## 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	SCET	PST	
	OWLT =		ERT-8hrs	Comments
	01:31:10		08:00:00	
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	

Diss 74: nobelin A: and 3-way Acquisition (w/DSS-45)0005:34: nobelin A: and 3-way Acquisition (w/DSS-45)00DSS-34: nobel Monopulse03:17:0001:45:5019:17:00Enable monopulse only when requested by RS OperationsOfficial Start of Rev 255 Ring Occultation03:17:1001:46:0019:17:10Approximate timeRing C In03:39:5002:24:0619:45:50Ionosphere primarily affects signals frequency/phaseDSS-34: Inabiter OFF03:39:5002:23:5019:55:00DSS-35: Disable Monopulse Without Clearing the Offsets04:18:0002:24:5020:18:00Ring B In04:18:0005:11:5603:40:4621:11:56Approximate time; Strong signals in the Cassini DivisionRing B Out05:11:5603:40:4621:11:56Approximate time; Strong signals in the Cassini DivisionSS-34: Enable Monopulse05:50:003:38:5002:38:50Disable monopulse only when requested by RS OperationsRing A In05:20:5303:40:4621:11:56Approximate time; Strong signals in the Cassini DivisionSS-34: Enable Monopulse05:49:3904:18:2921:49:39All signals back to full strength (free-space) levelsRing A Out05:50:1704:25:0721:56:17Approximate time; Ring F is usually not detectable in real-timeDSS-34: Enable Monopulse Without Clearing the Offsets06:40:0005:08:5022:40:00Prior to switching to 1-wayDSS-34: Begin X- & S-band 1-Way Acquisition06:42:0005:10:5022:42:00PC/N0 (X-70m tim OFF, Ka-34m) = 48, 48 dB-HzDSS-34:	DSS 74, Desin V and Shand 2 Way Association (m/DSS 42)	02.15.00	01.42.50	10.15.00	
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Ring A Out $05:49:39$ $04:18:29$ $21:49:39$ All signals back to full strength (free-space) levelsRing F $05:56:17$ $04:25:07$ $21:56:17$ Approximate time; Ring F is usually not detectable in real-timeDSS-63: Begin Pre-Cal $06:00:00$ $04:28:50$ $22:00:00$ $04:28:50$ $22:00:00$ Official End of Rev 255 Observations. Begin 20 m Deadtime $06:40:10$ $05:09:00$ $22:40:10$ Prior to switching to 1-wayDSS-34: Disable Monopulse Without Clearing the Offsets $06:40:00$ $05:01:50$ $22:40:00$ Prior to switching to 1-wayDSS-34: Begin X- & S-band 1-Way Acquisition $06:42:00$ $05:10:50$ $22:42:00$ PC/N0 (X-70m thm OFF, S-70m) = 54, 42 dB-HzDSS-74: Begin X- and S-band 1-Way Acquisition $06:42:00$ $05:10:50$ $22:42:00$ PC/N0 (X-34m thm OFF, Ka-34m) = 48, 48 dB-HzDSS-74: Begin X- and S-band 1-Way Acquisition $06:42:00$ $05:10:50$ $22:42:00$ PC/N0 (X-34m thm OFF, Ka-34m) = 48, 48 dB-HzDSS-74: Begin X- and S-band 1-Way Acquisition $06:42:00$ $05:10:50$ $22:42:00$ PC/N0 (X-34m thm OFF, Ka-34m) = 48, 48 dB-HzDSS-74: Begin X- and S-band 1-Way Acquisition $06:42:00$ $05:10:50$ $22:42:00$ PC/N0 (X-34m thm OFF, Ka-34m) = 48, 48 dB-HzDSS-34: Enable Monopulse $06:42:00$ $05:10:50$ $22:42:00$ PC/N0 (X-34m thm OFF, Ka-34m) = 48, 92DSS-34: Enable Monopulse $06:44:00$ $05:12:50$ $22:42:00$ PC/N0 (X-34m thm OFF, Ka-34m) = 48, 92DSS-34: Enable Monopulse $06:44:00$ $05:12:50$ $22:42:00$ Enable monopulse o	DSS-34: Enable Monopulse	05:30:00	03:58:50	21:30:00	Enable monopulse only when requested by RS Operations
