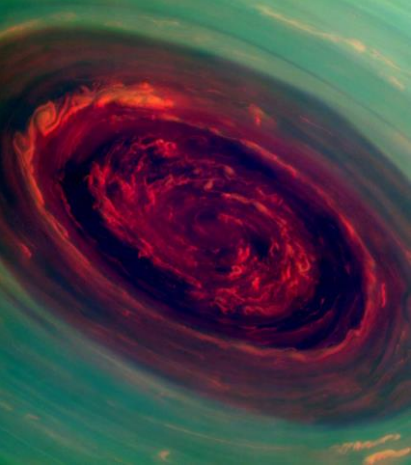
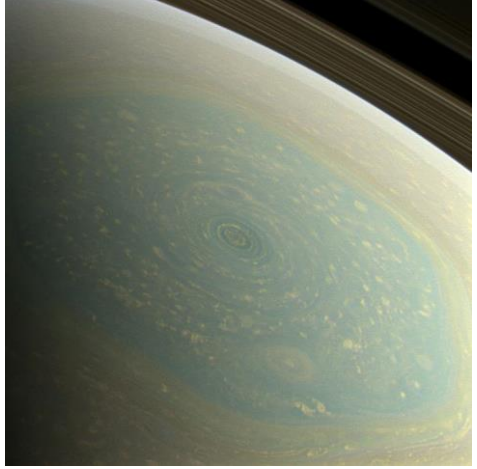
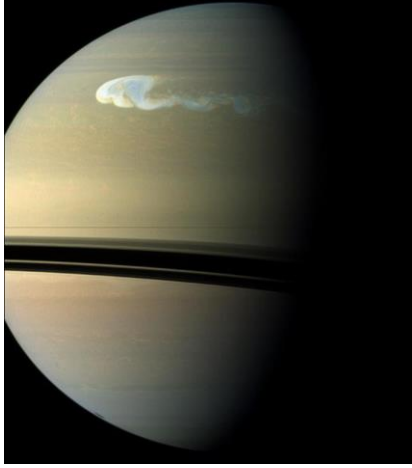


Science Planning & Sequence Team
CASSINI

SATURN TARGET WORKING TEAM

Rev 48 Segment Legacy Package

Segment Boundary: July 20, 2007 – July 22, 2007
2007-201T00:36:00 – 2007-203T00:36:00 (SCET)

Integration Began 06/02/2003
Segment Delivered to S32 Sequence 07/23/2003
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 2 day segment, roughly centered about periapse, in the Prime Mission, during an equatorial orbital phase. The views of Saturn were of the dark side through periapse (5.36 Rs), with the phase angle dropping as the spacecraft moved outbound. By the time the segment ended the views of Saturn were of a mostly lit face.

- Saturn science included CIRS regional mapping inbound and VIMS feature tracking and UVIS stellar occultations on the outbound leg.

- Several icy satellite observations were also conducted during this segment of Helene, Tethys, and Enceladus by the ORS instruments. VIMS looked at the rings at high phase. Images for optical navigation were also taken, and CDA performed an eccentricity scan.

- Offsets were needed for the waypoint covering periapse to keep the sun away from the ORS boresights.

