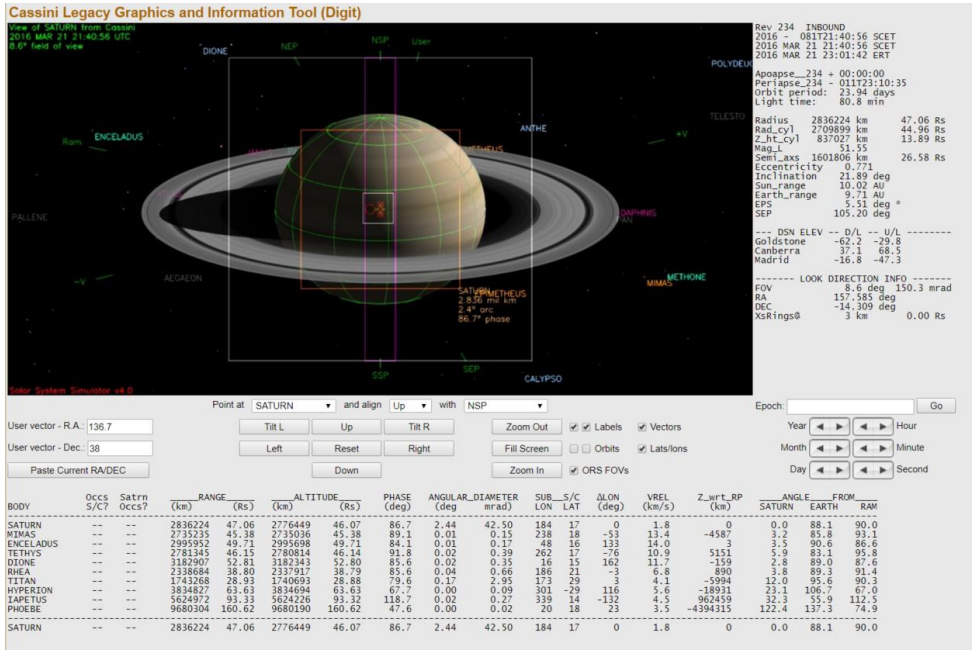
Event	Start doy hh:mm	End doy hh:mm	CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)	ENGR (Mb)	TOTAL (Mb)
OBSERVATION_NOR	077 20:54	079 11:59	0.0	36.9	134.4	14.1	88.5	34.8	84.4	0.0	126.6	316.0	510.0	0.0	163.3	1509.0
SP_233EA_C70METNON079_PRIME	079 11:59	079 20:24	0.0	7.9	64.8	3.0	0.0	7.5	18.2	0.0	27.3	3.8	0.0	0.0	0.0	132.5
DAILY TOTAL SCIENCE	077 20:54	079 20:24	0.0	44.8	199.2	17.1	88.5	42.2	102.6	0.0	153.9	319.9	510.0	0.0	163.3	
OBSERVATION_NOR	079 20:24	081 00:09	0.0	26.2	351.6	10.0	53.8	47.6	83.1	0.0	330.9	1.1	687.5	0.0	116.0	1707.7
SP_233EA_M70METNON081_PRIME	081 00:09	081 07:24	0.0	6.8	67.5	2.6	0.0	6.4	15.7	0.0	23.5	4.0	0.0	0.0	0.0	126.5
DAILY TOTAL SCIENCE	079 20:24	081 07:24	0.0	33.0	419.1	12.6	53.8	54.0	98.8	0.0	354.4	5.1	687.5	0.0	116.0	
OBSERVATION_NOR	081 07:24	083 07:09	0.0	45.0	142.2	17.2	688.5	73.6	103.1	0.0	154.7	290.1	60.0	0.0	199.6	1774.0
SP_234EA_G34B26NON083_PRIME	083 07:09	083 15:39	0.0	8.0	81.0	3.1	0.0	7.6	18.4	0.0	27.5	4.7	0.0	0.0	0.0	150.2
DAILY TOTAL SCIENCE	081 07:24	083 15:39	0.0	53.1	223.2	20.3	688.5	81.1	121.5	0.0	182.2	294.8	60.0	0.0	199.6	
OBSERVATION_NOR	083 15:39	084 07:10	0.0	14.6	183.6	5.6	89.9	13.8	33.5	0.0	50.3	0.0	347.5	0.0	64.9	803.6
SP_234EA_G34B26NON084_PRIME	084 07:10	084 15:40	0.0	8.0	81.0	3.1	0.0	7.6	18.4	0.0	27.5	4.7	0.0	0.0	0.0	150.2
DAILY TOTAL SCIENCE	083 15:39	084 15:40	0.0	22.7	264.6	8.6	89.9	21.4	51.9	0.0	77.8	4.7	347.5	0.0	64.9	
OBSERVATION_NOR	084 15:40	085 12:55	0.0	20.0	144.0	7.7	450.0	18.9	45.9	0.0	141.5	49.8	320.0	0.0	88.8	1286.6
SP_234EA_C34HEFOTP085_PRIME	085 12:55	085 21:55	0.0	8.5	86.4	3.2	0.0	8.0	19.4	0.0	29.2	4.9	0.0	0.0	0.0	159.7
DAILY TOTAL SCIENCE	084 15:40	085 21:55	0.0	28.5	230.4	10.9	450.0	26.9	65.3	0.0	170.7	54.8	320.0	0.0	88.8	
OBSERVATION_NOR	085 21:55	086 12:55	0.0	14.1	100.8	5.4	50.0	13.3	32.4	0.0	48.6	253.6	50.0	0.0	62.7	631.0
SP_234EA_C70METOTB086_PRIME	086 12:55	086 21:55	0.0	8.5	86.4	3.2	0.0	8.0	19.9	0.0	29.2	4.9	0.0	0.0	0.0	160.1
DAILY TOTAL SCIENCE	085 21:55	086 21:55	0.0	22.6	187.2	8.6	50.0	21.3	52.3	0.0	77.8	258.6	50.0	0.0	62.7	
OBSERVATION_NOR	086 21:55	088 06:55	0.0	31.1	230.4	11.9	900.0	58.7	101.0	0.0	106.9	88.8	400.0	0.0	138.4	2067.2
SP_234EA_G34BWGNON088_PRIME	088 06:55	088 15:25	0.0	8.0	81.0	3.1	0.0	15.1	26.0	0.0	27.5	4.7	0.0	0.0	0.0	165.4
DAILY TOTAL SCIENCE	086 21:55	088 15:25	0.0	39.1	311.4	14.9	900.0	73.8	127.0	0.0	134.5	93.4	400.0	0.0	138.4	
OBSERVATION_NOR	088 15:25	089 06:40	0.0	14.4	162.0	5.5	51.4	27.1	46.7	0.0	49.4	0.0	337.5	0.0	64.2	758.2
SP_234EA_G34HEFNON089_PRIME	089 06:40	089 15:10	0.0	8.0	81.0	3.1	0.0	15.1	26.0	0.0	27.5	4.7	0.0	0.0	0.0	165.4
DAILY TOTAL SCIENCE	088 15:25	089 15:10	0.0	22.4	243.0	8.6	51.4	42.2	72.7	0.0	76.9	4.7	337.5	0.0	64.2	
OBSERVATION_NOR	089 15:10	090 10:55	0.0	18.6	134.4	7.1	88.5	35.1	60.4	0.0	312.8	283.8	60.0	0.0	82.5	1083.4
SP_234EA_C70METNON090_PRIME	090 10:55	090 16:25	0.0	5.2	48.6	2.0	0.0	4.9	11.9	0.0	17.8	3.0	0.0	0.0	0.0	93.4
DAILY TOTAL SCIENCE	089 15:10	090 16:25	0.0	23.8	183.0	9.1	88.5	40.0	72.3	0.0	330.7	286.8	60.0	0.0	82.5	
OBSERVATION_NOR	090 16:25	091 06:41	0.0	13.5	37.8	5.1	0.0	12.7	30.8	0.0	46.2	1.9	340.0	0.0	59.6	547.7
SP_234EA_G34BWGNON091_PRIME	091 06:41	091 15:11	0.0	8.0	81.0	3.1	0.0	7.6	18.4	0.0	27.5	4.7	0.0	0.0	0.0	150.2
DAILY TOTAL SCIENCE	090 16:25	091 15:11	0.0	21.5	118.8	8.2	0.0	20.2	49.2	0.0	73.8	6.6	340.0	0.0	59.6	

