

## S66 Rev145 T74 Titan Gravity

- S66 Rev145 T74 Titan Gravity Observation
  - Telemetry ON, Coherent mode (2-way and 3-way)
  - Covered by all complexes
    - Madrid -> Goldstone -> Canberra -> Madrid

- Science Highlights

T74 is the sixth flyby of the Cassini mission for acquisition of Titan gravity data. This flyby was not dedicated to RSS as with the previous five. Another instrument (CAPS) accepted degradation to their science so that the HGA is Earth-pointed for RSS ride-along and acquire gravity data.

“The goal is to measure the fluid and dynamic Love number of Titan and determine Titan's geoid. The determination of the fluid Love number is the only way to find out with confidence whether Titan has a liquid ocean. However, more flybys are needed. The determination of the geoid is crucial to understanding the internal structure of Titan through correlative analysis of the gravity and RADAR planetary radii data.”

# DSN Antennas

- DSN Coverage

	Pre	BOT	EOT	Post								
11 048	1115	1245	1410	1425	DSS-25 CAS	TP RS145-GRVORT2	4886	N748	1A1	GSE Unramped		
11 048	1135	1305	2145	2200	DSS-34 CAS	TP RS145-KADWN1	4887	N750	1A1	GSE Unramped		
11 049	0115	0245	0830	0845	DSS-55 CAS	TP RS145-T74GRV1	4887	N750	1A1	Unramped		
11 049	0420	0550	1615	1630	DSS-25 CAS	TP RS145-T74GRV1	4887	N748	1A1	Unramped		
11 049	1020	1150	2255	2310	DSS-34 CAS	TP RS145-T74GRV1	4888	N750	1A1	Unramped		
11 049	2045	2215	0530	0545	DSS-55 CAS	TP RS145-T74GRV	4888	N750	1A1	Unramped		
11 050	1115	1245	2145	2200	DSS-34 CAS	TP RS145-KADWN2	4889	N750	1A1	GSE Ramped		
11 050	1145	1245	2245	2300	DSS-43 CAS	T/P T74 PB	4889	N003	1A1	GSE Ramped		

- 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



# ORTs

## Completed

ORT on DOY 030 (Jan 29-30) over DSS-25, X- and Ka-band

11 030 0615 0745 1310 1325 DSS-25 CAS TP RS144-GRVORT 4868 N748 1A1

- DSS-25 prime
- Verified monopulse, acquired pointing data

## Coming up

ORT on DOY 041 (Feb 10) over DSS-55, X- and Ka-band

11 041 2145 2315 0645 0700 DSS-55 CAS TP RS145-GRVORT1 4880 N750 1A1

11 041 2215 2315 0815 0830 DSS-65 CAS TKG PASS 4880 N006 1A1

- DSS-65 prime
- DSS-55 to verify monopulse, conduct monopulse on-point phase calcs as needed, acquire pointing data

ORT on DOY 045 (Feb 14) over DSS-34, X- and Ka-band

11 045 1130 1300 1625 1640 DSS-34 CAS TP RS145-GRVORT2 4884 N750 1A1

11 045 1200 1300 2200 2215 DSS-45 CAS TKG PASS 4884 N006 1A1

- DSS-45 prime
- DSS-34 no monopulse?! Verify blind pointing

ORT on DOY 048 (Feb 17) over DSS-25, X- and Ka-band

11 048 1115 1245 1410 1425 DSS-25 CAS TP RS145-GRVORT2 4886 N748 1A1

11 048 1135 1305 2145 2200 DSS-34 CAS TP RS145-KADWN1 4887 N750 1A1

- Also GSE Passes
- DSS-25 to verify monopulse, conduct monopulse on-point phase calcs as needed, acquire pointing data
- DSS-34 no monopulse?! Verify blind pointing

# 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 – Unramped except for outbound GSE over DSS-34 and DSS-43 on DOY 050

Equipment status?

Pointing Plan

- Except for DSS-34, enable monopulse throughout gravity observation. If problematic, stay with blind pointing
  - Are 4<sup>th</sup>-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

DSS-55 LQG

SNT - Enable at all throughout

Receivers during closest approach (high dynamics)

Power drops at switch from 3-way to 2-way?

- Observed during previous gravity observations.

RSSG: Ensure AWVR units at Goldstone and Madrid are ready