S16 Rev 18 Timeline for RSS Rhea Gravity Observation

2005/330-331, Sat-Sun November 26-27, 2005
Rhea Closest Approach C/A: 2005/330-23:50 ERT

EPOCH: GMB_E018_Rhea 2005-330T22:37:39 SCET
OWLT = 01:12, RTLT = 02:24

Times below are rounded and may differ by a minute from other timelines
Closed-loop Doppler is prime for gravity. Open-loop is backup
RSR = Radio Science Receiver (open-loop receiver) RSSG = Radio Science Systems Group
RSSG: Note Telemetry Bit Rate changes during observation for possible change in SNR. Set RSR fgain accordingly. Do no change during observation

DOY	Time ERT	Date/Day PST	Time PST	Event	Comments
330	04:30	Fri 11/25	8:30 PM	DSS-25 Pre-cal	Cassini specific 4th-order pointing model, TLC enabled
	06:00		10:00 PM	DSS-25 BOT	No downlink until ~09:44 ERT
	07:20		11:20 PM	DSS-25 Transmitter ON	
	07:30		11:30 PM	DSS-26 Pre-cal	Cassini specific 4th-order pointing model
	07:45		11:45 PM	Ka-band ON (KEX & Ka-TWTA)	On-board s/c. ON prior to start of observation for thermal stabilization
	09:00	Sat 11/26	1:00 AM	DSS-26 BOT	No downlink until ~09:44 ERT
	09:24		1:24 AM	Begin S/C Turn to Earth (SOE time: 092344)	Turn by SP
	09:25		1:25 AM	*RSSG: Begin RSR recording (X & Ka)*	
	09:44		1:44 AM	End S/C Turn to Earth (SOE time: 094444)	Signal may be present shortly before 09:44 as s/c is turning to Earth
	09:44		1:44 AM	Begin 1st Segment	2-way at DSS-25, 3-way at DSS-26
				DSS-25 and DSS-26 Enable Monopulse	After 2-way lock at DSS-25, 3-way lock at DSS-26
				Note to RSSG	Telemetry Bit Rate: 35550 throughout 1st segment
	10:41		2:41 AM	DSS-25 Transmitter OFF	REAL-TIME CHANGE: 3 mins later than 10:38 time in SOE/SFOS
	11:42		3:42 AM	DSS-25 Transmitter ON	
	12:45		4:45 AM	DSS-34 Pre-cal	Cassini specific 4th-order pointing model
	13:03		5:03 AM	End 1st Segment	
				Begin S/C Turn from Earth (SOE time: 130238)	Telemetry Bit Rate: 1896
				DSS-25 and DSS-26 Disable Monopulse	At loss of Ka-band signal
	13:10		5:10 AM	RSSG: End RSR Recording (X & Ka)	
	13:45		5:45 AM	Begin S/C Turn to Earth (SOE time: 134543))	Turn by SP
	13:50		5:50 AM	*RSSG: Begin RSR recording (X & Ka)*	
	14:06		6:06 AM	End S/C Turn to Earth (SOE time: 140643)	
	14:06		6:06 AM	Begin 2nd Segment	2-way at DSS-25, 3-way at DSS-26 and DSS-34*
				DSS-25, DSS-26 and DSS-34* Enable Monopulse	After 2-way lock at DSS-25, 3-way lock at DSS-26 and DSS-34
				Note to RSSG	Telemetry Bit Rate: 35550 until 1545
	14:15		6:15 AM	DSS-34 BOT	
	14:34		6:34 AM	DSS-25 Transmitter OFF	REAL-TIME CHANGE: 3 mins later than 14:31 time in SOE/SFOS
	15:45		7:45 AM	*Note to RSSG*	Telemetry Bit Rate change: 33180 until 1640
	16:40		8:40 AM	*Note to RSSG*	Telemetry Bit Rate change: 27650 until end of 2nd segment
	16:55		8:55 AM	End 2nd Segment	
				Begin S/C Turn from Earth (SOE time: 165437)	Telemetry Bit Rate: 1896
				DSS-25, DSS-26 and DSS-34 Disable Monopulse	At loss of Ka-band signal
	17:00		9:00 AM	*RSSG: End RSR Recording (X & Ka)*	
	17:40		9:40 AM	DSS-26 EOT	May release earlier at ~1700 ERT
	18:40		10:40 AM	DSS-25 EOT	May release earlier at ~1700 ERT

