SOST: Delivery Package for Rev 49 Rhea

Segment Boundary 2007-239T22:20:00 – 2007-242T16:34:00

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SOST Rev 49 Rhea

- Science to be accomplished during this flyby:
  - Quasi-targeted flyby of Rhea (ORS, RADAR)
  - Also an excellent Tethys opportunity
  - RADAR will measure Rhea's radar reflectivity and constrain the bulk density of the top decimeter of the surface.
  - This encounter is an excellent wake crossing for CAPS, allowing measurements of the moon-magnetosphere interaction and the composition of material sputtered off the surface. This encounter, 7.7 body radii downstream, complements the close, targeted encounter on rev 18.
  - UVIS will measure the UV albedo of both Tethys and Rhea, as well as performing searches for tenuous atmospheres.

Attitude Strategy

Request	Riders	Start(SCET)	Start(Epoch)	Duration	End(SCET)	Primary Pointing	Secondary Pointing	Comments
SP_049SA_WAYPTTURN239_PRIME	M	2007-239T22:20:00		000T00:30:00	2007-239T22:50:00	ISS_NAC to Saturn	NEG_Z to NSP	16.8 min turn from -Z to EA, +X to NEP; safe WP
NEW WAYPOINT		**2007-239T22:50:00**		**000T23:50:00**	**2007-240T22:40:00**	**ISS_NAC to Saturn**	**NEG_Z to NSP**	
UVIS_049SA_MOS49APO005_PRIME	C, M	2007-239T22:50:00		000T14:00:00	2007-240T12:50:00	ISS_NAC to Saturn	NEG_Z to NSP	
SP_049EA_DLTURN240_PRIME	C, M	2007-240T12:50:00		000T00:30:00	2007-240T13:20:00	XBAND to Earth	POS_X to NEP	17.1 min turn
SP_049EA_G34HEFOTB240_PRIME	C, M, N	2007-240T13:20:00		000T09:00:00	2007-240T22:20:00	XBAND to Earth	Rolling	
SP_049SA_WAYPTTURN240_PRIME	M	2007-240T22:20:00		000T00:20:00	2007-240T22:40:00	ISS_NAC to Saturn (0.0,0.0,10.0 deg. offset)	POS_X to NEP	11.7 min turn from -Z to EA, +X to NEP; safe WP
NEW WAYPOINT		**2007-240T22:40:00**		**000T11:35:00**	**2007-241T10:15:00**	**ISS_NAC to Saturn (0.0,0.0,10.0 deg. offset)**	**POS_X to NEP**	
CIRS_049RF_FMOVIEC001_PRIME	I, M, V	2007-240T22:40:00		000T05:10:00	2007-241T03:50:00	CIRS_FPB to Rings	POS_X to NSP	SNER-3
CIRS_049SA_COMPFT008_PRIME	M	2007-241T03:50:00		000T06:00:00	2007-241T09:50:00	ISS_NAC to Saturn	POS_X to NEP	SNER-3
SP_049TE_WAYPTTURN241_PRIME	M	2007-241T09:50:00		000T00:25:00	2007-241T10:15:00	ISS_NAC to Tethys	POS_Z to NSP	15.7 min turn; safe WP
NEW WAYPOINT		**2007-241T10:15:00**		**000T09:11:00**	**2007-241T19:26:00**	**ISS_NAC to Tethys**	**POS_Z to NSP**	
CIRS_049TE_FP1DSKIN001_PRIME	M, V	2007-241T10:15:00		000T00:45:00	2007-241T11:00:00	ISS_NAC to Tethys	POS_Z to NSP	SNER-3
ISS_049TE_MORPHO001_PRIME	C, M, U, V	2007-241T11:00:00		000T01:40:00	2007-241T12:40:00	ISS_NAC to Tethys	POS_Z to NSP	S_N_ER_-3; accommodate VIMS integration times
CIRS_049TE_FP1DSKOUT001_PRIME	M, U, V	2007-241T12:40:00		000T01:00:00	2007-241T13:40:00	ISS_NAC to Tethys	POS_Z to NSP	SNER-3
VIMS_049TE_TETHYS001_PRIME	C, M, U	2007-241T13:40:00		000T00:45:00	2007-241T14:25:00	ISS_NAC to Tethys	POS_Z to NSP	S&ER-3
ISS_049TE_COLORF001_PRIME	C, M, V	2007-241T14:40:00		000T01:00:00	2007-241T15:40:00	ISS_NAC to Tethys	POS_Z to NSP	SNER_3; accommodate VIMS integration times
UVIS_049TE_ICYLON049_PRIME	C, M, V	2007-241T15:40:00		000T00:30:00	2007-241T16:10:00	ISS_NAC to Tethys	POS_Z to NSP	S&ER-3
CIRS_049TE_FP3REGION001_PRIME	M, U, V	2007-241T16:10:00		000T00:30:00	2007-241T16:40:00	ISS_NAC to Tethys	POS_Z to NSP	SNER-5a 16:10-16:25; SNER-3.
