

## Demo - How to set up a scan on $\mu$ CT45 (Carousel version)

By PCMD MicroCT Imaging Core

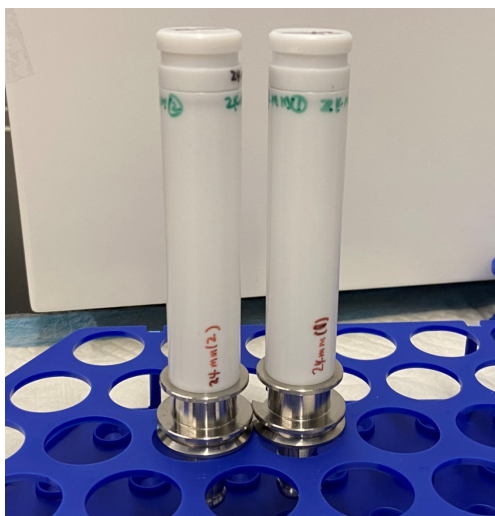
(Note: This video demo is the **Carousel version**. Please load the sample holder on the carousel.)

YouTube link: <https://www.youtube.com/watch?v=fzIfffR5XyE>

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 details how to wrap 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 which sample holder to use (diameter: 9mm, 14mm, 24mm, 34mm, 48mm), please consult with the manager.



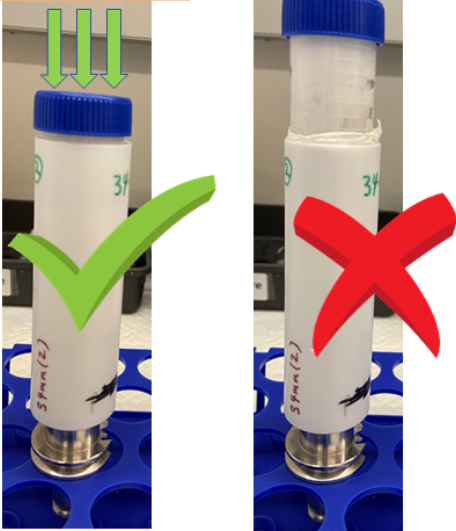
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Note 3: Besides PBS, you can also fill the sample holder with ethanol, water, 10% formalin, or other media, depending on the post-processing plans regarding your sample after scanning.

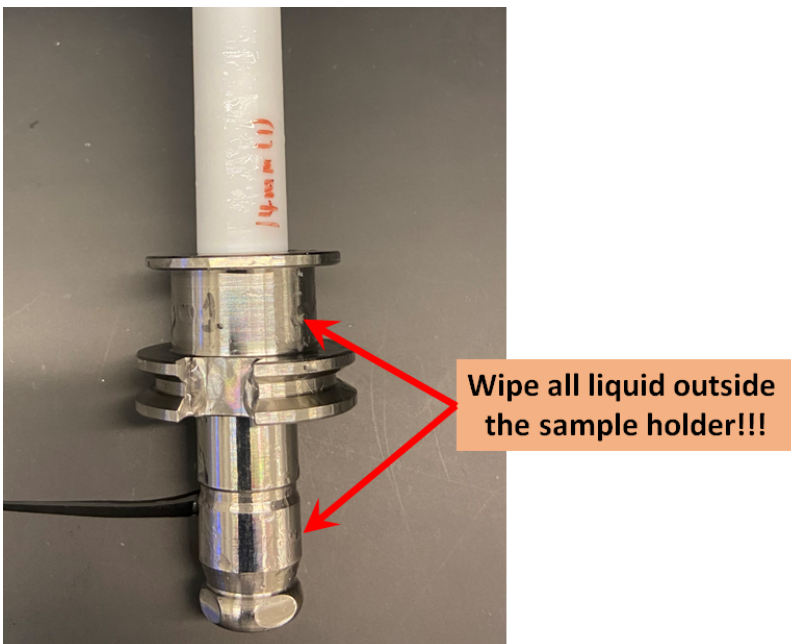
Note 4: Depending on your scan resolution, you may prepare your sample in 15 or 50 mL centrifuge tube and place the centrifuge tube into our sample holder for convenient sample loading and removal.

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

Push it to the bottom



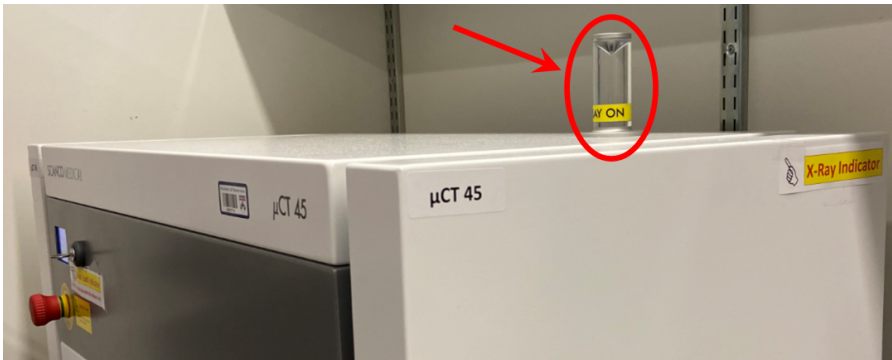
2. Before proceeding to the next step, please **use a paper towel to wipe away any liquid outside the sample holder. Any liquid outside the holder can damage the scanner!**



## Step 2: Open the door

1. Please confirm:

(1) The X-ray tube is OFF



(2) The Door Locker indicator shows unlocked



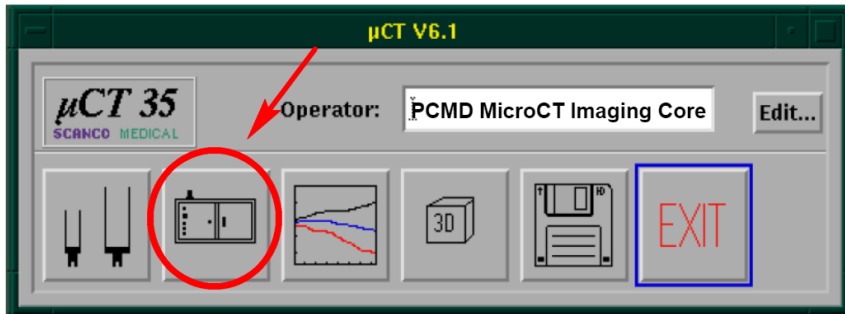
(3) Type “que” in the command window, and press Enter to confirm there is NO “MEASUREMENT” showing up.

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 terminal shows the command '\$ que' entered, with 'que' highlighted by a red box and a red arrow. The output shows a queue of two jobs. A red box highlights the entire output area. An orange callout box says 'Type “que”, and press Enter.' and another orange callout box says 'No “MEASUREMENT” is showing up.'

```
DISK1:[MICROCT45]
%OCL-I-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
$
```

## How to set up a scan on $\mu$ CT45 (Carousel version)

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  $\mu$ CT45.



