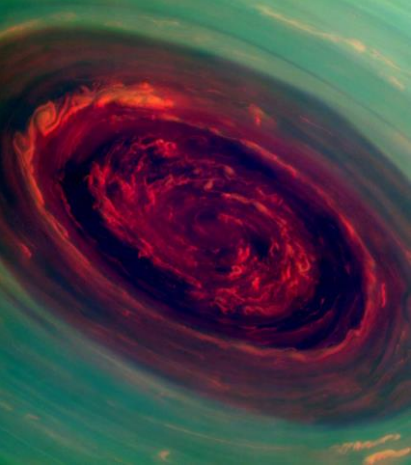

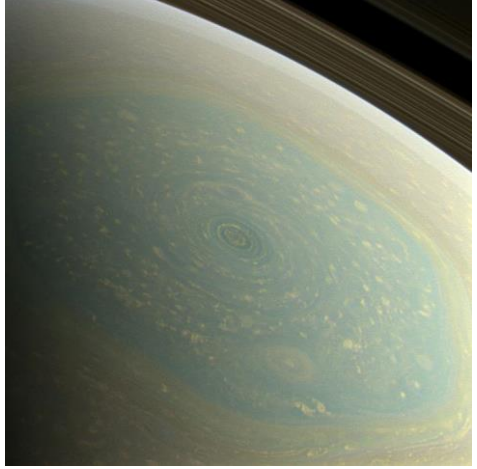
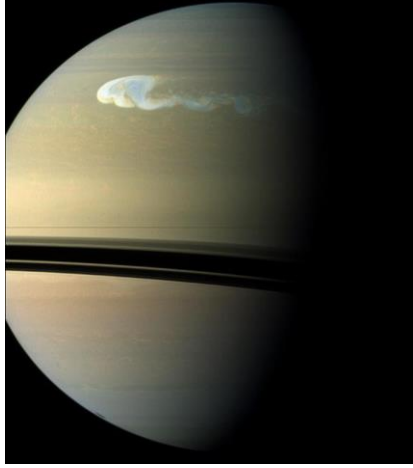

Science Planning & Sequence Team
CASSINI

SATURN TARGET WORKING TEAM

Rev 73_74 Segment Legacy Package

Segment Boundary: June 23, 2008 – June 29, 2008
2008-175T18:24 – 2008-181T19:00 (SCET)

Integration Began 11/03/2003
Segment Delivered to S41 Sequence 01/23/2008
Lead Integrator was Barbara Larsen

Legacy Package Assembled by Kyle Cloutier

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

Segment Overview and Final Products

Segment Summary

- Saturn 73_74 was the last Saturn segment in Prime mission. This segment required reintegration in 2007 (integration originally done in 2003) due to OTM that moved as a result of extending the tour to XM.
- Saturn 73_74 was an apoapse segment in an inclined orbit. The segment included coverage of both hemispheres, starting at low sub-spacecraft latitudes, with a good view of the south pole and hemisphere, and ended at high sub-spacecraft latitudes, with a good view of the north pole and hemisphere.
- Saturn science for this segment included ORS south pole auroral observations, ISS Limb scans, VIMS cylindrical maps, and VIMS methane florescence mapping.
- Other science for this segment included CIRS ring observations, and ORS observations of Dione, Enceladus, Tethys, and Rhea.

Final Sequenced SPASS (1 of 2)

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End	Primary	Secondary	Comments
SATURN revs 73/74 Segment		2008-175T18:24:00		006T00:36:00	2008-181T19:00:00			
SP_073SA_WAYPTTURN176_PRIME	M	2008-175T18:24:00		000T00:30:00	2008-175T18:54:00	ISS_NAC to Saturn	POS_Z to NSP	SP Turn to Waypoint
NEW WAYPOINT		2008-175T18:54:00		002T23:00:00	2008-178T17:54:00	ISS_NAC to Saturn	POS_Z to NSP	
ISS_073SA_SPOLECAM001_PRIME	C, M, U, V	2008-175T18:54:00		000T06:45:00	2008-176T01:39:00	ISS_WAC to Saturn	POS_Z to NSP	
ISS_073SA_LIMBSCAN001_PRIME	U, V	2008-176T01:39:00		000T02:00:00	2008-176T03:39:00	ISS_NAC to Saturn	POS_Z to North_Pole_Dir	Observe night limb for MAPS Titan vertical profile.
CIRS_073RI_SUBML25LP001_PRIME	C, M	2008-176T03:39:00		000T09:00:00	2008-176T12:39:00	CIRS_FP1 to Rings	POS_Z to NSP	
ISS_073ST_CALSTAR2001_PRIME	C, M	2008-176T12:39:00		000T04:15:00	2008-176T16:54:00	ISS_NAC to Star (0.0,35.0,0.0 deg. offset)	POS_X to NSP	
NAV_073SK_OPNAV761_PRIME	C, M	2008-176T16:54:00		000T00:59:00	2008-176T17:53:00	ISS_NAC to Satellites	POS_Z to NSP	Starts at waypoint, ends at Earth point
NAV_073EA_DLTURN761_PRIME	M	2008-176T17:53:00		000T00:01:00	2008-176T17:54:00	XBAND to Earth	ISS_NAC to Saturn	
SP_073EA_G34HEFNON176_PRIME	C, M	2008-176T17:54:00		000T09:00:00	2008-177T02:54:00	XBAND to Earth	5_Hr_Rolling	
SP_073SA_WAYPTTURN177_PRIME	M	2008-177T02:54:00		000T00:30:00	2008-177T03:24:00	ISS_NAC to Saturn	POS_Z to NSP	SP Turn to Waypoint
ISS_073DI_LOWPHASEJ001_PRIME	C, M, U	2008-177T03:24:00		000T00:36:00	2008-177T04:00:00	ISS_NAC to Dione	POS_Z to NSP	
VIMS_073SA_CH4FLUOR001_PRIME	M	2008-177T04:00:00		000T03:50:00	2008-177T07:50:00	ISS_NAC to Saturn	POS_Z to NSP	
ISS_073DI_ZEROPHASE001_PRIME	C, M, U	2008-177T07:50:00		000T01:10:00	2008-177T09:00:00	ISS_NAC to Dione	POS_Z to NSP	
CIRS_073OT_1STAROBS001_PRIME	M, V	2008-177T09:00:00		000T05:55:00	2008-177T14:55:00	CIRS_FP3 to Star	PIC	
ISS_073DI_LOWPHASEX001_PRIME	C, M, U, V	2008-177T14:55:00		000T00:34:00	2008-177T15:29:00	ISS_NAC to Dione	POS_Z to NSP	ISS will point CIRS_FP1 to Dione in last 5-minutes.
CIRS_073OT_1STAROBS002_PRIME	M	2008-177T15:29:00		000T05:55:00	2008-177T21:24:00	CIRS_FP3 to Star	PIC	
SP_073SA_DLTURN177_PRIME	M	2008-177T21:24:00		000T00:19:30	2008-177T21:43:30	XBAND to Earth (-20.0,-10.0,-20.0 deg. offset)	POS_X to NSP	SP Turn to Earth
SP_073SA_DLTURN477_PRIME	M	2008-177T21:43:30		000T00:10:30	2008-177T21:54:00	XBAND to Earth	POS_X to NSP	SP Turn to Earth
SP_073EA_G70METNON177_PRIME	C, E, M	2008-177T21:54:00		000T06:00:00	2008-178T03:54:00	XBAND to Earth	POS_X to NSP	Removed roll for RBOT (SCR-107881).
SP_073SA_WAYPTTURN178_PRIME	M	2008-178T03:54:00		000T00:17:00	2008-178T04:11:00	ISS_NAC to Saturn (45.0,0.0,-20.0 deg. offset)	POS_Z to NSP	SP Turn to Waypoint
SP_073SA_WAYPTTURN578_PRIME	M	2008-178T04:11:00		000T00:13:00	2008-178T04:24:00	ISS_NAC to Saturn	POS_Z to NSP	SP Turn to Waypoint
ISS_073ST_CALSTAR1001_PRIME	C, M, R	2008-178T04:24:00		000T10:36:00	2008-178T15:00:00	ISS_NAC to Star	NEG_Z to NSP	
ISS_073EN_GLOCOL001_PRIME	M, R, U	2008-178T15:00:00		000T00:30:00	2008-178T15:30:00	ISS_NAC to Enceladus	POS_Z to NSP	
ISS_073IC_CALLAMP001_PRIME	C, M, R	2008-178T15:30:00		000T01:24:00	2008-178T16:54:00	ISS_NAC to 189.2/62.216	NEG_X to NSP	
NAV_073SK_OPNAV781_PRIME	M, R	2008-178T16:54:00		000T00:59:00	2008-178T17:53:00	ISS_NAC to Satellites	POS_X to NSP	Starts at waypoint, ends at Earth point
NAV_073EA_DLTURN781_PRIME	M, R	2008-178T17:53:00		000T00:01:00	2008-178T17:54:00	XBAND to Earth	POS_X to NSP	