Final Sequenced SPASS

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S032, length = 29 ...		2007-195T01:06:00	E048_SEQUENCE_032+000T00:00:00	028T22:14:00	2007-223T23:20:00			
SATURN rev 48 Segment		2007-201T00:36:00		002T00:00:00	2007-203T00:36:00			
SP_048SA_WAYPTTURN201_PRIME	M	2007-201T00:36:00		000T00:26:30	2007-201T01:02:30	ISS_NAC to Saturn (-10.0,0.0,10.0 deg. offset)	NEG_Z to North_Pole_Dir	Part 1 of 2-part turn
SP_048SA_WAYPTTURN501_PRIME	M	2007-201T01:02:30		000T00:05:30	2007-201T01:08:00	ISS_NAC to Saturn	NEG_Z to North_Pole_Dir	Part 2 of 2-part turn
NEW WAYPOINT		**2007-201T01:08:00**		**000T11:02:00**	**2007-201T12:10:00**	**ISS_NAC to Saturn**	**NEG_Z to North_Pole_Dir**	
CDA_048OT_ECCSCAN001_PRIME	M	2007-201T01:08:00		000T07:30:00	2007-201T08:38:00	NEG_Z to NSP	NEG_X to 267.0/4.5	rocking around z-axis
CIRS_048SA_REGMAP008_PRIME	M, U, V	2007-201T08:38:00		000T03:00:00	2007-201T11:38:00	CIRS_FP3 to Saturn	NEG_Z to NSP	
SP_048SA_WAYPTTURN401_PRIME	M	2007-201T11:38:00		000T00:27:00	2007-201T12:05:00	ISS_NAC to Saturn (-10.0,-2.0,15.0 deg. offset)	POS_Z to North_Pole_Dir	Part 1 of 2-part turn
SP_048SA_WAYPTTURN601_PRIME	M	2007-201T12:05:00		000T00:05:00	2007-201T12:10:00	ISS_NAC to Saturn (-10.0,0.0,15.0 deg. offset)	POS_Z to North_Pole_Dir	
NEW WAYPOINT		**2007-201T12:10:00**		**000T14:16:00**	**2007-202T02:26:00**	**ISS_NAC to Saturn (-10.0,0.0,15.0 deg. offset)**	**POS_Z to North_Pole_Dir**	
VIMS_048RI_RPXHIPH001_PRIME	C, I, M, R	2007-201T12:10:00		000T04:20:00	2007-201T16:30:00	VIMS_IR to Rings	NEG_Z to NSP	
ISS_048HE_COLORF001_PRIME	C, M, R, U	2007-201T16:30:00		000T01:00:00	2007-201T17:30:00	CIRS_FP3 to Helene	POS_X to North_Pole_Dir	
RADAR_048TE_SCATTRADL001_PRIME	M	2007-201T17:30:00		000T01:00:00	2007-201T18:30:00	NEG_Z to Tethys (0.0,0.0,15.0 deg. offset)	POS_X to NSP	RADAR must control primary and secondary axes to obtain correct polarization.
CIRS_048TE_FP1FAZ0P5388_PRIME	I, M, U, V	2007-201T18:30:00		000T01:00:00	2007-201T19:30:00	CIRS_FP1 to Tethys	POS_Z to North_Pole_Dir	
SP_048EA_DLTURN201_PRIME	M, U	2007-201T19:30:00		000T00:22:00	2007-201T19:52:00	XBAND to Earth (0.0,0.0,-50.0 deg. offset)	POS_X to NEP	
SP_048EA_DLTURN401_PRIME	M	2007-201T19:52:00		000T00:08:00	2007-201T20:00:00	XBAND to Earth	POS_X to NEP	
SP_048EA_G70METOPN202_PRIME	C, M	2007-201T20:00:00		000T06:00:00	2007-202T02:00:00	XBAND to Earth	POS_X to NEP	RPWS requires no rolling & to be on thrusters during activity. Transition to thrusters needs to be done in the background sequence.
Periapse R = 5.4 Rs, lat = ...		2007-201T20:31:00		000T00:00:01	2007-201T20:31:01			
SP_048SA_WAYPTTURN202_PRIME	M	2007-202T02:00:00		000T00:26:00	2007-202T02:26:00	ISS_NAC to Saturn	POS_Z to North_Pole_Dir	
NEW WAYPOINT		**2007-202T02:26:00**		**000T23:40:00**	**2007-203T02:06:00**	**ISS_NAC to Saturn**	**POS_Z to North_Pole_Dir**	
VIMS_048SA_FEATRACK003_PRIME	M	2007-202T02:26:00		000T00:30:00	2007-202T02:56:00	ISS_NAC to Saturn	POS_Z to NSP	
UVIS_048ST_DELORI001_PRIME	M	2007-202T02:56:00		000T00:40:00	2007-202T03:36:00	UVIS_FUV to Star	POS_Z to North_Pole_Dir	
VIMS_048SA_FEATRACK002_PRIME	M	2007-202T03:36:00		000T01:25:00	2007-202T05:01:00	ISS_NAC to Saturn	POS_Z to NSP	
UVIS_048ST_BETORI003_PRIME	M	2007-202T05:01:00		000T00:53:00	2007-202T05:54:00	UVIS_FUV to Star	POS_Z to North_Pole_Dir	
UVIS_048ST_THREESTAR001_PRIME	M	2007-202T05:54:00		000T01:26:00	2007-202T07:20:00	UVIS_FUV to Star	POS_Z to North_Pole_Dir	
CIRS_048TE_FP1FAZ0P5390_PRIME	I, M, U, V	2007-202T07:20:00		000T01:19:00	2007-202T08:39:00	CIRS_FP1 to Tethys	POS_Z to North_Pole_Dir	
ISS_048EN_GLOCOLA101_PRIME	C, M, U	2007-202T08:39:00		000T00:40:00	2007-202T09:19:00	ISS_NAC to Enceladus	POS_Z to North_Pole_Dir	
VIMS_048SA_FEATRACK001_PRIME	M	2007-202T09:19:00		000T05:17:00	2007-202T14:36:00	NEG_Y to Saturn	POS_Z to NSP	
NAV_048SK_OPNAV021_PRIME	M, N	2007-202T14:36:00		000T00:59:00	2007-202T15:35:00	ISS_NAC to Satellites	NEG_X to Sun	Starts at waypoint, ends at Earth point
NAV_048EA_DLTURN021_PRIME	M	2007-202T15:35:00		000T00:01:00	2007-202T15:36:00	XBAND to Earth	POS_X to NSP	
SP_048EA_G70METOTP202_PRIME	C, M, N	2007-202T15:36:00		000T09:00:00	2007-203T00:36:00	XBAND to Earth	POS_X to NSP	