Segment Geometry (1 of 2)



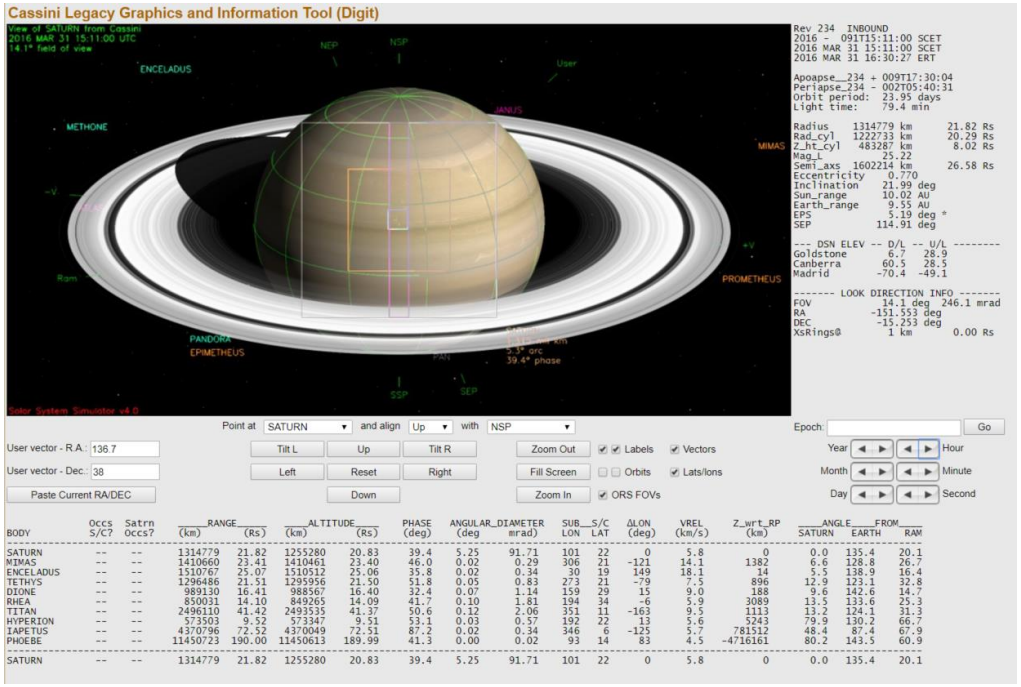
Seg Start (Left)

Apoapse (below)



	Saturn Range	Phase Angle	Sub-S/C Lat.
Segment Start	20.36 Rs	137.2	0
Apoapse	47.06 Rs	86.7	17
Segment End	21.82 Rs	39.4	22

Segment Geometry (2 of 2)



Seg End

Solar Geometry – ORS Boresight Concerns

No ORS Boresight Solar Constraints on Science Pointing Noted.

Daily Science Highlights (1 of 3)

DOY 072 (12 March 2016): As the first full day of the `Saturn_233_234` segment began, VIMS observed the disk of Saturn to record movies of the ringed planet as Cassini receded towards apoapse. Following this observation, the Ultraviolet Imaging Spectrograph mapped the planet in the ultraviolet to study the distribution of hazes and organic compounds high in Saturn's atmosphere.

DOY 073 (13 March 2016): The next science observation was led by CIRS, which repeatedly scanned north and south across Saturn's disk to create a global map of the planet in the infrared with all three of its focal planes. This observation was followed by a downlink to relay the science and engineering data collected at that point in the segment.

DOY 074 (14 March 2016): VIMS took the opportunity to create another global movie of Saturn in the near infrared. This was followed by an observation in the CIRS MIRMAP campaign, during which CIRS focused on one particular latitude, observing as the planet rotated beneath.

DOY 075 (15 March 2016): As DOY 075 began, CIRS was still in the middle of its 22-hour-long MIRMAP observation. At the conclusion of this observation, Cassini pointed its high-gain antenna Earthward to relay the engineering and science data collected over the previous two days.

