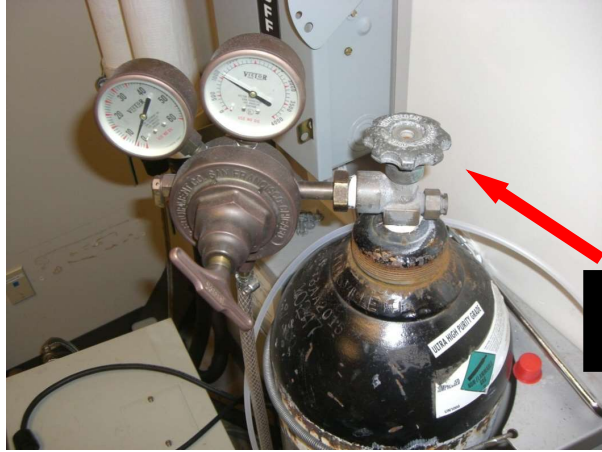


Zeiss EM900 Transmission Electron Microscope Instructions

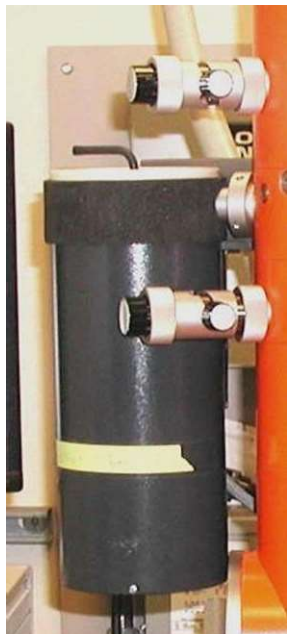


Main Valve

The nitrogen only needs to be turned on, using the main valve, if you are venting the column to change the filament. Some instruments have this as an option during specimen exchange but not this one.



Turn the power on to the TEM by turning the key switch to 50kV or 80kV (50kV is used for most biological applications); check that the magnification is set at 3000X. **Note: If there is blue tape over the top of something, this is something you should not change.**

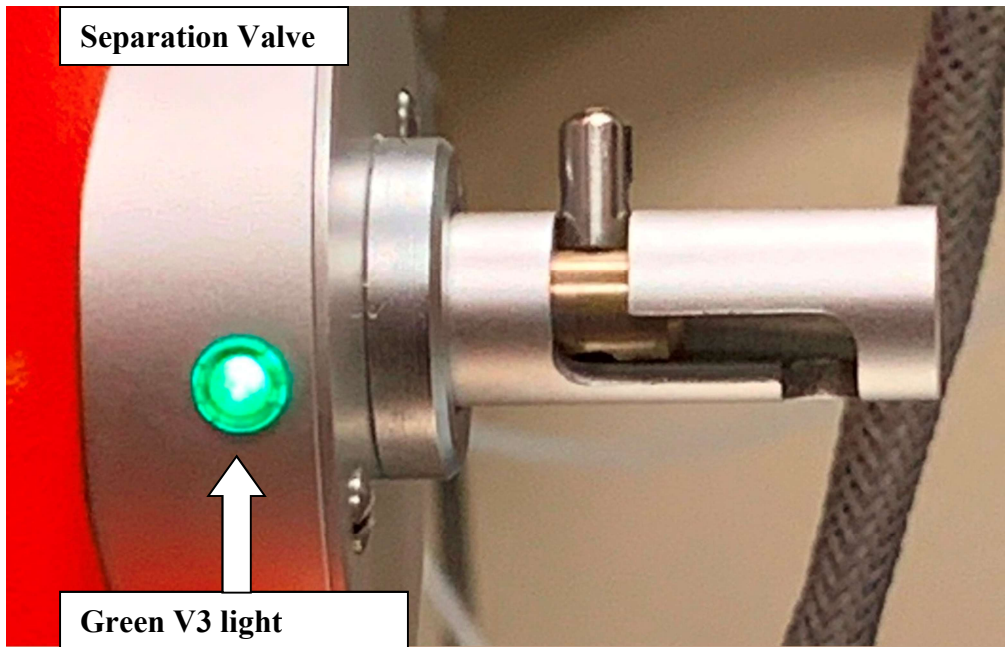


Fill the anti-contamination device, on the left side of the column, with liquid nitrogen. Pour slowly as it will boil off quickly at first and you will need to refill it if it is not filled to near the top. A full device of liquid nitrogen should last for 4 hours. Please see microscopy center manager or approved representative for help in filling it.

