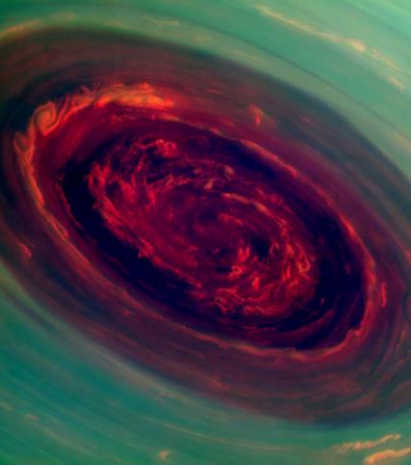
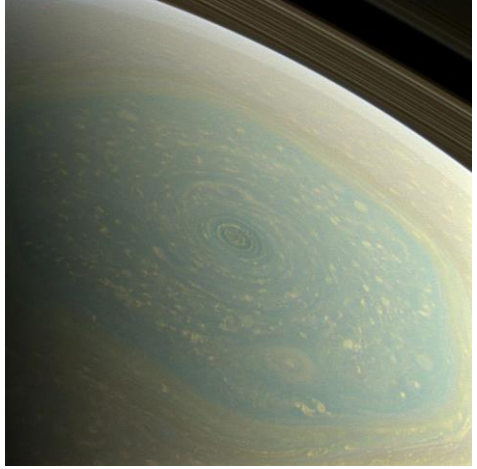
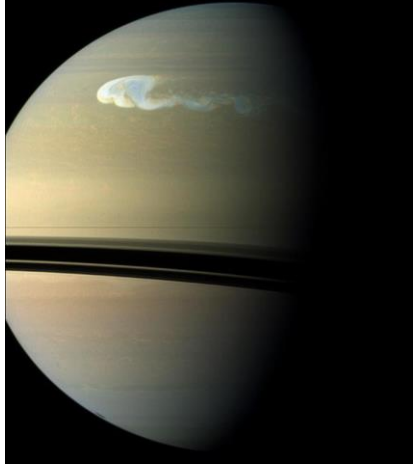


Science Planning & Sequence Team
CASSINI

SATURN TARGET WORKING TEAM

Rev Ba Segment Legacy Package

Segment Boundary: December 3, 2004 – December 10, 2004
2004-338T15:36:00 – 2004-345T06:06:00 (SCET)

Integration Began 07/01/2002
Segment Delivered to S06 Sequence 09/23/2003
Lead Integrator was Scott Edgington

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 6.5 day long segment in the early days of the Prime Mission. The orbit was slightly inclined at the time and the segment covered part of the inbound leg toward periapse 00B.
- Saturn TWT also shepherded another segment during this rev which included the periapse. These two segments were developed together until this “A” segment had to be temporarily shelved pending the resolution of critical activities in preparation of the Huygens Probe release.
- A large portion of the time in this segment was allocated to probe activities and optical navigation images as the team tried to better define the ephemerides of the various bodies in the Saturnian System following Orbit Insertion.
- Saturn science included several CIRS composition measurements, ISS movies, and VIMS global imaging.
- ISS looked for spoke formation in the rings.
- Power budget constraints required many Instruments to go to sleep or mute during various probe activities.

