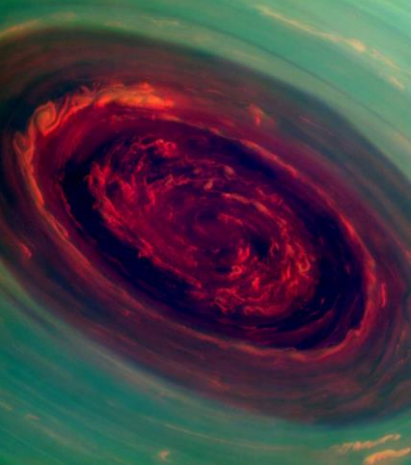
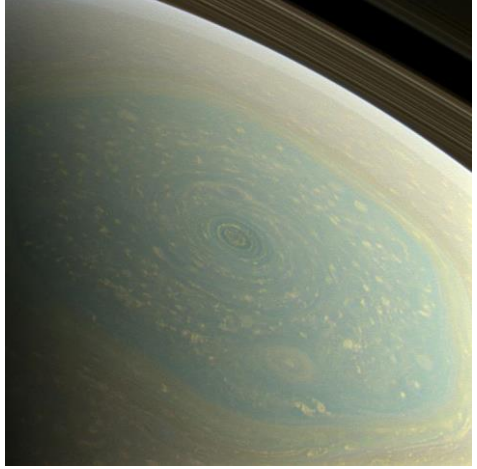
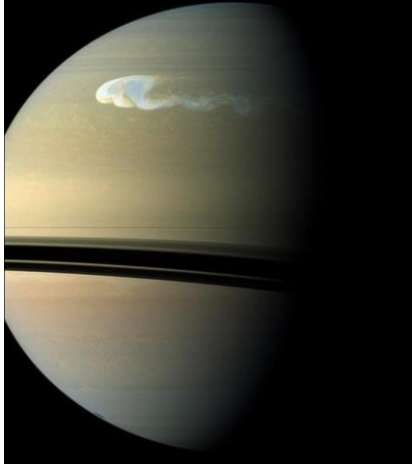


Science Planning & Sequence Team
CASSINI

SATURN TARGET WORKING TEAM

Rev 55 Segment Legacy Package

Segment Boundary: January 1, 2008 – January 5, 2008
2008-001T15:03:00 – 2008-005T05:48:00 (SCET)

Integration Began 07/14/2003
Segment Delivered to S36 Sequence 08/13/2003
Lead Integrator was Shawn Boll

Legacy Package Assembled by Shawn Boll

Table of Contents

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

Segment Overview and Final Products

Segment Summary

- This was a ~3.5 day periapse segment in the Prime Mission, during an inclined orbital phase. The views of Saturn were mid-phase, focused on the northern hemisphere inbound. At periapse (3.97 Rs), the spacecraft had moved to the dark side of the planet, with views of the southern hemisphere. By the time the segment ended the views of Saturn were at a low phase.
- The segment began about 2.5 days before periapse and ended about a day after.
- Saturn science inbound included CIRS far-IR and regional mapping, ISS WAC Photopolarimetry, a VIMS stellar occultation, and UVIS northern auroral movies.
- At periapse, CIRS conducted a Saturn limb integration and INMS got prime time to study the composition of the inner magnetosphere.
- Noteworthy out-of-discipline activities included observations of the rings, Dione, and Titan. Images for optical navigation were also taken.
- Some waypoints required offsets to keep the CIRS and VIMS radiators a safe direction from solar heating.