Zeiss EM900 Transmission Electron Microscope Instructions

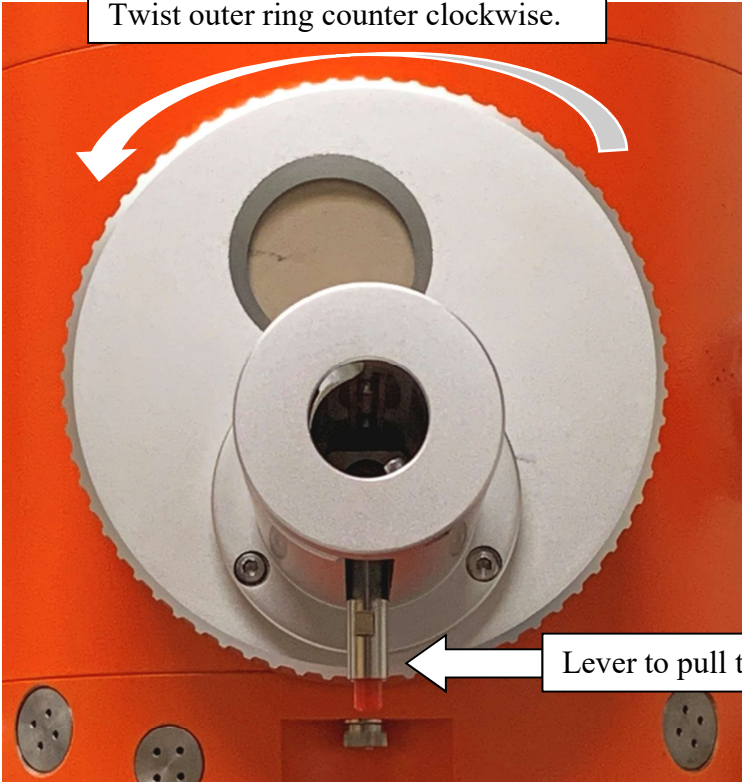


Once the TEM is turned on it will take about 30 minutes to pump down to operating pressure. When the Green OPEN V3 light comes on the system has pumped down to operating pressure.



Zeiss EM900 Transmission Electron Microscope Instructions

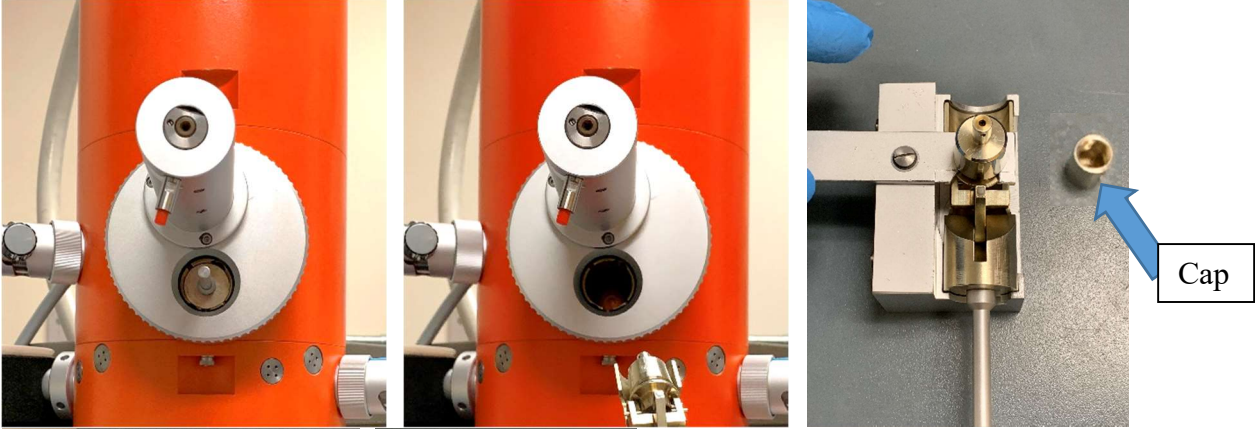
Loading the Sample – Gloves must be worn for these steps to protect the equipment.



