

Science Planning & Sequence Team

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

• 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.

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	М	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	С, М	2008-176T03:39:00		000T09:00:00	2008-176T12:39:00	CIRS_FP1 to Rings	POS_Z to NSP	
						ISS_NAC to Star (0.0,35.0,0.0 deg.		
ISS_073ST_CALSTAR2001_PRIME	С, М	2008-176T12:39:00		000T04:15:00	2008-176T16:54:00	offset)	POS_X to NSP	
NAV_073SK_OPNAV761_PRIME	С, М	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	М	2008-176T17:53:00		000T00:01:00	2008-176T17:54:00	XBAND to Earth	ISS_NAC to Saturn	
SP_073EA_G34HEFNON176_PRIME	С, М	2008-176T17:54:00		00:00:00:00	2008-177T02:54:00	XBAND to Earth	5_Hr_Rolling	
SP_073SA_WAYPTTURN177_PRIME	м	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	М	2008-177T04:00:00				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	м	2008-177T15:29:00		000T05:55:00	2008-177T21:24:00	CIRS_FP3 to Star	PIC	
						XBAND to Earth (-20.0,-10.0,-20.0		
SP_073SA_DLTURN177_PRIME	м	2008-177T21:24:00		000T00:19:30	2008-177T21:43:30	deg. offset)	POS_X to NSP	SP Turn to Earth
SP_073SA_DLTURN477_PRIME	м	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).
						ISS_NAC to Saturn (45.0,0.0,-20.0		
SP_073SA_WAYPTTURN178_PRIME	м	2008-178T03:54:00		000T00:17:00	2008-178T04:11:00	deg. offset)	POS_Z to NSP	SP Turn to Waypoint
SP_073SA_WAYPTTURN578_PRIME	М	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	
						ISS_NAC to Saturn (40.0,0.0,-10.0		
SP_074SA_WAYPTTURN179_PRIME	м	2008-179T02:54:00		000T00:16:00	2008-179T03:10:00	deg. offset)	POS_Z to NSP	SP Turn to Waypoint
SP_074SA_WAYPTTURN479_PRIME	М	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	М	2008-179T03:24:00		000T06:00:00	2008-179T09:24:00	CIRS_FP3 to Star	PIC	
VIMS_074SA_CYLMAP002_PRIME	м	2008-179T09:24:00		000T07:59:00	2008-179T17:23:00	ISS_NAC to Saturn	POS_Z to NSP	
						XBAND to Earth (-45.0,0.0,-20.0		
SP_074SA_DLTURN179_PRIME	м	2008-179T17:23:00		000T00:16:00	2008-179T17:39:00	deg. offset)	POS_X to NSP	SP Turn to Earth
SP_074SA_DLTURN479_PRIME	М	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	С, М	2008-179T17:53:00		000T09:00:00	2008-180T02:53:00	XBAND to Earth	3_Hr_Rolling	
						ISS_NAC to Saturn (30.0,0.0,-20.0		
SP_074SA_WAYPTTURN180_PRIME	С, М	2008-180T02:53:00		000T00:17:00	2008-180T03:10:00	deg. offset)	POS_Z to NSP	SP Turn to Waypoint
SP_074SA_WAYPTTURN580_PRIME	С, М	2008-180T03:10:00		000T00:13:00		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	М	2008-180T06:53:00		000T10:15:00	2008-180T17:08:00	ISS_NAC to Saturn	POS_Z to NSP	
						XBAND to Earth (-30.0,0.0,0.0 deg.		
		2008-180T17:08:00			2008-180T17:24:00	offset)		SP Turn to Earth
SP_074SA_DLTURN480_PRIME	С, М	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	
						ISS_NAC to Saturn (45.0,0.0,-20.0		
	М	2008-181T01:38:00		000T00:15:00	2008-181T01:53:00	deg. offset)	POS_Z to NSP	SP Turn to Waypoint
SP_074SA_WAYPTTURN481_PRIME	м	2008-181T01:53:00		000T00:15:00	2008-181T02:08:00	ISS_NAC to Saturn	-	SP Turn to Waypoint
								Turn from WP to Tethys (offset (0,10,0)), dwell 40
								min, turn directly to Dione, dwell 40 min, turn directly
	C, M, U	2008-181T02:08:00				ISS_NAC to Tethys		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		5_Hr_Rolling	
						XBAND to Earth (0.0,0.0,25.0 deg.		
		2008-181T16:25:00			2008-181T16:31:00	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	