Final Sequenced SPASS

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S036, length = 39 ...		2007-348T16:00:00	E054_SEQUENCE_036+000T00:00:00	038T21:35:00	2008-022T13:35:00			
SATURN rev 55 Segment		2008-001T15:03:00		003T14:45:00	2008-005T05:48:00			
SP_055SA_WAYPTTURN001_PRIME		2008-001T15:03:00		000T00:30:00	2008-001T15:33:00	ISS_NAC to Saturn	POS_X to NSP	
NEW WAYPOINT		**2008-001T15:33:00**		**001T17:42:00**	**2008-003T09:15:00**	**ISS_NAC to Saturn**	**POS_X to NSP**	
CIRS_055RI_TEMPU33MP001_PRIME	C, U	2008-001T15:33:00		000T02:45:00	2008-001T18:18:00	CIRS_FP1 to Rings	POS_X to NSP	
CIRS_055SA_FIRMAP030_PRIME	C, M, V	2008-001T18:18:00		000T11:00:00	2008-002T05:18:00	CIRS_FP1 to Saturn	POS_X to NSP	
SP_055EA_DLTURN002_PRIME	M	2008-002T05:18:00		000T00:30:00	2008-002T05:48:00	XBAND to Earth	POS_X to NEP	
SP_055EA_G34HEFNON002_PRIME	C, M	2008-002T05:48:00		000T09:00:00	2008-002T14:48:00	XBAND to Earth	POS_X to NEP	
SP_055SA_WAYPTTURN002_PRIME	M	2008-002T14:48:00		000T00:30:00	2008-002T15:18:00	ISS_NAC to Saturn	POS_X to NSP	
UVIS_055SA_NAURMOV001_PRIME	I, M, V	2008-002T15:18:00		000T06:30:00	2008-002T21:48:00	ISS_NAC to Saturn (2.12,0.0,1.83 deg. offset)	NEG_X to Sun	This is combined with ISS WAC Photom. At end of scan on dayside stop long enough to take 8 images (about 6 minutes). Dwell also on nightside end of scan to get ISS auroral images in several filters.
SP_055EA_DLTURN402_PRIME	M	2008-002T21:48:00		000T00:30:00	2008-002T22:18:00	XBAND to Earth	POS_X to NEP	
SP_055EA_M34HEFOTP002_PRIME	C, M, N	2008-002T22:18:00		000T09:00:00	2008-003T07:18:00	XBAND to Earth	POS_X to NEP	
NAV_055SK_OPNAV031_PRIME	M	2008-003T07:18:00		000T01:56:00	2008-003T09:14:00	ISS_NAC to Satellites	POS_X to NEP	Starts at Earth point, ends at NEW waypoint
NAV_055SA_WAYPTTURN031_PRIME	M	2008-003T09:14:00		000T00:01:00	2008-003T09:15:00	ISS_NAC to Saturn (0.0,0.0,10.0 deg. offset)	POS_X to NEP	
NEW WAYPOINT		**2008-003T09:15:00**		**000T10:45:00**	**2008-003T20:00:00**	**ISS_NAC to Saturn (0.0,0.0,10.0 deg. offset)**	**POS_X to NEP**	
VIMS_055ST_ALPSCOOCC001_PRIME	I, M, U, V	2008-003T09:15:00		000T02:25:00	2008-003T11:40:00	VIMS_IR to 247.352/-26.432	POS_X to NEP	
CIRS_055SA_REGMAP015_PRIME	M, U, V	2008-003T11:40:00		000T07:05:00	2008-003T18:45:00	CIRS_FP1 to Saturn	POS_X to NEP	
ISS_055DI_REGGEODA001_PRIME	C, M, U, V	2008-003T18:45:00		000T01:01:00	2008-003T19:46:00	ISS_NAC to Dione	POS_Z to NSP	
SP_055SK_WAYPTTURN003_PRIME	M	2008-003T19:46:00		000T00:14:00	2008-003T20:00:00	ISS_NAC to 310.0/25.0	POS_X to NEP	
NEW WAYPOINT		**2008-003T20:00:00**		**000T05:55:00**	**2008-004T01:55:00**	**ISS_NAC to 310.0/25.0**	**POS_X to NEP**	
VIMS_055RI_SOLAROCC001_PRIME	M, U	2008-003T20:00:00		000T01:45:00	2008-003T21:45:00	ISS_NAC to Sun (-20.0,0.0,-0.109 deg. offset)	NEG_Z to NEP	UVIS will ride along.
CIRS_055SA_LIMBINT007_PRIME	C, M, U, V	2008-003T21:45:00		000T03:54:00	2008-004T01:39:00	CIRS_FPB to Saturn	POS_X to 175.0/70.0	Left limb, +X to RA/Dec (175,70) for the period (2008-004T00:05-01:25) for MAG; SNER-2 from 004T00:44 to 004T00:59 for RPWS.
Periapse R = 4.0 Rs, lat = ...		2008-004T00:47:58		000T00:00:01	2008-004T00:47:59			
SP_055SA_WAYPTTURN404_PRIME	M	2008-004T01:39:00		000T00:16:00	2008-004T01:55:00	ISS_NAC to Saturn (0.0,5.0,0.0 deg. offset)	POS_X to NEP	
NEW WAYPOINT		**2008-004T01:55:00**		**000T14:53:00**	**2008-004T16:48:00**	**ISS_NAC to Saturn (0.0,5.0,0.0 deg. offset)**	**POS_X to NEP**	
CIRS_055DI_ORSDIONE001_PRIME	C, I, M, U	2008-004T01:55:00		000T01:20:00	2008-004T03:15:00	ISS_NAC to Dione (0.0,5.0,0.0 deg. offset)	POS_X to NEP	Coordinate with ISS; SNER-5 for ISS.
INMS_055SA_INMAGCOMP001_PRIME	C, M	2008-004T03:15:00		000T00:38:40	2008-004T03:53:40	NEG_X to 55.463/17.479	POS_Z to NEP	
INMS_055SA_INMAGCOMP002_PRIME	C, M	2008-004T03:53:40		000T00:51:20	2008-004T04:45:00	NEG_X to 49.463/1.688	POS_Z to NEP	
CIRS_055RI_TEMPL37MP001_PRIME	C, M	2008-004T04:45:00		000T02:03:00	2008-004T06:48:00	CIRS_FP1 to Rings (0.0,5.0,0.0 deg. offset)	POS_X to NEP	
SP_055EA_DLTURN004_PRIME		2008-004T06:48:00		000T00:30:00	2008-004T07:18:00	XBAND to Earth	NEG_X to NEP	
SP_055EA_G34HEFOTB004_PRIME	C, E, M, N	2008-004T07:18:00		000T09:00:00	2008-004T16:18:00	XBAND to Earth	NEG_X to NEP	
SP_055SA_WAYPTTURN004_PRIME	M	2008-004T16:18:00		000T00:30:00	2008-004T16:48:00	ISS_NAC to Titan	POS_X to North_Pole_Dir	
NEW WAYPOINT		**2008-004T16:48:00**		**000T13:30:00**	**2008-005T06:18:00**	**ISS_NAC to Titan**	**POS_X to North_Pole_Dir**	
CIRS_055TI_TEMPMAP034_PRIME	I, M, R, U, V	2008-004T16:48:00		000T06:23:00	2008-004T23:11:00	CIRS_FPB to Titan	POS_X to North_Pole_Dir	
SP_055EA_DLTURN404_PRIME	R	2008-004T23:11:00		000T00:30:00	2008-004T23:41:00	XBAND to Earth	NEG_X to NEP	
SP_055EA_M70METNON004_PRIME	C, R	2008-004T23:41:00		000T06:07:00	2008-005T05:48:00	XBAND to Earth	NEG_X to NEP	

