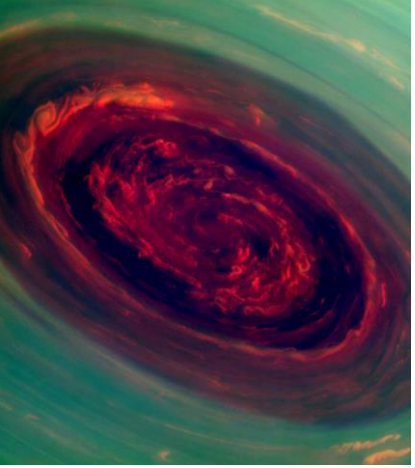

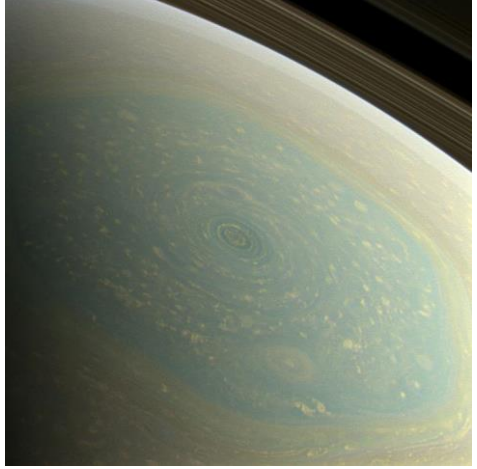
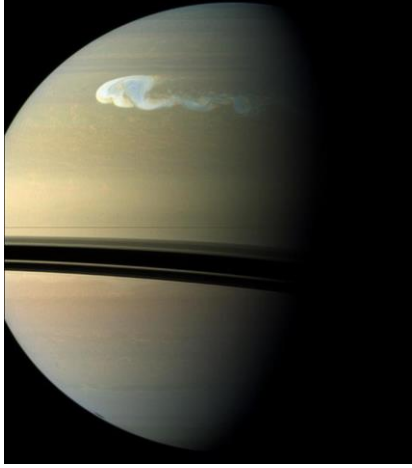

Science Planning & Sequence Team
CASSINI

SATURN TARGET WORKING TEAM

Rev 170-171 Segment Legacy Package

Segment Boundary: Aug 14, 2012 – Aug 25, 2012
2012-227T19:20:00 – 2012-238T02:19:00 (SCET)

Integration Began 10/11/2011
Segment Delivered to S74 Sequence 12/20/2012
Lead Integrator was Shawn Brooks.

Legacy Package Assembled by Keven Uchida

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

Segment Overview and Final Products

Segment Summary

- This was a ~10.25 day long Solstice Mission, periapsis segment. The S/C was in an inclined orbit.
- CIRS and ISS led the majority of the activities in this segment. CIRS activities included compositional as well Far-IR and Mid-IR mapping. ISS focused on mapping to study/characterize Saturn's winds. UVIS performed two EUV-FUV mapping observations.
- There were three out-of-discipline activities: ISS performed two Titan monitoring studies and MAG an 8hr long calibration roll.
- Due to a conflict (near the end of the segment) with the MSL Mars mission EDL, swaps of DSN stations were made and the end time of the segment was extended, from the original time, by a number of hours.
- After pre-placement of the "template" activities, 6 gaps/open-periods remained, ranging in durations from 3 to 14 hours (see page 11), to be filled with science. There is no record why, but all but the last Gap was left unfilled.
- There were no ORS boresight constraints/issues in this segment.

