Hitachi-HT7700 TEM Operation

No magnetic samples!!!
No Organic/bio samples!!!

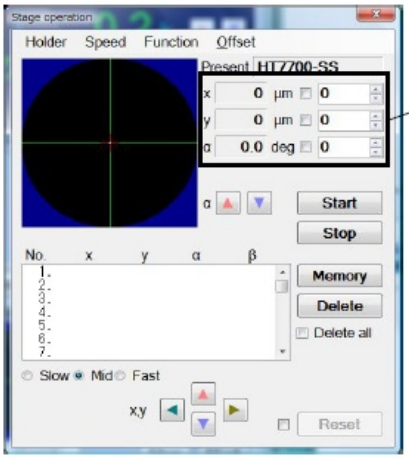
Initial conditions:

☐ Check Vacuum system (2X10-6 or better) ☐ HV On

Check of Specimen Stage Coordinates

For loading a specimen, the specimen stage should be at the coordinate location (home position). The x, y and α coordinates of specimen stage can be checked on the Stage operation window

- "**Operation**" -> "**stage operation**"
- set the specimen stage at the home position (x, y, α = 0)
  Check the box next to the greyed out Reset button and then click Reset button to reset the stage.



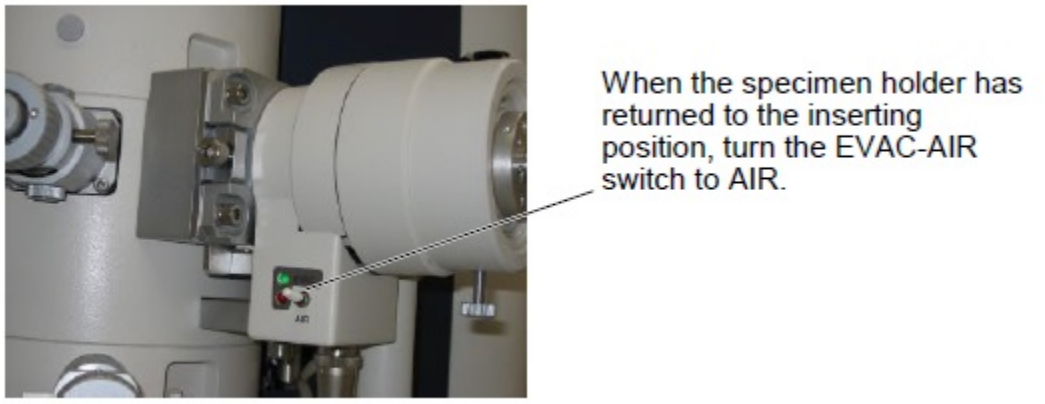
NOTE: If the specimen holder is taken out other than in the home position, the objective lens and adjacent parts may be damaged by the specimen holder.

Pull the sample holder out of the column

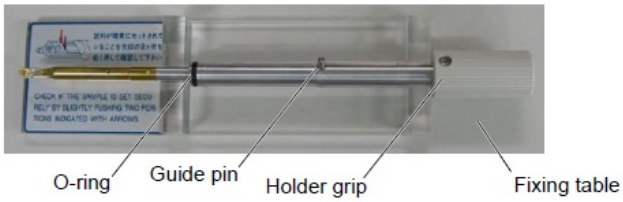
Draw out the specimen holder from the column.

- hold the handle and pull straight back until the holder stops, turn the specimen holder clockwise 15°
- pull back again until the holder stops, turn the specimen holder counterclockwise 30° making sure that you turn all the way till you can no longer rotate the holder.

- turn the "**EVAC-AIR**" switch to "**AIR**", wait for about 10 seconds (Two sounds)
- remove the sample holder (avoid touching the sample holder beyond the O-ring)



Load your sample



Do not touch to the left of the O-ring for this is the vacuum side of the holder.

Fix the holder with the holder fixing table.

Flip the end of the sample holder up and insert your grid with the darker side up.

