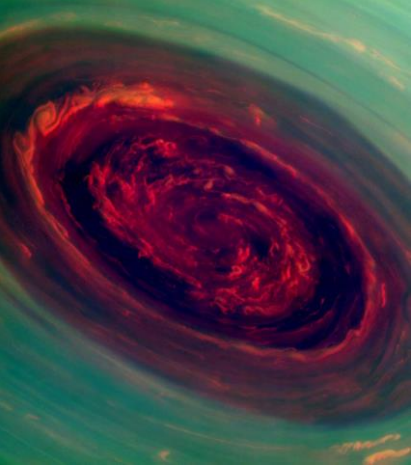

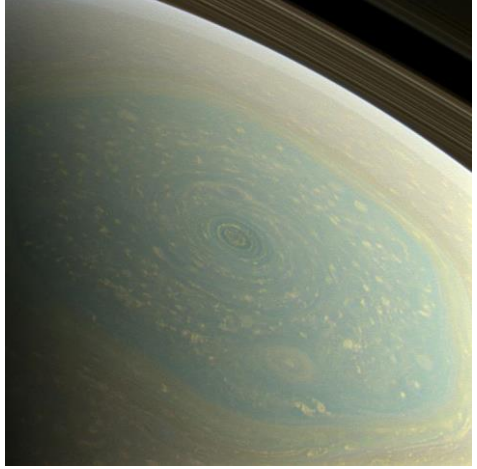
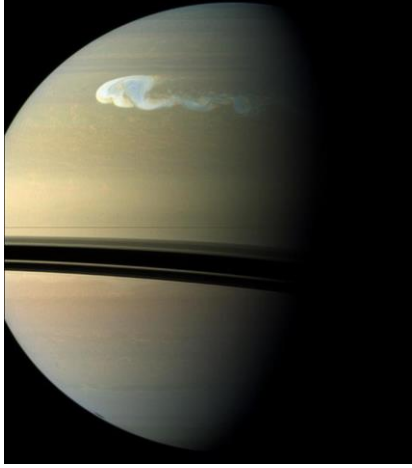

Science Planning & Sequence Team
CASSINI

SATURN TARGET WORKING TEAM

Rev 042 Segment Legacy Package

Segment Boundary: Apr 05, 2007 – Apr 07, 2007
2007-095T07:33:00 – 2007-097T23:48:00 (SCET)

Integration Began 04/21/2003
Segment Delivered to S29 Sequence 04/24/2003
Lead Integrator was Jerod Gross
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 is a Prime Mission, ~2.5 day long inbound segment, with the S/C in an inclined orbit. Periapse is approximately 16 hours after segment end.
- Throughout this segment, Saturn phase angles were relatively high, ranging between 117 and 165 degrees. The view was limited to Saturn's northern hemisphere. (See page 7).
- The segment began with OPVNAV satellite observations. VIMS and UVIS then led observations focused upon methane fluorescence and aurora. CIRS ended the segment leading a ring study.
- There were no ORS boresight constraints/issues in this segment.
- OTM 103 was scheduled for the last DL of segment.

