

S84 T102 Titan Bistatic &  
Occultation

6/18/14 (1)  
DOY 169  
T102

DOY 169, DSS-43 & DSS-34

NOPE: Lu & Sandy  
Dusty (new RS OE)

Ops room: Aseel, Elias, Danny, Dustin  
Essam, Jeff  
David R. on phone

ACE: Grant

0705 43 & 34 Briefing

ACE: RS bistatic occ taking place  
Have timeline → yes

Per SOE & timeline

43 XMTR on & off has been changed

On 120014

Off 123508

Ka on 103417

off 16542?

Monopulse on per RS

Weather? → fine, wind ∅

Equipment? → green

0709 Told 43 & 34 to go through standard  
pre-cal activities, & to let us know when  
they are done & we'll go through bistatic calibrations

Fgam

43 XR	60
43 XL	37
43 SR	50
43 SL	30
34 XR	55
34 KR	55
34 KL	35

0739 43 tracking in A3  
Both rrvs X-band.

me → completed steps on page 10?

43 → Yes. Now on page 12  
thru step 8

0745 Told 43 we are almost done configuring the open-loop rrvs. We just need a few more minutes and then we'll go over steps on page 12

0750 Started 43 <sup>Bistatic</sup> calibrations

Rev 6

0800 34 saying completed setup activities & ready for bistatic calibrations

→ Just to verify, completed steps on page 10  
34 → yes

0803 34: Name of 4th order pointing model  
34 crew

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Put switch 43 in B position  
→ it is in B position now

0803 34 Bistatic calibrations

084200 34 done w/ pre-cal bistatic cal

084230 Told 34 done w/ pre-cal bistatic cal  
please go to point

0845 NOA (Sandy) asking if want 34 to put  
switch 34 in A position  
me → standby

me to NOA: It's in timeline @ 103000, but  
since done w/ calibrations, can switch  
back now.

084539 Told 34 to put switch 43 in A position

0848 34: On-point  
crew change @ 0900

0849 NOA (Sandy) to 34: Which crew supporting  
34: Currently B  
next D

0852 <sup>to NOA</sup> 34 asking about step 6.2 #10  
enable BNT on both DCs.  
Is that correct.

0856 Lu on phone.  
OK to enable SNT?

me → what is step 6.2?

Lu → step says to enable SNT when go to point:

me → they can set up for SNT measurement

Lu → Select .25 for X & 0.5 for Ka?

me → Standard

Lu → Yes

0859 Told 34: Before team B leaves, wanted to say thank u & we appreciate the support (seemed confused 😊)

0902 Lu on phone

34 on point. OK to turn noise diode on to verify performance

checked w/ tssum

me → OK

will disable off end of SNT measurement

0913 NOA (Sandy) to 34

Regarding step 10 under 6.2, can see where it gets confusing

Want to verify diodes before SNT measurement. Should include step to change to nominal value ....

Execute steps 1-4 on page 21 of presentation

0915 34 to NOA: Completed 1-4 on page 21

0919 34 SNT

X 23.1

Ka 36.9

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0926 Lu called on phone

Need Rev 7 of bistatic procedure.

Add step to reconfigure back to nominal values @ end of bistatic calibrations.

After step 20 for 43.. reconfigure back to nominal value.. remember caused problem during one CRT

me → but only time we are enabling SNT is SNT measurement. If we reconfigure for nominal, have to change to 12.5 for Mini Cal. Is it only problem if we enable SNT

Lu → Yes.

me → steps are good

Lu → OK. if only enable SNT during SNT measurement, then good. Will remove step from Briefing Message

0935 Done w/ 43 pre-cal calibrations

0936 Told 43 coe completed bistatic calibrations. Please go to point & complete step 10 on page 10

## Closed-loop rows

43	X	DCC 01
43	S	DCC 04
34	X	DCC 02
34	Ka	DCC 05

## Predicts

Baseline	1-way
Bistat In	3-way w/2
Occ In	3-way w/3
Occ Eg	3-way w/4
Bist. Eg	3-way w/5
Baseline	1-way

094130 Lu telling 43

Step 10 6.3.1.1

wait 1035 to do SNT or do step 1-4 on page 21 now (SNT means)

→ will have diodes setup now

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0944 43 telling NOA page 21 steps 1-4?  
Both rxrs are s-band.