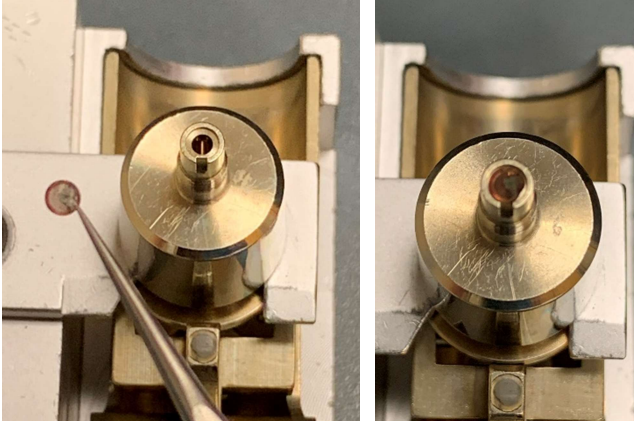
Twist outer ring counter clockwise.

Lever to pull toward you and up.

The Sample holder is kept in the chamber under vacuum to keep it clean and free of moisture. To remove the sample holder from the chamber, pull the lever on the bottom towards you then bringing it to the one o'clock position. Next twist the outer ring counter clockwise to expose the sample cartridge.



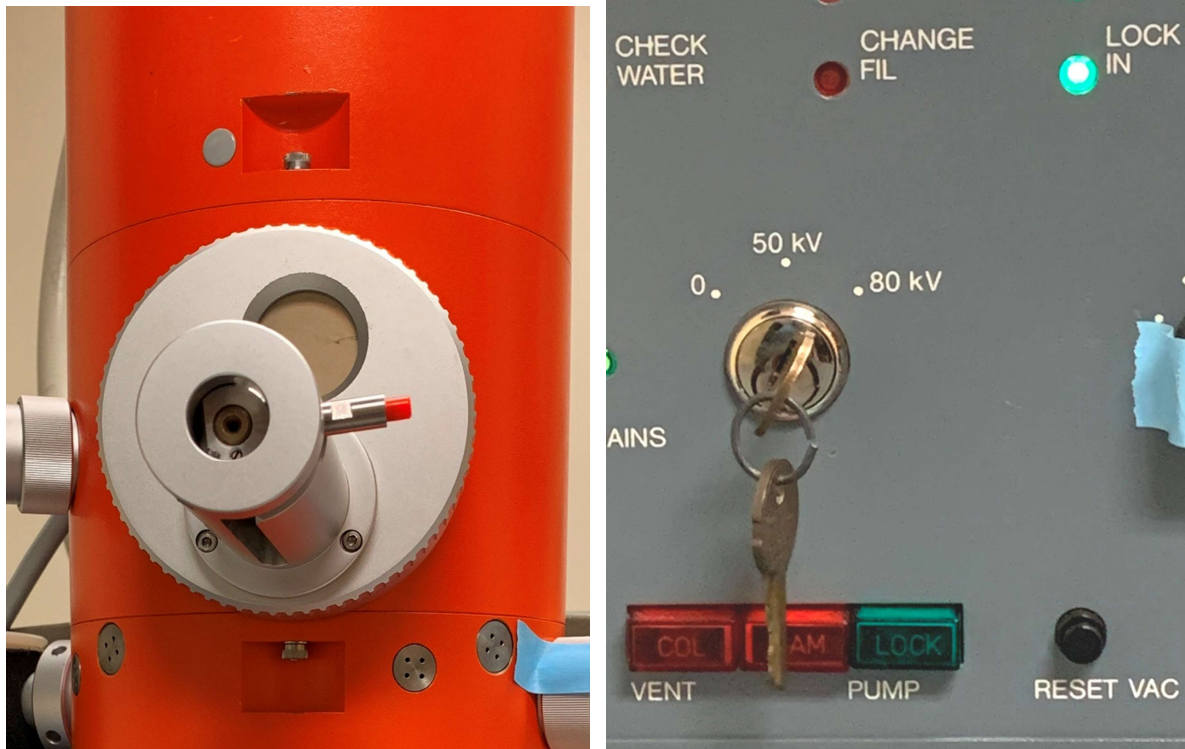
Cap



Using the wrench found in the left-hand drawer of the TEM. Screw into the cartridge and slide the cartridge out of the chamber. Place the cartridge in the cartridge slide-in case and tilt the cartridge head up 90° and hold in place by swinging the arm under the head. Remove the screw-on cap and place your sample in the cartridge. Replace screw-on cap but do **not** overtighten.

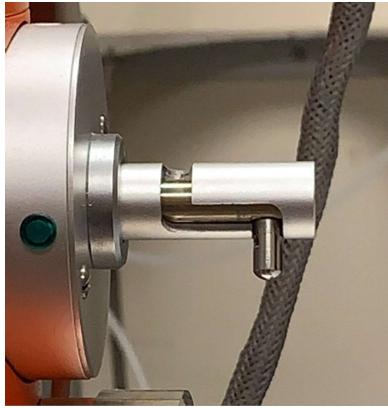
Zeiss EM900 Transmission Electron Microscope Instructions

Once your sample is loaded in the cartridge, place the cartridge into the chamber, remove the screw wrench, and turn the chamber door clockwise completely. If it is not turned all the way to the right the cartridge cannot be pushed into the chamber. Finally turn the cartridge to the three o'clock position. Because of the age of the TEM when you move the lever to the three o'clock position sometimes the V3 light goes out possibly due to a leak although one cannot be detected. If this happens press the RESET VAC on left panel and wait for OPEN V3 to light back up. Once OPEN V3 is lit press the green lock button and the LOCK IN light will illuminate. You will wait for two loud clicks and then will finish sliding the cartridge into the chamber. To do this you will turn the slider all the way down and then press the red button to push in. The slide will stop at halfway in, let go of the button and push it again. You will now be able to push the cartridge all the way in.



At this point the V3 light should remain illuminated. If for any reason it has turned off press RESET VAC again and wait for it to come back on.

Zeiss EM900 Transmission Electron Microscope Instructions



Open V3 by sliding the lever down and then to the right. Make sure it locks into the notch at the end.