Final Sequenced SPASS

Gap 1

Gap 2

Gap 3

Gap 4

Gap 5

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
SATURN_170_171 Segment		2012-227T19:20:00		009T23:14:00	2012-237T18:34:00			
SP_170SA_WAYPTTURN227_PRIME		2012-227T19:20:00		000T00:40:00	2012-227T20:00:00	ISS_NAC to Saturn	NEG_Z to 132.2/58.6	
NEW WAYPOINT		**2012-227T20:00:00**		**001T20:05:00**	**2012-229T16:05:00**	**ISS_NAC to Saturn**	**NEG_Z to 132.2/58.6**	
UVIS_170SA_EUVFUV001_PRIME		2012-227T20:00:00		000T16:00:00	2012-228T12:00:00	UVIS_FUV to Saturn	NEG_Z to 132.2/58.6	
CIRS_170SA_FIRMAP001_PRIME	I, V	2012-228T12:00:00		000T11:00:00	2012-228T23:00:00	CIRS_FP1 to Saturn	NEG_X to NSP	
SP_170EA_DLTURN229_PRIME		2012-229T15:25:00		000T00:40:00	2012-229T16:05:00	XBAND to Earth	NEG_X to 294.0/20.0	
NEW WAYPOINT		**2012-229T16:05:00**		**000T11:10:00**	**2012-230T03:15:00**	**XBAND to Earth**	**NEG_X to 294.0/20.0**	
ENGR_170SC_KPTYBIAS229_PRIME		2012-229T16:05:00		000T01:30:00	2012-229T17:35:00	POS_Z to DELTA_H (0.0,0.0,-29.998 deg. offset)	NEG_X to Sun	
SP_170EA_G34B26SEQ229_PRIME	C, R	2012-229T17:35:00		000T09:00:00	2012-230T02:35:00	XBAND to Earth	Rolling	CDA. NEG_X to (294/20). CIRS heating
SP_170SA_WAYPTTURN230_PRIME	I	2012-230T02:35:00		000T00:40:00	2012-230T03:15:00	ISS_NAC to Saturn	NEG_Z to 132.2/58.6	
NEW WAYPOINT		**2012-230T03:15:00**		**001T12:50:00**	**2012-231T16:05:00**	**ISS_NAC to Saturn**	**NEG_Z to 132.2/58.6**	
CIRS_170SA_MIRMAP001_PRIME	I, V	2012-230T03:15:00		000T22:00:00	2012-231T01:15:00	CIRS_FP3 to Saturn	NEG_Z to NSP	
SP_170EA_DLTURN231_PRIME		2012-231T15:25:00		000T00:40:00	2012-231T16:05:00	XBAND to Earth	NEG_X to 294.0/15.0	
NEW WAYPOINT		**2012-231T16:05:00**		**000T11:10:00**	**2012-232T03:15:00**	**XBAND to Earth**	**NEG_X to 294.0/15.0**	
SP_170EA_YGAP231_PRIME		2012-231T16:05:00		000T01:30:00	2012-231T17:35:00	XBAND to Earth	NEG_X to 294.0/15.0	
SP_170EA_G70METSEQ231_PRIME	C	2012-231T17:35:00		000T09:00:00	2012-232T02:35:00	XBAND to Earth	Rolling/SRU	CDA. NEG_X to (294/15). SID suspend. CIRS heating
SP_170SA_WAYPTTURN232_PRIME	I	2012-232T02:35:00		000T00:40:00	2012-232T03:15:00	ISS_NAC to Saturn	NEG_Z to 132.2/58.6	
NEW WAYPOINT		**2012-232T03:15:00**		**001T12:50:00**	**2012-233T16:05:00**	**ISS_NAC to Saturn**	**NEG_Z to 132.2/58.6**	
ISS_170TI_M60R3CLD232_PRIME	C, I, V	2012-232T03:15:00	E170_M60R3CLD232+000T00:00:00	000T01:30:00	2012-232T04:45:00	ISS_NAC to Titan	NEG_Z to 132.2/58.6	
ISS_170SA_WIND5HR001_PRIME	U	2012-232T04:45:00		000T05:00:00	2012-232T09:45:00	ISS_NAC to Saturn	NEG_Z to 132.2/58.6	No Preference to secondary pointing
CIRS_170SA_COMPSIT001_PRIME	I, U, V	2012-232T09:45:00		000T06:00:00	2012-232T15:45:00	CIRS_FP1 to Saturn	NEG_Z to NSP	
ISS_170SA_WIND5HR002_PRIME	U	2012-232T15:45:00		000T05:00:00	2012-232T20:45:00	ISS_NAC to Saturn	NEG_Z to 132.2/58.6	No Preference to secondary pointing
ISS_170SA_WIND5HR003_PRIME	U	2012-232T20:45:00		000T05:00:00	2012-233T01:45:00	ISS_NAC to Saturn	NEG_Z to 132.2/58.6	No Preference to secondary pointing
CIRS_170SA_COMPSIT002_PRIME	I, U, V	2012-233T01:45:00		000T06:00:00	2012-233T07:45:00	CIRS_FP1 to Saturn	NEG_Z to NSP	
ISS_170SA_WIND5HR004_PRIME	U	2012-233T07:45:00		000T05:00:00	2012-233T12:45:00	ISS_NAC to Saturn	NEG_Z to 132.2/58.6	No Preference to secondary pointing