### Step 3: Place the sample holder onto the carousel

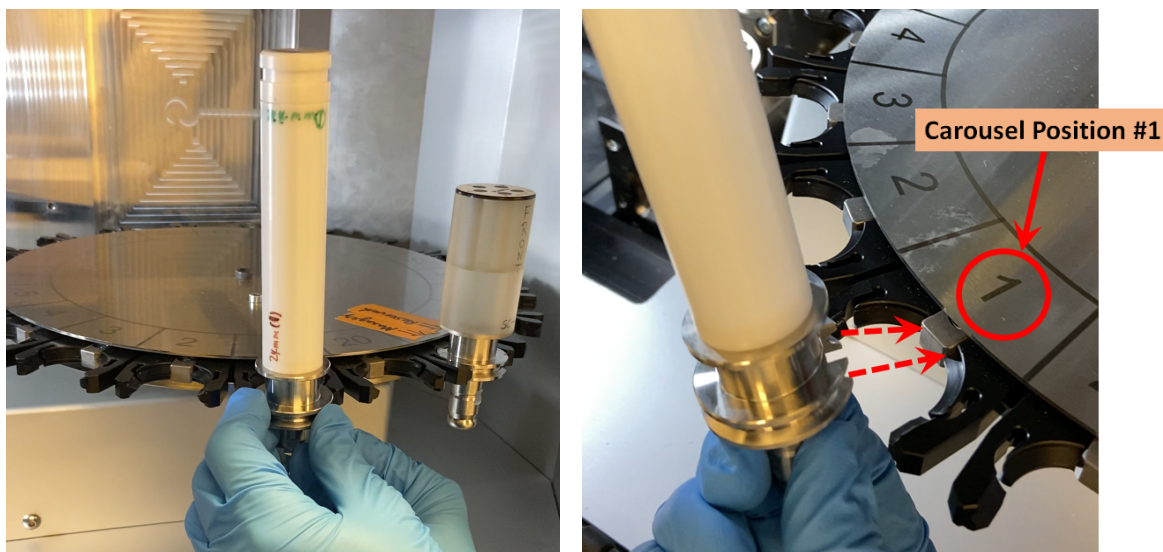
(Note: This video demo is the **Carousel version**. You need to remove the sample holder on the rotation/loading stage.)



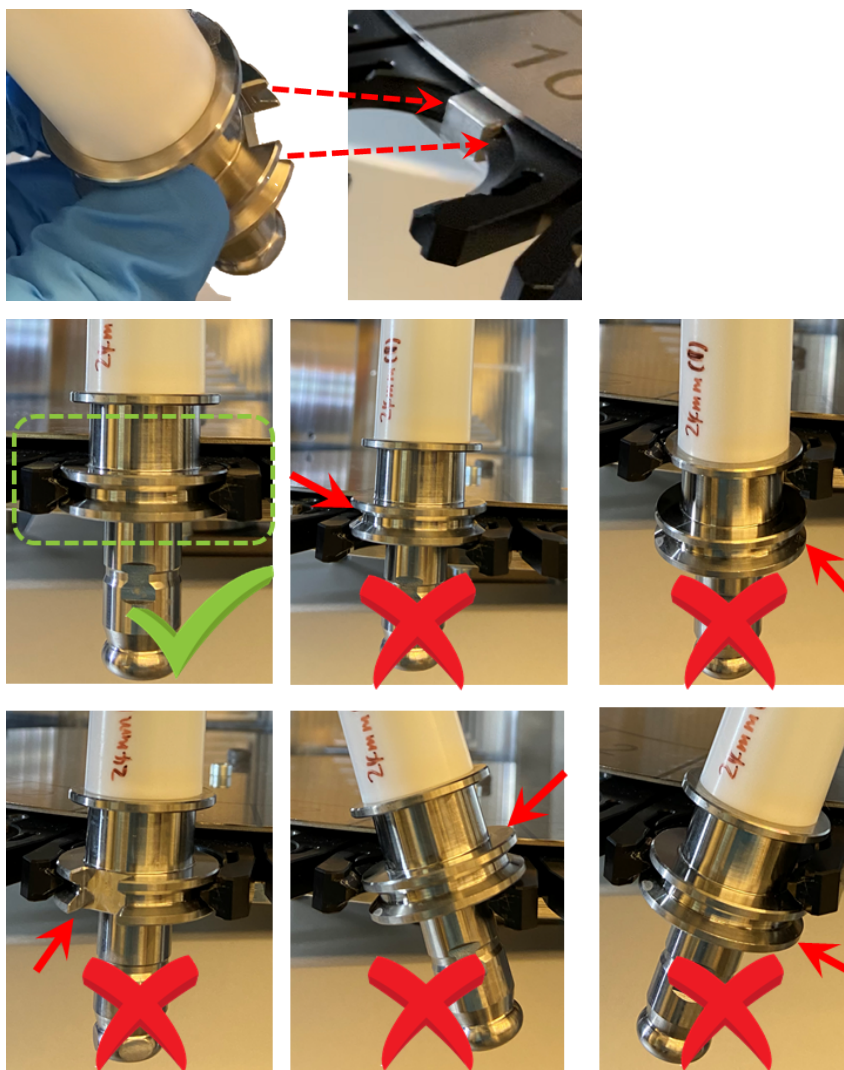


## How to set up a scan on $\mu$ CT45 (Carousel version)

1. Place the sample holder onto the carousel. **Please write down the carousel position# !**



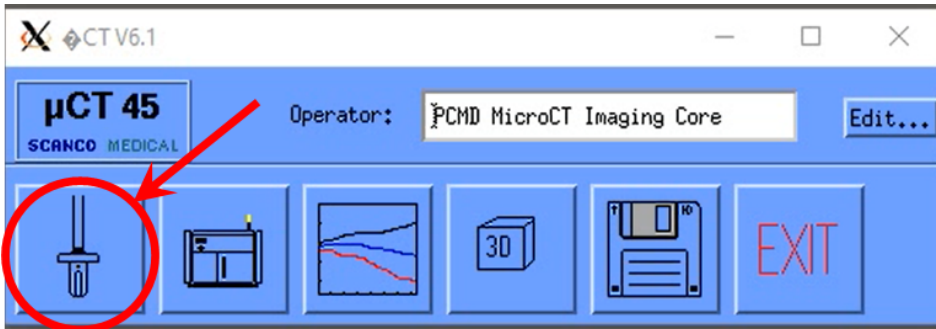
**IMPORTANT: Make sure the sample holder is loaded CORRECTLY onto the carousel!**



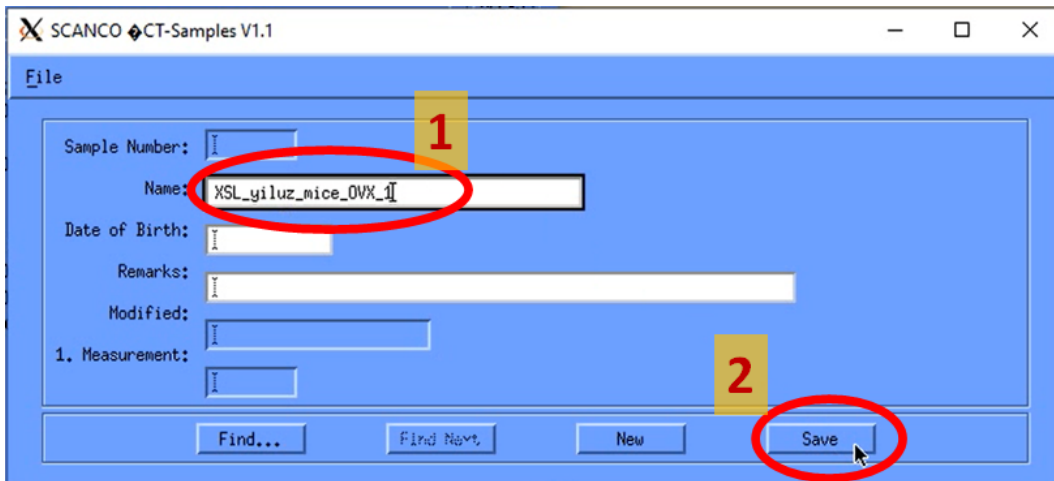
2. Close the door on  $\mu$ CT45. (You will hear a “click” sound to confirm it is secure.)