Final Sequenced SMT and Data Volume

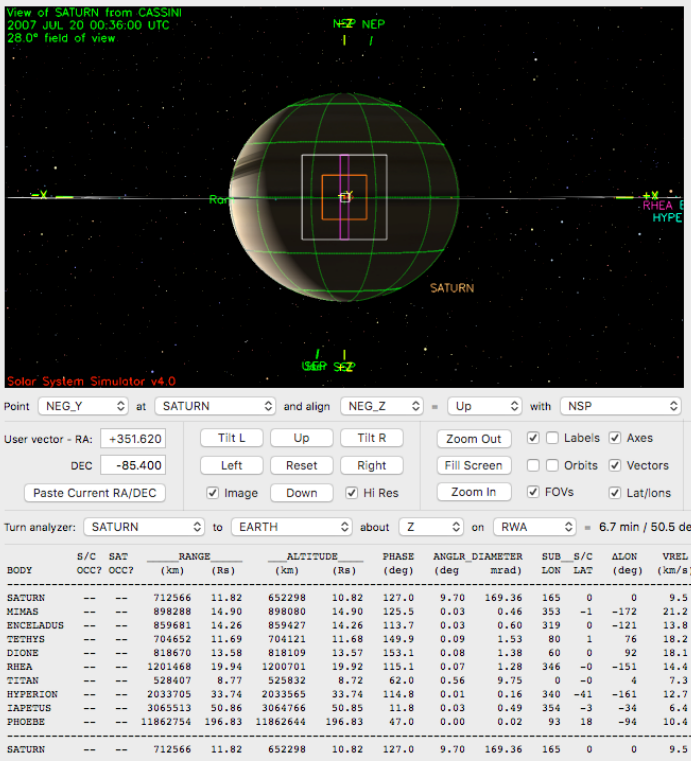
DATA VOLUME SUMMARY --- TRANSFER FRAME OVERHEAD INCLUDED (80 BITS PER 8800-BIT FRAME)

			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_048EA_G70METOPN202_PRIME	201 20:00	202 02:00	251	2388	82	2721	3474	752	0	1193	35	3949	2088	-1862	0	0%	1861
SP_048EA_G70METOTP202_PRIME	202 15:36	203 00:36	1861	1526	57	3444	3474	29	18	245	53	3760	2830	-930	40	0%	930

