About the Occultation

- S74 Rev 168 Saturn rings occultation
  - Ingress only
  - Telemetry OFF, Ranging OFF, 2-way/3-way mode
  - Covered by Canberra

- From Essam Marouf:

  The Rev168 ingress ring occultation will be the second in a group of four occultations planned during the June to August 2012 period. They are specifically designed to sample new range of ring opening angle (~12.5 to 13.5 degrees), while covering complementary range of ring longitudes. The four occultations are on Revs 167 to 170. The Rev168 occultation will be only the second ring occultation conducted in 2-way and 3-way configurations using an uplink signal from DSS-43 to provide a reference signal to replace the one usually provided by the Cassini UltraStable Oscillator (USO). Measurements at three radio wavelengths (0.94, 3.6, and 13 cm; Ka-, X-, and S-bands) will be collected at the Canberra complex (DSS-43 and DSS-34). The occultations are expected to yield high resolution radial profiles of ring structure, shedding more light on variability of dynamical ring features (waves, wakes, edges, gaps, narrow ringlets, ...) with ring longitude, opning angle, and wavelength. In addition, measurements of the strength and shape of the collective forward scattering function are expected to shed more light on physical properties of multitude of ring features (particle sizes, aggregate sizes or wakes, wake orientation, packing fraction, ring thickness, ...).

DSN Antennas

- DSN Coverage

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        Pre    BOT    EOT    Post
12 180  0610   0710   1435   1450    DSS-43 CAS   TP RS168-RIOCC   5385 1635   1A1
12 180  0855   0955   1415   1430    DSS-34 CAS   RS168-RIOCC D/L  5385 N750   1A1
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- Receivers scheduled
  - 2 closed-loop receivers per antenna
  - Open-loop receivers (RSRs, WVSRs, VSRs)
  - Open-loop data are prime. Closed-loop data are backup
    - Will need ramp info in closed-loop data for processing

- Antennas Band and Polarization Capabilities

DSS-43	DSS-34*
X-RCP X-LCP	X-RCP
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
  - Only RCP will be recorded
    - 2-way/3-way and 1-way modes

RSR/VSR/WVSR Assignment

Aseel: VOCA
Don: Ops Room Displays

DSS	Operator	Station	Open-loop Receiver	RSR Assignment
43 (2-way)	Elias	rsops1	RSR1	RSR1A -> XRCP RSR1B -> SRCP
43 (1-way)	Danny	rsops3	WVSR1	WVSR1A -> XRCP WVSR1B -> SRCP
34 (2-way)	Don	rsops2	RSR2	RSR2A -> XRCP RSR2B -> KRCP
34 (1-way)	Danny	rsops3	WVSR2	WVSR2A -> XRCP WVSR2B -> KRCP

RSSG will be in Ops Room at 10:45 pm on Wednesday, June 27th (180/0545)

ORTs

ORT on DOY 165 (June 13) over DSS-34, X- and Ka-band

12 165 0600 0730 1430 1445 DSS-34 CAS   RS167-OCCORT MC 5370 N750   1A1
- Station conducted on-point phase cals in 1-way and 2-way modes
- Monopulse successful, but Don reported eDMD displays showed the "Conscan Type" as "NONE"
    - Accum Az & El offsets were updating and station confirmed monopulse was enabled
    - Looks as though this one field ("Conscan Type") of the eDMD display wasn't updating.
- No Ka-band spurs at +/- 180 Hz
    - Were first observed during E19 support when both DSS-25 and DSS-34 were tracking, and uplink was over DSS-25
- Very good Ka-band!

ORT on DOY 167 (June 15) over DSS-43, X- and S-band

12 167 0415 0515 1215 1230 DSS-43 CAS   SEQ RS167-ORT   5372 1639   1A1
- To verify X- and S-band signals
- Both looked very good

ORT on DOY 169 (June 17) over DSS-34, X- and Ka-band

12 169 0345 0515 1415 1430 DSS-34 CAS   SEQ RS168-ORT MC 5374 N750   1A1
- Station conducted on-point phase cals in 1-way and 2-way modes
- No Ka-band spurs at +/- 180 Hz
- Not clear if there was a jump in Ka-band power when monopulse was enabled due to fluctuations
- Ka-band fluctuating by ~3 dB during 1-way and ~1 dB during 2-way
    - Station investigated during 1-way
        - Turned off the Ka-band SNT from 06:13:23 until 06:54:03 and they disabled monopulse from 06:30:43 until 06:54:17
        - They concluded that the reason for these fluctuations was the overcast weather
- Not clear if there was a jump in Ka-band power when monopulse was enabled due to fluctuations