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

		I			OBS	ERVATI	ON_PERI	0D		DOWNLINK_PASS							
		ĺ				P4			P5	RECO	RDED			PLAYE	ACK		
	Start	End	START	SCI	HK+E	TOT AL	СРАСТУ	MRCN	OPNAV	sci	ENGR	TOTAL	CRACTY	MARGN	NET		CAROVR
DOWNLINK PASS NAME	doy <u>hh:mm</u>	doy <u>hh:mm</u>			(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)		(Mb)	(Mb)	(Mb)	(%)	(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 SP_073EA_M70METRSS178_PRIME		178 03:54 178 20:54	2153 1059	951 2080	80 59	3184 3198	3498 3498	313 300	0 9	177 81	35 18	3397 3305		-1060 -2439	276 276	2% 2%	1059 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 SP_074EA_G34HEFSEQ180_PRIME		180 02:53 181 01:38	2286 0	859 1206	63 62	3209 1269	3498 3498	289 2229	0	288 441	53 47	3550 1757	3706 787	156 -971	276 120	2% 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

DATA VOLUME REPORT --- TRANSFER FRAME OVERHEAD NOT INCLUDED

Event	Start doy <u>hh:mm</u>	End doy <u>hh:mm</u>	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 OBSERVATION_SI SP_073EA_G34HEFNON176_PRIME DAILY TOTAL SCIENCE	175 18:24 175 18:24 175 18:24 175 18:24 176 17:54 175 18:24		126.0 0.0 0.0 32.4 158.4	25.4 0.0 0.0 9.7 35.1	241.2 0.0 18.0 86.4 345.6	0.0 0.0 1.6	1597.4 8.7 0.0 0.0 1597.4	50.8 0.0 0.0 19.4 70.2	102.7 0.0 0.0 39.8 142.4	0.0 0.0 0.0 0.0 0.0	110.0 0.0 0.0 42.1 152.1	158.5 0.0 0.0 2.5 161.0	180.0 0.0 0.0 0.0 180.0	0.0 0.0 0.0 0.0	19.2 0.0 0.0 0.0	2615.3 8.7 18.0 233.9
OBSERVATION_NOR SP_073EA_G70METNON177_PRIME DAILY TOTAL SCIENCE	177 21:54	177 21:54 178 03:54 178 03:54	68.4 21.6 90.0	25.8 11.3 37.1	118.8 72.0 190.8	3.4 1.1 4.5	210.0 0.0 210.0	41.0 13.0 54.0	83.9 26.5 110.4	0.0 0.0 0.0	88.9 28.1 117.0	35.9 1.6 37.6	266.0 0.0 266.0	0.0 0.0 0.0		957.7 175.2
OBSERVATION_NOR Observation_opn SP_073EA_M70METRSS178_PRIME Daily Total Science	178 03:54 178 17:54	178 17:54 178 17:54 178 20:54 178 20:54	50.4 0.0 10.8 61.2	26.4 0.0 5.7 32.1	146.9 0.0 13.3 160.2	0.0	1413.3 8.7 0.0 1413.3	99.6 0.0 21.3 120.9	61.8 0.0 13.3 75.1	0.0 0.0 0.0 0.0	252.0 0.0 14.0 266.0	7.7 0.0 0.8 8.5	0.0 0.0 0.0 0.0	0.0 0.0 0.0	11.4 0.0 0.0	2072.1 8.7 79.8
OBSERVATION_NOR SP_074EA_G34BWGRSS478_PRIME DAILY TOTAL SCIENCE	178 21:54	178 21:54 179 02:54 179 02:54	3.6 18.0 21.6	1.9 9.4 11.3	10.8 51.5 62.3	0.2 0.9 1.1	0.0 0.0 0.0	7.1 35.6 42.7	4.4 22.1 26.5	0.0 0.0 0.0	4.7 23.4 28.1	0.3 1.4 1.6	0.0 0.0 0.0	0.0 0.0 0.0	0.8 0.0	33.8 162.3