DOY 076 (16 March 2016): CIRS and ISS began the first of a set of back-to-back coordinated observations to map out the winds and composition of the Saturnian atmosphere. ISS observed Saturn for a five-hour period. CIRS then initiated a stare at the planet to study its atmospheric composition. CIRS handed off to ISS again roughly one rotation period later so that ISS could observe the same region of the atmosphere. Wind speeds can be measured by comparing the first set of ISS images against the second. Now that Cassini was back in the equatorial plane, it is only then that this observing campaign had been resumed.

DOY 077 (17 March 2016): At the conclusion of the joint ISS/CIRS winds and composition observations, a downlink relayed the Saturn science and spacecraft engineering data recorded over the previous two days.

Daily Science Highlights (2 of 3)

DOY 078 (18 March 2016): As DOY 078 got under way, ISS concluded an observation in the Titan Meteorological Campaign intended to routinely survey Titan for interesting atmospheric activity. UVIS then turned back towards Saturn to record another observation in its EUVFUV campaign to study hazes and organic compounds high in Saturn's atmosphere.

DOY 079 (19 March 2016): Following the UVIS EUVFUV observation, CIRS pursued on observation targeting one of a preselected set interesting latitude bands to obtain compositional and structural information about Saturn's atmosphere. This was followed by a downlink to relay science and engineering data.

DOY 080 (20 March 2016): Almost the entire observation period was dedicated to an additional observation in the CIRS MIRMAP campaign, following which the spacecraft pointed the high-gain antenna back towards the Earth. MAG, MIMI and RPWS briefly increased their data collection rates to study the more distant regions of Saturn's magnetosphere.

DOY 081 (21 March 2016): A downlink over the Madrid complex began the day. Following this, ISS checked in again with Titan. At the conclusion of this Titan cloud monitor, ISS then turned its attention towards the small, irregular satellite Surtur. This was one of the last dedicated stares intended to study the rotational period of these unique objects. Apoapse occured on this day and, with it, the beginning of rev 234.

DOY 082 (22 March 2016): Following ISS' observation of Surtur, UVIS executed another EUVFUV. EUVUFVs were implemented on a routine basis to observe Saturn at a several different geometries, which is key to deriving information about Saturn's atmosphere from these observations.

DOY 083 (23 March 2016): After the downlink that began the day, ISS snapped some images of Titan and its atmosphere. Afterwards, CIRS turned back towards Saturn. The remainder of the day was dedicated towards a CIRS MIRMAP.

DOY 084 (24 March 2016): After the conclusion of the CIRS MIRMAP and a downlink over the Goldstone Deep Space Network complex, ISS and CIRS took turns studying Saturn's winds and the composition of its atmosphere.

Daily Science Highlights (3 of 3)

DOY 085 (25 March 2016): The joint ISS/CIRS set of observations concluded on this day, followed by a downlink. During a pause in the downlink, Orbital Trim Maneuver #444 was executed. This OTM was notable for its magnitude. Imparting a change in velocity of over 8 m/s, it represented one of the largest such maneuvers remaining in the mission.

DOY 086 (26 March 2016): Still some 42 Saturn radii from the planet and five days removed from apoapse, Cassini spent the bulk of the day's science period dedicated to UVIS' EUVFUV campaign. Towards the end of the day, MAG and MIMI stepped up their data collection rates to record additional data on Saturn's magnetic field and magnetosphere.

DOY 087 (27 March 2016): DOY 087 was dedicated to another pair of joint CIRS/ISS winds and composition studies.

DOY 088 (28 March 2016): With the conclusion of the CIRS/ISS Saturn observations, Cassini radioed science and engineering data back to Earth. As science activities resumed following this downlink, CIRS recorded another observation in its MIRMAP campaign, which continued into the next day.

DOY 089 (29 March 2016): After the conclusion of the CIRS MIRMAP from the previous day and the subsequent downlink, Titan again became the focus for another Titan Meteorological Campaign survey observation. This was followed by a UVIS EUVFUV observation of Saturn's atmosphere and high hazes.

DOY 090 (30 March 2016): The UVIS EUVFUV concluded on this day and was followed by a nine-hour downlink over the Canberra complex. RPWS spent the day at elevated data collection rates to study Saturn's outer magnetosphere.

DOY 091 (31 March 2016): As DOY 091, which is the last day of the `Saturn_233_234` segment, began, Cassini had closed to within 26 Saturn radii from Saturn, which was close enough for VIMS to resume prime science activity. The principle science observation was an 8.5-hour long observation of Saturn's atmosphere, during which time VIMS recorded nine mosaics of Saturn's northern hemisphere. At the conclusion of the subsequent downlink over Goldstone, the `Rings_234` segment began.

Segment Integration Planning

Timeline Gaps and Suggested Observations

There were no gaps to discuss during integration. The timeline was entirely filled in advance with CAKE template activities by the leads.

Initial SMT and Data Volume (1 of 3)

Beginning of Integration:

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

			OBSERVATION_PERIOD							DOWNLINK_PASS						
			P4						P5	RECORDED		PLAYBACK				
DOWNLINK PASS NAME	Start doy hh:mm	End doy hh:mm	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_233EA_C70METNON073_PRIME	073 13:38	073 22:38	0	1886	164	2050	3322	1272	0	74	53	2177	3392	1214	1472	12%	0
SP_233EA_C34HEFNON075_PRIME	075 13:38	075 22:38	0	2043	165	2208	3322	1114	0	74	53	2335	831	-1505	258	3%	1504
SP_233EA_C70METNON077_PRIME	077 13:24	077 22:24	1504	1397	164	3064	3322	258	0	74	53	3191	3473	281	887	7%	0
SP_233EA_C34BWGNON079_PRIME	079 13:24	079 22:24	0	1598	165	1763	3322	1559	0	74	53	1890	796	-1094	606	6%	1093
SP_233EA_M70METNON081_PRIME	081 00:09	081 07:54	1093	1279	109	2481	3322	841	0	64	46	2590	2091	-499	606	6%	499
SP_234EA_G34BWGNON082_PRIME	082 07:09	082 15:39	499	1131	98	1728	3322	1594	0	70	50	1848	546	-1302	606	6%	1302
SP_234EA_G34B26NON083_PRIME	083 07:09	083 15:39	1302	550	65	1917	3322	1405	0	70	50	2037	589	-1448	606	6%	1447
SP_234EA_G34BWGNON084_PRIME	084 07:10	084 15:40	1447	722	66	2235	3322	1087	0	70	50	2355	551	-1805	606	6%	1804
SP_234EA_C34HEFOTP085_PRIME	085 12:55	085 21:55	1804	795	90	2689	3322	633	0	74	53	2816	737	-2079	606	6%	2079
SP_234EA_C70METOTB086_PRIME	086 12:55	086 21:55	2079	574	63	2716	3322	606	0	74	53	2843	3764	921	2358	26%	0
SP_234EA_G34BWGNON088_PRIME	088 06:55	088 15:25	0	1188	140	1328	3322	1994	0	70	50	1448	561	-887	1436	27%	886
SP_234EA_G34HEFNON089_PRIME	089 06:40	089 15:10	886	649	65	1601	3322	1722	0	70	50	1720	642	-1079	1436	30%	1079
SP_234EA_C70METNON090_PRIME	090 10:55	090 19:55	1079	723	83	1886	3322	1436	0	74	53	2012	3558	1545	1545	37%	0
SP_234EA_G34BWGNON091_PRIME	091 06:41	091 15:11	0	486	45	532	3322	2790	0	70	50	652	566	-86	0	0%	86