Final Sequenced SPASS (2 of 2)

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End	Primary	Secondary	Comments
NEW WAYPOINT		2008-178T17:54:00		000T09:30:00	2008-179T03:24:00	XBAND to Earth	POS_X to NSP	
SP_073EA_M70METRSS178_PRIME	C, M, R	2008-178T17:54:00		000T03:00:00	2008-178T20:54:00	XBAND to Earth	Rolling	
Apoapse Per = 7.0 d, inc =...		2008-178T20:42:53		000T00:00:01	2008-178T20:42:54			
RSS_074EA_BORESIGHT002_PRIME	C, M, R	2008-178T20:54:00		000T01:00:00	2008-178T21:54:00	XBAND to Earth	POS_X to NSP	
SP_074EA_G34BWGRSS478_PRIME	C, E, M	2008-178T21:54:00		000T05:00:00	2008-179T02:54:00	XBAND to Earth	POS_X to NSP	
SP_074SA_WAYPTTURN179_PRIME	M	2008-179T02:54:00		000T00:16:00	2008-179T03:10:00	ISS_NAC to Saturn (40.0,0.0,-10.0 deg. offset)	POS_Z to NSP	SP Turn to Waypoint
SP_074SA_WAYPTTURN479_PRIME	M	2008-179T03:10:00		000T00:14:00	2008-179T03:24:00	ISS_NAC to Saturn	POS_Z to NSP	SP Turn to Waypoint
NEW WAYPOINT		2008-179T03:24:00		002T17:14:00	2008-181T20:38:00	ISS_NAC to Saturn	POS_Z to NSP	
CIRS_074OT_3STAROBS006_PRIME	M	2008-179T03:24:00		000T06:00:00	2008-179T09:24:00	CIRS_FP3 to Star	PIC	
VIMS_074SA_CYLMAP002_PRIME	M	2008-179T09:24:00		000T07:59:00	2008-179T17:23:00	ISS_NAC to Saturn	POS_Z to NSP	
SP_074SA_DLTURN179_PRIME	M	2008-179T17:23:00		000T00:16:00	2008-179T17:39:00	XBAND to Earth (-45.0,0.0,-20.0 deg. offset)	POS_X to NSP	SP Turn to Earth
SP_074SA_DLTURN479_PRIME	M	2008-179T17:39:00		000T00:14:00	2008-179T17:53:00	XBAND to Earth	POS_X to NSP	SP Turn to Earth
SP_074EA_G70METSEQ179_PRIME	C, M	2008-179T17:53:00		000T09:00:00	2008-180T02:53:00	XBAND to Earth	3_Hr_Rolling	
SP_074SA_WAYPTTURN180_PRIME	C, M	2008-180T02:53:00		000T00:17:00	2008-180T03:10:00	ISS_NAC to Saturn (30.0,0.0,-20.0 deg. offset)	POS_Z to NSP	SP Turn to Waypoint
SP_074SA_WAYPTTURN580_PRIME	C, M	2008-180T03:10:00		000T00:13:00	2008-180T03:23:00	ISS_NAC to Saturn	POS_Z to NSP	SP Turn to Waypoint
CIRS_074RI_TEMPU16LP001_PRIME	C, M, U	2008-180T03:23:00		000T03:30:00	2008-180T06:53:00	CIRS_FP1 to Rings	POS_Z to NSP	
VIMS_074SA_CYLMAP003_PRIME	M	2008-180T06:53:00		000T10:15:00	2008-180T17:08:00	ISS_NAC to Saturn	POS_Z to NSP	
SP_074SA_DLTURN180_PRIME	C, M	2008-180T17:08:00		000T00:16:00	2008-180T17:24:00	XBAND to Earth (-30.0,0.0,0.0 deg. offset)	POS_X to NSP	SP Turn to Earth
SP_074SA_DLTURN480_PRIME	C, M	2008-180T17:24:00		000T00:14:00	2008-180T17:38:00	XBAND to Earth	POS_X to NSP	SP Turn to Earth
SP_074EA_G34HEFSEQ180_PRIME	C, E, M	2008-180T17:38:00		000T08:00:00	2008-181T01:38:00	XBAND to Earth	5_Hr_Rolling	
SP_074SA_WAYPTTURN181_PRIME	M	2008-181T01:38:00		000T00:15:00	2008-181T01:53:00	ISS_NAC to Saturn (45.0,0.0,-20.0 deg. offset)	POS_Z to NSP	SP Turn to Waypoint
SP_074SA_WAYPTTURN481_PRIME	M	2008-181T01:53:00		000T00:15:00	2008-181T02:08:00	ISS_NAC to Saturn	POS_Z to NSP	SP Turn to Waypoint
ISS_074DI_RHTEHILAT001_PRIME	C, M, U	2008-181T02:08:00		000T02:37:00	2008-181T04:45:00	ISS_NAC to Tethys	POS_Z to NSP	Turn from WP to Tethys (offset (0,10,0)), dwell 40 min, turn directly to Dione, dwell 40 min, turn directly to Rhea, dwell 40 min, turn to WP.
VIMS_074SA_CYLMAP001_PRIME	M, R	2008-181T04:45:00		000T04:23:00	2008-181T09:08:00	ISS_NAC to Saturn	POS_Z to NSP	
NAV_074SK_OPNAV811_PRIME	M, R	2008-181T09:08:00		000T00:59:00	2008-181T10:07:00	ISS_NAC to Satellites	POS_X to NSP	Starts at waypoint, ends at Earth point
NAV_074EA_DLTURN811_PRIME	M, R	2008-181T10:07:00		000T00:01:00	2008-181T10:08:00	XBAND to Earth	ISS_NAC to Saturn	
SP_074EA_M70METSEQ181_PRIME	C, E, M, R	2008-181T10:08:00		000T09:00:00	2008-181T19:08:00	XBAND to Earth	5_Hr_Rolling	
SP_074EA_RWDTURN181_PRIME	C, M, R	2008-181T16:25:00		000T00:06:00	2008-181T16:31:00	XBAND to Earth (0.0,0.0,25.0 deg. offset)	ISS_NAC to Saturn	
SP_074EA_RWDTURN381_PRIME	M, R	2008-181T18:55:00		000T00:06:00	2008-181T19:01:00	XBAND to Earth	ISS_NAC to Saturn	

