

Quartet holder - user guide

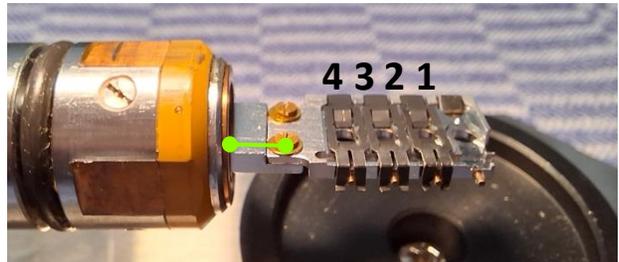
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The quartet holder (EM-01070 SQH) can be used to load multiple grids into the TEM at once. Normally it can hold up to 4 samples, but the latch at position 1 has snapped off due to improper use. **The holder is very fragile, and improper use can damage both the holder and the TEM!** You are only allowed to use this holder after completing the training.

Quartet holder features (Figure 1)

- **The grid-selection knob:** to select which grid to observe. Rotating the knob will move the holder tip in/out of the holder.
 - Note: outside of the TEM, when rotating from position 1->4 you have to push on handle-side-end of the holder. Inside the TEM, the vacuum will do this for you.
- **The grid holder latches**
 - Originally the holder had 4 latches, but the latch on position 1 has snapped off.
 - The latches should be opened in from tip to holder (so 2-3-4) and closed from 4-3-2.
 - Always open/close one latch at the time.

Position 1 selected



Position 4 selected



Figure 1: The quartet holder in the 1 or 4 position. Note how the extension of the holder-tip and the handle-end has changed (green lines).

How to not break the holder and/or TEM:

- Be gentle with the latches. Double-check that they are really closed well.
- Move the objective aperture from the column:
 - When inserting/removing the holder
 - When selection a different position.
- When inserting/removing the holder from the TEM, the grid-selection knob has to be in position 1.
- Select the correct holder in the TEMcenter software

More information

- JEOL instructions – see folder labeled “Sample holders” in JEOL2100 room
- <https://iubemcenter.indiana.edu/equipment/tem-holders/jeol-specimen-quartet-holder.html>

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Loading grids into the holder

- The latches can be opened by putting a tweezer tip underneath the latch (see Figure 2) and **GENTLY** lifting it up.
- Always open the latches one-by-one from tip-to-holder, so 2-3-4.
- Load the grids from holder-to-tip, so 4-3-2. First close the latch before continuing with the next grid.
- Close the latches by squeezing them with tweezers as indicated in Figure 2.
- After closing all the latches, double-check that the holder is **fully secured**:
 - Check from the side: are the latches locked down completely?
 - Carefully hold the holder upside-down: do the latches stay in place?

Loading the holder into the TEM

- Remove the **objective aperture** from the column (Figure 5)
- Check: the grid-selection-knob on the holder is on **position 1**
- Select the quartet holder in the **TEMcenter software**: EM-01070SQH: SPECIMEN QUARTET HOLDER (Figure 4)
- Load holder in TEM as normal.

Changing the sample position while imaging

- Screen down (off camera)
- Go to lowmag mode
- Remove the **objective aperture** from the column
- Turn the grid-selection-knob to the desired position whilst observing the movement on the phosphorescent screen.
- Reminder: you should probably change the file name or note down the file number.

Removing the holder from the TEM

- Remove the **objective aperture**
- Turn the grid-selection-knob to **position 1**
- Proceed as normal.

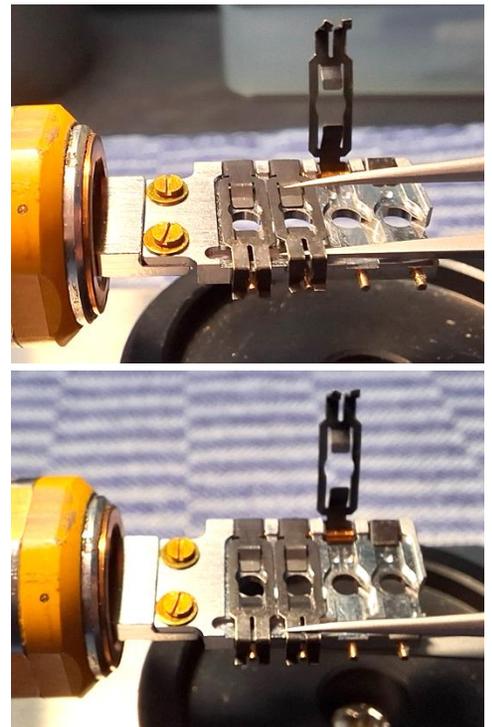


Figure 2. Top: open a latch by inserting the one arm of the tweezer underneath and lifting it up. Bottom: close the latch by squeezing around the latch.

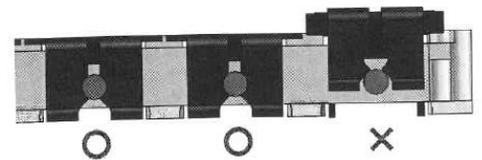


Figure 3: check that the latches are really closed!



Figure 4: TEMcenter holder selection

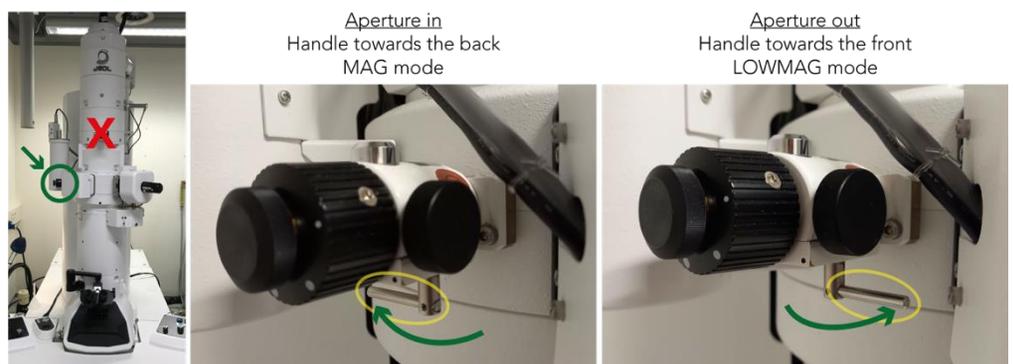


Figure 5: How to insert/remove the objective aperture into the TEM column