- Assumes MAPS instruments at minimal data rates.
- There is 86 Mb of carryover at the end of the segment.
  - DSS-14 (70M), DSS-15 (34m) in maintenance during last downlink period.
  - Can gain an extra 30 Mb of capacity by going to DSS-26.
- Can add an additional:
  - 1214 Mb on DOY 073 downlink
  - 258 Mb on DOY 077 downlink
  - 606 Mb on DOY 086 downlink
  - 1436 Mb on DOY 090 downlink

Initial SMT and Data Volume (2 of 3)

Beginning of Integration:

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	071 22:53	073 13:38	0.0	36.5	259.2	20.4	75.8	34.5	83.7	0.0	125.5	253.6	980.0	0.0	162.0	2031.3
SP_233EA_C70METNON073_PRIME	073 13:38	073 22:38	0.0	8.5	0.0	3.2	0.0	8.0	19.4	0.0	29.2	4.9	0.0	0.0	0.0	73.3
DAILY TOTAL SCIENCE	071 22:53	073 22:38	0.0	45.0	259.2	23.7	75.8	42.5	103.1	0.0	154.7	258.6	980.0	0.0	162.0	
OBSERVATION_NOR	073 22:38	075 13:38	0.0	36.8	316.8	14.0	51.7	34.7	84.2	0.0	126.4	0.0	1360.0	0.0	163.0	2187.6
SP_233EA_C34HEFNON075_PRIME	075 13:38	075 22:38	0.0	8.5	0.0	3.2	0.0	8.0	19.4	0.0	29.2	4.9	0.0	0.0	0.0	73.3
DAILY TOTAL SCIENCE	073 22:38	075 22:38	0.0	45.3	316.8	17.3	51.7	42.7	103.7	0.0	155.5	4.9	1360.0	0.0	163.0	
OBSERVATION_NOR	075 22:38	077 13:24	0.0	36.6	259.2	14.0	180.0	34.5	83.7	0.0	125.6	130.4	520.0	0.0	162.0	1546.0
SP_233EA_C70METNON077_PRIME	077 13:24	077 22:24	0.0	8.5	0.0	3.2	0.0	8.0	19.4	0.0	29.2	4.9	0.0	0.0	0.0	73.3
DAILY TOTAL SCIENCE	075 22:38	077 22:24	0.0	45.1	259.2	17.2	180.0	42.5	103.2	0.0	154.8	135.4	520.0	0.0	162.0	
OBSERVATION_NOR	077 22:24	079 13:24	0.0	36.8	271.2	14.0	88.5	34.7	84.2	0.0	126.4	357.5	570.0	0.0	163.0	1746.3
SP_233EA_C34BWGNON079_PRIME	079 13:24	079 22:24	0.0	8.5	0.0	3.2	0.0	8.0	19.4	0.0	29.2	4.9	0.0	0.0	0.0	73.3
DAILY TOTAL SCIENCE	077 22:24	079 22:24	0.0	45.3	271.2	17.3	88.5	42.7	103.7	0.0	155.5	362.4	570.0	0.0	163.0	
OBSERVATION_NOR	079 22:24	081 00:09	0.0	24.3	330.0	9.3	54.1	22.9	55.6	0.0	83.4	0.0	687.5	0.0	107.6	1374.7
SP_233EA_M70METNON081_PRIME	081 00:09	081 07:54	0.0	7.3	0.0	2.8	0.0	6.9	16.7	0.0	25.1	4.3	0.0	0.0	0.0	63.1
DAILY TOTAL SCIENCE	079 22:24	081 07:54	0.0	31.6	330.0	12.1	54.1	29.8	72.4	0.0	108.5	4.3	687.5	0.0	107.6	
OBSERVATION_NOR	081 07:54	082 07:09	0.0	21.9	21.6	8.4	881.7	51.8	50.2	0.0	75.3	0.0	10.0	0.0	97.2	1218.1
SP_234EA_G34BWGNON082_PRIME	082 07:09	082 15:39	0.0	8.0	0.0	3.1	0.0	7.6	18.4	0.0	27.5	4.7	0.0	0.0	0.0	69.2
DAILY TOTAL SCIENCE	081 07:54	082 15:39	0.0	29.9	21.6	11.4	881.7	59.4	68.6	0.0	102.9	4.7	10.0	0.0	97.2	
OBSERVATION_NOR	082 15:39	083 07:09	0.0	14.6	93.0	5.6	50.0	13.8	33.5	0.0	50.2	234.0	50.0	0.0	64.8	609.5
SP_234EA_G34B26NON083_PRIME	083 07:09	083 15:39	0.0	8.0	0.0	3.1	0.0	7.6	18.4	0.0	27.5	4.7	0.0	0.0	0.0	69.2
DAILY TOTAL SCIENCE	082 15:39	083 15:39	0.0	22.6	93.0	8.6	50.0	21.3	51.8	0.0	77.8	238.7	50.0	0.0	64.8	
OBSERVATION_NOR	083 15:39	084 07:10	0.0	14.6	183.6	5.6	66.7	13.8	33.5	0.0	50.3	0.0	347.5	0.0	64.9	780.5
SP_234EA_G34BWGNON084_PRIME	084 07:10	084 15:40	0.0	8.0	0.0	3.1	0.0	7.6	18.4	0.0	27.5	4.7	0.0	0.0	0.0	69.2
DAILY TOTAL SCIENCE	083 15:39	084 15:40	0.0	22.7	183.6	8.6	66.7	21.4	51.9	0.0	77.8	4.7	347.5	0.0	64.9	
OBSERVATION_NOR	084 15:40	085 12:55	0.0	20.0	144.0	7.7	90.0	18.9	45.9	0.0	68.8	72.5	320.0	0.0	88.8	876.6
SP_234EA_C34HEFOTP085_PRIME	085 12:55	085 21:55	0.0	8.5	0.0	3.2	0.0	8.0	19.4	0.0	29.2	4.9	0.0	0.0	0.0	73.3
DAILY TOTAL SCIENCE	084 15:40	085 21:55	0.0	28.5	144.0	10.9	90.0	26.9	65.3	0.0	98.0	77.4	320.0	0.0	88.8	
OBSERVATION_NOR	085 21:55	086 12:55	0.0	14.1	100.8	5.4	50.0	13.3	32.4	0.0	48.6	253.6	50.0	0.0	62.7	631.0
SP_234EA_C70METOTB086_PRIME	086 12:55	086 21:55	0.0	8.5	0.0	3.2	0.0	8.0	19.4	0.0	29.2	4.9	0.0	0.0	0.0	73.3
DAILY TOTAL SCIENCE	085 21:55	086 21:55	0.0	22.6	100.8	8.6	50.0	21.3	51.8	0.0	77.8	258.6	50.0	0.0	62.7	

