S73 Rev 165 Timeline for RSS Enceladus (E19) Gravity Observation

and Gravity Science Enhancements

2012/122-123, Tue-Wed, May 1-2, 2012 PDT

Enceladus Closest Approach: 2012/123-10:45 ERT

OWLT = 01:13, RTLT = ~02:26

Closed-loop Doppler is prime for gravity. Open-loop is backup

RSR = Radio Science Receiver (open-loop receiver) RSSG = Radio Science Systems Group GSE = Gravity Science Enhancement

RSSG: Note telemetry bit rate changes. Set RSR fgain accordingly and do not change during observation

DOY	Time ERT	Date/Day PDT	Time PDT	Event	Comments
				X-TWTA ON	Has been ON for days
122	00:45	Mon 4/30	5:45 PM	DSS-25 Pre-cal	Pass# 0122. Cas specific 4th-order pointing model, TLC enabled
	01:15		6:15 PM	DSS-14 Pre-cal	Pass# 0122
	02:15		7:15 PM	DSS-25 BOT	1-way
	02:15		7:15 PM	DSS-14 BOT	1-way
				Begin Inbound GSE	
	02:15		7:15 PM	Ka-band ON (KEX & Ka-TWTA)	Stays ON until end of inbound GSE
				DSS-25 Enable Monopulse	At 1-way acquisition
	02:25		7:25 PM	DSS-14 Transmitter ON	DKF time 022500
	04:50		9:50 PM	DSS-14 Tracking Mode Change	1-way to 2-way. DKF time 045040
	04:50		9:50 PM	DSS-25 Tracking Mode Change	1-way to 3-way. DKF time 045040
	08:54		1:54 AM	DSS-14 Transmitter OFF	5 minutes after DKF time 084910
	11:15		4:15 AM	Ka-band OFF	DKF time 111435
	11:15		4:15 AM	End Inbound GSE	DKF time 111451
				DSS-25 Disable Monopulse	At loss of Ka-band signal
	11:15		4:15 AM	DSS-25 EOT	
	11:15		4:15 AM	DSS-14 EOT	
122	22:00	Tue 5/1	3:00 PM	DSS-55 Pre-Cal	Pass# 0122. Cas specific 4th-order pointing model, TLC enabled
	23:30		4:30 PM	DSS-55 BOT	No signal until ~0237 ERT
123	00:00		5:00 PM	DSS-55 Acquire 1-way Signal	DKF time 235952. s/c on Earth point for ~19 minutes
	00:12		5:12 PM	DSS-55 Transmitter ON	DKF time 001107
	00:19		5:19 PM	DSS-55 Loss of Signal	DKF time 001851
	00:30		5:30 PM	DSS-25 Pre-cal	Pass# 0123. Cas specific 4th-order pointing model, TLC enabled
	00:45		5:45 PM	Ka-band ON	On board s/c. Stays ON until end of outbound GSE
	02:00		7:00 PM	DSS-25 BOT	No signal until ~0237 ERT
	02:15		4:15 AM	*RSSG: Begin RSR recordings (X & Ka)*	
	02:30		2:30 AM	*RSSG: RSR att auto*	
	02:37		7:37 PM	Begin 1st Segment - Begin Coherent Downlink	DKF time 023651
				DSS-55 Acquire 2-way Signal	
				DSS-25 Acquire 3-way signal	
				DSS-55 Enable Monopulse	As requested by RSSG
				DSS-25 Enable Monopulse	As requested by RSSG
	03:28		8:28 PM	DSS-55 Transmitter OFF	5 minutes after DKF time 032307
	04:05		9:05 PM	DSS-55 EOT	
	05:49		10:49 PM	End 1st Segment	DKF time 054852
				Begin s/c turn from Earth	
				DSS-25 Disable Monopulse	At loss of Ka-band signal
	06:10		11:10 PM	*RSSG: End RSR recordings (X & Ka)*	
	06:49		11:49 PM	DSS-25 Transmitter ON	DKF time 064837
	07:10	Wed 5/2	12:10 AM	DSS-34 Pre-cal	Pass# 0123. Cas specific 4th-order pointing model
	08:40		1:40 AM	DSS-34 BOT	No signal until ~0915 ERT

DOY	Time ERT	Date/Day PDT	Time PDT	Event	Comments
	08:45		1:45 AM	*RSSG: Begin RSR recordings (X & Ka)*	
	08:55		1:55 AM	*RSSG: RSR att auto*	
	09:15		2:15 AM	Begin 2nd Segment - Begin Coherent Downlink	DKF time 091422
				DSS-25 Acquire 2-way signal	
				DSS-34 Acquire 3-way signal	
				DSS-25 Enable Monopulse	As requested by RSSG
				DSS-34 Enable Monopulse	As requested by RSSG
	09:54		2:54 AM	DSS-25 Transmitter OFF	5 minutes after DKF time 094837
	10:45		3:45 AM	E19 Enceladus Closest Approach	Altitude 77 km
	11:50		4:50 AM	DSS-25 EOT	
	12:15		5:15 AM	End 2nd Segment	DKF time 121422
				Begin s/c turn from Earth	
				DSS-34 Disable Monopulse	At loss of Ka-band signal
	12:49		5:49 AM	DSS-34 Transmitter ON	DKF time 124837
	14:45		7:45 AM	*RSSG: Begin RSR recordings (X & Ka)*	
	14:55		7:55 AM	*RSSG: RSR att auto*	
	15:14		8:14 AM	Begin 3rd Segment - Begin Coherent Downlink	DKF time 151422
				DSS-34 Acquire 2-way signal	
				DSS-34 Enable Monopulse	As requested by RSSG
	16:07		9:07 AM	DSS-34 Transmitter OFF	5 minutes after DKF time 160208
	18:28		11:28 AM	End 3rd Segment	
				Begin s/c turn from Earth	
				DSS-34 Disable Monopulse	At loss of Ka-band signal
	18:45		11:45 AM	DSS-34 EOT	
124	01:00	Wed 5/2	6:00 PM	DSS-14 Pre-cal	Pass# 0124
	02:00		7:00 PM	DSS-14 BOT	1-way
				Begin Outbound GSE	
	02:10		7:10 PM	DSS-14 Transmitter ON	
	03:00		8:00 PM	DSS-25 Pre-cal	
	04:30		9:30 PM	DSS-25 BOT	
				DSS-25 Enable Monopulse	At 1-way acquisition
	04:36		9:36 PM	DSS-14 Tracking Mode Change	1-way to 2-way. DKF time 043545
	04:36		9:36 PM	DSS-25 Tracking Mode Change	1-way to 3-way. DKF time 043545
	10:09		3:09 AM	DSS-14 Transmitter OFF	5 minutes after DKF time 100407
	11:00		4:00 AM	Ka-band OFF	DKF time 105936
	11:00		4:00 AM	End Inbound GSE	
				DSS-25 Disable Monopulse	At loss of Ka-band signal
	11:00		4:00 AM	DSS-14 EOT	
	11:00		4:00 AM	DSS-25 EOT	

Gravity Science Enhancement (GSE) passes:

Inbound
12 122 0045 0215 1115 1130 DSS-25 CAS TP RS165-ENGSE 5326 N748 1A1
12 122 0115 0215 1115 1130 DSS-14 CAS TKG PASS 5326 N003 1A1

Outbound
12 124 0100 0200 1100 1115 DSS-14 CAS T/P E19PB 5328 N003 1A1
12 124 0300 0430 1100 1115 DSS-25 CAS RS165-EN GSE 5328 N748 1A1