SP_170EA_DLTURN233_PRIME		2012-233T15:25:00		000T00:40:00	2012-233T16:05:00	XBAND to Earth	NEG_X to 294.0/15.0	
NEW WAYPOINT		**2012-233T16:05:00**		**000T11:10:00**	**2012-234T03:15:00**	**XBAND to Earth**	**NEG_X to 294.0/15.0**	
SP_170EA_YGAP233_PRIME	M	2012-233T16:05:00		000T01:30:00	2012-233T17:35:00	XBAND to Earth	NEG_X to 294.0/15.0	
SP_170EA_G34HEFSEQ233_PRIME	C, M, R	2012-233T17:35:00		000T09:00:00	2012-234T02:35:00	XBAND to Earth	5_Hr_Rolling	CDA. NEG_X to (294/15). SID suspend. CIRS heating
SP_170SA_WAYPTTURN234_PRIME	I, M	2012-234T02:35:00		000T00:40:00	2012-234T03:15:00	ISS_NAC to Saturn	NEG_Z to 132.2/58.6	
NEW WAYPOINT		**2012-234T03:15:00**		**001T12:34:00**	**2012-235T15:49:00**	**ISS_NAC to Saturn**	**NEG_Z to 132.2/58.6**	
ISS_170TI_M90R3CLD234_PRIME	C, I, M, V	2012-234T03:15:00	E170_M90R3CLD234+000T00:00:00	000T01:30:00	2012-234T04:45:00	ISS_NAC to Titan	NEG_Z to 132.2/58.6	
UVIS_170SA_EUVFUV002_PRIME	I, M, V	2012-234T04:45:00		000T16:00:00	2012-234T20:45:00	UVIS_FUV to Saturn	NEG_Z to 132.2/58.6	
CIRS_170SA_COMPSIT003_PRIME	I, U, V	2012-234T20:45:00		000T11:00:00	2012-235T07:45:00	CIRS_FP1 to Saturn	NEG_Z to NSP	
SP_170EA_DLTURN235_PRIME	M	2012-235T15:09:00		000T00:40:00	2012-235T15:49:00	XBAND to Earth	NEG_X to 294.0/15.0	
NEW WAYPOINT		**2012-235T15:49:00**		**000T11:10:00**	**2012-236T02:59:00**	**XBAND to Earth**	**NEG_X to 294.0/15.0**	
ENGR_170SC_KPTYBIAS235_PRIME	M	2012-235T15:49:00		000T01:30:00	2012-235T17:19:00	NEG_Z to DELTA_H (0.0,0.0,-15.002 deg. offset)	NEG_X to Sun	
SP_170EA_G70METSEQ235_PRIME	C, M	2012-235T17:19:00		000T09:00:00	2012-236T02:19:00	XBAND to Earth	Rolling/SRU	CDA. NEG_X to (294/15). SID suspend
SP_170SA_WAYPTTURN236_PRIME	I, M	2012-236T02:19:00		000T00:40:00	2012-236T02:59:00	ISS_NAC to Saturn	NEG_Z to 132.2/58.6	
NEW WAYPOINT		**2012-236T02:59:00**		**001T12:50:00**	**2012-237T15:49:00**	**ISS_NAC to Saturn**	**NEG_Z to 132.2/58.6**	
ISS_170SA_WIND5HR005_PRIME	M, U	2012-236T02:59:00		000T05:00:00	2012-236T07:59:00	ISS_NAC to Saturn	NEG_Z to 132.2/58.6	No Preference to secondary pointing
CIRS_170SA_COMPSIT004_PRIME	I, U, V	2012-236T07:59:00		000T06:00:00	2012-236T13:59:00	CIRS_FP1 to Saturn	NEG_Z to NSP	
ISS_170SA_WIND5HR006_PRIME	U	2012-236T13:59:00		000T05:00:00	2012-236T18:59:00	ISS_NAC to Saturn	NEG_Z to 132.2/58.6	No Preference to secondary pointing
Apoapse Per = 21.3 d, inc ...		2012-236T16:38:50		000T00:00:01	2012-236T16:38:51			
CIRS_171SA_COMPSIT001_PRIME	I, M, U, V	2012-236T18:59:00		000T11:00:00	2012-237T05:59:00	CIRS_FP1 to Saturn	NEG_Z to NSP	
MAG_171SU_CALROLL002_PRIME	I, M, V	2012-237T07:09:00		000T08:00:00	2012-237T15:09:00	NEG_X to Earth (0.0,0.0,-30.0 deg. offset)	Rolling	
SP_171EA_DLTURN237_PRIME	M	2012-237T15:09:00		000T00:40:00	2012-237T15:49:00	XBAND to Earth	NEG_X to 294.0/15.0	
NEW WAYPOINT		**2012-237T15:49:00**		**000T10:30:00**	**2012-238T02:19:00**	**XBAND to Earth**	**NEG_X to 294.0/15.0**	
ENGR_171SC_YBIASRTC237_PRIME	M	2012-237T15:49:00		000T01:30:00	2012-237T17:19:00	POS_Z to DELTA_H	NEG_X to Sun	
SP_171EA_G70METSEQ237_PRIME	C, M, R	2012-237T17:19:00		000T09:00:00	2012-238T02:19:00	XBAND to Earth	NEG_X to 294.0/15.0	CDA. NEG_X to (294/15). EOS