Final Sequenced SMT and Data Volume (1 of 2)

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

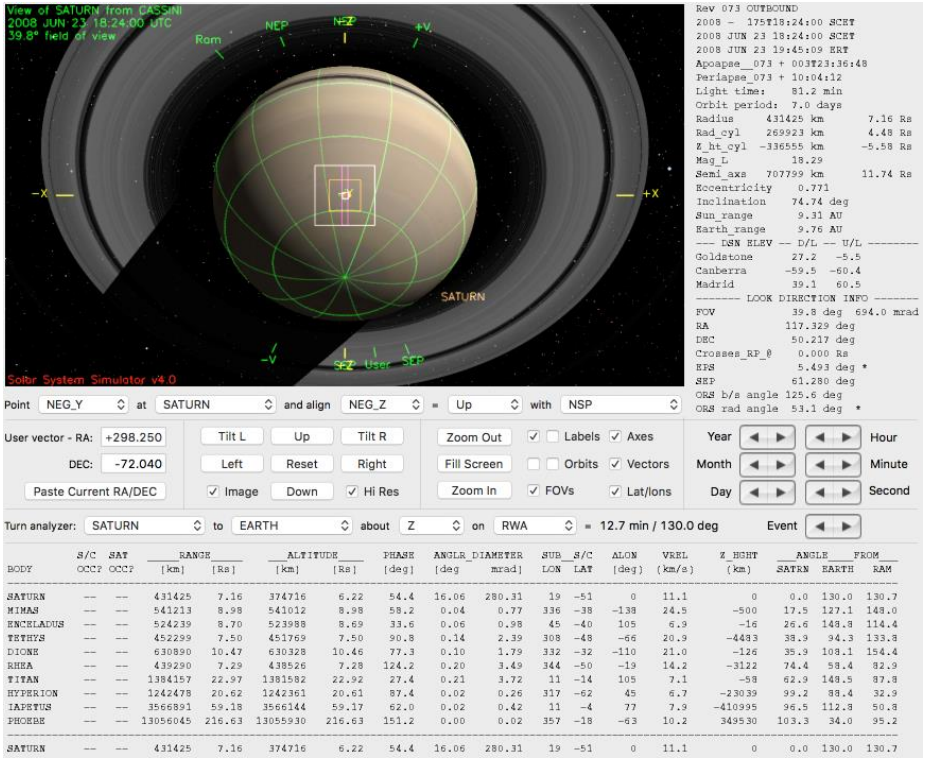
			OBSERVATION_PERIOD							DOWNLINK_PASS						
			P4						P5	RECORDED		PLAYBACK				
DOWNLINK PASS NAME	Start doy hh:mm	End doy hh:mm	START (Mb)	SCI (Mb)	HK+E (Mb)	TOTAL (Mb)	CPACTY (Mb)	MRGN (Mb)	OPNAV (Mb)	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGN (Mb)	NET_MARGN (Mb)	(%)	CAROVR (Mb)
SP_073EA_G34HEFNON176_PRIME	176 17:54	177 02:54	0	2638	99	2737	3498	760	9	236	53	3035	882	-2154	276	2%	2153
SP_073EA_G70METNON177_PRIME	177 21:54	178 03:54	2153	951	80	3184	3498	313	0	177	35	3397	2337	-1060	276	2%	1059
SP_073EA_M70METRSS178_PRIME	178 17:54	178 20:54	1059	2080	59	3198	3498	300	9	81	18	3305	866	-2439	276	2%	2439
SP_074EA_G34BWGRSS478_PRIME	178 21:54	179 02:54	2439	33	4	2476	3498	1021	0	164	29	2670	383	-2287	276	2%	2286
SP_074EA_G70METSEQ179_PRIME	179 17:53	180 02:53	2286	859	63	3209	3498	289	0	288	53	3550	3706	156	276	2%	0
SP_074EA_G34HEFSEQ180_PRIME	180 17:38	181 01:38	0	1206	62	1269	3498	2229	0	441	47	1757	787	-971	120	1%	970
SP_074EA_M70METSEQ181_PRIME	181 10:08	181 19:08	970	943	36	1949	3498	1549	9	1461	53	3472	3581	109	120	2%	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	175 18:24	176 17:54	126.0	25.4	241.2	4.2	1597.4	50.8	102.7	0.0	110.0	158.5	180.0	0.0	19.2	2615.3
OBSERVATION_OPN	175 18:24	176 17:54	0.0	0.0	0.0	0.0	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.7
OBSERVATION_SI	175 18:24	176 17:54	0.0	0.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.0
SP_073EA_G34HEFNON176_PRIME	176 17:54	177 02:54	32.4	9.7	86.4	1.6	0.0	19.4	39.8	0.0	42.1	2.5	0.0	0.0	0.0	233.9
DAILY TOTAL SCIENCE	175 18:24	177 02:54	158.4	35.1	345.6	5.9	1597.4	70.2	142.4	0.0	152.1	161.0	180.0	0.0		
OBSERVATION_NOR	177 02:54	177 21:54	68.4	25.8	118.8	3.4	210.0	41.0	83.9	0.0	88.9	35.9	266.0	0.0	15.5	957.7
SP_073EA_G70METNON177_PRIME	177 21:54	178 03:54	21.6	11.3	72.0	1.1	0.0	13.0	26.5	0.0	28.1	1.6	0.0	0.0	0.0	175.2