	19:47		11:47 AM	DSS-34 Transmitter ON	
	20:50		12:50 PM	DSS-55 Pre-cal	4th- or 1st-order pointing model?**, TLC enabled. NO Monopulse
	21:45		1:45 PM	Begin S/C Turn to Earth (SOE time: 214540)	Turn by SP
	21:50		1:50 PM	*RSSG: Begin RSR recording (X & Ka)*	
	22:10		2:10 PM	End S/C Turn to Earth (SOE time: 221040)	
	22:10		2:10 PM	Begin 3rd Segment	2-way at DSS-34, 3-way at DSS-55*
				DSS-34 Enable Monopulse	After 2-way lock
				DSS-55 NO MONOPULSE	
				Note to RSSG	Telemetry Bit Rate: 14220 until 2300
	22:20		2:20 PM	DSS-55 BOT	
	22:45			Uplink transfer from DSS-34 to DSS-55	
				Note to RSSG	Telemetry Bit Rate change: 22120 until 2315
	23:10		3:10 PM	DSS-34 EOT	Telemetry Bit Rate change: 27650 until 2335
				DSS-34 Disable Monopulse	At loss of signal
	23:15		3:15 PM	*Note to RSSG*	
	23:27		3:27 PM	DSS-55 Transmitter Off	REAL-TIME CHANGE: 3 mins later than 23:24 time in SOE/SFOS
	23:35		3:35 PM	*Note to RSSG*	Telemetry Bit Rate change: 1896 (no playback) until 0005
	23:50		3:50 PM	Rhea Closest Approach	
331	00:05		4:05 PM	*Note to RSSG*	Telemetry Bit Rate change: 27650 until 0030
	00:30		4:30 PM	*Note to RSSG*	Telemetry Bit Rate change: 33180 until end of 3rd segment
	01:09		5:09 PM	DSS-55 switch to 2-way	
	01:44		5:44 PM	End 3rd Segment	
				Begin S/C Turn from Earth (SOE time:014334)	Telemetry Bit Rate: 1896
	01:46		5:46 PM	Ka-band OFF (KEX & Ka-TWTA)	Exact time: 014539
	01:50		5:50 PM	*RSSG: End RSR Recording (X & Ka)*	
	04:30		8:30 PM	DSS-55 Transmitter ON	
	04:46		8:46 PM	Ka-band ON (KEX & Ka-TWTA). Unique Opmode (1)	On-board s/c. ON prior to start of observation for thermal stabilization
	05:46		9:46 PM	S/C Transition to Unique Opmode. X-TWTA ON (2)	X-TWTA + RADARWA+KEX+Ka-TWTA
	05:50		9:50 PM	DSS-63 Pre-cal	
	06:46		10:46 PM	S/C Transition to Standard RSSK Opmode	
	06:50		10:50 PM	DSS-63 BOT	
	06:30		10:30 PM	DSS-55 Transmitter OFF	REAL-TIME CHANGE: 3 mins later than 06:27 time in SOE/SFOS
	06:40		10:40 PM	*RSSG: Begin RSR recording (X & Ka)*	
	06:46		10:46 PM	Begin S/C Turn to Earth (SOE time: 064538)	Turn by SP
	06:53		10:53 PM	End S/C Turn to Earth (SOE time: 065338)	
	06:53		10:53 PM	Begin 4th Segment	2-way at DSS-55, 3-way at DSS-63
				DSS-55 NO MONOPULSE	
				Note to RSSG	Telemetry Bit Rate: 142201 throughout 4th segment
	08:51	Sun 11/27	12:51 AM	End 4th Segment	
				Begin S/C Turn from Earth (SOE time: 085033)	Telemetry Bit Rate: 1896
	08:55		12:55 AM	DSS-63 EOT	
	08:55		12:55 AM	*RSSG: End RSR Recording (X & Ka)*	
	09:25		1:25 AM	Ka-band OFF (KEX & Ka-TWTA)	
	09:35		1:35 AM	DSS-55 EOT	May release earlier at ~0900 ERT

* A few minutes before BOT. 2-way signal may not be present until BOT

** Antenna Calibration Expert is assessing pointing performance from DSS-55 DOY 326 ORT, and will recommend which pointing model to use

(1) "This transition enables a unique opmode with an overlay of the Kex and KaTWTA on top of RADRWA for the last 2 hours of the RADAR activity"

(2) "This transition enables a unique opmode with an overlay of the X-TWTA on top of RADRWA+Kex+KaTWTA. MIMI must be in low power mode (approx 18 watts) and CDA may not articulate"