Power Up, Operation, and Power Down of Dish Surface Optimization System (DSOS)
Melanie Leong, October 19, 2005 - To assure you are using the correct tables type "./" before every command

1. Verify Flow to the Dish Heat Exchangers

The daycrew will be checking these, however the locations are good to know in case of emergency. There are (4) Neslabs and their manifolds, (2) on each side of the 3rd floor.

a) Open the dome's shutter. This helps the dish and Neslabs come to ambient temperature.

b) To help bleed out any air in the plumbing, which restricts coolant flow, tip the dish to a ZA of 4°. Leave at this zenith angle for 15 minutes before changing to another zenith angle.

c) Verify that the Neslabs for the dish are set to 0.0 °C. Current readings will go to their set temperatures when the shutter is open.

d) Verify that the pumps are working - their respective pressure gages on the manifolds read about 8 psi.

e) Open (full counter clockwise) all 6 valves on each manifold. DO NOT open the bleed valves. Check the return tubes, going into the Neslab baths, for proper exit flow of coolant. Better than a trickle is desirable. You do not need to check Neslab 1, its cover is difficult to open.

f) After inspection and 15 minutes, tip the dish to 45°. If SHARCII is mounted on the Cass focus, top off with liquid nitrogen.

2. Login to tpick as visitor

Log in from a computer that is not prone to crashing! I usually use my own laptop. The Controller's computer name is tpick.

a) Open an xterm shell

b) ssh 128.171.86.102 -l visitor

c) Call for password You will automatically be cd'd to the correct directory.

3. Initialize and Create the Night's Baseline Setting

This should be done with the dome open at least 1 hour and after sunset, dish ZA = 45°.

a) Activate the daemon. Type: ./DSOSdaemon [Enter]

b) Activate the remote server for SHARCII IRC. Type: ./DSOSserver [Enter]

c) Start the SHARCII client and server – see SHARCII instructions.

d) If you would like the DSOS status monitor displayed, bring up a terminal and enlarge it to accommodate the picture to be displayed. Type: ./DSOSmonitor [Enter]

e) To initialize, execute this at the beginning of your observation run. You don't need to do it again until the next night. Open a second terminal. Type the command: ./DSOSinit [Enter]

4. Power to the Driver Amplifiers

There are (4) power supplies in each Driver rack (2 taller racks) (8) power supplies all together.
The Controller Rack (smaller one in the middle) should already be powered on.
There are (2) Neslabs, (1) on the fourth floor, and (1) on the right side of the System racks. They should be on and set to 5 °C.

a) Turn on the Power Supplies, in pairs, via their front panel switches.

b) When the following is displayed on both Power Supplies
Output: Voltage 0.00 VOLTS
Current 0.0 AMPS

Press [Menu]. This should display:
Restore from Memory: (1 thru 9 - just be sure set voltage and current are correct)
15.00 V 75.0 A 3000 W

c) When the proper Restore setting is displayed press **at the same time** for both power supplies: [Enter]
This ensures that both biases are applied to the power amps at the same time.

Both power supplies should initially display something like the following:
Output: Voltage 15.00 VOLTS
Current 75.0 AMPS

d) Repeat this procedure step for the second pair of power supplies in Driver Rack 1, and again for both power supply pairs in Driver Rack 2.

5. Let the Dish System Settle for about 15 minutes

The Power Supply displays should reflect the current demands, cycle, and then settle after 15 minutes depending on the amount of initial toothpick displacements. The settled current values are about 9 Amps or less for both +15 Volt and -15 Volt power supplies.

6. To Operate the DSOS While Observing

Here are several commands for running the DSOS. If the DSOS monitor is activated enter these commands from a second shell.

a) **This should already have been done in Step 3.** If this has not been performed yet, power down the Driver power supplies, wait 40 minutes, go back to Step 3, and repeat steps 3 through 5. (./DSOSinit)

b) The following command gets the present ZA from the antenna computer and sends commands to specific toothpicks. New command values are sent and their settings logged every 2.5 minutes in agent.log.

You should be in the correct directory at login.
Type: ./DSOSagent [Enter]

c) The following command sets the System back to its baseline value. This takes about 8 minutes to settle.

   Perform this at the end of the night's run.
   Type: ./DSOSbase [Enter]

6a. IF You Want to Rebaseline

If you initialized the system's thermistors during the day before the sun has set, reinitializing 1 hour after the sun has gone down would be a good thing to do. It is NOT recommended that you perform this often.

a) Command the DSOS to go back to its original reference. Type: ./DSOSbase
b) After 8 minutes, turn off the Driver power supplies.
c) Move the dish to a zenith angle of 45°.
d) Wait 40 minutes for the dish to come to ambient temperature.
e) Go to Step 3 of this procedure and start over again.

Another reason to reset the baseline is if the ambient temperature changes more than 5 °C from the initial ambient temperature. Significant changes in temperature in the middle of the night usually indicates bad observing weather, so be sure to check if it is raining or snowing. You may need to shut the dome.

7. * Check the System periodically * to make sure everything is powered up and running correctly.

Are thermistor and/or D/A values reading 0.00?
Is coolant not flowing to the Dish and the System racks?
Any Neslabs, pumps, and rack fans are not running?
Any Driver power supply pairs too one sided? Example: PS1= 5V / 75A and PS2=15V / 0.00A

Should any of the above occur, **power down the Power Supplies first**! Then shut the rest of the system down.

If any of these things cease to function, the System may get damaged and the Dish will not be adjusted correctly.

VERY ESSENTIAL STEP - Notify Melanie what has failed, and when it occurred. Failure to do this will keep the DSOS from operating while you are here.

8. System Shutdown Sequence

To be done when you are shutting down in the morning.

a) Control-c : to stop agent from running
b) Type: ./DSOSbase [Enter]
c) Control-c : to close the DSOS status monitor display, (./DSOSmonitor)
d) Power down the Driver Power Supplies via their front panel switches. There are (4) in each Driver Rack, (8) total.
e) Log out of tpick.
f) Leave everything else on.

A. Some Solutions

Computer Crash

If the computer you are running the DSOS software from crashes, sorry, you are hosed. :)

a) Shut the power supplies down.
b) Control-c and log out of tpick if possible.
c) Call me so that I can talk you through a power cycle and initialization process of tpick.
d) Reboot or, better yet, find another computer to run tpick from.
e) Start from step 2 of this Users Procedure.

Neslabs

In case the alarm sounds on any of the Neslabs:
With the message ADD - Fill with distilled water to the LOWER fill line in the unit's bath.
With the message Error 54 -

a) Press the up and down arrow keys on the front panel simultaneously and hold for 10 seconds until the alarm turns off.
b) Press the computer control button (picture of a keyboard on the button) so that the light is off.
c) Power the Neslab off.
d) Power the Neslab back on. Alarm and error message should be gone.

Glycol Pumps

In case any of the 4 pumps to the dish manifolds fail, usually no or low pressure reading on meters, and the pump is hot to the touch:

a) Turn off the Driver Rack power supplies.
b) Close the manifold valves to the associated pump. There are 3 valves for each pump, turn them clockwise until the valves are closed.
c) Shut the power off to the pump by either turning its associated power strip off, or by unplugging the pump from its power strip.
d) Follow steps 8a, 8d, 8e. Do not use the DSOS until pump is repaired or replaced.
e) VERY ESSENTIAL STEP - Notify Melanie which pump has failed, and at what time. Failure to do this will keep the DSOS from operating while you are here.

Good Sky,
Melanie