



SATURN TARGET WORKING TEAM

Rev 008 Segment Legacy Package

**Segment Boundary: May 22, 2005 – May 24, 2005
2005-142T19:00:00 – 2005-144T02:42:00 (SCET)**

**Integration Began 09/10/2001
Originally Delivered to S11 Sequence on 01/16/2002
Lead Integrator was J. Gross**

**Segment Redelivered to S11 Sequence on 11/11/2004
Lead Integrators were S. Edgington and K. Perry**

Legacy Package Assembled by Keven Uchida

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

Segment Overview and Final Products

- This is a Prime Mission outbound segment (periapse occurs ~1.5 days prior to segment start). The S/C is in an inclined orbit.
- Descending ring plane crossing occurs at 143T05:37:06, approximately half way through the segment.
- This is a short segment, with only one observation period of 21h30m in duration. Originally, this segment started 15 hours earlier than the current start time of 142T19:00:00. The Saturn_TWT gave up this time as part of a trade with the Rings_TWT for a new Saturn Segment in Rev 9 (spanning 2005-160T17:21:00 to 2005-163T01:25:00)
- Once the segment was shortened, it was assumed that a CIRS FIRMAP of Saturn would fill most (or all) of the single remaining gap – indeed, the FIRMAP filled the entire gap in the final product.
- No ORS boresight to Sun issues/concerns

Final Sequenced SPASS

Saturn 008 Legacy

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
SATURN rev 8 Segment		2005-142T19:00:00		001T07:42:00	2005-144T02:42:00			
SP_008SA_WAYPTTURN142_PRIME	M	2005-142T19:00:00		000T00:30:00	2005-142T19:30:00	ISS_NAC to Saturn	POS_X to NSP	
NEW WAYPOINT		2005-142T19:30:00		001T07:42:00	2005-144T03:12:00	ISS_NAC to Saturn	POS_X to NSP	
CIRS_008SA_FIRMAP007_PRIME	C, M, U	2005-142T19:30:00		000T21:30:00	2005-143T17:00:00	CIRS_FP1 to Saturn	POS_X to NSP	
SP_008EA_DLTURN143_PRIME	M	2005-143T17:00:00		000T00:42:00	2005-143T17:42:00	XBAND to Earth	NEG_X to NEP	
SP_008EA_G34HEFNON143_PRIME	C, M	2005-143T17:42:00		000T09:00:00	2005-144T02:42:00	XBAND to Earth	Rolling/SRU	



Final Sequenced SMT and Data Volume

Saturn 008 Legacy

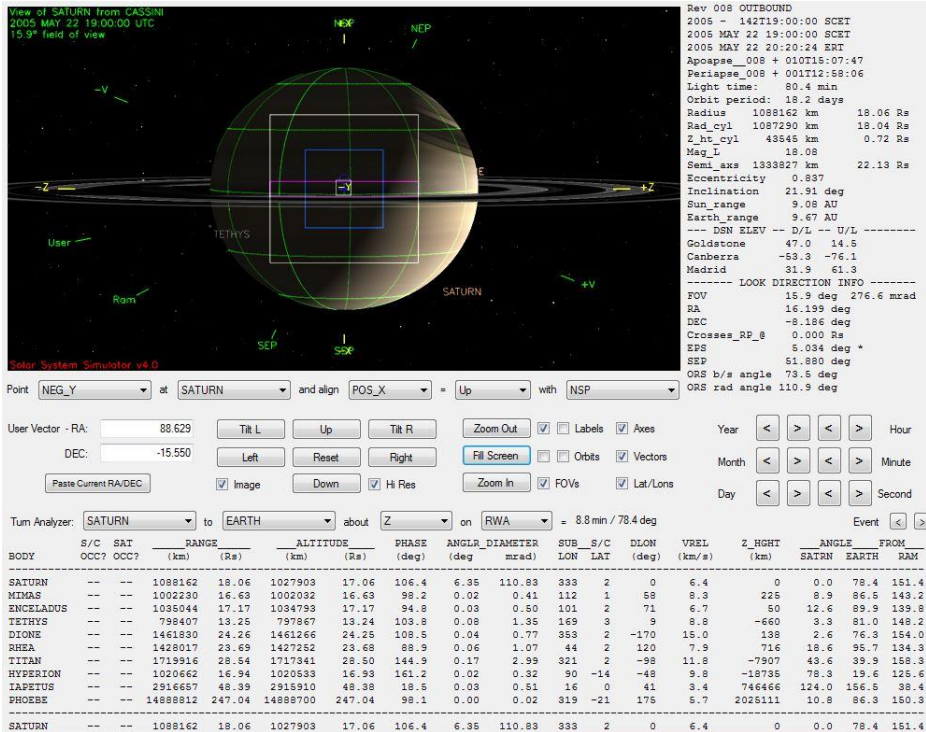
DATA VOLUME SUMMARY --- TRANSFER FRAME OVERHEAD INCLUDED (80 BITS PER 8800-BIT FRAME)