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	201 00:36	201 20:00	113.6	205.9	134.4	4.1	626.8	63.3	83.1	210.4	545.6	152.0	227.3	0.0	15.9	2382.3
SP_048EA_G70METOPN202_PRIME	201 20:00	202 02:00	21.6	11.3	55.8	1.1	0.0	14.2	19.4	0.0	1056.7	1.6	0.0	0.0	0.0	1181.8
DAILY TOTAL SCIENCE	201 00:36	202 02:00	135.2	217.2	190.2	5.2	626.8	77.5	102.5	210.4	1602.2	153.6	227.3	0.0		
OBSERVATION_NOR	202 02:00	202 15:36	49.0	182.0	28.6	2.4	156.7	32.2	54.0	0.0	323.6	433.0	250.5	0.0	11.1	1523.1
OBSERVATION_OPN	202 02:00	202 15:36	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_048EA_G70METOTP202_PRIME	202 15:36	203 00:36	32.4	17.0	86.4	1.6	0.0	21.3	38.9	0.0	42.4	2.5	0.0	0.0	0.0	242.5
DAILY TOTAL SCIENCE	202 02:00	203 00:36	81.4	199.0	115.0	4.1	156.7	53.6	92.9	0.0	366.0	435.4	250.5	0.0		

Segment Geometry (1 of 2)




```
Rev 048  INBOUND
2007 -  201T00:36:00 SCET
2007 JUL 20 00:36:00 SCET
2007 JUL 20 02:00:08 ERT
Apoapse__048 + 010T14:28:08
Periapse_048 - 19:54:59
Light time:    84.1 min
Orbit period:  39.7 days
Radius      712566 km       11.82 Rs
Rad_cyl     712559 km       11.82 Rs
Z_ht_cyl      3101 km        0.05 Rs
Mag_L           11.82
Semi_axs   2245085 km       37.25 Rs
Eccentricity    0.856
Inclination     0.31 deg
Sun_range       9.23 AU
Earth_range    10.12 AU
--- DSN ELEV -- D/L -- U/L --------
Goldstone      29.9   61.7
Canberra       32.2    5.0
Madrid        -34.9  -20.3
------- LOOK DIRECTION INFO -------
FOV            28.0 deg  489.0 mrad
RA            -80.694 deg
DEC             3.115 deg
Crosses_RP_@    0.000 Rs
EPS             2.914 deg
SEP            27.487 deg
ORS b/s angle  52.9 deg
ORS rad angle 140.7 deg
```

Point NEG_Y at SATURN and align NEG_Z = Up with NSP

User vector - RA: +351.620 DEC -85.400 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