Flip the end of the sample holder down to secure the sample.

Check to make sure the sample will not fall out of the holder

Insert the sample holder

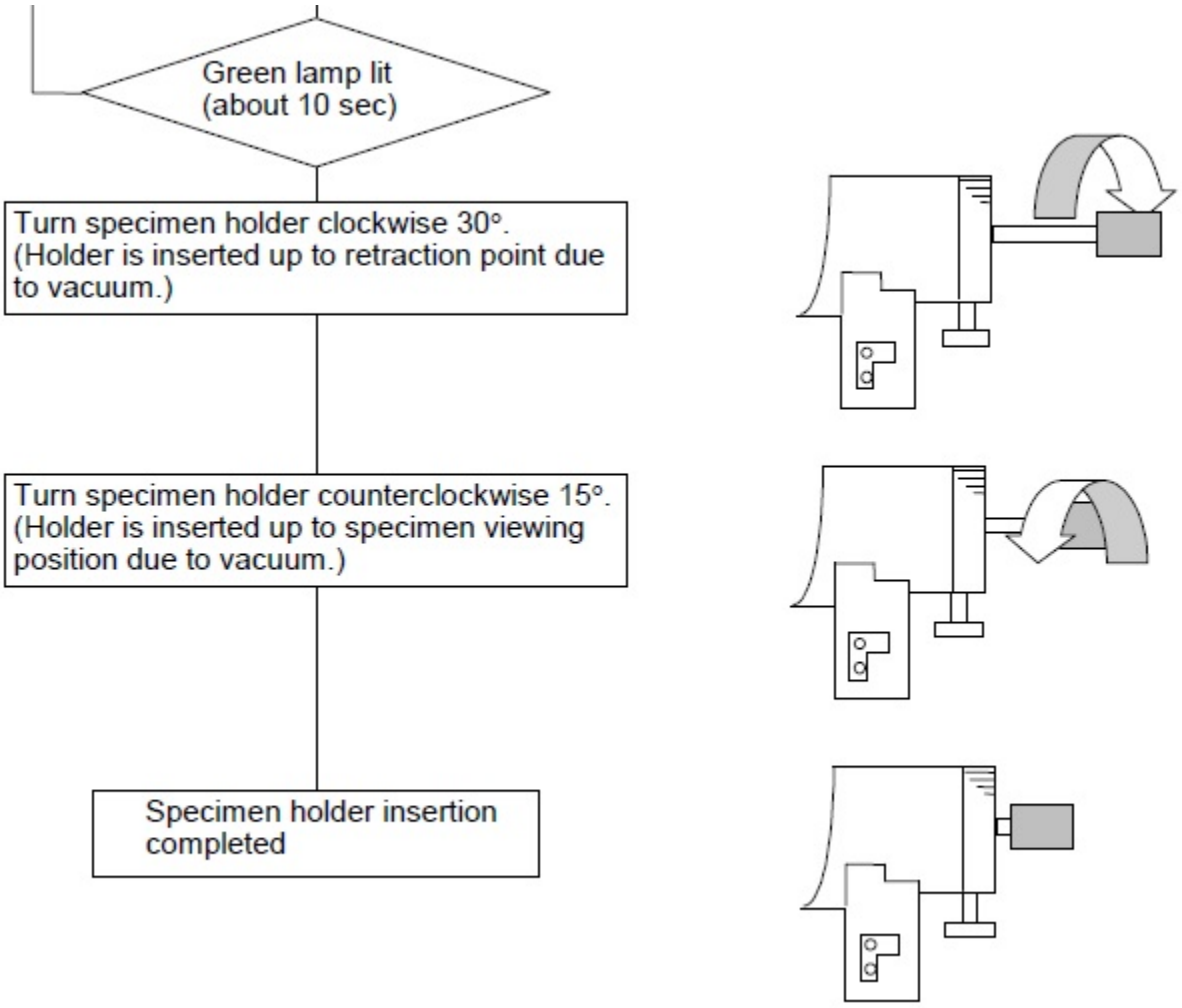
Set the specimen holder in the stage so as to align its guide pin with the cylinder groove of specimen stage.