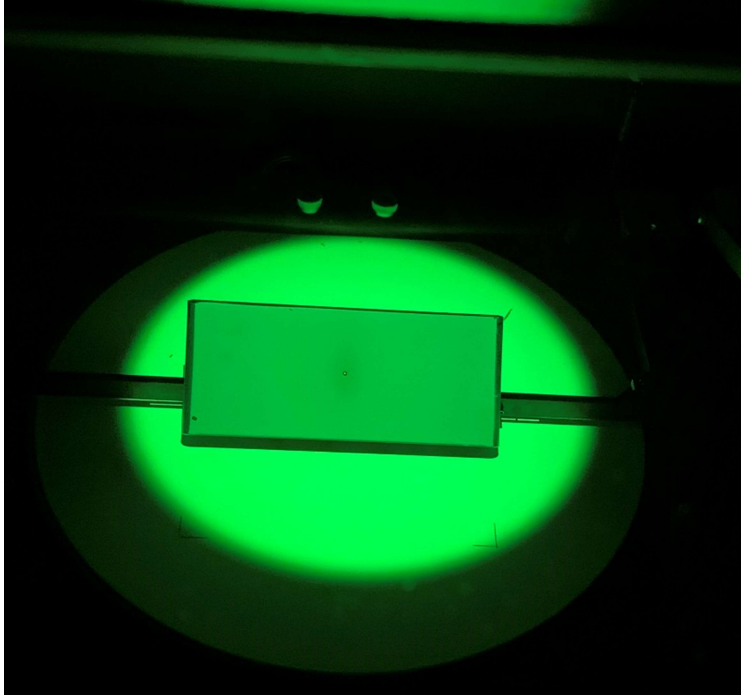


Once V3 is open the green light on Beam button will illuminate. On the right panel depress the μ A button and keep depressed while you press the green BEAM button on the left. Watch the Exposure Time gauge to see that the red pin pegs to the right. This confirms that there is power going to the filament.



Now the green button on the left will go out and the red button on the right will illuminate. Press the center, FIL, button.

Zeiss EM900 Transmission Electron Microscope Instructions



As long as the beam brightness is correct and your grid is not blocking the beam you should get a circular phosphorescent glow on the screen. The lights in the room will need to be turned off for this operation.



The brightness knob is the smaller inner knob. Turning it clockwise makes the image less bright, turning to the left it will get brighter until you come to the crossover point. The beam of light will get smaller until it hits crossover then it will open out again and get duller as you turn counter clockwise. The amount you can turn counter clockwise after crossover is very small. When opening the beam out back and forth from crossover the beam should spread symmetrically. If it does not spread symmetrically you should make adjustments taught to you by the microscopy center manager or an approved representative.



Once you have your sample on the screen you can use the world's hardest to use trackball to move around on your sample. If while moving, your sample it does not go the direction you wish you can push the X←→Y button to help it move in the correct direction. While the X-, X+, Y-, Y+ buttons above the trackball will move in the direction you want to go, the movements are too great to be of much help.

Zeiss EM900 Transmission Electron Microscope Instructions



At some point you may end up moving the sample too far to the right, left, top, or bottom and you cannot move your sample any longer. To correct this you must press reset and the sample will reset to the center of the grid.



Once you have your sample image in the center of the screen, press the green IN button on the camera control. This inserts the camera under the beam.

