

Demo - How to set up a scan on μ CT45 (Non-carousel version)

By PCMD MicroCT Imaging Core

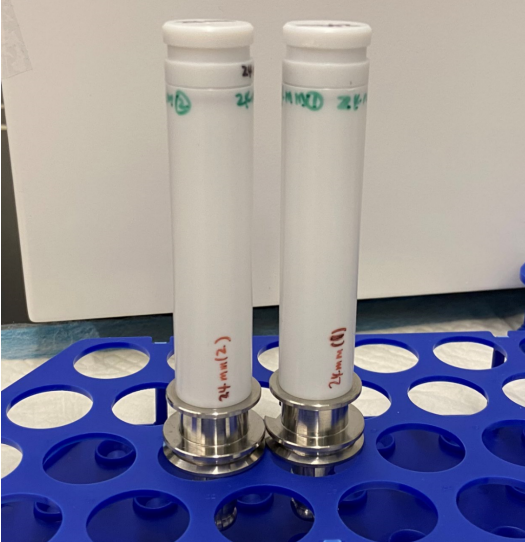
(Note: This video demo is the **Non-carousel version**. Please load the sample holder directly on the rotation/loading stage, NOT on the carousel.)

YouTube link: <https://www.youtube.com/watch?v=JEoLn1i9EjE>

All our video tutorials are listed on our website: <https://www.med.upenn.edu/orl/uct/user-tutorials.html>

Step 1: Wrap & put the sample into the sample holder

1. Wrap up the sample in gauze, and push them into the sample holder.



Note 1: The following video shows the details of wrapping the sample securely into the sample holder.

(Please watch from **0:00** to **6:50**) <https://www.youtube.com/watch?v=QUt0QqIYJ80>

(The Youtube link can be found on our website <https://www.med.upenn.edu/orl/uct/>)

Make sure the sample is secured tightly in the sample holder, which is IMPORTANT to avoid motion artifacts during scanning!

Note 2: If you are unsure to use which sample holder (diameter: 9mm, 14mm, 24mm, 34mm, 48mm), please consult with the manager.

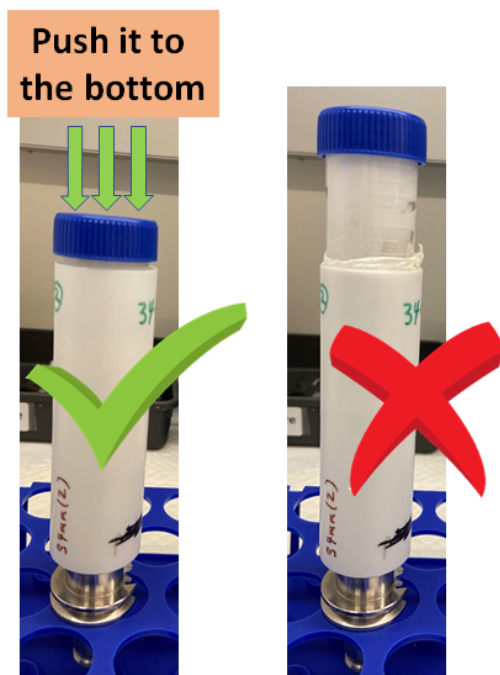


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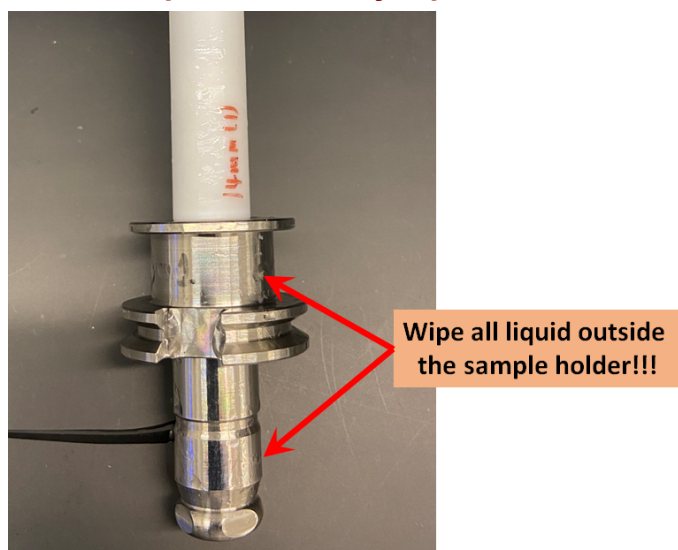
Note 3: Besides PBS, you can also fill the sample holder with ethanol, water, 10% formalin, or other medium, depending on the post-processing of your sample.

Note 4: Depending on your scan resolution, you may prepare your sample in 15 or 50 mL centrifuge tube, and place the centrifuge tube into our sample holder for fast sample loading and removal.

Please make sure you push the centrifuge tube into the bottom of the sample holder. No space should be allowed between the centrifuge tube and the sample holder bottom. Excessive height above the sample holder can cause accidents inside the scanner!



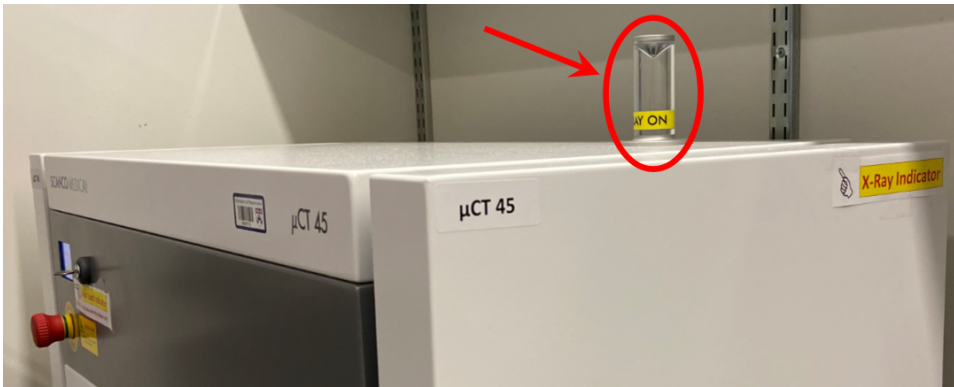
2. Before proceeding to the next step, please **use a paper towel to wipe any liquid outside the sample holder. Any liquid outside the holder can damage the scanner!**