Lu → Configure now SRCP & XRCP

0950 Talk w/ Lu over phone about X43 12.5 diodes  
How do they calibrate?

Lu → Maintenance people, not real-time  
Engineering

Used to do real-time, but not any more

Told him Essam said XLCP 12.5 diode was  
more like 20 (later corrected. It was XRCP)

Lu checked

XL is good

XR is 22.35 K

Essam checked & confirmed that it was  
XR, not XL, that was off

Lu: X-band on DC01 is no good

S-RCP 0.25 is off. Use S <sup>me</sup> → no

for 12.5, 8 would give you 10.8

Lu: <sup>me</sup> will not change today. Use 12.5  
Next time check before.  
They will give us real-time readings of  
calibration values

Will ask station after experiment to calibrate  
DC01 off on 12.5, DC04 off on 0.25

- 1011 Lu asking 43 if rcvd email about J102 movie.  
sent ~3 hrs ago
- 1019 Got 43 SNT values. Agree w/ eDMD
- 1020 Asked 34 for SNT values. Disagree w/ eDMD.  
Asked 34 to repeat Ka-band  
34: Want ambient or SNT from rcvr?  
me → SNT. Gave correct values
1022. Asked 43 & 34 to reconfigure per steps  
7 & 8 on page 21 (End of SNT meas.)
- 1023 43 & 34 completed steps 7 & 8  
→ Verified SNT disabled
- 1020 - ~1025 SNT Measurement
- |        |               |              |
|--------|---------------|--------------|
| 103420 | S-band signal | S resid 12.6 |
| 103440 | X-band        | X resid 47.8 |
| 103512 | Ka-band       | Ka resid 182 |
- 1036 Told 43 & 34 we see strong signals @  
all three bands. Try to acquire
- 103840 Asked 34 to put switch 43 in B (to check  
KLCP)
- 1051 Told 34 we continue to see spurs @ Ka-band.  
Can we get DR.
- 1052 Told 43 we also see spurs @ X-band after TLM  
off. DR for that as well.



1054 Ka resid n 187.  
Went a few Hz down then up.  
When TLM went off, 10 Hz jump in  
freq! Temperature change?

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1057 Asked 34 to put switch 43 in A position  
 $P_x/N_0$  increase to 40!  
(from n 20)

105815 34 Mono enabled  
A3 +5 ~~6L-5~~ deviation 68.77  
⇒ 2 dB Jump!

1101 David called on phone  
see 4.5 MRE . Will monitor

1005 34 Weather Update

1007 34 said was just told that it's quite foggy  
outside

Sleepy © ©

1200 start recordings 100k

120014 43 Xmitr On

1200 Dip in Ka-band  
(corresponds to A3 360)

1203 P./No. (Baseline/Thermal Stabilization)

43 XR	54.91	——	<sup>60</sup> gain
43 XL	32.94	——	37
43 SR	41.72	——	50
43 SL	20.13	——	30
34 XR	49.8	——	55
34 KR	50.1	——	55
34 <del>H</del> error	32.5	——	35

1207 Ka has been drifting ~ 2 Hz/min.  
Prepare for baseline, enter SFRO  
Bistatic

Put @ 200

120725 34 Ka 1kHz SFRO -180 (VSRIB.)  
Also on WSRIB

To put carrier @ +200 Hz from center

1211 Mono corrections

Az .8 EL -5.2 elevation 66.3

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1239 David called on phone  
me: what do you think so far?  
David: Errors different (than OET)  
weather different.  
Clear, foggy  
Weather affect pointing

1243 Told 34 to put 43 in B at 124138

124800 34 disabled mono w/o clearing offsets  
(before I called them at 124815)

A3 2.67  
E1 -6.08  
elevation 61.31

↓ Was discussing  
w/ David what to do.  
He wanted to calculate  
cross-EL offsets, clear mono,  
& enter manual offsets.  
I prefer to keep.

1249 Lu & Dusty  
called.

Dusty saying RSR1 showing no signal detected  
for last 3 mins!

Now we started turn to Titan, so no signal.  
But he said it's been showing no detection  
for a while & he wanted us to be aware of it.

125050 Lu saying to tell station about Mini Cal  
Coops! Distractions!!

125120 Told 43 & 34 if setup for mini cal to  
go ahead & enable the diodes

1321 Lu called on phone  
43 when switched RCP to LCP then  
switched microwave switches not from DTT!!  
34 did it right.  
He will tell them

1324 Lu to 43: Next minimal @ 144456, for  
that & the last one when switching RCP to  
LCP, perform from DTT JF switches & not  
from microwave switches.

