

S95 Rev 239 Timeline for RSS Titan T122 Gravity Observation

and Gravity Science Enhancements

2016/222-224, Tue-Thu Aug 9-11, 2016 PDT

Titan Closest Approach: 2016/223-09:51 ERT

OWLT = ~01:20, RTLT = ~02:40

Canberra DSS-35 related activities
Madrid DSS-55 related activities
Goldstone DSS-25 related activities
New Norcia DSS-74 related activities
Canberra DSS-43 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 fgain accordingly and do not change during observation

Time ERT	Time PDT	Event	Comments
DOY 222 August 9			
15:30:00	8:30 AM	Ka-band ON (KEX & Ka-TWTA)	ON until end of outbound GSE. X-TWTA has been ON since DOY 207
16:00:00	9:00 AM	DSS-55 Pre-Cal	Pass# 0222. Cassini specific 4th-order pointing model
17:10:00	10:10 AM	RSSG: Begin DSS-55 RSR recordings (X & Ka)	
17:30:00	10:30 AM	DSS-55 BOT	1-way
17:30:00	10:30 AM	DSS-55 Acquire X- and Ka-band signals 1-way	
		DSS-55 Enable Monopulse	At Ka-band 1-way acquisition
17:30:00	10:30 AM	Begin Inbound GSE	
17:30:00	10:30 AM	RSSG: Note telemetry B/R 22120	
17:40:00	10:40 AM	DSS-55 Transmitter ON	18 kW, Ramped uplink predicts
18:45:00	11:45 AM	RSSG: Note telemetry B/R change to 27650	
20:14:59	1:14 PM	RSSG: Note telemetry B/R change to 22120	
20:17:00	1:17 PM	DSS-55 Disable Monopulse without clearing the offsets	Before mode switch to 2-way
20:19:56	1:19 PM	DSS-55 Tracking mode change to 2-way	
		DSS-55 Enable Monopulse	At Ka-band 2-way acquisition
21:10:00	2:10 PM	DSS-25 Pre-Cal	Pass# 0222. Cassini specific 4th-order pointing model
22:30:00	3:30 PM	RSSG: Note telemetry B/R change to 14220	
22:10:00	3:10 PM	RSSG: Begin DSS-25 RSR recordings (X & Ka)	
22:40:00	3:40 PM	DSS-25 BOT	
22:40:00	3:40 PM	DSS-25 Acquire X & Ka-band signals 3-way with DSS-55	
		DSS-25 Enable Monopulse	When requested by RSSG. Wait for ~10 degrees elevation
23:10:00	4:10 PM	DSS-25 Transmitter ON Uplink transfer from DSS-55	18 kW, Ramped uplink predicts
23:10:05	4:10 PM	DSS-55 Transmitter OFF, Uplink transfer to DSS-25	
23:29:59	4:29 PM	RSSG: Note telemetry B/R change to 1896	
23:30:00	4:30 PM	DSS-55 EOT	
23:30:00	4:30 PM	End Inbound GSE	
23:45:00	4:45 PM	DSS-55 End of Post-Cal	
23:50:00	4:50 PM	RSSG: End DSS-55 RSR recordings (X & Ka)	
DOY 223			
00:33:00	5:33 PM	Official Start of Titan T122 Gravity Observation	Official start of observation
00:33:39	5:33 PM	RSSG: Note telemetry B/R change to 22120	Expect decrease in signal power of about 6.45 dB

Time ERT	Time PDT	Event	Comments
01:00:02	6:00 PM	RSSG: Note telemetry B/R change to 27650	
01:40:00	6:40 PM	DSS-35 Pre-Cal	Pass# 0223. Cassini specific 4th-order pointing model
01:50:00	6:50 PM	DSS-25 Acquire X & Ka-band signals 2-way	
02:50:00	7:50 PM	RSSG: Begin DSS-35 RSR recordings (X & Ka)	
03:10:00	8:10 PM	DSS-35 BOT	
03:10:00	8:10 PM	DSS-35 Acquire X- and Ka-band 3-way with DSS-25	
		DSS-35 Enable Monopulse	When requested by RSSG. Wait for ~10 degrees elevation
03:35:00	8:35 PM	DSS-35 Transmitter ON, Uplink transfer from DSS-25	18 kW, Ramped uplink predicts
03:35:05	8:35 PM	DSS-25 Transmitter OFF, Uplink transfer to DSS-35	
05:15:02	10:15 PM	RSSG: Note telemetry B/R change to 22120	
06:15:02	11:15 PM	DSS-25 Tracking mode change to 3-way w/ 35	
06:15:02	11:15 PM	DSS-35 Tracking mode change to 2-way	
06:30:03	11:30 PM	RSSG: Note telemetry B/R change to 14220	
		August 10	
07:30:00	12:30 AM	DSS-25 EOT	
		DSS-25 Disable Monopulse	At loss of Ka-band signal
07:30:00	12:30 AM	DSS-74 Pre-Cal	
07:30:00	12:30 AM	RSSG: Note telemetry B/R change to 33180	
07:45:00	12:45 AM	DSS-25 End of Post-Cal	
07:50:00	12:50 AM	RSSG: End DSS-25 RSR recordings (X & Ka)	
08:30:00	1:30 AM	DSS-74 BOT	
08:30:00	1:30 AM	DSS-74 Acquire X-band signal 3-way w/ DSS-35	
09:51:00	2:51 AM	T122 Titan Closest Approach	Altitude 1700 km
11:30:00	4:30 AM	DSS-74 EOT	
11:45:00	4:45 AM	DSS-74 End of Post-Cal	
12:15:05	5:15 AM	RSSG: Note telemetry B/R change to 27650	
13:55:00	6:55 AM	DSS-55 Pre-Cal	Pass# 0223. Cassini specific 4th-order pointing model
14:15:05	7:15 AM	RSSG: Note telemetry B/R change to 22120	
15:00:05	8:00 AM	RSSG: Note telemetry B/R change to 14220	
15:05:00	8:05 AM	RSSG: Begin DSS-55 RSR recordings (X & Ka)	
15:25:00	8:25 AM	DSS-55 BOT	
		DSS-55 Acquire X- & Ka-band singals 3-way w/ DSS-35	
		DSS-55 Enable Monopulse	When requested by RSSG. Wait for ~10 degrees elevation
15:25:30	8:25 AM	DSS-35 Transmitter OFF	
15:45:00	8:45 AM	DSS-35 EOT	
		DSS-35 Disable Monopulse	At loss of Ka-band signal
15:55:00	8:55 AM	DSS-55 Transmitter ON	18 kW, Ramped uplink predicts
16:00:00	9:00 AM	DSS-35 End of Post-Cal	
16:05:00	9:05 AM	RSSG: End DSS-35 RSR recordings (X & Ka)	
16:30:07	9:30 AM	RSSG: Note telemetry B/R change to 22120	
18:03:00	11:03 AM	DSS-55 Disable Monopulse without clearing the offsets	Before mode switch to 1-way
18:05:40	11:05 AM	DSS-55 Tracking mode change to 1-way	Begin coherent data gap
		DSS-55 Enable Monopulse	When requested by RSSG
18:33:00	11:33 AM	DSS-55 Disable Monopulse without clearing the offsets	Before mode switch to 2-way
18:35:10	11:35 AM	DSS-55 Tracking mode change to 2-way	End coherent data gap
		DSS-55 Enable Monopulse	When requested by RSSG
18:45:06	11:45 AM	RSSG: Note telemetry B/R change to 27650	