DAILY TOTAL SCIENCE	177 02:54	178 03:54	90.0	37.1	190.8	4.5	210.0	54.0	110.4	0.0	117.0	37.6	266.0	0.0		
OBSERVATION_NOR	178 03:54	178 17:54	50.4	26.4	146.9	2.5	1413.3	99.6	61.8	0.0	252.0	7.7	0.0	0.0	11.4	2072.1
OBSERVATION_OPN	178 03:54	178 17:54	0.0	0.0	0.0	0.0	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.7
SP_073EA_M70METRSS178_PRIME	178 17:54	178 20:54	10.8	5.7	13.3	0.5	0.0	21.3	13.3	0.0	14.0	0.8	0.0	0.0	0.0	79.8
DAILY TOTAL SCIENCE	178 03:54	178 20:54	61.2	32.1	160.2	3.1	1413.3	120.9	75.1	0.0	266.0	8.5	0.0	0.0		
OBSERVATION_NOR	178 20:54	178 21:54	3.6	1.9	10.8	0.2	0.0	7.1	4.4	0.0	4.7	0.3	0.0	0.0	0.8	33.8
SP_074EA_G34BWGRSS478_PRIME	178 21:54	179 02:54	18.0	9.4	51.5	0.9	0.0	35.6	22.1	0.0	23.4	1.4	0.0	0.0	0.0	162.3
DAILY TOTAL SCIENCE	178 20:54	179 02:54	21.6	11.3	62.3	1.1	0.0	42.7	26.5	0.0	28.1	1.6	0.0	0.0		
OBSERVATION_NOR	179 02:54	179 17:53	53.9	28.3	43.2	2.7	0.0	106.6	66.2	0.0	70.1	0.0	480.0	0.0	12.2	863.3
SP_074EA_G70METSEQ179_PRIME	179 17:53	180 02:53	32.4	17.0	86.4	1.6	0.0	64.0	39.8	0.0	42.1	2.5	0.0	0.0	0.0	285.8
DAILY TOTAL SCIENCE	179 02:54	180 02:53	86.3	45.2	129.6	4.3	0.0	170.6	106.0	0.0	112.2	2.5	480.0	0.0		
OBSERVATION_NOR	180 02:53	180 17:38	176.0	27.8	64.8	2.7	0.0	104.9	65.2	0.0	69.0	63.1	615.0	0.0	12.1	1200.6
OBSERVATION_SI	180 02:53	180 17:38	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0
SP_074EA_G34HEFSEQ180_PRIME	180 17:38	181 01:38	213.1	15.1	75.6	1.4	0.0	56.9	35.4	0.0	37.4	2.2	0.0	0.0	0.0	437.2
DAILY TOTAL SCIENCE	180 02:53	181 01:38	389.1	42.9	147.4	4.1	0.0	161.8	100.6	0.0	106.5	65.3	615.0	0.0		
OBSERVATION_NOR	181 01:38	181 10:08	30.6	16.0	37.7	1.5	400.0	60.5	37.6	0.0	39.8	40.3	270.0	0.0	6.9	940.9
OBSERVATION_OPN	181 01:38	181 10:08	0.0	0.0	0.0	0.0	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.7
SP_074EA_M70METSEQ181_PRIME	181 10:08	181 19:08	339.6	17.0	86.4	1.6	0.0	63.4	39.8	0.0	897.5	2.5	0.0	0.0	0.0	1447.8
DAILY TOTAL SCIENCE	181 01:38	181 19:08	370.2	33.0	124.1	3.2	400.0	123.8	77.4	0.0	937.3	42.8	270.0	0.0		

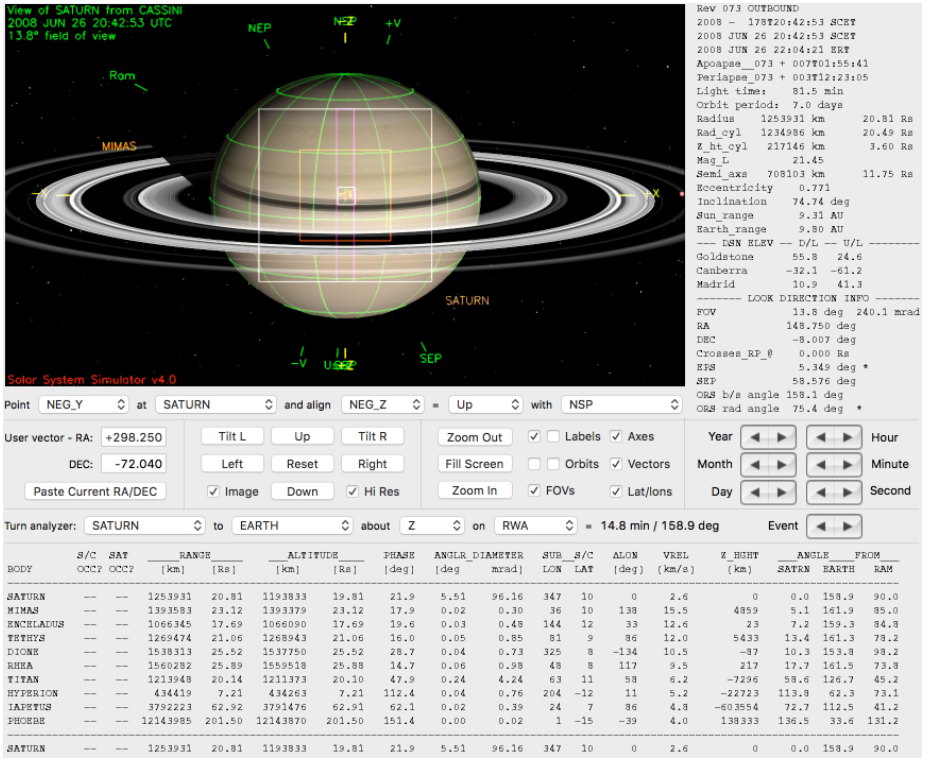
Segment Geometry (1 of 2)



