

## Philips EM430 TEM

### Operating Instructions

Place your specimen in one of the holders, insert in the microscope, fill the LN2 cold trap dewar, and wait until the HV2 PRESSURE INDICATOR reads less than  $40\mu\text{A}$ . If using the microscope at 250 or 300 kV, make sure that it has been conditioned within the last 24 hours. See separate conditioning instructions.

1) Select the accelerating voltage you will be using with the HIGH TENSION knob(33a), and turn on the HT(14).

2) Bring up the filament current on the FILAMENT knob(35) one division every 15 seconds until it is saturated (position 10 or until the filament image has no dark area in the center). Be sure the inner knob(34) remains on 1 at all times.

Align the microscope as follows:  
Set the magnification to 25, the spot size to 2.

3) Retract the specimen holder into the airlock. Condense the illumination to a spot, then use the DEFLECTION controls(24 & 36) to center the illumination. Use the COND STIG(23) to make the spot round. Use the INTENSITY controls(27a,b) to fully illuminate the screen. Spread the beam to get a 3-5 sec. exposure time on the EXP TIME meter(5). Adjust the GUN TILT controls(21) to give a minimum exposure time on the meter.

4) Now turn the ALIGNMENT/CAMERA LENGTH knob(53) to position 2(you will need to depress the blue inner knob(52)) and center the illuminated area with the DEFLECTION controls(24 & 36).

5) Switch to position 3, and center the illuminated area with the GUN SHIFT controls(63). Repeat steps 4 & 5 until the spot remains centered for both conditions.

6) Switch to position 5, and insert the specimen. Use the DEFLECTION controls(24 & 36) to center the illumination. Use the INTENSITY controls(27a,b) to fully illuminate the screen.

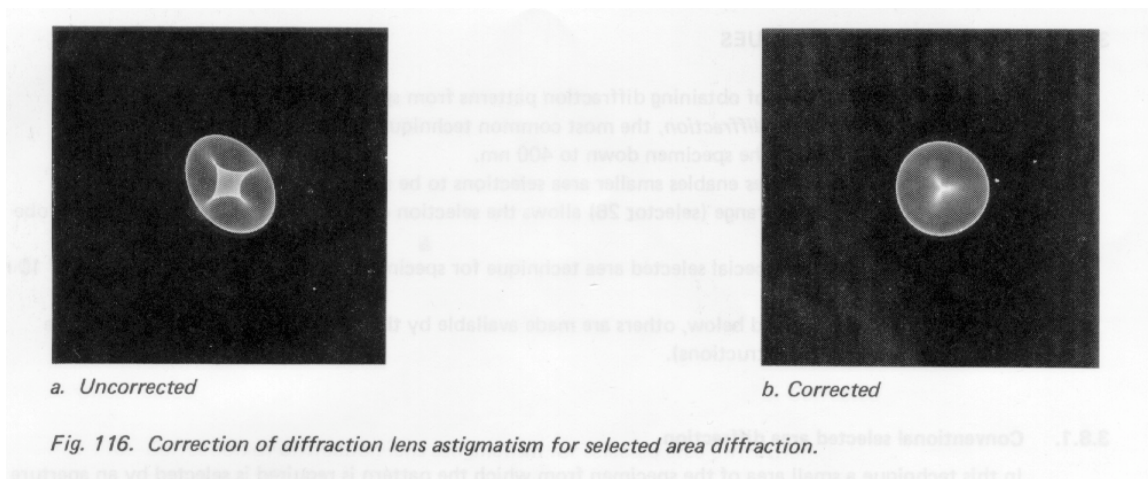
7) Unlock the goniometer motor, and tilt the specimen to adjust the specimen height to the eucentric position and focus the image, then retract the specimen into the airlock.

8) Focus the beam to the smallest spot using the Intensity controls(27a,b), and center the spot using the DEFLECTION controls(24 & 36).

9) Set the WOBLER X-Y selector(28) to X, and depress the WOBLER button(29).

10) Superimpose the two spots using the X BEAM TILT CENTERING controls(65).

- 11) Set the WOBBLER X-Y selector(28) to Y, recenter the spot with the DEFLECTION controls(24 & 36), and repeat step 11 for the Y-direction.
- 12) Reinsert the specimen, and bring some recognizable feature to the screen center.
- 13) Switch to position 7, press the NORM button(39), adjust the INTENSITY controls(27a,b)to fully illuminate the screen, and check that the recognizable feature is still in the center. If not, condense the beam to a spot, center the spot using the SPOT CENTRE controls(64), spread the beam and center the recognizable feature using the LM SHIFT controls(60).
- 14) Repeat steps 12 & 13 until the illumination and image both remain centered. Then underfocus the image, and check to see that the recognizable feature remains centered. If not, adjust LM CENTRE(62) to bring the feature back to the center, and repeat from step 13.
- 15) Switch to position 9, retract the specimen holder, set the SPOT SIZE control(30) to 4, the INTENSITY control(27a) fully clockwise, and press the D button(40) on the FUNCTION SELECTOR.
- 16) Switch the ALIGNMENT/CAMERA LENGTH knob(53) to camera length position 6, then use the DIFFR FOCUS knob(41) to focus the cross-over of the beam on the screen. Use the DIFFR POINT ALIGNMENT knobs(42) to bring the cross-over to the center of the screen, then adjust the DIFFR STIGM controls(58) to obtain a three-fold symmetry as shown below.



- 17) Switch the ALIGNMENT/CAMERA LENGTH knob(53) to alignment position 10, press the M button(40) on the FUNCTION SELECTOR, and reinsert the specimen holder.
- 18) Adjust the SPOT SIZE knob(30) to 2, spread the beam, and make sure that you have a focussed image at the eucentric position. Then retract the specimen holder.
- 19) Condense the beam to a spot, and center the spot using the GUN SHIFT controls(63). Adjust the SPOT SIZE control(30) to position 6, condense the beam, and center the spot

using the DEFLECTOR controls(24 & 36). Repeat until the spot remains centered at both spot sizes.

20) Return the Alignment/Camera Length control to camera length position 6, and the MAGNIFICATION to position 25.

The microscope is now aligned and ready for use!