Time ERT	Time PDT	Event	Comments
19:10:47	12:10 PM	DSS-55 Transmitter OFF	
20:15:07	1:15 PM	RSSG: Note telemetry B/R change to 22120	
21:50:59	2:50 PM	End Titan T122 Gravity Observation - End Coherent Data	
21:50:59	2:50 PM	Begin turn from Earth	
21:50:59	2:50 PM	DSS-55 Loss of X- and Ka-band signals	
		DSS-55 Disable Monopulse	At loss of Ka-band signal
21:51:00	2:51 PM	RSSG: Note telemetry B/R change to 1896	
22:10:00	3:10 PM	RSSG: End DSS-55 RSR recordings (X & Ka)	
22:30:00	3:30 PM	DSS-55 EOT	
22:45:00	3:45 PM	DSS-55 End of Post-Cal	
DOY 224			
03:15:00	8:15 PM	DSS-35 Pre-Cal	Pass# 0224. Cassini specific 4th-order pointing model
04:25:00	9:25 PM	RSSG: Begin DSS-35 RSR recordings (X & Ka)	
04:45:00	9:45 PM	DSS-35 BOT	1-way
04:45:00	9:45 PM	DSS-35 Acquire X- and Ka-band signals 1-way	
		DSS-35 Enable Monopulse	At Ka-band 1-way acquisition
04:45:00	9:45 PM	Begin Outbound GSE	
04:45:00	9:45 PM	DSS-43 Pre-Cal	Pass# 0224
04:45:08	9:45 PM	RSSG: Note telemetry B/R 1896	
04:55:00	9:55 PM	DSS-35 Transmitter ON	18 kW, Ramped uplink predicts
05:25:00	10:25 PM	RSSG: Begin DSS-43 RSR recordings (X)	
05:45:00	10:45 PM	DSS-43 BOT	
05:45:00	10:45 PM	DSS-43 Acquire X-band signal 1-way	
05:45:10	10:45 PM	RSSG: Note telemetry B/R change to 124426	Expect decrease in signal power of about 6.45 dB
06:00:11	11:00 PM	RSSG: Note telemetry B/R change to 142201	
	August 11		
07:33:00	12:33 AM	DSS-35 Disable Monopulse without clearing the offsets	Before mode switch to 2-way
07:35:18	12:35 AM	DSS-35 Tracking mode change to 2-way	
		DSS-35 Enable Monopulse	At Ka-band 2-way acquisition
07:35:18	12:35 AM	DSS-43 Tracking mode change to 3-way w/ 35	
11:15:00	4:15 AM	DSS-43 EOT	
11:15:11	4:15 AM	RSSG: Note telemetry B/R change to 1896	Expect increase in signal power of about 6.45 dB
11:30:00	4:30 AM	DSS-43 End of Post-Cal	
11:35:00	4:35 AM	RSSG: End DSS-43 RSR recordings (X)	
11:34:49	4:34 AM	DSS-35 Transmitter OFF	
13:35:00	6:35 AM	Begin RWA bias	
13:43:17	6:43 AM	Ka-band OFF	
		DSS-35 Disable Monopulse	At loss of Ka-band signal
13:45:00	6:45 AM	End RWA bias	
13:45:00	6:45 AM	End Outbound GSE	
13:45:00	6:45 AM	DSS-35 EOT	
14:00:00	7:00 AM	DSS-35 End of Post-Cal	
14:05:00	7:05 AM	RSSG: End DSS-35 RSR recordings (X & Ka)	