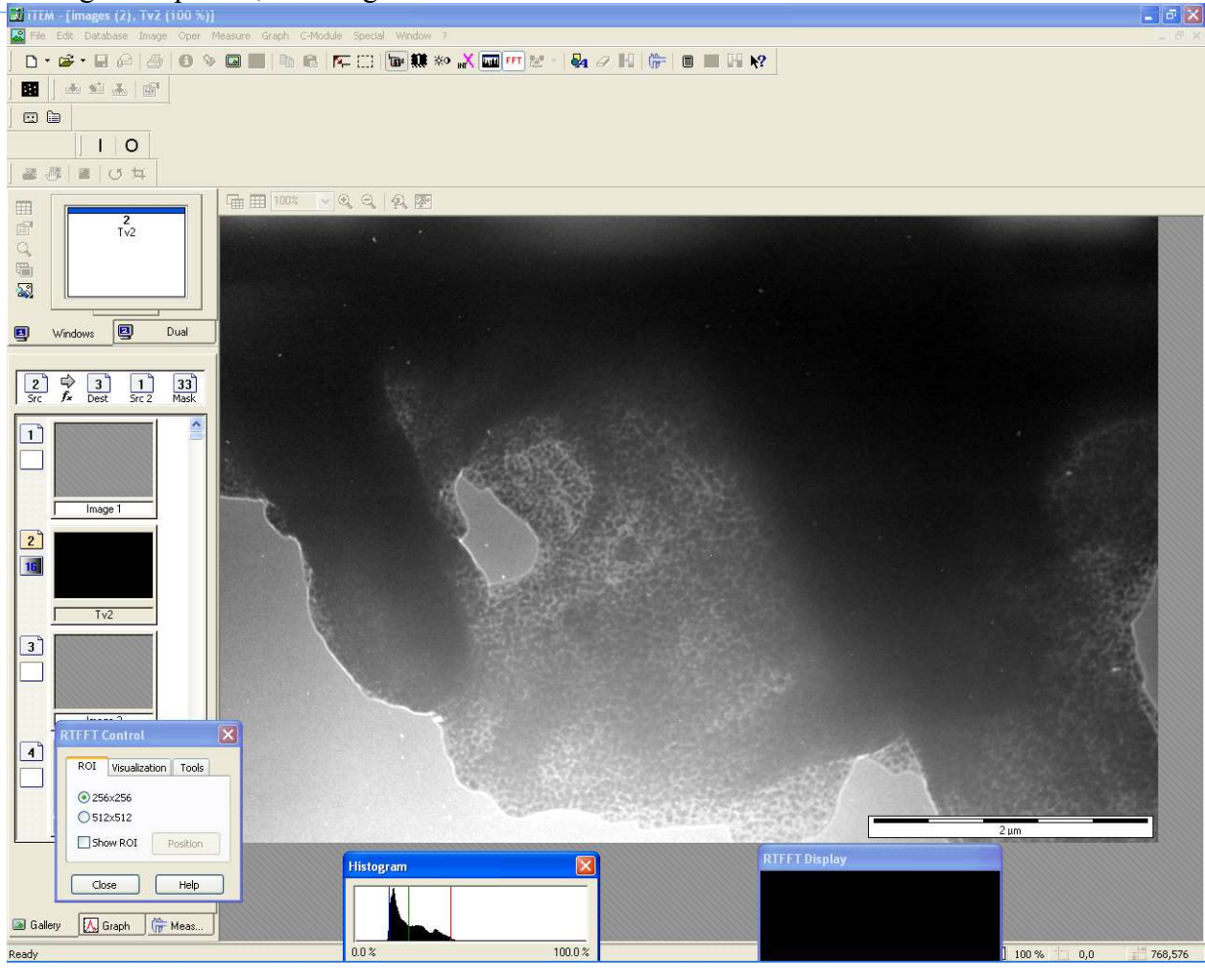


Open the software. If the computer is off turn it on and when it requires a password just press enter.