Final Sequenced SPASS

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
SATURN rev 42 Segment		2007-095T07:33:00		002T16:15:00	2007-097T23:48:00			
NAV_042SK_OPNAV951_PRIME	M	2007-095T07:33:00		000T00:59:00	2007-095T08:32:00	ISS_NAC to Satellites	NEG_X to Sun	Starts at Earth point, ends at NEW waypoint
NAV_042SA_WAYPTTURN951_PRIME	M	2007-095T08:32:00		000T00:01:00	2007-095T08:33:00	ISS_NAC to Saturn	NEG_X to Sun	
NEW WAYPOINT		**2007-095T08:33:00**		**001T23:15:00**	**2007-097T07:48:00**	**ISS_NAC to Saturn**	**NEG_X to Sun**	
VIMS_042SA_CH4FLUOR001_PRIME	C, I, M, U	2007-095T08:33:00		000T06:00:00	2007-095T14:33:00	ISS_NAC to Saturn	NEG_X to Sun	Secondary axis Neg-X to Sun for MIMI
SP_042EA_DLTURN095_PRIME	M	2007-095T14:33:00		000T00:30:00	2007-095T15:03:00	XBAND to Earth	NEG_Y to Saturn	SP Turn to Earth
SP_042EA_M34BWGNON095_PRIME	C, M	2007-095T15:03:00		000T09:00:00	2007-096T00:03:00	XBAND to Earth	NEG_Y to Saturn	2nd axis = NEG_Y to Saturn for MIMI
SP_042SA_WAYPTTURN096_PRIME	M	2007-096T00:03:00		000T00:30:00	2007-096T00:33:00	ISS_NAC to Saturn	NEG_X to Sun	SP Turn to Waypoint
UVIS_042SA_NAURMOV001_PRIME	C, I, M, V	2007-096T00:33:00		000T21:15:00	2007-096T21:48:00	ISS_NAC to Saturn	NEG_X to Sun	2nd axis = NEG_X to Sun for MIMI
SP_042EA_DLTURN096_PRIME		2007-096T21:48:00		000T00:30:00	2007-096T22:18:00	XBAND to Earth	NEG_Y to Saturn	SP Turn to Earth
SP_042EA_G70METNON096_PRIME	C	2007-096T22:18:00		000T09:00:00	2007-097T07:18:00	XBAND to Earth	NEG_Y to Saturn	2nd axis = NEG_Y to Saturn for MIMI
SP_042SA_WAYPTTURN097_PRIME		2007-097T07:18:00		000T00:30:00	2007-097T07:48:00	ISS_NAC to Saturn	NEG_Z to 202.14/-23.73	SP Turn to Waypoint. RBOT Segment 3 compromise
NEW WAYPOINT		**2007-097T07:48:00**		**000T16:32:00**	**2007-098T00:20:00**	**ISS_NAC to Saturn**	**NEG_Z to 202.14/-23.73**	
CIRS_042RI_SUBMU40HP001_PRIME	C, I, M, U, V	2007-097T07:48:00		000T06:19:00	2007-097T14:07:00	CIRS_FP1 to Rings	NEG_Z to NSP	
SP_042EA_DLTURN097_PRIME	I, M	2007-097T14:07:00		000T00:23:00	2007-097T14:30:00	ISS_NAC to Saturn	NEG_Z to NSP	CDA provided the RA/Dec (the original RA/Dec was 192.2/-64.5, which is unsafe for CIRS)
SP_042EA_DLTURN397_PRIME	M	2007-097T14:30:00		000T00:18:00	2007-097T14:48:00	XBAND to Earth	NEG_X to 107.3/-70.2	CDA provided the RA/Dec (the original RA/Dec was 192.2/-64.5, which is unsafe for CIRS)
SP_042EA_M34BWGOTP097_PRIME	C, M, N	2007-097T14:48:00		000T09:00:00	2007-097T23:48:00	XBAND to Earth	NEG_X to 107.3/-70.2	2nd axis chosen for CDA

Final Sequenced SMT and Data Volume

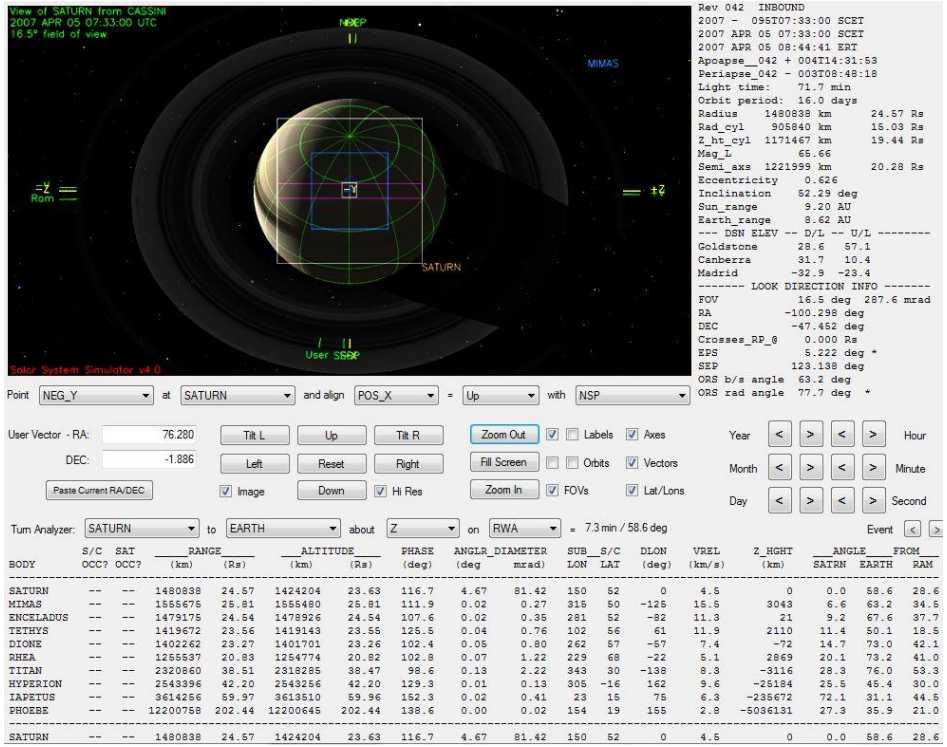
DATA VOLUME SUMMARY --- TRANSFER FRAME OVERHEAD INCLUDED (80 BITS PER 8800-BIT FRAME)