Final Sequenced SMT and Data Volume

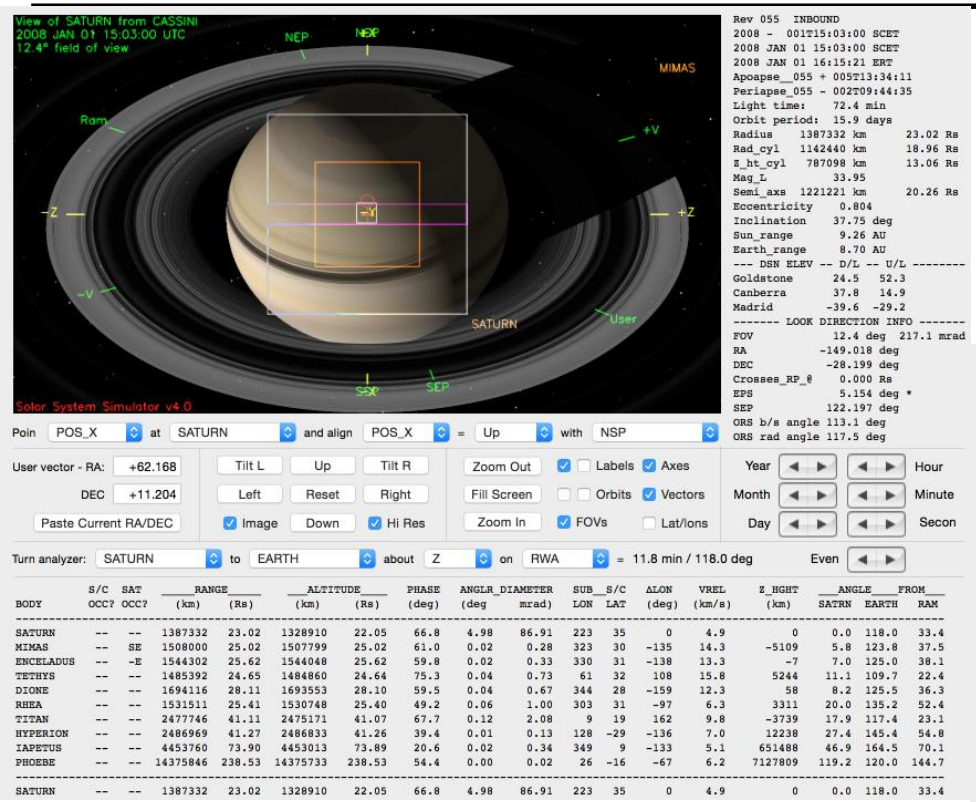
DATA VOLUME SUMMARY --- TRANSFER FRAME OVERHEAD INCLUDED (80 BITS PER 8800-BIT FRAME)

			OBSERVATION_PERIOD							DOWNLINK_PASS							
			P4						P5	RECORDED		PLAYBACK					
DOWNLINK PASS NAME	Start day hh:mm	End day 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 (%)	CAROVR (Mb)
SP_055EA_G34HEFNON002_PRIME	002 05:48	002 14:48	0	554	62	617	3491	2875	0	231	53	900	1073	173	324	2%	0
SP_055EA_M34HEFOTP002_PRIME	002 22:18	003 07:18	0	778	32	810	3491	2681	0	232	53	1095	870	-226	151	1%	226
SP_055EA_G34HEFOTB004_PRIME	004 07:18	004 16:18	226	2058	101	2385	3491	1106	27	556	53	3021	1031	-1990	151	1%	1990
SP_055EA_M70METNON004_PRIME	004 23:41	005 05:48	1990	579	31	2600	3491	891	0	168	36	2804	3040	235	151	1%	0

DATA VOLUME REPORT --- TRANSFER FRAME OVERHEAD NOT INCLUDED

Event	Start day hh:mm	End day 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	001 15:03	002 05:48	53.1	8.0	198.0	2.7	0.0	31.9	50.8	0.0	69.6	10.0	100.0	0.0	12.1	536.0
OBSERVATION_SI	001 15:03	002 05:48	0.0	0.0	25.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.5
SP_055EA_G34HEFNON002_PRIME	002 05:48	002 14:48	32.4	4.9	86.4	1.6	0.0	19.4	38.9	0.0	42.4	2.5	0.0	0.0	0.0	228.5
DAILY TOTAL SCIENCE	001 15:03	002 14:48	85.5	12.8	309.9	4.3	0.0	51.3	89.7	0.0	112.0	12.5	100.0	0.0		
OBSERVATION_NOR	002 14:48	002 22:18	27.0	5.2	0.0	1.4	336.0	16.2	32.4	0.0	35.4	117.7	200.0	0.0	6.1	777.4
SP_055EA_M34HEFOTP002_PRIME	002 22:18	003 07:18	32.4	6.4	86.4	1.6	0.0	19.4	38.9	0.0	42.4	2.5	0.0	0.0	0.0	230.1
DAILY TOTAL SCIENCE	002 14:48	003 07:18	59.4	11.7	86.4	3.0	336.0	35.6	71.3	0.0	77.8	120.2	200.0	0.0		
OBSERVATION_NOR	003 07:18	004 07:18	86.4	68.9	239.9	12.1	199.0	86.5	96.6	0.0	660.0	156.6	419.2	0.0	19.6	2044.7
OBSERVATION_OPN	003 07:18	004 07:18	0.0	0.0	0.0	0.0	26.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.1
OBSERVATION_SI	003 07:18	004 07:18	0.0	0.0	13.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	14.6
SP_055EA_G34HEFOTB004_PRIME	004 07:18	004 16:18	32.4	6.4	86.4	1.6	0.0	19.4	38.3	0.0	366.3	0.0	0.0	0.0	0.0	550.8
DAILY TOTAL SCIENCE	003 07:18	004 16:18	118.8	75.4	339.9	13.8	199.0	106.0	134.9	0.0	1026.2	156.6	420.2	0.0		
OBSERVATION_NOR	004 16:18	004 23:41	26.6	5.3	91.9	1.3	200.0	15.9	29.5	0.0	34.8	18.5	150.0	0.0	6.0	580.0
SP_055EA_M70METNON004_PRIME	004 23:41	005 05:48	22.0	4.4	75.6	1.1	0.0	13.2	19.8	0.0	28.8	1.7	0.0	0.0	0.0	166.7
DAILY TOTAL SCIENCE	004 16:18	005 05:48	48.6	9.7	167.5	2.4	200.0	29.2	49.3	0.0	63.7	20.2	150.0	0.0		

