S98 Rev 268 Rings and Atmospheric Occultations
DOY 095-096, April 5-6, 2017
DSS-74, DSS-43, DSS-63, DSS-55, DSS-84, DSS-14, DSS-26

Ops: Elias (RSR/DSS-55), Clement (RSR/DSS-63), Danny (WVSR/DSS-63, PRSR/DSS-63), Jay (WVSR/DSS-35), Aseel (PRSR/DSS-74, DSS-84) and VOCA
NOA: Lu
ACE: Mike then Bill

Fgains:
63X   61
63S   49
55X   55
55Ka   55

1-way offsets:
S   745,710
X   2,734,275
Ka   10,390,230

RSS Shifts:
2130   Elias
2330   All others

Not in timeline, but scripted
At DSS-63, switch from 3-way/43 to 2-way at 04:12:00
At DSS-55, switch from 3-way/43 to 3-way/63 at 04:12:00
At DSS-14, switch from 3-way/63 to 2-way at 11:01:10

DOY 095

2145   DSS-74 Pre-Cal
Wind speed 0.7 m/s
Relative humidity 90%
Equipment green

2200   Lu to DSS-74
What was the frequency offset you'll be using?
DSS-74 -> BLF 7175.028420 MHz
Lu -> that should apply to not only DSS-74 but also DSS-84

2215   DSS-43 Pre-cal
Uplink only support
Weather: 12 C, 39% relative humidity, wind 4 kph

Transmitter on and off per timeline

Lu to DSS-43
What crew?
43 -> Crew D

231500   DSS-43 transmitter on, 18.021 kW, LCP

2340 <mark>DSS-55 Pre-Cal</mark>   X DCC07   Ka DCC06
Clear sky, wind 6.2 kph
Equipment green
4th order blind pointing model: cas55.sem

Lu to DSS-43
What crew?
55 -> Crew C

2348   NOA to DSS-55
Follow timeline. No signal until
Backup uplink. Load DSS-63 ETX

2356   NOA to DSS-55
Lu: franz code is TV
Reason we want same ETX is because table from DSS-63 was modified by RS team
55 -> will be distributed after link at DSS-63 is built

2359   DSS-55 to NOA
Want to make sure that want us to load the exciter predicts file, not the exciter table file
Lu -> want you to use uplink predicts from DSS-63

Equipment status at Madrid:
RSR1A – Red but can be used by overriding dig vfy test
RSR2B – Digitizer test fails due to unknown cause. Can be used by overriding dig vfy test
VSR – Red

Did commands in the script on both RSR1A and RSR2B
Set DIG_VFY_TST OFF
(before issuing vfy)

DOY 096

0010 <mark>DSS-63 Pre-Cal</mark>   X DCC05   S DCC04
Confirm have received BM for today's activity
63 -> yes

ACE -> Confirm have received RS timeline v2
63 -> yes
ACE -> Support will be per RS timeline. CA only w/ your station providing prime uplink and 55 backup
BOT 011000, xmtr on 014650, EOT 090500
63 -> weather clear sky, equipment green, wind 1.9 kph

0021   NOA to DSS-74
Just a reminder that you have an uplink transfer with DSS-43 at 004746

0040   NOA to Madrid
(in response to them saying they don't have 3-way predicts with DSS-74)
Switch predicts to 2-way @ 63 and 3-way @ 55 at 04????
RS -> can we make that switch at 041200 so that it's consistent with open-loop
NOA -> copy that

Lu on phone
DSS-74 used Fro -380
Me -> how do you know that?
Lu -> their BLF 7175082420
Our 7175082800
They are lower -380

014650   DSS-43 transmitter off
014740   DSS-74 transmitter on 15.5 kW

0129   S-band signal! Oscillating
         At -155
         No sfro needed at S
         Expect X to be -620 (to put at +100)

0130   X-band signal
Sfro X -670 (put at +100)

0131   Ka-band signal

WVSRs S- and Ka-band fgain settings finalized
(X-band will be done after telemetry goes off)

0131   RS to NOA
We're seeing strong signals at all three bands in the open-loop receivers

0132   DSS-55 in-lock on both X- and Ka-band

0134   DSS-74 in lock on X- and S-band

Don't see signal in the 16 KHz PRSR
Turns out the FFT display was lagging behind
Brought up a new display and signal was present

