

Science Planning & Sequence Team

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.

Keven Uchida

Segment Overview and Final Products

- 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.

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
SATURN rev 42 Segment		2007-095T07:33:00	- A 2 10 10 10 10 10 10 10 10 10 10 10 10 10	002T16:15:00	2007-097T23:48:00	Autoro co anticon		
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	С	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
SW 1925						072		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	CMN	2007-097T14-48-00		00.00-P0T000	2007-097T23-48-00	XBAND to Earth	NEG X to 107 3/-70 2	2nd axis chosen for CDA

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

		1			OBS	SERVATIO	ON_PERI	D		l			DOWNLIN	K_PASS			
		I				P4			₽5 	 RECC 	RDED	 		PLAYE	BACK		
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_N (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	48	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
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Event	Start doy hh:mm	End doy 1	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 OBSERVATION_OPN SP_042EA_M34BWGNON095_PRIME DAILY TOTAL SCIENCE	095 07:33 095 07:33 095 15:03 095 07:33	095 095 096 096	15:03 15:03 00:03 00:03	27.0 0.0 32.4 59.4	6.7 0.0 8.1 14.8	86.4 0.0 86.4 172.8	1.4 0.0 1.6 3.0	280.0 17.4 0.0 280.0	16.2 0.0 19.4 35.6	32.4 0.0 38.9 71.3	0.0 0.0 0.0 0.0	35.4 0.0 42.4 77.8	108.7 0.0 2.5 111.2	180.0 0.0 0.0 180.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0	774.2 17.4 231.7
OBSERVATION_NOR SP_042EA_G70METNON096_PRIME DAILY TOTAL SCIENCE	096 00:03 096 22:18 096 00:03	096 097 097	22:18 07:18 07:18	191.5 113.0 304.5	39.0 17.0 55.9	306.0 86.4 392.4	66.6 1.6 68.2	200.0 0.0 200.0	48.1 19.4 67.5	101.1 58.3 159.4	0.0 0.0 0.0	104.9 685.4 790.3	384.9 2.5 387.4	560.0 0.0 560.0	0.0 0.0 0.0	0.0	2002.0 983.6
OBSERVATION_NOR OBSERVATION_SI SP_042EA_M34BWGOTP097_PRIME DAILY TOTAL SCIENCE	097 07:18 097 07:18 097 14:48 097 07:18	097 097 097 097	14:48 14:48 23:48 23:48	27.0 0.0 32.4 59.4	14.1 0.0 17.0 31.1	91.0 13.5 87.6 192.1	3.3 0.0 1.6 5.0	208.0 0.0 0.0 208.0	16.2 0.0 19.4 35.6	48.6 0.0 58.3 106.9	0.0 0.0 0.0 0.0	35.4 0.0 42.4 77.8	113.9 0.0 2.5 116.3	74.5 0.0 0.0 74.5	0.0 0.0 0.0 0.0	0.0 0.0 0.0	632.0 13.5 261.2

Segment Geometry

Saturn 042 Legacy

72.0 min

10.76

0.626 52.30 deg

9.20 AU

8.66 AU

- D/L -- U/L --

24.0 deg 418.8 mrad

44.1 14.9 -50.8 -71.1

29.2 55.2

-18.208 deg

-16.846 deg

0.000 Rs

120.500 deg

15.0 deg

> < > Hour

> < > Minute

>

5.377 deg *

< >

ANGLE

0.0 19.9 59.5

6.9

11.2 28.0 49.6

15.3 13.5

34.2 52.1

12.4 12.0 68.8

41.1 22.5 82.8

11.8 16.6 70.5

35.1 54.9 62.9

51.9

0.0

-7778

-18341

-30042

-5065737

Second

Event < >

FROM SATRN EARTH RAM

52.4

41.6

23.6 52.8

33.2 68.2

19.9 59.5

10.18 Rs

9.90 Rs

2.36 Rs

20.28 Rs



11.5

12.9

9.7

9.6

141 12.5

-123

16

13

127

82

7

TITAN

HYPERTON

IAPETUS

PHOEBE

SATURN

------2065115

1593179

3945290

11245434

26.43

34 27

65.46

186.59

613295 10.18

1590604

2064987

3944542

553336

11245323

26.39 153.7

34 26 168 6

65.45 130.1

9.18 165.0 11.28

141.1

186.59

0.19

0.01

0.02

0.00

3.23 342 5 -120

0.16 86 20 -169

0.38

0.02

196.86

Saturn 042 Legacy

No ORS Boresight Solar Constraints on Science Pointing

Saturn 042 Legacy

No Science Highlights Available

Segment Integration Planning

Saturn 042 Legacy

Info on Suggested Observations was Not Available

Beginning of Integration:

SMT Report

			1			OB:	SERVATJ	ION PER	IOD			1		DO	WNLINK P	ASS		
			1				P4			1	P5	I RECO	RDED		PL	AYBACK		
	Start	E	nd I	START	SCI	HK+E	TOTAL	L CPACT	y ma	RGIN	OPNAV	I SCI	ENGR	TOTAL	CPACTY	MAR	GIN	CAROVR
DOWNLINK PASS NAME	doy hh:m	n do	y hh:mm	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(%)	(Mb)	(Mb)	(Mb)]	(Mb)	(Mb)	(Mb)	(2)	(Mb)
P_042EA_M34HEFNON095_PRIME	095 15:03	09	5 00:03	0	865	25	890	3534	2643	75%	17	226	53	1186	1060	-127	-12%	127
P_042EA_G70METNON096_PRIME	096 22:18	09	07:18	127	2295	75	2496	3569	1072	30%	0	218	53	2767	4256	1489	35%	0
P_042EA_M34HEFOTP097_PRIME	097 14:48	09	23:48	0	203	25	228	3569	3340	94%	0	132	53	413	886	474	53%	0
TA VOLUME REPORT																		
TA VOLUME REPORT	Start	End		CAPS	CDJ	A C	IRS]	INMS	ISS	MAG	MIMI	RADAR	RPWS	UVIS	VIMS	PROBE	ENGR	тота
TA VOLUME REPORT	Start doy hh:mm	End	hh:mm	CAPS (Mb)	CD/ (Mb)	A C	IRS J Mb) (INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)	ENGR (Mb)	tota (Mb
TA VOLUME REPORT wont BSERVATION_NOR	Start doy hh:mm 095 07:33	End doy 095	hh:mm 15:03	CAPS (Mb) 27.0	CDJ (Mb) 4.(A C) (1	IRS] Mb) (0.0	DNMS (Mb) 1.4 2	ISS (Mb) 80.0	MAG (Mb) 16.2	МІМІ (Мb) 32.4	RADAR (Mb) 0.0	RPWS (Mb) 35.4	UVIS (Mb) 108.7	VIMS (Mb) 360.0	PROBE (Mb) 0.0	ENGR (Mb)	тота (Мb 865.
NTA VOLUME REPORT EVent PBSERVATION_NOR PBSERVATION_OPN	Start doy hh:mm 095 07:33 095 07:33	End doy 095	hh:mm 15:03 15:03	CAPS (Mb) 27.0 0.0	СD/ (МЬ) 4.0 0.0	A C) (1) (2	IRS] Mb) (0.0 0.0	INMS (МБ) 1.4 2 0.0	ISS (Mb) 80.0 17.4	MAG (Mb) 16.2 0.0	МІМІ (МЬ) 32.4 0.0	RADAR (Mb) 0.0 0.0	RPWS (Mb) 35.4 0.0	UVIS (Mb) 108.7 0.0	VIMS (Mb) 360.0 0.0	РКОВЕ (Мb) 0.0 0.0	ENGR (Mb) 0.0 0.0	TOTA (Mb 865. 17.
TA VOLUME REPORT Wont BSERVATION_NOR RESERVATION_OPN P 042EA M34HEFNON095_PRIME	Start doy hh:mm 095 07:33 095 07:33	End doy 095 095	bh:mm 15:03 15:03 00:03	CAPS (Mb) 27.0 0.0 32.4	CDJ (Mb) 4.0 0.0	A C) (7) () () (IRS] Mb) (0.0 0.0 6.4	(Mb) 1.4 2 0.0 1.6	ISS (Mb) 80.0 17.4 0.0	MAG (Mb) 16.2 0.0 19.4	МІМІ (МЬ) 32.4 0.0 38.9	RADAR (МБ) 0.0 0.0 0.0	RPWS (Mb) 35.4 0.0 42.4	UVIS (Mb) 108.7 0.0 0.0	VIMS (Mb) 360.0 0.0 0.0	РКОВЕ (МЬ) 0.0 0.0 0.0	ENGR (Mb) 0.0 0.0	TOTA (Mb 865. 17. 226.
TA VOLUME REPORT vent BSERVATION_NOR BSERVATION_OPN P_042EA M34HEFNON095_PRIME BSERVATION_NOR	Start doy hh:mm 095 07:33 095 07:33 095 15:03 096 00:03	End doy 095 095 096	bh:mm 15:03 15:03 00:03 22:18	CAPS (Mb) 27.0 0.0 32.4 80.1	СD/ (МЬ) 4.0 4.9 13.0	A C) (1) (1) (1) (1) (1) (1)) (1)) (1)	IRS J Mb) (0.0 6.4 6.0	(Mb) 1.4 2 0.0 1.6 4.0	ISS (Mb) 80.0 17.4 0.0 0.0	MAG (Mb) 16.2 0.0 19.4 48.1	MIMI (Mb) 32.4 0.0 38.9 93.6	RADAR (Mb) 0.0 0.0 0.0 0.0	RPWS (Mb) 35.4 0.0 42.4 104.9	UVIS (Mb) 108.7 0.0 0.0 384.9	VIMS (Mb) 360.0 0.0 0.0 1260.0	PROBE (Mb) 0.0 0.0 0.0 0.0	ENGR (Mb) 0.0 0.0 0.0	TOTA (Mb 865. 17. 226. 2294.
TA VOLUME REPORT Vent BSERVATION_NOR P 042EA M34HEFNON095 PRIME BSERVATION_NOR P 042EA_G70METNON096_PRIME	Start doy hh:mm 095 07:33 095 07:33 095 15:03 096 00:03 096 022:18	End doy 095 095 095 096	hh:mm 15:03 15:03 00:03 22:18 07:18	CAPS (Mb) 27.0 0.0 32.4 80.1 32.4	CDJ (Mb) 4.0 4.5 13.0 6.5	A C) (1) (2) (2) (2) (2) (2) (2) (2) (2	IRS J Mb) (0.0 0.0 6.4 6.0 6.4	(NMS (Mb) 1.4 2 0.0 1.6 4.0 1.6	ISS (Mb) 80.0 17.4 0.0 0.0 0.0	MAG (Mb) 16.2 0.0 19.4 48.1 19.4	MIMI (Mb) 32.4 0.0 38.9 93.6 29.2	RADAR (Mb) 0.0 0.0 0.0 0.0 0.0	RPWS (Mb) 35.4 0.0 42.4 104.9 42.4	UVIS (Mb) 108.7 0.0 0.0 384.9 42.4	VIMS (Mb) 360.0 0.0 0.0 1260.0 0.0	PROBE (Mb) 0.0 0.0 0.0 0.0 0.0	ENGR (Mb) 0.0 0.0 0.0 0.0	TOTA (Mb 865. 17. 226. 2294. 217.
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Keven Uchida

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