Final Sequenced SPASS

Saturn Ba Legacy

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S006, length = 32 ...		2004-320T07:49:00	E00A_SEQUENCE_006+000T00:00:00	031T05:33:00	2004-351T13:22:00			
SATURN rev B Segment		2004-338T15:36:00		006T14:30:00	2004-345T06:06:00			
NAV_00BSK_OPNAV381_PRIME	M	2004-338T15:36:00		000T00:59:00	2004-338T16:35:00	ISS_NAC to Satellites	POS_Z to NSP	Starts at Earth point, ends at NEW waypoint
NAV_00BSA_WAYPTTURN381_PRIME	M	2004-338T16:35:00		000T00:01:00	2004-338T16:36:00	ISS_NAC to Saturn	POS_Z to NSP	
NEW WAYPOINT		**2004-338T16:36:00**		**000T16:15:00**	**2004-339T08:51:00**	**ISS_NAC to Saturn**	**POS_Z to NSP**	
CIRS_00BSA_COMPSITA011_PRIME	M, V	2004-338T16:36:00		000T02:15:00	2004-338T18:51:00	CIRS_FP1 to Saturn	POS_Z to NSP	
NAV_00BSK_OPNAV382_PRIME	M	2004-338T18:51:00		000T00:59:00	2004-338T19:50:00	ISS_NAC to Satellites	POS_Z to NSP	Starts at waypoint, ends at Earth point
NAV_00BEA_DLTURN382_PRIME	M	2004-338T19:50:00		000T00:01:00	2004-338T19:51:00	XBAND to Earth	NEG_X to NEP	
SP_00BEA_M70METNON338_PRIME	C, M	2004-338T19:51:00		000T12:00:00	2004-339T07:51:00	XBAND to Earth	NEG_X to NEP	
NAV_00BSK_OPNAV391_PRIME	M	2004-339T07:51:00		000T00:59:00	2004-339T08:50:00	ISS_NAC to Satellites	POS_Z to NSP	Starts at Earth point, ends at waypoint
NAV_00BSA_WAYPTTURN391_PRIME	M	2004-339T08:50:00		000T00:01:00	2004-339T08:51:00	ISS_NAC to Saturn	POS_Z to NSP	
NEW WAYPOINT		**2004-339T08:51:00**		**005T23:12:00**	**2004-345T08:03:00**	**ISS_NAC to Saturn**	**POS_Z to NSP**	
CIRS_00BSA_COMPSITA012_PRIME	M	2004-339T08:51:00		000T12:50:00	2004-339T21:41:00	CIRS_FP1 to Saturn	POS_Z to NSP	
NAV_00BSK_OPNAV392_PRIME	M	2004-339T21:41:00		000T00:59:00	2004-339T22:40:00	ISS_NAC to Satellites	POS_Z to NSP	Starts at waypoint, ends at Earth point
NAV_00BEA_DLTURN392_PRIME	M	2004-339T22:40:00		000T00:01:00	2004-339T22:41:00	XBAND to Earth	POS_X to NSP	
SP_00BEA_M70METNON339_PRIME	M	2004-339T22:41:00		000T04:50:00	2004-340T03:31:00	XBAND to Earth	POS_X to NSP	
SP_00BEA_G34HEFNON340_PRIME	M	2004-340T03:31:00		000T02:24:00	2004-340T05:55:00	XBAND to Earth	POS_X to NSP	
Transition RWA power to RCS...		2004-340T03:52:00		000T00:20:49	2004-340T04:12:49			
SP_00BNA_PROBENOM002_NA	M	2004-340T05:55:00		000T02:10:00	2004-340T08:05:00	XBAND to Earth	POS_X to NSP	
Transition RWA following Pr...		2004-340T08:00:00		000T00:22:36	2004-340T08:22:36			
SP_00BEA_G34HEFNON440_PRIME	M	2004-340T08:05:00		000T06:51:00	2004-340T14:56:00	XBAND to Earth	POS_X to NSP	
SP_00BEA_G34HEFNON540_PRIME	M	2004-340T14:56:00		000T00:45:00	2004-340T15:41:00	XBAND to Earth	POS_X to NSP	
NAV_00BSK_OPNAV401_PRIME	M	2004-340T15:41:00		000T00:59:00	2004-340T16:40:00	ISS_NAC to Satellites	POS_Z to NSP	Starts at Earth point, ends at waypoint
NAV_00BSA_WAYPTTURN401_PRIME	M	2004-340T16:40:00		000T00:01:00	2004-340T16:41:00	ISS_NAC to Saturn	POS_Z to NSP	
ISS_00BSA_3X3MOVIEA001_PRIME	M	2004-340T16:41:00		000T11:10:00	2004-341T03:51:00	ISS_NAC to Saturn	POS_Z to NSP	
NAV_00BSK_OPNAV411_PRIME	M	2004-341T03:51:00		000T00:59:00	2004-341T04:50:00	ISS_NAC to Satellites	POS_Z to NSP	Starts at waypoint, ends at Earth point
NAV_00BEA_DLTURN411_PRIME	M	2004-341T04:50:00		000T00:01:00	2004-341T04:51:00	XBAND to Earth	POS_X to NSP	
SP_00BEA_G34HEFNON341_PRIME	C, M	2004-341T04:51:00		000T09:00:00	2004-341T13:51:00	XBAND to Earth	POS_X to NSP	
Probe Depassivation #2 - Co...		2004-341T08:00:00		000T02:00:00	2004-341T10:00:00			
NAV_00BSK_OPNAV412_PRIME	M	2004-341T13:51:00		000T00:59:00	2004-341T14:50:00	ISS_NAC to Satellites	POS_Z to NSP	Starts at Earth point, ends at waypoint
NAV_00BSA_WAYPTTURN412_PRIME	M	2004-341T14:50:00		000T00:01:00	2004-341T14:51:00	ISS_NAC to Saturn	POS_Z to NSP	
ISS_00BSA_3X3MOVIEA002_PRIME	M	2004-341T14:51:00		000T09:10:00	2004-342T00:01:00	ISS_NAC to Saturn	POS_Z to NSP	
NAV_00BSK_OPNAV421_PRIME	M	2004-342T00:01:00		000T00:59:00	2004-342T01:00:00	ISS_NAC to Satellites	POS_Z to NSP	Starts at waypoint, ends at Earth point
NAV_00BEA_DLTURN421_PRIME	M	2004-342T01:00:00		000T00:01:00	2004-342T01:01:00	XBAND to Earth	POS_X to NSP	
SP_00BEA_M34HEFNON342_PRIME	M	2004-342T01:01:00		000T03:54:00	2004-342T04:55:00	XBAND to Earth	POS_X to NSP	
Probe Contingency Period - ...		2004-342T04:55:00	E00B_PROBECON_PSAON-000T00:05:00	000T08:20:00	2004-342T13:15:00			
SP_00BEA_M34HEFNON542_PRIME	M	2004-342T04:55:00	E00B_PROBECON_PSAON-000T00:05:00	000T01:01:00	2004-342T05:56:00	XBAND to Earth	POS_X to NSP	
SP_00BEA_G34HEFNON342_PRIME	M	2004-342T05:56:00		000T07:19:00	2004-342T13:15:00	XBAND to Earth	POS_X to NSP	
SP_00BEA_G34HEFNON442_PRIME	M	2004-342T13:15:00	E00B_PROBECON_PSAOFF+000T00:05:00	000T01:26:00	2004-342T14:41:00	XBAND to Earth	POS_X to NSP	
NAV_00BSK_OPNAV422_PRIME	M	2004-342T14:41:00		000T00:59:00	2004-342T15:40:00	ISS_NAC to Satellites	POS_Z to NSP	Starts at Earth point, ends at waypoint
NAV_00BSA_WAYPTTURN422_PRIME	M	2004-342T15:40:00		000T00:01:00	2004-342T15:41:00	ISS_NAC to Saturn	POS_Z to NSP	
CIRS_00BSA_COMPSITB011_PRIME	M, R, V	2004-342T15:41:00		000T05:55:00	2004-342T21:36:00	CIRS_FP1 to Saturn	POS_Z to NSP	
NAV_00BSK_OPNAV423_PRIME	M, R	2004-342T21:36:00		000T00:59:00	2004-342T22:35:00	ISS_NAC to Satellites	POS_Z to NSP	Starts at waypoint, ends at Earth point
NAV_00BEA_DLTURN423_PRIME	M, R	2004-342T22:35:00		000T00:01:00	2004-342T22:36:00	XBAND to Earth	POS_X to NSP	
SP_00BEA_M70METNON342_PRIME	C, M, R	2004-342T22:36:00		000T06:00:00	2004-343T04:36:00	XBAND to Earth	Rolling/SRU	
NAV_00BSK_OPNAV431_PRIME	M	2004-343T04:36:00		000T00:59:00	2004-343T05:35:00	ISS_NAC to Satellites	POS_Z to NSP	Starts at Earth point, ends at waypoint
NAV_00BSA_WAYPTTURN431_PRIME	M	2004-343T05:35:00		000T00:01:00	2004-343T05:36:00	ISS_NAC to Saturn	POS_Z to NSP	
CIRS_00BSA_COMPSITC011_PRIME	M, V	2004-343T05:36:00		000T16:00:00	2004-343T21:36:00	CIRS_FP1 to Saturn	POS_Z to NSP	
NAV_00BSK_OPNAV432_PRIME	M	2004-343T21:36:00		000T00:59:00	2004-343T22:35:00	ISS_NAC to Satellites	POS_Z to NSP	Starts at waypoint, ends at Earth point
NAV_00BEA_DLTURN432_PRIME	M	2004-343T22:35:00		000T00:01:00	2004-343T22:36:00	XBAND to Earth	POS_X to NSP	
SP_00BEA_M70METNON343_PRIME	C, M	2004-343T22:36:00		000T06:00:00	2004-344T04:36:00	XBAND to Earth	Rolling/SRU	
NAV_00BSK_OPNAV441_PRIME	M	2004-344T04:36:00		000T00:59:00	2004-344T05:35:00	ISS_NAC to Satellites	POS_Z to NSP	Starts at Earth point, ends at waypoint
NAV_00BSA_WAYPTTURN441_PRIME	M	2004-344T05:35:00		000T00:01:00	2004-344T05:36:00	ISS_NAC to Saturn	POS_Z to NSP	
ISS_00BRI_SPKFORM001_PRIME	M	2004-344T05:36:00		000T03:00:00	2004-344T08:36:00	ISS_NAC to L_ANSA_B	POS_Z to NSP	
VIMS_00BSA_FARGLO004_PRIME	M	2004-344T08:36:00		000T11:30:00	2004-344T20:06:00	ISS_NAC to Saturn	POS_Z to NSP	
NAV_00BSK_OPNAV442_PRIME	M	2004-344T20:06:00		000T00:59:00	2004-344T21:05:00	ISS_NAC to Satellites	POS_Z to NSP	Starts at waypoint, ends at Earth point
NAV_00BEA_DLTURN442_PRIME	M	2004-344T21:05:00		000T00:01:00	2004-344T21:06:00	XBAND to Earth	POS_X to NSP	
SP_00BEA_M70METOTP345_PRIME	M, N	2004-344T21:06:00		000T09:00:00	2004-345T06:06:00	XBAND to Earth	POS_X to NSP	