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	--	--	431425	7.16	374716	6.22	54.4	16.06	280.31	19	-51	0	11.1	0	0.0	130.0	130.7
MIMAS	--	--	541213	8.98	541012	8.98	58.2	0.04	0.77	336	-38	-138	24.5	-500	17.5	127.1	148.0
ENCELADUS	--	--	524239	8.70	523988	8.69	33.6	0.06	0.98	45	-40	105	6.9	-16	26.6	148.8	114.4
TETHYS	--	--	452299	7.50	451769	7.50	90.8	0.14	2.39	308	-48	-66	20.9	-4483	38.9	94.3	133.8
DIONE	--	--	630890	10.47	630328	10.46	77.3	0.10	1.79	332	-32	-110	21.0	-126	35.9	108.1	154.4
RHEA	--	--	439290	7.29	438526	7.28	124.2	0.20	3.49	344	-50	-19	14.2	-3122	74.4	58.4	82.9
TITAN	--	--	1384157	22.97	1381582	22.92	27.4	0.21	3.72	11	-14	105	7.1	-58	62.9	148.5	87.8
HYPERION	--	--	1242478	20.62	1242361	20.61	87.4	0.02	0.26	317	-62	45	6.7	-23039	99.2	88.4	32.9
IAPETUS	--	--	3566891	59.18	3566144	59.17	62.0	0.02	0.42	11	-4	77	7.9	-410995	96.5	112.8	50.8
PHOEBE	--	--	13056045	216.63	13055930	216.63	151.2	0.00	0.02	357	-18	-63	10.2	349530	103.3	34.0	95.2
SATURN	--	--	431425	7.16	374716	6.22	54.4	16.06	280.31	19	-51	0	11.1	0	0.0	130.0	130.7

Segment Start: 2008-175T18:24

Apoapse: 2008-178T20:42:53



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	--	--	1253931	20.81	1193833	19.81	21.9	5.51	96.16	347	10	0	2.6	0	0.0	158.9	90.0
MIMAS	--	--	1393583	23.12	1393379	23.12	17.9	0.02	0.30	36	10	138	15.5	4859	5.1	161.9	85.0
ENCELADUS	--	--	1066345	17.69	1066090	17.69	19.6	0.03	0.48	144	12	33	12.6	23	7.2	159.3	84.8
TETHYS	--	--	1269474	21.06	1268943	21.06	16.0	0.05	0.85	81	9	96	12.0	5433	13.4	161.3	78.2
DIONE	--	--	1538313	25.52	1537750	25.52	28.7	0.04	0.73	325	8	-134	10.5	-87	10.3	153.8	98.2
RHEA	--	--	1560282	25.89	1559518	25.88	14.7	0.06	0.98	48	8	117	9.5	217	17.7	161.5	73.8
TITAN	--	--	1213948	20.14	1211373	20.10	47.9	0.24	4.24	63	11	58	6.2	-7296	58.6	126.7	45.2
HYPERION	--	--	434419	7.21	434263	7.21	112.4	0.04	0.76	204	-12	11	5.2	-22723	113.8	62.3	73.1
IAPETUS	--	--	3792223	62.92	3791476	62.91	62.1	0.02	0.39	24	7	86	4.8	-603554	72.7	112.5	41.2
PHOEBE	--	--	12143985	201.50	12143870	201.50	151.4	0.00	0.02	1	-15	-39	4.0	138333	136.5	33.6	131.2
SATURN	--	--	1253931	20.81	1193833	19.81	21.9	5.51	96.16	347	10	0	2.6	0	0.0	158.9	90.0

	Saturn Range	Phase Angle	Sub-S/C Lat.
Segment Start	7.16 Rs	54.4 deg	-51
Apoapse	20.81 Rs	21.9 deg	10
Segment End	8.99 Rs	65.8 deg	59

Segment Geometry (2 of 2)


```
Rev 074  INBOUND
2008 - 181T19:00:00 SCET
2008 JUN 29 19:00:00 SCET
2008 JUN 29 20:21:52 ERT
Apoapse_074 + 002T22:15:08
Periapse_074 - 14:09:25
Light time:    81.9 min
Orbit period:  7.0 days
Radius      541690 km       8.99 Rs
Rad_cyl     278187 km       4.62 Rs
Z_ht_cyl    464801 km       7.71 Rs
Mag_L         34.08
Semi_axs    707829 km      11.74 Rs
Eccentricity   0.771
Inclination   74.75 deg
Sun_range      9.31 AU
Earth_range    9.84 AU
--- DSN ELEV -- D/L -- U/L --------
Goldstone     38.9    5.7
Canberra     -49.8   -65.6
Madrid        28.2    55.4
------- LOOK DIRECTION INFO -------
FOV           31.7 deg  554.0 mrad
RA           179.124 deg
DEC          -54.514 deg
Crosses_RP_@   0.000 Rs
EPS            5.194 deg *
SEP           56.026 deg
OBS b/s angle 114.1 deg
OBS rad angle  99.6 deg
```