DOWNLINK PASS NAME	Start doy hh:mm	End doy hh:mm	OBSERVATION_PERIOD							DOWNLINK_PASS							
			P4				P5			RECORDED		PLAYBACK					
			START (Mb)	SCI (Mb)	HK+E (Mb)	TOTAL CPACTY (Mb)	MRGN (Mb)	OPNAV (Mb)	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGN (Mb)	NET_MARGN (Mb)	(%)	CAROVR (Mb)	
SP_008EA_G34HEFNON143_PRIME	143 17:42	144 02:42	0	623	77	700	3395	2694	0	170	53	923	908	-15	0	0%	15

DATA VOLUME REPORT --- TRANSFER FRAME OVERHEAD NOT INCLUDED

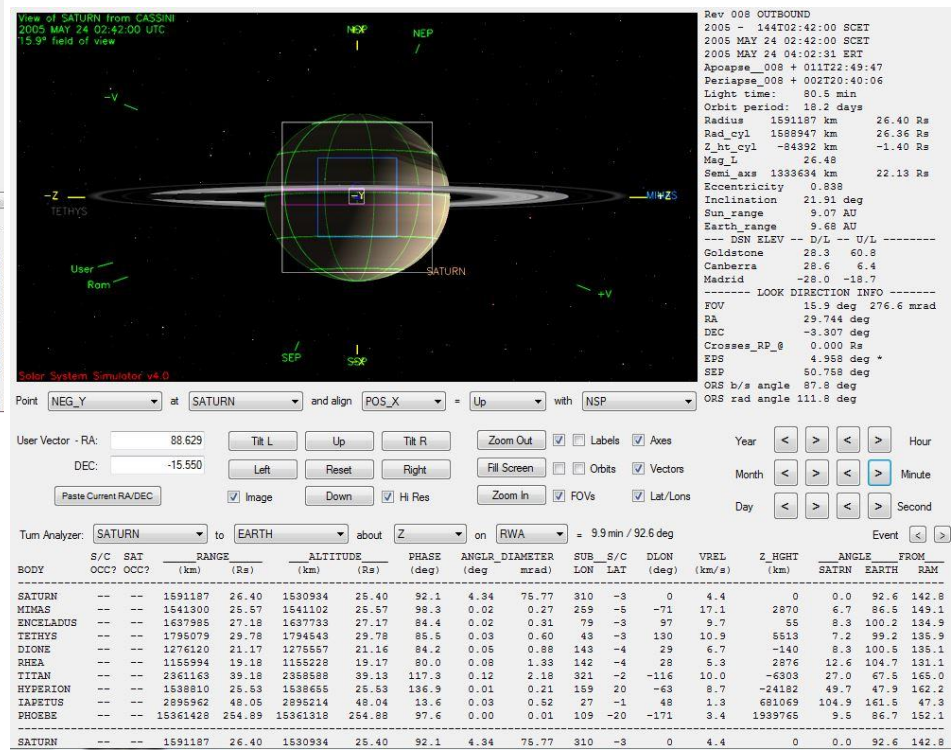
Event	Start doy hh:mm	End doy hh:mm	CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)	ENGR (Mb)	TOTAL (Mb)
OBSERVATION_NOR	142 19:00	143 17:42	61.8	14.3	309.6	4.1	0.0	27.1	61.6	0.0	88.5	37.1	0.0	0.0	0.0	603.9
OBSERVATION_SI	142 19:00	143 17:42	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_008EA_G34HEFNON143_PRIME	143 17:42	144 02:42	24.3	4.9	64.8	1.6	0.0	10.5	24.3	0.0	35.1	2.5	0.0	0.0	0.0	168.0
DAILY TOTAL SCIENCE	142 19:00	144 02:42	86.1	19.1	387.9	5.7	0.0	37.6	85.9	0.0	123.6	39.6	0.0	0.0		

Segment Geometry



← Seg Start (2005-142T19:00:00)

↓ Seg End (2005-144T02:42:00)



	Saturn Range	Phase Angle	Sub-S/C Lat.
Segment Start	18.1	106.4	+2
Segment End	26.4	92	-3

No ORS Boresight Solar Constraints on Science Pointing

No Science Highlights were Available

Segment Integration Planning

- Saturn_008 was a short segment with only one observation period 21h30m in duration. From the start, it was suggested that a CIRS FIR map of Saturn (CIRS_008SA_FIRMAP007_PRIME) would cover nearly the entire period.

Beginning of Integration:

(Based on CIMS inputs as of 11/18/01)

- Need VIMS inputs for accurate data volume determination.
- Even without VIMS, we are over our data volume by ~18%. How do we cut back? Margin will be 0, if everyone cuts equally by 23%.

Playback	Start doy hh:mm	End (Mb)	Volume (Mb)	5 % (Mb)	ENG+HK (Mb)	SCIENCE (Mb)	TOTAL (Mb)	MARGIN (Mb)
PLAYBACK**	143 17:18	144 02:33	933	47	130	929	1058	-172

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)	RSS (Mb)	ENG (Mb)	SCIENC (Mb)	TOTAL
OBSERVATIO	142 19:15	143 17:18	79.4	2.4	309.6	4	16	47.6	71.4	0	103.2	77.9	0	0	56.3	20.2	788
PLAYBACK**	143 17:18	144 02:33	33.3	0	86.4	1.7	0	20	30	0	43.3	2.5	0	0	53.2	0	270.3

Legacy Note: Nearly all of the 172 Mb data overrun was eventually eliminated (no details were provided), with only 12 Mb remaining upon segment delivery. See Page 15.

