S71 Rev158 D3 Dione Gravity Observation

- Telemetry ON, Coherent mode (2-way and 3-way)
- Covered by all complexes
  - Canberra -> Madrid -> Goldstone

- Science Highlights (From Luciano Iess)

  Gravity observation to study the internal structure of Dione. D3 is the first Dione flyby with tracking at closest approach. In spite of the small mass of the satellite, the spacecraft acceleration will be clearly detected in Doppler data. The accuracy of range rate measurements provides good sensitivity not only to the monopole, but also to the quadrupole field, which will be determined for the first time

DSN Antennas

- DSN Coverage

	Pre	BOT	EOT	Post					
11 345	0230	0400	1300	1315	DSS-55 CAS	TP RS158-GSE1	5184 N750	1A1	GSE
11 345	2130	2300	0415	0430	DSS-34 CAS	TP RS158-D3GRAV	5185 N750	1A1	D3 Gravity
11 346	0210	0340	1300	1315	DSS-55 CAS	TP RS158-D3GRAV	5185 N750	1A1	D3 Gravity
11 346	0935	1105	2110	2125	DSS-25 CAS	TP RS158-D3GRAV	5185 N748	1A1	D3 Gravity
11 346	1735	1905	0400	0415	DSS-34 CAS	TP RS158-GSE2	5186 N750	1A1	GSE
11 346	1805	1905	0325	0340	DSS-43 CAS	TKG PASS D3PB	5186 N003	1A1	GSE

- Receivers scheduled
  - 2 closed-loop receivers per BWG antenna
  - Open-loop receivers
  - Closed-loop data are prime. Open-loop data are backup
  - LCP not required. Only RCP

RSR/VSR/WVSR Assignment

DSS	Operator	RS Ops Machine	Open-Loop Receiver	RSR Assignment
34	Elias/Aseel	rsops1	RSR2	RSR2A -> XRCP RSR2B -> KRCP
55	Elias/Aseel	rsops1	RSR2	RSR2A -> XRCP RSR2B -> KRCP
25	Aseel/Don	rsops1	RSR2	RSR2A -> XRCP RSR2B -> KRCP

RSSG will be in RS Ops Room at 1:30 pm on SundayDecember 11 (345/2130)

DON: 7:00 PM - 9:00 PM (Sat) For GSE

DON: 1:30 PM - 5:30 PM (Sun)

ELIAS: 5:00 PM - 1:30 AM (Sun-Mon)

ASEEL: 6:00 PM - 8:00 PM (Sun)

ASEEL: 1:00 AM - 5:30 AM (Mon)

DON: 5:00 AM - 12:00 PM (Mon)

ORTs

Completed

ORT on DOY 325 (Nov 21) over DSS-25, X- and Ka-band
11 325 1730 1900 2225 2240 DSS-25 CAS RS157-GRVORT1 MC 5164 N748 1A1
- Also USO Characterization
- Problematic monopulse. Values not updating (DR# G112142). No pointing data acquired

ORT on DOY 333 (Nov 29) over DSS-25 and DSS-55, X- and Ka-band
11 333 1045 1215 2100 2115 DSS-25 CAS RS157-GRVORT2 MC 5172 N748 1A1
11 333 1045 1215 1400 1415 DSS-55 CAS RS157-GRVORT2 MC 5172 N750 1A1
- DSS-25 prime
- Verified monopulse, acquired pointing data
- DSS-25 eDMD monopulse offsets took about 5 minutes after monopulse was enabled to start updating
- DSS-55 monopulse initially didn't work. Station did on-point phase cal shortly after BOT, fixed phase offset and enabled monopulse (DR# M106556)

Ongoing

ORT on DOY 339 (Dec 5) over DSS-34, X- and Ka-band
11 339 1645 1815 0315 0330 DSS-34 CAS RS158-GRVORT3 MC 5179 N750 1A1
- DSS-25 to verify monopulse, conduct monopulse on-point phase cals as needed, acquire pointing data

Coming up

ORT on DOY 342 (Dec 8) over DSS-55, X- and Ka-band
11 342 0245 0415 1015 1030 DSS-55 CAS RS158-GRVORT4 MC 5181 N750 1A1
- DSS-55 to verify monopulse, conduct monopulse on-point phase cals as needed, acquire pointing data

Misc

Support schedule:

- GSEs will be partially supported and then scripted
- David Rochblatt real-time support not required since there will be no Monopulse offsets decisions during experiment. Need to have good pointing models in case monopulse is problematic

SPS Predicts – Ramped

- Based on analysis by NOPEs and Telecom, unramped predicts not possible except during Inbound GSE

Equipment status?

Pointing Plan

- Enable monopulse throughout gravity observation. If problematic, stay with blind pointing
  - Are 4th-order pointing models good? Need good models in case monopulse is problematic
  - Data to David Rochblatt from recent ORTs
- Watch for monopulse enables at low Elevation angles. Wait till ~10 degrees

SNT - Enable at all throughout

RSSG: Ensure AWVR units at Goldstone and Madrid are ready