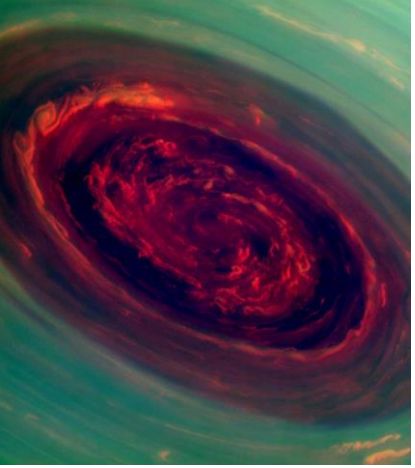

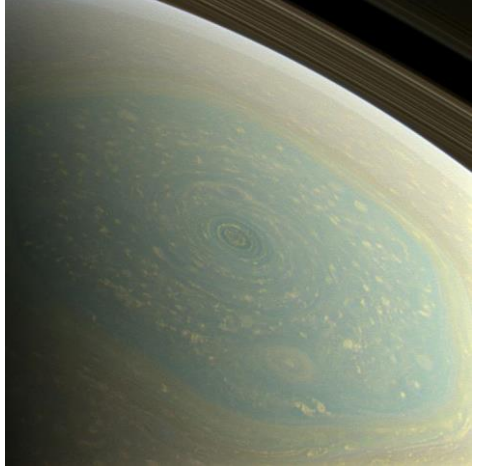
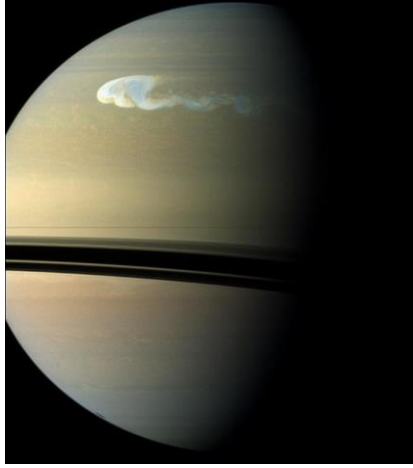

Science Planning & Sequence Team
CASSINI

SATURN TARGET WORKING TEAM

Rev 207 Segment Legacy Package

Segment Boundary: August 17, 2014 – August 20, 2014
2014-229T10:37:00 – 2014-232T10:21:00 (SCET)

Integration Began 10/28/2013
Segment Delivered to S85 Sequence 01/03/2014
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

- 3 day segment with the first two days inbound and the final day including Rev 207 periapse (15.94 Rs). Falls in the first inclined phase (IN-1) of the Solstice Mission.
- Began integration with a very open timeline, with no PIEs (Pre-Integrated Events) or significant out-of-discipline requests. Timeline was filled with suggested observations.
- Focused on Saturn atmospheric science
  - ORS Limb and wind studies led by ISS.
  - UVIS and VIMS led Aurora and CIRS Compositional Sit & Stare.
  - VIMS-led south hemisphere mapping.
- One waypoint was chosen for the entire segment for science compatibility and turn time mitigation.
- Data volume negotiations were not especially contentious.

