About the Occultation

- S56 Rev 123 Saturn rings and atmospheric occultation
  – Telemetry OFF, 1-way mode
  – Covered by Canberra and Madrid

- From Essam Marouf:

  The Cassini S56/Rev123 Radio Science observations include ingress and egress ring occultations and an egress atmospheric occultation. Rev 123 is the first in a set of three especially designed Cassini orbits (the other two are Revs 125 and 133) that capture optimized diametric ring occultations covering the full ring system from ansa-to-ansa. The slow optimized geometry is similar to that of another set implemented early in the Nominal Mission (in 2005). The difference is that the rings are nearly closed during the second set, while they were much more open during the first. The ring-opening angle for Rev 123 is 4.8 degs (compared with 20 to 23.5 degs in 2005). The highly elongated path of the radio signals through the rings enhances sensitivity to tenuous ring material especially in Ring C and the Cassini Division but causes the signals to become noise-limited in other dense ring regions (such as most of Ring B), the opposite of the 2005 set. Thus, the two sets nicely complement one another. The multiple occultations provide fair sampling of variations of profiles of various dynamical ring features with observation longitude. The atmospheric occultations associated with Revs 123, 125, and 133 are all near equatorial, much as was the case for the 2005 observation set. The almost 4.5 years time difference between the two sets provide valuable information about potential variability of Saturn's equatorial winds and other atmospheric physical properties with time.

DSN Antennas

- DSN Coverage

Pre	BOT	EOT	Post					
09 359 1750	1920	2315	2330	DSS-34 CAS	TP RS123-RIOCC2	4467	N750	1A1
09 359 1820	1920	2315	2330	DSS-43 CAS	TP RS123-SAOCC1	4467	1639	1A1
09 359 2350	0120	0610	0625	DSS-55 CAS	TP RS123-SAOCC1	4467	N750	1A1
09 360 0020	0120	0610	0625	DSS-63 CAS	TP RS123-RIOCC3	4467	1639	1A1

- Receivers scheduled
  - 2 closed-loop receivers per antenna (RSRs, WVSRs, VSRs)
  - Open-loop data are prime. Closed-loop data are backup

- Antennas Band and Polarization Capabilities

	DSS-43	DSS-34*	DSS-63	DSS-55*
	X-RCP X-LCP	X-RCP	X-RCP X-LCP	X-RCP X-LCP
	S-RCP S-LCP	K-RCP K-LCP	S-RCP S-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
  - Record RCP only at DSS-34 and DSS-55

RSR/VSR/WVSR Assignment

Aseel: VOCA
Danny/Elias: Ops Room Displays

DSS	Operator	Station	Open-Loop Receiver	RSR Assignment
34	Danny	rsops1	RSR1	RSR1A -> XRCP
				RSR1B -> KRCP
43	John	rsops2	RSR2	RSR2A -> XRCP
				RSR2B -> SRCP
			WVSR1	WVSR1A -> XLCP
				WVSR1B -> SLCP
55	Elias	rsops1	RSR1	RSR1A -> XRCP
				RSR1B -> KRCP
63	Don	rsops2	RSR2	RSR2A -> XRCP
				RSR2B -> SRCP
			WVSR1	WVSR1A -> XLCP
				WVSR1B -> SLCP

RSSG will be in RS Ops Room at 9:00 am on Friday 12/25/0 (359/1700)

ORTs

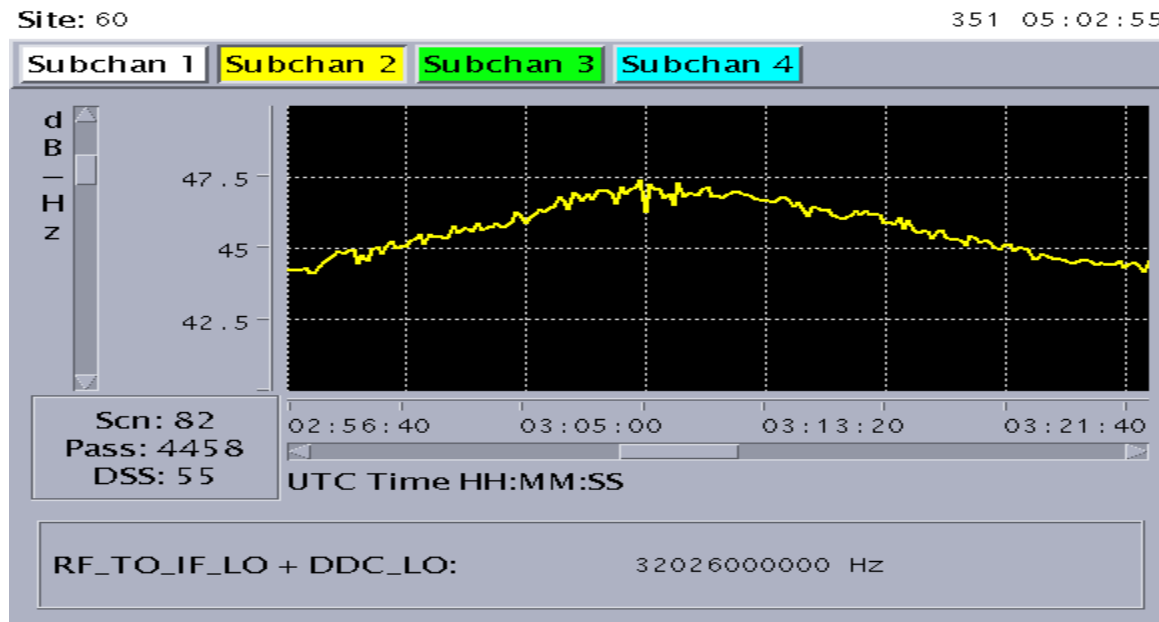ORT on DOY 348 (December 14) over DSS-63, X- and S-band

09 348 0130 0230 1120 1135 DSS-63 CAS   TP RS122-OCCORT2 4455 1639   1A1

- Also prime pass
- Verify X- and S-band

ORT on DOY 351 (December 17) over DSS-55, X- and Ka-band

09 351 0045 0215 1115 1130 DSS-55 CAS   TP RS122-OCCORT3 4458 N750   1A1

- Also prime pass
- Pointing data acquired
- Are the Ka-band oscillations back?

ORTs continued

Upcoming ORTs

ORT on DOY 353 (December 19) over DSS-55, X- and Ka-band

09 353 0030 0200 1100 1115 DSS-55 CAS   TP RS123-OCCORT4 4460 N750   1A1

- Also prime pass
- To acquire pointing data

ORT on DOY 356 (December 22) over DSS-34, X- and Ka-band

09 356 1415 1545 2045 2100 DSS-34 CAS   TP RS123-OCCORT1 4464 N750   1A1

09 356 1445 1545 0045 0100 DSS-43 CAS   TKG PASS   4464 N003   1A1

- DSS-43 prime pass
- DSS-34 to acquire pointing data

No DSS-43 S-band ORTs

No GSEs surrounding Occultation

Misc

Plan for Cassini Specific 4th Order Pointing Models
- Don to send David pointing data from the ORTs
- Has the DSS-55 pointing model been updated since the antenna was last used for a science experiment (DOY 173/June 22, 2009)

SNT
- Enable X only at DSS-34 and DSS-55 throughout
    - Remember to change configuration during occultation so that values are recorded in NMC log
- Conduct SNT measurements

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