Zeiss EM900 Transmission Electron Microscope Instructions

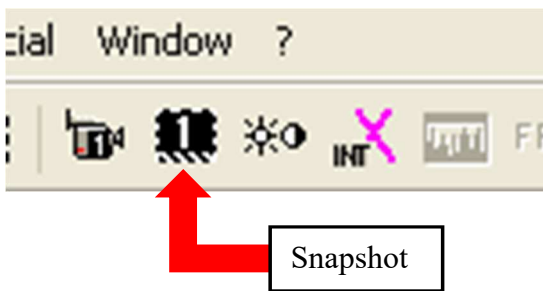
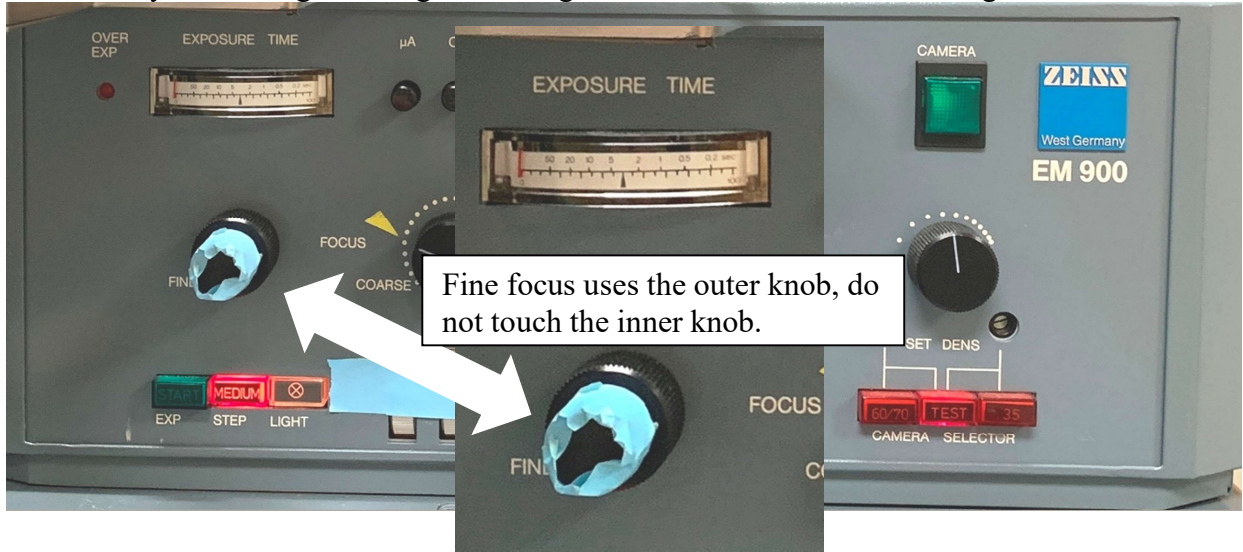