ISS_049TE_MORPHO007_PRIME	M, U, V	2007-241T16:40:00		000T00:15:00	2007-241T16:55:00	ISS_NAC to Tethys	POS_Z to NSP	S_N_ER_-3; accommodate VIMS integration times
SP_049EA_DLTURN241_PRIME	C, M	2007-241T16:55:00		000T00:30:00	2007-241T17:25:00	XBAND to Earth	POS_X to NEP	19.9 min turn
SP_049EA_G70METALT241_PRIME	M	2007-241T17:25:00		000T01:46:00	2007-241T19:11:00	XBAND to Earth	Rolling	
SP_049RH_WAYPTTURN241_PRIME	M, R	2007-241T19:11:00		000T00:15:00	2007-241T19:26:00	ISS_NAC to Rhea	POS_X to NSP	10.2 min turn; safe WP; S&ER-5A
NEW WAYPOINT		**2007-241T19:26:00**		**000T21:08:00**	**2007-242T16:34:00**	**ISS_NAC to Rhea**	**POS_X to NSP**	
SP_049NA_DEADTIME241_PRIME	**M, R**	**2007-241T19:26:00**		**000T00:30:00**	**2007-241T19:56:00**	**ISS_NAC to Rhea**	**POS_X to NSP**	
RADAR_049RH_SCATTRAD001_PRIME	M	2007-241T19:56:58	GMB_E049_Rhea-000T05:30:00	000T02:00:00	2007-241T21:56:58	NEG_Z to Rhea	PIC	RADAR must control primary and secondary axes to obtain correct polarization.
VIMS_049RH_RHEA001_PRIME	C, M, U	2007-241T21:56:58	GMB_E049_Rhea-000T03:30:00	000T00:45:00	2007-241T22:41:58	ISS_NAC to Rhea	POS_X to NSP	S&ER-3
ISS_049RH_CRESCENT001_PRIME	C, M, U, V	2007-241T22:41:58	GMB_E049_Rhea-000T02:45:00	000T00:45:00	2007-241T23:26:58	ISS_NAC to Rhea	POS_X to NSP	S_N_ER_-3
UVIS_049RH_ICYMAP004_PRIME	C, M, V	2007-241T23:26:58	GMB_E049_Rhea-000T02:00:00	000T00:30:00	2007-241T23:56:58	ISS_NAC to Rhea	POS_X to NSP	S&ER-3
CIRS_049RH_FP1NITMAP001_PRIME	M, U, V	2007-241T23:56:58	GMB_E049_Rhea-000T01:30:00	000T00:45:00	2007-242T00:41:58	CIRS_FP1 to Rhea	POS_X to NSP	SNER-3
VIMS_049RH_RHEA002_PRIME	C, M, U	2007-242T00:41:58	GMB_E049_Rhea-000T00:45:00	000T00:30:00	2007-242T01:11:58	ISS_NAC to Rhea	POS_X to NSP	S_N_ER_3 ; S_N_ER_2 at Rhea -30 minutes
CIRS_049RH_HIRESMAP001_PRIME	M, U, V	2007-242T01:11:58	GMB_E049_Rhea-000T00:15:00	000T00:15:00	2007-242T01:26:58	CIRS_FP1 to Rhea	POS_X to NSP	SNER-2
ISS_049RH_HIGHRES001_PRIME	C, M, U, V	2007-242T01:26:58	GMB_E049_Rhea+000T00:00:00	000T01:00:00	2007-242T02:26:58	ISS_NAC to Rhea	POS_X to NSP	S_N_ER_-3
UVIS_049RH_ICYMAP005_PRIME	C, M, V	2007-242T02:26:58	GMB_E049_Rhea+000T01:00:00	000T00:45:00	2007-242T03:11:58	ISS_NAC to Rhea	POS_X to NSP	S&ER-3
CIRS_049RH_FP1DAYMAP001_PRIME	M, U, V	2007-242T03:11:58	GMB_E049_Rhea+000T01:45:00	000T00:30:00	2007-242T03:41:58	CIRS_FP1 to Rhea	POS_X to NSP	SNER-3
VIMS_049RH_RHEA003_PRIME	C, I, M, U	2007-242T03:41:58	GMB_E049_Rhea+000T02:15:00	000T02:00:00	2007-242T05:41:58	ISS_NAC to Rhea	POS_X to NSP	S&ER-3; 6x6 mosaic for ISS
CIRS_049RH_FP3DAYMAP001_PRIME	I, M, U, V	2007-242T05:41:58	GMB_E049_Rhea+000T04:15:00	000T00:45:00	2007-242T06:26:58	CIRS_FP3 to Rhea	POS_X to NSP	SNER-3
SP_049NA_DEADTIME242_PRIME	**M**	**2007-242T06:30:00**		**000T00:30:00**	**2007-242T07:00:00**	**ISS_NAC to Rhea**	**POS_X to NSP**	
SP_049EA_DLTURN242_PRIME		2007-242T07:00:00		000T00:34:00	2007-242T07:34:00	XBAND to Earth	POS_X to NEP	20.2 min turn
SP_049EA_M34BWGOPN242_PRIME	C	2007-242T07:34:00		000T02:00:00	2007-242T09:34:00	XBAND to Earth	Rolling	
SP_049EA_M70ARROPN242_PRIME	C	2007-242T09:34:00		000T04:31:00	2007-242T14:05:00	XBAND to Earth	Rolling	
SP_049EA_G70METOPN242_PRIME		2007-242T14:05:00		000T03:29:00	2007-242T17:34:00	XBAND to Earth	Rolling	