Step 2: Open the door

1. Please confirm:

(1) The X-ray tube is **OFF**



(2) The Door Locker indicator shows **unlocked**



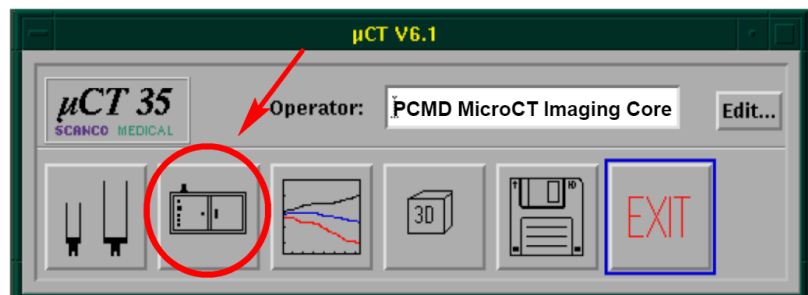
(3) Type “**que**” in the command window, and press **Enter** to confirm there is NO “**MEASUREMENT**” showing up.

A screenshot of a terminal window titled 'MICROCT45 on SC2361::DISK1:[MICROCT45]'. The window has a menu bar with 'File', 'Edit', 'Commands', 'Options', 'Print', and 'Help'. The command prompt shows '\$ que' with a red circle around 'que' and a red arrow pointing to it. A text box above the command says 'Type “que”, and press Enter.' The output shows a queue of two jobs in the 'SNS_JOB_POOL'. A red box encloses the entire output. A text box at the bottom right of the red box says 'No “MEASUREMENT” is showing up.'

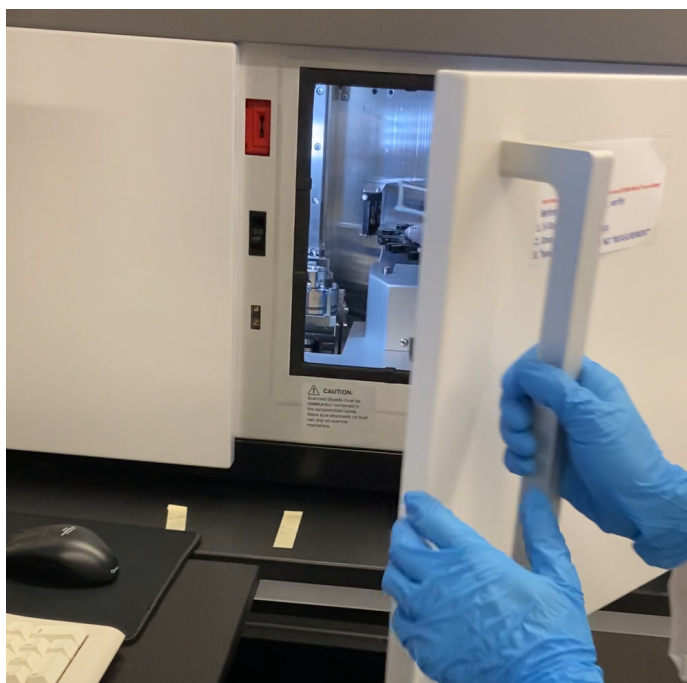
```
DISK1:[MICROCT45]
%DCI-T-SUPERSEDE, previous value of UCT_DUAL_STACK_RECO has been superseded
$ que
QUEUE: SNS_JOB_POOL
  560 SNS_MONITOR_PROCESSING_JOB SC2361$DKC1:[MICROCT45.SCRATCH]SNS_FDK_GPU_2020
092319340266_204153D2.LOG;
  564 SNS_MONITOR_PROCESSING_JOB SC2361$DKC1:[MICROCT45.SCRATCH]SNS_FDK_GPU_2020
092320213186_204153E0.LOG;
2 jobs in SNS_JOB_POOL
Total number of jobs: 2
$
```

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Note: If no “MEASUREMENT” is showing up after the “que” command, but the Door Locker indicator still show locked, please click the “Scan” button in the control box (shown below) to unlock.



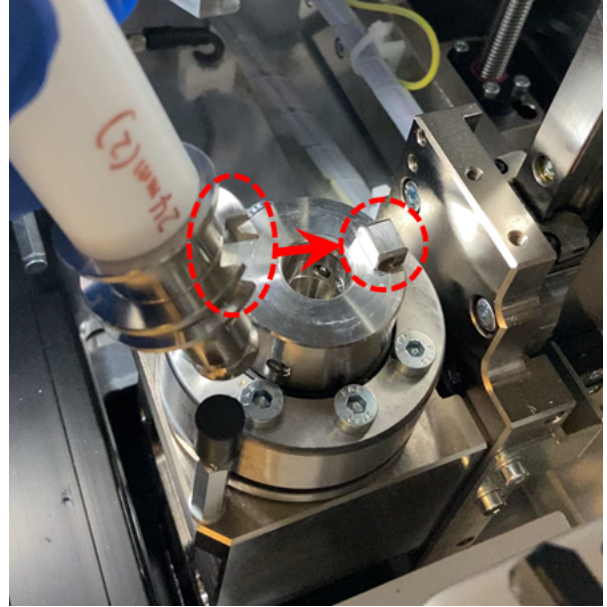
2. Open the door on μ CT45.



Step 3: Place the sample holder onto the rotation/loading stage

(Note: This video demo is the **Non-carousel version**. Please load the sample holder directly on the rotation/loading stage, NOT on the carousel.)

