

## LEO 982 SEM/FEG OPERATING INSTRUCTIONS

**MICROSCOPE SHOULD BE IN THE ON POSITION (KEY-UPPER RIGHT MAIN CONSOLE PANEL (If not, seek assistance)).**

### A. VENTING THE CHAMBER

**NOTE:** In order to vent, make sure dry nitrogen tank has been turned on. Then do the following:

- a. Press **VENT** (located on chamber console) LED will go out.
- b. Wait-when ambient pressure is obtained in the chamber, the door may be gently pulled open.  
**BE CAREFUL WHEN PULLING DOOR OPEN-DO NOT OVER-EXTEND THE ATTACHED CABLES.**

### B. MOUNTING STUBS

Before placing samples in chamber, make sure you wear the white cotton gloves. This is to prevent contamination products from entering the chamber. There are five stub positions; place stubs in their appropriate positions and tighten down set screw on side of Holder with screwdriver. The #1 position is the first stub hole to the right of stage arrow. **DO NOT OVER TIGHTEN-JUST FINGER TIGHT.**

### C. EVACUATING THE CHAMBER

Slide door in slowly (you will feel resistance when you have it nearly closed). Just push gently in and the door will close. Press the **EVAC** button located on chamber console. Then turn off the N2 tank. **NOTE:** Due to the size of the 982 chamber, pump time is normally 10 minutes; however, if you have the door open for great lengths of time, it could take up to 20 minutes. Try and minimize the time the door is open.

### D.LOGGING IN

1. While microscope is pumping, you may log in your time (see book provided). You need to write your name, SEM class, the time you start, finished, and the number of photos taken. (Regular users need to put in an **Account # and fill out a charge slip.**)
2. Go to **MENU** (on scope), go to **DISPLAY** and hit the **ENTER** key; by using the arrow keys go to **IMAGE LABEL, ENTER**, then type whatever name you want to give your sample. Do not forget to update this for each sample. Make sure that all **DATA FIELDS** are **ON** (this will label your image with all pertinent information (**MAG, LABEL**, etc.). If you find yourself in some other menu, just hit the **ESC** key and you will return to the main menu.
3. **If you wish to maintain Photo Parameters:**  
Go to **PHOTO** main menu) **ENTER, PHOTO PARAMETERS, ENTER**. Type your name and adjust photo number to 000000 or if you are doing consecutive pictures, set number for last one taken. (EXAMPLE: If 000004 was your last photo, then you will enter that number back in when you work the next time). Use arrows to go through menu and hit **ESC** to return to main menu.

## E. STAGE INITIALIZATION

- a. Turn **INFRARED CAMERA ON** (right console-CAMERA switch). On the right monitor you will now be able to visualize the chamber.
- b. To initialize the stage, simultaneously press the **2 RED KEYS** on main console table (left side). On left monitor “CONT:\” will appear. At this time on keyboard, press “CONTROL” and “\” at the same time. This will reset stage. You now may proceed by using the ROTATE knob (located on chamber door), the Z HEIGHT (located to far left of red buttons on console table), and the TRACKBALL. To move from one sample to another turn the ROTATE KNOB (on chamber door) and move to your first sample.

**!!WARNING: DO NOT** run Z all the way up. (The X and Y knobs are controlled by the motor, DO NOT TURN MANUALLY).

## F. FILAMENT SETTINGS

**NOTE:** The filament heating will be done by the EM Center staff; however, you must always check the filament settings before turning on the **HIGH VOLTAGE**. This is done by the small toggle switch located next to the **CURRENT reading** (labeled A/uA). The numbers must stay below the indicated settings (listed on right console). If the numbers are higher, do not turn on voltage and seek assistance.

Once settings have been checked and they are within the limits, you may press the **HIGH VOLTAGE** button on. Remember, this can only be done once the proper operating vacuum is achieved.