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	--	--	541690	8.99	485734	8.06	65.8	12.78	222.98	177	59	0	9.3	0	0.0	111.3	46.5
MIMAS	--	--	618162	10.26	617966	10.25	61.3	0.04	0.67	32	50	124	23.1	2849	16.8	114.6	30.5
ENCELADUS	--	--	467760	7.76	467512	7.76	91.8	0.06	1.10	140	84	8	14.0	25	25.9	85.5	64.4
TETHYS	--	--	614911	10.20	614380	10.19	65.1	0.10	1.76	317	49	-88	5.4	-4685	28.6	114.7	69.7
DIONE	--	--	764728	12.69	764166	12.68	46.3	0.08	1.47	341	37	-135	10.8	-40	27.4	132.6	54.2
RHEA	--	--	762902	12.66	762137	12.65	64.1	0.12	2.01	335	38	-93	4.9	2534	43.7	117.2	81.0
TITAN	--	--	1031853	17.12	1029278	17.08	157.8	0.29	4.99	2	27	14	10.3	-5055	92.6	18.7	112.6
HYPERION	--	--	1384044	22.96	1383913	22.96	154.3	0.01	0.24	2	52	-11	8.4	-5555	100.3	28.5	136.3
IAPETUS	--	--	3774184	62.62	3773437	62.61	89.6	0.02	0.40	9	7	98	12.1	-754256	67.7	85.1	42.4
PHOEBE	--	--	12745380	211.48	12745267	211.48	156.8	0.00	0.02	215	-13	-13	9.7	-61582	117.7	28.0	151.0
SATURN	--	--	541690	8.99	485734	8.06	65.8	12.78	222.98	177	59	0	9.3	0	0.0	111.3	46.5

Segment End: 2008-181T19:00

	Saturn Range	Phase Angle	Sub-S/C Lat.
Segment Start	7.16 Rs	54.4 deg	-51
Apoapse	20.81 Rs	21.9 deg	10
Segment End	8.99 Rs	65.8 deg	59

Solar Geometry – ORS Boresight Concerns

No ORS Boresight Solar Constraints on Science Pointing

Daily Science Highlights (1 of 2)

Tuesday, June 24th (DOY 176) - The ORS instruments took images of Saturn's south pole aurora. When the dayside of Saturn came in view, the WAC made a movie of Saturn's day side. ISS, with UVIS and VIMS riding along, observed the rings behind the night side limb of Saturn. CIRS made one of a set of approximately one hundred observations whose combined goal is to probe details of the ring particle size and distribution and their icy composition by looking at how the rings' thermal emission varies with wavelength for light waves ranging from about 1/100 millimeter up to about a millimeter. The ring particles are mostly water ice, with sizes varying from a few millimeters to several meters. It has been known from ground-based observations that at infrared wavelengths much smaller than a millimeter, the rings radiate their heat very efficiently so that the thermal radiation indicates their temperature; but at wavelengths longer than about 1mm, the emission from the rings is primarily diffusely reflected light. The change in behavior has to do with the ratio of the wavelength to the particle size, but also with the reflectivity of ice itself. Until Cassini, we have had no measurements that tell us exactly at what wavelengths this change occurs, and so the relative importance of these two effects has been hard to assess.

Wednesday, June 25th (DOY 177) - Dione was the focus of the day's ORS observations. Although the satellite was nearly a million kilometers from Saturn, the phase angle was very low going under one degree. VIMS also did long integrations on Saturn's day side mapping methane fluorescence.

Daily Science Highlights (2 of 2)

Thursday, June 26th (DOY 178) - ISS continued the efforts from several days before to calibrate the instrument by observing stars. CIRS took advantage of the time spent pointing at dark sky to do a deep space calibration. An opportunity to observe Enceladus provided ISS with global color and polization data and UVIS with measurements of the ultraviolet albedo. The MAPS instruments continued their study of the inner magnetosphere.

Friday, June 27th (DOY 179) - VIMS made the first of three cylindrical maps of Saturn.

Saturday, June 28th (DOY 180) - CIRS made a radial scan of the rings to measure temperature. VIMS completed the second of three cylindrical maps of Saturn.

Sunday, June 29th (DOY 181) - The three-part cylindrical mapping of Saturn by VIMS was completed. The rest of the day was devoted to ORS observations of Tethys, Dione, and Rhea during which ISS did high-latitude spectrophotometry.

Segment Integration Planning

Timeline Gaps and Suggested Observations

Request	Start Time	Epoch Relative Start Time	Duration	EndTime	Effective Rate	Data Volume	SPASS Type	Primary Pointing	Secondary Pointing	Agreement
SP_Turn	2008-176T03:09:00		000T00:30:00	2008-176T03:39:00	0	0	Prime	ISS_NAC to Saturn		
CIRS Rings Submm & Temp	2008-176T03:39:00		000T09:00:00	2008-176T12:39:00						
ISS Star Cal	2008-176T12:39:00		000T04:15:00	2008-176T16:54:00						
OPNAV	2008-176T16:54:00		000T01:00:00	2008-176T17:54:00						
SP_073EA_G34HEFNON176_PRIME	2008-176T17:54:00		000T09:00:00	2008-177T02:54:00	0	0	Prime	XBAND to Earth		
SP_Turn	2008-177T02:54:00		000T00:30:00	2008-177T03:24:00	0	0	Prime	ISS_NAC to Saturn		
ISS Dione	2008-177T03:24:00		000T00:36:00	2008-177T04:00:00						
VIMS CH4 Flourescence	2008-177T04:00:00		000T03:50:00	2008-177T07:50:00						
ISS Dione	2008-177T07:50:00		000T01:10:00	2008-177T09:00:00						
CIRS Cal	2008-177T09:00:00		000T10:30:00	2008-177T20:30:00						
ISS Dione	2008-177T20:30:00		000T00:54:00	2008-177T21:24:00						
SP_Turn	2008-177T21:24:00		000T00:30:00	2008-177T21:54:00	0	0	Prime	XBAND to Earth		
SP_073EA_G34HEFNON177_PRIME	2008-177T21:54:00		000T06:00:00	2008-178T03:54:00	0	0	Prime	XBAND to Earth		
SP_Turn	2008-178T03:54:00		000T00:30:00	2008-178T04:24:00	0	0	Prime	ISS_NAC to Saturn		
ISS Star Cal???	2008-178T04:24:00		000T10:36:00	2008-178T15:00:00						
ISS Enceldus	2008-178T15:00:00		000T00:30:00	2008-178T15:30:00						
ISS Cal Lamp???	2008-178T15:30:00		000T01:24:00	2008-178T16:54:00						
OPNAV	2008-178T16:54:00		000T01:00:00	2008-178T17:54:00						
SP_073EA_G34BWGNON178_PRIME	2008-178T17:54:00		000T09:00:00	2008-179T02:54:00	0	0	Prime	XBAND to Earth		
SP_Turn	2008-179T02:54:00		000T00:30:00	2008-179T03:24:00	0	0	Prime	ISS_NAC to Saturn		
CIRS Star Cal	2008-179T03:24:00		000T06:00:00	2008-179T09:24:00						
VIMS Atmospheres	2008-179T09:24:00		000T07:59:00	2008-179T17:23:00						
SP_Turn	2008-179T17:23:00		000T00:30:00	2008-179T17:53:00	0	0	Prime	XBAND to Earth		
SP_074EA_G34HEFNON179_PRIME	2008-179T17:53:00		000T09:00:00	2008-180T02:53:00	0	0	Prime	XBAND to Earth		
SP_Turn	2008-180T02:53:00		000T00:30:00	2008-180T03:23:00	0	0	Prime	ISS_NAC to Saturn		
CIRS Rings	2008-180T03:23:00		000T03:30:00	2008-179T06:53:00						
VIMS Atmospheres	2008-179T06:53:00		000T10:15:00	2008-180T17:08:00						
SP_Turn	2008-180T17:08:00		000T00:30:00	2008-180T17:38:00	0	0	Prime	XBAND to Earth		
SP_074EA_G34HEFNON180_PRIME	2008-180T17:38:00		000T08:00:00	2008-181T01:38:00	0	0	Prime	XBAND to Earth		
SP_Turn	2008-181T01:38:00		000T00:30:00	2008-181T02:08:00	0	0	Prime	ISS_NAC to Saturn		
ISS Dione	2008-181T02:08:00		000T02:37:00	2008-181T04:45:00						
VIMS Atmospheres	2008-181T04:45:00		000T04:23:00	2008-181T09:08:00						
OPNAV	2008-181T09:08:00		000T01:00:00	2008-181T10:08:00						
SP_074EA_M34HEFNON181_PRIME	2008-181T10:08:00		000T09:00:00	2008-181T19:08:00	0	0	Prime	XBAND to Earth		