1. Place the sample holder onto the rotation/loading stage (on the left side of the carousel).



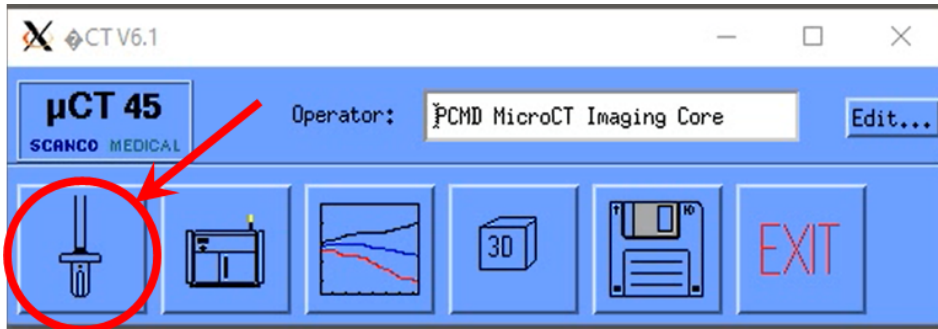
IMPORTANT: Make sure the sample holder is loaded fully on the rotation/loading stage!



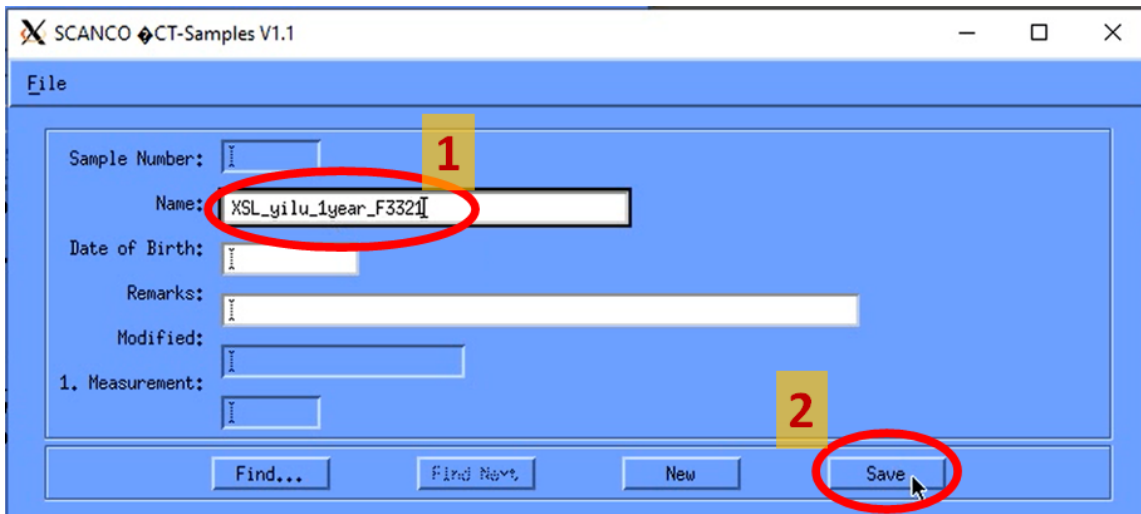
2. Close the door on μ CT45. (You will hear a “click” sound to confirm it is secure.)

Step 4: Create sample folder

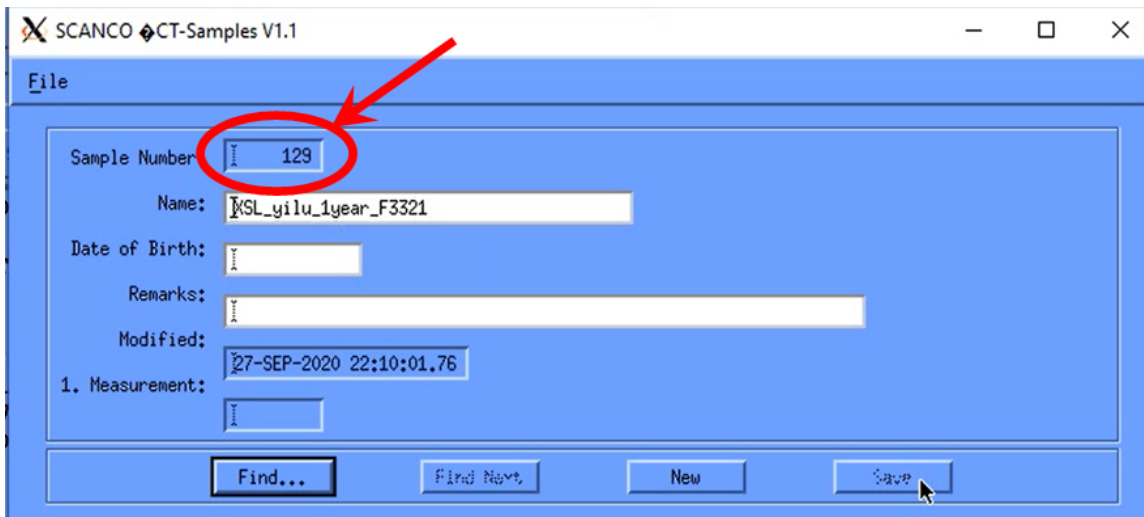
1. Click the first left button in the Control box (at the left bottom of the screen)



2. In the “ μ CT-Samples” window, enter your sample name:
PI's initial_your name or Pennkey_Sample info
Click the “Save” button