			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_042EA_M34BWGNON095_PRIME	095 15:03	096 00:03	85	781	25	892	3498	2606	18	234	53	1196	918	-279	920	5%	279
SP_042EA_G70METNON096_PRIME	096 22:18	097 07:18	279	2020	76	2375	3498	1123	0	993	53	3421	4435	1014	920	4%	0
SP_042EA_M34BWGOTP097_PRIME	097 14:48	097 23:48	0	651	26	677	3498	2821	0	264	53	994	766	-228	-94	0%	227

DATA VOLUME REPORT --- TRANSFER FRAME OVERHEAD NOT INCLUDED

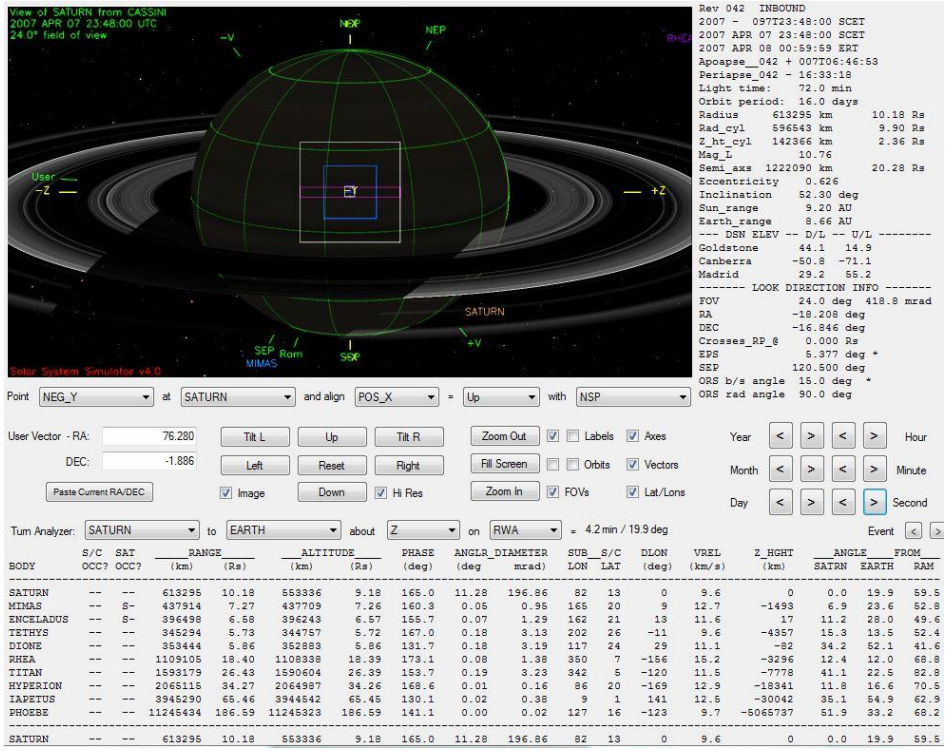
Event	Start doy hh:mm	End doy hh:mm	CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)	ENGR (Mb)	TOTAL (Mb)
OBSERVATION_NOR	095 07:33	095 15:03	27.0	6.7	86.4	1.4	280.0	16.2	32.4	0.0	35.4	108.7	180.0	0.0	0.0	774.2
OBSERVATION_OPN	095 07:33	095 15:03	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_042EA_M34BWGNON095_PRIME	095 15:03	096 00:03	32.4	8.1	86.4	1.6	0.0	19.4	38.9	0.0	42.4	2.5	0.0	0.0	0.0	231.7
DAILY TOTAL SCIENCE	095 07:33	096 00:03	59.4	14.8	172.8	3.0	280.0	35.6	71.3	0.0	77.8	111.2	180.0	0.0		
OBSERVATION_NOR	096 00:03	096 22:18	191.5	39.0	306.0	66.6	200.0	48.1	101.1	0.0	104.9	384.9	560.0	0.0	0.0	2002.0
SP_042EA_G70METNON096_PRIME	096 22:18	097 07:18	113.0	17.0	86.4	1.6	0.0	19.4	58.3	0.0	685.4	2.5	0.0	0.0	0.0	983.6
DAILY TOTAL SCIENCE	096 00:03	097 07:18	304.5	55.9	392.4	68.2	200.0	67.5	159.4	0.0	790.3	387.4	560.0	0.0		
OBSERVATION_NOR	097 07:18	097 14:48	27.0	14.1	91.0	3.3	208.0	16.2	48.6	0.0	35.4	113.9	74.5	0.0	0.0	632.0
OBSERVATION_SI	097 07:18	097 14:48	0.0	0.0	13.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.5
SP_042EA_M34BWGOTP097_PRIME	097 14:48	097 23:48	32.4	17.0	87.6	1.6	0.0	19.4	58.3	0.0	42.4	2.5	0.0	0.0	0.0	261.2
DAILY TOTAL SCIENCE	097 07:18	097 23:48	59.4	31.1	192.1	5.0	208.0	35.6	106.9	0.0	77.8	116.3	74.5	0.0		