Final Sequenced SPASS

Gap 1

Gap 2

Gap 3

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S85, length = 67 days		2014-212T05:09:00		066T19:52:00	2014-279T01:01:00			
SATURN_207 Segment		2014-229T10:37:00		002T23:44:00	2014-232T10:21:00			
SP_207SA_WAYPTTURN229_PRIME		2014-229T10:37:00		000T00:40:00	2014-229T11:17:00	ISS_NAC to Saturn	NEG_X to Sun	
NEW WAYPOINT		**2014-229T11:17:00**		**000T14:20:00**	**2014-230T01:37:00**	**ISS_NAC to Saturn**	**NEG_X to Sun**	
UVIS_207SA_EUVFUV001_PRIME	C, I	2014-229T11:17:00		000T07:40:00	2014-229T18:57:00	UVIS_FUV to Saturn	NEG_X to Sun	
ISS_207SA_WINDS001_PRIME	C, V	2014-229T18:57:00		000T06:00:00	2014-230T00:57:00	ISS_NAC to Saturn	NEG_X to Sun	
SP_207EA_DLTURN230_PRIME		2014-230T00:57:00		000T00:40:00	2014-230T01:37:00	XBAND to Earth	NEG_Y to 313.0/9.0	
NEW WAYPOINT		**2014-230T01:37:00**		**000T09:40:00**	**2014-230T11:17:00**	**XBAND to Earth**	**NEG_Y to 313.0/9.0**	
SP_207EA_C34HEFOTP230_PRIME	C, E, N	2014-230T01:37:00		000T09:00:00	2014-230T10:37:00	XBAND to Earth	NEG_Y to 313.0/9.0	MIMI. NEG_Y to Saturn (0,0,-40). OTP. SID suspend. CIRS heating
SP_207SA_WAYPTTURN230_PRIME		2014-230T10:37:00		000T00:40:00	2014-230T11:17:00	ISS_NAC to Saturn	NEG_X to Sun	
NEW WAYPOINT		**2014-230T11:17:00**		**000T07:50:00**	**2014-230T19:07:00**	**ISS_NAC to Saturn**	**NEG_X to Sun**	
UVIS_207SA_SAURSLEW001_PRIME	V	2014-230T11:17:00		000T03:35:00	2014-230T14:52:00	UVIS_FUV to Saturn	NEG_X to Sun	
VIMS_207SA_AURSTARE001_PRIME	C, I	2014-230T14:52:00		000T03:35:00	2014-230T18:27:00	ISS_NAC to Saturn	NEG_X to Sun	
SP_207SA_DLTURN230_PRIME		2014-230T18:27:00		000T00:40:00	2014-230T19:07:00	XBAND to Earth	NEG_Y to 313.0/9.0	
NEW WAYPOINT		**2014-230T19:07:00**		**000T09:40:00**	**2014-231T04:47:00**	**XBAND to Earth**	**NEG_Y to 313.0/9.0**	
SP_207EA_G70METOTB230_PRIME	C, N	2014-230T19:07:00		000T09:00:00	2014-231T04:07:00	XBAND to Earth	NEG_Y to 313.0/9.0	MIMI. NEG_Y to Saturn (0,0,-40). same secondary as OTP pass. OTB. SID suspend. CIRS heating
SP_207SA_WAYPTTURN231_PRIME		2014-231T04:07:00		000T00:40:00	2014-231T04:47:00	ISS_NAC to Saturn	NEG_X to Sun	
NEW WAYPOINT		**2014-231T04:47:00**		**000T19:04:00**	**2014-231T23:51:00**	**ISS_NAC to Saturn**	**NEG_X to Sun**	
ISS_207SA_LIMBSCAN001_PRIME	V	2014-231T04:47:00		000T01:00:00	2014-231T05:47:00	ISS_NAC to Saturn	NEG_X to Sun	
CIRS_207SA_COMPSIT001_PRIME	I, U, V	2014-231T05:47:00		000T07:42:00	2014-231T13:29:00	CIRS_FP1 to Saturn	NEG_X to Sun	Collaborative Rider(s): ISS. CIRS_FP1 to Saturn South Pole
Periapse R = 15.940 Rs, lat...		2014-231T05:47:18		000T00:00:01	2014-231T05:47:19			
ISS_207SA_LIMBSCAN002_PRIME	V	2014-231T13:29:00		000T01:00:00	2014-231T14:29:00	ISS_NAC to Saturn	NEG_X to Sun	
VIMS_207SA_SHEMMAP001_PRIME	C	2014-231T14:29:00		000T07:42:00	2014-231T22:11:00	ISS_NAC to Saturn	NEG_X to Sun	
ISS_207SA_LIMBSCAN003_PRIME	V	2014-231T22:11:00		000T01:00:00	2014-231T23:11:00	ISS_NAC to Saturn	NEG_X to Sun	
SP_207EA_DLTURN231_PRIME		2014-231T23:11:00		000T00:40:00	2014-231T23:51:00	XBAND to Earth	POS_X to 313.0/10.0	
NEW WAYPOINT		**2014-231T23:51:00**		**000T11:15:00**	**2014-232T11:06:00**	**XBAND to Earth**	**POS_X to 313.0/10.0**	
SP_207EA_YGAP231_PRIME		2014-231T23:51:00		000T01:30:00	2014-232T01:21:00	XBAND to Earth	POS_X to 313.0/10.0	
SP_207EA_C70METNON232_PRIME	C	2014-232T04:36:00		000T05:45:00	2014-232T10:21:00	XBAND to Earth	POS_X to 313.0/10.0	Secondary for TOST.