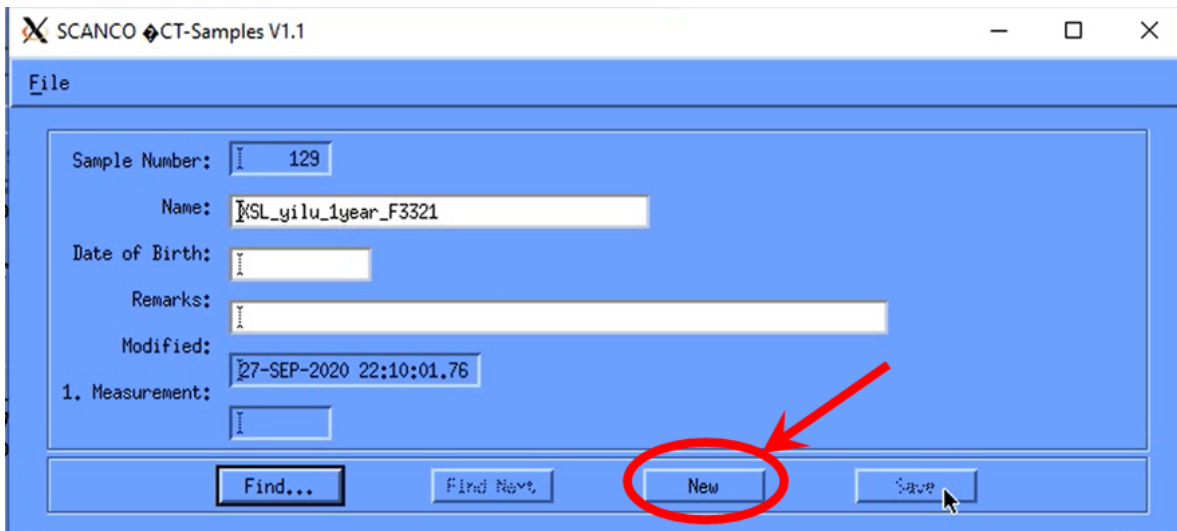


3. Record the generated “Sample Number” as you will need this in later steps.



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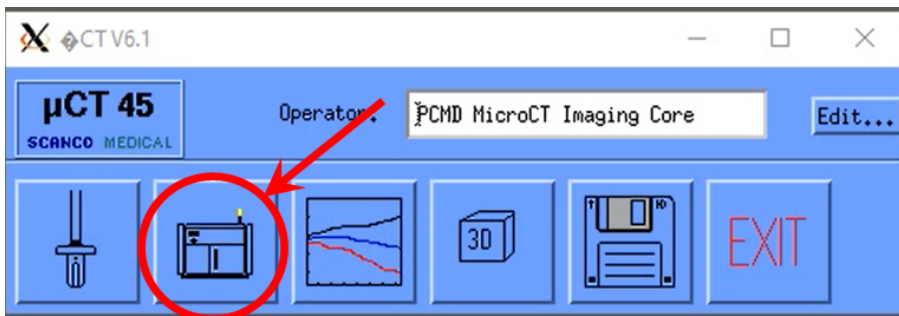
4. (If you need to create multiple sample folders) Click the “New” button to create additional sample folders. Remember to record your “Sample Number” as it will be required for subsequent steps.



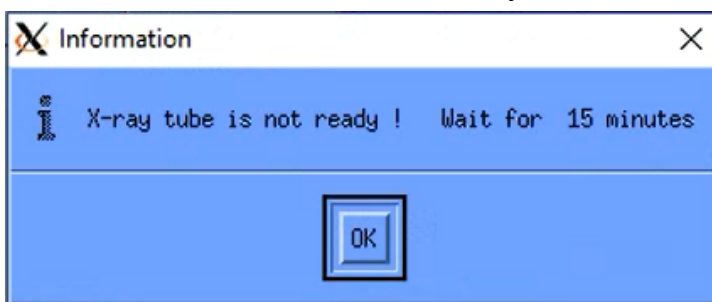
5. Close the “ μ CT-Samples” window

Step 5: Perform a scout view

1. Click the second left button in the Control box to open the scan software

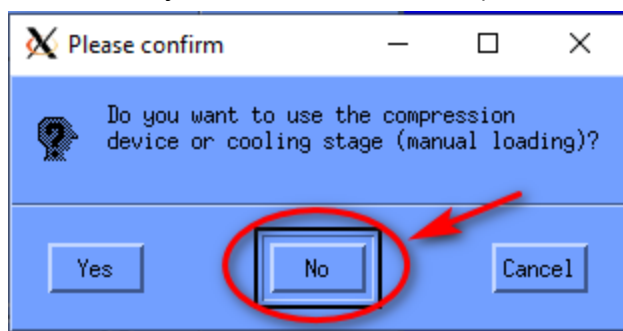


2. (Optional) If the scanner hasn't been used for the last 8 hours, you will see the “Information” window, and wait for the X-ray tube to warm up (15~20 min).

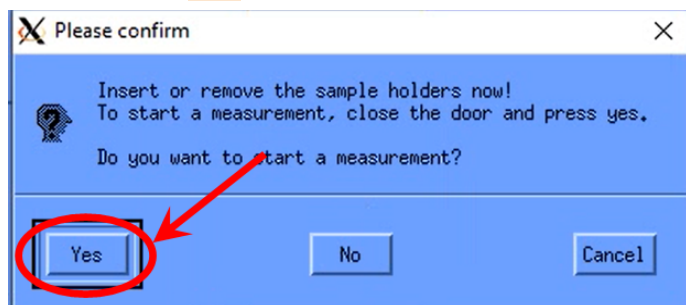


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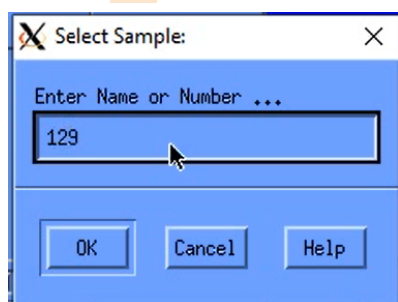
- Click “No” on the window to confirm you don’t want to use the compression device (which is rarely used on our scanner).