Telemetry Modes

TELEMETRY MODE REPORT

SCET	TELEMETRY MODE	REQUEST
2007-239T22:20:00	S_N_ER_3	SP_049NA_G34OBSOTB240_NA
2007-240T13:20:00	RTE_N_SPB_27650	SP_049EA_G34HEFOTB240_PRIME
2007-240T14:50:00	RTE_N_SPB_33180	SP_049EA_G34HEFOTB240_PRIME
2007-240T21:20:00	RTE_N_SPB_27650	SP_049EA_G34HEFOTB240_PRIME
2007-240T22:20:00	S_N_ER_3	SP_049NA_M34OBSALT242_NA
2007-241T16:10:00	S_N_ER_5A	SP_049NA_M34OBSALT242_NA
2007-241T16:25:00	S_N_ER_3	SP_049NA_M34OBSALT242_NA
2007-241T17:25:00	RTE_N_SPB_124425	SP_049EA_G70METALT241_PRIME
2007-241T19:11:00	S_N_ER_5A	SP_049NA_M34OBSALT442_NA
2007-241T19:56:58	S_N_ER_8	SP_049NA_M34OBSALT442_NA
2007-241T21:56:58	S_N_ER_3	SP_049NA_M34OBSALT442_NA
2007-242T00:56:58	S_N_ER_2	SP_049NA_M34OBSALT442_NA
2007-242T01:26:58	S_N_ER_3	SP_049NA_M34OBSALT442_NA
2007-242T07:34:00	RTE_N_SPB_22120	SP_049EA_M34BWGOPN242_PRIME
2007-242T09:34:00	RTE_N_SPB_110600	SP_049EA_M70ARROPN242_PRIME
2007-242T13:50:00	RTE_N_SPB_99540	SP_049EA_M70ARROPN242_PRIME
2007-242T14:05:00	RTE_N_SPB_110600	SP_049EA_G70METOPN242_PRIME
2007-242T15:20:00	RTE_N_SPB_124425	SP_049EA_G70METOPN242_PRIME

Op Modes

Request	Start Time	Epoch Relative Start Time	Duration
ENGR_049SC_DFPWTCM240_PPS	2007-240T13:19:02		000T00:00:58
ENGR_049EA_MECVRCLS001_THERM	2007-240T22:10:00		000T00:06:10
ENGR_049SC_DFPW240_PPS	2007-240T22:20:00		000T00:00:47
ENGR_049SC_RADWU241_PPS	2007-241T19:11:00		000T00:00:07
ENGR_049SC_RADRWA241_PPS	2007-241T19:41:58	GMB_E049_Rhea-000T05:45:00	000T00:00:44
ENGR_049SC_DFPW241_PPS	2007-241T21:56:21	GMB_E049_Rhea-000T03:30:37	000T00:00:37
ENGR_049EA_MECVROPN001_THERM	2007-242T07:44:00		000T00:06:10

