

## JEOL 1010 TEM Operation

1. Log in (note the “start time” from the meter on the scope).
2. Beam current should be ~ 053 with HT button on.
3. Take out specimen holder: pull holder out until it stops, turn towards you (counterclockwise), and pull out slowly (vacuum will pull it in).
4. Open specimen clamps on the specimen holder with the forceps and put grids in. Position #1 is at the tip of the rod.
5. Put back specimen holder: push in until it stops, green light will go on, wait for the green light to go off (~40 sec), turn clockwise and put the holder in very gently (vacuum will try to draw it in).
6. Turn up the brightness and contrast knobs on the side of the TEM screen and go to the main menu – Page 1
  - Should be at 80 KV
7. Choose Specimen select #1 position.
8. Turn on filament button: FIL.
9. Focus the black dot on the small screen with the eyepieces off the sample.
10. Set the height of the specimen with the goniometer when measuring is critical.

11. Focus image and center illumination:

- Bring small focus screen into view
- Turn wobbler on by pushing down image X button.
- Push on (16X) button and focus with coarse and fine knob
- Turn wobbler off
- Take small focus screen out of view
- Bring the illumination to a smaller spot with the brightness knob and center with the shift X and Y knobs
- Center image in brackets located on the fluorescent screen.

12. For digital images use the following instructions on using the Gatan Digital Camera.

### **Gatan Digital Camera**

**\*\*It is very important never to have the brightness all the way up on the microscope and to insert the camera. This will damage the scintillator!**

- On the camera box flip the camera switch to on. This is found on top of the microscope to the right. Both camera and shutter switches should be in the up position.
- Turn on the computer and monitor
- Password = **gatan**
- Make a new folder on the desktop by right clicking with the mouse on a blank area on the desktop, point to new, then click folder. Name folder as follows: username or Hutch account\_date. Example: jdoe\_081905. No spaces please.
- Allow for communication between the microscope and camera by pushing the **PF3 key** on the keyboard and then **Enter**.
- Double click on **Digital Micrograph** to bring up the software to run the camera.
- **Prepare a Gain Reference: Note-Need to be at 10,000X mag.**
  - This will optimize the signal to noise ratio of your image

- Pull the sample holder out to the middle position and turn slightly.
  - Turn down the brightness knob so the beam is uniform and set the exposure time to approximately 10 sec., found on microscope menu. Remove small screen from view(optional).
  - You may cover the viewing port if the room is bright
  - Go to the **Camera** menu and **prepare gain reference**
  - Insert the camera and answer ok to the prompts
  - It will take a few seconds to acquire and a prompt will come up to let you know if it has been successfully acquired.
- **View Sample Area:**
    - Remove the camera and insert the sample into the microscope.
    - Find an area of interest and focus.
    - Dim the beam for a 3-5 sec exposure time (on microscope menu) adjusted with brightness knob, remove small screen, and insert the camera.
    - Click on the “**Start View**” button to view a continuous image of the sample. This is found on the Camera View menu to the right of the screen.
    - Use the “**Search**” mode (this gives the fastest image refresh rate on the monitor).
    - Adjust the brightness on the intensity bar to the green zone with the brightness knob on the microscope if needed.
- **Adjust Focus (Focus Loupe):**
    - Click on “**Focus Loupe**”. This will allow continuous viewing of the image only from the selected sample area that is marked.
    - Focus with the microscope focus knobs.
    - Focus can also be obtained with the focus button under the TEM AutoTune menu (top right of the monitor).
- **Acquire the Final Image:**
    - After focus is set, click the “Start Acquire” button to record the final image. This is found on the Camera Acquire menu to the right of the screen.
    - Adjust for contrast and brightness using the histogram and sliders.
    - The image can be enlarged by dragging the corner of the image with the mouse and alt key held down.

- When viewing another specimen, stop view and take the camera out.
- **Saving Images:**
  - To save the image as a **Full Resolution Tiff Image:**
  - Go to the **Custom menu** and **SaveAsFullRestiff.s**
  - The micron bar will be saved with the image.
  - To save the image **in Gatan Digital Format – dm3:**
  - Go to the **File menu** and **Save as**
  - Name it and save as the **Gatan Format (\*.dm3)**
  - The image can be saved in a **Report View** with image notes
- **Save Images to Fred:**
  - See Research Computing Support web page on [mapping a drive](#) to your fred account.
- **Printing Images:**
  - To print a non-pixelated image choose Report format to see page layout
  - Click on the image to select it
  - Under the **Control palette** (left side of the screen) make sure the print width(W) and height(H) are approximately 7 x 7 inches.
  - Go to the **File** menu and **Print** and select the appropriate options.

13. When you are finished with your session:

- Turn off the filament button
- Take your grids out of the holder
- Put the holder back into the scope
- Log out (note the “elapsed time” from the filament meter on the scope).
- Flip switch to turn off the Gatan Camera.
- Turn down brightness and contrast on monitor and turn off the room lights on the scope