OBSERVATION_NOR SP_074EA_G70METSEQ179_PRIME DAILY TOTAL SCIENCE	179 17:53	179 17:53 180 02:53 180 02:53	53.9 32.4 86.3	28.3 17.0 45.2	43.2 86.4 129.6	2.7 1.6 4.3	0.0 0.0 0.0	106.6 64.0 170.6	66.2 39.8 106.0	0.0 0.0 0.0	70.1 42.1 112.2	0.0 2.5 2.5	480.0 0.0 480.0	0.0 0.0 0.0		863.3 285.8
OBSERVATION_NOR Observation_si SP_074EA_G34HEFSEQ180_PRIME DAILY TOTAL SCIENCE	180 02:53 180 17:38		176.0 0.0 213.1 389.1	27.8 0.0 15.1 42.9	64.8 7.0 75.6 147.4	2.7 0.0 1.4 4.1	0.0 0.0 0.0 0.0	104.9 0.0 56.9 161.8	65.2 0.0 35.4 100.6	0.0 0.0 0.0 0.0	69.0 0.0 37.4 106.5	63.1 0.0 2.2 65.3	615.0 0.0 0.0 615.0	0.0 0.0 0.0 0.0	0.0	1200.6 7.0 437.2
OBSERVATION_NOR OBSERVATION_OPN SP_074EA_M70METSEQ181_PRIME DAILY TOTAL SCIENCE	181 01:38 181 01:38 181 10:08 181 01:38		30.6 0.0 339.6 370.2	16.0 0.0 17.0 33.0	37.7 0.0 86.4 124.1	1.5 0.0 1.6 3.2	400.0 8.7 0.0 400.0	60.5 0.0 63.4 123.8	37.6 0.0 39.8 77.4	0.0 0.0 0.0 0.0	39.8 0.0 897.5 937.3	40.3 0.0 2.5 42.8	270.0 0.0 0.0 270.0	0.0 0.0 0.0 0.0	6.9 0.0 0.0	940.9 8.7 1447.8

K. Cloutier

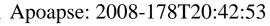
8

Segment Geometry (1 of 2)

Saturn 73_74 Legacy

Turn analyzer: SATURN Image: Constraint of the second sec	Tilt L Up Tilt R Z Left Reset Right Fi Image Down H i Res Z to EARTH © about Z	Up C with NSP C o pom Out ✓ Labels ✓ Axes I I S on No Vectors N Il Screen Orbits ✓ Vectors ✓ Lat/lons N N Zoom In ✓ FOVs ✓ Lat/lons ✓ Lat/lons N N Con RWA C = 12.7 min / 130.0 d M N N N Con RWA C = 12.7 min / 130.0 d M N N N N Con RWA C = 12.7 min / 130.0 d Km/s N	SR b/s angle 125.6 deg SR rad angle 5.11 deg Year Hour Minute Day Second Image: Second Sec	View of SATURN from CASSIN 2008 JUN 26 20:42:53 UT 13.8' field of view Ram MMAS CONTRACTOR OF THE ACCOUNT OF TH
ENCRLADUS 524239 TETHYS 630280 DIONE 630280 RHEA 439290 TITAN 1345157 HIFREION 1345457 HAVENE 13656831 PHOREE 13056085 2	8.70 523988 8.69 33.6 0. 7.50 45176 7.50 630.8 0. 10.47 63028 10.46 77.3 0. 7.29 438526 7.28 124.2 0. 22.97 138158 22.92 27.4 0. 20.62 124261 20.61 87.4 0. 59.18 356544 59.17 62.0 0. 116.63 13055930 216.63 151.2 0.	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
	Saturn Range	Phase Angle	Sub-S/C Lat.	DEC: -/2.040 Lett Reset Right Fill Screen Orbits ✓ Paste Current RA/DEC ✓ Image Down ✓ Hi Res Zoom In ✓ FOVs ✓