Final Sequenced SMT and Data Volume

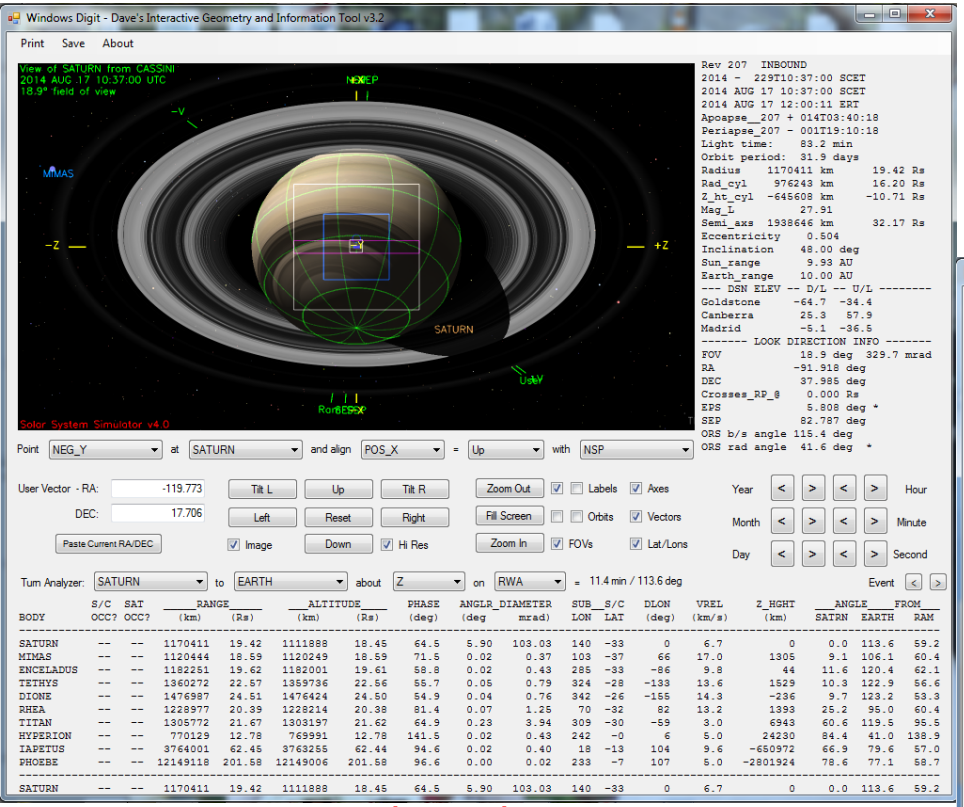
DATA VOLUME SUMMARY --- TRANSFER FRAME OVERHEAD INCLUDED (80 BITS PER 8800-BIT FRAME)

			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_207EA_C34HEFOTP230_PRIME	230 01:37	230 10:37	0	1013	63	1077	3322	2245	0	199	53	1329	654	-676	2090	15%	676
SP_207EA_G70METOTB230_PRIME	230 19:07	231 04:07	676	299	36	1010	3322	2312	0	199	53	1263	2905	1641	2090	15%	0
SP_207EA_C70METNON232_PRIME	232 04:36	232 10:21	0	1460	103	1563	3322	1759	0	134	34	1732	2087	355	448	3%	0