Initial SMT and Data Volume (3 of 3)

Beginning of Integration:

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	086 21:55	088 06:55	0.0	31.1	230.4	11.9	180.0	29.3	71.3	0.0	106.9	115.9	400.0	0.0	138.4	1315.3
SP_234EA_G34BWGNON088_PRIME	088 06:55	088 15:25	0.0	8.0	0.0	3.1	0.0	7.6	18.4	0.0	27.5	4.7	0.0	0.0	0.0	69.2
DAILY TOTAL SCIENCE	086 21:55	088 15:25	0.0	39.1	230.4	14.9	180.0	36.9	89.6	0.0	134.5	120.6	400.0	0.0	138.4	
OBSERVATION_NOR	088 15:25	089 06:40	0.0	14.4	162.0	5.5	28.2	13.6	32.9	0.0	49.4	0.0	337.5	0.0	64.2	707.7
SP_234EA_G34HEFNON089_PRIME	089 06:40	089 15:10	0.0	8.0	0.0	3.1	0.0	7.6	18.4	0.0	27.5	4.7	0.0	0.0	0.0	69.2
DAILY TOTAL SCIENCE	088 15:25	089 15:10	0.0	22.4	162.0	8.6	28.2	21.1	51.3	0.0	76.9	4.7	337.5	0.0	64.2	
OBSERVATION_NOR	089 15:10	090 10:55	0.0	18.6	134.4	7.1	88.5	17.6	42.7	0.0	64.0	283.8	60.0	0.0	82.5	799.2
SP_234EA_C70METNON090_PRIME	090 10:55	090 19:55	0.0	8.5	0.0	3.2	0.0	8.0	19.4	0.0	29.2	4.7	0.0	0.0	0.0	73.0
DAILY TOTAL SCIENCE	089 15:10	090 19:55	0.0	27.1	134.4	10.4	88.5	25.6	62.1	0.0	93.1	288.5	60.0	0.0	82.5	
OBSERVATION_NOR	090 19:55	091 06:41	0.0	10.2	0.0	3.9	0.0	9.6	23.3	0.0	34.9	0.0	400.0	0.0	45.0	526.7
SP_234EA_G34BWGNON091_PRIME	091 06:41	091 15:11	0.0	8.0	0.0	3.1	0.0	7.6	18.4	0.0	27.5	4.7	0.0	0.0	0.0	69.2
DAILY TOTAL SCIENCE	090 19:55	091 15:11	0.0	18.2	0.0	6.9	0.0	17.1	41.6	0.0	62.4	4.7	400.0	0.0	45.0	

	CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)
TOTAL RECORDED (OPNAV data not included)	0.0	445.5	2506.2	176.5	1885.2	451.1	1020.2	0.0	1530.2	1767.9	6092.5	0.0