## Step 4: Create sample folder

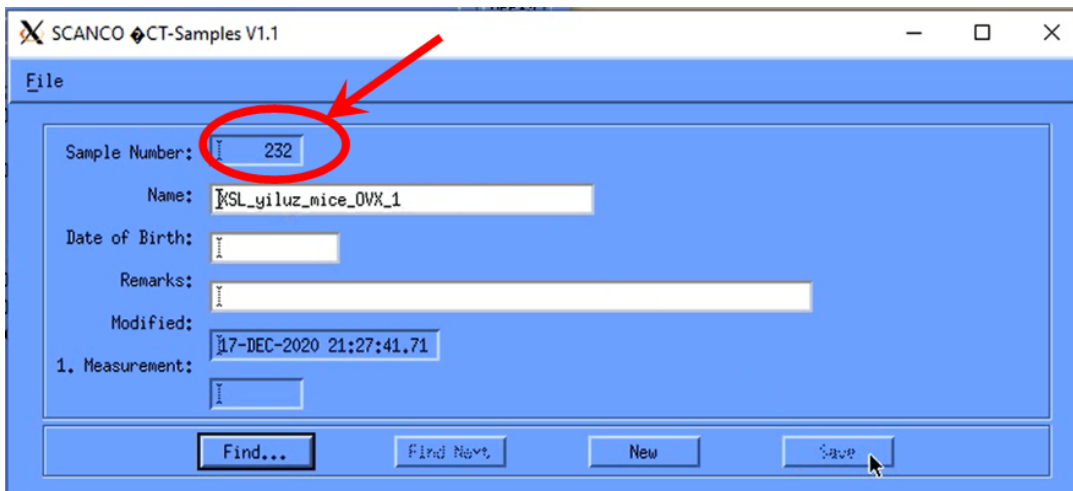
1. Click the first left button in the Control box (at the left bottom of the screen)



2. In the “ $\mu$ CT-Samples” window, enter your sample name:  
PI's initial\_your name or Pennkey\_Sample info  
Click the “Save” button

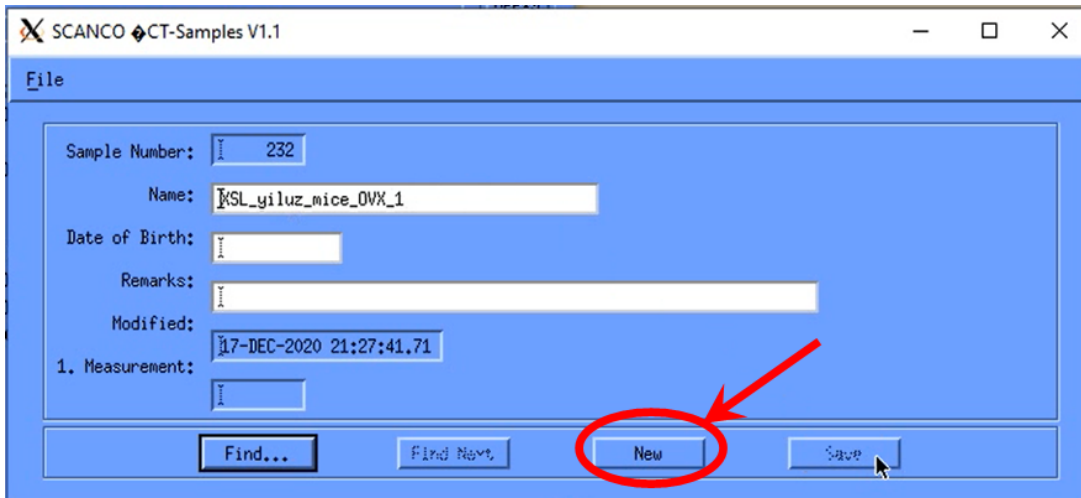


3. Record the generated “Sample Number” as you will need this in later steps.



#### How to set up a scan on $\mu$ CT45 (Carousel version)

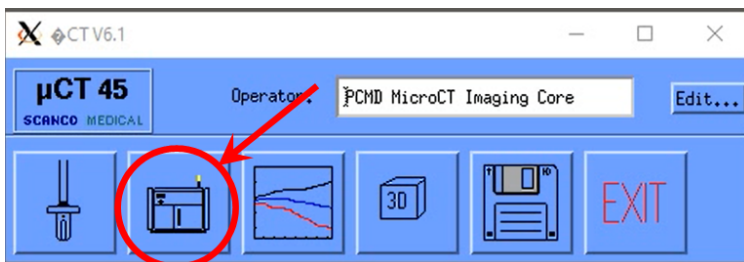
- (Optional if you need to create multiple sample folders) Click the “New” button to create additional sample folders. Remember to record your “Sample Number” information as it will be required for subsequent steps.



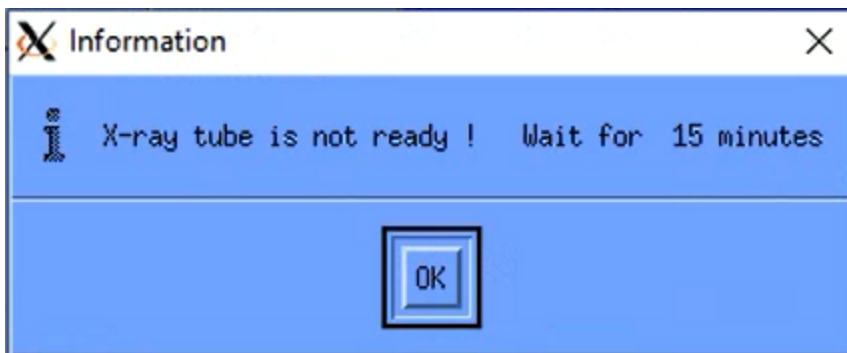
- Close the “ $\mu$ CT-Samples” window

### Step 5: Perform a scout view

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

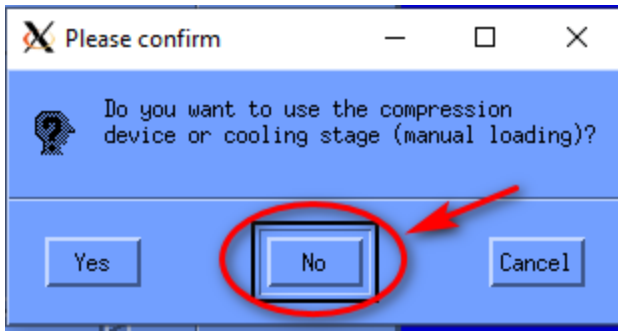


- (Optional) If the scanner hasn't been used for the last 8 hours, you will see the “Information” window, and wait for the X-ray tube to warm up (15~20 min).