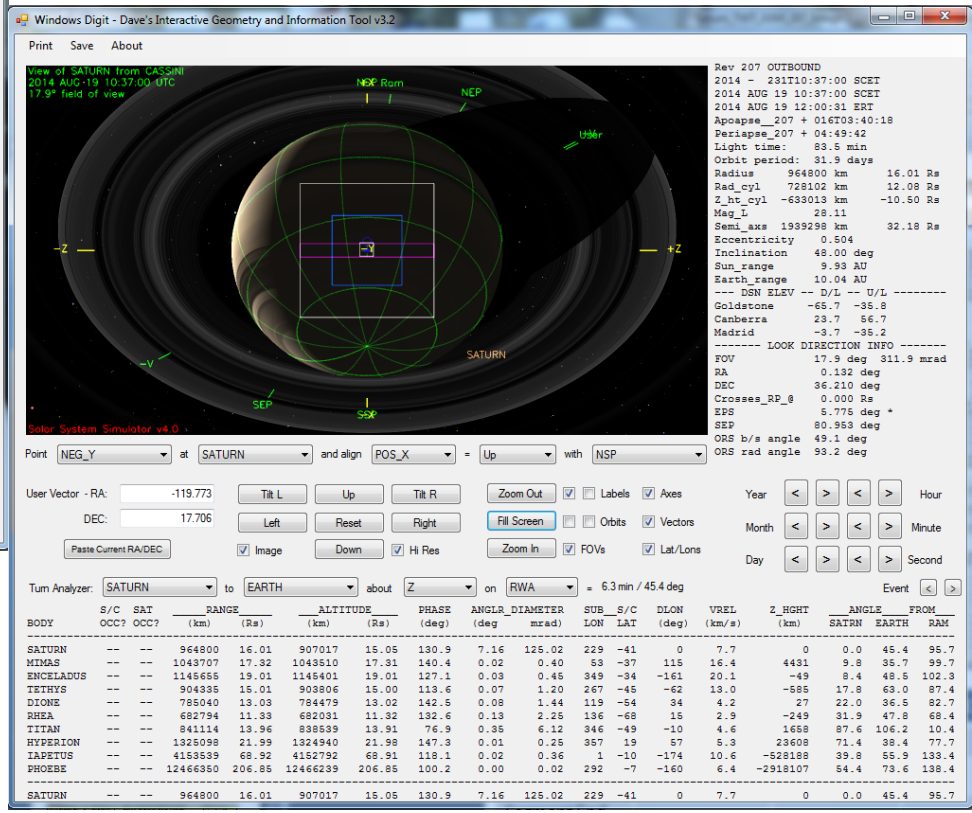
DATA VOLUME REPORT --- TRANSFER FRAME OVERHEAD NOT INCLUDED

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	229 10:37	230 01:37	0.0	28.3	98.4	5.4	350.0	26.7	45.9	0.0	70.7	138.9	240.0	0.0	62.7	1067.0
SP_207EA_C34HEFOTP230_PRIME	230 01:37	230 10:37	0.0	17.0	86.4	3.2	0.0	16.0	27.5	0.0	42.4	4.9	0.0	0.0	0.0	197.5
DAILY TOTAL SCIENCE	229 10:37	230 10:37	0.0	45.3	184.8	8.6	350.0	42.7	73.4	0.0	113.2	143.8	240.0	0.0	62.7	
OBSERVATION_NOR	230 10:37	230 19:07	0.0	16.0	25.8	3.1	35.0	15.1	26.0	0.0	40.1	64.9	70.0	0.0	35.5	331.5
SP_207EA_G70METOTB230_PRIME	230 19:07	231 04:07	0.0	17.0	86.4	3.2	0.0	16.0	27.5	0.0	42.4	4.9	0.0	0.0	0.0	197.5
DAILY TOTAL SCIENCE	230 10:37	231 04:07	0.0	33.0	112.2	6.3	35.0	31.1	53.6	0.0	82.5	69.9	70.0	0.0	35.5	
OBSERVATION_NOR	231 04:07	232 04:36	0.0	46.2	190.6	8.8	319.4	43.5	74.9	0.0	115.5	29.7	618.0	0.0	102.3	1549.0
SP_207EA_C70METNON232_PRIME	232 04:36	232 10:21	0.0	10.8	62.1	2.1	0.0	10.2	17.6	0.0	27.1	3.2	0.0	0.0	0.0	133.1
DAILY TOTAL SCIENCE	231 04:07	232 10:21	0.0	57.0	252.7	10.9	319.4	53.8	92.5	0.0	142.6	32.8	618.0	0.0	102.3	

Segment Geometry



Inbound



Outbound

	Saturn Range	Phase Angle	Sub-S/C Lat.
Segment Start	19.42 Rs	64.5 deg.	-33
Periapse	15.96 Rs	123.5 deg.	-44
Segment End	17.62 Rs	159.7 deg.	-19

Solar Geometry – ORS Boresight Concerns

No ORS Boresight Solar Constraints on Science Pointing Noted.

===== Aug 17 2014 =====

DOY 229:
UVIS performed UVIS EUV/FUV imaging of Saturn with one slow scan across Saturn's illuminated hemisphere to form spectral images. CIRS and ISS rode along, with ISS capturing WAC polarimetry.
ORS instruments conducted a joint observation to capture wind speed and polarimetry.
MAPS instruments continued their ongoing magnetospheric survey campaign.

