

# About the Occultation

- S60 Rev 133 Saturn rings and atmospheric occultation
  - Telemetry OFF, 1-way mode
  - Covered mainly Goldstone and Canberra, with short coverage by Madrid
- From Essam Marouf:

The S60 Rev133 Cassini orbit captures the last Saturn rings and atmospheric radio occultations in the Extended, or Equinox, Mission. The rings occultation is also the last of three geometry optimized diametric occultation tracks (the other two were on Revs 123 and 125). Cassini occults the rings and then the atmosphere on the ingress side, and again the atmosphere and then the rings on the egress side. Despite the nearly closed rings (ring opening angle = 1.98 degrees, the smallest probed during the mission lifetime), the Cassini tour designers did a remarkable job optimizing the occultation track so as to capture the full ring system both on the way in and out. The optimized track also captures two almost perfectly equatorial atmospheric occultations. The ingress and egress latitudes = 0.36S and 0.30N degrees, respectively, measured near the top of the troposphere.

The long physical path of the radio signals passing through the almost closed rings makes the signals extremely sensitive to tenuous ring material (Ring C, Cassini Division, parts of Ring A), however, the denser ring regions (most of Ring B, parts of Ring A, narrow optically thick ringlets in Ring C) will likely block all three radio signals. Corresponding observations of ring profiles and forward scattered signals will complement other observations acquired over a range of ring opening angle to provide rich characterization of detectable ring features and their physical properties. Comparison of the atmospheric occultation profiles with results from similar near-equatorial occultations completed in 2005, together with the more recent ones on Revs 123, 125, and 133 will provide information about potential variability with time of Saturn's equatorial winds as well as about other physical properties of the atmosphere and ionosphere.

# DSN Antennas

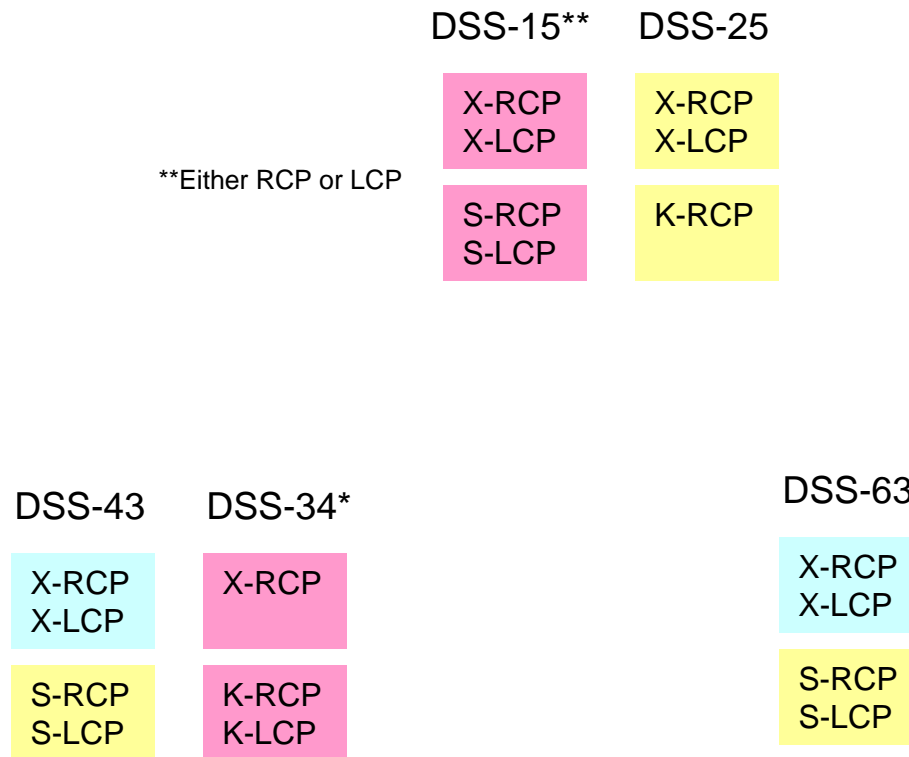
- DSN Coverage

	Pre	BOT	EOT	Post						
10 169	1205	1305	0000	0015	DSS-63 CAS	OTM253BU/RS133OC	4642	1639	1A1	
10 169	2015	2115	0730	0745	DSS-15 CAS	TP RS133-RISA OCC	4642	0624	1A1	
10 169	2030	2130	0730	0745	DSS-25 CAS	TP RS133-OCC D/L	4642	N71L	1A1	
10 170	0140	0310	0800	0815	DSS-34 CAS	TP RS133-RISA OCC	4643	N750	1A1	
10 170	0200	0300	0800	0815	DSS-43 CAS	TP RS133-RISA OCC	4643	1639	1A1	

