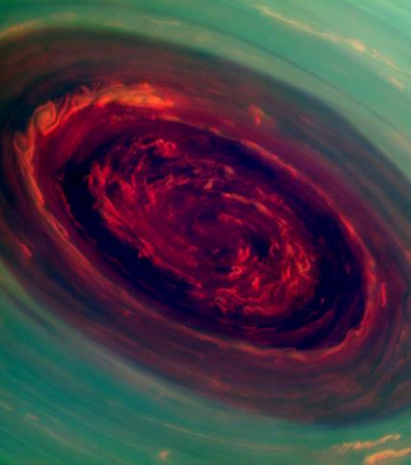

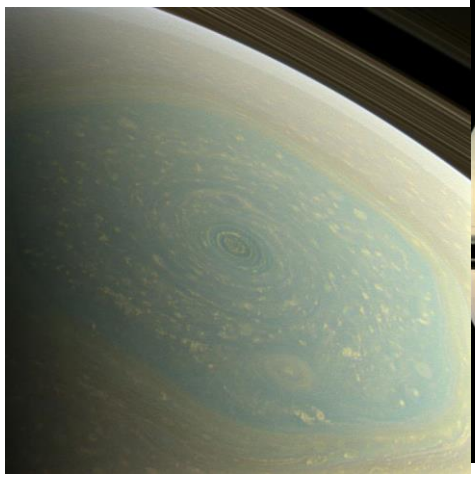
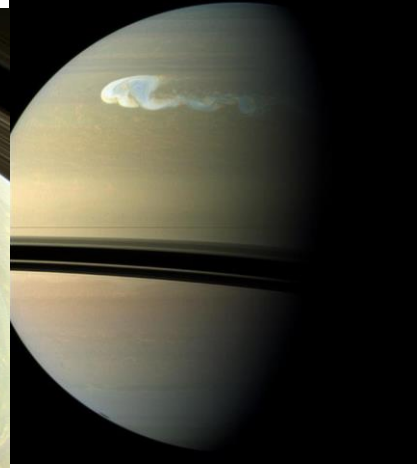

Science Planning & Sequence Team
CASSINI

SATURN TARGET WORKING TEAM

Rev 174_175 Segment Legacy Package

Segment Boundary: November 14, 2012 – November 28, 2012
2012-319T21:46:00 – 2012-333T20:32:00 (SCET)

Integration Began 01/09/2012
Segment Delivered to S76 Sequence 04/16/2012
Lead Integrator was Shawn Boll

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 segment fell in the first inclined phase (IN-1) of the Solstice Mission. It spanned from the Rev 174 outbound days preceding Rev 175 apoapse to just after Rev 175 periapse (6.89 Rs).

- Solar geometry impacted the science that could be planned in the day prior to periapse. A UVIS solar occultation observation was chosen when the Sun was not safely behind the planet. An ISS limb scan was performed during the eclipse portion, requiring special commanding to relax CMT (S/C automated constraint avoidance) limits (see page 11 & 21 for more details).

- The first 10 days of this segment was a designated “CAKE (Cassini Apoapse for Kronian Exploration)” period and was therefore filled with typical templated activities such as ORS wind studies, UVIS EUV/FUV measurements, and CIRS composition. Notable out-of-discipline activities for this period included a MAG calibration roll and a UVIS stellar-ring occultation PIE (Pre-Integrated Event).

- For the days around periapse, Saturn focused science included VIMS-led polar and regional mapping of both poles and hemispheres (incl. VIMS north pole PIE), VIMS auroal mapping, CIRS north hemisphere regional mapping, UVIS solar occultation, and the ISS limb scan mentioned above.

- Suggested observations in integration were selected for most periods and waypoints were chosen utilizing RBOT (reaction wheel) friendly attitudes for all periods except when not possible. One waypoint was used for the majority of the segment until the solar geometry conflicted. Following periapse, a different RBOT-friendly attitude was chosen.

- Due to Canberra 70-meter extended downtime, and the need for 70-meter coverage for data volume, Goldstone 70-meter downlinks on DOYs 323, 328 & 332 moved earlier to maximize data return.

Final Sequenced SPASS (1 of 3)

Gap 1

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S76, length = 72 days		2012-307T14:30:00		072T03:21:00	2013-013T17:51:00			
SATURN_174_175 Segment		2012-319T21:46:00		013T22:46:00	2012-333T20:32:00			
SP_174SA_WAYPTTURN319_PRIME		2012-319T21:46:00		000T00:40:00	2012-319T22:26:00	ISS_NAC to Saturn	NEG_Z to 135.5/44.6	
NEW WAYPOINT		**2012-319T22:26:00**		**000T18:35:00**	**2012-320T17:01:00**	**ISS_NAC to Saturn**	**NEG_Z to 135.5/44.6**	
ISS_174SA_WIND5HR001_PRIME	U, V	2012-319T22:26:00		000T05:00:00	2012-320T03:26:00	ISS_NAC to Saturn	NEG_Z to 135.5/44.6	No Preference to secondary pointing
CIRS_174SA_COMPSIT003_PRIME	U	2012-320T03:26:00		000T06:00:00	2012-320T09:26:00	CIRS_FP1 to Saturn	NEG_Z to 135.5/44.6	
ISS_174SA_WIND5HR002_PRIME	U, V	2012-320T09:26:00		000T05:00:00	2012-320T14:26:00	ISS_NAC to Saturn	NEG_Z to 135.5/44.6	No Preference to secondary pointing
SP_174EA_DLTURN320_PRIME		2012-320T16:21:00		000T00:40:00	2012-320T17:01:00	XBAND to Earth	NEG_X to 303.0/0.0	
NEW WAYPOINT		**2012-320T17:01:00**		**000T11:10:00**	**2012-321T04:11:00**	**XBAND to Earth**	**NEG_X to 303.0/0.0**	
SP_174EA_YGAP320_PRIME		2012-320T17:01:00		000T01:30:00	2012-320T18:31:00	XBAND to Earth	NEG_X to 303.0/0.0	
SP_174EA_C34HEFNON320_PRIME	C	2012-320T18:31:00		000T06:15:00	2012-321T00:46:00	XBAND to Earth	Rolling	CDA. NEG_X to (303/0).
SP_174SA_WAYPTTURN321_PRIME	M	2012-321T03:31:00		000T00:40:00	2012-321T04:11:00	ISS_NAC to Saturn	NEG_Z to 135.5/44.6	
NEW WAYPOINT		**2012-321T04:11:00**		**000T14:20:00**	**2012-321T18:31:00**	**ISS_NAC to Saturn**	**NEG_Z to 135.5/44.6**	
UVIS_174SA_EUVFUV001_PRIME	I, M	2012-321T04:11:00		000T05:40:00	2012-321T09:51:00	UVIS_FUV to Saturn	NEG_Z to 135.5/44.6	
MAG_174SU_CALROLL002_PRIME	M	2012-321T09:51:00		000T08:00:00	2012-321T17:51:00	NEG_X to Earth (0.0,0.0,-30.0 deg. offset)	Rolling	
SP_174EA_DLTURN321_PRIME	M	2012-321T17:51:00		000T00:40:00	2012-321T18:31:00	XBAND to Earth	NEG_X to 303.0/0.0	
NEW WAYPOINT		**2012-321T18:31:00**		**000T09:40:00**	**2012-322T04:11:00**	**XBAND to Earth**	**NEG_X to 303.0/0.0**	
SP_174EA_C34HEFOTP321_PRIME	C, E, M, N	2012-321T18:31:00		000T09:00:00	2012-322T03:31:00	XBAND to Earth	NEG_X to 303.0/0.0	CDA. NEG_X to (303/0). OTP. SID suspend
SP_174SA_WAYPTTURN332_PRIME		2012-322T03:31:00		000T00:40:00	2012-322T04:11:00	ISS_NAC to Saturn	NEG_Z to 135.5/44.6	
NEW WAYPOINT		**2012-322T04:11:00**		**000T14:20:00**	**2012-322T18:31:00**	**ISS_NAC to Saturn**	**NEG_Z to 135.5/44.6**	
ISS_174SA_WIND2HR001_PRIME	U, V	2012-322T04:11:00		000T02:00:00	2012-322T06:11:00	ISS_NAC to Saturn	NEG_Z to 135.5/44.6	No Preference to secondary pointing. collaborative with CIRS
CIRS_174SA_COMPSIT004_PRIME	U	2012-322T06:11:00		000T09:00:00	2012-322T15:11:00	CIRS_FP1 to Saturn	NEG_Z to 135.5/44.6	
ISS_174SA_WIND2HR002_PRIME	U, V	2012-322T15:11:00		000T02:00:00	2012-322T17:11:00	ISS_NAC to Saturn	NEG_Z to 135.5/44.6	No Preference to secondary pointing. collaborative with CIRS
SP_174EA_DLTURN322_PRIME		2012-322T17:51:00		000T00:40:00	2012-322T18:31:00	XBAND to Earth	NEG_X to 303.0/0.0	
NEW WAYPOINT		**2012-322T18:31:00**		**000T09:40:00**	**2012-323T04:11:00**	**XBAND to Earth**	**NEG_X to 303.0/0.0**	
SP_174EA_C34HEFOTB322_PRIME	C, M, N	2012-322T18:31:00		000T08:45:00	2012-323T03:16:00	XBAND to Earth	NEG_X to 303.0/0.0	CDA. same secondary as OTP pass. OTB. SID suspend
SP_174SA_WAYPTTURN323_PRIME	M	2012-323T03:31:00		000T00:40:00	2012-323T04:11:00	ISS_NAC to Saturn	NEG_Z to 135.5/44.6	
NEW WAYPOINT		**2012-323T04:11:00**		**000T06:29:00**	**2012-323T10:40:00**	**ISS_NAC to Saturn**	**NEG_Z to 135.5/44.6**	
UVIS_174SA_EUVFUV002_PRIME	I, M	2012-323T04:11:00		000T05:49:00	2012-323T10:00:00	UVIS_FUV to Saturn	NEG_Z to 135.5/44.6	
SP_174EA_DLTURN323_PRIME	M	2012-323T10:00:00		000T00:40:00	2012-323T10:40:00	XBAND to Earth	NEG_X to 303.0/0.0	
NEW WAYPOINT		**2012-323T10:40:00**		**000T11:10:00**	**2012-323T21:50:00**	**XBAND to Earth**	**NEG_X to 303.0/0.0**	
SP_174EA_YGAP323_PRIME	M	2012-323T10:40:00		000T01:30:00	2012-323T12:10:00	XBAND to Earth	NEG_X to 303.0/0.0	
SP_174EA_G70METNON323_PRIME	C, M	2012-323T12:10:00		000T07:35:00	2012-323T19:45:00	XBAND to Earth	Rolling/SRU	
SP_174SA_WAYPTTURN423_PRIME		2012-323T21:10:00		000T00:40:00	2012-323T21:50:00	ISS_NAC to Saturn	NEG_Z to 135.6/44.6	
NEW WAYPOINT		**2012-323T21:50:00**		**000T18:56:00**	**2012-324T16:46:00**	**ISS_NAC to Saturn**	**NEG_Z to 135.6/44.6**	
CIRS_174SA_COMPSIT005_PRIME	U, V	2012-323T21:50:00		000T09:22:00	2012-324T07:12:00	CIRS_FP1 to Saturn	NEG_Z to 135.6/44.6	
Apoapse Per = 15.9 d, inc ...		2012-324T02:54:05		000T00:00:01	2012-324T02:54:06			
UVIS_175ST_URALPLYR001_PIE	C, M, V	2012-324T07:12:00		000T08:28:00	2012-324T15:40:00	UVIS_HSP to 279.234/38.784	NEG_Z to 135.6/44.6	
SP_175EA_DLTURN324_PRIME	M	2012-324T16:06:00		000T00:40:00	2012-324T16:46:00	XBAND to Earth	NEG_X to 303.0/0.0	
NEW WAYPOINT		**2012-324T16:46:00**		**000T11:10:00**	**2012-325T03:56:00**	**XBAND to Earth**	**NEG_X to 303.0/0.0**	
SP_175EA_YGAP324_PRIME	M	2012-324T16:46:00		000T01:30:00	2012-324T18:16:00	XBAND to Earth	NEG_X to 303.0/0.0	
SP_175EA_C34HEFNON324_PRIME	C, E, M	2012-324T18:16:00		000T06:00:00	2012-325T00:16:00	XBAND to Earth	3_Hr_Rolling	CDA. NEG_X to (303/0). SID suspend
SP_175SA_WAYPTTURN325_PRIME	M	2012-325T03:16:00		000T00:40:00	2012-325T03:56:00	ISS_NAC to Saturn	NEG_Z to 135.6/44.6	
NEW WAYPOINT		**2012-325T03:56:00**		**000T06:35:00**	**2012-325T10:31:00**	**ISS_NAC to Saturn**	**NEG_Z to 135.6/44.6**	
ISS_175TI_M60R3CLD325_PRIME	C, M, V	2012-325T03:56:00	E175_M60R3CLD325+000T00:00:00	000T01:30:00	2012-325T05:26:00	ISS_NAC to Titan	NEG_Z to 135.6/44.6	
UVIS_175SA_EUVFUV001_PRIME	I, M	2012-325T05:26:00		000T04:25:00	2012-325T09:51:00	UVIS_FUV to Saturn	NEG_Z to 135.6/44.6	
SP_175EA_DLTURN325_PRIME		2012-325T09:51:00		000T00:40:00	2012-325T10:31:00	XBAND to Earth	NEG_X to 303.0/0.0	
NEW WAYPOINT		**2012-325T10:31:00**		**000T11:10:00**	**2012-325T21:41:00**	**XBAND to Earth**	**NEG_X to 303.0/0.0**	
SP_175EA_YGAP325_PRIME		2012-325T10:31:00		000T01:30:00	2012-325T12:01:00	XBAND to Earth	NEG_X to 303.0/0.0	
SP_175EA_G70METNON325_PRIME	C	2012-325T12:01:00		000T07:50:00	2012-325T19:51:00	XBAND to Earth	Rolling/SRU	CDA. NEG_X to (303/0). SID suspend
SP_175SA_WAYPTTURN425_PRIME		2012-325T21:01:00		000T00:40:00	2012-325T21:41:00	ISS_NAC to Saturn	NEG_Z to 135.6/44.6	
NEW WAYPOINT		**2012-325T21:41:00**		**000T20:35:00**	**2012-326T18:16:00**	**ISS_NAC to Saturn**	**NEG_Z to 135.6/44.6**	
ISS_175TI_M60R3CLD725_PRIME	C, V	2012-325T21:41:00	E175_M60R3CLD725+000T00:00:00	000T01:30:00	2012-325T23:11:00	ISS_NAC to Titan	NEG_Z to 135.6/44.6	
ISS_175SA_WIND5HR003_PRIME	U, V	2012-325T23:11:00		000T05:00:00	2012-326T04:11:00	ISS_NAC to Saturn	NEG_Z to 135.6/44.6	No Preference to secondary pointing
CIRS_175SA_COMPSIT001_PRIME	M, U	2012-326T04:11:00		000T06:00:00	2012-326T10:11:00	CIRS_FP1 to Saturn	NEG_Z to 135.6/44.6	
ISS_175SA_WIND5HR004_PRIME	M, U, V	2012-326T10:11:00		000T05:00:00	2012-326T15:11:00	ISS_NAC to Saturn	NEG_Z to 135.6/44.6	No Preference to secondary pointing