Final Sequenced SMT and Data Volume (1 of 2)

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

			OBSERVATION_PERIOD							DOWNLINK_PASS							
			P4						P5	RECORDED		PLAYBACK					
DOWNLINK PASS NAME	Start doy hh:mm	End doy hh:mm	START (Mb)	SCI (Mb)	HK+E (Mb)	TOTAL (Mb)	CPACTY (Mb)	MRGN (Mb)	OPNAV (Mb)	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGN (Mb)	NET_MARGN (%)	CAROVR (Mb)
SP_00BEA_M70METNON338_PRIME	338 19:51	339 07:51	1901	401	14	2316	3407	1091	35	897	71	3319	5643	2325	3813	34%	0
SP_00BEA_M70METNON339_PRIME	339 22:41	340 03:31	0	1117	50	1167	3407	2239	35	303	29	1534	2437	903	1488	23%	0
SP_00BEA_G34HEFNON340_PRIME	340 03:31	340 05:55	0	0	0	0	3407	3407	0	146	14	160	246	87	586	14%	0
SP_00BEA_G34HEFNON440_PRIME	340 08:05	340 14:56	0	121	36	157	3407	3250	0	222	40	419	906	488	782	11%	0
SP_00BEA_G34HEFNON540_PRIME	340 14:56	340 15:41	0	0	0	0	3407	3407	0	42	4	46	59	13	453	5%	0
SP_00BEA_G34HEFNON341_PRIME	341 04:51	341 13:51	0	1055	45	1100	3407	2307	35	724	53	1912	1220	-692	556	4%	692
SP_00BEA_M34HEFNON342_PRIME	342 01:01	342 04:55	692	1410	38	2140	3407	1266	35	275	23	2473	533	-1940	556	4%	1940
SP_00BEA_M34HEFNON542_PRIME	342 04:55	342 05:56	1940	0	0	1940	3407	1466	0	72	6	2018	123	-1894	556	4%	1895
SP_00BEA_G34HEFNON342_PRIME	342 05:56	342 13:15	1895	0	0	1895	3407	1512	0	516	43	2453	1019	-1434	667	4%	1435
SP_00BEA_G34HEFNON442_PRIME	342 13:15	342 14:41	1435	0	0	1435	3407	1972	0	101	8	1544	167	-1377	667	4%	1377
SP_00BEA_M70METNON342_PRIME	342 22:36	343 04:36	1377	795	27	2199	3407	1207	35	483	35	2753	3036	283	667	4%	0
SP_00BEA_M70METNON343_PRIME	343 22:36	344 04:36	0	1918	61	1979	3407	1427	35	828	35	2878	3036	158	384	3%	0
SP_00BEA_M70METOTP345_PRIME	344 21:06	345 06:06	0	3044	56	3100	3407	307	35	548	53	3737	3853	116	227	2%	0