To turn on the camera you can either select the video camera icon or click on the pink X (Intelligent Exposure). If you click on the Intelligent Exposure you will get a group of pop-up windows, one which contains another video camera icon. If you chose the camera icon on the menu bar there is a delay between focus and when it appears focused on screen. When using Intelligent Exposure the delay does not exist. When you capture images from the camera icon not Intelligent Exposure, the images look better.

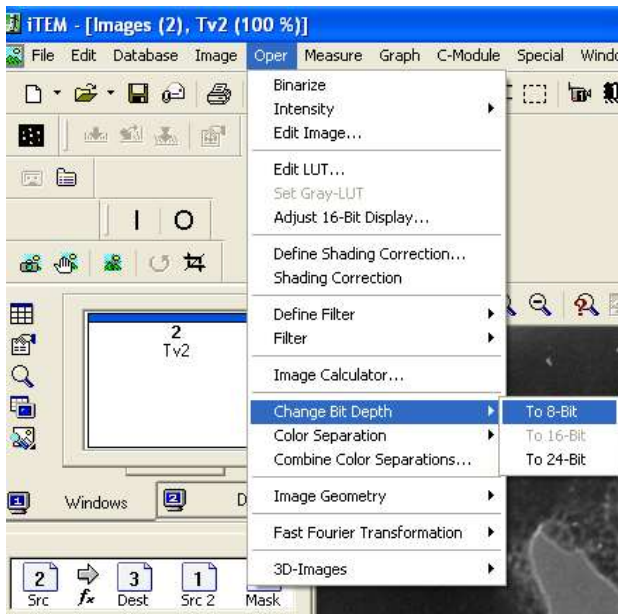


Zeiss EM900 Transmission Electron Microscope Instructions

Once you see your sample in the window you will need to bring up the magnification and fine focus until you have a good image. The magnification is to the left of the brightness knob.

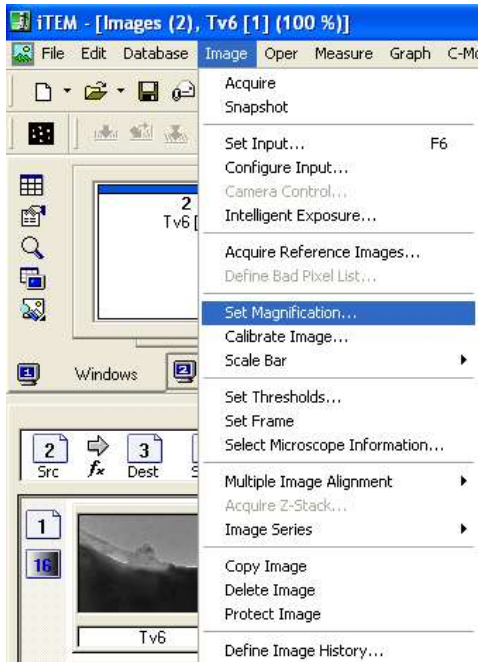


Once you have your image set up click on Snapshot. Note: This is a 35 year-old piece of equipment and the images will not always be as good as what you see in trade journals.