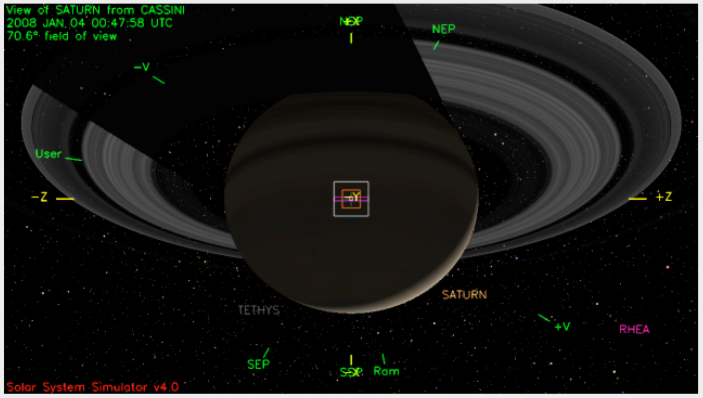
Segment Geometry (1 of 2)



BODY	S/C OCC?	SAT OCC?	RANGE (km)	RANGE (Rs)	ALTITUDE (km)	ALTITUDE (Rs)	PHASE (deg)	ANGLR_DIAMETER (deg	mrad)	SUB_S/C LON	SUB_S/C LAT	ALON (deg)	VREL (km/s)	Z_HGHT (km)	ANGLE_FROM SATRN	EARTH	RAM
SATURN	--	--	1387332	23.02	1328910	22.05	66.8	4.98	86.91	223	35	0	4.9	0	0.0	118.0	33.4
MIMAS	--	SE	1508000	25.02	1507799	25.02	61.0	0.02	0.28	323	30	-135	14.3	-5109	5.8	123.8	37.5
ENCELADUS	--	-E	1544302	25.62	1544048	25.62	59.8	0.02	0.33	330	31	-138	13.3	-7	7.0	125.0	38.1
TETHYS	--	--	1485392	24.65	1484860	24.64	75.3	0.04	0.73	61	32	108	15.8	5244	11.1	109.7	22.4
DIONE	--	--	1694116	28.11	1693553	28.10	59.5	0.04	0.67	344	28	-159	12.3	58	8.2	125.5	36.3
RHEA	--	--	1531511	25.41	1530748	25.40	49.2	0.06	1.00	303	31	-97	6.3	3311	20.0	135.2	52.4
TITAN	--	--	2477746	41.11	2475171	41.07	67.7	0.12	2.08	9	19	162	9.8	-3739	17.9	117.4	23.1
HYPERION	--	--	2486969	41.27	2486833	41.26	39.4	0.01	0.13	128	-29	-136	7.0	12238	27.4	145.4	54.8
IAPETUS	--	--	4453760	73.90	4453013	73.89	20.6	0.02	0.34	349	9	-133	5.1	651488	46.9	164.5	70.1
PHOEBE	--	--	14375846	238.53	14375733	238.53	54.4	0.00	0.02	26	-16	-67	6.2	7127809	119.2	120.0	144.7
SATURN	--	--	1387332	23.02	1328910	22.05	66.8	4.98	86.91	223	35	0	4.9	0	0.0	118.0	33.4

Seg Start (Left)

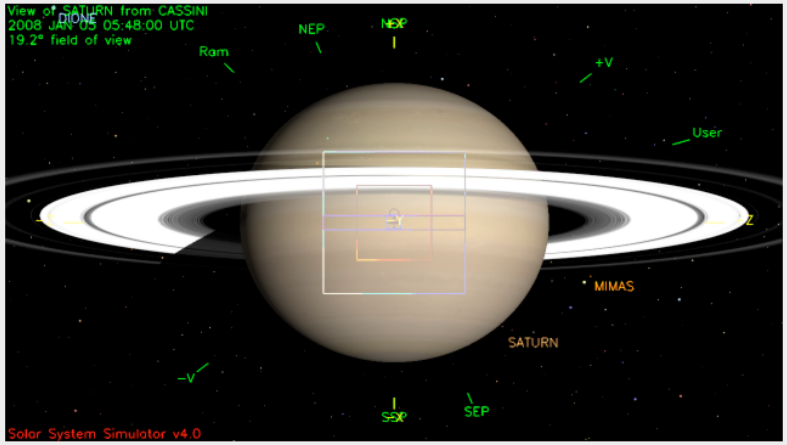
Periapse (below)



