

S82 Rev 202 Timeline for RSS Titan T99 Gravity Observation

and Gravity Science Enhancements

2014/064-066, Wed-Fri March 5-7, 2014 PST

Titan Closest Approach: 2014/065-17:45 ERT

OWLT = ~01:19, RTLTL = ~02:38

Canberra DSS-34 related activities

Canberra DSS-43 related activities

Madrid DSS-55 related activities

Goldstone DSS-25 related activities

Multiple stations related activities

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

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

DOY	Time ERT	Date/Day PST	Time PST	Event	Comments
				X-TWTA ON	Has been on since DOY 034
064	05:46:00	Tue, Mar 4	9:46 PM	Ka-band ON (KEX & Ka-TWTA)	ON for GSE
	12:45:00	Wed, Mar 5	4:45 AM	DSS-34 Pre-Cal	Pass# 0064. Cassini specific 4th-order pointing model
	13:15:00		5:15 AM	DSS-43 Pre-Cal	Pass# 0064
	14:00:00		6:00 AM	<i>RSSG: Begin DSS-34 RSR recordings (X & Ka)</i>	
	14:00:00		6:00 AM	<i>RSSG: Begin DSS-43 RSR recordings (X)</i>	
	14:15:00		6:15 AM	DSS-34 BOT	1-way
	14:15:00		6:15 AM	DSS-43 BOT	1-way
	14:15:00		6:15 AM	Begin Inbound GSE	
				DSS-34 Enable Monopulse	At Ka-band 1-way acquisition
	14:15:00		6:15 AM	<i>RSSG: Note telemetry B/R 124426</i>	
	14:25:00		6:25 AM	DSS-43 Transmitter ON	18 kW, Ramped uplink predicts
	15:29:51		7:29 AM	<i>RSSG: Note telemetry B/R change to 142201</i>	
	16:58:00		8:58 AM	DSS-34 Disable Monopulse without clearing offsets	Before mode switch to 3-way
	17:02:38		9:02 AM	DSS-34 Tracking mode change to 3-way w/ 43	
				DSS-34 Re-enable Monopulse	At Ka-band 3-way acquisition
	17:02:00		9:02 AM	DSS-43 Tracking mode change to 2-way	
	21:29:48		1:29 PM	<i>RSSG: Note telemetry B/R change to 124426</i>	
	21:32:13		1:32 PM	DSS-43 Transmitter OFF	
	22:59:48		2:59 PM	<i>RSSG: Note telemetry B/R change to 110601</i>	
	23:12:53		3:12 PM	Ka-band OFF	
	23:13:00		3:13 PM	DSS-34 Disable Monopulse	At loss of Ka-band signal
	23:14:49		3:14 PM	<i>RSSG: Note telemetry B/R change to 1896</i>	Expect increase in signal power of about 6.45 dB
	23:15:00		3:15 PM	End Inbound GSE	
	23:15:00		3:15 PM	DSS-34 EOT	
	23:15:00		3:15 PM	DSS-43 EOT	
	23:25:00		3:25 PM	<i>RSSG: End all Canberra RSR recordings</i>	
	23:30:00		3:30 PM	DSS-34 End of Post-Cal	
	23:30:00		3:30 PM	DSS-43 End of Post-Cal	