Waypoint Selection

RBOT-Friendly

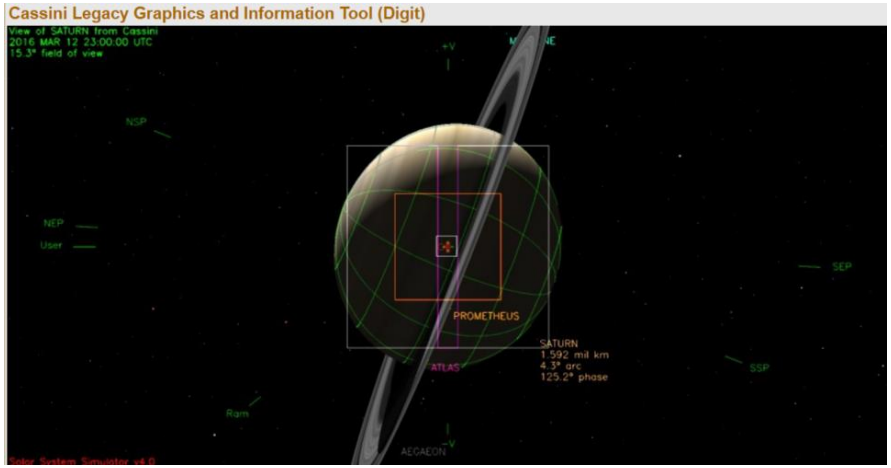
OBSERVATION PERIOD	START	END	POS_X	NEG_X	POS_Z	NEG_Z
SP_233NA_OBSERV071_NA	2016-071T22:53:00	2016-073T13:38:00	-----	186.6/ 73.7	186.6/ 73.7	-----
SP_233NA_OBSERV073_NA	2016-073T22:38:00	2016-075T13:38:00	-----	186.6/ 73.7	186.6/ 73.7	-----
SP_233NA_OBSERV075_NA	2016-075T22:38:00	2016-077T13:24:00	-----	186.4/ 73.8	186.4/ 73.8	-----
SP_233NA_OBSERV077_NA	2016-077T22:24:00	2016-079T13:24:00	-----	186.4/ 73.8	186.4/ 73.8	-----
SP_233NA_OBSERV079_NA	2016-079T22:24:00	2016-081T00:09:00	-----	186.4/ 73.8	186.4/ 73.8	-----
SP_233NA_OBSERV081_NA	2016-081T07:54:00	2016-082T07:09:00	-----	186.4/ 73.8	186.4/ 73.8	-----
SP_234NA_OBSERV082_NA	2016-082T15:39:00	2016-083T07:09:00	-----	186.4/ 73.8	186.4/ 73.8	-----
SP_234NA_OBSERV083_NA	2016-083T15:39:00	2016-084T07:10:00	-----	186.4/ 73.8	186.4/ 73.8	-----
SP_234NA_OBSERV084_NA	2016-084T15:40:00	2016-085T12:55:00	-----	186.5/ 73.8	186.5/ 73.8	-----
SP_234NA_OBSERV085_NA	2016-085T21:55:00	2016-086T12:55:00	-----	187.2/ 73.7	187.2/ 73.7	-----
SP_234NA_OBSERV086_NA	2016-086T21:55:00	2016-088T06:55:00	-----	187.2/ 73.7	187.2/ 73.7	-----
SP_234NA_OBSERV088_NA	2016-088T15:25:00	2016-089T06:40:00	-----	187.2/ 73.7	187.2/ 73.7	-----
SP_234NA_OBSERV089_NA	2016-089T15:10:00	2016-090T06:40:00	-----	187.2/ 73.7	187.2/ 73.7	-----
SP_234NA_OBSERV090_NA	2016-090T15:10:00	2016-091T06:41:00	-----	187.2/ 73.7	187.2/ 73.7	-----

Standard

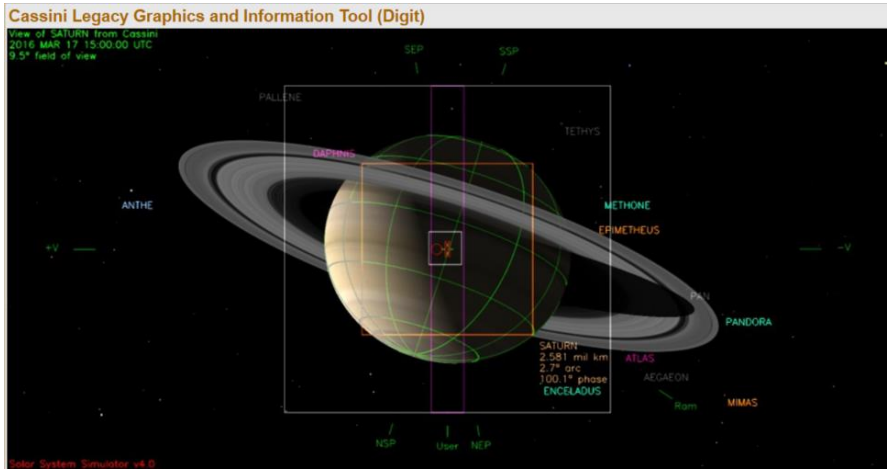
OBS_NAME	START	END	POS_X_2_NSP	POS_X_2_NEP	NEG_X_2_NSP	NEG_X_2_NEP	POS_Z_2_NSP	POS_Z_2_NEP	NEG_Z_2_NSP	NEG_Z_2_NEP	NEG_X_2_SUN	NEG_Z_2_EARTH
SP_233NA_OBSERV071_NA	2016-071T22:53:00	2016-073T13:38:00	**BAD**	**BAD**	OK	OK	OK	OK	**BAD**	**BAD**	OK	**BAD**
SP_233NA_OBSERV073_NA	2016-073T22:38:00	2016-075T13:38:00	**BAD**	**BAD**	OK	OK	OK	OK	**BAD**	**BAD**	OK	**BAD**
SP_233NA_OBSERV075_NA	2016-075T22:38:00	2016-077T13:24:00	**BAD**	**BAD**	OK	OK	OK	OK	**BAD**	**BAD**	OK	**BAD**
SP_233NA_OBSERV077_NA	2016-077T22:24:00	2016-079T13:24:00	**BAD**	**BAD**	OK	OK	OK	OK	**BAD**	**BAD**	OK	**BAD**
SP_233NA_OBSERV079_NA	2016-079T22:24:00	2016-081T00:09:00	**BAD**	OK	OK	**BAD**	OK	OK	**BAD**	**BAD**	OK	**BAD**
SP_233NA_OBSERV081_NA	2016-081T07:54:00	2016-082T07:09:00	**BAD**	OK	OK	**BAD**	OK	OK	**BAD**	**BAD**	OK	**BAD**
SP_234NA_OBSERV082_NA	2016-082T15:39:00	2016-083T07:09:00	**BAD**	OK	OK	**BAD**	OK	OK	**BAD**	**BAD**	OK	**BAD**
SP_234NA_OBSERV083_NA	2016-083T15:39:00	2016-084T07:10:00	**BAD**	OK	OK	**BAD**	OK	OK	**BAD**	**BAD**	OK	**BAD**
SP_234NA_OBSERV084_NA	2016-084T15:40:00	2016-085T12:55:00	**BAD**	OK	OK	**BAD**	OK	OK	**BAD**	**BAD**	OK	**BAD**
SP_234NA_OBSERV085_NA	2016-085T21:55:00	2016-086T12:55:00	**BAD**	OK	OK	**BAD**	OK	OK	**BAD**	**BAD**	OK	**BAD**
SP_234NA_OBSERV086_NA	2016-086T21:55:00	2016-088T06:55:00	**BAD**	OK	OK	**BAD**	OK	OK	**BAD**	**BAD**	OK	**BAD**
SP_234NA_OBSERV088_NA	2016-088T15:25:00	2016-089T06:40:00	**BAD**	OK	OK	**BAD**	OK	OK	**BAD**	**BAD**	OK	OK
SP_234NA_OBSERV089_NA	2016-089T15:10:00	2016-090T06:40:00	**BAD**	OK	OK	**BAD**	OK	OK	**BAD**	**BAD**	OK	OK
SP_234NA_OBSERV090_NA	2016-090T15:10:00	2016-091T06:41:00	**BAD**	OK	OK	**BAD**	OK	OK	**BAD**	**BAD**	OK	OK