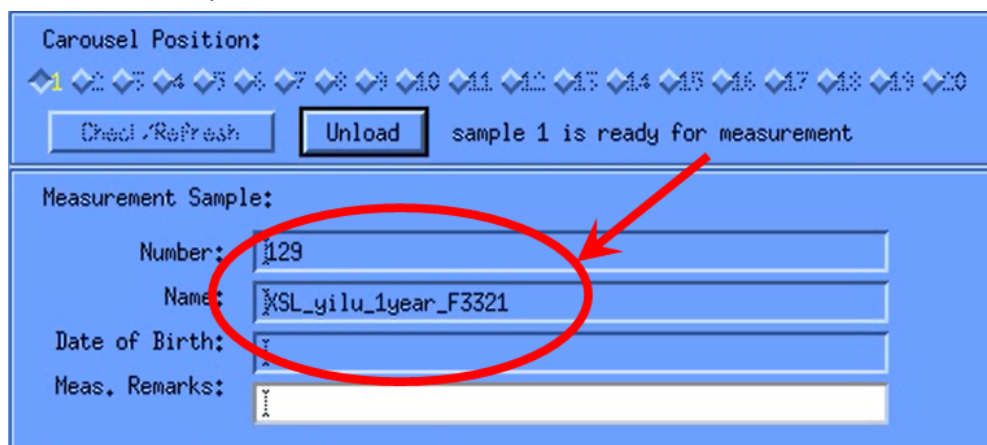
- Click “Yes” on the window to confirm you want to start a measurement (scan). Wait for 3 min.



- Enter Sample Number (generated in Step 4. It’s “129” in the video demo), and then click the “OK” button.



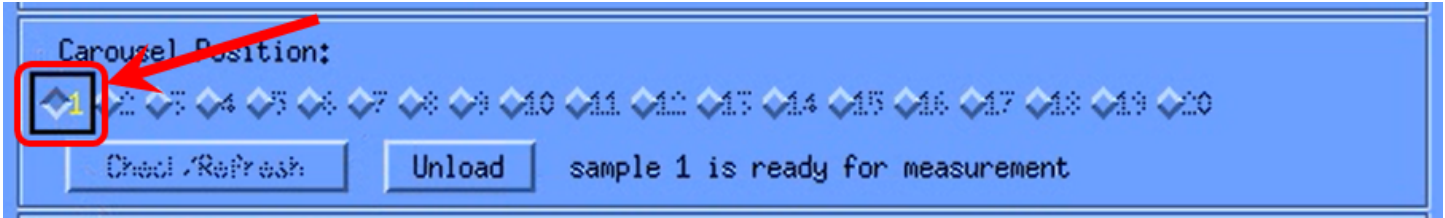
Then, the sample info will be shown in the scan software.



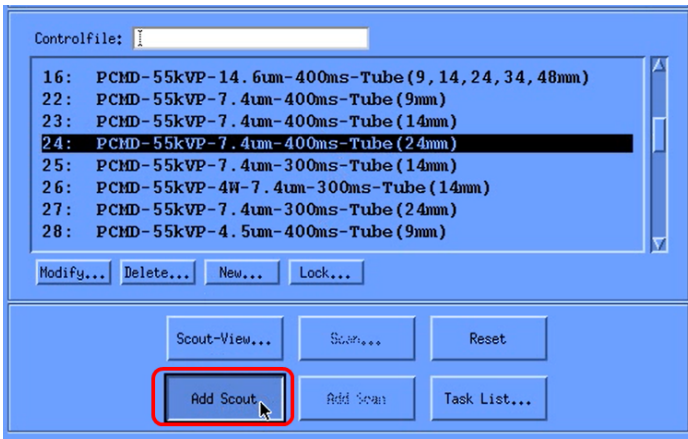
6. Click “1” in the Carousel Position.

Note 1: Position #1 here means the sample holder is on the rotation/loading stage.

Note 2: If position #1 is not selectable, please click the “Check/Refresh” button.



7. Select an appropriate controlfile (consult with the manager if unsure), and click the “Add Scout” button.



8. (Optional) If you want to use multiple controlfiles to scan your samples, you may select other controlfiles, and click the “Add Scout” button again

9. Click the “Task List...” button.

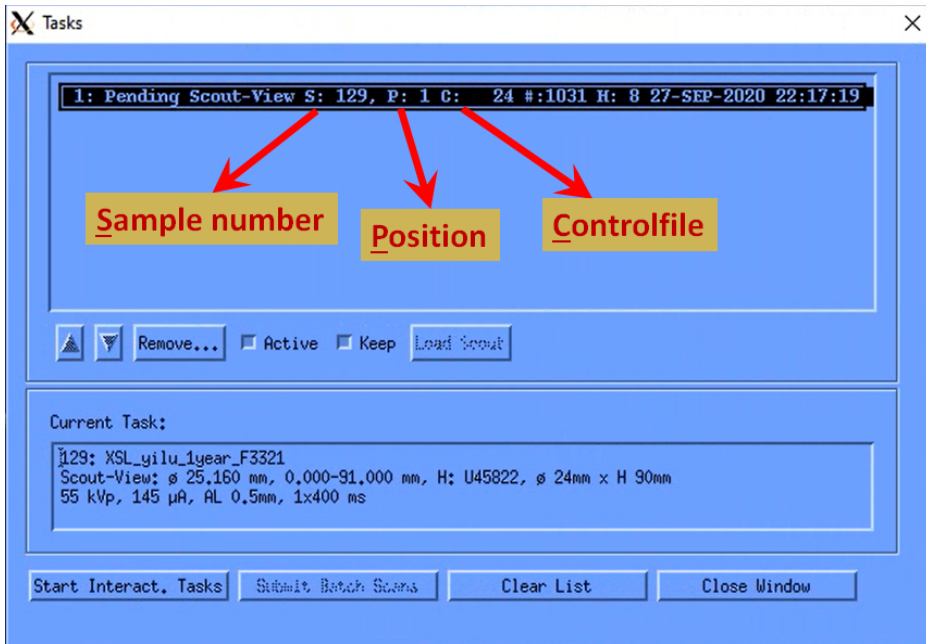


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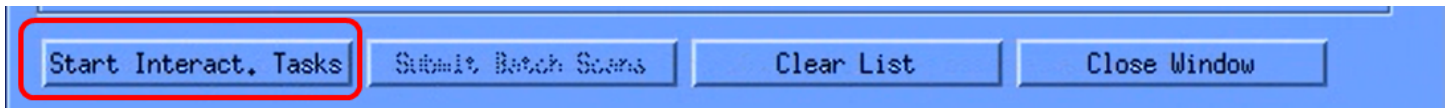
10. You will see the Pending Scout-view showing in the “Tasks...” window.