Final Sequenced SMT and Data Volume

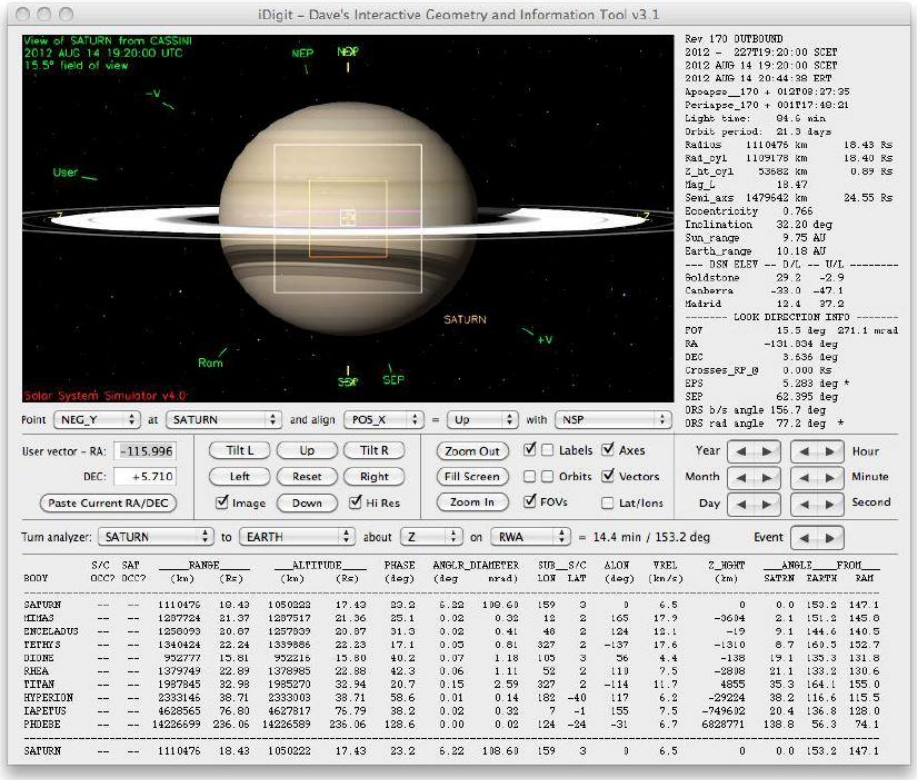
DATA VOLUME SUMMARY --- TRANSFER FRAME OVERHEAD INCLUDED (80 BITS PER 8800-BIT FRAME)

			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)	(%)	CAROVR (Mb)
SP_170EA_G34B26SEQ229_PRIME	229 17:35	230 02:35	0	1220	195	1415	3322	1907	0	163	53	1631	637	-994	1144	11%	994
SP_170EA_G70METSEQ231_PRIME	231 17:35	232 02:35	994	1019	165	2178	3322	1144	0	163	53	2394	3070	676	1629	17%	0
SP_170EA_G34HEFSEQ233_PRIME	233 17:35	233 21:35	0	1902	165	2067	3322	1255	0	163	24	2253	1358	-896	953	14%	895
SP_170EA_G70METSEQ235_PRIME	235 17:19	236 02:19	895	1221	164	2279	3322	1043	0	163	53	2495	3058	563	953	18%	0
SP_171EA_G70METSEQ237_PRIME	237 19:34	238 02:19	0	1629	167	1796	3322	1526	0	128	40	1964	2354	389	390	17%	0

