

Subject: S100 Rev 282 RSS Rings Occultation Completed

Date: Monday, July 10, 2017 at 2:52:14 AM Pacific Daylight Time

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To: rss@cgsa.jpl.nasa.gov

Dear All,

Apologies for the delay in sending out this report.

The Rev 282 chord rings occultation completed successfully on DOY 187 (July 6). It was covered by Canberra's DSS-43 and DSS-35, Madrid's DSS-63 and DSS-55, and ESA's New Norcia DSS-74. Since no uplink transfer is possible from Canberra to Madrid due to transmitter elevation limits, New Norcia's coverage was obtained to close the uplink gap and also to provide coverage at better elevation angles during the Canberra-Madrid overlap.

DSS-43 was first to provide uplink. The station was 5 minutes late in turning its transmitter on due to a delay in the antenna going to point. No impact to science since the tracking mode change round-trip-light-time (RTLTL) later occurred during the thermal stabilization/warmup period and before the official start of the observation.

The plan was then to transfer the uplink to DSS-74. Shortly before DSS-74's pre-cal, the ESA operator reported that the antenna was red and could not track (Elevation Servo Failure). It was Thursday night at New Norcia and the station was unattended, but maintenance was called in. The drive to the antenna is on a long narrow road, so it was going to take the maintenance crew a couple of hours to arrive. I've driven that road and it's challenging in the dark, especially with kangaroos around.

As we were waiting for the maintenance crew to arrive, Essam was consulted to suggest new uplink transfer times in case DSS-74 could not make the scheduled time. DSS-43 was asked to continue uplinking until further notice.

DSS-74 missed the scheduled BOT and the scheduled uplink transfer, which was timed to be observed at the Ring C turn-around time.

Maintenance arrived at the station ~1.5hr after the scheduled BOT and quickly fixed the problem. DSS-74 was able to make the new transfer time suggested by Essam, which was timed to reach the spacecraft as the ramp of Ring C was being probed.

The plan was then to transfer the uplink to DSS-63, which occurred on time. All uplink transfers were successful and there were no gaps in uplink.

When the DSS-74 uplink was observed RTLTL after its transmitter on, we saw a jump in frequency residuals (expected when uplink is switched to ESA stations), but the jump was small enough for all signals to remain within the 1 KHz recording bandwidth. When the uplink was transferred back to the DSN (DSS-63), the frequency residuals dropped back to nominal values.

The rings occultation completed as expected. The DST lost lock very briefly during Ring B.

Monopulse was utilized at DSS-35 and DSS-55. At DSS-35, a small (0.2 dB) jump in Ka-band signal power was observed when Monopulse was first enabled, indicating that the pointing model was good. However, at DSS-55, a big (11 dB) jump in Ka-band power was observed, and our monitor displays showed very high Monopulse corrections - indications that the pointing model was degraded.

Signal level degradations were observed at Madrid at all three bands during the last 20 minutes of the observation (baseline). The station reported scattered clouds but no rain. Discrepancy Report DR# M100001 was opened for data degradation, likely due to weather.

Another DR was opened at Madrid for an issue encountered with one of the open-loop receivers (WVSR) only receiving one IF source (normally, we can configure the A and B sides using different IF sources). This was of no

impact to data collection since backup data were planned to be acquired on that receiver. DR# M110079 was opened.

Just one more observation to go! :(

Regards,
Aseel