===== Aug 18 2014 =====

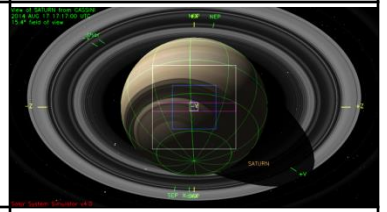
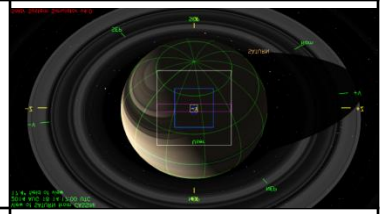
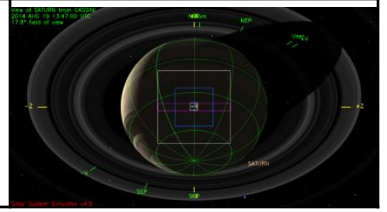
DOY 230:
UVIS, with VIMS riding along, viewed the southern Saturn aurora with rapid slews to image the auroral zone.
VIMS imaged Saturn's south polar auroral region, with 4 maps centered at the south pole. CIRS and ISS rode along.
MAPS instruments continued their ongoing magnetospheric survey campaign.

===== Aug 19 2014 =====

DOY 231:
Cassini went through periapse and moved oty to nearly 16 Rs.
ISS performed a series of Saturn limb scan observations by taking images along the bright limb of Saturn, with VIMS riding.
CIRS observed Saturn, conducting a COMPSIT which aimed to sit and stare at one location to derive composition. The other ORS instruments rode along.
VIMS, with CIRS riding, conducted Saturn south hemispheric mapping, with mosaics of the southern hemisphere centered on the south polar limb.
MAPS instruments continued their ongoing magnetospheric survey campaign.

Segment Integration Planning

Timeline Gaps and Suggested Observations

Gap	Start	End	Duration	Phase angle	Rs range	Sub-S/C Lat.	Snapshot (mid-gap)
1	2014-229T11:17:00	2014-230T00:57:00	000T13:40:00	65.2 to 81.3	19.3 to 17.65	-34 to -43	
	7.5 hr UVIS EUV/FUV, 6 hr ISS Movie						
2	2014-230T11:17:00	2014-230T18:27:00	000T07:10:00	95.4 to 106.0	16.7 to 16.2	-47 to -48	
	Aurora – Slew/Stare Split						
3	2014-231T04:47:00	2014-231T23:11:00	000T18:24:00	121.9 to 148.5	16.0 to 16.6	-45 to -30	
	ISS – 1hr, CIRS – 7.5 hrs, ISS – 1 hr, VIMS -7.5 hr, ISS – 1 hr (ISS spread out for phase coverage.						

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_207EA_C34BWGOTP230_PRIME	230 01:37	230 10:37	0	262	63	326	3322	2996	0	199	53	578	590	**94**	2834	64%	0
SP_207EA_G34BWGOTB230_PRIME	230 19:07	231 04:07	0	101	36	137	3322	3185	0	125	53	315	533	217	2823	74%	0
SP_207EA_C70METNON232_PRIME	232 01:21	232 10:21	0	327	90	417	3322	2905	0	199	53	669	3275	2605	2605	80%	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	229 10:37	230 01:37	0.0	28.3	0.0	5.4	0.0	26.7	45.9	0.0	70.7	0.0	**0.0**	0.0	62.7	322.7
SP_207EA_C34BWGOTP230_PRIME	230 01:37	230 10:37	0.0	17.0	86.4	3.2	0.0	16.0	27.5	0.0	42.4	4.9	0.0	0.0	0.0	197.5
DAILY TOTAL SCIENCE	229 10:37	230 10:37	0.0	45.3	86.4	8.6	0.0	42.7	73.4	0.0	113.2	4.9	**0.0**	0.0	62.7	
OBSERVATION_NOR	230 10:37	230 19:07	0.0	16.0	0.0	3.1	0.0	15.1	26.0	0.0	40.1	0.0	0.0	0.0	35.5	135.8
SP_207EA_G34BWGOTB230_PRIME	230 19:07	231 04:07	0.0	17.0	16.2	3.2	0.0	16.0	27.5	0.0	42.4	1.4	0.0	0.0	0.0	123.8
DAILY TOTAL SCIENCE	230 10:37	231 04:07	0.0	33.0	16.2	6.3	0.0	31.1	53.6	0.0	82.5	1.4	0.0	0.0	35.5	
OBSERVATION_NOR	231 04:07	232 01:21	0.0	40.1	70.2	7.6	0.0	37.8	65.0	0.0	100.1	3.6	0.0	0.0	88.7	413.1
SP_207EA_C70METNON232_PRIME	232 01:21	232 10:21	0.0	17.0	86.4	3.2	0.0	16.0	27.5	0.0	42.4	4.9	0.0	0.0	0.0	197.5
DAILY TOTAL SCIENCE	231 04:07	232 10:21	0.0	57.0	156.6	10.9	0.0	53.8	92.5	0.0	142.6	8.5	0.0	0.0	88.7	