DATA VOLUME REPORT --- TRANSFER FRAME OVERHEAD NOT INCLUDED

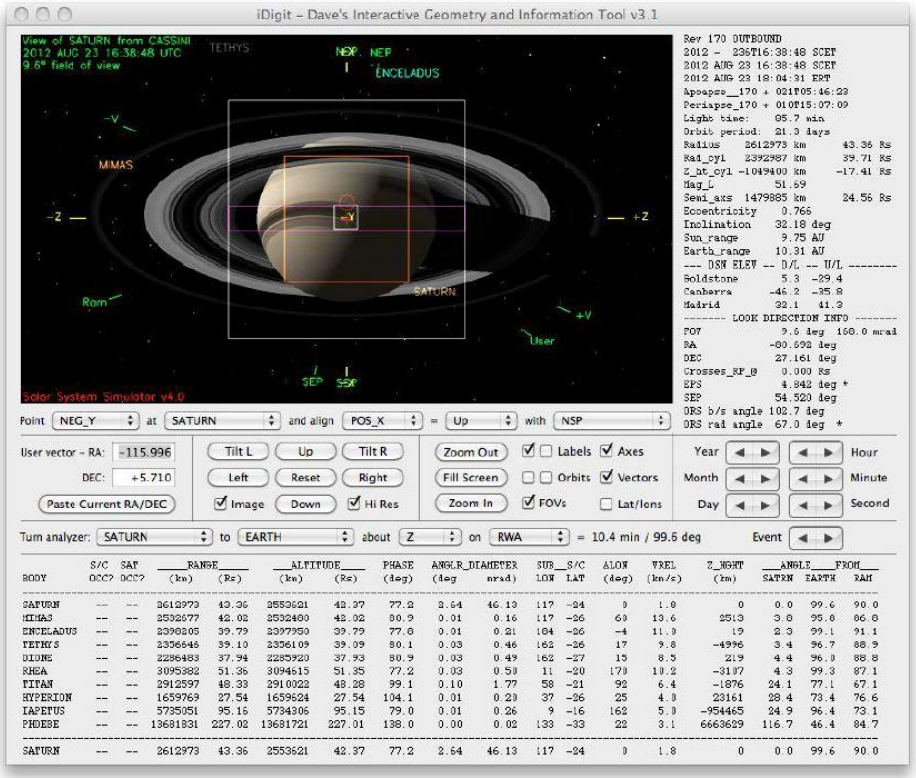
Event	Start doy hh:mm	End doy hh:mm	CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)	ENGR (Mb)	TOTAL (Mb)
OBSERVATION_NOR	227 19:20	229 17:35	0.0	43.6	273.6	26.7	4.4	41.1	108.2	0.0	149.8	230.9	330.0	0.0	193.3	1401.8
SP_170EA_G34B26SEQ229_PRIME	229 17:35	230 02:35	0.0	8.5	86.4	3.2	0.0	8.0	21.1	0.0	29.2	4.9	0.0	0.0	0.0	161.3
DAILY TOTAL SCIENCE	227 19:20	230 02:35	0.0	52.1	360.0	30.0	4.4	49.1	129.3	0.0	179.0	235.9	330.0	0.0	193.3	
OBSERVATION_NOR	230 02:35	231 17:35	0.0	36.8	316.8	14.0	60.1	34.7	91.3	0.0	126.4	0.0	330.0	0.0	163.0	1173.1
SP_170EA_G70METSEQ231_PRIME	231 17:35	232 02:35	0.0	8.5	86.4	3.2	0.0	8.0	21.1	0.0	29.2	4.9	0.0	0.0	0.0	161.3
DAILY TOTAL SCIENCE	230 02:35	232 02:35	0.0	45.3	403.2	17.3	60.1	42.7	112.3	0.0	155.5	4.9	330.0	0.0	163.0	
OBSERVATION_NOR	232 02:35	233 17:35	0.0	36.8	108.0	14.0	952.6	34.7	91.3	0.0	126.4	104.9	416.0	0.0	163.0	2047.7
SP_170EA_G34HEFSEQ233_PRIME	233 17:35	233 21:35	0.0	8.5	86.4	3.2	0.0	8.0	21.1	0.0	29.2	4.9	0.0	0.0	0.0	161.3
DAILY TOTAL SCIENCE	232 02:35	233 21:35	0.0	45.3	194.4	17.3	952.6	42.7	112.3	0.0	155.5	109.9	416.0	0.0	163.0	
OBSERVATION_NOR	234 02:35	235 17:19	0.0	36.5	216.0	13.9	52.6	34.4	90.6	0.0	125.5	295.8	344.0	0.0	161.9	1371.3
SP_170EA_G70METSEQ235_PRIME	235 17:19	236 02:19	0.0	8.5	86.4	3.2	0.0	8.0	21.1	0.0	29.2	4.9	0.0	0.0	0.0	161.3
DAILY TOTAL SCIENCE	234 02:35	236 02:19	0.0	45.0	302.4	17.2	52.6	42.4	111.7	0.0	154.7	300.7	344.0	0.0	161.9	
OBSERVATION_NOR	236 02:19	237 19:34	0.0	38.9	135.9	24.9	467.6	86.5	96.5	0.0	133.6	94.4	536.0	0.0	172.4	1786.8
SP_171EA_G70METSEQ237_PRIME	237 19:34	238 02:19	0.0	6.4	72.9	2.4	0.0	6.0	15.8	0.0	21.9	1.8	0.0	0.0	0.0	127.2
DAILY TOTAL SCIENCE	236 02:19	238 02:19	0.0	45.3	208.8	27.3	467.6	92.5	112.3	0.0	155.5	96.2	536.0	0.0	172.4	