0137   RS to DSS-55
Enable monopulse at 014000

0140   DSS-55 enabled Monopulse
Very small jump in power
~0.3 dB jump

014038   Telemetry off

WVSRs X-band fgain settings were finalized

0141   DSS-63 to DSS-74
Want to coordinate transfer
014650   DSS_73 carrier up
014655   DSS-74 carrier down

014650   DSS-63 17.7 kW LCP
014704   DSS-74 carrier down

0150   RS to DSS-74
Wanted to let you know that the PRSR is running and recording and all looks good

0151   RS to DSS-55
At 015500, disable monopulse w/o clearing the offsets

0152   Pc/No 1-way
        RSR   WVSR
63X   52.58   52.8
63S   40.55   40.6
55X   47.40   47.2
55Ka   45.29   45.1
74X   PRSR   46.7

0154   DSS-55 Monopulse offsets
AZ -4.81, EL 2.65, elevation 12.8

0155   DSS-55 Monopulse disabled w/o clearing the offset
AZ -5.29, EL 5.30, elevation 12.88

015710   Switch to 3-way w/ 43
sfro a 0 on RSRs and 74PRSR

015840   DSS-63 in lock 3-way w/ 43

Same for station 55 X and Ka-band

015900   DSS-74 has acquisition of X- and S- 3-way

015930   RS to DSS-55
Re-enable Monopulse

0159   NOA to DSS-74
The webcam looks much better
74 -> no more fisheye
RS -> RS seconds that. Much better
74 -> Finally caught up with technology! ☺

0230   DSS-74 EOT
ACE thanked them
-> Nothing. Everything went smooth
RS -> I also wanted to thank you for excellent support
84 -> Going to extend track by 10 mins or so

0235   DSS-74 to RS
You said you wanted to record noise baseline. Would you rather I stop track now?
RS -> No continue

0241   LOS DSS-74 signal in PRSR

0318   RS to DSS-55
At 0320 disable monopulse w/o clearing the offsets

0319   DSS-55 Monopulse offsets
AZ -3.18, EL 2.92, elevation 22.45

0320   DSS-55 Monopulse disabled w/o clearing the offsets
Offsets kept AZ -2.99, EL 3.00

0329   Transfer from DSS-43 to DSS-74 observed
Jump in residuals!
63X   -0.46 to 47.27
63S   -0.11 to 13.03
55X   -0.54 to 47.2   -18 to 30 WVSR, but 1-way w/ offset
55K   -2.9 to 179.5   -55 to 150 WVSR, but 1-way w/ offset

Why difference between RSR and WVSR
RSRs have ramps that don't match actual ramps being used by DSS-74
WVSRs don't have ramps (1-way w/ offset)

Scalloping. not real-ramps

0355   1-way signal

045940   Coherent signal

0412   Switched open-loop receivers predicts to coherent at Madrid

041345   DSS-63 in lock X- and S-band

041510   DSS-55 in lock X- and Ka-band
0417   ESOC voice check

0420   ==DSS-84 Pre-Cal==
Have briefing materials?
84 -> Indeed, v2
BOT 0500, transmitter on 072145, transmitter off and transfer to DSS-14 at 084505.
EOT 0920

0422   Talked to Lu on phone
Really no need for DSS-26. Should we release them?
Lu -> keep as backup to DSS-14 uplink
Me -> if DSS-14 uplink is successful at 0845, then can release. Should they do
monopulse calibrations? Practice?
Lu -> yes, it would be good practice

0425   RS to DSS-55
Enable Monopulse at 0428

0428   DSS-55 Monopulse enabled
Jump in power 45 -> 45.7
0.7 dB jump

042804   Coherent at Madrid
Drop in residuals
63X   45.55 to -0.39
63S   11.63 to -0.317
55X   45.75 to 0.5
55Ka   176.0 to 2.6

0434   RS to ACE (on SOPC cord)
Wanted to give you a heads-up that I spoke with Lu and we're likely going to release
26 early. We're going to keep them as backup to DSS-14 uplink, but if DSS-14 uplink
is successful at 0845, we're likely going to release 26. They are not going to acquire
any downlink data during this track
ACE -> copy thank you

0450   RS to DSS-84
Did you say you are in lock on Ka-band?
84 -> yes
RS -> can you give me your Ka-band frequency please?