DATA VOLUME REPORT --- TRANSFER FRAME OVERHEAD NOT INCLUDED

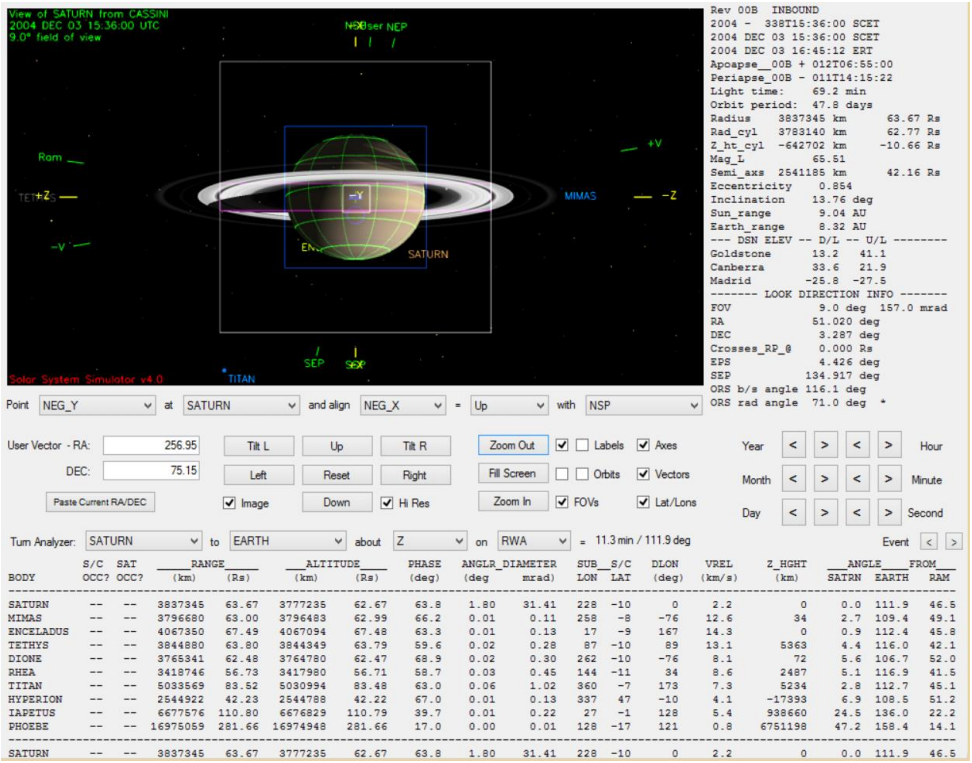
Event	Start doy hh:mm	End doy hh:mm	CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)	ENGR (Mb)	TOTAL (Mb)
OBSERVATION_NOR	338 15:36	338 19:51	64.0	3.1	32.4	0.8	0.0	30.2	22.3	0.0	162.6	0.0	82.0	0.0	0.0	397.4
OBSERVATION_OPN	338 15:36	338 19:51	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
SP_00BEA_M70METNON338_PRIME	338 19:51	339 07:51	180.6	8.6	86.4	2.2	0.0	85.4	63.1	0.0	459.2	3.3	0.0	0.0	0.0	888.7
DAILY TOTAL SCIENCE	338 15:36	339 07:51	244.5	11.7	118.8	2.9	0.0	115.6	85.4	0.0	621.8	3.3	82.0	0.0		
OBSERVATION_NOR	339 07:51	339 22:41	223.2	10.7	184.8	2.7	0.0	105.5	78.0	0.0	502.0	0.0	0.0	0.0	0.0	1106.8
OBSERVATION_OPN	339 07:51	339 22:41	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
SP_00BEA_M70METNON339_PRIME	339 22:41	340 03:31	72.7	3.5	0.0	0.9	0.0	34.4	25.4	0.0	163.6	0.0	0.0	0.0	0.0	300.4
SP_00BEA_G34HEFNON340_PRIME	340 03:31	340 05:55	35.9	1.6	0.0	0.4	0.0	17.0	11.9	0.0	77.8	0.0	0.0	0.0	0.0	144.5
DAILY TOTAL SCIENCE	339 07:51	340 05:55	331.8	15.7	184.8	3.9	0.0	156.9	115.3	0.0	743.3	0.0	0.0	0.0		
OBSERVATION_NOR	340 05:55	340 08:05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	120.0	0.0	120.0
SP_00BEA_G34HEFNON440_PRIME	340 08:05	340 14:56	102.8	4.9	0.0	1.2	0.0	48.6	43.5	0.0	18.5	0.0	0.0	0.0	0.0	219.6
SP_00BEA_G34HEFNON540_PRIME	340 14:56	340 15:41	11.3	0.5	0.0	0.1	0.0	5.3	4.9	0.0	19.4	0.0	0.0	0.0	0.0	41.5
DAILY TOTAL SCIENCE	340 05:55	340 15:41	114.1	5.4	0.0	1.4	0.0	53.9	48.4	0.0	37.9	0.0	0.0	120.0		

Final Sequenced SMT and Data Volume (2 of 2)

DATA VOLUME REPORT --- TRANSFER FRAME OVERHEAD NOT INCLUDED

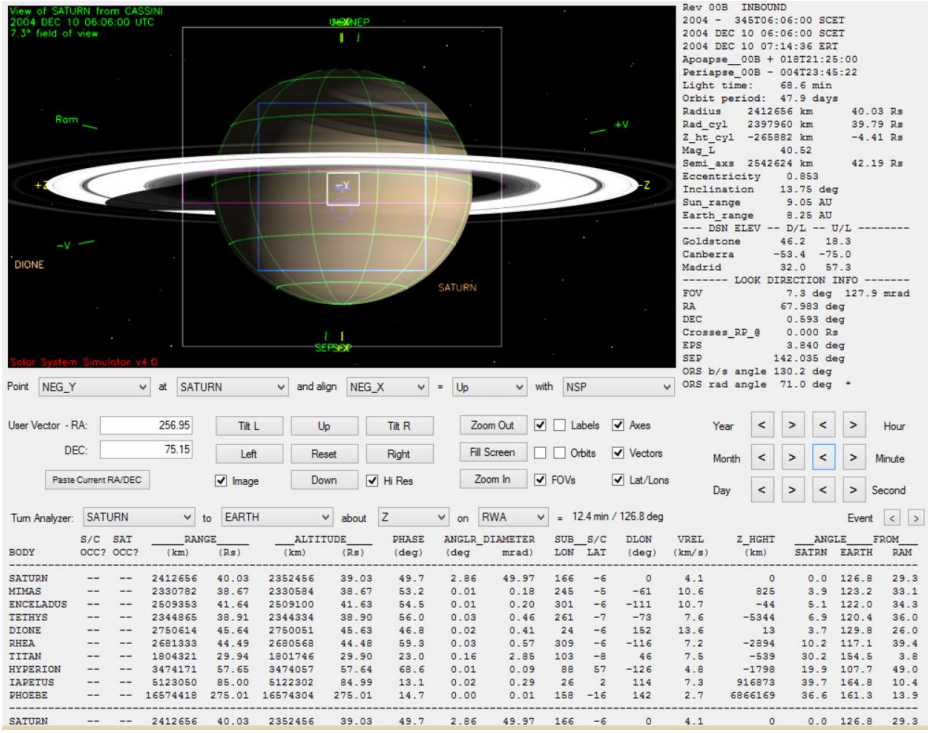
Event	Start doy hh:mm	End doy hh:mm	CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)	ENGR (Mb)	TOTAL (Mb)
OBSERVATION_NOR	340 15:41	341 04:51	198.1	9.5	0.0	2.4	126.0	93.7	85.3	0.0	530.4	0.0	0.0	0.0	0.0	1045.4
OBSERVATION_OPN	340 15:41	341 04:51	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
SP_00BEA_G34HEFNON341_PRIME	341 04:51	341 13:51	135.4	6.5	86.4	1.6	0.0	64.0	58.3	0.0	362.6	2.5	0.0	0.0	0.0	717.3
DAILY TOTAL SCIENCE	340 15:41	341 13:51	333.6	16.0	86.4	4.0	126.0	157.7	143.6	0.0	893.0	2.5	0.0	0.0		
OBSERVATION_NOR	341 13:51	342 01:01	659.6	8.0	0.0	2.0	126.0	79.4	72.4	0.0	449.8	0.0	0.0	0.0	0.0	1397.2
OBSERVATION_OPN	341 13:51	342 01:01	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
SP_00BEA_M34HEFNON342_PRIME	342 01:01	342 04:55	58.7	2.8	0.0	0.7	0.0	27.7	25.3	0.0	157.1	0.0	0.0	0.0	0.0	272.3
SP_00BEA_M34HEFNON542_PRIME	342 04:55	342 05:56	15.3	0.7	0.0	0.2	0.0	7.2	6.6	0.0	41.0	0.0	0.0	0.0	0.0	71.0
SP_00BEA_G34HEFNON342_PRIME	342 05:56	342 13:15	110.1	5.3	0.0	1.3	0.0	52.0	47.4	0.0	294.7	0.0	0.0	0.0	0.0	510.9
SP_00BEA_G34HEFNON442_PRIME	342 13:15	342 14:41	21.6	1.0	0.0	0.3	0.0	10.2	9.3	0.0	57.7	0.0	0.0	0.0	0.0	100.1
DAILY TOTAL SCIENCE	341 13:51	342 14:41	865.2	17.9	0.0	4.5	126.0	176.7	160.9	0.0	1000.4	0.0	0.0	0.0		
OBSERVATION_NOR	342 14:41	342 22:36	119.1	5.7	85.2	1.4	0.0	56.3	51.3	0.0	318.9	0.0	150.0	0.0	0.0	788.0
OBSERVATION_OPN	342 14:41	342 22:36	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
SP_00BEA_M70METNON342_PRIME	342 22:36	343 04:36	90.3	4.3	57.6	1.1	0.0	42.7	38.9	0.0	241.7	1.6	0.0	0.0	0.0	478.2
DAILY TOTAL SCIENCE	342 14:41	343 04:36	209.4	10.0	142.8	2.5	0.0	99.0	90.2	0.0	560.6	1.6	150.0	0.0		
OBSERVATION_NOR	343 04:36	343 22:36	270.9	13.0	230.4	3.2	0.0	128.0	116.6	0.0	888.4	0.0	250.0	0.0	0.0	1900.6
OBSERVATION_OPN	343 04:36	343 22:36	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
SP_00BEA_M70METNON343_PRIME	343 22:36	344 04:36	360.3	4.3	75.6	1.1	0.0	42.7	38.9	0.0	296.1	1.6	0.0	0.0	0.0	820.6
DAILY TOTAL SCIENCE	343 04:36	344 04:36	631.2	17.3	306.0	4.3	0.0	170.7	155.5	0.0	1184.6	1.6	250.0	0.0		
OBSERVATION_NOR	344 04:36	344 21:06	715.6	11.9	0.0	3.0	900.0	117.4	106.9	0.0	844.5	0.0	317.0	0.0	0.0	3016.3
OBSERVATION_OPN	344 04:36	344 21:06	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
SP_00BEA_M70METOTP345_PRIME	344 21:06	345 06:06	135.4	6.5	0.0	1.6	0.0	64.0	58.3	0.0	275.0	2.5	0.0	0.0	0.0	543.4
DAILY TOTAL SCIENCE	344 04:36	345 06:06	851.0	18.4	0.0	4.6	900.0	181.4	165.2	0.0	1119.6	2.5	317.0	0.0		

