About the Occultation

- S54 Rev 120 Saturn atmospheric occultation
  - Telemetry OFF, 1-way mode
  - Covered by Goldstone and Canberra
    - Goldstone covers ingress and egress. Canberra egress only

- From Essam Marouf:

  The S54 Rev120 Radio Science atmospheric occultation is the first Saturn occultation in more than a year time and is also the first after Saturn passed through the Equinox. The still nearly closed rings at this time (~3 degrees ring opening angle) frees the atmosphere from the rings allowing Cassini to probe a mid northern latitude range of angles that was sparsely sampled during the nominal mission. The ingress and egress occultations probe ~30 and ~22 degrees North latitude, respectively (measured near-the top of the troposphere). Measurements of the S-, X-, and Ka-band signals amplitude, frequency, and phase provide information about the large- and small-scale structure of the atmosphere, the temperature/pressure profile, abundance of microwave absorbing species, the electron number density profile of the ionosphere, and profile variability with latitude and solar zenith angle.

DSN Antennas

- DSN Coverage

Pre	BOT	EOT	Post				
09 305 1445	1615	2240	2255	DSS-25 CAS	TP RS120-SAOCC	4412 N748	1A1
09 305 1515	1615	2240	2255	DSS-14 CAS	TP RS120-SAOCC	4412 1639	1A1
09 305 1805	1935	2250	2305	DSS-34 CAS	TP RS120-SAOCC1	4413 N750	1A1
09 305 1905	1935	2250	2305	DSS-45 CAS	TP RS120-OCC D/L	4413 0688	1A2

DSS-43 is down for maintenance. DSS-45 scheduled instead for S-band support
DSS-45 D/L only, so shorter pre-cal

- 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-34*	DSS-14	DSS-25
	X-RCP	X-RCP X-LCP	X-RCP X-LCP
*Either KLCP (switch 43 in B position) or monopulse (switch 43 in A position)	K-RCP K-LCP	S-RCP S-LCP	K-RCP

  - LCP data are enhancement. Prime are RCP
  - Record RCP only at DSS-25, DSS-34 and DSS-45

RSR/VSR/WVSR Assignment

Danny: VOCA
Aseel: Monitor Remotely

DSS	Operator	Station	Open-loop Receiver	RSR Assignment
14	Don	rsops3	RSR3 and WVSR1	RSR3A -> XRCP RSR3B -> SRCP WVSR1A -> XLCP WVSR1B -> SLCP
25	Elias	rsops2	RSR2	RSR2A -> XRCP RSR2B -> KRCP
34	John	rsops1	RSR1	RSR1A -> XRCP RSR1B -> KLCP
45	John	rsops1	WVSR1	WVSR1A -> XRCP WVSR1B -> SRCP

RSSG will be in Ops Room at 7 am on Sunday, Nov 1st (305/1400)

ORTs

ORT on DOY 287 (October 14) over DSS-45 and DSS-14, X- and S-band
09 287 1900 2000 2345 0000 DSS-14 CAS   TP RS119-OCCORT1 4394 1639   1A1
09 287 1900 2000 0500 0515 DSS-43 CAS   TP RS119-OCCORT1 4395 1937   1A1
09 287 1930 2000 2045 2100 DSS-45 CAS   TP RS119-ORT D/L 4395 0688   1A1
-    DSS-43 prime
-    DSS-14 and DSS-45 verify S-band and X-band signals (RCP and LCP at 14)

Special test on DOY 290 (October 17) over DSS-34, X- and Ka-band, Monopulse on-point phase cal
09 290 1845 1945 0445 0500 DSS-34 CAS   TKG PASS   4398 N003   1A1
-    DSS-34 prime pass
-    DSS-34 monopulse was red during SCE. Station requested on-point phase cal. Ka-band was
     powered ON and cal completed before tracking started. Monopulse worked nominally during track

ORT on DOY 292 (October 19) over DSS-34, X- and Ka-band
•   09 292 1740 1910 0345 0400 DSS-34 CAS   TP RS119-OCCORT2 4400 N750   1A1
•   09 292 1815 1945 2325 2340 DSS-25 CAS   TP RS119-OCCORT2 4399 N748   1A1DSS-63
     prime, DSS-26 GSE
-    DSS-34 prime pass
-    Nominal supports. Pointing data acquired

ORT on DOY 295 (October 22) over DSS-34, X- and Ka-band
09 295 1800 1930 0430 0445 DSS-34 CAS   TP RS119-OCCORT1 4403 N750   1A1
-    DSS-34 prime pass
-    Nominal support. Pointing data acquired

GSEs surrounding Occultation (all will be scripted)
09 305 0330 0500 1400 1415 DSS-55 CAS   TP RS120-KDWN1   4412 N750   1A1
09 305 0400 0500 1400 1415 DSS-63 CAS   TKG PASS   4412 N003   1A1
09 306 1655 1825 0325 0340 DSS-34 CAS   TP RS120-ENGRV2 4414 N750   1A1
09 306 1725 1825 0325 0340 DSS-43 CAS   T/P E7 PB   4414 N003   1A1

Misc

Plan for Cassini Specific 4th Order Pointing Models
- Don sent David pointing data from ORTs
- DSS-34 noticeable jump in Ka-band power when monopulse was enabled
- More DSS-25 pointing data available from SCE – (DOY 268, 272, 276)

Equipment Status
- Goldstone RSR1
- DSS-14 S-Maser

SNT
- Enable X only at DSS-25 and DSS-34 throughout
- Conduct SNT measurements

DSS-14 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