Waypoints Chosen (1 of 5)

Waypoint 1 (2016-071T23:28:00 – 2016-073T23:18:00): ISS_NAC to Saturn; NEG_X to 186.6/73.7



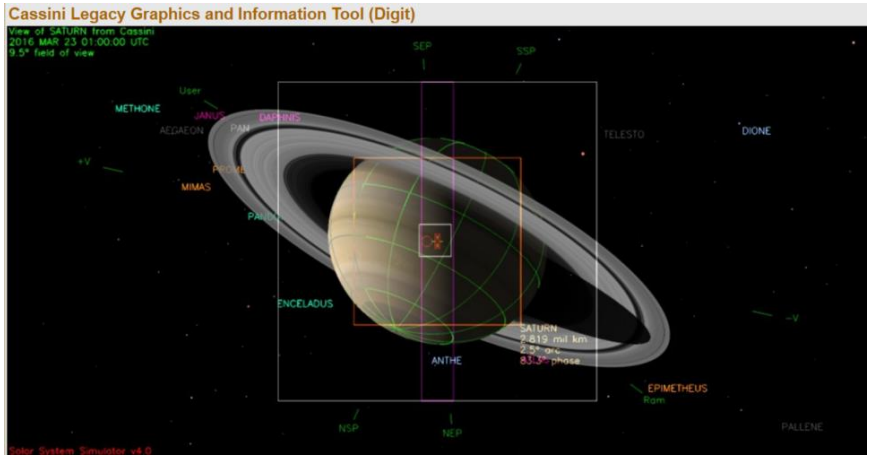
Waypoint 2 (2016-073T23:18:00 – 2016-081T08:14:00): ISS_NAC to Saturn; POS_Z to 186.6/73.7(73.8)



Waypoints Chosen (2 of 5)

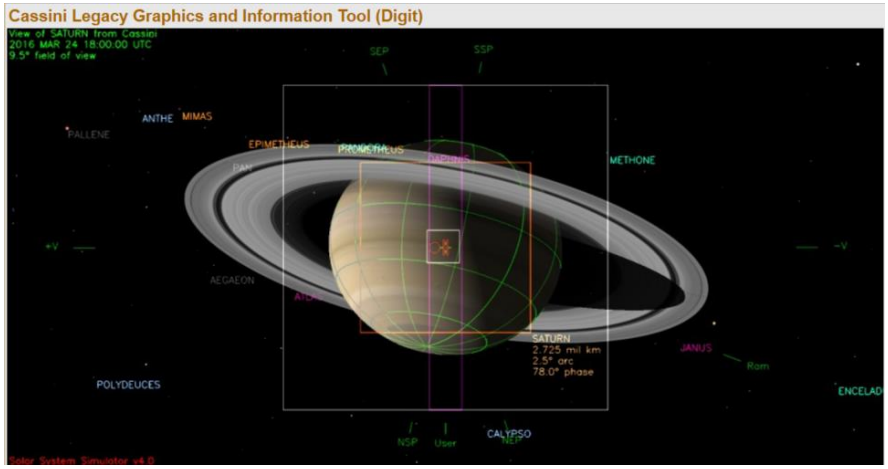
Waypoint 3 (2016-081T08:14:00 – 2016-082T13:09:00): ISS_NAC to Titan; NEG_Z to 63.86/-10.18

Waypoint 4 (2016-082T13:09:00 – 2016-083T16:19:00): ISS_NAC to Saturn NEG_X to Sun

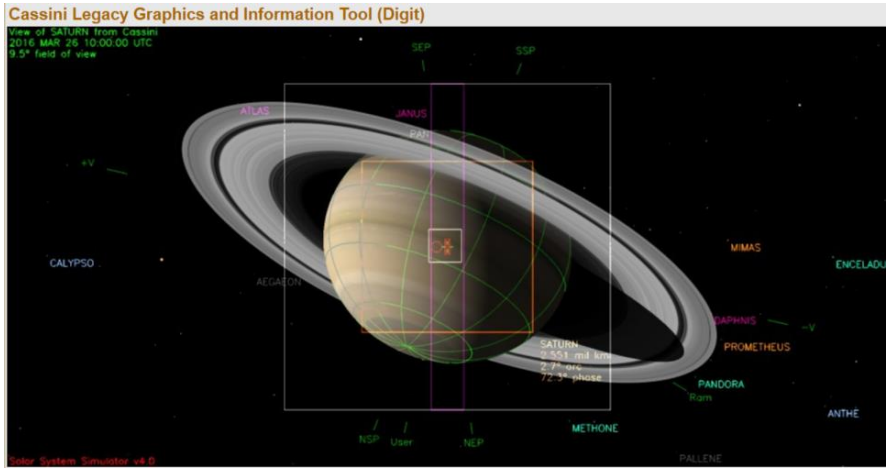


Waypoints Chosen (3 of 5)

Waypoint 5 (2016-083T16:19:00 – 2016-085T22:25:00): ISS_NAC to Saturn; POS_Z to 186.4(186.5)/73.8