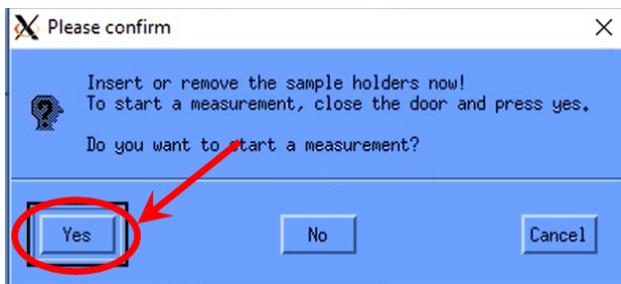


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- Click “No” on the window to confirm you don’t want to use the compression device (which is rarely used on our scanner).

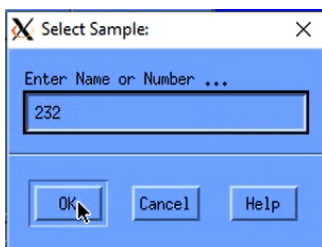


- Click “Yes” on the window to confirm you want to start a measurement (scan). Wait for 3 min.

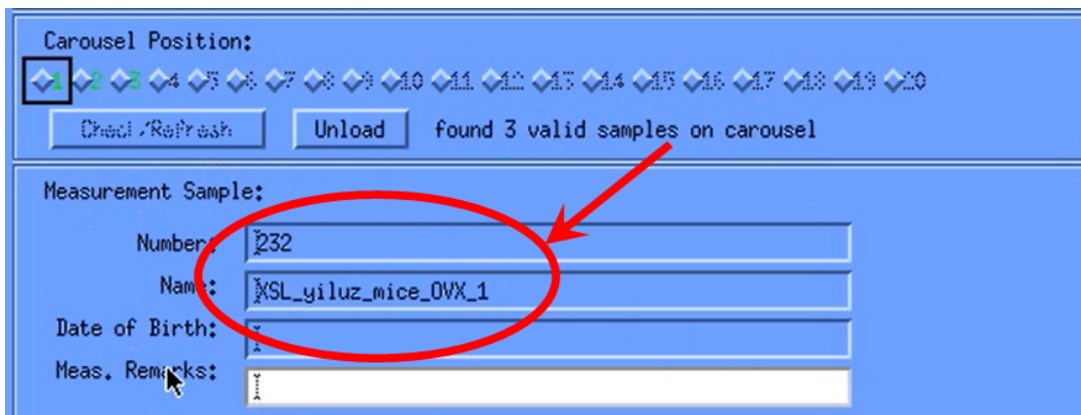


- Enter Sample Number (generated in Step 4. It’s “232” in the video demo), and then click the “OK” button.

(Tip: Although you can create multiple sample numbers for your scan, you only need to enter just 1 sample number for the temporary purpose of scout view. That’s to say, you don’t need to enter every sample number here just for the scout view.)



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



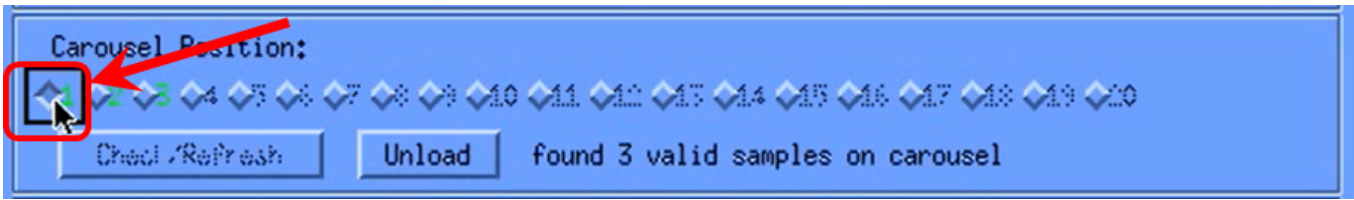


## How to set up a scan on $\mu$ CT45 (Carousel version)

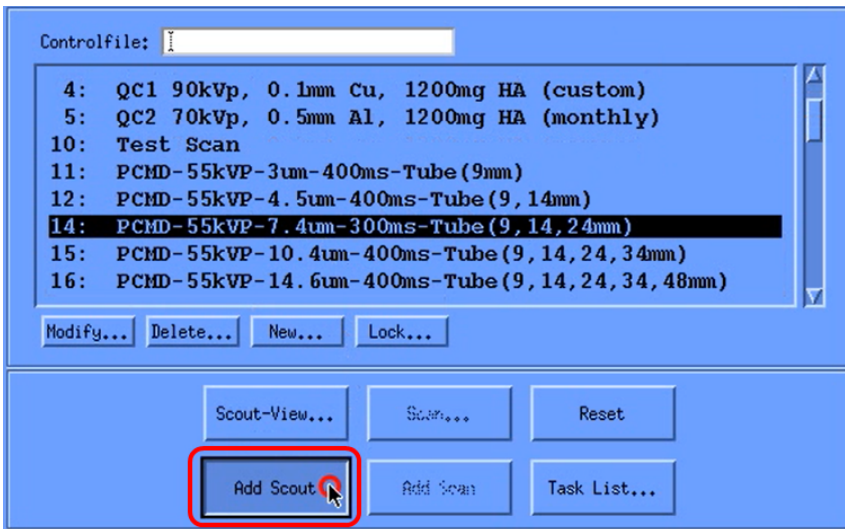
- Click the correct **Carousel Position** where your sample holder locates.

Note 1: Carousel position is the number you just recorded in previous steps.

Note 2: If no carousel position is selectable, please click the “**Check/Refresh**” button.



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



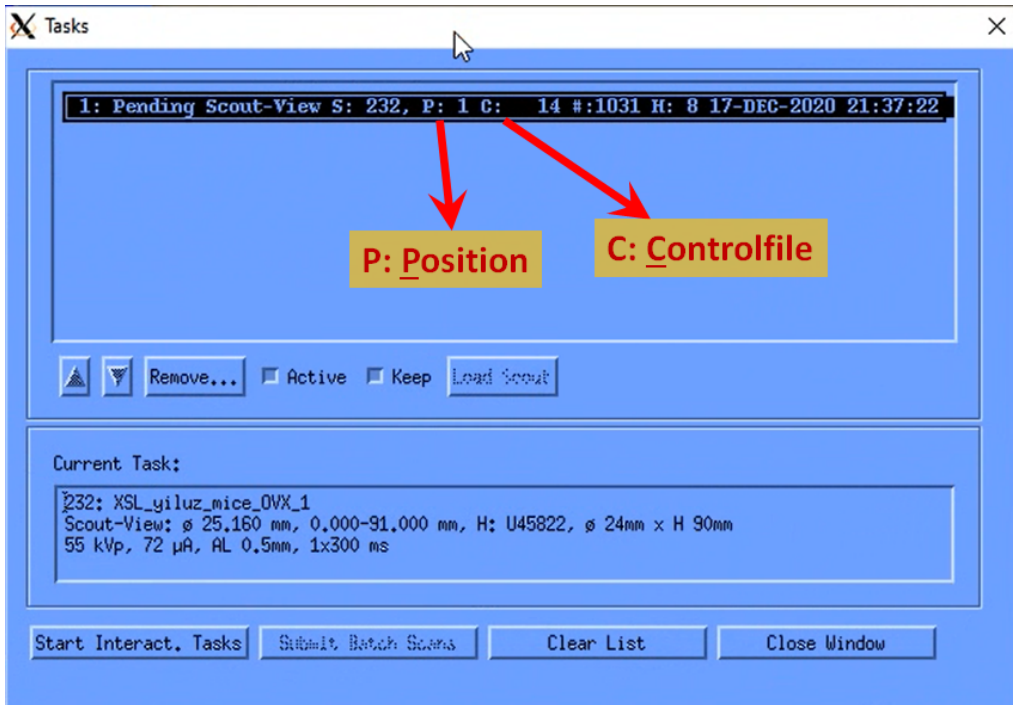
- Click the “**Task List...**” button.