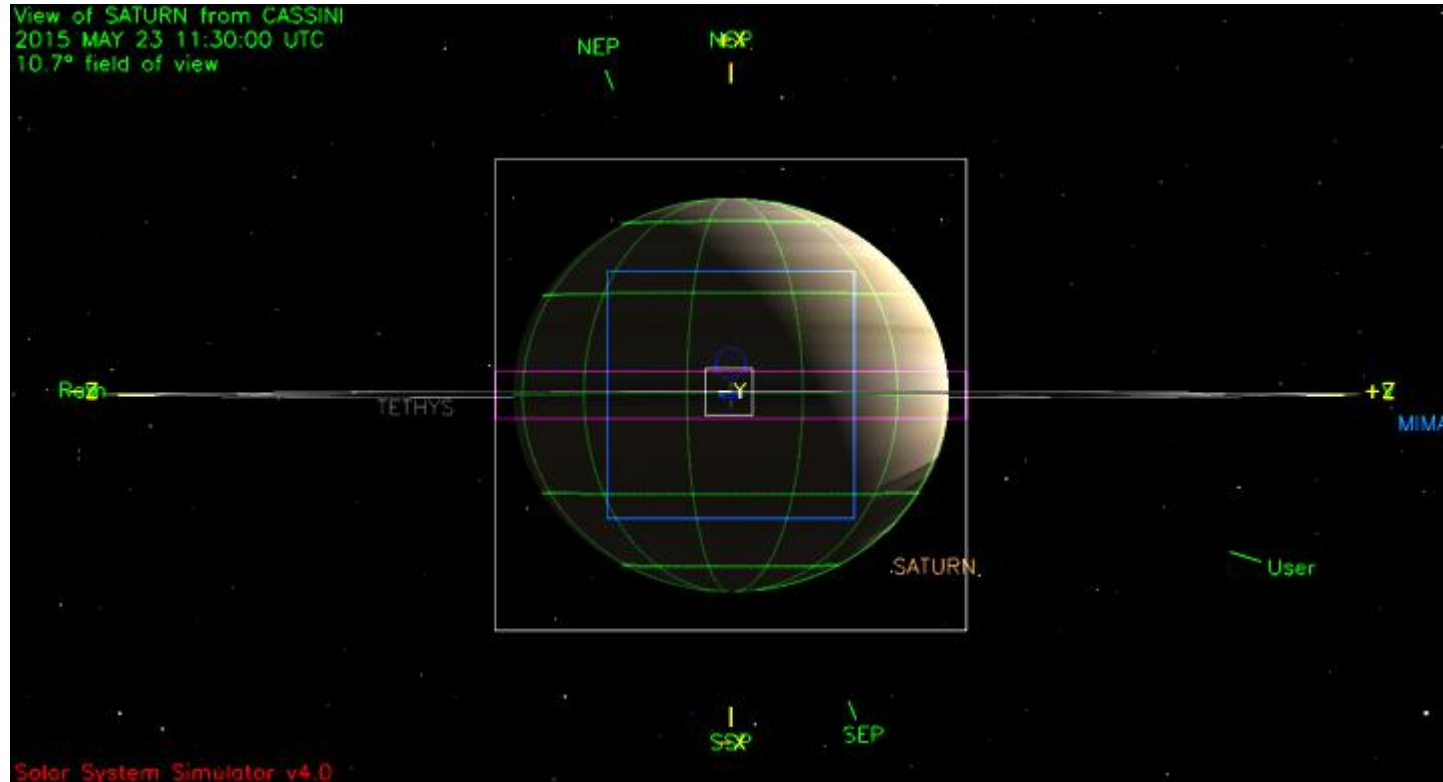
Waypoint Selection

Saturn 008 Legacy

No Waypoint Selection Info Available

Waypoints Chosen

Waypoint 1 (2015-142T19:30:00– 144T03:12): NEG_Y to Saturn, POS_X to NSP



Open Issues

• Pointing Issues

- None. All SP Turns and Waypoints have been checked using the software developed by Brad Wallis.

• Flight Rule/Mission Planning Guideline & Constraint Issues

- None known at this time

• Power Issues

- None known at this time

• CIMS Issues

- The following activities were deleted from Saturn 8, because they are outside this time period of this segment.
 - SP_008NA_G70METOBS144_NA
 - SP_008SA_WAYPTTURN144_PRIME
- All other activities were approved. There are no pending or denied activities.

• Data Volume Issues

- All Observation, Downlink and DSN Blocks (including telemetry modes) have been added to CIMS.
- All conflicts with DSN weekly maintenance were corrected.
- The data volume strategy involves carry-over.
 - 12Mb are carried over into XD 8/9

• Other Issues

- This segment occurs in a "CIRS Caution Period".