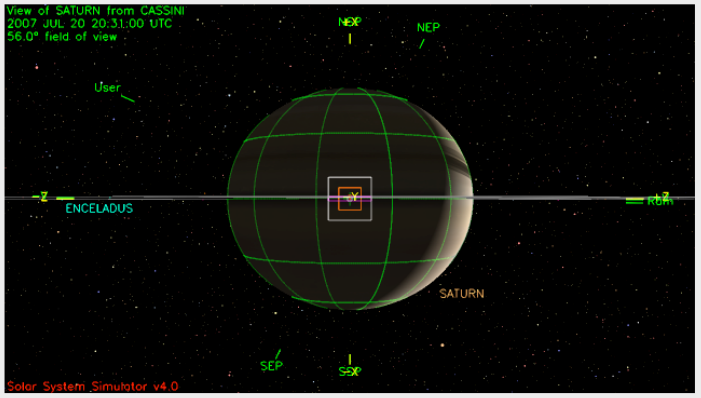
Year Month Day Hour Minute Secon

Turn analyzer: SATURN to EARTH about Z on RWA = 6.7 min / 50.5 deg Even

BODY	S/C OCC?	SAT OCC?	RANGE (km)	RANGE (Rs)	ALTITUDE (km)	ALTITUDE (Rs)	PHASE (deg)	ANGLR_DIAMETER (deg	ANGLR_DIAMETER 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	--	--	712566	11.82	652298	10.82	127.0	9.70	169.36	165	0	0	9.5	0	0.0	50.5	5.1
MIMAS	--	--	898288	14.90	898080	14.90	125.5	0.03	0.46	353	-1	-172	21.2	-1988	1.6	52.0	6.8
ENCELADUS	--	--	859681	14.26	859427	14.26	113.7	0.03	0.60	319	0	-121	13.8	6	13.7	63.7	18.8
TETHYS	--	--	704652	11.69	704121	11.68	149.9	0.09	1.53	80	1	76	18.2	233	24.0	28.1	18.9
DIONE	--	--	818670	13.58	818109	13.57	153.1	0.08	1.38	60	0	92	18.1	-25	27.5	25.0	22.4
RHEA	--	--	1201468	19.94	1200701	19.92	115.1	0.07	1.28	346	-0	-151	14.4	-1488	12.2	62.3	17.4
TITAN	--	--	528407	8.77	525832	8.72	62.0	0.56	9.75	0	-0	4	7.3	7774	170.5	120.5	165.4
HYPERION	--	--	2033705	33.74	2033565	33.74	114.8	0.01	0.16	340	-41	-161	12.7	-22479	12.6	62.6	17.8
IAPETUS	--	--	3065513	50.86	3064766	50.85	11.8	0.03	0.49	354	-3	-34	6.4	921024	135.7	171.0	140.4
PHOEBE	--	--	11862754	196.83	11862644	196.83	47.0	0.00	0.02	93	18	-94	10.4	-822132	82.9	129.7	88.0
SATURN	--	--	712566	11.82	652298	10.82	127.0	9.70	169.36	165	0	0	9.5	0	0.0	50.5	5.1

Seg Start (Left)

Periapse (below)




```
Rev 048 OUTBOUND
2007 -  201T20:31:00 SCET
2007 JUL 20 20:31:00 SCET
2007 JUL 20 21:55:11 ERT
Apoapse__048 + 011T10:23:08
Periapse_048 + 00:00:01
Light time:    84.2 min
Orbit period:  39.9 days
Radius      323184 km        5.36 Rs
Rad_cyl     323182 km        5.36 Rs
Z_ht_cyl     -1260 km       -0.02 Rs
Mag_L            5.36
Semi_axs   2251292 km       37.35 Rs
Eccentricity    0.856
Inclination     0.31 deg
Sun_range       9.23 AU
Earth_range    10.12 AU
--- DSN ELEV -- D/L -- U/L --------
Goldstone      68.9   49.1
Canberra       -9.4  -43.5
Madrid         -8.9   22.0
------- LOOK DIRECTION INFO -------
FOV            56.0 deg  978.0 mrad
RA             19.742 deg
DEC            -5.820 deg
Crosses_RP_@    0.000 Rs
EPS             2.849 deg
SEP            26.820 deg
ORS b/s angle  49.6 deg
ORS rad angle 101.6 deg
```