Note: S=Sample number, P=Position, C=Controlfile.

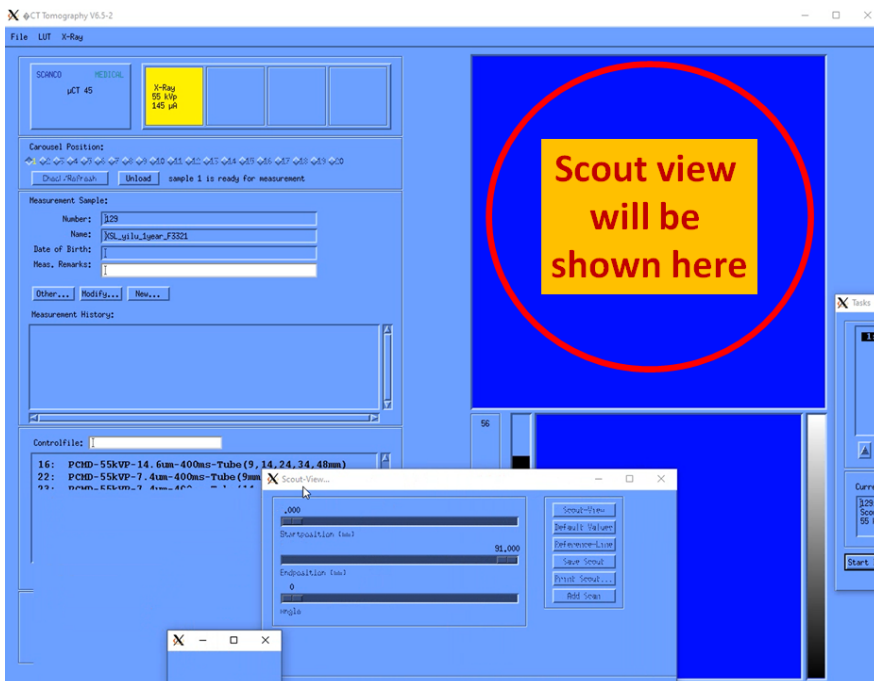
Make sure these info are correct. If incorrect, you may select and click the “Remove...” button.



11. After confirming all info in the “Tasks...” window is correct, click the “Start Interact. Tasks...” button.

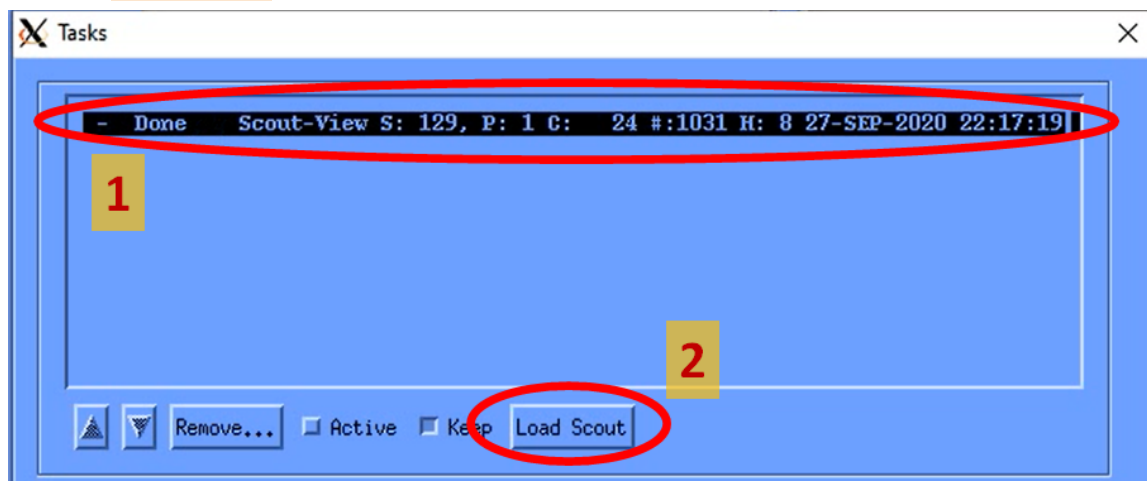


12. Wait for 3 min. You will see the X-ray tube turn ON and the Door lock indicator shows Locked.



Step 6: Select the region of interests and start scan

1. After the scout view is finished, select the “Scout-View” in the “Tasks...” window, and click the “Load Scout” button.

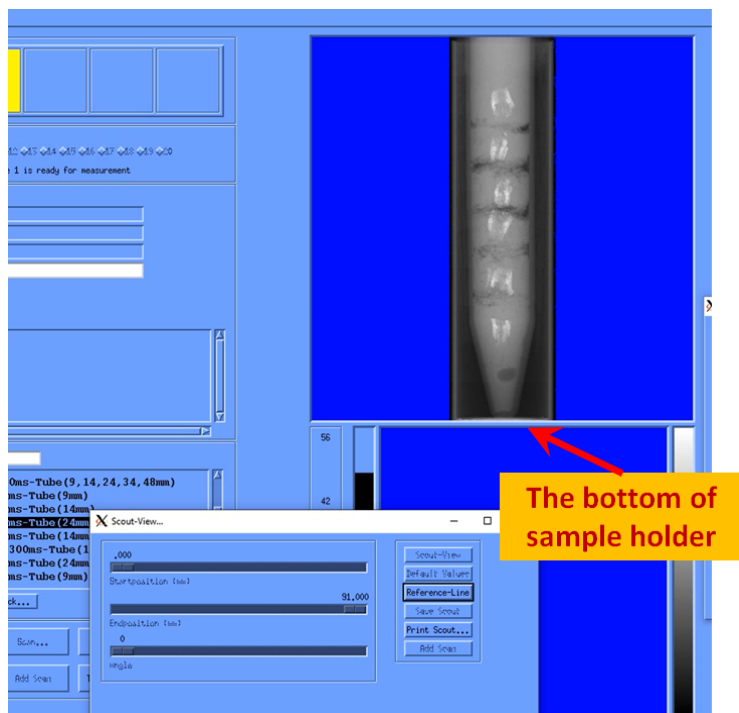


2. You will see your sample(s) in the software interface.

Tip 1: Click and hold the **Middle** button of the mouse: enlarging the scout view.

