CM10 SOP

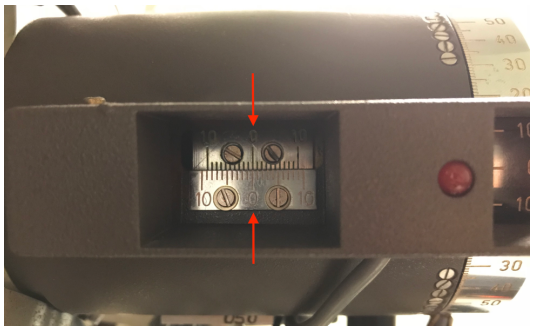
If you encounter any problems, or think anything is strange with the CM10, please contact any staff member before continuing.

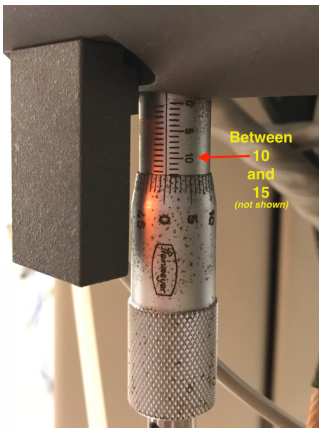
At the beginning of your session:

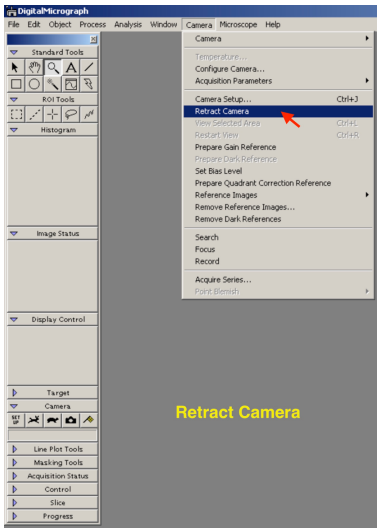
- Check the log book to see if there are any reported problems
- Top off the dewar with liquid nitrogen – move dewar to floor for safer filling
    - Cool for 15-20 minutes before inserting specimen holder
- If the screen is blank, use the 'Data Dim' knob to turn it back on
- Check the vacuum to assure IGP reading is below 20
    - Press the button adjacent to 'Vacuum' on the display; press 'Ready' below the display to return to the main display
    - Only insert/remove the holder or turn on the filament if the **IGP reading is below 20**

Before removing the specimen holder:

- Turn off the filament – turn filament knob counter-clockwise until it beeps
- Center the stage - the right stage knob should be set to 0 (align both 0s) and the left stage knob should be set between 10 and 15
- Lower the phosphor screen
- Retract the camera – in DM: Camera > Retract Camera
- Check the vacuum to ensure IGP reading is below 20







Removing the specimen holder:

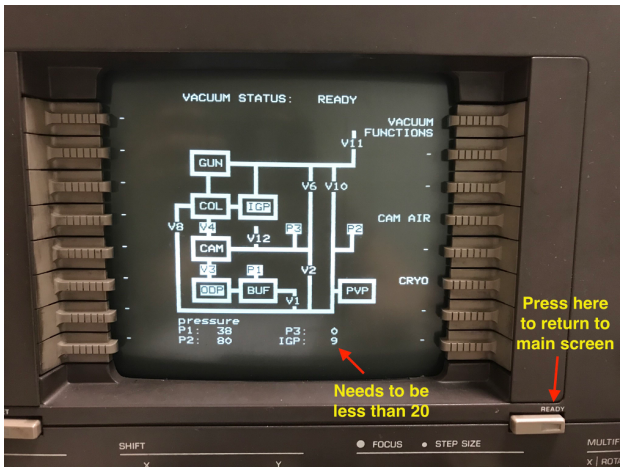
- Always hold the stage with other hand
- Pull specimen holder straight out until it stops
- Turn clockwise until slot on specimen holder aligns to the dot on the left side of the stage cover
- Pull specimen holder straight out using finger as a stabilizing force to overcome the pull of the vacuum during removal or with second hand on the specimen holder rod
- Always place the specimen holder in the transfer station

Loading sample into the specimen holder:

- Place the specimen holder on the transfer station
- Use the pick/broken tweezer to lift the clamp **gently**
- Remove old grid and center new sample grid
- Lower the clamp **gently** in place with pick/broken tweezer

Before inserting the specimen holder:

- Check the vacuum to assure IGP reading is below 20
    - Press the button adjacent to 'Vacuum' on the display; press 'Ready' below the display to return to the main display
    - Only insert/remove the holder or turn on the filament if the **IGP reading is below 20**



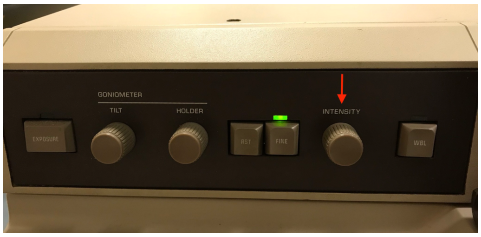
- Check that the stage is centered
- Check that the filament is off
- Check that the camera is retracted
- Check that the phosphor screen is down

Inserting the specimen holder:

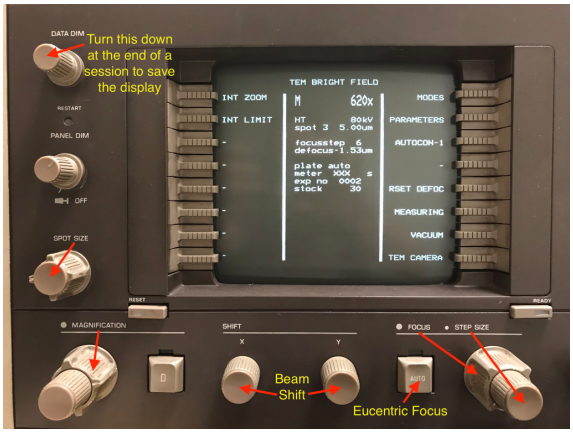
- Line up pin on the specimen holder rod at 3 o'clock position and insert the specimen holder into the stage
- Vacuum system will turn on to pump the airlock – note red light is **on**
- Wait for the 'click' sound
- Turn holder clockwise until specimen holder pin inserts into a groove – specimen holder should insert a bit farther
- Once the red light is **off**, turn the specimen holder counter clockwise back to 3 o'clock such that the specimen holder slot lines up with the pin on the stage
- Gently guide the specimen holder as the vacuum pulls it into the microscope

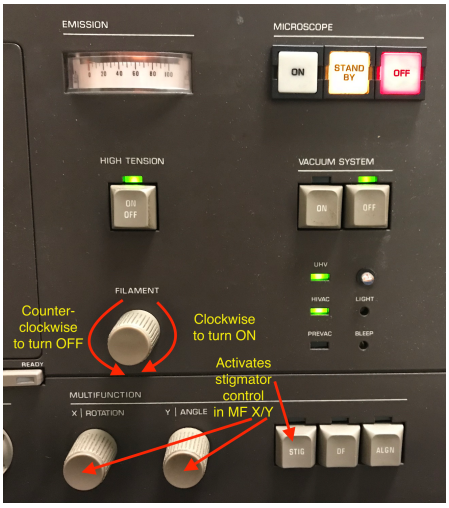
Components of the microscope:

- Left side controls:
    - INTENSITY knob – controls beam intensity
    - Phosphor screen lever
    - Stage control handle – controls the stage/sample movement



- Right side controls:
    - Main display
    - MAGNIFICATION knob
    - SHIFT X & Y – controls beam centering
    - FOCUS knob
        - Small knob controls the focus step size – use steps 2-4 usually
        - Large knob controls focus value
    - AUTO button –returns to eucentric focus
    - Stage control handle – controls the stage/sample movement
    - FILAMENT knob
    - STIG button—press to activate multifunction X & Y knobs to adjust objective stigmator





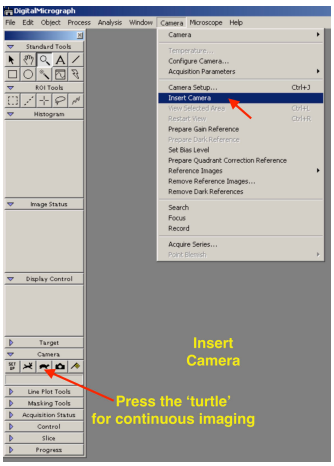
Viewing your sample:

- Check the vacuum to assure IGP reading is below 20
- Turn on the filament – turn filament knob clockwise until it beeps
- Look for the beam on the phosphor screen and lower the magnification if it is not visible (e.g. ~600x)
- Adjust beam intensity and the magnification to view the sample

To collect images of your sample:

- Find a region of interest on the sample
- Adjust beam intensity and magnification to view the sample at high magnification (e.g. ~46000x)
- Center the beam with the Shift X & Y knobs
- Insert the camera – in DM: Camera > Insert Camera

- In DM, on the left panel, press the 'turtle' icon button or 'rabbit' icon button for continuous view
    - Camera may be stopped by pressing the keyboard space bar
- Recenter the beam and start the FFT for focusing – in DM: Process > Live > FFT
    - FFT is a mathematical function of the image
    - Use the Thon rings to adjust the astigmatism and set the defocus value
- Focus knob has two functions:
    - Small knob controls the focus step size – use steps 2-4 usually
    - Large knob controls focus
    - If there are no Thon rings and the defocus value is far off (e.g. > ±100 µm), press the 'AUTO' button adjacent to the focus knob. It is the eucentric focus button and should bring the microscope back to a reasonable value.
- If image is astigmatic, press the 'Stig' button and use Multifunction X & Y to correct
    - When corrected, press the 'Stig' button again to return to the main display
    - Once the sample is in focus, press the button adjacent to 'Reset Def' on the display
- Adjust the defocus to approximately -1.5 µm to enhance image contrast
- In DM, on the left panel, press the 'camera' icon button to take an image



Saving your images:

- Using the prompt from DM, click yes to save your image
- Create a new folder for yourself
- Save the images with the default .dm3 – they can be converted later

Before leaving at the end of your session:

- Ensure the filament is off, the camera is stopped and retracted, and the stage is centered
- Insert the empty holder back into the microscope
- Save and close your images
- Sign the log book and note any problems
- Turn the data dim down to preserve the digital display
- Turn off the lights in the room and the "Scope In Use" light

Transfer your images to your Crystal account or via the remote server

- **Do not plug your personal USB drive into the camera computer**

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