BODY	S/C OCC?	SAT OCC?	RANGE (km)	RANGE (Rs)	ALTITUDE (km)	ALTITUDE (Rs)	PHASE (deg)	ANGLR_DIAMETER (deg	mrad)	SUB_S/C LON	SUB_S/C LAT	ALON (deg)	VREL (km/s)	Z_HGHT (km)	ANGLE_FROM SATRN	EARTH	RAM
SATURN	--	--	239537	3.97	180071	2.99	142.8	29.14	508.67	226	-22	0	16.9	0	0.0	32.9	90.1
MIMAS	--	--	414824	6.88	414617	6.88	146.6	0.06	1.00	4	-12	171	30.4	4783	9.5	28.6	82.4
ENCELADUS	--	--	358411	5.95	358157	5.94	112.1	0.08	1.43	44	-14	98	23.9	19	41.4	63.0	95.7
TETHYS	--	--	513966	8.53	513426	8.52	140.7	0.12	2.10	11	-9	157	27.2	-2788	17.6	34.3	81.4
DIONE	--	--	241210	4.00	240647	3.99	43.6	0.27	4.67	33	-22	33	13.3	-27	103.4	131.4	130.0
RHEA	--	--	718177	11.92	717410	11.90	162.9	0.12	2.14	351	-7	-141	22.6	-3261	30.7	17.5	72.5
TITAN	--	--	1277689	21.20	1275114	21.16	133.8	0.23	4.03	351	-4	-104	18.1	-7710	66.3	50.0	74.3
HYPERION	--	--	1177973	19.55	1177861	19.54	62.0	0.02	0.28	273	-65	-35	12.8	-7912	132.5	122.5	101.8
IAPETUS	--	--	3450838	57.26	3450091	57.25	16.5	0.02	0.43	3	-2	4	14.1	510465	148.0	167.5	121.9
PHOEBE	--	--	15137739	251.17	15137629	251.17	60.8	0.00	0.02	113	-20	83	16.9	7137628	85.1	113.6	130.0
SATURN	--	--	239537	3.97	180071	2.99	142.8	29.14	508.67	226	-22	0	16.9	0	0.0	32.9	90.1

	Saturn Range	Phase Angle	Sub-S/C Lat.
Segment Start	23.02	66.08	35
Periapse	3.97	142.8	-22
Segment End	14.91	19.5	-8

Segment Geometry (2 of 2)




```
Rev 055 OUTBOUND
2008 -  005T05:48:00 SCET
2008 JAN 05 05:48:00 SCET
2008 JAN 05 06:59:56 ERT
Apoapse__055 + 009T04:19:11
Periapse_055 + 001T05:00:25
Light time:    71.9 min
Orbit period:  16.0 days
Radius      898376 km       14.91 Rs
Rad_cyl     890165 km       14.77 Rs
Z_ht_cyl   -121186 km       -2.01 Rs
Mag_L          15.18
Semi_axs   1222033 km       20.28 Rs
Eccentricity    0.804
Inclination    37.76 deg
Sun_range       9.26 AU
Earth_range     8.65 AU
--- DSN ELEV -- D/L -- U/L --------
Goldstone      23.4   -5.6
Canberra      -60.0   -59.5
Madrid         40.5    58.7
------- LOOK DIRECTION INFO -------
FOV            19.2 deg  334.9 mrad
RA            136.246 deg
DEC             8.443 deg
Crosses_RP_@    0.000 Rs
EPS             4.933 deg *
SEP           125.912 deg
ORS b/s angle 160.5 deg
ORS rad angle  91.7 deg
```

Poin POS_X at SATURN and align POS_X = Up with NSP

User vector - RA: +62.168 DEC +11.204 Paste Current RA/DEC

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

Zoom Out Fill Screen Zoom In

Labels Axes Orbits Vectors FOVs Lat/lons

Year Month Day Hour Minute Secon

Turn analyzer: SATURN to EARTH about Z on RWA = 14.6 min / 156.0 deg Even

BODY	S/C OCC?	SAT OCC?	RANGE (km)	RANGE (Rs)	ALTITUDE (km)	ALTITUDE (Rs)	PHASE (deg)	ANGLR_DIAMETER (deg	mrad)	SUB_S/C LON	SUB_S/C LAT	ALON (deg)	VREL (km/s)	Z_HGHT (km)	ANGLE FROM SATRN	ANGLE FROM EARTH	ANGLE FROM RAM
SATURN	--	--	898376	14.91	838212	13.91	19.5	7.69	134.27	346	-8	0	7.3	0	0.0	156.0	145.4
MIMAS	--	--	1065885	17.69	1065679	17.68	24.5	0.02	0.39	336	-7	-151	20.6	-2502	5.1	151.1	149.7
ENCELADUS	--	--	894296	14.84	894044	14.83	34.8	0.03	0.57	281	-8	-81	18.7	20	15.3	140.7	154.3
TETHYS	--	--	821454	13.63	820923	13.62	0.5	0.08	1.32	96	-10	65	4.8	5522	19.1	174.7	129.2
DIONE	--	--	541097	8.98	540534	8.97	11.6	0.12	2.08	159	-13	12	7.6	65	9.9	163.5	135.6
RHEA	--	--	1104251	18.32	1103487	18.31	47.7	0.08	1.39	309	-6	-98	15.4	918	28.2	127.8	157.6
TITAN	--	--	339358	5.63	336783	5.59	128.9	0.87	15.18	17	-20	6	6.2	-7183	144.3	53.7	4.3
HYPERION	--	--	1481868	24.59	1481744	24.59	44.2	0.01	0.22	32	-56	80	3.4	-16896	63.7	140.3	89.4
IAPETUS	--	--	4372985	72.56	4372237	72.55	14.1	0.02	0.34	10	1	138	7.7	432878	33.6	170.3	116.7
PHOEBE	--	--	15778271	261.80	15778157	261.80	58.3	0.00	0.01	156	-19	-138	6.0	7141278	42.4	116.2	134.5
SATURN	--	--	898376	14.91	838212	13.91	19.5	7.69	134.27	346	-8	0	7.3	0	0.0	156.0	145.4

Seg End

Solar Geometry – ORS Boresight Concerns

No ORS Boresight Solar Constraints on Science Pointing.

Daily Science Highlights

DOY 001 - On the first day of 2008, CIRS led the way as it took temperature measurements of the rings as well as IR-mapping studies of Saturn. MAPS teams were in survey mode.

Week 4: DOY 2-8 (Wed, Jan 2 – Tues, Jan 8)
DOY 002 - Following the wrap-up of the previous day's CIRS observations the rest of the day was dedicated to looking at Saturn's northern aurora. UVIS led an ORS campaign to image this region.

