Timeline for Cassini Rev 255: 2-Way RSS Saturn's Ring & Atmospheric Occultations

January 03, 2016 UTC (DOY-003)

Essam Marouf & Aseel Anabtawi 12/29/2016 (v2)

	ERT UTC OWLT = 01:31:10	SCET	PST ERT-8hrs 08:00:00	Comments
DOY 2017-002				
RSSG: Load 1-W, 2-W, and 3-W Frequency Predicts				
DSS-43: Begin Pre-Cal	20:15:00	18:43:50	12:15:00	
DSS-43: Beginning Of Track	21:15:00	19:43:50	13:15:00	No downlink signals detectable
DSS-43 Transmitter ON, 18 kW, LCP, RAMP, NO SWEEP	**22:17:35**	20:46:25	14:17:35	
S-Band ON	22:31:58	21:00:48	14:31:58	Per PEF
DSS-34: Begin Pre-Cal	22:35:00	21:03:50	14:35:00	
Ka-Band ON	22:36:54	21:05:44	14:36:54	Per PEF
DOY 2017-003				
RSSG: Begin DSS-43 and DSS-35 Open-Loop Recordings	00:00:00	22:28:50	16:00:00	
DSS-34: Beginning Of Track	00:05:00	22:33:50	16:05:00	No downlink signals detectable
Spacecraft is Behind Saturn				No Detectable X/S/Ka downlink signals
RNG OFF	00:36:10	23:05:00	16:36:10	
Start of Rev 255 Egress Atmospheric Occultation	00:36:10	23:05:00	16:36:10	No Detectable X/S/Ka downlink signals
TLM OFF	00:36:11	23:05:01	16:36:11	
End of Turn to Egress Occultation IVD	00:59:14	23:28:04	16:59:14	
Start Tracking Saturn's Limb	00:59:14	23:28:04	16:59:14	Likely weak 1-way S-band signal detectable
DSS-43: Begin S-Band 1-Way Acquisition	00:59:14	23:28:04	16:59:14	Weak and scintillating S-band Signal; ~1.4° BA
RSSG: Enter 1-Way Open-Loop Frequency Offsets as Needed				
Weak S-band signal at DSS-43 (~1.35° BA)	01:19:55	23:48:45	17:19:55	Approx. time; 1-Way until X-band uplink lock, then 2-Way
DSS-43: Begin S-Band 2-Way Acquisition	01:19:55	23:48:45	17:19:55	Scintillating signal; DST may go in and out of lock
Weak X-band signal (~1.2° BA)	01:42:15	00:11:05	17:42:15	Approx. time; 1-Way until X-band uplink lock, then 2-Way
DSS-43: Begin X-Band 2-Way Acquisition	01:42:15	00:11:05	17:42:15	
DSS-34: Begin X-Band 3-Way Acquisition (w /DSS-43)	01:42:15	00:11:05	17:42:15	
Weak Ka-band signal (~1.0° BA) at DSS-35	02:01:45	00:30:35	18:01:45	Approx. time; 1-Way until X-band uplink lock, then 3-Way/43
DSS-34: Begin Ka-Band 3-Way Acquisition (w /DSS-43)	02:01:45	00:30:35	18:30:00	
DSS-74: Begin Pre-Cal	02:30:00	00:58:50	18:30:00	
RSSG: Begin DSS-74 Open-Loop Recordings	02:45:00	01:13:50	18:45:00	
Top of the Troposphere (~0.001° BA)	03:08:10	01:37:00	19:08:10	
End Tracking Egress Atmospheric Occultation	03:14:10	01:43:00	19:14:10	Pc/N0 (dB/Hz): ~ 54 (43X), 48 (35/X), 48 (35K), 42 (43S)
DSS-74: Beginning of Track	03:15:00	01:43:50	19:15:00	

