

About the Occultation

- S35 Rev 53 Rings occultation
 - Ingress occ only
 - Telemetry OFF, 1-way mode
 - Covered by Madrid

- From Essam Marouf:

The rev 53 RSS ring occultation is [the first in a sequence of 8 occultations implemented during the last seven months of the Cassini prime mission during the Cassini high-inclination sequence](#). The occultations capture the rings when the angle B between the Cassini-to-Earth line-of-sight and the ring plane is relatively small ($B = 6.6$ to 9.9 degs, compared with $B = 19.5$ to 23.5 degs early in the mission). The more elongated path of the radio signal through the rings (length $\sim 1/\sin(B)$) allows enhanced sensitivity to tenuous ring features at the expense of more attenuation by dense ring features, hence [the early and late occultation sets provide complementary information about ring structure and physical properties](#). Rev 53 is a "chord" occultation that partially probes the ring system (it does not probe Ring C or inner Ring B), but does so at $B = 6.7$ degs and hence [is expected to provide particularly valuable information about the structure of the Cassini Division, Ring F, and likely the less optically thick regions of Ring A](#). The relatively optically thick Ring B is expected to be mostly noise limited.

DSN Antennas

- DSN Coverage

| Station | Pre-cal | BOT | EOT | Post-Cal |
|---------|----------|----------|----------|----------|
| DSS-55 | 337/0330 | 337/0515 | 337/0815 | 337/0830 |
| DSS-63 | 337/0415 | 337/0515 | 337/0815 | 337/0830 |

- Receivers scheduled

- 2 closed-loop receivers per antenna
- Four RSRs, One VSR (A&B) and One WVSR (A&B) at Madrid are scheduled
 - Total: 8 open-loop receivers
- Open-loop data are prime. Closed-loop data are backup

- Antennas Band and Polarization Capabilities

DSS-63

X-RCP
X-LCP

S-RCP
S-LCP

DSS-55

X-RCP
X-LCP

K-RCP
K-LCP

Either KLCP (switch 43 in B position)
or monopulse (switch 43 in A position)

- LCP data are enhancement. Prime are RCP

RSR/VSR/WVSR Assignment

Aseel: VOCA

Roberto: Displays

| DSS | Operator | Station | Open-Loop Receiver | RSR Assignment |
|-----------|----------|---------|--------------------|-------------------|
| 63 | Danny | rsops1 | RSR1 | RSR1A -> XRCP |
| | | | | RSR1B -> SRCP |
| 55 | Elias | rsops2 | RSR2 | RSR2A -> XRCP |
| | | | | RSR2B -> KRCP |
| 63/55 LCP | Don | rsops3 | VSR1 and WVSR1 | 63 VSR1A -> XLCP |
| | | | | 63 VSR1B -> SLCP |
| | | | | 55 WVSR1A -> XLCP |
| | | | | 55 WVSR1B -> KLCP |

RSSG will be in RS Ops Room at 7 pm on Sunday 12/2/07 (337/0300)

ORTs

ORT on DOY 325 (November 21) over DSS-55, X- and Ka-band **completed**

07 325 0030 0215 1115 1130 DSS-55 CAS TP RSR52-OCCORT1 3699 N750 1A1

07 325 0115 0215 0715 0730 DSS-63 CAS TKG PASS 3699 N003 1A1

- Nominal DSS-55 collected pointing data (monopulse) to update the 4th-order blind pointing model

ORT on DOY 328 (November 24) over DSS-25, DSS-55 and DSS-34, X- and Ka-band **completed**

07 328 0745 0930 1830 1845 DSS-25 CAS TP RSR52-GRVORT1 3702 N748 1A1

07 328 0745 0930 1230 1245 DSS-55 CAS TP RSR52-GRVORT1 3702 N750 1A1

07 328 1415 1600 1830 1845 DSS-34 CAS TP RSR52-GRVORT1 3703 N750 1A1

- DSS-25 was prime for telemetry and uplink
- DSS-25 and DSS-34 not participating in Rev53 occ. Were scheduled as ORTs for a gravity observation that later got deleted. Kept DSS-25 as it is the prime pass, and kept DSS-34 since no Ka-band data were collected there for a while and pass was helpful with DSS-47 testing
- DSS-55 collected pointing data (monopulse) to update the 4th-order blind pointing model. Nominal support except for large monopulse offsets during 2-way
- Antenna problems at DSS-25 (DR#108183) seemed to affect monopulse (large offsets). After problem fixed, monopulse was re-started (disabled, offsets cleared and re-enabled), and offsets were much better
- Nominal DSS-34 support

ORT on DOY 333 (November 29/Thu evening) over DSS-25 and DSS-34, X- and Ka-band

07 333 0730 0915 1815 1830 DSS-25 CAS TP RSR53-GRVORT2 3707 N748 1A1

07 333 1400 1545 1815 1830 DSS-34 CAS TP RSR53-GRVORT2 3708 N750 1A1

- DSS-25 is prime
- Originally gravity ORT

ORT on DOY 334 (November 30/very early Friday) over DSS-63, X- and S-band

07 334 0815 0915 1815 1830 DSS-15 CAS TKG PASS 3708 N006 1A1

07 334 0815 0915 1045 1100 DSS-63 CAS TP RSR53-OCCORT2 3708 1639 1A1

- DSS-15 is prime for telemetry and uplink. No S-band support
- DSS-63 verify S-band and X-band (RCP and LCP)

Misc

Cassini Specific 4th Order Pointing Models

- Name:
DSS-55 cas55.sem

SNT

- Enable X at DSS-55 only throughout

DSS-63 Microwave Configuration

- Configure SRCP low noise to the SP MASER to the 01 output
- Configure SLCP through the diplexer to the SB HEMT to the 02 output