Data Volume

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_049EA_G34HEFOTB240_PRIME	240 13:20	240 22:20	0	514	52	566	3566	2999	84%	0	164	53	783	822	39	5%	0
SP_049EA_G70METALT241_PRIME	241 17:25	241 19:11	0	939	66	1005	3568	2563	72%	0	34	10	1050	645	-405	-63%	405
SP_049EA_M34BWGOPN242_PRIME	242 07:34	242 09:34	405	2071	43	2519	3566	1047	29%	0	61	12	2592	120	-2472	-2061%	2472
SP_049EA_M70ARROPN242_PRIME	242 09:34	242 14:05	2472	0	0	2472	3566	1094	31%	0	87	27	2585	1493	-1092	-73%	1092
SP_049EA_G70METOPN242_PRIME	242 14:05	242 17:34	1092	0	0	1092	3566	2473	69%	0	50	21	1163	1246	83	7%	0

Data Volume, cont'd

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	239 22:20	240 13:20	54.0	28.1	19.2	2.7	0.0	32.4	64.5	0.0	70.7	242.6	0.0	0.0	0.0	514.4
SP_049EA_G34HEFOTB240_PRIME	240 13:20	240 22:20	32.4	16.9	9.6	1.6	0.0	19.4	38.9	0.0	42.4	2.5	0.0	0.0	0.0	163.7
DAILY TOTAL SCIENCE	239 22:20	240 22:20	86.4	45.0	28.8	4.3	0.0	51.8	103.4	0.0	113.2	245.1	0.0	0.0		
OBSERVATION_NOR	240 22:20	241 17:25	68.7	117.1	213.6	11.3	127.7	41.2	66.5	0.0	90.0	22.3	180.7	0.0	0.0	939.0
SP_049EA_G70METALT241_PRIME	241 17:25	241 19:11	6.4	9.9	0.0	0.3	0.0	3.8	5.7	0.0	8.3	0.0	0.0	0.0	0.0	34.5
DAILY TOTAL SCIENCE	240 22:20	241 19:11	75.1	127.0	213.6	11.6	127.7	45.0	72.2	0.0	98.3	22.3	180.7	0.0		
OBSERVATION_NOR	241 19:11	242 07:34	98.6	51.7	122.4	2.2	557.4	26.7	49.8	249.2	348.2	293.2	271.1	0.0	0.0	2070.5
SP_049EA_M34BWGOPN242_PRIME	242 07:34	242 09:34	7.2	3.8	28.8	0.4	0.0	4.3	6.5	0.0	9.4	0.5	0.0	0.0	0.0	60.9
SP_049EA_M70ARROPN242_PRIME	242 09:34	242 14:05	16.3	8.5	14.4	0.8	0.0	9.8	14.6	0.0	21.3	1.2	0.0	0.0	0.0	86.9
SP_049EA_G70METOPN242_PRIME	242 14:05	242 17:34	12.5	5.3	0.0	0.6	0.0	7.5	11.3	0.0	11.7	0.7	0.0	0.0	0.0	49.7
DAILY TOTAL SCIENCE	241 19:11	242 17:34	134.6	69.2	165.6	4.0	557.4	48.3	82.2	249.2	390.6	295.7	271.1	0.0		

AVERAGE DATA RATE REPORT (calculated over observation periods and downlink passes)