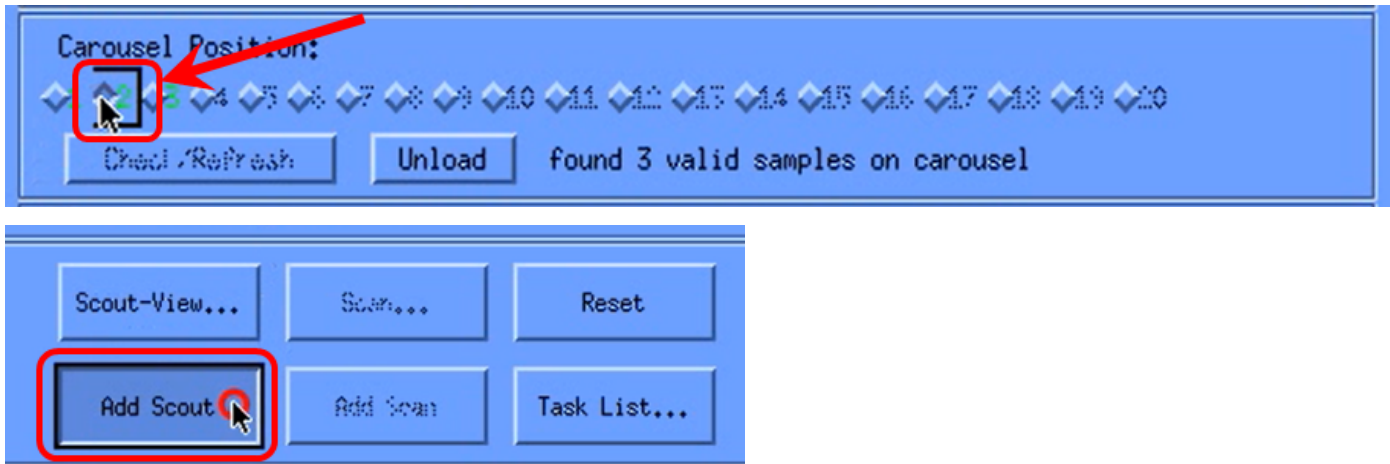
9. You will see the Pending Scout-view showing in the “Tasks...” window.

Note: P=Position, C=Controlfile.

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

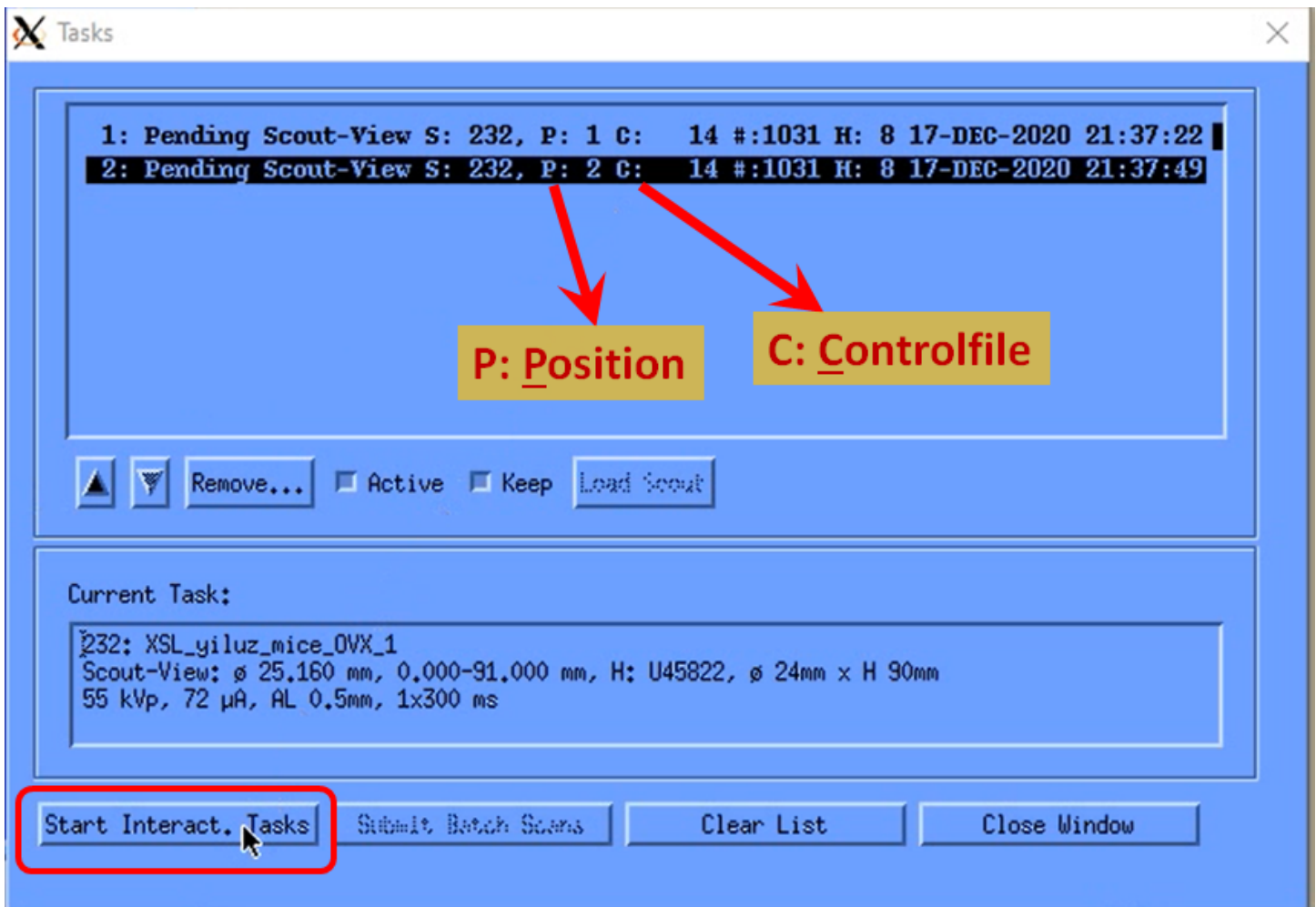


10. (Optional) If you loaded multiple sample holders on the carousel, you may select another Carousel Position, and click the “Add Scout” button again.