- flip up the "**EVAC-AIR**" switch to "**EVAC**"
- Pumping will be complete when the green lamp is lit and makes an alarm sound, (The green lamp is lit for about 10 seconds. During this period of time, the lock mechanism is released)- turn the specimen holder clockwise 30°; holder is inserted into the column, but not into viewing position- turn the specimen holder counterclockwise 15°; When the holder is further inserted, it reaches the viewing position.

NOTE The Specimen stage is equipped with a microswitch in order to check setting of the specimen holder. If this switch has not been pressed, the instrument system may judge that no specimen holder is set in the stage and evacuation may not start. In this case, push the holder lightly into the stage.

NOTE: Expect for 10 Seconds after completion of pre-evacuation, the specimen holder cannot be inserted into the objective lens. If the holder is forcibly turned, problems such as damage of the lock mechanism and dump the column vacuum.

If you miss the window of green light and beep sound, the level of vacuum in the specimen chamber will degrade. So, conduct re-evacuation by turning specimen chamber evacuation to AIR and then EVAC again. Unless this operation is performed, the lock mechanism cannot be released.



Turn on the filament/beam

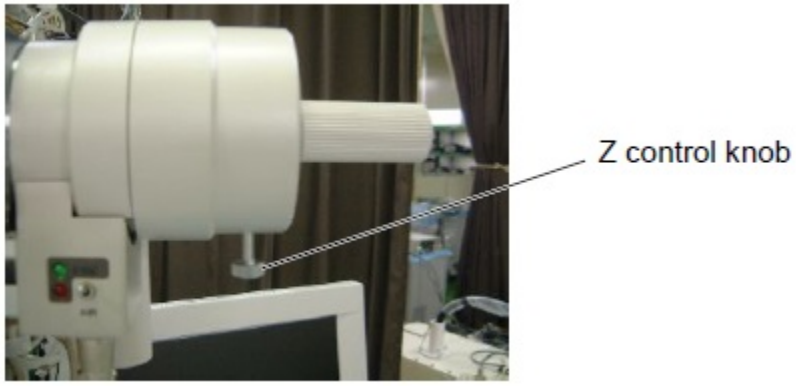
(a) Turn on the filament voltage (if the filament voltage is off)

- "**Operation**" -> "**HV/Filament Operation**"
- click "**Filam. on**", it takes about 30 seconds

(b) Turn on the beam

- Select Auto mode, click "**Beam On**"
  under Auto mode, the filament current will automatically turn on and turn off when you loading or remove the sample holder

(c) Click **Run**, to turn on the screen camera. (Left display)