24



from 0:42:5. ew Ram	CASSINI 3 UTC	NEP \	N522 +V							Rev 073 OUT 2008 - 178 2008 JUN 26 2008 JUN 26 Apoapse_07 Periapse_07	T20:42:5 20:42:5 22:04:2 3 + 0071 3 + 0031	53 SCET 21 ERT 101:55:4 12:23:0	
MIMAS										Rad_cyl 1 Z_ht_cyl Mag_L Semi_axs Eccentricit	d: 7.0 253931 k 234986 k 217146 k 21.4 708103 k y 0.7	cm cm 45 cm 771	20.81 Rs 20.49 Rs 3.60 Rs 11.75 Rs
										Inclination Sun_range Earth_range DSN ELE Goldstone	9.3 9.8		
				SAT	URN					Canberra Madrid LOC FOV	-32.1 10.9 K DIRECT 13.8	1 -61.2 9 41.3 FION INF 8 deg 2	2 3
mulato	or v4.0	_/	11 109822	SEP						RA DEC Crosses_RP_ EPS SEP	-8.0 0.0 5.3 58.5	750 deg 007 deg 000 Rs 349 deg 576 deg	
٥ ،	at SATURN	and	align NEG_Z	© = Up	p 0	with	NSP		٥	ORS b/s ang ORS rad ang			
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-72. nt RA/D		Left Res Image Dov			om In	✓ FOVs	orbits s	✓ Vector ✓ Lat/lor		Day		4 Þ 4 Þ	Minute Second
TURN	to	EARTH	about	z o	on RWA	0	2) = 1	14.8 min /	158.9	deg	Event	• •	1
SAT OCC?	RANGE[km] [R:			ASE ANGLR eg] [deg	DIAMETER mrad]	SUB	S/C LAT		VREL [km/2]	z_HGHT (km)	ANG	EARTH	ROM RAM
		.81 1193833		1.9 5.51 7.9 0.02	96.16 0.30	347	10 10	0 138	2.6	0 4859		158.9	90.0
		.69 1066090		9.6 0.03	0.48	144	12		12.6	23		159.3	84.8
		.06 1268943		6.0 0.05	0.85	81	9		12.0	5433		161.3	78.2
		.52 1537750		8.7 0.04	0.73	325	8		10.5	-87		153.8	98.2
		.89 1559518 .14 1211373		4.7 0.06 7.9 0.24		48	8 11	117 58	9.5 6.2	217		161.5 126.7	73.8
		.14 1211373 .21 434263		7.9 0.24 2.4 0.04	4.24	63 204	-12	58	5.2	-7296	58.6 113.8	62.3	45.2
		.21 434263		2.4 U.U4 2.1 D.D2		204	-12	36	4.8	-22723		112.5	41.2
	12143985 201			1.4 0.00	0.02	1	-15	-39	4.0	138333	136.5	33.6	131.2
	1253931 20	.81 1193833	3 19.81 23	1.9 5.51	96.16	347	10	0	2.6	0	0.0	158.9	90.0

Apoapse

Segment End

21.9 deg

65.8 deg

20.81 Rs

8.99 Rs

10

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BODY

SATURN MINAS ENCELADUS

TETHYS DIONE

RHEA TITAN HYPERION IAPETUS PHOEBE SATURN

OCC?