Point 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

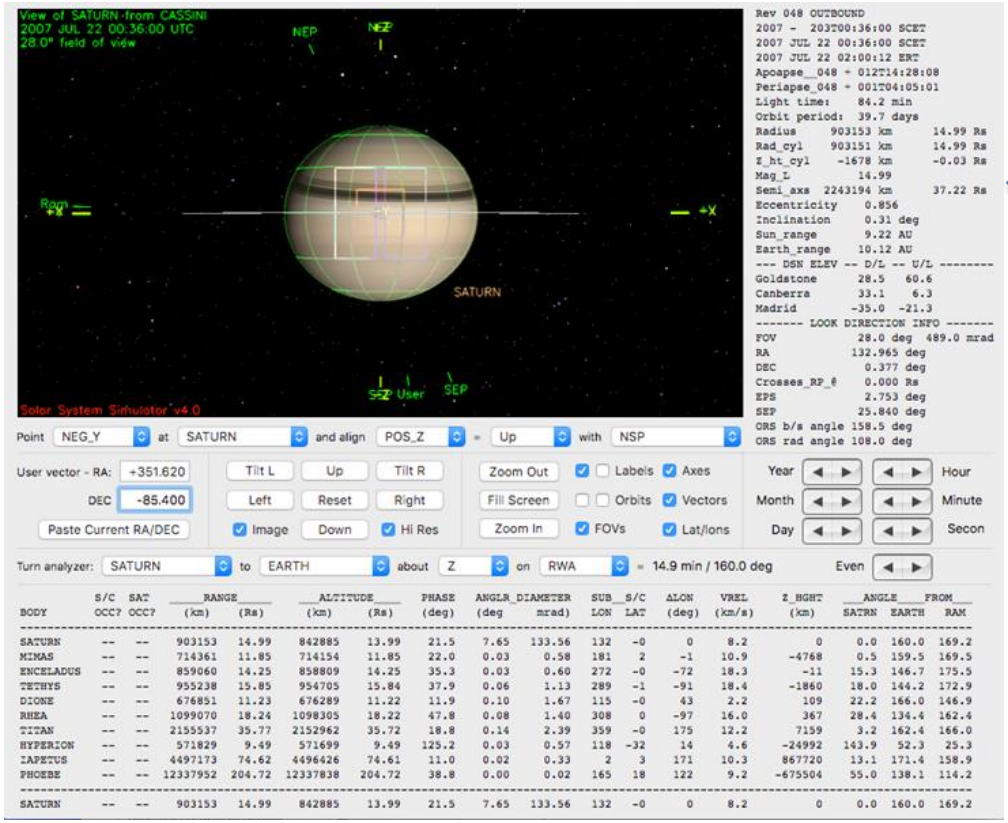
Year Month Day Hour Minute Secon

Turn analyzer: SATURN to EARTH about Z on RWA = 6.9 min / 52.4 deg Even

BODY	S/C OCC?	SAT OCC?	RANGE (km)	RANGE (Rs)	ALTITUDE (km)	ALTITUDE (Rs)	PHASE (deg)	ANGLR_DIAMETER (deg	ANGLR_DIAMETER 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	--	--	323184	5.36	262916	4.36	130.4	21.50	375.16	17	-0	0	14.8	0	0.0	52.4	90.0
MIMAS	--	--	183948	3.05	183748	3.05	156.7	0.13	2.25	236	-2	-29	7.0	1649	28.7	26.1	61.3
ENCELADUS	--	--	493749	8.19	493495	8.19	107.1	0.06	1.04	38	-0	123	24.0	7	23.9	75.5	113.9
TETHYS	--	--	105582	1.75	105051	1.74	67.0	0.59	10.24	96	0	19	5.5	-2277	65.1	115.4	155.0
DIONE	--	--	470553	7.81	469991	7.80	78.7	0.14	2.40	43	-0	84	16.9	-93	52.9	103.8	142.9
RHEA	--	--	731074	12.13	730307	12.12	165.9	0.12	2.10	340	-0	-117	20.1	-3301	40.1	16.6	49.9
TITAN	--	--	1268534	21.05	1265959	21.01	53.5	0.23	4.06	10	-0	87	15.5	8084	78.7	128.8	168.7
HYPERION	--	--	1329982	22.07	1329829	22.07	137.9	0.01	0.25	24	-22	-77	14.2	-24846	89.6	39.8	0.5
IAPETUS	--	--	3487189	57.86	3486441	57.85	19.3	0.02	0.43	6	-0	63	13.8	901519	111.0	163.4	154.1
PHOEBE	--	--	11495406	190.74	11495293	190.74	43.0	0.00	0.02	151	18	8	16.4	-761356	171.4	133.9	97.7
SATURN	--	--	323184	5.36	262916	4.36	130.4	21.50	375.16	17	-0	0	14.8	0	0.0	52.4	90.0

	Saturn Range	Phase Angle	Sub-S/C Lat.
Segment Start	11.82	127.0	0
Periapse	5.36	130.4	0
Segment End	14.99	21.5	0

Segment Geometry (2 of 2)



Seg End

Solar Geometry – ORS Boresight Concerns

No ORS Boresight Solar Constraints on Science Pointing.

Daily Science Highlights

Friday, July 20 (DOY 201):

On DOY 201, the Radio and Plasma Wave Science instrument (RPWS) performed a lightning whistler observation for about four hours. The reaction wheels were turned off with a transition to thruster control to eliminate any interference caused by the wheels. The spacecraft was in a quiescent state as it pointed at Earth. RPWS then ramped up their data-sampling rate and began listening for possible lightning storms on Saturn.

Highlights for other days were not available.