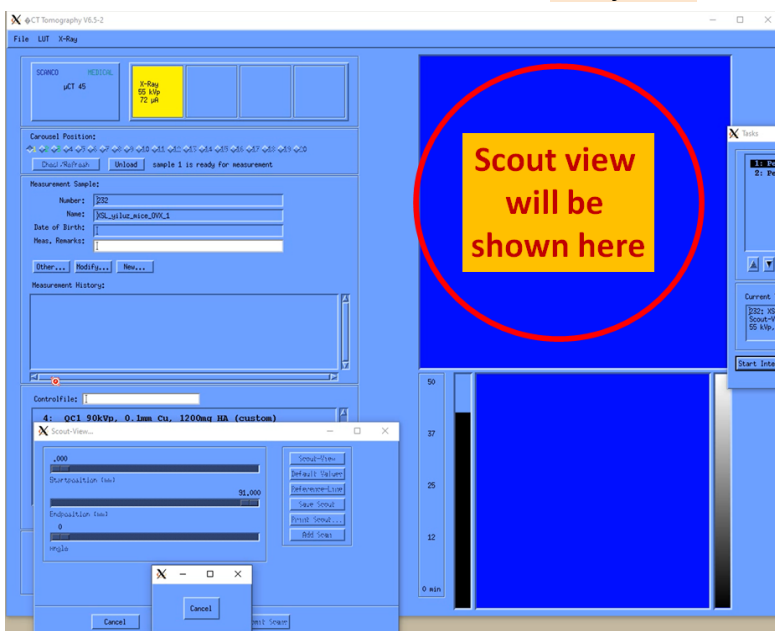


## How to set up a scan on $\mu$ CT45 (Carousel version)

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

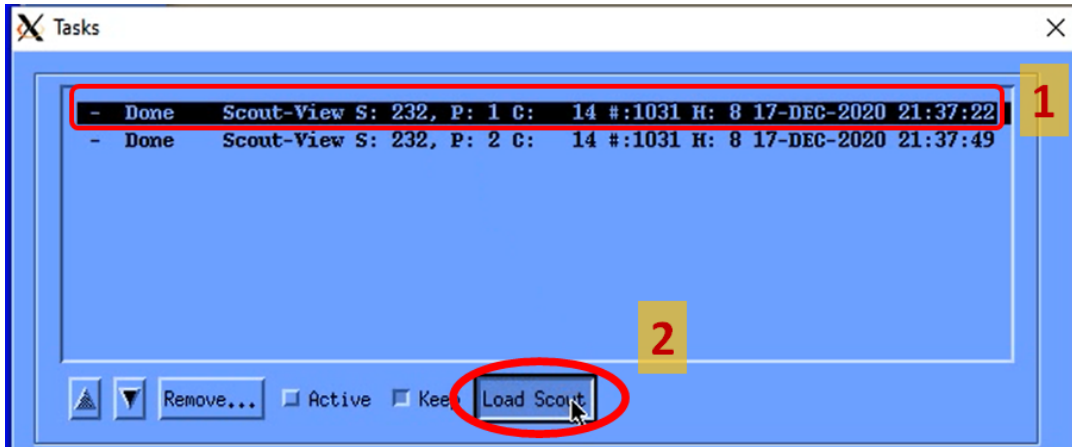


12. Wait for 3 min. You will see the X-ray tube turn ON and the Door lock indicator show Locked.



## 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.

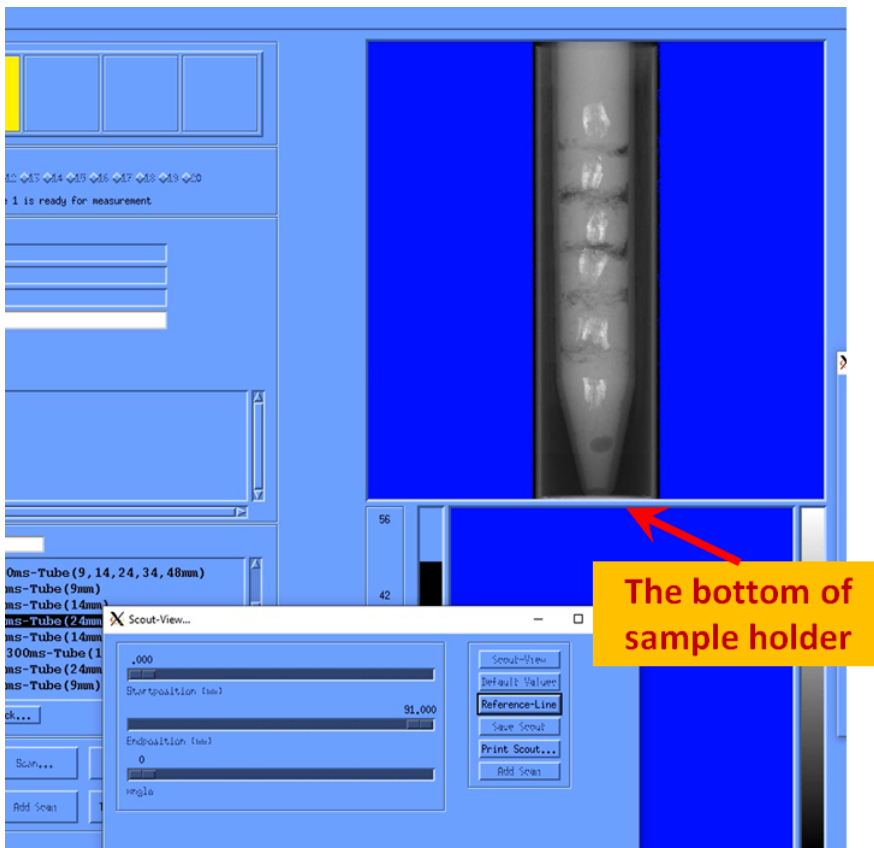


2. You will see your sample(s) in the software interface.

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.

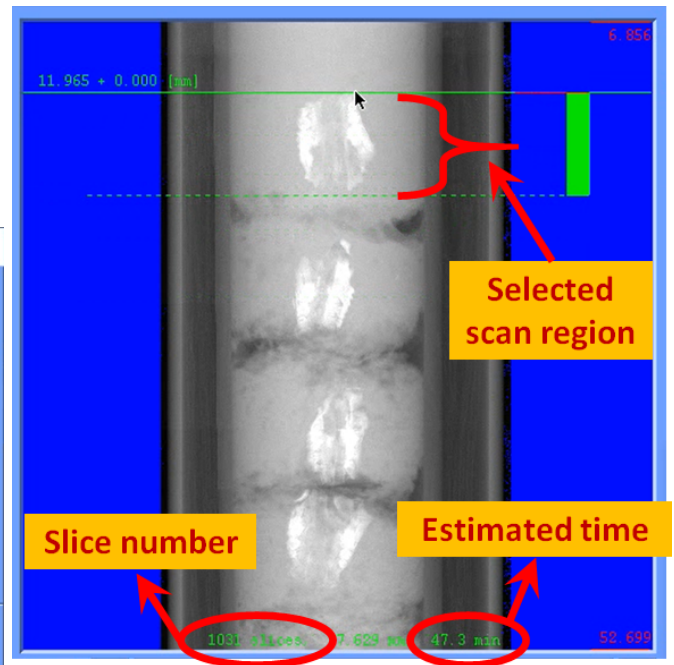
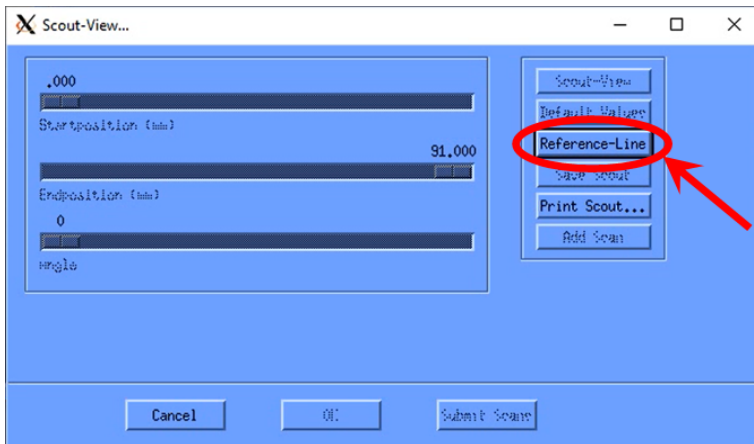
Tip 3: Click and hold both the **Middle** button of the mouse and **Shift** key: adjusting the contrast of the scout view.





