Timeline for Cassini Rev 251: 2-Way RSS Saturn's Ring Chord Occultation

December 5, 2016 UTC (DOY-340)

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	ERT UTC OWLT = 01:31:45	SCET	PST ERT-8hrs 08:00:00	Comments
DOY 2016-339				
RSSG: Load 1-W Predicts, 2-W, and 3-W Frequency Predicts				
DSS-34: Begin Pre-Cal	19:15:00	17:43:15	11:15:00	Support of OTM BU
RSSG: Begin DSS-34 1 & 16 KHz Open-Loop Recordings	20:15:00	18:43:15	12:15:00	
DSS-34: Beginning Of Track	20:45:00	19:13:15	12:45:00	
DSS-34: Begin X-band 1-Way Acquisition	20:45:00	19:13:15	12:45:00	Spacecraft is Earth pointed
DSS-34: Transmitter ON, 18 kW, LCP, RAMP, SWEEP	**20:55:00**	19:23:15	12:55:00	Per DKF
DSS-34: Begin X-band 2-Way Acquisition	23:58:26	22:26:41	15:58:26	Per DKF
DOY 2016-340				
DSS-43: Begin Pre-Cal	00:30:00	22:58:15	16:30:00	
DSS-74: Begin Pre-Cal	00:45:00	23:13:15	16:45:00	
RSSG: Begin DSS-43 1 & 16 KHz Open-Loop Recordings	01:00:00	23:28:15	17:00:00	
DSS-43: Beginning Of Track	01:30:00	23:58:15	17:30:00	Spacecraft is Earth pointed; downlink X-band detectable
DSS-43: Begin X-band 3-Way Acquisition (w/DSS-34)	01:30:00	23:58:15	17:30:00	PC/N0 (X-70m TLM ON) = 43 dB-Hz
DSS-74: Beginning Of Track	01:30:00	23:58:15	17:30:00	
DSS-74: Begin X-band 3-Way Acquisition (w/DSS-34)	01:30:00	23:58:15	17:30:00	
DSS-43: Transmitter ON, 18 kW, LCP, RAMP	**01:40:00**	00:08:15	17:40:00	Uplink transfer from DSS-34 to DSS-43. Per DKF
DSS-34: Transmitter OFF	**01:40:05**	00:08:20	17:40:05	
DSS-43: Transmitter OFF	**02:41:30**	01:09:45	18:41:30	Transmitter off time = start of 1-way baseline - RTLT
RSSG: Begin All DSS-43 and DSS-34 Open-Loop Recordings	02:45:00	01:13:15	18:45:00	1 & 16 KHz are already recording
S-Band ON	02:52:13	01:20:28	18:52:13	Via real-time commands
DSS-43: Begin S-band 3-Way Acquisition (w/DSS-34)	02:52:13	01:20:28	18:52:13	PC/N0 (S-70m) = 42 dB-Hz
DSS-74: Begin S-band 3-Way Acquisition (w/DSS-34)	02:52:13	01:20:28	18:52:13	
DSS-43: Transmitter ON, 18 kW, LCP, RAMP, SWEEP	**02:55:00**	01:23:15	18:55:00	Transmitter on time = start of 2- & 3-way baseline - RTLT
Ka-Band ON	02:57:09	01:25:24	18:57:09	Via real-time commands
Start of Thermal Stabilization Period	02:57:09	01:25:24	18:57:09	
DSS-34: Begin Ka-band 2-Way Acquisition	02:57:09	01:25:24	18:57:09	PC/N0 (Ka-34m) = 48 dB-Hz
DSS-34: Enable Monopulse	TBD			Enable Monopulse only when requested by RS Operations
DSS-43: Begin X- and S-band 2-Way Acquisition	04:43:30	03:11:45	20:43:30	PC/N0 (X-70m TLM ON, S-70m) = 43 dB-Hz, 42 dB-Hz
DSS-34: Begin X- and Ka-band 3-Way Acquisition (w/DSS-43)	04:43:30	03:11:45	20:43:30	PC/N0 (X-34m TLM ON, Ka-34m) = 37 dB-Hz, 48 dB-Hz
DSS-74: Begin X- and S-band 3-Way Acquisition (w/DSS-43)	04:43:30	03:11:45	20:43:30	