Final Sequenced SPASS (2 of 3)

Saturn 174_175 Legacy

Gap 4, left empty

Gap 5

Gap 6

Gap 7

Gap 8

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
SP_175EA_DLTURN326_PRIME	M	2012-326T17:36:00		000T00:40:00	2012-326T18:16:00	XBAND to Earth	NEG_X to 303.0/0.0	
NEW WAYPOINT		**2012-326T18:16:00**		**000T09:40:00**	**2012-327T03:56:00**	**XBAND to Earth**	**NEG_X to 303.0/0.0**	
SP_175EA_C34BWGOTP326_PRIME	C, E, M, N	2012-326T18:16:00		000T09:00:00	2012-327T03:16:00	XBAND to Earth	NEG_X to 303.0/0.0	CDA. NEG_X to (303/0). OTP. SID suspend
SP_175SA_WAYPTTURN327_PRIME		2012-327T03:16:00		000T00:40:00	2012-327T03:56:00	ISS_NAC to Saturn	NEG_Z to 135.6/44.6	
NEW WAYPOINT		**2012-327T03:56:00**		**000T14:20:00**	**2012-327T18:16:00**	**ISS_NAC to Saturn**	**NEG_Z to 135.6/44.6**	
ISS_175TI_M90R3CLD327_PRIME	C, V	2012-327T03:56:00	E175_M90R3CLD327+000T00:00:00	000T01:30:00	2012-327T05:26:00	ISS_NAC to Titan	NEG_Z to 135.6/44.6	
CIRS_175SA_COMPSIT002_PRIME	U, V	2012-327T05:26:00		000T12:10:00	2012-327T17:36:00	CIRS_FP1 to Saturn	NEG_Z to 135.6/44.6	
SP_175EA_DLTURN327_PRIME		2012-327T17:36:00		000T00:40:00	2012-327T18:16:00	XBAND to Earth	NEG_X to 303.0/0.0	
NEW WAYPOINT		**2012-327T18:16:00**		**000T09:40:00**	**2012-328T03:56:00**	**XBAND to Earth**	**NEG_X to 303.0/0.0**	
SP_175EA_C34HEFOTB327_PRIME	C, N	2012-327T18:16:00		000T09:00:00	2012-328T03:16:00	XBAND to Earth	NEG_X to 303.0/0.0	CDA. same secondary as OTP pass. OTB. SID suspend
SP_175SA_WAYPTTURN328_PRIME		2012-328T03:16:00		000T00:40:00	2012-328T03:56:00	ISS_NAC to Saturn	NEG_Z to 135.6/44.6	
NEW WAYPOINT		**2012-328T03:56:00**		**000T06:26:00**	**2012-328T10:22:00**	**ISS_NAC to Saturn**	**NEG_Z to 135.6/44.6**	
ISS_175TI_M90R3CLD328_PRIME	C, V	2012-328T03:56:00	E175_M90R3CLD328+000T00:00:00	000T01:30:00	2012-328T05:26:00	ISS_NAC to Titan	NEG_Z to 135.6/44.6	
UVIS_175SA_EUVFUV002_PRIME	I	2012-328T05:26:00		000T04:16:00	2012-328T09:42:00	UVIS_FUV to Saturn	NEG_Z to 135.6/44.6	
SP_175EA_DLTURN328_PRIME		2012-328T09:42:00		000T00:40:00	2012-328T10:22:00	XBAND to Earth	NEG_Y to 296.0/34.0	
NEW WAYPOINT		**2012-328T10:22:00**		**000T11:10:00**	**2012-328T21:32:00**	**XBAND to Earth**	**NEG_Y to 296.0/34.0**	
SP_175EA_YGAP328_PRIME		2012-328T10:22:00		000T01:30:00	2012-328T11:52:00	XBAND to Earth	NEG_Y to 296.0/34.0	
SP_175EA_G70METNON328_PRIME	C	2012-328T11:52:00		000T08:00:00	2012-328T19:52:00	XBAND to Earth	NEG_Y to 296.0/34.0	
SP_175SA_WAYPTTURN428_PRIME		2012-328T20:52:00		000T00:40:00	2012-328T21:32:00	ISS_NAC to Saturn	NEG_Z to 135.6/44.6	
NEW WAYPOINT		**2012-328T21:32:00**		**000T18:59:00**	**2012-329T16:31:00**	**ISS_NAC to Saturn**	**NEG_Z to 135.6/44.6**	
ISS_175SA_WIND5HR005_PRIME	U, V	2012-328T21:32:00		000T05:00:00	2012-329T02:32:00	ISS_NAC to Saturn	NEG_Z to 135.6/44.6	No Preference to secondary pointing
CIRS_175SA_COMPSIT003_PRIME	I, U, V	2012-329T02:32:00		000T06:00:00	2012-329T08:32:00	CIRS_FPB to Saturn	NEG_Z to 135.6/44.6	Collaborative Rider(s): ISS, UVIS, VIMS. Target FPB to 75S (CML+180 degrees). Auroral campaign with VIMS & ISS.
ISS_175SA_WIND5HR006_PRIME	U, V	2012-329T08:32:00		000T05:00:00	2012-329T13:32:00	ISS_NAC to Saturn	NEG_Z to 135.6/44.6	No Preference to secondary pointing
VIMS_175SA_SPOLMAP001_PRIME	I	2012-329T13:32:00		000T02:19:00	2012-329T15:51:00	ISS_NAC to Saturn	NEG_Z to 135.6/44.6	Collaborative Rider(s): ISS
SP_175EA_DLTURN329_PRIME		2012-329T15:51:00		000T00:40:00	2012-329T16:31:00	XBAND to Earth	NEG_Y to 296.0/34.0	
NEW WAYPOINT		**2012-329T16:31:00**		**000T11:10:00**	**2012-330T03:41:00**	**XBAND to Earth**	**NEG_Y to 296.0/34.0**	
ENGR_175SC_KPTYBIAS329_PRIME		2012-329T16:31:00		000T01:30:00	2012-329T18:01:00	NEG_Z to DELTA_H (0.0,0.0,-6.998 deg. offset)	NEG_X to Sun	
SP_175EA_C34HEFNON329_PRIME	C	2012-329T18:01:00		000T09:00:00	2012-330T03:01:00	XBAND to Earth	NEG_Y to 296.0/34.0	MIMI. NEG_Y to Saturn (0,0,-9.5). SID suspend
SP_175SA_WAYPTTURN330_PRIME		2012-330T03:01:00		000T00:40:00	2012-330T03:41:00	ISS_NAC to Saturn	NEG_Z to 135.6/44.6	
NEW WAYPOINT		**2012-330T03:41:00**		**000T14:20:00**	**2012-330T18:01:00**	**ISS_NAC to Saturn**	**NEG_Z to 135.6/44.6**	
VIMS_175SA_AURMAP001_PRIME	C, I, U	2012-330T03:41:00		000T07:40:00	2012-330T11:21:00	ISS_NAC to Saturn	NEG_Z to 135.6/44.6	Collaborative Rider(s): CIRS, ISS, UVIS
CIRS_175SA_REGMAP001_PRIME	U, V	2012-330T11:21:00		000T06:00:00	2012-330T17:21:00	CIRS_FPB to Saturn	NEG_Z to 135.6/44.6	slow (100 microrad/sec) scans 70S to 90S for Auroral Campaign
SP_175EA_DLTURN330_PRIME		2012-330T17:21:00		000T00:40:00	2012-330T18:01:00	XBAND to Earth	NEG_X to NEP	
NEW WAYPOINT		**2012-330T18:01:00**		**000T09:40:00**	**2012-331T03:41:00**	**XBAND to Earth**	**NEG_X to NEP**	
SP_175EA_C34HEFOTP330_PRIME	C, N	2012-330T18:01:00		000T09:00:00	2012-331T03:01:00	XBAND to Earth	NEG_X to NEP	CAPS. NEG_X to NEP or NSP. OTP
SP_175SA_WAYPTTURN331_PRIME		2012-331T03:01:00		000T00:40:00	2012-331T03:41:00	UVIS_SOL_OFF to Sun	POS_Z to NSP	
NEW WAYPOINT		**2012-331T03:41:00**		**000T14:20:00**	**2012-331T18:01:00**	**UVIS_SOL_OFF to Sun**	**POS_Z to NSP**	
VIMS_175SA_REGMAP001_PRIME		2012-331T03:41:00		000T02:25:00	2012-331T06:06:00	ISS_NAC to Saturn	POS_X to NSP	
SP_175NA_DEADTIME331_PRIME		**2012-331T06:24:00**		**000T00:19:59**	**2012-331T06:43:59**	**UVIS_SOL_OFF to Sun**	**POS_Z to NSP**	
UVIS_175SA_USUNOCC001_PRIME	V	2012-331T06:43:59	GMB_E175_Saturn_Solar_Occ_Ing-000T02:12:43	000T02:19:00	2012-331T09:02:59	UVIS_SOL_OFF to Sun	POS_Z to NSP	
ISS_175SA_LIMBSCAN001_PRIME	V	2012-331T09:02:59	GMB_E175_Saturn_Solar_Occ_Ing+000T00:06:17	000T03:08:00	2012-331T12:10:59	ISS_NAC to Saturn	POS_Z to NSP	Observe night limb for MAPS Titan vertical profile.
SP_175NA_DEADTIME431_PRIME		**2012-331T12:10:59**	**GMB_E175_Saturn_Solar_Occ_Ing+000T03:14:17**	**000T00:20:00**	**2012-331T12:30:59**	**UVIS_SOL_OFF to Sun**	**POS_Z to NSP**	
VIMS_175SA_REGMAP002_PRIME	M	2012-331T14:06:00		000T03:15:00	2012-331T17:21:00	ISS_NAC to Saturn	POS_Z to NSP	
SP_175EA_DLTURN331_PRIME	M	2012-331T17:21:00		000T00:40:00	2012-331T18:01:00	XBAND to Earth	NEG_X to NEP	
NEW WAYPOINT		**2012-331T18:01:00**		**000T09:40:00**	**2012-332T03:41:00**	**XBAND to Earth**	**NEG_X to NEP**	
SP_175EA_C34HEFOTB331_PRIME	C, M, N	2012-331T18:01:00		000T09:00:00	2012-332T03:01:00	XBAND to Earth	NEG_X to NEP	CAPS. same secondary as OTP pass. OTB. SID suspend
Periapse R = 6.894 Rs, lat ...		2012-332T02:15:20		000T00:00:01	2012-332T02:15:21			
SP_175SA_WAYPTTURN332_PRIME		2012-332T03:01:00		000T00:40:00	2012-332T03:41:00	ISS_NAC to Saturn	POS_X to 135.6/44.6	
NEW WAYPOINT		**2012-332T03:41:00**		**000T06:18:00**	**2012-332T09:59:00**	**ISS_NAC to Saturn**	**POS_X to 135.6/44.6**	
ISS_175SA_NPOLVORT001_PIE	C, U, V	2012-332T03:41:00		000T05:38:00	2012-332T09:19:00	ISS_NAC to Saturn	POS_X to 135.6/44.6	