Segment Geometry



Seg Start (Left)

Seg End (below)



	Saturn Range	Phase Angle
Segment Start	18.43 R_{Sat}	23.2 degrees
Apoapse	43.36 R_{Sat}	77.2 degrees
Periapse	N/A	N/A
Segment End	43.05 R_{Sat}	80.9 degrees

Solar Geometry – ORS Boresight Concerns

No ORS Boresight Solar Constraints on Science Pointing

Daily Science Highlights

DOY 227 (14 August 2012): Following a downlink with the Earth, Cassini turned its attention back to Saturn with UVIS mapping of Saturn's atmosphere in the ultraviolet to begin the Saturn_170/171 segment.
DOY 228 (15 August 2012): The UVIS EUVFUV map was followed by a CIRS observation to map Saturn's atmosphere with it's far infrared sensor.
DOY 229 (16 August 2012): This day's activity was largely constrained to a downlink and magnetospheric survey activities executed by the particles and fields (MAPS) instruments.
DOY 230 (17 August 2012): CIRS turned back to Saturn to map its atmosphere in the mid-infrared for 22 contiguous hours.
DOY 231 (18 August 2012): This day's activity was largely constrained to a downlink and magnetospheric survey activities executed by the particles and fields (MAPS) instruments.
DOY 232 (19 August 2012): ORS science activities resumed with another observation in the campaign to monitor Titan's atmosphere at brief yet frequent intervals. ISS and CIRS subsequently traded off observing Saturn's atmosphere in a joint campaign to measure Saturn's winds and atmospheric composition.
DOY 233 (20 August 2012): CIRS and ISS completed the second set of two coordinated campaigns to map out the winds and composition of the Saturnian atmosphere. The spacecraft subsequently turned its high-gain antenna back towards Earth to relay the data.
DOY 234 (21 August 2012): Following the downlink, ISS turned back towards Titan for the second observation in the Titan monitoring campaign in this segment. UVIS then executed another set of slow scans of Saturn's atmosphere in the ultraviolet.
DOY 235 (22 August 2012): As on DOY 228, the UVIS EUVFUV observation was followed by a CIRS compositional mapping activity intended to measure trace gases and isotopes in Saturn's atmosphere. This was followed by a downlink through the large, 70-meter dish at the DSN's Goldstone complex.
DOY 236 (23 August 2012): ISS and CIRS traded off observing Saturn to study its winds and atmospheric composition.
DOY 236 (23 August 2012): Following the conclusion of the final CIRS compositional study in that sequence of observations, the spacecraft performed an 8-hour roll to calibrate the sensors on the MAG instrument. This was followed by a engineering end-of-sequence Ybias activity. The segment and sequence then came to a close with the final downlink of the segment.