Goldstone's DSS-14 is down for maintenance. Requested DSS-15 instead for X- and S-band supports, and extended DSS-63 OTM support to cover part of ingress

- Receivers scheduled
  - 2 closed-loop receivers per antenna (RSRs, WVSRs, VSRs)
  - Open-loop data are prime. Closed-loop data are backup
- LCP data are enhancement. Prime are RCP
- Record RCP only at DSS-25, DSS-15 and DSS-34

# Antennas Band and Polarization Capabilities



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

# RSR/VSR/WVSR Assignment

Aseel: VOCA

DSS	Operator	Station	Open-Loop Receiver	RSR Assignment
25		rsops1	RSR1	RSR1A -> XRCP
				RSR1B -> KRCP
15		rsops2	RSR2	RSR2A -> XRCP
				RSR2B -> SRCP
63		rsops2	RSR2	RSR2A -> XRCP
				RSR2B -> SRCP
		WVSR1	WVSR1A -> XLCP	
			WVSR1B -> SLCP	
34		rsops1	RSR1	RSR1A -> XRCP
				RSR1B -> KRCP
43		rsops2	RSR2	RSR2A -> XRCP
				RSR2B -> SRCP
		WVSR1	WVSR1A -> XLCP	
			WVSR1B -> SLCP	
Two shifts: 12:30 pm - 7:30 pm and 7:00 pm - 1:30 am				
One person 4:30 am - 7:00 am for DSS-63 pre-cal/BOT				

# Upcoming ORTs

ORT on DOY 155 (June 4) over DSS-34, X- and Ka-band

- 10 155 0330 0430 1330 1345 DSS-43 CAS TKG PASS 4628 N003 1A1
- 10 155 0945 1045 1330 1345 DSS-34 CAS TP RS132-ORT D/L 4628 N71D 1A1
- DSS-43 prime pass
- DSS-34 to acquire pointing data

ORT on DOY 156-157 (June 5) over DSS-25 and DSS-34, X- and Ka-band

- 10 156 2045 2215 0805 0820 DSS-25 CAS T69 PB/RS132ORT2 4629 N748 1A1
- 10 157 0230 0400 0640 0655 DSS-34 CAS TP RS132-OCCORT3 4630 N750 1A1
- 10 157 0300 0400 0805 0820 DSS-43 CAS TKG PASS 4630 N003 1A1
- DSS-25 and DSS-43 prime passes
- DSS-25 and DSS-34 to acquire pointing data

ORT on DOY 157-158 (June 6) over DSS-15 and DSS-43, X- and S-band

- 10 157 2115 2215 0405 0420 DSS-15 CAS TP RS132-OCCORT3 4630 0624 1A1
- 10 158 0245 0345 0800 0815 DSS-43 CAS TP RS132-OCCORT3 4631 1639 1A1
- DSS-15 and DSS-43 prime passes
- Verify X- and S-band signals, RCP and LCP for DSS-43

ORT on DOY 160-161 (June 9) over DSS-25 and DSS-34, X- and Ka-band

- 10 160 2025 2155 0700 0715 DSS-25 CAS TP RS132-OCCORT4 4633 N748 1A1
- 10 161 0211 0341 0510 0525 DSS-34 CAS TP RS132-OCCORT 4634 N750 1A1
- DSS-25 prime pass
- DSS-25 and DSS-34 to acquire pointing data

No DSS-63 ORTs

No GSEs surrounding Occultation

# Misc

## Plan for Cassini Specific 4th Order Pointing Models

- Don to send David pointing data from the ORTs

## SNT

- Enable X only at DSS-25 and DSS-34 throughout
  - Remember to change configuration during occultation so that values are recorded in NMC log
- Conduct SNT measurements

## DSN Equipment Status? (NOPEs)

## RSR Equipment Status

- Madrid's RSR1 disk is being replaced. Likely to be completed before experiment

## DSS-43 and 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