Final Sequenced SPASS (3 of 3)

Gap 9

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
SP_175EA_DLTURN332_PRIME		2012-332T09:19:00		000T00:40:00	2012-332T09:59:00	XBAND to Earth	POS_X to NEP	
NEW WAYPOINT		**2012-332T09:59:00**		**000T11:10:00**	**2012-332T21:09:00**	**XBAND to Earth**	**POS_X to NEP**	
ENGR_175SC_KPTYBIAS332_PRIME		2012-332T09:59:00		000T01:30:00	2012-332T11:29:00	NEG_Z to DELTA_H (0.0,0.0,23.0 deg. offset)	NEG_X to Sun	
SP_175EA_G70METNON332_PRIME	C	2012-332T11:29:00		000T08:35:00	2012-332T20:04:00	XBAND to Earth	POS_X to NEP	CAPS. POS_X to NEP or NSP.
SP_175SA_WAYPTTURN432_PRIME		2012-332T20:29:00		000T00:40:00	2012-332T21:09:00	ISS_NAC to Saturn	POS_X to 135.6/44.6	
NEW WAYPOINT		**2012-332T21:09:00**		**000T12:53:00**	**2012-333T10:02:00**	**ISS_NAC to Saturn**	**POS_X to 135.6/44.6**	
VIMS_175SA_NPOLMAP001_PRIME	C, I	2012-332T21:09:00		000T12:13:00	2012-333T09:22:00	ISS_NAC to Saturn	POS_X to NSP	Collaborative Rider(s): ISS
SP_175EA_DLTURN333_PRIME		2012-333T09:22:00		000T00:40:00	2012-333T10:02:00	XBAND to Earth	POS_X to NEP	
NEW WAYPOINT		**2012-333T10:02:00**		**000T11:10:00**	**2012-333T21:12:00**	**XBAND to Earth**	**POS_X to NEP**	
SP_175EA_YGAP333_PRIME		2012-333T10:02:00		000T01:30:00	2012-333T11:32:00	XBAND to Earth	POS_X to NEP	
SP_175EA_G70METNON333_PRIME	C	2012-333T11:32:00		000T07:45:00	2012-333T19:17:00	XBAND to Earth	POS_X to NEP	CAPS. POS_X to NEP or NSP. pre-TOST flyby

Final Sequenced SMT and Data Volume

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)	NET_MARGN (%)	CAROVR (Mb)
SP_174EA_C34HEFNON320_PRIME	320 18:31	321 00:46	511	1083	106	1700	3322	1622	0	123	37	1859	471	-1389	927	11%	1388
SP_174EA_C34HEFOTP321_PRIME	321 18:31	322 03:31	1388	448	75	1911	3322	1411	0	182	53	2146	559	-1587	1090	11%	1587
SP_174EA_C34HEFOTB322_PRIME	322 18:31	323 03:16	1587	581	63	2232	3322	1090	0	176	52	2459	653	-1807	1194	12%	1807
SP_174EA_G70METNON323_PRIME	323 12:10	323 19:45	1807	284	38	2128	3322	1194	0	151	45	2324	2392	67	1623	16%	0
SP_175EA_C34HEFNON324_PRIME	324 18:16	325 00:16	0	1177	95	1272	3322	2050	0	117	35	1425	451	-974	1555	18%	974
SP_175EA_G70METNON325_PRIME	325 12:01	325 19:51	974	381	50	1404	3322	1918	0	157	46	1607	2466	859	1532	14%	0
SP_175EA_C34BWGOTP326_PRIME	326 18:16	327 03:16	0	1071	95	1165	3322	2157	0	182	53	1400	516	-885	673	6%	884
SP_175EA_C34HEFOTB327_PRIME	327 18:16	328 03:16	884	725	63	1673	3322	1649	0	182	53	1907	673	-1235	516	4%	1234
SP_175EA_G70METNON328_PRIME	328 11:52	328 19:52	1234	311	36	1582	3322	1740	0	160	47	1789	2485	695	516	4%	0
SP_175EA_C34HEFNON329_PRIME	329 18:01	330 03:01	0	1210	94	1304	3322	2018	0	210	53	1567	673	-895	-179	-1%	894
SP_175EA_C34HEFOTP330_PRIME	330 18:01	331 03:01	894	760	63	1718	3322	1604	0	257	53	2028	559	-1469	-179	-1%	1469
SP_175EA_C34HEFOTB331_PRIME	331 18:01	332 03:01	1469	1296	63	2829	3322	493	0	396	53	3278	668	-2610	-179	-1%	2609
SP_175EA_G70METNON332_PRIME	332 11:29	332 20:04	2609	700	36	3345	3322	-22	0	209	51	3582	2566	-1016	-179	-1%	1016
SP_175EA_G70METNON333_PRIME	333 11:32	333 19:17	1016	1257	65	2338	3322	984	0	188	46	2572	2402	-171	-179	-1%	171