DOY 003 - Activities on the spacecraft picked up on this day as periapse approached. VIMS observed both stellar and solar ring occultations, and CIRS led joint ORS campaigns to study Saturn's atmosphere. On the way to periapse, the spacecraft briefly turned its attention from Saturn to Dione, where ISS took images with the other ORS teams riding along. The MAPS teams took data as part of their campaign to image the dynamics of the inner magnetosphere.

DOY 004 - Following periapse, CIRS took another look at Dione, with others riding along. INMS took rare control of the spacecraft pointing to measure Saturn's inner magnetospheric composition. CIRS took some further temperature measurements of the rings as the spacecraft moved further from Saturn, and then turned their attention to Titan as the T40 flyby approached.

Segment Integration Planning

Timeline Gaps and Suggested Observations

Rev 55 - TOL

Activity	Start	Duration	Pointing	Notes	TLM
Segment Start/SPTurn to Waypoint	2008-001T15:03:00	00:30:00			
New Waypoint	2008-001T15:33:00				
CIRS FIRMAP	2008-001T15:33:00	13:45:00			
SP Turn to Downlink	2008-002T05:18:00	00:30:00	XBAND to Earth;		
Downlink	2008-002T05:48:00	09:00:00	XBAND to Earth;	Goldstone 34 HEF	
SP Turn to Waypoint	2008-002T14:48:00	00:30:00			
ISS Saturn 1x2 WPH	2008-002T15:18:00	05:00:00			
GAP	2008-002T20:18:00	01:30:00			
SP Turn to Downlink	2008-002T21:48:00	00:30:00	XBAND to Earth;		
Downlink	2008-002T22:18:00	09:00:00	XBAND to Earth;	Madrid 34 HEF	
SP Turn to Waypoint	2008-003T07:18:00	00:30:00			
CIRS Regional Map	2008-003T07:48:00	10:00:00			
RADAR/RSS?/SOST	2008-003T17:48:00	13:00:00			
SP Turn to Downlink	2008-004T06:48:00	00:30:00	XBAND to Earth;		
Downlink (delayed 1.5 hours)	2008-004T07:18:00	09:00:00	XBAND to Earth;	Goldstone 34 HEF	
SP Turn to Waypoint	2008-004T16:18:00	00:30:00			
CIRS Titan	2008-004T16:48:00	05:00:00			
SP Turn to Downlink	2008-004T21:48:00	00:30:00			
Downlink	2008-004T22:18:00	09:00:00	XBAND to Earth;	Madrid 34 HEF	

Initial SMT and Data Volume

First Appearance During Integration:

DATA VOLUME SUMMARY

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)	MARGIN (Mb)	(%)	OPNAV (Mb)	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGIN (Mb)	(%)	CAROVR (Mb)
SP_055EA_G34HEFNON002_PRIME	002 05:48	002 14:48	0	644	51	696	3572	2876	81%	0	229	53	977	1078	101	9%	0
SP_055EA_M34HEFOTP002_PRIME	002 22:18	003 07:18	0	771	26	797	3568	2771	78%	0	230	53	1081	863	-217	-25%	217
SP_055EA_G34HEFOTB004_PRIME	004 07:18	004 16:18	217	2136	83	2436	3498	1062	30%	35	144	53	2669	1036	-1633	-158%	1633
SP_055EA_M70METNON004_PRIME	004 22:18	005 05:48	1633	315	21	1969	3568	1599	45%	0	187	44	2200	3158	957	30%	0

DATA VOLUME REPORT

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	001 15:03	002 05:48	53.1	8.0	198.0	2.7	0.0	31.9	50.8	0.0	69.6	0.0	200.0	0.0	0.0	613.9
OBSERVATION_SI	001 15:03	002 05:48	0.0	0.0	30.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.5
SP_055EA_G34HEFNON002_PRIME	002 05:48	002 14:48	32.4	4.9	86.4	1.6	0.0	19.4	38.9	0.0	42.4	2.5	0.0	0.0	0.0	228.5
DAILY TOTAL SCIENCE	001 15:03	002 14:48	85.5	12.8	314.9	4.3	0.0	51.3	89.7	0.0	112.0	2.5	200.0	0.0		
OBSERVATION_NOR	002 14:48	002 22:18	27.0	5.2	0.0	1.4	336.0	16.2	32.4	0.0	35.4	117.7	200.0	0.0	0.0	771.3
SP_055EA_M34HEFOTP002_PRIME	002 22:18	003 07:18	32.4	6.4	86.4	1.6	0.0	19.4	38.9	0.0	42.4	2.5	0.0	0.0	0.0	230.1
DAILY TOTAL SCIENCE	002 14:48	003 07:18	59.4	11.7	86.4	3.0	336.0	35.6	71.3	0.0	77.8	120.2	200.0	0.0		
OBSERVATION_NOR	003 07:18	004 07:18	86.4	19.0	221.5	12.1	232.0	58.4	96.6	0.0	659.9	128.6	599.2	0.0	0.0	2113.9
OBSERVATION_OPN	003 07:18	004 07:18	0.0	0.0	0.0	0.0	34.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.8
OBSERVATION_SI	003 07:18	004 07:18	0.0	0.0	21.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.7
SP_055EA_G34HEFOTB004_PRIME	004 07:18	004 16:18	32.4	6.4	0.0	1.6	0.0	19.4	38.3	0.0	46.1	0.0	0.0	0.0	0.0	144.3
DAILY TOTAL SCIENCE	003 07:18	004 16:18	118.8	25.5	243.2	13.8	232.0	77.9	134.9	0.0	706.1	128.6	599.2	0.0		
OBSERVATION_NOR	004 16:18	004 22:18	21.6	4.3	72.0	1.1	0.0	13.0	25.0	0.0	28.3	0.0	150.0	0.0	0.0	315.3
SP_055EA_M70METNON004_PRIME	004 22:18	005 05:48	27.0	5.4	75.6	1.4	0.0	16.2	24.3	0.0	35.4	2.1	0.0	0.0	0.0	187.3
DAILY TOTAL SCIENCE	004 16:18	005 05:48	48.6	9.7	147.6	2.4	0.0	29.2	49.3	0.0	63.7	2.1	150.0	0.0		