Initial SMT and Data Volume

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_073EA_G34HEFNON176_PRIME	176 17:54	177 02:54	0	387	51	438	3531	3093 88%	17	231	53	740	903	164	18%	0
SP_073EA_G34HEFNON177_PRIME	177 21:54	178 03:54	0	863	66	929	3568	2639 74%	0	168	35	1133	577	-556	-96%	556
SP_073EA_G34BWGNON178_PRIME	178 17:54	178 22:54	556	1593	49	2198	3534	1336 38%	17	123	29	2368	384	-1983	-516%	1983
SP_074EA_G34BWGNON478_PRIME	178 23:54	179 02:54	1983	30	3	2017	3566	1549 43%	0	77	18	2112	228	-1884	-827%	1884
SP_074EA_G34HEFNON179_PRIME	179 17:53	180 02:53	1884	768	52	2704	3568	864 24%	0	235	53	2992	894	-2098	-235%	2098
SP_074EA_G34HEFNON180_PRIME	180 17:38	181 01:38	2098	919	51	3069	3568	500 14%	0	215	47	3331	802	-2528	-315%	2528
SP_074EA_M34HEFNON181_PRIME	181 10:08	181 19:08	2528	2203	38	4761	3534	-1228 -35%	17	300	53	3984	805	-3099	-385%	3099

Initial SMT and Data Volume

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	176 03:09	176 17:54	53.1	10.6	137.0	2.7	0.0	31.9	64.9	0.0	69.0	0.0	0.0	0.0	0.0	369.2
OBSERVATION_OPN	176 03:09	176 17:54	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
OBSERVATION_SI	176 03:09	176 17:54	0.0	0.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.0
SP_073EA_G34HEFNON176_PRIME	176 17:54	177 02:54	32.4	6.5	86.4	1.6	0.0	19.4	39.8	0.0	42.1	2.5	0.0	0.0	0.0	230.7
DAILY TOTAL SCIENCE	176 03:09	177 02:54	85.5	17.1	241.4	4.3	0.0	51.3	104.6	0.0	111.1	2.5	0.0	0.0		
OBSERVATION_NOR	177 02:54	177 21:54	68.4	13.7	114.0	3.4	210.0	41.0	83.9	0.0	88.9	9.7	230.0	0.0	0.0	863.0
SP_073EA_G34HEFNON177_PRIME	177 21:54	178 03:54	21.6	4.3	72.0	1.1	0.0	13.0	26.5	0.0	28.1	1.6	0.0	0.0	0.0	168.2
DAILY TOTAL SCIENCE	177 02:54	178 03:54	90.0	18.0	186.0	4.5	210.0	54.0	110.4	0.0	117.0	11.3	230.0	0.0		
OBSERVATION_NOR	178 03:54	178 17:54	50.4	10.1	0.0	2.5	1371.1	30.2	61.8	0.0	65.5	1.8	0.0	0.0	0.0	1593.5
OBSERVATION_OPN	178 03:54	178 17:54	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_073EA_G34BWGNON178_PRIME	178 17:54	178 22:54	18.0	3.2	43.2	0.9	0.0	10.8	22.1	0.0	23.4	1.4	0.0	0.0	0.0	123.0
DAILY TOTAL SCIENCE	178 03:54	178 22:54	68.4	13.3	43.2	3.4	1371.1	41.0	83.9	0.0	88.9	3.2	0.0	0.0		
OBSERVATION_NOR	178 22:54	178 23:54	3.6	0.7	14.4	0.2	0.0	2.2	4.4	0.0	4.7	0.3	0.0	0.0	0.0	30.4
SP_074EA_G34BWGNON478_PRIME	178 23:54	179 02:54	10.8	2.2	28.8	0.5	0.0	6.5	13.3	0.0	14.0	0.8	0.0	0.0	0.0	76.9
DAILY TOTAL SCIENCE	178 22:54	179 02:54	14.4	2.9	43.2	0.7	0.0	8.6	17.7	0.0	18.7	1.1	0.0	0.0		
OBSERVATION_NOR	179 02:54	179 17:53	53.9	19.3	43.2	2.7	0.0	32.4	66.2	0.0	70.1	0.0	480.0	0.0	0.0	767.9
SP_074EA_G34HEFNON179_PRIME	179 17:53	180 02:53	32.4	10.9	86.4	1.6	0.0	19.4	39.8	0.0	42.1	2.5	0.0	0.0	0.0	235.1
DAILY TOTAL SCIENCE	179 02:54	180 02:53	86.3	30.2	129.6	4.3	0.0	51.8	106.0	0.0	112.2	2.5	480.0	0.0		
OBSERVATION_NOR	180 02:53	180 17:38	53.1	10.6	64.8	2.7	0.0	31.9	65.2	0.0	69.0	0.0	615.0	0.0	0.0	912.3
OBSERVATION_SI	180 02:53	180 17:38	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0
SP_074EA_G34HEFNON180_PRIME	180 17:38	181 01:38	28.8	5.7	86.4	1.4	0.0	17.3	35.4	0.0	37.4	2.2	0.0	0.0	0.0	214.7
DAILY TOTAL SCIENCE	180 02:53	181 01:38	81.9	16.4	158.2	4.1	0.0	49.1	100.6	0.0	106.5	2.2	615.0	0.0		
OBSERVATION_NOR	181 01:38	181 10:08	30.6	6.1	16.3	1.5	893.3	18.4	37.6	0.0	39.8	9.5	1150.3	0.0	0.0	2203.3
OBSERVATION_OPN	181 01:38	181 10:08	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_074EA_M34HEFNON181_PRIME	181 10:08	181 19:08	32.4	6.5	156.5	1.6	0.0	19.2	39.8	0.0	41.5	2.5	0.0	0.0	0.0	299.9
DAILY TOTAL SCIENCE	181 01:38	181 19:08	63.0	12.5	172.8	3.2	893.3	37.5	77.4	0.0	81.3	11.9	1150.3	0.0		