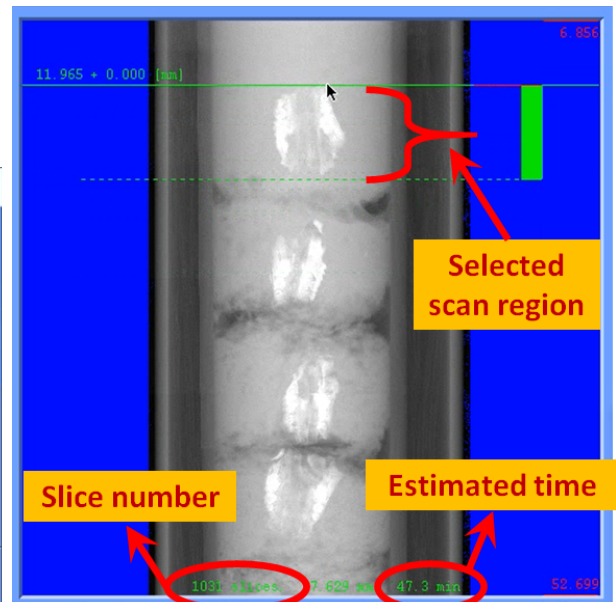
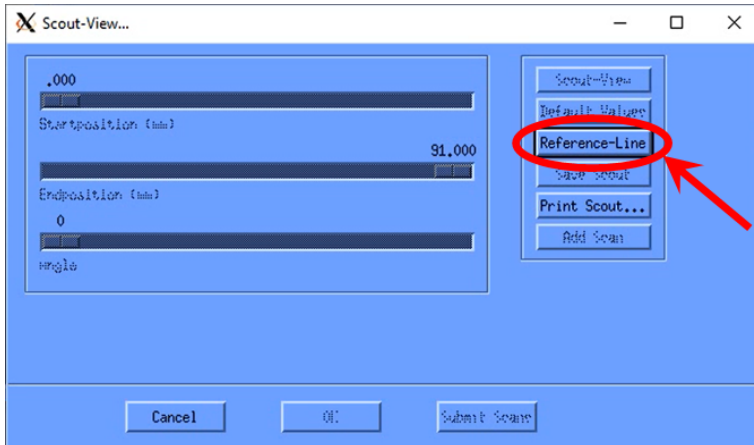
Tip 2: Click and hold the **Right** button of the mouse: moving the scout view.

Tip 3: Click and hold both the **Middle** button of the mouse and **Shift** key: adjusting the contrast of the scout view.



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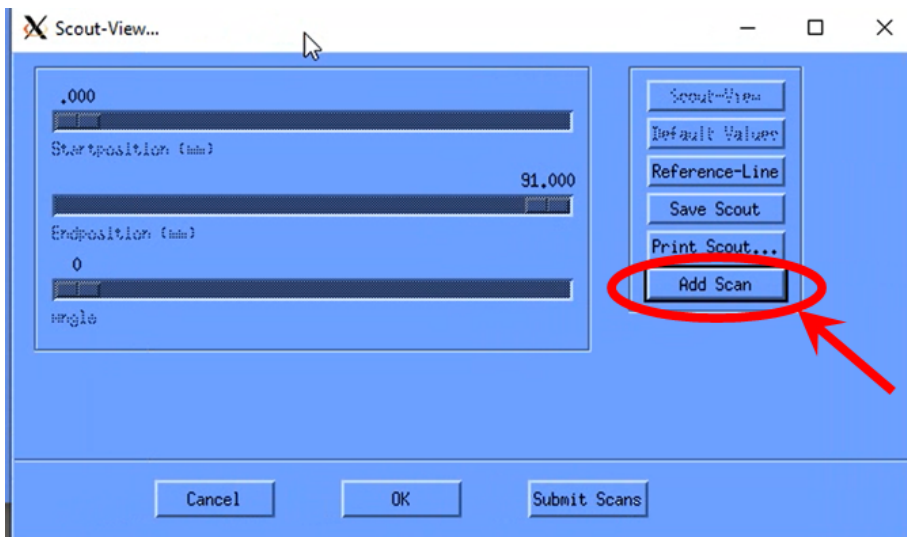
- Click the "Reference-Line" in the "Scout-View..." window, hover the mouse to your desired region. If necessary, press and hold the Shift key to adjust the scan slice number. Once you have identified your region of interest, click the Left button of the mouse to set your reference line.



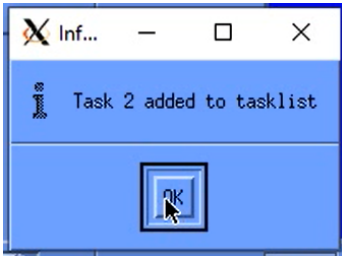
Note: If you want to change the position of the desired region, click the "Reference-Line" in the "Scout-View..." window again to cancel the previous selection.

- Once your scan region is selected, the estimated time will be shown. The actual time is longer than that, usually at a factor of 1.4. As the estimated time is 47.3 min in the video, the actual approximate scan time will be 66 (= 47.3 x 1.4) min.

- Click the "Add Scan" button in the "Scout-View..." window.