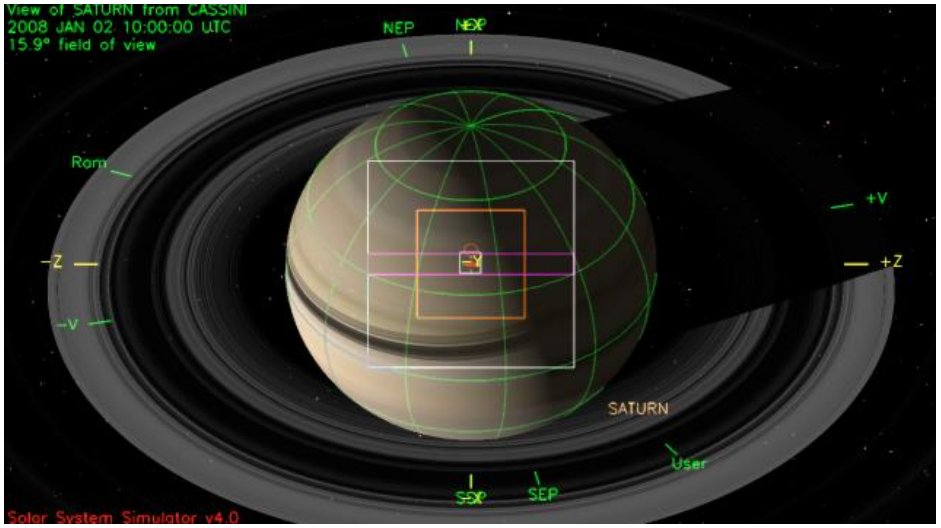
		CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)
TOTAL RECORDED (OPNAV data not included)	312.3	59.7	792.1	23.4	568.0	194.0	345.1	0.0	959.5	253.3	1149.2	0.0	

Waypoint Selection

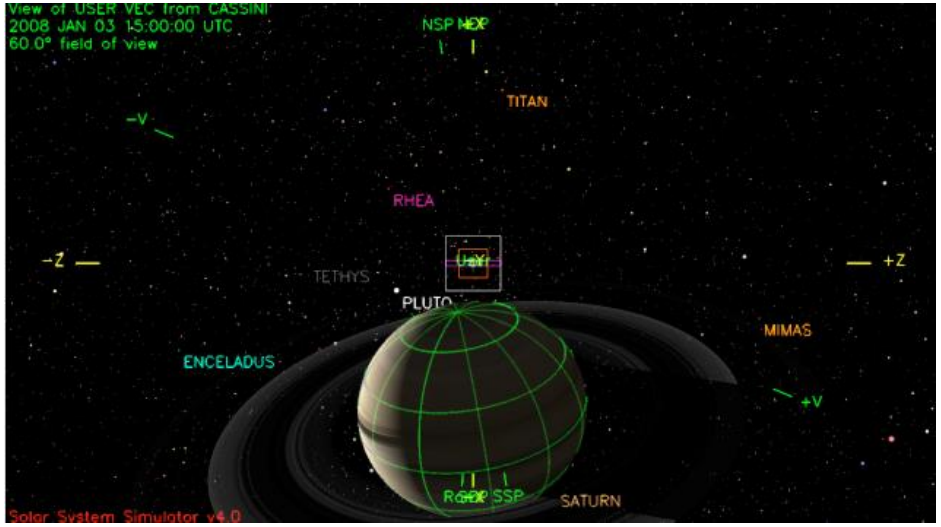
- Start – 003T07:18
  - ISS_NAC to Saturn; POS_X to NSP =>Safe.
- 003T07:18 – 004T16:18
  - ISS_NAC to R_ANSA (0,-5,0); POS_X to NSP =>Safe.
  - ISS_NAC to R_ANSA; POS_X to NEP =>Safe.
  - Anything to L_ANSA or Saturn is hard.
  - ISS_NAC to Dione (0,-35,0); NEG_X to NSP =>Safe except 0.722 deg. CIRS DeltaT.
- 004-T16:18 – End
  - ISS_NAC to Titan; NEG_Z to Saturn =>Safe.
  - ISS_NAC to Titan (0,0,35); NEG_X to N.Pole_Dir =>Safe.
  - ISS_NAC to Titan; NEG_X to Sun =>Safe except 0.6 deg. CIRS DeltaT.
  - ISS_NAC to Titan; POS_X to N. Pole_Dir =>Safe except 0.792 deg CIRS DeltaT.

Waypoints Chosen

Waypoint 1 (2008-001T15:33:00 – 2008-003T09:15:00): ISS_NAC to Saturn; POS_X to NSP