Segment Integration Planning

Timeline Gaps and Suggested Observations

Rev 48 - TOL

Activity	Start	Duration	Pointing	Notes	TLM
Segment Start/SPTurn to Waypoint	2007-201T00:36:00	00:30:00			
New Waypoint					
CIRS Regional Map	201T01:06:00	11:00:00			
Gap	201T12:06:00	01:07:00			
VIMS Ring Plane Crossing	201T13:13:00	03:13:00			
Gap	201T16:26:00	02:04:00			
CIRS Tethys High Spectral Resolution	201T18:30:00	01:00.:00			
SP Turn to Downlink	201T19:30:00	00:30:00	XBAND to Earth;		
Downlink	201T20:00:00	06:00:00		34M Goldstone HEF	
SP Turn to Waypoint	202T02:00:00	00:30:00			
UVIS EPSORI Stellar Occ.	202T02:30:00	00:40:00			
CIRS Tethys High Spectral Resolution	202T03:10:00	01:09:00			
UVIS BETORI Stellar Occ.	202T04:19:00	00:47:00			
UVIS Three Star Observation	202T05:06:00	01:20:00			
Gap	202T06:26:00	02:10:00			
VIMS Saturn Feature Track	202T08:36:00	06:00:00			
OPNAV	202T14:36:00	00:59:00			
NavTurn to Downlink	202T15:35:00	00:01:00	XBAND to Earth;		
Downlink	202T15:36:00	09:00:00		70M Goldstone Array	

Initial SMT and Data Volume

First Presentation 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)	MARGIN (%)	OPNAV (Mb)	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGIN (Mb)	MARGIN (%)	CAROVR (Mb)
SP_048EA_G34HEFOPN201_PRIME	201 20:00	202 02:00	0	2845	67	2913	3562	650	18%	0	401	35	3350	1996	-1354	-68%	1354
SP_048EA_G70ARROTP202_PRIME	202 15:36	203 00:36	1354	1481	47	2882	3533	652	18%	17	238	53	3190	3179	-11	-0%	11

NEED TO CUT 170 MB FOR 5% MARGIN

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	201 00:36	201 20:00	109.2	70.9	200.4	4.1	626.8	60.0	116.8	130.4	565.0	199.3	762.3	0.0	0.0	2845.3
SP_048EA_G34HEFOPN201_PRIME	201 20:00	202 02:00	21.6	39.7	75.6	1.1	0.0	13.0	38.9	0.0	211.7	0.0	0.0	0.0	0.0	401.5
DAILY TOTAL SCIENCE	201 00:36	202 02:00	130.8	110.6	276.0	5.2	626.8	72.9	155.7	130.4	776.7	199.3	762.3	0.0		
OBSERVATION_NOR	202 02:00	202 15:36	49.0	55.9	19.0	2.4	166.7	29.4	68.3	0.0	298.6	321.6	470.0	0.0	0.0	1480.9
OBSERVATION_OPN	202 02:00	202 15:36	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_048EA_G70ARROTP202_PRIME	202 15:36	203 00:36	32.4	16.8	86.4	1.6	0.0	19.4	38.9	0.0	42.4	0.0	0.0	0.0	0.0	238.0
DAILY TOTAL SCIENCE	202 02:00	203 00:36	81.4	72.8	105.4	4.1	166.7	48.8	107.2	0.0	341.0	321.6	470.0	0.0		

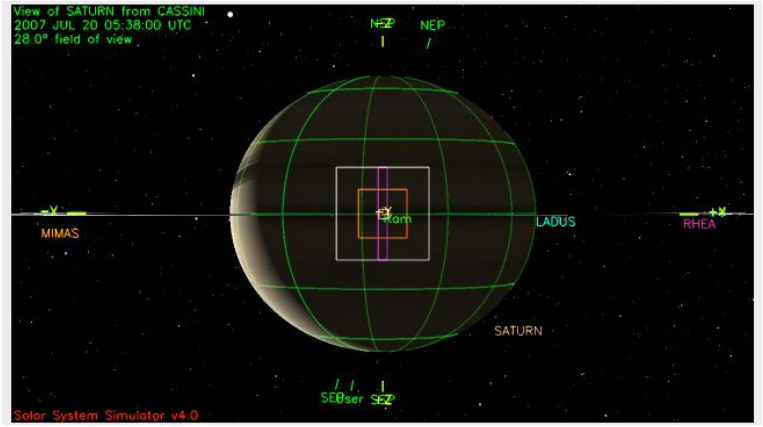
	CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)
TOTAL RECORDED (OPNAV data not included)	212.2	183.4	381.4	9.3	793.5	121.8	262.9	130.4	1117.7	520.9	1232.3	0.0