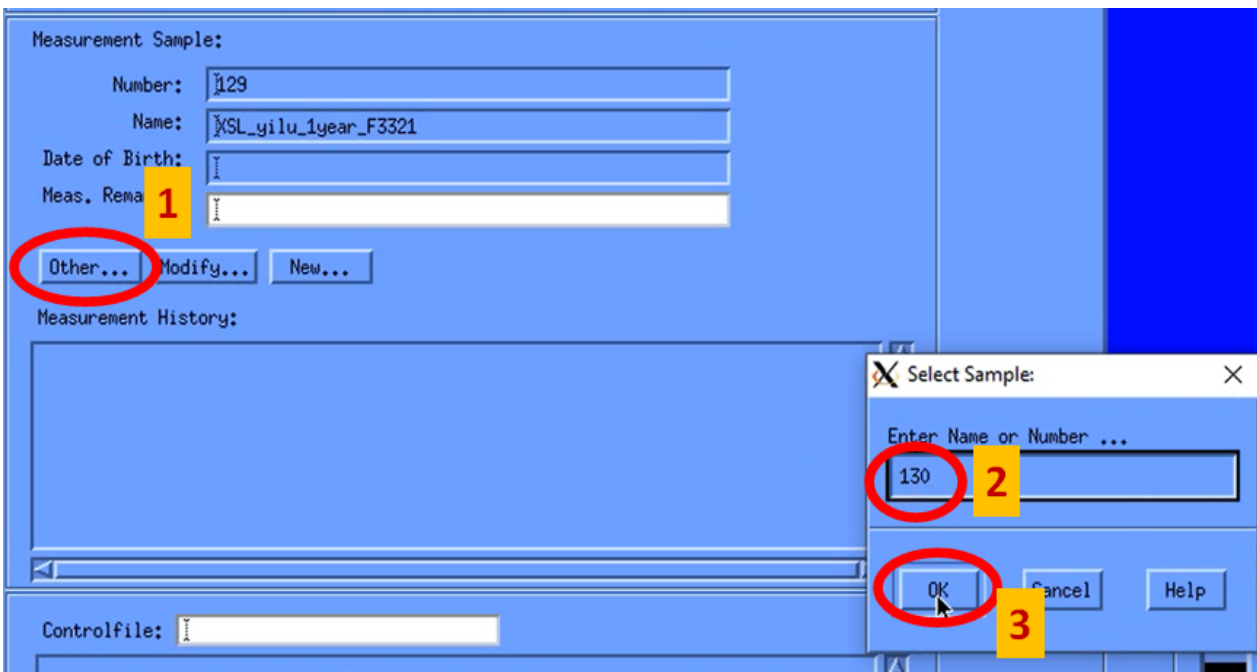


6. Click the “OK” button in the pop window “Information”.



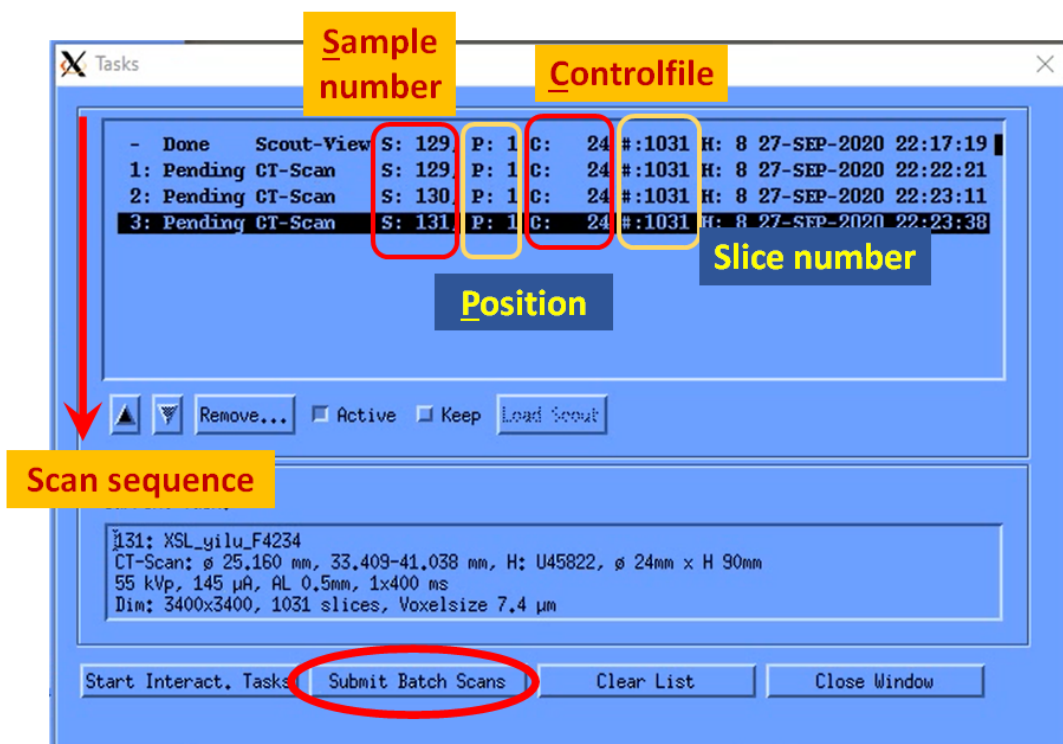
Optional: If you want to select the very middle region in the sample, press and hold the “Alt” key, and the central region will be selected based on the length of the sample.

7. Optional: If you have added all regions of interest for this sample number, you can change to another sample number. Click the “Other...” button, enter your next sample number, and click the “OK” button. Repeat the above **steps 3~6**.



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- Once all sample regions are added to the scan tasklist, double check if all info in the “Tasks” window are correct. If correct, click the “Submit Batch Scans” button.



- Wait for 2~3 min. The scan software will disappear.

- To confirm your scan is successfully initiated, type “que” in the command window, and press Enter. You will see the “MEASUREMENT” followed by the sample number. Done!

