

About the Saturn Gravity and Atmospheric Occultation

- S40 Rev 68 Saturn gravity and atmospheric occultation
 - Gravity inbound and outbound around the occultation
 - TLM ON, 2-way mode
 - Atmospheric occultation ingress and egress
 - Telemetry OFF, 1-way mode
 - Covered by Madrid and Goldstone

- From Essam Marouf and Nicole Rappaport:

The Cassini rev 68 periapsis period includes two special observations for Radio Science. The first is a North-South atmospheric and ionospheric occultations, the first in a family of five occultations that systematically probe for the first time the mid-northern latitudes of Saturn on the ingress side. They also probe high- southern latitudes on the egress side. For rev 68, the ingress latitude is 21.7 deg North and the egress is about 59.2 deg South, both measured near-the top of the troposphere. Collectively, the occultations will provide important information about the winds in Saturn's atmosphere. They also provide information about the large- and small-scale structure of the atmosphere, the temperature/pressure profile, abundance of microwave absorbing species, and the electron number density profile in the ionosphere. The second special RSS observation is a Saturn gravity field observation conducted by Doppler tracking of the spacecraft during time periods both before and after the occultation event. These measured frequency residuals provide critical information about Saturn's mass and the gravitational harmonics coefficients, J_2 , J_4 , J_6 , hence interior structure of the planet. The rev 68 gravity observation is the second of two in prime mission implemented on specially selected orbits to achieve this objective (the first was completed on Rev 28, 9/9/06).

DSN Antennas

- DSN Coverage

Station	Pre-cal	BOT	EOT	Post-Cal
DSS-55	138/1550	138/1720	139/0050	139/0105
DSS-25	138/1850	138/2020	139/0600	139/0615
DSS-26	138/1920	138/2020	139/0600	139/0615
DSS-15	138/2100	138/2200	139/0145	139/0200
DSS-63	138/2125	138/2200	139/0100	139/0115

26 scheduled as downlink only pass

15 and 63 for occultation. Originally has DSS-14, but conflict with Phoenix. Gave that up in exchange for 15 and 63. First time to use DSS-15 for occultation

- Receivers scheduled

- 2 closed-loop receivers per antenna
- Goldstone: Five RSRs (gave one to Phoenix), One VSR (A&B)
 - Total: 7 open-loop receivers at Goldstone, but will also be using the 6th RSR and releasing it to Phoenix for TCM
- Madrid: Four RSRs, One VSR (A&B), One WVSR (A&B)
 - Total 6 open-loop receivers at Madrid
- Occultation: Open-loop data are prime. Closed-loop data are backup
- Gravity: Closed-loop data are prime, open-loop are backup

- LCP data are enhancement. Prime are RCP.

Antennas Band and Polarization Capabilities

	DSS-15**	DSS-25	DSS-26*
**Either RCP or LCP	X-RCP X-LCP	X-RCP X-LCP	X-RCP X-LCP
	S-RCP S-LCP	K-RCP	K-RCP K-LCP

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

DSS-63	DSS-55*
X-RCP X-LCP	X-RCP X-LCP
S-RCP S-LCP	K-RCP K-LCP

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

RSR/VSR/WVSR Assignment

Aseel: VOCA
 Danny: Displays

DSS	Operator	Station	Open-Loop Receiver	RSR Assignment
55	Danny	rsops1	RSR1	RSR1A -> XRCP
				RSR1B -> KRCP
25	Danny	rsops1	RSR1	RSR1A -> XRCP
				RSR1B -> KRCP
26	Elias	rsops2	RSR2	RSR2A -> XRCP
				RSR2B -> KRCP
15	Elias	rsops2	RSR3	RSR3A -> XRCP
				RSR3B -> SRCP
63	Kamal	PC through rsops2	RSR2	RSR2A -> XRCP
				RSR2B -> SRCP
26 LCP	Don	rsops3	VSR1	26 VSR1A -> XLCP
				26 VSR1B -> KLCP
55 LCP	Don	rsops3	VSR1	55 VSR1A -> XLCP
				55 VSR1B -> KLCP
63 LCP	Don	rsops3	WVSR1	63 WVSR1A -> XLCP
				63 WVSR1B -> SLCP

RSSG will be in RS Ops Room at 8:30 am on Saturday 5/17/08 (139/1530)

Must release one RSR at Goldstone to support Phoenix TCM. Get times

WVSR at Goldstone scheduled for Phoenix pass BOT 1810, EOT 0655

ORTs

One ORT only since Rev67 experiment completed last week

ORT on DOY 136 (May 15) over DSS-55, X- and Ka-band

08 136 1410 1540 0015 0030 DSS-55 CAS TP RSR68-GRVORT3 3876 N750 1A1

- DSS-55 is prime
- Collect pointing data (monopulse) to update the 4th-order blind pointing model

DSS-54 ORT on DOY 134, but station not supporting DOY 138 observations

Provide David with DSS-55 ORT data, and monopulse data from Rev67 occultation (mostly DSS-25)

Misc

Goldstone Monopulse

- Issue with values not updating at DSS-25 for ~20 minutes

Status of oscillations at DSS-55?

Cassini Specific 4th Order Pointing Models

- Status

SNT

- Enable X only at DSS-55 and DSS-26 throughout
- Conduct SNT measurements

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

Status of DSS-15

- DSS-15 microwave configuration? (HEMT only?)