Ring F05:56:1704:25:0721:56:17Approximate time; Ring F is usually not detectable in real-timeDSS-63: Begin Pre-Cal06:00:0004:28:5022:00:00Official End of Rev 255 Observations. Begin 20 m Deadtime06:40:1005:09:0022:40:10DSS-34: Disable Monopulse Without Clearing the Offsets06:40:0005:08:5022:40:00Prior to switching to 1-wayDSS-34: Begin X- & S-band 1-Way Acquisition06:42:0005:10:5022:42:00PC/N0 (X-70m tlm OFF, S-70m) = 54, 42 dB-HzDSS-34: Begin X- and S-band 1-Way Acquisition06:42:0005:10:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-HzDSS-34: Enable Monopulse06:42:0005:10:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-HzDSS-34: Enable Monopulse06:42:0005:10:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 98 dB-HzDSS-34: Enable Monopulse06:42:0005:10:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 98 dB-HzDSS-34: Enable Monopulse06:42:0005:10:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 98 dB-HzDSS-34: Enable Monopulse06:42:0005:11:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 98 dB-HzDSS-34: Enable Monopulse06:44:0005:12:5022:42:00Enable monopulse only when requested by RS OperationsDSS-34: Enable Monopulse06:50:0005:18:5022:50:00PC/N0 (X-100 HI MOFF, Ka-100 HI	Ring A Out	05:49:39	04:18:29	21:49:39	All signals back to full strength (free-space) levels
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-wayDSS-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-HzDSS-34: Begin X- and S-band 1-Way Acquisition $06:42:00$ $05:10:50$ $22:42:00$ PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-HzDSS-34: End Of Track $06:42:00$ $05:10:50$ $22:42:00$ Enable monopulse only when requested by RS OperationsDSS-34: End Of Track $06:50:00$ $05:18:50$ $22:50:00$ Enable monopulse only when requested by RS Operations	Ring F	05:56:17	04:25:07	21:56:17	Approximate time; Ring F is usually not detectable in real-time
Official End of Rev 255 Observations. Begin 20 m Deadtime06:40:1005:09:0022:40:10DSS-34: Disable Monopulse Without Clearing the Offsets06:40:0005:08:5022:40:00Prior to switching to 1-wayDSS-43: Begin X- & S-band 1-Way Acquisition06:42:0005:10:5022:42:00PC/N0 (X-70m tlm OFF, S-70m) = 54, 42 dB-HzDSS-34: Begin X- & Ka-band 1-Way Acquisition06:42:0005:10:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-HzDSS-74: Begin X- and S-band 1-Way Acquisition06:42:0005:10:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-HzDSS-34: Enable Monopulse06:42:0005:10:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 98 dB-HzDSS-34: Enable Monopulse06:42:0005:10:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 98 dB-HzDSS-34: Enable Monopulse06:42:0005:10:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 98 dB-HzDSS-34: Enable Monopulse06:44:0005:12:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 98 dB-HzDSS-34: Enable Monopulse06:44:0005:12:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 98 dB-HzDSS-34: End Of Track06:44:0005:12:5022:42:00Enable monopulse only when requested by RS OperationsDSS-34: End Of Track06:00:00:00:00:00:00:00:00:00:00:00:00:0	DSS-63: Begin Pre-Cal	06:00:00	04:28:50	22:00:00	
DSS-34: Disable Monopulse Without Clearing the Offsets06:40:0005:08:5022:40:00Prior to switching to 1-wayDSS-33: Begin X- & S-band 1-Way Acquisition06:42:0005:10:5022:42:00PC/N0 (X-70m tlm OFF, S-70m) = 54, 42 dB-HzDSS-34: Begin X- & Ka-band 1-Way Acquisition06:42:0005:10:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-HzDSS-74: Begin X- and S-band 1-Way Acquisition06:42:0005:10:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-HzDSS-74: Begin X- and S-band 1-Way Acquisition06:42:0005:10:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-HzDSS-74: Begin X- and S-band 1-Way Acquisition06:42:0005:10:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-HzDSS-34: Enable Monopulse06:42:0005:10:5022:42:00PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-HzDSS-34: Enable Monopulse06:44:0005:10:5022:42:00Enable monopulse only when requested by RS OperationsDSS-34: End Of Track06:50:0005:18:5022:50:00PC/N0 (X-00 tlm PC/NO tlm PC/	Official End of Rev 255 Observations. Begin 20 m Deadtime	06:40:10	05:09:00	22:40:10	