	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	135.3	259.2	25.8	0.0	127.6	219.5	0.0	338.3	14.8	**0.0**	0.0

Waypoint Selection

RBOT - Friendly

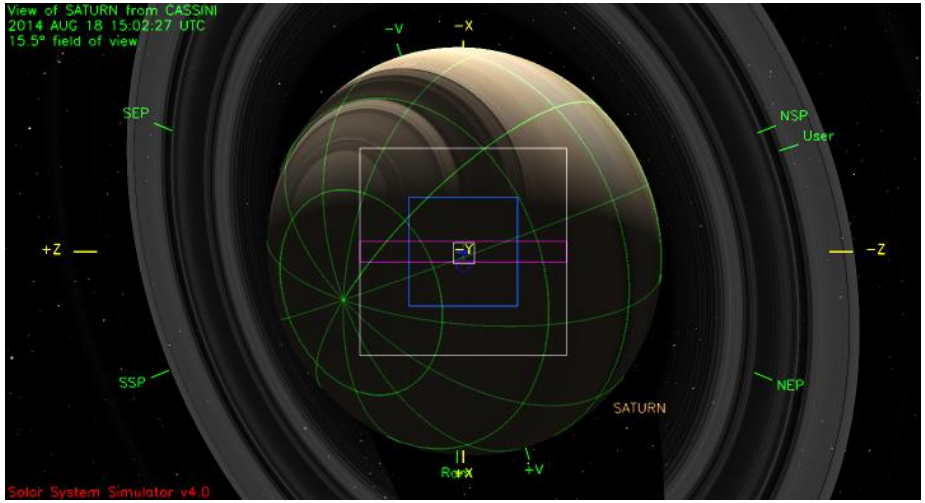
OBSERVATION PERIOD	START	END	POS_X	NEG_X	POS_Z	NEG_Z
SP_207NA_OBSERV229_NA	2014-229T10:37:00	2014-230T01:37:00	------	132.3/ 42.5	------	132.3/ 42.5
SP_207NA_OBSERV230_NA	2014-230T10:37:00	2014-231T01:37:00	------	132.3/ 42.5	------	132.3/ 42.5
SP_207NA_OBSERV231_NA	2014-231T10:37:00	2014-232T01:21:00	------	132.3/ 42.5	------	132.3/ 42.5

Gap/Obs. Period	X to NSP	Z to NSP	NEG_X to Sun	POS_Z to Sun
1	NEG_X only	NEG_Z only	Safe	Safe
2	NEG_X only	NEG_Z only	Safe	Safe
3	Both Bad	NEG_Z only	Safe	Safe

Waypoints Chosen

Waypoint 1 (2014-229T11:17:00 – 2014-232T10:21:00): ISS_NAC to Saturn; NEG_X to Sun

- This waypoint was chosen for the entire segment (downlinks excluded)



Notes & Liens

- Pointing:
  - “RBOT-friendly” waypoint secondaries were not used during observation periods as they were not compatible with the science objectives. Instead, a secondary was chosen to minimize turns between observations.
- Data Volume:
  - No issues
- DSN:
  - OTB pass moved, with NAV approval, to previous complex since it was placed on top of periapse.
- Resource checker:
  - No issues
- Opmodes:
  - No issues
- Hydrazine:
  - N/A
- Special Activities:
  - None

Sequence Liens (should all be SPLAT items):

- None