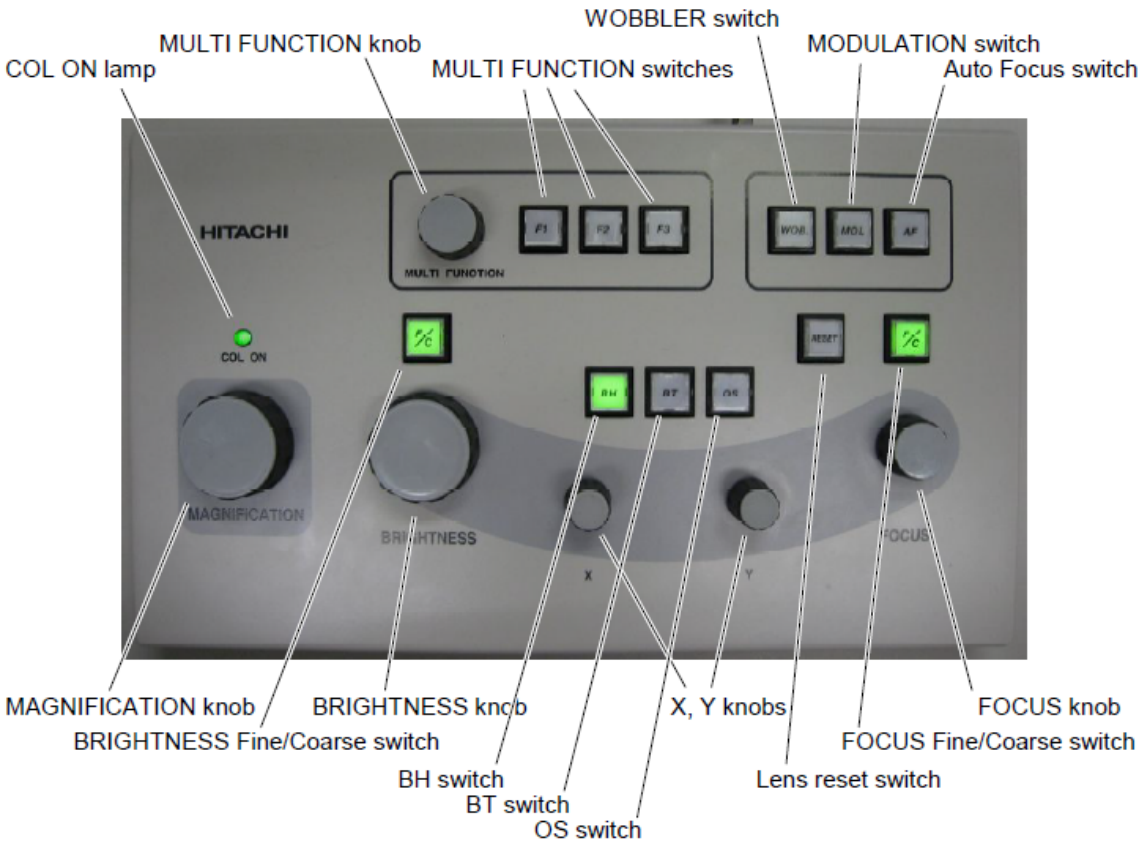
Specimen height adjustment

(a) Push "**Lens reset**" button on the operation panel Once

(b)At 20 Kx, find a feature near the middle of the viewing screen

(c) Press the "**WOB**" button on the operation panel;

(d) Adjust image focus by manipulating the Z control knob of the specimen stage the image on the screen should remain steady, cancel "**WOB**" button



Center the Beam (if the beam is not centered)

Push the "**BH**" button, adjust the Beam centre by using the X, Y knobs on the operation panel.

Start acquiring TEM images (Please always keep attention to the exposure intensity)

(a) Find your sample using the Screen camera (Left display)

You can use HC (>0.2K) mode to search your sample at the beginning, then change to HR mode (> 4 K) for getting images

(b) Lower the beam intensity and click "**Scr. out**"

(c) Open the "**Gatan Digital Micrograph**" software (Right display)

(d) Click "**Start View**" to start the image acquisition

Put the cursor in the blank area of the image window, adjust the intensity 2,000~3,000.

(e) Use "**Focus**" on the operation panel to adjust the focus of the sample

(f) Click "**Start Acquire**" to record the final image

(g) Click "**File**" –> "**Save Display As**" to save your image

(h) Switch to Screen camera: Click "**Stop View**", then "**Scr. in**" (left display), double click "**Link Screen**".

Before changing samples, please reduce magnification to 4 K and set the spacemen stage at the home position (x, y, α = 0)

Session shut down:

☐ Reduce magnification to 4 K

☐ Set the spacemen stage at the home position (x, y, α = 0)

☐ Remove the sample from the specimen holder, and store the holder in the standby position

☐ Click "**Beam off**" to turn off the beam

☐ Stop the Screen camera (if there are no users right after you)

☐ Click "**Film off**" to turn off the filament voltage