Segment Geometry (2 of 2)

Saturn 73_74 Legacy

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	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 End: 2008-181T19:00

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. **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

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SP_074EA_G34HEFNON179_PRIME 2008-179T17:53:00 000T09:00:00 2008-180T02:53:00 0 Prime XBAND to Earth SP_Turn 2008-180T02:53:00 000T00:30:00 2008-180T03:23:00 0 Prime ISS_NAC to Saturn CIRS Rings 2008-179T06:53:00 000T01:15:00 2008-180T17:08:00 Prime XBAND to Earth VIMS Atmospheres 2008-180T17:08:00 000T00:30:00 2008-180T17:38:00 0 Prime XBAND to Earth SP_074EA_G34HEFNON180_PRIME 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 000T00:30:00 2008-181T01:38:00 0 0 Prime XBAND to Earth SP_074EA_G34HEFNON180_PRIME 2008-181T01:38:00 000T00:30:00 2008-181T01:38:00 0 0 Prime XBAND to Earth SP_0Turn 2008-181T01:38:00 000T00:30:00 2008-181T01:38:00 0 0 Prime XBAND to Earth SP_0Turn 2008-181T01:38:00 000T00:30:00 2008-181T01:80:00	VIMS Atmospheres	2008-179T09:24:00		000T07:59:00	2008-179T17:23:00						
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CIRS Rings 2008-180T03:23:00 000T03:30:00 2008-179T06:53:00 VIMS Atmospheres 2008-179T06:53:00 000T101:15:00 2008-180T17:08:00 SP_Turn 2008-180T17:08:00 000T08:00:00 2008-180T17:38:00 0 0 Prime XBAND to Earth SP_074EA_G34HEFNON180_PRIME 2008-181T01:38:00 000T08:00:00 2008-181T01:38:00 0 0 Prime XBAND to Earth SP_Turn 2008-181T01:38:00 000T00:30:00 2008-181T01:38:00 0 0 Prime XBAND to Earth SP_Turn 2008-181T01:38:00 000T00:30:00 2008-181T02:08:00 0 0 Prime 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 000T04:23:00 2008-181T09:08:00 2008-181T09:08:00 <td>SP_074EA_G34HEFNON179_PRIME</td> <td>2008-179T17:53:00</td> <td></td> <td>00:00:e0T000</td> <td>2008-180T02:53:00</td> <td>0</td> <td>0</td> <td>Prime</td> <td>XBAND to Earth</td> <td></td> <td></td>	SP_074EA_G34HEFNON179_PRIME	2008-179T17:53:00		00:00:e0T000	2008-180T02:53:00	0	0	Prime	XBAND to Earth		
VINS Atmospheres 2008-179T06:53:00 000T10:15:00 2008-180T17:08:00 Prime XBAND to Earth SP_Turn 2008-180T17:38:00 000T00:30:00 2008-180T17:38:00 0 Prime XBAND to Earth SP_074EA_G34HEFNON180_PRIME 2008-180T17:38:00 000T00:30:00 2008-181T01:38:00 0 Prime XBAND to Earth SP_Turn 2008-181T01:38:00 000T00:30:00 2008-181T02:08:00 0 Prime XBAND to Earth SP_Turn 2008-181T01:38:00 000T00:30:00 2008-181T02:08:00 0 Prime ISS_NAC to Saturn ISS Dione 2008-181T02:08:00 000T04:23:00 2008-181T09:08:00 2008-181T09:08:00 2008-181T09:08:00 VIMS Atmospheres 2008-181T09:08:00 000T01:00:00 2008-181T10:08:00 2008-181T09:08:00	SP_Turn	2008-180T02:53:00		000T00:30:00	2008-180T03:23:00	0	0	Prime	ISS_NAC to Saturn		
SP_Turn 2008-180T17:08:00 000T00:30:00 2008-180T17:38:00 0 Prime XBAND to Earth SP_074EA_G34HEFNON180_PRIME 2008-180T17:38:00 000T008:00:00 2008-181T01:38:00 0 Prime XBAND to Earth SP_Turn 2008-181T01:38:00 000T00:30:00 2008-181T02:08:00 0 Prime XBAND to Earth SP_Turn 2008-181T01:38:00 000T00:30:00 2008-181T02:08:00 0 Prime ISS_NAC to Saturn ISS Dione 2008-181T02:08:00 000T04:23:00 2008-181T09:08:00 2008-181T09:08:00 <td>CIRS Rings</td> <td>2008-180T03:23:00</td> <td></td> <td>000T03:30:00</td> <td>2008-179T06:53:00</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	CIRS Rings	2008-180T03:23:00		000T03:30:00	2008-179T06:53:00						
SP_074EA_G34HEFNON180_PRIME 2008-180T17:38:00 000T08:00:00 2008-181T01:38:00 0 Prime XBAND to Earth SP_Turn 2008-181T01:38:00 000T00:30:00 2008-181T02:08:00 0 Prime ISS_NAC to Saturn ISS Dione 2008-181T02:08:00 000T04:23:00 2008-181T04:45:00 2008-181T09:08:00 VIMS Atmospheres 2008-181T09:08:00 200	VIMS Atmospheres	2008-179T06:53:00		000T10:15:00	2008-180T17:08:00						
SP_Turn 2008-181T01:38:00 000T00:30:00 2008-181T02:08:00 0 Prime ISS_NAC to Saturn ISS Dione 2008-181T02:08:00 000T02:37:00 2008-181T04:45:00 2008-181T04:45:00 2008-181T04:45:00 VIMS Atmospheres 2008-181T04:45:00 000T04:23:00 2008-181T09:08:00 2008-181T09:08:00 2008-181T09:08:00	SP_Turn	2008-180T17:08:00		000T00:30:00	2008-180T17:38:00	0	0	Prime	XBAND to Earth		
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 DPNAV 2008-181T09:08:00 000T01:00:00 2008-181T10:08:00	SP_074EA_G34HEFNON180_PRIME	2008-180T17:38:00		000T08:00:00	2008-181T01:38:00	0	0	Prime	XBAND to Earth		
VIMS Atmospheres 2008-181T04:45:00 000T04:23:00 2008-181T09:08:00 DPNAV 2008-181T09:08:00 000T01:00:00 2008-181T10:08:00	SP_Turn	2008-181T01:38:00		000T00:30:00	2008-181T02:08:00	0	0	Prime	ISS_NAC to Saturn		
DPNAV 2008-181T09:08:00 000T01:00:00 2008-181T10:08:00	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						
N_0/4EV_N24UELIA04T01_KMIAE Z000-T0T1T0:00:00 000103:00:00 000103:00:00 0 0 NUME XBWD t0 F9LU	SP_074EA_M34HEFNON181_PRIME	2008-181T10:08:00		00:00:00	2008-181T19:08:00	0	0	Prime	XBAND to Earth		