142030 Told 34 to put switch 43 back in A position  
at 143036

143024 1-way signals back  
ka resid -1625 !! Drifted faster than  
expected

1432 Switch to 2-way/3way .. sweep

1434 Steady 2-way signal

143424 Mono enabled  
⇒ no visible jump

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1435 Pci/No  
2-way / 3-way

43XR 55.03

43XL 32.55

43SR 41.65

43SL 16.55

34XR 49.5

34KR 50.2

34 error no signal / 15

w/1437 Ka 1-way offset -1900

1438 Told 34 to disable MONO @ 1439 w/p  
cleaning offsets

1439 Mono disable w/o cleaning Az 0.77<sup>EL</sup> -3.32  
elevation 40.96

1439 X 1-way offset -400

144015 Told 34 to put switch 34 in

144100 Told 43 & 34 to second minical @ 144456  
so enable diodes at that time  
& reminder to 43 to switch RCP to LCP  
thru DTT IF switches

144456 34 switch 43 position B

14456 Mini Cal #2

1480 Lu called on phone

They switched RCP to LCP correctly

1452 Told 34 to put switch 43 back in A  
@ 145400

1454 34 switch 34 in A

145645 1-way

145647-ish 2-way

150000 Mono enabled  
⇒ no jump

A3 -1.78, GL -2.17, elevation 36.61

150250 Told 34 to disable mono @ 150630  
w/o cleaning offsets

150630 34 disabled mono w/o cleaning offsets  
me ⇒ asked the to put switch 43 in B  
@ 150820

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Ka-band offset .. Resid -1412

X-band offset

150759 X-RCP RSR1A sfro 1-800

Put resid @ +275 Hz

1508 Ka-band RCP & LCP 1K offset -2300 (Put carrier @ n+300)

151337 XLCP RSR1B sfro 1-800  
Forgot to do @ 150759

1522 David R. off phone

Said that pointing was v. good during  
egrew bistatic. 2.5 mdeg MRE

152248 Told NOA (Lu) we are seeing beautiful  
surface echoes, mostly @ X-band, but  
also S & K

Lu → so seeing @ all

me → yes, but mostly X

Blank



1618 ACE Grant came by & Dave Doody

ⓐ

1622 Told 43 & 34 SNT meas.

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@ 163330. Configure per steps

1-3 on page 21, but wait on enabling SNT  
until 163330

1630 Duane Roth came by

163330 SNT enabled

Done 163740

(was going to record more  
but then station reminded  
me that timeline shows that it  
has to be done by 1637)

163820 34 asking if want switch 43 in A  
→ yes done ~ 163845

163840 1-way signals

(-2615 in 16K w/o SFRO)

Ka-band 1K @ -309 w/ SFRO -2300 Hz

X-band 1K @ 112 w/ SFRO -800 Hz

(-690 in 16K w/o SFRO)

164850 Told 34 to enable Mono @ 165300,  
disable w/o clearing offsets @ 165418, &  
finally put switch 43 in B position @ 165900.  
All per timeline

1651 Told 43 & 34 Mini Cal #3 at 170000  
To enable diode @ that time.  
Reminder for 43 to switch from RCP to LCP  
thru DTT IF switches

165300 Mono enabled

⇒ 1 dB jump!

Corrections Az +1.17 EL +4.69 elev. 13.65

165418 Mono disabled

165429 S & K<sub>1</sub>-band off

165900 34 switch 43 in B

170000 Mini Cal #3

171623 LOS X-band.  
S/C off Earth point

1718 Told 43 & 34 that we'll record noise  
baseline until 1730 & then ask them to  
go to stow

1730 ACE (Dave Doady) .. EOT officially.  
Super support. Hand over to RSS

1731 Told 43 & 34 when get to stow, to  
complete directives on page 10.. Steps  
1-8 & let us know when ready

1744 NOA (Jack!) following post-cal steps. 6/18/14  
Step #10 on page 10.. track in encoder mode or? T102  
me → We skip step 10 for post-cal. It's for pre-cal only

Super fast 43 post-Cal Calibrations  
Station said it took them a while to complete steps on page #10.

Took to slow.. then zenith... Will take a long time to complete & have a support after this  
me → We have to do them. Will go over very fast  
43 → still going to  
me → Can we start now?  
43 → yes

181210 43 saying have to stop & go to next support  
→ one min for last two steps? 30 sec each.  
→ OK

1813 Done

1815 Told 43 & 34 had a very successful expt. Thank u v. much for outstanding support. We are v. grateful.

NOA (Sandy) want to extend thanks.

1817 Called ROC. Jack.  
I hope I didn't push 43 too hard or upset anyone.  
Jack: No. They would've told you. This is level 3, next one is prob. 3. They would give you extra time if need it.

Maybe should increase post-cal

me →

DRs C110292 for Ka-band spurs @ DSS-34  
C110293 for X-band spurs @ DSS-43

Changes to timeline (v3):

1010 Begin recording all subchannels

⇒ not 100K.

Start rec. 100K @ 1200