Segment Integration Planning

Timeline Gaps and Suggested Observations

Gap	Start	End	Duration	Phase angle (range)	Range (R_{Sat})	Suggested observations/activities
1	2012-229T10:00:00	2012-229T15:25:00	000T05:25:00	43.3°-45.2°	27.82 – 28.88	See Legacy Note 1 below
2	2012-231T01:15:00	2012-231T15:25:00	000T14:10:00	54.4°-57.4°	34.45 – 36.31	
3	2012-233T12:45:00	2012-233T15:25:00	000T02:40:00	65.7°-66.1°	40.67 – 40.86	
4	2012-235T07:45:00	2012-235T15:39:00	000T07:54:00	72.4°-73.5°	42.86 – 43.07	
5*	2012-236T19:29:00	2012-236T23:24:00	000T03:55:00	77.6°-78.1°	43.35 – 43.34	

Legacy Note 1: Gaps were identified, but there were no suggested observations prior to the first meeting. There is no information why, but all but the last gap was left unfilled. Gap 5 that was partially filled with a CIRS COMPSIT observation.

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_170EA_G34BWGSEQ229_PRIME	229 17:35	230 02:35	0	1391	195	1587	3322	1735	0	180	53	1820	547	-1273	81	1%	1273
SP_170EA_G70METSEQ231_PRIME	231 17:35	232 02:35	1273	1451	165	2888	3322	434	0	180	53	3121	3070	-52	81	1%	51
SP_170EA_G34HEFSEQ233_PRIME	233 17:35	234 02:35	51	1974	165	2191	3322	1132	0	180	53	2424	670	-1754	81	1%	1753
SP_170EA_G70METNON235_PRIME	235 17:49	236 02:49	1753	1322	166	3241	3322	81	0	180	53	3474	3022	-453	483	8%	452
SP_171EA_G70METNON237_PRIME	**237 16:49**	**238 01:49**	**452**	**1653**	**161**	**2266**	**3322**	**1056**	**0**	**180**	**53**	**2499**	**2982**	**482**	**483**	**16%**	**0**

Alternate timeline

(Legacy Note: Changes below due to conflicts with MSL EDL)

- DOY 235 pass upgraded from DSS-63 (Madrid 70M) to DSS-14 (Goldstone 70M)
- DOY 237 pass upgraded from DSS-63 to DSS-14
- *Sequence boundary moved later by 7 hours, 15 minutes (**request not yet granted!**)*