Beginning of Integration:

DATA	VOLUME	SUMMARY	
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																		-1
		1			OB	SERVATI	ON_PERI	OD			1		DOW	NLINK_PA	ASS .			I.
		1									I							I
																		-1
		1				P4			1	P5	RECO	RDED		PL/	AYBACK			I.
		1							1		I	1						I.
																		-1
	Start	End	START	SCI	HK+E	TOTAL	CPACTY	r MA	RGIN	OPNAV	SCI	ENGR	TOTAL	CPACTY	MAR	GIN	CAROVR	I.
DOWNLINK PASS NAME	doy hh:mm	doy hh:mm	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(%)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(%)	(Mb)	I.
																		-1
SP_073EA_G34HEFNON176_PRIME	176 17:54	177 02:54	θ	387	51	438	3531	3093	88%	17	231	53	740	903	164	18%	0	I.
SP_073EA_G34HEFNON177_PRIME	177 21:54	178 03:54	θ	863	66	929	3568	2639	74%	0	168	35	1133	577	-556	-96%	556	I.
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	I.
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	I.
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	I.
SP_074EA_G34HEFNON180_PRIME	180 17:38	181 01:38	2098	919	51	3069	3568	500	14%	0	215	47	3331	892	-2528	-315%	2528	I.
SP_074EA_M34HEFNON181_PRIME	181 10:08	181 19:08	2528	2203	30	4761	3534 -	1228	-35%	17	300	53	3984	805	-3099	-385%	3099	I.
																		-1