## G. FOCUSING

To focus your sample, use the combination of **Z** and **FOCUS**. Once you raise the Z a small amount, then turn the FOCUS knob (when FOCUS LED is out, you are in COARSE FOCUS; when LED is lit, you are in MED/FINE FOCUS). Do this procedure until sample is in focus. Again, be very cautious using the Z. DO NOT go smaller than a working distance of 4 without assistance. Also remember, that when you take the Z up and then FOCUS, this will change your working distance. You will hear a warning tone when you are TOO close. When sample is in view and focused, you may turn INFRARED CAMERA off. **NOTE:** If while working you turn the trackball too far and lose sight of your sample, you may turn the INFRARED CAMERA back on to re-orient yourself.

## H. STIGMATION

Using the **MAG** switches, focus sample as clear as you can. To check for an astigmatism, go to at least a mag of 10,000X. Focus with the FOCUS COARSE/ MEDIUM knob. Then go to STIGMATOR X knob and bring image in as clear as you can; do the same with STIGMATOR Y. To fine tune, go back to COARSE/ MEDIUM FOCUS KNOB and sharpen the image.

## K. PHOTOGRAPHY:

- a. Use Scan mode (S1).
- b. It is easier to take pictures in the scan mode. Focus (at a higher magnification than you want to take your picture). Reduce magnification when finished.
- c. Go to SLOW SCAN 3 (S3). Once scan has reached bottom of image on right monitor, press the BLUE FRAME STORE button. (Wait until this process is complete. "Frame Store in Process" on menu screen will go off).
- d. Place a piece of PN55 film with the name Polaroid facing up in camera. Gently slide the film all the way in (you will hear a soft click). Then gently pull film towards you until it stops.
- e. Press YELLOW PHOTO button. Again, watch menu screen ("Photo in Process" will read across screen). When photo is finished another message, "Overlay Photo in Process" will appear. Wait until this message goes off.
- f. Once photo is finished, slide the piece of film back in carefully. Slide lever to the left (P position). Firmly and without hesitation pull film straight and all the way out. Wait 20-25 seconds, then pull open the film. Process the negative in the following solutions:

Sodium Sulfite	1 minute
Water rinse	30 seconds
Acid Hardener	2 minutes
Final water rinse	30 minutes

Briefly dip negative in photo flo solution(white bucket). This will prevent water spots. Hang up to dry.  
**NOTE:** Make sure you coat the positive with the provided coater.

### For thermal prints:

Press printer (to left of main console) on. To take an image, repeat C above, then go to printer and press the GREEN PRINT button.

### TAKING POLAROIDS FROM STORED IMAGES

1. Go to MEMORY (main menu key)
2. Go to PATH (sub directory): type in which drive you want. Most of the time your images will be on the hard drive (C drive) or on Zip (D drive).
3. Choose File you wish to print, and ENTER. Image will appear.
4. Slide a piece of PN55 film into holder (per instructions under Photography)
5. Press Blue Button (frame store). It is now photographing image.
6. Wait until photo is finished and remove.
7. Follow above directions for developing negative.

### **Transferring files from the Hard drive to a disk.**

1. Go to Utilities, enter
2. DOS SHELL, enter. NOTE: Be sure cap lock is OFF.
3. Type “cd <your directory>”, enter
4. Type “DIR”, enter
6. Type “copy \*.tif d:” (in this example, you are copying all the tif files and not the icon files to the zip drive)
7. Once transfer is complete, type “Exit”.  
(This will bring you back to main SEM main menu).

### **G. SHUT DOWN**

- a. Turn off High voltage (press High Voltage OFF button).
- b. Turn on INFRARED CAMERA (press camera button).
- c. Take the Z(height) to lowest setting-watch the right screen. It will stop at the lowest point.
- d. Reinitialize stage by pressing the two RED BUTTONS simultaneously. Look on left monitor—  
CONT:\ will appear. Press CONTROL and \. This will reset stage.
- e. Turn INFRARED CAMERA off.
- f. Check filament settings. Make sure that they are within the indicated limits.
- g. Turn Nitrogen Tank on. Press the chamber **VENT**. Once chamber is vented, remove samples, and close the door gently. Press **EVAC**. Turn Nitrogen Tank off.
- h. Log out your time, and number of photos or thermal prints taken, in book.