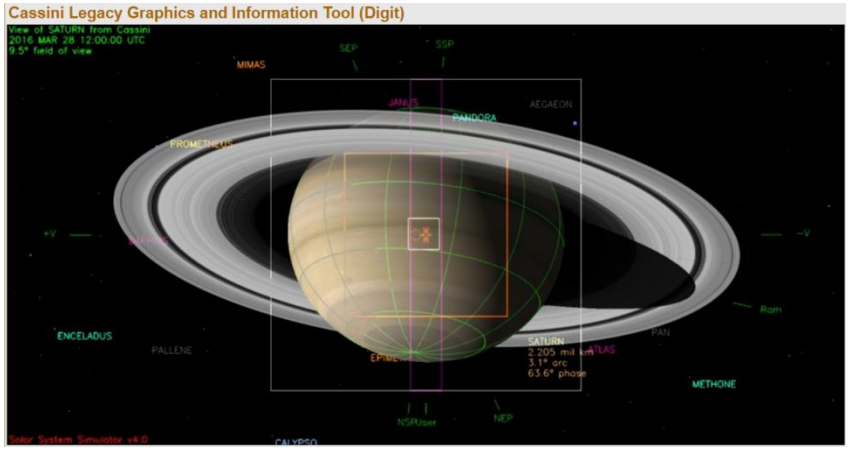


Waypoint 6 (2016-085T22:25:00 – 2016-086T22:25:00): ISS_NAC to Saturn; NEG_X to Sun

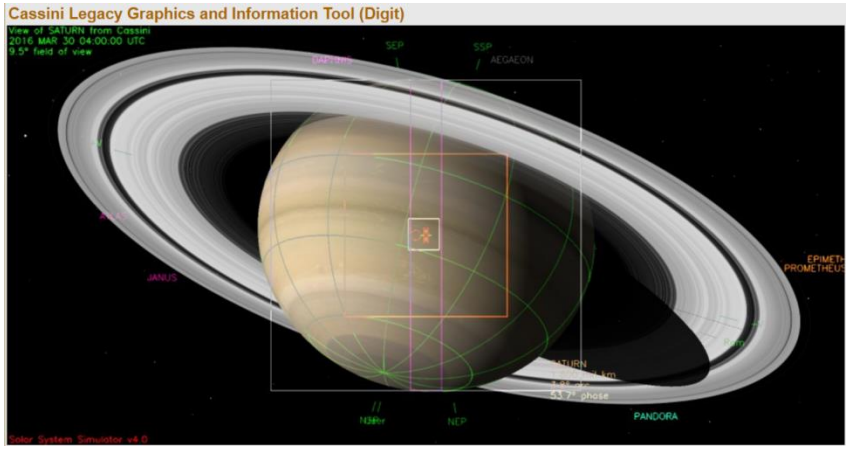


Waypoints Chosen (4 of 5)

Waypoint 7 (2016-086T22:25:00 – 2016-089T15:45:00): ISS_NAC to Saturn; POS_Z to 187.2/73.7

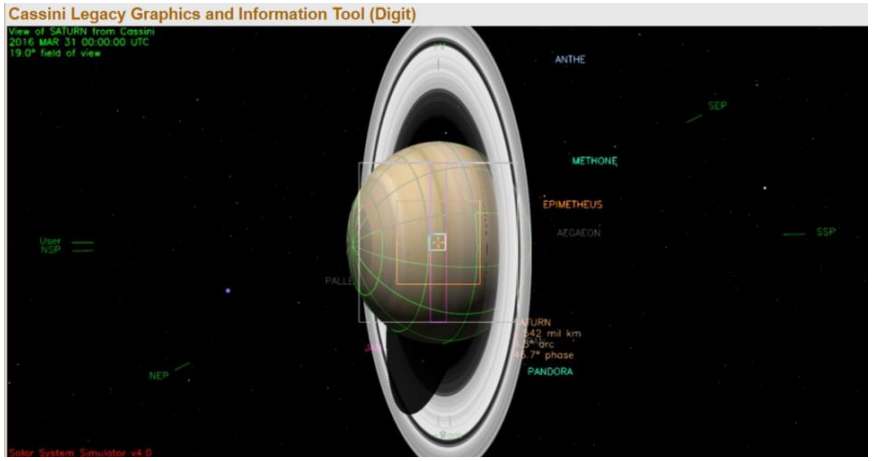


Waypoint 8 (2016-089T15:45:00 – 2016-090T20:20:00): ISS_NAC to Saturn; NEG_X to Sun



Waypoints Chosen (5 of 5)

Waypoint 9 (2016-090T20:20:00 – 2016-091T05:11:00): ISS_NAC to Saturn; NEG_X to 187.2/73.7



Notes & Liens (1 of 2)

- Pointing:
  - Observation periods (DOY 082, 085, 089) that are driven by UVIS EUVFUVs employ a `NEG_X to Sun` waypoint, as this is their preferred science attitude. These waypoints do not bracket a ring plane crossing, and, as such, do not force a 180-degree rotation of the secondary, which is AACS' primary concern about using this waypoint secondary.
  - The YGAP following the DOY 088 now follows the downlink. This is only a note, however, as this *does* follow YGAP guidelines. Also note that this YGAP isn't technically necessary, as this follows the OTM-444 CNTGCY pass.
  - `ISS_233OT_SURROT001_PRIME` is a jettison activity that does not conform to the "two-of-three" rule.

- Data Volume:
  - `Saturn_233_234` is carrying 77 Mb over into `Rings_234`. The Rings TWT has approved the request for carryover. Data compression will likely eliminate this carryover in practice if the proposed DSN remains moderately intact.

- DSN:
  - There is one level 3 request (from SCO) on the DOY 085 pass:

    1. Rev 233 OTM-444 Large ME OTM:
    Level 3 request from 2016-085/1415 to 2016-085/2315
    Station: DSS-45
  - The Saturn TWT would like to request a forbearance on the follow `ap_downlink` warning

    `Warning: 70m usage for sequence exceeds project commitment of <= 35%; is at` **38**`%` *(My bad! -- SMB)*

- Resource checker:
  - *none*

- Opmodes:
  - *none*

- Hydrazine:
  - *n/a*

Notes & Liens (2 of 2)

- Special Activities:
  - There are only three activities of some distinction to be noted here:
    - an RSS monopulse calibration on the DOY 077 DSS-34 pass: `RSS_233EA_DSNMONCAL002_RSS`,
    - the OTM CTGCY pass over DSS-25 on DOY 088, which backs up the large main engine burn OTM-444 ($\Delta V > 8$ m/s) and is in addition to the OTM back-up pass on DOY 086: `ENGR_234SA_OTMCTGCY444_ENGR`,
    - and the PEM being implemented during the DOY 091 pass: `ENGR_234EA_PEMA052_AACS`.

Sequence Liens (should all be SPLAT items):

- *none*