

## Buccino, Dustin R (332K)

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**From:** Anabtawi, Aseel (332K) <aseel.anabtawi@jpl.nasa.gov>  
**Sent:** Sunday, September 01, 2013 6:27 PM  
**To:** rss@dcs04.jpl.nasa.gov  
**Subject:** Rev 197 Rings Occ - Quick Report  
**Attachments:** 2013\_244\_dss14\_X\_conscan.png; 2014\_244\_Goldstone\_PowerPlots.pdf

Dear All,

We completed the Rev 197 rings egress occultation experiment.

Madrid continued tracking while the spacecraft was behind Saturn and ended a few minutes after we reached the top of the troposphere. The Goldstone tracks (DSS-14 and DSS-25) started while the s/c was behind Saturn and continued until the end of the experiment, therefore, the rings egress experiment was mostly covered by Goldstone. Weather at Goldstone was cloudy at first and then became clear with some winds.

The first egress coherent signal was observed at ~1952 ERT (S-band). DST lock was intermittent, but solid lock was achieved during Ring A and coherent signals were observed throughout.

The only problem to report was with DSS-14 X-band. We noticed that the signal power was fluctuating and was not as stable as DSS-25 X-band. Weather was good and winds were low, so we suspected that it was a pointing issue. We checked with the station, and they reported that they were tracking in encoder mode as opposed to the preferred precision mode. We asked them not to make any configuration changes until a sufficient exit baseline was acquired, and that we'd get back to them with more info. We talked with the NOPE, and he explained that the station has been having problems with precision mode tracking so they tracked in encoder mode today. We asked if enabling Conscan would help, and he said that the station enabled Conscan at 213735 ERT, which was a couple of minutes after we talked with them and requested that no changes be made. DSS-14 X-band looked more stable after Conscan was enabled (see attached plot), but the timing cut the exit free-space baseline short by a few minutes. The NOPE said that enabling Conscan is routine operations for the station, but he explained to them that Conscan should not be enabled or disabled during these science supports without consulting with RSS. The NOPE will look into putting clear instructions in future briefing messages.

The DSS-25 fourth-order pointing model was not updated for this experiment, but David Rochblatt assessed the data that were acquired during yesterday's ORT and recommended entering manual offsets of  $-2.3$  mdeg in elevation and  $+4.90$  mdeg in cross-elevation. If his predictions were correct, these values would improve the pointing during the entire period of interest and the reported monopulse corrections would be small. We waited until we reached the top of the troposphere to enable monopulse, but had just a few minutes to decide whether to clear or keep the monopulse offsets. As predicted by David, the DSS-25 monopulse corrections were small, so we decided to disable monopulse and clear the offsets (the manual offsets were kept). Overall, Ka-band signal power looked fine, but was fluctuating at times. We re-enabled monopulse at the end of the exit baseline (about 2 hours later) to check the pointing, and observed a small jump in Ka-band power ( $\sim 0.3$  dBs) - an indication that the Ka-band pointing was overall good.

As for DSS-55, monopulse was disabled without clearing the offsets prior to reaching the top troposphere on the ingress side. We re-enabled monopulse when we reached the top of the troposphere on the egress side to check the pointing. There was no visible jump in power, but the station was tracking at very low elevation angles and the signal was noisy. The station ended its track about three minutes later.

I don't have an egress plot similar to the one that I sent for ingress, so instead, attached are the Goldstone post-pass power plots (from the RSR log files). The plots cover the time period from egress until a few minutes after the end of Ring A.

I'll go through my notes and send any additional necessary details later.

Regards,  
Aseel