Segment Geometry (1 of 2)



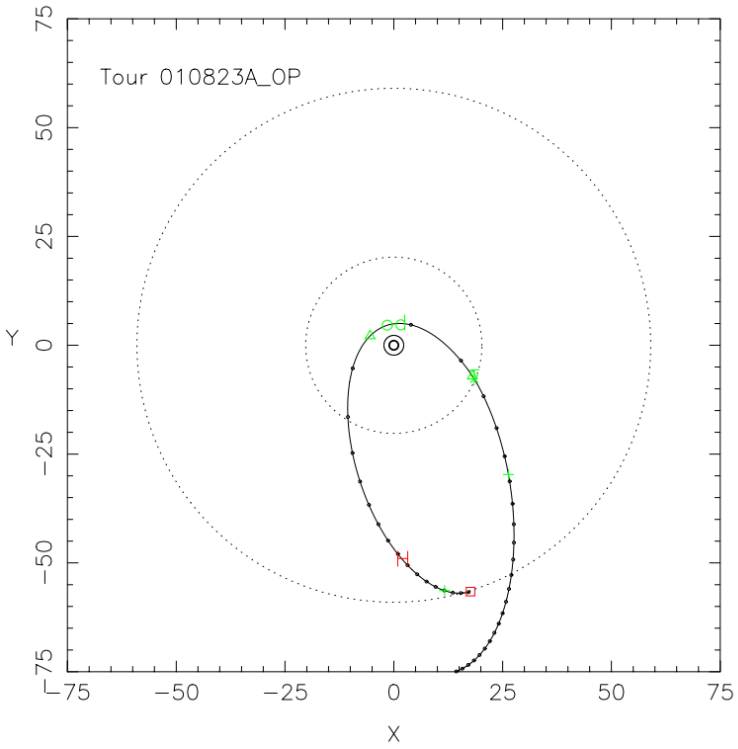
Seg Start (Left)

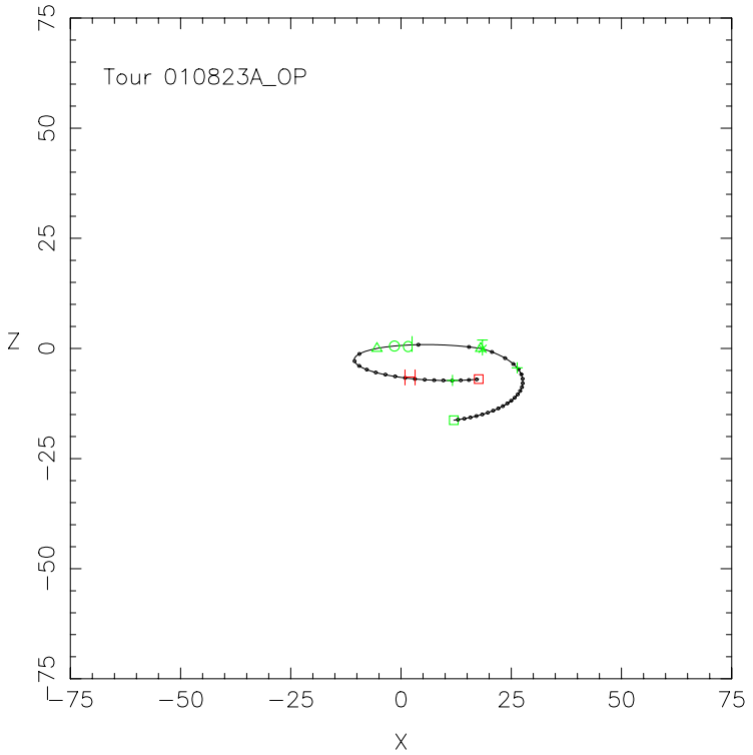
Seg End (below)