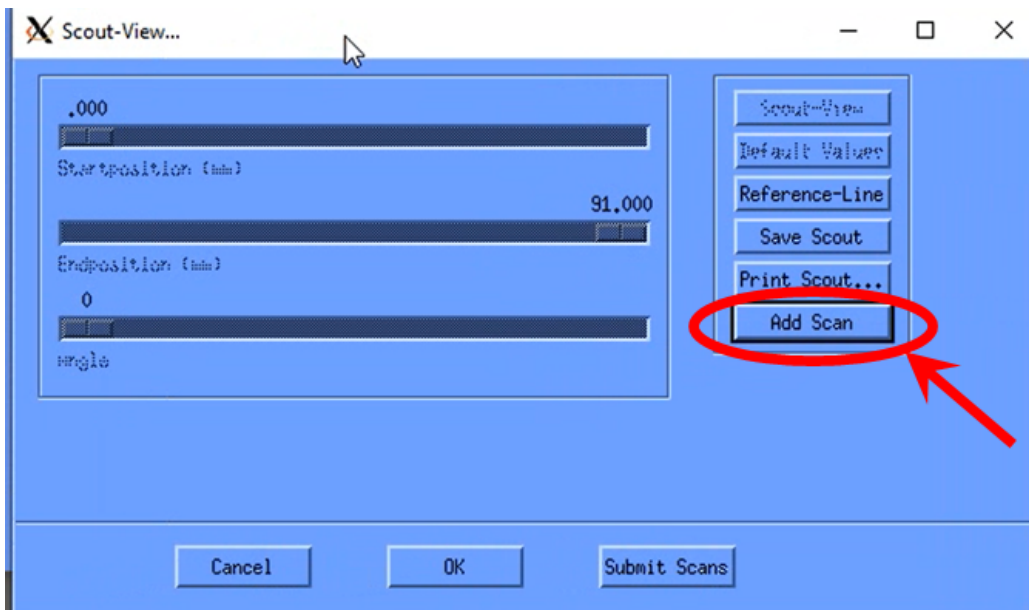
### How to set up a scan on $\mu$ CT45 (Carousel version)

- 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.

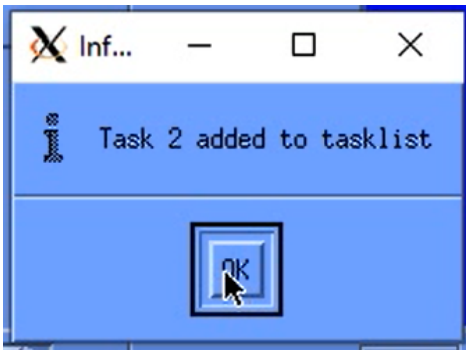


Note: If you want to change the position of the desired region, click the “Reference-Line” in the “Scout-View...” window again to cancel the previous selection.

- 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 ( $= 47.3 \times 1.4$ ) min.
- Click the “Add Scan” button in the “Scout-View...” window.



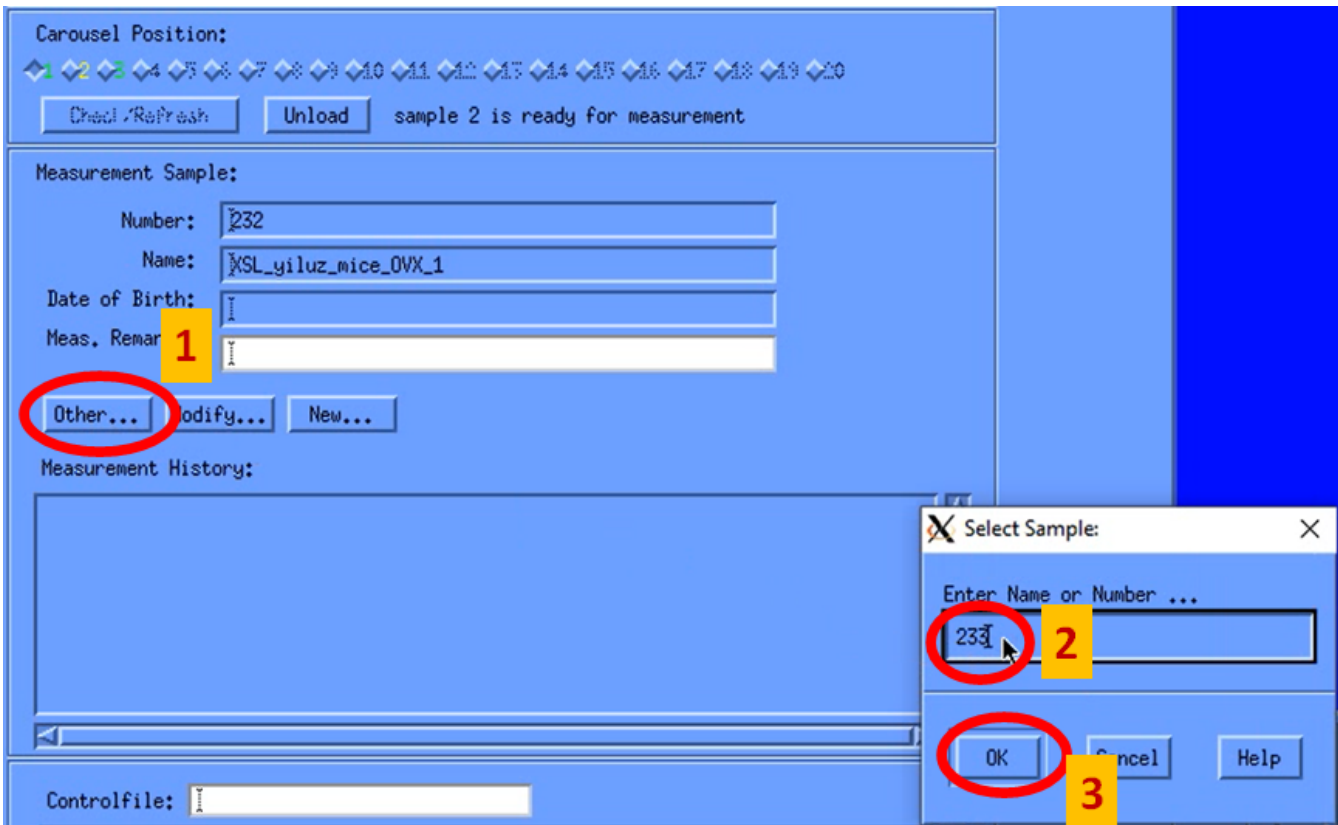
6. Click the “OK” button in the pop window “Information”.