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 PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-Hz   RSSG: Adjust 1-Way Open-Loop Frequency Offsets as Needed 06:42:00 05:10:50 22:42:00 PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-Hz   DSS-34: Enable Monopulse 06:42:00 05:10:50 22:42:00 Enable monopulse only when requested by RS Operations   DSS-34: End Of Track 06:50:00 05:18:50 22:50:00 PC/N0	DSS-34: Disable Monopulse Without Clearing the Offsets	06:40:00	05:08:50	22:40:00	Prior to switching to 1-way
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 PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-Hz   RSSG: Adjust 1-Way Open-Loop Frequency Offsets as Needed 06:42:00 05:10:50 22:42:00 PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-Hz   Begin ~15 m 1-Way Baseline 06:42:00 05:10:50 22:42:00 PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-Hz   DSS-34: Enable Monopulse 06:42:00 05:10:50 22:42:00 Enable monopulse only when requested by RS Operations   DSS-34: End Of Track 06:50:00 05:18:50 22:50:00 PC/N0 (X-34m tlm OFF, Ka-34m) = 48, 48 dB-Hz	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-74: Begin X- and S-band 1-Way Acquisition06:42:0005:10:5022:42:00RSSG: Adjust 1-Way Open-Loop Frequency Offsets as Needed06:42:0005:10:5022:42:00Begin ~15 m 1-Way Baseline06:42:0005:10:5022:42:00DSS-34: Enable Monopulse06:44:0005:12:5022:44:00DSS-34: End Of Track06:50:0005:18:5022:50:00	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
RSSG: Adjust 1-Way Open-Loop Frequency Offsets as Needed Begin ~15 m 1-Way Baseline06:42:0005:10:5022:42:00DSS-34: Enable Monopulse06:44:0005:12:5022:44:00Enable monopulse only when requested by RS OperationsDSS-34: End Of Track06:50:0005:18:5022:50:00	DSS-74: Begin X- and S-band 1-Way Acquisition	06:42:00	05:10:50	22:42:00	
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   22:50:00	RSSG: Adjust 1-Way Open-Loop Frequency Offsets as Needed				
DSS-34: Enable Monopulse06:44:0005:12:5022:44:00Enable monopulse only when requested by RS OperationsDSS-34: End Of Track06:50:0005:18:5022:50:00	Begin ~15 m 1-Way Baseline	06:42:00	05:10:50	22:42:00	
DSS-34: End Of Track 06:50:00 05:18:50 22:50:00	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-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	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	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	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: 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	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	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-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-34: End of Post-Cal	07:05:00	05:33:50	23:05:00	
<b>DSS-74: Transmitter OFF</b> 07:10:00 05:38:50 23:10:00 Per DKF	DSS-74: Transmitter OFF	07:10:00	05:38:50	23:10:00	Per DKF
<b>DSS-63: Transmitter ON</b> 05:43:50 23:15:00 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-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	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	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