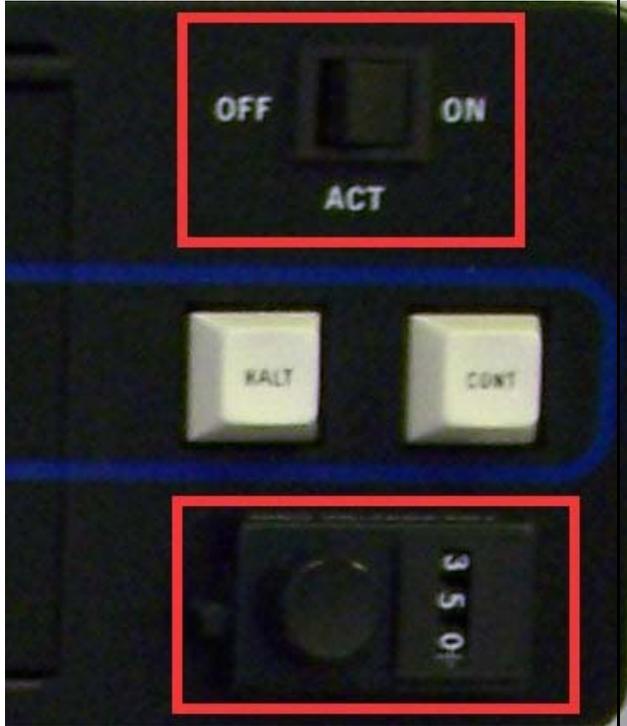


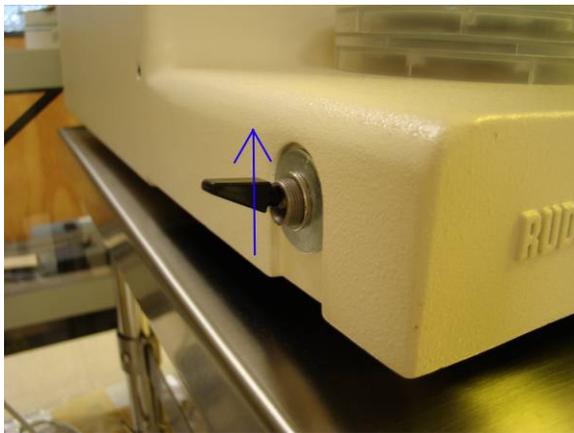
Rudolph Ellipsometer

Idle condition check:

- The machine should be turned off
- The dial setting should be at 350 and ACT should be On



- Turn on the ellipsometer using the switch on the left side of the machine



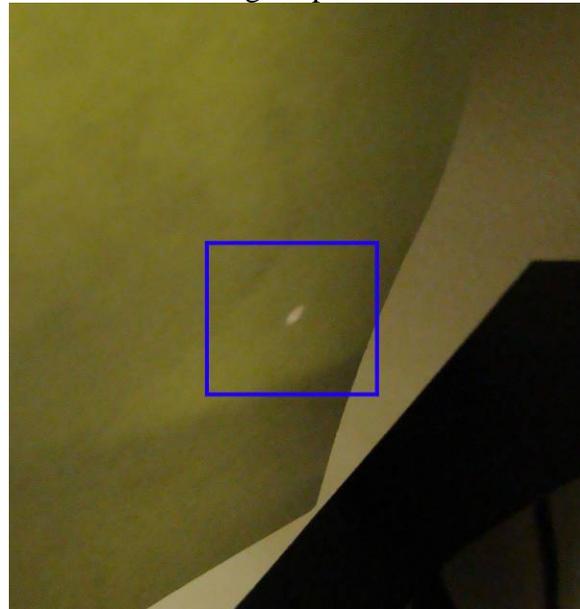
- Allow the lamp to stabilize, usually the amount of time it takes to mount and align a sample is sufficient

Loading a sample:

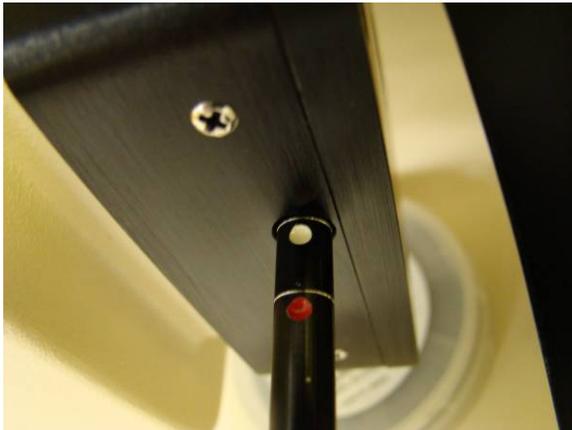
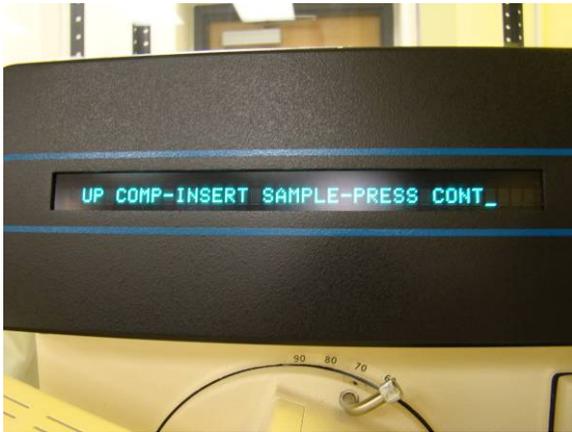
- Set the desired incidence angle of the light source and detector by pulling the lock pins out and rotating to the desired setting. It is important to make sure the stage will not interfere so move it to its lowest setting using the dial at the base. The default angle is 70 degrees.



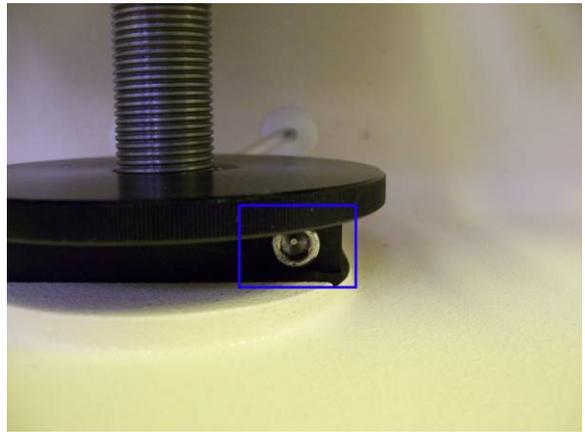
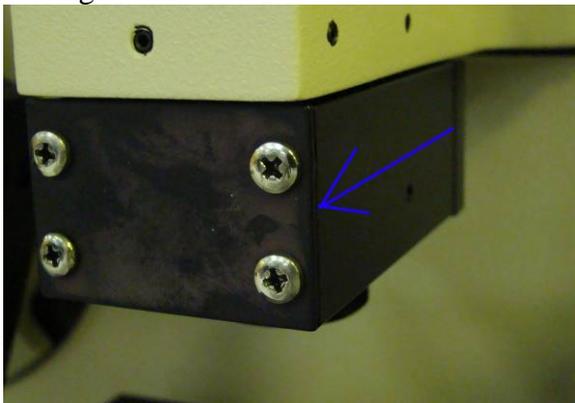
- Place your sample in the stage
- If you are measuring a specific location make sure the light is incident on it. It is helpful to use the edge of a wiper or cleanroom paper to follow the light's path.



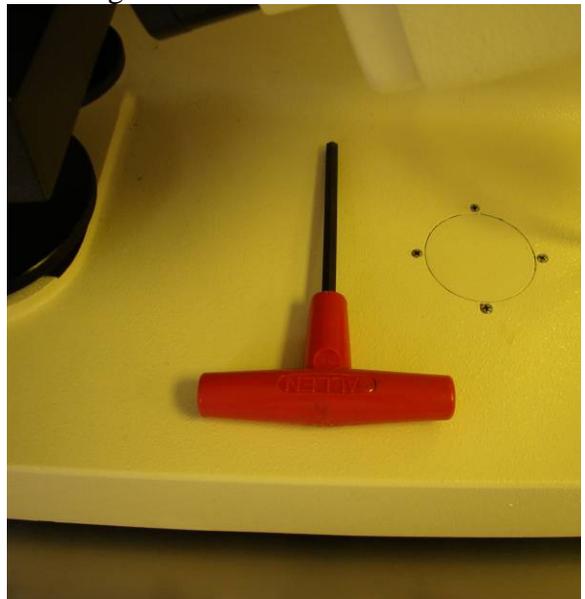
- For the initialization run (blue display reads "up comp"), white light is used on the source. Align the silver ring with the lamp housing with the white dot visible. After the initialization is when the specific wavelength for your measurement is set.