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	319 17:31	320 18:31	67.6	27.6	89.1	9.0	450.0	26.0	57.8	0.0	87.3	59.1	200.0	0.0	104.5	1178.0
SP_174EA_C34HEFNON320_PRIME	320 18:31	321 00:46	15.8	5.9	56.7	2.3	0.0	5.6	13.5	0.0	20.2	1.7	0.0	0.0	0.0	121.6
DAILY TOTAL SCIENCE	319 17:31	321 00:46	83.3	33.5	145.8	11.2	450.0	31.6	71.3	0.0	107.5	60.8	200.0	0.0	104.5	
OBSERVATION_NOR	321 00:46	321 18:31	44.7	16.7	70.5	6.4	50.0	65.6	38.3	0.0	57.5	94.6	0.0	0.0	74.2	518.5
SP_174EA_C34HEFOTP321_PRIME	321 18:31	322 03:31	22.7	8.5	86.4	3.2	0.0	8.0	19.4	0.0	29.2	2.5	0.0	0.0	0.0	179.9
DAILY TOTAL SCIENCE	321 00:46	322 03:31	67.4	25.2	156.9	9.6	50.0	73.6	57.8	0.0	86.7	97.0	0.0	0.0	74.2	
OBSERVATION_NOR	322 03:31	322 18:31	37.8	14.1	64.8	5.4	232.5	13.3	32.4	0.0	48.6	47.1	80.0	0.0	62.7	638.8
SP_174EA_C34HEFOTB322_PRIME	322 18:31	323 03:16	22.0	8.3	83.7	3.2	0.0	7.8	18.9	0.0	28.3	2.4	0.0	0.0	0.0	174.6
DAILY TOTAL SCIENCE	322 03:31	323 03:16	59.8	22.4	148.5	8.6	232.5	21.1	51.3	0.0	76.9	49.5	80.0	0.0	62.7	
OBSERVATION_NOR	323 03:16	323 12:10	22.4	8.4	44.6	3.2	50.0	7.9	19.2	0.0	28.8	96.4	0.0	0.0	37.2	318.1
SP_174EA_G70METNON323_PRIME	323 12:10	323 19:45	19.1	7.2	71.1	2.7	0.0	6.7	16.4	0.0	24.6	2.1	0.0	0.0	0.0	149.9
DAILY TOTAL SCIENCE	323 03:16	323 19:45	41.5	15.5	115.7	5.9	50.0	14.7	35.6	0.0	53.4	98.5	0.0	0.0	37.2	

* Negative SSR Margins did not result in a loss in science due to under-utilization/.compression.

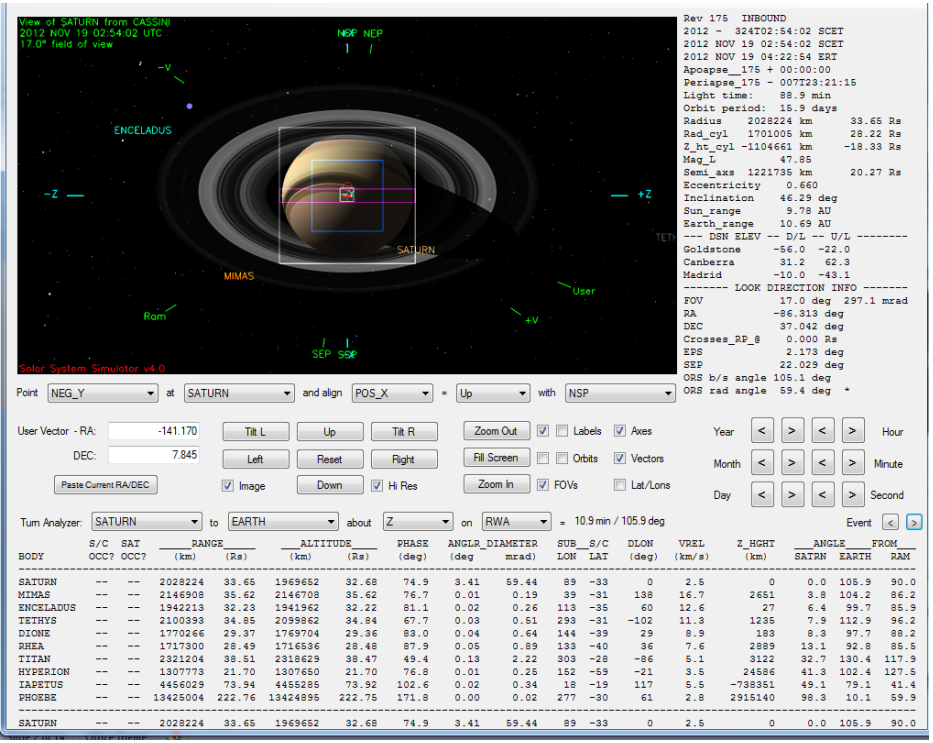
Final Sequenced SMT and Data Volume

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	323 19:45	324 18:16	56.7	21.2	204.7	8.1	0.0	20.0	48.6	0.0	73.0	353.2	381.0	0.0	94.1	1260.7
SP_175EA_C34HEFNON324_PRIME	324 18:16	325 00:16	15.1	5.7	54.0	2.2	0.0	5.3	13.0	0.0	19.4	1.6	0.0	0.0	0.0	116.3
DAILY TOTAL SCIENCE	323 19:45	325 00:16	71.9	26.9	258.7	10.3	0.0	25.4	61.6	0.0	92.4	354.9	381.0	0.0	94.1	
OBSERVATION_NOR	325 00:16	325 12:01	29.6	11.1	85.8	4.2	88.5	10.4	25.4	0.0	38.1	73.9	10.0	0.0	49.1	426.2
SP_175EA_G70METNON325_PRIME	325 12:01	325 19:51	19.7	7.4	73.8	2.8	0.0	7.0	16.9	0.0	25.4	2.1	0.0	0.0	0.0	155.2
DAILY TOTAL SCIENCE	325 00:16	325 19:51	49.4	18.5	159.6	7.1	88.5	17.4	42.3	0.0	63.4	76.1	10.0	0.0	49.1	
OBSERVATION_NOR	325 19:51	326 18:16	56.5	21.1	77.4	8.1	488.5	19.9	48.4	0.0	72.6	58.3	210.0	0.0	93.7	1154.6
SP_175EA_C34BWGOTP326_PRIME	326 18:16	327 03:16	22.7	8.5	86.4	3.2	0.0	8.0	19.4	0.0	29.2	2.5	0.0	0.0	0.0	179.9
DAILY TOTAL SCIENCE	325 19:51	327 03:16	79.2	29.6	163.8	11.3	488.5	27.9	67.9	0.0	101.8	60.7	210.0	0.0	93.7	
OBSERVATION_NOR	327 03:16	327 18:16	37.8	14.1	109.2	5.4	38.5	13.3	32.4	0.0	48.6	44.1	375.0	0.0	62.7	781.2
SP_175EA_C34HEFOTB327_PRIME	327 18:16	328 03:16	22.7	8.5	86.4	3.2	0.0	8.0	19.4	0.0	29.2	2.5	0.0	0.0	0.0	179.9
DAILY TOTAL SCIENCE	327 03:16	328 03:16	60.5	22.6	195.6	8.6	38.5	21.3	51.8	0.0	77.8	46.5	375.0	0.0	62.7	
OBSERVATION_NOR	328 03:16	328 11:52	21.7	8.1	52.3	3.1	88.5	7.6	18.6	0.0	27.9	70.6	10.0	0.0	35.9	344.4
SP_175EA_G70METNON328_PRIME	328 11:52	328 19:52	20.2	7.5	75.6	2.9	0.0	7.1	17.3	0.0	25.9	2.2	0.0	0.0	0.0	158.7
DAILY TOTAL SCIENCE	328 03:16	328 19:52	41.8	15.7	127.9	6.0	88.5	14.8	35.9	0.0	53.8	72.8	10.0	0.0	35.9	
OBSERVATION_NOR	328 19:52	329 18:01	55.8	20.9	54.0	8.0	534.9	19.7	47.8	0.0	71.8	58.2	328.0	0.0	92.6	1291.7
SP_175EA_C34HEFNON329_PRIME	329 18:01	330 03:01	51.2	8.5	86.4	3.2	0.0	8.0	19.4	0.0	29.2	2.5	0.0	0.0	0.0	208.4
DAILY TOTAL SCIENCE	328 19:52	330 03:01	107.1	29.4	140.4	11.2	534.9	27.7	67.3	0.0	100.9	60.7	328.0	0.0	92.6	
OBSERVATION_NOR	330 03:01	330 18:01	54.0	28.3	141.6	5.4	70.0	26.7	32.4	0.0	51.2	123.8	220.0	0.0	62.7	816.0
SP_175EA_C34HEFOTP330_PRIME	330 18:01	331 03:01	32.4	17.0	86.4	3.2	0.0	16.0	19.4	0.0	75.2	4.9	0.0	0.0	0.0	254.6
DAILY TOTAL SCIENCE	330 03:01	331 03:01	86.4	45.3	228.0	8.6	70.0	42.7	51.8	0.0	126.4	128.7	220.0	0.0	62.7	
OBSERVATION_NOR	331 03:01	331 18:01	54.0	55.6	0.0	13.1	150.4	26.7	32.4	0.0	373.6	123.7	455.0	0.0	62.7	1347.2
SP_175EA_C34HEFOTB331_PRIME	331 18:01	332 03:01	32.4	28.0	64.8	5.6	0.0	16.0	19.4	0.0	221.2	4.9	0.0	0.0	0.0	392.4
DAILY TOTAL SCIENCE	331 03:01	332 03:01	86.4	83.6	64.8	18.7	150.4	42.7	51.8	0.0	594.9	128.7	455.0	0.0	62.7	
OBSERVATION_NOR	332 03:01	332 11:29	30.5	16.0	40.6	3.0	186.3	15.1	18.3	0.0	132.5	51.0	200.0	0.0	35.4	728.6
SP_175EA_G70METNON332_PRIME	332 11:29	332 20:04	30.9	16.2	64.8	3.1	0.0	15.3	26.3	0.0	45.8	4.7	0.0	0.0	0.0	207.1
DAILY TOTAL SCIENCE	332 03:01	332 20:04	61.4	32.2	105.4	6.1	186.3	30.3	44.6	0.0	178.3	55.7	200.0	0.0	35.4	
OBSERVATION_NOR	332 20:04	333 11:32	55.7	29.2	88.0	5.6	300.0	27.5	47.3	0.0	72.4	0.2	620.0	0.0	64.6	1310.5
SP_175EA_G70METNON333_PRIME	333 11:32	333 19:17	27.9	14.6	72.9	2.8	0.0	13.8	23.7	0.0	26.4	4.3	0.0	0.0	0.0	186.3
DAILY TOTAL SCIENCE	332 20:04	333 19:17	83.6	43.8	160.9	8.4	300.0	41.3	71.0	0.0	98.7	4.5	620.0	0.0	64.6	