Event	Start doy hh:mm	End doy hh:mm	CAPS (bps)	CDA (bps)	INMS (bps)	MAG (bps)	MIMI (bps)	RPWS (bps)	UVIS (bps)
SP_049NA_G34OBSOTB240_NA	239 22:20	240 13:20	1000.0	521.1	50.0	600.0	1195.3	1310.0	4493.4
SP_049EA_G34HEFOTB240_PRIME	240 13:20	240 22:20	1000.0	520.2	50.0	600.0	1200.0	1310.0	76.0
SP_049NA_M34OBSALT242_NA	240 22:20	241 17:25	1000.0	1704.3	163.8	600.0	968.1	1310.0	324.1
SP_049EA_G70METALT241_PRIME	241 17:25	241 19:11	1000.0	1560.2	50.0	600.0	900.0	1310.0	0.0
SP_049NA_M34OBSALT442_NA	241 19:11	242 07:34	2211.3	1159.5	50.0	600.0	1117.2	7810.8	6576.9
SP_049EA_M34BWGOPN242_PRIME	242 07:34	242 09:34	1000.0	524.0	50.0	600.0	900.0	1310.0	76.0
SP_049EA_M70ARROPN242_PRIME	242 09:34	242 14:05	1000.0	519.9	50.0	600.0	899.9	1310.0	76.0
SP_049EA_G70METOPN242_PRIME	242 14:05	242 17:34	1000.0	424.7	50.0	600.0	900.0	933.9	54.2

DSN Requests

CASSINI DOWNLINK/DSN COVERAGE SUMMARY for 049RH_sp_031021.apf generated on 2003-Oct-21 11:21:05
(+ = pass overlaps with previous pass; * = in conflict with DSN weekly maintenance)

DOWNLINK PASS					DSN PASS					
NAME	START_TO_END SCET	START_TO_END ERT	DUR hh:mm	DATA_RATES kbps	ID	START_TO_END SCET	START_TO_END ERT	DUR hh:mm	CALS min	RADIO__CONFIG R UD D UD MAR
G34HEFOTB240	240T13:20-22:20	240T14:45-23:45	09:00	27,33,27	15	240T13:20-22:20	240T14:45-23:45	09:00	15/15	R XX - -- --0
G70METALT241	241T17:25-19:11	241T18:50-20:36	01:46	124	14	241T17:25-19:11	241T18:50-20:40	01:50	15/15	R XX - -- --0
M34BWGOPN242	242T07:34-09:34	242T08:59-10:59	02:00	22	54	242T07:34-09:34	242T08:55-11:00	02:05	15/15	R XX - -- --0
+M70ARROPN242	242T09:34-14:05	242T10:59-15:30	04:31	110,99	63*	242T09:34-14:05	242T10:55-15:30	04:35	15/15	R XX - -- --0
+G70METOPN242	242T14:05-17:34	242T15:30-18:59	03:29	110,124	14*	242T14:05-17:34	242T15:30-19:00	03:30	15/15	R XX - -- --0

Open Issues

- May need to try to waive DSN maintenance (Madrid *and* Goldstone 70 m antennas)

TWT/OST Integration Constraint and Guideline Checklist

Below are Target Working Team (TWT) and Orbiter Science Team (OST) constraints that must be followed during segment implementation. Any exceptions to constraint numbers 3, 4, 6, or 7 must be approved by the Science Planning Manager.

Constraint	C=Comply V=Violate N/A=Not Applicable	Comments	Disposition
1. A. SP has checked all waypoints turns to and from waypoints.	C		
B. All initial downlink attitudes have been checked as waypoints.	C		
2. All turns to and from waypoints checked for violations and margins. ☐CAPS ☐CDA ☐CIRS ☐INMS ☐ISS ☐MIMI ☐MAG ☐NAV ☐RADAR ☐RPWS ☐RSS ☐UVIS ☐VIMS Each Prime Instrument agrees to accept a reduction in observation time during implementation if problems arise.	C		
3. Custom handoffs limited to:			
A. ±3 hours from targeted Icy Satellite flyby	N/A		
B. ±3 hours from targeted Titan Flyby	N/A		
C. OpNavs preceding/following a downlink	N/A		
4. Minimum 30 min SPASS Prime request duration outside ±5 hours from targeted satellite flyby (5 min. integer duration if >30 min.)	C		
5. Live and Ground Movable Blocks include appropriate time margins.	C	K. Klaasen's margin for flyby 049RH is 30 min min. according to memo dated .	
6. Waypoints changes are ≤3 per day	C		
A. All turns that accomplish the waypoint strategy are requested by SP or OpNav.	C		
7. Live Movable Blocks limited to the following orbits: 7, 8, 9, 10, 12, 28, 51, 56, 57, 60, 63, 64	N/A		

Guideline	Yes / No	Comments
1. Were repeatable/reusable templates used where possible?	Yes	
2. During Pre-Integration: Was 30 min. used for 90º RWA turns and/or 10 min. for RCS turns?	Yes	

(DOUBLE-CLICK TO MAKE CHANGES)