	Saturn Range	Phase Angle	Sub-S/C Lat.
Segment Start	63.67	63.8	-10
Segment End	40.03	49.7	-6

Segment Geometry (2 of 2)





DOY	Range(km)	Alt(km)	SSCLat	SSCLon.	SSLat	SSLon	Vrad	Vtan	Phase	AD(rad)
338	3932349.096	3872246.335	-9.857	61.414	-23.246	354.923	1.636	1.3	64.617	0.03065
339	3783324.626	3723212.319	-9.565	150.509	-23.238	85.678	1.816	1.351	63.198	0.03186
340	3618135.721	3558013.064	-9.239	239.46	-23.229	176.432	2.01	1.413	61.659	0.03332
341	3435442.687	3375308.706	-8.868	328.227	-23.22	267.187	2.222	1.489	59.971	0.03509
342	3233556.033	3173409.546	-8.441	56.759	-23.211	357.941	2.455	1.582	58.092	0.03728
343	3010326.069	2950165.622	-7.937	144.976	-23.203	88.696	2.717	1.7	55.962	0.04004
344	2762925.618	2702749.402	-7.328	232.763	-23.194	179.451	3.017	1.853	53.494	0.04363
345	2487556.428	2427362.192	-6.565	319.93	-23.185	270.205	3.368	2.058	50.553	0.04846
349	947004.237	886739.22	1.313	286.058	-23.15	273.224	6.145	4.782	27.468	0.12737
350	366366.767	306215.972	8.176	312.555	-23.141	3.979	5.899	12.361	59.225	0.33051
351	664233.19	604043.609	-6.728	244.776	-23.132	94.733	6.944	6.818	138.178	0.18172
352	1196587.908	1136440.982	-8.401	307.84	-23.123	185.488	5.437	3.785	115.434	0.10078

Solar Geometry – ORS Boresight Concerns

No ORS Boresight Solar Constraints on Science Pointing.

Weekly Science Highlights

Science observations this week focused on the Composite Infrared Spectrometer (CIRS) integration of the main rings with the mid-infrared focal planes. This was to give the first detailed temperature measurements across the rings. Additionally, CIRS examined the oxygen compounds H_2O and CO_2 in Saturn's stratosphere as a function of latitude.

The Imaging Science Subsystem (ISS) continued to image small satellites for orbit determination, the Ultraviolet Imaging Spectrograph continued to capture mosaics of Saturn's magnetosphere, and ISS captured a 3x3 movie of the Saturnian southern hemisphere in several filters with the Narrow-Angle Camera to measure wind speeds and map the occurrence of "moist" convection.

Segment Integration Planning

Atmosphere Segment Information

Rev Ba →

- !st Segment
  - 2004-338T15:00 (Dec 3) to 2004-345T07:51 (Dec 10)
  - TOST segment follows

Rev Bb →

- 2nd Segment
  - Starts after TOST segment @ 2004-349T07:52 (Dec 14)
    - This is 6 hrs 24 min earlier than the original segment boundary 2004-349T14:16
  - Saturn TWT/MAG TWT currently boundary at 2004-352T00:00:00 (Dec 17)
  - Probe Quiet Period (PQP) currently set at 2004-351T00:00:00
    - Earth pointed
    - Can carry over to passes within PQP, but no guarantees for getting data back

Proposed Timeline

- 1st Segment
  - 338T14:06 - 338 15:06 OPNAV
  - 338T15:06 - 338T19:16 CIRS Composition
  - 338T19:16 - 338 20:16 OPNAV
  - 338T20:16 - 339T08:16 Downlink (Madrid)/ParamUpdate/Desat
  - 339T08:16 - 339T09:16 OPNAV
  - 339T09:16 - 340T03:51 ISS Atmosphere Movie
  - 340T03:51 - 340T04:51 OPNAV
  - 340T04:51 - 340T13:51 Downlink (Goldstone)
  - 340T14:51 -340T15:51 OPNAV
  - 340T15:51 - 341T03:51 CIRS Composition
  - 341T03:51 - 341T04:51 OPNAV
  - 341T04:51 - 341T13:51 Downlink (Goldstone)
  - 341T13:51 - 341T14:51 OPNAV
  - 341T14:51 - 341T??:?? CIRS Composition
  - 341T??:?? - 342T03:51 UVIS System Scan
  - 342T03:51 - 342T04:51 OPNAV
  - 342T04:51 - 342T13:51 Downlink (Goldstone)
  - 342T06:00 - 342T08:00 Probe Battery Status (Mute/Sleep)

Proposed Timeline

- 1st Segment (cont.)
  - 342T13:51 - 342T14:51 OPNAV
  - 34214:51 - 342T20:06 ???
  - 342T20:06 - 342T21:06 OPNAV
  - 342T21:06 - 343T06:06 Downlink (Madrid)
  - 343T06:06 - 343T07:06 OPNAV
  - 343T07:06 - 343T11:06 ISS Ring Spoke Formation
  - 343T11:06 - 343T20:06 VIMS Far Global Map
  - 343T20:06 - 343T21:06 OPNAV
  - 343T21:06 - 344T06:06 Downlink (Madrid)
  - 344T06:06 - 344T07:06 OPNAV
  - 344T07:06 - 334T20:06 ???
  - 344T20:06 - 344T21:06 OPNAV
  - 344T21:06 - 344T06:06 Downlink (Madrid)

Initial SMT and Data Volume (1 of 2)

Beginning of Integration:

DATA VOLUME SUMMARY

			OBSERVATION_PERIOD								DOWNLINK_PASS						
			P4							P5	RECORDED		PLAYBACK				
	Start	End	START	SCI	HK+E	TOTAL	CPACTY	MARGIN		OPNAV	SCI	ENGR	TOTAL	CPACTY	MARGIN		CAROVR
DOWNLINK PASS NAME	doy hh:mm	doy hh:mm	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(%)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(%)	(Mb)
SP_00BEA_M34HEFNON338_PRIME	338 19:51	339 07:51	0	378	15	392	3492	3100	89%	17	830	71	1310	1368	58	4%	0
SP_00BEA_G34HEFNON340_PRIME	340 05:06	340 15:41	0	0	0	0	3492	3492	100%	0	747	62	809	1405	596	42%	0
SP_00BEA_M34HEFNON342_PRIME	342 01:01	342 06:06	0	2409	39	2448	3491	1043	30%	35	387	30	2900	660	-2240	-339%	2240
SP_00BEA_M34HEFNON442_PRIME	342 21:21	343 06:21	2240	1859	23	4122	3487	-635	-18%	35	598	53	4173	1164	-3009	-259%	3009
SP_00BEA_M34HEFNON343_PRIME	343 21:21	344 06:21	3009	1380	52	4441	3498	-943	-27%	30	821	53	4402	1169	-3234	-277%	3234

