About the Occultations

- S57 Rev 125 Enceladus Plume Occultation and Saturn rings and atmospheric occultation
  - Telemetry OFF, 1-way mode
  - Covered by Canberra and Madrid
    - Enceladus Plume Occ covered by Canberra only

- From Essam Marouf:

  On S57/Rev125, and for the first time in its mission, Cassini will pass behind (will occult) the plume of Enceladus as seen from the Earth. Perturbations in the measured phase of the S/X/Ka-band signals, if detectable, will be used to constraint the abundance of plume plasme and neutral gas along the radio path. The dominant plume particle sizes and their abundance are likely not large enough to affect the measured signal strength. The radio path will probe altitudes larger than about 51 km. About 2 hours later, Cassini occults the rings and then the atmosphere of Saturn on the ingress side, and then again the atmosphere and the rings on the egress side. The occultation is the second of a set of three speacial diametric occultations (on Revs 123, 125, 133) optimzed by the tour designers to capture the rings from ansa-to-ansa, and to also capture two excellent near-equatprial atmospheric occultations (ingress and egress latitude = -1.4 and 2.1 degrees, respectively, measured near the top of the troposphere). The ring-opening angle for Rev125 is 4.8 degs making the observations especially sensitive to tenuous Ring C and the Cassini Division. Good measurements will also be collected over most of Ring A but are exepcted to be largely noise-limited over the dense Ring B. Corresponding ring profiles will add to Cassini rich characterization of various dynamical ring features and their variability with observation longitude. Comparisons of the atmospheric occultation profiles with results from similar near- equatorial occultations completed in 2005 will provide information about potential variability with time of Saturn's equatorial winds and other physical properties of the atmosphere and ionosphere.

DSN Antennas

- DSN Coverage

	Pre	BOT	EOT	Post						
10 026	1330	1500	2329	2344	DSS-34 CAS	TP	RS125-ENOCC1	4499	N750	1A1
10 026	1400	1500	2329	2344	DSS-43 CAS	TP	RS125-ENOCC1	4499	1639	1A1
10 026	2115	2245	0435	0450	DSS-55 CAS	TP	RS125-SAOCC1	4499	N750	1A1
10 026	2145	2245	0435	0450	DSS-63 CAS	TP	RS125-RIOCC3	4499	1635	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 5:00 am on Tuesday 1/26/10 (026/1300)

ORTs

Completed

ORT on DOY 019 (January 19, 18th local) over DSS-55, X- and Ka-band

10 019 2230 0000 0900 0915 DSS-55 CAS   TP RS125-OCCORT1 4492 N750   1A1

- Also prime pass
- Pointing data (monopulse) acquired
- Monopulse worked nominally. Problems encountered during Saturn gravity on 010-011 resolved?
- Ka-band fluctuations

Upcoming

ORT on DOY 020 (January 20, 19th local) over DSS-55, X- and Ka-band

10 019 2230 0000 0900 0915 DSS-55 CAS   TP RS125-OCCORT1 4492 N750   1A1
10 019 2300 0000 0900 0915 DSS-63 CAS   TKG PASS   4492 N003   1A1

- DSS-63 prime pass
- Acquire pointing data (monopulse)
- If on-point phase cals are needed, can perform since DSS-63 is prime (check that uplink is over DSS-63)

ORT on DOY 023 (January 23) over DSS-63 and DSS-43, X- and S-band

10 023 0615 0715 1615 1630 DSS-15 CAS   TKG PASS   4495 N006   1A1
10 023 0615 0715 0945 1000 DSS-63 CAS   TP RS125-OCCORT2 4495 1639   1A1
10 023 1155 1255 1615 1630 DSS-43 CAS   TP RS125-OCCORT2 4496 1639   1A1

- DSS-15 prime pass
- Verify X- and S-band, RCP and LCP

ORT on DOY 024 (January 24) over DSS-34, X- and Ka-band

10 024 1215 1345 2250 2305 DSS-34 CAS   TP RS125-OCCORT3 4497 N750   1A1

- Also prime pass
- Acquire pointing data (monopulse)

Misc

Status DSS-55 monopulse problems?

Status of RSR1B at Madrid?
- Had problems when it was used during the occultation experiment on DOY 359 (Dec 25th)
- ADC Amp and Desired Amp not as expected

Plan for Cassini Specific 4th Order Pointing Models
- Don to send David pointing data from the ORTs

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