Waypoint Selection

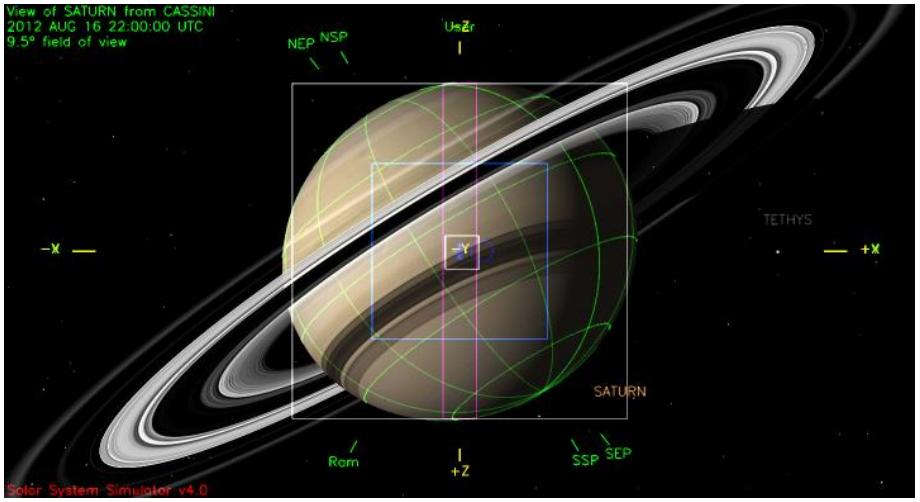
RBOT - Friendly

OBSERVATION PERIOD	START	END	POS_X	NEG_X	POS_Z	NEG_Z
SP_170NA_OBSERV227_NA	2012-227T19:20:00	2012-229T17:35:00	132.2/ 58.6	132.2/ 58.6	------	132.2/ 58.6
SP_170NA_OBSERV230_NA	2012-230T02:35:00	2012-231T17:35:00	132.2/ 58.6	132.2/ 58.6	------	132.2/ 58.6
SP_170NA_OBSERV232_NA	2012-232T02:35:00	2012-233T17:35:00	132.2/ 58.6	132.2/ 58.6	------	132.2/ 58.6
SP_170NA_OBSERV234_NA	2012-234T02:35:00	2012-235T09:49:00	132.2/ 58.6	132.2/ 58.6	------	132.2/ 58.6
SP_170NA_OBSERV235_NA	2012-235T18:49:00	2012-237T09:34:00	132.2/ 58.6	132.2/ 58.6	------	132.2/ 58.6

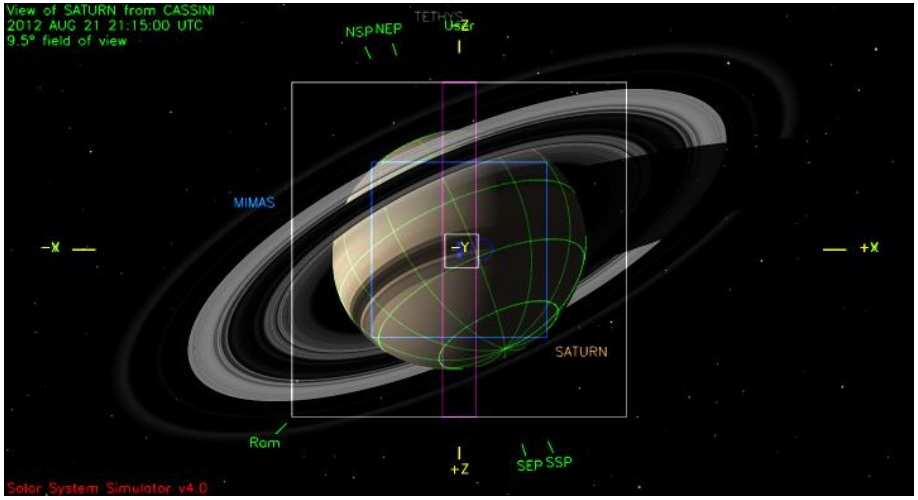
Waypoints Chosen

Note: The observation period waypoints were the same throughout the segment.

Waypoint 1-2 (2012-227T20:00:00 – 231T16:05:00): NEG_Y to Saturn, NEG_Z to 132.2/58.6



Waypoint 3-5 (2012-232T03:15:00 – 237T15:49:00): NEG_Y to Saturn, NEG_Z to 132.2/58.6



Notes and Liens

- Pointing:
  - Downlinks in this segment invoke minor CIRS heating and require SID suspend commands.
  - The implementation of the MAG CALROLL on DOY 237 is a violation of the "2-of-3" RBOT rule.
  - There are no other pointing issues of note.
- Data Volume:
  - none (Though we note that CIRS wishes to add riders to the ISS WINDS observations if sufficient data volume becomes available.)
- DSN:
  - There are *no* stations requested during maintenance, UNQ passes, split pass OTMs, split downlink passes (boresight cal/ Ybias cal), Level 3 requests or ap_downlink report check warnings (with the exception of excessive use of 70M stations).
  - The DOY 235 and DOY 237 downlinks were moved from Madrid (DSS-63) to Goldstone (DSS-14) in an attempt to avoid direct competition with MSL for DSN resources. This required us to extend the segment and change the end time/start time of S74/S75. *All necessary approvals have been obtained.*
  - RSS would like to exchange DSS-15 for DSS-25 on DOY 233 so that tracking and an ORT can be combined; owing to data volume restrictions, we were unable to accommodate this request at the segment level.
  - A second DSN pass on DSS-63 was added over the DOY 237 downlink at Goldstone to secure an additional ORT for RSS.
- Resource checker:
  - All 5 SPASS gaps listed in the segment resource checker run are expected and acceptable to the Saturn TWT.
- Opmodes:
  - none
- Hydrazine:
  - N/A
- Special Activities:
  - none

Sequence Liens (should all be SPLAT items):

- There are ***no*** liens for the S74 sequence inherited from the Saturn_170/171 segment.