Segment Geometry

APOAPSE



Rev 175 INBOUND
2012 - 324T02:54:02 SCET
2012 NOV 19 02:54:02 SCET
2012 NOV 19 04:22:54 ERT
Apoapse_175 + 00:00:00
Periapse_175 - 007T23:21:15
Light time: 88.9 min
Orbit period: 15.9 days
Radius 2028224 km 33.65 Rs
Rad_cyl 1701005 km 28.22 Rs
Z_ht_cyl -1104661 km -18.33 Rs
Mag_L 47.85
Semi_axs 1221735 km 20.27 Rs
Eccentricity 0.660
Inclination 46.29 deg
Sun_range 9.78 AU
Earth_range 10.69 AU
--- DSN ELEV -- D/L -- U/L --------
Goldstone -56.0 -22.0
Canberra 31.2 62.3
Madrid -10.0 -43.1
------- LOOK DIRECTION INFO -------
FOV 17.0 deg 297.1 mrad
RA -86.313 deg
DEC 37.042 deg
Crosses_RP_@ 0.000 Rs
EPS 2.173 deg
SEP 22.029 deg
ORS b/s angle 105.1 deg
ORS rad angle 59.4 deg

Point NEG_Y at SATURN and align POS_X = Up with NSP

User Vector - RA: -141.170 DEC: 7.845 Paste Current RA/DEC

Tilt L | Up | Tilt R | Left | Reset | Right | Down | Image | Hi Res

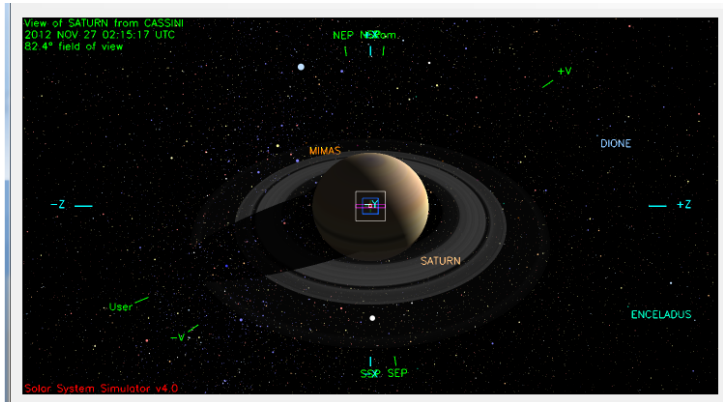
Zoom Out | Fill Screen | Zoom In | Labels | Axes | Orbits | Vectors | FOVs | Lat/Lons

Year Month Day Hour Minute Second

Turn Analyzer: SATURN to EARTH about Z on RWA = 10.9 min / 105.9 deg Event

BODY	S/C OCC?	SAT OCC?	RANGE (km)	RANGE (Rs)	ALTITUDE (km)	ALTITUDE (Rs)	PHASE (deg)	ANGLR_DIAMETER (deg)	ANGLR_DIAMETER mrad	SUB_S/C LON	SUB_S/C LAT	DLON (deg)	VREL (km/s)	Z_HGHT (km)	ANGLE_FROM SATRN	ANGLE_FROM EARTH	ANGLE_FROM RAM
SATURN	--	--	2028224	33.65	1969652	32.68	74.9	3.41	59.44	89	-33	0	2.5	0	0.0	105.9	90.0
MIMAS	--	--	2146908	35.62	2146708	35.62	76.7	0.01	0.19	39	-31	138	16.7	2651	3.8	104.2	86.2
ENCELADUS	--	--	1942213	32.23	1941962	32.22	81.1	0.02	0.26	113	-35	60	12.6	27	6.4	99.7	85.9
TETHYS	--	--	2100393	34.85	2099862	34.84	67.7	0.03	0.51	293	-31	-102	11.3	1235	7.9	112.9	96.2
DIONE	--	--	1770266	29.37	1769704	29.36	83.0	0.04	0.64	144	-39	29	8.9	183	8.3	97.7	88.2
RHEA	--	--	1717300	28.49	1716536	28.48	87.9	0.05	0.89	133	-40	36	7.6	2889	13.1	92.8	85.5
TITAN	--	--	2321204	38.51	2318629	38.47	49.4	0.13	2.22	303	-28	-86	5.1	3122	32.7	130.4	117.9
HYPERION	--	--	1307773	21.70	1307650	21.70	76.8	0.01	0.25	152	-59	-21	3.5	24586	41.3	102.4	127.5
IAPETUS	--	--	4456029	73.94	4455285	73.92	102.6	0.02	0.34	18	-19	117	5.5	-738351	49.1	79.1	41.4
PHOEBE	--	--	13425004	222.76	13424895	222.75	171.8	0.00	0.02	277	-30	61	2.8	2915140	98.3	10.1	59.9
SATURN	--	--	2028224	33.65	1969652	32.68	74.9	3.41	59.44	89	-33	0	2.5	0	0.0	105.9	90.0

PERIAPSE



Rev 175 INBOUND
2012 - 332T02:15:17 SCET
2012 NOV 27 02:15:17 SCET
2012 NOV 27 03:43:43 ERT
Apoapse_175 + 007T23:21:15
Periapse_175 + 00:00:00
Light time: 88.4 min
Orbit period: 16.0 days
Radius 415936 km 6.90 Rs
Rad_cyl 348877 km 5.79 Rs
Z_ht_cyl 226469 km 3.76 Rs
Mag_L 9.81
Semi_axs 1222185 km 20.28 Rs
Eccentricity 0.660
Inclination 46.32 deg
Sun_range 9.78 AU
Earth_range 10.63 AU
--- DSN ELEV -- D/L -- U/L --------
Goldstone -54.3 -20.0
Canberra 33.6 63.6
Madrid -12.4 -45.0
------- LOOK DIRECTION INFO -------
FOV 82.4 deg 1439.0 mrad
RA 93.665 deg
DEC -37.033 deg
Crosses_RP_@ 0.000 Rs
EPS 2.813 deg
SEP 29.125 deg
ORS b/s angle 74.7 deg
ORS rad angle 59.2 deg

Point NEG_Y at SATURN and align POS_X = Up with NSP

User Vector - RA: -141.170 DEC: 7.845 Paste Current RA/DEC

Tilt L | Up | Tilt R | Left | Reset | Right | Down | Image | Hi Res

Zoom Out | Fill Screen | Zoom In | Labels | Axes | Orbits | Vectors | FOVs | Lat/Lons