Event		Time 1		Time 2	Time 3	Notes
Redundant S-band On Commands		05:43:13		04:11:28	21:43:13	Per PEF. In background sequence
DSS-34: Disable Monopulse Without Clearing the Offsets		05:43:00		04:11:15	21:43:00	Prior to mode switch to 1-way
End of Thermal Stabilization Period		05:44:44		04:12:59	21:44:44	
Official Start of Rev251 Ring Occultation Experiment		05:44:45		04:13:00	21:44:45	
RNG OFF/TLM OFF		05:44:48		04:13:03	21:44:48	X-band signal level increase
Start 1-Way Baseline (~14 min)		05:45:00		04:13:15	21:45:00	
DSS-43: Begin X- & S-band 1-Way Acquisition		05:45:00		04:13:15	21:45:00	PC/N0 (X-70m TLM OFF, S-70m) = 54, 42 dB-Hz
DSS-34: Begin X- & Ka-band 1-Way Acquisition		05:45:00		04:13:15	21:45:00	PC/N0 (X-34m TLM OFF, Ka-34m) = 48, 48 dB-Hz
DSS-74: Begin X- and S-band 1-Way Acquisition		05:45:00		04:13:15	21:45:00	
Redundant Ka-band On Commands		05:48:09		04:16:24	21:48:09	Per PEF. In background sequence
RSSG: Enter 1-Way Open-Loop Frequency Offsets as Needed						
End 1-Way Baseline, Start 2-Way/3-Way Baseline		05:57:00		04:25:15	21:57:00	
RSSG: Clear 1-Way Open-Loop Frequency Offsets						
DSS-43: Begin X- & S-band 2-Way Acquisition		05:58:30		04:26:45	21:58:30	PC/N0 (X-70m TLM OFF, S-70m) = 54, 42 dB-Hz
DSS-34: Begin X- & Ka-band 3-Way Acquisition (w/DSS-43)		05:58:30		04:26:45	21:58:30	PC/N0 (X-34m TLM OFF, Ka-34m) = 48, 48 dB-Hz
DSS-74: Begin X- and S-band 3-Way Acquisition (w/DSS-43)		05:58:30		04:26:45	21:58:30	
DSS-34: Enable Monopulse		05:58:40		04:26:55	21:58:40	Enable Monopulse only when requested by RS Operations
Ring F		06:27:07		04:55:22	22:27:07	Approx. time; Ring F is usually not detectable in real-time
Ring A In		06:35:50		05:04:05	22:35:50	Approximate time
DSS-55: Begin Pre-Cal		06:55:00		05:23:15	22:55:00	
DSS-34: Disable Monopulse		07:05:00		05:33:15	23:05:00	Disable Monopulse only when requested by RS Operations
Ring A Out		07:16:14		05:44:29	23:16:14	
DSS-63: Begin Pre-Cal		07:25:00		05:53:15	23:25:00	
Ring B in		07:30:07		05:58:22	23:30:07	Potential loss of 2-Way signals over parts of Ring B
RSSG: Begin DSS-63 & DSS-55 Open-Loop Recordings		07:55:00		06:23:15	23:55:00	
DSS-63 & DSS-55: Beginning Of Track		08:25:00		06:53:15	00:25:00	
DSS-63: Begin X- & S-band 3-Way Acquisition (w/DSS-43)		08:25:00		06:53:15	00:25:00	PC/N0 (X-70m, S-34m) = 54, 42 dB-Hz
DSS-55: Begin X- & Ka-band 3-Way Acquisition (w/DSS-43)		08:25:00		06:53:15	00:25:00	PC/N0 (X-34m, Ka-34m) = 48, 48 dB-Hz
DSS-74: Transmitter ON, 18 kW, LCP, RAMP		**08:26:00**		06:54:15	00:26:00	**NO SWEEP**; Uplink transfer from DSS-43 to DSS-74
DSS-43: Transmitter OFF		**08:26:05**		06:54:20	00:26:05	
DSS-43 & DSS-34: End Of Track		08:45:00		07:13:15	00:45:00	
DSS-63 Transmitter ON, 18 kW, LCP, RAMP		**08:52:00**		07:20:15	00:52:00	**NO SWEEP**; Uplink transfer from DSS-74 to DSS-63
DSS-74: Transmitter OFF		**08:52:05**		07:20:20	00:52:05	
DSS-43 & DSS-34: End Of Post-Cal		09:00:00		07:28:15	01:00:00	
DSS-74: End Of Track		09:15:00		07:43:15	01:15:00	
DSS-74: End of Post-Cal		09:30:00		07:58:15	01:30:00	
RSSG: End DSS-43 & DSS-34 Open-Loop Recordings		09:30:00		07:58:15	01:30:00	
Rings Turn Around Time		09:31:01		07:59:16	01:31:01	Center of the chord occultation track

