

## JEOL JSM-5800 SEM Operation

### Specimen Loading and Exchange:

#### To Load Samples:

- Screw in stubs to holder and load specimen holder on microscope stage.
- Push **Evac button** on the chamber door, and make sure the door is sealed properly.
- Wait about 5 minutes for “**HT READY**”. Located on LCD on front of microscope,

#### To Exchange Samples:

- Turn HT off and wait approximately 15 minutes to cool.
- Select **STAGE** (LF5) menu on right CRT.
- Click **Init Position** and **Start**.
- Lower the working distance to approximately 20 with the **T/Z button** and **joystick** to avoid hitting the **Backscattered Detector**. WD is read out on the lower left of microscope on LCD.
- Push **Vent button** on the chamber door and remove the samples after the beep.

### Observation:

- Specimen(s) are loaded and **HT button** has been pushed and is ready.
- Position the first specimen:
- Select **STAGE** Menu.
- Click **LOAD**, if not pushed already.

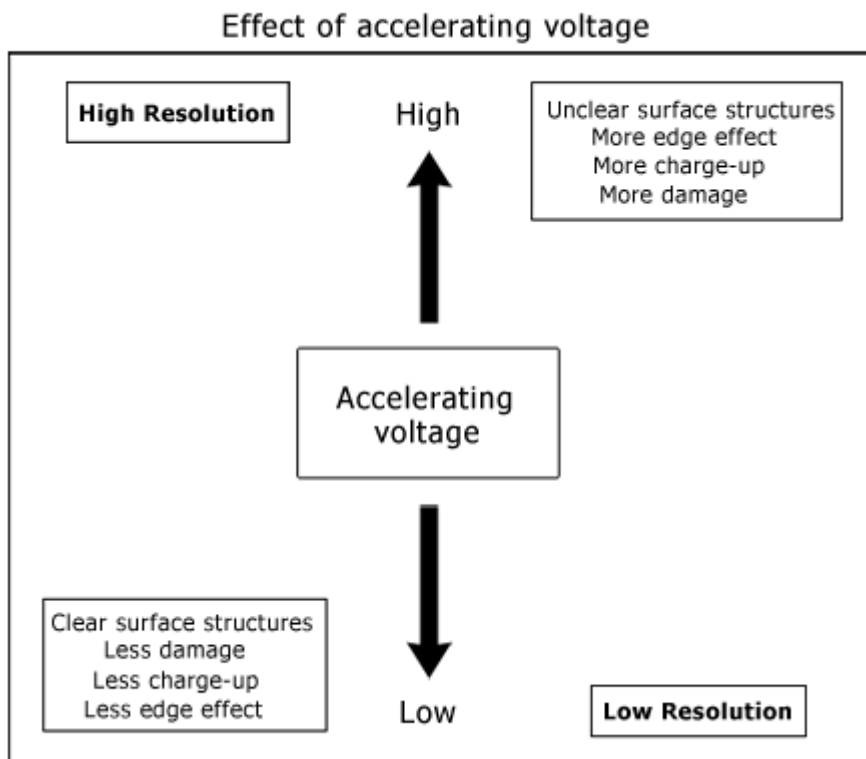
- Position the cursor on the desired stub
- Click **START**.

### Viewing Image and Setting Parameters:

- **TV2** on
- “Freeze” L or R off
- **INST MAG** on.
- If still no image, manually move stage and adjust brightness, etc, until the specimen is found. If still nothing then try **AUTO IMAGE**.
- The X/Y knob and the joystick will move the sample around.

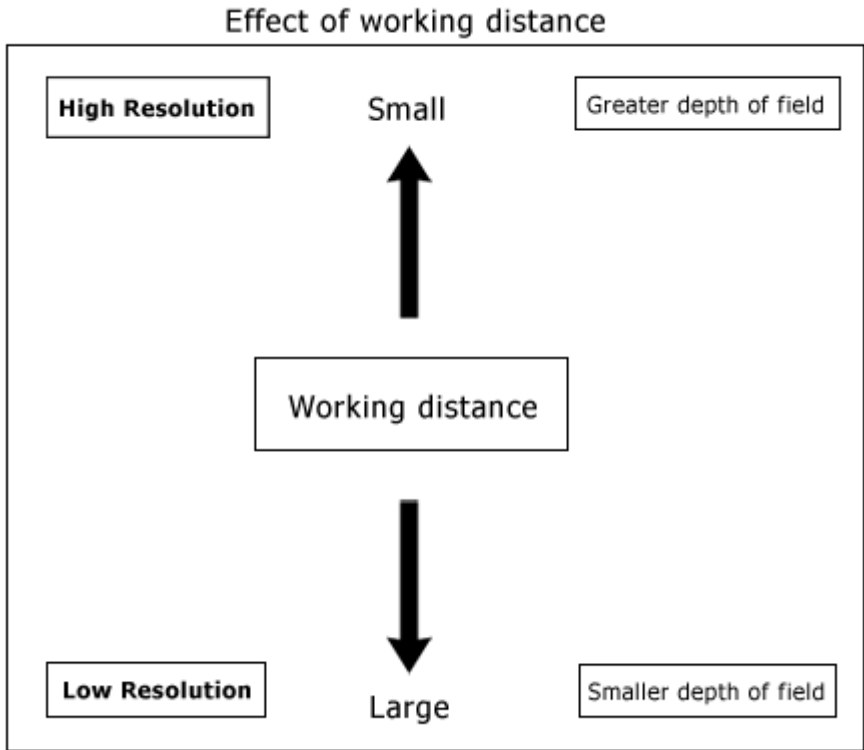
### Choose Accelerating Voltage:

- Press **ACCV** (F2) menu.
- See Figure for explanation.



### Set Z (WD) and T (tilt) as desired:

- WD is the distance from the underside of the objective lens to the specimen surface. See Figure for explanation.



**Set Spot Size as desired:**

- Spot Size on.
- Observe LCD graph while turning CRS/Fine knobs.
- Return to Tone function.

• **NOTES** For Spot Size:  
 Arrows (>>>) on LCD graph indicate spot size.

(>>>>>> -----) = Spot Size 7.

Spot sizes range from 1 to 24.

<u>Spot</u>	<u>Size</u>	<u>Current</u>	<u>Resolution</u>	<u>Noise</u>
1	Small	Low	High	Most
12	Medium	Medium	Medium	Medium
24	Large	High	Poor	Least

### **Objective Aperture Size:**

- #1 = 20uM (High Resolution)
- #2 = **30uM (Normal)**
- #3 = 100uM (High Current for EDS)

### **Centering Objective Aperture:**

- “**OL**” **WOBB** on.
- Increase Mag. to see image movement.
- Adjust aperture knobs to minimize movement.
- “**OL**” **WOBB** off.

### **Correct Stigmatism:**

- The image is astigmatism-free if it has no unidirectional defocusing when the objective lens is changed to under- or over-focus.
- This is done by adjusting the two knobs, x and y, of the stigmator with the **STIG** button pushed.

Set Desired Magnification, Focus, and Stigmatism before taking a photo.

### **Imaging:**

- Brightness and Contrast can be set by pushing the Tone button and TV2 two times to bring up the screen for adjustment. Bring the two bars in the middle with the knobs.

### **Save Tiff images using the Orion Imaging System:**

- A folder will be created for you on the desktop with your name and date Ex. Jdoe\_012407. Another folder called Export will be in this folder.
- Click on minimized JEOL Orion 5800.
- Go to the **File** menu and click on **User Login** and then click on your **name** and **Login**.
- The **EXT OFF** button (in red) on the left of the screen is the position for the connection with viewing on the SEM. The **EXT ON** button (in blue) and the **L** for live is the position for collecting live images from the SEM.

- Collection of the image defaults to **1280** resolution and **17 Sec.** for scanning speed. If you choose a smaller number the refresh rate becomes faster and the resolution is less. For photography the resolution should be 1280 and **90** sec. (can also do 17 sec.).
- Correct the brightness and contrast of the image by using the controls on the microscope or the **Line Scan Profile** button (in the image measurement selection) of the Orion image software.
- In order to save the image it must be frozen. Press the **L** button one time and the image will freeze (**F**) after it scans to the end of the photo. If you press the **L** button 2 times it will freeze (**F**) the image right away.
- On the bottom of the photo, type in the **KV**, **Mag**, and **WD**. This information will be saved along with the micron bar.
- Press the **Image File Handler** button (To the right of the **L**, **F** button). Then press the **Save...** button on top right and the **Save Image Data** Menu comes up. Press **OK**.
- Put this image in the regular folder and not the export folder.
- On the left side under **File** click the name of the file you just saved and click the **Export** button. **Save Image Data** Menu comes up and press **OK**. Put the image in the **Export** folder. This will export all data on the image.
- Click on **L** button and **EXT ON** button to switch over to the microscope.
- Minimize the JEOL Orion 5800 software.
- Transfer files to your fred account or copy onto CD.

### **Microscope shut down:**

- HT button should be pushed off
- Wait approximately **15 min** to take the samples out or ask the EM Staff to do this.
- Set Mag. to **300,000X** and **SL3**
- Turn down the screens all the way.