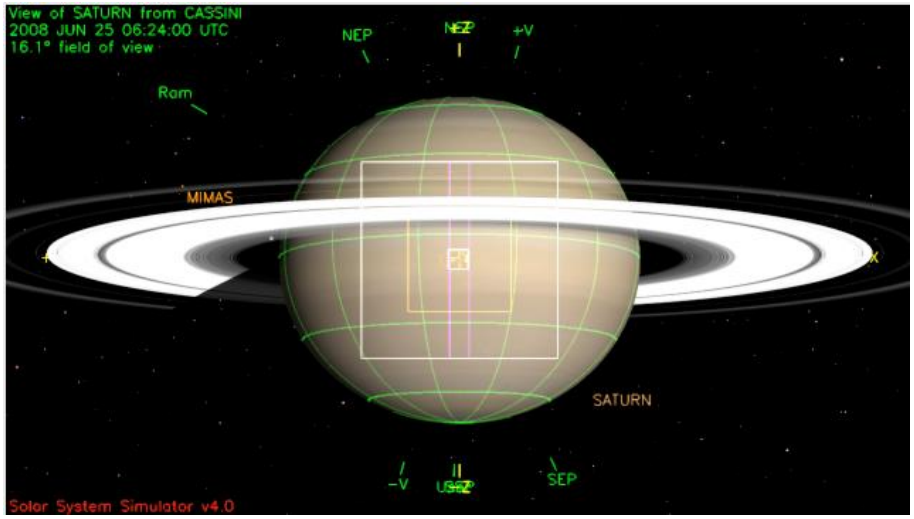
CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)
TOTAL RECORDED (OPNAV data not included)						489.5	110.3	974.4	24.5	2474.4	293.4	600.6	0.0	635.8	34.6	2475.3	0.0

Waypoint Selection

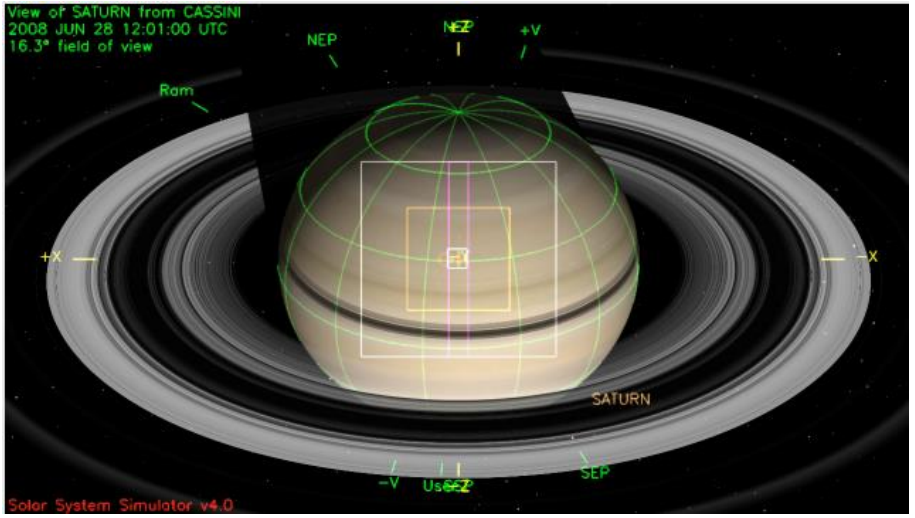
No Waypoint Selection Info Available.

Waypoints Chosen

Waypoint 1 (2008-175T18:54 – 178T17:54):
NAC to Saturn, POS_Z to NSP



Waypoint 3 (2008-179T03:24 – 181T20:38):
NAC to Saturn, POS_Z to NSP



Waypoint 2 (2008-178T17:54 – 179T03:24):
XBAND to Earth, POS_X to NSP
(Not pictured, for HGA Boresight Calibration)

Notes & Liens

- **Pointing Issues**
  - Profile rate / acceleration violations require adjustment at 176T18:22:00 & 180T17:27:36
- **Downlink Issues**
  - NAV has less than 6 hours of two-way on DOY 178 due to RSS boresight.
- **Data Volume Issues**
  - Accepted 33 Mb of carryover from preceding MAG segment
- **Telemetry Mode Issues**
  - Awaiting correction of DFPW to DFPW_normal in ENGR_073SC_DFPW175_PPS
- **CIMS Issues**
  - Awaiting OPNAV change of secondary on DL Turn NAV_073EA_DLTURN781_PRIME
- **Power/OPMODE Issues**
  - None
- **Guideline and Constraint Issues**
  - None
- **Other Issues**
  - Segment was re-integrated due to OTM that moved as a result of extending tour to XM
    - Boundary with preceding MAG segment moved earlier
    - Activities at beginning of segment changed substantially
  - Special activities requiring special attention include the RSS Boresight PIM