Activity						Comment
DSS-63 Transmitter OFF		**10:40:00**		09:08:15	02:40:00	Transmitter off time = End of DSS-63 2-way baseline - RTLT
Uplink Transfer from DSS-43 to DSS-74 Observed		11:29:30		09:57:45	03:29:30	
DSS-63: Begin X- & S-band 3-Way Acquisition (w/DSS-74)		11:29:30		09:57:45	03:29:30	PC/N0 (X-70m, S-70m) = 54, 42 dB-Hz
DSS-55: Begin X- & Ka-band 3-Way Acquisition (w/DSS-74)		11:29:30		09:57:45	03:29:30	PC/N0 (X-34m, Ka-34m) = 48, 48 dB-Hz
Ring B Out		11:31:42		09:59:57	03:31:42	
Ring A in		11:45:31		10:13:46	03:45:31	
RSSG: Switch Predicts		11:51:47		10:20:02	03:51:47	
Uplink Transfer from DSS-74 to DSS-63 Observed		11:55:30		10:23:45	03:55:30	
DSS-63: Begin X- & S-band 2-Way Acquisition		11:55:30		10:23:45	03:55:30	PC/N0 (X-70m, S-70m) = 54, 42 dB-Hz
DSS-55: Begin X- & Ka-band 3-Way Acquisition (w/DSS-63)		11:55:30		10:23:45	03:55:30	PC/N0 (X-34m, Ka-34m) = 48, 48 dB-Hz
DSS-55: Enable Monopulse		11:57:00		10:25:15	03:57:00	Enable monopulse only when requested by RS Operations
Ring A out		12:25:43		10:53:58	04:25:43	All signals back to full strength (free-space) levels
Ring F		12:34:23		11:02:38	04:34:23	Approx. time; Ring F is usually not detectable in real-time
Begin 2-Way Baseline		12:34:24		11:02:39	04:34:24	
DSS-55: Disable Monopulse Without Clearing the Offsets		13:42:00		12:10:15	05:42:00	Prior to mode switch to 1-way
End 2-Way/3-Way Baseline, Start ~20 min 1-Way Baseline		13:43:30		12:11:45	05:43:30	
DSS-63: Begin X- & S-band 1-Way Acquisition		13:43:30		12:11:45	05:43:30	PC/N0 (X-70m, S-70m) = 54, 42 dB-Hz
DSS-55: Begin X- & Ka-band 1-Way Acquisition		13:43:30		12:11:45	05:43:30	PC/N0 (X-34m, Ka-34m) = 48, 48 dB-Hz
RSSG: Enter 1-Way Open-Loop Frequency Offsets as Needed						
S-Band OFF		14:03:53		12:32:08	06:03:53	Per PEF
Ka-Band OFF		14:03:55		12:32:10	06:03:55	Per PEF
TLM ON/RNG ON		14:04:39		12:32:54	06:04:39	
End of Rev 251 RSS Ring Occultation Experiment		14:04:45		12:33:00	06:04:45	
Begin Spacecraft Turn From Earth Point		14:04:45		12:33:00	06:04:45	
DSS-63 & DSS-55: End Of Track		14:30:00		12:58:15	06:30:00	
RSSG: End DSS-63 & DSS-55 Open-Loop Recordings		14:35:00		13:03:15	06:35:00	
DSS-63 & DSS-55: End Of Post-Cal		14:45:00		13:13:15	06:45:00	

Canberra DSS-43 & DSS-34 related activities

New Norcia DSS-74 Activities

Madrid DSS-55 & DSS-63 related activities

Predicted rings event times are approximate and are based on Ref Traj 150901