**Timeline for Cassini Rev 171: 2-Way RSS Saturn Atmospheric Occultation**

**September 02, 2012 (DOY 246)**

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| | ERT UTC<br>OWLT =<br>1:26:50 | SCET | PDT<br>ERT-7hrs<br>7:00:00 | Comments |
|---|---|---|---|---|
| Spacecraft is Earth Pointed | 0:14:50 | 22:48:00 | 17:14:50 | SCET is DOY 245. Downlink pass plus RSS GSE over Canberra |
| Ka-Band ON | 0:14:50 | 22:48:00 | 17:14:50 | X-band and Ka-band downlink signals are detectable |
| DSS-55: Begin Pre-Cal | 8:45:00 | 7:18:10 | 1:45:00 | |
| RSSG: Load 1-W, 2-W, and 3-W Frequency Predicts | TBD | | | |
| DSS-43: Transmitter OFF | 9:10:00 | 7:43:10 | 2:10:00 | |
| DSS-43: End Of Track | 9:15:00 | 7:48:10 | 2:15:00 | |
| S-Band ON | 9:55:32 | 8:28:42 | 2:55:32 | |
| DSS-55: Begin of Track, 3-way with DSS-43 | 10:15:00 | 8:48:10 | 3:15:00 | X-band and Ka-band downlink signals are detectable |
| DSS-55: Transmitter ON, 18 kW, LCP, RAMP, SWEEP | 10:35:00 | 9:08:10 | 3:35:00 | |
| DSS-63: Begin Pre-Cal | 11:10:00 | 9:43:10 | 4:10:00 | |
| DSS-55: Switch to 1-way | 12:03:40 | 10:36:50 | 5:03:40 | |
| DSS-63: Begin of Track, 1-way | 12:10:00 | 10:43:10 | 5:10:00 | X-band and S-band downlink signals are detectable |
| DSS-55: Transmitter OFF | 12:48:40 | 11:21:50 | 5:48:40 | |
| DSS-63: Transmitter ON, 18 kW, LCP, RAMP, SWEEP | 13:19:00 | 11:52:10 | 6:19:00 | |
| DSS-55: Switch to 2-way | 13:28:40 | 12:01:50 | 6:28:40 | |
| DSS-63: Switch to 3-way with DSS-55 | 13:30:40 | 12:03:50 | 6:30:40 | |
| Start LMB Deadtime | 15:42:50 | 14:16:00 | 8:42:50 | X-, S-, and Ka-band signals detectable |
| RNG OFF/TLM OFF | 15:43:00 | 14:16:10 | 8:43:00 | X-band signal level increase |
| DSS-63 and DSS-55: Switch to 1-way | 15:43:20 | 14:16:30 | 8:43:20 | |
| DSS-55: Enable Monopulse | TBD | | | Enable monopulse only when requested by RS Operations |
| Begin 1-Way Free-Space Baseline | 15:43:21 | 14:16:31 | 8:43:21 | PC/N0 (X70, S70, X34, Ka34) = 54, 42, 48, and 48 dB-Hz |
| Start of atmospheric occultation observation | 16:02:51 | 14:36:01 | 9:02:51 | X-, S-, and Ka-band signals detectable |
| DSS-26: Begin Pre-Cal | 16:05:00 | 14:38:10 | 9:05:00 | |
| DSS-63: Transmitter OFF | 16:07:00 | 14:40:10 | 9:07:00 | End of DSS-63 uplink period |
| DSS-63: Begin X- & S-band 2-Way Acquisition | 16:12:40 | 14:45:50 | 9:12:40 | PC/N0 (X-70m, S-70m) = 54, 42 dB-Hz |

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|---|---|---|---|---|---|
| DSS-55: Begin X- & Ka-band 3-Way Acquisition | 16:12:40 | 14:45:50 | 9:12:40 | PC/N0 (X-34m, Ka-34m) = 48, 48 dB-Hz |
| DSS-14: Begin Pre-Cal | 16:35:00 | 15:08:10 | 9:35:00 | |
| Start Official 2-Way & 3-Way Free-Space Baseline | 17:13:08 | 15:46:18 | 10:13:08 | |
| DSS-26 & DSS-14: Begin of Track | 17:35:00 | 16:08:10 | 10:35:00 | X-, S-, and Ka-band signals detectable |
| DSS-14: Begin X- & S-band 3-Way Acquisition | 17:35:01 | 16:08:11 | 10:35:01 | PC/N0 (X70, S70) = 54 and 42 dB-Hz; likely little lower |
| DSS-26: Begin X- & Ka-band 3-Way Acquisition | 17:35:01 | 16:08:11 | 10:35:01 | PC/N0 ( X34, Ka34) = 48 and 48 dB-Hz; likely little lower |
| DSS-26: Enable Monopulse | TBD | | | Enable monopulse only when requested by RS Operations |
| Top of the ionosphere (68,000 km) | 17:40:00 | 16:13:10 | 10:40:00 | Ionosphere primarily affects signals frequency/phase |
| Upper Troposphere (~0.1° BA) | 18:03:02 | 16:36:12 | 11:03:02 | S/X/Ka signal intensities quickly drop and scintillate |
| Loss of 3-Way Ka-band signal (~1.15° BA) | 18:24:53 | 16:58:03 | 11:24:53 | Approximate time; Ka-band downlink signal absorbed |
| Loss of 2-Way & 3-Way X-band signal (~1.35° BA) | 18:29:06 | 17:02:16 | 11:29:06 | Approximate time; X-band downlink signal absorbed |
| Loss of 2-Way S-band signal | 18:30:06 | 17:03:16 | 11:30:06 | Approximate time |
| DSS-63: S-band 1-Way Signal Acquisition | 18:30:06 | 17:03:16 | 11:30:06 | Approximate time; S/C Aax-Osc kicks in |
| DSS-14: S-band 1-Way Signal Acquisition | 18:30:06 | 17:03:16 | 11:30:06 | |
| Loss of 1-Way S-band signal (~1.55° BA) | 18:33:21 | 17:06:31 | 11:33:21 | Approximate time; loss of all downlink signals |
| Cassini is behind Saturn as seen from Earth | | | | No downlink signals detectable |
| DSS-55 & DSS-63: End of Track | 20:00:00 | 18:33:10 | 13:00:00 | |
| DSS-55 & DSS-63: End of Psot Cal | 20:15:00 | 18:48:10 | 13:15:00 | |
| Ka-Band and S-Band OFF | 20:25:11 | 18:58:21 | 13:25:11 | End of RSS3 Op-Mode |
| TLM ON/RNG ON | 20:25:44 | 18:58:54 | 13:25:44 | End of Rev 171 RSS Experiments |
| End of Rev 171 RSS S/C Activities | 20:25:49 | 18:58:59 | 13:25:49 | |
| DSS-26 & DSS-14: End of Track | 20:40:00 | 19:13:10 | 13:40:00 | |
| DSS-26 & DSS-14: Post Cal | 20:55:00 | 19:28:10 | 13:55:00 | |

DSS-43 related activities

Madrid DSS-55 & DSS-63 related activities

Goldstone DSS-26 & DSS-14 related activities

Predicted atmospheric event times are approximate and are based on the Rev171 Live-Update OD on 8/27/12

Monopulse strategy is preliminary at this time and is finalized during real-time operations