Segment Geometry



Seg Start (Left)

Seg End (below)



	Saturn Range	Phase Angle	Sub-S/C Lat.
Segment Start	24.57	116.7	52.0
Segment End	10.18	165.0	13.0

Solar Geometry – ORS Boresight Concerns

No ORS Boresight Solar Constraints on Science Pointing

Daily Science Highlights

No Science Highlights Available

Segment Integration Planning

Timeline Gaps and Suggested Observations

Info on Suggested Observations was Not Available

Initial SMT and Data Volume

Beginning of Integration:

SMT Report

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)	MARGIN (%)	OPNAV (Mb)	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGIN (Mb)	MARGIN (%)	CAROVR (Mb)
SP_042EA_M34HEFNON095_PRIME	095 15:03	096 00:03	0	865	25	890	3534	2643	75%	17	226	53	1186	1060	-127	-12%	127
SP_042EA_G70METNON096_PRIME	096 22:18	097 07:18	127	2295	75	2496	3569	1072	30%	0	218	53	2767	4256	1489	35%	0
SP_042EA_M34HEFOTP097_PRIME	097 14:48	097 23:48	0	203	25	228	3569	3340	94%	0	132	53	413	886	474	53%	0

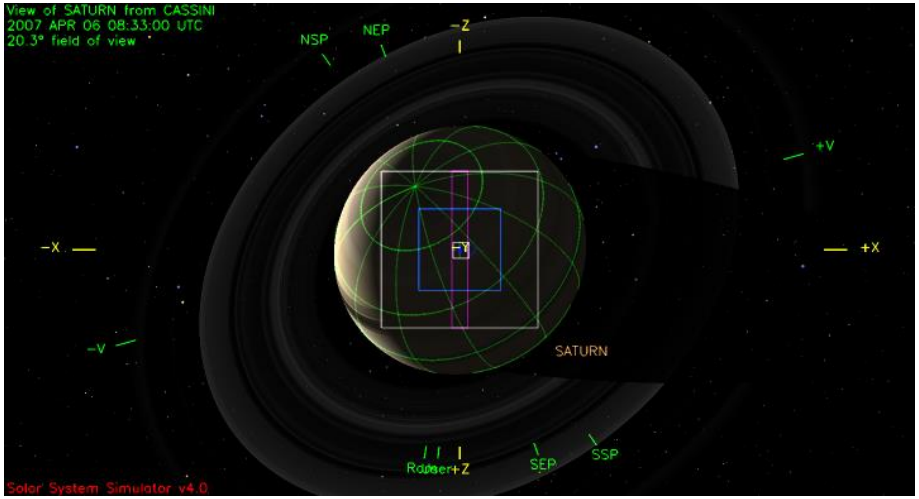
DATA VOLUME REPORT

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	095 07:33	095 15:03	27.0	4.0	0.0	1.4	280.0	16.2	32.4	0.0	35.4	108.7	360.0	0.0	0.0	865.1
OBSERVATION_OPN	095 07:33	095 15:03	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_042EA_M34HEFNON095_PRIME	095 15:03	096 00:03	32.4	4.9	86.4	1.6	0.0	19.4	38.9	0.0	42.4	0.0	0.0	0.0	0.0	226.0
OBSERVATION_NOR	096 00:03	096 22:18	80.1	13.0	306.0	4.0	0.0	48.1	93.6	0.0	104.9	384.9	1260.0	0.0	0.0	2294.7