DOY	Time ERT	Date/Day PST	Time PST	Event	Comments
065	01:10:00	Wed, Mar 5	5:10 PM	DSS-55 Pre-Cal	Pass# 0065. Cassini specific 4th-order pointing model
	02:40:00		6:40 PM	DSS-55 BOT	No signal until 03:40:33 ERT (spacecraft off Earth-point)
	02:50:00		6:50 PM	DSS-55 Transmitter ON	18 kW, Ramped uplink predicts
	03:10:00		7:10 PM	<i>RSSG: Begin DSS-55 RSR recordings (X & Ka)</i>	
	03:40:33		7:40 PM	Spacecraft Earth pointed	
	03:40:33		7:40 PM	DSS-55 Acquire 1-way X-band signal	
				<i>RSSG: Note telemetry B/R 1896</i>	
	03:45:36		7:45 PM	Ka-band ON	ON until end of outbound GSE
	03:45:36		7:45 PM	DSS-55 Acquire 1-way Ka-band signal	
				DSS-55 Enable Monopulse	When requested by RSSG
	05:24:00		9:24 PM	DSS-55 Disable Monopulse	Before mode switch to 2-way
	05:27:00		9:27 PM	DSS-55 Tracking mode change to 2-way	DKF time 052730
				DSS-55 Re-enable Monopulse	When requested by RSSG
	05:45:34		9:45 PM	Official Start of Titan T99 Gravity Observation	Official start of observation
	05:45:34		9:45 PM	<i>RSSG: Note telemetry B/R change to 27650</i>	Expect decrease in signal power of about 6.45 dB
	06:10:00		10:10 PM	DSS-25 Pre-Cal	Pass# 0065. Cassini specific 4th-order pointing model
	06:44:46		10:44 PM	<i>RSSG: Note telemetry B/R change to 22120</i>	
	07:10:00		11:10 PM	<i>RSSG: Begin DSS-25 RSR recordings (X & Ka)</i>	
	07:40:00		11:40 PM	DSS-25 BOT	
	07:40:00		11:40 PM	DSS-25 Acquire 3-way w/ DSS-55 signal	
				DSS-25 Enable Monopulse	When requested by RSSG. Wait for ~10 degrees elevation
	08:05:00	Thu, Mar 6	12:05 AM	DSS-55/DSS-25 Uplink Transfer from 55 to 25	18 kW, Ramped uplink predicts
	08:14:45		12:14 AM	<i>RSSG: Note telemetry B/R change to 14220</i>	
	08:59:45		12:59 AM	<i>RSSG: Note telemetry B/R change to 22120</i>	
	09:05:00		1:05 AM	DSS-55 EOT	
				DSS-55 Disable Monopulse	At loss of Ka-band signal
	09:20:00		1:20 AM	DSS-55 End of Post-Cal	
	09:25:00		1:25 AM	<i>RSSG: End DSS-55 RSR recordings (X & Ka)</i>	
	09:29:45		1:29 AM	<i>RSSG: Note telemetry B/R change to 27650</i>	
	10:39:00		2:39 AM	DSS-25 Disable Monopulse without clearing offsets	Before mode switch to 2-way
	10:42:27		2:42 AM	DSS-25 Tracking mode change to 2-way	
				DSS-25 Re-enable Monopulse	When requested by RSSG
	11:00:00		3:00 AM	DSS-34 Pre-Cal	Pass# 0065. Cassini specific 4th-order pointing model
	12:00:00		4:00 AM	<i>RSSG: Begin DSS-34 RSR recordings (X & Ka)</i>	
	12:30:00		4:30 AM	DSS-34 BOT	
	12:30:00		4:30 AM	DSS-34 Acquire 3-way with DSS-25 signal	
				DSS-34 Enable Monopulse	When requested by RSSG. Wait for ~10 degrees elevation
	12:40:00		4:40 AM	DSS-25/DSS-34 Uplink Transfer from 25 to 34	18 kW, Ramped uplink predicts
	14:59:43		6:59 AM	<i>RSSG: Note telemetry B/R change to 22120</i>	
	15:17:25		7:17 AM	DSS-25 Tracking mode change to 3-way w/ 34	
	15:17:25		7:17 AM	DSS-34 Tracking mode change to 2-way	
	16:44:43		8:44 AM	<i>RSSG: Note telemetry B/R change to 33180</i>	
	16:55:00		8:55 AM	DSS-25 EOT	
				DSS-25 Disable Monopulse	At loss of Ka-band signal
	17:10:00		9:10 AM	DSS-25 End of Post-Cal	