Waypoint Selection

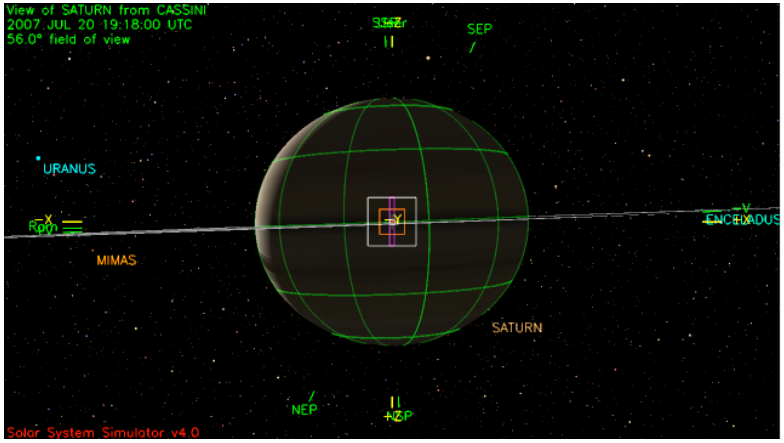
- NEG_Y to Saturn; POS_X to POLE_DIR
  - Safe for whole time except 201T12:45 – 15:45 (ORS to Sun < 15 deg)
  - **Safe for whole time with a (0.0,0.0,10.0) deg. Offset**
- NEG_Y to Saturn; NEG_X to POLE_DIR
  - Unsafe for most of period (radiators to sun, ORS to sun for ~3hrs.)
- NEG_Y to Saturn; NEG_Z to POLE_DIR
  - Unsafe for most of period (radiators to sun, ORS to sun for ~3hrs.)
- NEG_Y to Saturn; POS_Z to POLE_DIR
  - Unsafe for most of period (radiators to sun, ORS to sun for ~3hrs.)

Waypoints Chosen

Waypoint 1 (2007-201T01:08:00 – 2007-201T12:10:00): ISS_NAC to Saturn; NEG_Z to North_Pole_Dir

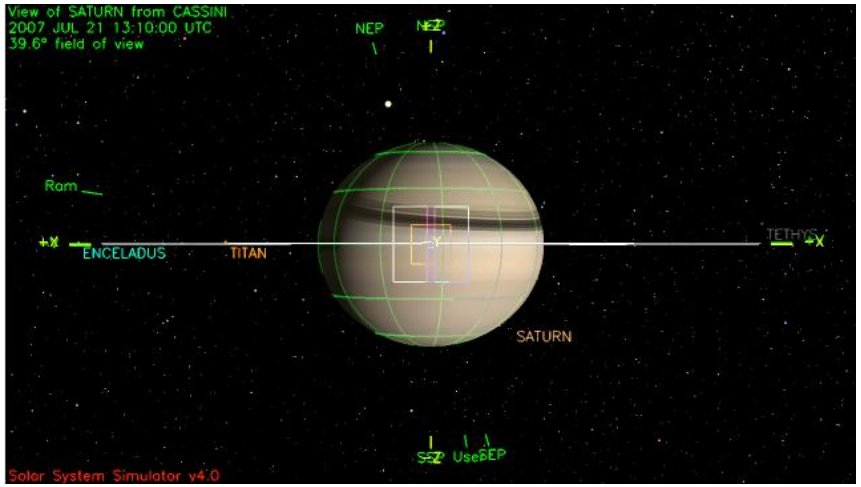


Waypoint 2 (2007-201T12:10:00 – 2007-202T02:26:00):
ISS_NAC to Saturn (-10,0,15 deg. offset); POS_Z to North_Pole_Dir



Waypoints Chosen

Waypoint 3 (2007-202T02:26:00 – 2007-203T02:06:00): ISS_NAC to Saturn; POS_Z to North_Pole_Dir



Saturn Rev 48 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.