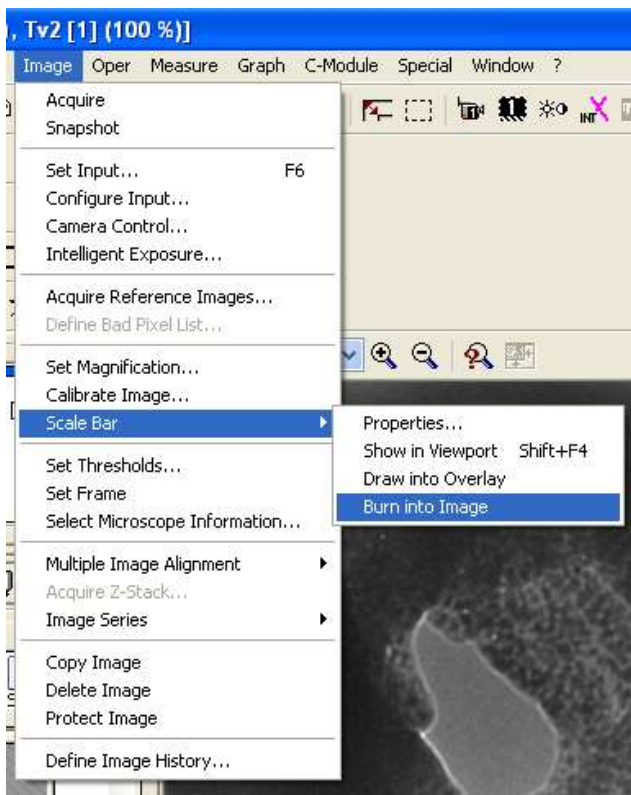
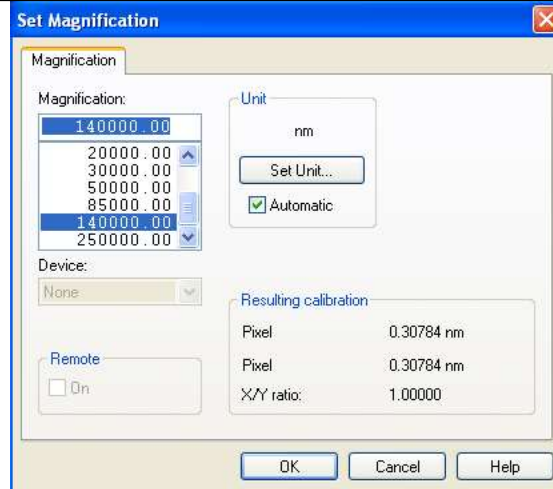


The software automatically saves your image to 24-Bit that cannot be opened in most computers. You will need to go to Oper > Change Bit Depth > To 8-Bit. A second image will now display on the left bottom panel.

Zeiss EM900 Transmission Electron Microscope Instructions



Next set the magnification, Image > Set Magnification. This step must be done in order for the next step to give you the correct scale bar.



Next burn the scale bar into the Image. Image > Scale Bar > Burn into Image.

Save your image immediately, don't trust yourself to remember what magnification you took an image at once you've taken a dozen images. This is after-market camera and software so it does not communicate with the TEM. If you don't change the Bit Depth, Magnification, Burn the Scale Bar, and save the image after every capture you may have the wrong information on your image(s).

Zeiss EM900 Transmission Electron Microscope Instructions

Please do not clutter the home screen with folders. Save your images to My Documents > Faculty Advisor > Your last name or email, this insures that if the hard drive becomes full after you graduate we can contact your faculty advisor to determine if your information can be deleted.

The camera can only be operated on Windows XP so the computer cannot be connected to the internet.