Initial SMT and Data Volume (2 of 2)

Beginning of Integration:

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	338 15:36	338 19:51	64.0	3.1	32.4	0.8	0.0	30.2	27.5	0.0	137.7	0.0	82.0	0.0	0.0	377.7
OBSERVATION_OPN	338 15:36	338 19:51	0.0	0.0	0.0	0.0	17.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.4
SP_00BEA_M34HEFNON338_PRIME	338 19:51	339 07:51	180.6	8.6	86.4	2.2	0.0	85.4	77.8	0.0	388.8	0.0	0.0	0.0	0.0	829.7
OBSERVATION_NOR	339 07:51	340 05:06	319.8	15.3	184.8	3.8	0.0	151.2	137.7	0.0	688.5	0.0	0.0	0.0	0.0	1501.1
OBSERVATION_OPN	339 07:51	340 05:06	0.0	0.0	0.0	0.0	52.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.2
SP_00BEA_G34HEFNON340_PRIME	340 05:06	340 15:41	146.5	7.6	86.4	1.9	0.0	69.2	68.6	0.0	315.4	0.0	0.0	51.0	0.0	746.6
DAILY TOTAL SCIENCE	338 15:36	340 15:41	710.8	34.6	390.0	8.7	0.0	336.0	311.6	0.0	1530.4	0.0	82.0	51.0		
OBSERVATION_NOR	340 15:41	342 01:01	484.3	24.0	86.4	6.0	252.0	228.9	216.0	0.0	1042.7	0.0	0.0	69.0	0.0	2409.4
OBSERVATION_OPN	340 15:41	342 01:01	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
SP_00BEA_M34HEFNON342_PRIME	342 01:01	342 06:06	76.5	2.8	7.2	0.9	0.0	36.2	32.9	0.0	164.7	0.0	0.0	66.0	0.0	387.2
DAILY TOTAL SCIENCE	341 13:51	342 06:06	560.8	26.8	93.6	6.9	252.0	265.1	248.9	0.0	1207.4	0.0	0.0	135.0		
OBSERVATION_NOR	342 06:06	342 21:21	229.5	5.4	160.8	2.7	191.5	108.5	98.8	0.0	494.1	0.0	143.7	423.9	0.0	1858.9
OBSERVATION_OPN	342 06:06	342 21:21	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
SP_00BEA_M34HEFNON442_PRIME	342 21:21	343 06:21	135.4	6.5	14.4	1.6	8.5	64.0	58.3	0.0	291.6	0.0	18.1	0.0	0.0	598.4
DAILY TOTAL SCIENCE	342 14:41	343 06:21	364.9	11.9	175.2	4.4	200.0	172.5	157.1	0.0	785.7	0.0	161.7	423.9		
OBSERVATION_NOR	343 06:21	343 21:21	225.7	10.8	216.0	2.7	0.0	106.7	97.2	0.0	486.0	0.0	234.4	0.0	0.0	1379.5
OBSERVATION_OPN	343 06:21	343 21:21	0.0	0.0	0.0	0.0	30.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.5
SP_00BEA_M34HEFNON343_PRIME	343 21:21	344 06:21	135.4	6.5	79.2	1.6	180.0	64.0	58.3	0.0	291.6	0.0	3.9	0.0	0.0	820.6
DAILY TOTAL SCIENCE	343 06:21	344 06:21	361.2	17.3	295.2	4.3	180.0	170.7	155.5	0.0	777.6	0.0	238.3	0.0		

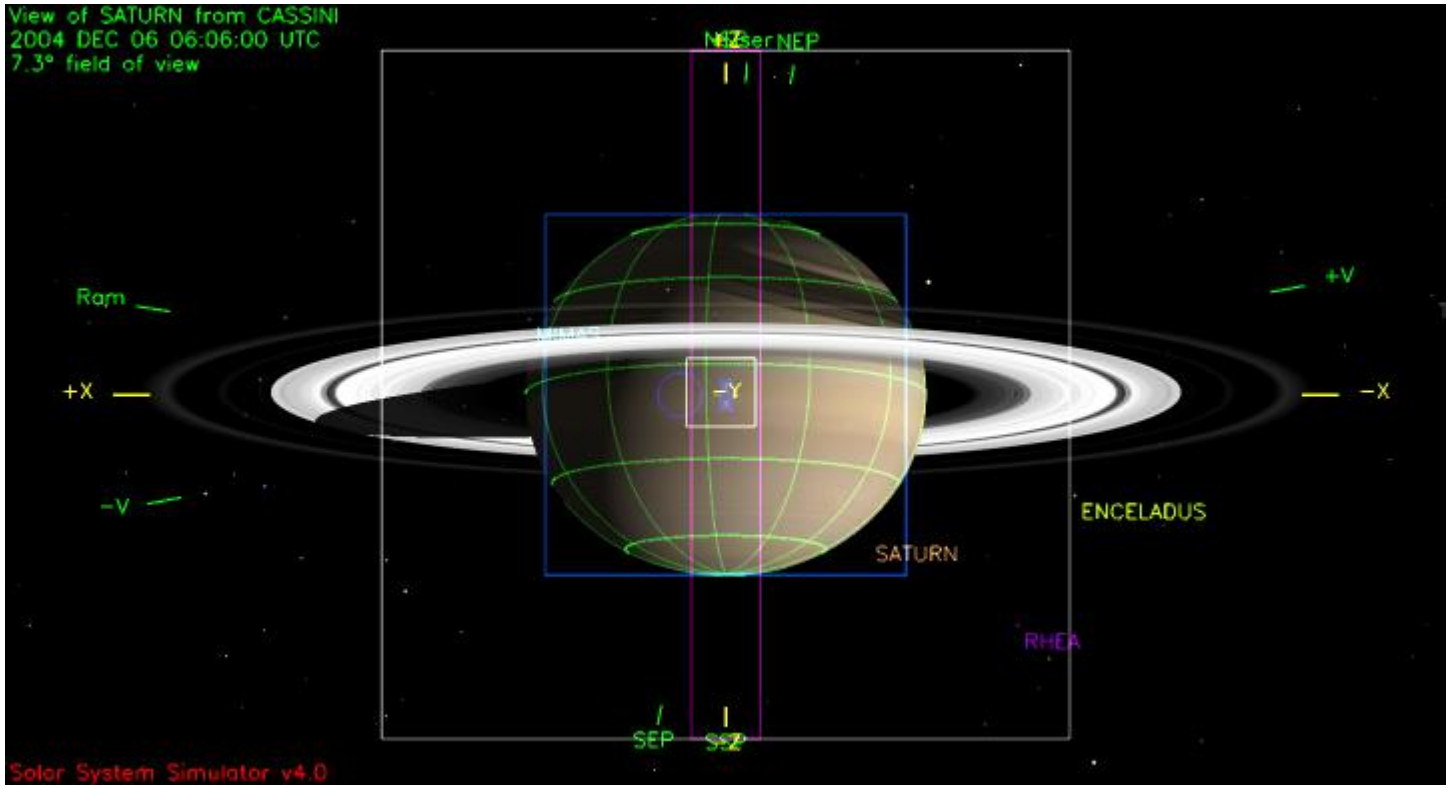
	CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)
TOTAL RECORDED (OPNAV data not included)	1997.6	90.6	954.0	24.3	632.0	944.3	873.2	0.0	4301.1	0.0	482.0	609.8