Beginning of Integration:

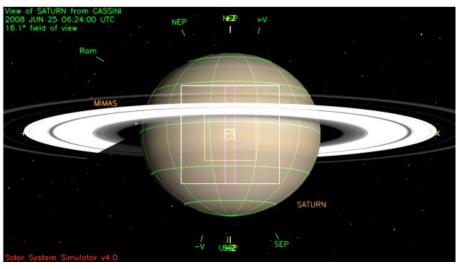
	Start	End	CAPS	CDA	CIRS	INMS	155	MAG	MIMI	RADAR	RPWS	UVIS	VIMS	PROBE	ENGR	TOTAL
Event	doy hh:mm			(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)
OBSERVATION_NOR	176 03:09			10.6	137.0	2.7	0.0	31.9	64.9	0.0	69.0	0.0	0.0	0.0	0.0	369.2
OBSERVATION_OPN	176 03:09	176 17:	54 0.0	0.0	0.0	0.0	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 02:5	54 32.4	6.5	86.4	1.6	θ.Θ	19.4	39.8	0.0	42.1	2.5	0.0	0.0	0.0	230.
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		
DBSERVATION_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.
SP_073EA_G34HEFNON177_PRIME	177 21:54	178 03:5	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.
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		
DBSERVATION_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.
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.
SP_073EA_G34BWGNON178_PRIME	178 17:54	178 22:5	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.
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		
BSERVATION_NOR	178 22:54	178 23:	54 3.6	6.7	14.4	0.2	8.8	2.2	4.4	0.0	4.7	0.3	0.0	0.0	0.0	30.
P_074EA_G34BWGNON478_PRIME	178 23:54	179 02:5	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.
DAILY TOTAL SCIENCE	178 22:54	179 02:	54 14.4	2.9	43.2	0.7	0.0	8.6	17.7	θ.θ	18.7	1.1	0.0	0.0		
DBSERVATION_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.
SP_074EA_G34HEFNON179_PRIME	179 17:53	180 02:5	53 32.4	10.9	86.4	1.6	θ.Θ	19.4	39.8	θ.Θ	42.1	2.5	0.0	0.0	0.0	235.
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		
BSERVATION_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.
BSERVATION_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.
SP_074EA_G34HEFNON180_PRIME	180 17:38	181 01:3	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.
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		
BSERVATION_NOR	181 01:38	181 10:0	98 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.
DBSERVATION_OPN	181 01:38	181 10:0	98 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.
P_074EA_M34HEFNON181_PRIME	181 10:08	181 19:0	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.
DAILY TOTAL SCIENCE	181 01:38	181 19:	88 63.0	12.5	172.8	3.2	893.3	37.5	77.4	0.0	81.3	11.9	1150.3	0.0		
APS CDA CIRS INMS	155	MAG			RPWS	UVIS	VIMS	PROBE					-		-	
			(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb)	(Mb) ((Mb) (МЬ)	(Mb)	(Mb)	(Mb)	
OTAL RECORDED (OPNAV data no	ot included	i)	489.5 1	10.3 9	74.4	24.5	2474.4	293.4	600.	5 6	.0 63	5.8	34.6 2	475.3	0.0	

No Waypoint Selection Info Available.

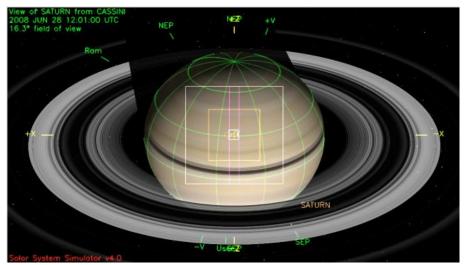
Waypoints Chosen

Saturn 73_74 Legacy

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)

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