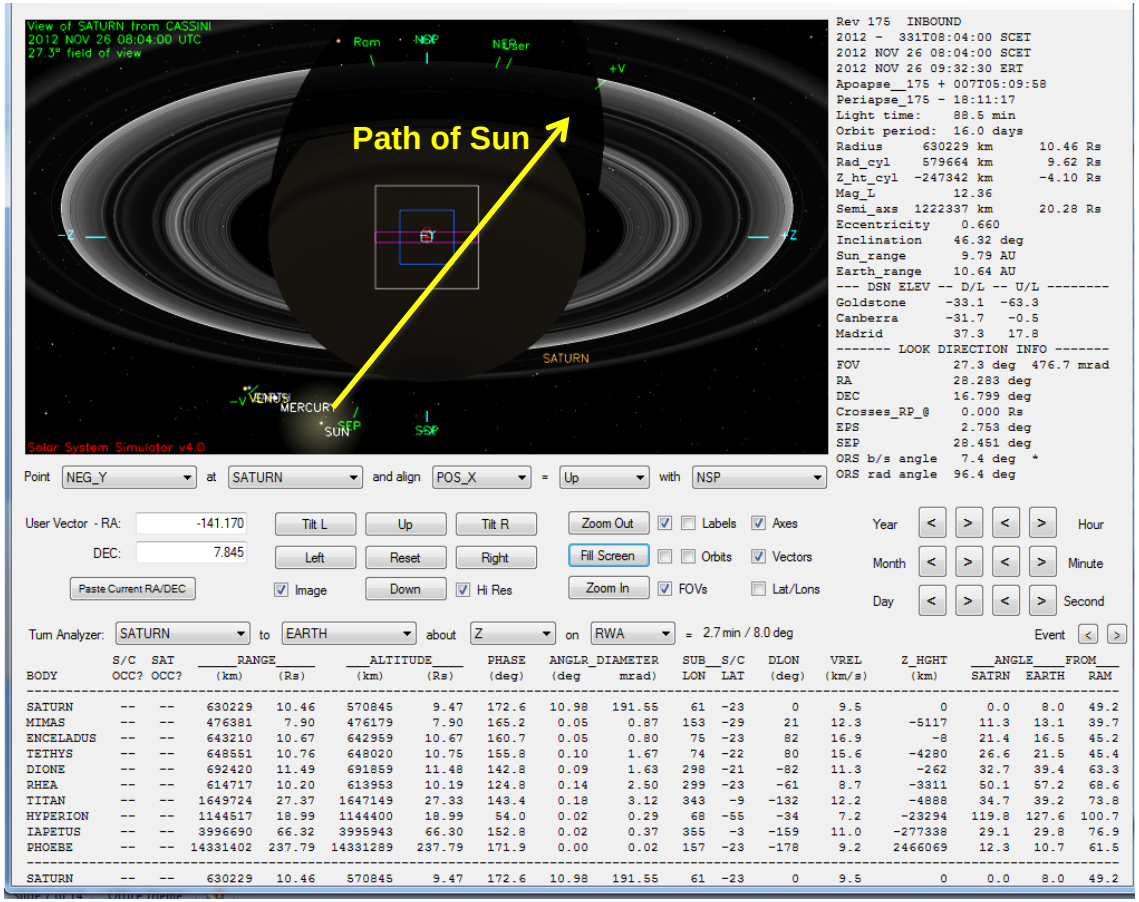
Year Month Day Hour Minute Second

Turn Analyzer: SATURN to EARTH about Z on RWA = 8.5 min / 73.6 deg Event

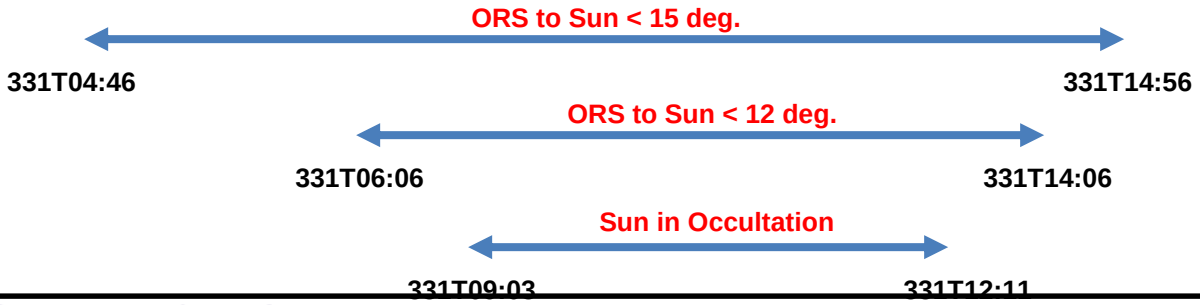
BODY	S/C OCC?	SAT OCC?	RANGE (km)	RANGE (Rs)	ALTITUDE (km)	ALTITUDE (Rs)	PHASE (deg)	ANGLR_DIAMETER (deg	ANGLR_DIAMETER mrad	SUB_S/C LON	SUB_S/C LAT	DLON (deg)	VREL (km/s)	Z_HGHT (km)	ANGLE_FROM SATRN	ANGLE_FROM EARTH	ANGLE_FROM RAM
SATURN	--	--	415936	6.90	357390	5.93	105.3	16.66	290.82	253	33	0	12.3	0	0.0	73.6	90.0
MIMAS	--	--	570701	9.47	570497	9.47	102.0	0.04	0.73	18	24	152	25.6	-2278	12.8	76.4	81.9
ENCELADUS	--	--	364643	6.05	364393	6.05	123.0	0.08	1.41	278	38	-54	9.2	16	34.8	57.5	99.4
TETHYS	--	--	227889	3.78	227361	3.77	83.6	0.27	4.74	194	75	-2	6.8	5577	43.2	97.1	132.5
DIONE	--	--	667158	11.07	666596	11.06	134.8	0.10	1.69	331	20	-120	16.9	62	30.9	44.6	78.9
RHEA	--	--	512560	8.50	511795	8.49	132.1	0.17	2.99	322	27	-59	8.9	-1363	68.2	50.1	102.4
TITAN	--	--	1245633	20.67	1243058	20.63	147.8	0.24	4.13	341	10	-88	11.6	-2729	72.4	34.6	86.8
HYPERION	--	--	1273488	21.13	1273352	21.13	35.9	0.01	0.26	158	-44	17	9.8	-26608	130.9	146.5	133.6
IAPETUS	--	--	3561425	59.09	3560678	59.08	151.7	0.02	0.42	354	5	-101	11.8	-220109	72.5	30.6	82.8
PHOEBE	--	--	13812203	229.18	13812091	229.18	170.9	0.00	0.02	143	-21	-115	12.8	2418058	73.6	11.5	63.6
SATURN	--	--	415936	6.90	357390	5.93	105.3	16.66	290.82	253	33	0	12.3	0	0.0	73.6	90.0

	Rs	Phase	Sub S/C Lat
Segment Start	26.6	44.7	-13
Apoapse	33.7	74.9	-33
Periapse	6.9	105.3	33
Segment End	17.2	15.1	8

Solar Geometry – ORS Boresight Concerns



- Pointing to NEG_Y to Saturn (center) would lead to an ORS to Sun violation between ~2012-331T04:46:00 and ~2012-331T14:56:00.
- Minimum NEG_Y to Sun angle is ~2.41° at 2012-331T10:26:00.
- The angle is less than 12 deg. from 2012-331T06:06 – 14:06.
- The sun is occulted from 09:03 – 12:11.
- Could UVIS make use of this time for an ingress occultaion?



Daily Science Highlights

DOY 320: The Saturn 174_175 segment began with a Saturn CAKE (dedicated apoapse for Saturn atmospheric science). ISS tracked Saturn features for winds, with mosaics in longitude as UVIS and VIMS rode along. CIRS measured oxygen compounds (H_2O, CO_2) in the stratosphere as a function of latitude with UVIS riding.

DOY 321: UVIS performed EUV/FUV imaging of Saturn with a slow scan across Saturn's visible hemisphere to form spectral images with ISS riding along. MAG executed a rolling calibration which rolls the spacecraft about an axis other than Z for determination of sensor offsets.

DOY 322: ISS tracked Saturn features for winds, with mosaics in longitude as UVIS and VIMS ride along. CIRS measured oxygen compounds (H_2O, CO_2) in the stratosphere as a function of latitude with UVIS riding.

DOY 323: UVIS performed EUV/FUV imaging of Saturn with a slow scan across Saturn's visible hemisphere to form spectral images with ISS riding along.

DOY 324: As Cassini proceeded through apoapse, CIRS measured oxygen compounds (H_2O, CO_2) in the stratosphere as a function of latitude with UVIS and VIMS riding. UVIS viewed a stellar occultation of the rings and atmosphere of Saturn. This was a high priority PIE activity.

DOY 325: ISS led a joint ORS effort to monitor Titan clouds. UVIS performed EUV/FUV imaging of Saturn with a slow scan across Saturn's visible hemisphere to form spectral images with ISS riding along.

DOY 326: ISS tracked Saturn features for winds, with mosaics in longitude as UVIS and VIMS ride along. CIRS measured oxygen compounds (H_2O, CO_2) in the stratosphere as a function of latitude with UVIS riding.

DOY 327: ISS led a joint ORS effort to monitor Titan clouds. CIRS measured oxygen compounds (H_2O, CO_2) in the stratosphere as a function of latitude with UVIS and VIMS riding.

DOY 328: ISS leds a joint ORS effort to monitor Titan clouds. UVIS performed EUV/FUV imaging of Saturn with a slow scan across Saturn's visible hemisphere to form spectral images with ISS riding along.

DOY 329: ISS tracks Saturn features for winds, with mosaics in longitude as UVIS and VIMS ride along. CIRS performs a Saturn auroral campaign with VIMS & ISS, while UVIS rides along as well. VIMS executes a Saturn south polar mosaic, while the other ORS teams ride along.

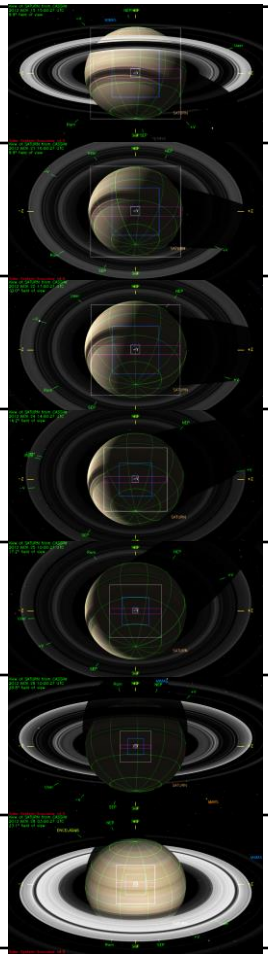
DOY 330: VIMS continues looking at Saturn’s south pole, leading a joint ORS auroral mapping activity. CIRS records a regional map of Saturn’s south polar region to measure temperatures of the southern vortex as part of the auroral campaign.

DOY 331: VIMS takes Saturn regional maps of mid-northern latitudes. UVIS observes an ingress solar occultation of Saturn, with VIMS riding. While the Sun is occulted, ISS, along with VIMS, will be looking at Saturn’s night-side limb. VIMS turns its attention back to the mid-northern latitudes with more Saturn regional mapping.

DOY 332: Following Saturn periapse, ISS performs NAC/WAC tracking of the possible Saturn north polar vortex with the other ORS instruments riding along. This is a high priority PIE observation. VIMS then undergoes more Saturn north polar mapping mosaics with ISS and CIRS as riders.

Segment Integration Planning

Timeline Gaps and Suggested Observations

Gap	Start	End	Duration	Phase angle range	Rs range	Sub S/C Lat	Snapshot (mid-gap)
1	2012-320T14:26:00	2012-320T16:21:00	000T01:55:00	50.9 to 51.6	28.8 to 29.0	-18	
4	2012-326T15:11:00	2012-326T17:36:00	000T02:25:00	91.1 to 91.8	31.2 to 31.0	-41	
5	2012-327T16:26:00	2012-327T17:36:00	000T01:10:00	99.2 to99.6	28.7 to 28.5	-44	
6	2012-329T13:32:00	2012-329T15:51:00	000T02:19:00	119.8 to 121.5	21.4 to 20.9	-46	
7	2012-330T03:41:00 *CIRS Mapping or VIMS aurora*	2012-330T17:21:00	000T13:40:00	130.4 to 145.2	18.2 to 14.7	-44 to -39	
8	2012-331T03:41:00 *UVIS Ingress Occultation or EUV/FUV*	2012-331T17:21:00	000T13:40:00	162.5 to 154.2	11.7 to 8.0	-30 to 0	
9	2012-332T:21:09:00 *VIMS Mapping*	2012-333T09:22:00	000T12:13:00	21.9 to 2.9	10.7 to 14.2	32 to 17	

- GAP 2: 2012- 322T17:11:00 (00:40:00)
- GAP 3: 2012-324T15:40:00 (00:26:00)

Initial SMT and Data Volume

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_174EA_C34HEFNON320_PRIME	320 18:31	321 03:31	0	971	88	1058	3322	2264	0	182	53	1293	668	-625	1908	21%	625
SP_174EA_C34HEFOTP321_PRIME	321 18:31	322 03:31	625	406	63	1094	3322	2228	0	182	53	1329	559	-770	1908	17%	770
SP_174EA_C34HEFOTB322_PRIME	322 18:31	323 03:31	770	581	63	1414	3322	1908	0	182	53	1649	668	-981	2017	18%	980
SP_174EA_G70METNON323_PRIME	323 12:10	323 21:10	980	288	37	1305	3322	2017	0	111	53	1468	2682	**1213**	3351	30%	0
SP_175EA_C34HEFNON324_PRIME	324 18:16	325 03:16	0	1096	89	1185	3322	2137	0	182	53	1419	673	-747	2215	24%	747
SP_175EA_G70METNON325_PRIME	325 12:01	325 21:01	747	324	37	1107	3322	2215	0	182	53	1342	2694	**1352**	3056	28%	0
SP_175EA_C34BWGOTP326_PRIME	326 18:16	327 03:16	0	1046	90	1136	3322	2186	0	182	53	1371	516	-856	1726	16%	855
SP_175EA_C34HEFOTB327_PRIME	327 18:16	328 03:16	855	678	63	1596	3322	1726	0	182	53	1831	673	-1159	1808	17%	1158
SP_175EA_G70METNON328_PRIME	328 11:52	328 20:52	1158	319	36	1514	3322	1808	0	113	53	1679	2703	**1023**	2607	26%	0
SP_175EA_C34HEFNON329_PRIME	329 18:01	330 03:01	0	1043	89	1133	3322	2189	0	210	53	1396	673	-724	1583	22%	724
SP_175EA_C34HEFOTP330_PRIME	330 18:01	331 03:01	724	213	63	1000	3322	2322	0	265	53	1318	559	-760	1583	24%	759
SP_175EA_C34HEFOTB331_PRIME	331 18:01	332 03:01	759	747	63	1570	3322	1752	0	526	53	2149	668	-1481	1583	27%	1481
SP_175EA_G70METNON332_PRIME	332 11:29	332 20:29	1481	222	36	1739	3322	1583	0	151	53	1943	2623	**680**	2664	51%	0
SP_175EA_G70METNON333_PRIME	333 11:32	333 20:32	0	308	64	372	3322	2950	0	232	53	657	2641	**1984**	1984	75%	0