2012/169 S73 ORT 34_K_RCP
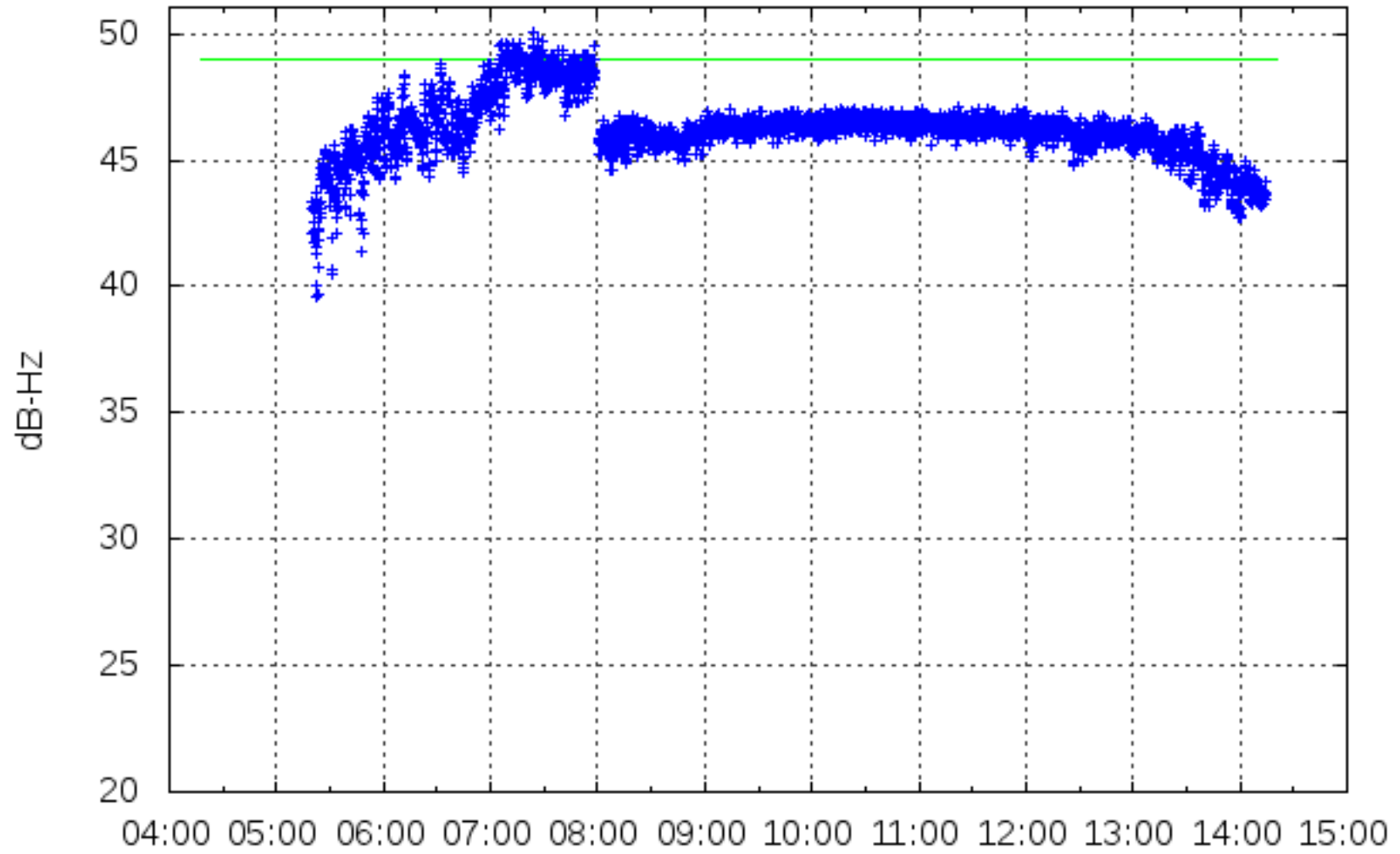
Misc

Uplink at DSS-43: 18 kW

DKF – Will not have accurate AOS/LOS and uplink times

NOPEs - Equipment Status?

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

Plan for predicts generation?
- RSS will need uplink predicts

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

Open-loop Recording bandwidths
- All except Ka-band 1-way: 1, 16, 50, 100 KHz
- Ka-band 1-way: 1, 2, 16, 50 KHz

Closed-loop receiver lock-up - Will be intermittent during Ring B