DSS-84: 32036.004, L-band 521 MHz

0504   RS to DSS-84
Can you give me a more exact L-band frequency (521 MHz)?
84 -> 521.009333
Used that to override predicts on PRSR and use FROV
set rf_to_if_lo to 31700
FROV = 521009333+31700000000 = 32221009333
Ddclo was automatically set to 560 MHz
Found signal! But it's not predict driven, so it's drifting

Multiple offsets and switches between predicts and FROV. Could only find signal
when override predicts

0525   RS to DSS-55
Disable Monopulse w/o clearing the offsets (should've done that at 0500!, per
timeline)
AZ 1.48, EL 4.72, elevation 27.32

Email from Michele (MLO station manager) states that:
IF1 = Fdl - 22400 - LO2
Where LO2 is adjustable

0526   RS to DSS-84
What's LO2 frequency?
84 -> 9115

Is rf_to_if_lo 22400 – LO2?
= 22400 – 9115 = 13285
Didn't work

Switched to FROV again and found signal

0552   Finally a Ka-band signal using predicts!!
IF1 = Fdl - 22400 - LO2
ADD 22400 and LO2 and that should be rf_to_if_lo in PRSR

0553   RS to DSS-84
Need that LO2 frequency during future supports since according to email from
Michel it's adjustable

84 -> we can make that **part of pre-pass briefing** if you'd like
Me -> sure

0613   DSS-55 to ACE
Not able to acquire Ka-band ca

0629   DSS-84 to RS
Now configured 1-way LO2 9105.0, frequency at L-band 520.669
RS -> we're actually still seeing S-band coherent signal so don't expect you'll see 1-way signal
84 -> so we're coming out of occultation in 3-way?
RS -> we're not going to see occ exit. We'll end track before we exit occultation
84 -> so you want me to configure back to 3-way or stay 1-way?
RS -> configure back to 3-way please

063130   S-band 1-way

063321   DSS-63 transmitter off

0634   DSS-84 to RS
Since s/c remained in lock, do you want us not to sweep?
RS -> we still want you to sweep to make sure DST locks up
Also,
Re-start closed-loop and open-loop for 3-way, and LO freq back to 9115.0

Note for the future:
Expect that station changing tracking modes will impact PRSR recording since LO2 changes. Have to make sure they don't change modes unnecessarily

0649   DSS-84 to RS
Still seeing coherent signal?
RS -> It's actually 1-way now, but you don't need to reconfigure. If you are recording, we'll consider this noise baseline
84 -> So next thing is transmitter on?
RS -> correct

0650   DSS-26 Pre-Cal
No downlink
Like you to go ahead and pre-cal as backup for uplink as backup to DSS-14. That's it and we'll probably release you early

Still seeing S-band 1-way signal

0710   Lost S-band 1-way signal

0719   DSS-84 to RS

2 minutes to carrier up

0720   DSS-14 Pre-Cal
0845 transfer from 84 to your station
100255 should see downlink, at that time should be 3-way w/ 84
No s-band support during this track
14 -> weather clear and calm
equipment green

0723   DSS-84 to NOA
carrier up 072130
If looking on web, can follow sweep of uplink

0725   DSS-84 to RS
I'm starting to upload New Norcia data, so I'm sending it to you and copy Jay, is that correct?
RS -> that's correct

0745   End open-loop recordings
DSS-14 1 KHz recording continued

Playback:
Madrid   096/0110 – 096/0745
DSS-74   096/0110 – 096/0250 (but not exact)
DSS-84   096/0430 – 096/0745 (but not exact)
Filename: SROI

0754   RS to ACE on SOPC CORD
We are done with Madrid recordings. If you have no use for them, we can release them early
ACE -> both of them
RS -> yes

0755   ACE to DSS-63 and DSS-55
RS advised that they have ended recording at both station so will release you early
RS -> I also wanted to thank you for your excellent supports. Everything was nominal and we got good data

0756   Lu called on phone
Is level 3 done?
Me -> yes, but don't forget to tell DSS-14 about predicts switch at 110110

0802   NOA to DSS-14 and DSS-26
Level 3 is over.
You track is nominal level 4 support. Reason is because s/c is currently behind Saturn and RS stopped recording, so it means that level 3 is over

NOA is off the net

0803   RS to NOA
A reminder to let DSS-14 know about the predicts switch since they don't have 3-way predicts with Malargue

0804   NOA to DSS-14
Currently DSS-84 has the uplink and since we can't generate 3-way predicts with ESA, at 110110 flag 2-way

0818   DSS-14 to DSS-84
Green for transfer. Carrier up 084500
84 -> carrier down here 084505

084500   DSS-14 transmitter on
DSS-14 to ACE
transmitter on
84 -> confirm carrier down on time

0846   DSS-84 to RS
Stop measurement and tear down automated. Will be off console
RS -> thank you very much for your excellent support

0854   ACE to DSS-26
Looks like we have a good uplink so we're going to release you from your support

0900   RS left the ops room