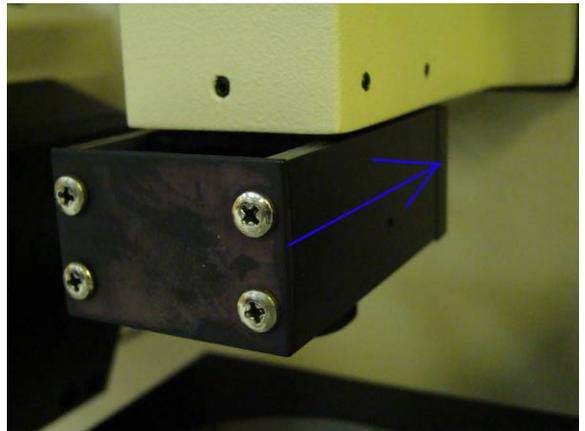
- View the sample through the eyepiece and set the focus by pulling the auto collimating telescope (ACT) away from the machine, unlock the focus dial using the 3/16" hex wrench, and adjust the dial at the base of the stage.



- Lock the dial so the focus does not change using the same 3/16" wrench as before



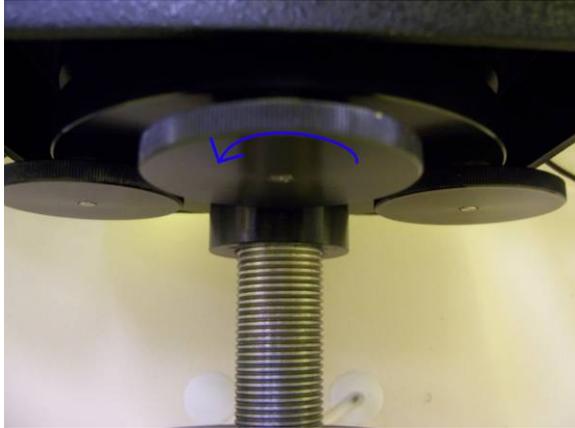
- Push the ACT back towards the machine



- Align the spot into the center of the crosshairs.

-

- There are 3 dials immediately beneath the stage for this adjustment. Start by slightly loosening the large one in the center.



- To move the spot to the right tighten the right dial. It may require that you loosen the left dial to do so. When the spot is aligned horizontally tighten the center dial and note the spot's final position. If it is not centered in the crosshair you will need to adjust the left and right dials to remove the tension from the stage and allow the center dial to bring the spot into the correct final position.
- Recheck the focus and adjust as necessary and recheck spot position. It is required for them both to be satisfied simultaneously.

Making a measurement:

- Press the "cont" key on the ellipsometer to run the "up comp" initialization



- When "down comp" is displayed set the light

source and detector to the desired wavelength and press "cont" again.



- When the measurement is complete the display will provide the Delta and Psi which will be needed for the thickness and refractive index measurements.
- Sometimes the machine will display communication error. To clear the error press the "cont" key
- Run the dafibm.exe program on the PC

Program Parameters:

- To toggle through the parameters press "Enter" to move forward or "Backspace" to back up
- To adjust the currently selected parameter press the "M" key

Program filename: Startup – *Do not change*

Number of layers: Single or Double – *Adjust as required S for single layer or D for double*

Path for Delta, PSI: KB>Calc – *Our system is not configured to use any other method*

Ambient: NA = 1.00 KA = 0.00 – *Refractive index of surrounding medium, usually air*

Upper Film: NU = x.xx KU = x.xx – *Refractive index of the top film, press "i" to use as the value to iterate*

Lower Film: NL = x.xx KL = x.xx – *Refractive index of bottom film, , press "i" to use as the value to iterate*

Substrate: NS = x.xx KS = x.xx – *Refractive index for substrate NS=3.858 KS=0.018 for silicon*

Sample ID: -- *Leave blank*

TU: *Thickness output limits in Angstroms.*
XX: *Refractive index output limits*

PHIO = *Incidence angle*

Lambda = *Measurement wavelength*

Print results: No *There is not a printer, please write down your results*

Iterate lim = 0.0010 *Recommended value*

Calculate orders: 0 to 7 *Recommended values, adjust as required*

- After all of the program parameters are set press "G"
 - Enter the Delta and Psi values pressing "Enter" after each
- The program will then display the thickness and refractive index data
- To enter another Delta and Psi number pair press enter.
- To quit press "M" to return to the menu, press "Q" to quit, and "Y" to confirm
 - You can terminate the program using the X in the top right corner of the window but usually this gives a program error and may make the computer slow to respond.