DSS-74: Begin X- and S-band 3-Way Acquisition (w/DSS-43)	03:15:00	01:43:50	19:15:00	
DSS-34: Enable Monopulse	03:17:00	01:45:50	19:17:00	Enable monopulse only when requested by RS Operations
Official Start of Rev 255 Ring Occultation	03:17:10	01:46:00	19:17:10	
Ring C In	03:39:50	02:08:40	19:39:50	Approximate time
Top of the ionosphere (~68,000 km)	03:42:16	02:11:06	19:42:16	Ionosphere primarily affects signals frequency/phase
DSS-43: Transmitter OFF	**03:39:40**	02:08:30	19:39:40	
DSS-74 Transmitter ON, 18 kW, LCP, RAMP, SWEEP	**03:55:00**	02:23:50	19:55:00	
DSS-35: Disable Monopulse Without Clearing the Offsets	04:18:00	02:46:50	20:18:00	Disable monopulse only when requested by RS Operations
Ring B In	04:19:38	02:48:28	20:19:38	Signals will likely be blocked over parts of Ring B
Ring B Out	05:11:56	03:40:46	21:11:56	Approximate time; Strong signals in the Cassini Division
Ring A In	05:20:53	03:49:43	21:20:53	Detectable signals over most of Ring A
DSS-34: Enable Monopulse	05:30:00	03:58:50	21:30:00	Enable monopulse only when requested by RS Operations
Ring A Out	05:49:39	04:18:29	21:49:39	All signals back to full strength (free-space) levels
Ring F	05:56:17	04:25:07	21:56:17	Approximate time; Ring F is usually not detectable in real-time
DSS-63: Begin Pre-Cal	06:00:00	04:28:50	22:00:00	
Official End of Rev 255 Observations. Begin 20 m Deadtime	06:40:10	05:09:00	22:40:10	
DSS-34: Disable Monopulse Without Clearing the Offsets	06:40:00	05:08:50	22:40:00	Prior to switching to 1-way
DSS-43: Begin X- & S-band 1-Way Acquisition	06:42:00	05:10:50	22:42:00	PC/N0 (X-70m tlm OFF, S-70m) = 54, 42 dB-Hz
DSS-34: Begin X- & Ka-band 1-Way Acquisition	06:42:00	05:10:50	22:42:00	PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-Hz
DSS-74: Begin X- and S-band 1-Way Acquisition	06:42:00	05:10:50	22:42:00	
RSSG: Adjust 1-Way Open-Loop Frequency Offsets as Needed				
Begin ~15 m 1-Way Baseline	06:42:00	05:10:50	22:42:00	
DSS-34: Enable Monopulse	06:44:00	05:12:50	22:44:00	Enable monopulse only when requested by RS Operations
DSS-34: End Of Track	06:50:00	05:18:50	22:50:00	
DSS-43: Begin X- & S-band 3-Way Acquisition (w/DSS-74)	06:57:20	05:26:10	22:57:20	
DSS-74: Begin X- & S-band 2-Way Acquisition	06:57:20	05:26:10	22:57:20	
S-Band OFF	06:59:31	05:28:21	22:59:31	Per PEF
Ka-Band OFF	06:59:33	05:28:23	22:59:33	Per PEF
DSS-63: Beginning of Track	07:00:00	05:28:50	23:00:00	
DSS-63: Begin X-Band 3-Way Acquisition (w/DSS-74)	07:00:00	05:28:50	23:00:00	
TLM ON/RNG ON	07:00:04	05:28:54	23:00:04	
DSS-43: End of Track	07:05:00	05:33:50	23:05:00	
DSS-34: End of Post-Cal	07:05:00	05:33:50	23:05:00	
DSS-74: Transmitter OFF	**07:10:00**	05:38:50	23:10:00	Per DKF
DSS-63: Transmitter ON	**07:15:00**	05:43:50	23:15:00	Per DKF
DSS-74: End of Track	07:15:00	05:43:50	23:15:00	
DSS-43: End of Post-Cal	07:20:00	05:48:50	23:20:00	
RSSG: End DSS-43 and DSS-35 Open-Loop Recordings	07:25:00	05:53:50	23:25:00	

DSS-74: End of Post-Cal	07:30:00	05:58:50	23:30:00	
RSSG: End DSS-74 Open-Loop Recordings	07:35:00	06:03:50	23:35:00	
DSS-63: Begin X-Band 1-Way Acquisition	10:12:19	08:41:09	02:12:19	Per DKF
DSS-63: Begin X-Band 2-Way Acquisition	10:17:19	08:46:09	02:17:19	Per DKF
DSS-63: End of Track	11:20:00	09:48:50	03:20:00	
DSS-63: End of Post-Cal	11:35:00	10:03:50	03:35:00	

Canberra DSS-43 & DSS-34 related activities
Madrid DSS-63
New Norcia DSS-74

Predicted atmospheric & ring event times are approximate and are based on reference trajectory 150901