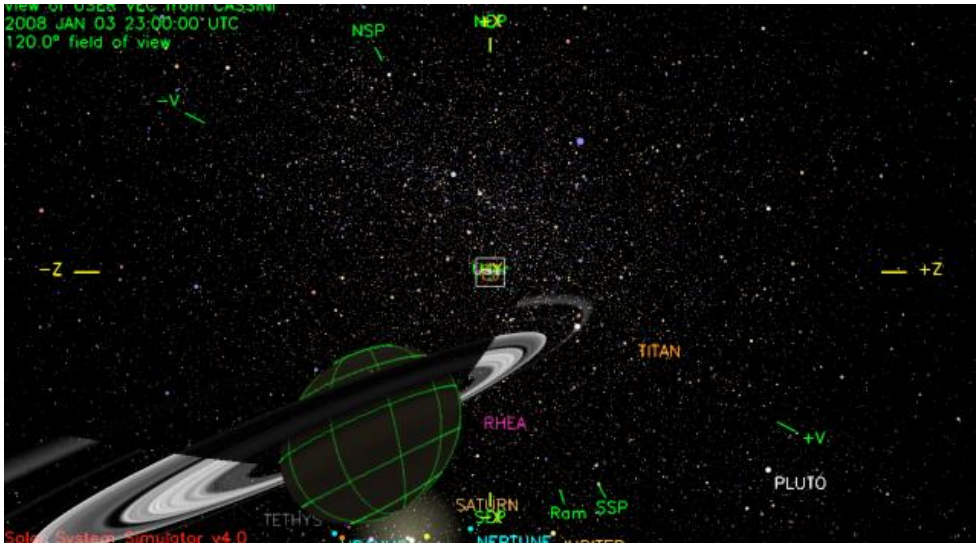


Waypoint 2 (2008-003T09:15:00 – 2008-003T20:00:00): ISS_NAC to Saturn (0,0,10); POS_X to NEP

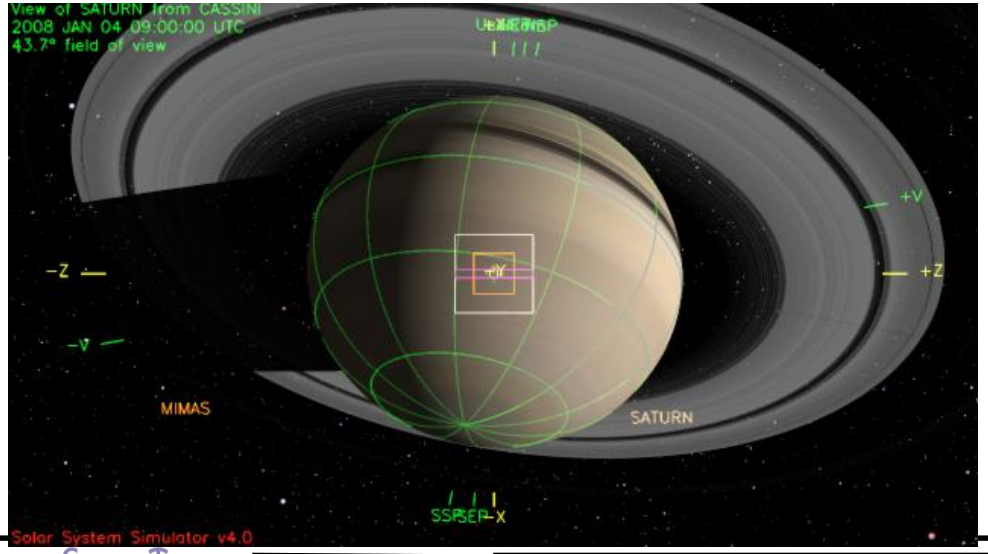


Waypoints Chosen

Waypoint 3 (2008-003T20:00:00 – 2008-004T01:55:00): ISS_NAC to 310.0/25.0; POS_X to NEP

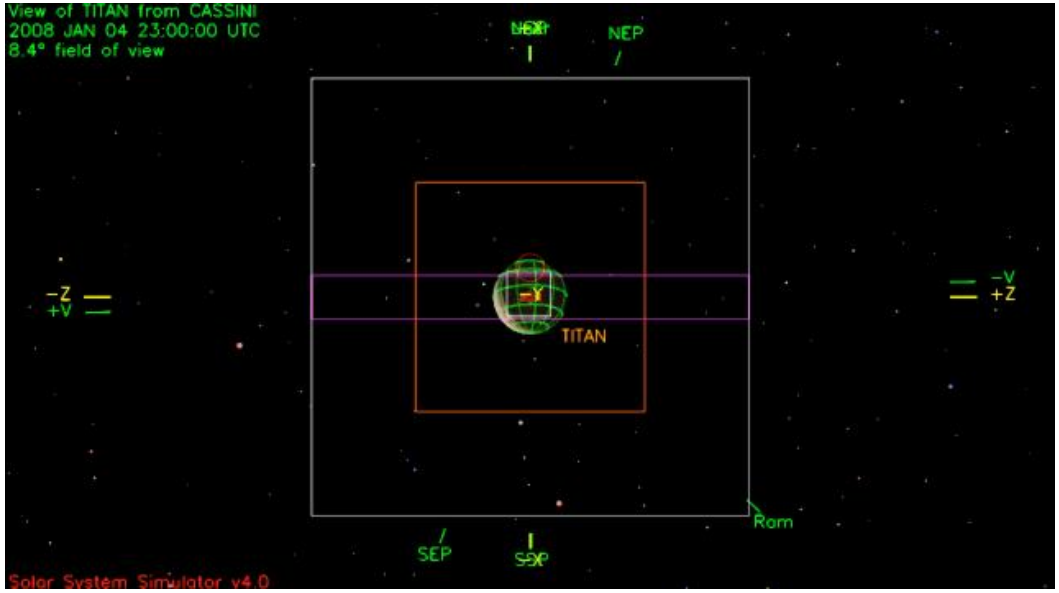


Waypoint 4 (2008-004T01:55:00 – 2008-004T16:48:00): ISS_NAC to Saturn (0,5,0); POS_X to NEP



Waypoints Chosen

Waypoint 5 (2008-004T16:48:00 - 2008-005T06:18:00): ISS_NAC to Titan; POS_X to North_Pole_Dir



Saturn Rev 55 Open Issues

- **Pointing Issues**
  - None
- **Data Volume Issues**
  - None
- **Telemetry Mode Issues**
  - None
- **CIMS Issues**
  - None
- **Power/OPMODE Issues**
  - None
- **Flight Rule/Mission Planning Guideline and Constraint Issues**
  - None
- **Other Issues**
  - The DSN Station request may be 5-10 minutes earlier than necessary.