

S76 Titan T87

- S76 Rev174 T87 Titan NAV Atmospheric Density Experiment
 - Altitude 973 km
 - Spacecraft on thrusters C/A +/- 1 hr
 - Telemetry ON, Coherent mode (2-way and 3-way)
 - Covered by all complexes
 - Canberra -> Madrid -> Goldstone
- Science Highlights

T87 is one of two passes in the Solstice Mission where INMS and the navigation team will simultaneously measure Titan's atmosphere. This is critical to understanding the differences in the atmospheric density calculated by INMS, NAV, AACS and UVIS. Navigation will determine Titan's atmospheric density by measuring the acceleration of drag on the spacecraft with Doppler shift observations

T87 is not an RSS flyby, but we will be supporting as we would a gravity flyby

DSN Antennas

- DSN Coverage

	Pre	BOT	EOT	Post											
12 318	0200	0330	0645	0700	DSS-34	CAS	TP	NV	RS	ATM	EXP	5523	N750	1A1	
12 318	0440	0610	1435	1450	DSS-55	CAS	TP	NV	RS	ATM	EXP	5523	N750	1A1	
12 318	1200	1330	1720	1735	DSS-25	CAS	TP	NV	RS	ATM	EXP	5523	N748	1A1	

This is a DSN Level 3 activity

DSS-34 track ends before the s/c is Earth-pointed. It will provide uplink only

DSS-34 BOT is about an hour before anything happens

- Originally thought uplink would start 40 minutes earlier than current plan, but that time is used to turn to Earth point
- Keep BOT as is, or change to BOT at 0410
 - At this time in sequence process, is it worth to release (requires new sequence products?)

- 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

S76 T87 Open-Loop Assignment

DSS Prdx Mode	Operator	Station	Open-loop Receiver	Channels	Subchannels	Bandwidths KHz
55	?/Gregory/ Aseel	rsops1	RSR2	RSR1A -> XRCP RSR1B -> KRCP	1, 2, 3, 4 1, 2, 3, 4	1, 8, 16, 50 1, 8, 16, 50
25	Aseel/?	rsops1	RSR2	RSR2A -> XRCP RSR2B -> KRCP	1, 2, 3, 4 1, 2, 3, 4	1, 8, 16, 50 1, 8, 16, 50

? = Elias or Danny

RSSG will be in Ops Room at 5:45 pm on Monday, November 12 (318/0145)

Likely three shifts

No need to configure RSRs for DSS-34. Uplink only

Misc

ORTs

- None officially planned, but BWG Ka-band tracks on 309, 312, 313, 314 that cover all antennas

12	309	0530	0700	1600	1615	DSS-55	CAS	TP	RS174-SCE9	5514	N750	1A1
12	312	0515	0645	1245	1300	DSS-55	CAS		RS174-SCE9 MC	5517	N750	1A1
12	313	1245	1415	2250	2305	DSS-25	CAS		RS174-SCE9/USO	5518	N748	1A1
12	313	1740	1910	2255	2310	DSS-34	CAS		RS174-OCCORT MC	5519	N750	1A1
12	315	0100	0230	0635	0650	DSS-34	CAS	TP	RS174-RIOCC	5520	N750	1A1

SPS Predicts

- Default predicts. No requirement for unramped

Equipment status?

- NOPEs? (DSS-34, DSS-55, DSS-25)

Uplink Plan

- Per SOE/DKF
- Gap due to transmitter limits during Canberra-Madrid overlap (no uplink transfer)
 - DSS-34 transmitter OFF 318/062500
 - DSS-55 transmitter ON 318/063500
 - DSS-55 can have transmitter ON a few seconds earlier (063416). Does NAV care?
 - Coherent gap RTLT later is 318/092314 to 093314

Misc Cont'd

Pointing Plan

- Enable monopulse throughout observation. If problematic, stay with blind pointing
- Stations to wait for RSSG to request monopulse enable
- Watch for monopulse enables at low Elevation angles (DSS-25). Wait till ~10 degrees (~1351z)

SNT

- Enable at all throughout

Closed-loop Receivers during closest approach

- High signal dynamics. Widen carrier loop bandwidth?

AWVR

- Elias: Are AWVR units at Goldstone and Madrid are ready?