Rev Ba Waypoint Suggestions

- ISS_NAC to Saturn, POS_X to NSP
  - Safe for the entire period
- ISS_NAC to Saturn, NEG_X to Sun
  - Safe for the entire period
- ISS_NAC to Saturn, POS_Z to NSP
  - Safe for the entire period

Waypoints Chosen

Waypoint 1 (Whole Segment): ISS_NAC to Saturn; POS_Z to NSP



Notes & Liens (1 of 3)

- **Pointing Issues**
  - No rolling allowed during passes with Probe activities or AACS Parameter Update
- **Data Volume Issues**
  - DSN stations 14 and 45 are under maintenance for half of this segment
  - SMT 9.1.1 should model bits to SSR correctly when the PROBE_CHK telemetry mode is active (e.g. it will ignore activities that can save data to the SSR during this period). Nevertheless, all instruments must have a gap during these periods
- **Telemetry Mode Issues**
  - During the observation block starting 2004-342T04:55:00, the telemetry mode S&ER-5 should be replaced by PROBE_CHK should the PCO be needed. Another alternative to S&ER-5, the leads can choose to downlink instead.
- **CIMS Issues**
  - The Probe activity PROBE_00BEA_BATSTAT001_PRIME is currently a Milestone in CIMS. This should be an activity of type PROBE_16662. This will add ~120Mb to the SSR for that period.
  - For the probe period, several teams still need to place sleep/mute and active/unmute into CIMS.
- **Power/OPMODE Issues**
  - None
- **Flight Rule/Mission Planning Guideline and Constraint Issues**
  - Currently, SCO requires CIRS and VIMS to be OFF during probe activities. Waivers 85233 and 85234 seek to remedy this.

Notes & Liens (2 of 3)

- **SCO FSW Update Contingency and AACS Parameter Update**
  - Should SCO require a FSW Update, the OPNAVs and CIRS request during the observation period starting 2004-338T15:36:00 may be pulled.
  - The AACS Parameter has already been planned for the first downlink
- **Probe Activities**
  - 2 Probe periods exist within this segment.
    - Battery Status Test & Battery Isolation
    - Probe Check Out Contingency
  - For each, **both** a Starting and Ending epoch corresponding the turning on and off of the PSAs have been provided in CIMS
    - E00B_PROBEBAT_PSAON 2004-340T06:00:00
    - E00B_PROBEBAT_PSAOFF 2004-340T14:51:00
    - EOOB_PROBECON_PSAON 2004-342T05:00:00
    - EOOB_PROBECON_PSAOFF 2004-342T13:10:00
  - SCO (and SP) has provided a standardized epoch-relative timeline for their instruments to Sleep/Mute and Un-mute/Active. It is expected that each team follow this timeline during implementation. This timeline is presented in the next two pages.
  - Waivers 85233 and 85234 seek to keep VIMS and CIRS, respectively, in a Sleep/Mute state rather than Off/Mute.

Notes & Liens (3 of 3)

- - 0:19:00 CAPS to SLEEP
- -0:18:00 CDA to SLEEP
- -0:17:00 CIRS to SLEEP
- -0:16:00 INMS to SLEEP
- -0:15:00 ISS to SLEEP
- -0:14:00 MAG - MAG stays ON/ACTIVE
- -0:13:00 MIMI to SLEEP
- -0:12:00 RADAR - *placeholder* for RADAR OFF
- -0:11:00 RPWS to SLEEP
- -0:10:00 RSS - KaT OFF *placeholder*
- -0:09:00 UVIS to SLEEP
- -0:08:00 VIMS to SLEEP
- -0:07:00 Thermal RSP heater ON
- -0:06:00 CAPS MUTE
- -0:06:00 CDA MUTE
- -0:06:00 CIRS MUTE
- -0:06:00 INMS MUTE
- -0:06:00 ISS MUTE
- -0:06:00 MAG MUTE
- -0:06:00 MIMI MUTE
- -0:06:00 RPWS MUTE
- -0:06:00 UVIS MUTE
- -0:06:00 VIMS MUTE
- -0:05:00 SP Switch to **PCHK** TLM mode
- **START Probe Activity**
- **0:00:00 Probe PSAs: ON**
- 0:00:00 **End Probe Activity (PSAs Off)**
- +0:05:00 SP Change to **RTE_N_SPB** telemetry mode
- +0:06:00 CAPS UN-MUTE
- +0:06:00 CDA UN-MUTE
- +0:06:00 CIRS UN-MUTE
- +0:06:00 INMS UN-MUTE
- +0:06:00 ISS UN-MUTE
- +0:06:00 MAG UN-MUTE
- +0:06:00 MIMI UN-MUTE
- +0:06:00 RPWS UN-MUTE
- +0:06:00 UVIS UN-MUTE
- +0:06:00 VIMS UN-MUTE
- +0:07:00 CAPS to ON / ACTIVE
- +0:08:00 CDA to ON / ACTIVE
- +0:09:00 CIRS to ON / ACTIVE
- +0:10:00 IMNS to ON / ACTIVE
- +0:11:00 ISS to ON / ACTIVE
- +0:12:00 MAG - usually already ON
- +0:13:00 MIMI to ON / ACTIVE
- +0:14:00 RADAR - *placeholder* for RADAR
- +0:15:00 RPWS to ON / ACTIVE
- +0:16:00 RSS - KaT ON *placeholder*
- +0:17:00 UVIS to ON / ACTIVE
- +0:18:00 VIMS to ON / ACTIVE
- +0:19:00 Thermal RSP heater OFF