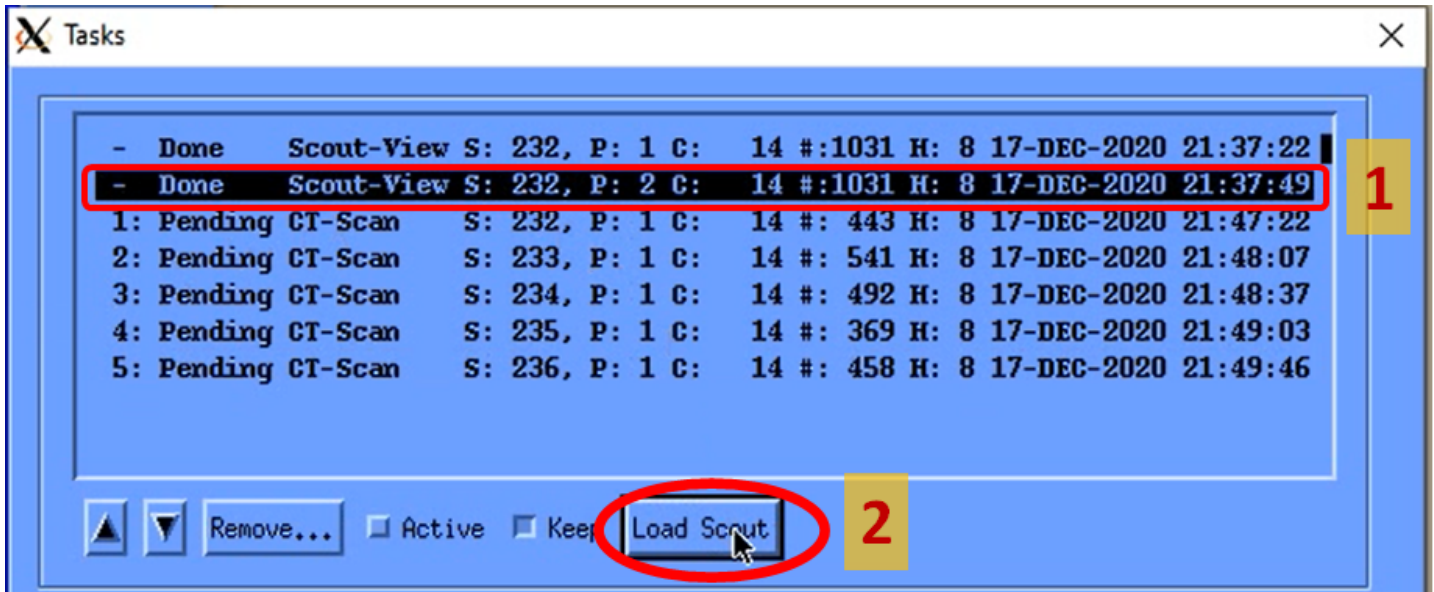
Optional: If you want to select the very middle region in the sample, press and hold the “Alt” key, and the central region will be selected based on the length of the sample.

7. You can add another sample for scan:

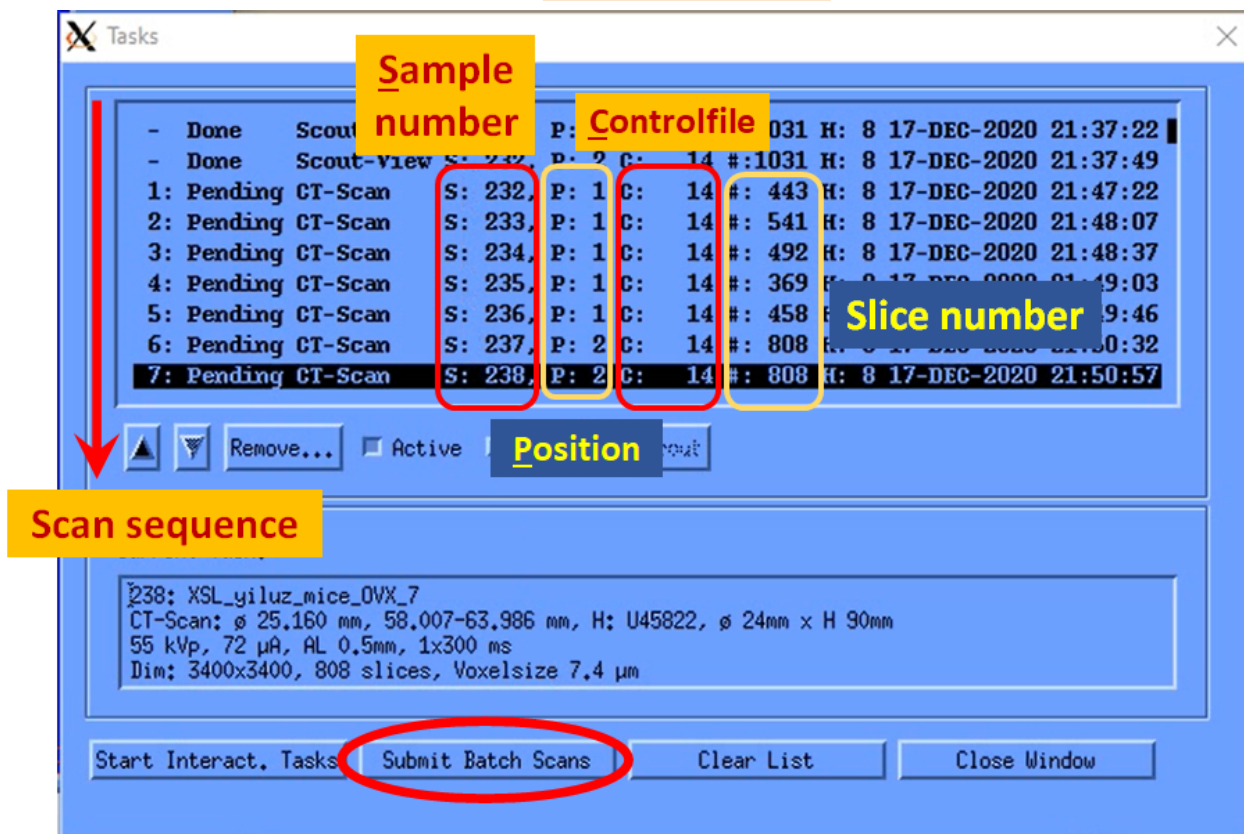
Click the “Other...” button, enter your next sample number, and click the “OK” button.



8. Optional: If you want to load the scout view of another sample holder, select the "Scout-View" in the "Tasks..." window, and click the "Load Scout" button. Then, select your interested region, and click the "Add Scan" button.



9. Once all samples 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.



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

11. 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!

```
MICROCT45 on SC4503::DISK1:[MICROCT45]
File Edit Commands Type "que", and press Enter. Help
$ que
QUEUE: SC4503_BATCH
666 MEASUREMENT_232 SC2361$DKC1:[MICROCT45.SCRATCH]MEASUREMENT_232.LOG;
667 MEASUREMENT_233 SC2361$DKC1:[MICROCT45.SCRATCH]MEASUREMENT_233.LOG;
668 MEASUREMENT_234 SC2361$DKC1:[MICROCT45.SCRATCH]MEASUREMENT_234.LOG;
669 MEASUREMENT_235 SC2361$DKC1:[MICROCT45.SCRATCH]MEASUREMENT_235.LOG;
670 MEASUREMENT_236 SC2361$DKC1:[MICROCT45.SCRATCH]MEASUREMENT_236.LOG;
671 MEASUREMENT_237 SC2361$DKC1:[MICROCT45.SCRATCH]MEASUREMENT_237.LOG;
672 MEASUREMENT_238 SC2361$DKC1:[MICROCT45.SCRATCH]MEASUREMENT_238.LOG;
7 jobs in SC4503_BATCH
Total number of jobs: 7
$
```