DATA VOLUME REPORT --- TRANSFER FRAME OVERHEAD NOT INCLUDED *** CAKE data added as ISS requests in initial SMT run.**

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	319 21:46	320 18:31	52.3	19.6	0.0	7.5	752.0	18.5	44.8	0.0	67.2	0.0	0.0	0.0	86.7	1048.6
SP_174EA_C34HEFNON320_PRIME	320 18:31	321 03:31	22.7	8.5	86.4	3.2	0.0	8.0	19.4	0.0	29.2	2.5	0.0	0.0	0.0	179.9
DAILY TOTAL SCIENCE	319 21:46	321 03:31	75.0	28.1	86.4	10.7	752.0	26.5	64.3	0.0	96.4	2.5	0.0	0.0	86.7	
OBSERVATION_NOR	321 03:31	321 18:31	37.8	14.1	0.0	5.4	194.0	70.2	32.4	0.0	48.6	0.0	0.0	0.0	62.7	465.3
SP_174EA_C34HEFOTP321_PRIME	321 18:31	322 03:31	22.7	8.5	86.4	3.2	0.0	8.0	19.4	0.0	29.2	2.5	0.0	0.0	0.0	179.9
DAILY TOTAL SCIENCE	321 03:31	322 03:31	60.5	22.6	86.4	8.6	194.0	78.2	51.8	0.0	77.8	2.5	0.0	0.0	62.7	
OBSERVATION_NOR	322 03:31	322 18:31	37.8	14.1	0.0	5.4	424.0	13.3	32.4	0.0	48.6	0.0	0.0	0.0	62.7	638.4
SP_174EA_C34HEFOTB322_PRIME	322 18:31	323 03:31	22.7	8.5	86.4	3.2	0.0	8.0	19.4	0.0	29.2	2.5	0.0	0.0	0.0	179.9
DAILY TOTAL SCIENCE	322 03:31	323 03:31	60.5	22.6	86.4	8.6	424.0	21.3	51.8	0.0	77.8	2.5	0.0	0.0	62.7	

Initial SMT and Data Volume

Beginning of Integration:

DATA VOLUME REPORT --- TRANSFER FRAME OVERHEAD NOT INCLUDED * CAKE data added as ISS requests in initial SMT run.

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	323 03:31	323 12:10	21.8	8.2	0.0	3.1	198.0	7.7	18.7	0.0	28.0	0.0	0.0	0.0	36.2	321.6
SP_174EA_G70METNON323_PRIME	323 12:10	323 21:10	22.7	8.5	17.8	3.2	0.0	8.0	19.4	0.0	29.2	0.7	0.0	0.0	0.0	109.6
DAILY TOTAL SCIENCE	323 03:31	323 21:10	44.5	16.6	17.8	6.4	198.0	15.7	38.1	0.0	57.2	0.7	0.0	0.0	36.2	
OBSERVATION_NOR	323 21:10	324 18:16	53.2	19.9	68.6	7.6	383.0	18.8	45.6	0.0	68.4	320.7	100.0	0.0	88.2	1173.8
SP_175EA_C34HEFNON324_PRIME	324 18:16	325 03:16	22.7	8.5	86.4	3.2	0.0	8.0	19.4	0.0	29.2	2.5	0.0	0.0	0.0	179.9
DAILY TOTAL SCIENCE	323 21:10	325 03:16	75.9	28.4	155.0	10.8	383.0	26.8	65.0	0.0	97.5	323.1	100.0	0.0	88.2	
OBSERVATION_NOR	325 03:16	325 12:01	22.1	8.3	21.6	3.2	200.5	7.8	18.9	0.0	28.3	0.0	10.0	0.0	36.6	357.2
SP_175EA_G70METNON325_PRIME	325 12:01	325 21:01	22.7	8.5	86.4	3.2	0.0	8.0	19.4	0.0	29.2	2.5	0.0	0.0	0.0	179.9
DAILY TOTAL SCIENCE	325 03:16	325 21:01	44.7	16.7	108.0	6.4	200.5	15.8	38.3	0.0	57.5	2.5	10.0	0.0	36.6	
OBSERVATION_NOR	325 21:01	326 18:16	53.5	20.0	21.6	7.7	790.5	18.9	45.9	0.0	68.8	0.0	10.0	0.0	88.8	1125.8
SP_175EA_C34BWGOTP326_PRIME	326 18:16	327 03:16	22.7	8.5	86.4	3.2	0.0	8.0	19.4	0.0	29.2	2.5	0.0	0.0	0.0	179.9
DAILY TOTAL SCIENCE	325 21:01	327 03:16	76.2	28.5	108.0	10.9	790.5	26.9	65.3	0.0	98.0	2.5	10.0	0.0	88.8	
OBSERVATION_NOR	327 03:16	327 18:16	37.8	14.1	21.6	5.4	488.5	13.3	32.4	0.0	48.6	0.0	10.0	0.0	62.7	734.5
SP_175EA_C34HEFOTB327_PRIME	327 18:16	328 03:16	22.7	8.5	86.4	3.2	0.0	8.0	19.4	0.0	29.2	2.5	0.0	0.0	0.0	179.9
DAILY TOTAL SCIENCE	327 03:16	328 03:16	60.5	22.6	108.0	8.6	488.5	21.3	51.8	0.0	77.8	2.5	10.0	0.0	62.7	
OBSERVATION_NOR	328 03:16	328 11:52	21.7	8.1	21.6	3.1	197.5	7.6	18.6	0.0	27.9	0.0	10.0	0.0	35.9	352.0
SP_175EA_G70METNON328_PRIME	328 11:52	328 20:52	22.7	8.5	20.0	3.2	0.0	8.0	19.4	0.0	29.2	0.8	0.0	0.0	0.0	111.8
OBSERVATION_NOR	328 20:52	329 18:01	53.3	19.9	66.4	7.6	752.0	18.8	45.7	0.0	68.5	1.7	0.0	0.0	88.4	1122.4
SP_175EA_C34HEFNON329_PRIME	329 18:01	330 03:01	51.2	8.5	86.4	3.2	0.0	8.0	19.4	0.0	29.2	2.5	0.0	0.0	0.0	208.4
DAILY TOTAL SCIENCE	328 20:52	330 03:01	104.5	28.4	152.8	10.9	752.0	26.8	65.1	0.0	97.7	4.1	0.0	0.0	88.4	
OBSERVATION_NOR	330 03:01	330 18:01	54.0	28.3	0.0	5.4	0.0	26.7	45.9	0.0	51.2	0.0	0.0	0.0	62.7	274.1
SP_175EA_C34HEFOTP330_PRIME	330 18:01	331 03:01	32.4	17.0	86.4	3.2	0.0	16.0	27.5	0.0	75.2	4.9	0.0	0.0	0.0	262.7
DAILY TOTAL SCIENCE	330 03:01	331 03:01	86.4	45.3	86.4	8.6	0.0	42.7	73.4	0.0	126.4	4.9	0.0	0.0	62.7	
OBSERVATION_NOR	331 03:01	331 18:01	54.0	55.6	0.0	9.5	0.0	26.7	45.9	0.0	548.9	0.0	0.0	0.0	62.7	803.3
SP_175EA_C34HEFOTB331_PRIME	331 18:01	332 03:01	32.4	28.0	86.4	3.1	0.0	16.0	27.5	0.0	322.7	4.9	0.0	0.0	0.0	521.1
DAILY TOTAL SCIENCE	331 03:01	332 03:01	86.4	83.6	86.4	12.6	0.0	42.7	73.4	0.0	871.7	4.9	0.0	0.0	62.7	
OBSERVATION_NOR	332 03:01	332 11:29	30.5	16.0	0.0	3.0	0.0	12.4	25.9	0.0	132.5	0.0	0.0	0.0	35.4	255.7
SP_175EA_G70METNON332_PRIME	332 11:29	332 20:29	32.4	17.0	15.8	3.2	0.0	4.4	27.5	0.0	47.8	1.4	0.0	0.0	0.0	149.5
DAILY TOTAL SCIENCE	332 03:01	332 20:29	62.9	32.9	15.8	6.3	0.0	16.8	53.4	0.0	180.3	1.4	0.0	0.0	35.4	
OBSERVATION_NOR	332 20:29	333 11:32	54.2	28.4	70.6	5.4	0.0	26.8	46.1	0.0	70.4	3.6	0.0	0.0	62.9	368.3
SP_175EA_G70METNON333_PRIME	333 11:32	333 20:32	32.4	17.0	86.4	3.2	0.0	16.0	27.5	0.0	42.4	4.9	0.0	0.0	0.0	229.9
DAILY TOTAL SCIENCE	332 20:29	333 20:32	86.6	45.4	157.0	8.7	0.0	42.8	73.6	0.0	112.8	8.5	0.0	0.0	62.9	

	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)	968.9	438.5	1296.0	124.5	4380.0	420.0	803.7	0.0	2085.7	363.3	140.0	0.0