SP_042EA_G70METNON096_PRIME	096 22:18	097 07:18	32.4	6.5	86.4	1.6	0.0	19.4	29.2	0.0	42.4	42.4	0.0	0.0	0.0	217.9
OBSERVATION_NOR	097 07:18	097 14:48	27.0	5.4	93.6	1.4	0.0	16.2	24.3	0.0	35.4	0.0	0.0	0.0	0.0	203.2
SP_042EA_M34HEFOTP097_PRIME	097 14:48	097 23:48	32.4	6.5	0.0	1.6	0.0	19.4	29.2	0.0	42.4	0.0	0.0	0.0	0.0	131.5

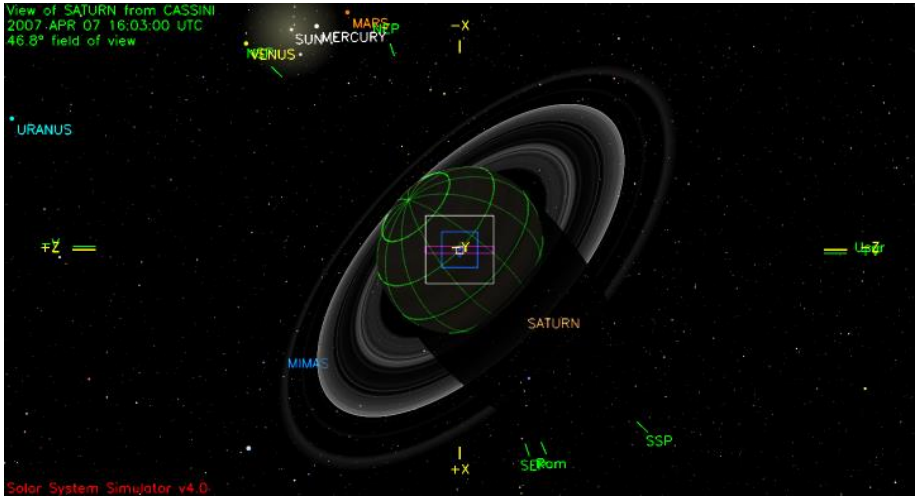
No Waypoint Selection Info Available

Waypoints Chosen

Waypoint 1 (2007-095T08:33:00 – 097T07:48:00): NEG_Y to Saturn, Neg_X to Sun



Waypoint 2 (2007-097T07:48:00 – 098T00:20:00): NEG_Y to Saturn, Neg_Z to 202.14/-23.73



Saturn Rev 42 Inbound Notes & Open Issues

- **Pointing**
  - All waypoints & downlink attitudes have been verified as being Flight Rule-safe.
    - None of the 3 downlinks are rolling. Each has a 2nd axis specified by either MIMI (DOYs 095 & 096) or CDA (DOY 097). The 2nd axis should not be changed without their input.
  - All SP turns have been allocated sufficient time and are Flight-Rule safe.
- **Data Volume**
  - No issues. Last pass in segment has 19% margin.
- **CIMS**
  - All of the expected requests for this delivery are approved in CIMS.
- **OpModes**
  - All OpMode transitions are in the CIMS delivery. No issues at this time.
- **Flight Rule / Mission Planning Guideline & Constraint Issues**
  - None known at this time.
- **DSN**
  - No DSN schedule conflicts. NAV & MP approve of DSN plan
- **Engineering Activities**
  - 097T14:48 = OTM-103 prime