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	17:20:00		9:20 AM	RSSG: End DSS-25 RSR recordings (X & Ka)	
	17:45:30		9:45 AM	T99 Titan Closest Approach	Altitude 1500 km
	21:59:42		1:59 PM	RSSG: Note telemetry B/R change to 27650	
	22:50:00		2:50 PM	DSS-55 Pre-Cal	Pass# 0065. Cassini specific 4th-order pointing model
	23:29:41		3:29 PM	RSSG: Note telemetry B/R change to 22120	
	23:50:00		3:50 PM	RSSG: Begin DSS-55 RSR recordings (X & Ka)	
	23:59:41		3:59 PM	RSSG: Note telemetry B/R change to 14220	
066	00:20:00		4:20 PM	DSS-55 BOT	
				DSS-55 Acquire 3-way w/ DSS-34 signal	
				DSS-55 Enable Monopulse	When requested by RSSG. Wait for ~10 degrees elevation
	00:26:15		4:26 PM	DSS-34 Transmitter OFF	
	00:45:00		4:45 PM	DSS-55 Transmitter ON	18 kW, Ramped uplink predicts
	00:45:00		4:45 PM	DSS-34 EOT	
				DSS-34 Disable Monopulse	At loss of Ka-band signal
	01:00:00		5:00 PM	DSS-34 End of Post-Cal	
	01:05:00		5:05 PM	RSSG: End DSS-34 RSR recordings (X & Ka)	
	01:14:41		5:14 PM	RSSG: Note telemetry B/R change to 22120	
	02:29:40		6:29 PM	RSSG: Note telemetry B/R change to 27650	
	03:00:00		7:00 PM	DSS-55 Disable Monopulse without clearing offsets	Before mode switch to 1-way
	03:03:33		7:03 PM	DSS-55 Tracking mode change to 1-way	Begin coherent data gap
				DSS-55 Re-enable Monopulse	When requested by RSSG
	03:13:00		7:13 PM	DSS-55 Transmitter OFF	5 minutes after DKF time 030808
	03:19:00		7:19 PM	DSS-55 Disable Monopulse without clearing offsets	Before mode switch to 2-way
	03:22:18		7:22 PM	DSS-55 Tracking mode change to 2-way	End coherent data gap
				DSS-55 Re-enable Monopulse	When requested by RSSG
	05:45:25		9:45 PM	End Titan T99 Gravity Observation - End Coherent Data	
	05:45:25		9:45 PM	Begin turn from Earth	
				DSS-55 Disable Monopulse	At loss of Ka-band signal
	05:45:25		9:45 PM	RSSG: Note telemetry B/R change to 1896	
	06:05:00		10:05 PM	RSSG: End DSS-55 RSR recordings (X & Ka)	
	06:15:00		10:15 PM	DSS-55 EOT	
	06:30:00		10:30 PM	DSS-55 End of Post-Cal	
066	10:30:00	Fri, Mar 7	2:30 AM	DSS-25 Pre-cal	Pass# 0066. Cassini specific 4th-order pointing model
	12:00:00		4:00 AM	DSS-25 BOT	No signal until 13:04:36 ERT (spacecraft off Earth-point)
	12:10:00		4:10 AM	DSS-25 Transmitter ON	18 kW, Ramped uplink predicts
	12:10:00		4:10 AM	DSS-34 Pre-Cal	Pass# 0066. Cassini specific 4th-order pointing model
	12:30:00		4:30 AM	RSSG: Begin DSS-25 RSR recordings (X & Ka)	
	12:40:00		4:40 AM	DSS-43 Pre-Cal	Pass# 0066
	13:04:36		5:04 AM	Spacecraft Earth-pointed	
	13:04:36		5:04 AM	Begin Outbound GSE	
	13:04:36		5:04 AM	DSS-25 Acquire 1-way signal	
				DSS-25 Enable Monopulse	At Ka-band 1-way acquisition
	13:04:36		5:04 AM	RSSG: Note telemetry B/R 1896	
	13:25:00		5:25 AM	RSSG: Begin DSS-34 RSR recordings (X & Ka)	
	13:25:00		5:25 AM	RSSG: Begin DSS-43 RSR recordings (X)	

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	13:40:00		5:40 AM	DSS-34 BOT	1-way
	13:40:00		5:40 AM	DSS-43 BOT	1-way
	13:50:00		5:50 AM	DSS-25/DSS-43 Uplink Transfer from 25 to 43	18 kW, Ramped uplink predicts
	13:59:38		5:59 AM	<i>RSSG: Note telemetry B/R change to 124426</i>	Expect decrease in signal power of about 6.45 dB
	14:00:00		6:00 AM	DSS-25 EOT	
				DSS-25 Disable Monopulse	At loss of Ka-band signal
	14:10:00		6:10 AM	<i>RSSG: End DSS-25 RSR recordings (X & Ka)</i>	
	14:15:00		6:15 AM	DSS-25 End of Post-Cal	
	14:44:00		6:44 AM	DSS-34 Disable Monopulse without clearing offsets	Before mode switch to 3-way
	14:47:13		6:47 AM	DSS-34 Tracking mode change to 3-way w/ 25	
				DSS-34 Re-enable Monopulse	At Ka-band 3-way acquisition
	14:47:13		6:47 AM	DSS-43 Tracking mode change to 3-way w/ 25	
	14:59:38		6:59 AM	<i>RSSG: Note telemetry B/R change to 142201</i>	
	16:27:12		8:27 AM	DSS-34 Tracking mode change to 3-way w/ 43	
	16:27:12		8:27 AM	DSS-43 Tracking mode change to 2-way	
	20:22:25		12:22 PM	DSS-43 Transmitter OFF	
	21:59:35		1:59 PM	<i>RSSG: Note telemetry B/R change to 124426</i>	
	22:59:18		2:59 PM	Ka-band OFF	
				DSS-34 Disable Monopulse	At loss of Ka-band signal
	22:59:34		2:59 PM	End Outbound GSE	
	22:59:34		2:59 PM	<i>RSSG: Note telemetry B/R change to 1896</i>	
	23:00:00		3:00 PM	DSS-34 EOT	
	23:00:00		3:00 PM	DSS-43 EOT	
	23:10:00		3:10 PM	<i>RSSG: End all Canberra RSR recordings</i>	
	23:15:00		3:15 PM	DSS-34 End of Post-Cal	
	23:15:00		3:15 PM	DSS-43 End of Post-Cal	