Waypoint Selection

RBOT - Friendly

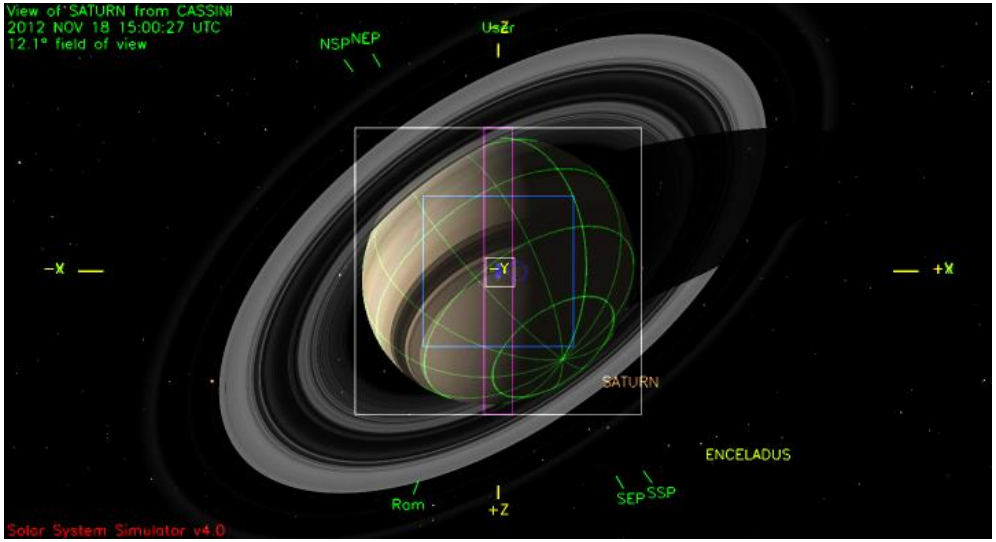
OBSERVATION PERIOD	START	END	POS_X	NEG_X	POS_Z	NEG_Z
SP_174NA_OBSERV319_NA	2012-319T21:46:00	2012-320T18:31:00	135.5/ 44.6	------	------	135.5/ 44.6
SP_174NA_OBSERV321_NA	2012-321T03:31:00	2012-321T18:31:00	135.5/ 44.6	------	------	135.5/ 44.6
SP_174NA_OBSERV322_NA	2012-322T03:31:00	2012-322T18:31:00	135.5/ 44.6	------	------	135.5/ 44.6
SP_174NA_OBSERV323_NA	2012-323T03:31:00	2012-323T18:31:00	135.5/ 44.6	------	------	135.5/ 44.6
SP_175NA_OBSERV324_NA	2012-324T03:31:00	2012-324T18:16:00	135.6/ 44.6	------	------	135.6/ 44.6
SP_175NA_OBSERV325_NA	2012-325T03:16:00	2012-325T12:01:00	135.6/ 44.6	------	------	135.6/ 44.6
SP_175NA_OBSERV425_NA	2012-325T21:01:00	2012-326T18:16:00	135.6/ 44.6	------	------	135.6/ 44.6
SP_175NA_OBSERV327_NA	2012-327T03:16:00	2012-327T18:16:00	135.6/ 44.6	------	------	135.6/ 44.6
SP_175NA_OBSERV328_NA	2012-328T03:16:00	2012-328T18:01:00	135.6/ 44.6	------	------	135.6/ 44.6
SP_175NA_OBSERV329_NA	2012-329T03:01:00	2012-329T18:01:00	135.6/ 44.6	------	------	135.6/ 44.6
SP_175NA_OBSERV330_NA	2012-330T03:01:00	2012-330T18:01:00	135.6/ 44.6	------	------	135.6/ 44.6
SP_175NA_OBSERV331_NA	2012-331T03:01:00	2012-331T18:01:00	------	------	------	------
SP_175NA_OBSERV332_NA	2012-332T03:01:00	2012-332T18:01:00	135.6/ 44.6	------	135.6/ 44.6	------
SP_175NA_OBSERV333_NA	2012-333T03:01:00	2012-333T11:32:00	135.6/ 44.6	------	------	------

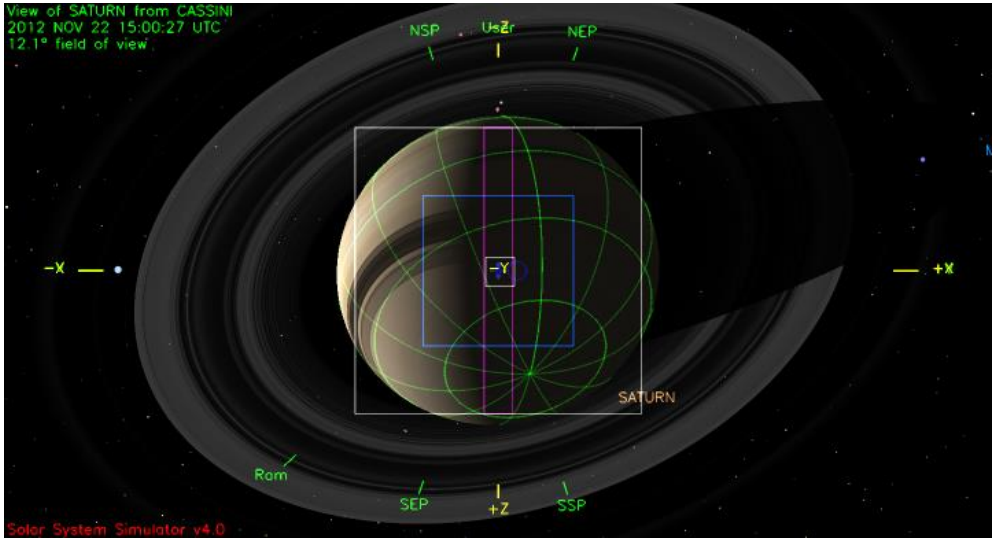
- Occ Port (NEG_Y (-20,0,0.109)) to Sun suggested for OBSERV331; POS_X to 135.6/44.6 works well, NEG_Z to 135.6/44.6 works with a little CIRS Saturn heating.

*** NEG_Y to Saturn not safe from 2012-331T04:46 to 14:56 (ORS to Sun < 15 deg.).**
- Minimum ORS to SUN angle is appx. 2.41 deg.

Waypoints Chosen

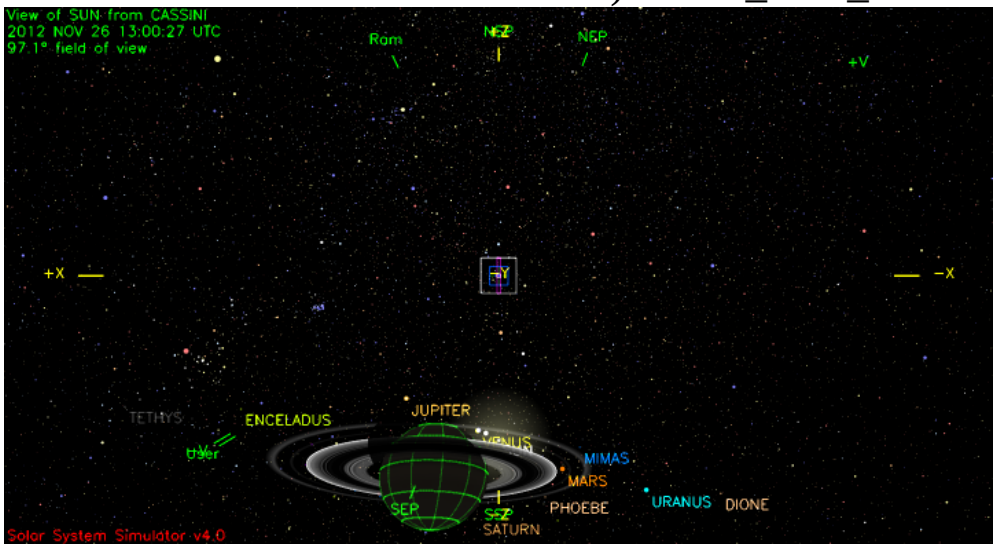
Waypoint 1 (2012-319T22:26:00 – 2012-331T03:41:00): ISS_NAC to Saturn; NEG_Z to 135.5/44.6



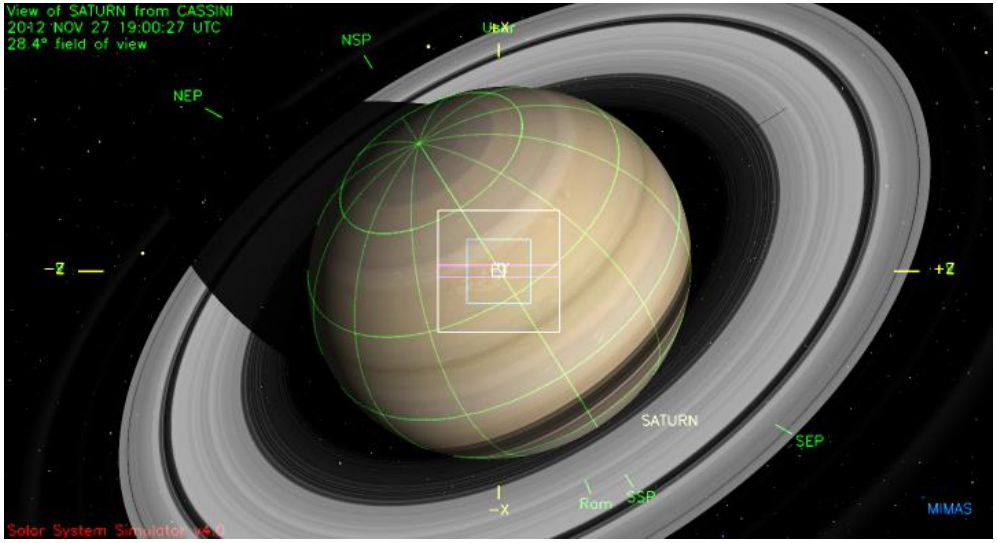


Waypoints Chosen

Waypoint 2 (2012-331T03:41:00 – 2012-332T03:41:00): UVIS_SOL_OFF to Sun; POS_Z to NSP



Waypoint 3 (2012-332T03:41:00– 2012-333T10:02:00): ISS_NAC to Saturn, POS_X to 135.6/44.6



Notes & Liens

- Pointing:
  - MAG CALROLL on DOY 321 violates “2 of 3” rule; places as close to a predicted ME OTM as possible.
- Data Volume:
  - Nothing special to note.
- DSN:
  - Downlinks on DOYs 323, 328 & 332 moved earlier to be wholly within Goldstone view-periods. This is due to Canberra 70M extended downtime, and the need for 70M coverage on these days for data volume.
- Resource checker:
  - All gaps are intentional and have been ignored in CIMS.
- Opmodes:
  - DFPW throughout
- Hydrazine:
  - N/A
- Special Activities:
  - CMT management requested for ISS LIMBSCAN from 331T09:03 to 331T12:11.

Sequence Liens (should all be SPLAT items):

- CMT management waiver for ISS LIMBSCAN on DOY 331.

CMT Management: -Y to Sun violation

- -Y to Sun CMT Management and flight rule waivers will be needed for the **ISS_175SA_LIMBSCAN001_PRIME on DOY 331** during the solar occultation
  - Time of Saturn Solar Occultation is from the tour atlas.
  - Timing uncertainty is ± 0.7206 min, use ± 6.0 minutes pad as determined using Brad Wallis' "ask_carnac.pro"